MARINE DIESELS IN NEWBURY

1-HISTORICAL BACKGROUND

On first consideration it may appear odd that relatively large diesel propulsion engines for ships should have been built in Newbury, an inland country town about as far from the ocean as it is possible to be in Britain.

In this respect, however, Newbury was by no means unique. In fact, some of the largest marine diesels ever built and installed in many ocean going ships in service today, were designed by Sulzer Bros of Winterthur, Switzerland, which is far further from the oceans of the world than Newbury.

The reason is, of course, historical, and the Newbury diesel history really has its roots back in 1790.

At that time Newbury was a small market town predominately serving the surrounding agricultural area, and a staging post on the route from London to the popular spa city of Bath and to the then important port of Bristol. Its sixteenth century parish church of St. Nicolas is a good example of the Perpendicular style of architecture, built from profits from the wool trade from which the town's prosperity had been derived and it is the site of two rather inconclusive battles of the English civil war of 1642-1646.

1790 was the year when Mr. William Plenty moved from Southampton and set up his business in Newbury to manufacture farming implements. The site he choose, which became known as The Eagle Iron Works, was in the centre of the town adjacent to the market place, behind the shops fronting, Cheap Street, It, remained there until 1965 when the Company, now named Plenty Limited, moved to its present premises in Hambridge Road thus releasing the original site for the present Kennet Centre shopping precinct.

The principal product in those early days was the Plenty plough which was patented as the 'improved Berkshire model' in 1800. Other products included cast iron pig troughs, large farm tanks, portable huts for shepherds and later, cast iron bridges.

Whether or not it was his earlier years in the port of Southampton, or the opening of the Kennet and Avon canal in 1810, which linked Bristol to London by water, and the subsequent contact with canal boats and the occasional sea going Vessel, what stimulated him is not certain, but, improbable as it may seem, William Plenty developed and built a very successful lifeboat. This was accepted by the Royal National Institution for the Preservation of Life from Shipwreck (the forerunner of The Royal National Lifeboat Institution), and by 1824 eleven of the fourteen lifeboats in service around the coast of Britain originated from Newbury.

William Plenty died in 1832 and was succeeded by his two sons, James and Edward Pellew (named after Admiral Sir Edward Pellew, who had been one of the early admirers and promoters of the Plenty lifeboat):

The Plenty zeal for invention and diversification had evidently not died with William, for in 1864 Plenty's took out their first steam engine patent, and thus laid the foundations of a product range that was to endure for very nearly a century. This first engine was a small single cylinder unit, and whilst many were fitted in small river launches and later, in Naval pinnaces, a whole range of sizes was ultimately developed, many for sea going ships and were exported world wide. Plenty steam engines were also fitted in the famous Nordenfelt submarines in 1885, where the procedure for a ‘crash dive' involved damping the boiler fires, unshipping the funnel, sealing the flue outlet, flooding the diving tanks and assisting the descent by the operation of vertically mounted propellers fore and aft - rather like a helicopter in reverse.

Plenty's also built the boilers to serve their steam engines, a 'boiler shop' being constructed in King's Road (on the corner with Gordon Road) for this purpose and in 1903 an agreement was concluded with the Great Western Railway Company for the provision of a railway siding into the site. Hitherto, all boilers had been despatched by road, many doubtless providing a foretaste of the traffic jams of the future.

These premises were to play a significant part later in the story.

Other Plenty involvements during this period included central heating equipment, engineering the sewage system in Cheap Street, country house electrical installations and sluice gates for the river Kennet near Hungerford.

It was around the turn of the century that Mr, Edward Pellew Plenty (1867-1949), grandson of the founder, in partnership with Mr. J Stradling, set up an agency to market the Benz motor car in Newbury and in accordance with the usual Plenty tradition this inevitably led to thoughts of entering into active automotive manufacture. It seems reasonable to assume that it was for this purpose that the company decided to engage the services of Henry Kent Norris, who was born in Devizes in 1884, and it is believed had studied engineering at Bristol, initially working with the Imperial Tobacco Company in that city.

A young professional engineer and motor car enthusiast, Kent Norris participated in some of the very early Tourist Trophy car races, in one of which he was reported in the Press as having been killed, at which his initial amusement was somewhat dampened when his father, coming to collect the body, discovered it in a hotel bar with an attractive young woman on its knee.

In 1908 the 'Newbury Van', as it was called, made its appearance. This was a 15 hundredweight commercial vehicle, with a two cylinder internal combustion engine mounted within the chassis under the driver's seat, with transmission via an epicyclic gearbox through a roller chain to the artillery type wheels. The price of the vehicle was £225 and prospective customers were offered a week's free trial together with the services of a driver. A limited number were produced until the outbreak of the first world war in 1914, when it is presumed that concentration on more essential products caused loss of interest in that particular project.

2 – PLENTY KROMHOUT BULB ENGINES

It was around the time of the development of the 'Newbury Van' that oil engine manufacture in Newbury started and it may be appropriate first briefly, to review the state of the art up to that time.
internal combustion engine development really started with Lenoir's two stroke double acting gas engine in the 1860's where a gas-air mixture was drawn into the cylinder, ignited, and expanded. This was followed by Otto's and Beau de Rochas' four stroke gas engines, and Dugald Clerk's and Robson's two stroke engines in the 1870's. As petroleum became commercially available, distillate fuels displaced gas and in the Priestman engine, lamp oil was mixed with air under pressure in an external heated vaporiser to form a ‘gas’ and ignited by spark in the cylinder. This four stroke engine was immediately successful and several tugs and fishing vessels were being propelled by it in the 1890's.

In his patent of 1890 Herbert Ackroyd Stuart took Priestman's idea a stage further by incorporating the heated vaporiser into the cylinder head and injecting the fuel into it from a high pressure 'jerk' pump, at around piston top dead centre. Instead of spark ignition, the fuel was directed onto the hot wall of the 'vaporiser', and this practice became known as ‘surface ignition'. He also increased the compression pressure from 25 to 40 lbs/sq, in., and used heavier oil and combustion was further assisted by the temperature rise of the air as it was compressed by the upstroke of the piston. Before starting the engine the vaporiser, or cylinder head pre-combustion chamber as it was termed, was heated by a blow lamp, but once the engine was running the combustion chamber temperature was self sustaining and the blow lamp could be extinguished - in fact, some designs featured an adjustable water drip into the cylinder in order that its latent heat of evaporation should absorb some of the excess heat and keep the temperature within bounds.

This was the originator of a long line of what became known as 'hot bulb' engines which continued to be manufactured by various companies, and with various refinements, for the next 40, years.

Two years after Ackroyd Stuart's patent Dr. Diesel developed his 'diesel cycle' engine which was based on the principal that as air, or any gas, is compressed its temperature increases and if it is compressed by the upward movement of the piston in the cylinder to a high enough pressure the resulting temperature will be sufficient to ignite the fuel as it is injected without the necessity to use a blow lamp to pre-heat the cylinder head. The increased compression pressure resulted, in accordance with thermo dynamic principles, increased thermal efficiency - i.e. more power for less fuel consumed.

Dr. Diesel's initial design was based on using coal dust as the fuel, later replaced by oil, blown into the cylinder by a blast of high pressure air obviously at a higher pressure than that in the cylinder. This, necessitated a high pressure compressor which in practice was a constant source of trouble which delayed the wider adoption of this type of engine and explained the continued popularity of the simpler, less efficient, but more reliable 'hot bulb' engine, particularly in smaller vessels where engineering expertise was less readily available. For example, in "The Last of the Sailing Coasters" Edmund Eglinton describes how, in the late 1920's when on passage from Newport, Wales to Guernsey in the auxiliary engined Schooner 'Mary Jones', her captain re-metalled and re-fitted a bottom end bearing at sea for the Bollinder hot bulb engine, using a ladle over the galley fire to melt the whitemetal. This illustrates both the simplicity of the engine and the versatility of the captain. It was, according to the captain, the first and only time that the engine had failed at sea.

The use of hot bulb engines for marine propulsion was adopted by Continental small ship owners, the Dutch and Scandinavians in particular, earlier and with more enthusiasm than by the British, possibly due to conservatism and the fact that Britain had been the principal developer of steam machinery or because coal was a frequent cargo in British coasters and was more readily available than fuel oil. Whatever the reason, this gave foreign oil engine manufacture a greater impetus, so that when Plenty's entered this field it was through a manufacturing licence with the firm of Kromhout of Amsterdam, arranged through the Dutch company's agent, Perman & Co. Ltd, of 82/83 Fenchurch Street, London.

It is not certain whether the initiative came from Plenty or Perman, but Plenty's experience and reputation in the manufacture of marine steam engines no doubt influenced the decision.
Plenty's have in their possession today a hand written note book detailing all the components, together with machining processes, times, and costs, required to manufacture a two cylinder Kromhout 2.H.3 hot bulb engine of 70 horsepower, complete with marine propulsion reversing gearbox - totalling 1146 hours at a wages cost of £45, plus some £148 for materials and 'small parts'. It would therefore appear that the wage rate for a skilled man in those days was in the order of 9½d per hour (about 4p today's money) and say £1.17s.0d (£1.85p) for an assumed 47 hour week.

This engine had cylinder bores of 240 mm and stroke of 310 mm, with a crankshaft 125 mm diameter, and typical hot bulb cylinder heads equipped with the usual blow lamps. It was a two stroke engine of the 'crankcase compression' type - i.e. air was drawn into the crankcase via a non-return valve on the upstroke of the piston and compressed on the down stroke, then as the piston neared the end of its downward travel an exhaust port in the cylinder wall was uncovered thus dissipating the residual pressure, followed by the uncovering of the transfer port which allowed the air under pressure in the crankcase to flow into the cylinder to expel the bulk of the remaining exhaust gases. Two of the principal limitations of this system will be appreciated: the volume of air provided from the crankcase was insufficient to expel all the exhaust gases, and thus limited the amount of air available for combustion; and each cylinder had to have its own separate crankcase which, for maximum effectiveness had to be of the smallest possible volume.

Also, it would not have been practicable to utilise forced lubrication partly because oil mist would have been drawn into the cylinder (lubricating oil is an expensive form of fuel!) and due to the risk of a crankcase explosion whilst the transfer port was uncovered. The Kromhout engine overcame the problem of lubricating the top end bearing - it just was not lubricated. The connecting rod eye was some 12 mm larger than the gudgeon pin diameter, and had a hardened steel flat topped insert on which the gudgeon pin, also hardened, rested. A square headed setscrew and check nut through the top of the connecting rod was adjusted to give approximately 1 mm clearance above the gudgeon pin. It was said that you could hear the connecting rod top end thumping from side to side as the engine was being barred over. Nevertheless, this arrangement, although crude, gave very little trouble in practice, and the gudgeon pin could be rotated and secured into the piston in three alternative positions as wear took place. It is not clear whether the above was the first engine built or whether this was a cost evaluation exercise before confirming the licence agreement but the first Plenty built Kromhout engine is believed to have left the Eagle Iron Works, around 1908 (Ref: illustration 1)

Then in 1910 a decision was made to transfer building of the oil engines to the old boiler shop premises in Kings Road under the management of Mr. Kent Norris, and to concentrate on steam engine manufacture in the town centre factory under the control of Mr. Gyles.

Over the succeeding ten years a number of Plenty Kromhout engines were delivered, including the propulsion engine for M.V. 'Grit'. This was the first motor vessel built and owned by F T Everard & Sons Ltd., of Greenhithe, and is described by B. Lavis in 'Shipping Wonders of the World' as the world's, first motor coaster. As had been the practice with the early steamships she was also equipped with sails to provide ancillary and emergency propulsion. Built in 1912 and sunk by U boat gunfire in 1916, "Grit' did however indicate the beginning of a significant change of outlook in the British coastal shipping industry, and also marked the beginning of an association which was profoundly to affect the future of oil engine manufacture in Newbury.

The method of starting the Kromhout engine was a rather interesting, if a somewhat acrobatic operation. Firstly the compression cocks would he opened and the engine barred round to just after top dead centre for the cylinder equipped with an air start valve, then the blow lamps would then be lit and played on the cylinder heads. After a while the fuel injection pump was primed and the quality of the smoke issuing from the compression cock examined, if considered suitable the compression cocks were closed, the air start valve lever would be pulled and returned by one hand immediately followed by closure of the screw down shut off by the other at the same time giving a few jerks of the foot operated injection pump priming lever, all whilst balancing on the other leg!

Not infrequently the engine would kick back and run in the opposite direction, The drill then was to shut off fuel injection to slow the engine until it just failed to pass over top dead centre, then prime the fuel injection pump as it started to swing back the opposite way, With luck it would then fire and carry on in the correct direction.

Luck was definitely needed, as reserves of starting air were limited - the air reservoirs being charged directly from one of the main engine cylinders via a valve adjacent to the cylinder head of similar design to the air start valve. There was usually no back-up compressor.

In one incident on one of the early engines, whilst effecting repairs with the ship drifting powerless towards the Cornish coast the Chief Engineer turned to the skipper and said "Well, you can have one start on the main engine or one bloody good blow on the whistle. Take your choice".

A sense of humour was a very necessary requirement under those sorts of conditions.

The Kromhout engine did not like running on light load, as then the hot bulbs would tend to cool off and the engine would stall on the application of load, resulting in a panic situation developing as the start procedure was initiated to the accompaniment of frenzied signals on the engineroom telegraph. When idling, it was therefore necessary to close off the circulating water, remembering to open up again after engaging the ahead clutch or astern brakeband.

During the l914-19l8 war part of the King's Road factory was given over to the production of 18 pounder shell cases with production and inspection processes being carried out with female labour, as recorded in existing photographs which also show a typical lathe in use at that time. (Ref. illus 2 & 3)

The King's Road premises were enlarged in 1918 by the addition of a new office block which remains today as an good example of early reinforced concrete building.

During the latter part of the decade Kent Norris had been busy developing his own designs of oil engines, and in 1919 he applied for the first of a number of patents, in this case Patent No. 159023 covering improvements to engine governors.

Henry Kent Norris was a tall man whose long legs earned him the sobriquet 'Split pin', with a keen inventive brain, a strong and forthright personality, and a dry sense of humour with a number of anecdotes arising, from his wide variety of interests gained in an era before specialisation necessarily narrowed the professional engineer's range of activities- He claimed to 'have held a spanner' for Geoffrey de Havilland when that aviation pioneer carried out his early experiments with aeroplanes at Seven Barrows, just south of Newbury, and in a consultant capacity he was Involved with Constantinescu in the development of interrupter gear to enable machine guns to fire between the blades of aeroplane propellers. (Constantinescu later developed a mechanical type of automotive torque converter one of which, installed in a solid tyred Trojan car and demonstrated its capabilities by being driven up the steps outside St. Paul's Cathedral in London).

Kent Norris also built a Humphrey pump - essentially a large "U" tube equipped with suitable valves to admit and expel water at one end and air and exhaust gases at the other as the column of water oscillated under the effect of internal combustion with the water column acting as the piston it was claimed that this pump worked quite well until the Inventor visited the Works and fiddled with the timing settings but the project was never commercially successful, although at least one (not built in Newbury) was installed, it is believed, by the London Metropolitan Water Board.

His principal interest, however, remained in the realm of oil engines, and in 1920 his P50 oil engine was unveiled and the Kromhout licence discontinued, being taken up by Day, Summers and Co. of Southampton.

3 - PLENTY SEMI-DIESEL ENGINES

During the post World War I period, the economic advantages of oil engine over steam propulsion were slowly becoming apparent to British coastal shipowners, a very conservative breed of men. Although perhaps more prone to the unexpected breakdowns, oil engines occupied less space than a steam engine with their attendant boilers, condensers, feed water tanks, etc., and consumed less fuel The running costs were therefore lower, and more space was released for the carriage of cargo. It was against this background that the new Plenty range of engines was launched,

The P50 range of engines, developed 50 bhp per cylinder, and was available in sizes up to 6 cylinders and 300 horsepower. (Ref. illus. 4). The engine had a bore of 335 mm and stroke 350 mm and was designed for a full speed of 300 rpm. Like the Kromhout engine it was a loop scavenge two stroke and utilised crankcase compression to provide the scavenge and combustion air. However, the compression pressure was increased, and unlike the Kromhout, it introduced the use of a heated plug in a water jacketted spherical combustion chamber instead of the uncooled hot bulb type of cylinder head, thereby being termed a 'semi-diesel engine'. Before starting this plug was pre-heated by a blow lamp, although an electrically heated plug was offered as an alternative.

It also featured pilot fuel injection directly onto the hot plug for easier starting, changing over to diffused injection once running (ref. illus. 4) water cooling of the crankcase and transfer port and therefore of the scavenge air and other novel features, including the governor patented by Kent Norris in 1919.

The original P50 design had a separate cylinder sandwiched between the crankcase and the cylinder head, with the cylinder head studs rooted in the crankcase and passing up through the cylinder water jacket space. However water sealing problems became apparent, so the design was then modified to a combined crankcase/cylinder casting.

As With the Kromhout engine, renewable cylinder liners were not then fitted.
To stiffen the whole structure the cylinders were coupled to each other by short cast iron flanged tubular struts, which occasionally fractured. This would become apparent when the engineer noticed the affected cylinder nodding to him as he passed by.

These engines were started by the controlled admission of compressed air to the cylinders in sequence, and for marine propulsion applications they were fitted with built-in clutches and reversing gearboxes. Reverse rotation was achieved through a gearbox containing bevel gears on the input and output shafts, connected by small bevel gears, mounted radially within a rotatable supporting ring, which was gripped by an encircling hand brake. For ‘Ahead’ the brake hand was released and the input and output shafts were clutched together and routed with the supporting ring and its bevel gears as one complete unit. Manoeuvring by direct reversing, that is to say by dispensing with the gearbox and actually running the engine in the opposite direction, of rotation, was tried out in 1923 but this was not a great success as the frequent admission of compressed air as the engine was started, stopped, and started again during the ship's manoeuvring, tended to cool the cylinder head hot plugs and render starting uncertain, making it necessary to light up the blowlamps and to keep them in action until manoeuvring had been completed.
A similar design of engine rated at 30 horsepower per cylinder and designated the P30 was also produced, and later the P5 and P10 (5 bhp and 10 bhp per cylinder) engines were made. These two smaller engines had the earlier type of hot bulb cylinder heads, and were advertised for auxiliary marine duties, and also as electrical generating sets for large private houses, etc.

The first two P50 single cylinder engines no’s. 501 and 502, were installed in stern wheel river craft on the Nile for the Egyptian Government - a somewhat bizarre application. More conventional applications. included a number of motor coasters for F.T. Everard & Sons Ltd and other owners, and a twin screw Installation for the motor tug 'Carlos Lomb' built at Chester for Liebigs of the Argentine. (Ref, illus. 6). With her, as she sailed for the Argentine under her own power, went Plenty's Guarantee Engineer Mr. Jim Haines, who was frequently involved on installation work and acceptance trials, and who later became Works Supervisor in the diesel factory. (He also later acted as Chief Engineer for Everard's in m.v. 'Suavity' at the Jubilee Spithead Naval Review.)
M.V. 'Prowess', which had a four cylinder P50 propulsion engine, was also equipped with a P30 engine which, by means of pulleys and shafting, drove a generator and also a Tangye cargo pump situated in a housing on the main deck.

Those were hard days for all seafaring folk, particularly for these in the coastal trade, and the skippers tended to make the most of their time ashore in the local hostelries. There are two typical anecdotes about one of them, "Ginger" Milton, who later went on to become Everard's Commodore Captain. At sea, after a heavy session ashore and wanting to relieve himself, he walked to the leeward end of the bridge forgetting that in 'Grit 11' it was open-ended and stepped smartly overboard. Luckily the crew were alert, and he was recovered without harm.
On another occasion with a gathering of other skippers in the "White Hart" adjacent to Everard's Greenhithe offices (and known as the 'sub office"), he won. a competition to see who could drink the most beer before having to answer the call of nature. His tally was seventeen pints - and he wasn’t wearing sea boots, either,

Although Originally designed for marine use, as main propulsion engines in smaller vessels and in generating sets and ether auxiliary roles in large ships, by 1922 the larger engines were also being advertised for land applications. A number were sold for mains power generation including installations in Farnham Power Station and a four cylinder P50 engine In Newbury Generating Station at Greenham Lock which remained in commission in a standby role until the 1950's.

During the period 1924-28, a range of air compressors and plunger pumps, for marine use in association with the Plenty engines, was also developed.

1926 was a very lean period in the Plenty fortunes, with orders few and far between, so that a decision was made to concentrate what little work was available into one factory, and the Kings Road works was closed. This was a time of great hardship and men were hired and fired as and when orders were received and completed. They would assemble hopefully at the factory gates each morning, the foreman would choose the lucky few he required that day, and the rest would be told to go home and "try again tomorrow". On occasions the Works would close completely for periods until new orders, were forthcoming.

At this time all the Kings Road plant , with the exception of one solitary engine, was removed to Cheap Street.

4 – THE PLENTY STILL ENGINE

In 1928 a decision was taken to separate the oil engine business from the other Plenty interests, and an independent company was set up as 'Plenty Still Oil Engines Ltd'., having as Directors Major C.H.L. Cazalet (Chairman), Mr. H Kent Norris (Managing Director), and Mr. E.P. Plenty. The reasoning behind this separation from Plenty & Sons is obscure - could there have been a conflict of personalities between Mr. Kent Norris and Mr. Gyles with their opposing interests and priorities ?

The objects of this new company were to take over and continue the manufacture of the Plenty semi-diesel engines, to manufacture engines built under the Still principle, and to develop further ranges of engines. For this purpose the new company acquired the premises in King's Road in which the Plenty engines had previously been constructed,

The connection with the Still Engine Company Limited appears to have been due to personal contact with Captain Acland, its works manager, whose family lived locally at Cold Ash.
Dr. Still's principle involved recovering some of the waste heat normally lost with conventional diesel engines. In very broad terms it may be said that, of the total heat energy content of the fuel oil, only one third was converted into useful mechanical energy, whilst one third disappeared up the funnel in the exhaust gases and one third was dissipated into the cooling water by conduction and the surrounding atmosphere by radiation.

The Still engine comprised normal two stroke diesel operation in the cylinder above the piston and steam pressure acting on the up stroke on the under side of the same piston, the steam being generated in a boiler heated by the diesel cycle exhaust gases, and using the diesel cylinder cooling water as boiler feed water. The boiler was also arranged for coal firing so that steam could he generated for starting purposes, after which the diesel exhaust would take over.

Whilst the engine promised a comparatively very good thermal efficiency, it was obviously considerably more complicated than either a straight steam or diesel engine, and introduced new problems in respect of cross contamination from the two different operating media, for example exhaust gases in the steam condenser and particularly oil contamination of the boiler feed water.

As far as the author can ascertain; the first marine application of a Still engine was in an experimental vessel named ‘Meccano', built by Denny's of Dumbarton in 1917, the engine having been constructed by Savery of Birmingham, possibly jointly with Denny's. The engine was removed after two years.

Licences to build the Still engine were taken out by several customers, including Scott's of Greenock, Peter Brotherhood Ltd. of Peterborough, Kitson &Co Ltd of Leeds, and Dujardin of Lille, in addition to the Newbury company.

Scott's first Still engine was installed in the merchant ship 'Dolius' and had been fully tested by 1925. Scott's next Still engine, installed in the 'Eurybates' in 1927, followed a modified arrangement, having separate steam and diesel cylinders - 5 diesel and 2 double acting steam which indicates that they had probably experienced some problems with the combination arrangement. Both these vessels, owned by the Alfred Holt Line, apparently gave good service, 'Dolius' being lost in World War II, and 'Eurybates' being re-engined in 1948, but as no other Still engines were built by Scott's, or bought by Alfred Holt, it must be assumed that there were significant shortcomings.

Kitson's built a Kitson-Still railway locomotive in 1927. This experimental engine had eight diesel/steam cylinders, four facing forward and four facing backwards either side of a transverse four throw crankshaft which drove a layshaft via 1.878:1 step down gears, The layshaft, situated between the first and second pair of driving wheels, terminated in overhung cranks which drove the three pairs of driving wheels via conventional coupling: rods. The engine's tender had a capacity of 1,000 gallons of water and 400 gallons of fuel oil which was used both for the engine internal combustion, and for firing the boiler assisted by the diesel exhaust.

It appears that an experimental Plenty-Still type engine had been built in the King's Road factory around 1925/6, and the first and only commercial engine of this type to be built in Newbury was delivered in January 1928 - and so was presumably actually built in the Cheap Street factory. This was a three cylinder version installed in the drift net fishing vessel 'Larus' built at Selby for Alexander Fishing of Lowestoft. cylinder bore was 280 mm, stroke 355 mm, and the engine developed 210 horsepower at 300 rpm. (Ref. illus. 7 & 8).
It was envisaged that steam operation would he utilised for starting, manoeuvring and for very low speed operation whilst fishing and the combined steam diesel cycles for passage to and from the fishing grounds.

The diesel cycle of the engine employed a reciprocating pump of 425 mm bore and 355 mm stroke for the provision of scavenge and combustion air, with fuel directly injected through nozzles in the cylinder heads. The engine was equipped with just a single fuel Injection pump and spill valve operated by a three lobed cam (ref, illus 9), in conjunction with three distributor valves, actuated via cam followers located at 120^0 around a single cam (ref. illus. 10), to direct fuel to each cylinder in turn. The cylinder head injectors were held down by spring loaded plates, thus also acting as emergency relief valves.

Steam was raised in a coal fired Cochrane vertical flue tube boiler modified with additional tubes through which the diesel exhaust pasted. Steam admission to and release from the bottom of the cylinder to operate on the underside of thee pistons was controlled by poppet valves operated by three sets of cams - for starting, ahead and astern and to provide cut off for normal ahead running - controlled by an elaborate system of gears, detents, and an eccentric shaft to lift the rockers clear,

Works tests indicated a fuel consumption of 0.378 lbs per bhp per hour.
During shop tests problems were experienced with the design of the injector nozzles due to impingement on the piston crowns, and although a number of variations were tried this problem was never completely overcome. With the benefit of hindsight it is possible to suggest that this may have been due to the inability at that time to generate high enough injection pressures to ensure adequate atomisation, especially considering the leakage potential both in the fuel injection pump and the distributor valves which were. all made "in house", and this may have been a significant factor in the ultimate failure of the engine.

The vessel went into service early in 1928 and initially, whilst the Newbury guarantee engineer was on board, operated reasonably well. However after he left, the performance of the engines gradually deteriorated ending with the vessel having to he towed into port. It appears that the owners felt that enough was enough and no real effort was made to investigate or correct the problems, so that the engine was removed from the vessel and returned to the King's Road works where it remained for several years.

The guarantee engineer referred to above was Mr. Edgar Wildsmith. He started his apprenticeship with Plenty's in 1918, and except for a short spell as a seagoing engineer, was involved for the succeeding fifty years with the testing and development of the Newbury oil engines. A colourful personality, in his capacity as chief service engineer and 'trouble shooter' he was very well known by and welcomed by Superintendents and Chief Engineers at ports all round the country. In his younger days his preferred mode of transport was his Harley Davidson motor cycle, and on one of his errands of mercy he was temporarily stranded one Sunday in the wilds of Scotland when the garage proprietor refused to sell him petrol 'on the Sabbath'. Such scruples did not, however, preclude him being offered, and charged for, accommodation for the night.
He was a clever and capable engineer who could no doubt have risen to a higher position in the industry had he wished, but who preferred the more direct contact with the engines provided by his work under Mr. Kent Norris. In fact, job satisfaction was the key to the firm's ability to retain a number of very capable engineers over the years, including no doubt, Henry Kent Norris himself.

Edgar had a phenomenal memory, and some of the information in this article regarding the early days of oil engine developments in Newbury is based on information recorded from him in the later part of his life.

Meanwhile production of the existing range of 'Plenty' engines continued, and at the same time Kent Norris began working on a 'solid injection' version of the P50 engine - which was to become Newbury's first true 'diesel'. Perhaps it should be explained here that to operate as a 'compression ignition', or 'diesel', engine, the air within the engine cylinder has to be compressed during the up stroke of the piston to a pressure of around 34 atmospheres in order to raise the temperature to the level of nearly 600° C required to ignite the fuel as it is injected and injection and combustion should be completed as nearly as possible at 'top dead centre' to obtain maximum work from the expansion of the hot gases.

It must also be appreciated that, considering that combustion can only take place where fuel and air are in contact - i.e. on the surface of the globules of oil - and that for a given quantity of oil, the ratio of surface area to volume increases as the size of the droplets is reduced, it is desirable to 'atomise' the injected oil as finely as possible, and to mix it as thoroughly an possible within the surrounding air, to achieve quick completion of the combustion process.
In a 'solid' Injection diesel engine this 'atomisation' is achieved by forcing the oil through very fine holes in the injector nozzle, requiring a fuel injection pressure in the order of 350 atmospheres to enable this to take place in the very limited time available, and to ensure the necessary diffusion within the combustion air. Such pressures were not easily achievable in the early days of the diesel engine and 'blast injection' had usually been adopted as a more practicable solution. (With this arrangement the fuel- oil was mixed with an air charge by the action of 'pulveriser rings' within the cylinder head fuel valve and was blown into the engine cylinder by a blast of air at a pressure of only about 65 atmospheres - more easily attainable in those days). However the provision of high pressure air compressors, without which the engine could not function, added a very unwelcome complication, and engine breakdowns were more often due to these compressors than to any other cause.

It was therefore the presumably new availability of the Bosch fuel injection pump that enabled Kent Norris to produce his 'S.I.D.' (Solid Injection Diesel) engine (Ref. illus. 11).

This engine was basically the P50 with a different cylinder head and fuel injection system, remaining a loop scavenge two stroke with crankcase compression for the provision of scavenge and combustion air. The cylinder head contained an almost conical shaped open combustion chamber, totally water jacketted. As previously, lubrication appears to have been by a bank of sight feed lubricators, with an annular grooved distribution ring against the side of the crank web supplying oil to the bottom end bearing via a drilled railway in the crank web and pin, and a quill fitted through the cylinder and liner to supply the gudgeon pin and top end bearing An extraction pump was fitted to rescue any oil that might survive and to return it to the ready use tank. Presumably, because of the minute oil flow through the main bearings, these were water cooled. Direct compressed air starting was standard on all engines, and propulsion engines could be equipped for direct reversing or supplied with a reversing gearbox.

Cylinder bore was 320 mm, stroke 390 mm, and output per cylinder was 55 bhp at 300 rpm, a power output 10% greater than obtainable in its semi-diesel configuration. Unlike its predecessors, this engine was fitted with renewable wet cylinder liners. In common with all the oil engines ever built by the Company, it was of the trunk piston type, the only exception being the two Still engines which, as the cylinders had to be sealed below the piston for the steam cycle, were of the crosshead type.

Unfortunately by the early 1930’s,trade was in a very depressed state, and in 1932, shortly after the engine had been launched, a decision was taken to wind up the business of Plenty Still Oil Engines Ltd.

5 – SIRRON DIESEL ENGINES 1932-1942

By 1932 Everard's had some eleven or so of their ships propelled by P5O engines, and the prospect of being unable to obtain spare parts caused them great concern so that they resolved that the business should be re-activated.

Thus The Newbury Diesel Company Limited was formed in the summer of 1932 with the Everard family (three sons and the daughter of the founder) being debenture holders. The board of Directors comprised Major CH.L. Cazalet (remaining as Chairman), Sir George Buchanan, Mr. F.W. Everard, Mr, W. J. Everard, and, presumably, Mr. H. Kent Norris as Managing Director. Another shareholder of interest was Mr. K. Lee Guinness, the well known racing driver and record holder whose interest presumably derived from contact with Kent Norris during his racing days. With the financial backing thus secured the new company took over the premises and all1 the assets of Plenty Still Oil Engines Ltd.

Later, in 1936, Everard’s bought out the other shareholders, and the Company became a wholly owned subsidiary of F.T. Everard & Sons Ltd.
The S.I.D, engine, which was hailed in the October 1932 edition of 'Motor Ship’ as 'a new airless injection diesel' and described in some detail, represented a bridge between the semi and true diesel, but retained the disadvantage of crankcase compression which, as mentioned earlier, did not supply a full charge of combustion air so limiting the amount of fuel that could he burnt and therefore limiting the power obtainable from a given swept cylinder volume. It also inherited various other disadvantages, notably a lubrication system that caused not infrequent bearing, failures.

The first of these engines, four cylinder versions, were fitted in M.V.'s 'Actuality' and 'Antiquity', built by Fellows of Great Yarmouth and towed round to be fitted out in the Everard yard at Greenhithe, As they were equipped with 1 ton L.S.E. electric winches the use of the P5 and P10 auxiliary engines was discontinued, being replaced by a general purpose set comprising a Russell Newbery 3 cylinder series D engine driving a 14 Kw L.S.E. generator, an NDC GS1 pump, and a Hamworthy air compressor.

As a matter of interest Everard's 'Aseity' had a D3 National general purpose auxiliary set and a DI National coupled to a 5 Kw Lawrence, Scott and Electromotor D.C. generator to provide power at sea for the electric steering gear then coming into use. Prior to this it had been the practice to shut down the auxiliary engine and to "run on the paraffin dynamo" - i.e. to light up the oil lamps to save the expense of running the generator at sea.

Thereafter RN, and in some instances National, engines were used for auxiliary drives until replaced by Kent Norris' 1O bhp per cylinder 'H' type, which were designed to similar dimensions and to fit into the same baseplate as the RN's, but with entirely different cylinder heads, pistons and gear driven instead of chain driven camshafts. These were succeeded by the 'J' type which featured, a block type fuel injection pump with integral governor in place *of* the individual fuel pumps and NDC camshaft and governor.

It is presumed that the SID engine was produced as a stop gap' whilst Kent Norris was engaged in designing and developing his next generation of engines. The new engine, designated the 'S.B.D.' (Solid [injection], Blown, Diesel) type, (ref. illus. 12 & 13), represented a radical departure from the previous designs and incorporated many features that were to be retained in all the later engines. It appeared in 1933 and introduced the use of the brand name '**SIRRON**' (i.e. Norris in reverse) by which all subsequent Newbury engines were to be known.

This engine replaced crankcase compression for the supply of scavenge and combustion air by using mechanical rotary blowers, one per cylinder running at twice crankshaft speed and driven by the camshaft drive chain, which were thus able to provide an ample air supply to purge the cylinders of exhaust gases and provide maximum combustion air. This arrangement was the subject of patent No.408489/32 taken out by Kent Norris in 1932, but differed slightly in that all blowers delivered into a common manifold. The blowers were, presumably, Powerplus 'S' type, for which a manufacturing licence had been taken out in September 1933.

The crankcase was a continuous chamber formed by individual arch shaped columns joined by front and back plates (a form of construction necessitated by the limitations of the machine tools in the factory) and supported entablatures, bolted together to form a continuous unit, containing the cylinder liners etc., secured by long through bolts rooted in the bedplate. The liners themselves, which were the subject of Kent Morris' patent No. 409246/33, Incorporated water cooled support 'bars' in the exhaust ports, and this feature remained in use in successive designs of engines of similar size until the 1950's.

Although a licence was taken out for an exhaust valve system to the Still patent no. 171838/20, this was not actually adopted. Instead rotary valves - large square "butterfly" type valves rotating within a square sectioned branch between the cylinder and exhaust manifold - were used to curtail the escape of scavenge air once the exhaust gases had been purged, and to allow the combustion air pressure to build up before the inlet ports covered. These valves, mounted on the back of the engine, were driven from the camshaft via helical gears and a cross shaft.

To the very great relief of the ships' engineers who had to run and maintain them, these engines were able to use a modern forced lubrication system, thus curing some of their nightmares in which hot and seized bearings had featured so prominently. The engines had cylinder bores of 320 mm and a stroke of 400 mm, developing 100 brake horsepower per cylinder at 300 rpm.

Three years later a modified version was produced, the rotary exhaust valves were discontinued - there had been a number of cases of debris, e.g. broken piston rings, jamming the valves and stripping the gear drive from the camshaft; Newbury designed blowers, running at four times crankshaft speed were adopted; and the piston and cylinder head combustion chamber were re-designed. The cylinder heads were constructed in two parts, the inner section containing the combustion chamber, being held down onto the liner flange by an outer section forming the outside of the cooling water jacket. "Dummies" were available, comprising a housing with two layshafts, to take the place of any blower that seized up at sea.

In 1935 Mr. Kent Norris obtained patent no. 466716/35 which introduced a spring connection between each fuel Injection pump rack and the control linkage, so that a Seizure of the rack in any fuel pump would not inhibit the ability to control the remaining fuel pumps and therefore the speed of the engine - a feature still very widely in use today.

As mentioned above, 1936 was also the year that the Company became a wholly owned subsidiary of F.T. Everard & Sons Ltd., and from then on the output was, with a very few exceptions, dedicated totally to the requirements of the parent company. A range of 10 bhp per cylinder four stroke diesel auxiliary engines (‘H’ and 'J' types) was developed around this time, later replaced by engines of 20 bhp per cylinder ('B', and later variants designated 'C' and 'D' types), and these were despatched to another company in the Group to be fitted out as generator sets. A very few of these, suitably modified, were used as marine propulsion engines, some being fitted in the parent company's sailing barges for auxiliary propulsion purposes.

Air compressors, reciprocating general service pumps, valve chests, weed boxes, etc., were also manufactured by the Newbury company in addition to the main propulsion engines, so that the parent company was able to supply a large proportion of the engine room machinery for their new ships from within their own resources.

It would appear that the rotary blowers of the S.B.D. engines. were not entirely trouble free, for in 1938 they were discontinued and replaced by a reciprocating scavenge pump driven off the crankshaft and mounted in line with the cylinders at the opposite end to the flywheel, This was then designated the 'L' type. (Ref. illus. 14).

Apart from the use of a reciprocating scavenge pump, the cylinder head incorporated a different design of combustion chamber patented by Mr. Paul Belyavin (patent no, 429378/35) used under licence from Flexofiltration Ltd., and the stroke was increased to 426 mm, but otherwise the engine was very similar to the S.B.D., and was also rated at 100 bhp per cylinder at 300 rpm.

The first 'L.' type was a five cylinder engine fitted into M.V. 'Serenity'. This incorporated a starting air compressor at the forward end of the engine driven by levers attached to the scavenge pump, but all subsequent engines of this and the successive type had compressors driven by an eccentric on the free end of the crankshaft via an eccentric strap and connecting rod. Later the practice of fitting engine driven air compressors was discontinued.

In 1938 work commenced on a seven cylinder 'L' type engine and because of its length, the bedplate was cast in two halves bolted together - again due to the limitations of the machinery available within the factory. This engine had been ordered for a new tug S.A. ‘Everard', but at that time Everard’s had the opportunity of buying cheaply a steamship hull that had been lying on the stocks at Workington for some ten years, so they had it towed to Goole for completion and installed the engine in that vessel instead. Unfortunately the propeller used had been designed for the slower running steam engine which the previous owners had originally intended to install, and consequently the diesel engine was never able to achieve its designed speed and output. Later, when the ship, (M.V. 'Sodality'), was, scrapped, the engine was removed, reconditioned, and installed into the tug 'R.A. Everard' where It gave many years good service, Incidentally this engine, at 37 tons, was the largest engine to be despatched from the Newbury factory by road transport.

In the meantime an 8 cylinder 'L' type, weighing 38 tons, was built instead and installed in the tug 'S.A. Everard' which became at that time, the highest powered direct driven motor tug on the river Thames. The tug itself was built by Fellows & Co. Ltd., of Great Yarmouth, (later to become another Everard subsidiary.)

At about this time the 'F' type engine was also developed. A 'little brother’ to the 'L.' type, it was of similar design, with a cylinder bore of 240 mm and stroke 345 mm, and developed 50 bhp per cylinder at 330 rpm, and available in 4, 5, and 6 cylinder versions.

Both 'L' and 'F" engines had two sets of fuel pump and starting air cams to cater for ahead and astern running, the appropriate cams being positioned by axial movement of the camshaft for reversing, but the controls were totally different, the 'F' type having a single manoeuvring handwheel which operated camshaft movement, starting air admission/cut off, and fuel pump control, successively as the handwheel was progressively turned in either direction away from its central 'stop' position, with an overlap between fuel admission and air cut off.
The 'L' type had three levers, one to slide the camshaft., one to operate the master air starting valve, and one to control fuel injection pump output, all with interlocks to ensure correct sequence of operation, In addition it had a speed limiting governor of the mechanical fly weight type, with the speed setting adjustable by a small handwheel.

In the very early 1940's the 'L' design was modified and re-named 'O' type. (Ref. illus. 15). The modifications Included principally re-design of the cylinder head and piston, with an open combustion chamber - i.e. combustion now taking place in the space between the underside of the cylinder head and the top of the piston crown, both of which were of shallow concave shape - and the provision of oil cooling to the piston crown with swinging links, or 'legs' as they were called in the factory, conveying cooling oil to and from the redesigned pistons. The pistons were in two parts, a hollow forged steel crown grooved to take the compression rings, and cast iron skirt containing the scraper, or oil control, ring, and trunnions for the oil cooling 'legs'.

The cylinder head was again in two parts, the inner section comprising a dished flame plate at the bottom and a circular flange at the top grooved to accept ‘O' ring seals, connected by hollow 'stalks' bored to accommodate the air start non return valve, relief valve and compression release valve and with a central copper tube expanded into a bored hole in the upper flange and a stepped bore in the flame plate to accept the fuel injector. This inner head was held down by a circular outer head ring and the water jacket was formed by the space around the inner head 'stalks' enclosed by the outer head ring. This was a very practical method of construction, simplifying the moulding and thus reducing the risk of faulty castings and yet producing a robust assembly.

'O' type engines, probably the best and most successful of all the Sirron engines, became the staple engine in the Everard fleet for over two decades, mostly in 5 and 6 cylinder versions but with a few 4's and one only 8 cylinder unit. During the War a number of these engines were also supplied for installation in Admiralty tugs and motor minesweepers.

Shortly after the 'O' type, the 'F' type engine underwent some of these modifications to become the 'G' type, and then, with the provision of oil cooled pistons as well, re-named the 'GA' type.

In 1939 a contract was negotiated between the Newbury Diesel Co and Hector Engineering for the production of mobile compressor sets for use with road repair pneumatic drills. These had previously utilised Mercedes diesel engines, but with the imminent outbreak of war Hector Engineering sought an alternative supply. For this purpose Kent Norris designed his 'B' type engine, largely based on the Mercedes, but with a NDC combustion chamber type cylinder head. These engines, which developed 20 bhp per cylinder, operated on the four stroke cycle, as did the 'H' and 'J' types which they ultimately replaced for marine auxiliary applications.

The reciprocating circulating pump was later replaced by a belt driven Gilkes or Jabsco pump and type re-named 'C' type. Modification to the crankshaft dimensions in line with alterations to the classification society requirements, and the use of a four bolt marine type bottom end bearing instead of a two bolt design earned the designation 'D' type. Ultimately a very few of the six cylinder 'D's were built as Mk 11 versions with integral instead of 'marine' type bottom ends, increased clearance volumes, and equipped with Holset turbochargers to raise the rating from 120 bhp to 150 bhp, but no great effort. was made to maximise their potential.

6 – SIRRON DIESEL ENGINES 1943-1969

During World War 11 production continued apace, but part of the first floor of the east bay of the Newbury Diesel Co. factory was taken over for production of one of the components of the ASDIC submarine underwater detection system (later re-named SONAR). The strictest confidentiality was maintained, and no member of the staff was admitted without the necessary pass.

In 1928 a 10 ton overhead travelling gantry crane had been installed in the Works main bay, in which heavy machining, erection and engine testing were carried out and the crane rails extended through doors beyond the end of the building and over the railway siding. The progressively increasing size and weight of the engines in many cases became beyond the capacity of this crane, whereupon it was necessary after completion of testing, to dismantle these engines down to manageable sections which were then carried out by the crane and re-assembled on the railway wagon. Initially this work was carried out in the open air - a popular job on fine summer days only - but in 1943 the building was extended over the end of the railway lines so that the work could be carried out in sheltered conditions. With some of the very largest engines, only partial re-assembly was possible dependent upon the craneage capacity at the receiving destination, in which case the Newbury installation engineer would complete the work with the engine in place within the hull of the ship.

In 1942 Mr. Kent Morris commenced design work on what was to be the biggest of all the Sirron engines - the 'P' type and the first of this class was completed in 1944 for installation in Everard's M.V.`Supremity' of 2,770 tdw.

This engine had a cylinder bore of 407 mm and stroke of 648 mm, and was rated at 200 bhp per cylinder at 250 rpm. It was built in 4, 5, and 6 cylinder sizes, the largest weighing over 70 tonnes and being approximately 10 metres long, 2 wide, and 4 high. (Ref illus. 16). There is a fine model of this engine in the National Maritime Museum, Greenwich.

The construction was generally along the lines of the 'O' type, except that, due to limitations of the production machinery in the factory, the bed plate was built up from two longitudinal side members with separate transverse members carrying the main bearings, the transverse members having large projections engaging into slots milled along the inside of the longitudinals. A large single steel plate sealed the underside.

The other principal differences were the cylinder head external shape, and the method of phasing the camshaft for astern running.
The original cylinder head was in the form of a shallow cylinder, incorporating the water jacket, surrounded by a heavy section square casting secured by the through bolts rooted in the bedplate transverse members. These square outer heads were bolted together with the intention that they should form effectively a long continuous beam. However following sealing problems this design was superseded by a design more similar to the 'O' type with the outer ring held down in a more conventional manner by separate studs in the top of the entablature.

The camshaft carried only one fuel cam and one starting air cam per cylinder and was chain driven via a form of epicyclic gear which enabled the camshaft to be rotated through a fixed angle relative to the crankshaft to phase the cams for astern running, the front slope of the cam for fuel injection in ahead and the reverse slope for astern and similarly for starting air.

Being a direct reversing engine, as with all the previous engines, sea water circulation was by an engine mounted plunger pump, and the gear type lubricating oil supply and evacuating pumps were equipped with suction and delivery valves in both branches.

In the early post war years several Sirron 'O' and ‘P’ type engines were built under contract by John I. Thornycroft & Co. Ltd., of Southampton, presumably as Everard's new building programme to replace wartime losses and build up their fleet outstripped the capacity of the Newbury works. Two of these engines, 6 'O' type, were installed in M.V. Balmoral, (which was thus built and engined by Thornycroft's), commissioned in 1949 for Red Funnel Steamers Ltd. This vessel is now owned and maintained by ‘Waverly Excursions Ltd.', a non profit making operation set up by the Paddle Steamer Preservation Society, and operates a number of day trips for enthusiasts from ports in Wales and the Bristol Channel.

In the early days of marine oil engines it was the general practice to use direct sea water cooling, but for some reason Everard’s persisted in this practice on all the Sirron engines, Including the 'O' and, 'P' types, This meant that the water flow rate had to be amply large enough to maintain the outlet temperature below 50° C to prevent the deposition of salts, and in practice outlet water temperatures were little higher than sea temperature, with the result that acids were formed from the condensation of some of the exhaust gases, increasing liner and bearing wear. It also increased thermal stresses, corrosion within the water jacket spaces and due to the possible contamination by salt water, prevented the use of modern detergent lubrication oils which contain additives to neutralise acids, prevent frothing, and reduce oxidation, deposition of carbon, sludge formation, etc. The extra cost in terms of more frequent overhauls, and increased maintenance and spare part consumption over the years must have been huge. The engines were fitted with lubrication oil coolers and it is difficult to understand why the parent company would not accept fresh water heat exchangers which were, after all, not very dissimilar.

By the early 1950's turbocharging was being adopted by many manufacturers of very large marine two stroke engines, but the Newbury Diesel Co. were the first to apply this principle to relatively small loop scavenge diesel engines and the first Sirron engine to be turbocharged, in late 1952, was a 6 cylinder 'GA' type engine using a Napier TS 100 turbocharger, developing; 420 bhp - a 40% increase over the naturally aspirated version. (Ref. illus l7). This engine was installed in the tug 'E.A. Everard' and gave many years of satisfactory service.

By 1956 this had been followed by turbocharged and intercooled variants of the 'O' and 'P' types, designated ‘Mk11', also increasing the service ratings by 40%, - i.e. to 140 and 280 bhp per cylinder respectively, and further details were contained in an article in 'The Marine Engineer and Naval Architect' issue of February and March 1956. From then on all subsequent Sirron propulsion engines were of the turbocharged type.

These turbocharged engines retained the reciprocating scavenge pumps in series with the turbocharger, with the intercooler fitted between the scavenge pump and inlet manifold, and no auxiliary blowers were therefore necessary for starting or low speed operation.

In 1965 Henry Kent Norris retired at the age of 81, and he died nearly four years later in January 1969. He was a truly remarkable man whose active involvement in the field of two stroke oil engines had covered a period over which they had developed from the first crude hot bulb type to the type of engine in use in most of the largest motor ships today. Whilst his achievements had perhaps not themselves led the advance in the evolvement of two stroke diesel engine design generally, they had been in the forefront and had run parallel with and mirrored all the significant developments. This is the more remarkable considering that this was carried out in a small company of under one hundred employees, and very limited resources.

The slow speed of the direct drive engines, and therefore their size, was due to the fact that large slow running propellers are more efficient than small higher speed ones. This together with the fact that the two stroke engine delivered one power stroke per cylinder per revolution and was therefore approximately twice as powerful as the naturally aspirated four stroke engine for a given swept volume had made the slow speed two stroke engine the natural choice for marine propulsion. However the advent of turbocharging totally altered the situation as far as small ships were concerned, as the four stroke engine, by virtue of having a separate induction stroke with escape to exhaust completely closed off, was able to accept very much higher boost pressures than the two stroke and could then therefore produce a higher specific power output.

Thus during the late 1950's and 60's small ship owners were starting to change over to a more cost effective package comprising unidirectional highly rated medium speed four stroke engines together with the hydraulically operated reverse reduction gearboxes, or reduction gearboxes and controllable pitch propellers, then becoming available.

With this in mind in 1966 Everard's commissioned the Company to produce a crash design study for a small highly rated four stroke medium speed turbocharged diesel engine. This engine, designated 'T' type, was designed by the talented Mr. John Illingworth, who had been Chief draughtsman under Mr. Kent Norris, and included a number of novel features - again largely as the result of the limitations of the production plant available. A four cylinder development engine was built and extensively and successfully tested, and a 1600 bhp eight cylinder version developed.

This was quite an amazing achievement bearing in mind that the 'T' type was a totally new engine for the Company, whereas the previous engines had been developed by a process of evolution.
However, before this engine could be put into service the parent company decided to abandon the project. This was no doubt a very wise decision. Although the 'T' type was up to the performance standards of other engines of that type then currently available, the pace of development was increasing rapidly, with engine builders striving to boost the ratings of their basic engines, and installing more sophisticated production machinery in an effort to keep production costs down. With the very limited resources available to them, the Newbury company would simply not have been able to compete for long.
In 1967 the last Sirron engine left the Newbury works. This was engine no 878 a 6 ‘O’ Mk II to be installed in M.V. ‘Apricity’

Although the end of an era, this was to be by no means the end of the Company which today, over 20 years later, is alive and flourishing

In 1963, Mr. P.J, Humphreys had been invited by the late Mr. F.A.J.B, 'Fred', Everard to become managing director designate of The Newbury Diesel. Co. Ltd., This offer he accepted on the understanding that the parent company was prepared to increase its investment in the company, with which he was able to carry out a degree of much needed modernisation of the plant and equipment.

One of the first assignments he received from Everard's was to produce bridge remote control systems for the Company's range of engines. The first of those, which he developed in conjunction with Westinghouse of Chippenham, was fitted on the 'GA' Mkll engine in the above mentioned tug 'E.A. Everard' early in 1964. This proved satisfactory, and he then independently designed systems for the 'O' Mkll and 'P' Mkll engines, which were all direct reversing, and then for the later propulsion systems, utilising other makes of medium speed four stroke engines, adopted by the parent company, thereby laying the foundations for its future prosperity in the field of marine automation and control.
These proved so successful that the Company started to receive orders for similar systems destined for other shipowners, and thus started the move away from total dependence on the parent company as its sole customer.

A complementary alarm protection system was next developed by the Company, and it was then decided to set up a marine automation production sub-department within the factory with Mr. Terry Barnard as manager, under whom the range of products was progressively refined and expanded.

It might be mentioned here that the Company had had a good record for training, and a number of ex-apprentices went on to hold responsible positions both within the Company and with other firms in the area. However, with the advent of the Industrial Training Boards, the situation changed, Whilst the introduction of the first year formalised off-the-job training was welcomed, the bureaucratic requirements of the Engineering Industry Training Board proved increasingly difficult for the limited and already heavily loaded staff to cope with and apprentice training was, reluctantly, ultimately discontinued.

During the next few years the Company's heavy plant was utilised in the production of engine spares and on sub contract machining, whilst its marine automation interests continued to expand. During this time a number of alternative potential products to replace diesel engine manufacture were investigated, but none of these were suitable for the rather basic production plant in the factory.

It was then decided to concentrate the Newbury Diesel Company's activities entirely onto its more profitable marine automation and control business and to remove the spare parts business to the parent company's repair facility at Greenhithe, where it would be very useful fill-in work for their machine shop, Accordingly in 1981 the Company moved to a modern and more suitable factory, and the King's Road premises was sold.

In 1987 with Mr. Humphreys nearly at retirement age, and feeling that the business, which was by now producing sophisticated electronic remote control. systems and a range of related products designed by Mr. Barnard, was far divorced from its real interests as ship owners, Everard sold the business to the Radamec Group of Chertsey.

Under the modified title of ‘Newbury Diesel Controls Ltd.', and with Mr. Barnard as Operations Director, it continues its business today, still in Newbury

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P.J. Humphreys,
Newbury February 1989.