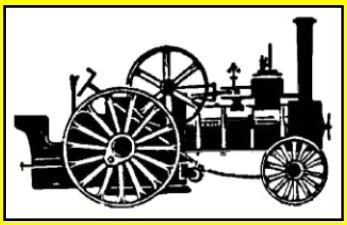
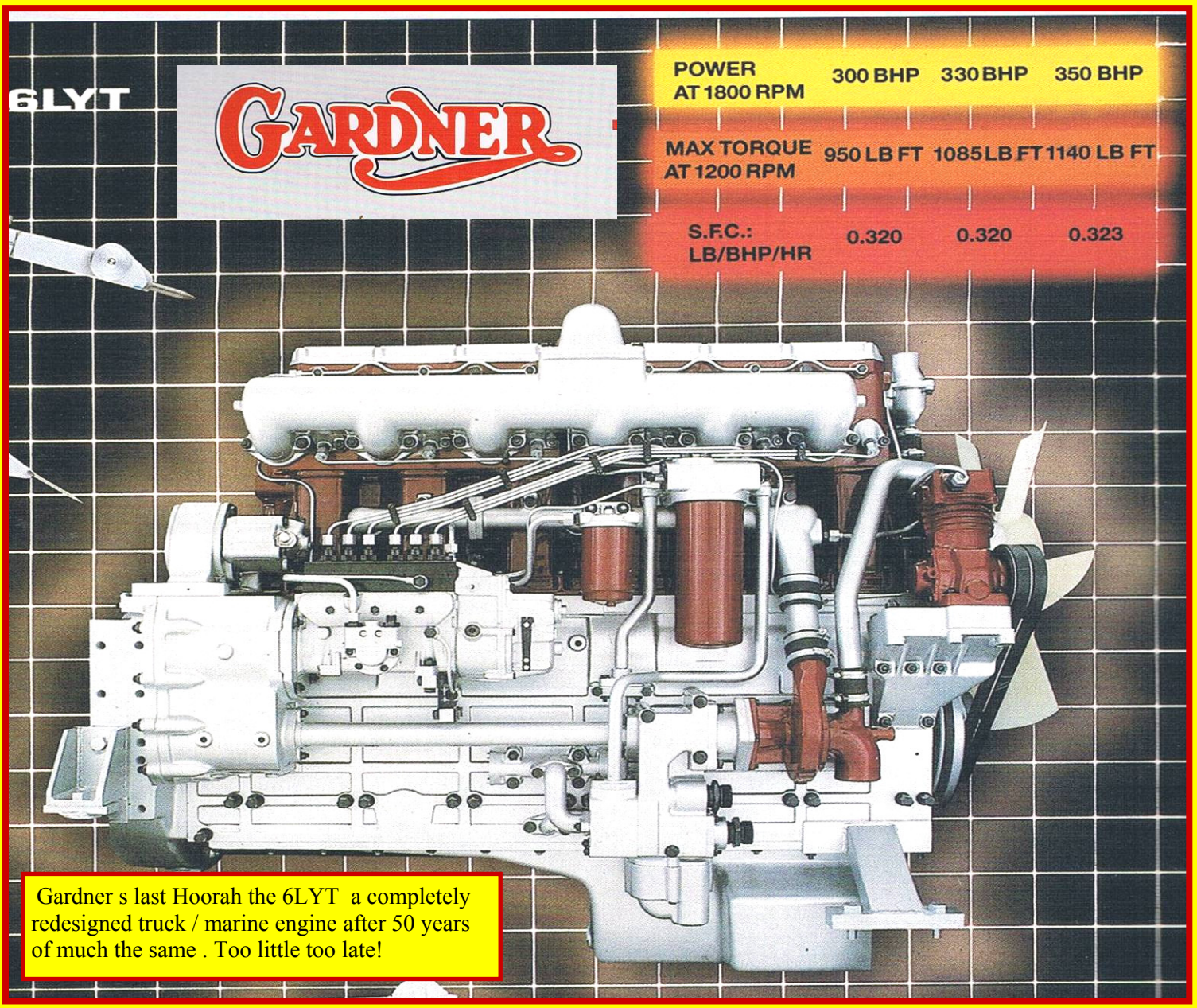
Issue 650 March 2025

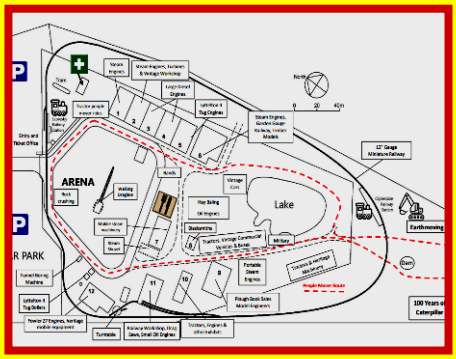
Extracts from the Melbourne Steam Traction Engine Club Newsletter

A Wisp of STEAM SUPREME





Gardner s last Hoorah the 6LYT a completely redesigned truck / marine engine after 50 years of much the same . Too little too late!

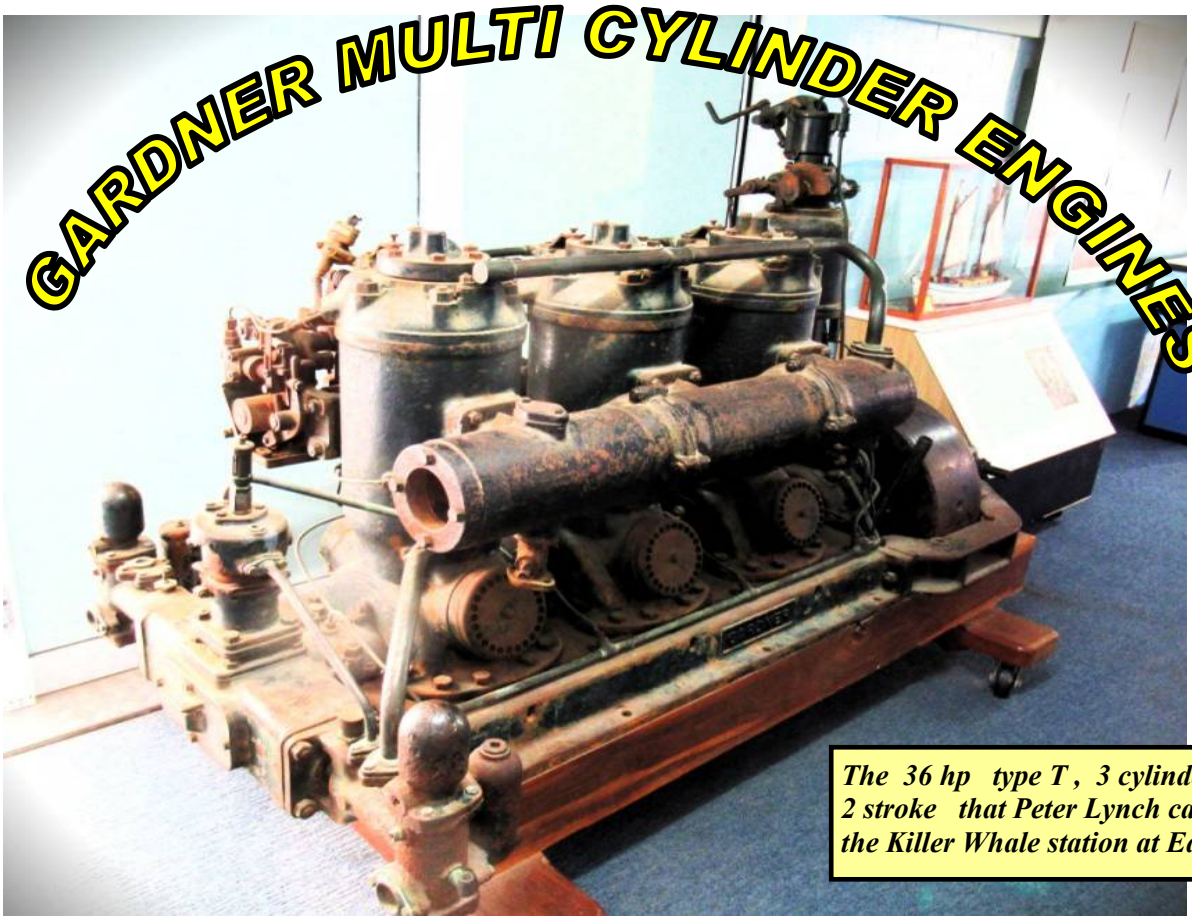


More on Logging Winches

Scoresby Car Show

Rally Rangments

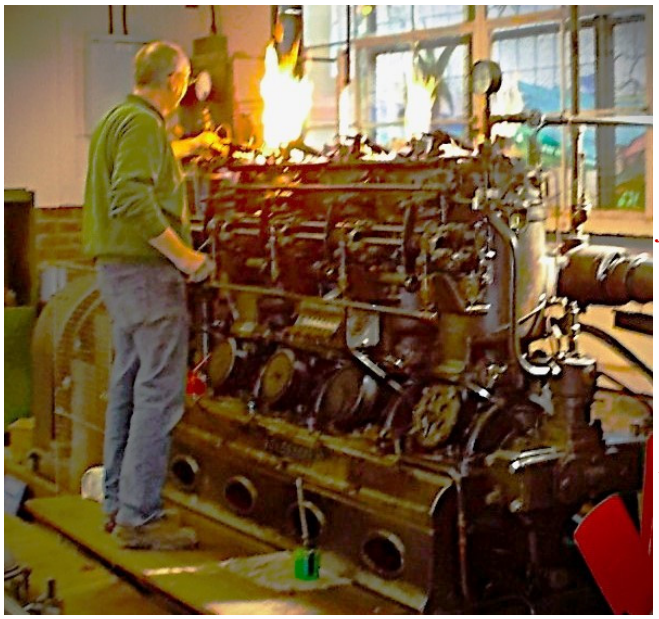
GARDNER MULTI CYLINDER ENGINES



The 36 hp type T , 3 cylinder reversible 2 stroke that Peter Lynch came across in the Killer Whale station at Eden .

These engines had an almost cult following so when Peter Lynch came across one in a museum it was thought worth touching on their background while on the subject

L. Gardner and Sons Ltd founded an engineering and machinery works in Manchester England in 1868. Around 1900 the boys diversified into engine production the first being a fractional HP hot air engine . Internal combustion soon followed . Small horizontal 4 stroke hot tube kero engines were soon developed for stationary work



.**The T series** of vertical 2 stroke multi cylinder hot bulb engines , often called Semi Diesels, soon followed for marine applications

The dead giveaway is that the engine shown above is a marine engine is the water cooled exhaust manifold and dual water circulating pumps.

A similar engine but this time a T 5 cylinders was started up for Phil and our party at the Anson Museum . Note Geoff Challinor lighting the hot bulb lamps on the cylinder heads . This is characteristic of a hot bulb engine where ignition is assisted by the hot surface in contrast to a True Diesel were ignition is by the heat of compression alone

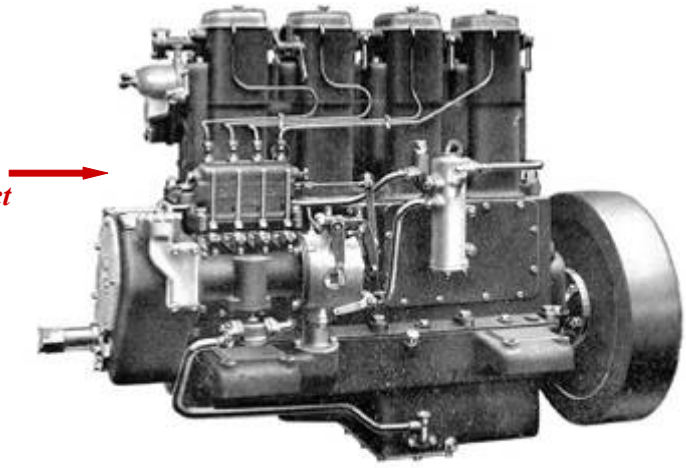
Gardner also offered an extensive range of 4 stroke magneto ignition multi cylinder marine engines . A unique version had a separate fixed throttle carburettor for each cylinder with the load controlled by varying the opening of the intake valves. Something that made a brief resurgence in the car industry before the electric car fad.

The late Nev Morris demonstrated to us such an engine that he restored from a pile of scrap . Note the 3 motorbike carbs and the very complicated linkage to vary the intake lift valve lift and timing Warwick pic

With the development of their proper **compression ignition** 4 stroke Diesel engines and subsequent increase in demand a sales subsidiary, Norris, Henty and Gardners Ltd, was formed. in 1912 to handle the marketing .

During the (1914–1918) war production greatly increased with , in addition to petrol engines for tanks the company made munitions, parts for heavy guns and machine tools to aid the war effort . Such was their reputation they became amongst other things a leading supplier of crankshaft turning machines to many allied countries including a batch to Russia.

L Series With the war over they made rapid development in the design of an easy starting , economical *Direct Injection* multi cylinder 4 stroke engines which became the L series . While primarily intended for marine and stationary work so impressive was it (50 % reduction in fuel cost) that in 1929 a Gardner "4L2" marine engine was fitted into a Lancia bus as an experiment.



A 4- L2 Gardner engine is reputed to be the first successful Direct Injection Diesel to be fitted to a Commercial vehicle . interweb pic

This conversion was successful and prompted Gardner to introduce the smaller lighter "LW" series of diesel engines of the same 4 1/4 " bore and 6 " stroke but designed especially for road vehicles . Ironically it was later modified and supplied as a marine engine as well .

The LW (Light Weight !) engine was a modular design, with sturdy aluminium crankcase, separate cast iron cylinder block comprising either 2 , 3 or 4 cylinders and heads for 2 and 3 cylinders . With all using the same pistons conrods and valve gear this allowed combinations of 2 3,4,5 & 8 cylinders to be offered' .

Brian Smiths 8-LW rail motor Gardner being lined up for the Feb 16th clearing Sale .(went for nearly $ 3 k)
Also in the sale is this Hyster Forklift bought back from the dead by the Lacombe boys , It has a Holden Red motor and sold well how good is that ?

Really How Good The LW engines soon had an almost cult like following with many enthusiast suggesting that in their day they may have been the best marine / automotive diesel engine ever produced.

Is the engine really that great or is it simply rose coloured glasses ? I attended an SAE lecture by Isuzu on their latest Diesel engine in 1979 and they used a Gardner as a baseline stating they had the highest thermal efficiency of all engine they tested but were not sure why.

There is no doubt Gardner's were designed for longevity and low fuel consumption and exceptionally easy starting by any standard. They have large piston and bearing surface area for their horsepower and the block is heavy with strong head bolts. Lubrication is good and cooling is more than adequate for the heat produced. All of this beef results in minimal wear and if maintained and operated right will have extremely long life . Some UK bus companies scheduled overhaul was at 1.1 million miles. Interweb

Looking at their engines, as an Engine Design Engineer , they obviously got things pretty right way back in 1929 where as others mostly Prechamber Engines such as the Diesel Grey Fergy still had issues right up into the 1950.s Quite remarkable !

Key Enablers were - Low friction , about 15 % of fuel goes in overcoming engine friction most of which is due to the pistons and camshaft Gardners only use 2 compression rings per cylinder , others have up to 5 .

- Small bore and long connecting rods make for low side thrust on cylinder walls further reducing friction .
- Low engine revs, the LW for example is 1300 for boats and 1700 for trucks (½ the rpm and you ½ the friction loss)
- Good combustion due to direct injection into a bowl in the piston for low heat loss and good air mixing due to masked inlet valve and multi holed injectors .
- Resisting the temptation to over fuel at full load. With a Diesel above about 80 % of the theoretical maximum fuel you start to get black smoke and guzzle fuel although power still continues to to rise slightly . The factory seals the pump settings to keep out of this range hence the conservation power ratings and good fuel consumption . Usually tampered with by drivers .
- Free flowing exhaust (3 " dia with straight thru muffler is mandated for 8LW)
- Long Life with above average piston and bearing surface area for their horsepower and rigid block with strong head bolts makes for a lowly stressed engine . Lubrication is good , (mine has 3 oil pumps and an oil cooler). The radiator is oversize and the cooling water is distributed directly to each cylinder head.
- Accurately made from good materials All their parts and much

A piston from a LW Gardner powered Lakes Entrance fishing boat Warwick pic

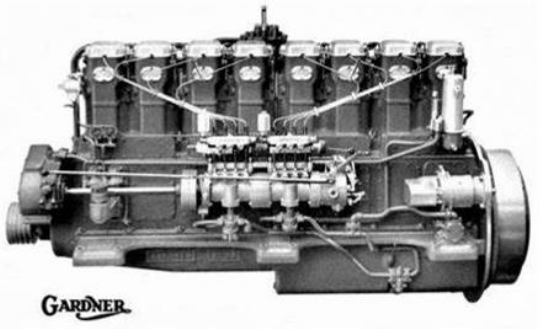
of their production machinery was made in house to their own exacting standards e.g. (Crankshaft lathes)
All of this attention to detail and overdesign resulted in an expensive but efficient engine with low wear and if maintained and operated right will last just about forever.
The Trade Off is a lower revving engine that is bigger , heavier and more expensive and with less power and torque than contemporaries but gets exception fuel consumption and long life . Virtues greatly appreciated by marine operators and owners of heavy trucks in the days of unreliable engines and drivers who did not count .

When I got my 1955 Foden the factory seal was still on the left front sump bolt of its 8 LW Gardner engine showing it had never been touched. Andy from Hong Kong pic .

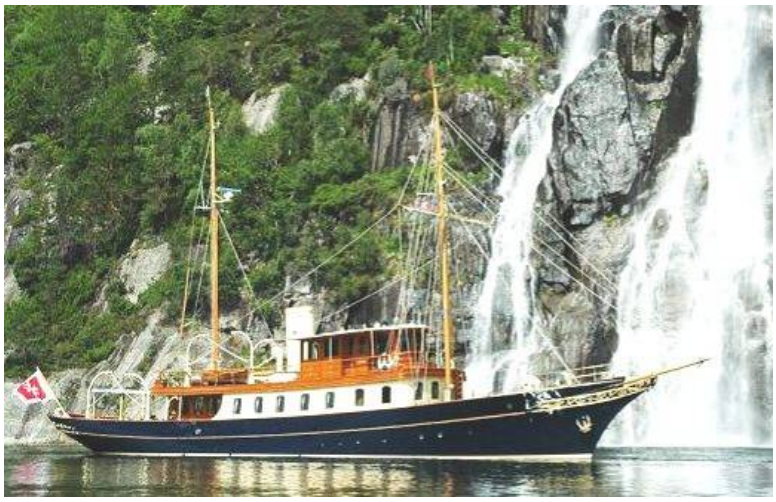
The 4LK an engine, not seen much out here , was a little 4 cylinder of only 3-8 litre , light and compact being aluminium block and head using cast iron liners. Main use was for small and auxiliary power unit for pumps and generators particularly during the war. The Gardner boys had a lot of fun fitting them to luxury saloon cars and opening them up to 3000 rpm while still getting exceptional fuel consumption in various trials but they never became a factory fitment.

The LXC was probably the last of the great Gardner truck engines its larger bore at 5 1/4 " and more modern construction was welcome. Gone were the oil leaks and precision fitted engine bearings had replaced scraped in parts. The last iteration, the 8 cylinder CT, even had a turbo charger for 290 hp out of 14 litre . Unfortunately they were very expensive while the completion had not stood still with regard to performance and cost.

The L3 Biggest of the Gardner multi cylinder Diesels with 5 1/2 " bore and & 7 3/4 " stroke giving 24 l for the 8 cylinder . Rated at 230 hp @ 1150 rpm for marine and 260 hp @ 1300 for rail with specific fuel consumption of 0.328 lb/hp/hr corresponding to an incredible 40 % efficiency .



There would appear to be no greater status than having a left and right hand pair of these in your luxury motor yacht.



MY (motor yacht) Atlantide with its fully rebuild pair of Gardner 8 L3 Gardnermarine.com

The Verdict

In the late 1920,s the Gardner engine was clearly miles ahead of the competition in terms of Fuel consumption , Ease of Starting and Reliability . Their bowl in piston direct injection compression ignition design pioneered by Diesels has now stood the test of time and only relatively recently has it been universally adopted by engine manufactures many of whom had become preoccupied with separate precombustion chamber arrangements of Ricardo and the likes of Ackroyd Stewart . I wonder if this has something to do with long running British anti German sentiments ? These configurations are not true Diesels in my book because for ignition they rely on heaters such as glow plugs for cold starting and not solely on the heat of compression alone as Diesel's stipulates in his patent.

Research by Graham Edge indicates Gardners studied Diesel's writings and built a couple of pretest engines to his patents during their development work to optimize combustion . This is credible when you compare the valve , injector and piston configuration of our Willans Engine built to Diesel's 1897 licence . The main difference between this and later engines is in the way fuel is delivery into the cylinder against the pressure of the burning charge . Diesel blasted it in with 800 psi air where as 20 years later Gardner had available high pressure jerk pumps thanks to Bosch so bypassed that inconvenience . That said the downside of early Gardners is the clouds of white smoke on cold start. It is not oil or it would be blue smoke . I believe it is minute droplets of unburnt fuel that have impinged on the cold piston surfaces and expelled as vapour . We saw this on the Willans before we got it sorted. I suspect the combination of a low compression ratio (13:1) and poor atomization of low pressure sprayers (the Gardner name for injectors) to be the main contributor . However we must remember in those days, nearly 100 years ago , steam still ruled the waves and rails so smoke and oil leaks where quite the norm .

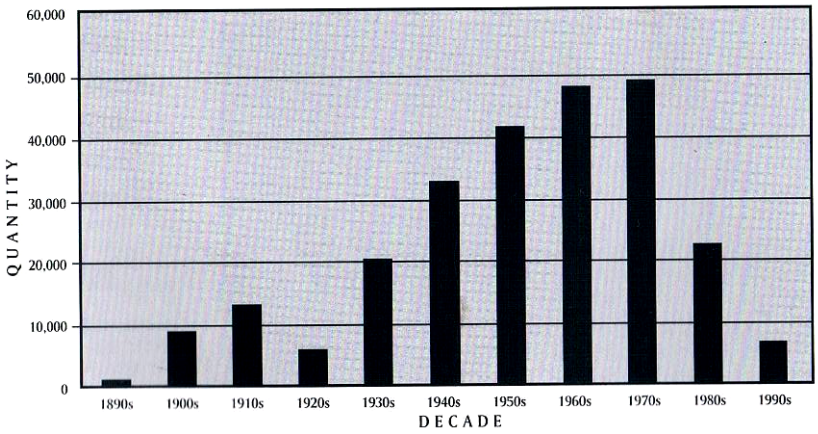
When judged by the standard of the day I think Gardner engines were probably the best in the world.

For years Gardners had full order books with their engines being standard or optional on most heavy British Lorries and

enjoyed a huge marine market for fishing boats and auxiliary power for luxury yachts , also widely used in busses and rail motors .
The result was the company employed over 3000 people at it's peak and was making all it could ackn. L. GARDNER & Sons Limited Legendary Engineering Excellence . Book by Graham Edge

Sandstone Estates 25 ton Bagnall Diesel shunter has a 8L3 with fluid flywheel and preselector gearbox . Warwick spent some time in Africa getting this in order and was rewarded with a drive.

By the early 70's the wheels started falling off British industry and volumes were plummeting leading to Gardner being bought by Hawker Siddely in 1977 . Volumes continued to plummet and by 1986 they were taken over by Perkins , with sadly the last engine being built in 1997

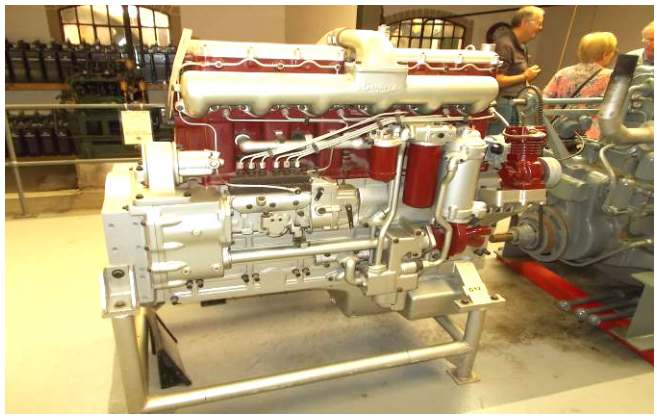


Engine Production volumes by decade Graham Edges book

What Went Wrong. A complicated combination of events existed in the British Economy due to highly unstable post WW2 conditions. The country was by then bankrupt so adopted a policy that 50 % of production had to be exported to bring in revenue. Couple this with a great shortage of raw materials due to Industry such as steel works being run into the ground meant a wait of over 12 months for a local concerns to get a truck with a Gardner engine. Not helped was industrial relations were by then in tatters with confrontational tactics bringing about national strikes such as coal miners lasting for over 1 year.

That is not all thought! In 1957 the long standing 20 mph speed limit for heavy trucks was lifted to 30 on the main roads and 40 on dual carriageways and gross weight raised from 24 to 32. tonnes . Suddenly the low power of the plodding Gardners became an issue and if the governor was fiddled with economy and engine life could become a problem . Couple this with excessive waiting times operators turned to European trucks , often Volvo, and surprise surprise , they offered superior performance and handled the higher revs with out blowing up and to boot had comfortable seats and cabins with heaters so rapidly began to take market share.

Meanwhile if you wanted to stay British other engine manufactures had not been idle and had been steadily improving while Gardner had stagnated so were now no longer superior. The writing was on the wall for traditional manufactures like Foden and Gardner who by this time did not have the resources for upgrading and entered into the descending circle of successive take overs and amalgamations. For Gardners despite a valiant struggle to bring out a new engine , finally turbocharged , the fight was effectively over by 1990 .



6LYT the first new engine design for 50 years now turbocharged and timing gears behind the flywheel instead of at the front . Warwick pic at Anson Engine Museum

It seems very difficult for family owned business to survive the 3 rd generation with it's changing times and older members not willing to hand over to the next generation who are perhaps not as interested or motivated and crippling inheritance tax .

Still it must be said to get an engine so right nearly 100 years ago I find truly remarkable. Warwick Bryce ..

SS SS SS SS SS SS SS

Rally Timetable

Be lined up ready
Do not wait to be asked .

Displays on throughout the days
* Earthmoving—Earthmoving Area
* Caterpillar Club— Ploughing Paddock
* Hay Bailing - Stationary Engine compound
* Lyttelton Steam Tug engines—Shed 6 see their clock
* Stone Crushing - Arena

Time	Event	Location
10:30am	Straddle Truck Demonstration	Main Arena
11:30am	Willans Diesel Engine	Shed 3
1:30pm	Big Foot demonstration and walk	Main Arena
2:00pm	Grand Parade	Main Arena
2:30pm	Arena open for public viewing	Main Arena
3:00pm	Willans Diesel Engine	Shed 3
3:15pm	Public clear Arena	Main Arena

Logging Winch Feedback

Long Standing Club Member John Horwood Writes The article - last SS - range a bell with me. Of interest is that the "lumber" handling methods were similar in BC and here. McLean's mill, which is a living, breathing, functioning museum, is based on Vancouver Island, British Columbia, and best accessed by steam loco from Port Alberni. Highly recommended for anybody visiting BC Canada.

The sign on the winch informs ….. Steam Donkeys were the workhorse of the BC forest industry from 1900 to 1950's . They were used for Yarding , hauling the log out of the woods to a central collection point for the railways

Used in conjunction with a spar tree anchored by steel guy lines with its great height it allowed loggers to reach far out into the woods to retrieve timber. First the high rigger must prepare the selected spar tree by climbing it with his climbing spurs and safety belt and trimming off branches on the way up . Then he must hang the rigging i.e. attaching guy lines and pulleys to attach the cable to be yarded

← A steam logging loco runs visitors out into the woods

Original Message---
From: John Horwood .
Thanks John

Warwick Writes My dad used to talk about using sky lines to extract logs out of the bush up on Whitlands plateau between Whitfield and Tolmie in the years between the wars. They drove the mill with an old portable engine which had it pressure down rated and safety reset . It then did not have enough power to drive the saw properly so they jammed the safety shut which used to scare him . Also he used to relate how when going up the steep winding road to Whitlands the back wheel of their old traction engine came off which no doubt created some excitement . Those were the days ! . This brings back memories of a similar impromptu demonstration in the arena at our rally some years ago

At the Heyfield Rally Gary Aitken's son Brian often exhibits a timber winch . He built it using a steam winch and an old boiler mounted on a couple of logs and fitted a canopy . Being flat at the rally site there is no high wire so he can only demonstrate winching logs along the ground at the moment anyway . Interweb pic →

Years ago I saw an old vertical boiler shaped like a bottle , it was lying in the bush on its side . Apparently specially designed for driving logging winches the shape allowed it to be moved around by rolling along the ground (after removing the gauges etc first I imagine . Apparently relocating winches was best done when not too many people were around.

Thanks to those who contributed It is good when a story generates extra info that can add to the knowledge on a subject

Cheers Warwick

Steam Shovel Jo Lloyd remarks ... the sandblasting has been a huge step forward but there is still a lot of painting to be done so Jo would really appreciate a hand with this. Drop Jo an email at lloydfam@bigpond.net.au or call her on 0449501267 if you can lend a hand.

Jo has been painting the cabin frame and the hope is to have enough done to erect it for the rally while at the same time clear that corner of the arena .

Now the new plates have been permanently fitted to the deck the plan is to stand the posts up and bolt on the girts and purlins , where it is . Then after the rally concentrate on the wall sheets and timber for the deck .

In the mean time Robert Jones is sourcing new period style curved corrugated sheets and the sample he has is looking very smart .

After this it is up to the steam people to concentrate on the boiler and associated piping .

Tackling it in this way allows much of the work to be done at ground level .

Jo started repainting the Bendigo made Horsfield pumps outside bay 1 but interupted it after the first one to concentrate on the Steam Shovel for the rally. The Australian made pumps originally came from Cerberus Naval base so they have a bit of local history .

BBQ Upgrade . This very popular facility caught us out during our last Christmas breakup due to a flat battery . Since it only requires a small amount of electricity to light the gas and control the timer it tends to get forgotten about . Aaron Morris used his initiative and came up with a solar powered charging system and a new battery . Kerry Shaw then set about building a erecting a small tower to mount the panel . It shows how a simple bit of work can make the difference to the amenity of our grounds for both members and visitors.

Battery charging circuit is already built into the solar panel making it very convenient . Aaron and Lens pics

Rally Preparation

Just a few of the things getting put in order as part of the Rally preparation Those whose work schedule allows getting down to the grounds have been very busy getting things in order and having a bit of fun at the same time .

Engine Pens One example is Peter Morris who noticed one of the corner posts of the engine pens had rotted and needed replacing . Now getting out rotted posts can be a bit of a struggle but Peter has just the right equipment that needed trying

Peter using his proline borer, mounted on a Chamberlain Industrial mk 2 tractor . Made short work of replacing a rotted post in compound area. Photo Aaron .

Looks like just the thing for boring the 3 holes down by the lake for our windmill once the rally is over . Ed.

. **TOILETS** We are getting in first this year and avoiding the drama and embarrassment of last year when they blocked due to roots

Toilet pipes being cleaned and inspected prior to busiest weekend of year. Andrew Fair-weather pic

Ploughing Engine

A big surge has been put in, particularly by Peter Jackman and team , to get the club's Ploughing engine back in steam for this rally . Remember last year when a stay started leaking and the engine had to be taken out of service . At the time the extent of the problem was not known because the leak was behind the huge cast bracket that supports the vertical shaft that drives the winding drum. Removing this looked like a daunting task but after a bit of advice following a Goldsmith visit it turned out not too impossible although the flywheel had to be removed and the crankshaft lifted to get the bracket off. This revealed a leak from the tell tale drilling in one stay . Just for good measure 5 surrounding stays were replaced while they were accessible but as it turns out they were still serviceable . All is now back together but there is still a few small things to do . It will be touch and go if it is in ticket for the rally so no promises of steam ploughing is being made so it does not appear on the program but will definitely happen if possible

RunDay

This was a bit of a mixed day. First it was declared a Total Fire Ban but not advertised properly for Melbourne . This was to the great disappointment of a number of members who came down with the intention of steaming up some engines in preparation for the rally but had to abandon the idea on finding out . Even to the extent of having to put away our Steam Locomotive Clive when it was about to be lit up . This left us with no mobile steam and only our Diesel loco Reg.

Never mind our grounds had been booked for a car show and early on they had been busy erecting tents to provide shade and setting up food and ice cream stalls obviously expecting a good crowd .

The group set things up a bit differently to usual with their hospitably and picnic area behind the blacksmith shop were we usually put the engine pens which gave a nice outlook over our lake .

Cars entering the site were then directed around the arena and down between the Blacksmiths and truck sheds. The classic cars were then doubled lined up to the on the Right (West) side of the road to the Top Paddock and support vehicle to the Left . This worked really well now our shade trees are well established and the recently mown grass lush and green rather the parched as in old days.

Our visitors enjoying our very pleasant surrounding proving our hard work has paid off .

Now for the Cars themselves . I began to feel a bit disappointed for them as hardly anyone had turned up despite all their preparation so I got a couple of my old things out to fill the ranks .

Not to have worried though It turned out to be their annual Park Orchards Classic Car Rally and Show and Shine run by the Lions Club as a fund raiser. Open to all makes and models it kicked off at a Park in Park Orchards (no surprise) at 1 minutes intervals with the destination for lunch and display at the MSTEC grounds at Scorseby . Each car had a list of questions to answer from clues along the way.

About 11 o'clock they started to pour in and park up .

Unfortunately later in the day we got a couple of short storms

Warwick's Chev had most of them tricked as I do not think they had ever seen a car with no cloths on before . They were telling each other it must be a side valve and other misinformation .

Pommy , Australian and American cars well represented Not much Asian stuff .

Hope my Chev did not see this it might get ideas about a tart up

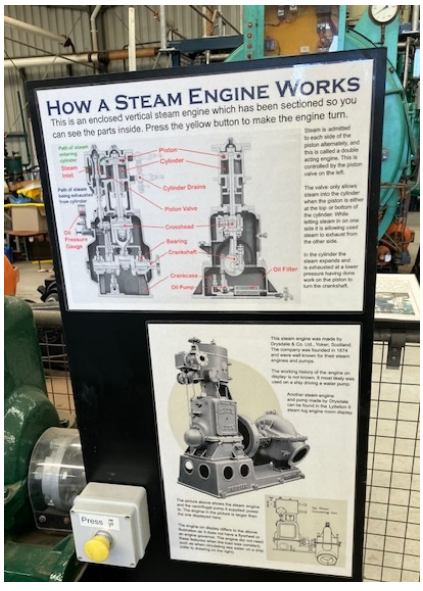
A car that took my fancy was this Aston Martin DB-5 made famous in the James Bond film Goldfinger which probably ensured the survival of the marquee but that is not what appeals about it to me . It is the DB bit which of course stands for David Brown the famous gear and tractor manufacturer who used his family fortune to dabbled in exotic cars.

David Brown the 3 rd bough the ailing low volume sports car manufacture Aston in 1947 only ending its production in 1972 and eventually allowing it to be resurrected by Ford in the 1990's as the DB 7 .

Stepping back to the start grandfather David Brown started out as a pattern maker in the late 1890's and soon moved into gear manufacturing . In the1930's they entered in to a joint project with Harry Ferguson to produce the first 1350 fergys but they soon fell out so Brown went on to produce his own tractor which we all know as the David Brown , (we have 2 at the club) His tractors proved very popular and were sold in large numbers around the world making him a very wealthy man but eventually being sold to Case. No the car does not have a tractor engine but a 4 litre OHC inline 6 cylinder with ZF 5 speed gearbox . The company now trading as David Brown Gear Systems is still a major force in the heavy gear sector in industrial mining marine and military circles Wiki

JUNIOR(S) MATTER(S)

Paula is pleased to report that Matt Bolins has just signed up as a MSTEC member and is keen to get involved with the Juniors . Paula showed Matt around the club on the Feb RunDay, as a bit of an orientation, and discovered Matt's skills in film making, photography, social media, marketing/promotion amongst his passion for industrial history, rail and more. Matt and Paula then discussed the club's communications and mentioned the club's newsletter, Steam Supreme, and particularly, the juniors section *Junior(s) Matter(s)* - which has the purpose of raising the profile of junior members at the club. Matt is keen to get involved with this section with her support and of course, the Editor, Warwick . We met briefly today and then Matt had a good look around our facilities and took quite a portfolio of snaps of things that caught his eye . Here are a couple . Ed



RALLY LAYOUT Below is a map showing the grounds layout for the rally . Take notice of it so if you are wondering were to display your tractor for example or a visitor wants to know were to park their vintage car you can assist .

This way things can run smoothly , a couple of years ago some members inadvertantly grabbed the spot reserved for some large visiting vehicles.

Note no members or exhibitors to park within the Rally area