



The Pyrenees Heritage Preservation
Magazine

GOLDSMITH

No 150 December 2018
Lake Goldsmith Steam Preservation
Association Inc

Registration No:- A0032895

Rally Grounds:-

1234 Lake Goldsmith-Carngham Road
Lake Goldsmith Vic. 3373

**Next Rally No. 113
LAKE GOLDSMITH**

AUTUMN RALLY MAY 6 & 7 2019

Highlight Theme:-
1 & 2 cylinder tractors



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What a great sight at a steam rally, all lined up and ready for action
Vintage Road Making, Land Rover's 70th year, a Foden collection, a Tractor Trek and a wheel bar-
row were all part of the 112th Lake Goldsmith Spring 2018 Rally.



Editors Overview

Welcome to Goldsmith 150, December 2018

Dear Readers.

The 112th rally, with its drawcard features of Road Making, 70 years of Land Rovers, a Tractor Trek and a turnout of Foden's was another that still continues to amaze me.

Land Rovers of all shapes and sizes from Series 1 to current Range Rovers, including Military versions that had served in Afghanistan and civilian recreational models filled the quadrangle while others were scattered around the grounds. Thanks to the Land Rover Owners Club of Victoria and the Victorian Military Vehicle Corp members for their support that created a lot of interest for members and visitors.

The Harry Ferguson Tractor Club hosted another successful Trek around the Lake Goldsmith, Beaufort and Cross Roads district as a lead-up event to the Rally Weekend. Ron & Linda Harris provided morning tea at the Beaufort Goods shed, and the Fergy Club arranged a BBQ lunch at the Cross Roads CFA station.

The Road Making event attracted all sorts of equipment that had at some time been used by our road makers. Josh Franc organised the event. The area was roughed out before the rally and a collection of vintage graders and rollers took over to finish the job, thanks to all who brought these machines along, there seemed to be enough to cover the area of the road, and then some.

The grounds and shed all looked at their best with lots on show, and the visiting exhibitors filled the compounds with a variety of machinery ranging from steam models, steam miniatures, stationary engines and tractors.

Again The Shenandoah's Crew treated us to the sight and sound of Muzzle Loading American Civil War Artillery, while the Evans family showed how to ride early bikes, and our President entertained the visitors with a running commentary of the Grand Parade and tours of some of the clubs attractions.

The President, Committee (and Editor) hope that you find something of interest in this December edition 150 of Goldsmith.

A HD print quality version of Goldsmith 150 will be available from the website as usual at:-

www.lakegoldsmithsteamrally.org.au/magazine.html

Thanks to Eva's Gallery for many of the action Rally Pictures, if you would like a copy contact the editor.

Mission Statement

To foster, nurture, encourage and demonstrate technical, agricultural and life skills associated with the Industrial Era.

To provide a quality environment where these skills may be used to educate and entertain members and visitors.

To run two weekend rallies each year, and be available at convenient time for other interested groups or individuals.

To conserve and develop a heritage collection.

Find us on the net at:- www.lakegoldsmithsteamrally.org.au

Or contact us by email:- info@lakegoldsmithsteamrally.org.au

Or write to:- The Secretary:- P.O. Box 21 Beaufort 3373

Or contact the editor:- goldsmithgazet@optusnet.com.au

To register for this "cost & obligation free" bi-monthly e-magazine

email:- goldsmithgazet@optusnet.com.au or Ph 0425 744 052

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The area for the road was laid out before the rally, and this International TD 18, which was fitted with an Armstrong Holland Hydraulic Blade and a Harman Winch was a lonely sight on the mown lawn in the weeks before the Rally .

By the end of the Rally the scene was a bit different with the road worked and rolled by one Jelbart IC and seven steam rollers.



There was plenty of vintage machinery on hand to move dirt. This Caterpillar D7 is fitted with a set of 3 massive rippers and a cage to protect the operator when working in timber. It seems to be the ultimate unstoppable juggernaut.



The other Inter was fitted with a Drott 4 in 1 bucket which were very popular before excavators moved them aside for loading.



These towed scrapers were not used but they were capable of shifting a lot of material before the arrival of the self propelled scrapers.



The “road to be made” was on the parade ground lawn, so there was no road metal used in a base, but there was quite a bit of rock crushed for use elsewhere.

The rock was transported in a Foden-Steam wagon from the stockpile and used in crushers around the site and in a new base for the Fowler Ploughing Engine.



Drawn Graders and graders were on display, and some were put to work on the road. Development of the self propelled graders made these 2 man grad-



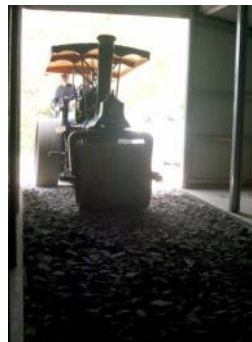
ers obsolete. The self propelled graders became popular in the 1930's, and many Tractors were used by various manufactures as the power and transmission unit of their graders. In Australia, Malcolm Moore, based at Port Melbourne in Victoria produced Graders based on Fordson Tractors.

Three late models based on EN 27 Petrol Tractors arrived at the rally in working order to put in some work on the road project. This really was a trip back to how roads were made in my youth.



The grader above shows its stuff while a Foden Traction Engine rests up on the right.

Whilst there was no stone base to the road there was rock on hand to be feed through crushers, and some was laid and rolled outside the Scienceworks shed to provide a hard pack area for the Fowler Ploughing engine which is housed inside. This base of large rocks was similar to the Telford road bases shown in the last edition of Goldsmith. These rocks were spread with a small Caterpillar and



rolled in with Peter Godden's Ruston Hornsby Steam Roller. Getting traction on the rough stones on the ramp took some effort until the stone was rolled and compacted making a base for a surface of



fine aggregate in the future. This part of the vintage road making was a real work in progress, and it certainly made it easier to get the massive Fowler Ploughing Engine in and out of the shed as the drive wheels only have a few centimetres of clearance through the door.

This was a good project, and many thanks to those involved.



A second portable stone crusher was in action, with a Foden Steam Wagon behind which had been used to move the stone (top right picture on the last page). Graders were not the only Malcom Moore machinery that were based on Fordson Tractors. This cable operated mechanical loader was another reminder of pre-hydraulic earthmoving machinery (below left). Below right, this Tar heat-



er was ready for action, and made a great exhibit behind this Fowler from Western Victoria.

The Miles family from New Zealand were ready to spread aggregate behind their Ruston Proctor with this 1912 spreader.



Not quite vintage, but getting on, this Kubota was ready to help out where it could.



These No 12 Caterpillar Graders still had mechanical control with gearboxes and rods to control the blade and rake operation. Hydraulic power steering was an option.

The No 12 was first introduced in 1936, and the model E was introduced in 1959 and stayed in production until 1965 when the model F was introduced. The Model E had a 115hp engine, weighed in at around 13 Tons, and nearly 20 000 were produced, some in Australia. They were a popular grader, and they made an impression at the rally.



Another familiar sight before backhoe tractors and excavators were side loading floats and petrol powered prime movers such as this Bedford TK. The TK had a 300ci petrol motor, or an optional 330ci diesel. Later models had Holden V8 motors fitted. Eventually they came out as Isuzu Bedford's, and eventually they just morphed to Isuzu. These must have been one of the most popular trucks in Australia. The Jaques 15 Face Shovel on the back was also popular, they were available as a dragline, with masts up to 40', and back acting buckets. This one worked at Corio near Geelong and resides at the Rally Ground with the J series Bedford tipper that it worked with for much of its working life.

The pair can usually be seen working in the earthwork demo area at the North of the rally grounds.



This Albaret Steam Roller was made in France at Rantigny, about 60KM North of Paris. The company also made IC powered Road Rollers. It was later taken over by Caterpillar who continued to make



road compaction equipment at the plant.

This machine travelled up from near Heyfield to join in the Road making display. It was great to see this rare French machine in action at the Rally.

The Machine

was manufactured in the late 1940's or early 1950' as part of a batch for use in the French Colonies of Indo China. This is 1 of 2 machines that were imported from Thailand, the other is in Queensland. The disc wheels can be filled with water or sand to raise their weight from 8 to 11 tons.



Above, right & below are 3 Steam Road Rollers are Ballarat's own. They were produced at Cowley's Eureka Ironworks in Ballarat East near the site of the historic Eureka Stockade. The company



started in the early 1880's producing machinery and boilers for the Gold Mines in the area.

A dozen or so Steam Rollers were produced in the late 1920's and 30's

The top left Roller is owned by the Scobie Family at Lake Goldsmith. The top right machine is owned by Phillip Smyth of Ballarat. It frequently arrives under its own Steam. The Lower Roller belongs to the Reynolds Family from Melbourne.



The Jelbart IC Road Roller left, was manufactured in Ballarat. These rollers used Jelbart's stepped piston 2 stroke engines which were used in their early Tractors. (see Goldsmith No 126 for some tractor details). Rollers were built until 1932, and

Jelbart worked with Cowley's for construction of these machines. The characteristic note of these engines at low load is unmistakable and provides some competition for Shenandoah's crew



Aveling and Porter in England developed their first Steam Road Roller in 1865 and in 1867 they patented the first practical Road Roller and went into production. The company became the world's largest manufacturer of Road Rollers (Steam and IC). They are believed to have produced in excess of 20,000 of them. The company name was changed to Aveling Barford in 1932.



The Beaufort based Roller on the right above is operated by John and Josh Franc, its history can be seen in Goldsmith No 129B Oct 2014 page 3. The Roller above left was restored by the late John Norris at Lake Goldsmith and is owned and operated by Eric Wolverson.

The Steam Road Roller on the left was manufactured by Ruston Hornsby at Lincoln in England in 1926. It can also be seen at Melbourne Steam Traction Club at Scoresby, East of Melbourne at their Steamfest Rally in March.

It put in some time rolling rocks at the rally. (see page 6)



The John Fowler Steam Roller above spent its working life at Northcote near Melbourne and it is now owned by John Brown at Lake Goldsmith .



Two items that were synonymous with road construction were Furphy Water carts for Steam Rollers and Dust suppression and Kero lights in the days before Red & White plastic replaced timber safety fences.



David Pope's model land rover and Malcolm Moore Grader were unexpected entrants for the 112th Rally. The rollers were geared to stitch up the display.

For 70 years the Land Rover has been with us. From its early beginnings as a vehicle to provide farmers with transport and a workhorse, it grew into a commercial and military stalwart and developed a line of all wheel drive on and off road family wagons.

Ex-military Land Rovers generally continue in a second life, and fortunately some new owners preserve their background and provide an insight into their past, and provide the new owner with the means to enjoy a day out.



Camouflage netting and some other immaculately presented military gear above makes an ideal setting for a few moments of time out in the quadrangle at the 112th rally.

There seemed to be Land Rovers everywhere, and they made a great show with a great range of models including a fantastically presented Series 1 seen below.





The Land Rover Owners' Club of Victoria set up camp in the centre of the Quadrangle where they were surrounded by land Rovers of all shapes sizes and colours.

Thanks to trip leader Steve Ringe from Lismore, Victoria for arranging the "70 years of Land Rover at Lake Goldsmith" display at our Spring 2018 Rally. The Club was established in 1963 and it represents the interest of Land Rover owners and the preservation of Land Rover vehicles. Their website can be found at:- www.lrocv.com.au where a copy of a recent "REVIEW" magazine can be downloaded.

The Forward Control Land Rover 109FC Series IIA (above) is a rare sight as only about 3100 were produced between 1962 and 1966. These light 4WD civilian trucks generally had a hard life and not a lot survived. They were based on the standard 109" chassis with minimal changes to bring the cab forward.

They were superseded by the 110FC Series IIB which ran from 1967 to 1971 during which time about 11000 were built. They can be recognised their lower headlights which were just above the front Bumper Bar. They used the 4 cylinder petrol or diesel engines, or the 6 cylinder F head rover car engine as did the conventional series II & III Land Rovers produced at the same time.

The next forward control model was built to a Military spec, and it was not available on the civilian market until the military disposed of them much later.

The model (below) was the 101FC which was initially designed as a gun tractor for the British 105mm Field Gun. They were expected to be transported by plane so a compact design was a basic requirement. They were also to be used as field ambulances and Radio communication vehicles.

Various prototypes were evaluated before the 101FC was put into production in 1972 and continued until 1978 by which time over 2500 had been built.

The 101FC was powered by the 3500cc Rover V8 and the All Wheel Drive transmission introduced



on the early Range Rover that was introduced in 1971 or thereabouts.

The main use of these 1 Tonne trucks was to support the mobile "Rapier Air defence Missile" launcher which required a team of up to 3 * 101 FC's in different configurations to tow the Search Radar, Launcher, support equipment and Missiles plus the 6 man crew.



This Missile had an operational range of about 8Km. It was optically sighted and radio controlled by an operator in the van who used a joy stick to guide it to contact. As its accuracy was good enough for direct contact, only a small charge (about 1.5 Kg) and a contact fuse were required. Later, Blindfire narrow beam radar was added to improve performance in poor visibility, and proximity fuses were used to destroy unmanned drones which were too small to hit directly.

Development of these Missiles started in the 1960's in response to the need to destroy supersonic aircraft, and replace the mobile Bofors and other Anti Aircraft Guns in use at the time. The missile reached

speeds of Mk 2.5. About 600 launchers and 25 000 Missiles were built.

They saw action in the Falkland's, the Iran, Iraq and Gulf Wars. They were also stationed around London during the 2012 Summer Olympics.

With the collapse of the Soviet Union the military threats changed and the Rapier units were reduced in the 1990's and some 101FC's were released to the public.

Much of the Missile testing was carried out at Woomera, and the Australian Military acquired 50 or so 101FC's with Rapier Systems. Disposal sale of these vehicles began in the 1990.



For use as a Gun Tractor a trailer with 1 Tonne of ammunition could be towed behind the 101FC and the Model L118 105mm Light field Gun was towed behind. The 6 man crew travelled in the 101FC Tractor.

Early trailers could be powered from the gearbox via a tail shaft speed PTO and a series of Cardan Shafts through the trailer coupling.

The vehicles was effectively a 6 wheel drive when the trailer drive was engaged. Under most circumstances this was not needed but it helped in sand. If the trailer drive was engaged when the trailer was at an angle to the tractor it could push the tractor on its side, and right it in reverse.. These trailers were very expensive and they were later withdrawn in favour of unpowered trailers. One powered trailer combination came to Australia.

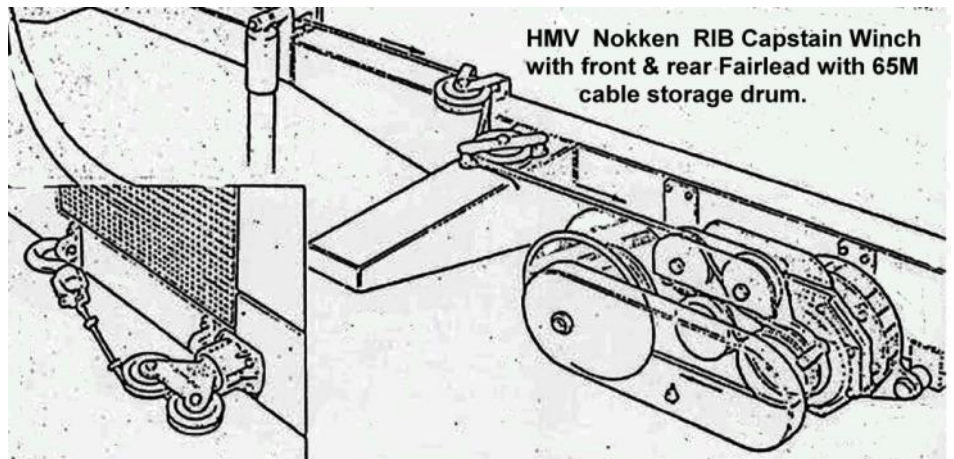
Some tractors were fitted with a chassis mounted PTO driven capstan winch (see next Page) which allowed the cable to be fed through fairleads at the front and rear of the Tractor.
(see lower left picture on previous page) The capstan winch with its five or six wraps offers a con-

stant pull through its full range. This can not be done with a drum winch which reduces the pull as the cable builds up on the drum.

The Australian Army used the L118 105mm field Gun, and as I understand it they are still in reserve.

The Land Rover 101FC was an innovative design when it was introduced, with full time four wheel drive via a central differential combined with Rover's Production V8 to provide a compact versatile Gun and Missile Tractor, field Ambulance and Communication vehicle. Rover considered producing a commercial version of the 101FC in the mid 1980's but the idea did not go ahead.

We were lucky to have two of these Tractors at the Rally, for the 70th Land Rover Anniversary.



Land Rover have had a long history with the ADF, and after these vehicles have finished their active service they have been purchased by Military Vehicle collectors, and we are fortunate that many members of the Victorian Military Vehicle Corp displayed a range of Land Rovers that are not normally seen on the roads. Many of these vehicles were complete with Military attachments and replica arms and gear that had seen active service. These were a complement to the Land Rover show.



The Grand Parade came to life when this Land Rover put out enough smoke to match the Shenandoah's crew, but they could not match the “bang” of their Muzzle loading Field Gun.







In addition to the Military models there were plenty of civilian models as well, from a Series 3 ex Rural Fire Brigade fire tender from Mt Darrach near Wyndham in SE NSW. A WW2 Willies Jeep was on hand. Rover designer Maurice Wilks, based his concept of a combined light Tractor and vehicle on the Jeep. See Goldsmith 139 P 15 for some history. Thanks to all the Land Rover owners for a great show. Ed.





These Riley cars made a colourful display of British Sports Sedans and Tourer's from the 1930's to the Pathfinder. Riley produced cars from 1905 and in 1934 they were 2nd and 3rd outright at Le Man's with a 1.5 Litre Car. There 4 cylinder twin low cam engine had a crossflow head and hemi-spherical combustion chambers decades ahead of other manufacturers which gave them a performance edge in their day. They looked good and performed well and have a popular following.



Shenandoah's crew keep the crowd awake with their historic re-enactments from the US Civil War and displayed their historic board in the Founders Building.



This 1937 V8 Ford Truck Engine made a neat display of a side valve and made quite a bark.



Radial Aeroplane engines always look and sound great at any time, and this Pratt and Whitney R985 Wasp Junior is no exception. The engine was built in 1942 and last worked on a Grumman Ag Cat in the Echuca area. The detail restoration is incredible. In recent years we have had quite a few radials on show at various rallies, and this trend is something that I hope increases.

Below, early action on the arena, and a few bouts boats slip their moorings in the pond.





Left, Self propelled exhibits always seem to exhibit an array of novel innovations. This one uses a Garden seat and Reynolds Steering Wheel guide the Lister Diesel (?) and the occupants around the 40 acre sight in in comfort and Style that Shanks Pony can never match.

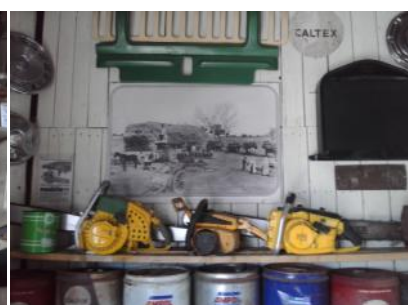
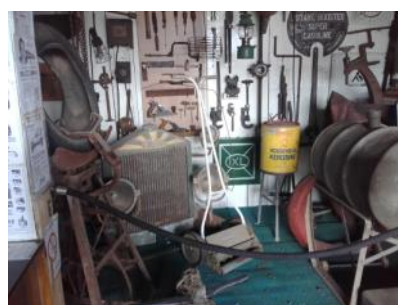
On the right, a tiller directs the Presidential Limo in Industrial comfort between guiding tours.



This early belt drive Triumph Motor Bike contrasts with a later Indian with a sidecar at Popy's



Across the road a pair of Harleys line up with an early Norton. It is good to see these motor bikes collecting in the area that many years ago was the clubs motor bike circuit. The magic has returned.



Inside some motor-ing reminders of days gone by and home mechanics workshop



This Gibson Garden Tractor lines up for the starters rope near this Rowtrac 5 Garden Tractor.



The International Harvester Club of Australia has moved to a new site and had their tent set up with some of the makers trucks and Tractors on display. This club has its headquarters at the Geelong Show Grounds and they will be there in force on January 12 & 13 at the Truck & Machinery Show.



Lofts Shed was looking spotless with its wide variety of displays and a nice Roller was parked outside.





Williams & Morris, shed 43A had some new fretwork clocks and animated birds on show to complement the collection of unusual pedal powered on show outside.



Meanwhile in shed 1 the Tamis family had their leatherworking display open with all manner of leatherworking tools and products on show. In the other end of the shed the engines were up and running. This is the first shed that many see when they come in from the carpark, and it sets a good standard.



Action started early before the rally in the compounds as exhibits were unloaded and set up. This unusual tandem joined some early rotary mowers and a well preserved 1930's style toy car that would have been some boys dream of things to come when a real car would come his way.



Some other unusual bikes were being ridden in the Parade by Robin and Patricia Evans.



The compounds had a great variety of visiting exhibits and displays, it is so hard to get to see them all and harder still to photograph and get some background stories on them. The Visitors who fill these compounds are a major feature of Lake Goldsmith Rallies and they attract a lot of attention.



The Harry Ferguson Tractor Club of Australia continued their workshop with the students from the Alice Millar School at Mt Macedon (see edition 149 Oct 2018). The Tractor was worked on by the students in the Club shed, and it was ready for the Grand Parade on Sunday.

This was a great achievement by the club members and the students and it is a lesson in what can be achieved by an inspired team. Hopefully this theme is developed and that a new generation becomes involved in heritage preservation in all its shapes and forms.

The Fergie club was also the organiser of this years tractor trek on the Friday before the Rally.

Unfortunately the weather forecast was for a much gloomier day than the one that arrived.

The entrants got under way on time and headed for Beaufort for morning tea with at the Beaufort



goods shed. They started in the car-park and headed North up Cheesemans Road and headed off on a forest road that took them through to the Beaufort-Carnham road and then into Beaufort and on to the goods shed yards in Albert street.





Visitors cars provide reminders of yesterdays motoring, from Australia's own Holden , IC and Steam from America and the UK. It was good to see the Sparks Family's well presented collection of miniature Steam Traction and Wagons and Replica steam Car back at our Rallies on a new site.

Melbourne Steam Trac on Engine Club's

STEAMFEST

March 9th - 11th 2019



National Steam Centre, 1200 Ferntree Gully Rd Scoresby
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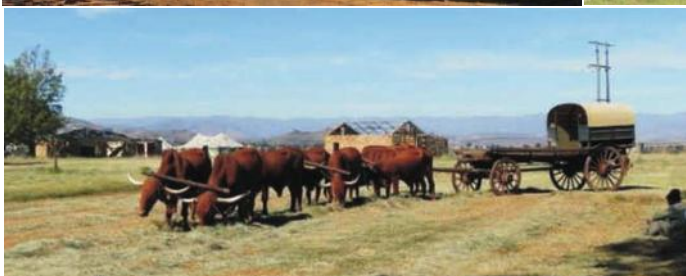
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THEME FOR NOVEMBER MEETING IS
"OLD & UNUSUAL TOOLS"

Alexandra Timber Tramway & Museum
 STATION STREET ALEXANDRA VICTORIA

Enjoy train rides in an historic steam, diesel or petrol train

MARKET DATES

2018	2019
8 September	12 January
13 October	9 February
10 November	9 March
8 December	13 April
	11 May

2ND SATURDAY OF MONTH

Alexandra Market
 2nd SATURDAY OF THE MONTH
 SEPTEMBER TO MAY
 STALLHOLDERS WELCOME
 info@alexandratramway.org.au
 0427 509 988

WHERE TO FIND US...
 Station Street, Alexandra Victoria

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Portarlinton Bayside Miniature Railway

SUMMER SCHOOL HOLIDAY RUNNING:

This passenger carrying miniature railway situated within the grounds of the Portarlinton Bayside Family Park, corner Point Richards & Boat Roads, Portarlinton (Melways Map Ref No. 444 C5) and operates every Sunday from 11.00 am to 4.00 pm, during the summer months (September-April). During the Summer School Holiday period, the railway will also operate a special service on the following days:

Wednesday, 26 th December, 2018	} from 11.00 am
Wednesday, 2 nd January, 2019	
Wednesday, 9 th January, 2019	} to
Wednesday, 16 th January, 2019	
Wednesday, 23 rd January, 2019	} 4.00 pm
Wednesday, 30 th January, 2019	

Further details can be obtained from the railway at P. O. Box 419, Port Arlinton, 3223, or from Margaret on our Telephone Info Line- Tel No. 0476-124-598.



GEELONG CLASSIC TRUCK &

MACHINERY SHOW
12TH & 13TH JANUARY 2019

As there is a Club display of more than '40 Years of Manufacturing at the Geelong Plant' at this rally, why not make a long weekend in Geelong commencing by coming to the General meeting on the Friday night?
 (12th January 7.30 pm)

At this preceding Friday night Club's General meeting a long serving PLANT employee, Mr. Adrian Innes, will be speaking on the Operations of the Plant.
 To hear this address is something **NOT TO BE MISSED !!**
 I fully recommend your attendance *Frederic*

2019 has some Rallies coming up.

The Alexandra Timber Tramway and Museum and the Portarlinton Bayside Miniature Railway have events over January and beyond, and the Geelong Vintage Machinery and Classic Truck show has its Annual event in January. The NHMA Rally & Steamfest at Scoresby are in March.

For those who can get to South Africa The Stars Of Sandstone is in April, and the 113th Lake Goldsmith Rally is in May.

It is a good start to 2019

LAKE GOLDSMITH STEAM AND VINTAGE 113TH RALLY 4TH & 5TH MAY, 2019

Regular attractions include:

- 65 Display Sheds
- Steam & Oil Engines
- Steam Powered Shovels & Saw Mill
- Displays of Earthmoving, Cars, Motorcycles, Tractors & Trucks
- Radio Controlled Model Boats
- Attractions for Ladies & Children
- Blacksmithing
- Threshing
- On-site Catering

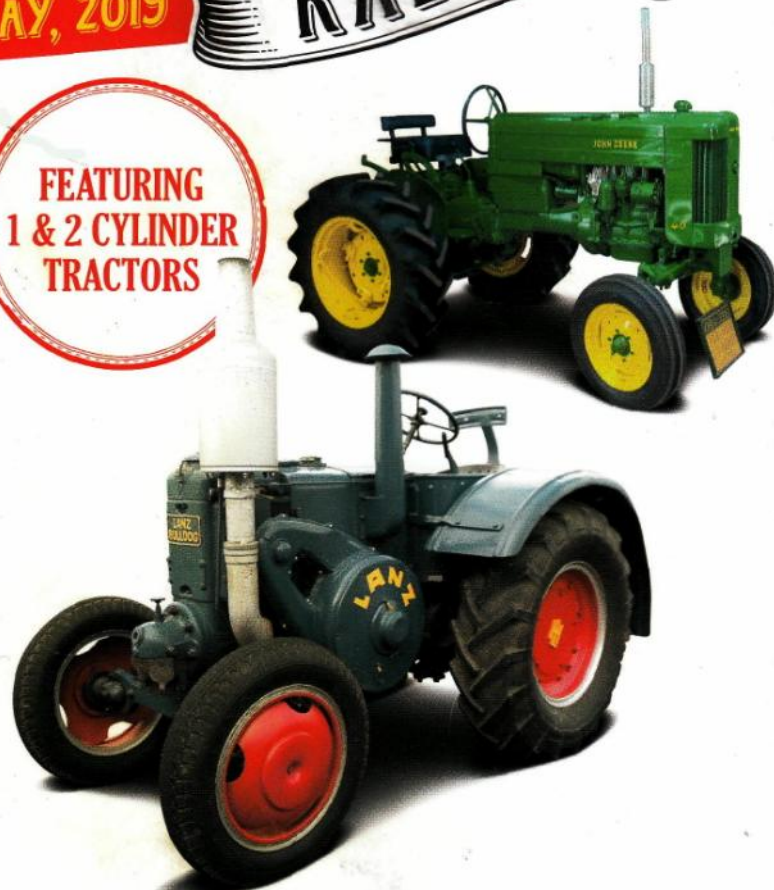
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FEATURING
1 & 2 CYLINDER
TRACTORS



ADMISSION PRICE: • Adults \$15.00

• Children aged 5-16 \$5.00 • Exhibitors and Children under 5 free

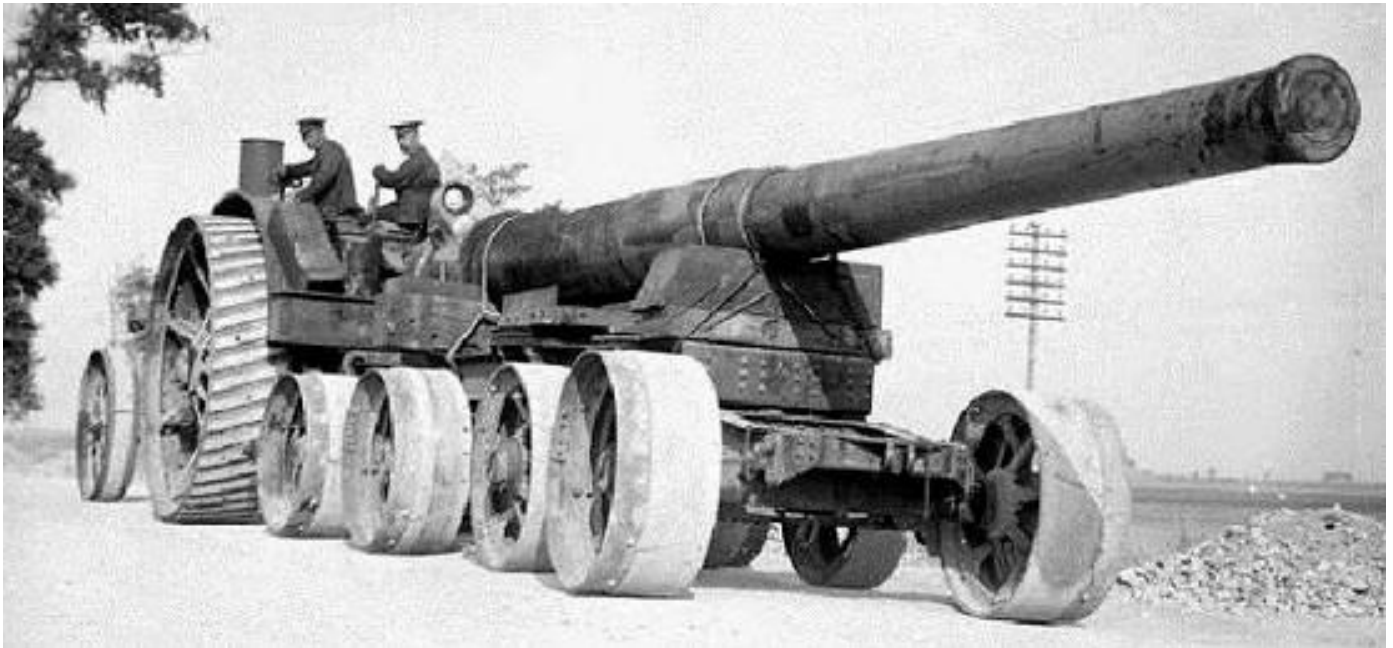
For rally information contact: Trevor Ph: 0407 539 041
or Graeme Ph: (03) 9723 3310 Mob: 0418 388 149

www.lakegoldsmithsteamrally.org.au • PO Box 21 Beaufort 3373

Correction

In the last edition (No 149 OCT 18 P 35) the picture below was labelled as a steam traction engine. This picture seems to crop up here and there without any identification. Eventually some more information has turned up. The Gun Tractor is one of 97 (complete with 291 trailers) ordered by the Royal Navy to transport 15" guns for the defence of Paris.

The Tractors and Trailers were made by William Foster & Co. of Lincoln in the UK.



The barrel in the picture is thought to be a 7.5" Naval Gun from HMS Swiftsure (1903) being transported to a coastal installation. From the rear the Tractor is a good simulation of a Steam Traction Engine. Other pictures that have come to light give a different view, so please accept my apologies.



Under load there is enough smoke and vapour to look like steam, and the profile looks right.

William Foster & Co. started business milling grain and building harvesting machinery. They had an engineering shop, and they were building portable steam engines in the late 1850's and in 1889 they built their first Traction Engine. In 1906 that started working with Tractors, and in 1909 they worked with Richard Hornsby to build the 80hp steam compound tracklaying "Yukon Tractor" to haul 100 Ton loads of coal along 40 miles of cross country tracks in all seasons. Foster manufactured the Boilers (Ruston had converted to producing the Hornsby Acaroid), and the coal carrying trailers.



In 1912 Fosters were looking to add Internal Combustion Tractors to their range. In 1913 they built a tractor which was intended for sale in Argentina. The motor for this tractor was a 6 cylinder Knight sleeve valve engine produced by Daimler, which since 1910 had been part of BSA (Birmingham Small Arms). Knight had come over from Chicago to join Daimler earlier, and

Fredrick Lanchester had joined Daimler to develop the double sleeve valve engine into a reliable performer.

As can be seen above and on the previous page, the new tractor retained the general outline of a Steam Traction Engine. The drive wheels seem to be driven by an exposed gear ring and pinion, and the cooling tower discharged a haze of steam and oil fume.

Before lead was added to petrol, and before metallurgy & lubricants provided improved materials, sleeve valve engines had a longer operating time between major services than Poppet valves. Their high oil consumption and oil haze was an acceptable compromise, and they tended to perform better as the carbon built up. They were popular on high priced large engined cars, where their silent running was a bonus.

The 80bhp Steam Yukon engine on the left demonstrates how much more compact the new tractor was.

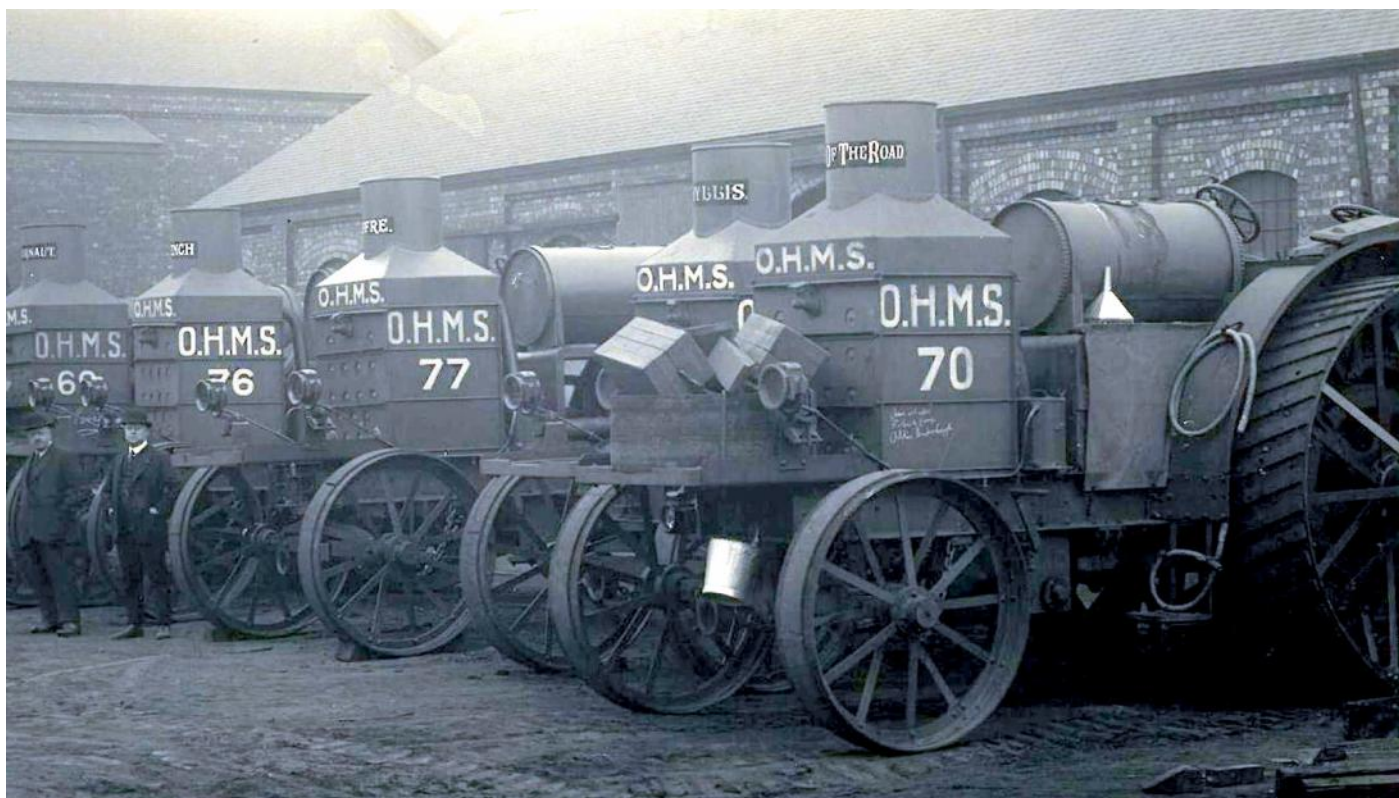
World War 1 intervened which made selling to Argenti-



na difficult and the Coventry Ordnance works had a problem delivering 15" Guns across France for the defence of Paris. The timing was perfect, and Sir Winston Churchill, then first Lord of the Admiralty, approved the purchase of 97 Tractors and 291 trailers mentioned earlier.

The Royal Navy managed these projects, which were using Naval Guns, manned by Naval Crews and the tractor units were



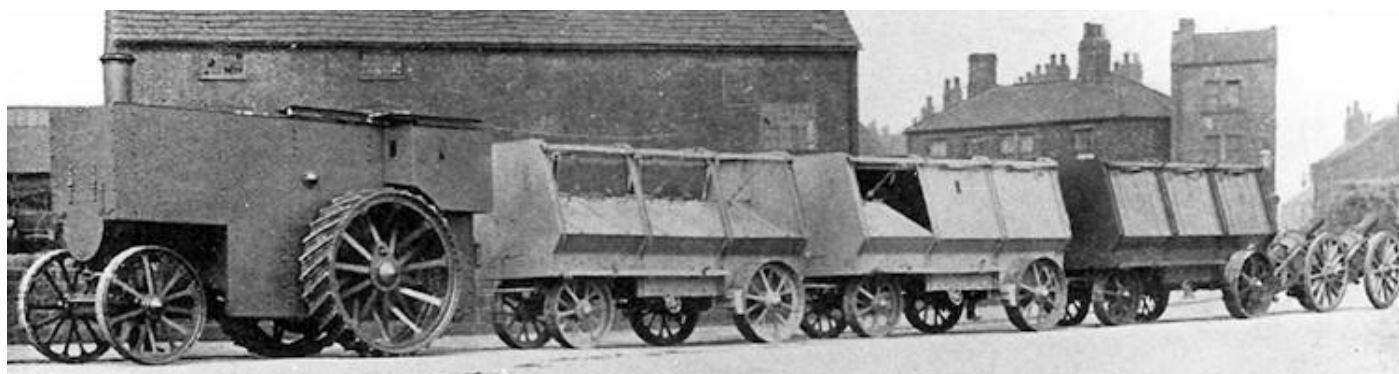


referred to as “Landships”. The order was completed in mid 1915 and delivered to the recently formed “ Royal Marine Artillery unit” who were to operate the guns.

The story did not end there. The Daimler Division of BSA was heavily involved in War Production, producing Gnome and Bentley Radial engines as well as V8 and V12 Aeroplane Engines.

The sleeve valve engines were to continue in their cars until the mid 1930’s, by which time conventional Poppet Valve designs had improved to the point which reduced the sleeve valves advantages, although single sleeve engines continued in planes through World War 2 where the quiet running had a distinct advantage in many situations.

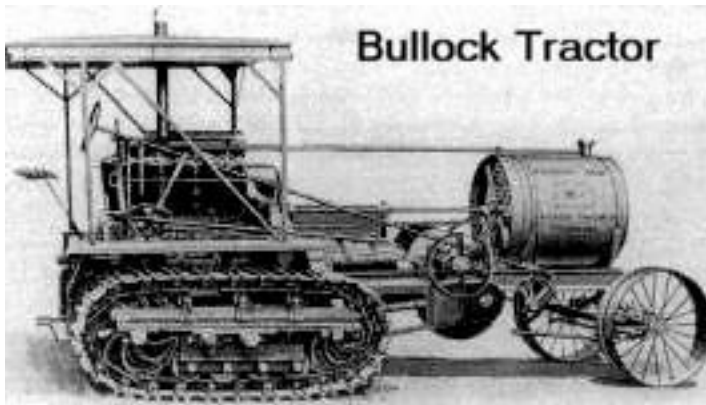
Back to Fosters, the Military were looking to develop a machine that could force its way over rough terrain, through barb wire entanglements and cross trenches and protect troops from the deadly machine gun cross fire and shrapnel. The Tank was on its way, although no one knew it then.



The “protected vehicle” concept had been around from Leonardo De Vinci’s time, and in siege form from earlier times. Fowlers built 4 armoured Traction Engines each with 3 armoured trailers for the Boer War in 1900, and in 1910 a tank like transporter using 2 Hornsby Tracklayer Tractors, arranged back to back and carrying Machine Guns and 12 pounders was proposed by Capt. Tom Tulloch as a counter for the German build up of artillery at the time. At the time no one was interested, and Hornsby sold their “Roberts” track patents and the Caterpillar name to Holt in California, who it appears did not use them as it had a good



Wm Foster & Co Ped Rail Drive Wheel Trials c1904

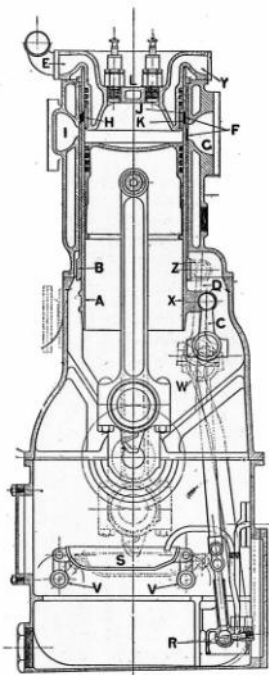
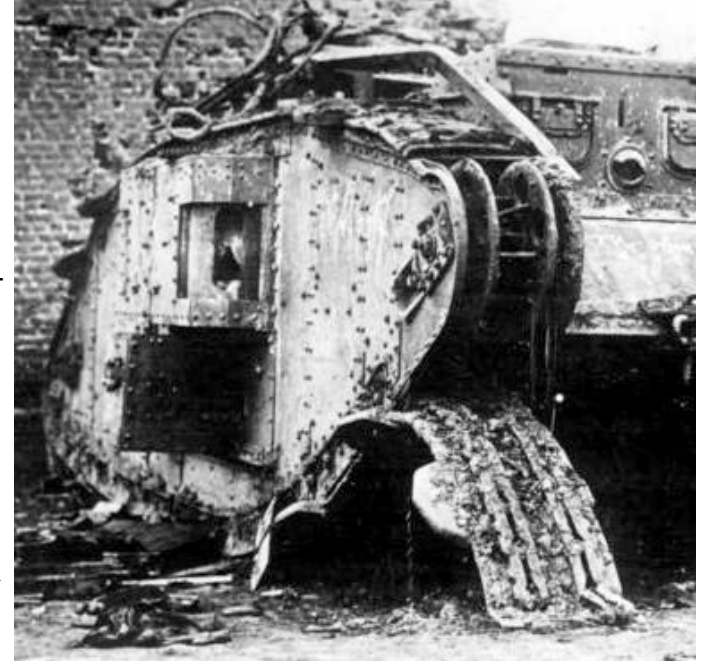


Bullock Tractor



design of its own. There were no Track makers in the UK at the time, no one was interested.

In 1915 the "Landships Committee" was formed by Winston Churchill to tackle ways of overcoming the advantages of trenches as a defensive barrier. Long armoured vehicles were proposed and William Foster & Co of Lincoln were awarded development contracts.

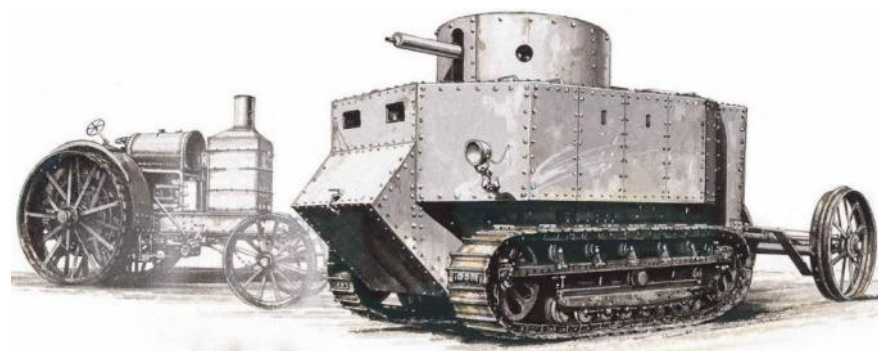


The Foster Daimler Gun Tractor was to be the basis of the early experiments and ultimately the basis of the early machines, which evolved to become the MK1, 2, 3, 4 & finally the Mk5 "Tank"

They had a good primary 2 speed & reverse transmission which had been designed by Fosters Manager, William Tritton, and a 13 litre Daimler Knight sleeve valve engine, which had been improved by Dr. Fredrick Lanchester to produce 105 bhp at 1000rpm. Steering was to be via differential braking

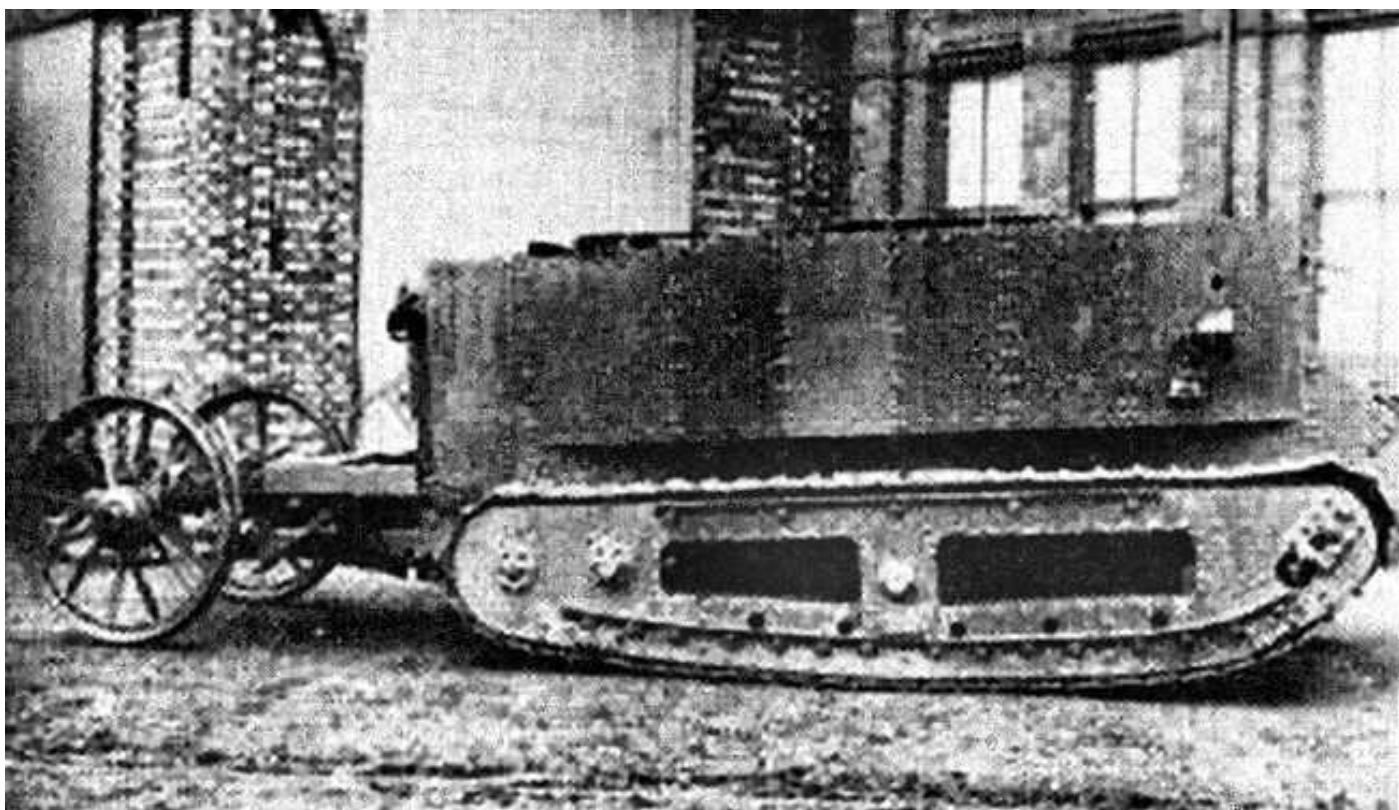
The first proto type used a lengthened pair of "Bullock" "Creeping Grip" agricultural tracks imported from America, but these proved impractical for crossing trenches as they were short and the track fell below the fixed track guide rolls when moving over trenches, and could fail to realign, potentially leaving the machine exposed and isolated with a thrown track. William Tritton (who it appears had disliked tracks) designed a new track that worked

when fitted to what was to be known as "Little Willie", the first prototype tank. The track could be tensioned at the front roller, and the track links had flanged horns so that they could not fall away from the rollers when the tank crossed a trench or shellhole, as can be seen on the damaged Tank (above right).



"Lincoln No 1" which used the lengthened Bullock Track units mentioned above. A Turret was tried, but later discarded, as were the tracks which could only get over a 4' trench (the spec called for a minimum 5). Little Willie had a range of 18 miles and a speed of 2 mph.

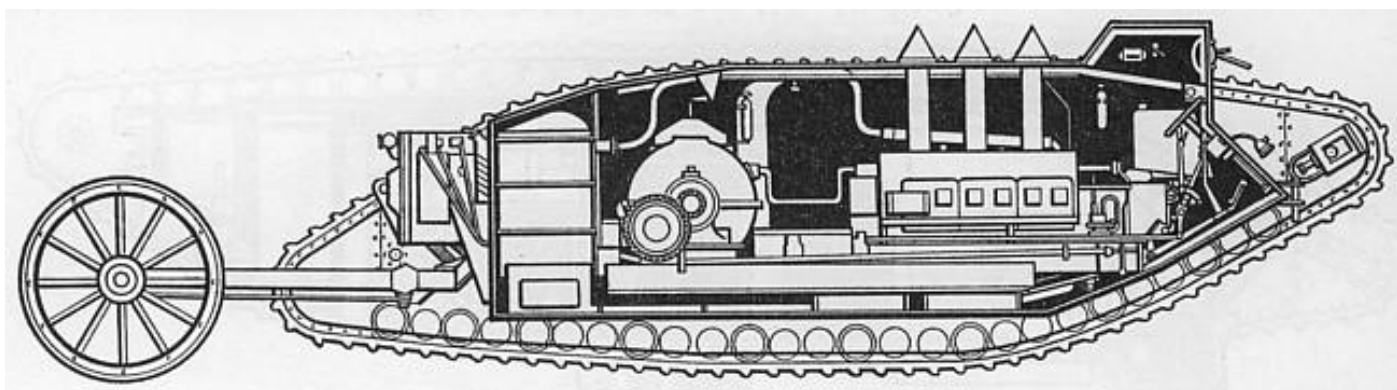
Steering was by braking the worm drive differential shafts with some help from the rudder like trailing wheels to minimise the power losses turning the 16 Ton machine. The wheels were also expected to help crossing trenches. These trailing wheels were the front wheels of the Gun Tractor, one



of which had been retained for the land ship prototype. It is not difficult to see how the cover name "Water carrier for Mesopotamia" was shortened to "Tank" by Major Ernest Swinton.

The name "Little Willie" is thought to have been a derogatory reference to Kaiser Bill. The obvious changes were the new tracks which were much longer and wider, with a curved bottom to help reduce steering effort, and track retaining guide rails, and the elimination of the Turret which was popular on other light armoured "cars" of the time. The turret was high, effecting stability, and the trenches that the tank was meant to straddle were shadowed by the hull.

While Wm. Tritton continued with the development of Little Willie, Major Walter Wilson of the



British Royal Naval Air service worked on Big Willie (above) which was built to a different contract

Big Willie became the "Wilson Machine" or "Mother" as it became the Mk 1 Tank when it was adopted after comparative trials with Little Willie. 100 were ordered on February 12 1916. It was the first production tank. It was in service in August and in action in September 1916.

The distinctive Rhombic Track design and 25 foot length let it climb the required 4'6" embankment, and it could cross trenches 11'6" wide. It weighed 28 Tons and could move along at 3.7 mph, had a range of 24 Miles. The side mounted "sponson" could be removed for transport, as could the Grenade deflecting





net on top. Being nearly twice the weight of Little Willie a second gearbox was added in each track to provide a lower speed when needed. This 2 speed and neutral gearbox was also the steering mechanism. Broad sweeping turns could generally be managed with the rear wheel Ackerman steering, but for any tight cornering or manoeuvring the steering gearboxes were used. The crew had been increased from the six used in Little Willie to Eight with the addition of two steersmen who each operated a track gearbox under instruction from the driver.

To change direction the vehicle was stopped, and the drive disengaged in the selected track. The vehicle was driven on one track until it was pointing in the right direction. The vehicle was stopped again, the drive was re-engaged and the vehicle moved forward again. This system was in use on steam shovels at the time. There was not enough power available for braked differential steering.

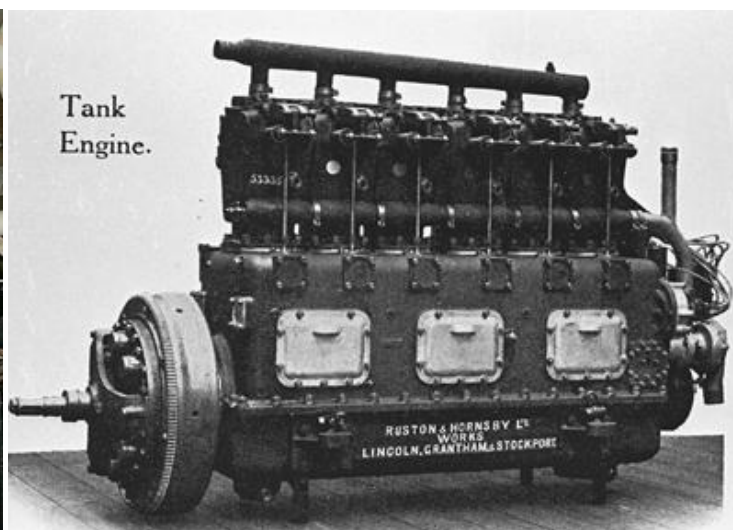
This system was to be upgraded on the Mk 4, but it was the Mk 5 introduced in 1917 that saw the introduction of a 19 Litre 150hp Ricardo engine and an epicyclic steering system developed by Major Wilson. The new steering reduced the 4 people required to drive the Mk 4 to 1 for the Mk 5.

The elimination of the huge worm drive transmission allowed a commanders observation “observation tower” to be installed. The Mk 5 was a vast improvement on its predecessor.

Manufacture of the Mark 5 shifted to the Metropolitan Amalgamated Railway Carriage & Wagon Company Ltd in Birmingham, so the story drifts away from Fosters and Wilson. Wilson went on to design the Wilson Preselector Gearbox used by Armstrong Siddeley and other British cars, as well as other heavy vehicles and later Tanks.

William Tritton was knighted in 1917 and Mjr Walter Wilson received a CMG. In 1919 Tritton and Wilson were recognised as the inventors of the Tank by the Royal Commission on Awards to Inventors and they received a joint award of £15 000.

The Ricardo engine (right) was designed to fit in the same compartment as the earlier Daimler.



Conditions inside the tanks were to say the least, unpleasant. Noise, heat, fumes and injury when travelling over rough terrain with no sprung suspension, working in near darkness, sharing the space with fuel tanks and ammunition & extra petrol in cans, in a steel box of 1/4" & 1/2" thick armour that was only proof against rifle fire and shrapnel with a mechanical system that was prone to break down or become bogged in No-Mans land was a test for any soldier.

These tanks were conceived, developed, tested, manufactured and deployed in a relatively short time, from Lincoln No1 in Aug 1915 to Mk 1 in France in August 1916 and 400 Mk 5's ready for action in France in May 1918. 400 were supplied, 200 male with 6 pound (57mm) guns, 200 female with machine guns of which some were converted to Hermaphrodites a 6 pound gun in one sponson to protect the female tanks from an attack from captured male tanks in use by the Germans.

Many of the upgrades planned were not used in order to avoid interrupting production and the delivered Mk 5 was actually an upgraded Mk4.

Just as interesting is how a company with an agricultural Steam background developed a Hybrid petrol tractor intended for Argentina, managed to develop a massive Gun tractor and then adapt it to produce the Worlds first Tank is a story of innovation and resourceful use of existing technology.

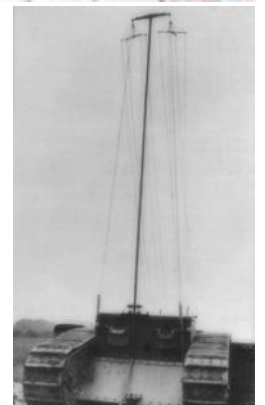
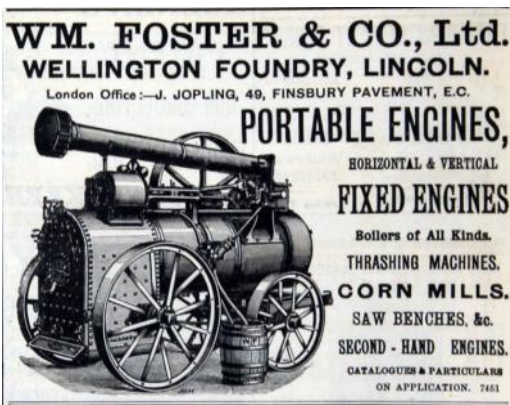
The involvement of the Royal Navy in early armoured cars, Gun Tractors and Landships left their mark on Tanks with Crews, Hulls, Hatches Turrets and Sponsons.

These Tanks were expected to be expendable with the sole aim of ending the stalemate of trench warfare. Not only did they succeed in their aim, they introduced a combat vehicle that rapidly developed into a highly mobile war machine that is a mainstay in modern armies. To achieve this, new strategies had to be developed to maximise the advantage of the Tank and overcome countermeasures that the enemy would develop

Anyone with an interest in any aspect of this story can search out a lot on the internet, although you may have to try a lot of sites. I hope that someone is as fascinated with this piece of industrial and military as I was.

William Foster included the Tank Profile on the name-plate casting of its Thrashing machines. Foster survived until they were taken over by W H Allen and later Amalgamated Engineering.. Below, clockwise from the top left, an early Foster Add, The Gun Tractor, an unarmed Wireless tank (another first)

And a view of the Mk 5 tank production line, and a Mk 5 tank and the 8 Man crew. Ed.





Sir Wm Tritton

Charles Knight

Sir Wn Churchill

Walter Wilson

Sir John Monash

Five of the main players in the success of the Tank in World War 1 were from the left, Sir William Tritton in his managerial and technical roll in developing and building a petrol version of a rural traction engine which used a 105hp Knight engine developed with Daimler. Churchill recognised the military potential of the tractor, and as First Sea Lord formed the “Landships committee”. Tritton developed a workable tank track design and Walter Wilson designed a “Landship” to use the tracks to cross trenches, and later designed a steering system that led to an effective practical tank in 1917.

John Monash, the General in charge of Australian Forces on the Western Front developed tactics that made the tank into a force that played a major roll in bringing an end to hostilities in WW 1, and an end to the mass slaughter when the machine gun forced traditional combat into static trenches.

Sir John Monash was born in West Melbourne in 1865. He was educated at Scotch College and at Melbourne University where he gained Degrees in Law, Engineering and the Arts. He was active in the university Militia and he had a personnel interest in Military History and contributed papers on the subject. He was also a meticulous strategic planner who achieved success by ensuring that every one involved understood their part in the event.

When WW1 started he was a Colonel in the Militia, and although he was not a professional soldier he was in charge of the AIF’s 4th Brigade in Egypt and Gallipoli where he distinguished himself.

In 1916 he was in France, and in 1917 as a Lieutenant General, he led the entire Australian New Zealand Army Corps (ANZAC) on the Western Front.

The Mk 1 Tanks had arrived in France and began being deployed in September 1916 as an untried machine with no experienced crews or battle tactics or expected enemy counter measure.

By July 4 1918 Monash was able to test his new theory of combined attack using Artillery Air and British Tanks to support 7000 Australian and 1000 American troops at the Battle of Le Hamel. The Battle was over 93 minutes after it started. The noise masked the Tanks and the tactic was used for future attacks using Tanks. Monash’s plan to use machinery to protect troops worked. Three Tanks were damaged but repairable, but they performed beyond expectations, and better than they had ever done before. For the first time Monash had used planes to drop machine gun ammunition to the front making the machine gun a practical offensive weapon. From Le Hamel to the Hindenburg line success followed success and the rate of casualties diminished. Monash’s well trained and coherent troops and British Tanks showed the way to end World War 1.

The Tank experiment had worked.

The ANZAC troops and Sir John Monash had locked their place in history and our folk law.

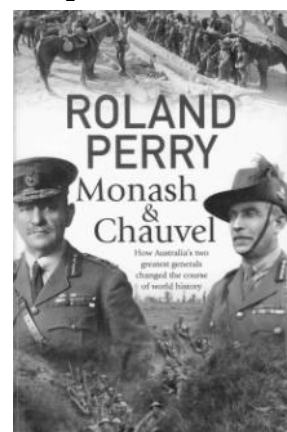
From Traction Engine to Tractor to Tank to Victory, the law of unexpected consequences.

We tend to see our interest in steam and internal combustion tractors from a rural and commercial perspective. The roots of military combat vehicles share their origins with Steam Traction when for the first time power and mobility could advance beyond what was achievable with draft animals.

With this year being the centenary of the armistice that ended the fighting there is a lot of reading available. One book that I can recommend is Monash and Chauvel by Roland Perry.

This book outlines the history of these Australian military leaders in France and the Middle East . It includes the political intrigues and personnel alliances that go with leaders in all fields of endeavour. Enjoy the read.

It was written in 2017 ISBN 978 1 76029 143 3





Again Ron & Linda Harris hosted the Tractor Trek morning tea at the Lake Goldsmith Goods Shed. On pages 25 & 26 there are some pictures of the first stage of the Tractor Trek. Unfortunately the photographer picked up a tek screw in a tyre, so there are no pictures after morning tea. Thanks to all who stopped to offer assistance. The shed is well laid out with a lot of local and railway history, and enough chairs to sit around and take five after the trekkers continued on their way to Cross Roads.

