



Ancient Iron

Official Newsletter of

Marlborough Vintage Farm Machinery Society Inc.

Issue 13 December 2018



Open Day October 2018

Welcome to the last edition of Ancient Iron for 2018. While another year has raced by we hope you have achieved some of your goals that you may have set at the start of the year. For those of you who have had medical issues throughout the year we hope you have recovered or are on the road to recovery. No doubt we have all lost some family or friends to which we offer our condolences. To those of you who are about to have a birthday, Happy Birthday. Enjoy the festive season, stay safe, look out for your family and friends and if you are travelling drive safely. Here's hoping we get some good weather over the Christmas & New Year period and we look forward to catching up again soon.

Progress to date:-

Somewhere back in April 2018 and by some means , David Brown restorations came into my life. One is not sure whether this was self inflicted or through the coercion of others who had better remain anonymous!! However it has been a rewarding journey with new personalities to be understood and acclimatised to, as well as quite a bit of uncharted territory as far as the MVFMS Inc setup goes. Best not forget the awe inspiring collection that brings a smile and a chuckle to the face of this newbie.

Firstly the 880 was completed probably about June of this year,with very little involvement from me, no sooner that this was out of the shed when team leader Ted Hutchinson shoved the DB VAK 1A into the shed before anybody had a chance to propose something other than that particular tractor or other project. Such was Ted's enthusiasm when doing restorations! Work proceeded with what some would call a minor war against rusted up parts, the tractor having come from a possibly coastal Kaikoura location .

Well, disaster struck with the passing of Ted, our team leader, a much respected member of the Society and believed, if what one hears, to be the life and soul of Society meetings. Sadly missed and certainly, not forgotten.

Our erstwhile Restorations Convener then cast his eagle eye about for a replacement for Ted, resulting in muggings getting the nod. I do hope John,that you did ask others as well as this is quite an honor for a new chum to take on such a project!

At this point, 14/9/18 the original four speed has been mostly dismantled, the motor is seized solid in the piston department, so was put aside in favour of one from a six speed that does turn over and MAY prove to be a winner. The team is doing a partial dismantle of the six speed for rear mudguards, brake parts and any other useful bits that are well seized on the original. The mission is to keep the rare four speed as original as practical to create a suitable Memorial to Ted, without breaking our hearts over the project!

The hearts referred to are Bruce Davies, Alan McWha, Warren Johnston, Myself and Alan Gifford who provides largely moral support but is a good sounding board for info regarding the affairs of Marlborough! We do appreciate the support of the whole Club team , it is great and just makes life so much easier, with things like help with pulling dead tractors out of sheds to get to the one required has been invaluable. Putting them back was interesting to say the least! With the park's undulating topography being of little help at all!



**L to R are Bruce Davies,
Alan McWha & Ian Conway**



Warren Johnston is busy at work cleaning off years of grease and dirt



Help Wanted With Alan McWha leaving the restorations team there is now a vacancy so if anyone is interested in helping with this project and future projects please contact Ian Conway. This type of work is very rewarding when you consider that you often start with a rusty piece of machinery that most people would condemn to the scrap heap and finish up with a shiny restored tractor like the photo below.

A Big Thank You Ian Conway has advised us that Graham Gifford of O'Dwyers Road has very generously donated two new rear tyres and a new 6 volt battery for the David Brown restoration. He also has another 6 volt battery should we have a use for it.

“ So if you run into Graham , give him a hearty handshake and a big thank you!”

A little history about David Brown and the VAK1A Crop master

While flipping through *The Times* newspaper in late 1946, industrialist and engineer David Brown stumbled upon an ad selling a “High Class Motor Business.” Already steeped in the world of engineering and manufacturing, the Englishman’s interest was piqued. He visited the company headquarters only to discover that the company for sale was none other than Aston Martin. During Brown’s visit he had the chance to drive one of the company’s prototypes, and seeing great potential in it, he opted to purchase the company with which his name would forever be tied.

But before Brown swooped in to change the course of Aston Martin with the DB-line of sports and touring cars (to which he lent his initials), he manufactured tractors. He first worked in his grandfather’s David Brown Gear Company Ltd. (with whom he obviously shared a name), and by 1931 David had moved on from managing director and was running the family firm following his father Percy’s passing.

David Brown had been trying to break into motor vehicle manufacturing for some time, and the spark that made it happen was a partnership with engineer Harry Ferguson. Together they established the Ferguson-Brown Company in

1936, from which came the Ferguson-Brown tractor. Although the farm tractor was by all measures quite successful, Ferguson and Brown did not prove compatible, and after a bout of disagreements on design among other things, the partnership dissolved.

Afterward, while Ferguson fell into a doomed team-up with Henry Ford in Detroit, Brown quickly brought out a fresh tractor design of his own. The VAK1 “Crop master” tractor strutted its stuff at the Royal Agricultural Show in 1939. VAK stands for Vehicle Agricultural Kerosene, and it had a 35-horsepower four-cylinder gasoline engine and four-speed transmission. Breaking away from the gray paint that Ferguson was known for, Brown demanded the Crop master be painted Hunting Pink, or red.

The tractor couldn’t have arrived at a more ideal time, becoming a critical tool in food production during World War II. More than 7700 VAK1s were sold—a huge success for Brown.

The Crop master ran either on petrol or paraffin (tractor vaporising oil), and it came with a double seat that was designed for two people to ride. Later on, the style became known as the “courting tractor,” perhaps for those who hoped to kill two birds with one stone and mix tractor work with a little dating. While many other tractor designs have the brakes on the right side of the tractor and the clutch on the left, that system had to be modified for the dual-seat design.





Keith Worner and Jim Hammond are progressing with the repairs on the Massey Harris



The old traction engine that is usually on display at the entrance to Brayshaw Park has been moved and is being prepared for sand blasting and a coat of paint.



Bernard Mason is getting this old dray ready to go to the Renwick Museum to replace the dray that was completely destroyed by a 19 year old intoxicated driver in September.

Pictured below is Ian Conway who along with Chris McKay spent a lot of time getting the Dray out of the shed for Renwick Museum and spent an equal amount of time putting everything back again like this incomplete Dray.



Change Of Secretary



After at least eight years and possibly ten years (John can't recall just how many its been), John has resigned his position as club secretary. On behalf of MVFM we would like to thank you for all the time and effort you have put into the job. Attending meetings, taking minutes, typing them up and sending them out, writing and answering letters along with your experience and wisdom has been greatly appreciated by us all. John will continue as restorations convenor so with all your extra spare time John we should soon see restorations coming out the workshop at a great rate!!



Our resident Blacksmith and his wife, Warren & Kathy Johnston, have taken on the role of club secretary. Warren commented that "he is the secretary with his own secretary" and judging by what we have seen so far they are both doing a great job. Kathy is also very handy with a camera and because we were away at the time of our last open day Kathy kindly sent us her photos which we have included in this edition.

Club Curator



Jim Creswell has recently taken over the position as Curator after John Burnett resigned. Jim is keen to get started in this role and with his background of working with farm machinery he'll have no problems getting to grips with it, although he did mention he may require a bit of help with the computer side of things.

No problem Jim, I'm sure John will be happy to help you out.

Jim is pictured here busy getting the replacement Dray ready for Renwick Museum.

Melbourne Steam Traction Engine Club

Sometime ago I mentioned I had visited the Ferntree Gully Steam Museum in September 2017. In their Steam Hall they have a big collection of steam engines, oil engines & diesel engines from small to large in all categories. At one end of the Hall they were preparing a large foundation for an equally large diesel engine, the Willans "Air Blast – Diesel". One of the club members there, Adrian Anderson, has sent me these photos of progress to date, with the exception of the photo below, which I took in September 2017 which shows the size of the foundation being constructed.



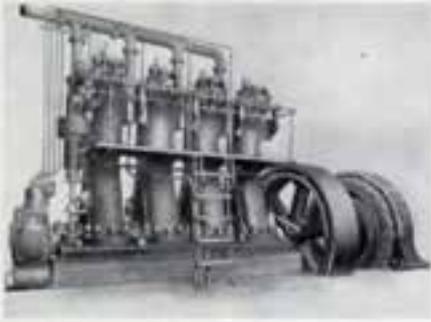
The foundation is completed



The Willans sitting in place showing the Reavell & Co. Quadruple 3 stage air compressor at the front of the Motor which is driven by the crankshaft.



The engine with the flywheel yet to be fitted but with the alternator and exciter in position.

WILLANS-DIESEL ENGINES		
<p>LOW FUEL COSTS.</p> <p>SILENT RUNNING.</p> <p>SPARE PARTS INTERCHANGEABLE IN ACCORDANCE WITH OUR STANDARD.</p> <p>SMALL MAINTENANCE CHARGES.</p>		<p>ILLUSTRATION SHOWS 300 B.H.P. WILLANS-DIESEL ENGINE IDENTICAL WITH ONE SUPPLIED FOR DRIVING MESSRS. D. NAPIER & SONS' WORKS, AND MANY OTHER INSTALLATIONS.</p>
<p>SPECIALISTS IN CASTINGS FOR INTERNAL COMBUSTION ENGINES.</p>	<p>FOR DETAILS AND DETAILS ON APPLICATION:</p> <p>WILLANS & ROBINSON LTD., VICTORIA WORKS, RUGBY.</p>	

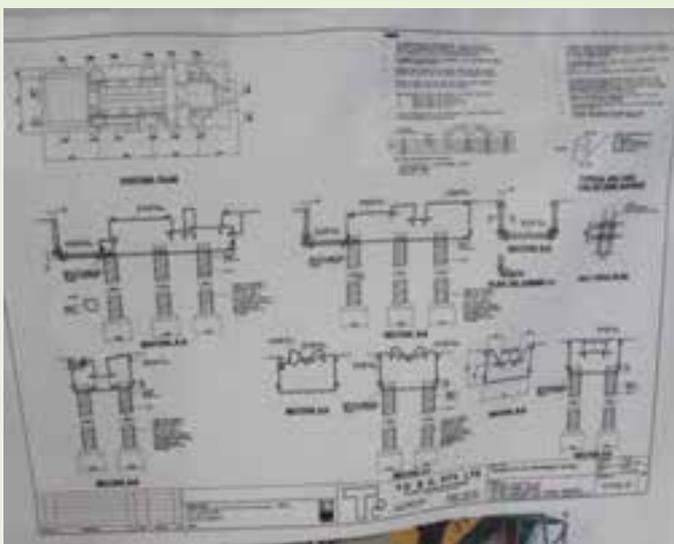
This type of engine was first designed by Rudolf Diesel and Mirrlees-Watson were the first British Company to manufacture an engine using Rudolf Diesel's designs under an exclusive license granted in 1897. This particular engine was manufactured and sold by Willans & Robinson Ltd of Rugby, England in 1904. It is an "Air Blast Diesel" built to designs patented by Rudolph Diesel. Willans & Robinson negotiated a license agreement with Dr Rudolph Diesel's Engine Company in about 1904 to use his engine and fuel injection system. The English-Electric Company purchased Willans & Robinson in 1919 and continued to manufacture these engines until the early 1930's. This is a three-cylinder, Vertical, Compressed Air-Blast Injection Diesel Engine . This engine was built around 1928 and was one of two bought and installed by Carlton & United Breweries (CUB) at their Carlton Brewery in Melbourne as a standby generator. The second engine was installed at the Victoria Brewery. It was originally installed with a DC generator, which was later replaced with an AC alternator. By 1950 the engine was made redundant because a larger standby diesel generator was installed. The Willans was removed and re-erected at CUB's Yorkshire Brewery in Collingwood and was in operation by 1953. Following a bearing failure in September 1969 the engine was destined to be scrapped. Fortunately it was saved, and passed through several hands before it was donated to the Melbourne Steam Traction Engine Club, located at Fern Tree Gully in 2011. The engine has undergone a major restoration of which one of the biggest jobs was to repair the severely damaged crankshaft big end journal. This was caused by a lubrication failure. The club looked throughout Australia to find a suitable company who had both the equipment and experience to repair a crankshaft of this size. Unable to find a company, the club turned to Goltens in Singapore, who are considered to be world experts in this sort of repair. When Goltens received the crankshaft they had difficulty finding a true reference surface and so it had to be set up in their crank grinding machine with steadies at each main bearing journal to find the true centre line.



Goltens offer full NDT inspection (Magnaflux and Hardness)
 Hardness removal via Annealing
 Crankshaft grinding and polishing
 Crankshaft straightening
 Crankshafts up to 7 Meters in length
 Crankshafts up to 4.5 Tons



Once the Crankshaft was repaired work started on the foundation for the engine. Fortunately the club was able to recover a number of documents with the engine including the original recommendations for the foundation designs.



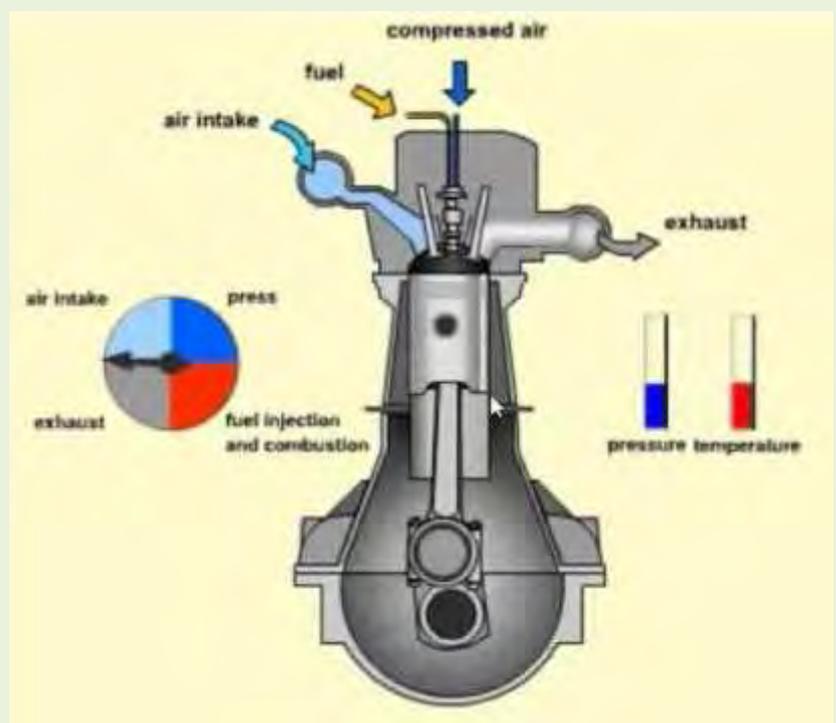
The foundations required for large vibrating loads for engines such as the Willans, which rely on the foundation to maintain crankshaft alignment, meant professional help was needed.

The original Willans foundation drawings were studied, which also included a recommendation to use piles in difficult soil. Mirrlees also made similar recommendations from the same era. Soil testing experts were called in who found very weak and wet saturated silted clay under the top layer of hard fill. Civil engineers with expertise in such matters were then engaged to come up with a design to suit these conditions.

The engine is of historical significance, not only because it uses the same principles as Rudolf Diesel's engine but because it was one of the first generation of large industrial diesel engines used in Victoria. It is also significant for the massive design of the engine and the open crank, "A-Frame" form supporting the cylinders. This engine develops 250bhp at 220 rpm. The cylinders are 15 inch dia.(381mm) with a stroke of 22 inches (559mm). The complete engine weighs about 40 tonnes with the flywheel weighing 7 tons alone, hence the need for the large foundation.

A large number of Air Blast Diesels were manufactured by many well known engine manufacturers including Sulzer, Man & Mirrlees. In Australia, Walkers of Queensland also manufactured a small number of these engines. One of these has been found in an old sugar mill in Queensland and preservation of it has begun.

A Blast Diesel engine requires a constant supply of compressed air at a pressure of at least 800 psi. The Willans uses a Reavell & Co. 3 stage Quadruple air compressor connected to the front of the crankshaft to achieve this. The compressor has four pistons, two of the four are low pressure and deliver the compressed air to the first receiver. The second stage piston is supplied by the first stage receiver and increases the pressure and so on until the pressure is increased to 900 psi.



The diagram on the right gives a basic cross section of an "Air Blast Diesel"

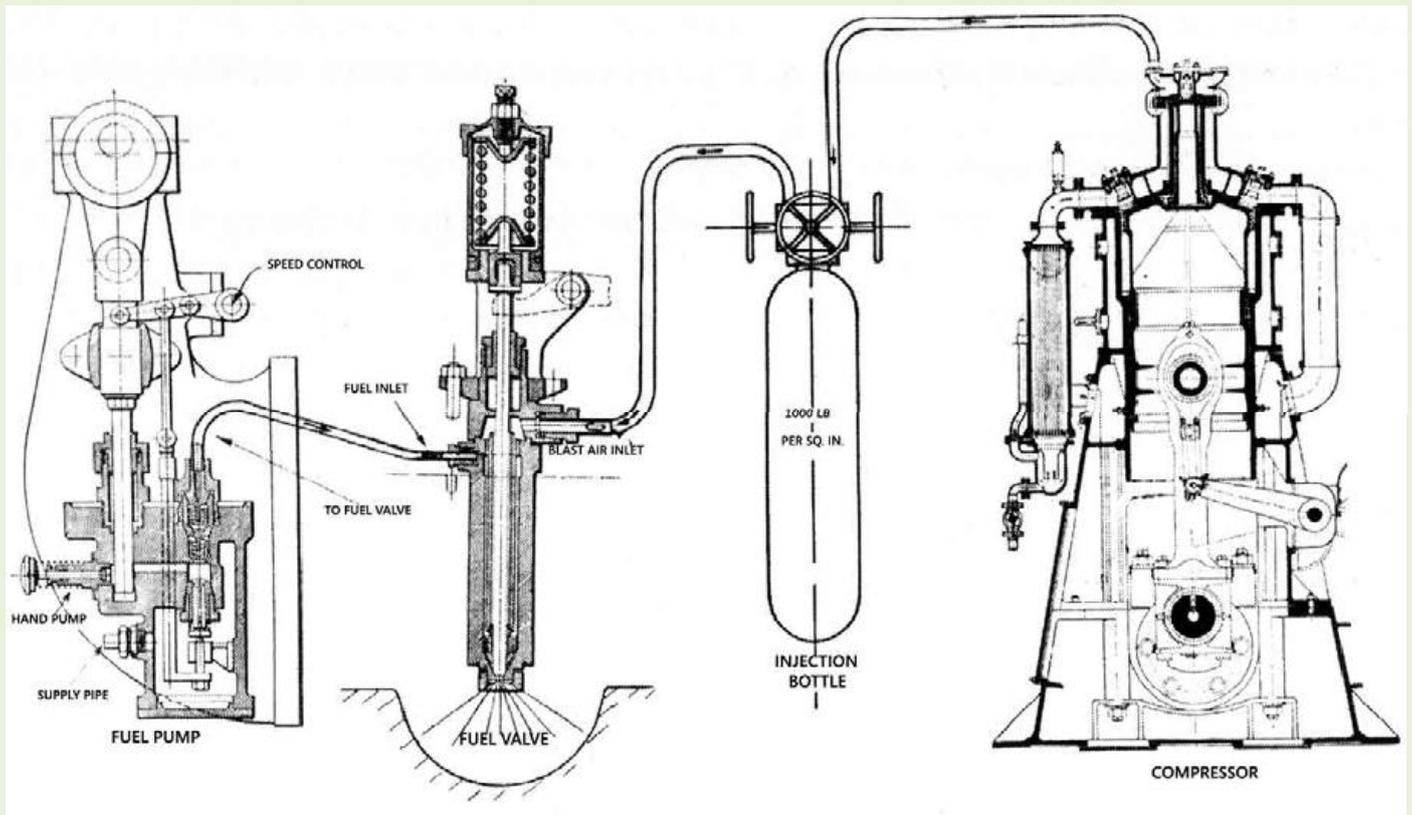
When the piston starts on its downward or intake stroke it draws in fresh air from the atmosphere via the inlet manifold and inlet valve. The piston now starts on its upward or compression stroke where the air is compressed to about 1/14th of its original volume. This raises the pressure in the cylinder to about 500 psi and as the piston reaches the top of its stroke the temperature of the compressed air is near 1000 degrees Fahrenheit(540 Deg Celcius). At the same time fuel is pumped up to the fuel valve by a low pressure pump. The fuel valve is also under constant air pressure from the compressor. At this stage the needle valve in the fuel atomiser is lifted off its seat by a cam on the cam shaft to allow the compressed air at about 900 psi and the fuel to blow through an atomiser in the fuel valve and thus spray a fuel mist into the cylinder. With a blast – injection engine there is not an explosion as such when the fuel ignites but rather a controlled burn which lasts for approximately ten percent of the power stroke. This makes this type of diesel engine run quieter than a modern diesel with solid injectors. The speed and load of the engine is controlled by the air pressure passing through the fuel atomiser.

In a modern diesel, close to spontaneous combustion occurs, which raises the pressure in the combustion chamber to about 2500 psi. This has the same effect as hitting the top of the piston with a ten ton sledge hammer and of course the knock that goes with it.

All the first diesel engines were air – blast because they did not have the technology to manufacture solid injectors that could handle the required pressures to achieve good fuel atomisation. In 1912, Ruston, Proctor & Co. Ltd., were

one of the first companies to develop a fuel injector that would also become the basis of the fuel injector that is still in use today.

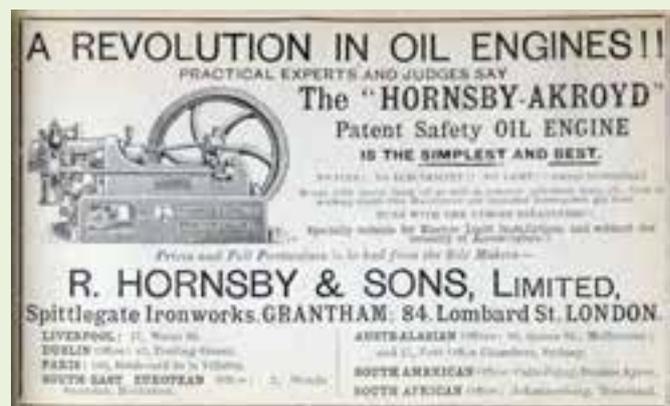
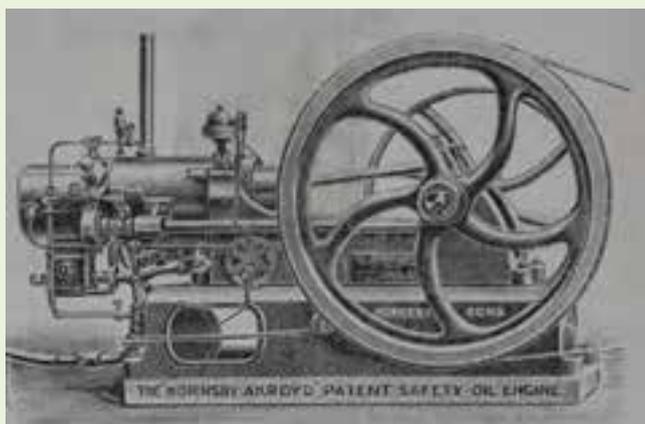
Diagram of an "Air Blast Diesel" fuel injection system



Piston

Miramar, Wellington 1913 Years before, in the borough of Miramar, two Willans & Robinson Air Blast diesels were about to be assembled and commissioned at the Miramar Power House to supply DC electricity for the new trams and borough lighting. These were the first of their kind to be used in NZ. The two engines, of 3 cylinders each, produced 50hp/cylinder to make a combined 300hp. They would run on Taranaki crude petroleum, NSW Shale Oil or any other suitable fuel that could be purchased at a suitable price. The engines were assembled by J J Niven & Co of Wellington, under the supervision of Mr. A Phillips, their Internal Combustion specialist who was also being assisted by Mr. F C Jacobs who had six years experience with diesel engines at the Porirua Hospital, which had the oldest diesel plant in NZ.

It is also interesting to note, two years earlier, Herbert Ackroyd Stuart (a Welshman) had invented the low compression "Hot bulb" oil engine. The first prototypes were built in 1886 and production started in 1891 by Richard Hornsby & Sons of Grantham, Lincolnshire, England under the title Hornsby Akroyd Patent Oil Engine.



Rudolph Diesel

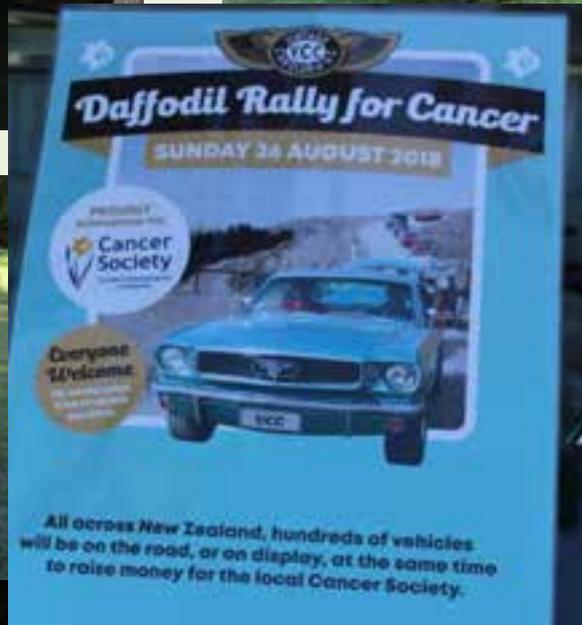
On the evening of 29 September 1913, Dr. Rudolf Diesel boarded the steamer *Dresden* in Antwerp on his way to a meeting of the Consolidated Diesel Manufacturing company in London, England. He took dinner on board the ship and then retired to his cabin at about 10 p.m., leaving word to be called the next morning at 6:15 a.m.; but he was never seen alive again. In the morning his cabin was empty and his bed had not been slept in, although his nightshirt was neatly laid out and his watch had been left where it could be seen from the bed. His hat and overcoat were discovered neatly folded beneath the afterdeck railing.

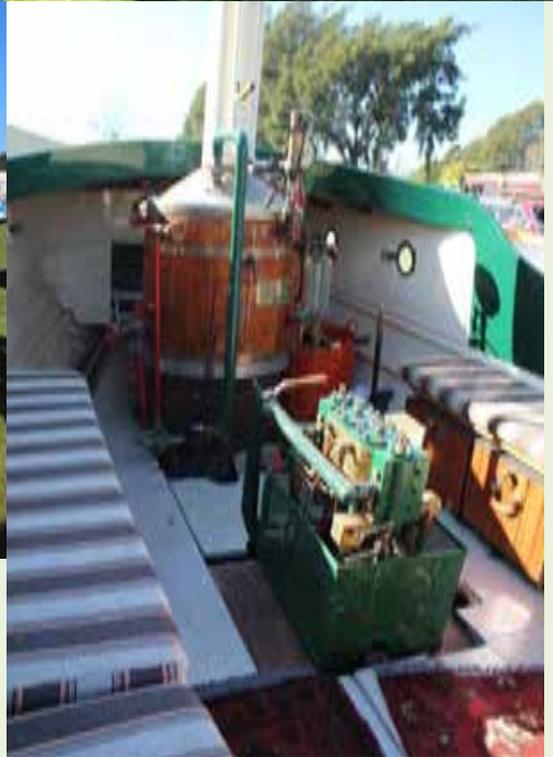
Ten days later, the crew of the Dutch boat *Coertzen* came upon the corpse of a man floating in the North Sea near Norway. The body was in such an advanced state of decomposition that it was unrecognizable, and they did not bring it aboard. Instead, the crew retrieved personal items (pill case, wallet, I.D. card, pocketknife, eyeglass case) from the clothing of the dead man, and returned the body to the sea. On 13 October, these items were identified by Rudolf's son, Eugen Diesel, as belonging to his father. On 14 October 1913 it was reported that Diesel's body was found at the mouth of the Scheldt by a boatman but he was forced to throw it overboard because of heavy weather. There are various theories to explain Diesel's death. Certain people, such as his biographer Grosser in 1978, argue that Rudolf Diesel committed suicide. Another line of thought suggests that he was murdered, given his refusal to grant the German forces the exclusive rights to using his invention; indeed, Diesel boarded the *SS Dresden* with the intent of meeting with representatives of the British Royal Navy to discussing the possibility of powering British submarines by diesel engine – he never made it ashore. Yet, evidence is limited for all explanations, and his disappearance and death remain unsolved.

Shortly after Diesel's disappearance, his wife Martha opened a bag that her husband had given to her just before his ill-fated voyage, with directions that it should not be opened until the following week. She discovered 200,000 German marks in cash (\$1.2 million USD today) and a number of financial statements indicating that their bank accounts were virtually empty. In a diary Diesel brought with him on the ship, for the date 29 September 1913, a cross was drawn, indicating death. This, however, does not solve the question whether he ended his life by his own hand, or whether he fell victim to a crime.



Daffodil Rally for Cancer











Moving On

We sadly farewelled Alan & Karen McWha who, for family reasons, are moving to Christchurch. Alan has been part of the restorations team for a long time. He was Ted Hutchison's right hand man and was involved with just about every David Brown tractor restoration in recent times. He also helped restore numerous ploughs, both tractor & horse drawn and several cultivators. Alan will still be involved with vintage machinery when he shifts to Christchurch as he will once again team up with Alan Petersen who is also living in ChCh. Alan Petersen was also a member of the restoration team.



Alan & Karen pictured with one of the many David Brown's that Alan helped restore

Karen has been involved with the kitchen, helping out with the catering of numerous events that the "Catering Ladies" have undertaken. Karen is also very handy with a sewing machine and she made tractor themed aprons for the ladies to wear, teapot cosies and coasters for the tables among other things. She is also a keen advocate for the revamp of the kitchen at MVFM. We would like to thank them both for all they have done for MVFM and wish them all the best for the future and hope to see them both again, maybe at one of our open days or whenever they are in Blenheim.



A farewell morning tea for Karen & Alan was well attended



New Signage



Finally the new sign has been erected at the entrance to Brayshaw Park by Park Administrators. This along with the Model Railways new track featuring the wind mill, water tank & goods shed and also the refurbished traction engine, when it is completed, should make for an eye catching entrance.

Other Museums

If you are ever in Kaikoura with some spare time, call in and have a look at the museum. It is well worth it with a very interesting display about the Kaikoura Earthquake and a museum full of interesting displays about its history.

December 2018 is also the 40th anniversary of the UFO sightings off the Kaikoura coast and so they have a display to commemorate this event with some interesting people to talk about it.



Check Kaikoura's Museum website for more info.



The old stump that was positioned between Patchett's Green and the cottage was recently removed. John Simmons started the job with his wee digger but after struggling a bit and running out of fuel the big gear was called in to finish the job.

Pictured are Jeff Rowberry in front on the Ford County and Bruce Davies on the Cat D4.

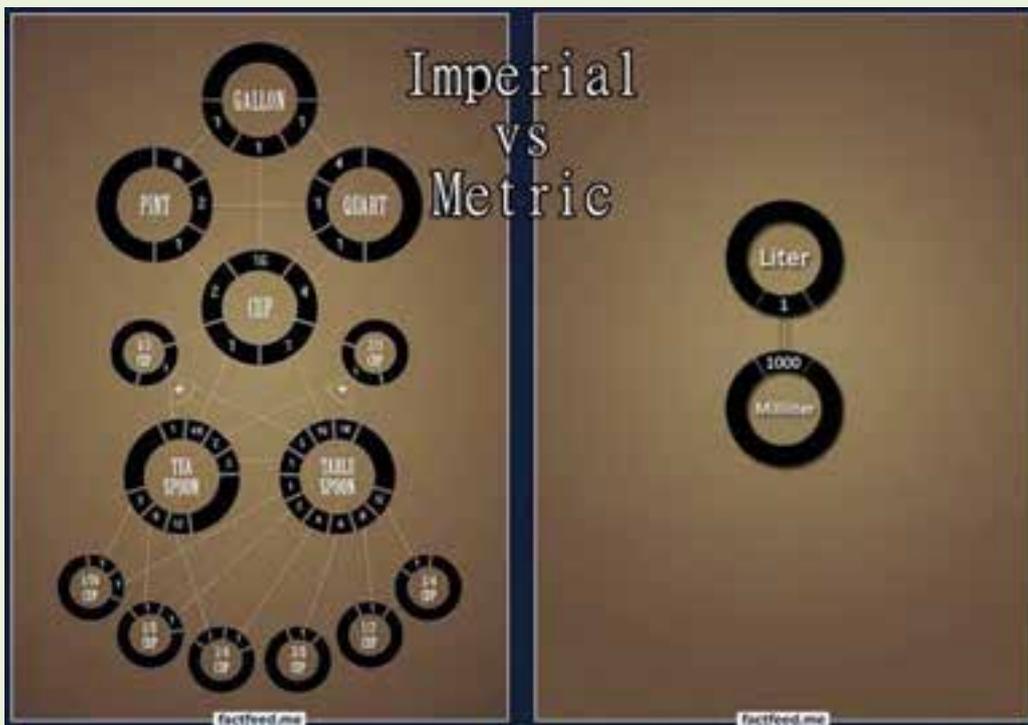
Photo supplied by Peter Tester



Three Phase Power has now been run from the steam roller shed to the Cooke, Holdaway & Barr shed. Pictured above the shed on the right are the two new security cameras that will give further coverage around MVFM. Jim Donald is keeping an eye on Ross Cooke on the right while Ernie Thompson fills in the trench below.



You could be forgiven for thinking that several persons in these photos might have worked for the Ministry of Works once upon a time!!



And we talk about the good old days!!

Nothing easy about the old system.

RUSTY TOOLS

Tools grow dull, when they grow dull they are set aside and when they are set aside they RUST. A neglected tool has an odd, magnetic power. It pulls you in. Pick it up and the next thing you know, you're scraping away rust with your thumbnail, trying to make out the manufacturer's name. You vaguely remember how you came by it, a sale, garage sale, clearing sale, auction, father-in-law or a neighbour who was moving away. Everybody has them, these hidden little jewels. Restoring them is pretty easy. All it takes is some basic chemistry and a little work to salvage tools that look like they have been sitting on the bottom of the ocean floor for a century or two. As a restorer of anything old that we pick up from auctions I have found that it does take patience and some elbow grease to remove rust. But with time and effort you are able to remove rust from many metal surfaces. You can also remove rust with ingredients from your own home.

1. Use White Vinegar. The vinegar reacts with the rust to dissolve it off the metal. To use, soak the metal in white vinegar for a few hours and then scrub the rusty paste off.

If the object is too big to soak directly in the white vinegar, pour a layer over the top and allow it time to set. You can also wipe it down with a rag soaked in vinegar.

Try dipping aluminum foil in the vinegar and using it as a brush to scrub off the rust. It is less than steel wool, but will still do the trick in removing the rust.

You can use regular vinegar and allow your rusty metal objects to soak in it for up to 24 hours before rinsing. This method should not require as much scrubbing.

2. Using Lemon and Salt. Sprinkle salt over the rusted area so that it is coated and then squeeze the juice of a lemon over the top. Use as much of the juice as you can get, and allow the mixture to set for 2 – 3 hours before scrubbing off.

Use the rind from the lemon to scrub the mixture off. It is strong enough to remove the rust without further damaging the metal.

3. Using a Paste using Baking Soda. Mix baking soda with water until it is thick enough to spread on the metal. Allow time for it to soak and then scrub off.

Try using a tooth brush to scrub the baking soda off, and rinse with water.

The baking soda mixture can be watered down as much as you like, there is no exact recipe.

4. Use Citric Acid. Buy a small box of citric acid in powder form from your supermarket.

Put some citric acid in a plastic container and pour in hot water, enough to clean the item being cleaned. For fun you can watch the bubbles reacting!

Leave overnight then rinse and dry. More than likely whilst you are busy cleaning, restoring tools and small rusty objects you end up with rust stains on your clothing.

5. Remove Rust Stains from Clothing. If your clothing comes into contact with rust, you can remove the residue from your clothing using lemon juice and water.

Apply lemon juice to the affected area, but don't let it dry. Use water to rinse the lemon juice and rust away.

Wash the item of clothing.

For heavier fabric with a worse rust stain, you can also apply salt to the area in addition to Lemon juice

Rust Removal using Electrolysis

Several years ago, and I can't recall how it happened, I came into an inexpensive and easy way to clean rust and grease, and, in some cases, paint, from your rusty cast iron and sheet metal parts. Taking advantage of common household cleaning products, items many of us have laying around the garage, kitchen or laundry room, and some science, you can clean parts from a single bolt up to an entire trailer frame through a process known as "electrolysis".

What you need:

- A non-conducting container - a large plastic bucket works really well.
- Battery charger - big is better, however even one able to produce 6 to 10 amps should do. A student recently used my site as the basis for a school project and used a computer power supply in place of battery charger.
- Sacrificial electrodes. Concrete reinforcing rod works well (rebar) cut into lengths about 4" taller than your bucket or container. **Do not use stainless steel!** The results are a health hazard and illegal (more on that later)
- LAUNDRY soda, also called washing soda. (see below for details)
- Wire and/or cables for connecting electrodes together.
- Water.
- Small lengths of small chain (used to suspend the rusty parts in solution) or some other means to suspend the part to clean into the solution.

The Setup:

The science behind rust removal by electrolysis. <http://antique-engines.com/electrol-details.asp>

Want to make your own laundry soda? Take baking soda, spread it out onto some baking paper and bake it in the oven at a little over 300 degrees for an hour or so it will drive away a water and CO2 molecule thus making washing soda. At temperatures above 300 degrees Fahrenheit (149 degrees Celsius), baking soda decomposes into sodium carbonate, water, and carbon dioxide.



Why you should not use stainless steel electrodes. <http://antique-engines.com/stainless-steel-electrodes.htm>

Electrolysis on a larger scale - cleaning a trailer frame. <http://antique-engines.com/trailer-electrolysis.htm>

Most of my Humdinger mudpump rig was cleaned using electrolysis. <http://antique-engines.com/humdng.asp>

Loosen that stuck piston with your soft drink.

Using a plastic, or non-conductive bucket (not metal), mix a solution of 5 gallons water to 1/3 to 1/2 cup laundry soda. Mix well so all soda is dissolved. Do not try to use other salts. You won't get better results and dangerous effects may occur. Caustic soda, for example, is far too corrosive. Solutions of ordinary table salt can generate chlorine gas (toxic) at the positive electrode (anode).

Clean the electrodes so they aren't too rusty - especially at the top ends - they need to make good electrical contact with your wire or cable AND with the water. I take mine to a wire wheel and give them just a real quick going over. Place electrodes in bucket around sides, so the clean, rust free ends stick up above the bucket. Use clamps or some means to hold them in place around the perimeter of the inside of the bucket or container so that they cannot move freely or fall into center of bucket. The electrodes must

not touch the part(s) to be cleaned, which will be suspended in center of bucket. I use small C clamps. Whatever you use, it shouldn't be copper, and will get a bit messy if it gets into your cleaning solution. Tie the electrodes together with wire or cables. I use copper wire twisted around the top ends, and have used old jumper cables. All electrodes need to be tied together "electrically". This will become the "anode" grid. Since the cleaning process is somewhat "line of sight" it's best to surround the part to be cleaned to some extent with the electrodes.

Suspend part to be cleaned into bucket so it hangs in the middle, not touching bottom, and not touching electrodes. I place a piece of rebar across top of bucket (see photo below) and bolt a small piece of chain to my part to be cleaned, and clamp the chain on the rod so that the chain hangs from the rod, and suspends the part into solution below. The part to clean then becomes the "cathode".

Attach battery charger - place **NEGATIVE LEAD** (this is critical!!) on the piece that is to be cleaned. Attach **POSITIVE**, or **RED lead** of charger, to electrode "grid" formed when you placed electrodes, or rods, into bucket and tied them all together.

Make sure electrodes and part to be cleaned are not touching each other, then turn on charger. Within seconds, you should see a lot of tiny bubbles rising from the part suspended in the mixture. Do not do this inside, or in a closed area - those bubbles are the component parts of water - H₂O - hydrogen and oxygen. Remember the Hindenburg? Well, actually that was caused in part by the explosive coating they painted on the skin of the craft, but the hydrogen will burn explosively so DO be careful!

See how the rust and bubbles are attracted to the electrodes in the photo below? You will need to clean them from time to time - they will get covered with gunk; in fact, after many uses, they will have eroded down and need to be replaced. That is why I use rebar(concrete reinforcing bar) - it's easy to get, cheap, and most of all - SAFE FOR YOU and your environment! You can pour the waste solution on the lawn and it won't hurt it. Do watch out for ornamental shrubs, which may not like iron rich soil, however. No use making your spouse mad!

How large an item can you clean? Well, it's up to your imagination, your budget - because it takes water, your time and wife's patience. Terry Lingle demonstrated this process on a very large scale using a tank made of plywood and lined with plastic, a DC welder for power supply and hundreds of gallons of water. You will need to use more electrodes with larger parts and a larger "tank".

How small? A student recently used the description on my web site as the basis for her science project in school. She used a computer power supply for the power source to clean a small part in a plastic bucket on a table.

Safety Precautions:

- Make sure no spills can get to the battery charger. (electrocution potential as with any electric appliance)
- The leads from the charger are relatively safe, but you may still get a bit of a shock if you put your hands in the solution or touch the electrodes while the charger is running.
- Turn off the current before making adjustments to the setup. Just as a "spark" can cause a charging battery to explode in your face, this process produces similar gases because this process splits water into hydrogen gas (at the negative electrode) and oxygen at the positive electrode).
- Hydrogen will burn explosively if ignited. All flames, cigarettes, torches, etc. must be removed from the area, and sparks caused by touching the leads together must be avoided. The work should be performed outside or in a well ventilated area to remove these gases safely.
- Washing soda solutions are alkaline and will irritate the skin and eyes. Use eye protection and gloves. Immediately wash off any solution spilled or splashed onto your body.

Washing soda

Washing soda should be in the laundry section of your grocery store, but it's NOT baking soda. If you're interested, washing soda is Sodium Carbonate or "soda ash" (Na_2CO_3), baking soda is Sodium Bicarbonate (NaHCO_3), and borax is Sodium Tetraborate Decahydrate ($\text{Na}_2\text{B}_4\text{O}_7 \cdot 10\text{H}_2\text{O}$), all different chemical compounds.



Bernie Masons Trip



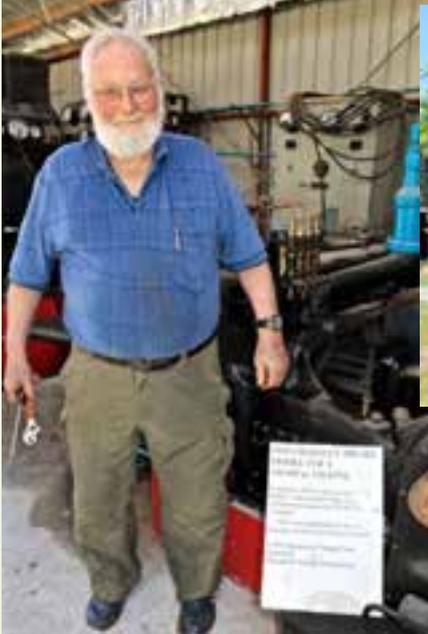
Bernie has recently returned from a once in a life time trip to Kazakhstan on a hunting trip. After our last general meeting he gave us a very interesting talk about his adventure while showing us the photos he had taken. Bernie had hoped to have an article written up for this news letter but like most of us at this time of year he ran out of time but we hope you will get a chance to have it ready for the next edition.



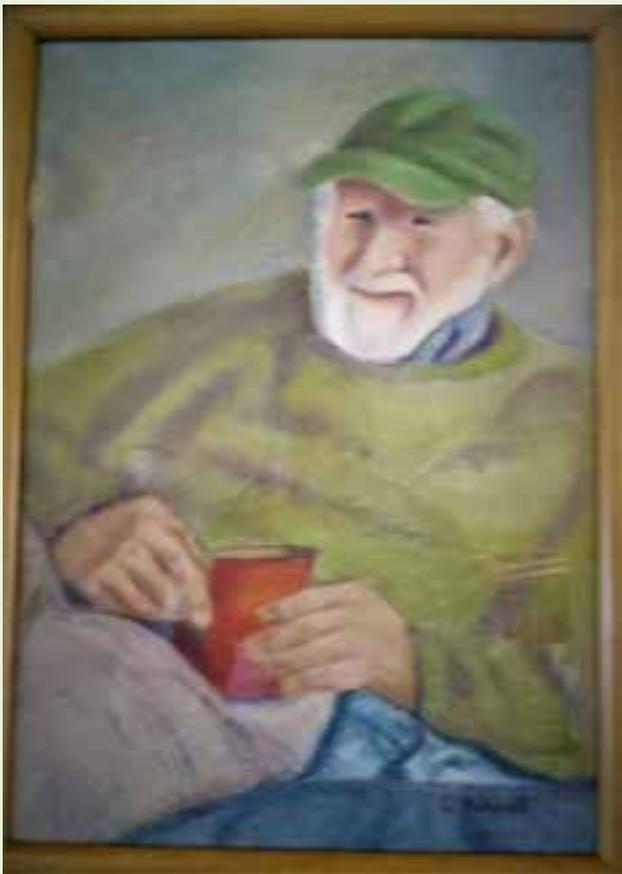
Open Day 25th October

Photos courtesy of Kathy Johnston





Our Ted



After a long battle with illness we said farewell to Ted Hutchison in early August after he passed away on July 31st. Ted was another much loved member of MVFM and will be sadly missed. Ted was the force behind restorations for a long time and although he might have been a bit biased towards his choice of restorations he never the less turned out plenty of restored tractors and ploughs.



A lovely tribute left in Ted's honour outside the workshop

Christmas Parade







Don't forget this massive display will be on Saturday & Sunday of Easter 2019

All the event information, the vehicle registration link and ticketing can be found online at www.wheelsatwanaka.co.nz

Land Rover Display/Museum

Trudy & Richard Paterson live at Leslies Road, Okaramio. They have a small farm with a collection of vintage machinery and an even larger collection of land Rovers & Range Rovers. Their display will be open to locals and visitors alike by appointment from early January 2019.

Contact phone number 03-5727031

Email address trudy.blue.shoes@gmail.com

We hope you have enjoyed this edition of Ancient Iron, Merry Christmas to you all and all the best for the New Year.

