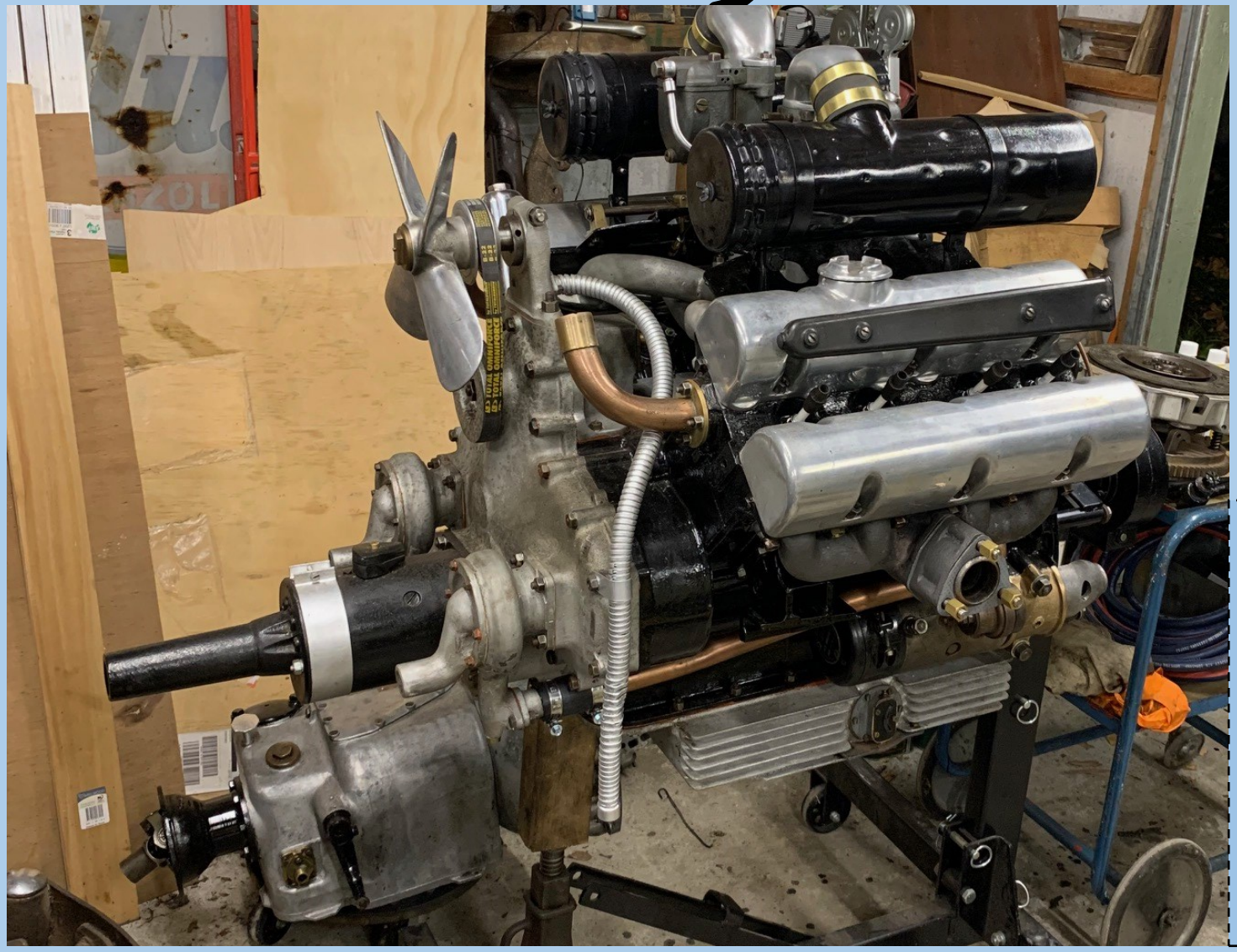
# Riley Restorer



**A magazine for Riley restoration enthusiasts in Australasia Inc**

**June 2023**

**A Web address is coming soon**

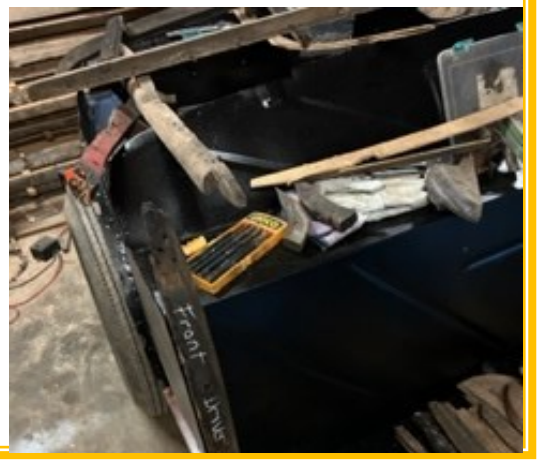
## The Silver streak V8 engine

## Editorial

Thankyou to all of those who sent proxy voting forms in. There were 16 in number and with those a quorum of members was easily obtained for the June business meeting. Minutes will accompany this magazine.

I have a new mobile number:
0477 386 880.

We are seeking more members. Although the magazine is shared with the NZ club's library and anyone can look at it on line your interest in restoring and maintaining Rileys keeps them on the road. The RR club offers expert advice on many generations of Rileys, loans of parts for copying and Riley bits can be obtained for a donation to the spare parts department.
Below: A current project see page 9 – 11 a Riley roadster build.




**The Editor appreciates receiving articles by the 21st of the month**

## Riley Restorers Club of Australasia Inc Committee

| Position | Name | Email | Telephone |
|---|---|---|---|
| President | Wayne Powrie | Wayneapow @gmail.com | 0418 373 104 |
| Treasurer | Doreen Wheeler | Doreen.w.wheeler @gmail.com | 0400 049 493 |
| Secretary | Philip Wyllie | philip.w.wyllie @gmail.com | 0477 386 880 |
| Web coordinator | Marshall Holmes | marshall.holmes @outlook.com.au | 0477 377 109 |

## Spare parts

New spare parts may be purchased by contacting the secretary who will do his best to dispatch them on the same day . Ask about our second hand parts.

Parts can be obtained through the secretary. Ask him about trades people who provide quality services.

## Contents

## June business meeting

The meeting convened at Phil and Doreen's home at 11.20 am, Sixteen members attended by proxy vote making a quorum. Our president, Wayne Powrie opened the meeting to those present and acknowledge those who were unable to attend and welcomed those physically present.

The main business of the meeting was the establishment of a WEB site. Marshall reported that he was doing training that afternoon to learn about creating and populating a site.

Other points of interest include the importance of maintaining the uniqueness of the club. To this end both proxy voters and those present affirmed the importance of providing support for the restoration and maintenance of Rileys. Many also said that it is important to not replicate what other clubs were doing including the accumulation of new parts and running rallies.

## Activities during June and July

**Sunday 18th June: A** Run to Marshall Holmes home at 50 Cook Street, Northgate, Depart Maleny show grounds at 9 am, The development of the WEB site will be explored at Marshall's home.

**Thursday 29th June: Garage run to Wayne and Louise' home.** Meet at Maleny show grounds and travel past Witta, through Conondale to Chinaman Creek Road, Cambroon. After visiting his garage and Riley collection we return via Kenilworth, Mapleton and Montville.

**Sunday August 2nd** Club business meeting to be held at 74 Treehaven Way, Maleny at 11 am.


# 70th Anniversary

An event celebrating the 70th Anniversary of the

**Riley Pathfinder**

will be held at
10am-3pm, on the

**8th of October, 2023**

**Venue:** The Pétanque Club Pavilion at Hanging Rock.

For further information contact:

**chromed_off@hotmail.com**

# The Silver Streak power plant by Paul Baee with Phil Wyllie

The bottom end had already been assembled. The crank was machined to take slipper shells, the conrod little ends were fitted into the eight Riley 9 pistons and these were fitted into the bores that had been prepared for them. The big ends were converted to slipper shells that had been made for MGB or Austin A 40 vehicles. The oil pump was in reasonable order and BMW oil filters in series were fitted into the oil filter canister. The sump that had 4 inches of oily sediment had been cleaned out and the sump was now serviceable. Like the 12/4s it has a sender unit fitted to the side of the sump that measures the amount of oil that is in the sump. It was likely to have had water in it at some time. The sulphur accumulated from the old oil also had its effect. The protective mesh that is fitted to all Rileys was rotted out.

Paul found a person who sold a mesh material, so a new protective mesh was made. A new sender unit, mesh and the cleaned sump and gasket were fitted.

.

The Silver streak engine has the same head studs as the RMA. Like other Rileys the threaded openings go into the water jacket so the bottom of the studs were rotted away. Twenty four studs are required for this engine and NSW spares only had 19 new ones in stock so others needed to be made. Being a V8 this engine was requiring double the number of everything that other Riley custodians

**Below: A lonely head stud**

need in order to restore their Rileys. Twenty four new high tensile head nuts were made for the project. The valves are a standard Riley 9 item. Double 12/4 springs with collets were purchased from the Riley Register. They originally began their life as Perkin's diesel components.

**Above: The best of the heads with plugs, valves, valve collets and springs fitted.**

Nothing was done to the gearbox in the hope that it was in good working order. The oil was drained and mono grade 30 Castrol XL was purchased from Castrol's Vintage suppliers in Western Australia.

All of the parts were removed from the fire wall and this was cleaned and painted black in anticipation of fitting the engine. There are three openings in the fire wall, two are for tools and the other is an access door for the changing of light globes and cables for the dash instruments. It was constructed in such a way that the bonnet needed to come off before the door could be opened. Instead of studs, captive nuts were fitted so the cover could be slipped off when something needed to be done to any of the instruments, light globs or cables needed to be changed.

**Below: A shiny refurbished fire wall**

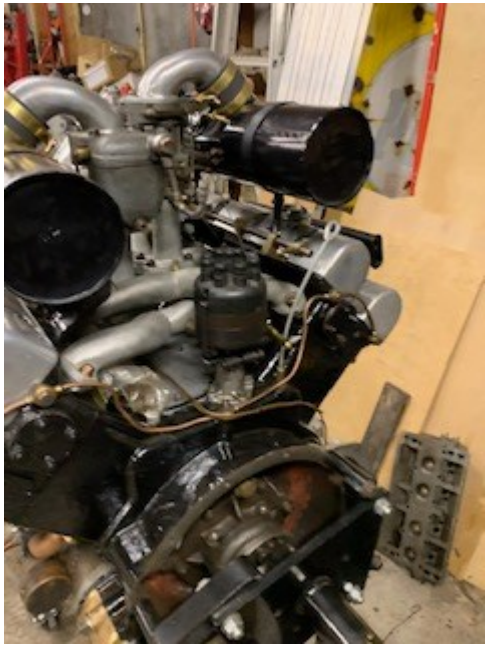
**Above: The gearbox**

The air box is called a 'Bergas Muffler Air cleaner'. The air was originally designed to enter at the front via a tube. It was perforated and a 'carpet underfelt ' material was used to sift the air. Of course this had a long time ago become clogged and there was no simple way of cleaning it. So Paul set it alight and allowed it to smoulder over night until the material was turned into ashes. After cleaning and repainting the airbox was fit ted with an A5 paper filter that could be easily removed and replaced.

**Above: The air cleaners**

The engine heads had 18 mm diameter spark plug threads except for the front drivers' side head and this had a bung fitted into it making the spark plug thread 14 mm. When the bung was removed it was discovered that there was a porosity hole behind it. To solve the problem, it was decided to remachine the offending spark plug thread and fit a sealing bung to it. Bungs were also made for the other spark plug openings so that they would all accommodate 10 mm, long reach spark plugs. Such plugs were thought necessary as the original 18 mm plugs only reached halfway down the plug tube requiring the fuel air mixture to travel up the tube from the combustion chamber to combust. The only difference in the look from the original plugs is that the plugs will be of a narrower hexagon. Filling the hole with a weld was considered but the head would have required heating and there was no confidence that a weld fix would work because the location of the hole into the water jacket was half way down the spark plug opening.

More than a year ago an advertisement appeared in the Riley Register offering a V8 engine, valuable spare parts and another gearbox. Out of all of the engine parts there were a sufficient number of heads to make up two good ones for the Silver streak. The best two of the heads was refurbished by a ACT engineer who had considerable experience with Rileys.



**Above: A complex assembly**

The 8/90 Adelphi engine has multiple gaskets each having its own unique shape. For example, the inlet manifolds each require 8 different gaskets. To get the gaskets, it was decided to have gasket dies made. The dies consist of a rubber base with a sharp cutting edge that runs around the outside edge and around the inside openings. These are then fitted to a machine that stamps out the gasket shape. In his role as spare parts officer for the NSW club Paul has had dies made for many Riley applications and so the idea of having a die made was not as big a drama as it is for the Riley Restorer editor. The unique thing about these dies is that the gaskets that come from them are unique to the only three or four V8 Riley engines that currently exist in the world. Of particular interest to the editor is the rocker cover gasket. It has a complex shape and is only useful for these unique Riley Adelphi's. The head gasket has been made. The heads have been assembled and are ready to be fitted when the three remaining head studs become available.

**Adjacent: The heads trial fitted**

There are two water pumps fitted to the Adelphi V 8s. They are driven from the exhaust cams and once again they look similar to the 12/4s, but their shape and internal arrangement are unique. A drive dog runs from the front of the exhaust cams into the water pumps. They are sealed from the engine oil with 3-inch diameter carbon rings. The impellers live inside the pumps and are driven by the cam shafts. There is a nut that fixes the mechanism together at the front of the pump with a copper washer to seal the water in the units. To disassemble them 3/16th of an inch holes were drilled into the impellers and a tool was made to hold the drive dog and via this method it was possible to disassemble the units. The inlet opening for the water were both rotted out . The internal mechanism on one of them was rotted out. Both of the units had cracks, and both required Speedy seals to line the drive shaft. The seals in both pumps were worn to unusual sizes. To meet this challenge, Paul found a company that sold graphite, and this was machined to produce the two seals required. New aluminium tubes were welded to the units to receive the water hoses.

**Adjacent: Maybe with all of those complex parts a sign like this won't go astray**


## *The latest on the Imp special by Mel Carey*

My brother Jeff, who recently retired from the Air Force, came to my rescue by welding up the very light weight cross bar to the vertical steel strapping for the headlight mounting that has been bolted to the to the chassis rails.

The head light supports are made from engine connecting rods which does sound a bit odd, but they do the job well.

Headlight and side lights/ indicators are fitted up and the little car is starting to look like a 1930s special.

Fellow members, Phil and Wayne have been kind enough to do for me a little research in regards to getting the rear mudguards repaired and so I am now patiently stripping back many coats of paint and old stripper before presenting them for repair.

**Centre picture: The rear guards readied for inner extensions**

# A failed attempt to assemble the Side Valve (SV) gearbox

All of the gears, bearings and gear shifting fingers were removed from the gearbox a few months ago. During that time lots of photos were taken to reinforce my fading recollection abilities. When the box was an empty shell, it was taken to a welder who welded new fixing points where the old ones had been. The box had fractured, and the fixing points broken off because the box was originally bolted straight onto the chassis. At home the excess weld on the box was taken off with a mill and the results were cleaned up with the use of a ¼ inch die grinder. The results were very pleasing.

**Adjacent: The box cleaned and washed**

The box was then cleaned from swarf and washed again with solvents to takes off any remaining oil and grit. It was now ready for a rebuild.

All of the old gears were laid out on a bench and the new gears that had been purchased in Victoria were taken out of their box. They were washed in solvent to take off the protective grease that they were packed in, and the two sets were laid alongside of each other. Immediately a fog of confusion rolled in (as it does in Maleny) and blocked out the sunshine of my hopeful expectations. The gears were different from the old ones! I expected that they would be the same. My idea was that I would simply replace the old gears with the new ones. After fiddling with them for a while they were measured. The ID on

**Above: The new main shaft gears are the same as the old ones**

Some were the same as the originals. A few were not.

**Above: Some clear differences.**

One had been made with an internal spline but there were no corresponding parts in my pile of bits. The ODs were different as well. The climactic rebuild that I was expecting after months of preparation and a trip to Melbourne was swept away by the harsh reality of poor communication. What the seller was offering was different from what I understood them to be.

**Above: There was no corresponding shaft with internal splines amongst my original parts**

A telephone call was made to the Riley enthusiast who had arranged the purchase. He was asked, ‘what was the name and contact details of the people from whom you obtained the parts?’ These details were passed onto me. I spoke to Bob, the son of the engineer who had cut the gears. Yes he said, John - his father had made maybe twenty modified sets of gears that brought the ratios closer together and made the top gear bigger to allow for faster speeds on modern sealed roads. The original deal was that Riley SV custodians sent their boxes to this gearbox specialist who removed all of the old gears, fitted the modified new ones with new shafts and sent them as a completed box back to the custodians. What I had was only the gears that didn’t fit the old shafts. ‘But’, he said, ‘if you send the box to us with all of the bits, we will rebuild it for you and you will only need to pay for our time’. One of my friends consoled me with the comment that the specialist gearbox builder would do a better job than what I could do and what I got back would be a complete box that could be fitted straight into the drive train of the SV Riley. Yes, I said, but I like doing things for myself. For me this is what my hobby is all about -DIY.

**Above: the original and new top gear**

Anyway the bits were all carefully packed into a box to take with me on my next trip to Melbourne. In the meantime I would work on an idea that involved assembling the engine and gearbox into the chassis so the fixing points on the engine and gearbox would not break again.

**Above: One of the original flexible couplings and adjacent one that a friends made on a CNC machine.**

A few weeks previously a conveyer belt assembly manufacturer had been contacted, a length of conveyer belt had been purchased, a friend had cut discs out of the material on a CNC machine and the beginnings of flexible couplings had been made. These were components used prior to the invention of universal joints.

There are four in the drive train of a SV. One is at the back of the engine and joins it to a propeller shaft that is attached to another flexible coupling at the front of the gear box. There are another two, one at the back of the gearbox and the other at the front of the differential. My next project is to find someone who has a laser machine to cut the fixing washers out that allows you to clamp two coupling disks together and make rigid fixing points for the three fingered drive shafts on either side of the coupling.

**Below: The original lay cluster**


The Middle page
An RMC build

There is a lot more to reframing a Riley than what you may think when first looking at the project. Careful de-nailing to prevent tearing or warping of the skin takes a while. Then of course there is the oxidation of the metal. In some critical points the skin can be so thin that it will part company as soon as it is lifted from the timber frame. There may be no skin at all because rust has eaten the metal away completely. So careful disassembly needs to occur. Then of course there is the work of previous custodians. Many Rileys get extra bolts to hold the skin together when the timber has rotted away. They may also get steel rods, flat bar or angle iron to hold the body together. In this case there was flat bar and angle iron to hold the 'B' pillar in place and to steady the scuttle. Usually these pieces can be removed without too much difficulty but when bolts are put through the skin there is generally some warping of the metal and holes to be welded over. That was the case with this Riley. It took some days to disassemble but when this was completed the skin went off to a sand blaster and when it came back there were many parts that were see through quite apart from the battery box.

**A rare view: The scuttle is upside-down revealing the battery box**

The sandblaster put a thin black acrylic undercoat on the skin to 'seal' it but on this occasion it was insufficient so part of this rebuild was etch priming and undercoating all of the underbody parts as well as top coating all the surfaces that can't be accessed after the body has been reassembled. Patching the body can be done in most places when it is apart so the battery box, the front sill mounts, parts of the floor panels and the inner skirt for the scuttle were patched. After that all of the hidden areas of the scuttle and under body parts were sealed and painted with an etch, undercoat and black topcoat.

The sills were of course rotten, the dome-headed bolts were rusted down to needle size and the front sill mount largely needed replacing. Replacement timber was in the form of a slab of Flooded Gum. When it was stacked it was 2 inches thick. It dries at the rate of 1 inch per year and over a couple of years it shrinks and depending on its location in the tree, warps and shrinks to about a 45-millimetre thickness. It had been purchased two years previously and had been drying in the workshop ever since. On the sunny coast timber never drops below 14% moisture content so when the roadster goes home to Victoria the timber will lose a little more moisture and maybe shrink an extra millimetre. This was taken into consideration when the timber was thicknessed, and the thicknessing brought the timber back to straight boards. The edges were taken off two specimens of slab and they were put through a thicknesser until top and bottom was flat and un-encumbered with knots or splits. A template was used to mark the outside shape and the timber was passed through a band saw.

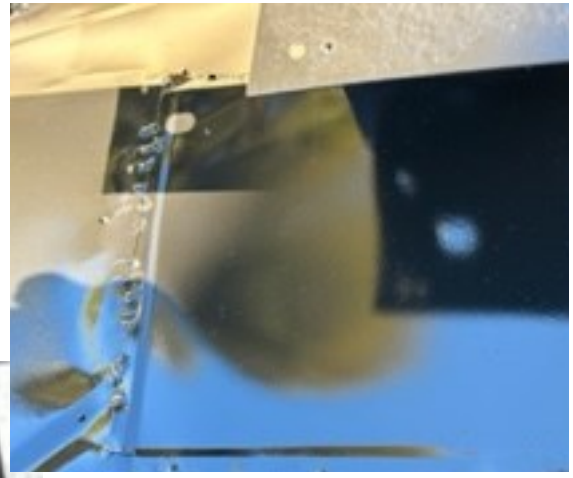
At this stage stainless steel cup headed bolts, taper headed bolts, prong 'T' nuts and bronze silicon nails were purchased from a wooden boat fastener supplier. A large variety of these suppliers can be found on the internet and the one that supplied fasteners for this project was located on the Gold Coast. To my knowledge BSF fasteners of this size and shape are not available so American equivalents were used.

The front sill support and the angle iron sill edging on this roadster is quite interesting. No other RM Rileys have them.

**Above and adjacent: The angle iron sill edging and the front supports cleaned and new steel welded into them**

The front support had mostly rusted away and required new steel where they were bolted to the sill. The packing material under it was a chipboard and the steel sitting on it was rusted away as well. Replacement packing that is currently being used is a synthetic material used to make drain pits. They probably have a half-life of several Riley custodian's lifetimes. The material can be purchased in sheets and cut to size on a bandsaw.

The sheet steel that makes up the floor of the boot, the inner guards and the back of the cabin has a number of vulnerable parts because much of it is the sandwich for the timber frame and the floor is flat allowing water to pool over large areas. So some of the patches were quite large. To get them sitting flush with the floor a bead roller was used to make a shoulder around the edge of the patch. A vice grip could not be used as the patches were a distance from the edge of the floor so holes were drilled around the edge of the patch and 1/8$^{th}$ inch bolts were used to clamp the patch in place while the patch edges were welded to the boot floor. The steel that forms the rear wheel arches was also paper thin or rusted through. Patches could be butt welded in these places and so this was done.



**Above: The boot floor painted**

The battery box had been repaired previously with another box being placed inside the original. This had rusted out as well. After it's removal panel beaters steel was cut and bent to a right angle and welded onto the sides of the original box to make the edges of the floor. A piece of steel was then laid into the bottom of the structure and welded into place as was

the original. The technique used to patch the boot floor was also used to fix the battery box floor in place. Holes were drilled at strategic points; bolts were employed to clamp the floor and edges together and the result welded. The drill holes were then filled in with weld. Other patches that could not be clamped were treated in the same fashion. And after cleaning up the welds, the scuttle was painted with an etch primer and two coats of black topcoat.

The top skins were also treated in the same fashion except that the patches were shaped using an English Wheel first, so they conformed to the original shape of the roadster skin. These patches were butt welded into position and then filed to produce a smooth result. The outer skin for the tub was different. The outer edge on the driver's side was rusted right through so to avoid an error of welding it not quite straight  it is intended to lay it in its correct position on the timber frame and patch it in situ.

The new sills were painted with a water based paint and this was allowed to soak into the timber, the result was painted again with a marine varnished sourced from the timber boat fastener suppliers. This was painted again with an oil based brown paint that looked similar to the original timber colour.

**Above The sills can be imagined in the timber**

The sill were drilled and the angle iron fitted using tapered stainless steel bolts. The front steel support was fixed into position with round headed coach bolts with the heads set into the sill. The inner tub steel and the inner scuttle steel was then fitted into place.

**Above: The passenger side sill thicknessed, cut out with a band saw, painted, and angle iron fixed into position with stainless steel bolts.**

The major cross rib sits on top of the steel behind the seat. More details about making and fitting the timber will be in the next magazine so long as I am careful to keep my fingers away from the band saw blade. Just for now this story will be finished with some comments about the timber used in the frame. The rib is Queensland Mountain Ash.


The moisture meter indicates that the timber moisture level is 15%.

On the Mouldy (sunshine) coast and in Rainy Maleny the lowest levels that can be achieved is 14% but out west it can drop as low as 10 to 12%.


**Above: The prongs of the moisture meter are pushed into what was left of the original rib.**

Arrayed around the roadster are samples of the timbers used and lots of finger prints.  Some of the timbers are originals taken from roadsters during re-building and the others are not yet used.

Patterns may be seen around the roadster but they vary from one vehicle to another and significantly from one version of the roadster to another. The one pictured shows samples of the timbers  with variations of up to ½ inch on the central rib.

The result is a little nervousness when someone asks for the timbers alone. Will they fit?

The next few pictures show the stainless steel fixings, a few more welds in the scuttle and more kindling.

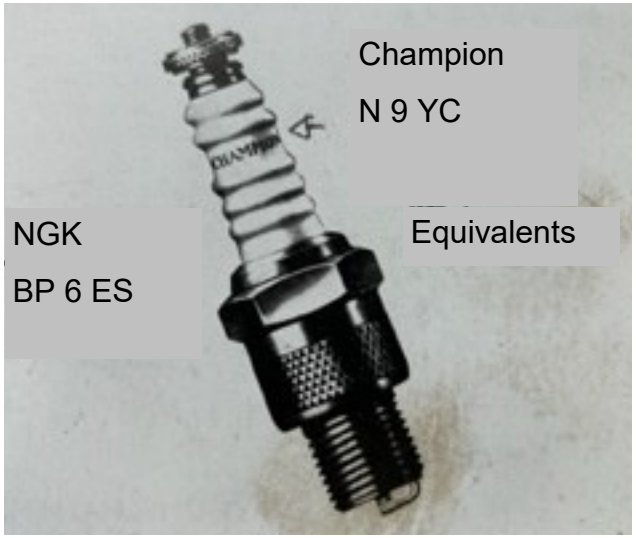
## Spark plugs in Rileys

The RM workshop manual recommends Champion N9YC plugs . Its NGK equivalent is BP 6 ES. Are these the right plugs to use under all conditions for the whole life of a Riley engine? Originally Rileys were used as the daily ride but now they might only be taken out of the garage on a weekend or once a month. Does this make a difference in the type of plug that is best for the engine? Further, does engine wear make a difference? In Albert, a 1950 drophead the intervals between runs has been infrequent. Occasionally not all of the plugs have fired and a regular activity prior to going on a run has been to remove the plugs, clean them from carbon build up and replace them. Carbon build up has been because the engine has not had long runs and it has not heated up sufficiently. Cleaning the plugs prior to using the Riley has worked but is there a lazier solution? So a question has arisen about what plug to use for a Riley that is less frequently taken out of the garage and what plug to use when the engine is worn?

Below is pictured a Champion spark plug from the workshop manual. In NGK the symbols have the following meanings:

B…….Diameter of thread. (14mm)

P…….Projected tip (centre electrode.



6 … Heat range 6 is the standard and 4 is hotter (heat in the combustion chamber. The reverse is true of Champion and Bosch where the higher number is for the hotter plug.

E...Thread length (3/4 inch long).

S… Standard type earth electrode in centre.

About 90% of cars have metric threaded spark plugs.

A little history may be of interest. Belgian French engineer Etienne Lenore invented the spark plug in 1860. In the 1890s several engineers lodged patents for their versions of the spark plug. No prizes for guessing who they were. They include Serbian Nicola Tesla, Englishman Frederick Simms and German Robert Bosch, They became widely used after the invention of the magneto in 1902 by Bosch engineer, Gottlob Honold. Early manufacturers of spark plugs include American manufacturer Champion, British manufacturer Lodge Brothers and London based KLG who pioneered the use of mica for insulating their plugs.

Other points of interest are that the best burn in the combustion chambers is achieved if the plug is fitted so the electrode points towards the centre of the chamber and the earth wire is situated on the outside edge of the combustion chamber. Thin washers have been used to locate the plug so it tightens in this position. This does not matter in a Riley as the combustion chambers are spheres and the plug is located in the centre of the chamber. Regular maintenance or replacement of plugs is important for all internal combustion engines. Poor fuel economy, lack of get up and go, poor idling and one or more plugs not firing are signs of deterioration. Carbon build up in plugs from incomplete burning of fuel can be the result of using the wrong plugs.

Accepting that the workshop manual recommendations are the right ones for the engine the equivalent NGK plug appears to perform better and last longer.

At this point of writing about my interest in spark plugs Phil Soden published the Riley Gazette. On page 12 there is a very interesting article on spark plugs and it seemed to be saying everything that needed to be said on the subject. So I congratulated . Phil and thought that this article could be shelved for a later occasion. But then he said ‘I do not know what to believe with plug brands, and since changing to warmer plugs to cure extreme soot problems in my Riley, I use NGK too, because that was what the parts store recommended. The parts store has since closed so I am unsure whether it was changing business conditions or poor advice’. With that in mind here are some of the thoughts expressed in the Gazette The article says *‘A “hot” plug is one that retains heat and is suitable for engines that employ lower combustion chamber temperatures, that is to say in engines of low compression ratio, or in engines of high compression ratio which are not used under severe operating conditions’.*