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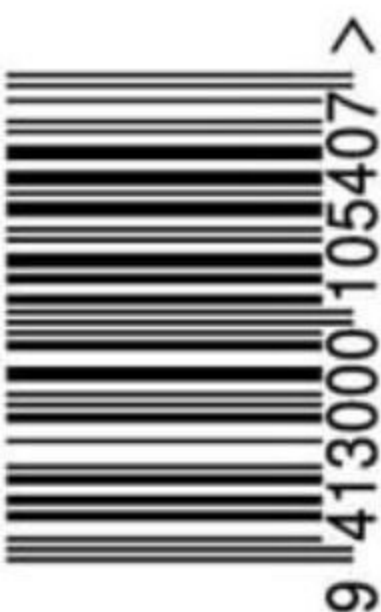
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Our friend, Enrico Miglino

IT'S A TOUGH CHOICE

Last summer, we managed to get time away from *The Shed* magazine workshop and hired a camper-van for five days. Being lovers of the hot sun and the warm ocean, we headed to Northland.

Not being ardent motor homers (it's on our bucket list), we sought the security and comfort of camp-grounds even though we were able to freedom camp. Nothing like heaps of hot water to wash the dishes and an ice cream shop close at hand, eh?

Our first camp-ground was a revelation: amazing facilities, stunning views, and the total joy for us grandparents at seeing kids playing till almost dark – unsupervised and carefree; sliding down steep hills on cardboard boxes, jumping on the flying fox, and playing searchlight when the daylight faded. This playtime was great entertainment for us too – and there was not a screen to be seen anywhere.

What did surprise us was to discover that not the whole world had moved to camping with a motor home; many had caravans. These were treasured homes on wheels, and, when you asked about them, the restoration tales flowed freely.

“This was Mum and Dad’s, and it means a lot to me, so I restored it and use it every holidays.”

“The great thing about a caravan is you can leave it here and head off in the car for the day; it’s much more convenient.”

“When we attend a big party at a friend’s, we take our caravan and park it up on their property. No worries about a tired or tipsy drive home.”

So, it did make us reconsider our bucket-list choice. We aren’t there yet, but the passion that these owners had for their sturdy homes on wheels is undoubtedly making us consider a caravan now when we never had before.

You will see this passion for caravans in this issue’s cover feature: caravans restored with love and skill by sheddies. It would be awesome to have a small one of these tucked away for trips. Maybe it’s time to look on Trade Me, ha ha.

Finally, I received some very sad news at the beginning of January. One of our *Shed* family of writers, Enrico Miglino, has passed away. His long-time troublesome back pain turned out to be much more than that, and a tumour was discovered. He passed away very quickly at the end of December.

Enrico was a fierce and loyal supporter of the magazine, and proudly told all and sundry of his involvement and what a great magazine it was for sheddies of all interests.

Our condolences to his family and friends. We will sorely miss him as a writer and a friend. 📺

Greg Vincent
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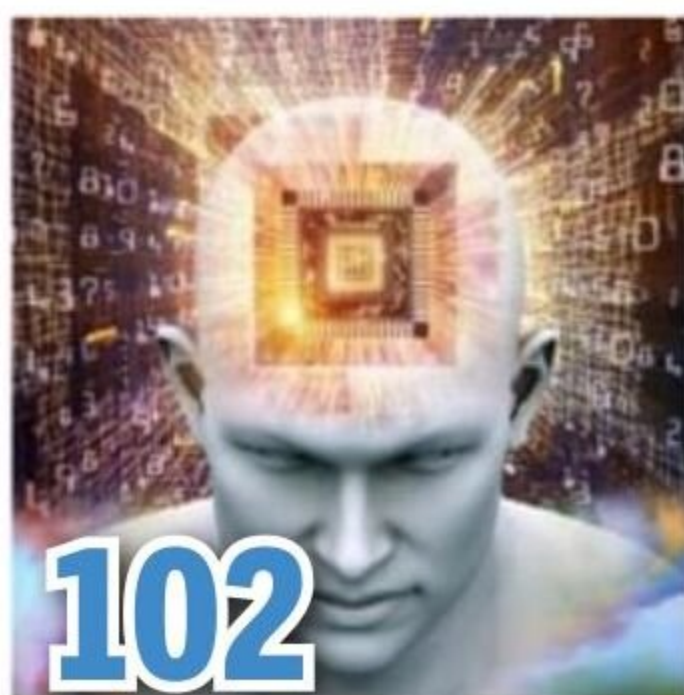
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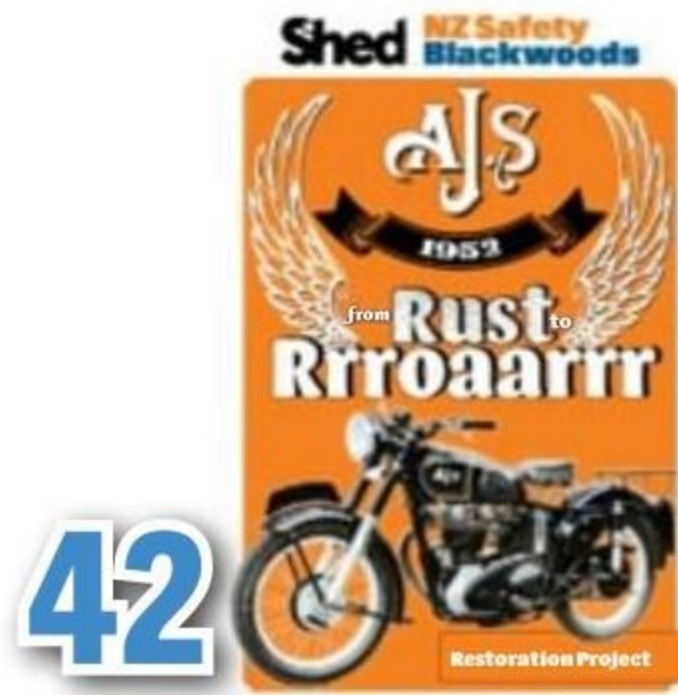
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ON THE ROAD

The allure of a classic caravan can be strong, and many of these gems are being lovingly restored – in fact, Beach Hop even has a prize for the best retro caravan



AGAIN!

New life for old caravans

By Chris Hegan | Photographs: *The Shed*, Marty and Zoe Radford,
Kim Crosland, and Gerald Watts

On holiday with the Trail-Lite in the '60s



The Trail-Lite as found



Penman & Crotty;
the phone number
tells the story



Passing on the skills – Peter with Sam Northover

They may be the curse of the travelling motorist, particularly on New Zealand's many long, winding, and narrow roads, but caravans – especially old caravans – can light a fire of passion in some hearts.

Restoring an old caravan has the appeal of being a shorter and less technically demanding task than restoring, say, a vintage motor vehicle, and when *The Shed* set out to do a piece on caravan restorations, we were spoiled for choice.

I started with a call on Peter Newman, retired CEO of TrailLite Group in Pukekohe, to look at an immaculately restored 1956 Trail-Lite caravan. TrailLite is the only major survivor of the introduction by former prime minister Robert Muldoon of a 20 per cent sales tax on caravans and boats, which scythed through the two industries in 1979. Peter had joined the firm a few years earlier



Peter bought the caravan as soon as he saw it and thought that it would be a great project for his apprentices

when it was owned by Brian Penman and Jim Crotty, cabinetmakers.

From coffins to caravans

"One of them built a caravan for himself," Peter says. "Someone saw it and wanted to buy it, so he sold it and built another one, and it went from there.

"That was in 1954, and that's the way things were in those days. Even when I

started in 1970, caravans were probably 50 per cent of the business. The rest was bespoke cabinetmaking and coffins. The guy who bought the business from Penman and Crotty decided to go exclusively caravans. That was around 1971.

"Then, after Muldoon introduced the sales tax, he decided to pack it in and I bought the business. We started with a very sharp pencil, budgeting to build



Breanna working on the caravan's restoration



The original power points



Samara Gilson stripping a panel with Peter



The interior was no challenge for ex-cabinetmaker Peter



Rule one in caravan restoration: sort the chassis



Historic caravan restoration

36 caravans in the first year – the year before, we had built 130 – and we ended up making 12. It was a nail-biting time all right.”

Restoration project

When someone contacted Peter a few years ago asking if he would put a date on his old Trail-Lite, Peter bought it on sight against the day that he would have time to restore it, seeing its value as a promotional vehicle for the company.

The materials and methods that TrailLite now uses to build its high-end motor homes and caravans are entirely different from those used in the '50s, so Peter, newly retired, took the opportunity to work with the firm's apprentices to restore the caravan and pass on his traditional skills.

It is a time capsule. Nothing has been modernised. Stepping inside takes



"I'm a cabinetmaker by trade, so the interior wasn't a problem, but the aluminium sheeting is something I hadn't done before"



“It was incredible. The condition it was in was amazing for its age”



The '56 Trail-Lite — a perfect period piece

me instantly back to the Christmas holidays of my early childhood (although we never had anything quite as flash as this).

“I’m a cabinetmaker by trade,” Peter explains, “so the interior wasn’t a problem, but the aluminium sheeting is something I hadn’t done before. But I’d watched it done, so I had a pretty good idea. The aluminium panels on the lower half of the caravan are a rolled aluminium product that you can’t buy now, so we had to panel beat and straighten a few of those panels. We reused that but replaced the roof. The caravan is probably 95 per cent original.

“It was incredible. The condition it was in was amazing for its age. I can’t say for sure what the framing wood is, but it was mostly kahikatea when I was working with them. It’s ideal – very light, strong, and straight-grained.” ►



Striking '50s design



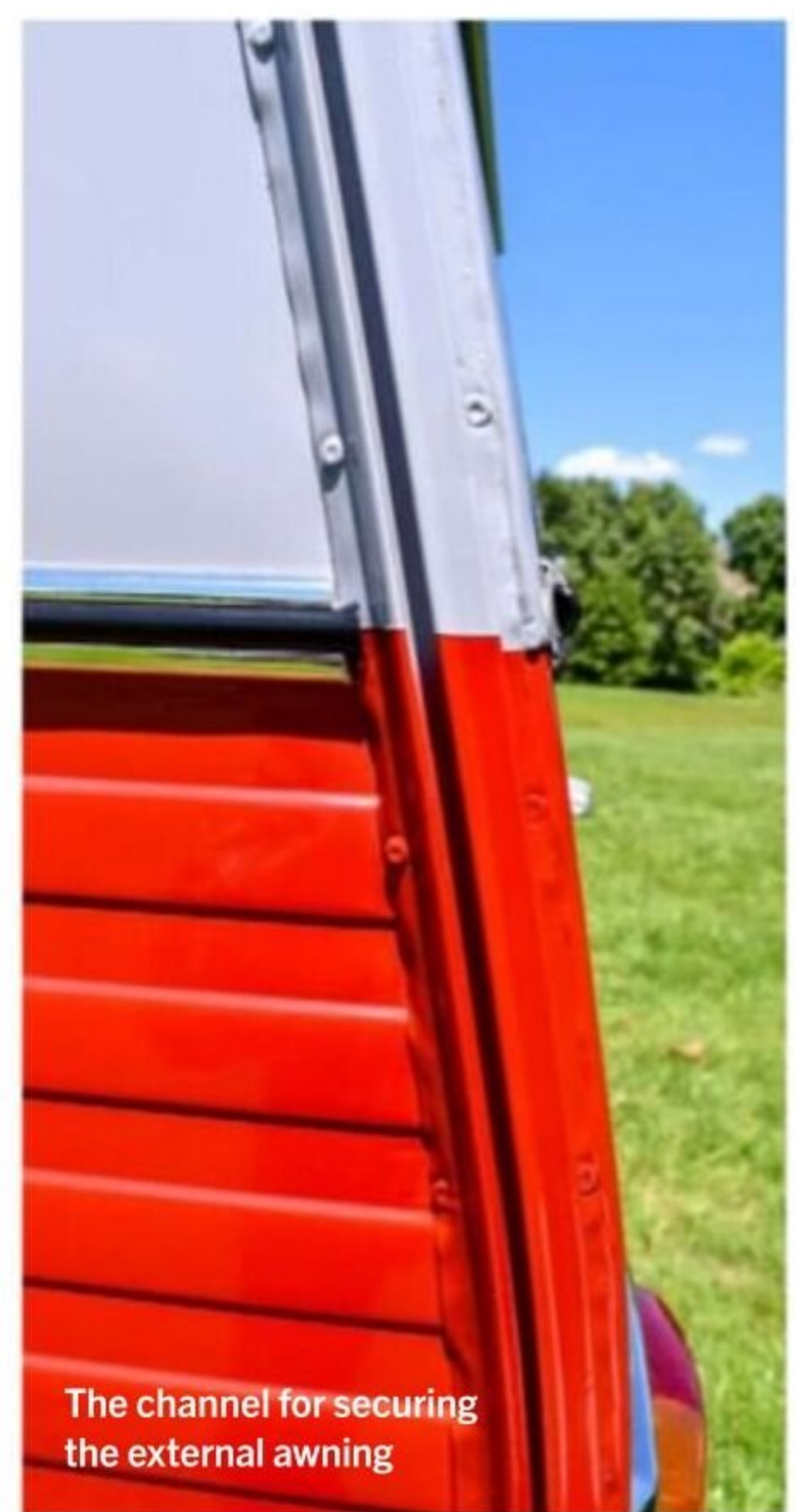
Caravan dining, '50s style



Nice period features still intact and working



The restored chassis



The channel for securing the external awning

Trail-Lites grace the covers of 1960s magazines



On the brink of collapse



Rotten luck



Chassis painted and floor joists in place

MARTY AND ZOE'S CARAVAN

Having hitting the trail for more extensive caravan restos, I revisited Marty Radford and Zoe from *The Shed That Ate the House* (*The Shed*, Issue No. 114). Marty and Zoe's magnificent vehicles and steam projects had somewhat overshadowed their immaculate caravan restoration during my first visit, so I went back for a closer look.

Not an easy road

It must have seemed like a project cursed from the start.

Zoe had her heart set on a small 10-foot caravan. Marty bought a neglected caravan cheaply off Trade Me and set off to Te Awamutu to collect it. He got no further than the southern motorway before a learner driver hit and wrote off his Falcon ute.

"I was in the slow lane, towing the big transporter trailer. A learner driver in the fast lane first mounted the median strip – I don't know whether it was uneven brakes or a mistake – then panicked, overcompensated, and turned hard into our lane straight in front of me. I hit him and sent him spinning, then hit him again because, with the big trailer, I couldn't stop fast enough.

"So that was the ute written off. I had to borrow a mate's one and start again. Then on the way back, thanks to its rotten frame, the caravan started to collapse," Marty says.

Had they bought a lemon?

"It sat in a corner for six months while I packed a sad over the fact that we'd bought a lemon," says Marty. "But I'm so

tight I couldn't bring myself to write off all that money. So we took it all apart, carefully preserving the tin parts which were nailed onto the wooden frame.

"Getting the nails out was a bit tricky, so I used an angle grinder with a worn-out stone to take the heads off and popped the aluminium over the nails. It was the least destructive way of getting it off.

"Moving the roof in one section meant I had to get a group of mates around to move it every time – but that's what you have good friends for. I got a bit carried away and made a whole new frame. You can't use H3 or H4 because it will react with the aluminium, so I used boracic treated. It's only 20x30mm pine. We bought a whole lot of ceiling battens, ran them through a bench saw, and picked all the best bits, because you can't have a single knot in it."

Marty made a big MDF table the size of the caravan's sides. Each side comprised four panels.

"With it all in bits, we could reverse engineer how it was made in the factory," he says. "We beefed up bits that made it better because they were trying to make it cheaply, but I wanted it to be as strong and as hard-wearing as possible.

"To steam the curved side frames, I made a boiler out of an old gas bottle with a couple of litres of water in it, put a barbecue burner under it, then ran a piece of heater hose off a car. You can buy plastic bag on a roll and seal it off to the length you want. So we took a length of that stuff and put strips of 30x5mm timber in it and steamed them," he tells me.

"I screwed bits of angle iron to the table along the lines of the curve, bent the steamed strips around the angle irons, and clamped them in place. They came out of the steamer pretty wet, and I had to wait a week or more for them to dry out, but, clamped in place and dried out, they held their shape pretty well.

"I then put down baking paper to stop the wood from getting stuck to the table and glued and re-clamped them. Originally, there were three layers of laminate, but because I wanted to make it stronger and to last, I used four." ►



Laminated frame assembled, glued, and clamped



Completing the side frames



Floor and frames in place

"It sat in a corner for six months while I packed a sad over the fact that we'd bought a lemon"



Getting there –
framed and lined

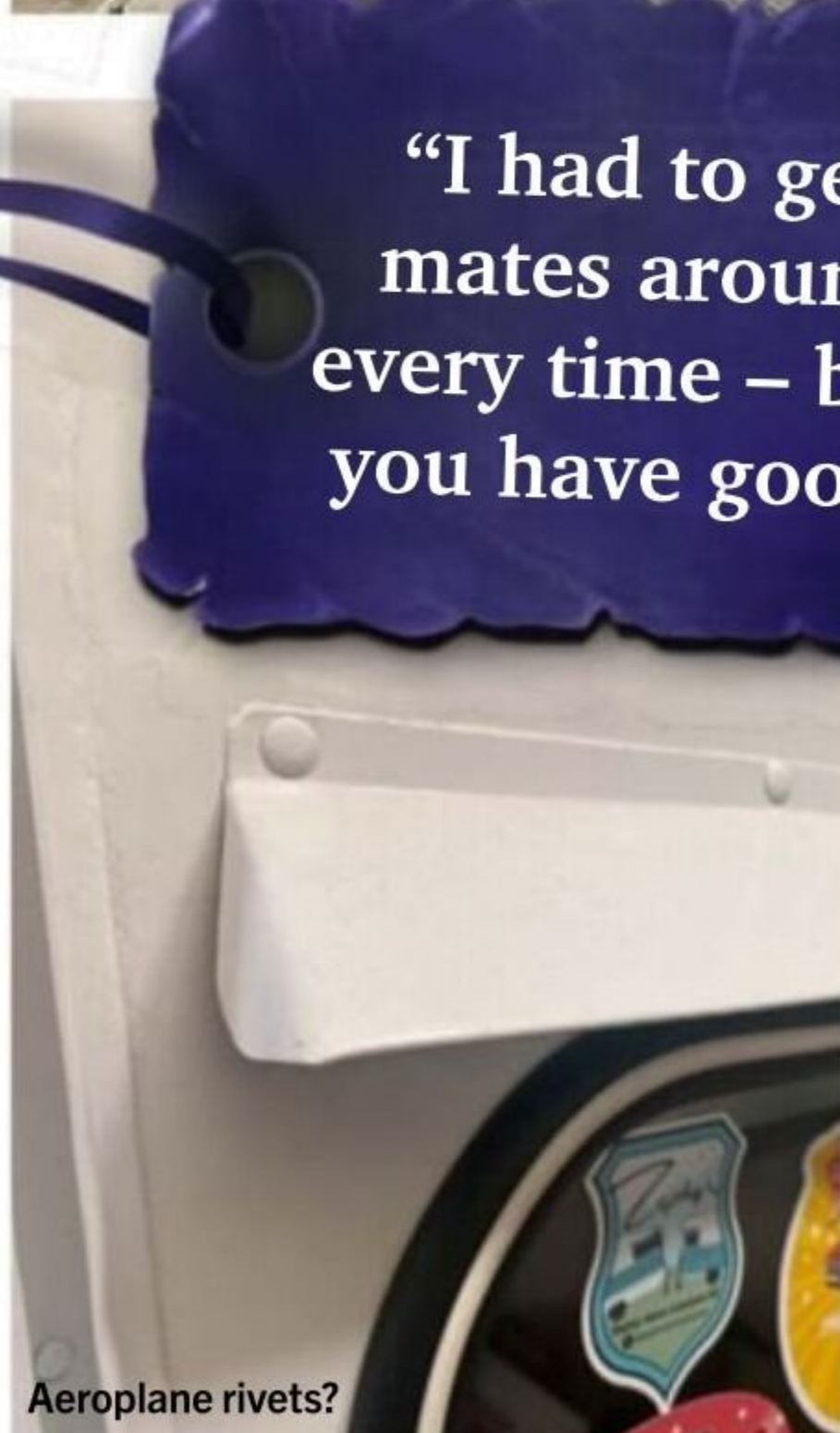


Skin on and primed



Many paint jobs later

“I had to get a group of
mates around to move it
every time – but that’s what
you have good friends for”



Aeroplane rivets?



Three lights plus reflector,
American style

He explains that every part of the wooden frame had originally been laminated, the factory using every piece of wood it had to save money, but he cut the front profiles and the arches over the wheels out of stronger, solid timber.

Built it back, tough

Marty applied this focus on strength and durability throughout the whole project.

The original frame was bare wood, which, with years of condensation inside the walls, had rotted to the point of collapse. Marty blasted and painted both sides of the skin to prevent corrosion, and primed and painted the framing

before the sides went on.

The clearance and back lights, originally faded and brittle plastic, have been replaced with glass lights from old English cars, probably Morris Minors.

"If I'd used plastic," he says, "I would have had to replace them in 10 or 15 years. Then you go to Repco and find that they've changed them and they won't fit any more."

This attention to detail borders on the fanatical. Marty shows me where all the external rivets don't seem to be the usual pop rivets.

"These are actually pop rivets, but I bogged up the holes to make them look like aeroplane rivets," he says.

I have to agree that it is a classier look.

He has even mounted a little wheel at the top of the door's exterior to prevent it from snagging the awning.

The new interior layout

Apart from a couple of small cabinets and doors, the interior is new with a different layout.

"This cabinet here was smaller – just a cupboard for hanging clothes – but we've made it deeper to fit a fridge, which it didn't used to have," he explains. "There's a battery underneath which we can charge off a solar panel; it also runs off mains power.

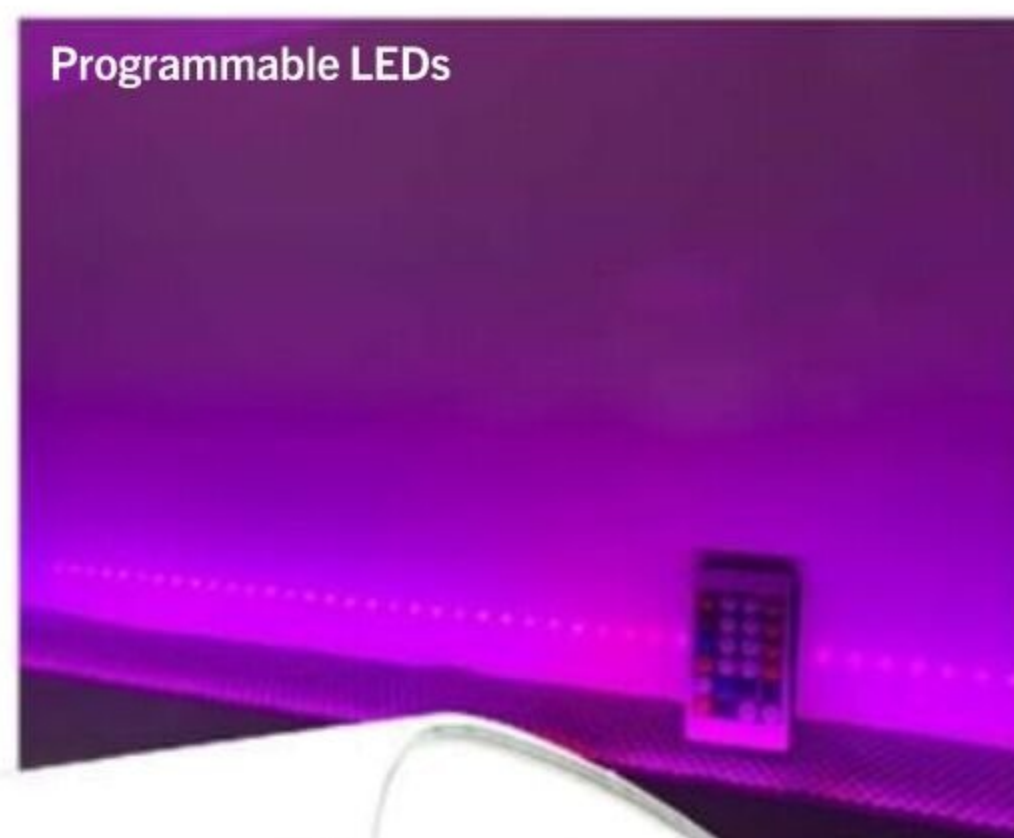
"The lights are all LED and use much less power, and the only other thing needing power is the electric water pump, replacing the old hand pump. So we can get by fine without a power supply."

Marty has rigged an ingenious cooling system to remove the hot air from behind the fridge, which can build up in an enclosed space. A cover over a grille operates as a wind tunnel when the vehicle is on the road, sucking air up through two tubes in the floor and carrying the heat out of the grille. When the van is stationary, a small computer fan does the same job.

As a final touch, a graphic artist friend copied the original Zephyr logo in Marty and Zoe's trademark purple and produced a decal to replace the original. ►



Zephyr logo in Radford colours



Programmable LEDs



The final result



Zoe gets her wish



DAZED AND CONFUSED



The "turd emoji"

Marty and Zoe have a wide circle of friends, for many of whom the big event of the year is Beach Hop at Whangamatā, where thousands gather to show off their super-pimped or lovingly restored classic vehicles, including caravans and pretty much everything with wheels. The pair urge me to call on their fellow Beach Hoppies Kim Crosland and Gerald Watts to see their dazzling restored and remodelled caravan, 'Dazed & Confused'.

Gerald and Kim's caravan started life as a "turd emoji", as some wit described it. They found it mouldering



(1) Rat's haven. (2) Strong bones.
(3 and 4) Not a hard choice.

away in an overgrown backyard, where it had been used as a container for old newspapers. It had no branding and they were sure that it was homemade.

"We don't know when it was built," says Gerald, "but we found a shred of newspaper in a rat's nest dated 1953, so it's at least that old. It was quite common in those days for people to build their own caravans from plans in magazines like *Popular Mechanics*."

Gerald and Kim had much better luck than Marty and Zoe with their collapsing wreck – the turd emoji had strong, sound bones.

Says Gerald: "We think it was probably built by an engineer, because it had a

welded steel frame and undercarriage, quite well made."

However, the tow-bar, the door, and the front and back panels were ruined beyond repair.

Good bones help

Kim and Gerald had a new door and panels made and restored the rest of the panels.

To affix the new panels, they glued

lengths of wood to the steel and nailed it into the wood. Parts of the chassis and running gear were rusted out. They replaced the centre member of the chassis frame and welded on a new tow-bar. The leaf springs were still good but a new axle and mag wheels completed the substructure.

Some rust in the frame needed repair, so, to prevent further rust, they filled all the box section framing with cavity wax. ►

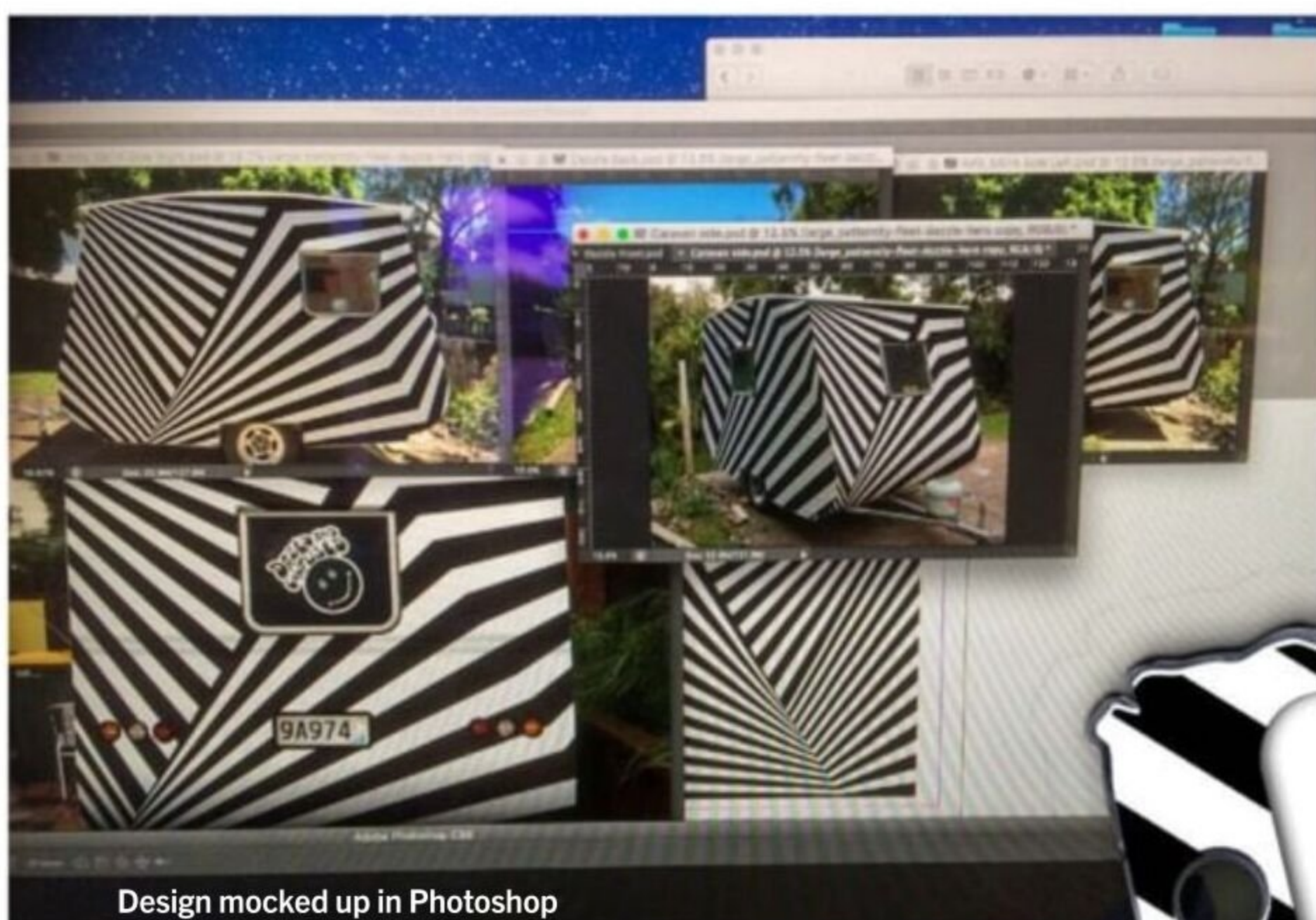
"Gerald and Kim's caravan started life as a 'turd emoji'"



Many hours of sanding later



Plain white — not so special



Design mocked up in Photoshop

Paint stripper saw off all the turdy tones. Then, after a clean-down with methylated spirits and water and many hours of sanding, it was ready for its new livery.

The surfaces were prepared with an etch primer and spray-painted with a two-pot white metal paint – which drew vocal complaints from the neighbours about the spray drift.

Once the caravan was clean white all over, the problem of the exterior began: how to superimpose the extravagant and striking design. They almost didn't do it. A friend who has restored a number of caravans was adamant that they should respect the era of the caravan's origins.

"He said, 'You can't do it like that; it's got to be original', and he almost got us to change our minds," recalls Kim, "but I said, no, we've gotta do it, be a bit different."

Confusing the enemy

Kim, an artist and graphic designer, generated computer images of both the exterior and interior. The striped design is based on the dazzle camouflage used by the British and US navies in the world wars. It was dreamed up as a way to confuse submarines. A ship painted like that was highly visible but the broken-up lines and shapes made it very hard for a submariner looking through a periscope to tell which direction the vessel was pointing and how fast it was going.

But how to turn a design in a computer image into a three-dimensional paint job?

The plan was to mask off every part that would remain white with tape and paper, then paint in the black.

"We started doing it by just looking at the pictures and it was taking hours. We'd spent four hours and thought it would probably take a week. Then we had the idea to use an old-school overhead projector," explains Kim. "I

"They filled all the box section framing with cavity wax"



Design on acetate sheets



Overhead projector in use

drew the patterns onto the transparent sheets, and, starting when it got dark, we projected them onto the caravan and taped and masked along the lines.”

“So it was one or two o’clock in the morning and we were still masking up this damn caravan, with the mosquitoes attacking us,” says Gerald. “It was a nightmare but we got it all done in one night. We did that at home, then [to avoid another run-in with the neighbours] we drove it to our friend’s place, on the highway, with all this red tape all over it. We painted it all black. When we removed the masking, it came up beautiful – but I’d never want to do that again.”

The final touch is the logo of the New Zealand Motor Caravan Association, which, on closer inspection, is not quite what it appears to be. In the centre is a skull and crossbones, with crossed syringes for the bones.

“That’s from Covid,” explains Gerald. “The association said you had to be vaccinated to use their campgrounds. We cancelled our subscription and asked for our money back. Heaps of people did.”

The inside story

“We totally revamped the interior to suit us,” says Gerald. “It was full of borer – completely shot.” ▶



The magic emerges



New Zealand Motor Caravan Association – not!



Graphite-polystyrene insulation



Kauri benchtop with natural edge



Old kauri table

The pair knew exactly what they wanted thanks to Kim's precise computer design specs. They ripped everything out of the interior including the rimu floor. Wall and ceiling cavities were packed with 30 per cent more efficient black polystyrene insulation infused with graphite.

All the wood is kauri. The kauri floor is demolition tongue and groove from a house in Kumeū. The beautiful sink bench and worktop are made from kauri slabs with a black resin streak down the centre.

The kauri dining table was cut down from a 100-year-old kauri table they found on Trade Me.

"The guy had put a lot of effort into restoring it," says Gerald. "He was a bit shocked when we told him we were going to cut it up and put it in a caravan, but we pointed out that at least it was going to be used."

"The only thing with kauri," he warns, "is that it's so soft. Drop anything hard on it and it leaves a dent."

Rock-star cushions

Kim has an extensive portfolio of mostly monochrome paintings of rock stars, which she prints onto cushions and other fabric.

On opening the caravan door, you are confronted with a startling portrait of Kurt Cobain; step inside and face a glaring Alice Cooper on the wall. More faces stare from the cushions around the table.

Modern features include clearance lights in front and triple rear lights, a 150W solar panel on the roof to charge the expensive but very safe gel battery, an electric water pump, 40-litre fresh water and grey water tanks – the latter vented to an external breather – and a programmable LED lighting system.

Again for safety, they mounted the gas bottle outside on the tow-bar connected to the inside hob by a removable hose, meaning that there's no rubber left outside to perish in the weather. Seeing a photo of the network of wires connected to the distribution board, I assumed it was a professional job.

"Not at all," says Gerald. "We did it ourselves; learned it from YouTube."

With nothing left to be done and very little maintenance needed, all that is left for Kim and Gerald now is to enjoy their travels and the startled stares of passers-by and other motorists.

"It's our pride and joy," declares Gerald. "We'll never sell it." 📱

"A friend who has restored a number of caravans was adamant that they should respect the era of the caravan's origins"

Peter Newman's caravan resto tips

Before you start your rebuild, you've got to start with your chassis; that's the foundation. If there's any rust, it has to be repaired or replaced.

Next, make sure your running gear is OK. Definitely remove the wheels and check the axles and springs.

If the caravan has brakes, they must work, even if a caravan of that weight would not need brakes under modern regulations. Our featured '56 Trail-Lite has a hydraulic brake. When the towing car applies its brakes, the caravan's momentum causes a hydraulic system in the tow-bar to compress and activate the caravan's brakes. If you're looking at one of those, check and, if necessary, repair the hydraulics.

Have a good look for rot; there are plenty of telltale signs. Open the ceiling cupboards where the roof joins the walls to check that there's no staining, which is a sign of water ingress.

Along the back edges and corners, same – a place where you'll find signs of water ingress. Look inside the cabinets under the bunks – another place where you'll find signs of water and rot.

If the caravan is more than 2m wide, it may not have originally required clearance lights, but it will need them to get a WOF these days.

These are front-facing clear or orange lights on each side of the caravan. The '56 Trail-Lite is just under 2m wide, so Peter was able to do a perfect restoration and still be road legal.

If a window is intact, you can put it back. But if the glass needs



replacing, you have to use safety glass.

Likewise, while a very old or homemade model may have one rear light or even a simple reflector at the rear, you will need to fit rear, turning, and brake lights.

Take great care removing the panels. You will want to reuse them – aluminium's surface can corrode but it doesn't rust – or use them as templates to make new ones.

Drill out any pop rivets. They may have creases in them to allow for heat expansion, so be sure not to replace a creased panel with a plain flat one. Fix the bottom edge first and then fasten the top edge, making sure that the panel bends at the creases to create a slight concave tension against the frame – otherwise the panel will expand when it gets hot and bulge out from the wall.



Pride and joy – with themed cat



Simon's multicolour cubic design studio shed with new bamboo deck

The shed season

In spring, Christchurch sheddies emerge from their winter caves

By Ritchie Wilson | Photographs: Ritchie Wilson

In England, the aristocracy have a regular round of summer events called 'The Season'. It starts with the Grand National horse race in April, followed by the Oxford/Cambridge Boat Race, the Chelsea Flower Show, the Derby, Ascot, and Wimbledon, and culminates with the Edinburgh Festival in August.

In the same way, some things are annual events in the Christchurch sheddie scene. At the beginning of November, there was, in its second year, the Rotary Ōtautahi Passport Christchurch Shed Tour, Behind the Shed Door, with 15 sheds available to be viewed. Then, towards the end of that month, came Syd's Moped Run, which has been held every year since 1995.

Behind the Shed Door

Some of the sheds on the Behind the Shed Door self-drive tour were familiar from the previous year, but several were new. Two of those were a community pottery school and a racing car shed.

The pottery school is in the grounds of St Faith's Anglican Church in

New Brighton, just a couple of blocks from the beach. The school is run by Brenda, who took up pottery as therapy after the Christchurch earthquakes. She has an ambition to study pottery in Japan, perhaps in Christchurch's sister city Kurashiki. St Faith's was having a fair during our visit, and I bought some spanners and another Workmate.

While we were at the beach, we caught up with Jane and Simon, whose Mondrian-inspired studio has received a new bamboo deck since the last tour. The gradually fading colour of the natural bamboo complements the bright paint of the colourful cube shed.

Impressive collection

The racing car shed fully lives up to its name. A large agricultural-type shed set on a ridge and separated from the two family homes by swathes of manicured lawns, it looks over the encroaching subdivisions to the snow-covered mountains.

The building has space for eight or so cars of the type that most New Zealand car lovers would covet: a Porsche or

two, an open-wheel race car, a limited-edition Toyota saloon car racer, and other exotica. In complete contrast were two Austin Sevens from about 1930 – tiny, angular, both painted in that brown-red so loved by designers of the vintage era. One is a Chummy, the other a closed car – both captivating.

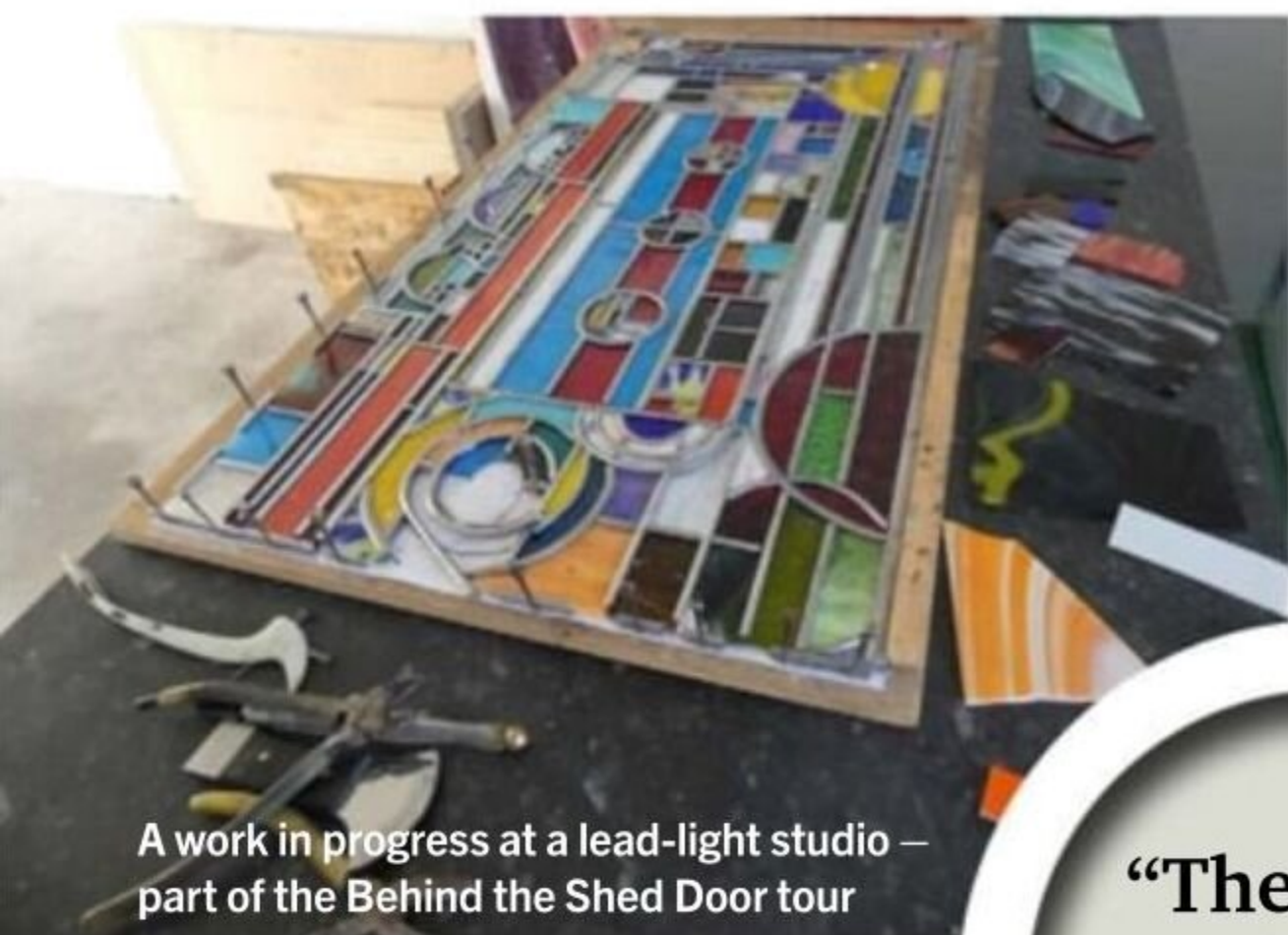
A man in a high-vis vest came out of the nearest house and we chatted about the Suzuki Ignis that we had driven up in. Was it a good car? Would we buy another?

Yes and yes.

We were limited in the number of sheds we were able to visit because we had to be at the Theatre Royal at 1.30pm for a matinee of the Royal New Zealand Ballet's *A Midsummer Night's Dream*. Felix Mendelssohn's composition (most of which he wrote when he was only 17) was fabulous, the lighting fascinating, the dancing superb.

Pedal power

Syd's Run is named after the late Sydney Falconer, who organised the original event with friends from the



A work in progress at a lead-light studio – part of the Behind the Shed Door tour



Small-frame Vespa with saddlebags alongside a step-through with both saddlebag and beer crate



Pottery tutor Brenda at the wheel at St Faith's pottery shed

"The racing car shed fully lives up to its name"



Some riders have a small motorcycle especially for Syd's Run

local branch of the Vintage Car Club of New Zealand. It is for small motorcycles, and follows a leisurely path around the outskirts of Christchurch. Originally, the two-wheelers were supposed to be able to be moved by pedal power as well as by two-stroke mixture, but pedals were very uncommon at the 2024 run.

The run is advertised as being for mopeds, clip-ons, scooters, and step-throughs. The appearance of the bikes in the most recent event ranged from the immaculate (a red Honda NQ50 / Nifty 50, a Vespa Super 150) to ones that were very far from factory original.

Accessories aplenty

An accessory seen on a few of the bikes was a beer crate attached to the rear carrier. Other bikes had saddlebags. Some had both crate and bags.

There is no official count of the number of bikes taking part in this event, but for years it has been unquestionably pretty high. Last year, there would have been around 500 machines gathered in the car park of the largely disused

Princess Margaret Hospital (which meets only 11 per cent of current earthquake standards) to prepare for the mass departure.

The noise as the bikes left was confronting, but the smoke was much less than would have been expected from such a large fleet of small motorcycles, many of them two-strokes.

The fleet traditionally heads first to the Lyttelton road tunnel (super noisy), but the 2024 route (devised by Pablo Fernandez) was a loop from the coast to an inland domain for lunch and then back to the city (more noise).

In the distant past, the tour would involve stops at numerous bars and pubs. It hardly needs to be said that times have changed; the run is no longer the financial bonanza for the hospitality trade that it used to be.

As with many motorcycling activities in Christchurch, Johnny Moore's Crash Palace is central; that is where the various awards are presented at the end of the run.

Hopefully, there will be another Rotary shed tour and Syd's Moped Run this year. Fingers crossed! 🍀

THE SHED ONLINE

What's happening online at the-shed.nz?

Every week, we upload new content onto The Shed website to add to the hundreds of articles and videos already on the site for readers to discover, learn from, and enjoy. Some uploads of the past few months include:



Project: how to build a potting shed

A great summer project
<https://the-shed.nz/building-a-potting-shed/>



Building an electric pedal car

A sheddie goes the extra mile on a kitset
<https://the-shed.nz/small-vehicle-large-challenge/>



Tricks of the trade

Get furniture repair tips from a pro
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From Rust to Rrrroarr video – part 1

Enjoy our AJS motorbike restoration in video form
<https://the-shed.nz/from-rust-to-rrroarr-video-part-1/>



LETTER OF THE
MONTH

MAKING THINGS TAKE PATIENCE



We live in a changing world. Ways of making things have changed. Many of the ways are better; faster, cleaner, more accurate, repeatable, and kinder to the planet and to people.

But there can be a smothering effect that accompanies change. The enthusiasm that new technology attracts tends to override valued and long-standing beneficial practices that have stood the test of time.

The 'instant result' solutions offered by digital technology have largely displaced the kinaesthetic fine motor control skills that were the basis of achievement in earlier times.

I want to suggest some areas of valuable learning that digital technology cannot typically provide.

1. The experience of creating transformation
2. The creative experience of modelling living forms
3. The pleasure of combining a number of processes and materials while applying design criteria
4. The learning that arises when one makes a mistake

(See photo 1.)

Hidden beneath the rough-sawn surface of a piece of wood is a new picture waiting

to be revealed. The grain pattern might be coarse or fine, straight or curved. There might be a hidden burl.

Each wood sample will have its distinctive colour, which will intensify when a finish is applied. The selected grain direction will offer contrast.

A further vivid example occurs when working the surface of sterling silver. There is a remarkable transformation when the original nondescript surface is subject to filing, abrasive paper, followed by a polishing mop. Silver never fails to reward when its distinctive deep lustre emerges (see photo 2).

To fashion an item from the realm of 'the living' gives a new dimension to the created world around us. The face captured by a Kenyan artist is distinctive and unique. I am aware of copying technologies available via digital technologies but am not aware of originating techniques.

The age-old craft of forging heated steel is another pursuit worth exploring (see photos 3–5).

Combining materials always offers the opportunity to consider design elements such as balance, contrast, proportion, and pattern (see photos 6 and 7).

If I have to produce four accurately drilled holes, the best outcome will be via a CNC mill. The holes will be positioned

with impressive accuracy.

If circumstances mean I must use hand methods, I might be disappointed. But the disappointment, hopefully, will lead to some very important learning. I will learn to be patient and persistent. I will have to try again. There is usually a measure of tedium mixed in with moments of delight when in the business of making.

So, confidence develops around the use of tools and machines and what you can and cannot do with materials.

I recognise the need for balance. Along with the points I have made, I am happy to admit there is a place for digital technology. If I need to profile a piece of laser-cut paua shell and mill a recess to house it, then a CNC mill is the obvious answer; likewise, using a CNC lathe to make a shoulder joint for a model robot.

To focus for a moment on the making of small engines – these are remarks made by Richard Bratby when the closure of Mamod Models in the UK was announced. (It is estimated that Mamod made 2.5 million model steam engines during its 80-year production run.)

"In a computerised world, pursuits such as modelling, crafting, and heritage restoration are gloriously offline. They're all about physical craft; old but characterful technologies, and the ancient pleasure of making something with your



hands and operating it with skill.”

He is lamenting the loss of making skills.

So, in the end, my cry is for time. The instant push-button solution has a part to play, but it's not the main act. Patience and time cannot be sidestepped if we want to progress towards satisfaction and pleasure as we create.

Looming in the background is the question: What part should schools be playing if the points I am making are worth considering?”

Regards,

Russell Gifford



GREAT SAFETY ADVICE

Dear Ed.,

I've just read the article entitled Smokin' – Making a Double-barrel Smoker, published in *The Shed*, Issue No. 118 – which I enjoyed.

As an engineer with 30-plus years' experience, however, I would have liked to see a paragraph of caution with regard to cutting drums with a grinder, due to the possibility of an explosion from any trapped gases. The issue is that no matter how old the drum is, or how it has been stored, there is always the risk of this.

There are two main ways to deal with this, and it is referred to as 'purging the atmosphere'.

One is to fill the drum to the top with water and just let the water leak out as you cut, while the other is to run a hose from a car exhaust into the drum for about five minutes or so. The CO₂ from the exhaust removes the oxygen – which is the flammable component – from the 'atmosphere'.

An alternative approach is to use a hammer and cold chisel; with a bit of practice, it takes no longer than the grinder.

The same problem is inherent in the cutting of gas bottles. For this, I remove the valve and then fill it with water. This ensures that any gas residue is flushed out.

Regards,

Brian Bruton

LETTER OF THE MONTH PRIZE

Every issue, our Letter of the Month winner will receive a copy of *Best of The Shed 1* and *2*. More top projects from 15 great years of *The Shed* magazine.



Odd Jobs

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From the archives



FORGING AHEAD

Make a forge from an LPG gas bottle

By Jude Woodside | Photographs: Jude Woodside

Lighting
up the
forge for
the first
time



Removing the safety cage for the valve

I first considered building one of these when I saw the examples that Shane Minnear (Cutting Edge) and Kieran Gleeson (Yambuk Blacksmith) had in their sheds in a past issue of the magazine. I happen to have a few old 9kg LPG bottles lying about that I considered would be fine for the job.

When I came to select one, however, the most likely candidate proved to be full of gas – far too much gas to vent, so, having committed to making the forge, I opted for the second-best option and bought a new bottle. At only \$65, it wasn't a huge outlay, although I know that many of you will be shaking your heads at my frivolous wastefulness.

Buying a new bottle has one very handy upside: there is no volatile gas in the bottle. If there was, then certain precautions would be absolutely essential. Our welding expert, Greg Holster, outlined the safest methods for neutralising a used gas bottle in a previous article in *The Shed* (Issue No. 45, October/November 2012) and they bear reiterating here.

Make sure that the bottle is empty, and remove the valve. These valves are usually well set in, so it will require some exertion and a long lever. To make this process easier, especially when handling a large, round, smooth bottle, you can tack the base of the bottle to the worktable (assuming you have a metal table).

Inert gas

The simplest method is to fill the bottle with water, or you could fill it with an inert gas such as argon or carbon dioxide. ►



Marking out the door opening



The bottle tacked to the bench for stability



Unscrewing the valve



Removing the foot

“Using water around a device that has low amperage and high voltage is always potentially risky”

Greg prefers to inert the bottle by changing the air in the tank at least three times with inert gas and keeping the gas running while he is cutting. Water filling is simplest, but be careful using electric angle grinders – make sure the angle grinder is isolated through a residual-current device (RCD) or use an air-powered grinder.

In the full expectation that I would be working with a used bottle, I had purchased an air-driven, cut-off wheel that I figured would be more accurate than working with an angle grinder. It would have been more accurate, but it needed a somewhat thinner wheel than the 1.8mm version that it came with.

The wheel was taking a while to cut through the bottle. Fortunately, we were in the well-equipped premises of Construction Engineering in Henderson, Auckland, where there was a plasma cutter to hand.

The plasma cutter made short work of the process of opening up the bottle for the door. Incidentally, had this been a used bottle, the plasma cutter would have been perfectly happy to be used with the bottle filled with water while the top was cut, but using water around a device that has low amperage and high voltage is always potentially risky.

First, the various protrusions such as the safety cage that surrounds the valve and the ring at the foot of the bottle need to be removed. It's a good idea to use the safety cage ring as a template for marking the door of the bottle first, as it's roughly the right size and shape.

Draw a straight edge across the opening and this can be the base of the door.

Now, making sure the bottle is neutralised, cut the door out of the top of the bottle. As noted, we used the plasma cutter but other tools that would be useful include an air-powered reciprocating saw or the aforementioned cut-off wheel with a 1mm wheel. An angle grinder could also be used with care. ►



The cut-off wheel worked, but it really needed a thinner blade



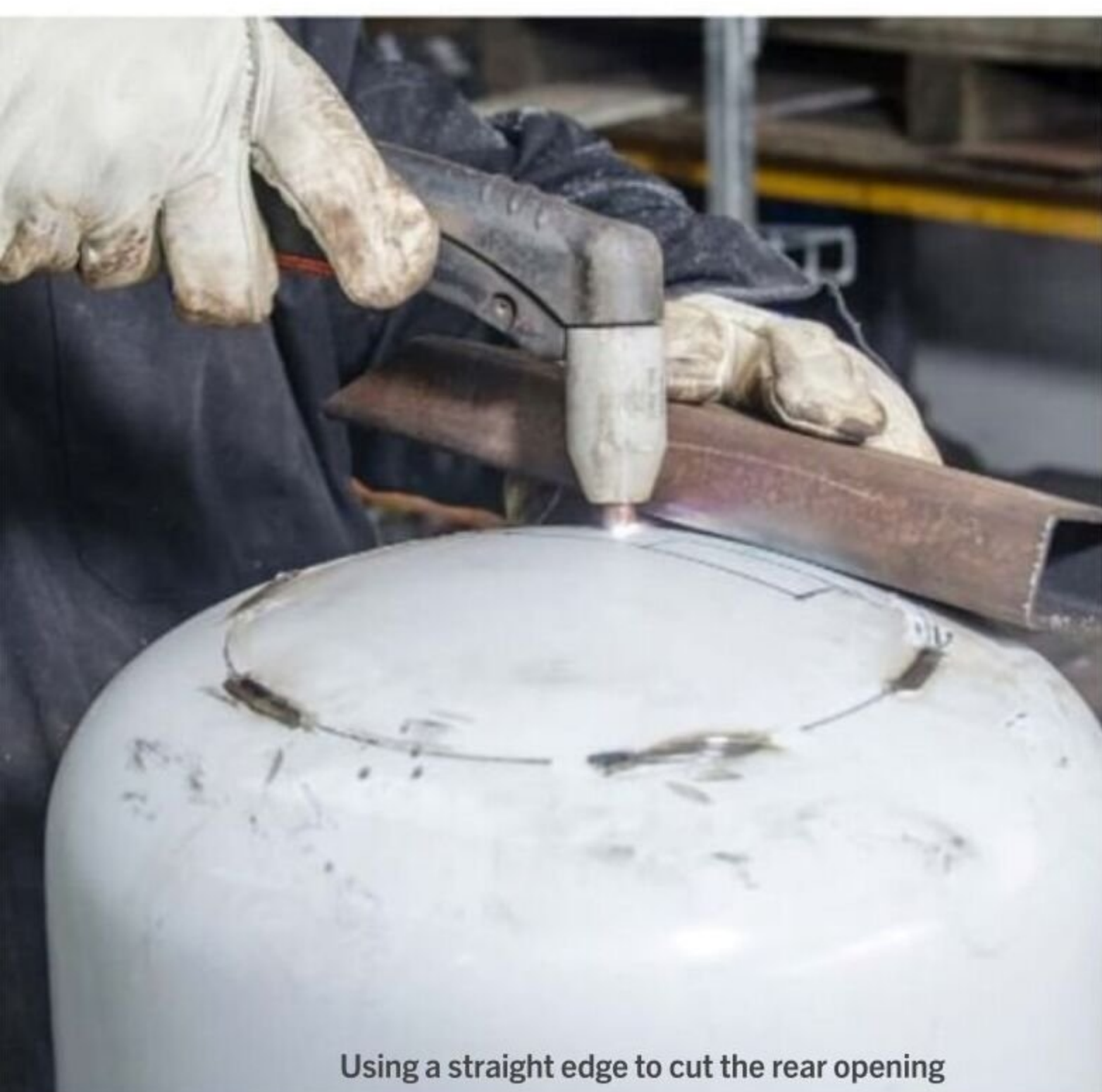
The plasma makes short work of the opening



Measuring the opening in the front ...



... and transferring it to the rear



Using a straight edge to cut the rear opening



The rear slot cut



Cutting the hole for the burner



Making a registration mark prior to cutting the end off



Marking the cut line



Cutting the end off the bottle

Burner fitting

With the door cut, lay the bottle on the table and brace it so that the base of the door is level. It pays to check the level with a square to ensure that it is parallel. Next, transfer the height of the floor to the rear of the bottle and mark a slot roughly 100x25mm on the rear, with the base corresponding to the floor of the door. This opening will allow air to circulate and gases to exit the forge.

Now, it is necessary to cut a hole for the fitting of the burner. In this case, I purchased a burner from Gameco in Masterton. In fact, the whole idea for the project was fired (excuse the pun) by the availability of good-quality, professionally made burners. These have been difficult to obtain locally, and many people simply make their own. I was not confident that I had the knowledge to make my own, and the consequences of failure could be dramatic.

I purchased a burner kit online for AU\$450. It came with everything, including a pressure gauge. There are cheaper alternatives from Gameco – it's worth calling them to get a quote.

The burner nozzle can be welded into the side of the forge but I wanted the option to remove it in the event that I decided to upsize the forge, so I found a galvanised flange connector fitting to



**“So wear
some sort
of breathing
protection when
cutting the stuff
and working
with it”**

fit the burner, which is threaded, and threaded the other end into the forge.

Kaolin wool

The hole is cut roughly midway and to one side. It may be possible to run it vertically – I have seen that done – but I preferred it offset a little for ease of storage. The next stage was to remove the rear of the bottle entirely to allow the interior to be packed with kaolin wool – or ‘ceramic fibre blanket’, to give it its correct name. This is a material made from kaolin clay, which is melted at 2000°C and spun in a continuous stream. The resultant wool-like material is made into mats and rolls for lining kilns, refractories, and foundries.

Kaolin wool needs to be handled with some care, as the material is mainly silica and the dust from its use can lodge in the lungs and possibly cause silicosis eventually. Silicosis is one of those silent killers that takes many years to manifest;



Pristine interior



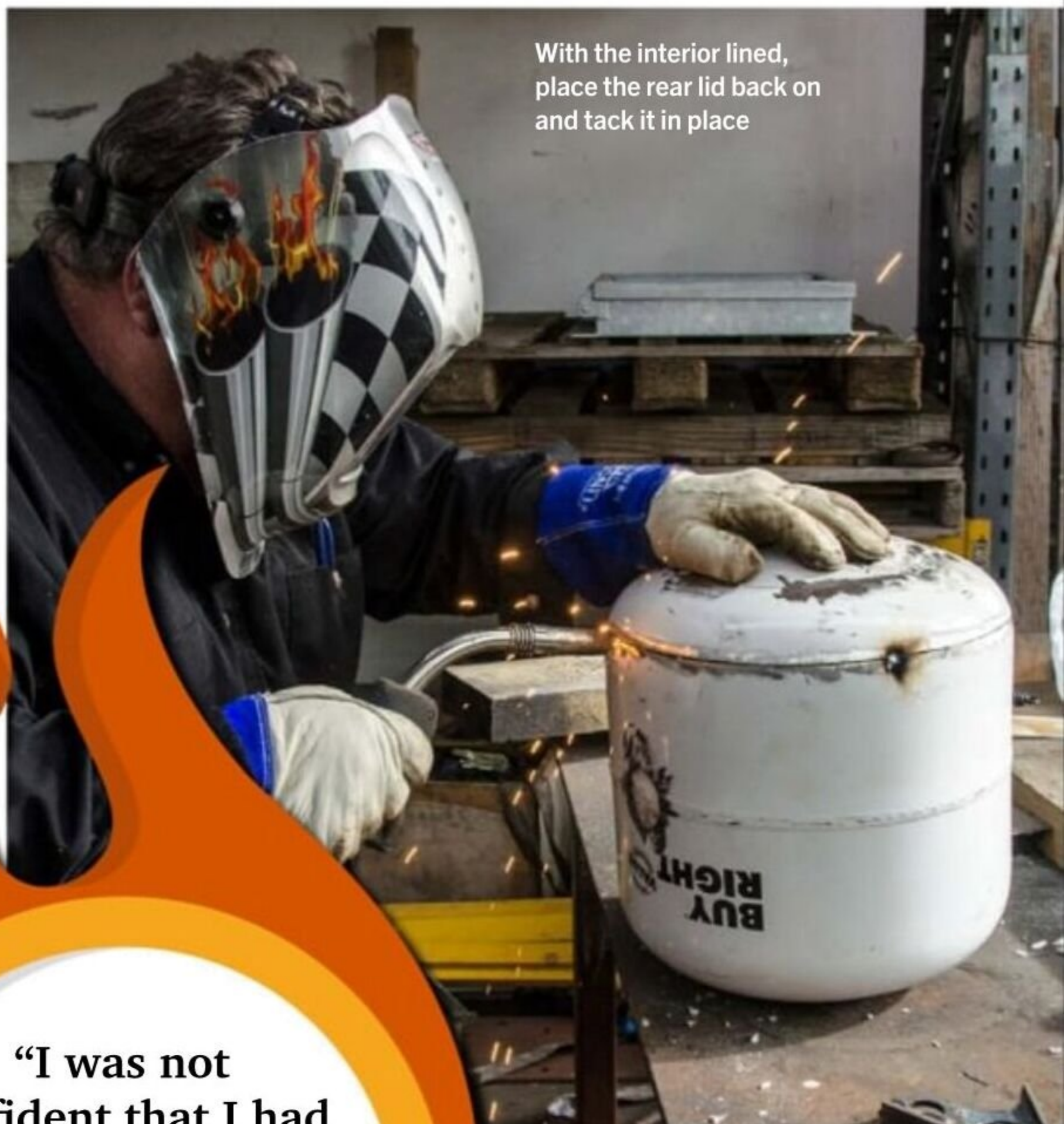
Use the rear piece to cut a disc of wool to fit. Cut another for the front



Cutting the wool for the interior



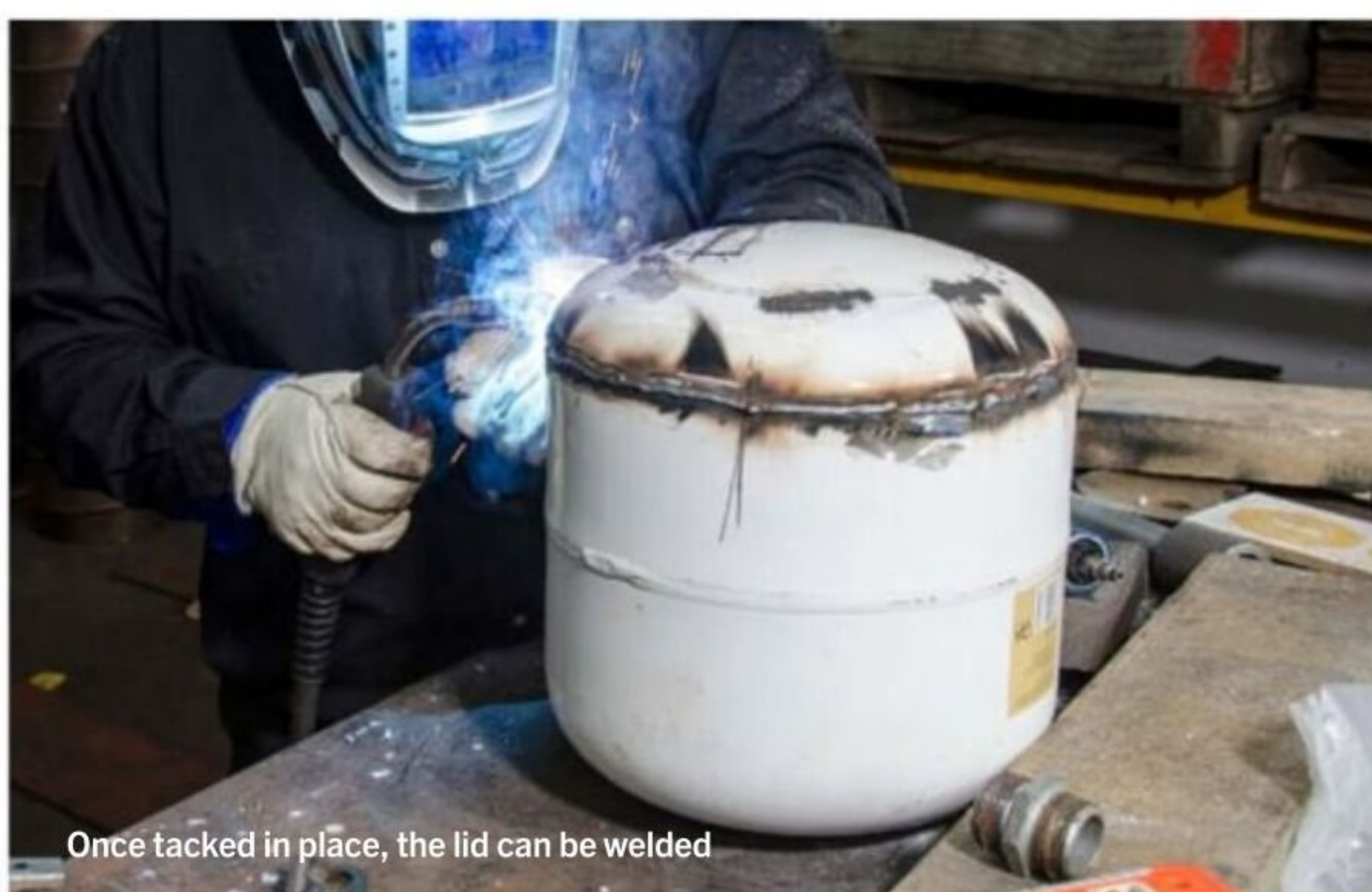
Hardening the wool at the burner site



With the interior lined, place the rear lid back on and tack it in place



Once the wool is dry, you can start to carefully cut the hole for the burner



Once tacked in place, the lid can be welded

“I was not confident that I had the knowledge to make my own, and the consequences of failure could be dramatic”

short of a lung transplant, it's incurable. So wear some sort of breathing protection when cutting the stuff and working with it.

Make a mark somewhere on the bottle to aid in realigning the pieces, and draw a line around the base as evenly as possible. Now, cut the rear off with a grinder and a cutting disc (it's faster than the plasma).

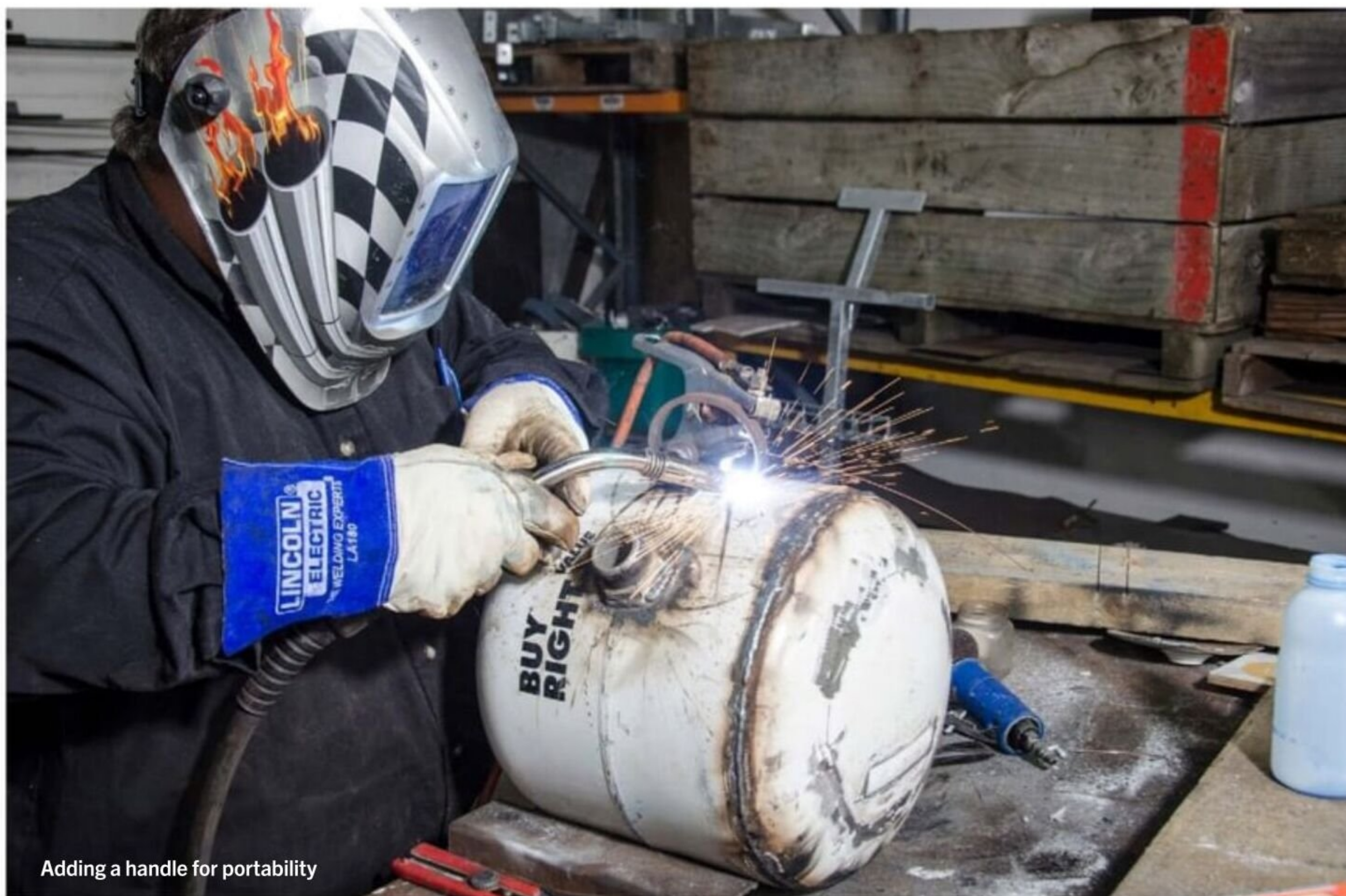
Unroll the kaolin wool – make sure you are wearing a mask. Next, cut two discs to fit both the front and rear of the bottle. Place one disc into the front of the bottle and measure the depth remaining. I cut an amount equivalent to the circumference of the bottle. This was, of course, too much; I forgot to account for the interior measurement and the depth of the wool itself. But it was easy enough to trim the excess once the wool was rolled and laid in the bottle.

Burner attachment

Now the rear of the bottle needs to be reattached. This is just a case of fitting the lid back on and tacking it before carefully rewelding the two pieces. I was fortunate to have the services of



The pipe fitting welded to the bottle – the fitting was heavily galvanised, which explains the sparks



Adding a handle for portability

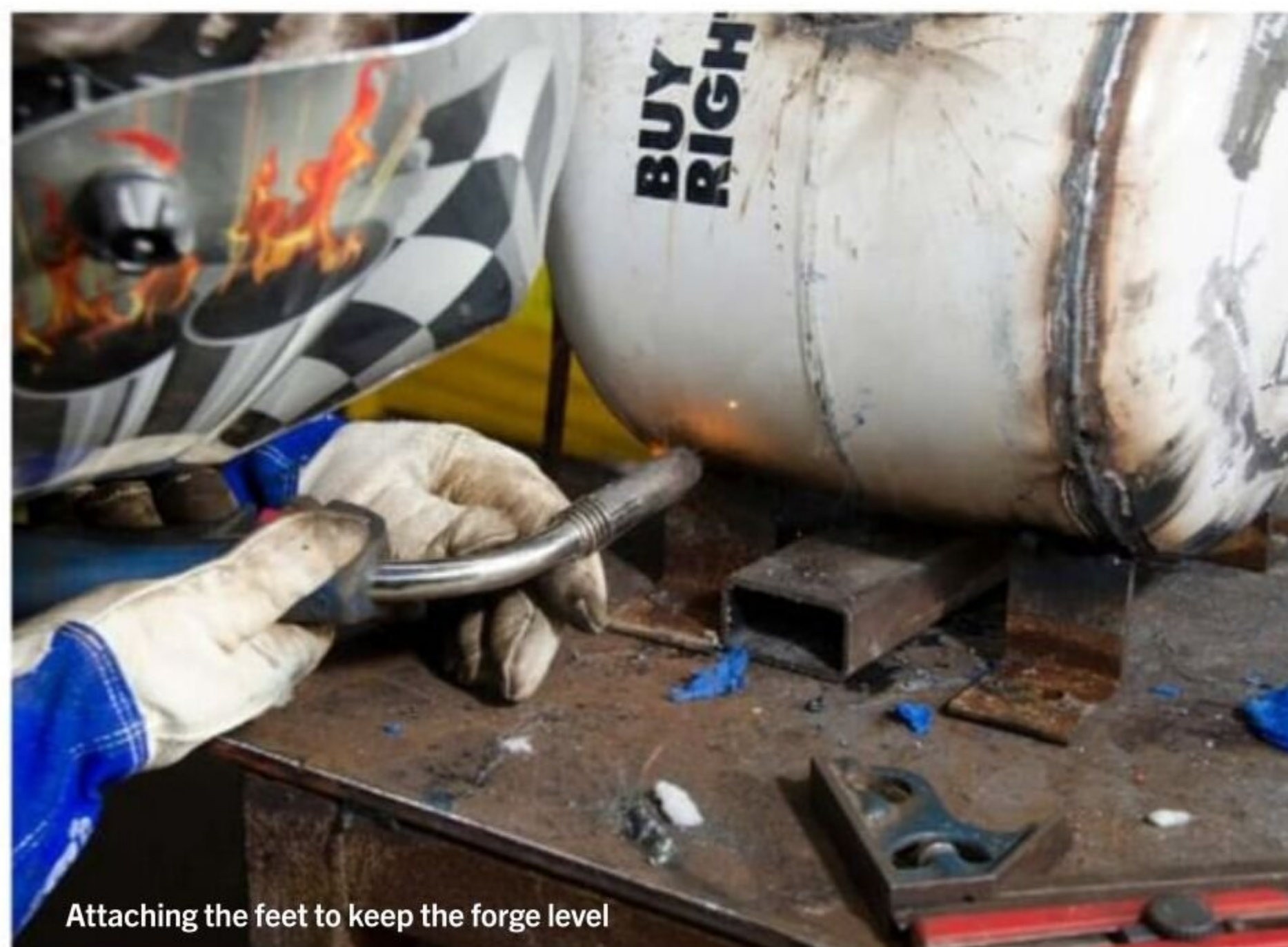
an accomplished welder, Greg Holster, to do this, so it looks like a bought one. However, looks don't matter: it's performance that counts.

Now it's time to fix the burner attachment. To do this, it is useful to harden the kaolin and there is a hardener specifically for this job. Wait until the hardener has rigidised the wool enough that it can be cut without tearing. Once we had a hole of sufficient diameter, we applied some hardener to the inside, which meant cutting through the wool in the door opening.

The idea of hardening the area around the burner is to prevent the wool from being blown into the burner stream, or the burner flow disturbing the wool in general. With the hole established, it was possible to fit the pipe fitting to the opening and weld it in place.

The basics were completed and it only remained to add legs to keep the forge level and a handle to make it portable.

One more refinement, which might not be strictly necessary, is to lay a floor in the forge – a flat surface to work on. This is made with another refractory product called 'refractory castable'.



Attaching the feet to keep the forge level

Firing up

Castable is a heat-proof, cement-like product often used in foundry linings. It is mixed with water, and can be cast into specific shapes or used as a lining. It's easy to mix – similar to concrete. Don't get it too wet – add the water in stages. It is laid on the floor of the forge and smoothed out and left to set. It will take a day or two to set. Don't be

tempted to dry it with the burner, except in short bursts. Use gloves if you are handling the material, as it contains glass and cement.

Connecting the burner is a simple enough matter. Wrap the end of the burner tube in Teflon thread tape before screwing on the burner assembly. Attach the hose to the shut-off valve and the





Final touches



The pressure valve with gauge

regulator to the gas bottle. Check all the fittings with soapy water and briefly run the gas in a well-ventilated environment to ensure that there are no leaks.

LPG is a pernicious gas. It is heavier than air and can travel long distances to pool in crevices, drains, and gullies. Where possible, use it in a well-ventilated environment; open all doors in your shed or work outdoors.

That thrilling feeling

With the castable set and dry, it's time

to fire up.

Lighting the flame is easiest with a taper. Once the flame is established, the intensity of the flame can be adjusted using the valve on the burner.

There are few things more thrilling than firing up the forge and heating up a piece of metal to bright red for the first time. It helps, too, if it happens to be a freezing cold night so that you can experience the other benefit of these forges: they are very good gas heaters.

Remember: if you are heating up

metal, you will need somewhere to place the metal after you take it out of the forge, and you will need tools to handle the hot metal. I used oven gloves, but, with hindsight, that's not the best material for handling hot steel. Be careful where you place the metal. Don't place it on a concrete floor, for example. I'm going to have to get a few blacksmith tongs and some better gloves – not to mention the anvil, oil bath ... oh dear, I can sense another obsession coming on. 📺



“There are few things more thrilling than firing up the forge and heating up a piece of metal to bright red for the first time”

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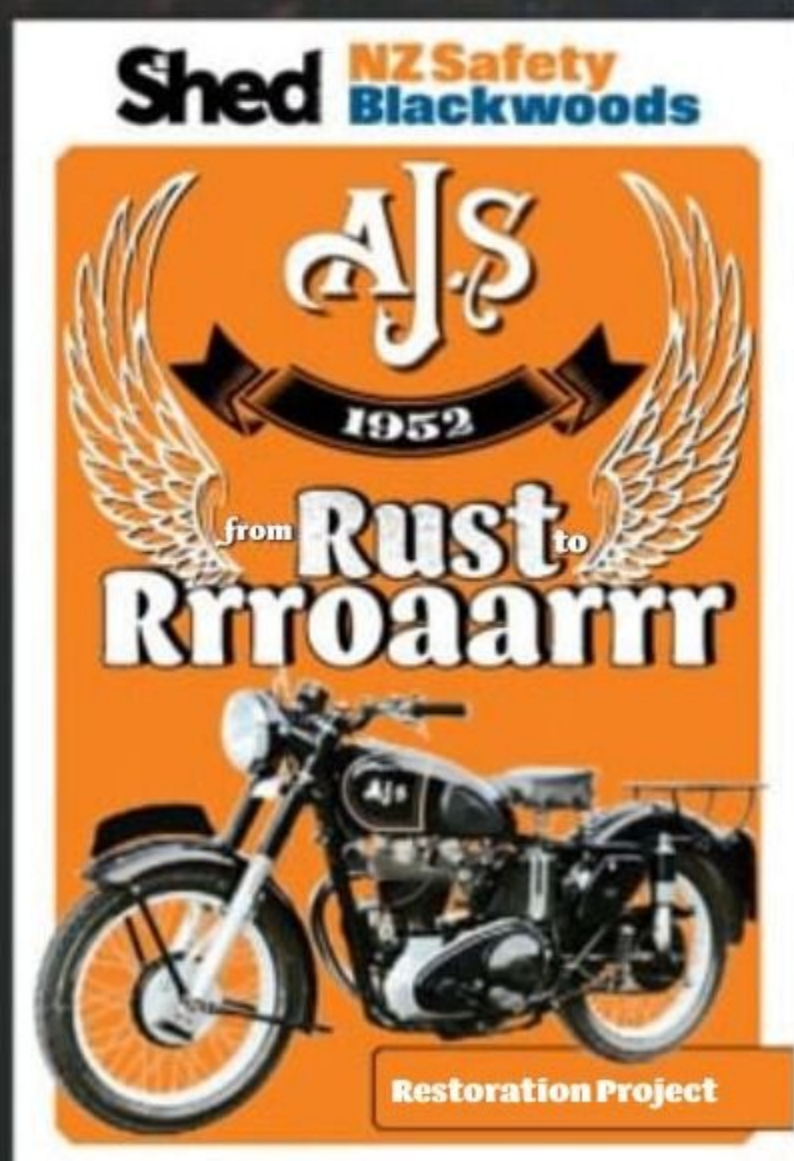
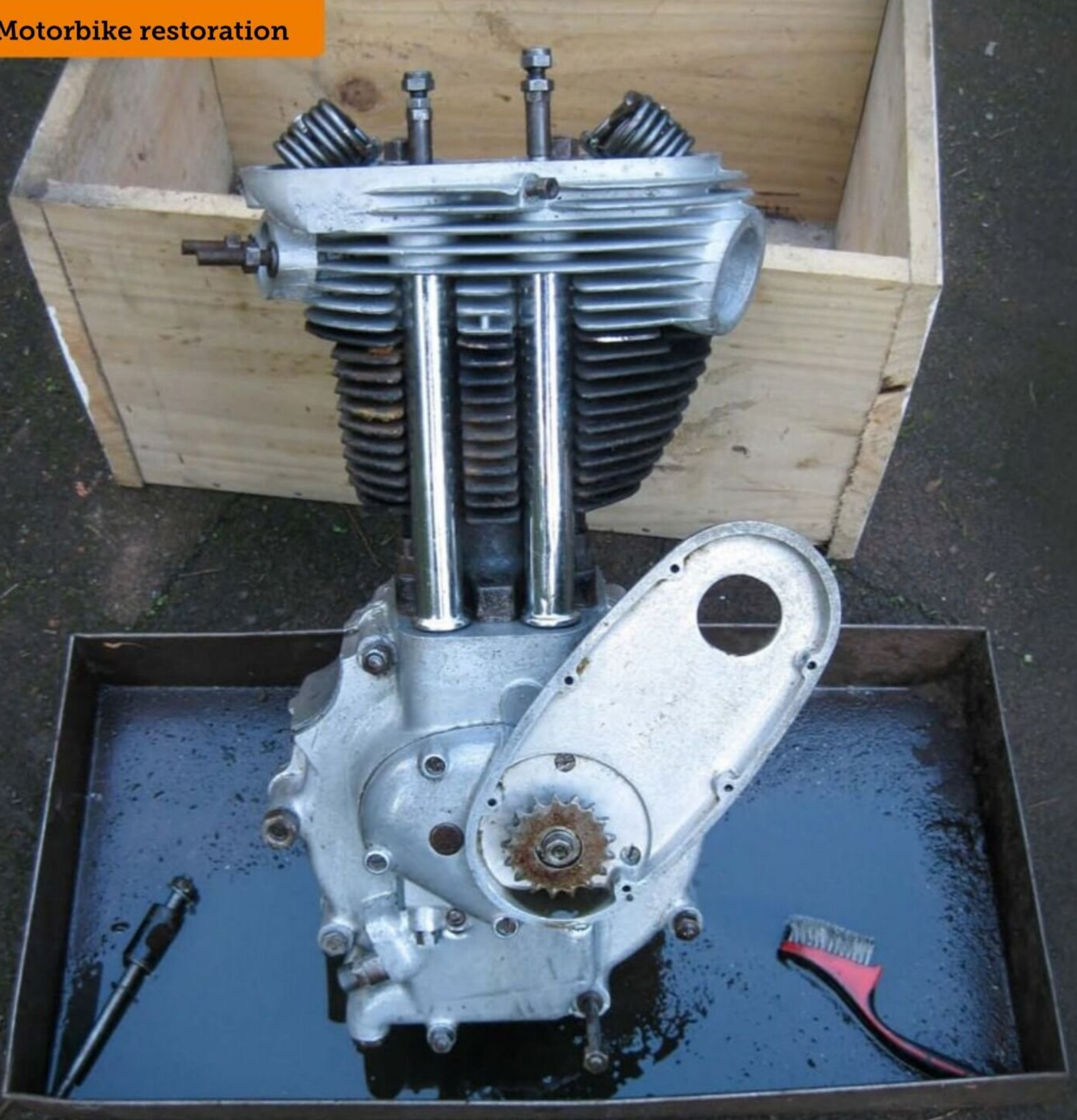
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PART 2

from Rust to Rrrroarrrr

The secrets of successful nickel plating

By Peter Barton | Photographs: Peter Barton

Above: As shown in the previous instalment, the two pushrod cover tubes have been plated and incorporated into the engine rebuild

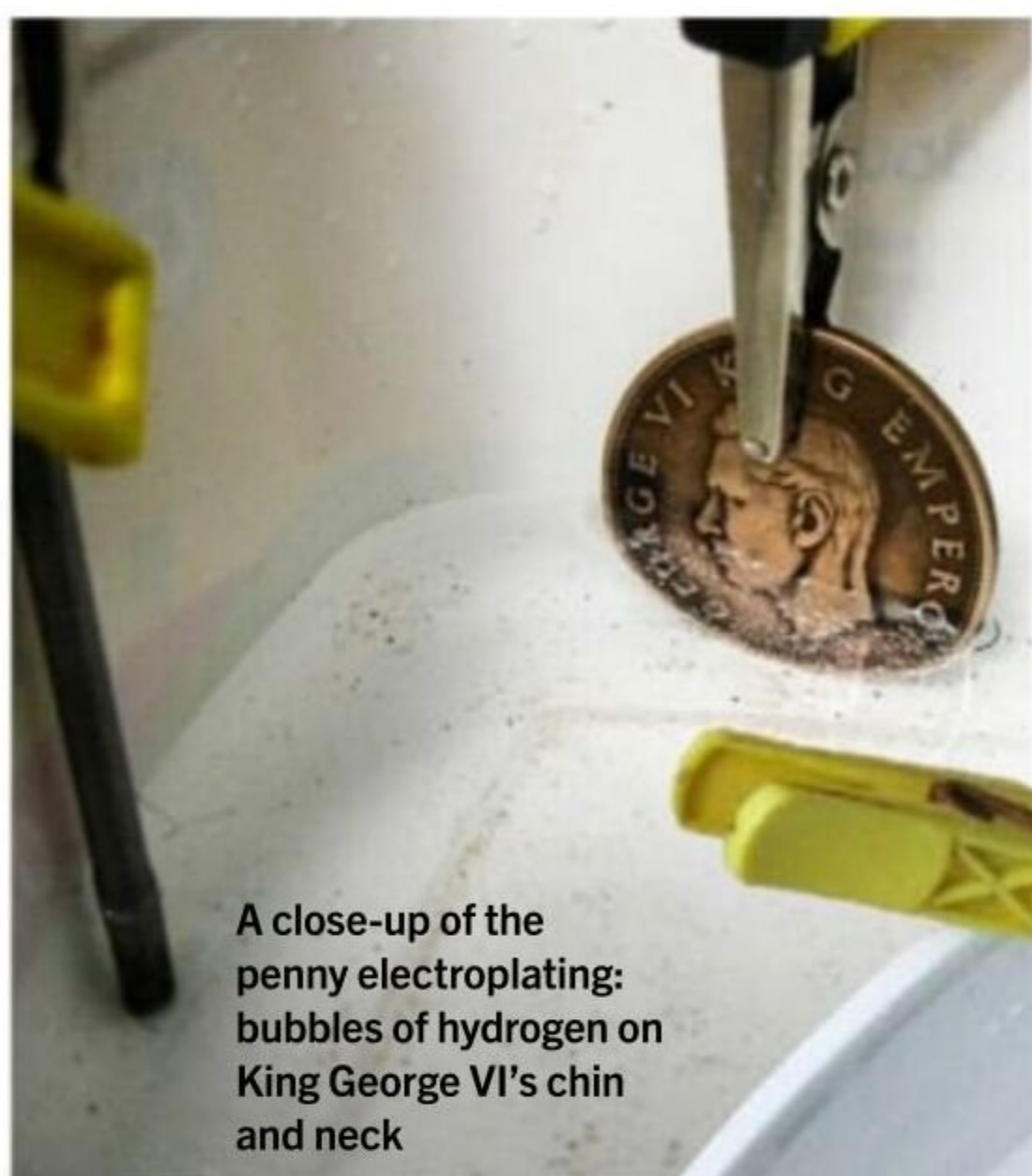
RESTORATION TIMELINE

Part 3: Frame painting, gear-box, primary chain case, and motor install

Part 4: Electricals, upholstery, and tank

Part 5: Suspension repairs, front and back

Part 6: Re-lace wheels, fit brakes and speedo



A close-up of the penny electroplating: bubbles of hydrogen on King George VI's chin and neck

In part one of this series, I described how I started rebuilding, as cheaply as possible, an old bitser AJS 500 motorbike, and talked about the start of my nickel-plating tasks. I have decided on a nickel-plating finish instead of chromium for my AJS.

Before I could finish assembling the motor, I somehow had to fix the appearance of the two rusty pushrod cover tubes that ran up the side of the barrel between the head and crank-case. One had some minor dings. The article showed what I managed.

To paint or plate? I would prefer that they were chromium plated, but that's expensive, and DIY was out of the question since the chemicals are not available to sheddies and the conditions (temperature, acids, toxic heavy metal, vapours) are difficult to work with. However, I had some nickel welding rods left over from the cast-iron repairs to the cooling fins, and various websites gave information about nickel plating. Some web photos showed quite attractive nickel finishes and stated that nickel won't corrode – that is, it keeps its appearance.

My first attempt

The very first nickel plating I did was a trial: putting a layer of nickel (shiny like chromium) onto a copper penny. I used a mix of white vinegar, salt, and water (the 'electrolyte') and a piece of nickel welding rod (with its coating smashed

The set-up for electroplating: a penny using a nickel welding rod. The penny on the right is connected to the negative of the battery via a clip, wire, and solder

off) in an old margarine pot.

I attached the welding rod (the 'anode') to the positive end of a dry cell (a torch battery) via a clip, wire, and solder.

The penny (the 'cathode') was cleaned with a Steelo pad and attached in the same way to the negative end of the cell. I put the penny and the rod (well separated so they would not short-circuit) into the electrolyte and waited. Slowly, the electrolyte turned green; the penny was bubbling and getting a silvery layer. As I mentioned in part one, this first plating was not a total success but it was enough to get me enthusiastic; instead of paying to get parts of the bike chromium plated, I could try my own nickel plating and polish.

My methods

I now have my own methods.

A bit more care is required than many of the DIY websites indicate. Compared with commercial plating factories, I use low electric currents; a cheap multimeter set at 10A maximum range is ideal for monitoring my work.

I use high-power resistors or festoon

auto bulbs to control the current, and an old computer power unit that supplies either 5 or 12V DC – usually, the 5V is sufficient for my bits.

A car battery could be used for current supply, but more resistors or bulbs would be necessary to keep currents low, and a fuse, in case of short circuits, would be essential.

My home water supply is rainwater stored in plastic tanks, so I can use it directly. Otherwise, I would have to use deionised or distilled water. Water collected from a dehumidifier would probably be OK. Any cut-down plastic bottle or glass jar is fine for the plating tank (metals cannot be used). I often use 'brush' (DALIC) plating instead of a tank.

The overall scheme for my plating is like this:

1. Preparation

I now have a routine that starts with a degreasing (e.g., with propyl alcohol) and very thorough sandblasting/cleaning/polishing of the piece.

If there is any chromium, I must

The tail side (a tui in a kowhai tree) has a better nickel layer than the head, even though it was pointed away from the nickel rod



A closer look at the nickel plating on the head side of the penny; some flaking of the nickel: not properly cleaned, or too much current, or too much interference from the hydrogen bubbles?



The electrolyte (white vinegar, salt, and water) has gone green with nickel ions, and the penny has a flaky nickel layer on part of the head

The kick-start pedal before any treatment; chromium plating peeling off and bad rust



The kick-start pedal has been de-chromed, sanded, and polished



remove it. I do this by making the piece an anode in a five per cent (50 grams per litre of water) sodium carbonate electrolyte solution, with a stainless-steel cathode. The electrolyte goes pale yellow in about 5 minutes. I then rinse and keep this electrolyte for further use.

A flap disc on an angle grinder is often too harsh for any preparatory sanding: too many deep scratches. I cut my own discs, for both my 100 mm angle grinder and Dremel-type polisher, using 600- and 1200-grit wet and dry papers.

I can also strip nickel, which is usually the bulk underneath chromium plating, by making the piece an anode in sulphuric acid electrolyte with some glycerine added, and with a stainless-steel cathode. But I don't usually bother.



The front suspension tube extension: some rust pitting, a dent (circled), and the screw thread masked by insulation tape



The front suspension tube extension: rust sanded off, the dent still visible

“But it was enough to get me enthusiastic”

Instead, I sand/polish back to steel.

I continue to clean, making the workpiece the ‘anode’ in a caustic soda solution (electrolyte), with some stainless-steel as the cathode. (I use stainless-steel mesh, but one or two stainless-steel bolts would do.)

A couple of minutes of this with both anode and cathode fizzing away – oxygen at anode (i.e. workpiece); hydrogen at cathode – and any traces of fingerprint grease should be gone.

The piece should not show any ‘water break’: a film of water on it should not break into rivulets or drops. It cannot be touched by hand from now on – I use gloves and plastic clothes pegs.

A couple of rinses in rain or distilled water and the steel is ready for immediate nickel plating.

2. First coating of nickel (first ‘strike’)

I can do this in a tank or by brush plating.

I try to set the current at a rate of about 1 to 2A per 100cm² surface area on the workpiece (i.e., about 10cm by 10cm by guesstimate).

If I have a large bolt-head with a total surface of, say, 5cm², then I would try to set the current at about 0.1A. I don’t have the pressure of ‘time is money’ as in commercial operations – and my plating solutions (electrolytes) would not be as good as theirs anyway and not so able to handle higher currents. ►



Marking out circles for my 1200-grit fine sanding pads



Electrolytic cleaning and degreasing. A jar with six per cent caustic soda solution, stainless-steel mesh cathode (the negative side of the power supply), and the workpiece as the anode

The 'brush' for brush plating: a small piece of plastic kitchen scouring pad attached by rubber band to a 'woven' mat of nickel tape; a spare piece of scouring pad



"I don't have the pressure of 'time is money' as in commercial operations"

I no longer use nickel welding rods, but I get nickel ribbons from gogo.co.nz for making the anodes and for making Watts bright nickel (and Wood's) electrolyte. I have included a recipe for making a nickel electrolyte at the end of this article. The prepared workpiece is the cathode.

This first nickel strike must be made thick enough for the underlying steel not to react directly with the later copper plating electrolyte.

It's best to nickel plate at about 60 degrees: it helps the nickel get into fine scratches on the surface (it 'throws' well). I stand the tank in a bucket of near-boiling water.

No touching! (Use gloves or plastic clothes pegs.)

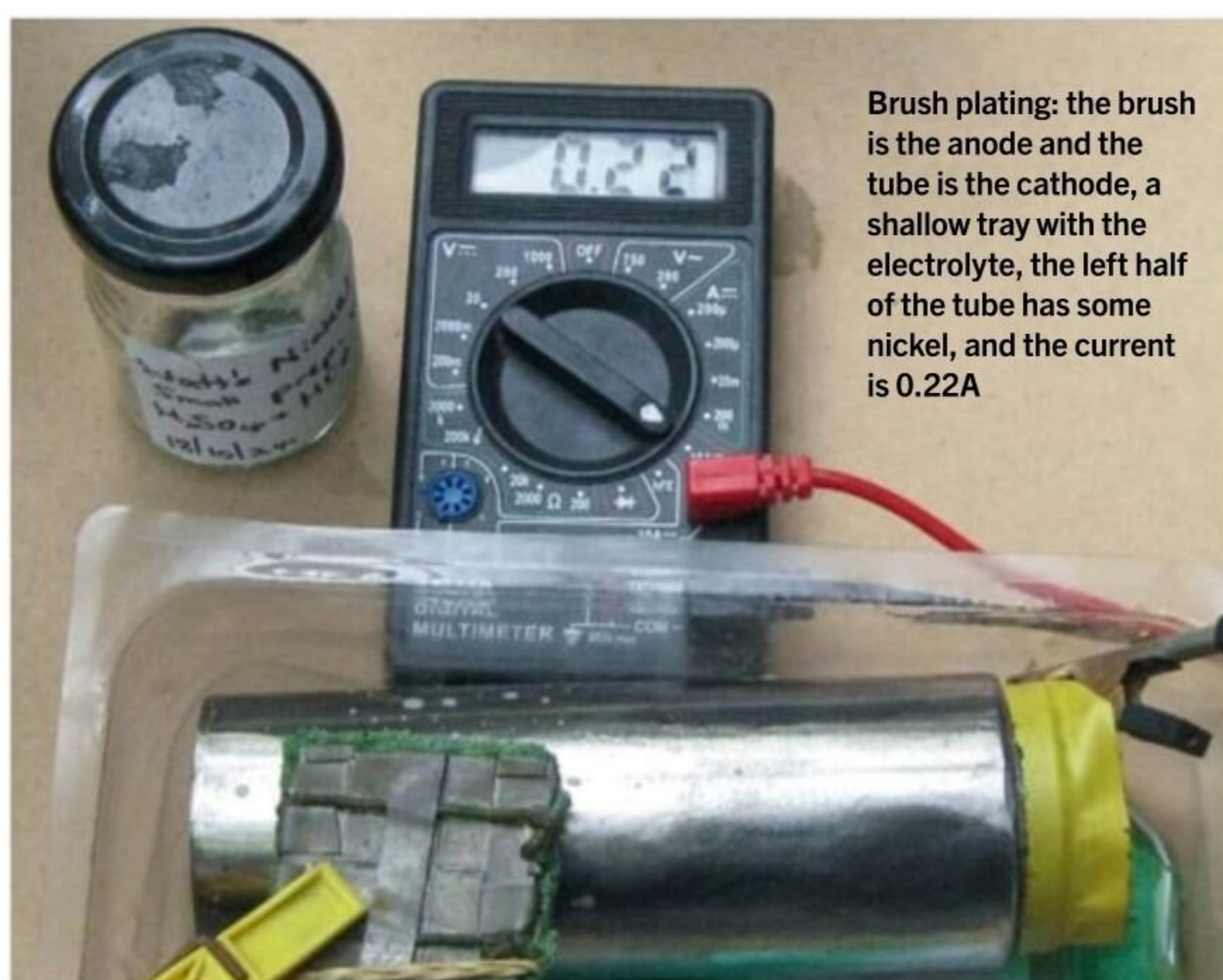
I take the piece out of the tank, rinse it with boiling water, air dry it, dip a cotton bud in some copper electrolyte, and dot it onto the workpiece surface. If there is an immediate pink colour of copper, then the nickel strike is not thick enough. More nickel is needed, so I continue plating.

Over the past couple of years, I have made a number of mistakes. One came about when I trial-plated some nuts, which were a bit pitted with rust.

I sanded them carefully to get rid of the rust, and then, because of the uneven but cleaned pitting, decided to plate with copper. My thinking was that copper is easier to get and cheaper than nickel, and softer, therefore I could do a thick copper plate and easily sand/polish it back to get a good mirror surface for the final nickel.

I used a strip of copper as the anode and the cleaned nut as the cathode. I immediately got a pinkish layer of copper OK, but, when I pulled the nut out after a few minutes and polished it, all the copper came off and the steel underneath was more pitted than ever (from a direct reaction between the iron and copper solution: an 'immersion layer'). ►

Brush plating: the brush is the anode and the tube is the cathode, a shallow tray with the electrolyte, the left half of the tube has some nickel, and the current is 0.22A

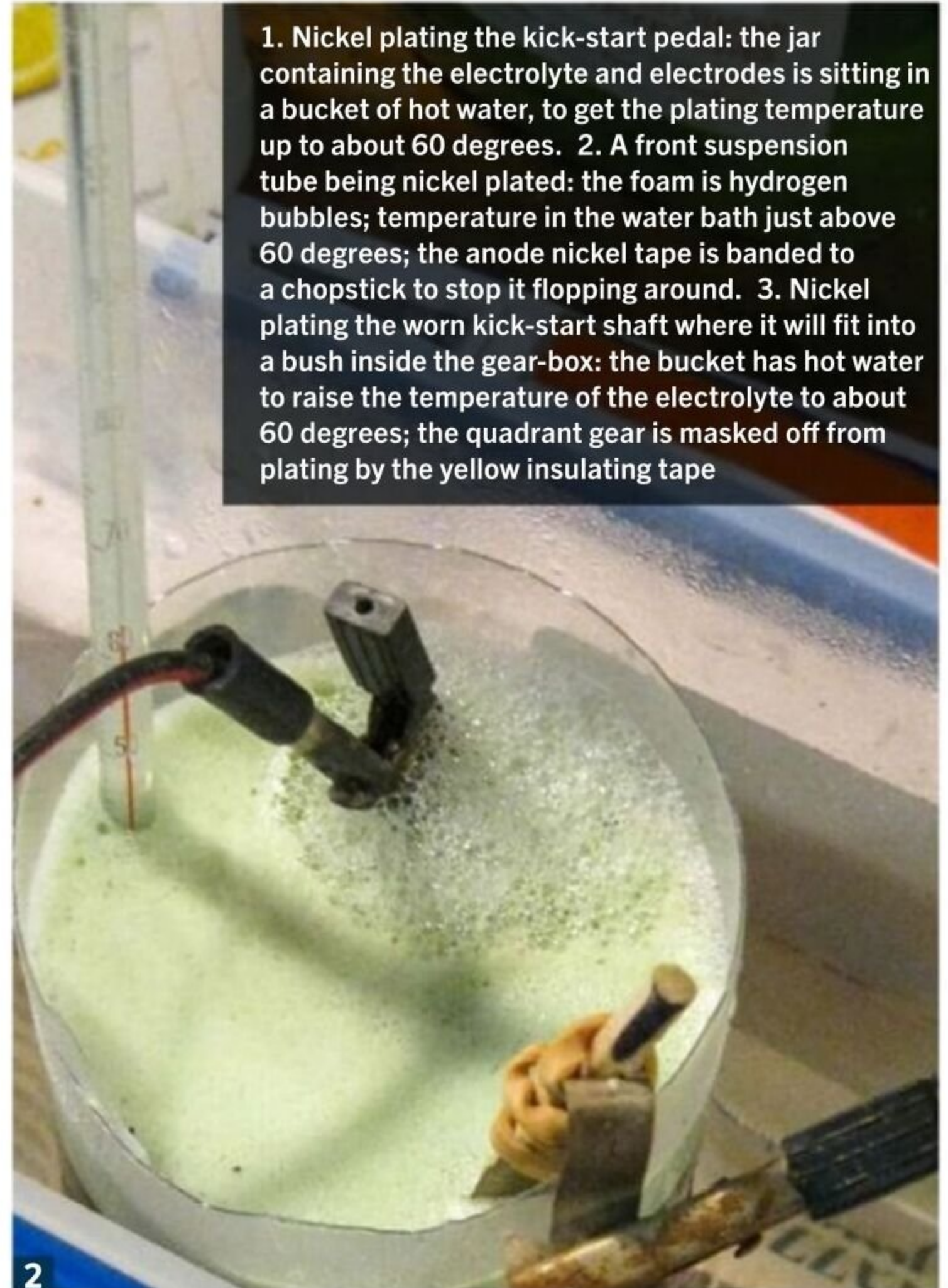


A closer view of brush plating; the creamier nickel is to the right





1

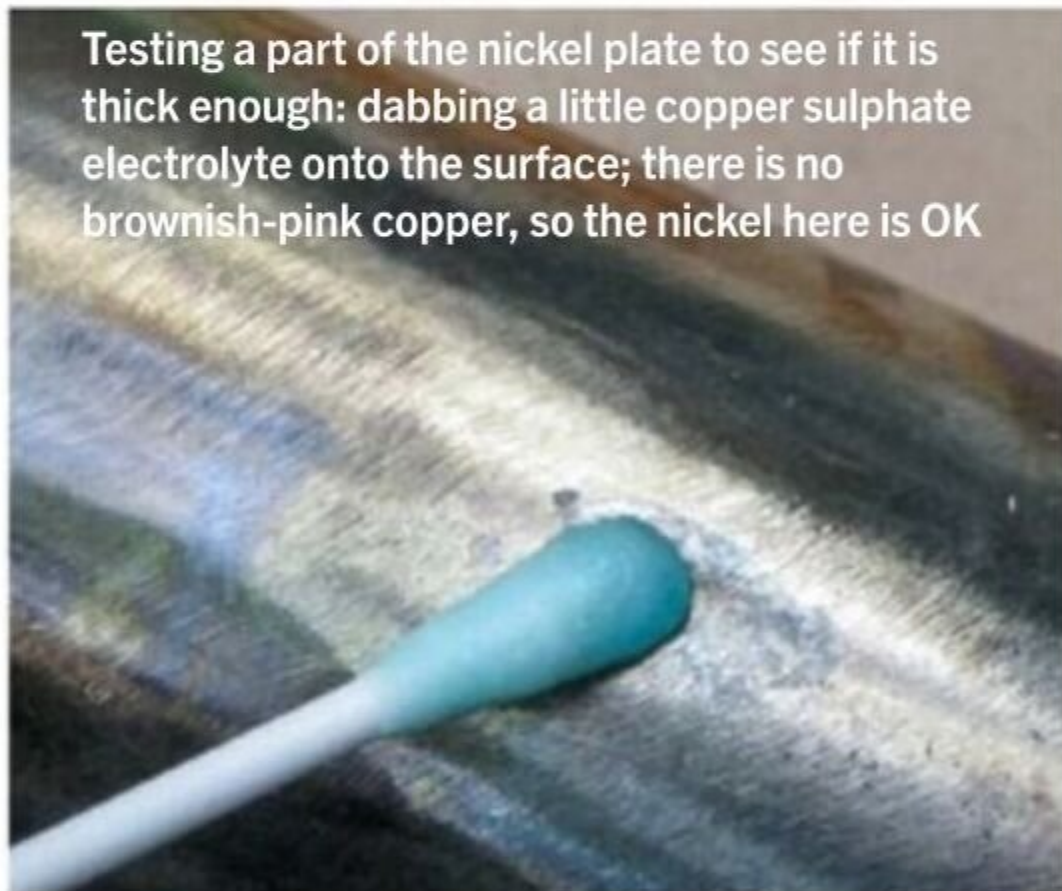


2



3

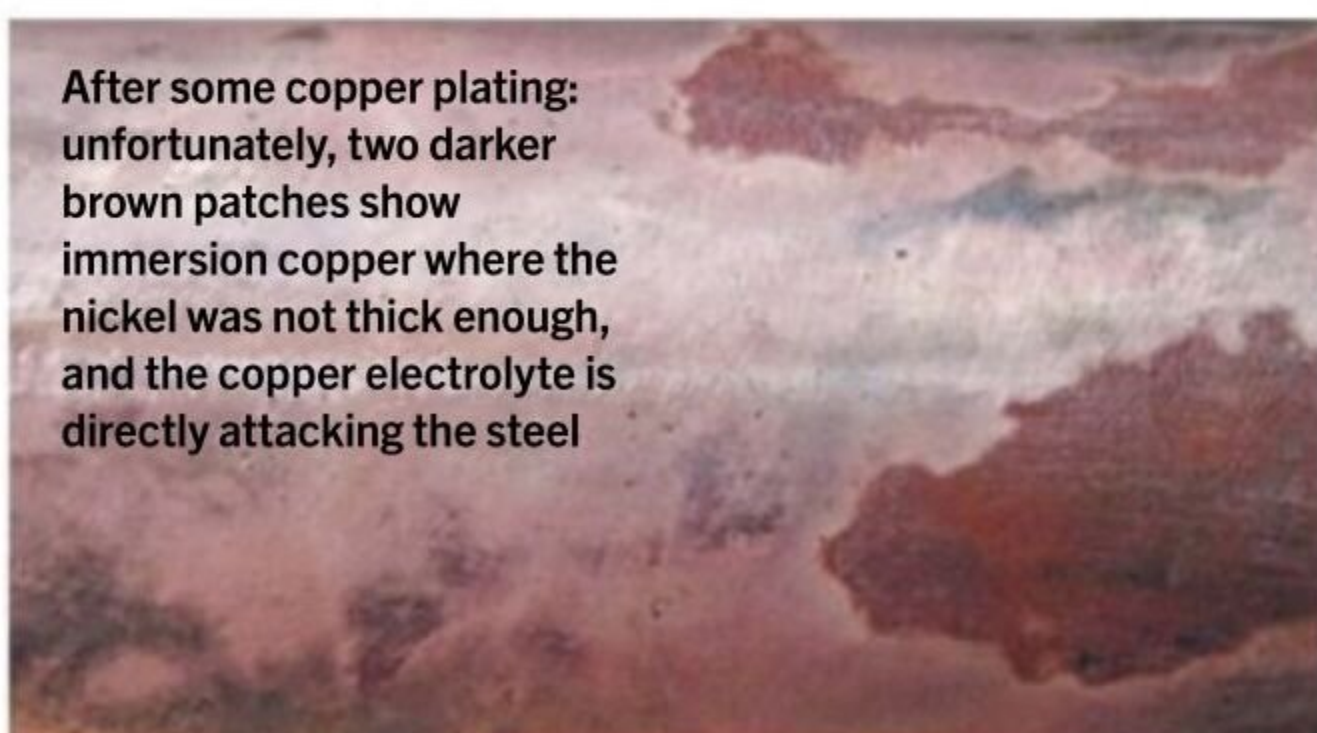
1. Nickel plating the kick-start pedal: the jar containing the electrolyte and electrodes is sitting in a bucket of hot water, to get the plating temperature up to about 60 degrees. 2. A front suspension tube being nickel plated: the foam is hydrogen bubbles; temperature in the water bath just above 60 degrees; the anode nickel tape is banded to a chopstick to stop it flopping around. 3. Nickel plating the worn kick-start shaft where it will fit into a bush inside the gear-box: the bucket has hot water to raise the temperature of the electrolyte to about 60 degrees; the quadrant gear is masked off from plating by the yellow insulating tape



Testing a part of the nickel plate to see if it is thick enough: dabbing a little copper sulphate electrolyte onto the surface; there is no brownish-pink copper, so the nickel here is OK



The front suspension tube, nickel polished



After some copper plating: unfortunately, two darker brown patches show immersion copper where the nickel was not thick enough, and the copper electrolyte is directly attacking the steel



The immersion copper patches just rub off, showing the underlying steel



The kick-start pedal comes out of copper plating; the copper will always be matte until polished



The magneto has a steel cap over the points; it was badly dented. In this photo it has been plated with a first strike of nickel, then a layer of copper, which has been polished. Flux and solder have been dropped onto the dents ready for smoothing with a gentle flame

"I find spot brush plating is best"



So I learned

Rule: you cannot plate copper directly onto steel (unless you use a cyanide process: not for me); you must put the first layer, a 'strike', of nickel onto the steel first.

I can fill any dents now with brazing. My neighbour kindly filled the dings in the pushrod tubes with brass. (I used to obtain exchange oxyacetylene bottles, but BOC Gas changed the rules).

I can also fill any small dents with solder and then file and polish. Less heat is required than for brazing, and some of my filling was close to sensitive threads; I didn't want to risk distortion from heat. Solder will take easily onto nickel or copper plate, but not onto steel.

I have tried using a tinker's dam to hold molten solder in place (some masticated, chewed bread as a mastic stopbank – it's very cheap); it worked OK.

The disadvantage of solder is that it is much softer than nickel or copper, so the junction between solder and, say, nickel easily shows up. The cover for the magneto points gave me a lot of trouble. Another layer of nickel should be plated onto sanded and polished solder patches (before a layer of copper is put on); for this, I find spot brush plating is best.

After any filling or handling, filing,



Copper plating in action: the bucket of hot water raises the temperature to about 35 degrees

polishing, etc., the nickel-plated piece must be thoroughly cleaned by making it the cathode in dilute sulphuric acid electrolyte, approximately six parts of acid to 100 parts of water, with a stainless-steel anode. (No touching with bare hands.) This 'activates' the surface ready to take the next plate and avoids later peeling. Three or four minutes with both cathode and anode bubbling away (oxygen at the stainless steel, hydrogen at the workpiece), a final rinse in rain or distilled water, and the piece can go into the plating tank as the cathode. Again, there should be no water break. It's now ready for the copper plate.

3. Copper plating

If the workpiece was pitted, scratched, or filled, I make a substantial layer of copper, which can be aggressively filed/sanded/polished. This copper layer will come out of the plating as a matte surface; it will always need at least some polishing. Use gloves.

I use an electrolyte, which is a strong solution of copper sulphate with some sulphuric acid added, plus a few drops of hydrochloric acid per litre (acid copper).

For me, the copper anode is a length of narrow copper tube wound into a spiral. If I were to use copper wire – for example, from an old transformer – I would make sure that it had any enamel or varnish sanded off. I got copper sulphate from a horticultural supplies shop (where I also got boric acid, used in the Watts bright nickel electrolyte recipe).

I used to get very puzzled with some of my copper plating because it would start off well but quickly get very slow. I use a cheap multimeter switched to 10A max for measuring the electric current, and this copper-plating current would die away from, say, 1A to a tiny fraction of an amp. This indicated another mistake: I now know that a copper anode area must be at

least four times the surface area of the piece being plated.

I generally use a tank (a cut-down two-litre clear plastic bottle that used to contain white vinegar) with a copper tube spiral winding down the inside perimeter as the anode.

In any tank plating, it is good to have several anodes spaced around the inside perimeter of the tank (or have the anode spiral around the inside wall) so that any layer is reasonably even.

If the current is too high for the surface area of the workpiece or for the strength of the electrolyte, the piece may come out of the tank looking burnt, almost like charcoal.

I do the copper plating at roughly 40 degrees temperature. For this, I sit the tank in a bucket with a little boiled water. If I need to do further copper plating, I repeat the cathode / sulphuric acid clean. This prep must also be done again before the final nickel layer. ►

4. Final nickel plate

This is much the same as the first nickel strike.

If the finish is not good enough from the tank (or any brush plating) then some polishing can be done. A final rinse with boiling water helps to passivate the nickel – that is, stops it from staining.

The final appearance is like polished stainless steel and not quite as sumptuous as chromium.

For very large pieces, such as wheel rims, or something small, such as the valve lifter cam, I used DALIC, or brush plating. This is like painting, except that the only loss from the brush should be from dripping or water evaporation, as the metal in the electrolyte is kept replenished from the brush anode.

The preparation stages are the same. I use a brush cut from a plastic dishwashing scouring pad partly wrapped with the plating metal as the anode. The workpiece is connected as the cathode. I avoid short circuits between the metals and work on a small plastic tray to contain the electrolyte; the brush is saturated with electrolyte, and it will dribble.

The brush must be kept moving to avoid any burnt patches. I think the scouring pad rubbing against the workpiece helps to keep the surface receptive to the plating.

For the larger wheel rims, I made an adjustable holder like a laboratory stand, and, as the tray, used a section of plastic roof guttering on a slight slope with just one guttering stop, glued to the lower end.

When I finish, it is easy for me to tip electrolyte or cleaner from the gutter back into storage and rinse with my squirty bottle. The rinsings, of course, are kept, evaporated, and recycled.

The cathode gets the new layer of metal, which, in my case, means copper or nickel. For copper plating, the copper comes from a copper anode via the copper electrolyte.

If I'm nickel plating, the nickel comes

Early plating trials: a piece of steel band, half-plated. From right to left: the initial nickel strike; a layer of copper; then, on the left, the final nickel plate



“On very small parts, I use nail polish”



Still brush plating – the creamier-looking nickel plate is to the left of the piece; steel is to the right

from the nickel anode via the nickel electrolyte. The anodes gradually dissolve away as the plating builds up on the workpiece.

Masking methods

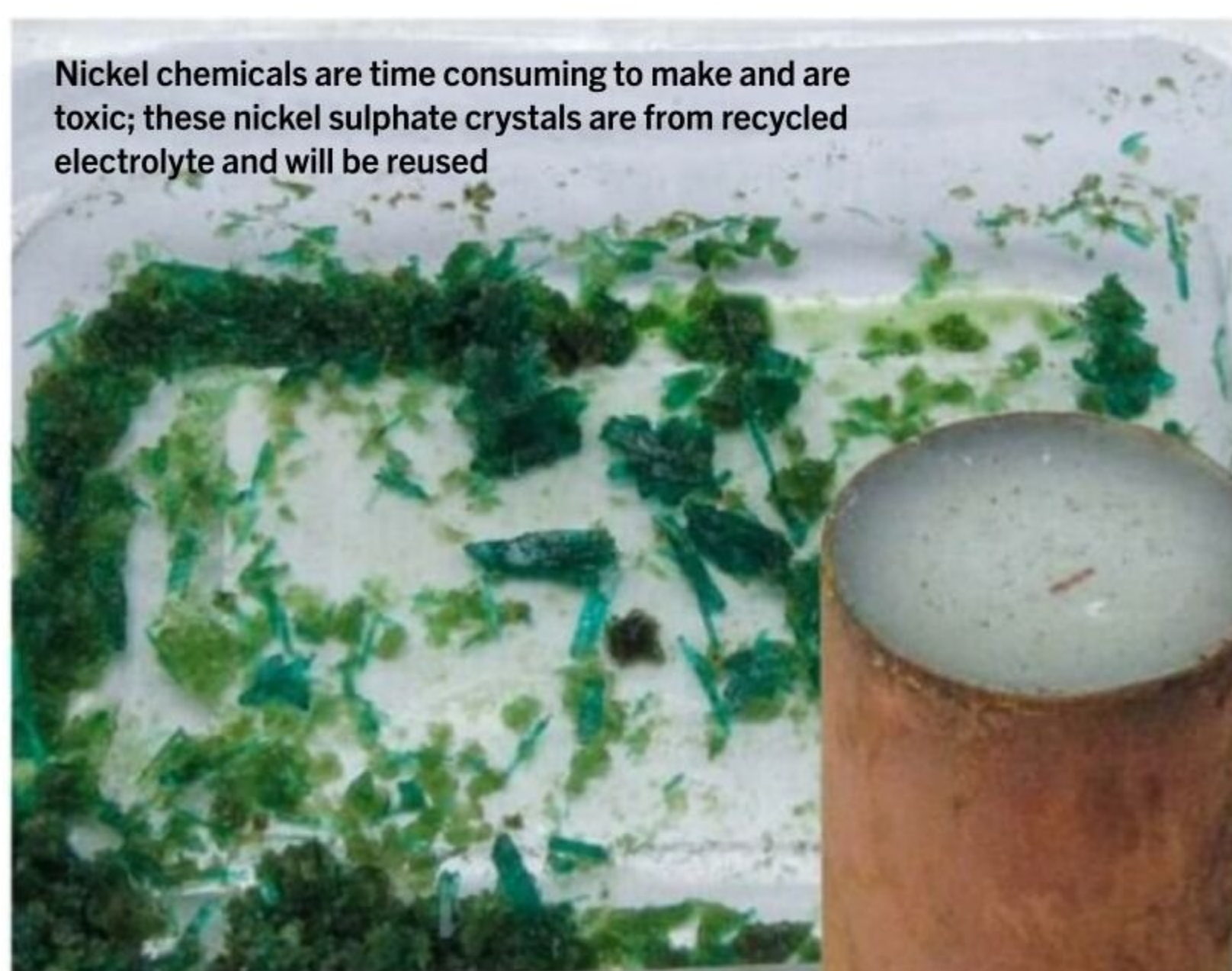
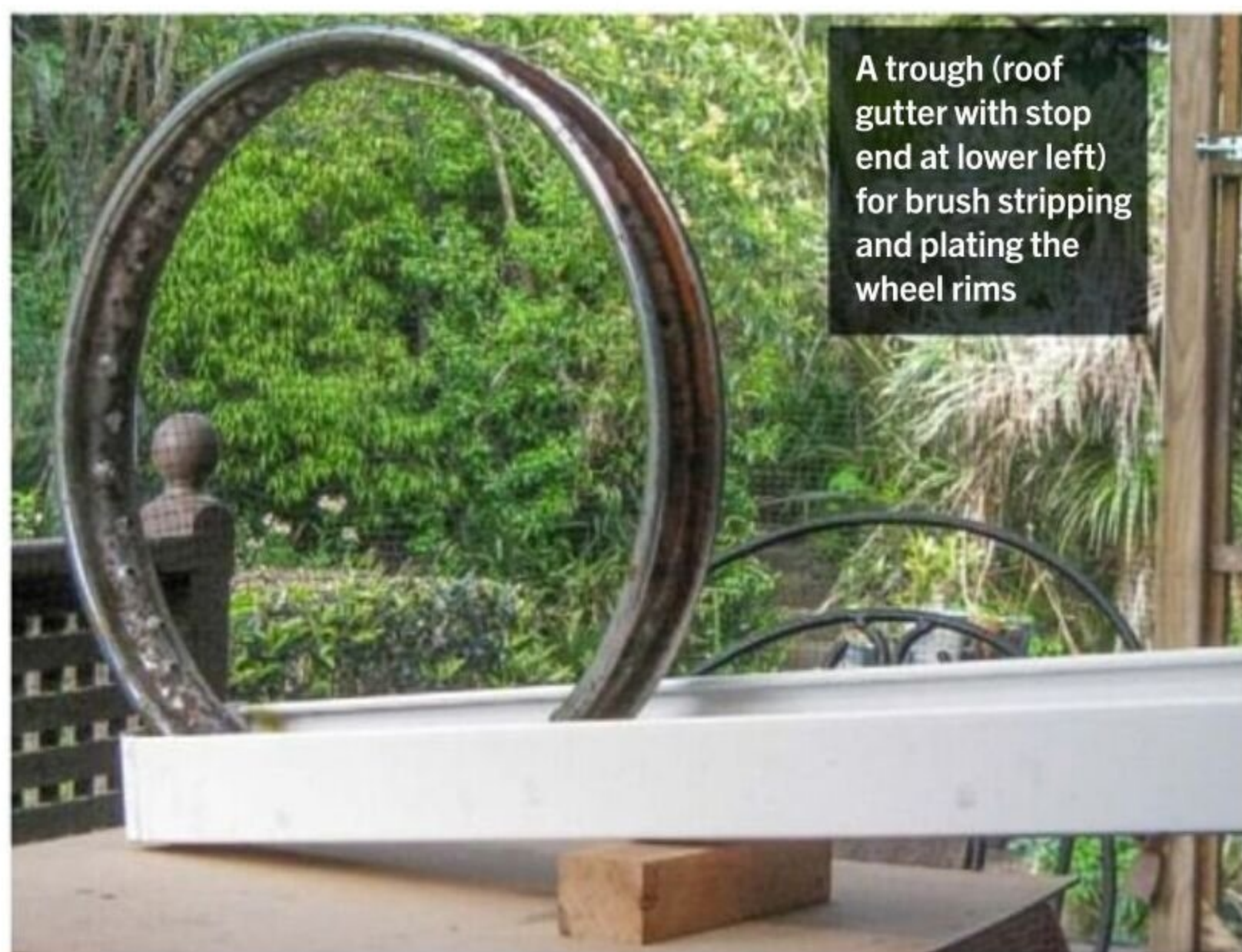
I mask the parts of pieces where I don't want plate.

Plastic insulation tape is good for winding onto screw threads; on very small parts, I use nail polish. Sometimes, I don't need to dip the whole piece in the electrolyte anyway, and a part can be out of it; this is where I clip the electrical lead. I have also filled the inside tubes

with melted wax and then cooled it to solidify. This worked well and is necessary when copper plating a tube.

For the pushrod cover tubes, I put a rubber bung in each end of the tubes after filling them with glass marbles to keep them weighted down in the electrolyte.

The best system for suspending the workpiece in the electrolyte is to use wire (or make a strip) of the same metal that is going to be plated. I make hooks at each end of the wire, one hook to hang onto the piece, the other to suspend it from the 'busbar' (a thick, cleaned copper wire



or tube that sits across the tank from side to side and is clipped into the negative or cathode side of the electric circuit).

If there is no way that the piece can be hooked, I wind the strip tightly onto the piece; this winding can be shifted halfway through the plating. I always wear gloves and eye protection, as you never know when there might be a splash.

By using a strip of the same metal to be plated as the cathode hanger, I can sometimes use the strip as anode material. For example, I use thin nickel strip hangers in nickel plating; they will

A tube after nickel then copper plating: the inside of the tube probably has little if any nickel plate; putting the tube into copper electrolyte means that the electrolyte would directly attack the steel interior; the solution is to pour molten wax into the tube before copper plating



Harvesting sulphuric acid from a dud car battery – full safety gear for this job

MY NICKEL ELECTROLYTE RECIPE

This assumes you have some nickel (e.g., tape from gogo.co.nz).

To make about 50ml of electrolyte (scale up or down, but this is a good quantity for brush plating). Stir gradually into 35–40ml of clean water – always wearing full personal protective gear:

5ml of harvested battery acid (reasonably concentrated sulphuric acid – treat with respect)

5ml of hydrochloric acid (spirits of salts from a hardware store, also worthy of your respect)

1g or thereabouts of boric acid (horticultural supplies)

Use about 5cm of nickel tape connected as an anode; about the same length for the cathode

Avoid short circuits and ensure that no metals – for instance, clips other than nickel – are in the electrolyte. This can be done in, say, a margarine container or similar.

Connect to 1.5–5V (a torch battery will do). The anode will gradually disappear, the electrolyte will go green, and the cathode will fizz (bubbles of hydrogen). If the anode has fully dissolved, put more in.

If you let this carry on for an hour or two or three, you will notice that the fizzing decreases and tiny sparkly crystals (nickel) may be noticeable on the cathode. If there are no bubbles at all at the cathode and the electrolyte has gone milky, add two or three drops of battery acid.

It's just about ready. Add a drop of dishwashing detergent (to act as the sodium allyl sulphonate) and maybe a drop of molasses (these in the roles of levellers and brighteners) and it's probably even better.

For tank plating, you would probably want about two litres (or more). Scale the above recipe up by about 40 times.



get some nickel plating too. If I used brass wire as the hanger for nickel plating then I would get some nickel plating onto the brass – not a problem, except that this hanger would then be useless as later nickel anode material (if I needed it) because of possible copper/zinc contamination.

Brass plating

Brass plating is possible; the anode is brass and the electrolyte is a caustic soda solution made immediately before the plating and then conditioned for an hour or so by doing a dummy run between two brass electrodes.

I found that the prepared electrolyte cannot be kept, even overnight, as it decomposes (breaks down into copper oxide sediment). The electrolytes for copper and nickel plating can be stored indefinitely. I use glass flagons because plastics (at least some types) seem to get brittle with time.

Nickel chemicals (and copper, to a lesser extent) are bad news in the environment, including in any animal

body. They are also quite expensive and difficult to make.

I work on a large plastic tray, and I collect any washings or spillage (nickel and copper separately) and recycle them. I do this by collecting them, using a little wash water from a squeeze bottle to rinse anything, and collecting that too, and then putting the rinses into shallow pans (like those from takeaways, or meat trays), well away from any interfering hands, to evaporate then be reused. I make sure they are well labelled and dated.

Cleaning up

When all my plating operations are finished, I will add caustic soda (sodium hydroxide) solution to the metal solutions. This gives me nickel hydroxide and copper hydroxide sludges, which do not readily dissolve in water. I will evaporate all the water away from the sludges and then seal them in plastic bags for the tip.

I put nickel plate onto the worn end of the kick-starter shaft before I

could finish reassembly of the gear-box (a Burman CP model, common in bikes this age). This was to try and stop a tendency of the kick-starter quadrant gear to jam. I also ground off the first, mangled quadrant tooth (and cut back the second tooth to half-size) as recommended by my *Modern Motorcycle Mechanics* (J. B. Nicholson, Saskatoon, 1969).

The external nuts and bolts are now nickel plated and kick-starting is so much better.

If you do a web search for ‘Watts bright nickel’, you will probably get a formulation that assumes you can buy nickel sulphate and chloride, plus ‘allyl sulfonates’ as ‘brighteners’. These can be hard to get for New Zealand sheddies. 📄

Coming up in part three of From Rust to Rrrroarr: I carry out more work on the engine, gear-box, and primary chain then commence painting some of the bike frame.

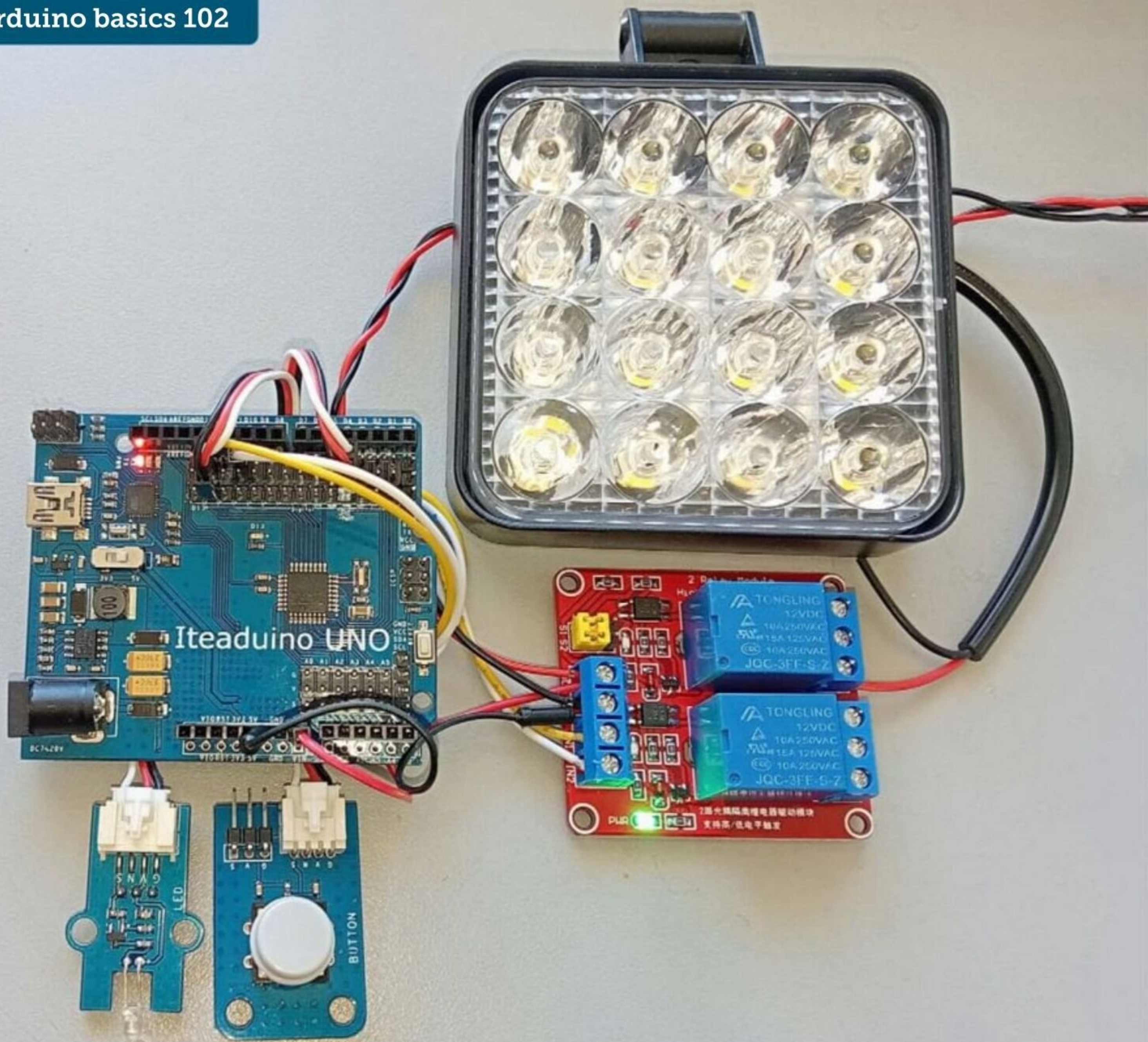


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ARDUINO 102: OUTPUTS

What goes in must come out

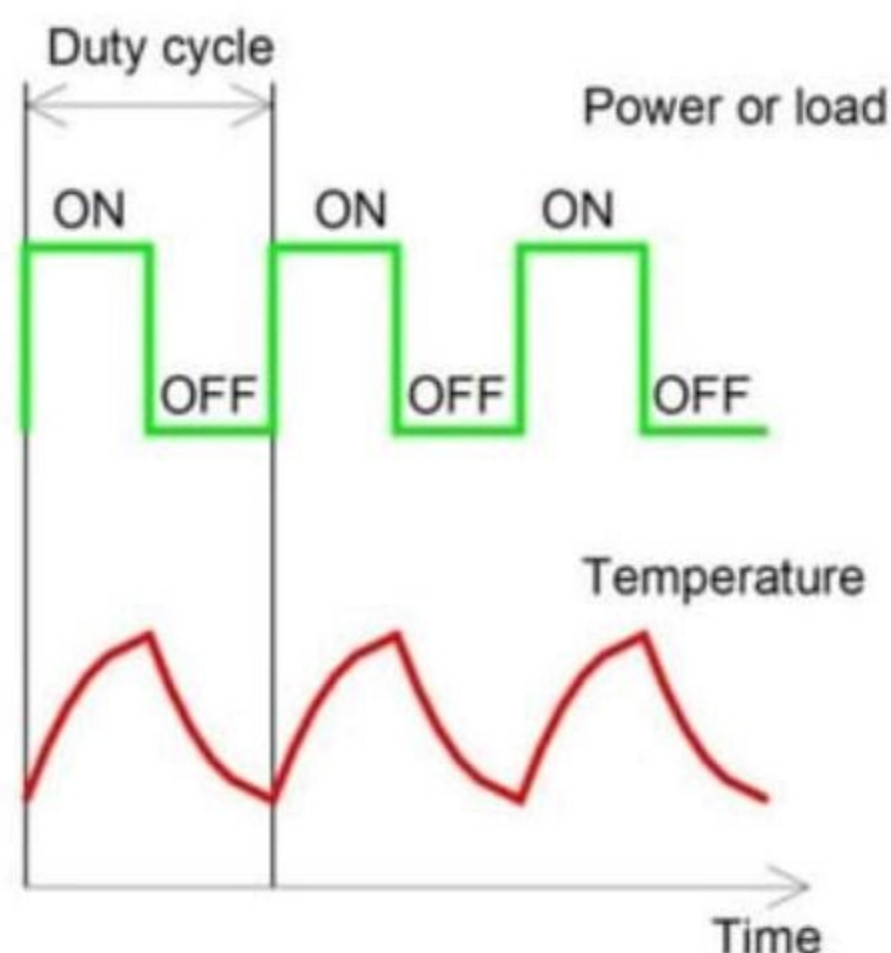
By Mark Beckett | Photographs: Mark Beckett

In the last issue, we covered inputs – and, as the saying goes, ‘what goes in must come out’, so, regardless of what you use the Arduino to detect, you’ll eventually need to do something with the information. ‘Input’ and ‘output’ refer to the

direction of data with regard to the microcontroller. If you’re ‘outputting’, it means the micro is sending information to something else, be it an LED, relay, display, SD card, or another microcontroller. The official documentation states:

“It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs” – which is not exactly correct, as each analogue input can also be an output.

I referred to the UNO pinout (<https://github.com/BelKed/pighixxx-uploads->



archive.bloeb/master/pinouts/Arduino/UNO/2013/uno.pdf) and spoke about the ‘special pins’. If you look in the sixth column on the right, you’ll see that pins 3, 5, 6, 9, 10, and 11 are marked ‘PWM’.

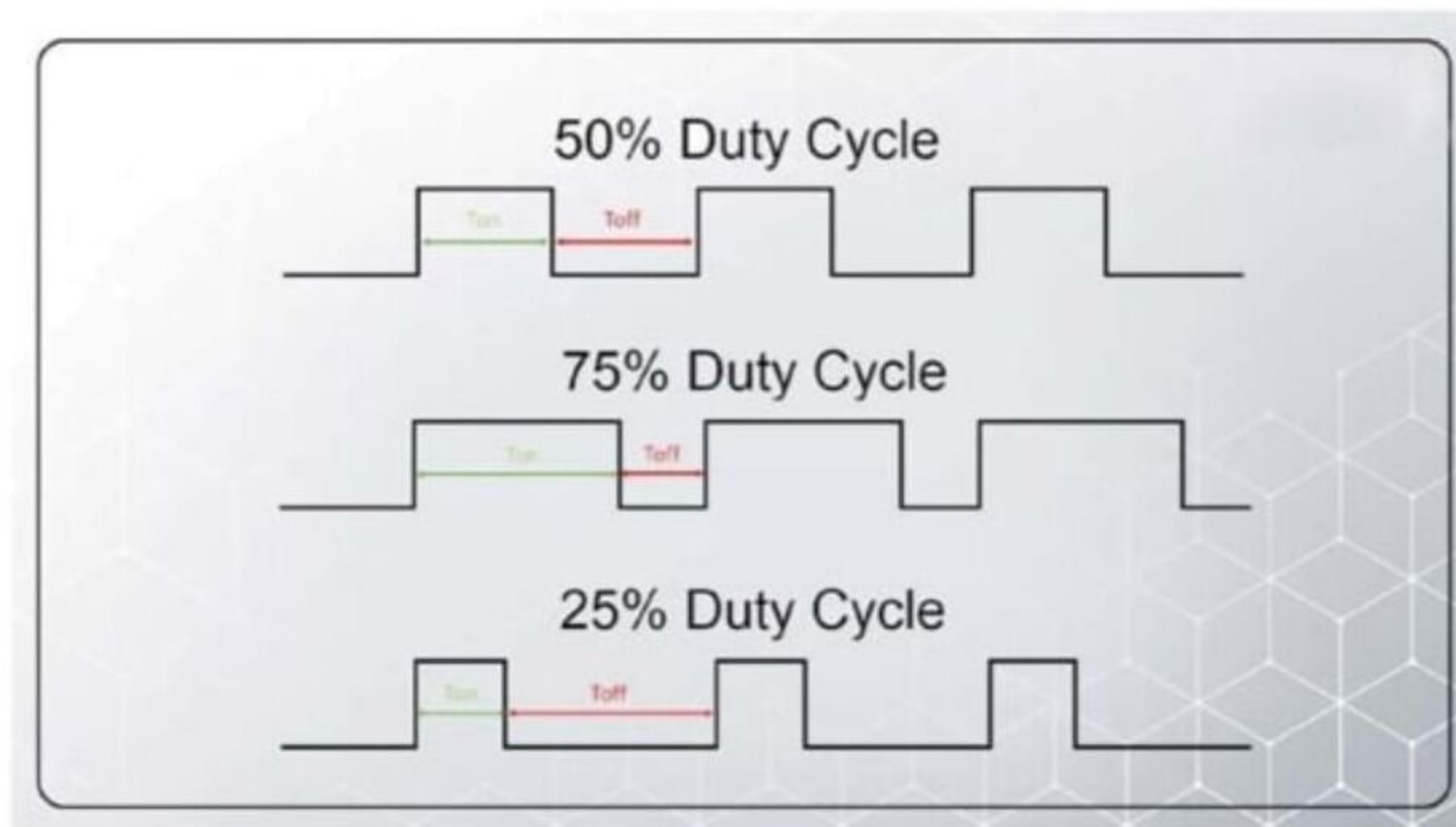
Output power

‘Digital’ is simply two states – On (1; full power) or Off (0; no power) – but ‘pulse width modulation’ (PWM) is where you control the amount of On v. Off to limit the effective output power. The picture shows PWM applied to a heater; when On, the heater starts increasing the temperature, and when Off, it stops heating. The On + Off time is referred to as the ‘duty cycle’ and, in a perfect world, a 50 per cent duty cycle (On time the same as the Off time) would give half the heat. In PWM, the frequency is usually a lot higher, but this analogy gives you an idea of the principle.

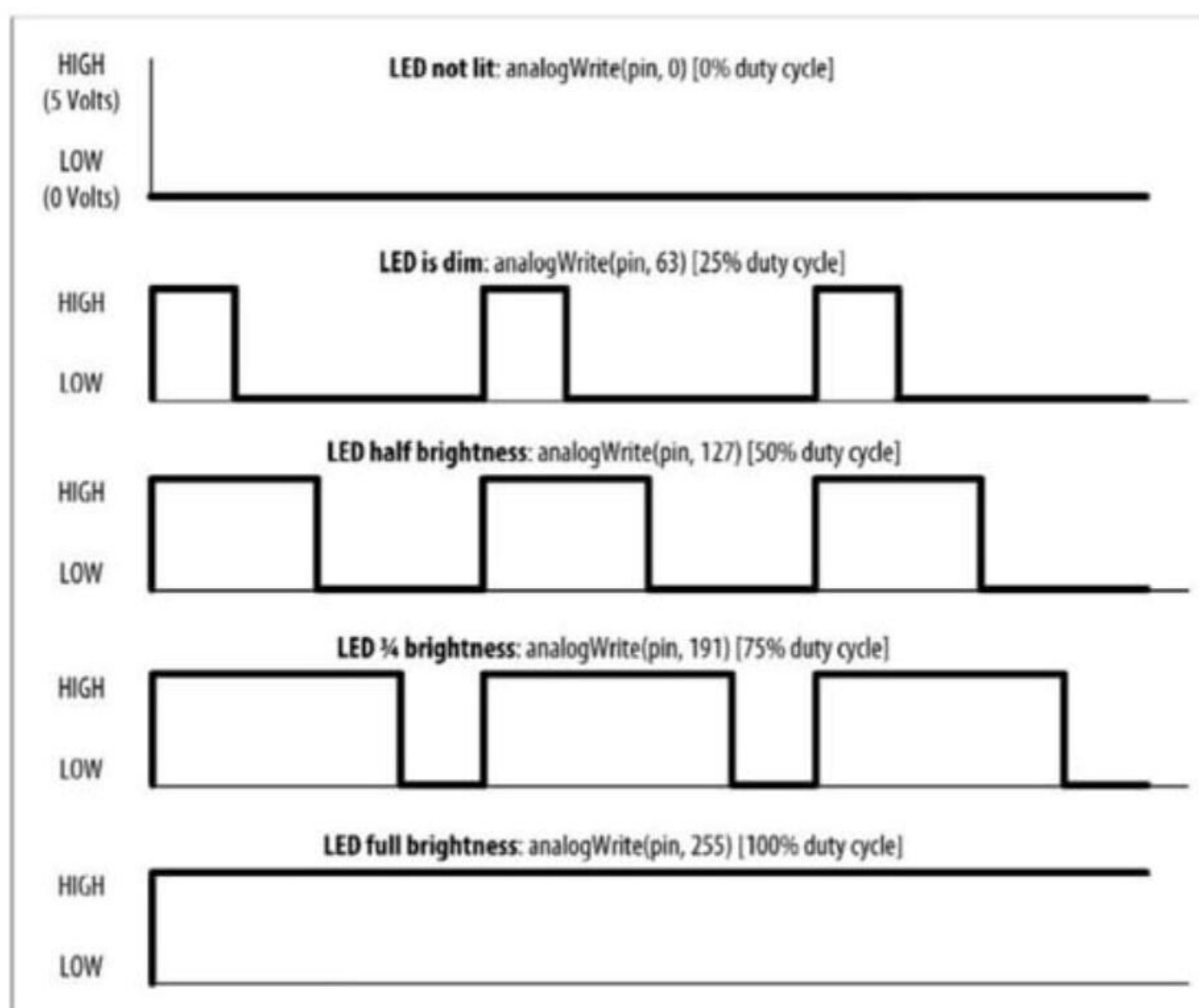
Analogue input has a range from 0 to 1023, but PWM uses 0 to 255, so you need to divide by four. Luckily, you can use ‘map’, which does the conversion for you. The syntax is: `map(value, from Low, from High, to Low, to High)`. See the example sketch; if you need more info, check out arduino.cc/reference/en/language/functions/math/map/.

I’ve provided one example using a rotary sensor and another using a button to control the brightness of an LED.

Note: LEDs and lamps are not linear in their voltage/current and light output. So, when you run the examples, you’ll note that, at the upper setting, there is



Duty cycle



LED brightness control using PWM

very little change.

Digital output

In the series intro (Issue No. 116), I talked about LEDs and current limiting: “There are many examples out there that connect an LED directly to an output pin without a resistor. This is a big no-no as it relies on the internal circuitry to limit the current and causes both excessive current to be drawn and extra heat in the MCU [microcontroller].”

The official documentation of the Atmel chip (309 pages) states that each pin can sink or source 40mA, but the overall current for the chip is limited

to 200mA. That’s five pins sinking or sourcing 40mA or 10 pins at 20mA total – not a lot, and easy to exceed if you’re not sensible. It also relies on the manufacturer of the board adding enough heat sinking to stop it thermally running away.

By default, all the Arduino pins are inputs. To make them function correctly, we need to set them as outputs with pin mode: `pinMode(ledpin, OUTPUT); //sets the pin as an output.`

After that, we simply write `digitalWrite(13, HIGH); digitalWrite(13, LOW)` to change the internal LED on pin 13.

If you’ve been following these articles, you will probably recall that,

in Issue No. 117, the example sketch `Arduino102_ON_Time` uses another variable to set the pin state:

```
/ Power on Self test  this is an
example where you can show the
LEDs work prior to the code running.
  Led1State = HIGH;      //Set the
state to HIGH
  Led2State = HIGH;
  digitalWrite(LED1, Led1State); //
Turn the LED ON or OFF based on
the state
  digitalWrite(LED2, Led2State);
  delay(5000);          // we are
just waiting
  Led1State = LOW;      //Set the
state to LOW
  Led2State = LOW;
  digitalWrite(LED1, Led1State); //
Turn the LED ON or OFF based on
the state
  digitalWrite(LED2, Led2State);
```

and `Arduino102_Time_Debounce` writes a HIGH or LOW:

```
if (SwitchState == LOW)
// If the switchState is LOW then we
turn ON the LED
{
  digitalWrite(LED1, HIGH);
// Turn ON the LED
  digitalWrite(13, HIGH);
// Turn ON the internal LED
}

if (SwitchState == HIGH)
// If the switchState is HIGH then we
turn OFF the LED
{
  digitalWrite(LED1, LOW);
// Turn OFF the LED
  digitalWrite(13, LOW);
// Turn OFF the internal LED
}
```



Can you help my friend UNO, “I’m not sure where to begin”

You can also use `digitalRead` to check what state it is, `x = digitalRead(13)`, where `x` will be High (1) if the output is On or Low (0) if it’s Off.

I was helping with an Arduino intro at a school and couldn’t work out why the LED that the student was controlling was very dim. At first, we blamed the hardware, until we spotted that the pin hadn’t been set as an output – so double-check your pin declarations.

Toggle

There are examples out there to toggle an output. Basically, the output is written as the opposite of what it already is, `digitalWrite(13, !digitalRead(13))`, where the exclamation symbol (!) represents Not. So, this single line does three things: it reads pin 13, which will be High (1) or Low (0), and then makes it Not or opposite. If pin 13 was High, it is now Low. Finally, pin 13 is written with that value (Low).

I can’t recall toggling an output; if I did, I separated the code just because it’s easier to read or for others to

understand, but that doesn’t stop you from using it if it suits your application.

Port manipulation

In Issue No. 118, we discussed the point that the Arduino separates the IO into three ports: Port D, Port B, and Port C.

You can write to one or more pins directly; for example, `PORTD = B10101000;` // sets digital pins 7,5,3 HIGH, but you do need to have set the pins as output – otherwise nothing will happen.

In my opinion, if you’re manipulating ports, you’re way past this series, and using `digitalWrite`, the speed of an output change is approximately nine microseconds (μ s), so port manipulation is best left for really fast applications or convenience.

Using port manipulation can also limit the hardware on which you can use the code, so it isn’t always a universal solution.

Large loads

If you want to control something that uses more than 40mA or runs from

a voltage higher than the supply (5V or 3V3), you need to add some sort of interface. Traditionally, this was a transistor, but lately mosfets (the acronym for metal–oxide–semiconductor field-effect transistors) have taken over. The Asian suppliers offer plenty of mosfet modules for less than \$1.

For small loads, I use an NPN BC337 or MPSA06, as they can switch 500mA, take very little base current, and are available locally at less than \$1.

Transistors always need a resistor to limit the base current. A 1kΩ resistor in series with the output pin and the transistor base will limit the current to 5mA and will allow the transistor to switch the maximum current.

4N33 optocouplers can control 100mA and require very little input current to achieve this. One advantage is that you can control them by sinking or sourcing current.

There is some discussion regarding adding a resistor between pin 6 (base) and pin 4 (emitter) of the optocoupler. The effect is to reduce the time for it to turn off and help if stray voltages are around. I've used them with and without the resistor, but just bear it in mind if you have weird results.

Solid-state relays (SSRs) are a good solution for switching AC, and there are versions for controlling DC. They come in various forms and are sometimes found on circuit boards.

Relays and coils

Relays are an option for larger loads but are really only an On/Off device and not suited for high-speed switching. Whatever you use, always consider the size of the power supply, cabling, and printed circuit board (PCB) traces. There are 5V coil relays, but it's generally safer to use a transistor to switch the coil.

Current flowing through a relay or coil creates a magnetic field. When this current is interrupted, the magnetic force collapses and causes a voltage in the coil that is opposite polarity. The voltage can be very high and needs to be 'snubbed'. This is where a reverse-biased diode (often called a 'flyback') is added across the coil and effectively dumps it back into the coil. There are some



Mosfet driver module

disadvantages, as explained by Durakool – durakool.com/media/uzxj3x1k/a-laymans-guide-to-coil-suppression.pdf – which may not be a problem in most applications.



Transistors and mosfets designed for switching high-current loads usually have an internal diode, but, if there is any doubt, you can add one for a few cents. It's also worth pointing out that anything that is reactive/inductive (relays, coils, or motors) requires more current to start than when in its steady state – that is, a motor that draws 100mA running may take 200–300mA to energise, and the stall current could



DC SSR

be a lot more. Generally, it's better to use a much larger transistor – but only if you can supply enough base current to turn it on fully. For example, a TIP35 switching 15A requires anything between 200mA and 1A base current, which is far beyond the Arduino's capabilities.

Fail to Safe

This is probably a good place to introduce something that will come up in a later issue when we discuss 'Errors'.

The concept is that, should the controller crash or the power fail, then whatever is being controlled turns Off. Microcontrollers can crash either due to an unexpected error in code or when the power drops but not enough to activate the reset logic.

Truck brakes are a good example of Fail to Safe as they use air pressure to hold Off the brakes. Any loss of pressure and the brakes come On. Cars use hydraulic fluid to apply the brakes but have dual circuits and an emergency/handbrake to cover a problem.

To help with controller or software crashes, a watchdog circuit is employed. These are usually an independent integrated circuit (IC) that is tied to the reset pin of a microcontroller. The microcontroller pulses a pin that effectively resets the watchdog timer. If the watchdog times out, it will pull the reset pin 'Low', thereby resetting the micro and hopefully turning off anything that it is controlling.

The Atmel chip has a built-in watchdog, which can be configured – <https://forum.arduino.cc/uploads/short-url/pmAawgzXwHc84U1KPbokFqyga0E.pdf> gives a very good explanation.



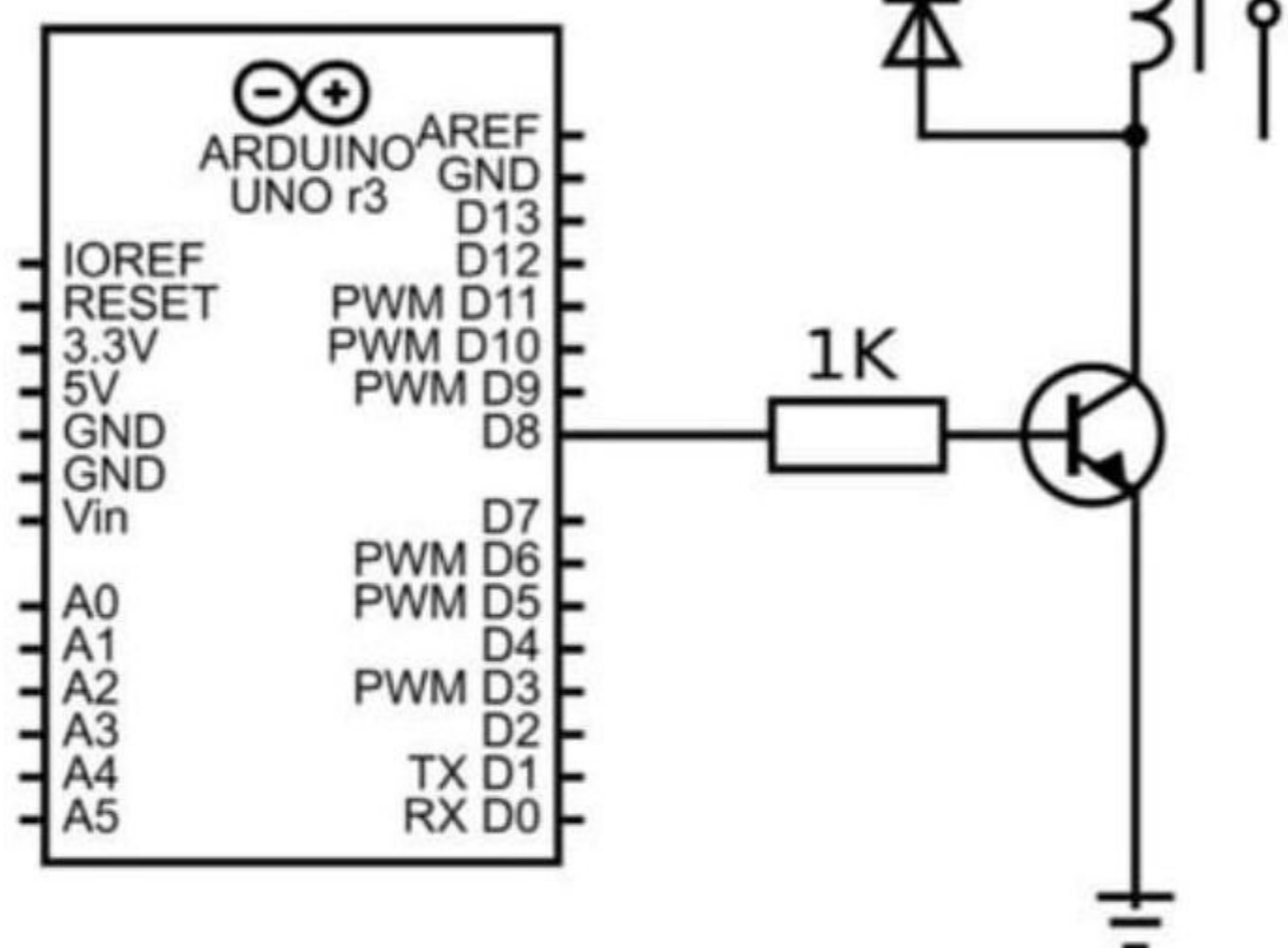
A sketch to try

I've provided an example sketch for you to try.

The watchdog timer (WDT) is set at approximately two seconds (2000mS) and the sketch resets it regularly unless the push-button is pressed and held. After approximately two seconds, the

**“Truck brakes
are a good
example of
Fail to Safe”**

Arduino driving a transistor and relay



WDT resets the controller and it starts again. There are lots of delays used just to show it functioning, but it gives an example of something you can adapt.

I've seen sketches that use the timer to wake the controller up from sleep, so just be aware of what the sketch does before using it and wondering why it doesn't work as expected.

In one of my projects, I used a second microcontroller that pulsed a pin that controlled a relay. If either microcontroller crashed, the relay

would drop out and effectively turn it Off but for Version 3 I'm using only one microcontroller (Arduino UNO), so a WDT will be used.

If your project is simply turning on a light, then it may not be useful, but if you are controlling a pump and it stays on, will it run dry? If so, then maybe you need to consider some options.

In the next article on Arduino basics, we'll cover code error and some methods that you can use to deal with unintended issues. 📄

Download the code examples



Arduino 102 Series – Output 1.ino
<https://tinyurl.com/mfddb3u>



Arduino 102 Series – Output 2.ino
<https://tinyurl.com/5n75cj9h>

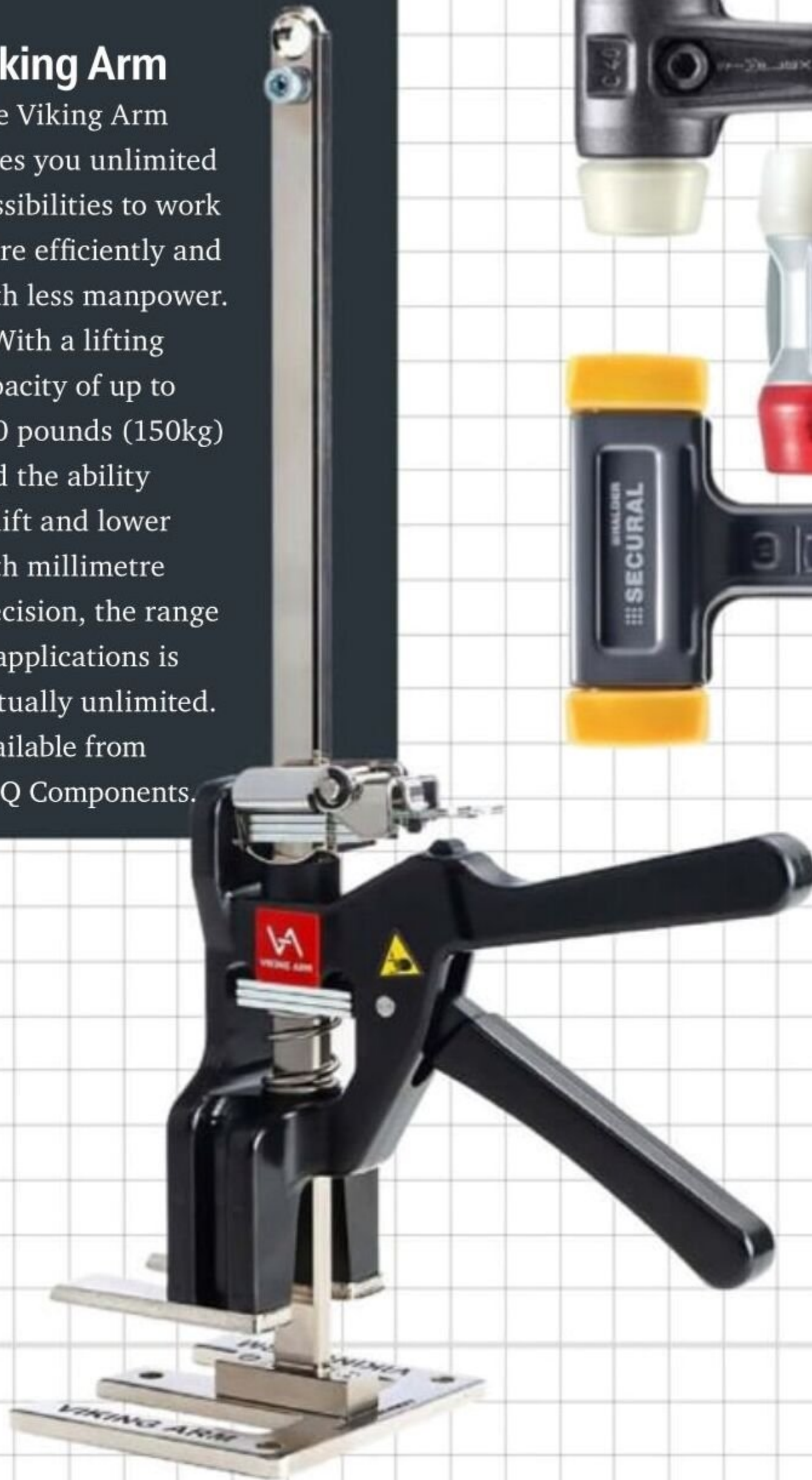


Arduino 102 Series – Output 3.ino
<https://tinyurl.com/5fa4sfxx>

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With more than 57 swap centres nationwide, Eziswap Gas is a better way to purchase industrial gas. It's also New Zealand's only 100 per cent Kiwi-owned, nationwide industrial gas provider. Win-win!



MOTAT MILITARY TRANSPORT GROUP

A group of people dedicated to preserving
parts of New Zealand's military history

By Chris Hegan | Photographs: Mike Beck, Chris Hegan, and Ross Goldsworthy

‘**L**est we forget.’ On 25 April every year, veterans and uniformed services parade through the Auckland Domain to the memorial in front of the museum, followed by a procession of beautifully kept military vehicles, mainly World War II vintage.

The meticulously maintained vehicles are the work, indeed the *raison d’être*, of the Auckland branch of the New Zealand Military Vehicle Club and the military sub-group of MOTAT’s road transport section. Fisher & Paykel engineering manager Mike Beck is deeply involved in both outfits and is well into his second decade of volunteering at MOTAT.

“I had an interest in vintage trucks and it has morphed into various things. I also run the military vehicle club,” he says.

We look over a Bren gun carrier.

“This was received in the 1970s and given a light cosmetic touch-up,” says Mike. “We started on it in earnest in 2007. It has never been restored, but maintained and had some repairs of dubious quality. Our ethos is to preserve and only restore where it’s necessary, such as when you have a wreck.” ▶



Above: A smart turnout – dawn parade 2024
Below: 1941 LP2 armoured Bren gun carrier





Indian rebuild – Lance awaits the engine

“Our ethos is to preserve and only restore where it’s necessary, such as when you have a wreck”



Getting there

The best Indian guy in New Zealand

The reference to wrecks takes us to Lance Painter, who is working on the bones of a 1942, 500cc Indian motorcycle, cleaning and repainting the frame.

“We’re waiting on the engine,” Lance explains. “We’ve sent it to Paul Hanes down in the Waikato, who’s the best Indian guy in New Zealand. He brings in parts as well, so it gives us a bit of confidence that he knows what he’s doing. I’ve done one engine 30 years ago, so better him than me.”

Lance shows me a photo of the bike when MOTAT first received it.

“You can see it’s in the desert colours, so we’re reproducing that,” he says. “It has had parts stripped at a stripping company. We believe it was in the desert but we don’t have a lot of history on it. We are ready to assemble it but can’t do a lot without the engine.”

“Practically everything is done. If we get the engine back soon, this will be on display this year.”

Great progress

I return a few weeks later to find the bike well on the way to being finished, looking pristine with its new engine in place. Hanes has done a magnificent job, donating his work on the gear-box and fuel system.

The only big job remaining is to make a new exhaust pipe. The one that the bike



The soldier's friend – army ambulance

came with is clearly not original, with two connections from the twin manifolds meeting the main pipe at an angle.

“It has to curve, and to make that is quite a business. We’ll fill it with casting sand so it doesn’t split, weld a cap over each end, then heat it up until it will bend without breaking or tearing,” Lance says.

Most treasured vehicle

In another shed, we find Mike’s most treasured vehicle, a 1942 GMC six-wheel-drive truck in excellent condition, alongside a 1939 MkII Valentine tank, a Holmes recovery tractor – aka a military tow-truck – and a Ford ambulance.

In the same shed as the GMC stands

MOTAT’s working searchlight, rescued sometime after the coastal searchlight installation at North Head was decommissioned. It was ‘trailerised’ in the 1950s with its own generator after radar came in and there was no longer a need for coastal lights.

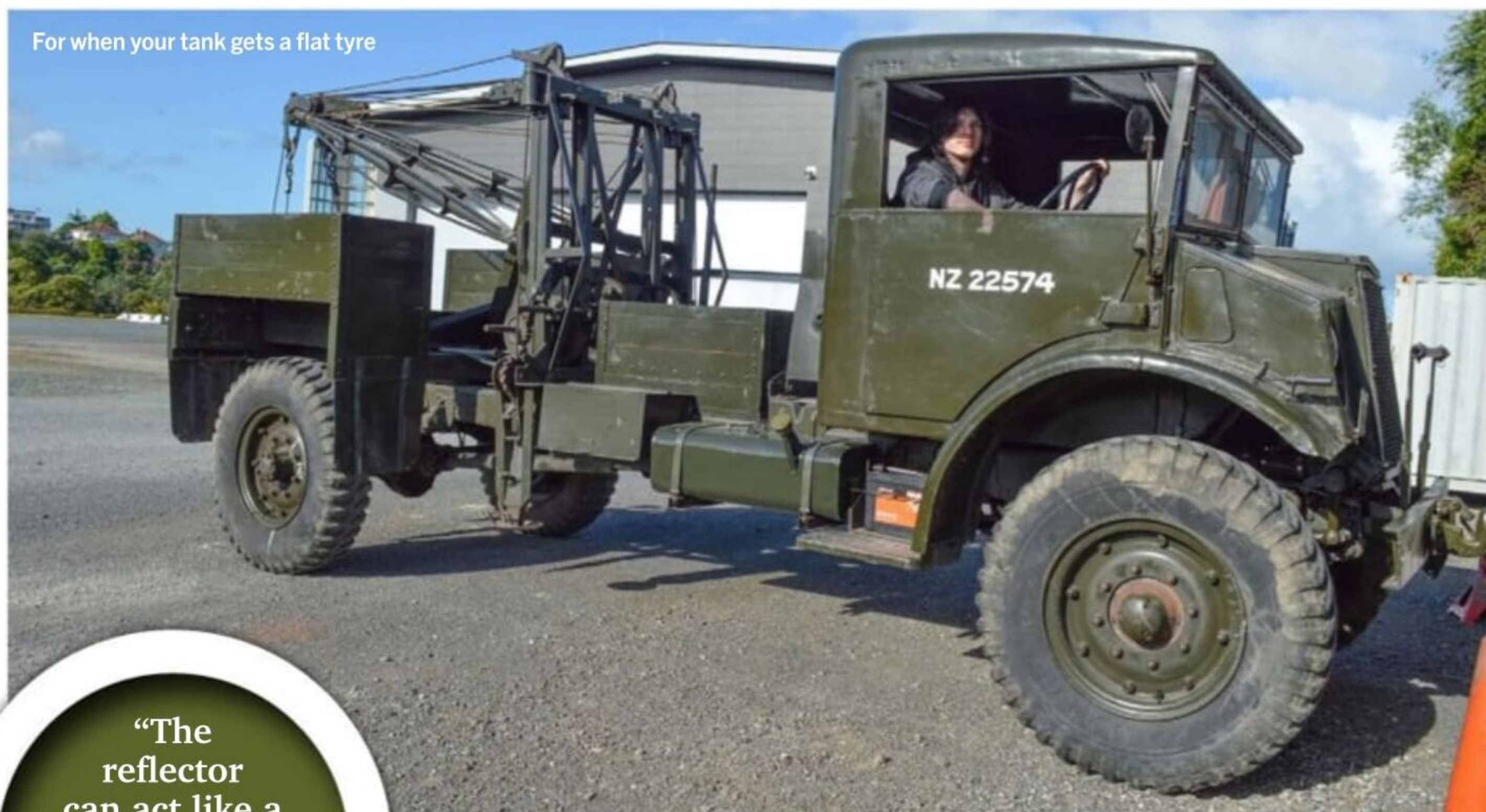
Still working, with a large fan on top, the Vickers 90cm reflector light produces a light rated at 900,000 candle power.

“They were stationed up and down Auckland’s coast – right along Tamaki Drive, North Head, Castor Bay,” Mike says. “They’re a coastal light, intended to operate horizontally. You need to be careful where you point it in daylight because the reflector can act



Six wheels go anywhere

For when your tank gets a flat tyre



“The reflector can act like a huge magnifying glass and set things on fire”

The big light in action



GMC truck pulling 90cm Vickers light and generator

like a huge magnifying glass and set things on fire.”

Ross, the searchlight guy

MOTAT is lucky to have the services of Ross Goldsworthy, a former warrant officer. I first speak to him by phone, as he is in hospital recovering from a knee repair.

Ross’s 30-year army career was unplanned – he was happily working as a storeman when he was swept up in the first round of post-war compulsory military training and, for reasons known only to the army, landed a plum job operating Auckland’s battery of coastal searchlights.

In the ’70s, he was asked to find searchlights for a police tattoo. He knew of three and had also heard that MOTAT had one. He checked it out and found that no one had any idea how to operate or maintain MOTAT’s Vickers 90cm reflector light.

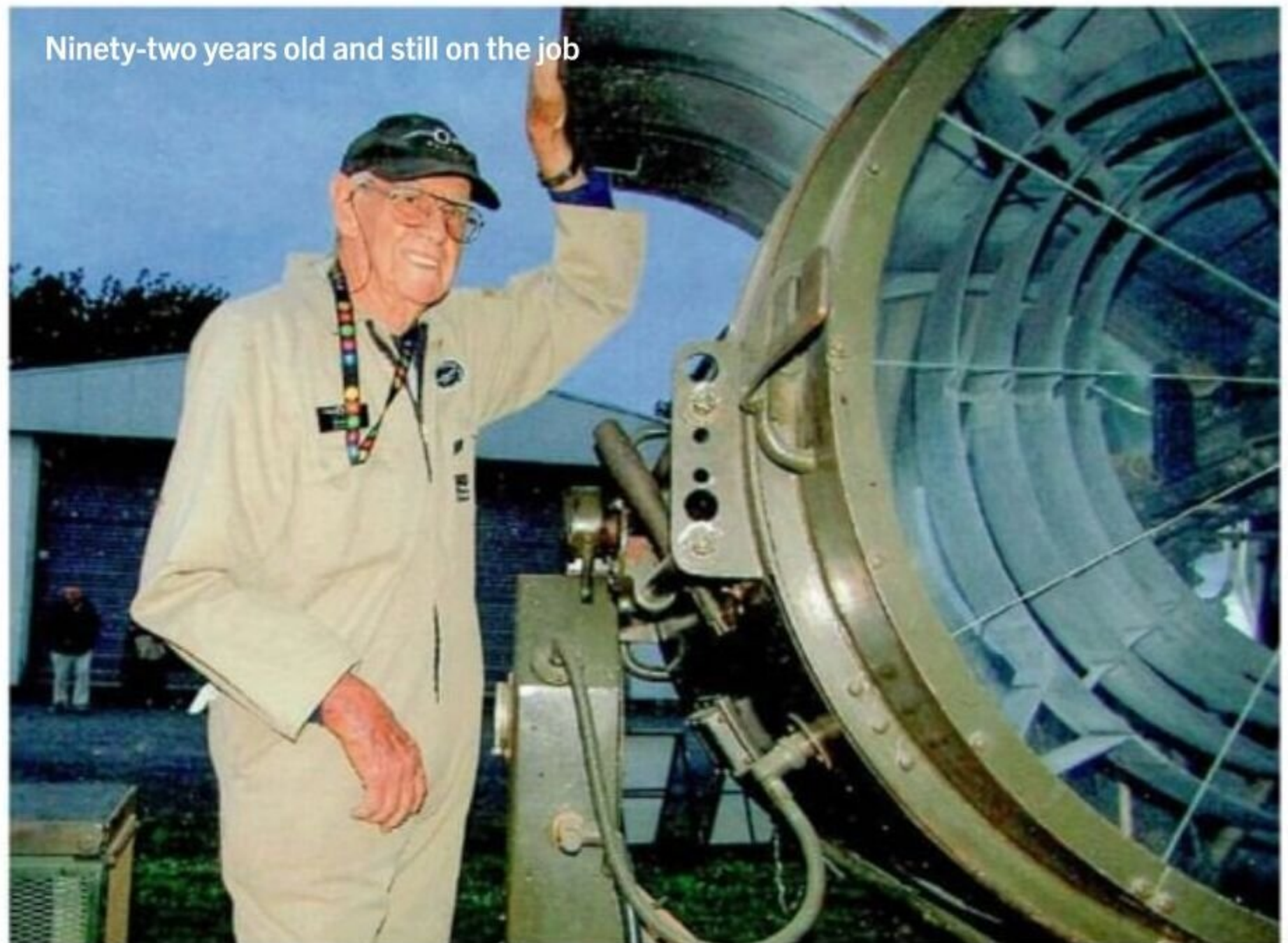
“I turned up and they said, ‘This thing won’t go,’” he says.

“I said, ‘You take off and have a cup of tea, and when you come back it will be going.’”

You don’t mess with these things

Running at 75V and able to pull up to 150A when the light is operating properly, making more than 11kW, and concentrating an enormous charge of electricity at one small point, this light is not something you would want to experiment with.

Ross has been helping out ever since, training others to operate and maintain the light, used every year for MOTAT’s



Ninety-two years old and still on the job



Ross (right) on searchlight duty in the 1960s



Be careful where you point that!



It goes just fine

Christmas Lights display.

American inventor Elmer Sperry invented the new searchlight in the early 20th century, and, after a patent battle with General Electric, the design went into production in the '30s.

"It was a mechanical-electrical piece of equipment that was way ahead of its time," Ross explains.

I point out that there was nothing new about carbon arc lights, but, when he explains how it works (see sidebar), I get the point.

"It uses a 16mm carbon rod. For comparison, a standard arc welder uses a 4mm rod. It's a lot of light. The inspection port we use to look through at the arc is the same as you use to look

at the sun. That's the equivalent of two No. 10 welding glasses."

The complicated mechanism looks tricky, and I wonder aloud how reliable it proved in service.

"Oh, when they were looked after properly, they ran like a dream," Ross says. "And it was a dream job if you were in the army. The generators that powered them ran throughout the shift so they didn't get fired up with a bang when a light was turned on."

Plenty of heat

"In the emplacement, there were big shunts like a great bedstead-type thing, lots of coils of wire to keep a load on the generator when the light wasn't using it. They warmed up

and kept the place dry, and in winter they were lovely," Ross tells me.

Was the beam hot?

"Very; if you put your hand in it, you'd find out quick enough. And if you put your hand on the light, of course it would cook it."

Although the searchlight could be moved by hand, that was not how it was usually operated at the emplacement at North Head.

North Head also had a directing station that controlled multiple lights both there and at Castor Bay, along Tamaki Drive, and at Narrow Neck.

"The directing station was at least 50m

"Was the beam hot?"
"Very; if you put your hand in it, you'd find out quick enough"



Any sleighs up there?



Ahead of its time



Behind the lens



Serious amperage

How the Sperry revolutionised arc lights

“Before these, they were running low-current-density lights that were nowhere near as bright,” says Ross. “When these came out, the Poms accepted the design; when war broke out, they made heaps of them.”

The positive point is a 16mm carbon rod with an 8mm soft core (A). It continuously rotates to form and maintain a crater. At the centre of that crater is a ball of luminous gas, which is the light source. The light shines onto a parabolic reflector, so, whatever angle the light hits it at, it comes out as a parallel beam as long as it is in focus.

The negative pole (B) is a 16mm carbon rod with a 3mm hard core that doesn’t rotate and burns to a point. That difference keeps the light at the positive pole.

Then there’s another positive feed electrode made of copper with a tungsten carbide tip (C). When the light is running properly and the main rod burns back, that electrode lowers into the arc stream and carries current down to a solenoid attached to a feed chain. The solenoid closes to activate the chain to move the carbon rod forward, which breaks the circuit to the solenoid so it automatically reloads on a spring.

The fourth rod (D), also carbon, has a negative charge. When the negative pole burns down and is about to break the circuit, that rod moves into the stream and sends a signal that pushes the main negative pole up into the optimal position.

above and out to the side. You never look down the beam of a searchlight, because you're wasting your time. If you want to see what the beam is finding, you're better to be at the side. When you look down the beam, every bit of rubbish that's in the air bounces the light back at you. Seagulls light up well. You drive your car on a good clear night and the lights are brilliant. Drive on a dirty wet night, they don't go anywhere near as far. Same principle," Ross explains.

"The directing station had a switch that let them take control. If we were behaving ourselves, they told us about it; if they were annoyed with us for some reason, they didn't bother. But normally we would get everything set up and then we would switch control to them. They had a dial in front of them that had bearing marks and outlines of some of the features of the landscape that they were looking out at."

Bright as

"How powerful were they in practice?" I ask.

"Well, I've run one of those lights on North Head and people have seen it go over the top of Coromandel Peninsula. During the war, the sentry beam from North Head used to go over the top of Tiri[tiri Matangi] Lighthouse. The



Vickers light in service on North Head

lighthouse keeper used to think it was marvellous. He didn't have to put on any lights inside; hwe could sit outside and read his newspaper."

Sentry beam?

"One of the lights was set stationary," Ross replies, "shining across the upper harbour at a low level. It was a sentry, a kind of trip-wire of light. The others could then be brought to bear on anything interesting; they could traverse through 320 degrees. The traversing rings are still there."

What made them so bright?

A few weeks later, I catch up with Ross at his home to rustle up some pictures. I take

the opportunity to ask what specifically made the Sperry a coastal light.

"The continuous feed magazine is only used in coastal lights, because when one rod burns out and the next one comes into action, there is a short break – just a few seconds, but that's enough for an anti-aircraft light to lose a plane. They used much longer single carbon rods," he says.

At 92 years of age, Ross is getting around well and is still building up his energy after six weeks in bed. However, he is in remarkably good health and raring to get back to MOTAT, training new generations in lighting up the skies. 📷

Ex-army 1944 AEC Matador 4x4 artillery tractor



"A vessel couldn't enter the harbour without passing through that beam of light"



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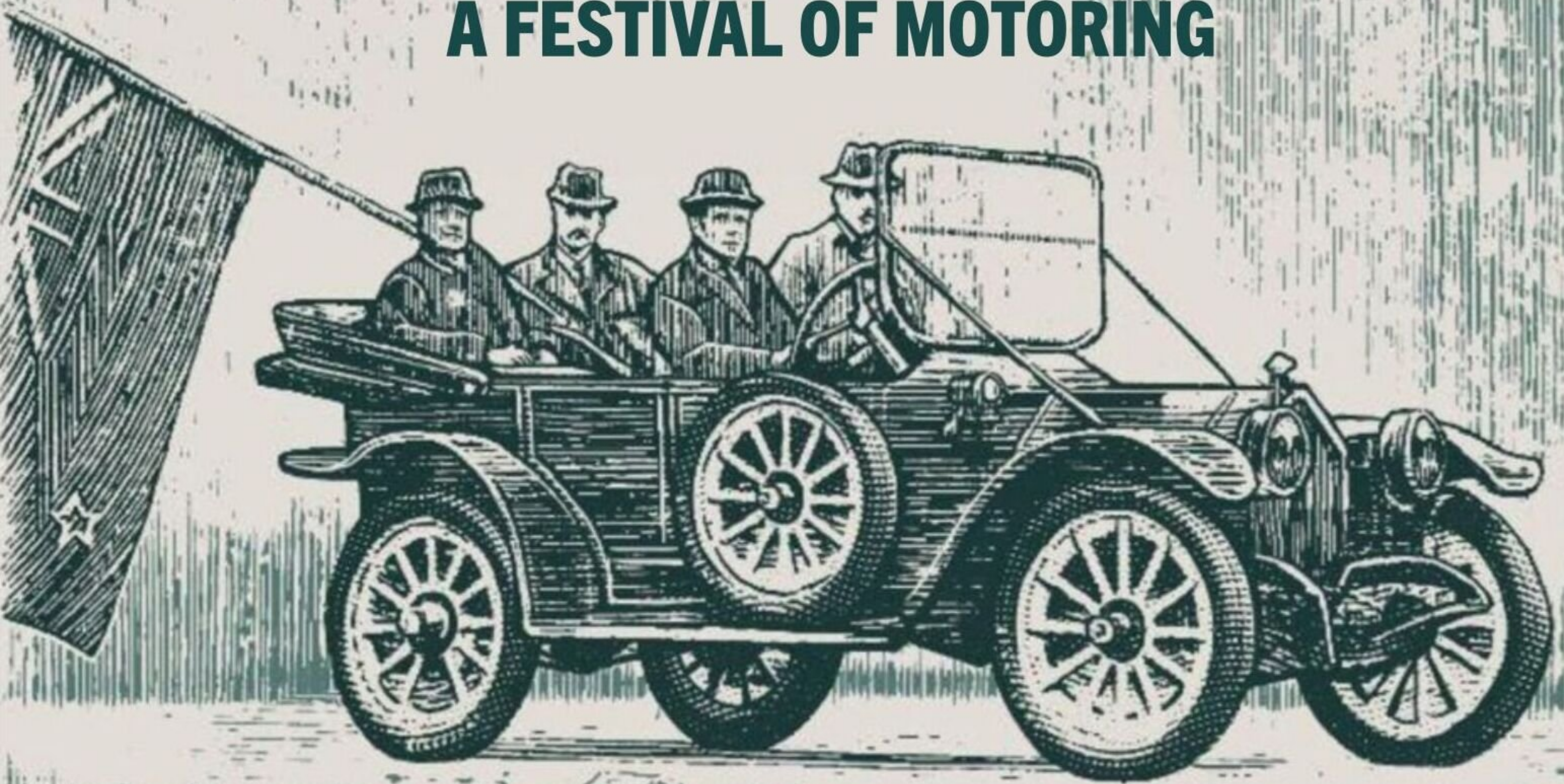
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CLASSIC

A FESTIVAL OF MOTORING



21–23 MARCH 2025

The easy rider – an Ayrburn tale

Roads are meant for cars. Today, at least. But back in 1915, the accepted wisdom was that roads were meant for more traditional forms of locomotion, like horses or well-soled feet. This modern contraption called the ‘automobile’ was seen by many as a dangerous fad or a reckless folly.

RM Paterson was not one of those people. Just like the loveable Toad in Kenneth Grahame’s *The Wind in the Willows* (published a few years prior), RM was an automotive enthusiast. To say that he enjoyed the practical and recreational rewards that his Buick tourer afforded him would be an understatement.

However, RM found it impossible to bring his beloved Buick home, because Skippers Canyon Road was officially

closed to motor vehicles during daylight hours. What to do? Drive the road at night and risk serious injury to himself or – even worse – his car? Or show the local powers that progress forces us to reassess everything, including the letter of the law?

No prizes for guessing which of these roads (pun intended) that RM went down. He filled his car with gas, supplies, and friends, and set off down the canyon road just as the sun reached its zenith. A joyous drive through stunning scenery and a pointed act of defiance. One that would see him convicted and ordered to pay 7 pounds, 12 shillings, and 9 pence in fines and court costs. A price worth paying for the thrill of driving this scenic road and seeding the idea that maybe automobiles do belong there after all.



AYRBURN CLASSIC

New Zealand's newest motoring event, the Ayrburn Classic, continues the story of RM Paterson and his penchant for motoring and love of a good time shared with good friends.

This festival of motoring is set to become a destination event for motoring enthusiasts across New Zealand and beyond, showcasing stunning classic and modern luxury vehicles amid breathtaking scenery and a lively atmosphere.

The Ayrburn Classic is an annual event offering an experience unique on New Zealand's event calendar, with restaurants, bars, food trucks, wine tastings, live entertainment, activations, exhibits, and more to complement the motoring spectacle. Celebrating the heritage, innovation, and prestige of

the global automotive industry, it draws inspiration from iconic international gatherings across the US, the UK, and Europe.

"Our vision for the Ayrburn Classic is to grow it into the most prestigious destination motoring event in the Southern Hemisphere, delivering an unmissable, unforgettable, and undeniably Kiwi experience for our guests," says Chris Meehan, founder and CEO of Ayrburn's owner, Winton.

BACK TO THE FUTURE

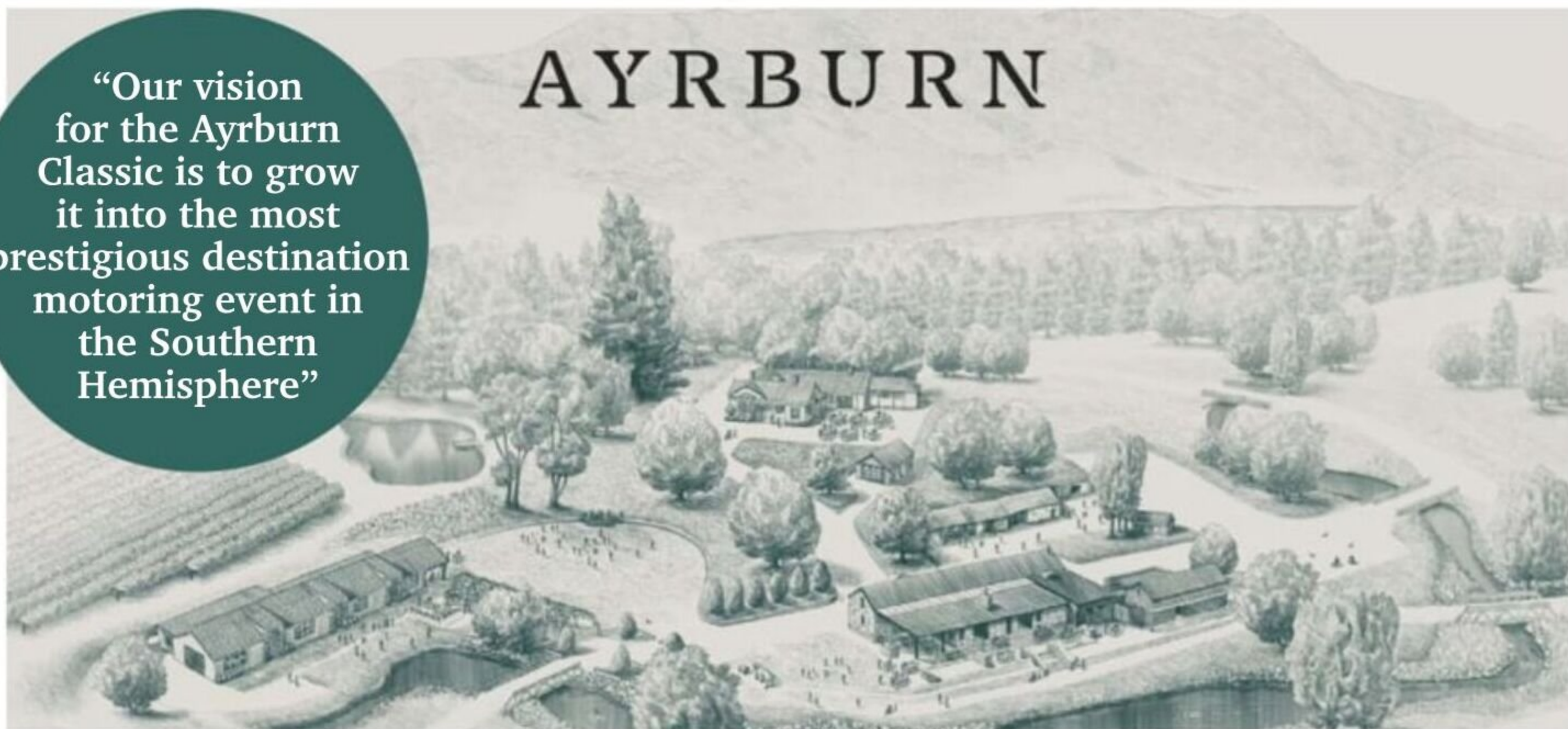
Over 160 years ago, Scottish-born William Paterson came across an expansive piece of land destined for remarkable things, tucked away in a beautiful pocket of Arrowtown,

Queenstown. With a backdrop of scenic beauty and foreground of rural opportunity, Ayrburn Farm was established as one of the first farms in the area, not long after WG Rees settled in the district in 1860 and gold was discovered in the Shotover River in 1862. The stories of Ayrburn are stories of people, places, buildings, and nature – tales rich in colourful characters and remarkable endeavours, eccentricity, and whimsy.

A successful wheat, sheep, and dairy farm for more than a century, with a long tradition of warm and generous rural hospitality, Ayrburn is now a world-class wine, food, and event destination. Seamlessly blending heritage and innovation, its crafted flavours,

"Our vision for the Ayrburn Classic is to grow it into the most prestigious destination motoring event in the Southern Hemisphere"

AYRBURN





captivating stories, and unparalleled experiences combine to offer visitors an all-in good time.

The old farm buildings are some of the main characters in the story of Ayrburn. Remediation of the wool-shed, stables, cart shed, and dairy started in October 2021. The process was delicate and slow, deconstructing each building and then recreating it with stronger hidden structures. Retaining heritage features such as the curved roof in the cart shed is essential to the execution and heart of Ayrburn, morphing the history and natural landscape with refinement to deliver a food and wine experience for the entire family to enjoy.

As Chris Meehan says, “An incredible amount of time has gone into making sure Ayrburn will be a place for great

times. It embodies our commitment to celebrating the stories of the past by giving them a new future.

“Ayrburn is not just a destination; it’s an invitation to have fun and experience the best of New Zealand’s food, wine, and hospitality in a place chosen 160 years ago for being one of the country’s most stunning locations.”

KIWI PIONEERS

In keeping with both Ayrburn’s pioneering history and New Zealand’s proud motoring heritage, the theme for the inaugural Ayrburn Classic is ‘Kiwi Pioneers’. Think of names such as McLaren, Britten, Saker, and Rodin, and this country’s contribution to automotive excellence and international motor sport comes to life.

2025 FEATURE CLASSES

- Kiwi Pioneers
- American Vintage and Muscle
- Best of British
- Exceptional European
- Japanese Icons
- Awesome Australians
- Supercar Stunners
- Unique and Exotic
- 2-Wheeled Wonders
- Best in Show
- People’s Choice

Entries opened Monday, 2 December 2024 and spaces are limited.

Visit ayrburnclassic.com to register.

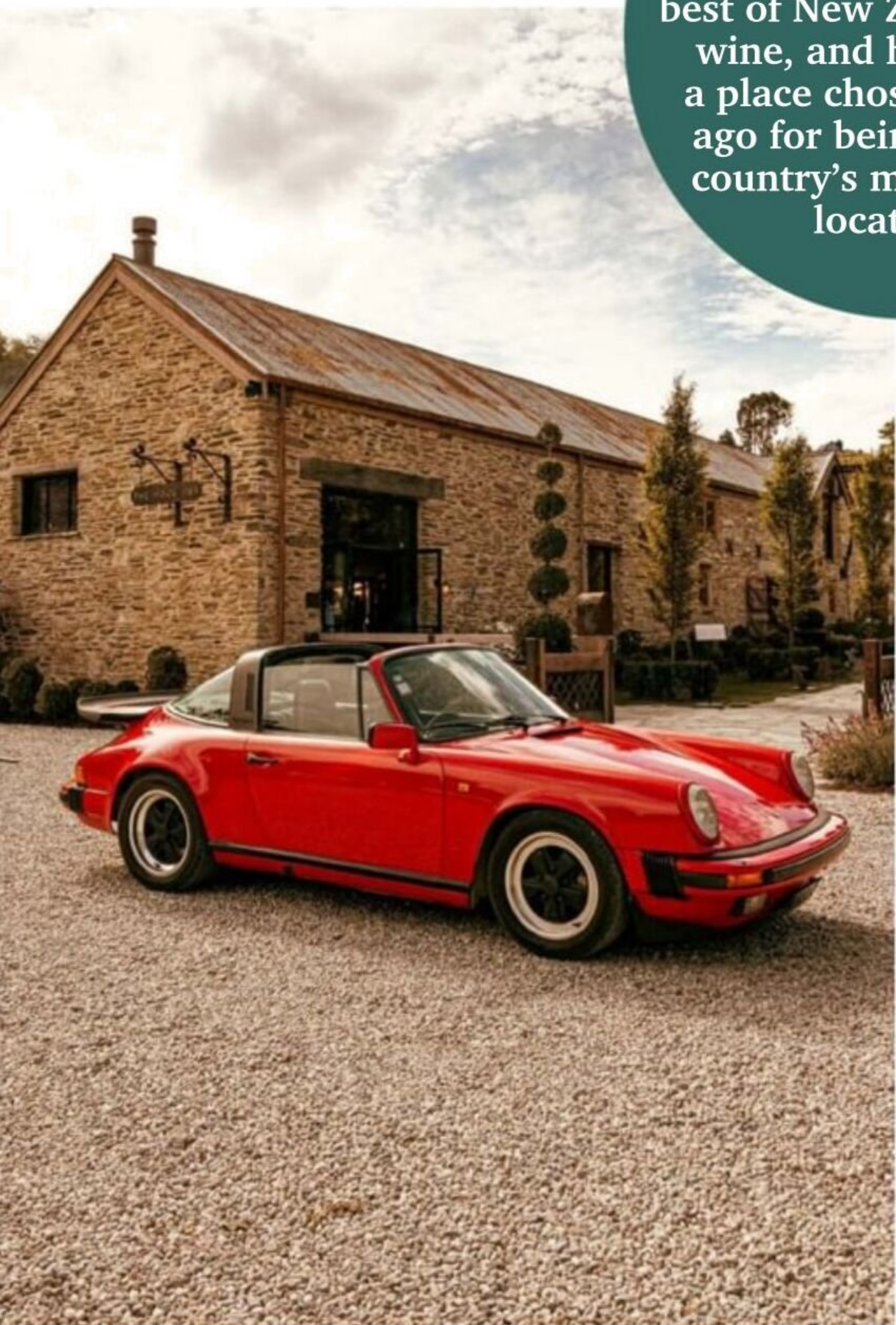
JUDGING TEAM

Ashley Webb – Chief Judge, Ellerslie Intermarque Concours d’Elegance judge, former editor of *New Zealand Classic Car* ►





“Ayrburn is not just a destination; it’s an invitation to have fun and experience the best of New Zealand’s food, wine, and hospitality in a place chosen 160 years ago for being one of the country’s most stunning locations.”





Bruce Lewis – Ellerslie Intermarque Concours d'Elegance judge

Quinton Taylor – Editor of *New Zealand Classic Car*, motorcycle and car racer and restorer

Janet and Jonathon Paape – Top-end marques and classics specialists

Greg Elder – Experienced restorer of classic and vintage vehicles, former racing driver, former Vintage Car Club of New Zealand president

David Merhtens – Notable restorer of Triumph sports cars, organiser of biennial Mainland Classic Tour since 1992

Vaughan Wilson – Collector, contributor to *New Zealand Classic Car*

This team of experts will be joined by international and guest judges, to be announced in the coming weeks.

PROGRAMME

Friday, 21 March

Morning–afternoon: Show cars arrive on site

Evening: Welcome party – invite only (entrants, judges, media, VIP)

Saturday, 22 March

9am: Early access – entrants, judges, media, VIPs

10am: General admission

11am: Showcase on The Dell

11.30am: Live music

2.30pm: Showcase on The Dell

3pm: Live music

4pm: Best-Dressed Awards

4.30pm: Miranda Easten concert

Evening: Awards Gala Dinner

Sunday, 23 March

9am: Early access – entrants, judges, media, VIPs

10am: General admission access

11am: Showcase on The Dell

11.30am: Best-Dressed Awards

12pm: Ladies' Long Lunch

12pm: Live music

2.30pm: Showcase on The Dell

3pm: Grand Prize draw

4pm: Collectable cars and memorabilia auction

Saturday afternoon features a very special performance by Kiwi country music star and serial DeLorean owner Miranda Easten.

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“Saturday afternoon features a very special performance by Kiwi country music star and serial DeLorean owner Miranda Easten”





The Stanley Fatmax
corded planer, jigsaw,
and circular saw

TOOLS

WANTS V. NEEDS

**Tendency to sweep through a hardware store as if it's your own personal treasure chest?
An expert brings the voice of common sense to decisions about tool purchases**

By Nigel Young | Photographs: Nigel Young

One of the first questions we'll always ask ourselves is, "What tools do I need?" The answer is usually, "As many as possible, as I'm a tool junkie."

However, in these days of tight discretionary dollars and cost-of-living increases, that isn't the correct answer for most of us.

So, how do we answer our question? This article is about the wants versus needs, and some form of structure for

balancing them. For myself, I've been buying tools for a number of years now, and some are up for replacement. I bought what I could afford at the time, and that hasn't really changed, but my understanding of both my requirements and the capabilities of the tools certainly has.

My horrible jigsaw

An example of this is my current replacement of a jigsaw and a planer –

both bought around 15 years ago.

The jigsaw is horrible and awkward to use, and the planer just died. The jigsaw was bought for a particular job, so it didn't owe me anything. As for the planer, its dust port was also broken, which was a nuisance, given my comments around dust control in the first article. Both of these had been XUIs and had served me adequately, but my use of them was limited due to my desire to avoid them.



My new Stanley Fatmax corded planer and jigsaw; in the middle is my original XU1 jigsaw – it paid for itself, which is about the best I can say for it

“As many as possible, as I’m a tool junkie”

I’ve since made a decision on brands, but more about that later.

Justifications

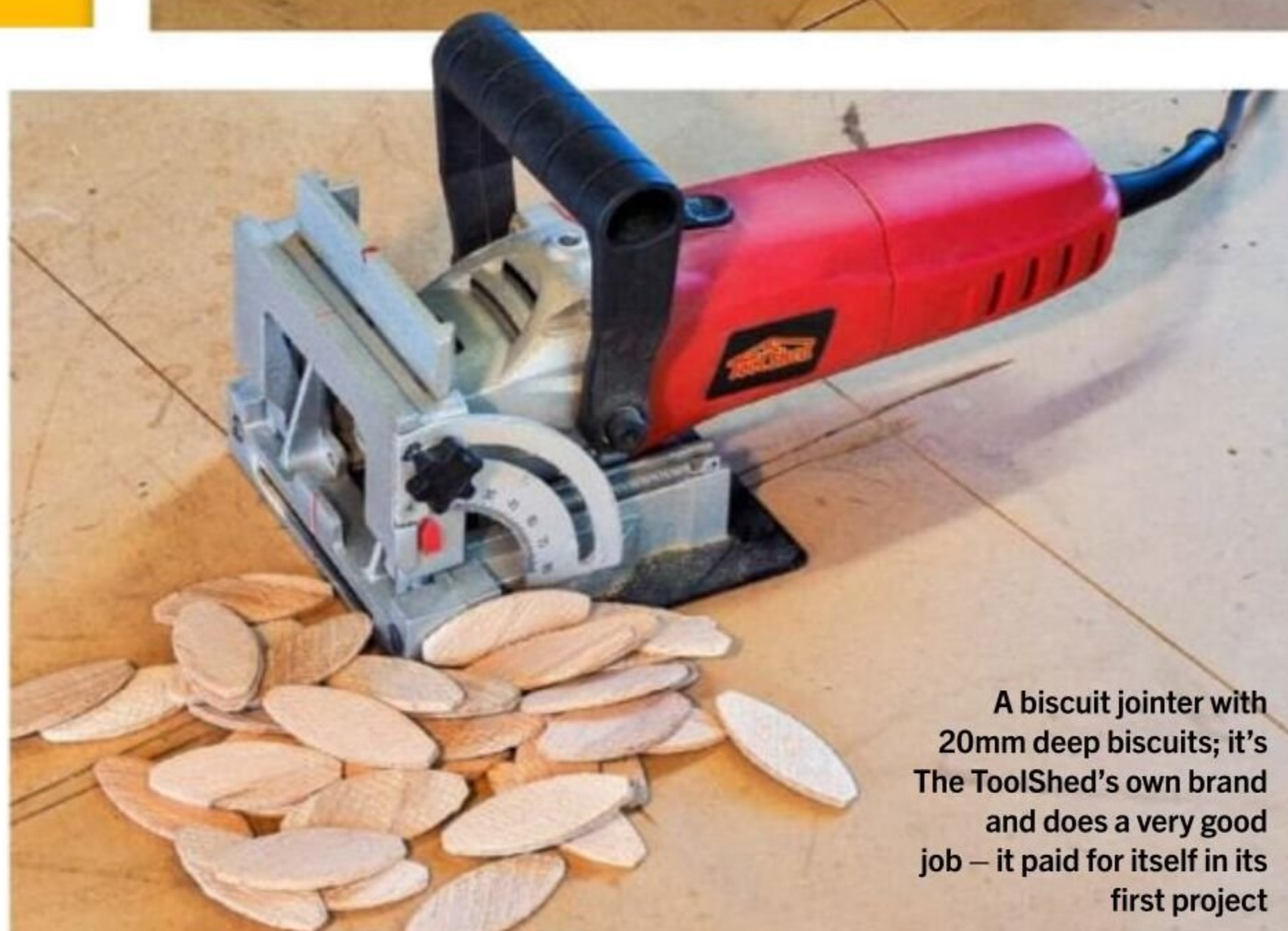
I mentioned that the jigsaw had been bought for a purpose and, therefore, paid for itself in that one project. This is a good starting point for your own analysis when buying tools – what is buying it saving you?

If you plan on building a bookcase for the lounge, for example, it may be a good idea to use the hardware store’s cutting service – which, in turn, would make the materials easier to handle and transport. That would require you to draw up a cutting list, so you would need to be sure of what you gave them. But it is a solution.

If, on the other hand, you wanted to do it yourself, then buying a circular saw might work if this was to be the first of several projects. In that case, do some homework around what you would like for a bookcase, see what sort of prices they sell for, and then figure out if you can do it for considerably less – including the cost of the tools. If so, then it’s a great decision.

Pays for itself

I had an example of this recently. I had to join some 25mm thick sheets. I had budgeted \$200 for this part of the



A biscuit jointer with 20mm deep biscuits; it’s The ToolShed’s own brand and does a very good job – it paid for itself in its first project

project, then realised that I could buy a biscuit jointer and biscuits for not much more than that.

The jointer paid for itself in that one job, and now I have it, along with a largely untouched packet of biscuits, for the future; it owes me nothing.

A biscuit jointer is a very specific tool, and not likely to be considered at the beginning of your woodworking days.

So, where to start with making these decisions? One question to consider is around the nature of your intentions: are you planning on making furniture out of MDF and the like? If so, then the next questions relate to handling, marking up, and cutting 2400x1200 sheets that

weigh 30-plus kilos each – an 18mm sheet of MDF weighs around 37kg, and handling them on your own takes a bit of practice, not to mention space around it to work on it.

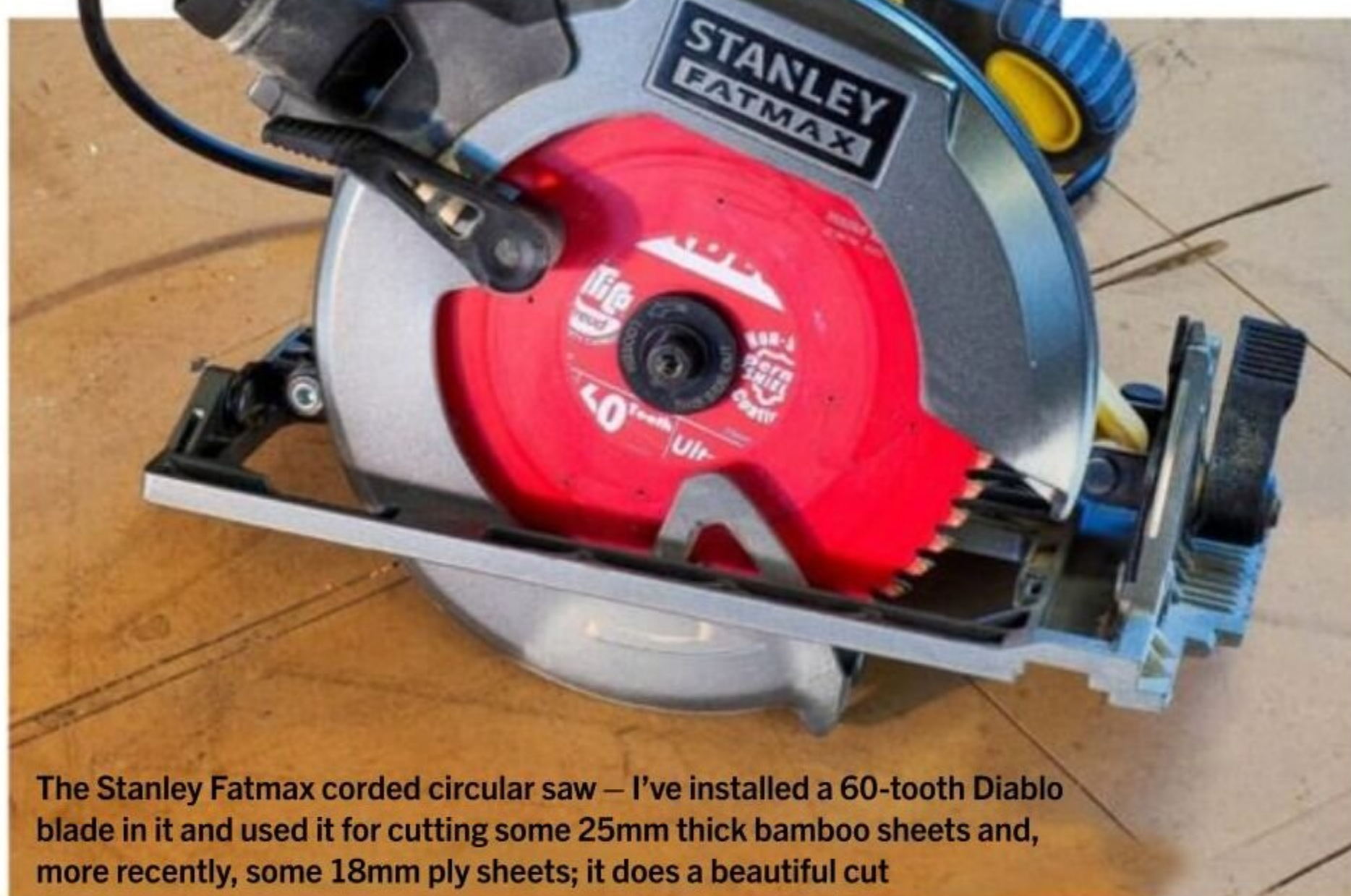
Health and safety

Then there’s dust control, as MDF dust is horrible, and that introduces us to another set of costs: health and safety. We’ll return to that one later.

In the meantime, the cut MDF has to be stacked in the order in which you want to use it, while protecting it from damage – MDF edges and corners are easily battered and bruised, and the MDF needs to be kept away from



My new Stanley Fatmax corded planer and jigsaw again – notice the red tip on the jigsaw blade; it is from a set of Diablo blades that I found on special



The Stanley Fatmax corded circular saw – I've installed a 60-tooth Diablo blade in it and used it for cutting some 25mm thick bamboo sheets and, more recently, some 18mm ply sheets; it does a beautiful cut



Never let anyone tell you that you have too many clamps – you always need at least one more. This collection is at the lower end of quality – it serves me by and large. There are also two trailer straps. The wooden clamp acts more as a stand – I used it when I was making a crossbow; it worked very well holding an odd shape

moisture because it soaks it up like a sponge and then bloats and starts to separate.

Assembly comes next – do you have enough clamps, for example? A piece of advice at this point: don't let anyone ever tell you that you have enough clamps; you always need at least one more.

On something the size of a bookcase, you may use trailer straps to hold it all together. If so, always check your squareness; things move – usually after you've applied the glue. In the case of a large item such as a bookcase or a table, the best way to check for squareness is to measure it across the diagonals; a tape measure run from top left to bottom right, then top right to bottom left, will soon show any inconsistencies – at which point some gentle persuasion might be in order.

One of the guys at my local MenzShed describes this process of persuasion as “giving it a good talking to” – and his attention to detail is second to none.

Methods

To this point, we've been using simple tools – a circular saw for the cutting, a hammer for the ‘persuasion’, a tape measure for the initial setting out and then ‘squaring’.

However, if we go back to the setting out at the beginning, the need to draw a straight line is obvious – but not as straightforward as you might think.

One way of achieving this is by using a straight edge – and, as odd as that may sound, these have been around for a long, long time. A straight edge is just what it suggests: a piece of timber, or perhaps aluminium or steel, that you know is absolutely straight. You keep it somewhere where it won't bow or warp – if it's wood – and bring it out as required.

A 2400mm long sheet will require a straight edge of at least that length – even longer if you want to be able to clamp it in place prior to drawing on the sheet. Now, you can buy straight edges in the form of large T-squares or even long spirit levels, for example, but they all cost money, and you may just have something at home that will do the job. If you have, then get out a black marker and write 'S T R A I G H T E D G E' on it in big letters – so that you don't cut it up by mistake in the future.

Battery power?

Cutting is one thing; fixing is another. These days, most things are glued and screwed, so a simple drill and driver set is essential.

You may be considering whether or not you should go cordless. While that is the way that the industry is moving, initial costs can be prohibitive. Add to this a battery's ability to just stop in the middle of a job, and compare it with a corded tool's superior torque – although, with the improvements in battery technology, that isn't quite the consideration it used to be – and again it comes down to both budget and intention.

If you're doing a lot of countersinking, for example, then a separate drill/driver for just a countersink bit is almost essential.

I myself use largely corded tools. However, my drill and driver are 18V battery powered from Hitachi – now known as 'HiKOKI' – a brand my father recommended to me as far back as the 1970s. I've had them for some years, and they haven't missed a beat.

If I take the full-on cordless route, I'll probably stick with them, as I already have the basics. As far as portable corded power tools go, I have a range of different brands – mainly Black+Decker,



Keeping things straight and square – the Stanley T-square is very useful across full-size sheets; the others all have their uses, and you soon figure out how and when you choose to use them



My cordless drill and driver are Hitachi (HiKOKI) – a brand that my father recommended to me back in the 1970s; they have never missed a beat

“The jointer paid for itself in that one job”

Bosch, Ozito, Ryobi, and The ToolShed. I have recently discovered Stanley Fatmax and have since bought a new skill saw, jigsaw, and planer from its corded range. I put a 60-tooth Diablo blade in the circular saw and used it for cutting the 2200x600x25mm bamboo sheets mentioned in a previous article.

Cutting long lengths

So far, we've been discussing handling items made from wooden-sheet materials, but do the same decisions

apply to using timber? As with all good, objective, and well thought through questions, the answer is yes and no.

Timber doesn't come in the same dimensions as sheet materials – not at our level, anyway. While sheet materials are best cut using a skill saw and some guides (more on that later), timber is far smaller in profile.

Ripping one down its length with a saw such as my TopmaQ table saw and stand, with a 305mm (12-inch) blade powered by a three-horsepower motor



My table saw from TopmaQ. While it doesn't have a nice cast-iron top, the T-square and horizontal arm both work very well. I installed an 80-tooth Makita 305mm (12-inch) blade to it for an excellent cut. Putting better quality blades on your tools can take them from making a reasonable cut to an excellent cut – it's a relatively cheap way to upgrade your tools

“At \$299, it was by far the best at that price point as far as I could tell”



My 250mm (10-inch) cross-cut saw – one of The ToolShed's own brands. For its price, I think it is excellent compared with many better-known brands. I've put one of The ToolShed's 90-tooth blades on it for a very fine cut

is one thing, but cutting across a piece of timber several metres long with it is quite another. A skill saw can be used for this, but, depending on accuracy and finishing requirements, a cross-cut saw – also often referred to as a ‘mitre saw’ – is so much better.

New mitre saw

I recently replaced my mitre saw after seven years of quite heavy use. After doing a lot of reading, checking, and YouTube watching, I settled on a 25.4cm (10-inch) shop brand from The ToolShed – the same brand as my biscuit jointer.

At \$299, it was by far the best at that price point as far as I could tell. I fitted it with an 80-tooth blade that was also The ToolShed’s own brand, a combination that resulted in a very good cut.

The only caveat that I’d add to this – and it applies to all powered saws: you need to fit a zero-tolerance cutting surface. This decreases tear-out at the back of the wood, as well as stopping thin slithers falling down into the gap for the blade and potentially jamming it. This point was reinforced for me recently when I fitted a new 80-tooth blade to my table saw – the amount of dust, slithers, and general crap that had fallen down was sufficient to clog the dust extraction port. Back to dust again.

Saw positioning

The cross-cut saw requires lots of space on either side – generally more on the left-hand side than the right, as left to right is the usual cutting direction.

You’ll often see one paired with a stand and roller benches out on either side, which is great, and, if it’s within the budget, then it’s worth considering. The cross-cut saw also allows for both horizontal and vertical angles, so you can do a surprising number of different cuts with it, making it a very versatile saw.

One thing you may have noticed is my reference to Diablo blades. There are two reasons for this. First, they are excellent blades, and you’ll often see them on YouTube videos – they’re the bright red ones. Having said that, I fitted an 80-tooth Makita blade to my

Oil and rag danger

Over the years, many a good workshop – professional, home, or of the MenzShed variety – has been set alight by nothing more than a rag impregnated with a vegetable-based oil being incorrectly disposed of after use or simply left lying around.

The types of oils that can start a fire are all readily available and commonly used by woodworkers. These include linseed, tung, Danish, and teak oils – and the one used on this project: buffing oil. Processed oil is more dangerous than natural oils, so, for example, boiled linseed is worse than raw. Similarly, natural fibres are more prone to ignition than man-made ones. While not usually a woodworker’s oil, biodiesel also belongs on this list.

Motor oils and spirits have spontaneously ignited on very rare occasions but only when an exact and very unusual set of circumstances occurred.

Vegetable oil on a rag oxidises when exposed to air. This oxidation process releases energy in the form of heat sufficient to start a fire; no other ignition source, such as a flame or spark, is needed in this process.

A rag that is balled up or folded will heat more quickly as it retains the heat more efficiently; if it is then thrown into a workshop rubbish bin with sawdust, offcuts, etc., it is little short of a bomb.

An important point to remember is that it is the oil that causes the fire; the material that has absorbed it plays no part in the process other than becoming the initial fuel. It follows that the common practice of cleaning up larger spills with sawdust is a really bad idea unless disposal of the absorbent afterwards is carried out thoroughly and correctly. Where available, sand is a much better option. If work is being carried out in a house or in a workshop that has carpet on the floor (why ever would you?) and oil is spilt,

you have the oil/fuel formula; while less likely, a fire is still possible. However, contaminated and folded or bundled drop sheets and even the clothing worn can pose a real risk.

Once the oil has dried on the absorbing material, there is no longer any risk.

The method that I use is simply to hang the rags I’ve used or may possibly have used (say, to wipe my hands) out to dry on a tree branch or fence. I leave them there until the next day, at least, before disposal. The oil has still oxidised, but the heat has been able to dissipate safely.

Hanging the rags over the clothesline is never a good idea as it may ignite a heated reaction of a different kind!

If sawdust has been used to clean up a spill or has become contaminated in some other way, put it into a sealable metal container and fill the container to the brim with water.

Some years ago, the New Zealand Fire Service noticed a disturbing number of fires in early education centres, always at the start of the Christmas holidays. On investigation, it was found that common practice was for teachers to give wooden toys and furniture a coat of linseed oil then throw the rags in the rubbish before locking up and heading home for six weeks.

An interesting item that I read while checking my facts, and one that illustrates the danger, is that, in the US, it’s estimated that 10 per cent of gyms that store their used exercise towels overnight in bins or bales for collection or laundering later experience a fire caused by the spontaneous ignition of natural body oils and products such as rubbing oils and sunscreen present on the towels!

Keith Preen
Senior Station Officer (Retired)
New Zealand Fire Service





Part of my collection of drivers and drills – the drivers in the case are from Kango; the drills in the clear case were on special at Mitre 10; the countersink bits and others I have collected over time

table saw, as it had a 30mm ‘arbor’ – the hole in the middle – and it is also an excellent blade, so there is no sense of inferior quality. The second reason is that the Diablo blades are a bit thinner than others, so there is less loss if you are doing multiple cuts across a sheet, for example.

A better quality blade is a good way to upgrade any tool – keep in mind that the manufacturers don’t know the reason that you’re buying it, so they fit a general blade that will do most jobs reasonably well. However, if you’re looking for a better finish, look to the blade rather than the tool; it is that, after all, that is doing all the work.

Accessories

This leads us to such areas as drill bits, screwdriver bits, screw type, and the like.

Once upon a time, joining materials was the domain of the hammer and nail, but now screwing materials together is so much easier, and more accurate given that the action of a hammer as opposed to that of a screwdriver is more ‘hit and miss’ – as many a thumb can testify.

The topic of screw choices is another article in itself, but the materials

themselves often dictate the type; there are specialist screws for wallboard, sheets, cladding, timber – get advice before starting on a project.

I recently bought some Kango screw heads for my power drill, as I was aware of the name and that Kango specialises in heavy-duty equipment. I’ve managed to break two so far – I suppose that is to be expected. I’m still researching drill bits – there is a lot of choice, from regular ones to Forstner, spade, and auger.

I found this article on our own *The Shed* website, and it is well worth a read: <https://the-shed.nz/know-the-drill/>.

Timber rules

Working with timber has its own set of rules and is when tools such as a planer come into their own.

The simplest breakdown is hardwood and softwood, with other considerations such as new or recycled timber, intended finish, and intended role. There is another article on this also, but some initial comments are that hardwood is harder to work with and will test your tools as well as your patience. The finish is superb, but it’s one you have to earn. As a simple rule, the harder a material

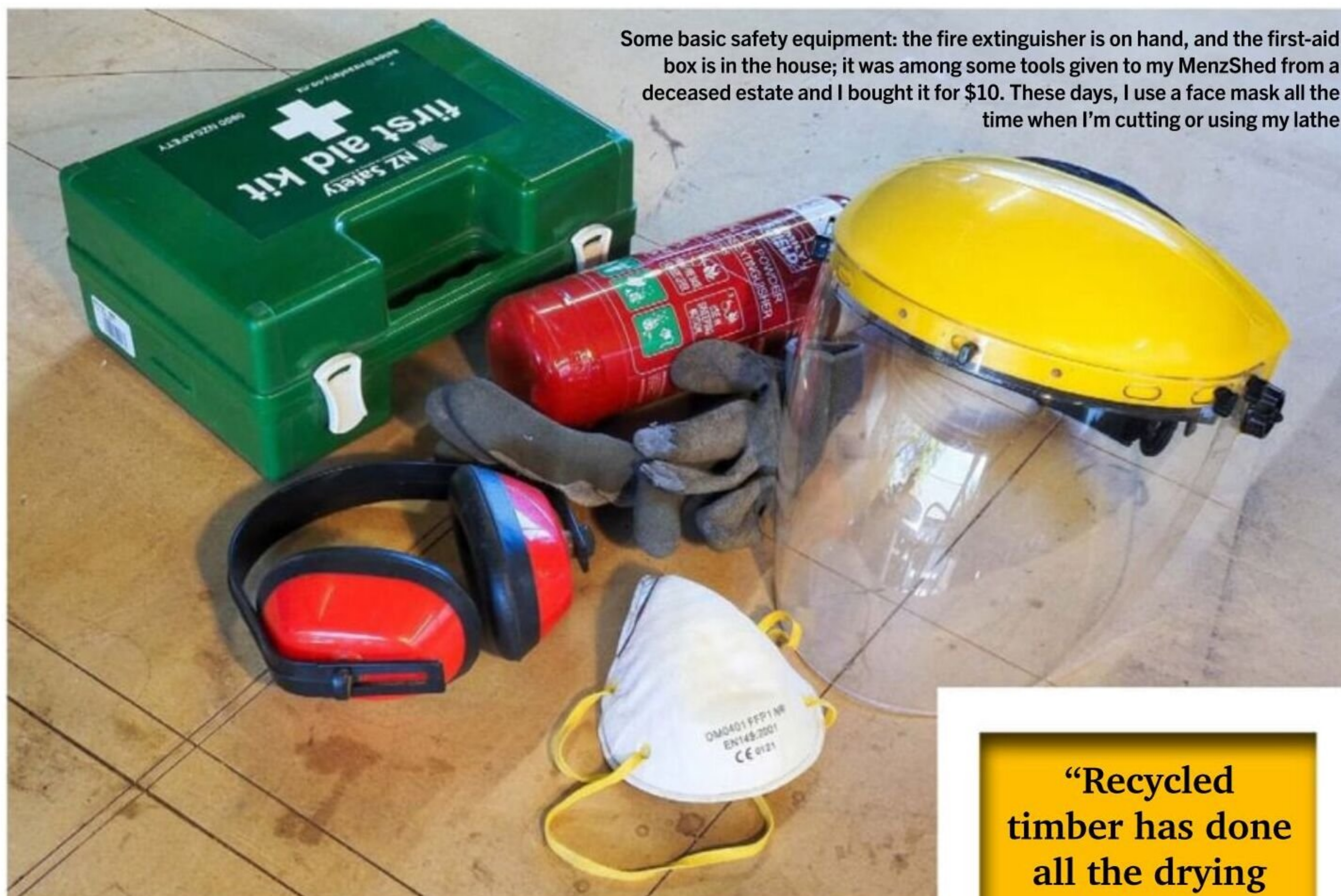
is, the more brittle it is, and the easier it splits, so all holes must be pre-drilled and countersunk before screwing.

The head of the screw is the main culprit here, so don’t rely on screw heads that are intended to countersink themselves – they are fine in softwoods, but hardwood is not so forgiving. Hardwoods are also prone to splinter, so watch your hands as you go and consider some decent gloves – which takes us again to our health and safety considerations.

Timber choices

Softwoods are much easier to work with but more prone to damage as you work – dings, gouges, twisting, and warping being examples.

They are lighter, but this is usually determined by moisture content, so do some research on this before buying. At this point, I suggest that new timber be avoided unless you have a specific reason for wanting it. Recycled timber is much cheaper – although that’s up for debate these days – and has done all the drying and shifting that it is ever likely to do. It is, therefore, far more stable, with the only real consideration being



Some basic safety equipment: the fire extinguisher is on hand, and the first-aid box is in the house; it was among some tools given to my MenzShed from a deceased estate and I bought it for \$10. These days, I use a face mask all the time when I'm cutting or using my lathe

the release of the tension inherent in the piece of wood when you rip it down or put it through a bandsaw.

A thicknesser helps here – but now we're starting to get into specialist tools, the sort that need justifying. This is also the territory of the MenzShed, so, again, I recommend that you join your local one, giving you access to a level of tools, expert advice, and assistance that far outweighs the modest cost of a joining fee.

Protection

The matter of health and safety has already been touched on; briefly, expect to spend some money on a decent face mask, noise suppressors (ear muffs), safety glasses, gloves, dust masks, and safety shoes. While steel caps aren't a necessity at our level, they are still advisable.

Wear clothes that don't flap and catch – overalls work well here – and consider having a fire extinguisher and first-aid kit on hand, as both fires and accidents happen. Workshops are hard to keep clean and tidy, so a decent broom, brush, and shovel are to be considered mandatory.



“Recycled timber has done all the drying and shifting it is ever likely to do. It is, therefore, far more stable”

Intent

Tools are determined by your intentions and their requirements. Consider what level of forming, fixing, and finishing you are looking for, because these three aspects dictate your needs. I've listed them in no particular order, and there will invariably be some level of crossover between them.

Forming

Drills, saws, planers, routers, hammers and chisels, rulers and tape measures,

a straight edge, decent pencils, clamps, vices and joining methods, and 'squaring' dominate this category. Also, guides and templates, and perhaps even a chalk line, if you're working on some larger projects.

Fixing

Drills, drivers, routers, clamps, glues, and screws – and again, 'squaring'.

Finishing

Sanding, edge planing and trimming,



Other useful tools: an orbital sander for finishing, a small handheld trimmer for edge treatment, a grinder – it's surprising how often I use it – and a belt sander for initial dressing of timber. I put some Diablo sandpaper on it partway through a project that I was working on – it turned a time-consuming job into one that was a little more exciting, shall we say



A can of Danish oil is great to have on hand. The yellow cloth is an anti-static one that removes dust prior to applying the finish. Read the sidebar on the previous page with regard to keeping rags from self-combusting, which can be a real problem

“Again, it comes down to both budget and intention”

hole filling, fine nails, and nail punches, finish types and appropriate brushes, rags and cleaning materials. I also keep a one-litre tin of Danish oil and some brushes on hand – you'll be surprised how often you use it once you have it.

One important issue to keep in mind here is how you apply the oils. I have learned to use a rag over a brush, as that tends to give a better finish – apply the oil from the tin to the surface with a brush, but use the rag to actually spread it. Keep in mind that solvents, oils, and rags can be a lethal combination and have caused apparently spontaneous fires. When you've finished using the rag, spread it out to dry and perhaps rewash it; leaving it bunched up is the catalyst for the combustion – a long time after you've put it down (see sidebar).

Each of these tools requires a degree

of learning – in terms of both correct handling and maintenance. Take chisels and hand planes, for example – blade sharpening borders on being an art form and isn't to be rushed. At the risk of sounding like a cracked record, your local MenzShed has both the sharpening tools and the expertise to teach you how to do this yourself.

Conclusion

Tools are a means to an end, allowing us to achieve our woodworking visions.

I haven't discussed hand tools here – a decent hand plane will cost you more than an electric one. Neither have I discussed lathes – I have one and need to learn how to use it properly. Lathes are a specialist area, and we tend to associate them with bowls and more decorative items, although that is simplifying to the extreme.

I'm thinking more in terms of my son-in-law, who knows nothing about woodworking but decided to build a bookshelf anyway. For a first project, he made a very good job of it, and it has now got him interested in doing more. For him, the buying of tools is on a project-by-project basis, and he'll slowly build up a good collection, with each one paying for itself in the savings made, as I outlined earlier.

Finally, a decent second-hand tool in a quality brand is far better value than a new crappy one – like the XU1 tools that I started with. I wish that I had realised that back then. A caveat to this is that second-hand electrical items should be checked by a registered specialist. There is probably an electrician at your local MenzShed who would be only too happy to give it a quick once-over – which is all part of the reason why you joined in the first place. It is also a great place for advice on what you should buy for each project. Of the money you need to spend, this membership is the best value of all – make the most of the opportunity it gives you. 📧



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Restoring antique bicycles



A WHEELED

More than just the tale of a bike collection, this is the history of a form of transport that was once very common, then became less popular, and is now undergoing a renaissance



HISTORY

By Ritchie Wilson | Photographs: Ritchie Wilson | Diagrams by NSW

Two classic racing cycles are the remnants of a large collection



The house in which Doug Watkinson grew up was across the road from Christchurch's Avon River. Doug and his brother had a canoe and were on the water most days.

Neighbouring kids also had canoes, so the river was the centre of the social scene. At that time, Christchurch – flat, with generally fine weather – was a city of bicycles, like present-day Copenhagen or 1990s Hanoi (on a particularly quiet day), with virtually every kid riding to school on a bike and most blue-collar workers biking to work.

The Watkinson brothers would frequently come across a bicycle that had been dumped in the Avon and would usually retrieve it and take it home. Getting these near-terminal machines into running order was, for a while, a major pastime, later superseded by an intense interest in motorcycles. Over two or three years, dozens of the bikes were bought and sold – almost always at a profit.

A vintage bike appears

Doug trained as a teacher, got married, had various classic cars, and became the long-serving principal of Burwood Primary School.

The school had an annual fair to raise money for the Parent-Teacher Association (PTA) and, at one of these, Doug saw a dilapidated but intriguing bicycle – it had turned-down handlebars and the remains of a narrow leather saddle. Doug immediately realised that the bike was a racer from the early 1900s, when cycle racing was immensely popular, and, thinking that it might have an interesting history, he bought it.

The only clue to the provenance of the bike was that some of the fittings were stamped 'BSA', so Doug naturally thought that the bike was a BSA (Birmingham Small Arms) from England. Over the next few years, he bought, or was given, other antique cycles and got to know other interested people. One day one of these rang him and said, "I've just bought a bike called a 'Speedy', and that bike of yours is also a Speedy!" This was electrifying news.

Speedy cycles

Speedy cycles were manufactured in Christchurch by Speedy Cycle Works, at 114 Manchester Street, owned by Jack Suckling. Doug thinks that Suckling probably made thousands of bicycles in the time that he was in business – many of them racers. One of his riders was the celebrated Phil O'Shea, who dominated cycle racing in this part of the world in the early years of last century, winning multiple times in high-profile races in both New Zealand and Australia.

O'Shea had the unique distinction in New Zealand of being known as 'The Champion'. Despite being gassed in World War I, he lived till he was 91. One person who knew him when he ran a bicycle shop on Riccarton Road in the 1950s says that he was a remarkably small man, but that "he must have had a heart like Phar Lap's" to achieve what he did. ►



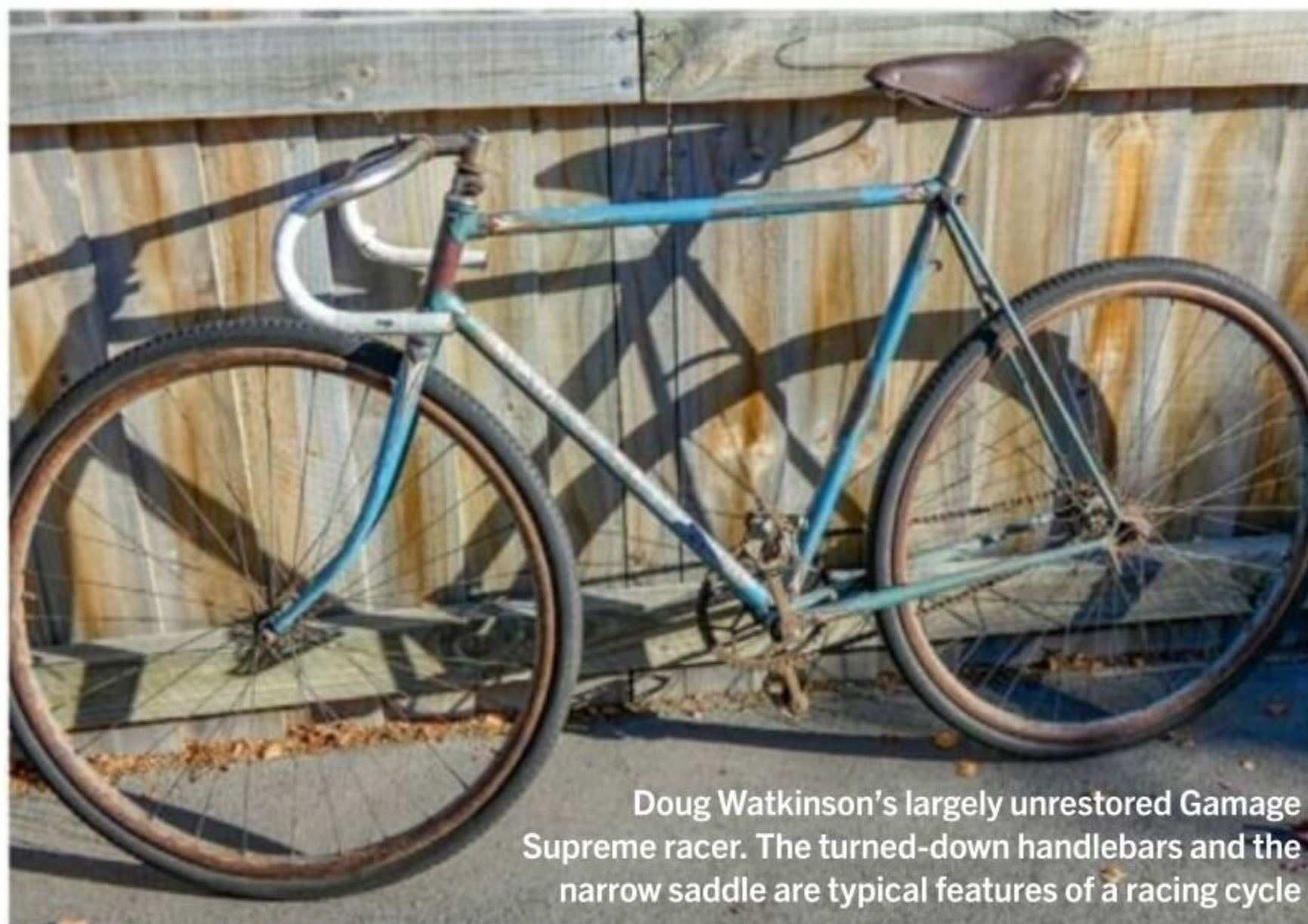
Bicycle wheel rims

The rim of a bicycle wheel has several functions. It has to hold the tyre securely; be strong enough to retain its shape under shock loads; and, usually, provide a surface that the bike's brakes can rub against. The type of brake used determines the general shape of the rim. The bicycle's rubber brake blocks, which use friction to convert moving energy into heat, can act either vertically or horizontally. Rod brakes are pulled vertically against the rim, so a flat surface parallel with the ground is needed. The Westwood rim, named after its inventor, is found on bicycles with rod brakes. It was a strong design, so is often found on wheels with the more powerful hub brakes. Calliper (cable) brakes act sideways, squeezing the rim, so a flat surface is needed on the rim's two outer edges. Endrick rims have this feature, so are used with calliper brakes. The Raleigh company of

Nottingham made a rim that was a combination of the Westwood and Endrick styles. Known as the 'Raleigh Pattern', it has braking surfaces on both the sides and along the inside surface, so is suitable for both rod and calliper brakes. Because of its strength, the Westwood rim was used on carrier (butcher's boy) bikes and was the rim of choice for motor wheels. Pre-World War II bicycles almost always had steel rims, which were either painted or nickel plated. The part of an antique bicycle that deteriorates most rapidly is this steel rim, so replacement 28-inch or 26-inch Westwood rims for classic bikes are sought-after items. There is little point in purchasing retro-style rims if the tyres that fit them are not available. Buying rims and tyres together is a smart move for the vintage bicycle restorer.



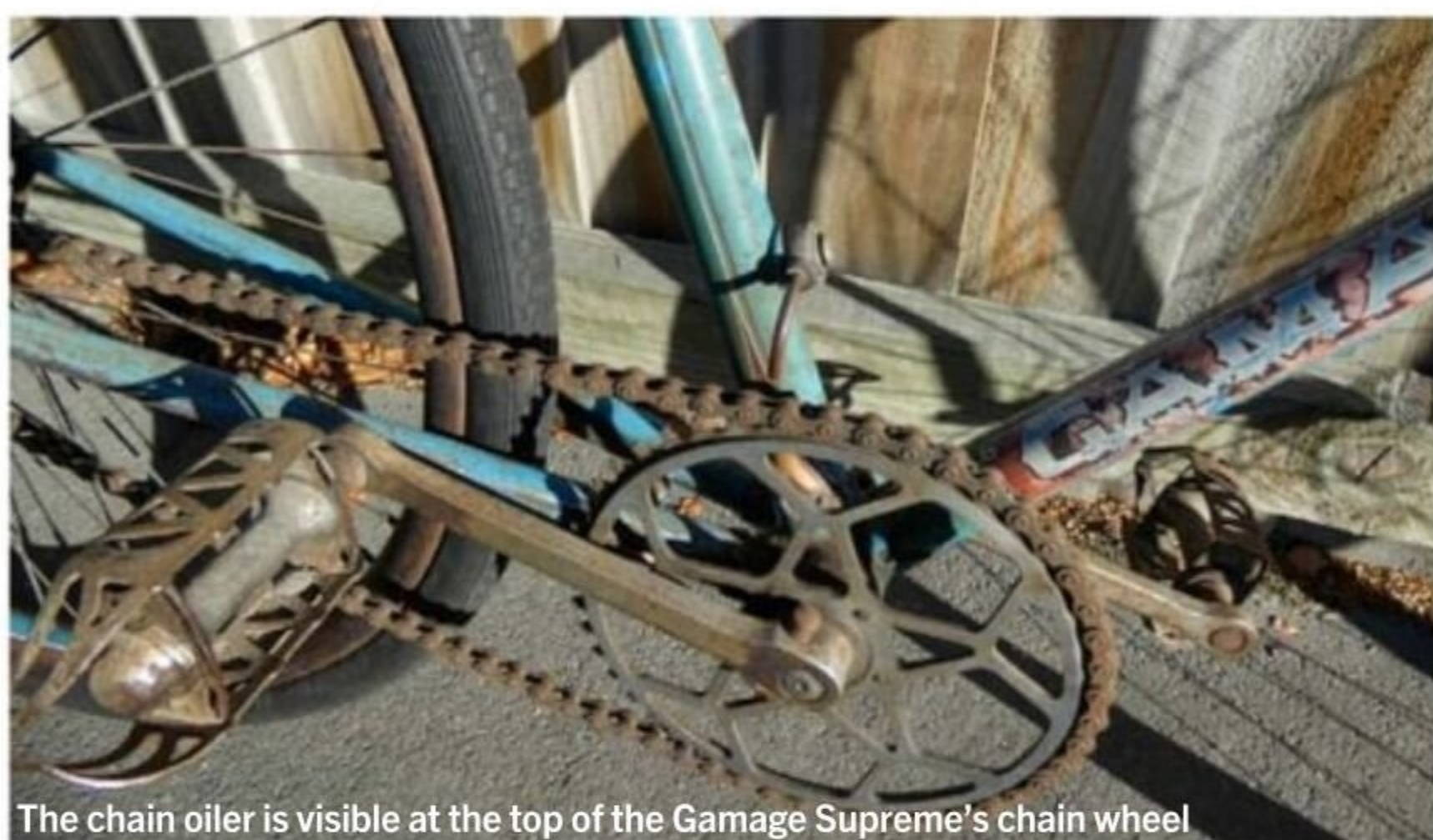
Some bicycle tyre sizes are hard to come by, so it pays to stock up



Doug Watkinson's largely unrestored Gamage Supreme racer. The turned-down handlebars and the narrow saddle are typical features of a racing cycle



A leather racing saddle – built for speed, not comfort



The chain oiler is visible at the top of the Gamage Supreme's chain wheel



The narrow leather racing saddle. The small metal brackets at the saddle's rear are for mounting a tool bag

Serial numbers

Each Speedy had a number stamped on the bracket at the top of the seat tube. These are almost certainly sequential, so it is possible to roughly date a Speedy from its number. Doug's is 573, and dates from 1909 or a year or two before. The nickel-plate finish on the bike had been painted over, so Doug stripped off the paint and had the frame re-nickelled by a firm in Sydenham – a not-inexpensive process, even 30 years ago. He swapped out the bike's fittings for period-correct items and generally restored it.

The frame is made of one-inch tubing brazed into cast steel lugs (brackets) with elaborate perforations or 'cut outs'. The bike has no brakes, no mudguards, and is remarkably light. The wheels are 28x3/8 inches and have Endrick-style nickel-plated rims.

Doug had red 'Speedy' decals made and the bottom bracket (where the axle connecting the pedals sits) is painted

the same colour. It was impossible to tell from contemporary black-and-white photographs what the colour actually was back in the day. He has since seen an unrestored Speedy with an elaborate and appropriately worn decal – almost certainly on the bike since it was new – which was sky blue. So, new decals are being made in the correct colour.

The racing saddle is much later than the bike, so its frame is plated in chrome rather than the nickel that would have been used in 1909.

How many cycles?

At one time, Doug owned six of the nickelled racers. A couple he got from the original, elderly owners, who were able to recall the year that the machines were made. Thus, Doug was able to construct a chronology linking the numbers with the approximate year of manufacture.

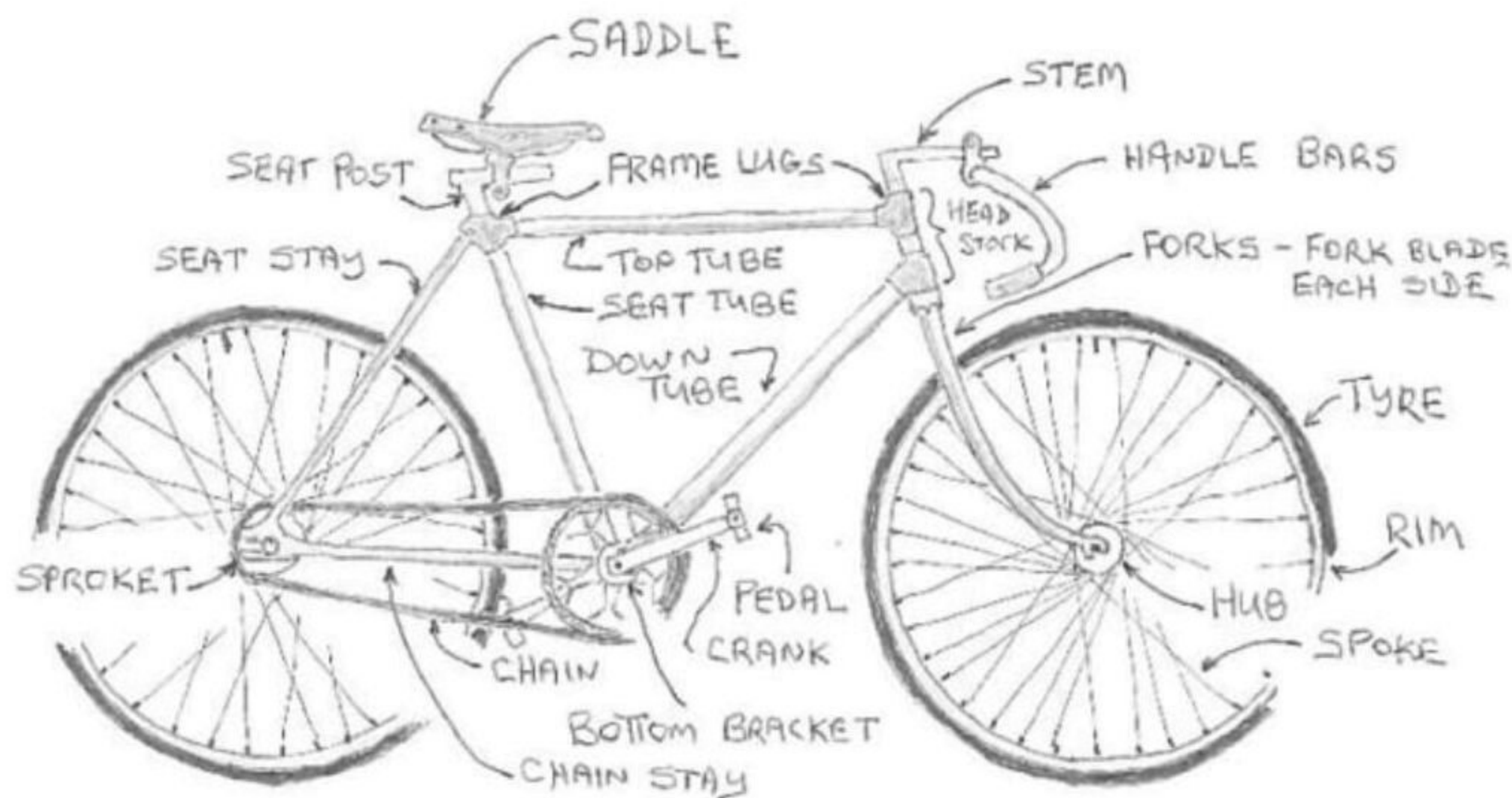
Interestingly, all of Doug's Speedys were the same size: all had 21-inch seat tubes.

Another Speedy owner that I contacted told me that his bike, number 172, was also a 21-incher and was too small for him to ride easily. Perhaps that was the only size that Speedy made, reflecting the small stature of the race riders of a century ago.

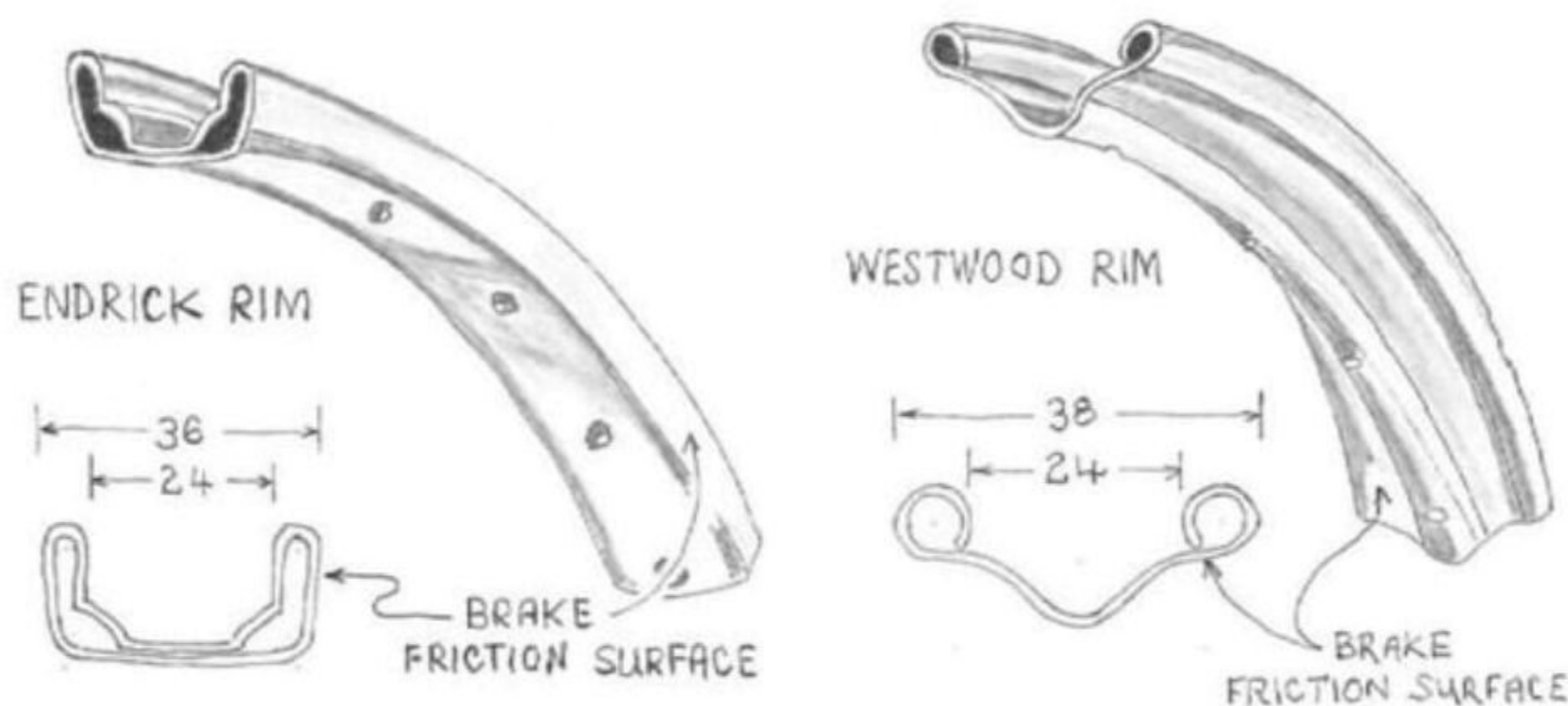
All of Doug's Speedy bikes, except the original, have recently been sold, as he and his wife Frances have moved into a smaller house. Their previous property had a four-car garage with a loft, which Doug says held 50 antique cycles (Frances says that it was more than 100). Almost all of them have also been sold. Folk would call round to pick up a bike that they had bought on Trade Me and go home with several more machines from the collection.

Gamage Cash cycles

As well as the Speedy, Doug has retained a Gamage Supreme, another Christchurch-built racing bike. It was made by the Gamage Cash Cycle Company of



The parts of a bicycle

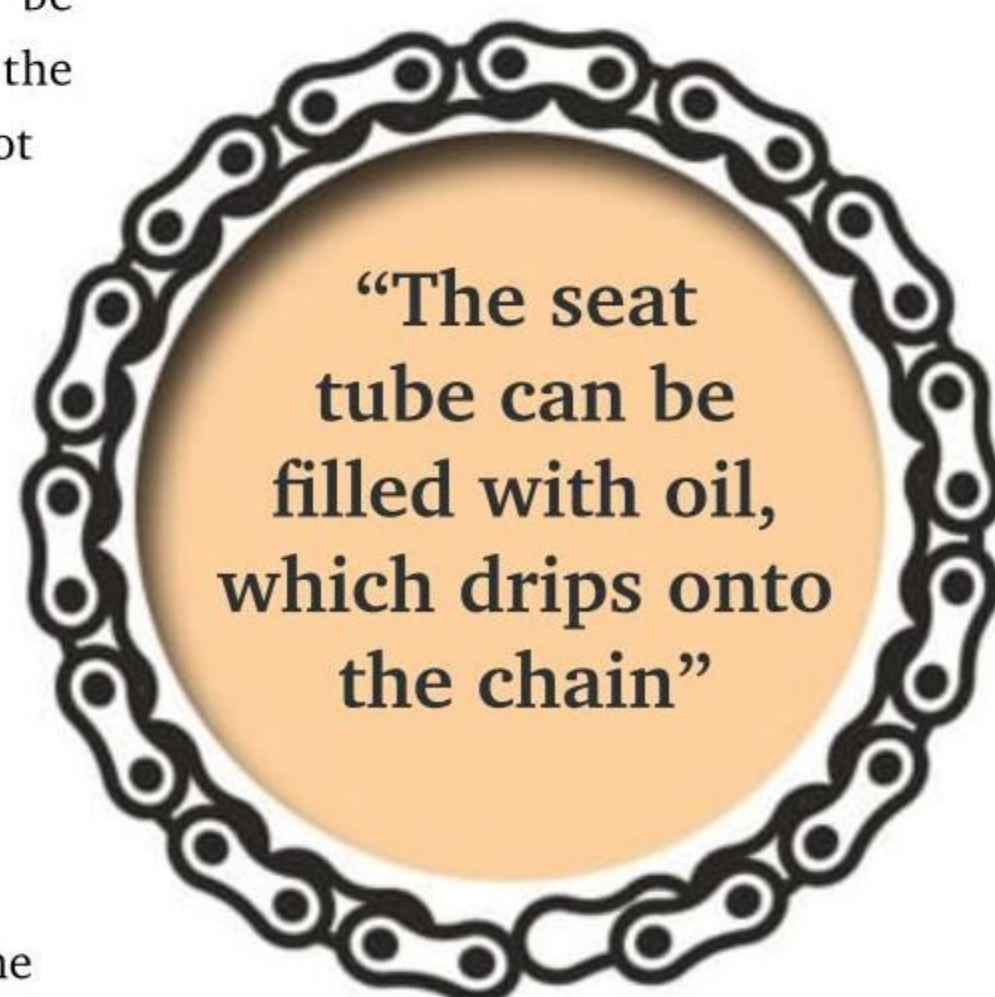


Two types of bicycle rim from the vintage era

High Street, which advertised that it could undersell other bike shops by 25 per cent because it “sold direct to the public”.

The bike has some very interesting accessories. The seat tube can be filled with oil, which drips onto the chain through a small tap and spigot screwed into the bottom of the tube. The glamour road races of Phil O’Shea’s glory days, such as the 100-mile Timaru to Christchurch race, were often on dusty shingle roads, so regular chain lubrication would have been highly desirable.

The rear wheel has two sprockets, one on each side of the hub; one is slightly larger than the other, and both lack a free-wheeling mechanism. A small hook is brazed onto one of the rear forks to allow the chain to be held out of the way when the back wheel is removed to change a tyre or to change the bike’s gearing by changing



The buildings that were once home to the Radiant Transfer Company and then to motorcycling icon John Britten

Water transfers

In Christchurch, the Radiant Transfer Company – which operated out of buildings that, in earlier days, had been the stables of the Gough family’s palatial Fendalton house, Mona Vale – was still in business at the end of the 1960s.

It would be remiss of me to fail to record that the Radiant Transfer Company’s building was the home of iconic motorcycle designer John Britten for many years; his daughter has only recently sold it.

A friend who used to own a classic cycle shop tells me that at one time he had a suitcase full of unused bicycle transfers. They were from more than 100 different businesses and he thought they were printed by Radiant. He remembers that many of them incorporated mythical creatures and gold ink.

Inkjet and laser printers can be used to make water transfers. The image is printed onto special water-slide decal paper and then sprayed with several coats of clear acrylic to waterproof the image.

After the acrylic has dried, the image is cut out of the original sheet and immersed in water for a minute. The transparent top layer of the transfer, which contains the image, is slid off the backing paper onto the bike (or whatever) and carefully smoothed out. The transfer sticks onto the substrate because of the sugar dextrose, which takes a day or so to completely dry. Back in the day, a coat of clear varnish would have covered the bike badges.



The Challenger was built in Nottingham England



One of Doug Watkinson's cycle motors – a Cyclemaster motor wheel

the sprockets being driven.

Racing bike features

The 'drop bars' (turned-down handlebars) are the characteristic feature of racing bikes. The leather saddle is an English Lycett.

The original owner's name – AJ Lancaster – is neatly painted on the seat end of the top tube. Andy Lancaster was a regular competitor in road racing in Canterbury in the mid 1930s. The *Christchurch Star* newspaper records, for example, that he was an entrant in Timaru's 50-mile South Island championship race of 1934, having a handicap of three minutes, giving him little chance of catching the

eventual winner, A Shultz, who started a whopping 15 minutes earlier, with a handicap of 17 minutes. The second place-getter had a handicap of 14 minutes; third place went to a rider who also started off 17 minutes earlier – not a good day for the handicapper.

The rims of the Gamage's wheels are made of laminated timber, possibly beech. Wooden rims are significantly lighter than steel ones. Saving weight in the wheels is even more important than weight reduction in the frame of racing bicycles because the wheels are rotating – which is why modern racers have aluminium or carbon-fibre wheels.

The Gamage came with a second

set of wheels, also with wooden rims, for track work. Wooden rims are still made, although in only tiny numbers. Generally, if you come across an old bike with wooden rims, it probably dates from around World War I and has some racing history.

Velodrome reunion

Just before the banked cycling track at English Park in Christchurch was ripped up in 2002 (having not been used for 30 years), a reunion for past competitors was held to celebrate the velodrome's history.

Doug met survivors of the golden age of road racing at the event, and he later contacted a few of them to see if they were interested in selling their old racers. Some of the old-timers' backyards were dotted with antique cycles.

After the Christchurch earthquakes, residents in the city's red zone had to leave their homes. Several people who were in this situation and who owned antique bicycles contacted Doug because they knew that he was a collector.

They would say, "There are a few old bikes behind the shed that you can have if you want them, because we have to leave."

Doug visited them all and took away



The Challenger's headlamp



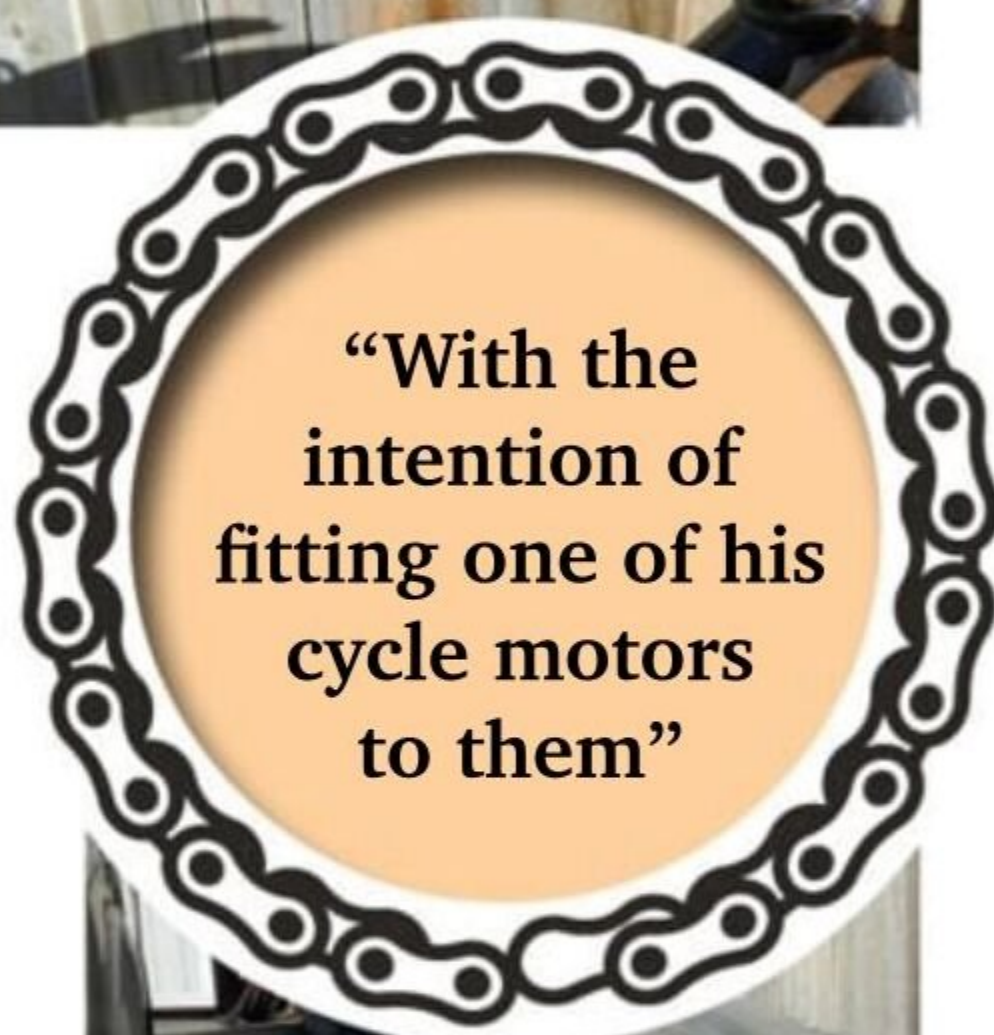
Elaborately sprung saddle on the Challenger bicycle



The Challenger's elaborate chain guard which was designed to stop oil from the chain getting on the rider's clothing



The top tube—mounted quadrant shifter for the Sturmev-Archer three-speed hub gears



“With the intention of fitting one of his cycle motors to them”

the ancient machines. Some had been engulfed in ‘liquefaction’ (underground sand, mud, and water forced to the surface by earthquakes) and had suffered severe deterioration, so were only good for parts; many had an interesting history that was known to the folk giving them away.

Vintage mopeds

Doug is also interested in thoroughbred touring cars and for many years was secretary of the Canterbury branch of the Vintage Car Club of New Zealand.

Mopeds (motor + pedal = moped) are where cycling and petrol engines intersect. Doug has just given up organising the branch's annual outing for vintage mopeds and motorised bicycles. It is not unusual for vintage car or motorcycle owners also to have one or two motorised bicycles. In addition to antique signs for cars, lubricants, spark plugs, and petrol, some people decorate their garage walls with bicycle motors – BSA Winged Wheels are a particular favourite.

Doug has retained a couple of 1950s roadster bikes with the intention of fitting one of his cycle motors to them. He has two Cyclemaster motor wheels. These 32cc two-strokes were made in Byfleet,



A typical 1930s roadster bicycle with bell, mud and chain guards, and a lighting system



Bicycle decals

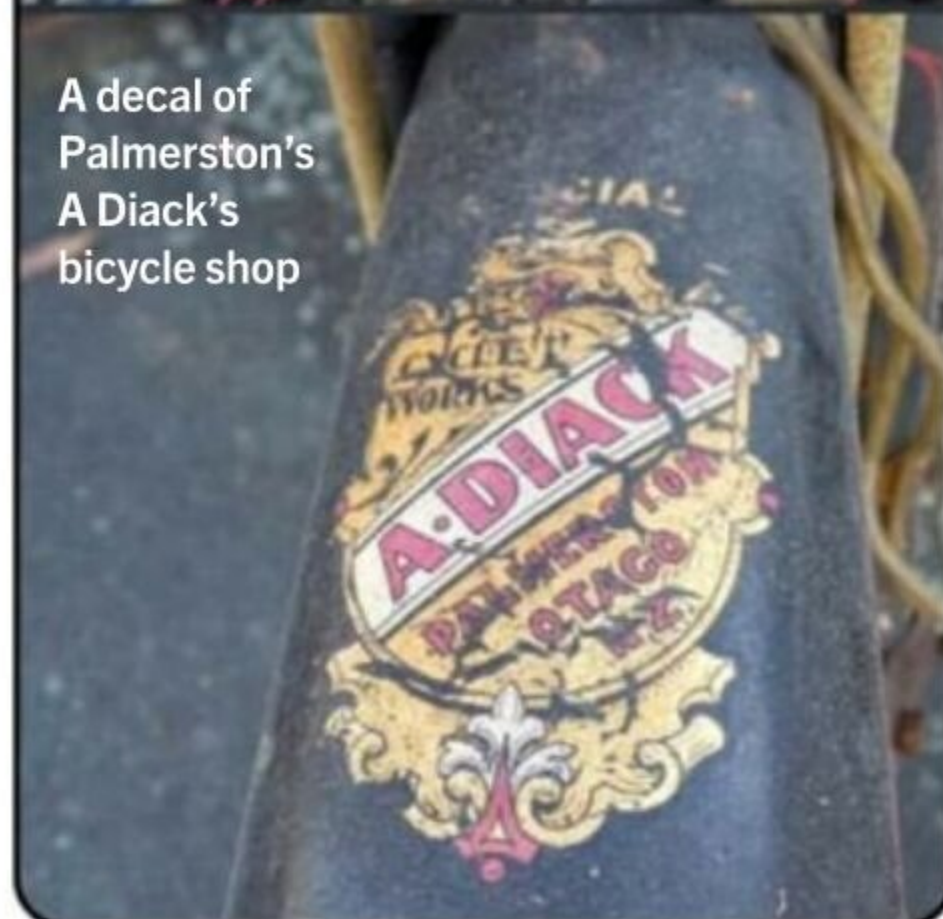
The end pages of Jonathan Kennett's book *The Bikes We Built* show some of the New Zealand bicycle badges recorded by photographer Shane Price; many were from Christchurch bike shops.

Doug Watkinson's Nottingham-made Challenger, which probably dates from the 1930s, sports several water transfer badges. One (on the rear guard) is from A Diack of Palmerston, New Zealand, another (on the chain guard) is from Davis & Prentice Ltd of Invercargill, New Zealand; the comparatively simple “Challenger, Nottingham, England”, is on the bottom tube.

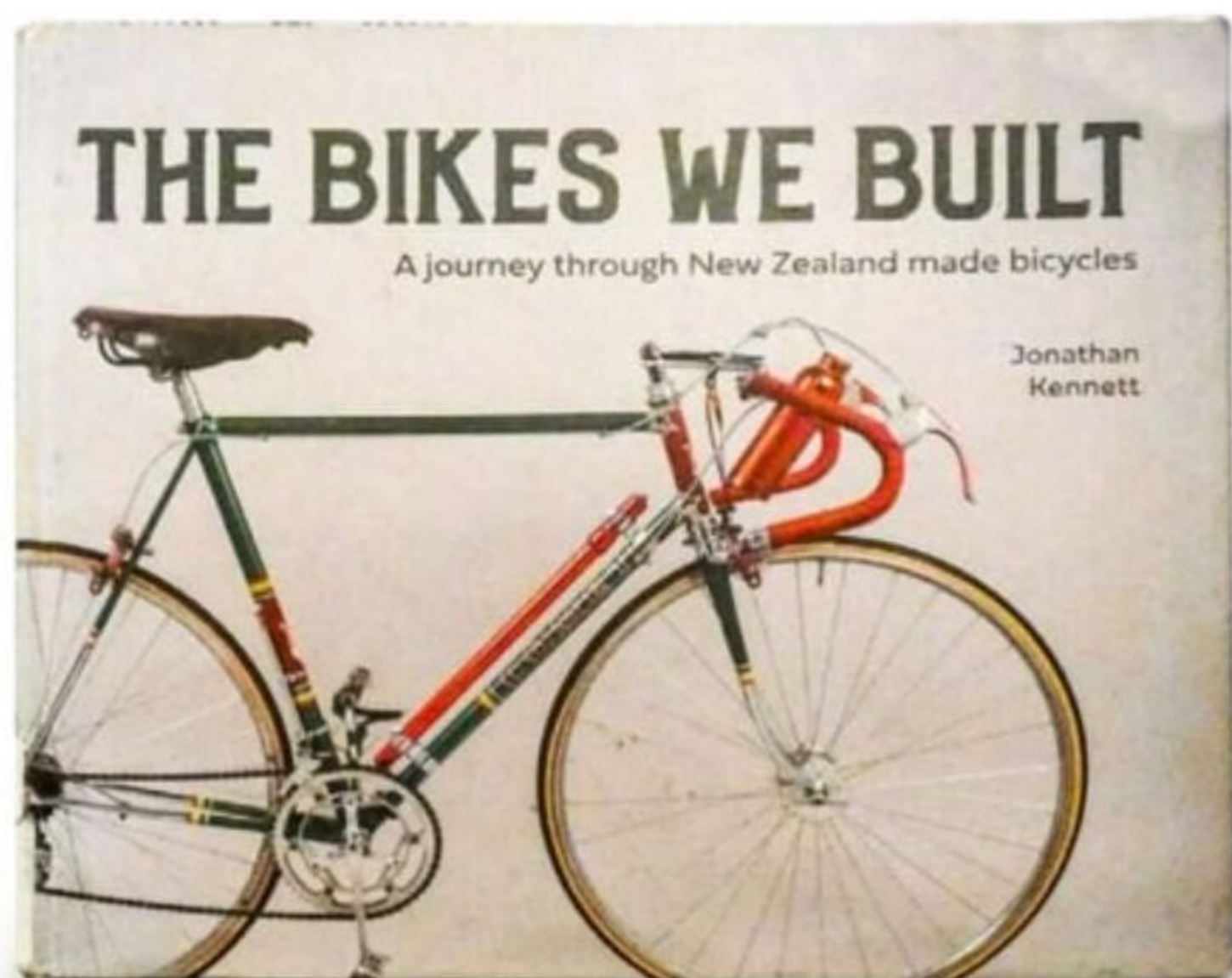
These badges are like heraldic crests. The Challenger badge probably indicates the maker. “A Diack” is probably the business that originally sold this bike new. Davis & Prentice Ltd presumably sold it as a second-hand machine. Or maybe one of the bike's owners simply applied the badges, virtually at random, just because he had access to the transfers.



The manufacturer's decal on Doug's Challenger bicycle



A decal of Palmerston's A Diack's bicycle shop



Two of Doug Watkinson's bicycles are featured in Jonathan Kennett's book

Surrey, England, by the giant EMI conglomerate from the early 1950s, with production ceasing in 1958.

The neat units feature an integral fuel tank, which means that fitting them to any full-size bicycle is just a matter of replacing the bike's rear wheel with the Cyclemaster wheel and attaching the throttle to the bike's handlebars. The unit also incorporates the rear brake. The wheel's rim is beefier than is usual to cope with the surge of the motor.

Doug also has a Trojan Mini-Motor, which is a type of cycle motor known as a 'clip-on'. Clip-ons propel the bicycle by a rotating shaft driving the front or rear wheel tyre using friction.

Books on bikes

Both Doug's Speedy and his Gamage Supreme feature in Jonathan Kennett's very attractive 2021 book *The Bikes We Built*, which describes 60 bicycles that were built in New Zealand between 1869 (yes, 1869!) and 2021. Kennett is a prolific writer of bicycling books and has also written a biography of Phil O'Shea called *Wizard on Wheels*.

Bicycle manufacturing was a fairly large industry here in the 1960s, '70s, and '80s. The tube was made by Steel and Tube from steel smelted by New Zealand Steel from iron sand extracted from the North Island's west coast. In 1984, the combined production of the Healing, Morrison, and Cyclemakers factories was getting on for 1000 bikes a day in more than 50 styles.

Like many parts of the New Zealand economy, these companies couldn't compete with imports produced using much cheaper labour. When import restrictions were abandoned, and tariffs on imported cycles drastically reduced – in what Jonathan Kennett describes as the “economic revolution” of the late 1980s”, domestic bicycle making didn't survive long.

Many of the mass-produced bicycles described in *The Bikes We Built*, such as the Morrison Raleigh 20 and the Healing Loline – two of my favourite bikes – will be familiar to readers of *The Shed*. Visiting a cycling enthusiast like Doug Watkinson makes me want to oil the hubs and check the tyres of my motley collection of grids.



Prolific designer Vincenzo Piatti tinkering with one of his Mini-Motors

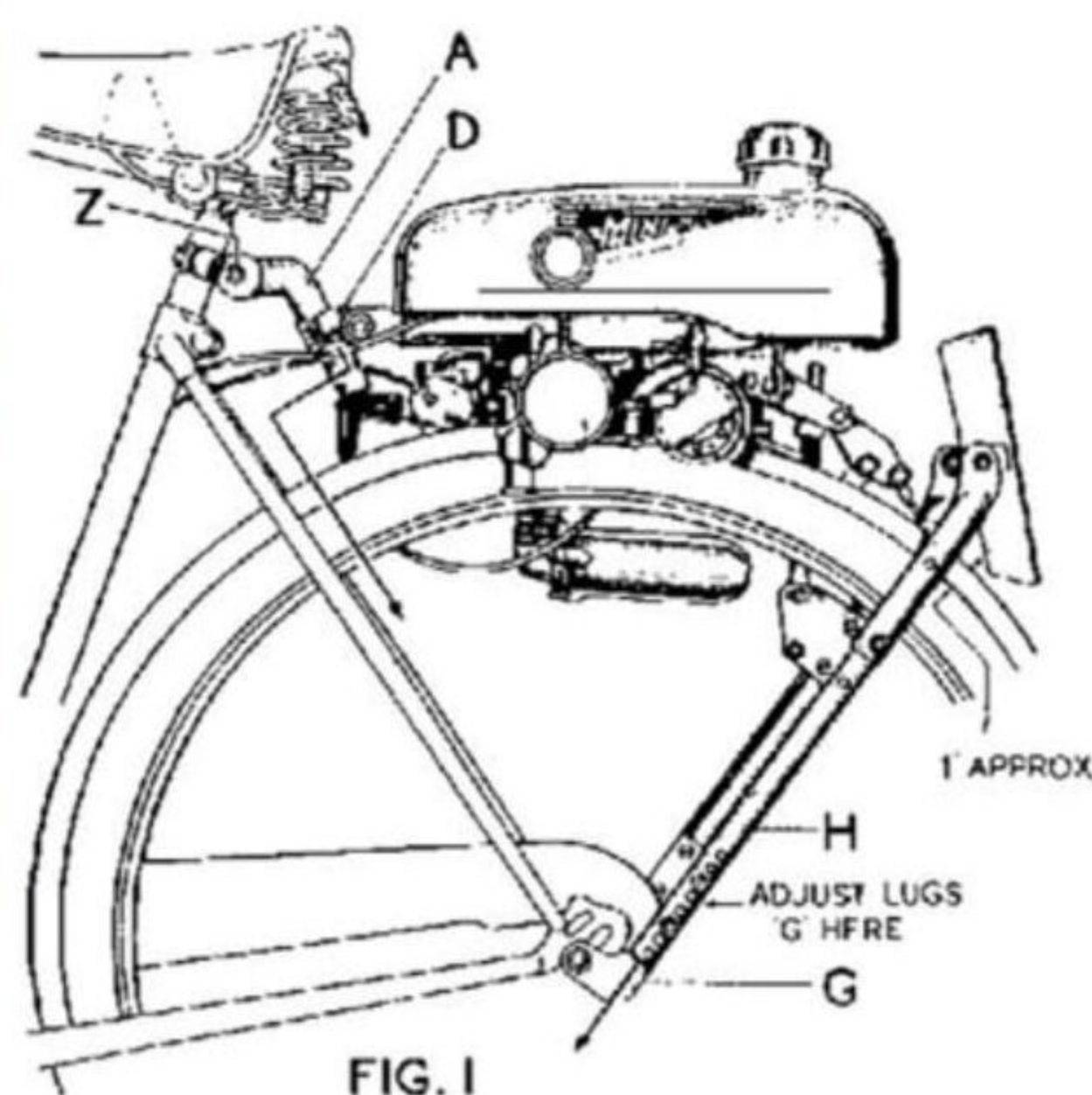
CYCLE MOTORS

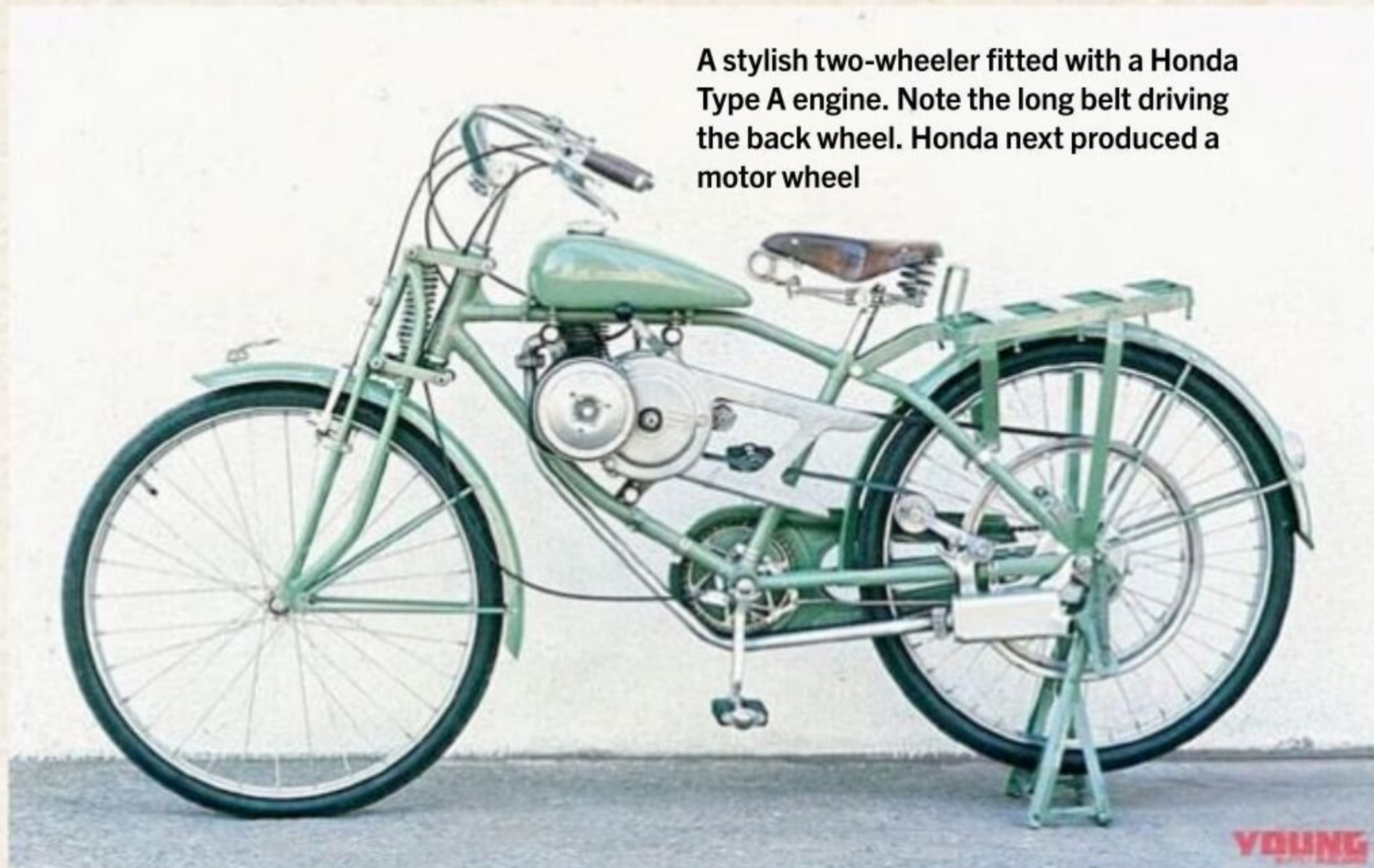
In the first couple of decades after World War II, European countries that had been involved in the conflict had some common features. One was that there was a huge amount of work to do, and another was that the workers were not well paid.

Workers often had to travel significant distances to work in the new factories, but there may have been no public transport and the few cars for sale were expensive. Bicycles were the usual solution.

Small motors that made the bicycle much faster and better able to cope with strong winds and hills were a popular accessory.

A diagram from the Mini-Motor installation manual





A stylish two-wheeler fitted with a Honda Type A engine. Note the long belt driving the back wheel. Honda next produced a motor wheel

A contemporary ad for Trojan's Mini-Motor



These cycle motors came in two main types: motor wheel and clip-on. The motor wheels replaced the original rear wheel; clip-ons were bolted to the frame and powered a roller, which was in contact with the tyre of either the front or rear wheel.

Motor wheel manufacturers

One common make of motor wheel was Cyclemaster; another was the Winged Wheel, made by BSA. Both were manufactured in Britain.

The Winged Wheel had a separate petrol tank, which was mounted above the back wheel, while the Cyclemaster's was lower, near the

hub of the back wheel.

Clip-ons sat in a frame over one of the bicycle's wheels and drove it by friction. They were cheaper than motor wheels but less efficient – especially when the road was wet, as the driving cog could slip on the wet rubber of the tyre.

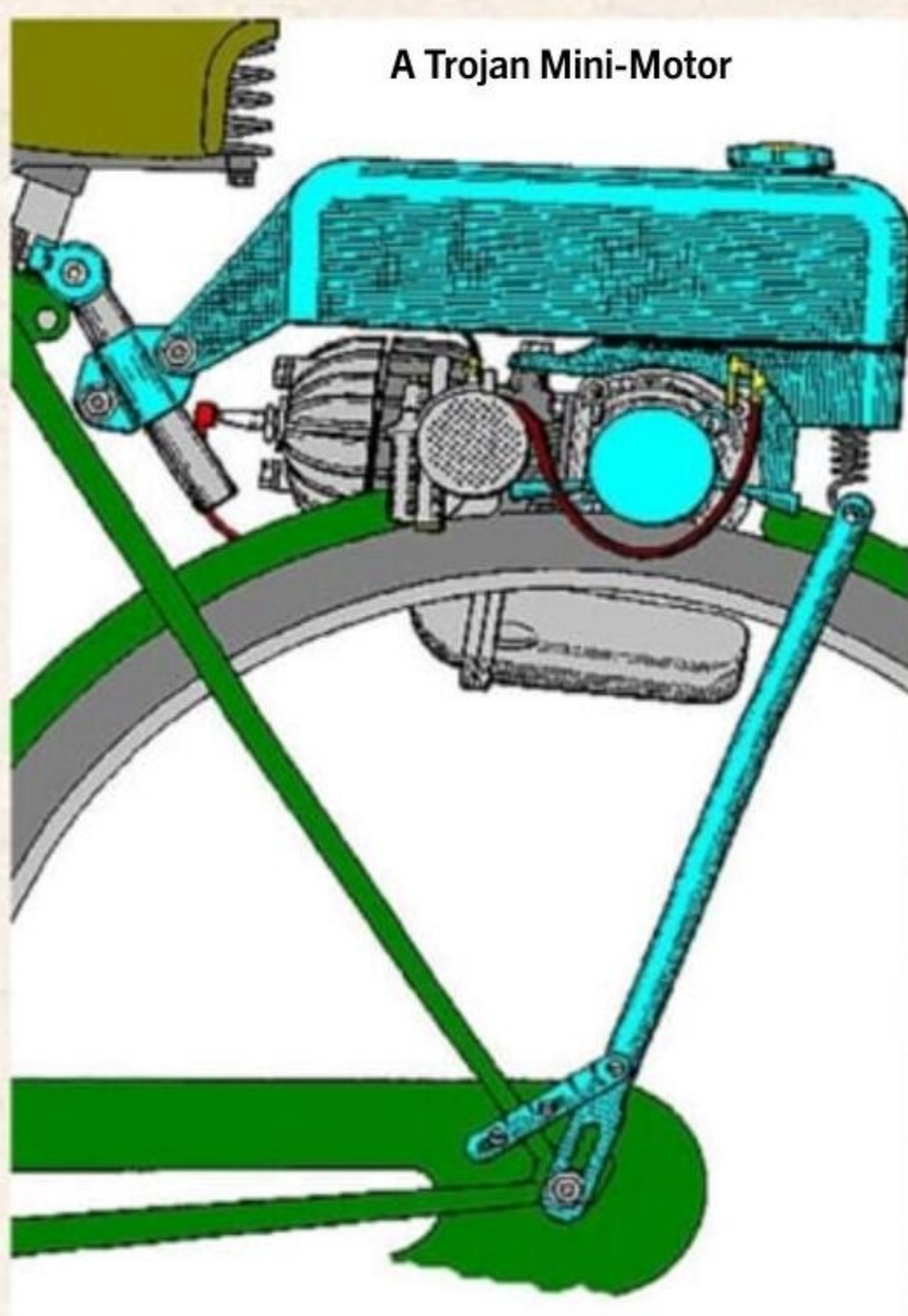
The Mini-Motor clip-on was designed by the Italian engineer Vincenzo Piatti. It was made under licence in England by Trojan, and it is estimated that more than 100,000 had been made by the time production ceased in 1958. It was labelled as a 'Gearless Cycle Outboard'. A French version was also produced.

First Japanese cycle motor

The first product of the Honda Motor Company, now known as the 'Type A' engine, was a clip-on that drove a bicycle's back wheel by belt.

The 50cc rotary-valve two-stroke's design was based on that of a Japanese army radio generator and was produced from 1947 to 1951. The company's second

"More than 100,000 Mini-Motor clip-ons had been made by the time production ceased in 1958. It was labelled as a 'Gearless Cycle Outboard'"



Another Vincenzo Patti design. At least one made it to Christchurch

“Scooters, such as the Italian Vespa or the New Zealand-assembled NZeta, had swept all other two-wheel types into the dustbin of history”

At the front, a full-width door; at the rear, a large “wrap-round” window. Other details shown in the rear view are the external filler-cap and the lift-up tail cowling which gives access to the transmission and carburettor.

A Trojan 200 bubble car. It was a Heinkel Kabine built under licence. Seven thousand or so were built between 1960 and 1965. Heinkel was a German plane-maker that made the first jet-engined fighter but turned to micro-car and scooter manufacturing after World War II

One of Doug's Mini-Motors



A cycle motor petrol tank. The Morris Cycles decal is probably from one of the very many Christchurch bicycle shops



product was the Cub F. This was also a cycle motor, but, very interestingly, it was a motor wheel not a clip-on.

As economic conditions improved, workers could afford more stylish transportation, and sales of the cycle motors declined. Mopeds such as the French VéloSoleX, whose engine was mounted in front of the head stock and drove the front wheel by friction, and the Cyclemate, made by Cyclemaster, were increasingly popular.

By the 1960s, motor scooters, such as the Italian Vespa or the New Zealand-assembled NZeta, had swept all other two-wheel types into the dustbin of history, and the manufacturers of cycle motors either went broke or moved onto more sophisticated products.

For a short time, Cyclemaster made the Piatti S 125 – also designed by Vincenzo Piatti – which resembled a sausage on wheels. One writer thought it was the “worst scooter ever”.

Trojan, maker of the Mini-Motor, moved on to make small motorcycles. In the wake of the Suez Crisis of 1956 (which resulted in severe shortages of petrol in the UK), the company made a three-wheeled bubble car called the ‘Trojan 200’. This was a Heinkel Kabine built under licence between 1960 and 1965. After that, Trojan built McLaren Elva racing cars. 🏎️



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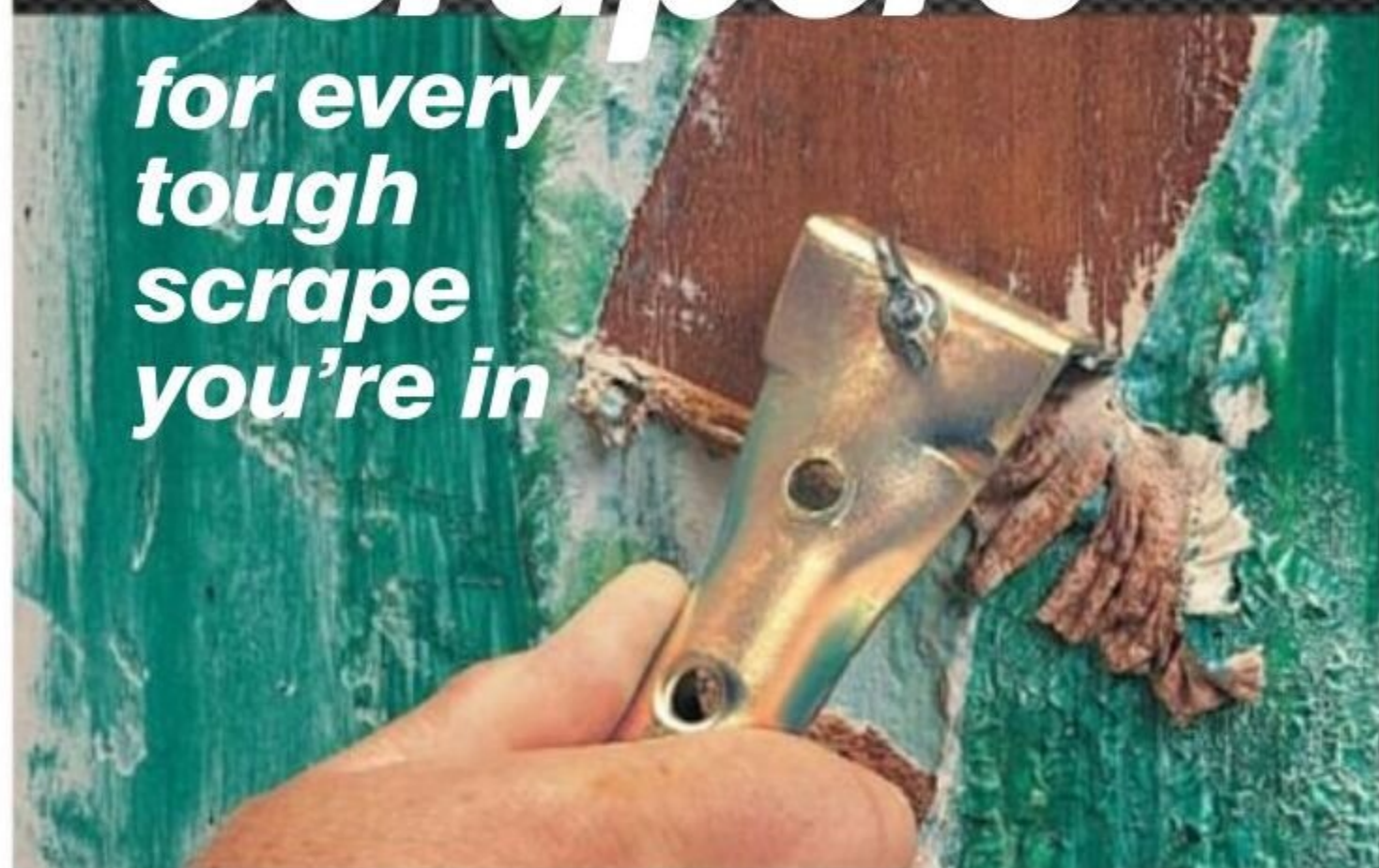
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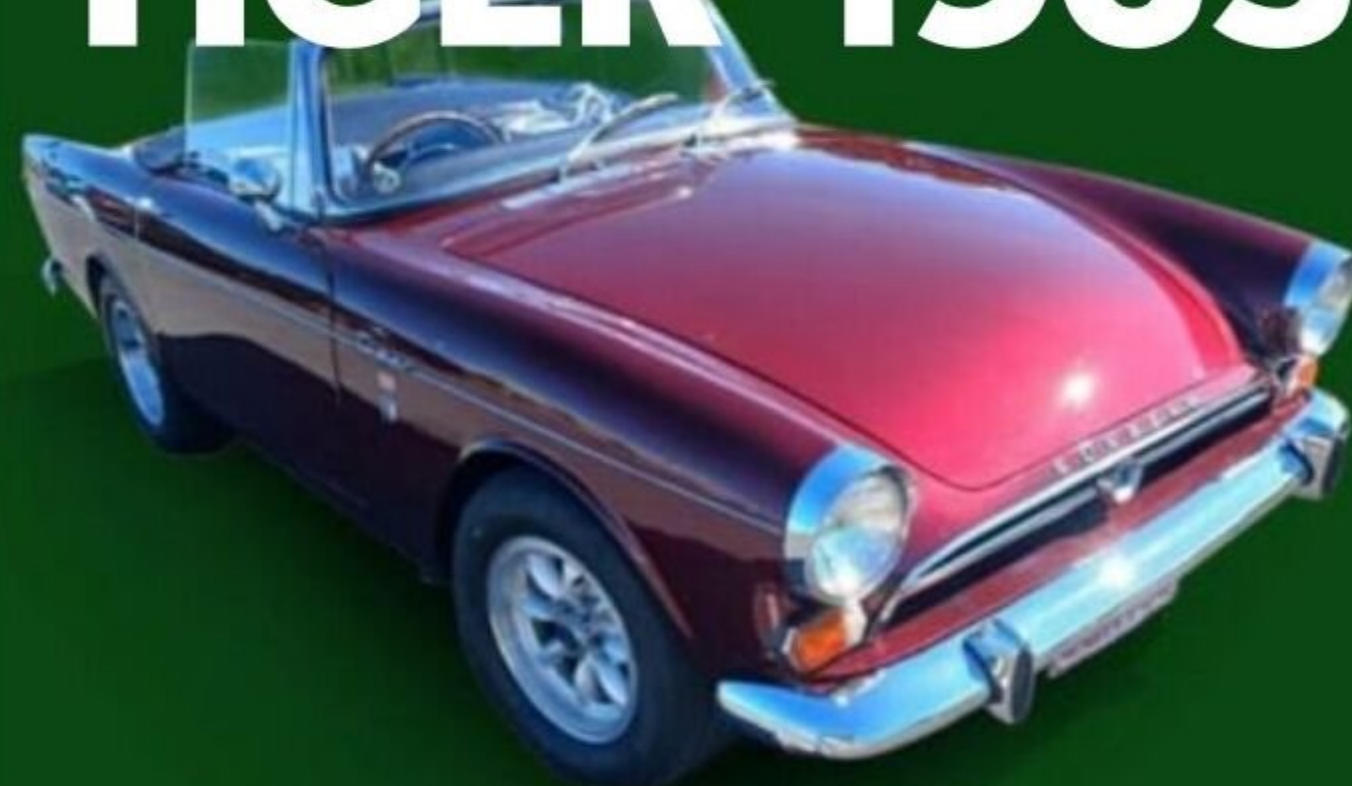
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RESURGENCE IN POPULARITY FOR TIMELESS PASTIME

Play your heart out on a multitude of pinball machines at YOPS, or take a machine home with you; the choice is yours

Nestled in the heart of Wellington, New Zealand, Ye Olde Pinball Shoppe (YOPS) is more than just a pinball arcade and bar – it's a community hub for pinball enthusiasts and casual players alike.

Founded by Hamish Guthrey, a passionate pinball aficionado and former home entertainment systems expert, YOPS seamlessly blends the charm of retro pinball with modern technology, creating a unique and immersive experience.

Since opening its doors over three years ago, YOPS has grown into a vibrant gathering place, hosting regular tournaments and events that transform pinball into a competitive and spectator-friendly sport. With approximately 24 machines on site, ranging from classic titles to innovative newcomers such as *Labyrinth* and *Pulp Fiction*, the arcade offers something for everyone.

Follow the action from home

The integration of large screens and

multi-angle camera set-ups above each machine allows spectators to follow the action, whether in the arcade or via livestreams from the comfort of their homes. This cutting-edge approach has positioned YOPS as a leader in marrying traditional gameplay with modern viewing experiences.

Beyond its role as an arcade, YOPS doubles as a showroom for Multimorphic and Barrels of Fun pinball machines, offering New Zealanders the chance to bring the excitement home.



As the country's exclusive distributor of high-demand machines such as *The Princess Bride* and the aforementioned *Labyrinth*, YOPS has tapped into a niche market of high-value family entertainment. This dual role as an entertainment venue and sales hub underscores its innovative business model.

YOPS caters for everyone

The community-focused ethos of YOPS is evident in its diverse offerings, from corporate hire packages to free-play nights that cater for families, friends, and competitive players. The arcade's welcoming atmosphere draws a multigenerational crowd, with middle-aged patrons reliving their youth alongside skilled young competitors.

Despite challenges such as high shipping costs for machines and parts, YOPS continues to innovate. Plans to introduce QR-code payment systems and high-tech tournament set-ups reflect Hamish's commitment to staying ahead of the curve.

For Hamish, YOPS isn't just a business; it's a labour of love. His vision of celebrating pinball's nostalgic charm while embracing modern advances ensures that YOPS remains a cornerstone of Wellington's entertainment scene.

With its blend of community, competition, and cutting-edge technology, YOPS is likely to keep the timeless thrill of pinball alive for generations to come. 🎮

To find out how to purchase your very own pinball machine, turn to **page 39**.



THE Shed

QUIZ NO. 1

You've got a shed, and you know how to use it – but do you really understand how everything works? Test your sheddie knowledge here

1



What two metals is solder an alloy of?

- (a) Aluminium and lead
- (b) Tin and lead
- (c) Brass and lead

4



What gas is commonly used when TIG welding?

- (a) CO₂
- (b) Argon
- (c) A mixture of nitrogen and CO₂

2



At what temperature does solder melt?

- (a) 180°C to 190°C
- (b) 150°C to 160°C
- (c) 130°C to 140°C

5



What is the tool shown in the picture?

- (a) A very coarse file
- (b) A gasket-removing tool
- (c) A thread-restoration tool

3



What does the welding term 'TIG' stand for?

- (a) Tungsten inert gas
- (b) Timed impulse governed
- (c) Thorium inside grounded

6



What common liquid is a good cutting lubricant to use when drilling aluminium?

- (a) Kerosene
- (b) Water
- (c) Nail polish remover

7



What problem arises if you tighten stainless-steel nuts and bolts without a lubricant?

- (a) They squeak when shaken
- (b) They become magnetic
- (c) They stick together and cannot be undone

8



How much is a 'thou' (or 0.001 of an inch) in metric measurement?

- (a) 1.00mm
- (b) 0.400mm
- (c) 0.025mm

9



Galvanised steel has been coated with what?

- (a) Zinc
- (b) Lead
- (c) Tin

10



What is the tool in the picture?

- (a) A tool-makers clamp
- (b) A brake-hose shut-off tool
- (c) A craniometer

How many questions did you get correct?



Answers

1. (b) Tin and lead – usually in the proportion of 60 per cent tin and 40 per cent lead
2. (a) 180°C to 190°C
3. (a) Tungsten inert gas; this is because of the tungsten electrode used. The electrode arcs to the metal of the item being welded but does not melt. A filler rod is manually applied to add metal to the weld
4. (b) Argon; this can be used for stainless-steel, steel, and aluminium welding
5. (c) A thread-restoration tool; this is used like a file to repair bruised threads
6. (a) Kerosene – it makes a big difference, not only when drilling but with any aluminium cutting, especially tapping
7. (c) They stick together and cannot be undone. This is because of a process called 'galling', whereby the thread surface of both nut and bolt bind together when rubbing tightly across each other. This occurs at a molecular level, and it is often referred to as 'cold welding'. It is recommended to use an anti-seize lubricant on all stainless-steel fasteners
8. (c) 0.025mm – to be precise, it is 0.0254mm; the conversion factor for converting a decimal inch size to millimetres is 25.4
9. (a) Zinc
10. (a) A tool-makers clamp – this is particularly useful for holding metal material when machining. It is more likely to be found in a tool-making workshop than anywhere else due to the intricate work that tool-makers perform. (By the way, a craniometer is used to measure the size of a person's head!)



In a world in which we are constantly inundated with information, *The Shed shrink* urges us to practise listening to our gut feeling when deciding what is true and what is not

By Mark Seek | markseek@rocketmail.com

I'd like to talk about intuition – or, in layman's terms, gut feeling. I recently asked myself whether intuition is still relevant for me and whether it is as reliable in our daily lives today as it may have been in the past.

I came to the conclusion that, yes, it most definitely is relevant – especially when we need to decide whether what's in front of us is real or fake. Considering that people in the Western world have become consumers of mass information and gluttons for instant knowledge, how helpful it would be if we had an innate ability to understand the rights and wrongs of something instinctively, without the need for conscious reasoning. So, ideally, having the skills and abilities to decide whether information is credible is our responsibility.

This is a unique opportunity to tune into our human intuition.

Look at these stats

Following are some statistics from Jefferson Bethke's book

To Hell With the Hustle – a reputable source, obviously.

- Five quintillion bytes of data are created every day.
- Only 0.5 per cent of all data is ever analysed or used.
- Every two days, we develop as much information as we did between the dawn of civilization and 2003.
- By 2020, 1.7 megabytes of new information were being created every second for every human on earth.

Can you even wrap your mind around those statistics? The amount of data we consume in a day would probably have been a person's lifetime's worth in 1574.

Psychologists believe that intuition relies on the powers of pattern matching; I was not aware of that! Experts say that the mind combs experiences of similar situations stored in its long-term memory banks and presents in-the-moment judgements based on those. This automatic information processing that underlies intuition can be seen in everyday

situations. An example, known as 'highway hypnosis', can be when a driver travels for miles without consciously thinking about the actual activity of driving the car.

My highway hypnosis

My version goes something like this: I am chugging along aboard my old Royal Enfield; I get the sense that I have been transported through some kind of time portal, most likely triggered by the melodic primitive sound of the 350cc single-cylinder thumping away beneath me. This, combined with the aroma of oil and fuel, gives me the nostalgic impression that I'm riding along country roads in the 1950s. Obviously, that's fake. Often, once I arrive at my destination, I am unable to recall every twist and turn in the road.

In relationships, gut feelings are handy. I'm sure we've all had those experiences when, for no apparent reason, we feel that somebody is deceiving us or a situation makes us feel uneasy. ►

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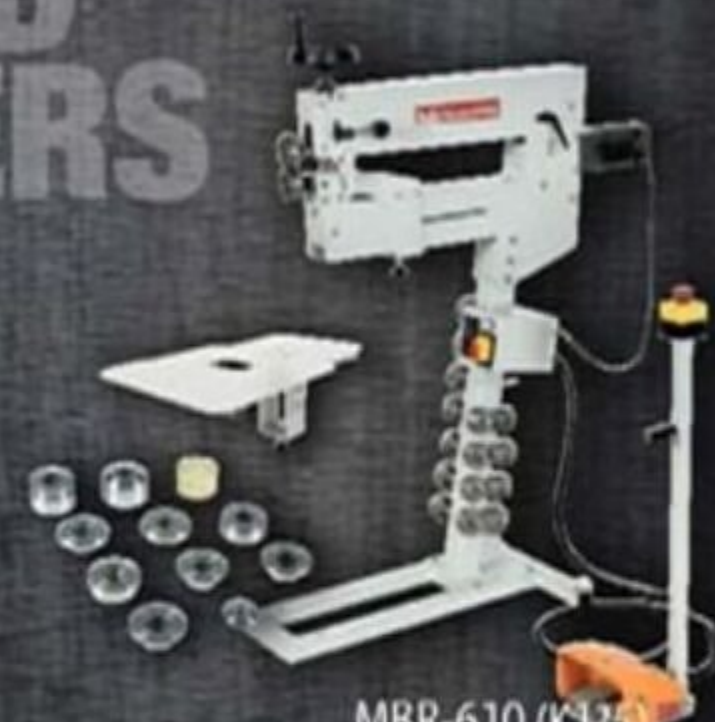


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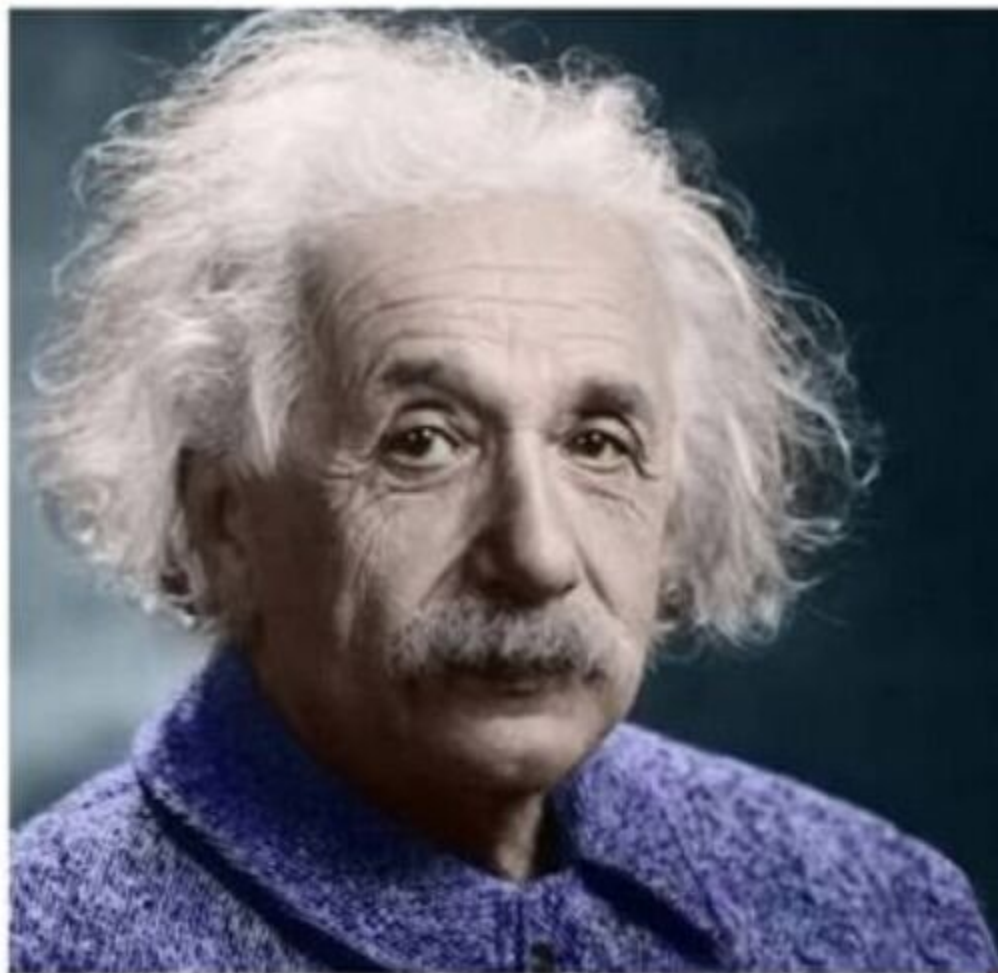
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“The intuitive mind is a sacred gift and the rational mind is a faithful servant. We have created a society that honours the servant and has forgotten the gift” – Albert Einstein

First impressions

So how do gut feelings relate to first impressions? Intuition, like first impressions, serves the brain's need to predict and prepare for what will happen next.

First impressions are rapid, holistic assessments of people based on subtle perceptual cues and judgement of intent to help or harm (a little bit like trick or treat). Is that child standing in my doorway dressed as a serial killer going to snatch my cat? Or is it an innocent little darling who just wants a bar of chocolate?

These perceptions rely on automatic processes and rapid evaluation systems.

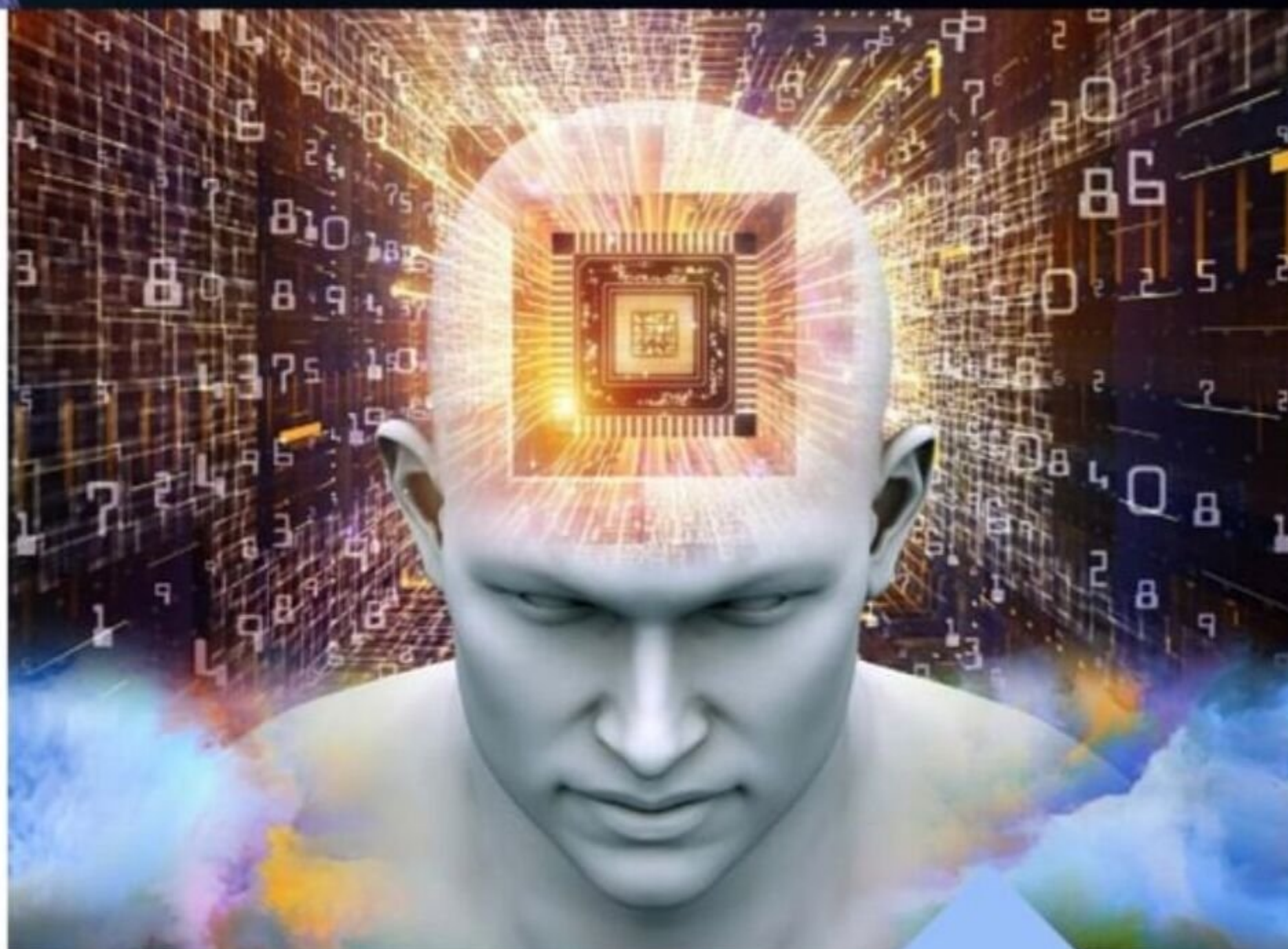
However, emotions can be deceptive and are not always foolproof; they may result from biased previous experiences.

Using my intuition

I recently employed my skills as an intuitive counsellor without being consciously aware that that was what I was doing.

I was at a meeting where most of the participants were not familiar to me. I found myself watching body language, facial expression, and reactions to the topics that required a response. I was using my intuition to gather information on each of the group members.

One person shared some personal experiences, as the group was a safe space for people to talk openly. At the completion of the meeting, I was able to pass a book on to this person. I had a 'gut feeling' to lend it to them; in fact, I felt almost compelled to give it to them, and I'm glad I trusted my intuition. I spoke with the person in question some days later, and was told that the book had provided much-needed comfort.



I had used my intuition, or gut feeling. Sometimes this skill appears as a voice in my head – yes, I know what that sounds like, but that's the only way I can describe it to you.

Maybe you have applied intuition in dealings with your children or a co-worker. It's about trusting your instincts with the ability to read a situation and make a good evaluation of it, when you are deciding whether or not you are willing to engage.

Positive outcome

When we do this, it increases the potential for a positive outcome.

As humans, if we refrain from exercising physically, the outcome is that we get lazy. I liken that scenario to our brains too. We need our intuition to be stimulated or we will lose it. If we disregard something for long enough, it becomes redundant.

How we interface with the latest trend in technology, artificial intelligence

“People in the Western world have become consumers of mass information and gluttons for instant knowledge”

(AI), will become a real challenge for many, myself included. But one thing that AI has not mastered – as far as I am aware – is emotional intelligence (EI). A computer or a robot will not have intuition and is unlikely to be able to be developed with EI. Thank God for that!

Intuition and EI are human qualities, and we should remind ourselves that these unique parts of our make-up have a purpose and, with practice, can be relied on to improve our interactions with each other and ultimately reduce worry, anxiety, fear, and dread. 📖

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HONDA'S GAME-BREAKER – 1977 HONDA CIVIC

Having dominated the world motorcycle championships of the 1960s, Honda had a crucial decision to make in 1969. Would Soichiro Honda heed his engineer's pivotal advice?

Very few examples of the early Civic – a car that set Honda on the path to becoming a giant of the car world – remain road-registered in New Zealand.

The retired Tauranga owner of this example, Graham Inglis, is thrilled with his classic little Honda Civic – the first of 11 generations built so far by the company. The Civic became a household name.

"It's quite amazing the number of people who not only wave but come up to me in the street and tell me how much they like the little Honda and its colour," says Graham, "and then they want to start talking about it. A guy in our vintage car club wants to buy it; he has been pushing me a bit, but it's not for sale!"

ALSO FEATURED IN THIS LATEST EDITION:

1959 Cadillac Coupe de Ville; 1977 Ford Falcon panel van; restomodded Austin A30; Commonwealth Games Holden Kingswood; restoring English classic cars; car museums to visit; scores of events to enjoy this summer; and much, much more.

See classiccar.co.nz for a complete and illustrated content rundown of what's in this summer holiday edition.

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TEACH YOUR CHILDREN WELL

This might be the most important skill of all

By Murray Grimwood | Photographs: Murray Grimwood

Recently, I've spent some time passing skills on to young folk. On reflection, I've been doing that for years, but the need has never seemed more pressing, more urgent, and perhaps that makes me more aware of the process.

It is an interesting tightrope walk; not running a guilt trip (nothing is their fault) but gifting knowledge and abilities that we think they might need in a troubled future.

Beginnings

It started decades ago when I was a supervisor in a government soak-up-the-unemployed 'work scheme'.

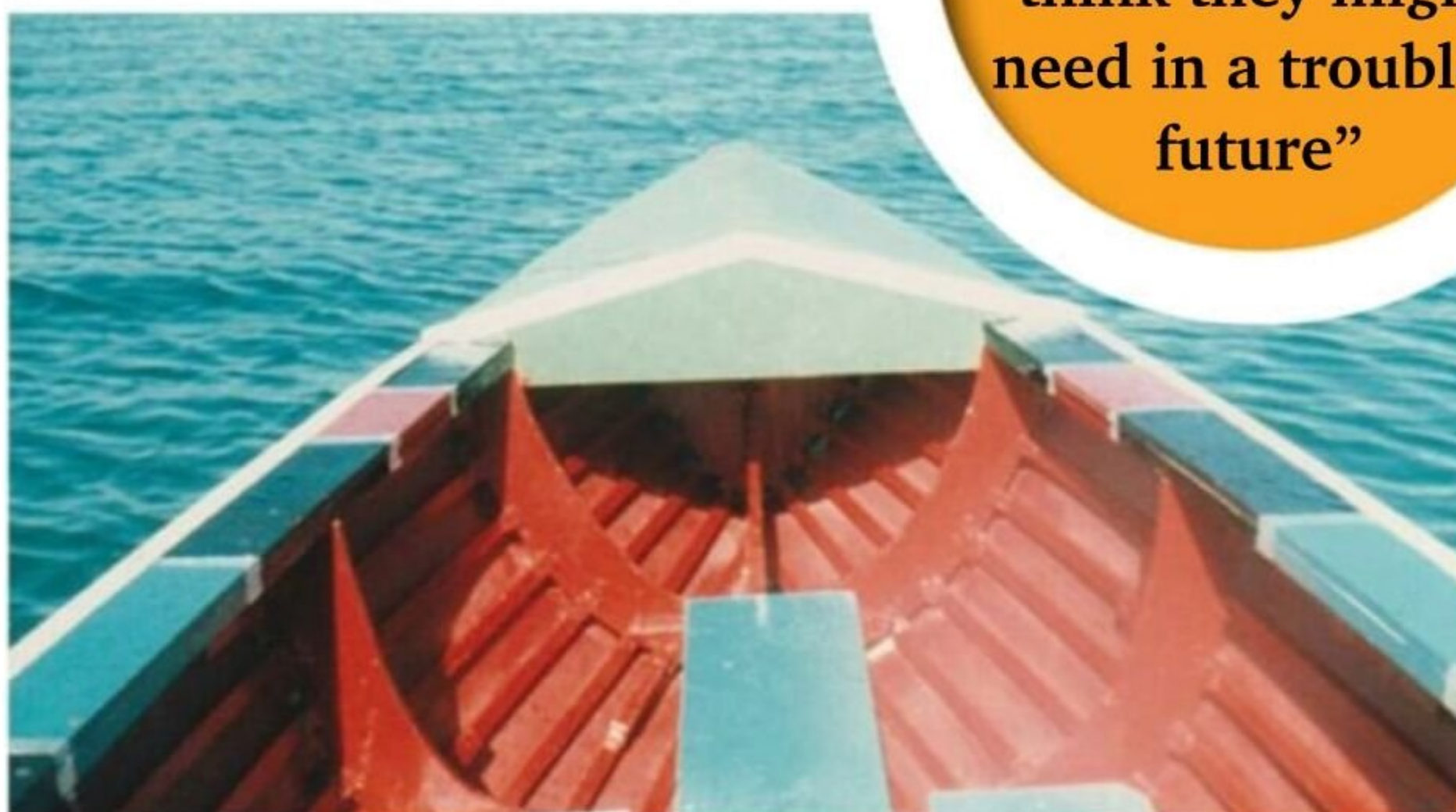
Actually, it wasn't work skills those young folk needed; being able to read and write would often be top of the list, and turning up for work at 8am would be near the bottom. I quickly found that, if you gave respect, you got it. If you initiated a group-think about a problem (rather than telling them what to do with no debate allowed), you got buy-in, participation.

Then, one lunchtime, they asked 'the boss' what he was interested in. I said "boat design" and proceeded to explain



Using on-hand materials:
the nine-foot canoe that
grew to 16 feet

**"Gifting
knowledge and
abilities that we
think they might
need in a troubled
future"**



Launching day



Pink Floyd, eat your heart out



'lofting'. By day's end, they had hatched a plan to design and build themselves a canoe. We got the idea past those it needed to be gotten past, scrounged some space and time, and they started drawing. It turned out that a couple of them had tech-drawing basics and one was a natural artist. Then the bigger boss became slightly wary of our nine-foot canoe, which had somehow grown to 16 feet, so we appeased him by chopping a little off one end.

Memorable

Skills? Measuring, screwing, glueing, planing, sanding, covering, painting – and cooperation and teamwork.

The sheer camaraderie of launch day, the joy on the faces; I'll never forget it. Or them – some are still friends today.

A later project came when one of them bought a small Ford with a run big end. For a few weeks, we spent Thursday afternoons (our 'free' time) lifting the motor out, honing, re-ringing, re-bearing, valve-grinding, then lifting it back in – not to mention the problem-solving and the aforementioned camaraderie. We aligned the new clutch plate with a piece of broom handle and set the tappets. The day that it burst into life was as good as that day we launched the boat.

Closer to home

Our own children assimilated their skills osmotically; Dad and I, between us, were



Mentoring, but giving ownership, is the way to go – I'm merely chairing the meeting while they discuss the next stage



Real skills are never forgotten ...

always doing or making something.

For as long as they knew Dad, he made a living out of his workshop – much of it building and selling digital measurement machinery. They watched as he helped me build our first house; with the second house, they helped while he watched. Pragmatically, I regard both sons as having surpassed me now and watch them in wonder and pride.

Eco-hut

Back in the early 2000s, my primary school teacher better-half came home with a question. There was an interschool ‘eco-hut challenge’; all you could build for under \$100 – could I mentor the interested kids through the process? Sure!

Again, treating young ’uns with respect delivered results. A couple of lunchtime meetings were called, so, even before we started, we were somewhat whittled down to the self-motivated.

Further meetings brainstormed what to build – largely driven by what they could obtain. The mother of one had a lot of spare hay bales. Someone’s father had bricks. Someone else had some old roofing iron. They settled on a brick-floored straw-bale hut, and negotiations began with the (supportive)

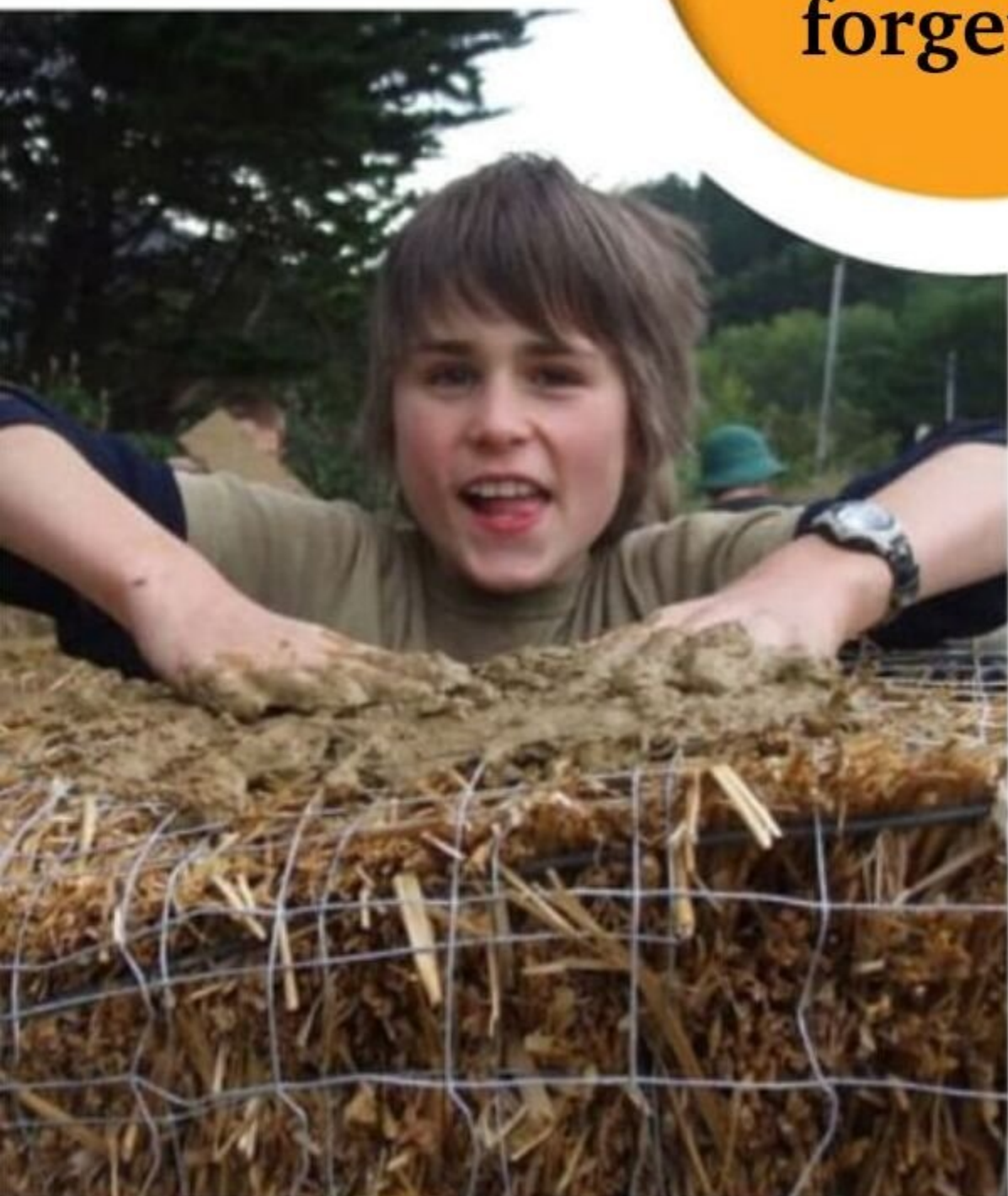
**“The joy
on the faces;
I’ll never
forget it”**



So many skills ...



... and so much fun



This photo is of the day after school broke for Christmas; they chose to come back and finish the plastering. Mud everywhere – it’s a priceless memory

Sorry, Mum — mud everywhere.



Plastered; a mammoth effort from a gutsy bunch of youngsters

board of trustees and the staff as to the hut's siting. That process ended with a kind of bus shelter design, open to staffroom observation!

On the ground-clearing day, a southerly was blowing straight from Antarctica, but they were up for it and becoming a team with a mission. They mixed various plaster concoctions to see what worked best; they wired the bales; they did it all. Skills? It's hard to think of a project that could deliver more. They never faltered – even coming back the day after school finished for Christmas to do the final layer of plastering.

Claddy boats

This exercise is a lot of fun, and I've run it multiple times; one school even has a 'Claddy Cup' raced for yearly.

I give the students the task of building something out of flax – claddies and leaves – to carry a block of wood afloat while keeping said block dry. Rather than give hints, I've found it best to let things run from there; you'd be surprised what turns up!

Rafts are common; catamaran/waka forms are too, but every now and then, something will be thrown up out of left field – and I smile. Lateral thinking is a great skill, and we do youngsters a great disservice dissuading it in the interests of brick-in-the-wall conformity.

Natural building

A couple of times, I've been called in to help teach natural building: straw bale, cob, mud-brick. Besides being a means of learning skills, it is a ton of fun, and all the post-event reviews are amazingly positive. Obviously, not much can be built in a day, and the volume of materials needing to be assembled is also a factor. So, we have evolved a set of mini-brick formers, a carpet-clad easel for practising plastering, and a simple frame that allows wattle-and-daub construction to be explored.

Watching the first timid trowelful being applied, then the dawning of understanding, then the so-fast young uptake and the pride in final accomplishment – well, I can't think of anything better to do with a day than facilitate such processes.



“I can’t think of anything better to do with a day”



Melting moments

A summer school this time; could I talk to them about solar energy? Yes, of course – but then I spent a night wondering how to include a practical exercise. I came up with a task: to melt a square of chocolate using solar energy. I gave them some materials – foil, tape, cardboard – and a build-time limit. Then we had a race – first to melt!

I had my money on a very slick parabola – but a fairly primitive box structure won the day. Resilience v. efficiency, perhaps?

Is it getting worse?

Recently, I was asked to help a school erect a display/storage box for its garden produce. The thing was the size of an old-school postbox with a glass-fronted door, similar to those Lilliput Libraries one sees dotted around. It was to be hung on a 100x100 tanalised post.

The school dug the hole, then was stymied. No idea! I was called – post in hole, braced, Readycrete, gone ... This is what happens when you just pay other



people to do your stuff; you end up not knowing which end of a hammer is which. If you're a teacher, how can you pass on skills you don't have?

My research is anecdotal observation and not scientific – but I reckon there are fewer tool-savvy kids now than there were when I was young. I notice that the average age of people at working bees is probably in the Gold Card territory, or close to it. Yet those same people were turning out for the same working bees when they were 30.

What happened? Screen time? OSH? The need to be good little consumers? How do we reverse that trend?

Conclusion

Hands-on is an important part of learning but is becoming increasingly difficult to facilitate. That is a pity, because, ahead, we will need more hands-on capabilities than currently. Skill in swiping a screen doesn't plant things, make things, fix things, or facilitate thinking – and it's planting, making, fixing, and thinking that we'll be needing.

Some kids are naturally driven, or naturally talented; I once wrote an article about three teenage girls who were aiming to sail solo around the world (two succeeded). Their focus – and, in at least one case, skills – far exceeded anything that I've managed to amass in seven decades.

But for every person like that, there are a hundred entirely capable of rising to the occasion if tasked to do so. They are the ones I like to facilitate, the ones who will be doing tomorrow's teaching.

Leaving design to children's imagination is important. Yes, some approaches will fail, but problem-solving is perhaps the biggest skill of all, and learning from failure is an essential ingredient. That leads to adaptation skills, those 'that didn't quite work, but if I tweak this and reverse that' pathways so familiar to sheddies.

Louis Armstrong's "They'll learn much more than I'll ever know" comes to mind – and if we can kick-start that process ... 📁



Carpet squares on an easel – ideal for practising plastering and experimenting with mixes

“Problem-solving is perhaps the biggest skill of all”



Melting moments – I thought a parabola with focal point would win, but a simple unfocused box won the day



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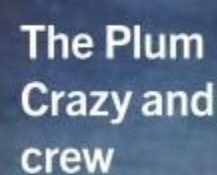
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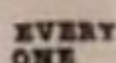
“If you know what your passion is, then it’s simple,” declares Neville Gadd – and his passion has fuelled his life

By Jason Burgess | Photographs: Jason Burgess





THE FASTEST & QUICKEST
SMALLBLOCK ALTERED
IN THE WORLD...
WOULD YOU LIKE
TO TRY AND
DRIVE IT?



who's sat
on the banks
at Auckland
and Hastings
racketballs, then
an admiration for
the 4-wheelie fighter
pilots in Top Alcohol.
It's what they come to
see, hear, smell and feel. For
hardened fans, there's nothing
like like it. One cat has recently
brought fans to their feet every time
rolled up to stage. It's not the fastest, it's not
even the prettiest, but "Run Crazy" is everyone's
favourite underdog, and what most would
describe as the most bizarre, cantankerous,
seen in the land.

The little purple car has a mere 260 cubic inches, but each one packed with enough explosive horsepower to emulate the performances of machines with twice its displacement. If you missed this one last summer, you really did miss out. Its burmed or lung and fierce, most times with a sharp left or right-hand lurch at the end of it. The noise is horrendous — while it doesn't shake the ground quite like Alan Dunlop's Funny, the sound emitted by the smallblock at full cry through the exhaust is deafening.

Standing out in the starline, there's not a car in the country aside from Hogan's fueler that hurts the photographers' ears more than Pam Crazy. After backing up through its fumes-as-logblank, the car crawls in to staging with the finesse and delicacy of an enraged bull, the little Cherry belting out its uncomfortable roar at 7000rpm as the pilot eases the clutch pedal and brake lever, gently inching the machine up to the line. As the starline beams get closer the revs climb higher, the car twitches and shudders under the strain, and a few long seconds before the tree counts down the car quivers and jers erratically as the clutch tries to hold, while the engine pulls up to an accelerating

10,000rpm. When the last amber fruitfully flashes, the mouse-a-motor still produces over 3 horsepower per cubic inch in the driver's left. Entirely well in a good mood it's well on its way. The After 5's finish-line timers hit around 7½ through the finish line and beyond 100mph, that feels like being contrary and so often doles, that 1000-plus horsepower. For a man-owner and right or toward the right, just what happens when driver Neville Galt, just what happens when driver Neville Galt is a multiple-choice question, and he is the answer for a little question, and he can do more than just go, going for the right and make the best of whatever situation he is in, just him out.

We've probably all said it one time or another how we'd love a shot at driving a car like this and many in their naivety figure that they could handle it "no sweat!" But the closer you get to the startline the more the thought of driving Plum Crazy loses its appeal. Just standing within 10 feet of it when it's in action is more than most can handle.

It's hard to imagine just what it would be really like sitting in the cockpit of the world's fastest smallblock. Altered to run at 10,000rpm the horsepower would be there, and that includes its launch because of the type of clutch and the small block's inherent lack of torque. There's just three big shifter buttons to swap gears with, just a couple levers to ratchet in the five gear compound downers to your legs. You sit strapped ergonomically inside and housing, strapped together by a five-point the maze of rillage tubing is hard to breathe, and a harness so tight that's a hard to breathe, and a four-layer firewall, boots, gloves, balaclava and the helmet all add up to unbearably heat. The stench of a control still gets to F. operating a respirator and the 250 degree F. over the temperature of the deflating monster only 3 feet away makes it even worse. The heat is insupportable, the unbearably fuel makes your eyes intolerable, the unbearably deflating the helmet, water, the noise is horrific deflating is restricted to your legs and minimal use of your arms. You can't

even turn your head. And the wheelbase should be at least another 100" longer for the car's insurance level.

[illegible]

It seems Auckland's Neville Gadd would have to be an Ironman, 6 feet tall and 200lbs, rough-shaven and even rougher spoken, and in his least 20 years of racing under his belt. "I suspect Alcohol the majority are the type you'd expect to find in such a sport," John Cate, Sam Lavenex's Duck Pull coach, says. "I think they're a bit like Willie Williams are the kind who don't hit and play even harder. They're faster than others and play under her nails that often, and O'Grady shaves a little closer than the rest. Even though they've got a toughness that goes beyond skin deep, Neville appears to be the most misplaced from the outside, but once you do know him, you'll realise he belongs in there."

He's a true modern-day Superman. Like Clark Kent he shares that quiet nature, but the dual-personality they have in common shines through when he slots into his tuxedo, making it hard to imagine that Neville Gadd the person, and Neville Gadd the Drag Placer could be the same human being. He's a quiet, unassuming bloke with an admirable set of values and an honest, open, caring nature that not only seems to make him misplacé in the rugged world of drag racing, but almost out of step with the twentieth

century. He possesses a great sense of family tradition and loyalty, working as a co-director of the family company, J.E. Gads Ltd., the manufacturers of Laser Sports Bags. His family's involvement extends to interest from Mum, and an enviable amount of support and help from Dad along with some sponsorship, though no more than a business deal with no "hand-out" as you might think. His Brother Rob helps prepare the car and makes an indispensable crew-member on race days, who keeping a lid on the amiable crew who sometimes are reminiscent of the "Beasty Boys" in full song. Neilson's family are justifiably proud of his incredible achievements, and he's equally proud to be a part of that family.

Kind to bend to peer

Neville's not a kind to bend to peer pressures, his strong will as a kid prevented him from going anywhere then, and he doesn't bend now by trying to emulate the person he is in circumstances say that he should be. There's no man-staunch macho attitudes or tough guy impressions, nor does he attempt to cover up his inner feelings. If there's someone he doesn't get along with he doesn't call him mate to his face, and he doesn't talk behind his back, being a firm believer in the old adage "If you haven't got something good to say about someone — say nothing." If rules and regulations of the sport disadvantage him, he'll just keep quiet, figuring that the rules will be the best for the sport as a whole and direct his energy into getting himself into line with those rules, instead of trying to make the rules suit him to the detriment of the class, or the sport. That's just the way he is — perhaps old-fashioned, but anyone older will tell you the world was a better place when they were like that... He's proud to say he and his majority were like that... he's close to, and his cares about people he's close to. I like affection towards kids it amazes me says "I like caring towards man adults most of the time — they don't hide their emotions or try to be someone they're not. They only know how to be open and honest, that's the way I try to be and how I think others should be."

— Mike Clark, 28 years old

The Plum Crazy plot is a mere 24 years old, and stands only 5'6" tall, with a voice that's soft and slow, and incredibly, considering what he

N2 HOT ROD □ OCTOBER 1990 9

The 1990 *New Zealand Hot Rod* magazine story

Nev reckons that the work he does is, “all the stuff that no one really thinks of”.

“With so many car projects on the go at once, living spaces are a low priority for the couple”



Nev and Wendy Gadd
(photo: Jo Constable at Design Space)

His efforts usually go into the unseen things such as upgrades to structural details, chassis builds, and bespoke floors and firewalls. He helps owners get their imported rods roadworthy to meet New Zealand’s tough compliance laws. That alone could be enough to keep one man busy, yet Nev’s immense shed and yard are also populated with a profusion of personal projects, including dragsters, rods, roadsters, donor cars, and engine parts.

Nev and his wife Wendy are also in the process of building, and doing all the finishing on, their expansive steel-frame home. He points out pallets of building materials; his newly built woodworking mezzanine area – that will one day become a pool room; and two containers filled with a kiln and ceramic supplies for Wendy’s adjacent studio. However, with so many car projects on the go at once, living spaces are a low priority for the couple.

Hooked on drag racing

For Nev, his first drag meet at Meremere with his older brothers changed his life. It was 1977, and he still recalls the event clearly – and one car in particular:



Hombre

“Pete Lodge’s ‘Hombre’ came out three times that day. It only went down the track once. That was it; I was hooked. I didn’t even have my licence – I was at intermediate school.”

As soon as Nev began working, he started buying tools.

“My father didn’t understand it, especially when I came home with a compressor,” Nev says. “I bought a tow rope for a drag car before I even had one. That is a lucky thing: if you know what your passion is, then it’s simple.”

Hombre was a ’70s drag racing sensation. The fibreglass body was based on a Fiat Topolino, and the car was powered by a 392-cubic-inch (ci) Chrysler motor with a 6-71 supercharger and Hilborn four-port injection, running on nitro.

“Many years later,” recalls Nev, “I ended up with it as a rolling chassis. We lengthened it, got rid of the suspension, and ran a Donovan small block – all aluminium – three-speed Lenco, with a pedal clutch. ►



Plum Crazy off the starting line



Plum Crazy in action

“That is a lucky thing: if you know what your passion is, then it’s simple”

“We had a lot of help from Alan Shadwick at Als Blower Drives in Henderson.”

Nev renamed the car Plum Crazy, and in the 1989/1990 season, it became the fastest small block altered in the world.

The first that Nev’s crew knew about their record-breaking feat was when they read about it in a magazine.

He declares, “You don’t get anything for that except, perhaps, bragging rights.”

Self-taught

When it comes to his professional life, Nev has an ability to turn his hand to anything and make a good job of it.

He is self-taught and comments, “Anything you are going to do, you have to jump in with the confidence of a four-year-old in a Batman shirt, don’t you?”

After leaving school, he worked as a pattern cutter for his family’s business, making sports and school bags. Cheap imports flooding the market in the ’90s was the death knell for local manufacturers, so Nev turned his hand to aluminium technologies for architectural products.

“Then I got in with a company that fitted out all the Telecom vehicles – trucks, vans, and trailers. We also did a lot of sheet-metal stuff,” he comments.

When a job came up at Magoo’s Street Rods in Masterton, the Gadds moved south.

“I was the engineer at Magoo’s, doing

all the chassis. I loved the job, but after eight years, it was time to move on.”

Initially, people thought that Nev had moved back to Auckland, but he and Wendy were busy doing up houses and working at building their brand-new, all-in-one house/workshop and studio, which, from the outside, resembles a giant steel barn.

“The locals found me, and I started doing a lot of small jobs – exhaust work, fuel tanks, putting an independent Jag rear end into a T-bucket – not the long-term stuff like this,” he says.

A couple that races together ...

According to Nev, “Wendy and I met racing. I was crewing on a car that was owned by a girlfriend of hers. Wendy used to hang around, asking lots of questions.”

One day, Nev gave Wendy some spanners and suggested that she spanner-check the car for him.

“I said, ‘Just go around and check if everything is tight.’ She said, ‘Do you really want me to do something like that?’ I said, ‘Yeah – there’s no point you just standing there; it’s all just mechanical stuff.’”

The rest is a 33-year history. Now,

when it comes to buying cars, racing gear, machinery, and equipment for the workshop, it is Wendy who encourages Nev to go and get it.

“This is why we have been in this building for 10 years,” Nev admits, smiling, “and are still camping downstairs.”

The Torana(s)

While getting married, buying houses, and having kids curtailed the racing for Nev, both he and Wendy are revving up for this season’s drag meets.

“We were at the drags one day,” recalls Nev, “and decided we were sick of watching. I did up a house we had, and when we sold it, we bought the ‘Nailer’ [front-engine dragster]. It came with a goose-neck trailer, so we needed a bigger tow vehicle. Wendy put her IROC Camaro up for sale to help fund the tow vehicle, but the first offer she got was to swap it for a 1978 Torana drag car minus motor and transmission. Now we’ve got two drag cars and no tow vehicle. Finally, we ended up with a Chev C3500 dually pickup.”

Wendy currently races a two-tone, orange and black Torana – it is one of three Toranas she owns. The two-tone is powered by a Camaro small block, with a turbo 400 behind it.

As Wendy remarks, “We don’t do little, we don’t do normal; we only do big, loud, and fast!”



Nev at the workshop door



The Dictator

Tickling the Torana

Like everything that passes through the 'shop, the Torana got some fine-tuning from Nev.

First off, he swapped a Holden 305 engine from his ute for the Camaro small block. After that, the final touches were all aesthetic: the original scoop bonnet was switched for a flat bonnet, and the stainless-steel screws framing the windscreens stood out like the proverbial, so he countersunk the screws on the rear screen and painted them black.

For the front, "I flushed it and cut a whole new screen," he says.

There was no bumper, so he built a downscaled front bumper, narrower and sitting close to the body.

He explains, "I used big, flanged rivets to make it look like bumper bolts – not that anybody would see that. The edge is painted prime black, and I put a tow hook through it."

To date, Wendy has topped out at 117mph in the Torana, but Nev is sure that, for the type of car it is, it can go a lot faster – although he does acknowledge that they are running "a basic street engine".

The Gadds recently bought a 1936 Canadian-assembled right-hand-drive Studebaker Dictator for Wendy because they "wanted something not too hot roddish but still unique".

Other than getting the speedo refurbed, Nev has not had to do anything to this ride. ►



Wendy's Torana with Nailer (photo: Neville Gadd)



Wendy's Torana



Nev in Nailer

Nailer

On a rack above the Torana is Nailer, a 1982 front-engine dragster built by Don Tourte in California. With a whopping 187-inch wheelbase, this beast is powered by a 417 Donovan block – an aluminium copy of an old 392 Chrysler Hemi – with a two-speed Lenco transmission, originally air shifted but now modified to manual.

The paint job reflects the car's US roots. Its original owner, Wally Allrad, was a builder – hence 'Nailer'. The names of Wally's labourers are all listed on

the fuselage, as are those of a couple of construction companies that sponsored the car.

According to Nev, Allrad's son and Tourte's son were playmates. Through them, Wally met Don and convinced him to come out of retirement to build his chassis.

"When we got it, the chassis was all black and knocked around a bit," Nev says. "We blasted it, painted it, tidied it up, and got all the front end and steering arm chromed."

Performance problems

Having raced Nailer for a season, Nev has had a chance to isolate and remedy some performance problems.

He admits, "We fried the clutch pack in the Lenco because the air bottle didn't have enough pressure in it. I have eliminated that and reduced weight by taking all that stuff off; now it's shifted manually. It used to have a shift light with a dry cell battery in it. I took that off too; if my bum can't tell me when it's time to change gear, then I shouldn't be in it."

He has had new billet heads made, as the original cylinder heads were too soft, but he still needs work on the clutch, "to get it off the line better. I'll do it all. I helped a guy with a 417 Donovan in a funny car for a few seasons. They are a cool motor to work on. In my opinion, they are quite easy."

Nev has managed a top speed of 187mph but is adamant that he can achieve 200mph.

"[It will be] all old school – nothing electronic on the car; no computer, shift lights, or MSD stuff," he says. "No pyrotechnics on the exhaust to tell me what is happening. We are going to run it, keep a watch on the spark plugs, tune it, and hopefully get 200mph out of it."



A montage of Wendy's Torana with original bodywork and Nev's Nailer

Three Fords and a Chev

Of the four custom jobs on site at Nev's, three are Fords. A couple of them have turned into long-term projects because of the time it takes to locate parts, or do work that satisfies certifiers, or because the work required is done on a piecemeal basis to suit the client's budget.

One project is a '33 cabriolet with a vintage Pete Osborne body and a Kiwi Connections chassis by Duane Jones in California.

"The certifier was not happy with all the US welds on the boxing plates being grounded down," says Nev.

As well as remedying the welds, Nev has set up the rear end for a new triangulated four-link suspension: "I've welded all the brackets on and kicked the chassis up to suit the body."

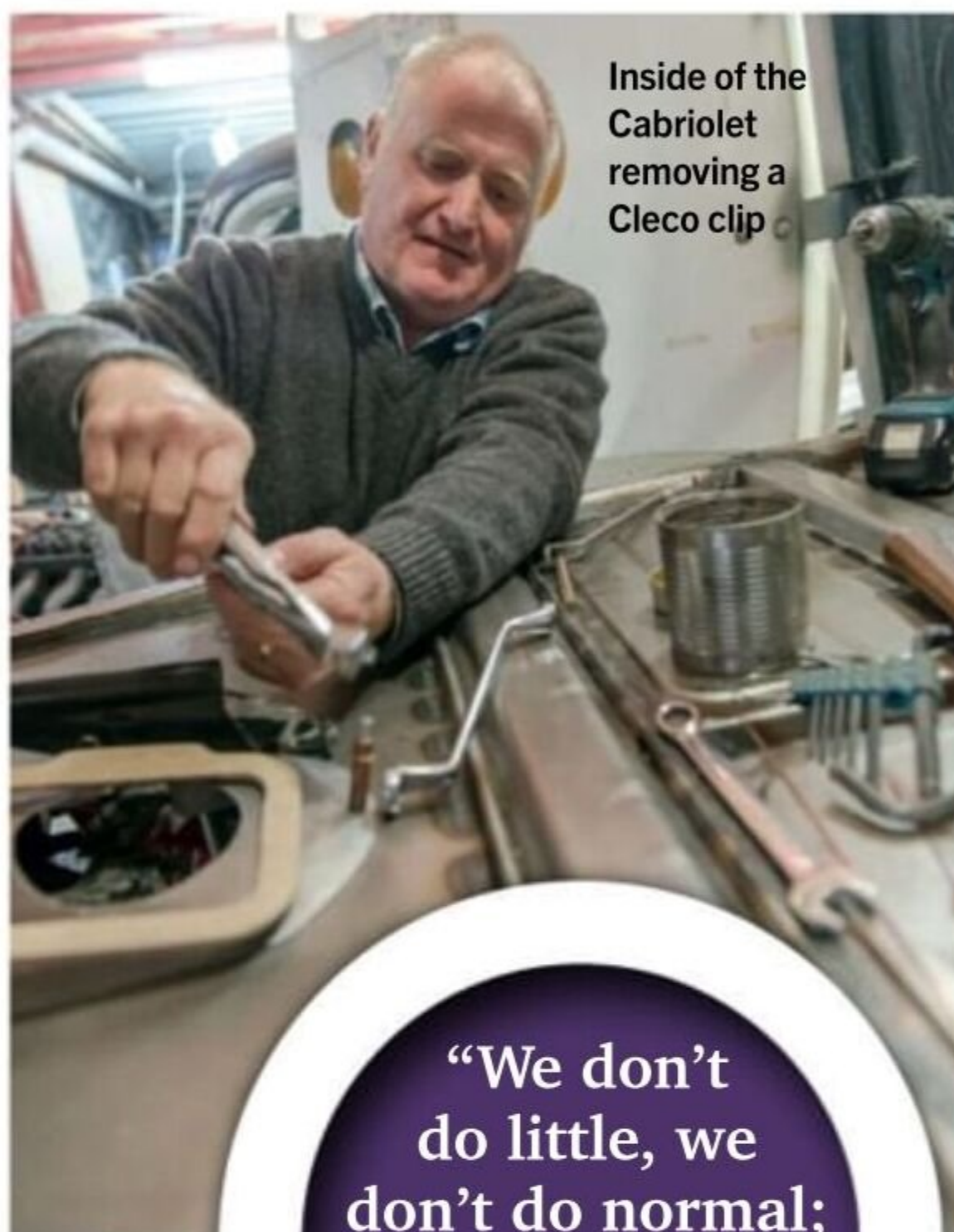
The old firewall was full of holes, so that has been recessed out and upgraded with a new 1.25mm thick steel floor with beaded edges and 2.4mm rails across to mount the seats to.

Nev has recreated the original Ford criss-cross floor pattern with a bead roller. "I got James [the client] to turn the handle," he says.

Seat-belt mounts will be welded in

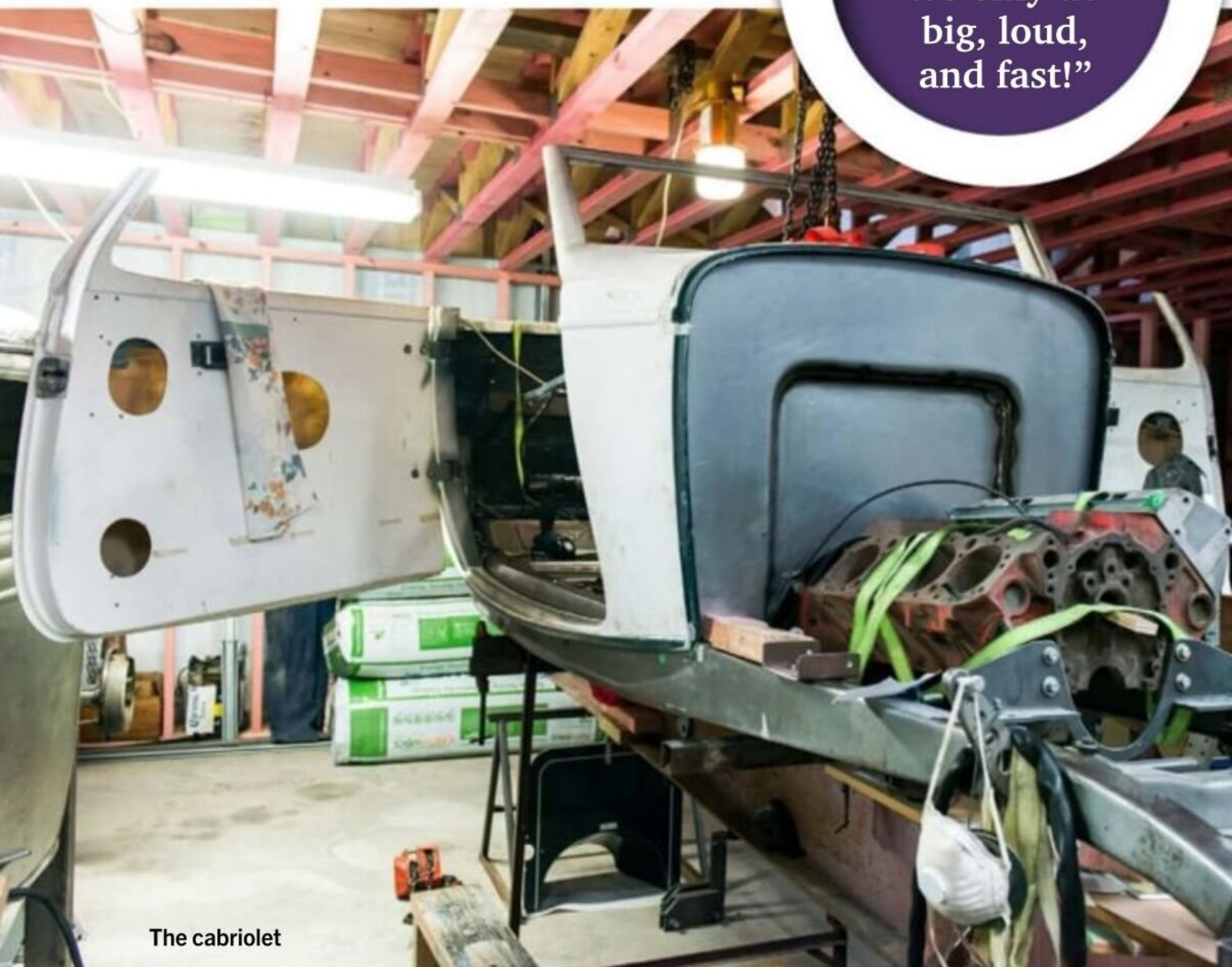


"A small wedge out of the Cabriolet chassis to kick the rails up at the back, to suit the body."



Inside of the Cabriolet removing a Cleco clip

"We don't do little, we don't do normal; we only do big, loud, and fast!"



The cabriolet



Hyster

Of all the vehicles inside and outside the shop, Nev reckons that his 1965 Hyster fork hoist is his favourite.

He bought it from a guy who was about to scrap it because he said that the steering was shot. Nev got it home and fitted a GM Chevelle steering box, which works perfectly. Against all odds, he has also located a brand-new distributor cap for it.

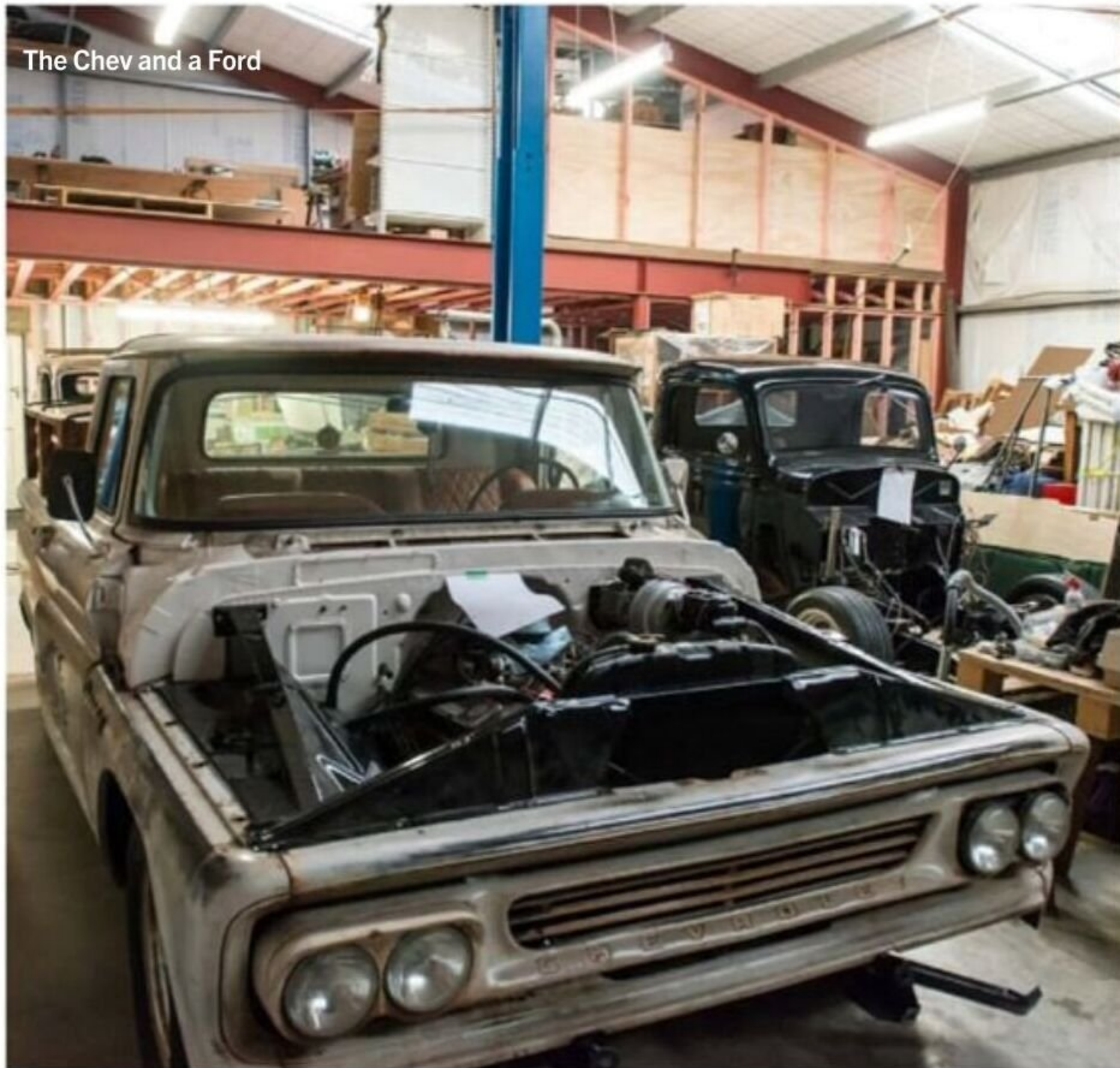
"I put in the number for it in the States, and even though the hoist was made here, it was recognised," says Nev.

The Hyster has already earned its keep; not only does it take care of the heavy lifting in the workshop, but it has also been used to install insulation and the upstairs windows — all made by Nev, of course.

He says, "I even got the Chorus guy who installed our fibre line up on it 'cos the little ladder he brought wouldn't reach the top of the doors."



A new curve-sided driver's side kick plate



The Chev and a Ford



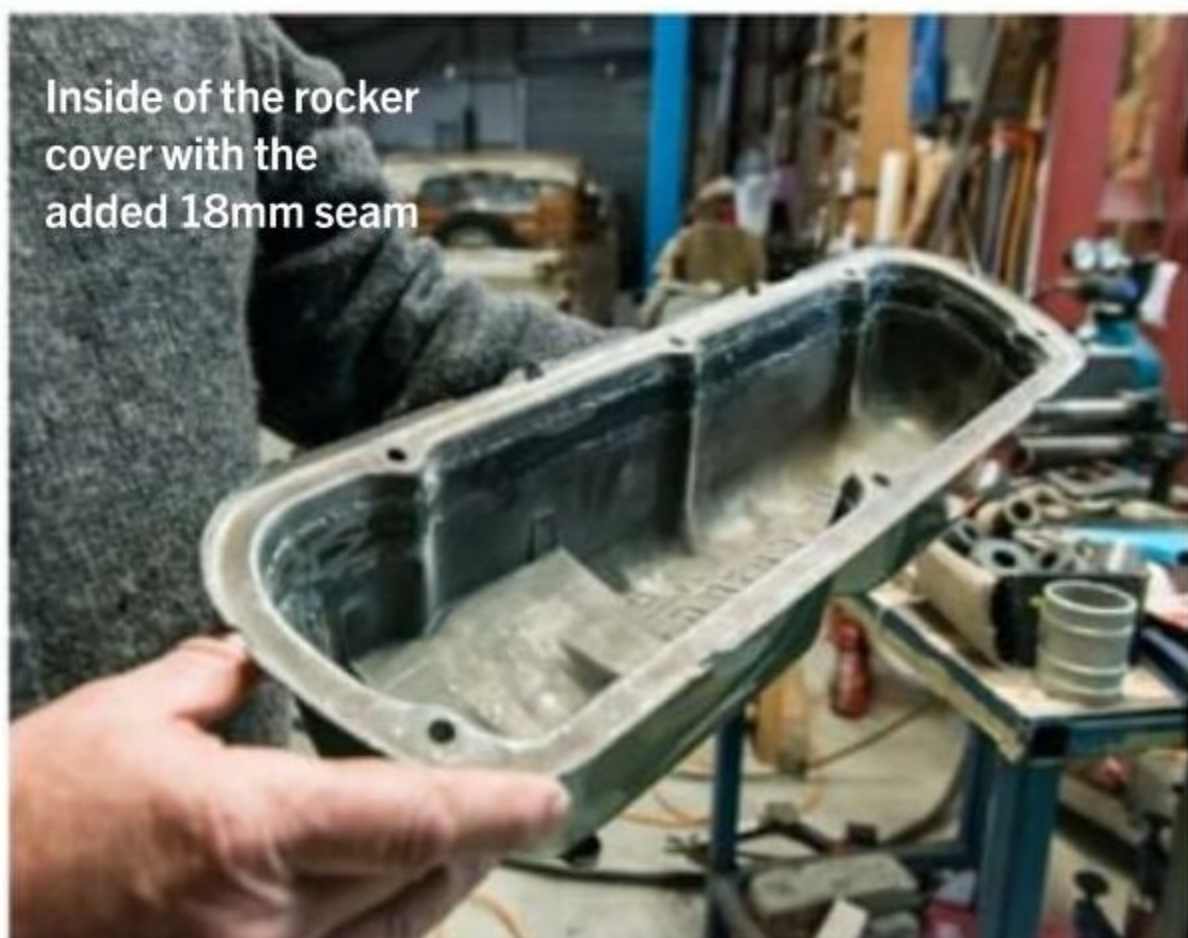
Original rocker cover (left) and modified Ford cover on the engine



Piecing together a floor section



Nev inspecting his handiwork in the roof-chop Ford



Inside of the rocker cover with the added 18mm seam

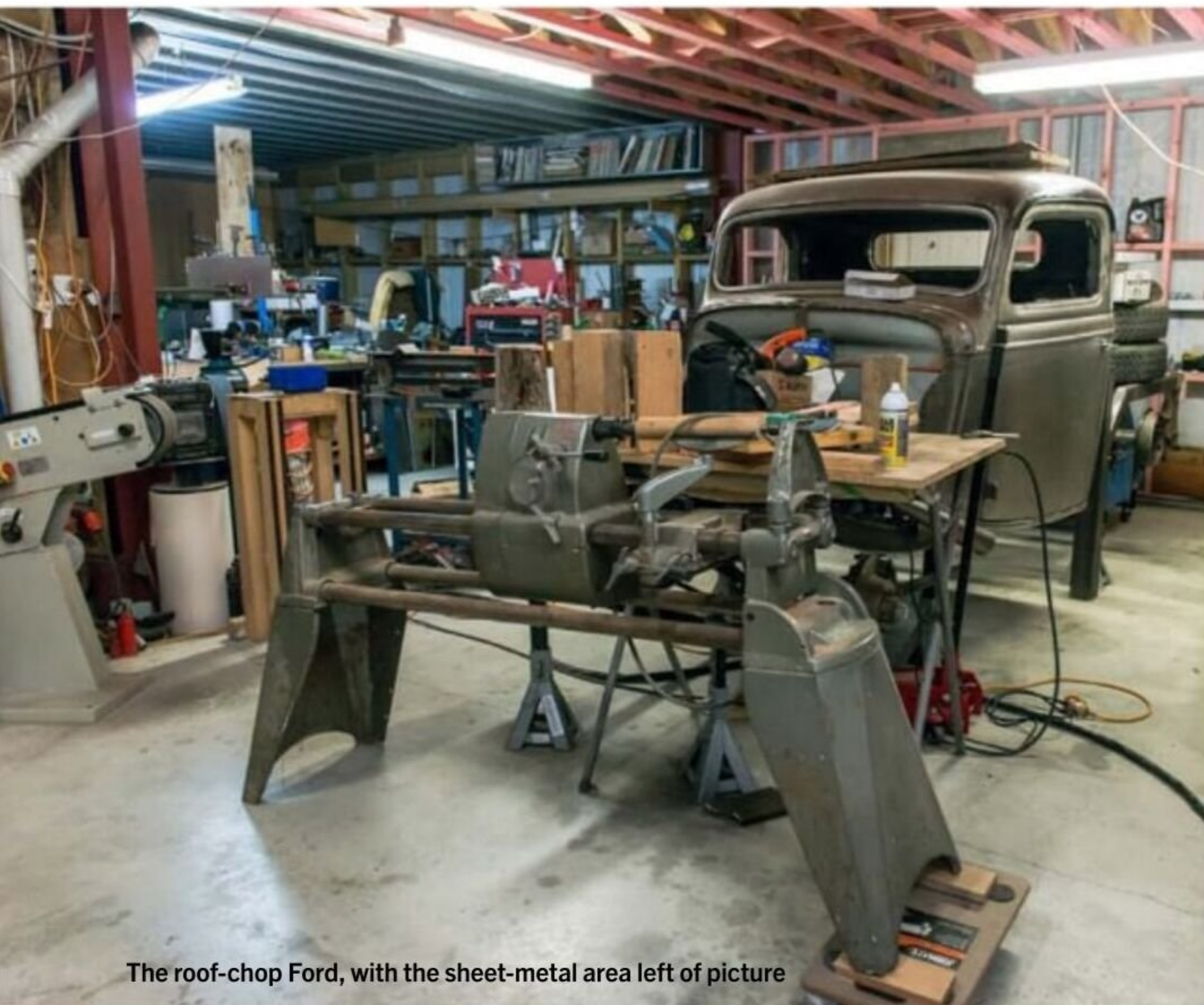


A Nev-made plug for a fuel sensor: "a M30 thread but very fine — unusual for a thread of that diameter"



Heat marks from the 'fish plate' welded onto the inside of the chassis over the join

"The owner still cannot understand why he could not get a certificate of compliance here"



The roof-chop Ford, with the sheet-metal area left of picture

underneath, and Nev will drill through the bead to tap a thread for the seats. He also has created a removable tunnel over the transmission and built an aluminium boot for a new gear indicator.

The '35 pickup

Another compliance job is a '35 Ford pickup with a standard-height cab. It, too, was brought in from the States, but before the owner imported it, he completed a 1000-mile cross-state roadie without incident. Because of that experience, Nev reckons that the owner still cannot understand why he could not get a certificate of compliance here.

Before Nev inherited the job, a local engineer – who has since moved north – had already rebuilt a compliant-ready front end.

Says Nev: “I never saw it in its original state, but apparently it was diabolical. It had a racing – floating disc – front end, so they had put the back half of a brake pad in to stop it floating; stuff like that, stuff that ain’t right.”

A new steering column has been located because the original could not be identified. Once the rolling chassis and steering are working, a mechanic will

reinstate the engine and box. Then Nev will put it all back together.

“It had oodles of lights and wiring underneath; we are getting rid of a lot of that,” he says. “The seat-belt mount is just into a panel of steel with a washer behind it, so I have to build something in there. That is going to be fun, ’cos it’s all painted.”

More mods

Another '35 Ford ute, with a roof chop, is in for completion. Nev actually built the chassis at Magoo’s. Since then, he has added the firewall, the floor, and beaded floor sides. As it is a four-speed manual conversion, he has had to create room for three pedals. He has already finished a curved driver’s side kick panel, so that the driver has enough room for his foot and accelerator, and created a floor door to access the brake and clutch master cylinders.

To finish the motor, the client wanted Power by Ford rocker covers but could not get covers tall enough to clear the existing Edelbrock roller rockers, so Nev has created an extra 18mm ‘strip’ of height within the Ford covers.



XK120 Jag roadster

Nev has recently acquired an air hammer system, and a collection of dies from the US, which gives him the ability to start shrinking and stretching.

First, though, he is building the steel frame for the hammer to mount on to. That will fit along the side of his English wheel in the sheet-metal area. He bought the hammer system because he wants to build an XK120 '58–'59 aluminium roadster Jag from an old XJ donor Jag.

He says that the Jag is a practice run for building his version of a Holden Efijy concept car, a 5.2m long V8 custom coupé.

“Although,” says Nev, “we’ll change the back of ours, because we don’t like the original design.”



The Holden Efijy concept car, an inspiration for a future fabrication

“That sounds easy,” he observes, “but, when you start thinking about the tapers, it took ages. The covers had a few dings in them; they had to be straightened out before I started. Everyone will think that it is just a pair of Ford rocker covers; no one will know what went into it.” ►



Nev and the Chev pickup

The Chev

As for the 1960 Chev pickup, Nev reckons, “that is a job that has snowballed.

“I was supposed to change the power-steering bracket so that the belt stayed in line better, do a radiator repair, and fit a new hose. We took the radiator out and then the owner decided to take the engine out to clean. While it was out, he repainted the whole of the engine bay ’cos he is a spray painter. Now I’m changing the heater hoses because the old ones were red and he didn’t like that.”

The fuel tank, which is normally situated behind the seat, is going to be relocated underneath the tray, and Nev is also designing a new exhaust system.

“He had already had an exhaust done for it but he turned up one day thinking the engine was bugged,” says Nev. “I had a bit of a listen, got a piece of wood from an old pallet, pushed the exhaust

system off the chassis, and the noise went away. He’d hit something and whacked the exhaust into the chassis because it was the lowest thing on the vehicle. We will reroute it so it’s no longer the lowest thing.”

For lesser men, listening to Nev running through his multitudinous work projects and plans for everything from home building and restorations to assembling rods and racing drag cars is frankly daunting, almost exhausting.

Somehow, though, he is energised by work – apparently, the more, the better. He shows no sign of stress, fatigue, or lack of imagination.

He admits, “I love fabricating – anything, particularly steel – and getting it as close to my mind’s-eye picture as possible. I have not gotten there yet because what’s in my head is always perfect.”



Traps for hot rodding rookies

Nev remarks, “A lot of first-time hot rodders want to build a T-bucket because they think it is easy, but they forget that everything you do is out on display. At the end of the day, [they are] harder to build ’cos you can’t hide anything. Build the car you want. Don’t do something because you think it is cheaper; it will probably end up costing the same because it will still take the same amount of time and effort.”

Nev advises that buying something from the US without the correct paperwork is a nightmare in the making. “It might be cheap to buy,” he warns, “but if the paperwork is not right, then there is no fixing that. You can’t register it here, ever.

“There are a lot of rods around that haven’t been complied. You could race it but it would never be legal on the road. I know a guy who shipped a rod back to America just to get the correct paperwork. He got around it that way, but probably spent another 10 grand doing so.”

The other point about importing from the US is that “nine out of 10 things you buy from the States can’t just bolt on. You have to do something else to make it work or, at the minimum, buy the bolts to bolt it on. If you could do that, then I wouldn’t have a job.”

“I love fabricating – anything, particularly steel”

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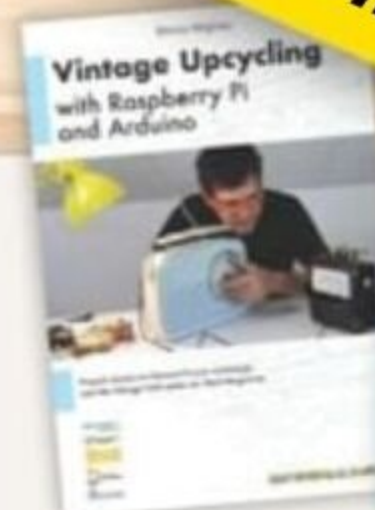
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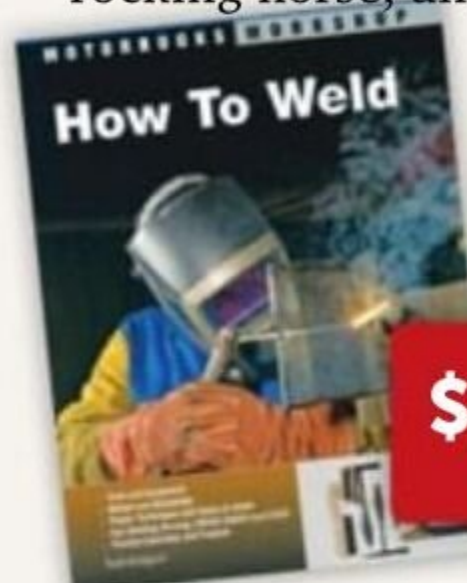
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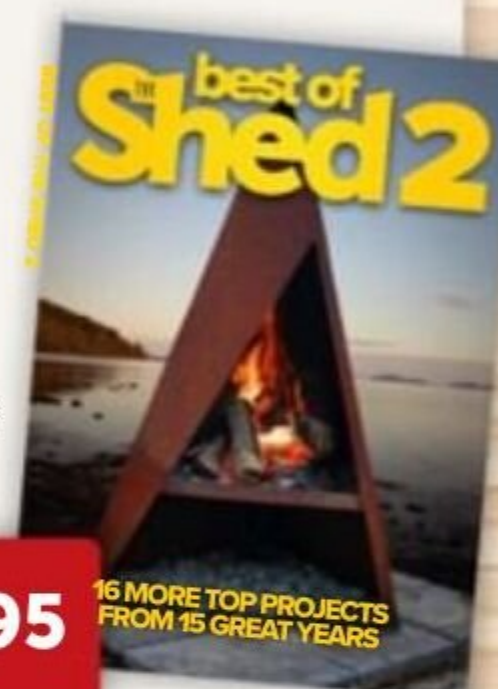
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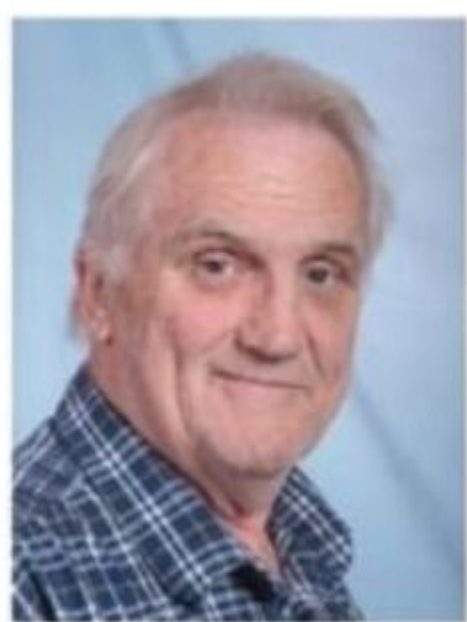
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The shed nearing completion



NEW BEGINNINGS

The lunatics may appear to have taken over the asylum, but Jude has an exciting new place to escape to and shut the world out

By Jude Woodside

Another new year – they do seem to come around more quickly these days. I am looking forward to it because, in spite of everything, I am a perpetual optimist, and I have recently finished building my shed. At least, I will have by the time this magazine is printed. Now comes the fun bit: fitting it out.

There are benches to build, cupboards and storage to be made or found. That's always the most vexing part: the decisions on what to make and where to put it. But at least I am building something in the shed rather than building the shed.

In many ways, I regret that I didn't document this as well as I might have. However, I do have enough to make a story of the process, so I may do that in the near future. It has many lessons in it.

I'm happy

I am pleased with a few things about

the space. It is well lit throughout. It is warm yet easily cooled, so it will be a space that I can use year-round. It is very large (160m²) – although, once you see all your gear in it, it does diminish somewhat. But, compared with what I have had in the past, it's enormous, and that is a very liberating feeling.

People ask me what I intend to build in this industrial-sized space, and I have no real answer to that. Initially, I have benches and utilitarian things to make to help the place become productive. Then I have a few projects in mind. I want to build a pool table for my house. I bought the slate for it a year or so ago. Actually, I bought a pool table with a full sheet of slate, but the table was in such poor condition that I dismantled it and had the slate cut into three parts. It is easier to level the table if the slate is in three bits rather than being one enormous sheet.

When taking the table apart, that became obvious. The rest is just a large torsion box, so I kept the legs and plan to rebuild the rest.

Now, I have the time

I also want to rebuild my old workbench. I built it more than 30 years ago, and it was never quite right. But I had neither the time nor the machinery to fix it; now, at last, I have both.

I am also hoping to capitalise the shed a bit so it can return some of what I have invested – more than I planned.

Otherwise, looking outwards from my quiet valley, the world does seem to be in a precarious place; in many ways, it seems that the lunatics really have taken over the asylum. It is good to have a place that I can escape to and shut the world out.

I trust you will all have a happy and productive new year. 📁

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