

# Smoke Signals



Winter 2013 - [ironindian.com.au](http://ironindian.com.au)

Inside: Rigid racer + Vindian + Flat Tracker



# From the President

Mark Barthelmie

How quickly the time goes! It was only a few short weeks ago we were at the All British Rally enjoying the sunshine and now all of a sudden its winter again. Dark cold nights are here but of course it's the perfect time to get stuck into some winter maintenance on your old Indian or maybe a paint job or even a major overhaul.

Having just completed a whistle stop tour of Eastern Europe, my lovely lady and I were discussing the differences in traffic flows, speeds and general road manners the other day. One thing that was very noticeable was the lack of harassment by any of the police forces in UK, France, Belgium, Germany, Austria, Hungary, Czech republic, Slovakia or Poland.

The Harley rally we attended in Poland had been graced by a positive endorsement from the local regional authorities, so much so that the helmet law was suspended to try and encourage more visitors for the week of the rally. Can't imagine that happening here! But of course Europe is also struggling financially and what more positive way to try and encourage more visitors to the region than by sponsoring the rally and instructing a softly softly approach to policing?

Our government could learn a thing or two about basic economics from these guys. We saw bikers from all over Europe there, including the latest club to join the European federation - they were from Turkey - plus a large number of new clubs from Russia. So it's certainly in full swing in Europe.

It's not uncommon on the autobahn

to be riding along at about 130kmh and have a car approach you very quickly flashing his lights to get past. It happened a number of times and the passing speed would have been approaching 200kmh.

It never ceases to amuse me at the rabid attitude of the authorities here towards speed. The road rules were, I believe, mostly formed in the 1960s, including the maximum speed limits. Now there is no doubt that there are far more cars on the road now than then. Of course no-one ever seems to mention the ABS brakes, traction control, ceramic brakes and four-pot brake calipers and all the very many other advances in technology that have happened since the introduction of the speed limits.

Surely you would think that makes our vehicles safer, so why are we stuck with speed limits from the 1960s? I would be very interested to see the accident statistics compared between Australia and in particular Germany and I would be very surprised to see if there was much difference despite the massive differences in speed limit. Food for thought maybe?

I would like to thank all the committee members who put a lot of work in behind the scenes to make the club run for you, it can be a thankless task at times so I just want to give everyone concerned there a pat on the back and say thanks from all of us.

In the meantime try and keep warm and busy and no doubt we will meet on the road somewhere

Best regards,  
Mark

# News & Gossip Indian Launch



Indian Motorcycles' launch of the new generation bike starts at Sturgis on August 3 and the local distributor will be mirroring the event at a function in Sydney.

We're told some 125 bikes have been

sold locally - a healthy result, given that motorcycle retail in general has been flat over recent months.

The American launch (see indianmotorcycle.com) will be the subject of a web-cast.

## Our cover

Our cover this issue features a very special rigid racer owned by collector Peter Arundel and ridden by Steve Hari.

Peter tells us the machine recently toured NZ, where it joined in a drag race against Burt Munro's old bike, along with a host of other events.

Rob Blackburn of *Motorcycle Trader* magazine supplied the story.





# News & Gossip

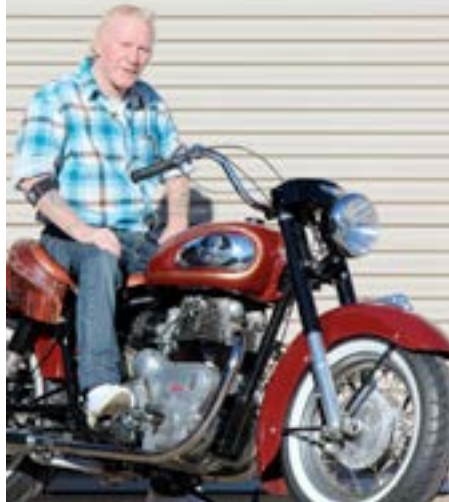
And, before you know it, the club's biggest rally of the year will be upon us! Yep, the Crazy Horse is on for the end of September (27-29), in beautiful downtown Corryong, at the foot of the Snowy Mountains.

The centre of the event is the Mountain View Motel in Corryong, which is close to the centre of town. Fiona, at the motel, knows about the event and will be expecting your boooking on tel (02) 6076 1766.

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Those of you not already familiar with the area should know it features some of the best riding in the country. See you there...





ACN No. - 086434344

**MEMBERSHIP APPLICATION / RENEWAL FORM FROM INDIAN RIDERS AUSTRALIA INC.**

*Membership of the club shall be open to all persons acceptable under the rules of the club.*

Name : \_\_\_\_\_

Address : \_\_\_\_\_

Town / Suburb : \_\_\_\_\_ P.O. Box : \_\_\_\_\_ State : \_\_\_\_\_ Country : \_\_\_\_\_

Phone No. (Hm) : \_\_\_\_\_ (Wk) : \_\_\_\_\_ (Mob) : \_\_\_\_\_

E-mail : \_\_\_\_\_

Indians Owned : (Model / Year) : \_\_\_\_\_

Ref Plate Bikes registered through the Indian Riders Association : \_\_\_\_\_ Reg No. : \_\_\_\_\_

Bike : \_\_\_\_\_ Reg No. : \_\_\_\_\_

Bike : \_\_\_\_\_ Reg No. : \_\_\_\_\_

Other Motorcycle Owned (especially non Indian Motorcycle) : \_\_\_\_\_

**Declaration by Applicant :**  
If accepted for membership I undertake to uphold the objectives of the Club and to be active in Club events as far as reasonable possible. \_\_\_\_\_ Date : \_\_\_\_\_

(Applicant Signature) \_\_\_\_\_

*Indian Owners membership annual subscription - \$50 First Copy of Quarterly Magazine by post  
- \$50 Sub Copy of Quarterly Magazine obtained  
Non Indian Owners annual subscription - \$50 First Copy of Quarterly Magazine by post  
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Membership to Motorcycling Australia (Roundtable Associates) only \$35 - optional

*Do you have a business you would like to advertise in the Newsletter Yes \_\_\_\_\_ No \_\_\_\_\_*

Total Forwarded \$ \_\_\_\_\_

Please return completed application and fee to :

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Werribee Vic 3060  
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Cheque No. \_\_\_\_\_

Received \_\_\_\_\_ Mx Received \_\_\_\_\_ Mx Received \_\_\_\_\_ Mx Received \_\_\_\_\_ Mx

## Membership

Included with this mag (electronic and print) is a membership renewal form. Don't forget to get it in pronto, particularly if you have a bike registered through the club, as that reg depends on current membership!

## Coming up

That stunning bike at left is none other than Steve Higginbotham's Enfield Indian, a nicely restored version with one or two subtle and practical modifications.

Look for a big feature on it in the next edition of *Smoke Signals*.



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# On the **Market**

## Member bikes for sale



Phil Pilgrim has a freshly-built 80ci four-speed 1947 Chief (above) on offer, plus a very nice Gilroy Chief (right) and a Springfield engine. Tel 0400 009 252.



Mark Barthelmie has two 2010-build Kings Mountain Chiefs (left and bottom right) on offer, plus a 1957 Trailblazer and 1941 741B. Tel 0433 106 669.

*Smoke Signals* is the journal of the Iron Indian Riders Association of Australia and is published quarterly. The opinions expressed in here are not necessarily shared by the club or its office-holders.

Our thanks to a zillion folk who helped to sling this mag together, in particular the authors you see in these pages. We're always looking for more material, so if you have a story, let the Editor know via [guyallen@optusnet.com.au](mailto:guyallen@optusnet.com.au). All material is copyright. Contact the Editor for permission to reproduce it.



Noel Thornby is selling the 1941 741 at top and the 2001 Indian Spirit shown above. Tel 0400 970 248.



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## Opinion

# Strike me rigid

**Rob Blackburn ponders a fast 89-year-old...**

The *AMCN* Phillip Island Classic meeting held each January is historic road-racing at its best. And historic doesn't mean slow. Lap times produced by the fastest historic bikes are simply stunning. The combination of the talent of Shawn Giles and some inspired engineering sees a modified 1981 Suzuki Katana lapping within about 4.5 seconds of the best Australian Superbike times.

And what about ridiculously fast, really old bikes? At the 2002 event, Victorian Steve Hari set a new Unlimited Pre-War-class time that still stands. Steve was aboard a 1924 Indian Eight-Valve 990 when he reeled in the 4.45km circuit in 1m 59.490sec – a lap time that would be beyond the reach of a lot of fast riders on the latest sportsbikes.

It amazes me that a bike which originally rolled out of the Hendee factory in Springfield, Massachusetts, way back in 1924, could be developed to this degree.

Think about it – 1924 was four years before Kingsford Smith would fly across the Pacific and eight years before the Sydney Harbour Bridge would open. Supplies of groceries, milk and ice were still being delivered to homes then by horse-drawn carts that were not much slower than the handful of cars that chugged diffidently about our streets.

The Eight-Valve Indian's performance-transforming treatment is down to its

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## Opinion

current owner, Indian aficionado Peter Arundel. His team systematically went about the task of exploiting all modifications allowable under historic racing rules to extract modern performance from the grand old veteran.

A period-piece externally, the engine's internals have been almost totally re-engineered to produce something like 75kW (100hp) at around 6000rpm. Drum brakes from a later 841 military Indian rein in the speed but the rigid frame with girder fork is still authentic period-primitive.

Steve Hari gives a few insights into what life's like aboard the flying Indian: "It was just one of those freaky days when I got the record. I was actually racing Ginger Molloy, who was on a Bultaco 250. He had always been an idol of mine. He smashed the lap record as well. We went toe to toe. It was pretty hard racing and very interesting. Ginger slip-streamed me down toward Honda corner and he managed to out-brake me into Honda. So I just let the thing rip out of there and then I actually out-braked him and dived underneath him into Siberia. You shouldn't be able to do that on a rigid pre-war bike against a lightweight 250 with suspension.

"On a fast rigid-bike, when the back end starts bouncing and the front end moves as well, you use up a lot of track. So, for a fast lap, you need a lot of room in the corners and you have to use it wisely. With a wide entry and a tight apex you can power-slide through turns – with no rear suspension there's no risk of it loading up and then high-siding you. Tyre pressure is really important as well.



Too hard and the back end bounces more; too soft and you'll burn the tyre up in a couple of laps.

"It's very challenging and very satisfying when you get it right and put in a good lap."

In case you think the old Indian is a

one-trick pony, let me share with you that in the weeks after she knocked out that sub-two-minute lap at the Island, the boys stripped her of all the unnecessary stuff – things like brakes – and made some subtle steering geometry adjustments.

Arundel then carted her to Lake Gaird-

ner where he blazed across the salt lake at an eye-watering 158.73mph (255km/h).

Yep. Another record.

*Our thanks to Rob Blackburn  
(words), Peter Arundel (pictures)*



# Member Bikes

# Outlaw

# tracker

Club member Dave Morgan on Groote Eylandt is an occasional correspondent and, whenever he writes, we sit up and take notice. Here he lets us in on his latest acquisition - a Scout flat-tracker...

G'day,  
I have been living on Groote Eylandt for 9 years with 3 to 5 to go. I work at the Port as a ship loader, maintainer. We mine and export manganese ore, which is used mainly in the hardening of steel.

I have been riding bikes for over 30 years and, when I got to Groote I was looking for a classic to slow the pace down a bit - a 1962 Harley was first choice. It was about my vintage.

However a mate told me of a 1944 Indian Chief, a restored military model, which was for sale, this was in 2007. I flew over to Cairns had a look and the rest is history.

This kicked off my disease. The bike had been restored 12 years earlier but had a few dings and scratches. Once on Eylandt I rode it around for about a year getting used to foot clutch/hand shift, and the starting procedure.

It was then I found all was not as it should be in the engine department. So out comes the motor and off to Melbourne for a complete rebuild, Kevlar clutch and a 12 volt conversion.

It was about then I realised I needed to sell a kidney or one of the grandchildren!

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Of course while all this was happening off came all the tin ware, back to bare metal for a respray in my preferred shade of red, as I'm not keen on green. After a few years of

riding the sealed section between Alyangula and the airport - a 30km round trip with one corner (woohoo!) - I decided a couple more improvements would be beneficial for when I return to the real world.

I purchased an eight-inch duplex front brake from Germany and a four-speed overdrive gear box from the States. I'm now running out of body parts to sell on the black market... Fast forward to August this year and they have laid bitumen across the Eylandt from

Alyangula to Umbakumba, a 142km stretch with hills and sweepers to make bike riders grin. The old girl cruises along at a healthy 60mph all the way.

In doing this, a mate Garry Anderson on his 09 Rocker and me on my Chief became the first people on these makes of bikes to transverse Groote. Not enough for the record books but a story for the Grandkids or around a campfire.

I have a sidecar in the making with the



*Dave's 1944 Chief (below) has been joined by this very pretty 1929 Scout flat-tracker (above).*



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# Member Bikes



frame and wheel finished, plus tub and upholstery to complete.

In January this year it was my 50th birthday and I

was wondering what to buy myself. I received a call from a mate in Sydney who had imported a container of bikes and parts from the States. He was in fact looking for another person but rang me by mistake. Needless to say by

the end of this phone call I was the proud owner of a 1929 Indian Scout Flat tracker! It has a 600cc bottom end with a 1000cc top end with carby to suit.

It originated in Ventura, California where it was raced in what was the Outlaw series, during the 1980s and '90s. The bike came with its trophies, news clippings and even the rider's boots! Sadly he has since passed away.

However I'm in contact with a bloke over there who has known both rider and owner for 35 years and we are sharing a few yarns from across the world. At the moment the bike is at my Dad's place on the Sunshine Coast.

While I was down there for a few weeks over Easter, I was invited to attend

the All Indian Rally at Boonah. I took my bike down on a trailer for show and tell purposes and to look at the club bikes. As it turns out, the venue was the show-grounds which has an oval flat track - my tent was five meters away.

So off the trailer it came, fuel, oil, a short push start and she fired into life. I headed straight onto the track, I was very apprehensive as it has no brakes and, as for power, the rear tyre is screwed to the rim.

Needless to say the maiden run was a lot of fun and it showed me it's potential.

You can see this via YouTube: search for "1929 Indian Scout Flat tracker".

I intend to keep it as is, apart for a few mods to get it to club rego stage. I will now bring it to Groote to keep me out of the pub. I also have a Triumph Speed Triple 900, at Dad's to keep the reflexes sharp while on holidays. Thanks for your time.

*Cheers,  
Dave*



# Member Project

## *From Indian to Vindian*

**Phil Pilgrim's decision to build his own version of a rare factory prototype led him down a long and often frustrating path. Here's part 1 of his story...**

The original Vindian prototype took three weeks to build - though that was with people on the job full-time. What I can say from experience is that, should you decide to build one of your very own, plan on months locked away in the shed.

Let's get a few basic questions out of the way before we get into the detail of the build.

Why build one? Rarity and having something very different is a good start. Plus you pick up a significant amount of performance, along with a four-speed foot-shift which, as those of you who own Springfield hand-shift bikes know, can be a good enough reason in itself!

What are the basic ingredients? Let's start with a 1946-52 Chief chassis, plus a 1946-55 Indian/HRD engine assembly. Plus an angle grinder!

Okay, a decent depth of mechanical knowledge is helpful, as is a well-equipped workshop and access to a network of specialist help.

Actually, when it comes to the engine, you might consider opting for a modern Vincent-pattern engine, such as those made by JMC Classics in the UK.

So much for the basics - let's have a look at the build...

Quickly remove the existing Indian engine as instructed in service sheets, then arm yourself with a small angle grinder fitted with a thin slitting wheel, hastily cut off the rear gearbox mount on the frame (pics 1). At this stage you have passed the point of no return, so you can then remove the kicker crank spindle.

The cross rail in the frame is much too low for fitting the new powerplant, therefore it needs removing as well. I suggest you sit the Vincent engine in the frame at this stage to calm your nerves - this will also encourage you to keep progressing as you will get a rough idea how it looks.

Phil Irving said it was an easy fit: "Like a kernel into a nut."

I reckon more like a "watermelon into a grape" - it's very squeezy. The first thing is the magneto area followed by the front valve spring cap, the exhaust pushrod cap and the front exhaust pipe with nut. You could cut the frame, but I resolved to merely flatten the offending areas.

The original Vindian, apparently, was assembled by cutting out the seat post tube - fairly drastic. This would alter the integrity of the frame strength, but would simplify the engine moving further to the



*Above: Pilgrim's finished project gets some fettling.*

*Below: 'Black Bastard' the donor bike is about to be transformed...*



# Member Project

rear. I can see this would complicate the mounting of the seat “pogo stick” but an Indian 4 seat tube is much shorter - so there is an idea for somebody.

The oxy-acet plant is needed for the heating of these areas, along with a lot of lifting the engine in and out. The biggest problem is the rear mount for the engine. You can't get the engine far enough to the rear of the frame, even after grinding the rear of the crankcases and the seat post tube.

In my opinion the factory, and two previous replicas, made a severe under-estimation of the forces on this part of the frame as they welded a small tube on the seat post tube and fitted it with the Vincent RFM stud.

The factory can be forgiven for their version as it really was a mock-up and would have not gone into production this way.

Vincent engines are stressed members and the powerplant is hung on seriously heavy-duty head brackets. The Indian had the motor bolted in around the crankcases, I decided on a fully machined rear mount with offset bolt holes to give it some strength. Sam Vella of SJV Engineering (tel 03 9383 7888) manufactured the mount on a Saturday morning. Thanks for that, Sam.

This mount is crucial as the whole engine & chain alignment are all relying on this fixture. The other area that needs attention is the lower front engine plates, these are standard Vincent front stand plates cut-off at the front & bolted onto the crankcases, jack the engine up slightly, then through the Indian engine

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# Member Project



mount lug welded to the frame, mark your 9/16 hole for drilling. Remove the plates and drill both plates together for alignment.

The right hand plate needs to be notched at the top to clear the brake pedal lug. Pictured beside is the standard Vincent engine plate. With the cut versions, note the two spacers 5/16" for right hand and 1/8" left hand to align the engine. You will also notice the clutch pedal sits far to low and needs to be lifted, as the Indian factory did on 1950/53 models by





# Member Project

welding a spacer on top of the existing spindle hole, as on Blackhawk models but longer. If you don't the gearchange pedal fouls the exhaust pipe.

At this point, note the rear footboard lug just below the bulge on the chaincase, there is no room for the left hand exhaust pipe so it needs to be removed and modified to sweep underneath instead of above. This can be achieved by buying a 1940/45 right hand footboard lug (JG-2310) from Jerry Greer Engineering and grinding it to suit before welding it on. But I found they were out of stock and manufactured mine over a day - terrible job to do, it's better to buy one. Jim Brownlee of Outercycle Engineering bent the exhaust pipes and handlebars (tel 03 976 19217), while the Vincent mufflers came from Reband in South Australia (tel 08 8552 4825).

I purchased a new set of four-and-a-quarter gallon tanks from Iron Horse Coral, which are all welded - some people solder them. Unfortunately the front cable on the Vincent motor needs to fit inside the left hand tank. The rocker caps and oil lines foul the fitting as well, while the fuel taps need to be shifted. Indian taps are useless and 1/4 BSP tap unions ensure trouble-free taps from a British bike will cure your problems forever. John Bennett (tel 03 5786 5198) is the greatest tank manufacturer in Australia, so I let him cut the tanks and notch them for cable entries on the front. This way there are no unsightly clutch/valve-lifter cables hanging like jungle vines around the engine.

Another major step is the brazing of all  
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# Member Project

the lugs on the frame note I said “brazing” as Indian frames have cast-iron lugs on them and steel will have problems when electrically welded on to them. I asked many people to give me advice on this, including Aces Engineering Supplies (tel 03 9311 6644), who supply large amounts of the welding consumables in Victoria. They said, “Although modern rods will stick cast-iron to steel, the cooling and pre-heating of such areas are critical and could/would promote cracking!”

Chris Knoop, the metallurgist in our association, totally agreed, as did two other gun welders. So I, a humble motorcycle mechanic of some 40 years experience, listened.

I contacted Rob Baker of RG Baker Eng (tel 03 9899 1400) to braze weld the frame. He is a practical man and suggested ways to fix the clearance problems encountered in getting the engine to fit. He logically thought the easiest way was to cut the frame to give more clearance around the magneto and front cylinder exhaust nut. Even know the nuts are machined off halfway on the cooling rings, as on the original Vindian.

I disagreed with the first plan, but the next one was brilliant: “So why don’t I shift the exhaust port over 3/8” on the front cylinder, seeing I am remachining the stripped exhaust port thread anyway?” he said. This is the thinking outside of the square. He did this modification and it made the exhaust very easy to fit.

Jim Brownlee from Outercycle said it was much easier to pull the front bend



around the frame tube, so I’m happy that I did this. As I’m not building a factory replica, it’s easier to make these sorts of decisions.

I noticed 5/8” needed welding onto the brake pedal lever boss and decided to remove the it and make a longer one (2” overall) with the accompanying pivot sleeve as it is just a quick (Pics 11). The extra clearance is needed to clear the right hand exhaust pipe and Vincent magneto drive gear cover.

To give you some idea of the level of detail you get dragged into with a project like this, I’ve included a picture of the modified left hand rear engine mount is next to a standard one.

Sometimes it’s nice, just for a change of pace, to get some big parts done, like the wheels shown – it helps provide a little extra motivation!

*Phil Pilgrim*

*(Look for Phil’s second instalment in the next Smoke Signals.)*





# Kubota 12v *conversion*

It may not be everyone's idea of the perfect weekend, but Daryl Colt reckoned he could spend quality time in the workshop and save some money while he was it. Here's how he tackled a Kubota alternator conversion...

I was tossing up converting my 347 to 12 volt electrics, but two things annoyed me. Firstly the cost of a Cycle Electric Generator (yes I'm tight), and the fact that I find them quite ugly.

I understand that they are a proven change-out for the Autolite generator, and a lot of guys run them reliably on bikes that have done some serious miles, but I

like a challenge!

What sparked me was seeing that Phil Pilgrim had started to do one, and my machine shop background jumped to life. I thought that this can't be too hard to do, so let's give it a crack...

I procured a few alternator units from one of our members (who shall remain nameless for security reasons) and pro-



Above: Daryl Colt (left) and Robert Gosper at this year's Great Race.  
Opposite: the troublesome Autolite.



# Tech Advice



ceeded to strip one down. What intrigued me was that I haven't seen an alternator like these before, where the whole outer housing rotates, and the field coils are fixed. This particular unit has no slip-ring, just two wires running from the field coils to the regulator/rectifier. Being an alternator, it does run a regulator/rectifier which, talking to my electrical mates, is the box of tricks, do-dad thingy, that does all the special AC/DC converting of the electro stuff. It also dissipates heat energy, while clipping the voltage through the diodes, and making the magic smoke stay in there. Apparently you need to keep it, so I did (confusing, eh?).

So I started to sketch things up, and was chasing down materials, when I

*The Kubota set-up.*

found out that the outside diameter of an Autolite generator doesn't coincide with any pipe or tube sizes. You can either modify your existing housing, machine one from scratch, or source a VW generator housing. The VW housing is only 0.5mm smaller on the outside diameter, so will work fine when cut down.

After pulling down the alternator, it was quite easy to remove the mounting lugs. A hacksaw will sort that out. With the lugs removed, and the field coils taken off, it is easily chucked in a lathe and machined. I basically skimmed the outside diameter of the housing, and machined the already existing step



*Above: left and middle units are Autolite, while the one on the right is from a VW.  
Below: inside the Kubota.*



# Tech Advice



*Above: Mounting lugs removed, the alternator has seen a session in the lathe.*

further in. This stepped diameter would slip into a shoulder that was machined into a shortened Autolite or VW case, or in my instance, the purpose-made dummy casing.

The next challenge was where to mount the regulator / rectifier. In talking to many people, there were a lot of differing opinions on where to mount it. Remotely somewhere, somewhere in the breeze so it keeps cool, but to me the objective was to hide it. I'm trying to make this look as standard as possible, so hidden was the go. Yes, I know it gets hot, but this is the trial unit and I'll suck it and see. One piece of advice from an auto electrician was that being so low output (15 amps max) that it shouldn't get too hot anyway.

With a little trimming from the fins, I slotted it onto the hollow end of the housing, and fastened it with a couple of bolts. The theory being that the cooling fins are in contact with the housing, and this is acting as a big heat sink to help with cooling as well.

Now to the pulley, or drive end. These



little units like to be spun quickly, so I needed to reduce the pulley size on the alternator. I chose the smallest diameter I could run with the v-section belt used as standard. I think this was around 1 7/8 or so. I actually used an old washing machine v-pulley that dad had in abundance stashed under his bench. Cut in half (because the nose of the alternator is already tapered), a small spacer, and all was good.

I welded a couple of mounting tabs for the rear cover, and used the original cover to keep it looking stock. I also mounted the original cut-out on top. The wiring was straight forward, but requires an extra wire from the ignition for feedback to the regulator.

It has been on two club runs, so far without issue, but some further testing will satisfy me on its reliability. It is different in how it works as the feedback to the regulator will stop it producing current if the battery doesn't need it. I can ride with the lights off and have a 2 amp positive charge, turn the lights on and still have a 2 amp positive charge. The regulator maintains this via the feedback circuit. Took me a while to work that one out, with a bit of head scratching!!!!

Painted all up it looks the goods, and you would be hard pressed to pick it at all. Anybody wanting the dimensions or further information, get in touch.



*Left: The whole alternator needs solid mounting to the casing, so I drilled and tapped the alternator body, and countersunk the case in three spots radially. These three screws get hidden by the generator clamp so they can't be seen.*

*Right: My purpose made housing with radial drilling.*





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