



INCORPORATED



Club Newsletter of Minis Manawatu Incorporated

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COPY DEADLINE

To guarantee your article appears in the next issue, please submit it to the editor no later than the 8th day of the month.

INSIDE THIS ISSUE

Club Captain's Report.....	1
Editorial.....	1
Car Batteries Are Not 12 Volt.....	2
Calcium Car Batteries.....	4
Birthdays.....	4
Events Calendar.....	5
Dannevirke Car Club Events.....	5
What's the Story?.....	8
Classifieds.....	11
Write an Article.....	11

ADVERTISER INDEX

Tremaine Tyres & Wheels.....	5
Ultimate Engine Steady Kit.....	8
Team Mcmillan Mini.....	11
ManADE.....	11

Club Captain's Report

It's amazing how quick this year is passing with that it being spring, but unfortunately has not got off to a great start.

4th of September seeing the people of Canterbury having an earthquake that I'm sure they are not going to forget in a hurry, then the 7th September some of the Manawatu become very wet with over night rain.

I'd like to take this chance to wish any one effected by either of the above incidents all the best and hope with time that all will be better and brighter.

Last month's Club event was organised by Robbie and Denise, I'd like to thank them very much for taking the time to organise a run/lunch stop. An enjoyable game of ten pin bowls, the weather first thing on the day looked rather bleak so may of put some people off joining us, as it turned out the day was kind to us. We stopped at the Saddle Road Windfarm viewing area and it was enjoyable being up there on such clear day which

Editorial

This month, we have not one, but two articles discussing the advances that have been made in lead-acid battery technology over the past 40 years or so, and what this could potentially mean to owners of older vehicles like ourselves.

They are slightly contradictory, so I suggest you read them both, and the linked resources if you desire, draw your own conclusions. If you do so, please share your findings with the rest of us.

If, however, you take only one thing from the articles, please let it be this:

"For batteries not in weekly use, more deep cycle and starting batteries are killed by bad charging practices than those that will die of old age.

meant the view was great (not often seen up there this time of the year) thanks guys for a great outing.

This Month, Raeleen has organised for us go go to Daytona, we are hoping to make up teams and go from there, \$30.00 pp. See flyer in newsletter.

With it being September, that only means one thing, **it's less than 2 months until MiniMEET 2010** (labour weekend). It's rather scary to think I myself still have 2 cars to sort for the event, and still try do my bits for Nats - no doubt it will all come together.

Registrations have started to filter in, so hopefully we will see a good attendance when registrations close. Please, if you are going to register for the Nats could you do sooner rather than later.

Please go to Website to find more information on Nationals.

Happy motoring,
Russell Rankin

To prevent permanent sulfation, and in a well ventilated area, keep the battery continuously connected to a "smart" or float charger matched to the battery type; recharge the battery whenever it drops below 80% State-of-Charge (SoC); or use AGM (Ca/Ca) or Gel Cell (Ca/Ca) VRLA battery. **A cheap, unattended, unregulated "trickle" charger can destroy a battery by overcharging it.** (Car Battery FAQ)

Please don't kill your battery by allowing it to self-discharge, or overcharging by leaving it connected to a simple, non-float, battery charger.

Stay tuned,
Brendon Green

f Coming Up: September 26th: Daytona Teams Racing. Contact Raeleen.

Car Batteries Are Not 12 Volt

There are at least three variations of the lead-acid battery in current automotive use¹. In the most common configuration, the car battery has six cells, each producing about 2.1 volts. Thus the total battery output voltage is about 12.6 volts.

It is the "about" in the previous two sentences that leads to trouble when a charging system is not matched to the type of battery installed.

The three major contributors to battery chemistry are lead (Pb), lead dioxide (PbO₂), and sulfuric acid (H₂SO₄). Unfortunately, pure lead is too soft to withstand the physical abuse of mobile applications, so about 6% antimony (Sb) was added to strengthen it. This led to another problem - water usage.

Antimony added to the lead grids acted as a catalyst and made outgassing (loss of hydrogen and oxygen during use) worse, and frequent water replenishing was required. So battery manufacturers looked for another material that could strengthen the lead grids.

Calcium (Ca) was added to both the positive and negative electrodes in the early 1970s. It reduced outgassing enough to allow manufacturers to claim they building "maintenance-free batteries".

However, lead/calcium (Ca/Ca) batteries are not very resistant to "deep-cycling" (deep discharge followed by a full charge). This made them inappropriate for uses such as to power trolling motors in fishing boats. It also required a higher charging voltage. *General Motors studied the charging characteristics of lead/calcium batteries and set the voltage regulators of cars equipped with the "Delco Freedom II" battery at 14.8 volts.* Lower settings prevented charging to full capacity. This is too high for lead/antimony (Sb/Sb) batteries and will cause them to lose water rapidly.

The third type of battery frequently used in automotive service uses "hybrid" (Sb/Ca) construction. Its positive grid is strengthened with antimony, and the negative grid with calcium. Water usage is greatly reduced, although regular checking is advisable.

The hybrid battery is more resistant to deep cycling than the lead/calcium, but is still not as good in this respect as the original lead/antimony style. Most cars supplied with hybrid batteries have their voltage regulators set to 14.3 volts, although it is reported that the higher 14.8 volt setting of GM cars does no harm if the water level is checked regularly.

A fourth type, the "gel cell", has appeared in automotive use. Early reports were that its manufacturer recommended charging at 13.8 to 14.1 volts², suggesting it used hybrid chemistry. However, it also does not allow the user to add water, so it may indeed be lead/calcium.

Older vehicles with voltage regulators set at about 14.0 volts simply will not fully charge lead/calcium or hybrid batteries. Stories abound of cars with older regulators leaving their owners stranded on cold mornings shortly after a "new, improved, maintenance-free" battery was installed. Even two weeks of sitting in the garage, with no load other than the electric clock and burglar alarm, can discharge a battery if the voltage regulator prevented it from being properly charged.

The challenge is particularly severe in the case of foreign manufacturers. Many firms are so certain, and so proud, of their engineering expertise that they have declined to modernise their specifications to meet present battery specifications. Bosch, for example, still teaches its "factory-trained" service technicians that 13.8 volts is enough. As late as 1992 the Product Support Manager of their Automotive Service Division wrote³ that "13.6-13.8 VDC may in fact be adequate", and that "a fully charged battery cannot be charged with 14 VDC or higher. Doing so will cause the battery to be overheated and damaged".

Only slightly contradicting him is a statement from Bosch's Customer Relations Representative⁴ that "the alternator and voltage regulator should charge between 13.8 and 14.2 volts". This representative also recommended a local Bosch Authorized Service Center, who assured me that "13.7 volts is enough".

Mercedes-Benz⁵ offered their usual advice: "we suggest the installation of an original Mercedes-Benz battery".

The National Technical Director of the Mercedes-Benz Club of America⁶ was considerably more flexible: "the specified voltage for Mercedes-Benz cars of the mid-1980s is 13.0 to 14.5 volts". But clearly 13.0 volts is not enough, and Bosch says 14.5 "will overheat and damage the battery". In an early 1993 letter he says local MB technicians tell him that alternators usually check out around 14.2 to 14.4 volts, and that they replace regulators that call for less than 14.0 volts - thus contradicting the Bosch Product Support Manager. Are we having fun yet?

Of course, *battery chemistry is also a function of temperature.* Modern regulator designs usually charge to higher voltages in cold weather. Bosch has offered this graph in a technical manual⁷ covering alternators. Although they do not mention different types of battery construction in this 1982 manual, the graph would appear to display the lower limit of appropriate voltages for

3 Private correspondence from Dieter Richter (Bosch), 14 September 1992.

4 Private correspondence from John Haralamos (Bosch), 28 August 1992.

5 Private correspondence from Thomas Trivento (Mercedes-Benz Owner Service), 1 October 1992.

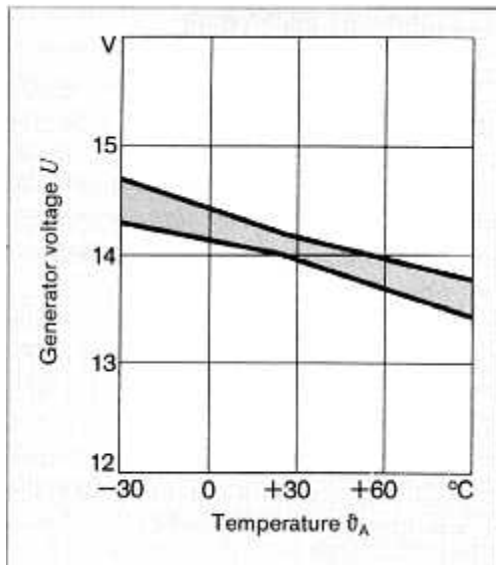
6 Private correspondence from Frank King (MBCA), 20 January 1993.

7 "Technical Instruction Manual - Alternators", Robert Bosch GmbH #VDT-U 1/8 En (12.82), June 1982.

1 "Batteries: Current Designs", Mike Dale, Motor magazine, November 1985.

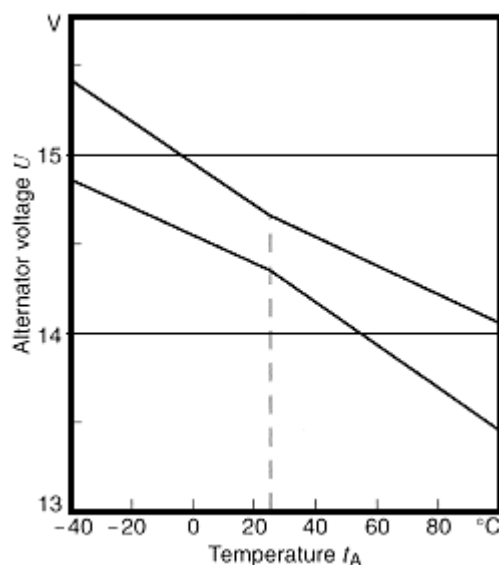
2 Email from Ronald Dwelle, 13 February 1999.

hybrid batteries. Too bad their own “factory-trained service technicians” choose to ignore it! By the way, these are stated to be the permissible tolerance ranges of the regulator at an alternator speed of 6000 RPM and a load of 5 Amps.



Bosch technical manual, 1982

Personal experience clearly reinforces the dependence of battery performance on a good match between the regulator and the battery chemistry. A 1973 Mercedes whose regulator delivers 14.1 volts keeps its battery well-charged even though the car is driven infrequently and only for short distances. A 1982 model whose regulator provided 13.6 volts would not keep its battery charged - a trickle charger was necessary in cold weather. A 1988 300TE charging at about 13.9 volts has frequent battery problems, while a 1991 560SEC which charges at about 14.1 volts has caused little trouble.



Bosch technical manual, 1995

In a more recent document⁸, Bosch recognizes the effect of calcium on battery chemistry. Elsewhere in this same 1995 handbook they recommend that when external chargers are used, lead/calcium and hybrid batteries be charged at no more than 14.4

⁸ “Automotive Electric/Electronic Systems”, Second Edition, Robert Bosch 1995.

volts **and** the charger have a certain characteristic known as “Type IU”. The “IU” characteristic is well-defined in this reference. However, under the more controlled environment of an automotive charging system (the regulator is temperature-compensated), voltages greater than fifteen are sometimes useful. At a modest air-intake temperature of 25° C (77° F), this chart suggests settings between 14.3 and 14.7 volts.

At one time Interstate offered a line of “Extreme Performance” batteries⁹. Recently they reappeared on their Web site under the name “*Optima Spiralcell*”, so they may have a cooperative agreement with Optima. *Optima* has added a little silver to the plates and some sodium sulfate in the electrolyte, and fabricated the lead plates in a spiral. Their main claim to fame is their ability to be charged very quickly, allegedly due to the greater surface area of their plates and the ensuing lower internal resistance (on the order of 3 milliohms). Since there is no way to add water, they may be lead/calcium (+silver), and the higher charging voltages would apply.

Their [charging advice](#) supports this theory. They suggest that alternator settings anywhere from 13.8 to 15.0 volts are appropriate, but that they can be rapidly charged at as much as 15.6 volts. Elsewhere in the same document it is suggested that for constant-voltage charging 14.7 to 15.0 VDC is correct (supporting the “lead/calcium” hypothesis).

Owners on various mailing lists have reported their satisfaction with adjustable regulators. One source mentioned is [Transpo Electronics](#), and another is [Doug Sogolow](#).

If you have a choice, try to get your system to charge within the range suggested by Bosch's newer graph. 14.5 volts at moderate temperature is not a bad target. The improvement in life and performance of lead/calcium and hybrid batteries will be worth it!

Additional information can be found at [various places](#) on the Internet¹⁰. Those who don't mind a little math and physics can find a more complete explanation from [ThermoAnalytics](#), in the context of hybrid and electric vehicles¹¹.

Source: Dan Landiss, <http://landiss.com/battery.htm>

Submitted by Brendon Green

(for more information than you probably ever wanted to know about car batteries, their characteristics, and their charging systems, the “*Battery FAQ*” (<http://www.batteryfaq.org/>) is well worth a read - ed)

⁹ “Extreme Performance”, Interstate Batteries Web site © 1998,

http://www.interstatebatteries.com/products/product_line/extreme_specs_charging.htm, (page no longer found)

¹⁰ “Car Battery Frequently Asked Questions”, Bill Darden, <http://www.batteryfaq.org/>

¹¹ “Battery Modeling for HEV Simulation by ThermoAnalytics Inc”, <http://www.thermoanalytics.com/support/publications/batterymodelsdoc.html>

Calcium Car Batteries

A little something all of us should now be aware of is the gradual shift away from the conventional lead acid car batteries we are all used to, to the new calcium type batteries that are now prevalent in the market place. Calcium batteries are still lead acid but have calcium incorporated into the plates.

All the major new car manufacturers over recent years now specify and manufacture their cars with calcium type batteries as factory standard. As the number of vehicles with these batteries has increased, the battery suppliers have been phasing out the old lead acid type and superseding these to the new calcium type batteries. Chances are if you have bought a new battery in the last couple of years it may well be a calcium type battery.

So what does this mean for us using older cars? Not a lot really - the new batteries are more efficient with better CCA (Cold Cranking Amps) ratings, casing sizes and terminal positions have altered in some cases, so fitment may require some adjustment. The biggest thing we need to be aware of in vehicles that are infrequently used is the problems with charging the battery particularly if it has become heavily discharged (flat!). A conventional battery charger will not fully charge a calcium battery.

A 4-stage charge is used, specially designed for calcium batteries. Stage one (bulk or constant charge) quickly charges the battery while stage two, the absorption mode (constant voltage), ensures the battery is thoroughly charged. A third stage is the critical stage for calcium type batteries. It charges the battery to 16 Volts to remove any acid stratification and returns a full hydrometer reading. The final stage in the charging process (float), maintains the battery at a safe voltage ready for use.

Most garages and dealerships all now have specific calcium chargers and you can buy from automotive accessory specialists calcium chargers for the home but the better ones of these are still relatively pricey.

My understanding is that a standard battery charger or permanent automatic trickle charger will maintain a calcium battery if it is not discharged. So if your battery has gone flat and it's not that old and won't appear to charge - you may have a calcium type battery that requires a calcium charger.

Source: "Dom",
<http://www.mgmanawatu.com/calcium-car-batteries/>

Submitted by Roo Fenn

Birthdays

Happy birthday to: Alan White, Sue Taylor.

Daytona

Teams racing

Sunday 26th September- 1pm

Ages 14 and up

Cost \$30 per person

3 relay of 10 laps

Computerised lap score

Certificates to the winning drivers

Everyone welcome

If you are interested please phone or text Raeleen

027-423-1000 we need to know numbers by 19th September

23c Bennett Street

Palmerston North

Events Calendar

Date & Time	Event	Venue & Time	Contact
2010			
Sunday September 26 th	f Daytona Teams Racing See page 4 for details	Daytona Indoor Raceway , 23c Bennett Street, Palmerston North, 1:00pm	Raeleen - 027-423-1000
Sunday October 3 rd	DCC - Gravel Sprint See page 5 for details	Tararua Road , Ballance, Tararua 9:00am - 5:00pm	Rod Bracegirdle - 06-374-1535, rjbracegirdle@xtra.co.nz
Labour Weekend October 22 nd - 24 th	f 16 th Annual National MiniMeet	Palmerston North / Feilding	minimeet@minismanawatu.org.nz
Sunday November 7 th	DCC - Sealed Motorkhana/Autocross See page 5 for details	Oringi , Tararua 9:00am - 5:00pm	Rod Bracegirdle - 06-374-1535, rjbracegirdle@xtra.co.nz
Sunday November 14 th	Tui HQ - Mangatainoka Motors See page 6 for details	Tui Brewery , Mangatainoka, 11:00am	Jo Hirst - 06-376-0815, jo@tui.co.nz
2011			
March	f Chrome, Classic & Custom Show 'n' Shine	Railway Land, Palmerston North, 10:00am - 2:00pm	To be confirmed

f Want to RSVP online? Check out our Facebook Events page: [facebook.minismanawatu.org.nz/events](https://www.facebook.com/minismanawatu.org.nz/events)

Dannevirke Car Club Events

The Dannevirke Car Club (DCC) has a number of gravel and sealed events coming up. The sealed events will be fine for your Mini(s), but please check with them before taking your pride 'n' joy on one of their gravel sprints. For further details, check out the DCC website (www.dannevirkecarclub.co.nz) or contact Rod Bracegirdle on rjbracegirdle@xtra.co.nz or 06-374-1535.

TREMAINE TYRES & WHEELS

593 Tremaine Ave, Palmerston North
Amory Yarwood (Manager)

Ph: 06-353-3590 Cell: 027-602-7971
Email: amory@tremaine-tyres.co.nz
Web: www.tremaine-tyres.co.nz

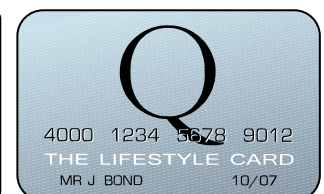
Stockists of:



Suppliers of:



We Accept:



10", 12", & 13" PERFORMANCE SUPERLITES AVAILABLE



This coupon entitles the bearer to:
One (1) wheel alignment service at the discounted rate of \$50 inc. GST
on presentation of a valid Minis Manawatu membership card

Coupon code: GAKU3BBJ. Coupon expires: 20th November 2010.
Limit: One per member. Not to be used with any other offer.

MANGATAINOKA MOTORS

INVITES YOU AND YOUR CLUB TO TUI HQ SUNDAY 14TH NOVEMBER FOR A DAY OF LOOKING AT WELL TUNED BEAUTIES, AND WE DON'T JUST MEAN THE TUI BREWERY GIRLS!

- PRIZES FOR BEST CAR – VINTAGE/HOT ROD/CLASSIC
- PRIZES FOR BEST DRESSED DRIVER
- OFFICIAL JUDGES – THE TUI BREWERY GIRLS
- FREE BREWERY TOURS
- ROCK N ROLL DANCING AND A DJ
- 11.00AM ASSEMBLE AT TUI HQ
- 12.30PM BBQ LUNCH
- 2.00PM PRIZE GIVING
- \$15 ENTRY FEE PER CAR – INCLUDES 1 BBQ MEAL AND A DONATION TO CHILDREN'S CHARITY.

BRING A TOY TO BE DONATED TO CHILDREN'S CHARITY

A GREAT FAMILY DAY OUT. FATHER CHRISTMAS ALSO MAKES A SPECIAL APPEARANCE, SO BRING A SMALL GIFT IF YOU HAVE CHILDREN. LAST YEAR WE RAISED OVER \$2,000 FOR THE CANCER SOCIETY AND A WHOLE CAR LOAD OF TOYS MADE THEIR WAY TO A LOT OF VERY GRATEFUL CHILDREN.

FOR MORE INFO CONTACT JO HIRST ON EITHER JO@TUI.CO.NZ OR 06 576 0615

NB: OTHER BBQ MEALS CAN BE PURCHASED ON THE DAY FOR \$10 – CHILDREN UNDER 10 PAY THEIR AGE (PROCEEDS OF WHICH GO TO A LOCAL COMMUNITY GROUP)



ENTERTAINING THE BOYS (AND GIRLS) SINCE 1889.

What's the Story?

Wow, what a *huge* response last month! My inbox was overflowing with a grand total of, well, zero entries for me to choose from.

Never mind, we'll try this one.

Using a maximum of 50 words, write a caption or short story about the picture opposite, and get it to me before next month's copy deadline. (P.S. It's not too late to send in a caption for last month)

The best one, as judged by myself, will be published in the next issue of "InTune". Anonymous submissions are okay, but please be sure to include your name so we know who to credit the Club Points to.

If you have a weird, wacky, or just plain amusing photo, please submit it to me for a future column. Got an old photo that never quite made it into InTune? Then send it in too! - ed



Does your engine 'clunk' every time you change gear or decelerate?
Does your exhaust leak, even after you keep fixing it?
Do you break bottom engine mounts on a regular basis?
Is all your horsepower getting sucked up from movement in the drive train?

THEN YOU NEED THIS:

THE ULTIMATE ENGINE STEADY KIT!



Complete easy fitting kit for **big and small bore engines.**

Stop engine flexing, gaining instant horsepower. Precision ground mating surfaces with attractive zinc coated components. Fully adjustable arm guaranteed to fit.

ONLY \$140.00 MADE IN NEW ZEALAND

Contact : Roo 06 3627150 - 027 4822887



MiniMEET 2010

16th Mini Nationals
Labour Weekend 22nd - 25th October 2010



Calling all Mini owners and enthusiasts

Join us, and other like-minded individuals, for a fun-filled weekend here in the Manawatu, at the 16th Annual National Mini Meet.

Highlights of the weekend will include:

- ☞ Show 'n' Shine in The Square, Palmerston North
- ☞ Rocker cover racing
- ☞ Navigation Trial around Manawatu and surrounding districts
- ☞ Motorkhanas and Sprints around Manfeild Track, Feilding
- ☞ Tiki-tour around the Manawatu (if enough interest)
- ☞ Prizes, trophies, and ribbons galore

If this sounds like you, please contact us for more information.

Phone:

Roo Fenn, 06-362-7150, cell 027-482-2287
Russell Rankin, 06-323-1408, cell 027-235-8818 / 027-600-6341

Post:

MiniMEET 2010
PO Box 4388
Manawatu Mail Centre
Palmerston North 4442

Email:

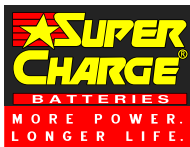
minimeet@minismanawatu.org.nz

Web:

www.minismanawatu.org.nz/nationals

Sponsors

Minis Manawatu Incorporated would like to thank the very generous donations of all of our sponsors for making this event possible.





INCORPORATED
 Mini Meet 2010
 hosted by
 Minis Manawatu Inc.
 P O Box 4388
 Palmerston North



Labour Weekend
 22 – 24 October 2010



REGISTRATION FORM

Please make your cheque payable to Minis Manawatu Inc. If you wish to pay by Direct Credit please ensure that the funds are deposited no later than 30th September 2010, and you must include the Driver's Name as the Reference Code.

Bank Account Details are: 38 9008 0145707 02

Please post entries to:

The Treasurer
 Minis Manawatu Inc
 C/- K C Rankin
 5 Cullinane Ave
 Feilding 4702

Email: karen@minismanawatu.org.nz

Phone: 06 323 1408 after 6.00pm or Russell 027 235 8818

Entries in by 30th September 2010. Late fee of \$20.00 will apply if Registration after this date.

Name:	ITEM	COST	x	QTY	=	TOTAL
Address:	Entry for full week-end (Includes: 1 person show'n'shine, Sunday events, 2 ppl navi trial, 2 ppl nibbles Sat)	\$55.00		.....		.....
Phone (Hm):	Entry for Saturday only (Includes: 1 person show'n'shine, 2 ppl navi trial, 2 ppl nibbles Sat)	\$25.00		.....		.....
Phone (bus):	Entry for Sunday only (Includes: 1 person motorkhana & sprints)	\$40.00		.....		.....
Mobile:	Saturday night nibbles (Extra adult, if not registered as above)	\$5.00		.....		.....
Email:	Saturday night nibbles (Per child)	\$2.50		.....		.....
Name of Additional Driver:	Sunday night Prize giving (Per adult)	\$27.50		.....		.....
Car/s entered: (Make, Model & Year Please):	Sunday night Prize giving (Child up to & including age 12)	\$1.00 per year		.....		.....
	<u>Minimeet 2010 Apparel (please indicate sizes)</u>					
	Mens Polo-shirts S – 5XL	\$43.50		.....		.....
	Womens Polo-shirts 8–24	\$43.50		.....		.....
Engine Size:	Kids Polos 4 – 16	\$41.00		.....		.....
	Kids T-shirts 4 – 16	\$31.05		.....		.....
Club Name:	Caps	\$20.00		.....		.....
	<u>TOTAL</u>					.....

Submit Form

Classifieds

Wanted to Buy

Minis Manawatu cap lost at AC/DC concert on Saturday night. Flew off my head in windy Wellington. Minis Manawatu logo with slimy green colour on peak. Contact Roo 06-362-7150 or 027-482-2887.

Need that obscure Mini bit, but can't seem to find it anywhere? Contact the Editor to place your ad here! Ads are FREE for club members, and run for up to 3 months, after which you will be contacted for renewal. Photos are OK too (will be cropped & resized to approx 4cm²).

Wanted to Sell



Mini Clubman project. 1100

Engine, brand new front suspension bushing, rear sub frame sand blasted and rust proofed, front sub frame rust proofed. Hotwire 10" wheels with Dunlop aquajets

and flares. Mini spares alloy inlet manifold, LCB extractors, centre exit exhaust. Body virtually rust free, floor pans and boot perfect, only rust I can find is a bit in the gutter and a small hole at the top of the right A pillar. Under body rust proofed. Home respray, blue with white roof, white bonnet, boot lid still in primer. Paint job not quite finished, I have a litre left to finish off. Rear valence has been dented, has filler. Registration lapsed, will need a re-vin. Open to offers. Contact Gay

Landmark tel 06-353-7050 or email landmark@inspire.net.nz.

CLUBBY1 license plate, red, \$800. Phone Jeff 027-488-7844.

1976 Mini 1000. Three owner original 122,000kms, sold new in Palmy, never had stereo fitted, all original. Phone Dion 027-362-1899 or 06-929-4111.

Set of number plates on hold for a MORRIS MINI 1968, complete with chassis plate. \$250.00. Contact Scott on 021-037-5789.

1979 LEYLAND MINI (Round Nose). Reg on hold, 10" Mags, Red, 1000cc eng with blown head gasket + 850cc eng. Suit Project. Ph: Michael 06-354-6873 or 027-825-8778. \$800.00 o.n.o.

1980 1275GT, yellow with black roof & GT stripes, 104,000kms, 4 owners, very good condition, new interior, Recaro seats, good stereo, reluctant sale, owner going overseas, \$6500, ph Alan 06-354-7915 or email awhite@hmw.co.nz



Mini Motor 1000cc. Condition unknown. Ph Bruce 06-323-2111

Got a shed-load of obscure Mini bits? Need some cash? Solve both problems by contacting the Editor and placing your ad here! Ads are FREE for club members, and run for up to 3 months, after which you will be contacted for renewal. Photos are OK too (will be cropped & resized to approx 4cm²).

4 NEW WAYS TO BUY A MINI



MINI
ONLINE STORE



MINI INTERACTION
CENTRE



MINI
MOBILE AGENT



MINI
GARAGE

Write an Article

This is your newsletter too, so if you want to write an article, send in photos (preferably captioned), create a flyer or advertisement for your upcoming event, or just give me feedback, go for it!

Preferred format is email (plain text, or attached as OpenDocument (preferred), Microsoft Office (NOT Microsoft Publisher!), PDF, or scanned image), but handwritten is good, too (provided I can read it). Email it to editor@minismanawatu.org.nz, fax it to me on 06-929-4889, or send it to the P.O.

Box on the cover page.

And please, if you organise an event, don't forget to send me the results for inclusion in the next edition of the newsletter!

ManADE ?



**We love your car
almost as much as you do.**

Manawatu Automotive

Diagnostic and Electrical

Servicing - Diagnostics - Electrical - Mechanical

MAKING YOUR CAR WORK LIKE IT SHOULD

903 Tremaine Ave Phone Simon Perchard

Workshop 06 354 0603 Mobile 0274 204 286

Email manade@extra.co.nz

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