

MINI

Mini Car Club of Auckland



OCTOBER 2013



CLUB CONTACTS

| | |
|-------------|--|
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| Captain | Chris Roper – 09 817 4080 club-captain@minis-auckland.org.nz |
| Secretary | Vic Hayes 09 413 9011 joynvic@paradise.net.nz |
| Treasurer: | Kevin Taylor – 021 121 8363 treasurer@minis-auckland.org.nz |
| Committee: | Kevin Patrick – 021 993 324 rolyat@xtra.co.nz |
| | Trent Dixon – 021 335 883 creativeheads2012@gmail.com |
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| Web Monkey: | Gavin Agnew – 09-2980046 web@minis-auckland.org.nz |

CLUB ROOMS

Northern Sports Car Club
Mt Richmond Domain
Great South Road
Otahuhu
Ph: 09 276 0880

Meets 7.30pm 1st Tuesday of each month
Committee meets every 3rd Tuesday each month.

Address correspondence to:
Mini Car Club of Auckland Inc P.O.
Box 72-970
Papakura 2244
Auckland New Zealand



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Don't forget to touch base with:
<http://www.minis-auckland.org.nz>

Events Calendar

| | |
|-----------------------------|---|
| Fri 25th – Sun 27th October | Mini Nationals held in Nelson over labour weekend. |
| Tuesday 5th November | Club Night held at the Northern Sports Club, Mt Richmond Domain entry off Great South Road at 7.30pm. |
| Sunday 24th November | War Birds Open Day more details to come |
| Sunday 24th November | Inter Club Auto-cross more details to come |
| Sunday 1st December | Hamilton Classic Motor Show - We have received an invite from the Hamilton Vintage Classic Museum Motor Show at the Hamilton Classic Museum 10am to 3pm. We will leave from the BP Bombay at 8:15am Contact Kevin Taylor – 021 121 8363 |
| Tuesday 3rd December | Xmas BBQ please bring a salad or dessert to share with your fellow club members. (Sausages and bread supplied) held at the Northern Sports Club, Mt Richmond Domain entry off Great South Road at 7.30pm. |
| Sunday 8th December | This years Annual Economy Run will meet at BP Bomby at 8:45am for 9:00am start. We will travel to Raglan where you will have a hours to explore, have lunch or check out the markets prior to a convoy run home. Please note this is a run not a trial. |



**XMAS
BBQ DINNER**
TUESDAY 3RD DECEMBER





Club Points

As of 4-9-2013

| FirstName | clubnights | Events | Runs | totals |
|-------------------|------------|--------|------|--------|
| Kyle Apanui | 2 | 1 | 1 | 4 |
| Nic Apanui | 2 | 1 | 1 | 4 |
| Rex Coubray | 2 | 2 | | 4 |
| Kevin Taylor | 2 | 1 | 1 | 4 |
| Rob Apanui | 1 | 1 | 1 | 3 |
| Catherine Ashton | | 2 | 1 | 3 |
| Gary Ashton | | 2 | 1 | 3 |
| Mike Bates | 2 | | 1 | 3 |
| Trent Dixon | 1 | 2 | | 3 |
| Ian Gillanders | 2 | | 1 | 3 |
| George Gray | 2 | 1 | | 3 |
| Alan Murie | 2 | | 1 | 3 |
| Shelagh Murie | 2 | | 1 | 3 |
| Lee Norman | 2 | 1 | | 3 |
| Kevin Patrick | 2 | 1 | | 3 |
| Warwick Robinson | 1 | 2 | | 3 |
| Chris Roper | 1 | 1 | 1 | 3 |
| Richard Underwood | 2 | 1 | | 3 |
| Gavin Agnew | 2 | | | 2 |
| Jason Agnew | | 2 | | 2 |
| Jan Bates | 1 | | 1 | 2 |
| Russel Bolton | 2 | | | 2 |
| Fiona Clark | 1 | 1 | | 2 |
| Jo Clark | 1 | 1 | | 2 |
| Lloyd Clark | 1 | 1 | | 2 |
| Susan Coubray | 1 | 1 | | 2 |
| Dayle Cowley | 2 | | | 2 |
| Ross Galloway | 2 | | | 2 |
| Murray Grant | 2 | | | 2 |
| Keith Hargraves | 2 | | | 2 |
| Steve Landon | 2 | | | 2 |





President's Report.

Hi fellow club member's.

This is the first president's report I have ever written. So here goes.

Firstly I would like to congratulate the current past president, Warwick Robinson for all the work he has put into the club over the last 16 or so years as president. I know with Warwick staying on the committee for 2013/14 the committee and I can tap into his knowledge and experience.

Secondly I would like to welcome aboard the club members that put there names forward and were elected to the committee for the next 12 months. The club seems to have a good team dedicated to work hard and take the club into the future. Talking about hard work, the next 12-14 months is going to busy .With MCCoA holding the mini nationals over labour weekend 2014 here in Auckland. The committee will be calling on club members for a helping hand to make the mini nationals a success.

Congratulations to all the winners at the AGM prize giving in August a full list of

winners later in the magazine .Thanks to Michele Bowler for presenting the prizes and for her wit.

A big THANKS to the Crispe family for Donating the Graham Crispe Memorial Trophy to the club. It is an awesome looking trophy .If you haven't seen this trophy.

You can view it in the clubs glass cabinet in the club rooms.

There are lots of activities on the calendar over the next few months. The weather is getting warmer so polish up those minis (if your car is not ready, use your everyday driver) and get out there and support your club.

Also we need articles for the magazine, no matter how small /large. Any stories that may be interesting to fellow club members just email them to the editor@minis-auckland.org.nz

To next time! Keep on mining

Murray



Note to All

Northern Sports Car Club Mt Richmond Domain
Great South Road. Otahuhu, Ph: 09 276 0880



We are still looking for an editor to help with producing the club magazine

What's involed being an editor?

This is a very important duty it is the ears and eyes of the of the total membership of the club. As we usally have 30% attendance at the club meetings that leave 70% reliance on the club magazine for any information of passed and future events and general articles of interest. The editor obviously cannot do it all, he or she should ask for, and expect interesting articles from various quaters. The job entails collecting information of past events and updating the calendar of forthcoming events. His or her duty is to put the magazine along side the designer together and have it printed and mailed out.



Our new club website coming soon



Captains Log



Hullo

All You Mini People

This is my last report as Club Captain.

When I took on the role I said I would do it for two years, well now they are up so I am standing down but will continue on the committee till after the Nationals hosted by us in 2014.



I have already been active in arranging venues etc. and I would like to carry on with being involved.

Murray Grant has stepped up to the plate as our new President, Chris Roper has volunteered his services for the role of Club Captain. I would like to take this opportunity of congratulating them.

Kevin Taylor is our new Treasurer and Vic Hayes will continue as our Secretary. So all in all we have a good strong executive on the committee.

Our AGM and prize giving was a great success with Michelle Bowler from the USA Distributing the trophy's as well as holding the floor with her Life's History, what a treat she is. She is now a club Member, just goes to show the drawing power a Mini has over some people.

A big thanks to Paul and Diane Crispe for the new Trophy in Memory of Graham, to be challenged for in Gymkhanas and also Warwick Robinson for the Trophy to be awarded to the Best Female club member for the year.

Well that's about it from me so will see you all at the next club night.

Yours

Honest George



New Club Captain

> Chris



Hi to all you mini nuts.

Here goes my first edition as Club Captain !

The first Gymkana since our A.G.M was held at Pukekohe last Sunday with a great Auckland turn out. This was a round of Auckland versus Waikato and was held at Customkit (Kevin Taylors workplace) for the second time. Thanks Kev.

Yes, I know I was not there! Major oil pressure problems stopped me although I can now report that I think they are resolved. A jammed oil pressure valve being the cause. This was also the first round for Auckland drivers to contest the new Graham Crispe memorial trophy. Thanks to Jo for running the day for us as Clark of Course along with the many helpers.

Next interclub round is an Autocross in November on grass. (Check out the Club Calander for details) These are a lot of fun and quicker than a gymkana as it is more of a speed event.Why not bring along your helmet and overalls and have a go.Remember the Nationals are on this Labour Weekend in Nelson. It is still not too late to book if you are

thinking about going.Check out there web site www.minisinnelsoninc.co.nz www.minisinnelsoninc.co.nz for all the info.

Vic has kindly organised a day trip for those not going to the Nationals. This will run to Waihi and back with a lot of fun along the way. Again check club calander for more info.

As soon as an event is confirmed it goes on the club web site events calander first. So if it has not made it to the Mag, check there first ! Keep Sunday the 1st of December free if you would like a day in Hamilton.

The first annual “ Hamilton Classic Motor Show is being held at the Classic Museum and Jukebox Diner. A covoy will be leaving Bombay B P at 8.15am. Cars 30 years or older are preferred so dust off your pride and joy.

Remember this is your club. If you have any ideas about things you would like to do talk to a committee member. If you are unable to organise it on you own, there is always some one to help so don't be shy !!!

Cheers Chris



Mini "in" box

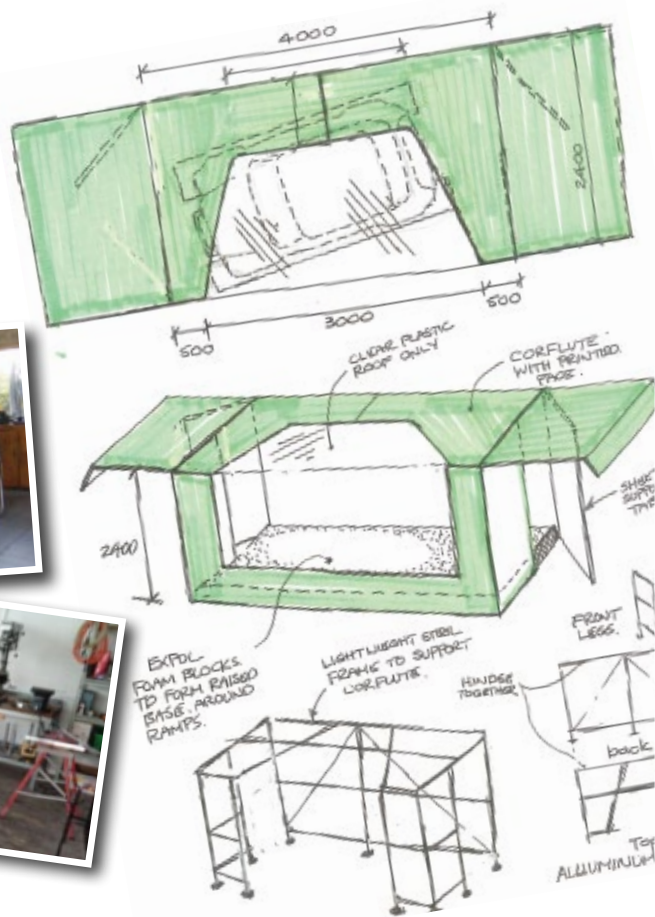
DREAM TO REALITY



One of New Zealand's biggest motor shows "CRC speed show" based in Auckland which aims to represent all aspects of the motoring world. (www.speedshow.co.nz) This very popular show this year decided to have a show within the show and stage a high end show car competition, and keeping to it's principles invited over 55 top cars representing 10 different categories from hot rod, American muscle, European custom etc. to even custom bikes all from around New Zealand.



Planning the idea



I was part of the European custom category, and naturally thinking I might not be up to the grade against top competition I decided to take a leaf out of the hot rodder's books and not only feature my car but build a purpose themed display around it. I had always had the idea for 10 odd years, this was the ideal opportunity to make it happen.

So the start of the Mini "n" box project based on a Corgi model of my Rover Sportspack 1.3i (BRG). The idea was an exact replica, down to the opening ends

which would facilitate viewing and a sense of interaction by the public.

The build was to be over a few weekends!!!! However a solid 9 weeks later with one colleague nearly full time on the project we just got there. We designed as we went and tried to take into account not only the final set up but transportation and eventual storage plus possible lighting points, panel weight... etc.

Yes it was a big structure over 7.0m long x2.3m wide x2.2 high (height so could fit in my garage as an option) Built on

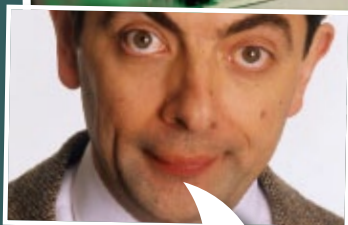
an interlocking aluminium frame and clad with pre painted Aluco ACM panels, glued to the framing and bolted together . The front and roof like the original corgi model has a PVC finish . Finally graphics to match the original. The only deviation was the back drop we created a larger than life Mr Bean face to create a British theme but also to appeal to the young at heart!!

This turned out to not only be an epic build in the time frame, but equally matched it in a financial sense (even with 3 sponsors on board for some of the materials) my usual mini fund has

been depleted but on seeing the final product I have no regrets at all.

The display was unveiled at the recent show to an amazing reaction and I am thrilled to say won first place in the “European Custom” section, and one of the premier awards of “ BEST DISPLAY” As it turned out after judging, my fear that my show mini would not match the high competition proved to be unfounded as it was with points of the best on display but certainly The combination with an innovated display proved an winning double act.





well done Phil





Special Thanks to my sponsors...

(who without there help would not have made this possible)



PSP LTD (NZ) – ACM panels

ONFORM SIGNS LTD (NZ) – Signage & graphics

CAFÉ BLIND SOLUTIONS LTD (NZ) – Clear plastic

And on the mini side for all there help....

FINAL TOUCH, CAMZ AUTOSOUND, MINIBITZ & Neil Scott...

Phillip Walters

SUPERMINI CHALLENGE
2013 / 2014 SEASON
MINI MIGLIA - 1380cc

Dixon³¹ Racing



We have been racing in the Super Mini Challenge for past four seasons and are looking forward to the up and coming season starting labour weekend 2013.

Since the fun day back in May where a few club members enjoyed some hot laps around Taupo, we have completely rebuilt the engine and gearbox, shocks and running gear also wrapped the car in a new design.

Dixonracing would like to acknowledge our new and existing sponsors

- > **Harty Mechanical Services Ltd**
- > **Hall Automation and Electrical Ltd**
- > **Creativeheads Ltd**
- > **Planitdesign Ltd**



We encourage any club members that wants to be part of the Super Mini Series events, can come out to a track and spend the day with us in the pits or in the grand stand and experience the fun of mini racing at any of the 4 North Island Tracks in the IRC Summer Series

Check our website as we will be posting to our live blog on how we are going

www.dixonracing.co.nz



2013 – 2014 RACE CALENDAR

ROUND 1: 26/27 October 2013 (Labour Weekend) Taupo

ROUND 2: 16/17 November 2013 Pukekohe (Thunder in the Park)

ROUND 3: 4/5 January 2014 Taupo

ROUND 4: 1/2 February 2014 Hampton Downs

ROUND 5: 22/23 February 2014 Manfield

ROUND 6: 22/23 March 2014 Hampton Downs

ROUND 7: 19/20 April 2014 (Easter) Taupo

WWW.DIXONRACING.CO.NZ



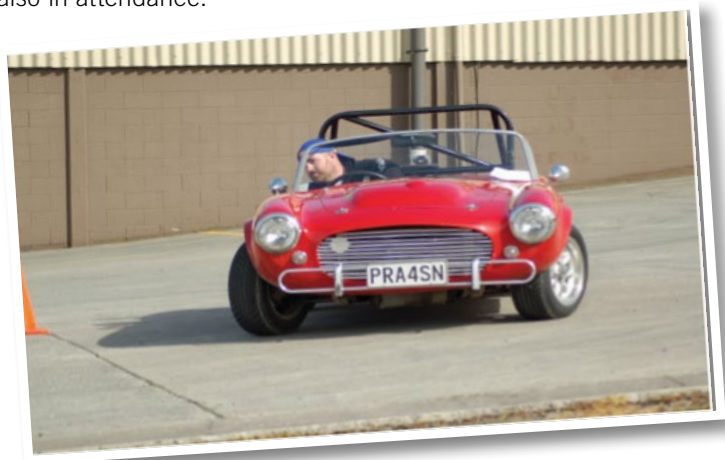
1ST ROUND OF THE AUCKLAND VS WAIKATO

MOTORKHANA SERIES 2013-14



The Interclub Series kicked off this year on concrete in the yard behind Customkit at Pukekohe. Competitors from Minis Waikato (MW) & MCCoA were lined up at the gate when I arrived (no I wasn't late) to open up the yard and documentation was soon underway as Minis were unloaded and the timing lights were set up (thanks David) and the Official of the day Jo assisted by Rex & Gary decided which course they would set to get us underway.

There were 17 competitors entered – a small but talented team from MW, Garth, David & Gavin in their round nose Minis and BenT in his fathers Wasp (an open fibreglass mini based kitcar),with team manager RalphT & AlanT (Wasp owner which makes him Ben's dad) also in attendance.



MCCoA was represented by a mixture of experienced (old) campaigners and several members taking part in their first motorkhana. There was only one lady entrant at the event which was a bit disappointing – so the Ladies prize went to Jo (Jo was distracted as the organizer so didn't want her times recorded which was a shame as it looked to me like all her runs were neat & tidy and no cones were harmed by the green machine).

The first couple of tests were run in the rain so the courses were pretty slippery but the weather cleared up in the afternoon and dried out nicely.

Test 1 involved lots of garages, head straight into the middle one, reverse into the end one on the right, forward into the second one on the left, then reverse into the second one on the right, forward etc etc before backing out of the last garage and doing a reverse flick to return to the start/finish garage. Keith (MCCoA) completed this in 34.67 seconds (faster than it took me to write it) so he was throwing the gauntlet down or was that his driving glove? BenT was second fastest so MW were in the hunt. KP managed to cop a couple of penalties (cones?) so that put him on the back foot.

Test 2 was a bit of a marathon, a sort of increasing circles test but with a slalom thrown in – it was hard to remember where you were up to, my second run was slower as I added an additional circle I shouldn't have but there were a

two guys that got it totally wrong on both runs so their penalty was slowest time plus 15 seconds –ouch that hurt didn't it Lloyd & Andrew. Rex was fastest on this test followed closely by Keith with David (MW) not far behind.

Test 3 was a quick there and back (reverse), sounds simple but cones close on either side when you're reversing are hard to spot, but everyone got through this OK except Andrew who got a couple more penalties. Garth (MW) was fastest followed by NickT who was competing for the first time driving red MINTED, my new motorkhana / fun Mini. I must have forgotten to tell him that it's not polite to beat his father/car owner. I later heard that Viv had told him to "drive it like you don't own it"



We had a break now for a BBQ lunch, time to check the oil, pump up the tyres, let down the tyres, check your times and see who was setting the pace. A large group of club members had turned up to watch the event during the day and it was good to see them there. A new member also turned up to say giddyay on his way to Hampton Downs, Russell had his recently acquired Aussie Cooper S with him so it was good to meet him and introduce him to a number of club members who came over to inspect/ admire his Cooper. We look forward to seeing Russell at future events.

Two more tests to go. Test 4 , I can't remember it to write about it but Rex was fastest again closely followed by Lee. NickT beat me again but must have hit a cone as he got a 5sec penalty and Garth was still hanging in there for Waikato.

Test 5, last run for the day. It looked quite simple with a line of cones across the middle of the course which you approached at speed from different directions. It turned out to be more difficult than it looked once you had swung around the bottom cone and headed back up the course and wondered which way do I go now ? Luckily for me you get 2 runs on each test as I choked on my first run and abandoned ship but pulled myself

together for the next run and did OK. Unfortunately Lloyd and Keith both lost the plot and their way and didn't record a time so got max time plus a 15sec penalty so game over for them. Andrew completed his run with the Moke's tyres screaming and he must have taken out at least 4 cones to receive a 20sec penalty so game over for him too. Lee recorded fastest time for the test in the Minibits mini just beating KP who was sharing the car for the day and BenT & Garth were close behind. I was just beaten again by NickT (he must have been listening to all the good advice I was giving him !).

Jo and Fiona were left to sort out the results while the rest of us recovered the cones and packed the trailer ready to go home. Jo then got everyone together to thank them for coming and announcing that MCCoA had won the round.

INDIVIDUAL PLACES WERE:

1ST : KP (MCCOA)

2ND : REX (MCCOA)

3RD : GARTH (MW)

4TH : BENT (MW)



Special mention was to the first timers NickT & Ash who placed 7th & 8th respectively, well done guys – we hope that you had fun and want to do it again.

You may be wondering why if BenT came 4th how come I'm writing the report ? Well when Jo got home and tidied up the results sheet before emailing it out she found an error, a penalty hadn't been recorded in the correct place so she quickly recalculated and found that Waikato had won the round & Rex had been fastest. So she sent out these results.

However RalphT picked up that there may another error and after that was corrected we now had the



FINALFINAL RESULT :

1ST ROUND TO MCCOA.

INDIVIDUAL PLACES WERE :

1ST : REX (MCCOA) (Rex also got the prize for stopping closest to the timing lights - sideways in the finish garage, I think it was decided that he hadn't completed the course and got a penalty as well !)

2ND : GARTH (MW)

3RD : BENT (MW)

4TH : KEVT (MCCOA)

5TH : LEE (MCCOA)

6TH : DAVID (MW)

Thanks to Customkit for letting us play in their yard again and use their facilities. Thanks Jo for organizing the event & taking care of the paperwork, thanks Fiona for entering all the times in the computer, thanks Viv for buying the food & thanks to Murray & the young guys who did the BBQ cooking. Looking forward to the 2nd round which is to be an Autocross at Te Kowhai in November (details to be confirmed)

KevT

Phillip Walters & Murray Grant

Coffee & Classics

SMALES FARM





*last sunday of every
month from 10.00am
and 1.00pm anyone
welcome to attend.*

~





Pukemiro Bush Railway

AUGUST 4TH

Minis Waikato had invited us to join them on a run to visit the Pukemiro Bush Railway that operates public open days on the first Sunday of each month. So the opportunity to have a follow the leader run in the country to join other minis and the chance to have a ride on a steam train were too good to resist for the 10 Minis plus 1 other notamini that turned up at BP Bombay on a sunny Sunday – well it wasn't raining, yet. After topping up the team, fuel for the Minis & coffee for the crew we had a drivers briefing before setting off. Viv & I were leading the run, first time on a club outing in Red MINTED. The rules of the run were 1) all the red minis are at the front, 2) don't overtake the leader and 3) make sure the mini behind you sees which way you went. We managed 2 out of 3 of the rules OK.

We departed Bombay heading for Tuakau and over the Waikato River then hairpin right turn to tiki tour through Onewhero, I had discovered an interesting geological feature on the map that I wanted to have a look at – the Onewhero Tuft Ring. The Tuft Ring is the rim of an ancient volcanic cone and the road runs around the rim but interestingly the road is set out as a square. So part way around the rim I stopped the convoy to tell them about the fascinating feature (in case they hadn't already guessed). However it was soon apparent that we had lost the tail end of our team as 3 Minis and notamini

were missing. Mike & Jan were tail end Charlies in the Rotary Platforms monster truck (clearly notamini !) so I phoned Mike to see where they'd got too. Mike knew where our final destination was so they were heading south on the main road (Highway22) having lost contact after the Tuakau bridge. We arranged a rendezvous point at the Glen Murray intersection and set off to catch them up, nice roads, good company, no traffic. The reunited convoy now headed east to meet up with Minis Waikato near the Mercer Bridge. They had been on their own Tiki tour and were waiting for us to arrive. We joined their convoy and the combined group of now 18 minis etc headed off to Pukemiro. The Waikato group were touring at a slightly higher pace than our convoy had been so I enjoyed being Tail End Charlie on the end of their group for a while before dropping back to make sure that the Auckland crew were still coming.

We arrived at Pukemiro Bush Railway and there were already plenty of other cars in the carpark so the Station Master (or was it the Fat Controller ?) got us to park the Minis alongside the railway track so that may for some great photo opportunities. We were now free to have a look around the station & workshops which was pretty interesting. There was a carpentry shop where they are restoring old passenger carriages and other areas where heavy engineering was going on to rebuild the boiler on one of their steam locos. There was also some other interesting

rolling stock parked up along the track including a couple of steam cranes. We had a picnic lunch before most of us went for a train ride. Unfortunately we missed being pulled by the steam loco which was working when we arrived, they had coupled up the diesel loco for the afternoon runs but it was great to ride the tracks.

Mid afternoon we said our farewells to the Waikato crew, some of us headed into nearby Huntly of a coffee with the Waikato Club President before heading home while others headed north to reconnect with Highway 22 and return home that way. The Ropers & Taylors were invited to have a look at Ralph & Cathy's barn so followed them into Hamilton while the others headed north on SH1. Ralph gave us a tour of the barn and showed us some of the minis hiding there before we also headed for home.

A great day was had by all – especially the train spotters, Red MINTED went really well (just a little bit smokey) and to the best of my knowledge all made it home safely.



KevT



AGM Prize Giving Awards

Bradley Russell Memorial trophy for club spirit Aggregate point award

Rob Apanui

1st Rex Coubray

2nd Alan Murie

3rd Shelagh Murie

Economy challenge

1st Sandra Langton

2nd George Langton

3rd Ian Mc Donnell

Trails Points

1st equal Fiona Clark Alan Murie

2nd Shelagh Murie

Show n Shine Classic mini

1st Graham Wing

2nd Murray grant

3rd Ngaire Stephens

Show n Shine Modified

1st Chris McMurray

2nd Richard Underwood

3rd Nick Apanui

Show n Shine Restored

1st Lee Norman

Show n Shine Best in show

Richard Underwood

Motorsport Award

Ben Fitness

Motor Sport Highly Commended

Alan Murie

Lead Foot Award

Rex Coubray

Automatically Earned IT Award

Lloyd Clark

Dip Stick Award

Chris Roper

Aquacut Switched ON Award

Phil Walters

Female Club Member Award

Jan Bates

Most Improved Car Award

Trent Dixon

Congratulations to all the winners







Keeping your Mini Cool

The Workings of the Coolant System

Engine swaps or modifications are amongst the top few in the Mini owner's list of desires for their car. Little thought or consideration is given to the cooling system when either of these upgrades is carried out - largely because very few understand just what the cooling system does and how it does it, and that shortfalls in compatibility between the cooling system's capability and the power output of the engine can spell disaster for the new engine. All this is obviously exaggerated in the case of racing engines. Questions along these lines are popular -- in most cases too late to be of use, so a little explanation should go a long way ...

COOLING SYSTEM FUNCTIONS

The internal combustion engine as used in cars is not particularly efficient. Burning a fuel/air mixture produces energy, but because this method of energy produces high levels of heat, much of the energy produced must be dissipated. This is essential to prevent component failure through thermal fatigue. The components most susceptible to failure in this manner are the pistons, piston rings, cylinder walls,



cylinder head, valves and associated parts; although excessive heat will eventually cause more wide spread failures. The energy/heat level is regulated by the cooling system, passing into the coolant from the combustion chamber in the head, and partially via the cylinder walls to the radiator, then to atmosphere.

The combustion chamber are must be cooled sufficiently to prevent pre-ignition and detonation, problems that are exaggerated by current low-octane, unleaded fuels, and the ever-tightening legislation on lower emissions and lean burn engines. Fortunately the latter does

not affect the venerable A-series engine, although those seeking to maximize fuel economy should take note. If an inefficient or inadequate cooling system is used, further losses will be experienced. The higher the combustion chamber temperatures are, the more the ignition has to be retarded to avoid the onset of the aforementioned pre-ignition and detonation. This causes a reduction in engine output; particularly torque that is the mainstay of driving the car. Further torque losses are caused when an engine is running too hot by increased inlet temperatures, creating a less dense fuel/air mixture. Heat dissipation and temperature control are regulated by the cooling system. A thermostat is fitted to keep the temperature constant and consistent at the required level. Heat dissipation is largely by thermal conductivity. The coolant passes over the hot metal surfaces inside the cylinder head and water jacket around the cylinders where heat is transferred to it as it is at a lower temperature. The coolant then passes into and through the radiator where the heat is passed into the cooler air.

THE COOLANT EXPLAINED

Water is the most common form of coolant used in car engines. It has excellent heat transfer properties in its liquid state and does an extremely good job when properly controlled. It does have one or two shortcomings though. The worst from a cooling point of view when not controlled is its very high surface tension – the thing that allows bugs to walk around on it without sinking. This surface tension limits its ability to ‘wet’ the metal surfaces of the water jacket, forming a sort of barrier. Because of this, hot-spots can be caused – particularly around the combustion

chambers where temperatures are highest. These hot-spots form vapor bubbles by boiling the water despite the fact that the bulk of the passing water is well below boiling point. The bubbles formed on the metal surfaces then act as an insulator around this area, greatly impeding heat transfer. This in turn reduces the cooling system’s efficiency, thereby increasing the combustion chamber temperature. The eventual result is component failure, the piston usually being the first to go, or maybe the spark plug, then the exhaust valve, inlet valve, and so on. The speed at which this can happen can be alarmingly quick, and is governed by the severity of the hot-spot and the dynamic loads on the engine (i.e. foot hard down = max load = blisteringly quick melt down if there is a hotspot present). Anti-freeze is widely used as an additive to water in car cooling systems, and is indeed essential where freezing temperatures are to be experienced. It also raises the boiling point slightly, as well as providing some lubrication for the water pump seals and reduces the formation of rust on the iron surfaces. The reduction of corrosion helps prevent blockages in the radiator. It does not, however, increase the cooling capability of the system. Many people are under the false impression that adding more anti-freeze will solve over-heating problems. Nothing could be farther from the truth.

No more than is absolutely necessary to provide sufficient protection in the environment in which the car is used should be added. Follow the manufacturer’s instructions to the letter. Although as standard, all road cars have a larger cooling capability than is required to allow for a fairly strong anti-freeze/water mix, bigger or more powerful (tuned) engines will soon

render it inadequate. Water, as previously mentioned, has amazing heat transfer properties, far better than almost any other liquid cooling medium within a vast majority of spheres. It is certainly superior to a mix of anti-freeze (usually glycol based) and water. In fact, water has up to two-and-a-half times greater thermal conductivity to, say, a glycol-type coolant given the same operating capacity.

As the cooling system works by conductivity – from hot metal to a cooler liquid (as in the engine water jacket) then from hot liquid to cooler metal surfaces (as in the radiator), the coolant's thermal conductivity is of ultra importance. Tests carried out by major motor manufacturers have concluded that the improvement of glycol's thermal conductivity is of ultra importance. Tests carried out by major motor manufacturers have concluded that the improvement of glycol's thermal conductivity is practically directly proportional to the amount of water added to it. Just to illustrate this, a 50/50 water and glycol mix has about 70% of the thermal conductivity of water on its own.

To labor the point so that you are left in no doubt about this, other factors such as the viscosity of the coolant, and the convection coefficient of the coolant in a tube (a complex relationship between the thermal conductivity, viscosity, tube diameter – as in a radiator core tube – and turbulent flow of the system) influence the effectiveness of the system. A 50/50 glycol/water mix has roughly four times the viscosity (thickness) of water alone and, as previously mentioned, about 70% of the thermal conductivity. A trial using these factors established that this mix had approximately 50% of the convection coefficient of water only.

Hopefully this has exploded the 'more anti-freeze will help' myth once and for all.

CAPABILITY IMPROVEMENT OPTIONS

So ... what can be done, and when is it needed? The last thing you need to do is install your mega-hyperpower engine with a cooling system that is a wild guess at best, to find that it is woefully inadequate, causing the early demise of your pride and joy. To given an illustration of the standard system's capability, even the Cooper S having its radiator with increased 'gills per inch' would over-heat at anything but a steady 70 mph. To all intents and purposes, if you put a 1275 engine in where there used to be a 998, put an up-rated radiator in as well. The standard 998 radiator will cope with the application of a stage one kit, but going to a decent modified head and fast road cam will sorely test it if it is in any other condition than A1 perfect.

It is common practice to remove the thermostat and fit a blanking sleeve in a bid to improve cooling. If this is done, you must blank off the bypass hose, otherwise stagnant areas of water will occur causing the dreaded hot-spots. However, the danger with fitting a blanking sleeve is that the engine may not reach proper operating temperatures, and this can be every bit as bad as running a little too hot. I would strongly advise using a thermostat in ALL road cars, of at least 82 degrees to make sure the correct running temperatures are achieved. A blanking sleeve is not the answer to over-heating problems. I always run a thermostat in my race engines unless bound for foreign shores where high ambient temperatures are experienced. Many folk think they have to fit a blanking sleeve if they are blanking off the by-pass hose. Not so. Blank off the troublesome



by-pass hose then fit a thermostat that has had six or eight eight-inch holes drilled around the periphery. These holes allow water to circulate before the engine is up to temperature and the thermostat opens.

Fitment of an auxiliary radiator will help if the two-core is not enough – say on a race or rally car. Use the matrix out of the heater box, and plumb this in going from the heater tap take-off, into the back fitting of the matrix, then out of the front fitting and into the bottom hose. Mount the matrix behind the grill for maximum benefit – around fifteen degrees temperature drop can be expected. If you pass the water coming out of the heater tap take-off down the front of the matrix first, you will be blowing hot air across the water going back out of the matrix and into the engine. It is important to know that not taking water out the heater tap take-off will increase the temperature that the number four cylinder runs at substantially due to reduced flow around that chamber. Some folk make the mistake of taking the water out of here and connecting it back to the bottom hose. This is putting un-cooled water straight back into the engine. If you do not want to run an auxiliary radiator or internal heater, plumb the hose from the heater take-off into the top hose. This is the least that should be done.

FURTHER ASSISTANCE

Ensure you always use the water pump with the deep impellor. These are fitted to everything as standard these days, but 850/998/1098 engines before about 1975-ish had the old shallow impellor type. The shallow impellor protrudes from the gasket face by 7.9mm (5/16") and the deep impellor by 15.75mm (5/8"). All Metros also have the bypass hose blanked off in

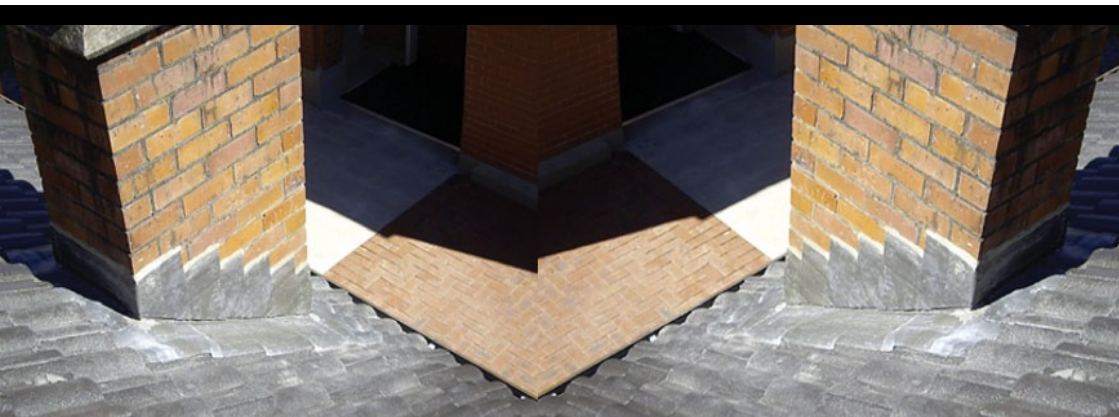
the casting, as do the very late Minis. The exception to the rule here is the 850, there is rarely enough material in the block to be able to run these. If fitting to an old 998/1098 block, it may be necessary to grind some of the cylinder wall away to clear the deep impellor. To help engines that will be run mainly at high rpm, use the Metro 1275 large diameter water pump pulley (4.725" diameter), as this will slow the pump speed down, reducing the onset of cavitation.

There are a couple of alternative fans available, the old two-blade type (that is usually run double up to make a four-blade), or the six-blade export type fan. I am ignoring the old metal multi-blade type, as they are not generally available and not that good. The fourblade is very noisy but very good, the six-blade much better than the standard plastic one, but a little noisier.

Apart from this, make sure your hoses are in good condition, and you have the right hose for the right engine, particularly when going from a 998 to a 1275 based engine. The top hose is very much different – the 998 looking like a boomerang, the 1275 one shaped like a question mark. Using the 998 one on a 1275 will put a kink in the hose that will cause a severe restriction. It will also be necessary to change the top radiator bracket. This is caused by the thermostat housing pointing sideways on the 998 and forwards on the 1275. The Cooper S top hose and bracket, or 1275GT versions, are the ones to use.

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