

NCRS AUSTRALIAN CHAPTER NEWSLETTER



March April Edition 2017





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OFFICE BEARERS

<u>President</u>	Murray Forman
<u>Vice President</u>	Rod Grogan
<u>Secretary</u>	Wendy Forman
<u>Treasurer</u>	Deborah Bridge
<u>Membership Officer</u>	Joe Caruana
<u>Merchandise</u>	Richard Dickens
<u>Webmaster</u>	Gary Cowans
<u>Editor</u>	Wendy Forman
<u>No. Plate Registrar</u>	Andrew Mavin
<u>Event Co-ord.</u>	Andrew Christopolous
<u>Committee</u>	Harry Turner Ross Reynolds Colin Morris Terry Martin
<u>Public Officer</u>	Murray Forman
<u>Legal Advisor</u>	Andrew Christopolous

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TBA

Queensland

Bryan Wharton

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Murray Forman

Ph: 02-4567-8330

Victoria

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Note: The State Rep is normally the first point of contact for enquiries regarding NCRS Australia membership or general club info. Enquiries from Tasmania covered by VIC Rep, from NT covered by SA Rep

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Treasurer:	Deb Bridge		



NCRS AUSTRALIA INC CHAPTER NEWSLETTER



President: Murray Forman



Vice-Pres.: Rod Grogan



Secretary: Wendy Forman



Treasurer: Deborah Bridge



Editor: Wendy Forman



Web Master: Gary Cowans



Merchandise Richard Dickens



Event Co-Ord: Andrew Christopolous



No. Plate Reg: Andrew Mavin



Membership Officer Joe Caruana



COMMITTEE MEMBERS



Terry Martin



Ross Reynolds



Harry Turner

Colin Morris

STATE REPRESENTATIVES



WA:Terry Martin



QLD:Bryan Wharton



NSW:Murray Forman VIC: tba



Presidents Report - Murray Forman

Hi Everyone,

The Year is moving on and we have been quite busy. So far we have achieved two Judging Meets and it is only in April. Wendy and I travelled to Perth and had a successful Judging Meet with very good attendants at the Trade Winds Hotel in Fremantle. The full report is later in this Newsletter.

The second Judging Meet was here in Sydney, I must say, I am very disappointed with the poor attendance at this Meet. For the 9 members who did turn up, it really put a lot of work on the small group. But they all rose to the occasion and we had a successful day, even though it finished very late.

The decision was made at the last AGM that one of the criteria's for Club Registration both here in NSW and WA, is that you have to attend a Judging Meet to qualify for this Registration. Perth had 18 members turn up and Sydney had 9, very disappointing.

This year there are two Judging Meets in Sydney. The next one is on September 3rd. If we get the same attendance, there will be problems with registration for the Members that do not attend. There was plenty of notification prior to this Meet as well as the Newsletter and Facebook. So to those concerned, please make the effort to support your Chapter and assist in running these Judging Meets.

There is another Chapter Judging Meet coming up in Brisbane on June 4th, Wendy and I will be travelling there to do this Meet, so have a think about supporting our QLD Members and travel up and make their Chapter Meet a success as well.

The Committee is also working on doing some luncheon cruises. So as soon as we have more details, we will let you know.

Our Membership is staying the same and The Chapter is in a secure financial position.

Also, in 2018 NCRS Australia Inc. has put up their hands to assist the Southern Arizona Chapter who is running the National Convention in Las Vegas. On July 15 – 20 2018. The assistance we are offering is strictly manpower, helping with sign-ins, parking, judging and manual tasks. Our intentions are to get a group and do a Road Tour to the event then you can do your own thing after that. At the moment we have got 6 couples that have indicated expressions of interest. So, if you are interested, please contact me and let me know. This is not a full commitment, just an expression of interest at this time. There will be more information on this event with costs, in the near future

Hope you enjoy this edition of our Newsletter.

Murray Forman
President.



Vice Presidents Report

Well another three months have passed since our last newsletter and we have seen a few changes.

Facebook

Our Facebook page is operating well with a lot of interest from both here in Australia and overseas. You can now view our Facebook page directly from our NCRS Australia Webpage. So I would expect plenty of likes and thumbs up! Visitor postings are most welcome.

Please contribute to our page with any of your interesting photos by contacting me directly via email to roadhouse@aapt.net.au

Website

NCRS Australia website has been revamped and so we need some new photos of members cars to complete its reformation. Please contact Gary Cowans for inclusion. Send pictures and information about your car to gary.cowans@bigpond.com

The new Facebook link on the front page makes it very easy to access current events and interesting information pertaining to anything Corvette.

Merchandise

Some new merchandise has been added to our range, including (very comfy) T-Shirts, Mugs, Pens and Tote bags. See photos of merchandise and samples of new Polo shirts below.





NCRS Logo

We have had some discussion around upgrading our Australian Chapter Logo. This has resulted in some new preliminary designs for your consideration. Feedback on these new designs would be greatly appreciated.

1, 2 and 3 are Classic Old School Diner logos with retro icon design and Australian colours



Social events

Looking forward to some breakfast runs during the winter months as well as our regular monthly BBQ's. So keep in touch with upcoming events through our Facebook page. New faces always welcome.

See you on the road
Rod Grogan
VP NCRS Australia





Secretary's Report

Since we last spoke, both Murray and I have had a great time travelling around doing the Chapter Meets.

I haven't sent out any letters or emails since we last spoke, but we have received Newsletters from other Australian Corvette Car Clubs.

I hope to see you at some upcoming events.

Wendy Forman
Secretary

Editors Report – Wendy Forman

As you can see, once again we have got a full Newsletter. But unfortunately, it is full of Editorials from the same people all the time, I would really like some other editorials from other members, no matter how small the subject matter may, you must be doing exciting things out there, so we would love to see a small editorial with some photos, that would be great.

We put this newsletter together and email it out to everyone, but we do miss your comments on what you thought of the Newsletter, whether it is interesting or boring, so please give us your thoughts, we would love to hear from you.

If you have any new ideas that we can expand on, let us know.

My email address is eagleviews@bigpond.com

Once again it is a big Newsletter, please enjoy.

Wendy Forman
Editor.



Treasurer's Report

Bank Balances 1/1/17 – 31/3/17

Opening Balance - \$11, 808.59
 Closing Balance - \$14, 461.36

Income from memberships 1/1/17 – 31/3/17

Total income from Memberships - \$2450.00

Date	Amount	Surname	First Name
21/03/2017	\$ 50.00	Kilbane	
20/03/2017	\$ 50.00	Carr	Brent
13/03/2017	\$ 50.00	Steve	Peter
9/03/2017	\$ 50.00	Baker	
8/03/2017	\$ 50.00	Flood	Ron
6/03/2017	\$ 50.00	Randell	
3/03/2017	\$ 50.00	Lynn	Bob
27/02/2017	\$ 50.00	Munter	Scott
27/02/2017	\$ 50.00	Bishop	Neil
27/02/2017	\$ 50.00	Owerko	Clive
27/02/2017	\$ 50.00	Caruana	Joe
27/02/2017	\$ 50.00	Breekveldt	Frank
24/02/2017	\$ 50.00	Breekveldt	Frank
23/02/2017	\$ 50.00	Reynolds	Ross
14/02/2017	\$ 50.00	Grime	Allen
13/02/2017	\$ 50.00	Bridge	Deb
13/02/2017	\$ 50.00		
13/02/2017	\$ 50.00	Kissell	Barry
10/02/2017	\$ 50.00	Benjaminsen	M
7/02/2017	\$ 50.00	Mavin	Andrew
7/02/2017	\$ 50.00	Jones	Glen
6/02/2017	\$ 50.00	Leean	Sharon
6/02/2017	\$ 50.00	Wood	Allen
6/02/2017	\$ 50.00	Hehir	Patrick
6/02/2017	\$ 50.00	Wilkinson	Gary
3/02/2017	\$ 50.00	Dickens	Danyelle
3/02/2017	\$ 50.00	Morris	Colin
2/02/2017	\$ 50.00	Mahboub	Peter
2/02/2017	\$ 50.00	Martin	Terrence
2/02/2017	\$ 50.00	Gardner	John
31/01/2017	\$ 50.00	Geiger	Richard
31/01/2017	\$ 50.00	Grogan	Rod
31/01/2017	\$ 50.00	Poynton	John



31/01/2017	\$ 50.00	Younane	Joseph
31/01/2017	\$ 50.00	Cooper	Angela
30/01/2017	\$ 50.00	Wharton	Bryan
30/01/2017	\$ 50.00	Cowans	Gary
29/01/2017	\$ 50.00	Turner	Harry
1/02/2017	\$ 100.00	Alder	David
		Wilson	
6/03/2017	\$ 150.00	Harrison	
		Pimlett	
8/02/2017	\$ 300.00		
Total	\$2,450.00		

Income from other sources 1/1/17 – 31/3/17

Income from other sources- \$2,465.23

NSW meet	\$ 430.00
Donation	\$ 120.00
Perth Meet	\$ 665.00
Paypal	\$ 830.23
Other	\$ 420.00
Total Income:	\$ 2,465.23

eXpenses 1/1/17 – 31/3/17

Total expenditure- \$2,262.46

Fees	\$ 90.75
Food	\$ 73.93
Running costs	\$ 514.00
Sponsorship	\$ 300.00
Merchandise	\$ 943.07
WA Trip	\$ 340.71
Total Outgoings	\$ 2,262.46

Report prepared by Deb Bridge
1st April 2017.

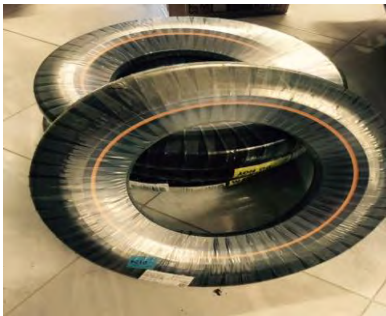


New Members

No New members to Report

Things For Sale

1968 Original style Reproduction Delco Battery
\$250.00 Contact Murray 0402917400 Great Condition



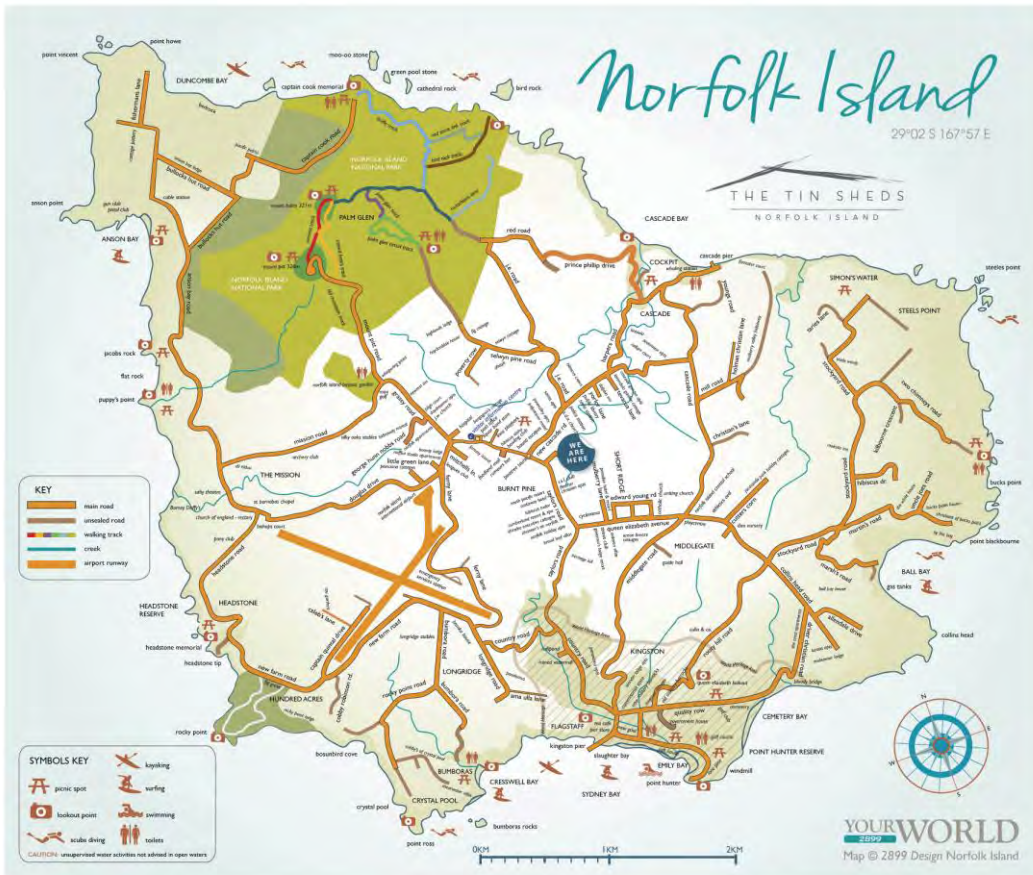
4 only B F Goodrich Silvertown 7.75 x15 4 ply polyester tyres Please contact Murray Forman
0402917400 or email eagleviews@bigpond.com for price

Disclaimer

"The NCRS Australian Chapter does not authenticate the content/statements of the Technical Articles that it accepts for publication in it's Newsletter. All Technical articles and their contents are the sole opinion of the submitter. The content is not researched/affirmed for it's total authenticity.



Wendy and Murray Trip to Norfolk Island





Norfolk Island is located in the South Pacific Ocean - an area called Oceania. The island lies on the Norfolk Ridge, which runs from New Zealand to New Caledonia. It lies 500 miles SSE of Noumea, 700 miles NW of Auckland, 900 miles east of Brisbane and 1100 miles NE of **Sydney**.



Our view as we arrive to the Island.

On arrival we were picked up by our Host, who escorted us to our Rental vehicle being a 2014 RAV4. There are lots of imported Japanese second hand vehicles on the Island brought in by boat via Japan, New Zealand then Norfolk. Therefore our RAV4 had all Japanese commands. We couldn't understand anything she was saying.





On arrival at our accommodation, to our surprise, we have this gorgeous cliff top view.



Norfolk Island, was made into a convict penal settlement by the British, just after they arrived in Australia. The convicts were made to build all the buildings on the Island including their own goal cells. They were forced to enter the water in leg irons and cut sandstone from the reef, just off the main beach so they could build the buildings



This magnificent building was originally the Commissary that was later converted to a Church. The convicts excavated thousands of tons of soil, cut the sandstone and build this building including the walls, within an eight -month period. Today, it would take 8 months just to do the paperwork.



Here you see holes in the walls where beams came across and in that elevated platform, they held 12 boy convicts. The top of the walls were embedded with broken glass to stop them from climbing over. Some of their crimes were stealing a loaf of bread or pieces of clothing for warmth.



The convicts also built this jetty where the boats could come in to be unloaded, unfortunately there is a major reef between the open sea and the jetty, so the only way to get the provisions through the reef was to use small rowing boats from the ship to the shore. Then they would use the gantry on the pier to winch the goods ashore.



Today, they still use a similar system. They use the above power boat to tow smaller rowing boats called “Lighters”, the reason being as they unload the goods from the ship, the ship gets “lighter”, hence the given name.



The above photo is one of the “lighters” they use today.



Here is the delivery ship that comes from New Zealand twice a month, the goods are craned overboard into the lighters and towed through a small gap in the reef to the dock where they are unloaded by a crane onto awaiting trucks. They use three lighters and two towboats to complete this operation.



Above is the cargo being craned off the ship onto the lighters. When they have larger and heavier items that will not fit in the lighters, they then tie two lighters together and put the larger item on a frame onto the lighters as shown below with a truck.



We asked them had they ever lost cargo off the lighters, the answer “of course not!!!!”



YES!!!! To answer all your questions, there is ONE Corvette on the Island. As you can see, the lighters are big enough to take the C3 inside without any problem. They steer the lighters by a large ore system, like they use in the canals of Venice while being towed in to shore.



Once next to the dock, they have now a new Kato hydraulic crane to do the job. Everything is craned ashore, including the Tow Boat, Lighters and small fishing boats. There is no other way to get things from shore to the water and back again

The locals say it worked fine back in the Convict days, so why change now.





The scenery is fantastic all around the Island unfortunately our photos would make this a 200 page newsletter, so only a few will do to give you an idea of the beauty of this remote Island.



There are two lookouts on the Island; this one is Mt Pitt with elevation 320 meters it overlooks over the whole island so it is perfect spot to have all communication towers on top of it





Unfortunately all good things have to come to an end, but we'll be back.



Bye Bye to Norfolk
Murray and Wendy.



Perth Chapter Meet 2017

We started the Judging in the bottom car park of the Tradewinds in Fremantle.

We had three cars to judge but, as this was the first Judging Meet we were doing on a one-day event, I was concerned that we would be unable to complete that task.

The decision was made to judge one car on the Saturday Morning. This turned out to be a successful decision as, at this stage, our judges are unable to complete three cars in one day.

The reason being is that our judges read the Judging Manual to make a decision, where in America, a lot of the decisions are made by experience which cuts out a lot of reading time. So from now on, we will only do two cars on a single day event.



Murray is explaining to the judges the new Paint Judging Procedure.



It was great to see our Members attend, Ian Gibbings, Patrick Hehir and Alan Grimes. Gary Cowans on the chair.

Colin and Jarran working on the 73 Mechanical.



Colin and Jarran hard at judging



Murray is assisting with the judging on the 73.



Andrew and Ian working on exterior of 64.





Terry Martin's 66



Terry working on exterior on Andrews 64



Wendy tabulating.

Murray presenting Andrew Ridge with his Top Flight 96.9 Well done Andrew





Murray is presenting Neil Bishop with his Top Flight 95-9 congratulations.



Murray is presenting Terry Martin with his Top Flight 99-9 Fantastic score.

Murray and Wendy



Sydney chapter Meet April 2017

We had 2 cars to judge at this meet Rods 65 and Andrews 63





We only had 9 members show for the judging, so it was a long day, but we were able to complete the task.

Andrews 63 Coupe





Rod , receiving Longest Driven Award.



Rod receiving his Top Flight 98.9 % , well done Rod



Richard receiving his Sportsman Award for his excellent Mark of Excellence 78



Andrew was unable to attend at the very last time so he authorised Murray to represent the car .So this meant he was not there to receive his Top Flight 95.6%
Well don't Andrew and Murray





Harry's car show in Orange

The Gnoo Blas CCS is an annual event held at the Sir Jack Brabham Park in Orange NSW. Each year they have guest motor sport legends attend.

This year they had Spencer Martin whom drove for David McKay during the early 1960's driving from Jaguar 3.4's, to a Ferrari 250LM & Brabham Climax's. Then from the mid '60's he drove for Bob Jane in sports cars & a Brabham 2.5 Climax in which he won the Australian Drivers Championship, also know as the Gold Star Championship.

Also in attendance was Peter Brock's brother Phil, or as some may recall 'Splitpin'.

Along with Mark Webber's dad, Alan.

Other 400 cars on display, which was mainly overcast until 2pm.

Last photo is yours truly with Spencer Martin.

Should keep it in mind for a Club run next year.

Cheers,
Harry





Spencer Martin who drove for David McKay during the early 1960's

Big Al's Last Run



BIG AL'S LAST RUN

Eleven Corvettes from the Western Australian NCRS Chapter attend the Big Al's Memorial Poker Run on Saturday February 11 at Perry Lakes reserve.

Sadly this was the last run as its founder, Alan Erdman passed away last June.

The annual hot rod car show and poker run has been running annually since 1981, when Big Al and some friends rounded up 54 cars and their owners for a show and shine then a cruise. The winner of the run was the best poker hand by selecting a card from checkpoints along the route.

Big Al was helped by a loyal group of hardworking volunteers who, every year, worked for months leading up to Big Al's Poker Run to ensure its success. The profit from the runs was donated to Wheels for Hope charity.

In recent years the event has attracted more than 600 hot rods, street machines, classic cars, trucks and other unusual pre-1978 vehicles with the record in n 2001, when Big Al's Poker Run attracted 820 vehicles!

The weather was little inclement for the final run by it still attracted 750 classics.

Attending were Melissa & David Alder & children, Jill & David Moroney, Wendy & Neil Bishop, Belen & Gary Cowans, Terry Martin, Morten Benjaminsen, Andrew Ridge, Les Vanderweide, Ian Gibbings, Gary Wilkinson & Jarran Baker and sausage dog.







Something on the Spooky Side



My 63 cluster

Back in 2003 Wendy and I went to Carlisle to buy our 63 Coupe, after making the deal, the Seller said by the way, there is a fully repaired Cluster in the back you can have it in the price.

So, Wendy and I shipped the car back to Australia, where we stripped and rebuilt the car. On assembly, we removed the old cluster and installed the fully reconditioned unit. The old unit was put up in the roof for storage for that rainy day when it was needed.





I have been working on Andrew's car to bring it up to Top Flight status. His speedo is out of adjustment, only at the stationary position. When on the road it operates ok

So I said to Andrew, after the Judging Meet, why don't I pull the unit out and have it rebuilt. Then I remembered my old cluster in the roof. So up I went and dusted the old unit off. When I looked at the mileage on my old dusty unit, it was 57701. Then I thought this sounded familiar, so on inspection with Andrews cluster, to my astonishment and disbelief, it read 57701 as well.

What are the chances of this ever happening, let alone trying to make it happen.

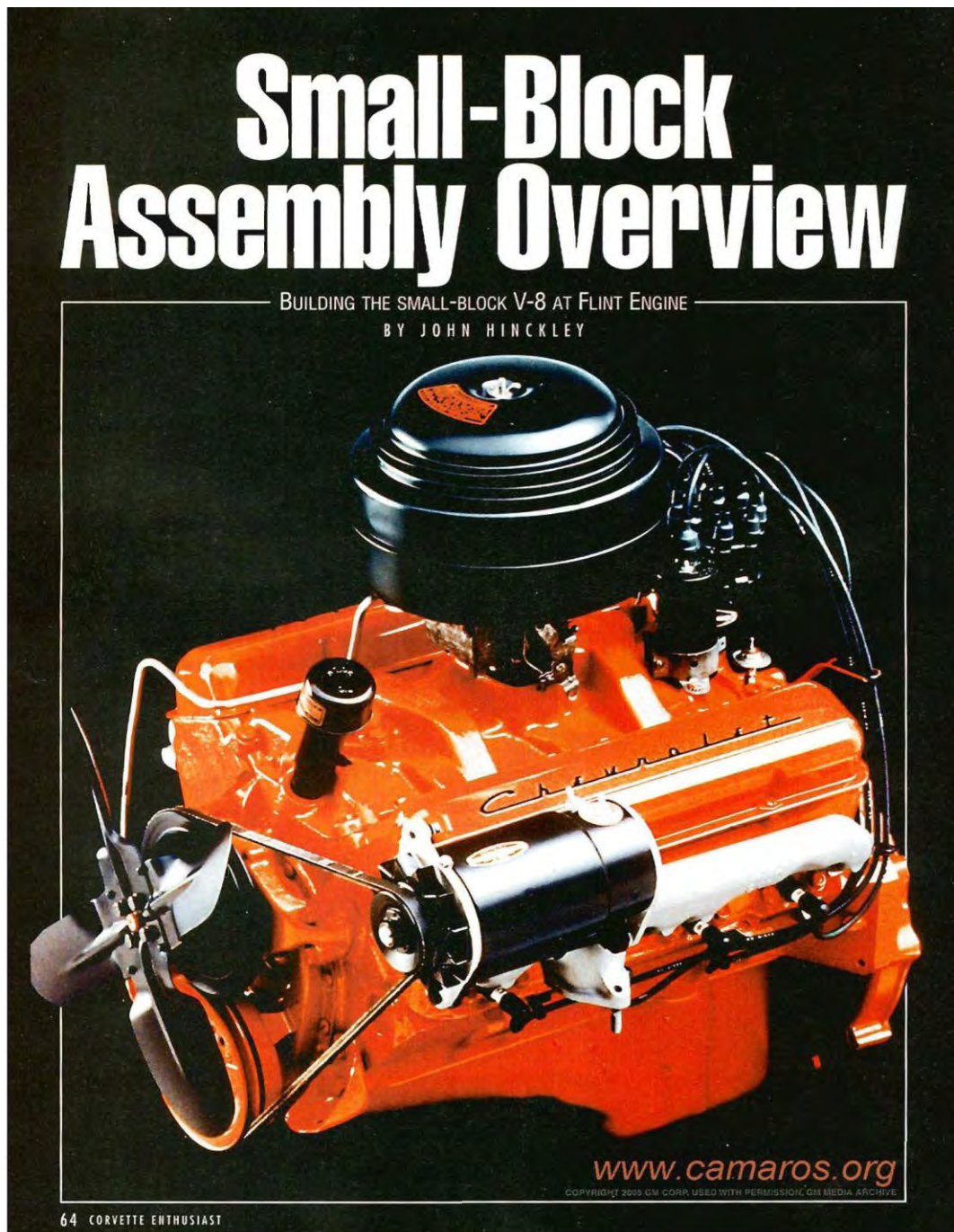
This is all a LITTLE SPOOKY !!!!!!!



Andrews 63 Cluster.



Small -Block Assembly Overview





11

11 Later engines also had a Flint Engine "Number One Team" sticker applied to the front of the passenger side valve cover.

12 Add the water pump, distributor, spark plugs and exhaust manifolds, and this is what a com-



12

pleted engine looked like when it left the paint booth on the way to the shipping area.

13 An actual photo of the 1955 V-8 being hoisted from the delivery conveyor for placement in its shipping rack. The generator brace shown was



13

frequently damaged in shipping, and was later reallocated for installation at the car assembly plants. Note the "lag" exhaust manifolds, no oil filter pad, and no side motor mount bosses. Copyright 2005 GM Corp. Used with permission, GM Media Archive

of the four operators in that station (two on each side of the line).

While the last engine was leaving the station, each operator reached up and grabbed the piston/rod assembly he needed for his assigned cylinder on the next engine, put protectors on the rod bolts, applied a ring compressor, and "stuffed" the assembly into the bore of the upside-down block. Then he grabbed the rod cap and installed it (after removing the bolt protectors) with the nuts finger-started.

The crew in the second station did the same thing for their four cylinders, and the empty piston/rod tray was conveyed back to the piston/rod subassembly area to be reloaded again. The rod cap nuts were torqued with twin-spindle air nutrunners in the next station. Piston-stuffing was an incredible thing to watch at 170 engines per hour; 42 seconds total in two work stations to install eight rods and pistons is quite a contrast to the way we carefully assemble our restoration engines today. In present-day engine plants, this operation is fully automated, done by machines, with no one in sight, and modern precision machining methods and process controls result in only one bore and piston size; select-fitting pistons to bores is no longer required.

Think about how many finished pistons there were, with two nominal bore diameters (for 283s and 327s), at least three different piston crown configurations for each displacement, and up to eight different tolerance-graded piston diameters for each nominal bore diameter and crown type.

FINAL ASSEMBLY: The timing cover and harmonic balancer went on next. The balancer was pressed on, using an overhead hydraulic tool that engaged both the balancer hub and the rear end of the crankshaft, to avoid damage to the crankshaft thrust bearing. The oil pump and shaft went on next, followed by the oil pan, then either the flexplate or flywheel and clutch assembly, bellhousing or (C1) Powerglide adapter, clutch fork, and clutch inspection cover (on manuals).

Next, the engine was turned upright to car position, and the lifters and heads were installed. The heads arrived from their machining and assembly department on a conveyor with the pressed rocker studs, valves, springs, retainers and locks already installed. The same cylinder head casting was frequently used for "small" (1.94" and 1.5") and "large" (2.02" and 1.6") intake and exhaust valves. In those cases, machining differences included a large cut on the intake side of the combustion chamber to un-shroud the flow around the intake valve.

The crankcase oil/vapor separator canister, intake manifold, pushrods, rocker arms, balls and nuts went on next, followed by valve adjustment and the valve covers. The engine build date and suffix code was gang-stamped on the block pad, based on the suffix code previously scrawled on the side of the block. One gang-stamp was set up each morning for each engine suffix type to be built that day. If there were 46 different types of engines scheduled to be built, there would be 46 gang-stamps

set up and placed in a rack adjacent to the stamping operation for the stamping operator to select from. The operator selected the correct stamp holder, positioned it on the pad, and smacked it with a small sledgehammer.

Assembly of the water pump and the unique-to-Corvette engine-mounting bracket (on C1s) came next, followed by the coolant bypass fitting and hose on certain engines.

The distributor and spark plugs went in after that, followed by the exhaust manifolds, temperature sender, thermostat and housing, and the engine was ready for hot-test. It was hoisted off the end of the build line with a scissors hook under the exhaust manifolds, and hung on a delivery conveyor to hot-test, where it was placed in a hot-test stand.

HOT-TEST: The engine was clamped in place and four quarts of oil were pumped into the fill tube opening, which was then plugged. Adapters connected the thermostat housing and water pump to a circulating water supply; a shunt adapter was screwed into the oil filter cavity; and a slave spark plug wire harness with its own coil and timing light connection was attached to the distributor and the spark plugs, while a natural gas adapter elbow was attached to the carburetor pad and an air-powered starter was clamped to the front of the bellhousing, along with clamping exhaust manifold outlet adapters to the flex pipes that extracted the exhaust fumes.

The operators then fired the engine, checked for oil pressure and oil or water leaks, set the timing, tightened



the distributor hold-down clamp and chisel-staked the reference mark on the distributor base and intake, and listened for any unusual noises. Oil and water were drained, all test adapters were disconnected, and the engine was hoisted out of the test stand and placed on another conveyor that took it to the paint booth. Engines needing further attention due to test discrepancies were set aside for repairs. Once repairs were completed, those engines were re-tested and sent on their way.

PAINTING: As engines entered the paint booth (one every 13 seconds), plastic or cardboard masks were applied to the carburetor and fuel pump mounting pads, water pump hub, spark plugs, and temp sender, a can was placed over the distributor, and a piece of masking tape was applied to the stamp pad. Engines with aluminum intake manifolds and valve covers had those parts covered with vacuum-formed plastic masks. The engine was sprayed with the cheapest orange enamel available in bulk that month, with two spray operators on each side of the booth;

then the masks were removed as the engine exited the booth, and the paint air-dried as the engine was conveyed to the shipping area.

SHIPPING: When the engine arrived in the shipping area, it was routed, based on its suffix code, to a specific dock location, where it was plucked off the delivery conveyor with an air hoist and placed in a steel shipping rack with two other identically coded engines. Full racks were then taken by a fork truck and loaded into a waiting railroad car, or into a truck if it was a rare "expedited" shipment. With up to 100 different engine configurations, and 5,000 engines per day shipping to 20 different assembly plants all over the country, Flint Engine was, for its day, an industrial miracle in terms of production control.

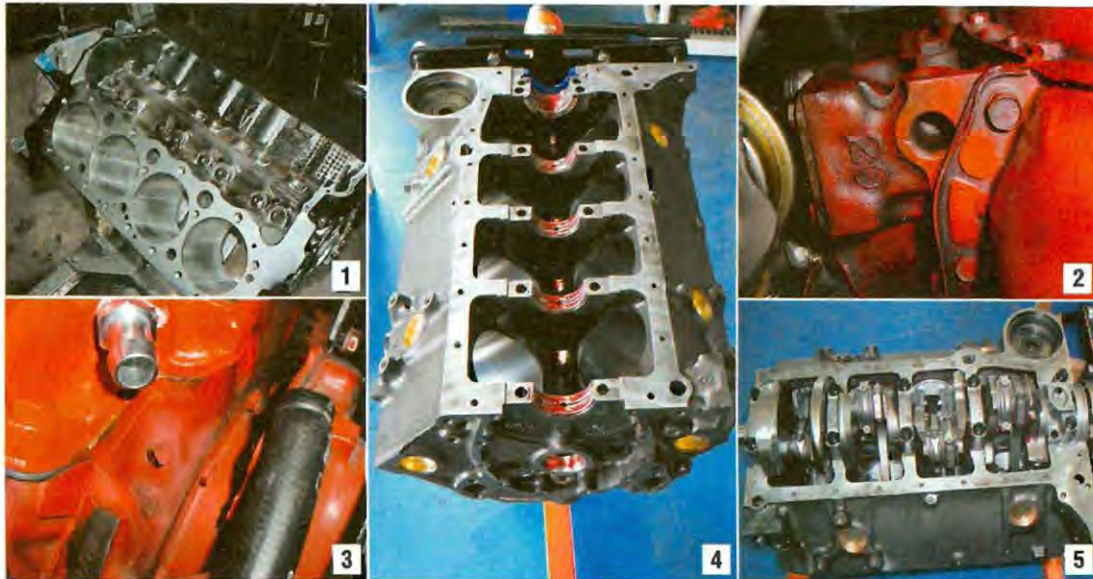
120 Corvette engines per day was only 2.5 percent of Flint V-8's daily volume, and filled only half a rail car, so St. Louis got a rail car of engines every other day. Chevrolet didn't waste money by shipping half-full rail cars.

When those engines left Flint, they were essentially "bare-naked." All

other final dress components on the engine were installed at St. Louis, as indicated by the part number callouts in the applicable Assembly Instruction Manual. Fuel-injection engines departed from the carbureted-engine format somewhat, as their injection units and plumbing were installed at Flint Engine, leaving only a vacuum line, electrical connection, and throttle linkage to be assembled at St. Louis.

The Flint V-8 engine manufacturing sequence remained pretty much the same through the '50s, '60s and '70s, with only minor variations in conveyors, exhaust manifold installation, painting, and progressive improvement in machining processes that improved quality and reliability. Tonawanda Engine (New York) and McKinnon Industries (Canada – now St. Catherine's, where the LS1/LS6 current engines are built) also built small-block engines, but neither supplied them to the Corvette plant. Tonawanda was the sole source for big-blocks, and supplied them to all assembly plants.

Now that we have the engine built, tested, painted, and shipped, we'll follow it down the Engine Dress Line at St. Louis. Tune in next month for that trip! ■



1 The bare block looked like this when it came off the machining line and emerged from the high-pressure washer, ready for assembly.

2 This hole below the fuel pump boss was one of two master gauge holes used to register the bare block to its machining pallet; the other one is just inboard of the starter.

3 Here's the square-head 1/8" NPT oil gallery plug just above the timing cover that identifies a Flint block. Tonawanda engines don't have the hole or the plug.

4 The block started down the assembly line upside-down, beginning with the bare air-gauging station, cam and main bearings and core plugs, heading for cam and

crank installation. Photo Dave McDufford

5 After piston-stuffing, the bottom end looked like this. Both master gauge holes for machining are visible in this photo. Photo Dave McDufford

Since this year is the 50th anniversary of the Chevrolet small-block V-8 engine, with about 90 million of them produced since 1955 in various configurations, all based on the original block with 4.4" bore spacing, it is interesting to know how they were manufactured.

Thousands of books and articles have been written about how to rebuild or modify them, but almost nothing has ever been written about how they were originally manufactured. Even the plant that built all the C1-C4 Corvette iron small-blocks is gone, closed in 1999 and bulldozed, and now there's just a big open space on Van Slyke Road in Flint where the Chevrolet-Flint V-8 Engine Plant stood for 44 years. Let's go back in time to the '60s and see how this brilliant design was brought to life every day by the 4,000 folks at Flint V-8 who produced them.

OVERVIEW: The Flint V-8 Engine Plant built the engines from scratch; raw castings for the block, heads, water pump, intake manifold, exhaust manifolds, oil pump, flywheel and camshaft were supplied from the Saginaw Foundry, and raw crankshaft and connecting rod forgings were produced at Chevrolet-Detroit Forge. Unfinished cast pistons, rings, main and rod bearings, valves, springs and retainers, harmonic dampers, clutches,

and timing chains were purchased from outside suppliers, with distributors supplied by Delco-Remy.

Flint V-8 built 5,000 engines in up to 100 unique configurations every day on two shifts, on two lines. Line No. 1 ran at 170 engines per hour (one every 21 seconds), and line No. 2 ran at 110 per hour (one every 32 seconds). The combined output (one engine every 13 seconds) from both lines was routed to the final hot-test stands, then through the paint booth, and then to shipping, where they were placed in steel shipping racks and shipped out either by rail or truck to 20 different car and truck assembly plants in the U.S. and Canada. Flint V-8 was the exclusive supplier of small-block engines to St. Louis; all Corvette small-blocks were "Flint engines."

Aside from the difference in the casting date format between a Flint and Tonawanda small-block, the easiest way to tell a "Flint block" is to look for the square-head 1/8" NPT plug at 11 o'clock just above the timing cover. Tonawanda blocks don't have the hole

or the plug. This was a result of different machining processes between the two plants for drilling the oil galleries.

MACHINING DEPARTMENT: 60,000 iron castings, 40,000 aluminum castings, and 45,000 steel forgings (blocks, heads, intakes, water pumps, oil pumps, flywheels, exhaust manifolds, camshafts, pistons, cranks and rods) were processed every day into finished parts through the Machining Department. Machining ran on three shifts, and occupied approximately two-thirds of the plant's floor space.

The block line consumed the most space, with the huge deck broaches feeding long, high-speed transfer lines that did the drilling and tapping of bolt holes, the boring and honing of cam, crank, cylinder and lifter bores, and gun-drilling of all the oil galleries. The block was clamped and precisely registered to its machining pallet by pins into two master locating holes in the pan rail surface adjacent to the fuel pump and starter pads on the right side of the block.



6 The timing cover, harmonic damper, and oil pump were added just prior to oil pan installation. Photo Dave McDufford

7 On later engines, the same casting was used for both valve sizes. This 461 head for the large 2.02"/1.6" valves shows the extra machining cut in the side of the chamber to unshroud the intake valve.

8 From my rare-photo file, here's a typical engine plant date/suffix gang-stamper. One stamp was set up each

day for each suffix, and was used all day long.

9 A typical 1967 stamp pad; the characters on the right were stamped by the engine plant after the heads went on, identifying the date and engine suffix code. The one on the left is the VIN derivative, stamped at the car assembly plant. More on this one next month.

10 Later engines had a sticker applied to the back of the passenger side valve cover identifying the engine suffix code.

Machining operations were followed by high-pressure/temperature washers, and from there, the fully machined blocks entered a buffer system ahead of the engine assembly line. The other machined parts followed the same pattern – machining, washing, and buffer storage (and assembly for cylinder heads, oil and water pumps). Piston machining was physically located adjacent to the engine assembly area, for reasons we'll see shortly.

There was little storage space at Flint Engine for incoming raw castings, which arrived from the Saginaw Foundry 24 hours a day via a huge dedicated over-the-road truck fleet; most castings were machined within a day or two of their arrival, some literally within hours. What little "buffer" stock of castings existed was at the Saginaw Foundry, 40 miles north of Flint.

ENGINE ASSEMBLY: The first operation

on the assembly line (with the block upside-down) was to assign a sequence number and engine configuration code (the same as the suffix letters that would be stamped on the pad later on) to each block. The letter code and sequence number were marked on the sides of the block with a grease pencil. The next operation was to air-gauge the finished cylinder bores for piston size, and to stamp a corresponding letter code on the pan rail adjacent to each cylinder; in those days there were up to eight different graded-tolerance sizes for each nominal bore diameter. That information was then "broadcast" electronically to the piston and rod subassembly area with the engine sequence number for later use.

Freeze plugs (which have nothing to do with "freezing" – those holes are there to provide an exit path for the sand cores in the foundry "shake-out" line) and oil gallery plugs went in next, followed by the cam bearings, camshaft, then the main bearings and the crankshaft, followed by the rear main seal, main caps, timing chain and sprockets and the unique-to-Corvette 1/8" spacer ring in front of the crank sprocket on the C1s.

PISTON STUFFING: At this point it got really interesting – time for piston/rod "stuffing." The piston type and gauged bore size codes had earlier been "broadcast" to the piston and rod subassembly area along with the engine sequence number. The piston department had many huge precision piston-finishing machines that cam-ground the pistons to the correct clearance for the eight graded bore sizes and finished the wrist pin bores. That area prepared a tray for each engine with eight numbered nests corresponding to that engine's cylinder numbers – 1,3,5,7 on one side, 2,4,6,8 on the other side.

Each of the eight nests on each sequence-numbered tray had a ringed piston machined to the correct graded size for that bore, assembled to a rod which already had the bearings assembled and the rod torqued to "crush" the bearing shells, then disassembled, with each rod's cap and nuts in a little compartment next to the end of the rod. That tray was hung on an overhead conveyor, which took the trays, in engine sequence, directly over the "piston-stuffing" operations on the main assembly line, within easy reach



2017 Calendar

APRIL

Sunday April 2nd NCRS Chapter meet Sydney

MAY

JUNE

Sunday June 4th NCRS Chapter meet Brisbane

JULY

AUGUST

SEPTEMBER

Sunday September 3rd NCRS Chapter meet Sydney

NOTE; In Perth members meet every Saturday morning at Terry Martins workshop, the address is 3B Niche Rd, WANGARA WA Please contact Terry on 0448-816067

All Members and partners welcome to the eastern states BBQ. Please contact Harry Turner on 0409-409599.

Should the weather be doubtful at Rouse Hill, the venue will automatically move to Harry and Di's home at Regent St, Riverstone

Some of the BBQ's will be changed to different members places on the dates allocated above. We plan to update this calendar with each Newsletter.

If you wish to add anything to this calendar, ie; a car show, cruise.

Please let me know and the Committee will view your request.

Harry Turner 0409-409599 or c5harry@live.com.au



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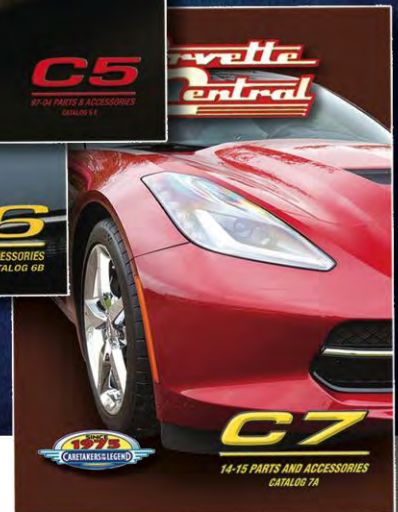
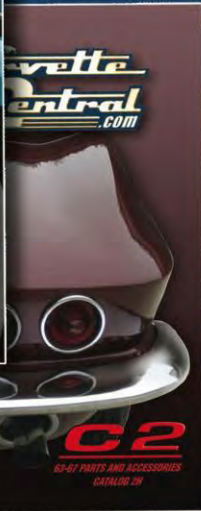
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Membership Officers Report

For the members that have not made their renewals this will be their final reminder so PLEASE if you want to remain a member bring your membership up to date

NCRS Australia Inc. Club Membership - RENEWALS

- 12 month period runs from 1ST February to 31st January of each year.
- Renewals are therefore due each February, reminder notices will be sent.
- Membership fee is \$50.00 per annum.
- Payments can be made by either:
 - EFT to NCRS Australia Inc, A/C No.10245414 BSB no. 062:595
 - PAYPAL: ncrsaustrialiainc@gmail.com
 - BPay: Please contact Deb Bridge for your customer number **email**

Please note your membership numbers with all payments to ensure confirmation receipt by email.

General Enquiries: info@NCRS.com.au
Membership Enquiries: membership@NCRS.com.au
Membership Officer: Joe Caruana 0439 600 900



NATIONAL CORVETTE RESTORERS SOCIETY AUSTRALIA INC.

P.O Box 207 Kurmond NSW 2757

www.NCRS.com.au

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Surname: _____ First Name: _____ Date of Birth: _____
Address: _____
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H/ Phone: _____ W/ Phone: _____ M/ Phone: _____
Email: _____ Occupation: _____
Spouse /Partner Preferred Name: _____

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Please use the following code to denote condition: **(R)** Restored, **(UR)** UN Restoration,
(EO) Excellent Original, **(GO)** Good Original, **(PO)** Poor Original, **(LH)** Left hand Drive.
(If insufficient space – please attach a further, separate listing).

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