TMC – Ontario Chapter – Newsletter

May 2007

The 2007 Season

We have prepared a tentative schedule of club events for 2007, this has been emailed to all members with a known email.

Club website: (please visit the website for more information and contact).
http://www.MaseratiClubOntario.org

Bernard Stamm who often prepares the events document and attends events as best he can will be going to Asia for at least a few months starting at the end of June. Bernard will try to prepare an event schedule as best he can before leaving. After that you will need to contact Giovanni or Stuart for more information (please to the website for contact).

The club website is for everyone. Anyone wanting to contribute to it in any way with articles and images or other information please contact Stuart Cork. Also, please visit the website for contact information.

TMC-OC = The Maserati Club – Ontario Chapter

TMC is actually a larger international club, of which we are a chapter. For those who may be unaware we have always been members of TMC starting in the 90s. You are certainly free to attend other TMC events listed at its website. The TMC website is:

http://www.TheMaseratiClub.com

Club Incorporation
The Club incorporation has been completed and a bank account has been opened. Please pay membership dues to Giovanni.

Club Dues
Club membership for 2007 has been reduced to $ 75 CAD. Last year we wanted to cover the cost of incorporation and that has been accomplished.

Magazines and Calendars
Giovanni has received the calendars, please make arrangements to drop by and pick one up or you will get it at the first event that you attend. The magazine “il Tridente” still has not been issued yet, however we will notify you once we have more information.

Article: Turbos: What are They and What do They Do ?

In short, a turbo increases the horsepower of a motor. Given the same motor, displacement and cylinders, the turbo charged version has more horsepower and in some cases significantly more.

How does a turbo do that ?
The turbo unit is a compressor and pressurizes the intake manifold. This means that it pushes air-gas mixture into the engine above atmospheric pressure.

Turbo is another word to turbine. A turbo can be considered in two halves with a single linear shaft that runs between and through them. This shaft connects two separated chambers A) exhaust B) intake. Each chamber has an in and an out port.

Chambers
A) Exhaust: in from the engine exhaust,
out into the exhaust piping, catalytic converter, mufflers and tailpipe.

B) Intake: in from fresh air which ideally comes in through the filter housing,
out into the intake manifold in into the cylinders.

Each chamber has a wheel with many small blades on it similar to a paddle wheel; except all the blades are at an angle. Each of the two wheels is connected to the same single shaft that runs between the two chambers. So if you spin the wheel on either side, the other side will also spin. As a result, as the hot exhaust gas exits the engine into the turbo, it pushes against the turbine blades on the exhaust side and forces the wheel and shaft to spin, this causes the wheel on the intake side to also spin forcing air-gas mixture into the engine at pressure higher than atmospheric (via operation as a centrifugal pump).

Important Notes (CRITICAL):
The extra energy does NOT come from the flow of exhaust gas through the system forcing the turbine wheel to spin, but rather the force of EXPANSION of the hot gases that turns the wheel. This is due to the geometry of the blades, the hot exhaust gases are forced between the outside wall of the turbo housing and the movable blades (by virtue of being connected to a free-floating shaft) and while at the same time EXERTING an expanding force. This expansion of the gas is the same principle of the water boiling in a pot forcing up on the lid.

An engine can have more than one turbo unit, typically one, two or four (such as the Bugatti EB110 quad-turbo). For the twin-turbo, typically there is one per bank, the quad-turbo is two per bank and typically only run against 12 cylinders with three cylinders per turbo.

As a result the exhaust runs cooler and the noise is also less as the turbo unit dampens the noise. The reason the exhaust runs cooler is because the heat in the exhaust was converted into mechanical energy to run the turbo/turbine.

Two Stage
A two-stage turbo configuration is not the same as twin-turbo (Biturbo). A two-stage is the output of one turbo as the input into a second turbo. I have read that some Porsche 959 had two two-stage turbos, so that would be four turbo units all together, however, I am not sure if this is actually true. A two-stage is more practical when more power is desired from a four cylinder or in-line engine where there is a single exhaust header. Two-stage is very rare and more exotic.

In Detail…Why More Pressure Gives More Power/Boost
Lets consider an engine with only one cylinder 500 cc which is also equal to 500 ml or 0.5 L. Consider one without turbo (normally aspirated) and one with turbo and everything else is the same.

The cylinder head draws back so that the combustion chamber can fill with air-gas mixture. As the cylinder head draws back a vacuum is created and the mixture is sucked in to fill that vacuum. But that is an over simplistic view and is a misleading, a vacuum doesn't really suck. What actually happens is the pressure on the outside pushes in, and in the case of the naturally aspirated engine, the outside pressure is atmospheric and that is what pushes in.

So if we want to have more pressure so that we can push more air-gas mixture in, then we need more pressure than just atmospheric and that is what the turbo does. Given a certain RPM, there is a certain length of time (duration) that the intake value is open so that the cylinder can draw mixture (fuel) before the value closes. The more mixture (fuel) we can force into the cylinder (combustion chamber) in this duration of time, the harder the "explosion" and the more power we get. More fuel in the chamber means "bigger" explosion (often referred to as controlled combustion).

Turbo Lag
The turbo wheels have inertia. This is a natural resistance to movement unless acted on by a force. In this case we have a rotation moment of inertia. When the engine is near ideal, the wheels are <u>not</u> spinning fast and relatively creating negligible pressure (turbo boost). Before the turbo can generate any noticeable pressure/boost the wheel needs to "really" get spinning, so there is a certain amount of energy and time lost at the start while the wheel gets spinning. This time duration is called the "turbo lag", but its worth it when that boost kicks in and the car goes ballistic !!

Generally, the bigger the turbo, the bigger the punch, bigger the lag. Small turbos are more responsive and have a relatively short turbo lag but less boost. The pitch/angle of the blades, and the number of the blades also impacts the turbo lag and boost. Turbos can run up to 17,000 RPM, remember this number is completely independent of the engine RPM.

Intercooler
As the pressurized intake comes out of the turbo it is very hot. This is because when you compress gas it gets hot. Recall the basic gas law PV=znRT. This hot gas puts backpressure on the turbo. By reducing the backpressure against the turbo, we increase the over throughput of the turbo and this means even more air-gas mixture is being pushed into the engine.

By cooling the intake mixture downstream of the turbo, the mixture contracts, takes up less volume and generates less backpressure against the turbo. Keep in mind, we still have the same amount of mixture plus the extra mixture that the turbo now makes up because of the reduced backpressure because it can run even faster. However, once the turbo is running yet even faster eventually the backpressure will balance against the increased throughput but at a higher throughput of mixture as a result of the presence of the intercooler.

Most intercoolers are air-to-air however liquid-to-air are available and typically of higher performance.

Some people say that the intercooler "increases the density" of the mixture. It is true that the density is increased, but that isn't a practical way of looking at the matter. Increasing the density of the intake doesn't help if we are not putting in more. It is the more (mixture), that gives us more power. Higher density is great only if you are putting in the same or more volume which again translates to more mixture (fuel).

Other Notes:
The shaft is oil lubricated with an input and output from the engine oil. Later version turbos were water jacketed and even later were roller bearing. In the original IHI turbos from Japan, the shaft was simply sealed against packing. The later water jacket turbo had a hollow housing through which cooling water is forced, similar to your engine block thus helping to keep the turbo cool. The latest roller bearing turbos have the shaft sealed against a bearing ring reducing the resistance to rotation even further.

Because turbos are connected directly to hot exhaust gases around 1500 C, they get very hot and this kind of heat reduces the operational lifespan of just about anything particularly the seal and thus the ability to generate good pressure/boost. Anything that can be done to cool the outside temperature of the turbo during normal operation is beneficial.

Warning, never instant cool such as spraying water on a hot turbo, the instant contraction of the thick solid iron metal casting will misshape and distort the unit and this also thus destroys the shaft seal and the disassembly interface and gasket.

The Genius
Why is a turbo charged engine so amazing and interesting. Because you are getting **significantly more** power from burning the same amount of fuel as compared to a non-turbo engine. Why – because you are using the energy stored in the hot exhaust gases rather than just letting that energy go out your tailpipe!

The heat in the hot exhaust gases is known, in engineering terms, as "internal energy". That "internal energy" is being converted into **"mechanical energy"** via the turbo unit, this is real energy that would otherwise be wasted.

The turbo allows us to generate similar power as larger 5.0L engines but with only half the displacement and thus a much smaller and thus lighter engine. Smaller engine means less weight and thus faster acceleration, F=ma.

Turbo Images

The various pipe ends would normally have hosing taking the various fluids to their destinations, to revamp there are four open pipe ends.

1) Exhaust into the turbo from exhaust header.
2) Exhaust out of the turbo to mufflers.
3) Intake into the turbo from filter housing.
4) Intake out of the turbo, pressurized into the the engine.

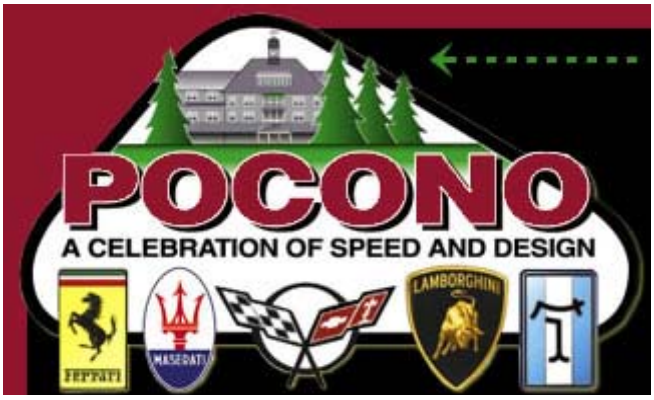
Lake Simcoe: The Briars - Front Lawn

Pocono News

"A 4-day gathering of 5 great marques at Pocono Raceway &
Pocono Manor Golf Resort & Spa:

Corvette, De Tomaso, Ferrari, Maserati, & Lamborghini"

Every year Pocono has a wonderful event: CSD – Celebration of Speed and Design. Our club TMC-OC has attended this event in the past. Those interested in the Pocono event, please visit the website (below). Usually there is a Road Rally through the mountains and a world-class concourse and of course the track.



Pocono, PA, USA ● 2007 May 26-29

Hotline: (609) 397-8866
Online: http://www.Pocono-csd.com

Number of Examples Built:

This is NOT a complete list, if you know of better information or mistakes please let us know at bernard.stamm@QuoteSoftware.com

Model	Engine	HP	Number	
Qporte Royal	4.9L-V8-Carb?	300	53	('86-'90)
Biturbo (II)	2L-3v	180	9206	('82-'88)
Biturbo E	2.5-v3	185	4577	('83-'87)
Biturbo S/S II	2L-3v	205	1038	('83-'86)
Biturbo ES	2.5L-3v	205	1408	('84-'86)
Biturbo i	2L-3v	188	683	('86-'88)
Biturbo i (E)	2.5L-3v	200	?	('86-'87)
Biturbo Si	2L-3v	220	992	('86-'88)
Biturbo Si 'Black'	2L-3v	220	105	('87-88)
Biturbo Si	2.5L-3v	(188)	?	('86-'88)
425 425i	2.5L-3v	196	2372	('83-'86)
420	2L-3v	185	2810	('83-'86)
420 i	2L-3v	(188)	1142	('86-'88)
420 S	2L-3v	210	254	('85-'87)
420 Si	2L-3v	220	524	('86-'88)
228 (carb)	2.8L-4v	255	?	('84-'85)
228 i	2.8L-3v	250	469	('86-'92)
222	2L-3v	220	total= 1156	
SE(91),4V,E,SR(94)	2.8L-3v	250	210	('91-'94)
222 E/SE	2.8-3v	248	722	('88-'93)
222.4v	2.8L-4v	278	130	('91-'94)
422	2L-3v	220	978	('88-'92)
Racing	2L-4v	283	230	('90-'92)
Racing 4.18v	2L-3v	220	77	('90-'92)
2.24v I series	2L-4v	245	1147	('88-'92)
2.24v IIa series	2L-4v	245	254	('91-'93)

4.24v I series	2L-4v	245	384	('90-'92)
4.24v IIa series	2L-4v	245	490	('91-'93)
Spyder	2L	180-245	1082	('84-'94)
	2.5L	185-220	1049	('84-'88)
	2.8	250	823	('89-'94)
Spyder	2L-3v	180	276	('84-'86)
Spyder	2.5L-3v	196	1049	('84-'86)
Spyder i	2L-3v	220	297	('87-'88)
Spyder i (87-88)	2.5L-3v	220	?	('87-'88)
Spyder iE	2.8L-3v	250	122 ?	('88-'94)
Spyder i MY '90	2L-3v	220	309	('89-'92)
Spyder iE MY '90	2.8L-3v	250	603	('89-'94)
Spyder IIIa	2L-4v	245	200	('91-'94)
Spyder IIIa	2.8L-3v	250	220	('91-'94)
222	2L-3v	220	1156	('88-'90)
430	2.8L-3V	250	995	('87-'94)
430 “New Look”	2.8L-3V-4V	250-278	291	('91-'94)
Karif	2.8L-3v	255-285	221	('88-'90)
Shamal	3.2L-V8-4v	326	369	('89-'96)
Chubasco	-	-	1 static('90)	
Barchetta “Corsa”	2L-4v	306	10-16(13) ('91)	
Barchetta “Stradale”	2L-4v	306	1 static('92)	
Ghibli II series I	2L-4v	306	428	('92-'94)
Ghibli II	2L-V6-24v	279-306		
Ghibli II GT	2.8L-V6-24v	284		
Ghibli Primatist 1997-1998	2L-V6-24v	306-330	35	

NL: New Look
MY Model Year
KS: Kit Sportivo

TMO-OC: 2007 Events Calendar

Maser Miglia to be deteremined.

Pocono CSD May 27-30 (see page above dedicated to this event).

Late Autgust

"Italian Performance Auto Parade" - Windsor, Ontario
Phone Gerry at (519) 948.5152
Twin Cam Motor (Windsor) Ltd
1393 Drouillard Road, Windsor, Ontario, N8Y 2R8

Mosport Track Days, please visit:

http://www.mosport.com/roadhome.htm

Cars for Sale

1 Maserati 430, 1989, but with a 2.5L-FI, 68,000 km, good condition, $ 17,000 CAD. Must see many very nice upgrades. Included: installed set of four Maserati OEM Oz wheels from a Ghibli II. Michael Chang, (647) 885.8055, TheCarlingroup@yahoo.com

2 Maserati 228, 1989, manual transmission, excellent condition. Contact Robert Hanna (416) 833.72.82.

3 Maserati 228, 1990, automatic transmission, excellent condition. Contact Robert Hanna (416) 833.72.82.

4 Maserati Race Car, upgraded 2.8L with biturbo chassis. Contact Robert Hanna (416) 833.72.82.

5 Maserati 425i, 1987, 2.5L-V6-3v-FI (210 HP), twin turbo dual air-to-air intercoolers. 5-speed manual transmission, sunroof, power windows. Transmission recently serviced. Stainless-steel muffler. Small amount of rust on passenger side door; otherwise in great shape. Blue steel exterior with tradiational tan interior. Odometer 93,000 km, $9,500 CAD, contact Saverio Rinaldi, (416) 456.5953, srinaldi@symaptico.ca

6 Alfa Romeo Milano, odometer 140,000 km, good condition, $ 5,000 CAD, contact Michael Chang, (647) 885.8055, TheCarlingroup@yahoo.com

TMC-OC: Positions

President:	Giovanni Marcelli	(416) 464.4831 gmarcelli@accubid.com
Vice-President:	Stuart Cork	(416) 738.2850 info@Corskan.com
Secretary:	Saverio Rinaldi	(416) 456.5953 srindaldi@ConsultingCadre.net
Treasurer:	Jill Brown	(416) 530.6983 gotoJustJill@yahoo.ca
Communications:	Bernard Stamm	(228) 206.4302 Skype: quotesoftware bernard.stamm@QuoteSoftware.com

Mechanics and Shops that will service your precious Maserati:

1	Robert Hanna (416) 833.7282	Although Robert has closed his shop he is still happy to help as best he can. He may be available for repairs – call him.
2	Lenny's (416) 201.0102 www.AutoMega.ca	218 Evans Avenue, Etobicoke
3	Rock's Auto Restoration (416) 686.8700	2543 Gerrard St. East Toronto, Ontario, M1N-1W9
4	Ferrari Maserati of Ontario (416) 749.5325 www.Ferrari-Of-Ontario.com	5243 Steeles Avenue West, Toronto
5	Caliber Automobiles (416) 259.9889	150 The Queensway, Etobicoke
6	Bieri Automobiles (416) 291.4561 www.BieriAuto.com	522 Ellesmere Road, Scarborough
7	Autoworks (Doug Good) (519) 884.6540	Waterloo, Ontario Has beautiful fully restored GT 3500 and Ferrari Dino.

complete