Operators Manual

For all Versions of

Victor 2 / Victor 2 Plus / Victor 2 Super

SIMONINI FLYING SRL

Via Per Marano 4303 - 41010 San Dalmazio di Serramazzoni (Mo)

P.I and C.F. 01557360367

Tel: 0536/953005 Fax: 0536/953006.

www.Simonini-flying.com

info@simonini-flying.com

Important Notice

DANGER

THIS ENGINE, BY ITS DESIGN, MAY BE SUBJECT TO SUDDEN STOPPAGE. ENGINE STOPPAGE CAN RESULT IN CRASH LANDINGS. SUCH CRASH LANDINGS CAN LEAD TO SERIOUS INJURY OR DEATH AND OR DAMAGE TO PROPERTY.

DO NOT FLY THE AIRCRAFT EQUIPPED WITH THIS ENGINE AT LOCATIONS, AIRSPEEDS, ALTITUDES OR OTHER CIRCUMSTANCES FROM WHICH A SUCCESSFUL ENGINE OFF LANDING CANNOT BE MADE, AFTER SUDDEN ENGINE STOPPAGE, EITHER DELIBERATE OR ACCIDENTAL OR INCIDENTAL.

WARNING

THIS ENGINE IS NOT A CERTIFICATED AIRCRAFT ENGINE. IT HAS NOT RECEIVED ANY SAFETY OR DURABILITY TESTING NOR DOES IT CONFIRM TO ANY AIRCRAFT STANDARDS.
IT IS FOR USE IN EXPERIMENTAL, UNCERTIFICATED AIRCRAFT AND VEHICLES ONLY, WHERE ENGINE FAILURE WILL NOT COMPROMISE SAFETY.
THE USER ASSUMES ALL RISK OF USE AND ACKNOWLEDGES BY HIS USE THAT HE KNOWS THIS ENGINE IS LIABLE TO STOP SUDDENLY.

CONTENTS

SAFETY

Safety is paramount and all persons using this engine must be responsible for their own safety as well as the safety of those in the vicinity and those who may be affected.

We include some important safety information and tips; however this list is neither complete nor comprehensive.

GENERAL SAFETY POINTERS

1. Never mix fuel in an enclosed space or area where the fumes could be accidentally ignited or may cause self-combustion.

2. Ensure that all controls work in the correct sense and that you know ON and OFF positions of the throttle and ignition. Make sure that these are easily accessible when in the process of starting the engine and that you can operate them in the correct sense instinetive1y and immediately.

3. Ensure that no fuel can be spilled on to the hot exhaust or hot engine parts. Use only safety approved fuel containers and never transport fuel in an unsafe manner.

4. Do not refuel the aircraft or vehicle with engine running.

5. Check all engine mounts and frames regularly as well as all the drive components, fuel lines, wiring and fuel and air filters.

6. Check for fuel contamination, air vents and exhausts. Protect engine while it is not in use from any Contamination entering fuel or carburetor system.

7. Ensure that you remove all storage protection before starting the engine.

8. Maintain your engine in top condition and assume it is going STOP running at any time. Ensure that you have a way out to safety in event of unexpected failure.

9. Never run the engine on the ground with the propeller turning unless you are doing so in a designated engine run up area and can observe anyone or anything entering the danger area.

10. If Starting by hand cranking the propeller, have an observer who is well briefed and can act as a safety officer. Ensure Aircraft is suitably restrained.

11. Never leave your aircraft with the engine running. You may be held responsible if the aircraft causes an accident even If you are not in the cockpit.

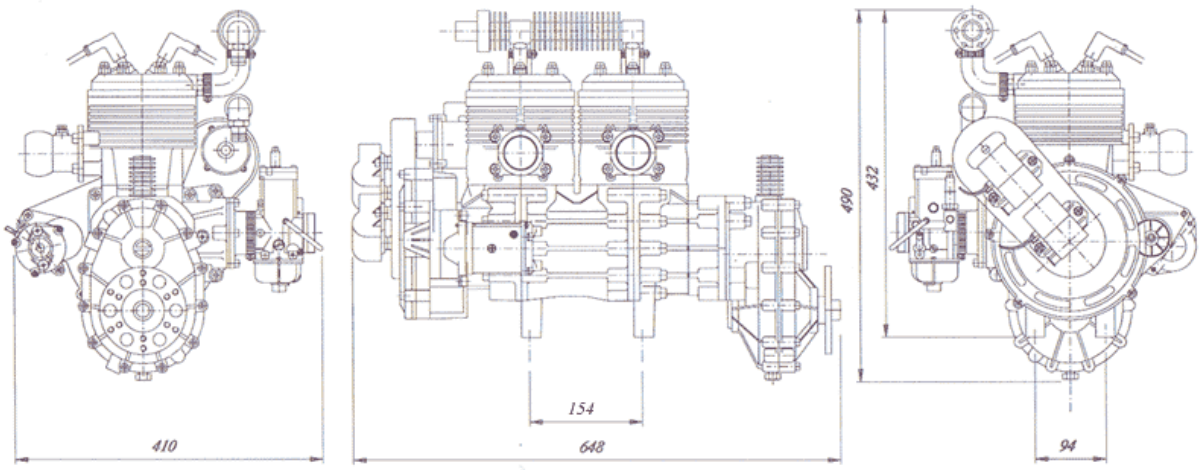
12. Always maintain the engine / aircraft log and enter any unusual engine behavior. Do not fly until the problem has been corrected and the corrective action recorded in the logbook.

1. DESCRIPTION OF ENGINE

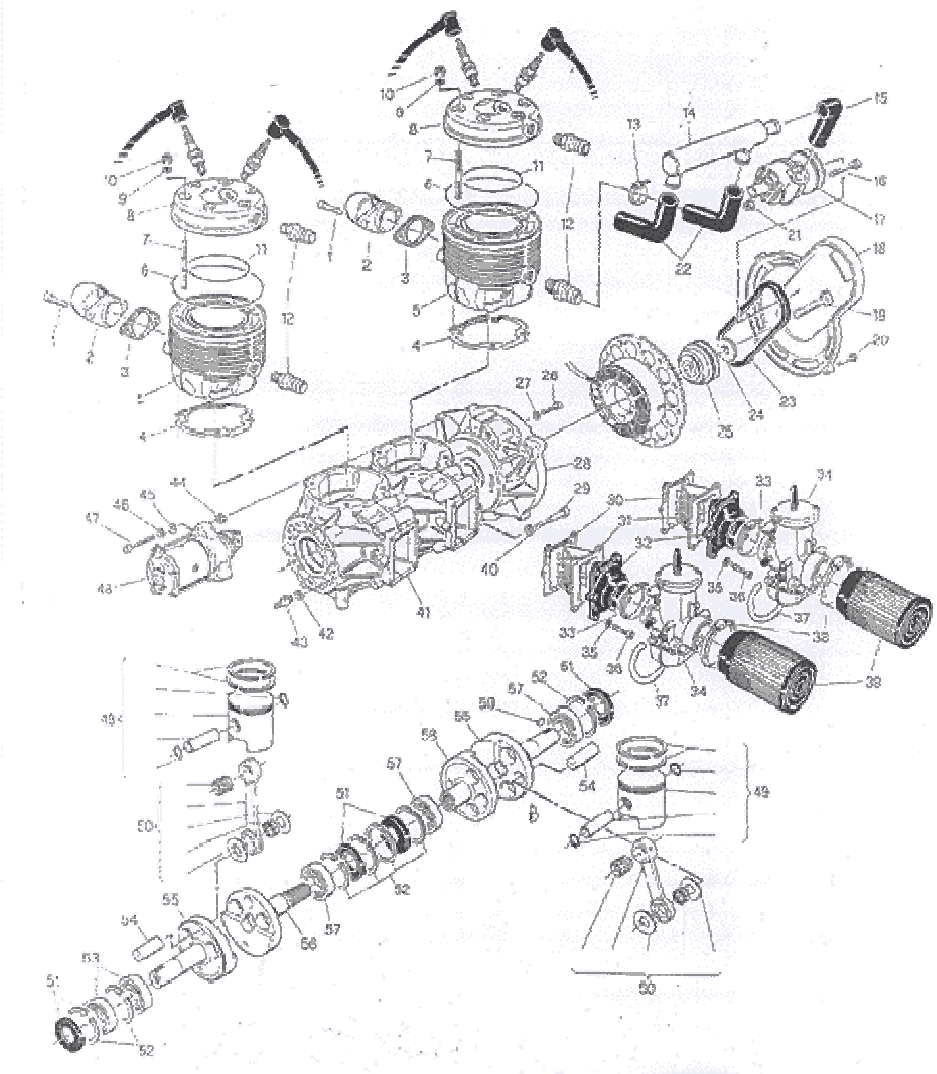
1.1 EACH ENGINE IS SUPPLLED WITH:

Bing carburetors (BING 54 36mm for Victor 2 and Victor 2Plus, BING 54 38mm for Victor2Super), air filters, fuel pump, exhaust systems, electric starter, reduction gear type “C” with elastic joint on primary gear, system to charge battery in flight.

1.2 VICTOR 2, VICTOR2PLUS AND VICTOR2SUPER ENGINES DIMENSIONS



1.3 EXPLODED VIEW OF VICTOR 2 / VICTOR 2 PLUS / VICTOR 2 SUPER ENGINE



Exploded view of Victor 2 engines. Part list as numbered items.

1.4 PARTS OF SIMONINI VICTOR 2 / VICTOR 2 PLUS / VICTOR 2 SUPER ENGINES

PART#	DESCRIPTION	QUANTITY
1	BOLTS FOR EXHAUST MANIFOLD x4	4
2	EXHAUST MANIFOLD x 2	2
3	EXHAUST MANIFOLD GASKET x 2	2
4	CYLINDER BOTTOM GASKET x2	2
5	CYLINDER x2	2
6	VYTON 0 RING x 2 OUTER 2	2
7	STUD FOR CYLINDER HEAD, 6 FOR EACH CYLINDER	12
8	CYLINDER HEAD x 2	2
9	CYLINDER HEAD WASHER, 6 FOR EACH CYLINDER	12
10	CAP NUTS FOR CYLINDER HEAD, 6 FOR EACH CYLINDER	12
11	VYTON 0 RING x 2 INNER	2
12	WATER OUTLETS TOP AND BOTTOM x 4	4
13	HOSE CLIPS FOR WATER OUTLET AND HOSE PIPE BENDS x10	10
14	HEAT DISSIPATER TOP *I* BOTTOM	1
15	HOSE PIPE HEAT DISSIPATOR TO WATER PUMP	1
16	8MM. BOLT TO HOLD WATER PUMP POSITION	1
17	WATER PUMP	1
18	ENGINE COVER PLATE, MAG END	1
19	12 MM. BOLT TO HOLD MAGNETO	1
20	6 MM. SCREWS TO HOLD ENGINE COVER PLATE	6
21	NUT TO POSITION WATER PUMP	1
22	HOSE PIPES WITH 90 DEG. BEND FROM CYLINDER HEADS TO HEAT DISSIPATERS x4	4
23	WATER PUMP BELT	1
24	FLAT WASHER FOR WATER PUMP	1
25	WATER PUMP BELT PULLEY	1
26	8 MM. BOLT	1
27	WASHER 8MM.	1
28	ENGINE MAG END CASING	1
29	BOLT 8MM.	1
30	GASKET INLET AT REED VALVES x 2	2
31	REED VALVES x 2	2
32	RUBBER FLANGE TO HOLD CARBURETORS x 2	2
33	HOSE CLIPS TO HOLD CARBURETORS x 2	2
34	CARBUREITORS x 2	2
35	SPRING WASHERS FOR CARBURETOR BOLTS x 12	12
36	CARBURETOR BOLTS 6 MM x 12	12
37	BREATHER TUBE FOR CARBURETORS x 2	2
38	HOSE CLAMPS x 2 FOR AIR FILTERS	2
39	A IR FIL1ERS x 2	2
40	SPRING WASHERS FOR CRANKCASE 8mm	20
41	CRANKCASE	1
42	WASHER FOR DEPRESSION OUTLET FROM CRANKCASE	1

43	DEPRESSION OUTLET FOR FUEL PUMP	1
44	NUT FOR ELECTRIC STARTER x 2	2
45	WASHER FOR ELECTRIC STARTER x 2	2
46	SPRING WASHER FOR ELECTRIC STARTER x 2	2
47	BOLT FOR ELECTRIC STARTER x2	2
48	ELECTRIC STARTER	1
49	PISTON ASSEMBLY 2	2
50	CONNECTING ROD ASSEMBLY x 2	2
51	OIL SEAL	4
52	CIRCLIPS FOR Oil SEALS	7
53	BEARINGS	2
54	CONROD PIN	2
55	CRANKSHAFT WITH WOODRUFF KEY HOUSING SHAFT	2
56	CRANKSHAFT WITH MALE SPLINE	1
57	BEARING	2
58	CRANKSHAFT WITH FEMALE SPLINE	1
59	WOODRUFF KEY	1

2. FUEL AND OIL

The VICTOR 2 / VICTOR 2 PLUS / Victor 2 Super engine uses unleaded or leaded petrol at least 87 octane rating. The engine requires the petrol to be premixed with two-stroke oil.

STOP: Do not run the engine without ensuring that it is correctly loaded (e.g. propeller is mounted).

Fuel contamination can be a major cause of engine failure. Ensure that your fuel container is clean inside before you use it to fill up with fuel or oil.

Filter all fuel that goes into the fuel container. Also use a filter when transferring fuel from fuel container into the aircraft tanks. The Victor 2 / Victor 2 Plus / Victor 2 Super engine is designed to run on unleaded petrol or leaded petrol or avgas mixed with 2 Semi-synthetic Oil.

The Oil to be premixed with fuel must meet or exceed the specifications API, TC, JASO, FC.

It is recommended only to use a semi- synthetic 2-stroke oil like Bardahl or MixoilSynt Api or equivalent. Use of Semi- Synthetic Oil pre-mixed in the petrol / avgas will greatly reduce the buildup of carbon deposits in the cylinder heads and pistons. This will increase your service intervals.

2.1 MIXING PROCEDURE:

Use a clean container of known volume.

Pour Oil into container.

Pour Fuel into the can using a fine mesh filters.

Close container cap firmly and shake container for a few moments so that the oil and fuel are mixed properly.

2.2 OIL MIXING RATIOS

Type of fuel	Fuel Qty.	%age of oil	Oil Qty.
Unleaded	10 Lit.	3%	300ml.
	15 Lit.	3%	450ml.
	20 Lit.	3%	600ml.
	25 Lit.	3%	750ml.
	30 Lit.	3%	900ml.
	33.3Lit.	3%	1lit.

Type of fuel	Fuel Qty.	%age of oil	Oil Qty.
Leaded/Avgas	10 Lit.	2.5%	250ml.
	15 Lit.	2.5%	375ml.
	20 Lit.	2.5%	500ml.
	25 Lit.	2.5%	625ml.
	30 Lit.	2.5%	750ml.
	40 Lit.	2.5%	1lit.

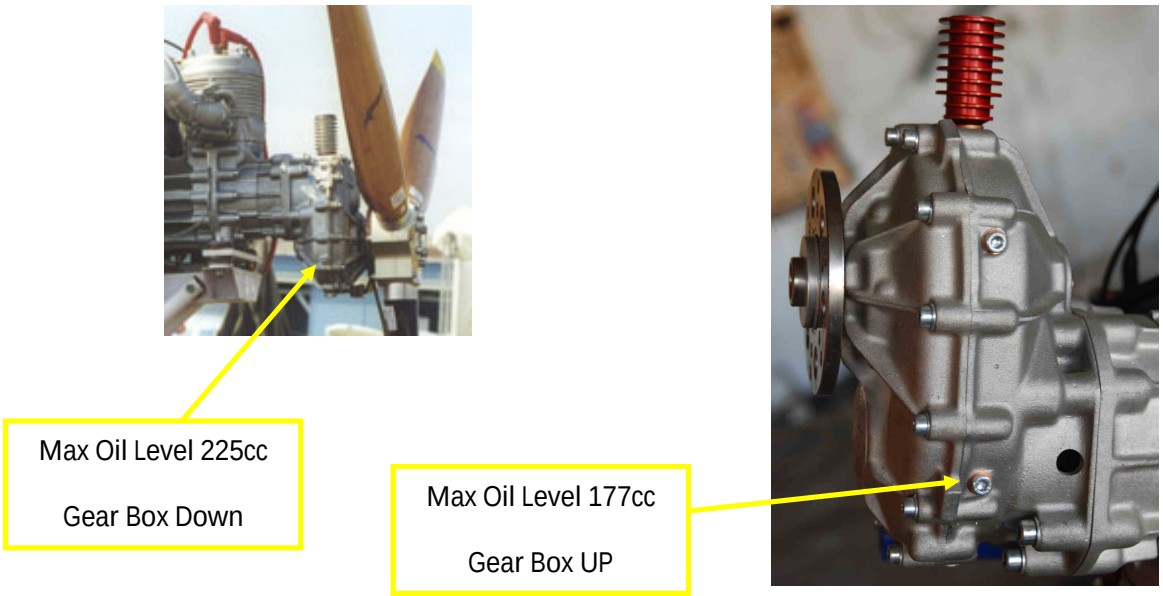
3. GEARBOX OIL

Reduction Gearbox Oil in the Simonini Type *"C"* reduction gearbox. Recommended Oil is 9OWX/140EP. The quantity required to fill the gearbox is 170cc with gear box upright and 225cc with gear box down.

Warning: Do not run the engine without sufficient oil in the Gear Box.

On the side of the Gear Box there are two Allen Screws which are used to inspect and indicate the level of oil in the gear box.

It is always the lower of the 2 screws that indicates maximum oil level. The lower Allen screw can be carefully opened to check that the oil leve1 is sufficient. Do not over fill above this level. When the instillation requires the gear box to be fitted with the propeller shaft below the crankshaft, the oil filler cap and the oil drain plug are interchanged.



Replace the Gearbox oil after the first 10 hours of use. The next change of Gearbox Oil is at 100 hours of use or once every 12 months, whichever comes first.

Stop: Ensure before every flight that you have sufficient oil in the gearbox.

4. FUEL PUMP

The Victor 2 / Victor 2 Plus /Victor 2 Super engine comes equipped with a Mikuni Membrane Pump. This is a pneumatic pump operated by the pressure pulses from the crankcase of the engine.

Install the pump 3 - 4 cm higher than the crankcase pressure outlet. This will prevent a build-up of fuel / oil mix in the lower compartment of the fuel pump, which in turn may lead to less efficiency.

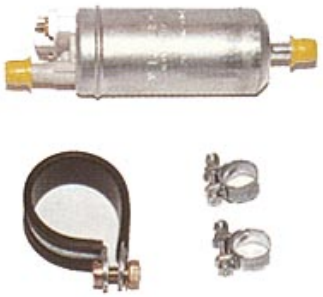
The length of the tube, which connects the engine crankcase depression to the fuel pump, should be as short as possible, ideally less than 15 cm and not more than 30 cm long.

If your aircraft fuel tank is located more than 50/60 cm below the carburetor and fuel pump, install an electric pump near the fuel tank. This pump will help push the fuel up to the membrane pump and prevent vapor locks pump subsequent engine failures. Please follow the fitting schedule of the electric pump.

Stop: The maximum fuel pressure exerted by the electric fuel pump should not exceed 0.3 bar (4.35 psi).

When fitting an electric booster fuel pump ensure that there is fuel filter installed in line before the pump. This will prevent the electric pump from clogging up with foreign material, which may result in fuel starvation and resultant engine stoppage.

The electric booster fuel pump must be of the type where it allows fuel to pass through even when it is not working.



Example of electric fuel pump that may be used as a Booster pump

5. BREAKING IN PROCEDURE

EACH SIMONINI VICTOR 2 / *VICTOR* 2 PLUS / VICTOR 2 SUPER *ENGINE* IS *ASSEMBLED AND RUN IN AT THE FACTORY.*

EACH ENGINE IS SUBJECTED TO A DYNAMIC TEST. THE ENGINE IS SECURELY MOUNTED ON A TEST BENCH AND A SUITABLE PROPELLER INSTALLED ON IT.

THE ENGINE IS STARTED AND KEPT RUNNING FOR UP TO 4 *HOURS AT*

VARIABLE SPEEDS. TEMPERATURES AND POWER OUTPUTS ARE REGULARLY CHECKED WHILE *THE ENGINE* IS *BEING RUN.*

THE CUSTOMER/USER IS NOT REQUIRED TO DO ANY RUNNING OR BREAKING IN PROCEDURES ON THE ENGINE.

THE CARBURETORS ARE SET AT THE FACTORY FOR THE IDEAL SETTINGS.

WHEN THE ENGINE IS *MOUNTED ON YOUR AIRCRAFT, ENSURE THAT BOTH CARBURETOR SETTINGS ARE EQUAL WHEN INSTALLING THE THROTTLE AND CHOKE OPERATING CABLES.*

ADJUST THE CARBURETOR SLIDES UNTIL YOU GET AN 8 *MM GAP UNDER THE SLIDES WHEN VISIBLE FROM THE AIR FILTER SIDE.*

TURN THE CARBURETOR AIRSCREWS FULLY CLOSE AND THEN UNSCREW THEM BY 1 TO 1. 5*TURNS.*

THE ENGINE SHOULD BE RUNNING AT FULL OPEN THROTTLE WITH 6500RPM. IN THE CASE OF MAX. RPM. IS NOT DEVELOPED, CHECK PROPELLER PITCH/SIZE AND MAIN JET SIZE.

6. STARTING PROCEDURE

NOTE: ALL SIMONINI ENGINES ARE RUN IN AT THE FACTORY AFTER ASSEMBLY.

Ensure that the engine is fitted securely to the aircraft. All electric concoctions must be checked to be correct. All fuel lines must be securely fitted.

Stop: Ensure that there is sufficient fuel and oil in the fuel tank and enough oil in the gearbox. Insufficient fuel and oil will cause the engine not to Start.

Ensure that there is sufficient coolant in the radiator. Insufficient coolant will cause the engine to overheat in a matter of seconds and thereafter cause seizure of the pistons and resultant catastrophic failure.

With the engine cold, Open fully chokes on the Bing Carburetors. Keep throttle at the idle position.

Ensure that ignition switches are ON and that you can instantly switch them off if required.

Ensure that the aircraft brakes are on. If no brakes, ensure you have chocks under the wheels to stop the aircraft from rolling away unintentionally.

Ensure that there is nobody near the Propeller and that the slipstream not causes damage to any other aircraft or persons or property.

Engage electric starter. As soon as the engine fires, open throttle so the engine runs at slightly over 2000/2200 rpm.

Ensure that the starter motor is disengaged from the engine. Do not run the Starter motor for more than 5 seconds at a time.

Once the engine fires, within 10 seconds close the Chokes and the engine should be running smoothly.

Once the engine is running for about 2 minutes, increase the RPM to 3800 - 4000. Check exhausts Gas temperatures on both cylinders. The difference should not exceed 20 ° C.

Warm up the engine until the water temperature reaches 50 ° C.

Now the engine should be ready for flight.

7. NORMAL WORKING CONDITIONS

It is recommended to use as much as gas your aircraft needs, it depends on your requirements and as occasion may require. Reach height as soon as possible, above all if you are flying with a delta motor.

Do not exceed maximum 6500 RPM. Do not run the engine in the climb out at Full Open Throttle for more than 3 minutes.

Idling rpm should be 2000 rpm. Less than this may cause unnecessary vibrations. Higher idling rpm will cause a reduction in the fuel / air mixture enrichment in the starting circuit of the carburetor and may make cold engine start-ups difficult.

Before shut down, the engine should be run until any heat build-up from previous high power settings (e.g. taxi back to hangar) has dissipated. Run the engine at 3000 rpm for 2 minutes and then at 2000 rpm or smooth idle speed for a short while.

Do not idle for prolonged periods (e.g. holding point checks) as the normal rich conditions at this carburetor setting may cause high carbon deposits on the spark plugs and piston rings causing fouling. At low revolutions, the vibrations are high and the loads on the propeller, gearbox, and drive train and should be avoided for longevity of the engine.

8. CARBURETOR

The Victor 2/ Victor 2 Plus / Victor 2 Super engine is equipped with 2 Bing Double Float Carburetors. The Bing Carburetor is a piston type carburetor with float Chamber.

The following methods and combinations can adjust the Carburetor.

1. By Main Jet / Idle Jet / Needle Jet of various sizes.

2 .The Jet Needle size and position can also be varied.

3 .The Air / Fuel Mixture screw, Carburetor piston stop height can be changed.

When anyone of the above components or settings is changed, it affects the others so that other small adjustments may be required.

Each Carburetor must be fitted with the slide axis at right angles in relation to the crankshaft axis, both from the top and the intake side, to ensure equal fuel distribution to both cylinders.

When you receive the engine from Simonini Flying, the engine has been run in and the carburetor settings checked.

NOTE: The Simonini Factory is at 600 meters above Mean Sea Level; thus when the engine is run in at the Factory, it is set to produce maximum power at that altitude. If you are to operate the engine at a very different altitude, you may need to retune the Carburetor mixture settings to produce optimum power.

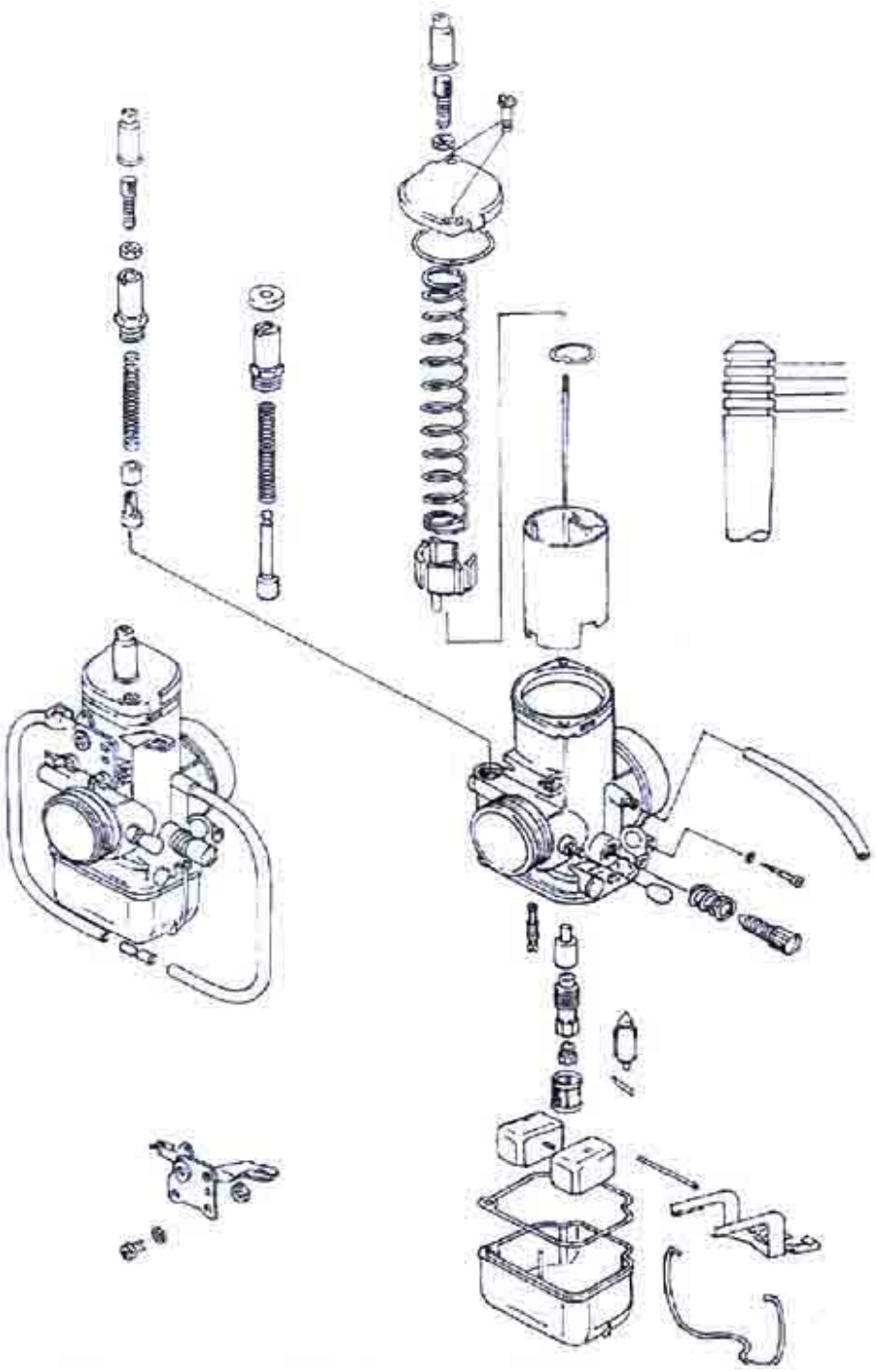
Stop: When you attach the throttle cable and choke cables, please ensure that you have both the carburetor slides moving exactly equally up and down in unison. If not, it will cause the engine to run rough or worse malfunction. The throttle control mechanism must enable the carburetor slides to attain their full open position.

Ensure that aircraft movement or controls movement does not affect the movement of throttle and choke cables. This may cause the throttle settings to change inadvertently.

Ensure that Air filters and Exhausts and Radiators are installed in place before starting the engine. They must be in place to produce proper carburetion for the engine.

Special operating conditions or extreme altitude and or climatic changes will require different Jetting. Contact your dealer for the correct carburetor jets setting. The Victor 2 engine/ Victor 2 Plus / Victor 2 Super engine is fitted With "Reed Valves" between the Carburetors and the crankcase. These valves add to the efficiency of the engine in controlling carburetion and fuel economy. The Reed Valves require changing of the VALVES after 400 hours of use.

8.1 BING CARBURETOR EXPLODED VIEW



9. EXHAUST SYSTEM

The Simonini Engines produce a high power output to weight ratio with the help of very highly tuned exhaust systems. The exhaust system is manufactured in the Simonini factory for each engine type.

Stop: **Do not attempt to make any changes to the Simonini Exhaust Systems.**

Any changes will invalidate the warranty and may severely reduce the performance and power output of the engine. Any changes will affect adversely the fuel economy as well as the reliability of the engine.

Vibrations caused by incorrect mounting and fixing of the exhaust system will result in a reduced life span of the exhaust system.

Ensure that the entire system is free from vibrations through the entire range of power settings.

Ensure that there is no harmonic resonance or vibration present due to the engine, propeller and aircraft combination. This means that you must mount the exhaust system on shock resilient mounts.

Ensure that the ball joints of the various exhaust system components are lined with an anti-galling product (e.g. copper loaded grease or graphite dry lubricant).

Secure the exhaust system to the aircraft.

Secure all the springs by loosely wire locking them.

10. REDUCTION GEARBOX

The Simonini Victor 2 / Victor 2 Plus / Victor 2 Super engine comes fitted With the Simonini Type "C" gearbox. There are various ratios that the customer cans specify when ordering. Please confirm and check that you have the correct reduction gear ratio for your combination of propeller, aircraft and engine.

10.1 REDUCTION RATIOS AVAILABLE

2.54:1	2.76:1	3.06:1	3.47:1	4.00:1

The Gear Box Input Shaft is fitted with a rubber "Donut" elastic joint that acts as a vibration damper.

The Reduction Gearbox may be fitted with the drive output propeller shaft above or below the crankshaft axis.

10.2 PROPELLER MASS MOMENT OF INERTIA:

With the Type "C" Simonini gearbox, the propeller mass moment of inertia must not exceed 6000 kg cm^2.

Before fitting the propeller, check with the propeller manufacturer if the mass moment inertia meets these requirements. Your warranty will be invalid if the propeller exceeds the limits.

10.3 PROPELLER MASS BALANCE AND PITCH SETTING FOR GROUND ADJUST PROPELLER:

A new propeller must be balanced to better than one gram to avoid problems and overstressing the gearbox drive train. You must ensure that the propeller is also tracked to within 1 mm at the

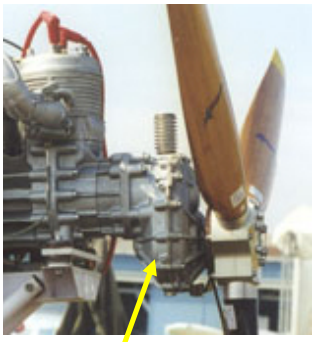
tips. Check for balance and tracking of the propeller after the first fifty hours of operation and 100 hours thereafter.

Stop: Imbalance in Pitch causes extreme cyclic load settings, Blade to Blade should be better than 0.1° or 6 :

Warning: Even though the gearbox is fitted at the factory and the engine has been run in, you must check that it has the correct type and quantity of oil in it. The oil may have been drained before dispatching the engine to you!

Before you start the engine, ensure that the gearbox contains oil of the correct type and quantity.

Use gearbox oil with viscosity that meets SAE 140, A*PI GLA.* It is recommended to use Castrol EP-140 for the Simonini type C gearbox. On first filling the dry gearbox you will require 170 cc of oil with gear box upright. With gear box down, you will require 225 cc of oil to fill it. The oil filler is always located on the top of the gearbox.



Max Oil Level 225cc

Gear Box Down

Max Oil Level 177cc

Gear Box UP

10.4 PROCEDURE TO FILL GEAR BOX OIL:

1. Unscrew and remove the 4cm tall ribbed aluminum heat exchanger plug on top of the gearbox.

2. Use an Allen key to unscrew the lower of the 2 Allen screws on the side of the gearbox. This lower hole is your maximum oil level indicator.

3. Fill in the correct quantity of EP 140 oil from the top of the gearbox. It will take some time for the oil to dribble down on the inside of the gearbox and start to ooze out from the oil level indicator hole.

4. Screw in the Allen screw. Torque it to 10 Nm.

5. Screw in the heat exchanger plug on top of the gearbox Torque it to 20 Nm and wire-lock.

6. Ensure that the tiny hole on top of this heat exchanger plug is free to act as a breather hole for the oil in the gearbox.

Stop: You must ensure that you have sufficient oil in the gearbox for every flight.

10.5 PROCEDURE TO DRAIN GEAR BOX OIL:

1. After running the engine, the gearbox should be warm and the oil inside should be warm and have a low viscosity.

2. Place a container or pan under the gearbox. The container should be large enough to hold 250 ml of oil.

3. Remove the heat exchanger plug on top of the gearbox.

4. Unscrew the Lower Allen screw on the side of the gearbox.

5. Unscrew the drain plug at the bottom of the gearbox and let the oil dribble down into the collection pan or bowl. It may take a while for all the oil to dram out.

6. Clean the magneto in the drain plug and check for metal fillings.

7. After the gearbox is completely drained, screw the drain plug back in, torque is 20 Nm.

Drain and change the gearbox oil after the first 10 hours of engine use.

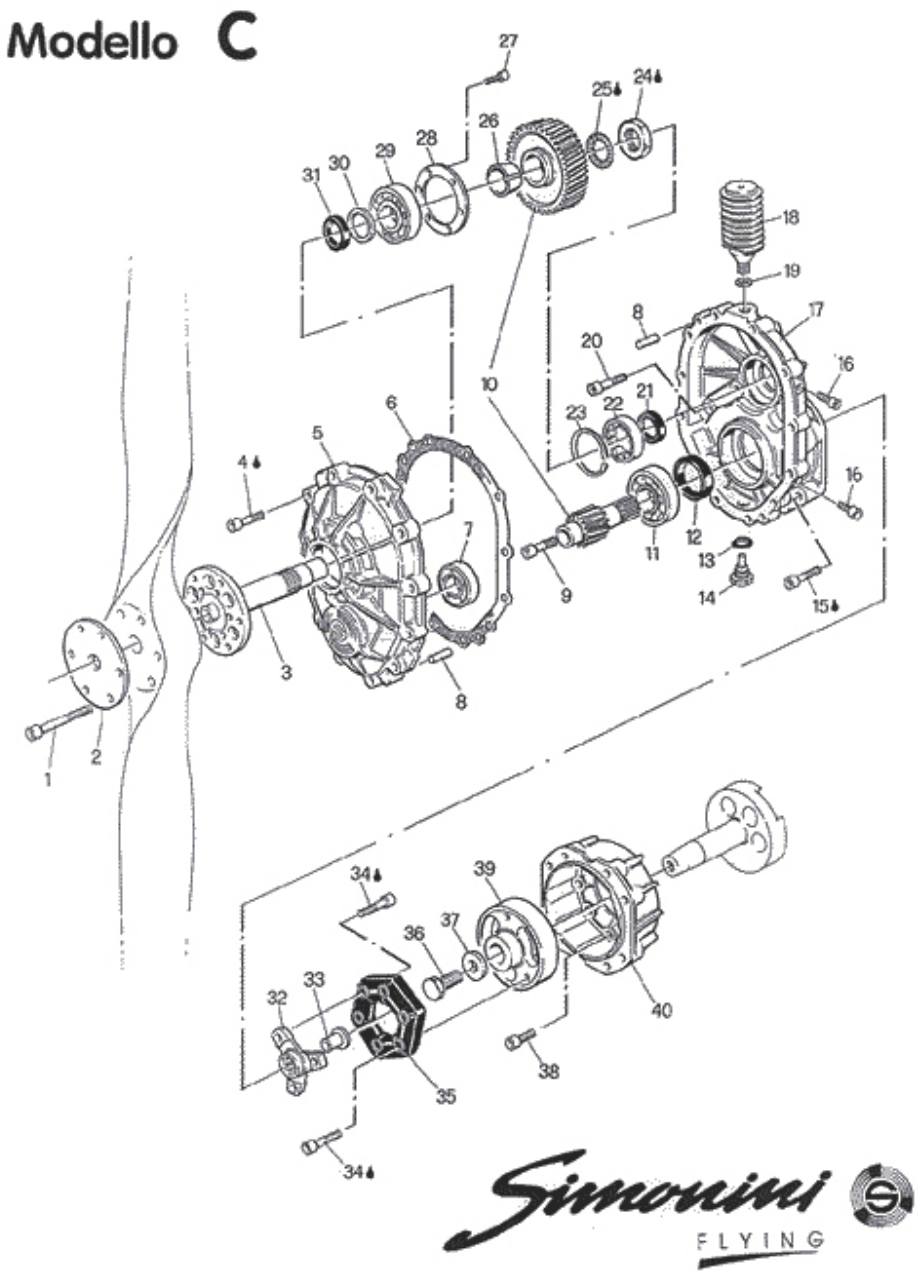
Thereafter drain and change gearbox oil every 100 hours of use or once every 12 months, whichever is sooner.

You must ensure that you have sufficient oil in the gearbox for every flight. Check oil level every 50 hours.

Please dispose of used oil in the correct oil disposal unit

Giving due consideration to the environment

10.6 EXPLODED VIEW OF SIMONINI TYPE “C” GEARBOX



10.7 PART LIST FOR SIMONINI TYPE "C" GEAR BOX

Part #		Quantity
1	BOLT FOR PROPELLER	6
2	PLATE FOR PROPELLER HUB	1
3	POWER OUTPUT SHAFT	1
4	6MM ALLEN SCREWS FOR GEARBOX	12
5	GEARBOX FRONT COVER	1
6	GASKET	1
7	BEARING	1
8	PIN TO LOCATE GEARBOX FRONT COVER	1
9	BOLT	1
10	GEAR ASSEMBLY DRIVE GEAR AND DRIVEN GEAR	1
11	BEARING	1
12	OIL SEAL	1
13	WASHER	1
14	OIL DRAIN PLUG	1
15	BOLTS	8
16	SCREW TO CHECK MAX OIL LEVEL WITH *GIB* UP	1
17	SCREW TO CHECK MAX OIL LEVEL WITH *GIB* DOWN	1
18	OIL FILLER SCREW WITH HEAT DISSIPATER	1
19	WASHER	1
20	BOLTS 8 MM	8
21	OIL SEAL	1
22	BEARING	1
23	CIRCLIPS FOR OIL SEALS	1
24	BEARING	1
25	THRUST WASHER	1
26	CONE WASHER	1
27	BOLTS	6
28	PLATE	1
29	BEARING	1
30	0 RING	1

31	OIL SEAL	1
32	TRIANGLE FLANGE	1
33	LOCATOR BOLT	1
34	BOLTS	6
35	RUBBER DONUT	1
36	BOLT	1
37	WASHER	1
38	BOLTS	8
39	FLY WHEEL	1
40	GEAR HOUSING	1

11. IGNITION SYSTEM

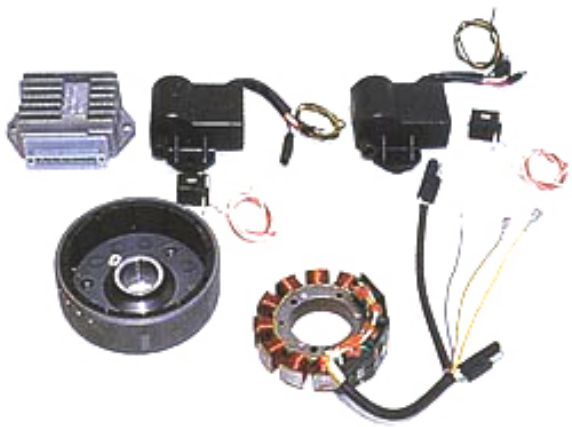
The Simonini Victor 2 / Victor 2 Plus / Victor 2 Super engine is equipped with a breaker-less 12 Volts 170 w Ducati Capacitor-Discharge Dual Ignition.

The Ignition system consists of:

1. F1ywheel Magneto Generator.

2. Two twin Ignition Coils with Integrated Control Circuit.

3. Magnetic Pickups which act as Triggers for the Sparks.



The 12 Poles f1ywheel generator is an outer rotor type with 12 integrated permanent magnetos. The Stator is fitted with 12 coils. Out of the 12 coils, 8 Coils are used for supplying power to Auxiliary Equipment and 4 coils are used for the Twin Ignitions. The Grey cable is to be used for connection to a suitable tachometer.

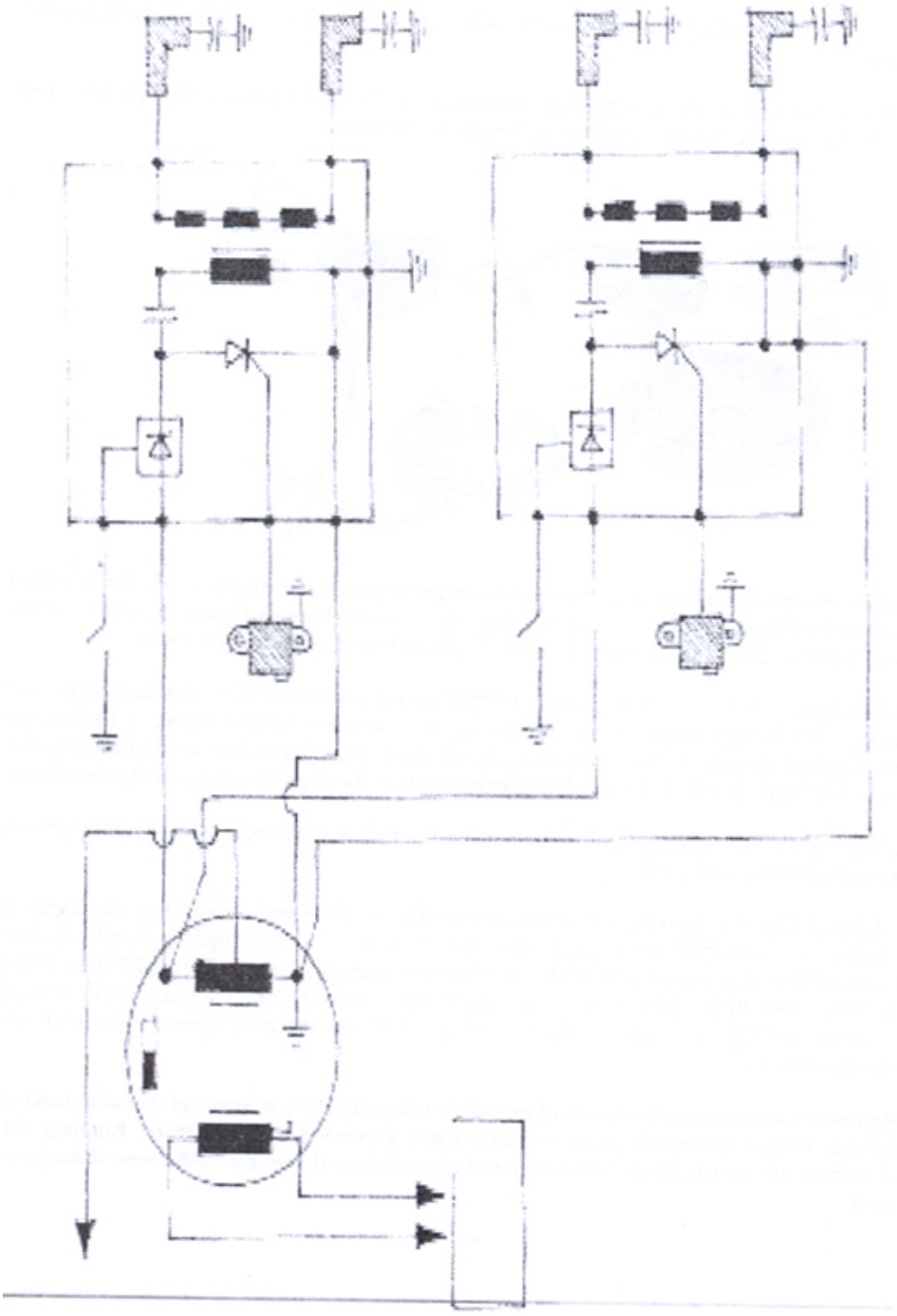
The two pairs of charging coils fitted on the Generator Stator are independent of each other and supply one Ignition Circuit each. The Energy supplied is stored in the Ignition Capacitor. At the moment of Ignition, the External Triggers supply an Impulse to the Control Circuits and the Ignition Condensers arc discharged via the Primary winding of the Ignition Coil. The Secondary winding supplies the High Voltage for the Ignition Spark.

Before every flight, complete your pre-flight or Vital Actions Checks. Include the Checks to see that each Ignition Circuit is working independently and together.

To check each Ignition Circuit is working, run the engine at 3000 to 4000 rpm. Ensure that the aircraft is stationary with brakes or chocks and pointing into the wind. Now turn one (left) Ignition Switch off. The reduction or drop in RPM must not exceed 300 RPM. Now turn the Ignition switch on. Let the RPM rise to the previous setting (3000 - 4000 RPM). Now turn the second (right) Ignition Switches off. The reduction or drop in RPM must not exceed 300 RPM. Now turn the Ignition Switch on. Ensure that both Ignition switches are on before you proceed for rake-off.

Stop: Both Ignition Circuits must be switched on before take-off! Do not carry out running tests of the ignition without the spark plugs connected and grounded to the engine. Running the engine without the spark plugs connected and grounded to the engine will cause damage of the control circuits.

11.1 IGNITION CIRCUIT DIAGRAM



12. SPARK PLUGS

The Victor 2 /Victor 2 Plus / Victor 2 Super is installed with 2 NGK B9ES Spark Plugs on each Cylinder. The gap on the spark plug electrodes should be between 0.4 to 0.5 mm.

As the fuel and oil that you use may vary from time to time; check the condition of all the spark plugs on your engine regularly. Remember to check and clean the spark plug caps. At the same time check for evidence of shorting caused by build-up of fretting residues (powdery substance).

Clean and re-gap plugs if necessary. Gap = 0.4mm to 0.5mm

Replace spark plugs every 100 hours,

Always replace all the four plugs at the same time. When replacing spark plugs after checks, you should put them back in the same position. This will prevent possible damage to the cylinder head threads. Always use anti-seize paste when instilling spark plugs.

If plugs are sooty with oil deposits, the engine is running too cold (i.e. too rich). The Carburetion and Air Filters should be checked for cleanliness.

It is recommended only to use a semi- synthetic 2-stroke oil like Bardahl or MixoilSynt Api or equivalent. Use of Semi- Synthetic Oil pre-mixed in the petrol / avgas will greatly reduce the buildup of carbon deposits in the cylinder heads and pistons.

If plugs have whitish deposits with evidence of melt droplets; it may be a lean mixture. If carburetor calibration is correct and no evidence of manifold leaks neither lack of fuel nor incorrect float settings is found, check the cooling system.

The temperature measured under the spark plugs Cylinder Head Temperature (CHT) on each cylinder must not exceed 120° C. at full power.

The temperature of the coolant exiting the cylinder heads (water Temperature) at maximum power must not exceed 80° C.

The Normal Operating temperature range for the Coolant / Water temperature is between 55° C to 65° C.

Do not take-off until the Water temperature has reached 50° C.

13. ELECTRICAL STARTER

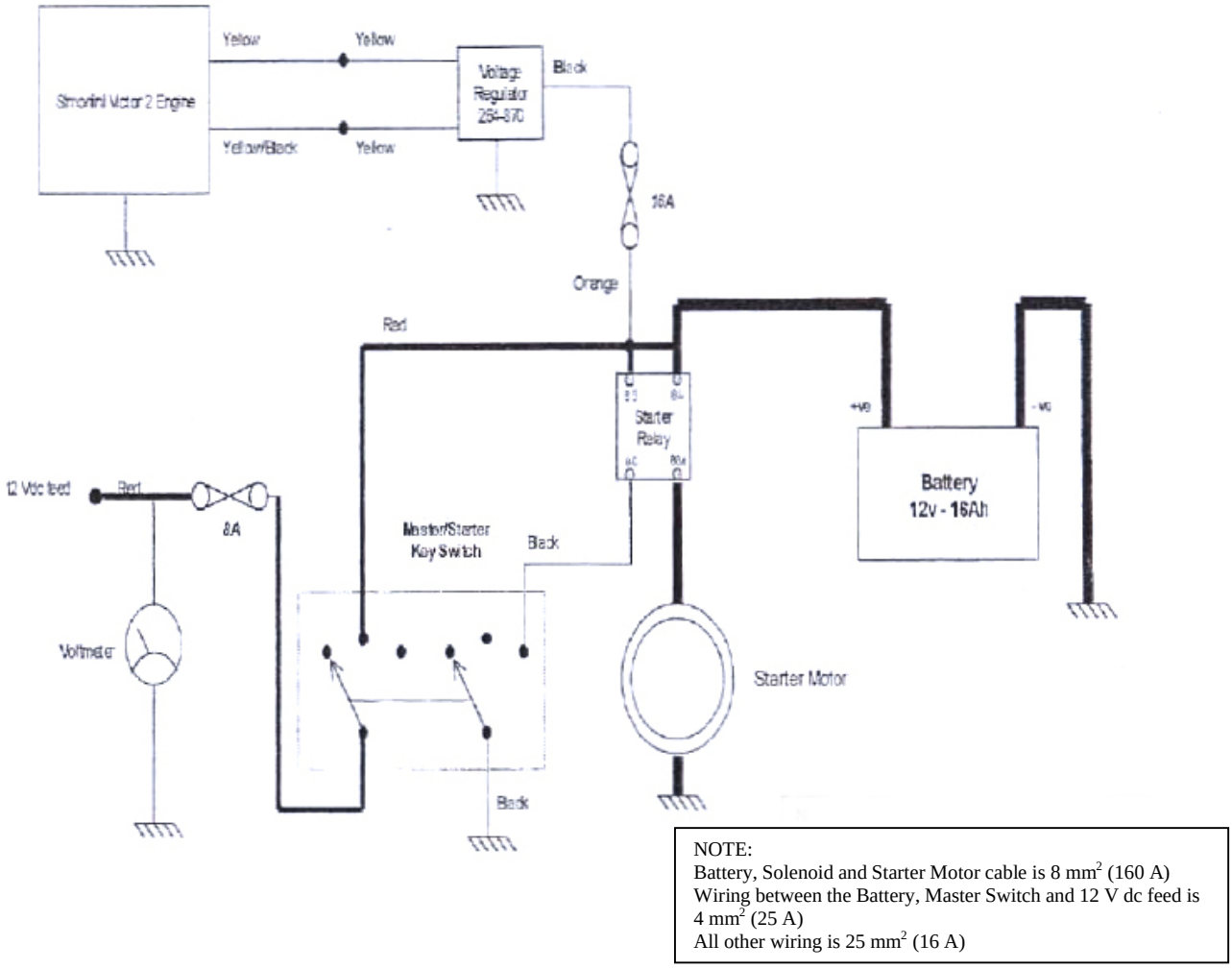
The Victor 2 /Victor 2 Plus / Victor 2 Super engine is equipped with an electric starter motor as standard. This is fitted on the magneto end of the engine.

The starter motor is a high performance, lightweight device that sits alongside the engine. The starter has a "Bendix" clutch; which engages the ring gear fitted on the crankshaft for starting the engine.

Once the engine has started, the "Bendix" clutch disengages the electric starter motor.

A "starter engaged" lamp indicator may be installed in the cockpit to ensure that the "Bendix" clutch and solenoid switch have disengaged after the engine is running.

13.1 TYPICAL ELECTRIC WIRING SCHEMATIC FOR STARTER MOTOR.



NOTE:
Battery, Solenoid and Starter Motor cable is 8 mm^2 (160 A)
Wiring between the Battery, Master Switch and 12 V dc feed is 4 mm^2 (25 A)
All other wiring is 25 mm^2 (16 A)

Starter motor, Starter switch and Voltage Regulator wiring Diagram

14. BATTERY

The starter motor will need a Battery of 16 ampere hours with a high discharge rate.

The cables supplying power from the battery to the starter motor should be of as short a length as practicable and should be at least 8mm^2 flexible multi-strand cables.

14.1 POWER SOURCE:

The Simonini Victor 2 /Victor 2 Plus / Victor 2 Super engine is fitted with a Ducati generator coil, which outputs 170 watts of alternating current. The Ducati rectifier cum regulator supplied with the engine converts this electrical power output from AC to DC The rectifier / regulator outputs 13.8 volts DC. This output is then routed to the battery fitted into the aircraft. Ensure that a **15 amp** fuse is fitted in line between the battery and the regulator.

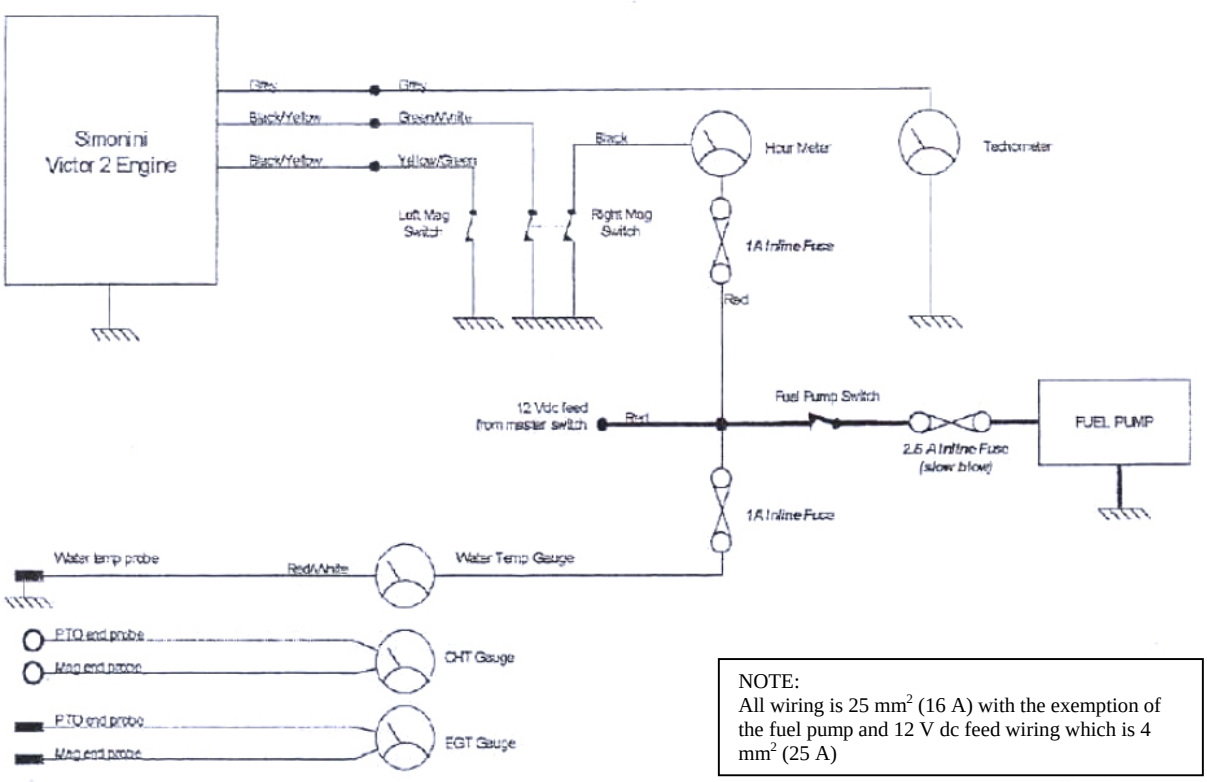
14.2 RELAY FOR POWER SUPPLY TO STARTER:

The starter relay (or solenoid) which can be supplied, with the engine must be securely mounted at a suitable place as close to the starter and battery as possible.

14.3 FUSE:

A 15 amp fuse (no fuse should be rated greater than the smallest cable in the fused circuit) must be installed between the battery charging circuit and the main power terminal.

14.4 TYPICAL WIRING DIAGRAM



Ignition, fuel pump ancillaries wiring diagram

15. INSTRUMENTS

The Victor 2 / Victor 2 Plus / Victor 2 Super engine has two separate cylinders and two separate cylinder heads inline. Each cylinder head carries 2 spark plugs. Each cylinder head feeds into the heat dissipater/coolant carrier tubes. The coolant temperature is measured on the top heat dissipater tube.

Each cylinder has one exhaust pipe. The Exhaust Gas Temperature is measured at the exhaust manifold.

15.1 MINIMUM INSTRUMENTS REQUIRED WITH THE ENGINE:

RPM counter to measure Engine Speed.

Two EGT Gage to measure Exhaust Gas Temperatures at the exhaust manifold on each cylinder.

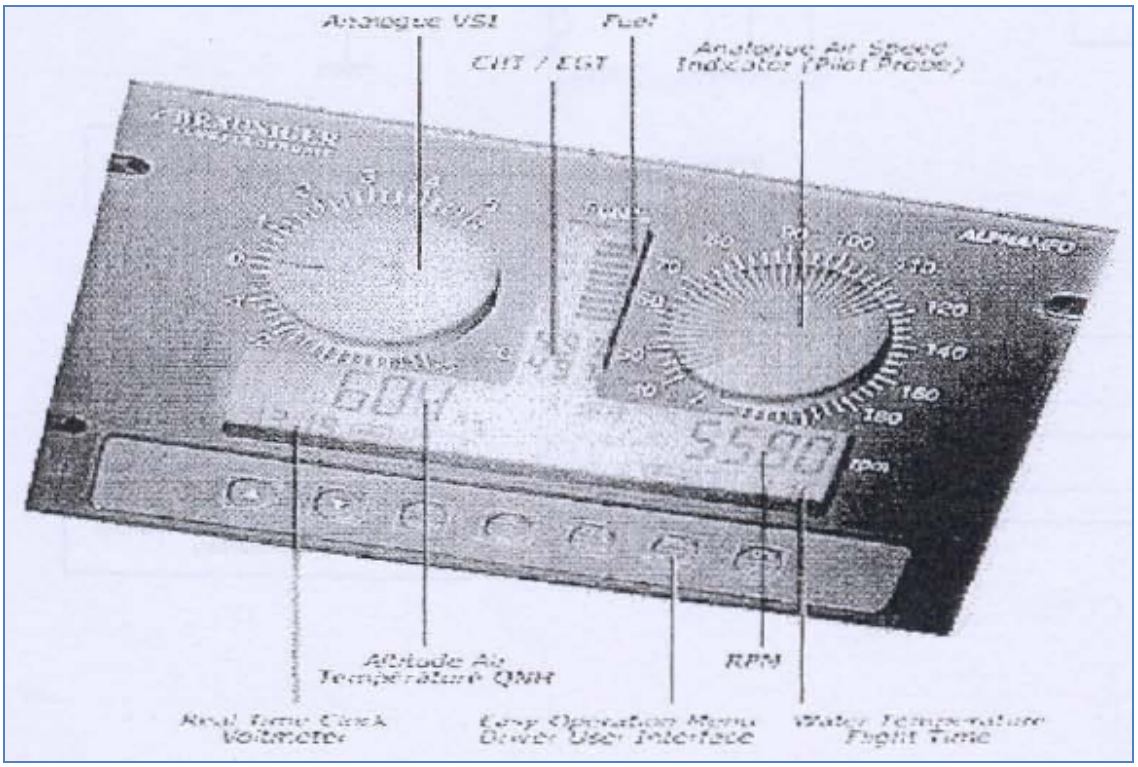
Water Temperature Gauge to measure Coolant Temperature located on the top heat dissipater.

Engine Hour Meter : This is essential to keep records of how many hours the engine has to run before the next service or check.

Voltage / Ampere Gauge to indicate battery charge, this is necessary to ensure that the alternator is charging the battery when the engine is running. The battery must be able to supply power to the electric starter to start the engine when required.

We suggest you could use the Alpha Multi Function Display (MFD) instrument with this engine. It has been specifically designed to use the connection on the 12-pole flywheel generator used on the Ducati CDI Systems. The Tachometer on the Alpha MFD measures the frequency of the pulses provided by one of the transducers supply winding where it is connected. This instrument also provides all the information required in flight and on the ground after the flight for the pilot owner to enter into the aircraft and engine log books.

Be informed you can also use a simple runs indicator, connected to the grey wire.


Analogue VSI
Fuel
CHT / EGT
Analogue Air Speed Indicator (Pilot Probe)
Altitude Air Temperature QNH
RPM
Real Time Clock Voltmeter
Lcd Operation Menu Driver User Interface
Water Temperature Flight Time

16. SPECIAL OPERATION CONDITION

If you are operating from water, i.e. float planes, beware of the following risks and take adequate protection measures:

Water ingestion into the air filters in takeoff and landing due to spray and splash. Use good quality air filters (K and N type filter recommended for the Bing carburetors but in some Countries they use different air filters with a large surface which increase the performance), with the correct oil impregnation. Dry filter paper elements will absorb water causing the carburetion mixture to become over-rich resulting in loss of power.

Corrosion due to water, salt-water operations will cause more corrosion than non-salt water, so ensure that you wash the aircraft and engine (when cold) after salt-water operations.

Submersion in water of entire aircraft and or engine will spoil your day!

16.1 ENGINE MOUNTED INSIDE COWLING:

When the engine is mounted inside a cowling you must ensure that the cowl inlet is not restricted and the exit area is double the inlet area. All the airflow entering the cowling should flow onto and thru the radiator to ensure optimum cooling.

There should be no leakage of air between the inlet and exit on cowling, i.e. the radiator should not be starved of air throughput.

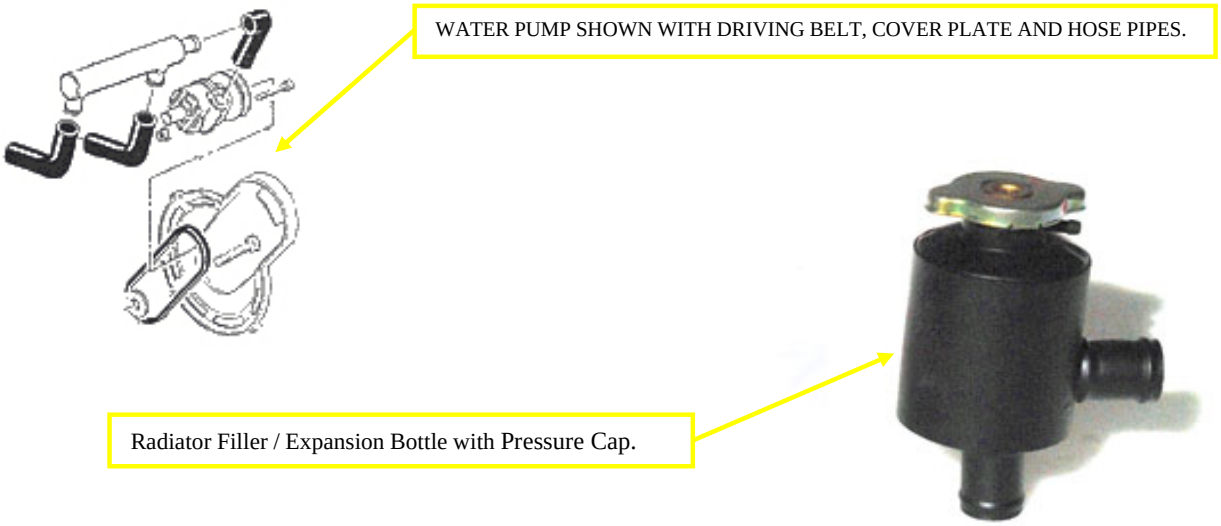
There should be a minimum difference in air pressure between the air inlet and air exit.

Extreme changes in temperature and humidity due to climatic changes can cause carburetor icing, vapor lock in fuel lines, overheating, etc. These climatic changes may cause changes in carburetor calibration and may require a change of jets, needles, etc.

17. LIQUID COOLING SYSTEM:

The Simonini Victor 2 / Victor 2 Plus / Victor 2 Super engine is liquid cooled. The engine is equipped with an integral water pump, the water pump is belt driven. The coolant is pumped around the cylinders and cylinder heads under pressure from the water pump. There are 2 finned heat dissipaters which route the coolant water to and from the radiator. The top heat dissipater is fitted with a thermostat designed to open at 57° C. The other end of the top heat dissipater is to be fitted with the coolant temperature sender.

The WATER PUMP DRIVE BELT must be checked for condition and tension before every 100 hours.



The radiator fitted to the Victor 2 /Victor 2 Plus / Victor 2 Super engine must be between 1000 to 1100 cm² radian surface areas. The radiator mountings and security must be ensured before every flight.

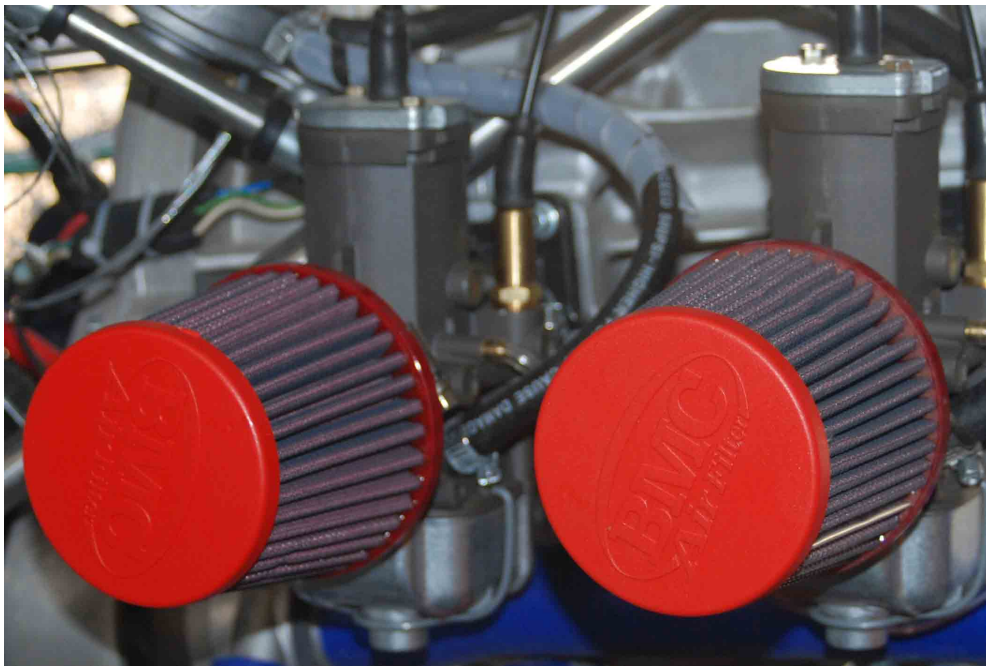
The coolant should be a mixture of 70% water and 30% anti-freeze suitable for aluminum. If necessary, change the anti-freeze percentage to ensure the effective cooling.

The maximum coolant temperature must not exceed 75°C. If on takeoff the coolant temperature exceeds 50°C. You must reduce power until the temperature drops below 50° C.

The radiator filler/ expansion bottle is of the pressure relief type with an over flow tube. Ensure that the overflow tube is routed into a bottle to capture any coolant, which may overflow due to expansion.

18. AIR FILTERATION SYSTEM

The Victor 2 / Victor 2 Plus / Victor 2 Super engine has one air filter on each carburetor intake. The air filter is made from a special fabric enclosed inside a wire mesh cage.



The air filters must be clean and oiled with light filter oil. The filter oil prevents moisture from clogging the filter cloth.
Check the Air Filters every 50 hours for dirt and clean with filter detergent and water and re-oil if necessary.
Stop: Disconnect spark plugs leads for all maintenance and inspection procedures also ensure that all ignition switches are grounded and the battery master switches are turned off.

A clogged or dirty air filter can:

1. Change the fuel / air mixture and may make starting the engine difficult.

2. Make the fuel / air mixture rich causing the plugs to foul up.

3. Cause the engine to consume more fuel than normal.

4. Cause excessive carbon build-up.

19. MAINTENENCE SCHEDULES:

Warning: Maintenance on engines and systems requires special knowledge and tools. It is recommended that you have a qualified person do the maintenance on the engine or take it to the authorized service centre or dealer.

Service times are based on average use; assuming engine is run at least once per week for a normal operation cycle or flight. Total time before tear down is determined by the frequency and conditions of usage. The Victor 2 / Victor 2 Plus / Victor 2 Super is a very low maintenance engine, about every 150 hours using. Use the chart below as an aid. Do not overlook anything that you may find is necessary to check and replace on your particular aircraft and engine combination. It is your responsibility to check that the electrical and fuel systems around the engine are in perfect working order.

19.1 DESCRIPTION OF CHECKS

Engine Hours	**10**	**25**	**50**	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**
Gearbox oil check	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Gearbox oil Replace	X			X		X		X		X		X		X
Gearbox Springs and Shim check, Replace if Required								X						X
Spark plugs, check and Re-gap	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Spark Plugs Replace				X		X		X		X		X		X
Carb. Needles, Jets, Pistons check for wear. Replace if necessary						X				X				X
Carb. Rubber Hoses, check and Replace if Required				X		X		X		X		X		X
Carb. Air filter Clean			X	X	X	X	X	X	X	X	X	X	X	X
Water Pump Drive Belt, check Condition/Replace			X	X	X	X	X	X	X	X	X	X	X	X
Rubber Coupling Drive Shaft Replace								X						X
Reed Valve Replace								X						X
Replace Radiator Coolant				X		X		X		X		X		X
Check Small End/Big End Bearing Play Within Limits				X		X		X		X		X		X

Carbon Build up, check, if More than 1.5mm, decoke								X						X
Major Overhaul of complete engine														X

19.2 INITIAL START-UP PROCEDURE:

Your engine has been run in at the factory. However, after installation in your aircraft and prior to starting for the first time please use the checklist provided for initial start-up.

1	Check Engine is secure in its mounting system. Check all bolts, washers and nuts are correctly fastened with proper torque and wire-locked where required.
2	Check all electrical connections are secure and correctly made.
3	Check all fuel connections are secure and correctly made.
4	Check all Temperature senders are secure and correctly made.
5	Check Radiator is secure and filled with sufficient coolant. Check radiator cap is securely fastened and safety-locking wire fitted.
6	Check Gear Box filled with sufficient oil EP 140 type.
7	Check torque of the oil level Allen screw is 10Nm
8	Check Oil filler / heat dissipater screw is Fastened and it's torque is 20 Nm
9	Check oil drain plug is fastened with torque of 20 Nm
10	Check sufficient fuel and oil mixture is filled in the fuel tank.
11	Check both carburetors are securely fitted. Both the idle screw adjusters must be used to obtain an 8 mm gap under the throttle piston passage when viewed from the air-filter side. Refit Air filters.
12	Check the two airscrews so that they are equal at 1 to 1¼ turn open.
13	Check the battery is fully charged to enable the electric starter to turn.
14	Check aircraft is chocked and brakes applied. Ensure that the propeller slipstream will not damage anything nor hurt anyone.
15	Prime the carburetors by either hand primer or electric fuel pump.
16	Keep throttle lever in aircraft closed. Apply full choke.
17	Engage starter motor for not more than 5 seconds.
18	When engine fires, wait for 5 seconds to close choke lever so the engine runs smoothly.
19	Warm the engine up for 2 minutes and stabilize the RPM at about 3800 - 4000 rpm. Check exhausts Gas Temperatures on both exhausts. They should stabilize and the difference should not exceed 20 °C between the 2 cylinders
20	Wait for the coolant temperature to reach 50°C.
21	At maximum power and rpm the exhaust gas temperature should not exceed 600/620°C.
22	Run the engine at various power settings for 10 minutes. Monitor the engine instruments continuously. If any of the indicators go outside the permissible operating parameters, shut down

	the engine immediately.
23	When testing is completed check everything on the engine for leaks and security of Fixing, etc.

19.3 STORAGE PROCEDURE

If the engine is not going to be used for a period of 2 months or more, use the following procedure for storage:

1. Start the engine and remove the air filters from the carburetors.

2. Spray 2-stroke oil that you use in the petrol oil mixture directly in to the carburetor throat until the engine stalls. This will ensure that all the parts in the crankcase and the top and bottom conrod bearings are well lubricated.

3. Reinstall the air filters and after the engine has cooled down cover it with suitable covers. You may also cover the exhaust opening with suitable cover to stop foreign material from entering.

20. CHECK FOR CARBON BUILD-UP AND RING CONDITION

1. After 300 hours of engine operations remove the exhaust manifolds and check for carbon build-up around the piston rings.

2. Remove the spark plugs and shine a light thru the hole in the cylinder head to check for dark brown color of carbon build-up.

3. You only need to de-carbonize the engine every 300 hours. This will coincide with the gearbox service internal. If on observation you find that there is no sign of carbon forming, you will not need to open the cylinders and decoke.

4. However, the use of mineral oil or fuels with additives may cause carbon to build-up sooner.

5. Take precautions to prevent personal injury, i.e. safety goggles, etc.

21. GEARBOX MAINTENANCE

The Simonini "C" Type Gear Box is a very low maintenance item.

1. Change the oil in the gearbox after the first 10 hours of operation.

2. Thereafter check oil level every 50 hours or if the aircraft has not been flown for more than 2 months, before the next flight.

3. The next oil change is to be done after 100 hours of operation or once every 12 months whichever is earlier.

4. Replace the coupling "donut" after 300 hours of operation, when the gear box is opened for service.

Oil quantity required for gearbox:

Drive shaft above crankshaft…….170CC

Drive shaft below crankshaft …….225CC

Oil type to be used is 90W / EP 140.

Stop: **Please dispose of used oil in an oil disposal unit. Think about the environment!**

22. TORQUE DATA:

M12	STARTER FLY WHEEL	70NM
M8	WATER PUMP BODY	22NM
M8	STARTING STATOR COIL SUPPORT	23NM
M8	STARTER MOTOR	23NM
M8	CYLINDER HEAD	23NM
M8	CYLINDER BASE	23NM
M6	REDUCTION GEAR BOX COVER	10NM
M8	REDUCTION FLANGE	23NM
M8	REDUCTION SEMI-BOX	23NM
M8	REDUCTION CRUSE	30NM
M10	RUBBER FLEXIBLE COUPLING (DONUT)	60NM
M12	REDUCTION GEAR NUT	70NM
M6	GEAR BOX OIL LEVEL INDICATOR	10NM
-	GEAR BOX OIL FILTER / HEAT DISSIPATER	20NM
-	GEAR BOX OIL DRAIN PLUG	20NM

23. WEAR LIMITS:

PISTONS WITH NEW CYLINDERS AT ASSEMBLY	0.08 -0.09 mm
WEAR LIMIT BETWEEN CYLINDER AND PISTON	0.15 mm
MAXIMUM CYLINDER CONICAL LEVEL	0.04 mm
MAXIMUM OVALISATION	0.04 mm
DATUM POINT TO MEASURE PISTON IS 12/13 mm FROM MANTLE BASE	
DRIVE SHAFT NEW AT ASSEMBLY OUT OF CENTRE	0.01 mm
DRIVE SHAFT USED, AT ASSEMBLY AFTER SERVICE	0.04 mm
AXIAL CRANKSHAFT CLEARANCE	0.03 mm
RESILIENT RUBBER "DONUT" AT ASSEMBLY	0.35-0.45mm

24. TECHNICAL DATA

24.1 DESCRIPTION

Two stroke, two cylinders, and oil in fuel premix lubrication, water-cooled with integrated water pump and electric starter.

• Dual Ignition, Bing Carburetors, Reed Valves and Tuned exhaust pipes.

Specification	Victor 2	Victor 2 Plus	Victor 2 Super
BORE	80mm x 2	80mm x 2	82mm x 2
STROKE	72mm x 2	76mm x 2	76mm x 2
DISPLACEMENT	724cc	764cc	802cc
COMPRESSION RATIO	9.5 TO 1	9.5 TO 1	9.5 TO 1
POWER OUTPUT	92 hp SEA @ 6100 rpm X	102 hp SEA @ 6200 rpm X	110 hp SEA @ 6200 rpm X
MAX TORQUE	10.80 Kgm	11.45 Kgm	N/A
MAX RPM	6200 RPM	6200 RPM	N/A
MAX. CYLINDER CONICAL LEVEL	0.4mm	0.4mm	0.4mm
MAX.OVALISATION	0.4mm	0.4mm	0.4mm

ROTATION DIRECTION	Counter clockwise, viewed toward PTO without reduction gearbox
CYLINDER MATERIAL	Aluminum with Nicasil Ceramic Coating
PISTON MATERIAL	Aluminum with silicon
PISTON-CYLINDER CLEARANCE	Maximum 0.15mm

24.2 TEMPERATURE:

CHT measured under the spark plug	…….....	80°-100°C (NORMAL)
		120° C (MAXIMUM)
Difference between 2 cylinders	……..……	20° C
EGT measured at each exhaust manifold		
At cruise power	…….	550°-580° C (NORMAL)
At maximum power at max speed	…….	620° C (MAXIMUM)
Difference between 2 cylinders *	…….	20°C
Water / Coolant Temperature	…….	65°-75°C (NORMAL)
Measured at heat dissipater	…….	80°C (MAXIMUM)

* The exhausts Gas Temperatures are more reliable when the engine is stabilized at full power or cruise power

24.3 IGNITION AND GENERATOR SYSTEM

Breaker-less DUCATI capacitor discharge dual ignition with magneto generator.

GENERATOR OUTPUT	……....	170 W AC @ 6000 RPM, 13.5V RMS
AC RECTIFICATION	……....	DUCATI RECTIFIER REGULATOR
BATTERY CHARGING	……....	DUCATI RECTIFIER REGULATOR
IGNITION TIMING	……...……	1.96mm (18°) BTDC
SPARK PLUG	……....	NGK B9ES TWO ON EACH CYLINDER

24.4 FUEL SYSTEM:

CARBURETOR	…….	TWO BING 36 mm FOR VICTOR2 AND VICTOR2PLUS, TWO BING 38mm FOR VICTOR2SUPER WITH CABLE CHOKES AND AIR FILTERS
FUEL PUMP *	…….	MIKUNI PNEUMATIC FUEL PUMP
FUEL	…….	UNLEADED GASOLINE OR AVGAS
LUBRICATION OF ENGINE	…….	PREMIX TWO STROKE OIL IN GASOLINE 2.5% OIL BY VOLUME TO LEADED FUEL 3% OIL BY VOLUME TO UNLEADED FUEL

* **ADDITIONAL ELECTRIC FUEL PUMP MAY BE REQUIRED, SEE INSTALLATION NOTES**

24.5 OTHER INFORMATION

LUBRICATION OF REDUCTION GEARBOX	.....	GEAR OIL API-GL4, SAE l40 EP OR 85W-140 EP
DIRECTION OF PROPELLER SHAFT	……...	CLOCKWISE VIEWED TOWARD PROPELLER FLANG
STARTER	……...	SIMONINI ELECTRIC STARTER

24.6 STANDARD VERSION INCLUDE

SIMONINI VICTOR 2 / VICTOR 2 PLUS /VICTOR 2 SUPER ENGINE WITH:

1. SIMONINI REDUCTION GEAR BOX TYPE *"C"*

2. SIMONINI ELECTRIC STARTER (INTEGRAL)

3. BING 54 (VICTOR2 AND VICTOR2PLUS) /58 (VICTOR2SUPER) CARBURETOR × 2

4. AIR FILTER

S. DUCATI TWIN ELECTRONIC IGNITION SYSTEM (INTEGRAL)

6. NGK SPARK PLUGS × 4

7. DUCATI RECTIFIER / REGULATOR

8. MIKUNI PNEUMATIC FUEL PUMP

9. SIMONINI EXHAUST SYSTEM

12. SIMONINI WATER PUMP (INTEGRAL)

24.7 WEIGHT

ENGINE…… 52 KG

INCLUDING: Reduction gearbox type "C" and oil, electric starter, 2 air filters, 2 carburetors, exhaust system, radiator.

25. OPERATING LIMITATION

The Victor 2 / Victor 2 Plus / Victor 2 Super engine is to be operated within the operating limitations listed below.

DESCRIPTION	LIMITATION NOT TO EXCEED
Cylinder Head Temp	120° C
Exhaust Gas Temp	580° C
Radiator Coolant Temp	80° C
Gear Box Inertia.	6000 Kgm^2
RPM Min And Max	2200 Min – 6500 Max
Max Continuous RPM	600RPM
Max Fuel Pressure	0.3BAR / 4.35 psi
Time Between Overhaul	600 HOURS

26. WARRANTY CONDITION

1. Simonini F1ying SRL as the manufacturer warrants through their authorized distributors from the date of sale to the first customer, every Simonini Victor 2 / Victor 2 Plus / Victor 2 Super non-certified aircraft engine, sold as new and unused (except for running in procedures done by Simonini Flying SRL) and delivered by an authorized Simonini Flying SRL distributor, for a period of the earliest of:

• One year from shipment by Simonini

• The first 500 operational hours from date of first purchase for private- owners.

2. Simonini Flying SRL will, at its option, repair and or replace components defective in material and or workmanship under normal use and service with genuine Simonini components without charge for parts or labor during the warranty period. All parts replaced under the warranty will become the property of Simonini Flying SRL.

3. You must present to an authorized Simonini Flying distributor or service centre the hard copy of the Simonini Flying warranty registration card and or proof of purchase delivered to customer from the selling dealer at the time of purchase.

4. Exclusions are not covered by warranty:

- Normal wears on all items
- Replacement parts and or accessories, which are not Simonini Flying parts and or accessories
- Damage resulting from installation of parts other than genuine Simonini Flying parts.
- Damage caused by failure to provide proper maintenance as detailed in the Operators Manual.
  The labor, parts and lubricants cost of all maintenance services including tune-ups and adjustments will be charged to owner.
- Aircraft engines designed and or used for racing or commercial purposes.
- All optional accessories installed on aircraft engine.
- Damage resulting from running the aircraft engine without propeller.
- Damage resulting from modification to the engine not approved in writing by Simonini Flying.
- Damage caused by electrolysis.
- Cold seizure and piston scuffing.
- Use of a gear reduction not designed by Simonini Flying.
- Use of propellers, which exceed the inertia and balance limits as specified by Simonini Flying.
- If engine instruments recommended by Simonini Flying have not been used.
- Losses occurred by the aircraft engine owner other than the parts and labor, but not limited to mounting and dismounting of the engine from the aircraft, such as loss of use, transportation, towing, telephone calls, taxis, or any other incidental or consequential damage.
- Damage resulting from accident, fire or other casualty, misuse, abuse or neglect.
- Damage / rust / corrosion, premature wear to engine caused by water ingestion.
- Damage resulting from sand / stones infiltration.
- Damage resulting from any foreign material ingestion.
- Damage resulting from service by an unqualified mechanic.

ANNEX

DECLARATION OF QUALITY

Whit the present we declare that the engines that we sell are submitted to strictly controls. Every part is singularly checked, then assembled then re-checked after the installation following the industrial concepts of construction.

The testing engineers come from "Ferrari" schools and they are specialized on engines constructions.

In particular:

1. Each engine is manufactured according to design.
   Each engine is assembled at the factory and run for 4 hours at the factory.
2. The engine run is done with the following parameters checked:
   - RPM
   - CHT
   - EGT
   - Water Temperature
   - Engines are checked for leaks of exhaust gases, coolant liquids or fuel /oil mixtures.
   - After engine run is completed, all components are visually checked for leaks.
   - After engine is cooled down to ambient temperature, all cylinders head bolts, gearbox bolts, spark plugs, water-temp belt are checked for the respect of the correct torque and tension curve parameters.
   - All exhausts arc checked for possible cracks.
   - Final inspection is done by testing engineers before engine is dispatched to the customer.
3. All exhausts are manufactured on jigs in the factory (avoiding differences between them).
4. All exhausts are made of mild steel using MIG welding.
5. All exhausts are welded by qualified welders at the "Istituto Professionale Statale Ferrari" in Maranello Italy. The welders have a further apprenticeship at the factory and internal checks.
6. Each exhaust is checked by quality control manager at Simonini factory before it leaves the factory.

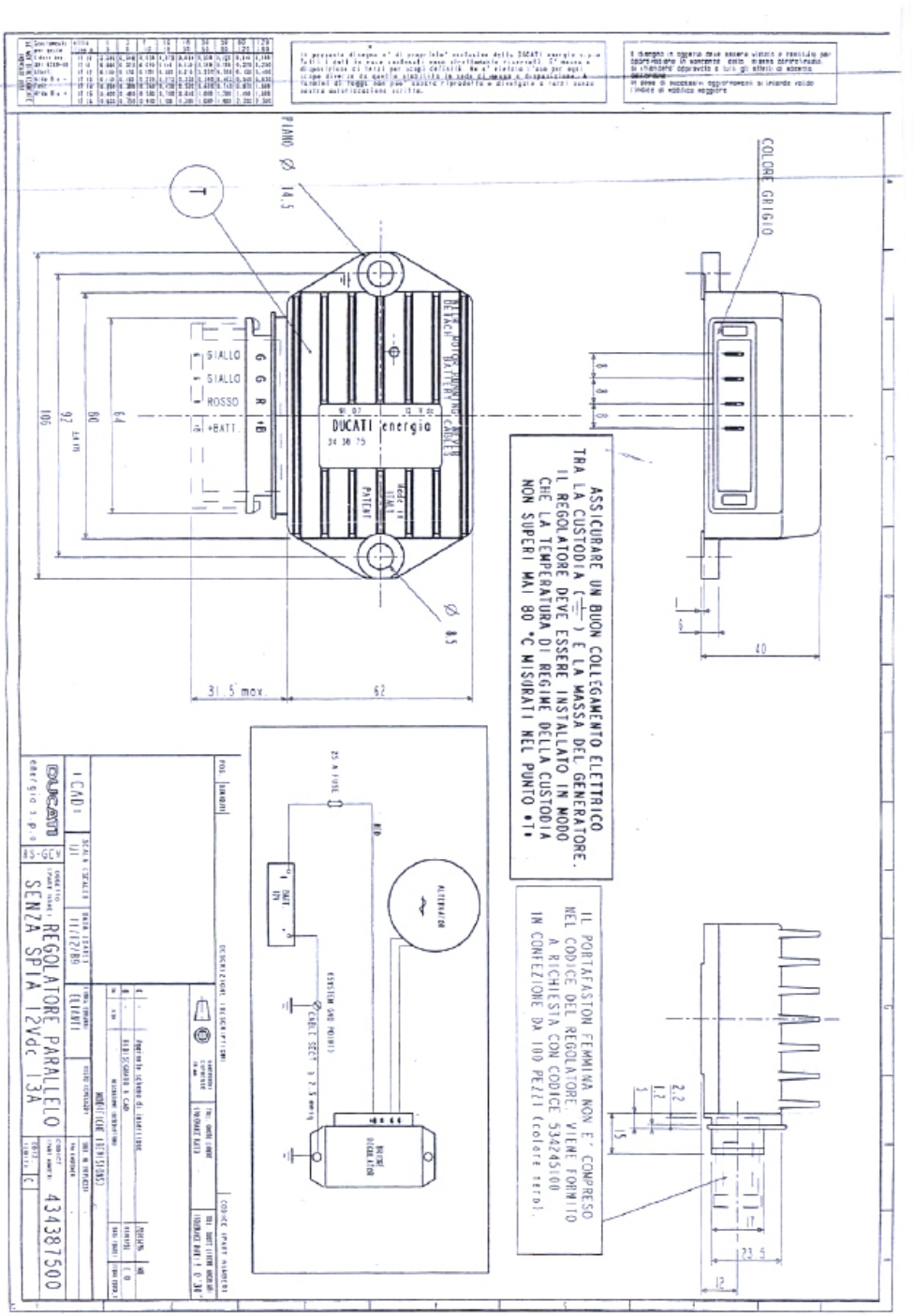
Simonini Enzo

Record no 14: Aluminum Alloy LM 25

Additional information	Heat treated castings
Specifications and information	BS 1490,LM25
Tensile strength. (soft / hard) MPa	150 / 280 / precipitance
0.2% Proof / yield stress (soft / hard) MPa	100 / 200 MPa
Fracture toughness $MN/m^3/2$	25
Density kg/m^3	2700
Elongation %	2
Hardness (Vickers) (soft/hard)	70 / 150 kgf/mm^2
Tensile modulus GPa	80
Melting temperature deg C	630
Fatigue limit (50 million cycles) MPa	60
Electrical conductivity %IACS (Cu=lOO)	39
Thermal conductivity W/m K	100
Coeff. of thermal expansion mm/km K	19
Specific heat J/kg K	900
Availability (1 .. 15) (1=rare, 15=common)	7
Relative cost (1 .. 9999) (Mild steel=10)	200
Corrosion (l .. 30) (Least .. Most Cathodic)	3

Corrosion resistant die casting.
Si 6.5-7.5;Mg O.2-0.45;Al rem.

DUCATI REGULATOR



DUCATI ALTERNATOR