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MWFLY NETWORK

BUSINESS MAGAZINE

BACK TO BUSINESS

After the most important aviation shows of 2023, the market is looking for a new engine brand

16 ENGINE CONFIGURATIONS

STOL, cruise, consumption, What to choose?

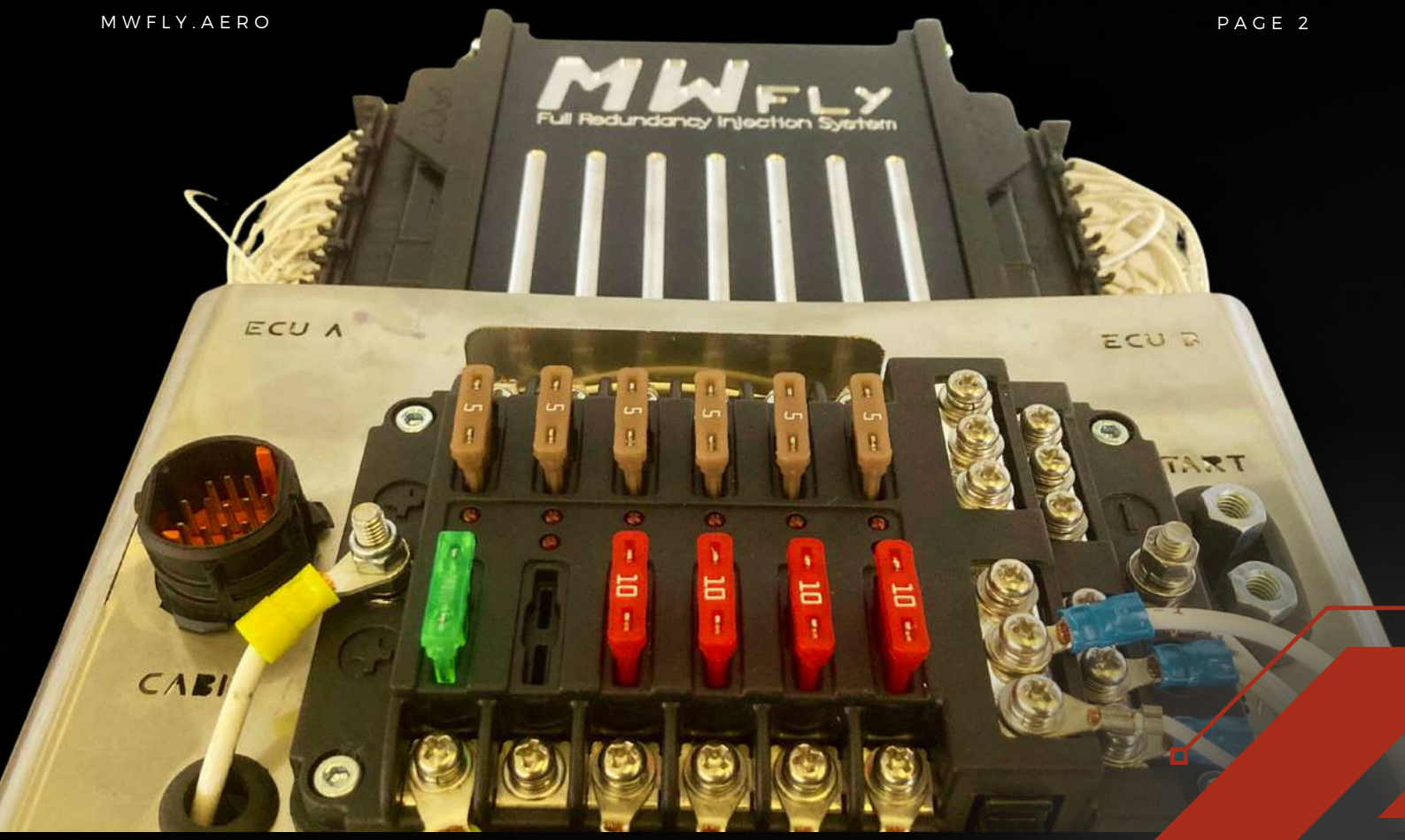
SPECIAL REPORT

Lycoming

MWfly

What happens in the USA? MOSAIC

EXCLUSIVE SUMMARY



New Era for Aviation engines

Carburation engines are still commonly used in light aviation. The move to fuel injection will be mandatory.

Injection  carburetor

The automotive industry spends millions in technology. With the advent of fuel injectors in the 1980s, carburetors gradually fell out of popularity, eventually reaching the point where they are virtually extinct. Light aviation is ready to take advantage of this consolidated technology.

MWfly is an aeronatical engine designed for aviation purposes.

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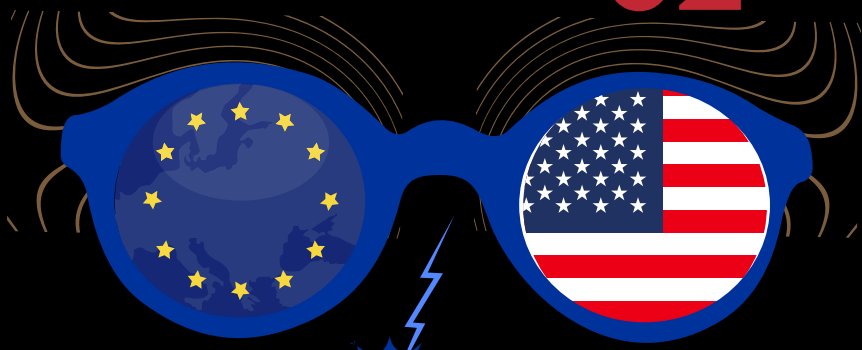

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SPECIAL REPORT

20 years of development.
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Multiple aviation projects are being developed with MWfly. “WINNER” is one of them.

TAYRONA

97.000 € +VAT

world aircraft company
WACSA
south america

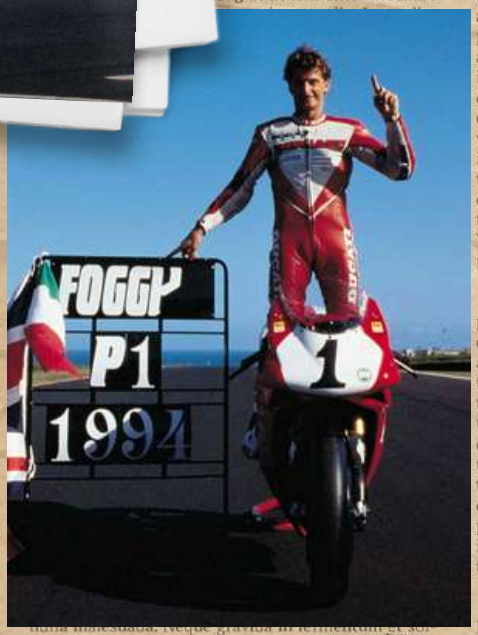
Classic

EXCLUSIVE

POWERED
MW FLY

FLY MARE
www.FlyMare.com

EXCLUSIVE
INTERVIEW



1

LEGENDS
a list of successes

The past gives us context, allows us to review who we were to know who we are now.

1994. The first of many successes - Carl Fogarty's team.

Telemetry has multiple applications in different sectors. In the world of motorsport, it is mainly used to improve performance and to increase the safety of the riders.

Eng. Stefano Marella (MWfly CEO) 1994 Ducati Team

Observant and direct, used to walk in all type of shoes.

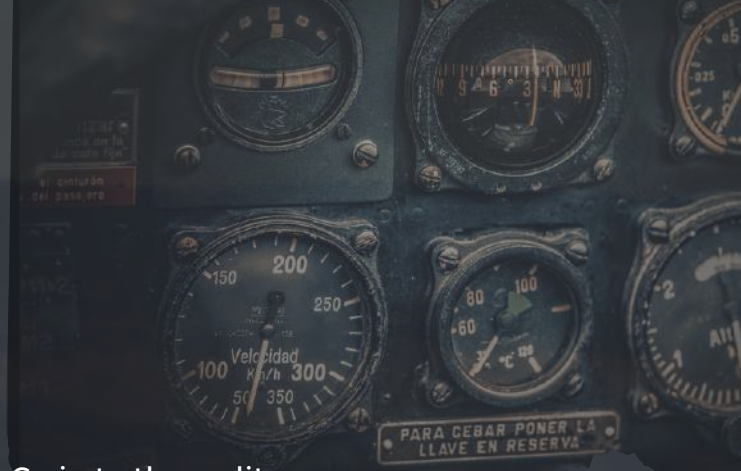
What would it take to convince mechanics and maintenance centers? Taking into account that they have been working with mechanical systems for more than 50 years.

This is a generational problem and a regulation problem. Unfortunately in aviation the safety factor has been placed as an element in opposition to technological development. In Aviation everything that is new seems to be a danger, but in fact this "protectionism" for what is already consolidated has blocked the way to new technologies. The problem therefore is to change this mentality, but I am sure that it will have to change because the market requires it.

Talking about the efficiency, field where he is an expert.

Do you think that data acquisition systems could improve maintenance plans, making them more efficient?

This is a discussion in which I have already participated in years ago. Scheduled maintenance in aviation has very high costs and many interventions are useless and others perhaps prove harmful, if instead we were able, through a monitoring system, to carry out the maintenance needed suddenly and at the right time it would be much less expensive and also safer. Just think about the oil level warning light on cars, how many people have avoided destroying the engine by topping up the engine oil before the scheduled service!



Go in to the reality,

Stefano, in such an "analog" world, such as that of aviation engines, what do you think it is necessary to do to convince users to make the leap to "digital"?

Look at what is happening in the automotive world, today the user is more attentive to all the additional functions than to the performance of the car. I believe that this attention to digital and what the digital world offers will soon also arrive in aviation and will be an irreversible transition. I experienced the same transition in the world of competitions from carburetors to fuel injection systems. In the beginning obviously there were many detractors but now it is unthinkable to go back to carburetors.

Questions that are a “must” actually.

Growing restrictions on the emission of greenhouse gases, and the focus that the authorities are beginning to put on all sectors. What room for improvement do you think the injection systems have with respect to the old carburetors?

Compared to carburetors with electronic injection control, it is possible to improve combustion efficiency in any environmental conditions, significantly reducing consumption and consequently emissions.

> *“I have always believed that victory is the due to team’s hard work”*

A question of trust

To what extent can t**he analysis of engines and online data directly from the distributor or authorized technical service to the customer, be effective and in which cases could it save money for the customer?**

We believe that a monitoring and diagnostic system, as well as a data acquisition system, are essential tools for engine maintenance, identification of malfunctions and troubleshooting. For MWfly engines, EMS system we have provided a page dedicated to the diagnosis of the control unit, through which it is possible to provide remote and immediate assistance to the user. Through this service we can identify many engine problems, check the severity, plan a targeted intervention and therefore reduce costs and times for the maintenance itself, but above all make the pilot safe.

Injection is not a common system to be on board for ultralight pilots.

What reliability can we expect from a modern injection system and its components?

In automotive, electronic injection on engines was born in the 1980s. The first injection systems were very simple with the sole purpose of replacing the carburetor. The injection was continuous, and there was a single injector on the throttle body. Then it moved to one injector per cylinder, to semi-phased and then to phased injection. Obviously we all remember the problems that there were at the beginning, cars stopped due to the injection but since then the progress is equivalent to the evolution that occurred in the same period with mobile phones. Regarding reliability, some people think that after all if a car stops due to a control unit failure it is not a big problem, neglecting that if it is not a problem for the person driving it that can stop on the side of the road, it could be a huge problem for the car manufacturer that have to recall millions of cars. Therefore it is mandatory for car manufacturers a high reliability, so I have no problem stating that today's engine control units are absolutely reliable. However, on our engines, following the aeronautical principle that a failure must not stop the engine, we have adopted 2 control units by default.

Magneti Marelli Motor Sport it is part of MWfly past and present

LAST BUT NOT EAST THE TEAM

I was lucky enough to be able to work for some racing teams including Ducati SBK in 1994 and 1995, for the Peugeot Italia rally team in 1999 and then many others. What I can say is that the winning teams have common denominators, the first is a outstanding driver, who makes the difference, the second certainly is a competitive vehicle and last but not least is the team. I have always believed that victory is due to the entire team's hard work, just as I believe that the success of MWfly is the result of the work of all those who, in their own way, have made a contribution.

AN UNRELATED COMPARISON

Vs

USA

MOSAIC

2

EUROPE

600 KG. BRAND NEW

> *MOSAIC rule will encourage manufactures to make Light Sport Aircraft operations safer, more versatile and accessible while maintaining rigorous safety standards*
>
> David Boulter. FAA Associate Administrator for Safety
> *Washington, July 2023*

In 2004 the United States stepped on the accelerator and started the clock. 15 years later Europe started a lazy wake up to follow the USA. Some are still sleepy and others will not wake up.

There is no standard worldwide description of an LSA. A summary can be: A fairly new category of small, lightweight aircraft that are simply used to fly.

UPGRADING REGULATION A NEW BUSINESS OPORTUNITY

Modernization of Special Airworthiness Certification

- Removes arbitrary weight limits on LSAs, basing it on stall speed instead. This allows heavier planes up to around 3,000 lbs.
- Increases maximum LSA stall speed modestly from 45 to 54 knots.
- Removes speed limit, potentially permitting LSAs to reach 250 knots.
- Eliminates restrictions on advanced features like retractable landing gear.
- Expands LSA categories to include helicopters, gyrocopters.
- Allows IFR and night flying operations.
- Sport pilots can fly up to 4-seat LSAs but only carry 1 passenger.
- Enables commercial aerial work like photography with an LSA.
- Public comments will shape the final rule expected in 1-2 years.

MOSAIC

Eng. Guido Fantini (MWfly CTO) 2016 Ottawa - Sonex first ignition

MWfly BACKSTAGE

3

INTERVIEW

Smiling and reserved until a strong personality jumps out at any technical issue.

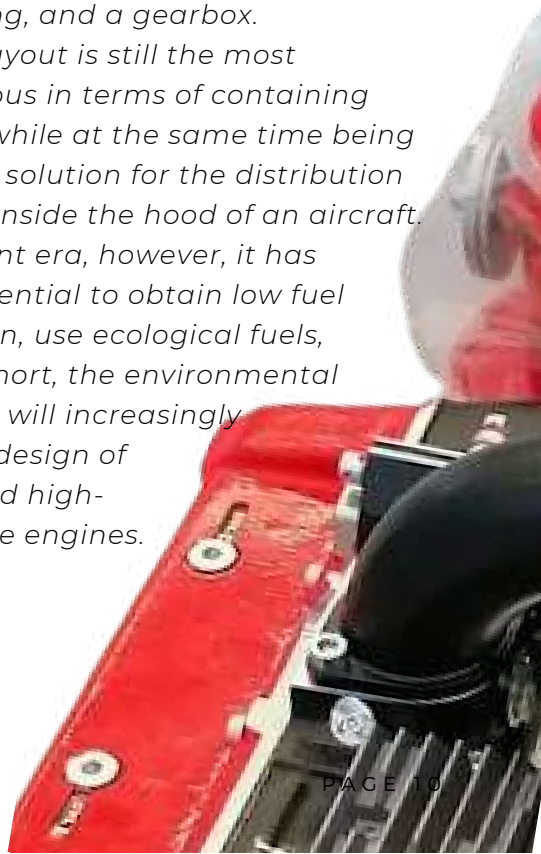
Friedrichshafen 2023 special visit to the MWfly booth.
Rian Johnson (President and Chief Technology Officer, Van´s aircraft) talking in the hall after.

— Rian, **What do you think?.**
— "**Impressive**" he said.

> ***The solution is here, we only have to find it***

Guido, What configuration do you think is ideal for a 21st century aviation engine?

My ideal aviation engine for the 21st century is expressed in the MWfly engines of the Spirit series. An eye was turned to tradition, adopting the 4-cylinder boxer layout, and an eye to innovation, using electronic injection, overhead camshaft, liquid cooling, and a gearbox.
The boxer layout is still the most advantageous in terms of containing vibrations, while at the same time being the optimal solution for the distribution of volumes inside the hood of an aircraft.
In the current era, however, it has become essential to obtain low fuel consumption, use ecological fuels, reduce, in short, the environmental impact: this will increasingly lead to the design of efficient and high-performance engines.



Now let´s go to your influences.

Lamborghini is an iconic world. You were part of them. Which engine influenced you the most?

I worked at Lamborghini Auto for three years, as an engineer in the calculation office. There I refined my structural and fluid dynamics knowledge on high-performance engines, also using the first three-dimensional solid modeling programs. The complexity and at the same time the harmony of those engines has always fascinated me. I am convinced that what appears well-proportioned and beautiful in appearance usually also works well.

Let´s go to the present.

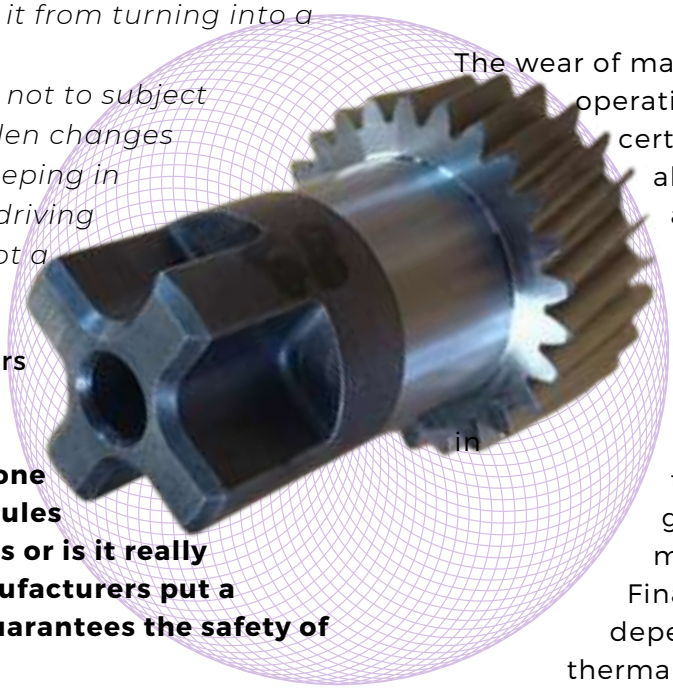
Reading the MWfly manuals it seems you thought about every event. In your opinion, which would be the most important parameters to check in flight of the engine?

Spirit engines are very robust and reliable, and therefore generally withstand stresses not foreseen at the design stage quite well.
However, a well-done installation is the starting point for obtaining a reliable product over time.
The parameters to keep an eye on in flight are the fuel pressure, the oil pressure, the temperature of the coolant and of the engine and the gearbox oil.
The EM-m digital panel was designed for this purpose, which, in addition to providing the main instruments necessary for flight, groups together, in a dedicated page, all the engine parameters with the related fields of acceptability and alarms.

You are a pilot and an aircraft owner.

For you, what elements ensure long life and reliability in an aviation engine? What could be the weak points to review or check throughout the useful life of the engine?

A good flight begins with good maintenance of the engine, carrying out all the checks required by the periodic maintenance program and a careful pre-flight examination of all the critical points, such as the tightening of the propeller and the exhaust system, the state of the electrical wiring, of the fuel and cooling system. Every anomaly must be resolved as soon as possible to prevent it from turning into a failure.
It is very important not to subject the engine to sudden changes in speed,always keeping in mind that you are driving an airplane and not a motorbike.



Let's give our readers some secrets.

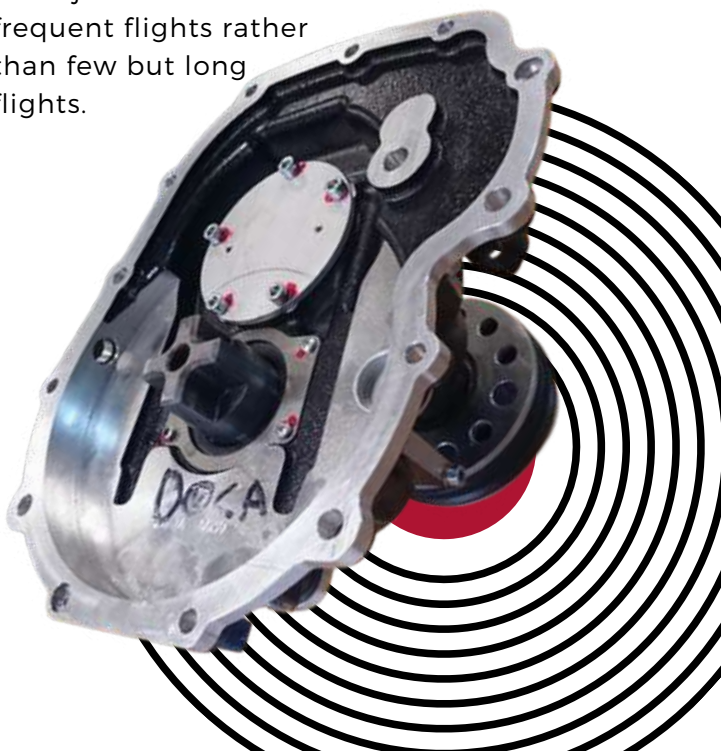
What is TBO? I is done to conform to the rules for aviation engines or is it really a limit where manufacturers put a safe barrier that guarantees the safety of their product?

The TBO of the engines is set in the design phase, considering the sizing of the various engine parts, as well as their exploitation index: the same engine in the hands of different users, with different mission profiles or mounted on different types of aircraft (plane or helicopter) will have different usage problems.
The TBO provided is the one set during the certification phase. and represents an easily achievable goal for every engine, as long as it is used in accordance with what is prescribed in the manuals.

To finish, truth or urban legend?

In your opinion, can the engine rotation speed, always within the limits established by the user manual, alter the maintenance plan of an engine? That is, if an engine is always operated at the maximum continuous RPM, would it have more wear than another that did it 400 RPM below?

The wear of materials is linked to the operating cycles, and therefore certainly to the engine rpm; it is also linked to the load applied to each cycle, and therefore to what percentage of power is usually used; finally, it is strongly linked to transients, i.e. to variations in speed and power, as it is in that circumstance that the greatest stress on the mechanical parts occurs. Finally, wear also strongly depends on the number of thermal cycles to which the engine is subjected: it is worse to make short but frequent flights rather than few but long flights.



UNDER THE SPIRIT

IN SHORT >

WHAT TO EXPECT

Modern, simplicity, compactness and weight containment. What does it mean? Large engineering.

Integrated design, all components and accessories needed for flight are pre-installed on the engine.

Versatility, the engine is developed in 2 different displacements and 16 versions, with or without gearbox, with clockwise or anticlockwise rotation, in pushing or pulling application.

MATERIALS >

Construction with monobloc base-cylinder and cylinder liners in anti-seize spheroidal cast iron brought back in wet.

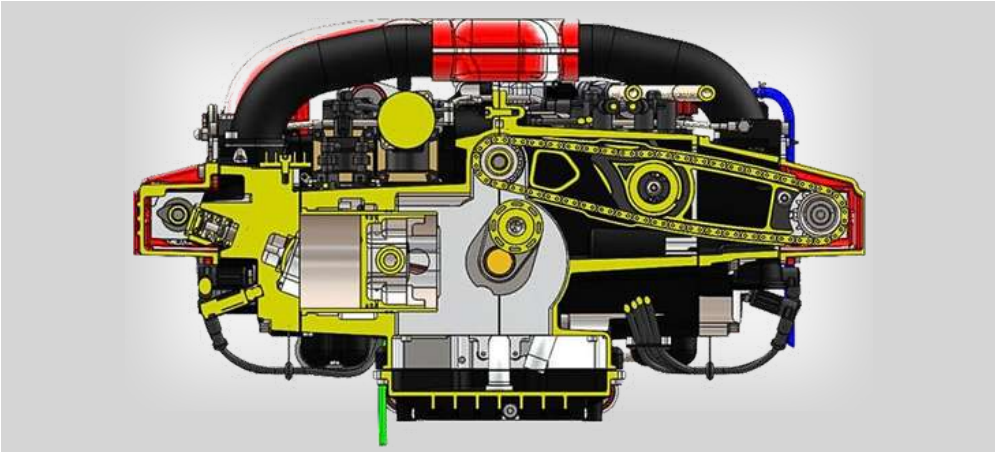
Single piece cylinder head with high turbulence combustion chambers

Forged crankshaft with 4 main bearings and monolithic connecting rods

Special low expansion aluminium pistons, machined from solid.

PROPELLER AND GEARBOX >

Helical gear reduction unit, with torsional damper, separate lubrication, Integrated electro-hydraulic propeller governor (constant speed propeller). Variable pitch propeller system designed and built by MWfly. Gearbox equipped models turn higher engine rpm—as much as 4700 rpm—for increased power and slower prop rpm (2400 rpm) to support longer propellers. There are two gearbox ratios available; some can accommodate hydraulically controlled constant-speed propellers along with either left or right-hand rotation.

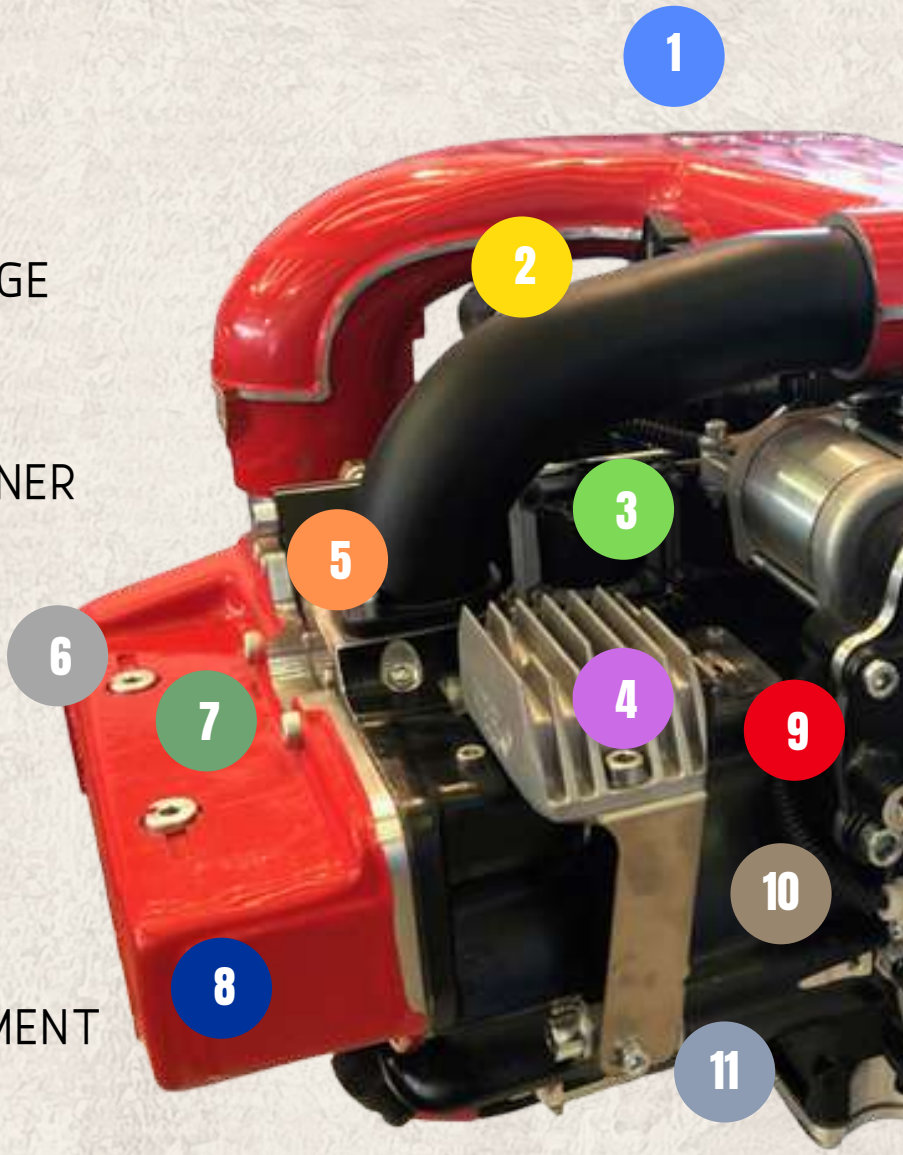


MAIN FEATURES >

- ASTM Certification Production
- Quality control with coordinate machine (CMM DEA)
- Dual fuel pumps
- Dual fuel filters
- Pre-installed steel fuel system
- Open circuit anti-vapor lock fuel system
- High pressure steel tube lubrication system
- 100% liquid cooled with integrated thermostatic valve
- Generator operation only in case of battery failure
- In case of generator failure operation with battery (16 Ah battery) for 1h
- Possibility of mounting a second generator
- Gear and chain distribution, with overhead camshaft (S.O.H.C.).
- Cylinder liners in anti-seizure pearlitic cast iron
- PSRU with large section helical gears
- PSRU with separate lubrication
- Torsional damping system
- Anti-kickback starting system (ADC System)
- Double injection and electronic ignition
- Limp-home strategy
- Double injection and ignition circuit
- Engine mounts tested at 16G
- High turbulence anti-knock combustion chamber
- Distribution with automatic double spring tensioner
- Forced lubrication and semi-dry sump (possibility of dry sump)
- Double injection and electronic ignition with CAN Aerospace data line.

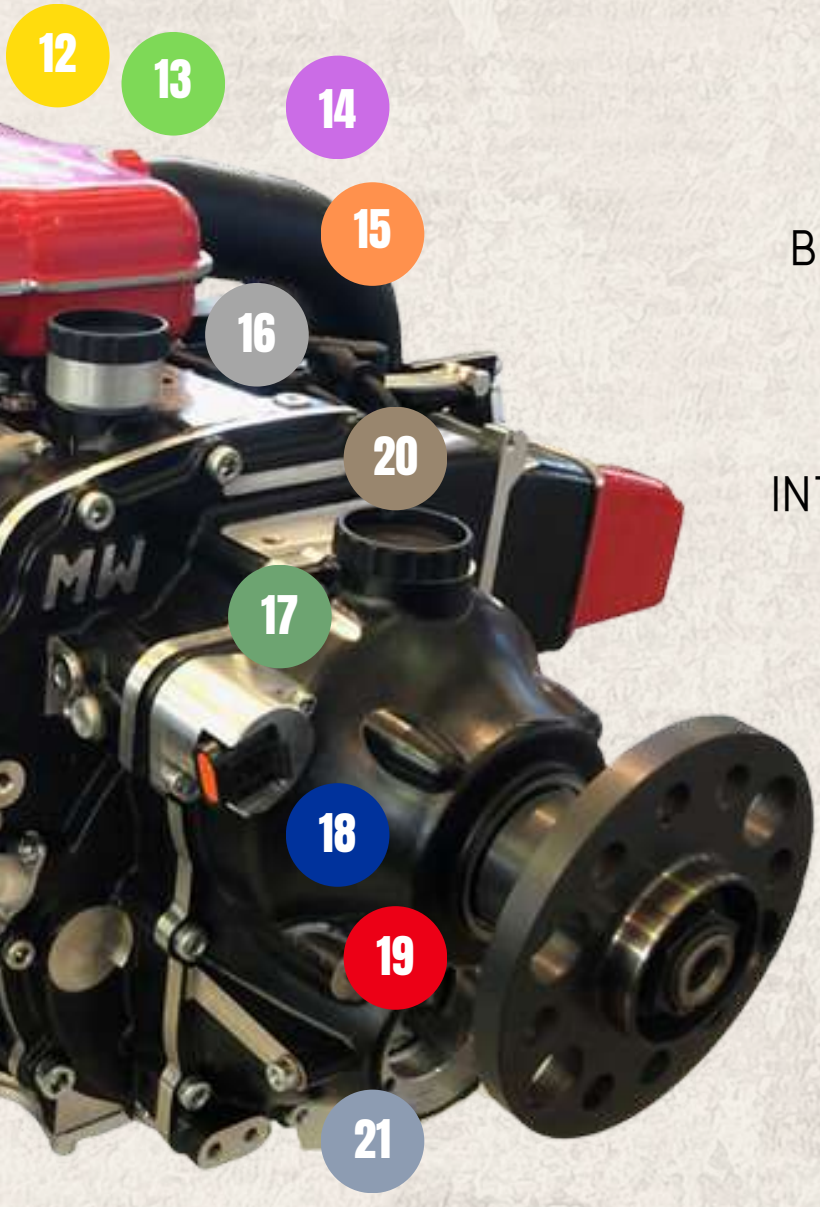
SAFETY

1. DUAL E.C.U.
2. INTEGRATED ENGINE WIRING LOOM
3. 300W GENERATOR
4. INTEGRATED VOLTAGE REGULATOR
5. DUAL CHAIN TENSIONER
6. CAST IRON PISTON LINER
7. CONNECTOR CLIP SYSTEM
8. S.O.H.C. WITHOUT HYDRAULIC ADJUSTMENT
9. CRANK SHAFT CONSTRUCTION WITH PHASE PINS
10. INTEGRAL DESIGN OF CONNECTING ROD
11. INTEGRATED OIL TANK



IEC60068-2-6 COMPLIANT

EQUIPMENT



AUTOMATIC FUEL PUMP CONTROL 12

LIMP HOME STRATEGY 13

BATTERY OR GENERATOR FAULT STRATEGY 14

WATER COOLING WITH INTEGRATED THERMOSTAT 15

FUEL CIRCUIT 16

DUAL IGNITION 17

SECONDARY SHAFT 18

DUAL RPM SENSOR 19

SEPARATE GEARBOX LUBRICATION 20

GEARBOX HELICAL GEARS 21

NOV 30

LIMITED OFFER

160CV

FREE

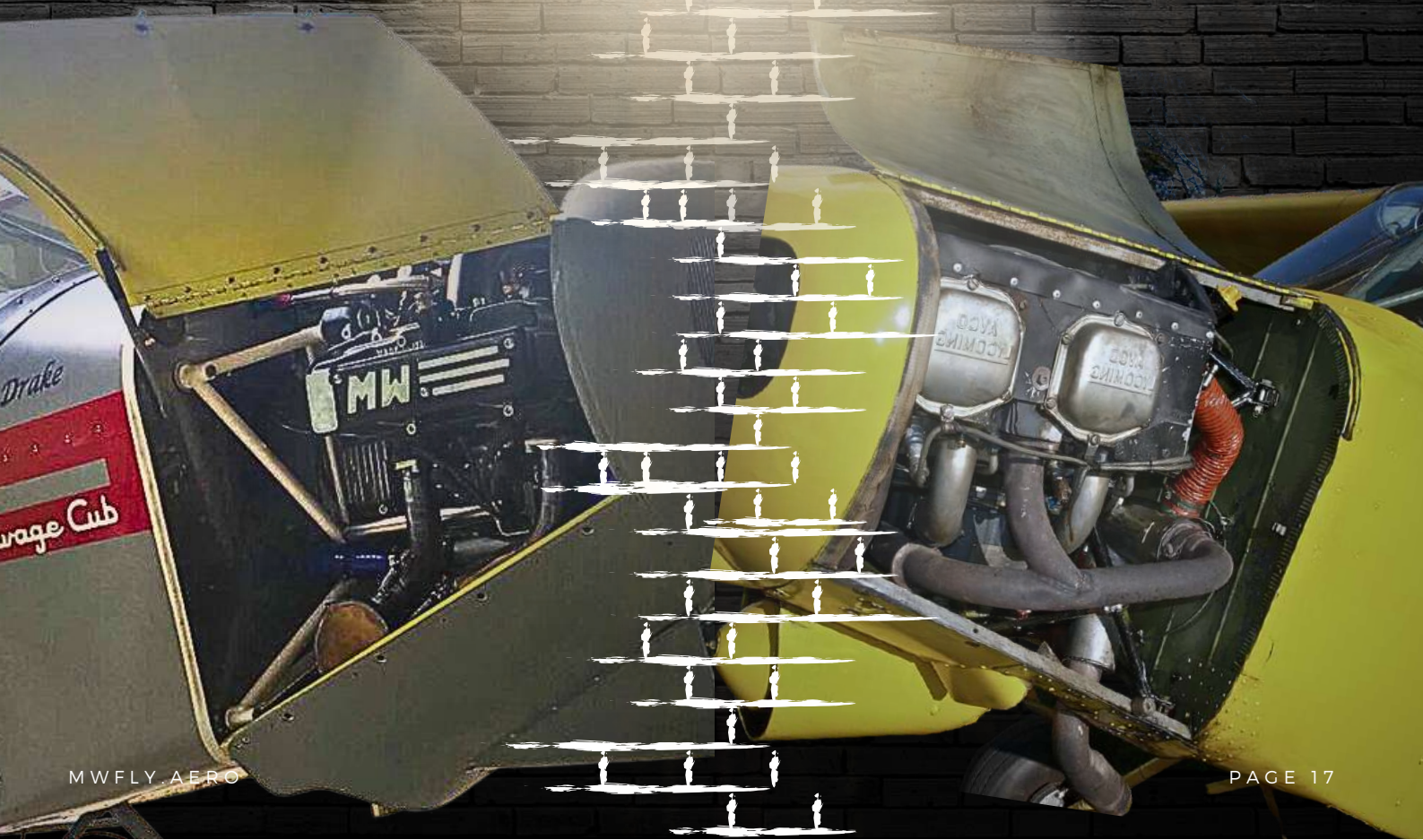
EMS

MW FLY

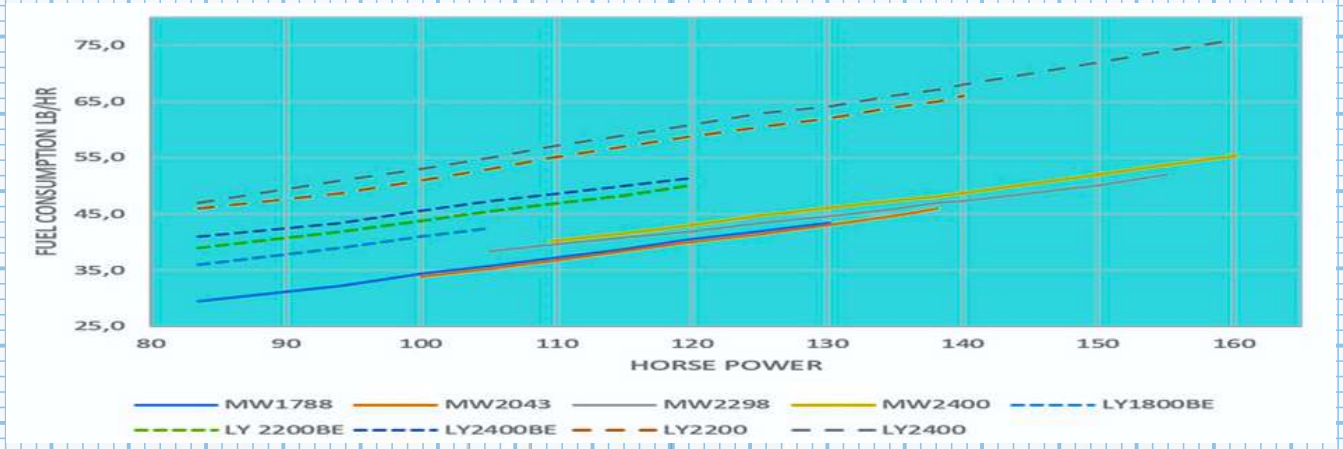
W712A

EM-m + HIS+ GPS (integrated)
(Horizontal Situation Indicator) + AHRS
(Altitude and Heading Reference System)

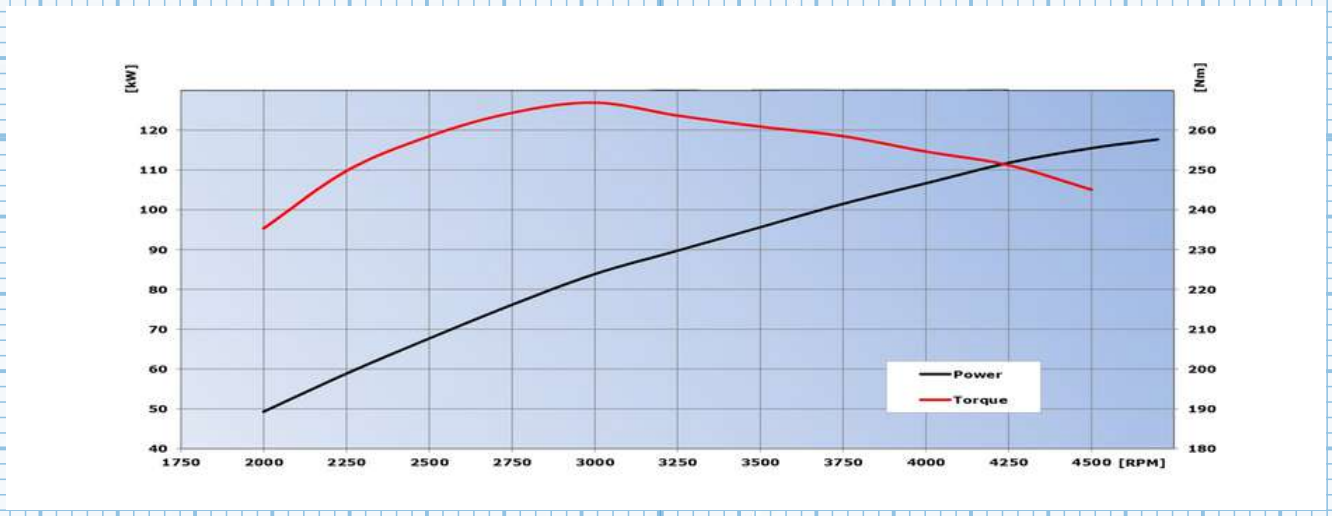
MW FLY		LYCOMING
SPIRIT 160 HP	Engine type	IO-360-L2A
2019	Year of design	1955
160 HP @ 4700	Power @ RPM	160 HP @ 2400
178 Lbs	Weight (dry)	278 Lbs
16,5x30x23,3	Dimension (HxWxL) [inch]	24,84x33,37x29,81
Aspirated	Alimentation	Aspirated
Gear	Transmission to prop	Direct
155	Displacement [inch]	361
4 – boxer	N. cyls and layout	4 – boxer
2X electronic fuel injection	Fuel system	Mechanical fuel injection
SOHC	Engine timing	OHV
Liquid	Cooling system	Air-oil
10,1:1	Compression ratio	8,5:1
1: 1.958	Propeller drive ratio	1:1
Unleaded (MOGAS) & 100LL	Fuel type	100LL (AVGAS)
145	Fuel consumption [gr/BHP/h]	380



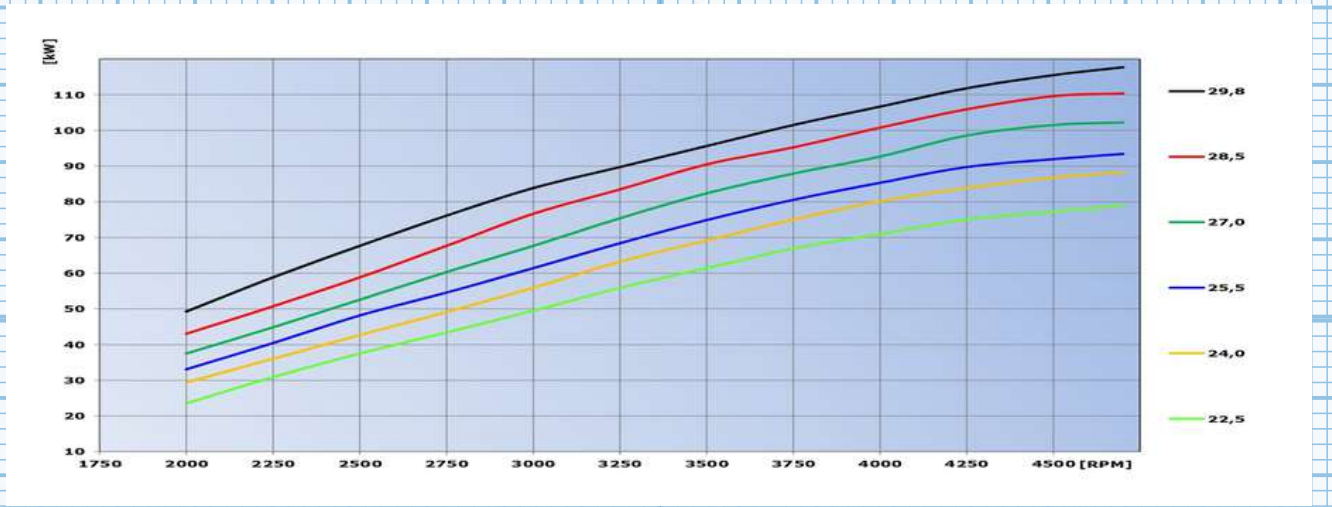
Consumption MWfly vs Lycoming



Max. power and torque MWfly

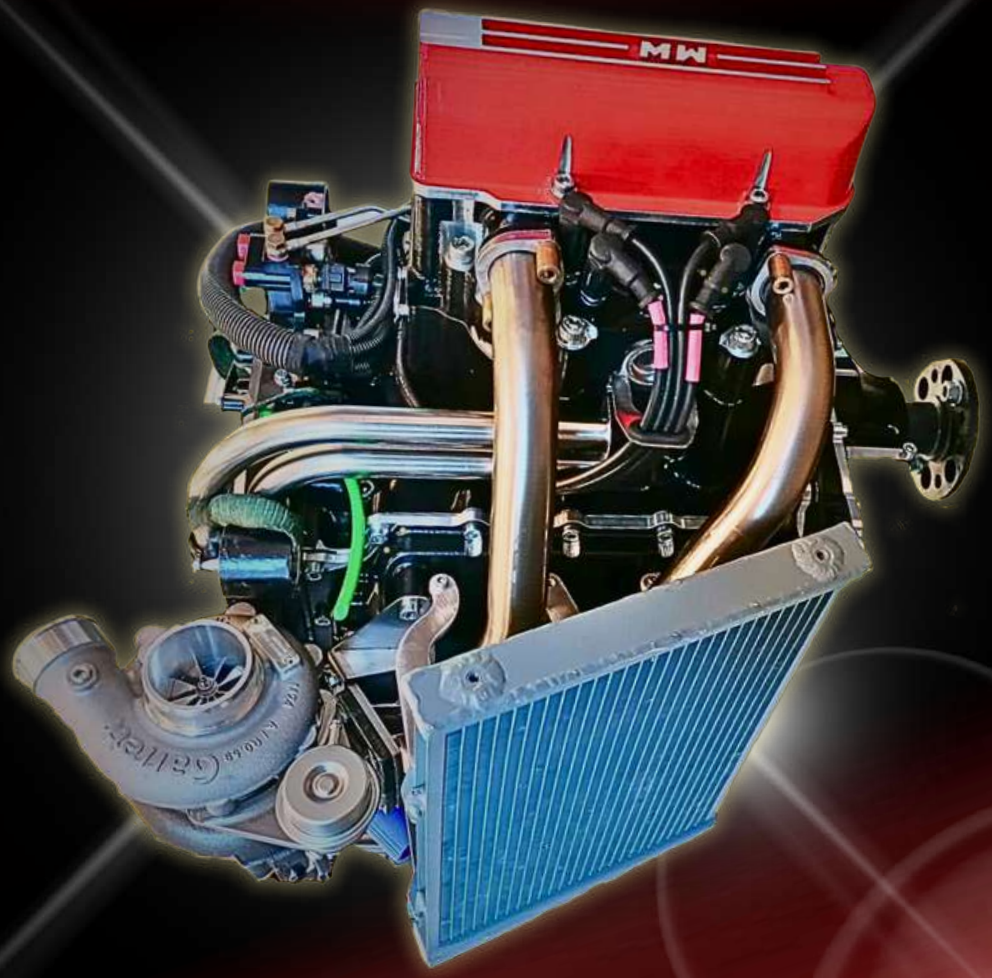


Power at constant map MWfly



MW FLY 4

GET IT IN 2024



Turbo

ORDER NOW

info@mwfly.aero

FLASH SALE

AMIGO

21.000 €

In September the new MWfly factory demo arrived, this strong and useful AMIGO by ICP is on sale. It is "almost on flight" because it needs some special equipment to installed on it. Very easy to put in flight again. A good price instead RTF to be customized by the new owner was our preference. Easy wing disassembly for transport.

660 HOURS FROM NEW
MWFLY ENGINE B22 115HP
WOOD PROPELLER BY PROPELLERS
MGL DISPLAY
FULL ANALOGIC INSTRUMENT
PORTATIL RADIO

ORDER NOW

TURBO VERSION

240cv of power
30.000 FT

Spirit Turbo is possible to order in three different types, **Turbo version normalized for altitudes up to 15,000 feet**, a **Supercharge Turbo with the aim of reaching 240hp** and finally a T**urbo Normalized for flight up to 30,000 feet**. The first two are dedicated and designed for sports aviation and general aviation, while the last version is for application on high-altitude drones.

In 2018 the Spirit engine was design from the B25 engine project with the aim of developing the turbo version. All the updates made with the Spirit engine (in particular the crankshaft on bushings, and airbox) have been tested and are already consolidated. From May 2023 the last phase of development of turbo version began, i.e. the installation of the turbo on the engine.

Currently the design phase has been completed, and we are entering the testing phase, which will begin in November.

The turbo normalized version up to 15,000 feet will then be available for all actual engine versions, a benefit to rotary-wing aircraft (helicopters and gyroplanes) and for applications in particularly mountainous geographical areas (such as Chile, Peru, California, Nevada etc).

The version with turbo power, however, will be developed only for the current Spirit 160 PSRU which will become the SPIRIT TS 240hp PSRU engine. On request of the American market MWfly will developed the supercharged version of the SPIRT 115hp DIRECT version which should become a version which will become the Spirit TS 160hp version.

The increase in weight compared to the current standard exhaust will be approximately 7kg, we expect slightly greater consumption at the same power output for the normalized version while for the version with supercharge turbo there will be an increase in consumption linked to the increase in power.

SUN 'n FUN
Aerospace Expo

30TH SHOW
AERO
FRIEDRICHSHAFEN

CONFIRMED

Let´s talk business

HERE!

N-060

MW FLY

SUN 'n FUN

Aerospace Expo

Celebrating 50 Years

SUN 'n FUN Lakeland FLORIDA 1975 2024 FLY-IN

APRIL 9-14, 2024

BUSINESS

5

INVESTMENT TIPS

In 2017 MWfly engines were certified in Canada for an helicopter for school proposed. Now many projects are powered by MWfly.

Transport Canada

Transport Canada

SPECIAL CERTIFICATE OF AIRWORTHINESS **CERTIFICAT SPÉCIAL DE NAVIGABILITE**

1. Nationality and Registration Marks Marques de nationalité et d'immatriculation	2. Aircraft Manufacturer and Model - Constructeur et modèle de l'aéronef	3. Aircraft Serial Number Numéro de série de l'aéronef
C-FTKS	SKT Helicopters SKYRIDER 06	281018SHT

4. Engine Manufacturer - Constructeur du moteur	5. Engine Model - Modèle du moteur	6. Maximum Permissible Take-off Weight Masse maximale admissible au décollage
METAL WORK	B22R	▶ 600 Kg lbs.

7. **Classification / Catégorie** ▶ ☐ restricted / restreint ☑ limited / limité ☐ amateur-built / construction amateur ☐ owner maintenance / maintenance par le propriétaire

8. This Special Certificate of Airworthiness is issued pursuant to the *Aeronautics Act* and certifies that, as of the date of issuance, the aircraft in respect of which it was issued has been inspected and found to be safe for flight.

8. Ce certificat spécial de navigabilité est délivré en vertu de la *Loi sur l'aéronautique* et certifie, qu'à la date de délivrance dudit certificat, l'aéronef visé par ce certificat a été inspecté et peut voler en toute sécurité.

9. This aircraft has not been shown to comply with the International Civil Aviation Organization airworthiness standards. Therefore, approval of the foreign civil aviation authority is required prior to flight over its territory.

9. Il n'a pas été démontré que cet aéronef est conforme aux normes de navigabilité de l'Organisation de l'aviation civile internationale. Il faut, par conséquent, obtenir la permission de l'Autorité de l'aviation civile étrangère avant de survoler leur territoire.

10. Operating conditions dated 2017-05-25 (yyyy-mm-dd) are a part of this certificate.

10. Les conditions d'exploitation en date du 2017-05-25 (aaaa-mm-jj) font partie du présent certificat.

11. The aircraft identified above shall be maintained and certified in accordance with the applicable requirements of the *Canadian Aviation Regulations*.

11. L'aéronef ci-haut mentionné est maintenu et certifié conformément aux exigences pertinentes du *Règlement de l'aviation canadien*.

12. This Certificate shall remain in force until suspended or cancelled in accordance with the *Aeronautics Act*.

12. Le présent certificat reste en vigueur à moins qu'il n'y ait suspension ou annulation conformément à la *Loi sur l'aéronautique*.

2017-05-25
Date of Issue (yyyy-mm-dd)
Date de délivrance (aaaa-mm-jj)

JEFF W. LANGFORD
For the Minister of Transport - Pour le ministre des Transports

Seal
Sceau

Canada

24-0074 (0710-07)

JEAN JOORDENS

BUSINESS OPPORTUNITY

Transition from a turbine powered by kerosene to a piston engine powered by gasoline greatly reduces consumption as well as the production of ultrafine particles. The main differences between the MWfly engine and aircraft engines that make us chosse MWfly, are:

- completely water-cooled engine
- fuel injection
- SOHC (overhead camshaft)
- It meets the new standards imposed on the engine of a gasoline car

The combination of these features makes the MWfly engine one of the most efficient gasoline engines with a fuel consumption of around 145gr/HP/h most other aircraft piston engines consume around 190 (too expensive)

2023: start of integration of the new MWfly B25 engine 230gr / CV / h

WINNER

Thanks to this engine, on a fleet of 50 helicopters, we will save 1.15 million liters of fuel in 10 years, equivalent to 39 trucks of 30,000 liters.

This mean a reduction of 2.5 million tonnes of CO2

Pre-sale agreement is signed with Plane Aviation

MW FLY

NEXT

MWFLY.IT

SPECIAL COVERAGE

MWFLY TURBO ENGINE

INSTALLATION ADVICE

INSIDE THE FACTORY: PRODUCTION MANAGER

SUN AND FUN STAND 2024

INSTALLATIONS IN PROGRESS

WHO IS FLYING?

SUCCESS TIPS TO START YOUR BUSINESS

order now!

info@mwfly.aero