



Maxwell Propulsion Systems, Inc.

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Maxwell Propulsion Systems April/May Update

Hello All:

It has been awhile since we got out an update, but since we have some really exciting things going on, I thought it would be good fill everyone in on our continued progress.

Subaru Long Block: Complete.

For our MX1 system we have standardized on using a brand new EJ25 STI Turbo short block coupled with stock, normally aspirated heads. In the past two months, we have built three engine packages using this configuration. In our continued commitment to building in quality, our standard process now includes race-balancing all short block components. We send the crank, rods, pistons, etc. out to be weighed and balanced. Next we verify that all clearances are within tolerance and only then assemble the long block. While the process is costly in terms of time and money, it is only in this way that we can be assured that the engine will have a long and safe life. This end result is that MPS has a true race-balanced engine, perhaps it will be the first such Subaru offered for retail sales? Further, all components used in the long block assembly are new and unmodified, thus readily obtainable from any local Subaru dealership.

PSRU: Complete.

Flight testing continues, but no problems/issues/ concerns have been noted to date...it just keeps on running. We delivered one PSRU and a 2nd will be delivered this week; a 3rd will be installed on the MPS N787MX Sportsman. *Note: While the MPS PSRU, with its 13.4 pound flywheel installation, is 17 pounds heavier than the A40 PSRU, the entire MPS FWF package (including the new alternator noted below) weighs in at 57 pounds less than a comparably equipped Lycoming O-360.* Weight details are found on our website under Products. (NB: These are actual numbers; we weighed the O-360 and Hartzell Prop that came with our Sportsman.)

As a follow-up to prior discussions, Attached as Figure 1 is a copy of the chart showing the vibration test results. The testing was performed using the process, software and instruments described in Contact! Issue 90, *A vibration study of a Mazda 13B installation in a Van's RV6A*, page 22-24. The chart shows the MX1 results using the lower and upper *Acceptable Limits* for a reciprocating engine.

Attachment Frame: Complete.

Modifications to the original GlaStar frame to increase its strength and accommodate mounting for the Sportsman have been developed. These will be incorporated into all future frames.

Cowling: Complete.

As we worked on our Sportsman at the Glasair facility, we were extremely pleased to discover that the cowling supplied by Glasair for both the GlasStar and Sportsman proved to be an excellent fit for the MX1 engine package. We need to determine whether the same holds true for the RV market.

Inflight Adjustable CAP 220: Complete.

Four of our 13 production units have been delivered; a 5th will be installed on our Sportsman.

Dual Electronic Ignition: Complete.

Twenty-one systems have been shipped to customers. We have fuel maps available for the NSI EJ25, NSI EJ22 and the MPS MX1; customization is possible.

Starter: Complete.

A brand new starter that mounts directly to the new PSRU (in contrast to the modifications required to fit the A40) has been identified and is included in all future engine packages.

Exhaust: Complete.

In conjunction with Aircraft Exhaust, we have incorporated a slip joint that allows the builder to change the pipe's angle, thus, in most applications, no cowling modifications would be required. In addition, this joint provides an attachment mechanism to support the pipes on the engine frame. To date we have delivered 6 exhaust systems to customers.

Fuel system: Complete.

To date we have completed retrofits for five NSI customers.

Future Development Plans

On the drawing board are three additional projects we are working on to complete the engine package:

High amp Alternator Package

We have identified a new 110 amp alternator in response to concerns that the original one, rated at 45-55 amps, was only marginally adequate when used on the increasingly common electronic systems. In addition to providing the larger capacity, reliability is increased in that all internal components are new, rather than remanufactured. The prototype of the mounting bracket is complete and drawings are ready to go to machining. As with the majority of the MPS subsystems, this kit can be retrofitted to the NSI package.

Cooling System

While MPS still has six cooling systems in inventory, and are able to ship systems equipped with these, our plan is to use two side-mounted radiators with cooling fans. Eliminating the large plenum and radiator frees up space at the rear of the engine compartment, thus allowing installation of a

Turbo!

That's right, any MX1 package that uses the STI shortblock sits in a direct upgrade path to installing a turbo. The selected turbo and exhaust should arrive today or tomorrow. At that time we will install the Sportsman's engine as well as the turbo onto the dyno. Dominic Acia, AKA, "our tuning guy" is an excellent Subaru mechanic and extremely well qualified to guide the installation and tuning of the turbo. His goal is to develop turbo packages that will accommodate HP ratings up to 250 with at least an 18,000 foot service ceiling.

New Partners

This has been a very good year as regards completing development of the complete MX1 engine package. We are also excited to announce that we have entered into a business relationship with two other manufacturers: The New Zealand company, Autoflight, has given us permission to sell their heavy duty, 300hp gear box in combination with either the MX1 normally aspirated system or, when available, the MX2 turbo. See <http://www.autoflight.co.nz/reduction/> for additional details.

In addition, we are now offering any of the wide range of products available from Vari-Prop. See <http://www.variprop.com/> for a full description of their product line.

Over the next months, we hope to develop some joint marketing with these two highly qualified companies.

Show Season Plans

As for other news, we are well into show season. By invitation of Contact! Magazine, Wayne Stafford and Dominic Acia conducted an alternative engine forum at Sun 'n Fun. In addition, Mark Kiedrowski joined them Friday and Saturday to talk with customers about MPS and our packages. We were extremely fortunate that very late in the day (about two weeks prior to the show!) Larry Morgan of VariProp offered to share his Sun 'n Fun display space with us. This provided an unexpected opportunity to meet with potential customers and talk about our products.

On the heels of Sun 'n Fun, we are gearing up for the Arlington Fly-in and an official display at the show in Space #40. We are on tap to conduct two forums, one Thursday and one Friday. We are focusing very hard on getting N787MS, AKA Maxwell Dreamliner, flying and ready to offer test rides.

Again this year, we will host a BBQ for both current and potential MPS customers. Details will be announced, but if you are coming to Arlington, remember to put this 1st Annual Event on the schedule.

We are also going to Oshkosh (Gwen's very first time!). We will have a display in the North Display Area, space 414. At both Arlington and Oshkosh, we plan to have two planes on display...N787MX and Bill Grave's T-51 (<http://www.b2engines.com/>) powered by a 150 HP 4-cylinder Turbo Suzuki.

Well, this was a rather long-winded update. In closing, I want to sincerely thank our customers for their ever continuing support. While the engine/PSRU development process lasted 9-10 months longer than projected, at this point we are extremely confident that MPS has a product that we can produce and that will give our customers excellent

service for many years. We thoroughly believe that the MPS product line, coupled with our commitment to customer service and support will prove to be an unbeatable package.

Best Regards,

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MX1 Vibration Test

