

38E Engine Upgrade

Grasshopper Flying Club

June 2011

38E Engine Upgrade

- **With the installation of the 180HP engine, several flight characteristics of 38E have changed:**
 - Maximum gross weight increased to 2,550 lbs.
 - Fuel consumption increases, which means that flight endurance decreases
 - *There are several flight accident reports indicating fuel exhaustion after 2hrs 30 minutes*
 - Flaps limited to 30 degrees
 - Mag check is 1,800 RPM, 175 RPM drop, 50 RPM difference
 - New V-speeds, weight and balance, and operational procedures; see “Airplane Flight Manual Supplement”
 - New airspeed indicator markings
 - Review shutdown procedure!
 - Tire pressure: Nose – 45 PSI, Mains – 38 PSI

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- **Engine break-in:**

- Extends until 50 hours of use - or – oil consumption stabilizes
 - Fuel consumption can be very high during break-in
- Flights must of reasonably long duration
 - With mandatory fuel refill stops at not more than 2 hour intervals until we have collected adequate fuel consumption data for this engine
 - Minimize take-offs and landings
 - Minimize ground operations
 - Cruise at 65%-75% power
 - Descend at low-cruise power; avoid closed throttle descents
- Use only the oil provided. DO NOT USE AEROSHELL 15W50

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- Updated Airspeed indicator markings

- *Note: The underlined values represent an INCREASE in stall speeds at low airspeeds, such as when landing. Exercise additional caution.*

| Marking | KIAS “Old” | KIAS “New” |
|-------------------------------|------------|-----------------|
| White Arc (flaps 30 deg.) | 33 – 85 | <u>40</u> – 85 |
| Green Arc (normal ops.) | 44 – 127 | <u>50</u> – 127 |
| Yellow Arc Structural Cruise) | 127 -158 | 127 -158 |
| Red Line (Exceed speed) | 158 | 158 |

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- **Updated Weight and Balance Information**
 - Empty weight (includes unusable fuel and oil): 1470 lbs.
 - Moment: 54,079.84
 - Arm: 36.78
 - Usable Fuel Capacity: 40 gal. = 240 lbs.
 - Maximum take-off weight: 2,550 lbs.
 - Full-fuel useful load: 840 lbs
- **Note the official source of weight and balance information is official weight and balance sheet in 38E**

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- **To calculate the performance and fuel consumption, we need this information collected on each flight during the break-in:**
 - Accurate flight duration
 - Altitude
 - Temperature
 - Cruise power
 - Fuel consumption

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