SUPER-SIZE IT

Bigger is always better. Well, at least it is sometimes. In the world of model aviation, bigger airplanes are often easier to fly than their smaller siblings. Reactions to control inputs are slightly, just very slightly, slower allowing the pilot more time to plan and maneuver. Larger aircraft are easier to see, important if you are on the plus side of 40 years old. Since wing area increases by the square of the wingspan and chord, most larger models have lighter wing loadings and are more forgiving.

Up to a point, bigger is better for model RC trainers as well. Trainer aircraft powered by .40-size engines are easier to fly than .25-powered trainers. The larger 40-size aircraft handle winds better and are not as sensitive to control inputs. Trainers that are too large however, do become more difficult to fly. Why? The answer is too much momentum and increasing wing loading after a certain point, requiring the new pilot to think too far ahead of the aircraft in order to fly it well.

There have been several attempts to market trainers with wingspans from eight feet and up, powered by larger glow engines or by small gas engines. For the most part, these larger trainers proved too expensive and possessed too steep a learning curve for most new model pilots. They were not huge successes.

What is the upper size limit for trainers? What size provides the best combination of low wing loading, good control response, easy visibility, low momentum, cost efficiency and short in-flight lead-time? There are many opinions on this subject, but there also seems to be a general consensus as well. The majority of RC instructors seem to think that a 60-size trainer is one of the best learning platforms.

The problem has been that there are few 60-size Ready-To-Fly (RTF), RC trainers available. There are some excellent Almost-Ready-To-Fly (ARF) 60-size trainer aircraft, but these require more work and need a radio and engine to fly. The new Hangar 9®, Alpha 60® RTF trainer is helping to end this problem

Photo 1 Photo 2

The Alpha 60 is a larger version of the tremendously popular Alpha 40 trainer. Both RTF aircraft feature the popular JR Quattro radio system, installed. Both also feature Evolution engines that are factory pre-run and set. These engines have proven themselves to be reliable, very powerful and cost effective (read "less expensive than you would ever have thought"). As its name suggests, the Alpha 60 has the Evolution .61 engine installed, already broken-in with the mixture controls factory pre-set.

How much larger is the Alpha 60? The wingspan is 9 in. longer at 72 in. while the wing's chord is 2.25 in. bigger at 13.5 in. This doesn't appear to be much of a size increase until you realize that the wing area has grown by 255 sq. in., a 36% increase. Even though the Alpha 60 weighs two pounds more than the Alpha 40, the wing loading is exactly the same at 17.3 oz. per sq. ft.

The aircraft's overall length is just 2 in. longer at 54 in. But the fuselage itself is much deeper and wider than traditional, 40-size trainers. The landing gear has a wider stance making for better ground handling, especially in windy conditions. The wider fuselage not only accommodates the larger Evolution .61 engine and a larger fuel tank, but also makes bolt-on wings more practical. Finally, no more rubber bands although optional rubber band wing mounting is included if you prefer that form of wing attachment system.

Assembly

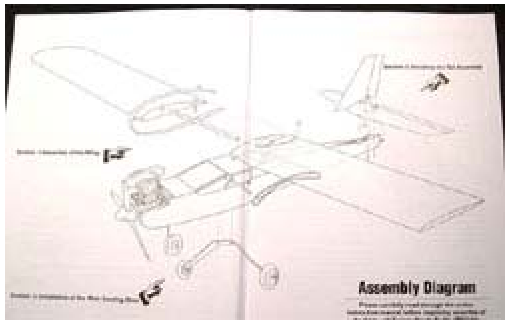

Photo 3

Like all RTF aircraft, you do not build the Alpha 60. You assemble it. All the assembly steps are shown in photo 3 taken of the assembly summary printed in the instruction book. (You may want to click on this photo to enlarge it for better legibility). The instruction book also contains detailed assembly photos of each step.

Horizon claims that the Alpha 60 can be assembled in about 30 minutes. Except for one minor difficulty, the total assembly time was just *17 minutes*. Every *major* assembly step went just as listed in the instruction book. There were no major problems and almost everything fit to perfection.

Photo 4   Photo 5

The first assembly step is getting the wing ready to fly. A hollow, lightweight aluminum spar is inserted into both wing halves as in photo 4. The aileron servo is already installed, as is the rear locater pin near the trailing edge. This pin slides into a matching slot in the other wing half (photo 5). Slide the wing halves together and then seal the center section with the provided clear tape. The tape holds the wing halves together as well. Connect the one loose aileron control rod to the aileron and the wing is done if you intend to hold it on with rubber bands. Another assembly step comes later if you wish to use the more efficient nylon wing bolts.

Photo 6   Photo 7

The fuselage goes together almost as quickly. The horizontal stabilizer and the vertical fin (photo 6) are assembled using two wing nuts. Slide the two threaded shafts that are glued into the bottom of the vertical fin through the matching holes in the horizontal stabilizer (photo 7). Firmly tighten the two wing nuts and make sure they are aligned as in photo 8. Before installing the tail assembly to the fuselage, use a small square to be sure the fin is exactly vertical to the stab (photo 9). Ours was perfect.


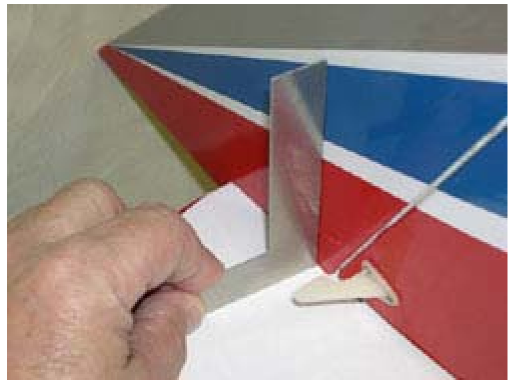
Photo 8   Photo 9

Next, position the tail assembly onto the fuselage (photo 10). The tail attaches to the fuselage using two bolts. We suggest that you first loosely install the rear bolt. This bolt is accessible from outside the rear of the fuselage, just under the elevator control rod. The other tail mounting bolt must be inserted through a hole in the fuselage. We suggest using a magnetic screw holder for this task (photo 11). Tighten both bolts and hook up the two control rods.


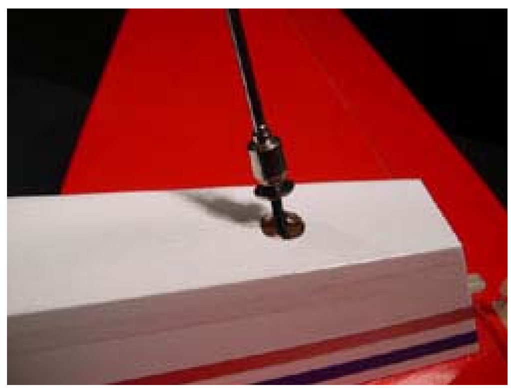
Photo 10   Photo 11

Working forward, install the landing gear onto the bottom of the fuselage using two supplied screws. The Alpha 60 uses an aluminum sheet landing gear (photo 12). This type of landing gear is far superior to the wire main gear found on most 40-size trainers. Not only is sheet gear stronger than wire gear and easier to install, it has less air drag. The Alpha 60’s main landing gear allows smoother landings, as it is not as “bouncy” as is wire gear. The wheels are already installed. Be sure that the tapering side faces front as in photo 13.

 

Photo 12   Photo 13

The Alpha 60 missed being the first RTF ever assembled by Sport Aviator to have no assembly difficulties just by a nose. That nose being the spinner. The propeller blade cutouts in the spinner's nose cone were misaligned by about 0.05 in. This was just enough to prevent the three screws that mount the nosecone to the backplate from fitting into their respective slots shown in photo 14. It took but a few minutes to carefully shave the trailing edges of each slot (photo 15) to permit proper alignment. After minor trimming, the spinner fit perfectly.

 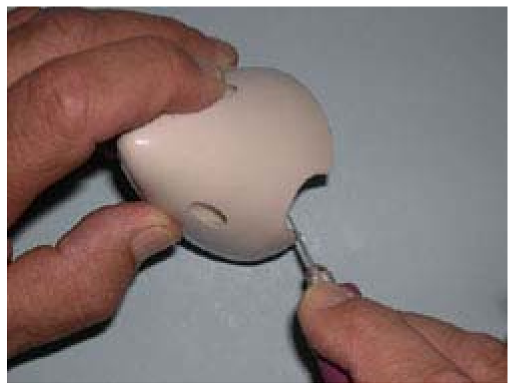

Photo 14   Photo 15

Make sure the propeller is mounted correctly. Since it is all black with few markings, it is possible to mount it backwards. This dramatically reduces performance. There is a black "E", the Evolution trademark, molded into the front of the blade (photo 16) and it should be facing forward when the propeller is correctly mounted.

Photo 16

Wing Mounting System

The Alpha 60 offers the option to mount the wing using Nylon bolts instead of rubber bands. TAKE THIS OPTION. It is cleaner, the wing always mounts in the same position keeping flight trim constant and there are no poles sticking out the sides of this very attractive fuselage. Almost everything is done for you so there is but five minutes extra work involved.


Photo 17   Photo 18

If you have one, use a modeling heating iron to make sure the covering is firmly attached around the pre-drilled holes in the wing's leading edge (photo 17). Then carefully cut the covering out of these holes with a modeling razor knife. Do the same for the boltholes near the wing's trailing edge. The rear bolt nuts are already mounted in the fuselage (photo 18).


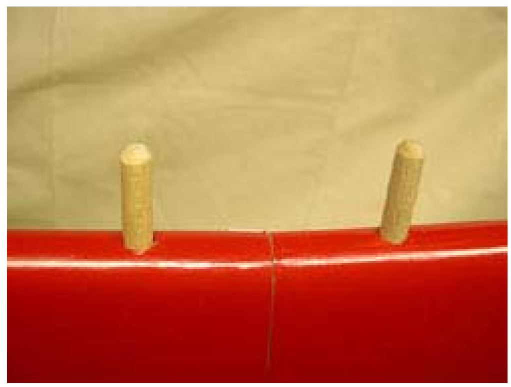

Photo 19   Photo 20

Using a toothpick, apply some five-minute epoxy into the front holes (photo 19) and then insert the two short wooden dowels provided (photo 20). Using Alcohol, clean any excess epoxy from the wing immediately. Make sure there is no epoxy on the outside of the wing then, before everything dries, slide the dowels into the pre-drilled holes in the front fuselage former and bolt the wing in place. This procedure insures that the dowels are properly aligned and will not affect the wing's incidence. After about 10 minutes, remove the wing and let the epoxy cure a few hours before flying.

That's all there is and you are almost ready to fly. But before you corral your instructor and go charging out to the field, make sure you perform all the preflight checks as outlined in "Ready To Fly?…Maybe" in Sport Aviator's Flight-Tech Section. That way, you will not have any unpleasant surprises when you are ready for that all-important, and exciting, first flight. We did not completely follow this sound advice and did need to pay for it later on.

Flying The Alpha 60


Photo 21   Photo 22


Photo 23   Photo 24

This story begins on a dreary, cold and windy day, in a land far, far away. Well, it was cold (38 deg.) and windy (20 plus mph) but we went to our club's nearest flying field so it was not really that far way. As the ground pictures show, the Alpha 60 makes a good field impression. The larger size makes a bold impression and the color graphics are impressive. Even at the field, the Alpha 60's extra size is evident.

Before getting ready to fly, we range tested the Alpha's JR Quattro radio system. The Quattro is JR's most basic radio system. The transmitter features servo reversing on all four channels, adjustable length control sticks and accepts a "buddy box" trainer cord. The included JR R700 FM receiver is designed to resist interference and extend range. One nice thing is that this is a seven-channel receiver. Three extra functions are available should you ever upgrade to a transmitter with additional channels.

The servos are JR 527 and use metal bushings to support the output arms. These servos produce 43 in. oz. of torque, more than enough even for this large aircraft, and are relatively fast at 0.25 seconds for a 60-degree transit time.

On the range test, we got tired of walking at about the 200 ft. mark and everything still worked. Since antennas on most JR radios do not fully collapse, their range-test signal is stronger and usually exceeds 300 ft before losing range. From experience, I have learned that if there is a JR range problem, it always shows itself before reaching the 50 ft. mark. But I went out to 200 ft. because I really liked this aircraft and wanted to be as sure as possible that there would be no problems.

The fuel tank was filled with Magnum 15% Nitromethane fuel. The tank size is not specified, but it appears to hold about 12 ounces. This was enough for 18-20 minutes flying time. The Evolution .61 engine was factory run and set. During construction, I was careful not to touch any of the mixture settings. With everything set, we got ready to start the engine (photo 25).

Photo 25

Please Note: We printed this photo *only* because numerous Sport Aviator readers have written in asking what your editor looks like. OK, I'll wait. When you stop laughing, wipe the tears from your eyes and then continue reading the rest of this story.

The Evolution .61 engine started on the first attempt after adding a few drops of prime. The high-speed mixture control was perfect, requiring no adjustments. But Hangar 9 surely did not plan for 38 degrees when they factory pre-set the idle mixture control. The mixture was slightly too rich but was easily corrected.

All Evolution engines have mixture limiters to prevent excessively lean or rich settings that may damage or stall the engine. But enough mixture control remains to handle even absurdly low temperatures. These engines also have a flywheel mounted just behind the spinner. This is a great idea as the extra momentum makes for a more consistent idle. The engine proved to have some power as it turned the 12 in. diameter, 3-bladed propeller at 10,600 rpm. After adjustment, the idle remained steady at 2,450 rpm. But from experience with the Hangar 9 Arrow, we knew the 3-bladed propeller would cause extra braking during the approach so the idle was set at 2,800 rpm using the transmitter trim tab. If this proved too high, it could always be lowered during the approach.

It was too windy, a direct 90-degree crosswind at over 20 mph, to taxi out to the runway so the Alpha 60 was carried to the runway's end for takeoff. Despite the heavy crosswind, the Alpha stayed on track, with just some right rudder steering and aileron to keep the windward wingtip level, rolled about 75 ft. before taking off at 29 mph (photo 26) and began a good climb to altitude; gaining 1,400 fpm at 30 mph. Once at altitude, we added two clicks up trim and one of right aileron. Then we tried a few fly-bys for the camera (photo 27).


Photo 26 Photo 27

The Alpha 60 handled the wind with few problems. Control sensitivity was factory set at "very mild" but there was enough control to loop and roll (photos 28 and 29). The Alpha 60 would hold a steady 1,800 fpm climb at 33 mph. Top speed, because of the 3-bladed propeller, was just 50 mph.


Photo 28 Photo 29

After about 10 minutes, we thought it prudent to land with extra fuel on board, as several approaches might be required for a good landing. In fact, just one was required. The Alpha easily held the standard crosswind slip correction (photo 30) and maintained a constant 34 mph speed on the approach. The aircraft's extra size and momentum made for a steady crosswind track (photo 31). With little drama and no fuss, the touchdown at 30 mph was unexciting (photo 32).

Photo 30   Photo 31

After landing is when we made the big mistake. Always check the outside and inside of your model aircraft after the very first flight. How many times have I told that to model pilots everywhere? Too many times to think about. Yet I didn't this time. The bigger aircraft handled so very well and was such fun to fly, that I became over-confident.

Photo 32   Photo 33

We fueled up again and took off. I tried a steep takeoff (photo 33) to see what would happen if a student pilot applied too much elevator at takeoff. The airspeed bled off quickly but the Alpha maintained an 800 fpm climb at 24 mph. I then applied additional up elevator to stall the aircraft. The full-power stall was a non-event at 18 mph. The wings stayed level as the nose dropped. After losing a minimum of altitude, the Alpha was flying again. Definitely a good aircraft for new pilots.

Photo 34

In Sport Aviator's Advanced Training Section, there is an article on learning rudder use, creatively entitled "Using The Rudder." The Alpha 60 inspired such confidence that I decided to use the second flight to take the stall turn photos that were to accompany that article. During the vertical portion of the stall turn shown in photo 34, the engine suddenly went lean. It went *very* lean. I immediately reduced the throttle to idle and flipped the nose downwards. Whenever an engine goes suddenly lean in the air, get the nose level or pointed down as soon as possible and reduce throttle.

I believe the evolution .61's flywheel kept the engine turning long enough for it to regain some power once the aircraft was level. My thanks go to Newton's laws of momentum and to the Evolution's designers. The engine would only run below half-throttle, however. In a 20 mph wind, this was now less fun than it was a few seconds ago.

I setup for a long approach, planning to touch down near the runway's far end. If the engine died on approach, it should still be possible to make the near runway end. Keep this rule in mind if you have to land without power. Always plan to land "long" and you will usually reach somewhere on the runway. As the Alpha glided past me, I noticed that the nosewheel was pointed too far back (photo 35). It must have come loose somehow.

Photo 35

Not wanting to "plant" the airplane on the ground with a loose nosewheel, I applied the one-third throttle that was left and climbed to make another approach. The Alpha 60's slow speed handling was *outstanding*. The aircraft climbed slowly, but climbed, at one-third throttle, flew the entire landing pattern and set up again for the approach as steadily as if full power were available. This airplane was performing in a heavy crosswind, with little power, at very low airspeeds, far better than any pilot had a right to expect. The Alpha 60 was proving itself a true pilot's airplane on only its second flight

The second approach was much slower to setup a power-on, with whatever power there was, slow and soft touchdown. Just before touch down, the Alpha was hit with a huge wind gust, raising the right wing tip (photo 36) and lowering the left one almost to the ground. Even though the airspeed was near minimum and the controls set on mild, recovery was quick and easy with just a little right rudder. The wind faded right after the gust and the Alpha 60 made a soft landing with the nose gear still attached (photo 37).

Photo 36 Photo 37

This review started out to be about a larger than usual trainer. It ended up being a story about a thoroughbred model aircraft with performance reserves usually found only in high-performance competition models. The performance reserves the Alpha 60 exhibited on that eventful second flight directly relate to it's being an excellent trainer. Great slow speed ability. Excellent control response. Wind handling beyond good. The aircraft's stability kept me from looking like an idiot by saving the airplane from damage.

Why an idiot? Because I didn't perform all the pre-flight checks that I should have done. I tightened the nose wheel bracket screws but I did not apply thread locking compound to the bolts, as I should have. The result was that three of the four bolts holding the nose gear to the firewall had fallen out.

The engine had suddenly gone lean because I did not carefully check inside the airplane after the first flight. The radio and flight battery are held in place by a plywood plate placed over them (photo 38). This plate also holds the fuel tank in place at the front of the aircraft. A single screw at the rear secures the plywood plate. During manufacture, the hardwood block holding the screw had been cracked (photo 39). I did not check this screw before flying. The problem would have been easily seen and corrected if I had.

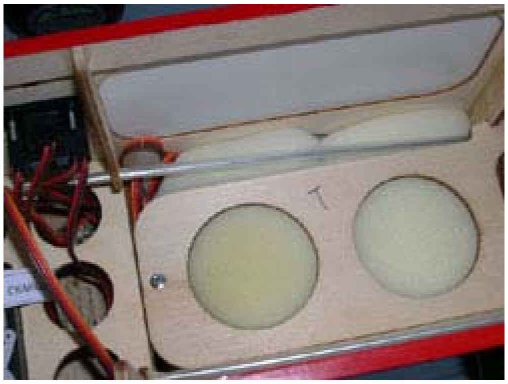
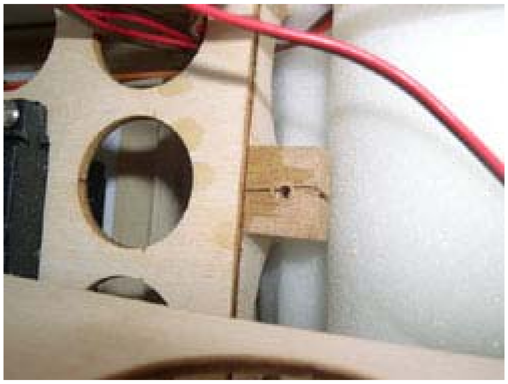

Photo 38   Photo 39

Since I had not done a proper preflight, the screw vibrated loose from the cracked block. The plywood plate was left unsecured. During the pull to vertical, the plate worked loose as shown in photo 40. Look carefully at the photo and you will note that the fuel tank also slid all the way backwards. This crimped the fuel line and increased the distance the fuel had to flow to get into the engine. The result was a very lean mixture condition. It was a wonder that the engine ran at all but the Evolution .61 must posses excellent fuel draw. Enough fuel could get to the engine below half throttle, but not enough for higher power settings.


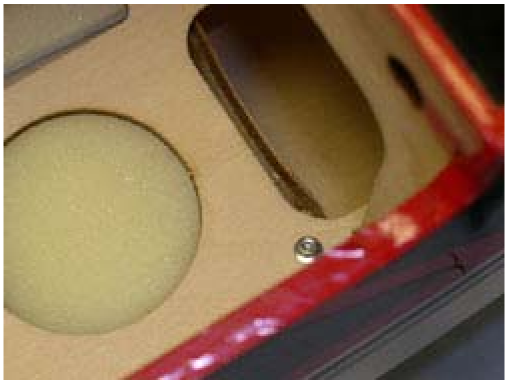

Photo 40   Photo 41

The fix was simple and shown in photo 41. A new hardwood block was epoxied in place of the old and an additional screw was mounted near the front of the plate. The Alpha 60 and I have shared about 30 flights since then with no problems of any nature. The aircraft has proven to be an excellent trainer and a relaxing aircraft to fly and land. The 3-bladed propeller keeps the airspeed relatively constant even when the student pilot lets the airplane's nose drop in a turn. There is little pitch-up when the wings are leveled after that descending turn.

The constant airspeed makes it easier to fly for a new pilot. The best training speed is right at 38 mph, only a little faster than most 40-size trainers. Yet the Alpha 60's larger size makes it appear that the airplane is flying more slowly.

One feature about landings that is especially important involves throttle control. The 3-blade propeller does not have as much pitch as would the standard, 60-size 2-blade propeller. As a result, more rpm's are required when flying the approach. This allows the student to learn throttle control as discussed in "Basic Landing Techniques" in Sport Aviator's Pri-Fly Section. The Alpha 60, like the smaller Alpha 40 and the Hangar 9 Arrow, fly the final approach using about three "clicks" of throttle. This is exactly how high performance aircraft, which all sport pilots eventually fly, are best landed. The Alpha 60 teaches this landing technique now, rather than forcing the new pilot to relearn proper throttle control later on.

Photo 42

One final landing note. In order to get those pretty, nose-high touchdowns like the one in photo 42, relocate the elevator control rod clevis one hole in the control horn closer to the elevator. This provides just enough extra elevator authority to raise the nose, but not enough control to cause any problems for the new pilot.

The plate problem is obviously a one-of-a-kind thing. I have never heard of this happening with any of the many Hangar 9 aircraft that use this system. The mounting block could have been broken during shipment or assembly. It is important to remember that even this very rare situation would have been found by performing a proper pre-flight inspection. I will not make that mistake again and I trust you will not either.

The Alpha 60 is a pilot's airplane that I am proud to have in my hangar. I have used it to fly two new pilots and it performed as well for them as it always does for me. It will do the same for you.

✈

Flight Data Results

***Take Off Speed:**	**29 mph**
Climb Out Speed	**30 mph**
Best Training Speed:	**38 mph**
Top Speed:	**50 mph**
Sustained Climb Rate:	**1,800 fpm**
Range	**18-20 minutes**
Dive Speed:	**57 mph**
Best Glide Speed:	**34 mph**
Gliding Descent Rate:	**-1,000 ft./min.**
400' Glide Distance:	**1,220 ft.**
Level Stall Speed:	**24 mph**
60-deg. Bank Stall Speed:	**29 mph**
Landing App. Speed:	**34 mph**
Touch Down Speed:	**28 mph**

*All results are an average of 3 flight tests

Aircraft Specifications

Type:	Basic Trainer
Engine Used:	Evolution .61
Propeller:	3-blade, 12 in. dia.
Top RPM:	10,600 rpm
Idle RPM:	2,450 rpm
Test Weight:	7.25 lb.
CG Location:	At Spar
Elevator Movement:	5/8 in.
Aileron Movement:	3/8 in.
Rudder Movement:	1 in.

Weather Data

Temp	Wind	Alt.
38 deg. F	20+mph	300 ft.

Additional Aircraft Specifications

Manufacturer:	Hangar 9	**Length:**	54 in.
Cost:	$380.00	**Wingspan:**	72 in.
Radio:	JR Quattro 4-channel	**Wing Area:**	965 sq. in.
Servos:	4 x JR 527	**Wing Loading:**	17.3 oz./sq. ft.
Engine:	Evolution .61	**Weight:**	7.25 lb.
Airfoil:	Flat Bottomed		

Special Airframe Features: 3-Bladed Propeller, Quick Assembly. The best performing basic trainer airframe tested so far.

Notable Positives

Outstanding low speed performance
Extremely fast assembly
Very good looks
Easy to see large size
Great basic trainer performance
Pre-Run, factory-adjusted engine

Notable Negatives

Red wing bottom hard to see. Needs a white stripe on one side.