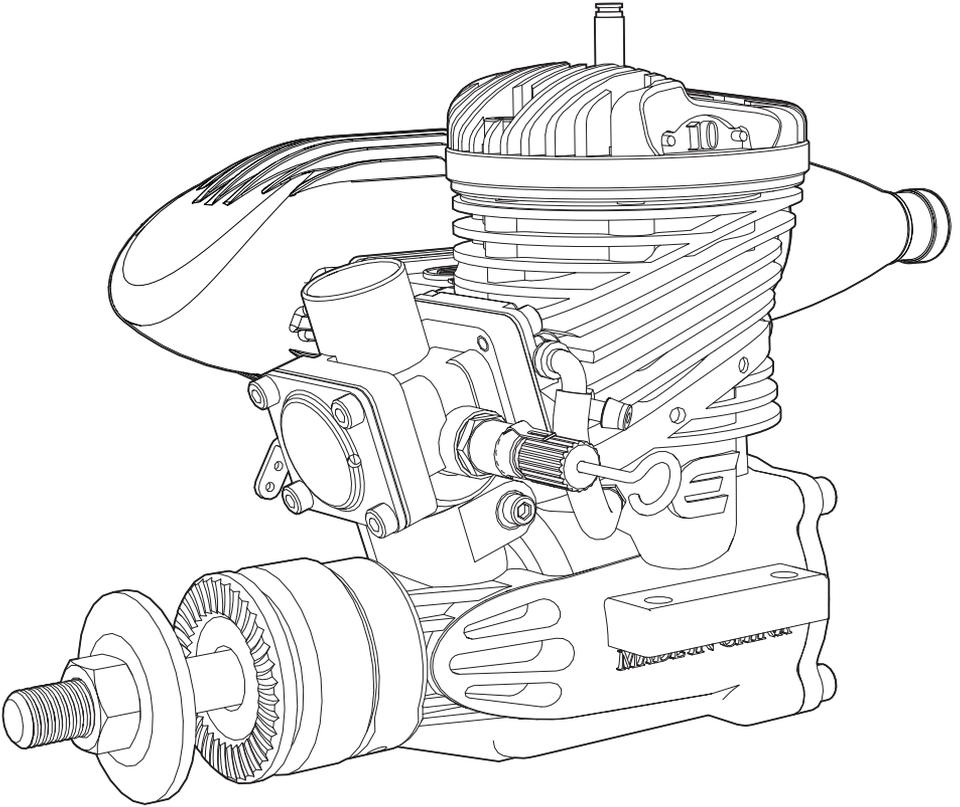




GAS/PETROL

10GX2

Evolution® Gas Engines



NOTICE

All instructions, warranties and other collateral documents are subject to change at the sole discretion of Horizon Hobby, LLC. For up-to-date product literature, visit horizonhobby.com and click on the support tab for this product.

MEANING OF SPECIAL LANGUAGE

The following terms are used throughout the product literature to indicate various levels of potential harm when operating this product:

NOTICE: Procedures, which if not properly followed, create a possibility of physical property damage AND a little or no possibility of injury.

CAUTION: Procedures, which if not properly followed, create the probability of physical property damage AND a possibility of serious injury.

WARNING: Procedures, which if not properly followed, create the probability of property damage, collateral damage, serious injury or death OR create a high probability of superficial injury.



WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating. Failure to operate the product correctly can result in damage to the product, personal property and cause serious injury.

This is a sophisticated hobby product and NOT a toy. It must be operated with caution and common sense and requires some basic mechanical ability. Failure to operate this Product in a safe and responsible manner could result in injury or damage to the product or other property. This product is not intended for use by children without direct adult supervision. Do not use with incompatible components or alter this product in any way outside of the instructions provided by Horizon Hobby, LLC. This manual contains instructions for safety, operation and maintenance. It is essential to read and follow all the instructions and warnings in the manual, prior to assembly, setup or use, in order to operate correctly and avoid damage or serious injury.



CAUTION: This product can become extremely hot when in use, which could lead to burns.

Age Recommendation: Not for children under 14 years. This is not a toy.

Safety Warnings

Model engines produce a substantial amount of power, which can create unsafe situations if not used correctly. Always use common sense and observe all safety precautions when operating, handling or performing any procedure involving your engine. Failure to follow safety precautions could result in serious injury and property damage.

- Always ensure spectators, especially children, are at least 30 feet away when running the engine.
- Always ensure that the propeller is securely attached to the engine shaft and all retaining fasteners are tightened properly before EACH flight. Use of blue threadlock to tighten nuts is advisable.
- Always keep small parts out of the reach of children as they can be choking hazards.
- Always secure the airplane before powering the engine.
- Always keep your face and body away from the path of the propeller blades when starting or running your engine.
- Always wear safety glasses or goggles when starting and running your engine.
- Always keep your fuel in a safe place away from sparks, heat or anything that can ignite.
- Always ensure the aircraft is secure and will not move once the engine is started.
- Always rebind your transmitter to your receiver(s) after setup and before first flight.
- Always ensure the throttle failsafe is set to low throttle in your transmitter.
- Always perform a range check prior to flight.

- Always use the throttle linkage to close the carburetor fully or turn off the ignition power switch to stop the engine.
- Never use hands, fingers, or any other body part to stop the propeller.
- Never throw any object into a propeller to stop it.
- Never run the engine in the vicinity of loose small objects, such as gravel or sand, to avoid the propeller uncontrollably throwing such materials.
- Never wear loose clothing or a loose neckstrap when operating your model engine as these items could become entangled in the propeller.
- Never have loose objects such as screwdrivers, pencils, etc. in your pockets when operating your model engine. These could fall into the propeller.
- Never allow fuel to come into contact with eyes or mouth. Gasoline and other fuels used in model engines are poisonous.
- Always ensure gasoline and fuel are stored in a clearly marked container away from the reach of children.

Precautionary Guidelines

- Always mount the engine securely on a bench mount or high-quality engine mount.
- Always use the correct size and pitch of propeller for your engine. Refer to the Propeller Chart in this manual.
- Always confirm proper balance of your propeller prior to installation of the engine. Failure to do so could result in damage to the engine and/or airframe.
- Always utilize an electric starter to start your engine.
- Always discard any propeller that is nicked, scratched, cracked or damaged in any way.
- Always run your model engine in a well-ventilated area. Model engines can produce possibly harmful carbon monoxide fumes.
- Always store fuel in a cool, dry location. Do not allow fuel containers to come in direct contact with concrete, as the fuel may absorb moisture.
- Always responsibly discard fuel if there is condensation and/or water inside the fuel container.
- Never return unused fuel from the fuel tank back into the fuel container.
- Never attempt to repair or modify a propeller beyond its intended use.
- Never handle model engines, mufflers and/or tuned pipes until they have had time to cool. They can become extremely hot when in use.

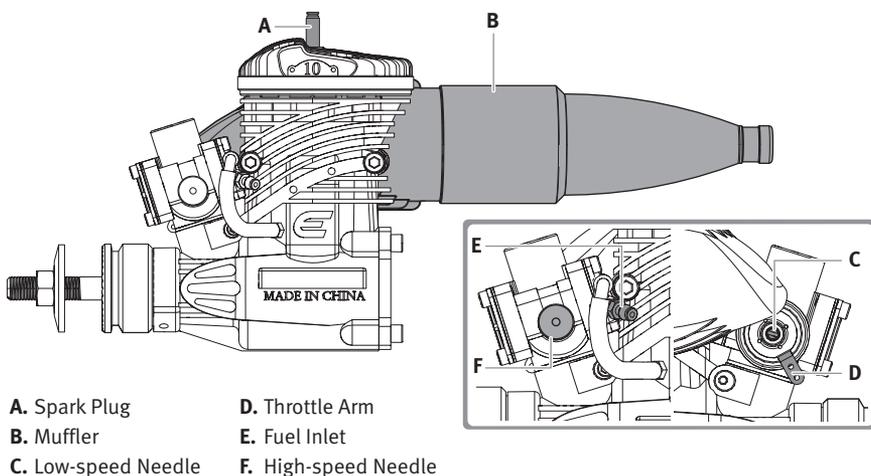
Included Content

Engine

EVOA113	Evolution® RPM Telemetry Adapter
EVOA121	Sintered Plastic Filter Clunk
EVOG10300	Ignition Unit
EVOG10350	Spark Plug
EVOG10601B	Muffler
EVO100E46A	Muffler Screws & Gasket

Optional Items

APC10060 (APC12060)	10 x 6 propeller (break-in) (12 x 6 propeller (normal flight))
EVOA100	Optical Electronic Ignition Kill Switch
EVOA102 (EVOA103)	Medium Gas-FKM Fuel Tubing 1 meter (3 meters)
EVOA108	Evolution Locking Fuel Can Cap
EVOA112	Evolution 3 Wire Ignition/Receiver Switch
HAN155	Ultra Fuel Pump
HAN156	Tachometer

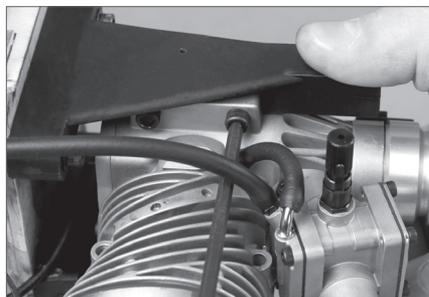


Installing the Engine

1. Secure the engine mount on the airplane firewall. Tighten the engine mount screws in the firewall.
2. Install the engine on the engine mount according to the airplane manufacturer's instructions.



WARNING: Tighten all engine mounting screws before each flight. If you do not tighten the engine mounting screws, the screws may vibrate loose and cause the engine to separate from the fuselage.



Installing the Muffler



⚠ The muffer mounting accessory package includes mounting screws (2), lock washers (2), muffer gaskets (2) and L-wrenches (2).



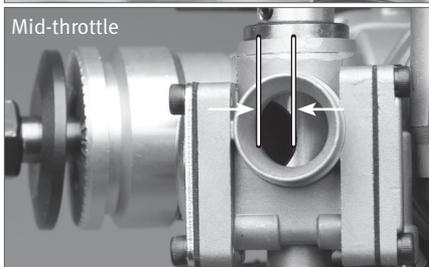
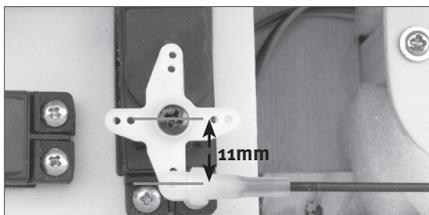
1. Put a lock washer on each of the muffer screws. Push the muffer screws through the cylinder head.
2. Place the muffer gasket over the engine mounting screws.
3. Align the muffer with the exhaust opening and the muffer mounting screws.
4. Tighten the muffer screws.

IMPORTANT: Tighten the muffer screws after the first few tanks of fuel. The muffer screws may loosen from heat and vibration.

Connecting the Throttle Linkage



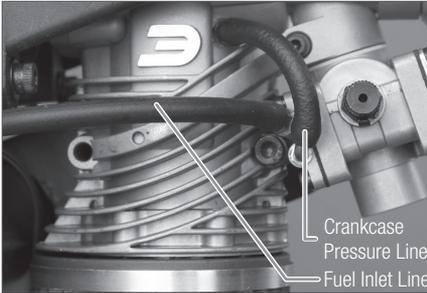
1. Use a secure method to attach the throttle linkage to the throttle arm on the carburetor.
2. Power on the transmitter and receiver.
3. Move the throttle stick to the middle stick position.
4. Adjust the throttle arm so the arm is 90 degrees to the throttle pushrod.
5. Center the throttle servo. Install a servo arm with a hole 11mm (7/16 in) from the center of the arm.
6. Use a clevis to attach the throttle linkage to the servo arm.



Adjusting the Throttle Opening

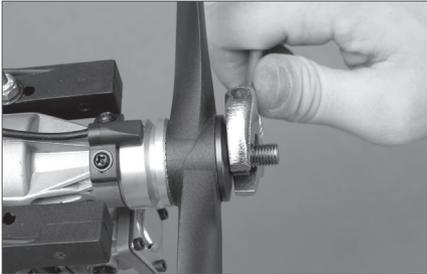
1. Lower the throttle and center the throttle trim.
2. Adjust the length of the throttle linkage until the throttle is open 1mm.
3. Move the throttle stick up to confirm the throttle opens. If the throttle does not open, reverse the throttle channel in your transmitter.
4. Move the throttle stick and throttle trim down to confirm the throttle closes.
5. If you reversed the throttle channel in your transmitter and you are using a 2.4GHz radio system, you must re-bind your radio system to set the correct failsafe position.

Attaching the Fuel Lines



1. Connect medium diameter tubing to the carburetor and the fuel tank supply line.
2. Connect medium diameter fuel tubing to the vent line in the fuel tank. Route the other end of this line to the outside of the fuselage.
3. If using a three-line tank, connect medium diameter fuel tubing to the third line and route this line to a convenient location for fueling/de-fueling your model. We recommend using a fuel filler like the one included in the Hangar 9® Fuel Filler with "T" Fitting and Overflow Fitting (HAN116), which also includes a vent line connector. We also recommend using medium diameter FKM fuel tubing for all plumbing in your fuel setup.

Attaching the Propeller and Spinner



1. Remove the prop nut and prop washer from the crankshaft.
2. Install the spinner backplate, followed by the propeller, prop washer and prop nut.
3. Cover the propeller with a cloth and use an adjustable wrench to tighten the prop nut.
4. Install the spinner cone. Make sure the spinner cone is not touching the propeller. Trim the propeller opening if necessary.
5. Tighten the spinner screw(s) to secure the spinner cone.

Recommended Propellers

10 x 6–13 x 8

- ◆ 12 x 6 has tested to be the best sport propeller for all-around performance, although the performance is very good throughout the recommended range.

Connecting the Electronic Ignition

The Evolution Electronic Ignition Assembly is designed and engineered specifically for the small block engine series. It is smaller and lighter so it fits into tighter spaces of the airplanes the engines are designed to power. The battery voltage required is between 4.8V (4-cell Ni-MH pack) and 8.4V (2S Li-Po battery) and no voltage regulators are needed with any of these batteries. We recommend a 2S Li-Fe or Li-Po battery with a capacity of at least 800mAh. The maximum current draw at full throttle is 450mA, and our more typical average has been between 250–300mA.

The assembly consists of:

- Ignition module with battery connector, ignition sensor connector, tachometer readout connector and spark plug connector
- Ignition sensor (already attached to your engine)
- Sensor magnet (already installed in the prop drive hub of your engine)

Mounting Your Electronic Ignition

- You can mount the unit in any orientation and place that is convenient for your installation. The module is sized to fit into the fuel tank compartment of most glow powered airplanes alongside or underneath the recommended fuel tanks. You can also mount it to the firewall or under the engine firewall extension if your airplane is so equipped. Keep in mind that it should be mounted away from the heat of the muffler.
- Secure the ignition module to your chosen location with foam padding to provide vibration isolation. We typically mount it with tie wraps after wrapping the ignition in lightweight 1/4-inch foam rubber.
- You may need to route both the spark plug connector wire and the ignition sensor wire through the firewall, so be sure to plan ahead and provide adequately sized holes that will allow you to pull either the ignition sensor connector or the spark plug cap connector through the holes for later ignition removal.
- Mount a good quality radio receiver type switch between the ignition unit and the battery. We recommend the Evolution 3-Wire Ignition/Receiver Switch (EVOA112). Mount this switch in a convenient place on the outer fuselage close to the front of the airplane to make it easy to turn the ignition on and off. Being able to easily shut off the ignition is an important safety consideration.
- For added security and controllability, add an additional radio-operated kill switch (such as the Optical Ignition Kill Switch EVOA100) between the ignition battery connector lead and the ON/OFF switch.
- Connect the ignition sensor wire to the ignition module. The sensor wire will only fit into one of the connectors so you cannot connect it wrong.
- Connect the ON/OFF switch to the battery connector lead of the ignition module. This connector is the red connector.
- If desired, you can connect either the separately available tachometer readout or the included Evolution®/Spektrum™ Telemetry Adapter Cable (EVOA113) to the tachometer readout connector. Plug the other end of the adapter cable into a Spektrum telemetry module's RPM input port.
- Connect the spark plug connector to the spark plug. This adapter has a push on and rotate clockwise 1/6 turn locking mechanism to ensure a solid connection. If the spark plug is not secured as described above, you will likely experience radio interference. Always perform a radio range check with the engine running to ensure the ignition is not causing interference with your radio.
- Make sure you charge your ignition battery before operating the engine.

Fuel

This engine requires a mix of 20:1 gas to oil lubricant ratio for break-in and normal operation.

The needle bearing at the bottom end of the conrod depends upon this lubricant ratio to operate properly.

Do not use leaner than a 20:1 gas/oil ratio or the warranty on your engine will be voided.

To properly mix the fuel, add 6.75 oz of high quality 2-stroke oil to one gallon (or 53 mL of oil to one liter) of 87–93 octane fuel.

Fuel Delivery System

It is very important to properly construct your fuel supply system to the engine to avoid operating problems. Our experience has shown that many seemingly engine-related operating problems are in fact fuel delivery problems, not engine-related problems.

Fuel Filtering - Because of the incredibly small amount of fuel that is being used by this engine, filtration of the fuel is mandatory in two different spots in the system:

1. Between the fuel jug and the tank.
2. Within the fuel tank itself (with a sintered plastic filter clunk EVOA121).

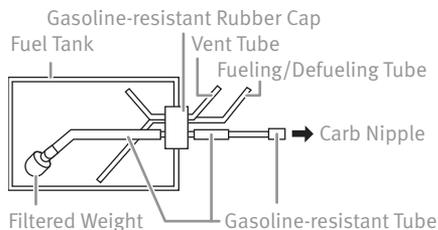
◆ One of these filter clunks is included with your engine.

Tank Location - Because there is a crankcase pressure-driven pump on the carburetor, tank location is less critical than with a muffler pressure-driven system; however, it is still good practice to mount the fuel tank in line with the carburetor, and as close to the rear of the engine as possible.

◆ Care taken in mounting the tank as described will provide trouble free operations in all flight attitudes.

Tank Capacity– Choose a tank between 6–10 oz (180–300 mL). These tanks will yield 18 minutes (for the smaller tank) to 30 minutes (for the larger tank) of full throttle flying time.

- Ensure you use a tank stopper made for use with gasoline and/or smoke oil.
- We suggest a three-line tank system; one for the line to the carburetor with the clunk attached internally, one for the vent line to the atmosphere, and one dedicated to fueling/defueling the tank.



- Ensure you use the included sintered plastic filter clunk inside the fuel tank.
- Ensure there is a good seal system for the dedicated fueling/defueling line. We recommend the HAN116 Fuel Filler Assembly.

Engine Break-in

Your new engine needs to be broken in to ensure long life of all components. The piston and liner construction is ABC (Aluminum piston, Brass Chromed liner), which requires a specific break-in procedure that cannot be fully accomplished with bench runs. Because the ABC piston and liner rely on the close fit of the piston to the liner to provide the compression seal, the engines are built with a taper to the liner. For the piston to fully seat with the liner, the engine requires repeated heating and cooling cycles, and must be done at a needle setting that is only slightly rich of peak.

Breaking in an ABC piston and liner by running it rich does not provide the necessary thermal growth to accomplish the needed piston and liner fitting. Using a rich needle setting does not allow for proper expansion of the liner, resulting in the connecting rod receiving a larger force when it moves past Top Dead Center (TDC). Allowing the engine to heat will expand the liner and reduce the load on the connecting rod, ensuring a proper engine break-in. Doing the break-in with a light load on the engine (e.g. a smaller than normal propeller) makes this task much easier. Please follow the steps below to ensure a successful experience.

Important considerations during break-in

- Perform the break-in process with the engine mounted on your airplane. There is no need to bench run the engine prior to mounting it on your airplane.
- Use the suggested break-in prop to begin your break-in process. This provides a light load and high RPM that, when matched with the heat of the engine, will break in the engine properly.
- Use the recommended fuel with a 20:1 gas to oil ratio.

The proper break-in flight procedure is to fly the airplane at full throttle through a series of figure eight maneuvers (i.e. Cuban Eight). These maneuvers in particular benefit the engine because, when climbing, the additional load on the engine will increase the temperature and, when diving, the lighter load and higher RPM will decrease the temperature, thus providing the heating/cooling cycles required for the break-in process.

Break-in Process

- **First tank of fuel:** Set the high-speed needle valve at 2.5 turns out and use the suggested break-in prop. Run the engine on the ground for its first tank of fuel and DO NOT go above half throttle. Cycle the throttle between idle and half throttle every minute.
- **Second tank of fuel:** Tune the needle valve to be slightly rich of the peak RPM at full throttle without a drop in RPM. Do not run at full throttle on the ground for more than 30 seconds at a time. Tune the low speed needle valve for a smooth transition from idle to mid-range, go back to full throttle to confirm the main needle valve setting and then fly. During this flight, be sure to be conscientious of extended periods of heating the engine. Be sure to mix-in some cool-down dives and lower-throttle flying.
- **Third tank of fuel:** Fly the engine at high throttle while performing the recommended figure eight maneuvers. This will help the piston ring and cylinder liner to expand and contract; helping the breaking-in process. Tune the needle valve to be slightly rich of the peak RPM as necessary.
- **Fourth tank of fuel:** Select one of the recommended propellers for normal operation and mount it on your engine. Tune the main needle valve to be slightly rich of the peak RPM and the low speed needle valve for a smooth transition from idle to full throttle and continue to break-in the engine in flight.

Do not worry about an engine setting being slightly rich during this process. When set correctly, the engine will occasionally sound as if it is misfiring (which it is). During the climbing maneuvers this should go away and might return during the diving maneuvers. If it does not go away during the climbs, land the airplane and lean the high-speed needle by 1–2 clicks, then take off and fly again. Enjoy the break-in process—you are doing a lot of flying.

Telemetry

Telemetry is a huge asset to help you tune your engine. The ignition module is even capable of communicating with Spektrum™ telemetry systems directly so you won't have to add an additional RPM sensor. You will need to connect the Evolution Ignition Telemetry Adapter (EVOA113) between the RPM port on the ignition unit and the RPM port on your Spektrum telemetry module in order to utilize this feature. Telemetry systems other than Spektrum may require a dedicated RPM sensor. We recommend using the Spektrum DSMX® Full Range Aircraft Telemetry Module (SPM9548) in conjunction with the included adapter. This system allows you to see real-time RPM and temperature readings from the engine.

The temperature sensor should be wrapped around the base of the spark plug on the cylinder head. Using telemetry gives you an accurate representation of actual temperature and RPM figures during use, and warnings can be set to go off if your engine is getting too hot. The temperature range can be 230–300°F on average. Set your maximum temperature warning to go off if the engine exceeds 325°F. If your engine is continually near this peak temperature or higher, immediately decrease throttle to bring the temperature down. If this continues to occur, land the airplane and add additional baffling to your cowl. It is not good for the engine to run at temperatures this high and could cause damage if not attended to.

Starting and Operating the 10GX2 Engine

For baseline needle settings, please see Engine Specifications section. With the 10GX2 it is very important to allow the cylinder head temperature to stabilize above 170°F (77°C) before making any adjustments; adjusting prior to the engine warming up will lead you to inaccurate settings. As the engine warms up, you will notice the RPM naturally rising.

If you do not have a temp gun or have sensors installed on your engine, allow the engine to run at half throttle for at least 45 seconds before attempting to set the high-speed needle. If you have accurately set the low-speed needle as described you should not need to adjust it.

Priming

1. Make sure your ignition is off.
2. Open the throttle fully, hold a finger over the carburetor intake and flip the propeller 6 times.
3. Remove your finger from the carburetor and flip the engine another 6 times.
4. Close the carburetor completely with your throttle stick and then open it two detents from closed. This will allow the engine to start at a high throttle setting.

Because each fuel system and installation is slightly different, you may find the need to modify the above procedure for your individual setup. The above procedure should work for most installations.

Starting and Running the Engine

Until the engine is broken in, use an electric starter to start the engine. Once it is fully broken in it can be started by hand, but it is easier and safer to start the engine with an electric starter.

1. Turn on the ignition.
2. Rotate the propeller in a backwards direction against compression.
3. Push the starter firmly against the nose cone and engage. The engine should start relatively quickly, within 1–2 seconds. Once the engine starts, disengage the starter.
4. Let the engine run at mid-throttle for 45 seconds to stabilize the temperatures.
 - a. If the engine doesn't start quickly, disengage the starter. Continuously running the starter can flood the engine.
 - b. Check to make sure that fuel is moving through the carburetor system.
 - c. If the engine appears not to have any fuel, repeat the priming procedure above.
 - d. Repeat 1–4 of Starting and Running the Engine.

High-Speed Needle Adjustment

Needle adjustments need to be made in small increments. It may take 5 seconds or more before you will notice a change in your engine after making adjustments. Be patient. Use a tachometer, this is a very important part of properly setting your high-speed needle valve.

The procedure below is for setting the needles prior to flight. The final adjustments need to be made after noting the performance in the air.

1. With the engine started and warmed up, open the throttle fully and note the RPM. Listen to the engine.
 - a. If the engine occasionally mis-fires but maintains a fairly constant RPM after 5 seconds, your engine is rich. Reduce the throttle to idle and turn in (clockwise) the high-speed needle 2 clicks. Repeat this until the engine stops mis-firing.
 - b. If the engine does not mis-fire and the RPM steadily decreases from the highest RPM achieved when you opened the throttle, it is lean. Reduce the throttle to idle and open (counterclockwise) the high-speed needle 2 clicks. Repeat this until the engine maintains the RPM achieved when the throttle is wide open. Your goal here is to achieve a good transition between high and low speed, and that the high-speed RPM will be steady on the ground.
2. Fly your aircraft for the in-air testing.
 - a. During flight, if the engine seems to slow down or sag when climbing, your engine is running slightly lean. Land the airplane and open the high-speed needle valve 2 clicks and take-off again.
 - b. During flight, if you hear the engine mis-firing occasionally in level flight, this is an indication it is running too rich. Land the airplane and close the high-speed needle valve 2 clicks and take-off again.
 - c. Repeat the above process until your engine performance is steady and repeatable. This high-speed needle setting should not change more than $\pm 1-2$ clicks in the future when using the same propeller. If it does, something is wrong in the fuel delivery system and should be investigated.

If you are using onboard telemetry and have a temperature monitor on the head of your engine, your readings should be between 200°F (93°C) and 300°F (149°C). If you see consistent temperatures above 325°F (163°C) you should land your airplane and add baffling to your cowl in order to increase cooling to the engine. See the Telemetry section for information on the proper positioning of your sensor.

Low-Speed Needle Adjustment

If you have properly set the idle needle, the low-speed setting should be within 1/16th of a turn from perfect. Remember we are talking about minute amounts of fuel going through the carburetor, any adjustments you now make to the idle needle should be very small.

Take into consideration the length in service (e.g. break-in time) and the size of propeller you are using. In the beginning, use a smaller propeller early in the break-in process. You will not be able to achieve an idle much below 2000 RPM. The larger the propeller, the lower your idle RPM will be, and the more broken in your engine is will allow a lower idle RPM (14 x 6 should be about 1800–2000 RPM).

Your engine will idle at low-speed needle settings from far too rich to far too lean without any damage, so the quality of the idle is not a good indicator of the proper low-speed needle settings. The transition from idle to full throttle will be used to determine the position of the low-speed needle.

1. With the engine started and warmed up, open the throttle fully, then reduce to idle and note the RPM. Listen to the engine.
2. Let the engine idle for ten seconds and then rapidly advance the throttle to full open. One of three things will occur:
 - a. The engine responds instantaneously. Your low speed needle is set perfectly. Now use your throttle trim to achieve the lowest reliable idle.
 - b. The engine slowly accelerates to full throttle. This indicates the low speed needle is set too rich and that fuel is building up in the crankcase. Shut the engine off and lean (clockwise turn) the low speed idle screw by an amount equal to the thickness of the screwdriver blade you are using to make the adjustment.
 - ◆ Restart the engine and repeat steps 1 and 2.
 - c. The engine stutters or stops on its way to full throttle. This indicates the low speed needle is set too lean. With the engine off, richen (counterclockwise turn) the low speed idle screw by an amount equal to the thickness of the screwdriver blade you are using to make the adjustment.
 - ◆ Restart the engine and repeat steps 1 and 2.
3. Once you have achieved the instantaneous throttle transition, your low-speed needle is set perfectly. Now go back and recheck your high-speed needle valve setting. There is some interaction between the two needles so you might need to do this process (HS and LS needle setting) a couple of times. Patience here will reward you with an easy to use engine. Don't try to do this too quickly.

It is possible that with a heavier-loaded propeller that you may need to richen the needle in order to attain a smooth, instantaneous response again, but using the above procedure should lead you to the proper setting every time.

Troubleshooting Guide

If the Engine Does Not Start

- Check and use a new spark plug if needed.
- Check fuel lines.
- Check for proper mechanical function by turning the engine over.
- Check that the carburetor is correctly installed.
- Reset the needle valves to the factory settings. High-speed 2.25 turns out, Low-speed 4.25 turns out when the throttle barrel is 1.5mm open.

Mechanical Faults

If the engine cannot be turned over easily

- The most likely cause is the engine is flooded and by turning the engine over you are trying to compress the fuel, not air.
 1. Remove the spark plug.
 2. Cover the cylinder head with a cloth or paper towel and turn the propeller over to expel all the excess fuel.
 3. Replace the spark plug and try starting again.

- A possible cause is the piston is seized in the cylinder: loosen and unscrew the cylinder head bolts.
 1. Carefully remove the cylinder liner.
 2. Visually examine the piston and cylinder to find the possible cause of the engine's mechanical problem.

Mechanical repairs must ALWAYS be completed by an authorized Horizon Hobby service center.

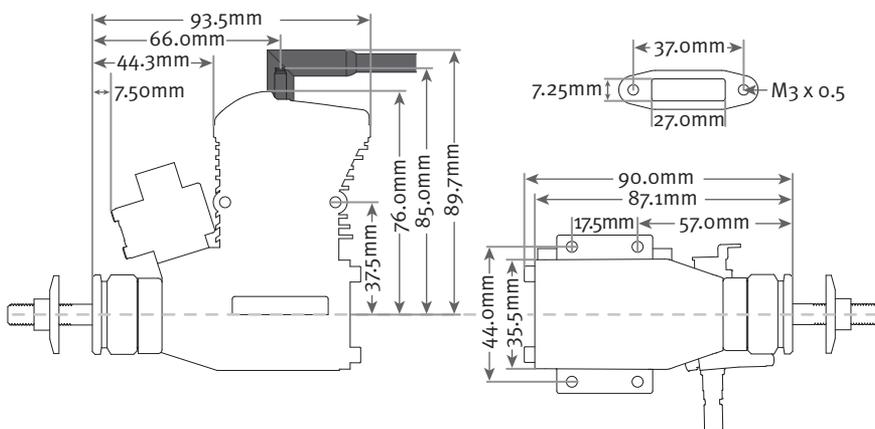
Maintenance

After each flying session, fully drain the fuel from the tank.

1. Start the engine and run it until the fuel is completely run out of the engine.
2. Try starting the engine three more times or until it will no longer fire. This gets all the fuel out of the engine.

If you need additional help or have any questions, please call Horizon's Support Team. Horizon has trained technicians who are qualified to answer your engine questions.

10GX2 Specifications



Disp	9.73cc	Weight	
Bore	24.0mm	Engine Only	15.6 oz (442 g)
Stroke	21.5mm	Muffler	3.60 oz (102 g)
Cylinder	Single	Ignition	3.40 oz (96 g)
Propeller	12 x 6 @ 11,100 RPM	Total	22.6 oz (640 g)
Base Needle Settings	High: 2.25 Low: 4.25		

2-YEAR LIMITED WARRANTY

What this Warranty Covers - Horizon Hobby, LLC (Horizon) warrants to the original purchaser that the product purchased (the "Product") will be free from defects in materials and workmanship for a period of 2 years from the date of purchase.

What is Not Covered - This warranty is not transferable and does not cover (i) cosmetic damage, (ii) damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or due to improper use, installation, operation or maintenance, (iii) modification of or to any part of the Product, (iv) attempted service by anyone other than a Horizon Hobby authorized service center, (v) Product not purchased from an authorized Horizon dealer, (vi) Product not compliant with applicable technical regulations, or (vii) use that violates any applicable laws, rules, or regulations. OTHER THAN THE EXPRESS WARRANTY ABOVE, HORIZON MAKES NO OTHER WARRANTY OR REPRESENTATION, AND HEREBY DISCLAIMS ANY AND ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. THE PURCHASER ACKNOWLEDGES THAT THEY ALONE HAVE DETERMINED THAT THE PRODUCT WILL SUITABLY MEET THE REQUIREMENTS OF THE PURCHASER'S INTENDED USE.

Purchaser's Remedy - Horizon's sole obligation and purchaser's sole and exclusive remedy shall be that Horizon will, at its option, either (i) service, or (ii) replace, any Product determined by Horizon to be defective. Horizon reserves the right to inspect any and all Product(s) involved in a warranty claim. Service or replacement decisions are at the sole discretion of Horizon. Proof of purchase is required for all warranty claims. SERVICE OR REPLACEMENT AS PROVIDED UNDER THIS WARRANTY IS THE PURCHASER'S SOLE AND EXCLUSIVE REMEDY.

Limitation of Liability - HORIZON SHALL NOT BE LIABLE FOR SPECIAL, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, LOSS OF PROFITS OR PRODUCTION OR COMMERCIAL LOSS IN ANY WAY, REGARDLESS OF WHETHER SUCH CLAIM IS BASED IN CONTRACT, WARRANTY, TORT, NEGLIGENCE, STRICT LIABILITY OR ANY OTHER THEORY OF LIABILITY, EVEN IF HORIZON HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. Further, in no event shall the liability of Horizon exceed the individual price of the Product on which liability is asserted. As Horizon has no control over use, setup, final assembly, modification or misuse, no liability shall be assumed nor accepted for any resulting damage or injury. By the act of use, setup or assembly, the user accepts all resulting liability. If you as the purchaser or user are not prepared

to accept the liability associated with the use of the Product, purchaser is advised to return the Product immediately in new and unused condition to the place of purchase.

Law - These terms are governed by Illinois law (without regard to conflict of law principals). This warranty gives you specific legal rights, and you may also have other rights which vary from state to state. Horizon reserves the right to change or modify this warranty at any time without notice.

WARRANTY SERVICES

Questions, Assistance, and Services - Your local hobby store and/or place of purchase cannot provide warranty support or service. Once assembly, setup or use of the Product has been started, you must contact your local distributor or Horizon directly. This will enable Horizon to better answer your questions and service you in the event that you may need any assistance. For questions or assistance, please visit our website at www.horizonhobby.com, submit a Product Support Inquiry, or call the toll free telephone number referenced in the Warranty and Service Contact Information section to speak with a Product Support representative.

Inspection or Services - If this Product needs to be inspected or serviced and is compliant in the country you live and use the Product in, please use the Horizon Online Service Request submission process found on our website or call Horizon to obtain a Return Merchandise Authorization (RMA) number. Pack the Product securely using a shipping carton. Please note that original boxes may be included, but are not designed to withstand the rigors of shipping without additional protection. Ship via a carrier that provides tracking and insurance for lost or damaged parcels, as Horizon is not responsible for merchandise until it arrives and is accepted at our facility. An Online Service Request is available at http://www.horizonhobby.com/content/_service-center_render-service-center. If you do not have internet access, please contact Horizon Product Support to obtain a RMA number along with instructions for submitting your product for service. When calling Horizon, you will be asked to provide your complete name, street address, email address and phone number where you can be reached during business hours. When sending product into Horizon, please include your RMA number, a list of the included items, and a brief summary of the problem. A copy of your original sales receipt must be included for warranty consideration. Be sure your name, address, and RMA number are clearly written on the outside of the shipping carton.

NOTICE: Do not ship LiPo batteries to Horizon. If you have any issue with a LiPo battery, please contact the appropriate Horizon Product Support office.

Warranty Requirements - For Warranty consideration, you must include your original sales receipt verifying the proof-of-purchase date. Provided warranty conditions have been met, your Product will be serviced or replaced free of charge. Service or replacement decisions are at the sole discretion of Horizon.

Non-Warranty Service - Should your service not be covered by warranty, service will be completed and payment will be required without notification or estimate of the expense unless the expense exceeds 50% of the retail purchase cost. By submitting the item for service you are agreeing to payment of the service without notification. Service estimates are available upon request. You must include this request with your item submitted for

service. Non-warranty service estimates will be billed a minimum of 1/2 hour of labor. In addition you will be billed for return freight. Horizon accepts money orders and cashier's checks, as well as Visa, MasterCard, American Express, and Discover cards. By submitting any item to Horizon for service, you are agreeing to Horizon's Terms and Conditions found on our website http://www.horizonhobby.com/content/_service-center_render-service-center.

ATTENTION: Horizon service is limited to Product compliant in the country of use and ownership. If received, a non-compliant Product will not be serviced. Further, the sender will be responsible for arranging return shipment of the un-serviced Product, through a carrier of the sender's choice and at the sender's expense. Horizon will hold non-compliant Product for a period of 60 days from notification, after which it will be discarded.

Warranty and Service Contact Information

Country of Purchase	Horizon Hobby	Contact Information	Address
United States of America	Horizon Service Center (Repairs and Repair Requests)	servicecenter.horizonhobby.com/RequestForm/	4105 Fieldstone Rd Champaign, Illinois, 61822 USA
	Horizon Product Support (Product Technical Assistance)	www.quickbase.com/db/bghj7ey8c?a=GenNewRecord 888-959-2305	
	Sales	sales@horizonhobby.com 888-959-2305	
United Kingdom	Service/Parts/ Sales: Horizon Hobby Limited	sales@horizonhobby.co.uk +44 (0) 1279 641 097	Units 1-4, Ployters Rd Staple Tye, Harlow, Essex, CM18 7NS, United Kingdom
Germany	Horizon Technischer Service	service@horizonhobby.de	Christian-Junge-Straße 1 25337 Elmshorn, Germany
	Sales: Horizon Hobby GmbH	+49 (0) 4121 2655 100	
France	Service/Parts/ Sales: Horizon Hobby SAS	infofrance@horizonhobby.com +33 (0) 1 60 18 34 90	11 Rue Georges Charpak 77127 Lieusaint, France
China	Service/Parts/ Sales: Horizon Hobby – China	info@horizonhobby.com.cn +86 (021) 5180 9868	Room 506, No. 97 Changshou Rd. Shanghai, China 200060

Compliance Information for the European Union

 10GX2 Gas Engine (EVOE10GX2)

EU Compliance Statement: Horizon Hobby, LLC hereby declares that this product is in compliance with the essential requirements and other relevant provisions of the R&TTE and EMC Directive.

A copy of the EU Declaration of Conformity is available online at: <http://www.horizonhobby.com/content/support-render-compliance>.



Instructions for disposal of WEEE by users in the European Union

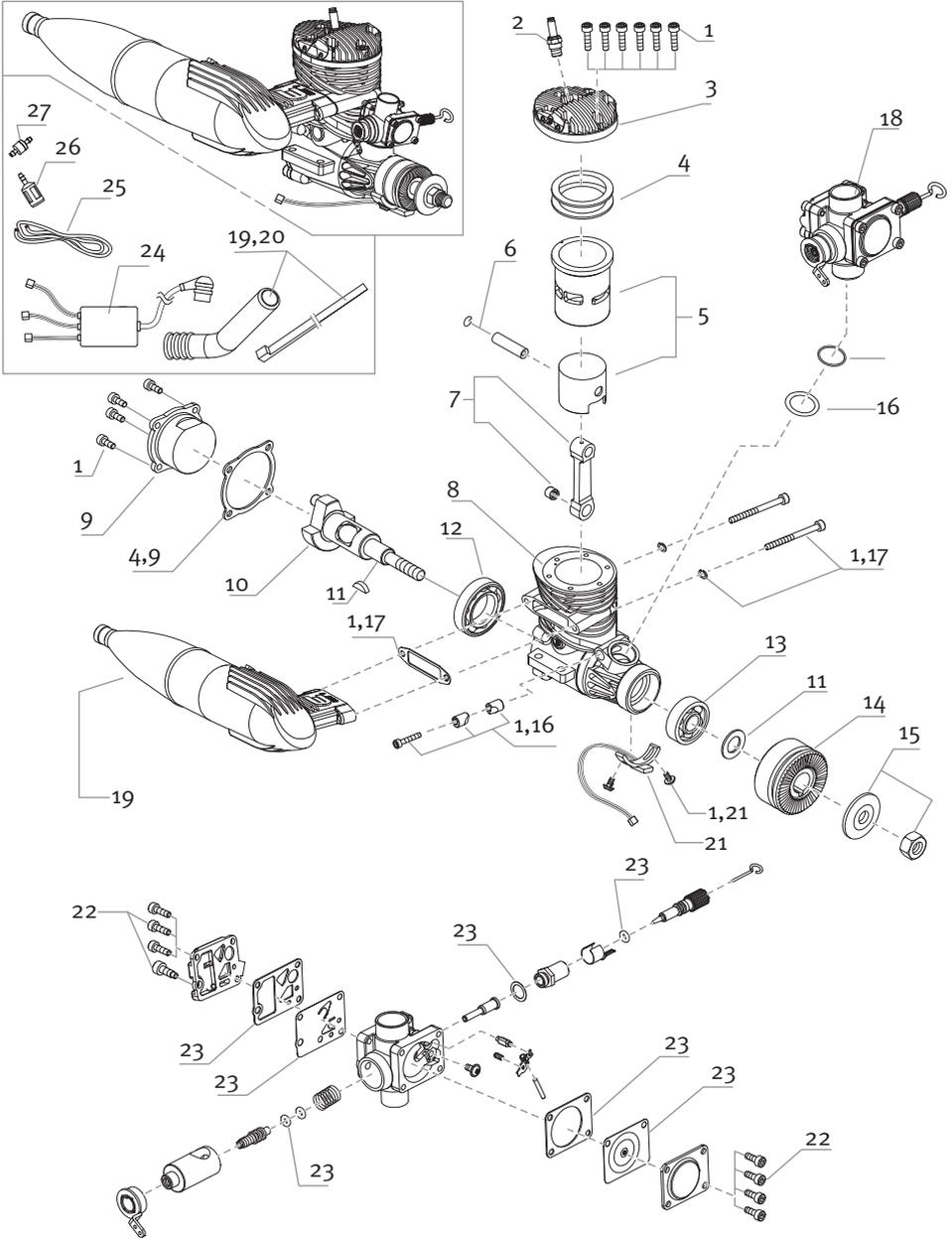
This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment. For more information about where you can drop off your waste equipment for recycling, please contact your local city office, your household waste disposal service or where you purchased the product.



Elenco ricambi

#	Part	Description	Beschreibung	Description	Descrizione
1	EVOG10100	Crankcase Screw Set	Kurbelgehäuse Schraubenset	Vis de carter	Set viti carter
2	EVOG10350	Spark Plug (1/4-32)	Zündkerze 1/4- 32	Bougie 1/4-32	Candela (1/4-32)
3	EVOG10103	Cylinder Head	10GX: Zylinderkopf	Culasse	Testa cilindro
4	EVOG10104	Engine Gasket Set	Motordichtungsset	Set de joints du moteur	Set guarnizioni motore
5	EVOG10203	Cylinder Piston Set	Zylinder Kolben Set	Piston	Set cilindro-pistone
6	EVO052213	Wrist Pin with E-clip	Pleuelbuchse mit E-clip	Axe de piston avec clips	Spinotto con clip
7	EVOG10204	Connecting Rod with Bearing	Pleuel mit Lager	Bielle	Biella con cuscinetto
8	EVOG10101B	Crankcase	Kurbelwelle	Carter	Carter
9	EVOG10102	Rear Cover with Gasket	Hinteres Motorgehäuse mit Dichtung	Bouchon de carter arrière avec joint	Tappo posteriore con guarnizione
10	EVOG10210	Crankshaft	Kurbelwelle	Vilebrequin	Albero motore
11	EVO91219	Crankshaft Key and Thrust Washer	Kurbelwelle Scheibenfeder	Clavette de vilebrequin et rondelle bleue	Chiavetta albero motore e rondella reggispinta
12	EVO052110	Rear Crankshaft Bearing	Kurbelwellenlager hinten	Roulement arrière de vilebrequin	Cuscinetto posteriore albero
13	EVO91109	Front Crankshaft Bearing	Kurbelwellenlager vorne	Roulement avant de vilebrequin	Cuscinetto anteriore albero
14	EVOG10219	Propeller Driver	Propellermitnehmer	Plateau d'hélice	Rondella trascinamento elica
15	EVO040228	Propeller Washer and Nut (1/4-28)	Propellerunterlegscheibe und Mutter	Rondelle et boulon d'hélice (1/4 x 28)	Rondella elica e dado (1/4-28)
16	EVOG10129B	Carburetor Retainer and Oring	Vergaserfeder und O-Ring	Clavette de carburateur et joint torique	Fermo carburatore ed Oring
17	EVO100E46A	Muffler Screw Set	Schalldämpferschraubenset	Jeu de vis de montage pour silencieux	Set viti silenziatore
18	EVOG08801B	Carburetor Assembly	Vergaser	Carburateur	Carburatore completo
19	EVOG10601C	Muffler Assembly	Schalldämpfer	Silencieux	Silenziatore completo
20	EVOA104	Exhaust Deflector Kit	Auslass Deflektorkit	Kit de déflecteur	Kit deflettore scarico
21	EVOG10310A	Ignition Sensor Set	Zündsensor Set	Capteur d'allumage	Set sensore accensione
22	EVOG08825B	Carburetor Screw Set	Vergaserschraubenset	Visserie pour carburateur	Set viti carburatore
23	EVOG08109	Carburetor Gasket Set	Vergaserdichtungsset	Set de joints de carburateur	Set guarnizioni carburatore
24	EVOG10300	Ignition Unit	Züleinheit	Module d'allumage	Accensione
25	EVOA102	Med Gas-FKM Fuel Tubing	Evolution Viton Kraftstoffschlauch Medium 1m	Durite essence FKM diamètre médium	Tubetto carburante MED Gas-FKM
26	EVOA121	Sintered Plastic Filter Clunk	Evolution Tankpendel Kunststoff	Filtre plongeur	Pendolino con filtro sinterizzato
27	EVOA105	Inline Fuel Filter	Evolution Inline Kraftstofffilter	Filtre à carburant	Filtro carburante in linea

EXPLODED VIEW/EXPLOSION SZEICHNUNG/VUE ÉCLATÉE/VISTA ESPLOSA





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