

FAQ's (Q & A)

Carburetor Adjustments

Q: How should I adjust my carburetor

A: Brison test runs each engine and sets the carburetor, and timing. **NO adjustments should be necessary.** If adjustments are required make them when the engine is warm and has been cleared out. Let the engine warm up for a full minute before applying throttle. If acceleration hesitates, then shut the engine off and adjust the low mixture screw open about 1/16 turn. Restart and repeat run up. The idle mixture or low needle settings are between 1-1/2 and 2 1/4 out on the 2.0-2.4-2.6-and 3.2 sizes; 5/8 to 7/8 out on the 4.2 and 5.8 size engines. The high speed mixture is set between 5/8 and 1 on all single cylinder engines. Use a tachometer to adjust the high speed mixture for maximum RPM and then open the needle about 1/16 turn for initial flights. Do not force the mixture screws when closing against the seat, be very careful, then open the required amount. The 4.8 and 6.4 Twin engine needle settings are between 7/8 and 1-1/4 for the high and low needles. Too lean a setting of the high needle will cause overheating and DAMAGE to the engine. Too lean a setting of the low needle will cause acceleration to hesitate. The low needle also sets the transition point. The transition point should be kept below 4500 rpms to control vibration.

Kill Switches

Q: What is a "Kill Switch" and why do I need one?

A: A "Kill Switch" is an electronic switch that sits in line between the ignition battery and the ignition module. When the switch is off, it disconnects the battery from the ignition.

The "Kill Switch" is also a safety measure. The location of the kill switch should be on the front of the aircraft, in a very accessible place. Should you have to shut the engine down quickly, turning off the switch will stop the engine from running.

The switch itself can be any toggle or radio manufacturer switch. If a radio manufacturer switch is used, the charging jack can be used to charge the ignition battery.

Oil & Gas

Q: What type of oil should I use in my Brison gas engine, and what should the ratio of gas to oil be?

A: The oil used in our gas engines are of the 2 stroke, air cooled type, generally found at any auto parts, lawn mower, or motorcycle shops. There are many different brands of 2 stroke, air cooled, engine oil on the market. Klotz and Amzoil are generally found in hobby shops and work well. There are 2 types of oil, petroleum based, and synthetic based, or a combination of both. Synthetic oil can be used from the beginning, but some experts prefer petroleum based oil for the initial break in of about one gallon of fuel mix. We slightly favor the latter method.

The ratio of gas to oil depends on the oil type. We recommend a 64:1 ratio for petroleum based oils. (2 ozs. of oil to 1 gallon of gasoline.) Synthetic oils 80:1. (1.6 ozs. per gallon.)

Q: What octane gas should I use, and what about using Aviation Gas (AVGAS)?

A: We prefer to use higher octane rated gasolines between 91 through 93. Higher grade gasoline will have less impurities associated with it, helping the motor run cleaner and prevent pre-ignition. AVGAS is only available to full scale pilots, or people that have a "N" number issued to them. AVGAS contains lead, and has an octane rating of 100. The advantage of AVGAS is that it is odorless. When using AVGAS, the tuning of the carburetor needs to be paid more attention too, due to the increased fuel consumption.

RF Noise

Q: *What is RF Noise and why do I need to be concerned about it?*

A: RF Noise is electrical noise created by the spark of the spark plug in the engine and any metal hitting metal. This electrical noise can and will interfere with our radio system and not allow us to have control of our aircraft. The use of a resistor spark plug diminishes the RF noise, but does not eliminate it.

The installation of the radio and ignition system is critical in order to have maximum control of your aircraft. As a rule of thumb, the closest radio equipment and ignition system equipment should be no less than 12 inches apart. The further the better. This includes the rx and ignition battery packs. Be sure to follow all ignition installation and range checking procedures. Do not fly if there is any doubt about the radio's performance with the engine running at all throttle settings.

Q: *After a range check with the engine running, my range is considerably shorter than with the engine off. What is the minimum range that is acceptable with the engine running?*

Check with the manufacturer of the radio equipment for their specifications. Each radio manufacturer has different specifications. If you feel your range is too short, check the following:

- Make sure your ignition and radio equipment are at least 12 inches apart.
- Check to see if your spark plug is of the resistor type.
- If your throttle cable is metal, change it to a plastic tube, Nyrod type system.
- Check the engine, mount, and muffler system for any loose metal to metal contact.
- If your ignition system has a ground wire, make sure that it is attached to the spark plug base or grounded to the cylinder head.

If you checked the above and still can't seem to get a good range check with the engine running, contact the engine and ignition manufacturer and seek their advice.

Soft Mounts

Q: *I have heard a lot of talk about soft mounts, good and bad. Should I use one for my single cylinder gas motor, and if so, which one?*

A: Soft mounts on gas motors are probably one of the most controversial topics in giant scale. The problem with a single cylinder motor is the amount of harmonic vibration that resonates through the airframe. This is the damaging vibration. The movement of the motor on a soft mount is not the issue. Most people get nervous when they see a soft mount in action, due to the amount of engine movement.

What makes a soft mount work, is how much of this harmonic vibration the mount absorbs and does not pass through to the airframe. This is based on design, and the type of rubber used to make the soft mount. Many people have attempted to make their own soft mounts by just using a

Lord mount and attaching it to a disc behind the motor. This is not an effective soft mount. For many years before twin engines became popular, TOC pilots used the Hyde™ soft mount, designed and patented by Meryle Hyde. Another good soft mount is manufactured by Scale Aviation.

Spark Plugs

Q: What kind of spark plug should I use, and is one brand better than another?

A: Because of our radio equipment and RF noise generated by the ignition system, we need to use a resistor type spark plug. In most cases, the letter "R" in the model number indicates that the plug is a resistor plug. Popular brands include Champion, Bosch, and NGK. There are several different sizes of spark plugs available. The type of boot determines the height of plug that is required. All new Brison engines now come with a short style NGK BPMR7A plug which accepts a common rubber boot and also the popular Bosch metal resistor cap.

Q: Do I need to gap the plugs, and if so what should the gap be set for?

A: In most cases, spark plugs for our small air cooled motors come already gapped to the proper settings. You should always check them prior to use. The plugs should be gapped for .020". To check this, you will need the use of a spark plug gap gauge. These are found at the auto part stores and are generally priced about \$.99 each.

Q: The spark plugs that can be used have different heat ranges. Does it matter what heat range plug is used?

A: You should always use the heat range plug that the engine manufacturer or ignition manufacturer recommends. Depending on your weather conditions, such as high altitude or high humidity, changing the heat range of the plug will have little or no benefit.

Starting

Q: What are the starting procedures for a gas motor?

A:

1. Fill the tank with fresh filtered fuel.
2. Have a friend hold the aircraft or secure the aircraft to a stationary object or other suitable apparatus if help is not available. **Never** fly alone!
3. Close the choke.
4. Turn on the ignition switch.
5. With a chicken stick, **not your fingers**, begin flipping the prop through its compression stroke until the engine fires. It should not continue to run with the choke closed.
6. Open the choke and continue flipping the prop counter clockwise. The engine should start in less than 5 flips. Maintain a fast idle for at least 60 seconds, then accelerate the engine and check for good response. **NEVER START THE ENGINE WITH THE THROTTLE FULLY OPEN. IT WILL BACKFIRE!**

Q: My engine seems to flood easily. What should I do to prevent it from flooding?

A: Some engines require little priming, especially after the first run of the day. In these cases, do not choke the engine prior to starting. Flip the prop with the choke open

Timing

Q: What is timing in regards to a gas engine?

A: Timing is the control of the spark in an ignition engine. Some motors have fixed timing. For ease of starting, a timing of 0 to 4 degrees before top dead center (BTDC) is desirable. For maximum power, timing of 26-30 degrees BTDC is desired. Engines that have a fixed timing are creating a compromise in ease of starting, while trying to maintain a good power setting. Engines that have a fixed timing will not idle as well as an engine with a variable timing.

The engine timing is factory set between 0 and 4 degrees BTDC at the idle position, and 27 degrees BTDC at the high speed position. With mechanical timing advance ignition systems, timing can be adjusted by lengthening (advancing) or shortening (retarding) the timing linkage rod that connects the white round timing wheel to the carburetor. Be careful that this linkage is sound and cannot become detached while running from vibration.

With Auto-Advance ignition systems, the white timing wheel is locked at 27 degrees and can be adjusted by loosening the #6-32 button head cap screw that retains the sensor and/or the #6-32 set screw. Engines timed over 30 degrees can cause rod bearing failure, which can cause damage to the piston and cylinder.

New production Brison engines come with Auto-Advance ignition only, and a new-design fixed timing sensor, not a "ring" or "wheel", that is set to 27 degrees advance at the factory and is non-adjustable.

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