



## **FUEL REQUIREMENTS**

### **TYPE OF FUEL TO USE**

- Use clean, fresh, regular unleaded gasoline for B&S spark ignition internal combustion engines.
- Fresh fuel prevents gum from forming in the fuel system or on essential carburetor parts. Purchase fuel in quantity that can be used within 30 days to assure freshness and volatility tailored to the season.
- Unleaded fuel is required in USA. Engines fitted with exhaust catalytic converter require unleaded gasoline. Leaded gasoline will foul / damage the exhaust catalyst and will void warranty on engine emission control defects. The use of unleaded gasoline results in fewer combustion deposits and longer valve life. In countries other than the USA, leaded gasoline may be used for engines without catalytic converter, and if unleaded gasoline is unavailable.
- Clean fuel, free of dirt & water, is required for optimal engine operation. Inspect portable storage container to make sure gasoline is free of dirt, grass debris, rust particles, and water.

### **OCTANE REQUIREMENT**

- Use minimum of 87 AKI antiknock index (R+M)/2 or minimum of 91 RON research octane number.
- In high altitude regions, above 5000 feet elevation, of the USA the minimum antiknock index available is typically 85 AKI (R+M)/2, which is acceptable to use in B&S engines due to reduced tendency to experience detonation at high altitude. Operation at high altitudes above 5000 feet elevation requires a high altitude carburetor jet kit to compensate for richer air / fuel operation due to less dense air at high altitude.
- To remain emissions compliant, high altitude adjustment is required. Operation without this adjustment will cause decreased performance, increased fuel consumption, and increased emissions. See an Authorized Briggs & Stratton Dealer for high altitude adjustment information.
- Operation of the engine at altitudes below 2,500 feet (762 meters) with the high altitude kit is not recommended. Operation with the high altitude kit at lower altitudes will cause the engine to run lean and could cause severe engine damage due to overheating, misfire (popping), and speed instability (hunting/surging).
- If the customer is going to operate the engine for a short period of time (less than a month or 10 hours) at altitudes below 2,500 feet with the high altitude kit installed it may not be necessary to reinstall the original jets unless poor performance is observed due to lean operation. However, if they are moving to a lower elevation for an extended period it will be necessary to remove the high altitude kit and return to the standard configuration to remain in emissions compliance and improve performance.
- For customers in the 2,500 – 5,000 feet above sea level elevations the engine may be run in either the standard or high altitude configuration based on their experienced performance. If the engine is running rich, black smoke, flooding, or rich misfire may be observed then the high altitude kit should be installed. If no run performance issues are observed then the standard configuration should be maintained. Each application and engine model will perform differently at higher altitudes and it may be necessary to compensate for altitude on some and not on others.
- Use of gasoline with a lower antiknock index than stated above may result in engine damage due to detonation / knocking or pre-ignition, and will **void engine warranty**.

### **MIXING FUEL AND OIL**

- For 4-cycle engines, do not mix oil with gasoline.
- For 2-cycle engines, use 2-cycle oil at mix ratio of 50:1 gasoline-to-oil. Use B&S P/N 272075 2-cycle oil or equivalent high-grade BIA or NMMA TCW3-certified two-cycle oil

## OXYGENATES IN FUEL

- B&S allows the use of oxygenate blended gasoline where the oxygenate content is up to 10% ethanol (gasohol) or up to 15% MTBE (Methyl tertiary butyl ether) by volume. However, ethanol blended gasoline can attract moisture which leads to separation and formation of acids during storage. Acidic gasoline can damage the fuel system of an engine while in storage. B&S strongly recommends removing ethanol-blended fuels from engine during storage.
- Use of gasoline containing higher than the EPA approved limits, for volume percentage of ethanol more than 10%, or MTBE more than 15%, may cause engine damage and will **void engine warranty**.
- Use of the following oxygenates may cause engine damage and will **void engine warranty**:
  - Alcohols:
    - § MeOH (Methanol)
    - § IPA (Isopropanol)
    - § TBA (T-Butanol)
  - Ethers:
    - § TAME – Tertiary amyl methyl ether
    - § ETBE – Ethyl tertiary butyl ether
- In some areas, state or local laws require that the service pump be marked indicating the use of alcohols or ethers. However, there are areas in which the pumps are unmarked. If you are not sure whether there is alcohol or ethers in the gasoline you buy, check with the service station operator.

## FUEL CONTAINING MMT

- Do not use gasoline that contains the octane-enhancing additive called MMT (Methylcyclopentadienyl Manganese Tricarbonyl). MMT is found in some premium-unleaded gasoline and has been found to create engine combustion deposits, and may cause engine damage, by fouling spark plugs & fouling exhaust catalyst. Use of gasoline containing MMT will **void engine warranty**.

## UNAPPROVED FUELS

- B&S spark ignition 4-cycle & 2-cycle internal combustion engines are intended to use only unleaded gasoline. The following alternative fuels are not approved and if used may cause engine damage and will **void engine warranty**:
  - Diesel fuel
  - B20 Bio-Diesel with 20% vegetable based / soy bean oil
  - Kerosene
  - E85 alternative gasoline fuel with 85% ethanol.
  - E22 alternative gasoline fuel with 22% ethanol.
- Modification of engine fuel system or carburetor to run on alternative fuels is not permitted, and will **void engine warranty**.

## FUEL STABILIZER

- For engine fuel system protection from gum formation use B&S gasoline additive available from your Authorized Briggs & Stratton Dealer (Fuel Fresh P/N 5041 or single pouch, or Fresh Start replacement cartridge P/N 5097D or bulk pack P/N 100092). See storage instructions.

## ENGINE RUN PERFORMANCE & GASOLINE

- All fuel is not the same. If you experience starting or performance problems after new fuel has been used in your engine, switch to a different fuel provider or change brands.

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