BRIGGS&STRATTON®

REPAIR MANUAL

106200, 10R200, 10U200

SINGLE CYLINDER OHV
AIR-COOLED ENGINES

Foreword

This manual was written to assist engine technicians and service personnel with the repair and maintenance procedures for Briggs & Stratton® engines. It assumes that persons using this manual have been properly trained in and are familiar with the servicing procedures for these products, including the proper use of required tools and safety equipment and the application of appropriate safety practices. Persons untrained or unfamiliar with these procedures or products should not attempt to perform such work.

Proper maintenance and repair is important to safe, reliable operation of all engines and engine-driven systems. The troubleshooting, testing, maintenance, and repair procedures described in this manual are appropriate for the Briggs & Stratton engines described herein. Alternative methods or procedures may pose risk to personal safety and the safety and/or reliability of the engine and are not endorsed or recommended by Briggs & Stratton.

All information, illustrations, and specifications contained in this manual were based on the data available at the time of publication. Briggs & Stratton Corporation reserves the right to change, alter, or otherwise improve the product or the product manuals at any time without prior notice.

Briggs & Stratton offers two complementary publications to enhance understanding of engine technology, maintenance, and repair. (Neither publication, however, is a substitution for a recognized training program for engine technicians.)

- For consumers, *Small Engine and Equipment Maintenance Guide* (p/n CE8155) provides a comprehensive overview of how small air-cooled engines work, basic troubleshooting, and step-by-step maintenance procedures.
- For engine technicians and consumers alike, an in-depth study of engine theory and operation can be found in the textbook *Small Engines* (p/n CE8020).

Both publications can be purchased at BRIGGSandSTRATTON.COM or through a local Briggs & Stratton Authorized Service Dealer.

This engine repair manual includes the following engine models:

- MODEL 106200
- MODEL 10R200
- MODEL 10U200

NOTICE **Models 10R200 and 10U200 have limited service parts. Review the parts list for part availability before conducting any service work.**

SECTION 1 – GENERAL INFORMATION

1

Engine Identification

Engine identification is located at (**A**) or (**B**) as shown.

1

Acronyms, Abbreviations and Meanings

Acronyms and Abbreviations	Meaning
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
MAG	Magneto
p/n	Part Number
PTO	Power Take-Off
RPM	Revolutions Per Minute
TDC	Top Dead Center
TNL	Top No-Load

Order of Engine Assembly and Disassembly

Order of Disassembly	Section Number	Section Procedure
Drain oil	2	Change Oil
Spark plug	2	Service Spark Plug
Air cleaner assembly	2	Change Air Filter
Control panel trim	5	Remove Control Bracket
Governor control bracket	5	Remove Control Bracket
Air cleaner base	5	Remove Control Bracket
Carburetor	4	Remove Carburetor
Disassemble carburetor	4	Disassemble Carburetor
Fuel tank	4	Remove Fuel Tank
Rewind starter	11	Remove Rewind Starter
Blower housing	2	Adjust Armature Air Gap
Exhaust manifold	12	Remove Muffler
Armature	9	Remove Flywheel
Flywheel	9	Remove Flywheel
Rocker cover / breather	6	Remove Breather
Cylinder shield	7	Remove Cylinder Head
Rocker arms	7	Disassemble Cylinder Head
Push rods	7	Remove Cylinder Head
Cylinder head	7	Remove Cylinder Head
Valves, springs and seals	7	Disassemble Cylinder Head
Crankcase cover	9	Remove Crankshaft and Camshaft
PTO oil seal	10	Remove PTO Bearing
PTO bearing	10	Remove PTO Bearing
Camshaft and tappets	9	Remove Crankshaft and Camshaft
Connecting rod and piston	8	Remove Piston and Connecting Rod
Crankshaft	9	Remove Crankshaft and Camshaft
MAG oil seal	10	Remove MAG Bearing
MAG bearing	10	Remove MAG Bearing
Oil sensor (if equipped)	6	Remove Oil Sensor

Order of Assembly	Section Number	Section Procedure
Oil sensor (if equipped)	6	Install Oil Sensor
MAG bearing	10	Install MAG Bearing
MAG oil seal	10	Install MAG Bearing
Crankshaft	9	Install Crankshaft and Camshaft
Connecting rod and piston	8	Install Piston and Connecting Rod
Camshaft and tappets	9	Install Crankshaft and Camshaft
PTO bearing	10	Install PTO Bearing
PTO oil seal	10	Install PTO Bearing
Crankcase cover	9	Install Crankcase Cover
Valves, springs and seals	7	Assemble Cylinder Head
Cylinder head	7	Install Cylinder Head
Push rods	7	Install Cylinder Head

Order of Assembly	Section Number	Section Procedure
Rocker arms	7	Install Cylinder Head
Adjust valve clearance	2	Adjust Valve Clearance
Rocker cover / breather	6	Install Breather
Cylinder shield	7	Install Cylinder Head
Flywheel	9	Install Flywheel
Armature	9	Install Flywheel
Adjust armature air gap	2	Adjust Armature Air Gap
Blower housing	2	Adjust Armature Air Gap
Rewind starter	11	Install Rewind Starter
Assemble carburetor	4	Assemble Carburetor
Carburetor	4	Install Carburetor
Governor control bracket	5	Install Control Bracket
Air cleaner base	5	Install Control Bracket
Static governor adjustment	2	Perform Static Governor Adjustment
Fuel tank	4	Install Fuel Tank
Control panel trim	5	Install Control Bracket
Air cleaner assembly	2	Change Air Filter
Exhaust manifold	12	Install Muffler
Spark plug	2	Service Spark Plug
Fill engine with oil	2	Change Oil

SECTION 2 – SAFETY, MAINTENANCE AND ADJUSTMENTS

2

This repair manual contains safety information that is designed to:

- Make you aware of hazards associated with engines.
- Inform you of the risk of injury associated with those hazards.
- Instruct you how to avoid or reduce the risk of injury.

Safety Alert Symbol and Signal Words

The safety alert symbol ⚠ indicates a potential personal injury hazard. A signal word (**DANGER**, **WARNING**, or **CAUTION**) is used with the alert symbol to designate a degree or level of hazard seriousness. A safety symbol may be used to represent the type of hazard. The signal word ***NOTICE*** is used to address practices not related to personal injury.

⚠ **DANGER** indicates a hazard which, if not avoided, *will* result in death or serious injury.

⚠ **WARNING** indicates a hazard which, if not avoided, *could* result in death or serious injury.

⚠ **CAUTION** indicates a hazard which, if not avoided, *could* result in minor or moderate injury.

NOTICE addresses practices not related to personal injury.

Hazard Symbols and Meanings

Symbol	Meaning	Symbol	Meaning
	Safety information about hazards that can result in personal injury.		Read and understand the Operator's Manual before operating or servicing the unit.
	Fire hazard		Explosion hazard
	Shock hazard		Explosion hazard
	Hot surface hazard		Toxic fume hazard
	Amputation hazard - moving parts		Chemical hazard
	Kickback hazard		Thrown object hazard - wear eye protection
	Amputation hazard - entanglement		

General Safety Messages

Prior to work, read and understand the section(s) of this manual that pertain to the job. Follow all safety warnings.

- Always use fresh gasoline. Stale fuel can cause gum deposits in the carburetor and cause leakage, flow restrictions, or other problems.
- Check fuel lines and fittings frequently for cracks or leaks and replace if necessary.

⚠ **WARNING**

Before attempting to service this equipment, read and understand this manual and the operating instructions of the engine and the equipment.

⚠ **WARNING**

Failure to follow instructions could result in serious injury (including paralysis) and even death.

⚠ **WARNING**

Battery post, terminals, and related accessories contain lead and lead compounds - chemicals known to the State of California to cause cancer and reproductive harm. Wash hands after handling.

⚠ **WARNING**

Certain components in this product and its related accessories contain chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm. Wash hands after handling.

⚠ **WARNING**

Briggs & Stratton Engines are not designed for and are not to be used to power: fun-karts; go-karts; children's, recreational, or sport all-terrain vehicles (ATVs); motorbikes; hovercraft; aircraft products; or vehicles used in competitive events not sanctioned by Briggs & Stratton. For information about competitive racing products, see www.briggsracing.com. For use with utility and side-by-side ATVs, please contact Briggs & Stratton Engine Application Center, 1-866-927-3349. Improper engine application may result in serious injury or death.

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects, or other reproductive harm.

WARNING

Fuel and its vapors are extremely flammable and explosive which could cause burns, fire or explosion resulting in death or serious injury.

When Adding Fuel

- Turn engine OFF and let engine cool at least 2 minutes before removing the fuel cap. Loosen cap slowly to relieve pressure in tank.
- Fill fuel tank outdoors or in well-ventilated area.
- Do not overfill fuel tank. To allow for expansion of the fuel, do not fill above the bottom of the fuel tank neck.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- If fuel spills, wait until it evaporates before starting engine.
- Do not light a cigarette or smoke.

When Starting Engine

- Ensure that spark plug, muffler, fuel cap and air cleaner (if equipped) are in place and secured.
- Do not crank engine with spark plug removed.
- If engine floods, set choke (if equipped) to OPEN / RUN position, move throttle (if equipped) to FAST position and crank until engine starts.

When Operating Equipment

- Do not operate this product inside any building, carport, porch, mobile equipment, marine applications, or enclosure.
- Do not tip engine or equipment at angle which causes fuel to spill.
- Do not choke the carburetor to stop engine.
- Never start or run the engine with the air cleaner assembly (if equipped) or the air filter (if equipped) removed.

When Changing Oil

- If you drain the oil from the oil fill hole (not recommended), the fuel tank must be empty or fuel can leak out and result in a fire or explosion.

When Tipping Unit for Maintenance

- When performing maintenance that requires the unit to be tipped, the fuel tank, if mounted on the engine, must be empty or fuel can leak out and result in a fire or explosion.

When Transporting Equipment

- Transport/move/repair with fuel tank EMPTY or with fuel shutoff valve OFF.
- Do not tip engine or equipment at angle which causes fuel to spill.
- Disconnect spark plug wire.

When Storing Fuel or Equipment with Fuel In Tank

- Store away from furnaces, stoves, water heaters, clothes dryers, or other appliances that have pilot lights or other ignition source because they could ignite fuel vapors.

WARNING

Starting engine creates sparking which could ignite nearby flammable gases causing explosion or fire resulting in death or serious injury.

- If there is natural or LP gas leakage in the area, do not start engine.
- Do not use pressurized starting fluids because vapors are flammable.

WARNING

POISONOUS GAS HAZARD. Engine exhaust contains carbon monoxide, a poisonous gas that could kill you in minutes. You CANNOT see it, smell it, or taste it. Even if you do not smell exhaust fumes, you could still be exposed to carbon monoxide gas. If you start to feel sick, dizzy, or weak while using this product, get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

- Operate this product ONLY outside far away from windows, doors and vents to reduce the risk of carbon monoxide gas from accumulating and potentially being drawn towards occupied spaces.
- Install battery-operated carbon monoxide alarms or plug-in carbon monoxide alarms with battery back-up according to the manufacturer's instructions. Smoke alarms cannot detect carbon monoxide gas.
- DO NOT run this product inside homes, garages, basements, crawlspaces, sheds, or other partially-enclosed spaces even if using fans or opening doors and windows for ventilation. Carbon monoxide can quickly build up in these spaces and can linger for hours, even after this product has shut off.
- ALWAYS place this product downwind and point the engine exhaust away from occupied spaces.

WARNING 

Starter cord kickback (rapid retraction) will pull hand and arm toward engine faster than you can let go which could cause broken bones, fractures, bruises, or sprains resulting in serious injury.

- When starting engine, pull the starter cord slowly until resistance is felt and then pull rapidly to avoid kickback.
- Remove all external equipment / engine loads before starting engine.
- Direct-coupled equipment components such as, but not limited to, blades, impellers, pulleys, sprockets, etc., must be securely attached.

WARNING 

Rotating parts could entangle hands, feet, hair, clothing, or accessories resulting in serious injury.

- NEVER operate equipment without protective housing or covers in place.
- DO NOT wear loose clothing, jewelry or anything that could become entangled in the equipment.
- Tie up long hair and remove jewelry.
- Keep hands and feet away from rotating parts.

WARNING 

Running engines produce heat. Engine parts, especially mufflers, become extremely hot which could cause severe thermal burns or catching fire to combustible debris, such as leaves, grass, brush, etc., resulting in serious injury.

- Allow muffler, engine cylinder and fins to cool before touching.
- Remove accumulated debris from muffler area and cylinder area.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.

WARNING 

Unintentional sparking could cause fire or electric shock resulting in death or serious injury.

Unintentional start-up could result in entanglement, traumatic amputation, or laceration.

Before performing adjustments or repairs:

- Disconnect the spark plug wire and keep it away from the spark plug.
- Disconnect battery at negative terminal (only engines with electric start.)
- Use only correct tools.
- Do not tamper with governor spring, links or other parts to increase engine speed.
- Replacement parts must be of the same design and installed in the same position as the original parts. Other parts may not perform as well, may damage the unit, and may result in injury.
- Do not strike the flywheel with a hammer or hard object because the flywheel may later shatter during operation.

When testing for spark:

- Use approved spark plug tester.
- Do not check for spark with spark plug removed.

WARNING 

Charging batteries produce hydrogen gas which could cause explosion resulting in death or serious injury.

- Do not store or charge a battery near an open flame or device that utilizes a pilot light or can create a spark.

WARNING 

Damaged, worn, or loose fuel components can leak fuel which could cause explosion or fire resulting in death or serious injury.

- All fuel components should be in good condition and properly maintained.
- Repairs should only be made with factory approved parts.
- Repair work should be done by a qualified technician.
- Flexible supply lines should be checked regularly to make sure they are in good condition.

WARNING

Prolonged or repeated contact with used motor oil could cause injury.

- Used motor oil has been shown to cause skin cancer in certain laboratory animals.
- Thoroughly wash exposed areas with soap and water.

NOTICE

Failure to follow instructions could result in property damage.

Maintenance Schedule

First 5 Hours
• Change oil
Every 8 Hours or Daily
• Check engine oil level • Clean area around muffler and controls • Clean finger guard
Every 25 Hours or Annually
• Clean air filter * • Clean pre-cleaner *
Every 50 Hours or Annually
• Change engine oil • Check muffler and spark arrester
Annually
• Replace air filter • Replace pre-cleaner • Replace spark plug • Replace fuel filter • Clean air cooling system *

* In dusty conditions or when airborne debris is present, clean more often.

Fuel Recommendations

Fuel must meet these requirements:

- Clean, fresh, unleaded gasoline.
- A minimum of 87 octane / 87 AKI (91 RON). For high altitude use, see below.
- Gasoline with up to 10% ethanol (gasohol) is acceptable.

NOTICE Do not use unapproved gasolines, such as E15 and E85. Do not mix oil in gasoline or modify the engine to run on alternate fuels. Use of unapproved fuels will cause damage to engine components, **which will not be covered under warranty**.

To protect the fuel system from gum formation, mix a fuel stabilizer into the fuel. See **Storage**. All fuel is not the same. If starting or performance problems occur, change fuel providers or change brands. This engine is certified to operate on gasoline. The emissions control system for this engine is EM (Engine Modifications).

High Altitude

At altitudes over 5,000 feet (1524 meters), a minimum 85 octane / 85 AKI (89 RON) gasoline is acceptable.

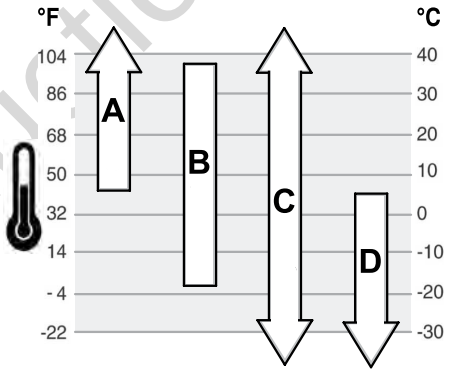
For carbureted engines, high altitude adjustment is required to remain emissions compliant. Operation without this adjustment will cause decreased performance, increased fuel consumption, and increased emissions. Contact a Briggs & Stratton Authorized Service Dealer for high altitude adjustment information. Operation of the engine at altitudes below 2,500 feet (762 meters) with the high altitude adjustment is not recommended.

For Electronic Fuel Injection (EFI) engines, no high altitude adjustment is necessary.

Oil Recommendations

We recommend the use of Briggs & Stratton Warranty Certified oils for best performance. Other high-quality detergent oils are acceptable if classified for service SF, SG, SH, SJ or higher. Do not use special additives.

Outdoor temperatures determine the proper oil viscosity for the engine. Use the chart to select the best viscosity for the outdoor temperature range expected.



A **SAE 30** Below 40 °F (4 °C) the use of SAE 30 will result in hard starting.
B **10W-30** Above 80 °F (27 °C) the use of 10W-30 may cause increased oil consumption. Check oil level more frequently.
C **Synthetic 5W-30**
D **5W-30**

Service Fuel Filter

When the fuel tank is mounted to the engine, refer to *In-Tank Fuel Filter*. When the fuel tank is NOT mounted to the engine, refer to *In-Line Fuel Filter*. For model 10R200, refer to *In-Carburetor Fuel Filter*.

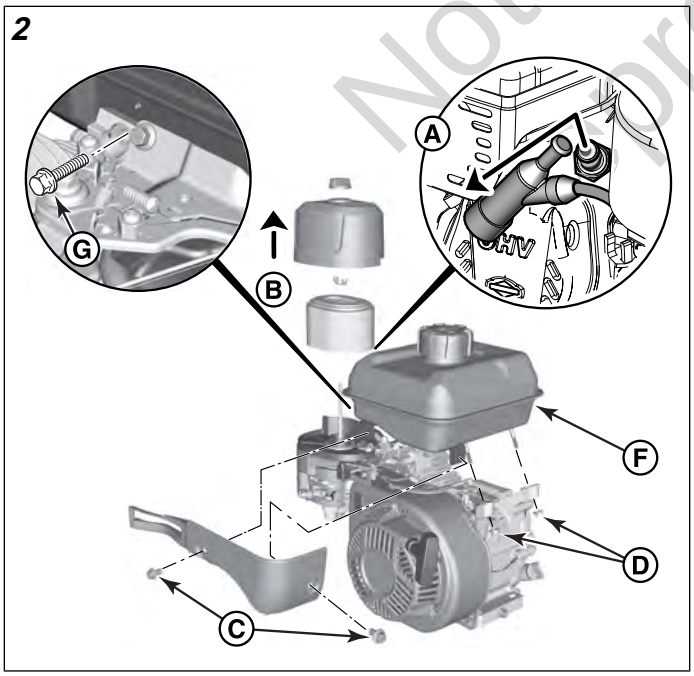
In-Tank Fuel Filter (Models 106200 and 10U200)

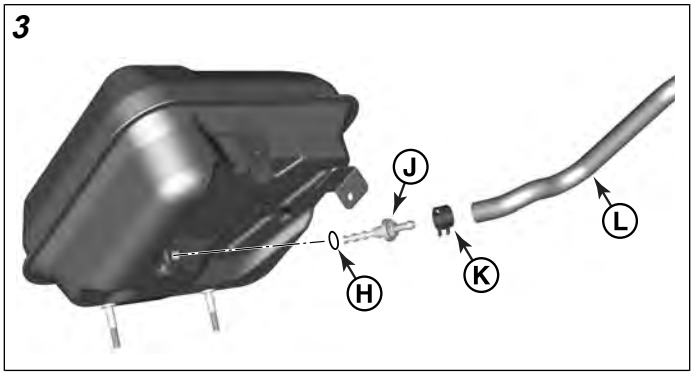
1. Drain fuel tank by running engine until fuel tank is empty.
2. Disconnect the spark plug wire from the spark plug (**A**).

3. Remove the air cleaner cover and air filter (**B**) as instructed in *Change Air Filter* found in this section.
4. If equipped, remove the control panel trim screws (**C**) and then remove the control panel.
5. Remove the two nuts (**D**) from fuel tank.
6. Remove screw (**G**) from opposite side of fuel tank.
7. Lift fuel tank and slide fuel line clamp (**K**) away from fuel filter (**J**). Remove fuel line (**L**) with fuel line removal tool (p/n 19600).
8. Remove fuel filter (**J**) and O-ring (**H**) from fuel tank and check for dirt or debris; clean or replace as necessary.
9. Install cleaned or new fuel filter and O-ring into fuel tank. Torque fuel filter to the value listed in ***Section 13 - Engine Specifications***.

Note: Make sure o-ring is seated in groove of fuel filter.

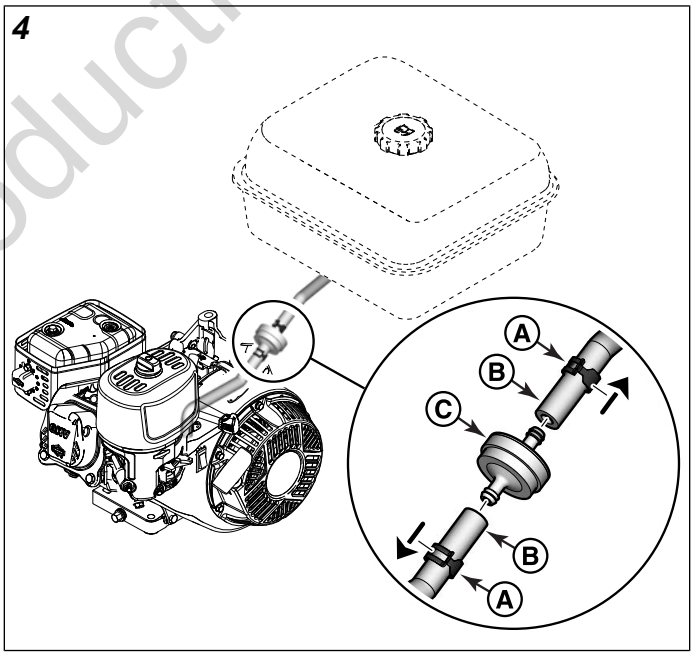
10. Check the fuel line for cracks or leaks. Replace fuel line if necessary.
11. Install fuel line with clamp (**K**) onto fuel filter making sure clamp retains fuel line securely.
12. Place tank onto engine. Install screw (**G**) and nuts (**D**). Torque screw and nuts to the values listed in ***Section 13 - Engine Specifications***.
13. If equipped, install control panel trim using screws (**C**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
14. Install the air filter and air cleaner cover (**B**) as instructed in *Change Air Filter* found in this section.
15. Reconnect the spark plug wire to the spark plug (**A**).





In-Line Fuel Filter (Models 106200 and 10U200)

1. Drain fuel tank by running engine until fuel tank is empty.
2. Slide the clamps (**A**) away from the fuel filter (**C**). Twist and pull the fuel lines (**B**) off fuel filter. Discard the fuel filter.
3. Check the fuel lines for cracks or leaks. Replace if necessary.
4. Install a new fuel filter (**C**) between fuel lines (**B**) and secure with clamps (**A**). Make sure arrow on fuel filter points in the direction of fuel flow.



In-Carburetor Fuel Filter (Model 10R200)

WARNING

Before servicing the carburetor or other fuel system components, drain fuel tank by running engine until fuel tank is empty and turn OFF the fuel valve (if equipped).

Do not attempt to stop the fuel flow by plugging the fuel hose.

1. Disconnect spark plug wire from spark plug. Secure spark plug wire away from spark plug.
2. Move fuel shut-off lever (**N**) to the closed position.
3. Remove sediment bowl (**R**), rubber seal (**Q**) and fuel filter (**P**).
4. Check fuel filter for dirt or debris; clean or replace as necessary.
5. Install cleaned or new fuel filter, rubber seal, and sediment bowl onto carburetor. Torque sediment bowl to the value listed in ***Section 13 - Engine Specifications***.
6. Connect spark plug wire to spark plug.

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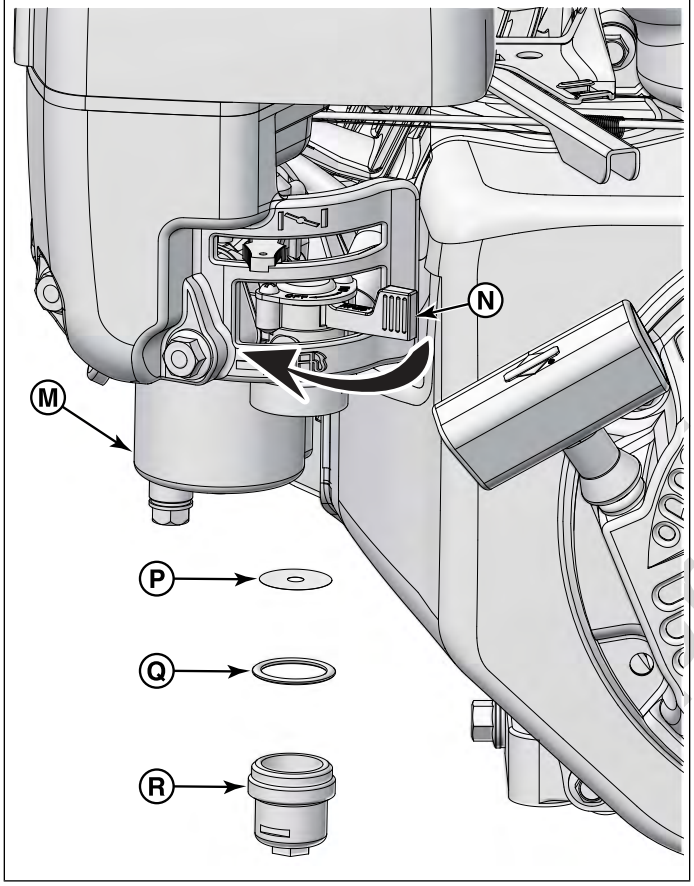


Change Oil

WARNING

Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

Running engines produce heat. Engine parts, especially muffler, become extremely hot.

Severe thermal burns can occur on contact.

- If you drain the oil from the oil fill hole (not recommended), the fuel tank must be empty or fuel can leak out and result in a fire or explosion.
- Allow muffler, engine cylinder and fins to cool before touching.

CAUTION

Avoid prolonged or repeated skin contact with used motor oil.

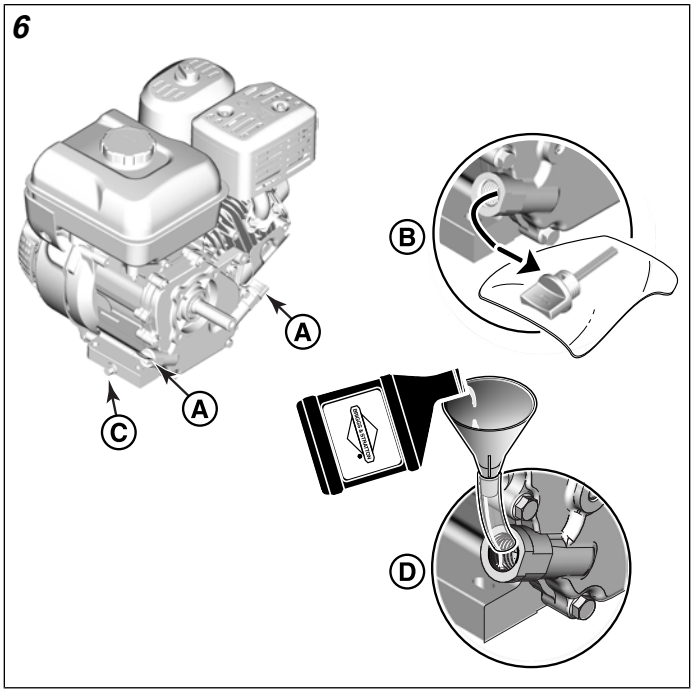
- Used motor oil has been shown to cause skin cancer in certain laboratory animals.
- Thoroughly wash exposed areas with soap and water.

Used oil is a hazardous waste product and must be disposed of properly. Do not discard with household waste. Check with your local authorities, service center, or dealer for safe disposal/recycling facilities.

- Place engine level.
- Clean the oil fill area of any debris.
- See ***Section 13 - Engine Specifications*** for oil capacity.

1. With engine off but still warm, disconnect the spark plug wire and keep it away from the spark plug.
2. Clean area around oil fill. Remove oil fill cap/dipstick (**A**) and wipe with a clean cloth (**B**).
3. Remove one of the oil drain plugs located at the base of the engine (**C**). Drain the oil into an approved container.
4. Reinstall the oil drain plug and torque to the recommended value listed in ***Section 13 - Engine Specifications.***
5. Slowly pour fresh oil of proper weight and classification into the oil fill opening (**D**). Pause to permit oil to settle. Insert the dipstick; do not turn or tighten.
6. Remove dipstick and wipe clean. Reinsert dipstick but do not screw it in. Remove dipstick and check the oil level (**E**). It should be within the hatch area on the dipstick. DO NOT overfill.
7. Reinstall dipstick and tighten hand tight.
8. Wipe up any remaining oil.
9. Reconnect the spark plug wire to the spark plug.

6



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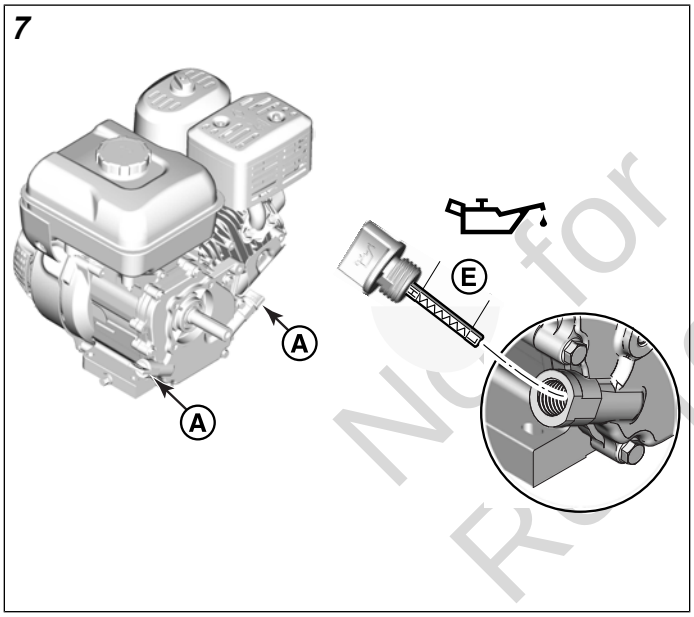

Change Air Filter

A correctly serviced air filter protects internal engine parts from airborne dirt and dust. Poor filter maintenance will allow dirt and dust to be drawn into the engine, causing wear to the intake system and contamination of the oil. Dirt in the oil forms an abrasive mixture which wears down moving parts.

WARNING

Fuel and its vapors are extremely flammable and explosive which could cause burns, fire or explosion resulting in death or serious injury.

- Never start or run the engine with the air cleaner assembly or the air filter removed.

NOTICE Do not use pressurized air or solvents to clean the filter. Pressurized air can damage the filter and solvents will dissolve the filter.

The air filter system uses either a Dual Element Oval, Oil Bath, Foam Low Mount or Foam Large Panel filter.

Dual Element Oval Air Filter

1. Remove knob (**A**) from air cleaner cover (**B**), then remove air cleaner cover.
2. Remove nut (**E**) from air filter assembly (**C** and **D**), then remove air filter assembly. Be careful that dirt and/or debris does not enter the carburetor. If dirt and/or debris enters the carburetor, damage can occur to the engine and void your warranty.
3. Remove O-ring seal (**H**) from air cleaner base (**F**). Inspect for damage and replace if necessary.
4. Remove foam pre-cleaner (**D**) from air filter cartridge (**C**).
5. Gently tap air filter cartridge on a hard surface to loosen debris. Brush or vacuum any remaining debris from the air filter cartridge. Replace cartridge if very dirty.
6. Wash foam pre-cleaner in warm, soapy water, and then rinse with clean water and allow to air dry.
7. Assemble dry foam pre-cleaner (**D**) to air filter cartridge (**C**).
8. Install O-ring seal (**H**) onto air cleaner base (**F**).
9. Install air filter assembly (**C** and **D**) onto air cleaner base (**F**) and retain using nut (**E**). Do not over-tighten.
10. Install air cleaner cover (**B**) and secure using knob (**A**). Do not over-tighten.

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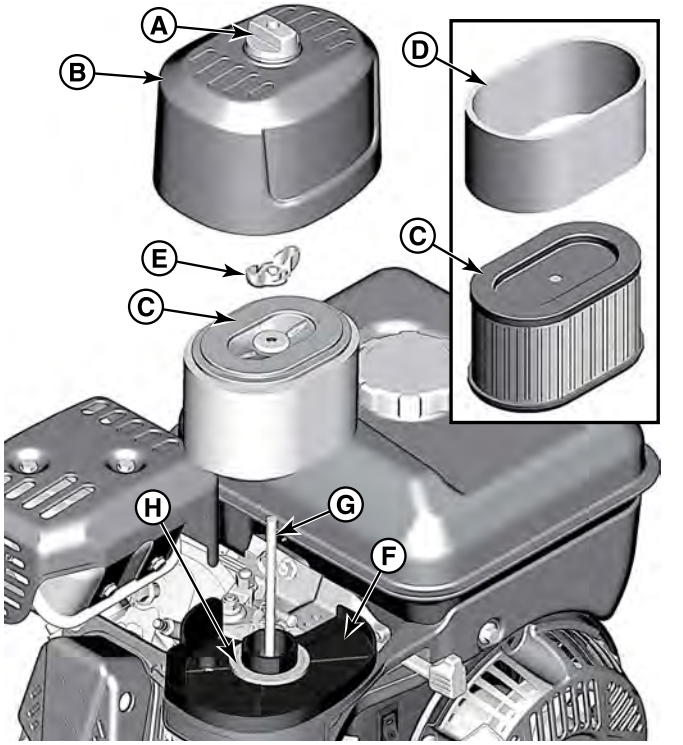

Oil Bath Air Filter

1. Remove knob and washer (**A**) from air cleaner cover (**B**), and then remove air cleaner cover. Be careful that dirt and/or debris does not enter the carburetor. If dirt and/or debris enters the carburetor, damage can occur to the engine and void your warranty.
2. Remove foam filter (**C**) from cover (**B**).
3. Wash foam filter in warm, soapy water, and then rinse with clean water and allow to thoroughly air dry. If foam filter is damaged, replace with a new foam filter.
4. Apply a small amount of SAE 30 oil onto foam filter. Squeeze foam filter until oil is evenly distributed. Squeeze foam filter in a clean cloth to remove excess engine oil.
5. Remove retainer (**E**) and O-ring (**F**) from bowl (**D**).
6. Remove bowl (**D**) from air cleaner base (**G**). Pour dirty oil into an approved receptacle.
7. Remove o-ring seal (**H**) from air cleaner base (**G**). Inspect for damage and replace if necessary.
8. Wash bowl (**D**) and cover (**B**) in warm, soapy water. Wipe dry with a clean cloth.
9. Install o-ring seal (**H**) and bowl (**D**) onto air cleaner base (**G**).
10. Pour clean SAE 30 oil into bowl (**D**). Correct oil level (**J**) is shown on side of bowl. Do not overfill. Do not pour oil into carburetor. Pour oil only into bowl. If oil or debris enters the carburetor, damage can occur to the engine and void your warranty. If oil or debris enters the carburetor elbow, wipe with a clean dry cloth.
11. Install retainer (**E**) and O-ring (**F**) into the bowl (**D**).
12. Install foam filter (**C**) into cover (**B**).
13. Install air cleaner cover (**B**) and secure using washer and knob (**A**). Do not over-tighten.

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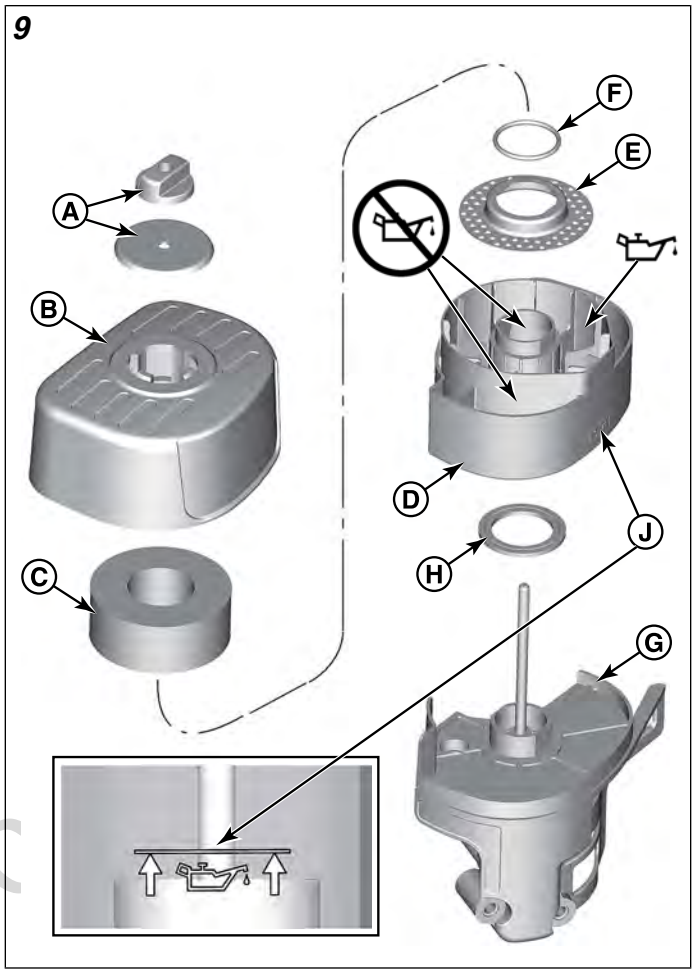
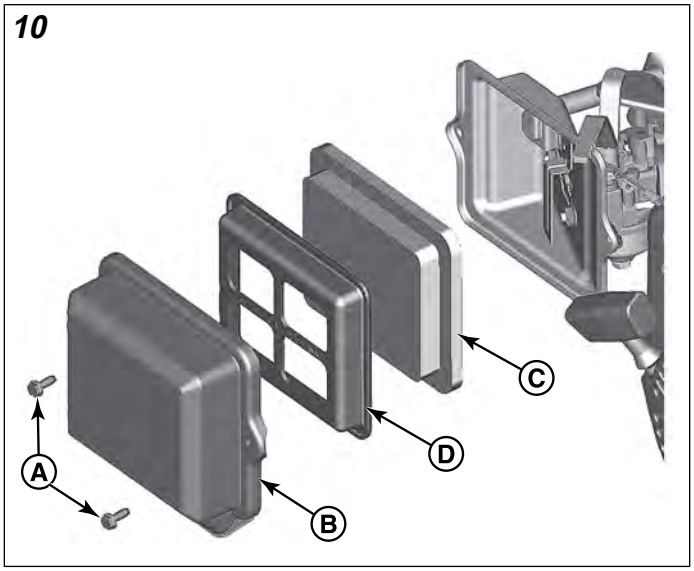


Foam Low Mount Air Filter

1. Remove two fasteners (**A**) from air cleaner cover (**B**), and then remove air cleaner cover. Be careful that dirt and/or debris does not enter the carburetor. If dirt and/or debris enters the carburetor, damage can occur to the engine and void your warranty.
2. Remove retainer (**D**) and foam filter (**C**) from air cleaner cover (**B**).
3. Wash foam filter in warm, soapy water, and then rinse with clean water. Squeeze foam filter in a clean cloth to dry. If foam filter is damaged, replace with a new foam filter.
4. Saturate foam filter with clean engine oil. Squeeze foam filter in a clean cloth to remove excess engine oil.
5. Install foam filter (**C**) and retainer (**D**) into air cleaner cover (**B**).

6. Install air cleaner cover (**B**) and secure with two fasteners (**A**). Do not over-tighten.

10



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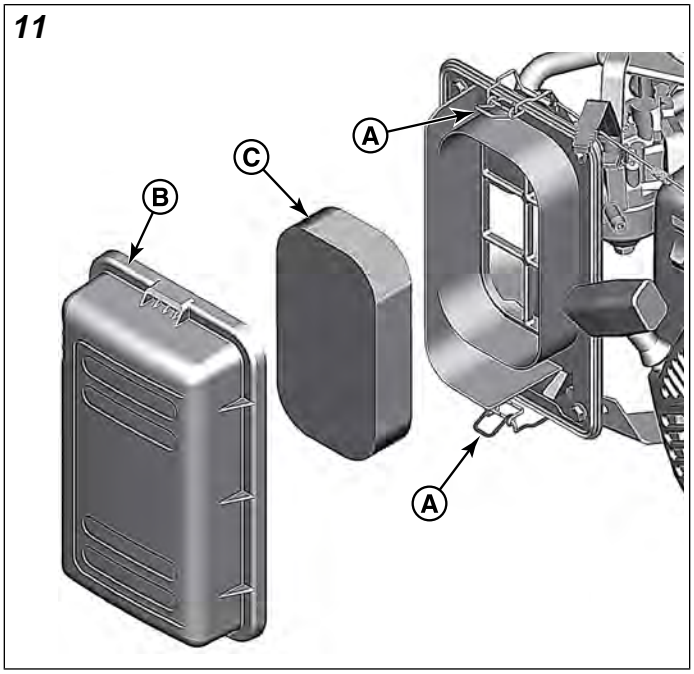


Foam Large Panel Air Filter

1. Open two fastening clips (**A**), and then remove air cleaner cover (**B**) and foam filter (**C**). Be careful that dirt and/or debris does not enter the carburetor. If dirt and/or debris enters the carburetor, damage can occur to the engine and void your warranty.
2. Wash foam filter in warm, soapy water, and then rinse with clean water. Squeeze foam filter in a clean cloth to dry. If foam filter is damaged, replace with a new foam filter.
3. Saturate foam filter with clean engine oil. Squeeze foam filter in a clean cloth to remove excess engine oil.
4. Install foam filter (**C**) into air cleaner cover (**B**).
5. Install air cleaner cover (**B**) and secure with two fastening clips (**A**).

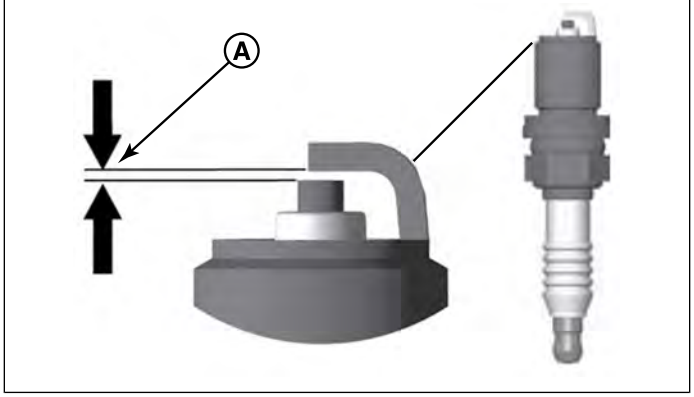
Service Spark Plug

NOTICE Spark plugs have different thread lengths and heat ranges. When changing a spark plug, use only the specified replacement or engine damage could occur.

Note: In some areas, local law requires using a resistor spark plug to suppress ignition signals. If this engine was originally equipped with a resistor spark plug, use the same type for replacement.

1. Disconnect the spark plug wire.
2. Remove and inspect spark plug for wear and damage. Replace spark plug if electrodes are burned away or if the porcelain is cracked.
3. Do not sand-blast or bead-blast the spark plug. Clean by scraping or wire brushing and then washing in a commercial solvent.
4. Using a wire gauge, check and set the gap (**A**) to the value listed in ***Section 13 - Engine Specifications.***

12



5. Install spark plug by hand and tighten finger tight. Then torque to the value listed in ***Section 13 - Engine Specifications.***
6. Connect the spark plug wire.

Clean Air Cooling System

2

WARNING

Running engines produce heat. Engine parts, especially muffler, become extremely hot.

Severe thermal burns can occur on contact.

Combustible debris, such as leaves, grass, brush, etc., can catch fire.

- Allow muffler, engine cylinder and fins to cool before touching.
- Remove accumulated debris from muffler area and cylinder area.

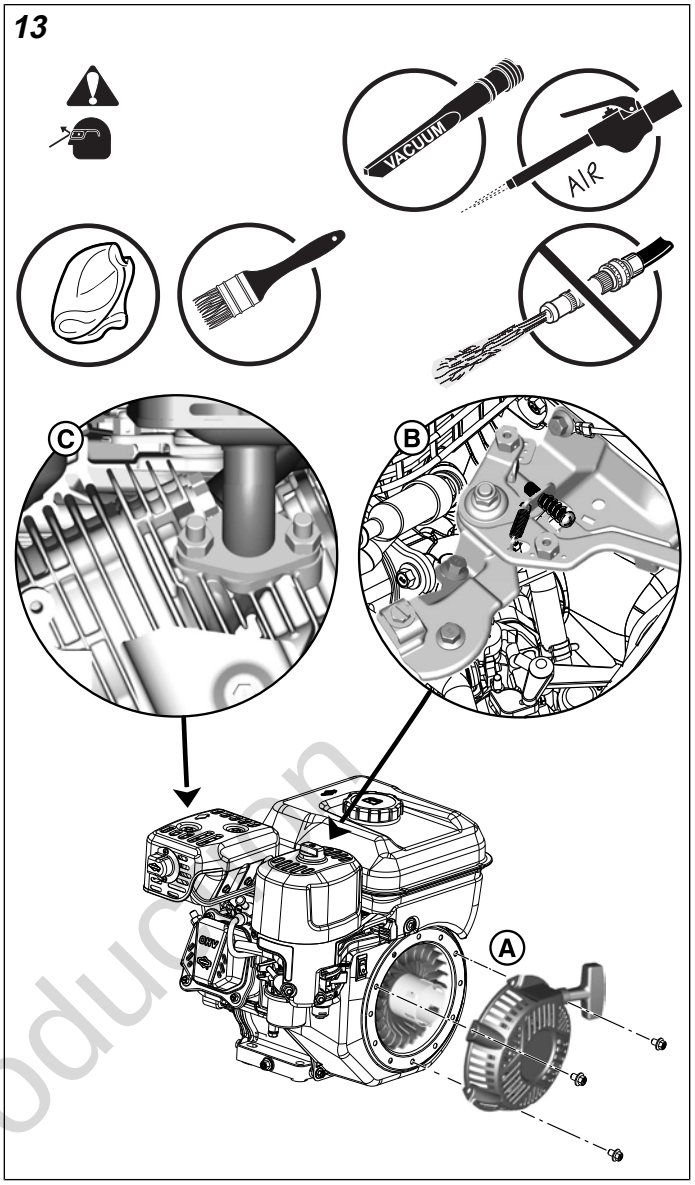
NOTICE Do not use water to clean the engine. Water could contaminate the fuel system. Use a brush or dry cloth to clean the engine.

This is an air cooled engine. Dirt or debris can restrict air flow and cause the engine to overheat, resulting in poor performance and reduced engine life.

1. Use a brush or dry cloth to remove debris from the air intake area (**A**).
2. Keep linkage, springs and controls (**B**) clean.
3. Keep the area around and behind the muffler (**C**) free of any combustible debris.
4. Use a brush, vacuum and/or compressed air to remove debris from cylinder cooling fins.

After a period of time, debris can accumulate in the cylinder cooling fins and cause the engine to overheat. This debris cannot be removed without partial disassembly of the engine. Have a Briggs & Stratton Authorized Dealer inspect and clean the air cooling system as recommended in the **Maintenance Schedule**.

13



Clean Combustion Chamber

Remove combustion chamber deposits every 500 hours or whenever the cylinder head is removed.

With the piston at Top Dead Center (TDC), scrape deposits from top of piston and upper bore with a plastic scraper.

Remove the loosened deposits from around the top ring land area using compressed air or a shop vacuum and a soft bristle brush.

NOTICE Use care to prevent debris from entering the engine.

Do not damage bore, top of piston, cylinder head or gasket mounting surfaces.

It is not necessary to remove the discoloration marks on the piston, valves and/or cylinder head. These marks are normal and will not affect engine operation.

Storage

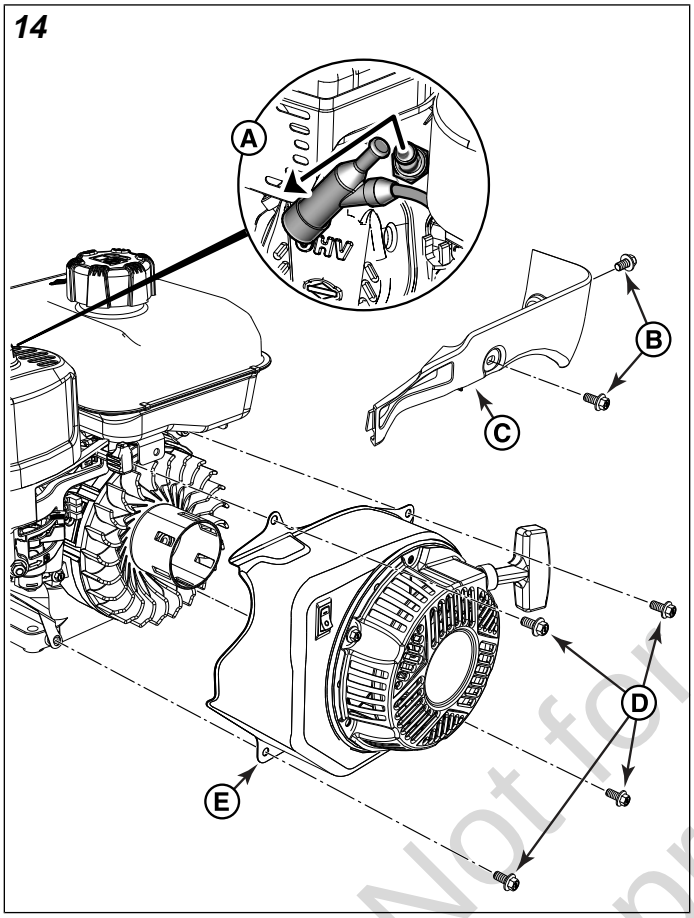
Fuel can become stale when stored over 30 days. Stale fuel causes acid and gum deposits to form in the fuel system or on essential carburetor parts. To keep fuel fresh, use **Briggs & Stratton® Advanced Formula Fuel Treatment & Stabilizer**, available wherever Briggs & Stratton genuine service parts are sold.

There is no need to drain gasoline from the engine if a fuel stabilizer is added according to instructions. Run the engine for 2 minutes to circulate the stabilizer throughout the fuel system before storage. If gasoline in the engine has not been treated with a fuel stabilizer, it must be drained into an approved container. Run the engine until it stops from lack of fuel. The use of a fuel stabilizer in the storage container is recommended to maintain freshness.

Adjust Armature Air Gap

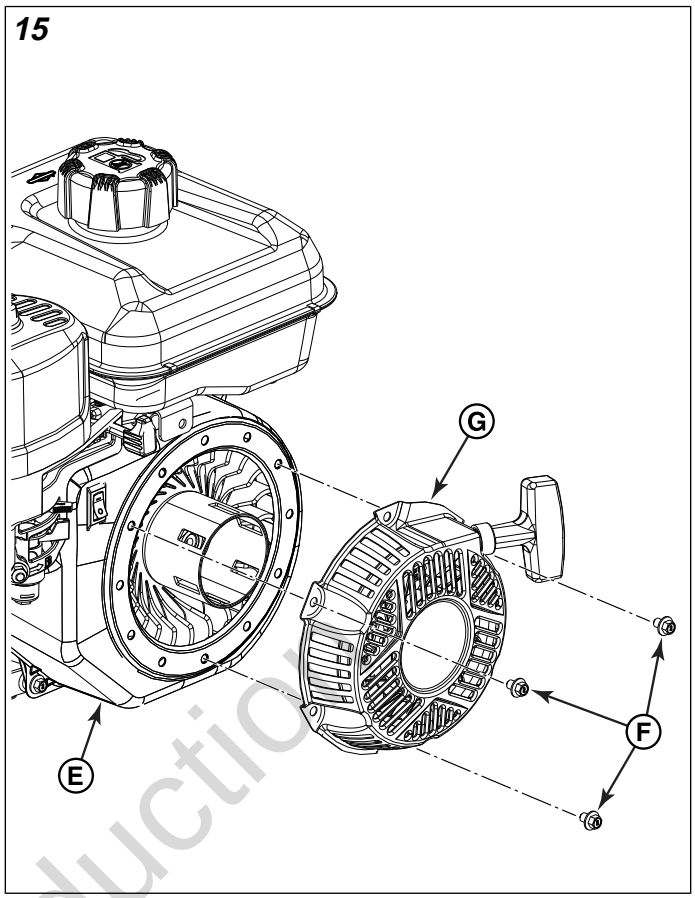
1. Disconnect spark plug wire (**A**) from spark plug. Secure spark plug wire away from spark plug.

14



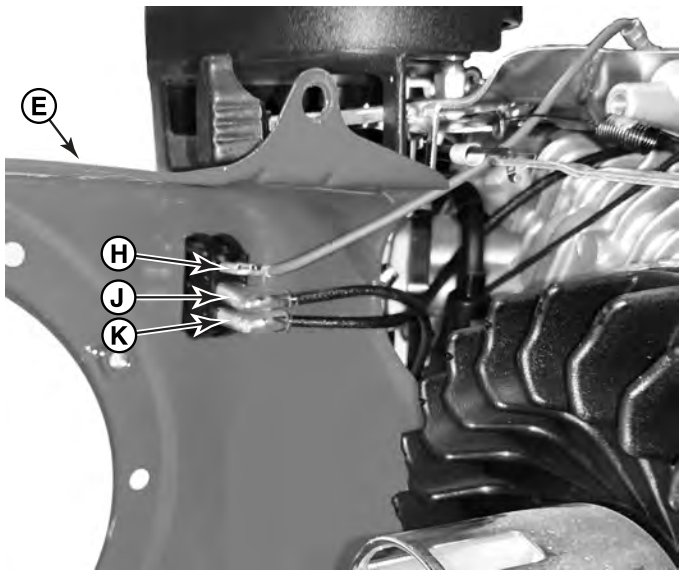
2. If equipped, remove two screws (**B**) and then remove control panel trim (**C**) from engine.
3. 106200 engine: Remove screws (**F**) and then remove rewind starter assembly (**G**) from blower housing (**E**).

15



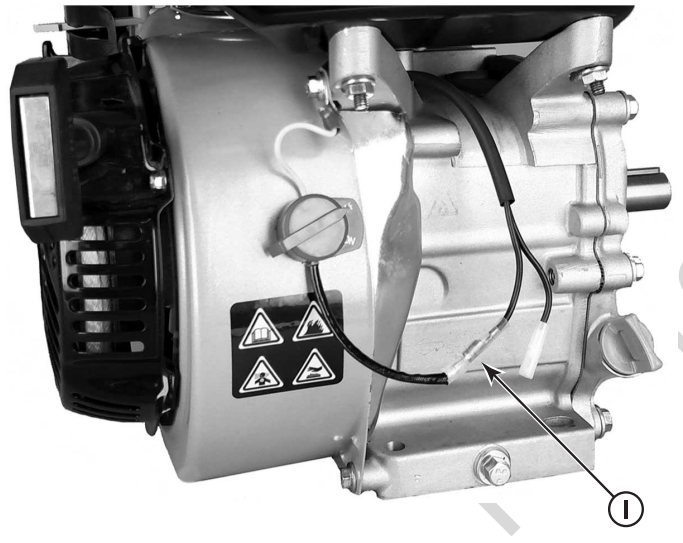
4. Remove four screws (**D**) that attach blower housing (**E**) to engine. Do not remove blower housing at this time. **Tip:** Remove upper left screw with a 1/4" drive rachet and extension.
5. 106200 engine: Carefully swing blower housing (**E**) away from engine to gain access to the stop switch wire connections.

16



6. 10R200 and 10U200 engines: Disconnect black wire (**I**) from stop switch located at rear of blower housing. Mark each end of wire for reassembly.

17

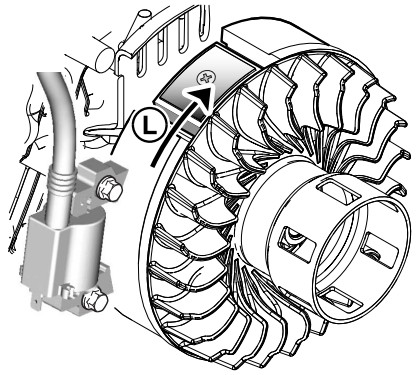


106200 engine: Mark each wire on stop switch for reassembly and then disconnect wires from stop switch.

A. Top Terminal (**H**) - Red ground wire
B. Center Terminal (**J**) - Black coil wire
C. Bottom Terminal (**K**) - Black low oil sensor wire, if equipped

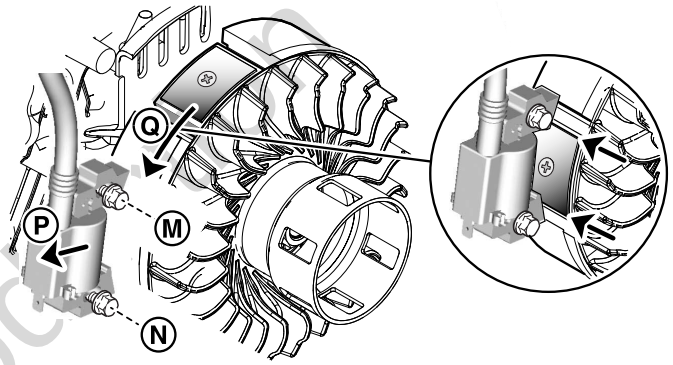
7. Carefully remove blower housing from engine and set aside.
8. Turn flywheel so that magnet is away from armature legs (**L**).

18



9. Loosen two screws (**M** and **N**).
10. Slide Armature (**P**) away from flywheel.
11. Tighten screw (**N**) to secure Armature.
12. Turn flywheel so that magnet is aligned with armature legs (**Q**).

19



13. Insert a gauge 0.008 - 0.016 in. (0.2 - 0.4 mm) thick (**R**) between flywheel and armature legs.
14. Loosen screw (**N**). Press armature legs (**P**) tight against flywheel.

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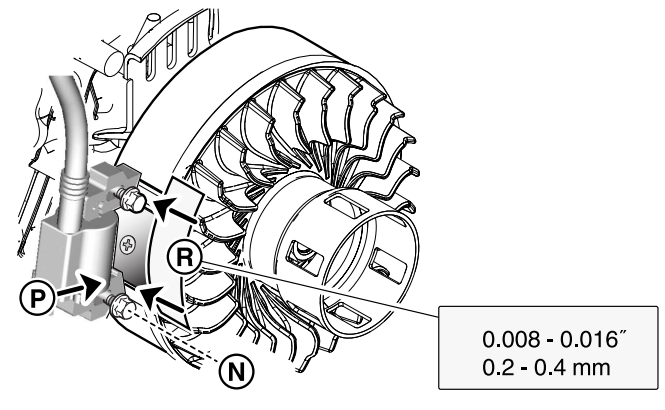
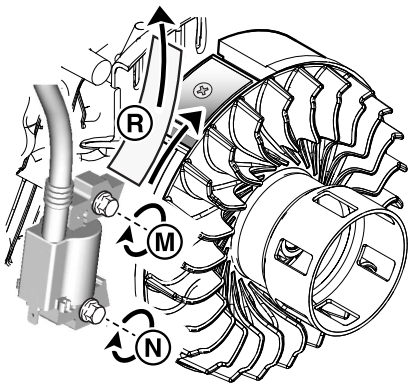


15. Torque both screws (**M** and **N**) to the value listed in ***Section 13 - Engine Specifications***.

16. Rotate flywheel to remove gauge (**R**).

21



17. 106200 engine: Place blower housing near engine so that wires can be reconnected to the stop switch.
18. 106200 engine: Connect stop switch wires to the same terminals as removed from.

Note: When connecting wires, make sure that they are routed ahead of the spark plug wire to prevent them from contacting the flywheel.

A. Top Terminal (**H**) - Red ground wire
B. Center Terminal (**J**) - Black coil wire
C. Bottom Terminal (**K**) - Black low oil sensor wire, if equipped

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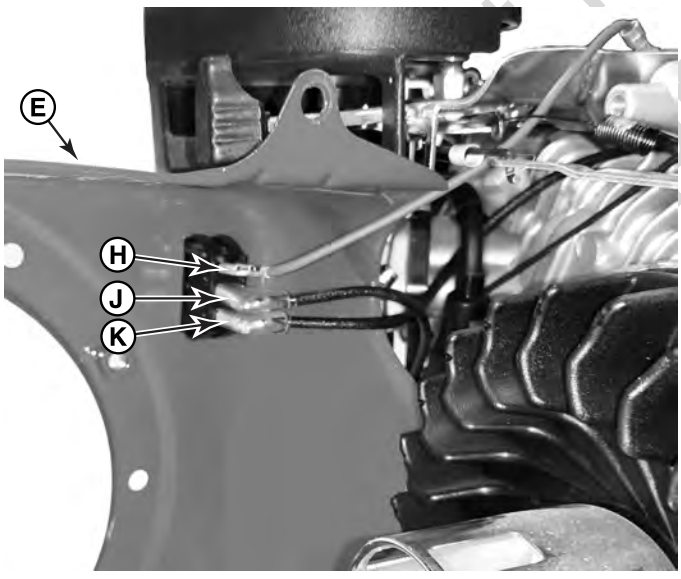


19. Carefully install blower housing (**E**) making sure that it rests flat against engine. Check to make sure that no wires are pinched between blower housing and engine. Install four screws (**D**) that attach blower housing to engine.
    10U200 engine: Secure the yellow stop switch wire with the upper right-hand screw.

    Tip: Install upper left-hand screw with a 1/4" drive rachet and extension. Be careful to not cross-thread the screw.

    Torque screws to the value listed in ***Section 13 - Engine Specifications***.
20. 10R200 and 10U200 engines: Connect the black stop switch wires located at rear of blower housing.
21. 106200 engine: Install rewind starter assembly (**G**) on blower housing (**E**) and secure using screws (**F**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
    Tip: To ensure that pawls engage in flywheel cup evenly, install screws loosely, pull starter rope, tighten screws and then release starter rope. Torque screws to the value listed in ***Section 13 - Engine Specifications***.
22. If equipped, install control panel trim (**C**) onto engine using two screws (**B**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
23. Connect spark plug wire to spark plug.

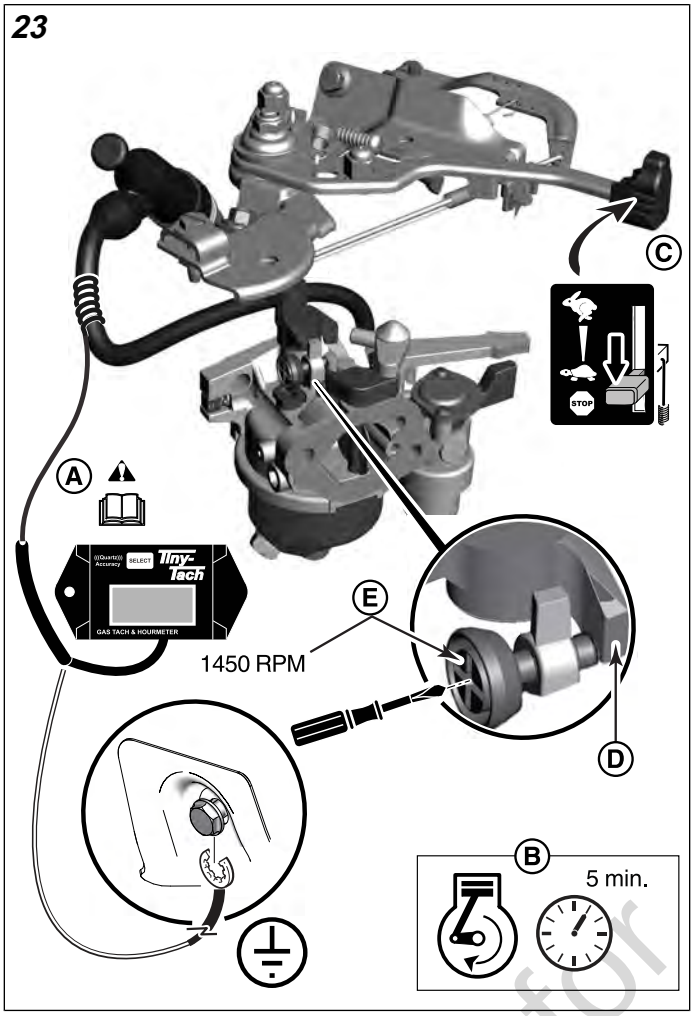
Carburetor

Note: The carburetor type can be identified by a number stamped on the edge of the mounting flange. These carburetors have a fixed high speed main jet, an adjustable idle speed and manual/remote choke and speed control.

Adjust Idle Speed

1. Attach a tachometer to the engine per the manufacturer's instructions (**A**).
   Use Digital Tachometer/Hour Meter (p/n 19598), Commercial Tachometer (p/n 795193) or the Treysit Sirometer (p/n 19200).
2. Start and run engine for five minutes to warm up engine before making adjustments (**B**).
3. Move throttle control lever to slow position (**C**).
4. Hold throttle lever (**D**) against the idle screw (**E**) while adjusting idle screw to obtain 1450 RPM.
5. Stop engine and then disconnect tachometer wires from engine.

23



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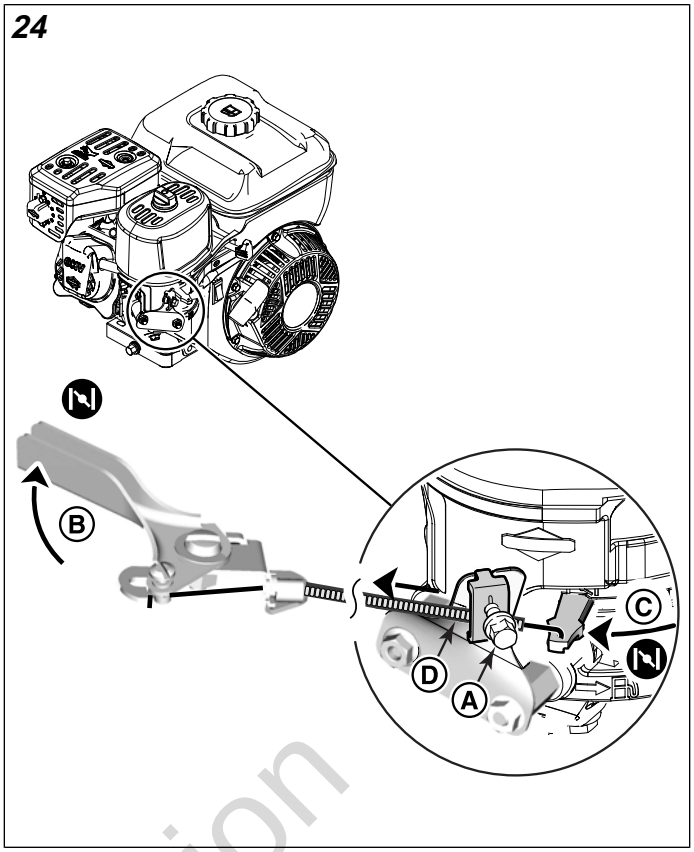

Remote Choke and Throttle Controls

Adjust Remote Choke Control - Carb Mounted

1. Loosen choke control wire casing screw (**A**) on remote choke mounting bracket.
2. Move equipment choke control lever or knob to "choke" position (**B**).
3. Move engine choke control lever to "choke" position (**C**).
4. Move choke control wire and casing (**D**) in the direction of the arrow to close choke completely.
5. Tighten casing clamp screw securely.
6. Operate choke control to confirm proper operation.

Adjust Remote Throttle Control - Control Bracket Mounted

There are two locations on the control bracket that the remote cable can be mounted. Refer to the following illustration.

1. Remove air cleaner cover and air filter as instructed in *Change Air Filter* found in this section.
2. Loosen throttle control wire casing screw (**A**) on control bracket.
3. Move equipment throttle control lever to "fast" position (**B**).
4. Move engine throttle control lever to "fast" position (**C**).
5. Move throttle control wire and casing (**D**) in the direction of the arrow until it stops.
6. Tighten casing clamp screw securely.
7. Install air filter and air cleaner cover and instructed in *Change Air Filter* found in this section.

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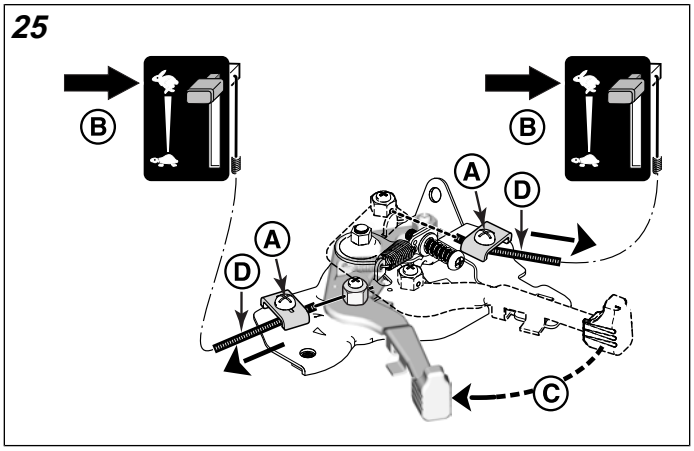

Remote Throttle Control - Carburetor Mounted

The carburetor mounted remote throttle control is not adjustable.

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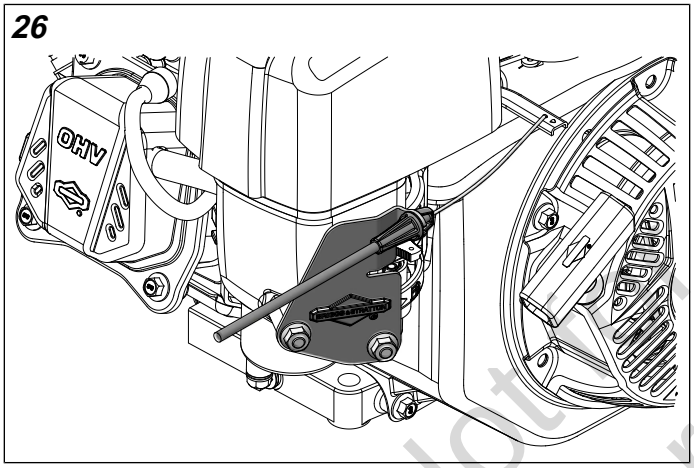

Governor

A complete governor system adjustment includes a static governor adjustment, engine warm-up, idle and/or governed idle speed adjustment, and top no-load speed adjustment. Be sure to complete all steps.

Perform Static Governor Adjustment

1. Drain fuel tank by running engine until fuel tank is empty.
2. Disconnect the spark plug wire from the spark plug.
3. Remove the air cleaner assembly as instructed in *Change Air Filter* found in this section.
4. Remove the control panel trim and fuel tank as instructed in *In-Tank Fuel Filter* found in this section.
5. Move throttle lever (**A**) to Fast position.
6. Remove nut (**B**) and screw from the governor lever. Spread clamp apart using a screwdriver. Remove and discard the governor lever.

Note: Each time the governor lever is removed, it must be replaced with a new governor lever.

7. Install nut (**B**) and screw from the previous step onto a new governor lever. Slide the new governor lever onto the governor shaft.
8. While holding governor lever (**C**) toward carburetor (wide open throttle), use the appropriate tool to rotate the governor shaft (**D**) clockwise until it stops.
9. Torque governor lever nut (**B**) to the value listed in ***Section 13 - Engine Specifications***.

NOTICE Do not allow governor arm or shaft to move while torquing governor lever nut.

10. Reinstall fuel tank, control panel trim, air cleaner assembly and spark plug wire.
11. Before starting engine, manually actuate governor lever and throttle linkage to check for binding.

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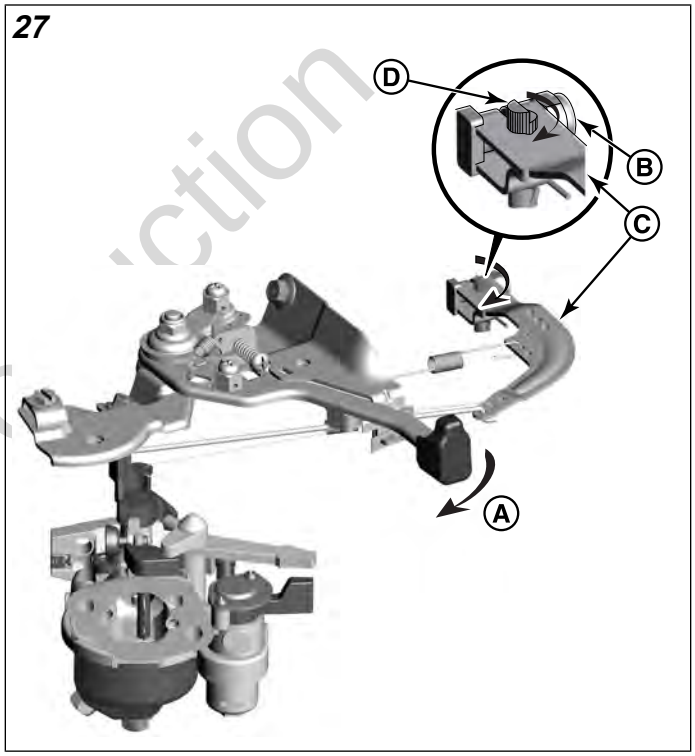

Adjust Idle Speed

Adjust the idle speed as instructed in *Carburetor, Adjust Idle Speed* found in this section.

Adjust Top No-Load Speed

1. Find the Top No-Load Speed for your engine.

Note: Correct top no-load RPM for each model-type-trim can be found at:

Dealers — www.thepowerportal.com

Consumers — Please contact your local Briggs & Stratton authorized service dealer. Have your complete model-type-trim number and code number available when calling.

2. Attach a tachometer to the engine per the manufacturer's instructions (**A**).
   Use Digital Tachometer/Hour Meter (p/n 19598), Commercial Tachometer (p/n 795193) or the Treysit Sirometer (p/n 19200).
3. Start and run engine for five minutes to warm up engine before making adjustments (**B**).
4. Move throttle control lever to fast position (**C**).
5. Adjust Top No-Load Speed adjustment screw to obtain the engine speed determined in Step 1 (**D**).

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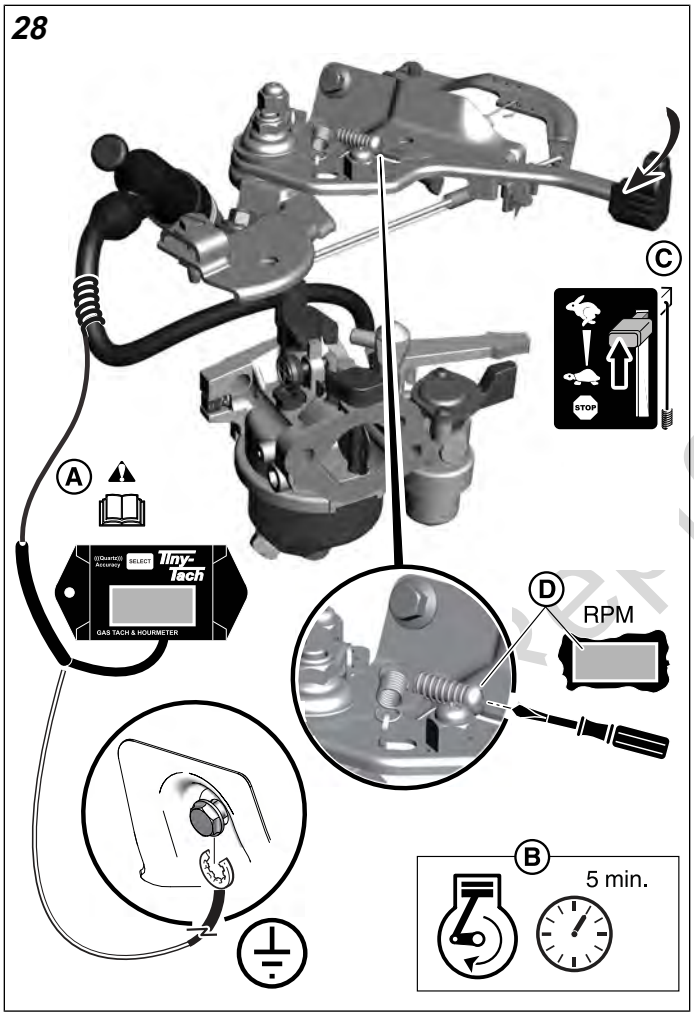

Adjust Valve Clearance

Note: Check valve clearance while the engine is cold.

1. Remove spark plug wire and spark plug.
2. Remove the four rocker cover screws and remove the rocker cover.
3. Turn crankshaft clockwise (**J**) (flywheel end) until piston (**H**) is at top dead center on the compression stroke.
4. Insert a plastic drinking straw (**B**) into the spark plug hole (**C**) as a gauge, then slowly turn crankshaft clockwise (**J**) (flywheel end) until the piston has moved down the bore 1/4” (6mm) (**G**). This prevents the compression release from holding the valves open.

Note: Do not use items as a gauge that could break in the cylinder or scratch the piston head.

5. Check valve clearance using a feeler gauge (**A**). If valve adjustment is necessary, hold rocker ball nut (**D**) with a wrench and loosen jam nut (**E**), and then adjust rocker ball nut to obtain the clearance (**F**) listed in ***Section 13 - Engine Specifications***.
6. Hold rocker ball nut (**D**) and tighten the jam nut (**E**) to the torque value listed in ***Section 13 - Engine Specifications***.
7. Check clearance again and re-adjust, if necessary.
8. Repeat for other valve.
9. Clean head and rocker cover surfaces of any debris. Install new rocker cover gasket, if necessary.
10. Install rocker cover using four screws. Torque screws to the value listed in ***Section 13 - Engine Specifications***.
11. Install spark plug and torque to the value listed in ***Section 13- Engine Specifications***.
12. Install spark plug wire onto spark plug.

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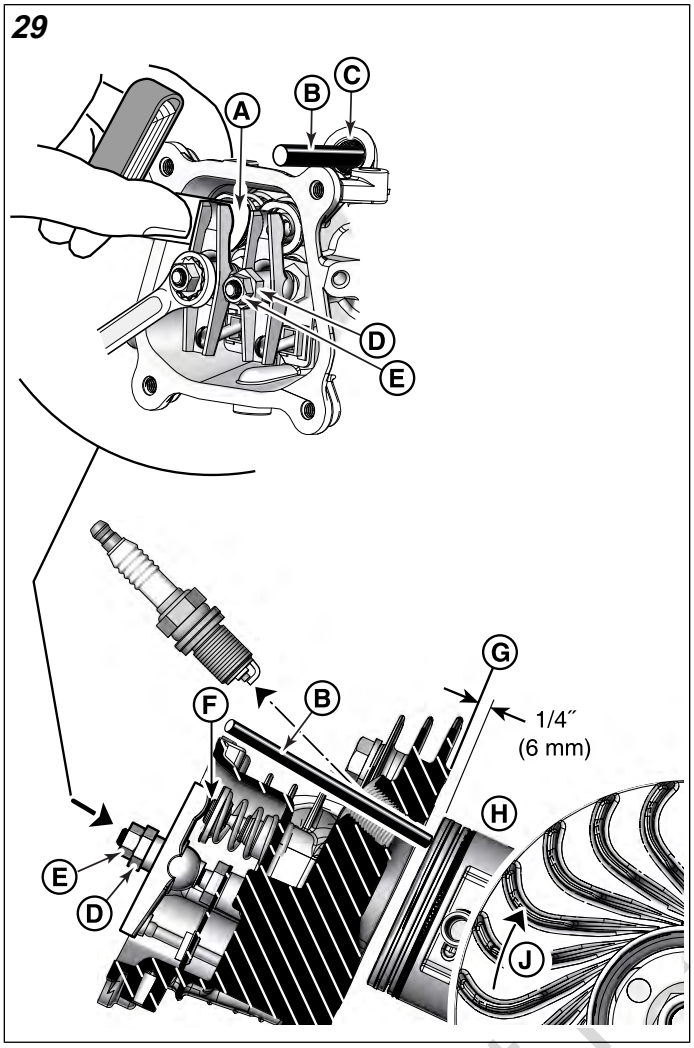

SECTION 3 – TROUBLESHOOTING

Most complaints concerning engine operation can be classified as one or a combination of the following:

- Will not start
- Hard starting
- Lack of power
- Runs rough
- Vibration
- Overheating
- High oil consumption

What appears to be a problem with the engine may actually be the fault of the equipment. Following is a list of some common engine symptoms and their relationship to equipment problems.

No Start - Hard Start

- Loose belt or blade
- Cranking under load
- Misadjusted controls
- Interlock system malfunction

Engine Will Not Stop

- Equipment stop switch not functioning
- Engine ground wire damaged or disconnected

Vibration

- Bent cutter blades
- Loose spindles and couplings
- Bent/broken deck or weldments
- Bent crankshaft
- Loose equipment mounting bolts
- Damaged or worn belts and pulleys
- Out of balance impeller

Power Loss

- Bind or drag in moving parts of equipment
- Grass build-up under deck
- No lubrication in equipment gear box
- Excessive belt tension

Once equipment sources are ruled out, the cause for most of these symptoms can be determined by performing a systems check in the following order:

1. Ignition
2. Carburetion
3. Compression

This check-up can usually be completed in a matter of minutes and is the quickest and most reliable method of determining the cause of such problems.

Check Ignition

Engine Stopped

With spark plug installed, connect Ignition Tester #19368 to spark plug lead and connect ground wire to a good ground on the engine. Make sure engine oil level is within the hatch area on the dipstick. Set throttle control to the fast or start position. Pull the starter rope or activate the electric starter (if equipped). If spark jumps the tester gap, you may assume the ignition system is functioning satisfactorily.

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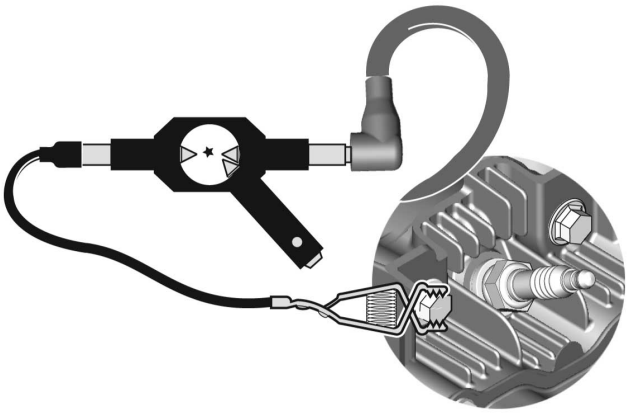

Engine Running

If engine runs but misses during operation, a quick check to determine whether the ignition is at fault can be made by installing Ignition Tester #19368 between the spark plug lead and spark plug. If spark is good but engine misses, install a new spark plug.

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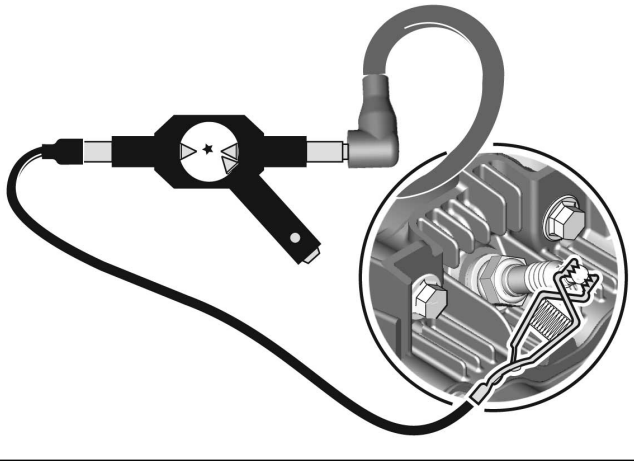

If spark does not occur, look for:

- Improperly operating interlock system

- Shorted equipment or engine stop switch wire
- Incorrect armature air gap
- Armature failure

Check Carburetion

Before making a carburetion check, be sure the fuel tank has an ample supply of fresh, clean gasoline.

Be sure the shutoff valve, if equipped, is open and fuel flows freely through the fuel line. If fuel fails to flow or is slow, check for plugged fuel cap vent, fuel line restriction or plugged fuel filter.

Be sure throttle and choke controls are properly adjusted.

If engine cranks but will not start, remove and inspect the spark plug.

If plug is wet, look for:

- Over choking
- Excessively rich fuel mixture
- Water in fuel
- Float needle valve stuck open
- Plugged air cleaner
- Fouled spark plug

If plug is dry, look for:

- Leaking carburetor or intake manifold gaskets
- Gummy or dirty carburetor, fuel filter, fuel lines or fuel tank
- Float needle valve stuck closed
- Inoperative fuel pump (if equipped)
- Inoperative fuel shut-off solenoid (if equipped)

A simple check to determine if the fuel is getting to the combustion chamber through the carburetor is to remove the spark plug and pour a small quantity of gasoline through the spark plug hole. Replace the plug. If the engine fires a few times and then stops, look for the same conditions as for a dry plug.

Check Compression

Use Leakdown Tester #19545 to check the sealing capabilities of the compression components.

Follow the instructions provided with the tester to perform the leakdown test.

Note: Any air leaks at the connections or fittings of the tester will affect the accuracy of the test.

Listen for air leaking from the cylinder head gasket, carburetor, exhaust system, and the cylinder breather tube.

- Air flowing between the cylinder and cylinder head indicates that the cylinder head gasket is leaking.
- Air flowing from the carburetor indicates air is leaking past the intake valve and seat.
- Air flowing from the exhaust system indicates air is leaking past the exhaust valve and seat.
- Air flowing from the cylinder breather tube or high oil fill dipstick tube indicates air is leaking past the piston rings.

Possible Causes for Poor Compression:

- Loose cylinder head bolts
- Damaged head gasket
- Burned valves, valve seats and/or loose valve seats
- Insufficient tappet clearance
- Warped cylinder head
- Warped valve stems
- Worn bore and/or rings
- Broken connecting rod

Equipment Used for Testing

Note: Not all testing equipment shown is used on every engine model.

Digital Multimeter

A digital multimeter is recommended for all electrical testing of Briggs & Stratton® engines. The meter can be used to read volts, ohms, amperes, and to test diodes.

Briggs & Stratton offers a clamp style multimeter (p/n 19602) that does not require use of a DC shunt. A Digital Multimeter can also be used but will require a DC shunt.

NOTICE Digital multimeters are equipped with fuses to prevent damage to the meter if the input limits are exceeded. Check the fuses if the meter displays a reading of 0.00 when testing DC Volts output.

DC Shunt

The Fluke® meter will withstand DC input of 10 - 20 amps for up to 30 seconds.

The UNI-T® meter will withstand DC input of 10 amps for up to 10 seconds.

When checking DC output on 10 and 16 amp regulated systems, the DC Shunt #19468 is required to avoid blowing a fuse in either of the meters.

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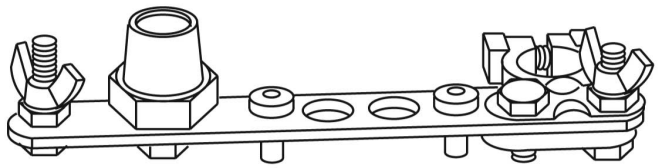

Tachometer

Tachometer p/n 19200 (**A**) or p/n 19598 (**B**) are available from your Briggs & Stratton source of supply.

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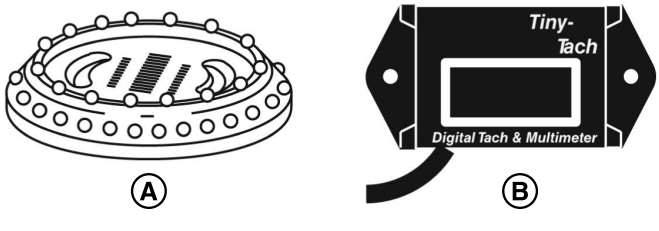

Starter Motor Test Fixture

A starter motor test fixture may be made from 1/4” (6 mm) steel stock.

1. Drill two 3/8” (10 mm) holes for starter mounting bracket (**B**).
2. Using same spacing, drill an additional 3/8” (10 mm) hole (**A**) for alternate starter mounting position.
3. Using a #7 bit, drill two holes for mounting Tachometer #19200. Tap the holes for 1/4-20 NC screws (**C**).

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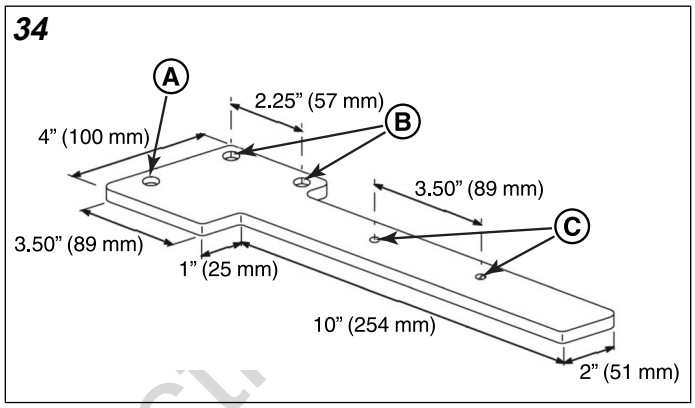

Other Equipment

A growler or armature tester (checks armature for continuity, shorts, and opens) is available from an Automobile Diagnostic Service supplier.

Also, a known good 12 Volt battery is required when testing starting systems or alternators.

Low Oil Sensor System

Engine Will Not Start

1. Check engine oil level. If oil level is between ADD and FULL, proceed to Step 2. If low, add oil until level is between ADD and FULL mark on dipstick. If engine starts and runs the problem is corrected.
2. Disconnect module wire from sensor wire as shown. Use Digital Multimeter #19602 to check resistance.

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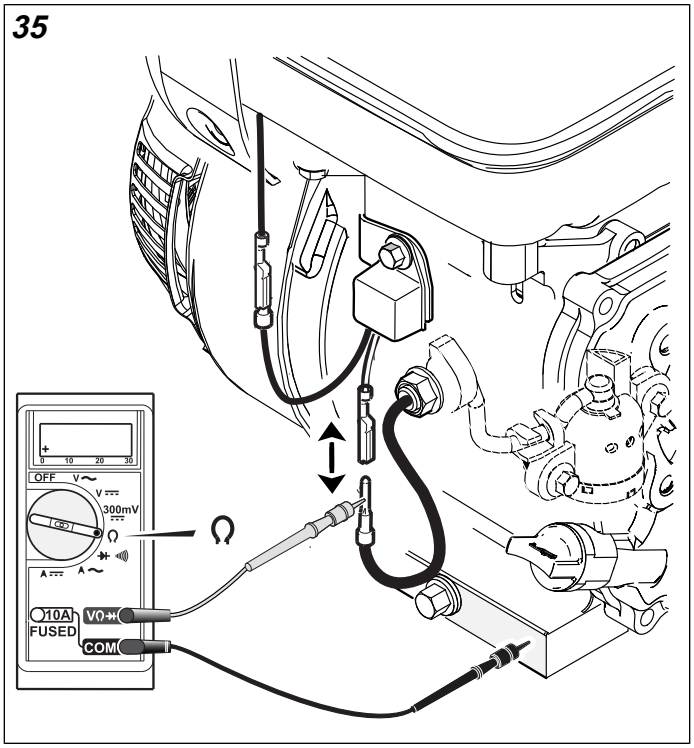

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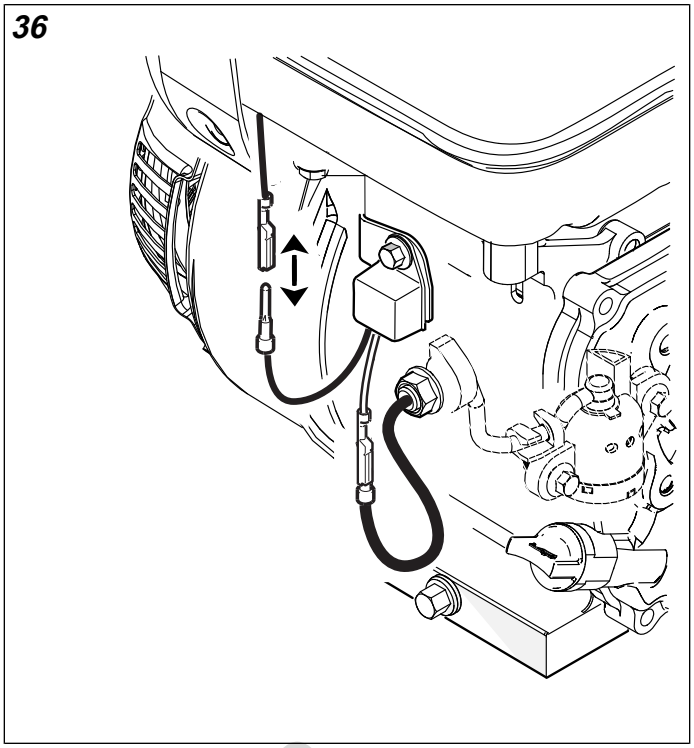

3. Rotate selector to (Ohms) position.
4. Insert RED test lead into the V Ω receptacle in the meter.
5. Insert BLACK test lead into COM receptacle.
6. Connect either test lead to sensor wire.
7. Connect other test lead to base of cylinder. If meter reads "near zero" resistance, replace sensor in cylinder. If meter reads more than "near zero" resistance, proceed to Step 8.
8. Reconnect module wire to sensor wire.
9. Disconnect module wire to wire harness.
10. With module wire disconnected and not touching ground, try to start the engine. If engine starts, replace module. If engine does not start, check Low Oil Sensor System wiring for shorts to ground. Repair as needed.

SECTION 4 – FUEL SYSTEM AND CARBURETION

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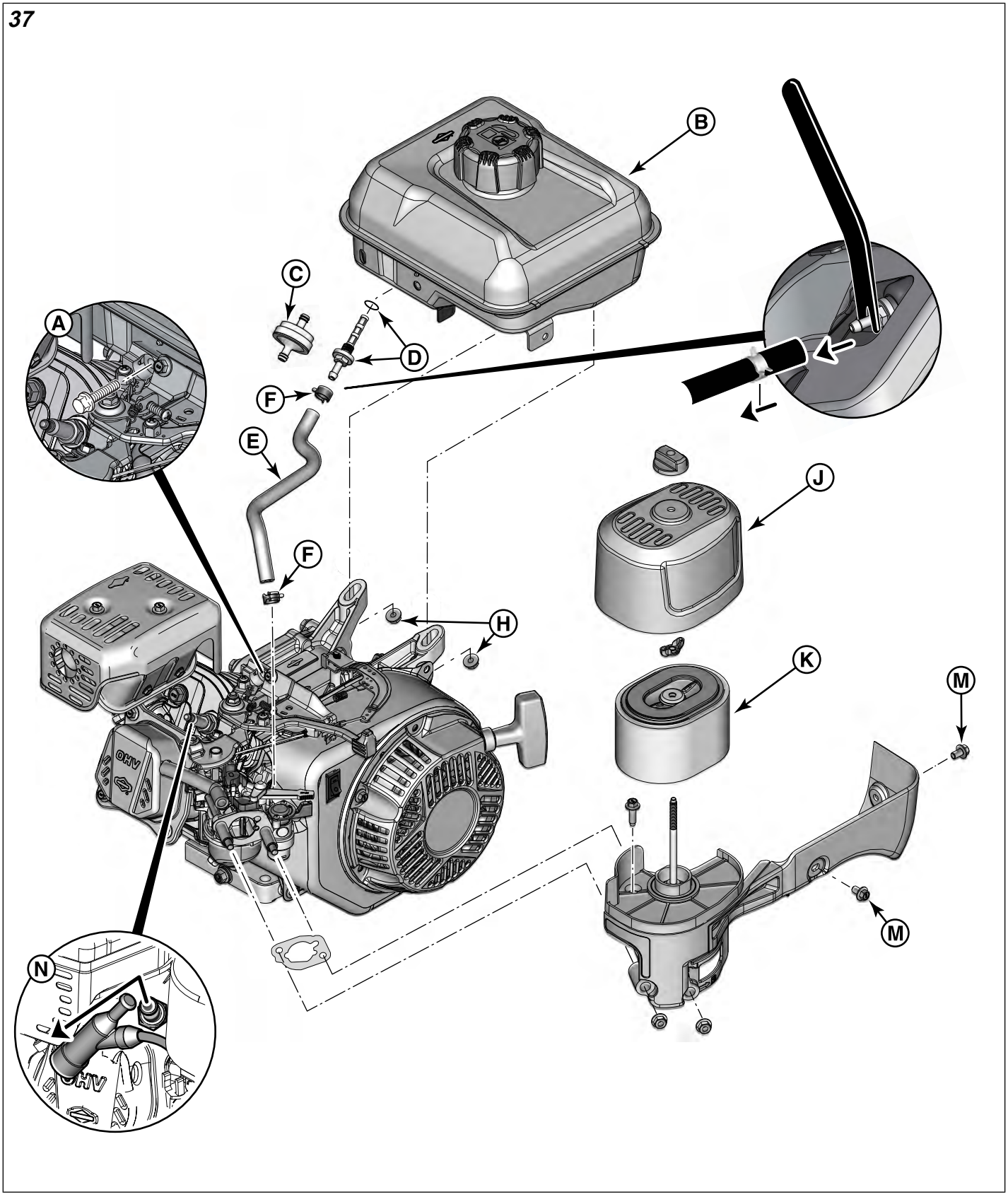


WARNING

Fuel and its vapors are extremely flammable and explosive.

Fire or explosion can cause severe burns or death.

When Adding Fuel

- Turn engine OFF and let engine cool at least 2 minutes before removing the fuel cap.
- Fill fuel tank outdoors or in well-ventilated area.
- Do not overfill fuel tank. To allow for expansion of the fuel, do not fill above the bottom of the fuel tank neck.
- Keep fuel away from sparks, open flames, pilot lights, heat, and other ignition sources.
- Check fuel lines, tank, cap, and fittings frequently for cracks or leaks. Replace if necessary.
- If fuel spills, wait until it evaporates before starting engine.

When Starting Engine

- Ensure that spark plug, muffler, fuel cap and air cleaner (if equipped) are in place and secured.
- Do not crank engine with spark plug removed.
- If engine floods, set choke (if equipped) to OPEN / RUN position, move throttle (if equipped) to FAST position and crank until engine starts.

When Operating Equipment

- Do not tip engine or equipment at angle which causes fuel to spill.
- Do not choke the carburetor to stop engine.
- Never start or run the engine with the air cleaner assembly (if equipped) or the air filter (if equipped) removed.

When Changing Oil

- If you drain the oil from the oil fill hole (not recommended), the fuel tank must be empty or fuel can leak out and result in a fire or explosion.

When Transporting Equipment

- Transport with fuel tank EMPTY or with fuel shut-off valve OFF.

When Storing Fuel Or Equipment With Fuel In Tank

- Store away from furnaces, stoves, water heaters or other appliances that have pilot lights or other ignition sources because they can ignite fuel vapors.

Remove Fuel Tank

1. Drain fuel tank (**B**) by running engine until fuel tank is empty.
2. Disconnect spark plug wire from spark plug (**N**). Secure spark plug wire away from spark plug.
3. Remove the air cleaner cover (**J**) and air filter (**K**). For detailed instructions and air cleaner variations, refer to *Change Air Filter* found in Section 2.
4. If equipped, remove the control panel trim screws (**M**) and then remove the control panel trim.
5. Remove two nuts (**H**) from fuel tank.
6. Remove screw (**A**) from opposite side of fuel tank.
7. Lift fuel tank and slide fuel line clamp (**F**) away from fuel filter (**D**). Remove fuel line (**E**) with fuel line removal tool (p/n 19600). For in-line fuel filters (**C**), remove clamps and fuel lines from both sides of filter. For detailed instructions, refer to *In-Tank Fuel Filter* or *In-Line Fuel Filter* found in Section 2.
8. Remove in-tank fuel filter and O-ring (**D**) from fuel tank (**B**).

Inspect Fuel Tank

1. Clean gummy or dirty fuel tanks with Briggs & Stratton Carburetor Cleaner #100041 or #100042, or equivalent.
2. Inspect fuel tank for:
   - Corrosion
   - Leaks
   - Broken mounting brackets
3. Check fuel cap and filler neck for:
   - Proper seals
   - Vents
4. Check in-tank fuel filter for dirt or debris; clean or replace as necessary.

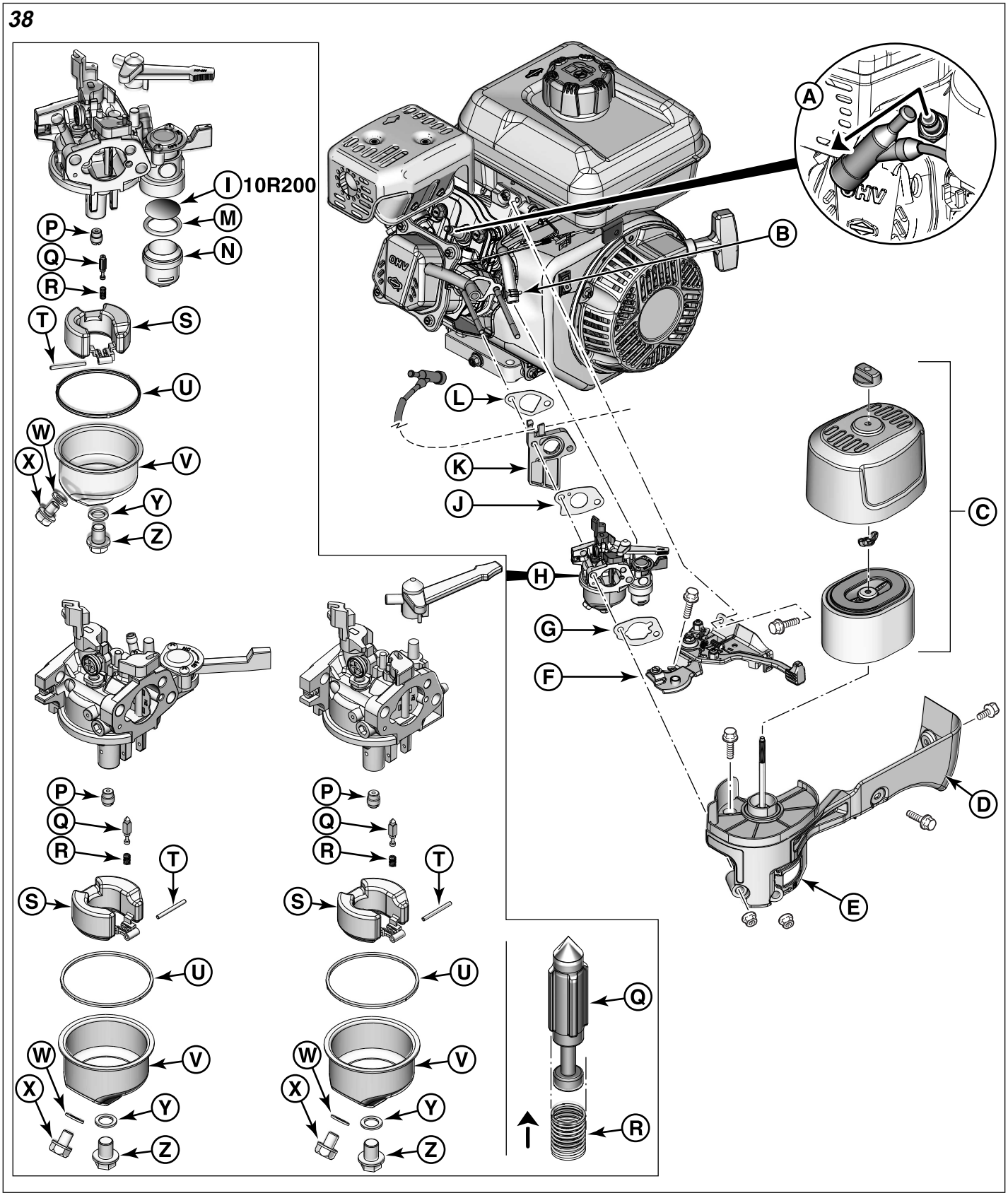
Note: Always replace in-line fuel filters; do not attempt to clean and reuse.

5. Check the fuel line(s) for cracks or leaks; replace if necessary.

Install Fuel Tank

1. Install cleaned or new in-tank fuel filter and O-ring (**D**) into fuel tank (**B**) and torque to the value listed in ***Section 13 - Engine Specifications***. For in-line fuel filters (**C**), install a new fuel filter between fuel lines and secure with clamps. Make sure arrow on fuel filter points in the direction of fuel flow. For detailed instructions, refer to *In-Tank Fuel Filter* or *In-Line Fuel Filter* found in Section 2.

2. Install fuel line (**E**) with clamp (**F**) onto in-tank fuel filter (**D**) or fuel tank fitting (in-line fuel filter applications). Make sure clamp retains fuel line securely.
3. Install fuel tank (**B**) onto engine. Install screw (**A**) and nuts (**H**). Torque screw and nuts to the values listed in ***Section 13 - Engine Specifications***.
4. If equipped, install control panel trim and secure with screws (**M**). Torque screws to the value listed in ***Section 13 - Engine Specifications***
5. Install the air filter (**K**) and air cleaner cover (**J**). For detailed instructions and air cleaner variations, refer to *Change Air Filter* found in Section 2.
6. Reconnect the spark plug wire to the spark plug (**N**).
7. Partially fill tank with fuel and check for leaks; repair as necessary.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Carburetor and Carburetor Overhaul Kit

Consult the Illustrated Parts List for the correct carburetor and carburetor overhaul kit for your engine.

Remove Carburetor

WARNING

Before servicing the carburetor or other fuel system components, drain fuel tank by running engine until fuel tank is empty and turn OFF the fuel valve (if equipped).

Do not attempt to stop the fuel flow by plugging the fuel hose.

4

1. Disconnect spark plug wire from spark plug (**A**). Secure spark plug wire away from spark plug.
2. Remove air cleaner assembly (**C**), control panel trim (**D**) if equipped, air cleaner base (**E**) and control bracket (**F**) as instructed in *Remove Control Bracket* found in Section 5.
3. Slide fuel line clamp (**B**) away from carburetor (**H**). Remove fuel line from carburetor fitting with fuel line removal tool (p/n 19600).
4. Carefully slide carburetor away from engine. Then remove the spring (**AB**) and linkage (**AC**) from the throttle lever (**AA**) shown in the following illustration.

Note: Linkage slides straight up and out from groove of throttle lever when at idle.

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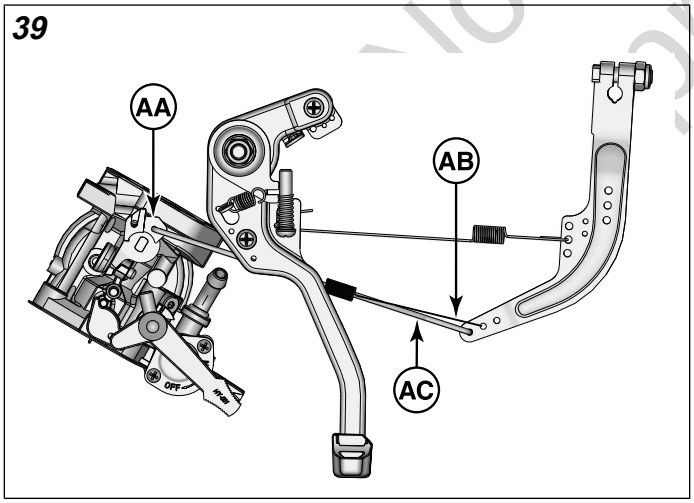

5. Slide carburetor completely off of studs.

Disassemble Carburetor

1. Place a container under the carburetor bowl and remove the drain plug (**X**) and washer (**W**).
2. Remove bowl nut (**Z**) and metal or fiber washer (**Y**) and then remove the bowl (**V**) and rubber gasket (**U**). Discard the fiber washer (if equipped), and rubber gasket.
3. Remove float hinge pin (**T**) and then remove the float (**S**).
4. Remove inlet needle (**Q**) and spring (**R**) from float.
5. Remove main jet (**P**) from carburetor.
6. If equipped, remove sediment bowl (**N**), seal (**M**), and fuel filter (**I**, 10R200 only) from carburetor.

Inspect and Clean Carburetor

1. Inspect openings in the carburetor body for evidence of wear or damage. If found, replace the entire carburetor assembly.
2. Inspect choke shaft, choke valve, throttle shaft, and throttle valve for evidence of wear or damage. Replace parts as necessary.
3. Using Carb/Choke Cleaner p/n 100041, p/n 100042 or ultrasonic cleaner, thoroughly clean the following components, and then follow with compressed air to dry:

   - Passages in the main jet
   - Inside and outside of the fuel bowl
   - Inside and outside of the sediment bowl
   - Float
   - Choke shaft and choke valve
   - Throttle shaft and throttle valve
   - All passages, openings, and the inside and outside of the carburetor body

NOTICE Do not soak the carburetor or non-metallic components, such as floats or seals in carb/choke cleaner or they will be damaged.

4. 10R200 engine: There is a fuel filter screen in the sediment bowl. Check fuel filter screen for dirt or debris; clean or replace as necessary.
5. If any passages remain plugged after cleaning, replace the component or the entire carburetor assembly.

Assemble Carburetor

Consult the Illustrated Parts List to obtain the appropriate carburetor overhaul kit before reassembling the carburetor.

1. If equipped, install sediment bowl (**N**), seal (**M**), and fuel filter (**I**, 10R200 only) onto carburetor.
2. Install main jet (**P**) into carburetor. Tighten main jet securely, but do not over-tighten.
3. Install new inlet needle (**Q**) and spring (**R**) onto float (**S**).

4. Install float and then install the float hinge pin (**T**).
5. Install new rubber gasket (**U**), bowl (**V**), old metal or new fiber washer (**Y**) and bowl nut (**Z**).

Note: Make sure rubber gasket is seated properly in groove of carburetor.

Torque bowl nut to the value listed in ***Section 13 - Engine Specifications***.

6. Install drain plug (**X**) and washer (**W**). Torque drain plug to the value listed in ***Section 13 - Engine Specifications***.

Install Carburetor

Note: Always replace air cleaner gaskets and carburetor mounting gaskets any time the carburetor has been removed for service.

1. If not already Installed, slide gasket (**L**) and carburetor spacer (**K**) onto studs.

Note: Make sure gasket is properly orientated on carburetor. An improperly orientated gasket will cause poor engine performance. Refer to illustration at the beginning of the carburetor section.

2. Slide new gasket (**J**) and carburetor (**H**) onto studs only far enough so that linkage (**AC**) can be installed onto throttle lever (**AA**). Refer to the following illustration. Once linkage is installed, slide the carburetor completely onto studs until it is against the engine. Slide new gasket (**G**) onto studs.

Note: Make sure gasket is properly orientated on carburetor. An improperly orientated gasket will cause poor engine performance. Refer to illustration at the beginning of the carburetor section.

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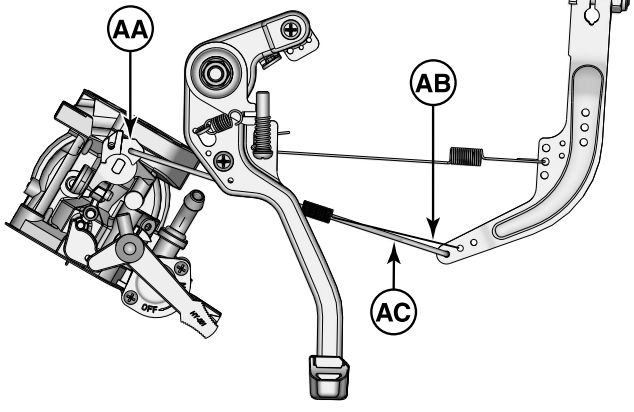

3. Install spring (**AB**) onto throttle lever (**AA**).
4. Install fuel line (**B**) with clamp onto carburetor fitting. Make sure clamp retains fuel line securely.
5. Install control bracket (**F**) and air cleaner base (**E**) as instructed in *Install Control Bracket* found in Section 5.
6. Perform static governor adjustment as instructed in *Perform Static Governor Adjustment* found in Section 2.
7. Install control panel trim (**D**) if equipped, as instructed in *Install Control Bracket* found in Section 5.
8. Install air cleaner assembly (**C**) as instructed in *Change Air Filter* found in Section 2.
9. Connect spark plug wire to spark plug (**A**).

SECTION 5 – CONTROLS AND GOVERNOR SYSTEM

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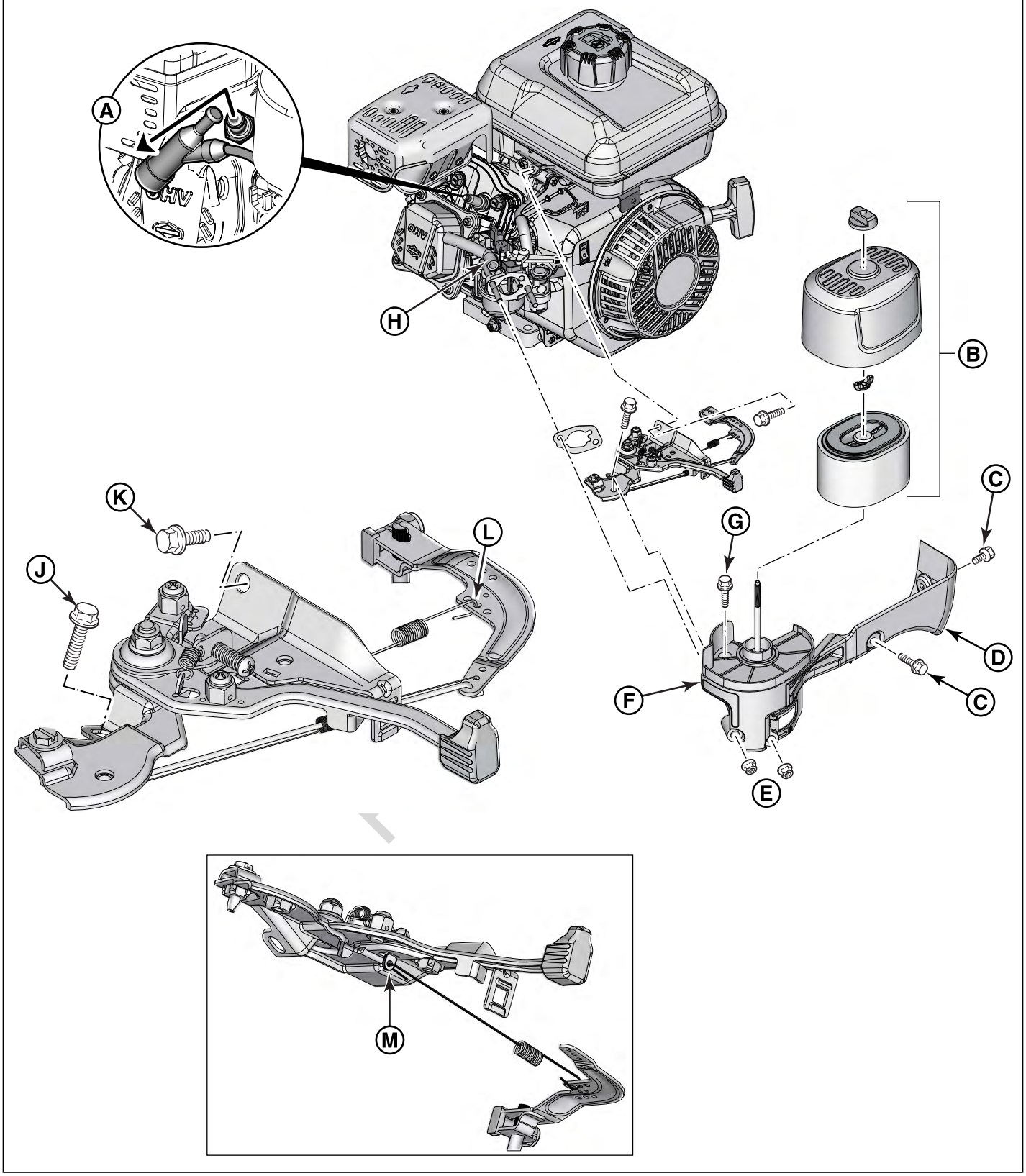

Remove Control Bracket

1. Disconnect spark plug wire from spark plug (**A**). Secure spark plug wire away from spark plug.
2. Remove air cleaner cover and air filter (**B**) as instructed in *Change Air Filter* found in Section 2.
3. For engines equipped with a control panel trim (**D**), remove two screws (**C**) and then remove the control panel trim from the engine.
4. Remove breather tube (**H**) from air cleaner base (**F**).
5. Remove two nuts (**E**) and one screw (**G**) and then remove the air cleaner base from the engine.
6. Remove the remote throttle control cable from the control bracket, if equipped.
7. Disconnect the ground wire from the control bracket stop switch terminal, if equipped.
8. Remove two control bracket screws (**J**) and (**K**).
9. Remove the governor spring from the throttle lever (**M**).

Note: If removing the opposite end of the governor return spring (**L**) from the engine, mark the hole that it is in for reassembly.

Install Control Bracket

1. Connect the governor spring to the throttle lever (**M**).

Note: If the opposite end of the governor spring (**L**) was removed from the engine, connect it to the marked hole that it was removed from.

2. Install control bracket using two screws (**J**) and (**K**). Install ground wire under screw (**K**), (106200 engine only). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
3. If equipped, install the remote throttle control cable to the bracket as instructed in *Adjust Remote Throttle Control* found in Section 2.
4. If equipped, connect the ground wire to the control bracket stop switch terminal.
5. Install air cleaner base (**F**) onto engine using two nuts (**E**) and one screw (**G**). Torque nuts and screw to the value listed in ***Section 13 - Engine Specifications***.
6. Install breather tube (**H**) onto air cleaner base.
7. Perform static governor adjustment as instructed in *Perform Static Governor Adjustment* found in Section 2.
8. If equipped, install control panel trim (**D**) onto engine using two screws (**C**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
9. Install air filter and air cleaner cover (**B**) as instructed in *Change Air Filter* found in Section 2.

Note: Instructions for all air cleaner configurations are found in Section 2.

10. Connect spark plug wire to spark plug (**A**).

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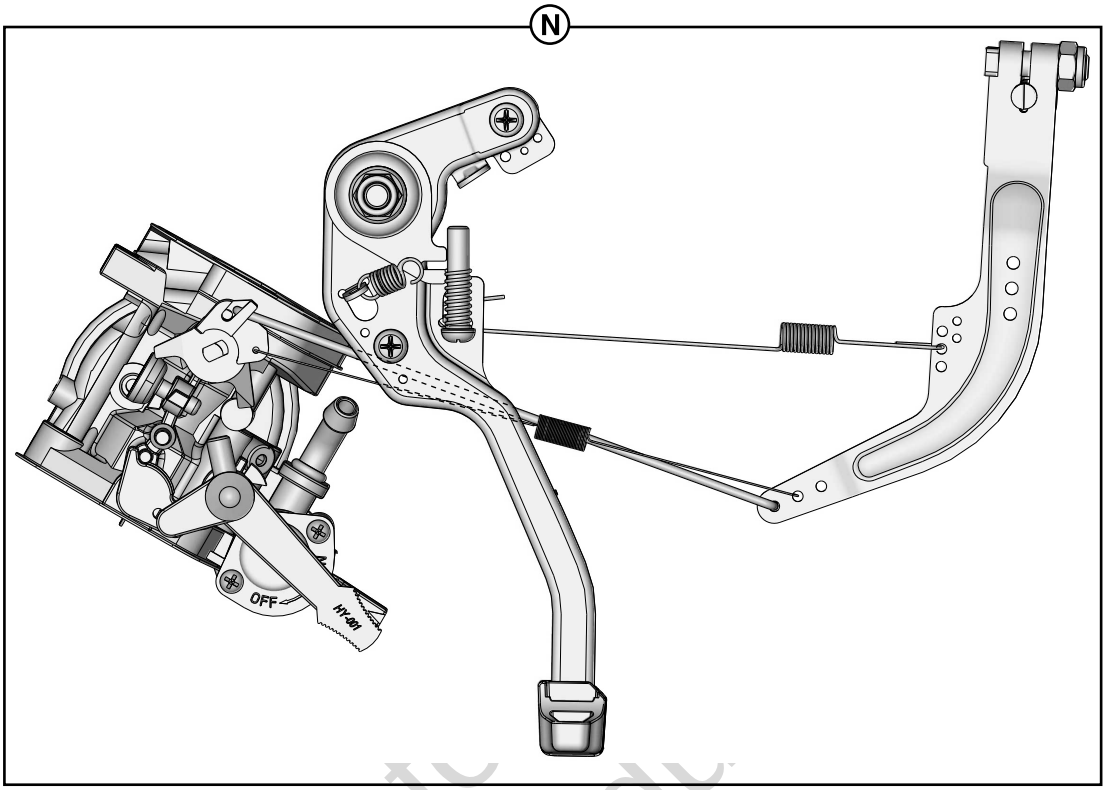

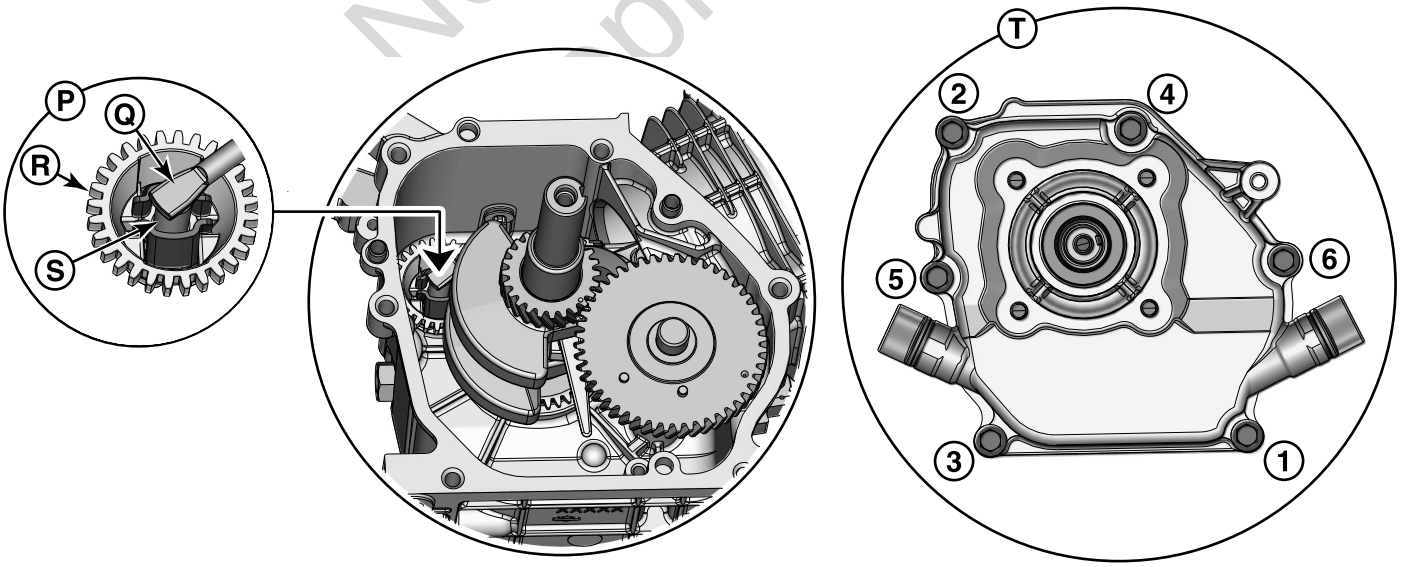

Be sure to note orientation of linkages and springs (N) before removing.

Top No-Load Speed

Briggs & Stratton supplies engines with an adjustable top no-load speed, which the equipment manufacturers set to their own specifications. Do not exceed these limitations.

Note: Correct top no-load speed for each model-type-trim can be found at:

- Dealers — www.thepowerportal.com
- Consumers — Please contact your local Briggs & Stratton authorized service dealer. Have your complete model-type-trim number and code number available when calling.

Top no-load speed should be checked with a tachometer when the engine is operating on a completely assembled unit. The equipment should be operated under no-load when making this check.

If a governor spring must be replaced, consult the appropriate Illustrated Parts List for the correct part number. After the spring is installed, check the top no-load speed with an accurate tachometer, as noted above, and adjust as required. Refer to *Adjust Top No-Load Speed* found in Section 2.

Disassemble

1. Drain oil from engine. Refer to *Change Oil* found in Section 2.
2. Disconnect spark plug wire from spark plug. Secure spark plug wire away from spark plug.
3. Remove breather hose (**D**), rocker cover (**E**) and gasket (**G**) as instructed in *Remove Breather* found in Section 6.
4. Remove rocker arms (**T**) and push rods (**V**) as instructed in *Remove Cylinder Head* and *Disassemble Cylinder Head* found in Section 7.
5. Remove burrs and clean crankshaft (**J**), then remove crankcase cover (**D**) and gasket (**C**). See illustration entitled *CRANKSHAFT AND CAMSHAFT* in Section 9.
6. Remove camshaft (**K**) and tappets (**U**) as instructed in *Remove Crankshaft and Camshaft* found in Section 9.

Inspect

1. Rotate governor crank (**Q**) away from governor gear assembly (**P**).
2. Check governor crank for excessive wear or damage; replace if necessary.
3. Check governor cup (**S**) for cracks or breaks; replace if necessary.
4. Check governor gear (**R**) for chipped or damaged teeth.

Note: If the governor gear assembly is damaged, the engine must be replaced. There are no replacement parts available.

Assemble

1. Rotate governor crank (**Q**) until paddle contacts cup (**S**).
2. Install tappets (**U**) and camshaft (**K**) as instructed in *Install Crankshaft and Camshaft* found in Section 9.
3. Check mating surfaces of crankcase cover and cylinder housing for burrs. Remove all burrs and make sure surfaces are clean.
4. **Note**: References for this step are found in the illustration at the beginning of Section 8. Install crankshaft cover (**B**) and gasket (**C**). Make sure cover slides over locating pins (**D**) and rests flat against the cylinder housing.
5. Install and step-torque screws in the sequence shown to avoid damage to the crankcase cover. Torque screws to the value listed in ***Section 13 - Engine Specifications***.
6. Install push rods (**V**) and rocker arms (**T**) as instructed in *Install Cylinder Head* found in Section 7.
7. Adjust valve clearance as instructed in *Adjust Valve Clearance* found in Section 2.
8. **Note**: References for this step are found in the illustration at the beginning of Section 7. Install rocker cover (**J**) with a new rocker cover gasket (**K**). Step-torque screws in the sequence shown until final torque value is achieved. Torque screws to value listed in ***Section 13 - Engine Specifications***.
9. Connect spark plug wire to spark plug.
10. Fill engine with oil. Refer to *Change Oil* found in Section 2.
11. Adjust governor system as instructed in *Governor* found in Section 2.

SECTION 6 – LUBRICATION SYSTEM

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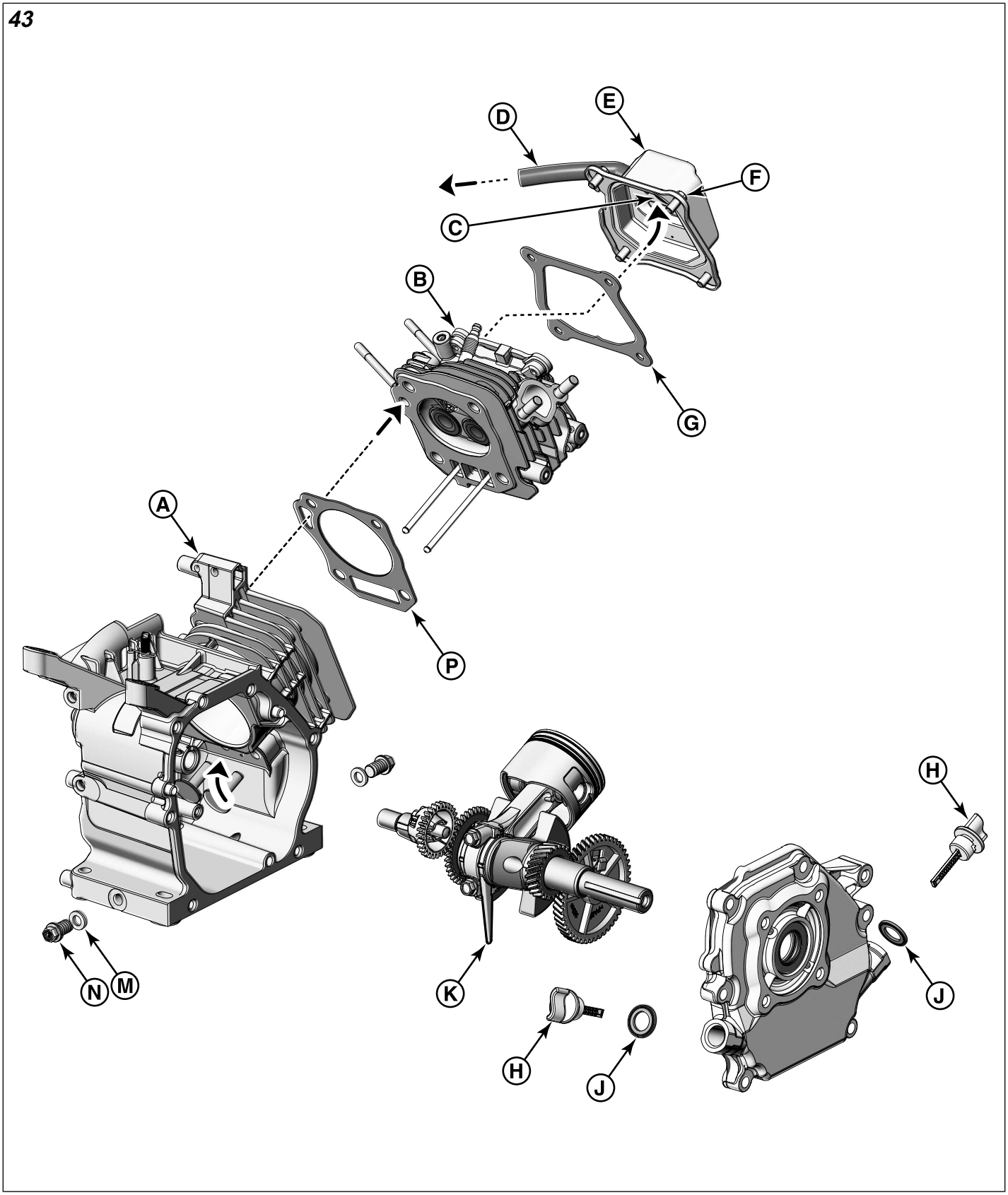


Breathers

Briggs & Stratton engines utilize a breather valve (**C**) to control and maintain cylinder vacuum. The breather valve is a fiber disc or reed which closes on the piston up stroke and opens on the piston down stroke.

The breather is located inside the rocker cover.

Service Breather

Remove Breather

1. Disconnect breather hose (**D**) from air cleaner base.
2. Remove rocker cover (**E**) with breather hose (**D**). Remove and discard gasket (**G**).

Check Breather

1. Gently blow air into the breather hose (**D**). There should be no air flow through the valve.
2. Apply vacuum to the breather hose. Air should flow freely through the valve.
3. If air flow is restricted under vacuum at the breather hose, or has no resistance when blowing on the breather hose, replace the rocker cover.

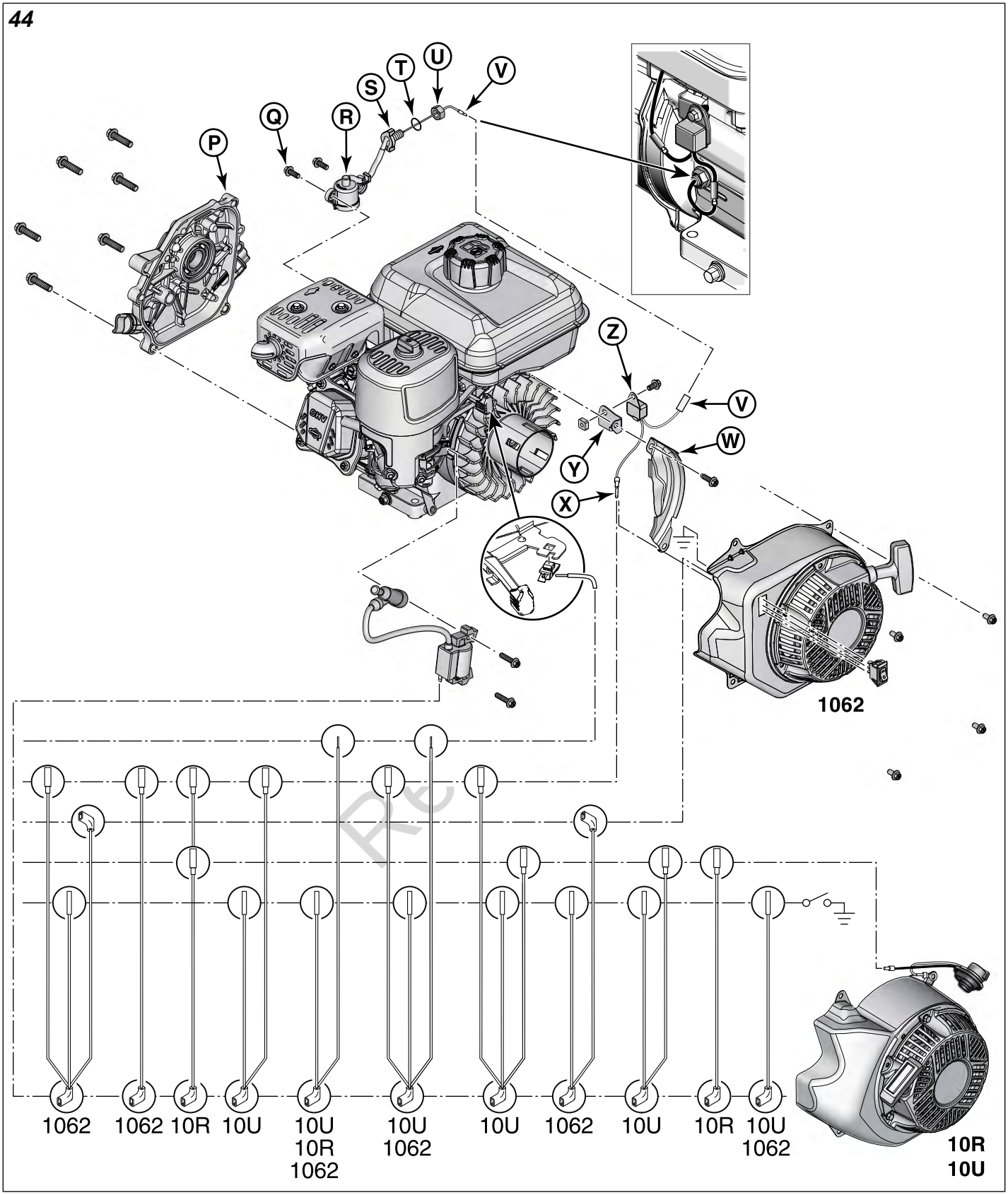
Install Breather

1. Slide breather hose (**D**) completely onto hose connection on air cleaner base.
2. Place new gasket (**G**) and rocker cover (**E**) on cylinder head (**B**).
3. Install four screws (**F**) and torque to values listed in ***Section 13 - Engine Specifications***.
4. Securely insert other end of breather hose (**D**) into hole in rocker cover (**E**).

Lubrication System

This engine is splash lubricated. The dipper (**K**) is integral to the rod cap.

Inspect the dipper for evidence of bending, cracking, or looseness. Replace if necessary following instructions in ***Section 8 - Piston, Rings, and Connecting Rod***.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Low Oil Sensor System

The Low Oil Sensor System consists of:

- Oil Sensor (**R**) (located inside cylinder)
- Oil Sensor Module (**Z**)
- Mounting Bracket (**Y**)

If the oil level is low, the oil sensor will close. The engine cannot be restarted until sufficient oil is added.

Identification

The *Low Oil Sensor System* will stop a running engine if the oil level runs below the ADD level on the dipstick. The engine can be restarted, but will only run briefly.

Troubleshooting

In engines equipped with a *Low Oil Sensor system*, if the engine halts during operation, or will not remain running upon starting, check oil level. if oil level is at FULL and engine continues to halt, the module is faulty or the internal cylinder float is sticking. See *Low Oil Sensor System* found in Section 3.

Remove Oil Sensor

1. Remove spark plug wire from the spark plug and then remove the spark plug.
2. Drain oil from engine and all fuel from fuel tank.
3. If removing the oil sensor module bracket (**Y**) and flywheel guard (**W**), refer to *Remove Flywheel* found in Section 9.
4. Remove crankcase cover (**P**) and camshaft as instructed in *Remove Crankshaft and Camshaft* found in Section 9.

Note: Prior to removing camshaft, align timing marks on crankshaft and camshaft.

Note: When removing camshaft, be careful that tappets do not slide out of their respective holes.

5. Disconnect wires at connections (**V**) and (**X**).
6. Rotate crankshaft to move counterweights away from the oil sensor fitting (**S**).
7. Remove nut (**U**) from oil sensor assembly (**R**) and then remove the oil sensor fitting from hole in cylinder housing.
8. Remove two screws (**Q**) and then remove the oil sensor assembly from the cylinder housing.

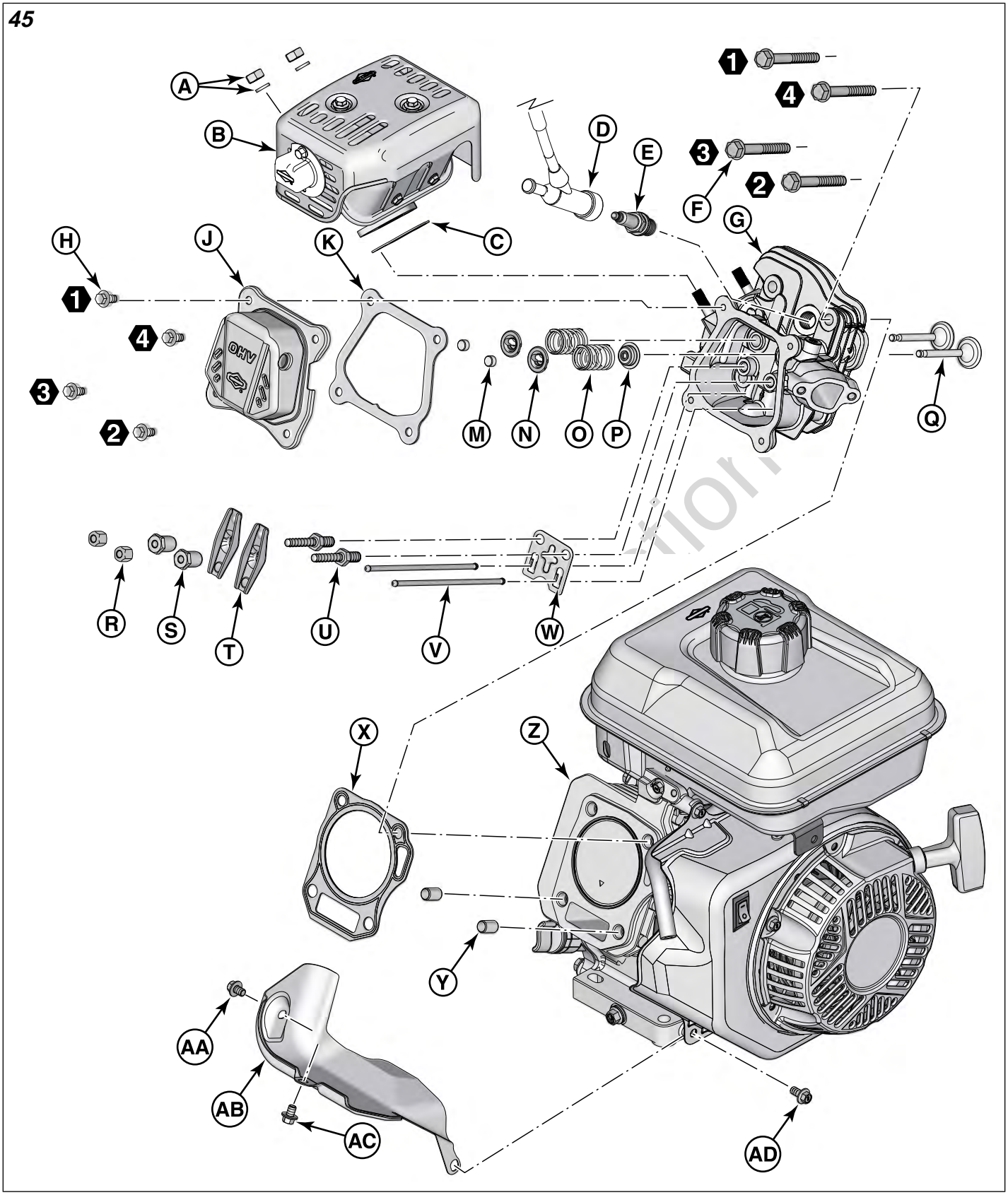
Install Oil Sensor

1. Make sure that the rubber washer (**T**) is installed on the oil sensor fitting (**S**). Insert wire connector (**V**) and oil sensor fitting through inside wall of cylinder housing.
2. Rotate oil sensor fitting back and forth to make sure rubber washer is seated against cylinder housing. Install nut (**U**) onto oil sensor fitting and torque to the value listed in ***Section 13 - Engine Specifications***.
3. Install oil sensor (**R**) using two screws (**Q**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
4. Install camshaft and crankcase cover (**P**) as instructed in *Install Crankshaft and Camshaft* and *Install Crankcase cover* found in Section 9.
5. If oil sensor module (**Z**) is installed on the engine, connect wires at connections (**V**) and (**X**). If oil sensor module is not installed on the engine, do not install it at this time.

Note: The oil sensor module and flywheel guard is installed later in Section 9.

6. Check valve clearance as instructed in *Adjust Valve Clearance* found in Section 2. Adjust valve clearance if necessary.
7. Fill engine with oil. Refer to *Change Oil* found in Section 2.
8. Install spark plug by hand and tighten finger tight. Then torque to the value listed in ***Section 13 - Engine Specifications.***
9. Connect the spark plug wire.

SECTION 7 – CYLINDER HEAD AND VALVES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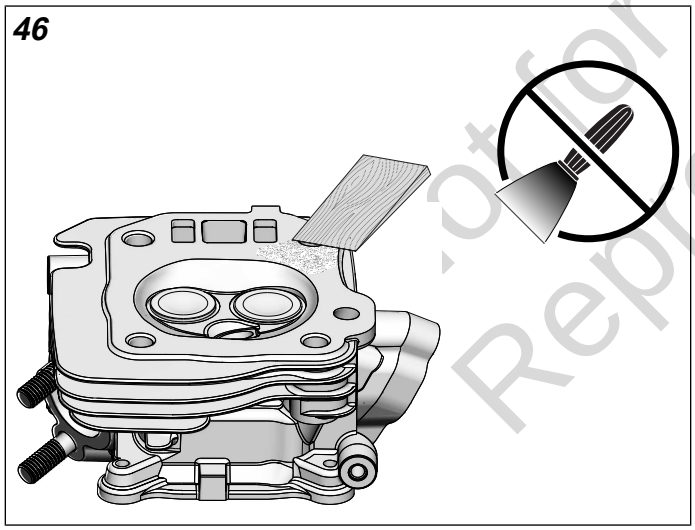
Remove Cylinder Head

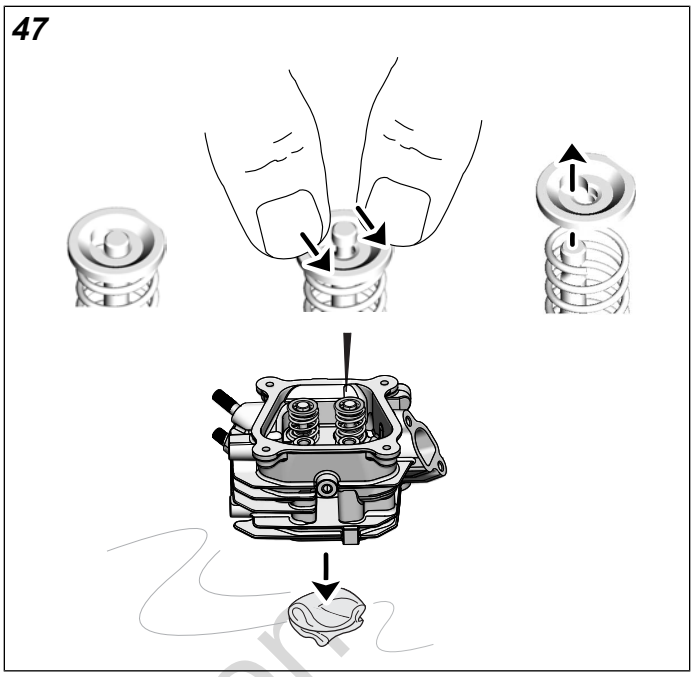
1. Remove four screws (**H**) from rocker cover (**J**), then remove cover and gasket (**K**).
2. Remove three screws (**AA**), (**AC**) and (**AD**) from cylinder head shield (**AB**).
3. Remove two nuts (**A**) from muffler (**B**), then remove muffler and gasket (**C**).
4. Using a plastic scraping tool, carefully clean all traces of muffler gasket from the head and muffler mating surfaces.
5. Remove control bracket as instructed in *Remove Control Bracket* found in Section 5.
6. Remove carburetor as instructed in *Remove Carburetor* found in section 4.
7. Remove and mark the four cylinder head screws (**F**) for reinstallation. Each cylinder head screw must be installed into the same hole as removed from.
8. Remove head (**G**) and gasket (**X**) from cylinder.
9. Remove push rods (**V**) one at a time, marking the location and orientation of each for proper installation later.
10. Using a plastic scraping tool, carefully clean all traces of head gasket from the head and cylinder mating surfaces.

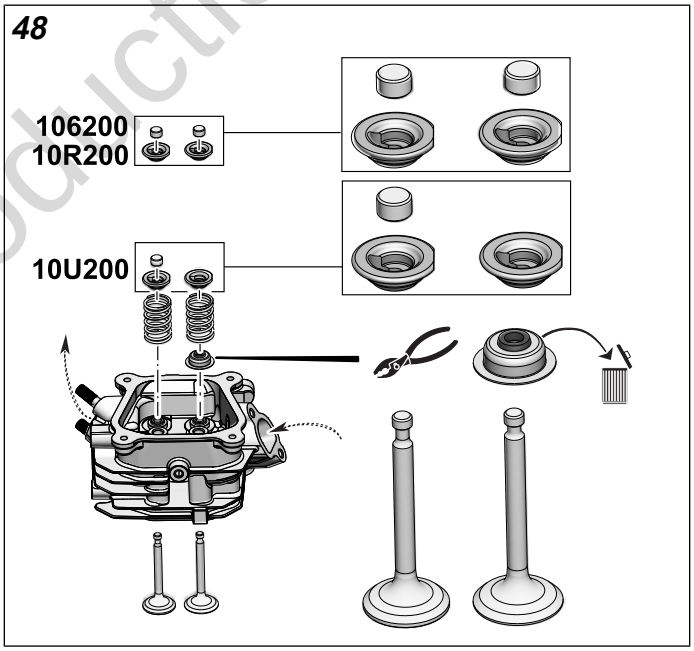


Disassemble Cylinder Head

1. Remove jam nuts (**R**) and rocker nuts (**S**) from rocker arm studs (**U**), then remove rocker arms (**T**).
2. Remove rocker arm studs (**U**), and push rod guide plate (**W**).
3. Support valve side of cylinder head on clean shop towels. Remove valve cap (**M**) from exhaust valve (**Q**). Using thumbs, press down on each valve spring retainer (**N**) and disengage retainer from valve stem. Remove retainers (**N**), springs (**O**), valves (**Q**), and intake valve stem seal/washer (**P**).

Note: Refer to the following illustrations and the exploded view at the beginning of this section.





Inspect Cylinder Head

1. Visually inspect head for cracks, excessive heat discoloration, warping of the cylinder or rocker cover mating surfaces, and burned or damaged valve seats. Replace head if any of these problems are found.

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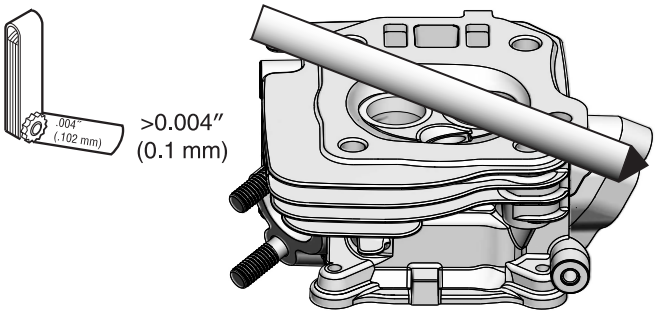

2. If head passes visual inspection, check valve guides for wear. If valve guides meet or exceed the reject dimension shown in ***Section 13 - Engine Specifications***, replace the cylinder head.
3. Inspect valves for wear or damage. If slight wear is found, lap the valve and seat as instructed in the following steps. If excessive wear or damage is found, replace cylinder head.

Note: Valve faces can be resurfaced on a commercially available valve grinder. However, Briggs & Stratton does not recommend this practice because the quality of the resurfacing may be insufficient.

7

4. Place a small amount of lapping compound #94150 around the valve face of one valve. Make sure that lapping compound only comes into contact with the valve face and valve seat.
5. Oil the valve guide and valve stem and then insert the valve into the cylinder head.
6. Using Valve Lapping Tool #19258, rotate the valve clockwise and counterclockwise, approximately 20 ° each way. Continue this action for a short period of time.
7. Remove the valve. Use a rag dipped in mineral spirits to clean the valve face. Inspect the surface made by the lapping compound. Make sure that the width of the lapped surface is equal around the entire valve and within 3/64 - 1/16" (1.2 - 1.6 mm). If both conditions **are not** met, replace the valve.
8. Repeat this procedure for the remaining valve.

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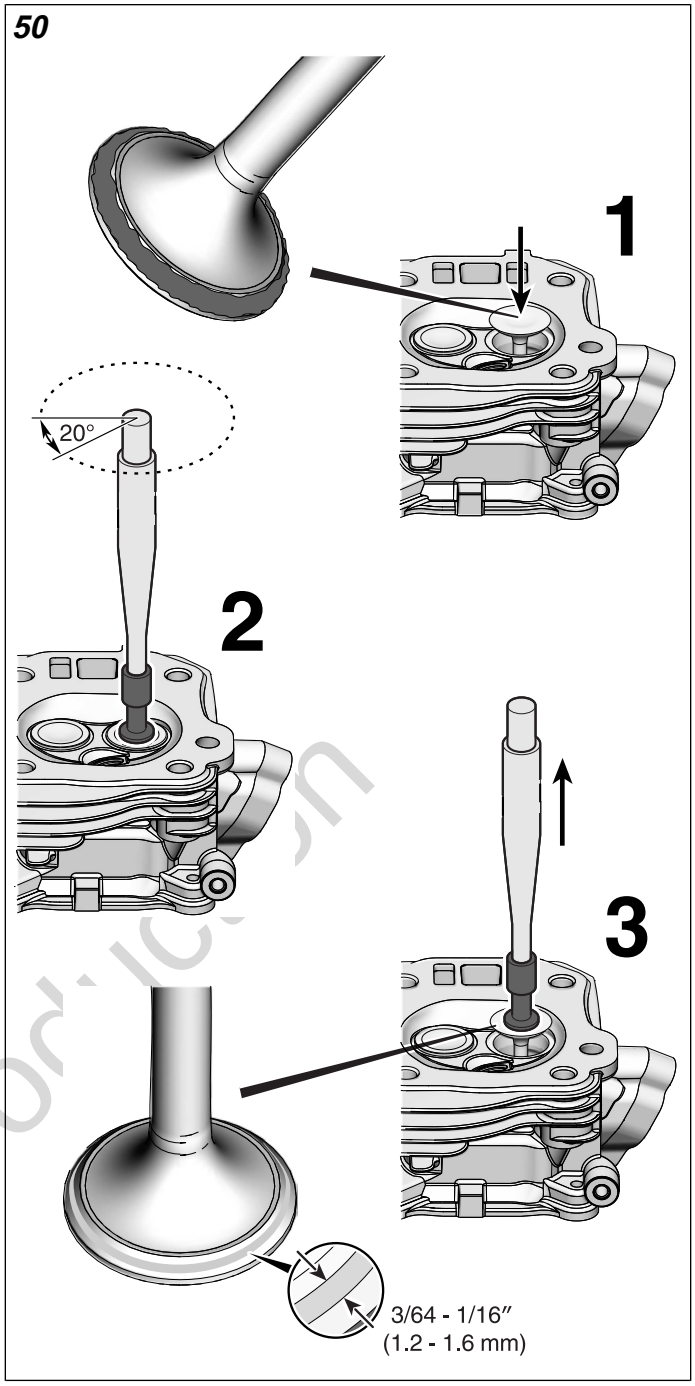


9. Use a rag dipped in mineral spirits to thoroughly clean all lapping compound from the valves and cylinder head.

Assemble Cylinder Head

1. Install push rod guide plate (**W**) into cylinder head (**G**) and secure with rocker arm studs (**U**). Torque rocker arm studs to value listed in ***Section 13 - Engine Specifications***.
2. Lightly coat valve stems with lubricant, then insert valves (**Q**) into cylinder head (**G**).

Note: Do Not get lubricant on valve face, valve seat, or exposed end of valve stem.

3. Oil inside diameter of new stem seal/washer (**P**) and install on intake valve stem. Slide seal/washer down against cylinder head.
4. Support valve side of cylinder head on clean shop towels. Place valve springs (**O**) and valve spring retainers (**N**) over valve stems. **10U200 engine only – Retainer with larger counterbore must be used on exhaust valve.** Using thumbs, press against each retainer until it securely locks into groove in valve stem.

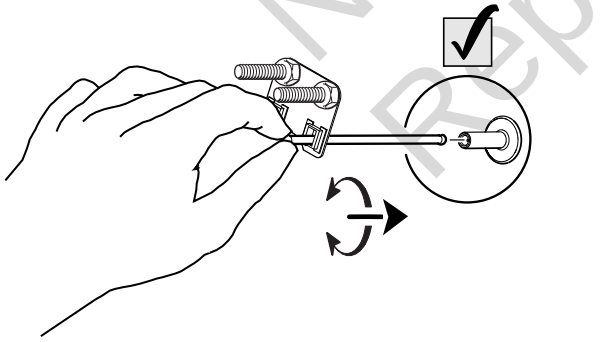
Install Cylinder Head

1. Install a locating pin (**Y**) into each bottom mounting hole.
2. Coat threads of all cylinder head screws (**F**) with lubricant.
3. Install a new head gasket (**X**) on locating pins (**Y**) and cylinder (**Z**).
4. Install cylinder head (**G**) on cylinder and start screws (**F**) by hand. **Note**: Install each cylinder head screw into the same hole that it was removed from. Step-torque screws in the sequence shown until final torque value is achieved. Refer to the illustration at the beginning of this section for the proper sequence. Torque screws to value listed in ***Section 13- Engine Specifications***.

NOTICE Do not fully torque each screw in one step as it may result in a warped cylinder head. Step-torque all screws to approximately 1/3 of final torque value, then to 2/3 final torque value, then finish at final torque value.

5. Install push rods (**V**) through guides (**W**) and into same positions as removed. Ensure push rods are seated in valve tappets as shown in the following illustration.

51



6. 10U200 engine only – Install valve cap (**M**) onto end of exhaust valve stem (**Q**). 106200 and 10R200 engines only – Install valve cap (**M**) onto end of intake and exhaust valve stems (**Q**).
7. Install rocker arms (**T**) onto rocker arm studs (**U**), then install adjuster nuts (**S**) and jam nuts (**R**). Tighten nuts until there is zero clearance between the valve stems and rocker arms.
8. Rotate crankshaft at least twice to ensure proper movement of the push rods and rocker arms.
9. Adjust valve clearance as instructed in *Adjust Valve Clearance* found in Section 2.
10. Install rocker cover (**J**) with a new rocker cover gasket (**K**). Torque screws (**H**) in the sequence shown and to value listed in ***Section 13 - Engine Specifications***.
11. Install cylinder head shield (**AB**) using screws (**AA**), (**AC**) and (**AD**). Torque screws to the value listed in ***Section 13 - Engine Specifications***.
12. Install carburetor as instructed in *Install Carburetor* found in section 4.
13. Install control bracket as instructed in *Install Control Bracket* found in Section 5.
14. Install muffler (**B**) and new gasket (**C**). Torque nuts (**A**) to the value listed in ***Section 13 - Engine Specifications***.

SECTION 8 – PISTON, RINGS AND CONNECTING ROD

8

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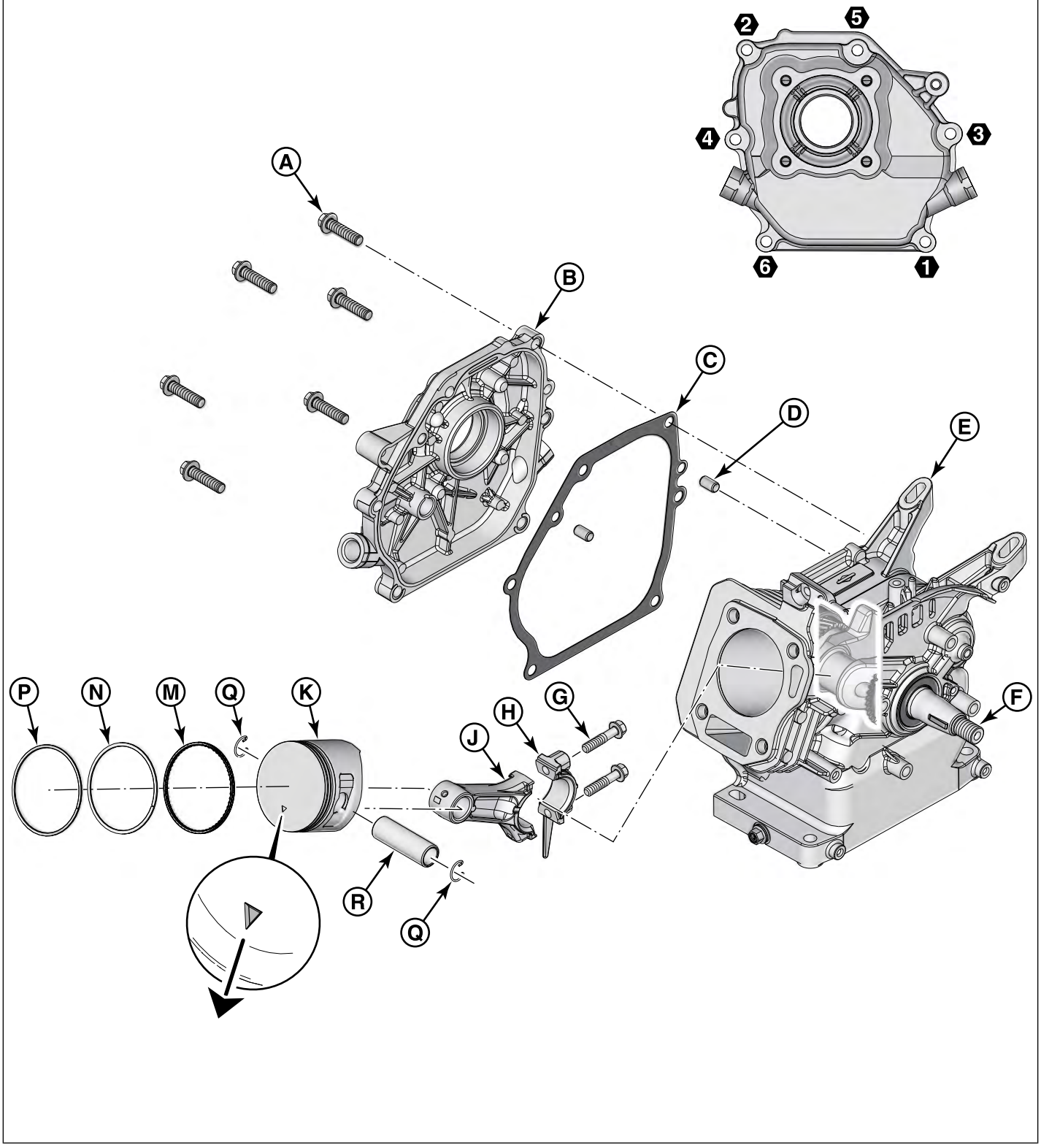

Remove Piston and Connecting Rod

1. Carefully remove any carbon or ridge at top of cylinder bore to prevent ring breakage.

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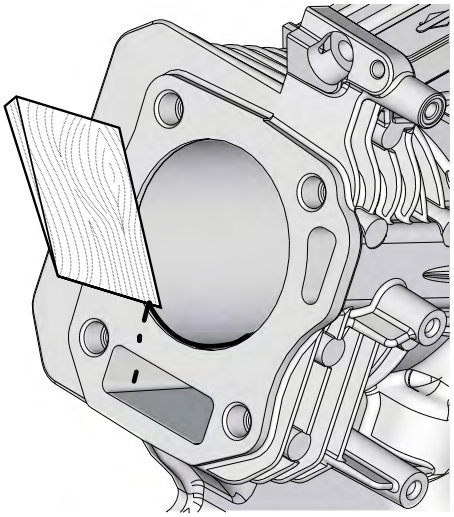

2. Remove rod bolts (**G**) and connecting rod cap (**H**).
3. Push piston and rod assembly out through top of cylinder bore.

Disassemble Piston and Connecting Rod

1. Remove the two piston pin retainers (**Q**) using a needle nose pliers.
2. Slide out piston pin (**R**) from connecting rod and piston. Remove connecting rod from piston.
3. Using Piston Ring Expander #19340, remove the top compression ring (**P**) and then the center oil wiper ring (**N**). Note the order and orientation of the rings before removal.

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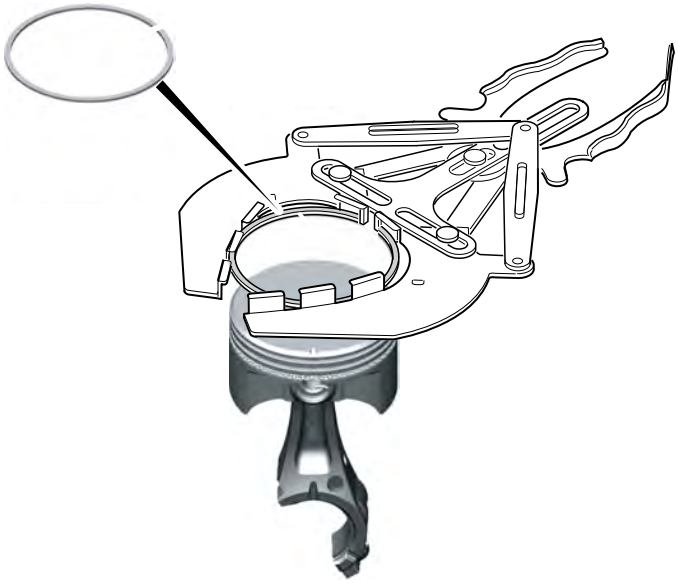
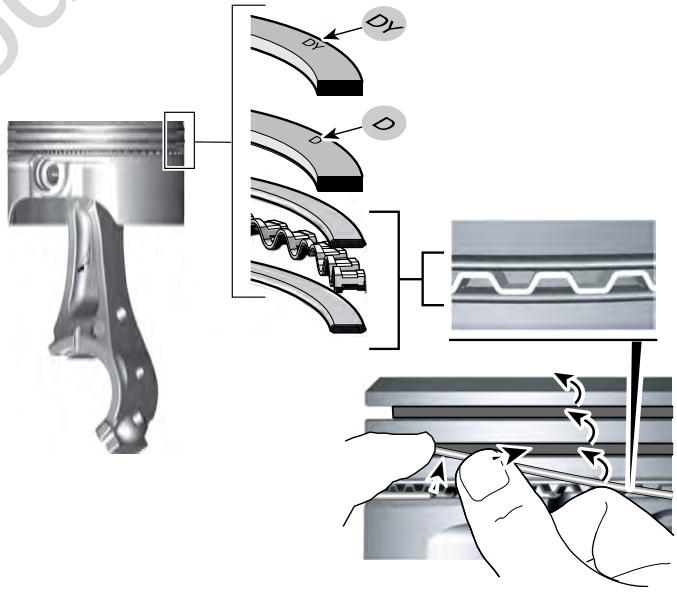


4. Remove the bottom oil control ring (**M**) by hand as follows:
   - Grasp one end of the upper steel rail and wind the rail from the oil ring groove into the center ring groove. Repeat into the top ring groove and then off the piston.
   - Remove the spring expander, then remove the lower steel rail.

55

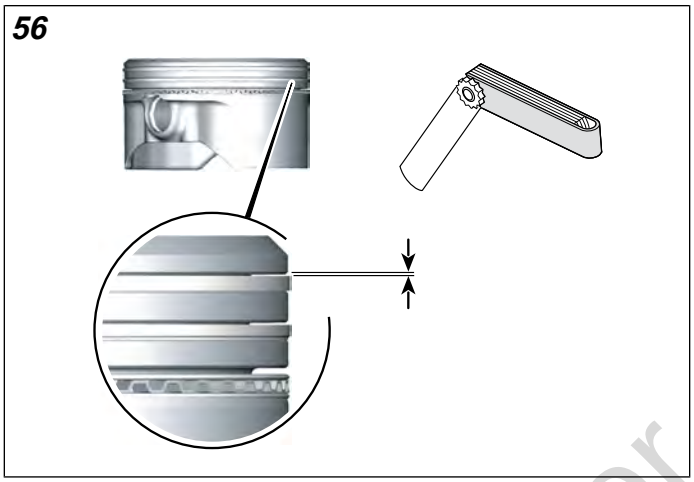


Inspect Piston and Pin

1. Inspect piston (**K**) for scoring, galling, or other damage. Replace piston if necessary.

2. Using a dial caliper or plug gauge, measure the pin bore diameter. Compare with reject dimensions listed in ***Section 13 - Engine Specifications***. If pin bore exceeds reject dimensions, replace the piston.
3. Measure outside diameter of pin (**R**) and compare to the reject dimension listed in ***Section 13 - Engine Specifications***. If pin is smaller than the reject dimension, replace the pin.
4. Clean any carbon from the top ring groove in piston.
5. Place a NEW compression ring in top groove of piston. Using a feeler gauge, measure clearance between ring and ring land. Compare with reject dimension listed in ***Section 13 - Engine Specifications***. If clearance meets or exceeds the reject dimension, replace the piston.

56



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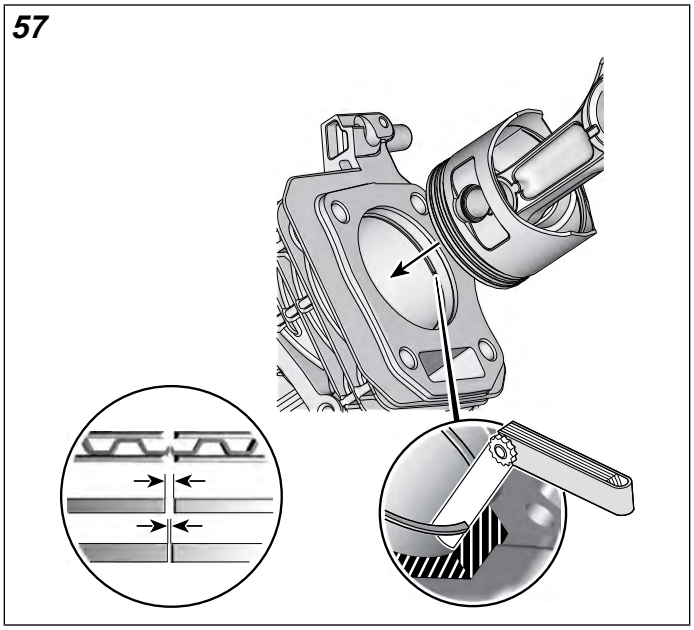
Check Ring End Gap

It is recommended that the entire ring set be replaced when servicing the piston and/or cylinder bore. However, the original rings can be re-used if they are not damaged and are checked as follows:

1. Clean all carbon from the rings and the cylinder bore.
2. Insert one of the original rings approximately one inch down the cylinder bore.

Note: Slide the ring into the cylinder using the piston. This will ensure that the ring is positioned square in the cylinder.

57



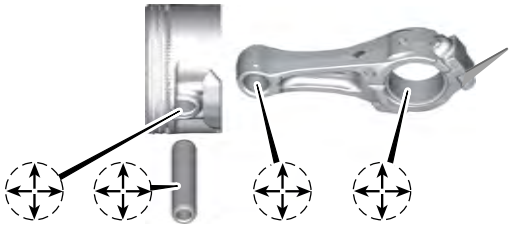
3. Measure the ring end gap with a feeler gauge.
4. Repeat the procedure for each ring in the set.
5. Compare with reject dimensions listed in ***Section 13 - Engine Specifications***. If gap of any of the rings meets or exceeds the reject dimensions, all rings should be replaced as a set.

Inspect Connecting Rod

If the bearing surfaces on the connecting rod (**J**) are scored, the connecting rod must be replaced.

1. Reinstall rod cap and bolts on rod. Torque bolts to the value listed in ***Section 13 - Engine Specifications***.
2. Using a Telescoping Gauge #19485 and micrometer, or plug gauge, measure the two bearing diameters. Compare with reject dimensions listed in ***Section 13 - Engine Specifications***. If either bearing exceeds the reject dimensions, the rod must be replaced.

58



3. Remove rod bolts and rod cap. Set aside.

Assemble Piston and Connecting Rod

1. Install a new piston pin retainer (**Q**) into one groove in piston bore (**K**).
2. Oil the piston pin bore (**K**), connecting rod pin bore (**J**), and the pin (**R**). Insert rod into piston, then slide pin through piston and rod bores until it seats against the retainer.

Note: The arrow on the piston must point to the oil hole on the rod. When installed in engine, the arrow must point toward the push rods.

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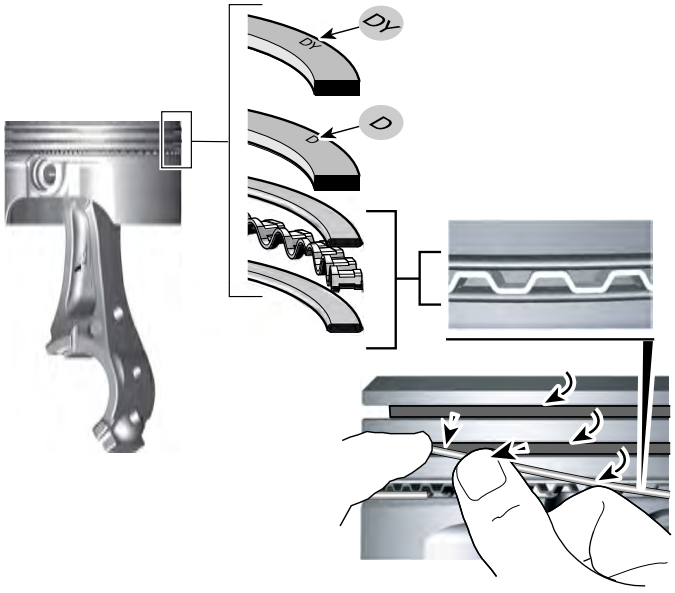
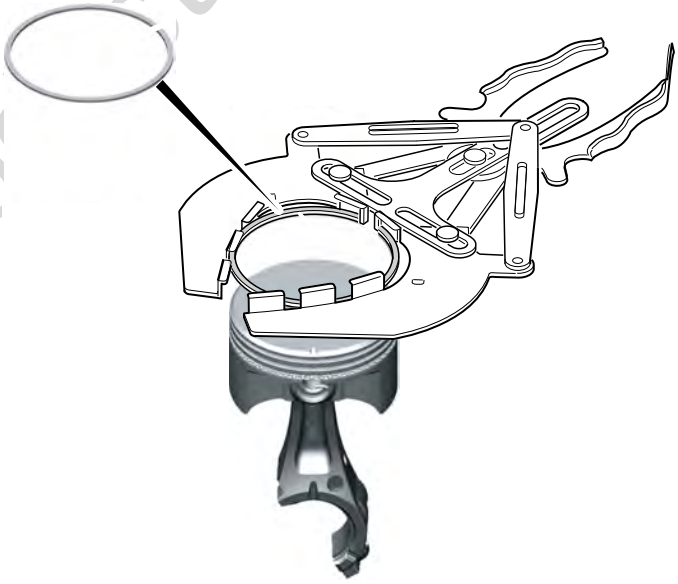
3. Install a new piston pin retainer into groove on open side of piston pin bore. Ensure retainers are firmly seated in grooves.
4. Install the bottom oil control ring (**M**) by hand as follows:
   - Grasp one end of lower steel rail and wind it over the top ring groove, then into the center ring groove, and finally into the oil ring groove.
   - Install the spring expander on top of the lower rail, and then install the upper steel rail.

60



5. Using Piston Ring Expander #19340, install the center oil wiper ring (**N**), and then the top compression ring (**P**). Follow the orientation noted at time of disassembly, or use the instructions provided if installing a new ring set.

61

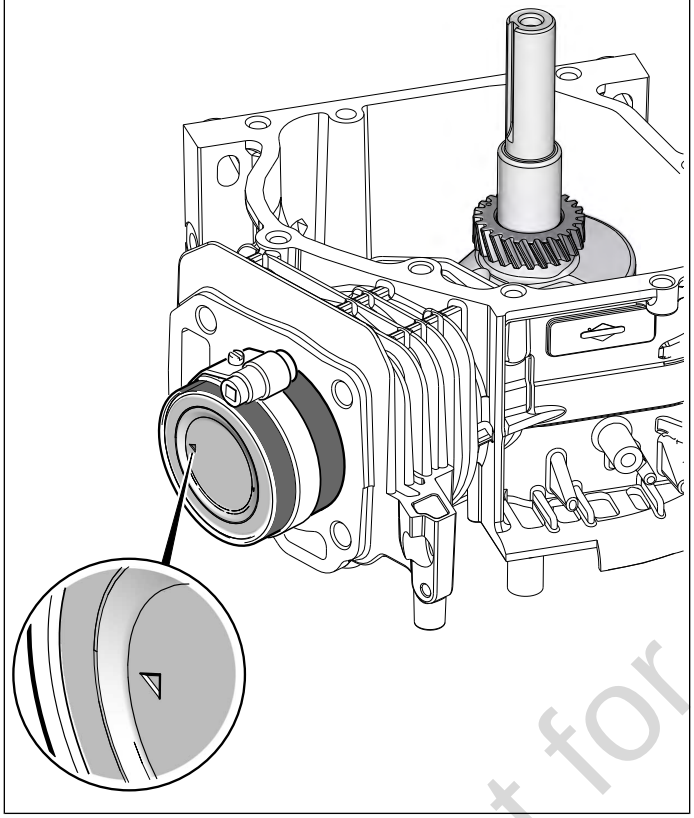


Install Piston and Connecting Rod

1. Thoroughly clean and oil cylinder bore, crankpin journal, piston skirt and inside wall of ring compressor.
2. Rotate crankshaft (**F**) until crankpin journal is at bottom of stroke.
3. Using Ring Compressor Tool #19070 or #19230, install piston (**K**) with arrow pointing toward valves, taking care not to damage crankpin journal or connecting rod bearing.

NOTICE Apply steady pressure to piston until fully installed in cylinder bore. If piston sticks, do not pound or hammer on the piston crown. Loosen ring compressor and repeat procedure.

62



4. Fit connecting rod bearing on crankpin journal, then install rod cap (**H**) with match marks aligned.

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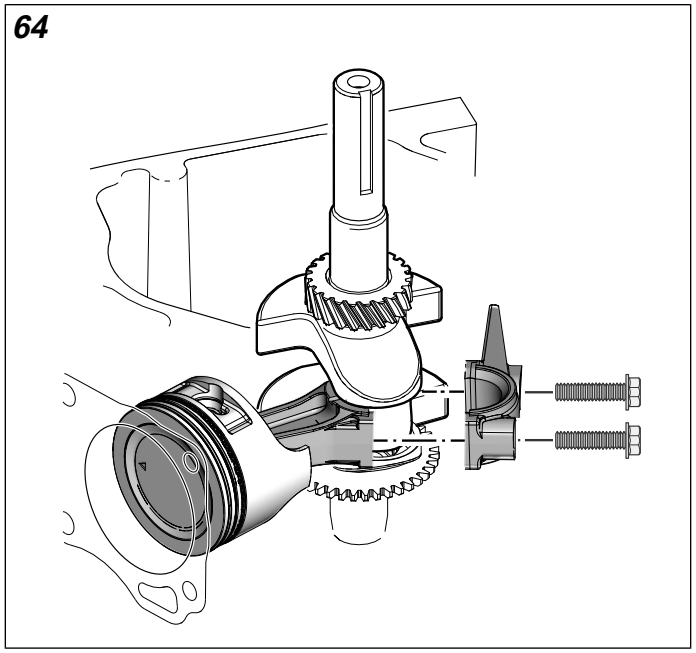


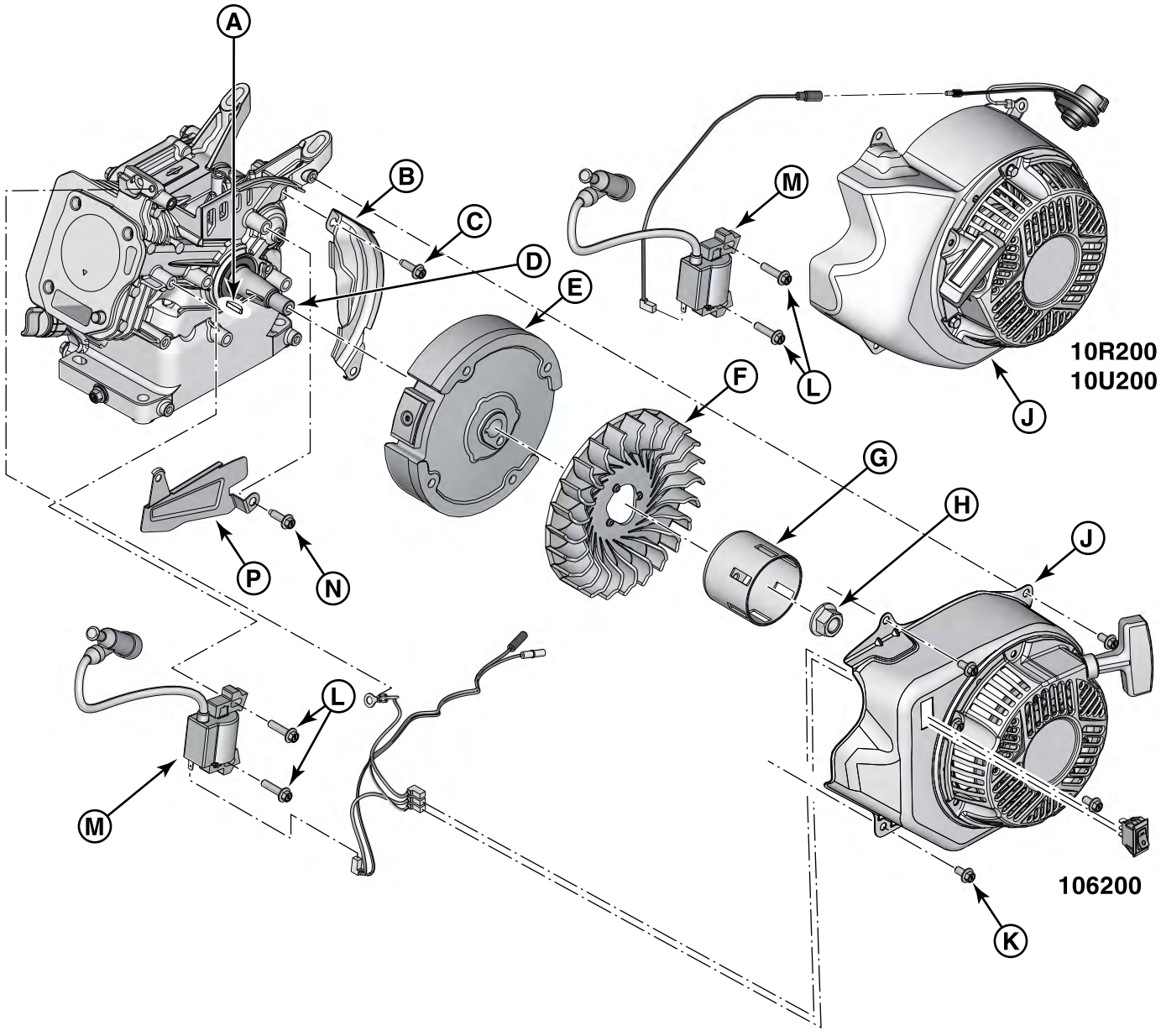
5. Cap should snap into position when assembled correctly. Install rod screws (**G**).
6. Tighten screw closest to piston first, then screw farthest from piston second. Torque screws to values listed in ***Section 13 - Engine Specifications***.

NOTICE Failure to use a torque wrench can result in loose rods causing breakage, or overtightened rods causing scoring.

7. Rotate crankshaft two revolutions to ensure crankpin and rod do not bind.
8. Move connecting rod sideways to ensure rod has clearance on crankpin side.

SECTION 9 – CRANKSHAFT, CAMSHAFT AND FLYWHEEL

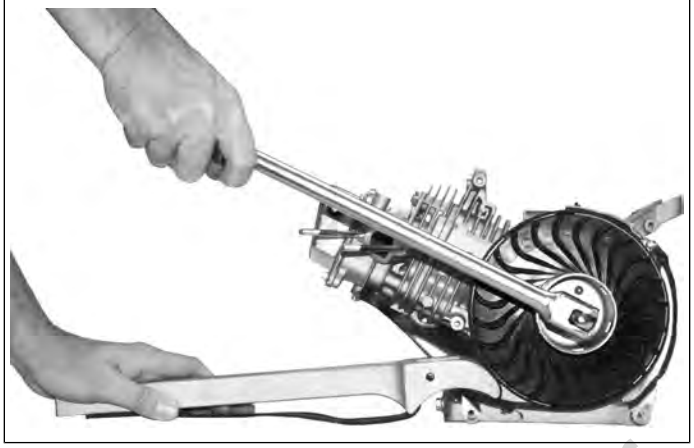
65



Remove Flywheel

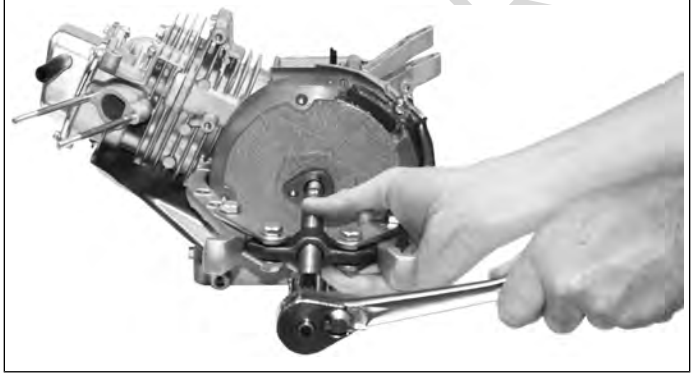
1. Remove blower housing (**J**) as instructed in *Adjust Armature Air Gap* found in Section 2.
2. Remove flywheel guard (**B**).
3. Rotate flywheel (**E**) so that magnet is away from armature (**M**).
4. Remove the two armature screws (**L**) and then remove the armature.
5. Using a strap wrench, socket and breaker bar, remove flywheel nut (**H**).

66



6. Remove flywheel cup (**G**) and fan (**F**).
7. When flywheel does not have drilled and tapped puller holes, remove flywheel from crankshaft (**D**) with a gear puller, as shown.
   When flywheel has drilled and tapped puller holes, remove flywheel from crankshaft (**D**) with flywheel puller #19203. Thread flywheel nut flush with end of crankshaft before installing puller.

67



Inspect Flywheel

Inspect flywheel key (**A**) for partial or complete sheering.

Inspect flywheel (**E**) for cracks, burrs on taper or keyway and distortion of keyway.

Inspect taper on crankshaft (**D**) for burrs, rust or other damage.

Inspect fan (**F**) for cracks and broken fins.

If parts are damaged, replace with new parts.

Install Flywheel

1. Clean flywheel taper (**E**) and crankshaft taper (**D**) of grease, oil and dirt.
2. Install key (**A**) into keyway of crankshaft.

NOTICE **Use only** an original Briggs & Stratton flywheel key.

3. Slide flywheel (**E**) onto crankshaft (**D**) with keyways aligned.
4. Install fan (**F**) against flywheel making sure that hole in fan fits around boss on flywheel. When fan is installed correctly, it will fit flush against the flywheel at all points.

WARNING
DO NOT use an impact wrench to install flywheel.

5. Install cup (**G**) and flywheel nut (**H**).
6. Using a strap wrench, socket and torque wrench, torque flywheel nut to the value listed in ***Section 13 - Engine Specifications***.

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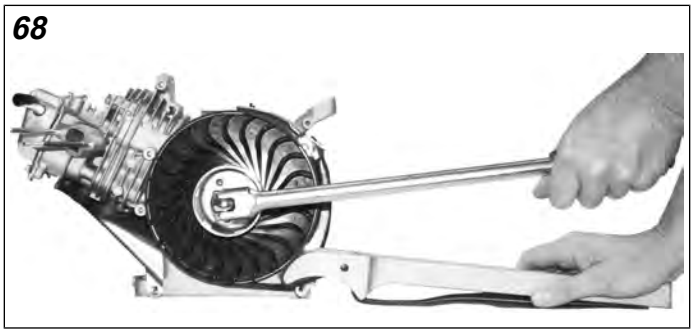
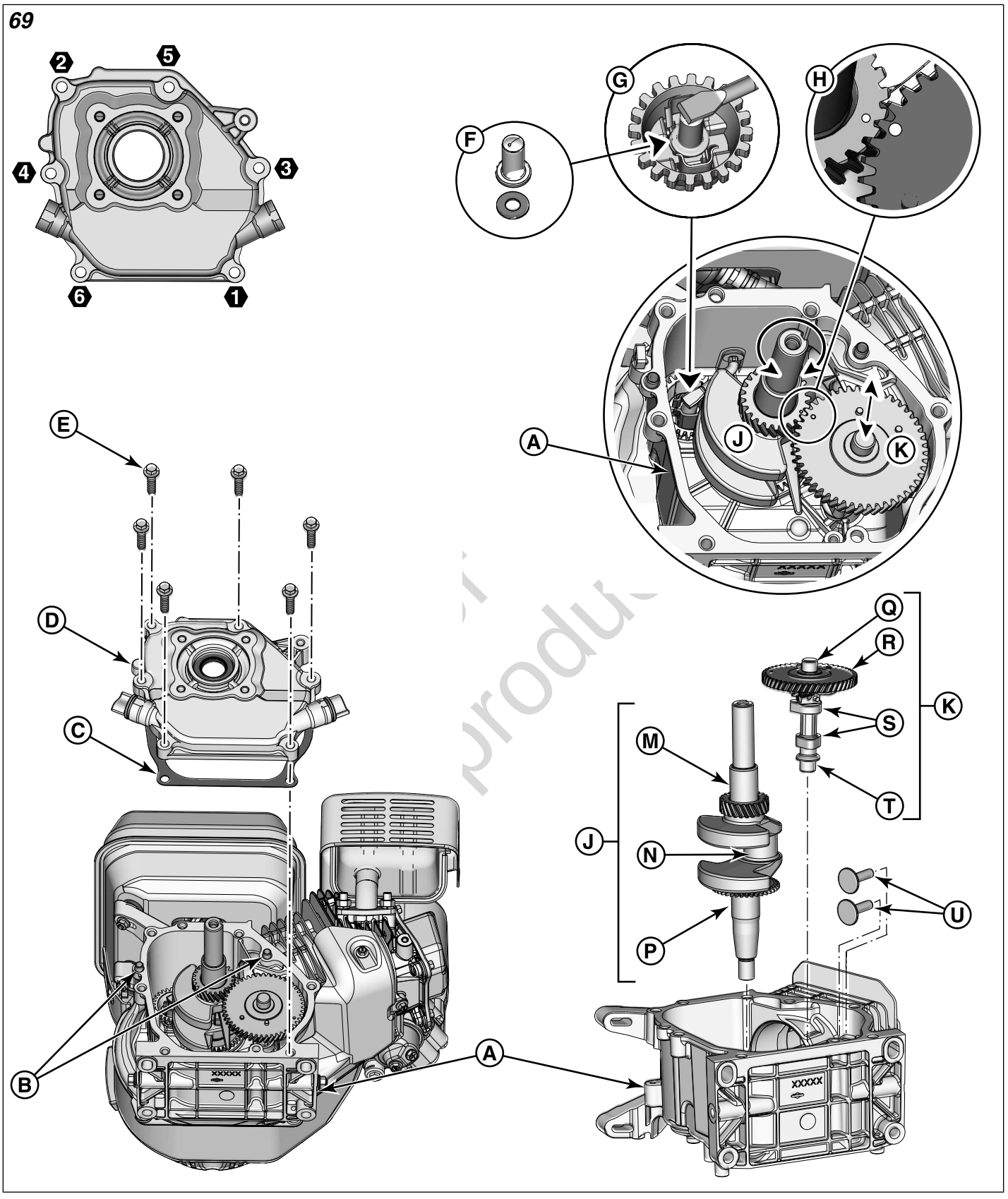


7. Install flywheel guard (**B**) and secure with top screw (**C**). Align bottom hole of flywheel guard with mounting hole in cylinder. Do not install the bottom screw at this time.
8. Install armature (**M**), adjust armature air gap, and install blower housing (**J**) as instructed in *Adjust Armature Air Gap* found in Section 2.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Remove Crankshaft and Camshaft

1. Remove spark plug wire from the spark plug and then remove the spark plug.
2. Drain oil from engine and all fuel from fuel tank.
3. Remove blower housing/rewind assembly as instructed in *Adjust Armature Air Gap* found in Section 2.
4. Remove flywheel/fan assembly as instructed in *Remove Flywheel* found in Section 9.
5. Remove burrs and clean crankshaft (**J**), then remove crankcase cover (**D**) and gasket (**C**).

Note: To ease crankcase cover removal, position piston at TDC with both valves closed.

Note: If crankcase cover sticks, tap lightly with soft hammer on alternate sides near dowel pins (**B**). It is not necessary to remove dowel pins.

6. Carefully tip engine with PTO end facing up, as shown in illustration.
7. Rotate crankshaft until timing marks (**H**) are aligned. With camshaft in this position, the valve tappets (**U**) will remain clear of cam lobes. Lift out camshaft (**K**).
8. Remove one tappet and mark it for reinstallation. Each tappet must be installed into the same hole as removed from. Follow the same procedure for the second tappet.
9. Remove rocker cover and cylinder head as instructed in *Remove Cylinder Head* found in Section 7.
10. Remove connecting rod cap and piston as instructed in *Remove Piston and Connecting Rod* in Section 8.
11. Slide crankshaft out from cylinder housing (**A**).

Inspect Crankshaft and Camshaft

Inspect Crankshaft

1. Inspect crankshaft (**J**) for scoring on PTO journal (**M**), crankpin journal (**N**), and MAG journal (**P**). Replace crankshaft if scoring is found or if crankshaft is bent. DO NOT attempt to straighten bent crankshafts.
2. Using a micrometer, measure the journal diameters. Compare results to values listed in ***Section 13 - Engine Specifications***. If wear exceeds the reject dimensions, replace the crankshaft.

Inspect Camshaft

1. Check gear (**R**) for worn or damaged teeth. Check lobes (**S**) and journals (**Q**, **T**) for scratching or scoring. Check compression release mechanism (located under gear **(R)**) for wear, burrs, or sticking. Replace camshaft if any of these conditions are found.
2. Using a micrometer, measure the journal diameters. Compare results to values listed in ***Section 13 - Engine Specifications***. If wear exceeds the reject dimensions, replace the camshaft.

Install Crankshaft and Camshaft

1. Lubricate the cylinder housing oil seal with engine oil.
2. Make sure the paddle (**G**) on the governor shaft is positioned on top of the governor cup and washer (**F**) inside the cylinder housing (**A**).
3. Support both ends of the crankshaft (**J**), and carefully install into the cylinder housing.
4. Install piston and connecting rod cap as instructed in *Install Piston and Connecting Rod* found in Section 8.
5. Apply lubricant to shafts of tappets (**U**). Install each tappet into the same hole that it was removed from.
6. Install camshaft, making sure tappets clear cam lobes. Timing marks (**H**) must align as shown.

Install Crankcase Cover

1. Install dowel pins (**B**) in dowel pin holes of cylinder housing (**A**).
2. Using a new gasket (**C**) and an oil seal protector, install crankcase cover (**D**). Do not force cover on cylinder housing.
3. Install screws (**E**). Step-torque screws in the sequence shown until final torque value is achieved. Refer to the illustration at the beginning of this section for the proper sequence. Torque screws to value listed in ***Section 13 - Engine Specifications***.

NOTICE Do not fully torque each screw in one step as it may result in a warped crankcase cover. Step-torque all screws to approximately 1/3 of final torque value, then to 2/3 final torque value, then finish at final torque value.

4. Install valves, springs and seals as instructed in *Assemble Cylinder Head* found in Section 7.
5. Install cylinder head as instructed in *Install Cylinder Head* found in Section 7.
6. Reinstall push rods and rocker arms. Adjust valve clearance as instructed in *Adjust Valve Clearance* found in Section 2.
7. Install rocker cover with a new rocker cover gasket. Torque screws to value listed in ***Section 13 - Engine Specifications***.
8. Install flywheel/fan assembly as instructed in *Install Flywheel* found in Section 9.
9. Install blower housing/rewind assembly as instructed in *Adjust Armature Air Gap* found in Section 2.
10. Fill engine with oil. Refer to *Change Oil* found in Section 2.

11. Install spark plug by hand and tighten finger tight. Then torque to the value listed in ***Section 13 - Engine Specifications.***
12. Connect the spark plug wire.
13. Adjust governor system as instructed in *Governor* found in Section 2.

Check and Adjust Crankshaft End Play

When crankcase cover (**D**) is installed with a standard gasket (**C**), end play should match values listed in ***Section 13 - Engine Specifications***.

If end play is more than specified, add a shim between the crankshaft and crankcase cover bearing.

SECTION 10 – CYLINDER AND CRANKCASE COVER

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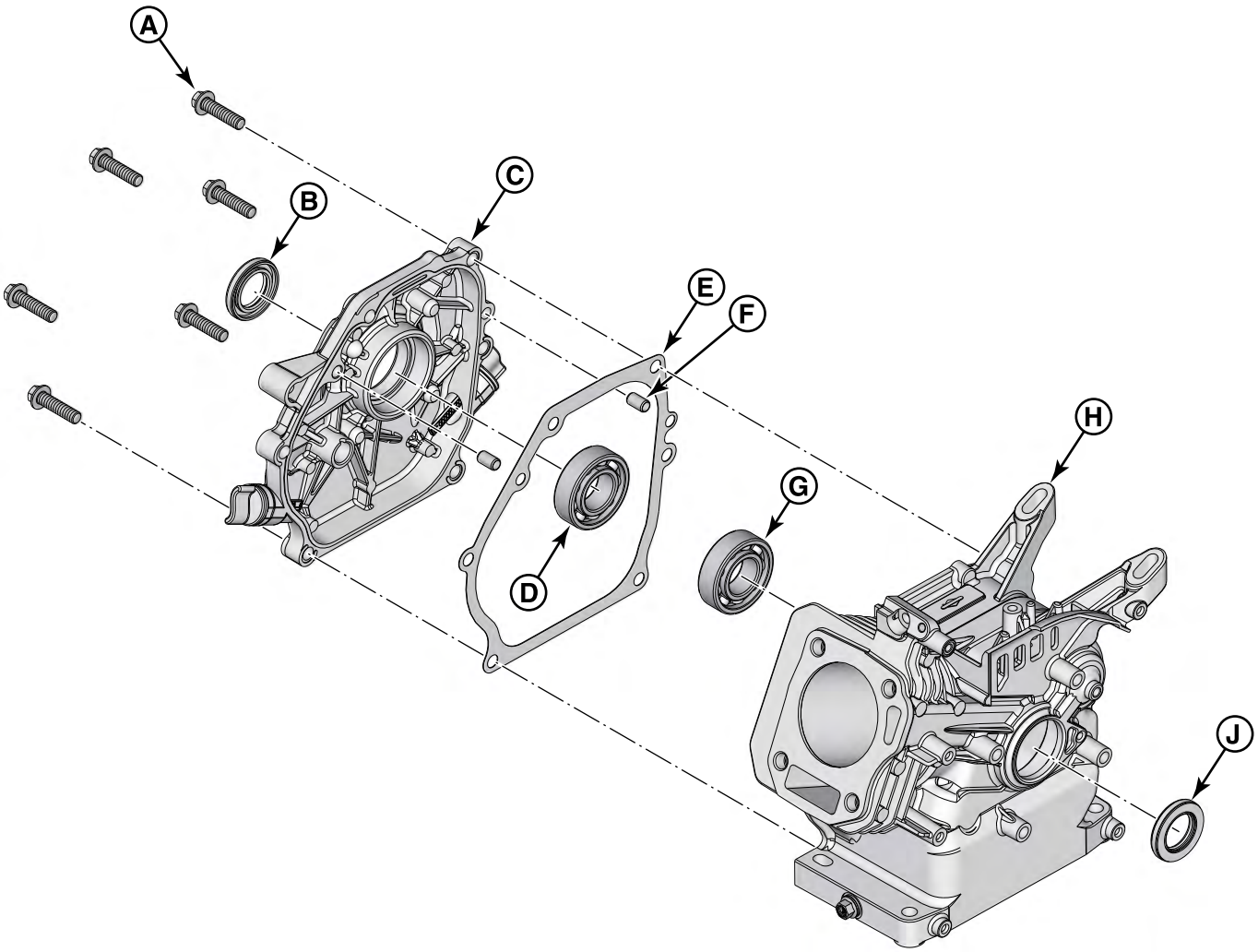
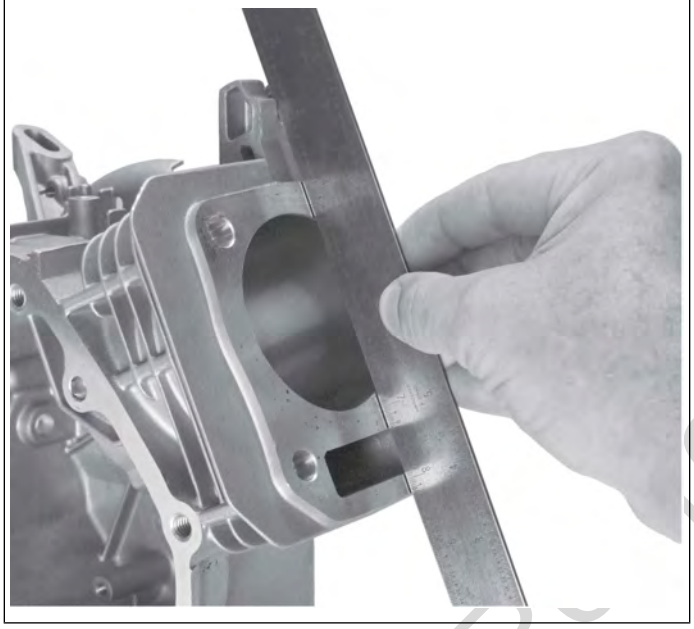


Cylinder

Inspect and Measure Cylinder

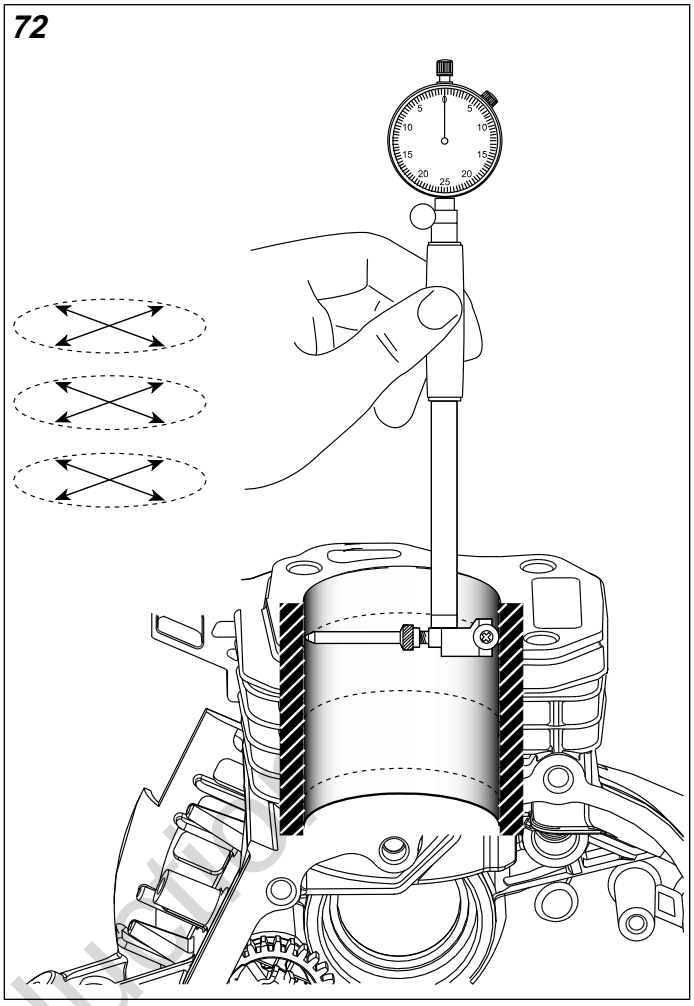
1. Using a plastic scraper, remove all traces of head gasket and cover gasket material.
   - Visually check cylinder for cracks, stripped threads, and bore damage. Bore damage, if not severe, may be corrected by reconditioning or resizing.
   - If cracks are found, replace the cylinder.
   - Stripped threads can sometimes be repaired using a helicoil, but if multiple holes have thread damage, replace the cylinder.
2. Using a straight edge, check across cylinder head mounting surface for distortion. If mounting surface is distorted more than 0.004” (0.1 mm), the cylinder must be replaced.

71



3. Using a Dial Bore Gauge #19487 (preferred), or a Telescoping Gauge #19485 and Dial Caliper #19609, measure the diameter of the bore. If necessary, recondition or resize the bore as described below.

72



Take two measurements (90° apart) at the top, center, and bottom of the piston ring travel.

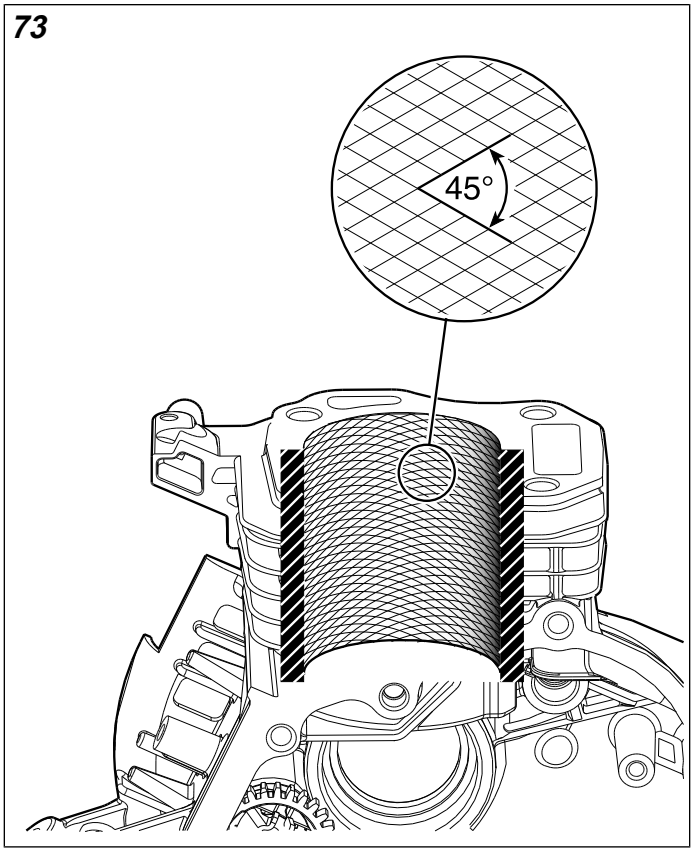
Compare measurements to the standard cylinder bore size provided in ***Section 13 - Engine Specifications***.

Recondition Cylinder Bore

If cylinder bore is within specification and shows no signs of scoring or other damage, it can be reconditioned using a rigid hone with finishing stones to restore the proper crosshatch angle.

The correct crosshatch of approximately 45° ensures proper lubrication and piston ring break-in.

73



Note: IT IS MOST IMPORTANT THAT THE ENTIRE CYLINDER BE THOROUGHLY CLEANED AFTER HONING.

Resize Cylinder Bore

If the cylinder bore is worn more than 0.003” (0.08 mm) oversize, or is 0.0015” (.04 mm) out of round, it must be resized.

Always resize to exactly 0.020” (.51 mm) larger than standard bore size. Done accurately, the service oversize rings and pistons will fit perfectly with proper clearances.

Use the stones and lubrication recommended by the hone manufacturer to produce the proper sizing and finish.

Note: IT IS MOST IMPORTANT THAT THE ENTIRE CYLINDER BE THOROUGHLY CLEANED AFTER HONING.

Clean Cylinder

1. Wash the cylinder thoroughly with kerosene or other commercial solvent.
2. Wash cylinder again using a stiff brush with soap and hot water.
3. Rinse cylinder thoroughly with hot running water.
4. Repeat washing and rinsing until all traces of honing grit are gone.

Note: Honing grit is highly abrasive and will cause rapid wear to all of the internal components of the engine.

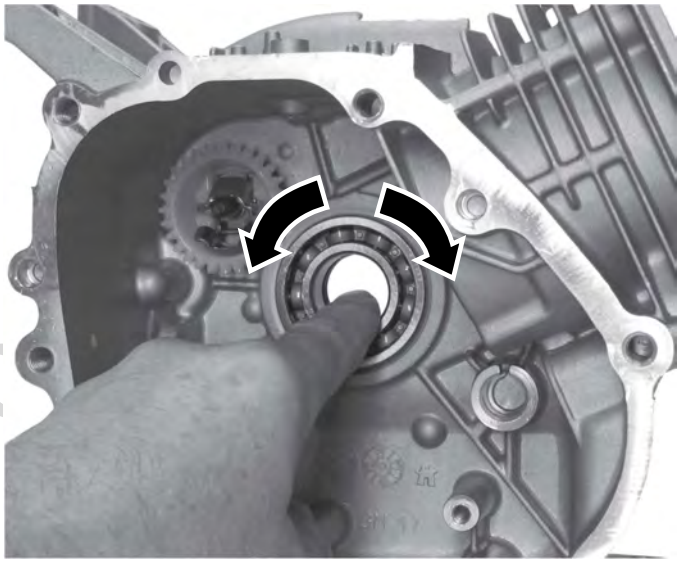
When cylinder and cylinder housing has been thoroughly cleaned, use a clean white rag to wipe the cylinder bore and internal cylinder housing surfaces. If honing grit is still present, it will appear as a grey residue on the rag. Re-wash and rinse entire cylinder, then check again. When there is no trace of honing grit on the rag, the cylinder is properly cleaned. Oil the cylinder bore to protect the surface.

MAG Bearing

Inspect MAG Bearing

Ball bearing must rotate freely. If any rough spots are felt, the ball bearing must be replaced.

74



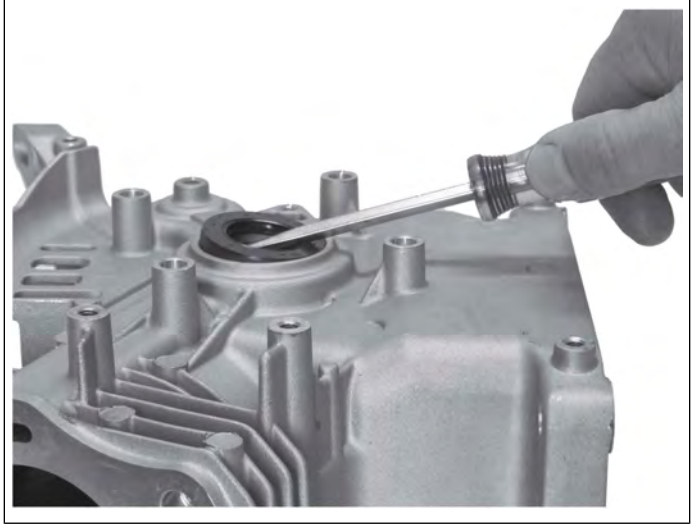
Note: DO NOT reuse ball bearing. The bearing races are usually damaged during removal.

Note: Standard and reject sizes for the MAG bearing are shown in ***Section 13 - Engine Specifications***.

Remove MAG Bearing

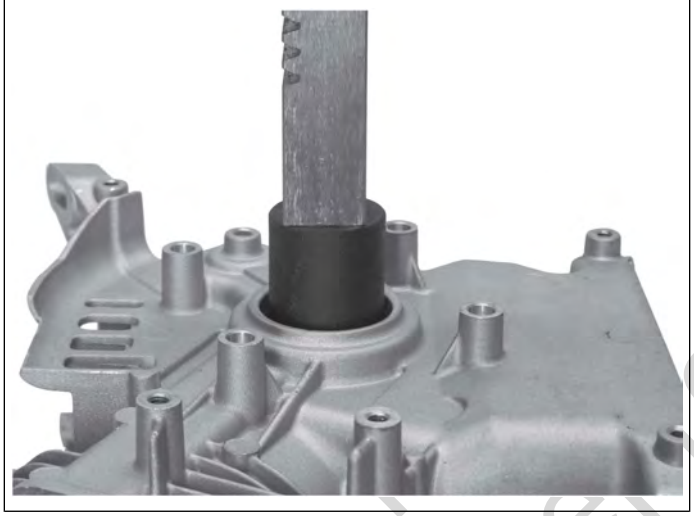
1. Remove and discard oil seal (**J**) from cylinder housing (**H**).

75



2. Place a bearing driver tool on the MAG bearing (**G**). Press driver tool until bearing is extracted.

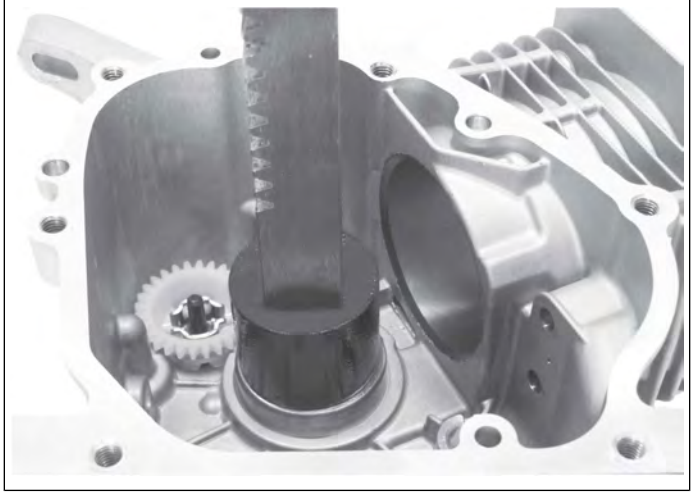
76



Install MAG Bearing

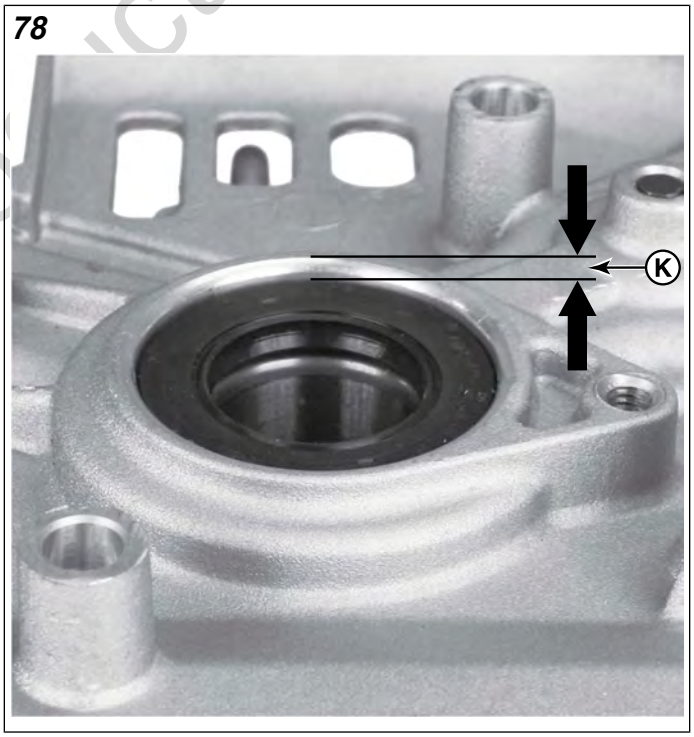
1. Remove burrs and imperfections from MAG bearing bore in cylinder housing (**H**). Clean and lightly lubricate all MAG bearing bore surfaces in cylinder housing.
2. Lubricate outside diameter of new MAG bearing (**G**) and position it on top of MAG bearing bore in cylinder housing.
3. Place a bearing driver tool on the MAG bearing. ***Important:*** Make sure to use a bearing driver tool that will not come into contact and damage the governor gear. The governor gear is not a replaceable part.

77



4. Press driver tool until bearing is seated in bore.
5. Clean and lightly lubricate all MAG oil seal bore surfaces in cylinder housing.
6. Install new oil seal (**J**). Press oil seal past flush to the following dimension (**K**).
   Dimension K (Models 106200 and 10R200) = 0.060 ± 0.010 in. (1.50 ± 0.25 mm)
   Dimension K (Model 10U200) = 0.065 ± 0.006 in. (1.65 ± 0.15 mm)

78



Crankcase Cover

Inspect and Measure Cover

1. Remove oil seal and discard.

2. Visually inspect cover for cracks, stripped threads, and wear in bearing surfaces. If damage is found, replace the cover.

Clean Cover

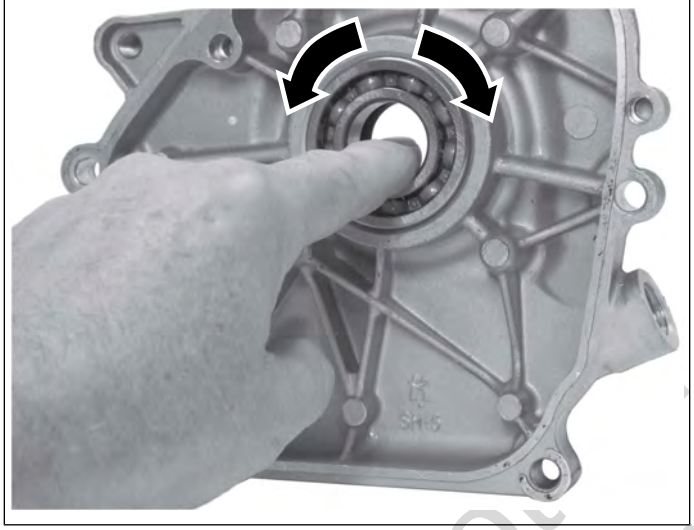
1. Wash the cover thoroughly with kerosene or other commercial solvent to remove oil sludge and residues.

PTO Bearing

Inspect PTO Bearing

Ball bearing must rotate freely. If any rough spots are felt, the ball bearing must be replaced.

79



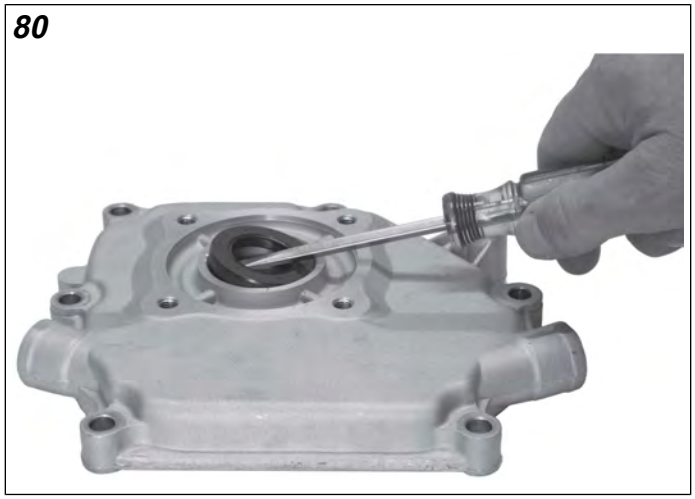
Note: DO NOT reuse ball bearing. The bearing races are usually damaged during removal.

Note: Standard and reject sizes for the PTO bearing are shown in ***Section 13 - Engine Specifications***.

Remove PTO Bearing

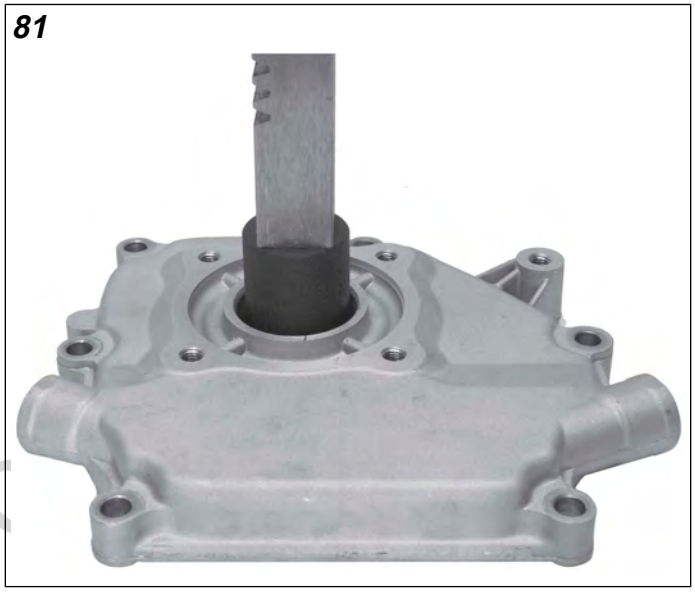
1. Remove and discard oil seal (**B**).

80



2. Place a bearing driver tool on the PTO bearing (**D**). Press driver tool until bearing is extracted.

81



Install PTO Bearing

1. Remove burrs and imperfections from PTO bearing bore in cover (**C**). Clean and lightly lubricate all PTO bearing bore surfaces in cover.
2. Lubricate outside diameter of new PTO bearing (**D**) and position it on top of PTO bearing bore in cover.
3. Place a bearing driver tool on the PTO bearing.

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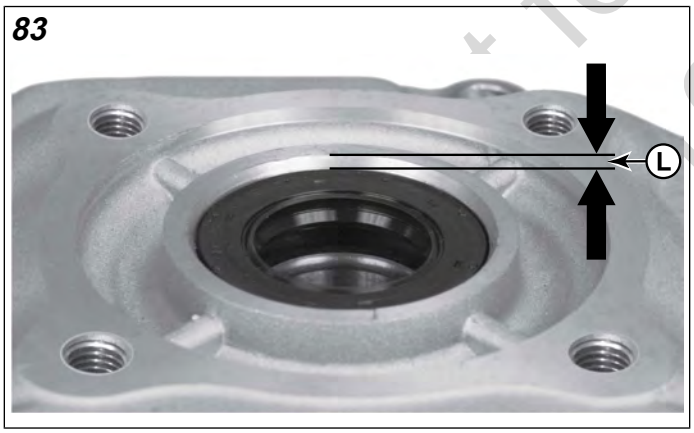
4. Press driver tool until bearing is seated in bore.
5. Clean and lightly lubricate all PTO oil seal bore surfaces in cylinder housing.
6. Install new oil seal (**B**). Press oil seal past flush to the following dimension (**L**).
   Dimension L (Models 106200 and 10R200) = 0.167 ± 0.010 in. (4.25 ± 0.25 mm)
   Dimension L (Model 10U200) = 0.124 ± 0.006 in. (3.15 ± 0.15 mm)

83



SECTION 11 – STARTER

11

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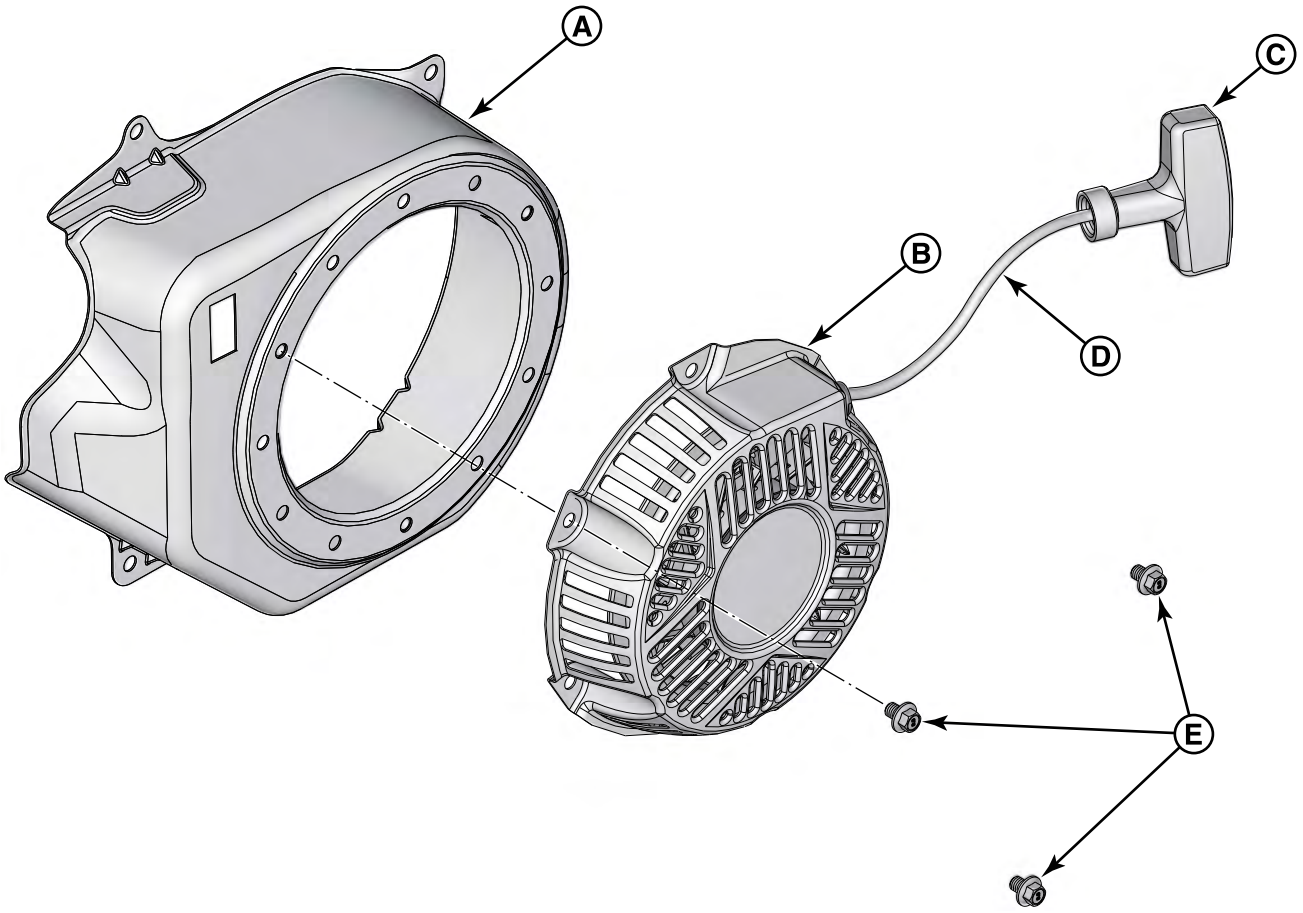


Remove Rewind Starter

1. Remove screws (**E**) and then remove rewind starter assembly (**B**) from blower housing (**A**).

Inspect Rewind Starter

1. Pull rope and confirm that pulley moves freely in both directions.
2. Confirm that there is increasing tension when pulling rope and decreasing tension when releasing rope.
3. If rope is broken, confirm that there is increasing tension when rotating the pulley counter-clockwise by hand.
4. Inspect the starter housing for wear or burrs at the rope eyelet.
5. **If any of the above tests and inspections fail, replace the rewind starter assembly.**
6. Inspect the rope for broken or frayed areas. Replace rope if necessary.

Replace Rewind Starter Rope

Note: Models 10R200 and 10U200 have limited service parts. Review the parts list for part availability before conducting any service work.

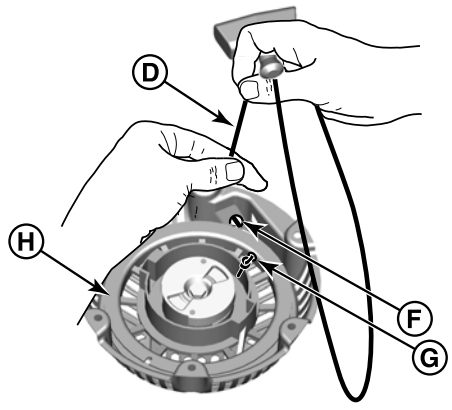
Note: Consult the *Illustrated Parts List* or *Section 13 - Engine Specifications* for the correct diameter and length of rope.

1. Hold rewind assembly firmly and pull out rope (**D**) until pulley (**H**) stops.

Note: Spring tension in pulley will increase as rope is pulled out.

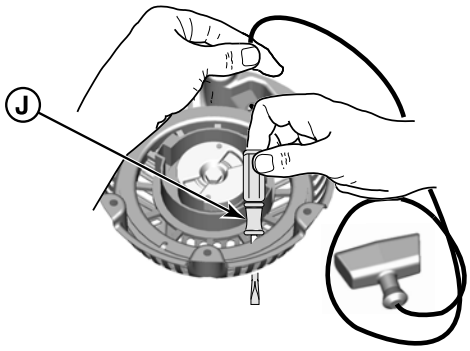
Note: If the rope is broken, turn pulley counter-clockwise until spring is wound tightly.

85



2. Rotate rewind pulley clockwise to line up holes of pulley (**G**) and rope eyelet (**F**) and secure pulley assembly with a screwdriver (**J**) to prevent it from spinning.

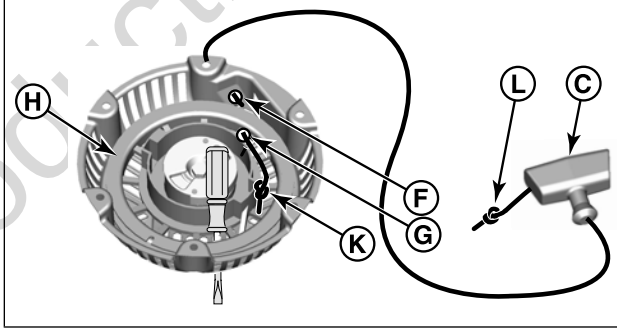
86



3. Cut through middle of rope (**D**) and then remove pieces from pulley (**H**) and handle (**C**).
4. Insert one end of new rope through pulley (**G**) and rope eyelet (**F**).

Note: Make sure that both ends of rope are sealed to prevent fraying and ease installation. Sealing is typically accomplished by melting rope ends.

87



5. Tie a knot at end of rope on pulley side (**K**). Fit knot into recess of pulley.

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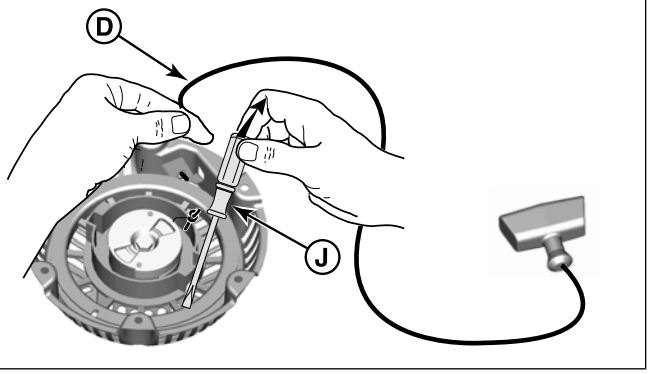
6. Insert the other end of rope into handle (**C**) and tie a knot (**L**) to secure it. Fit knot into opening of handle.
7. Hold rope (**D**) firmly while removing screwdriver (**J**). Then slowly allow rope to rewind itself on pulley.

89

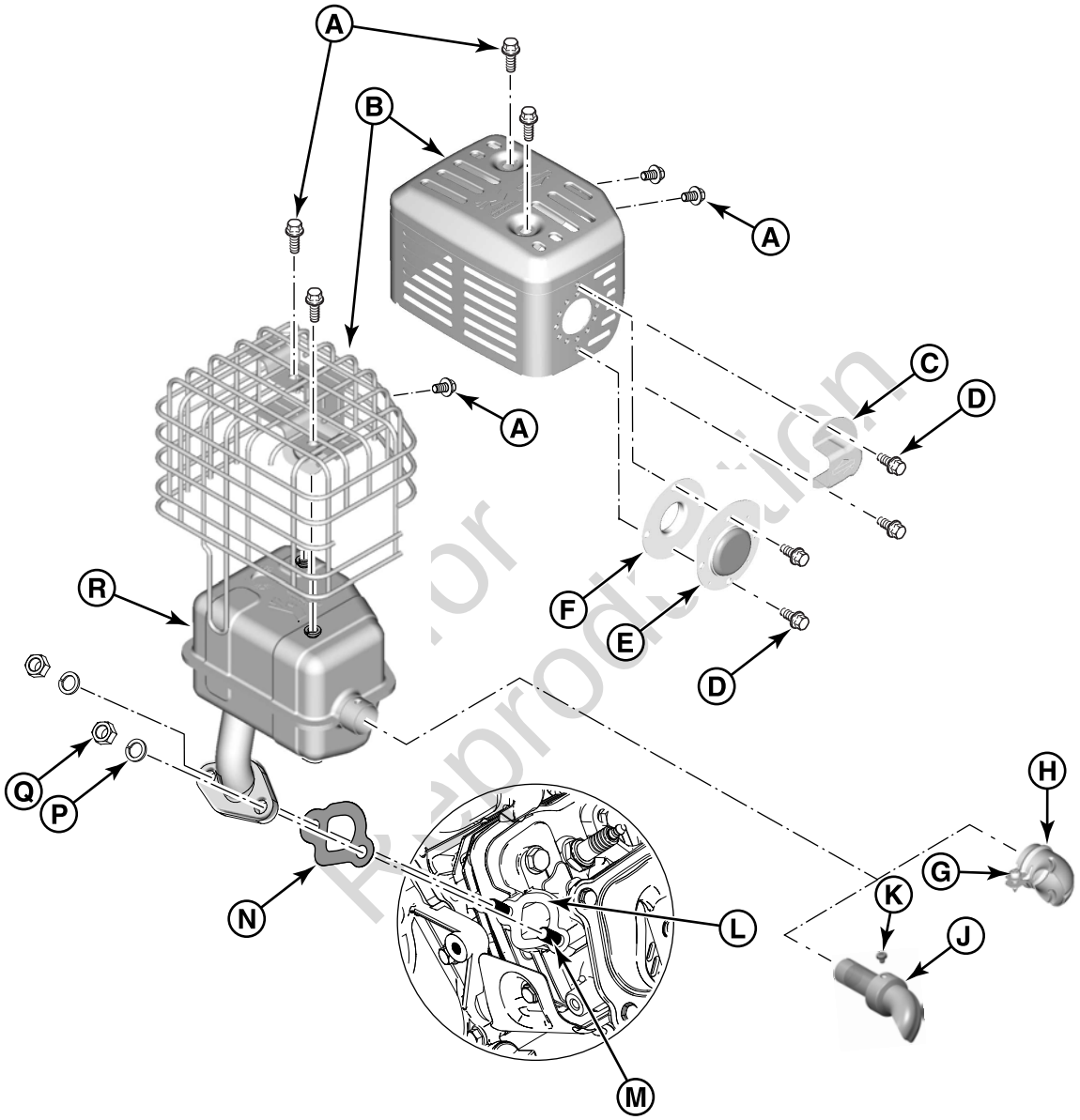


Install Rewind Starter

1. Install rewind starter assembly (**B**) on blower housing (**A**) and secure using screws (**E**). Torque screws to the value listed in ***Section 13 - Engine Specifications***. **Tip:** To ensure that pawls engage in flywheel cup evenly, install screws loosely, pull starter rope, tighten screws and then release starter rope. Torque screws to the value listed in ***Section 13 - Engine Specifications***.

SECTION 12 – EXHAUST SYSTEM

90



12

Exhaust System Warnings

WARNING

Running engines produce heat. Engine parts, especially mufflers, become extremely hot.

Severe thermal burns can occur on contact.

Combustible debris, such as leaves, grass, brush, etc., can catch fire.

- Allow muffler, engine cylinder and fins to cool before touching.
- Remove accumulated debris from muffler area and cylinder area.
- It is a violation of California Public Resource Code, Section 4442, to use or operate the engine on any forest-covered, brush-covered, or grass-covered land unless the exhaust system is equipped with a spark arrester, as defined in Section 4442, maintained in effective working order. Other states or federal jurisdictions may have similar laws. Contact the original equipment manufacturer, retailer, or dealer to obtain a spark arrester designed for the exhaust system installed on this engine.

WARNING

Replacement parts must be the same and installed in the same position as the original parts or fire could result.

OEM Statement

Some engines may be equipped with an exhaust system (muffler, bracket, and hardware) supplied by the equipment manufacturer. Contact the equipment manufacturer for muffler service information.

The exhaust system covered in this section is supplied by Briggs & Stratton.

Inspect Exhaust System

All exhaust system components must be inspected whenever the exhaust system is disassembled. Check the muffler mounting bracket and/or muffler adapters for cracked welds or breakage. Check the muffler for split seams, loose internal parts, or cracked welds. Replace any damaged parts with new original equipment parts. **Never reinstall broken or damaged components.**

Muffler Deflector

Remove Muffler Deflector

1. Prior to removing the muffler deflector, note its orientation for reinstallation.

Note: Orientation of muffler deflector should match the illustration at the beginning of this section.

2. For mufflers with a stamped metal guard, remove screws (**D**) from muffler deflector (**C**). For mufflers with a wire guard, loosen screw (**G**) from muffler deflector (**H**).
3. Remove the muffler deflector.

Inspect Muffler Deflector

Inspect muffler deflector monthly or every 50 hours.

1. Clean muffler deflector.
2. Check muffler deflector for holes, cracks or breakage.
3. Replace any damaged parts with new original equipment parts. **Never reinstall broken or damaged components.**

Install Muffler Deflector

Note: Install the muffler deflector in the same orientation as when it was removed. Orientation of muffler deflector should match the illustration at the beginning of this section.

1. For mufflers with a stamped metal guard, install muffler deflector (**C**) using two screws (**D**). Torque screws to the value listed in ***Section 13 - Engine Specifications***. For mufflers with a wire guard, install muffler deflector (**H**) onto muffler (**R**). Tighten clamp screw (**G**) securely.

Spark Arrester

Remove Spark Arrester

1. Prior to removing the spark arrester, note its orientation for reinstallation.

Note: Orientation of spark arrester should match the illustration at the beginning of this section.

2. For mufflers with a stamped metal guard, remove screws (**D**) from spark arrester (**E**) and muffler adapter (**F**). For mufflers with a wire guard, remove screw (**K**) from spark arrester (**J**).
3. For mufflers with a stamped metal guard, remove spark arrester and muffler adapter from stamped metal guard. For mufflers with a wire guard, remove spark arrester from muffler.

Inspect Spark Arrester

Inspect spark arrester monthly or every 50 hours.

1. Clean spark arrester and muffler adapter.
2. Check spark arrester and muffler adapter for holes, cracks or breakage.
3. Replace any damaged parts with new original equipment parts. **Never reinstall broken or damaged components.**

Install Spark Arrester

Note: Install the spark arrester in the same orientation as when it was removed. Orientation of spark arrester should match the illustration at the beginning of this section.

1. For mufflers with a stamped metal guard, install muffler adapter (**F**) and spark arrester (**E**) using two screws (**D**).
   For mufflers with a wire guard, install spark arrester (**J**) using screw (**K**).
2. Torque screws to the value listed in ***Section 13 - Engine Specifications***.

Muffler

Remove Muffler

1. Remove the muffler deflector as instructed in *Remove muffler deflector*, or the spark arrester as instructed in *Remove Spark Arrester*.
2. Remove screws (**A**) and then remove the muffler guard (**B**).
3. Remove two nuts (**Q**) and lock washers (**P**) and then remove the muffler (**R**) and gasket (**N**).

Inspect Muffler

1. Check the muffler, tube and flange for cracked welds or breakage.
2. Check the muffler for split seams, loose internal parts, or cracked welds.
3. Replace any damaged parts with new original equipment parts. **Never reinstall broken or damaged components.**

Install Muffler

1. Clean mounting surfaces of muffler (**R**) and cylinder head (**L**) of any dirt, debris and gasket material.
2. Lightly coat threads of mounting studs (**M**) with lubricant.
3. Place new exhaust gasket (**N**) on mounting studs.
4. Place muffler mounting flange on mounting studs.
5. Install two nuts (**Q**) and lock washers (**P**) and torque to value listed in ***Section 13 - Engine Specifications***.
6. Install muffler guard (**B**) using screws (**A**). Torque screws to the value listed in ***Section 13 - Engine Specifications***
7. Install the muffler deflector as instructed in *Install muffler deflector*, or spark arrester as instructed in *Install Spark Arrester*.

SECTION 13 – ENGINE SPECIFICATIONS

13

Specifications — Models 106200 and 10R200

ENGINE SPECIFICATIONS	
Armature Air Gap	0.008 - 0.016 in (0,20 - 0,41 mm)
Bore	2.68 in (68,00 mm)
Compression Ratio	8:1
Crankshaft End Play	0.003 - 0.030 in (0,09 - 0,75 mm)
Displacement	9.95 ci (163 cc)
Fuel Tank Capacity	3.2 qt (3,1 L)
Ignition Timing	Fixed
Oil Capacity	18.3 - 21.7 oz (550 - 650 ml)
Spark Plug Gap	0.027 - 0.033 in (0,7 - 0,9 mm)
Stroke	1.77 in (45 mm)
Valve Clearance - Intake	0.004 - 0.006 in (0,10 - 0,15 mm)
Valve Clearance - Exhaust	0.006 - 0.008 in (0,15 - 0,20 mm)

FASTENER TORQUE SPECIFICATIONS	TORQUE
Air Cleaner Base to Carburetor Studs (Dual Element Oval Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Air Cleaner Base to Control Bracket (Dual Element Oval Air Filter)	40 - 60 lb-in (5 - 7 N-m)
Air Cleaner Base to Carburetor Studs (Oil Bath Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Air Cleaner Base to Control Bracket (Oil Bath Air Filter)	40 - 60 lb-in (5 - 7 N-m)
Air Cleaner Base to Carburetor Studs (Foam Low Mount Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Air Cleaner Base to Carburetor Studs (Foam Large Panel Air Filter)	35 - 55 lb-in (4 - 6 N-m)
Air Cleaner Retainer to Air Cleaner Base (Foam Large Panel Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Armature	80 - 110 lb-in (9 - 12 N-m)
Blower Housing	60 - 110 lb-in (7 - 12 N-m)
Carburetor Bowl Nut	49 - 80 lb-in (6 - 9 N-m)
Carburetor Drain Plug	49 - 80 lb-in (6 - 9 N-m)
Carburetor Studs (to Head)	50 - 70 lb-in (6 - 8 N-m)
Connecting Rod	110 - 140 lb-in (12 - 16 N-m)
Control Bracket	80 - 110 lb-in (9 - 12 N-m)
Control Panel Trim	35 - 55 lb-in (4 - 6 N-m)
Crankcase Cover	16 - 21 lb-ft (22 - 28 N-m)
Cylinder Head	15 - 20 lb-ft (20 - 27 N-m)
Cylinder Shield	40 - 60 lb-in (5 - 7 N-m)
Flywheel Finger Guard (Located on Right Side of Flywheel)	60 - 110 lb-in (7 - 12 N-m)
Flywheel Guard (Located on Left Side of Flywheel)	40 - 60 lb-in (5 - 7 N-m)
Flywheel Nut	53 - 71 lb-ft (72 - 96 N-m)
Fuel Tank Hex Nuts	45 - 65 lb-in (5 - 7 N-m)
Fuel Tank Screw	75 - 95 lb-in (9 - 11 N-m)
Governor Lever Nut	35 - 45 lb-in (4 - 5 N-m)
Low Oil Sensor	50 - 70 lb-in (6 - 8 N-m)
Low Oil Sensor Module	30 - 80 lb-in (3 - 9 N-m)
Low Oil Sensor Fitting Nut	30 - 50 lb-in (4 - 6 N-m)
Manifold - Exhaust (to Head)	80 - 110 lb-in (9 - 12 N-m)
Muffler Deflector	25 - 35 lb-in (3 - 4 N-m)
Muffler Guard	71 - 124 lb-in (8 - 14 N-m)

FASTENER TORQUE SPECIFICATIONS	TORQUE
Oil Drain Plug	12 - 17 lb-ft (16 - 23 N-m)
Oil Fill Cap	10 - 30 lb-in (1 - 3 N-m)
Remote Choke Stud	35 - 71 lb-in (4 - 8 N-m)
Remote Choke Nut	35 - 71 lb-in (4 - 8 N-m)
Rewind Starter	25 - 35 lb-in (3 - 4 N-m)
Rocker Arm Stud	15 - 22 lb-ft (20 - 30 N-m)
Rocker Ball Set Screw or Nut	60 - 80 lb-in (7 - 9 N-m)
Rocker Cover	70 - 90 lb-in (8 - 10 N-m)
Sediment Bowl	44 - 88 lb-in (5 - 10 N-m)
Spark Plug	12 - 17 lb-ft (16 - 23 N-m)
Stator (to Cylinder), AC Option	80 - 110 lb-in (9 - 12 N-m)

REJECT DIMENSIONS	STANDARD SIZE	REJECT SIZE
CYLINDER		
Mag Bearing	N/A	N/A
Camshaft Bearing	0.551 in (14,00 mm)	0.553 in (14,05 mm)
Bore Out-Of-Round	0.002 in (0,05 mm)	0.004 in (0,09 mm)
Bore Diameter	N/A	N/A
CYLINDER HEAD		
Intake		
Valve Seat Angle	45 degrees	
Valve Seat Width	0.028 in (0,70 mm)	0.075 in (1,90 mm)
Valve Stem Diameter	0.216 in (5,47 mm)	0.210 in (5,32 mm)
Valve Guide	0.217 in (5,51 mm)	0.220 in (5,59 mm)
Exhaust		
Valve Seat Angle	45 degrees	
Valve Seat Width	0.028 in (0,70 mm)	0.075 in (1,90 mm)
Valve Stem Diameter	0.216 in (5,47 mm)	0.210 in (5,32 mm)
Valve Guide	0.217 in (5,51 mm)	0.220 in (5,59 mm)
CRANKCASE COVER/SUMP		
Camshaft Bearing	0.551 in (14,00 mm)	0.553 in (14,05 mm)
CRANKSHAFT		
Crank Pin Journal	1.180 in (29,98 mm)	1.178 in (29,93 mm)
Mag Side Journal	0.983 in (24,98 mm)	0.981 in (24,93 mm)
PTO Side Journal	0.983 in (24,98 mm)	0.981 in (24,93 mm)
CAMSHAFT		
Mag Side Journal	0.550 in (13,98 mm)	0.548 in (13,93 mm)
PTO Side Journal	0.550 in (13,98 mm)	0.548 in (13,93 mm)
CONNECTING ROD		
Crank Pin Bearing	1.182 in (30,03 mm)	1.184 in (30,08 mm)
Piston Pin Bearing	0.709 in (18,01 mm)	0.711 in (18,06 mm)
PISTON		
Piston Pin Diameter	0.708 in (17,99 mm)	0.707 in (17,96 mm)
Piston Pin Bore	0.709 in (18,01 mm)	0.711 in (18,06 mm)
Top Ring End Gap	0.011 in (0,28 mm)	0.041 in (01,04 mm)
Middle Ring End Gap	0.017 in (0,43 mm)	0.047 in (1,19 mm)
Oil Ring End Gap	0.018 in (0,45 mm)	0.053 in (1,34 mm)
Top Ring Land Clearance *	0.002 in (0,05 mm)	0.009 in (0,23 mm)
STARTER ROPE		
Model 106200		

REJECT DIMENSIONS	STANDARD SIZE	REJECT SIZE
Rope Size	0.177 in (4,5 mm)	
Rope Length	54.00, 102.00 in (1,37 / 2,59 m)	
Rope Size	0.157 in (4,0 mm)	
Rope Length	85.00 in (2,16 m)	
Model 10R200		
Rope Size	0.157 in (4,0 mm)	
Rope Length	45.00 in (1,14 m)	

* Only Top Ring Land Clearance needs to be checked. The piston is good or rejected based on this measurement.

Specifications — Model 10U200

ENGINE SPECIFICATIONS	
Armature Air Gap	0.008 - 0.016 in (0,20 - 0,41 mm)
Bore	2.68 in (68,00 mm)
Compression Ratio	8.5:1
Crankshaft End Play	0.002 - 0.013 in (0,05 - 0,33 mm)
Displacement	9.95 ci (163 cc)
Fuel Tank Capacity	3.2 qt (3 L)
Ignition Timing	Fixed
Oil Capacity	18.3 - 21.7 oz (550 - 650 ml)
Spark Plug Gap	0.027 - 0.033 in (0,7 - 0,9 mm)
Stroke	1.77 in (45 mm)
Valve Clearance - Intake	0.005 - 0.007 in (0,13 - 0,18 mm)
Valve Clearance - Exhaust	0.005 - 0.007 in (0,13 - 0,18 mm)

FASTENER TORQUE SPECIFICATIONS	TORQUE
Air Cleaner Base to Carburetor Studs (Dual Element Oval Air Filter)	35 - 70 lb-in (4 - 8 N-m)
Air Cleaner Base to Control Bracket (Dual Element Oval Air Filter)	70 - 120 lb-in (8 - 14 N-m)
Air Cleaner Base to Carburetor Studs (Foam Low Mount Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Air Cleaner Base to Carburetor Studs (Foam Large Panel Air Filter)	70 - 120 lb-in (8 - 14 N-m)
Air Cleaner Retainer to Air Cleaner Base (Foam Large Panel Air Filter)	30 - 50 lb-in (3 - 6 N-m)
Armature	70 - 120 lb-in (8 - 14 N-m)
Blower Housing	70 - 120 lb-in (8 - 14 N-m)
Carburetor Bowl Nut	49 - 80 lb-in (6 - 9 N-m)
Carburetor Drain Plug	49 - 80 lb-in (6 - 9 N-m)
Carburetor Studs (to Head)	45 - 60 lb-in (5 - 7 N-m)
Connecting Rod	120 - 140 lb-in (14 - 16 N-m)
Control Bracket	70 - 120 lb-in (8 - 14 N-m)
Control Panel Trim	35 - 55 lb-in (4 - 6 N-m)
Crankcase Cover	18 - 19 lb-ft (24 - 26 N-m)
Cylinder Head	21 - 22 lb-ft (28 - 30 N-m)
Cylinder Shield	70 - 120 lb-in (8 - 14 N-m)
Flywheel Finger Guard (Located on Right Side of Flywheel)	70 - 120 lb-in (8 - 14 N-m)
Flywheel Guard (Located on Left Side of Flywheel)	40 - 60 lb-in (5 - 7 N-m)
Flywheel Nut	54 - 59 lb-ft (73 - 80 N-m)
Fuel Tank Hex Nuts	70 - 120 lb-in (8 - 14 N-m)
Fuel Tank Screw	70 - 120 lb-in (8 - 14 N-m)
Governor Lever Nut	70 - 120 lb-in (8 - 14 N-m)
Low Oil Sensor	70 - 120 lb-in (8 - 14 N-m)
Low Oil Sensor Module	35 - 70 lb-in (4 - 8 N-m)
Low Oil Sensor Fitting Nut	70 - 120 lb-in (8 - 14 N-m)
Manifold - Exhaust (to Head)	16 - 22 lb-ft (22 - 30 N-m)
Muffler Deflector	26 - 44 lb-in (3 - 5 N-m)
Muffler Guard	71 - 124 lb-in (8 - 14 N-m)
Oil Drain Plug	21 - 22 lb-ft (28 - 30 N-m)
Oil Fill Cap	18 - 26 lb-in (2 - 3 N-m)
Rewind Starter	70 - 89 lb-in (8 - 10 N-m)
Rocker Arm Stud	15 - 22 lb-ft (20 - 30 N-m)
Rocker Ball Set Screw or Nut	70 - 120 lb-in (8 - 14 N-m)
Rocker Cover	70 - 120 lb-in (8 - 14 N-m)

FASTENER TORQUE SPECIFICATIONS	TORQUE
Spark Plug	19 - 26 lb-ft (26 - 36 N-m)
Stator (to Cylinder), AC Option	70 - 120 lb-in (8 - 14 N-m)

REJECT DIMENSIONS	STANDARD SIZE	REJECT SIZE
CYLINDER		
Mag Bearing	N/A	N/A
Camshaft Bearing	0.551 in (14,00 mm)	0.553 in (14,05 mm)
Bore Out-Of-Round		0.002 in (0,04 mm)
Bore Diameter	N/A	N/A
CYLINDER HEAD		
Intake		
Valve Seat Angle	45 degrees	
Valve Seat Width	0.031 in (0,80 mm)	0.075 in (1,90 mm)
Valve Stem Diameter	0.216 in (5,47 mm)	0.210 in (5,32 mm)
Valve Guide	0.217 in (5,51 mm)	0.220 in (5,59 mm)
Exhaust		
Valve Seat Angle	45 degrees	
Valve Seat Width	0.031 in (0,80 mm)	0.075 in (1,90 mm)
Valve Stem Diameter	0.214 in (5,43 mm)	0.208 in (5,28 mm)
Valve Guide	0.217 in (5,51 mm)	0.220 in (5,59 mm)
CRANKCASE COVER/SUMP		
Camshaft Bearing	0.551 in (14,00 mm)	0.553 in (14,05 mm)
CRANKSHAFT		
Crank Pin Journal	1.180 in (29,98 mm)	1.178 in (29,93 mm)
Mag Side Journal	0.983 in (24,98 mm)	0.981 in (24,93 mm)
PTO Side Journal	0.983 in (24,98 mm)	0.981 in (24,93 mm)
CAMSHAFT		
Mag Side Journal	0.550 in (13,98 mm)	0.548 in (13,93 mm)
PTO Side Journal	0.550 in (13,98 mm)	0.548 in (13,93 mm)
CONNECTING ROD		
Crank Pin Bearing	1.182 in (30,03 mm)	1.184 in (30,08 mm)
Piston Pin Bearing	0.709 in (18,01 mm)	0.711 in (18,06 mm)
PISTON		
Piston Pin Diameter	0.708 in (17,99 mm)	0.707 in (17,96 mm)
Piston Pin Bore	0.709 in (18,01 mm)	0.711 in (18,06 mm)
Top Ring End Gap	0.011 in (0,28 mm)	0.041 in (01,04 mm)
Middle Ring End Gap	0.017 in (0,43 mm)	0.047 in (1,19 mm)
Oil Ring End Gap	0.018 in (0,45 mm)	0.053 in (1,34 mm)
Top Ring Land Clearance *	0.002 in (0,05 mm)	0.009 in (0,23 mm)
STARTER ROPE		
Rope Size	Not Serviceable	
Rope Length	Not Serviceable	

* Only Top Ring Land Clearance needs to be checked. The piston is good or rejected based on this measurement.

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