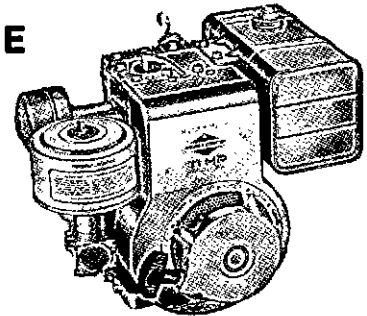


## Briggs & Stratton OPERATING AND MAINTENANCE INSTRUCTIONS



### MODELS 251400 to 251499 252400 to 252499

#### IN THE INTEREST OF SAFETY

**DO NOT RUN ENGINE AT EXCESSIVE SPEEDS.** Operating an engine at excessive speeds increases the hazard of personal injury. **DO NOT TAMPER WITH PARTS WHICH MAY INCREASE THE GOVERNED SPEED.**

For rotary lawnmower safety, USA Standard Safety Specifications for Power Lawn Mowers specify a maximum blade tip speed of 19,000 feet per minute, primarily to reduce the hazard from thrown objects.

Rotary lawnmower manufacturers select the governed top speed of the engine based on the length and design of the cutter blade and design of other mower parts.

All rotary lawnmowers should be checked for conformance to the USA Standard Safety Specifications for Power Lawn Mowers on blade tip speed, if the engine is repaired or replaced, or if mower parts are changed.

**DANGER: GASOLINE VAPOR IS HIGHLY FLAMABLE.** Refuel outdoors preferably, or only in well ventilated areas.

**DO NOT STORE, SPILL OR USE GASOLINE NEAR AN OPEN FLAME** or devices such as a stove, furnace, water heater which utilize a pilot light, or devices that can create a spark.

If gasoline is accidentally spilled, move machine away from area of spill and avoid creating any source of ignition until gasoline vapors have dissipated.

**DO NOT REFUEL GASOLINE TANK WHILE ENGINE IS RUNNING.**

**DO NOT RUN THE ENGINE IN AN ENCLOSED AREA.** Exhaust gases contain carbon monoxide, an odorless and deadly poison.

**TO PREVENT ACCIDENTAL STARTING** always remove the spark plug from the engine, before working on the engine or equipment driven by the engine.

**ALWAYS KEEP HANDS AND FEET CLEAR OF ROTATING PARTS.**

#### IN THE INTEREST OF ENVIRONMENT

A muffler which leaks because of rust or damage can permit an increased exhaust noise level. Therefore, examine the muffler periodically to be sure it is functioning effectively. To purchase a new muffler, see **SERVICE AND REPAIR INFORMATION**.

**WARNING:** If this engine is not equipped with a spark arrester and is to be used on any forest covered, brush covered, or grass covered unimproved land, before using on such land a spark arrester must be added to the muffler. The arrester must be maintained in effective working order by the operator. In the State of California the above is required by law (Section 4442 of the California Public Resources Code). Other states may have similar laws. Federal laws apply on federal lands. See your Authorized Briggs & Stratton Service Center for spark arrester muffler options.

## SERVICE & REPAIR INFORMATION

If service or repair is needed, contact an Authorized Briggs & Stratton Service Center. To serve you promptly and efficiently, the Service Center will need the model, type and code number on your engine.

Each Authorized Service Center carries a stock of original Briggs & Stratton repair parts and is equipped with special service tools. Trained mechanics assure expert repair service on all Briggs & Stratton engines.

Major engine repairs should not be attempted unless you have the proper tools and a thorough knowledge of internal combustion engine repair procedure.

Your nearest service center is listed in the 'Yellow Pages' under "Engines Gasoline", or "Gasoline Engines". He is one of over 21,000 authorized dealers available to serve you.



This illustrated book includes "Theories of Operation", common specifications, and detailed information covering the adjustment tune-up and repair procedures for 2 through 16 H.P. single cylinder models. It is available from any Authorized Briggs & Stratton Service Center. Order as Part Number 270962.

FORM NO. 270861-9/77  
PRINTED IN U.S.A.



**BRIGGS & STRATTON CORPORATION**  
Milwaukee, Wisconsin 53201

# BEFORE STARTING

## READ THE OPERATING INSTRUCTIONS OF THE EQUIPMENT THIS ENGINE POWERS

Use a high quality detergent oil classified "For Service SC, SD, SE or MS". Detergent oils keep the engine cleaner and retard the formation of gum and varnish deposits. Nothing should be added to the recommended oil.

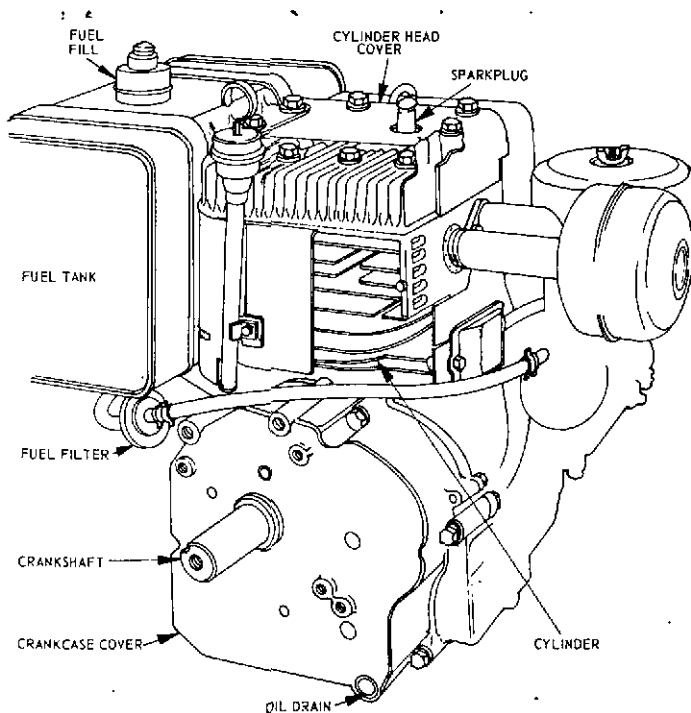
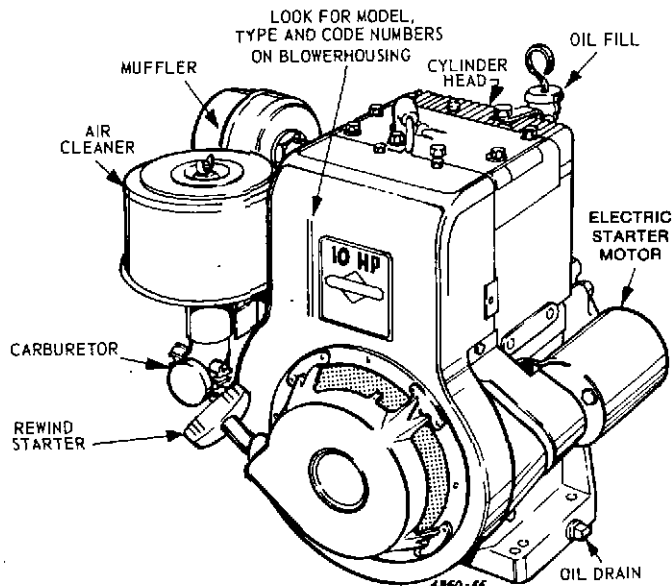
## OIL RECOMMENDATIONS

### SUMMER

(Above 40° F.) Use SAE 30  
If not available, Use SAE 10W-30 or 10W-40

### WINTER

(Under 40° F.) Use SAE 5W-20 or SAE 5W-30  
If not available, Use SAE 10W or SAE 10W-30  
Below 0° F. Use SAE 10W or SAE 10W-30  
Diluted 10% with Kerosene.

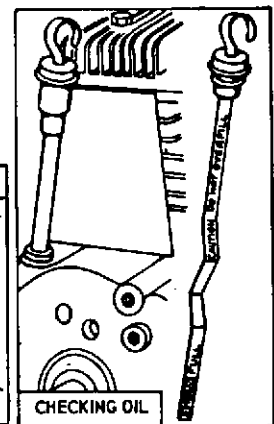
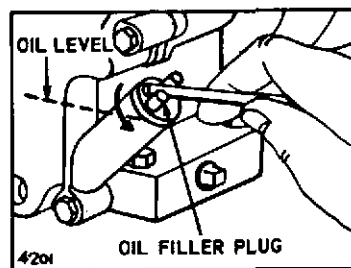


## TO FILL CRANKCASE WITH OIL

Place engine level. Clean area around oil fill before removing oil fill plug or dipstick.

**OIL FILL PLUG** Use screw driver or bar to remove oil fill plug. Fill crankcase to point of overflowing. **POUR SLOWLY.** Capacity 3 pints. (1.4 Liters) Replace oil fill plug.

**EXTENDED OIL FILL.** Remove cap and dipstick. **Fill to full mark** on dipstick. **POUR SLOWLY.** Capacity 3 pints. (1.4 Liters): When checking oil level push dipstick assembly firmly but slowly until cap bottoms on tube. **Do not overfill.** Dipstick assembly must be pushed fully into tube at all times when engine is operating.

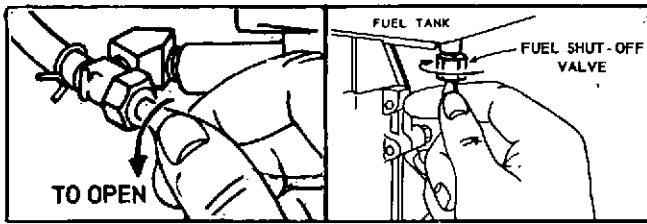


## FILL FUEL TANK

Use clean, fresh, lead-free, or leaded "regular" grade automotive gasoline. **DO NOT MIX OIL WITH GASOLINE.**

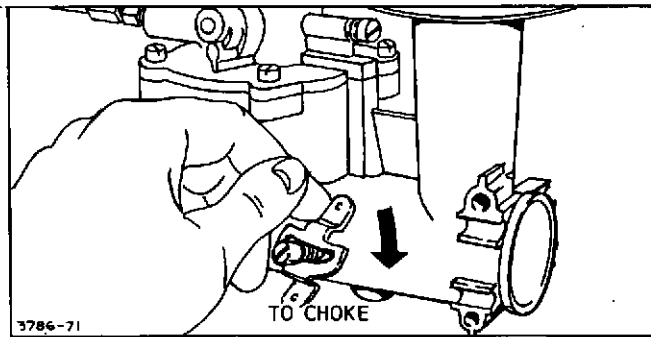
# STARTING

**OPEN FUEL VALVE** on engines so equipped.

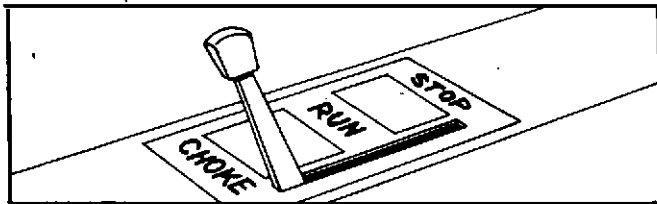


**CHOKE ENGINE** Engine may be equipped with either manual, remote or choke-a-matic controls.

**MANUAL CHOKE:** Move lever as illustrated.



**REMOTE CHOKE:** Move equipment control lever to "CHOKE" position.

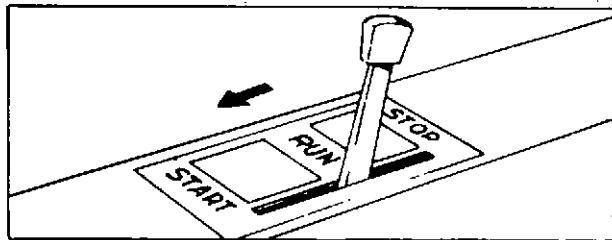


**CHOKE-A-MATIC:** Move lever to "Full Choke" or "Start" position.

NOTE: This should fully close choke on carburetor. If it does not, remote control must be re-adjusted. See ADJUSTMENT section.

NOTE: A warm engine requires less choking than a cold engine.

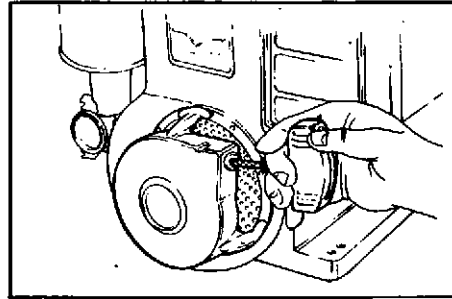
**GOVERNOR THROTTLE CONTROL LEVER:** Move governor throttle control lever to "RUN", "FAST" or "START" position if so equipped.



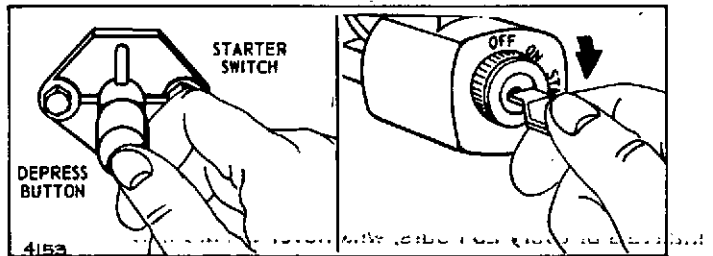
## TO START ENGINE

**DANGER: ALWAYS KEEP HANDS AND FEET CLEAR OF MOWER BLADE OR OTHER ROTATING MACHINERY.**

Rewind Starter. Grasp starter grip as illustrated and pull out cord rapidly. Repeat if necessary with choke opened slightly. When engine starts open choke gradually.



Electric Starter. Turn key to "Start" position and/or press starter button on powered equipment. When engine starts open choke gradually.



NOTE: If fuel drips out of carburetor while trying to start engine, the engine is over choked. Pull starter several times or push starter switch with choke open.

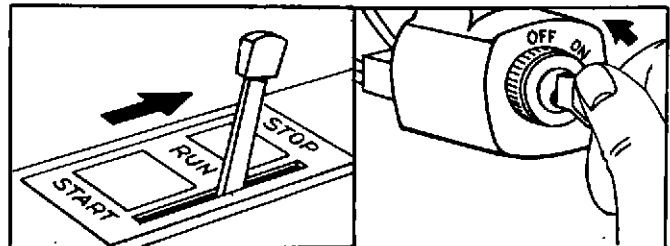
## COLD WEATHER STARTING HINTS

1. Be sure to use the proper oil for the temperature expected.
2. Declutch all possible external loads.
3. Set throttle at part-throttle position.
4. A slightly richer fuel mixture, obtained by turning carburetor needle  $\frac{1}{2}$  turn counterclockwise, will usually improve cold starting.
5. A warm battery has much more starting capacity than a cold battery.
6. Use fresh winter grade fuel.

NOTE: Winter grade gasoline has higher volatility to improve starting. Do not use gasoline left over from summer.

## TO STOP ENGINE

Move engine speed control to "STOP" position or turn key to "OFF" position.



# GENERAL INFORMATION

These engines are single-cylinder, L-head, air-cooled type

## MODEL SERIES 251400 to 251499

Bore ..... 3-7/16"  
 Stroke ..... 2-5/8"  
 Displacement ..... 24.36 cu. in. (399.2 cc)  
 Horsepower ..... 10 H.P. max @ 3600 R.P.M.  
 Torque (Ft. Lbs.) ..... 16.8 max. @ 2400 R.P.M.

## MODEL SERIES 252400 to 252499

Bore ..... 3-7/16"  
 Stroke ..... 2-5/8"  
 Displacement ..... 24.36 cu. in. (399.2 cc)  
 Horsepower ..... 11 H.P. max @ 3600 R.P.M.  
 Torque (Ft. Lbs.) ..... 16.8 max. @ 2800 R.P.M.

The horsepower ratings listed above are established in accordance with the Society of Automotive Engineers Test Code-J607. For practical operation, the horsepower loading should not exceed 85% of these ratings. Engine power will decrease 3½% for each 1,000 feet above sea level and 1% for each 10° above 60° F.

In some areas, local law requires the use of a resistor spark plug so as to suppress ignition signals. If an engine was originally equipped with a resistor spark plug, be sure to use the same type of spark plug for replacement.

Major engine repairs should not be attempted unless you have the proper tools and a thorough knowledge of internal combustion engine repair procedure.

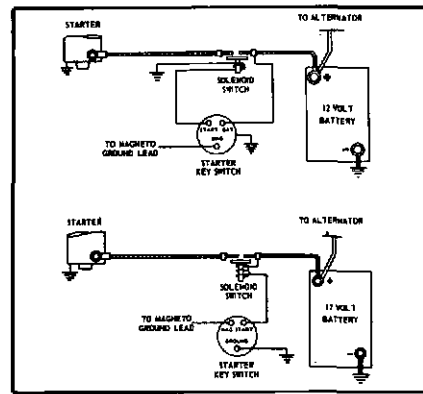
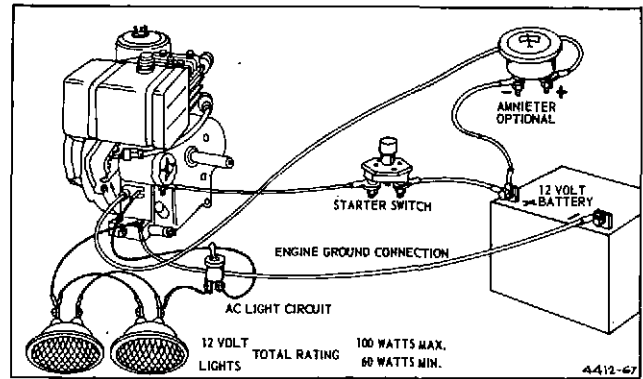
## TUNE-UP SPECIFICATIONS

| Spark Plug Type     | A.C.  | Autolite | Champion |
|---------------------|-------|----------|----------|
| Short Plug          | CS-45 | A7N      | CJ-8     |
| Long Plug           | GC-46 | A71      | J-8      |
| Resistor Short Plug | None  | AR7N     | RCJ-8    |
| Resistor Long Plug  | R-46  | AR80     | RJ-8     |

Spark Plug Gap ..... .030"  
 Ignition Point Gap ..... .030"  
 Intake Valve Clearance ..... .005" - .007"  
 Exhaust Valve Clearance ..... .009" - .011"

**WARNING:** For electrical safety always remove cable from negative(-) side of the battery before attempting any repairs or maintenance.

## TYPICAL WIRING DIAGRAMS



## STORAGE INSTRUCTIONS

Engines to be stored over 30 days should be completely drained of fuel to prevent gum deposits forming on essential carburetor parts, fuel filter and tank.

- All fuel should be removed from the tank. Run the engine until it stops from lack of fuel. The small amount of fuel that remains in the sump of the tank should be removed by absorbing it with a clean, dry cloth.
- While engine is still warm, drain oil from crankcase. Refill with fresh oil.
- Remove spark plug, pour one ounce (2 or 3 tablespoons) of engine oil into cylinder and crank slowly to distribute oil. Replace spark plug.
- Clean dirt and chaff from cylinder, cylinder head fins, blower housing, rotating screen, and muffler areas.
- Store in a clean and dry area.

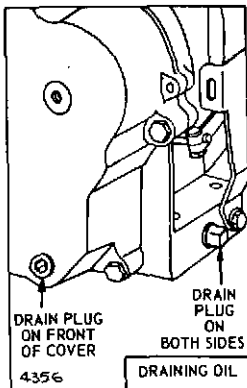
BRIGGS & STRATTON ENGINES ARE MADE UNDER ONE OR MORE OF THE FOLLOWING PATENTS:

|           |           |           |           |           |           |   |
|-----------|-----------|-----------|-----------|-----------|-----------|---|
| 2,559,322 | 2,796,453 | 3,114,851 | 3,149,618 | 3,194,224 | 3,252,449 | DESIGN                                  |
| 2,693,789 | 2,999,491 | 3,116,433 | 3,165,094 | 3,236,937 | 3,276,439 | D-191,806 D-196,017 D-197,175 D-213,476 |
| 2,693,791 | 2,999,562 | 3,144,097 | 3,168,936 | 3,242,741 | 3,378,099 | OTHER PATENTS PENDING                   |
|           |           |           |           |           | 3,415,237 |   |

# MAINTENANCE

**CHECK OIL LEVEL** regularly—after each 5 hours of operation. BE SURE OIL LEVEL IS MAINTAINED.

**CHANGE OIL** after first 5 hours of operation. Thereafter change oil every 25 hours of operation. Remove oil drain plug and drain oil while engine is warm. Replace drain plug. Remove dipstick or oil fill plug and refill with new oil of proper grade. Replace dipstick or oil fill plug.

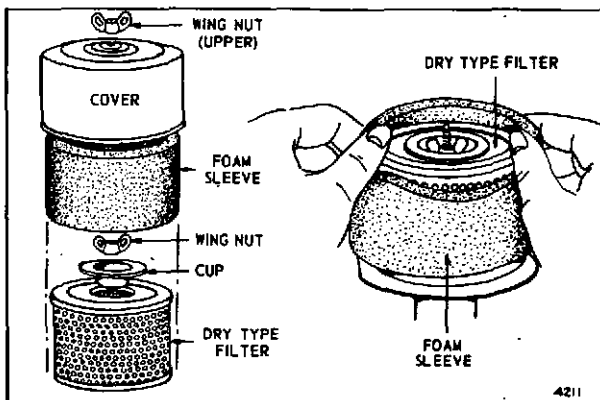


## TO SERVE DUAL ELEMENT AIR CLEANER

Clean and re-oil foam element pre-cleaner at 3 month intervals or every 25 hours, whichever occurs first.

**NOTE:** Service Air Cleaner more often under dusty conditons.

1. Remove wing nut and cover.
2. Remove foam pre-cleaner element by sliding it off the paper cartridge.
3. A.—Wash foam in liquid detergent and water.  
b.—Wrap foam in cloth and squeeze dry.  
c.—Saturate foam in engine oil. Squeeze to distribute and remove excess oil.
4. Install foam element over paper cartridge. Re-assembly cover and screw down tight.



Yearly, or every 100 hours, whichever occurs first, remove paper cartridge. Clean by tapping gently on flat surface. If very dirty, replace cartridge, or wash in a non or low sudsing detergent and warm water solution. Rinse

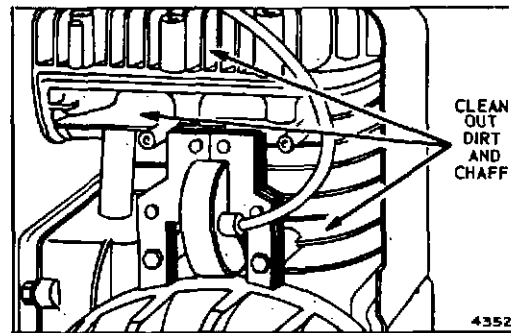
thoroughly with flowing water from inside until water is clear. Cartridge must be allowed to stand and air dry thoroughly before using.

**CAUTION** Petroleum solvents are not to be used to clean cartridge. They may cause deterioration of the cartridge. DO NOT OIL CARTRIDGE.

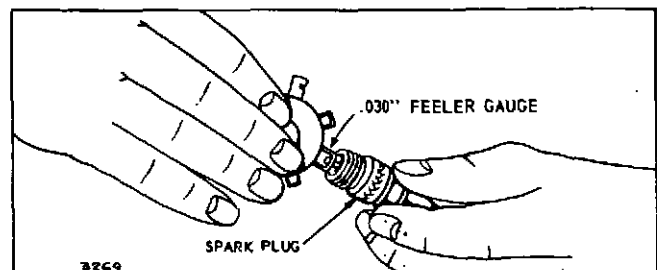
**CLEAN COOLING SYSTEM** Grass or chaff may clog cooling system after prolonged service in cutting tall dry grasses or hay.

Continued operation with a clogged cooling system causes severe overheating and possible engine damage. Remove blower housing and clean regularly.

**CAUTION:** Clean muffler area of all grass, dirt and debris. Whip clean.



**SPARK PLUG**—Clean and reset gap at .030" every 100 hours of operation.



**CAUTION:** Do not blast clean spark plugs. Spark plugs should be cleaned by scraping or wire brushing and washing with a commercial solvent.

**REMOVE CARBON DEPOSITS**—Clean combustion chamber, top of piston and around both valves every 100-300 hours of operation.

**SPARK ARRESTER EQUIPPED MUFFLER**—If engine muffler is equipped with spark arresstor screen assembly, remove every 50 hours for cleaning and inspection. Replace if damaged.

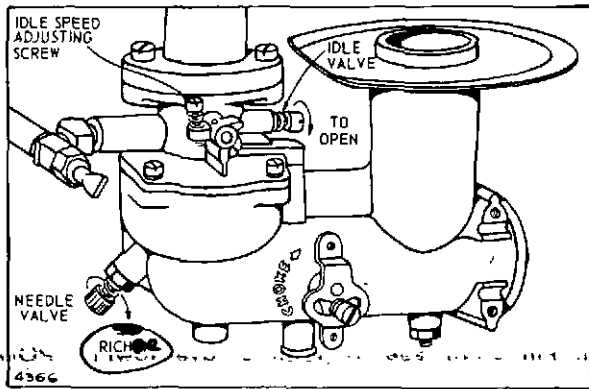
# ADJUSTMENTS

## CARBURETOR ADJUSTMENTS

Minor carburetor adjustment may be required to compensate for differences in fuel, temperature, altitude and load.

**TO ADJUST CARBURETOR**—Turn needle valve clockwise until it just closes.

**CAUTION:** Valve may be damaged by turning it in too far. Now open needle valve 1½ turns counterclockwise. Close idle valve in same manner and open 1 turn. This initial adjustment will permit the engine to be started and warmed up prior to final adjustment.



## FINAL ADJUSTMENT

Place governor speed control lever in "FAST" position. Turn needle valve in until engine misses (lean mixture) then turn it out past smooth operating point until engine runs unevenly (rich mixture). Now turn needle valve to the mid-point between rich and lean so the engine runs smoothly. Hold throttle at idle position and set idle speed adjustment screw until fast idle is obtained (1750 RPM). Hold throttle in idle position and turn idle valve in (lean) and out (rich). Turn idle valve to the mid-point between rich and lean until engine idles smoothly. Then reset idle speed adjusting screw so that engine idles 1750 RPM. Release throttle—engine should accelerate without hesitation or sputtering. If engine does not accelerate properly, the carburetor should be re-adjusted to a slightly richer mixture.

## CONTROL ADJUSTMENTS

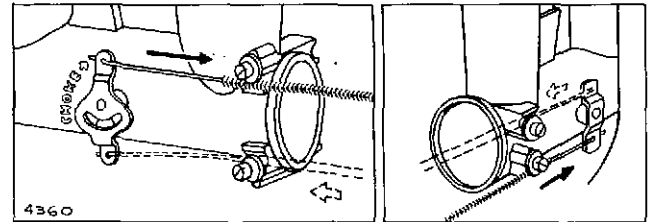
Proper choke and stop switch operation is dependent upon proper adjustment of remote controls on the powered equipment.

### TO CHECK OPERATION OF CHOKE CONTROLS:

Move remote control lever to "Choke" position. The carburetor choke should be closed.

### TO ADJUST CHOKE:

Place remote control lever on equipment in "CHOKE" position. Loosen control casing clamp screw. Move control casing and wire until choke is completely closed. Tighten casing clamp screw.

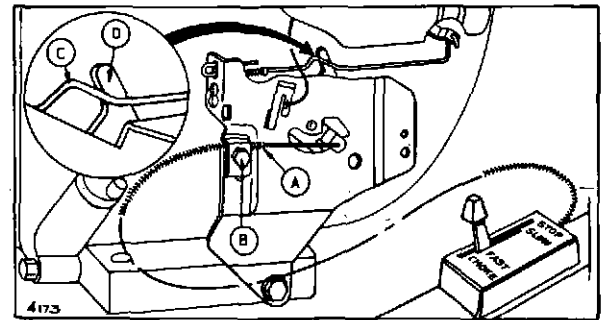


### To Check Operation of Choke-A-Matic Controls:

- Remove air cleaner.
- Move remote control lever to "Choke" position. The carburetor choke should be closed.
- Move remote control to "Stop" position. Lever should make good contact with stop switch.
- Replace air cleaner.

### To adjust

Place remote control lever on equipment in FAST (high speed) position. Loosen control casing clamp screw "B". Move control casing "A" and wire until lever "D" touches choke operating link at "C". Tighten casing clamp screw "B".



## GOVERNOR CONTROL ADJUSTMENTS

The recommended operating speed range is 1800 to 4000 RPM. The standard speed setting (no load) is 3600 RPM. Idle speed is 1750 RPM.

**NOTE: DO NOT EXCEED THE MAXIMUM RECOMMENDED SPEED OF YOUR EQUIPMENT.**

Refer to illustration. Select the control on your engine. To increase engine speed move control in direction shown by arrow.

