

STIHL BR 320, 400

Instruction Manual

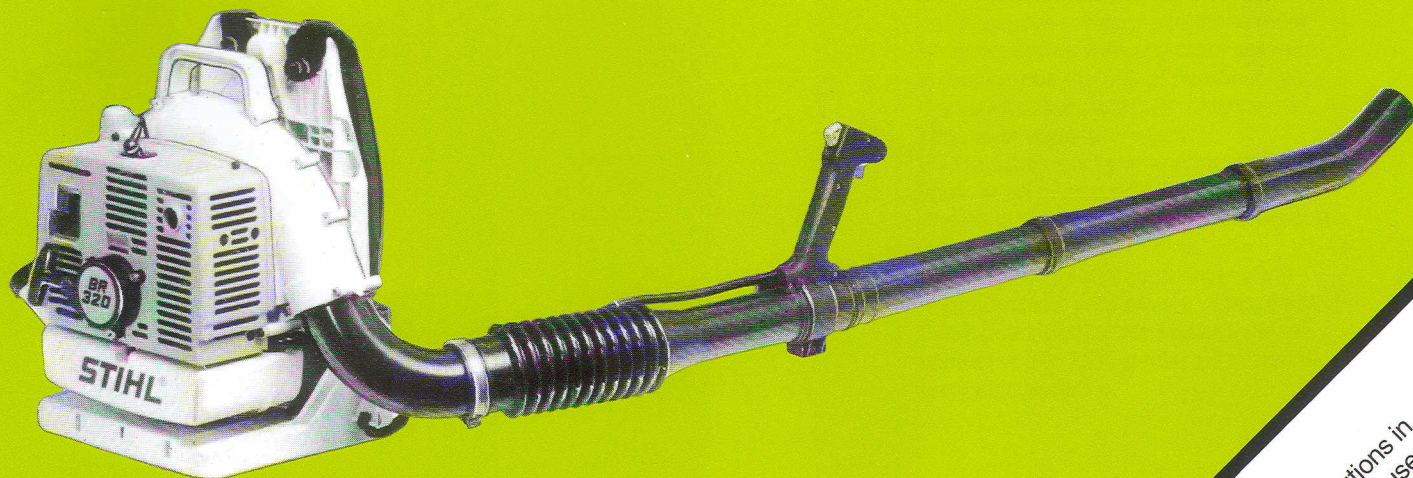
Owner's Manual

Assembling

Safety Precautions

Operating Instructions

Maintenance



Warning:

Always follow safety precautions in
Owner's Manual - improper use
can cause serious injury!

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This Manual contains operating and safety instructions for all STIHL BR 320, BR 320 L, BR 400 blowers.

Pay special attention to the safety precautions outlined on pages 4 to 9. Allow only persons who understand this Manual to operate your blower.

To receive maximum performance and satisfaction from your STIHL blower, it is important that you read and understand the maintenance and safety precautions before using your blower.

Contact your STIHL dealer or the STIHL distributor for your area if you do not understand any of the instructions in this Manual.

Warning!

Because a blower is a high-speed tool, some special safety precautions must be observed as with any other power tool to reduce the risk of personal injury. Careless or improper use may cause serious or even fatal injury.

STIHL's philosophy is to continually improve all of its products. As a result, engineering changes and improvements are made from time-to-time.

If the operating characteristics or the appearance of your blower differ from those described in this Manual, please contact your STIHL dealer for information and assistance.

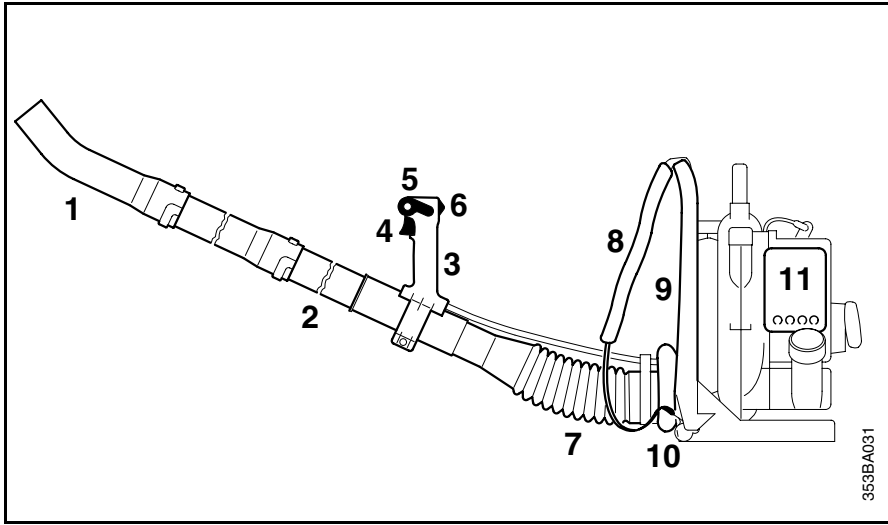
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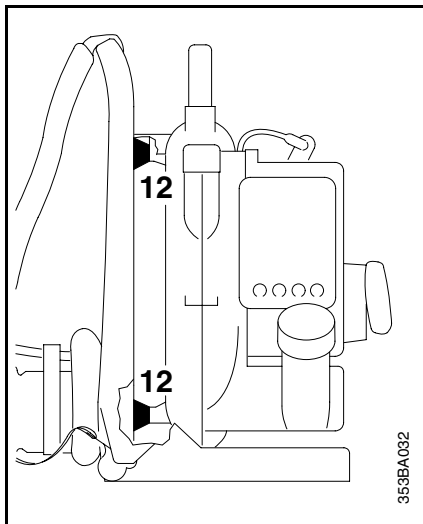
BR 320, 400

Parts and Controls



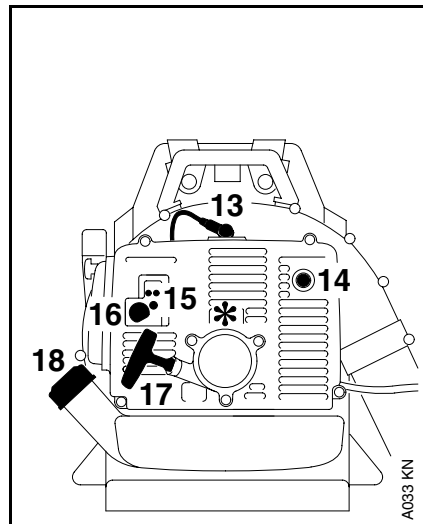
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- 1 = Nozzle
- 2 = Blower tube
- 3 = Control handle
- 4 = Throttle trigger
- 5 = Setting lever
- 6 = Stop switch
- 7 = Pleated hose
- 8 = Harness
- 9 = Back plate
- 10 = Back padding
- 11 = Air filter



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- 12 = Rubber buffers
- 13 = Spark plug boot
- 14 = Muffler (with spark arresting screen)
- 15 = Carburetor adjusting screws
- 16 = Choke knob
- 17 = Starter grip
- 18 = Fuel filler cap



A033 KN

* = Serial number

Definitions

- 1. Nozzle**
Aims and widens the spray or airstream.
- 2. Blower tube.**
Directs spray or airstream.
- 3. Control handle.**
Handle on the flexible hose to hold and direct the tube in the required direction.
- 4. Throttle trigger.**
Controls the speed of the engine.
- 5. Setting lever.**
Sets the throttle to various positions.
- 6. Stop switch.**
Stops engine.
- 7. Pleated hose.**
For spraying, dusting or spreading in the desired direction.
- 8. Harness.**
For carrying the unit.
- 9. Back plate.**
Helps protect the back of the user.
- 10. Back padding.**
Increases carrying comfort.
- 11. Air filter cover.**
Cover the air filter element.
- 12. Rubber buffers.**
Elements designed to reduce the transmission of vibrations created by the engine to the operators back.
- 13. Spark plug terminal.**
Connects the spark plug to the ignition wire.
- 14. Muffler.**
Attenuates exhaust noises and diverts exhaust gases away from operator.
- 15. Carburetor adjustment screws.**
For tuning carburetor.
- 16. Choke knob.**
Eases engine starting by enriching mixture.
- 17. Starter grip.**
The grip of the pull starter, which is the device to start the engine.
- 18. Fuel filler cap.**
For closing the fuel tank.

Safety Precautions



Warning!

The use of any blower may be dangerous. It is important that you read, fully understand and observe the following safety precautions and warnings.



Reread the owner's manual and the safety instructions periodically.



Warning!

Careless or improper use of the machine may cause serious injury. Have your STIHL Dealer show you how to operate your blower. Observe all applicable local safety regulations, standards and ordinances.



Warning!

Minors should never be allowed to use a blower : Bystanders, especially children, and animals should not be allowed in the area where a machine is in use.

Never let the unit run unattended.

Do not lend or rent your machine without the owner's manual. Be sure that anyone using your unit understands the information contained in this manual. Most of these safety precautions and warnings apply to the use of all STIHL blowers. Different models may have different parts and controls. See the appropriate section of your owner's manual for a description of the controls and function of the parts of your machine.

Safe use of a blower involves

1. the operator
2. the blower
3. the use of the blower .

THE OPERATOR

Physical Condition

You must be in good physical condition and mental health and not under the influence of any substance (drugs, alcohol, etc.) which might impair vision, dexterity or judgment. Do not operate a blower when you are fatigued .

Be alert - if you get tired while operating your machine, take a break. Tiredness may result in loss of control. Working with any blower can be strenuous. If you have any condition that might be aggravated by strenuous work, check with your doctor before operating the machine.



Warning!

Prolonged use of a blower, (or other machines) exposing the operator to vibrations may produce whitefinger disease (Raynaud's phenomenon) or carpal tunnel syndrome. These conditions reduce the hand's ability to feel and regulate temperature, produce numbness and burning sensations and may cause nerve and circulation damage and tissue necrosis.



Warning!

The STIHL BR 320, 400 is equipped with an antivibration system (AV). The AV system is designed to reduce the transmission of engine vibrations to the operator's hands. An AV system is recommended for those operators who use blowers on a regular or sustained basis.

Antivibration systems do not guarantee that you will not sustain whitefinger disease or carpal tunnel syndrome. Therefore, continual and regular users should monitor closely the condition of their hands and fingers. If any of the above symptoms appear, seek medical advice immediately.

Proper Clothing

Clothing must be sturdy and snug-fitting, but allow complete freedom of movement. Avoid loose-fitting jackets, flared or cuffed pants, scarfs, unconfined long hair or anything that could be drawn into the air intake.



Wear overalls or long pants to protect your legs. Do not wear shorts. Use of gloves when working with the blower is recommended.

Good footing is most important. Wear sturdy shoes with nonslip soles.



Warning!

To reduce the risk of injury associated with the inhalation of dust, use a face filter mask when using your blower in dusty conditions.



Warning!

Proper eye protection is a must. Even though the discharge is directed away from the operator, ricochets and bounce-backs can occur during blower operations.



Never operate a blower unless wearing goggles or properly fitted safety glasses with adequate top and side protection which comply with ANSI Z 87.1 (or your applicable national standard).

Blower noise may damage your hearing. Wear sound barriers (ear plugs or ear muffs) to protect your hearing. Continual and regular users should have their hearing checked regularly.

THE BLOWER

For illustrations and definitions of the blower parts see the chapter on "Parts and Controls"!



Warning!

Never modify a blower in any way. Only attachments supplied by STIHL or expressly approved by STIHL for use

with the specific STIHL blower models are authorized. Although certain unauthorized attachment are useable for the STIHL blower, their use may be extremely dangerous.

THE USE OF THE BLOWER

Transport

Always turn off the engine before taking the machine off your back and putting it down. When transporting your unit in a vehicle, properly secure it to prevent turnover, fuel spillage and damage to the machine.



Warning!

Before starting work, always inspect the rubber buffers which connect the engine to the pack frame. If the buffers are torn or damaged, they should be replaced by your STIHL dealer. Failure of one or more buffers may cause the engine or fuel tank to hit or rub against other parts, and may lead to serious injury from increased vibrations or from fire as the result of fuel leakage. Adjust carrying harness to suit your size before starting work.

Fueling

This STIHL unit uses an oil-gasoline mixture for fuel (see the chapter on "Fuel" of your owner's manual).



Warning!



Gasoline is an extremely flammable fuel. If spilled or ignited by a spark or other ignition source, it can cause fire and

serious burn injury or property damage. Use extreme caution when handling gasoline or fuel mix.

Do not smoke or bring any fire or flame near the fuel.

Fueling instructions

Fuel your machine in well-ventilated areas, outdoors only. Always shut off the engine and allow it to cool before refueling. Relieve fuel tank pressure by loosening fuel cap slowly. Never remove fuel filler cap while engine is running.

Select bare ground for fueling and move at least 10 feet (3 m) from the fueling spot before starting the engine. Wipe off any spilled fuel before starting your blower and check for leakage. Always tighten fuel filler cap securely after fueling.



Warning!

To reduce the risk of serious injury from burns, never attempt to refuel the unit until it has been completely removed from the operator.



Warning!

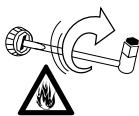
Check for fuel leakage while refueling and during operation. If fuel or oil leakage is found, do not start or run the engine until leak is fixed and spilled fuel has been wiped away. Take care not to get fuel on your clothing. If this happens, change your clothing immediately.

Always store gasoline in approved container.



Warning!

Unit vibrations can cause an improperly tightened fuel cap to loosen or come off and spill quantities of fuel. In order to reduce risk of fuel spillage and fire, tighten fuel cap by hand with as much force as possible.



The screw driver end of the STIHL combination wrench or other similar tool can be used as an aid in tightening slotted fuel caps.

Starting

You should always inspect your unit before starting it. Make sure the controls and safety devices are working properly.



Warning!

Your blower is a one-person machine. To reduce the risk of eye or other injury

from thrown objects, insure that bystanders are at least 50 feet (15m) away during use.

Stop the engine immediately if you are approached.

The assistance of another person may be needed in placing the unit on your back after starting. In order to reduce the risk of injury to the assistant from thrown objects or from contact with fumes, the engine should be kept at idle speed during this brief period, and your assistant should not stand in the area of the outlet nozzle or exhaust. Otherwise, the unit should be started and operated without assistance.

For specific starting instructions, see the appropriate section of your owner's manual. Place the machine on firm ground or other solid surface in an open area. Maintain good balance and secure footing.



Warning!

When you pull the starter grip, don't wrap the starter rope around your hand. Do not allow the grip to snap back, but guide the starter rope slowly back to permit the rope to rewind properly. Failure to follow this procedure may result in injury to hand or fingers and may damage the starter mechanism.

Working instructions and important adjustments



Warning!

Never operate your machine if it is damaged, improperly adjusted or not completely and securely assembled.



Warning!

Start and operate your unit outdoors in a ventilated area.

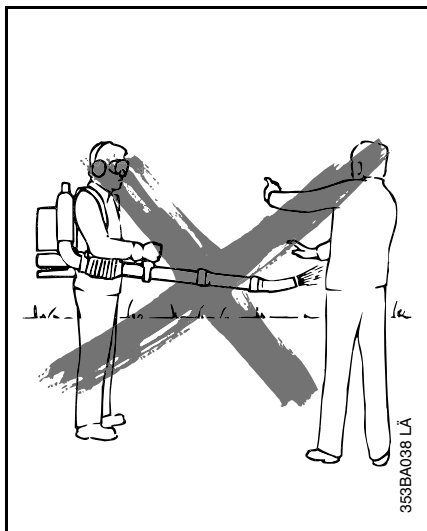
Keep the space behind the engine clear at all times to allow for the escape of hot and toxic exhaust fumes.

Operate your machine under good visibility and daylight conditions only. Work carefully.

Working Conditions

When working with the blower, always wear it on your back using the carrying harness. Wrap your fingers tightly around the handle, keeping the control handle cradled between your thumb and forefinger. Keep your hand in this position to have your machine under control at all times.

Make sure your control handle and grip is in good condition and free of moisture, pitch, oil or grease.



Warning!

To reduce the risk of personal injury, do not direct air blast towards bystanders, since the high pressure of the air flow could injure eyes and could blow small objects at great speed.

Warning!



Your blower produces poisonous exhaust fumes as soon as the combustible engine is running. These gases (e.g. carbon monoxide) may be colorless and odorless.

To reduce the risk of serious or fatal injury from breathing toxic fumes, never run the blower indoors or in poorly ventilated locations. Ensure proper ventilation when working in trenches or other confined areas.

Warning!

Use of this product can generate dust, mists, and fumes containing chemicals known to cause respiratory disease, cancer, birth defects, or other reproductive harm. If you are unfamiliar with the risks associated with the particular dust, mists or fumes at issue, consult your employer, governmental agencies such as OSHA and NIOSH and other sources on hazardous materials. If the substance being blown or vacuumed is a commercial substance, review the material safety data sheet for that substance and / or consult the material manufacturer / supplier. The state of California and some other authorities, for instance, have published lists of substances known to cause cancer, reproductive toxicity, etc.

Control dust, mist and fumes at the source where possible. In this regard use good work practices and follow the recommendations of OSHA / NIOSH and occupational and trade associations. When the inhalation of toxic dust, mists and fumes cannot be eliminated, the operator and any bystanders should always wear a respirator approved by

NIOSH / MSHA for the substance at issue.

Warning!

Dust with silica in its composition may contain crystalline silica. Silica is a basic component of sand, quartz, brick, clay, granite and numerous other minerals and rocks, including masonry and concrete products. Repeated and / or substantial inhalation of airborne crystalline silica can cause serious or fatal respiratory disease, including silicosis. In addition, the state of California and some other authorities have listed respirable crystalline silica as a substance known to cause cancer. When encountering such materials, always follow the respiratory precautions mentioned above.

Warning!

Breathing asbestos dust is dangerous and can cause severe or fatal injury, respiratory illness or cancer. The use and disposal of asbestos containing products have been strictly regulated by OSHA and the Environmental Protection Agency. Do not blow or disturb asbestos or asbestos containing products, such as asbestos insulation. If you have any reason to believe that you might be disturbing asbestos, immediately contact your employer or a local OSHA representative.



Warning!
Always shut off the engine before cleaning or servicing the unit or replacing parts.

Never insert any foreign object into the air intake of the machine or into the nozzle of the blower. It will damage the fan wheel and may cause serious injury to the operator or bystanders as a result of the object or broken parts being thrown out at high speed.

Do not place the blower on the ground when operating at high speed, because small objects such as sand, grass, dust, etc. may be pulled into the air intake and damage the fan wheel.

In the event of the machine catching fire (for whatever reason) throw it off quickly by releasing the spring catches on both sides of the harness.

In an emergency, you may slip out of the harness and throw off the machine quickly by first releasing the lap belt - on machines that are so equipped - and then lifting the tabs of the two sliding harness adjusters to slacken the shoulder straps. Try this procedure a number of times before using the machine in order to become accustomed with it. Pay attention to the direction of the wind, i.e., do not work against the wind.

To reduce the risk of stumbling and loss of control, do not walk backward while operating the machine.

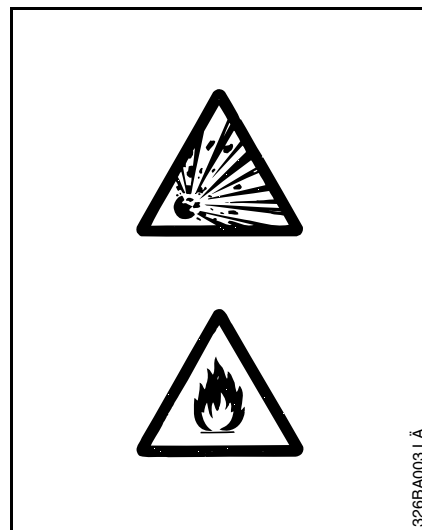
Operating Instructions

The blower may be used only for the operations described in your manual.

Use of Blower

The STIHL blower can be used for clearing leaves and grass clippings from gardens and driveways and can also be used for blow-sweeping paper, trash, dust, light snow etc. from large areas, sport stadiums or parks.

Gravel paths and walks, gravel-covered flat roofs, ditches etc. can be blow-swept quickly. Other applications are blowing out pipes, drains, gutters and your carport.



Using the Vacuum Attachment (special accessory)

The vacuum is designed to pick up dry material such as leaves, grass, small twigs and bits of paper.



Warning!
To reduce the risk of personal injury from fire and explosion, never attempt to pick up hot or burning substances (e.g. smoldering ashes, glowing cigarettes) or combustible fluids (e.g. gasoline, paint thinners).

MAINTENANCE, REPAIR AND STORING

Maintenance, replacement, or repair of the emission control devices and systems may be performed by any nonroad engine repair establishment or individual. However if you claim warranty for a component which has not been serviced or maintained properly or if nonapproved replacement parts were used, STIHL may deny warranty.

Use only identical STIHL replacement parts for maintenance and repair. Use of parts manufactured by others may cause serious or fatal injury.

Follow the maintenance and repair instructions in the appropriate section of your owner's manual. Refer to the maintenance chart at the end of this manual.

Warning!

Always stop the engine and make sure that the fan is stopped before doing any maintenance or repair work or cleaning the blower. Do not attempt any maintenance or repair work not described in your owner's manual. Have such work performed at your STIHL service shop only.

Check fuel filler cap for leaks at regular intervals. Use the specified spark plug and make sure it and the ignition lead are always in good condition.

Warning!

A worn or damaged muffler is a fire hazard and may cause loss of hearing. Check to see that the muffler is in good condition. The blower must not be operated if the muffler is not functioning properly or has been removed.

Remember that the risk of forest fires is greater in hot weather. Use the spark arresting muffler supplied with the unit. Never touch a hot muffler or burn will result.

Warning!

In order to reduce the risk of fire, do not modify or remove any part of the muffler or spark arrestor.

Tighten all nuts, bolts and screws except the carburetor adjustment screws after each use.

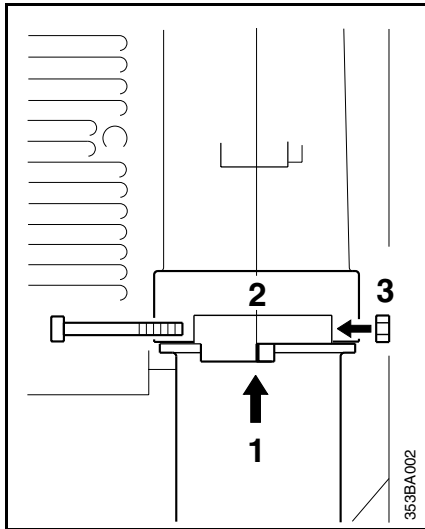
Keep spark plug and wire connection tight and clean. The spark plug electrode gap should be checked with a feeler gauge at least every 50 operating hours and reset if necessary. Fit a new spark plug if the electrodes are badly pitted.

For any maintenance please refer to the maintenance chart **and to the warranty statement** near the end of this manual.

Store blower in a dry, high or locked location place and out of reach of children.

Before storing for longer than a few days, always empty the fuel tank.

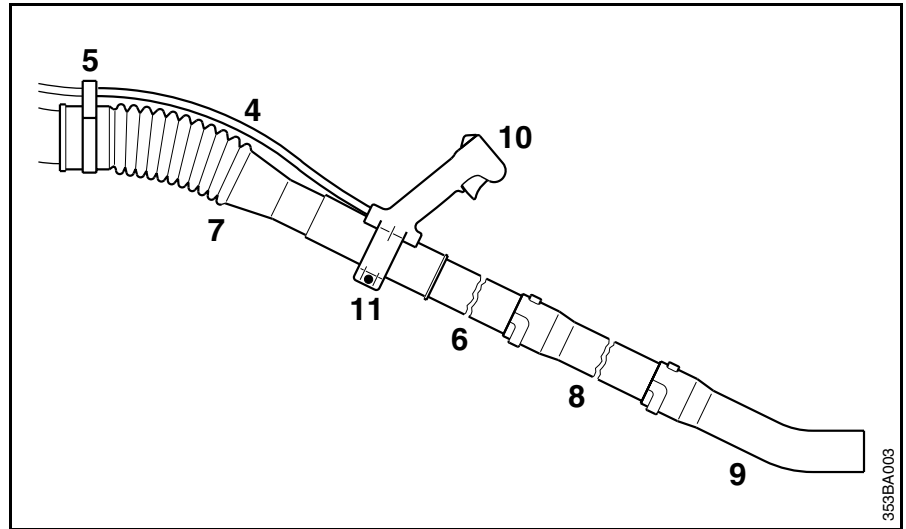
Assembling the Blower



Tools are stowed on the underside of the blower (one combination wrench and one carburetor screwdriver)

Mounting the elbow

- Line up the stops on the elbow (1) and fan housing stub (2).
- Push the elbow (1) into the stub (2) as far as it will go
- Fit the nut (3) into the hexagon recess on the stub.
- Insert the screw in the nut from the other side and tighten moderately - the elbow must still turn.



Important: The throttle cable is already connected and must not be kinked during assembly.

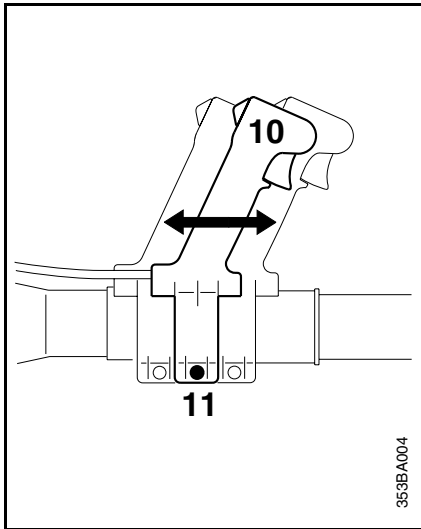
- Secure throttle cable (4) to the pleated hose with the retainer (5).

Mounting the blower tube

- Push the blower tube (6) into the pleated hose (7).
- Push blower tube (8) onto the end of tube (6) and rotate it clockwise to engage the bayonet coupling.

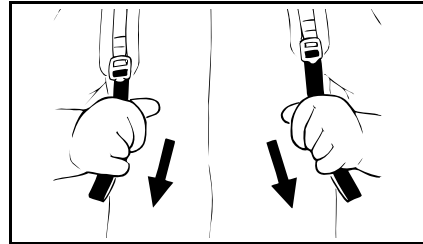
- Push the nozzle (9) onto the end of blower tube (8) and rotate it clockwise to engage the bayonet coupling.
- Rotate the pleated hose (7) counter-clockwise as far as the stop and leave it in that position.
- Turn the control handle (10) to the horizontal position.
- Now rotate the complete blower tube until the nozzle points in the same direction as the control handle.
- Tighten down the clamp screw (11).

Using the Blower



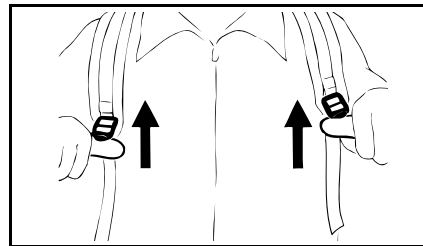
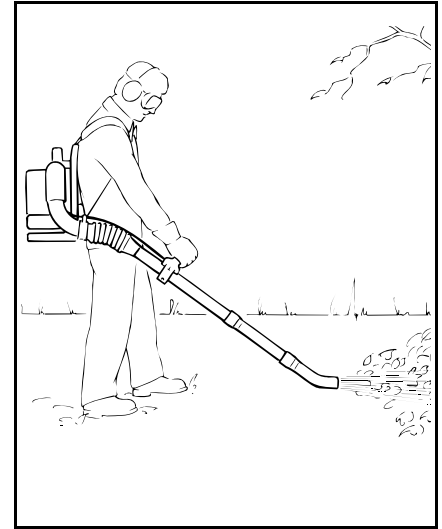
Adjusting the control handle

- Put the unit on your back.
- Release the clamp screw (11).
- Slide the control handle (10) along the pleated hose to the most comfortable position.
- Retighten the clamp screw (11).



Adjusting the harness straps

- Pull the ends of the straps downward to tighten the harness.



- Lift the tabs of the two sliding adjusters to slacken the harness straps.
- Adjust the straps so that the back-plate is held firmly and comfortably against your back.

The BR 320/400 blower is designed for single-handed operation. It is carried as a backpack and operated with the right hand on the control handle.

The powerful ground-level airstream can be aimed highly accurately and effectively. It enables the operator to quickly blow-sweep large areas.

The blower can be used for clearing leaves, grass, paper, dust and light snow in gardens, sports stadiums, parks, driveways and parking lots. It is also suitable for drying cars and clearing forest paths.

Fuel

This engine is certified to operate on unleaded gasoline and with the mix ratio 50:1.

Your two-stroke engine requires a mixture of brand-name gasoline and quality two-stroke engine oil with the classification TC.

Use regular branded unleaded gasoline with a minimum octane rating of 90 RON (U.S.A./Canada: pump octane min. 89!). If the octane number of the regular grade gasoline in your area is lower use premium unleaded fuel. Fuel with a lower octane rating may result in preignition (causing "pinging") which is accompanied by an increase in engine temperature. This, in turn, increases the risk of the piston seizure and damage to the engine.

The chemical composition of the fuel is also important. Some fuel additives not only detrimentally affect elastomers (carburetor diaphragms, oil seals, fuel lines etc.), but magnesium castings as well. This could cause running problems or even damage the engine. For this reason it is essential that you use only name branded fuels!

Use only STIHL two-stroke engine oil or equivalent branded two-stroke air-cooled engine oils with the classification TC for mixing.

Using the vacuum attachment (special accessory)

The vacuum attachment is used to pick up leaves, grass and other materials. Even big leaves, pieces of cardboard and bark fit through the large diameter suction tube.

Take particular care when vacuuming **damp** leaves as they may clog the fan.

Never pick up hot or burning substances, e.g. smoldering ashes, glowing cigarettes. Never vacuum close to a fire or other naked flames.

Working techniques

To minimize blowing time, use rakes and brooms to loosen debris before blowing.

Recommended working techniques to minimize airborne debris and pollution:

- In dusty conditions, slightly dampen surfaces.
- Use the full blower nozzle extension so the airstream can work close to the ground.
- Do not direct debris at subjects such as open windows or freshly-washed cars.
- After using blowers, clean up. Do not blow debris onto neighbouring properties.

Recommended working techniques to minimize noise:

- Operate power equipment only at reasonable hours - not early in the morning, late at night or during the noon-break when people might be disturbed. Comply with times listed in local ordinances. Usual recommendations are 9:00 a.m. to 12:00 a.m. and 03:00 p.m. to 5:00 p.m. on workdays for professionals. Special considerations should be given to neighbours on weekends.
- Fewer engines mean less noise; therefore use only one piece of power equipment at a time, when possible.
- Operate power blowers at the lowest possible throttle speed to do the job.
- Check your equipment before operation, especially the muffler, air intakes and air filters.

Conserve water by using power blowers instead of hoses for those lawn and garden applications where a blower can be properly used, such as cleaning patios or porches.

Fueling



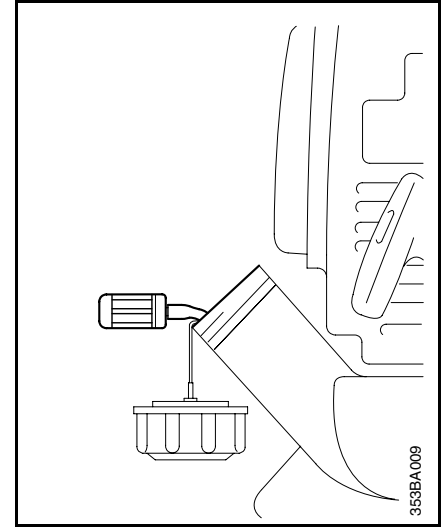
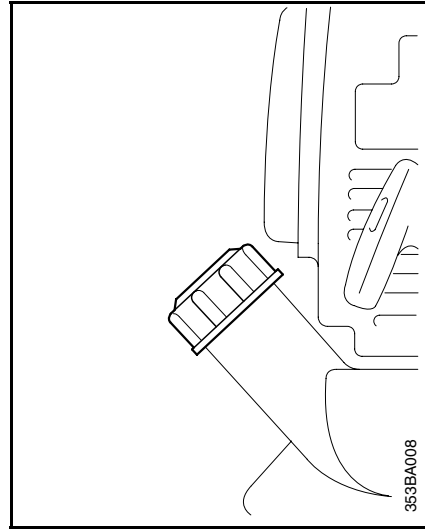
We recommend STIHL 50:1 two-stroke engine oil since it is specially formulated for use in STIHL engines.

Do not use BIA or TCW (two-stroke water cooled) mix oils!

Take care when handling gasoline. Avoid direct contact with the skin and avoid inhaling fuel vapour.

The canister should be kept tightly closed in order to avoid any moisture getting into the mixture.

The fuel tank and the canister in which fuel mix is stored should be cleaned from time to time.



Fuel mix ages:

Only mix sufficient fuel for a few days work, not to exceed 3 months of storage. Store in approved safety fuel-canisters only. When mixing, pour oil into the canister first, and then add gasoline.

Gasoline Oil (STIHL 50:1 or equivalent branded TC oils)

US gal. US fl.oz

1	2.6
2 1/2	6.4
5	12.8

Dispose empty mixing-oil canisters only at authorized disposal locations.

Before fueling, clean the filler cap and the area around it to ensure that no dirt falls into the tank.

Always thoroughly shake the mixture in the canister before fueling your machine.

Warning!

In order to reduce the risk of burns or other personal injury from escaping gas vapor and fumes, remove the fuel filler cap carefully so as to allow any pressure build-up in the tank to release slowly.

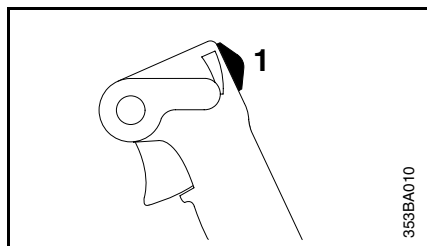
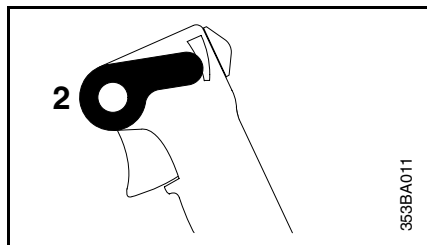
Warning!

After fueling, tighten fuel cap as securely as possible by hand.

Change the fuel pick up body every year.

Before storing your machine for a long period, drain and clean the fuel tank and run engine until carburetor is dry.

Starting

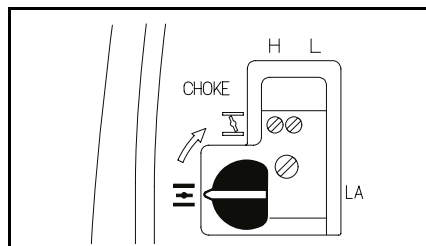
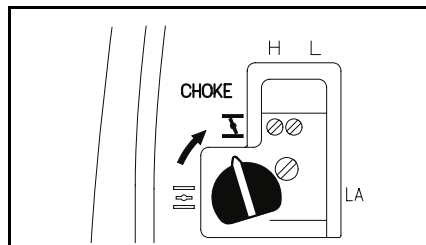


Observe safety precautions - see chapter "Safety Precautions" in this manual.

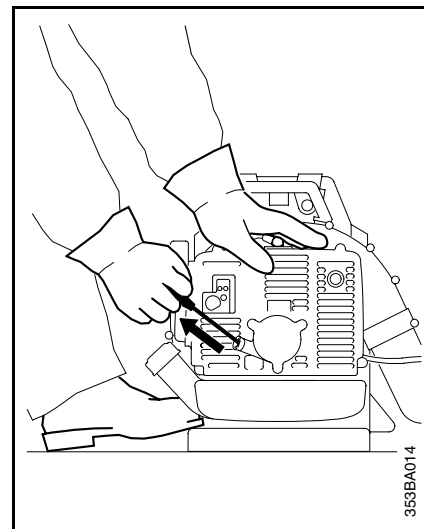
- Slide the stop switch (1) to
- Move the setting lever (2) to **I** the center position - **starting throttle position**.

Note:

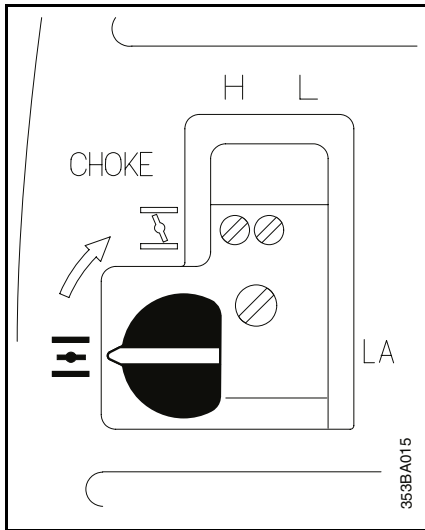
The setting lever can be used to select any throttle opening between idle speed (lower stop) and full throttle (upper stop). Set the lever to idle speed before shutting down the engine.




- If the engine is **cold**, turn the choke knob to **H**
- If the engine is **warm**, turn the choke knob to **L**. Also use this position if the engine has been running but is still cold.

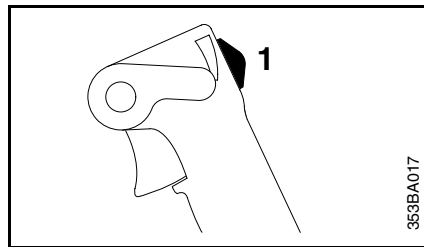
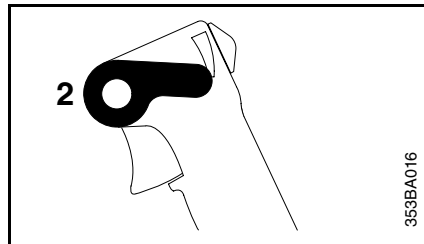


- Put the unit on the ground. Check that bystanders are well clear of the general work area and the nozzle.
- Make sure you have a firm footing: Hold the unit with your left hand on the housing and put one foot against the base plate to prevent it slipping.
- Pull the starter grip slowly with your right hand until you feel it engage and then give it a brisk strong pull. Do not pull the starter rope out more than 75cm (30") as it might otherwise break.
- Do not let the starter grip snap back.
- Guide it slowly back into the housing so that the starter rope can rewind properly.



When the engine begins to fire:

- If engine is **cold**:
Turn choke to  and continue cranking until engine runs.
- If engine is **warm**:
Continue cranking until engine runs.

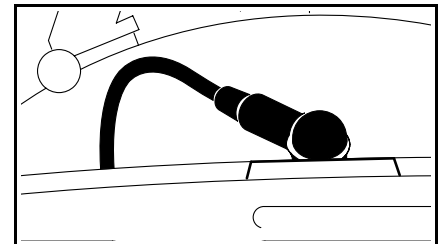


As soon as engine runs:


- Move the setting lever (2) to its lower end position so that engine settles down to idle speed.
- To stop the engine:**
- Slide the stop switch (1) to 0



At very low outside temperatures: Allow engine to warm up

- As soon as engine runs:
- Move the setting lever to its lower stop - the engine returns to idling speed.
- Open throttle slightly - warm up engine for a short period.



If the engine doesn't start:

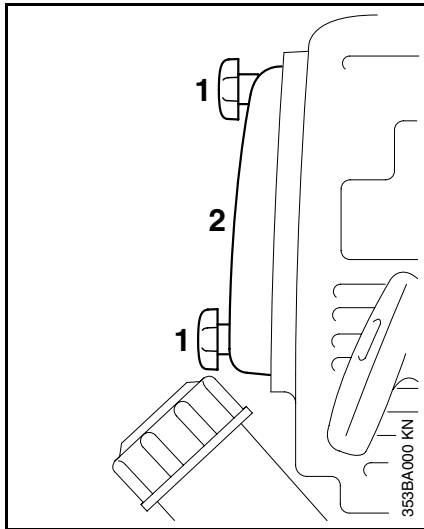
If you did not turn the choke knob to  quickly enough after the engine began to fire, the combustion chamber has flooded.

- Remove spark plug boot.
- Unscrew and dry off the spark plug.
- Set the stop switch to 0.
- Open the throttle fully.
- Pull the starter rope several times to clear the combustion chamber.
- Refit the spark plug and connect the spark plug boot.
- Set stop switch to **I** .
- Turn choke knob to  even if the engine is cold.
- Now start the engine.

Fuel tank run until dry and then refueled

- Pull starter rope several times to prime the fuel pump and fuel line.
- Now start the engine.

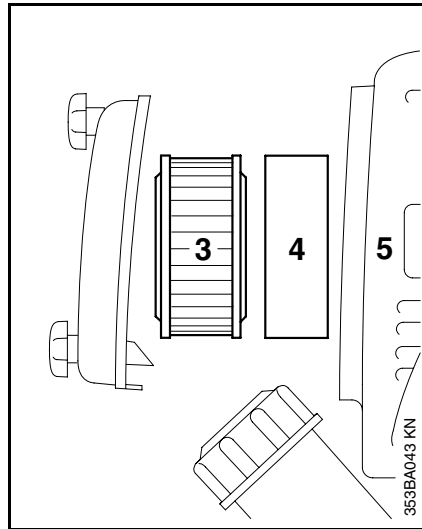
Cleaning the Air Filter



Dirty air filters reduce engine power, increase fuel consumption and make starting more difficult.

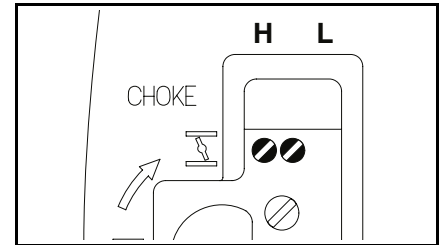
If there is a noticeable loss off engine power

- Turn choke knob to \overline{I}
- Release the screws (1) and pull off the filter cover (2).
- Clean away loose dirt from around the filter.



- Remove the prefilter (4) (if fitted) from the filter element (3).
- Wash the prefilter in fresh, non-flammable cleaning solution (e.g. warm soapy water) and then dry. Always replace a damaged filter element.
- Take out the filter element (3) - if it is dirty, fit a new one.
- Fit the felt element (3) in the filter base (5).
- Slide the prefilter (4) over the filter element.
- Fit the filter cover and tighten down firmly.

Adjusting the Carburetor



Motormanagement

Exhaust emissions are controlled by the design of the fundamental engine parameters and components (e.g. carburation, ignition, timing and valve or part timing) without the addition of any major hardware.

The carburetor comes with a standard setting.

This is the optimum setting to ensure your machine will operate reliably with the lowest possible emission under most operating conditions.

Standard setting

If it is necessary to readjust the carburetor from scratch, first carry out the standard setting.

Turn

H = high speed adjusting screw and
L = low speed adjusting screw
counterclockwise (richer)
or as far as stop.

If you don't have a tachometer, do not set the high speed adjusting screw any leaner by turning it beyond the standard setting.

Operation at high altitude (mountains) -

Slight correction **may** be necessary.

Use a **tachometer** to set the high speed adjusting screw (**H**) to obtain the highest possible engine speed. From that position, turn the high speed adjusting screw (**H**) 1/8 counterclockwise (richer) or as far as stop. Avoid risk of engine damage which can be caused by lack of lubrication and overheating -

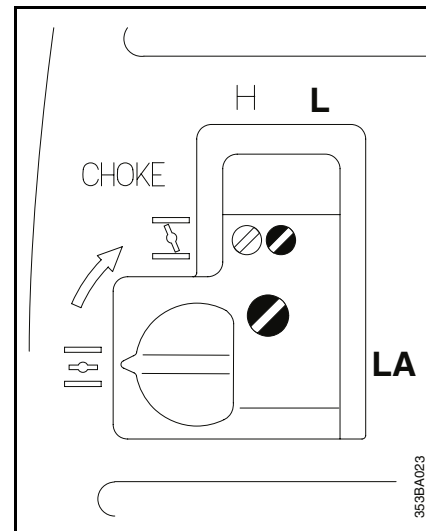
- Check air filter and clean it if necessary.
- Set idle speed correctly.
- Warm up the engine.

Turn the high speed adjusting screw (**H**) and low speed adjusting screw (**L**) clockwise (leaner) at higher altitudes.

Turn the screws very slowly and carefully - slight changes have a noticeable effect on the engine's running behavior.

Corrections to high speed adjusting screw:

The high speed adjusting screw (**H**) alters the power output and maximum off-load engine speed. If you turn this screw too far clockwise and make the setting too lean, there is a risk of engine damage.



Setting idle speed

It is usually necessary to change the setting of the idle speed adjusting screw (**LA**) after every correction to the low speed adjusting screw (**L**).

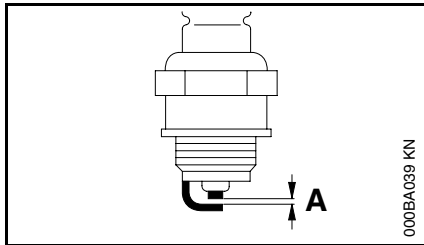
Engine stops while idling

Turn the idle speed adjusting screw (**LA**) clockwise until the engine runs smoothly.

Erratic idling behavior, poor acceleration

Idle setting is too lean.
Turn the low speed adjusting screw (**L**) counterclockwise until engine runs and accelerates smoothly.

Checking Spark Plug



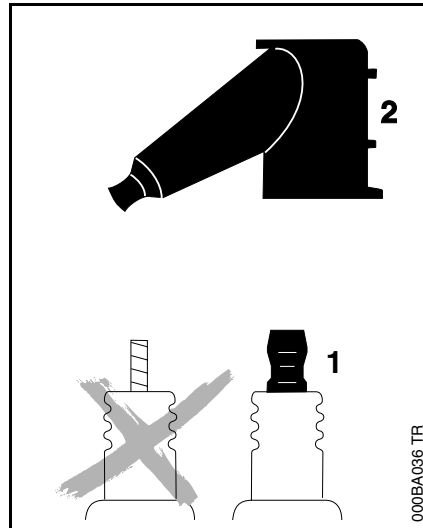
Wrong fuel mix (too much engine oil in the gasoline), a dirty air filter and unfavorable running conditions (mostly at part throttle etc.) affect the condition of the spark plug. These factors cause deposits to form on the insulator nose which may result in trouble in operation.

If engine is down on power, difficult to start or runs poorly at idling speed, first check the spark plug.

- Remove spark plug - see chapter "Starting":
- Clean dirty spark plug.
- Check electrode gap - it should be 0.5mm/0.02" (A) - readjust if necessary.
- Use only resistor type spark plugs of the approved range.

Rectify problems which have caused fouling of spark plug:

Incorrect carburetor setting, too much oil in fuel mix, dirty air filter, unfavorable running conditions, e.g. operating at part load.

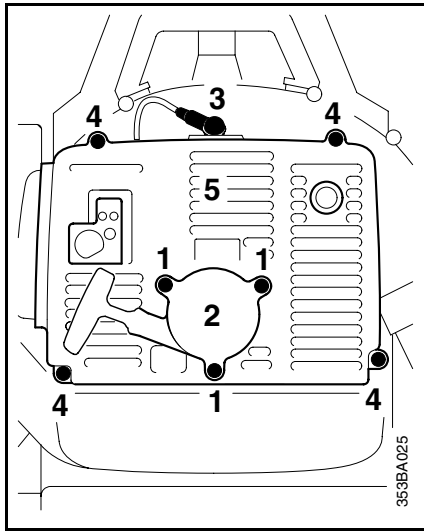


- Fit a new spark plug after approx. 100 operating hours - or earlier if the electrodes are badly eroded.

Warning!

To reduce the risk of fire and burn injury, use only spark plugs authorized by STIHL (see "Specifications"). Always press spark plug boot (2) snugly onto spark plug terminal (1) of the proper size. (Note: If terminal has detachable SAE adapter nut, it must be attached.) A loose connection between spark plug terminal and ignition wire connector in the boot may create arcing that could ignite combustible fumes and cause a fire.

Spark Arresting Screen in Muffler



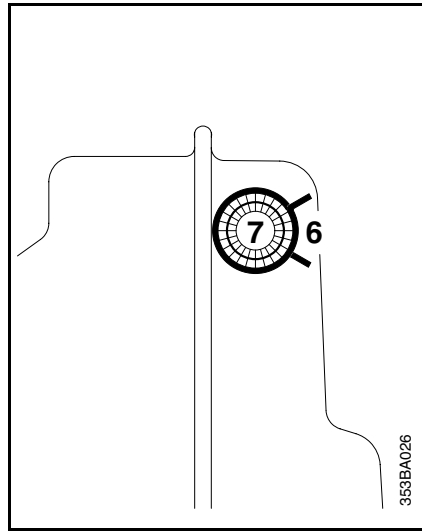
If the engine is down on power, check the spark arresting screen in the muffler.



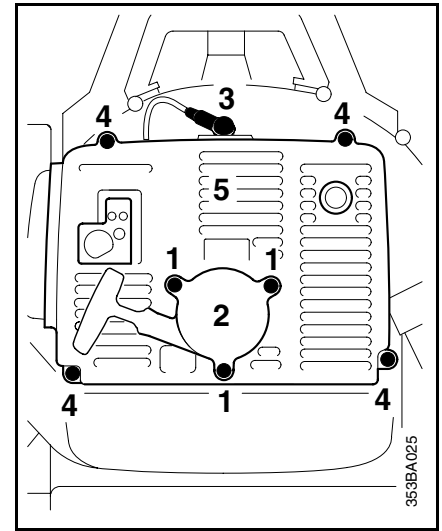
Warning:

Wait until engine has cooled down completely before performing the following operations.

- Take out starter cover mounting screws (1).
- Remove the starter cover (2).
- Pull off the spark plug boot (3).
- Take out the housing mounting screws (4).
- Remove the housing (5).

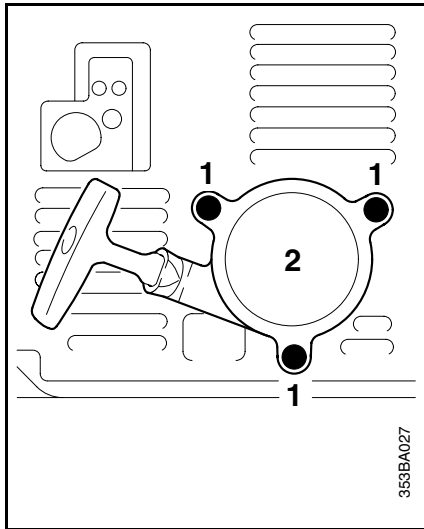


- Squeeze the ends of the clip (6) together and lift the clip away.
- Take the spark arresting screw (5) out of the muffler.
- Clean the spark arresting screen.
- If screen is damaged or heavily carbonized, fit a new one.
- Install the spark arresting screen (7).
- Fit the clip (6).

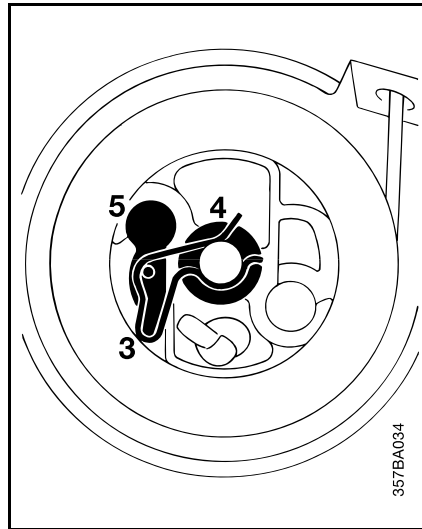


- Place housing (5) in position.
- Tighten down housing screws.
- Fit the spark plug boot (3).
- Fit the starter cover (2).
- Tighten down the starter cover screws (1).

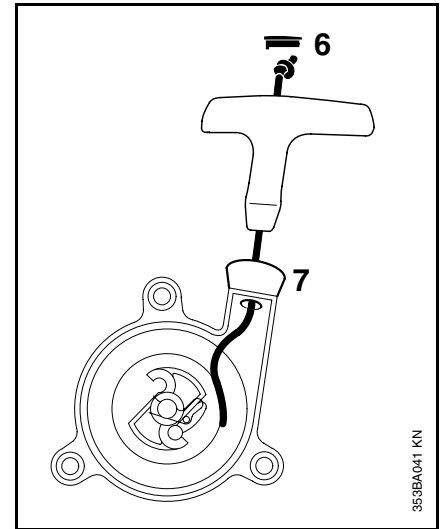
Replacing Starter Rope and Rewind Spring



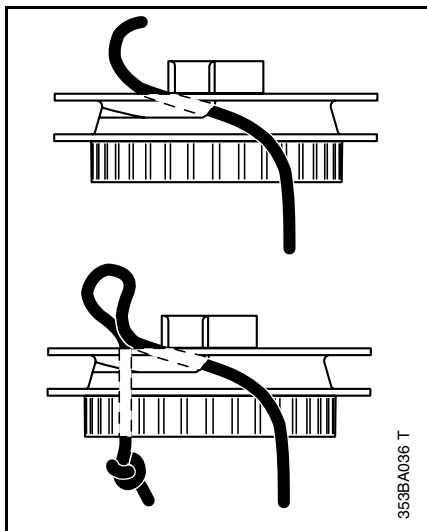
- Remove the three screws (1).
- Lift the starter cover (2) off the engine.



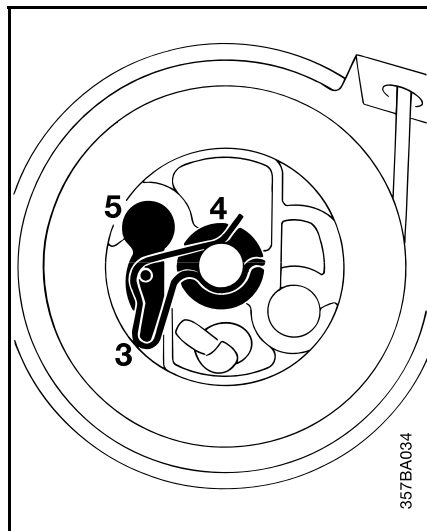
- Remove the spring clip (3).
- Remove the rope rotor with washer (4) and pawl (5).



- Ease the cap (6) out of the starter grip.
- Remove remaining rope from the rotor and grip.
- Tie a simple overhand knot in the end of the new starter rope - 1113 195 8200 - and then thread the rope through the top of the grip and the rope bush (7).
- Refit the cap in the grip.



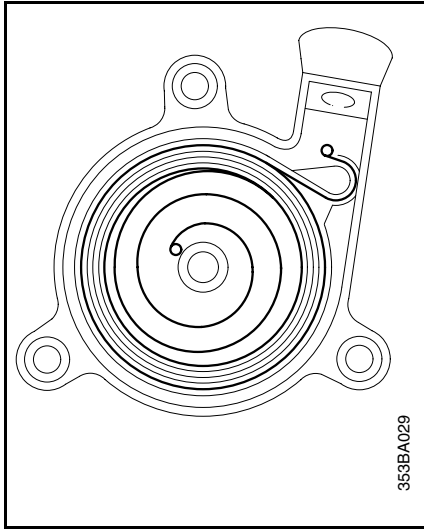
- Thread the rope through the rotor and secure it with a simple over-hand knot.



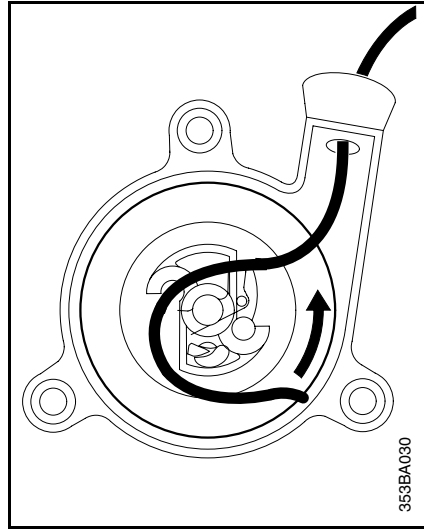
- Coat rope rotor bearing bore with non-resinous oil.
- Slide rotor onto starter post - turn it back and forth so that anchor loop of rewind spring engages -
- Refit the pawls (5) in the rotor -
- Fit the washer (4) on the starter post
- Use screwdriver or suitable pliers to install spring clip (3) on starter post and over the pawl pegs - the spring clip must point in clockwise direction - see illustration.

Replacing a broken rewind spring

- Lubricate the new spring with a few drops of non-resinous oil -
- Remove the rope rotor - see "Replacing Starter Rope" -
- Remove parts of old spring.




- Fit new spring housing - bottom plate must face downward. Engage outer spring loop over the lug.
- Refit the rope rotor. Go to "Tensioning rewind spring".
- If the spring has popped out and uncoiled: Refit it in the counterclockwise direction - start outside and work inward.



Tensioning rewind spring

- Make a loop in the unwound starter rope and use it to turn the rope rotor six full revolutions in the direction of the arrow
- Hold the rotor steady - straighten the twisted rope -
- Release the rotor -
- Let go of rope slowly so that it winds onto the rotor. The starter grip must sit firmly in the rope guide bush. If the grip droops to one side: Increase spring tension by one additional turn.

- When starter rope is fully extended it must be possible to rotate the rotor at least another half turn. If this is not possible, the spring is over-tensioned and could break. Take off one turn of the rope.
- Fit the fan housing on the crankcase.
- Tighten down the screws firmly.
- Set the Master Control lever to 

Operating Instructions

During break-in period

A factory new machine should not be run at high revs (full throttle off load) for the first three tank fillings. This avoids unnecessary high loads during the break-in period.

As all moving parts have to bed in during the break-in period, the frictional resistances in the engine are greater during this period. The engine develops its maximum power after about 5 to 15 tank fillings.

During operation

After a long period of full-throttle operation, allow engine to run for a while at idle speed so that the heat in the engine can be dissipated by flow of cooling air. This protects engine-mounted components (ignition, carburetor) from thermal overload.

After finishing work

Storing for a short period:
Wait for engine to cool down. To avoid condensation, fill the fuel tank and keep the unit in a dry place until you need it again.

Storing for an long period:
see chapter "Storing the Machine".

Storing the Machine

For periods of about 3 months or longer:


- Remove the blower tube and nozzle.
- Drain and clean the fuel tank.
- Run engine until carburetor is dry - this helps prevent the carburetor diaphragms sticking together.
- Thoroughly clean the machine - pay special attention to the cylinder fins and air filter.
- Store the machine in a dry, high or locked location - out of the reach of children and other unauthorized persons.

Maintenance Chart

Please note that the following maintenance intervals apply for normal operating conditions only. If your daily working time is longer than normal or operating conditions are difficult (very dusty work area) shorten the specified intervals accordingly.		before starting work	after finishing work or daily	after each refueling stop	weekly	monthly	if faulty	if damaged	as required	see page:
Complete machine	Visual inspection (condition, leaks)	x		x						
	Clean		x							
Control handle	Check operation	x		x						14-15
Air filter	Clean								x	16
	Replace							x		16
Filter in fuel tank	Check						x			12-13
	Replace felt and strainer								x	12-13
Fuel tank	Clean					x				12
Carburetor	Check idle adjustment	x		x						16-17
	Idle setting								x	16-17
Spark plug	Readjust electrode gap						x			18
Cylinder fins	Clean				x					
Spark arresting screen in muffler	Inspect					x				
	Clean or replace							x		
All accessible screws and nuts (not adjusting screws)	Retighten								x	

The user of this unit should carry out only the maintenance operations described in this manual. Other repair work may be performed only by an authorized STIHL Service dealer.

Warranty claims following repairs can be accepted only if the repair has been performed by an authorized STIHL Service dealer using original STIHL spare parts.

Original STIHL parts can be identified by the STIHL part number, the **STIHL** logo and the STIHL parts symbol . The symbol may appear alone on small parts.

Specifications

Model	BR 320	BR 320 L	BR 400
STIHL single cylinder two-stroke engine			
- Displacement	44.9 cm ³ (2.74 cu.in)	44.9 cm ³ (2.74 cu.in)	56.5 cm ³ (3.45 cu.in)
- Bore	41 mm (1.61 in)	41 mm (1.61 in)	46 mm (1.81 in)
- Stroke	34 mm (1.34 in)	34 mm (1.34 in)	34 mm (1.34 in)
- Engine power	2.0 kW (2.7 bhp)	1.4 kW (1.9 bhp)	2.5 kW (3.4 bhp)
Air flow rate (with blower tube and nozzle)	740 m ³ /h (435 cfm)	650 m ³ /h (383 cfm)	810 m ³ /h (476 cfm)
Air velocity (with blower tube and nozzle)	72 m/s (236 ft/s)	64 m/s (210 ft/s)	80 m/s (252 ft/s)
Max. air flow rate	1000 m ³ /h (512 cfm)	870 m ³ /h (588 cfm)	1060 m ³ /h (624 cfm)
Weight (dry)	8.9 kg (19.6 lb)	9.0 kg (19.9 lb)	8.9 kg (19.6 lb)
Bystanders noise per ANSI B 175.2-1990	73 dB(A)	70 dB(A)	75 dB(A)

Ignition System

Type: Electronic
magneto ignition
Spark plug
(suppressed): Bosch WSR 6 F
or
NGK BPMR 7 A;
Heat range 200
Electrode gap: 0.5 mm (0.02 in)
Spark plug thread: M 14 x 1,25;
9.5 mm (0.37 in)
long

Fuel System

Carburetor: All position
diaphragm
carburetor with
integral fuel pump
Air filter: Paper filter element
Fuel tank capacity: 1.5 l (3.2 US pt)
Fuel mix: See chapter
"Fuel"

Dimensions

Height: 445 mm (17.5 in)
Width: 480 mm (18.9 in)
Depth: 280 mm (11.0 in)

Special Accessories:

Blower to Mistblower conversion kit,
vacuum attachment, hip belt, back rest
padding

STIHL Incorporated Federal and California Emission Control Warranty Statement

Your Warranty Rights and Obligations

The U.S. Environmental Protection Agency (EPA), the California Air Resources Board (CARB) and STIHL Incorporated are pleased to explain the Emission Control System Warranty on your model year 2000 and later equipment type engine. In California, new small off-road engines must be designed, built and equipped to meet the State's stringent anti-smog standards. In other states, new 1997 and later model year small off-road equipment engines must be designed, built and equipped, at the time of sale, to meet the U.S. EPA regulations for small non road engines. The equipment engine must be free from defects in materials and workmanship which cause it to fail to conform with U.S. EPA standards for the first two years of engine use from the date of sale to the ultimate purchaser.

STIHL Incorporated must warrant the emission control system on your small off-road engine for the period of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road equipment engine.

Your emission control system includes parts such as the carburetor and the ignition system. Also included may be hoses, and connectors and other emission related assemblies.

Where a warrantable condition exists, STIHL Incorporated will repair your small off-road equipment engine at no cost to you, including diagnosis (if the diagnostic work is performed at an authorized dealer), parts, and labor.

Manufacturer's Warranty Coverage:

The small off-road equipment engines are warranted for two years in California. In other states, 1997 and later model year small off-road equipment engines are also warranted for two years. If any emission-related part on your engine is defective, the part will be repaired or replaced by STIHL Incorporated free of charge.

Owner's Warranty Responsibilities:

As the small off-road equipment engine owner, you are responsible for the performance of the required maintenance listed in your owner's manual. STIHL Incorporated recommends that you retain all receipts covering maintenance on your small off-road equipment engine, but STIHL Incorporated cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

Any replacement part or service that is equivalent in performance and durability may be used in non-warranty maintenance or repairs, and shall not reduce the warranty obligations of the engine manufacturer.

As the small off-road equipment engine owner, you should be aware, however, that STIHL Incorporated may deny you warranty coverage if your small off-road equipment engine or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

You are responsible for presenting your small off-road equipment engine to a STIHL service center as soon as a problem exists. The warranty repairs will be completed in a reasonable amount of time, not to exceed 30 days. If you have any questions regarding your warranty rights and responsibilities, please contact a STIHL customer service representative at 1-800-467-8445 or you can write to STIHL Inc., 536 Viking Drive, P.O. Box 2015, Virginia Beach, VA 23450-2015.

Coverage by STIHL Incorporated

STIHL Incorporated warrants to the ultimate purchaser and each subsequent purchaser that your small off-road equipment engine will be designed, built and equipped, at the time of sale, to meet all applicable regulations. STIHL Incorporated also warrants to the initial purchaser and each subsequent purchaser that your engine is free from defects in materials and workmanship which cause the engine to fail to conform with applicable regulations for a period of two years.

Warranty Period

The warranty periods will begin on the date the utility equipment engine is purchased by the initial purchaser and you have signed and sent back the warranty card to STIHL. If any emission related part on your engine is defective, the part will be replaced by STIHL Incorporated at no cost to the owner. Any warranted part which is not scheduled for replacement as required maintenance, or which is scheduled only for regular inspection to the effect of "repair or replace as necessary" will be warranted for the warranty period. Any warranted part which is scheduled for replacement as required maintenance will be warranted for the period of time up to the first scheduled replacement point for that part.

Diagnosis

You, as the owner, shall not be charged for diagnostic labor which leads to the determination that a warranted part is defective. However, if you claim warranty for a component and the machine is tested as non-defective, STIHL Incorporated will charge you for the cost of the emission test.

Mechanical diagnostic work will be performed at an authorized STIHL servicing dealer. Emission test may be performed either at STIHL Incorporated or at any independent test laboratory.

Warranty Work

STIHL Incorporated shall remedy warranty defects at any authorized STIHL servicing dealer or warranty station. Any such work shall be free of charge to the owner if it is determined that a warranted part is defective. Any manufacturer-approved or equivalent replacement part may be used for any warranty maintenance or repairs on emission-related parts and must be provided without charge to the owner. STIHL Incorporated is liable for damages to other engine components caused by the failure of a warranted part still under warranty.

The California Air Resources Board's Emission Warranty Parts List specifically defines the emission-related warranted parts. These warranted parts are:

Carburetor
Choke (Cold start enrichment system)
Intake manifold
Air filter
Spark plug
Magneto or electronic ignition system (ignition module)
Catalytic converter (if applicable)
Fasteners

Where to make a claim for Warranty Service

Bring the product to any authorized STIHL servicing dealer and present the signed warranty card.

Maintenance Requirements

The maintenance instructions in this manual are based on the application of the recommended 2-stroke fuel-oil mixture (see also instruction "Fuel"). Deviations from this recommendation regarding quality and mixing ratio of fuel and oil may require shorter maintenance intervals.

Limitations

This Emission Control Systems Warranty shall not cover any of the following:

- repair or replacement required because of misuse, neglect or lack of required maintenance,
 - repairs improperly performed or replacements not conforming to STIHL Incorporated specifications that adversely affect performance and/or durability, and alterations or modifications not recommended or approved in writing by STIHL Incorporated,
- and
- replacement of parts and other services and adjustments necessary for required maintenance at and after the first scheduled replacement point.



WARNING!

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

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englisch/english USA /CARB/EPA