

Operator's Manual

Floor Saw

BFS 1214



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CALIFORNIA

Proposition 65 Warning:



Engine exhaust, some of its constituents, and certain vehicle components, contain or emit chemicals known to the State of California to cause cancer and birth defects or other reproductive harm.

Foreword

This manual provides information and procedures to safely operate and maintain this Wacker Neuson model. For your own safety and protection from injury, carefully read, understand and observe the safety instructions described in this manual.

Keep this manual or a copy of it with the machine. If you lose this manual or need an additional copy, please contact Wacker Neuson Corporation. This machine is built with user safety in mind; however, it can present hazards if improperly operated and serviced. Follow operating instructions carefully! If you have questions about operating or servicing this equipment, please contact Wacker Neuson Corporation.

The information contained in this manual was based on machines in production at the time of publication. Wacker Neuson Corporation reserves the right to change any portion of this information without notice.

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1. Safety Information

This manual contains DANGER, WARNING, CAUTION, *NOTICE*, and NOTE callouts which must be followed to reduce the possibility of personal injury, damage to the equipment, or improper service.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.



WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE: Used without the safety alert symbol, **NOTICE** indicates a situation which, if not avoided, could result in property damage.

Note: *Contains additional information important to a procedure.*

1.1 Laws Pertaining to Spark Arresters

Notice: State Health Safety Codes and Public Resources Codes specify that in certain locations spark arresters be used on internal combustion engines that use hydrocarbon fuels. A spark arrester is a device designed to prevent accidental discharge of sparks or flames from the engine exhaust. Spark arresters are qualified and rated by the United States Forest Service for this purpose.

In order to comply with local laws regarding spark arresters, consult the engine distributor or the local Health and Safety Administrator.

1.2 Operating Safety



Familiarity and proper training are required for the safe operation of the machine. Machines operated improperly or by untrained personnel can be hazardous. Read the operating instructions contained in this manual and the engine manual, and familiarize yourself with the location and proper use of all controls. Inexperienced operators should receive instruction from someone familiar with the machine before being allowed to operate it.

- 1.2.1 Do not allow anyone to operate this equipment without proper training. People operating this equipment must be familiar with the risks and hazards associated with it.
- 1.2.2 Do not touch the engine or muffler while the engine is on or immediately after it has been turned off. These areas get hot and may cause burns.
- 1.2.3 Do not use accessories or attachments that are not recommended by Wacker Neuson. Damage to equipment and injury to the user may result.
- 1.2.4 NEVER operate the machine with the beltguard missing. Exposed drive belt and pulleys create potentially dangerous hazards that can cause serious injuries.
- 1.2.5 Never leave the machine running unattended.
- 1.2.6 Be sure operator is familiar with proper safety precautions and operation techniques before using machine.
- 1.2.7 Always wear protective clothing appropriate to the job site when operating the machine.
- 1.2.8 Wear hearing protection when operating equipment.
- 1.2.9 Close fuel valve on engines equipped with one when machine is not being operated.
- 1.2.10 Store the machine properly when it is not being used. The machine should be stored in a clean, dry location out of the reach of children.
- 1.2.11 Always operate machine with all safety devices and guards in place and in working order. Do not modify or defeat safety devices. Do not operate machine if any safety devices or guards are missing or inoperative.
- 1.2.12 Read, understand, and follow procedures in the Operator's Manual before attempting to operate the machine.

1.3 Operator Safety while using Internal Combustion Engines



WARNING

Internal combustion engines present special hazards during operation and fueling. Read and follow the warning instructions in the engine owner's manual and the safety guidelines below. Failure to follow the warnings and safety standards could result in severe injury or death.

- 1.3.1 DO NOT run the machine indoors or in an enclosed area such as a deep trench unless adequate ventilation, through such items as exhaust fans or hoses, is provided. Exhaust gas from the engine contains poisonous carbon monoxide gas; exposure to carbon monoxide can cause loss of consciousness and may lead to death.
- 1.3.2 Do not smoke while operating the machine.
- 1.3.3 Do not smoke when refueling the engine.
- 1.3.4 Do not refuel a hot or running engine.
- 1.3.5 Do not refuel the engine near an open flame.
- 1.3.6 Do not spill fuel when refueling the engine.
- 1.3.7 Do not run the engine near open flames.
- 1.3.8 Refill the fuel tank in a well-ventilated area.
- 1.3.9 Replace the fuel tank cap after refueling.
- 1.3.10 ALWAYS check the fuel lines and the fuel tank for leaks and cracks before starting the engine. Do not run the machine if fuel leaks are present or the fuel lines are loose.

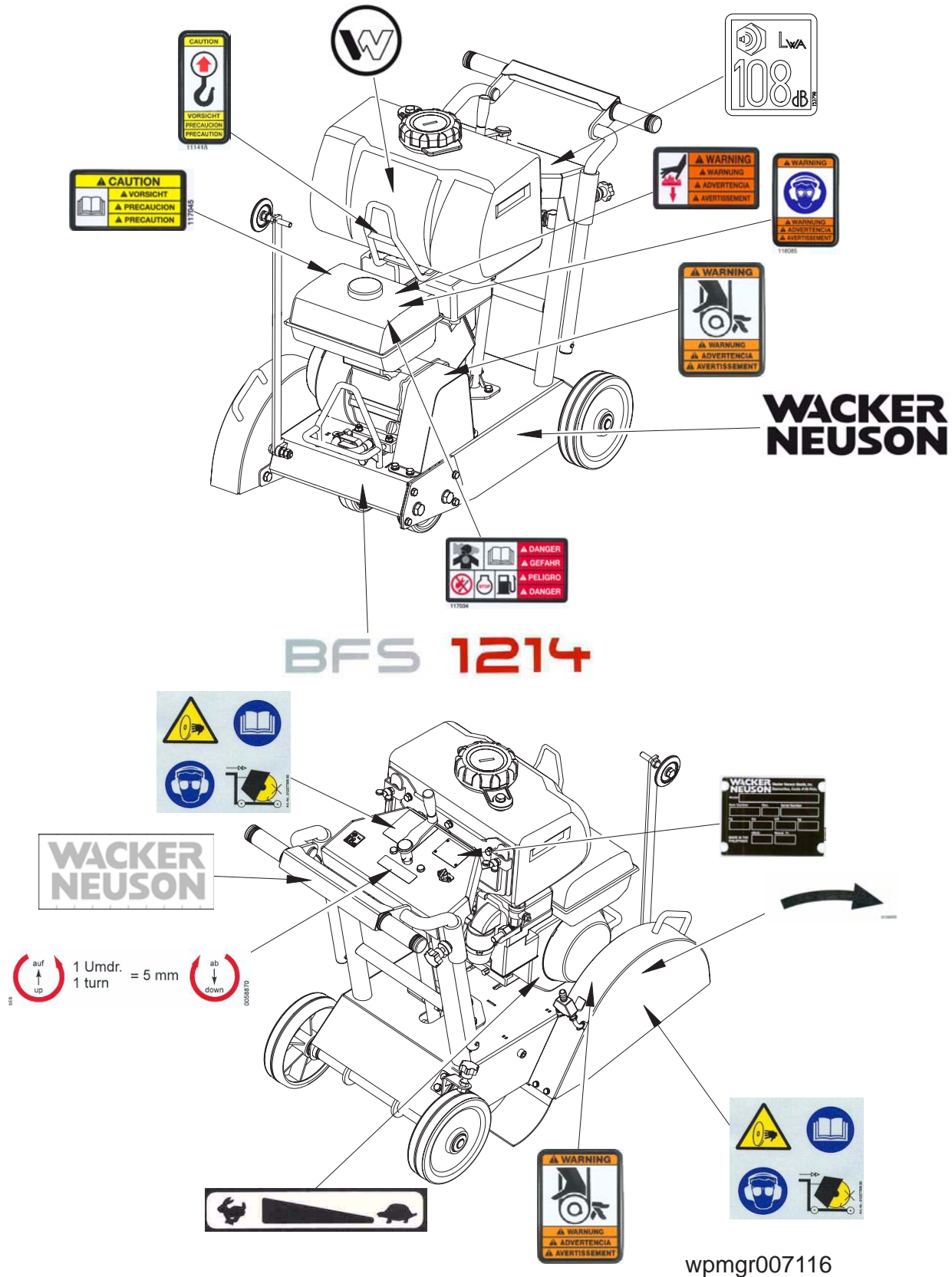
1.4 Service Safety

**WARNING**

A poorly maintained machine can become a safety hazard! In order for the machine to operate safely and properly over a long period of time, periodic maintenance and occasional repairs are necessary.








- 1.4.1 Do not attempt to clean or service the machine while it is running. Rotating parts can cause severe injury.
- 1.4.2 Do not crank a flooded engine with the spark plug removed on gasoline-powered engines. Fuel trapped in the cylinder will squirt out the spark plug opening.
- 1.4.3 Do not test for spark on gasoline-powered engines if the engine is flooded or the smell of gasoline is present. A stray spark could ignite the fumes.
- 1.4.4 Do not use gasoline or other types of fuels or flammable solvents to clean parts, especially in enclosed areas. Fumes from fuels and solvents can become explosive.
- 1.4.5 Keep the area around the muffler free of debris such as leaves, paper, cartons, etc. A hot muffler could ignite the debris and start a fire.
- 1.4.6 Replace worn or damaged components with spare parts designed and recommended by Wacker Neuson Corporation.
- 1.4.7 Disconnect the spark plug on machines equipped with gasoline engines, before servicing, to avoid accidental start-up.
- 1.4.8 Keep the machine clean and labels legible. Replace all missing and hard-to-read labels. Labels provide important operating instructions and warn of dangers and hazards.






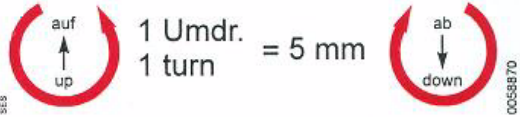

1.5 Label Locations

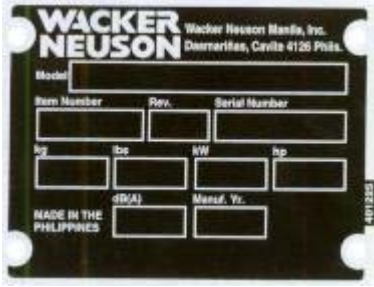




1.6 Warning and Informational Labels

Wacker Neuson machines use international pictorial labels where needed. These labels are described below:

Label	Meaning
	<p>WARNING! Always wear hearing and eye protection when operating this machine.</p>
	<p>WARNING! Hot surface!</p>
	<p>Guaranteed sound power level in dB(A).</p>
	<p>WARNING! Hand injury if caught in moving belt. Always replace beltguard.</p>
	<p>CAUTION! Read and understand the supplied Operator's Manual before operating this machine. Failure to do so increases the risk of injury to yourself and others.</p>
	<p>Company label</p>
	<p>Company label</p>

Label	Meaning
	<p>Machine name sticker</p>
	<p>CAUTION Lifting point.</p>
	<p>Throttle control lever: Turtle = Idle or Slow Rabbit = Full or Fast</p>
	<p>DANGER! Engines emit carbon monoxide; operate only in well-ventilated area. Read the Operator's Manual. No sparks, flames, or burning objects near the machine. Shut off the engine before refueling.</p>
	<p>Cutting blade: rotation label</p>
	<p>Cutting depth label</p>
	<p>Machine operation instruction label</p>

Label	Meaning
	<p>A nameplate listing the model number, item number, revision number, and serial number is attached to each unit. Please record the information found on this plate so it will be available should the nameplate become lost or damaged. When ordering parts or requesting service information, you will always be asked to specify the model number, item number, revision number, and serial number of the unit.</p>
	<p>Company logo</p>
	<p>This machine may be covered by one or more patents.</p>

2. Technical Data

2.1 Engine Data

Engine Power Rating

Net power rating per SAE J1349. Actual power output may vary due to conditions of specific use.

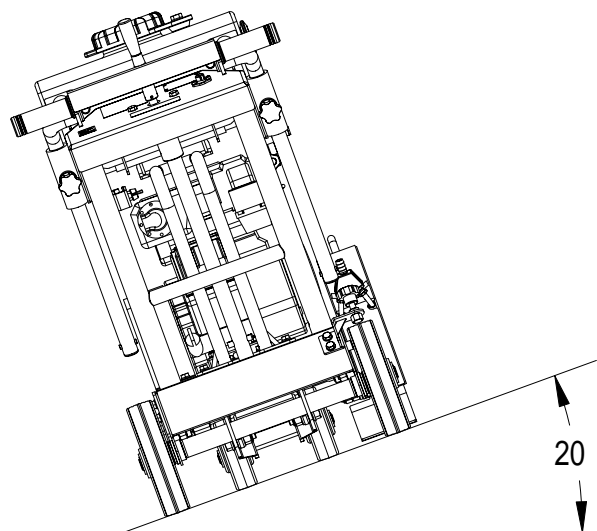
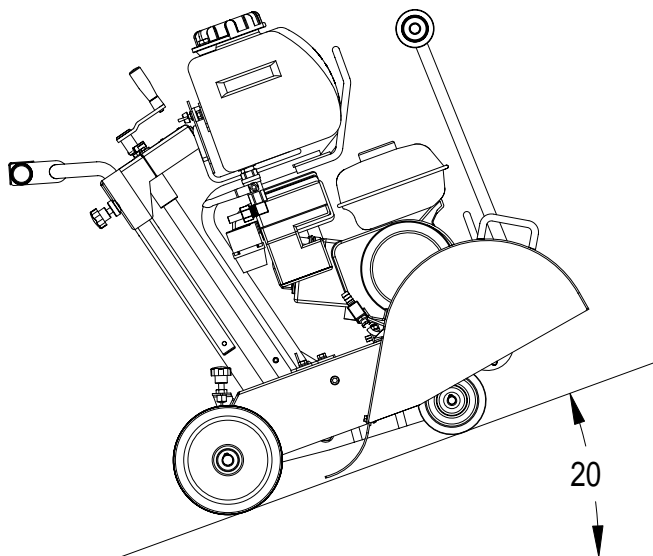
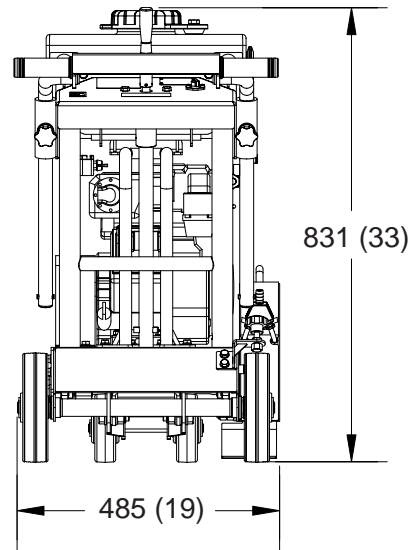
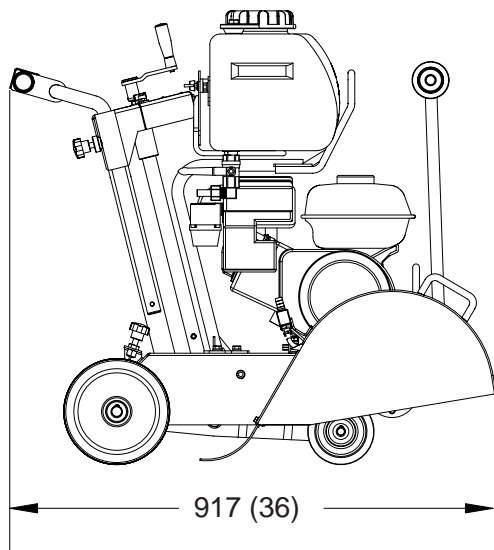
		BFS 1214 0630093
Engine		
Engine Make		Robin
Engine Model		EX170D40240
Maximum rated power @ rated speed	kW (Hp)	4.2 (5.7) @4000 rpm
Engine Speed	rpm	4000
Engine Speed - idle	rpm	1600
Spark Plug		NGK BR6HS Champion RL86C
Electrode Gap	mm (in.)	0.6-0.7 (0.02-0.03)
Air Cleaner	type	Dual element type (Urethane foam and paper element)
Engine Lubrication	oil grade	Above 40° F (4° C) use SAE 30 Between 15° F (-9° C) and 40° F (4° C) SAE 20 Below 15° F (-9° C) SAE 10W30 SF or SE
Engine Oil Capacity	ml (oz.)	600 (20)
Fuel	type	Regular unleaded gasoline
Fuel Tank Capacity	l (qts.)	3.6 (3.8)

2.2 Machine Data

		BFS 1214 0630093
Machine		
Operating Weight: (w / 350 mm Diameter blade, full water tank)	kg (lbs.)	86 (190)
Dry Weight (w/o blade)	kg (lbs.)	68 (150)
Water Tank Capacity	l (qts.)	20 (21)
Nominal Blade Speed	rev/min	2890
Arbor Diameter	mm (in)	27 (1.06)

2.3 Dimensions

mm (in.)



wpmgr005588

3. Operation

3.1 Recommended Fuel

The engine requires regular grade unleaded gasoline. Use only fresh, clean gasoline. Gasoline containing water or dirt will damage fuel system. Consult engine owner's manual for complete fuel specifications.

3.2 Application

The Floorsaw should only be operated in a forward direction. The drive engine fastened to the frame drives the cutting blade by way of a drive belt.

The infinitely variable cutting depth of the cutting blade is adjusted with the help of a hand crank, and 1 turn of the crank equals 5 mm (0.20 in) cutting depth adjustment.

The Blade guard can be swung away upwards for an easier assembly of the cutting blade.

The blade guard is moreover linked to the water tank via a hose and a coupling.

Wetting the cutting blade with water will stop dust forming during the cutting process.

The coupling fitted to the water hose means an external water supply can be used.

The engine works according to the 4-stroke principle, is started by means of a recoil starter, takes in the air via a dry air filter and is air cooled.

The engine speed can be infinitely varied with the help of the throttle lever; the optimum cutting speed of the cutting blade is only achieved when the drive engine is turning at full speed.

In order to facilitate the starting, the engine is provided with a choke.

During operation, there should always be sufficient water in the water tank

3.3 Before Starting

3.3.1 Read and understand the safety and operating instructions at the beginning of this manual.

3.3.2 Check:

- Oil level in the engine
- Fuel level
- Condition of the air cleaner
- Tightness of the external fasteners
- Condition of the fuel lines

3.4 To Start

See Graphic: wc_gr000655

- 3.4.1 Open fuel valve by moving lever down (**a1**).

Note: If engine is cold, move choke lever to close position (**d2**). If engine is hot, set choke to open position (**d1**).

- 3.4.2 Turn engine switch to “ON” (**b2**).

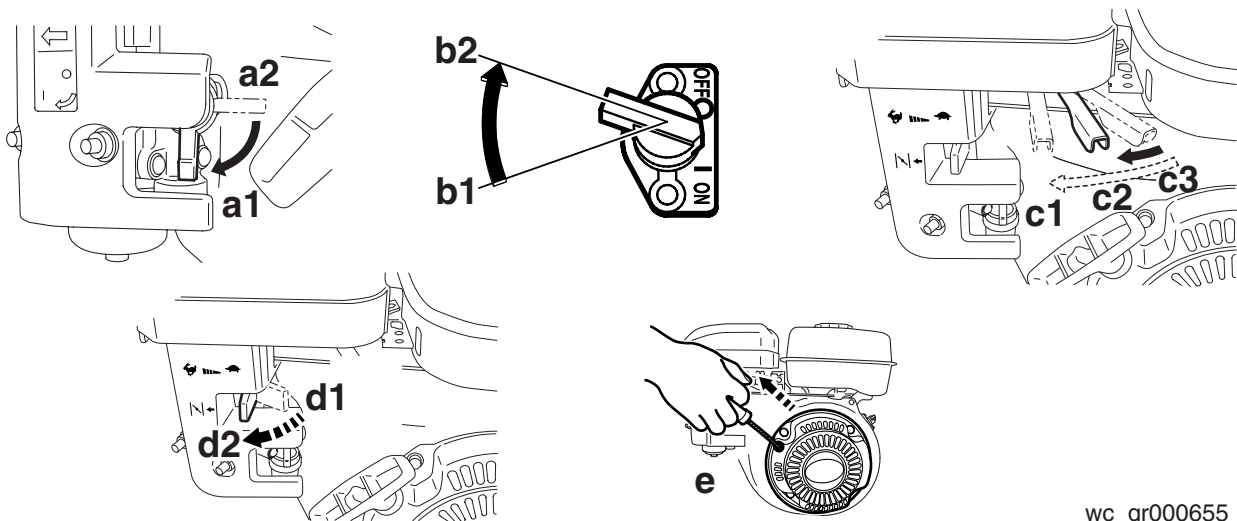
- 3.4.3 Open throttle by moving it slightly to left (**c2**).

- 3.4.4 Pull starter rope (**e**).

Note: If the oil level in the engine is low, the engine will not start. If this happens, add oil to engine.

- 3.4.5 Open choke as engine warms (**d1**).

- 3.4.6 Open throttle fully to operate (**c1**).



wc_gr000655

3.5 To Stop

See Graphic: wc_gr000655

- 3.5.1 Reduce engine RPM to idle by moving throttle completely to right (**c3**).

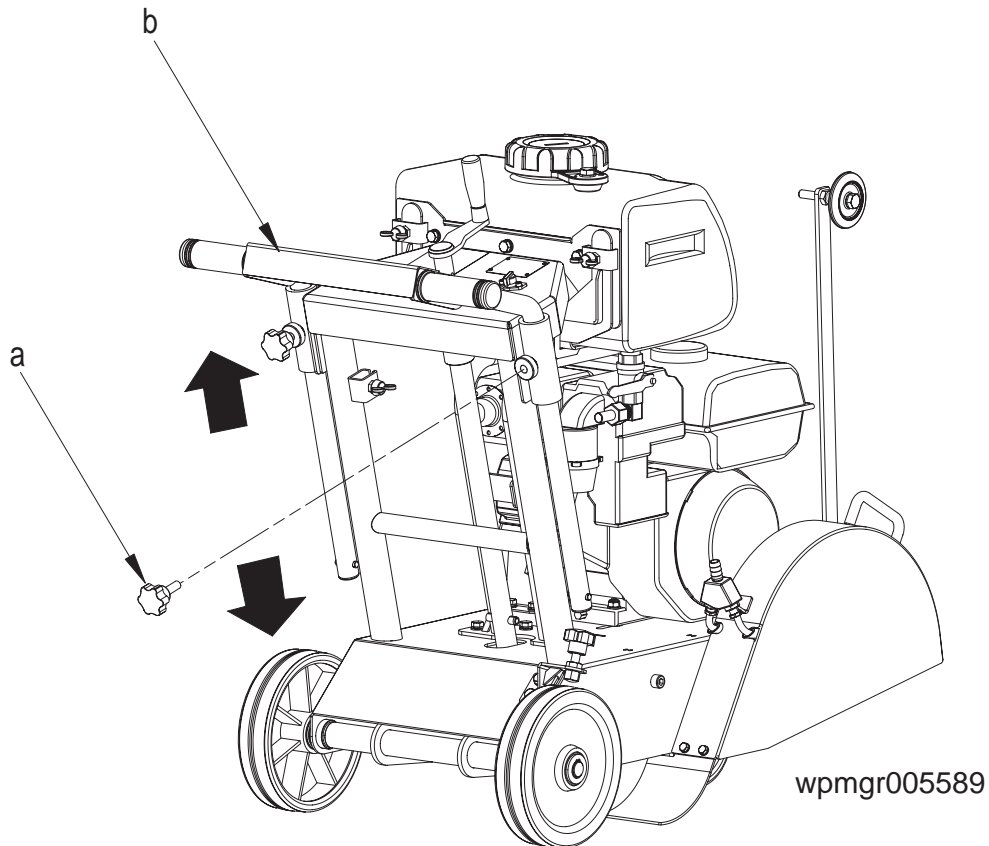
- 3.5.2 Turn engine switch to “OFF” (**b1**).

- 3.5.3 Close fuel valve (**a2**).

3.6 Guide Handle Adjustment

See Graphic: wpmg005589

- 3.6.1 For ease of operation, the guide handle **(b)** can be adjusted depending on the machine operator.
- 3.6.2 Loosen the knob **(a)**, then push down or pull up the guide handle **(b)** to the desired length.
- 3.6.3 Once adjusted, tighten the knob **(a)**, to prevent the guide handle **(b)** from slipping during operation.



3.7 Use of Cutting Blade

3.7.1 General application instructions for use of diamond cutting blades:

- 3.7.1.1 Never use a diamond cutting blade of a diameter larger than necessary to cut down to a certain depth.
- 3.7.1.2 Pull the blade out of the cut if it has stopped turning and before restarting the engine. Check to see if the belt has been tensioned sufficient if the cutting blade should get stuck in the cut. Also check the tensioning screw and make sure that it is correctly tightened.
- 3.7.1.3 Always cut a straight line. Mark the line clearly allowing the operator to follow it easily without having to guide it from one side to the other to come back to the line (do not cut narrow curves).
- 3.7.1.4 Sufficient drive power is essential, therefore always cut with engine at full throttle.
- 3.7.1.5 Never exceed the maximum turning speed (printed on cutting blade).
- 3.7.1.6 Only use appropriate cutting blade for the material you are going to cut. Wacker Neuson has an extensive selection of diamond blades in different grades of qualities for you.

Diamond blades for asphalt are suited for:

- Asphalt
- Freshly mixed concrete (from 48 hours to 28 days old)
- Sandstone
- Sandy bricks
- Floor toppings
- Sandy limestone

Not suited for:

- Set concrete
- Hard bricks or paving setts
- Concrete with exposed aggregates by washing
- Natural stone

Diamond blades for concrete are suited for:

- Set concrete (older than 28 days with reinforcements up to maximum diameter of 6mm)

Not suited for:

- Other kind of materials



DO NOT cut into the crushed stone layer or similar material layer when working with a diamond blade. Uneven wear may occur when cutting along road edges or two different types of materials (cutting along joints). Special care is required if the material to be cut shows irregularities (eg. reinforcement bars). This could easily lead to an overloading of the cutting blade. Proceed carefully when starting a cut. Lower the blade into the material slowly.

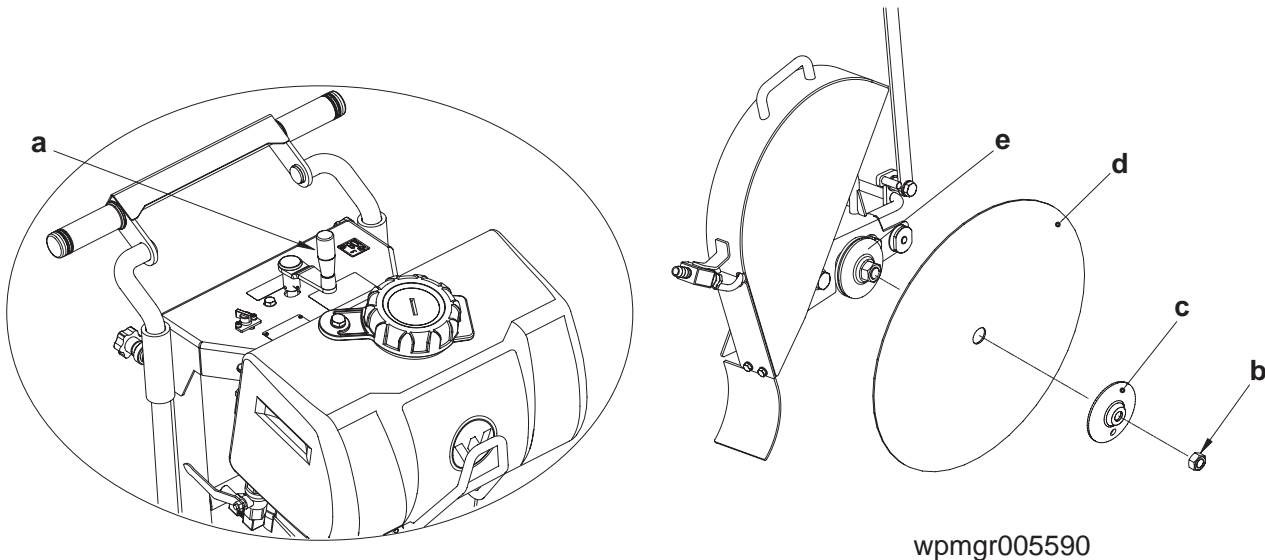


CAUTION: Special care is required when working on slopes (lanes and surfaces). Make sure the machine is not exerting a lateral pressure on the blade.

3.7.2 Installation of Cutting Blade:

See Graphic: *wpmgr005590*

- 3.7.2.1 Make sure that the engine is switched "OFF".
- 3.7.2.2 Turn the crank (a) counter-clockwise until the machine tilts up at maximum height.
- 3.7.2.3 Lift the blade-guard up from the front side.
- 3.7.2.4 Using the wrench that comes with the machine, remove the nut (b) which fastens the face-plate (c).
- 3.7.2.5 Take out the face-plate (c), and then place the blade (d) through the shaft next to the supporting disc (e).
- 3.7.2.6 Then re-install the face-plate (c) and secure by tightening the nut (b).
- 3.7.2.7 Lower the cutting blade guard back down.



wpmgr005590

3.7.3 Removal of Cutting Blade:

See Graphic: wpmgr005590

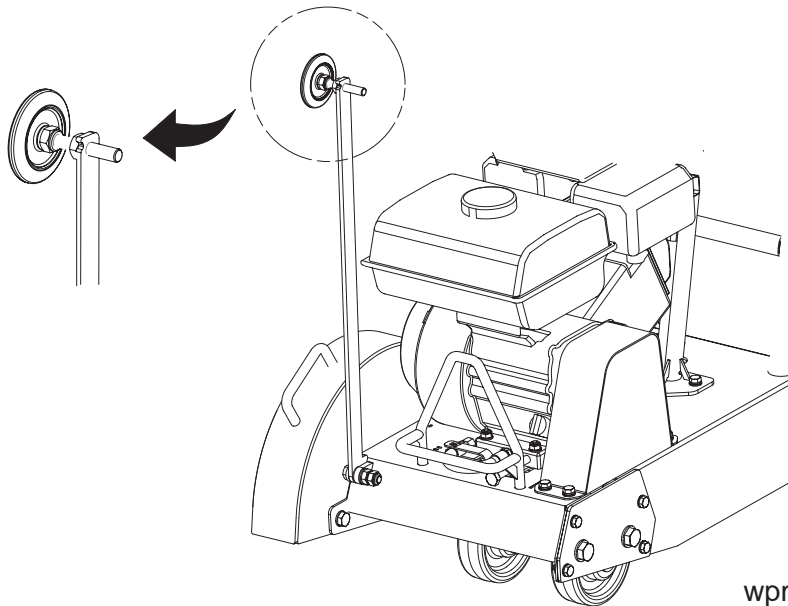
- 3.7.3.1 Make sure that the engine and the water feed is switched "OFF", and the blade is cool.
- 3.7.3.2 Turn the crank **(a)** counter-clockwise until the blade no longer touches the floor.
- 3.7.3.3 Lift the blade-guard up from the front side.
- 3.7.3.4 Loosen & remove the nut, and then remove the face-plate and the blade from the shaft.
- 3.7.3.5 Lower the cutting blade guard back down.

NOTE: Store the face-plate, nut and the cutting blade in such a way as to avoid them getting dirty. Assemble these parts back before transport of the machine.

3.8 Guide Wheel

See Graphic: wpmgr005591

The Guide Wheel makes the job of cutting long straight cuts easier.



wpmgr005591

3.9 Cutting Depth Adjustment

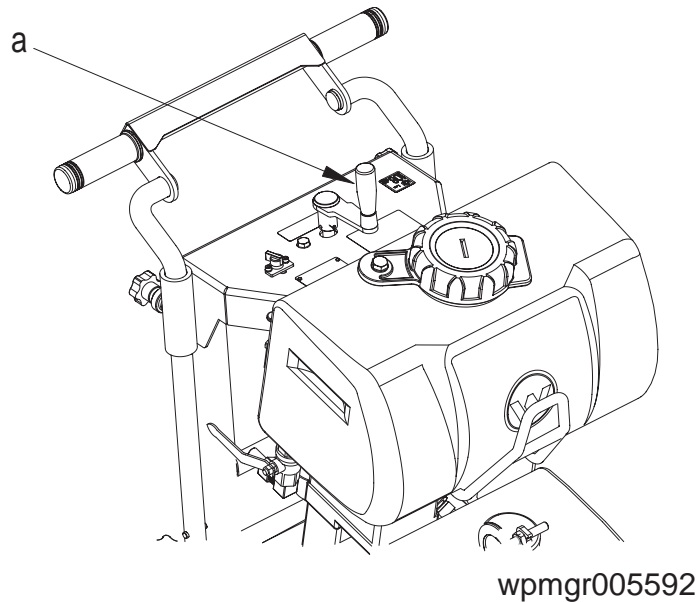
See Graphic: wpmgr005592

The cutting depth can be precisely set with the crank (a). One turn of the crank is equal to 5 mm (0.20 in) cutting depth.

A clockwise turn deepens the cutting depth.

A counter clockwise turn reduces the cutting depth.

Note: Make sure that the engine is in full throttle before and during cutting operation.



3.10 Water Tank

See Graphic: *wpmgr005593*

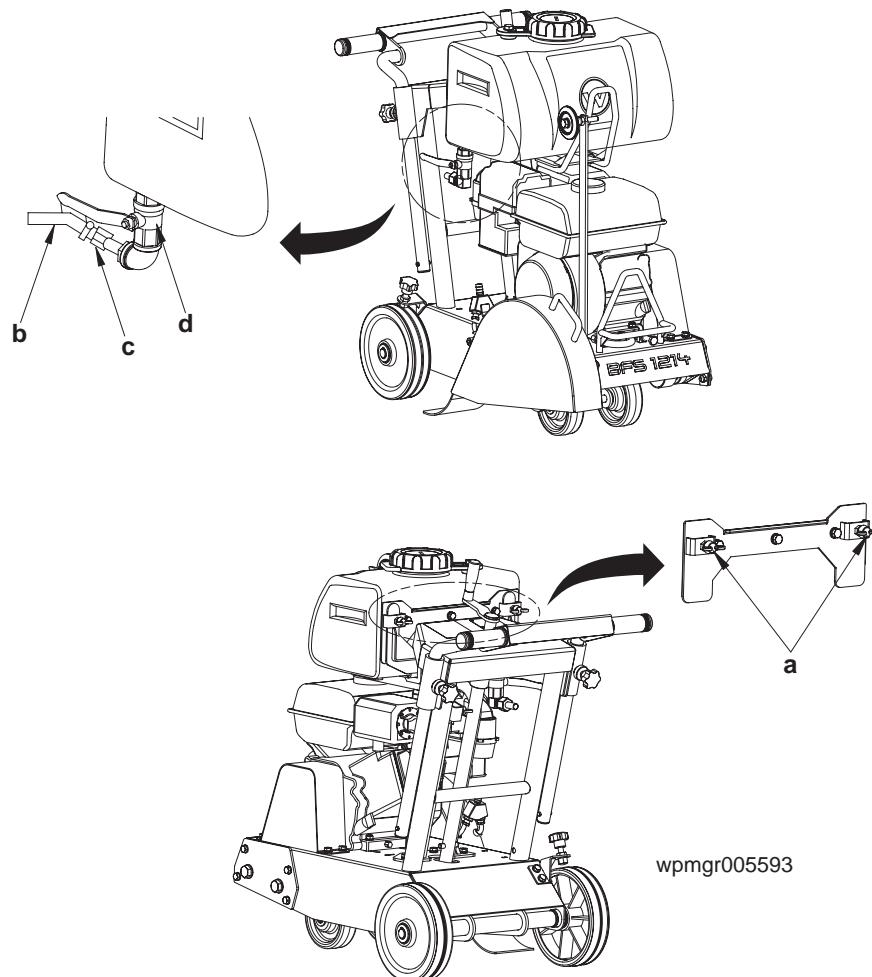
The machine is equipped with an integrated, removable water tank. Two wing screws (a) can be found assembled at the back of the tank. This holds the water tank in place, within the frame assembly.

To remove the tank

- 3.10.1 Turn off the valve (b) and disconnect the removable nut coupling (c) from the tank.
- 3.10.2 Loosen the two wing screws (a) at the back of the water tank, and pull up the water tank by its handle.

To install the tank

- 3.10.3 Mount the tank in place into the frame assembly. Make sure that the wing screws are in proper alignment with the frame assembly.
- 3.10.4 Tighten the two wing screws (a) found at the back of the tank.
- 3.10.5 Re-connect the removable nut coupling (c) securely into the elbow fitting (d) of the water tank.



wpmgr005593

4. Maintenance

4.1 Periodic Maintenance Schedule

The chart below lists basic engine maintenance. Refer to the engine manufacturer’s Operation Manual for additional information.

	Daily before starting	After first 20 hrs.	Every 2 weeks or 50 hrs.	Every month or 100 hrs.	Every year or 300 hrs.
Check fuel level.	■				
Check engine oil level.	■				
Inspect fuel lines.	■				
Inspect air filter. Replace as needed.	■				
Check external hardware.	■				
Check and adjust drive belt.		■	■		
Apply grease on grease points and on bearing fittings.				■	
Clean air cleaner elements.			■		
Change engine oil.		■		■	
Clean engine cooling fins.				■	
Clean sediment cup / fuel filter.				■	
Check and clean spark plug.				■	

4.2 Spark Plug

See Graphic: *wc_gr000028*

Clean or replace the spark plug as needed to ensure proper operation. Refer to your engine operator's manual.



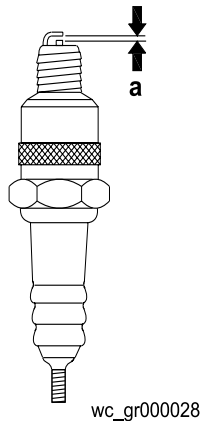
WARNING

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Do not touch the muffler while it is hot.

Note: Refer to section "Technical Data" for the recommended spark plug type and the electrode gap setting.

- 4.2.1 Remove the spark plug and inspect it.
- 4.2.2 Replace the spark plug if the insulator is cracked or chipped.
- 4.2.3 Clean the spark plug electrodes with a wire brush.
- 4.2.4 Set the electrode gap **(a)**.
- 4.2.5 Tighten the spark plug securely.

NOTICE: A loose spark plug can become very hot and may cause engine damage.



4.3 Air Cleaner

See Graphic: *wc_gr000656*



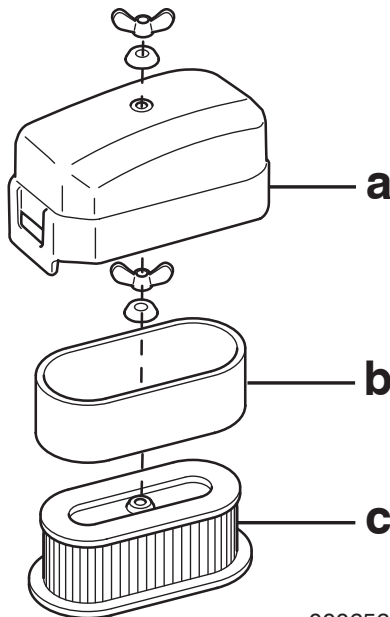
WARNING

NEVER use gasoline or other types of low-flash point solvents for cleaning the air cleaner. A fire or explosion could result.

NOTICE: NEVER run the engine without the air cleaner. Severe engine damage will occur.

The engine is equipped with a dual-element air cleaner. Under normal operating conditions, the elements should be cleaned once every week. Under severe, dry and dusty conditions, the elements should be maintained daily. Replace an element when it is saturated with dirt that cannot be removed.

- 4.3.1 Remove the air cleaner cover **(a)**. Remove the filter assembly by pulling it straight up. Inspect both elements for holes or tears. Replace damaged elements.
- 4.3.2 Wash the foam element **(b)** in a solution of mild detergent and warm water. Rinse it thoroughly in clean water. Allow the element to dry thoroughly.
- 4.3.3 Tap the paper element **(c)** lightly to remove excess dirt or blow compressed air through the filter from the inside out. Replace the paper element if it appears heavily soiled.



4.4 Engine Oil

See Graphic: *wc_gr000087*

4.4.1 Drain oil while engine is still warm.

Note: *In the interests of environmental protection, place a plastic sheet and a container under the machine to collect any liquid which drains off. Dispose of this liquid in accordance with environmental protection legislation.*

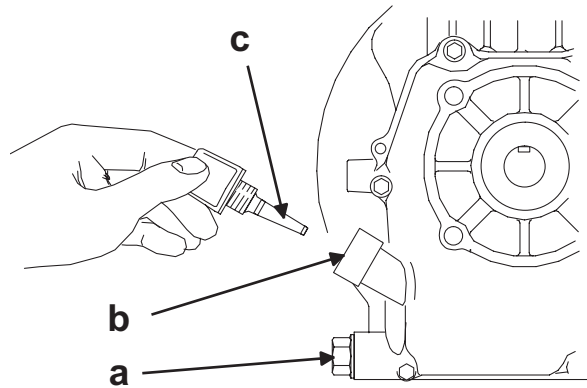
4.4.2 Remove the oil drain plug **(a)**.

4.4.3 Allow the oil to drain.

4.4.4 Install the drain plug.

4.4.5 Fill the engine crankcase through the oil filler opening **(b)**, to the upper mark on the dipstick **(c)**. Do not thread in the dipstick to check the level. See *Technical Data* for oil quantity and type.

4.4.6 When the crankcase is full, reinstall the dipstick.

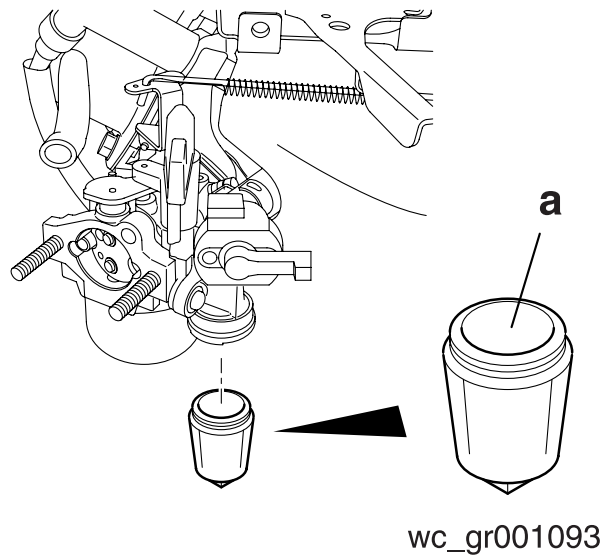


wc_gr000087

4.5 Cleaning Fuel Strainer

See Graphic: *wc_gr001093*

- 4.5.1 To remove water and dirt, close the fuel lever and remove the fuel strainer.
- 4.5.2 Inspect the fuel strainer (**a**) for water and dirt.
- 4.5.3 After removing any dirt and water, wash the fuel cup with a nonflammable solvent.
- 4.5.4 Reinstall securely to prevent leakage.



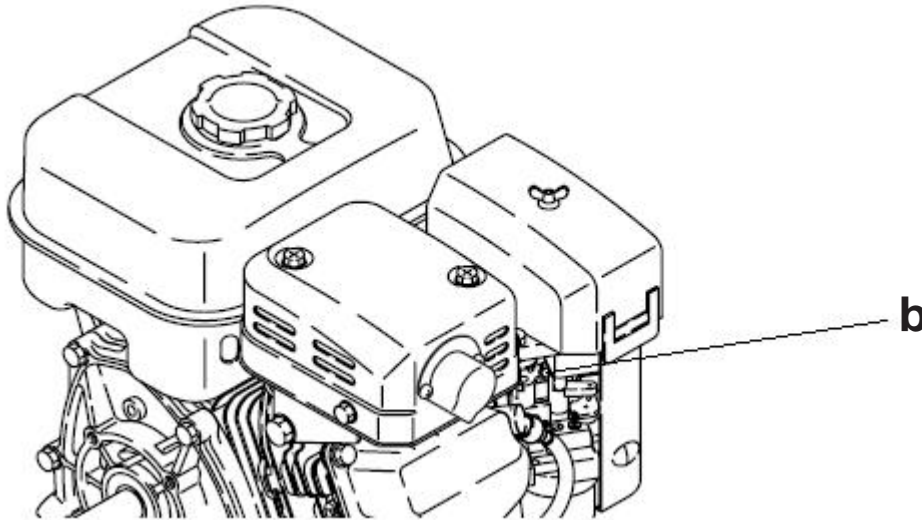
4.6 Adjusting the Engine Speed

See Graphic: *wpmgr005041*

Adjust the idle when the engine is warm.

4.6.1 Start the engine and allow it to warm up for a minute.

4.6.2 With the throttle in lowest (slowest) position, adjust the idle speed screw **(b)** to obtain the correct idle speed. See *Technical Data*.



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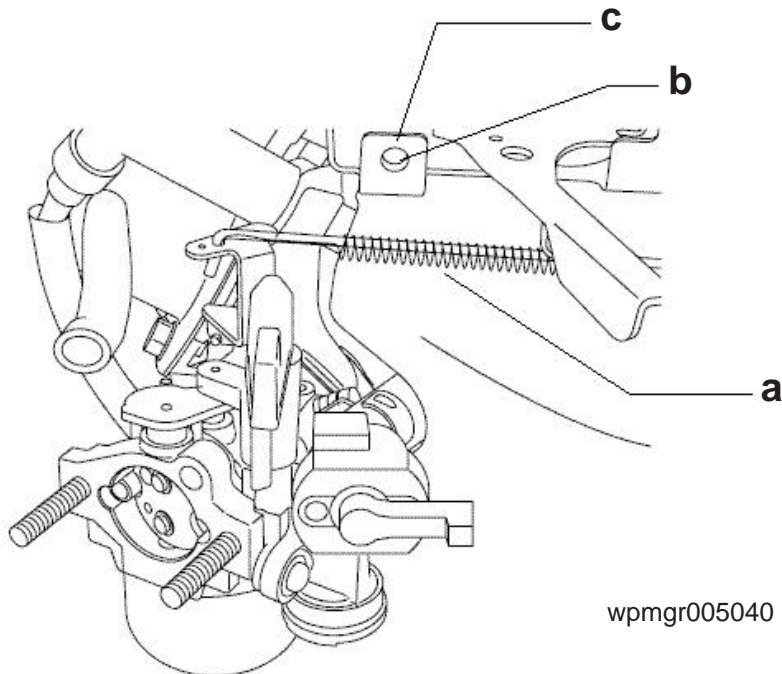
4.7 Adjusting the Idle Speed

See Graphic: *wpmgr005040*

Adjust the engine to a full load speed. See *Technical Data*.

To adjust the engine speed:

- 4.7.1 Set the coarse adjustment by attaching the governor spring (**a**) to the center hole of the throttle arm.
- 4.7.2 Start the engine and allow it to warm up for a minute.
- 4.7.3 With the throttle in the highest (fastest) position, adjust the throttle screw (**b**) with a spring lock (**c**) inserted on it to obtain correct engine speed.



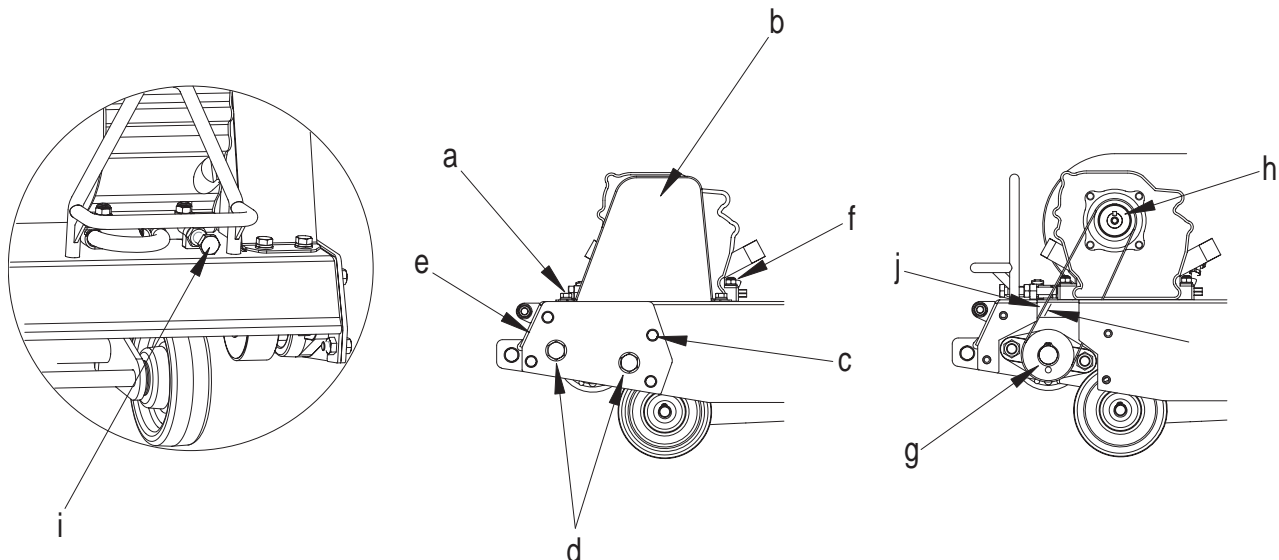
wpmgr005040

4.8 Drive Belt

See Graphic: wpmgr005594

To check belt tension or replace the belt:

- 4.8.1 Loosen the four screws **(a)** and remove the beltguard **(b)**.
- 4.8.2 Loosen the four screws **(c)** and the two nuts **(d)** and remove the cover plate **(e)** together with the bearing attached to it.
- 4.8.3 Loosen the four nuts **(f)** which holds the engine to the frame assembly.
- 4.8.4 When replacing a belt, attach the new belt into the pulley **(g)** and into the engine pulley **(h)**. Tension the belt by adjusting the tensioning screw **(i)**. To check for proper belt tension, belt should deflect 10-12 mm (0.40-0.48 in) when pressed midway **(j)** between engine pulley **(h)** and pulley **(g)**.
- 4.8.5 When belt tension is attained, tighten the four nuts **(f)** on the engine base.
- 4.8.6 Re-install the beltguard. Fasten the four beltguard screws **(a)**.
- 4.8.7 Re-install the cover plate **(e)** with the bearing. Fasten the four screws **(c)** and the two nuts **(d)**.

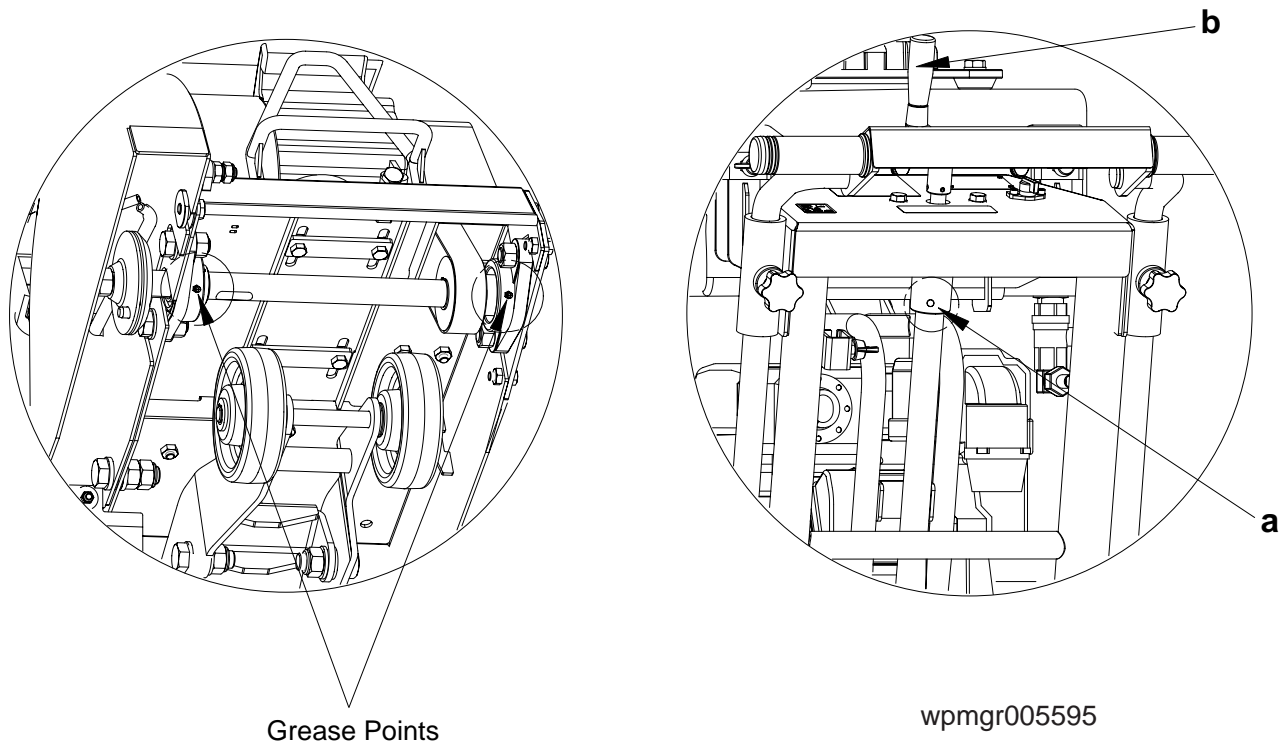


wpmgr005594

4.9 Lubrication Points

See Graphic: wpmgr005595

- 4.9.1 Position the machine at its maximum height by turning the crank (b) counter-clockwise.
- 4.9.2 Apply grease on the hole (a) and **grease points** as shown.

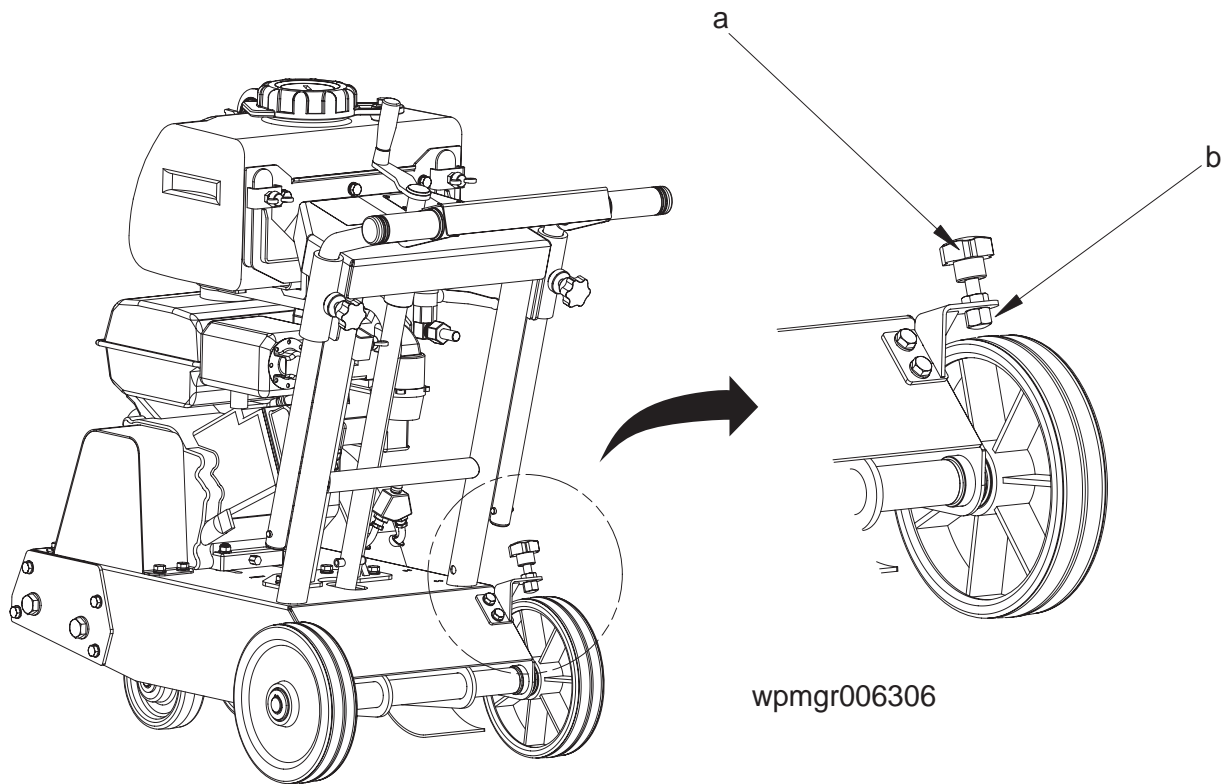


4.10 Parking Brake

See Graphic: *wpmgr006306*

The machine features a parking brake.

- 4.10.1 When the machine is not in use, tighten the knob **(a)** until the nut **(b)** touches the wheel of the machine.
- 4.10.2 Make sure that the Parking brake is securely blocking the wheel and preventing the machine from moving.



4.11 Lifting the machine

See Graphic: wpmgr005596

To lift the machine manually:

- 4.11.1 Switch the engine to "OFF" and empty the water tank.
- 4.11.2 Fold up the guide wheel and remove the cutting blade.
- 4.11.3 Turn the crank so that the machine is in its lowest cutting position.
- 4.11.4 Obtain help from a partner and plan the lift.



CAUTION

CAUTION: To avoid burns or fire hazards, let the engine cool before transporting the machine or storing it indoors. Turn "OFF" the fuel valve and keep the engine level to prevent fuel from spilling.

- 4.11.5 Grasp the machine by the lifting handles **(a)** and **(b)**, as shown.
- 4.11.6 DO NOT use the guide handle or other machine parts as lifting points.

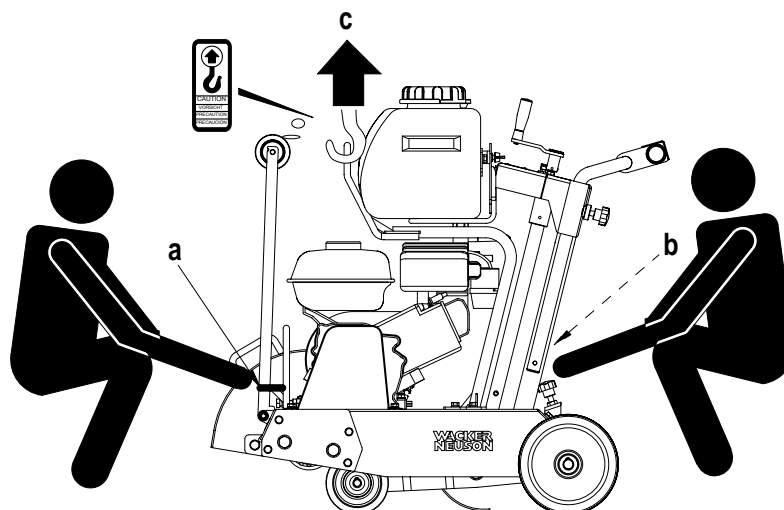
To lift the machine mechanically:



CAUTION

CAUTION: Before attempting to lift, be sure that lifting devices can safely handle weight of machine. See Technical data for weight of machine.

- 4.11.1 Switch the engine to "OFF" and empty the water tank.
- 4.11.2 Fold up the guide wheel and remove the cutting blade.
- 4.11.3 Turn the crank so that the machine is in its lowest cutting position.
- 4.11.4 Attach hook, harness or cable to machine lifting frame **(c)** as shown, and lift as desired.
- 4.11.5 DO NOT use the guide handle or other machine parts as lifting points.



wpmgr005596

4.12 Storage

If the machine will be stored for more than 30 days:

- 4.12.1 Remove dirt from the machine.
- 4.12.2 Empty the water tank.
- 4.12.3 Clean or replace engine air filter.
- 4.12.4 Change engine oil and clean engine thoroughly with an oiled cloth.
- 4.12.5 Place multi-purpose grease on the rear wheel's valve stem.
- 4.12.6 Cover the machine and store in a clean dry area.

