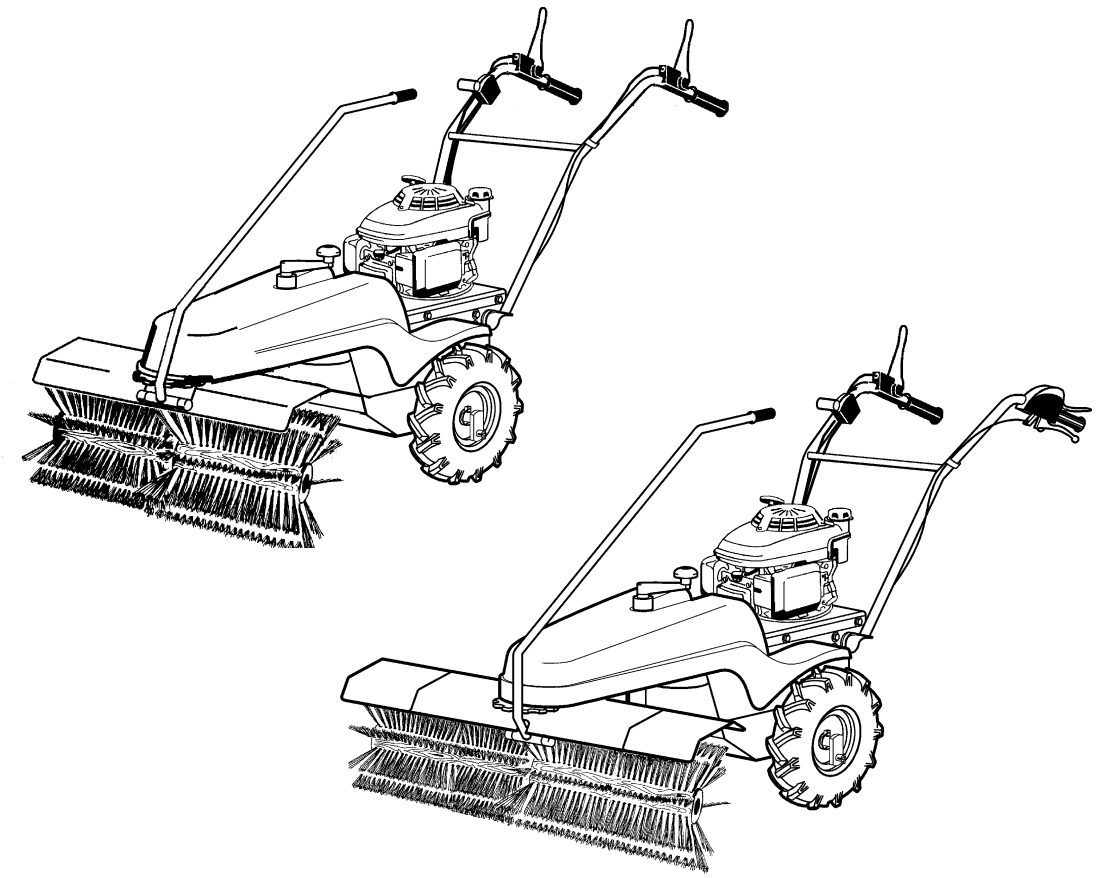
Operating Instructions

Translation of the original operating instructions

Sweeper
7100 Cleanstar
- compact
- comfort

7100 compact 80 cm
7100 comfort 100 cm - with Reverse Gear and Variator



5782_3, 5782_4

Before commissioning the machine, read operating instructions and observe warnings and safety instructions.

CE

Operating Instructions No. 998 785-A 02.12

GB

Please complete:

Machine Type No. .....

Identification No. .....
.....

Engine Type: .....

Engine No. .....

Date of Purchase: .....

For name plate,
refer to p3/fig.A/22 or B/22.

For engine type and number,
refer to p460/fig. C/7.

Please state these data when ordering spare parts to avoid wrong deliveries.

Only use original agria spare parts!

Specifications, figures, and dimensions stated in these instructions are not binding. No claims can be derived from them. We reserve the right for improvements without changing these instructions.

Amount of delivery:

- *Operating instructions*
- *Base machine*
- *Tool kit*

Please observe that only those activities are described here which are required for operating the sweeper. All other information on the engine may be taken from the enclosed engine operating instructions!

Symbols


Warning – Danger


Important information


Choke


Fuel


Oil


Engine Start

Engine Stop


Brush drive


Wheel drive


Wheel drive engaged


Wheel drive disengaged


Slow


Fast


Open (unlocked)


Closed (locked)

→agria - Service← *= contact your agria-workshop*


see engine operating instructions

Fig. A

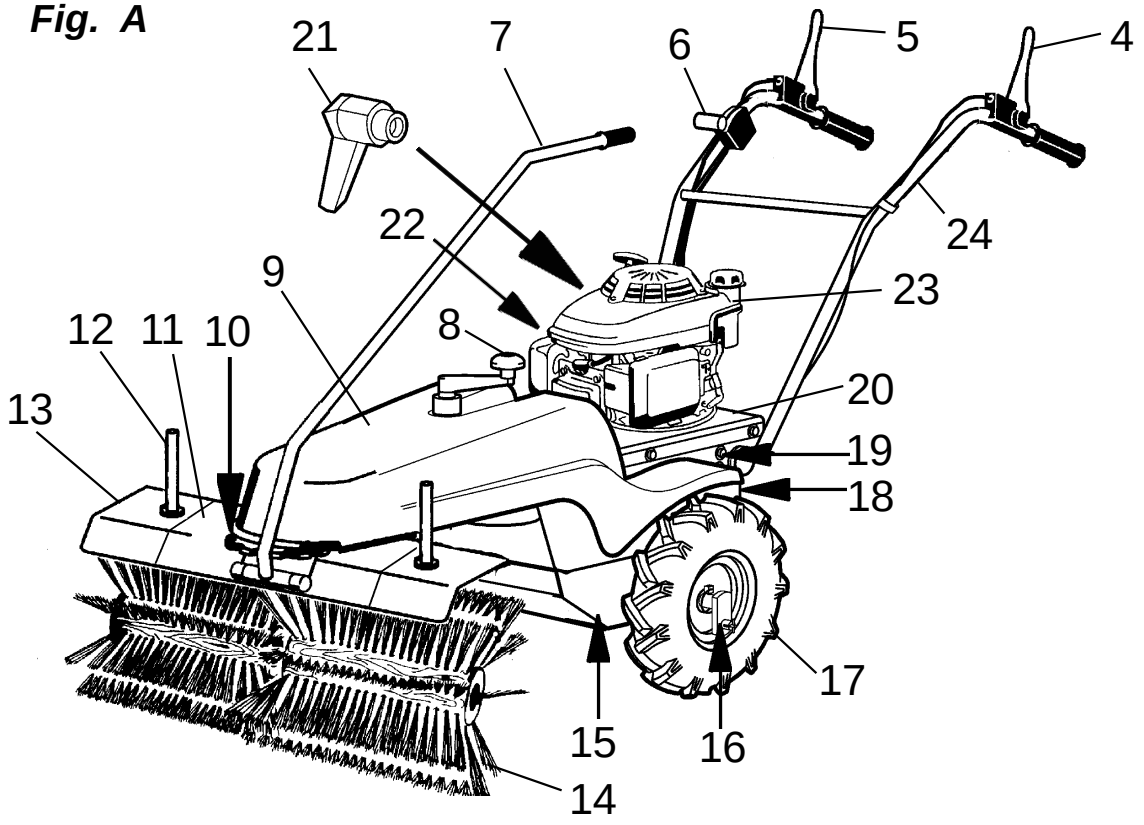

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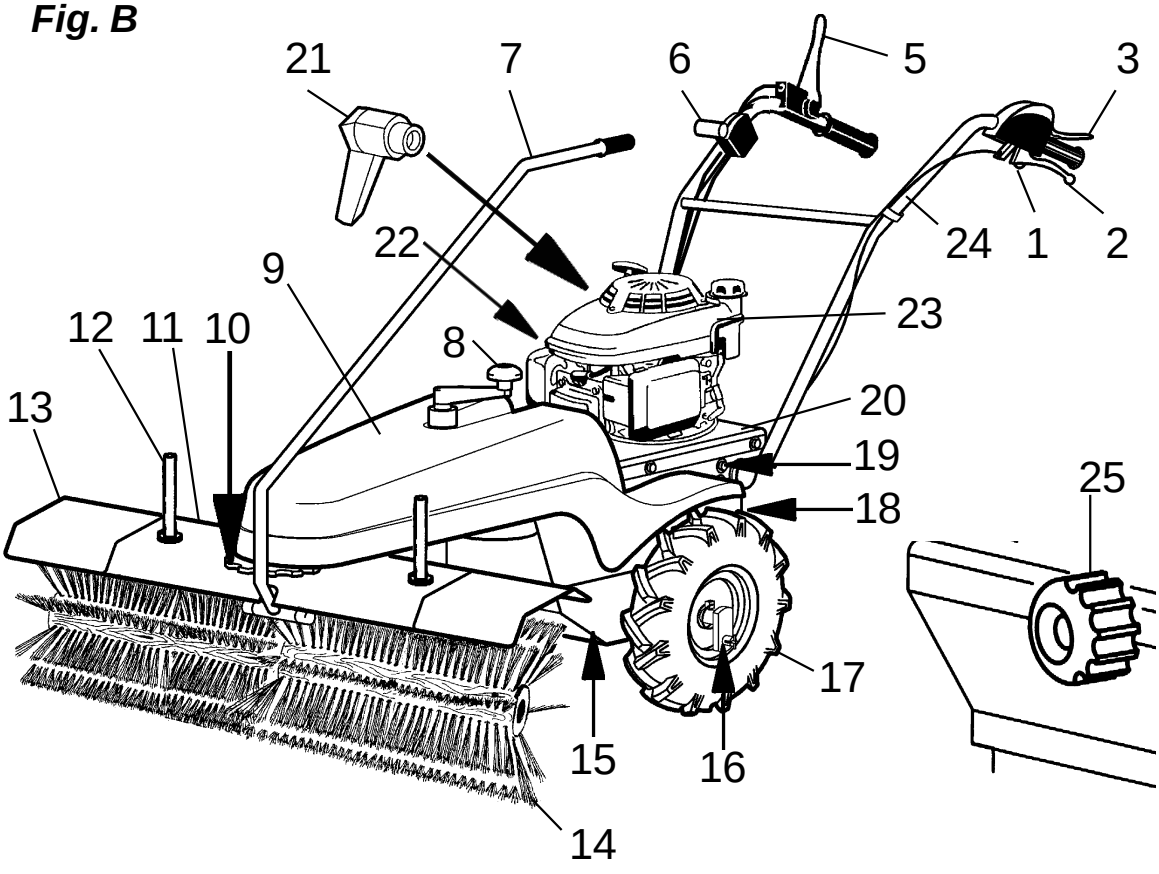
Fig. B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Figures A and B

1 *Pawl for clutch lever (comfort version)*
2 *Clutch and F/R lever for wheel drive engagement (comfort version)*
3 *Safety circuit lever (comfort version)*
4 *Clutch lever and safety circuit lever for wheel drive engagement (compact version)*
5 *Clutch lever for brush drive*
6 *Speed control lever*
7 *Rod that pivots the implement*
8 *Height adjustment crank*
9 *Protective hood*
10 *Notched plate to lock the rod*
11 *Main guard*
12 *Coupling pin for implement attachment*
13 *Extension guard*
14 *Rotary brushes*
15 *Worm gear (wheel drive)*
16 *Wheel dog*
17 *Drive wheel*
18 *V-belt housing cover (rear)*
19 *V-belt housing*
20 *Engine base plate*
21 *Clamping lever for handlebars height adjustment*
22 *Name plate/machine identification no.*
23 *Engine*
24 *Handlebars*
25 *Dial for manual speed adjustment of rotary brushes (comfort version)*

Lubricants and Anti-Corrosive Agents:

Use the lubricants specified for engine and gearbox (see "Specifications").

We recommend using ***Bio-lubricating oil*** *or* ***Bio-lubricating grease*** *for "open" lubrication points or nipples (as specified in the operating instructions).*

We recommend using ***Bio-slushing oil*** *to preserve machines and attachments (do not apply on painted covers). You can brush or spray the oil.*

Anti-corrosive agents are environmentally friendly and degrade fast.

Using ecologically safe Bio-lubricants and Bio-anti-corrosives, you contribute to environmental protection and to the wellbeing of humans, animals and plants.

Fuel:

This engine runs smoothly on ***conventional unleaded regular and supergrade petrol (including E10)****.*

Do not add oil to petrol.

If, for environmental reasons, you use unleaded petrol, make sure the fuel is drained completely when shutting down the engine for more than 30 days. This is to prevent resin residue from depositing in the carburetor, fuel filter, and tank. Or add a fuel stabilizer to the fuel.

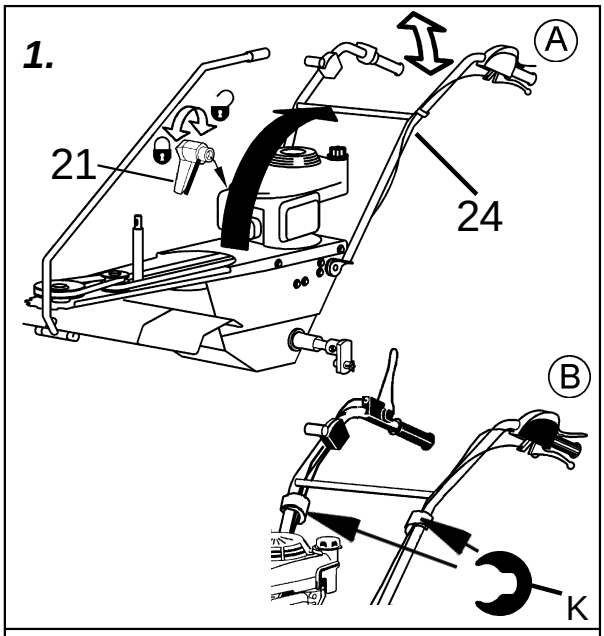
For further instructions see "Engine Preservation".

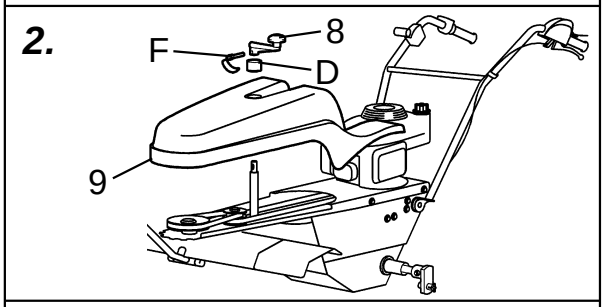
Maintenance and Repair:

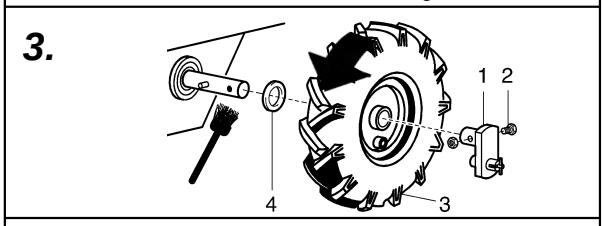
The trained mechanics of your agria workshop expertly carry out any maintenance and repair work.

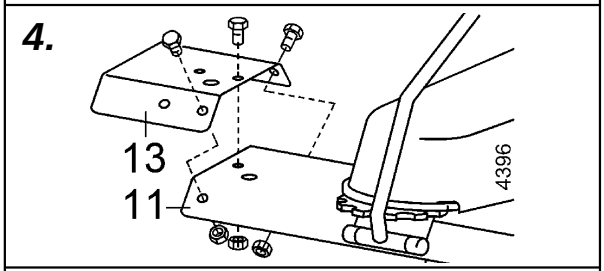
You should only carry out major maintenance work and repairs on your own, if you have the proper tools and knowledge of machines and internal combustion engines.

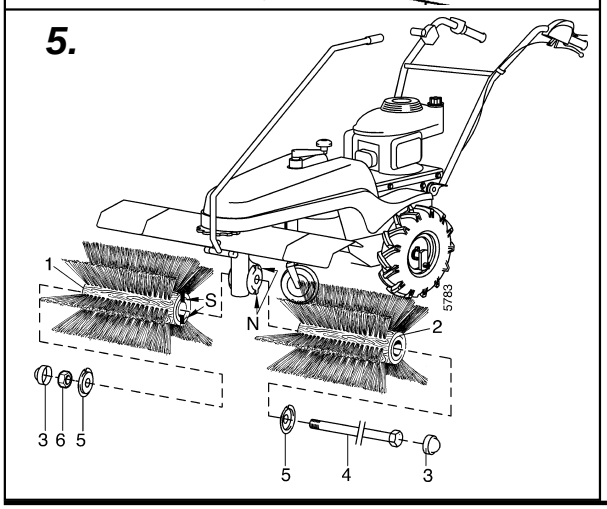
Do not hammer against the flywheel with a hard object or metal tools as it might crack and shatter in operation, causing injuries and damage. Only use suitable tools to pull off the flywheel.

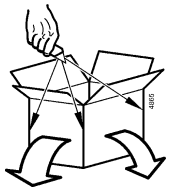












Unpacking

- *Open the box top.*
- *Cut all corners open and fold down the sides.*

1. Attaching the handlebars

Ⓐ *Raise the handlebars*

- *Unscrew the clamping lever (21) until the notches are exposed*
- *Pivot the handlebars (24) to the rear up to correct working height* ➔ *page 20*
- *Re-tighten clamping lever (21).*

Ⓑ *Attach cables and electric lines with the three clips (28) to the handlebars in accordance with fig.*

2. Fitting the protective hood (9)

with spacer (D), crank (8) and linch pin (K).

3. Fitting the drive wheels

- *Coat the wheel shaft on both sides with a little grease*
- *fit washers and drive wheels on both sides - pay attention to direction of arrow for cleated tyres.*
- *Mount wheel dog with screw (2) and securing nut - wheel dog settings* ➔ *page 20.*

4. Mounting extension guards

- *Attach an extension guard to either side of the main guard (11), using three hex head bolts and locking nuts for each guard* ➔ *page 22.*

5. Attaching the rotary brushes

➔ *page 21*

6. Starting up

See page 26 for details.

Before starting the engine, read the operating instructions and note:

Warning

This symbol marks all paragraphs which affect your safety. Pass all safety instructions to other users and operators.

Due Use

The sweeper, including the implements approved by the manufacturer, is constructed for normal use in cleaning park and pathway areas, for gathering and sweeping up loose dirt, and may also be used as a snow-clearing machine after it has been fitted with suitable brushes and a rake blade (due use).

Any other type of operation is considered undue. The manufacturer is not liable for any damages resulting from undue use, for which the risk lies with the user alone.

Due use includes compliance with manufacturer's instructions on operation, maintenance and repair.

Any unauthorized changes to the sweeper render manufacturer liability null and void.

General Instructions on Safety and Accident Prevention

Basic Rule:

The standard accident prevention regulations must be adhered to, as well as all other generally accepted rules governing operational safety, occupational health and road traffic regulations.

For drives on public roads, the national traffic code applies.

Accordingly, check the sweeper for road and operational safety each time you take up operation.

Only persons familiar with the sweeper and instructed on the hazards of operation are allowed to use, maintain and repair the sweeper.

Teenagers of 16 years or younger may not operate the sweeper!

Only work in good light and visibility.

Operator's clothes should fit tight. Avoid wearing loose fitting clothes. Wear solid shoes.

Note the warning and instruction signs on the sweeper for safe operation. Compliance is for your own safety.

When transporting the sweeper on vehicles or trailers outside the area to be sweeped, ensure that the engine is turned off and the wheel dogs are engaged.

Careful with rotating tools – keep at a safe distance!

Beware of coasting tools. Before you start any maintenance or repair on them, wait until tools have come to a complete stop.

Riding on the machine during operation is not permitted.

Implements and their weight affect the driving, steering, braking, and tip-over characteristics of the sweeper. Therefore, ensure steering and braking functions are sufficient. Match operating speed to conditions.

Do not change settings of governor. High engine speed increases risk of accidents.

Working Area and Danger Zone

The user is liable to third parties working within the sweeper's working range.

Staying in the danger zone is not permitted.

Check the immediate surroundings of the sweeper before you start it. Watch out for children and animals.

Careful! Dirt and stones may get airborne during sweeping. People and animals must keep out of this area. Watch out for vehicles, window panes and other objects to avoid damage.

Before you start work, clear the area from any foreign object. During operation, always watch out for further objects and remove them in time.

For operation in enclosed areas, ensure that a safety distance is kept to enclosures to prevent damage to tools.

Operation and Safety Devices

Before You Start the Engine

Become familiar with the devices and operating elements and their functions. Above all, learn how to turn the engine off quickly and safely in an emergency.

Ensure that all protective devices are mounted and positioned to provide protection.

Starting the Engine

Do not start engine in closed rooms. The carbon monoxide contained in the exhaust fume is extremely toxic when inhaled.

Before you start the engine set all operating elements to neutral or idling position.

For starting the engine, do not step in front of the sweeper and the implement.

Operation

Never leave the operator's position at the handlebars while sweeper is at work.

Never adjust the operating handles during work – danger!

During operation the operator must keep at a distance as defined by the handlebars, especially when turning the machine.

Riding on the machine during operation or in transport is not permitted.

If clogging occurs in the brushes or in the implement, turn off the engine and clean the brushes or the implement with an appropriate tool.

In case of damage to the sweeper or to the implement, immediately turn off the engine and have it repaired.

If steering causes problems, immediately bring the sweeper to a halt and turn it off. Have the malfunction removed without delay.

To prevent the sweeper from sliding on slopes, make sure it is secured by another person using a bar or a rope. This person must be located at a higher position than the vehicle and at a safe distance from the attachment at work.

If possible, always work horizontally on the slope.

End of Operation

Never leave the sweeper unattended with the engine running.

Before you leave the sweeper, turn off the engine.

Secure sweeper against unauthorized use - remove spark plug connector.

Implements

Only mount implements with the engine and the implement drive switched off.

Always use appropriate tools and wear gloves when changing implements and parts thereof.

For mounting and dismounting implements bring stands into proper position and ensure stability.

Secure sweeper and implements against rolling off (wheel chocks).

Beware of injuries while coupling implements.

Mount implements as specified and only couple at specified points.

Secure sweeper and implement against unauthorized use and rolling off when you leave the machine. If necessary, install transport or security devices and secure.

Weights

Always fit weights onto appropriate weight mounting devices.

Snow Clearing

Ensure snow dozer is mounted correctly! Wear slip-proof shoes.

When pivoting the snow dozer watch out for crush and shear points. Adjust working speed to conditions. Operator may be injured when the machine hits an obstacle.

Maintenance and Cleaning

Never carry out any maintenance or cleaning with the engine running.

Before you work on the engine, always remove spark plug connector (petrol engine only).

Check regularly and, if necessary, replace all guards and tools subject to wear and tear.

Keep sweeper and implement clean to avoid risk of fire.

Check nuts and bolts regularly for tight fit and re-tighten, if necessary.

After maintenance and cleaning, ensure that you re-install all safety devices and guards and adjust them properly.

Only use original agria spare parts. All other commercial spare parts must correspond to quality and technical requirements specified by agria.

Storage

It is not allowed to store the sweeper in rooms with open heating.

Never park the sweeper in closed rooms with fuel left in tank. Fuel vapours are hazardous.

Engine, Fuel, and Oil

Never let the engine run in closed rooms. Extreme danger of intoxication! For the same reason, also replace damaged exhaust parts immediately.

Caution with hot engine parts!

The exhaust and other engine parts become very hot, if the engine runs and immediately after turning off. Hold for sufficient distance from hot surfaces and keep children away from the running engine.

Be careful when dealing with fuel. Great danger of fire! Never refill fuel close to open fire, inflammable sparks or hot engine parts. Do not refill fuel in closed rooms. Do not smoke when refilling!

Refill only with the engine switched off and cooled down.

Do not spill any fuel, use a proper filling device.

In case of fuel spillage, pull the sweeper away from the spillage before you start the engine.

Make sure fuel is of specified quality.

Store fuel in approved cans only.

For safety reasons the petrol tank and fuel cap should be replaced regularly.

Store anti-corrosive agents and stabilizing liquids out of reach of children. If sickness and vomiting occur, see a doctor. If fuel has contacted eyes, rinse them thoroughly, avoid inhaling of vapours.

Read and observe enclosed instructions.

1

Before you dispose of opened and seemingly empty pressurised tins (e.g. of assist-starting liquids) make sure they are completely empty. Empty them in ventilated places safe from spark formation or flames. If necessary, dispose of tins in hazardous waste deposits.

Be careful when draining hot oil, danger of burns.

Make sure oil is of specified quality. Storage is in approved cans only.

Dispose of oil, greases, and filters separately and properly.

Tyres and Tyre Air Pressure

When working on tyres, make sure sweeper is parked properly and secured against rolling off.

Any repairs are to be carried out by trained mechanics only and with the appropriate tools.

Regularly check tyre air pressure.

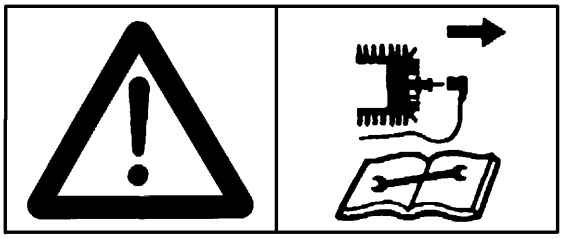
Excessive pressure may cause bursts.

Use appropriate tyre air pressure when mounting weights or implements.

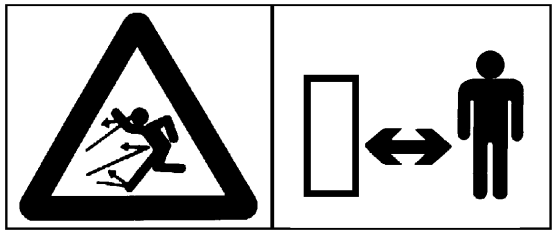
Electrical System

Persons having a pacemaker must not touch live parts of ignition system when the engine is running.

Explanation of Warning Signs



Before any cleaning, maintenance, and repair work switch off the engine and pull spark plug connector.



With engine running, keep at a safe distance. Dirt and stones may get airborne during sweeping. People and animals must keep out of this area.

Signs

When working with the machine, wear individual protective ear plugs.

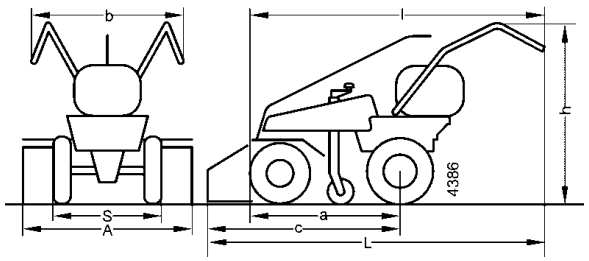
Wear protective gloves.

Wear solid shoes.

2.1 Sweeper

agria-Cleanstar

Dimensions:



a ..... 890 mm
b ..... 630 mm
e ..... 1335 mm
h ..... 960-1060 mm
l ..... 1650 mm
L Collector ..... 1930 mm
L Snow dozer ..... 1890 mm
A ..... 800 or 1000 mm (depending on brush version)
S ..... 480 mm

Weights:

compact 80 cm ..... approx. 91 kg
comfort 100 cm ..... approx. 98 kg

Collector 80 cm ..... approx. 11, 5 kg
Collector 100 cm ..... approx. 13,0 kg

Snow dozer blade 80 cm approx. 11,0 kg
Snow dozer blade100 cm approx. 13,5 kg

Tyres: *..... 3.50 - 6 field tyres*
..... 13x5.00-6 Lawn tyres

Tyre pressure: *..... 0,8 bar*

Clutch:

There are two separately engageable V-belt clutches and idler pulleys fitted between engine and wheel drive/ brush drive

compact version:

The rotary brushes are adjustable to one of two available speeds ..... 130 rpm
..... 230 rpm

comfort version:

Friction clutch for reversing Brush speed is adjusted steplessly via a variator from ... 100 rpm ... 200 rpm

Always use original agria V-belts (see wear parts list on page 42)

Transmission:

Wheel drive: ..... worm gear
Brush drive: ..... bevel gear

Ground speeds:

Forward travel ..... 2.8 km/h
Reverse travel
(Comfort version only) ..... 1.8 km/h

Handlebars:

height-adjustable without tools

Noise level:

Noise level: ..... L_{pA} 75 dB in accordance with EN 11201 (at operator's ear)

sound power level in accordance with EN ISO 3744:1995 : .....
measured ..... L_{WA} 95 dB
guaranteed ..... L_{WA} 96 dB

Vibration acceleration value:

on handlebar grip ..... a_{hw} = 3,02 m/s^2 in accordance with 2002/44/EC

2.2 Engine

Manufacturer: ..... Honda

Type: ..... GCV 135 N2E

Version: ..... Fan-air-cooled
1 cylinder-4-stroke
OHC engine (petrol)

Bore: ..... 64 mm

Stroke: ..... 42 mm

Piston displacement: ..... 135 ccm

Output: ..... 3.4 kW
at 3600 rpm

Torque: ..... max 9.7 Nm
at 2500 rpm

Spark plug: ..... NGK BPR6ES Bosch

Spark plug gap: ..... 0.7–0.8 mm

Ignition:

Transistor trip coil, contactless;
ignition point: 20° before dead centre,
radio remote screened according to
VDE 0879

Valve lash (engine cold)
Intake: ..... 0.15 ± 0.04 mm
Outlet: ..... 0.20 ± 0.04 mm

Starter: ..... Recoil starter

Fuel tank capacity: ..... 1.1 l

Fuel: ..... unleaded petrol
octane number at least 91 RON
(also E10)
(refer to fuel recommendations
in this manual)

Air filter: ..... Dry element filter

Carburetor: ..... Float carburetor
Throttle valve type

Mixture control screw: ..... opened by
approx. 1 turn in base setting

Top no-load speed: ..... 3250 rpm

Idling speed: ..... 1550–1850 rpm

Engine oil:

Filling quantity ..... approx. 0.55 l
Multi-grade oil SAE 10 W-40
SG, SF or higher quality grade

Operability on Slopes:

Engine is suited for use on slopes
(with oil level at “max” = upper level
mark)

Continuous operation possible up to
20° inclination (37 %)

2.3 Engine

Manufacturer: ..... Honda

Type: ..... GCV 160 N2E

Version: ..... Fan-air-cooled
1 cylinder-4-stroke
OHC engine (petrol)

Bore: ..... 64 mm

Stroke: ..... 50 mm

Piston displacement: ..... 160 ccm

Output: ..... 4.1 kW
at 3600 rpm

Torque: ..... max 11.4 Nm
at 2500 rpm

Spark plug: ..... NGK BPR6ES Bosch

Spark plug gap: ..... 0.7–0.8 mm

Ignition:

Transistor trip coil, contactless;
ignition point: 20° before dead centre,
radio remote screened according to
VDE 0879

Valve lash (engine cold)
Intake: ..... 0.15 ± 0.04 mm
Outlet: ..... 0.20 ± 0.04 mm

Starter: ..... Recoil starter

Fuel tank capacity: ..... 1.1 l

Fuel: ..... unleaded petrol
octane number at least 91 RON
(also E10)
(refer to fuel recommendations
in this manual)

Air filter: ..... Dry element filter

Carburetor: ..... Float carburetor
Throttle valve type

Mixture control screw: ..... opened by
approx. 1 turn in base setting

Top no-load speed: ..... 3250 rpm

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Engine oil:

Filling quantity ..... approx. 0.55 l
Multi-grade oil SAE 10 W-40
SG, SF or higher quality grade

Operability on Slopes:

Engine is suited for use on slopes
(with oil level at “max” = upper level
mark)

Continuous operation possible up to
20° inclination (37 %)

The agria Cleanstar sweeper is suited for application in amenity areas and winter road clearance. The following components are available for sweepers:

- *Rotary brushes*

80 cm coarse	*agria item no. 6194 051*
80 cm fine	*agria item no. 6194 061*
100 cm coarse	*agria item no. 6194 151*
100 cm fine	*agria item no.6194 161*

- *Collectors*

80 cm	*agria item no. 6194 211*
100 cm	*agria item no. 6194 221*

- *Sprinkling assy*
  agria item no.6194 481
- *Spray apron*
  agria item no.6194 921

The following implements are available for winter road clearance:

- *Snow dozers*

80 cm	*agria item no.6196 011*
100 cm	*agria item no. 6196 021*

3.1 Engine

The four-stroke petrol engine runs on commercial petrol (refer to fuel recommendations p6).

During the first 20 operating hours (break-in period) do not operate the engine at maximum speed.

***Even after the break-in period** never operate the engine at higher speed than is necessary for the work in hand.*

ⓘ ***High engine speed is harmful to any engine and considerably affects its longevity. This applies especially for no load operation. Any overspeed (have the engine roar) can result in immediate damage.***

Cooling System

*The **engine** is **fan-cooled**. Therefore keep the grille on the recoil starter and the cooling fins on the cylinder clean and free from sucked-in plant trash.*

Idling-Speed

Always ensure that idling-speed is adjusted correctly. At low speeds and with the speed control lever set to idle, the engine is supposed to run smoothly and without run-out.

Air Filter

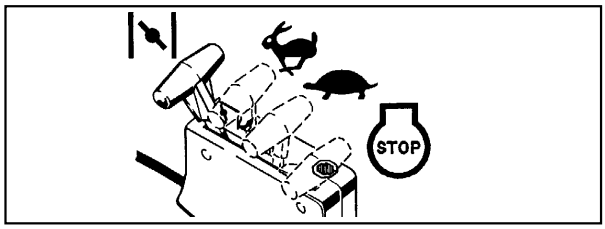
The air filter cleans the air as it is inducted. A clogged filter reduces engine output.

Ignition System

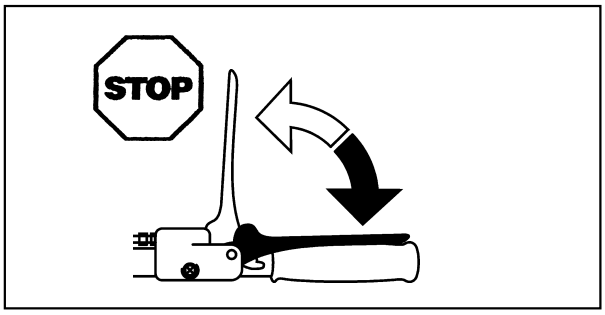
The engine is equipped with a maintenance-free, contactless electronic ignition system. We recommend to have necessary check-ups done by an expert only.

Speed Control Lever
(Engine-shut-off switch)

The speed control lever (A/6) on the handlebar sets the engine speed steplessly and actuates the CHOKE and the engine-shut-off switch. For the appropriate positions see the illustration.



ⓘ *The speed control lever also serves as **engine safety circuit**. In an emergency move the lever to position "STOP" to shut off the engine instantly.*



3.2 Safety Circuit Lever

*The **Cleanstar compact** sweeper has a safety circuit mechanism for wheel/ brush drives integrated in the clutch lever.*

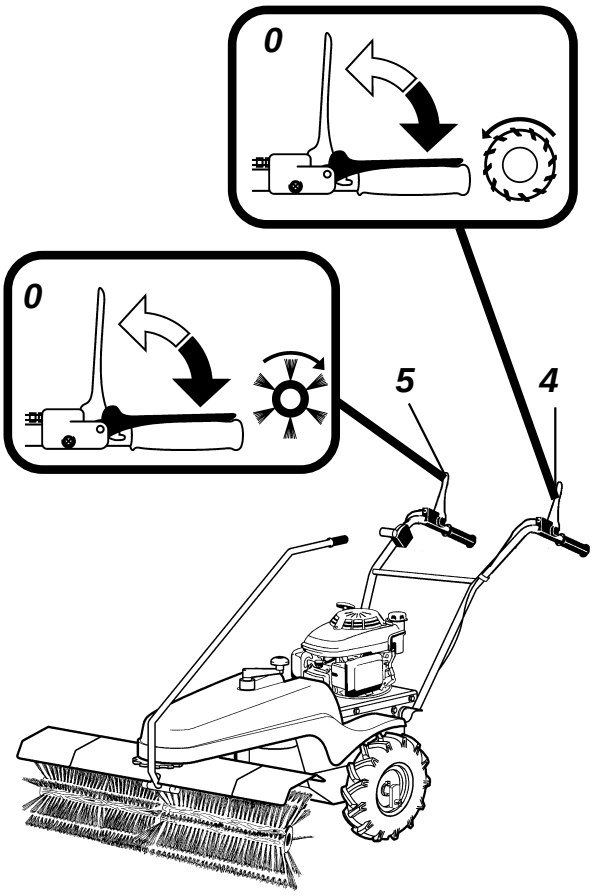
- ***Stop position:** Release the clutch levers (A/4 or A/5) to disengage either drive.*

⚠ ***Do not tie down the safety circuit lever.***

ⓘ *The safety circuit lever also serves **as engine safety circuit** in an emergency. Upon release, the lever will automatically go to STOP position.*

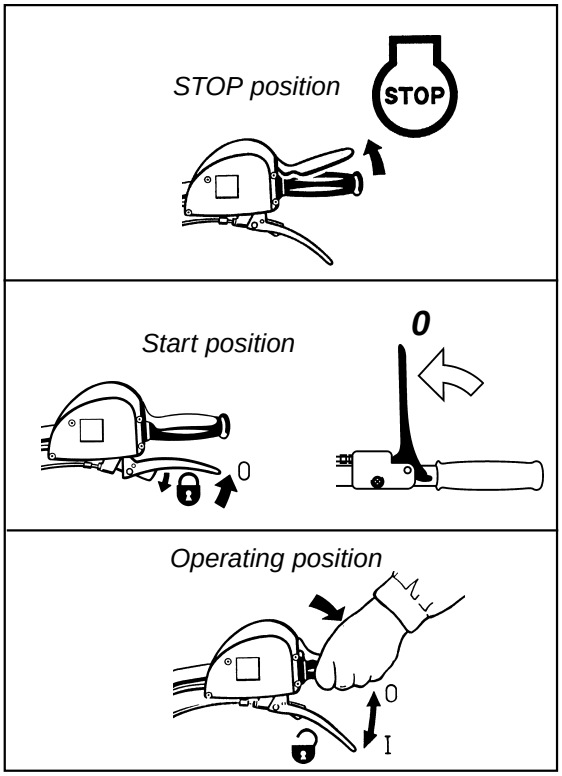
3

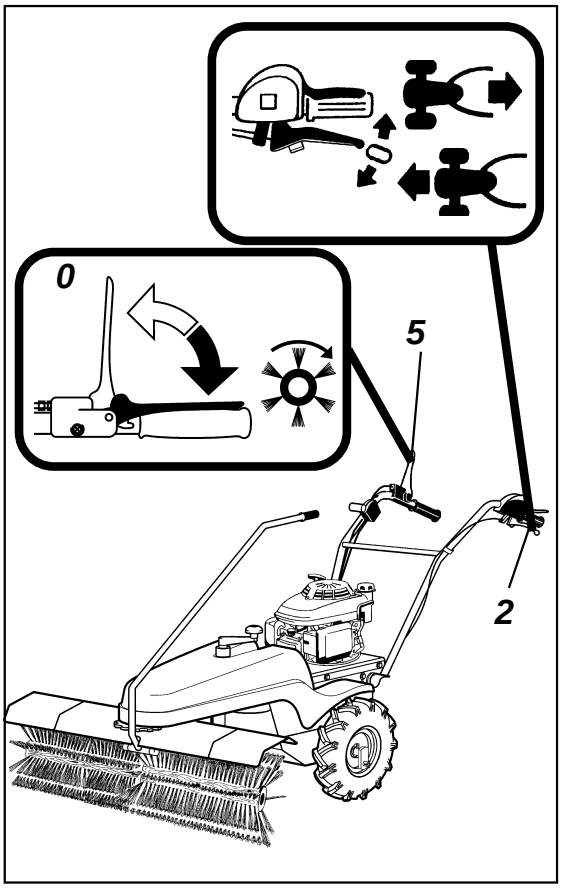
3.3 Clutch



Wheel drive and brush drive engagement is via a V-belt clutch. To engage the clutch, depress the wheel drive clutch lever (A/4) and the brush drive clutch lever (A/5). Upon release, the clutch levers will automatically move to position “0” (drives are disengaged).

Each clutch is operated individually and independently.





3.2 Safety circuit

*The **Cleanstar comfort** sweeper is equipped with a safety circuit lever.*

- ***Stop position:** Upon release of the lever – with wheel drive and brush drive engaged – the ignition system is switched off (engine is shut off).*

Caution – engine keeps running due to centrifugal mass.

- ***Start position:** Pull the clutch lever (B/2) to start the machine and to interrupt work. Lock the lever with pawl (B/1) and move the brush drive lever (B/5) to position "0".*

- ***Operating position:** Press the safety circuit lever (B/3) down to start operation.*

⚠ ***Do not tie down the safety circuit lever.***

ⓘ *The safety circuit lever also serves **as engine safety circuit** in an emergency. Upon release, the lever will automatically go to STOP position.*

3.3 Clutch

Wheel drive and brush drive engagement is via a V-belt clutch. To engage the clutch, depress the wheel drive clutch lever (B/2) and the brush drive clutch lever (B/5).

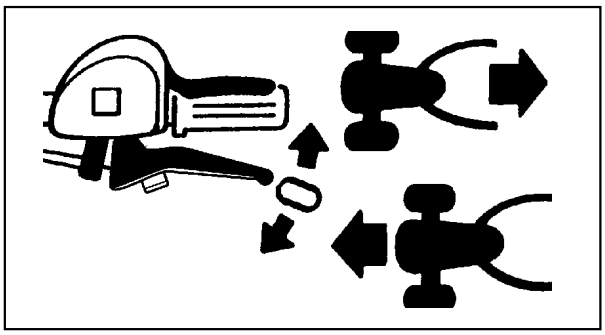
Each clutch is operated individually and independently.

The wheel drive clutch is combined with reverse speed engagement.

Wheel Drive

*The **Cleanstar comfort** sweeper has one forward and one reverse speed.*

The forward/reverse speed is engaged/ disengaged via clutch lever (B/2).



- *Forward speed is engaged when the clutch lever is (B/2) released and the pawl is not locked.*
- *No gear is engaged when the clutch lever is pulled half way (B/2, pawl is locked).*
- *Reverse speed is engaged when the the clutch lever (B/2) is pulled all the way.*

It is possible to lock the clutch lever in position "0" with pawl (B/1).

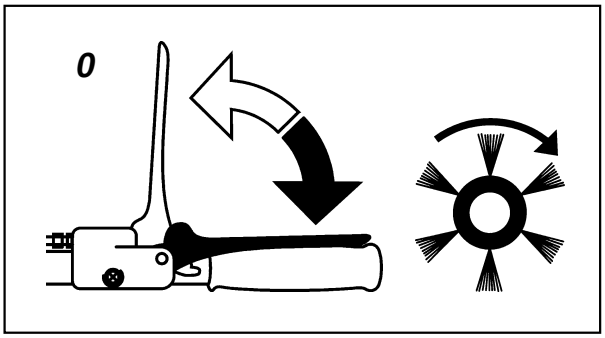
⚠ ***During slope operation always turn machine towards the slope.***

The levers are factory-set to a play of 1–2 mm to prevent the clutch from slipping during work.

Check the clutch play after the first operating hour and readjust the play if necessary (see maintenance instructions).

Brush drive

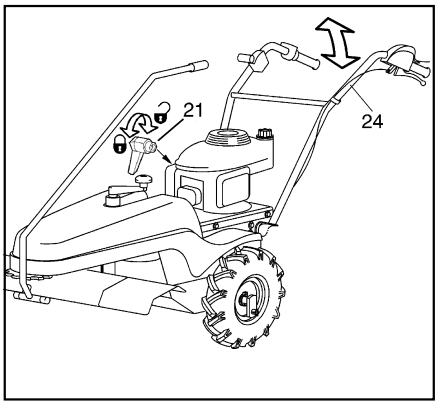
The brushes are driven by a V-belt clutch and a bevel gear.



Operate lever (B/5) to turn the brushes on/off:

- *Depress the lever to turn them on. The engine starts driving the brushes.*
- *Push the lever (B/5) up to turn them off.*

ⓘ ***Note:** Park the sweeper only when all drives are disengaged (see "Storage", page 41) to avoid clutch problems.*



3.4 Handlebars

Handlebars Height Adjustment

● *Unscrew the clamping lever (21) until the notches are exposed*

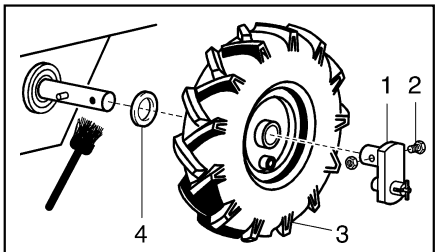
● *Adjust the handlebars (24) to the desired height and notch them into the proper position.*

● *Re-tighten clamping lever (21).*

3.5 Drive Wheels

The drive wheels (3) are attached with dogs (1) and screws (2) to the shaft. This allows attachment and removal.

Washers or spacer tubes (4) are fitted between the gearbox and drive wheels.



1 Wheel dog
2 Screw with nut
3 Drive wheel
4 Washer or Spacer tube

3.6 Snow Chains

The mounting of snow chains is to be undertaken when the driving wheels have been removed.

The lock and the tightening chains must be on the inner side of the wheels, otherwise there may be possible damage to the wheel dog (1).

3.7 Wheel Dogs

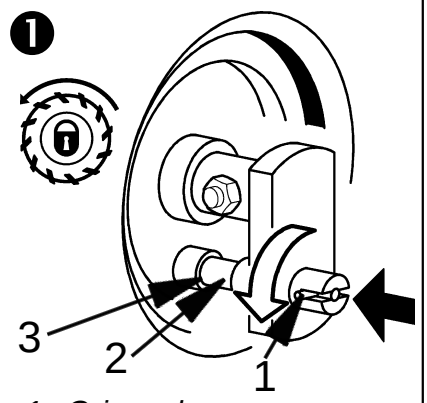
Wheel dogs are fitted to engage/disengage the wheels independently of the gearbox.

Pushing the Machine

Disengage the dogs to push the machine when the engine is shut off.

Turning Aid

Engange the dog on one wheel for easier turning.

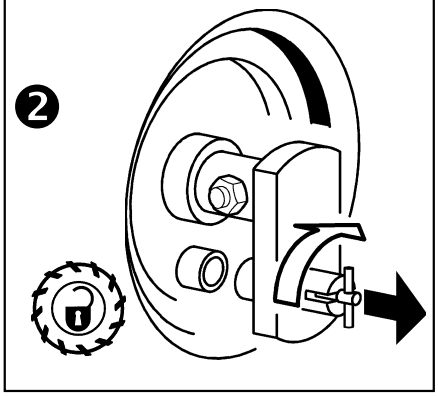


1 Grip end
2 Dog pin
3 Hole on drive wheel

❶ *Engaging the Wheel Dogs*

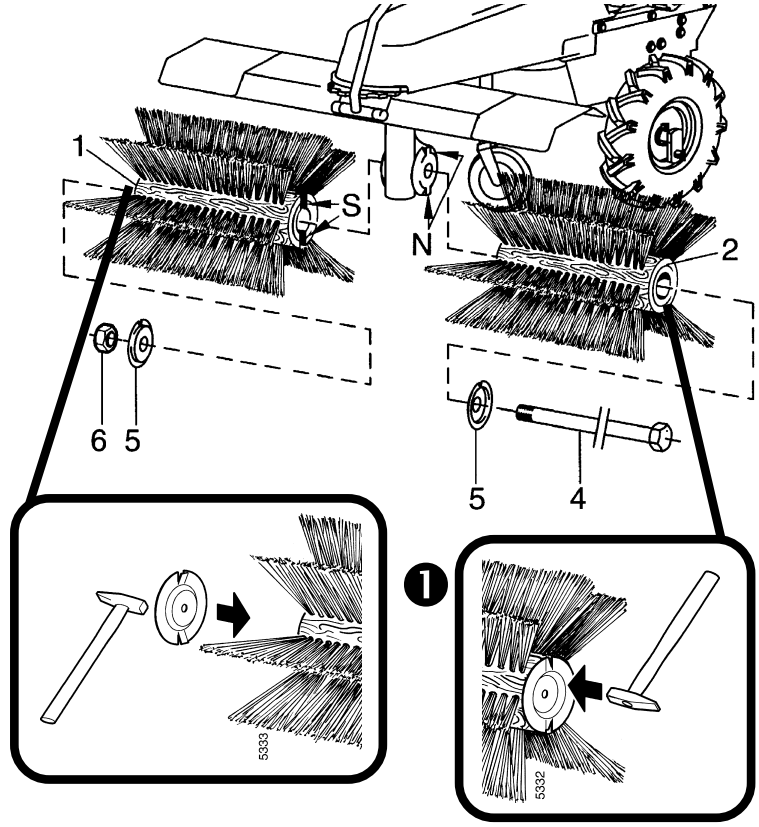
● *Align the dog pins (2) with the appropriate holes (3) on the drive wheels.*

● *Turn the pins on their ends (1) by 90 degrees until the ends mesh into the slot. Turn each dog to either side until the pin locks completely into the hole.*



❷ ***Disengaging the Wheel Dogs***

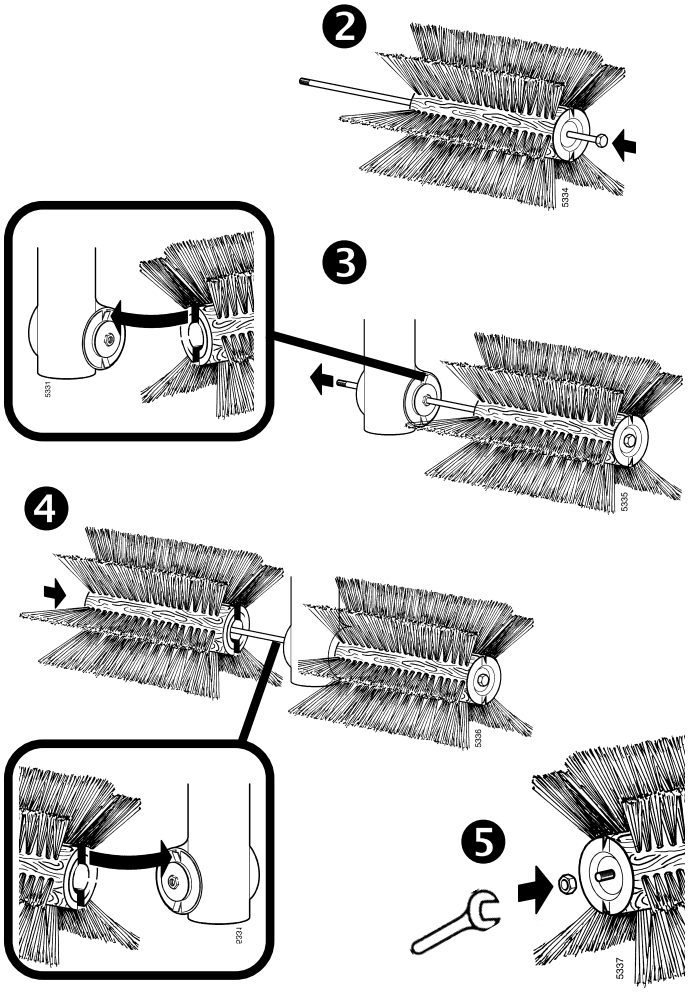
● *Grab the end (1) of each dog pin to pull it out and rotate it by 90 degrees.*



1 Right rotary brush
2 Left rotary brush
3 Nut cap
4 Tensioning anchorage
5 Disc
6 Nut

3.8 Attaching the Rotary Brushes

Wear safety gloves to attach/remove the brushes. Danger of crushing.



❶ *Mount the discs onto both sides of the rotary brushes.*

❷ *Push the tensioning anchorage through the left rotary brush.*

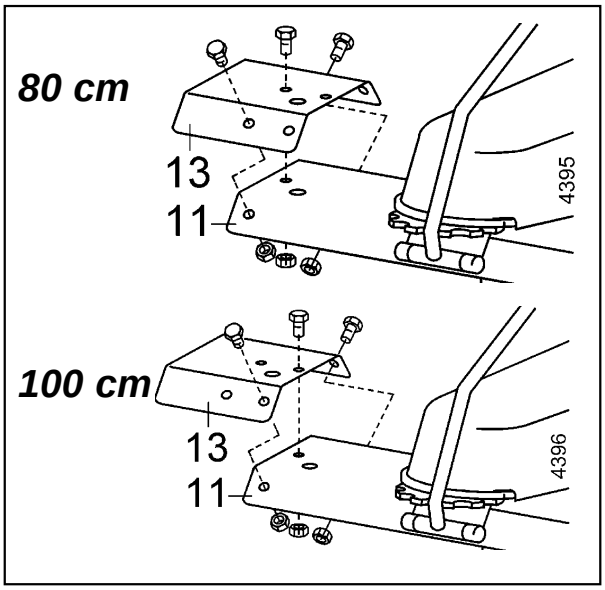
❸ *Push the tensioning anchorage with the rotary brush through the drive shaft from the left - insert groove on rotary brushes into cam of the drive plate.*

❹ *slide right rotary brush onto tensioning anchorage*

- insert groove on rotary brushes into cam of the drive plate.

❺ *Screw on and tighten hexagonal nut.*

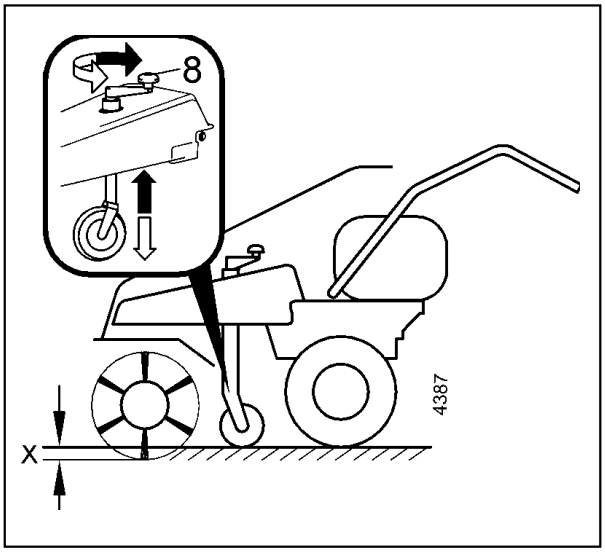
*To **remove** the brushes, reverse the above order.*



Mounting Extension Guards:

Attach the extension guards (13) to the main guard (11) to match brush width. Use three hex head bolts and lock nuts for each guard.

3.9 Sweeping Height Adjustment

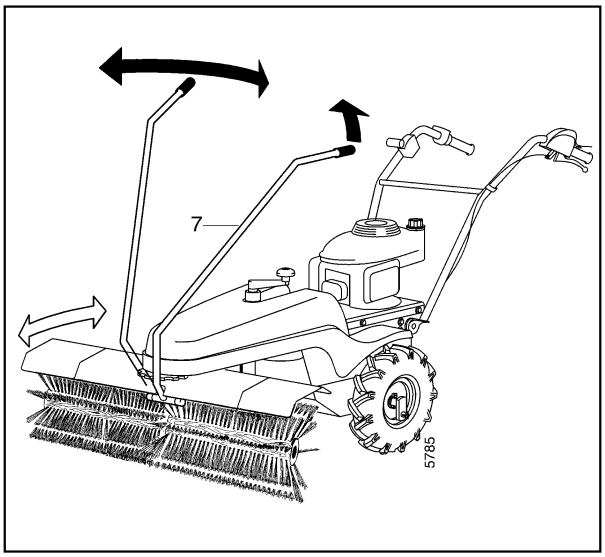


The sweeping height is altered by adjusting the castor wheel.

- *Turn the crank (8) to adjust the wheel height.*
- *Reduce the sweeping height only if absolutely necessary (to the height of X) to ensure clean sweeping and long service life of the brushes.*

Dirt, powder snow ..... x = 2–3mm

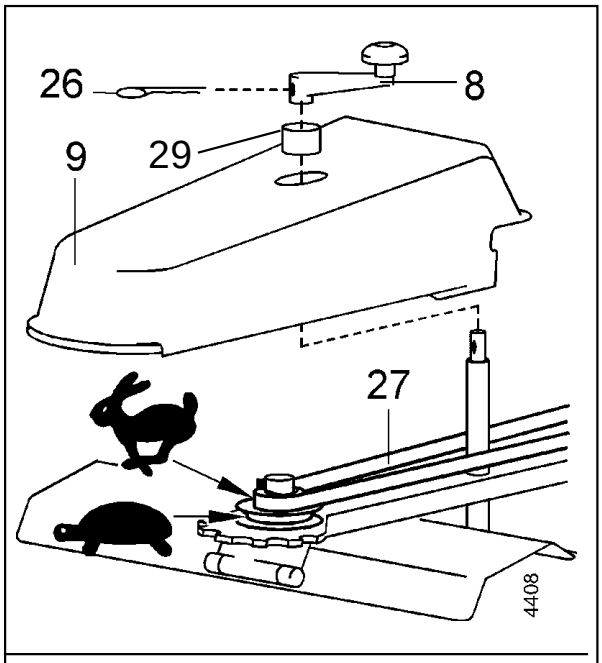
Wet snow ..... x = max 8 mm

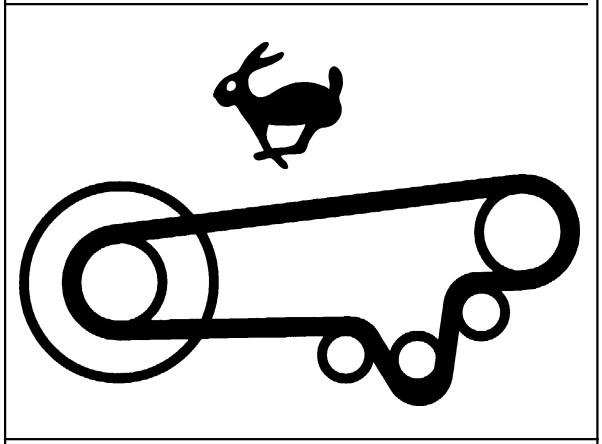


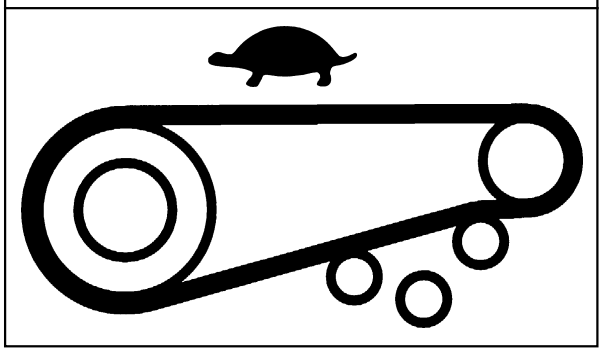
3.10 Side Adjustment

The brush can be angled to the right or left to sweep the rubbish or snow to one side.

- *Fold the rod (7) forward until the notches are exposed.*
- *Pivot the rod to turn the brushes to the left or right.*
- *Fold the rod to the rear and down again and mesh it into the proper notch.*







3.11 Sweeping Speed

The speed of the rotary brushes is adjusted by changing the V-belt. Remove the protective hood (9) to do this.

Adjustment

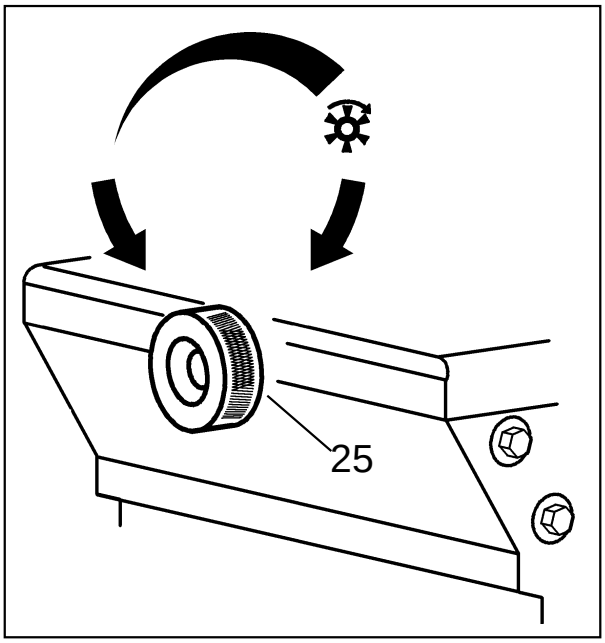
Select a slow speed for dust sweeping = .

Select a fast speed for snow sweeping = .

⚠ ***Always shut off the engine and remove the spark plug connector to change the V-belt.***

- *Remove the R-clip (26).*
- *Remove the crank (8).*
- *Remove the protective hood (9) and spacer (29).*
- *Change the V-belt (27) to the right pulley and re-route it around the idler pulleys, see illustration.*
- *Reverse the above order to attach the protective hood, spacer, crank and R-clip.*

⚠ ***Do not operate the engine without the protective hood mounted.***



3.11 Sweeping Speed

The speed of the rotary brushes is steplessly adjusted via a variator.

Always engage the brush drive before you adjust sweeping speed.

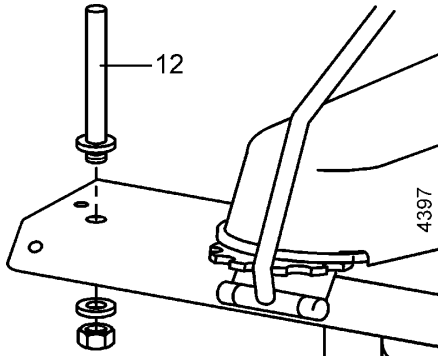
Adjustment

Select a slow speed for dust sweeping: Turn the dial (25) in counter-clockwise direction.

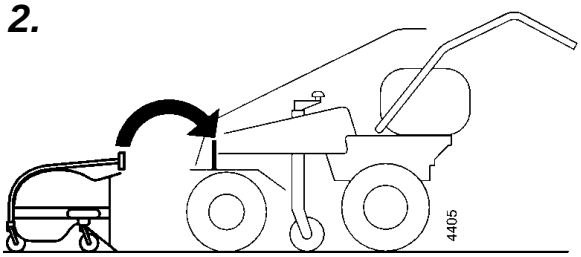
Select a fast speed for snow sweeping: Turn the dial (25) in clockwise direction.

To adjust the speed from slow to fast, give the dial a maximum turn of 6 full turns.

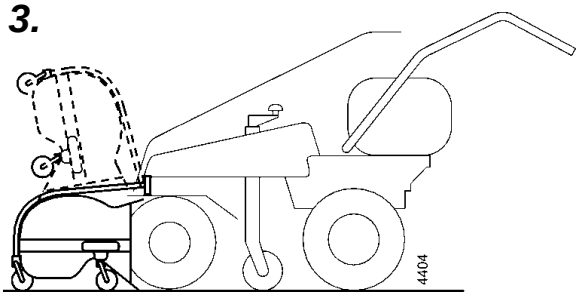
1.



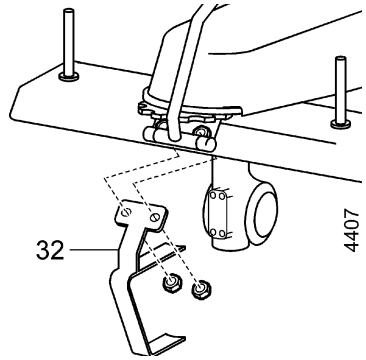
2.



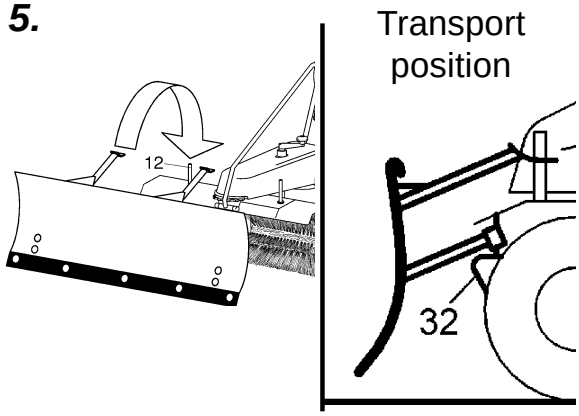
3.



4.



5.



3.12 Implements

1. Coupling Pin

Fit the coupling pins (12) to attach the collector or the snow dozer.

●Attach the pins (12) together with washers and hex nuts to both sides of the main guard

2. Attaching the Collector

●Attach the collector by sliding its tubes onto the coupling pins from the top front.

3. Emptying the Collector

●Take the machine to the dump area and fold the box upwards by pulling on its handle to the rear or on its frame from the front – the swept up material will now drop from the collector.

Alternatively:

●Remove the collector upwards from its coupling pins and carry it to the dump area for emptying.

4. Snow Dozer Assembly

●When attaching the snow dozer for the first time fit the stop (32) to the lower front of the main guard using the rod attachment bolts. The stop does not need to be removed for sweeping.

5. Attaching the Snow Dozer

●Attach the snow dozer blade by sliding its tubes onto the coupling pins from the top front (12).

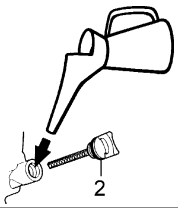
●Operate the rod to pivot the blade like the rotary brushes.

●To move the blade into transport position, lift it and rest it on the tang on the stop (32).

4.1 Commissioning the Machine

Please note that durability and operational safety of the engine depend to a large extent on its breaking-in. Always allow a cold engine to warm up for some minutes and never run it at full throttle at the beginning. Make sure the air filter is serviced regularly and to use clean fuel.

Please note: for the first 20 hours of operation (break-in period) do not use the engine at full power.

> ***Note:*** *For reasons of transport, the engine is not filled with engine oil!*
>
> *Before you operate the engine the first time, fill in engine oil!*
>
> 
>

For this purpose, park the machine in such a way that the engine is in a horizontal position. For oil filling quantity and quality refer to "Specifications".

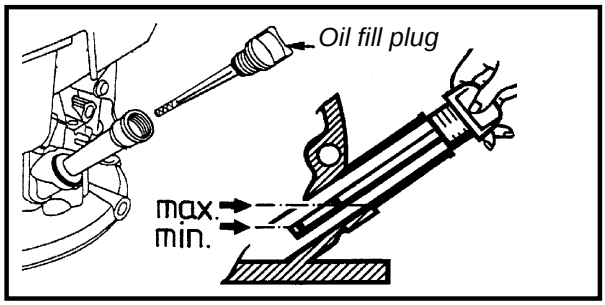
Check the oil level after filling.

Each time you take up operation

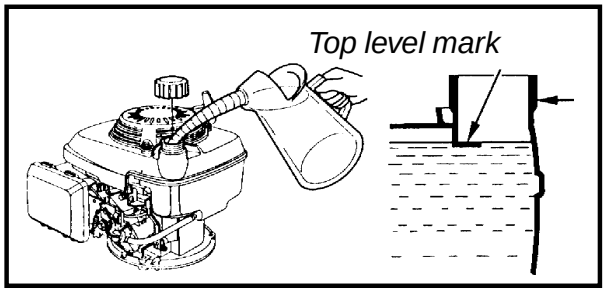
Check the engine oil level:

- *Remove the oil fill plug (C/4).*
- *Clean the oil dip-stick with a clean rag, insert it again but do not screw it in.*
- *Remove the dip-stick and read the oil level. If necessary, fill engine oil up to the level mark "max".*

Ensure the oil fill plug is tightly screwed into the filler neck during engine operation.



- *Check whether sufficient fuel is filled into the tank.*

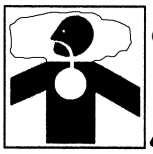


Do not fill the fuel tank to the point of spillage. Instead, top up fuel to the top level mark to allow the fuel to expand.

Be careful when dealing with fuel.

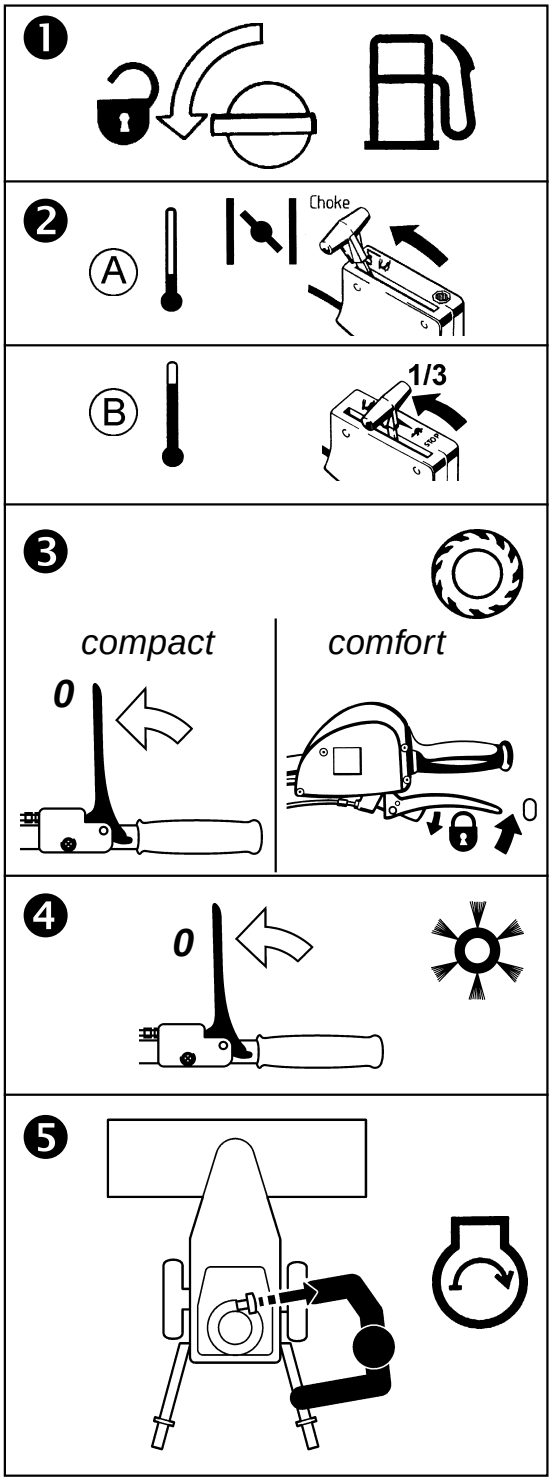
- *Fuel is easily inflammable and explosive in certain conditions!*
- *Never refill close to open fire, inflammable sparks or hot engine parts.*
- *Do not refill in closed rooms.*
- *Before each fuel fill, shut off the engine and wait until it has cooled off.*
- *Do not smoke during filling and keep away from open fire and sparks.*
- *Do not spill any fuel, use a proper filling device. If fuel is spilled on the ground, ensure the area is absolutely dry and the vapours have evaporated before you start the engine.*

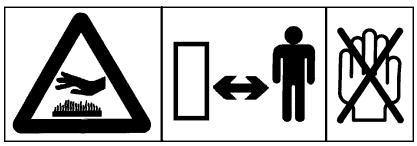
4.2 Starting the Engine *(with the engine in horizontal position)*



- *Check whether all guards are in proper position.*

Do not start the engine in closed rooms. Exhaust fumes contain carbon monoxide which acts toxic when inhaled.





❶ *Open the fuel tap (C/11).*

❷

Ⓐ *Cold engine:*
Set the speed control lever (A/6 or B/6) to "START" ("CHOKE") position.

Ⓑ *When the engine is warm or in hot weather:*
Move the speed control lever to 1/3 position.

❸

Compact Version:

- *Leave the wheel drive engagement lever (A/4) in position "0" (start position).*

Comfort Version:

- *Pull the clutch lever (B/2) and lock it with pawl (B/1) (start position).*

❹ *Leave the brush drive engagement lever (A/5 or B/5) in position "0" (start position).*

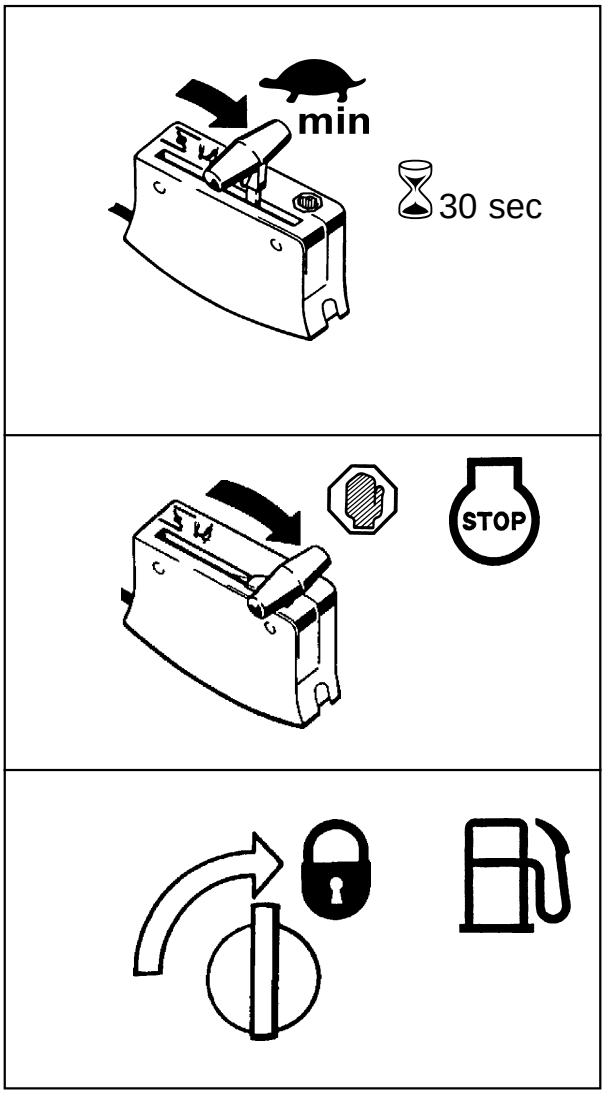
❺ *Pull the starting-rope on handle (C/2) until you feel the starter clutch engage. Then* ***pull hard and fast*** *to start the engine. After the start, let the rope glide back. Do not let it snap.*

Warning: *To start the engine, step behind the handlebars and pull the starter rope towards the rear. Keep off the danger zone.*

Caution with hot engine parts!

The exhaust and other engine parts become very hot, if the engine runs and immediately after turning off. Hold for sufficient distance from hot surfaces and keep children away from the running engine.

4



4.3 Shutting off the Engine

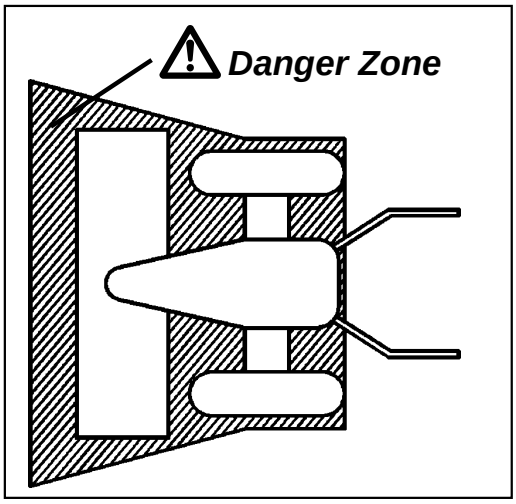
❶ *Set the speed control lever to idling position and let the engine run with idling speed for approximately 1/2 minute.*

❷ *Move the speed control lever completely to the STOP position.*

⚠ *For shutting off the engine, do **not** set the control lever to the CHOKE position – risk of fire!*

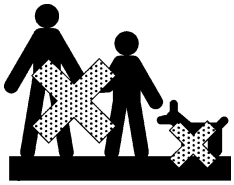
❸ *Close the fuel tap.*

ⓘ *The speed control lever also serves as **engine shut-off lever**. When necessary, move the speed control lever to STOP to stop the engine.*

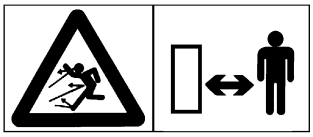


4.4 Danger zone

Keep out of the sweeper's danger zone during starts and operation.



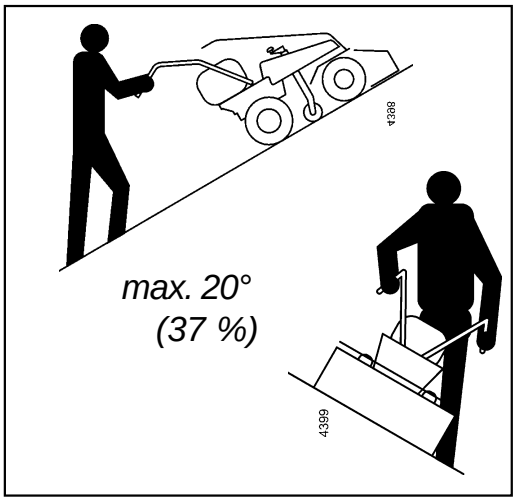
Check the immediate surroundings for foreign objects and for children and animals in particular!



Careful! Dirt and stones may get airborne during sweeping.

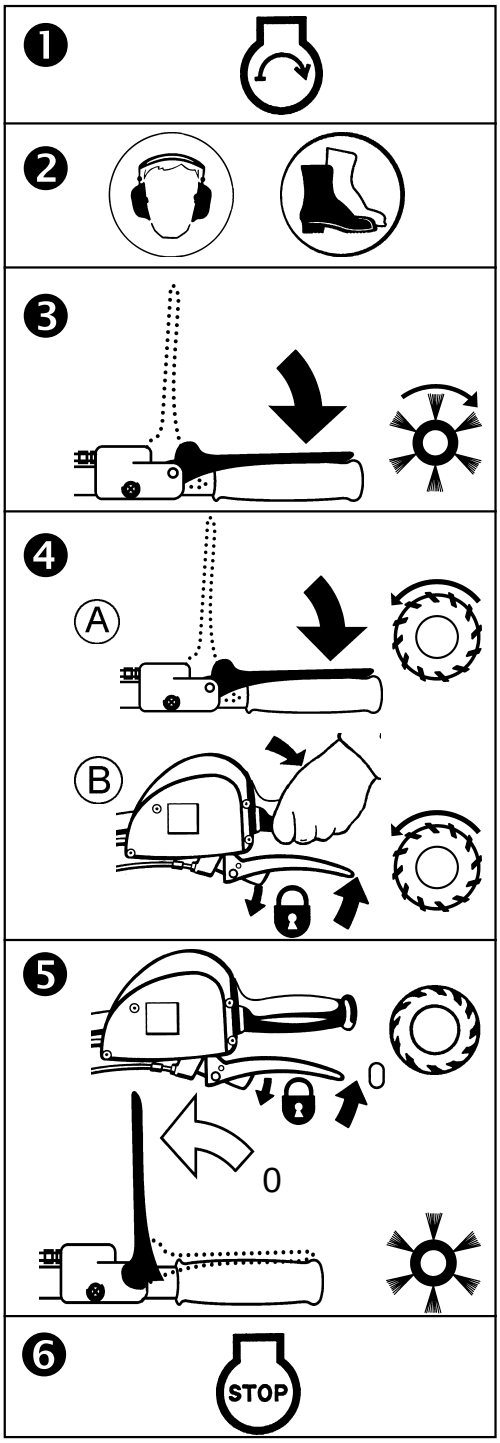
People and animals must keep out of this area.

Watch out for vehicles, window panses and other objets to avoid damage.



Only work on slopes of up to a max. of 20°.

For operation on banks, always turn machine towards the slope!



4.5 Sweeping

❶ *Start the engine as described in "Starting the engine"*

⚠ ***Check safety circuit function - Only operate the machine if safety circuit works!***

❷ *Wear individual protective ear plugs and solid shoes.*

❸ *Slowly pull the brush drive engagement lever (A/5 or B/5) and pull the throttle at the same time to start the brushes.*

Ⓐ ***Compact version:***

❹ *Slowly depress the clutch lever (A/4); the sweeper travels forward.*

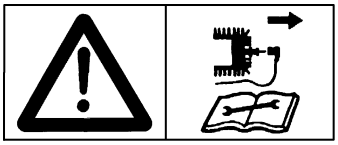
Ⓑ ***Comfort version:***

❹ *Pull softly on the clutch lever that engages the wheel drive (B/2), unlock the pawl (B/1), release it slowly: the sweeper moves off in forward direction.*

After sweeping or in case of clogging:

❺ *Disengage both drives*

❻ *Shut off the engine*



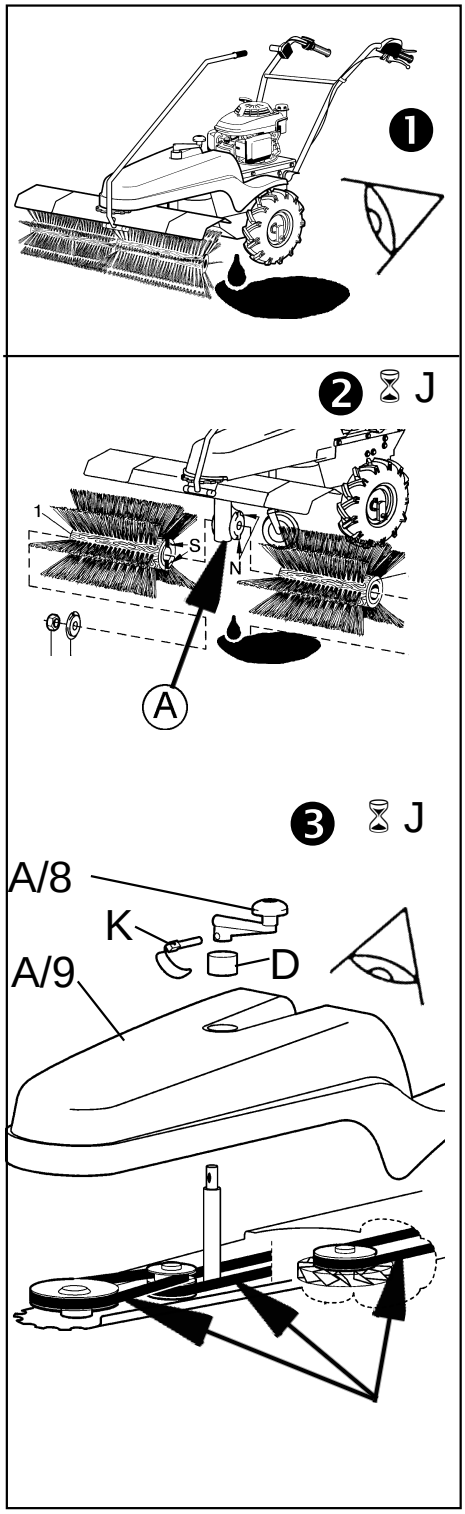
⚠ ***Shut off the engine and disconnect the spark plug connector, if cleaning is necessary during operation.***

4.6 Snow Clearance

⚠ ***Attach the snow dozer blade properly. Wear slip-proof footwear. Working speed must suit conditions to prevent the operator is injured if the machine hits an obstacle.***

Apart from adhering to operating instructions for the sweeper, it is also important to observe the following maintenance instructions.

Warning: Only do maintenance work with the engine shut off. To prevent accidental start while working on the rotary brushes or on the engine, always remove the spark plug connector from the spark plug.



5.1 Drive

❶ Worm Gear of Wheel Drive

The worm gear is permanently lubricated. Lubricating and servicing is not necessary.

❷ Worm Gear of Brush Drive

Ⓐ *The worm gear is permanently lubricated to work for approximately 250 operating hours.*

Oil change is not necessary if there are no leakages.

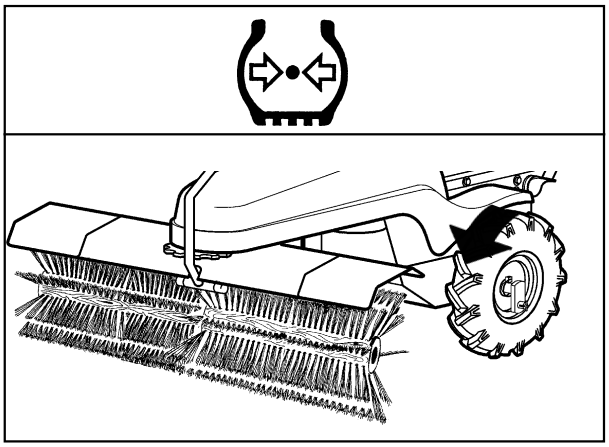
Suitable oil is SAE 90 transmission oil, approx. 0.3 l

❸ V-Belts

Inspect the condition of the V-belts at least once per year.

- *Remove the protective hood. For details see "Sweeping Speed".*
- *Replace the V-belts when they are worn.* ***Only use original agria V-belts!***

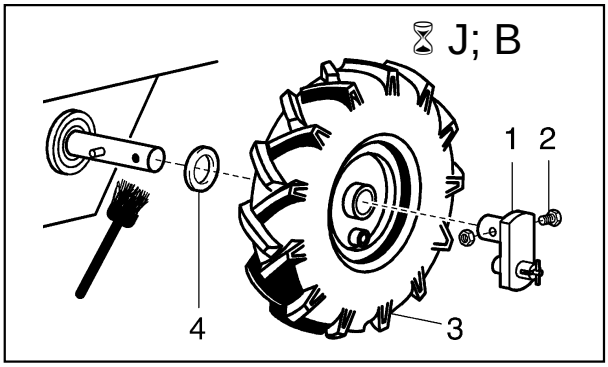
5



Drive-wheels

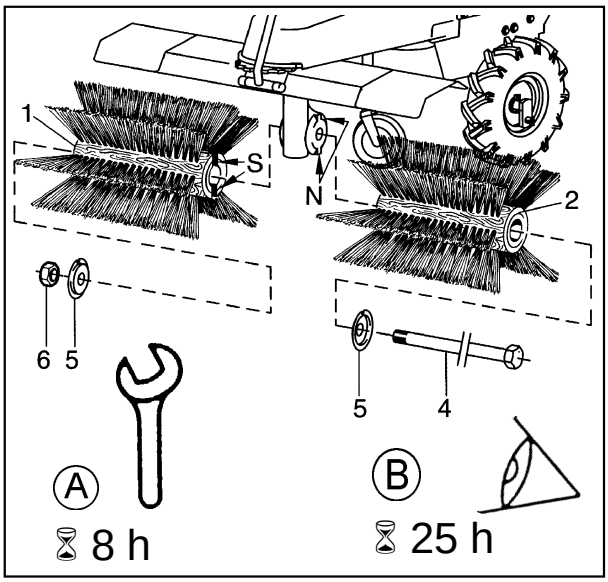
● *Check the tyre pressure periodically. In particular, ensure that both tyres have equal pressures to give smooth riding.*

● *Attach the wheels with the pointed part of tread lugs showing in travel direction (seen from above) to obtain full traction.*



Wheel Shaft

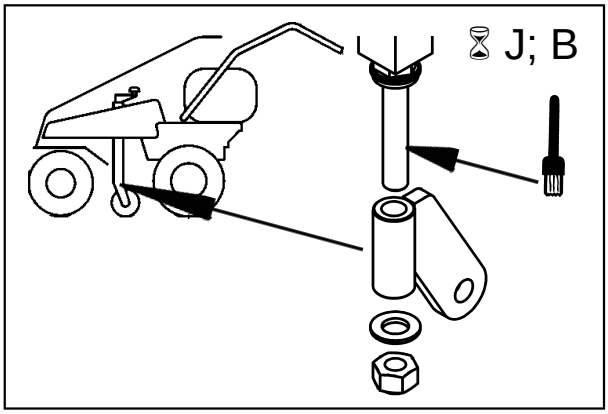
Apply bio-lubricating grease to the wheel shaft around the hub each time the machine was cleaned with a pressure washer or at least once per year.



5.2 Sweeper

Ⓐ *Check the tensioning anchorage for tight fit **before each operation** and at intervals of **8** operating hours.*

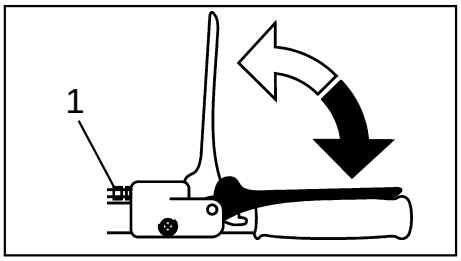
Ⓑ *Check the rotary brushes for wear at least after every **25** hours and replace them in good time. Minimum diameter is 250 mm.*



5.3 Adjusting Spindle

*Apply bio-lubricating grease to the adjusting spindle in the area of the swinging hub each time the machine was cleaned with a pressure washer or at least **once per year**.*

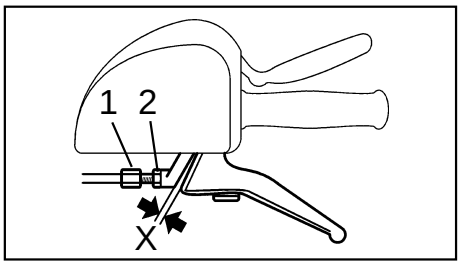
5.4 Checking and Adjusting Clutch Play



Wheel and Brush Drive, Compact Version

- *The clutches must be disengaged i.e. wheel and brush drive must come to a stop when the levers (A/4 or A/5) are released and in top position.*
- *When the lever is pushed down, the drive must be engaged and the V-belts must not slip. If necessary, adjust the cable on the cable setting screw (1).*

Wheel Drive, Comfort Version



For smooth V-belt clutch operation ensure the play X on clutch lever (B/2) is set to 1–2mm. Check the clutch play while the drive is engaged.

Also ensure that the clutch is disengaged i.e. the wheel drive must come to a stop when the lever is in position "0" (pawl is locked).

If the clutch play needs further adjustment, set it on the cable-setting screw.

- *Undo locking nut (2)*
- *Adjust the setting screw (1) in such a way that the play on the lever is X = 1–2 mm.*
- *Retighten the locking nut (2)*

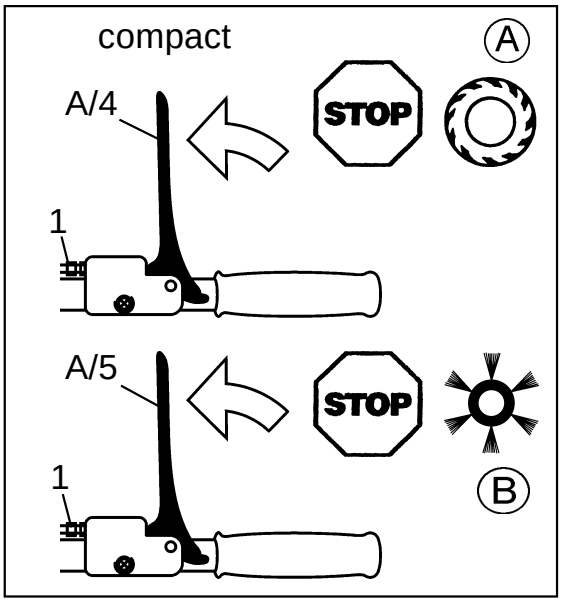
Brush Drive, Comfort Version

For checking and adjusting refer to "Brush Drive, Compact Version".

5

5.5 Safety circuit

Check the safety circuit function each time you take up operation and each time you maintain or service the machine.



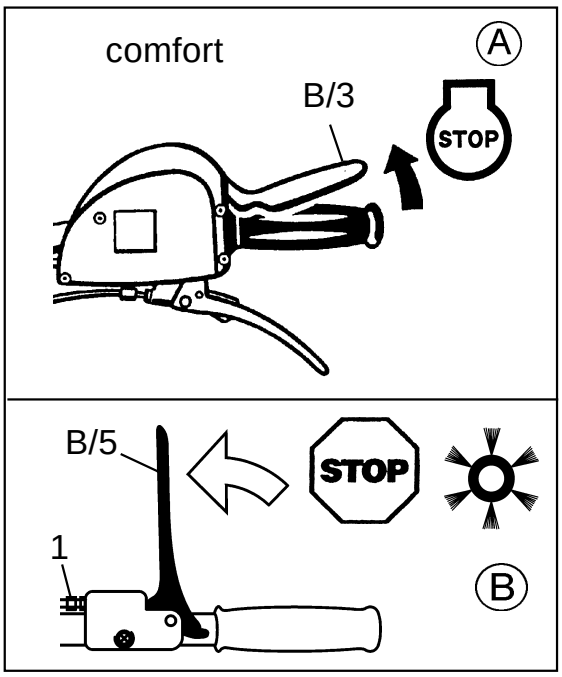
Compact Version:

Ⓐ ***Wheel Drive***

- *Upon release of the handle (A/4) the wheel drive must come to a stop.*
- *If necessary, adjust the levers by setting the cable-setting screw (1).*

Ⓑ ***Brush Drive***

- *Upon release of the handle (A/5) the brush drive must come to a stop.*
- *If necessary, adjust the levers by setting the cable-setting screw (1).*



Comfort Version:

Ⓐ ***Drive***

- *Upon release of the handle (B/3) and with clutch engaged the engine must come to a stop.*
- *Check the electric lines and connections for good condition, replace, if necessary.*

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Ⓑ ***Brush Drive***

- *Upon release of the handle (B/5) the brush drive must come to a stop.*
- *If necessary, adjust the levers by setting the cable-setting screw (1).*

5

Please observe that only those activities are described here which are required for operating the sweeper.

All other information on the engine may be taken from the enclosed engine operating instructions!

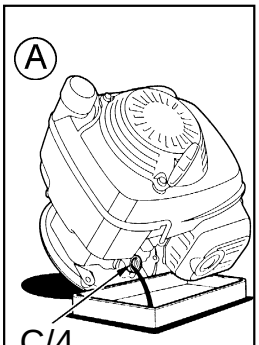
5.6 Checking the Engine Oil Level

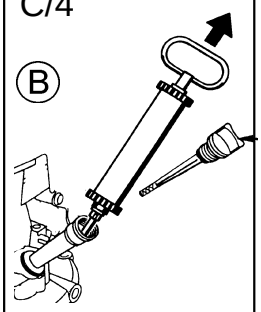
Before each operation and after 5 operating hours!

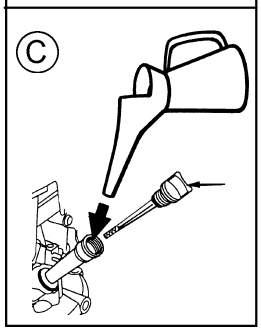
- *Only with the engine shut off and in horizontal position.*

see engine operating instructions

5.7 Changing the Engine Oil







For the first time after 5 operating hours, *after that after* ***every 50*** *operating hours or* ***annually*** *(whatever comes first). Under high loads or at high temperatures, change the oil already after 25 operating hours.*

- *Drain and filler plug (C/4).*
- *To drain the oil, pivot the handlebars upwards. Tilt the machine backwards and to the left. Then drain the oil into a suitable container (A).*

We recommend to drain the fuel through the filler neck into a fuel can before draining the oil.

Alternatively,

use a suction pump to pump the oil from the machine (B).

- *Dispose of the waste oil properly!*
- *Fill in fresh engine oil. For oil filling capacity and quality see specifications.*

Fill in the oil using a funnel or similar device if possible (C).

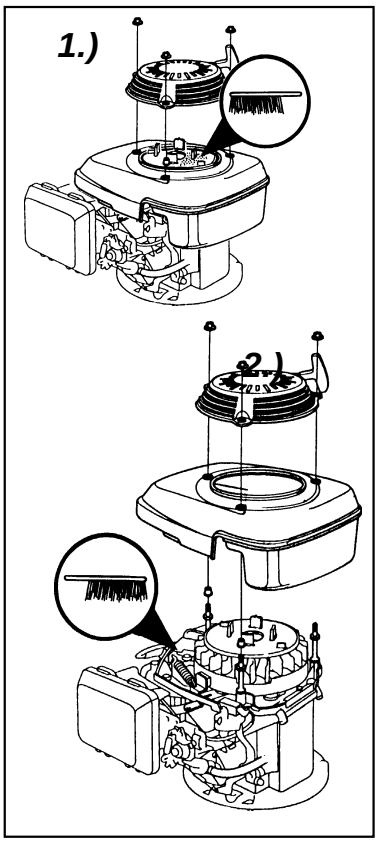
Only change oil while the engine is still warm, but not hot – ***danger of burns!***

5

5.8 Cooling fan grille

After prolonged operation, the cooling system may become clogged by dirt etc. To avoid any overheating and damage to the engine, regularly clean the cooling fan grille (C/3).

Check before each operation!



5.9 Air cooling system

*1) Clean the rotating strainer at **50**-hour intervals as a minimum (earlier in very dusty and trashy conditions). To do this, remove the recoil starter. See the illustration below.*

*2) Clean the internal cooling fins and surfaces at **100**-hour intervals as a minimum (earlier in very dusty and trashy conditions).*

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5.10 Governor

For smooth engine performance keep governor linkages, springs and actuating devices clean and free from dust and dirt. Do not bend or twist parts. (Governor linkages on carburetor C/6).

5.11 Exhaust system

Regularly clean the area around the exhaust (C/9) from grass, dirt, and inflammable deposits.

– Risk of fire!

Check before each operation.

Caution with hot engine parts!
The exhaust and other engine parts become very hot, if the engine runs and immediately after turning off. Hold for sufficient distance from hot surfaces and keep children away from the running engine.

5.12 Speed Control

Devices for actuating engine speed must be adjusted correctly to start, operate and shut off the engine at correct speed rates.

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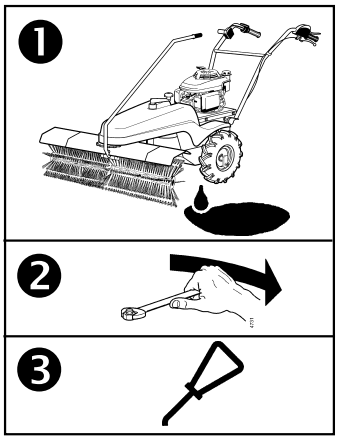
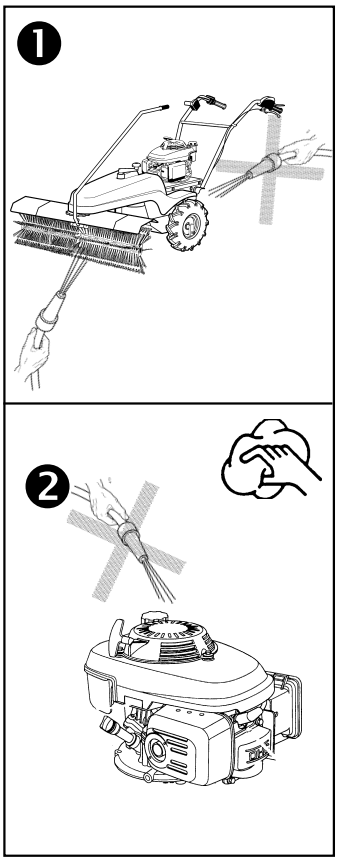


5.13 General

❶ *Watch out for fuel and oil leakage and repair, if necessary.*

❷ *Regularly check bolts and nuts for tight fit and retighten, if necessary.*

❸ *Slightly grease all gliding and moving parts (e.g. rod that pivots the implement, etc.) with Bio-lubricating grease and Bio-slushing oil.*



5.14 Cleaning

❶ *On no account spray water into the fan slots in the drive housing!*

After each cleaning (washing with water, especially with pressure washer) lubricate all lubrication points, oil and let the sweeper run for a short time to press water out.

❷ ***Clean the engine only with a cloth.*** *Avoid spraying with air-compressed water jets, as water might leak into ignition and fuel system, causing malfunctions.*

5

5.15 Storage

For longer periods of no operation

a) Clean thoroughly

Repair paint coat

b) Engine preservation

- *Drain fuel completely or fill fuel tank and add fuel stabilizer (agria no. 799 09).*

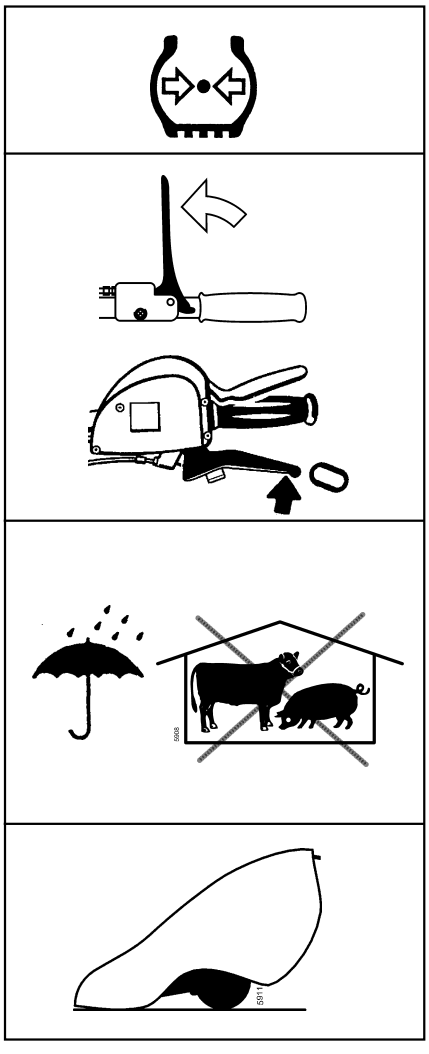
- Observe enclosed instructions. *Let engine run for approx. 1 minute.*

- *Change the engine oil.*

- *Fill a tea-spoon (approx. 0.03l) of engine oil into the spark plug opening. Slowly crank the engine.*

- *Re-fit the spark plug and set the piston to compression via the recoil starter (pull the starter grip until resistance is felt) – valves are closed.*

- *Slowly crank the engine after every 2–3 weeks (spark-plug connector is removed). Then set the piston to compression again.*



c) Drive-wheels

Support drive-wheels in such a way that tyres have no ground contact. Pneumatic tyres are quickly destroyed, if left standing under load and uninflated.

d) Disengaging the Drives

Always park the machine with wheel drives disengaged (position "0") to avoid clutch problems.

e) Parking

To avoid severe corrosion:

- to preserve the machine from atmosperic influences

do not park the machine:

- in humid rooms

- in rooms where fertilizer is stored

- in stables or adjacent rooms.

f) Covering the machine

Protect the machine with cloth or a similar cover.

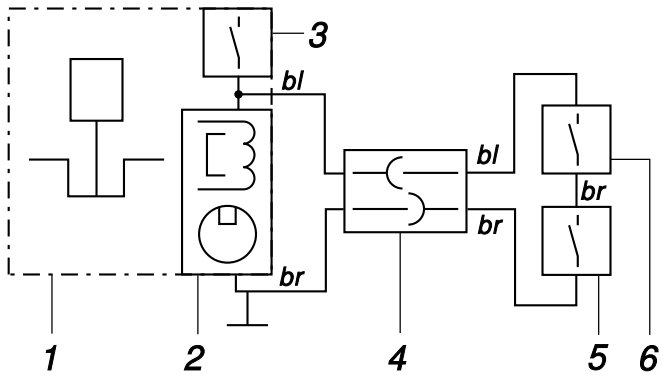
Observe safety instructions! *Have all serious malfunctions on the machine or engine repaired by your agria workshop. They have the proper tools. Improper repairs can only add to the damage.*

Problem	Possible cause	Remedy	Page
Engine does not start	- Spark plug connector not connected	Connect spark plug connector	
	- Speed control lever not in position CHOKE	Move speed control lever to position "CHOKE"	27
	- Fuel tank empty or poor fuel	Fill fresh fuel	26
	- Fuel line clogged	Clean fuel line	
	- Defective spark plug	Clean, adjust or exchange spark plug	BM
	- Engine too much fuel ("flooded engine")	Dry and clean spark plug and start at FULL THROTTLE	BM
	- Inleaked air due to loose caburetor and suction line	Tighten attachment bolts	
Misfirings in engine	- Engine running in CHOKE range	Move speed control-lever to operating position,	27
		if necessary, adjust speed control ✶	BM
	- Loose ignition cable	Fit connector tightly on ignition cable, fix ignition cable retaining device, fit connector tightly on spark plug	
	- Clogged fuel line or poor fuel	Clean fuel line, fill fresh fuel	26
	- Vent opening in fuel tank cap clogged	Exchange fuel tank cap	
	- Water or dirt in fuel system	Drain fuel and fill fresh fuel	
	- Air filter clogged	Clean air filter or exchange	BM
	- Carburetor misadjusted	Re-adjust carburetor ✶	BM
Excessive temperature in engine	- Low engine oil level	Refill oil immediately	35
	- Impaired cooling	Clean cooling fan grille,	36
		clean internal cooling fins ✶	36
	- Air filter clogged	Clean air filter	BM
	- Carburetor misadjusted	Re-adjust carburetor ✶	BM
Misfirings in engine at high speeds	- Short firing intervals	Adjust spark plug	BM
	- Incorrect idle mix	Adjust carburetor ✶	BM
Engine frequently stalls in idle	- Firing interval too long, defective spark plug	Adjust or replace spark plug	BM
	- Carburetor misadjusted	Re-adjust carburetor ✶	BM
	- Air filter clogged	Clean air filter	BM
Engine does not run smoothly	- Speed control linkages are clogged or jammed	Clean speed control linkages	36

Problem	Possible cause	Remedy	Page
Engine does not stop when set to stop	- Speed and engine stop are not properly adjusted	Readjust speed control	✶ BM
Engine output too low	- Loose cylinder head or damaged gasket	Tighten cylinder head, exchange gasket	✶
	- Poor compression	Have engine checked	✶
	- Air filter clogged	Clean the air filter	BM
Wheel drive or brush drive does not stop with disengaged clutch	- Incorrect hand clutch lever adjustment	Adjust hand clutch lever	✶ 33
Excessive vibration	- Attachment bolts loosened	Tighten attachment bolts	37
	- Loose anchorage fixture on rotary brushes	Immediately turn off engine! Check anchorage fixture and all bolts and nuts for tightness, exchange damaged parts	32

✶ = For this purpose contact your agria workshop.
BM = See engine operating instructions.

Electrical Wiring Diagram, Comfort Version



1 Engine
2 Magnet ignition system
3 Engine-off-switch
(on speed control lever next to engine)
4 Connector pair
5 Switch in safety circuit lever
6 Switch in clutch lever

agria Order No.

799 09	*Fuel stabilizer*	*pouch*	*5g*
771 83	*Oil suction pump*		

Varnishes

181 03	*Spray varnish birch-green*	*spray tin*	*400ml*
712 98	*Spray varnish red, RAL 2002*	*spray tin*	*400ml*
509 68	*Spray varnish black, RAL 9005*	*spray tin*	*400ml*

Wear Parts

761 98	*Air filter element*	
759 99	*Spark plug NGK BPR 6ES; BOSCH WR 7 DC*	
766 44	*V-belt for wheel drive*	*X10x872*
100 796	*V-belt for brush drive*	*10x1900 (compact)*
762 81	*Reverse gear flat belt*	*20x960 (comfort)*
765 43	*V-belt for brush drive*	*13x760 (comfort)*
784 03	*V-belt for brush drive*	*13x1480 (comfort)*
6194 051	*rotary brushes 80 cm coarse*	
6194 061	*rotary brushes 80 cm fine*	
6194 151	*rotary brushes 100 cm coarse*	
6194 161	*rotary brushes 100 cm fine*	

Emergency Tyre Repair:

713 13	*Tyre repair gel*	*bottle*	*1l*

Spare Parts List

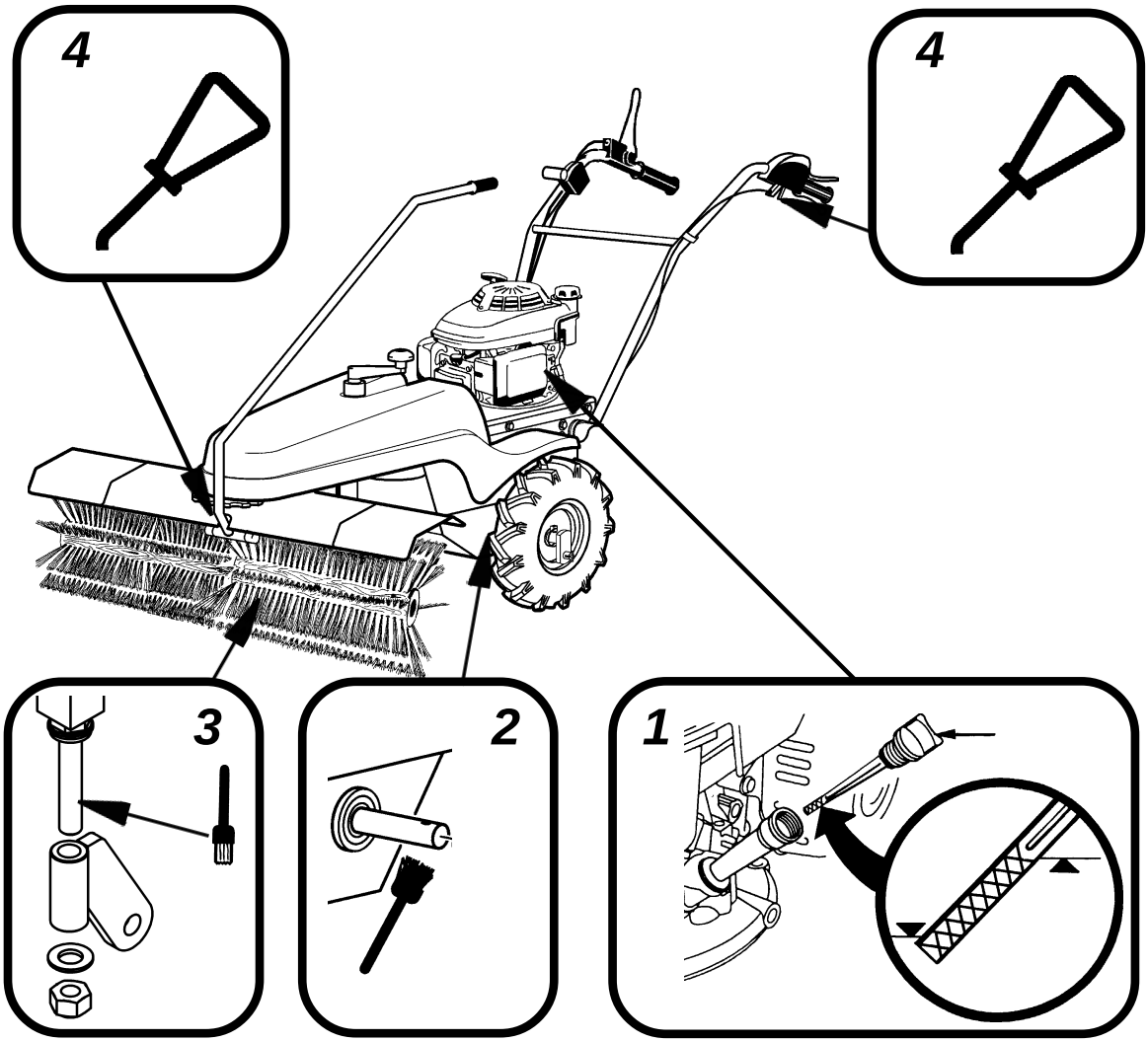
997 157	*Cleanstar sweeper type 7100*
997 145	*Honda Engines*

Inspection and Maintenance Chart

agria

			After operating hours						min. every 3 months	min. yearly		
	P	A	5	8	25	50	100	250			B	page
Check safety circuit function		K										34
Check free play of levers		K										33
Check air filter		K										BM
Clean cooling grille		K										36
Check engine oil level, refill, if necessary	1	K	K									35 BM
Clean exhaust			K									36
First engine oil change	1		W									35
subsequent oil changes	1					W						35
Clean engine, check bolts and nuts					K							37
Check wear of rotary brushes earlier if required					W							32
Clean air filter insert					W				W			BM
Replace air filter insert, earlier, if required						W						BM
Clean spark plug, adjust gap						W						BM
Replace spark plug							K					BM
Clean guide plates, cooling fins, earlier, if required							W					36
Clean fuel tank							W					BM
Clean fuel strainer							W					BM
Change oil in worm gear of brush drive								W				31
Lubricate all gliding parts	4									K	K	37
Grease wheel-shaft	2									K	K	32
Grease adjusting spindle	3									K	K	32
Replace fuel hoses										W*		BM

A = Each time before you take up operation
B = After each cleaning
K = Checks and maintenance to be executed by operator
W = Maintenance to be executed by professional workshop
P = Item no. in lubrication chart
BM = See engine operating instructions
* = After 2 years

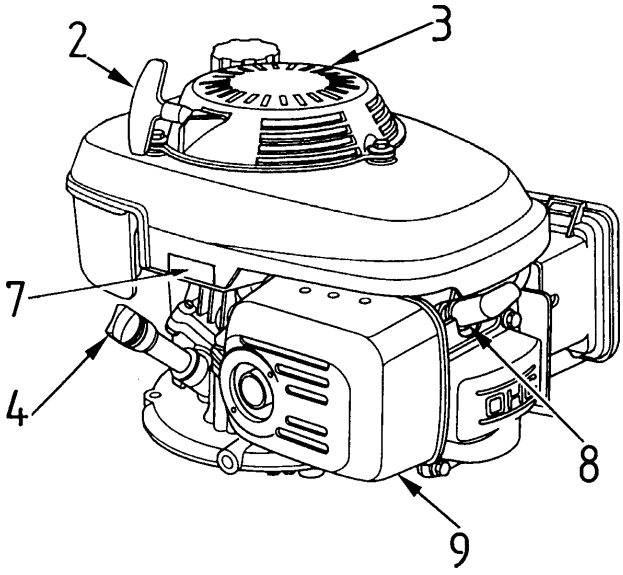


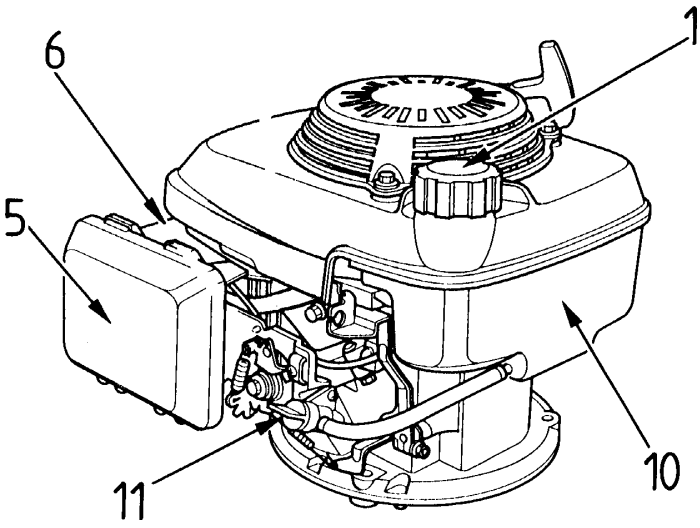
1 Engine oil	*8 h*	*(page 35)*
2 Wheel shafts	*annually*	*(page 32)*
3 Adjusting spindle	*annually*	*(page 32)*
4 Lever bearings etc.	*annually*	*(page 37)*

Fig. C

Honda GCV135 and GCV160 Engines

1 Fuel tank cap
2 Starter handle
3 Air strainer
4 Oil fill plug, dip-stick
5 Air filter
6 Carburetor / speed control governor
7 Engine type no. / identification no.
8 Spark plug / spark plug connector
9 Exhaust with guard
10 Fuel tank
11 Fuel tap





Declaration of Conformity

agria

EG-Konformitätserklärung
EC Declaration of Conformity
CE Déclaration de conformité
EG conformiteitsverklaring

(D)	(F)	(GB)	(NL)
Wir	*Nous*	*We*	*Wij*

agria-Werke GmbH
Bittelbronner Str. 42
D-74219 Möckmühl/Württ.

erklären, dass das Produkt	*déclarons que le produit*	*herewith declare that the product*	*verklaren dat het produkt*
Kehrmaschine	***Balayeuse***	***Sweeper***	***Veegmachine***

Cleanstar compact 7100 051; 7100 061
Cleanstar comfort 7100 151; 7100 161

*mit allen einschlägigen Bestimmungen der EG-Maschinenrichtlinie **2006/42/EG** in Übereinstimmung ist.*	*est conforme à toutes les exigences respectives selon la directive relative aux machines **2006/42/CE**.*	*conforms to all relevant specifications of the Directive on Machinery **2006/42/EC.***	*voldoet aan de desbetreffende bepalingen van de EG-machinerichtlijn **2006/42/EG.***
*Die Maschine ist auch in Übereinstimmung mit allen einschlägigen Bestimmungen der folgenden EG-Richtlinie: **2004/108/EG.***	*La machine est aussi conforme à toutes les exigences respectives selon la directive CE suivante: **2004/108/CE.***	*It is also conform to all relevant specifications of following EC directive: **2004/108/EC.***	*De machine voldoet ook aan de desbetreffende bepalingen van het volgende EG-richtlijn: **2004/108/EG.***

Möckmühl, den 02.02.2010

Siegfried Arndt	*Rudolf Tigges*
Geschäftsführer	*Leiter Entwicklung & Konstruktion*
Directeur	*Responsable développement et études*
Managing Director	*Head, Research and Development*
Bedrijfsleider	*Hoofd ontwikkeling en constructie*

Herr Tigges ist bevollmächtigt die technischen Unterlagen zusammenzustellen.
Monsieur Tigges est habilité à agencer la documentation technique.
Mr. Tigges is authorized to assort the technical documents.
De heer Tigges is gemachtigd om de technische documentatie op te stellen.
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