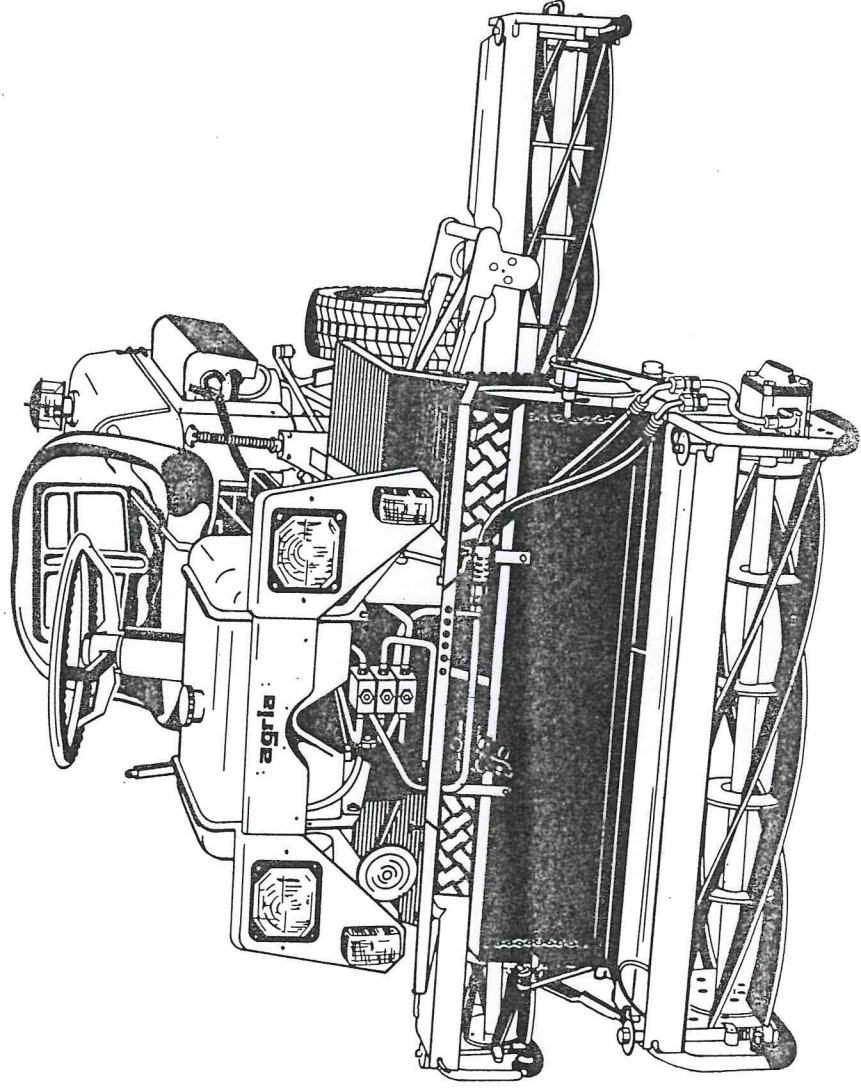


*Machines for soil cultivation, care and  
maintenance of lawns and landscapes*

**agriA**

## ***Operating instructions for AGRIA Triple Cylinder Mower Type 9300***



Operating instructions Order No. 998061

Contact your authorized AGRIA dealer for service  
and prompt delivery of spare parts.

Authorized AGRIA dealer

## Safety precautions

Before using this machine carefully read the operating instructions and note:



### Warning sign

This sign appears in these operating instructions wherever your safety is involved. Pass on all safety instructions to other users as well.

### Intended use

This triple cylinder mower is designed solely for use in customary park and amenity area operations and maintenance (intended use).

Use in any other way is considered as contrary to the intended use. The manufacturer accepts no liability for damage or injury resulting from this misuse, and these risks must be borne solely by the user.

Compliance with and strict adherence to the conditions of operation, service and repair as specified by the manufacturer also constitute essential elements for intended use.

This triple cylinder mower should be operated, serviced and repaired only by persons familiar with all its particular characteristics and acquainted with the relevant safety rules.

The accident prevention regulations, all other generally recognized regulations on safety and occupational medicine and the road traffic regulations must be observed at all times.

No responsibility will be borne by the manufacturer for damage resulting from any unauthorized modifications to the machine. Observe the safety and warning signs and decals provided on the machine to ensure safe operation and for your own protection.

### General safety and accident prevention regulations

#### Basic rules:

Always check the general operating and road safety of the triple cylinder mower before starting!

In addition to the instructions contained in this operator's manual, also observe the general safety and accident prevention regulations!

Minors under 16 years of age must not be allowed to operate this machine!

Always comply with the local traffic regulations when driving on public roads!

Before starting work, familiarize yourself with all the controls and instruments and their functions. Ensure that all guards are correctly installed. During work is too late!

The operator is responsible for the safety of all other persons in the working area!

No-one must be allowed to remain in any area in which they may be exposed to danger from the machine!

The engine must only be started from the driving seat. The engine must not be started by short-circuiting the electrical connections on the starter as the machine could then immediately start to move off!

Before moving away, always check the immediate vicinity of the machine (e. g. for children). Ensure adequate visibility!

When mowing always ensure that operating and other personnel **keep a safe distance from the rotating blades.**

Ensure that light and visibility conditions permit safe operation of the machine.

Never run the engine in a closed building!

Clothing worn by the operator must be close-fitting. Avoid wearing loose clothing. Wear sturdy footwear!

Handle fuel with care as it is highly inflammable. Never refuel the machine in the vicinity of naked flames, sparks or hot engine parts. Do not smoke during refuelling!

Always stop the engine and remove the ignition key before refuelling. Fill fuel tank outdoors. Do not spill fuel (use a suitable filling aid)!

Prevent fires by keeping the machine clean!

Take care when handling battery acid (toxic and corrosive)!

### Transporting passengers

Transportation of passengers during operation of the mower or its attachments is not permitted!

When driving outside the working area, switch of the mower drive and raise the mowing cylinders into the transport position.

### Operation

Before starting the engine ensure that the transmission and mowing cylinder drives are disengaged!

Do not operate the triple cylinder mower before ensuring that all guards are correctly fitted!

On completion of work on the triple cylinder mower replace the guards and ensure that they are in correct position.

Before commencing work remove all obstacles from the working area and inspect the ground for obstacles while working.

If blockages occur during operation, switch off the engine, secure the machine and clean the mowing cylinders (5) with a suitable tool (wooden handle)!

Beware of rotating tools – keep a safe distance!

High-inertia implements do not become stationary immediately. Allow sufficient time for the rotating blades to “coast down” to a halt before working on them!

If damage is caused to the machine, switch off the engine immediately, remove the ignition key and have the damage repaired!

Observe maximum permissible axle loads and total weights!

Take particular care when working on steep slopes.

### Leaving the Triple Cylinder Mower

When leaving the triple cylinder mower unattended ensure that it are secured against rolling away and that it cannot be used by unauthorized persons (apply hand brake, position chock blocks). Switch off the engine. Engage range and gear shift levers. Remove ignition key.

Never leave the triple cylinder mower unattended as long as the engine is still running!

Never leave the driving seat as long as the mower in operation!

### V-belts drives

Always shut off the engine before fitting or removing V-belts!

The guards for the V-belt drives must be installed correctly!

After switching off the drive, the mowing cylinders may be continue to run for a while. Keep a safe distance and continue work on the machine only when the mowing cylinders are at a complete standstill!

## **Maintenance**

*Before carrying out repair, maintenance and cleaning work or remedying faults ensure that the drive is switched off, that the engine is at standstill and the ignition key removed!*

*Escaping fluid (fuel or hydraulic oil) under high pressure can penetrate the skin and cause serious injury. If any fluid is injected into the skin, consult a doctor immediately as otherwise serious injuries or infection may result!*

*Regularly check the hydraulic lines for damage and aging! The replacement hoses must conform with the technical requirements of the attachment manufacturer!*

*When searching for leakages take the necessary precautions to prevent injury!*

*Take precautions when draining hot oil - fire hazard!*

*Ensure that the oil and fuel used are of the specified quality and store only in approved containers!*

*Store oil, fuel, grease and filters separately and correctly!*

*Regularly check nuts and bolts for tightness and retighten if necessary!*

*Replace guards after servicing!*

*Do not attempt to mount a tyre unless you have the proper equipment and experience to perform the job safely!*

*Retighten wheel nuts after the first 2 operating hours, then check them every 50 operating hours.*

*Always disconnect the battery ground strap before working on the electrical system!*

*Before performing electric welding work on the triple cylinder mower disconnect the cables from the generator and the battery!*

*Repair work, such as welding, grinding, drilling etc., must not be performed on protective supporting parts.*

*Close the fuel cock before servicing.*

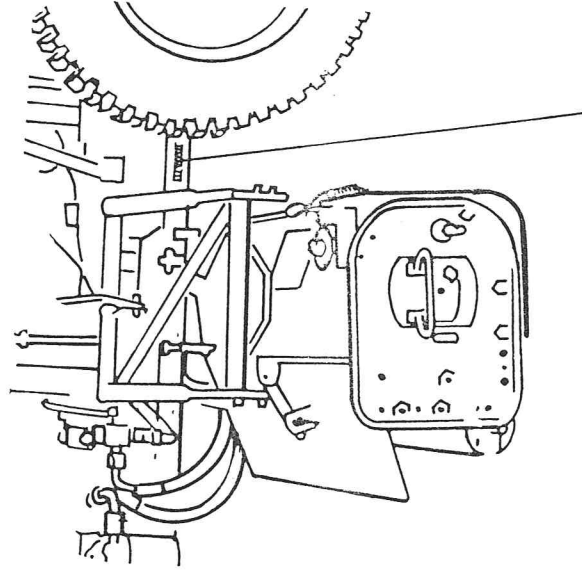
*Use only original/AGRIA spare parts or commercially available parts of at least the same quality conforming to AGRIA's established technical requirements.*

# Contents

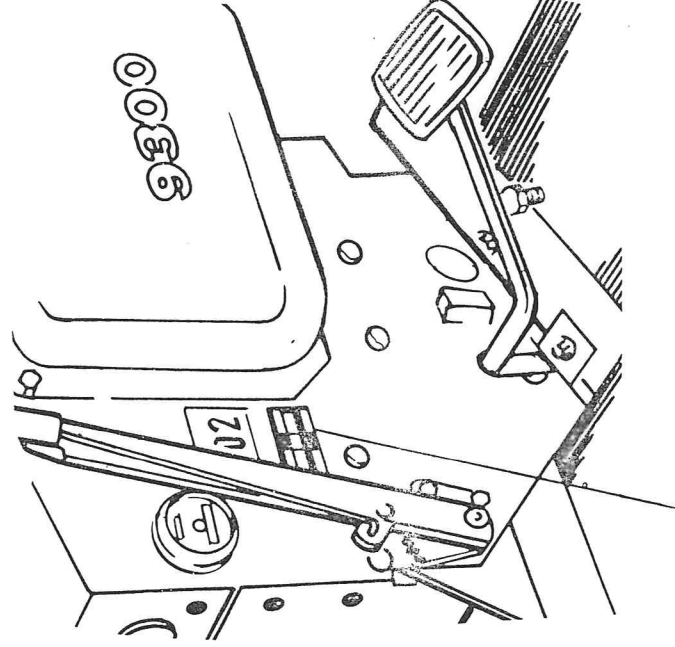
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**Please complete below:**

Machine model/type: .....
Vehicle ident. No.: .....
Date purchased: .....



The vehicle ident. No. is stamped into the frame on the right.



The data plate is provided on the right-hand side of the instrument panel.

# Technical details

## Triple Cylinder Mower

**Dimensions:** Overall length 2620 mm  
 Overall height 1250 mm  
 Overall width (depending on the position of the trailing rollers) 1340 - 1420 mm  
 Wheelbase 1405 mm  
 Track width, front 640 mm  
 Track width, rear 880 mm  
 Ground clearance approx. 170 mm  
 Toe-in 2 - 3 mm

**Mowing Equipment:** Mowing widths 2160 mm, 1590 mm, 910 mm  
 Cutting height adjustable from 14 to 60 mm  
 Cylinder speed from approx. 200 - 750 rpm (depending on engine speed)

**Tyres:** Front 23 x 10.50 - 12  
 (special lawn tread) Rear 18 x 7.00 - 8

**Tyre pressure:** Drive and steering wheels 0.8 bar

**Weights:** Weight empty (petrol version) approx. 920 kg  
 Weight empty (diesel version) approx. 940 kg  
 Perm. gross weight approx. 1100 kg  
 Perm. axle load, front approx. 810 kg  
 Perm. axle load, rear approx. 320 kg

**Fuel tank capacity:** approx. 32 ltr.

**Electrical system:** Voltage 12 volt  
 Three-phase generator 12 V, 40 AH  
 Sliding gear starter motor  
 Battery 12 V, 44 AH

**Air filter:** Micro-dry filter (petrol engine)  
 combination air filter (diesel engine)

**Steering axle:** Swing axle  
**Steering:** - gear segment depending on type  
 - hydr. steering

**Brake system:** Parking brake, mechanically actuated shoe brake acting on drive wheels, service brake, hydrostatically controlled by driving pedal

**Gearing:** - Hydrostatic transmission  
 - Mechanical gear-shift system for 2 speeds  
 Differential with lock

**Oil required:** Differential approx. 4.0 ltr.  
 Gear pump gearing approx. 2.0 ltr.  
 Gear oil SAE 90 (DIN 51512) - API GL5 (e.g. BP Energear Hypo)

Hydraulic system approx. 20 ltr. hydraulic oil ATF Dexron

**Driving speeds:** Forwards: 0 - 10 km/h  
 mowing: 0 - 20 km/h  
 Reverse: 0 - 6 km/h  
 mowing: 0 - 12 km/h  
 road speeds:

**Hydraulic system:** Service pressure max. 180 bar

## Engines

**Make and type of engine:** Renault 688-7/45  
**Design:** Four-cylinder four-stroke petrol engine  
**Bore:** 70 mm  
**Stroke:** 72 mm  
**Cubic capacity:** 1100 cc  
**Compression:** 8.5 : 1  
**Rating:** 19 kW  
**at speed:** 2850 rpm (governed - integrated in carburettor)  
**Engine idling speed:** approx. 850 ± 25 rpm  
**Ignition:** Battery coil ignition  
**Spark plug:** Bosch W 7 B (W 175 T 36) Champion L 87 Y (EYOUEM 705 S = initial equipment) electrode gap 0.7 mm  
**Ignition timing:** 8° ± 1 (with mag. gen. gun = remove vacuum hose from distributor)  
**Contact angle:** 57° or 63% ± 3

**Contact breaker gap:** 0.4 - 0.5 mm  
**Ignition sequence:** 1-3-4-2 (cylinder 1 = drive end)  
**Cooling:** Water cooling, sealed water circuit (coolant 7.0 ltr.) with frost protection down to -20°C

**Carburettor:** Solex 32 - RBJ - down-draught  
**Lubrication:** Force-feed lubrication

**Amount of oil required:** approx. 3.0 ltr. multigrade oil SAE 20W/40

**Valve clearance:** Inlet 0.15 mm  
 (with engine cold) Outlet 0.20 mm

**Fuel:** Unleaded regular-grade petrol (from engine No. 5505 onwards)

**Noise emission when stationary:** 77 dB (A) N

**Noise emission when driving:** 78 dB (A) N

**Make and type of engine:** Kubota V 1200-B  
**Design:** Four cylinder four-stroke diesel engine

**Bore:** 75 mm

**Stroke:** 70 mm

**Cubic capacity:** 1228 cc

**Rating** 20 kW

**at speed:** 2900 rpm

**Engine idling speed:** approx. 850 rpm

**Injection pump:** Diesel Kiki (NP-PFR 4 KD 50/2 NP 1)

**Injection nozzles:** —

**Injection pressure:** 140 bar

**Cooling:** Water cooling, sealed water circuit (coolant approx 7.0 ltr.) with frost protection down to -20°C

**Lubrication:** Force-feed oil lubrication

**Amount of oil required:** approx. 5.7 ltr. multigrade oil 10W/40

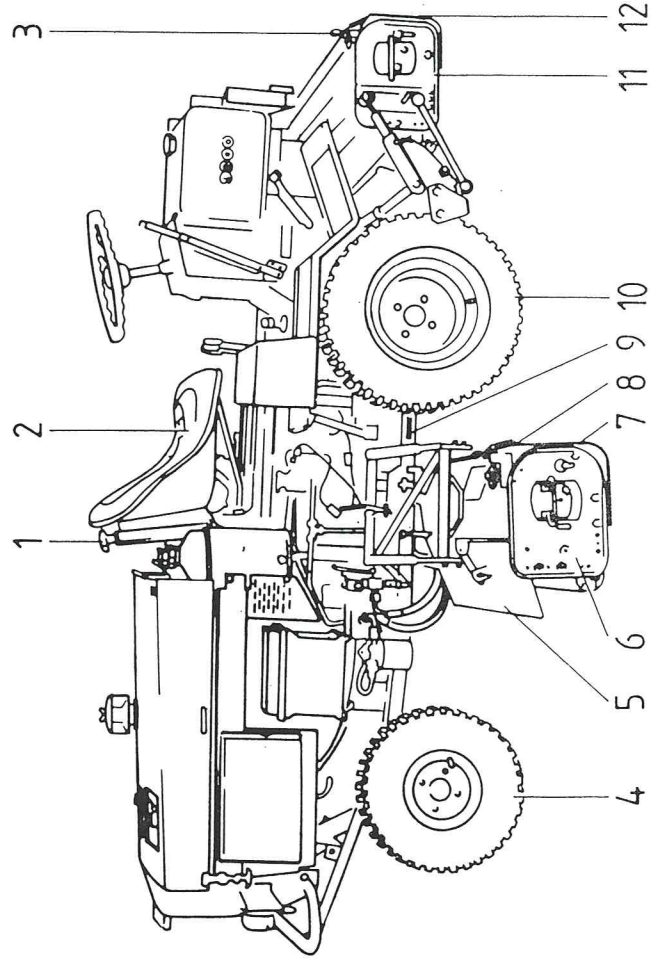
**Valve clearance:** 0.15 +0.035 (0.145 to 0.185 mm)  
 (with engine cold) -0.005

**Fuel:** Diesel fuel No. 2-0

**Injection point:** 25° before UDP

**Noise emission when stationary:** 77 dB (A) N

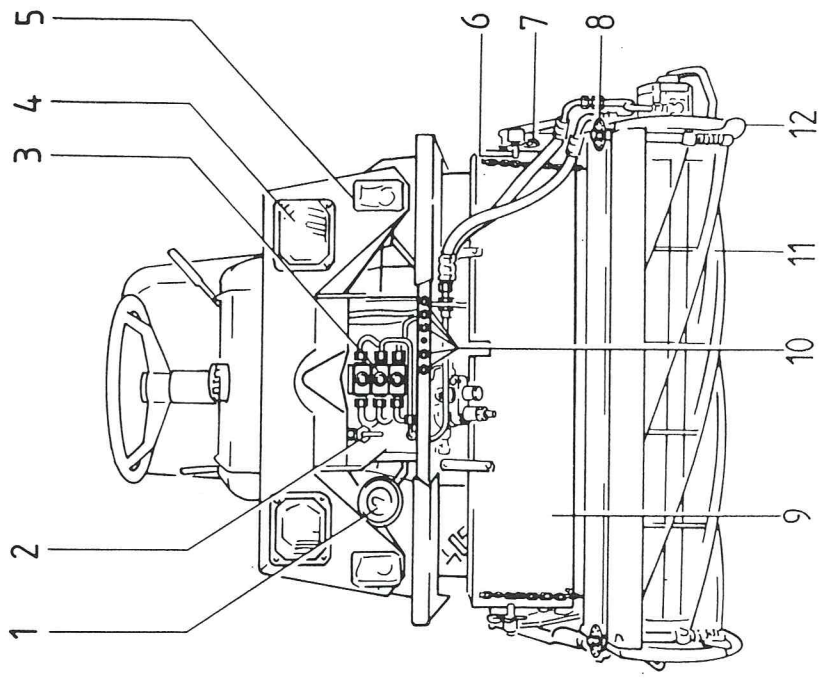
**Noise emission when driving:** 79 dB (A) N



**Fig. 1**

- 1 Adjusting screw for driver's seat
- 2 Driver's seat
- 3 Guard tension spring
- 4 Rear wheel (steering axle)
- 5 Grass deflector plate
- 6 Side mowing cylinder
- 7 Guard for side mowing cylinder
- 8 Guard tension spring
- 9 Vehicle identification number
- 10 Front wheel (drive axle)
- 11 Front mowing cylinder
- 12 Guard for front mowing cylinder

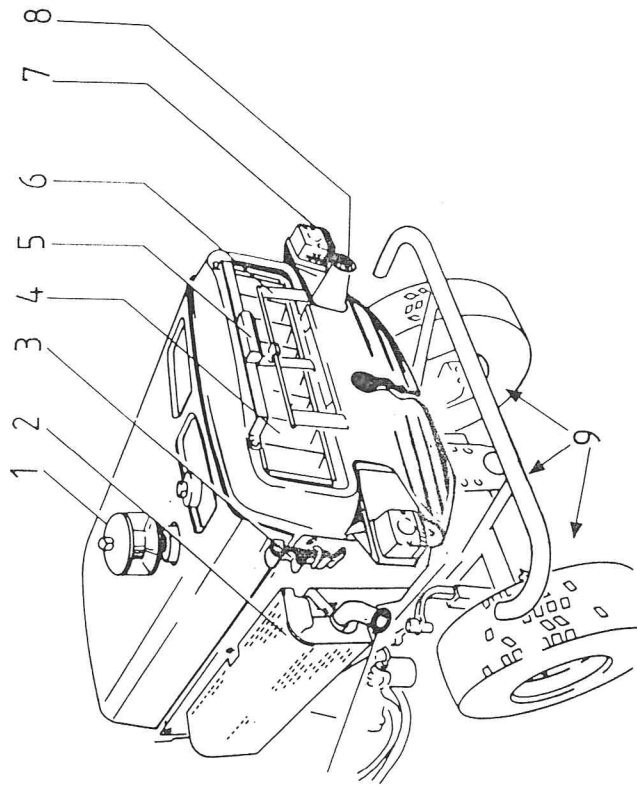
## II



**Fig. II**

- 1 Horn
- 2 Fuel cock
- 3 Hydraulic valves
- 4 Headlamp
- 5 Direction indicator lamp
- 6 Retaining bolt for front cylinder
- 7 Spring clip
- 8 Cylinder adjusting screw
- 9 Impact guard
- 10 Grease nipple
- 11 Front mowing cylinder
- 12 Skid

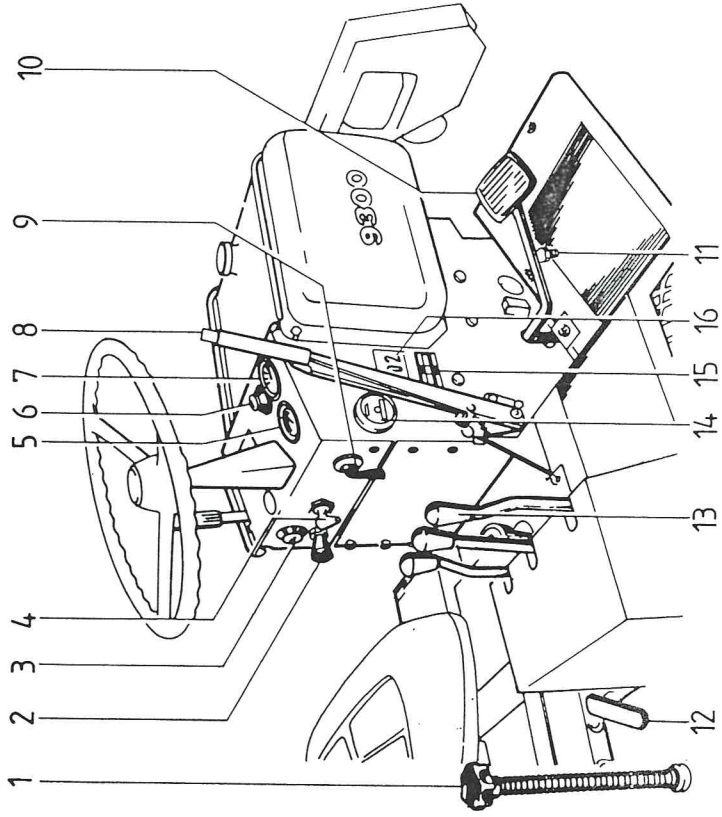
## III



**Fig. III**

- 1 Air filter preseparator
  - 2 Exhaust muffler
  - 3 Hood clamp
  - 4 Cooling air strainer
  - 5 Number plate lighting
  - 6 Number plate holder
  - 7 Combined flasher and tail lamp
  - 8 Reflector
  - 9 Grease nipple
- (for version with mechanical steering)

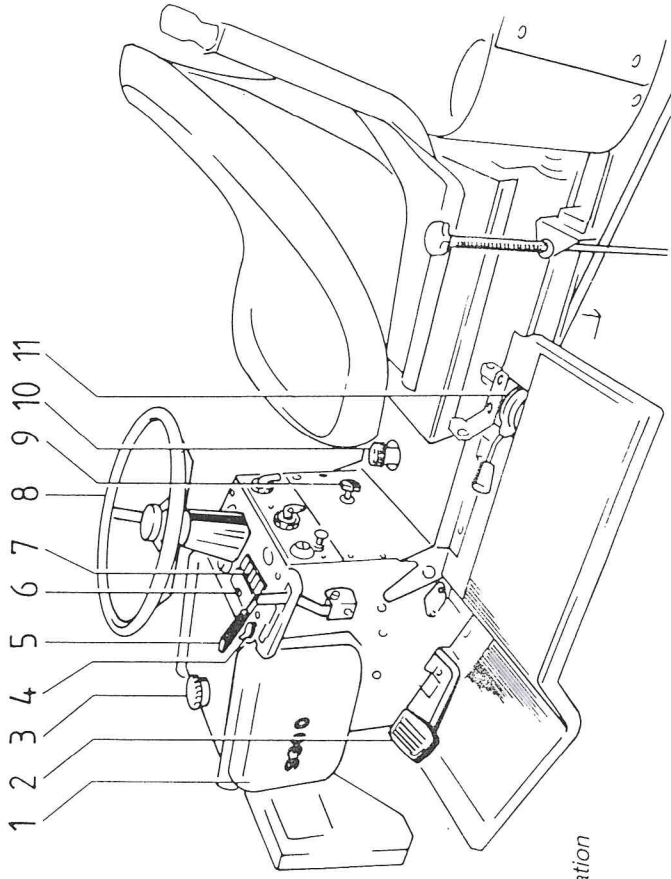
## IV



**Fig. IV**

- 1 Control rod for changing direction of rotation (mowing cylinder)
- 2 Preheater starter pull switch
- 3 Push button for horn
- 4 Light/ignition switch
- 5 Thermometer for hydr. oil temperature
- 6 Push button for warning indicator switch
- 7 Thermometer for cooling water temperature
- 8 Hand brake lever
- 9 Direction indicator switch
- 10 Driving pedal
- 11 Stop screw
- 12 Slow/fast operating lever
- 13 Hydr. control lever
- 14 Hour meter
- 15 Nameplate
- 16 Decal

## V

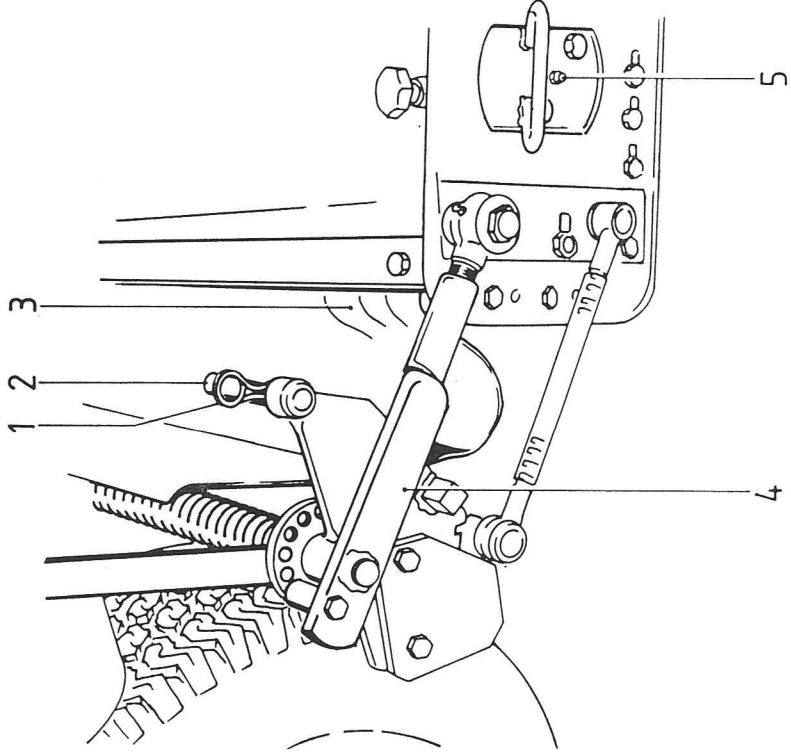


**Fig. V**

- 1 Fuel tank
- 2 Foot pedal for differential lock
- 3 Fuel tank cap
- 4 Socket
- 5 F/R operating lever
- 6 Fuse box
- 7 Control lamps
- 8 Steering wheel
- 9 Control knob for changing direction of rotation (front mowing cylinder)
- 10 Oil inlet/oil dipstick for differential gear
- 11 Throttle control lever



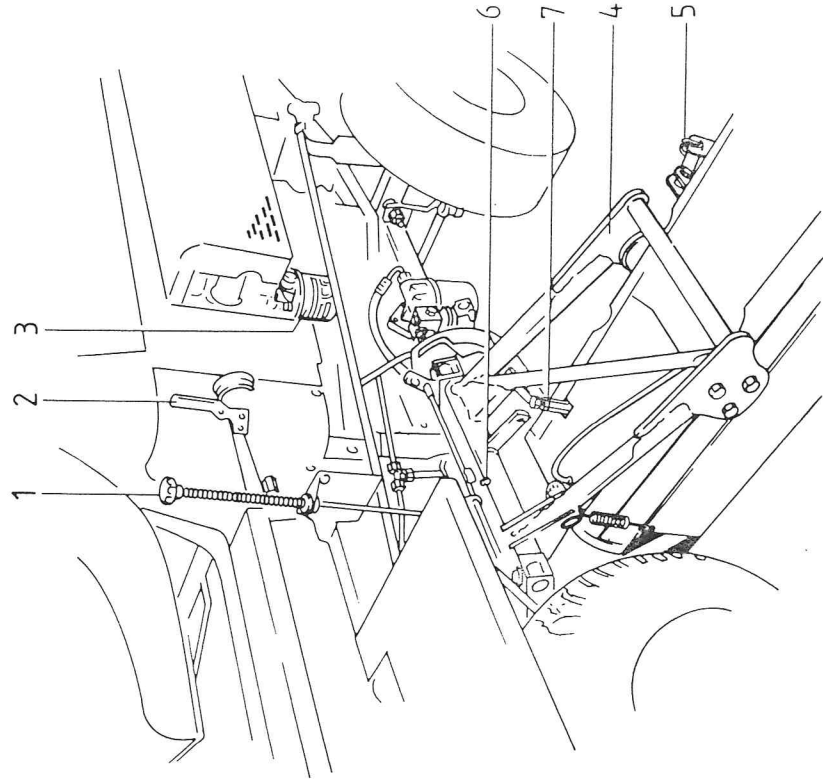
## VI



**Fig. VI**

- 1 Clip spring
- 2 Retaining bolt for transport
- 3 Impact guard
- 4 Lifting arm, top
- 5 Grease nipple for mowing cylinder

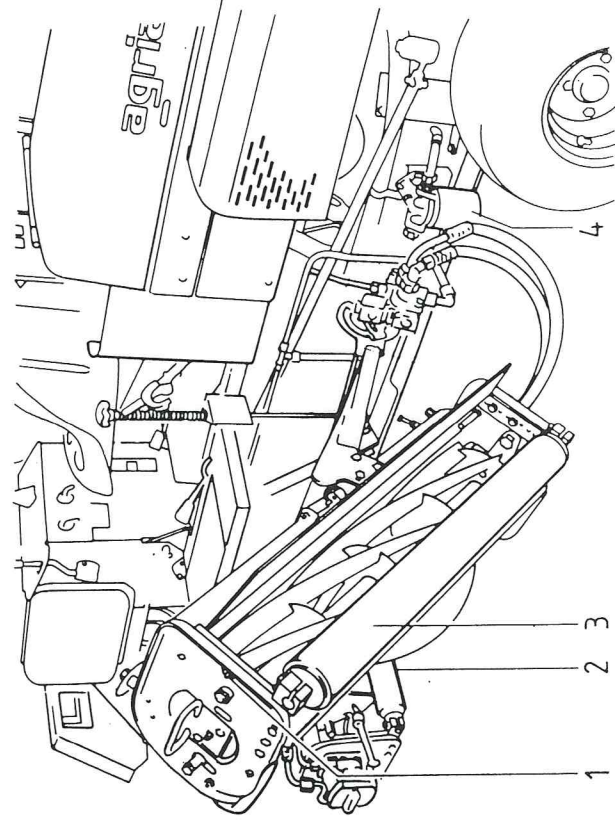
## VII



**Fig. VII**

- 1 Control rod for changing direction of rotation (mowing cylinder)
- 2 Retaining hook for side mowing cylinder
- 3 Fuel filter (only for diesel engine)
- 4 Side cylinder carrier
- 5 Grease deflector plate adjuster
- 6 Grease nipple
- 7 Stop screw for side cylinder carrier

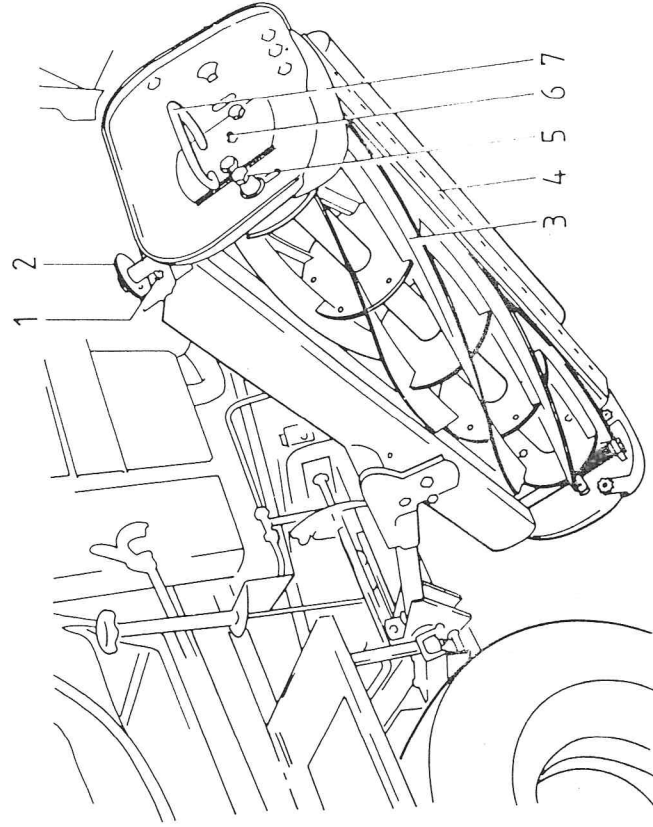
## VIII



**Fig. VIII**

- 1 Mounting screw for trailing roller holder
- 2 Trailing roller – front cylinder
- 3 Trailing rollers – side cylinder
- 4 Hydraulic oil filter

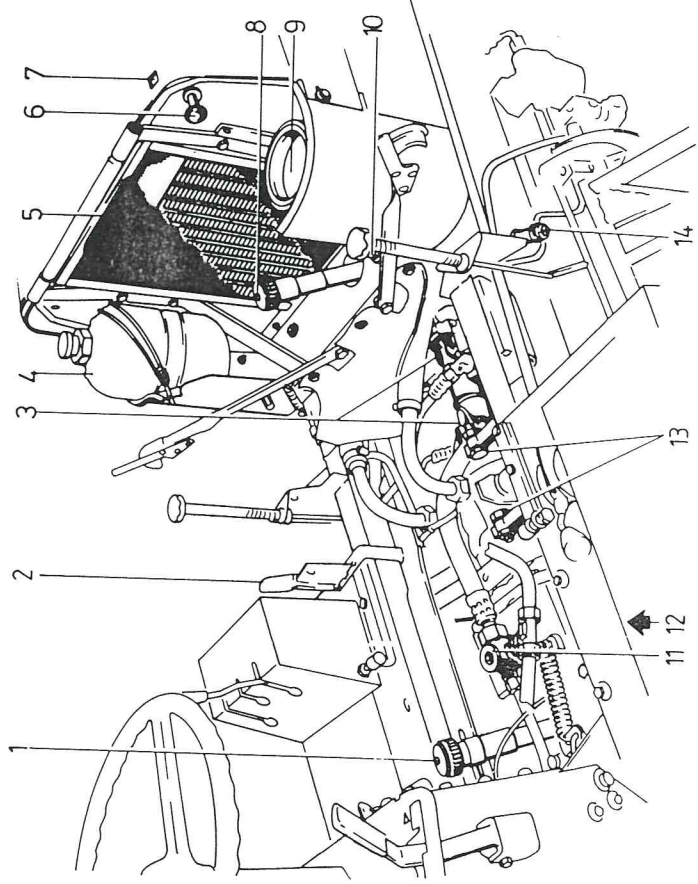
## IX



**Fig. IX**

- 1 Grease nipple for mowing cylinder bearing
- 2 Cylinder adjusting screw
- 3 Mowing cylinder
- 4 Bottom knife
- 5 Clamping screw for cylinder adjusting screw
- 6 Grease nipple for mowing cylinder bearing
- 7 Hand grip

X



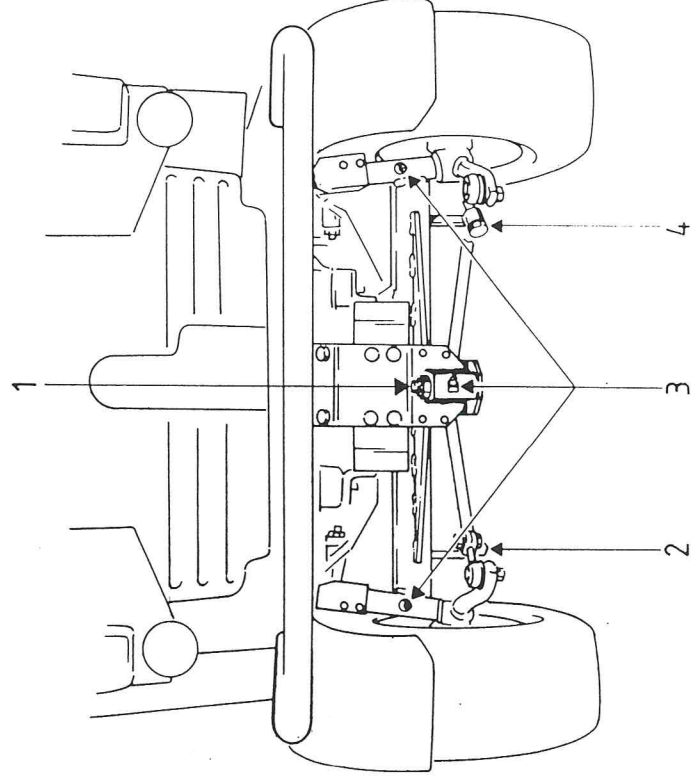
(driving seat not shown)

**Fig. X**

- 1 Oil filler neck/oil dipstick with vent for differential gear
- 2 Slow/fast stage control lever
- 3 Grease nipple for cardan shaft
- 4 Expansion tank for cooling water circuit
- 5 Removable cooling air strainer
- 6a Pull button for choke (for petrol engine version)
- 6b Pull button for switching off engine (for diesel engine)
- 7 Recess for mounting the side mower guard
- 8 Oil filler neck and vent for gear pump drive
- 9 Tin of lapping paste
- 10 Oil dipstick for gear pump drive
- 11 Oil drain plug
- 12 Oil drain screw for differential
- 13 Stop screw for driving pedal adjustment (these were adjusted at the factory and should not be re-adjusted)
- 14 Oil drain screw for gear pump drive

**Only for version with hydraulic steering**

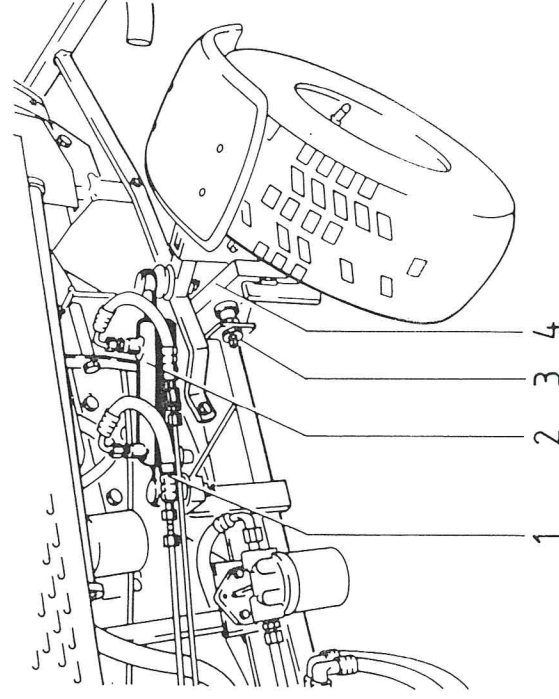
**XI**



**Fig. XI**

- 1 Castellated nut with split pin  
(for reversing lever steering)
- 2 Stop screw for steering lock
- 3 Grease nipple
- 4 Stop screw for steering lock

**XII**

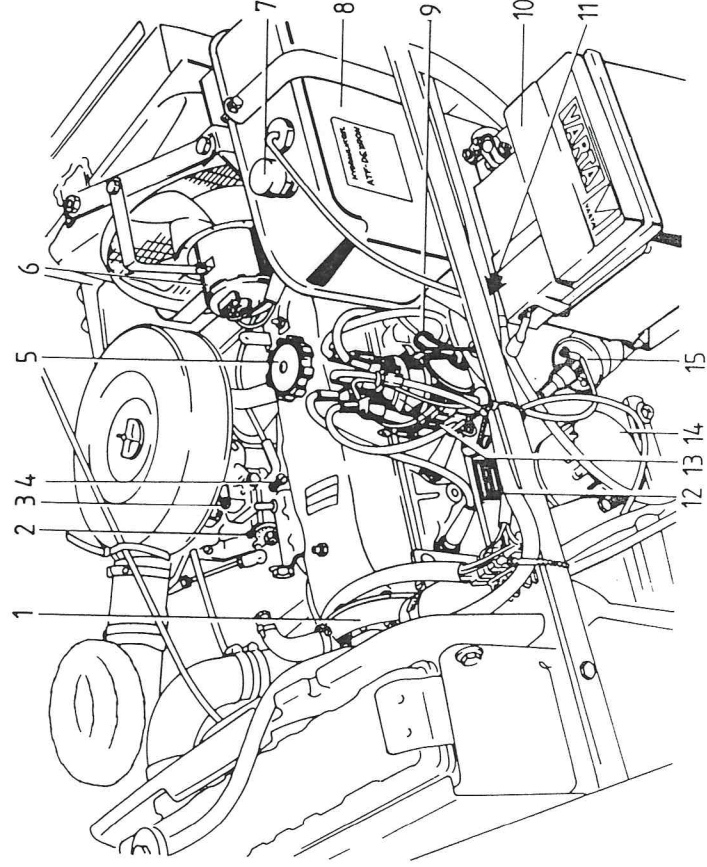


**Fig. XII**

- 1 Steering cylinder – hydraulic connection
- 2 Steering cylinder
- 3 Stop screw for rear axle beam
- 4 Rear axle beam

**Version with four-cylinder, four-stroke petrol engine**  
**(Renault 688-7/45)**

**XIII**

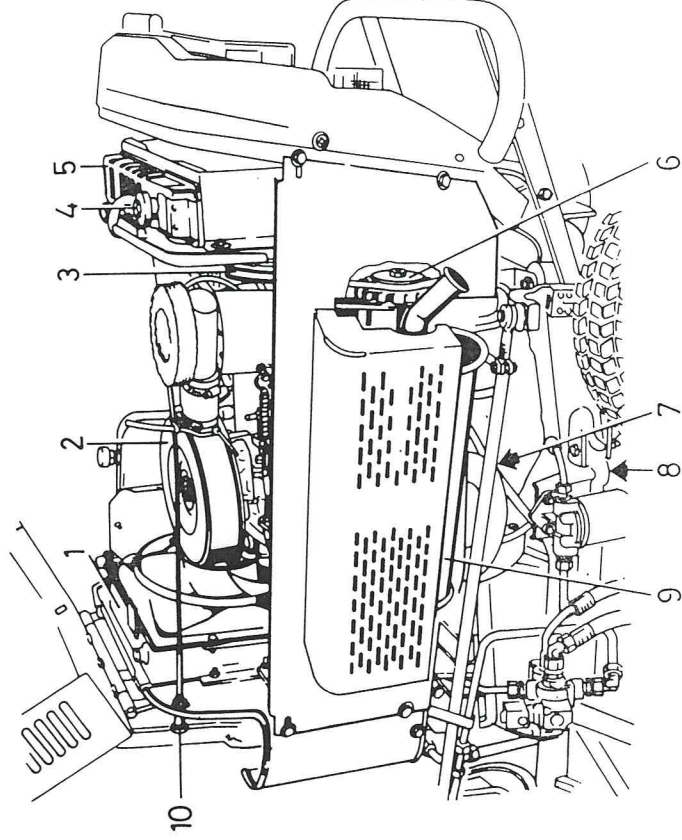


**Fig. XIII**

- 1 Water pump
- 2 Carburettor idling adjustment screw
- 3 Carburettor idling jet
- 4 Carburettor air adjustment screw
- 5 Engine oil filler neck
- 6 Fan for oil cooler
- 7 Air filter filler opening and dipstick for hydraulic oil
- 8 Equalizing tank for hydraulic oil
- 9 Oil dipstick for engine oil
- 10 Battery
- 11 Petrol pump
- 12 Engine type plate
- 13 Ignition distributor
- 14 Engine oil filter
- 15 Ignition coil

**Version with four-cylinder, four-stroke petrol engine**  
**(Renault 688-7/45)**

**XIV**

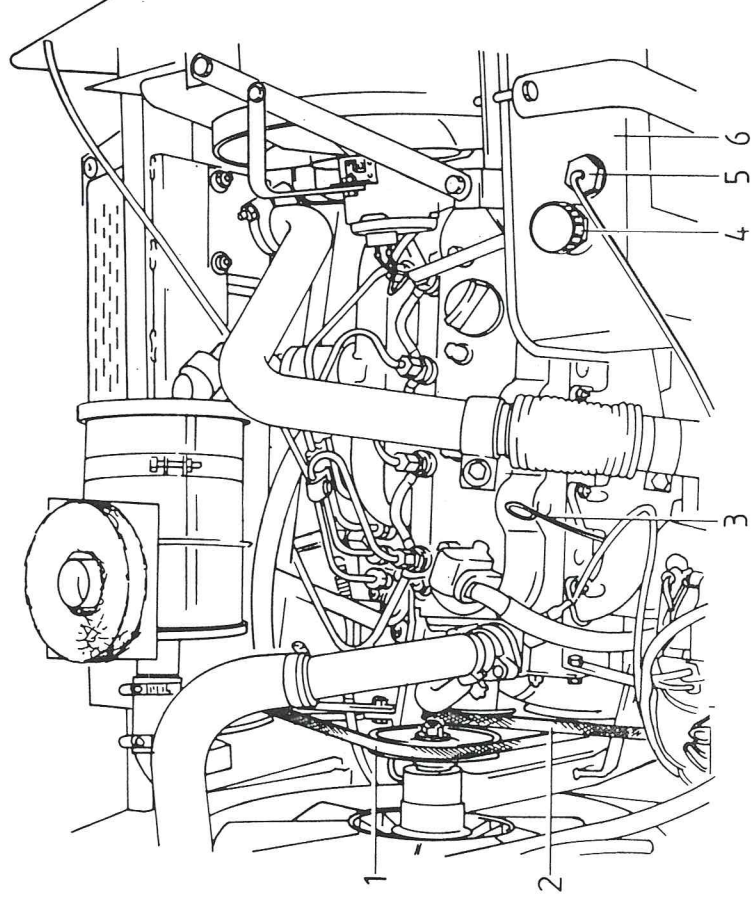


**Fig. XIV**

- 1 Oil cooler
- 2 Air filter
- 3 V-belt for water cooler fan
- 4 Cap
- 5 Water cooler
- 6 Three-phase generator
- 7 Starter
- 8 Drain plug for engine oil
- 9 Exhaust muffler
- 10 Pull button for choke

**Version with four-cylinder, four-stroke diesel engine  
(Kubota V 1200 B)**

**XV**

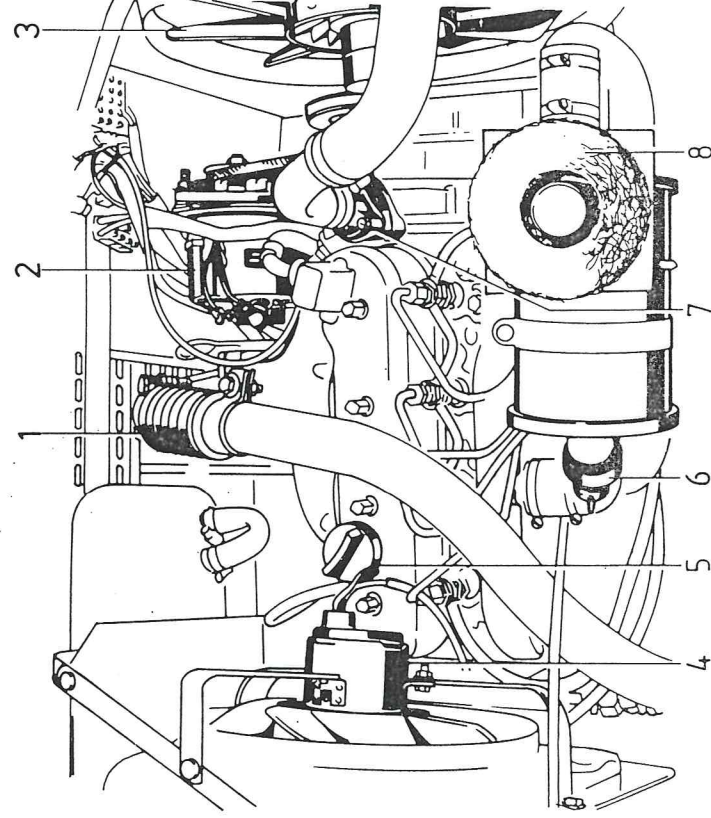


**Fig. XV**

- 1 V-belt for fan, hydraulic oil pump
- 2 V-belt for generator, water pump
- 3 Oil dipstick
- 4 Air filter/filler opening and dipstick for hydraulic oil
- 5 Hydraulic oil level switch
- 6 Equalizing tank for hydraulic oil

**Version with four-cylinder, four-stroke diesel engine**  
**(Kubota V 1200 B)**

**XVI**



**Fig. XVI**

- 1 Steel bellows, exhaust
- 2 Three-phase generator
- 3 Impeller
- 4 Fan for oil cooler
- 5 Filler opening for engine oil
- 6 Dust removal valve
- 7 Thermostat
- 8 Dry air filter



## General description

### Transmission

The triple cylinder mower is equipped with a hydrostatic transmission with pedal-operated stepless speed control. The operating lever for slow or fast speed stage (for mowing and road speeds) is located on the right underneath the driving seat (X/2).

When this lever is pushed forwards the speed stage for road travel is engaged; when it is pulled back, the speed stage for mowing is engaged.

Shift the lever to the centre **for the idling position. For towing or pushing** the lever must be shifted to the idling position to prevent **damage being caused to the hydrostatic transmission.**

**Caution:** No braking effect is achieved with the hydrostatic transmission. Use the hand brake for slowing down.

### Forwards/reverse travel

For forwards travel push the F/R lever (V/5) forwards; in doing so press the lever to the left slightly until the locking bolt is released from the notched plate. For reverse travel pull the F/R lever to the rear down the shift gate.

In centre position the F/R lever is in idling or starting position.

### Differential gear


If special circumstances require it, the integral differential gear can be locked: Depress the pedal for the differential (V/2) lock only as long as necessary.

To prevent damage to the gearing **the differential lock must never be operated when negotiating curves.**

### Brake system

When the driving pedal is released (IV/10) (in driving operation) the hydrostatic transmission acts as a service brake. The auxiliary and parking brake is operated by the hand brake lever (IV/8).

This lever locks in place automatically when pulled and can only be released again by pressing the knob at the top of the hand brake lever.

 Always check the brakes before driving the tractor!  
Thoroughly check the brake systems at regular intervals!

Adjustment and repair work to the brake system must be performed only by authorized workshops or recognized brake service stations!

### Electrical system

In position "0" the ignition key can be inserted in the lighting/ignition switch (IV/4).

Position 1 = parking light. Both parking lights and both combined stop and numberplate lights are on.

In position 2 both low beams are switched on; at the same time both parking lights and the two combined stop and numberplate lights are on.

When the ignition key is depressed in position "0" this switches on the ignition. The oil pressure control lamp (red) (V/7) and the charging control lamp (yellow) must light up.

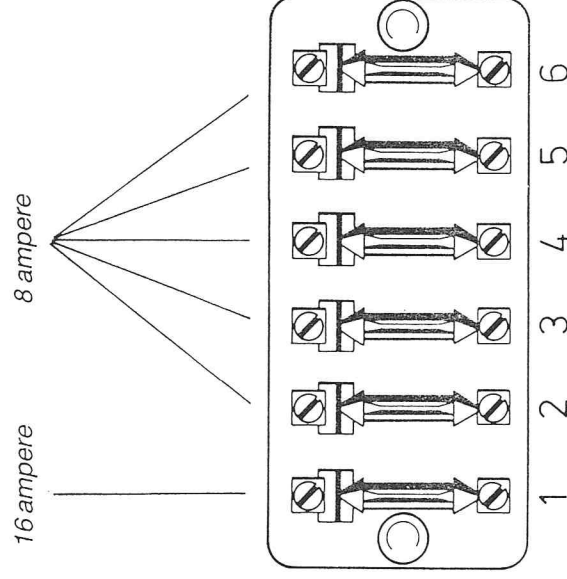
The flashing indicator lights are operated by swivelling the lever of the direction indicator switch to left or right. At the same time the green pilot lamp blinks in unison with the indicator lights.

The warning indicator system is switched on by pressing the knob of the hazard warning switch (IV/6), whereby all flashing indicators, including the glowlamp in the knob, flash in unison. When a cab is fitted, the windscreen wipers can be connected to the electric socket (V/4).

Five 8 ampere and one 16 ampere fuses in the fuse box (V/6) protect the electrical system.

When a short-circuit occurs in the electrical system the corresponding fuse blows. Fuses must not be replaced before the cause of the failure is eliminated.

To replace a fuse, remove the cover of the fuse box and take out the blown fuse by pressing it against the retaining spring clip.



The electrical system components protected by the fuses are:

Fuse 1 = Oil filter, flashing indicator lights

Fuse 2 = Lighting/ignition switch, preheater starter switch, horn

Fuse 3 = Driving light (low beam)

Fuse 4 = Side light and tail light, left

Fuse 5 = Side light and tail light, right

Fuse 6 = Not in use

Before working on the electrical system do not forget to detach the negative lead from the battery to prevent short-circuiting.

The integral three-phase generator must always be galvanically connected to the battery during operation. While the engine is running neither the generator cable nor a pole terminal on the battery should be detached, removed or interchanged.

The battery must not be charged before it is disconnected from the electrical system, i.e. the positive and negative leads must be detached.

**Note:** Always disconnect the battery ground strap (negative pole) before working on the electrical system!

Ensure that the terminals are correctly connected – first the positive terminal and then the negative terminal!

Caution: battery fumes are explosive!

Avoid sparks and naked flames near the battery!

Remove the plastic cover when recharging the battery to avoid the accumulation of highly explosive fumes!

Always cover the positive terminal with the cap provided. Grounding = explosion hazard!

## Preparing the Municipal tractor for service

Please note that the service life and reliability of the engine of the **new mower** depend to a great extent on the running-in period.

Always let the cold engine warm up for a few minutes before loading it to the maximum.

Ensure that the filters are maintained correctly.

Before the mower is operated for the first time, i.e. before starting the engine, ensure that there is:

- sufficient fuel in the fuel tank (V/1),
- sufficient engine oil in the engine according to the mark on the oil dipstick,
- sufficient hydraulic oil in the equalizing tank (XIII/8 and XV/6) = up to the bottom edge of the dipstick when the cylinders are lowered,
- sufficient coolant in the cooling system. The coolant level in the expansion tank (X/4) should be at "maximum" (only top up the water in the expansion tank).
- sufficient acid in the battery (approx. 1 cm above the top edge of the plates). Ensure that all lubricating points are greased according to the lubrication plan and that the parking brake is applied and secured by its catch.



Never adjust the driving seat while the vehicle is in motion – accident hazard!

Before and after operating the mower adjust the mirrors to ensure uninterrupted rear view of working area (with mounted hood).

Do not carry out any welding, drilling, sawing or grinding work on the cab or safety frame. In case of damage always have the affected parts replaced!

Check the brake performance before starting!

Shift to a lower speed in good time before driving downhill!

Note that if the engine is at a standstill or the hydraulic power steering fails, steering will require considerably more force!

In the event of any malfunction of the steering or the brakes, stop the mower immediately. Have the faults rectified without delay!

### Starting the four cylinder four-stroke engine

Always ensure that the mowing cylinders are raised or switched off before starting the engine to prevent the running cylinder drives from overloading the battery.

With the engine cold

1. Shift the F/R lever (V/5) to the centre = starting position.
2. Shift throttle lever (V/11) to neutral (depress).

Take care when handling battery acid (toxic and corrosive!)

Use only specified fuses. Excessively strong fuses will destroy the electrical system!

Operate the starter for a limited time only to prevent the coil overheating. Let the starter cool down!

3. Pull out knob for choke (X/6)
4. Insert ignition key into light/ignition switch (IV/4) and press home. The oil pressure control lamp (red) and the charging control lamp (yellow) must light up.
5. Press starter (pushbutton IV/2a).

As soon as the engine starts, slowly push in the pull button for the choke and open the throttle slightly. The oil pressure control lamp must go out when the engine starts. If this lamp lights up while the mower is being driven it indicates a fault in the oil supply to the engine. Stop the engine immediately and check the oil level. If the cause of the disturbance lies elsewhere, consult your dealer.

The oil control lamp must also go out when the engine has started. If it lights up while the mower is being driven the battery will no longer be charged and a fault is indicated in the electrical system.

With the engine warm

As for cold engine but do not pull the choke button! Open throttle slightly during starting procedure.

**Never start the engine in a closed room. Always ensure that there is good ventilation and that the exhaust gases are quickly drawn off.**

### Stopping the engine

**Only when the mowing cylinders are raised!** Secure the mowing cylinders with the hook and bolt provided (see also under "Transport position").

Withdraw the ignition key from "0" position in the ignition switch and apply the hand brake.

**Do not leave the ignition key in the switch while the mower is unattended.**

### Starting the two cylinder four-stroke diesel engine

Shift the F/R lever to centre = starting position.

Shift throttle lever to full throttle.

Insert the ignition key in the light/ignition switch and press home. The oil and battery charging lamps should light up.

Pull out the knob of the preheater starter switch (IV/2) to the first stop. The glow lamp (symbol **N**) must light up.

Hold the pull button until the glow lamp goes out, then pull the knob out to its limit to start the engine.

As soon as the engine starts, push the pull button back into its initial position and regulate the engine speed.

The oil pressure control lamp must go out when the engine starts. If this lamp lights up while the mower is being driven it indicates a fault in the oil supply to the engine. Stop the engine immediately and check the oil level. If the cause of the disturbance lies elsewhere, consult your dealer.

The oil control lamp must also go out when the engine has started. If it lights up while the engine is being driven the battery will no longer be charged and a fault is indicated in the electrical system.

Let the engine warm up at medium speed.

If the engine does not start up within the first 10 seconds, interrupt the starting procedure and wait approx. 30 seconds, then repeat the starting procedure.

**Do not start the engine in a closed room. Ensure that there is good ventilation and that the exhaust gases are quickly drawn off!**



Do not use a starting fluid when employing an electrical starting aid – explosion hazard!

The starting fluid is flammable and explosive!

Used and apparently empty pressure bottles should always be completely emptied in a well ventilated space away from sparks and flames!

When towing the machine ensure that the operating levers are in the correct positions and keep within the admissible speed limit!

## Stopping the four cylinder four-stroke diesel engine

Shift the throttle lever to the idling position and let the engine continue to idle for approx. 30 seconds.

Pull back the pullbutton for switching off the engine (X/6) and hold it until the engine stops.

Turn the ignition key to position "0" and then withdraw it. Press down the cover. Apply the hand brake.

**Always remove the ignition key before leaving the mower unattended.**

Always ensure that the fuel tank is never completely empty.

All the lines are vented at the factory and a small amount of fuel is provided in the tank. If, however, venting is to be repeated for any reason, proceed as described under "Care and Maintenance".

## Driving

Select the driving speed range; raise the driving seat and position the operating lever (X/2, as described under "Hydrostatic transmission").

Select direction of travel with F/R lever (V/5, as described under "Forwards/Reverse travel").

Open throttle approx. 2/3.

To obtain maximum speed or when certain service or operating conditions demand full engine power, open the throttle wide:

Slowly depress the foot pedal (not jerkily). The position of the pedal determines the travelling speed of the mower.

In **neutral**, i.e. with the pedal at the stop, the mower will come to a halt.

If for any reason the mower must be stopped quickly, let the driving pedal move back into neutral and use the hand brake to stop the machine.

Always apply the hand brake when parking the mower.

## Raising the mowing cylinders into the transport position

While the engine is running, raise the **front mowing cylinder** by operating the centre control lever. When released, the control lever returns automatically to centre position.

Raise the left and right side cylinders by the guard bars and push the left/right retaining bolt (VI/2) (removing the spring clip VI/1 beforehand) under the top lifting arms (VI/4) and secure again with the spring clip.

Push the control lever for the **side cylinders** left and right upwards until the particular side cylinder is raised into its inclined end position, then let the control lever spring back into centre position and secure all 3 control levers with the catch against unintentional operation (see page 20).

Press the mowing cylinders into place and secure with the hooks provided (VII/2). Ensure that the locking levers for the retaining hooks snap into place under the connecting tube of the side cylinder carriers!

**Caution!** The mowing cylinders must be raised into the transport position and covered with the **guard plates** (I/12) provided before driving on public roads and by-ways.

The grass deflector plate (II/5) of the side cylinders must be positioned against the trailing rollers.

## Cutting height adjustment

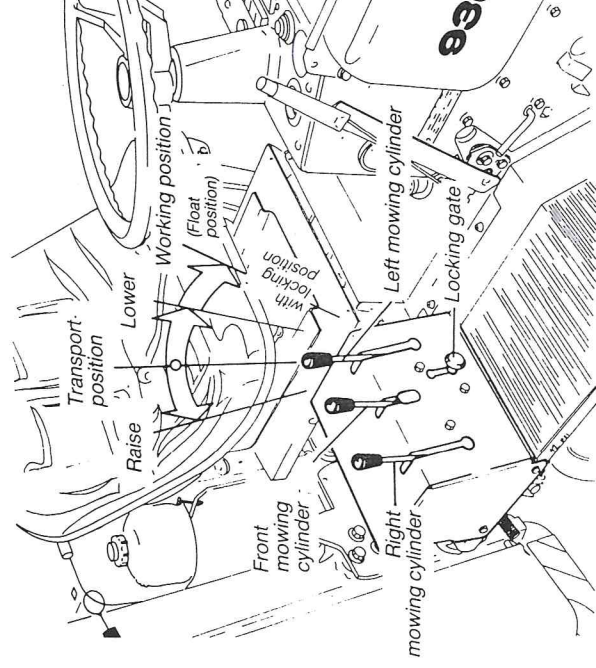
The cutting height is adjustable within a range of 14 to 60 mm. The narrowly spaced mounting holes in the roller bracket of the trailing rollers (VII/2 and 3) together with the two slots in the frame side plates permit step-by-step adjustment.

The cutting height is adjusted as follows:

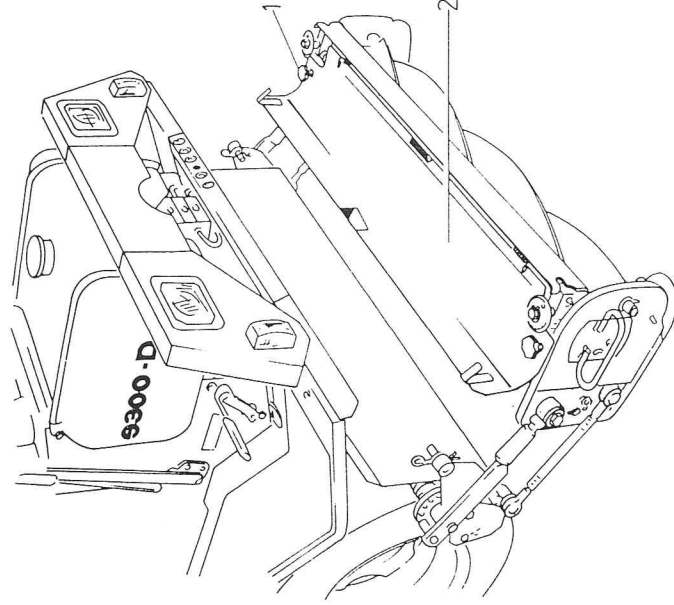
- Bring the mowing cylinders into the mowing position (with the machine standing on a level concrete floor)
  - Place wooden blocks of uniform size under the bottom knives according to the required cutting height.
  - Remove the hex. screws from the roller brackets of the front and side mowing cylinders.
  - Reposition the trailing rollers on the frame side plates upwards or downwards, depending on the cutting height required. (Downwards to increase and upwards to reduce the cutting height.) Ensure uniform adjustment left and right.
  - Screw the roller bracket back on.
- Ensure that the front and side mowing cylinders are uniformly adjusted.

## Mowing

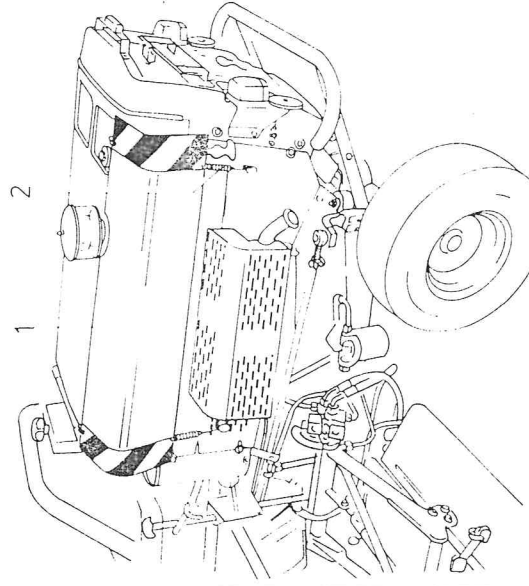
Each mowing cylinder can be lowered separately into the working position or raised into the transport position. The control levers to be used are shown in the adjacent illustration.



Remove front guard plate from the mowing cylinder: Unscrew hand screws (1), insert guard plate as shown in the picture below and secure with the hand screws (1).



Also remove the two side guard plates (1) from the mowing cylinders and insert them into the recesses provided in the engine hood, then secure them with the two springs (2). (See illustration below.)



Check for correct height adjustment and ensure that the knife cylinders glide easily and uniformly on the bottom knives (see also section "Adjusting the knife cylinders").

Release the locking devices on the operating levers of the control valves for the mowing cylinders, the retaining bolt of the front cylinder and the retaining hook of the side cylinders.

Lower the mowing cylinders by depressing the relevant operating lever for the control valves left and right and leave in this position.



As soon as the mowing cylinders have been lowered to a certain height above ground the relevant cylinder drive switches on automatically.

When the mowing cylinders are raised, the drive switches off automatically.

Position the operating lever (X/2) to the slow speed stage and set the triple cylinder mower in motion as described under "Driving".

The operating speed of the mower depends on:

- a) the height, density and type of grass to be mown,
- b) the type of terrain.

**Note:** Depress the driving pedal slowly. Avoid jerking the machine into motion!

The best mowing results in difficult terrain or under harsh working conditions are obtained by:

- opening the throttle lever wide,
- Depressing the driving pedal only as far as necessary.

Mow across slopes **only** with lowered side cylinders. Tipping hazard!

The forward speed is matched to the ground conditions by operating the driving pedal accordingly.

When mowing ensure that the **hydraulic oil temperature** (indicated on IV/5) does not exceed 75° C.

The **cooling water temperature** (indicated on IV/7) should not exceed max. 110° C. If the cooling water temperature is too high damage may be caused to the engine! (Check level of coolant and tension of the V-belt for the water pump. Clean the radiator segments).

if the cooling water temperature is too high do not switch off the engine immediately but let it continue to run for 1 - 2 minutes at a somewhat higher idling speed to ensure that the cooling water remains in circulation for a short time.

Optimum engine and hydraulic cooling can only be achieved if the fans are able to draw in the cooling air through the segments of the water and oil coolers without hindrance. Grass deposits and pollen dust can impair the cooling efficiency of the cooling segments.

The water and oil coolers must therefore be cleaned regularly and thoroughly with a nylon brush (do not use pointed or sharp tools, as these may damage the segments!) to remove grass deposits and dust.

The wire screen in front of the water and oil coolers must be pulled out for cleaning and must be cleaned frequently. Occasionally the cooler segments should be cleaned with compressed air.

To facilitate cleaning the rear cover can be hinged open to the rear (see under Maintenance!).

Before the cold season begins check whether there is sufficient antifreeze in the cooling water!

When mowing ensure that operating personnel and other persons **keep a safe distance away from the rotating mowing cylinders**.

Cleaning work in the knife cylinders must **never** be performed while the **engine is running** or the mowing cylinders are switched on.

The grass should not be cut too short as it will dry out too quickly in warm weather and this will encourage weed growth.

If possible, mow only when the grass is dry, as wet grass tends to cling to the mowing cylinders and to roll into clumps. Short grass can be left to lie, as it acts as fertilizer. It also prevents the turf from drying out in dry weather. The ejection plates mounted on the side cylinders must be raised to their highest ejection position when mowing wet grass. For dry grass the angle of inclination should be adjusted to a correspondingly lower setting (relocate plug VII/5 in the perforated bar).


After work is ended, the mower should always be carefully cleaned, as plant juices mixed with dust and grass deposits adhere strongly to all parts, hindering the movement of the rotating parts.

## Checking and adjusting the knife cylinders

It must be ensured that the cylinder knives **do not** come into contact with the bottom knife. This would cause excessive wear and noise.

The settings must be checked daily and readjusted if necessary.

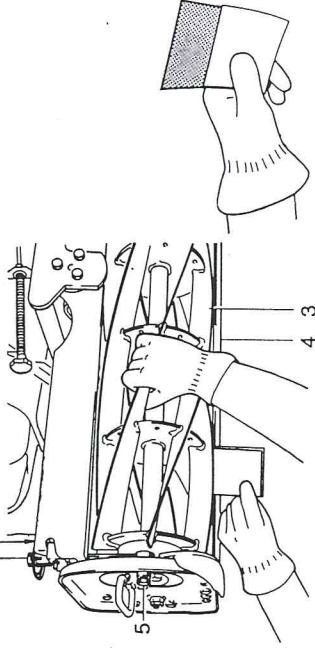
Checking the knife cylinder adjustment

 Raise the cylinders into transport position (securing them mechanically) and shift the F/R lever into neutral. Switch off the engine and apply the hand brake. Wear protective gloves!

To check the cutting gap proceed as follows:

Take **two strips of newspaper placed one above the other** and hold them vertically against the bottom knife (4) at different points along the entire width of the cylinder (3) and slowly turn the cylinder by hand. If the adjustment is correct only **one** layer of the newspaper should be cut through at most (see illustration). If both layers are cut through, the cutting gap is too narrow. If none of the layers is cut through, the gap is too wide. Repeat this procedure on all 6 knife cylinders.

If the cutting gap is too narrow or too wide the cylinders must be adjusted.



## Adjusting the knife cylinders

Proceed as follows:

Bring the cylinders into the mowing position and shift the F/R lever into neutral. Switch off the engine and apply the hand brake.

Wear protective gloves!

Slacken off the clamping screws (5 and 8) at both ends of the cylinder. With the aid of the cylinder adjusting screws (2) the knife cylinders can be adjusted towards or away from the bottom knife.

To adjust the cylinder towards the bottom knife, i.e. to reduce the cutting gap, turn the cylinder adjusting screws clockwise.

To raise it from the bottom knife, i.e. to widen the gap, turn the adjusting screws anti-clockwise, taking care to ensure that both sides are uniformly adjusted. Usually a 1/16 or 1/8 turn of the spindle adjusting screw is sufficient.

**Note:** Turn the left and right adjusting screw uniformly only one division on the scale at a time, then check whether the cylinders rotate freely by turning them manually. If the setting is correct the cylinders should not make contact with the bottom knife.

The correct adjustment of the cylinders must now be checked again after tightening the clamping screws (5 and 8). The cylinder units are sharpened and correctly adjusted if they cut through **one** layer of a **double layer** of newspaper along the entire width. The second, uncut layer shows that the cutting gap is adequate. If this is not the case and this cannot be achieved by readjustment, the units must be lapped (see section "Lapping").

If, inadvertently, the adjustment is too tight, unscrew the cylinder adjusting screws uniformly anti-clockwise by one division each. If the knife cylinder does not lift from the bottom knife it is advisable to lever it upwards with a suitable piece of wood inserted between the bottom knife carrier and the cylinder. After adjustment, retighten all the clamping screws (5 and 8).

## Lapping the cylinders

Knives that no longer cut well can be resharpened by "lapping".

The following items are required:

1. Lapping paste No. 54985
2. Lapping paste No. 54986

These aids are supplied with the machine as standard.

For lapping the cylinders must rotate against the working direction (i.e. in reverse) at as low a speed as possible.

Proceed as follows:

- Secure the machine by applying the hand brake, shift the F/R operating lever to neutral, **switch off the engine**.
- On the cutting assembly to be lapped, adjust the cylinder until it lightly touches the bottom knife in accordance with the section "Readjustment".
- Switch on the engine and let it idle.

- Using the brush, apply a uniform coating of lapping paste to each reverse-rotating cylinder over its entire width and then adjust it uniformly as required with the adjusting screws. Repeat this procedure until a **double layer** of newspaper can be cut through at **one stroke** over the entire width of **each knife (in forward rotation)**. Keep a safe distance!
  - After lapping, thoroughly wash the lapping paste off the cylinders with water, ensuring that no traces of abrasive remain on the cylinders.
  - The projections forming at the extreme right and left ends of the bottom knives after lapping must be removed with a bastard file to ensure faultless running of the mowing cylinders.
  - After finishing the lapping procedure the cylinder units must be raised to approx. half height by operating the control lever. This automatically changes the direction of rotation of the mowing cylinders. The mowing cylinders can now be lowered into the mowing position again.
- Lapping, of course, cannot remove jagged edges or excessive unevenness. In such cases the mowing cylinders must be correctly sharpened on a cylindrical grinding machine and the bottom knives on a surface grinding machine.
- Correct care and maintenance of the mowing mechanism will be rewarded by long service life and high cutting efficiency.

### Mowing cylinder ground pressure (front cylinder only)

The pressure of the mowing cylinders on the ground can be adjusted with the aid of the balance springs. If the pressure is to be increased, the springs must be relaxed, if it is to be reduced, the tension of the springs must be increased.

The spring tension on the front cylinder is adjusted as follows:

1. Start the engine and bring the front mowing cylinder into transport position.
2. Unscrew the hex. nut (Fig. 3) on the spring adjusting plate. Remove hex. screw (Fig. 4) (use spring tensioner supplied (Fig. 1) to overcome the spring tension).
3. Turn the right spring adjusting plate (Fig. 2) with the aid of the spring tensioner according to the ground pressure required.  
Turning the adjusting plate to the front **increases the spring tension and increases the ground pressure** turning it to the rear **reduces the spring tension and increases the ground pressure**
4. Rejoin the adjusting plate and the lifting lever with the mounting screw and the hex. nut.
5. Adjust the spring tension on the left spring adjusting plate in the same way.

As the mowing cylinder on the right side is heavier (front hydraulic motor) the spring tension here must be a little higher (turn the spring adjusting plate one hole further to the front).

**Note:** The sharp edges of the mowing cylinder knives are extremely dangerous if not handled correctly. For this reason the guard plates on the mowing cylinders must only be removed for mowing and immediately replaced after work is finished. The grass deflector plates on the side cylinders must also be fitted to the trailing rollers.

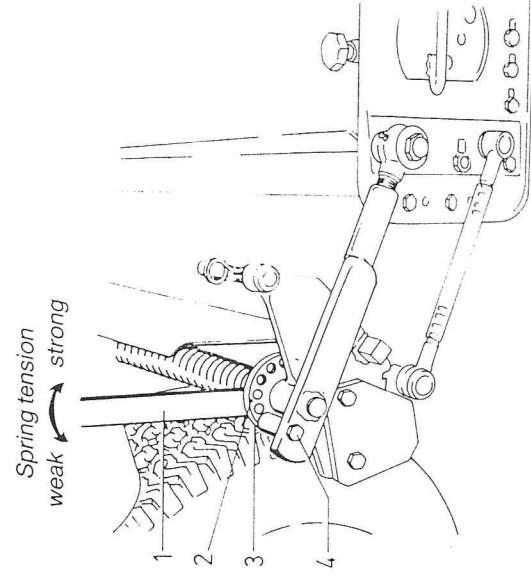


The control valve operating levers must be switched to neutral **before transporting the mower** and must be locked in place. The mowing cylinders must be raised and mechanically locked.

Extreme care must be taken when working on the cutting units. Persons and animals must be kept a safe distance away from the rotating cylinders.

#### Accident hazard:

The triple cylinder mower must be handled in accordance with the prevailing terrain and ground conditions. Particular care must be exercised when working and turning on slopes. Never declutch or change gear on slopes.



- 1 Spring tensioner
- 2 Spring adjusting plate
- 3 Hex. nut
- 4 Hex. screw

## Care and Maintenance (basic machine)

Apart from the operating instructions for the triple cylinder mower it is equally important to observe the following instructions on care and maintenance:

- Grease all **lubricating** points in accordance with the lubrication chart. Grease must visibly emerge.
- The oil in the **gear pump drive** must be changed after the first 25 and then after every 600 operating hours. The oil drain screw is located on the left bottom side (X/14). Remove the oil dipstick (X/10) to check the oil level. For inlet point see X/8. For amounts required refer to "Technical Details" (change the oil only when the engine is warm).
- Change the oil in the **worm gear unit** after the first 25 and then after every 600 operating hours. The oil drain screw is located at the engine end on the worm gear housing. For location of inlet see X/1.
- When changing the oil the mower should be raised slightly to enable the old oil to drain completely. (Change the oil only when the engine is warm).
- For the amounts required refer to "Technical Details" (Oil dipstick = X/1).
- Remove the **air filter preseparator** from the engine hood and wash it in cleaning agent and water (do not use petrol). (After every 25 operating hours or daily if dust deposits are high).

### Hydraulic system

In order to ensure that the oil level in the hydraulic oil equalization tank does not drop below the bottom mark a level switch is provided.

The control lamp (installed in the instrument panel) lights up when the oil level is too low.

After each replacement of the hydraulic oil (oil change) the hydraulic oil system must be vented.

#### **Cleanliness is of the greatest importance when carrying out any work on the hydraulic system.**

Even slight contamination in the oil can have an adverse effect on the function and the service life of the hydrostatic transmission. It is essential that any work on the hydraulic system, details of which cannot be given here, should be performed only by trained personnel.

Use only hydraulic oil ATF Dexron. Amount required: 20 litres.

### Changing the oil and the oil filters

Drive with the left front wheel onto an approx. 10 cm high wooden wedge.

Lower the mowing cylinders.

Remove the screw plug at the **bottom** of the hydraulic tank.

Properly collect and dispose of the old oil.

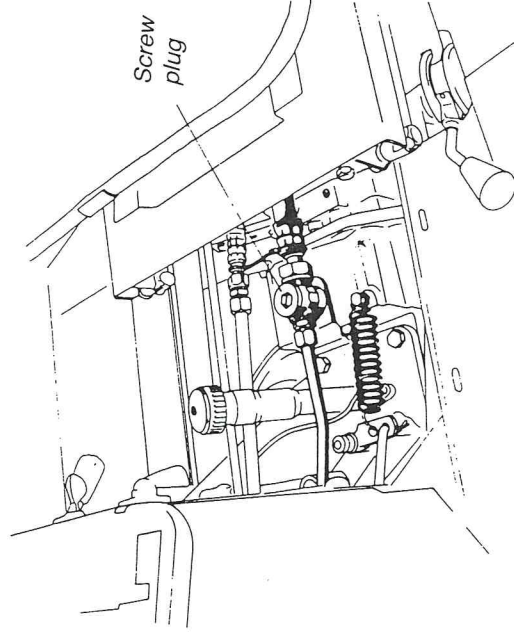
Replace all 3 screw type filter cartridges and ensure that all new rubber seals are lightly oiled before screwing in the new cartridges.

#### **Caution! Do not start the engine without oil in the hydraulic system!**

To fill in the oil, screw the air filter out of the equalizer tank and remove the sealing plug from the oil cooler and unscrew the screw plug (see adjacent sketch).

Alternately fill in hydraulic oil into the equalizing tank and the oil cooler. When the oil level is visible in the oil cooler, replace the sealing plug. Continue to fill the equalizer tank with oil until the oil level no longer drops below the dipstick (replace the screw plug).

Let the engine run for a while with the mowing cylinders switched on until the hydraulic system is vented to the point where the oil level in the equalizer tank remains constant. If necessary fill in oil up to the bottom edge of the dipstick.



#### **Intervals between oil and filter changes:**

Filter after 25 hrs. then every 200 hrs.

Oil the first time after 25 hrs. then every 600 hrs. If only the oil filters are changed top up with oil.

Normally the oil level should remain unchanged during the operating period. If it drops, there must be a leakage in the system which must be remedied immediately.

If the triple cylinder mower is subjected to heavy duty work the oil level may rise due to the heat expanding the oil but it will return to normal as soon as the oil has cooled again.



The hydraulic system is under constant high pressure!

When searching for leakages take the necessary precautions to prevent injury and use suitable aids!

Always depressurize the system and lower the mowing cylinder before working on the hydraulic system!

Before working on the hydraulic system always switch off the engine and prevent the mower from rolling away (apply hand brake and chock the wheels!)

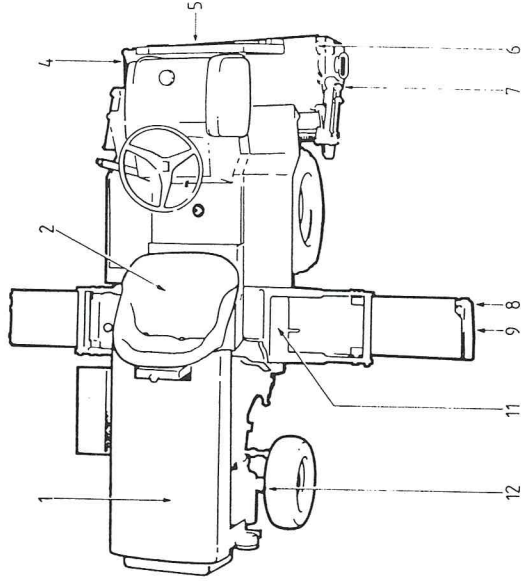
When connecting hydraulic cylinders and motors ensure that the hydraulic hoses are connected as specified! Note that when the hydraulic connections are switched, their function is reversed (e.g. raising/lowering) – accident hazard!

Regularly check the hydraulic hoses for damage and aging and replace if necessary! The hydraulic hoses must be replaced every 5 years. Pressure hoses if possible every 3 years. The replacement hoses must meet the requirements of the equipment manufacturer!

Never unscrew or tighten screw unions in the hydraulic system as long as it is under pressure.

Before disconnecting screw unions thoroughly clean their surroundings. Immediately seal all openings with rubber plugs to prevent oil escaping and dirt from entering the system.

## Location of grease nipples



- 1 Grease nipple for axle pivot pins (1 x)
- 2 Grease nipple for cardan shaft (2 x)
- 4\*) Grease nipple for mowing cylinder bearing, left (1 x)
- 5\*) Lubricating bar
- 6\*) Grease nipple for mowing cylinder bearing, right (1 x)
- 7 Grease nipple for lifting arm, top (2 x)
- 8\*) Grease nipple for side mowing cylinder bearing, left (2 x)
- 9\*) Grease nipple for side mowing cylinder bearing, right (2 x)
- 11 Grease nipple for side cylinder carrier (2 x)
- 12 Grease nipple for axle journal (2 x)

\* = Do not use a high-pressure grease gun!

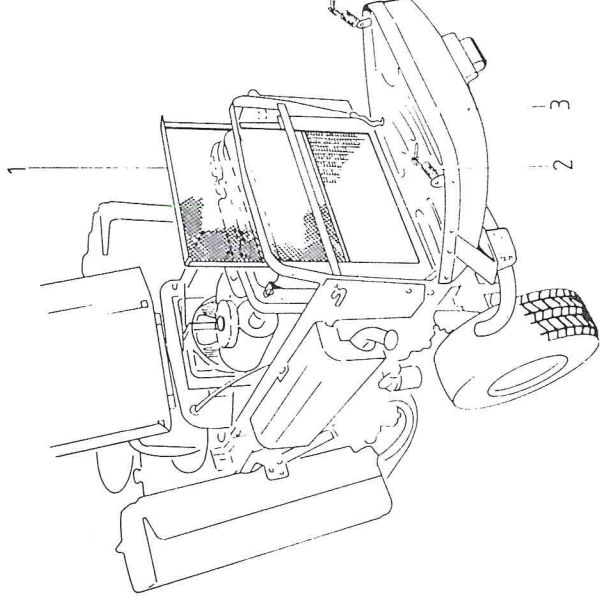
**Note:** The cardan shaft (No. 2) only needs to be greased once a year during the winter service.

Ensure that the bearing points are correctly and thoroughly greased (with multi-purpose grease)!

Always grease the steering axle in no-load condition, i.e. with the mower raised.

Before greasing, wipe the nipples with a rag to prevent dirt particles from entering the nipples. Continue to press in the grease until new grease begins to emerge at the edge of the lubricating points, forming a so-called grease collar.

Do not wipe away this grease collar, it protects the bearing points from outside ingress of water and dirt.



To obtain better access to the water cooler the rear cover (3) can be hinged open. To do so, unhook the two springs (2).

The oil and the water cooler as well as the radiator wire screen (1) are to be cleaned daily.



## Maintenance tasks

**Note:** Apart from the maintenance tasks listed here it is essential for the tasks given in the maintenance manual to be performed also.

	Daily	Intervals in operating hours				
		25	50	100	200	600
First differential gear oil change		X				
Thereafter every						X
First oil change in geared oil pump drive		X				
Thereafter every						X
Oil level in hydraulic oil tank			X			
First hydraulic oil change		X				
Thereafter every						X
Clean air filter preseparator		X				
If dust deposits are high	X					
First hydraulic oil filter change		X				
Thereafter					X	
Grease grease nipples) <sup>1</sup>		X				
Check sharpness of knife cylinder	X					
Blow out water and oil coolers	X					
Clean cooler screen	X					
Check hydraulics system for leakage	X					
Check tyre pressure		X				
Check battery					X	
Retighten pressure lines of hydraulic system					X	
Retighten all nuts and bolts		X				

With new wheels or a new machine the wheel bolts/nuts must be checked after the first 2 operating hours and retightened, if necessary. Otherwise always during servicing.

### Tightening torques:

Front wheels (M 16 x 1.5) – 180 Nm (18 mkp)

Rear wheels (M 12 x 1.5) – 100 Nm (10 mkp)

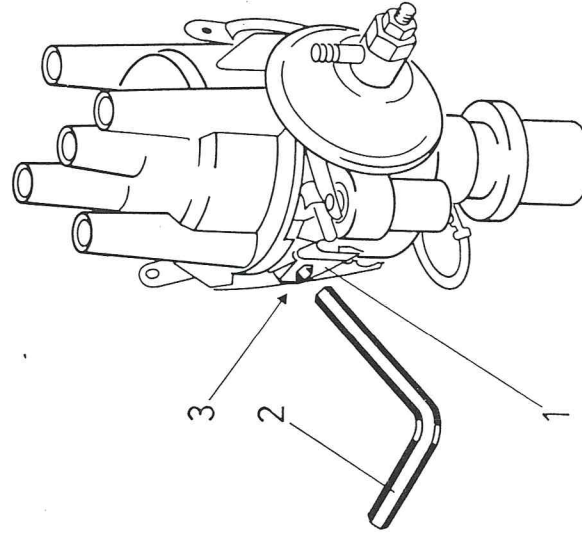
During the first maintenance service (inspection) retighten all hose clips.

<sup>1</sup> = **Note:** The cardan shaft (Fig. 2) needs greasing only once a year during the winter service.

## Care and Maintenance

### (Four cylinder, four-stroke petrol engine)

The carburettor adjustment must be carried out in a qualified workshop.



### Adjusting the

### contact breaker gap

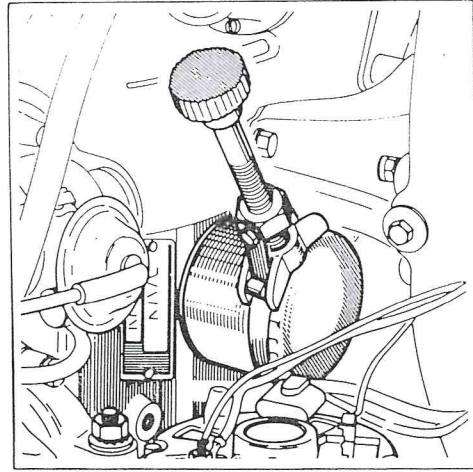
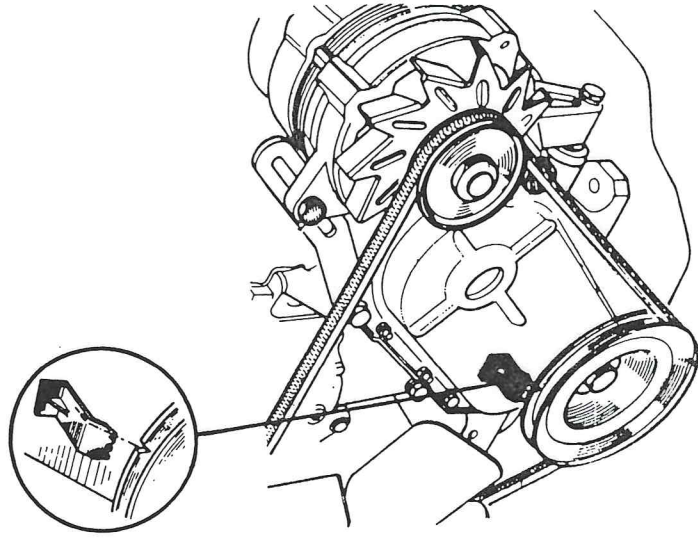
Proceed as follows:

1. Push back the cap (1),
2. Insert an Allen key (2) into the opening (3) and adjust the contact gap by turning the key to left or right.
3. Replace the cap on opening (3).

### Ignition timing adjustment

After adjusting the contact breaker gap the ignition timing must be reset. The ignition timing is given on one of the sparking plug cables. The ignition point is marked on the V-belt pulley as shown above.

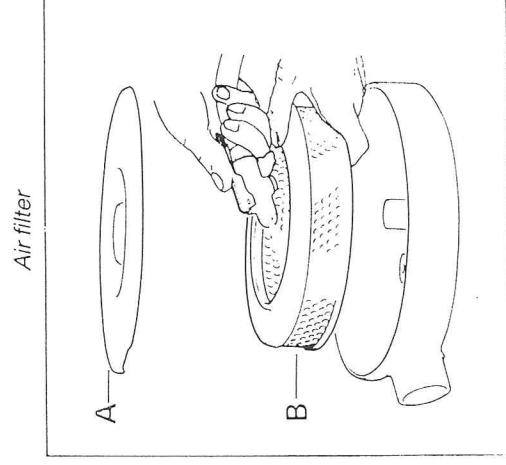
An additional ignition timing mark is provided on the second V-belt pulley. The relevant indicator is screwed on to the motor.



### Replacing the engine filter

- Oil the gasket
- Screw in the filter until the gasket lies flush against the casing
- Tighten approx.  $\frac{1}{4}$  of a turn
- Slacken off and retighten until the gasket lies flush against the casing. Then tighten  $\frac{1}{2}$  to  $\frac{3}{4}$  of a turn.

Check during operation to ensure that no oil leaks.



Air filter

### Replacement of air filter

Remove cap A. Replace filter insert B.

### Cleaning the air filter

Blow with compressed air under low pressure, as shown in the illustration.

**Note:** These tasks are to be performed at shorter intervals if the air contains a great deal of dust.

### Tightening torques:

**Four cylinder, two-stroke petrol engine** (Renault 688-7/45)  
 Cylinder head: 65 Nm (6.5 mkp)  
 Flywheel: 50 Nm (5.0 mkp)  
 Connecting rod bearing: 45 Nm (4.5 mkp)  
 Crankshaft main bearing: 55 - 65 Nm (5.5 - 6.5 mkp)

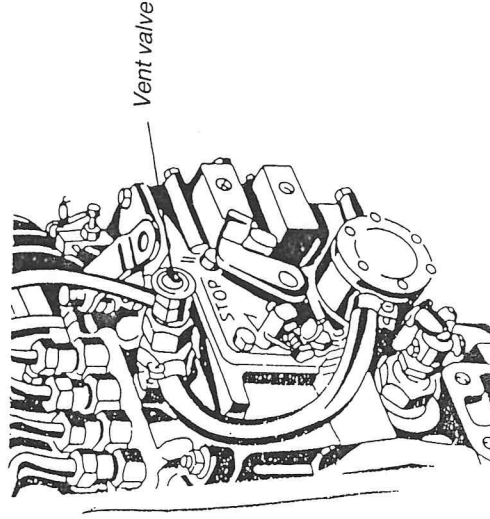
### Maintenance tasks

	Intervals in operating hours						
	Daily	25	50	100	200	400	600
Check oil level (and before each operation)	X						
1st engine oil change		X					
Thereafter every			X				
1st engine oil filter replacement		X					
Thereafter every					X		
Check cooling water level (fill up with distilled water only)	X						
Change the cooler cleaning agent and coolant every 12 month approx. 2½ ltr. anti-freeze (such as BP-antifrost) and then top up only with distilled water				X			
Check V-belt tension			X				
Clean air filter (blow out lightly)				X			
Replace air filter: insert					X		
1st valve clearance check	X						X

– Start the engine.

– Open the vent valve on the injection pump. As soon as fuel emerges bubble-free, close the valve again.

Except when venting, the vent valve on the injection pump must always remain closed, otherwise the engine will stall.

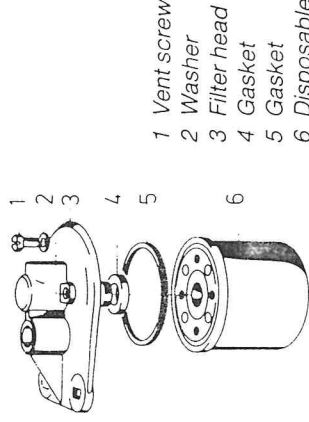


### Fuel filter

The screw-on filter (disposable filter cartridge (6)) is to be replaced for the first time after 200 operating hours, then every 400 operating hours. Before unscrewing the filter, disconnect the fuel pipe from the fuel tank.

The new filter cartridge should only be screwed in moderately tight by hand (ensure that the seal (5) does not leak!).

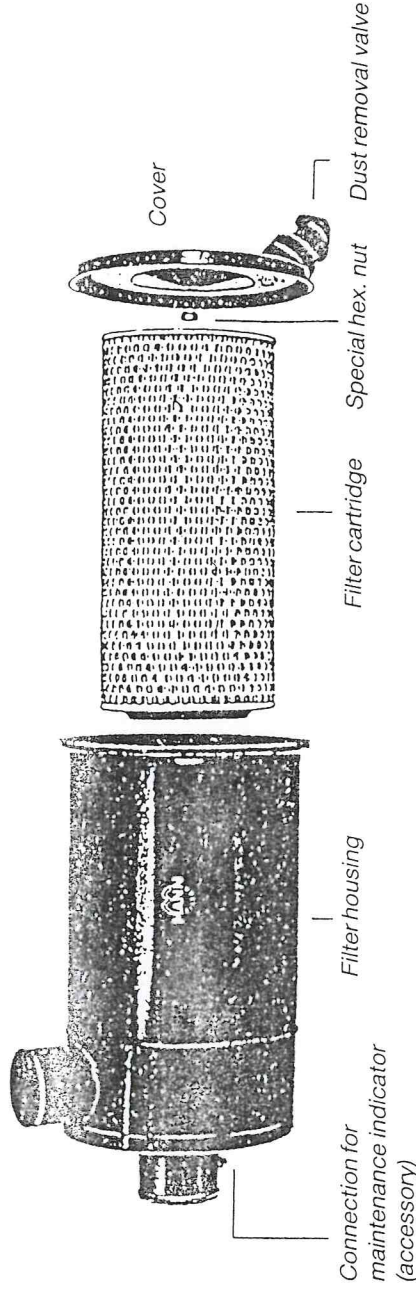
After replacing the filter the entire fuel line up to the injection pump is to be vented in accordance with the description.



- 1 Vent screw
- 2 Washer
- 3 Filter head
- 4 Gasket
- 5 Gasket
- 6 Disposable filter cartridge

### Servicing the dry air filter

The dry air filter is designed as a combination air filter in which a cyclone type preseparator is installed between the filter cartridge and the filter housing. In addition the air filter is equipped with a dust removal valve. The arrow mark on the filter cover must point upwards.



### Care and Maintenance

#### (Four cylinder, four-stroke diesel engine)

##### Venting the fuel supply system

Venting of the fuel supply system is necessary:

- after the fuel filter and the fuel lines have been removed and replaced;
- after the fuel tank has been run dry, or
- before the engine is used again after a long outage.

##### To vent the system proceed as follows:

- Fill up the fuel tank (open fuel cock)
- Slacken off vent screws on fuel filter. As soon as the fuel emerges free of bubbles, retighten the screw.

## Maintenance

Ensure that the engine is at a standstill before performing any maintenance work on the air intake system. Do not start the engine when the filter cartridge is removed.

The **dust removal valve** is practically maintenance-free. Any tightly-packed dust deposits are removed by compressing the valve.

The **filter cartridge** must be replaced after approx. 400 operating hours, at the latest, however, after one year. The safest, quickest and cleanest way to service the filter is to replace the fouled filter cartridge with a new one. During the replacement intervals the filter cartridge can be cleaned by blowing out the dust up to 3 times. To do so, place the compressed air gun on a tube, the end of which is bent approx. 90°. It should be long enough to reach to the bottom of the cartridge. Blow dry compressed air (max. 5 bar) through the cartridge from the inside to the outside by moving the tube up and down in the cartridge, until no more dust develops.

Before its reinstallation check the cleaned cartridge for damage, for instance to the paper bellows, to the rubber seals, and for crushing or denting of the metal casing etc.

Cracks and holes in the paper bellows can be detected by shining a light through the paper with a hand lamp.

Never use damaged cartridges. If in doubt, replace the cartridge with a new one.

Do not tap the filter cartridge clean.

**Note:** If a maintenance indicator is screwed onto the filter casing (order No. 61760) filter maintenance is only then necessary when the maintenance indicator is engaged – red field visible when the engine is switched off. After the filter maintenance has been carried out the red field should be released by pressing the reset button.

## Maintenance tasks

	Intervals in operating hours					
	Daily	25	50	100	200	400   600
Check oil level (and before each operation)	X					
1st engine oil change		X				
Thereafter every (after changing over to another oil type change the oil the 1st time after 35 hrs. then every 100 hrs.)			X			
1st engine filter change		X				
Thereafter every			X	X		
Check V-belt tension				X		
1st fuel filter change					X	
Thereafter every					X	X
Change dry air filter cartridge						X
Clean complete cooling system (blow out cooler etc.)	X					
1st valve check		X				
Thereafter every						X
Check cooling water level	X					
Change cooler cleaning agent and coolant every 12 months. approx. 2½ ltrs. anti-freeze (such as antifrost), top up only with distilled water.						



**The cylinder head must not be retightened.**

Do not let the engine run in a close room – the fumes are toxic!

Always operate the starter from the driving seat, never short-circuit the battery!

Always switch off the ignition to stop the engine!

Do not switch off the engine at high speeds!

Ensure that the engine is at a standstill before performing any maintenance work on it!

Always disconnect the battery ground strap (negative pole)!

Secure the triple cylinder mower with the parking brake. Use wheel chocks on slopes – remove the ignition key!

Ensure that the engine is switched off before refuelling – no smoking!

Ensure that the oil and fuel are of the specified quality and that both are stored only in approved containers!

Take care when draining hot oil to protect against burns!

Ensure that drained oil is correctly disposed of!

### Tightening torques:

**Four cylinder, four-stroke diesel engine** (Kubota V1200-B)

Cap nut – valve cover: 7 - 9 Nm (0.7 - 0.9 mkgp)

Cylinder head bolts and hex. nuts:

M 8 x 1.25 40 - 45 Nm ( 4 - 4.5 mkgp)

M 9 x 1.25 66 - 71 Nm (6.6 - 7.1 mkgp)

Flywheel bolts:

M 10 x 1.25 55 - 60 Nm (5.5 - 6.0 mkgp)

Crankshaft nut:

M 20 x 1.5 140 - 160 Nm ( 14 - 16 mkgp)

Connecting rod bolts:

M 7 x 0.75 27 - 31 Nm (2.7 - 3.1 mkgp)

Take care when removing the radiator cap. The coolant is under pressure and scalding hot! Unscrew the radiator cap up to its stop, then release the pressure before removing the cap completely! If the cooling water temperature is excessive, determine and remedy the cause before continuing work!

The engine must be switched off and at a standstill before draining the coolant!

Ensure that the correct coolant is filled into the cooling system!

After completion of maintenance work ensure that all guards are fitted correctly!

When working on the wheels ensure that the mower is secured against rolling away (wheel chocks)!

When working underneath the chocked up mower ensure that no persons are on it!

Repairs to tyres may only be performed by qualified persons using the proper tools!

Beware of excessive tyre pressure – explosion hazard!

Check the tyre pressure regularly!

Ensure that all wheel nuts and bolts of the front and rear wheels and the track adjusting elements are retightened in accordance with the manufacturer's instructions!

The wheel nuts and bolts must also be retightened after every track adjustment and after every wheel change.

If the machine is not to be used for a lengthy period the battery must be kept fully charged with a fresh preserving current of approx. 0.06 Amp., or its charging state checked at monthly intervals and fully recharged if necessary (do not forget to disconnect the battery ground strap beforehand).

**The battery must never be left fully discharged.**

## **General**

Ensure that all **V-belts** are correctly tensioned.

Oil all **moving parts** at regular intervals.

**Occasionally check all nuts and bolts to ensure that they are tight.**

If the triple cylinder mower is not to be used for a lengthy period of time:

- a) thoroughly clean the machine, check all parts and replace as necessary.
- b) Chock up the mower so that the wheels do not rest on the ground. Pneumatic tyres become unserviceable in a very short time if left without air under load.

Ensure that the reversing lever (XI/1) bearing has no play (check when servicing the machine).

Adjust the stop screws (VII/3) such (grease them slightly beforehand) that when the machine is chocked up and the rear wheels are removed, the bearing block can still be easily moved up and down.

## **Maintenance instructions for the battery:**

Check the **acid level of the battery** regularly, in warm weather more frequently, and top up with distilled water as necessary. The acid level should be approx. 1 cm above the top edges of the plates.

The manual “Repair guidelines“ for the triple cylinder mower is available under the Order No. 997102.

# Wiring diagram

