



Hako

Instruction Manual

Hako-Citymaster 1800 TDI (1199.00/1199.02)

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Please note positively that Hako cannot accept any legal claims which are referred to the explanations given in this manual.

In case of any possibly necessary repairs, please make sure that only genuine spare parts are installed, since only genuine spare parts will give you the assurance that your machine will be reliably ready to operate at all times.


We reserve the right for technical improvements.

Valid from
Chassis No. 1199.00.2.0101.1

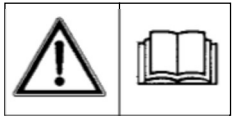
Hako-Werke GmbH
D-23843 Bad Oldesloe
Hamburger Str. 209-239
Phone (04531) 8060

Congratulations !

You decided for the dependable and comfortable Hako-Citymaster 1800 TDI. This vacuum sweeper was designed under particular consideration of aspects of our environment for use on roads, footpaths and in public areas. Performance and service life of your machine are a direct function of proper operation, servicing and maintenance. The instruction manual is located behind the driver's seat.

Before first operation read these instructions carefully. The manual will inform you in detail about operation of the machine and provides valuable information about service and maintenance with "Caution" and the symbol  as used in this manual identifies items relevant to safety. Please make sure to pass all safety instructions to other operators.

Prior to first operation of this machine, read the manual carefully and strictly comply with the instructions contained.



Please also refer to the General Safety Provisions (page 45).

The present Owner's Manual deals with the Hako-Citymaster 1800 TDI and includes information about the optional handheld suction hose and extra water pump. For more options, as for example the oxidative catalyst, A/C installation, high-pressure water jet installation, please go by the separate Owner's Manuals issued for these items.

Proper use

This sweeper has been designed for sweeping roads, parking grounds, foot-paths and similar areas and for collecting dry and moist residues normally found in such places under normal road and weather conditions.

Using the machine beyond this scope of application will be deemed improper use; the manufacturer cannot be held liable for consequential damage; such use would be at the owner's sole risk. The machine must not be used for collecting poisonous, flammable or other substances hazardous to health.

The term of proper use also includes operation, maintenance and repair work to be performed in compliance with the manufacturer's specifications. The sweeper may be used, serviced and repaired by personnel only that is familiar with the machine and aware of possible hazards involved.

Accident Prevention Regulations, and all other aspects of safety and working medicine will have to be complied with, this also includes pertinent road traffic regulations.

If modifications to the machine are made in absence of the manufacturer's prior consent, the latter cannot be held liable for damage resulting from such unauthorized modification.

Acceptance of the machine

Upon receipt, check machine for possible damage in transit. For refund of such damage have Deutsche Bahn AG or your freight forwarder confirm such damage; mail notification and waybill to:

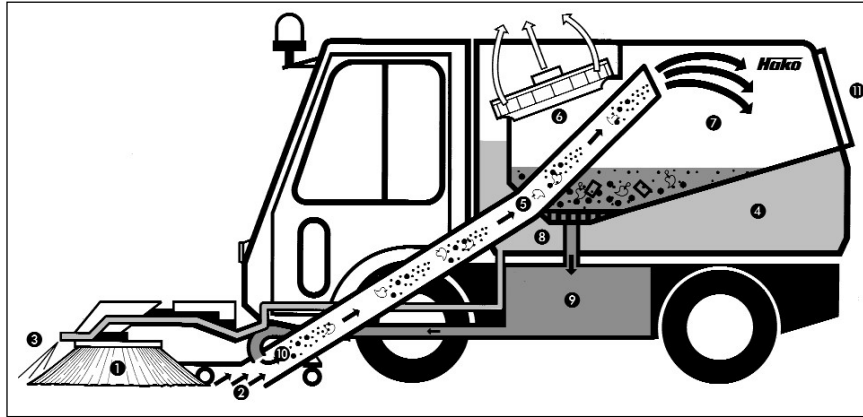
Hako-Werke GmbH
Hamburger Str. 209-239
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Service plan for VW-Diesel engine

The service plan is packed with your machine. In your own interest make sure that this service plan is filled out at acceptance. Warranty for this VW Diesel engine under the Terms of Warranty as stipulated on this service plan will commence the day the machine is delivered to the customer.

Notes on warranty

The terms of the sales contract apply. Damages are not subject to warranty if they are due to non-compliance with the maintenance and service provisions. Any maintenance work has to be performed by an authorized Hako service work-shop and confirmed in the "maintenance certificate" which is the warranty document. The following is excluded from warranty: natural wear and tear after overload and damages caused by inexpert handling and unauthorized modification of the machine. Moreover, any claim for warranty cannot be accepted if damages at the machine are caused by fitting of parts or accessories without Hako's prior and explicit consent or by non-compliance with the maintenance instructions.



Operating principle

- 1 hydromotor-powered plate brushes sweep garbage
- 2 into a full-width intake duct, running on rollers
- 3 a water spray system as part of the sweeping brushes effectively reduces formation of dust
- 4 the water spray system is fed from a big-size water tank
- 5 through a suction duct with overdimensioned cross section,
- 6 a multi-stage suction turbine routes garbage into a
- 7 stainless steel hopper
- 8 water contained in the garbage is drained from the hopper through a screen and is returned into
- 9 the recirculating water tank
- J this water is reused, i.e. distributed by a spray nozzle in the suction duct, to bind dust
- K for dumping, this hopper swings back by hydraulic power. Dumping height and width fit standard garbage containers.

Special safety instruction for use on public roads



When slowing down the Citymaster 1800 TDI on public roads by releasing the accelerator pedal, equally actuate the brake pedal. This activation is mandatory for safety reasons since then the stop lights alight to inform the following road users that the vehicle slows down.

Road traffic regulations

Before using the machine on public roads, make sure to comply with national traffic regulation, in particular with regard to type approval, driver's license mandatory, arrangement of warning plates or stickers when using a rotating beacon.

General Safety Provisions

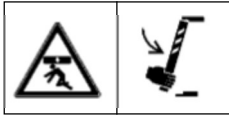
Apart from the instructions contained in this manual, the general safety instructions and accident prevention regulations, as imposed by law, e.g. BGV D29 (former VBG 12), will have to be complied with. Do not put the Owner's Manual aside without reading it, even if you used similar sweepers before. Take time to read it now and save time later.

Prior to operation make yourself familiar with all systems and controls and "where they arrive". Avoid the mess of having to read this book while trying to run the machine. The instruction manual has to be kept onboard

The Hako-Citymaster 1800 TDI may be run by skilled personnel only; such personnel will have to have evidenced their qualification for running the machine to the owner or his authorized representative; operators explicitly will have to be instructed by the owner or his authorized representative to use the machine.

- the instruction manual has to be kept onboard
- never leave machine unattended with the engine running;
- the operator must not leave the machine unless having stopped the engine and secured the machine against unintended movement, having closed the parking brake and removed the ignition key;
- to secure machine against unauthorized use, remove key and lock door;
- the operator has to run the machine within its design limits; when driving the machine account for local conditions and watch out for other persons, in particular for children.
- when doing transportation rides, make sure dirt hopper is in low position; lift hopper for dumping only; before lifting, operator has to make sure that the area behind the hopper is clear of persons or objects; place machine on solid and level ground before lifting the hopper;
- keep clear of hazard zone;
- warning and instruction stickers attached to machine contain important information about safe operation;

Replace illegible or missing warning and instruction labels.



Caution! To avoid contusion hazard maintain adequate safety clearance when lifting and lowering the hopper;

- before commencing work, the operator has to make sure the machine and its accessories are in proper and safe condition. Machines with known defects must not be used;
- the machine may be started and stopped by the driver seated only;
- before starting engine, stop all drive systems.
- avoid filling fuel tanks while engine is running; do not smoke or handle open flames when filling fuel tanks or working in the vicinity of the fuel system
- a good approach to prevention of accidents is proper maintenance of the machine;

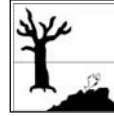
- before commencing a cleaning or servicing job on the machine, make sure engine does not run and key is removed;
- Only stop the engine from a high speed range in case of malfunctions and only after the suction turbine has been turned off.
- use appropriate tools for servicing, maintenance and adjusting work;
- as far as aspects of safety are concerned, spares will have to be at least of the same quality as genuine parts;
- when working under the lifted hopper, this item has to be secured with a jackbar; make sure hopper jackbar is installed;
- in compliance with para. 57 BGV D29, the Hako-Citymaster 1800 TDI has to be serviced in regular intervals and inspected for safe condition not less than once a year;
- before commencing any work on the electric system, disconnect battery (negative lead);
- never use open flames when handling batteries, in particular when checking the electrolyte level;
- charger rooms should be adequately ventilated.
- spilled (straight) battery acid must not get into the sewer before having been neutralized. Comply with regulations imposed by law and local regulations;
- never run the Hako-Citymaster 1800 TDI in absence of proper safety installations;
- a second person may be transported only if machine is equipped with a second seat; transport of other persons is not admitted;
- do not exceed the admissible weight and admissible axle load limits (even with reduced loading);
- the implements have to be attached at the indicated points;
- use of a mobile phone will require to stop machine; an external antenna is mandatory;
- before remedying a clogged suction hose, turn the engine off and wait until the suction turbine stands still.

Safety information on retrofitting electric or electronic systems or components

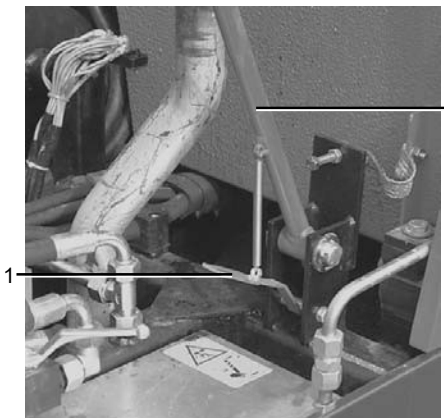
The machine features electronic components that might be influenced by electromagnetic radiation from other systems. Such influence might involve personal hazards if the following safety information is not complied with. When performing retrofit actions, i.e. installation of electric and electronic systems and/or components it will be the operator's sole responsibility to determine whether such installations interfere with the vehicle's standard electronic circuits or other components. Electric and electronic components so installed will have to comply with EMC-Rule 89/336/EWG and its revisions and be marked CE.

When installing mobile communication systems (e.g. transceivers, mobile phones) the following requirements have to be met in addition:

- only items approved by the national authorities (e.g. in Germany a BZT license) may be installed;
- the items have to be installed in a firm place
- use of handheld or mobile systems inside the vehicle will require use of an external antenna;
- transmitter module is to be installed in adequate distance from the vehicle's electronic circuits;
- for antenna installation it will be important to establish good contact between antenna ground and vehicle ground.



Caution! Collect oil and fuels and dispose. Pollution of ground water! Do not let fuel, hydraulic oil other media penetrate the soil. Wipe away spilled substances. Do not check or maintain the machine with the engine running! Collect operating fluids and filter and provide for disposal of these media in accordance with the regulations imposed by law.



- 1 lock
- 2 jackbar

Briefing

Detailed briefing is recommend before first operation of the machine. First operation of the Hako-Citymaster 1800 TDI has to be performed by a service engineer of your local Hako-distributor. Right away after shipping the machine, we advise your distributor: He will contact you to make a date for briefing lessons.

First operation

Before first operation of the Hako Citymaster, check the following:

Dirt hopper jackbar

A jackbar (2) is located at the right behind the driver's cabin. It extends automatically when the hopper is lifted. Before lowering the hopper, swing this jackbar to a vertical position and lock in place with lever (1). Otherwise, this jackbar would get stuck under the hopper.

Fuel



Avoid filling fuel tanks while engine is running; do not smoke or handle open flames when filling fuel tanks or working in the vicinity of the fuel system. Fuel tank is located on the left, behind the driver's cabin. The filler neck is accessible and the filler cap lockable by key.

Note : Make sure to wipe away spilled fuel and tightly close the cap.

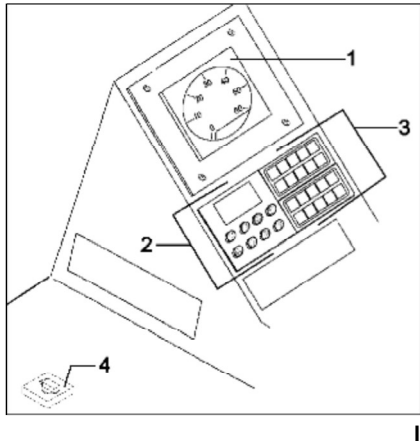
Engine oil

Engine oil has been filled in the factory. Check oil level (refer to page 60).

Note: use clean oil and fuel only; store oil and fuel in approved and closed containers only.

Hydraulic oil

Hydraulic oil has been filled in the factory. For reasons of safety check oil level with gauge glass; for this check lift hopper and secure with jackbar. Black floater has to float in the upper area of the gauge glass.



- 1 speed indicator
- 2 multi-function display
- 3 pilot lights
- 4 Summer/winter switchover

Operation

Controls

- 1 Speed indicator***
indicating the current travelling speed
* instead of speed indicator, installation of tachograph

2 multi-function display
displays the following functions in a 2-line display when depressing the following keys



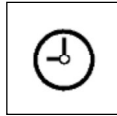
engine rpm



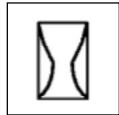
fuel level



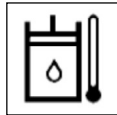
coolant temp.



time



hourmeter



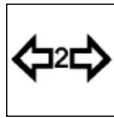
hydraulic oil temp.



distance traveled



void



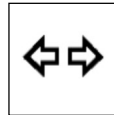
3 Pilot lights
Second directional flasher

light GREEN when a trailer or rear implement is attached and the directional flasher is working.

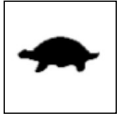


Hopper down
this RED light signals hopper up.

Caution: do not attempt to drive the machine when RED light is ON (except just before dumping).

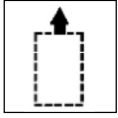


Directional flasher
lights GREEN when directional flasher is working



Creep speed
lights GREEN when creep speed is selected.

Note: will light during transportation ride only, not in sweeping mode



Forward travel
lights GREEN when forward speed is selected

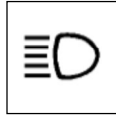


Travel mode indicator
lights yellow when travelling mode has not been released.

Note : Travelling mode released only after the driver is correctly seated (seat contact switch has reponded), the lamp then extinguishes. The pilot lamp also servers as monitouring device for correct functioning of the seat contact switch. If the lamp does not light after driver has left the seat, check the seat contact switch system.



Parking brake
lights RED when parking brake is closed

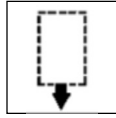


Hi-beam
lights BLUE when head-lights are in hi-beam mode

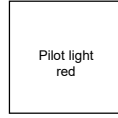


High speed
lights GREEN when high speed is selected.

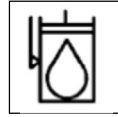
Note: will light during transportation ride only, not in sweeping mode.



reverse travel
lights GREEN when reverse speed is selected



overload
lights RED when hopper is an overload situation



Hydraulic oil level
lights RED when hydraulic oil level is low, the same time a buzzer sounds.

Note: float in gauge glass on hydraulic tank in low position

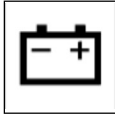


(red) brake fluid indication lamp

Alights in case of insufficient brake fluid level.



Immediately contact the nearest qualified brake service centre to have the brake system checked.

**Battery charge**

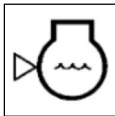
lights RED when battery has to be charged. Has to light when ignition is turned ON and dim when

engine fires

**Oil pressure**

lights RED if engine oil pressure is low. Has to light when ignition is turned ON and dim when

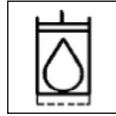
engine fires

**Cooling water/coolant level indicator**

serves as monitoring device of the filling level in the compensation tank.

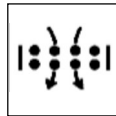
The lamp flashes red when filling level is insufficient.

Note : Flashing stops only after resetting ignition.

**Hydraulic oil filter monitor**

to monitor condition of hydraulic oil filter.

Note: this YELLOW light appearing during operation, stop machine immediately.

**Air filter indicator**

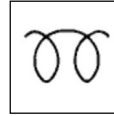
serves as monitoring device for the air filter. The lamps lights yellow if cleaning filter is required.

Note : Correctly clean air filter or replace.

Note : in case of high engine output the pilot lamp may alight shortly. Cleaning/replacing according to instructions is required only if the lamp lights permanently.



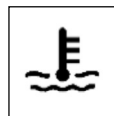
If the pilot lamp lights permanently at 3000 rpm when the machine is standing, proceed to cleaning /replacing of the air cleaner according to the instructions.

**Pre-glowing indicator**

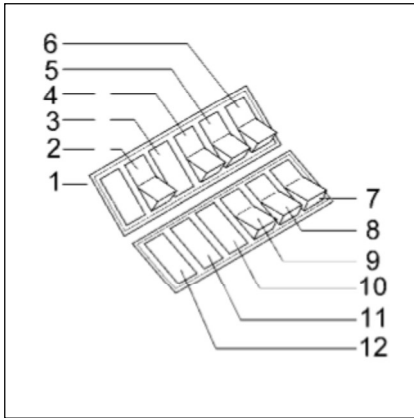
lights YELLOW when actuating the starter switch. Start cranking engine when this

light dims

Note : Flashing lamp signals error of the engine controller.

**Coolant temperature**

lights RED when coolant temperature overshoots limit



II

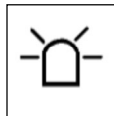
Functional switches:

- 1 Working floodlight (optional) or winter service (optional)
- 2 Rotating beacon
- 3 Air conditioning (optional)
- 4 Engine speed regulation
- 5 Suction turbine / sweeping mode
- 6 Suction mouth / accessory mount
- 7 Lighting
- 8 Hazard warning flasher
- 9 Heater fan
- 10 Additional water pump (optional)
- 11 Heated exterior mirror
- 12 Rear fog lamp for l-h steering version only (optional)

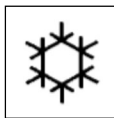


1 Working floodlight (optional) or winter service (optional)

turns the searchlight ON /OFF or the winter service implements such as front broom Yellow insert for winter service

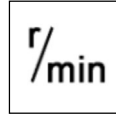


2 rotating beacon
turns the rotating beacon ON/OFF



3 Air conditioning (optional)
turns the A/C ON/OFF.

Please refer to the documents of the air conditioning system for further information.



4 Engine speed regulation
After switching on (II/5) the engine speed is automatically set to 1900

rpm. Speed can modified by up and down function in a range between 1900 and 2200 rpm.



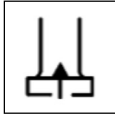
5 Suction turbine / sweeping

turns the suction turbine ON/OFF and activates sweeping operation the same time;

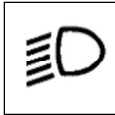


Switching the suction fan on and off after standstill of the machine.

Note: as soon as the motor is running, the suction turbine starts idling, even if the switch was not depressed



6 Suction mouth / accessory mount
lifts and lowers the sweeper and the accessory mount; shift forward = lower, shift approx.
3 seconds back = open coarse particle flap – collect coarse garbage.



7 Lighting
turns vehicle's lighting system ON/OFF

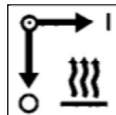
The switch (Fig.I/4) changes over standard lighting (including flashlights) of the device bottom to the device top.
The only exception are the lateral flashlights which assume their function as before.



8 Hazard warning flasher
turns the hazard warning flasher ON/OFF. A pilot light in the switch flashes RED when system is ON

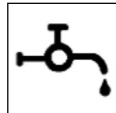


9 Heater fan
turns the heater fan ON/OFF depress forward end = fan OFF
whip horizontal = low speed
depress rear end = high speed



Heater control valve (not on display)
turns the heater ON/OFF; this valve is located at the

top end of the driver's cabin



10 Water pump
turns the water pump ON/OFF.
The water pump in turn supplies spray nozzles located in the brush arms and in the suction mouth. Valves (III/3) are used to adjust water flow.

1st stage
Standard water pump on/off

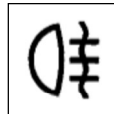
2nd stage
Additional water pump on/off

Note: to build-up water pressure, hold switch depressed for about 2 - 3 seconds.



11 Heated exterior mirror (optional)
turns the heating facility integrated in the mirror

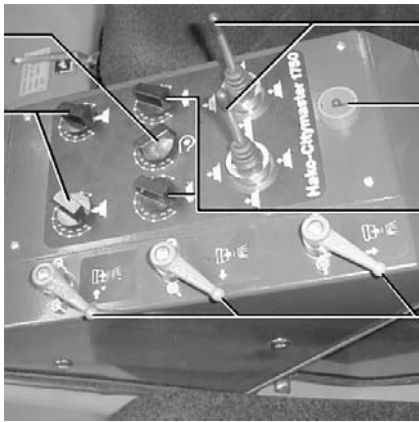
ON/OFF



12 Rear flog lamp (optional)
turns the rear fog lamp ON/OFF.

Note: This lamp is available in left-hand steering version only.

Additional water pump (optional)
turns additional water pump ON/OFF. We recommend to use this pump when working in dusty environment



III

- 1 Suction turbine speed control
- 2 Brush load controller
- 3 Water control valves (spray nozzles)
- 4 Brush speed control
- 5 Parking brake button
- 6 control sticks for plate brushes

1 Suction turbine speed control
controls suction turbine speed.
Adjust speed as a function of actual degree of soilage.
We recommend :

- step 5 - 6 for minor soilage
- step 7 - 8 for normal soilage
- step 9 - 10 extreme soilage

2 Brush load controller
adjusts brush contact pressure

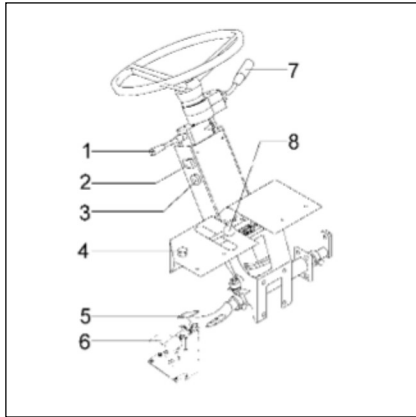
3 Water control valves
to turn spray valves ON/OFF and to control water flow to both of the brushes and suction mouth

4 Brush speed control
to control rotational speed

- 5 Parking brake button**
to actuate the parking brake
Caution: never actuate parking brake during traveling (damage to multiple-disc brake!). Parking brake won't unlock unless engine is running.
The lamp of the pushbutton extinguishes only 30 seconds after the ignition has been turned off.
Before leaving the machine with the engine running, engage the parking brake.
- 6 Control sticks for plate brushes**
to lower, lift and pivot the brushes

Windshield washer

The tank for the windshield washer is located behind the cabin. Lift hopper to get access to the filter neck.



IV

- 1 travel selector stick
- 2 dirt hopper switch
- 3 starter switch
- 4 12 V outlet
- 5 brake pedal
- 6 accelerator pedal
- 7 multi-function switch
- 8 steering column lock lever

1 Travel selector

to preselect direction of travel as well as low and high traveling speed

forward	= forward travel
central	= neutral
lever back	= return travel
lever up	= low speed
lever down	= high speed

Note:

The lever must not be used for slowing down speed.
Set the lever to "neutral" position on principle when the machine stands still with the engine running.

2 Dirt hopper switch

to lift / lower dirt hopper.
If the hopper is filled, increase engine speed.

3 Starter switch

to preglow, start and stop engine, secure against unauthorized use;

0	= engine and electric system OFF
1	= preglow until yellow light dims
2	= start; depress ignition key and turn CW until engine starts cranking

Note: an installed safety feature prevents double starting action.

4 12 V outlet

12 V outlet
to connect electrical equipments.

The cabin outlet has a connected load of 90 W, cabin outlet together with the radio of 120W max.

5 Brake pedal

actuates the dual-circuit hydraulic brake (works on all of the 4 wheels)

6 Accelerator pedal

for continuous travel speed control.
Before actuating the accelerator pedal select direction on stick (IV/1)
= slowly depress forward end of pedal

release pedal, will return to neutral automatically, machine stops

Note: never actuate pedal by jerks; before reversing, allow machine to stop; a buzzer will sound when driving in reverse speed

7 multi-function switch

contains the following functions:

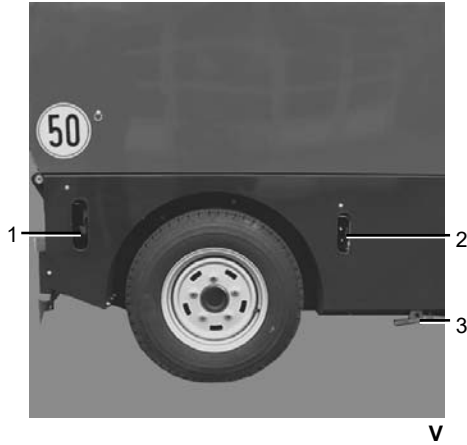
- horn
- windshield washer
- windshield wiper (2-speed plus interval)
- hi-beam ON/OFF
- hi-beam, impulse
- directional flasher

8 Steering column lock lever

to incline steering column as follows:

- pull lever back
- incline steering column as desired
- push lever forward

Caution! never attempt to drive unless steering column is in locked position, adjust only adjust only after machine has been stopped.



- 1 Manual pump
- 2 Selector valve
- 3 Water tank drain valve

1 Manual pump

to lift the dirt hopper and opening parking brake in case of an engine failure.

2 Selector valve

to lift or lower dirt hopper, opening and closing parking brake.

To actuate the selector valve use the fork-wrench tool kit of the machine.

Note: Do not actuate the valve with the machine running.

The selector valve features two positions:

- valve position up (standard position) = lift hopper with hand pump

- valve position down = open brake manually

Note : The valve has to be in its up position during operation

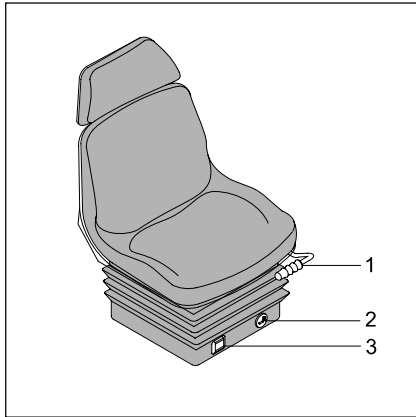
3 water tank drain valve

to drain the recirculating water tank

How to run the Hako-Citymaster 1800 TDI



Do not attempt to start engine unless a driver is seated. Adjust seat and steering column to a comfortable position



VI

Adjust driver's seat:

- lever (VI/1) for lengthwise displacement
- indicator (VI/2) for weight adjustment. Optimum adjustment of cushioning

system is attained if the driver is seated and the indicator case shows the green field.

- knob (VI/3) for weight setting of the pneumatic cushioning to the driver's weight
 - press knob = blow cushioning up
 - pull knob = deflate cushioning

Adjust steering column

- pull steering column lock lever
- adjust steering column
- push steering column lock lever forward again and lock column.



never attempt to ride the machine unless steering column is locked and has been adjusted after the machine has been stopped.

- the driver has to be seated
- Note :** The machine is equipped with a safety circuit via seat contact switch.

For driving actuate the following controls in the following sequence:

- travel selector stick neutral
- suction turbine OFF
- depress brake pedal
- turn key forward until Yellow preglow light dims, push key against steering column and turn forward until engine starts cranking



Before using public roads (transport) turn searchlights OFF, lift brushes to standby position, turn hydraulics OFF and lift accessory mount including sweeping attachment.

Always adapt your traveling speed to local conditions and the load situation of your particular vehicle. Road contact, steering and brake action are influenced by filled hoppers and water tanks. Make sure steering response and brake action are sufficient. Never exceed specified axle load and total weight limits. Perform transportation rides with dirt hopper in low position only. Lift hopper just before dumping only. Carry Owner's Manual, first aid kit and warning triangle on the machine all the time.

The Hako Citymaster 1800 TDI must be run by skilled personnel only; such personnel will have to have evidenced their qualification for running the machine to the owner or his authorized representative; operators explicitly will have to be instructed by the owner or his authorized representative to use the machine. A second person may be transported on a suitable seat only. Passenger transport prohibited.



Never run engine in an indoor location.

Note: when engine fires, engine oil pressure light and charge light have to dim.

At temperatures below 0 °C allow the engine after firing to run idle for at least 5 minutes and at temperatures below -10°C for at least 15 minutes to warm-up.



Before machine starts rolling make sure the hopper is in low position (check pilot light) and check whether surrounding is clear of persons (children). Maintain good visibility, never leave driver's seat while machine is rolling.

- adjust direction and speed of travel with control stick
 - forward travel, 1 speed
= 0 to 30 km/h
 - forward travel, 2 speed
= 0 to 50 km/h
- slowly depress accelerator pedal, machine starts rolling

Stop machine, shut down engine

- return accelerator to neutral
- actuate brake pedal if hydrostatic brake action is insufficient
- when machine comes to standstill, actuate parking brake.

Note: Parking brake won't open unless engine is running!

- return selector stick to neutral.
- shut engine down

Note: do not attempt to shut engine down in an high rpm situation.



Before leaving the machine:

lower sweeping attachment, secure machine against unintended movement, e.g. by closing the parking brake, pull ignition key lock cabin doors.

Sweeping

take the following actions before sweeping:

- lower hopper

Note: do not use any water at temperatures below freezing point. Drain residual water from tanks and pump.

- fill fresh water tank
- open both hose couplings, connect hose
- fill tank until water starts overflowing at the forward RH end of the tank. Capacity approx. 380 litres.
- fill recirculating water tank; open rear hopper flap and fill water until filter screen in bottom of hopper is covered
- close and lock rear flap
- set all controls to neutral or zero
- actuate brake pedal
- start engine, refer to "drive the Hako-Citymaster 1800 TDI"

- turn suction turbine ON, engine speed automatically rises to approx. 1,900 rpm
- lower accessory mount and sweeping attachment, shift suction mouth to operating position
- lift brush arms out of their lock with control switch, swing out and lower
- select brush speed as required by degree of soilage
- adjust brush ground pressure as required by degree of soilage
- adjust suction turbine speed as required
- continuously adjust sweeping width between 1,200 and 2,500 mm
- turn water pump ON
- open water valves for LH and RH spray nozzles, adjust waterflow as required
- open water valve for nozzle in suction duct as required
- turn rotating beacon ON
- turn lighting and searchlights (optional) ON as required
- select direction of travel and speed

- slowly depress accelerator pedal until machine starts rolling and go ahead accelerating

Note: Note: never exceed admissible max. weight. Dump hopper when over-load light on control panel turns ON.

Lift hopper

In case of an engine failure lift hopper as follows :

- actuate manual pump (V/1); to ease pump action plug tube of scraper tool onto pump lever
- move lever up and down until hopper is fully lifted and jackbar is located under lock.

Cleaning work after sweeping

Perform the following cleaning work with a water hose at least once a day, or more frequent in case of severe soilage :

Note: do not direct water jet on electric or electronic components.

- lift suction nozzle and clean with water jet from top and bottom end
- clean sweeping attachment and front lift-out mechanism
- dump dirt hopper, lift to top end and secure in place with jackbar. Stop engine, open rear flap, clean hopper inside with water jet. Open bottom screen from below and clean; this action includes screens on both sides. Drain recirculating tank, flush and fill. Start engine, lower hopper and fill to a level of about 2cm over bottom screen. Start sweeping, water from the recirculating tank is returned to hopper through the suction pipe, thus flushing the system. Continue flushing for about 3 to 5 minutes.

- clean suction turbine, connect water hose to coupling underneath hopper (LH, forward end) and allow water to run into turbine, turbine running at medium speed. This action may be made in parallel with recirculation cleaning, as described above. Continue flushing for about 3 to 5 minutes.
 - clean suction turbine housing, uninstall lamellar grille above suction turbine (loosen 3 ea. screws on forward end and fold item back) Clean housing inside with water jet, water will be drained through 2 hoses and suction pipe to suction mouth. Inspect hoses for clogging. A small inspection plate screwed to the front left side of the hopper may be removed for cleaning the suction turbine housing.
- Note:** do not use vapour jet or high-pressure cleaners.
- clean VW-Diesel engine's radiator and hydraulic installation; to this end open rear screen, clean both sides of screen, clean radiator (fins) with compressed air, if required, close screen.

Maintenance work

Engine

for more details about operation and maintenance of the VW engine refer to the VW Owner's Manual enclosed at the Hako Citymaster 1800 TDI.



- engine may be started from the driver's seat only
- before commencing any servicing work on the Hako Citymaster stop engine and remove ignition key
- before commencing any maintenance, cleaning, setting or repair work or during breaks, stop engine and take adequate action to avoid unintended movement.
- use appropriate tools for maintenance, repair and setting work only
- as far as aspects of safety are concerned, spare parts at least need to be of comparable quality as genuine parts
- when working under the lifted hopper, secure it with the jackbar against accidental lowering.

- The diagnosis plug for the engine controller is located in the cabin under the left-hand dashboard.

Check engine oil level

lift hopper and secure with jackbar. Check oil level on machine standing on level ground, after having stopped engine, allow oil to return to sump, which may take a few minutes. Oil level should read between max. and min. mark on dipstick. Do not run engine when reading is under min. mark. Difference between max. and min. marks equals 1 litre.



When filling oil, avoid spilling over hot engine - fire hazard.

Fill engine oil

Unscrew filler cap on cylinder head, fill oil, check level on dipstick.

Note: avoid oil level above max. mark.

Change oil

Engine oil has to be changed after every 150 hours of operation; make sure engine is warm.

Drain plug is located on the left end of the sump. To get access remove bottom fairing under engine compartment. Collect oil and dispose of in accordance with current requirements. Filler neck is located in the valve cap. Engine oil: SAE 5-W40, SAE 10-W40, SAE 15-W40 (equals VW spec. 50500 or 50501). Fill 4.5 litres. Check oil level.

Engine oil filter

Replace oil filter together with the oil after every 150 hours of operation.

Note: after having started engine, check oil system for leaks.

Fuel system

The fuel tank is located behind the cabin, on the left. The filler neck is accessible and can be locked by key. Stop engine before refueling and remove ignition key. Never fill fuel in indoor locations, remove spilled fuel with a cloth right away. Avoid smoking or handling open flames when refueling or working in the vicinity of the fuel system.

Fill with Diesel fuel CZ 51min. according to EN 590.

Fuel capacity is 52 litres.

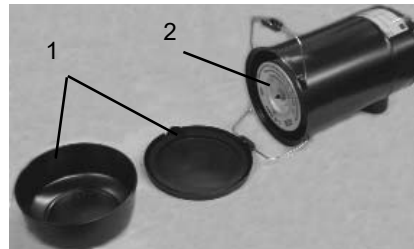
Note: for more information about fuel, in particular under the aspect of winter service, refer to the VW Owner's Manual. The fuel line from the tank holds a fuel strainer that has to be changed after first 300 hours of operation but at least after 600 hours of operation.

Air cleaner

Note: We cannot give a warranty for cleaned air cleaner cartridges.

With its filtering cartridge, the air cleaner uses a separator (Fig. A/1) which considerably extends the service life of the cleaner element (Fig. A/2). Check this separator for soiling weekly and clean if required. The cleaner cartridge has to be replaced e.g. if the indicator lights permanently but at least after 600 hours of operation.

Note: do not clean or replace the cleaner cartridge with the engine running.

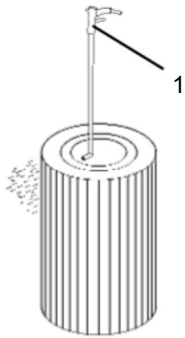


A

Dismount filter element as follows:

- Lift hopper and place jackbar.
- Open the lockings, remove separator (Fig. A/1) and clean from coarse particles.
- Dismount filter element.
Carefully blow-out the filter element with dry compressed air (3bar max.) by moving the pipe (Fig. B/1) up and down in the filter element until dust rising has finished. Replace heavily soiled or damaged filter element.
- Mount filter element, place separator and close lockings.

Note: do not run the engine without filter element.



B

Engine and hydraulic cooling system

a) drive engine

The cooling system is filled with a long-life anti-freeze mix to preclude damages by corrosion or calcification and to raise the boiling point of the water. For this purpose, the coolant has to remain in the system all over the year. Due to its raising the boiling point of the water the coolant guarantees operating safety at higher ambient temperatures and more important engine loading. Before the cold season starts, check coolant concentration and add concentrate as required to guarantee adequate anti-freeze properties.

Check coolant level in expansion tank in regular intervals. The engine being cold, coolant level in the expansion tank has to read between min. and max. marks. Engine being warm, level will be higher.



Fill coolant:

Caution: hazard of scalding!
Never attempt to open cap while engine is hot. Cooling system is pressurized!

To maintain proper antifreeze and corrosion inhibiting properties and to avoid calcification, never dilute coolant in the warm season by filling pure water. Filling capacity of the cooling system is approx. 8 litres

Cooling air intake

Cooling air is aspirated through an air grille with screen located in the rear. Check this screen for accumulated dirt every day and clean as required. Clean screen from both sides; also clean bottom panel between screen and radiator. Clean radiator with compressed air from time to time.

b) hydraulic installations

For correct function of all hydraulic installations, protect the hydraulic oil from overheating. For this purpose we installed a separate radiator next to the engine radiator and one common fan supplying both radiators with fresh air.

Travel drive assembly

The Hako-Citymaster 1800 TDI uses a hydrostatic drive system. Traveling speeds adjust continuously within the limits of the gear selected. Accelerator pedal will return to neutral automatically, thus dynamically decelerating the machine by the hub motors; if additional braking power is required, just actuate the service brake. Travel drive hydraulics use a closed loop system. Hydraulic pump is engine-driven and supplies hub motors in the rear wheels with pressurized oil.

Towing

Rear wheels are blocked unless the engine is running. Should your Hako-matic 1800 TDI once need to be towed, actuate valve (V/2) to open the parking brake, then open bypass valve as described below:

The towing lug is located at the front of the sweeping attachment.

Caution: The steering is not fully operable if the engine is off.

Selector valve

- shift valve (V/2) arm down
= loosen parking brake
- to loosen parking brake actuate manual pump (V/1); to amplify pumping action plug scraper tool on pump lever. This scraper tool is located in the rear of the machine. Continue pumping until you feel counteraction and RED pilot light for the parking brake dims.

Actuate bypass valve

Seen in the direction of travel, the bypass valve is located at the left behind the fuel tank and is accessible via an opening of the fairing.

- open bypass valve
= spanner (size 9) upwards
- close bypass valve
= spanner (size 9) downwards

Note: to avoid damages at the hydraulic installations do not tow the Hako Citymaster 1800 TDI farther than 500m and do not exceed a speed of 5 km/h.

Change hydraulic oil and filter

First hydraulic oil change after 600 hours of operation., thereafter every 600 hours, but not less than once a year, even if the specified service hour parameter has not been attained. Use hydraulic oil only as approved by the manufacturer.

In the factory the hydraulic system has been filled with multi-range oil HVPLP 46, e.g. Mobiloil DTE 15 M.

Biologically degradable hydraulic oil (option)

e.g. Mobiloil: Mobil EAL Syndraulic 46 or
Fuchs Plantohyd S. or
Panolin HLP Synth 46

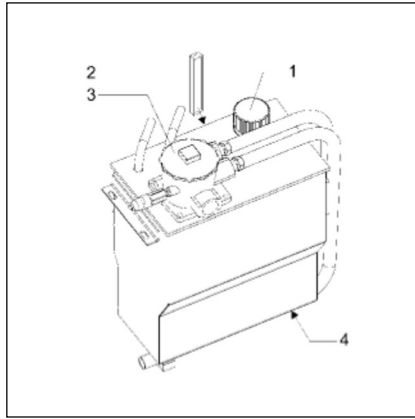
Change the oil as described below:

- run engine to warm oil
- lift hopper and secure with jackbar
- **Note:** you may also lift the hopper with the manual pump (refer to page 59)
- drain hydraulic oil by removing the drain plug (VII/4) and collect the used oil in an appropriate recipient.
- re-insert drain plug
- fill fresh oil through filler (VII/1) until floater appears at the upper end of the gauge glass (VII/2) until float appears at upper end of gauge glass.

Note: use clean oil only which was stored in approved and sealed containers.

Collect oil and dispose of in compliance with local regulations.

Replace oil filter at each oilchange.



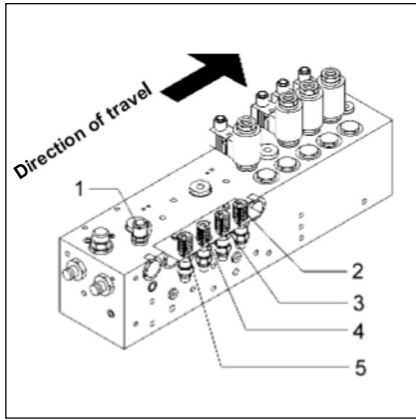
VII

- 1 tank cap / filler neck
- 2 gauge glass
- 3 return suction filter
- 4 drain plug (spanner size 17)

Return suction filter

The return suction filter (VII/3) is located on the hydraulic oil tank. This filter element has to be replaced after the first 75 hours of operation. Then replace as required, i.e. if the indicator at the dashboard lights.

In the hydraulic tank, additional suction sieves are located. They may be unscrewed and checked at each hydraulic oil change. Proceed to inspection via the filter opening in the tank.



Gauge outlets (fittings)

The M16x2 fittings allow gauging of the following pressure levels at an oil temperature of approx. 50°C:

Fitting 1

Sweeping attachment and hopper:
approx. 180 bar max.

Fitting 2

Drive pump with forward travel:
approx. 315 to 330 bar

Fitting 4

Suction turbine: operating pressure
approx. 115 bar with sweeping mode
(engine speed 2,600 rpm)

Fitting 5

Drive pump supply pressure
approx. 25 bar with sweeping mode
(engine idling)

Fitting 3

Drive pump with reverse travel:
approx. 315 to 330 bar

Hub motors in rear wheels

Change transmission oil for the multi-disc brakes in the rear wheel hub motors after 150 hours of operation, then every 600 hours.

- rotate hub motor until drain plug points down
- open drain plug, drain oil
- rotate drain hole to a turn drain hole to a horizontal position.
- fill transmission oil until housing is full; equals approx. 0.5 litres of e.g. Mobiloil Mobilgear 630.

Hydraulic system of power steering, hopper lift, sweeper and suction turbine

Three pumps flanged to the travel drive pump supply the suction turbine, sweeper, power steering and hopper lift with pressurized oil. The pump located at the travel drive pump supplies the suction turbine, whereas all other functions are driven by the second pump.

Power steering

the power steering circuit is supplied with pressurized oil by the same pump as the for hopper lift and sweep-ing attachment. A valve gives preference to the power steering circuit all the time.

Power steering won't work unless engine is running.

Note: with the engine not running, high steering power will be required.

Toe-in: 0 to 2 mm

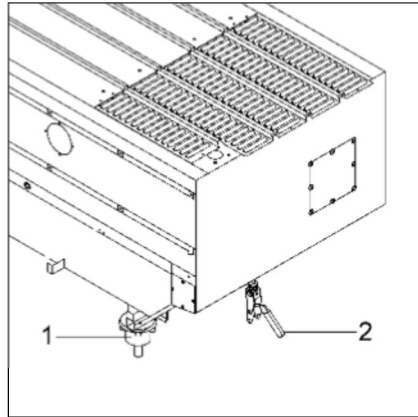
check as required and every 600 h.

Water spray system

The Hako Citymaster 1800 TDI uses a 380 litres fresh water tank located in the bottom area of the dirt hopper and extending into the side walls. Filling points use "D"-fittings and are located on both sides of the hopper.

Note: water may be supplied from the public water supply net through a "D"-fitting only. The electric water pump is located on a structural member on the RH end of the machine, its supply pressure is 4 bar. Spray nozzles are arranged at the forward brushes so that the water is directed against the brush, binds dust and spreads water over the area in front of the brush.

One more nozzle is located in the suction duct inlet to wetten the suction duct. All of these nozzle are controlled independent of each other and may be adjusted as required for a particular mission. Water control valves are arranged on the central control panel in the cabin. Water supply should be adjusted as to allow the machine to work dust-free.



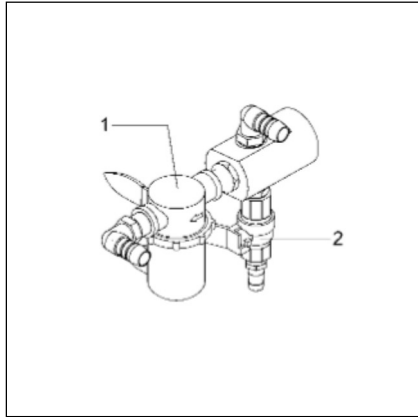
- 1 full-way valve
- 2 control lever, fine-mesh screen

Note: all of the nozzles and the strainer should be inspected for clean condition once a day, as well as screens in the overflow hoses of the freshwater tank. The Hako-Citymaster uses water recycling system. Recirculating water tank is located on the RH side behind the cabin, underneath the hopper. Tank capacity is approx. 60 litres.

Note: to allow extended dust-free sweeping, we recommend to fill approx. 100 litres of water in the dirt hopper before commencing the mission. When lifting the hopper, connection with the recirculating tank will be closed by a two-way valve located on the right of the hopper. Recirculating tank, fine-mesh screen, hopper and full-way valve have to be cleaned once a day!

For more details refer to page 59 "cleaning work".

Before performing such cleaning work, lift hopper. The full-way valve (VIII/1) and lever (VIII/2) to open the screen are located underneath the hopper.



IX

- 1 strainer
- 2 drain valve

Drain water from the recirculating tank and hopper

To drain the recirculating tank, open fresh valve located behind the rear wheel case. Freshwater tank is drained through a drain valve (IX/2). Inspect strainer (IX/1) in the supply line for clogging once a day and clean as required.

Caution: Drain the tanks, pumps and all water components when temperature is less than zero degree.

Sweeping attachment

The sweeping unit is attached to the Hako-Citymaster 1800 TDI by a triangular link. Hydraulic cylinders for brush lifting and the brush drive motors are supplied through hydraulic hoses.

The hose routed outside carries water to the spray nozzles. A hydraulic fitting in the front panel supplies the actuator for the suction mouth flap.

Sweeping track width and lift arms are adjusted in the factory. Sweeping track width with lowered sweeping unit (without brush pressure) should amount to:

- RH brush = 11 to 03 o'clock
- LH brush = 09 to 01 o'clock position.

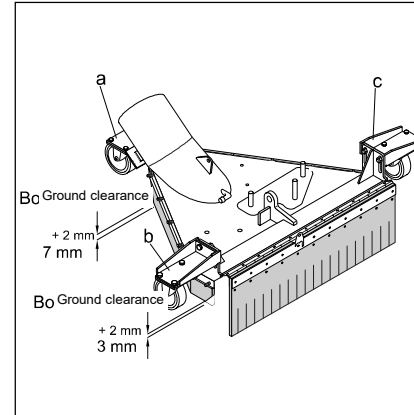
Adjustment work should be performed by factory-trained personnel only.

Suction mouth

The suction mouth is lowered together with the sweeping unit. The sealing strip located on this suction mouth needs to have an approx. 0.4 inches (10 mm) ground clearance.

Adjustment is performed by displacing the three rollers located

under the suction mouth. To maintain suction power, replace defective seals (forward flap either). Service rollers with grease after every 75 hours of operation, or more frequent, as required.



Dirt hopper/ suction turbine

The suction turbine, driven by a hydraulic motor, is located in the top area of the dirt hopper. It spins at approx. 3,000 rpm. The suction turbine needs to be cleaned every day. To avoid poor suction pressure, inspect and clean seals at rear flap and suction duct every day. Replace worn seals. For more details about daily cleaning routine refer to page 59 "cleaning after sweeping".

Service brake

The Hako-Citymaster 1800 TDI uses a dual circuit hydraulic service brake on all 4 wheels. The are actuated by a brake pedal. Brake action of the rear wheels is load-controlled. Break fluid container is located on the rear wall of the cabin. Fill level must read between both marks and has to be checked at daily intervals. Add fluid as required and check for the reason of a fluid loss. Fill capacity is approx. 0.5 litres.

Note: Change brake fluid every 2 years.

Parking brake

The multiple-disk parking brake is located on the hub motors of the rear wheels and runs in an oil bath.

Actuation is electric, controlled by a button on the center console. The brake being closes, a RED light in the switch will turn ON.

Note: do not actuate the parking brake while the machine is rolling. To open the brake, actuate switch while the engine is running (multi-disc brake has to be supplied with pressurized oil).

Electric system

The Hako-Citymaster 1800 TDI features a 12-volt power supply running on a 14 volt 34/90 Amps alternator. Fusebox is located at the LH forward end of the center console.

Fuses

plug-in fuses F1 to F30

- F1 = 5A, control device for Diesel injection system
- F 2* = 10A, multi-function display, rotating beacon, cabin lighting, starter contactor, stoplight, delay-action contactor (travelling/sweeping), delay-action contactor (parking brake) trip log
- F 3 = 15A, parking and rear light
- F 4 = 10A, hazard warning switch
- F 5 = 10A, preglow relay, pilot lamps, multi-function display, trip log, starting lock
- F 6 = 10A, travel (sweeping and travelling, front sweeper function, parking brake, soiled water valve, cooling system level, K3 control voltage relay
- F 7 = 15A, front sweeper function, winter service
- F 8 = 15 Amps, headlights & hi-beam, panel lighting, stand-by lighting
- F 9 = 10 Amps, parking light & rear light, LH
- F 10 = 10 Amps, parking and rear light, RH plus license plate light
- * = 15 A when the machine has two rotating beacon lights

- F 11 = 15 Amps, windshield wiper and washer, horn, pulse light
- F 12 = 10 Amps, directional flasher
- F 13 = 10 Amps, hi-beam, LH
- F 14 = 10 Amps, hi-beam, RH
- F 15 = 10 Amps, headlight, LH
- F 16 = 10 amps, headlight, RH
- F 17 = 10A, no. 1 water pump, lift/lower hopper
- F 18 = 15 Amps, heater fan, A/C/fan
- F 19 = 10 Amps, searchlight (optional)
- F 20 = 10 Amps, #2 water pump (optional)
- F 21 = 5 Amps, camera (optional)
- F 22 = 10 Amps, hot mirror, radio
- F 23 = 15 Amps, accessory plug connector, radio, continuous positive
- F24 = 15A switchover working and transport ride
- F25 = 10A starting lock
- F26 = 10A compressor, driver's seat
- F27 = 7.5A rear fog lamp (L-H steering version only)
- F28 = 5A control device Diesel injection system
- F29 = 10A control device Diesel injection system
- F30 = 30A control device Diesel injection system

Note: never direct water jet against electric or electronic components such as solenoid valves, plug connectors etc.

One more fusebox is located on the left of the battery. This box holds the following fuses, starting from the rear end:

- F 41 50 Amps fuse
- F 42 50 Amps fuse
- F 43 50 Amps fuse for engine pre-glow relay K

Battery

The 12 volts / 74 Ah (low maintenance) battery is located on top of the LH rear wheel housing.

Note: never attempt to run engine unless battery is connected. Never use a battery charger to sustain cranking. Before commencing work on the electric system, disconnect ground cable of the battery. Always disconnect battery for charging or when doing electrowelding on the machine.

Note: provide for disposal of used batteries in accordance with the applicable regulations.

Wheels

The Hako-Citymaster 1800 TDI uses 195 R14 C 106 P pneumatic tires as a standard option. Other dimensions are available, e.g. to reduce specific ground pressure.

Wheelchange

For changing a wheel, the Hako-Citymaster 1800 TDI has to be jacked. Attaching points are located on both sides in front of the rear wheel and behind the front wheel. Wheels are secured with 5 ea. attaching nuts (spanner size 19). Torque nuts to 130 Nm. Check torque after first 10 hours and thereafter every 150 hours.

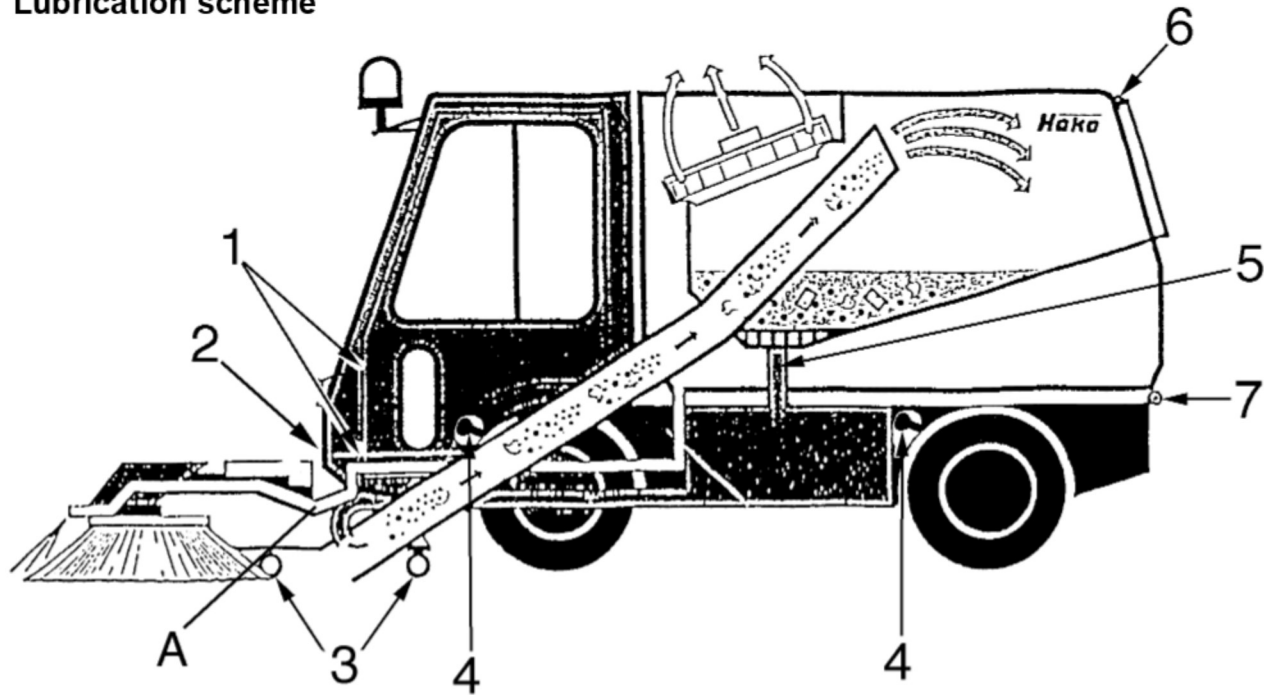
Hauling

When hauling the Hako-Citymaster 1800 TDI on a truck, close parking brake and secure machine with straps. Eyebolts are located on both sides and at the front end (1 in center). If the machine is hauled without the sweeping attachment installed, secure it by its forward triangular mount.

Lubrication scheme

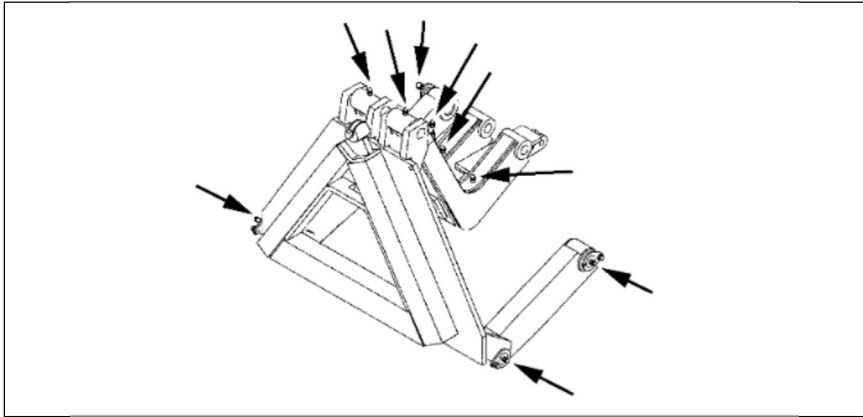
All points stipulated on page 70/71 (lubrication scheme) have to be serviced with grease after every 75 hours of operation, the rollers weekly.

Lubrication scheme



- 1 door hinges, LH & RH
- 2 brake pedal shaft 1 ea.
- 3 rollers under suction mouth
- 4 spring hinge bolt (front and rear), 1 ea. nipple on forward bolt

- 5 fine screen lever
- 6 hinges, rear fairing
- 7 pivot pin, dirt hopper
- A front lift out system

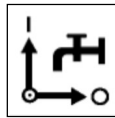


Front lift out system

Lubrication points of the front lift out system, as shown in the diagram, are serviced with grease every 75 hours of operation. Decrease these intervals when working in salt-laden atmosphere.

Hand suction hose 1187.01 (optional)

take the following actions when working with the handheld suction hose:



- Set direction selector to neutral
- Engage parking brake

- close valve underneath driver's seat (set lever to "0")
- lift hopper by a minor amount and run engine
- use cap out of hardware kit, locate on hopper inlet (held in place by suction pressure)
- lower hopper; air won't be aspirated through the suction mouth but through the handheld hose instead
- put handheld suction hose off hook
- turn suction turbine and water pump to ON
- open water valve on suction pipe allow suction pipe end to slip over the ground.

Note: when job is complete, remove cap from hopper inlet.

Additional water pump 1182.01 (optional)

this water pump supplies water into the intake stud of the hopper when sweeping extremely dry garbage. This water pump is actuated by a separate switch (11/9).

This manual does not describe all options. If these options such as e.g. winter service are used observe the instructions of the individual implements.

Specifications

<p>Ratings automotive travelling (speed I/II) sweeping speed gradability, max. perm. weight, sweeping lateral tilt sweeping width sweeping capacity</p>	<p>mph (km/h), max. mph (km/h), max. % degrees in (mm) sq.ft/h (m²/h)</p>	<p>30 / 50 15 22 8 1,400–2,500 37,500</p>
<p>Dimensions and weights length (to include brush) width (to include brush) height (without beacon) dumping height/width wheel track, front/rear wheel base turning circle, outside, LH/RH deadweight (without option) payload with adm. weight of 4000/3500kg max. perm. weight (with pneumatic tires) max. axle load front/rear max. perm weight (with 215/75 R 14 112 P tires) adm. axle load front/rear overload warning ground clearance</p>	<p>in (mm) in (mm) in (mm) in (mm) in (mm) in (mm) in (mm) in (mm) in (kg) in (kg) in (kg) lb. (kg) lb. (kg) lb. (kg) mm</p>	<p>4,480 1,380 1,980 1,370 / 1,100 1,065 / 1,065 1,700 8,620 / 8,620 2,590 1,410 / 0,910 4,000 1,800/2,300 3,500 1,800 / 2,300 adjustable 150</p>

<p>Wheel suspension / brakes suspension, front & rear tires (standard) inflation pressure tires (special-purpose) inflation pressure rims service brake parking brake brake fluid – fill capacity</p>	<p>bar</p> <p>litres</p>	<p>GRP blade spring 195 R 14 C 106 P 4,5 215 R 14 C 112 P hydraulic, dual circuit, acting on 6J x 14 H2 multi-disc brake, acting on rear wheels SAE J 1703 / 0.5 l</p>
<p>Suction and sweeping installation suction turbine speed / dia. airflow, max. suction duct dia. suction mouth brush</p> <p>brush speed</p>	<p>rpm m³/min mm</p> <p>brush dia. mm</p> <p>rpm</p>	<p>3,000 max. ±50/0,550 71 175 hydraulic suspension, on rollers 2/900 ea. steel, plastic, or com- pound bristles</p> <p>140 max.</p>
<p>Noise emission The sound pressure level (LpA) measured in accordance with DIN EN ISO 11201 under standard operating condi- tions at the operator's ear won't exceed - with operation mode suction turbine and plate brushes (2200 rpm) ON</p>	<p>dB (A)</p>	<p>77</p>
<p>Vibrations the weighted effective acceleration determined IAW EN 1032 acting upon the body (feet and seat area), under normal operating conditions, won't exceed</p>	<p>m/s²</p>	<p>0.5</p>

<p>Capacities hopper / max. fill capacity fresh water tank recirculating water tank with overflow protection, approx. recirculating water tank w/o overflow protection, approx. fuel tank hydraulic oil tank</p>	<p>m³ / kg litres litres litres litres litres</p>	<p>1,7 / 1,240 380 approx. 150/60 approx. 60 52 40</p>
<p>Engine make / model displacement rated power torque compression ratio max. speed idle speed cooling cooling liquid, Note: do not mix with other types capacity, to include cabin heater engine oil, summer-/winter time capacity, to include filter fuel tank fuel consumption (normal sweeping), approx. air cleaner</p>	<p>ccm kW/min, rpm Nm at rpm rpm rpm factory filling litres SAE litres litres litres/h</p>	<p>VW / 1,9 I TDI EURO 3/AVM049522 1,896 61,5/3000 215 at 1,900 19,5:1 3000 900 pressurized liquid cooling system. GLACELF AUTO SUPRA 9 5 W-40 (VW 50500 or 50501) 4.5 54 approx. 5.3 MANN-Piclou</p>
<p>Electric system battery, low maintenance alternator starter motor</p>	<p>V/Ah V/A/kW V/kW</p>	<p>12/63 14 / 120 / 1,68 12/1.8</p>

Maintenance Work

Performing maintenance work as recommended will make sure to work with a dependable machine at all times.

It is better to take precautions than repairing damage, and it saves money! Please get in touch with your local Hako-distributor if you cannot do the job in-house; he will be glad to have this work done for you. Service contracts are available either. For questions and parts orders always have your machine's chassis & engine serial number on hand. The data plate is located on the right forward end of the chassis, behind the cabin (lift hopper). The engine serial number (engine code plus serial) is embossed on the left side of the cylinder head.



When cleaning or servicing the machine, or replacing parts, have the engine stopped and the key removed. Use appropriate tools for service, repair and adjusting work. As far as aspects of safety are concerned, spares at least need to be of the same quality as genuine parts.

Fluids (fuel, hydraulic oil) leaking under high pressure, may penetrate your skin and cause serious injuries. If high-pressure fluids caused injuries, see a doctor immediately; otherwise serious infections may be caused. Depressurize systems before disconnecting lines. Before pressurizing the system is again, make sure all connections and fittings are tight and the lines are in good shape. It will be hard to detect hydraulic oil escaping through a small orifice; use a piece of cardboard or wood when searching for leaks.

Collect oils and fuels and dispose pursuant to regulations imposed by law! Do not remove or install tires, or repair a rim. Take wheels with defective tires to a specialized repair shop.

Caution: Jack vehicle and provide for safe support

Before commencing any work on the electric system, always disconnect negative battery lead.

Pursuant to para. 57 VBG D 29, the Hakomatic 1800 TDI road sweeper has to be inspected by an authorized expert for safe condition as required, but not less than once a year. Such inspection includes roadworthy condition and operational safety either. Roadworthy condition also may be confirmed by an expert's opinion on IAW StVZO also. Results of such inspection have to be kept on file at least until next inspection is performed. For more details please address your local Hako distributor. He will draw-up a proposal for this inspection imposed by law. If the Hako-Citymaster 1800 TDI has to bear a license plate, para. 29 StVZO calls for an annual inspection (this period of time being extends to 24 months for vehicles with a max. admissible weight of more than 3.5 tons).

Maintenance schedule	service hours					
	daily	after 10/75	every 150	every 300	every 600	every 1200
clean machine (refer to pages 59 and 60)	●					
inspect air cleaner element weekly, clean as required						
replace filter cartridge - at least yearly					●	
brake test (function) / adjust as required	●	▲				
check fuel level, refuel as required	●					
check water nozzles, clean as required	●					
check strainer in hopper, clean as required clean water circulation	●					
inspect oil and water radiator for soiling, clean with compressed air as required	●					
clean suction fan	●					
inspect plate brushes for wearing	●					
check sweeping track width, adjust as required	●					
check sealing strips on suction mouth, adjust as required	●					
inspect hopper seals (rear fairing), replace as required	●					
■ = after the first 10 hours of operation ▲ = after the first 75 hours of operation						

Maintenance schedule	service hours					
	daily	after 10/75	every 150	every 300	every 600	every 1200
check engine oil level, add as required	●					
check coolant level in expansion tank, add as required	●		●			
check hydraulic oil level on tank, add as required	●		●			
visual inspection for oil leaks on engine and hydraulic system	●		●			
Clean water strainer in pump inlet and both overflow strainers, replace if required	●		●			
replace return- and suction filter cartridge (hydraulic) Note: First change by bio-hydraulic oil after 50 hours		▲			●	
change hydraulic oil Note: Change bio-hydraulic oil every 400 hours					●	
Check the play of the wheel bearings and replace if required					●	
Check the toe-in 0-2 mm					●	
check torque of wheel nuts (130Nm) for tight fit or after wheelchange		■			●	
lubricate in accordance with scheme (page 70/71)						
change engine oil				●		
replace engine oil filter				●		
■ = after the first 10 hours of operation ▲ = after the first 75 hours of operation						

Maintenance schedule	service hours					
	daily	after 10/75	every 150	every 300	every 600	every 1200
inspect radiator and hoses for leaks, replace defective or porous hoses				●		
check V-belt for proper tension and good shape, adjust tension or replace				●		
inspect exhaust system for damage				●		
check brake fluid level (change every 2 years)	●					
replace fuel strainer					●	
Drain off water of fuel filter				●		
Replace toothed belt, replace gearings as required						●
check electrolyte level in battery				●		
clean battery terminals and service with grease				●		
change oil in both hub motors after first 150 service hours, at least yearly						●
inspect wear plate in hopper for shape of rubber coat				●		
check suction turbine for speed, play of bearing and soiling	●		●			
Trial run and operational check	●					
■ = after the first 10 hours of operation ▲ = after the first 75 hours of operation						

EC Declaration of Conformity

according to
Directive 89/392/EEC

Hako-Werke GmbH
Hamburger Straße 209-239
D-23843 Bad Oldesloe

declare under sole responsibility, that the product

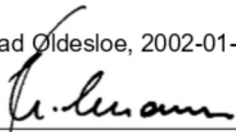
Hako-Citymaster 1800, Typ: 1199

to which this declaration corresponds to the relevant basic safety and health requirements of the Directive 89/392/EEC, and to the requirements of the other relevant Directives: –89/336/EEC.

For the relevant implementation of the safety and health requirements mentioned in the Directives, the following standard(s) and/or technical specification(s) has (have) been respected:

EN 292, EN ISO 14982

Bad Oldesloe, 2002-01-07



Bernd Heilmann, Management

EC Declaration of Conformity

according to 2000/14/EG

We Hako-Werke GmbH

declare, that the following product

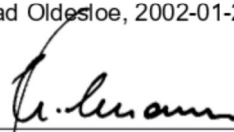
- | | |
|------------------------------|-----------------|
| 1. Type | Sweeper |
| 2. Model | Citymaster 1800 |
| 3. Serial number | 1199 |
| 4. Engine | |
| – Manufacturer | Volkswagen AG |
| – Model | AVM 049522 |
| – Power kW bei U/min | 61,5/3000 |
| Measured sound power level | 109 dB (A) |
| Guaranteed sound power level | 112 dB (A) |

confirms with the requirements of the EC-Directive 2000/14/EC. The conformity procedure is used in accordance with appendix V. Notified body is TÜV NORD GROUP, TÜV Hannover/Sachsen-Anhalt e.V., European authorised body DE-10, Am TÜV 1, 30519 Hannover, Germany.

European reference code: CE-DE-10-139 700

The documentation will be kept by Hako GmbH in the development department.

Bad Oldesloe, 2002-01-23



Bernd Heilmann, Management

Maintenance document

<p>Acceptance inspection Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	<p>Special remarks</p>			<p>10 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>
<p>75 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	<p>150 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	<p>300 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	<p>450 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	
<p>600 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hour</p>	<p>750 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hour</p>	<p>900 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hour</p>	<p>1050 operating hours Maintenance Workshop stamp</p> <p>carried out on _____</p> <p>at _____ operating hours</p>	

<p>1200 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>1350 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>1500 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>1650 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>
<p>1800 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>1950 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>2100 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>2250 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>
<p>2400 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>2550 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>2700 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>	<p>2850 operating hours Maintenance Workshop stamp</p> <p>carried out on _____ at _____ operating hours</p>



Spitzentechnik für eine saubere und schönere Umwelt

Superior technology for a cleaner and better environment



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