

HOWO Road Sweeper Truck

8000L Dust Bin and 4000L Water Tanker

User's Manual



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Road Sweeper Truck

OWNER'S MANUAL

Preface

Thank you for purchasing CS TRUCKS products. For better using your HOWO Road Sweeper Truck, get the best operating performance, we strongly suggest that before the operation process you should read this manual instructions carefully, and to manipulate the program handily.

The manual detailed describes the performance of road sweeper truck, structure, usage, precautions and maintenance of such knowledge. While showing details of the truck, both pictures and description will together help you get better understanding of how to use truck. Before the operation, the skilled operator should carefully read the contents of the manual.

After master the truck performance characteristics, methods of operation and precautions, then could start to operate this street sweeping truck. In order to ensure the staff turnover after the operation, and properly use of the truck. This manual book must be properly kept, shall not be lost and damage.

----CS TRUCKS

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Chapter 1. General Description

*CS TRUCKS Road Sweeper Truck based on type II HOWO 4*2 Left Hand Drive chassis, capacity for Dust tank can be up to 8000Liters and capacity for Water tank can be up to 4000Liters, which also installed with best performed American brand CUMMINS B140 33 diesel auxiliary engine. Sweeping Device installed at middle of truck with 4 brushes for cleaner sweeping working; Vacuum Suction Device installed rear of truck for dust suction and avoid second pollution. The Auxiliary engine and Fan use centrifugal auto clutch connection, which can ensure auxiliary engine no-loading starting. The sweeping device can be retract automatically when blocked, which efficiently protect the device from damage while operation.*

The vehicle designed to fully rely on the advantages of the original of HOWO brand chassis, fully consider the product's convenience and reliability, also the chassis HOWO technology features. The road sweeper has advantage of sweeping widely and suction efficiently, and maintenance for whole truck can be easily. The tank material is international standard stainless steel, which can effective to avoid rusting. Arrow light installed at rear of tank to make sure working safety.

The HOWO 4x2 Road Sweeper Truck sweeping speed faster and can efficiently avoid raising dust. The Truck is widely used for city road, high-way, airport road, seaport road, bridge, square, community, factory, etc. Therefore, the vehicle is an ideal Road Sweeper Truck mainly for road cleaning.



(Preview for your HOWO 8+4cbm Road Sweeper Truck)

Chapter 2, Main Technical Data

i ,Road Sweeper Truck technical parameter

Items		12CBM HOWO Road Sweeper Truck
S I Z E	Outer Dimension (L×W×H) (mm)	9000x2500x3200
	Wheelbase (mm)	4600
Kerb Weight (kg)		9800
G E A R	Gearbox brand	HOWO HW19710
	Model	10-shift gearbox
	Type	Manual
Cab capacity (includes driver)		2
E N G I N	Brand	WEICHAI
	Model	WP10.300E22
	Type	Six cylinder inline, four stroke, water-cool, turbocharged Inter-cooling, diesel
	Rating Power (kW/HP)	220 / 300

Note: 1.The vehicle height includes top exhaust vent.

2. We keep the right to revise the parameters on the list above.

Sweeper system basic parameter list

Items		Parameter
Water Tanker	Capacity (Liters)	8000
	Material	Stainless Steel
Dust Tanker	Capacity (Liters)	4000
	Material	Stainless Steel
Auxiliary Engine	Model	CUMMINS technology engine
	Specifications	Four stroke, water cooled, diesel engine
	Power	103KW
Sweeping System Parameter	Brush	Four brushes
	Maximum sweeping width	3.2 m
	Sweeping speed	3~20 km/h
	Maximum sweeping ability	64000 m ² /h

ii ,Road sweeper trucks advanced features

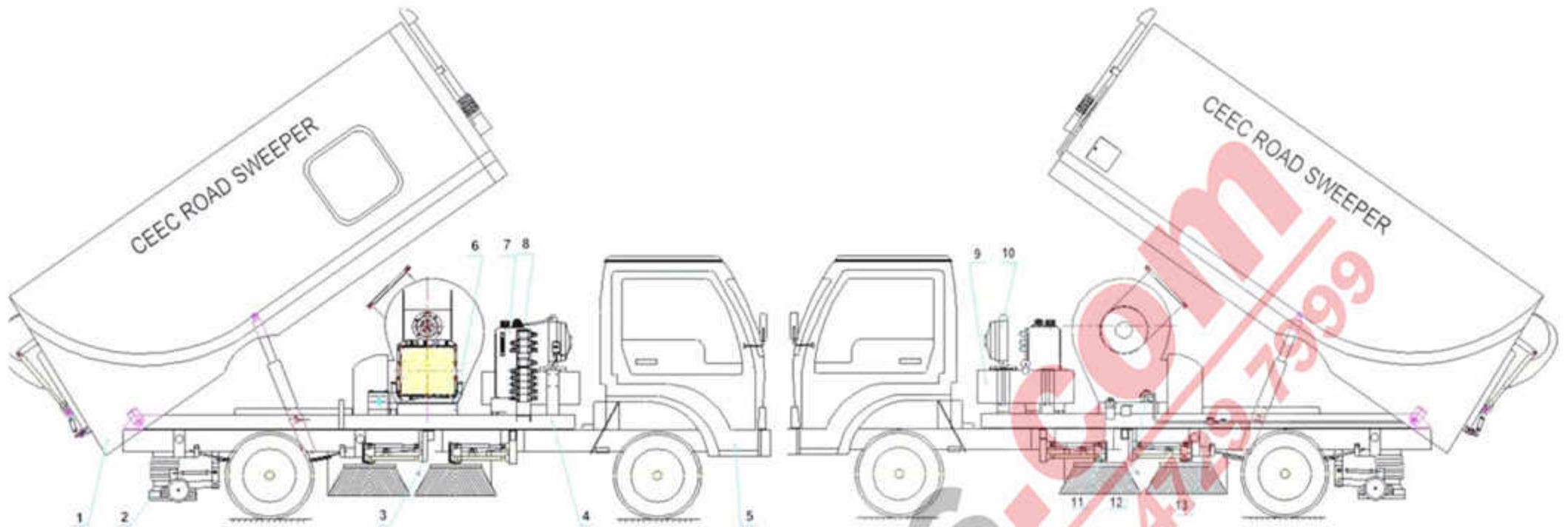
This vehicle is a wet road sweeping vehicle retrofitted by adding a top mounted dedicated sweeping device powered by CUMMINS technology auxiliary engine to the HOWO chassis. This CEEC5160TSL road sweeper truck has a simple and proper structure with four brushes in the middle and a suction plate at the back part of the vehicle. The efficient suction system makes low noises when the vehicle is working. The whole vehicle is stable in performance.

- 1. At the back part of this street cleaning truck there is an indicating arrow to make sure the road sweeper truck can work safely.*
- 2. With individual controls for the water sprayed through the brush disks or the suction pipe, this vehicle is easy to operate.*
- 3. High quality automatic centrifugal clutch is adopted in this product to start the auxiliary engine without load. The clutch is in a semi-open structure which makes it easy to check to what degree the wear plate is worn. Just unscrewing one gland bolt you can take out the core of the clutch to replace the wear plate.*
- 4. The hydraulic valve group of our road sweeper truck is composed of thread cartridge valves introduced from the American HF (Hydra Force) company. The thread cartridge valves feature compact structure, light weight, powerful functions, high reliability and easy maintenance. They are popular hydraulic valves for vehicles in Europe and America. The hydraulic valve group contains an electric-hydraulic proportional speed regulating valve to control the revolving speed of the sweeping brushes. The operator can achieve stepless regulation to the revolving speed of the sweeping brushes by adjusting the electronic control rotary knob. Besides, customers can also choose to install the sandwich valve group produced by Japanese Yuken according to the practical need.*
- 5. The driving motors of the sweeping brushes and the brush disks are high-quality cycloidal motors which have high transmission efficiency and long service life.*
- 6. The electronic control system of this road sweeper truck is controlled by single chip microcomputer. The highly centralized control box is quite intelligent with low failure rate and only a few control switches. With such an electronic control system, the operator can control all the operations of the vehicle in the cab.*
- 7. When dumping garbage, the garbage bin can incline 60° at most. Since the water tank is mounted under the garbage bin, the bottom board of the garbage bin has already inclined 12° from the vehicle body. This makes the garbage dumping more easily and thoroughly.*
- 8. Various sorts of optional equipment are available. Customers can decide to install rolling brushes to the suction port. Rear mounted dirty water suction pipe or snow plow can be added to this road sweeper truck to make it multifunctional.*

Chapter 3, Road Sweeper Truck Structure Components

i ,Road Sweeper Truck Structure Components

Overview for HOWO Road Sweeper truck technical drawing:



- | | |
|--------------------------------|---|
| 1. Dust Tank Assembly | 2. Dust Vacuum Suction Device |
| 3. 4 units brushes Assembly | 4. CUMMINS Tech Auxiliary Engine Assembly |
| 5. HOWO chassis | 6. Power Assembly |
| 7. Hydraulic Oil Tank Assembly | 8. Hydraulic Pipeline and Valve |
| 9. Diesel Fuel tank | 10. Radiator Assembly |
| 11. Auxiliary Engine Oil Pump | 12. Water Spray Pump |
| 13. Solenoid Valve | |

Above drawing show detailed parts for this HOWO road sweeper truck, which use original ISUZU type 2 chassis, with white color single row cabin, wheelbase 4700mm, CUMMINS B190 33 diesel engine with 190PS, detailed picture for chassis as below:

Pictures show customer required chassis for record



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Sweeping Brush Assembly: Totally four units, Water spraying nozzle above the brushes



Left Side View (Driver's Side)
2 brushes



Right Side View
2 brushes



Water Spraying
Nozzles

Left Side view of the Truck: equipped with Radiator, imported PLC modules, both chassis engine and auxiliary use same fuel tank.

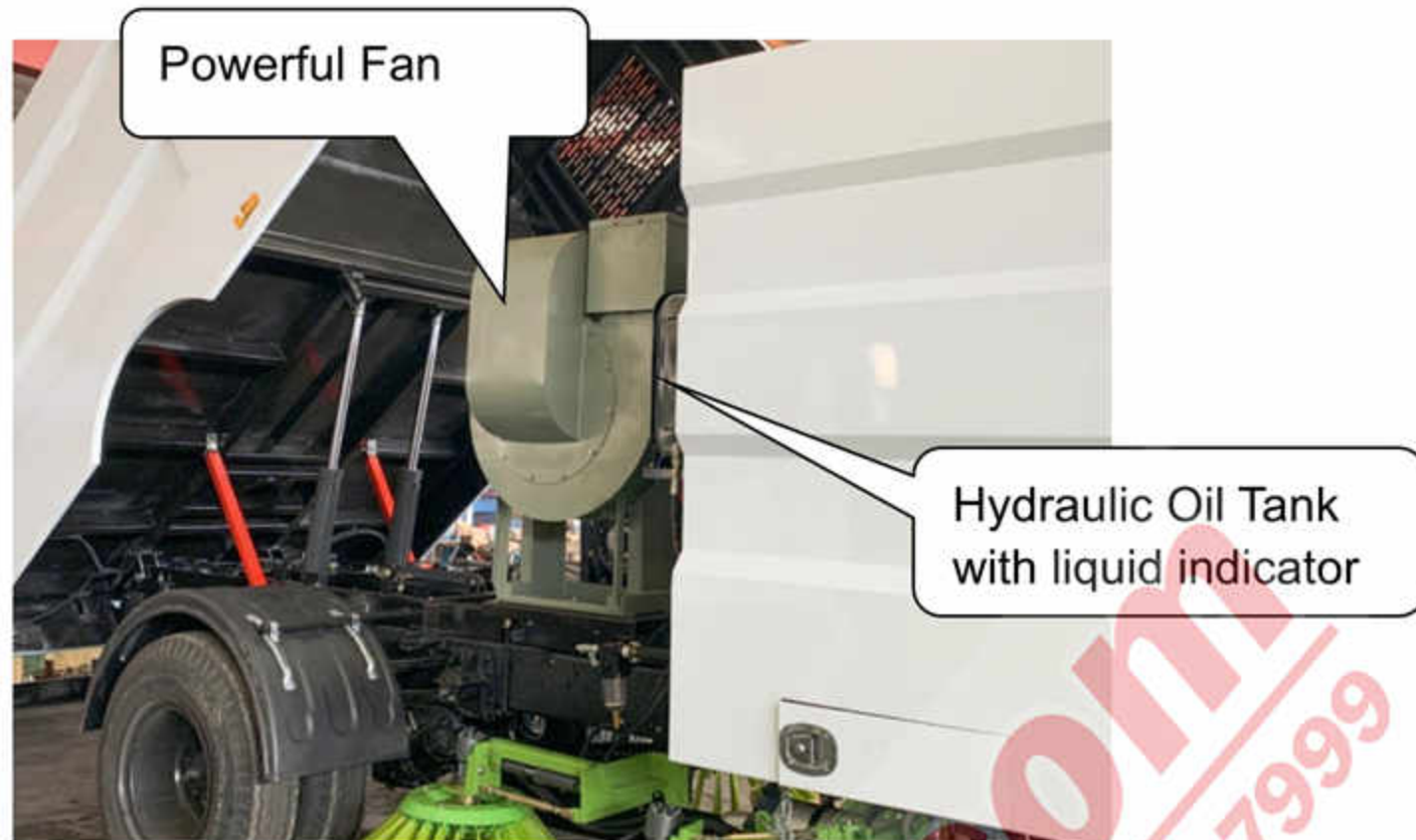


Hydraulic Oil Tank

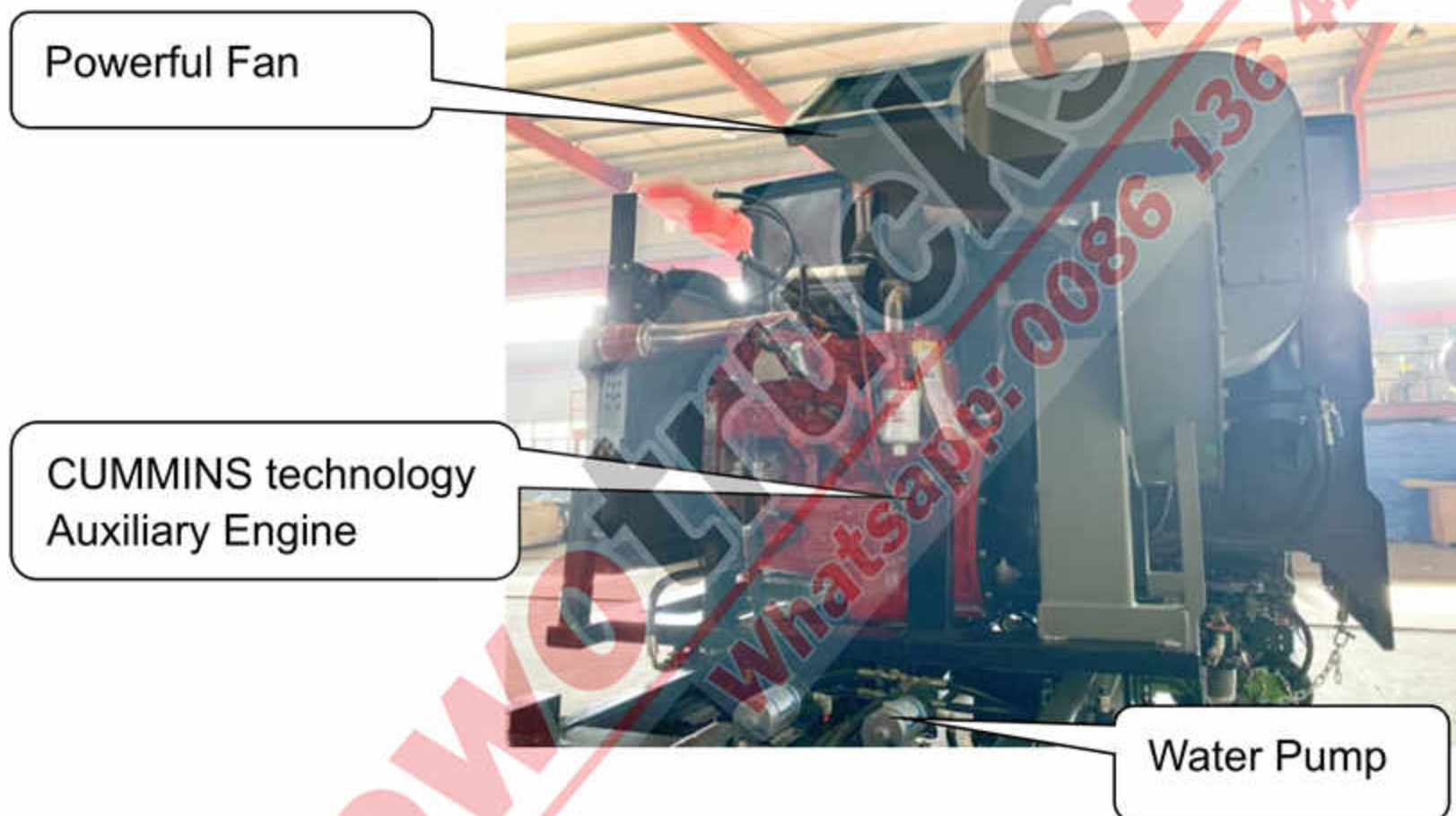
Radiator
Make sure the Cooling Liquid is enough before truck working

Fuel Tank (Both ISUZU chassis engine and Auxiliary engine use same tank)

Right Side view of the Truck: equipped with Powerful fan and Hydraulic Oil Tank. Water Inlet Valve



Middle view of the Truck: equipped with CUMMINS technology auxiliary engine and Water pump.



When lifting the tank, make sure the **Red Safety Support** in right position



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Rear view of the Truck: equipped with ISUZU technology auxiliary engine.



Top Clearance Lamp (2 set)
For safety while working

Arrow Light (2 sets)
For safety while working

Dust Vacuum Suction Device

Rear Discharging Door

Arrow Light Control Box



Control System of the road sweeper truck: Main control box in Cabin & rear control box.



Rear Control Box



- Main Control Box (In Cabin)**
1. Control the whole Sweeping operation
 2. English Version Panel for guidance
 3. Control the whole body up & down
 4. Control the rear door open & close
 5. English Version Panel for guidance

Top of the road sweeper truck: on top of the body with one Exhaust-vent.



On top of the road sweeper truck body installed one Exhaust-Vent

Chapter 6, Road Sweeper Truck Working Principles

The operator should fully understand Whole Structure and Working Principle for HOWO Road Sweeper Truck before any operation. Only trained person can operate this vehicle properly and to prevent unnecessary accidents and equipment damage.

i ,How are the sweeper trucks working?

The HOWO Road Sweeper Truck makes use of the CUMMINS technology auxiliary engine to get the power, and the engine drive the sweeping system, fans and vacuum suction plate working. Operation the main control box inside the cabin, and adjust the truck speed to sweeping faster and slowly. After sweeping working, cleaning the dust tank, add enough water into water tank, and ready for next time operation.

ii ,What is the main component for truck?

The road sweeper truck is refitted based on the HOWO 4x2 LHD chassis. The refit part includes road sweeping assembly, actuator device and operation system.

- *Road sweeping assembly: One stainless steel dust tank & one carbon steel water tank. 4 units brushes, vacuum suction plate and water spraying system.*
- *Actuator device: includes Isuzu technology auxiliary engine, drive line, etc., which can pass the power to the pump.*
- *Operation system: helps come to all special functions' convert.*

iii, How to operate road sweeper trucks?. **(Very Important)**

Steps 1-6 show how to operate road sweeper, Steps 7-14 show how to stop road sweeper and discharge garbage:

Main control box in cabin (English version plate):



Below Steps 1-7 show how to operate road sweeper:

1. Operate **SWITCH #10** to start CUMMINS auxiliary engine, and control the Auxiliary Engine **Revolving Speed** panel: Recommended working Revolving Speed is 1800r/min~2000r/min, which based on road condition

CUMMINS technology
Auxiliary Engine



2. Operate **SWITCH #4 and #5** control Left Front Sweep & Right Front Sweep:

Operation **SWITCH #4**: Turn to Down, the **LEFT SIDE** Front Brush move down to the ground.

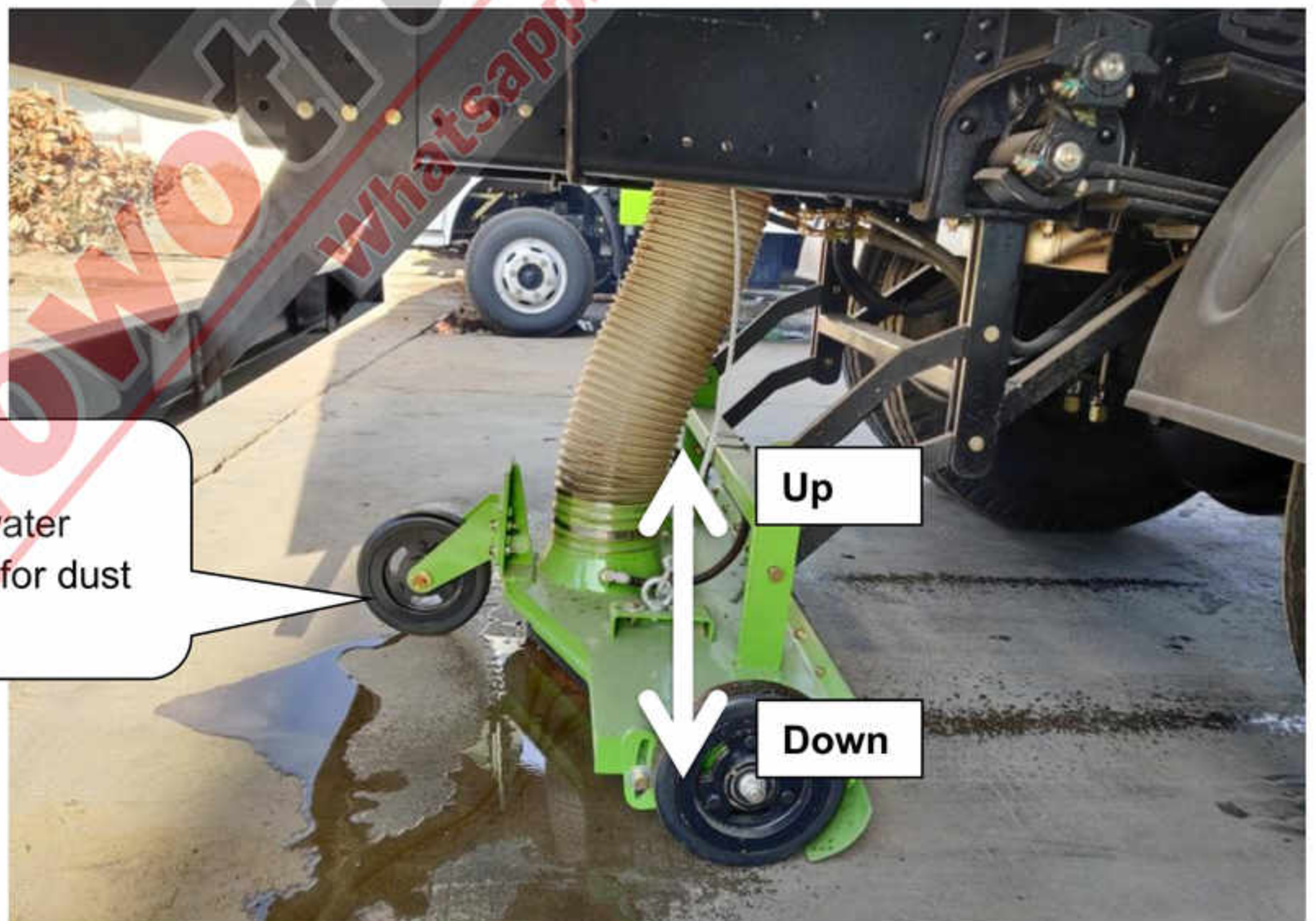
Operation **SWITCH #5**: Turn to Down, the **RIGHT SIDE** Front Brush move down to the ground.





3. Operate **SWITCH #9** to control Suction Plate Up & Down

Operation **SWITCH #9**: Turn to Down, the Suction Plate down to the ground.



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4. Operate **SWITCH #1** to control all Water Pump

Operation **SWITCH #1**: Turn to ON, water pump 1, 2, 3 start working.



5. Operate **SWITCH #3** to control all Sweeper Plate

Operation **SWITCH #3**: Turn to Full, all sweeping brushes start working.

Turn to Right, Left Front Stop, only right sweeping brushes start working.



6. Operate **SWITCH #2** to control Light

Operation **SWITCH #4**: Turn to ON, sweeping light on, special for night working.
Turn to OFF, sweeping light off, special for daytime working.



(Position Depend on the truck design)

Below Steps 7-14 show how to stop road sweeper and discharge garbage:

7. Operate **SWITCH #3** to control all Sweeper Plate

Operation **SWITCH #3**: Turn to Stop, all sweeping brushes stop working.

8. Operate **SWITCH #1** to control all Water Pump

Operation **SWITCH #1** Turn to OFF, water pump 1, 2, 3 stop working.

9. Operate **SWITCH #4 and #5** control Left Front Sweep & Right Front Sweep:

Operation **SWITCH #4**: Turn to Up, the LEFT SIDE Front Brush move upward.

Operation **SWITCH #5**: Turn to Up, the RIGHT SIDE Front Brush move upward.

10. Operate **SWITCH #9** to control Suction Plate Up & Down

Operation **SWITCH #9**: Turn to Up, the Suction Plate move upward.

11. Operate **SWITCH #1** to control all Water Pump

Operation **SWITCH #1** Turn to ON, water pump 1, 2, 3 start working.

12. Operate **SWITCH #7** to control Rear Door Open & Close

Operation **SWITCH #7**: Turn to UP, Rear Door open ready for garbage discharge.

13. Operate **SWITCH #6** to control Dust Bin Up & Down

Operation **SWITCH #6**: Turn to UP, Dust Bin rising for discharge garbage.



14. Temperature Instrument Panel: When temperature is over 100 °C, please stop working.

Chapter 7, Troubleshooting

After carefully reading the above information, you must be well known how to use the ISUZU Road Sweeper Truck; below show some important parts to help solve problems.

Trouble	Analysis	Troubleshooting
Hydraulic System Leakage	<ol style="list-style-type: none"> Pipeline joint loose Seal ring or compound gasket damaged Oil tank and pipeline welding trouble 	<ol style="list-style-type: none"> Fastening pipeline joint Replace seal ring or compound gasket Cleaning and welding again
Hydraulic System Working Pressure is Lower or no Pressure	<ol style="list-style-type: none"> Overflow valve blocked or adjust lower pressure Electric system poor contact or air switch trip Hydraulic pump damaged or excessive inside drain 	<ol style="list-style-type: none"> Adjust the overflow valve and reset the pressure to 14Mpa Carefully exam all electric circuit, connect the air switch Replace hydraulic pump or sealing element
High Temperature for Hydraulic System	<ol style="list-style-type: none"> Improper setting for overflow valve Hydraulic pipeline blocked 	<ol style="list-style-type: none"> Resetting system pressure to 14Mpa Carefully exam all pipeline and eliminate blocking problem
All Hydraulic Operation invalidity	<ol style="list-style-type: none"> Electric control box disconnect, no power on hydraulic system Overflow valve does not work Hydraulic pump damage or transfer belt breakage 	<ol style="list-style-type: none"> Carefully exam whole electric circuit Checking and resetting overflow valve Replace hydraulic pump or transfer belt
Collision and no proper retract problem for garbage tank	<ol style="list-style-type: none"> Garbage tank tilting device counterbalance valve improper adjusting Overflow pressure improper 	<ol style="list-style-type: none"> Adjusting the counterbalance valve pressure, and make sure the tank drop down safety Adjust overflow pressure to 14Mpa
Sweeping plate rotating speed slowly or no working	<ol style="list-style-type: none"> Working temperature too low, hydraulic oil viscosity higher, which make higher resistance Sweeping brush gears improper Hydraulic motor or hydraulic pump damaged 	<ol style="list-style-type: none"> Replace the hydraulic oil to recommend type Mobile #46 Hydraulic Oil (compression resistance & wear resisting) Adjust to proper gear Repair the hydraulic motor or hydraulic pump
Rear Sweeper cannot drop down properly	<ol style="list-style-type: none"> Sweeping plate idle Magnetic valve blocked, and electromagnetic coil damaged Hydraulic lock blocked 	<ol style="list-style-type: none"> Turn off the sweeping plate Replace or washing magnetic valve, replace the coil Washing or replace the hydraulic lock

<p>Rear Sweeping plate drop down and suction device raising not proper position</p>	<ol style="list-style-type: none"> 1. Sweeping plate and suction device hydraulic cylinder leakage 2. Suction device wire rope too long or breakage 3. Magnetic exchange valve or double-way lock blocked and leakage 	<ol style="list-style-type: none"> 1. Replace the hydraulic cylinder 2. Adjust or replace suction device wire rope 3. Maintenance the magnetic exchange valve or double-way lock
<p>Hydraulic oil color changed or exist air bubble</p>	<ol style="list-style-type: none"> 1. Hydraulic pump suffered empty absorption, and air enter into joint, pipeline or oil pimp 2. Oil tank seals is leaking or water enter into tank during washing 3. Hydraulic oil filter blocked and cause insufficient oil supply 	<ol style="list-style-type: none"> 1. Carefully checking pipeline, eliminate air into problem 2. Carefully exam the sealing for tank, replace the seal ring. Replace the hydraulic oil if necessary 3. Cleaning or replace the filter
<p>Sweeping plate, Suction Device or Garbage bin tilting device not work</p>	<ol style="list-style-type: none"> 1. Magnetic exchange valve damage or electromagnetic coil poor connection 2. Magnetic exchange valve element does not work 	<ol style="list-style-type: none"> 1. Carefully exam the magnetic exchange valve, replace it if necessary 2. Push the valve element to eliminate block, cleaning it if necessary

Chapter 7, Others for Attention

After carefully reading the above information, you must be well known how to use the HOWO Road Sweeper Truck; below show some parts you need to pay attention while using the truck.

i ,Precautions for Use

➤ Please strictly follow the following owner manuals:

Road Sweeper Owner's Manual

➤ Carefully examination the road sweeper truck:

1. Examine all parts, especially steering device, braking device, Suspension, tires and other joints, etc.
2. Examine Braking System, maintenance if need any help.
3. Examine the tire pressure.
4. Examine all lights on the truck, including Head Light, Fog Light, Turning Light, Tail Light, Arrow Light.
5. Examine the rear Anti-Static tape, replace it if not tough the ground

➤ It is strictly forbidden to operate the Power Take Off (PTO) under the condition of the clutch not separation (Not step the clutch pedal). When release the clutch, you should slowly. The operation of the PTO must only on the condition of neutral for clutch.

➤ It is better to cleaning the dust tank and add enough water into the water tank.

➤ When operating all the Valves, it is not good to overexert, for overexert will influence the valve's service life.

ii ,Maintenance

- *The maintenance of the chassis including clutch and transmission gearbox should be properly.*
- *It should be checked all coupling and lubrication at fixed period to exclude the tight parts, and make sure all parts in good lubrication condition.*
- *When the brush wear, adjust the height of the brush plate, replace all brushes only if cannot use any more.*
- *Always add enough cooling liquid into radiator to make sure Auxiliary engine never be overheat.*
- *The strainer inside filter should be washed frequently. Exchange it if necessary.*

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