

# **POWERSTAR Water Fire Truck**

## **User's Manual**



**POWERSTAR TRUCKS INDUSTRY CO., LIMITED**

**<http://www.isuzutruckscn.com/>**

## Preface

Thank you for purchasing POWERSTAR products. For better using your ISUZU water fire truck, get the best operating performance, we strongly suggest that before the operation process you could read this manual instructions carefully, and to manipulate the program handily.

The manual detailed describes the performance of water fire 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 water 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.

----POWERSTAR TRUCKS



POWERSTAR

POWERSTAR

## Contents

Chapter 1. General Description.....	4
Chapter 2, Main Technical Data .....	5
Chapter 3, XIONGZHEN Fire Pump .....	7
i , What is XIONGZHEN Fire Pump? .....	7
ii , Why choose XIONGZHEN Fire Pump? .....	8
iii, How to operate and maintenance XIONGZHEN Fire Pump? .....	8
Chapter 4, YIFENG Water Pump .....	10
i , What is YIFENG Water Pump? .....	10
ii , Why choose YIFENG Water Pump? .....	12
iii, How to operate and maintenance YIFENG Water Pump? .....	12
Chapter 5, Water Fire Truck Structure Components.....	14
i ,Water Fire Truck Structure Components .....	14
Chapter 6, Water Fire Truck Working Principles.....	19
i ,How are the water fire trucks working?.....	19
ii ,What is the main component for truck? .....	19
iii, How to operate water fire truck Fire Pump System?. (Very Important).....	20
IV,How to operate water fire truck Water Pump System?. (Very Important) .....	23
Chapter 7, Others for Attention .....	28
i ,Precautions for Use.....	28
ii ,Maintenance.....	28

## Chapter 1. General Description

POWERSTAR TRUCKS Water Fire Truck based on type II ISUZU 6\*4 model chassis, water tanker capacity could up to 14,000liters, mainly used for water storage, transportation and spraying, and all kinds of firefighting work, the working aerial can be city street, factory, community and other areas of need.

The vehicle designed to fully rely on the advantages of the original ISUZU 6\*4 LHD chassis, fully consider the product's convenience and reliability. The water tanker material is international stainless steel, which can be durable and service for a long time. As for tank capacity, this can be up to 14 CBM, with front spraying nozzle, side spraying nozzle, rear spraying nozzle and monitor, also top fire monitor for easy operation, and can cover all customers' water transport & spraying requirement.

The ISUZU 6\*4 Water Tanker Truck equipped with Liquidometer, rear climbing ladder, side & rear guard plate and front, side and rear spraying nozzle, top fire monitor to help better use of the trucks. Also have rear working platform and top working platform for easy operation. Therefore, the vehicle is an ideal Water Fire Truck mainly for water transportation & water spraying, and firefighting work.



(Preview for your ISUZU Water Tanker Trucks)

## Chapter 2, Main Technical Data

### Basic parameter:

Items		14 CBM ISUZU Water Fire Truck
S I Z E	Outer Dimension (L×W×H) (mm)	10000*2500*3900
	Wheelbase (mm)	4000+1300
Kerb Weight (kg)		12400
G E A R	Gearbox brand	FAST
	Model	9-shift gearbox
	Type	Manual
Cab capacity (includes driver)		2+1
E N G I N	Model	ISUZU 6HK1-TCG40
	Type	Four cylinder inline, four stroke, turbocharged Inter-cooling, diesel
	Rating Power (kW/HP)	206 / 280
	Emission Standard	Euro 4

Note: 1.The vehicle height includes Top Fire Monitor.

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

### Water Tanker basic parameter list

Items		Parameter	
Water tanker	Capacity (CBM)	14	
	Material	Stainless Steel	
	Painting	White painting with standard logo	
	Special Equipment	Liquidometer	Equipped on side of tank
		Valves	Equipped on side & rear of tank
Climbing Ladder		Equipped at rear of tank	
Water	Brand	YIFENG	

Pump	Model		65QZ50/110N		
	Water Flow Rate	m <sup>3</sup> /h	50		
		l/min	833		
	Lifting (m)		110		
	Self-Suction Height (m)		6.5		
	Self-Suction Capacity (min/4m)		1.5		
	Rated Power (kw)		24		
More details for Water Pump showing as below					
Fire Pump	Brand		XIONGZHEN		
	Model		CB10/40-XZ		
	Water Inlet Diameter		φ 125		
	Water Outlet Diameter		φ 80		
	Maximum Vacuum		≥80 Kpa		
	7m depth suction time		≤35 s		
	Working Model		1	2	3
	Flow Rate (L/S)		40	28	20
	Outlet Pressure (Mpa)		1.00	1.30	1.00
	Rated Rotation Speed (r/min)		3135 ± 50	3390 ± 50	3010 ± 50
	Shaft Power (kw)		60	61	39
	Suction Depth (m)		3	3	7

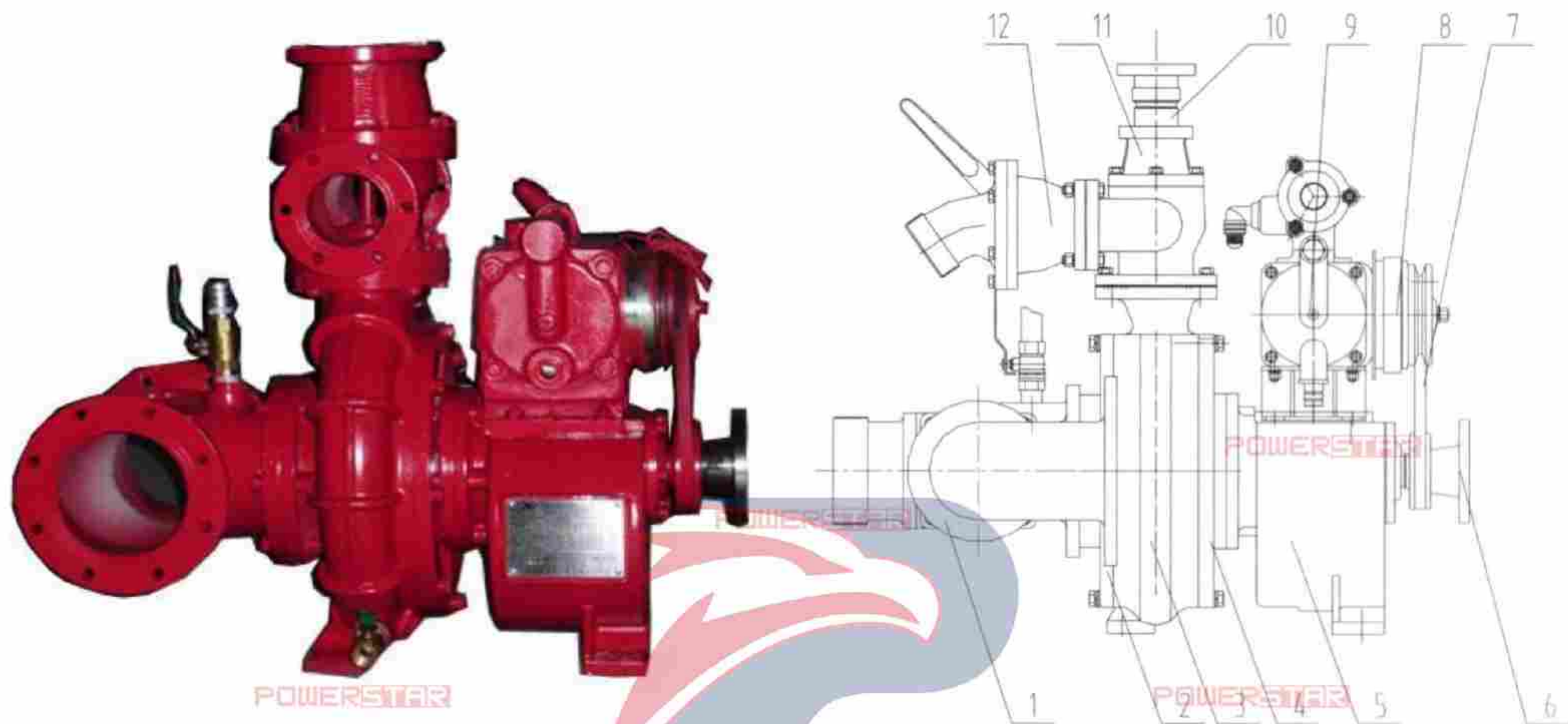
**POWERSTAR**

## Chapter 3, XIONGZHEN Fire Pump

### i , What is XIONGZHEN Fire Pump?

XIONGZHEN Fire Pump is one of TOP Chinese brand fire pump. The 1 unit ISUZU 6\*4 Water Fire Truck use CB10/40-XZ model fire pump, the fire pump is newly produced National Patent Products which based on Germany, Austria and American fire pump advantages, also our many years' independent developing & production of pump. The fire pump comply with national standards GB6245-2006. Advanced features for the pump showing as below: Simple Structure, Smooth Operation, High Efficiency and Reliable Quality.

Below is basic structure for CB10/40-XZ model fire pump:



1. Water Inlet Four-Way Valve	2. Front Cover
3. Pump Shell	4. Rear Cover
5. Bearing House	6. Connecting Shaft Flange
7. Belt Roller	8. Electro-magnetic Clutch
9. Piston Primer Pump	10. Water Inlet Valve
11. Check Valve	12. Water Outlet Valve

## ii , Why choose XIONGZHEN Fire Pump?

XIONGZHEN brand CB10/40-XZ model fire pump is specially designed fire pump, which is an idea pump widely used in light duty, middle duty and heavy duty water tanker fire trucks, foam fire trucks, water-foam fire trucks, water-foam-powder fire trucks, and more excellent than Similar Products.

## iii, How to operate and maintenance XIONGZHEN Fire Pump?

1. Before operating the XIONGZHEN CB10/40-XZ model fire pump, below thing need to be done firstly:

- Turn off all water outlet valves on the fire pump
- Foam fire truck should turn off foam ball valve and foam proportioner
- Turn on the water inlet valve on the fire pump
- Turn off the water injection valve
- Fire pump rotation with no water may damage the pump (Safe Rotation Time  $\leq 1$  min)

2. After using the fire pump, below thing need to be done:

- Turn on all water outlet valves on the fire pump and pipeline, discharging all the water inside the truck, then turn off all the valves
- Checking the bearing shaft oil level, suggest to change shaft oil every two years.

3. While using fire pump, there are may be some unpredicted malfunction, following diagram help you better know the possible reason and solution:



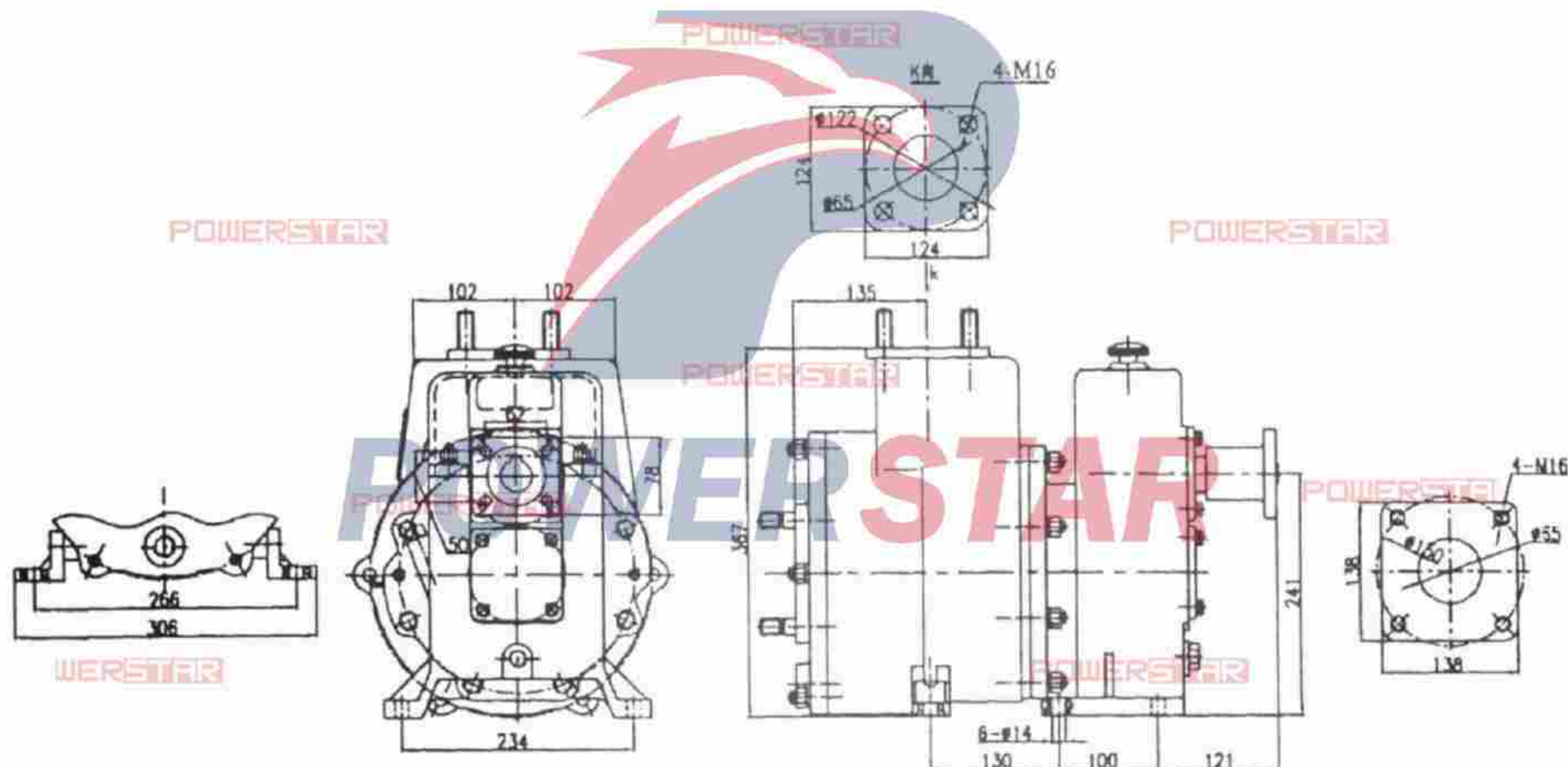
Malfunction	Possible Reason	Solution
Pump Cannot Start Working	<ol style="list-style-type: none"> <li>1. The pump is not combined</li> <li>2. Impeller Jammed</li> <li>3. Pump frozen</li> </ol>	<ol style="list-style-type: none"> <li>1. Combining the pump</li> <li>2. Clean the Impeller or change new one</li> <li>3. Heating the pump carefully</li> </ol>
Water Diversion not Working	<ol style="list-style-type: none"> <li>1. Suction depth too much (<math>&gt;7m</math>)</li> <li>2. Electromagnetic clutch damage or now electric power</li> <li>3. Water outlet valve pressure <math>\geq 0.2Mpa</math></li> <li>4. Triangular belt slipped</li> <li>5. Pressure switch blocked</li> <li>6. Piston ring damage</li> <li>7. Air inlet or outlet valve damage</li> <li>8. Water inlet pipeline damage or gasket damage</li> <li>9. Pump water outlet valve not turn off or leakage</li> <li>10. Water inlet pipeline air suction valve not turn on</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the suction depth (<math>\leq 7m</math>)</li> <li>2. Change the Electromagnetic clutch or connect electric power</li> <li>3. Reduce the valve pressure <math>&lt; 0.2Mpa</math></li> <li>4. Change new belt</li> <li>5. Change or cleaning the pressure belt</li> <li>6. Change new piston ring</li> <li>7. Change new air inlet and outlet valve</li> <li>8. Change new suction pipeline or change new gasket</li> <li>9. Close the water outlet valve or change new valve</li> <li>10. Turn on the air suction valve</li> </ol>
Bearing box or Gear box overheating	<ol style="list-style-type: none"> <li>1. Oil level too high or too low</li> <li>2. Bearing shaft damage</li> </ol>	<ol style="list-style-type: none"> <li>1. If too high, drop some oil; If too low, add some oil</li> <li>2. Change new bearing shaft</li> </ol>
Too Noise for pump	<ol style="list-style-type: none"> <li>1. Suction depth too much (<math>&gt;7m</math>)</li> <li>2. Pump has vapor cloud</li> <li>3. Pump bracket loosen</li> <li>4. Shaft bearing damage</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce the suction depth (<math>\leq 7m</math>)</li> <li>2. Reduce the pump rotation speed, reduce the jet flow</li> <li>3. Fasten the pump bracket</li> <li>4. Change new shaft bearing</li> </ol>
Pump performance not good	<ol style="list-style-type: none"> <li>1. Water filter and suction nozzle filter blocked</li> <li>2. Engine power not enough</li> <li>3. Water outlet valve not fully open</li> <li>4. Rear water injection valve not closed</li> </ol>	<ol style="list-style-type: none"> <li>1. Clean all the filter</li> <li>2. Check the engine</li> <li>3. Turn on the valve completely</li> <li>4. Turn off the water injection valve</li> </ol>

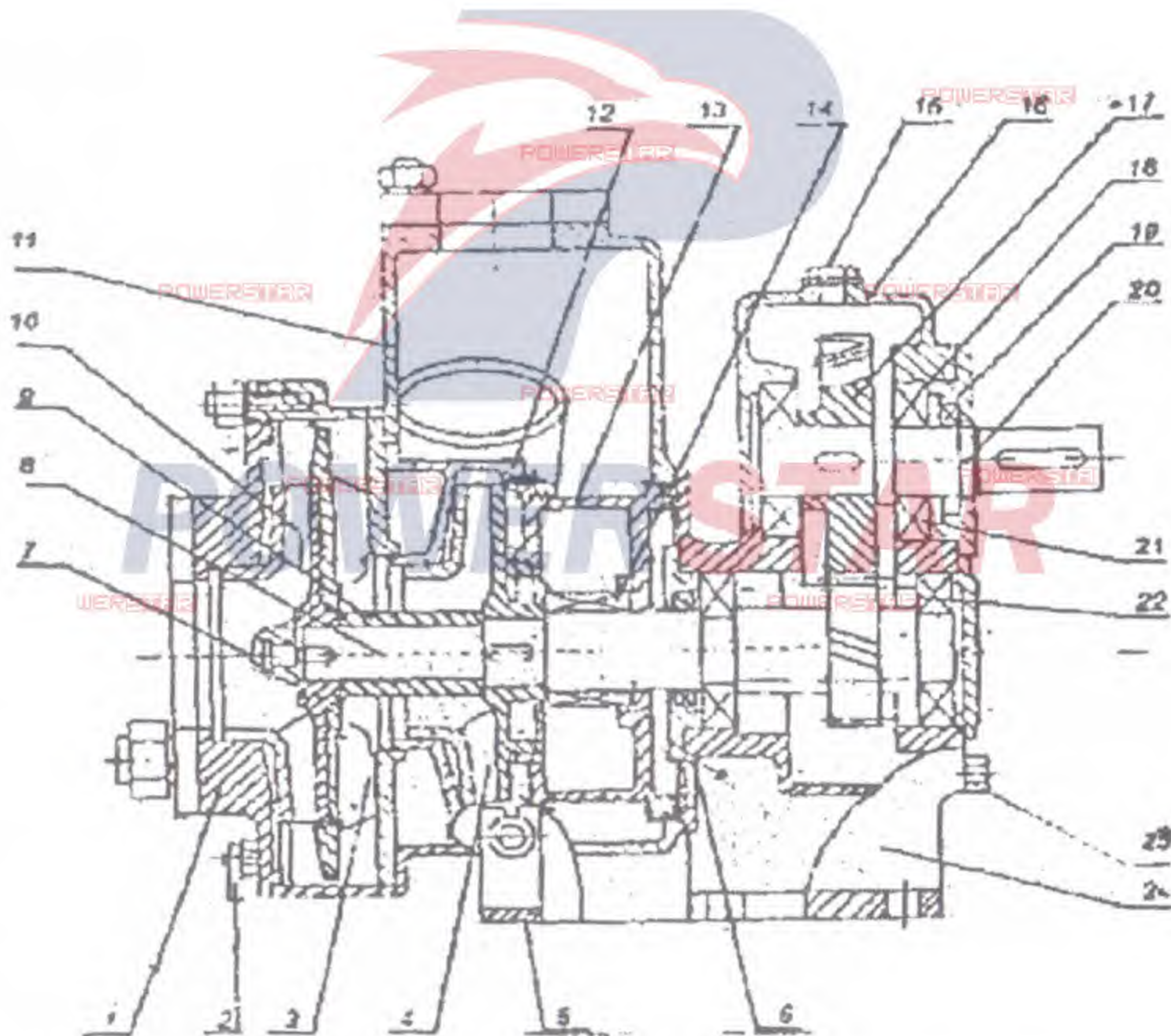
## Chapter 4, YIFENG Water Pump

### i , What is YIFENG Water Pump?

YIFENG Pump is one of TOP Chinese brand water pump. The 1 unit ISUZU 6\*4 Water Fire Truck use 65QZ50-110 model water pump, the pump is newly produced National Patent Products which based on our many years' independent developing & production of self-priming centrifugal pump. Also the pump complies with national standards QC/T29114-43. Advanced features for the pump showing as below: Simple Structure, Smooth Operation, High Efficiency and Reliable Operation.

Below is basic structure installation space for 65QZ50-110 model water pump:





1. Suction flange
2. Water drainage valve
3. Guide vane
4. Secondary impeller
5. Arm brace
6. Drain hole
7. Screw nut of impeller
8. Pump shaft
9. Small shaft sleeve
10. Primary impeller
11. Pump body
12. Triangular seal ring
13. Sealing receptacle
14. Mechanical seal
15. Fueling plug screw
16. Gear case
17. Drive gear
18. Bearing
19. Input bearing cap
20. Input shaft
21. Oil seal 35 × 62 × 12
22. Driven gear
23. Oil drainage bolt
24. Case body

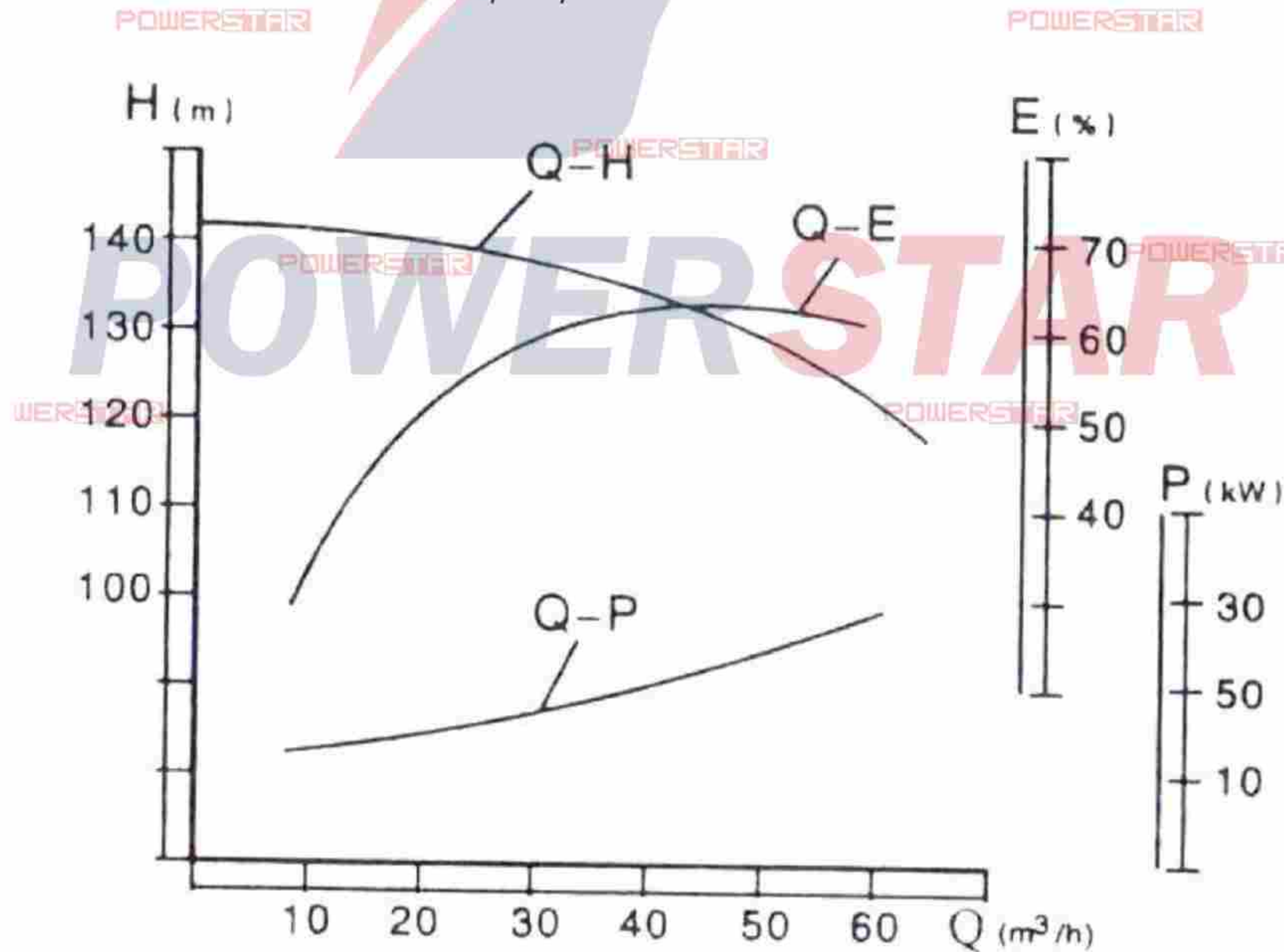
## POWERSTAR

POWERSTAR

POWERSTAR

## ii , Why choose YIFENG Water Pump?

YIFENG brand 65QZ50-110 model pump is specially designed water pump, and water flow rate can be up to 50m<sup>3</sup>/h, which is more excellent than Similar Products. Following is Performance Curve Diagram for 65QZ50-110 model water pump:



## iii, How to operate and maintenance YIFENG Water Pump?

1. Before operating the YIFENG 65QZ50-110 model water pump, first and most important thing you need to know is the pump Working Principle:

YIFENG 65QZ50-110 model water pump internal body should have some Liquid Storage. When pump start working, the Impeller rotates and inlet valve have Negative Pressure, the air into pipeline and mixed with the liquid inside pump, then enter into Gas-Liquid Separation Chamber through Delivery Chamber. Because of density difference for water & air, air separated from liquid and discharged from outlet valve, meanwhile liquid sink in the Gas-Liquid Separation Chamber, after many times cycle operation till no air inside the suction pipeline, and then the pump can start

working normally.

4. While using YIFENG 65QZ50-110 model water pump, there are may be some unpredicted malfunction, following diagram help you better know the possible reason and solution:

Malfunction	Possible Reason	Solution
Pump Cannot Self-Priming	<ol style="list-style-type: none"> <li>1. Residual liquid is not kept in the pump body or not enough</li> <li>2. Leakage of suction tube</li> <li>3. Rotating speed is too slow</li> <li>4. Too high suction or blockage of suction pipeline</li> <li>5. Too huge volume of leakage of mechanical seal</li> </ol>	<ol style="list-style-type: none"> <li>1. Fill sufficient residual liquid</li> <li>2. Check and eliminate leakage</li> <li>3. Adjust rotating speed</li> <li>4. Reduce suction process or shorten suction pipeline</li> <li>5. Repair or replacement</li> </ol>
Not Enough Pressure	<ol style="list-style-type: none"> <li>1. Blockage of impeller passage or suction pipeline</li> <li>2. Insufficient power or too low rotating speed</li> <li>3. Inlet or outlet valve not open completely</li> </ol>	<ol style="list-style-type: none"> <li>1. Remove obstruction</li> <li>2. Increase power to the rotating speed</li> <li>3. Open inlet or outlet valve completely</li> </ol>
High Consumption for pump shaft	<ol style="list-style-type: none"> <li>1. Over volume of flow</li> <li>2. Too high rotating speed</li> <li>3. Distortion of pump shaft or blockage or scratch of impeller</li> <li>4. Obstruction or blockage of passage in the pump</li> </ol>	<ol style="list-style-type: none"> <li>1. Reduce volume of flow</li> <li>2. Reduce appropriately</li> <li>3. Correction or replacement</li> <li>4. Remove obstruction</li> </ol>
Too Noise for pump	<ol style="list-style-type: none"> <li>1. Pump foot instability</li> <li>2. Cavitation phenomena</li> <li>3. Bearing sever wear</li> <li>4. Internal pipeline in pump blocked or stuck</li> <li>5. Sundries in pump or pipeline</li> <li>6. Pump and PTO not same shaft</li> </ol>	<ol style="list-style-type: none"> <li>1. Reinforce the pump</li> <li>2. Adjust working environment</li> <li>3. Replace it</li> <li>4. Adjust or replace it</li> <li>5. Cleaning up the pump or pipeline</li> <li>6. Adjust to same shaft</li> </ol>

# POWERSTAR

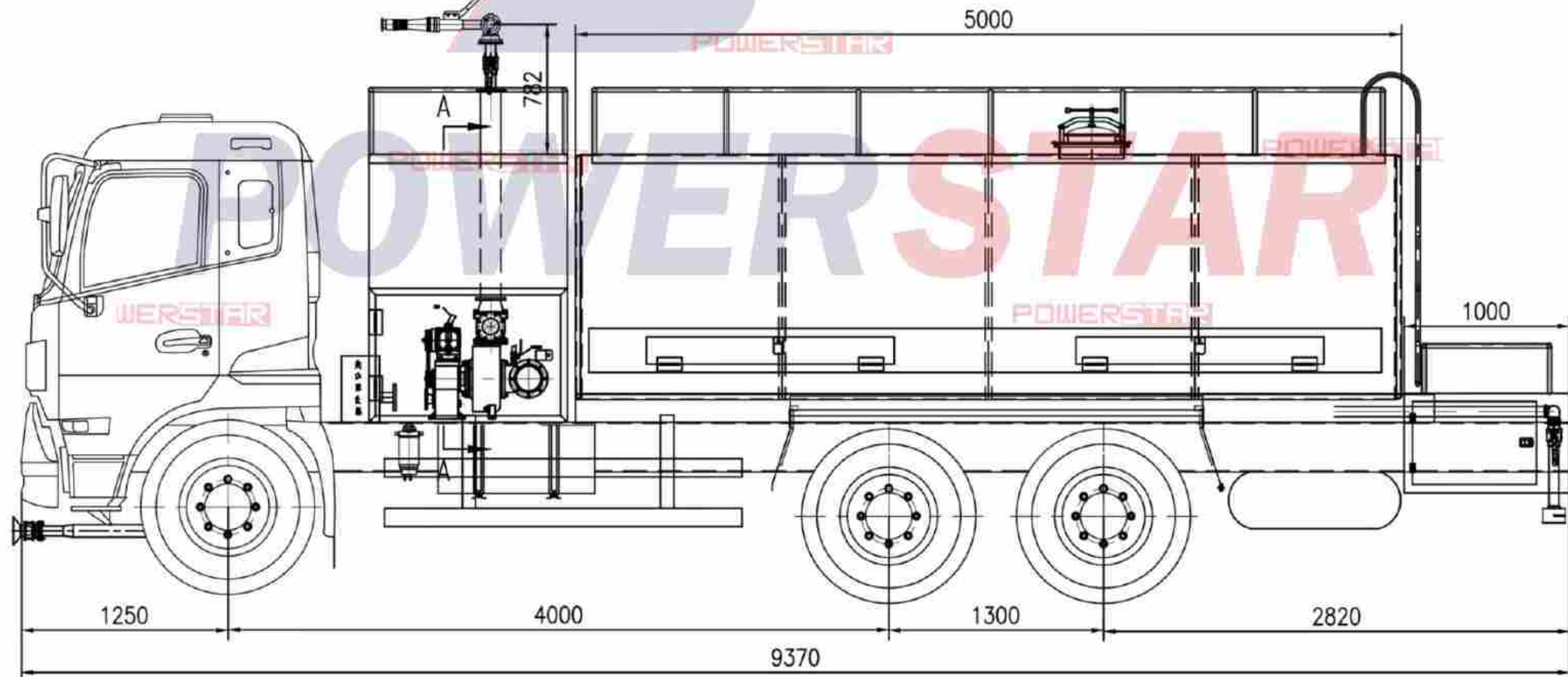
POWERSTAR

POWERSTAR

## Chapter 5, Water Fire Truck Structure Components

### i ,Water Fire Truck Structure Components

Overview for ISUZU 6\*4 water tanker truck technical drawing:

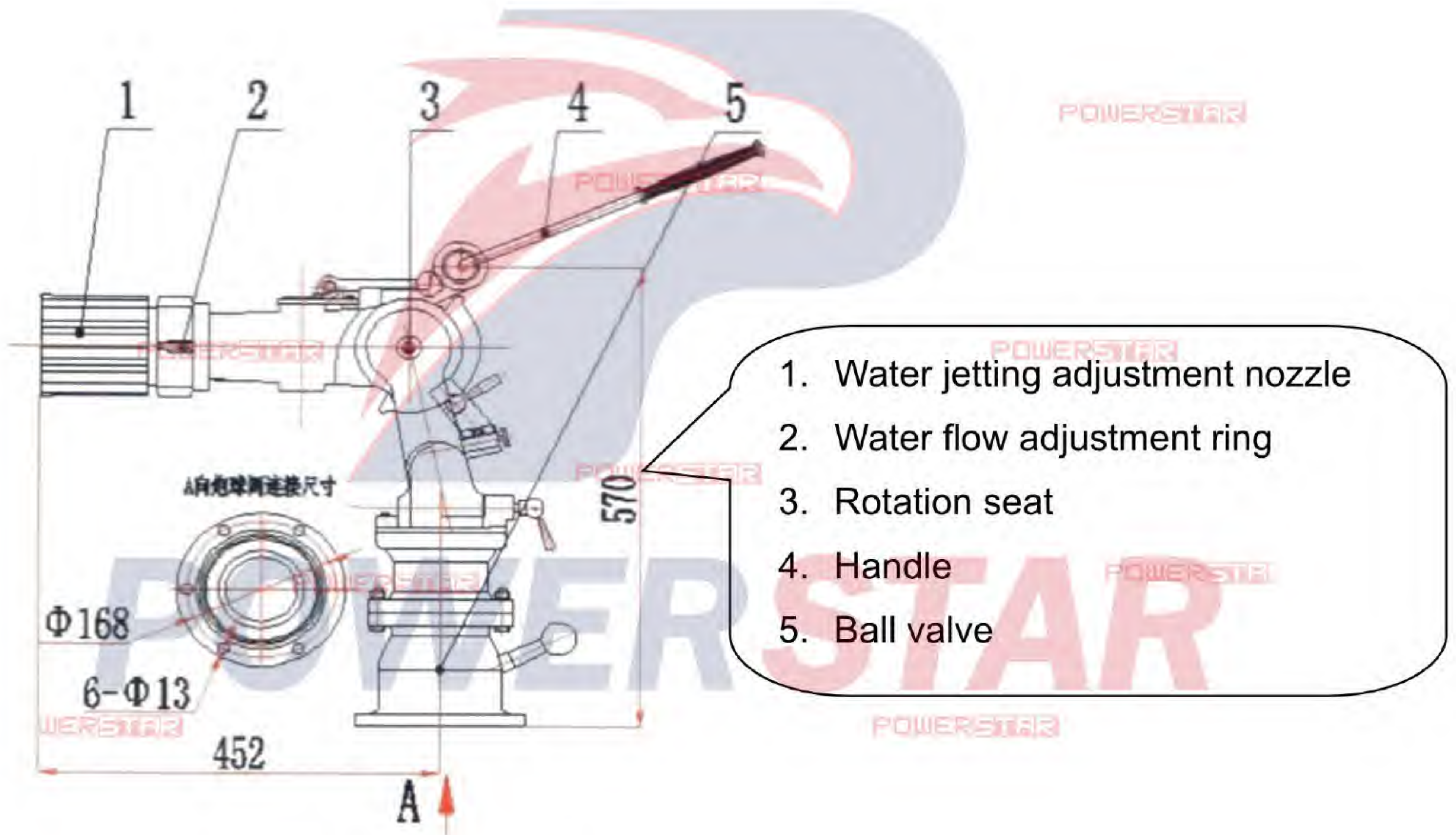


Above drawing show the water fire truck dimension for reference; the tanker has one 500mm manhole for easy maintenance, top and rear platform for easy operation. The whole water tank is **oval shape**; with tanker capacity is 14000 liters:

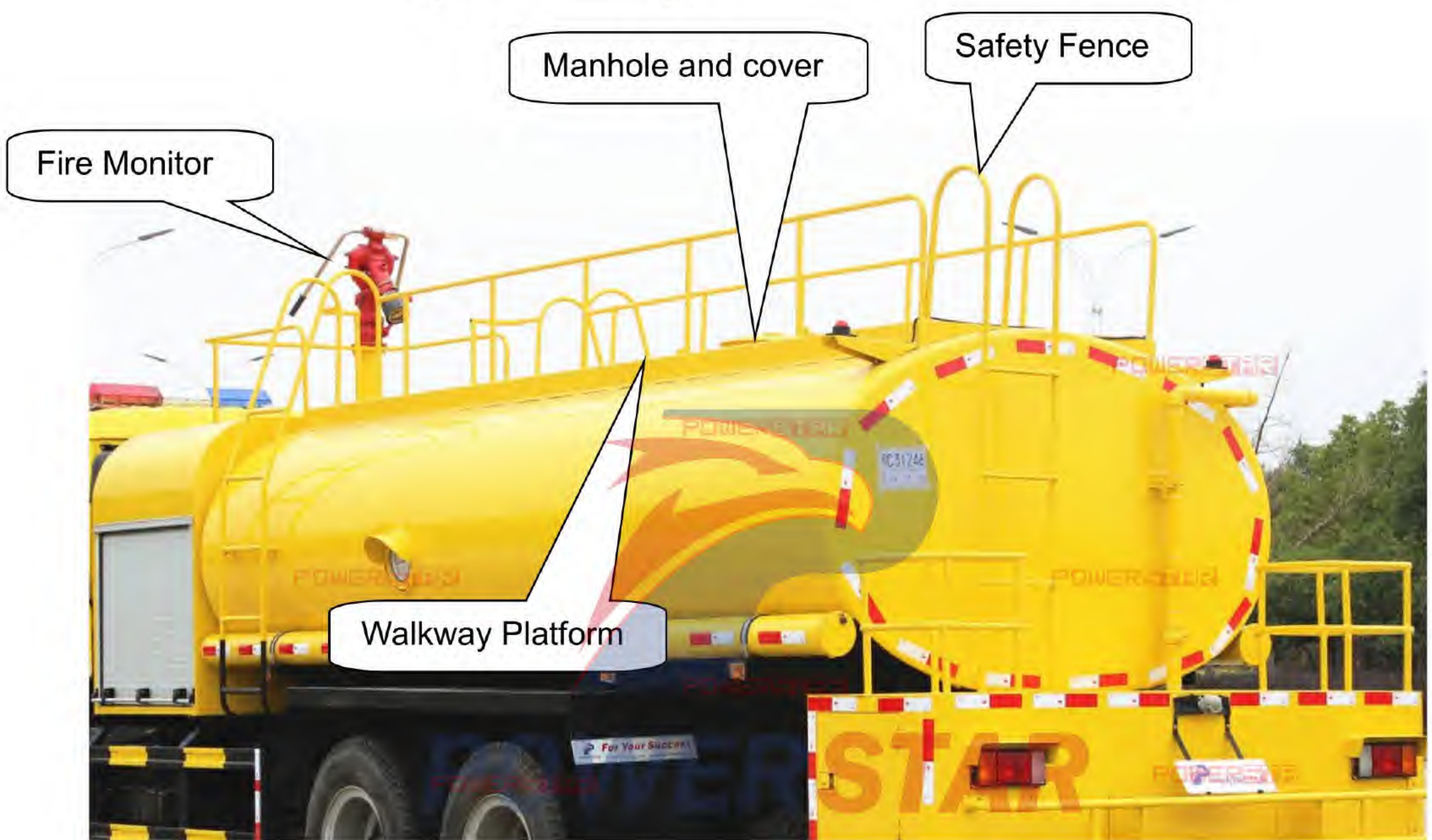
Top of the Tank: XIONGZHEN Fire monitor, safety fence, manhole and walkway platform



XIONGZHEN Fire Monitor on Top of tank, for firefighting working



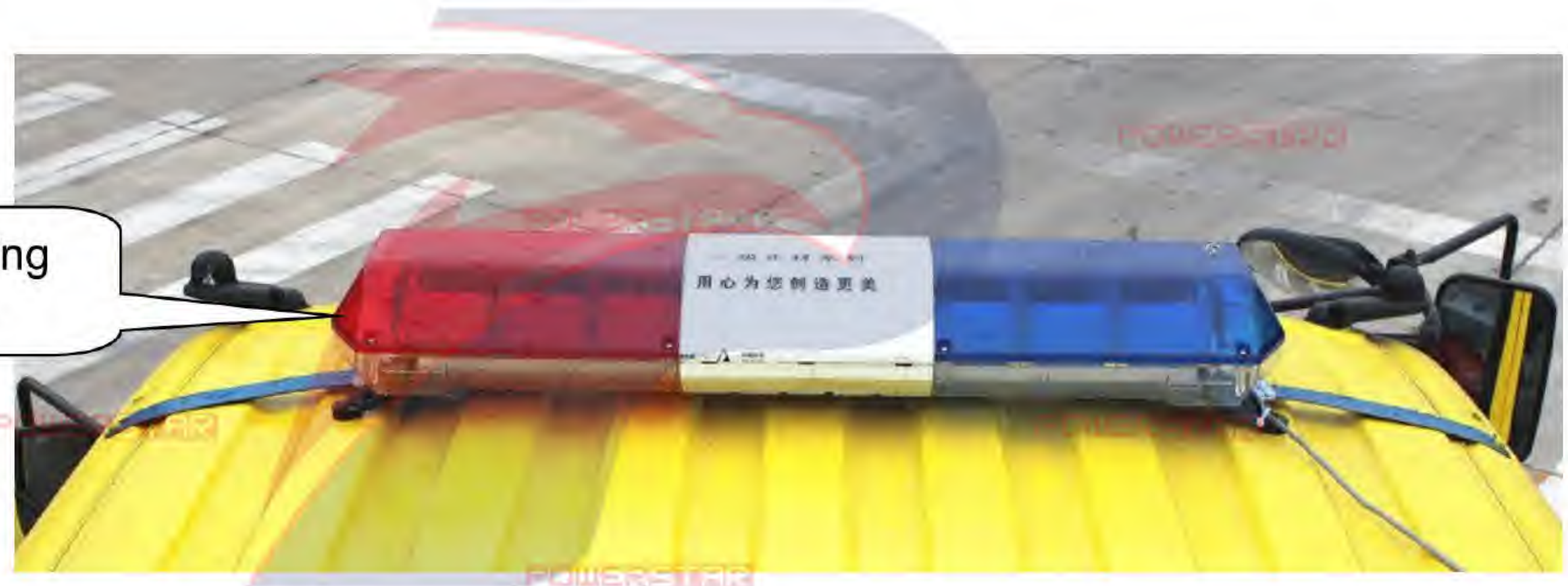
1. Water jetting adjustment nozzle
2. Water flow adjustment ring
3. Rotation seat
4. Handle
5. Ball valve



POWERSTAR

POWERSTAR

Pillow warning light on top



Control box in cabin



Rear of the Tank: Climbing ladder, working platform, water spraying nozzles, tool box.

Climbing ladder

Rear Working Platform

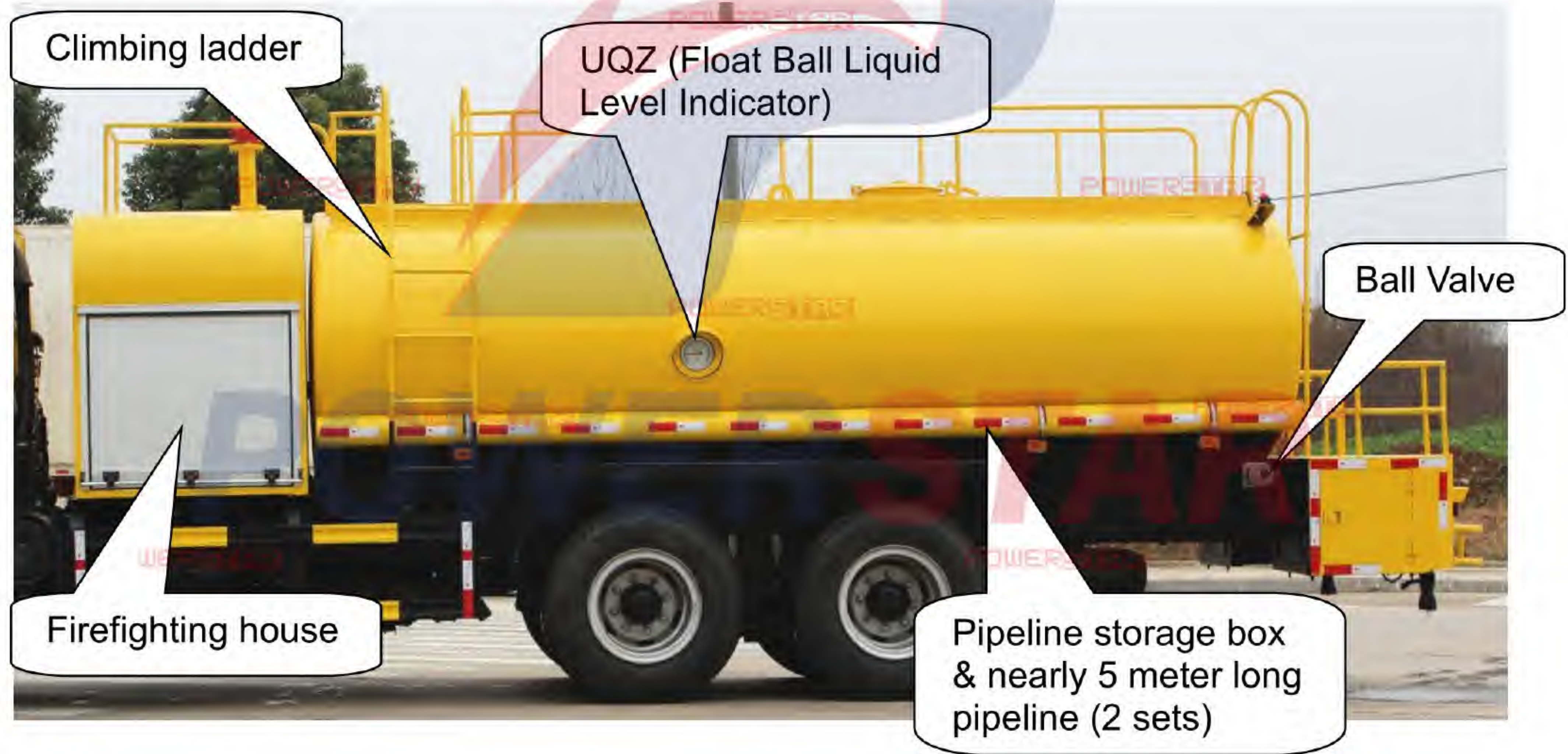
Water Spraying Nozzles (Two sides)

Tool Box (Two sides)





Left side of the Tank (Driver side): Climbing ladder, fighting house, Pipeline storage box and UQZ (Float Ball Liquid Level Indicator)

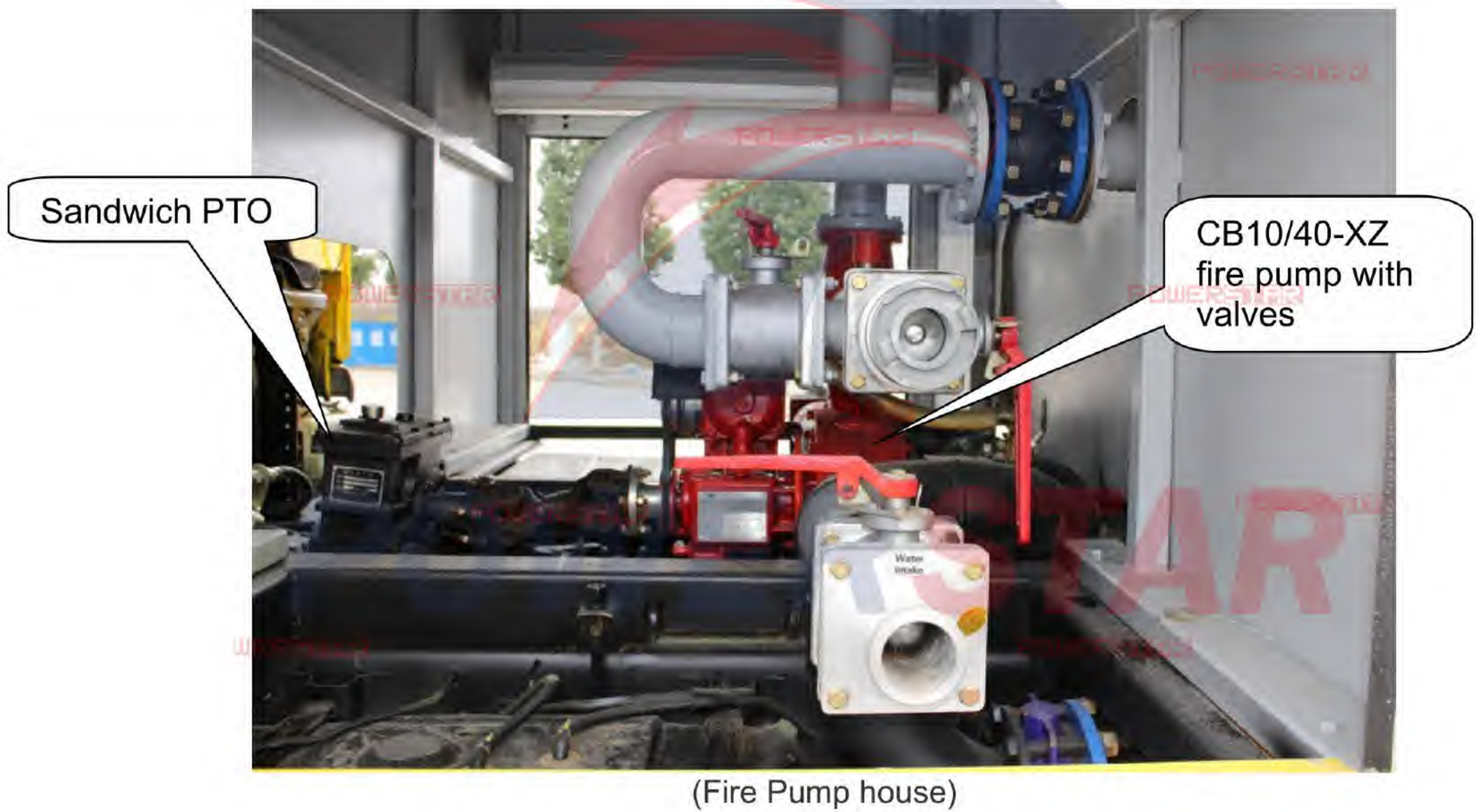


UZQ (Float Ball Liquid Level Indicator) --at driver side of water tank



Ball valve  
Left & Right side  
both installed





Right side of the Tank (Passenger side): Climbing ladder, fighting house, Pipeline storage box and UQZ (Float Ball Liquid Level Indicator)



## Chapter 6, Water Fire Truck Working Principles

The operator should fully understand Whole Structure and Working Principle for ISUZU 6\*4 Water Fire Truck before any operation. Only trained person can operate this vehicle properly and to prevent unnecessary accidents and equipment damage.

### i ,How are the water fire trucks working?

The ISUZU 6\*4 Water Tanker Truck has two separate watering working systems:

1. Water Pump system makes use of the special power take off (PTO) to get power from the engine, and then pass the power to the YIFENG 65QZ50-110 pump via drive axle so to rotate the water pump. The pump, pipelines valves and joints consist of the pipeline system. Turn on/off valves through the regulated program, the pump can absorb water into the tank from the source or exhaust the water inside the tank through the set lines, and then come to all function.
2. Fire Pump system makes use of the sandwich power take off (PTO) to get power from the engine, and then pass the power to the XIONGZHEN CB10/40-XZ pump via drive axle so to rotate the fire pump. The pump, pipelines valves, joints and top fire monitor consist of the pipeline system. Turn on/off valves and fire monitor through the regulated program, the pump can absorb water into the tank from the source or exhaust the water inside the tank through the set lines, and then come to all function.

### ii ,What is the main component for truck?

The water fire truck is refitted based on the ISUZU LHD 6\*4 chassis. The refit part includes water carrying assembly, actuator device, pipeline system and operation system.

- Water carrying assembly: A stainless steel container shaped ellipse, which is used to store work water.
- Actuator device: includes power take off, sandwich PTO, drive line, etc., which can pass the power from the chassis to the pump.

- Pipeline system helps come to all special functions, including fire pump system top fire monitor and side fire hose working; water pump system front, side and rear water spraying.
- Operation system: helps come to all special functions' convert.

### iii, How to operate water fire truck Fire Pump System?. (Very Important)

**Please Note: When wrench is PARALLEL with pipeline, the pipe flow;**

**When wrench is VERTICAL with pipeline, the pipe closed.**

1. Turn on the Fire Monitor switch firstly



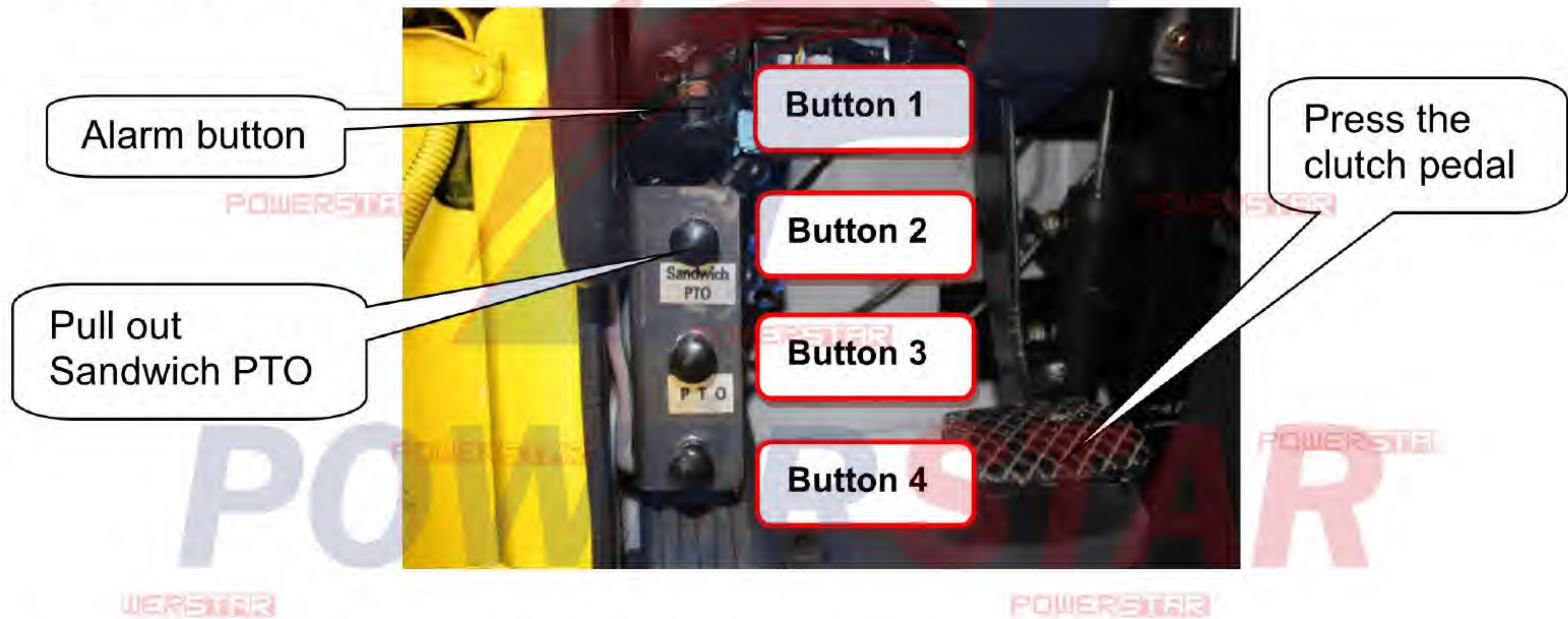
Fire Monitor Switch  
LEFT: ON position  
RIGHT: OFF position

2. Turn on the Main Switch of the truck battery

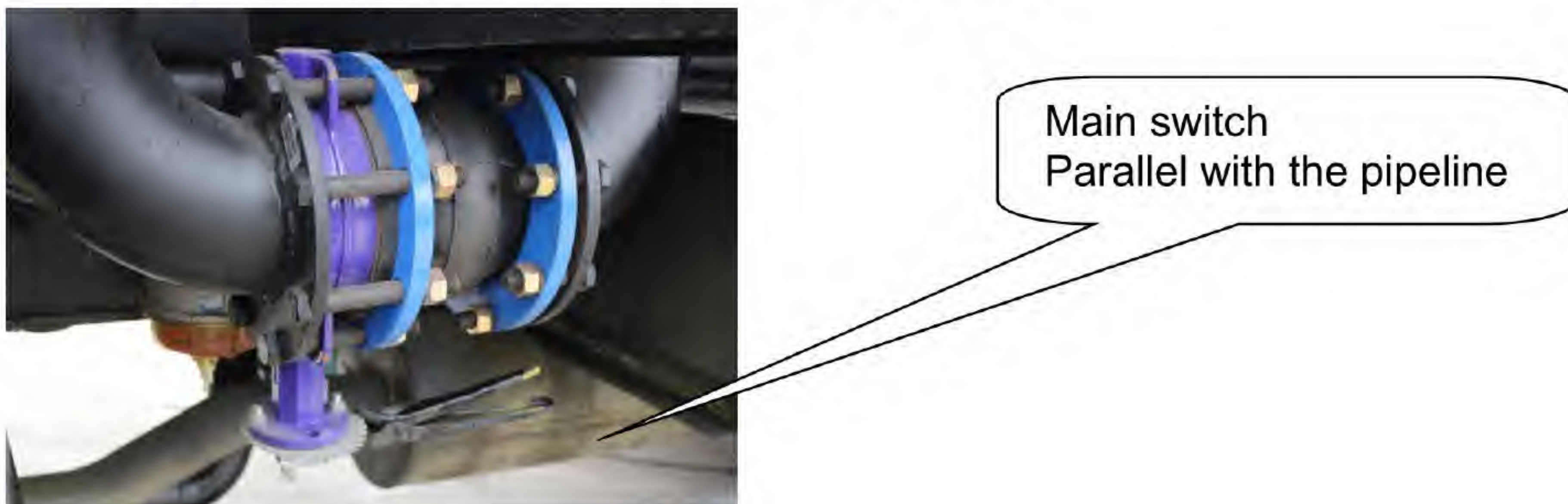


Main Switch of the  
truck chassis battery

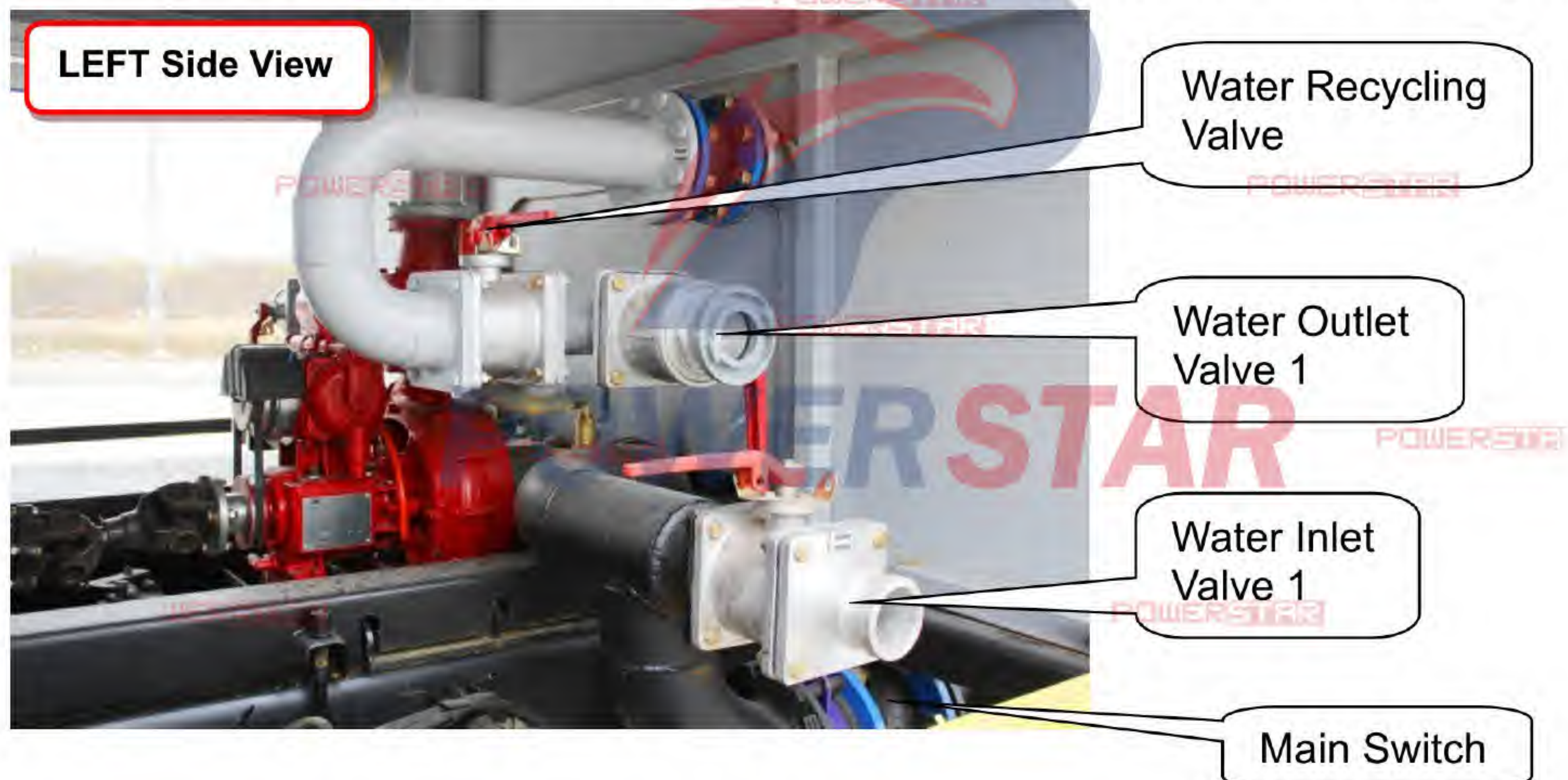
3. Start the truck engine, pressure the clutch pedal, and then pull out the Button 2 Sandwich PTO only, finally release the pedal slowly.

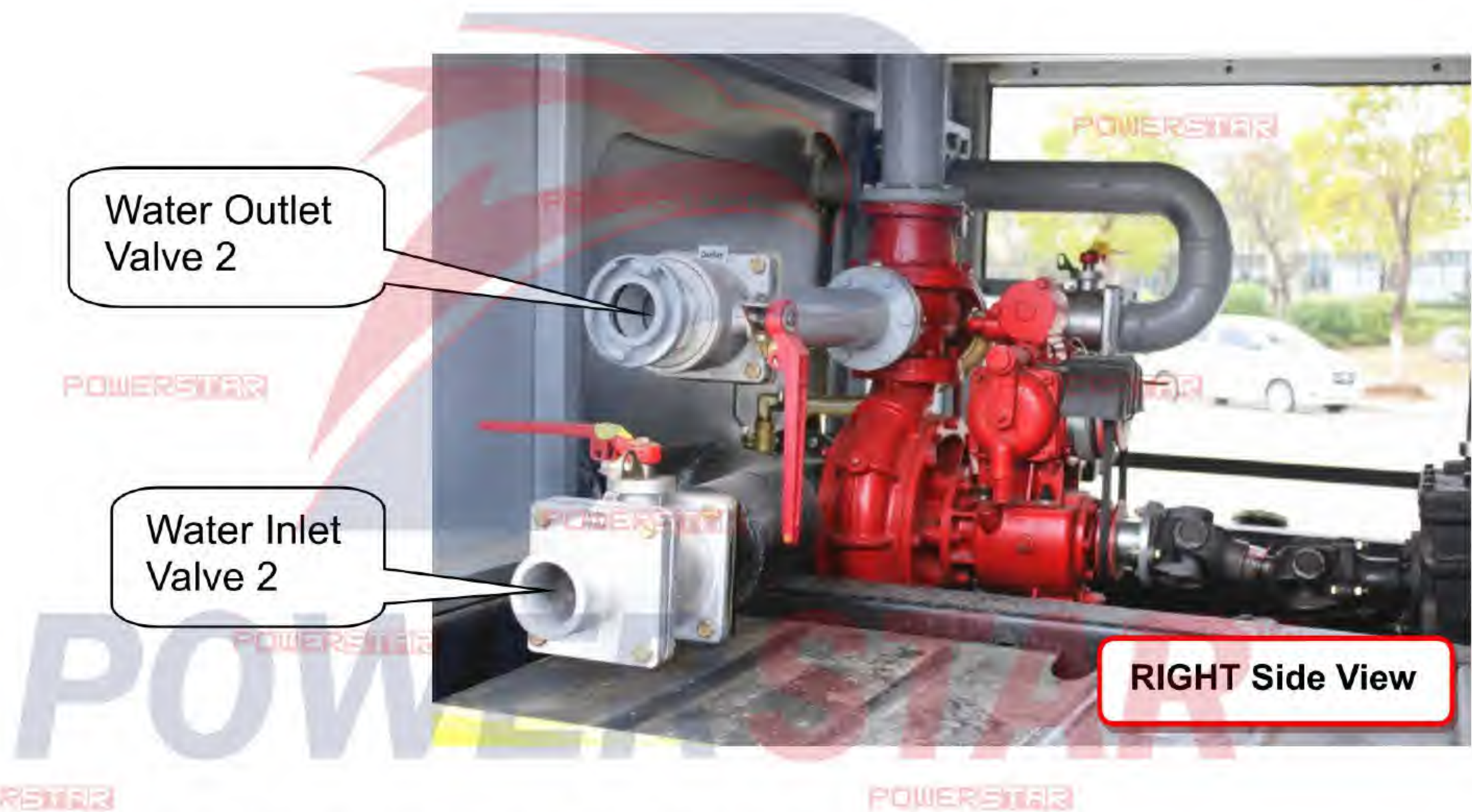


4. Switch the main valve wrench to parallel with the pipeline.



5. Turn Off Water Inlet Valve 1 & 2 and Water Outlet Valve 1 & 2, also Water Recycling Valve





6. Operate the top fire monitor can spraying water for firefighting working  
(Pressure Clutch Pedal can make water spraying faster and stronger)



360 degree rotation

Adjust the Water Jetting Nozzle can realize the water jetting as below:



Fog spraying

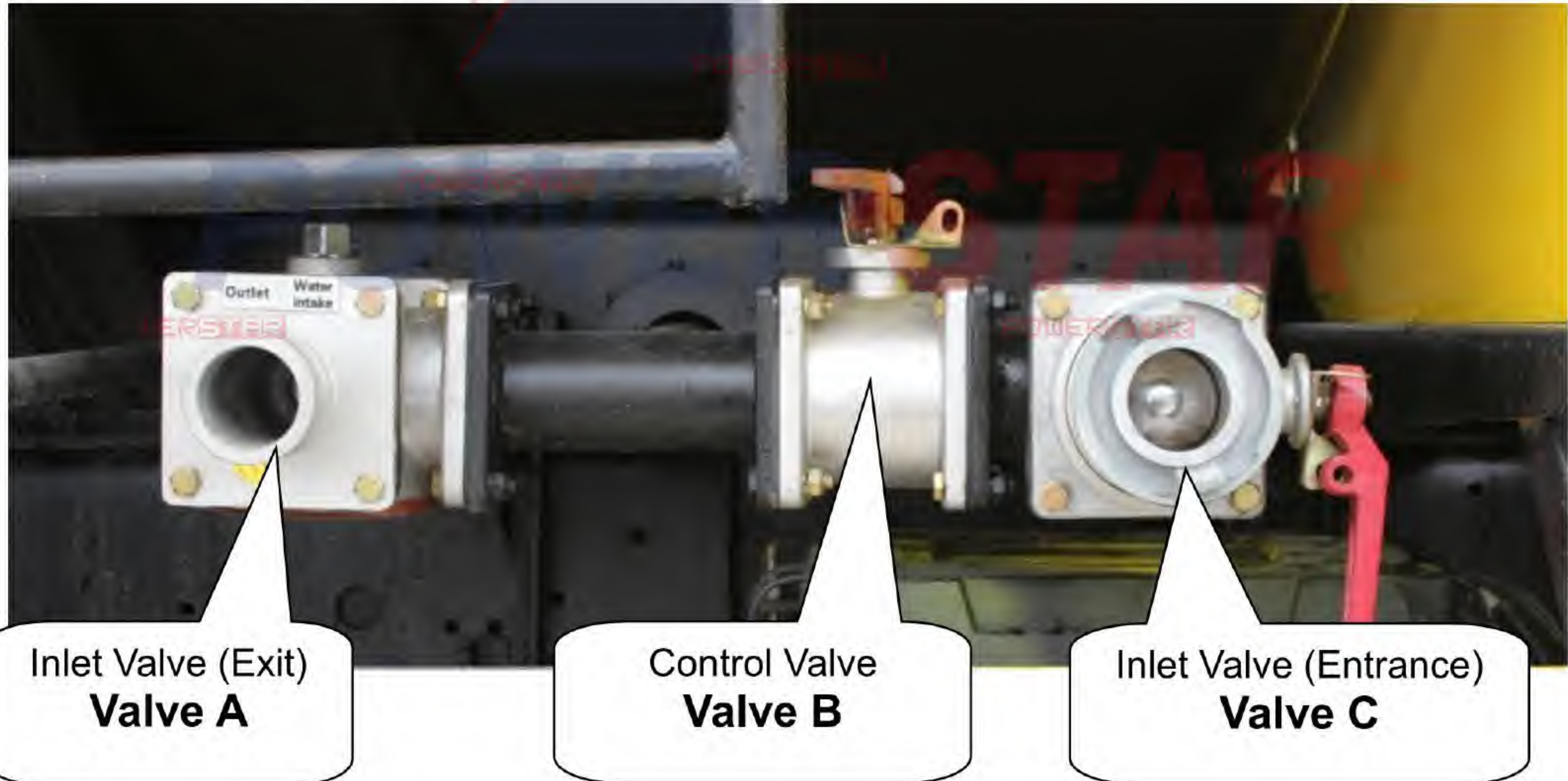


Straight line spraying

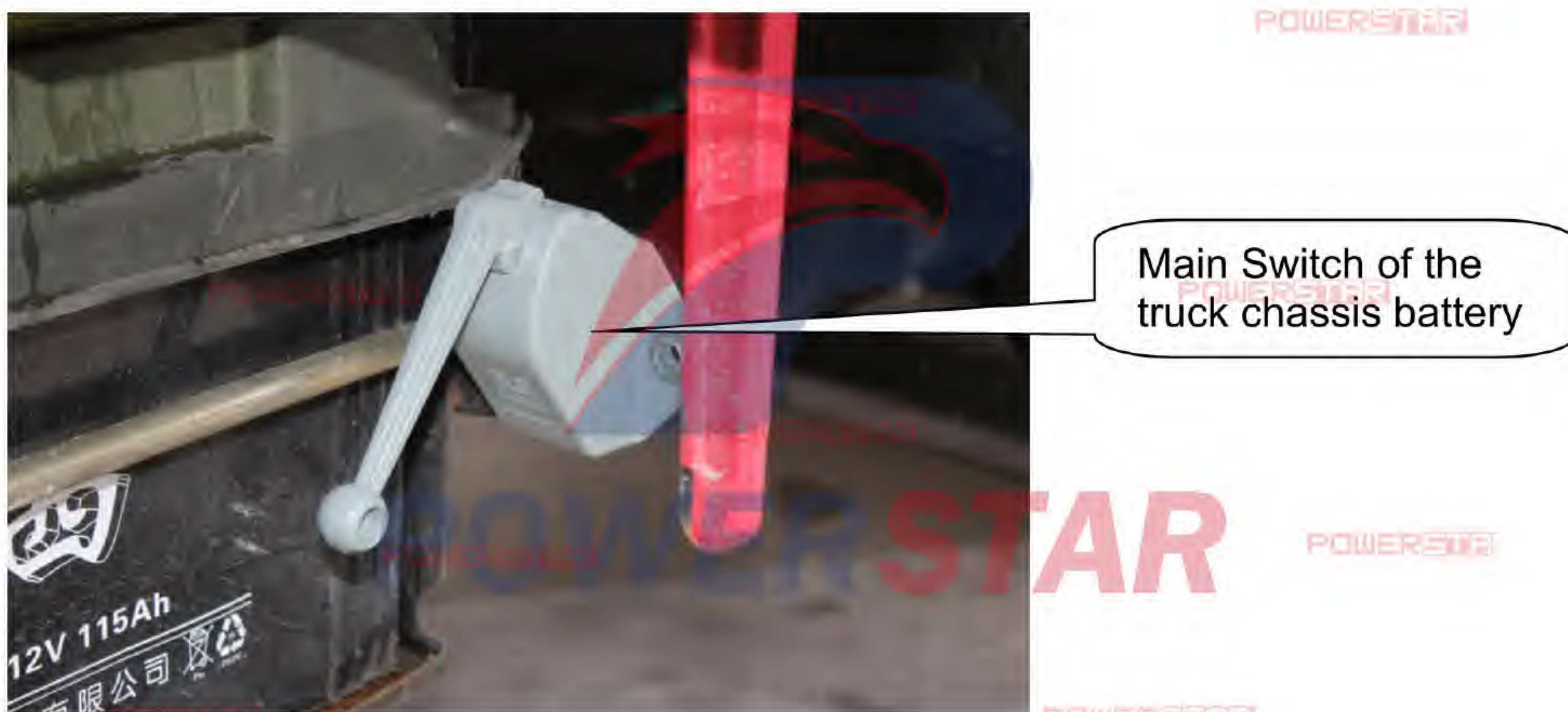
## IV, How to operate water fire truck Water Pump System?. **(Very Important)**

1. Refer to Chapter 5 and get more information about valves structure component.

**Please Note: When wrench is PARALLEL with pipeline, the pipe flow;**  
**When wrench is VERTICAL with pipeline, the pipe closed.**



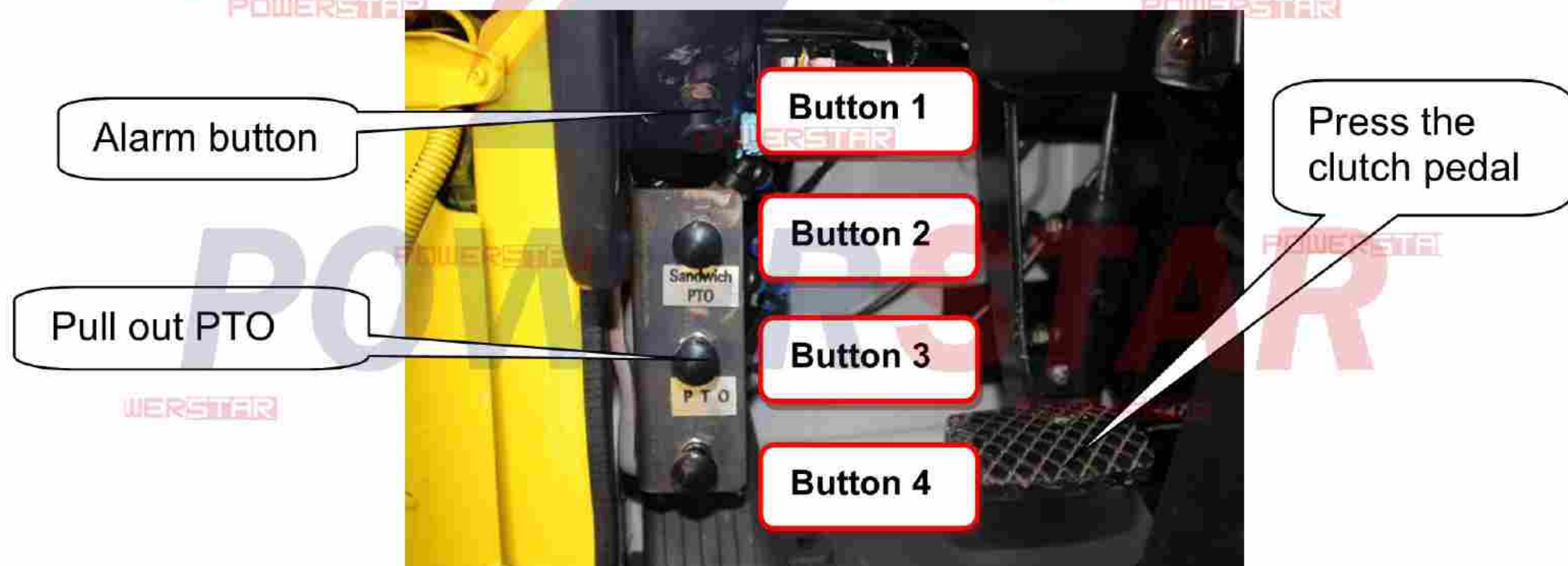
2. Turn on the Main Switch of the truck battery



3. Start the truck engine, pressure the clutch pedal, with Gearbox to Gear 2 or 3 or 4, and then pull out the Button 3/4 PTO only, finally release the pedal slowly.

**Driving Spraying: Pull out Button 3 PTO for working;**

**Static Spraying: Pull out Button 3 & 4 PTO for working.**



4. Carefully operate the water pump system as below:

- a) If this is **First Time to suction water**: You should injection at least 20Liters water into the water tank. Open the manhole cover and connect the tubes, then operation the Power Take Off and make pump working. Nearly 2 minutes later, when air exhaust out, the pump can start suction water normally.

- b) Special function operation showing as below, which mainly has following four functions:

- **Water pumping into the tank**: close **Valve A** & **Valve B**, open **Valve C**, make sure **Valve C** is RIGHT OPEN, connect the pipeline with Valve C, the other side of pipeline be in pond, river, etc, then the pump start working and water go into the tank through Inlet Valve C, details showing as below chart.

- **Water pumping out of the tank**: open **Valve A** & **Valve B**, close **Valve C**, then the pump start working and water go out of the tank through Outlet Valve A, details showing as below chart.



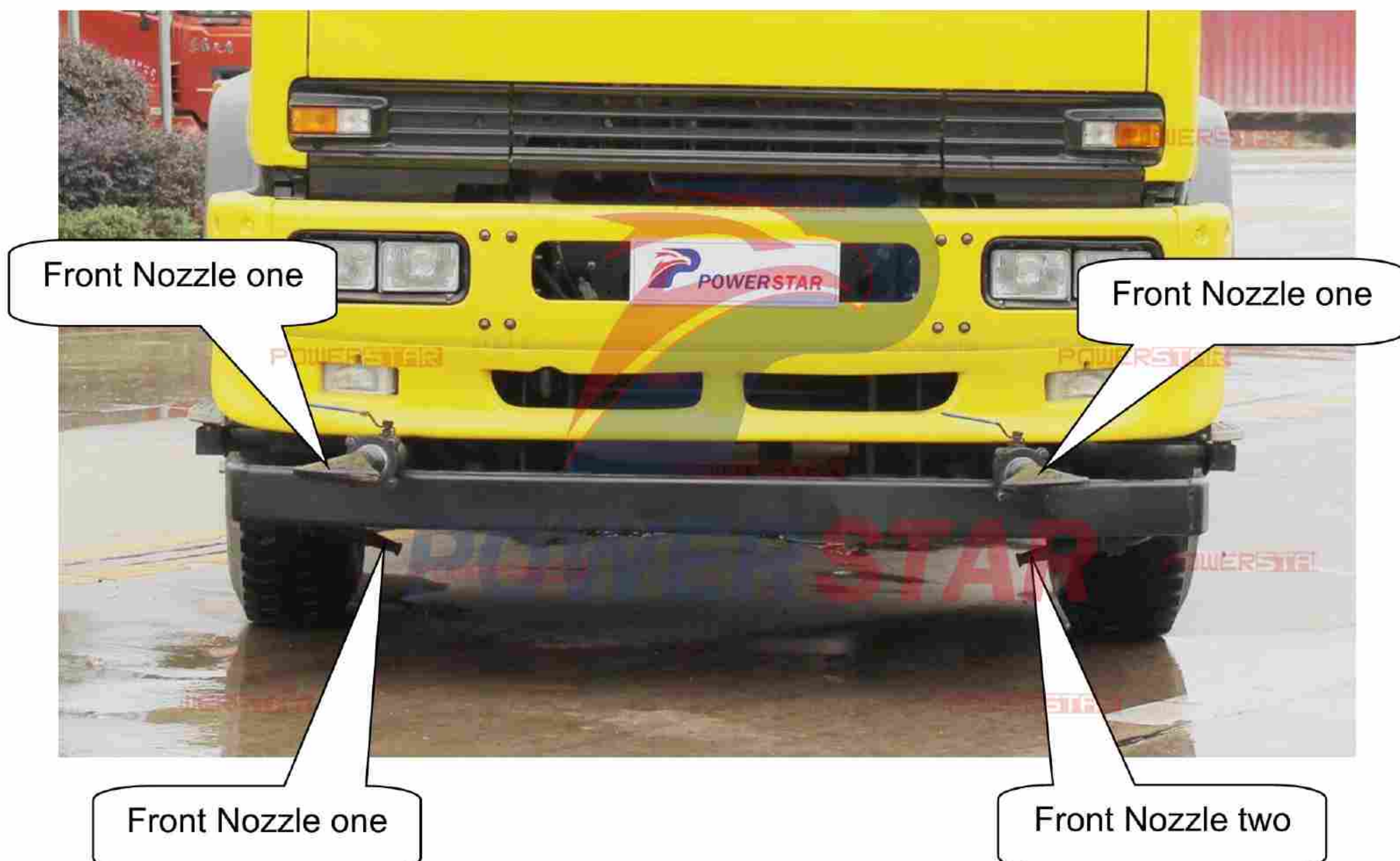
- **Water flowing out of the tank automatically (Water Pump does not work):**  
Option One, close **Valve B & Valve C**, open **Valve A**, then the water flow out of the tank automatically by self-gravity, details showing as below chart.  
Option Two, close **Valve C, Valve A & Valve B**, open **Automatically Outlet Valve**, then water flow out of the tank by self-gravity

- **Water spraying out of the tank (Spraying from Front Nozzle, Side Nozzle & Rear Nozzle):** close **Valve A & Valve C**, open **Valve B**, then the pump start working and water pumping out of the tank, and finally spraying through front Nozzle, side Nozzle & rear Nozzle, also the Monitor, details showing as below chart.

**Make sure at least one Nozzle keeps open before operating the sprinkling course.**

**PLEASE NOTE: Each Nozzle Has One Control Valve for Easy Operation**

**Front Nozzle:**



Front Nozzle one & two working model:



Front Nozzle three & four working model:



Side Nozzle:



Side Nozzle switch

Side Nozzle

Side Nozzle working model:



Rear Nozzle:



Rear Nozzle one

Rear Nozzle two

Rear Nozzle working model:



## Chapter 7, Others for Attention

After carefully reading the above information, you must be well known how to use the ISUZU 6\*4 Water Fire Truck; below show some parts you need to pay attention while using the truck.

### i ,Precautions for Use

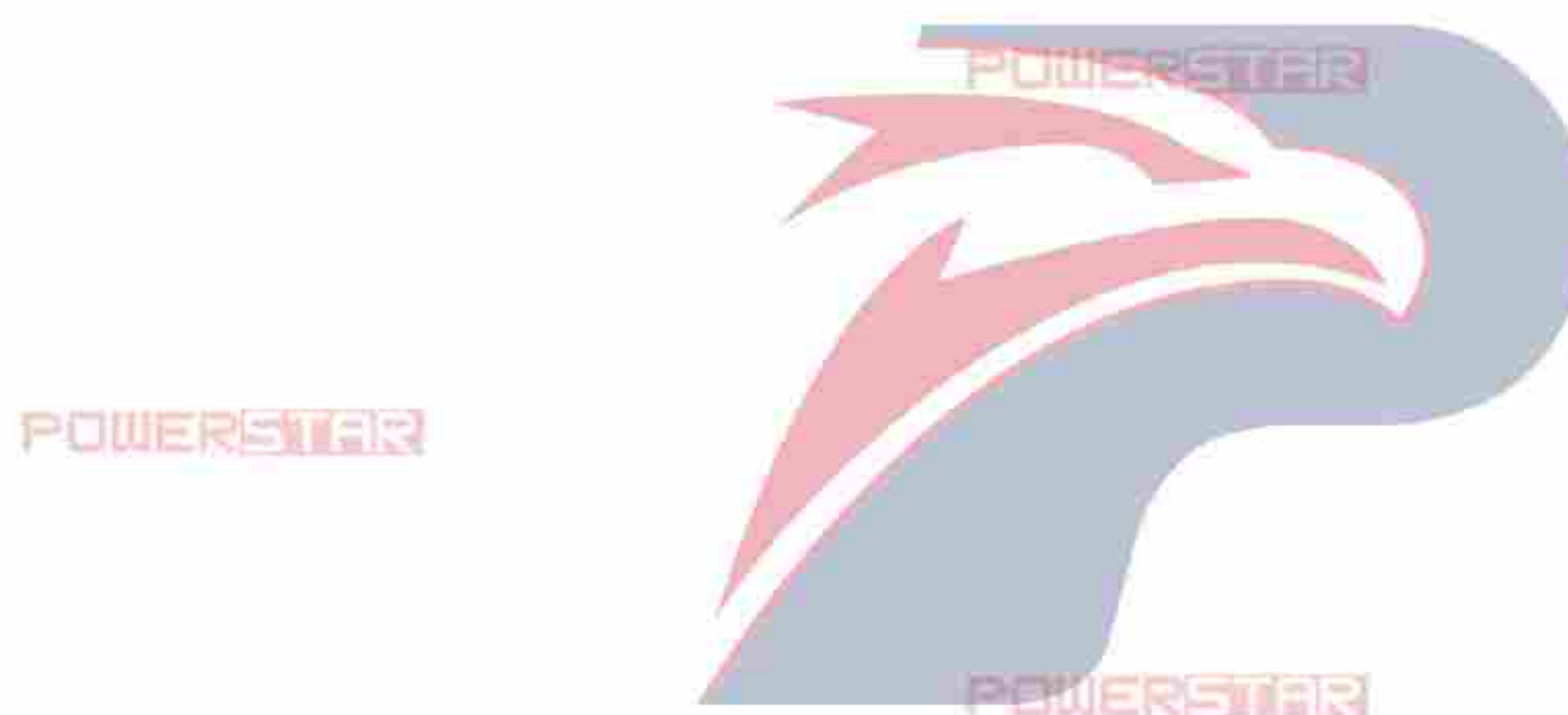
- Please abide strictly by the following manual:
  1. *Water Tanker Truck Owner's Manual*
- It is strictly forbidden to operate the pump without water. When the pump working over 2 minutes without water, you should stop the pump and carefully check everything and find the reason. (Referring to Chapter 3 & 4)
- It is strictly forbidden to operate the Power Take Off (Sandwich PTO & PTO) under the condition of the clutch not separation (Not step the clutch pedal). When release the clutch, you should slowly.
- It is better not to do Half-Load transportation.
- When operating the Three-Way Valves (Valve A, B, C & others), it is not good to overexert, for overexert will influence the valve ball's leakproofness. The open & close for Three-Way Valves should completely, and strictly forbidden working when valves not operated completely.

### ii ,Maintenance

- The maintenance of the Water Pump refer to the "*Water Fire Truck Owner's Manual*".
- When the temperature is below 0 °C, the storage water inside of the Pump, Pipeline and Tank should exhaust out to protect the parts from damage. If unused for a long time, please also exhaust out the water. When use truck again after long time, you should carefully check every parts.

- 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.
- The Fire Pump, Water Pump, Sandwich PTO, PTO, Transmission Gearbox should be carefully washed, checked and maintenance every year.
- The strainer inside filter should be washed every time after use it.

**POWERSTAR**



**POWERSTAR**