

# HOWO Manlifter Truck

**16m Working Height & Optional Insulated Bucket**

## User's Manual



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## **Preface**

*Thank you for purchasing our products. For better using your man lifter truck, get the best operating performance, we strongly suggest you before the operation process you could read the instructions carefully, and to manipulate the program handily.*

*The manual detailed describes the performance of man lifter truck with crane, structure, usage, precautions and maintenance of such knowledge. Before the operation, the 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 man lifter 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

*Man Lifter Truck with Crane mounted based on type II HOWO new model ELF chassis, arms could reach 16 meters height of air operations, widely used in street maintenance, landscaping works, television video, communications engineering, airport, decoration, aerial advertising and other areas of need.*

*The vehicle designed to fully rely on the advantages of the original chassis, fully consider the product's convenience and reliability. Working arms in the form of three folding, the vehicle advantages of a large work area, can adapt to different working conditions' requirements.*

*Powertrain system using hydraulic transmission fitted on slewing rotation saddle and bucket each with a separate operating system, the operation system priorities then bucket operations*

*The Man Lifter Truck equipped with overflow protection, emergency power, cylinder lock and other security devices to ensure safety operations. Cab for the single-row seat, comfortable driving.*

*Therefore, the vehicle is an ideal multi-purpose aerial vehicle.*



**(Preview for your HOWO 16m Man Lifter Truck)**

## Chapter 2, Safety Warnings

**Non familiar with or Non observe the following safety warnings are likely to cause accidents !**

- Before use, you must check whether the Man Lifter Truck with normal maintenance or not. (See seven)
- Before the operation, must be assured that the truck in a solid level ground. To determine the hand brake on brake position, all the necessary accessories must be in place (such as tire pads, safety warning flags, etc.). Legs must be supported on solid ground, in order to ensure stability. If you must work on slopes situation (max 5 °), must be fully extended legs, and operated in high-slope side
- Getting on/off the truck, should use the provided the bucket ladder, running and pad.
- The operator on the bucket must wear protective safety equipment specification requirements, and fixed in a safe anchor ring.
- The protective equipment has been used by the operator must be consistent with the work requirements, must meet safety standards.
- In operating equipment such as rotary or lifting arm, etc., must be confirmed no traffic obstruction, no obstructions or around high-voltage interference.
- Make sure that the truck maintains in a certain distance and pedestrians out away from the work area.
- Under the Arms/Booms is prohibited with mankind standing.
- Control valve should be operated and handled slowly, in order to achieve smooth movement, to prevent a sudden start or stop, to prevent contact with solid objects, arm and bucket work, such as tree branches, buildings, etc.
- Could not allowed the bucket in a situation of side working ,next to the bucket load, or lift from the bucket to the un-target subject, bucket prohibit to hang goods.
- Rated bucket loading 200kg, not allowed to overload. Rated load, including operators, tools, articles all of those.
- Not Allowed to stand, sitting on the edge of the bucket and human body lean on the bucket edge are prohibited either.

- *The bucket not allowed putting with ladder, cushions inside, and any approach of increase height of working are prohibited.*
- *Not allowed move the truck in the situation that bucket inside with human beings, otherwise it will lead to personal injury.*
- *Truck in moving or running, the arms and legs must be in the normal contraction.*
- *As operation or malfunction is found, please report immediately to the manufacturer.*

## **NOTICE:**

***Chassis platform as the angle of more than 5 ° the bucket truck shall not allowed be operated.***

***Human beings not allowed near with the hydraulic legs when the truck in working condition, otherwise it will cause injury.***

***Drinking or unconsciousness person prohibited to operate the truck.***

## **WARNING:**

***Side level force working on the bucket may cause disastrous, lead result in casualties.***

## ***To Dear Operator'***

*The letter is to enable the operator to understand of controlling of the Man Lifter Truck with Crane allows the operator to use the equipment effectively and safely. Before operation, you must be fully read with this manual. Any lifting equipment operated by untrained or careless user, are potentially dangerous.*

*The Man Lifter Truck hydraulic system designed advanced, with a safe and reliable technology. However, any equipment without maintenance could not keep the equipment in good working condition, the operation will potentially dangerous. So you are familiar with the equipment itself before the operating process goes. Any unclear changes or operations for this Aerial Platform truck, you must immediately report to the superiors or notify the manufacturer.*

*Observe the following regulations can ensure maximum operational safety, reduce downtime, and last the equipment's life.*

- 1. Only trained operators will be allowed to induction operation. Training includes safety procedures, mechanical principles, methods of operation and troubleshooting.*
- 2. Operator must be thoroughly familiar with the manual, especially on the part of the safety regulations*
- 3. Inspection in accordance with the instructions in the manual car operation.*
- 4. Only qualified spare parts allows use of change for this truck, qualified mechanic or dealer allowed for repairing work.*

**WARNING:**

*To alert that occur during all hazardous conditions, it is impossible. Operator is ultimately responsible for the safety of those. In case of emergency, you should use the experience to make the right judgments. The operator needs to comply with local regulations and relevant provisions.*

*Operating the Man Lifter Truck must be strictly in accordance with condition graph operations that otherwise result in serious injuries.*

**DAGNER!**

***No matter what position the first arm's in, the second arm cannot exceed the maximum lift angle of 70 °, otherwise it may cause personal injury work causing by bucket tipping.***

## Chapter 3, Main Technical Data

### i , Normal Operation Conditions:

- 1 Ambient Temperature:  $-20^{\circ}\text{C} \sim 45^{\circ}\text{C}$
- 2 Wind force scale limited within level six
- 3 Workplace should be a solid formation, legs must be supported in real soil, slope  $\leq 5$
- 4 Operations must be in the horizontal situation

### ii , Performance Parameters:

1、 Max Lifting Height	16m
2、 Min. Working radius	10m
3、 Bucket Loading Capacity	200kg
4、 First Arm/Boom Lifting Angle	$0^{\circ} \sim 70^{\circ}$
5、 Second Arm/Boom Lifting Angle	$0^{\circ} \sim 67^{\circ}$
6、 Third Arm/Boom Lifting Angle	$0^{\circ} \sim 90^{\circ}$
7、 Slewing Angle	$360^{\circ}$
8、 Slewing speed	$\leq 180^{\circ}/\text{min}$
9、 Max Hoist Capacity	1000kg
10、 Second Arm/boom lifting speed	0.08 ~ 0.15m/s
11、 First Arm/boom lifting speed	0.20 ~ 0.25m/s
12、 Hoist speed	0.15 ~ 0.20m/s
13、 Arms Type	Three arms folded

### iii, Vehicle Specifications

- 1、 Main Measurements
 

Overall Dimension	7450×2250×3100mm
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Wheelbase 4200 mm

## 2. Weights Information

G.V.W 9900 kg

N.V.W 6,200 kg

## 3. Performance Characteristics

Chassis Model ZZ1087F381CD183

Seats Nos. 2 people Allowed

Max Speed (Limited) 100Km/h

## 4. Engine Characteristics

Engine Model ISF3.8s3154

Type Diesel engine

Power 115KW / 154HP

Emission 3.76L

Emission Standard Euro 3

Rated Speed 2600rpm

Maximum Torque 500N.m

Maximum Torque Speed 1200-1900rpm

## Chapter 4, Man Lifter Structure Components

### i , PTO System

*PTO system consisted of the oil pump, PTO, electrical control switches and pneumatic solenoid valve. The system working in output the power to oil pump storage as a hydraulic energy. This system is controlled by an on/off switch that installed in the driving cab, through the interior of the switch's joint or separation, lead the gear be driven from the transmission make the pump stop or working.*

**Attention: Truck in driving, PTO should be in position of OUT-OFF transmission; make sure the oil pump not in RUNNING.**

### ii , Slewing Rotation System

*Slewing rotary system consisted by the hydraulic motor, gear reducer, slewing gear, etc. The system worked as: hydraulic motor drive the reducer, the small gear, in reducer output shaft, drive the slewing ring move, and slew the saddle turnable.*

### iii, Centre Slewing Joints

*The center slewing joints, installed in the center of rotatory saddle, achieved the oil and electric power through the truck. As the system equipped with rotatory rings, the hydraulic oil pipes and electric wires would not twisted together.*

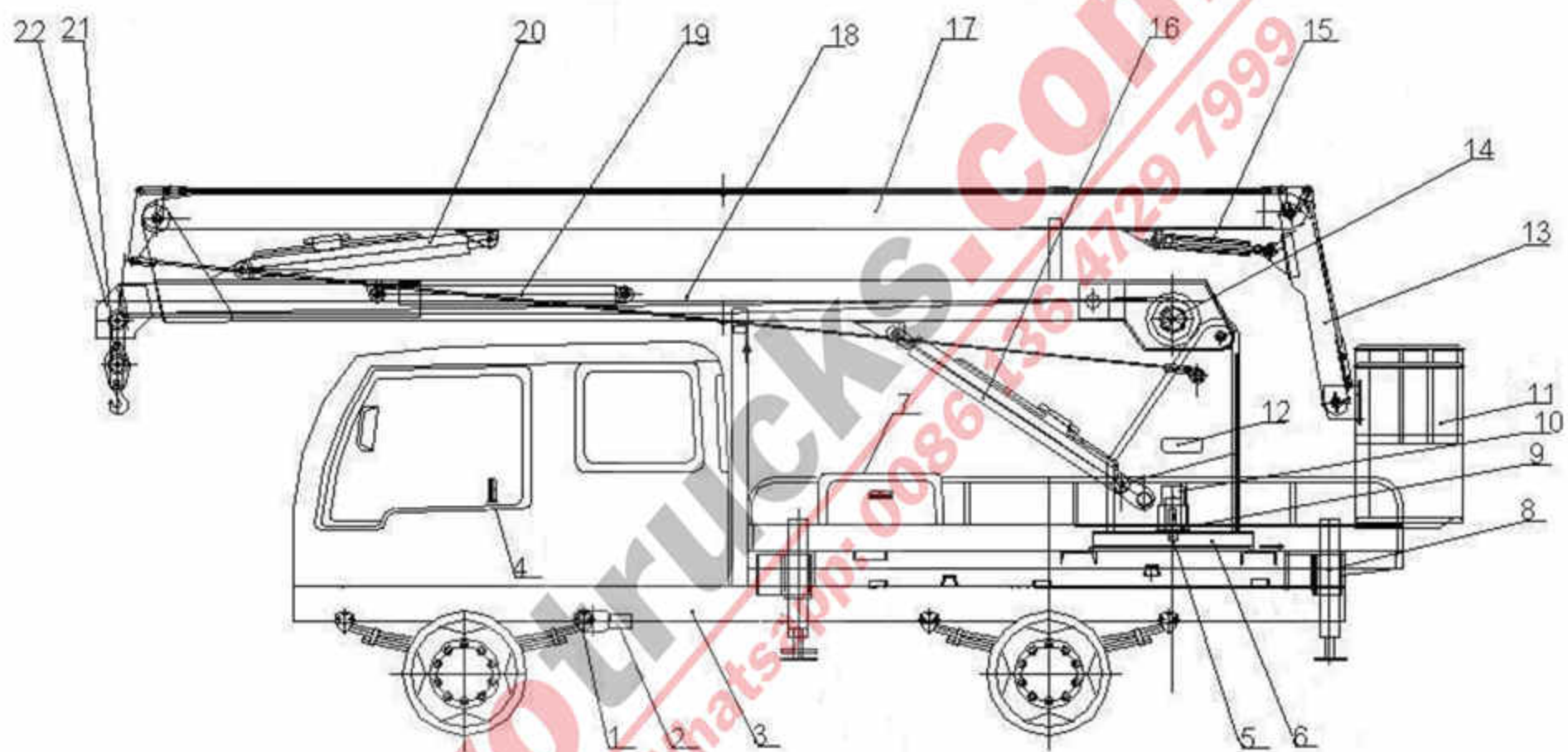
### iv, Hydraulic System

*The hydraulic system hydraulic oil supplied by ONE pump, worked pressure at 14Mpa, flux as 25L/Min, the pressure adjustable by an overflow valve.*

When the PTO coupling with the transmission ,the pump will in a situation of running, the oil output from the oil tank to all the legs which controlled by a control valve equipped in the control panel.

Finished leg operation, handle the operation poke into position marked as, then, the oil would derived from leg system to "To arms", and the upper control panel would be active, and then could start the next operation works.

Man Lifter Truck with Crane Technical Drawing:



- |                                  |                                  |                                |
|----------------------------------|----------------------------------|--------------------------------|
| 1. PTO                           | 2. Oil Pump                      | 3. HOWO single cabin Chassis   |
| 4. Hand brake                    | 5. Rotary Center Joint           | 6. Slewing Support             |
| 7. Hydraulic Leg Control box     | 8. Hydraulic Legs                | 9. Slewing Reducer             |
| 10. Hydraulic Motor              | 11. Bucket                       | 12. Arms Control Box           |
| 13. 3rd Arm ( <b>Bucket</b> )    | 14. Swing Mechanism              | 15. 3rd Arm Hydraulic Cylinder |
| 16. 2nd Arm Hydraulic Cylinder   | 17. 1st Arm ( <b>Upper Arm</b> ) |                                |
| 18. 2nd Arm ( <b>Lower Arm</b> ) | 19. Lifting Cylinder             |                                |
| 20. 1st Arm Hydraulic Cylinder   | 21. Lifting Arm                  | 22. Lifting Hook               |

## Chapter 5, Man Lifter Working Principles

*The operator should fully understand all control mechanism to operate vehicle properly. Only trained person can operate this vehicle to prevent unnecessary accidents and equipment damage.*

### i ,Driving of the Man Lifter Truck with Crane

- *Read the chassis manual and in which of chassis technical data before driving.*
- *Check if the joystick of PTO has separated to gear of vehicle before driving.*
- *The boom must be on the support arm resting place, the legs must be incorporated enough before driving.*
- *Inspection and maintenance should been carried out according to normal requirement before driving.*

### ii ,Pre-operational Checks

- *Check if this vehicle complies with “normal working conditions” of instructions or not.*
- *Check if all connected components of this fastener is solid or not.*
- *Check if all components are lubricated as required or not.*
- *Check if filling hydraulic oil and opening the oil discharging valve or not.*
- *Check engine is in normal or not.*

### iii, Man Lifter Truck operations **(Very Important)**

1. *Tighten the **hand brake**, press the clutch pedal, pulling the transmission to neutral position, engine idling, paddling the clutch, pulling the throttle lever equipped in left hand side of the cabin, coupling the PTO, oil pump start working, observing the if the pump with abnormal noise, vibration, oil leakage or other abnormal situations. Idle vehicle in a few minutes and then operate it in cold weather conditions.*

Following show the PTO working principle:



The Joystick at **UPPER** place  
 The Aerial Platform Truck **can work**.



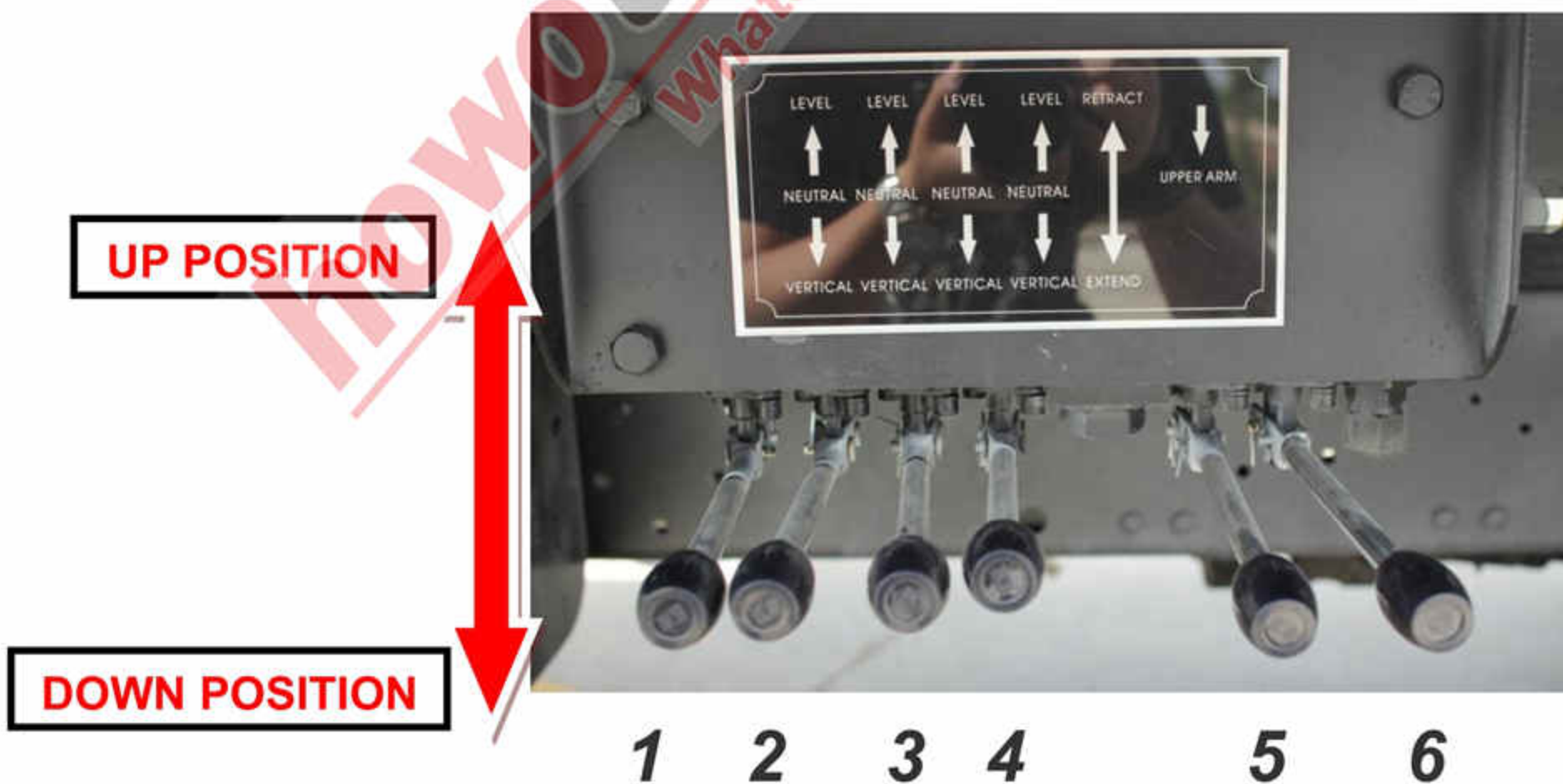
The Joystick at **LOWER** place  
 The Aerial Platform Truck **cannot work**

**Note:**

**When not use the Man Lifter Truck, please keep the PTO switch OFF position!**  
**When use the Man Lifter Truck, please keep the PTO switch ON position firstly!**

2. Following the instruction as following figures, firstly operating the legs.

**Note: The operation must follow the direction step by step!**



*Joysticks 1-4: Make directions for four legs to move **Vertically & Horizontally***

*Joysticks 2: Control the four legs to **Retraction & Stretch***

*Joysticks 1: Change the hydraulic pump to control the **Lower four legs or the upper platform.***

## *2.1. Hydraulic Legs Horizontally Stretching*

*Handle the joysticks 1-4 what labeled as "**Vertical, Level,**" Operate 1.2.3.4 joysticks to VERTICAL, and then operate joystick 5 to DOWN POSITION, four hydraulic legs in moving out horizontally. When operation, should read the pressure gauge changes, if the gauge showed pressure increased violently, it means the legs had totally retracted.*

*After the legs horizontally extend fully, free the joystick 5. Then replace the all four joysticks 1.2.3.4 to the middle NEUTRAL position, legs horizontally operation finished.*



**The Arrow in the picture show the Hydraulic legs horizontal direction move**

## *2.2. Hydraulic Legs Vertically Stretching*

*Operate 1.2.3.4 joysticks to LEVEL, and then operate joystick 5 to DOWN POSITION, four hydraulic legs in moving down vertically. When operation, should read the pressure gauge changes, if the gauge showed pressure increased violently, it means the legs had totally retracted.*

After the legs vertically extend fully, free the joystick 5. Then replace the all four joysticks 1.2.3.4 to the middle NEUTRAL position, legs vertically operation finished.



The Arrow in the picture show the Hydraulic legs vertical direction move

Operating leg action should be guided by this principle:

**When start working,**

- 1. Firstly stretch the horizontal leg,**
- 2. Then stretch the vertical leg.**

**When finish working,**

- 1. Firstly retraction the vertical legs,**
- 2. Then retraction the horizontal legs.**

Failure to do so will damage the vehicle or even legs. Stretch the leg must avoid any people to be suppressed.

3. Truck Panel Operation (Remember to put Joystick 6 at UPPER ARM place)

**Notice:**

**When lifting the arm system, firstly small arm then lifting the upper arm and lower arm;**

**When falling the arm system, firstly upper arm, then lower arm, finally small arm**

3.1 Aerial Platform Truck Operation. After the confirmation off operation, the control valve off "through the **upper arm**," the handle into the direction of the arrow, you can be on the BUCKET operation. Be familiar with the control box will help you use the man lifter truck conveniently and safety.





*(Accelerator Handle Joystick to make the whole man lifter working)*

**Please Note:**

**Step one: Button 1, 2, 4, 5, 6, 7 give the direction for all the system operation.**

**Step two: Pull Joystick to make button 1, 2, 4, 5, 6, 7 working and all the system operation.**

**(Pull Position: all the system working)**

**(Push Position: all the system stops working)**

1-Button HOOK: Control the **Lifting Hook**

**Operate this button to make the Lifting Hook go UP & DOWN!**

2-Button TELESCOPIC ARM: Control the **Lifting Hook**

**Operate this button to make the Hook Arm EXTEND & RETRACT!**

3-IGNITION SWITCH: Control the **Engine to Work**

**Operate Ignition Switch to start the engine and make man lifter to work!**

4-Button ROTATION: Control the **Man Lifter Rotation**

**Operate this button to make the whole Man Lifter Rotation!**

5-Button 2ND ARM: Control the **Lower Arm**

*Thirdly operate this button to make Lower Arm at suitable place!*

6-Button 1ST ARM: Control the **Upper Arm**

*Secondly operate this button to make Upper Arm at suitable place!*

7-Button 3RD ARM: Control the **Bucket**

*Firstly operate this button to make Bucket at suitable place!*



#### 4. Bucket operation (Similar like the Truck Panel Operation)

Reference to the truck operates shown in following. Corresponding to the action essentials above. Bucket operation, first should manipulate the column switching valve up moved. During operation, operating off legs must always push the valve handle distribution "through the upper arm", turn the valve operating handle must always be assigned into the "bucket", or bucket truck operator

cannot carry out actions on the job.



Convenient use Man Lifter truck in Bucket



Working light ON/OFF automatically



Control box in bucket for convenient operation  
(Same as main control box)

**WARNING: When operating this man lifter truck, the 3rd arm should be lift firstly, and raised the 1st arm 2 meters approx., finally lift the 2nd arm. Then the 3rd arm renewed after. Operations 3rd arm to fold is strictly prohibited.**

#### 5. Retractable bucket

After operation, firstly turn down the lower arm upper arm, forearm and then close. Parked in the lower arm and accurate arm resting on the support after the operation for retracting legs, and then torn off and power take off gear. After all arms & hydraulic legs at suitable place then you can drive.

**The Joysticks on Truck Panel & Bucket can control the whole system working. (Please use it with great caution)**

#### iv, Notes & Attentions

- *Outrigger operation, the level of the legs must be stretched and then stretched the vertical leg. After finishing, the vertical leg must be reduced, the level of the legs*
- *Get off the first operation, and then operating on the truck. After the first collection on the truck, and then close off.*
- *When Arm in work, rising the first arm and then moves the arm up and down the arm.*
- *Staff into the work bucket, must wear seatbelts, not overloaded.*
- *People who arrange operation on the ground cannot leave*

## Chapter 6, Hoist Hooker Operation

Operators can take advantage of the boom arm to lift materials. Crane has a load table, the rated lifting capacity.

Operator must memorize the amount of work lifting the truck for Lifting, you should know the hanging weight of the goods compared with the rated load when lifting goods, first it is lifted into place, then the percentage change in use to achieve the lower arm in place. At this point, the goods should not be hanging over the lower arm angle in this piece, the maximum permitted rated load.

### - WARNING -

**When using the crane must comply with the following regulations, such as failure to comply with these regulations will be the make operator and ground crew injury.**

- Lifting, lifting hoists are not allowed to exceed the rated load indicated in the table.
- Weight lifting is not allowed to load unknown goods.
- It will not allow pulling the side, except for what happened with the operator's side of the physical tension.
- Operating vehicles are not allowed to use pole, pull cables, etc., should be special device to do this work.
- Be sure to replace worn or damaged winch rope immediately
- Mankind prohibited standing in the bucket when hoist hooker working.
- The correct command is the basis for lifting should be planned and prepared.
- To comply with the procedures provided in this manual to ensure the stability of operating vehicles.

## Chapter 7, Maintenance & Repair

*To make the vehicle in good condition and improve the service life, you need regularly maintenance and repair. Find fault and solve in time to prevent accidents.*

### i , Chassis Truck Maintenance

- *Based on the instruction of the chassis.*

### ii , Routine Checking & Maintenance

- *Visual appearance, to determine the shape is good, whether the hydraulic components and piping leaks oil traces, if any leakage, the timely replace seals.*
- *Check the key components and fasteners loose coupling, and timely fastening.*
- *According to the lubrication sheet lubrication requirements for all components, check the hydraulic oil tank.*
- *Check the hydraulic hoses for wear, loose connections or oil leakage. In particular, especially on the pipeline.*
- *Check all welding point, especially bucket; arm, turntable, and other key parts of the weld rod have hairline cracks or cracks. If so, you should immediately stop and inform using the company's maintenance notice, are not allowed to weld personally .*

### iii, Hydraulic System Checking

#### 1、 Filter

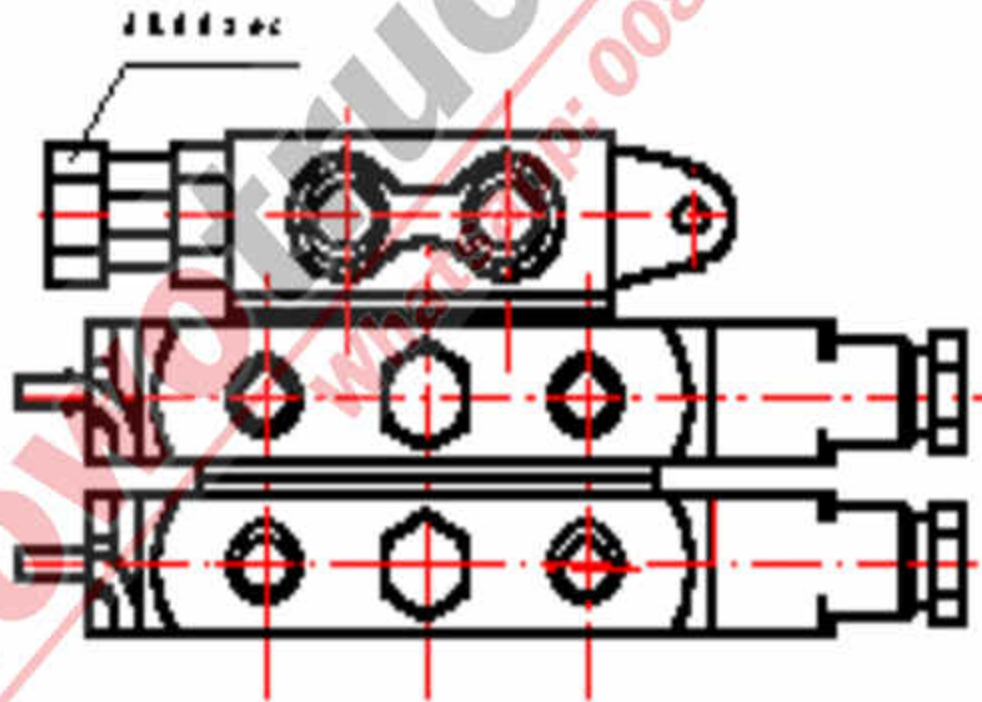
*Operating vehicles used for the first month (not less than four hours a day) to be replaced after the oil and return oil filter oil filter, clean the filter. Oil contamination is found, replace the hydraulic oil must be filtered before or after a thorough re-injection.*

## 2. The relief valve

Rated operating pressure of the truck is 14MPa, overflow pressure is between 16 ~ 17.5Mpa, operating vehicles over time, due to possible contamination of hydraulic oil to the oil filter oil filter or filter plug back pressure is low or there excessively high, then the staff should be cleaning the filter. Should the pressure is still too low, then the relief valve cannot shut, legs should be clean and adjust operation of the valve on the relief valve. Relief valve adjusted at the factory, usually without adjustment. For adjustment, it shall ask an experienced technician. Pressure adjustment is wrong, the vehicle will not work, or shorten the pump life and cause failure.

### 2.1 Pressure Adjustment

Make sure that truck stopped working, and not move. Unscrew the relief valve with a wrench on the cover sheet, which has a slotted cylindrical plug, use a flathead screwdriver to adjust them, the pressure increases, otherwise, counterclockwise pressure. System pressure reading is: stretch or shrink the legs in place, continue to operate, a sudden increase in pressure gauge, the value is reflected in the overflow system pressure. Note: when legs in place, the handle a little later, the observed data should immediately release it.



### 2.2 Relief valve cleaning

With 30 of the relief valve open or box end wrench to unscrew the whole body, with a clean gauze blocked ports, to prevent large oil spill, then press the top with a cross from the pressure inside the spool, back and forth several times, and add a little hydraulic fluid until the impurities discharged from the hole and remove impurities. At this point blown this end with mouth should not leak. (Be

*careful not to move other parts of the hydraulic system to prevent the influence of pressure)*

### 3、Hydraulic oil check

*Hydraulic system reliability and life of hydraulic components and hydraulic oil system cleanliness has an extremely close relationship. Most of the hydraulic system failures are due to impurities within the hydraulic oil caused, so keep the fluid in use and regularly check the oil cleanliness is very important.*

*Oil-based inspection method can be used intuition, if oil color, fog, haze or smell, the oil has become bad. Drop of oil on the hot plate, if the sound burst the water too much, and then be replaced with new oil. Generally changed every six months, three months to clean the filter once.*

*Timely check the oil temperature should not exceed 60 °C. If that cannot maintain the value of oil continues to rise, they should immediately stop checks.*

### iv, Rob's Adjustment

*Prolonged use of vehicle operation, the amount of deformation due to their own bar will appear loose, there will be two rod tightness, cannot result in fighting to maintain a balance, and you should adjust to the rod. Adjust the time using visual and hands.*

*Observe the rod hand touch the tightness of each of two steel bar with a wrench to adjust the adjustment nut clockwise to tighten, counterclockwise to loose, until leveling up.*

**Note: Staff must be checked before the operation lever, and the requirements must be thoroughly inspected once a month.**

v , **Malfunction Analysis**

<i>Malfunction</i>	<i>Possible Reason</i>	<i>Solution</i>
<i>Handle holded, cylinder does not move or move slowly.</i>	<ul style="list-style-type: none"> <li>➤ <i>PTO does not hang up the work file</i></li> <li>➤ <i>Pump damage</i></li> <li>➤ <i>Low pressure for relief valve.</i></li> <li>➤ <i>Suction filter blocked or tank liquid level is too low</i></li> <li>➤ <i>Cylinder or rotary infiltration within the central connector</i></li> <li>➤ <i>Engine speed is low, oil less than the system supply</i></li> </ul>	<ul style="list-style-type: none"> <li>➤ <i>Turn on power take off switch</i></li> <li>➤ <i>Replacement or repair</i></li> <li>➤ <i>Increase the pressure on</i></li> <li>➤ <i>Clean and change oil filter, oil</i></li> <li>➤ <i>Examined in order</i></li> <li>➤ <i>repair the Engine</i></li> </ul>
<i>Hydraulic system noise sound serious, severe beating pressure gauge pointer</i>	<ul style="list-style-type: none"> <li>➤ <i>Oil level is too low, inhaling air into the oil pipeline</i></li> <li>➤ <i>Oil filter or oil flow valve obstruction caused by poor hole</i></li> <li>➤ <i>Uneven pump operation</i></li> <li>➤ <i>Oil temperature is low or the oil has gone</i></li> </ul>	<ul style="list-style-type: none"> <li>➤ <i>Add a little hydraulic oil, the pipeline leaks mended; then load cycle times, cylinder movement to the limit position, to exclude air.</i></li> <li>➤ <i>Clean filter or valve replacement</i></li> <li>➤ <i>Repair or replace the pump</i></li> <li>➤ <i>Low speed pump, or replace the oil with new oil heating</i></li> </ul>
<i>Boom sink</i>	<ul style="list-style-type: none"> <li>➤ <i>Balancing valve failure</i></li> <li>➤ <i>The fuel tank vent</i></li> <li>➤ <i>Fittings leak</i></li> </ul>	<ul style="list-style-type: none"> <li>➤ <i>Balancing valve replacement</i></li> <li>➤ <i>Replace the seals or the exclusion of other causes</i></li> <li>➤ <i>Tighten fittings or replace seals</i></li> </ul>

<p>Oil temperature is too high</p>	<ul style="list-style-type: none"> <li>➤ At full capacity too often</li> <li>➤ Overflow relief valve pressure is too high, the system component parts are often subject to high impact</li> <li>➤ Pump speed is too high</li> <li>➤ High viscosity</li> <li>➤ serious leaking</li> </ul>	<ul style="list-style-type: none"> <li>➤ Appropriate parking cooling</li> <li>➤ Adjust the pressure relief valve</li> <li>➤ Appropriate to reduce engine speed</li> <li>➤ For a suitable viscosity hydraulic oil</li> <li>➤ Check the hydraulic components</li> </ul>
<p>Legs sinking or driving status automatically retracts legs stretched out</p>	<ul style="list-style-type: none"> <li>➤ The fuel tank vent</li> <li>➤ Fittings leak</li> <li>➤ Hydraulic lock failure</li> </ul>	<ul style="list-style-type: none"> <li>➤ Replacement of cylinder seal or the exclusion of other causes</li> <li>➤ Tighten fittings or replace seals</li> <li>➤ Replacement of hydraulic lock</li> </ul>

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## Chapter 8, Lubrication

Please lubricate all main parts according to the following table in order to increase of service life of all parts. The chassis lubrication should be operated with chassis manual.



12	Bucket Arm Hinge Point	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
11	Rod Axis Hinge Point	16	Oiling	ZG-3 Albany Grease ZG-3	Monthly
10	3rd Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
9	Lifting Hoister	1	Oiling	90# Industrial Gear Oil (90#)	Semiannual
8	Sewing Reducer	1	Oiling	90# Industrial Gear Oil (90#)	Semiannual
7	Sewing Supporter	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
6	Sewing Tooth Saddle	All Points	Properly Oiled	ZG-3 Albany Grease ZG-3	Monthly
5	1st Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
4	Hydraulic Legs	Related Points	Amounted Oiling	ZG-3 Albany Grease ZG-3	Monthly
3	Lifting Horizontal Cylinder Hinge Point	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
2	2nd Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany Grease ZG-3	Monthly
1	Arm Axis	4	Oiling	ZG-3 Albany Grease ZG-3	Monthly
SN	Item Name	Lubricated Points	Lubrications	Lubricants Types	Lubrication Cycle

Lubrication Table

NO.	Name	Lubrication Points	Lubrication System	Lubrication models	Lubrication Cycle
1	Arm axis	4	Oiling	ZG-3 Albany grease ZG-3	1month
2	2 <sup>nd</sup> Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany grease ZG-3	1month
3	Lifting Horizontal Cylinder Hinge Point	2	Oiling	ZG-3 Albany grease ZG-3	1month

4	Hydraulic Legs	Related Points	Amounted Oiling	ZG-3 Albany grease ZG-3	1month
5	1nd Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany grease ZG-3	1month
6	Slewing Tooth Saddle	All Points	Properly Oiled	ZG-3 Albany grease ZG-3	1month
7	Slewing Supporter	2	Oiling	ZG-3 Albany grease ZG-3	1month
8	Slewing Reducer	1	Oiling	90# Industrial gear oil 90 #	Semiannual
9	Lifting Hoister	1	Oiling	90# Industrial gear oil 90 #	Semiannual
10	3nd Arm Cylinder Hinge Point	2	Oiling	ZG-3 Albany grease ZG-3	1month
11	Rod Axis Hinge Point	16	Oiling	ZG-3 Albany grease ZG-3	1month
12	Bucket Arm Hinge Point	2	Oiling	ZG-3 Albany grease ZG-3	1month

## Chapter 9, Transport & Storage

*The overhead working truck drives in short distance while which should be transported by train and other transportation tools for long distance. The necessary Antifreeze and water-resistant measures should be down while it is fixed on transportation tools tightly.*

- *The outriggers strengthen for protecting front and rear axle's springs when the overhead working truck no using in short time and which should be taken following storage in long time no using situation.*
- *Wiping off the dust and grease the body often for keeping cleans.*
- *All tires are with required pressure and paved with wood for offing the ground, meanwhile, the boom cylinder rod fully retracted to the shortest position.*
- *Battery should be stored in a dry ventilated place after removed from truck and been checked and charged regularly.*
- *Observation of unload movement of all parts after engine started monthly for checking normal or not.*
- *The overhead working truck should be stored in the warehouse and which should be covered with waterproof cloth if placed in the open air. Inspection should be strengthen for truck in wet areas or wet season to prevent leaks corrosion and freezing in winter should be down to prevent sand.*