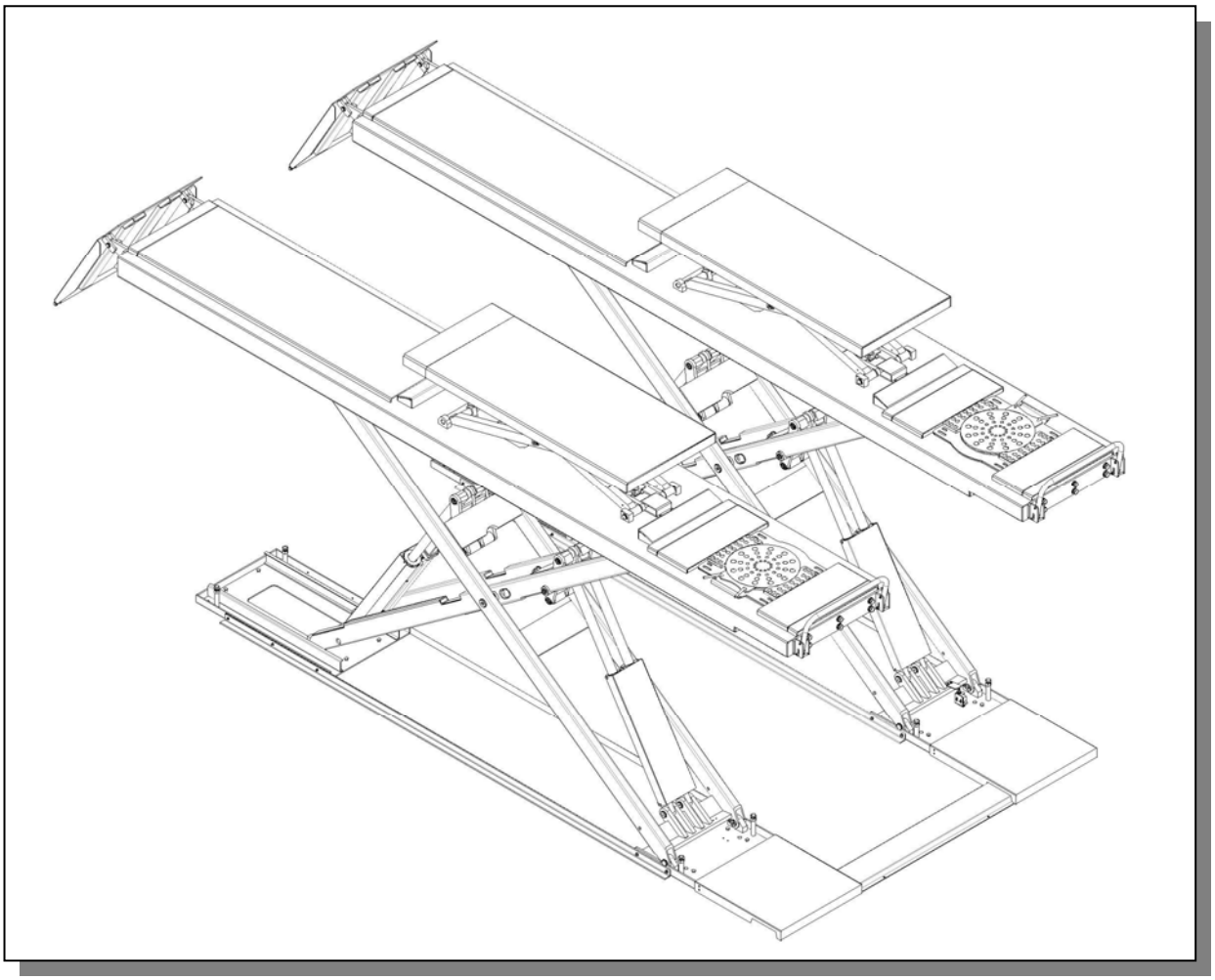
# PL-S40

## DOUBLE–LEVEL LOW PROFILE SCISSOR LIFT FOR WHEEL ALIGNMENT



# INSTRUCTION & MAINTENANCE MANUAL

Read this entire manual carefully and completely before installation or operation of the lift

# SCISSOR LIFT INSTRUCTION MANUAL

INDEX PAGE

# 1.Packing, transport and storage

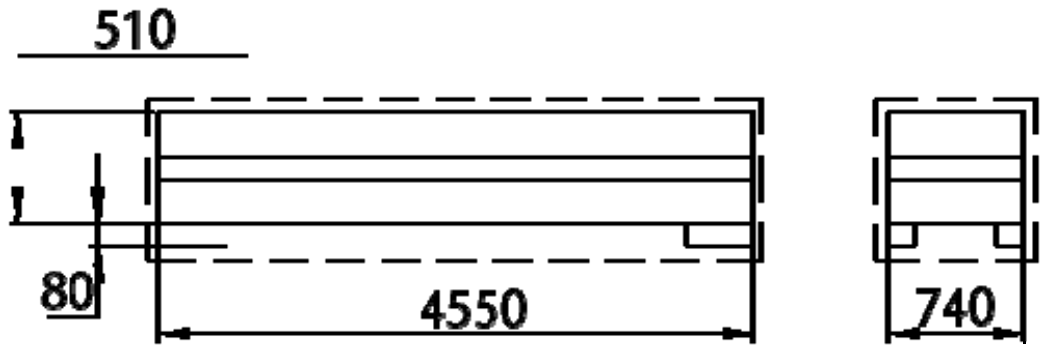
**All packing, lifting, handling, transport and unpacking operations are to be performed exclusively by expert personnel**.

## 1.1. Packing:

**Packing List**

| NO. | Name | Accessory name and quantity |
|---|---|---|
| 1 | Lift Beam | Main beam 1 piece |
| 2 | Lift Beam | Sub beam 1 piece |
| 3 | Loading dock board | 2pieces (including shaft 4pieces and snap ring Ø20 8pieces |
| 4 | Control Box | 1 set |
| 5 | Oil hose cover | 2 pieces |
| | Rubber cushion | 120mm×160mm×35mm 4pieces |
| | Composite plate for turn table | 4 pieces |
| 6 | Oil hose cover 1100 | 3pieces |
| 7 | Accessory box | 1 set(details are in the accessories packing list) |

**Table 1**




**Picture 1(Packing dimension picture)**

## 1.2. Transport:

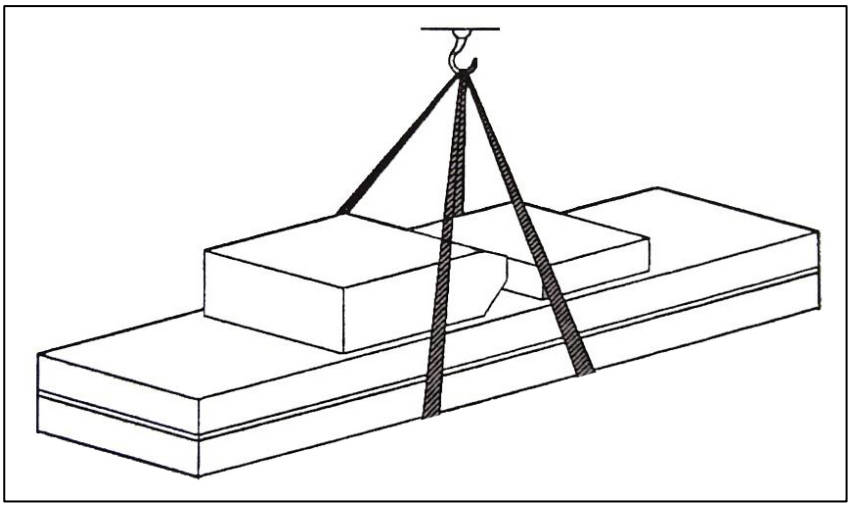
**Packing can be lifted or moved by lift trucks, cranes or bridge cranes. In case of slinging, a second person must always take care of the load, in order to avoid dangerous oscillations.**

During loading and unloading operation, goods must be handled by vehicles or ships.
At the arrival of the goods, verify that all items specified in the delivery notes are included. In case of missing parts possible defects or damage may due to transport operations.

If finding missing parts, possible defects or damage due to transport, one should examine damaged cartons according to **<<Accessories Packing List.>>** to verify the condition of damaged goods and missing parts, also the person in charge or the carrier must be immediately informed.

**The machine is heavy goods! Don't take manpower load and unload and transporting way into consideration, the safety of working is important**.

**Furthermore, during loading and unloading operation goods must be handled as shown in the picture**. (**Picture 2**)



**Picture 2 (Goods-lifted)**

## 1.3. Storage:

-The machine equipment should be stocked in the warehouse, if stocked outside should do the disposal well of waterproof.
-Use box truck in the process of transport, use container storage when shipping.
-The control box should be placed perpendicularly during the transport; and prevent other goods from extrusion.
-The temperature for machine storage : -25ºC-- 55ºC

# 2.Manual introduction

**This manual has been prepared for workshop personnel expert in the use of the lift operator and technicians responsible for routine maintenance fitter.**
Workers should read the **<<Instruction & Maintenance Manual>>** carefully before carrying out any

operation with the lift. This manual contains important information regarding:

-The personal safety of operators and maintenance workers.

-Lift safety.

-The safety of lifted vehicles.

Several tips should be done by the operator as follow:

1.Well conserving the manual. Manufacturer owns the right to make little change for the manual owing to the improvement of technology.

2.Good disposal the used oil.

3.The machine must be demolished by authorized technicians, just like for assembling

# 3.Description of the machine

## 3.1.Machine Application

Double-level low profile scissor lift can lift each kind of vehicle whose weight is less than 4000kg, suitable for use in four wheel alignment, vehicle tests, maintenance and caring for automobiles, which is particularly suitable for use in the basement or on the floor, without construction and hole.

**Lifts are designed and built to lift vehicles and hold them in the elevated position in an enclosed workshop. All other uses of the lifts are unauthorized. In particular, the lifts are not suitable for:**

**-Washing spray work;**

**-Use in outdoors;**

**-Creating raised platforms for personnel or lifting personnel;**

**-Use as a press for crushing purposes;**

**-Use as elevator;**

**-Use as a lift jack for lifting vehicle bodies or changing wheels**.

The manufacturer is not liable for any injury to persons or damage to vehicles and other property caused by the incorrect and unauthorized use of the lifts.

## 3.2.Structure Features

-Use hidden and thin scissor structure, dispense with construction and ground hole, the occupation is small

-Fixed directly to the floor, no ditch needed.

-Independent control box, low-voltage controlling, good security

-Same hydraulic cubage and in-phase cylinder, the synchronization of platform. Convenient for air/oil bleeding process.

-With hydraulic lock and mechanical dual-gear safety-claw lock double safety device, automatically open when lowering. Lock operation can has the safety-claw located, adversely, safe & reliable.

-Own protection of safety valve and burst-proof equipment for hydraulic failure and over loading. So when the oil pipe bursts, the machine will not fall quickly.

-Sliding blocks adopt oil free super-wearable materials.

-Use high quality hydraulic or electric element parts made in Italy, Germany, Japan and so on.

-The level of the lift can be adjusted in high precision to suit for various kinds of high-precision four-wheel alignment.

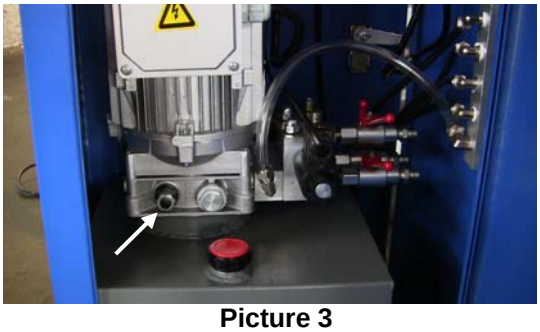
-Adjustable second-lifting platform length is suitable for various chassis of automobile.

-Manual lowering device in case of power off

**Safety lock structure**

The safety protection devices use to protect the operator in case of overload or machinery failure:

-In the case of overload, the overflow valve of the pump will open, the hydraulic oil will return to the oil tank

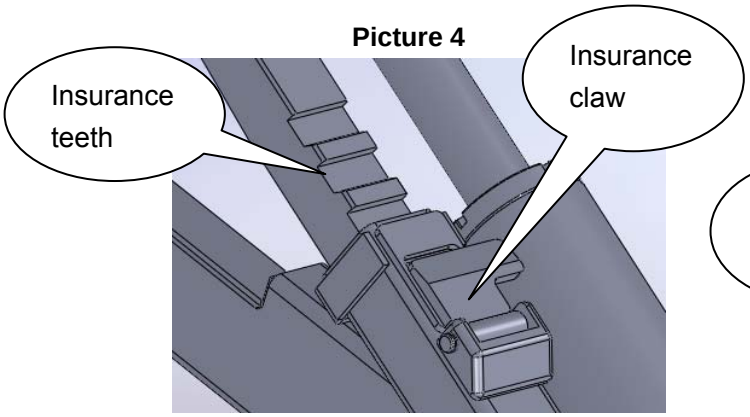


**Picture 3**

-The slave cylinder insurance teeth and claw are used for protecting the personal safety in case of other protection device fault. Make sure the integrity of gear module and that the safety tooth has occluded completely

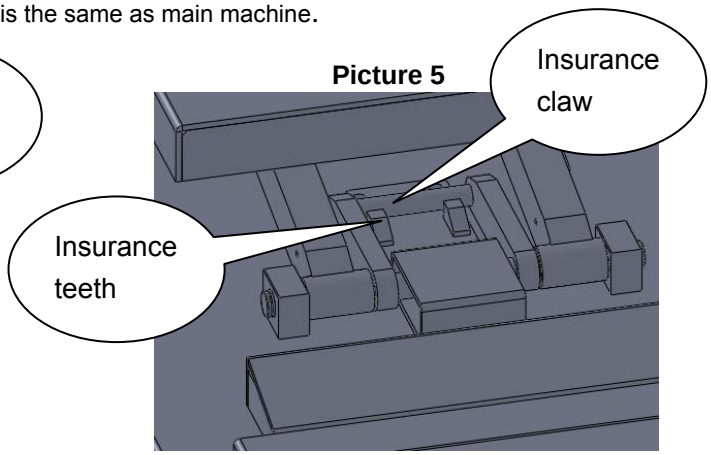
-The function of sub machine insurance claw is the same as main machine.

**Picture 4**




**Main machine**

**Picture 5**




**Sub machine**

## 3.3.Equipment

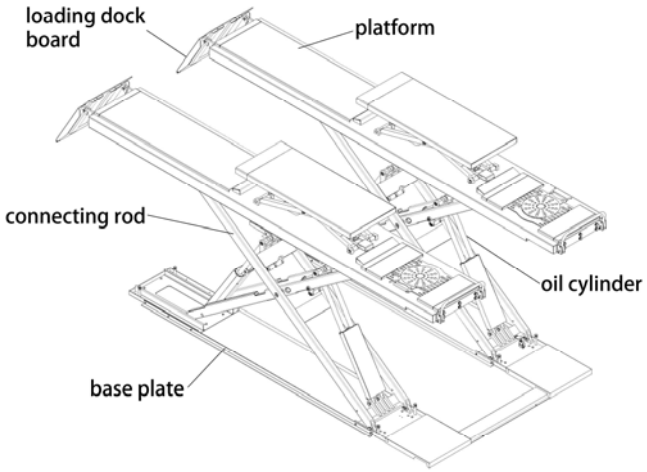
-Machine basement (The position and space of equipment installation)

-Machine frame (The main structure of lift and insurance institution )

-Control box (Machine-controlled part)

## 3.4.Frame

Make of base, steel connecting rod, main lifting platform hydraulic oil cylinder and loading dock board.




**Picture 6**

### 3.5.Control box

Under the control box is hydraulic oil tank and hydraulic pump, valve and other control system. On the control box is electrical system.

| Function of each valve on the power unit | |
|---|---|
| Name | Function |
| Gear pump | Extract hydraulic oil and provide high pressure. |
| Connecting block | Connect the motor and the gear pump. |
| Motor | Provide power for the gear pump. |
| Overflow valve | Adjust oil pressure. |
| Pressure-compensated valve | Control the speed of falling. |
| Lowering solenoid valve | Control flow of the hydraulic oil. |
| One-way valve | Control the one-way flow of hydraulic oil. |
| Ball valve | Debugging and control the returned oil. |

**Table 2**

# 4. Specifications

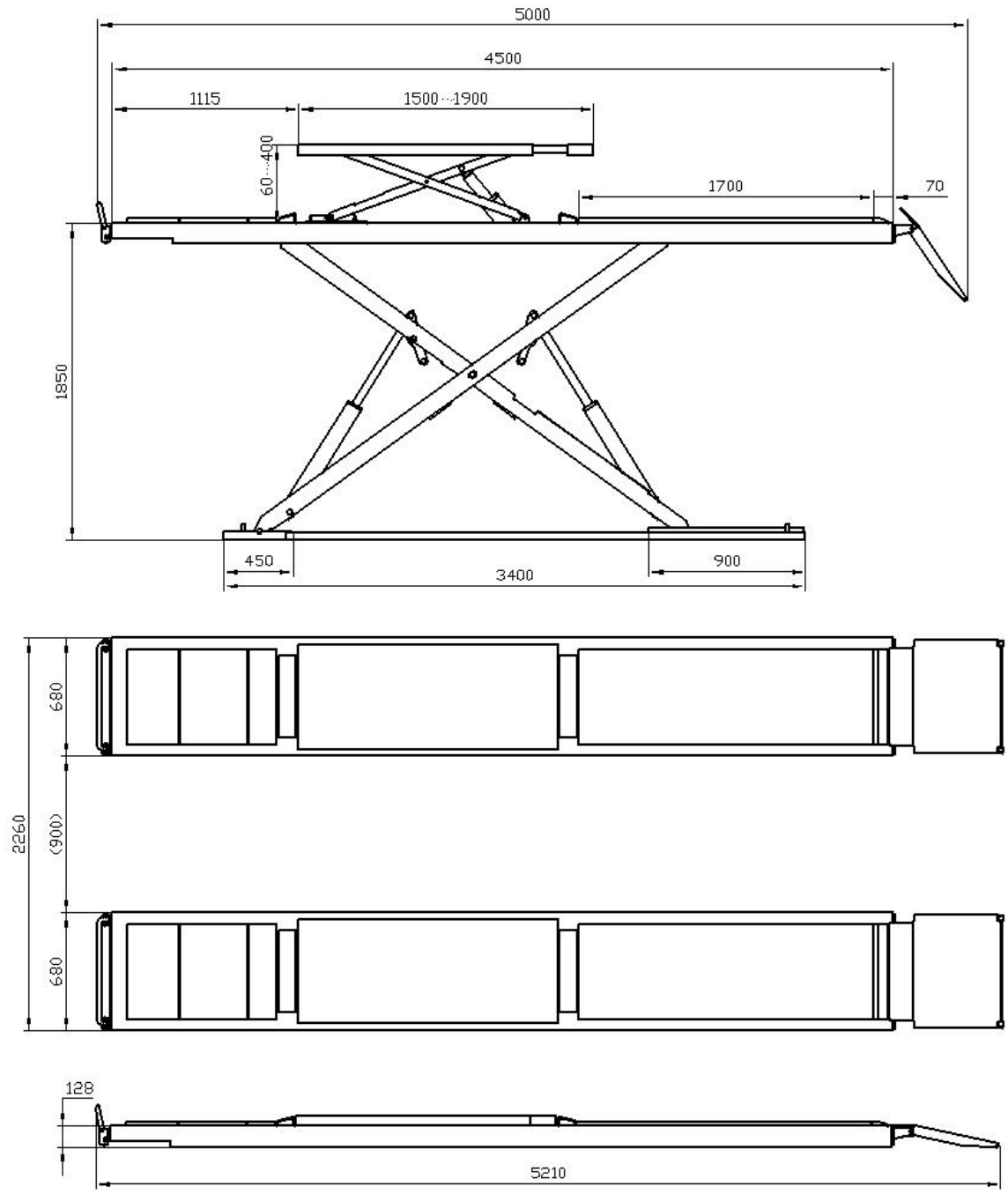
## 4.1 Main technical parameter

| Machine type | 4T |
|---|---|
| Drive | Electrical hydraulic |
| Lifting capacity | 4000kg |
| Main machine lift height | 1850mm |
| Sub machine lift height | 400mm |
| Platform initial height | 128mm |
| Main machine platform length | 4500mm |
| Sub machine platform length | 1500-1900mm |
| Main machine platform width | 680mm |
| Sub machine platform width | 600mm |
| Main machine lifting time | ≤75s |
| Main machine descent time | ≤60s |
| Sub machine lifting time | ≤20s |
| Sub machine descent time | ≤20s |
| Whole machine length | 5000mm |
| Whole machine width | 2260mm |
| Machine weight | 2280kg |
| Power supply | 3/N/PE~380V, 50Hz,10A |
| Whole machine power | 3kw |
| Hydraulic oil | 18L corresponds to wearable hydraulic oil |
| Gas pressure | 6-8kg/cm$^2$ |
| Working temperature | 5-40℃ |
| Working humidity | 30-95% |
| Noisy | < 70db |
| Storage temperature | -25℃~55℃ |

**Table 3**

| Hydraulic pump | |
|---|---|
| Rated flow | 2.7cc/r |
| Max working pressure | 26MPa |
| Rotate speed | 2800r/min |
| | |

## 4.2 External dimension drawing



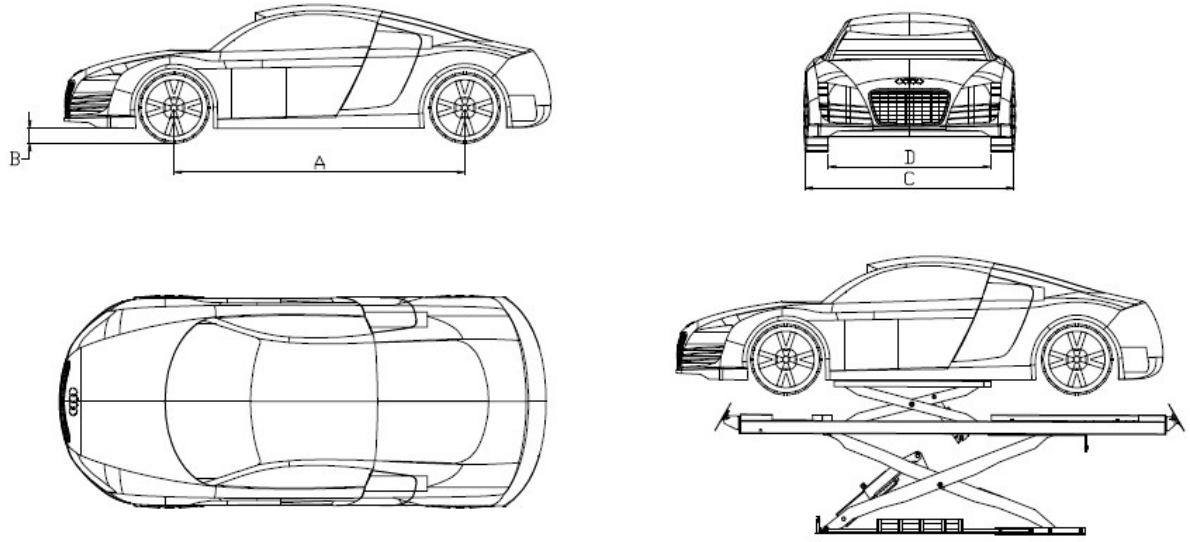

**Picture 7 (Lift dimension picture)**

## 4.3. Types of vehicles suitable for(For reference only)

This lift is suitable for virtually all vehicles with total weight and with dimensions not exceeding the below data. Maximum weight not exceed than 4000kg

**The max dimension of vehicle**:

The following diagrams illustrate criteria used to define the operating limits of the lift.




**Picture 8**

| | 4T | |
|---|---|---|
| | Min | Max. |
| A | 1900 | 3500/4000 |
| B | 100 | |
| C | | 1900 |
| D | 900 | |

The lower parts of the chassis could interfere with structural parts of the lift. Take particular parts of the sports-car.

The lift will also handle customized or non-standard vehicles provided they are within the maximum specified carrying capacity.

Also the personnel safety zone must be defined in relation to vehicle with unusual dimensions.

Do not use the lift without protection devices or with the protection devices inhibited.

Failure to comply with this regulation can cause serious injury to persons, and irreparable damage to the lift and the vehicle being lifted.

# 5. Safety notes

**General precautions**

The operator and the maintenance fitter are required to observe the prescriptions of safety regulation in force in the country of installation of the lift.

Furthermore, the operator and maintenance fitter must:

-Always work in the stations specified and illustrated in this manual;

-Never remove or deactivate the guards and mechanical, electrical, or other types of safety devices;

-Read the safety notices placed on the machine and the safety information in this manual.

**In the manual all safety notices are shown as follows:**

**Warning:** indicates following operations that are unsafe and can cause minor injury to persons and damage the lift, the vehicle or other property.

**Risk of electric shock:** a specific safety notice placed on the lift in areas where the risk of electric shock is particularly high.

**Risk and protection devices**

For optimal personal safety and safety of vehicles, observe the following regulations:

-Do not enter the safety and safety of vehicles is being lifted.

-Be sure to lift only approved vehicles, never exceed the specified carrying capacity, maximum height, and projection (vehicle length and width);

-Make sure that there is no person on the platforms during up and down movements and during standing.

**General risks for lifting or descent**

The following safety equipments are used to protect over loading or the possibility of engine failure.

In the condition of over loading, the over-falling valve will open and directly return oil to the oil tank.

Each bottom of oil cylinder is equipped with antiknock and locked valve. When the oil pipe is burst in the circuit of hydraulic pressure, the relevant antiknock and locked valve will work and limit the speediness of platform.

Safety tooth and gear module are parts which guarantee the safety of personnel beneath the machine in failure condition of other protections.

So make sure the integrity of gear module and that the safety tooth has occluded completely.

There is nothing abnormal should be left on the safety modules to prevent safety gear from occlude normally.

**Risk for extrusion**

During up and down operations, personnel leave the said area without following the rule and instruction.

During up and down operations, no person is admitted to work beneath the movable parts of the lift, should work in the safe zone.

**Risk of impact**

Before the operator begins up and down movements, make sure that there are no personnel inside the danger zone. When, due to operational reasons, the lift is stopped at relatively low elevations (lower than 1.75m above the ground) personnel must be careful to avoid impact with parts of the machine not marked with special colors.

**Risk of falling (vehicle)**

This hazard may arise in the case of incorrect positioning of the vehicle on the platforms, overweight of the vehicle, or in the case of vehicles of dimensions that are not compatible with the capacity of the lift.

When the platform is being tested, the vehicle engine can not be turned on.

There is nothing should be placed on the lift-lowering area and the movable parts of the lift.

**Risk of slipping**

The floor caused by lubricant contamination of around the lift. The area beneath and immediately surrounding the lift and also the platforms must be kept clean. Remove any oil spills immediately.

**Risk of electric shock**

Risk of electric shock in areas of insulated and shattered electric equipments

Do not use jets of water, steam solvents or paint next to the lift, and take special care to keep such substances clear of the electrical control panel.

**Risks related to appropriate lighting**

The operator and the maintenance fitter must be able to assure that all the areas of the lift are properly and uniformly illuminate compliance with the laws in force in the place of installation.

During up and down operations, the operator should continually observe the lift and can operate it only in the position of operator. When lifting and lowering the vehicle, the cushion needs being put in the bottom of chassis.

**The handling of safety devices is strictly forbidden. Never exceed the maximum carrying capacity of the lift, make sure the vehicles to be lifted have no load.**

**It is therefore essential to adhere scrupulously to all regulations regarding use, maintenance and safety contained in this manual.**

# 6. Installation

**Skilled and authorized personnel only should be allowed to perform these operations, follow all instructions shown below carefully, in order to prevent possible damage to the car lift or risk of injury to people.**

## 6.1. Installation requirements

-The car lift must be installed according to the specified safety distances from walls, pole -The specified safety distances from walls must be 600 mm at least, taking into consideration the necessary space to work easily. Because space for the control site and for possible runways in case of emergency is also necessary.

-The room must be previously arranged for the power supply and pneumatic feed of the car lift.

-The room must be 4000 mm in height, at least.

-The car lift can be placed on any floor, as long as it is perfectly level and sufficiently resistant. (≥21MPa,the thickness of concrete≥150mm)

-All parts of the machine must be uniformly lit with sufficient light to make sure that the adjustment and maintenance operations can be performed safely, and without reflected light, glare that could give rise to eye fatigue.

## 6.2. Base requirement

Concrete type: 425#, drying period ≥7 days.

Clean the raw surface, concrete thickness ≥150mm，ground level degree≤5 mm

Power supply for control unit (380V or 220V15A) and compressed air tube (Ø8x6mm)

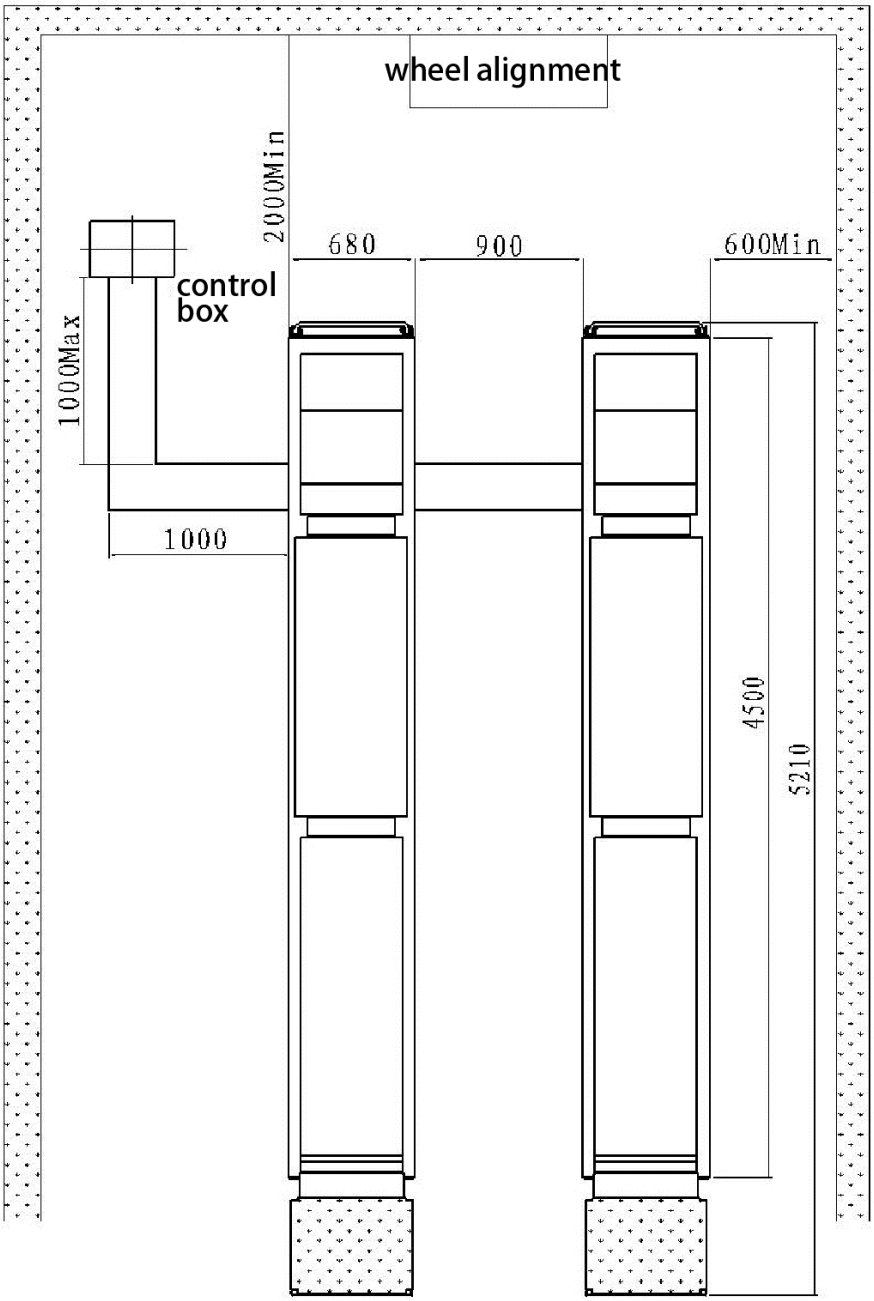
**Note**: The foundation of the end of the lift platformP1, P2 is the structure of concrete. When the thickness of inside level ground is less than 150mm, the end of P1, P2 should be irrigated the acreage: 6000×2500mm and thickness of concrete≥150mm

The basic thickness of concrete and leveling are keys, shouldn't egregiously expect the ability of level adjustment of machine-self.

## 6.3.Installation scheme for scissor lift

**Equipment basic picture**

**Picture 9** (The control box can be placed on the left or right)

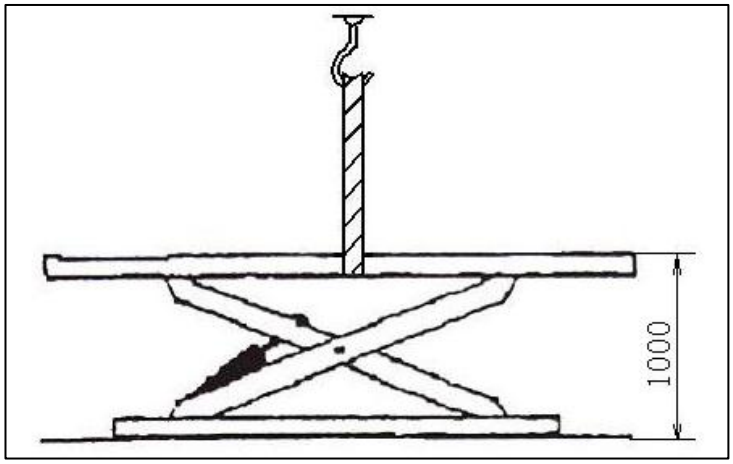


**Platform Installation:**

-Place two lift platforms on the position of the location

-The bottom of oil cylinder is located in the frontage of machine (the direction of getting on the vehicle)

-Use fork car or other lifting equipments to lift the platform (**Picture10**) and make sure that the safety equipment of machine is both turned on and locked.




**Picture 10**

**To avoid failure of machine safety equipment, can insert a wood in the middle part of joint-pole. Prohibit working beneath the lift when hydraulic system is not completely equipped with hydraulic oil and take the action of up and down operations.**

**-When moving the lift platform, adjust the space between two platforms; make sure that the two platforms are parallel.**

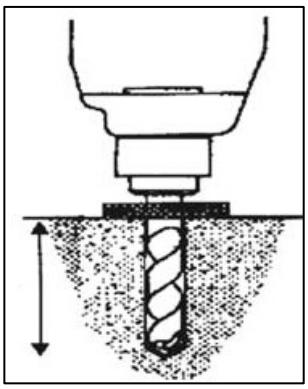
**Ground bolts installation**

The ground bolts installation must start after the expiry date on the maintenance of concert, otherwise, it will affect the quality of solidity.

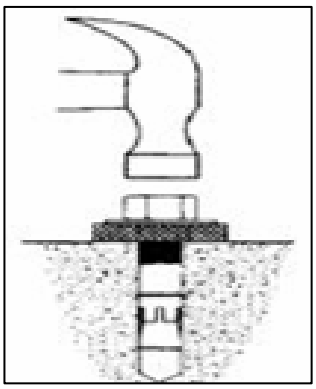
-Adjust the parallel of the platform and the distance of two platform as **Picture 11** requires.

-Fix the anchor bolts with a percussion electric drill (percussion drill bit is of 16), drill to 120mm hole and clean the hole.(**Picture 11)**

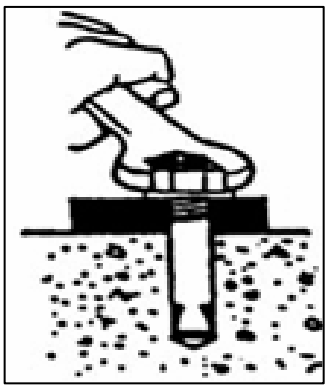
-Use light hammer to install the ground bolts into the hole (need not install the central expanded nail of ground bolts, install it after level adjustment.) (**Picture 12)**



**Picture 11**



**Picture 12**



**Picture 13**

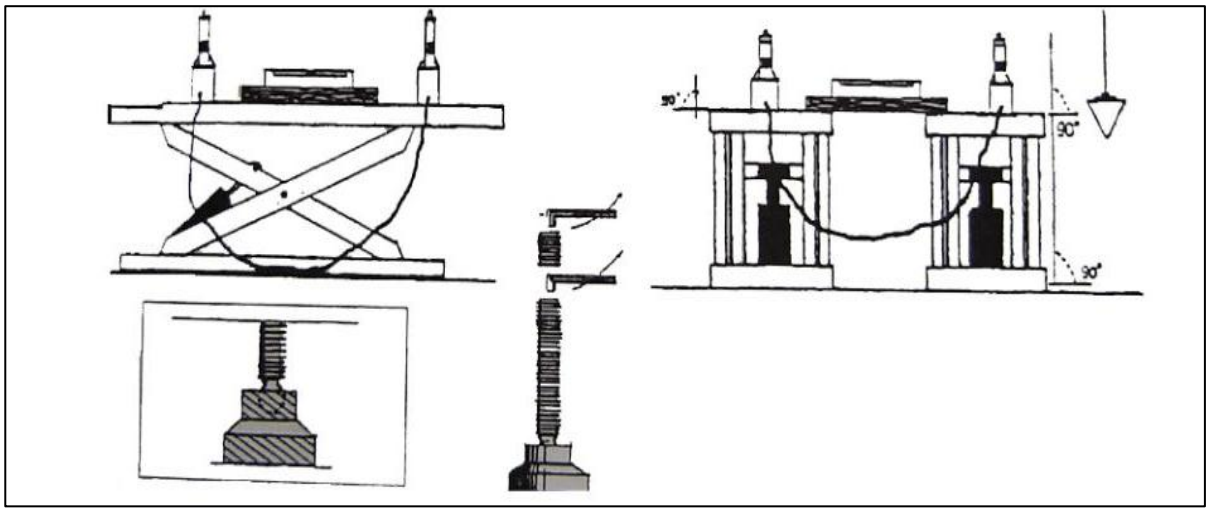
**Level adjustment**

-By using a level bar and the horizontal pipe and adjusting the adjustment screws at two sides of the base plate.

-If platform unevenness is resulted from basic unevenness, use iron block to fill up the low place.(**Picture 14)**

-After level adjustment, insert the central expanded nail of ground bolts and use heavy hammer to hammer it.(**Picture 12)**

-Screw down the ground bolts cap(**Picture 13)**




**Picture 14**

**Line connection**

Connect the electrical and oil line according to **<< circuit diagram>>** and **<<oil hose connection diagram>>**.

**Only after connecting the hydraulic system can connect the air loop, can not damage oil pipe, wire, and gas pipe.**

**In the process of connecting oil pipe and gas pipe, pay particularly attention to the protection of pipe tie-in to prevent abnormal thing from entering oil loop and gas loop, then damaging hydraulic system.**

**Electric circuit connection**

Follow the stated line-diameter and line-number of <<**the circuit diagram**>> to connect electric circuit.

**Only skilled special person is allowed to perform the operations.**

- Confirm the power switch is power off and the warning label "Do not power on" is pasted on it

-connection of power supply: the 380VAC three-phase and four-line connection wires (4×2.5mm2 cable wire) for power supply are connected to L1,L2,L3, and PE labeled entering-wire terminal in control box. The PE ground wire is connected under the bolt marked ground firstly (**Picture 22**) and then connected under the bolt marked ground of two platforms.

-if the lift is operated at 220V single-phase, connect the power line with L,N terminal in control box.

-Sensor connection: Main machine limit switch install on the support of sub platform base plate, connect the wire with 102#, 104# terminal in control box. Sub machine limit switch install on the support of sub machine, connect the wire with 104#, 108# terminal in control box.

**Hydraulic pipeline connection**

Follow **<<oil hose connection diagram >>** to connect the hydraulic oil hoses

**Only skilled and authorized person is allowed to perform the operations. And pay particularly attention to the protection of vita head.**

-Following tubing number to lead the high-pressure tubing out from the "working stop valve G" and "H" of control box and then connect it to oil cylinder. (Refer to <<**oil hose connection diagram**>>)

-When connecting tubing, pay attention to the protection of tubing tie-in to prevent impurities from entering hydraulic circuit.

**When connecting the tubing, be care of the mistake of each tubing number.**

**During the standard installation, control box is in the nearside of vehicle-entering direction. If placed on the right should adjust relevant tubing**.

**Oil hose connection of main machine**:

-Draw forth the oil hose ⑤# from the "main machine solenoid valve I", connect the oil hose with the main oil cylinder bottomed connector of main platform, and tighten them.

-Draw forth the oil hose ②# and ④# from "main machine oil make up stop valve G/K", connect the oil hose with the main oil cylinder top oil return outlet and sub oil cylinder bottomed oil inlet, tighten the connectors.

-Connect the oil hose ⑦# with the sub oil cylinder bottomed oil inlet of main platform and main oil cylinder top oil return outlet of sub platform, tighten the connectors.

- Connect the oil hose ⑧# with the main oil cylinder top oil return outlet of main platform and sub oil cylinder bottomed oil inlet of sub platform, tighten the connectors.

- Connect the oil hose ⑨# with the slave oil cylinder bottomed oil inlet of main platform and slave oil cylinder bottomed oil inlet of sub platform, tighten the connectors.

**Oil hose connection of sub machine**:

-Draw forth the oil hose ①# from the "sub machine solenoid valve J", connect the oil hose with the main oil cylinder bottomed connector of main platform, and tighten them.

-Draw forth the oil hose ③# and ④# from "sub machine oil make up stop valve H", connect the oil hose with the sub oil cylinder bottomed oil inlet, tighten the connectors.

-Connect the oil hose ⑥# with the main oil cylinder top oil return outlet of main platform and sub oil cylinder bottomed oil inlet of sub platform, tighten the connectors.

**Oil return hose connection** :

Draw forth the oil hose a#,b#,c# and d# from the oil return block, connect the oil hose with two slave oil cylinders and sub oil cylinder top oil return outlet of main machine, tighten the connectors.

**The oil hose number can not be mixed when connecting the oil hose.**

**The control box is installed on the left side of entering car direction in case of standard installation. Adjust the oil hose if the control box is placed on the right side.**

**Compressed air pipe connection**

Follow **<<gas loop diagram>>** to connect gas loop

**Only skilled and authorized person is allowed to perform the operations.**

**Air inlet pipe connection**

-Connect Φ8×5 compressed air supply pipe to the air supply jaws of pneumatic electromagnetic valve inside the control box.

**Air outlet pipe connection of main machine**

-Draw forth the Φ6×4 compressed air pipe from the pneumatic solenoid valve air outlet of main machine, connect the air pipe with air pipe T-union. Connect the air valve air inlet respectively above the safety device of the two platforms with air pipe connector

**Air outlet pipe connection of sub machine**

-Draw forth the Φ6×4 compressed air pipe from the pneumatic solenoid valve air outlet of sub machine, connect the air pipe with air pipe T-union. Connect the air valve air inlet respectively above the safety device of the two platforms with air pipe connector

-Install the oil-water separator before connecting the air pipe with control box, in order to extend the service lift and reliability of pneumatic components

**No knot is allowed during air pipe installation, avoid air circuit block**

**In the process of windpipe installation, the windpipe cannot be folded or tied to avoid that the gas loop is not smooth or it is jammed.**

**Before leading the compressed air supply pipe to the air supply jaws of pneumatic electromagnetic valve inside the control box, should extra install grease separator to separate compressed air, avoiding the failure of pneumatic cell action.**

# 7. Adjustment

**Preparation**

**Add oil and check the order of phase.**

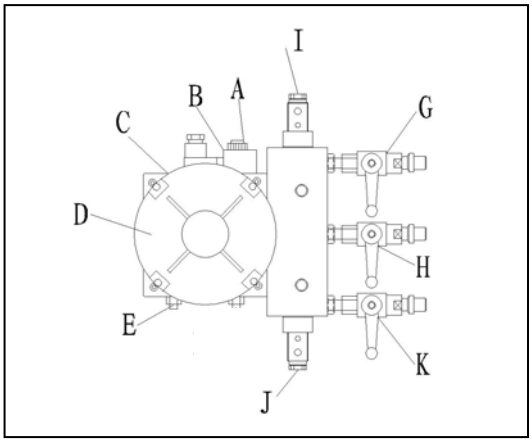
**After installing lift and connecting hydraulic circuit, electric circuit and gas loop, operate it as following:**

**-open the hydraulic oil tank, add 18L of hydraulic oil into the oil tank, the hydraulic oil is provided by the user.**

**Make sure the clean of hydraulic oil, prevent any impurity into the oil line, lead the digest of the oil line and no working of the solenoid valve.**

**-Press the "POWER" button to turn on power, clicking the "UP" button, check whether the motor turns clockwise (looking downward), if not press "POWER" button, change the phase of the motor.**

**When turn on power, the high voltage will exist in the control box, only authorized person can operate it**.




**Picture 15**

A: Descent valve core; B: Descent coil; C: One-way valve; D: Motor; E: Plug; F: Over flow valve; G/K: Main machine adjusting level valve; H: Sub machine adjusting level valve; J : Solenoid valve

### Main machine oil make-up adjustment

**Do not open both valves at the same time, platform movement will be unpredictable.**
**In Leveling position, only one side of the lift will move.**
**Use extreme care if a vehicle is on the lift**

-Turn the selector switch on the control panel to the "MAIN" position. Turn the selector switch in the control box to the "Working" position. Close the oil make up stop valve "H" on the sub machine and the "oil make up stop valve G" and "oil make up stop valve K" on the main machine.
-Press "UP" button SB1, motor start to lift the two platforms to the apex.
-Open the "oil make up stop valve G" and "oil make up stop valve K" on the main machine.
-Turn the selector switch in the control box to the "Adjusting" position.
-Vent air by loosening the screws at the top of main oil cylinders. Then tighten the screws.
-Turn the selector switch in the control box to the "Working" position. Close the "oil make up stop valve G" and "oil make up stop valve K" on the main machine. Press "DOWN" button SB2 to let the two platforms down to the ground.
-Repeat step 2 to step 6 for 4-5 times until there is no air out.
-Finish the oil make-up and air bleeding process.

**Note**: Micro adjust the platforms manually by " main machine oil make-up valve G/K" when the platforms are not in the same level ( observing the safety teeth whether they are in the same position or not)

**Check:** whether the locations of two safety-pawl equipments are agile and reliable, no leakage of the hydraulic system and the air system.

### Sub machine oil make-up adjustment

**Do not open both valves at the same time, platform movement will be unpredictable.**
**In Leveling position, only one side of the lift will move.**
**Use extreme care if a vehicle is on the lift**

-Turn the selector switch SA1 on the control panel to the "SUB" position.
-Close the "main machine oil make-up valve G/K" and " sub machine oil make-up valve H" ( clockwise 90° )

-Press "UP" button SB1, lift the main oil cylinder platform about 300mm

-Press "DOWN" button SB2, lower the main oil cylinder platform to the lowest position and then lift it about 400mm

-Turn the adjustment switch SA2 (fix on the side of electrical board) to "ADJUST" position. Open the oil make up stop valve "H" on the sub machine.

-Press "UP" button SB1, and the sub oil cylinder platform (looking from machine head direction) is lifted to about 300 mm.

-Press "DOWN" button. "SB2" to lower the sub oil cylinder platform to the lowest position.

-Repeat step6 and step 7 for 5-6 times to vent air automatically.

-Then lift the sub oil cylinder platform to 400mm. (two platforms of the Sub machine are lifted to the same height).

-Close the stop valve for make-up oil "H", turn SA2 to "WORK" position, and so come into the normal lift mode.

**Check:** whether the locations of two safety-pawl equipments are agile and reliable, no leakage of the hydraulic system and the air system.

Limit switch of sub machine adjustment

-turn "SA1" to "sub-machine", press "SB1", and thus the sub machine platform is lifted to about 400mm, adjust the limit switch "SQ2".

-lower the sub-machine platform, lift the sub-machine platform to 400mm, to check the efficiency of the sub machine.

Limit switch of main machine adjustment

-turn the "SA1" to "main machine", press "SB1" and then lift the platform to 1850mm, adjust limit position of SQ1.

Note: In order to adjust the highest limited position, place the main machine insurance claw on the final teeth of insurance rack about 5-10mm. The user can adjust the limit switch on random height according to the chamber height.

-lower the main machine platform, lift main machine platform to the limit position several times to check the efficiency of the limit position of the main machine.

**If the ceiling is lower than 4000mm, it should do the limit adjustment after lift the vehicle to the position which is lower than 200mm**

### Turntable location adjustment

-remove the transport screws(two hex socket head cap screws,two spring washer, two flat washer,don't fix transport screws after turntable location adjustment) under the turntable, remove the hexagon socket button head screws under padding block, change the sequence of padding block and turntable to make turntable at right place, fix the hexagon socket button head screws under padding block,change the distance between two turntables to suit the tyres.

### No load of main machine test

-Turn on the power QS.SA1 is on the "main machine" position and SA2 is on the "working" position. lose the main machine adjusting level valve G/K and sub machine adjusting valve H

-Press "UP" button SB1, pay attention to the synchronization and placidity of the lifting.

-Check whether highest limit of platforms is correct and reliable.

-Press "LOCK" button SB3,check whether safety pawl is correctly located, the oil line and the gas line are leakage.

**No load of sub machine test**

-SA1 is on the "sub machine" position. Press "UP" button SB1, pay attention to the synchronization and placidity of the lifting.

-Check whether highest limit of platforms is correct and reliable.

-Press "LOCK" button SB3,check whether safety pawl is correctly located, the oil line and the gas line are leakage

**When testing the lift, no person or other things are allowed to stand or be put near the two sides and beneath the machine. If any abnormal is found, stop it timely. After clearing obstacles, do the test again**.

**Load of main machine test**

-SA1 is on the "main machine" position

-Drive the vehicle whose weight doesn't exceed maximum lift weight to the platform, and then the driver leave it.

-Press "UP" button SB1, lift the platform and pay attention to the synchronization and placidity of the lifting.

-Check whether rack and hydraulic pump work normally .

-Check whether highest limit of platforms is correct and reliable.

-Press "LOCK" button SB3,check whether safety pawl is correctly located, the oil line and the gas line are leakage.

**Load of sub machine test**

-SA1 is on the "sub machine" position. Put the lift rubber cushion on the strut-seat

-Press "UP" button SB1, lift the platform and pay attention to the synchronization and placidity of the lifting.

-Check whether rack and hydraulic pump work normally

-Check whether highest limit of platforms is correct and reliable.

-Press "LOCK" button SB3,check whether safety pawl is correctly located ,the oil line and the gas line are leakage.

**When beginning load of machine test, no person or other things are allowed to stand or be put near the two sides and beneath the machine.**

**Test vehicle whose weight doesn't exceed maximum lift weight.**

**Check whether the oil line and the gas line are leakage. If any abnormal is found, stop it timely. After clearing obstacles, do the test again**.

# 8. Operation

**Only skilled and having been trained personnel is allowed to perform the operations. Check proceedings as following**.

**Text before operation:**

-Clear obstacles around the lift before operation.

-Pay attention to the synchronization and placidity of the lifting.

-Check whether the safety claw is flexible and reliable.

-Check whether the lift will stop automatically when it lift to the highest position

-No air leakage in the solenoid valve, air cylinder, air hose and union.

-Check whether the working sound of motor and gear pump are normal.

-Check whether the lifting vehicle or other goods exceed the capacity of the lift.

**Operation notices**

-Speed of vehicle should be kept in 5km/h when vehicle drives on the lift.

-The front wheel lies on the middle of the groove of turntable(the position of groove is adjustable) and the rear wheel lies on the sliding plate when vehicle stop.

-Tighten the brake and stack up antiskid(equipped by user) for vehicles.

-Press up button to lift the vehicle for 200-300mm,pay attention to the synchronization of the lifting.

-Go on press up button to lift the vehicle to the needed height.

-The chassis of vehicle should be filled up with rubber mat when the sub machine is lifting and lowering. The telescopic boom of sub machine should be taken back when the lift lowers.

-Pay attention to the synchronization of the lifting and lowering. If any abnormal is found, stop the machine timely, check and remove the trouble.

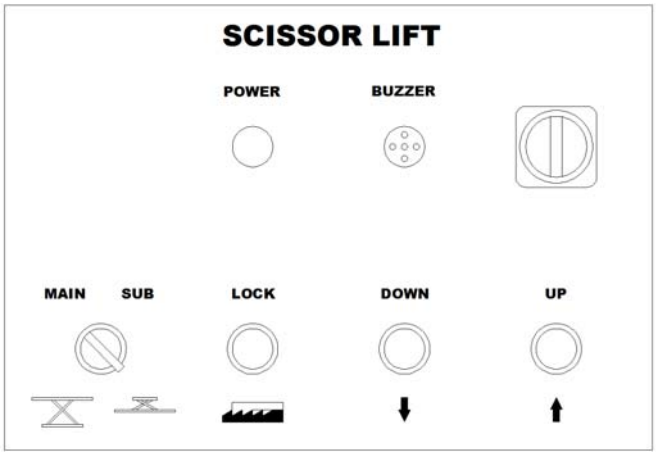
-The lift should be locked to keep the two insurance claw of platform in the same horizontal height during maintenance and four wheel alignment adjustment. Only after locking operation, personnel can enter below the lift and vehicle.

-Check whether the insurance claw is out of the insurance gear entirely and personnel is around the vehicle and the platform.

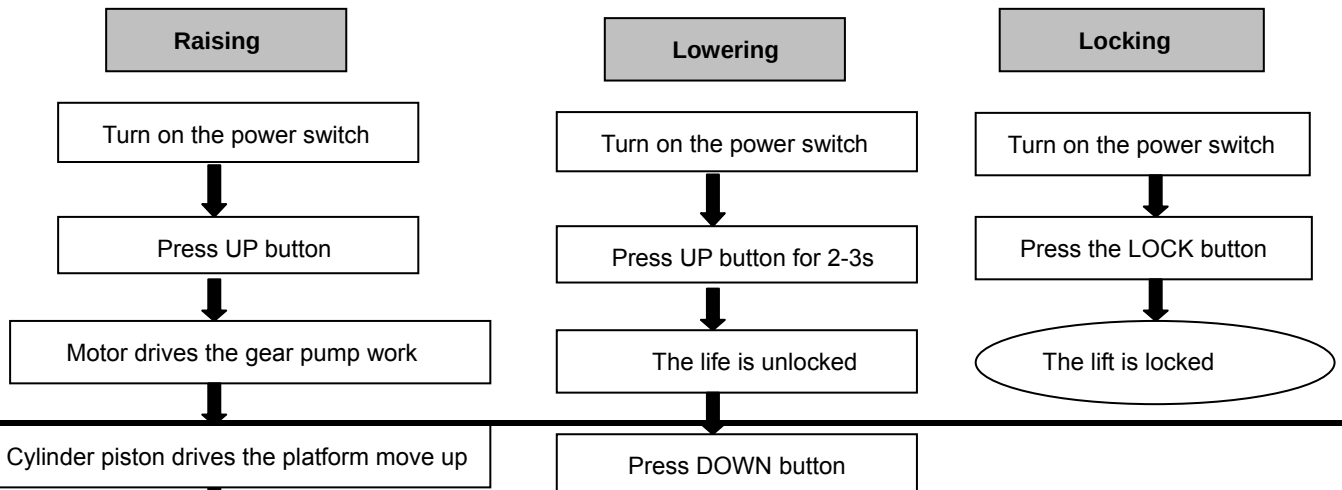
-Press down button to lower the vehicle to the ground or needed height.

-When the equipment is not used for a long time or over night, the machine should be lowered to the lowest position on ground, and remove vehicle, and cut off power supply.

**Instructions on control panel operation**




**Picture 16**



# 9. Maintenance and care

**Skilled personnel only is allowed to perform the operations**

### Daily checking items

The user must perform daily check. Daily check of safety system is very important – the discovery of device failure before action could save your time and prevent you from great loss, injury or casualty.

·Always wipe clean, keep the machine clean.

·Clear barriers and ground oil, keep the working condition clean.

·Check the integrity of each safety devices, ensure the motion is flexible and reliable.

·Check the reliability of limit switch motion.

·Check whether oil/air leakage of the machine exist.

### Weekly checking items

·All bearings and hinges on this machine must be lubricated once a week by using an oiler

·Check the working conditions of safety parts.

·Check the amount of oil left in the oil tank. Oil is enough if the carriage can be raised to highest position. Otherwise, oil is insufficient.

·Check whether the expansion bolts well anchored.

### Monthly checking items

·The safety gear, the upper and lower sliding blocks and other movable parts must be lubricated one month.

·Check whether the foundation bolts well anchored.

·Check the abrasion and leakage of oil/air hose.

### Yearly checking items

·The hydraulic oil must be replaced one time each year. The oil level should always be kept at upper limit position.

·.Check abrasion and damage of all the active parts.

·.Check the lubrication of roller. Lubricate it if drag phenomenon exist.

The machine should be lower to the lowest position when replace hydraulic oil, then let the old oil out, and should be filtering the hydraulic oil.

-Each team checks the agility and reliability of pneumatic safety equipment.

**Storage after use**

When the machine does not use for a long time:

·.Cut off the power supply and air source.

·.Lubricate all the active parts.

·.Drain the hydraulic oil of oil cylinder, oil hose and oil tank.

·Sheathe the machine with dust-proof cover.

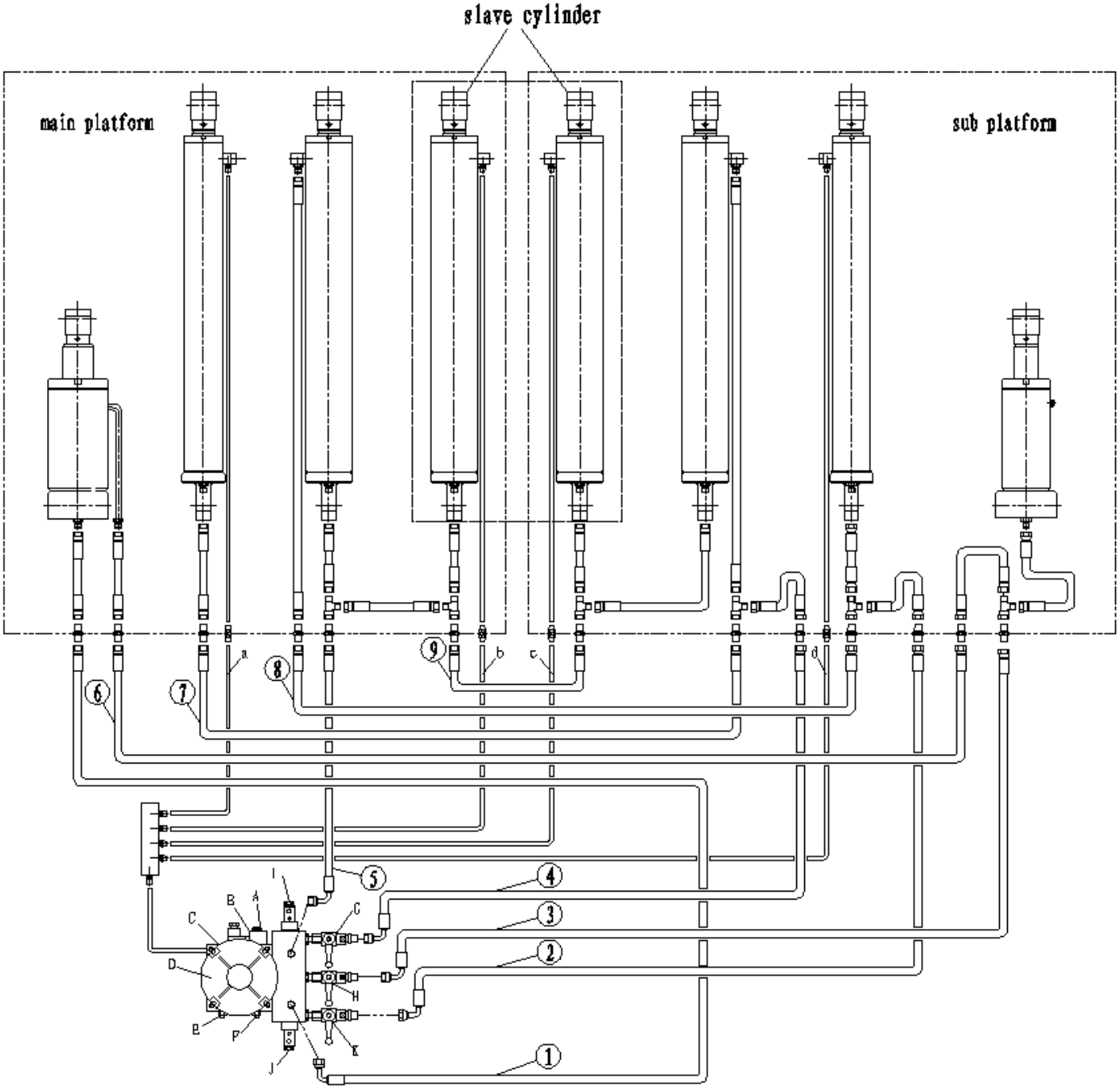
## 10. Trouble shooting table

**Skilled personnel only is allowed to perform the operations**

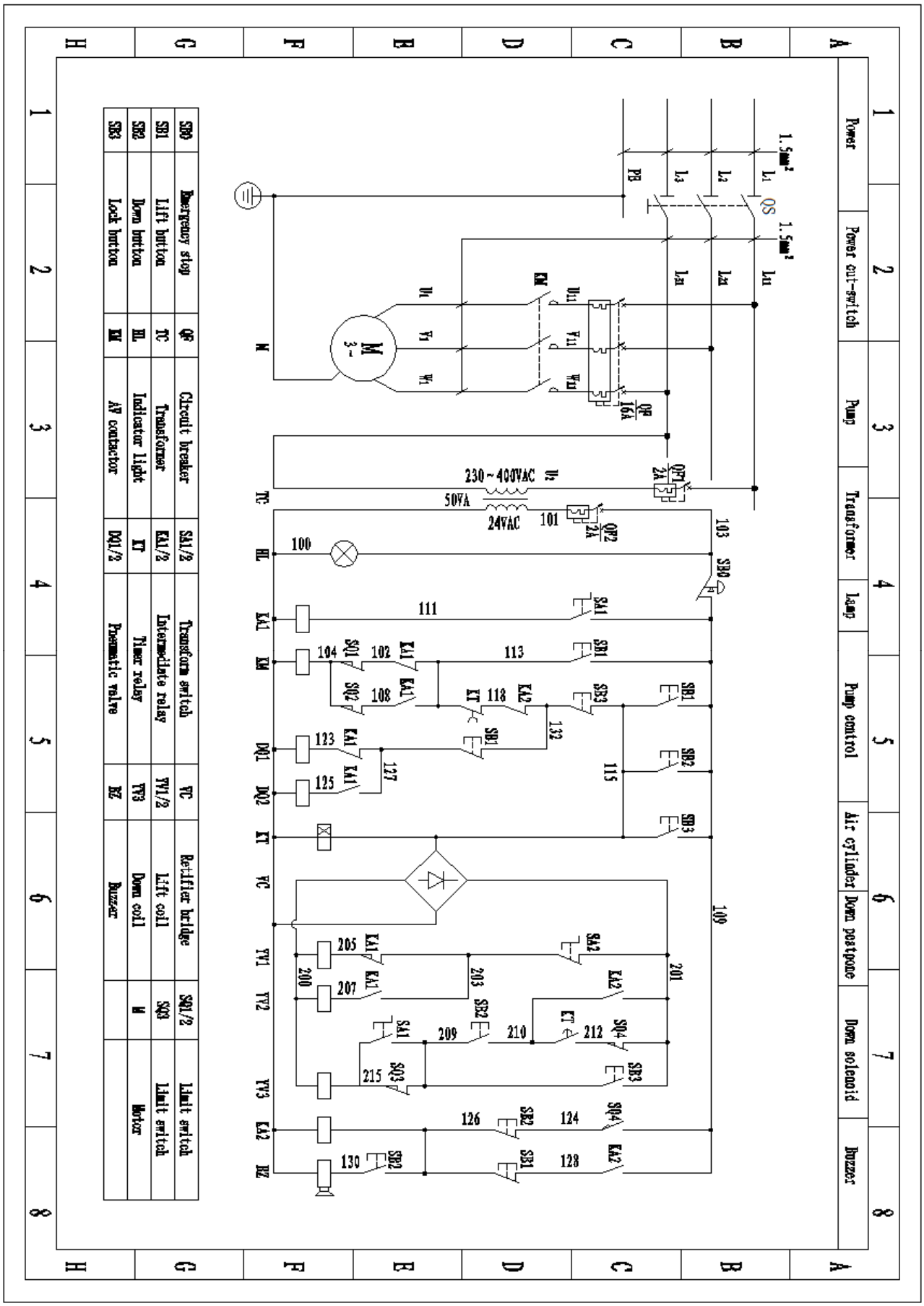
| Failure Phenomena | Cause and Phenomena | Resolutions |
|---|---|---|
| The motor does not run in lifting operation. | ①Connection of power supply wires is not correct. | Check and correct wire connection |
| | ②The AC contactor in the circuit of the motor does not pick up. | If the motor operates when forcing the contactor down with an isolation rod, check the control circuit. If the voltage at two ends of the contactor coil is normal, replace the contactor. |
| | ③The limit switch is not closed. | Check the limit switch, wires and adjust or replace the limit switch. |
| In lifting operation, the motor runs, but there is no lifting movement. | ①The motor turns reverse. | Change the phases of the power supply wires. |
| | ② It is normal while lifting with light load but abnormal while lifting with heavy load | Lift is overloaded and is unable to carry the load being attempted. Carefully lower and remove vehicle from lift. The spool of the lowering solenoid valve is stuck by dirt. Clean the spool. |
| | ③The amount of hydraulic oil is not enough. | Add hydraulic oil. |
| | ④The "operation stop valve" is not closed. | Screw down the "Operation stop valve" |
| When press "DOWN" button, the machine is not lowered. | ①The safety pawl are not released form the safety teeth. | First lift a little and then lowering |
| | ②The safety pawl is not lifted. | The air pressure is not enough, the safety pawl is stuck or the gas pipe is broken off, adjust pressure, check the gas pipe and replace it. |
| | ③The solenoid air valve does not work. | If the solenoid air valve is energized, but does not open the air loop, check or replace the solenoid air valve. |
| | ④The lowering solenoid valve is energized but does not work. | Check the plug and coil of the lowering solenoid valve and check the right turn tightness of its end copper nut and so on. |
| | ⑤The "antiknock valve" is blocked. | Remove the "antiknock valve" from the oil supply hole at the bottom of the oil cylinder, and clean the "antiknock valve". |
| The machine lowers extremely slowly under normal loads. | ①The hydraulic oil has too high viscosity or frozen, deteriorated (in Winter). | Replace with hydraulic oil in accordance with the instruction book. |
| | ②The "antiknock valve" for preventing oil pipe burst is blocked. | Remove or close air supply pipe and thus lock the safety pawl of the machine without lifting of the safety pawl. Remove the "antiknock valve" from the oil supply hole at the bottom of the oil cylinder, and clean the "antiknock valve". |
| The right and left platforms are not synchronous and not in the same height. | ① The air in the oil cylinder is not vent completely. | Refer to " Oil Make-up 'Adjust' Operation". |
| | ②Oil leakage on oil pipe or at its connections. | Tighten oil pipe connections or replace oil seals and then make-up oil and adjust levelness. |
| | ③The "oil make-up stop valve" can not be closed tightly and almost make-up oil and adjust every day. | Replace oil make-up stop valve, and then make-up oil and adjust. |
| Noisy lifting and lowering. | ①Lubrication is not enough. | Lubricate all hinges and motion parts (including piston rod) with machine oil |
| | ② The base or the machine is twisted. | Adjust again the levelness of the machine, and fill or pad the base. |

**Table 4**

## 11. Oil hose connection diagram

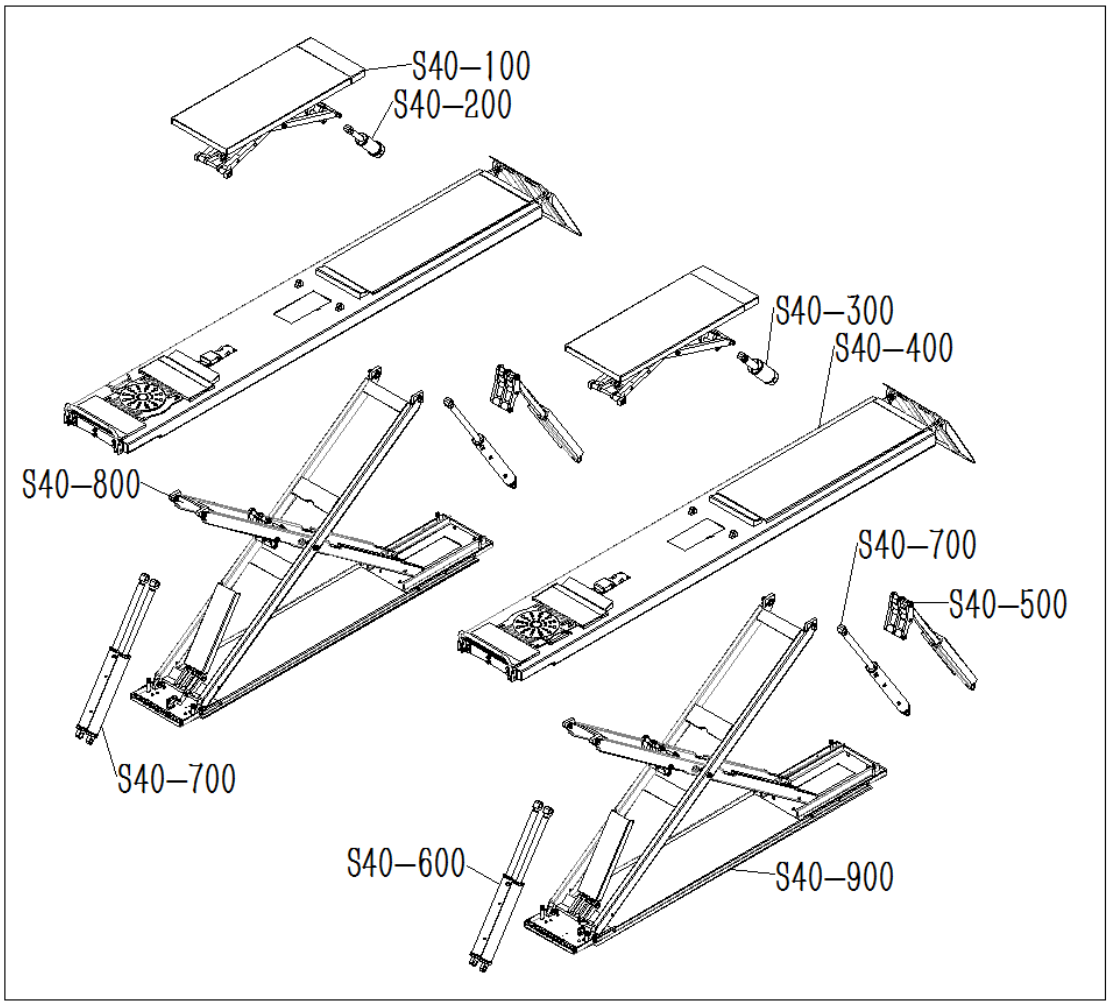

slave cylinder
main platform
sub platform
a
b
c
d
1
2
3
4
5
6
7
8
9
A
B
C
D
E
F
G
H
I
J
K

## 12. Circuit diagram

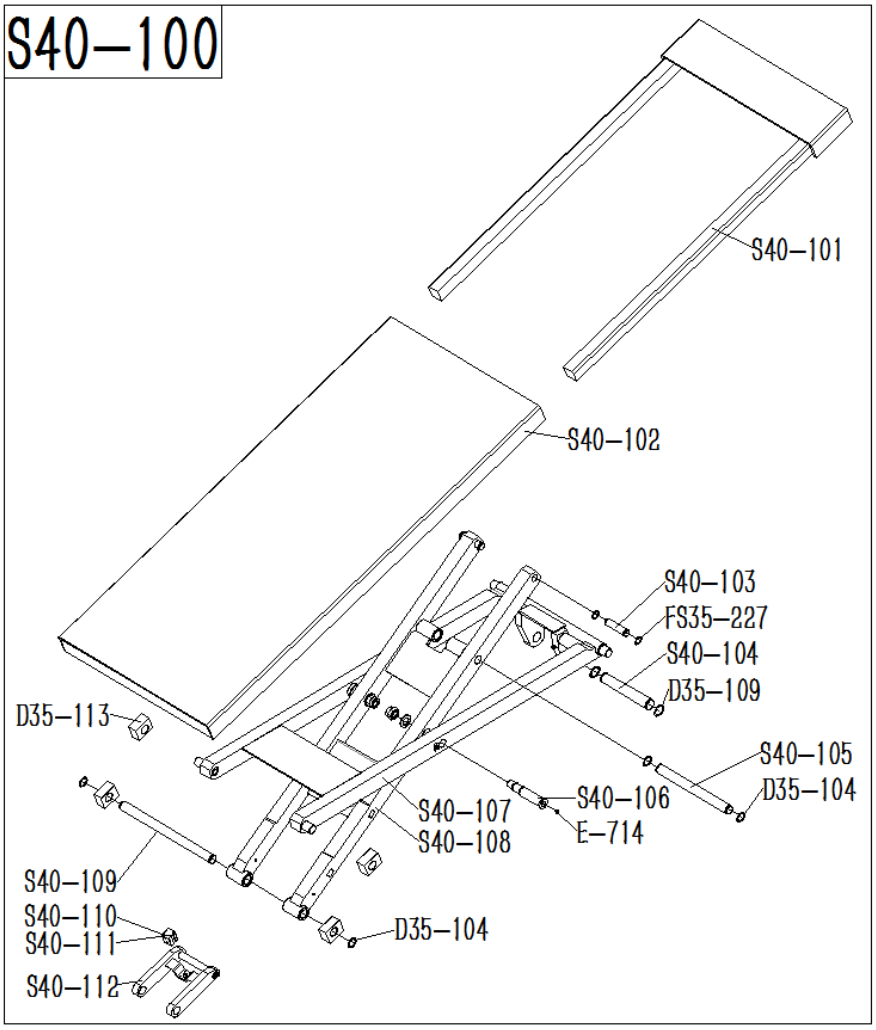



| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| SB0 | Emergency stop | QF | Circuit breaker | SA1/2 | Transform switch | VC | Rectifier bridge | SQ1/2 | Limit switch |
| SB1 | Lift button | TC | Transformer | KA1/2 | Intermediate relay | TV1/2 | Lift coil | SQ3 | Limit switch |
| SB2 | Down button | HL | Indicator light | KT | Timer relay | TV3 | Down coil | M | Motor |
| SB3 | Lock button | KM | AV contactor | DQ1/2 | Pneumatic valve | HZ | Buzzer | | |

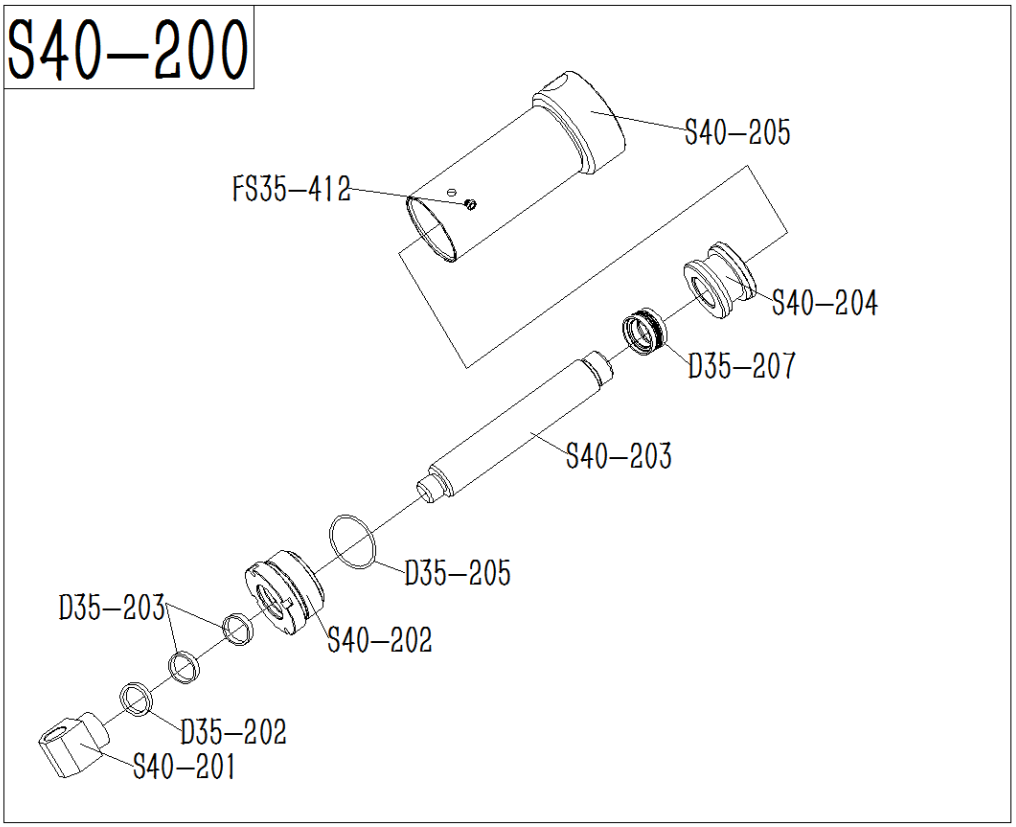
# 13.Explosion drawing



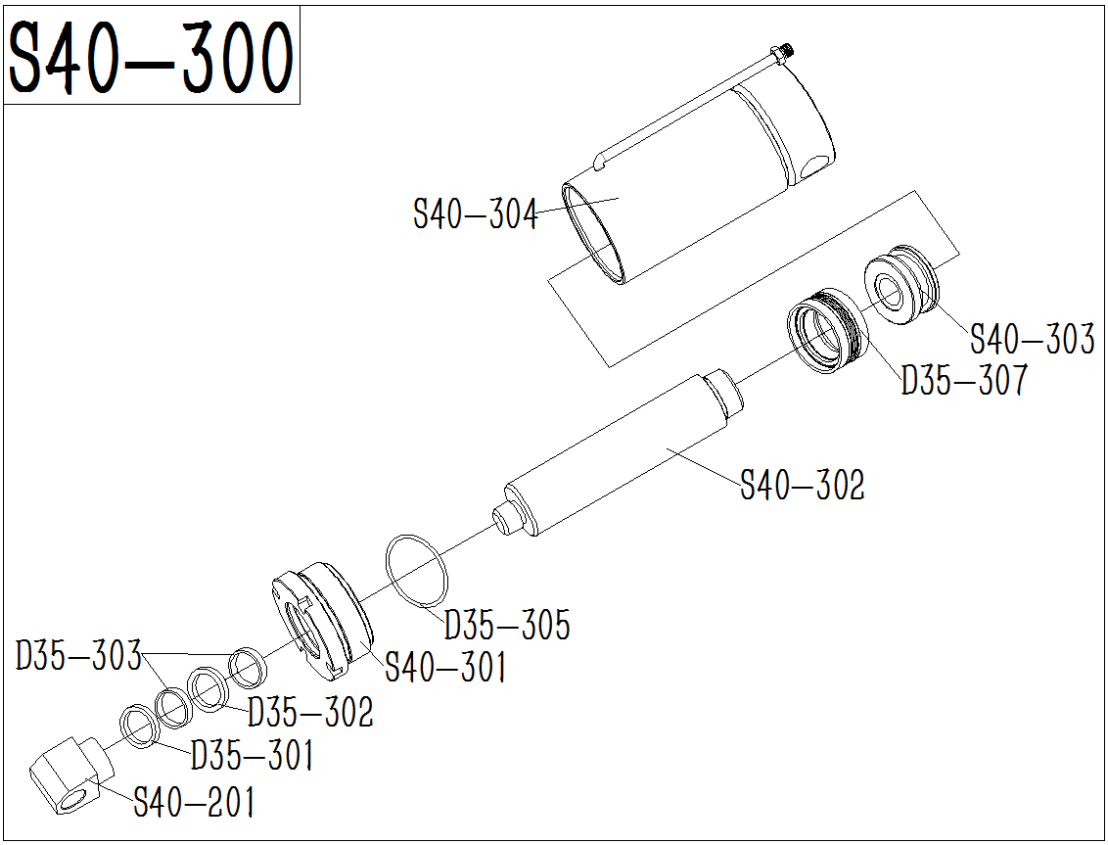

| | |
|---|---|
| S40-100 | complete sub machine assembly |
| S40-200 | complete sub oil cylinder assembly (sub machine） |
| S40-300 | complete main oil cylinder assembly (sub machine） |
| S40-400 | complete main platform assembly |
| S40-500 | starting rod complete |
| S40-600 | complete sub oil cylinder assembly (main machine） |
| S40-700 | complete main oil cylinder assembly (main machine） |
| S40-800 | connecting rod complete |
| S40-900 | base complete |



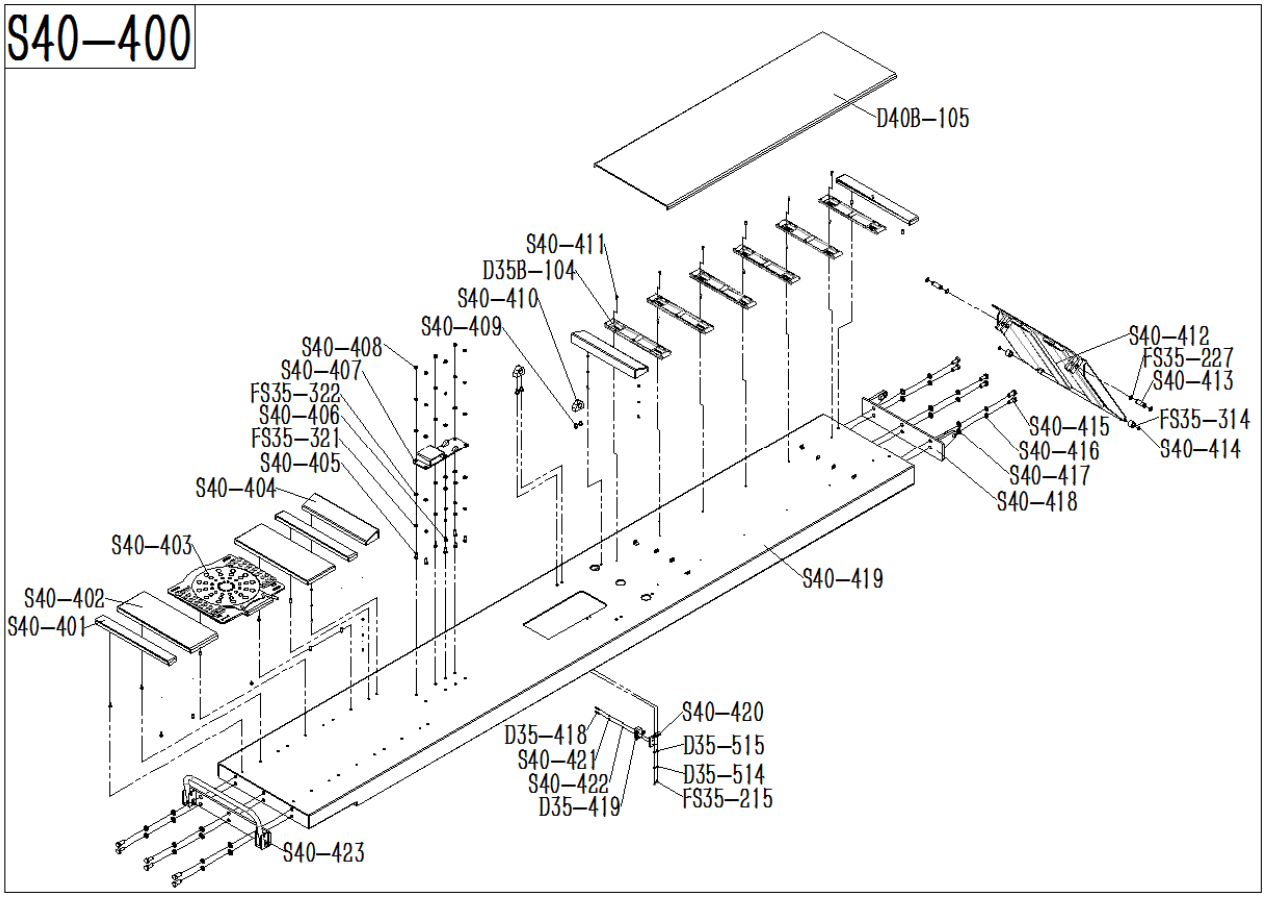

| | |
|---|---|
| S40-100 | complete sub machine assembly |
| S40-101 | telescopic boom 1110×600×60mm |
| S40-102 | top plate |
| S40-103 | stationary shaft (sub machine) |
| FS35-227 | shaft snap ring Ø20 |
| S40-104 | downward stationary shaft of oil cylinder (sub machine) |
| D35-109 | shaft snap ring Ø30 |
| S40-105 | upper stationary shaft of oil cylinder (sub machine) |
| D35-104 | shaft snap ring Ø25 |
| S40-106 | centre shaft (sub machine) |
| E-714 | grease plug |
| S40-107 | outer connecting rod (sub machine) |
| S40-108 | inner connecting rod |
| S40-109 | connecting shaft for inner connecting rod (sub machine) |
| S40-110 | cylinder SSDA16×15 |
| S40-111 | straight union M5-4×6 |
| S40-112 | insurance claw assembly (sub machine） |
| D35-113 | sliding block (sub machine) |




| | |
|---|---|
| S40-200 | complete sub oil cylinder assembly (sub machine） |
| S40-201 | oil cylinder support block (sub machine) |
| D35-202 | dust-proof ring Ø45×53×6.5 |
| D35-203 | wear ring |
| S40-202 | sub oil cylinder cover (sub machine) |
| D35-205 | O-ring Ø80×5 |
| S40-203 | sub oil cylinder piston rod (sub machine) |
| D35-207 | combined seal ring Ø80×60×22.4 |
| S40-204 | sub oil cylinder piston (sub machine) |
| FS35-412 | muffler G1/8 |
| S40-205 | Sub oil cylinder (sub machine) |

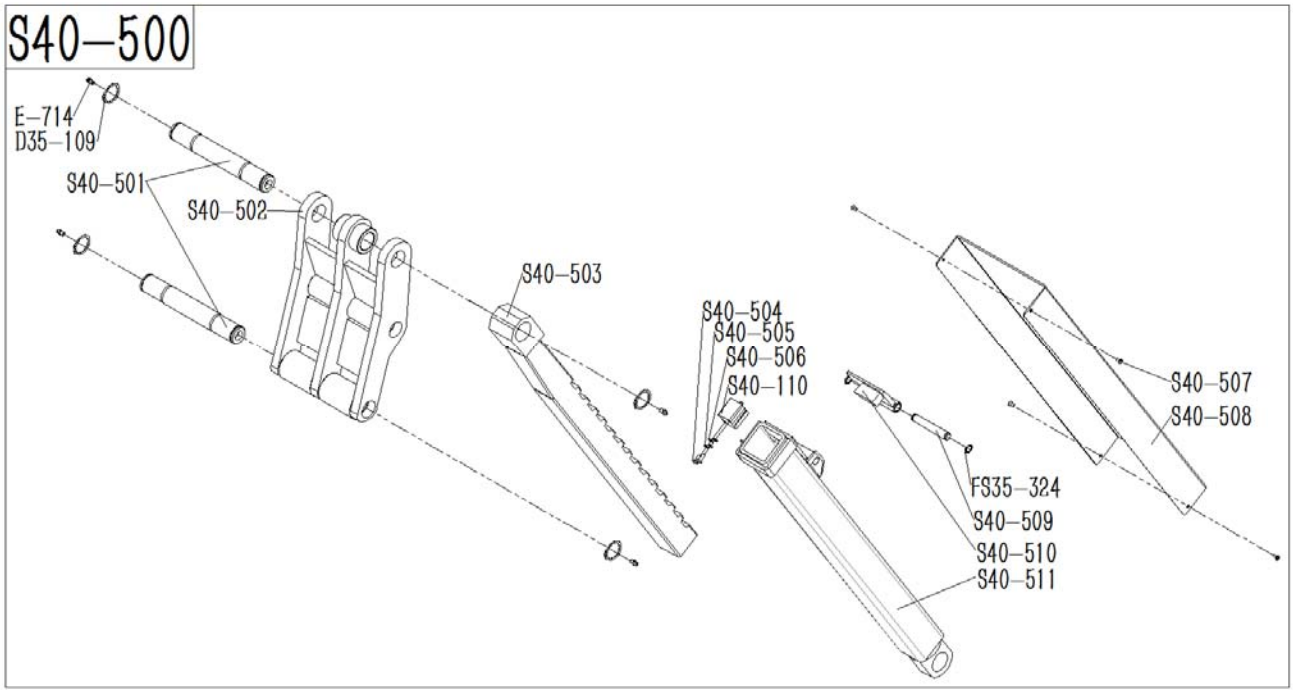



| | |
|---|---|
| S40-300 | complete main oil cylinder assembly (sub machine） |
| S40-201 | oil cylinder support block (sub machine) |
| D35-301 | dust-proof ring Ø60×68×6.5 |
| D35-303 | wear ring |
| D35-302 | U-ring Ø60×70×10.5 |
| S40-301 | main oil cylinder cover (sub machine) |
| D35-305 | O-ring Ø100×5 |
| S40-302 | main oil cylinder piston rod (sub machine) |
| D35-307 | combined seal ringØ100×75×22.4 |
| S40-303 | main oil cylinder piston (sub machine) |
| S40-304 | main oil cylinder (sub machine) |



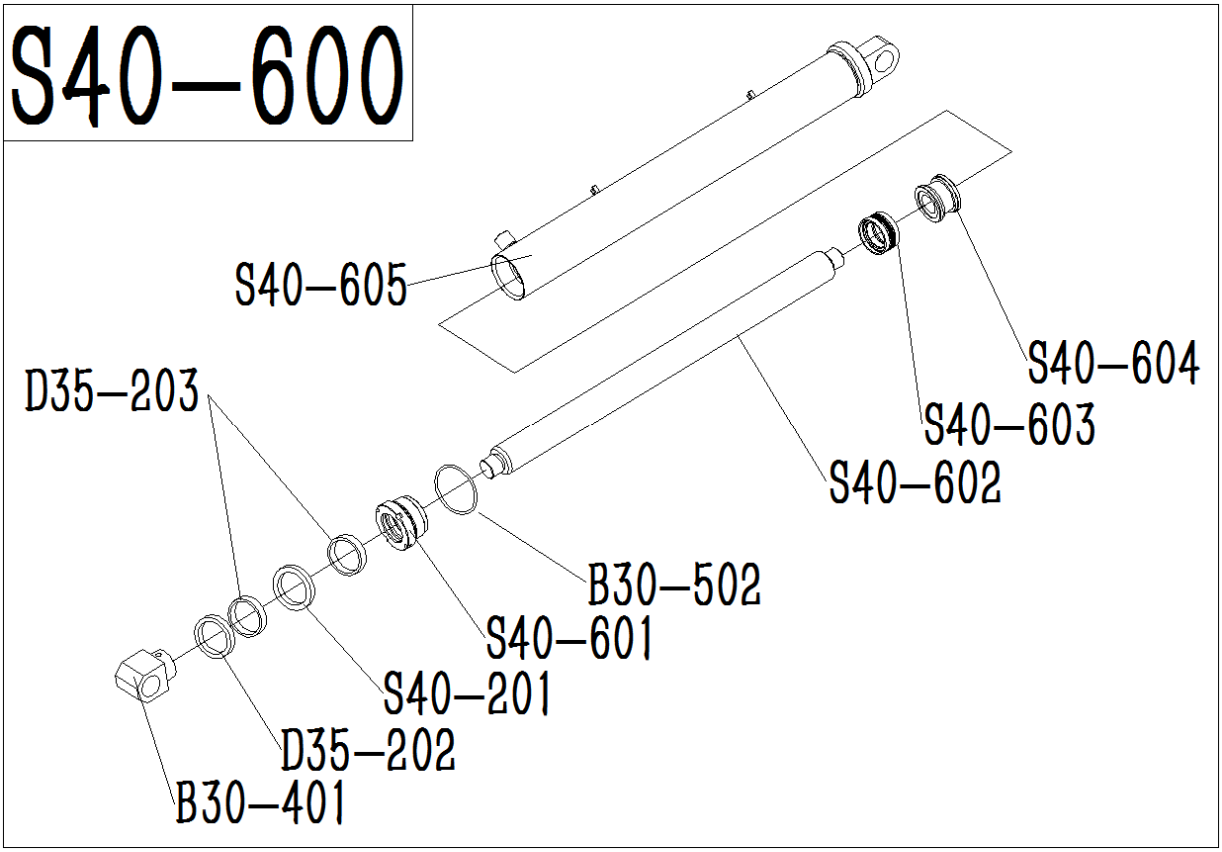

| | |
|---|---|
| S40-400 | complete main platform assembly |
| S40-401 | padding block 60mm |
| S40-402 | padding block 200mm |
| S40-403 | turntable |
| S40-404 | car guide |
| S40-405 | hex bolt M10×20 |
| FS35-321 | spring washer Ø10 |
| FS35-322 | flat washer Ø10 |
| S40-406 | hex bolt M10×16 |
| S40-407 | insurance case (sub machine） |
| S40-408 | hex nut M10 |
| S40-409 | hex socket head cap screw M12×16 |
| S40-410 | outer connecting rod lug (sub machine) |
| D35B-104 | movable equipment |
| S40-411 | hexagon socket M6×16 |
| D40B-105 | sliding plate |
| S40-412 | loading dock board |
| FS35-227 | shaft snap ring Ø20 |
| S40-413 | shaft of block car support |

| | |
|---|---|
| FS35-314 | sliding plate roller |
| S40-414 | shaft snap ring Ø16 |
| S40-415 | hex bolt M16×35 |
| S40-416 | spring washer Ø16 |
| S40-417 | flat washer Ø16 |
| S40-418 | fixed support of loading dock board |
| S40-419 | main platform |
| S40-420 | limit switch support (sub machine, only one side) |
| D35-515 | flat washer Ø6 (only one side) |
| D35-514 | spring washer Ø6 (only one side) |
| FS35-215 | hex socket head cap screw M6×12 (only one side) |
| D35-418 | cross pan head screw M4×25 (only one side) |
| S40-421 | spring washer Ø4 (only one side) |
| S40-422 | flat washer Ø4 (only one side) |
| D35-419 | limit switch LZ7311 (only one side) |
| S40-423 | block car support |

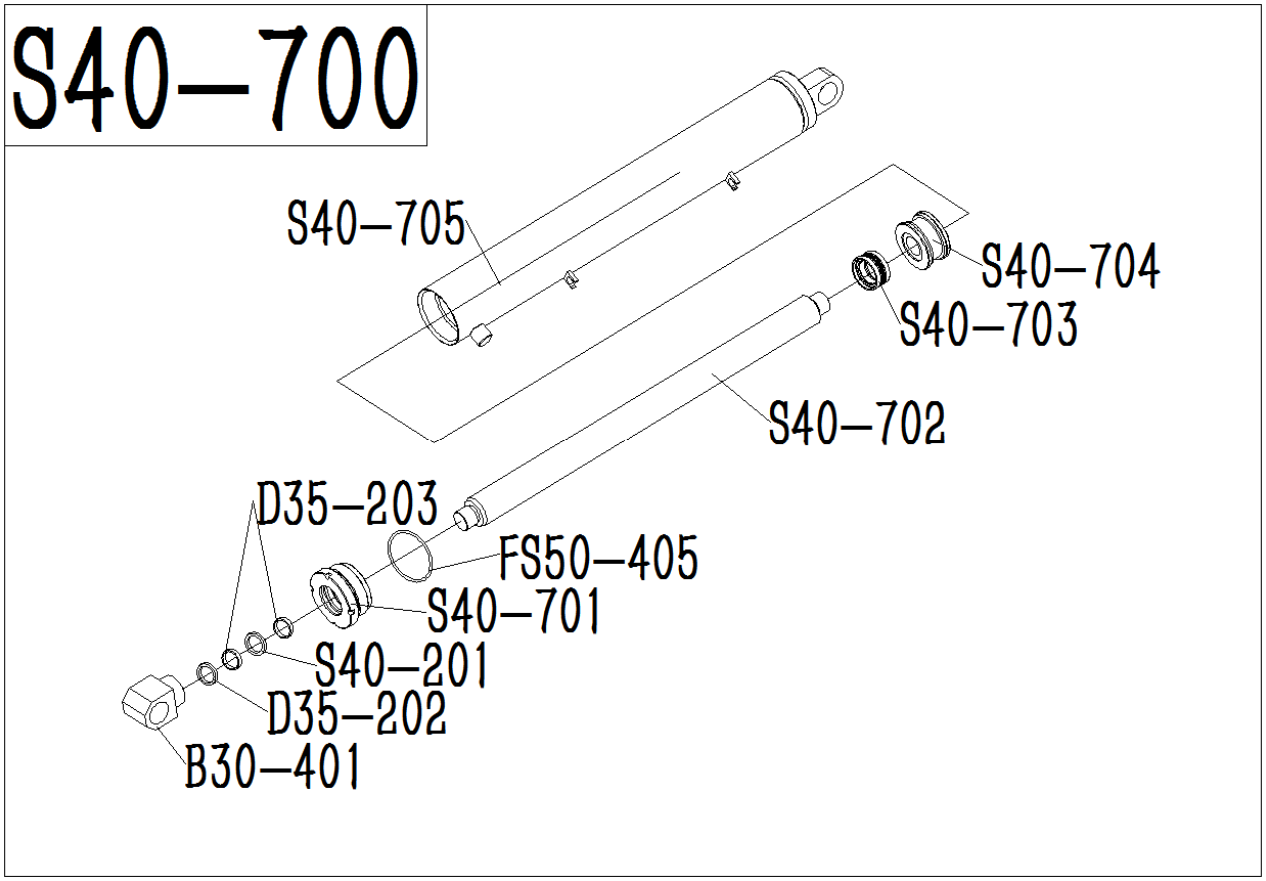



| | |
|---|---|
| S40-500 | starting rod complete |
| E-714 | grease plug |
| D35-109 | shaft snap ring Ø30 |
| S40-501 | upper stationary shaft of oil cylinder (main machine) |
| S40-502 | starting rod |
| S40-503 | insurance strip (main machine) |
| S40-504 | cross pan head screw M5×12 |
| S40-505 | spring washer Ø5 |

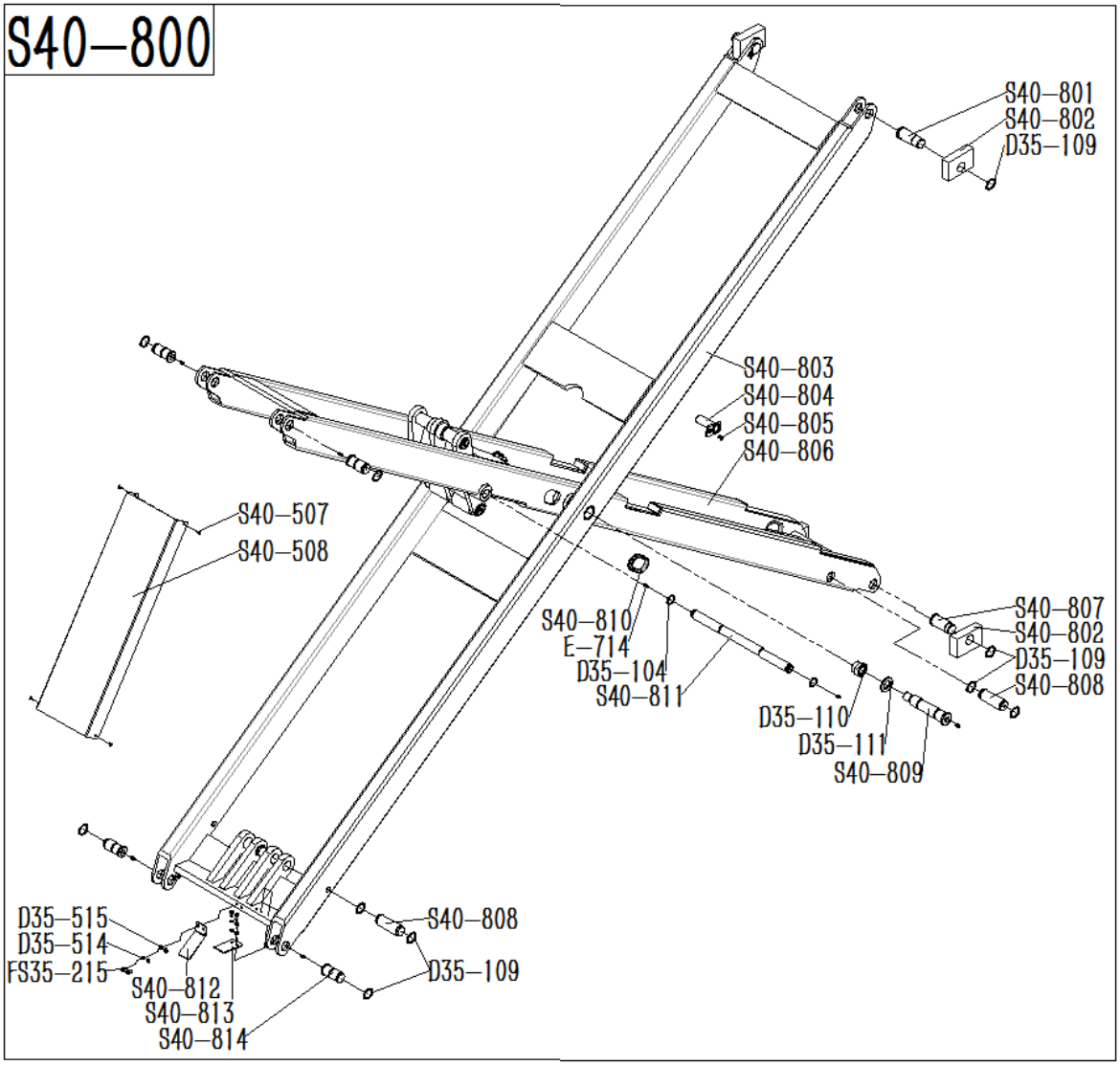
| | |
|---|---|
| S40-506 | flat washer Ø5 |
| S40-110 | cylinder SSDA16×15 |
| S40-507 | cross pan head screw M4×8 |
| S40-508 | cylinder cover |
| FS35-324 | shaft snap ring Ø12 |
| S40-509 | stationary shaft for insurance block |
| S40-510 | insurance block |
| S40-511 | insurance frame (main machine) |




| | |
|---|---|
| S40-600 | complete sub oil cylinder assembly (main machine） |
| B30-401 | oil cylinder support block (main machine) |
| D35-202 | dust-proof ring Ø45×53×6.5 |
| D35-203 | wear ring |
| S40-201 | U-ring Ø45×55×6 |
| S40-601 | sub oil cylinder cover (main machine) |
| B30-502 | O-ring Ø60×4 |
| S40-602 | oil cylinder piston rod (main machine) |
| S40-603 | combined seal ringØ60×48×20.5 |
| S40-604 | sub oil cylinder piston (main machine) |
| S40-605 | sub oil cylinder (main machine) |

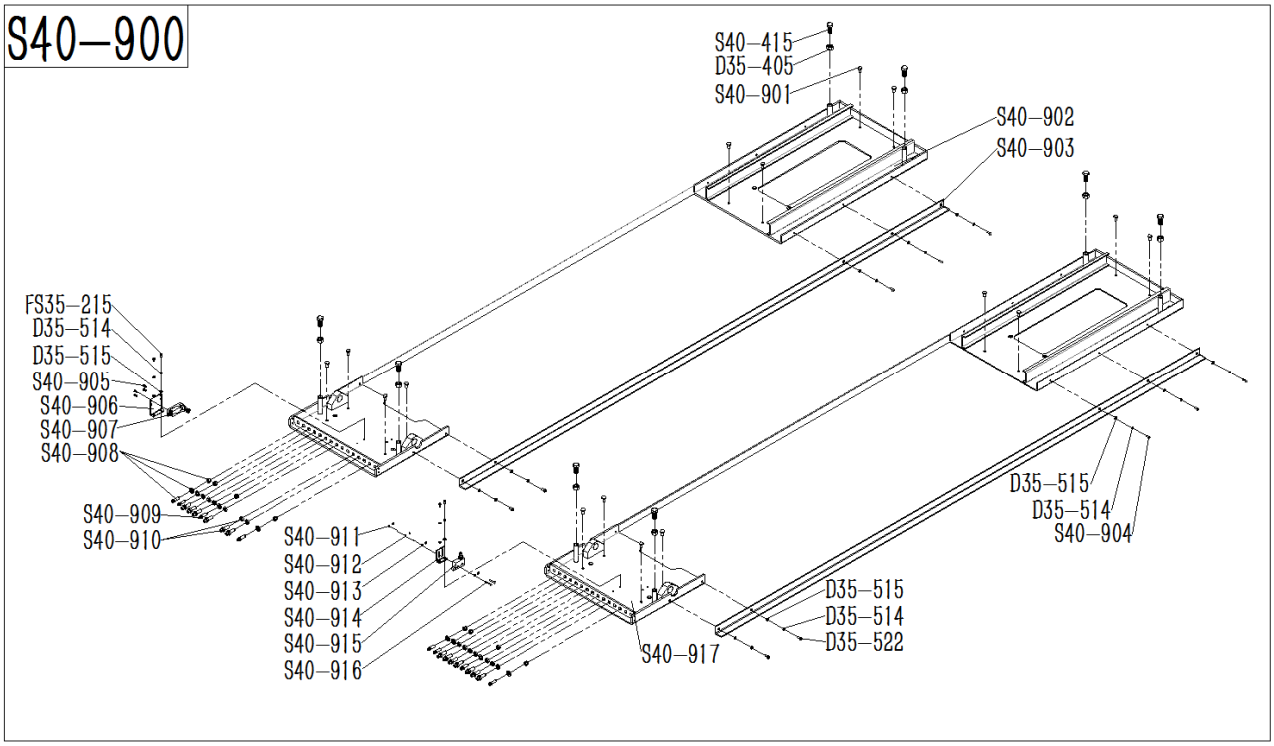



| | |
|---|---|
| S40-700 | complete main oil cylinder assembly (main machine） |
| B30-401 | oil cylinder support block (main machine) |
| D35-202 | dust-proof ring Ø45×53×6.5 |
| D35-203 | wear ring |
| S40-201 | U-ring Ø45×55×6 |
| S40-701 | main oil cylinder cover (main machine) |
| FS50-405 | O-ring Ø75×4 |
| S40-702 | oil cylinder piston rod (main machine) |
| S40-703 | combined seal ringØ75×63×20.5 |
| S40-704 | main oil cylinder piston (main machine) |
| S40-705 | main oil cylinder (main machine) |




| | |
|---|---|
| S40-800 | connecting rod complete |
| S40-801 | upper shaft of sliding block (main machine) |
| S40-802 | sliding block (main machine) |
| D35-109 | shaft snap ring Ø30 |
| S40-803 | out connecting rod (main machine) |
| S40-804 | short starting rod stationary shaft assembly |
| S40-805 | hexagon socket countersunk head screw M6×12 |
| S40-806 | inner connecting rod (main machine) |
| S40-807 | downward shaft of sliding block (main machine) |
| S40-808 | downward stationary shaft of oil cylinder (main machine) |
| D35-110 | hex locking nut M24 |
| D35-111 | flat washer Ø24 |
| S40-809 | centre shaft (main machine) |

| | |
|---|---|
| S40-810 | elliptic rubber sleeve |
| E-714 | grease plug |
| D35-104 | shaft snap ring Ø25 |
| S40-811 | long starting rod stationary shaft |
| S40-507 | cross pan head screw M4×8 |
| S40-508 | cylinder cover |
| D35-515 | flat washer Ø6 (at sub platform) |
| D35-514 | spring washer Ø6 (at sub platform) |
| FS35-215 | hex socket head cap screw M6×12 (at sub platform) |
| S40-812 | second lower-down limit switch block (at sub platform) |
| S40-813 | limit switch block (main machine) |
| S40-814 | stationary shaft (main machine) |




| | |
|---|---|
| S40-900 | base complete |
| S40-415 | hex bolt M16×35 |
| D35-405 | hex nut M16 |
| S40-901 | hex bolt M10×16 |
| S40-902 | big base plate |
| S40-903 | connecting iron assembly |
| D35-515 | flat washer Ø6 |
| D35-514 | spring washer Ø6 |
| S40-904 | hex socket head cap screw M6×16 |
| FS35-215 | hex socket head cap screw M6×12 |

| | |
|---|---|
| S40-905 | hex socket head cap screw M5×12 |
| S40-906 | second lower-down limit switch support |
| S40-907 | second lower-down limit switch LXJM1-8104 |
| S40-908 | Fast screw joint Ø6×4-Ø4×2.5 |
| S40-909 | Fast screw joint Ø8×5 |
| S40-910 | Straight coupling 2-G1/4×19 |
| S40-911 | hex nut M4 |
| S40-912 | spring washer Ø4 |
| S40-913 | flat washer Ø4 |
| S40-914 | limit switch support (main machine) |
| S40-915 | limit switch AZ7311 |
| S40-916 | cross pan head screw M4×30 |
| S40-917 | small base plate |
| D35-522 | hex bolt M8X16 |