Operation Manual

Wheel Loader

CAEL

Preface

Thanks for selecting and purchasing our product. Before using the product, please read the operation manual carefully. The manual will help you to operate the products correctly. It shows the products' performance, technical parameter, the use and the maintenance of the products, and the matters needed attention. Thanks for your trust and support!

Contents

Chapter 1 Use, Performance, and Cautions

ZL912 wheel loader is a kind of wheel loader with single bucket ,articulated and hydraulic unloading. It has been developed and designed in accordance with user requirements, reference models after absorption of domestic and similar structural features and advanced technology. The machine has been widely used in construction and field building.

ZL912 wheel loader has the following characteristics:

1, Single-arm Z-reversal structure, to achieve the max breakout force;

2. Use of articulated frame, small ,mobile and flexible turning radius .

3, The branded engine, front + rear axle drive, and robust power.

4, Improved hydraulic filtration system to ensure reliable circuit operation;

5, Rear diesel engine, hydraulic steering, simple and flexible operation

The machine is reasonable in design, compact in structure, flexible in manipulation, and easy to maintenance.

It is widely used in the construction, municipal engineering, urban and rural gardens, lime, sand, cement factories, mines and other enterprises and institutions and departments, in particular, apply to the narrow space for the loading operation of sand and construction machinery (mixer sand machine, mixer) . The main components of the loader are used brand-name manufacturer's products, interchangeability of good, reliable, well-resourced parts.

Warning!

1. The driver shall be specially trained and read the operation manual before operation.
2. New machine shall be operated without loads before working in fields .
3. Check engine oil level. Fill in diesel oil, engine oil, hydraulic oil and lubricate the joints.
4. To avoid damage coupling & other transmission parts, it is prohibited to start at high speed gear.
5. High speed or neutral gear driving shall be prohibited during going-down of slope.
6. In the cold-weather area, when the machine is not used, cooling water shall be drained out of water tank, so as to avoid freezing and cracking.

The specifications may alter at any time due to continuous improvement of the design and requirements of different users.

Chapter 2 The Technical Performance and Parameters

2.1 Machine Performance and Parameters

Model		ZL912
Overall Performance	Rated Load	**1200 kg**
	Operating Mass	**3700 kg**
	Bucket Capacity	**1 m^3**
	Bucket Width	**1800 mm**
	Dumping Height	**3200 mm**
	Dumping Reach	**900 mm**
	Max. Grade Ability	**30%**
	Max. Breakout Force	**40 KN**
Dimensions	Wheelbase	**2300 mm**
	Tread	**1390 mm**
	Mini Turning Radius	**3500 mm**
	Mini. Ground Clearance	**270 mm**
	Overall Size (LxWxH)	**6150 x1850 x 2800 mm**
Engine Equipped	Brand	**YUNNEI**
	Model	**YN27**
	Rated Power /Speed	**42 kW /2400 r/min**
	Max.Torque	**140 N.m**
	Bore x Stroke	**90mm x105 mm**
	Displacement	**2.7 L**
	Type	**4-Cylinder,In-line,Naturally-aspired,Water-cooled**
Transmission & Drive System	Torque Converter	**YJ265**
	Gearbox Type	**Counter-shaft , Power-shift**
	Gear Shift	**2 F + 2 R**
	Max. Travel Speed	**35 km/h**
	Drive Model	**4 x4**
	Axle	**Isuzu Reduction Axle**
Hydraulic System	Displacement of Work Pump	**50 mL/r**
	Displacement of Walk Pump	**18 mL/r**
	Working Pressure	**16 MPa**
Brake&Tyre	Service Brake	**Oil Brake**
	Parking Brake	**Drum-type Shoe Brake**
	Tyre Size	**20.5/70-16**

2.2 The Hydraulic System

	Model	CBFC50
Gear pump		

	Rated pressure（MPa）	16
	Nominal Displacement	50 ml/r
	Speed	2500 r/min
Multi-way valve	Model	ZL15.2
	Rated pressure (MPa)	16
	Rated flow (L/min)	63
	Max flow (L/min)	80

Chapter 3 The Security and Warning Sign

Despite numerous security precautions, there are still some potential danger. Necessary security warning signs shall be pasted on the machine as follows:

Figure 1 security caution label

Figure 2. reversing warning label

Figure 3 security caution label

Chapter 4 Inspect and Adjust

All components of the loader have been tested and adjusted to the best condition before delivery. It is unnecessary for the operator to make adjustment. Only after a period of working time, some of the components shall be appropriately adjusted by the methods as follows:

4.1 The engine: Please see Diesel Manual

4.2 Clutch:

1. Adjustment of Free Stroke of Clutch Pedal
To ensure the clutch no slipping during power transmission, 25-30 mm free stroke for clutch pedal shall keep between disengaging bearing and disengaging lever. During operations, the gap between disengaging lever and its bearing decreases gradually and even vanish. Therefore, the pedal's free stroke shall be checked and adjusted periodically.
The adjustment of free stroke is achieved by the alteration of the length of clutch pull rod.
Lengthen the pull rod and the free stroke of pedal reduce; Shorten the pull rod and the free stroke increases.

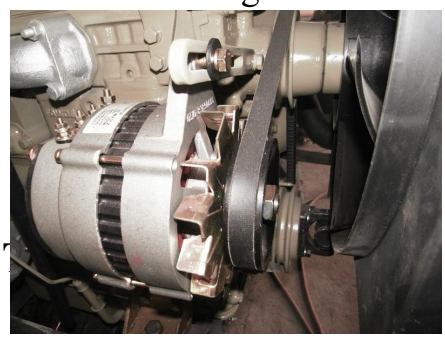
2. Adjustment of the position of Clutch Disengaging Lever
The lower edges of 3 pieces release lever and the disengaging bearing shall be contacted with each other during operation. The gap of them shall not be over 0.15 mm. It can be adjusted by fasten/unfasten the screws.
Disengage swiftly and contact smoothly when operating clutch. Smash is prohibited when joining clutch.

4.3 Triangle Belt Loose and Tight Adjustment

1, Generator Belt's Adjustment (Figure 4)

The generator belt's adjustment is changed generator's position to realize, Loosens lock nut which is on the generator adjusting yoke**,** Changes generator's position on the Scaffold , the loose and tight of the belt is moderate, then tight the lock nut.

Figure 4



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4.4 T

The loader has four universal joints, compatible with those of BJ130 automobile. There is an inject nipple on the cross axle. It should be added with lubricating grease once every 150 working hours

When assembling or disassembling the transmission shaft, the relative position of the two edge of flange cross shall be well noted, and kept in same surface. Any time shall attentions on tightness of the bolts on the two edge contact flange of the transmission shaft.

4.5 Drive Axle

Contact area of drive gear and driven gear shall in accordance with criteria. Therefore, it can be used for long-term and without adjusted. Adjustment is required only when replacement of defective parts or moving wear and tear parts.
Pay attention to the following items when adjusting:
(1) Drive gear's bearing clearance: It is obtained by adjusting the thickness of drive gear inner bearing race's mat. No gap on shaft-direction and free rotation is required after adjustment.
(2) Clearance of tooth side of Drive gear and driven gear: measures the clearance around radius 45mm of drive gear's flange plate, its displacement (arc length) should between 0.2-0.6mm. Inspect contact face with tintage method, trace shall be not less than tooth depth and tooth length by 40%, and is in slight intendancy to small edge. The joggle clearance and contact face are rectified by adjusted by the thickness of the race's mat and the adjustment nut of the two side trigger differential carrier.
(3) After driving for 100 hours every time, check driving axle oil level. The correct oil level is not less than oil filler lower level 10mm, when necessary, it should be added, After driving for 300 hours , the gear oil should be replaced. This loader should apply No. 18th hyperbolic curve gear oil.
(4) After driving for 100 hours every time, please replace shell bearing grease by one time. adjust bearing preload until a suitable degree.

4.6 The Braking System:

The machine uses BJ130 hydraulic brake system with 160mm brake pedal full stroke and 8-10mm free stroke. Check when the brake pedal is too low.
(1) Whether pipeline oil leak.
(2) Whether the gap between the shoe and drum is oversized or not.
(3) Whether there is air in pipeline or not.
After working for 200 hours every time, inspect the brake shoe attrition. When shoe wear down to the oversize of pedal travel, adjust the gap between the shoe and drum, the method is as follows:
(1) Prop up the wheels which need to be adjusted.
(2) Find the eccentric bolt in the back of brake shield plate, rotate the eccentric bolt until the shoe contact the drum, then, relax the eccentric bolt until wheel freely rotate and the shoe and the drum no longer rubbed.
Drain the air out of the brake pipes and cylinders when replace brake fluid and fill in new brake fluid in case no oil in storage pot. Its method is as follows:

(a) Step on the brake pedal continuously several times, loosen the bleeder valve, drain the air out of pipe, tighten up the air valve, and then loosen the brake pedal. Repeat several times until there is no air in the oil tubes.
(b) During air deflation, please supplement brake liquid continuously with the lowering of oil storage tank level. No oil in storage tank is prohibited. Replenish the brake liquid after all air are drained out. The loader shall use No. 912 brake oil.
Brake pedal's free stroke is adjusted by the push rod of master brake cylinder.

4.7 The Hydraulic System (Details see Figure 5)

Hydraulic System is composed by the gear pumps, .multi-way valve, privilege valve, dumping cylinder, steering cylinder, fuel tank and oil pipes.
Pressure oil flows from the gear pump to hydraulic cylinder through the manipulation of relative slide-valve of multi-way valve. When device does not work, the oil flows back to the oil tank through the middle oil pipe of multi-way valve.
Hydraulic system's use and maintenance should pay attention to the following several points:
1st, the oil in fuel tank must pass through strict filters, not only check and clean oil filter frequently, but also maintains the normal level.
2nd, Normally please replace the oil when the working time accumulates about 1200 hours. For interrupted use, replace the oil about a half year or one year every time according to specific conditions.
3rd, when hydraulic system start, please drain away air and prevent the air to enter the hydraulic system again.
4th, do not allow to adjust hydraulic system's working pressure at will.
5th, During the hydraulic system steady work, pay attention to the working condition and sound of hydraulic system various parts, so that prompt trouble clearing.

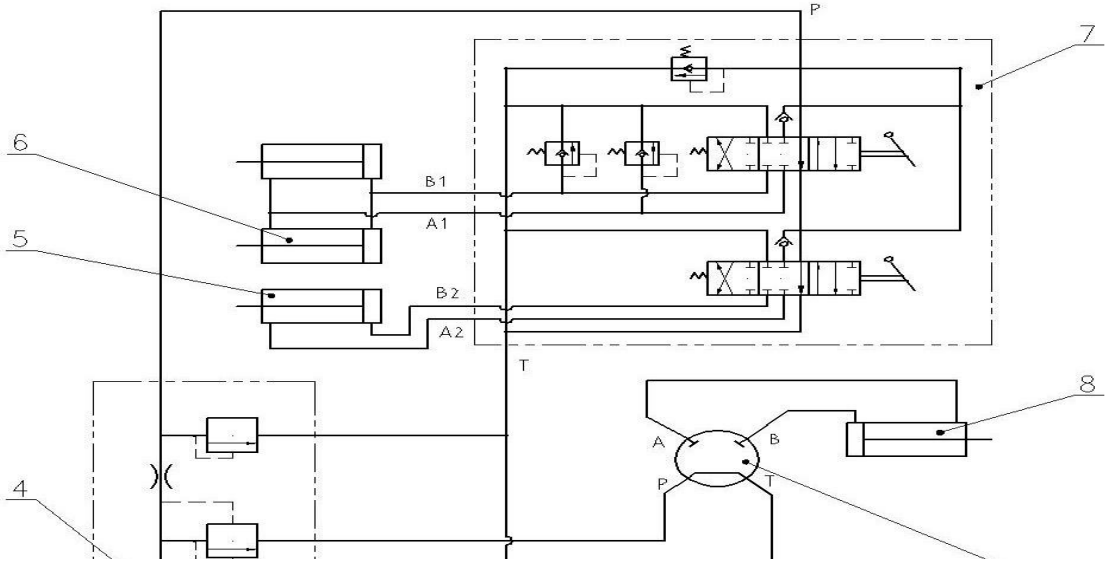


Figure 5

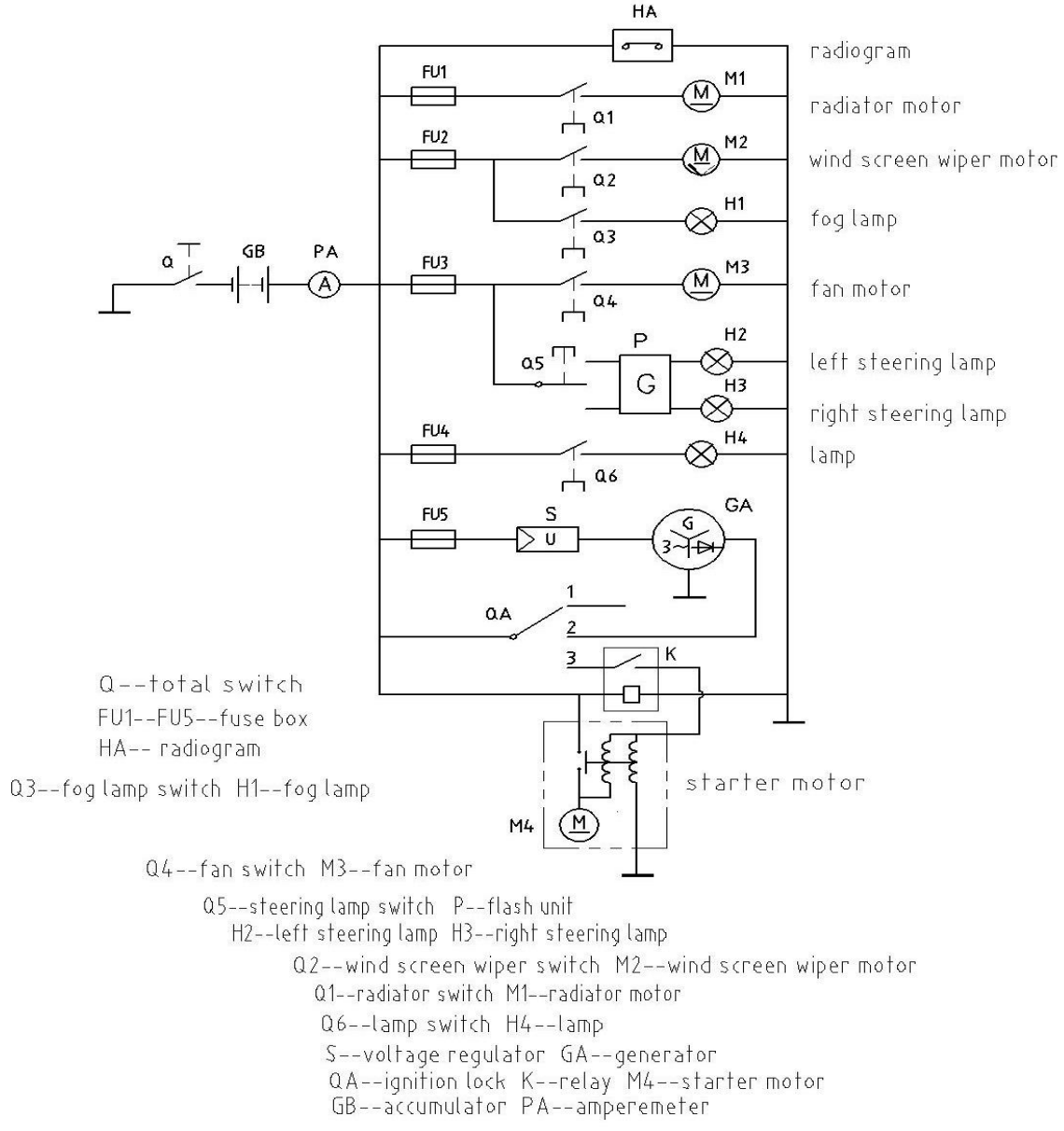
1,hydraulic tank 2. filter net 3.gear pump 4. privilege valve 5.unloading cylinder 6 lifting cylinder 7. Multi-way valve 8. steering cylinder 9. commutator 10. cooler

Chapter 5 Electrical Equipment

ZL-20 type loader's electrical system use voltage of 24 AC volts, negative earth system. Its electrical schematic diagram see **Figure 6.**

5.1 The Battery

Accumulator model is 2pcs 6-QA-80 .Its function is to supply electricity to starting motor when start-up the engine. When the engine is in normal working, if the generator voltage is lower than the battery voltage, it supply electricity to electrical appliances; if generator voltage is higher than the battery voltage, then the generator discharge the circuit to the battery to store electrical energy .



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1. Keep in charging state. Charge once per month at least in case of no use for long time.

2. Check regularly the electrolyte liquid level. The liquid level should be 10-15 mm higher than the pole plate, and supplement distilled water in case of insufficiency. When certain electrolyte leaks or sprinkles, should add the electrolytes with proportion of1.28.
3. Check the battery vent plug regularly. Remove the external soil and dirt, clean the spilled electrolyte, and electrodes should be coated with thin layer of calcium-based grease to prevent corrosion.
4. Battery should be fastened against vibration damaged.

5.2 Alternator and Regulator

1. Alternator:

Alternator has two wire connecting pole marked “+” and " F ". They shall be connected respectively with the same marked connecting pole on rectification regulator.

Alternator both ends fixed with bolts on the alternator bracket; another alternator bolster feet, adjust the belt triangle for the elasticity degree.

2. Relay Regulator

Relay regulator is composed by the circuit-intercepting device, voltage regulator, circuit limiter. Relay Regulator has two wire connecting poles marked "+"," F " and “-“ ground bolt. "+"," F" terminal should be connected with the same superscript marked terminal on the alternator .

Battery "+" terminal connect with Ampere meter "-" terminal. The Ampere meter "+" terminal should connect with electric locking first gear.

In case abnormal work of regulator found or after 1000 working hours, the skilled electrician is needed to make the adjustment.

5.3 The Electric Starter

Its application is to supply power from the battery to start the engine. The rotation of starter’s gears is driven by the electromagnetic drive and with a unidirectional roller clutch, to prevent the starter’s armature to be damaged after starting engine at revolving high speed.
The use time of the starter shall not surpass 15 seconds continuously. Two starting time interval is not less 45 seconds. In case several failure in starting, please check out the reason.

5.4 Others

1. The Ampere Meter
The Ampere meter display for current charge and discharge. when charge current to the battery from the alternator , the bias indicates to "+"; contrariwise the bias indicates to "-". when no current the bias indicates to "0"

2.Electricity Lock

The electricity locks control entire electrical system. After the key insertion locking hole, turn one gear toward right, and all electric appliance's power source connection; Turn two gear toward right,

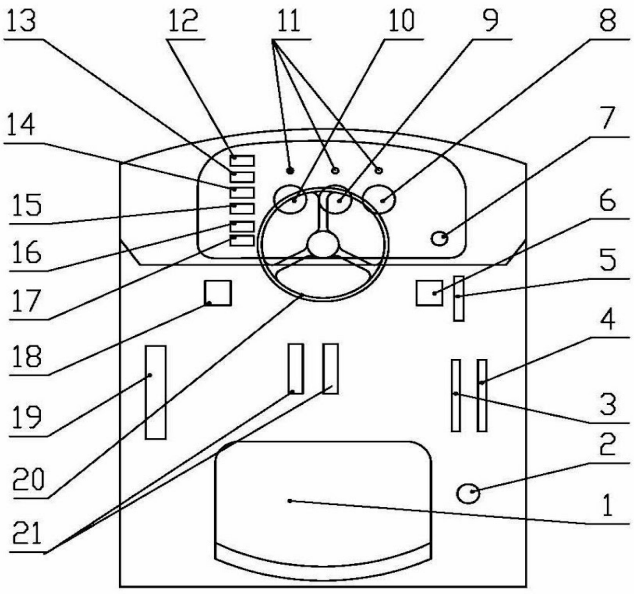
the generator starts. Loosen the electric lock at once and the key return automatic to first gear position, so as to protect starting motor.
3, the vehicles equipped with headlights, front and back turn signal lights, front and back fog lights and driving light， the specification of the lights as follow：

Item	Description	Quantity	Specification
1	headlights	1	12V 55W
2	front and back turn signal lights	4	
3	fog lights	4	12V 10W
4	driving light	2	12V 5/10W

Chapter 6 Driving Operation

Before driving and operating, the driver should be familiar with the structure, technical maintenance, operation methods and so on, in order to ensure safe driving and operation, extend the life of loader and productivity.
During driving and operating, should pay attention to the following safety matters:
1.The driver must learn traffic rules, the mechanical structure, methods of operation, and read the operating instruction carefully.
2. When traveling, no place is permitted for personnel riding except the cabin
3. Alert at any time by the reaction of the appearance about the work of departments.
4. During operation, people is prohibited to moving under bucket.
5. When switch off the engine, stop and park the loader to prevent accidents caused by steering failure.

6.1 Operate Mechanism and Appliance Arrangement Schematic Drawing (Figure 7)



1-seat
2-choke switch
3-moveing arm lift and drop control lever
4-unloading control lever
5-accelerator pedal
6-brake pedal
7-ignition lock
8-engine oil pressure gauge
9-amperameter
10-water thermometer
11-indicator light
12-steering light switch
13-light switch
14-high beam switch
15-fog lamp switch
16-fan switch
17-wiper switch
18-clutch pedal
19-handbrake lever
20-wheel
21-gearbox lever

Figure 7

6.2 A New Loader Commissioning

1.To use the new loader, commissioning must be carried out. Any new loader without commissioning shall not be used on formal working.
2.Commissioning of machines can run the friction parts, to avoid breakdowns and ensure reliable steady work.
3.This provision also applies to overhauled loader.
4.The commissioning of new loader includes 2 steps, namely, empty commissioning and operating test.

6.3 Empty Commissioning (about 8h)

1. Methods

(1) By the method of starting the diesel engine, after the initial start-up with idling low speed working about 5min (not put into gear), then gradually speed up to the highest speed for 10mins.
(2)Control the tipping rod, to make the bucket roll-over and withdraw. The time goes about 10 minutes.
(3) Put the forward gear, then reverse gear, empty run. At first low-speed ,then high-speed, uniform arrangement of each running.

2.Inspection Items

(1) Overall check various bolt, nut tight situation. Especially the cylinder cover bolts. , Exhaust pipes bolts , front and rear drive axle fixed bolts, ring rim nuts, transmission shaft bolts.
(2) Inspect gear box's oil level.
(3) check whether the parts of engine, gearbox and driven axle have abnormal voice.
(4) check whether the hydraulic systems, gearbox, engine lubrication systems, braking systems, engine cooling system leak oil or water .
(5) All instrument readings are normal or not.
(6) Steering flexible or not, braking sensitive and reliable or not.
(7)During working, devices is jammed or not . (8) Inspect electrical work.

6.4 Operating Test (about 20 h)

1. Operate according to the operation method, and gradually increase of the quantity of feeds.
2. During operation test, not only to check the empty commissioning projects, but also observe loading capacity with different materials.
3. During running-in, load capacity shall not surpass 70% of the rated load, the driving speed shall not surpass 70% of the maximum speed.

6.5 Driving Operation

(A) **Caution:**

1. The diesel added must be pure, diesel labeling requirements should be consistent with quality requirements.
2. The hydraulic oil used in the hydraulic system of work devices must be clean.
3. Make regular maintenance and lubrication as per regulation
4. Keep the engine at idle rotation after started. Start running when the water temperature reached 55 ℃
5. When the bucket reaches the required location, the control handle should be put in the middle position
6. It is prohibited to transport material while the bucket reach the highest position. Delivery of materials should be kept the bottom of bucket with ground clearance of 300 mm in order to maintain the stability of traveling.

B） **Drive with Empty Load**

1. Starting

Carry out pre-trip inspection to confirm that all the parts are normal , then start the engine. Before starting , all the joystick should be placed in the neutral position ,then insert the key to the electric switch and rotate one position clockwise, connect power, tread the accelerator, and then start the

engine. In case of low temperature in winter, the cooling water should be released, and add some hot water or boiling water to start. During start-up, should observe the oil press of engine, adaptively control throttle to prevent the bush-burning of engine.
One start-up time costs 5-15S. If it can't be stared over time, it should be stopped until a minute after starting for the second time. If engine can not be started for more than three times , should check the reasons and start again.
2. Start with the drive
After starting, the engine should be warmed up at speed of middle gear and pay close attention to the direction of oil pressure gauge. At the same time, check whether diesel engines and other systems are all normal. All the parts are right, then rise bucket to the transport position. First put lever at forward gear, slowly treads the accelerator pedal, you can travel loader now, and then choose a suitable gear to drive according to the circumstance of roads and your work.
3. Parking and off
Run idle for 2-3 minutes before the stop of engine, so as to make all the parts cool. In winter, after parking, duly screw the release valve of engine, drain out all the water in cooling system to prevent the frost crack of parts . When the water temperature to -20 ℃ -30 ℃, the battery should be removed, and put in the warm room so as to avoid frost crack.
In addition, withdraw the bucket of loader onto ground and shut off the electricity before parking.
(C) Operations to manipulate
Operating control is related to operation proficiency of the driver. Drivers of different proficiency have different operating practices. Grasp voluntarily in the operating practice, improves and sum up operating procedure unceasingly, raises the production efficiency and machine's life.
Before operation ,should clear the ground and fill the pits, eradicate the hard stone to prevent damage of tires .
1.Loading operation
① When go forward to the piled material with Igear, the ground clearance of the hinged point under the moving arm should be about 250 mm, Bucket bottom should be parallel with the ground
② At 1-1.5m away from the piled material , lay down the moving arm to adjust the bucket so that the blade of bucket can touch ground. The bucket bottom and ground angle at 3-7 º then shovel the material piled.
③Steps on the accelerator to cause the bucket be close to the material pile, continuously operate the bucket and move the arm until full load.
④After fully loading, the shovel upturn and the moving arm lift to the suitable altitude, then lets the control handle of moving arm return to the middle position.
⑤Loosens the accelerator, causes the engine to reduce the speed, hangs up reverse gears, slowly increase the accelerator, the loader withdraws from the material pile.
⑥ Drive to the dump place, or transport vehicles. If the ground too soft, without preparation of soil, can not assist with truck or the transport distance is about 500m , and the loader need drive to the dump place, the bucket must lift to the transport position, in order to ensure transportation safety.
2nd, loading operation
Scoop the sandy soil, rock, ore to loads the truck, the freight vehicle, container.
3rd, Preparation of soil operation
Use the angle between the scoop tip and the bottom, may scatters the earth, smoothly, lay ground and so on.
The preparation of soil work ensure the vehicles backlash to carry on by all means must. when carry on do march forward in the preparation of soil work situation, please maintain scoop's front rake for 0-10°.
4th, Bulldozes operations
Earth-moving scraper will be used as a bucket, you can achieve the bulldozing operation. At this point in bucket filled with sand to maintain the level of the ground state of operation.

5th, Hauling operations
inserts the traction rope in the rear part hauling ear , may realize hauling work.

Chapter 7 Technical Maintenance

The operating work environment of dumper are more worse, often operation on bumpy road construction site, the part are vulnerable by strong vibration or impact, will cause machine parts loose or damaged, in order to ensure the dumper is in good performance, the normal operation, extend service life, not only be familiar with the various parts structure of the machine, but also required regular inspect the technical state of machinery and technical maintenance seriously. In addition to this chapter introduces many the technology maintenance of parts except the engine, engine maintenance please refer the engine instruction.

7.1 Oil and lubrication Notes

1. Add fuel, hydraulic oil, lubricating oil and grease, should clean the inject oil tools, container and oil scrub to prevent water, mud, debris into the oil being.
2. Add variety of oils, it is important to make the machine in a horizontal position. Besides attaches the oil level indicating device to be possible to carry on the observation, up to generally overflows by the oil plug. The gear box oil dipstick on the covers of gear box.
3. When add lubricating oil, should put out the dirty oil , inject the clear wash oil to the right oil level, in the empty load situation, make the engine to work several minutes, then stopping work, puts out the wash oil , then inject clean oil, if the oil is too viscosity, may heat up slightly beforehand too greatly or dilutes, then inject.
4. Under the different working conditions, should use the different viscosity, the trademark oil, please strictly carry on according to Table 8-1.

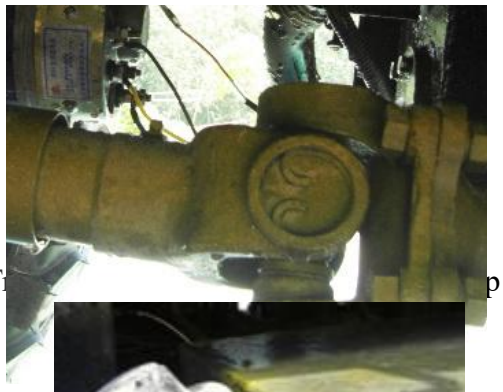
7.2 The type of loader oil (see table 8 - 1 shown)

Item model	
Fuel tank	Summer (10 ℃ above) No. 0 diesel, in winter (10 ℃ below) No. 10 diesel.
Oil Pan	Summer (10℃ above) CC40, winter CC30 diesel engine lubricating oil
transmission gear box, drive axle bridge	18 # hyperbola gear oil
hydraulic oil container	Winter No.46, Summer No.68 anti-wear hydraulic oil (International oil)
Various grease nipple	Combination calcium base lubricating oil
Brake oil	plus "912" synthetic brake fluid

7.3 Lubricates

The correct lubrication can reduce machine's friction and the components attrition greatly, thus lengthens machine's life. when lubricate please note the fore-mentioned oil used instruction, the lubricating oil please select according to the Table 8-1.
Engine's lubrication please base on the engine instruction booklet stipulate to carries on.

Pre-ar area



Tr p area

Hydraulic oil ar

g-up area

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H ts filling-up area

Hydrauli filling-up area

7.4 Routine Maintenance

The routine maintenance carries on each class of work , it is very important to avoid to the minimum accidents in normal work. The routine maintenance's prime task is as follow:
1. Pre and after operation of the machine, outside parts of the machine should keep clean.
2. Check whether the loosening of fasteners or missing, and filled and tightened.
3. Check whether the mechanical parts damage or not.
4. Check whether increase full of lubricating oil for each lubricating part.

5. Inspection of all fuel tanks (fuel tank, working fuel tanks, brake pot), oil level must be up to the mustard .
6. Check the engine cooling water is adequate.
7. Check the electrical system to see if any loose on wire connections and battery power is adequate.
8. Check appearance , light is complete, good.
9. Check whether the manipulation flexible and reliable or not.
10. After starting ,check oil leakage, water leakage, and abnormal noises.
11. Test the reliability of the braking, steering is flexible or not.

7.5 Regular Maintenance

(A)The technical maintenance of each week (about 50h after work)
besides routine maintenance project, but also needs to carry on as follows.
1. Inspect whether the brake pedal's traveling schedule does meet the requirement, if not , should adjust to tally.
2. Fasten the front and rear drive shaft connecting bolts, drive axle connecting bolt, nut tire.
3. Inspect the battery to a single cell level within the height and the proportion of electro-hydraulic (15℃ when proportion is 1.24-1.27), if insufficiency , add the distilled water and charge current.
4. Inject the calcium-based grease to the nozzles
(B) The technical maintenance of each month (after about 200h)
In addition to daily, weekly technical maintenance, but also to add the following items:
1. Survey tire pressure. Tire's standard inflation pressure is 0.3Mpa. if insufficient should fill.
2. Clean the filter of fuel, hydraulic oil. 3. Check the brake system whether there is oil leak or damage.
4. Inspect and fasten wheel bolts, brake disc and the bearing cap bolts.

7.6 Technical Maintenance of Each Quarter (after about 600h).

1. Inspects the multi-way valve, each kind of cylinder's leak situation, if has causes the work equipment drop phenomenon seriously, should be repaired and elimination.
2. Inspect whether there is a damage on the brake total pump leather cup.
3.Adjust the bush bearing gap, and make the outside ending beat brake disc is smaller than 0.20mm
(C) technical maintenance every six months (after about 1200h)
In addition to daily, weekly, monthly, quarterly technical maintenance of the project, but also added the following items:
1. Replace all the fuel and oil circuit system, hydraulic system oil, gearbox, the front and rear bridge and the brake oil, gear oil. And clean pipes, tube, filter, etc., and then pour into the new oil after purification.
2.Take apart and wash brake master cylinder, check the braking effect.

3. Inspect front and back the bridge, the main transmission gear meshing, the victims, the driven bevel gear of the gear gap is too large, should be adjusted to within 0.2-0.34mm.
4.The work installment and rack, whether there is distort, the welded joint break or not..

Chapter 8 General and Reasons for Failure Analysis

ITEM	Fault Phenomenon	Cause Analysis	Trouble solving
First, the engine		See Diesel Manual	
Second, clutch	1．joint slips	1.Footboard free stroke too small	1.Adjust
		2. The pressure spring weak	2.Replace pressure it
		3. There is greasy dirt on the friction piece surface	3.Clean
		4. Friction wear and tear excessive	4.Replace it
	2．when joint trembles	1.The spline wear excessive	1.Replace the clutch shaft or axis
		2. The bolts fastening Loosening	2.Wrap fastens
		3. There is fat on rubbing surface	3.Clean
		4. The separation lever to adjust inequality	4.Adjust
	3. the coupling is not easy to separate	1. Footboard free stroke oversized	1.Adjust
		2.The separation lever to adjust inequality	2.Adjust
Third, transmission gearbox	1.noise of sound	1.The gear attrition exceeds the time limit, tooth's lateral clearance oversized	1.Replace it
		2. Bearing attrition to exceed the time limit	2.Replace it
		3.The bolts fastening Loosening	3.Wrap fasten
		4.The lubricating oil insufficient	4.Added
		5.Gear and the axis spline wears excessive	5.Replace gear or shaft
	2.jump profile frequently.	1. Dials the fork axis retaining spring weak or no effect	1.Replace it
		2．Dial the fork axis located groove exceed wearing	2.Replace it
		3. Internal and external spline wear and tear	3.Replace axis or gear
	3．Shift is not flexible	1. Gear-side touch hair	1.Replace it
4.driving bridge	1．Noise when driving	1. The main reduction gear meshing point bad	1.Adjust or replace it

		2. Bearing wear exceeds or loose	2.Adjust or replace it
		3. Gear attrition to exceed	3.Replace it
	2． Noise when brake	1. Brake boot plate curving	1.Repair or replace
		2. Brake friction burr rivet loose	2.Repair
		3.Brake drum damage	3.Repair or replace
	3. Deviation of vehicle braking	1. There is oil on Brake shoe surface	1.Clean
		2． Gap adjustment improper	2.Adjust
		3. Sub-standard tire pressure	3.Adjust
	4.brake is not flexible	1. Brake drum brake shoe and gap improper adjustment	Adjusts
		2． Greasy dirt	2.Clean
		3． Brake friction burr wear to exceed.	3.Replace
Fifth, steering system	1. the steering wheel idle run light, the quick extension sinks	1.Oil supply inadequate	1.Readjust shunt valve, priority valve
	2. Turned weak	2.Working Oil pressure low	2.Readjust priority valve, overflow valve
	3. the rotation steering wheel cylinder is motionless	3.The air is in the system or the oil mass is insufficient	3.Deaerate or makes up the oil charge
Six, Brake System ,Hydraulic System	1.Lifing arm or dumper force insufficiency	1. Pressure relief valve adjust improper, system pressure low	1.Adjust the presses rating according to the system working pressure
		2. Oil suction pipe and the oil filter pluged	2.Clean or replace
		3. Gear pump, cylinder, pipe internal leakage	3.Replace oil pump, and according to normal subsidence quantity checkout system leak-proof
		4． Multi-way valve wear and tear excessive, stem and valve clearance should exceed the prescribed	4.Replace multitandem valve
	2. the operating system performance fall or unstable	1. Working oil deterioration	1. Replace.
		2. Pipe blockage	2. Cleaning oil duct system and fuel tank
		3. Oil filter jamed or damaged	3. Clean or replace
		4.there is air in the system	4.Inspect the oil system to leak air

	3. after lifting the arm, sinks voluntarily	1. Moves arm cylinder internal leakage	1.Takes apart to repair the cylinder, replace seal packing collar
		2. Multitandem valve lever gap oversized	2.Take apart to repair or to replace
	the oil temperature is excessively high	1.Load operating time excessively long	1. Stop or reduce the load.
		2. Oil mass insufficient	2.Refuel to stipulation oil level
	5. after the steering wheel returns to the position, continues to change	1. In the diverter returns to the position reed to damage	1.Take apart to repair or replace
		2． Match between the oil jacket and the oil or fuel distribution axis the deactivation or matches between the oil jacket and the valve chest deactivation	2.Disassemble the diverter to repair
	6． the foot braking force is insufficient	1. Brake to divide pump oil leak	1. Replace
		2.there is air in Brake hydraulic circuit	2. Deaerate
		3.Brake the total pump leather cup to damage	3.Replace
		4.Brake total oil pumping fluid insufficient	4． Refuel
		5． Push stroke adjustment Improper	5.Adjust traveling schedule
		6. Brake friction piece wears limit	6.Replace
Seven electrical systems	1. the engine is normal, but the accumulator cell does not charge or the charging rate is low	1. Battery plate vulcanize	1.Desulphurization processing, or replace pole plate
		2. Generator belt too loose or damaged	2. Adjusts or replaces
		3.Wiring is not strong, bad	3. Inspect and Elimination
		4. Regulator improperly adjusted or damaged	4.Adjusts or repairs
	2. the capacity of storage battery is insufficient	1. The Electrolyte proportion or liquid level excessively low	1.To re-adjust the proportion or adding electrolyte
		2. Pole plate short-circuit	2.Elimination of sediment, replacing electrolyte
		3. Pole plate vulcanize	3.Desulfurization process or replace the plate
		4. Wire connection is bad	4. Inspect and Elimination

		5. Pole plate active material Shedding	5.Replacement pole plate
	3. the generator does not generate electricity	1. Remanence disappears	1, according to the original polarity generators, batteries
		2. The magnetic field coil circuit fault	2, connected to both ends of the magnetic field coil,
		3. Commutator bad contact	3, Use No. 0 or No. 00 sandpaper or polishing
		4. Not flexible brush jammed	4. amend the brush size, adjust the spring pressure
		5. Armature turn-to-turn short circuit	5. Inspects and repairs

Chapter 9 Replacement Parts List

Loader replacement parts list as follow：

No.	Item	Installs Position	Fitting specification
	Oil seal	Driving axle driving bevel gear Flange connection	47x84x9.5
		Driving axle ring shell	SD115x140x14
	Single-row radial Thrust ball bearing	Clutch release bearing barrel	688991
	Triangle belt	Clutch	B1372
		Hydraulic pump	B1000
	Diesel filter net		
	Hydraulic filter net		

Chapter 10 Notes

1.Users notice

1st, user notice

1, the user when buys machine, must receive the instruction booklet, the certificate, three packages of certificates.

2, the operator before operating this aircraft, must read the instruction for use in detail, should carry on the operation, the debugging and the maintenance according to the instruction booklet in request.

3rd, This hydraulic system of the loader does not permit to adjust the pressure at will.

2nd, Safe Driving Matters Needing Attention

1st The driver must pass the specialized training, otherwise are not allowed to operate

2nd Prohibits driving after drinking alcohol strictly, when operation the attention must concentrate, does not permit to eating , smoking, chatting when driving.

Second, safe driving Attention

3rd, before driving, connected electricity and inspects each kind of signal, the flare, the measuring appliance and the instrument light complete good and working steady; Then inspection oil, the water, the electricity circuit route, the drivers, steering drive axle, the load bearing system components completely complete, only then starting engine.

4th. When operating, don't put your foot on the pedal switch board constantly, so as not to accidentally step on the switch, causing accident.

5th, when loading, the bucket, under the arm to refuse to staying, the stowage not to permit the imbalance, the overload, forbids the bucket to overhigh the delivers position to move with high speed, refuses the extreme turning, in the travel to refuse the personnel to jumps down, when curve must decelerate.

6th , unloading material, does not permit the material center of gravity imbalance, also beside does not allow the bulk material to stretch out the vehicle to help.

7th, In winter starting engine refuses to baking the engine. by fire. After starting, the engine must the idle operation for 5~10 minutes, when the water temperature, the oil temperature rise the rating, only then to working

Chapter 11 Some of Classic Operation for Loader

First: The loader operator was tight heel arrived in the cab floor when the loader are working, feet and the accelerator pedal to maintain the parallel, playful underground fuel pedal pressure.

Second: loader in operation, keep the throttle stabilize all the time. As the general operation of state, the throttle opening around 70% is appropriate.

Third: When the loader are working, the driver's foot should separate with the brake pedal, and keep the foot on the cab floor, prohibit step on the brake pedal all the time. The loader frequently works in uneven work site, if the foot always steps on the brake pedal, the loader body always up and down moves will cause driver happen to step on the brake pedal. In normal circumstances, must

use control the situation by which the accelerator decelerates and to shift gears. In this way, to avoid frequent braking system caused by overheating, but also for the speed loader quick.

Four: When car loader work, specially when the shovel digs the work, should in the accelerator stable situation, move with the circulation lifts fights control handle's method with the extension to cause the scoop shovel full material. Lifted fights with the extension operates bar's circulation to move is said “industrious”. This process is important, This process was very important for the oil consumption.

Five: Uses when the car loader must make scoop's raising to be very good with the turn over coordination. The normal process of the loader bucket digs :
1, the bucket keep flat in the ground, drives to the material to pile steadily. When the bucket parallel shovels the material piles and encounter fierce resistance (hits an obstruction) , it should be follow the principle as: first raises the arm, then turn the bucket . This may avoid that the bucket base hit the obstruction effectively, and show the max breakout force of the loader.
Six :
1, Prohibit to make the loader's tire to slip. In the loader operation, if hits the encounter fierce resistance, and step the acceleration pedal continuously, it will be occur the tires skidding phenomenon. This phenomenon is usually caused by incorrect operation due to the driver, so that it will be caused more fuel consumption and further damage the tire.
2, Prohibit to make the loader's rear tyre tilt, due to the rise of the loader force, when the driver operates the loader, such as bucket the raw soil and stone material mountain, if the operation is not correct ,it is easily to present two trailing wheels to turn upwards the lift-off the phenomenon. This tilt movements landing inertia will cause bucket blade plate fracture, bucket deformation;
When the rear tyre turns upwards very high, it is easy to cause the front and rear frame isostructuralism welding place dehiscence, even plate break and so on.
3. Prohibit to make the loader's. The bucket digs the ordinary material, the loader may work with II gear, Prohibit to impact to the material with II gear orientation to bucket the materials. The correct method , turn to I gear when the bucket approach the material, and go on finishing completes process