

This handbook is for reference only. In the course of maintenance, the actual situation of the generator set is accurate.

Maintenance Manual Of Diesel Engine Generator Set

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Common fault and treatment of diesel engine generator set

A. The principle and method of judging failure

The reason of diesel engine fault is often caused by many factors, different faults show different phenomena to troubleshooting, reason must first identify the fault, see through, in practice, listen, touch, smell and feeling, to find abnormal diesel engine performance, so as to find problems, solve problems, eliminate fault. Determine the general principle of diesel engine fault is: according to the structure, principle of contact, understand the phenomenon, combined with the actual, from simple to complex, from the outside to the inside, according to the department section, find the reasons.

1. Abnormal phenomenon of diesel engine operation

(1) Abnormal sound in operation: percussion, gun sound, boowering, exhaust sound, periodic friction, etc.

(2) Abnormal operation: diesel engine is not easy to start, severe vibration, unmoved load, unstable speed, etc.

(3) Abnormal appearance: diesel engine exhaust pipe white smoke, smoke, smoke, the system leaks, Water Leakage leakage, etc.

(4) Abnormal temperature: overheating of oil temperature or cooling water, overheating of bearings, etc.

(5) Smell: abnormal diesel engine operation, smell, smell, smoke and odor.

When the diesel engine is running, when the above abnormal phenomenon is found, it must be carefully checked. According to the failure phenomenon, the location and reason of the fault must be found out. Sometimes a fault may have several unusual phenomena. For example, after the wear of high pressure oil pump, it is possible to show difficulty in starting, and it may also exhibit low output power and low speed operation instability. Sometimes a kind of abnormal phenomenon may be caused by several kinds of faults. Therefore, when the diesel engine runs abnormal, we must carefully identify the causes of the abnormal phenomena, which requires us to be good at analyzing, reasoning and judging, grasping the essence through the phenomenon, finding out the cause and location of the failure, and eliminating the trouble.

2. Analysis and inspection method of diesel engine fault

(1) To identify the fault according to the abnormal sound position, with a screwdriver or through a half meter long end sharpened fine iron, to listen to the needle judgment, end post ear, the other end touches the surface of each inspection part, can clearly monitor the site of the abnormal noise and size the sounds of nature. The sound of different parts is often different. For example, the main bearing gap is too large impact sound is dull, the valve and the piston rattle is crisp, if the flywheel keyway with the loose a "crash oink oink" and so on, therefore, according to the different sound, to determine the fault location.

(2) If the partial stop is used to judge the fault analysis, if the fault is suspected to be caused by a cylinder, it can stop the cylinder work and observe whether the failure phenomenon is gone, so as to determine the cause and location of the failure.

(3) The comparison method to determine the fault analysis, the suspected failure may be due to a component caused by the replacement of a new component, then began to run the diesel engine before and after work is changing, so as to find out the fault reason.

(4) It is difficult to judge by analyzing the cause of the failure based on the test method. It is difficult to judge the cause of the failure. It can be used to change the technical state in the local area to observe whether the diesel engine's performance is affected or not, so as to identify the cause of the failure.

Diesel engine is used for a long time, the fault phenomenon many, due to various types of diesel engines, domestic and imported its structure and the environment is different, the fault reasons are different, therefore, in dealing with the problem, the specific problems should make concrete analysis according to different

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situations. Reason analysis and judgement of diesel engine fault, is a meticulous work, should not be in order to clarify the fault reasons before the demolition of a mess, so not only can not eliminate the fault, and may open in the heavy components, the fault cannot reach the requirement of technology caused by heart.

A. Common fault and elimination method of diesel generator set

(一) Diesel engine cannot start

At normal temperature, the diesel engine should normally start in a few seconds, and sometimes it needs to be repeated 1~2 times to start it normally. If after 3~4 repeated start, diesel engine can not start, should be regarded as the starting obstacle, need to find out the cause, with the failure to remove, then start.

1. Failure of the startup system: this failure is shown to be incapable of driving rotation or starting low speed low, cause of failure, troubleshooting, and see the following table:

Start system failure list

Failure phenomenon	Cause of failure	Elimination method
Diesel engine cannot start	Motor start 1. Battery power shortage 2. Starting system circuit wiring error or electrical parts contact bad. 3. The starting motor carbon brush and commutator contact.	1. Replace the power sufficient battery or add the battery in parallel 2. Check the wiring of the starting circuit correctly or firmly 3. Repair or replace the brush, clean the commutator surface by abrasive paper and blowing dust
	Compressed air start 1. The pressure of compressed air in the gas tank is too low 2. Incorrect installation position of air distributor	Re inflate Check and adjust

2. Failure of the fuel supply system

The diesel engine can not start. After checking the starting system, the system circuit or parts are all good. The fuel supply system should be checked. If he fails, it means that the fuel system does not supply oil or fuel supply is abnormal. If the diesel engine does not fire or fire, it will not be transferred to normal operation.

Failure list of fuel supply system:

Failure phenomenon	Cause of failure	Elimination method
	(1) There is air in the fuel system	Check whether the fuel line joint is relaxed 1. Unscrew the deflated plug injection pump and fuel filter, with a hand pump the fuel pressure to the overflow plug without bubbles, and then tighten the screw, and tighten the knob. 2. Unscrew the nut at one end of the nozzle of the high-pressure oil pipe, and pry the fuel injection pump spring. When the fuel flowing out of the gateway is empty, screw the nut tightly, and then pry the fuel pump spring several times, so that all fuel injectors

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Diesel engine cannot start		are filled with fuel.
	(1) Blockage of fuel pipe or filter	(2) Check the parts of the pipeline to find out the fault location to make it unblocked. If the fuel filter is blocked, the filter core should be cleaned or replaced.
	(2) Oil supply pump does not supply oil or intermittent supply	(3) Check whether the inlet pipe is leaking, if the inlet of the oil pipe is excluded. The oil pump should not be supplied and the oil pump should be overhauled
	(3) Large fuel injection pressure	(4) Adjusting the injection pressure of the injector
	(4) Little or no oil spray	(5) The injector is disassembled, still attached to the high-pressure oil pipe, and prying the injection pump spring to observe the good atomization of the nozzle.
Failure of fuel injection pump 1) Injection pump spring break 2) The rack card of the injection pump is dead in the parking position 3) The oil pump is stuck or spring end 4) Fuel injection pump blocked 5) Injection of injector needle valve		1) Change the spring 2) Disassemble the repair 3) Disassemble the cleaning or replacement of the oil valve 4) Disassemble the cleanup 5) Remove cleaning and grinding nozzles or replacement of new parts.

(二) Low compression pressure of diesel engine

When the crankshaft is rotated by manpower, it feels that the compression stroke is not very resistance, the cause of its failure and the method of removing it, see the table below.

Short list of compressed pressure

Failure phenomenon	Cause of failure	Elimination method
Diesel engine cannot start	Valve leakage 1) The gap between the valves is too small and the closure is not strict 2) The valve is bitten by the valve. 3) The valve cones and seats are badly worn, causing tight seal	1) Check and adjust the valve clearance to meet the technical requirements specified in the specification 2) Open the cylinder head, remove the valve charcoal, clean the valve, and lubricate the valve rod. 3) Grinding the valve
	The piston ring is badly worn, and the air leakage between the piston ring and the cylinder liner 1) The gap between piston and cylinder sleeve is too large 2) Piston ring or ring cut overlap	Disassemble the piston and replace the piston ring 1) Replacement of piston or cylinder as worn by wear 2) Clean the piston ring and stagger the incisions of the rings

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(三) Abnormal oil pressure

After the use of diesel engine oil pressure is insufficient or excessive rotary screw to adjust the pressure back to normal, but can not be adjusted, reference can be shown in the following table processing method

A list of abnormal oil pressure

Failure phenomenon	Cause of failure	Elimination method
Diesel engine cannot start	(1) Oil pipeline leak or block break	(1) Repair the leakage part of the pipeline to make the oil road open and replace the tubing joint when necessary
	(2) Gradually reduce the pressure after the operation of the machine	(2) Check whether the front of the gear pump is blocked Check whether the front of the gear pump is blocked
	(3) Low oil level in oil sump	(3) A specified oil plane for oil sump injection
	(4) Gear wear or assembly of oil pump	(4) Test the performance of the oil pump and replace the gear or the new pump
	(5) Blockage of oil cooler or oil filter	(5) Cleaning, filter core
	(6) The oil pressure regulator is paralyzed and the pressure regulating valve is unflat	(6) Change the spring and trim the pressure valve plane
	(7) The oil seal at the front of the crankshaft, the end of the crankshaft, the connecting oil pipe between the rocker shaft, the cam bearing, and the connecting rod bearing.	(7) Overhaul all parts of the oil spill, if the wear of each bearing exceeds the allowable value, it must be replaced.
	(8) Maladjustment of the oil pressure regulator, resulting in insufficient pressure or excessive pressure	(8) Adjust oil pressure
	(9) Oil pressure gauge damage or pressure gauge connection related blocking	(9) Replace the new table and remove the plugging of the connecting tubing

(四) Insufficient power of diesel engine

The output power of the diesel engine is usually said not required to load no power with diesel engine, for the basic working principle of diesel engine fault should be analyzed, check the air intake, fuel injection quantity is sufficient, the combustion process is normal, the compression pressure is large enough to analyze and judge, step by step, find out the cause of the malfunction, and to be eliminated as shown in the table below:

A diesel engine cannot send a specified list of power

Failure phenomenon	Cause of failure	Elimination method
Exhaust black smoke	(1) Air distribution mechanism and inlet and exhaust system failure. Incorrectly, the gap between the exhaust valve and the rocker arm is not correct	1. Specified clearance for inspection and adjustment 2. Check and adjust the timing of gas distribution

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Power shortage		<ol style="list-style-type: none"> 1. Incorrect timing of gas distribution 2. Valve spring damage 3. Leakage of gas valve with carbon seal face 4. Air filter plugging 5. The exhaust pipe and the silencer have a serious coke, and the exhaust is not smooth. 	<ol style="list-style-type: none"> 3. Replacement valve spring 4. Clean up the charcoal and grind the valve 5. Cleaning uplift filter 6. Scavenging carbon
	Compression weakness	<p>(2) Lack of compression</p> <ol style="list-style-type: none"> 1. The cylinder head is leaking with the body close to the body, and its performance is that there is a stream of air flowing out of the gasket. <ol style="list-style-type: none"> 1) Big nut loosening of cylinder head 2) Cylinder head gasket damage 2. The piston ring is stuck and the valve bar bites inflexibly 3. Air leakage of cylinder head injector <ol style="list-style-type: none"> 1) Damage of cap copper washer in injector 2) The hole plane of the injector has not been cleaned up 3) Leakage of injection nozzle and injector 	<ol style="list-style-type: none"> 1) Tighten the big nut according to the specified torque 2) Check cylinder head and body joint surface, replace cylinder pad 3. Cleaning and maintenance <ol style="list-style-type: none"> 1) Replacement washer 2) Cleaning hole 3) Tighten the cap or grind plane of the injector
	High water temperature	Diesel engine overheating (cooling or lubrication system failure)	<ol style="list-style-type: none"> 1) Check the normal operation of the cooling water circulation system 2) Check the sensitivity of the tank thermostat 3) Check the lubrication system and remove the scale in the water jacket, clean the oil cooler to reduce the coolers
	Oil supply is not normal	<p>Fuel system failure</p> <ol style="list-style-type: none"> 1. Fuel system into the air 2. Failure of fuel injection pump 3. Fault of the injector 	<ol style="list-style-type: none"> 1. Release the air from the fuel system as described above 2. Repair or replace a pair of parts 3. Repair or replace the injection nozzle couple

(五) An abnormal sound of a diesel engine

If the diesel engine is running abnormal noise, we should first know the location of the abnormal sound, the phenomenon of noise, the time and the changing rule. The footman sound should also be real-time observation of smoke, smoke volume changes, and with the needle listen to judgment, find out the root of the fault, the following table lists some abnormal phenomena, causes and elimination methods.

Abnormal sound list of diesel engine running

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Failure phenomenon	Cause of failure	Elimination method
A rhythmic, crisp metal knocking in the cylinder	Long injection time	Re adjustment of injection time
A low, indistinct knock in the cylinder	Late injection time	Re adjustment of injection time
The diesel engine has a slight and sharp noise during the operation of the engine, and this sound is especially clear at idle speed.	The piston pin and the connecting rod hole is too loose	Replace the connecting rod bearing to make the clearance range
The diesel engine sounding after the start of the engine, this sound gradually lightens with the heat of the diesel engine.	The gap between the piston and the cylinder sleeve is too large	Replace the piston ring
When the diesel engine is running at idle speed, the crash sound of the crankshaft is heard.	The wear of the thrust bearing of the crankshaft causes the gap to be too large, leading to the movement of the crankshaft.	Check the thrust bearing and adjust it to the specified gap with the gasket. If the wear is serious, a new piece is replaced.
But when the diesel engine is running in 1500r/min, the crash sound of the machine is heard in the crankcase. At this time, the speed of the engine is suddenly reduced and a heavy and powerful impact can be heard.	The crankshaft connecting rod is too loose	Check the connecting rod bearing and replace if necessary
The diesel engine is issued during the operation. (1) Especially sharp and piercing sound, when the accelerator is increased, the noise is clearer.	(1) Crankshaft roller bearing is tighten	(1) Check the roller bearing with a sound and replace it
(2) A "rattling" sound	(1) Crankshaft roller bearing loosening	Replace a new piece
(3) A diesel engine bearing a sliding bearing bearing a heavy impact	(3) The gap between the spindle is too large and the sound of the connecting rod bearing is similar to that of the impact sound.	(3) Check and replace the main shaft tile
A rhythmic and slight percussion sound from the cylinder head of a diesel engine	Valve spring break, valve tappet bending, push rod sleeve wear	Replace the fittings and adjust the gap between the valve
An abnormal sound is set out on the front cover. When the engine suddenly reduces the speed, the sound can be heard.	(1) Gear wear too much (2) Overlarge gap	Adjust the gap and change the gear when necessary
During the operation of a diesel engine, a heavy and uniform	Piston bumper valve) Remove the cylinder head cover,

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rhythmic knocking is heard at the cylinder head, and the stud of the cylinder cover housing is pinched by fingers, which is a piston with a piston touching the valve.		check against reason, adjust the valve clearance, when necessary to increase gas cap gasket (as the need to increase 0.20 ~ 0.40mm copper gasket, cylinder pad with old substitute)
Hear dry friction sound at the head of the cylinder	There is no oil in the sphere at the sphere of the rocker arm adjustment screw and the push rod	Pour oil at the surface of a sphere

Diesel engine exhaust smoke color is not normal

The diesel engine with the load operation, the exhaust smoke color is generally light gray, slightly heavier load, it may be dark gray (allowing operation in a short period of time). Exhaust smoke here is not normal, black smoke exhaust, smoke or white smoke. The exhaust smoked black, indicating that the combustion was incomplete. Blue smoke exhaust said the oil into the combustion chamber in combustion. The white smoke indicates that the diesel droplets are not burning in the combustor. See the following table and eliminate fault cause abnormal exhaust smoke

The exhaust smoke color is not normal list

Failure phenomenon	Cause of failure	Elimination method
Exhaust black smoke	<ul style="list-style-type: none"> (1) Diesel engine driven load over design regulations (2) Insufficient oil supply for each cylinder injection pump (3) The valve gap is not normal and the valve seal line is in bad contact (4) The fuel is too late to burn part of the fuel in the exhaust pipe of the diesel engine 	<ul style="list-style-type: none"> (1) Adjust the load to make it within the scope of the design (2) Adjust the oil supply in each cylinder to make it even (3) Check valve clearance, valve, valve spring and seal, and eliminate defects (4) Adjust the injection advance angle (adjusted according to the machine model) (5) Bad spray atomization
Exhaust white smoke	When the nozzle is injecting, there is a drop of oil. Poor atomization, low injection pressure	Check the injection nozzle couple, if the seal is bad, replace the new nozzle, check the injection pressure and adjust to the required requirements.
Blue smoke exhaust	<ul style="list-style-type: none"> (1) The air filter is blocked, the intake is not smooth, or the oil is too much in the filter. (2) Stuck piston rings, too much wear, lack of flexibility, so that the oil into the combustion chamber 	<ul style="list-style-type: none"> (1) Check air filter for fault reasons for cleaning or reducing oil to the specified level (2) Clean the piston ring and replace the new piston ring if necessary

The oil temperature is too high, the consumption is too large, the dilution is diluted.

When the diesel engine is running, this kind of fault occurs because of the wear of the running parts and the increase of clearance. The cause and elimination method of the fault are listed in the table below.

Excessive excessive consumption of oil temperature and dilution list

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Failure phenomenon	Cause of failure	Elimination method
Too much oil is not too much oil	<ul style="list-style-type: none"> (1) Insufficient oil or too much oil (2) Heavy load of diesel engine (at the same time exclude black smoke) (3) Oil cooler blockage 	<ul style="list-style-type: none"> (1) Check and reduce oil in accordance with the regulations (2) Reduce load (3) Cleaning the inner of the oil cooler
Too much oil consumption	<ul style="list-style-type: none"> (1) Pipeline joint and other parts of oil leakage (2) The piston ring is stuck or worn too much. Cylinder wear too much, or the oil ring oil holes are coke blocking, make the oil into the combustion chamber through the piston channeling (characterized by blue smoke exhaust, smoke oil filling port) (3) Use improper oil 	<ul style="list-style-type: none"> (1) Tighten the joints, check leakage and eliminate (2) Replace the piston ring or oil ring and replace the cylinder sleeve if necessary (3) Replace the appropriate oil
Oil dilution	<ul style="list-style-type: none"> (1) The piston ring is stuck or worn out (2) The use of improper oil (3) Diesel oil into the oil <ul style="list-style-type: none"> 1. Excessive fuel injection 2. The oil nozzle drops oil, the fuel injection pressure is too low, so that the fuel can not burn well. 	<ul style="list-style-type: none"> (1) Replace the piston ring (2) Replace the appropriate oil (3) Check cooling system <ul style="list-style-type: none"> 1. Adjust the injector <p>Repair or replace a new nozzle</p>

Oil flat oil plane rise

In the normal operation of diesel engine, oil bottom shell is added when the plane increased, mainly because of the cooling water into the oil, the oil is floating yellow foam, can remove the oil from the oil pan on the glass, standing 1 hours, on the bottom of the cup of water without precipitation identification. The causes and methods of troubleshooting are shown in the table below.

A list of oil floor engine oil plane elevations

Failure phenomenon	Cause of failure	Elimination method
Oil plane rise	1. The cylinder liner under the sealing ring is damaged	(1) Replace sealing ring
	There is a crack in the cylinder head (at this time the water in the exhaust increases and condenses up)	Replacement of cylinder head
	Cylinder pad damage	Cylinder gasket
	Water cooling type oil cooler core is damaged, the cooling water into the oil (removal of cooling water to see whether there is oil)	Repair or replace the core of a cooler
	Leakage of water between cylinder liner and body	Check the damage of the gasket between the cylinder sleeve and the body, and replace the new part when necessary

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	The cylinder liner has been corroded and there is a small hole in the leakage of water	Replacement of cylinder sleeve
	The water leaking into the pump sump 1. Water leakage of water pump shaft and water seal 2. Water pump seal water rubber ring damage	1. Repair and replace the sealing cover of water seal 2. Replace the sealed water rubber ring

(六) Diesel engine overheating

The overheating of diesel engine is mainly due to the high temperature of the outlet water of the cooling water, which leads to the increase of the temperature of the heated parts, the reduction of the gap and the decrease of the material strength, which is easy to cause the seizure or fracture accident of the parts. The reasons for this type of failure and the method of exclusion are listed in the table below

Overheating list of diesel engines

Failure phenomenon	Cause of failure	Elimination method
Diesel engine overheating	(1) Cooling system failure 1. Air plug is formed in water pump or water pipe 2. Water shortage in the radiator 3. Heat sink radiator and copper tube surface area of too much scale 4. The fan belt is relaxed and the speed reducing component is reduced 5. Serious scale or water channel blockage in the cooling system 6. Damage of pump impeller 7. Thermostat failure	1. Remove the air in the water pump or water pipe, and check whether the joints of each tube are tightened and not leaking. 2. Check the water level and add foot water 3. Scavenging, cleaning the surface 4. Adjust the belt to stand or replace 5. Clean the water and dredge the water 6. Change the impeller of the pump 7. Check the thermostat for repair or replacement
	Long time overload operation of diesel engine	Reduce load
Oil dilution	Oil supply advance angle is too small	Check and adjust

(七) General malfunction of fuel injection pump in diesel engine

The diesel engine in starting or running, injection pump injection, injection volume, injection quantity is excessive or uneven caused by fault injection, the diesel engine can not start or start after the exercise is not normal, this is often the failure of the diesel engine, its causes and elimination methods, as shown in the table

General breakdown list of fuel injection pump

Failure phenomenon	Cause of failure	Elimination method
Non fuel injection pump	(1) No oil in the tank (2) Fuel oil pump failure (3) Fuel filter or tubing block (4) Entering the air in the fuel system (5) Plunger wear of fuel injection	(1) Add fuel to the tank (2) Overhaul fuel pump (3) Clean (4) Exclude the air in the system (5) Replacement plunger couple (6) Remove cleaning and grinding or

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	<p>pump</p> <p>(6) The oil outlet valve can not be closed or damaged</p>	<p>replacing oil seal washer</p>
Inhomogeneous injection	<p>(1) The fuel system enters the air</p> <p>(2) Spring break of oil outlet valve</p> <p>(3) Surface and outer wear of oil outlet valve</p> <p>(4) Fracture of core spring of oil pump</p> <p>(5) Impurities make the oil pump core block</p> <p>(6) Oil pressure is too low</p> <p>(7) Improper adjustment of gear</p>	<p>(1) Exclude air</p> <p>(2) Fuel oil pump for maintenance</p> <p>(3) Grinding or dressing</p> <p>(4) Change the spring</p> <p>(5) Cleaning oil pump</p> <p>(6) Check oil pump and filter, and clean</p> <p>(7) Adjust the gear to the factory regulation mark</p>
Excessive oil output	<p>(1) Unbalance of each cylinder in the injection pump</p> <p>(2) Assembly error</p>	<p>(1) Readjustment</p> <p>(2) Reassembly and adjustment</p>

(八) General malfunction of the injector

During the operation of a diesel engine, a cylinder injector does not spray oil, spray atomization is bad or serious oil leakage or fuel injection pressure is too high or too low. The reasons and elimination methods are listed in the table.

General breakdown list of the injector

Failure phenomenon	Cause of failure	Elimination method
Little or no oil is sprayed out	<p>(1) There is air flowing into the oil road</p> <p>(2) Oil needle or oil needle</p> <p>(3) Oil or oil with loose needle needle</p> <p>(4) Oil leakage is serious</p> <p>(5) Fuel injection pump is abnormal</p> <p>(6) The needle body and the needle over oil</p>	<p>(1) Exclude air</p> <p>(2) Check, repair, or replace</p> <p>(3) Replacement of injection nozzle couple</p> <p>(4) Check the joint of the oil road and fasten it and replace it if necessary.</p> <p>(5) Overhaul and adjust</p> <p>(6) Cleaning and overhauling</p>
Low fuel injection pressure	<p>(1) Pressure adjusting screw loosening</p> <p>(2) Pressure reduction caused by pressure regulating spring</p>	<p>(1) Adjust the injection pressure to the specified value</p> <p>(2) Adjust or replace a new spring</p>
Fuel injection pressure is too high	<p>(1) Pressure regulating spring pressure is too large</p> <p>(2) Oil needle is stuck</p> <p>(3) The injection was blocked</p>	<p>(1) Adjust the pressure or change the spring</p> <p>(2) Repair nozzle</p> <p>(3) Maintenance and cleaning</p>
Oil spill in injector	<p>(1) Pressure regulating spring break</p> <p>(2) Oil needle body surface damage</p> <p>(3) The oil needle was bitten</p> <p>(4) Take long and deform</p> <p>(5) The flat wear of the injector shell is</p>	<p>(1) Replace a new spring</p> <p>(2) Replacement of injection nozzle couple</p> <p>(3) Cleaning or replacing the injection nozzle couple</p>

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	not flat	(4) Replace (5) A plane or replacement of a shell.
Injector nebulization	(1) Oil needle body deformation or wear (2) Oil needle body face wear or burn	(1) Replacement of injection nozzle couple (2) Replacement of injection nozzle couple
Injection molding	(1) Hole plugs (2) Excessive wear of oil needle and oil needle (3) The oil needle was bitten	(1) Replacement or cleaning (2) Replacement of injection nozzle couple (3) Cleaning or replacing
Diesel engine overheating	The surface of the nozzle or burn with blue black	Overhaul the cooling system and replace the nozzle couple

General fault of oil pump for diesel engine

General breakdown of diesel oil pump

Failure phenomenon	Cause of failure	Elimination method
Fuel oil shortage	(1) Fracture of oil pump stop valve (2) Piston wear (3) Inlet gas leakage	(1) Replacement check valve (2) Replace the piston (3) Tighten pipe joint nut

(九) Fault of speed control

When the diesel engine runs, the speed is unstable or the speed regulation is unstable, the idle speed can not reach or the phenomenon of the flying car. The so-called "flying car" means that the diesel engine speed is lost control, the speed is much more than the required speed of sitting high. This kind of fault will cause major accidents and bring great harm to the diesel engine. Modern diesel generator sets are usually equipped with automatic vehicle protection devices. Once a flying car is present, it will be protected automatically. However, there is no diesel runaway protection device, once the speed, because of the serious cursive will cause the connecting rod bolt fracture, broken cylinder cover, the piston and other parts, and even make the crankshaft counterbalance and governor fly hammer broke, flywheel rupture, valve spring break and other major accidents, a direct threat to personal safety

Judging the fault of the flying car is mainly based on the change of the sound of the diesel engine, because the speed of the engine rises rapidly, so the noise of the exhaust becomes screaming. Once the sound is heard, immediate and effective measures must be taken to avoid greater losses. The emergency treatment of the flying car is to try to stop quickly.

(1) Quickly cut off the oil road

Pull the throttle quickly to the parking device and turn off the oil switch. But because of the reason is that most occur speed throttle of pump plunger out of control, therefore, timely throttle is pulled in the parking position, low-voltage circuit has diesel still can not quickly make the engine stop, this time should also quickly unscrew the high-pressure oil pipe connecting nut, the fuel injector immediately, most of the time can stop quickly.

(2) Quickly cut off the air passage

If a diesel engine is equipped with explosion-proof device, the intake passage can be quickly closed. The diesel engine without this device can be wrapped or directly blocked by the air filter. As long as the intake passage is blocked, the diesel engine can be stopped quickly.

It pointed out that the occurrence of losing control running fault, are not allowed to remove the load, otherwise it will make the speed more rapidly increased risk greater. After parking, careful and careful analysis

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of the cause of the flying car, in time to eliminate the fault, to ensure the safety of operation.

The failure causes and elimination methods of diesel engine speed control failure are shown in the table below

A breakdown list of diesel engine speed control

Failure phenomenon	Cause of failure	Elimination method
Unstable speed adjustment	<ul style="list-style-type: none"> (1) Unbalance of oil supply in each cylinder (2) Part of the nozzle hole, blocked or leakage of carbon (3) Loose rod pin loosening (4) Fracture of the core spring of the injection pump (5) Spring break of oil outlet valve 	<ul style="list-style-type: none"> (1) Adjust the oil quantity control sleeve (2) Overhaul and clean the injection hole or replace the nozzle (3) Replacement of rod pin (4) Change the spring (5) Replacement of the oil valve spring
The idle speed can't be reached.	<ul style="list-style-type: none"> (1) The handle is not in the end (2) Spring ring crush (3) The gear rod slightly jammed 	<ul style="list-style-type: none"> (1) Put the speed control handle to the end and overhaul (2) Disassembly and maintenance (3) Disassembly and maintenance
The idle speed of the car and diesel engine is unstable	<ul style="list-style-type: none"> (1) Long use deformation of speed regulating main and auxiliary spring (2) Flying iron roller pin hole and car wear loose (3) Improper matching of gear tooth rod of oil pump (4) Flying iron is unfolded or closed. (5) The cover hole of the governor casing of the governor is loosened and the camshaft travel gap is too large (6) The gap between the pin hole and the pull rod of the tooth rod and the rod pin is too large (7) Improper adjustment of low speed stabilizer (8) Adjust the rack (or adjust the fork) to get astringent (9) Exorbitant speed (10) The lower part of the screw loose shell governor, rod pin (11) Breakage of speed control spring (12) The continuous pin of the tooth rod and the pull rod fell off, and the spring pin was broken (13) Leveraged pin drop off (14) Injection pump rack card (15) Damage of ball bearing of governor 	<ul style="list-style-type: none"> (1) Replace a piston ring to adjust or replace a new spring (2) The replacement of Frestech iron (3) Readjusting the assembly (4) Maintenance correction (5) Overhaul the copper gasket and adjust to the specified gap (6) Replacement of rod pin (7) Adjust according to the regulations (8) Check the flexibility of the rack and hole and pull rod (or fork structure) connection part (9) Each part of the overhaul, open the speed limit screw seal return adjustment (10) Repair and reassemble (11) Change the spring (12) Overhaul or replace (13) Overhaul or replace (14) Remove the total pump for maintenance (15) Replacement bearing (16) Overhaul or replace (17) Change the oil surface height by replacing oil of No. 11 diesel engine

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	(16) Governor sleeve (17) The oil surface of the diesel pump is too high and the viscosity of the oil is too high.	
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Failure of motor starting device

The starting device of diesel engine is also easy to cause failure. When it fails, it will cause diesel engine to start failure. Therefore, maintenance should be strengthened at ordinary times to ensure the normal start and operation of diesel engine. Once a fault occurs, we should analyze and find out the cause of the failure according to the scene, and eliminate it in time. We will list the causes, reasons and elimination methods of this kind of fault.

电动机起动装置的故障一览表

Fault list of motor starting device

Failure phenomenon	Cause of failure	Elimination method
Starting motor gear can not enter meshing	(1) Starting motor relay does not work 1. Start button destruction or bad contact 2. Conversion switch contact burnout 3. Insufficient voltage (battery power shortage, circuit system contact or leakage) (2) The starting motor drive gear is not meshing with the diesel engine flywheel gear ring 4. The wear of the single side of the gear is heavier or pilling. 5. The starting motor gear is not parallel to the center line of the flywheel gear ring 6. Start the motor gear section to the oversize or top death of the full section of the flywheel tooth 7. Lever decoupling of starting motor 8. Loosening of copper sleeve for starting motor drive gear 9. Loosening of the fastening nut of the starting motor clutch	1. Repair or replace the start button 2. Disassemble and clean the contacts 3. Check electric circuit and battery 4. Repair gear 5. Reappear installation to eliminate non parallel phenomena 6. The gap should be in the range of (2.5 to 5) mm, and the method of adding or reducing the gasket should be adjusted without the requirement. 7. Reinstall and adjust 8. Disassemble the starting motor for maintenance 9. Disassemble and reassemble
Starting the motor into meshing but the diesel engine cannot rotate or turn weak	1. Insufficient voltage (poor circuit contact, leakage or battery power shortage) 2. Clutches slipping 3. The starting motor commutator	1. Check electrical circuits and batteries 2. Add washer and adjust the washer between the inner pressure ring and the friction plate

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	share oil or ablation, brush wear, lack of brush spring pressure 4. The impact or short circuit of the armature of the starting motor and the magnetic field coil	in the clutch 3. The starting motor commutator wear such as erosion sand cleaning, and needs to be repaired 4. Disassembly and repair
The diesel engine has been started, but the start gear can't be separated and a sharp noise is made.	1. The starting motor relay adhered to the contact side and two contacts 2. Start conversion switch size copper contact disc and contact adhesion 3. Start motor lever decoupling or eccentric screw loosening 4. Leveraged reset spring break or lose elasticity 5. Breaking or bending of the armature axis of the motor 6. The tooth picking card dead	1. Check the electrical circuit and repair the contact 2. Disassemble the contact and repair the contacts 3. Adjust and tighten 4. Change the spring 5. Change the starting motor 6. Trimming tooth surface
Battery power shortage	1. Low liquid level 2. There is a short circuit between the poles 3. Polar plate sulfation 4. Insufficient power supply for charging generator 5. Poor contact wire contact	1. A dilute sulfuric acid solution with distilled water or a specific gravity of 1:1 2. Clean up the sediment and replace the electric liquid 3. Elimination of sulfation by repeated charge and discharge 4. Repair relay regulator and belt tightness 5. Check the connection line to make it in good contact
The temperature of the battery is too high	(1) There is a short circuit inside the battery (2) Overcharging current is too large	1. Eliminate short circuit 2. Maintenance and relay regulator
The battery shell is deformed and the seal is broken	(1) Overcharging current is too large (2) External circuit short circuit	(1) Maintenance and relay regulator (2) Eliminate short circuit
Electrohydraulic uncleanness	Electrohydraulic turbid, impurity	Replacement of electroliquid
Electrohydraulic sediments	Abscission of the active material of the plate	Less sediment, remove and continue to use. Deposit more, replacing the plate

Generator work is not normal

A list of abnormal failure of the generator

Failure phenomenon	Cause of failure	Elimination method
A rechargeable generator	(1) The brushes and	(1) Adjust the pressure of the

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commutator has a strong spark	commutator contact (2) Commutator erosion, pitting or lose round (3) Protruding of mica film	brush to make it contact normal (2) To meet the requirements of commutator dressing (3) Curettage mica
The generator works with noise and percussion	(1) Bearing wear has obvious loosening (2) The bearing is too tight and the installation is incorrect. (3) The loose screw of the magnetic pole causes friction between the pole and the armature.	(1) Replacement bearing (2) Calibration of bearing coordination and improvement of installation (3) Tighten the screw to check whether the air gap is enough, or not.
High temperature of the generator	(1) Armature coil short circuit (2) Short circuit of magnetic field coil (3) Bearing oil or bites (4) Belt tightening force (5) The spring force of the brush is too strong	(1) Check and repair with a short circuit tester (2) Use an electric bridge to measure resistance and repair (3) Add lubricating oil or cleaning bearings to replace grease (4) Adjustment of belt tension (5) Adjust the spring pressure of the brush
The ammeter is not just the charge state	(1) Poor contact of wire in charging circuit (2) Charging generator commutator is incorrect or ablation (3) Excessive wear and tear of electric brush in charging power generation, insufficient pressure of brush spring (4) Charging generator brush card lag or poor contact with the commutator (5) An open or short circuit of a brush or a magnetic field winding (6) Rechargeable generator regulator failure (7) The low tension of the belt and the decrease of the rev of the rechargeable generator	(1) Exclude wire breaking or bad contact (2) Clean and repair. (3) Replace the brush (4) The brush move freely in the bracket, and full contact with the commutator (5) Check and repair with an electric bridge or a short circuit tester (6) Overhaul and adjust (7) Adjust the belt pulling force according to the regulations
Current indication charging current is too strong	(1) The armature of the charging generator is short circuited by the magnetic field circuit, and the adjustment can not	(1) Check the circuit carefully to eliminate the short circuit (2) Recheck and adjust the regulator

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	be controlled. (2) The regulator is not working properly	
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Use of diesel oil

The correct use of diesel engine oil. The rational use of diesel engine oil can not only prolong the service life of the diesel engine, but also save energy. In general, the principle of diesel engine oil selection is as follows:

1. The engines with high load and low speed generally use diesel engine oil with higher viscosity; the engine with light load and high speed selects diesel engine oil with smaller viscosity
2. Higher viscosity diesel engine oil is selected in the season with high temperature, and diesel engine oil with low viscosity is selected in the season with low temperature.
3. The new engine selects diesel engine oil with small viscosity; the old engine (big wear) selects the diesel engine oil with large viscosity
4. Priority selection of domestic diesel engine oil
5. Priority selection of diesel engine oil with low viscosity

The rational use of oil directly affects the quality of the use of oil, oil lubricating effect and period of use, should be regular oil changes, and the change in engine thermal state; ensure the normal oil level; keep the crankcase ventilation; pay attention to the maintenance of the filter, replace the oil filter regularly to prevent water mixed with oil.

Positive experience in oil selection

1. Oil is selected according to the instructions of the diesel engine. Use the oil of the grade of quality and viscosity specified in the instruction of the diesel engine, and follow the execution carefully.
2. The domestic engine can not use the imported oil.

Experience in oil addition

1. Change the oil on time
2. Not mixed use of new and old oil, prevent different oil mixed, prevent oil pollution
3. The injection of oil can not be more than a few, too much oil has a lot of harm:
 - (1) When the engine is working, the crankshaft stirs up to make the oil foam and deteriorate and increase the crankshaft rotation resistance. Therefore, it not only increases engine oil consumption, but also reduces engine power.
 - (2) The oil consumption increases as the oil moves to the combustor
 - (3) It is easy to produce deflagration in the engine, which accelerates the carbon accumulation in the combustion chamber. Engine oil more rather not less is wrong, the general line should be slightly lower than the oil level on the dipstick scale is appropriate, high oil would be counterproductive.