

7. TROUBLESHOOTING GUIDE

1. ENGINE

If the engine does not function properly, use the following chart to identify and correct the cause.

1) WHEN IT IS DIFFICULT TO START THE ENGINE

Trouble	Service	Remark
Fuel is thick and doesn't flow.	<ul style="list-style-type: none"> • Check the fuel tank and fuel filter. • Remove water, dirt and other impurities. • As all fuel will be filtered by the filter, if there should be water or other foreign matters on the filter, clean the filter with kerosene. 	
Air or water mixed in fuel system.	<ul style="list-style-type: none"> • If air is in the fuel filter or injection lines, the fuel pump will not work properly. • To attain proper fuel injection pressure, check carefully for loosened fuel line coupling, loose cap nut, etc. • Loosen joint bolt stop fuel filter and air vent screws of fuel injection pump to eliminate all the air in the fuel system. 	
Valve clearance is not as specified.	<ul style="list-style-type: none"> • Adjust valve clearance to 0.13 to 0.17mm (0.005 to 0.0067 in.) when the engine is cold. 	
Leaking valves.	<ul style="list-style-type: none"> • Grind valve. 	
Fuel injection timing is not as specified.	<ul style="list-style-type: none"> • Check injection timing 	
Engine oil becomes thick in cold weather and engine cranks slow.	<ul style="list-style-type: none"> • Change grade of oil according to the weather (temperature.) 	
Low compression	<ul style="list-style-type: none"> • Bad valve or excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts. 	
Battery is discharged and the engine will not crank.	<ul style="list-style-type: none"> • Charge battery. In winter, always remove battery from machine, charge fully and keep indoors. Install in machine at time of use. 	

2) WHEN OUTPUT IS INSUFFICIENT

Trouble	Service	Remark
Compression is insufficient. Leaking valves.	<ul style="list-style-type: none"> • Bad valve and excessive wear of rings, pistons and liners cause insufficient compression. Replace with new parts. • Grind valves. 	
Fuel is insufficient.	<ul style="list-style-type: none"> • Check fuel system. 	
Overheating of moving parts.	<ul style="list-style-type: none"> • Check lubricating oil system. • Check to see if lubricating oil filter is working properly. • Filter element deposited with impurities would cause poor lubrication. Change element. • Check the clearance of bearing are within specs. • Check injection timing. • Adjust timing 	
Valve clearance is not as specified.	<ul style="list-style-type: none"> • Adjust to proper valve clearance of 0.13 to 0.17 mm(0.005 to 0.0067 in.) with engine cold. 	
Air cleaner is dirty.	<ul style="list-style-type: none"> • Clean the element every 100 hours of operation. 	
Fuel injection pressure is wrong.	<ul style="list-style-type: none"> • Check injection pressure. 18.63MPa(190kgf/cm², 2702psi) 	
Injection pump wear.	<ul style="list-style-type: none"> • Do not use poor quality fuel as it will cause wear of the pump. • Check the fuel injection pump element and delivery valve assembly and replace as necessary. 	

3) WHEN ENGINE SUDDENLY STOPS

Trouble	Service	Remark
Lack of fuel	<ul style="list-style-type: none"> • Check the fuel tank and refill the fuel, if necessary. • Also check the fuel system for air or leaks. 	
Bad nozzle	<ul style="list-style-type: none"> • If necessary, replace with a new nozzle. 	
Moving parts are overheated due to shortage of lubrication oil or improper lubrication.	<ul style="list-style-type: none"> • Check amount of engine oil with oil level gauge. • Check lubricating oil system. • At every 2 times of oil change, oil filter cartridge should be replaced. • Check to see if the engine bearing clearances is within specs. 	

4) WHEN COLOR OF EXHAUST IS ESPECIALLY BAD

Trouble	Service	Remark
Fuel governing device bad	<ul style="list-style-type: none"> • Contact dealer for repairs. 	
Fuel is of extremely poor quality.	<ul style="list-style-type: none"> • Select good quality fuel. 	
Nozzle is bad.	<ul style="list-style-type: none"> • If necessary, replace with new nozzle. 	
Combustion is incomplete.	<ul style="list-style-type: none"> • Cause is poor atomization, improper injection timing, etc. Because of trouble in injection system or in poor valve adjustment, or compression leakage, poor compression, etc. Check for the cause. 	

5) WHEN ENGINE MUST BE STOPPED IMMEDIATELY

Trouble	Service	Remark
Engine revolution suddenly decreases or increases.	<ul style="list-style-type: none"> • Check the adjustments, injection timing and the fuel system. 	
Unusual sound is heard suddenly.	<ul style="list-style-type: none"> • Check all moving parts carefully. 	
Color of exhaust suddenly turns dark.	<ul style="list-style-type: none"> • Check the fuel injection system, especially the fuel injection nozzle. 	
Bearing parts are overheated.	<ul style="list-style-type: none"> • Check the lubricating system. 	
Oil lamp lights up during operation.	<ul style="list-style-type: none"> • Check the lubricating system. • Check, if the engine bearing clearances are within specs. • Check the function of the relieve valve in the lubricating system. • Check pressure switch. • Check filter base gasket. 	

6) WHEN ENGINE OVERHEAT

Trouble	Service	Remark
Engine oil insufficient.	• Check oil level. Replenish oil as required.	
Fan belt broken or elongated.	• Change belt or adjust belt tension.	
Coolant insufficient.	• Replenish coolant.	
Excessive concentration of antifreeze.	• Add water only or change to coolant with the specified mixing ratio.	
Radiator net or radiator fin clogged with dust.	• Clean net or fin carefully.	
Inside of radiator or coolant flow route corroded.	• Clean or replace radiator and parts.	
Fan or radiator or radiator cap defective.	• Replace defective parts.	
Thermostat defective.	• Check thermostat and replace if necessary.	
Temperature gauge or sensor defective.	• Check temperature with thermometer and replace if necessary.	
Overload running.	• Reduce load.	
Head gasket defective or water leakage.	• Replace parts.	
Incorrect injection timing.	• Adjust to proper timing.	
Unsuitable fuel used.	• Use the specified fuel.	

2. ELECTRICAL SYSTEM

Trouble	Service	Remark
Starting motor does not turn when starting switch is turned on.	<ul style="list-style-type: none"> • Inspect and repair the wiring • Charge the battery • Check starting switch • Check battery relay switch • Place the foot pedal and travel/swing control lever in the neutral 	
Starting motor turns the engine sluggishly.	<ul style="list-style-type: none"> • Charge the battery • Check the starting motor 	
Starting motor disengages before the engine starts up.	<ul style="list-style-type: none"> • Check and repair the wiring • Charge the battery 	
Engine oil pressure lamp does not light up when engine is stationary(When the starting switch is ON position).	<ul style="list-style-type: none"> • Check the lamp • Check the oil pressure switch 	
Charge lamp does not light up when the engine is stationary (When the starting switch is in ON position).	<ul style="list-style-type: none"> • Check the lamp • Check and repair the wiring 	

3. HYDRAULIC SYSTEM

Trouble	Service	Remark
Bucket lacks lifting power. Bucket lifting speed is slow.	<ul style="list-style-type: none">• Check the hydraulic oil level and add if necessary• Replace filter on rear	
Bubbles in oil.	<ul style="list-style-type: none">• Replace with specified oil• Add oil if needed	
Oil pressure is too low.	<ul style="list-style-type: none">• Bleed air from oil line• Add oil and bleed air	
Cylinder vibrates when operating.	<ul style="list-style-type: none">• Add oil	