

9 . TROUBLESHOOTING

1. ENGINE SYSTEM

Trouble symptom	Probable cause	Remedy
Oil pressure caution lamp fails to go out.	<ul style="list-style-type: none"> • Low oil level in oil pan. • Oil filter element clogged. • Loose or worn oil pipe joint leaks oil. 	<ul style="list-style-type: none"> • Add oil. • Replace element. • Check and repair.
Radiator pressure valve spouts steam.	<ul style="list-style-type: none"> • Lack of cooling water or water leakage. • Loosen fan belt. • Dust and scale accumulated in, cooling system. 	<ul style="list-style-type: none"> • Add water or repair. • Adjust belt. • Change water and clean the interior of cooling system.
Water temp gauge indicates red range, on right.	<ul style="list-style-type: none"> • Radiator fin clogged or fin damaged. • Thermostat or water temp gauge faulty. • Radiator filler cap loosening. 	<ul style="list-style-type: none"> • Clean or repair. • Replace • Retighten cap or replace packing.
Water temp gauge indicates red range, on left.	<ul style="list-style-type: none"> • Thermostat faulty. • Water temperature gauge faulty. 	<ul style="list-style-type: none"> • Replace • Replace
Engine fails to start.	<ul style="list-style-type: none"> • Lack of fuel. • Air mixed in fuel system. • Fuel injection pump or nozzle defective. • Starting motor rotates slowly. • Engine compression insufficient. • Valve clearance out of adjustment. 	<ul style="list-style-type: none"> • Addfuel. • Repair. • Replace. • See " Electrical system." • Adjust clearance
Engine emits whitish or bluish smoke.	<ul style="list-style-type: none"> • Excessive quantity of oil in oil pan. • Poor quality of fuel. 	<ul style="list-style-type: none"> • Reduce oil quantity. • Replace with specified fuel.
Abnormal sound heard. (Fuel combustion or mechanical sound)	<ul style="list-style-type: none"> • Poor quality of fuel. • Overheating • Muffler interior damaged. • Excessively large valve clearance. 	<ul style="list-style-type: none"> • Replace with specified fuel. • See Symptom "Radiator pressure valve spouts steam". • Replace • Adjust clearance.

2. ELECTRICAL SYSTEM

Trouble symptom	Probable cause	Remedy
Lamps dimming even at maximum engine speed.	• Faulty wiring.	• Check for loose terminal and disconnected wire.
Lamps flicker during engine operation.	• Improper belt tension.	• Adjust belt tension.
Charge lamp does not light during normal engine operation.	• Charge lamp defective. • Faulty wiring.	• Replace. • Check and repair.
Alternator makes abnormal sounds.	• Alternator defective.	• Replace
Starting motor fails to run.	• Faulty wiring. • Insufficient battery voltage.	• Check and repair. • Recharge battery.
Starting motor pinion repeats going in and out.	• Insufficient battery voltage.	• Recharge battery.
Excessively low starting motor speed.	• Insufficient battery voltage. • Starting motor defective.	• Recharge battery. • Replace
Starting motor comes to a stop before engine starts up.	• Faulty wiring. • Insufficient battery voltage.	• Check and repair. • Recharge battery.
Heater signal does not become red.	• Faulty wiring. • Glow plug damaged.	• Check and repair. • Replace
Engine oil pressure caution lamp does not light when engine is stopped (with starting switch left in "ON" position).	• Caution lamp defective. • Caution lamp switch defective.	• Replace • Replace

3. TORQUE FLOW SYSTEM

Trouble symptom	Probable cause	Remedy
1. Excessive oil temperature rise 1) Torque converter 2) Transmission	<ul style="list-style-type: none"> · Improper oil level. · Impeller interfering with surroundings. · Stator and free wheel malfunctioning. · Air sucked in. · Water intruding into transmission case. · Bearing worn or seizing. · Gauge malfunctioning. · Clutch dragging. · Bearing worn or seized. 	<ul style="list-style-type: none"> · Check oil level. Add or drain oil as necessary. · After draining oil from oil tank and transmission, check and replace interfering parts. · Check engine (stalling) speed. If necessary, replace. · Check the inlet side joint or pipe. If necessary, retighten joint or replace gasket. · Check drained oil. If necessary, change oil. · Disassemble, inspect, repair or replace. · Check and, if necessary, replace. · Check to see whether or not machine moves even when transmission is placed in neutral position. If so, replace clutch plate. · Disassemble, check and replace.
2. Noise operation 1) Torque converter 2) Transmission	<ul style="list-style-type: none"> · Cavitation produced. · Flexible plate damaged. · Bearing damaged or worn. · Gear damaged. · Impeller interfering with surroundings. · Bolt loosening. · Spline worn. · Noise gear pump operation. · Dragging caused by seizing clutch. · Bearing worn or seizing. · Gear damaged. · Bolt loosening. · Spline worn. 	<ul style="list-style-type: none"> · Change oil, replace parts leaking air. · Listen to rotating sound at lowspeed operation. If necessary, replace flexible plate. · Disassemble, check and replace. · Disassemble, check and replace. · Check impeller or check drained oil for mixing of foreign matter. If necessary, change oil. · Disassemble and check. If necessary, retighten or replace. · Disassemble, check and replace. · Disassemble, check and replace. · Check to see whether or not machine moves even when transmission is in neutral position. If so, replace clutch plate. · Disassemble, check and replace · Disassemble, check and replace · Disassemble, check and retighten or replace · Disassemble, check and replace

Trouble symptom	Probable cause	Remedy
3. Low output power 1) Torque converter	<ul style="list-style-type: none"> · Insufficient hydraulic pressure : <ul style="list-style-type: none"> - Low oil level. - Air sucked in. - Oil filter clogging. - Oil pump worn. (Low delivery flow) - Regulator valve coil spring fatigued. - Control valve spool malfunctioning. - Piston or O-ring worn. · Stator free wheel cam damaged. 	<ul style="list-style-type: none"> - Check oil level and add oil - Check joints and pipes. If necessary, retighten joint or replace packing. - Check and replace - Check oil pressure. If necessary replace pump. - Check spring tension. If necessary, replace. - Disassemble, check and repair or replace. - Disassemble, check measure and replace. - Check stalling speed. (Increased engine load will cause excessive drop of stalling speed.) - Check oil temperature rise. If any, replace free wheel.
2) Transmission	<ul style="list-style-type: none"> · Flexible plate deformed · Stator free wheel seizing. · Impeller damaged for interfering with the surroundings. · Use of poor quality of oil or arising of air bubbles. <ul style="list-style-type: none"> - Air sucked in from inlet side. - Low torque converter oil pressure accelerates generation of air bubbles. - Oil mixing with water. - Inching rod out of adjustment. · Clutch slipping <ul style="list-style-type: none"> - Lowering of weight. - Piston ring or O-ring worn. - Clutch piston damaged. - Clutch plate seizing or dragging. 	<ul style="list-style-type: none"> - Replace flexible plate - Check temperature plate. (No-load will cause temperature rise) - Replace free wheel if a drop of starting output is found. - Check drained oil for foreign matter. If any, change oil. - Check and change oil. - Check joints and pipes. If necessary, retighten joint or replace packing. - Check oil pressure. - Check drained oil and change oil. - Check and adjust. - Check oil pressure. - Disassemble, check, measure and replace. - Disassemble, check and replace. - Check to see whether or not machine moves even when transmission is in neutral position. If so, replace.

Trouble symptom	Probable cause	Remedy
4. Unusual oil pressure 1) Oil pressure is high 2) Oil pressure is low 3) Transmission	<ul style="list-style-type: none"> Control valve malfunctioning. Cold weather. (high oil viscosity) Use of improper oil. Gear pump malfunctioning (worn). Oil leaks excessively : <ul style="list-style-type: none"> (1) Control valve oil spring defective. (2) Control valve spool defective. Air sucked in. Low oil level. Oil filter clogging. Oil leaks excessively. 	<ul style="list-style-type: none"> (1) Check for spool operation. If necessary, replace valve. (2) Check for clogging of small hole in valve body. If necessary, clean or repair. When atmospheric temp is below freezing point (when normal oil pressure is recovered if heated to 60~80°C), change oil. Check and change oil. Disassemble, check and replace. Check spring tension (see spring specification). If necessary replace. Disassemble, check, and repair or replace valve. Check joints and pipes. If necessary, retighten joint or replace packing. Check oil level and add oil. Check and replace. Disassemble, check (piston ring and O-ring for wear and other defects), and replace.
5. Power is not transmitted 1) Torque converter 2) Transmission	<ul style="list-style-type: none"> Clutch plate damaged. Low oil level. Oil pump driving system faulty. Shaft broken. Lack of oil pressure. Low oil level. Inching valve and link lever improperly positioned. Forward/reverse spool and link lever improperly positioned. Clutch fails to disengage : <ul style="list-style-type: none"> (1) Clutch case piston ring defective. (2) Main shaft plug slipping out. Clutch seizing. Shaft broken off. Clutch drum damaged (spring groove). Clutch snap ring broken. 	<ul style="list-style-type: none"> Check for damage by listening to abnormal sounds at a low converter speed and replace. Check oil level and add oil Disassemble and check for wear of pump gear, shaft and spline. Replace defective parts. Check and replace. Check oil pump gear for wear and for oil suction force. If necessary, replace pump. Check oil level and add oil. Check measure and adjust. Check and adjust. Disassemble, check and replace Disassemble, check and repair or replace Check to see whether or not machine moves even then transmission is in neutral position. If so, replace. Disassemble, check(main shaft, etc.), and replace. Disassemble, check and replace. Disassemble, check and repair or replace.

Trouble symptom	Probable cause	Remedy
5. Power is not transmitted (Continue)	<ul style="list-style-type: none"> • Foreign matter intruding into oil passage to clutch. • Shaft spline worn. 	<ul style="list-style-type: none"> • Disassemble, check and repair or replace. • Disassemble, check and replace.
6. Oil leakage (Transmission and torque converter)	<ul style="list-style-type: none"> • Oil leaks from oil seal. • Oil leaks from case joining surfaces. • Oil leaks from joint or pipe. • Oil leaks from drain plug. • Oil leaks from a crack. 	<ul style="list-style-type: none"> • Disassemble and check for wear of seal lips and mating sliding surfaces (pump boss, coupling etc.) Replace oil seal, pump boss, coupling, etc. • Check and retighten or replace packing. • Check and repair or replace gasket. • Check and retighten or gasket. • Check and replace cracked part.

4. STEERING SYSTEM

Trouble symptom	Probable cause	Remedy
1. Steering wheel drags.	<ul style="list-style-type: none"> • Low oil pressure. • Bearing faulty. • Spring spool faulty. • Reaction plunger faulty. • Ball-and-screw assembly faulty. • Sector shaft adjusting screw excessively tight. • Gears poorly meshing. • Flow divider coil spring fatigued. 	<ul style="list-style-type: none"> • Check locknut. Repair. • Clean or replace. • Clean or replace. • Replace. • Clean or replace. • Adjust. • Check and correct meshing. • Replace.
2. Steering wheel fails to return smoothly.	<ul style="list-style-type: none"> • Bearing faulty. • Reaction plunger faulty. • Ball-and-screw assy faulty. • Gears poorly meshing. 	<ul style="list-style-type: none"> • Clean or replace. • Replace. • Clean or replace. • Check and correct meshing.
3. Steering wheel turns unsteadily. Steering system makes abnormal sound or vibration.	<ul style="list-style-type: none"> • Locknut loosening. • Metal spring deteriorated. • Gear backlash out of adjustment. • Air in oil circuit. 	<ul style="list-style-type: none"> • Retighten. • Replace. • Adjust. • Bleed air.
4. Abnormal sound heard when steering wheel is turned fully	<p>Valve</p> <ul style="list-style-type: none"> • Faulty. (Valve fails to open.) <p>Piping</p> <ul style="list-style-type: none"> • Pipe (from pump to power steering cylinder) dented or clogged. 	<ul style="list-style-type: none"> • Adjust valve set pressure and check for specified oil pressure. • Repair or replace.
5. Piping makes abnormal sounds.	<p>Oil pump</p> <ul style="list-style-type: none"> • Lack of oil. • Oil inlet pipe sucks air. • Insufficient air bleeding. 	<ul style="list-style-type: none"> • Add oil. • Repair. • Bleed air completely.
6. Valve or valve unit makes abnormal sounds.	<p>Oil pump</p> <ul style="list-style-type: none"> • Oil inlet pipe sucks air. <p>Valve</p> <ul style="list-style-type: none"> • Faulty. (Unbalance oil pressure) <p>Piping</p> <ul style="list-style-type: none"> • Pipe (from pump to power steering) dented or clogged. • Insufficient air bleeding. 	<ul style="list-style-type: none"> • Repair or replace. • Adjust valve set pressure and check specified oil pressure. • Repair or replace. • Bleed air completely.
7. Insufficient or variable oil flow.	<ul style="list-style-type: none"> • Flow control valve orifice clogged. 	<ul style="list-style-type: none"> • Clean.
8. Insufficient or variable discharge pressure.	<p>Piping</p> <ul style="list-style-type: none"> • Pipe (from tank to pipe) dented or clogged. 	<ul style="list-style-type: none"> • Repair or replace.

5. BRAKE SYSTEM

Trouble symptom	Probable cause	Remedy
1. Insufficient braking force	<ul style="list-style-type: none"> • Hydraulic system leaks oil. • Hydraulic system leaks air. • Disk worn. • Brake valve malfunctioning • Hydraulic system clogged 	<ul style="list-style-type: none"> • Repair and add oil. • Bleed air. • Replace • Repair or replace. • Clean.
2. Brake acting unevenly. (Truck is turned to one side during braking.)	<ul style="list-style-type: none"> • Tires unequally inflated. • Brake out of adjustment. • Disk surface roughened. • Wheel bearing out of adjustment. • Hydraulic system clogged. 	<ul style="list-style-type: none"> • Adjust tire pressure. • Adjust. • Repair by polishing or replace. • Adjust or replace. • Clean.
3. Brake trailing.	<ul style="list-style-type: none"> • Pedal has no play. • Piston cup faulty. • Brake valve return port clogged. • Hydraulic system clogged. • Wheel bearing out of adjustment. 	<ul style="list-style-type: none"> • Adjust. • Replace. • Clean. • Clean. • Adjust or replace.
4. Overheat	<ul style="list-style-type: none"> • Cooling oil insufficient. • Cooling system malfunctioning. • Excessive braking. 	<ul style="list-style-type: none"> • Add. • Repair or replace. • Use engine brake.

6. HYDRAULIC SYSTEM

Trouble symptom	Probable cause	Remedy
1. Large fork lowering speed.	<ul style="list-style-type: none"> • Seal inside control valve defective. • Oil leaks from joint or hose. • Seal inside cylinder defective. 	<ul style="list-style-type: none"> • Replace spool or valve body. • Replace. • Replace packing.
2. Large spontaneous tilt of mast.	<ul style="list-style-type: none"> • Tilting backward : Check valve defective. • Tilting forward : tilt lock valve defective. • Oil leaks from joint or hose. • Seal inside cylinder defective. 	<ul style="list-style-type: none"> • Clean or replace. • Clean or replace. • Replace. • Replace seal.
3. Slow fork lifting or slow mast tilting.	<ul style="list-style-type: none"> • Lack of hydraulic oil. • Hydraulic oil mixed with air. • Oil leaks from joint or hose. • Excessive restriction of oil flow on pump suction side. • Relief valve fails to keep specified pressure. • Poor sealing inside cylinder. • High hydraulic oil viscosity. • Mast fails to move smoothly. • Oil leaks from lift control valve spool. • Oil leaks from tilt control valve spool. 	<ul style="list-style-type: none"> • Add oil. • Bleed air. • Replace. • Clean filter. • Adjust relief valve. • Replace packing. • Change to SAE10W, class CF engine oil. • Adjust roll to rail clearance. • Replace spool or valve body. • Replace spool or valve body.
4. Hydraulic system makes abnormal sounds.	<ul style="list-style-type: none"> • Excessive restriction of oil flow pump suction side. • Gear or bearing in hydraulic pump defective. 	<ul style="list-style-type: none"> • Clean filter. • Replace gear or bearing.
5. Control valve lever is locked	<ul style="list-style-type: none"> • Foreign matter jammed between spool and valve body. • Valve body defective. 	<ul style="list-style-type: none"> • Clean. • Tighten body mounting bolts uniformly.
6. High oil temperature.	<ul style="list-style-type: none"> • Lack of hydraulic oil. • High oil viscosity. • Oil filter clogged. 	<ul style="list-style-type: none"> • Add oil. • Change to SAE10W, class CF engine oil. • Clean filter.

7. MAST AND FORK

1) MAST

Problem	Cause	Remedy
Forks fail to lower.	<ul style="list-style-type: none"> Deformed mast or carriage. 	<ul style="list-style-type: none"> Disassemble, repair or replace.
Fork fails to elevate	<ul style="list-style-type: none"> Faulty hydraulic equipment. Deformed mast assembly. 	<ul style="list-style-type: none"> See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system. Disassemble mast and replace damaged parts or replace complete mast assembly.
Slow lifting speed and insufficient handling capacity.	<ul style="list-style-type: none"> Faulty hydraulic equipment. Deformed mast assembly. 	<ul style="list-style-type: none"> See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system. Disassemble mast and replace damaged parts or replace complete mast assembly.
Mast fails to lift smoothly.	<ul style="list-style-type: none"> Deformed masts or carriage. Faulty hydraulic equipment. Damaged load and side rollers. Unequal chain tension between LH & RH sides. LH & RH mast inclination angles are unequal. (Mast assembly is twisted when tilted) 	<ul style="list-style-type: none"> Disassembly, repair or replace. See Troubleshooting Hydraulic Cylinders, pump and control valve in section 6, hydraulic system. Replace. Adjust chains. Adjust tilt cylinder rods.
Abnormal noise is produced when mast is lifted and lowered.	<ul style="list-style-type: none"> Broken load roller bearings. Broken side roller bearings. Deformed masts. Bent lift cylinder rod. Deformed carriage. Broken sheave bearing. 	<ul style="list-style-type: none"> Replace. Replace. Disassemble, repair or replace. Replace. Replace. Replace.
Abnormal noise is produced during tilting operation.	<ul style="list-style-type: none"> Insufficient lubrication of anchor pin, or worn bushing and pin. Bent tilt cylinder rod. 	<ul style="list-style-type: none"> Lubricate or replace. Replace.

2) FORKS

Problem	Cause	Remedy						
Abrasion	Long-time operations causes the fork to wear and reduces the thickness of the fork. Inspection for thickness is needed. · Wear limit : Must be 90% of fork thickness	If the measured value is below the wear limit, replace fork.						
Distortion	Forks are bent out of shape by a number of reasons such as overloading, glancing blows against walls and objects, and picking up load unevenly. · Difference in fork tip height <table border="1"><tr><td>Fork length (mm)</td><td>Height difference (mm)</td></tr><tr><td>equal or below 1500</td><td>3</td></tr><tr><td>above 1500</td><td>6</td></tr></table>	Fork length (mm)	Height difference (mm)	equal or below 1500	3	above 1500	6	If the measured value exceeds the allowance, replace fork.
Fork length (mm)	Height difference (mm)							
equal or below 1500	3							
above 1500	6							
Fatigue	Fatigue failure may result from the fatigue crack even though the stress to fork is below the static strength of the fork. Therefore, a daily inspection should be done. · Crack on the fork heel. · Crack on the fork weldments.	Repair fork by expert. In case of excessive distortion, replace fork.						