

## 9 . TROUBLESHOOTING

### 1. ENGINE SYSTEM

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

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

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

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

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

## 4. STEERING SYSTEM

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

## 5. BRAKE SYSTEM

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



## 6. HYDRAULIC SYSTEM

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

## 7. MAST AND FORK

### 1) MAST

Problem	Cause	Remedy
Forks fail to lower.	· Deformed mast or carriage.	· Disassemble, repair or replace.
Fork fails to elevate	· Faulty hydraulic equipment.  · Deformed mast assembly.	· 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.	· Faulty hydraulic equipment.  · Deformed mast assembly.	· 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.	· 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)	· 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.	· Broken load roller bearings. · Broken side roller bearings. · Deformed masts. · Bent lift cylinder rod. · Deformed carriage. · Broken sheave bearing.	· Replace. · Replace. · Disassemble, repair or replace. · Replace. · Replace. · Replace.
Abnormal noise is produced during tilting operation.	· Insufficient lubrication of anchor pin, or worn bushing and pin. · Bent tilt cylinder rod.	· 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.						