# 9. TROUBLESHOOTING

# 1. ENGINE SYSTEM

Trouble symptom	Probable cause	Remedy	
Oil pressure warning lamp fails to go out.	<ul><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>	Add oil.     Replace element.     Check and repair.	
Radiator pressure valve spouts steam.	<ul> <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><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> <li>Radiator fin clogged or fin damaged.</li> <li>Thermostat or water temp gauge faulty.</li> <li>Radiator filler cap loosening.</li> </ul>	<ul><li>Clean or repair.</li><li>Replace</li><li>Retighten cap or replace packing.</li></ul>	
Water temp gauge indicates red range, on left.	Thermostat faulty.     Water temperature gauge faulty.	· Replace · Replace	
Engine fails to start.	<ul> <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> <li>Add fuel.</li> <li>Repair.</li> <li>Replace.</li> <li>See " Electrical system."</li> <li>Adjust clearance</li> </ul>	
Engine emits whitish or bluish smoke.	<ul><li>Excessive quantity of oil in oil pan.</li><li>Poor quality of fuel.</li></ul>	Reduce oil quantity.     Replace with specified fuel.	
Abnormal sound heard. (Fuel combustion or mechanical sound)	<ul> <li>Poor quality of fuel.</li> <li>Overheating</li> <li>Muffler interior damaged.</li> <li>Excessively large valve clearance.</li> </ul>	<ul> <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 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.	<ul><li>Insufficient battery voltage.</li><li>Starting motor defective.</li></ul>	Recharge battery.     Replace
Starting motor comes to a stop before engine starts up.	<ul><li>Faulty wiring.</li><li>Insufficient battery voltage.</li></ul>	Check and repair.     Recharge battery.
Heater signal does not become red.  * Heater functions only when the coolant temperature is below 0°C	Faulty wiring.     Glow plug damaged.	Check and repair.     Replace
Engine oil pressure warning lamp does not light when enigne 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
Excessive oil     temperature rise     The converter	· Improper oil level.	· Check oil level. Add or drain oil as
1) Torque converter	Impeller interfering with surroundings.	necessary.  • After draining oil from oil tank and transmission, check and replace
	Stator and free wheel malfunctioning.	interfering parts.  · Check enigne (stalling) speed.  If necessary, replace.
	· Air sucked in.	Check the inlet side joint or pipe.  If necessary, retighten joint or replace gasket.
	Water intruding into transmission case	Check drained oil.  If necessary, change oil.
	Bearing worn or seizing.      Gauge malfunctioning.	<ul> <li>Disassemble, inspect, repair or replace.</li> <li>Check and, if necessary, replace.</li> </ul>
2) Transmission	· Clutch dragging.	Check to see whether or not truck moves even when transmission is placed in neutral position. If so, replace clutch plate.
	· Bearing worn or seized.	· Disassemble, check and replace.
2. Noise operation		
1) Torque converter	<ul><li>Cavitation produced.</li><li>Flexible plate damaged.</li></ul>	Change oil, replace parts leaking air.     Listen to rotating sound at lowspeed
		operation. If necessary, repacle flexible plate.
	· Bearing damaged or worn.	Disassemble, check and replace.
	Gear damaged.  Impaller interfering with surroundings.	Disassemble, check and replace.  Chack impoller or shoot drained ail.
	Impeller interfering with surroundings.	<ul> <li>Check impeller or check drained oil for mixing of foreign matter.</li> <li>If necessary, change oil.</li> </ul>
	· Bolt loosening.	Disassemble and check. If necessary, retighten or repalce.
	· Spline worn.	· Disassemble, check and replace.
	· Noise gear pump operation.	· Disassemble, check and replace.
2) Transmission	Dragging caused by seizing clutch.	Check to see whether or not truck moves even when transmission is in neutral position. If so, replace clutch plate.
	· Bearing worn or seizing.	· Disassemble, check and replace
	· Gear damaged.	Disassemble, check and replace
	· Bolt loosening.	Disassemble, check and retighten or replace
	· Spline worn.	· Disassemble, check and replace

Trouble symptom	Probable cause	Remedy	
3.Low output power     1) Torque converter	Insufficient hydraulic pressure :     Low oil level.     Air sucked in.	- Check oil level and add oil - Check joints and pipes. If necessary, retighten joint or repla-	
	<ul> <li>Oil filter clogging.</li> <li>Oil pump worn.</li> <li>(Low delivery flow)</li> <li>Regulator valve coil spring fatigued.</li> <li>Control valve spool malfunctioning.</li> </ul>	ce packing.  - Check and replace  - Check oil pressure. If necessary replace pump.  - Check spring tension. If necessary, replace.  - Disassemble, check and repair or replace.	
	- Piston or O-ring worn.	Disassemble, check measure and replace.	
	· Stator free wheel cam damaged.	Check stalling speed.     (Increased engine load will cause excessive drop of stalling speed.)     Check oil temperature rise.	
	· Stator free wheel seizing.	If any, replace free wheel.  - Check temperature plate. (No-load will cause temperature rise)  - Replace free wheel if a drop of starting output is found.	
2) Transmission	<ul> <li>Impeller damaged for interfering with the surroundings.</li> <li>Flexile plate deformed</li> <li>Use of poor quality of oil or arising of air bubbles.</li> </ul>	<ul> <li>Check drained oil for foreign matter.</li> <li>If any, change oil.</li> <li>Replace flexible plate</li> <li>Check and change oil.</li> </ul>	
	- Air sucked in from inlet side.	Check joints and pipes.     If necessary, retighten joint or replace packing.	
	<ul> <li>Low torque converter oil pressure accelerates generation of air beb- bles.</li> </ul>	- Check oil pressure.	
	<ul><li>Oil mixing with water.</li><li>Inching rod out of adjustment.</li></ul>	Check drained oil and change oil.     Check and adjust.	
	<ul><li>Clutch slipping</li><li>Lowering of weight.</li><li>Piston ring or O-ring worn.</li></ul>	Check oil pressure.     Disassemble, check, measure and replace.	
	<ul><li>Clutch piston damaged.</li><li>Clutch plate seizing or dragging.</li></ul>	<ul> <li>Disassemble, check and replace.</li> <li>Check to see whether or not truck moves even when transmission is in neutral position. If so, replace.</li> </ul>	

Trouble symptom	Probable cause	Remedy
Unusual oil pressure     Oil pressure is high	· Control valve malfunctioning.	(1)Check for spool operation. If necessary, replace valve.
	· Cold weather. (high oil viscosity)	<ul> <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> </ul>
2) Oil pressure is low	Use of improper oil.     Gear pump malfunctioning(worn).	Check and change oil.     Disassemble, check and replace.
2) Oil pressure is low	· Oil leaks excessively :	·
	(1)Control valve oil spring defective.	<ul> <li>Check spring tension (see spring specification).</li> <li>If necessary replace.</li> </ul>
	(2)Control valve spool defective.	Disassemble, check, and repair or replace valve.
	· Air sucked in.	· Check joints and pipes. If necessary, retighten joint or replace packing.
	· Low oil level.	Check oil level and add oil.  Check and replace.
3) Transmission	Oil filter clogging. Oil leaks excessively.	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	· Clutch plate damaged.	Check for damage by listening to ab- normal sounds at a low converter sp- eed and replace.
	Low oil level.     Oil pump driving system faulty.	Check oil level and add oil     Disassemble and check for wear of pump gear, shaft and spline.  Replace defective parts.
	· Shaft broken.	· Check and replace.
	· Lack of oil pressure.	Check oil pump gear for wear and for oil suction force.
2) Transmission	· Low oil level.	If necessary, replace pump.  · Check oil level and add oil.
	<ul> <li>Inching valve and link lever improperly positioned.</li> </ul>	· Check measure and adjust.
	· Forward/reverse spool and link lever improperly positioned.	· Check and adjust.
	Clutch fails to disengage: (1)Clutch case piston ring defective. (2)Main shaft plug slipping out.	Disassemble, check and replace     Disassemble, check and repair or replace
	· Clutch seizing.	Check to see whether or not truck moves even then transmission is in neutral position. If so, replace.
	· Shaft broken off.	Disassemble, check(main shaft, etc.), and replace.
	Clutch drum damaged (spring groove).     Clutch snap ring broken.	Disassemble, check and replace.     Disassemble, check and repair or replace.

Trouble symptom	Probable cause	Remedy	
5. Power is not transmitted (Continue)	<ul><li>Foreign matter intruding into oil passage to clutch.</li><li>Shaft spline worn.</li></ul>	<ul><li>Disassemble, check and repair or replace.</li><li>Disassemble, check and replace.</li></ul>	
Oil leakage     (Transmission and torque converter)	· Oil leaks from oil seal.	Disassemble and check for wear of seal lips and mating sliding surfaces (pump boss, coupling etc.) Replace oil seal, pump boss, coupling, etc.	
	<ul> <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> <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> <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> <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>
Steering wheel fails to return smoothly.	<ul> <li>Bearing faulty.</li> <li>Reaction plunger faulty.</li> <li>Ball-and-screw assy faulty.</li> <li>Gears poorly meshing.</li> </ul>	<ul><li>Clean or replace.</li><li>Replace.</li><li>Clean or replace.</li><li>Check and correct meshing.</li></ul>
Steering wheel turns unsteadily.     Steering system makes abnormal sound or vibration.	<ul><li>Locknut loosening.</li><li>Metal spring deteriorated.</li><li>Gear backlash out of adjustment.</li><li>Air in oil circuit.</li></ul>	<ul><li>Retighten.</li><li>Replace.</li><li>Adjust.</li><li>Bleed air.</li></ul>
Abnormal sound heard when steering wheel is turned fully	Valve · Faulty. (Valve fails to open.)  Piping · Pipe (from pump to power steering cylinder) dented or clogged.	<ul> <li>Adjust valve set pressure and check for specified oil pressure.</li> <li>Repair or replace.</li> </ul>
5. Piping makes abnormal sounds.	Oil pump  · Lack of oil.  · Oil inlet pipe sucks air.  · Insufficient air bleeding.	Add oil.     Repair.     Bleed air completely.
Valve or valve unit makes abnormal sounds.	Oil pump     Oil inlet pipe sucks air. Valve     Faulty. (Unbalance oil pressure)  Piping     Pipe (from pump to power steering) dented or clogged.     Insufficient air bleeding.	<ul> <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.	· Flow control valve orifice clogged.	· Clean.
8. Insufficient or variable discharge pressure.	Piping Pipe (from tank to pipe) dented or clogged.	· Repair or replace.

### 5. BRAKE SYSTEM

Trouble symptom	Probable cause	Remedy
1. Insufficient braking force	<ul> <li>Hydraulic system leaks oil.</li> <li>Hydraulic system sucks air.</li> <li>Disk worn.</li> <li>Brake valve malfunctioning</li> <li>Hydraulic system clogged</li> </ul>	<ul> <li>Repair and add oil.</li> <li>Bleed air.</li> <li>Replace</li> <li>Repair or replace.</li> <li>Clean.</li> </ul>
Brake acting unevenly.     (Truck is turned to one side during braking.)	<ul> <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> <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> <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>	Adjust.     Replace.     Clean.     Clean.     Adjust or replace.

### 6. HYDRAULIC SYSTEM

Trouble symptom	Probable cause	Remedy
Large fork lowering speed.	<ul> <li>Seal inside control valve defective.</li> <li>Oil leaks from joint or hose.</li> <li>Seal inside cylinder defective.</li> </ul>	Replace spool or valve body.     Replace.     Replace packing.
Large spontaneous tilt of mast.	<ul> <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><li>Clean or replace.</li><li>Clean or replace.</li><li>Replace.</li><li>Replace seal.</li></ul>
Slow fork lifting or slow mast tilting.	<ul> <li>Lack of hydruilc oil.</li> <li>Hydrauic 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> <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>
Hydraulic system makes abnormal sounds.	<ul> <li>Excessive restriction of oil flow pump suction side.</li> <li>Gear or bearing in hydraulic pump defective.</li> </ul>	Clean filter.      Replace gear or bearing.
5. Control valve lever is locked	<ul><li>Foreign matter jammed between spool and valve body.</li><li>Valve body defective.</li></ul>	Clean.     Tighten body mounting bolts uniformly.
6. High oil temperature.	<ul><li>Lack of hydraulic oil.</li><li>High hydraulic oil viscosity.</li><li>Oil filter clogged.</li></ul>	Add oil.     Change to SAE10W, class CF engine oil.     Clean filter.

### 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.	<ul> <li>See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system.</li> <li>Disassemble mast and replace damaged parts or replace complete mast assembly.</li> </ul>	
Slow lifting speed and insufficient handling capacity.	Faulty hydraulic equipment.      Deformed mast assembly.	<ul> <li>See troubleshooting hydraulic pump and cylinders in section 6, hydraulic system.</li> <li>Disassemble mast and replace</li> </ul>	
	Beloimed made addemary.	damaged parts or replace complete mast assembly.	
Mast fails to lift smoothly.	<ul><li>Deformed masts or carriage.</li><li>Faulty hydraulic equipment.</li></ul>	<ul> <li>Disassembly, repair or replace.</li> <li>See Troubleshooting Hydraulic</li> <li>Cylinders, pump and control valve in section 6, hydraulic system.</li> </ul>	
	<ul><li>Damaged load and side rollers.</li><li>Unequal chain tension between</li><li>LH &amp; RH sides.</li></ul>	· Replace. · Adjust chains.	
	<ul> <li>LH &amp; RH mast inclination angles are unequal. (Mast assembly is twisted when tilted)</li> </ul>	· Adjust tilt cylinder rods.	
Abnormal noise is produced when mast is lifted and lowered.	Broken load roller bearings.     Broken side roller bearings.	· Replace.	
whom must is inted and lowered.	<ul> <li>Deformed masts.</li> <li>Bent lift cylinder rod.</li> <li>Deformed carriage.</li> <li>Broken sheave bearing.</li> </ul>	<ul><li>Disassemble, repair or replace.</li><li>Replace.</li><li>Replace.</li><li>Replace.</li></ul>	
Abnormal noise is produced during tilting operation.	<ul> <li>Insufficient lubrication of anchor pin, or worn bushing and pin.</li> <li>Bent tilt cylinder rod.</li> </ul>	Lubricate or replace.     Replace.	

#### 2) FORKS

Problem	Caus	se	Remedy
Abrasion	Long-time operations causes the fork to		If the measured value is below the
	wear and reduces the	thickness of the	wear limit, replace fork.
	fork.		
	Inspection for thickness	ss is needed.	
	· Wear limit : Must be	e 90% of fork	
	thicknes	SS	
Distortion	Forks are bent out of	shape by a	If the measured value exceeds the
	number of reasons su	ıch as overloading,	allowance, replace fork.
	glancing blows agains	st walls and	
	objects, and picking u	p load unevenly.	
	Difference in fork tip	height	
	Fork length Height (mm) difference (mm)		
	equal or below 1500 3		
	above 1500	4	
Fatigue	Fatigue failure may result from the		Repair fork by expert.
	fatigue crack even though the stress to		In case of excessive distortion,
	fork is below the static strength of the		replace fork.
	fork. Therefore, a daily inspection		
	should be done.		
	· Crack on the fork he	eel.	
	· Crack on the fork w	eldments.	