CAT® Lift Trucks

Service Manual

Chassis & Mast

MC

DP60NM T20D-00011-up
DP70NM T20D-10011-up, AT20D-40011-up

For use with S6S and S6S-T Diesel Engine Service Manual 99709-27100

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Chapter 1 GENERAL INFORMATION

1. Model View 1-1
2. Applicable Truck Models 1-2
3. Serial Number Locations 1-3
4. Dimensions 1-4
5. Specifications 1-5
6. Performance 1-6

Chapter 2 COOLING SYSTEM

1. Specifications 2-1
2. Structure 2-2
3. Removing Fan Belt 2-3
   - 3.1 Preparation 2-3
   - 3.2 Removal Sequence 2-4
   - 3.3 Suggestions for Removal 2-4
4. Inspecting and Adjusting Fan Belt 2-5
   - 4.1 Inspecting Fan Belt 2-5
   - 4.2 Adjusting Fan Belt Tension 2-5
5. Installing Fan Belt 2-5
   - 5.1 Suggestions for Installation 2-5
6. Removing Oil Cooler and Radiator 2-6
   - 6.1 Preparation 2-6
   - 6.2 Removal Sequence 2-6
   - 6.3 Installation 2-6
7. Inspecting Radiator 2-7
   - 7.1 Radiator 2-7
   - 7.2 Radiator Rubber Mount (Rubber Cushion) 2-7
   - 7.3 Radiator Cap 2-7
   - 7.4 Connecting Hoses 2-7
   - 7.5 Coolant 2-8
   - 7.6 Oil Cooler for Transmission 2-9
8. Troubleshooting 2-10

Chapter 3 ELECTRICAL SYSTEM

1. Electrical Components and Wiring Outline 3-1
   - 1.1 Electrical Components and Wiring Diagram of Each Component 3-2
2. Console Box 3-6
   - 2.1 Outline of Console Box 3-6
   - 2.2 Disassembling Console Box 3-7
   - 2.3 Assembling Console Box 3-7
3. Meter Panel 3-8
   - 3.1 Disassembling Meter Panel 3-8
   - 3.2 Assembling Meter Panel 3-8

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3.3 Bulb Replacement 3-8
3.4 Warning Icons and Indicators 3-9
3.5 Hour Meter 3-10
3.6 Fuel Gauge 3-10
3.7 Connector 3-11
4. Switch Box 3-12
5. Main Electrical Components 3-13
5.1 Key Switch (Anti-Restart Switch) 3-13
5.2 Light Switch and Turn Signal Switch 3-14
5.3 Direction (FNR) Switch 3-15
5.4 Horn 3-16
5.5 Tank Unit 3-16
5.6 Stop Light Switch 3-17
5.7 Thermoswitch (T/C Oil) 3-18
5.8 Fuse Box 3-19
5.9 Relay Box 3-21
5.10 List of Lights 3-26
6. Battery and Maintenance 3-28
6.1 Battery Specific Gravity Condition and Adjustment 3-28
6.2 Relationship Between Electrolyte Specific Gravity and State of Charge 3-28
6.3 Precautions for Battery Charging 3-29
7. Wire Color 3-30
7.1 List of Wire Color Codes 3-30
8. Troubleshooting 3-31
8.1 Starter System 3-31
8.2 Gauges 3-31
8.3 Light Related Problems 3-32
8.4 Warning Device Problem 3-33
8.5 Battery-Related Problem 3-34

Chapter 4 POWER TRAIN

1. Removal and Installation 4-1
1.1 Overhead Guard, Covers, and Air Cleaner Element 4-2
1.2 Removing Harness 4-3
1.3 Removing Driving Control Related Parts 4-4
1.4 Removing Pipes/Hoses, Oil Cooler, and Radiator 4-5
1.5 Removing Engine and Transmission Unit 4-6
1.6 Installation 4-7
1.7 Suggestions for Removing Harnesses and Cables (Between Transmission and Frame) 4-9
2. Service Data 4-10

Chapter 5 POWERSHIFT TRANSMISSION

1. Specifications 5-1
2. Structure 5-2
2.1 Torque Converter 5-2
2.2 Transmission 5-3

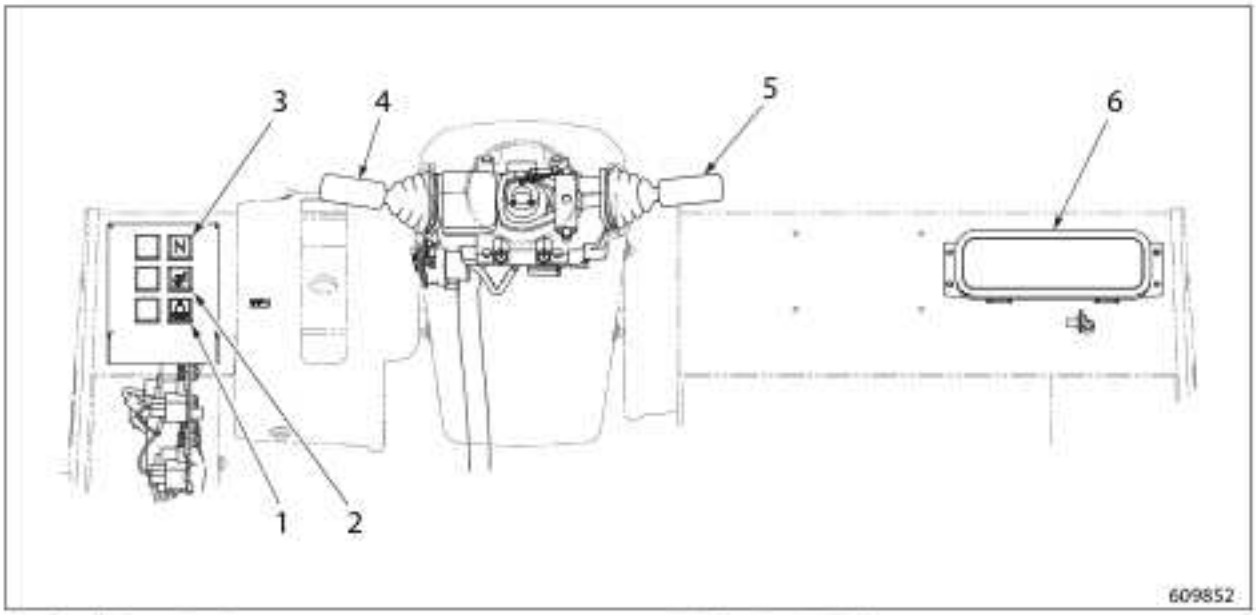
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2.3 Power Flow 5-4
2.4 Control Valve 5-5
2.5 Main Regulator Valve 5-6
2.6 Hydraulic Lines Diagram of Powershift Transmission 5-7
2.7 Automatic Gear Shifting Mechanism 5-8
2.8 Torque Converter Drive Control 5-9
3. Removal and Installation 5-10
3.1 Removal 5-10
3.2 Installation 5-10
4. Disassembling Torque Converter 5-11
4.1 Disassembly Sequence 5-11
4.2 Suggestions for Disassembly 5-11
5. Inspecting and Repairing Torque Converter 5-12
6. Assembling Torque Converter 5-14
6.1 Assembly Sequence 5-14
6.2 Suggestions for Assembly 5-15
7. Transmission (2nd Gear) 5-17
7.1 Disassembling Control Valve and External Parts 5-17
7.2 Disassembling Transmission Cover and Input/Counter/Output Shafts 5-18
7.3 Suggestions for Disassembly 5-19
7.4 Disassembling Stator Shaft and Oil Pump 5-20
7.5 Suggestions for Disassembly 5-21
7.6 Disassembling Input Shaft Subassembly 5-22
7.7 Suggestions for Disassembly 5-23
7.8 Disassembling Countershaft Subassembly 5-25
7.9 Suggestions for Disassembly 5-25
8. Inspection and Repair 5-26
8.1 Oil Pump 5-26
8.2 Stator Shaft 5-26
8.3 Friction Plate and Mating Plate 5-26
8.4 Input Shaft and Countershaft Clutch Drum 5-27
8.5 Input Shaft and Countershaft 5-28
8.6 Gears 5-28
8.7 Magnetic Strainer Assembly 5-28
8.8 Oil Seals of Transmission Cover and Torque Converter Case 5-28
9. Assembly 5-29
9.1 Input Shaft Subassembly (Countershaft Subassembly) 5-29
9.2 Suggestions for Assembly 5-30
9.3 Stator Shaft and Oil Pump 5-31
9.4 Suggestions for Assembly 5-32
9.5 Input Shaft, Countershaft, Output Shaft, and Transmission Cover 5-33
9.6 Suggestions for Assembly 5-34
9.7 Control Valve and External Parts 5-35
9.8 Disassembling Control Valve 5-36
9.9 Suggestions for Disassembly 5-37
9.10 Inspection and Repair 5-37
9.11 Assembly 5-38
9.12 Disassembling Main Regulator Valve 5-39
9.13 Inspecting and Correcting Main Regulator Valve 5-39

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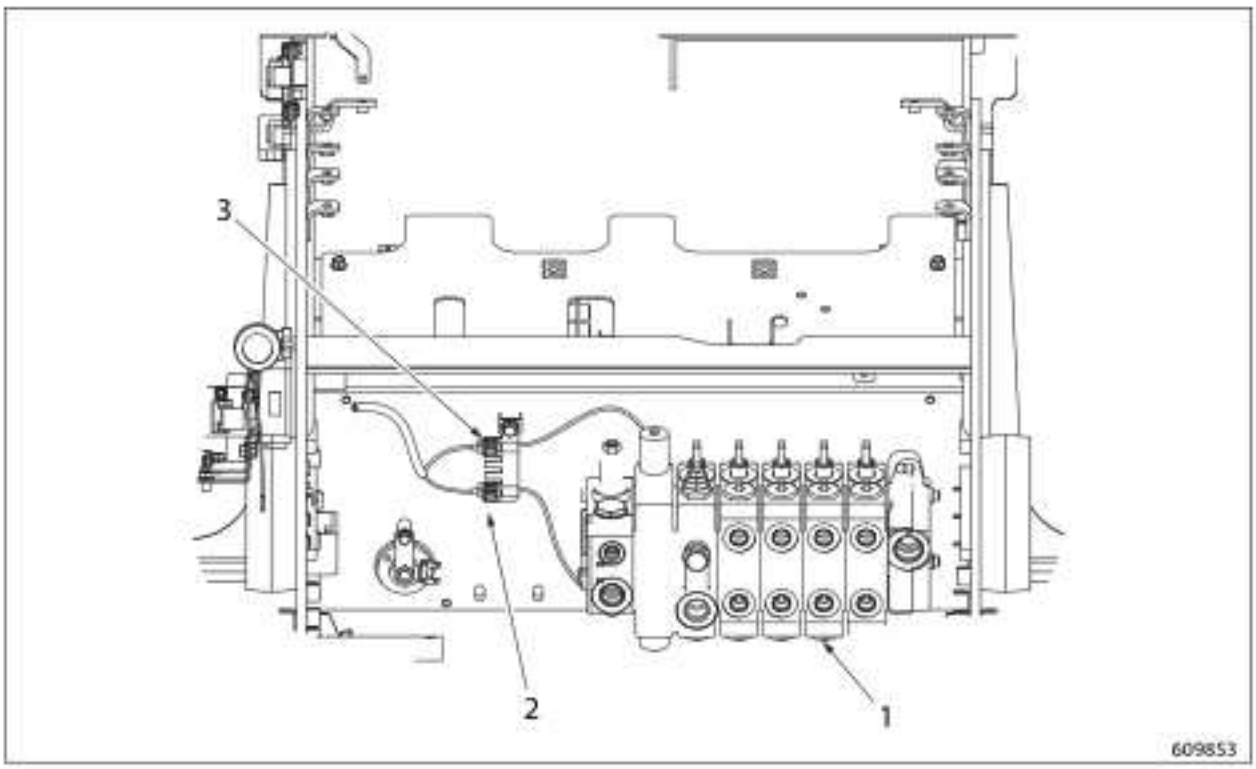
1.1 Electrical Components and Wiring Diagram of Each Component

Console box



1. Seat belt warning icon
2. Mast interlock indicator icon
3. Driving interlock indicator and neutral indicator icon
4. Direction (FNR) lever
5. Light switch and turn signal lever
6. Meter panel

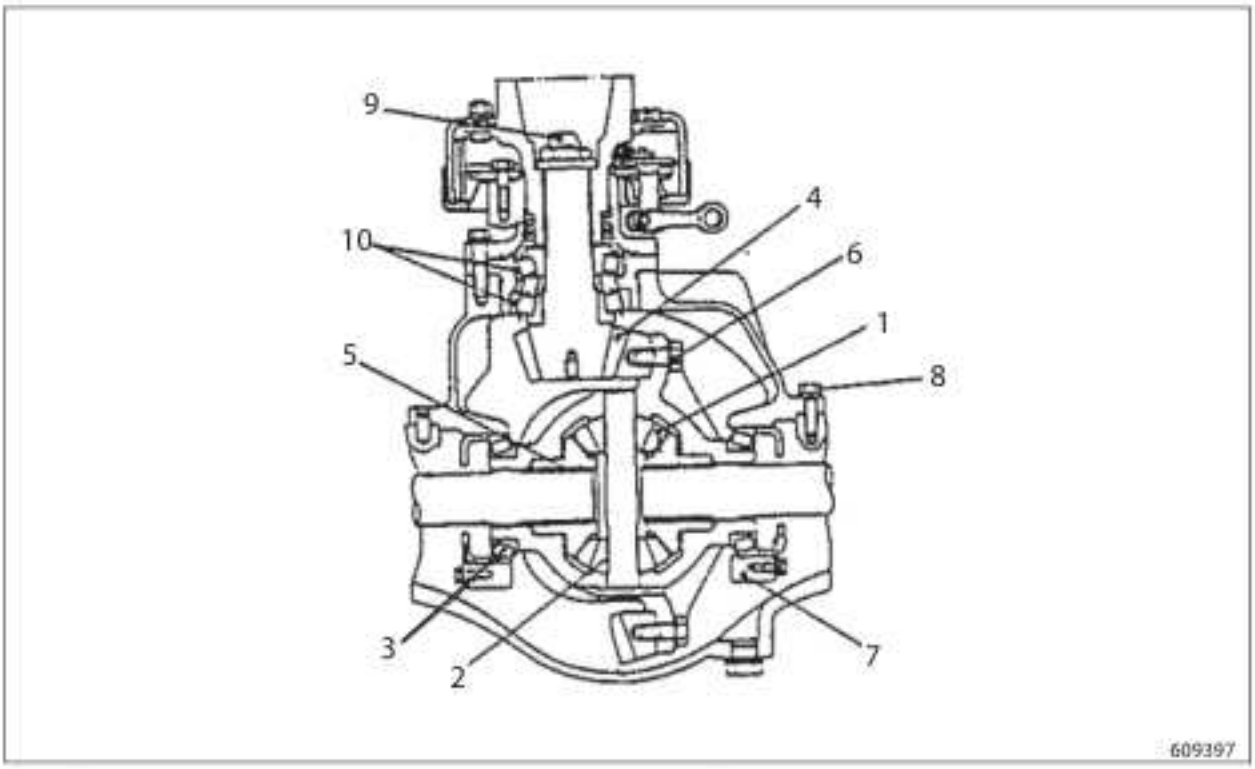
Control valve



1. Control valve
2. Lift lock harness
3. Unload harness

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14.2 Reduction Differential



Ref.	Item		Specification
1	Differential gear backlash	Standard	0.1 to 0.3 mm (0.004 to 0.012 in.)
		Limit	0.5 mm (0.020 in.)
2	Clearance between differential pinion and pinion shaft	Standard	0.02 to 0.07 mm (0.0008 to 0.0028 in.)
		Limit	0.35 mm (0.0138 in.)
3	Preload of differential case side bearing (tangential force on reduction gear periphery)	Standard	2.2 to 3.1 N-m (0.22 to 0.32 kgf-m) [1.623 to 2.286 lbf-ft]
		Standard	15.4 to 21.6 N (1.57 to 2.20 kgf) [3.462 to 4.856 lbf]
4	Backlash between reduction bevel gear and reduction bevel pinion	Standard	0.20 to 0.28 mm (0.0079 to 0.0110 in.)
5	Looseness of axle shaft spline	Standard	0.5 mm (0.020 in.)
6	Reduction bevel gear mounting bolt	Tightening torque	177 to 205 N-m (18.1 to 20.9 kgf-m) [130.54 to 151.20 lbf-ft] (Apply thread locker)
7	Side bearing cap bolt	Tightening torque	145 to 179 N-m (14.8 to 18.3 kgf-m) [106.95 to 132.02 lbf-ft]
8	Differential carrier mounting bolt	Tightening torque	141 to 173 N-m (14.4 to 17.6 kgf-m) [104.00 to 127.60 lbf-ft] (Apply thread locker on mounting face)
9	Input flange mounting bolt	Tightening torque	196 to 294 N-m (20.0 to 30.0 kgf-m) [144.56 to 216.84 lbf-ft]
10	Preload of reduction bevel pinion bearing (Tangential force on bearing retainer periphery)	Standard	2.0 to 2.9 N-m (0.20 to 0.30 kgf-m) [1.475 to 2.139 lbf-ft]
		Standard	24.5 to 37.2 N (2.50 to 3.79 kgf) [249.83 to 379.33 lbf]

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24. Troubleshooting

Hydraulic tank

Condition	Possible cause	Action
Hydraulic tank heats excessively	Not enough oil	Add
	Oil viscosity is improper	See Chapter "SERVICE DATA" and replace
	Overloaded due to harsh operating conditions	Check the working conditions, and if overloaded, urge the operator to stay within the load limit
	Line is clogged, which generates a restriction to oil line flow and causes local overheating	Oil line cleaning
	Relief valve is improperly adjusted	Set pressure adjustment
	Gear pump is worn	Pump replacement
	Clogs due to flattened outlet pipe or tube, etc.	Repair or replace
	Clogged oil cooler	Clean
Cylinders move too slow	Shortage of oil due to a natural loss	See Chapter "SERVICE DATA" and replace
	Oil leaks due to damaged oil line, seals, etc.	Repair or replace
	Oil viscosity is too high	See Chapter "SERVICE DATA" and replace

Gear pump

Condition	Possible cause	Action
Cylinders move too slow	Gear pump does not suck oil	Inspecting, repairing, or replacing pump and piping
	Oil leaks from hydraulic line	Check the oil level and contamination Add or change oil if necessary
	Oil level rises to an abnormal high level	Check control valve spools for misalignment Repair or replace
	Gear pump internal leaks	Pump replacement
Pump is too noisy	Poor pumping of oil	See Chapter "SERVICE DATA" and replace
	Cavitation	- Check suction pipe for any flat portions or loose connections. Retighten or replace if necessary - Check shaft oil seal for air-tightness. Replace pump - Check pump body for any outside interference, repair
Pump case, drive gear or pump port flange is damaged	Pressure exceeds the rating	Pump replacement
	Distortion or damage due to external strain or stress	- Check if return line has been blocked or excessively restricted - Check if pipe connection has been externally strained or stressed

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