CAT® Lift Trucks

Service Manual

MC/FC

Chassis, Mast & Options

EP16N	ETB15-20011-up
EP18N	ETB15-70001-up
EP20CN	ETB17-20011-up

For use with EP16N-EP20CN
Controller Service Manual.

99759-67110

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GENERAL INFORMATION

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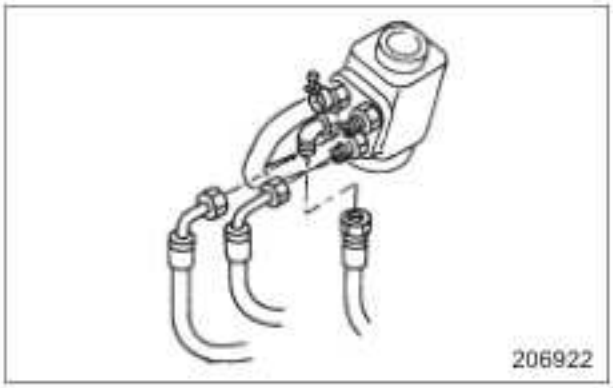
Technical Data

Truck Models				EP16N	EP18N	EP20CN
Class				1.6 ton	1.8 ton	2.0 ton
Load Capacity/Load Center			N (kgf)/mm [lbf/in.]	15690 (1600)/500 [3530/20]	17650 (1800)/500 [3970/20]	19610 (2000)/500 [4410/20]
Truck size	Length to Fork Face	A	mm (in.)	2074 (81.7)	2074 (81.7)	2188 (86.1)
	Width	B	mm (in.)	1070 (42.1)	1070 (42.1)	1130 (44.5)
	Height of Overhead Guard	C	mm (in.)	2048 (80.6)	2048 (80.6)	2048 (80.6)
Wheelbase		D	mm (in.)	1360 (53.5)	1360 (53.5)	1463 (57.6)
Truck weight, without load/ including battery			kg (lb)	3190 (7033)	3280 (7231)	3470 (7650)
Tread Front/Rear		E/F	mm (in.)	913/898 (35.9/35.4)	913/898 (35.9/35.4)	935/898 (36.8/35.4)
Tires Size	Front			18 x 7-8	18 x 7-8	200/50-10
	Rear			16 x 6-8	16 x 6-8	16 x 6-8
Turning Radius			mm (in.)	1810 (71.3)	1810 (71.3)	1910 (75.2)
Travel Speeds Unloaded/Loaded			km/h (mph)	17/17 (10.6/10.6)	17/17 (10.6/10.6)	17/17 (10.6/10.6)
Maximum Gradeability Unloaded/Loaded			%	35/27	35/25	35/24
Lift Speeds Unloaded/Loaded			m (in.)/sec	0.60/0.50 (23.6/19.7)	0.60/0.44 (23.6/17.3)	0.60/0.40 (23.6/15.7)
Lowering Speed Unloaded/Loaded			m (in.)/sec	0.5/0.52 (19.7/20.5)	0.5/0.52 (19.7/20.5)	0.5/0.52 (19.7/20.5)
Battery Voltage			V	48	48	48
Battery Rated Capacity (5 hrs.) MAX			Ah	600	600	720
Battery Compartment Size			mm (in.)	1006 x 521 x 650 (39.6 x 20.5 x 25.6)	1006 x 521 x 650 (39.6 x 20.5 x 25.6)	1006 x 624 x 650 (39.6 x 24.6 x 25.6)
Battery Weight			kg (lb)	865 (1907)	865 (1907)	1000 (2205)
Tilt Angle (forwards-backwards)				6°-7°	6°-7°	6°-7°
Traction Motor, 60 min rating			kW	2 x 5.0	2 x 5.0	2 x 5.0
Hydraulic Motor (15% duty)			kW	14	14	14
Traction Motor Control Method				MOSFET	MOSFET	MOSFET
Hydraulic Motor Control Method				MOSFET	MOSFET	MOSFET

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5. Removing steering hoses

   Disconnect the steering hoses and pipes at the connectors.

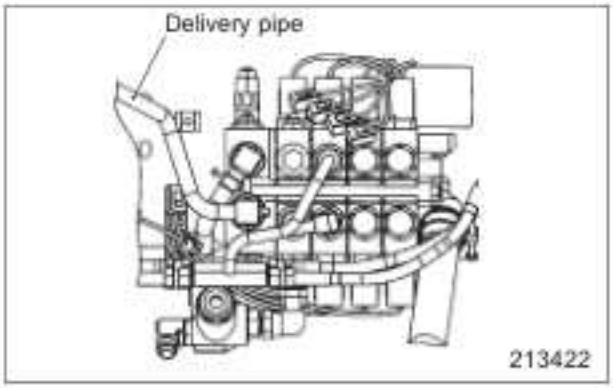


6. Removing delivery pipe and drive motor harness

   (1) Remove the drive motor harness at the connector.

   Disconnect the harnesses of the thermal and speed sensors located on the right and left sides.

   (2) The harnesses are secured to the delivery pipe with clamps. Loosen the clamps, and remove the delivery pipe.



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Control Valve

Problem	Possible cause	Remedy
Pump pressure does not increase.	1. Sticking of shuttle in proportional electromagnetic valve or plunger in proportional solenoid	Disassemble and clean. Proportional solenoid cannot be disassembled. If plunger in proportional solenoid is sticking, replace solenoid.
	2. Open circuit in lead wire or solenoid coil	Repair or replace.
	3. Low input current to solenoid	Check to make sure specified maximum current is supplied.
	4. Sticking of spool in flow priority valve	Disassemble and clean.
Spool sticks.	1. Abnormally high oil temperature flow in pipe	Remove the cause that is reducing fluid.
	2. Dirty hydraulic fluid	Replace hydraulic fluid and clean hydraulic circuits.
	3. Overtightened pipe port joint	Check tightening torque.
	4. Improper valve housing installation	Loosen mounting bolts, and check valve housing installation.
	5. Excessively high pressure	Install pressure gauge on inlet and cylinder circuit, and check pressure.
	6. Foreign particles stuck on spring seat	Disassemble and clean.
	7. Bent spool	Replace valve assembly.
	8. Sticking of shuttle in proportional electromagnetic valve or plunger in proportional solenoid	Disassemble and clean. Proportional solenoid cannot be disassembled. If plunger in proportional solenoid is sticking, replace solenoid.
	9. Uneven temperature distribution inside valve	Warm up entire hydraulic circuits.
Load cannot be maintained.	1. Oil leaks from cylinder	Check cylinders.
	2. Oil bypassing valve spool	Replace valve.
	3. Leaks from overload relief valve or shut-off valve	Remove and clean overload relief valve or shut-off valve (housing and relief valve seat section).
Load drops when spool is switched from neutral to lift.	1. Foreign particles stuck on load check valve.	Disassemble and clean.
Oil leaks from oil seal.	1. Paint adhesion on seal	Remove and clean seal.
	2. High back pressure in return circuit of valve	Check filter in return circuit for clogs, or check foreign particles stuck in return pipe.
	3. Foreign particles stuck on seal	Remove and clean seal.
	4. Loose cap	Clean cap and tighten cap bolts.
	5. Rips or scratches on seal	Replace seal.

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