CAT® Lift Trucks

Service Manual

Chassis, Mast & Options

EP20K	ETB8B-00011-up
EP25K	ETB8B-50001-up
EP30K	ETB9B-00011-up
EP35K	ETB9B-50001-up

For use with EP20K-EP35K Controller Service Manual.

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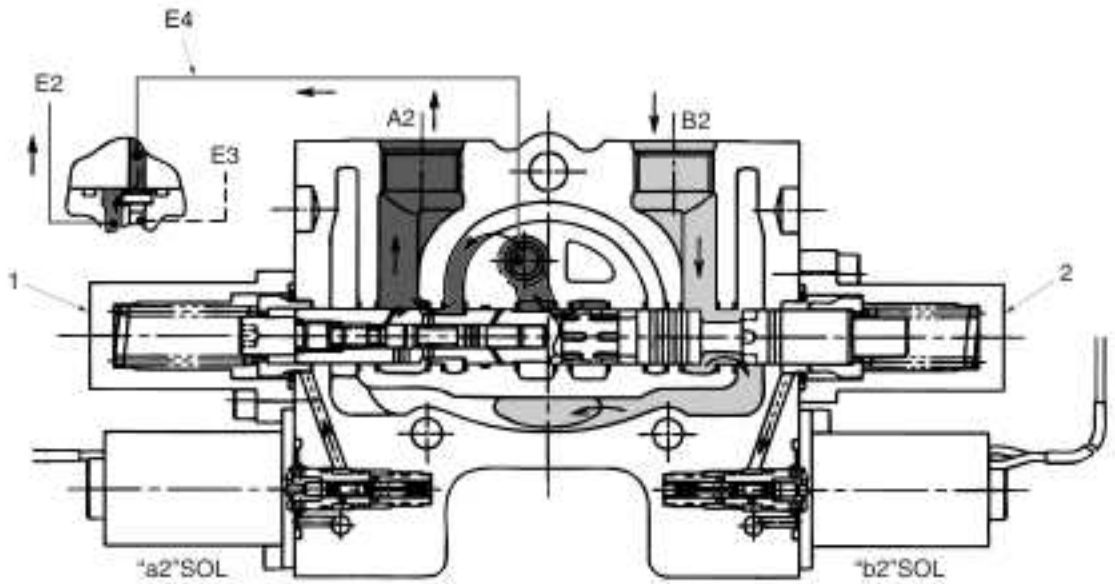
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GENERAL INFORMATION

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Tilt section



"a2" Solenoid Operation in Spool Switching (Tilt Backward)

To facilitate understanding of the following description, also refer to the hydraulic system schematic diagram for the "tilt backward" state (drawing No. 207457A) on page 9-79.

Activation of the proportional electromagnetic pressure control valve on the "a2" SOL side results in the generation of pilot pressure in cap 1, which exceeds the force of spring in cap 2 and pushes the spool to the right.

Oil from the control channel lifts the load check valve and flows through cylinder port A2 to the rod side of the tilt cylinder. At the same time, oil flows to the high-pressure selector through oil passage E4.

Oil at the bottom side flows to the low-pressure channel through cylinder port B2.

Since no pressure is fed to the damper chamber, the tilt lock valve is pressed to the right by the spring.

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Troubleshooting

Lift bracket, inner masts and middle masts do not rise or lower smoothly.	Faulty rotation of rollers	Apply grease or replace rollers.
	Improper mast strip clearance	Adjust with shims.
	Improper main roller or side roller clearance	Adjust front-to-back and right-to-left clearances.
Lift bracket or inner masts are lopsided.	Uneven chain tension between right and left chains	Adjust chain tension.
	Excessive side roller clearance	Adjust by adding shims.
	Uneven adjustment of shims between right and left lift cylinders (at maximum lift position)	Adjust by removing shims.
	Lift bracket retaining stopper in contact	Adjust chain tension.
Masts generate abnormal noise.	Faulty rotation of rollers	Apply grease or replace rollers.
	Defective hose pulley bearing (for triple-stage full free panoramic mast system only)	Replace.
Lift cylinders descent due to leaks.	Damaged gaskets in lift cylinders	Replace.
	Internal leak of control valve	Replace.
Entire masts shake.	Worn mast support bushings and caps	Retighten, or replace bushings and caps.
Masts are deformed in shape.	Uneven cargo load or overload	Replace assembly.
Uneven fork end heights	Bent finger bars	Repair or replace.
	Bent forks	Replace.
	Mast deformation due to uneven cargo load	Repair or replace.
Second lift cylinders move when first lift cylinder operates. (triple-stage full free panoramic mast system)	Low oil temperature	Increase oil temperature by raising and lowering lift bracket.
	No clearance for lift bracket roller surfaces	Readjust rollers.
	Clogged pipes	Inspect and clean hydraulic line.
	Improper air bleeding	Bleed hydraulic system.
Spongy operation of fall-prevention function when lifting operation is stopped.	Improper air bleeding	Bleed hydraulic system.

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Lubricant Quantities

Items \ Truck Models		2 ton class, 2.5 ton class	3 ton class, 3.5 ton class
Transfer oil capacity	liter (U.S.gal)	8.5 (2.25)	
Hydraulic system oil capacity	liter (U.S.gal)	N level: 28.2 (7.45) H level: 30.0 (7.93)	
Brake fluid capacity	cc (cu. in.)	99 (6.04)	

Recommended Lubricants and Brake Fluid

Lubricants/brake fluid		Specification	Recommendation for ambient temperatures, °C (°F) -30 (-22) -20 (-4) -10 (14) 0 (32) 10 (50) 20 (68) 30 (86)
Transfer and differential oil		API service classification CD	SAE 10W
Hydraulic oil			SAE 5W / SAE 10W
Brake fluid		F.M.V.S.S. No. 116 — DOT3 or DOT4 (SAE J1703)	
Grease	Wheel bearings	NLGI. No. 2 grade multipurpose type (lithium base), consistency: 265 to 295	
	Chassis	NLGI. No. 1 grade multipurpose type (lithium base), consistency: 310 to 340	

NOTICE: Avoid mixing lubricants. In some cases, different brands of lubricants are not compatible with each other and deteriorate when mixed. It is best to stick with the same brand at successive service intervals.

NOTICE: For lubricants for the steering actuator and steering gear, consult your Cat Lift Truck Dealer.

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