



Service Manual

Chassis & Mast

EC15K, EC18K, EC18KL

A3EC1-10200-up

A3EC1-20200-up

A3EC1-30200-up

A3EC2-40200-up

EC20K, EC25K

A3EC2-10200-up

A3EC2-20200-up

A3EC2-30200-up

A3EC2-40200-up

A3EC2-80200-up

EC25KE, EC25KL, EC30K

A3EC3-10200-up

A3EC3-20200-up

A3EC3-30200-up

A3EC3-40200-up

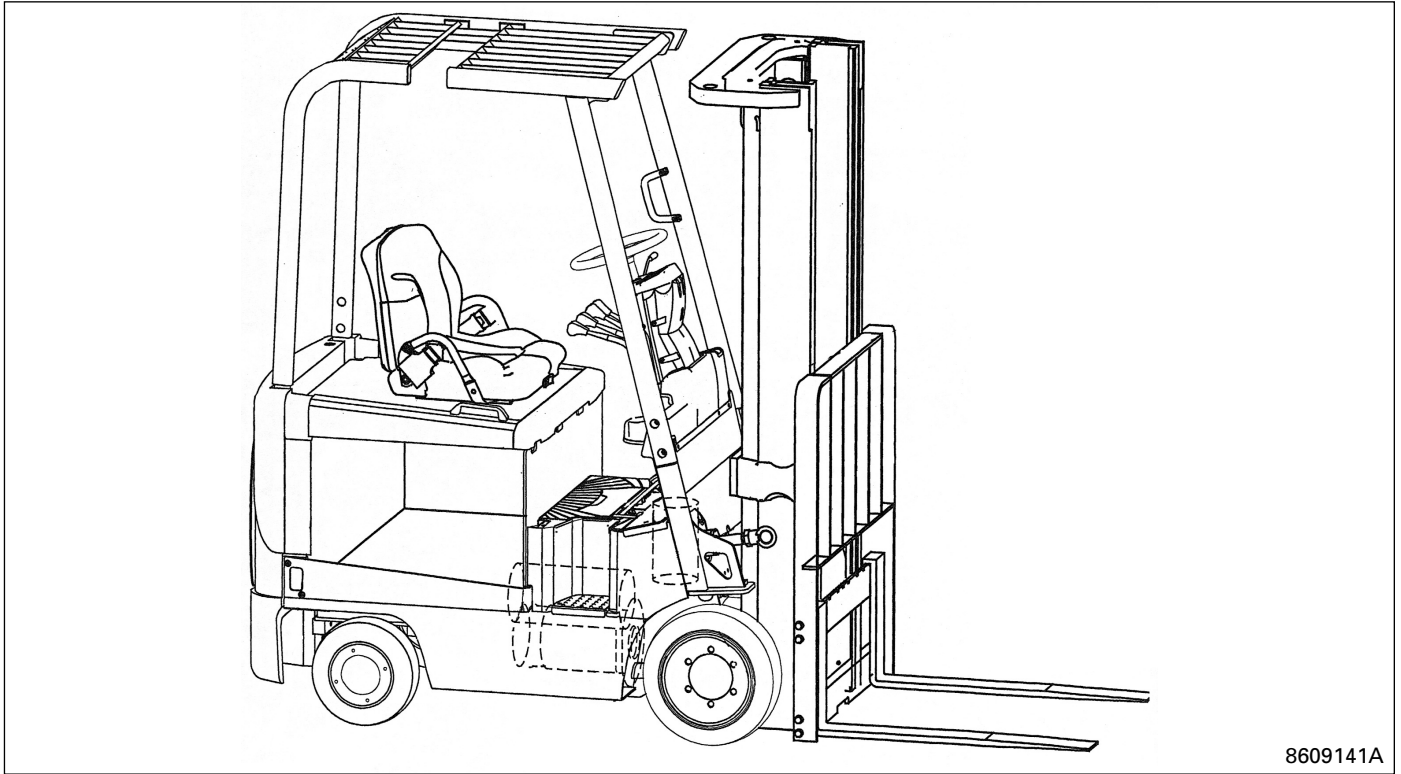
A3EC3-80200-up

EC30KL

A3EC4-40200-up

Scope

This service manual deals with all components or systems of the Cat lift trucks, except for the electrical system, which is covered in a separate manual.



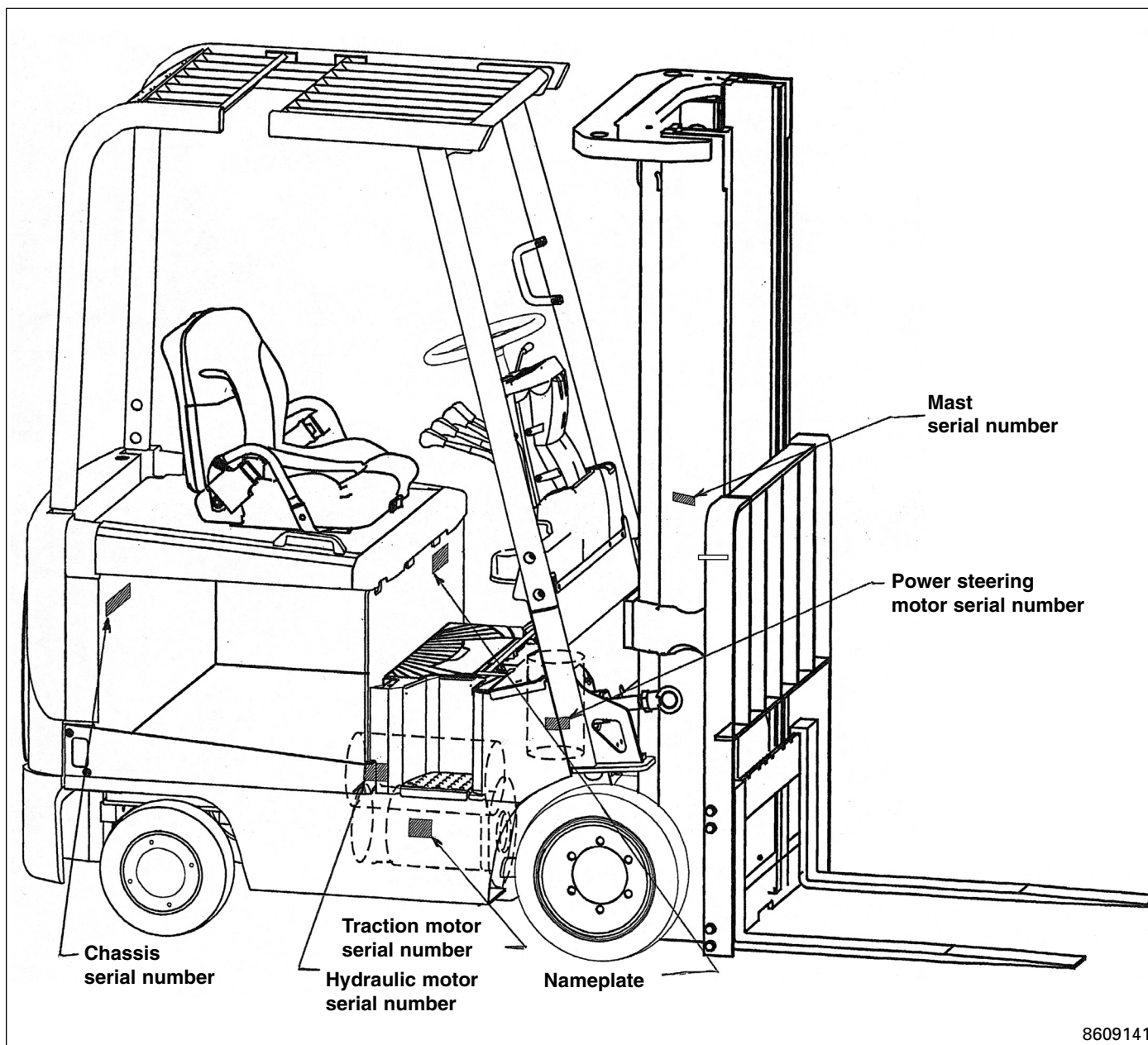
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Truck Models Covered

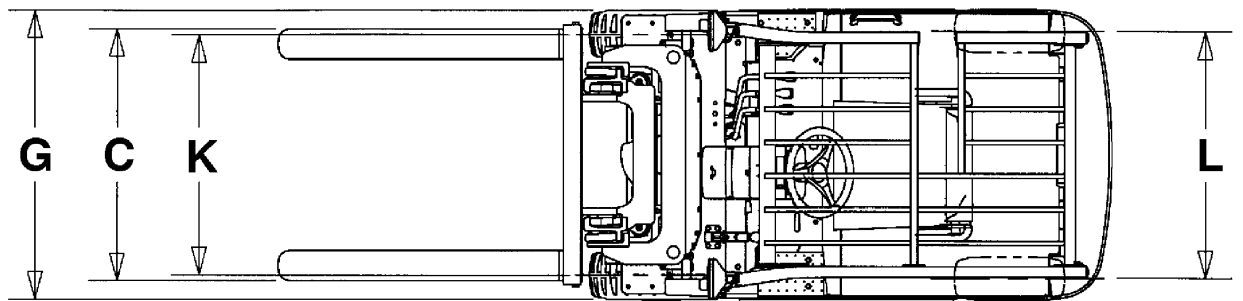
This service manual furnishes service and maintenance information for the following trucks.

Truck Model	Serial Number
EC15K, EC18K, EC18KL	A3EC1-10200-up
	A3EC1-20200-up
	A3EC1-30200-up
	A3EC2-40200-up
EC20K, EC25K	A3EC2-10200-up
	A3EC2-20200-up
	A3EC2-30200-up
	A3EC2-40200-up
	A3EC2-80200-up
EC25KE, EC25KL, EC30K	A3EC3-10200-up
	A3EC3-20200-up
	A3EC3-30200-up
	A3EC3-40200-up
	A3EC3-80200-up
EC30KL	A3EC4-40200-up

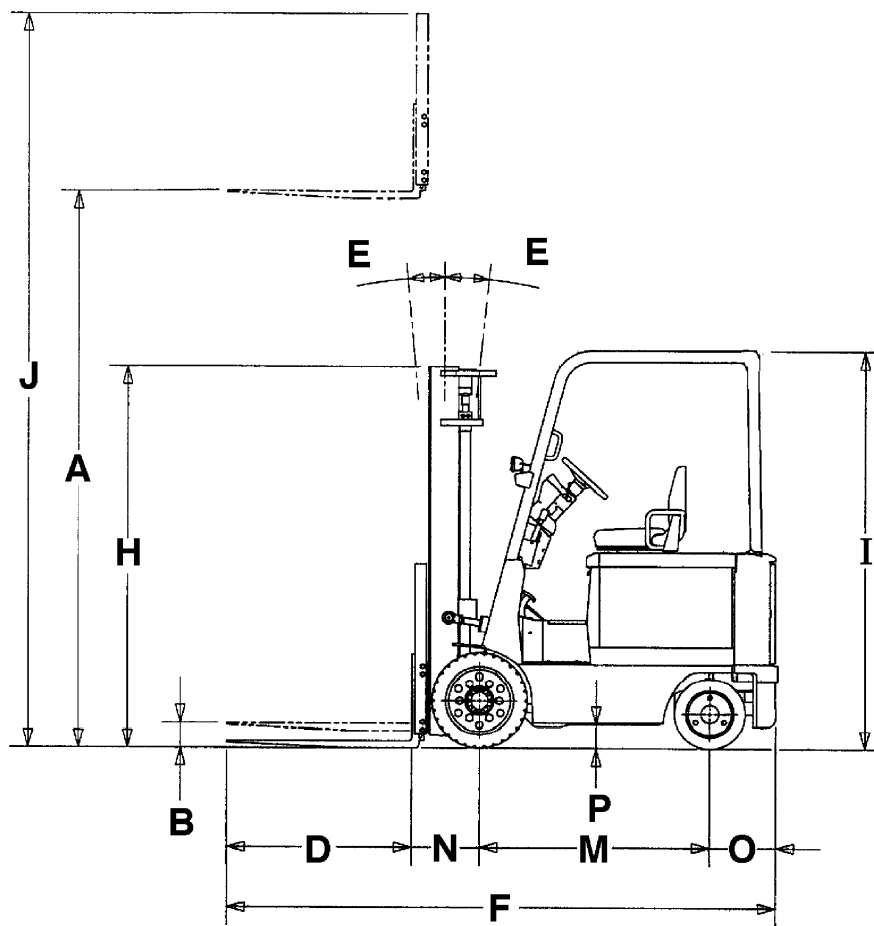
Nameplate and Serial Number Locations



Dimensions



8609142



8609143

GENERAL INFORMATION

Dimensions Chart

Ref#	Truck Model	EC15K, EC18K	EC18KL	EC20K, EC25K	EC25KE	EC25KL	EC30K	EC30KL
A	Maximum Lift	3320 (130)	3320 (130)	3340 (131)	3340 (131)	3340 (131)	3310 (130)	3215 (126)
B	Free Lift	115 (4.5)	115 (4.5)	130 (5.1)	130 (5.1)	130 (5.1)	135 (5.3)	135 (5.3)
C	Maximum Fork Spacing (outside to outside)1070	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)	818 (32.0)
D	Fork Length	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)	1070 (42)
E	Tilt Angle (forward/backward)	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°	5°/6°
F	Overall Length	3050 (120)	3123 (122.8)	3152 (124)	3252 (127.9)	3252 (127.9)	3325 (130.8)	3325 (130.8)
G	Overall Width (outside of tires)	945 (37.2)	970 (38.2)	1054 (41.5)	1054 (41.5)	1103 (43.4)	1103 (43.4)	1103 (43.4)
H	Overall Height (to top of mast, lowered)	2105 (83)	2105 (83)	2110 (83.5)	2110 (83.5)	2110 (83.5)	2110 (83.5)	2110 (83.5)
I	Overall Height (to top of overhead guard)	2180 (85.8)	2180 (85.8)	2207 (86.9)	2207 (86.9)	2207 (86.9)	2207 (86.9)	2207 (86.9)
J	Overall Height (to top of mast, extended)	4560 (180)	4560 (180)	4570 (180)	4570 (180)	4570 (180)	4540 (179)	4540 (179)
K	Tread (front)	793 (31.2)	818 (32.2)	875 (34.4)	875 (34.4)	900 (35.4)	900 (35.4)	900 (35.4)
L	Tread (rear)	826 (32.5)	826 (32.5)	897 (35.3)	897 (35.3)	897 (35.3)	897 (35.3)	897 (35.3)
M	Wheelbase	1170 (46.1)	1170 (46.1)	1280 (50.4)	1380 (54.3)	1380 (54.3)	1380 (54.3)	1380 (54.3)
N	Front Overhang	376 (14.8)	376 (14.8)	394 (15.5)	394 (15.5)	394 (15.5)	406 (15.9)	406 (15.9)
O	Rear Overhang	434 (17)	507 (19)	408 (16)	408 (16)	408 (16)	469 (18.4)	469 (18.4)
P	Underclearance (at center of wheelbase)	118 (4.6)	118 (4.6)	124 (4.9)	124 (4.9)	124 (4.9)	124 (4.9)	124 (4.9)

Unit: mm (in.)

General Information (Standard Models)

			Truck Model										
			Units	EC15K	EC18K	EC18KL	EC20K	EC25K	EC25KE	EC25KL	EC30K	EC30KL	
Standard Controller			GE SX Controller										
Standard Simplex Mast Size			meters	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	
Service Weight (standard axle)	Without Battery	kg (lb)	2095 (4620)	2335 (5140)	2595 (5720)	2685 (5920)	2870 (6330)	2695 (5940)	2865 (6320)	3335 (7353)	3502 (7721)		
	With Max. Battery		3298 (7270)	3534 (7790)	3797 (8370)	4296 (9470)	4482 (9880)	4509 (9940)	4681 (10320)	5150 (11353)	5317 (11722)		
Work Performance	Rated Capacity/ Load Center		kg/mm (lb/in.)	1500/500 (3000/24)	1800/500 (3500/24)	1800/500 (4000/24)	2000/500 (4000/24)	2500/500 (5000/24)	2500/500 (5000/24)	2500/600 (5000/24)	3000/500 (6000/24)	3500/500 (6500/29)	
	Maximum Fork Height		mm (in.)	3320 (130)			3340 (131)			3310 (130)	3215 (126)		
	Lift Speed (Rated Load)	36V	m/sec. (fph)	.24 (48)	.23 (45)	.34 (67)	.31 (61)	.28 (56)		.26 (51)	.23 (45)		
		48V		.34 (67)	.32 (64)	.47 (93)	.40 (78)	.38 (74)		.36 (70)	.31 (62)		
	Lowering Speed (rated load)			.50 (99)			.50 (98)						
	Tilt Angle (forward/backward)		degrees	5° / 6°									
Free Lift		mm (in.)	115 (4.5)			130 (5.1)			135 (5.3)				
Traveling Performance	Travel Speed (Without Load)	36V	km/h (mph)	12.9 (8.0)		14.3 (8.9)	11.6 (7.2)			11.1 (6.9)	10.8 (6.7)	13.2 (8.2)	
		48V		DNA		17.9 (11.1)	14.8 (9.2)			14.5 (9.0)	14.2 (8.8)	16.4 (10.2)	
	Minimum Turning Radius		mm (in.)	1790 (70.5)		1840 (72.5)	1890 (74.5)		1990 (78.5)		2045 (80.5)		
Power Train	Traction Motor Output	36V	60min.	8.2 (6.1)		9.6 (7.1)	8.3 (6.1)						
		48V	HP(kW)	DNA		13.4 (10.0)	11.7 (8.7)						
	Transfer Gear	Type		Spur									
		Ratio		3.538			3.067						
	Reduction Gear	Type		Bevel									
		Ratio		4.571			5.0						
	Differential	Axle Housing		Banjo									
		Gear Type/	Gears	Straight Bevel/2									
		Number	Pinions	Straight Bevel/2									

GENERAL INFORMATION

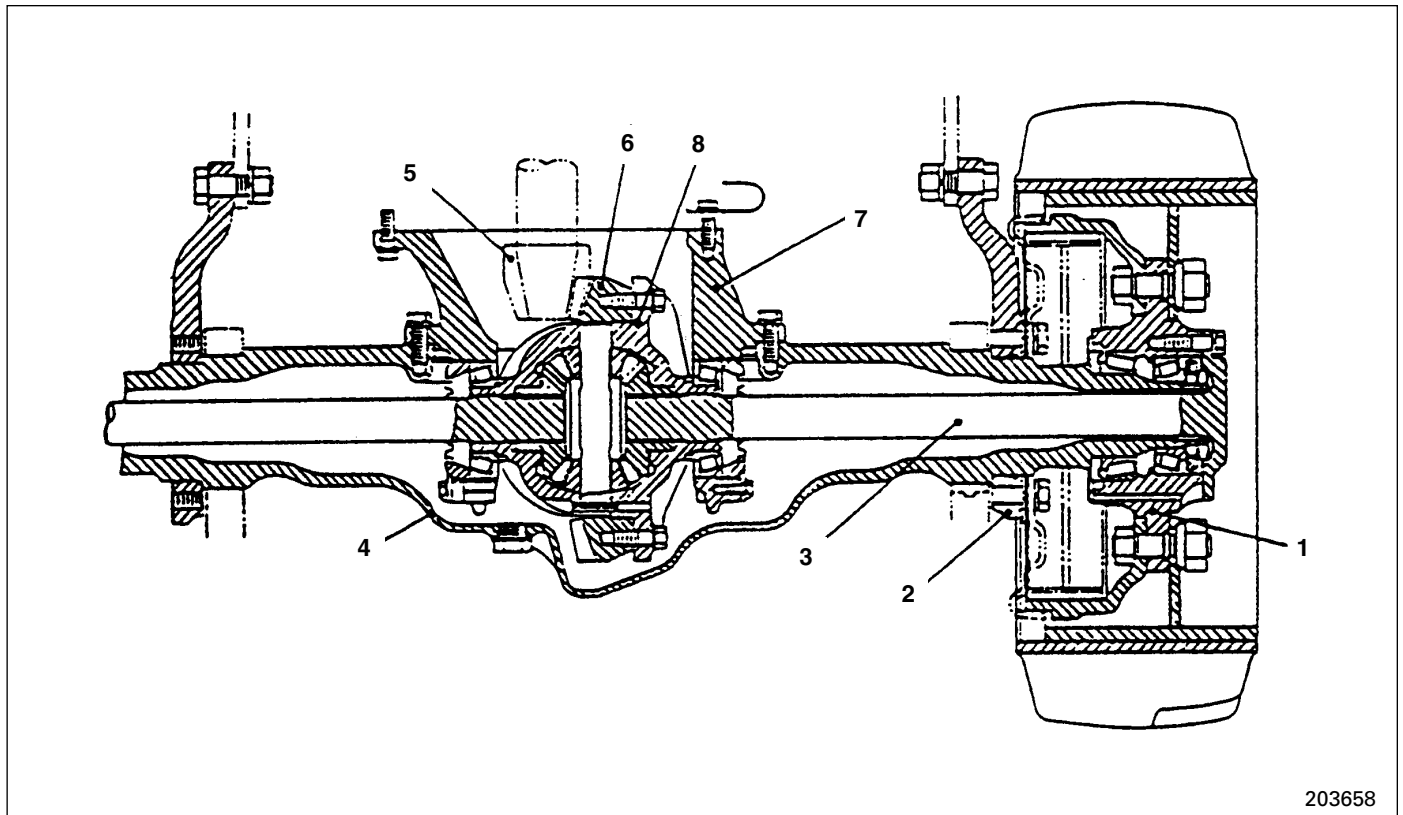
				Truck Model							
				Units	EC15K	EC18K	EC18KL	EC20K	EC25K	EC25KE	EC25KL
Power Steering System	Type			Dynamic Load Sense							
	Turning Angle	Inside	Degrees	83°		83°					
		Outside		54°		56°					
	Steering Wheel Diameter		mm (in.)	328 (13)							
	Cylinder Minimum Test Pressure		kgf/cm ² (psi) [kPa]	107 (1522) [10,500]		163 (2320) [16,000]					
Brake System	Service Brake	Type		Self-Adjusting Duo-Servo							
		Inside Drum Diameter	mm (in.)	254 + ₀ ^{0.13} (10.00 + ₀ ^{0.0051})							
		Lining Thickness	mm (in.)	4.87 (0.19)		6 (0.24)					
		Master Cylinder ID	mm (in.)	22.22 (0.8748)							
		Wheel Cylinder ID		22.22 (0.8748)		28.58 (1.1252)					
	Park Brake	Type		Mechanical, Mounted on Front Wheels							
		Lever Operating Effort	kgf (lbf) [N]	25 to 30 (55 to 66) [245 to 294]							
Traveling System	Mounting	Front Wheels		Fixed Type							
		Rear Wheels		Center Pivot Type							
	Wheel Alignment	Oscillation Angle	Degrees	3°							
		Camber		1°							

GENERAL INFORMATION

				Truck Model							
				Units	EC15K	EC18K	EC18KL	EC20K	EC25K	EC25KE	EC25KL
Hydraulic System	Hydraulic Pump	Type		Gear							
		Make		Parker Hydraulics, Inc.							
		Model		1PX230		1SX250	1PX290		1SX250		
		Displacement	cc (cu in.)	23.0 (1.403)/rev.		25.(1.526)	29(1.77)		25(1.526)		
		Make		Husco International							
	Control Valve	Model		5000CC Sectional Valve							
		Relief Pressure	kgf /cm ² (psi) [kPa]	263 (3750) [25855]							
		Flow Regulator Valve	Type		Variable						
	Regulated Flow Rate		liter (cu.in.) / min	48(2929)		59 (3600)				71(4332)	
	Lift Cylinders	ID	mm (in.)	45 (1.77)		50 (1.97)		55 (2.17)			
		Stroke		1650 (64.96)				1600 (62.99)			
	Tilt Cylinders	ID		63 (2.48)		70 (2.75)		80 (3.15)			
Stroke		79 (3.11)		81 (3.19)							
Hydraulic Tank Capacity liter (Approx)		1 (US gal.)	8 (4.8)		24 (6.3)		30 (7.9)				
Mast and Forks	Mast			Roller type CL							
	Mast Dimensions (Flange Inside Width x THK x WEB THK)	Outer	mm (in.)	100 x 15 x 12 (3.94 x 0.59 x 0.47)		115 x 20 x 13 4.53 x 0.79 x 0.51)		115 x 21 x 13 (4.53 x 0.83 x 0.51)			
		Inner		100 x 17 x 12 (3.94 x 0.67 x 0.47)		115 x 20 x 13 (4.53 x 0.83 x 0.51)					
	Main Rollers	Type		#6308 Ball Bearing		#6309 Ball Bearing					
		Diameter x Width		100 x 30 (3.94 x 1.18)		115 x 35 (4.53 x 1.58)		100 x 30 (3.94 x 1.18)			
	Side Rollers	Type		Lubricating type needle roller bearing							
		Diameter x Width	mm (in.)	42 x 36 (1.65 x 1.42)							
	Lift Chains			BL534		BL634		BL834			
	Forks (Lgth x Wdth x Thk)		mm (in.)	1070x100x35 (36x4x1.3)		1070 x100 x40 (42 x 3.9 x 1.6)		1070 x 125 x 45 (42 x 5 x 1.8)			
	Fork Spacing (out to out) min/max			240 / 818 (9.4/32)		284 / 958 (11.2/37.7)					
Battery	Voltage			36/48	36/48	36/48	36/48	36/48	36/48	36/48	
	Amp Hours (6 hr. rate)		36V	900		1300		1300			
			48V	700		800		1000			
	Compartment Dimensions	Height-Center	mm (in.)	598 (23.6)							
		Height-Edges		592 (23.3)							
		Length		708 (27.9)		775 (30.5)		875 (34.4)			
		Width		906 (35.6)		1003 (39.5)					
	Weight (Min/Max)		kg (lb)	750/1200 (1650/2650)		1000/1600 (2200/3550)		1315/1600 (2900/3550)		1400/1800 (3100/4000)	

Front Axle

Description



203658

- | | |
|--------------------|-------------------------|
| 1. Front wheel hub | 5. Reduction pinion |
| 2. Frame support | 6. Reduction gear |
| 3. Axle shaft | 7. Differential case |
| 4. Axle housing | 8. Differential carrier |

General Information

The frame supports hold the front axle housing in such a manner as to allow a limited amount of rotary motion of the housing, the rotary sliding surfaces being lubricated with grease.

The cushion tire is press-fitted to the outer ring of the wheel hub.

FRONT AXLE: REMOVAL & INSTALLATION

Removal

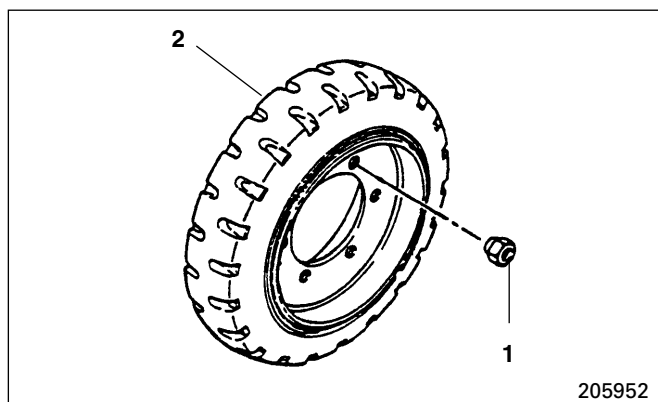
Front Wheels



WARNING

Be sure to use the same size and brand tire for replacement.

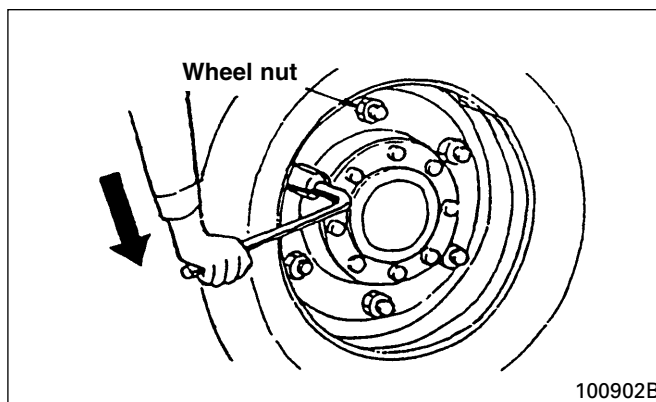
Removal Sequence



1. Wheel Nuts
2. Front Wheel

Suggestions

1. Park the truck on level floor with the parking brake applied, the direction lever in neutral, the forks lowered, and the key switch off.
2. Prepare tools, jacks, and wheel blocks.
3. Block the rear wheels.
4. Loosen the wheel nuts about two turns.



NOTE

Loosen, but do not remove, the wheel nuts.

5. Raise the front end of the truck. Use one of the methods shown.



WARNING

To prevent possible injury, do not replace the tire when the truck is loaded.

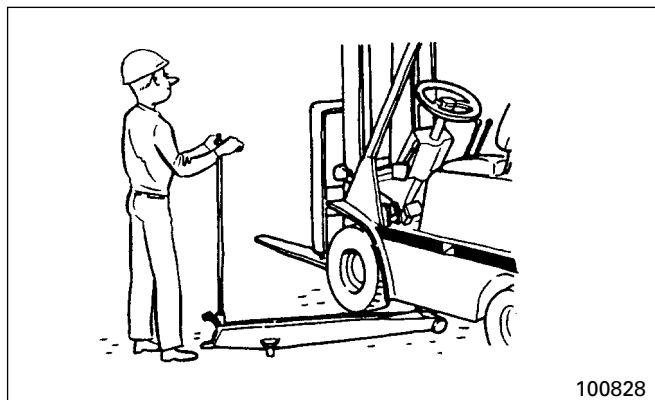
Dismount the truck before raising the front tire.

To prevent possible personal injury, raise the truck only until the tire just clears the ground.

Do not put any portion of your body under the truck. Securely support the truck on blocks after raising it.

Method 1

Position the jack under the frame and raise the truck until the tire clears the floor.



Jack Capacities

EC15K - 18KL	3000 kgf (6700 lbf)
EC20K - 30KL	5000 kgf (12,000 lbf)

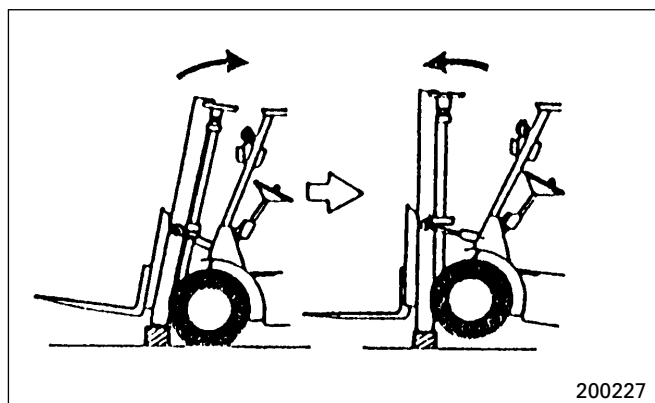
Method 2

Tilt the mast all the way back, place wood blocks under the mast, and tilt the mast forward.



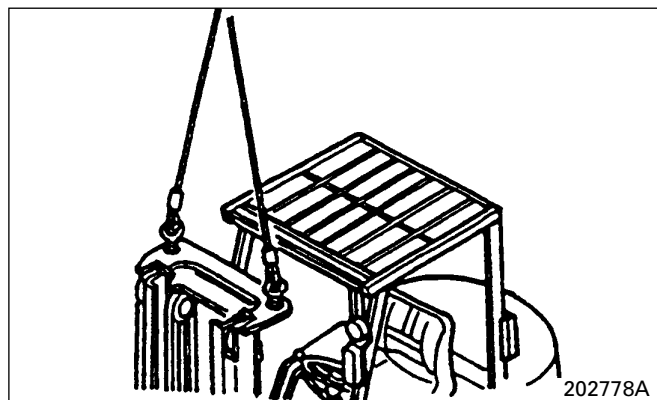
CAUTION

After raising the front end, securely support it by blocks.



Method 3

Fasten a hoist to the mast and lift the front end of the truck as shown.



6. Remove the wheel nuts (loosened in Step 4.)



CAUTION

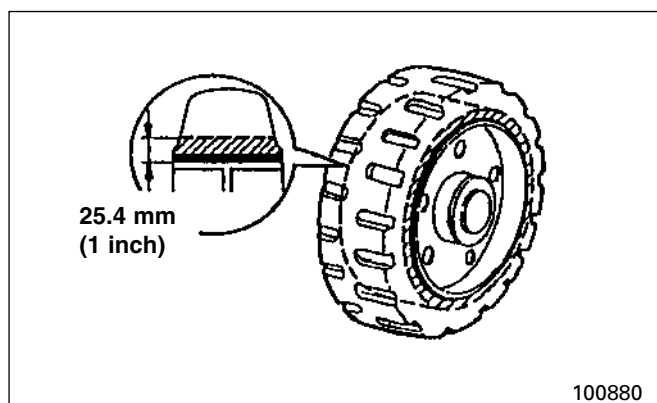
Be careful not to damage the bolt threads when removing the wheel.

7. Remove the wheel.

NOTE

Service Limit For Cushion Tires

Replace the tire if the height of the solid rubber portion is 25.4 mm (1 in. or less). For tire replacement, consult your Cat lift dealer.



FRONT AXLE: REMOVAL & INSTALLATION

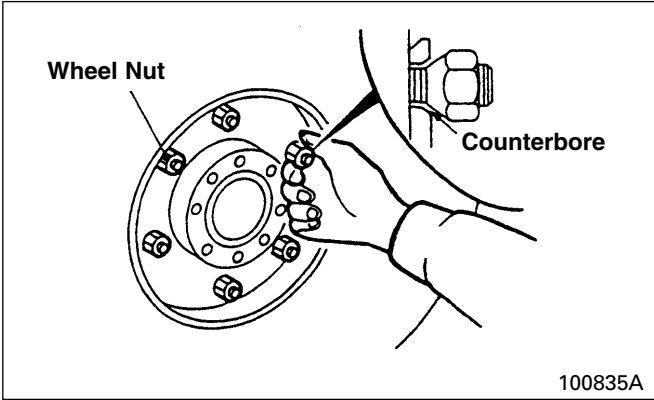
Installation

To install, reverse the removal sequence and do the following steps.

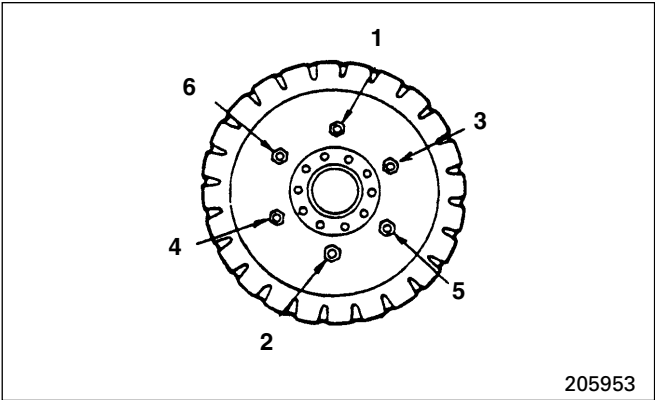


Use the same size and brand of tire.
Make sure the clamping surfaces of the wheel nuts and counterbores in the rim are free of dirt.

- 1. Install the tire and tighten the wheel nuts. Tighten each nut until its tapered portion is in full-face contact with the counterbore in the rim.



- 2. Lower the truck until the tire touches the floor. Then tighten the wheel nuts in numbered sequence shown below, in two or three steps, to the specified torque.



Tightening Torque For Wheel Nuts	
EC15K - 18KL	EC20K - 30KL
16 kgf•m	38.5 kgf•m
(116 lbf•ft)	(278 lbf•ft)
[157 N•m]	[378 N•m]

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