

KOMATSU

SHOP MANUAL

ELECTRIC REACH TRUCK

AR50 Series

FB10RL(F)/13RL(F)/15RL(F)/18RL(F)-14
FB10RW/13RW/15RW-14

M245-140001 and up
M245-140001 and up

KOMATSU FORKLIFT

PRECAUTIONS WHEN PERFORMING THE SERVICE WORK

Always pay attention to “Safety” before starting any work — this is important.

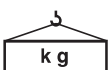
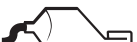
Never attempt any work where danger to yourself or to other persons.

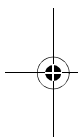
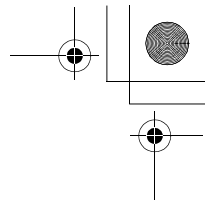
Whenever work requiring safety precautions are described in this manual, a flag mark  inserted, always make double sure that safety measures are taken.

Other unmarked work, should always be performed after studying and using your common sense to prevent accidents.

DESCRIPTION OF THE SYMBOLS

The symbols described below are used in this manual for convenience and better understanding.

Symbol	Item	Description
	Safety	Special safety precautions are needed to perform the work.
	Note	Special technical precautions are needed to perform the work
	Tightening torque	Fastening parts that require specified tightening force when assembling.
	Weight	Weight of parts or systems
	Coat	Places to be coated with adhesives, etc. when assembling
	Filling	Oil filling and its amount



SECTION INDEX

00. FOREWORD

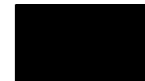
10. GENERAL AND SPECIFICATIONS



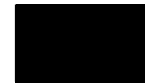
20. TESTING AND ADJUSTING



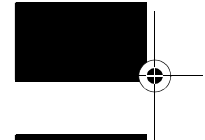
30. REMOVAL AND INSTALLATION



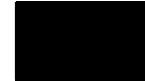
40. DISASSEMBLY AND ASSEMBLY



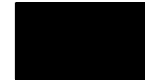
50. MAINTENANCE STANDARD



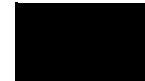
60. STRUCTURE AND FUNCTION



70. TROUBLESHOOTING

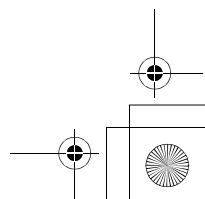
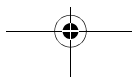
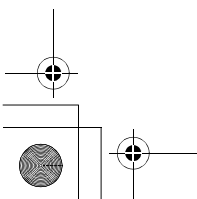


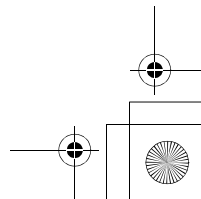
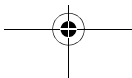
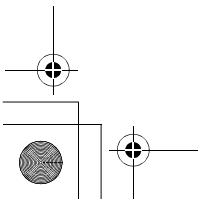
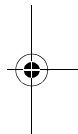
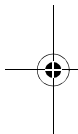
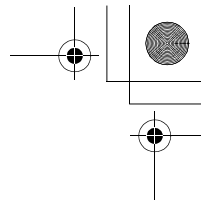
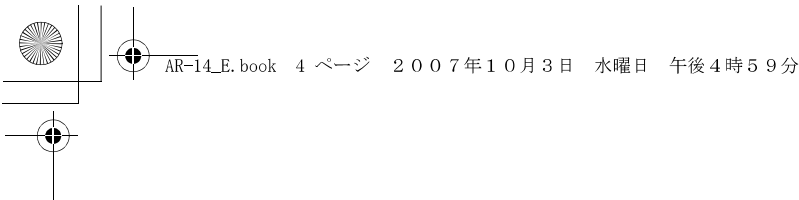
80. YEARLY INSPECTION CRITERIA

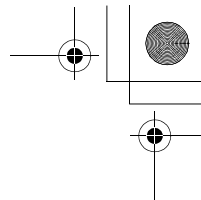
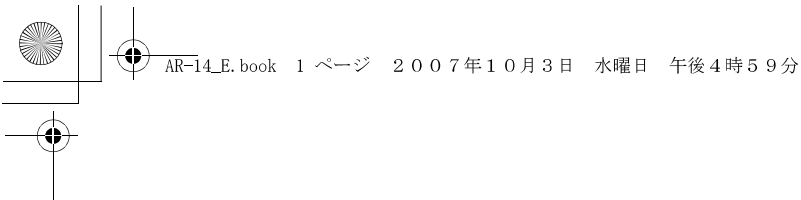


90. CONVERSION TABLE

APPENDIX

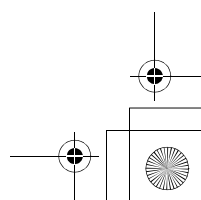
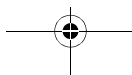
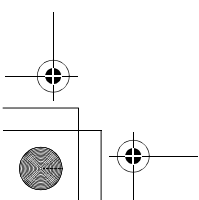
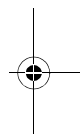
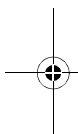






10. GENERAL AND SPECIFICATIONS

SPECIFICATION.....	10-2
SAFETY ITEMS FOR MAINTENANCE	10-7
STANDARD TIGHTENING TORQUE FOR BOLTS.....	10-14
STANDARD TIGHTENING TORQUE FOR PIPE JOINTS	10-15
HOW TO USE LOCTITE.....	10-16



SPECIFICATION

GENERAL AND SPECIFICATIONS

SPECIFICATION

1.Main specification

Characteristics	1.2	Model		Manufacturer's Designation		FB10RL-14, FB10RLF-14		FB13RL-14, FB13RLF-14			
	1.3	Power Type		Electric, Diesel, Gasoline, LPG, Cable		Electric		Electric			
	1.4	Operation Type		Pedestrian, Driver Standing, Sitting, Order Picking		Standing		Standing			
	1.5	Rated Capacity		Q1	Rated Capacity		kg	1000	1250		
	1.6	Load Center		c	Load Center		mm	500	500		
	1.6.1	Alternative Capacity		Q2	Capacity@600mm Load Center		kg	870	1080		
	1.8	Load Distance		x	Front Axle Center to Fork Face		mm	175	175		
	1.9	Wheelbase		y			mm	1110	1250		
	Weight	2.1	Service Weight		Including Min. Capacity Battery, see line 6.5		kg	2020	2035		
2.4		Axle Loading Mast/Forks Extended	Loaded	Front		kg	2555	2855			
Rear				kg	465	430					
Unloaded			Front		kg	905	890				
			Rear		kg	1115	1145				
2.5		Axle Loading Mast/Forks Retracted	Loaded	Front		kg	1940	2020			
Rear				kg	1080	1265					
Unloaded			Front		kg	690	635				
	Rear		kg	1330	1400						
Tyre	3.1	Tyre Type				Solid		Solid			
	3.2	Tyre Size	Front				φ 260 x 120		φ 260 x 120		
	3.3		Rear				φ 360 x 180		φ 360 x 180		
	3.4		Additional Wheels				φ 127 x 90		φ 127 x 90		
	3.5	Number of Wheel		Front/Rear(*=driven)				2/1*+2		2/1*+2	
	3.6	Tread, Front		b10			mm	975	975		
	3.7	Tread, Rear		b11			mm	—	—		
Dimensions	4.1	Tilting Angle		α/β	Forward/Backward		degree	3/5	3/5		
	4.2	Mast Height, Lowered		h1	with Std. Mast		mm	1995	1995		
	4.3	Std. Free Lift		h2	with Std. Mast, from Ground		mm	105	105		
	4.4	Std. Lift Height		h3	with Std. Mast, from Ground		mm	3000	3000		
	4.5	Mast Height, Extended		h4	with Std. Mast		mm	3935	3935		
	4.7	Height, Overhead Guard		h6			mm	2250	2250		
	4.19	Length, with Std. Forks		l 1			mm	1905	1905		
	4.21	Width, at Tyre		b1			mm	1095	1095		
	4.22	Forks		s/e/l	Thickness/Width/Length		mm	35x100x850	35x100x850		
	4.23	Fork Carriage Class		ISO 2328, Type A/B/no				Pin Mount	Pin Mount		
	4.24	Width, Fork Carriage		b3			mm	750	750		
	4.26	Width, between Reach Legs		b4			mm	752	752		
	4.28	Reach Travel		l 4			mm	440	580		
	4.31	Ground Clearance		m1	under the Mast		mm	75	75		
	m2			at the center of Wheelbase		mm	80	80			
	4.33	Right Angle Stacking		Ast	with L1000 x W1200 pallet		mm	2275	2310		
	4.34	Aisle		Ast	with L1200 x W800 pallet		mm	2340	2355		
	4.35.1	Turning Radius		Wa			mm	1325	1465		
	4.35.2			Wb			mm	670	555		
4.37	Length, without Forks		/7				1470	1610			
Performance	5.1	Travel Speed (FWD)		Loaded/Unloaded		km/h	9.5/10.5	9.5/10.5			
	5.2	Lifting Speed		Loaded/Unloaded		mm/s	350/540	320/540			
	5.3	Lowering Speed		Loaded/Unloaded		mm/s	500/550	460/550			
	5.4	Reach Speed		Loaded/Unloaded		mm/s	300/300	300/300			
	5.6	Max. Drawbar Pull		3min rating		N	5880	5880			
	5.8	Max. Gradeability		Unloaded 1.5km/h, 3min rating		%	32	31			
	5.10	Service Brake		Operation/Control			Mechanical, Disc	Mechanical, Disc			
	5.11	Parking Brake		Operation/Control			Mechanical, Disc	Mechanical, Disc			
	5.12	Steering		Operation/Control			Electric Power Steering	Electric Power Steering			
Drive	6.1	Drive Motor (AC)		60min rating		kW	4.5	4.5			
	6.2	Pump Motor (AC)		5min rating		kW	9	9.0			
	6.2.1	PS Motor (DC)		60min rating		kW	0.3	0.3			
	6.4	Battery Voltage				V	48	48			
	6.4.1	Battery Capacity, Min.				Ah/5-hour	201	201			
	6.4.2	Battery Capacity, Max.				Ah/5-hour	240	240			
	6.5	Battery Weight, Min. Capacity				kg	365	365			
Others	8.1	Drive Motor Control					MOS-FET inverter	MOS-FET inverter			
	8.1.1	Pump Motor Control					MOS-FET inverter	MOS-FET inverter			
	8.1.2	PS Motor Control					MOS-FET chopper	MOS-FET chopper			
	8.2	Relief Pressure for Attachment				bar	167	167			
	8.2.1	Hydraulic Tank Capacity				Ltr	16	16			

4.33 and 4.34 Values are not including a clearance. See Aisle width section for detail.

GENERAL AND SPECIFICATIONS

SPECIFICATION

Characteristics	1.2	Model	Manufacturer's Designation		FB15RL-14, FB15RLF-14	FB18RL-14, FB18RLF-14	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Electric	Electric	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Standing	Standing	
	1.5	Rated Capacity	Q1	Rated Capacity	kg	1500	1800
	1.6	Load Center	c	Load Center	mm	500	500
	1.6.1	Alternative Capacity	Q2	Capacity@600mm Load Center	kg	1300	1560
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	175	175
	1.9	Wheelbase	y		mm	1350	1500
	Weight	2.1	Service Weight	Including Min. Capacity Battery, see line 6.5		kg	2220
2.4		Axle Loading Mast/Forks Extended	Loaded	Front	kg	3245	3620
2.4.1				Rear	kg	475	480
2.4.2			Unloaded	Front	kg	955	970
2.4.3				Rear	kg	1265	1330
2.5		Axle Loading Mast/Forks Retracted	Loaded	Front	kg	2360	2465
2.5.1				Rear	kg	1360	1635
2.5.2			Unloaded	Front	kg	715	690
2.5.3	Rear			kg	1505	1610	
Tyre	3.1	Tyre Type			Solid	Solid	
	3.2	Tyre Size	Front		φ 254 x 114	φ 254 x 120	
	3.3		Rear		φ 360 x 180	φ 360 x 180	
	3.4		Additional Wheels		φ 127 x 90	φ 127 x 90	
	3.5	Number of Wheel	Front/Rear*(=driven)		2/1*+2	2/1*+2	
	3.6	Tread, Front	b10	mm	975	975	
	3.7	Tread, Rear	b11	mm	-	-	
Dimensions	4.1	Tilting Angle	α/β	Forward/Backward	degree	3/5	3/5
	4.2	Mast Height, Lowered	h1	with Std. Mast	mm	1995	1995
	4.3	Std. Free Lift	h2	with Std. Mast, from Ground	mm	105	105
	4.4	Std. Lift Height	h3	with Std. Mast, from Ground	mm	3000	3000
	4.5	Mast Height, Extended	h4	with Std. Mast	mm	3935	3935
	4.7	Height, Overhead Guard	h6		mm	2250	2250
	4.19	Length, with Std. Forks	l 1		mm	2005	2075
	4.21	Width, at Tyre	b1		mm	1095	1095
	4.22	Forks	s/e/l	Thickness/Width/Length	mm	35x100x850	38x100x850
	4.23	Fork Carriage Class	ISO 2328, Type A/B/no		Pin Mount	Pin Mount	
	4.24	Width, Fork Carriage	b3	mm	750	730	
	4.26	Width, between Reach Legs	b4	mm	752	752	
	4.28	Reach Travel	l 4	mm	580	730	
	4.31	Ground Clearance	m1	under the Mast	mm	75	75
	4.32		m2	at the center of Wheelbase	mm	80	80
	4.33	Right Angle Stacking	Ast	with L1000 x W1200 pallet	mm	2405	2460
	4.34	Aisle	Ast	with L1200 x W800 pallet	mm	2450	2475
	4.35.1	Turning Radius	Wa	mm	1560	1715	
	4.35.2		Wb	mm	555	555	
	4.37	Length, without Forks	/7		1710	1860	
Performance	5.1	Travel Speed (FWD)	Loaded/Unloaded		km/h	9.5/10.5	9.5/10.5
	5.2	Lifting Speed	Loaded/Unloaded		mm/s	320/540	300/540
	5.3	Lowering Speed	Loaded/Unloaded		mm/s	460/550	460/550
	5.4	Reach Speed	Loaded/Unloaded		mm/s	300/300	300/300
	5.6	Max. Drawbar Pull	3min rating		N	5880	5880
	5.8	Max. Gradeability	Unloaded 1.5km/h, 3min rating		%	28	27
	5.10	Service Brake	Operation/Control		Mechanical, Disc	Mechanical, Disc	
	5.11	Parking Brake	Operation/Control		Mechanical, Disc	Mechanical, Disc	
	5.12	Steering	Operation/Control		Electric Power Steering	Electric Power Steering	
Drive	6.1	Drive Motor (AC)	60min rating		kW	4.5	4.5
	6.2	Pump Motor (AC)	5min rating		kW	9.0	9.0
	6.2.1	PS Motor (DC)	60min rating		kW	0.3	0.3
	6.4	Battery Voltage			V	48	48
	6.4.1	Battery Capacity, Min.			Ah/5-hour	280	280
	6.4.2	Battery Capacity, Max.			Ah/5-hour	390	390
	6.5	Battery Weight, Min. Capacity			kg	495	495
Others	8.1	Drive Motor Control			MOS-FET inverter	MOS-FET inverter	
	8.1.1	Pump Motor Control			MOS-FET inverter	MOS-FET inverter	
	8.1.2	PS Motor Control			MOS-FET chopper	MOS-FET chopper	
	8.2	Relief Pressure for Attachment	bar		167	167	
	8.2.1	Hydraulic Tank Capacity	Ltr		16	16	

4.33 and 4.34 Values are not including a clearance. See Aisle width section for detail

SPECIFICATION

GENERAL AND SPECIFICATIONS

Characteristics	1.2	Model	Manufacturer's Designation		FB10RW-14	FB13RW-14	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Electric	Electric	
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Standing	Standing	
	1.5	Rated Capacity	Q1	Rated Capacity	kg	1000	1250
	1.6	Load Center	c	Load Center	mm	500	500
	1.6.1	Alternative Capacity	Q2	Capacity@600mm Load Center	kg	870	1080
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm	175	175
	1.9	Wheelbase	y		mm	1110	1250
	Weight	2.1	Service Weight	Including Min. Capacity Battery, see line 6.5		kg	2020
2.4		Axle Loading Mast/Forks Extended	Loaded	Front	kg	2560	2860
2.4.1				Rear	kg	460	425
2.4.2			Unloaded	Front	kg	910	895
2.4.3				Rear	kg	1110	1140
2.5		Axle Loading Mast/Forks Retracted	Loaded	Front	kg	1945	2025
2.5.1				Rear	kg	1075	1260
2.5.2			Unloaded	Front	kg	695	640
2.5.3	Rear			kg	1325	1395	
Tyre	3.1	Tyre Type			Solid	Solid	
	3.2	Tyre Size	Front		φ 260 x 120	φ 260 x 120	
	3.3		Rear		φ 330 x 145	φ 330 x 145	
	3.4		Additional Wheels		φ 150 x 80	φ 150 x 80	
	3.5	Number of Wheel	Front/Rear(*=driven)		2/1*+2	2/1*+2	
	3.6	Tread, Front	b10	mm	975	975	
	3.7	Tread, Rear	b11	mm	-	-	
Dimensions	4.1	Tilting Angle	α/β	Forward/Backward	degree	3/5	3/5
	4.2	Mast Height, Lowered	h1	with Std. Mast	mm	1995	1995
	4.3	Std. Free Lift	h2	with Std. Mast, from Ground	mm	105	105
	4.4	Std. Lift Height	h3	with Std. Mast, from Ground	mm	3000	3000
	4.5	Mast Height, Extended	h4	with Std. Mast	mm	3935	3935
	4.7	Height, Overhead Guard	h6		mm	2250	2250
	4.19	Length, with Std. Forks	l 1		mm	1905	1905
	4.21	Width, at Tyre	b1		mm	1080	1080
	4.22	Forks	s/e/l	Thickness/Width/Length	mm	35x100x850	35x100x850
	4.23	Fork Carriage Class	ISO 2328, Type A/B/no		Pin Mount	Pin Mount	
	4.24	Width, Fork Carriage	b3	mm	750	750	
	4.26	Width, between Reach Legs	b4	mm	752	752	
	4.28	Reach Travel	l 4	mm	440	580	
	4.31	Ground Clearance	m1	under the Mast	mm	75	75
	4.32		m2	at the center of Wheelbase	mm	80	80
	4.33	Right Angle Stacking	Ast	with L1000 x W1200 pallet	mm	2275	2310
	4.34	Aisle	Ast	with L1200 x W800 pallet	mm	2340	2355
	4.35.1	Turning Radius	Wa	mm	1325	1465	
	4.35.2		Wb	mm	670	555	
	4.37	Length, without Forks	/7			1470	1610
	Performance	5.1	Travel Speed (FWD)	Loaded/Unloaded		km/h	9.5/10.5
5.2		Lifting Speed	Loaded/Unloaded		mm/s	350/540	320/540
5.3		Lowering Speed	Loaded/Unloaded		mm/s	500/550	460/550
5.4		Reach Speed	Loaded/Unloaded		mm/s	300/300	300/300
5.6		Max. Drawbar Pull	3min rating		N	6080	6080
5.8		Max. Gradeability	Unloaded 1.5km/h, 3min rating		%	32	32
5.10		Service Brake	Operation/Control		Mechanical, Disc	Mechanical, Disc	
5.11		Parking Brake	Operation/Control		Mechanical, Disc	Mechanical, Disc	
5.12		Steering	Operation/Control		Electric Power Steering	Electric Power Steering	
Drive	6.1	Drive Motor (AC)	60min rating		kW	4.5	4.5
	6.2	Pump Motor (AC)	5min rating		kW	9.0	9.0
	6.2.1	PS Motor (DC)	60min rating		kW	0.3	0.3
	6.4	Battery Voltage			V	48	48
	6.4.1	Battery Capacity, Min.			Ah/5-hour	201	201
	6.4.2	Battery Capacity, Max.			Ah/5-hour	240	240
	6.5	Battery Weight, Min. Capacity			kg	365	365
Others	8.1	Drive Motor Control			MOS-FET inverter	MOS-FET inverter	
	8.1.1	Pump Motor Control			MOS-FET inverter	MOS-FET inverter	
	8.1.2	PS Motor Control			MOS-FET chopper	MOS-FET chopper	
	8.2	Relief Pressure for Attachment	bar		167	167	
	8.2.1	Hydraulic Tank Capacity	Ltr		16	16	

4.33 and 4.34 Values are not including a clearance. See Aisle width section for detail

GENERAL AND SPECIFICATIONS

SPECIFICATION

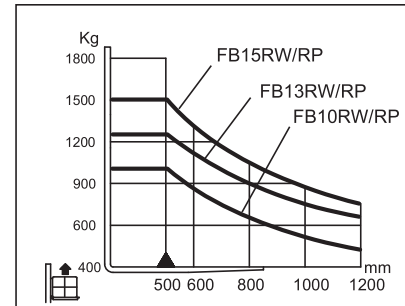
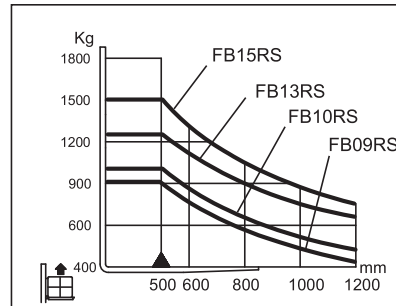
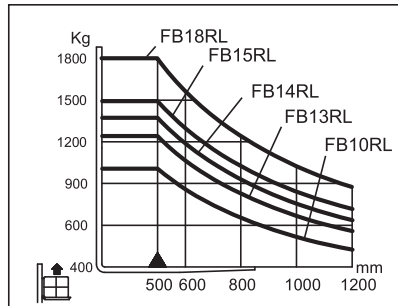
Characteristics	1.2	Model	Manufacturer's Designation		FB15RW-14
	1.3	Power Type	Electric, Diesel, Gasoline, LPG, Cable		Electric
	1.4	Operation Type	Pedestrian, Driver Standing, Sitting, Order Picking		Standing
	1.5	Rated Capacity	Q1	Rated Capacity	kg 1500
	1.6	Load Center	c	Load Center	mm 500
	1.6.1	Alternative Capacity	Q2	Capacity@600mm Load Center	kg 1300
	1.8	Load Distance	x	Front Axle Center to Fork Face	mm 175
	1.9	Wheelbase	y		mm 1350
Weight	2.1	Service Weight	Including Min. Capacity Battery, see line 6.5		kg 2220
	2.4	Axle Loading Mast/Forks Extended	Loaded	Front	kg 3250
	2.4.1			Rear	kg 470
	2.4.2		Unloaded	Front	kg 955
	2.4.3			Rear	kg 1265
	2.5	Axle Loading Mast/Forks Retracted	Loaded	Front	kg 2365
	2.5.1			Rear	kg 1355
	2.5.2		Unloaded	Front	kg 720
	2.5.3			Rear	kg 1500
Tyre	3.1	Tyre Type			Solid
	3.2	Tyre Size	Front		φ 254 x 114
	3.3		Rear		φ 330 x 145
	3.4		Additional Wheels		φ 150 x 80
	3.5	Number of Wheel	Front/Rear(*=driven)		2/1*+2
	3.6	Tread, Front	b10	mm	975
	3.7	Tread, Rear	b11	mm	-
Dimensions	4.1	Tilting Angle	α/β	Forward/Backward	degree 3/5
	4.2	Mast Height, Lowered	h1	with Std. Mast	mm 1995
	4.3	Std. Free Lift	h2	with Std. Mast, from Ground	mm 105
	4.4	Std. Lift Height	h3	with Std. Mast, from Ground	mm 3000
	4.5	Mast Height, Extended	h4	with Std. Mast	mm 3935
	4.7	Height, Overhead Guard	h6		mm 2250
	4.19	Length, with Std. Forks	l 1		mm 2005
	4.21	Width, at Tyre	b1		mm 1080
	4.22	Forks	s/e/l	Thickness/Width/Length	mm 35x100x850
	4.23	Fork Carriage Class	ISO 2328, Type A/B/no		Pin Mount
	4.24	Width, Fork Carriage	b3	mm	750
	4.26	Width, between Reach Legs	b4	mm	752
	4.28	Reach Travel	l 4	mm	580
	4.31	Ground Clearance	m1	under the Mast	mm 75
	4.32		m2	at the center of Wheelbase	mm 80
	4.33	Right Angle Stacking Aisle	Ast	with L1000 x W1200 pallet	mm 2405
	4.34	Aisle	Ast	with L1200 x W800 pallet	mm 2450
	4.35.1	Turning Radius	Wa	mm	1560
	4.35.2		Wb	mm	555
	4.37	Length, without Forks	/7		mm 1710
Performance	5.1	Travel Speed (FWD)	Loaded/Unloaded		km/h 9.5/10.5
	5.2	Lifting Speed	Loaded/Unloaded		mm/s 320/540
	5.3	Lowering Speed	Loaded/Unloaded		mm/s 460/550
	5.4	Reach Speed	Loaded/Unloaded		mm/s 300/300
	5.6	Max. Drawbar Pull	3min rating	N	6080
	5.8	Max. Gradeability	Unloaded 1.5km/h, 3min rating		% 29
	5.10	Service Brake	Operation/Control		Mechanical, Disc
	5.11	Parking Brake	Operation/Control		Mechanical, Disc
Drive	5.12	Steering	Operation/Control		Electric Power Steering
	6.1	Drive Motor (AC)	60min rating	kW	4.5
	6.2	Pump Motor (AC)	5min rating	kW	9.0
	6.2.1	PS Motor (DC)	60min rating	kW	0.3
	6.4	Battery Voltage		V	48
	6.4.1	Battery Capacity, Min.		Ah/5-hour	280
	6.4.2	Battery Capacity, Max.		Ah/5-hour	390
	6.5	Battery Weight, Min. Capacity		kg	495
Others	8.1	Drive Motor Control			MOS-FET inverter
	8.1.1	Pump Motor Control			MOS-FET inverter
	8.1.2	PS Motor Control			MOS-FET chopper
	8.2	Relief Pressure for Attachment		bar	167
	8.2.1	Hydraulic Tank Capacity		Ltr	16

4.33 and 4.34 Values are not including a clearance. See Aisle width section for detail

SPECIFICATION

GENERAL AND SPECIFICATIONS

2. Allowable Load Table



3. Dimension Diagram

