

KOMATSU

SHOP MANUAL

FG10/15/18-21

FG15H/18H-21

FD10/15/18-21

FG20/25/30-17

FG20H/25H-17

FG20N/25N/30N-17

FG35A-17

FD20/25/30-16

FD20H/25H/30H-16


FD20N/25N/30N-16

FD35A-16

PRECAUTIONS WHEN PERFORMING THE SERVICE WORK

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




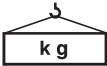

Never attempt any work where danger to yourself or to other persons.

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

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SPECIFICATIONS

AX50 (1.0 - 1.8ton) Series

					FG10T-21	FG10C-21	FD10T-21	FD10C-21		
Characteristics	1.2	Model	Manufacturer's Designation							
	1.3	Power Type	Electric, Diesel, Gasoline, LPG		Gasoline		Diesel			
	1.4	Operation Type			Sitting		Sitting			
	1.5	Rated Capacity	Rated Capacity	kg	1000		1000			
	1.6	Load Center	Rated Load Center	mm	500		500			
	1.6.1	Alternative Capacity	Capacity@600mm Load Center	kg	900		900			
	1.8	Load Distance	Front Axle Center to Fork Face	mm	L2	400		400		
	1.9	Wheelbase		mm	L3	1400		1400		
	Weight	2.1	Service Weight		kg	2080	2120	2180	2220	
2.2		Axle Loading	Loaded	Front	kg	2725	2760	2760	2790	
2.2.1				Rear	kg	355	360	420	430	
2.3			Unloaded	Front	kg	1065	1100	1095	1130	
2.3.1				Rear	kg	1015	1020	1085	1090	
Tyres	3.1	Tyre Type			Pneumatic		Pneumatic			
	3.2	Tyre Size	Front		6.50-10-10PR(I)		6.50-10-10PR(I)			
	3.3		Rear		5.00-8-8PR(I)		5.00-8-8PR(I)			
	3.5	Number of Wheel	Front/Rear (x=driven)		2*/2		2*/2			
	3.6	Tread, Front		mm	b4	890		890		
	3.7	Tread, Rear		mm	b3	895		895		
	Dimensions	4.1	Tilting Angle	Forward/Backward		degree	6/10		6/10	
4.2		Mast Height, Lowered	2-stage Mast		mm	h2	1995		1995	
4.3		Std. Free Lift	2-stage Std. Mast, from Ground		mm		135		135	
4.4		Std. Lift Height	2-stage Std. Mast, from Ground		mm	h1	3000		3000	
4.5		Mast Height, Extended	2-stage Std. Mast		mm	h3	3955		3955	
4.7		Height, Overhead Guard			mm	h4	2070		2070	
4.19		Length, with Std. Forks			mm	L1	2965		2965	
4.20		Length, to Fork Face			mm		2195		2195	
4.21		Width, at Tyre	Single		mm	b1	1070		1070	
4.22		Forks	Thickness x Width x Length		mm		31x100x770		31x100x770	
4.23		Fork Carriage Class	ISO 2328, Type A/B/no				Class 2, Type A		Class 2, Type A	
4.24		Width, Fork Carriage			mm		970		970	
4.31		Ground Clearance	Under Mast		mm		120		120	
4.32			at Center of Wheelbase		mm		130		130	
4.33		Right Angle Stacking Aisle	with L1000 x W1200 pallet		mm		3315		3315	
4.34	with L1200 x W800 pallet		mm		3515		3515			
4.35	Turning Radius			mm	Wa	1915		1915		
Performance	5.1	Travel Speed (FWD)	Loaded, 1st/2nd		km/h		19.0	9.0/19.0	19.0	8.5/19.0
			Unloaded, 1st/2nd		km/h		19.0	9.0/19.0	19.5	8.5/19.5
	5.2	Lifting Speed	Loaded		mm/s		580		620	
			Unloaded		mm/s		640		670	
	5.3	Lowering Speed	Loaded		mm/s		500		500	
			Unloaded		mm/s		550		550	
	5.6	Max. Drawbar Pull	Loaded, 1.5 km/h, 3 min rating		KN		10	11	13	14
	5.8	Max. Gradeability	Loaded, 1.5 km/h, 3 min rating		%		34	38	49	41
	5.10	Service Brake	Operation/Control				Foot/Hydraulic		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control				Hand/Mechanical		Hand/Mechanical	
	5.12	Steering	Type				FHPS		FHPS	
	6.4	Battery	Voltage/ Capacity at 5-hour rating		V/ah		12/33		12/64	
i.C Engine	7.1	Maker Model					NISSAN K15 GCT GK15		Komatsu 4D92E	
	7.2	Rated Output, SAE net			KW		27.2@2500		34.6@2450	
	7.3	Rated RPM			min-1		2500		2450	
	7.3.1	Max. Torque, SAE net			Nm@min-1		113@1600		142@1800	
	7.4	No. of Cylinder/Displacement			cm ³		4-1486		4-2659	
	7.6	Fuel Tank Capacity			Ltr		40		40	
Others	8.2	Relief Pressure for Attachment			bar		172		172	
	8.6	Clutch					T/C	Dry	T/C	Dry
	8.7	Transmission					TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

FG15T-21		FG15C-21		FD15T-21		FD15C-21		FG15HT-21		FG15HC-21	
Gasoline				Diesel				Gasoline			
Sitting				Sitting				Sitting			
1500				1500				1500			
500				500				500			
1350				1350				1350			
405				405				405			
1400				1400				1400			
2450	2490	2550	2590	2450	2490	2550	2590	2450	2490	2550	2590
3500	3535	3530	3565	3500	3535	3530	3565	3500	3535	3530	3565
450	455	520	525	450	455	520	525	450	455	520	525
1005	1040	1035	1070	1005	1040	1035	1070	1005	1040	1035	1070
1445	1450	1515	1520	1445	1450	1515	1520	1445	1450	1515	1520
Pneumatic				Pneumatic				Pneumatic			
6.50-10-10PR(I)				6.50-10-10PR(I)				6.50-10-10PR(I)			
5.00-8-8PR(I)				5.00-8-8PR(I)				5.00-8-8PR(I)			
2*/2				2*/2				2*/2			
890				890				890			
895				895				895			
6/10				6/10				6/10			
1995				1995				1995			
140				140				140			
3000				3000				3000			
3955				3955				3955			
2070				2070				2070			
3160				3160				3160			
2240				2240				2240			
1070				1070				1070			
35x100x920				35x100x920				35x100x920			
Class 2, Type A				Class 2, Type A				Class 2, Type A			
970				970				970			
120				120				120			
130				130				130			
3360				3360				3360			
3560				3560				3560			
1955				1955				1955			
18.5	8.5/18.5	18.5	8.5/19.0	18.5	8.5/18.5	18.5	8.5/19.0	18.5	8.5/18.5	18.5	8.5/19.0
19.0	9.0/19.0	19.0	8.5/19.5	19.0	9.0/19.0	19.0	8.5/19.5	19.0	9.0/19.0	19.0	9.0/19.0
570				620				590			
640				670				640			
500				500				500			
550				550				550			
10	11	13	14	15	14	13	14	15	14	13	14
26	27	33	31	37	35	33	31	37	35	33	31
Foot/Hydraulic				Foot/Hydraulic				Foot/Hydraulic			
Hand/Mechanical				Hand/Mechanical				Hand/Mechanical			
FHPS				FHPS				FHPS			
12/33				12/64				12/33			
NISSAN K15 GCT GK15				Komatsu 4D92E				NISSAN K21 GCT GK21			
27.2@2500				34.6@2450				34.6@2450			
2500				2450				2450			
113@1600				142@1800				152@1600			
4-1486				4-2659				4-2065			
40				40				40			
172				172				172			
T/C	Dry	T/C	Dry	T/C	Dry	T/C	Dry	T/C	Dry	T/C	Dry
TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

Characteristics	1.2	Model	Manufacturer's Designation		FG18T-21	FG18C-21	FD18T-21	FD18C-21	
	1.3	Power Type	Electric, Diesel, Gasoline, LPG		Gasoline		Diesel		
	1.4	Operation Type			Sitting		Sitting		
	1.5	Rated Capacity	Rated Capacity	kg	1750		1750		
	1.6	Load Center	Rated Load Center	mm	500		500		
	1.6.1	Alternative Capacity	Capacity@600mm Load Center	kg	1570		1570		
	1.8	Load Distance	Front Axle Center to Fork Face	mm	L2	405		405	
	1.9	Wheelbase		mm	L3	1400		1400	
	Weight	2.1	Service Weight		kg	2645	2685	2745	2785
2.2		Axle Loading	Loaded	Front	kg	3870	3905	3900	3935
2.2.1				Rear	kg	525	530	595	600
2.3			Unloaded	Front	kg	960	995	990	1025
2.3.1				Rear	kg	1685	1690	1755	1760
Tyres	3.1	Tyre Type			Pneumatic		Pneumatic		
	3.2	Tyre Size	Front		6.50-10-10PR(I)		6.50-10-10PR(I)		
	3.3		Rear		5.00- 8- 8PR(I)		5.00-8-8PR(I)		
	3.5	Number of Wheel	Front/Rear (x=driven)		2*/2		2*/2		
	3.6	Tread, Front		mm	b4	890		890	
	3.7	Tread, Rear		mm	b3	895		895	
	Dimensions	4.1	Tilting Angle	Forward/Backward	degree	6/10		6/10	
4.2		Mast Height, Lowered	2-stage Mast	mm	h2	1995		1995	
4.3		Std. Free Lift	2-stage Std. Mast, from Ground	mm	140		140		
4.4		Std. Lift Height	2-stage Std. Mast, from Ground	mm	h1	3000		3000	
4.5		Mast Height, Extended	2-stage Std. Mast	mm	h3	3955		3955	
4.7		Height, Overhead Guard		mm	h4	2070		2070	
4.19		Length, with Std. Forks		mm	L1	3200		3200	
4.20		Length, to Fork Face		mm	2280		2280		
4.21		Width, at Tyre	Single	mm	b1	1070		1070	
4.22		Forks	Thickness x Width x Length	mm	35x100x920		35x100x920		
4.23		Fork Carriage Class	ISO 2328, Type A/B/no			Class 2, Type A		Class 2, Type A	
4.24		Width, Fork Carriage		mm	970		970		
4.31		Ground Clearance	Under Mast	mm	120		120		
4.32			at Center of Wheelbase	mm	130		130		
4.33		Right Angle Stacking Aisle	with L1000 x W1200 pallet	mm	3395		3395		
4.34	with L1200 x W800 pallet		mm	3595		3595			
4.35	Turning Radius		mm	Wa	1990		1990		
Performance	5.1	Travel Speed (FWD)	Loaded, 1st/2nd	km/h	18.5	8.5/18.5	18.5	8.5/18.5	
			Unloaded, 1st/2nd	km/h	19.0	9.0/19.0	19.0	8.5/19.0	
	5.2	Lifting Speed	Loaded	mm/s	570		620		
			Unloaded	mm/s	640		670		
	5.3	Lowering Speed	Loaded	mm/s	500		500		
			Unloaded	mm/s	550		550		
	5.6	Max. Drawbar Pull	Loaded, 1.5 km/h, 3 min rating	KN	10	11	13	14	
	5.8	Max. Gradeability	Loaded, 1.5 km/h, 3 min rating	%	25	24	29	28	
	5.10	Service Brake	Operation/Control			Foot/Hydraulic		Foot/Hydraulic	
	5.11	Parking Brake	Operation/Control			Hand/Mechanical		Hand/Mechanical	
	5.12	Steering	Type			FHPS		FHPS	
	6.4	Battery	Voltage/ Capacity at 5-hour rating	V/ah	12/33		12/64		
I.C Engine	7.1	Maker Model			NISSAN K15 GCT GK15		Komatsu 4D92E		
	7.2	Rated Output, SAE net		KW	27.2@2500		34.6@2450		
	7.3	Rated RPM		min-1	2500		2450		
	7.3.1	Max. Torque, SAE net		Nm@min-1	113@1600		142@1800		
	7.4	No. of Cylinder/Displacement		cm ³	4-1486		4-2659		
	7.6	Fuel Tank Capacity		Ltr	40		40		
Others	8.2	Relief Pressure for Attachment		bar	172		172		
	8.6	Clutch			T/C	Dry	T/C	Dry	
	8.7	Transmission			TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	

FG18HT-21	FG18HC-21
Gasoline	
Sitting	
1750	
500	
1570	
405	
1400	
2645	2685
3870	3905
525	530
960	995
1685	1690
Pneumatic	
6.50-10-10PR(I)	
5.00- 8- 8PR(I)	
2*/2	
890	
895	
6/10	
1995	
140	
3000	
3955	
2070	
3200	
2280	
1070	
35x100x920	
Class 2, Type A	
970	
120	
130	
3395	
3595	
1990	
18.5	8.5/18.5
19.0	9.0/19.0
590	
640	
500	
550	
15	14
33	32
Foot/Hydraulic	
Hand/Mechanical	
FHPS	
12/33	
NISSAN K21	
GCT GK21	
34.6@2450	
2450	
152@1600	
4-2065	
40	
172	
T/C	Dry
TORQFLOW	Synchromesh

BX50 (2.0 - 2.5ton) Series

Characteristics	1.2	Model	Manufacturer's Designation			FG20T-17	FG20C-17	FD20T-16	FD20C-16
	1.3	Power Type	Electric, Diesel, Gasoline, LPG			Gasoline		Diesel	
	1.4	Operation Type				Sitting		Sitting	
	1.5	Rated Capacity	Rated Capacity	kg		2000		2000	
	1.6	Load Center	Rated Load Center	mm		500		500	
	1.6.1	Alternative Capacity	Capacity@600mm Load Center	kg		1810		1810	
	1.8	Load Distance	Front Axle Center to Fork Face	mm	L2	460		460	
	1.9	Wheelbase		mm	L3	1650		1650	
	Weight	2.1	Service Weight		kg		3220	3255	3310
2.2		Axle Loading	Loaded	Front	kg	4670	4705	4700	4745
2.2.1				Rear	kg	550	550	610	610
2.3			Unloaded	Front	kg	1480	1505	1510	1545
2.3.1				Rear	kg	1740	1750	1800	1810
Tyres	3.1	Tyre Type				Pneumatic		Pneumatic	
	3.2	Tyre Size	Front			7.00-12-12PR(I)		7.00-12-12PR(I)	
	3.3		Rear			6.00-09-10PR(I)		6.00-09-10PR(I)	
	3.5	Number of Wheel	Front/Rear (x=driven)			2*/2		2*/2	
	3.6	Tread, Front		mm	b4	965		965	
	3.7	Tread, Rear		mm	b3	960		960	
	Dimensions	4.1	Tilting Angle	Forward/Backward	degree		6/12		6/12
4.2		Mast Height, Lowered	2-stage Mast	mm	h2	1995		1995	
4.3		Std. Free Lift	2-stage Std. Mast, from Ground	mm		150		150	
4.4		Std. Lift Height	2-stage Std. Mast, from Ground	mm	h1	3000		3000	
4.5		Mast Height, Extended	2-stage Std. Mast	mm	h3	4050		4050	
4.7		Height, Overhead Guard		mm	h4	2110		2070	
4.19		Length, with Std. Forks		mm	L1	3450		3450	
4.20		Length, to Fork Face		mm		2530		2530	
4.21		Width, at Tyre	Single	mm	b1	1150		1150	
4.22		Forks	Thickness x Width x Length	mm		36x122x920		36x122x920	
4.23		Fork Carriage Class	ISO 2328, Type A/B/no			Class 2, Type A		Class 2, Type A	
4.24		Width, Fork Carriage		mm		1020		1020	
4.31		Ground Clearance	Under Mast		mm	115		115	
4.32			at Center of Wheelbase		mm	160		160	
4.33		Right Angle Stacking Aisle	with L1000 x W1200 pallet		mm	3650		3650	
4.34	with L1200 x W800 pallet		mm	3850		3850			
4.35	Turning Radius		mm	Wa	2190		2190		
Performance	5.1	Travel Speed (FWD)	Loaded, 1st/2nd	km/h		18.5	8.5/18.5	18.5	8.5/18.5
			Unloaded, 1st/2nd	km/h		19.0	9.0/19.0	19.0	8.5/19.0
	5.2	Lifting Speed	Loaded	mm/s		545		630	
			Unloaded	mm/s		600		685	
	5.3	Lowering Speed	Loaded	mm/s		450		450	
			Unloaded	mm/s		500		500	
	5.6	Max. Drawbar Pull	Loaded, 1.5 km/h, 3 min rating	KN		14	14	18	17
	5.8	Max. Gradeability	Loaded, 1.5 km/h, 3 min rating	%		28	27	36	34
5.10	Service Brake	Operation/Control			Foot/Hydraulic		Foot/Hydraulic		
5.11	Parking Brake	Operation/Control			Hand/Mechanical		Hand/Mechanical		
5.12	Steering	Type			FHPS		FHPS		
6.4	Battery	Voltage/ Capacity at 5-hour rating	V/ah		12/33		12/64		
I.C Engine	7.1	Maker Model				NISSAN K21 GCT GK21		Komatsu 4D94LE	
	7.2	Rated Output, SAE net		KW		34.6@2450		46.3@2450	
	7.3	Rated RPM		min-1		2450		2450	
	7.3.1	Max. Torque, SAE net		Nm@min-1		152@1600		186@1800	
	7.4	No. of Cylinder/Displacement		cm ³		4-2065		4-3052	
	7.6	Fuel Tank Capacity		Ltr		58		58	
Others	8.2	Relief Pressure for Attachment		bar		181		181	
	8.6	Clutch				T/C	Dry	T/C	Dry
	8.7	Transmission				TORQFLOW	Synchromesh	TORQFLOW	Synchromesh

FG20HT-17	FD20HT-16	FD20HC-16	FG25T-17	FG25C-17	FD25T-16
Gasoline	Diesel		Gasoline		Diesel
Sitting	Sitting		Sitting		Sitting
2000	2000		2500		2500
500	500		500		500
1810	1810		2260		2260
460	460		465		465
1650	1650		1650		1650
3220	3310	3355	3590	3625	3680
4670	4700	4745	5420	5455	5460
550	610	610	670	670	720
1480	1510	1545	1430	1455	1460
1740	1800	1810	2160	2170	2220
Pneumatic	Pneumatic		Pneumatic		Pneumatic
7.00-12-12PR(I)	7.00-12-12PR(I)		7.00-12-12PR(I)		7.00-12-12PR(I)
6.00-09-10PR(I)	6.00-09-10PR(I)		6.00-09-10PR(I)		6.00-09-10PR(I)
2*2	2*2		2*2		2*2
965	965		965		965
960	960		960		960
6/12	6/12		6/12		6/12
1995	1995		1995		1995
150	150		155		155
3000	3000		3000		3000
4050	4050		4050		4050
2110	2070		2110		2070
3450	3450		3655		3655
2530	2530		2585		2585
1150	1150		1150		1150
36x122x920	36x122x920		40x122x1070		40x122x1070
Class 2, Type A	Class 2, Type A		Class 2, Type A		Class 2, Type A
1020	1020		1020		1020
115	115		115		115
160	160		160		160
3650	3650		3775		3775
3850	3850		3905		3905
2190	2190		2240		2240
19.0	18.5	8.0/18.5	18.5	8.5/18.5	18.5
19.5	19.0	8.5/19.0	19.0	9.0/19.0	19.0
620	660		545		630
670	710		600		685
450	450		450		450
500	500		500		500
19	22	21	14	14	18
38	45	44	23	22	31
Foot/Hydraulic	Foot/Hydraulic		Foot/Hydraulic		Foot/Hydraulic
Hand/Mechanical	Hand/Mechanical		Hand/Mechanical		Hand/Mechanical
FHPS	FHPS		FHPS		FHPS
12/33	12/64		12/33		12/64
NISSAN K25 GCT GK25	Komatsu 4D98E		NISSAN K21 GCT GK21		Komatsu 4D94LE
42.6@2400	53.0@2400		34.6@2450		46.3@2450
2400	2400		2450		2450
186@1600	216@1700		152@1600		186@1800
4-2488	4-3318		4-2065		4-3052
58	58		58		58
181	181		181		181
T/C	T/C	Dry	T/C	Dry	T/C
TORQFLOW	TORQFLOW	Synchromesh	TORQFLOW	Synchromesh	TORQFLOW