

SERVICE MANUAL

FG35 FD35

FG40 FD40

FD45

FD50

FD50C

NOTE

For use with the 6G72 Gasoline Engine Service Manual.

For use with the S6S Diesel Engine Service Manual.

CHASSIS MAST

FOREWORD

This service manual is a guide to servicing of Mitsubishi Lift Trucks. The instructions are grouped by systems to serve the convenience of your ready reference.

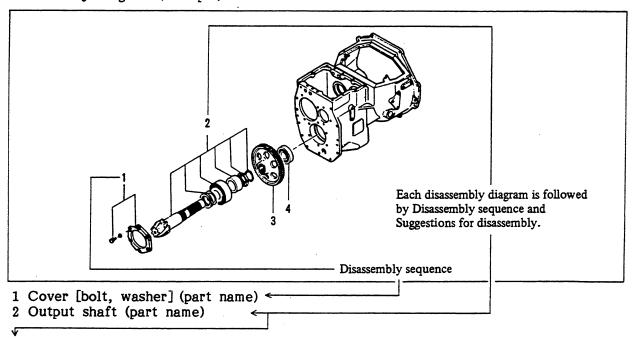
Long productive life of your lift trucks depends to a great extent on correct servicing — the servicing consistent with what you will learn from this service manual. We hope you read the respective sections of this manual carefully and know all the components you will work on before attempting to start a test, repair or rebuild job.

The descriptions, illustrations and specifications contained in this manual were of the trucks of serial numbers in effect at the time it was approved for printing. Mitsubishi reserves the right to change specifications or design without notice and without incurring obligation.

The gasoline models (FG35/FG40) are powered by Mitsubishi 6G72-32FD gasoline engine. The diesel models (FD35/FD40/FD45/FD50C/FD50) are powered by Mitsubishi S6S diesel engine.

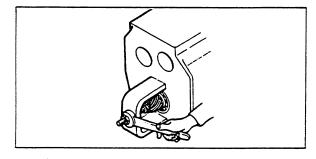
HOW TO READ THIS MANUAL

Disassembly diagram (example)



Suggestion for disassembly

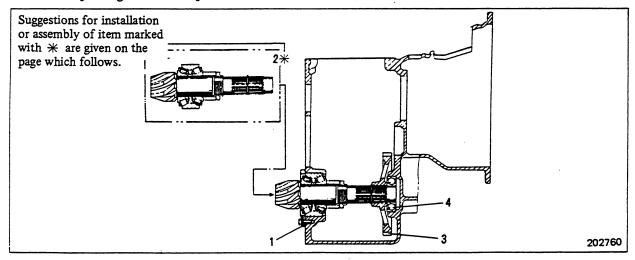
(1) Output shaft removal



Unit: mm [in						
Clearance between	A	0.020 to 0.105 [0.000 79 to 0.004 13]				
cylinder and piston	В	0.15 [0.005 9]				

- A: Assembly standard
- B: Repair or service limit

Reassembly diagram (example)



Reassembly sequence

 $4 \rightarrow 2*\rightarrow 3 \rightarrow 1$

(The same index numbering as that for disassembly is used.)

GROUP INDEX

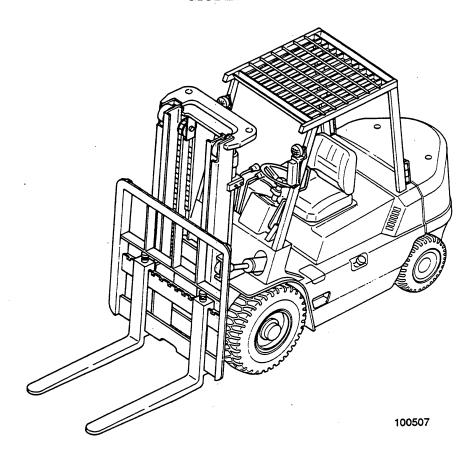
Group	Items involved
General	Serial number locations, Dimensions, Technical data
Cooling system	Fan removal and installation, Fan belt adjustment
Electrical system	Console box, Chassis electrical devices, Care of the battery, Schematic
Power train	Removal and installation
Clutches	Dry type clutch, Wet type clutch, Pressure plate assembly, Clutch booster, Clutch master cylinder, Clutch release cylinder, Adjustment
Manual transmission	Description, Suggestions for removal and installation, Disassembly, Inspection and repair, Reassembly
Powershift transmission	Torque converter, 1-speed transmission, Control valve, Automatic 2-speed transmission
Front axle and reduction differential	Front tires, Front axle, Reduction and differential
Rear axle	Rear axle, Rear tires
Brake system	Master cylinder, Wheel brakes, Brake booster
Steering system	Steering gear, Power cylinder, Flow divider
Hydraulic system	Tank, Pump, Control valve, Lift and tilt cylinders, Flow regulator valve, Down safety valve
Masts and forks	Dual-stage panoramic mast
Troubleshooting	
Service data	Maintenance standards, Periodic service chart, Periodic replacement parts, Lubrication instructions, Special tools, Inspection guide

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GENERAL INFORMATION

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MODEL VIEW

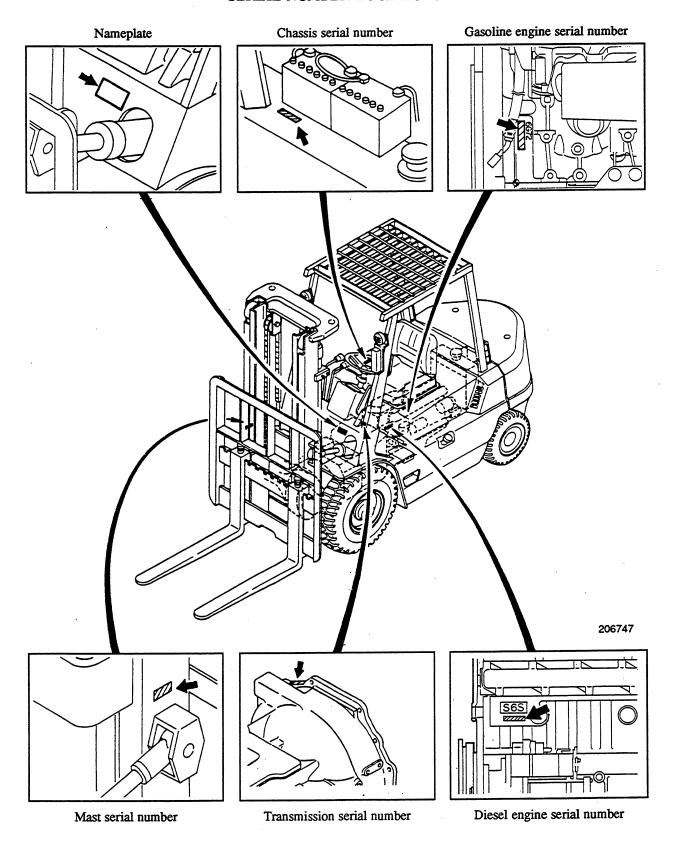


TRUCK MODELS COVERED

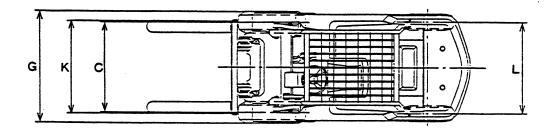
This Service Manual furnishes servicing and maintenance information for the following trucks:

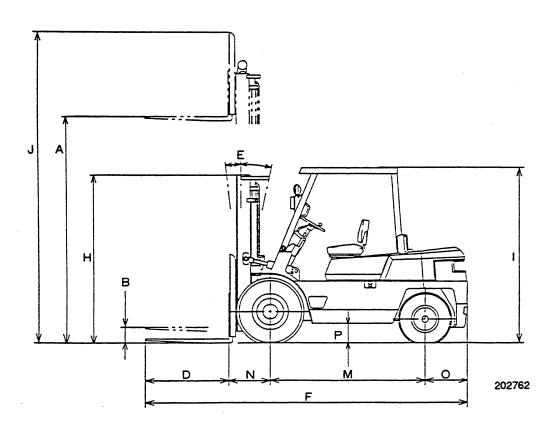
Truck model	Transmission	Model code – Serial number	Engine mounted		
FG35	Powershift	F29 – 00011-up	Mitsubishi 6G72 gasoline engine		
FG40	Powershift	F29 – 50001-up	Mitsubishi 6G72 gasoline engine		
77725	Manual	F19B - 00011-up	Mitsubishi S6S diesel engine		
FD35	Powershift	113B = 00011-up	1.11.000.00.1.000.00.00.00.00.00.00.00.0		
FD 40	Manual	F19B – 50001-up	Mitsubishi S6S diesel engine		
FD40	Powershift	F13B = 50001-up	Without State Control of State Control		
EC45	Manual	F28A - 00011up	Mitsubishi S6S diesel engine		
FG45	Powershift	1.2dA = 00011up	111111111111111111111111111111111111111		
FD50C FD50	Powershift	F28A - 50001-up	Mitsubishi S6S diesel engine		

SERIAL NUMBER LOCATIONS



DIMENSIONS





Unit: mm [in.]

Truck model Item		FG35 FD35					
lift		3 000 [118]					
		150 [5.9] 160 [6.5]			170 [6.7]		
d (outside)					300 to 1 500 [12 to 59]	
Fork length			1 070 [42]		1 220	0 [48]	
Tilt angle (forward – backward)				6° – 12°			
Overall length			4 205 [165.6]	4 335 [170.7]	4 540 [178.7]	4 545 [178.9]	
Overall width Single tire				1 460 [57.5]			
(outside of tires)	Dual tire	1 780 [70.1]				1 965 [77.4]	
	red)	2 150 [84.6] 2 350 [92.5]					
	guard)	2 250 [88.6]					
		4 135 [162.8]			4 285	4 285 [168.7]	
	Single tire		1 160	[45.7]			
it)	Dual tire		1 310 [51.6]			1 445 [56.9]	
Tread (rear)			1 180 [46.5]				
Wheelbase			2 000 [78.7]			2 150 [84.6]	
Front overhang			535 [21.1] 555 [21.		560 [22] 565 [22.2]		
ang		550 [21.7] 600 [23.6] 560 [22] 610 [24]				[24]	
rance (at	frame)			250 [9.8]			
	lift d (outside backward gth dth tires) ight mast lowe ight overhead ight overhead; ith ight hang hang	lift d (outside) backward) agth dth tires) ight mast lowered) ight overhead guard) ight nded) Single tire Dual tire Dual tire Dual tire Dual tire Dual tire T) chang	FD35 FD35	FD35 FD40	FD35 FD40 FD45	FD35 FD40 FD45 FD50C	

TECHNICAL DATA

_			7	ruck model	FG35	FG40	FD45	FD50C	FD50	
Iter					{FD35}	{FD40}	1243		E29A	
	el code				F29 {F19B} F28A					
Type					4 000 400	Standard	5,000,600	5 000/600		
	Capacity/ kgf/mm [load center lbf/in.]	r,		4 000/500 4 000/600 4 500/600 5 000/600 5 000/600 [8 000/24] [9 000/24] [10 000/24] [11 000/24] [11 000/24]				[11 000/24]	
	Maximum lift, mm [in.]					3 000 [118]				
General	Lift speed mm/sec [Lift speed (rate load), mm/sec [fpm]				[89] [94]}	480 [94]	420	[83]	
Ge	Lowering speed (rate load), mm/sec [fpm]					500 [98]				
	Tilt angle	(forward	- bac	kward)			6° – 12°			
İ	Free lift, mm [in.]			150	[5.9]	165 [6.5]	170	[6.7]		
		Manual transmiss	sion	Forward L to H		9.5 to 19.5				
	Travel speeds, km/h	eeds, (FD35 thr		Reverse L to H	[5.9 to 12.1]					
	[mph]	Powershift transmission models		Forward	20 [12.4]			14 to 24.5 [8.7 to 15.2]		
				Reverse						
ခ	Minimum turning radius, mm [in.]			2 740 [107.9]	544/07					
nan			Ins	ide	83°					
Performance	Steering	angie	Ou	tside			56°33'			
Pel	Minimur		Sir	ngle tire	2 360 [92.9]	2 400 [94.5]	2 450 [96.5]	2 510 [98.8]		
	intersect aisle, mr		Du	al tire	2 490 [98]	2 520 [99.2]	2 570 [101.2]		2 740 [107.9]	
				anual transmission odels, tan %	{20}	{17}	20			
	Gradeability (rated load)		sic	wershift transmis- on models, tan % 2 km/h [1.2 mph]	25	32 {22}	25	31	30	
d sure)	Front, kl	Pa	Si	ngle tire	8.25-15- 12PR(I) 686 (7) [100]		300-15-18PR(686 (7) [100]			
Tires (size and inflation pressure)	(kgf/cm²) [psi]		Dı	ual tire	7.50-16-12PR(I) 686 (7) [100]			8.25-15- 12PR(I) 686 (7) [100]		
Tire	Rear, kP	a (kgf/cm²) [psi]		7.00-12-12PR 686 (7) [100			2-12PR(I) .5) [121]	

Ite	m	Truck model	FG35 {FD35}	FG40 {FD40}	FD45	FD50C	FD50
337		Single tire (without load)	5 170 [11 400] {5 280 [11 642]}	5 590 [12 326] {5 700 [12 569]}	6 170 [13 605]	6 700 [14 774]	
Wei	ght, kg [lb]	Dual tire (without load)	5 280 [11 642] {5 390 [11 885]}	5 630 [12 414] {5 740 [12 657]}	6 210 [13 693]		6 910 [15 237]
	Engine model		6G72-32	FD {S6S}		S6S	
	Manufacturer		6G S6	72-32FD: Mi S: Mi	tsubishi Moto tsubishi Heav		
	Туре				cooled, 4-strol	ke cycle	
	No. of cylinders	- arrangement	6G S6	72-32FD: 6 - S: 6 -	- 60° - inline		
	Type of combus	tion chambers	6G S6	72-32FD: Ser S: Sw			
	Valve arrangem	ent	6G S6	72-32FD: Ov S: Ov	erhead with o	verhead cam	
	Type of cylinde	r liners	6G S6	72-32FD: Int S: Dr			
	Bore × stroke, n	nm [in.]	S6S:	: 3.59 × 2.99] 3.70 × 4.72]	94 × 120 [3.70 × 4.72]		
	Displacement, l	iter [cu in.]	6G72-32FD S6S: 4.996	: 2.972 [181] [305]	4.996 [305]		
	Compression ra	tio	6G72-32FD S6S: 22 : 1	: 8.9 : 1	22:1		
Engine	Rated output, P	S/rpm	6G72-32FD S6S: 82/2 4		82/2 450		
H	Maximum torqu N·m (kgf·m) [lb	ie, f·ft]/rpm	S6S:	: [132]/1 800 [184]/1 600	250 (25.5) [184]		
	Dimensions (ler mm [in.]	$gth \times width \times height)$,	6G72-32FD: 586 × 637 × 765 [23.1 × 25.1 × 30.1] 908 × 650 × 801 S6S: [35.7 × 25.6 × 31.5] [35.7 × 25.6 × 31.5])1 1.5]	
	Weight (service), kg [lb]	6G72-32FD S6S: 350 [7			350 [772]	
	Installation posi	tion			Rear		
	Intake	Open, BTDC			G72-32FD: 19).	
	valves	Close, ABDC			G72-32FD: 57 6S: 50	7° 0°	
	Exhaust	Open, BBDC	6G72-32FD: 57° S6S: 74°				
	valves	Close, ATDC			G72-32FD: 19	0. 6.	

Ite	·m	Truck model	FG35	FG40	FD45	FD50C	FD50	
110		Intoka velves (i)	{FD35}	{FD40}				
	Valve clearance	Intake valves, mm [in.] Exhaust valves, mm [in.]		6G72-32F S6S:	D: 0.25 [0.009 0.25 [0.009	9 8] (hot) 9 8] (cold)		
	Ignition		6G72-32FD: Spark S6S: Compression					
ne	Firing order			6G72-32F S6S:	D: 1-2-3- 1-5-3-			
Engine	Ignition or inje	ction timing, BTDC		6G72-32F S6S:	D: 5° 19°			
	Fuel tank capac	city, liter [U.S. gal]	105 [27.7]		125 [33]		
	No-load minim	um speed, rpm		6G72-32F S6S:	D: 600 to 650 650 to 700			
	No-load maxim	num speed, rpm		6G72-32F S6S:	D: 2 650 to 2 2 600 to 2			
	Taminiam anil	Туре			Mold			
ED)	Ignition coil	Manufacturer		D	iamond Electr	ic		
2-32		Type			Pointless			
G7.	Distributor	Manufacturer		rporation				
Ignition system (6G72-32FD)		Type of spark advance mechanism	Centrifugal-vacuum					
sys		Model		W	16EX-U/BP5E	ES		
tion	Spark plug	Manufacturer		Nippe	on Denso and	NGK		
Igni		Size, mm [in.]			14 [0.55]			
		Gap, mm [in.]		0.7 to	0.8 [0.028 to	0.031]		
(Conhumb	Type			Downdraft			
2FD	Carburetor	Manufacturer	Aisan Kogyo					
72-3	Governor	Type			Pneumatic	· · · · · · · · · · · · · · · · · · ·		
199	Governor	Manufacturer			Mikuni Kogyo)		
) wa	F1	Type		Elect	romagnetic plu	ınger		
syst	Fuel pump	Manufacturer			Jidosha Kiki			
Fuel system (6G72-32FD)	Air cleaner	Type × number		Cyclone	with paper ele	ment × 1		
F	All cleaner	Manufacturer		1	Nippon Rokak	i		
		Туре			Bosch			
	Fuel injection	Manufacturer			Nippon Denso			
(S)	pump	Plunger diam., mm [in.]			6.5 [0.256]			
Fuel system (S6S)		Cam lift (one side), mm [in.]			8 [0.31]			
sys		Туре			Throttle			
Fuel	Fuel injection	Spray holes, diam., mm [in.]			1.0 [0.04]			
	nozzles	Injection pressure, MPa (kgf/cm²) [psi]		13	.7 (140) [1 99	1]		

Ite	m	Truck model	FG35 {FD35}	FG40 {FD40}	FD45	FD50C	FD50	
		Туре			Sheathed			
Fuel system (S6S)	Heater plugs	Voltage – current, V – A		22 – 4.4				
tem	Fuel pump	Туре	Piston (Bosch)					
sys	ruer pump	Manufacturer	Nippon Denso					
Fue	Air cleaner	Type × number		Cyclone	with paper ele	ment × 1		
	All Cleaner	Manufacturer			Nippon Rokak	i		
Ę	Туре				Pressure feed			
Lubrication system	Oil pump				Trochoid type	:		
s uo	Oil filter			Pa	per element ty	ре		
cati	D-611	Oil pan		6G72-32FD:	4.0 [1.1] 5	S6S: 11 [2.9]		
ubri	Refill capacities liter [U.S. gal]	Oil filter			0.4 [0.1]	1 [0.3]		
1		Total			4.4 [1.2]	12 [3.2]		
u,	Туре			Fo	orced circulation	on		
Cooling system	Radiator			Corrugate	ed fin with pre	ssure cap		
s gu	Refill capacity,	liter [U.S. gal]		6G72-32FD:	11.85 [3.1]	66S: 11.85 [3.	1]	
ooli	Water pump		Centrifugal type driven by V-belt					
ŭ	Thermostat				Wax type			
ery	Type × number (Battery supplie	ed by MCFA or MCFE)	48D26 {48D26		48D26R × 2			
Battery	Voltage, V		12 {	24}	24			
	Capacity, Ah		40					
pı	Alternator type		3-phase AC					
or at	Manufacturer	i .	Mitsubishi Electric Corporation					
Alternator and regulator	Capacity, V – A	\	12 - {24 -			24 – 30		
A S	Voltage/current	regulator	Built-in IC type					
	Туре			F	Electromagneti	c		
tater	Manufacturer			Mitsubis	hi Electric Co	rporation		
St	Voltage – outpu	nt, V – kW	12 - {24 -			24 – 5		
	Control timer (FD35 thru FD5	Setting, sec			5 to 7			
ice	G	Operating voltage, V			16 to 30			
op dev	Stop solenoid (FD35 thru FD5	Rated current (at 24 V), A			11.3			
Engine stop device	Detector	Manufacturer				Mitsubish Corporation		
H H	(magnetic	Output, mA				180 mi	nimum	
	pickup)	Gap mm [in.]				0.7 ± [0.028 ±		

			Truck m	odel	FG35	FG40	FD45	FD50C	FD50
lte	Item Type			{FD35}	{FD40}				
	Clutch	T7.45	Facing (OD	×ID),	Dry, single disc (OP: wet type) 325 × 210 [12.8 × 8.3]				
	(FD35 thru	FD45)	mm [in.]		(wet: 325 × 225 [12.8 × 8.9]) DR-8 (wet: cork)				
			Material		L		ent, 1-stage, 2	-nhase	
	Torque com		Type	r's model			Okamura M15		
	Torque con	iverter	Manufacturer's model Stall torque ratio				3.2		
				and shift		Hydrau	ilic and colum	n shift	
		Power-		Forward		4.004		F1: 5.735,	F2: 3.239
ji.		shift	Ratios	Reverse		4.057		R1: 5.735,	R2: 3.239
Power train			Type			Synchro-mesh			
owe	Transmis-		Shift			Floor-shift			
Ы	sion	Manual (FD35	Forward	1st		8.462			
		thru FD45)	ratio	2nd		4.145			
		11043)	Reverse	1st		8.489			
			ratio	2nd		4.159			
	Reduction Type o		of gear		Spiral bevel				
	gear	Gear ra	atio		4.857				
		Housing			Banjo				
	Differ- ential		of gear and Gear		Straight bevel – 2				
		pinion – number		Pinion	Straight bevel – 4				
	Туре				Recirculating ball-and-nut				
	Gear ratio						20.0		
E E	Steering w	,	neter, mm [in	l.]			380 [15]		
syst		Туре	1' 1 TD .		Semi-integral				
Steering system	Power		cylinder ID > m., mm [in.]		$55 \times 25 \ [2.17 \times 0.98]$				
Stee	steering		ve stroke, mr	n [in.]	275 [10.8]				
		Relief p	pressure, f/cm²) [psi]			8·336 ⁺	490 (85 ⁺⁵) [1 2	209 ⁺⁷¹ 0]	
		Flow ra	te, liter [U.S	. gal]/min		17.5	± 0.5 [4.6 ± 6	0.13]	
	Front axle					Full-	floating tubula	r type	
_	Rear axle						Elliott type		
sten	Suspension	system	Front		Fixed type				
Traveling system	Casponsion	- 5,500111	Rear			C	enter-pivot ty	pe	
/elin		Toe-in,	mm [in.]		0				
Trav	Wheel	Cambe	r				1.0°		
	alignment	Caster					0°		
L		Kingpi	n inclination				5.0°		

		Truck model	FG35	FG40 {FD40}	FD45	FD50C	FD50	
Ite	m T	_	{FD35} {FD40} 1D45 1D35 Self-adjusting, duo-servo					
	ļ	Туре						
۔ ا		Drum diameter, mm [in.]		317.5 [12.50]			$332 \times 63 \times 10 \times 2$	
Brake system	Service brakes	it is the same and many limit		$51 \times 60 \times 6 \times .8 \times 2.4 \times 0.2$	2 ×2]	$[13.1 \times 2.5]$	$5 \times 0.4 \times 2$	
ķ		Master cylinder ID, mm [in.]	22.22 [0.874 8]				1.000]	
Bra		Wheel cylinder ID, mm [in.]		28.58 [1.125 2]	31.75 [1.250 0]	
	Parking brake	Туре		Mechanic	cal, mounted o	n wheels		
Brak	ce booster			Masterva	ac (vacuum sus	spended)		
Bod	v			Asse	embled-frame	type		
		Туре			Gear			
	Hydraulic pump	Manufacturer		yaba nazu}		Simazu		
		Hydraulic pump	Manufacturer's type)3245 32-48}		SPG2-48	
	• •	Rated discharge, liter [U.S. gal]/rpm		.0]/2 450 .6]/2 450}	1	16 [30.6]/2 4	50	
		Drive line			Universal join			
e e		Туре	KVS					
ster	Control	Manufacturer	Kayaba					
Hydraulic system	valve	Relief pressure, kPa (kgf/cm²) [psi]	19 123 ⁺⁴⁹⁰ (195 ⁺⁵ ₀) [2 773			773 ⁺⁷¹ 0]		
/dra	Flow	Type		Va	riable (Adjusta	ible)		
H	regulator valve	Regulated flow rate, liter [U.S. gal]/min		100 [26.4]		115	[30.4]	
	Lift	ID, mm [in.]		55 ^{+0.1} [2.56 ^{+0.0})004]	70 ^{+0.1} [2	2.76 ^{+0.004}]	
	cylinders	Stroke, mm [in.]			1 500 [59.06]			
	Tilt	ID, mm [in.]	80 0 1	[3.15 ^{+0.004}]	90	$0^{+0.1}_{0}$ [3.54 $^{+0.0}_{0}$	¹⁰⁴]	
	cylinders	Stroke, mm [in.]	185 [7.28]					
	Hydraulic	tank capacity, liter [U.S. gal]	58.5	[15.4]	69.3 [18.3]			

Ite	Truck model				FG35 FG40 FD45 FD50C FD5			
	Mast					Roller type CI	•	
	Mast dimensions (flange ID × thick × web thick), mm [in.]		Outer	118 × 23 × 14 [4.65 × 0.91 × 0.55]		130 × 25 × 16		5
			Inner	118 × 25 × 14 [4.65 × 0.98 × 0.55]		[5.	$12 \times 0.98 \times 0.$	63]
rks	Main rollers	Bearing		#6309 ball bearing		#6310 ball bearing		
and forks				118 × 40 [4.65 × 1.57]		130×40 [5.12 × 1.57]		
Mast	Side	Bearing		Lubricated type needle roller bearing				
Σ	rollers	rollers Diam × width, mm [in.]			52 × 36 [2.05 × 1.42]			
	Lift chain	ıs		BL	BL834 BL1023			
	Fork (leng	Fork (length × width × thick), mm [in.]			1 070 × 150 × 50 [42 × 5.9 × 2.0]		1 220 × 150 × 60 [48 × 5.9 × 2.4]	
	Fork spre	Fork spread (outer width), mm [in.]			300 to 1 190 [12 to 47]			300 to 1 500 [12 to 59]

COOLING SYSTEM

DESCRIPTION		
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INSPECTION AND ADJUST	MENT	
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Fan belt adjustment .		

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