

Book code No.

S7L00017E

KOBELCO

Hydraulic Excavator

MARK V

SERVICEMAN HANDBOOK

SK60v	LE-17701 ~
SK100v	YW-06501 ~
SK120v	LP-11001 ~
SK120LcV	YP-02301 ~
SK200v	YN-18001 ~
SK200LcV	YQ-02301 ~
SK220v	LQ-03301 ~
SK220LcV	LL-02301 ~

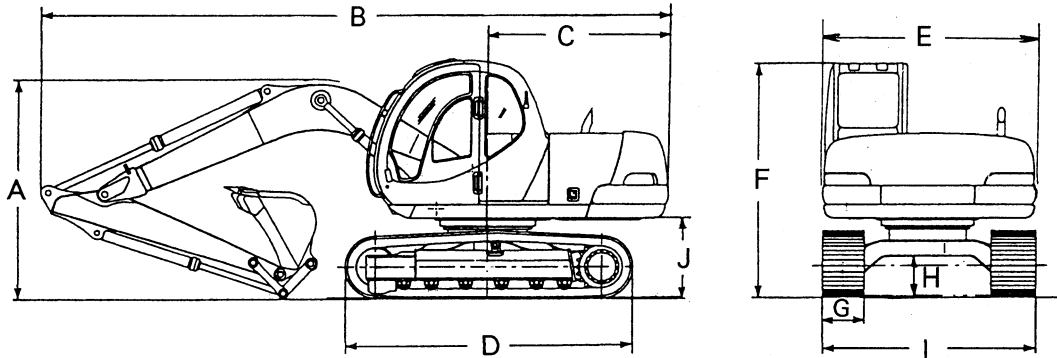
PRINTED IN JAPAN.
1992/04

CONTENTS

1. GENERAL DIMENSIONS	1
2. MACHINE SPECIFICATION TABLE	2
3. MAJOR SPECIFICATIONS	
3-1 ENGINE SPECIFICATIONS, CHARACTERISTIC CURVE.....	4
3-2 HYDRAULIC COMPONENTS	14
3-3 HYDRAULIC CYLINDER LIST	16
4. PERFORMANCE TABLE	18
5. WEIGHT OF COMPONENTS	19
6. CAPACITY TABLE OF LUBRICATION OIL AND COOLANT	23
7. LIST OF FILTER AND ELEMENT	23
8. SPECIFIED OIL AND GREASE, AND FILTER ELEMENT LIST	24
9. PROCEDURES FOR MEASURING AND ADJUSTING PRESSURE	34
10. HYDRAULIC OIL PUMP CONTROL CURVE	51
11. MECHATRO CONTROLLER	
11-1 INDICATION OF MULTI-PURPOSE DISPLAY SERVICE DIAGNOSIS.....	55
11-2 CLUSTER GAUGE CONNECTOR	56
11-3 SERVICE DIAGNOSIS INDICATION ITEMS.....	57
11-4 INDICATION OF MULTI-PURPOSE DISPLAY SELF DIAGNOSIS...	59
11-5 FAILURE HISTORY FUNCTION	63
11-6 MECHATRO "A" ADJUSTMENT	64
11-7 TROUBLE-SHOOTING	67-1
12. HYDRAULIC SYSTEM DIAGRAM.....	68
13. ELECTRIC CIRCUIT DIAGRAM	82
14. DIMENSIONS OF ATTACHMENTS	92
15. MAINTENANCE STANDARD	
15-1 PIN AND BUSHING TABLE OF ATTACHMENT	102
15-2 RESINOID SHIM TABLE OF ATTACHMENT	123
15-3 UNDER CARRIAGE.....	124
16. WORKING RANGES OF ATTACHMENT	130
17. LIFTING CAPACITY DIAGRAM	140
18. REFERENTIAL DATUM	
18-1 TIGHTNING TORQUES FOR NUTS AND SLEEVES.....	153
18-2 PIPE JOINT TIGHTENING TORQUE	154
18-3 "ORS" JOINT TIGHTENING TORQUE AND HANDLING	157
18-4 SPECIAL SPANNER FOR TUBE	158
19. CONVERSION TABLE.....	159

SK60v SK120v SK200v SK220v
SK100v SK120LCV SK200LCV SK220LCV

1. GENERAL DIMENSIONS



Unit : mm

MODEL	GENERAL DIMENSIONS										
	ARM	A	B	C	D	E	F	G	H	I	J
SK60v	1,730 (STD)	2,680	6,060	R1,700	2,785	2,170	2,590	450	380	2,150	770
	2,150 (LONG)	3,040	6,045					600		2,450	
	1,730+500 (EXTENTION)	2,890	6,055								
SK100v	2,220 (STD)	2,510	7,200	R2,050	3,320	2,490	2,725	500	455	2,490	905
	1,900 (SHORT)	2,515	7,215					600		2,590	
	2,700 (LONG)	2,915	7,155					700		2,690	
SK120v SK120LCV	2,500 (STD)	2,670	7,560	R2,100	3,570	2,490	2,725	500	455	2,490	905
	2,100 (SHORT)	2,600	7,550		(3,740)			600		2,590	
	3,000 (LONG)	3,050	7,520		(700)			700		(2,490)	
								(600)		(2,590)	
SK200v SK200LCV	2,940 (STD)	2,840	9,380	R2,700	4,170	2,715	2,900	600	465	2,800	1,055
	2,400 (SHORT)	2,995	9,470		(4,450)			700		2,900	
	3,300 (LONG)	2,835	9,390		(800)			800		3,000	
								(600)		(2,990)	
SK220v SK220LCV	2,980 (STD)	3,080	9,990	R2,850	4,350	2,840	2,930	600	480	2,990	1,080
	2,500 (SHORT)	3,245	10,050		(4,650)			700		3,090	
	3,660 (LONG)	3,065	9,960		(800)			800		3,190	
								(600)		(3,190)	
							(700)	(465)	(2,290)		
							(800)		(3,390)		

NOTE : The values in () shows LC type.

SK60v SK120v
SK100v SK120Lcv

2. MACHINE SPECIFICATION TABLE

ITEM	MODEL	SK60v			SK100v			SK120v / SK120Lcv		
PERFORMANCE										
STD bucket capacity	m ³	0.25			0.4			0.45		
Bucket capacity range	m ³	0.1~0.3			0.15~0.45			0.22~0.6		
Travel speed	km/h	5.5/3.5/2.5 (Low speed, FC mode)			7.0~1.0			7.0~1.0		
Swing speed	rpm	13/6.5			12/4.0			12/4.0		
Gradeability	° (%)	35 (70%)			35 (70%)			35 (70%)		
Travelling	ton	5.2			8.5			9.0		
Digging force	Bucket	4.8			7.7			8.0		
	Arm	3.7	3.4	3.2	6.5	5.8	5.2	7.0	6.3	5.7
	Arm length	1,730	2,150	1,730+500	1,900	2,220	2,700	2,100	2,500	3,000
DIMENSIONS AND WEIGHT										
Operating weight	ton	6.5 (450mm Shoes)			10.6 (500mm Shoes)			11.8 (500mm)		12.0 (500mm)
Dimensional for Transportation	Arm length	1,730	2,150	1,730+500	1,900	2,220	2,700	2,100	2,500	3,000
	Full length	6,060	6,045	6,055	7,215	7,200	7,155	7,550	7,560	7,520
	Full width	2,170	2,170	2,170	2,490	2,490	2,490	2,490	2,490	2,490
	Full height	2,680	3,040	2,890	2,725	2,725	2,915	2,725	2,725	3,050
Upper	Cab height from G.L.	2,590			2,725			2,725		
	Tail height from G.L.	770			905			905		
	Tail swing radius	1,700			2,050			2,100		
	Min. front swing radius	1,625			2,340			2,390		
Lower	Overall length of crawlers	2,785			3,320			3,570		3,740
	Crawler wheel centers	2,160			2,610			2,865		3,035
	Track gauge	1,700			1,990			1,990		1,990
	Overall width of crawlers	2,150			2,490			2,490		2,490
	Width of shoes ground pressure mm/kgf/cm ²	Grouser	450/0.30		Grouser	500/0.37		Grouser	500/0.39 : 500/0.37	
			600/0.23			600/0.32			600/0.33 : 600/0.31	
Flat		450/0.31		Flat	500/0.38		Flat	500/0.39 : 500/0.37		
		Triangle 600/0.23 : 700/0.20			Triangle 800/0.24			Triangle 800/0.25 : 800/0.24		
Ground clearance	mm	380			455			455		
ENGINE										
Model		ISUZU 4JB1			ISUZU 4BD1			ISUZU 4BDIT		
Rated power output	PS/rpm	57/2,200			76/2,300			85/2,100		
Max. torque	kgf·m/rpm	19.2/1,600			24/1,600			30.5/1,600		
Displacement	cc	2,771			3,856			3,856		
Capacity of fuel tank	ℓ	130			250			250		
HYDRAULIC SYSTEM										
Type of pumps		Two axial-piston, variable displacement pumps+gear pump			Two axial-piston, variable displacement pumps+gear pump			Two axial-piston, variable displacement pumps+gear pump		
Set pressure of system	kgf/cm ²	260/320 (Travel)			330			350		
Swing motor		Axial piston			Axial piston			Axial piston		
Travel motor		Axial piston			Axial piston			Axial piston		
Control valves		6-spool			6-spool			6-spool		
Capacity of HYD. oil tank	ℓ	50			100			100		
WORKING RANGES										
Length of Arm	mm	STD	LONG	EXT.	SHORT	STD	LONG	SHORT	STD	LONG
		1,730	2,150	1,730+500	1,900	2,220	2,700	2,100	2,500	3,000
Bucket capacity	m ³	0.25	0.2	0.2	0.45	0.4	0.32	0.5	0.45	0.33
Max. digging reach	mm	6,390	6,780	6,840	7,400	7,700	8,160	7,920	8,270	8,730
Max. digging depth	mm	4,200	4,610	4,690	4,780	5,100	5,580	5,200	5,600	6,100
Max. vertical wall digging depth	mm	3,600	3,960	4,090	4,230	4,560	5,020	4,600	4,980	5,400
Max. digging height	mm	7,400	7,720	7,760	7,820	8,040	8,350	8,350	8,520	8,800
Max. dumping clearance	mm	5,340	5,650	5,690	5,440	5,650	5,960	5,900	6,090	6,370

SK 200v SK 220v
SK 200Lcv SK 220Lcv

ITEM		MODEL			SK200v / SK200Lcv			SK220v / SK220Lcv		
PERFORMANCE										
STD bucket capacity		m ³			0.7			0.9		
Bucket capacity range		m ³			0.45~1.1			0.7~1.2		
Travel speed		km/h			7.0~1.0			7.0~1.0		
Swing speed		rpm			11/4.0			11/4.0		
Gradeability		° (%)			35 (70%)			35 (70%)		
Travelling		ton			16.3			18.4		
Digging force	Bucket	ton			11.8 (Power boost 12.8)			14.2 (Power boost 15.0)		
	Arm	ton			11.3 (12.3)			9.6 (10.4)		
	Arm length	mm			2,400			2,940		
DIMENSIONS AND WEIGHT										
Operating weight		ton			19.0 (600mm)			19.5 (600mm)		
Dimensions for Transportation	Arm length	mm			2,400			2,940		
	Full length	mm			9,470			9,380		
	Full width	mm			2,800			2,990		
	Full height	mm			2,995			2,900		
Upper	Cab height from G.L.	mm			2,900			2,930		
	Tail height from G.L.	mm			1,055			1,080		
	Tail swing radius	mm			2,700			2,850		
	Min. front swing radius	mm			3,460			3,900		
Lower	Overall length of crawlers	mm			4,170			4,450		
	Crawler wheel centers	mm			3,370			3,650		
	Track gauge	mm			2,200			2,390		
	Overall width of crawlers	mm			2,800			2,990		
	Width of shoes ground pressure	mm/kgf/cm ²	Grouser	600/0.43		600/0.41		Grouser	600/0.50	
				700/0.38		700/0.36			700/0.44	
				800/0.33		800/0.32			800/0.39	
Flat			600/0.44		600/0.42		Flat	600/0.51		
Triangle	900/0.30		900/0.29		Triangle					
Ground clearance	mm			465			480			
ENGINE										
Model		MITSUBISHI 6D31-T			MITSUBISHI 6D15-T					
Rated power output		PS/rpm			140/2,200			165/2,100		
Max. torque		kgf·m/rpm			47/1,700			60/1,600		
Displacement		cc			4,948			6,919		
Capacity of fuel tank		ℓ			315			315		
HYDRAULIC SYSTEM										
Type of pumps		Two axial-piston, variable displacement pumps+ gear pump			Two axial-piston, variable displacement pumps+ gear pump					
Set pressure of system		kgf/cm ²			350 (Power boost 380)			350 (Power boost 370)		
Swing motor		Axial piston			Axial piston					
Travel motor		Axial piston			Axial piston					
Control valves		6-spool			6-spool					
Capacity of HYD. oil tank		ℓ			142			160		
WORKING RANGES										
Length of Arm	mm	SHORT	STD	LONG	SHORT	STD	LONG			
		2,400	2,940	3,300	2,500	2,980	3,660			
Bucket capacity	m ³	0.8	0.7	0.6	1.0	0.9	0.7			
Max. digging reach	mm	9,420	9,900	10,220	9,890	10,310	10,970			
Max. digging depth	mm	6,190	6,700	7,090	6,530	7,010	7,690			
Max. vertical wall digging depth	mm	5,550	6,080	6,460	5,830	6,180	6,790			
Max. digging height	mm	9,400	9,660	9,770	9,630	9,770	10,170			
Max. dumping clearance	mm	6,560	6,830	6,970	6,710	6,870	7,250			

SK60V

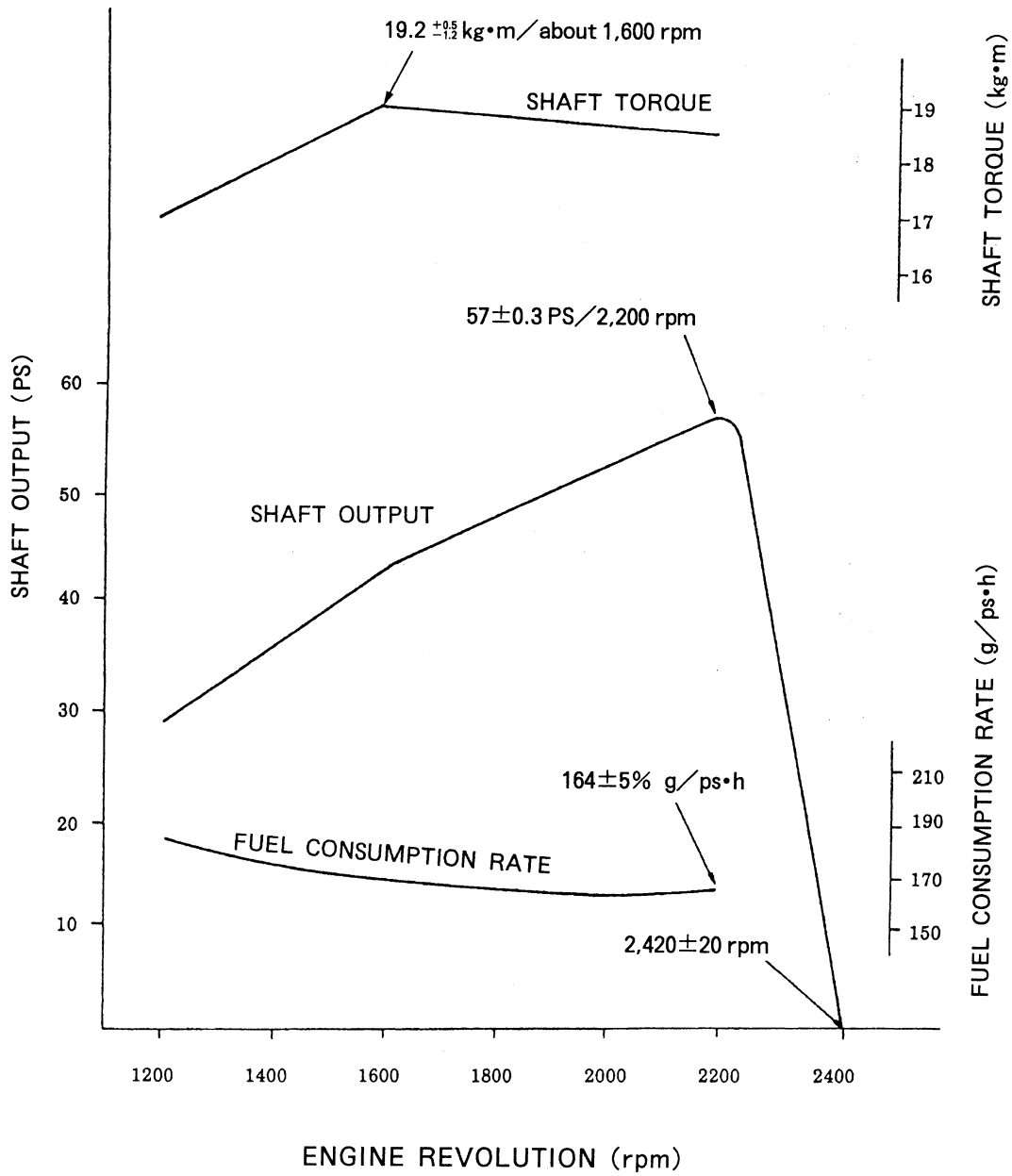
3. MAJOR SPECIFICATIONS

3-1 ENGINE SPECIFICATIONS, CHARACTERISTIC CURVE

Principal items

Model	ISUZU 4JB1 Diesel engine			
Type	4cycle, Water-cooled, Direct injection			
No. of cylinder—Bore×Stroke	4—93mm×102mm			
Total displacement	2,771cc			
Compression ratio	18.2			
output rating	57PS/2,200 rpm			
Max. torque	19.2kgf·m/1,600 rpm			
High idling	2,420±20 rpm			
Low idling	925±20 rpm			
Injection start pressure	185kgf/cm ²			
Firing order	1—3—4—2			
Fuel injection timing	17° before the top dead point			
Compression pressure	30kgf/cm ² at 200 rpm			
Valve clearance Valve action timing		Valve clearance	Open	Close
	Suction valve	In cold condition 0.4mm	24.5° before the top dead point	55.5° after the bottom dead point
	Exhaust valve	In cold condition 0.4mm	54° before the bottom dead point	26° after the top dead point
Motion of thermostat	Beginning of opening at 82°C, Full open at 95°C			
Starter	3.5KW			
Alternator	24V—20A			
Empty weight	240 kg			
Cooling fan drive method	φ 450 suction type, Belt drive, Pulley ratio1.117			
Turning direction	Counterclockwise as viewed from flywheel			

Engine characteristic curve
(ISUZU4JB1)

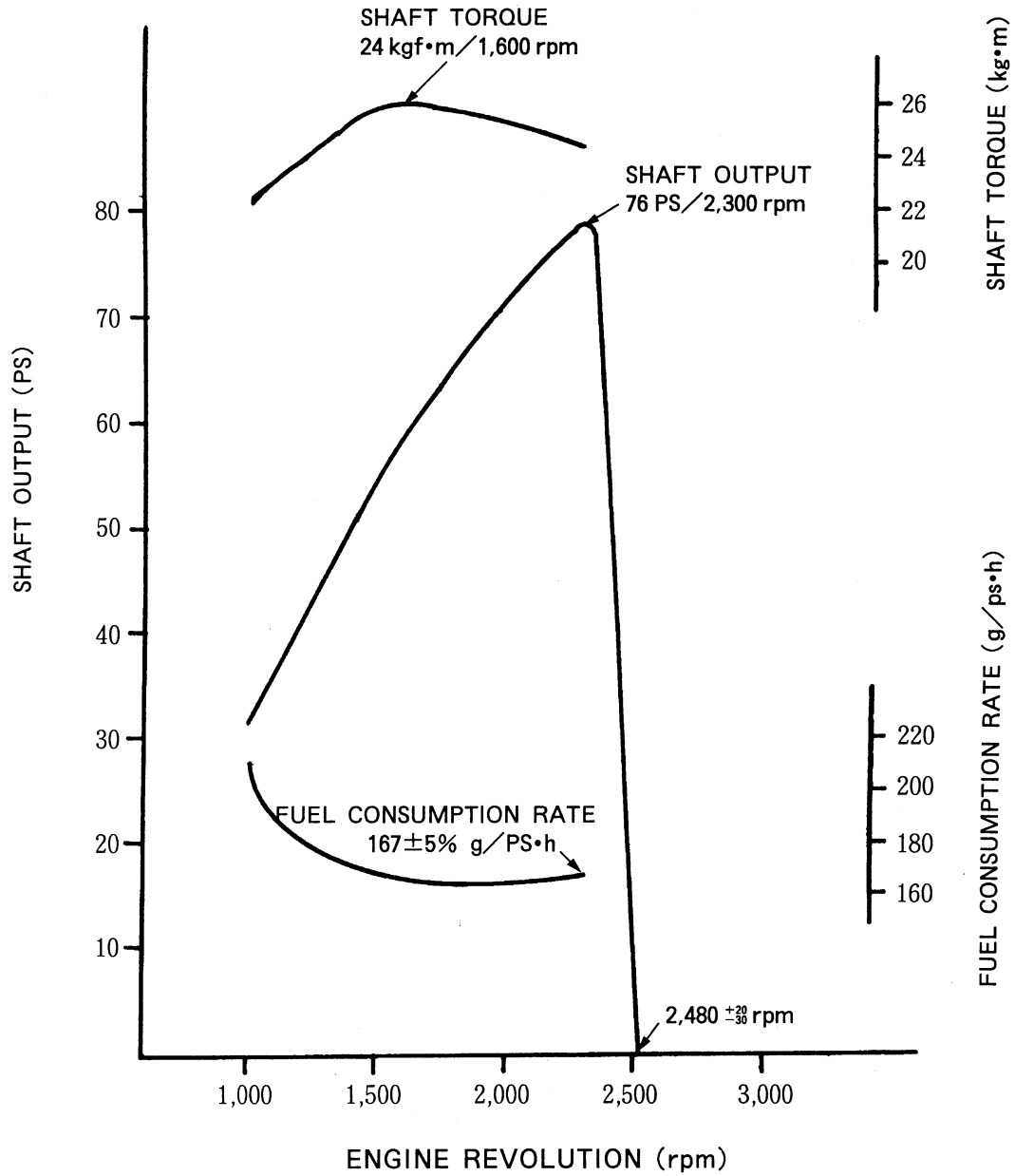


SK100v

Principal items

Model		ISUZU 4BD1 Diesel engine		
Type		4cycle, Water-cooled, Direct injection		
No. of cylinder – Bore×Stroke		4 – 102mm×118mm		
Total is dis placement		3,856cc		
Compression ratio		17.5		
output rating		76PS/2,300 rpm		
Max. torque		24kgf·m/1,600 rpm		
High idling		2480 \pm 30 rpm		
Low idling		935 \pm 25 rpm		
Injection start pressure		150kgf/cm ²		
Firing order		1 – 3 – 4 – 2		
Fuel injection timing		18° before the top dead point		
Compression pressure		31kgf/cm ² at 200 rpm		
Valve clearance Valve action timing		Valve clearance	Open	Close
	Suction valve	In cold condition 0.4mm	19° before the top dead point	47° after the bottom dead point
	Exhaust valve	In cold condition 0.4mm	57° before the bottom dead point	15° after the top dead point
Motion of thermostat		Bigining of opening at 82°C, Full open at 95°C		
Starter		24V – 4.5KW		
Alternator		24V – 30A		
Empty weight		325 kg		
Cooling fan drive method		φ 550 suction type, Belt drive, Pulley ratio 0.92		
Turning direction		Counterclockwise as viewed from flywheel		

Engine characteristic curve
(ISUZU4BD1)



SK120V
SK120LCV

Principal items

Model	ISUZU 4BD1T Diesel engine			
Type	4cycle, Water-cooled, Direct injection, With turbo charger			
No. of cylinder—Bore×Stroke	4—102mm×118mm			
Total is displacement	3,856cc			
Compression ratio	17.5			
output rating	85PS/2,100 rpm			
Max. torque	30.5kgf·m/1,600 rpm			
High idling	2,310 \pm 20 rpm			
Low idling	935 \pm 25 rpm			
Firing order	1—3—4—2			
Fuel injection timing	18° before the top dead point			
Compression pressure	31kgf/cm ² at200 rpm			
Valve clearance Valve action timing		Valve clearance	Open	Close
	Suction valve	In cold condition 0.4mm	19° before the top dead point	47° after the bottom dead point
	Exhaust valve	In cold condition 0.4mm	57° before the bottom dead point	15° after the top dead point
Motion of thermostat	Bigining of opening at 82°C, Full open at 95°C			
Starter	24V—4.5KW (R/G 付)			
Alternator	24V—30A			
Empty weight	345 kg			
Cooling fan drive method	φ 550 suction type, Belt drive, Pulley ratio 1.09			
Turning direction	Counterclockwise as viewed from flywheel			