KOBELCO

UR Series

SERVICEMAN HANDBOOK

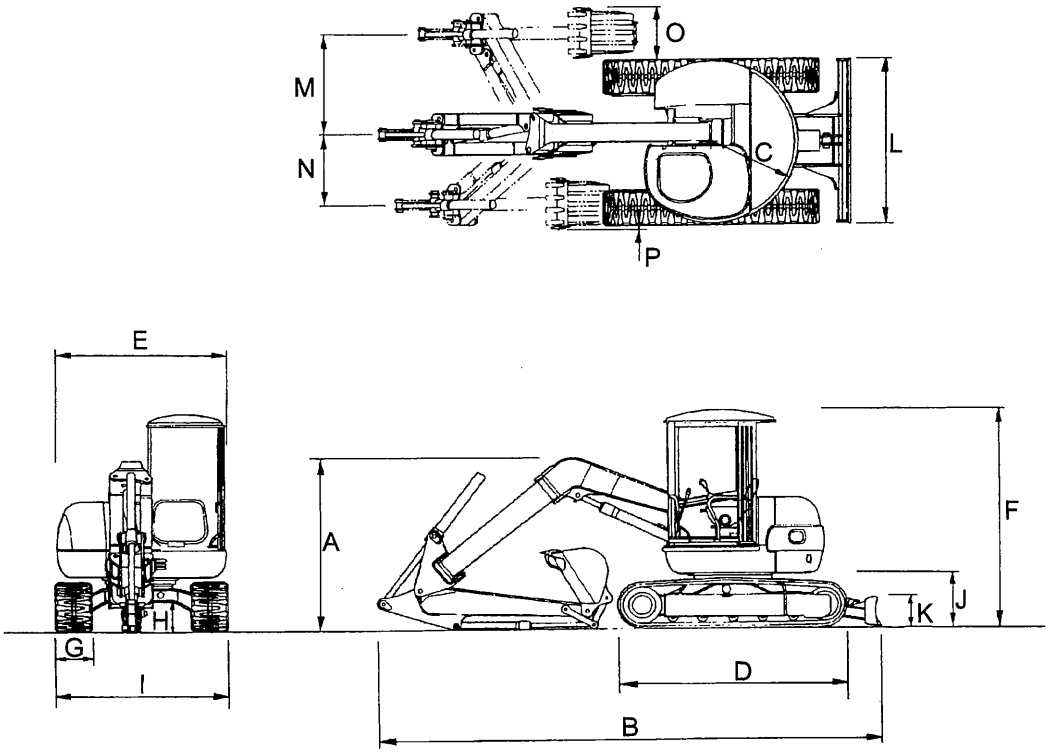
SK30UR-2	PR 03-02501~
SK50UR-2	YJ 02-04001~
SK75UR-2	YR 03-02801~

Book code No.S7LO0025E

1997.02 (J)
2005.05 (E)

CONTENTS

1. DIMENSIONS IN TRANSPORTATION



Unit : mm

	Arm	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
SK30UR-2	1,220	1,575	4,380	R775	2,010	1,525	2,400	300	310	1,550	570	350	1,550	860	745	475	40
	1,580	1,590	4,370														
SK50UR-2	1,910	2,000	5,570	R990	2,500	1,960	2,550	400	330	1,980	635	355	1,980	1,205	850	630	45
	1,530	1,980	5,560														
SK75UR-2	1,760	2,200	6,070	R1,075	2,800	2,170	2,760	450	380	2,320	750	500	2,320	1,370	1,005	690	115
	2,060	2,210	6,085														

2. MACHINE SPECIFICATIONS

Item			Model	SK30UR-2	SK50UR-2	SK75UR-2
Performance	Heaped capacity of bucket		m^3	0.07	0.16	0.28
	Travel speed	Rubber crawler	km/h(low/high)	3.0/5.1	3.0/5.0	3.5/5.6
		Iron crawler	km/h(low/high)	2.8/4.8	2.7/4.6	3.3/5.4
	Slewing speed		min^{-1}{rpm}	9.2	10	13
	Gradeability		degree	30	30	35
	Travel force	Rubber crawler	kgf	2,510	4,700	6,330
		Iron crawler	kgf	2,690	5,080	6,670
	Digging force	Bucket	kgf	2,310	3,500	4,800
		Arm	kgf	1,600	2,400	3,670
		Arm length	mm	1,220	1,910	1,760
	Ground pressure	Rubber crawler	kgf/cm^2	0.28	0.30	0.36
		Iron crawler	kgf/cm^2	0.29	0.31	0.36
Weight	Cab	Upper structure	kg	–	2,490	3,360
		Undercarriage	kg	–	1,810	2,900
		Machine weight	kg	–	5,340	7,820
	Canopy	Upper structure	kg	1,220	2,400	3,270
		Undercarriage	kg	1,010	1,810	2,900
		Machine weight	kg	2,920	5,250	7,730
Engine	Model			YANMER 3TNE84-YB 4-cycle water cooled	YANMER 4TNE88-YB 4-cycle water cooled	ISUZU 4JB1 4-cycle water cooled
	Output rating		PS/rpm	24/2,150	39.7/2,350	57/2,200
	Maximum torque		kgf·m/rpm	9.18/1,400	14.5/1,400	19.2/1,600
	Total displacement		L	1.496	2.189	2.771
	Number of cylinders-BoreXStroke		mm	3-84X90	4-88X90	4-93X102
	Fuel consumption rate		g/PS·h	180	185	164±5%
	Fuel tank capacity		L	32	53	105
Hyd. component	Hydraulic pump			Variable displacement double piston gear pump X 2		
	Setting pressure		kgf/cm^2	210	210 (230 travel)	260 (320 travel)
	Slewing motor			Axial piston motor		
	Travel motor			2-speed axial piston motor X 2		
	Control valve			7-spool+2-spool	8-spool	8-spool
	Hydraulic tank capacity(system capacity)		L	41(55)	50(70)	50(85)

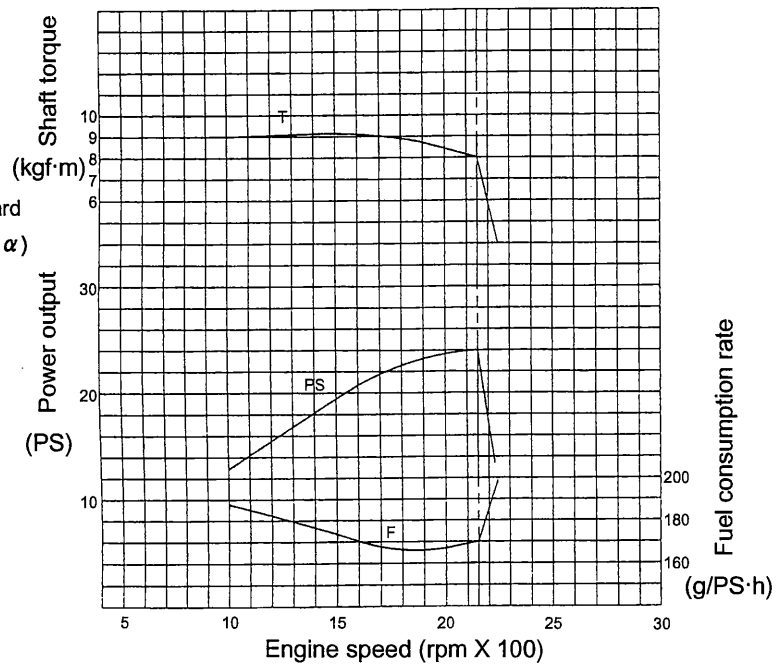
3. COMPONENT SPECIFICATIONS

3-1 ENGINE SPECIFICATIONS

Item \ Engine Model		YANMAR 3TNE84-YB
Type		Vertical 4-cycle water-cooled diesel engine
No. of cylinders-Bore x Stroke	mm	3-84 x 90
Displacement	cc	1,496
Compression ratio		18.0 (Effective 16.2)
Fuel injection timing (FID, b.T.D.C)	degree	12°
Dry weight		155 $^{+5}_{0}$
Firing order		1-3-2
Compression pressure	kgf/cm^2	33 at 250rpm
Recommended diesel gas oil		Diesel oil
Valve clearance at cool, intake and exhaust	mm	0.2
Intake valve timing (Open) (b.T.D.C)	degree	15°±5
Intake valve timing (Close) (a.B.D.C)	degree	45°±5
Exhaust valve timing (Open) (b.T.D.C)	degree	56°±5
Exhaust valve timing (Close) (a.B.D.C)	degree	18°±5
Injection pump		Bosch type
Governor		Mechanical centrifugal governor (All speed type)
Fuel injection pressure	kgf/cm^2	200±5
Cooling system		Liquid cooling / Radiator
Cooling fan		Pusher type, 6 blades 335dia.
Thermostat	degrees C	Starting 71, Full open 85
Cooling water capacity	L	2.0
Lubrication system		Forced lubrication with trochoid pump
Lubricating oil capacity	L	4.7
Recommended lubricating oil		API grade CD class
Fuel filtration		With water separator, paper cartridge type
Oil filtration		Paper cartridge type
Alternator		12V-40A
Starter		12V-1.4kW

Engine performance curve

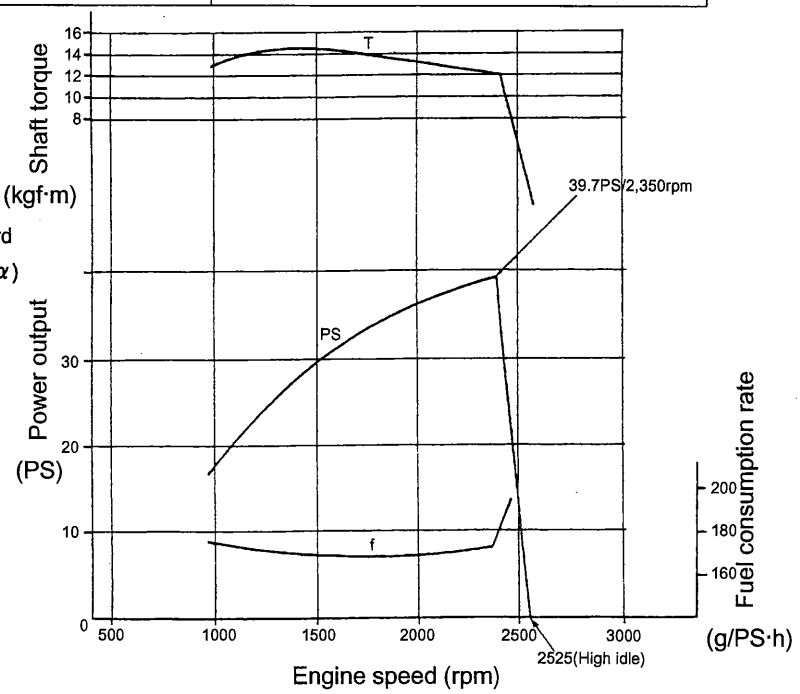
$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times PS \times \text{Standard load factor } (\alpha)$$



Item / Engine Model		YANMAR 4TNE88-YB
Type		Vertical 4-cycle water-cooled diesel engine
No. of cylinders-Bore x Stroke	mm	4-88 x 90
Displacement	cc	2,189
Compression ratio		18.0 (Effective 16.2)
Fuel injection timing (FID, b.T.D.C)	degree	14°
Dry weight		180
Firing order		1-3-4-2
Compression pressure	kgf/cm^2	30
Recommended diesel gas oil		Diesel oil
Valve clearance at cool, intake and exhaust	mm	0.2
Intake valve timing (Open) (b.T.D.C)	degree	15°±5
Intake valve timing (Close) (a.B.D.C)	degree	45°±5
Exhaust valve timing (Open) (b.T.D.C)	degree	56°±5
Exhaust valve timing (Close) (a.B.D.C)	degree	18°±5
Injection pump		Bosch type
Governor		Mechanical centrifugal governor (All speed type)
Fuel injection pressure	kgf/cm^2	200 $^{-10}_{0}$
Cooling system		Liquid cooling / Radiator
Cooling fan		Pusher type, 8 blades 410 dia. (Suction type)
Thermostat	degrees C	Starting 71, Full open 85
Cooling water capacity	L	2.7
Lubrication system		Forced lubrication with trochoid pump
Lubricating oil capacity	L	5.8
Recommended lubricating oil		API grade CD class
Fuel filtration		With water separator, paper cartridge type
Oil filtration		Paper cartridge type
Alternator		12V-40A
Starter		12V-2.0kW

Engine performance curve

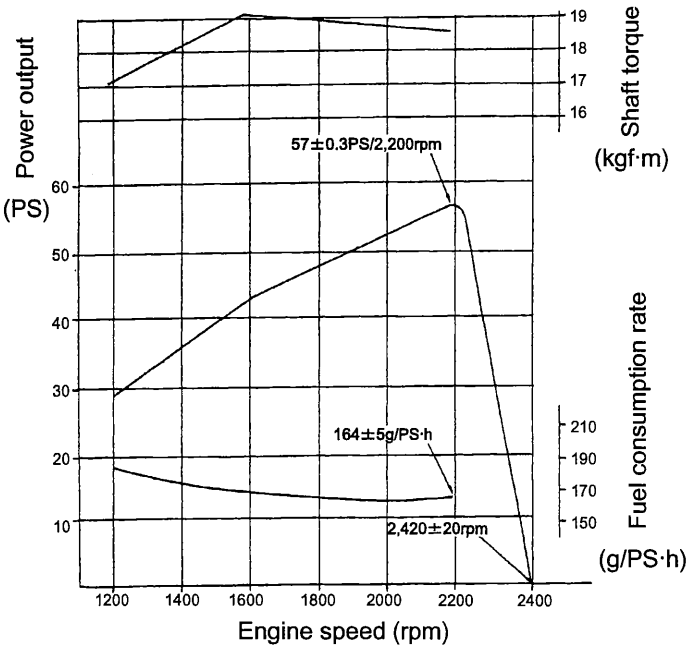
$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times PS \times \text{Standard load factor } (\alpha)$$



Item \ Engine Model		ISUZU 4JB1
Type		Vertical 4-cycle water-cooled direct injection diesel engine
No. of cylinders-Bore x Stroke	mm	4-93 x 102
Displacement	cc	2,771
Compression ratio		18.2
Fuel injection timing (FID, b.T.D.C)	degree	17°
Dry weight		253
Firing order		1-3-4-2
Compression pressure	kgf/cm^2	30 at 200rpm
Recommended diesel gas oil		Diesel oil
Valve clearance at cool, intake and exhaust	mm	0.4
Intake valve timing (Open) (b.T.D.C)	degree	24.5°
Intake valve timing (Close) (a.B.D.C)	degree	55.5°
Exhaust valve timing (Open) (b.T.D.C)	degree	54°
Exhaust valve timing (Close) (a.B.D.C)	degree	26°
Injection pump		Bosch type
Governor		Mechanical centrifugal governor (All speed type)
Fuel injection pressure	kgf/cm^2	185
Cooling system		Liquid cooling / Radiator
Cooling fan		7 blades 450 dia. (Suction type), plastic
Thermostat	degrees C	Starting 82
Cooling water capacity	L	5
Lubrication system		Forced lubrication
Lubricating oil capacity	L	About 8.0
Recommended lubricating oil		API grade CD class
Fuel filtration		With water separator, paper cartridge type
Oil filtration		Paper cartridge type
Alternator		12V-40A
Starter		12V-3.5kW

Engine performance curve

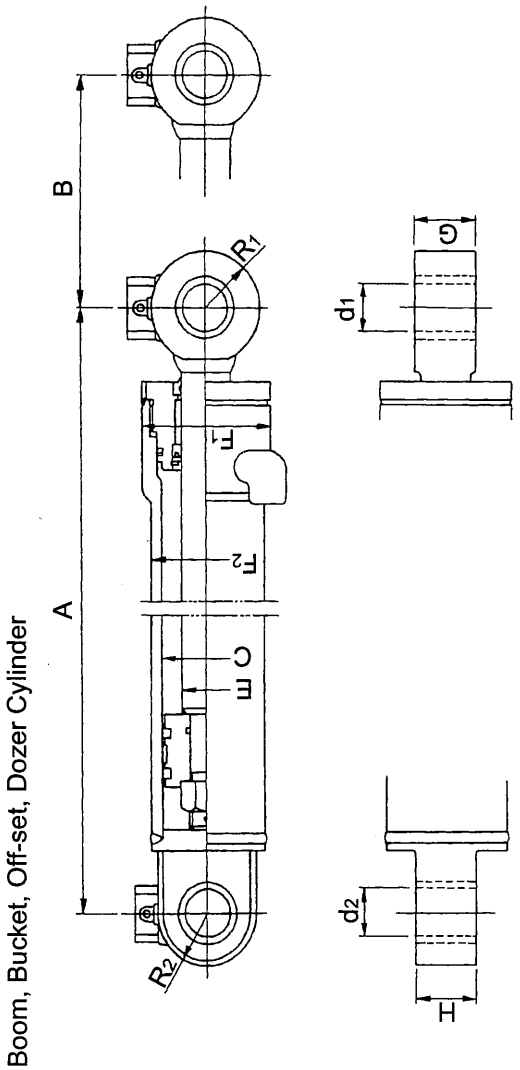
$$\text{Fuel consumption} = \frac{\text{Fuel consumption rate}}{0.835 \times 1000} \times PS \times \text{Standard load factor } (\alpha)$$

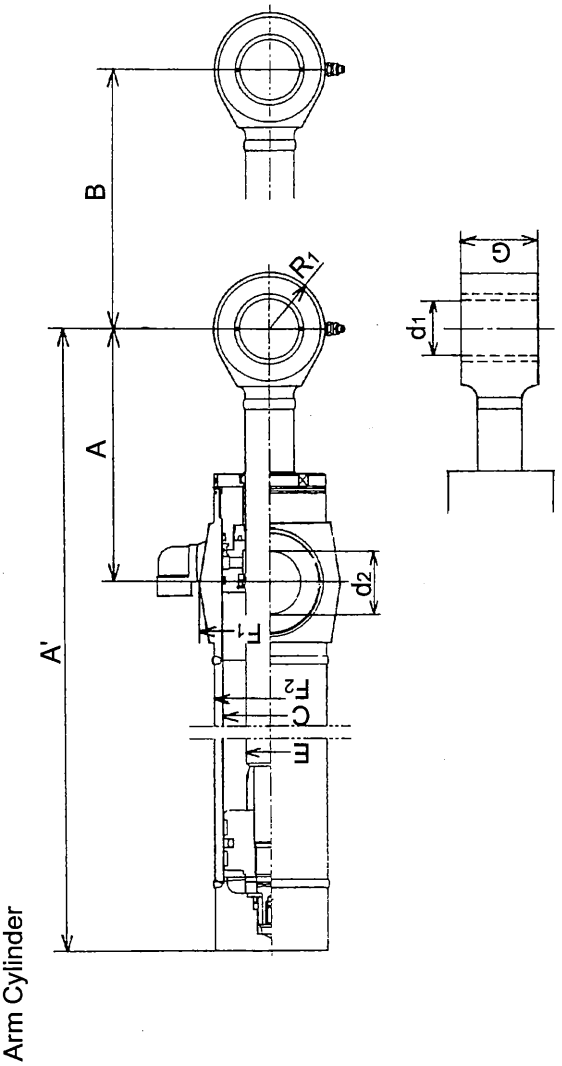


3-2 HYDRAULIC COMPONENTS

Item			Model	SK30UR-2	SK50UR-2	SK75UR-2
Hydraulic pump	First & Second	Type		Variable displacement double piston	Variable displacement double piston	Variable displacement double piston
		Displacement	cc/rev	15.6X2	23.5X2	30X2
		Delivery flow rate	L/min	33.5X2	55.2X2(at 2,350rpm)	71.4X2
		Working pressure	kgf/cm^2	210	210/230	260/320
	Third Type	Type		Gear pump	Gear pump	Gear pump
		Displacement	cc/rev	9	13.9	19.4
		Delivery flow rate	L/min	19.4X2	29.5	55.4
		Working pressure	kgf/cm^2	200	200	160
	Weight		kg	22	41	43
	Pilot	Type		Gear pump	Gear pump	Gear pump
		Displacement	cc/rev	5	5.45	9
		Delivery flow rate	L/min	10.7	12.8	21.4
		Working pressure	kgf/cm^2	35	35	35
Control valve	Main	Model		AC3AS	BCV-70C2	BCV-70B
		No. of element		7	8	8
		Main relief valve pressure	kgf/cm^2 at L/min	210 at 33.6	230 at 25 (Travel) 210 at 55 (ATT)	320 at 24 (Travel) 260 at 55 (ATT)
		Weight	kg	31	98	98
	Sub	Model		AC3A	–	–
		No. of element		2	–	–
		Main relief valve pressure	kgf/cm^2 at L/min	200 at 20	–	–
		Weight	kg	12	–	–
Slewing motor	Model			SGO1DE-054	SG015E-053C	SGO25DE-050
	Type			Axial piston motor	Axial piston motor	Axial piston motor
	Displacement		cc/rev	22.02	39.1	45.5
	Relief valve pressure		kgf/cm^2 at L/min	170 at 20	150 at 55	225
	Reduction ratio			14.72	18.6	15.537
	Reduction lubricant capacity		L	Lubricated with hydraulic oil	Lubricated with hydraulic oil	1.5
	Weight		kg	32	48	67
Travel motor	Model			PHW-250-41B-1S1-8057B	GMO5VL-C-16/27-1	GMO9L-A-23/37-1
	Type			Axial piston motor	Axial piston motor	Axial piston motor
	Displacement		cc/rev	12.24/22.16	15.5/27	23.2/37.2
	Relief valve pressure		kgf/cm^2 at L/min	240 at 20	–	–
	Reduction ratio			40.6	60	52.8
	Reduction lubricant capacity		L	0.8X2	1.1X2	1.7X2
	Weight		kg	45	62	90
Pilot valve	Work	Torque for operation	kgf·m	6	←	←
		Operating angle	degree	25(for port 2&4), 19(for port 1&3)	←	←
		Weight	kg	4.8	←	←
	Travel	Torque for operation	kgf·m	1.32	←	←
		Operating angle	degree	12.4	←	←
		Weight	kg	10	←	←

3-3 HYDRAULIC CYLINDER





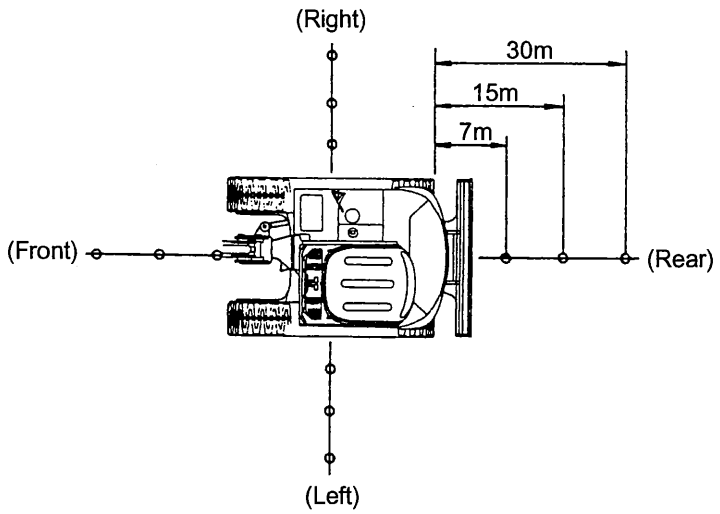
Machine	Applicable cylinder	Parts No.	A / A'	B	C	E	F1	F2	G	H	R1	R2	d1	d2	Weight (kg)	Cushion mechanism		Remarks
																Rod side	Head side	
SK30UR-2	Boom	PR01V00001F1	990	650	85	45	106	101	60	60	45	45	45	45	41	O		
	Arm	PR01V00002F1	235 / 869	509	80	40	115	95	50	–	45	–	45	–	32	O	O	
	Bucket	PR01V00003F1	700	420	70	35	85	85	45	45	37	42	40	40	21			
	Off-set	PR01V00004F1	675	407	70	35	85	85	45	45	37	42	40	40	20			
	Dozer	PR01V00005F1	560	140	95	55	114	114	60	60	50	50	55	55	32			
SK50UR-2	Boom	YJ01V00001F1	1,250	840	100	60	124	114	85	90	50	50	55	55	65	O		
	Arm	YJ01V00002F1	240 / 1,142	758	95	55	–	109	85	–	50	–	50	55	62	O	O	
	Bucket	YJ01V00003F1	945	610	80	50	93	89	60	60	50	50	45	45	34			
	Off-set	YJ01V00004F1	932	542	100	55	120	112	85	85	50	50	55	55	50	O	O	
	Dozer	YJ01V00005F1	540	175	110	60	136	136	70	70	55	65	55	55	46			
SK75UR-2	Boom	YR01V00001F1	1,405	975	115	70	142	131	95	95	60	70	65	65	100	O		
	Arm	YR01V00006F1	270 / 1,182	725	110	70	147	129	95	–	60	–	60	65	90	O	O	
	Bucket	YR01V00003F1	1,120	735	85	55	105	97	85	85	50	50	50	50	50			
	Off-set	YR01V00007F1	1,023	664	110	55	136	126	95	95	55	67	67	55	61			
	Dozer	YR01V00008F1 / YR01V00008F2	540	150	90	55	111	111	60	60	50	50	50	45	31			

4. PERFORMANCE

Earth : Soft soil
Dump truck loading by 90° slewing
(Start to dig from ground level)

Item / Machine	Slewing speed rpm High	Slewing speed rpm Low	Travel speed km/h	Traction kg	Grade-ability deg	Attachment digging force Arm (Arm length) kgf (mm)	Attachment digging force Bucket kgf	Fuel consumption L/h	Workload m^3/h	Cycle time 90°slewing sec	Remarks
SK30UR-2	9.2/5.4		Rubber crawler 3.0/5.1 Iron crawler 3.3/5.4	Rubber crawler 2,510 Iron crawler 6,670	30	1,600 (1,220)	2,310	3.50	16.8	15	
SK50UR-2	10/5.5		Rubber crawler 3.0/5.0 Iron crawler 2.7/4.6	Rubber crawler 4,700 Iron crawler 5,080	30	S type 2,800 (1,530) L type 2,400 (1,910)	3,500	5.60	33.6	15	
SK75UR-2	12.5/6.5		Rubber crawler 3.5/5.6 Iron crawler 3.3/5.4	Rubber crawler 6,330 Iron crawler 6,670	35	3,670 (1,760)	4,800	8.45	60.0	15	

Noise level



Unit : dB

Machine	7m Directions Front	7m Directions Rear	7m Directions Left	7m Directions Right	7m Noise level	15m Directions Front	15m Directions Rear	15m Directions Left	15m Directions Right	15m Noise level	30m Directions Front	30m Directions Rear	30m Directions Left	30m Directions Right	30m Noise level	Cab Door Open	Cab Door Close	Cab Close to operator's ear Right	Cab Close to operator's ear Left
SK30UR-2	63	64	65	65	64	58	56	60	59	58	52	51	52	54	52	—	—	78 (canopy)	78 (←)
SK50UR-2	65	70	68	69	68	61	64	63	64	63	56	58	57	58	57	—	—	80 (canopy)	78 (←)
SK75UR-2	68	68	68	71	69	61	62	62	64	62	56	56	56	58	57	—	—	——	——

5. WEIGHT OF COMPONENTS

Unit : kg

Item \ Model	Canopy	Cab
Machine complete	2,9200 (3,000)	3,030 (3,110)
● Upper structure (Assembly of followings)	1,220	1,330
●● Counterweight	216	←
●● Canopy (Cab)	46	160
●● Engine, Radiator	* 30	←
●● Hydraulic pump	22	←
●● Hydraulic oil & Fuel tank	* 50	←
●● Slewing motor	32	←
●● Control valve (8-spool)	31	←
●● Control valve (2-spool)	12	←
●● Boom cylinder	* 41	←
●● Upper frame	290	←
● Undercarriage (Assembly of followings)	1,010 (1,090)	←
●● Lower frame	310	←
●● Slewing bearing	40	←
●● Travel motor, Reduction gear	80	←
●● Upper roller	6	←
●● Lower roller	60	←
●● Idler adjuster	20	←
●● Idler assembly, Crawler	42	←
●● Sprocket	26	←
●● Swivel joint	22	←
●● Dozer	125	←
●● 300mm rubber shoe (300mm iron shoe)	240 (320)	←
●● Dozer cylinder	* 30	←
● Attachment (Assembly of followings)	545	←
●● Bucket assembly (0.07m^3)	70	←
●● Arm assembly (Assembly of followings)	106	←
●●● Bucket link	63	←
●●● Idler link	* 21	←
●●● Bucket cylinder	5	←
●●● Arm	7	←
●●● Pin (Arm cylinder attaching, Bucket attaching x 2)	10	←
●● Boom assembly (Off-set cylinder attaching, including following)	355	←
●●● Arm cylinder	* 32	←
● Fluid, Water (Assembly of followings)	69	←
●● Hydraulic oil, Engine oil	39	←
●● Fuel	26	←
●● Water (Coolant)	4	←

Note: 1 Marks * show a dry weight.
2 The figures in ( ) show the case of iron shoe.

Unit : kg

Item \ Model	Canopy		Cab (Option)	
	Rubber	Iron	Rubber	Iron
Machine complete	5,250	5,250	5,340	5,340
● Upper structure (Assembly of followings)	2,400	←	2,490	←
●● Counterweight	580	←	←	←
●● Canopy (Cab)	96	←	188	←
●● Engine	185	←	←	←
●● Hydraulic pump	41	←	←	←
●● Hydraulic oil tank	* 49	←	←	←
●● Fuel tank	* 29	←	←	←
●● Slewing motor	48	←	←	←
●● Control valve	98	←	←	←
●● Boom cylinder	* 65	←	←	←
●● Upper frame	650	←	←	←
●● Radiator	* 28	←	←	←
● Undercarriage (Assembly of followings)	1,810	←	←	←
●● Lower frame	540	←	←	←
●● Slewing bearing	76	←	←	←
●● Travel motor	62X2	←	←	←
●● Upper roller	4X2	←	←	←
●● Lower roller	8X10	←	←	←
●● Front idler	44X2	←	←	←
●● Idler adjuster	24X2	←	←	←
●● Sprocket	14X2	←	←	←
●● Swivel joint	22	←	←	←
●● Dozer	190	←	←	←
●● Dozer cylinder	* 46	←	←	←
●● Rubber shoe	260X2	——	260X2	——
●● Track link with 400mm iron shoe	——	260X2	——	260X2
● Attachment (Boom, 1.91m arm, 0.16m^3 bucket and followings)	1,040	←	←	←
●● Bucket assembly (0.16m^3) with 2 attaching pins	140	←	←	←
●● Arm assembly (Assembly of followings)	210	←	←	←
●●● Bucket link	11	←	←	←
●●● Idler link	7	←	←	←
●●● Bucket cylinder	* 34	←	←	←
●●● Arm (With idler link attaching pin, arm cylinder and rod pin)	140	←	←	←
●●● Pin (Bucket cylinder attaching pin)	6	←	←	←
●● Boom assembly (Assembly of followings)	710	←	←	←
●●● Rear boom, front boom, upper frame	590	←	←	←
●●● Arm cylinder	* 64	←	←	←
●●● Pin (Arm cylinder attaching pin and arm attaching pin)	10	←	←	←
●●● Off-set cylinder	* 50	←	←	←
● Fluid, Water (Assembly of followings)	117	←	←	←
●● Hydraulic oil, Engine oil	66	←	←	←
●● Fuel	44	←	←	←
●● Water (Coolant)	7	←	←	←

Note: Marks * show a dry weight.

Unit : kg

Item \ Model	Canopy		Cab (Option)	
	Rubber	Iron	Rubber	Iron
Machine complete	7,820	7,780	7,730	7,690
● Upper structure (Assembly of followings)	3,360	←	3,270	←
●● Counterweight	1,190	←	←	←
●● Canopy (Cab)	96	←	122	←
●● Engine	250	←	←	←
●● Hydraulic pump	42	←	←	←
●● Hydraulic oil tank	* 71	←	←	←
●● Fuel tank	* 57	←	←	←
●● Slewing motor	67	←	←	←
●● Control valve	99	←	←	←
●● Boom cylinder	* 100	←	←	←
●● Upper frame	700	←	←	←
●● Radiator	* 35	←	←	←
● Undercarriage (Assembly of followings)	2,900	2,900	2,900	2,860
●● Lower frame	1,000	←	←	←
●● Slewing bearing	115	←	←	←
●● Travel motor	90X2	←	←	←
●● Upper roller	5X2	←	←	←
●● Lower roller	15X10	←	←	←
●● Front idler	45X2	←	←	←
●● Idler adjuster	28X2	←	←	←
●● Sprocket	28X2	←	←	←
●● Swivel joint	21	←	←	←
●● Dozer	260	←	←	←
●● Dozer cylinder	* 31X2	←	←	←
●● Rubber shoe	420X2	—	←	—
●● Track link with 450mm iron shoe	—	413X2	—	413X2
● Attachment (Boom, 1.76m arm, 0.28m^3 bucket and followings)	1,560	←	←	←
●● Bucket assembly (0.28m^3) with 2 attaching pins	210	←	←	←
●● Arm assembly (Assembly of followings)	260	←	←	←
●●● Bucket link	17	←	←	←
●●● Idler link	15	←	←	←
●●● Bucket cylinder	* 50	←	←	←
●●● Arm (With idler link attaching pin, arm cylinder and rod pin)	148	←	←	←
●●● Pin (Bucket cylinder attaching pin)	7	←	←	←
●● Boom assembly (Assembly of followings)	1,250	←	←	←
●●● Rear boom, front boom, upper frame	870	←	←	←
●●● Arm cylinder	* 90	←	←	←
●●● Pin (Arm cylinder attaching pin and arm attaching pin)	16	←	←	←
●●● Off-set cylinder	* 61	←	←	←
● Fluid, Water (Assembly of followings)	135	←	←	←
●● Hydraulic oil, Engine oil	44	←	←	←
●● Fuel	86	←	←	←
●● Water (Coolant)	5	←	←	←

Note: Marks * show a dry weight.

6. SPECIFIED OIL, GREASE AND FILTER ELEMENT

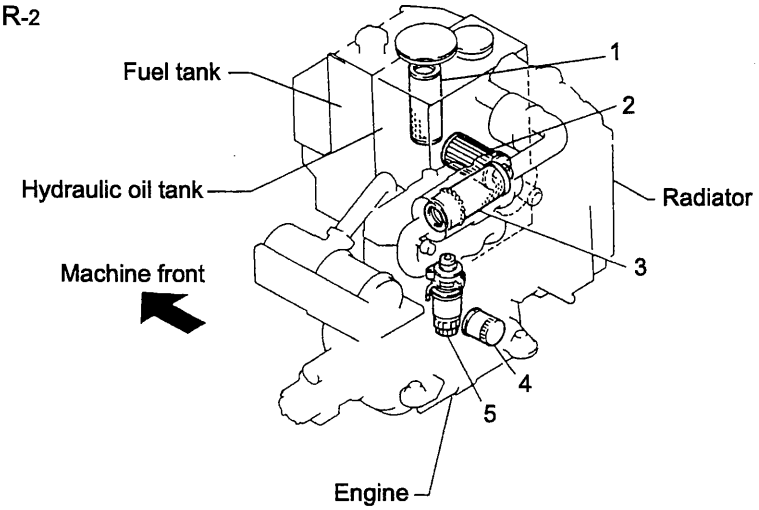
Lubricant list

Machine			SK30UR-2		SK50UR-2		SK75UR-2	
Serial number			PR02501~		YJ04001~		YR02801~	
No.	Component		Type of lubricant	Capacities	Type of lubricant	Capacities	Type of lubricant	Capacities
	Hydraulic tank	Tank	Hydraulic oil	27L	Hydraulic oil	50L	Hydraulic oil	50L
		Total system		41L		70L		85L
	Engine oil	H	Engine oil (API classification for service CD)	4.7L	Engine oil (API classification for service CD)	5.8L	Engine oil (API classification for service CD)	8L
		L		2.9L		3.5L		6L
	Upper roller		Gear oil (API classification for service GL-4)	0.04LX2		0.02LX2		0.02LX2
	Lower roller	S		0.07LX8		0.07LX10		0.09LX6
		W		———		———		0.16LX4
	Front idler			0.05LX2		0.08LX2		0.16LX2
	Slewing reduction		Hydraulic oil	Auto filling		———		1.5L
	Travel reduction			0.08LX2		1.1LX2		1.7LX2
	Attachment, Dozer pin		KOBELCO Genuine parts (Extreme pressure multipurpose grease)	28 places	KOBELCO Genuine parts (Extreme pressure multipurpose grease)	28 places	KOBELCO Genuine parts (Extreme pressure multipurpose grease)	33 places
	Slewing bearing			1 place		1 place		1 place
	Track adjuster			2 places		2 places		2 places
	Slewing gear		N.L.G.I. No.2 Lithium base with MoS2 grease	2.5kg	N.L.G.I. No.2 Lithium base with MoS2 grease	4.8kg	N.L.G.I. No.2 Lithium base with MoS2 grease	5kg
	Fuel tank		Diesel oil	32L	Diesel oil	53L	Diesel oil	100L
	Radiator	Radiator	Coolant (LLC)	1.8L	Coolant (LLC)	3.7L	Coolant (LLC)	3.8L
		Total system		4.9L		7.5L		11L

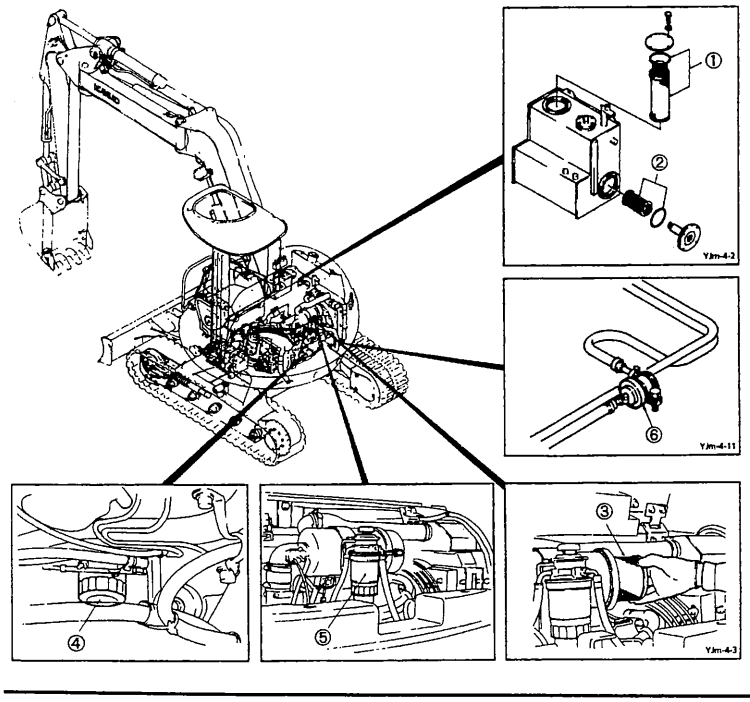
Filter element list

	Machine	SK30UR-2		SK50UR-2		SK75UR-2	
No.	Name / Section	Parts No.	Q'ty	Parts No.	Q'ty	Parts No.	Q'ty
1	Return filter (O ring)	PR50V00002P1 (ZD11G12500)	1	2446R336F1 (ZD11G12500)	1	YR50V00004P1 (ZD11P14000)	1
2	Suction strainer (O ring)	2446R344F1 (ZD11G12500)	1	←	1	YR50V00003P1 (ZD11P14000)	1
3	Air cleaner	121120-18901	1	←	1	YR11P00003S002	1
4	Engine oil filter	129150-35151	1	←	1	897049-7081	1
5	Fuel filter (Water separator)	129574-55710	1	←	1	894369-2993	1
6	Fuel prefilter	———	—	YJ21P1008P1	1	894369-2963	1
7	Water separator	———	—	———	—	121850-55710	1

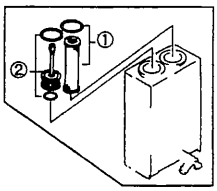
SK30UR-2

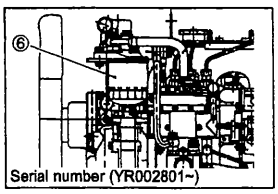


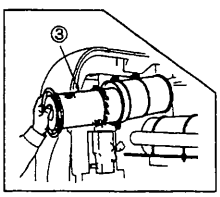
SK50UR-2

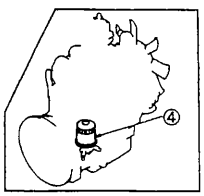


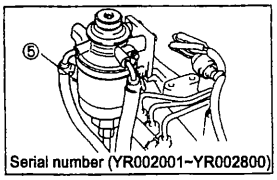
SK75UR-2

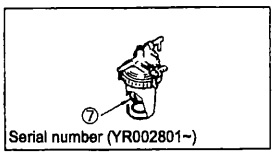












7. CAB, CANOPY INTERFERENCE PREVENTION SYSTEM

Outline

The canopy (cab) interference prevention equipment performs the following 4 large functions.

1. Height and depth indication
2. Height limit

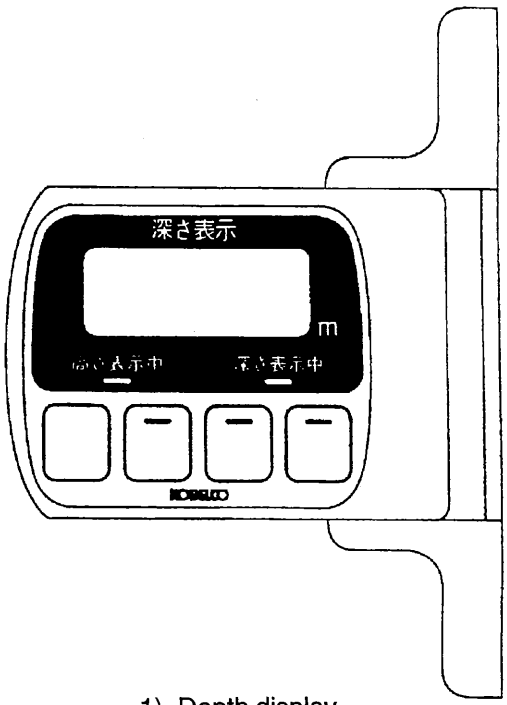
   When this machine stops automatically, all attachment doesn't function except the dozer operation.

   In case of **SK30UR-2**, dozer and travel are excluded.
3. Depth limit

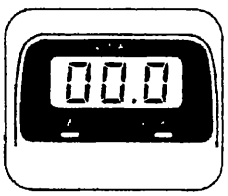
   When this machine stops automatically, all attachment doesn't function except the dozer operation.

   In case of **SK30UR-2**, dozer and travel are excluded.
4. Canopy (cab) interference prevention

   When this machine stops automatically, boom up, arm in and off-set left don't function.



1) Depth display



2) Indicating the height

3) Depth indication

CONTROLLER

7-1 SWITCH DESIGNATION

(1) Controller (See Fig.)
The controller is installed on the right front of operator seat, and it is foldable.
When this controller is folded, the display disappears but the functions are in live condition.

1) Depth display (See Fig.)

The difference between the present arm top pin position and boom foot pin position (0 level) is numerically indicated. (See 7-3 on page 22)

2) Red LED (Light Emitting Diode) during indicating the height

ON: Shows that the attachment is on the highest position when the auto stop with height limit is functioning.

3) Red LED (Light Emitting Diode) during depth indication

ON: Shows the depth indication except the case of above 2).

(2) Control switches (See Fig.)

1) Standard position setting switch

The position, where the arm top pin height (A) and the boom foot pin height (B) are in same level, is set as standard (0) level. (See Fig. on page 22)

Even if the engine key is turned off or the display panel is folded, this initial standard wouldn't change.

When you need to change this initial standard, move the arm top pin to the desired position and press this switch, you can get the new standard (0) level.

For example, if you need to change the standard (0) position to ground level, place the arm to the ground and press this switch.

2) Height limit switch

This switch is used to set the limit height.

The attachment is stopped automatically, when it reaches to the limit height.

If this switch is pressed, LED is illuminated, and the height limitation functions. Press it again, and the height limitation is released.

3) Depth limit switch

This switch is used to set the limit depth.

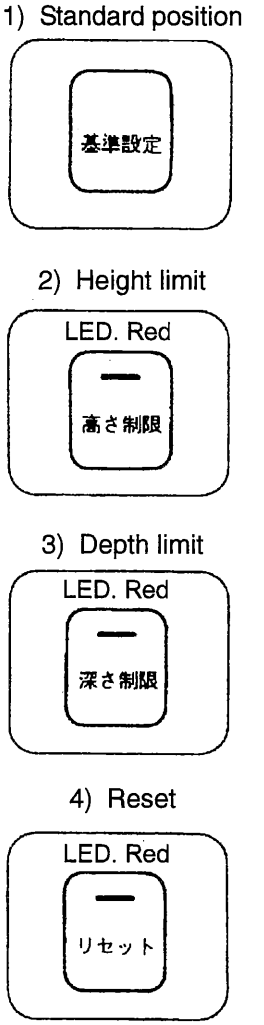
The attachment is stopped automatically, when it reaches to the limit depth.

If this switch is pressed, LED is illuminated, and the depth limitation functions. Press it again, and the depth limitation is released.

4) Reset switch

This reset switch is used to reset the setting of standard level, height limitation and depth limitation.

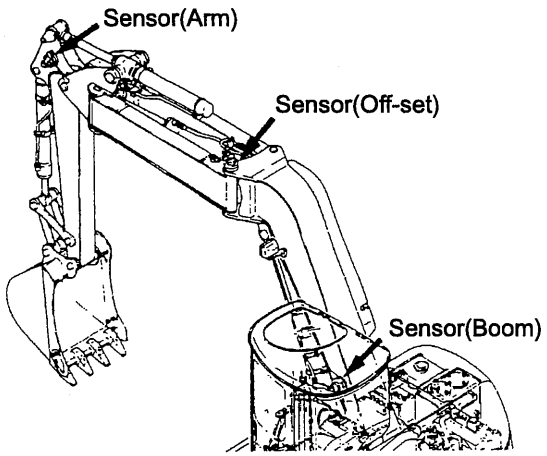
If this switch is pressed, LED is illuminated, and the display shows the setting is becoming initial standard.

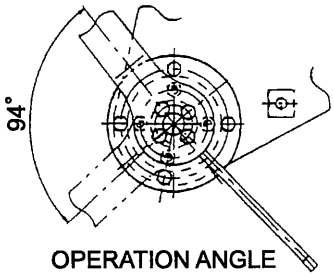


CONTROL SWITCHES

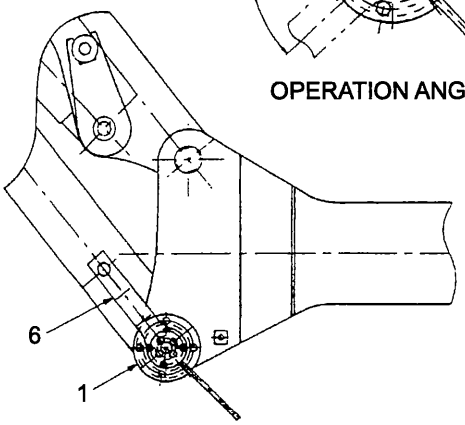
7-2 CONSTRUCTION

Sensor (Potentiometer) location

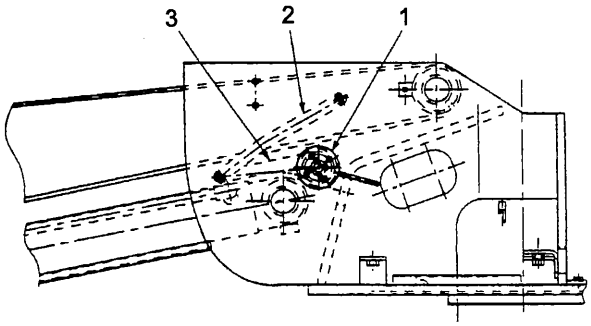




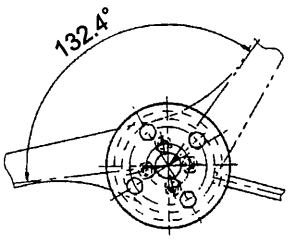
OPERATION ANGLE



FOOT OF OFF-SET

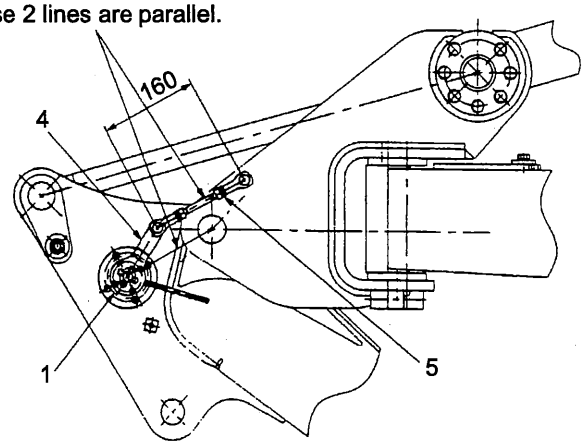


FOOT OF BOOM

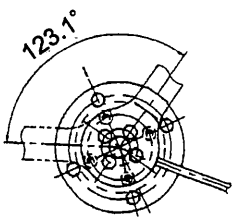


OPERATION ANGLE

Install a rod assembly so that these 2 lines are parallel.



FOOT OF ARM

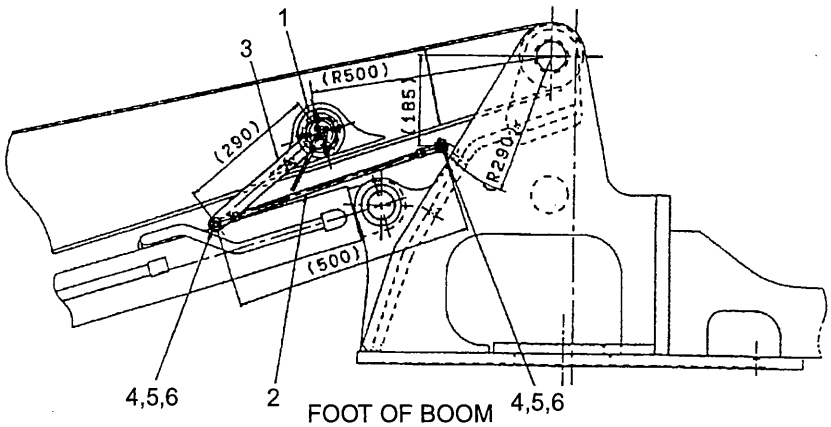


OPERATION ANGLE

1 Sensor
2 Lever assembly
3 Lever
4 Lever
5 Rod assembly

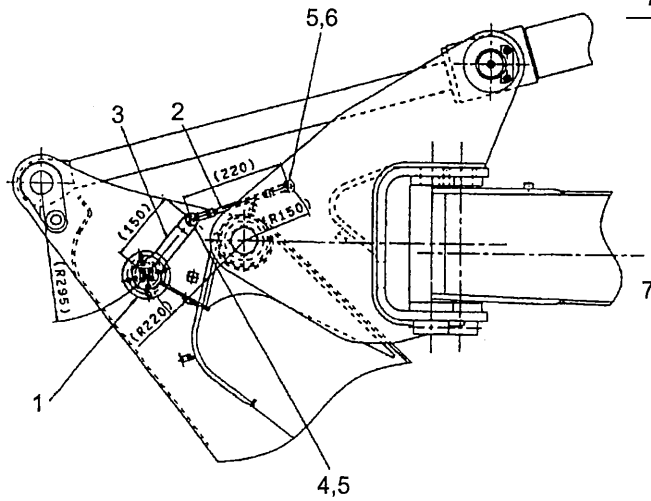
The distance between centers of ball joints with rod on the arm foot section is 160mm.

Sensor (Potentiometer) location

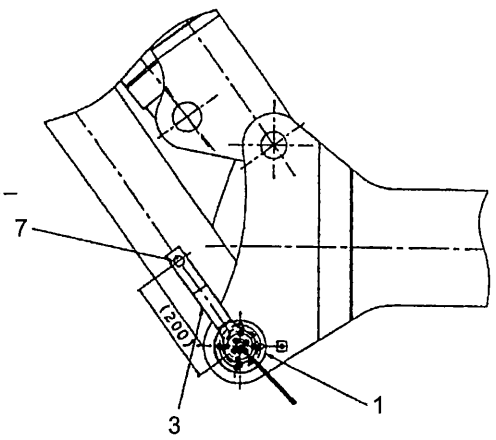


FOOT OF BOOM

No.	Parts		Boom	Arm	Off-set
1	SENSOR		1	1	1
2	ROD ASSEMBLY		1	1	—
3	LEVER		1	1	1
4	NUT	M10	2	1	—
5	LOCK WASHER	M10	2	2	—
6	WASHER	M10	2	2	—
7	NUT	M10	—	—	1



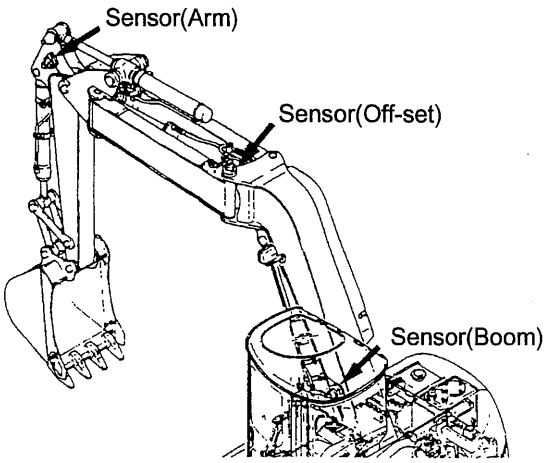
FOOT OF ARM

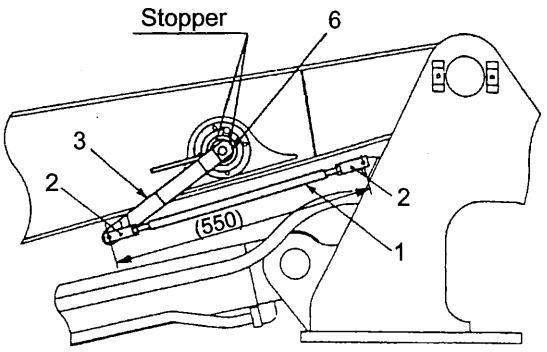


FOOT OF OFF-SET

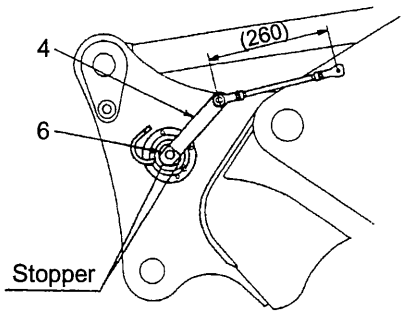
The distance between centers of ball joints with rod on the arm foot section is 500mm.
The distance between centers of ball joints with rod on the arm foot section is 220mm.

Sensor (Potentiometer) location

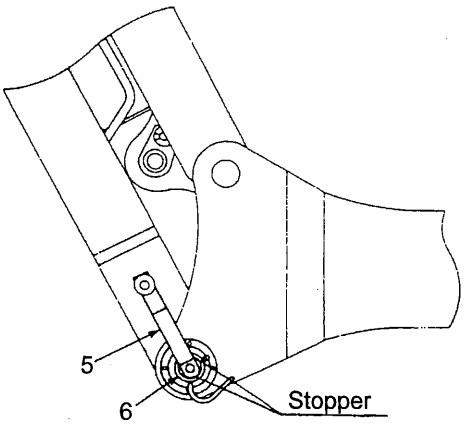




FOOT OF BOOM



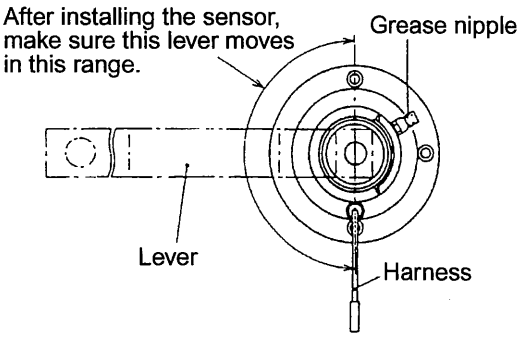
FOOT OF ARM



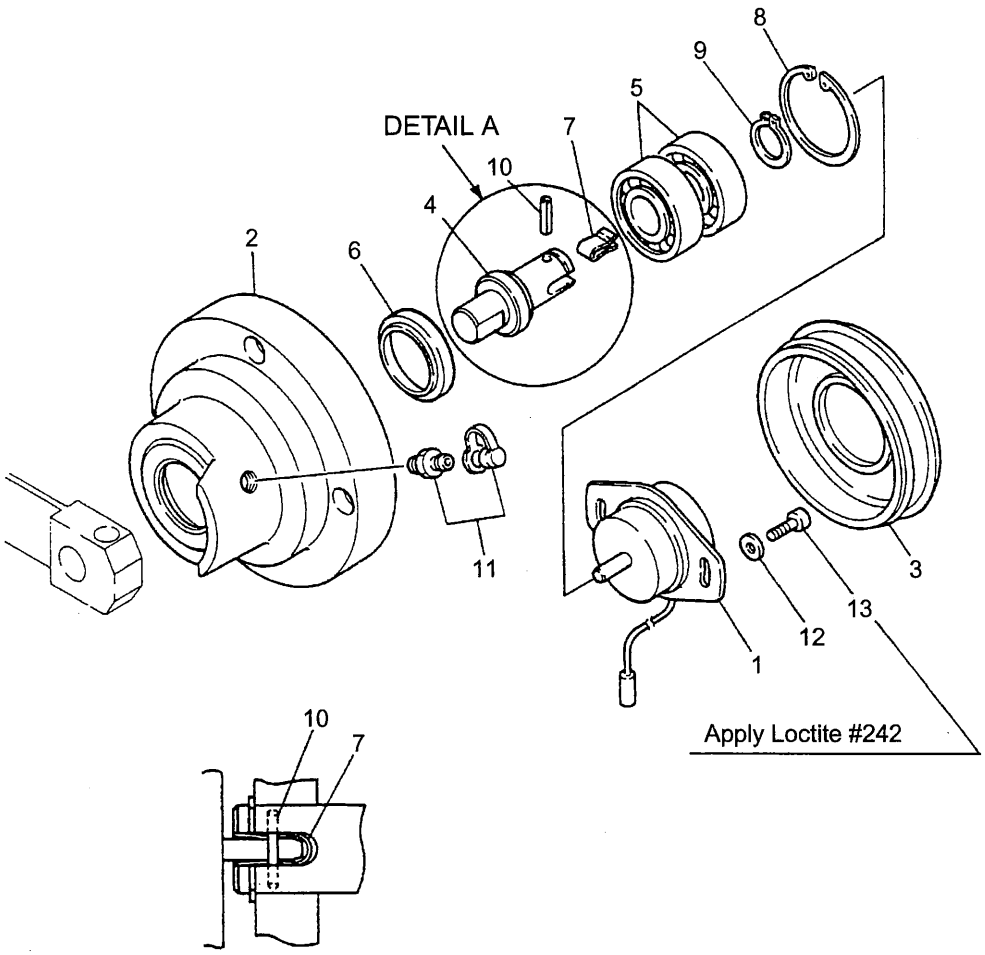
FOOT OF OFF-SET

1) When installing the lever on the sensor (potentiometer), make sure that the lever manually rotates 180 degrees. And then install the sensor on attachment. (See Fig.)
2) Install the sensor paying attention to the position of stopper as shown in the above figure.
3) The distance between centers of ball joints with rod on the boom foot section is 550mm.
4) The distance between centers of ball joints with rod on the arm foot section is 260mm.

No.	Parts	Q'ty
1	ROD	1
2	BALL JOINT	2
3	LEVER	1
4	LEVER	1
5	LEVER	1
6	SENSOR	3



Construction of sensor (Potentiometer) installation



DETAIL A

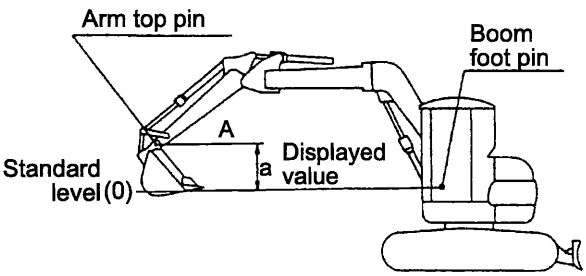
Apply small amount of grease to a grease-nipple (11) once a year.

No.	Parts	Q'ty	No.	Parts	Q'ty
	SENSOR ASSEMBLY	3	9	SNAP RING	1
1	POTENTIOMETER	1	10	SPRING PIN	1
2	BODY	1	11	GREASE- NIPPLE	1
3	COVER	1	12	WASHER	1
4	SHAFT	1	13	SOCKET BOLT	2
5	BEARING	2			
6	DUST SEAL	1			
7	SPRING	1			
8	SNAP RING	1			

7-3 INDICATOR ADJUSTMENT PROCEDURE AND CAB INTERFERENCE PREVENTION FUNCTION

(1) Height and depth display device

1) Move the arm top pin to the standard level position.
2) Press the **"Standard Setting"** switch.
   — 0.0(m) is displayed.
3) Move the attachment, and the height or depth from the arm point pin position at the time when the switch was pressed in Paragraph 2) is displayed. (See right Fig.)
4) When being necessary to change the standard position, position the arm top pin to the required point, and press the **"Standard Setting"** switch again.
5) In shipping machines or pressing the **"Reset"** switch, the boom top pin position is set to the standard position.
6) The set standard position does not change even if the engine key switch turns off or the indicator is folded.

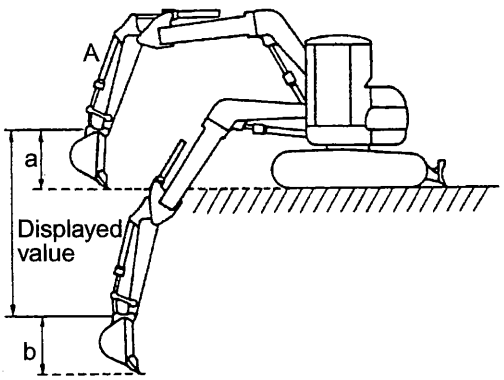


STANDARD LEVEL FOR HEIGHT AND DEPTH

[Example]

When desired to display the digging depth, put the attachment to level ground and press **"Standard Setting"** switch.

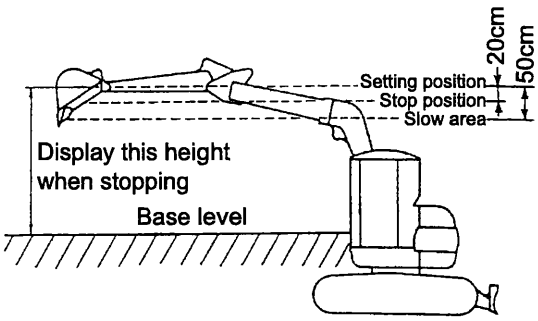
(Position A)
Taking the arm top pin position as "0", read the indicated value for a certain depth (Position B), which corresponds to the required digging depth.
But, attention must be paid to the bucket condition, which is equivalent to the standard setting to read correct depth.
(To be a=b)



DEPTH

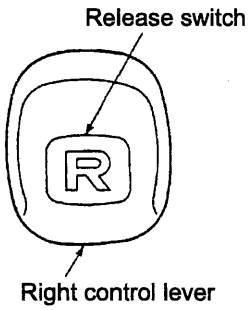
(2) Height limiting function
When the highest position of the attachment is detected and it reaches to the set height, the attachment stops moving.
The highest position is detected at three points, boom top, offset top and arm top points.

1) Move the attachment highest position to the required setting position.
2) Press the **"Height Limit"** switch.
   LED on the switch turns ON to tell that the setting was completed.
3) Then, since the attachment changes in stop condition, lower the attachment to the slow speed range keeping the release switch (R mark) on the right control lever pressed. That's all for setting.
4) When the attachment highest position comes closer to the set position than distance of 50cm during operation, the buzzer sounds intermittently and the operating speed slows down.
5) And when the attachment highest position comes closer to the set position than distance of 20cm further, the buzzer sounds continuously for 1.5 seconds and the attachment stops moving.
6) Press the **"Height Limit"** switch again and the setting is released.
   LED on the switch turns OFF to tell that the setting is released. If you press the **"Reset"** switch, the setting is released too, but in this same time the depth limit setting is released simultaneously and the standard setting is initialized.



HEIGHT LIMITATION SETTING

In the case of **SK30UR-2**, this slow-down isn't available, but only the buzzer sounds intermittently.



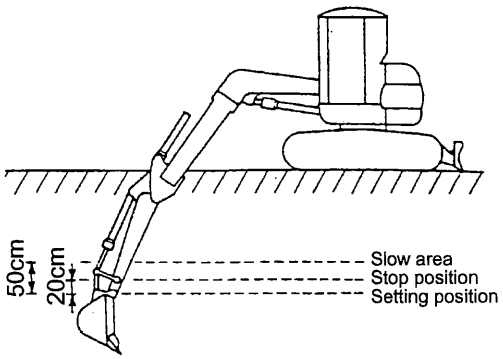
⚠ * The setting is not released even if the engine key is turned OFF or the indicator is folded.

* The depth display shows the height from the standard position to the highest positions of boom top, offset top and arm top.

* The stop function due to the height limit acts on the boom, offset, bucket, slewing and traveling operations.
  In the case of **SK30UR-2**, the height limit acts on the boom, offset, arm, bucket and slewing.

(3) Depth limiting function
When the arm top pin position (or bucket tooth tip) is detected and reaches to the set depth, the attachment stops moving.

1) Move the arm top pin position (bucket tooth tip) to the required setting position.
2) Press the **"Depth Limit"** switch.
   LED on the switch turns ON to tell that the setting was completed.
3) Then since the attachment changes in stop condition, raise the attachment to the slow speed range keeping the release switch (R mark) on the right control lever pressed. That's all for setting.
4) When the arm top pin or bucket tooth tip positions come closer to the set position than distance of 50cm during operation, the buzzer sounds intermittently and the operating speed slows down.
   In the case of **SK30UR-2**, this slow-down isn't available, but only the buzzer sounds intermittently.
5) And when the arm top pin or bucket tooth tip positions come closer to the set position than distance of 20cm further, the buzzer sounds continuously for 1.5 seconds, and the attachment stops moving.
6) Press the **"Depth Limit"** switch again, and the setting is released.
   LED on the switch turns OFF to tell that the setting is released.
   If you press the **"Reset"** switch, the setting is released too, but in this same time the height limit setting is released simultaneously and the standard setting is initialized.



DEPTH LIMITATION SETTING
(Arm top pin or bucket tooth tip position)

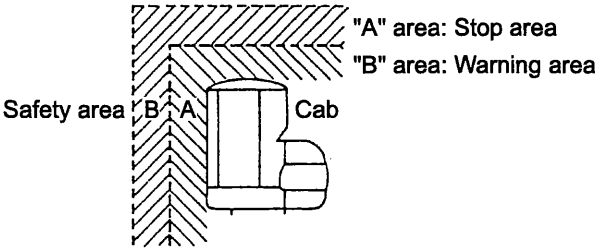
⚠
* The setting is not released even if the engine key is turned OFF or the indicator is folded.
* Since the attachment position is set or stopped moving, taking the arm the top pin position as standard position, the bucket tooth tip depth in stop condition varies with bucket posture.
* The stop function due to the depth limit acts on boom, offset, bucket, swing and traveling operations.
  In the case of **SK30UR-2**, the limit acts on the boom, offset, arm, bucket and slewing operations to stop moving.

(4) Cab interference prevention function

1) Operation in the range of "B" area (See Fig.)

When the arm top pin position (or bucket tooth tip) comes into the range of "B" area set from the cab position, the warning buzzer sounds intermittently to warn operator of danger.

And FC solenoid valve is excited to decrease the pump flow rate, resulting in slow operating speed. (Except for **SK30UR-2**.)



INTERFERENCE PREVENTION AREA

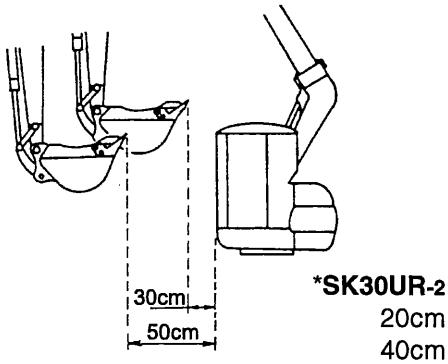
2) Operation in the range of "A" area (See Fig.)

1. By moving the attachment closer to the cab further (the bucket tooth tip comes into "A" area.) the excitation of solenoid valve for emergency stop is cut resulting in auto stop, and simultaneously the warning buzzer sounds continuously.

   But the warning continues for 1.5 seconds and then stops sounding.

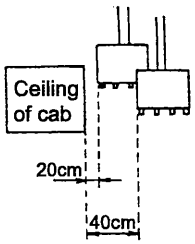
2. And the solenoid valves for emergency stop cut the pilot commands for boom up, arm in and offset left, consequently these movements stop.

3. Subsequently the interference with the cab is avoided. But the traveling, slewing, dozer, boom down, arm out, and offset right operations do not stop.



INTERFERENCE PREVENTION AREA IN FRONT

3) And the distance from the cab to the "A" area or "B" area varies depending on the bucket posture because the position is detected with arm top pin.

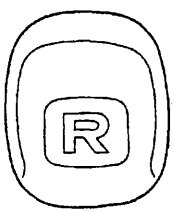


SIDE INTERFERENCE PREVENTION AREA

4) Releasing of auto stop

1. When required to move the attachment closer to the cab further, press the release switch (R mark) on the right control lever and the solenoid valve for emergency stop is forced to excite making the operation possible.

2. But the attachment can be returned into the safety side with normal lever, and then the above switch operation is not required.



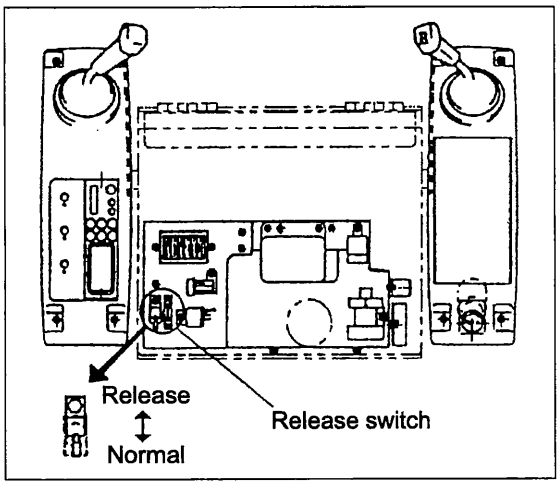
RELEASE SWITCH

7-4 IN THE FOLLOWING CASES

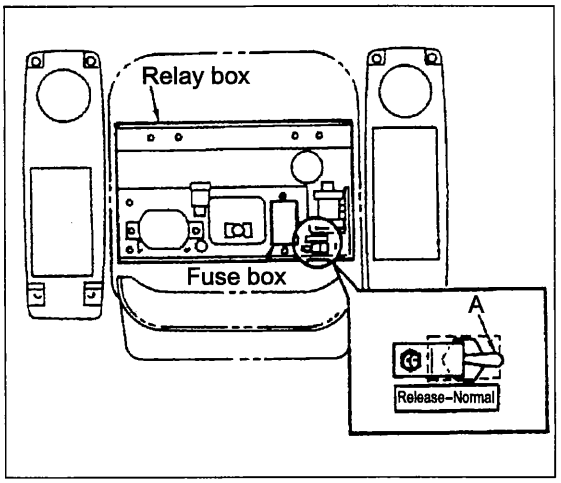
(1) The boom, off-set, arm, bucket, slewing and traveling other than dozer do not function. (**SK50UR-2, SK75UR-2**)
For **SK30UR-2**, the operations other than dozer and traveling do not function.
* The attachment may come in the range of height limit or depth limit. If it is in the limit range, those operations cannot be performed.

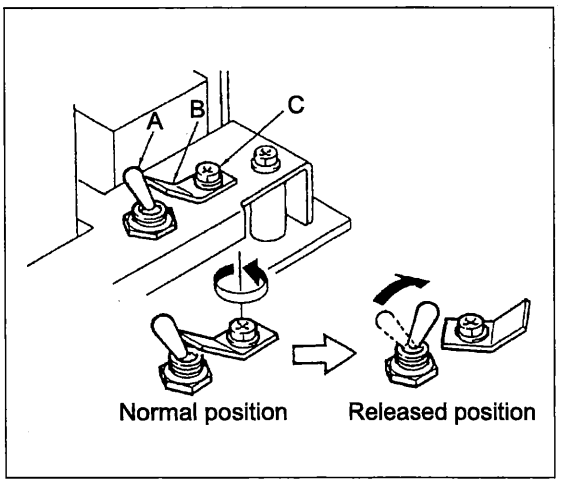
(2) The buzzer keeps sounding and the dozer does not move. (**SK50UR-2, SK75UR-2**)
For **SK30UR-2**, the operations other than dozer and traveling do not function.
* When it is obliged to operate the machine, set the stop release switch (toggle switch) in the relay box installed under the operator's seat to the release side and the stop condition is released.
But the buzzer continues sounding.

SK50UR-2, SK75UR-2



SK30UR-2





7-5 ADJUSTING PROCEDURE

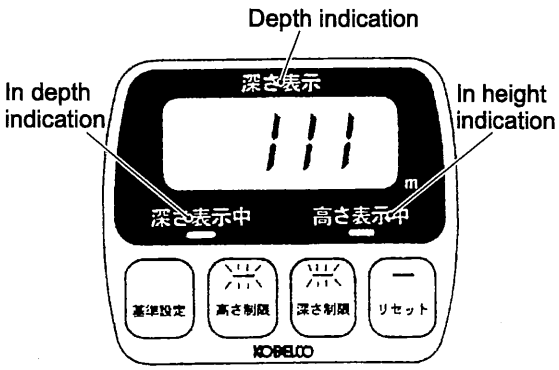
Store the values of angle sensor at stroke end of boom up, arm in and out, and off-set right and left in the controller.

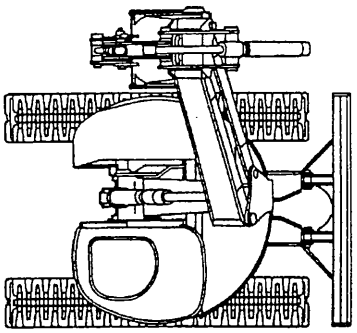
(1) Start engine.
(2) Keep the **"Standard Setting"** switch and **"Reset"** switch pressed simultaneously until the following condition is appeared. (For about 5 seconds)(See Fig.)
   1) Indication "111"
   2) Buzzer sounds continuously.
   3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn ON.

(3) Move the boom up, off-set right and arm in positions to the stroke ends respectively. (See Fig.)
(4) Press the **"Height Limit"** and **"Depth Limit"** switches the LED lamps are ON once simultaneously.
   The display changes in the following. (See Fig.)
   1) Indication "222"
   2) LED lamp on the **"Reset"** switch turns ON.
   3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn OFF.

(5) Move the off-set left (Cab side) and arm out positions to the stroke ends respectively. (The boom posture is not related.)
(6) Press the **"Reset"** switch the LED lamp is ON once.
   1) The arm top pin height is indicated on the depth display.
   2) Buzzer stops sounding.
   3) All LED lamps on the switch panel turn OFF.

This is end for adjusting procedure.
(* The bucket posture is not related to the above adjustment.)





* The bucket angle has no relation regarding adjustment.

IN ADJUSTING POSITION

SK50UR-2
SK75UR-2

Store the values of angle sensor at stroke end of boom up, arm in and out, and off-set right and left in the controller.

(1) Start engine.

(2) Keep the **"Standard Setting"** switch and **"Reset"** switch pressed simultaneously until the following condition is appeared. (For about 5 seconds)(See Fig.)

1) Indication "111"

2) Buzzer sounds continuously.

3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn ON.

(3) Move the boom up, off-set right and arm in positions to the stroke ends respectively. (See Fig.)

(4) Press the **"Height Limit"** and **"Depth Limit"** switches the LED lamps are ON once simultaneously.
The display changes in the following. (See Fig.)

1) Indication "222"

2) LED lamp on the **"Reset"** switch turns ON.

3) LED lamps on the **"Height Limit"** and **"Depth Limit"** switches turn OFF.

(5) Move the off-set left (Cab side) and arm out positions to the stroke ends respectively. (The boom posture is not related.)

(6) Press the **"Reset"** switch the LED lamp is ON once.
The display changes in the following.

1) Indication "777" or "666"

2) LED lamp on the **"Height Limit"** switch turns ON.

(7) Press the **"Height Limit"** switch LED lamp is ON and the display alternates form/to "666" to/from "777". Then press the switch until the indication accords with the value corresponding to the arm length.

[SK50UR-2]

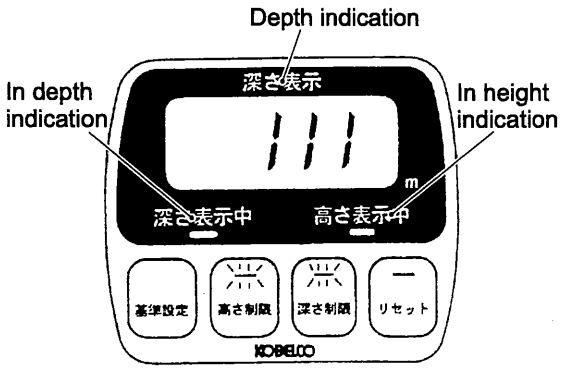
"666" ..... 1.53m arm (Short arm)
"777" ..... 1.91m arm (Standard arm)

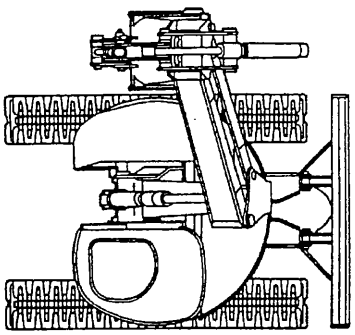
[SK75UR-2]

"666" ..... 2.06m arm (Long arm)
"777" ..... 1.76m arm (Standard arm)

(8) Then, press the **"Standard Setting"** switch and the buzzer stops sounding. This is end for adjusting procedure.

(9) And finally press the **"Reset"** switch. (To initialize standard setting position.)





* The bucket angle has no relation regarding adjustment.

IN ADJUSTING POSITION

7-6 ERROR CODE DISPLAY ON LIQUID CRYSTAL DISPLAY

(1) Angle sensor input error (Potentiometer)
Where the input signal from angle sensor is in disconnection or short circuit, the following code is displayed on liquid crystal display.
In this case, excepting dozer operation, since solenoid proportional valve's excitation is cut, the boom, arm, offset, bucket, slewing and travel operation stop and the buzzer is sounding continuously.

Code	Failure
300	Arm angle sensor input signal error
030	Off-set angle sensor input signal error
003	Boom angle sensor input signal error

Note:
The hundreds digit indicates the error of arm angle sensor, the tens digit indicates the error of offset and the units digit indicates the error of boom angle sensor, respectively.
For example, when the display shows 303, this indicates the errors of arm and boom angle sensors.

Corrective action:
Check the harness and angle sensor for possible failure.

(2) Adjusted data error **"Code 555"**
The input data of angle sensor at each stroke end of boom-up, arm-in and out, offset right and left operation is stored into controller at the time of adjustment (See Item 7.5 "Adjustment procedure"), but if the angle value of each input data differs more than 25 degrees from the theoretical value, the controller infers that it may be caused by faulty adjustment position or angle sensor input value error, and the data is not therefore written in controller.
In this case, error code "555" is displayed.

Corrective actions:
1. Check that it is on adjustment position.
2. Check on angle sensor and harness

[SK30UR-2]

(3) Set data error **"Code 444"**
When the angle sensor input data stored in controller at the time of adjustment is not in the specified range, the controller infers that the data is rewritten by a factor of same kind, and code "444" is displayed on the liquid crystal display to inform of error occurred.
In this case, excepting dozer operation, since solenoid proportional valve's excitation is cut, the boom, arm, off-set, bucket, slewing and travel operation stop and the buzzer is sounding continuously.

Corrective actions:
1. Adjust it again.
2. After readjustment, if error still occurs, replace the controller.

[SK50UR-2, SK75UR-2]

(4) Set data error **"Code 999"**
When the angle sensor input data of arm length stored in controller at the time of adjustment differs from standard length and long length, the controller infers that the data is rewritten by a factor of same kind, and code "999" is displayed on the liquid crystal display to inform of error occurred.
In this case, the controller infers that this machine equips standard length arm. And the controller controls cab interference prevention, height limitation and depth limitation.

Corrective actions:
1. Adjust it again.
2. After readjustment, if error still occurs, replace the controller.

7-7 ELECTRICAL EQUIPMENT CHECKING METHOD

(1) Checking angle sensor resistance
Checking is performed when angle sensor input error is displayed on the controller, or the stop position of attachment is too far or too close from specified position.

1) Disconnect the CN2 connector from the harness.

2) Measure the resistance at terminal section of connector (8 pins, female) on the harness side connected to the harness by the following procedure.

3) Checking on arm angle sensor
1. Remove the connector for boom and off-set angle sensors. (Under the condition where the arm angle sensor is connected.)
2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) in the pin arrangement shown in figure is about 5KΩ.
3. Check that the resistance between No.5 pin and No.2 pin (wire color Y-B) changes from about 0.9 KΩ to 4.1KΩ while arm operation changes from the arm out to the arm in.

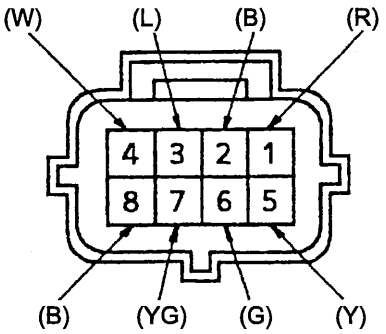
4) Checking boom angle sensor
1. For arm and offset angle sensors, remove connectors. (Under the condition where the boom angle sensor is connected.)
2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) is about 5KΩ.
3. Check that the resistance between No.3 pin and No.2 pin (wire color L-B) changes from about 0.7 KΩ to 4.3KΩ while boom operation changes from the boom up to the boom down.

5) Checking offset angle sensor
1. For boom and arm angle sensors, remove connector. (Under the condition where the offset angle sensor is connected.)
2. Check that the resistance between No.1 pin and No.2 pin (wire color R-B) is about 5KΩ.
3. Check that the resistance between No.4 pin and No.2 pin (wire color W-B) changes from about 3.7 KΩ to 1.3KΩ while offset operation changes from the off-set right to the off-set left.

⚠ The tolerance of above resistance is within 20%.

Check the sensor for possible abnormality

Trouble occurred → Angle sensor error
→ Disconnection of harness



CN2 8 PINS FEMALE CONNECTOR
(Harness side connector)

(2) Inspection for signal of angle sensor on depth display

When you operate independently each attachment, if you check the change of depth display, you can confirm the error of potentiometer easily.

1) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the boom-up and the boom-down are operated.

Or display is changed over 0.2m even though actual movement is about 0.1m.

→Boom angle sensor failure

→Boom angle sensor installation mistake

2) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the arm-in and the arm-out are operated.

Or display is changed over 0.2m even though actual movement is about 0.1m.

→Arm angle sensor failure

→Arm angle sensor installation mistake

3) Display doesn't change even though arm top pin position is moved over 0.1m actually, when the off-set right and the off-set left are operated.

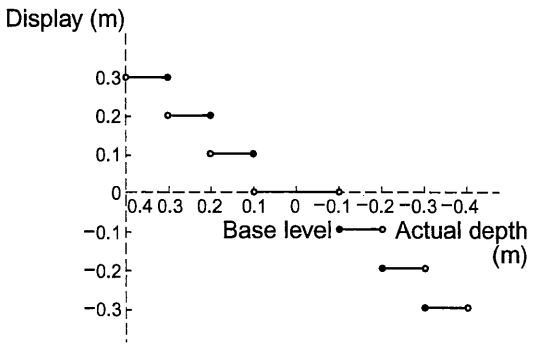
Or display is changed over 0.2m even though actual movement is about 0.1m.

→Offset angle sensor failure

→Offset angle sensor installation mistake

Note:

Because the digit of 1/100 m= 1cm in the display is omitted as shown in the graph, in the vicinity of the standard 0 level, the indicated value between 0.1 and 0m is displayed 00, and the value between 0 and –0.1m is displayed –00.



(3) Checking method of emergency stop (for interference prevention) and control cut solenoid valve (for height and depth limits)
Check them when the auto stop does not function.

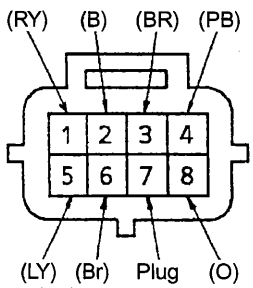
1) Disconnect connector CN1 on the controller.

2) Short circuit the No.2 and No.4 pins of pin arrangement in the figure of connectors (with 8P male terminal with O ring) on the harness side connected to CN1 with alligator clips, and the emergency stop relay in the relay box (wire color B-LW) is excited and the 3-sections solenoid valve is cut. Consequently the operation of boom up, arm in and off-set left (Cab side) become impossible.
   * Short-circuiting between No.2 and No.3 causes buzzer sounding.
   Short-circuiting No.2 and No.5 causes cutting of control.

3) When the operation is possible in the condition of short circuit between No.2 and No.4, disconnect one connector connected to 3-sections solenoid valve, and check the voltage of connector on the harness side.

   * In no voltage
     → Failure of 3-sections solenoid valve or hydraulic pressure
   * Voltage of 20V or higher
     → Fuse blown
     → Failure of relay for emergency stop
     → Disconnection of harness
     → The emergency stop switch is set to the release side.

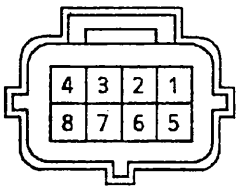
   * The hydraulic circuit is designed to stop when the 3-sections solenoid valve, control cut valve and solenoid valve are not live.



CN18 Pins Male (Harness side connector)

<Control side connector>

CN18 Pins Female

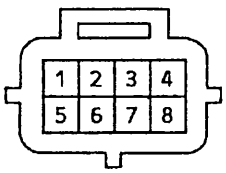


No.	Description	Male: Controller side wire color	Female: Outer harness wire color
1	24V input	Red	RY Red-Yellow
2	Grounding input	Black	B Black
3	Buzzer output	White-Black	BR Black-Red
4	Emergency stop relay output	Light green	LW Blue-White
5	Control cut relay output	Blue	LY Blue-Yellow
6	* FC relay output	Orange	PB Pink-Black
7	Standby output	Green	
8	Power for back light	Yellow	O Orange

* In case of **SK30UR-2**, this circuit isn't connected.

<Control side connector>

CN18 Pins Male



* Pin arrangement viewed from the connector inserting section

No.	Description	Male: Controller side wire color	Female: Outer harness wire color
1	Angle sensor 5V output	Red-Black	R Red
2	Angle sensor grounding	White	B Black
3	Boom angle sensor signal input	Light Violet	L Blue
4	Off-set angle sensor signal input	Gray	W White
5	Arm angle sensor signal input	Purple	Y Yellow
6	Standby input	Brown	
7	Release switch input	Pink	YG Yellow-Green
8	Release switch grounding	Sky Blue	B Black

8. PRESSURE AND PERFORMANCE STANDARD

Test procedure

Measure the value 3 times for each test, and calculate the average.

1. Main circuit pressure

(1) Measuring condition
Engine speed: High idling
Hydraulic oil temperature:
50 to 60C (122 to 140F)
Connect the pressure gauge to detecting port, operate the attachment, which is required the measuring of pressure.

Circuit		Detecting port		Relief valve
		Position	Size	
Boom Bucket		P1	PF1/4	R1
Arm Off-set		P2	PF1/4	R2
Dozer		P3	PF1/4	R3
Slewing	LH	P3	PF1/4	R4
	RH			R5

(2) Pressure adjustment

1) Loosen locknut, and adjust the setting pressure turning the setscrew.
CW turning: Increasing setting pressure
CCW turning: Decreasing setting pressure

2) After the adjustment, tighten up the locknut holding the setscrew not to allow its turning.

3) Again actuate the relief valve, and verify that the set pressure is being stable.

2. Pilot circuit pressure

(1) Measuring conditions
Engine: High idling
Hydraulic oil temperature:
50 to 60C (122 to 140F)
Connect the pressure gauge to detecting port and measure the pressure.

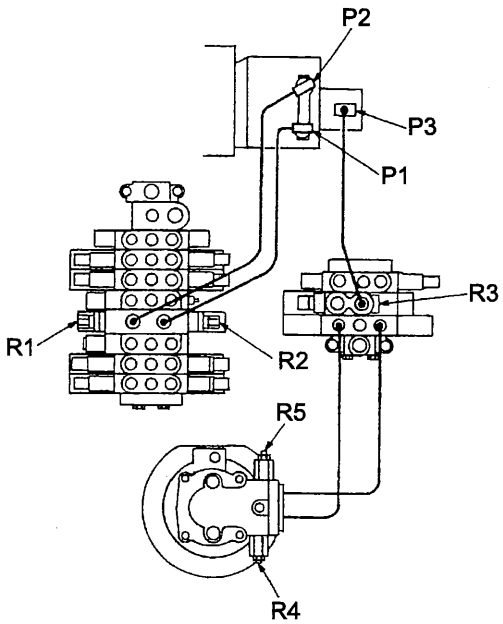
Detecting port		Relief valve
Position	Size	
P4	PF1/4	R6

(2) Pressure adjustment

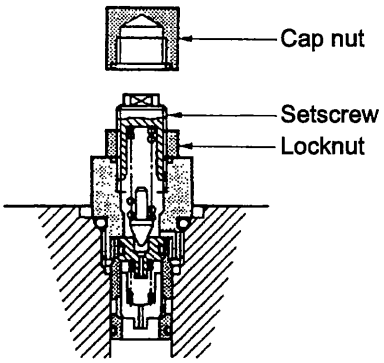
1) Loosen locknut, and adjust the setting pressure turning the setscrew.
CW turning: Increasing setting pressure
CCW turning: Decreasing setting pressure

2) After the adjustment, tighten up the locknut holding the setscrew not to allow its turning.

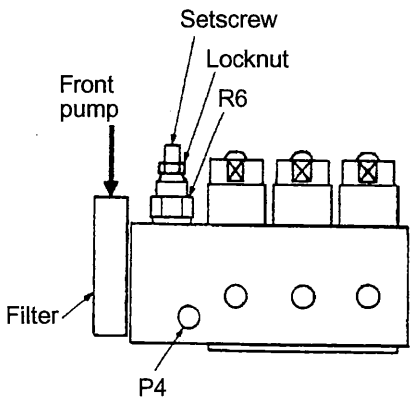
3) Again actuate the relief valve, and verify that the set pressure is being stable.



PRESSURE MEASURING



MAIN RELIEF VALVE



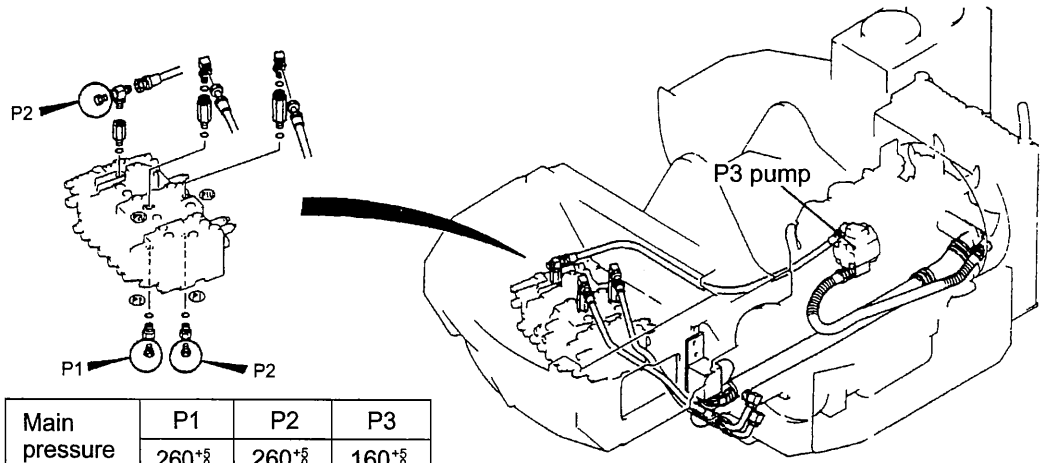
SOLENOID VALVE WITH RELIEF VALVE

3. Main relief pressure

(1) Warm the hydraulic oil to about 50 degrees C.
(2) Before connecting pressure gauge, bleed the hydraulic oil tank of air.
(3) Measure the pressure when the engine is high idling and at H mode.

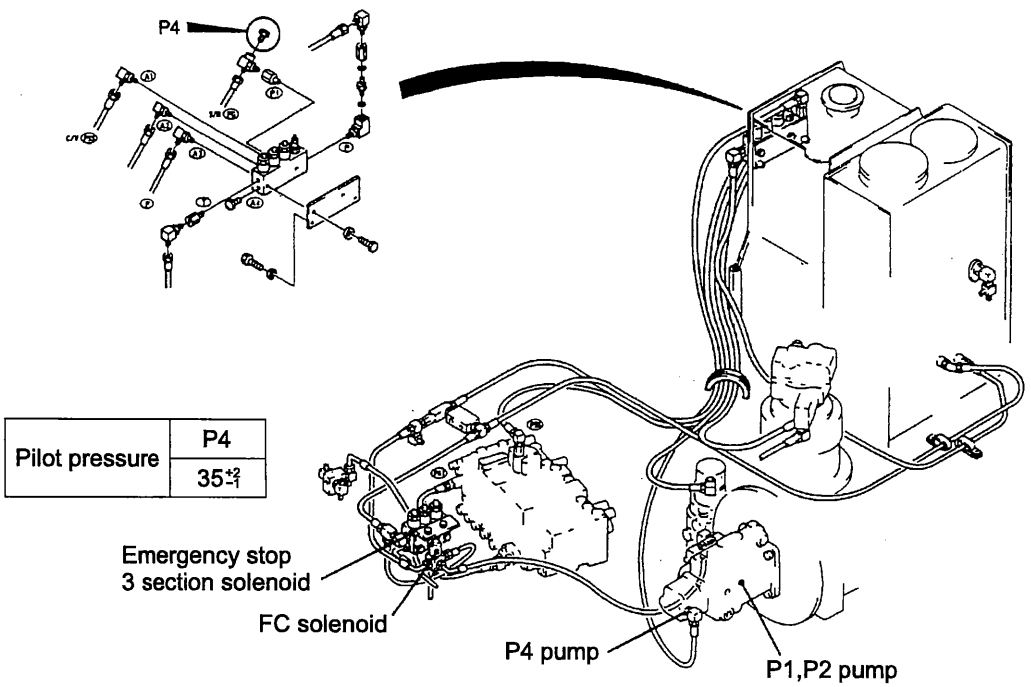
4. Pressure gauge location (All threads are PF1/4.)

(1) Measurement of P1, P2 and P3



Main pressure	P1	P2	P3
	260^{+5}_{0}	260^{+5}_{0}	160^{+5}_{0}

(2) Measurement of P4



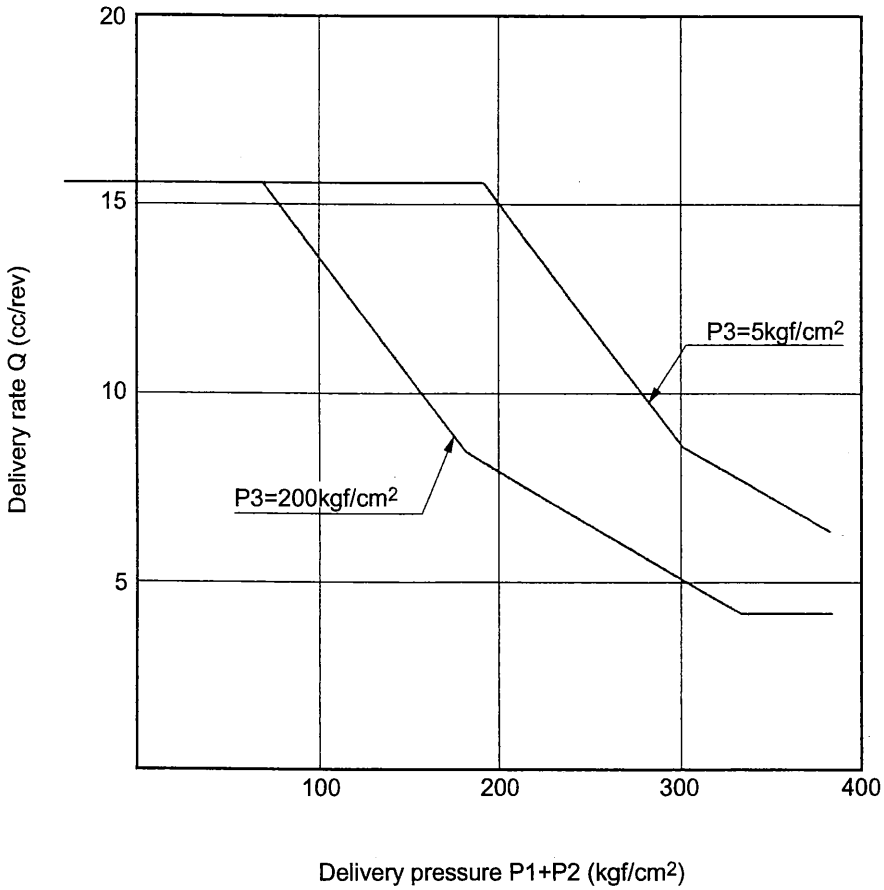
Pilot pressure	P4
	35^{+2}_{-1}

9. PERFORMANCE STANDARD TABLE

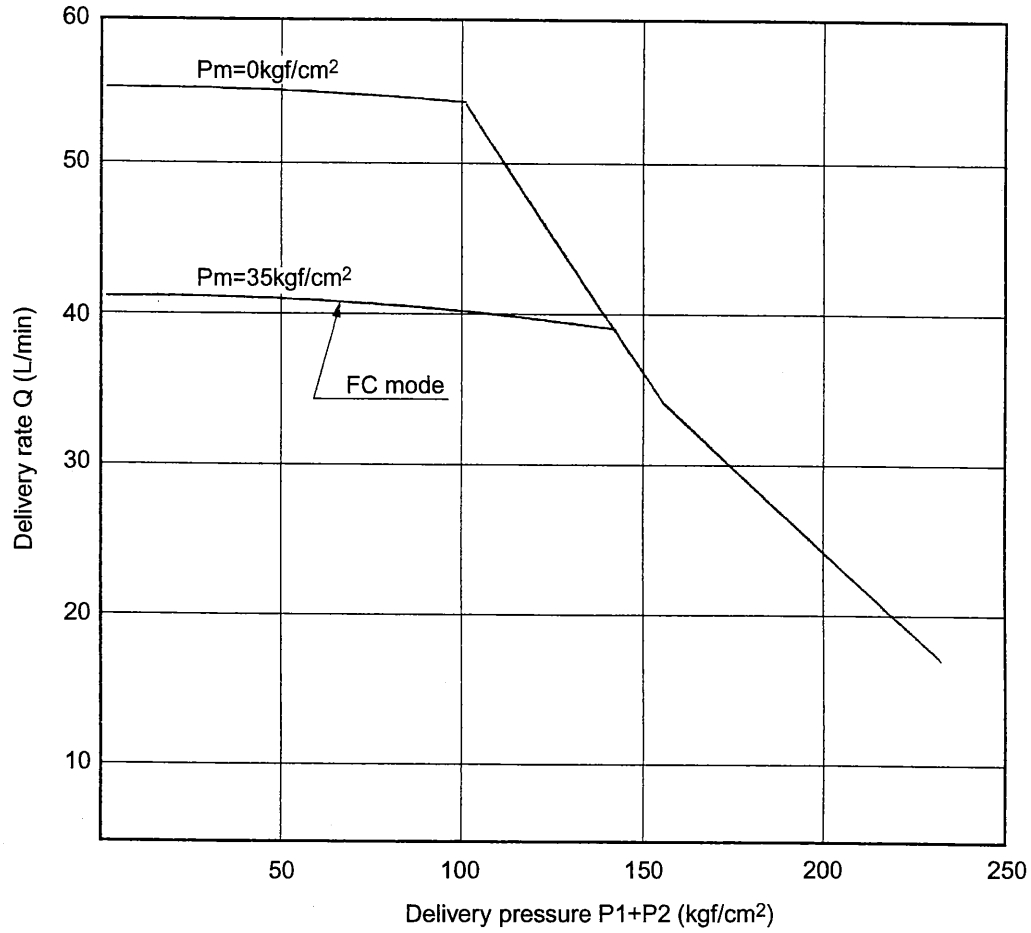
Item	Measuring position			Unit	SK30UR-2 Standard value	SK50UR-2 Standard value	SK75UR-2 Standard value
Measuring condition	Hydraulic oil temperature			℃	50±5	50±5	50±5
	Coolant temperature				75±15	75±15	75±15
	Engine speed	Low idling		rpm	1,000±50	1,050±50	950+50
		H mode, High idling			2,300±50	2,490±50	2,380±50
		FC mode			—	2,490±50	$1,600^{+50}_{0}$
		Deceleration			1,000±50	1,050±50	$1,600^{+50}_{0}$
Hydraulic pressure	Pilot relief	Primary delivery		kgf/cm²	35^{+3}_{0}	35^{+2}_{-1}	35^{+2}_{-1}
	Main relief set	P1	Attachment, Travel		210^{+10}_{0}	210^{+5}_{0}	260^{+5}_{0}
		P2	Attachment, Travel			230^{+5}_{0}	
		P3	Dozer		200^{+10}_{0}	200^{+5}_{0}	320^{+5}_{0}
	Overload relief set	Boom	H		280^{+10}_{0}	240^{+5}_{0}	160^{+5}_{0}
			R		250^{+10}_{0}		280^{+5}_{0}
		Arm	H,R				
		Bucket	H,R				
		Offset	H,R				
		Dozer	H,R				230^{+5}_{0}
		Travel	H,R			—	—
		Slewing	H,R		170^{+30}_{0}	150^{+40}_{-10}	260^{+5}_{0}
Travel	Travel speed (5 revolutions)	Rubber crawler	Low speed	Sec / 5 rev	26.3~27.3	—	—
			High speed		15.2~16.2	—	—
	Sprocket revolutions	Rubber crawler	Low speed	rpm	—	33.1~36.6	35.6±2
			High speed		—	23.1~62.7	55.9±3
	Travel deviation			mm /10m	125 or less	125	80
	Parking brake performance			mm / 5min	0	0	0
Slewing	Slewing speed		Standard	Sec / 2 rev	12.8~14.0	11.4~21.2	9.6±0.5
			Low speed		21.8~24.0	18.0~22.3	17.2±0.5
	Drift at slewing stop			mm	100~150		420~560
	Slewing natural drift by gravity			mm / 5min	0	0	0
Cylinder	Cylinder speed	Boom	Up	Sec	3.4~4.0	2.6~3.2	2.7±0.3
			Down		3.7~4.3	2.6~3.2	3.4±0.3
		Arm	In		3.6~4.2	3.7~4.3	3.5±0.3
			Out		3.3~3.9	2.9~3.7	2.3±0.3
		Bucket	Digging		2.7~3.3	3.2~3.8	3.8±0.3
			Dump		2.0~2.6	1.9~2.5	2.2±0.3
		Offset	Left		2.7~3.3	7.7~9.3	7.4±0.5
			Right		2.5~3.2	6.0~7.0	5.5±0.4
		Dozer	Down		2.9~3.5	3.2~3.8	1.3±0.2
			Up		1.9~2.5	2.3~2.9	0.8±0.2
	Cylinder drift by gravity	Boom		mm /10min	12 or less		10 or less
		Arm			10 or less		8 or less
		Bucket			5 or less		4 or less
		Offset			5 or less		
		Dozer			5 or less		
		Bucket tooth tip			200 or less	200 or less	85 or less
Slewing bearing	Amount of horizontal play at bucket tooth tip			mm	20~65	25~50	40
	Play of slewing bearing's meshing				0.7±0.4		1.2~2.8

10. P-Q CURVE OF MAIN PUMP

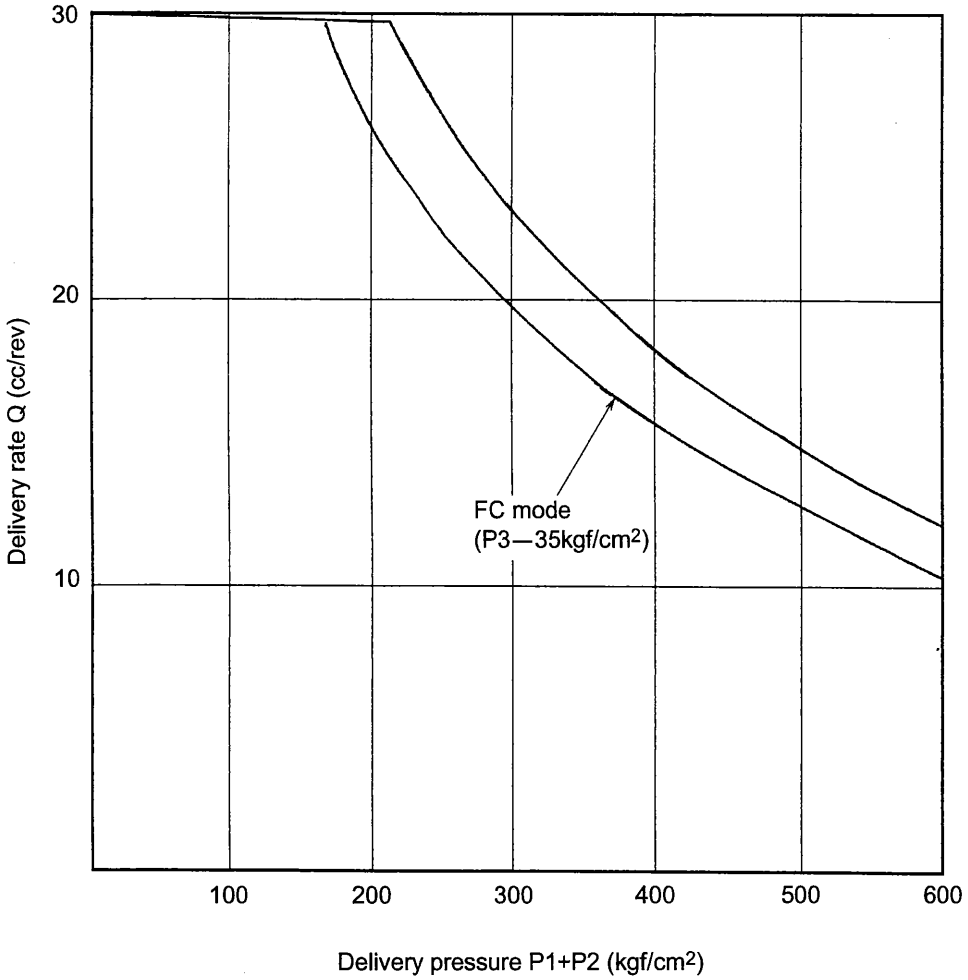
CHARACTERISTIC CURVE OF PUMP



CHARACTERISTIC CURVE OF PUMP

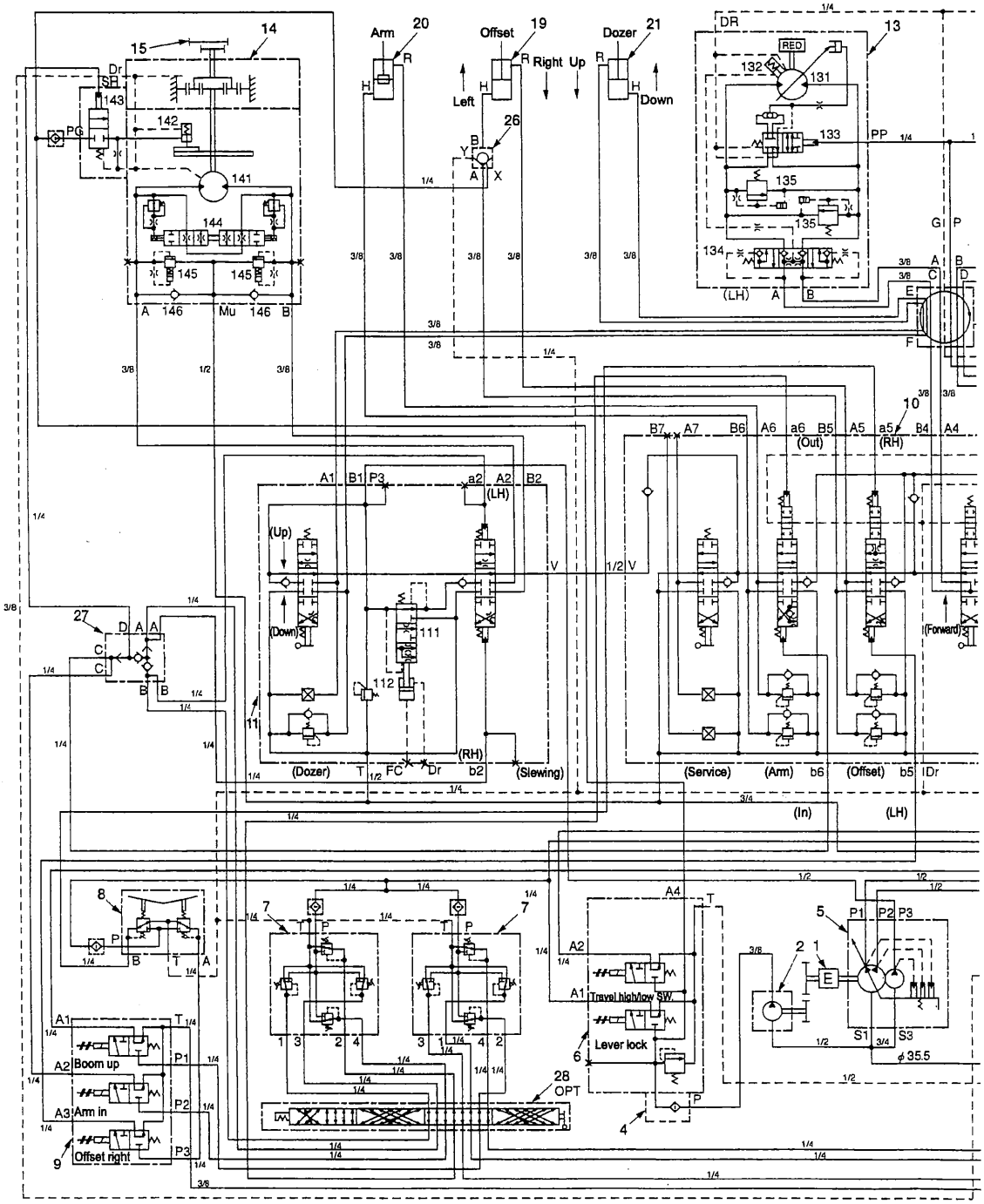


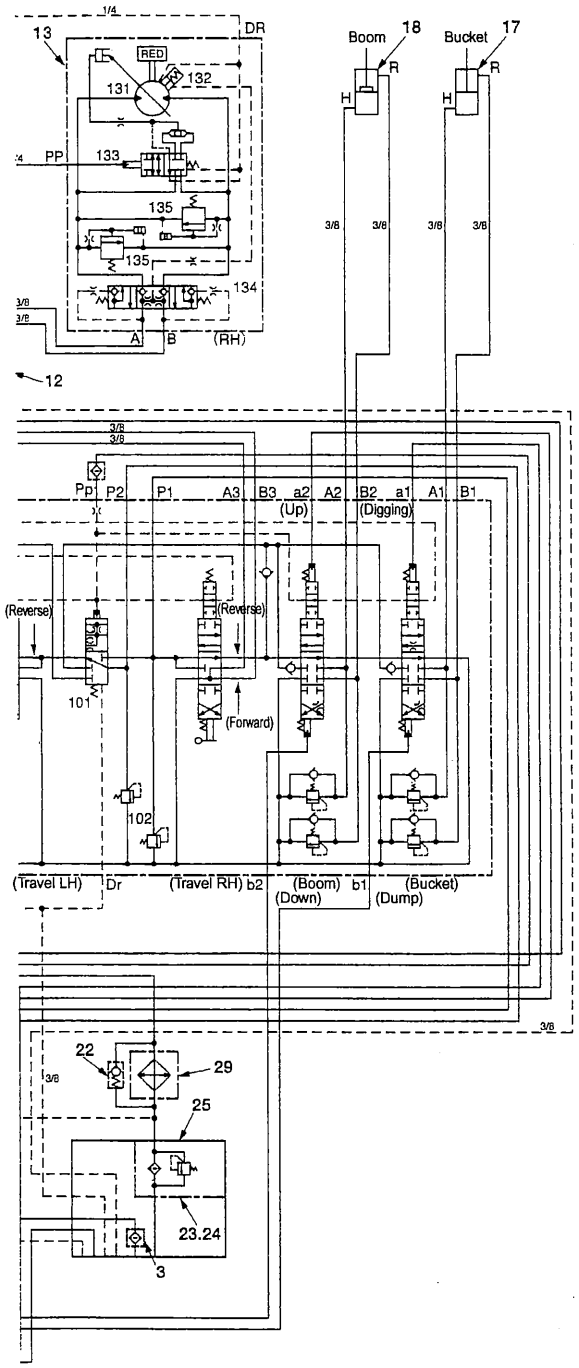
CHARACTERISTIC CURVE OF PUMP



MEMO

11. HYDRAULIC CIRCUIT DIAGRAM

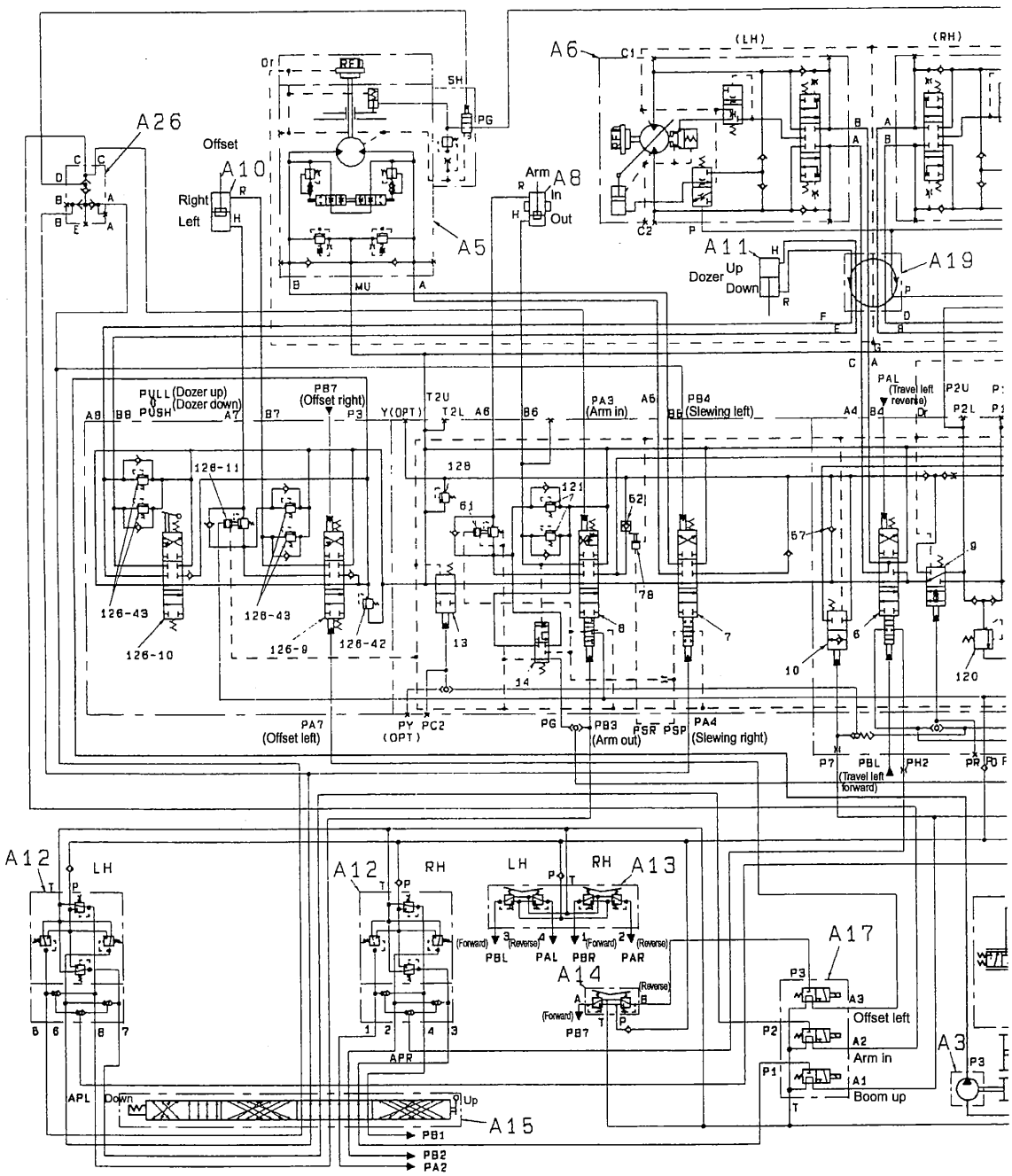


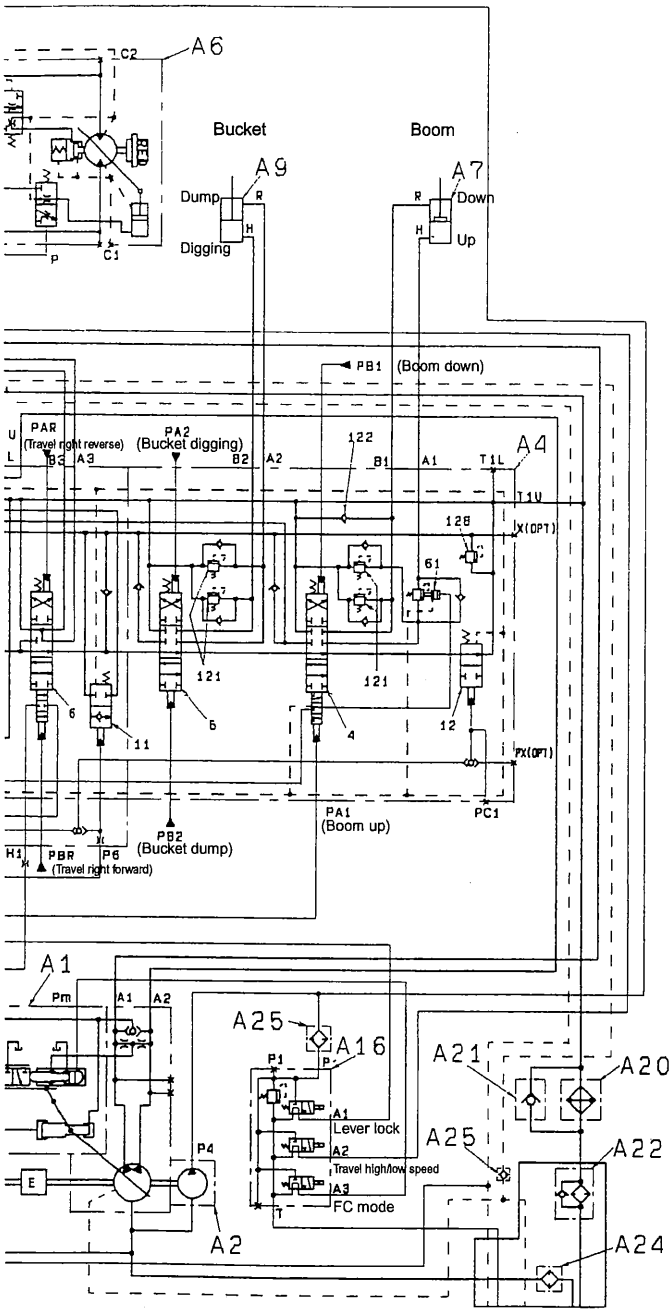


No.	Component
1	Engine
2	Gear pump (for Pilot)
3	Suction strainer
4	Line filter
5	Main pump
6	Solenoid valve (Travel speed & Lever lock)
7	Pilot valve (for Attachment)
8	Pilot valve (for Off-set)
9	Solenoid valve (Interference prevention)
10	Main control valve
11	Control valve (Dozer & Slewing)
12	Swivel joint
13	Travel motor
14	Slewing motor
15	Slewing ring
—	—
17	Bucket cylinder
18	Boom cylinder
19	Offset cylinder
20	Arm cylinder
21	Dozer cylinder
22	Check valve
23	Return filter
24	Bypass valve
25	Hydraulic oil tank
26	Pilot check valve
27	Shuttle valve
* 28	Multi control valve (Option)
29	Oil cooler
30	Block (Piping)

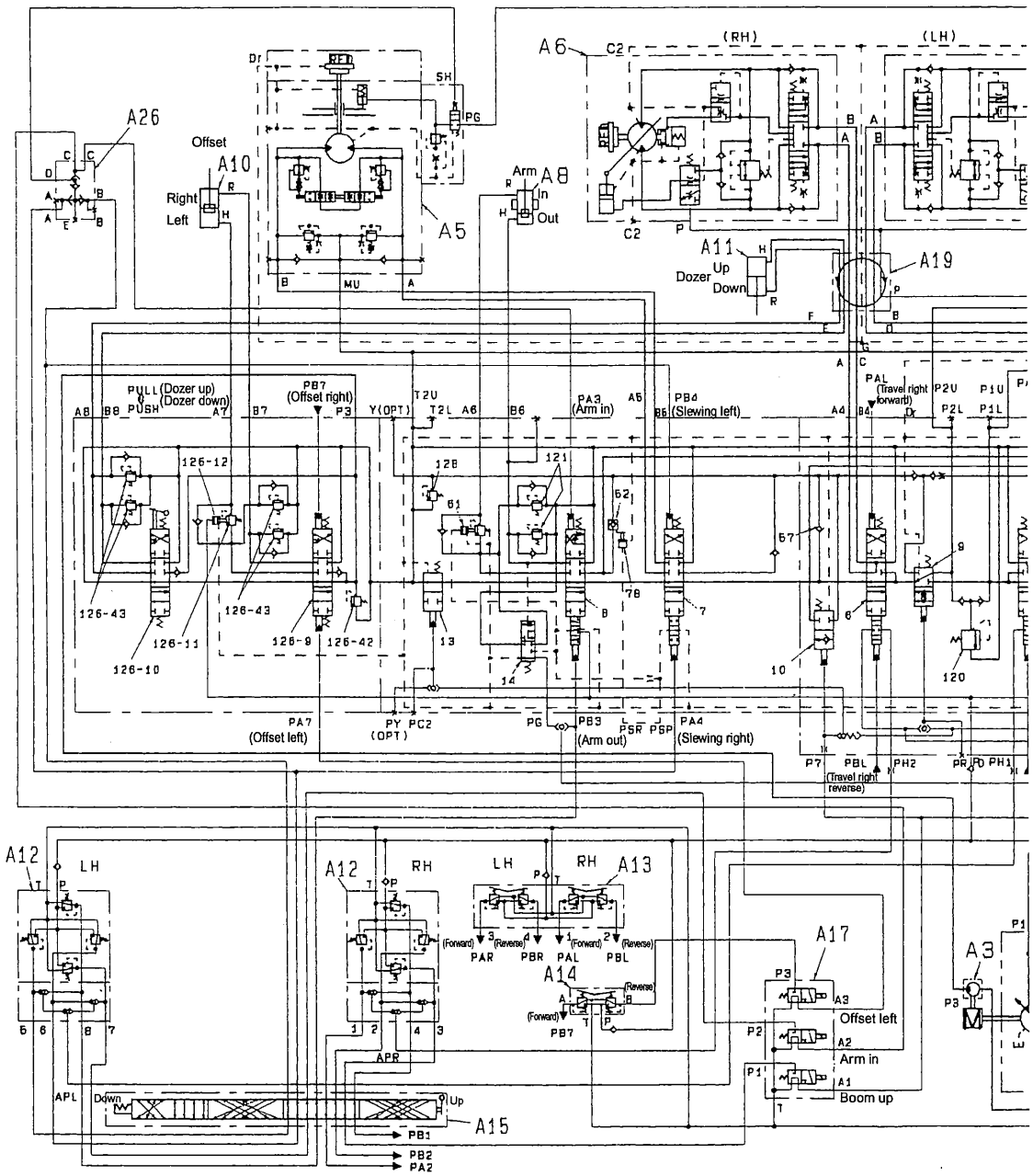
* Mark: Option

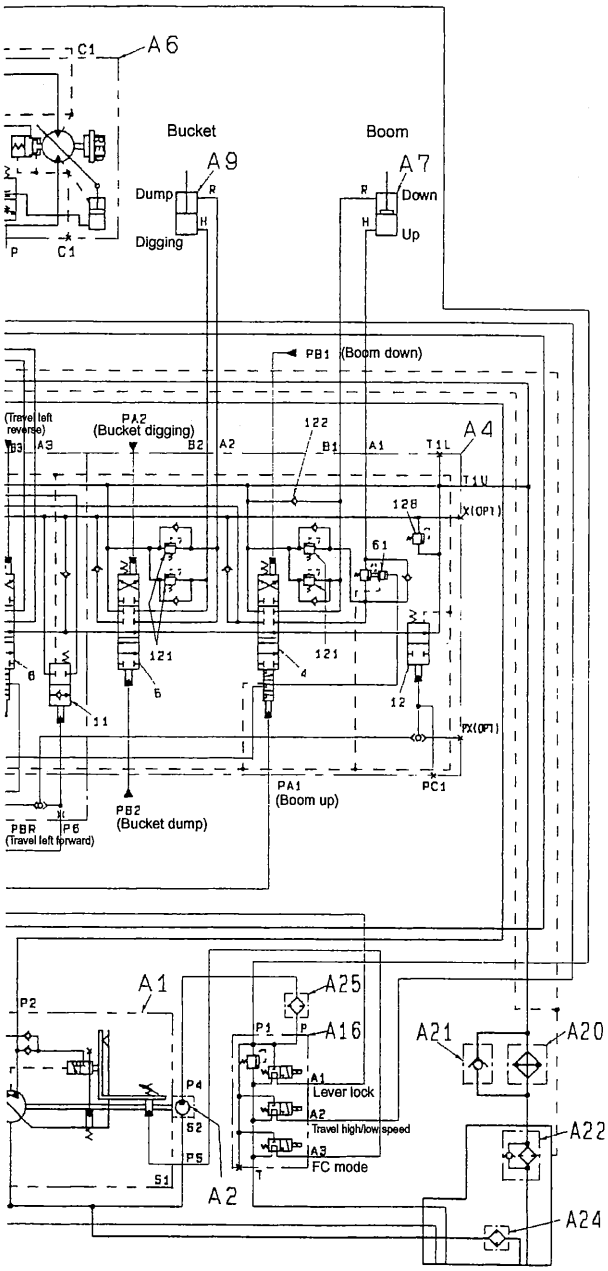
No.	Component (Inner parts)
101	Travel straight valve
102	Main relief valve (Travel)
111	—
112	Main relief valve (Slewing)
131	Travel motor
132	Parking brake (Travel)
133	Travel speed switch valve
134	Counter balance valve
135	Relief valve
141	Slewing motor
142	Parking brake (Slewing)
143	Slewing brake timer
144	Slewing anti-shock valve
145	Relief valve
146	Make-up valve





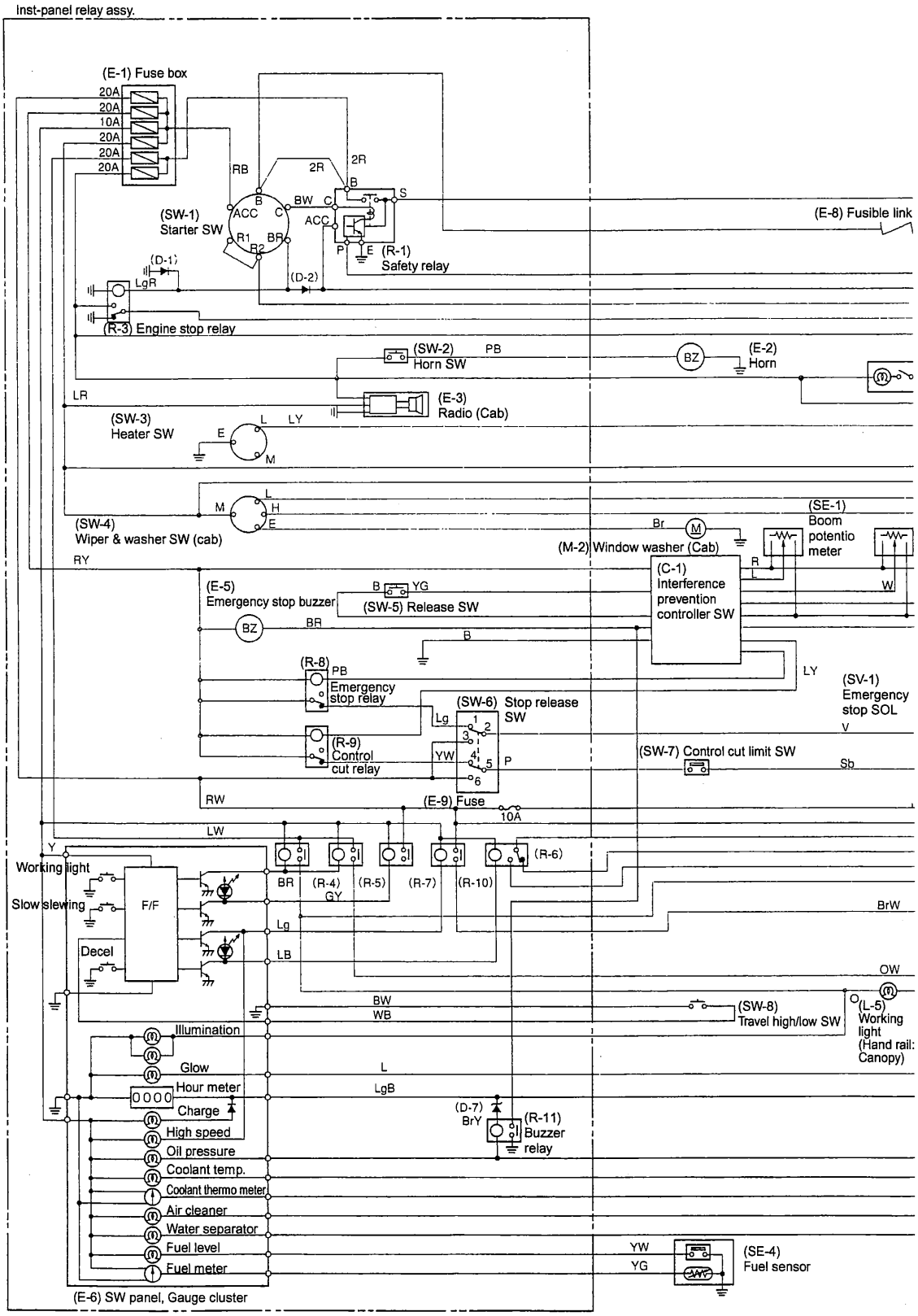
No.	Component
A1	Main pump
A2	Gear pump (for Pilot)
A3	Gear pump (Offset & Dozer)
A4	Main control valve
A5	Slewing motor
A6	Travel motor
A7	Boom cylinder (R & L)
A8	Arm cylinder
A9	Bucket cylinder
A10	Offset cylinder
A11	Dozer cylinder
A12	Pilot valve (for Attachment)
A13	Pilot valve (for Travel)
A14	Pilot valve (for Off-set)
A15	Multi control valve (Option)
A16	Solenoid valve (Lever lock)
A17	Solenoid valve (Interference prevention)
A18	—
A19	Swivel joint
A20	Oil cooler
A21	Bypass check valve
A22	Return filter
A23	—
A24	Suction strainer
A25	Inline filter
A26	Shuttle valve

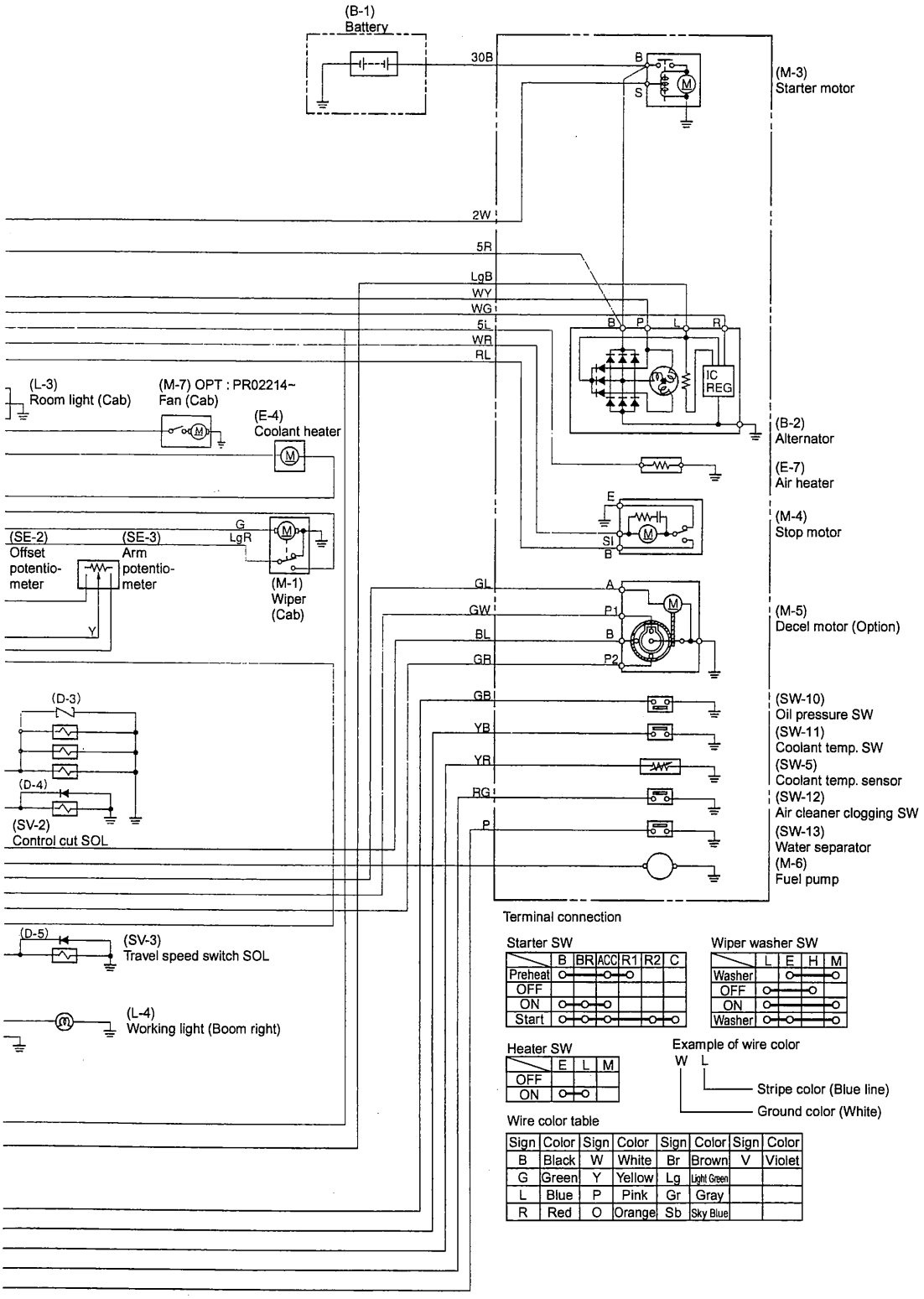


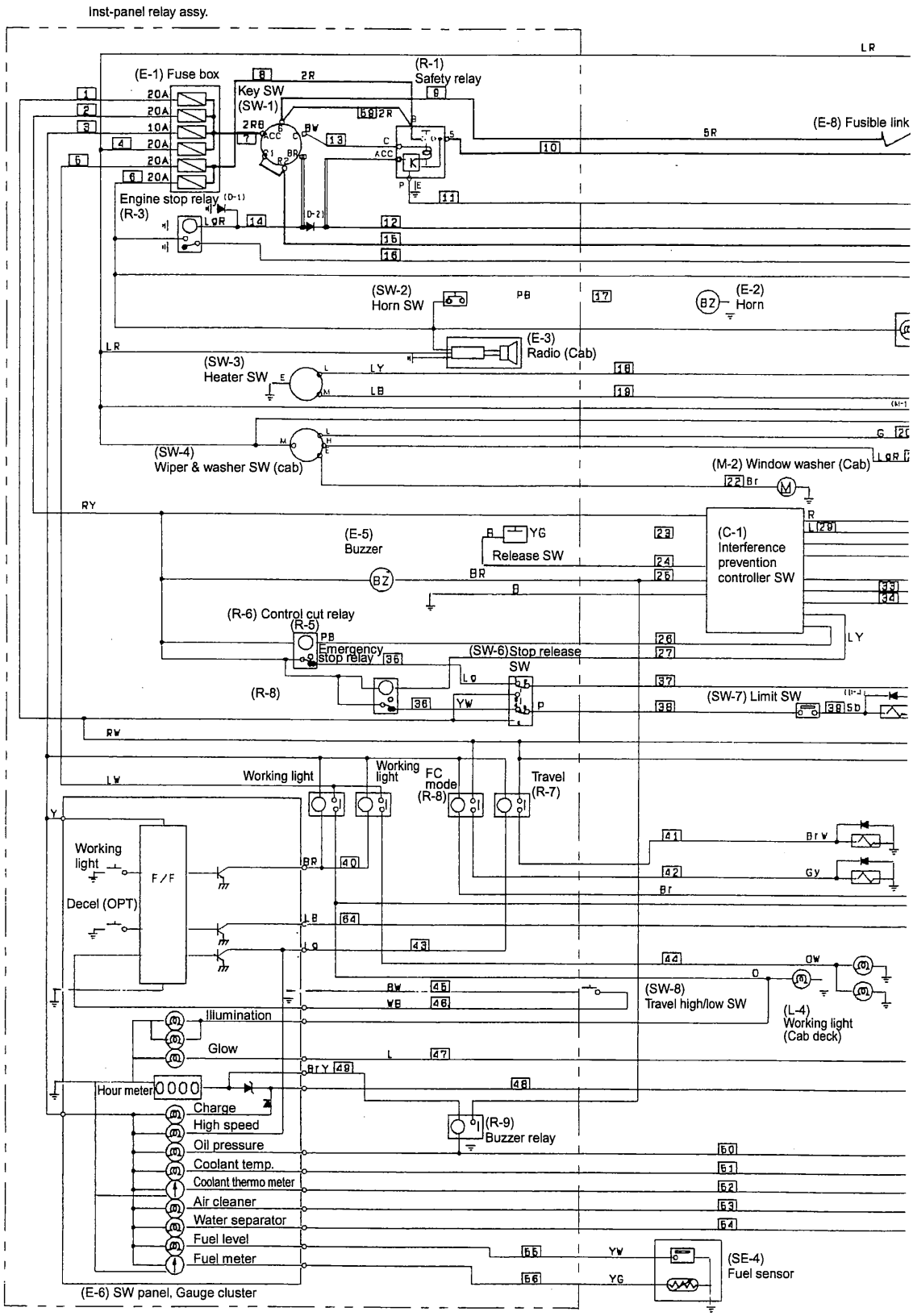


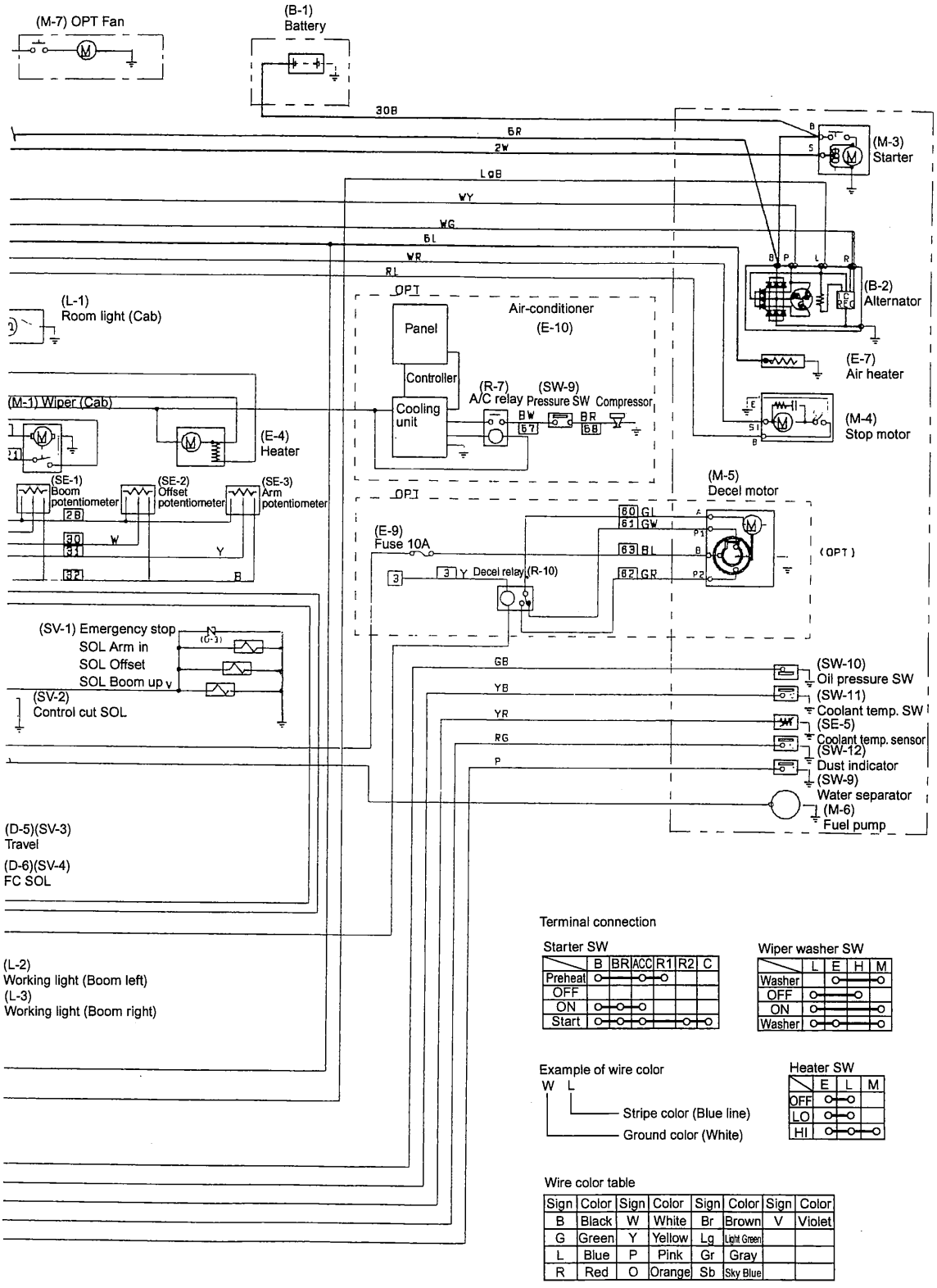
No.	Component
A1	Main pump
A2	Gear pump (for Pilot)
A3	Gear pump (Offset & Dozer)
A4	Main control valve
A5	Slewing motor
A6	Travel motor
A7	Boom cylinder
A8	Arm cylinder
A9	Bucket cylinder
A10	Offset cylinder
A11	Dozer cylinder
A12	Pilot valve (for Attachment)
A13	Pilot valve (for Travel)
A14	Pilot valve (for Off-set)
A15	Multi control valve (Option)
A16	Solenoid valve (Lever lock)
A17	Solenoid valve (Interference prevention)
A18	—
A19	Swivel joint
A20	Oil cooler
A21	Bypass check valve
A22	Return filter
A23	—
A24	Suction strainer
A25	Inline filter
A26	Shuttle valve

12. ELECTRIC CIRCUIT DIAGRAM









Terminal connection

Starter SW

	B	BR	ACC	R1	R2	C
Preheat	○		○	○		
OFF						
ON	○		○			
Start	○		○	○	○	○

Wiper washer SW

	L	E	H	M
Washer		○		
OFF		○		
ON		○		○
Washer		○		○

Example of wire color

W L

Stripe color (Blue line)

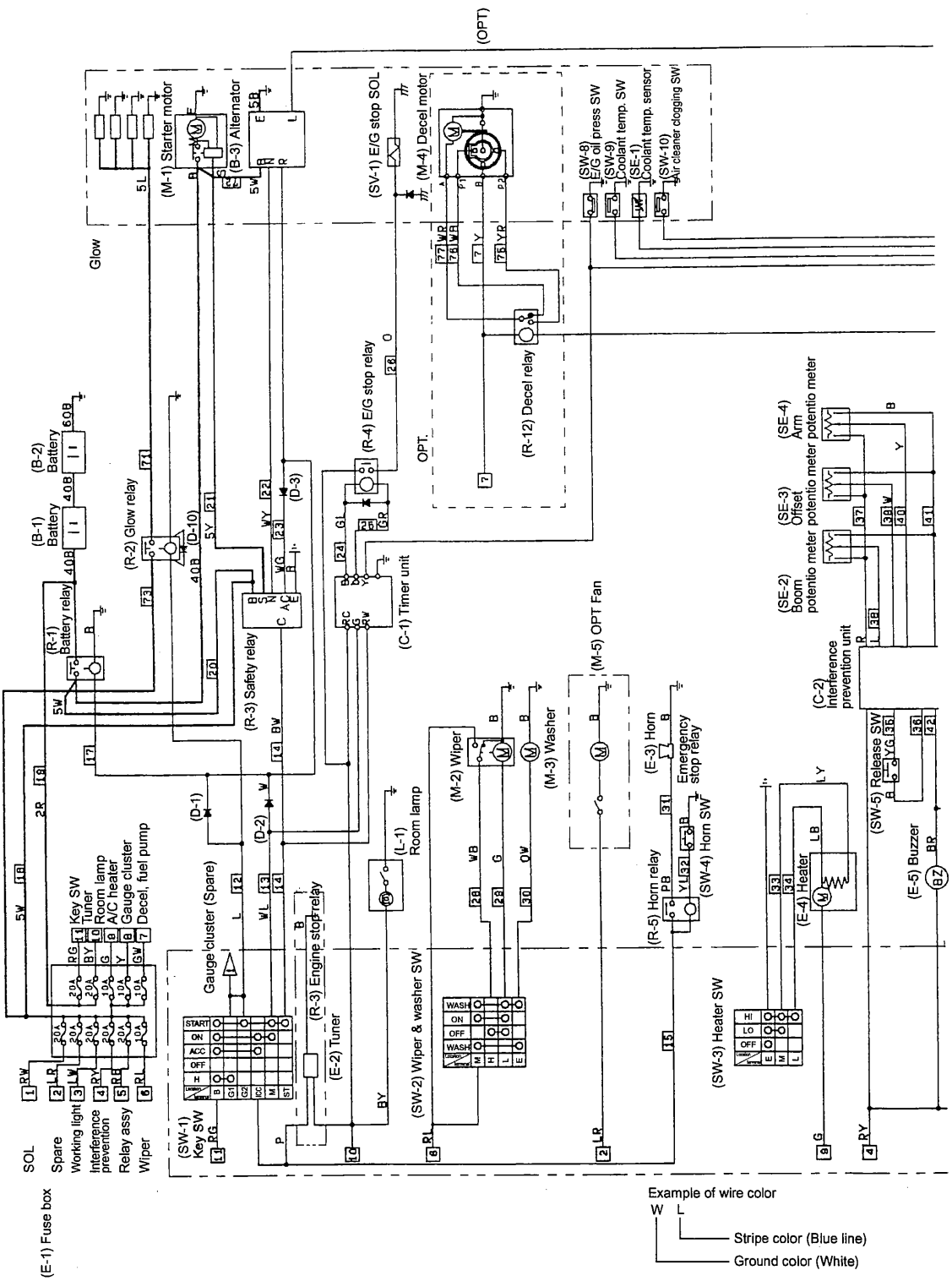
Ground color (White)

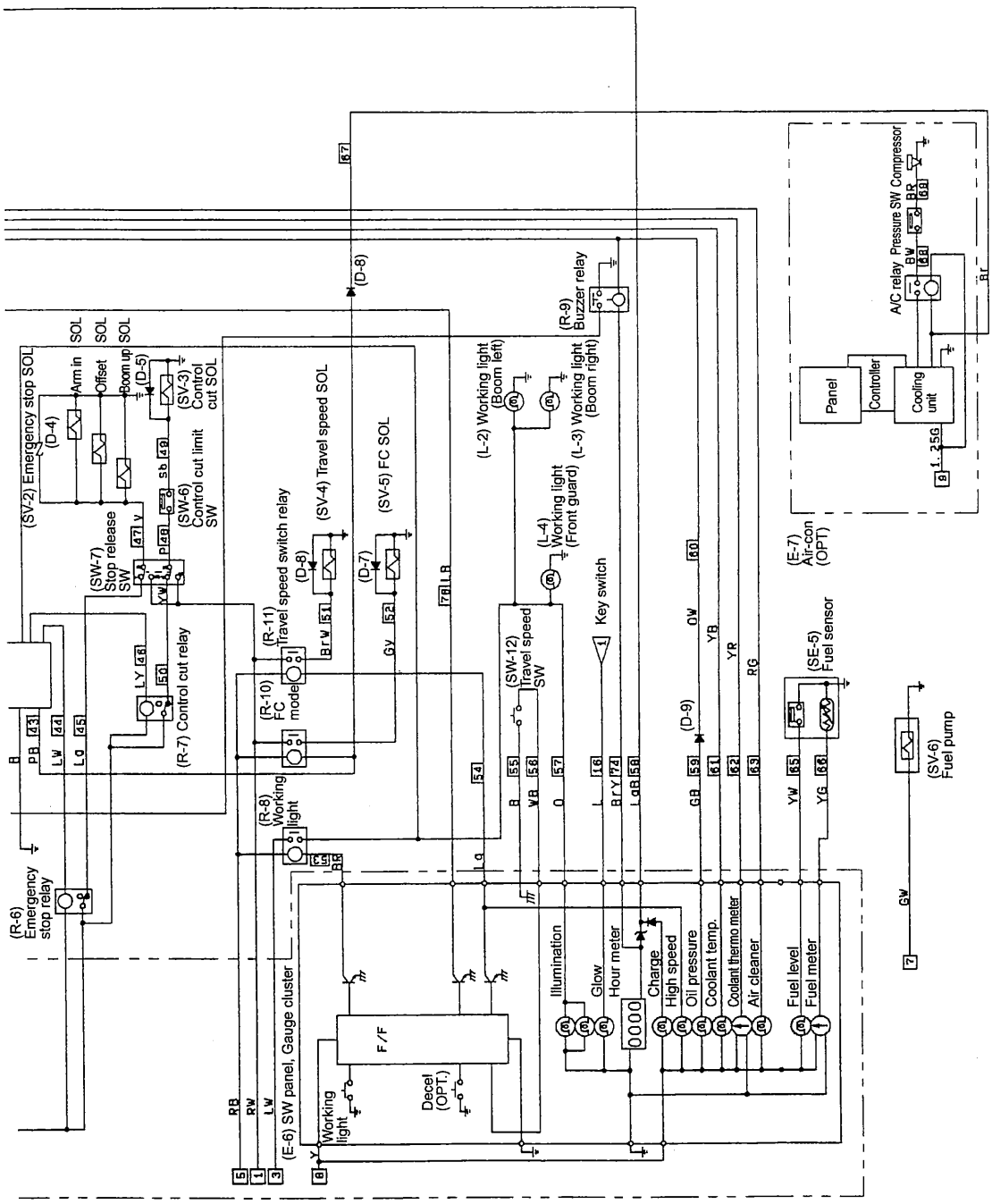
Heater SW

	E	L	M
OFF	○		
LO	○	○	
HI	○		○

Wire color table

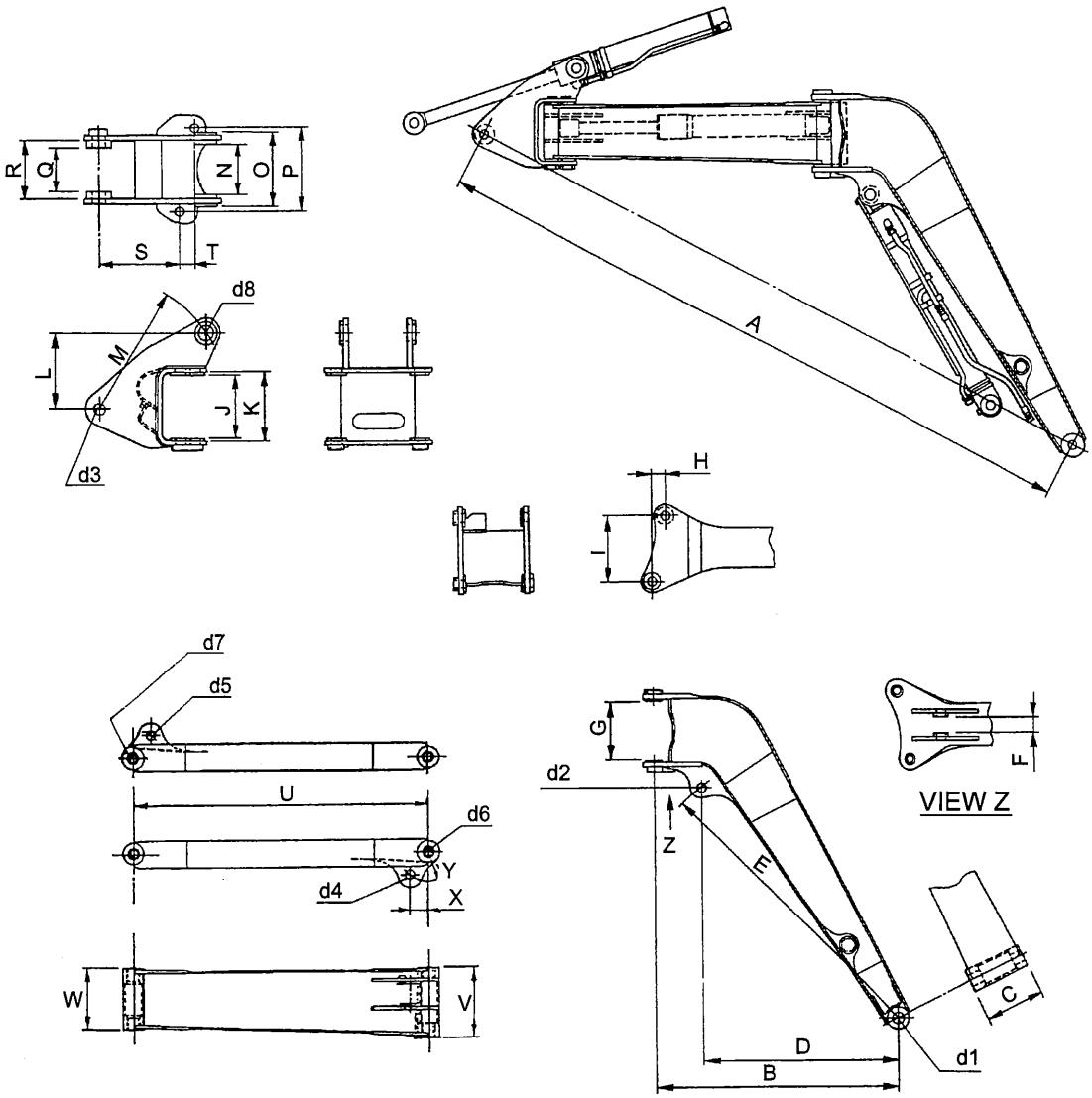
Sign	Color	Sign	Color	Sign	Color	Sign	Color
B	Black	W	White	Br	Brown	V	Violet
G	Green	Y	Yellow	Lg	Light Green		
L	Blue	P	Pink	Gr	Gray		
R	Red	O	Orange	Sb	Sky Blue		





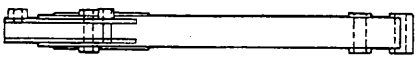
13. DIMENSIONS OF ATTACHMENT

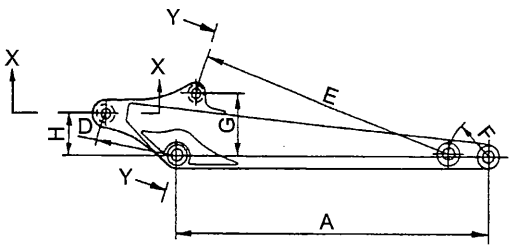
BOOM

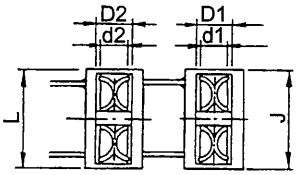


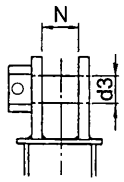
A : Boom length
B : Distance between boom foot pin and rear boom bracket pin
C : Width of boom foot
D : Distance between boom foot pin and boom cylinder rod pin bracket
E : Radius from boom foot pin to pin of boom cylinder rod pin
F : Inner width (SK75UR-3E), Outer width (SK130UR-1E)
G : Inner width of boss
H : Distance between pins
I : Distance between pins
J : Inner width of boss
K : Inner width of bracket
L : Distance between pins
M : Distance between pins
N : Inner width of boss
O : Outer width of boss
P : Distance between pins
Q : Inner width of boss
R : Inner width of bracket
S : Distance between pins
T : Distance between pins
U : Distance between pins
V : Outer width of boss
W : Outer width of boss
X : Distance between pins
Y : Distance between pins
Z : Inner width of boss
d1 : Pin dia.
d2 : Pin dia.
d3 : Pin dia.
d4 : Pin dia.
d5 : Pin dia.
d6 : Pin dia.
d7 : Pin dia.
d8 : Pin dia.

ARM

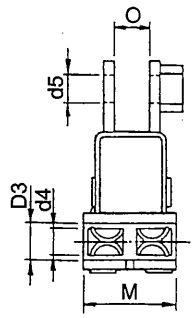




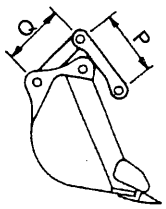




SECTION X-X



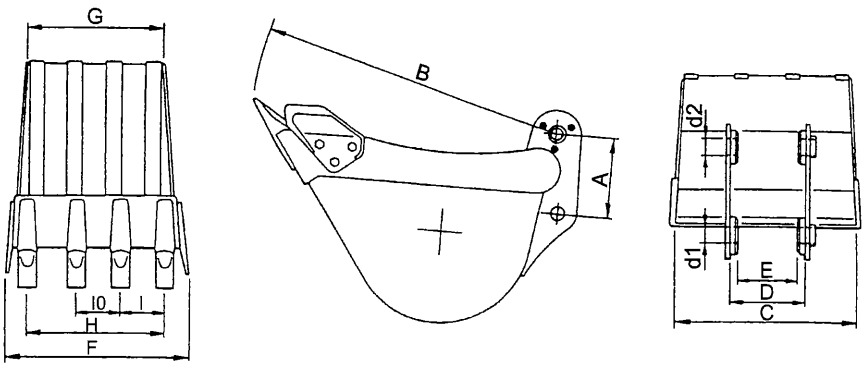
SECTION Y-Y



A : Arm length
D : Distance between pins of boss and bracket
D1 : I.D of boss
D2 : I.D of boss
D3 : I.D of boss
E : Distance between pins of boss and bracket
F : Distance between pins of boss and boss
G : Height between pins of boss and bracket
H : Height between pins of boss and bracket
J : Arm top end width (with bushing)

L : Arm top end width
M : Boss width
N : Bracket inner width
O : Bracket inner width
P : Link dimension
Q : Link dimension
d1 : Pin dia.
d2 : Pin dia.
d3 : Pin dia.
d4 : Pin dia.
d5 : Pin dia.

BUCKET



A : Distance between pin and bracket
B : Distance between bracket pin and tooth end
C : Inner width of bracket top end
D : Inner width of lug
E : Outer width of side cutter
F : Inner width of bucket bottom
G : Tooth outer width
H : Tooth outer width
l : Pitch between tooth
l0 : Pitch between tooth
d1 : Pin dia.
d2 : Pin dia.

Unit : mm

	Boom		
	SK30UR-2	SK50UR-2	SK75UR-2
A	2,648.5	3,527	3,870
B	898	1,256	1,478
C	173	250	360
D	712	1,056	1,198
E	R1,320	R1,680	R1,879
F	65	90	100
G	226	298	354
H	32	63	90
I	278	380	415
J	176	248	304
K	199	285	332
L	261	382	367
M	R501.5	R652	R651.5
N	126	245	285
O	200	335	373
P	278	380	415
Q	135	175	215
R	150	251	291
S	280	403	400
T	32	63	80
U	1,100	1,480	1,540
V	224	296	353
W	174	246	303
X	115	138.5	92
Y	R135	R174	R150
d1	Ø 45	Ø 60	Ø 60
d2	Ø 45	Ø 55	Ø 65
d3	Ø 45	Ø 55	Ø 60
d4	Ø 40	Ø 55	Ø 55
d5	Ø 40	Ø 55	Ø 55
d6	Ø 35	Ø 50	Ø 55
d7	Ø 35	Ø 50	Ø 55
d8	Ø 50	Ø 55	Ø 65

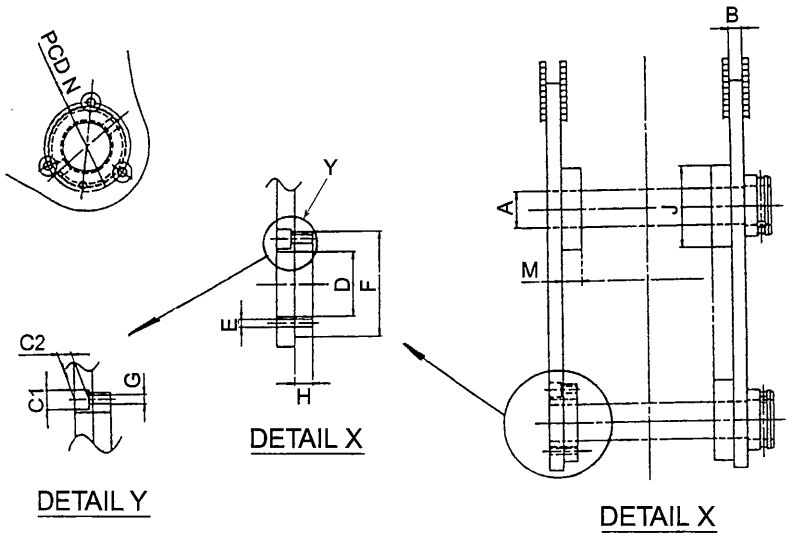
Unit : mm

	Arm					
	SK30UR-2		SK50UR-2		SK75UR-2	
	1.22M		1.91M	1.53M	1.76M	2.06M
A	1,220		1,910	1,530	1,760	2,060
B	—		—	—	—	—
C	—		—	—	—	—
D	R290		R448	R448	R416	R416
D1	Ø 45		Ø 55	Ø 55	Ø 65	Ø 65
D2	Ø 45		Ø 55	Ø 55	Ø 60	Ø 60
D3	Ø 55		Ø 65	Ø 65	Ø 70	Ø 70
E	R918		R1255.5	R1255.5	R1497.5	R1497.5
F	R180		R246	R246	R230	R230
G	257		356	356	417	417
H	153		210	230	248	248
I	—		—	—	—	—
J	122		150	150	180	180
K	—		—	—	—	—
L	122		150	150	180	180
M	130		170	170	210	210
N	58		90	90	100	100
O	52		66	66	90	90
P	243		358	358	420	420
Q	243		340	340	380	380
d1	Ø 35		Ø 45	Ø 45	Ø 50	Ø 50
d2	Ø 35		Ø 45	Ø 45	Ø 50	Ø 50
d3	Ø 45		Ø 50	Ø 50	Ø 60	Ø 60
d4	Ø 45		Ø 55	Ø 55	Ø 60	Ø 60
d5	Ø 40		Ø 45	Ø 45	Ø 50	Ø 50

Unit : mm

	Bucket									
	SK30UR-2			SK50UR-2			SK75UR-2			
	0.05M³	0.07M³		0.08M³	0.14M³	0.2M³	0.13M³	0.16M³	0.20M³	0.25M³
A	182	←		264	←	←	290	←	←	←
B	R685	←		R875	←	←	R1,040	←	←	←
C	305	385		310	510	600	381	450	550	650
D	180	←		208	←	←	238	←	←	←
D1	—	—		—	—	—	—	—	—	—
D2	—	—		—	—	—	—	—	—	—
D3	—	—		—	—	—	—	—	—	—
E	124	←		152	←	←	182	←	←	←
F	380	460		400	600	690	450	550	650	750
G	261	341		254	454	544	281	350	450	550
H	244	324		250	450	540	297	366	466	566
I0	122	162		125	150	180	148.5	183	166	190
I	122	162		125	150	180	148.5	183	150	188
K	—	—		—	—	—	—	—	—	—
L	—	—		—	—	—	—	—	—	—
M	—	—		—	—	—	—	—	—	—
N	—	—		—	—	—	—	—	—	—
O	—	—		—	—	—	—	—	—	—
P	—	—		—	—	—	—	—	—	—
Q	—	—		—	—	—	—	—	—	—
d1	Ø 35	←		Ø 45	←	←	Ø 50	←	←	←
d2	Ø 35	←		Ø 45	←	←	Ø 50	←	←	←
d3	—	—		—	—	—	—	—	—	—
d4	—	—		—	—	—	—	—	—	—
d5	—	—		—	—	—	—	—	—	—

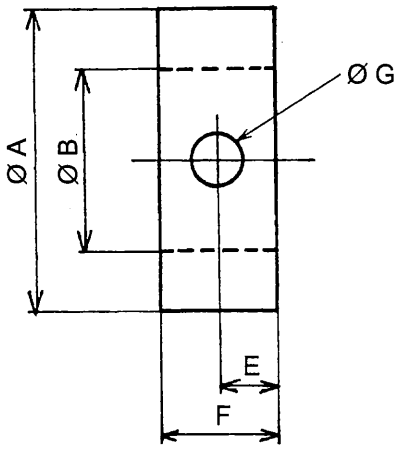
DIMENSION OF LUG SECTION



Unit : mm

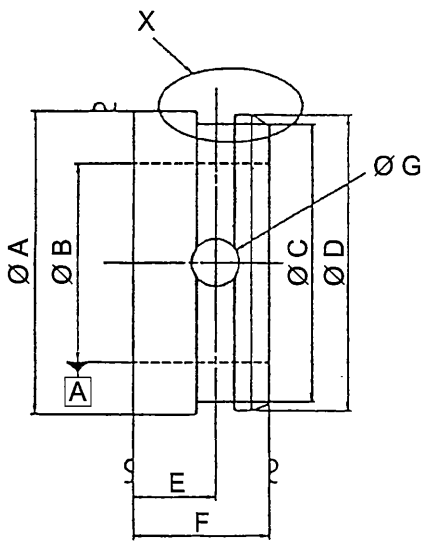
Item / Model	Pin hole dia	Lug plate thickness	Bolt bore depth	Hole dia.	Spring pin dia.	Boss outer dia.	Screw dia.	Boss width	Boss outer dia.	Boss width	Screw hole P.C.D
	Ø A	B	Ø C1 C2	Ø D	Ø E	Ø F	Ø G	H	Ø J	M	Ø N
SK30UR-2	35	12	21 5	45	8	90	10	12	70	28	72
SK50UR-2	45	14	21 3.5	60	8	108	10	12	85	28	85
SK75UR-2	50	19	20 15	65	8	110	10	9	110	28	91

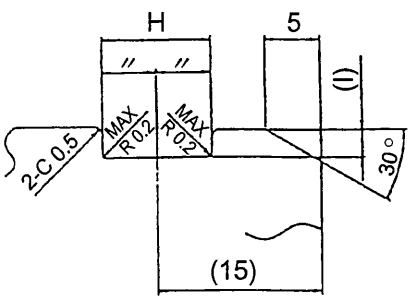
DIMENSION OF BOSS



Unit : mm

Model	Boss P. No	Ø A	Ø B	E	F	Ø G
SK30UR-2	PV61B01022P1	60.5	36.5	12	24	11
SK50UR-2	2418T21055D1	82.6	48.6	15	30	13





DETAIL X

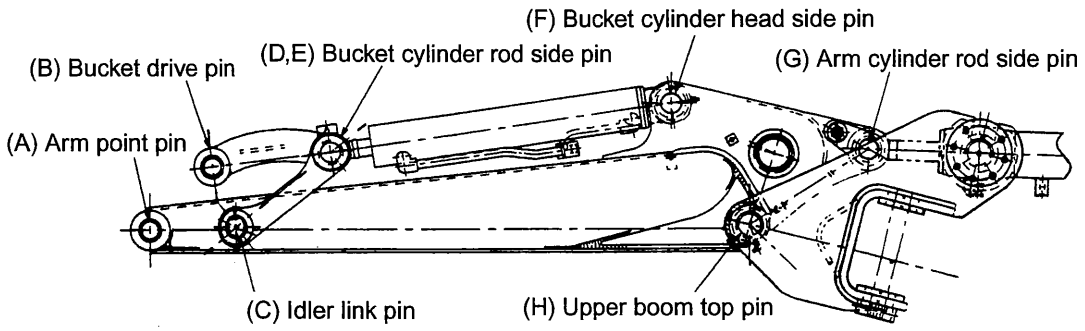
Unit : mm

Model	Boss P. No	Ø A	Ø B	Ø C	Ø D	E	F	Ø G	H	I
SK75UR-2	2418P26830	82.6	54	75.5 ± 0.2	80.5	23	38	13	10	2.5

14. MAINTENANCE STANDARD

14-1 CLEARANCE BETWEEN PIN AND BUSHING (Arm, Boom)

(1) Clearance between pin and bushing around arm.



CLEARANCE OF PIN AND BUSHING AROUND ARM

SK30UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Arm point pin	Ø 35	−0.06 −0.09	+0.05 0	0.06~0.14	More than 0.8	12	Replace bushing or pin
B	Bucket drive pin							
C	Idler link pin							
D	Bucket link (Idler link connection)	Ø 40		+0.03 0	0.06~0.12			
E	Bucket cylinder rod side pin			+0.10 −0.03	0.03~0.19			
F	Bucket cylinder head side pin							
G	Arm cylinder rod side pin	Ø 45						
H	Upper boom top pin			+0.025 0	0.06~0.115			

SK50UR-2

Unit : mm

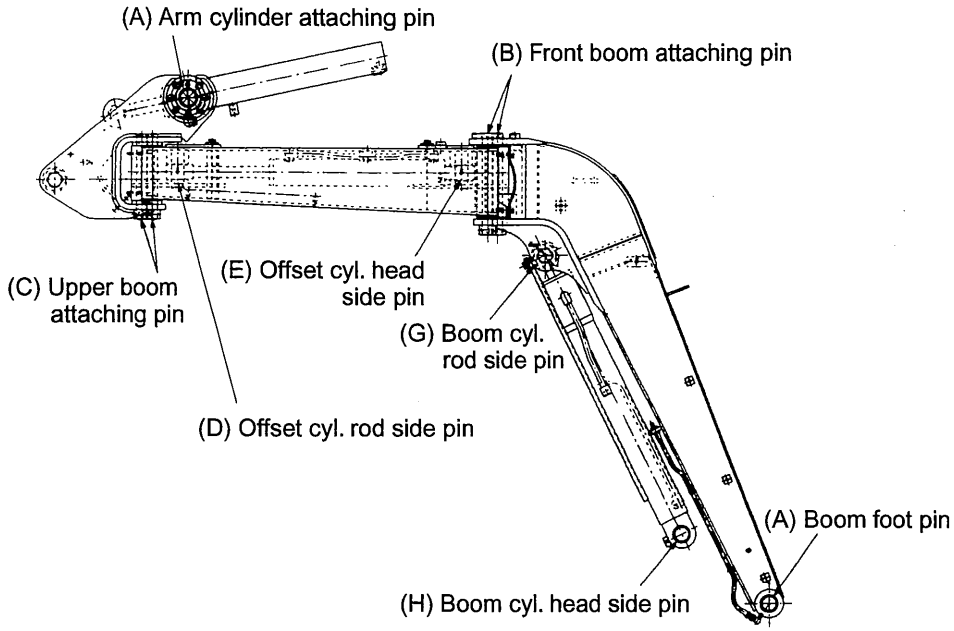
Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Arm point pin	Ø 45	−0.06 −0.09	+0.033 +0.097	0.093~0.187	1.5	12	Replace bushing or pin
B	Bucket drive pin			+0.040 +0.102	0.100~0.192			
C	Idler link pin							
D	Bucket link (Idler link connection)							
E	Bucket cylinder rod side pin			+0.050 +0.180	0.110~0.270			
F	Bucket cylinder head side pin			+0.050 +0.180	0.110~0.270			
G	Arm cylinder rod side pin	Ø 50						
H	Upper boom top pin	Ø 55		+0.043 +0.112	0.103~0.202			

SK75UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Arm point pin	Ø 50	−0.06 −0.09	+0.21 +0.07	0.13~0.30	More than 1.2	2.0	Replace bushing or pin
B	Bucket drive pin			+0.16 +0.06	0.12~0.25			
C	Idler link pin			+0.09 +0.01	0.07~0.18			
D	Bucket link (Idler link connection)							
E	Bucket cylinder rod side pin			+0.11 +0.01	0.07~0.20			
F	Bucket cylinder head side pin							
G	Arm cylinder rod side pin	Ø 60						
H	Upper boom top pin			+0.07 +0.01	0.07~0.16			

(2) Clearance between pin and bushing around boom.



CLEARANCE OF PIN AND BUSHING AROUND BOOM

SK30UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Boom foot pin	Ø 45	−0.06 −0.09	+0.25 0	0.06~0.115	More than 0.8	1.2	Replace bushing or pin
B	Front boom attaching pin	Ø 35		+0.05 0	0.06~0.14			
C	Upper boom attaching pin							
D	Offset cylinder rod side pin	Ø 40		+0.10 −0.03	0.03~0.19			
E	Offset cylinder head side pin							
F	Arm cylinder attaching pin	Ø 50	−0.06 −0.15	0 −0.025	0.035~0.15			
G	Boom cylinder rod side pin	Ø 45	−0.06 −0.09	+0.10 −0.01	0.05~0.19			
H	Boom cylinder head side pin							

SK50UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Boom foot pin	Ø 60	−0.06 −0.09	+0.022 +0.094	0.082~0.184	1.5	2.0	Replace bushing or pin
B	Front boom attaching pin	Ø 50		+0.036 +0.099	0.096~0.189			
C	Upper boom attaching pin							
D	Offset cylinder rod side pin	Ø 55		+0.050 +0.180	0.110~0.270			
E	Offset cylinder head side pin							
F	Arm cylinder attaching pin							
G	Boom cylinder rod side pin							
H	Boom cylinder head side pin							

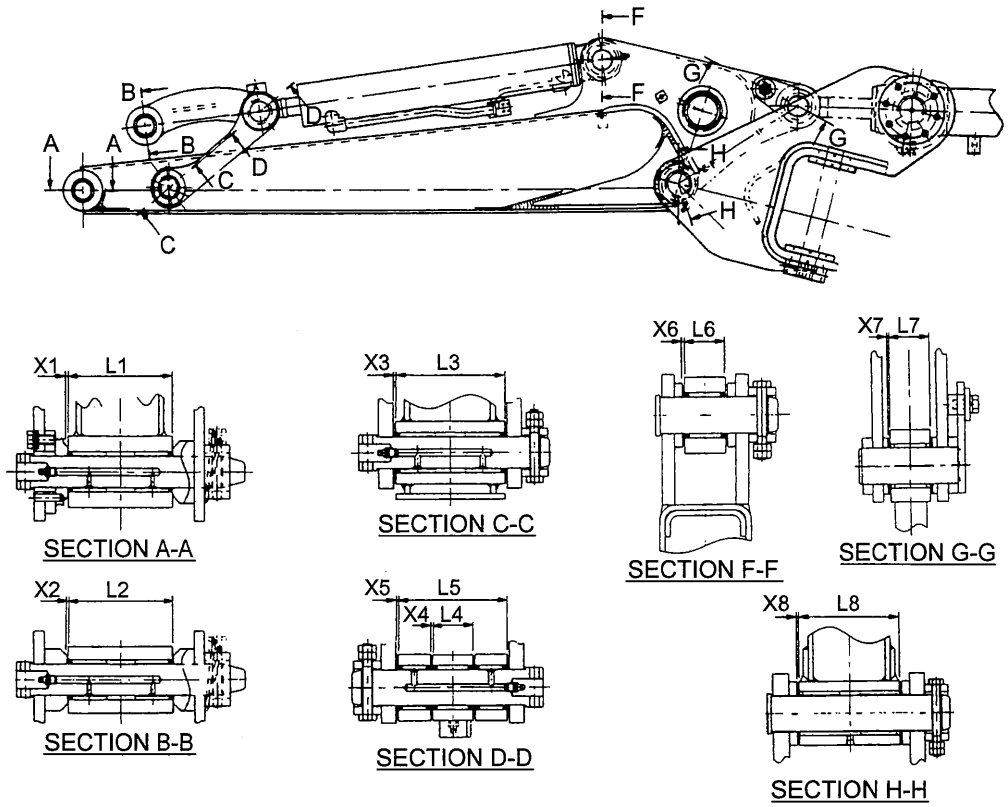
SK75UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Boom foot pin	Ø 60	−0.06 −0.09	+0.07 +0.01	0.07~0.16	More than 1.2	2.0	Replace bushing or pin
B	Front boom attaching pin	Ø 55		+0.10 +0.01	0.07~0.19			
C	Upper boom attaching pin							
D	Offset cylinder rod side pin			+0.11 +0.01	0.07~0.20			
E	Offset cylinder head side pin							
F	Arm cylinder attaching pin	Ø 65		+0.25 +0.01	0.11~0.34			
G	Boom cylinder rod side pin			+0.14 0	0.06~0.23			
H	Boom cylinder head side pin			+0.25 +0.05	0.11~0.34			

14-2 CLEARANCE IN THRUST DIRECTION (Arm, Boom)

(1) Clearance in thrust direction around arm and cylinder.



CLEARANCE IN THRUST DIRECTION AROUND ARM AND CYLINDER

SK30UR-2

Unit : mm

Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Arm point pin	Arm	L1	$122^{0}_{-0.2}$	0.3~1.0	More than 1.0		Shim adjustment
		Bucket		$124^{+1.0}_{-0.5}$				
B	Bucket drive pin	Link side	L2	$122^{0}_{-0.2}$	—	—	—	
		Bucket		$124^{-0.2}_{-1.2}$				
C	Idler link pin	Arm	L3	$122^{0}_{-0.2}$	0.1~0.5	More than 1.0	1.5	
		Link side		—				
D	Bucket link (Rod side)	Rod side	L4	$45^{0}_{-0.5}$	0.6~1.0			
		Link side		$50^{\pm0.2}$				
	Bucket link (Idler link connection)	Bucket link	L5	$122^{0}_{-0.2}$				
		Idler link		—				
F	Bucket cylinder head side pin	Bottom side	L6	$45^{0}_{-0.5}$	0.6~2.0	More than 2.0	3.0	
		Arm		$52^{+2.0}_{0}$				
G	Arm cylinder rod side pin	Rod side	L7	$50^{0}_{-0.5}$	0.6~1.0	More than 1.0	1.5	
		Arm		$56^{\pm1.0}$				
H	Upper boom top pin	Arm	L8	$130^{0}_{-0.2}$	0.1~0.5			
		Upper frame		$135^{+0.2}_{0}$				

SK50UR-2

Unit : mm

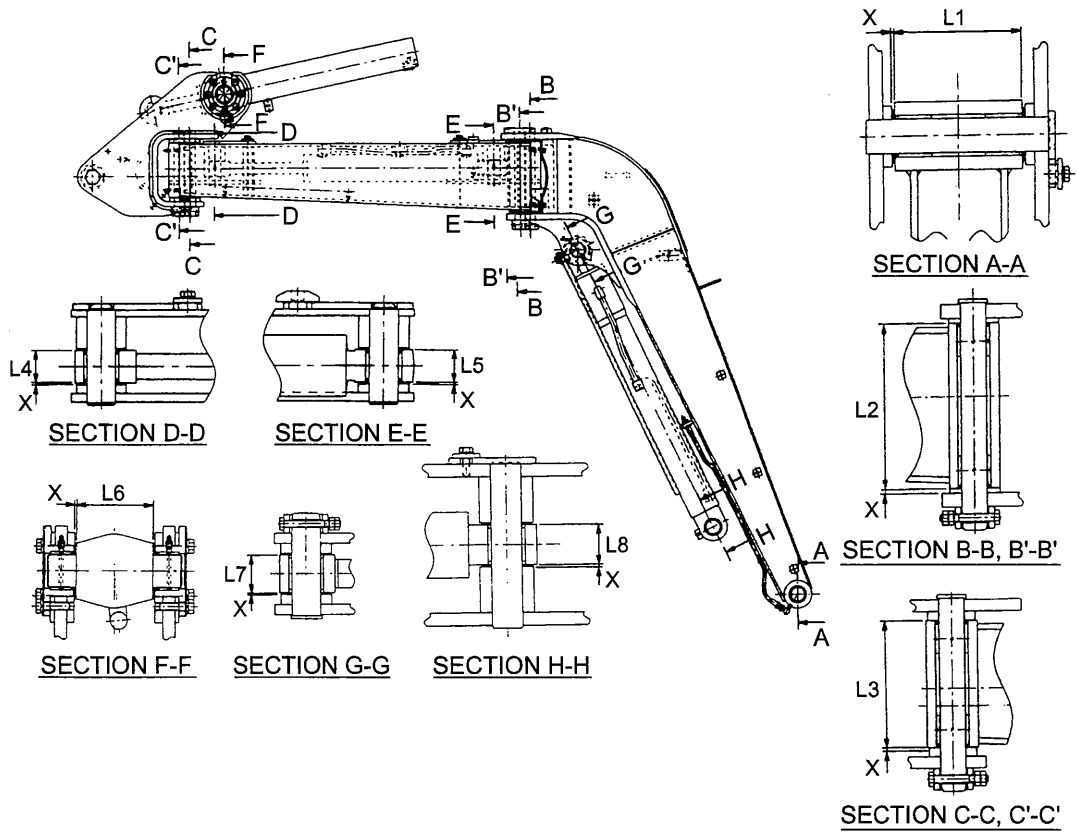
Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Arm point pin	Arm	L1	$150^{0}_{-0.2}$	Less than 1.0	1.5	2.0	Shim adjustment
		Bucket		$152^{+0.2}_{-1.2}$				
B	Bucket drive pin	Link side	L2	$150^{\pm 0.6}$				
		Bucket		$152^{+0.2}_{-1.2}$				
C	Idler link pin	Arm	L3	$150^{0}_{-0.2}$	Less than 0.6			
		Link side		—				
D	Bucket link	Rod side	L4	$60^{0}_{-0.5}$	0.6~1.0			
		Link side		$65^{+1.0}_{-1.2}$				
F	Bucket cylinder head side pin	Bottom side	L5	$60^{0}_{-0.5}$	0.6~2.0	2.5	3.0	
		Arm		$66^{\pm 1}$				
G	Arm cylinder rod side pin	Rod side	L6	$85^{0}_{-0.5}$				
		Arm		$90^{+1.0}_{0}$				
H	Upper boom top pin	Arm	L7	$170^{0}_{-0.2}$	Less than 0.6	1.5	2.0	
		Upper frame		$175^{0}_{-0.2}$				

SK75UR-2

Unit : mm

Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Arm point pin	Arm	L1	$180^{+0.6}_{-0.8}$	Less than 1.0	More than 1.2	2.0	Shim adjustment
		Bucket		$182^{+0.2}_{-1.2}$				
B	Bucket drive pin	Link side	L2	$180^{\pm 0.6}$	—	—	—	
		Bucket		$182^{+0.2}_{-0.2}$				
C	Idler link pin	Arm	L3	$180^{0}_{-0.2}$	Less than 0.5	More than 1.0	2.0	
		Link side		—				
D	Bucket link	Rod side	L4	$175^{0}_{-1.5}$	0.6~1.0	More than 1.2		
		Link side		—				
F	Bucket cylinder head side pin	Bottom side	L5	$85^{0}_{-0.5}$	0.6~2.0	More than 2.0		
		Arm		90^{+2}_{0}				
G	Arm cylinder rod side pin	Rod side	L6	$95^{0}_{-0.5}$	0.6~2.0	More than 2.0	2.5	
		Arm		$100^{+0.5}_{0}$				
H	Upper boom top pin	Arm	L7	$210^{0}_{-0.2}$	Less than 0.6	More than 1.0	2.0	
		Upper frame		$215^{+0.5}_{0}$				

(2) Clearance in thrust direction around boom and cylinder.



CLEARANCE IN THRUST DIRECTION AROUND BOOM AND CYLINDER

SK30UR-2

Unit : mm

Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Boom foot pin	Rear boom	L1	$170^{0}_{-0.2}$	8.0~10.2	More than 1.0	1.5	Shim adjustment
		Upper frame		178^{+2}_{0}				
B,B'	Front boom attaching pin	Front boom (LH)	L2	$224^{0}_{-0.2}$	2.3~2.7			
		Rear boom		$226^{+0.5}_{+0.3}$				
C,C'	Upper boom attaching pin	Front boom (LH)	L3	$174^{0}_{-0.2}$	2.3~2.7			
		Upper boom		$176^{+0.5}_{+0.3}$				
D	Offset cylinder rod side pin	Rod side	L4	$45^{0}_{-0.5}$	5.0~7.5	More than 2.0	3.0	
		Front boom (LH)		50^{+2}_{0}				
E	Offset cylinder head side pin	Head side	L5	$45^{0}_{-0.5}$	5.0~7.5			
		Front boom (RH)		50^{+2}_{0}				
F	Arm cylinder attaching pin	Head side	L6	$120^{0}_{-0.5}$	5.5~8.0			
		Upper boom		$126.5^{\pm1}$				
G	Boom cylinder rod side pin	Rod side	L7	$60^{0}_{-0.5}$	5.0~7.5			
		Rear boom		65^{+2}_{0}				
H	Boom cylinder head side pin	Head side	L8	$60^{0}_{-0.5}$	5.0~7.5	More than 1.0	1.5	
		Upper frame		65^{+2}_{0}				

SK50UR-2

Unit : mm

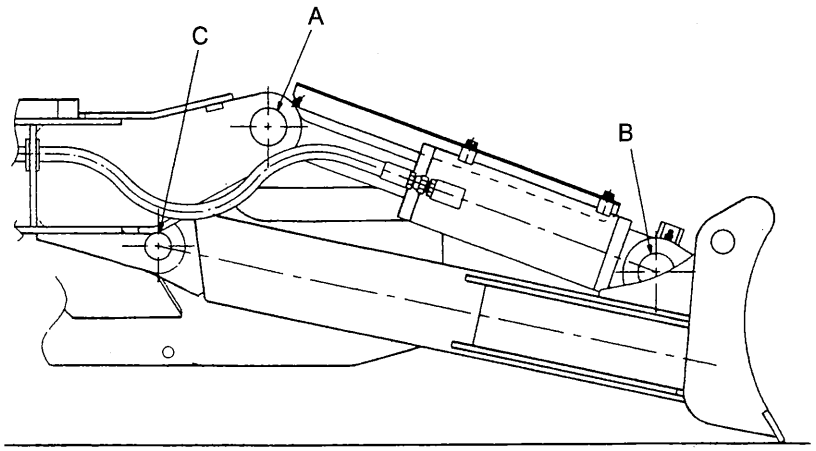
Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Boom foot pin	Rear boom	L1	$250^{\pm0.8}$	Less than 0.6	1.5	2.0	Shim adjustment
		Upper frame		255^{+2}_{0}				
B,B'	Front boom attaching pin	Front boom (LH)	L2	$296^{0}_{-0.2}$				
		Rear boom		$298^{+0.5}_{+0.2}$				
C,C'	Upper boom attaching pin	Front boom (LH)	L3	$246^{0}_{-0.2}$				
		Upper boom		$248^{+0.5}_{+0.2}$				
D	Offset cylinder rod side pin	Rod side	L4	90^{+2}_{0}	0.6~2.0	2.5	3.0	
		Front boom (LH)		$85^{0}_{-0.5}$				
E	Offset cylinder head side pin	Head side	L5	$85^{0}_{-0.5}$				
		Front boom (RH)		90^{+2}_{0}				
F	Arm cylinder attaching pin	Head side	L6	$240^{0}_{-0.5}$				
		Upper boom		$245^{+0.5}_{0}$				
G	Boom cylinder rod side pin	Rod side	L7	$85^{0}_{-0.5}$				
		Rear boom		90^{+2}_{0}				
H	Boom cylinder head side pin	Head side	L8	$90^{0}_{-0.5}$				
		Upper frame		95^{+2}_{0}				

SK75UR-2

Unit : mm

Symbol	Item		Basic size		Shim adjusting clearance X (Total of both sides)			Remedy
			Code	Dimension	Standard value	Repairable level	Service limit	
A	Boom foot pin	Rear boom	L1	$360^{0}_{-0.2}$	Less than 0.5	More than 1.2	2.0	Shim adjustment
		Upper frame		365^{+2}_{0}				
B,B'	Front boom attaching pin	Front boom (LH)	L2	$353^{0}_{-0.2}$				
		Rear boom		354^{+2}_{0}				
C,C'	Upper boom attaching pin	Front boom (LH)	L3	$303^{0}_{-0.2}$				
		Upper boom		304^{+2}_{0}				
D	Offset cylinder rod side pin	Rod side	L4	$95^{0}_{-1.5}$	0.6~2.0	More than 2.0	2.5	
		Front boom (LH)		100^{+2}_{0}				
E	Offset cylinder head side pin	Head side	L5	$95^{0}_{-1.5}$	0.6~1.0	More than 1.2	2.0	
		Front boom (RH)		100^{+2}_{0}				
F	Arm cylinder attaching pin	Head side	L6	$280^{0}_{-0.5}$				
		Upper boom		$285^{+0.5}_{0}$				
G	Boom cylinder rod side pin	Rod side	L7	$95^{0}_{-0.5}$	0.6~2.0	More than 2.0	2.5	
		Rear boom		100^{+2}_{0}				
H	Boom cylinder head side pin	Head side	L8	$95^{0}_{-0.5}$	0.6~1.0	More than 1.2	2.0	
		Upper frame		100^{+2}_{0}				

14-3 CLEARANCE BETWEEN PIN AND BUSHING (Dozer)



CLEARANCE BETWEEN PIN AND BUSHING (Dozer)

SK30UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Dozer cylinder (Rod side)	Ø 55	−0.06 −0.09	+0.10 −0.03	0.03~0.19	More than 0.8	1.2	Replace bushing or pin
B	Dozer cylinder (Head side)							
C	Dozer foot	Ø 40		±0.05	0.01~0.14			

SK50UR-2

Unit : mm

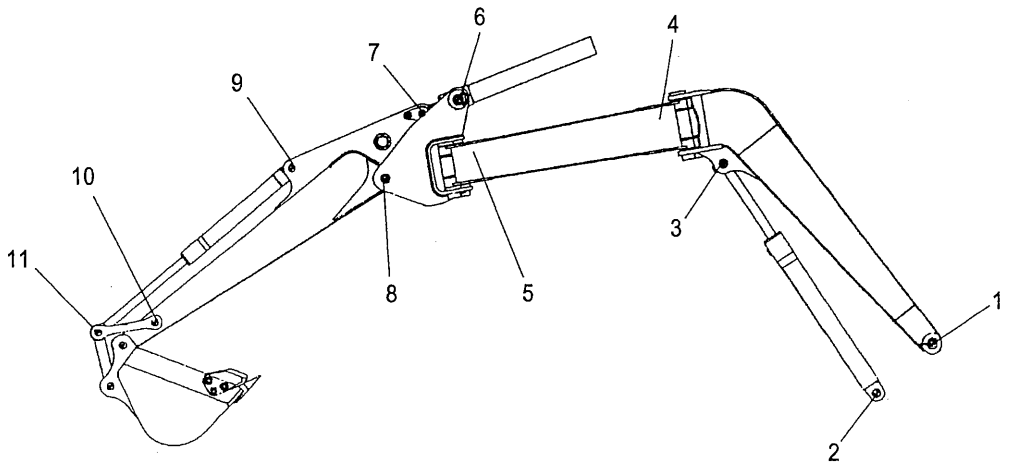
Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Dozer cylinder (Rod side)	Ø 55	−0.150 −0.210	+0.050 +0.180	0.200~0.390	1.5	2.0	Replace bushing or pin
B	Dozer cylinder (Head side)							
C	Dozer foot	Ø 40		+0.058 +0.117	0.208~0.327			

SK75UR-2

Unit : mm

Symbol	Item	Standard value				Clearance		Remedy
		Pin dia.	Pin dia. tolerance	Bushing I.d. tolerance	Clearance	Repairable level	Service limit	
A	Dozer cylinder (Rod side)	Ø 45	−0.15 −0.21	+0.09 0	0.15~0.30	More than 1.2	2.0	Replace bushing or pin
B	Dozer cylinder (Head side)							
C	Dozer foot	Ø 40		+0.18 +0.05	0.20~0.39			

14-4 PLASTIC SHIM LIST



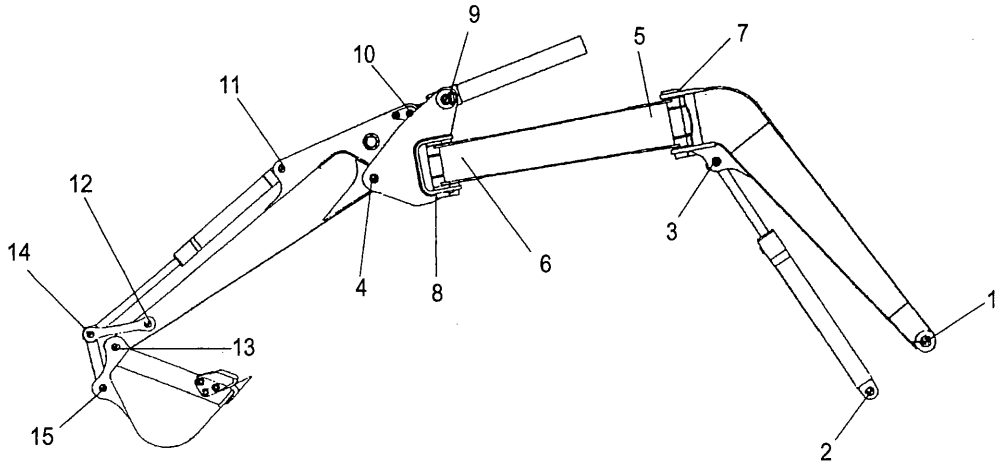
Note : The numbers of shim for item 11 are 4 pieces but the others are 2 pieces.

Unit : mm

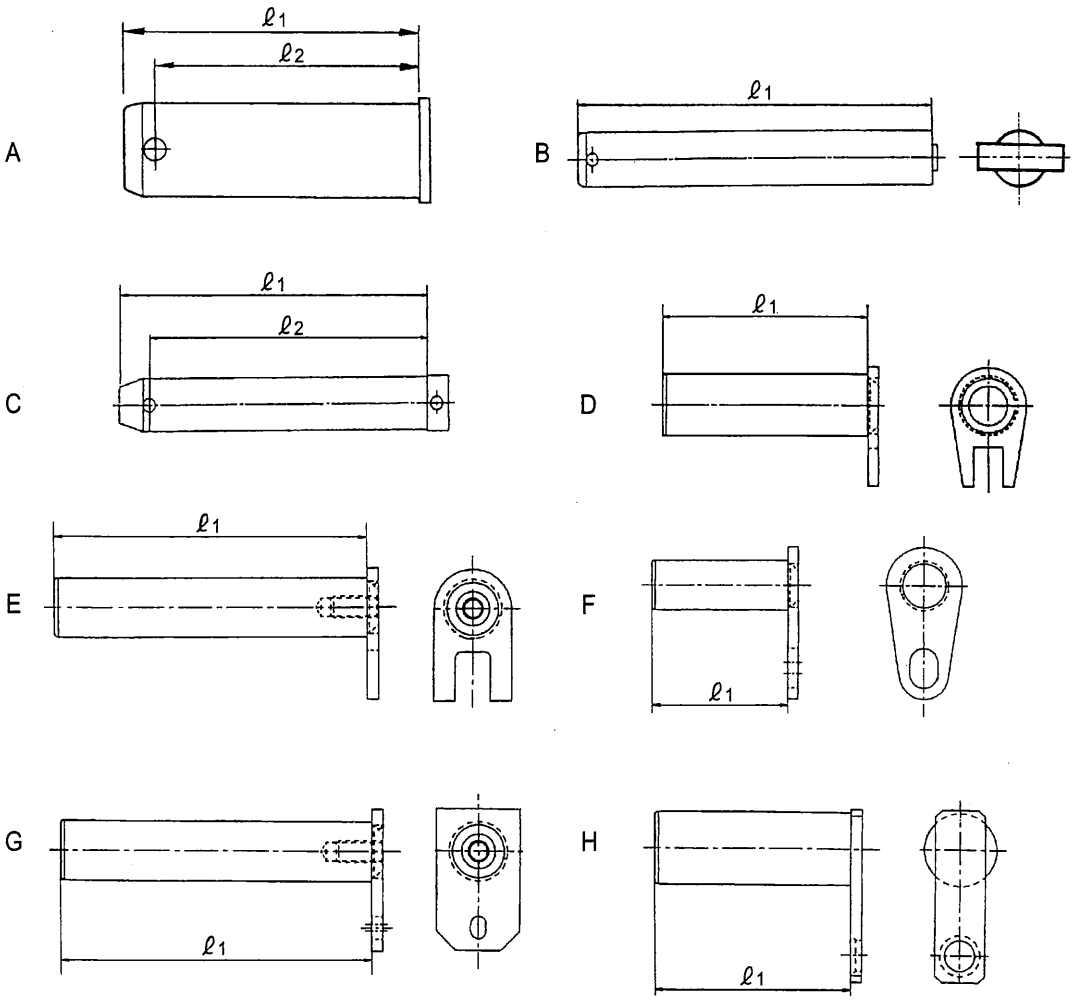
	SK30UR-2		SK50UR-2		SK75UR-2	
	P. NO	I.D X O.D X Thickness	P. NO	I.D X O.D X Thickness	P. NO	I.D X O.D X Thickness
1	PY12B01011P1	47 X 70 X 2	YR02B01265P1	62 X 130 X 2	YR02B01265P1	62 X 130 X 2
2	PY12B01011P1	47 X 70 X 2	YJ02B01112P1	57 X 100 X 2	YR02B01046P1	67 X 110 X 2
3	↑	↑	↑	↑	↑	↑
4	PR12B01018P1	42 X 65 X 2	YR12B01029P1	57 X 90 X 2	YR12B01029P1	57 X 90 X 2
5	↑	↑	↑	↑	↑	↑
6	PR02B01110P1	52 X 90 X 2	YJ02B01112P1	57 X 100 X 2	YR02B01262P1	72 X 120 X 2
7	PY12B01011P1	47 X 70 X 2	PY02B01001P1	52 X 80 X 2	PY02B01028P1	62 X 110 X 2
8	↑	↑	YJ12B01045P1	57 X 110 X 2	↑	↑
9	PR12B01018P1	42 X 65 X 2	PY12B01011P1	47 X 70 X 2	YR12B01028P1	52 X 90 X 2
10	PR12B01017P1	37 X 60 X 2	↑	↑	↑	↑
11	PR12B01018P1	42 X 65 X 2	↑	↑	↑	↑

14-5 PINS AND BUSHINGS

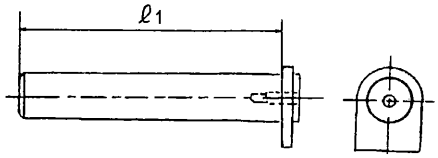
(1) Pins and bushings



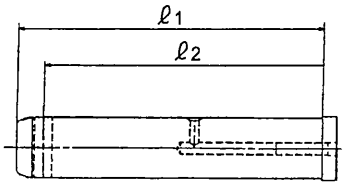
Pin



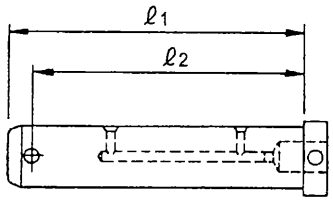
I



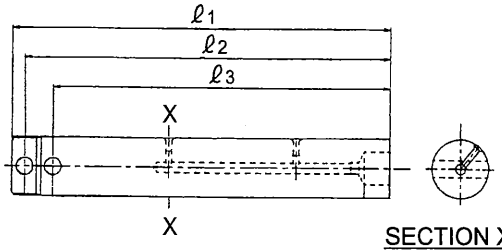
J



K

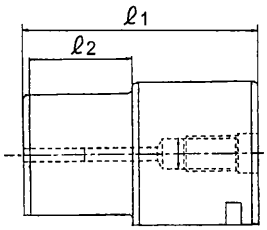


L

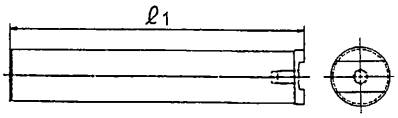


SECTION X-X

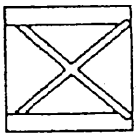
M



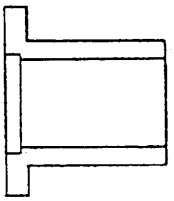
N



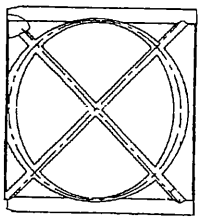
Bushing



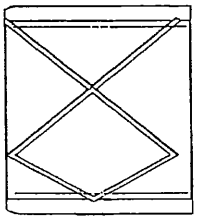
TYPE A



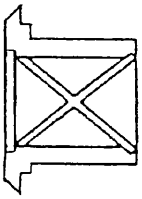
TYPE B



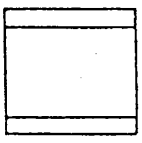
TYPE C



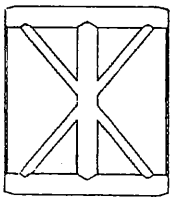
TYPE D



TYPE E



TYPE F



TYPE G

(2) Dimensions of pins and bushings.

SK30UR-2

Unit : mm

Item / No.	Pin				Bushing		Remarks
	Dia.	ℓ1	ℓ2	Type	I.D X O.D X Length	Type	
1	45	244	—	E	45 x 55 x 45	A	Dust seal
2	45	244	—	G			
3	45	163	146	A			
4	45	222	205	A	45 x 55 x 45	A	Dust seal
5	40	131	—	D			
6	40	131	—	D			
7	35	309	292	A	35 x 45 x 55	A	Dust seal
8	35	265	248	A	35 x 45 x 55	A	Dust seal
9	—	—	—	—	50 x 60 x 32	F	Dust seal
10	45	124	—	F			
11	40	132	115	A			
12	35	192	175	K	35 x 45 x 40	A	Dust seal
13	35	253	221	K	35 x 45 x 40	G	Dust seal
14	40	192	175	K	40 x 50 x 27	G	Dust seal
15	35	253	221	K	35 x 45 x 40	G	Dust seal
Bucket					35 x 45 x 43	B	

SK50UR-2

Unit : mm

Item / No.	Pin					Bushing		Remarks
	Dia.	ℓ1	ℓ2	ℓ3	Type	I.D X O.D X Length	Type	
1	60	351	—	—	I	60 X 70 X 65	C	Dust seal
2	55	185	168	—	C			
3	55	200	183	—	A			
4	55	323	306	—	A	55 X 65 X 55	A	Dust seal
5	55	151	—	—	H			
6	55	151	—	—	H			
7	50	399	382	—	A	50 X 60 X 50	A	Dust seal
8	50	357	340	—	A	50 X 60 X 50	A	Dust seal
9	55	110	49	—	M			
10	50	147	—	—	F			
11	45	151	135	—	A			
12	45	221	204	—	C	45 X 55 X 45	G	Dust seal
13	45	290	280	258	L	45 X 55 X 45	G	Dust seal
14	45	221	204	—	C	45 X 55 X 33.5	G	Dust seal
15	45	290	280	258	L	45 X 55 X 45	G	Dust seal
Bucket						45 X 60 X 46	B	

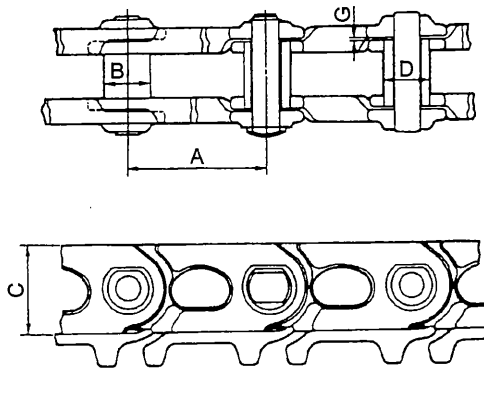
SK75UR-2

Unit : mm

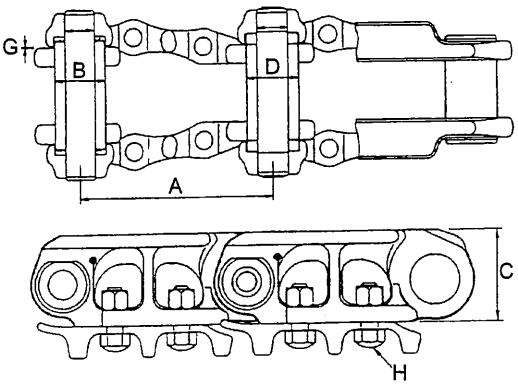
Item / No.	Pin				Bushing		Remarks
	Dia.	ℓ_1	ℓ_2	Type	I.D X O.D X Length	Type	
1	60	486	—	N	80 X 70 X 65	D	Dust seal
2	65	175	—	D			
3	65	222	205	A			
4	60	379	362	A	60 X 70 X 55	A	Dust seal
5	55	163	—	D			
6	55	163	—	D			
7	55	472	455	A	55 X 65 X 55	F	Dust seal
8	55	404	387	B	55 X 65 X 55	F	Dust seal
9	65	128	69	M			
10	60	176	—	F			
11	50	180	163	A			
12	50	274	257	K	50 X 60 X 50	F	Dust seal
13	50	333	301	C	50 X 65 X 57	E	Dust seal
14	50	274	257	K	50 X 60 X 36	F	Dust seal
15	50	333	301	C	50 X 65 X 47	A	Dust seal
Bucket					50 X 65 X 48	B	

14-6 UNDERCARRIAGE

MAINTENANCE STANDARD OF TRACK LINK



SK30UR-2

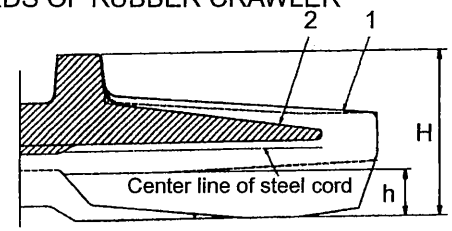


SK50UR-2, SK75UR-2

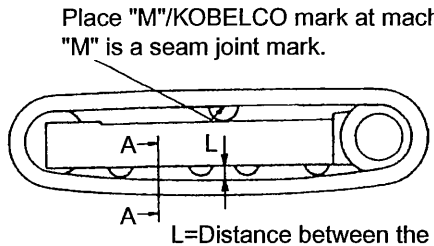
Unit : mm

Model				SK30UR-2	SK50UR-2	SK75UR-2	Remedy
A	Link pitch	Standard values		101.6	135	155.6	Replace
		Repairable level		103.6	139	160	
		Service limit		104.5	140	164	
B	O.D of bushing	Standard values		Ø 32.20 $^{0}_{-0.04}$	Ø 35.02 $^{+0.03}$	Ø 41 $^{+0.214}_{+0.174}$	
		Repairable level		Ø 30.5	Ø 32	Ø 37	
		Service limit		Ø 29.5	Ø 31	Ø 36	
C	Height of link	Standard values		61 $^{+0.3}_{0}$	65	75	Replace
		Repairable level		57	61	69	
		Service limit		55.5	60	67	
D	Interference between bushing and link	Basic dimension		Ø 32	Ø 35.02	Ø 41	Replace
		Tolerance	Shaft	$^{+0.2}_{+0.16}$	$^{+0.03}_{0}$	$^{+0.214}_{+0.174}$	
			Hole	$^{+0.05}_{0}$			
		Repairable level (Interference)		0.1	0.05	0.05	
		Service limit (Interference)		0	0	0	
E	Interference between track and link	Basic dimension		Ø 19	Ø 22.03	Ø 44	Replace
		Tolerance	Shaft	$^{+0.21}_{+0.17}$	$^{+0.03}_{0}$	±0.04	
			Hole	$^{+0.05}_{0}$			
		Repairable level (Interference)		0.1	0.05	0.05	
		Service limit (Interference)		0	0	0	
F	Interference between master pin and links	Basic dimension		Ø 19	Ø 21.88	Ø 24	
		Tolerance	Shaft	$^{+0.2}_{+0.1}$	-0.03	$^{-0.05}_{-0.08}$	
			Hole	$^{+0.05}_{0}$			
		Repairable level (Interference)		0.05	0.05	0.05	
		Service limit (Interference)		0	0	0	
G	Clearance between links (both sides)	Standard values (Both sides)		1.2	1.0	—	Replace
		Repairable level (Both sides)		6	8	8	
		Service limit (Both sides)		7	10	10	
H	Tightening torque of shoe bolt (kgf·m)			—	22±3	30±3	Retighten

MAINTENANCE STANDARDS OF RUBBER CRAWLER



SECTION A-A

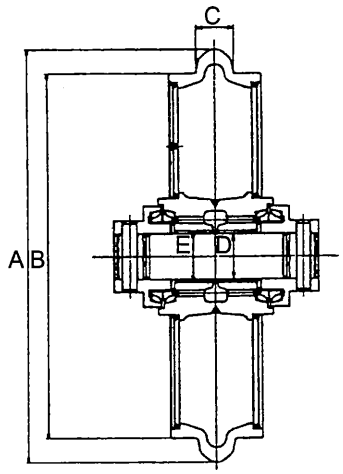


L=Distance between the bottom of frame and top of rubber crawler

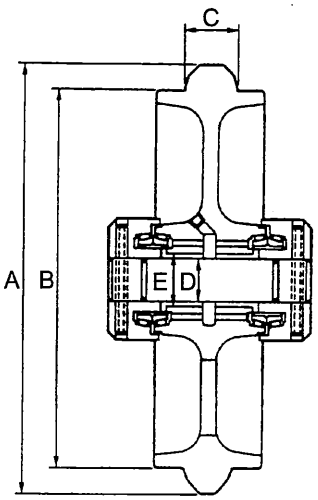
Unit : mm

Item	Model	SK30UR-2	SK50UR-2	SK75UR-2	Remedy
Sag of rubber crawler L	Standard values	68~78	70~85	130~145	Adjustment
	Repairable level	—	—	160	
	Service limit	—	—	170	
Cracks and cuts on rubber crawler	Standard values	None	←	←	Replace
	Repairable level	Where the depth of them does not reach to the steel cord	←	←	
	Service limit	Where the depth of them reaches to the steel cord	←	←	
Breakage of steel cords	Standard values	None	←	←	Replace
	Repairable level	None	←	←	
	Service limit	Exist	←	←	
Contact surface of rubber crawler and lower roller	Standard values	None	←	←	Replace
	Repairable level	Where 10 percent of core(2) is visible from outside	←	←	
	Service limit	Where a half of core is visible from outside	←	←	
Height H (Lug projection h)	Standard values	85 (25)	98 (24)	107 (31)	Replace
	Repairable level	65 (5)	84 (10)	82 (6)	
	Service limit	60 (0)	78 (5)	76 (0)	

MAINTENANCE STANDARDS OF FRONT IDLER

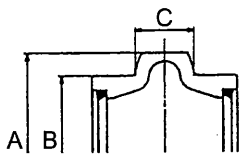


(a)



(b)

● Iron crawler spec.



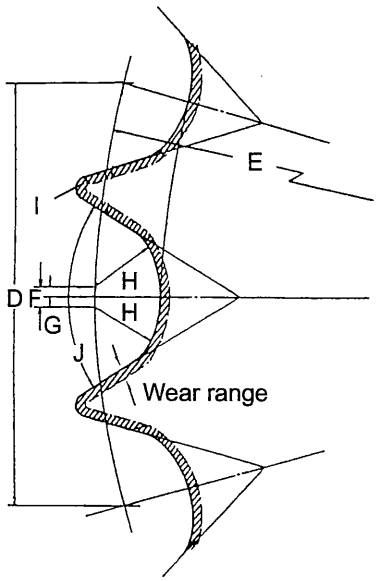
(c)

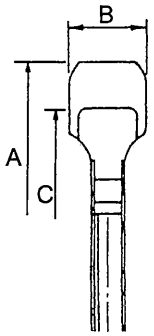
Unit : mm

Symbol	Item \ Model	SK30UR-2	SK50UR-2	SK75UR-2	Remedy
A	Standard values	Ø 347	Ø 364	Ø 453(Ø 432)	Repair by build-up welding or replace
	Repairable level	—	—	—(—)	
	Service limit	—	—	—(—)	
B	Standard values	Ø 305	Ø 320	Ø 400	
	Repairable level	Ø 301	Ø 312	Ø 394	
	Service limit	Ø 299	Ø 310	Ø 392	
C	Standard values	40	40	104	
	Repairable level	36	36	98	
	Service limit	34	34	96	
D	Basic dimensions	$Ø\ 35_{-0.03}^{0}$	$Ø\ 45_{-0.089}^{-0.050}$	$Ø\ 50_{-0.075}^{-0.050}$	Replace of bushing
	Repairable level (Clearance)	0.5	1.5	1.5	
	Service limit (Clearance)	0.8	2.0	2.0	
E	Basic dimensions	$Ø\ 42_{0}^{+0.025}$	$Ø\ 49_{+0.030}^{+0.020}$	$Ø\ 57_{-0.02}^{+0.03}$	
	Repairable level (Interference)	0.01	0	0	
	Service limit (Clearance)	0	0.01	0.01	
	Reference drawing	(b)	(a)	(a) (c)	

Note: The values in ( ) show the value for iron crawler.

MAINTENANCE STANDARDS OF SPROCKET

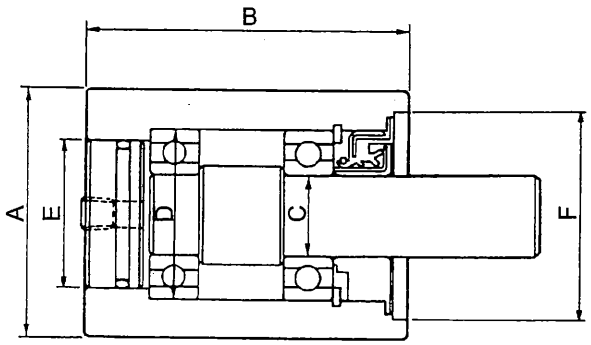




Unit : mm

Symbol			SK30UR-2	SK50UR-2	SK75UR-2	Remedy
A	O.D of sprocket	Standard values	Ø 385.6	Ø 435.8	Ø 540^{+2}_{0}	Repair by build-up welding or replace
		Repairable level	Ø 380	Ø 430	Ø 534	
		Service limit	Ø 378	Ø 428	Ø 532	
B	Width of sprocket teeth	Standard values	36	32^{0}_{-1}	$38^{+0.5}_{-2.5}$	Replace
		Repairable level	30	28	32	
		Service limit	28	26	30	
C	I.D of sprocket bottom	Standard values	—	Ø 380.4	Ø 487	Repair by build-up welding or replace
		Repairable level	—	Ø 374	Ø 481	
		Service limit	—	Ø 372	Ø 479	
	Sprocket teeth wear	Service limit	4	—	—	Replace
D	Standard values	Link pitch	101.6	135	156	
		Number of teeth	23	19	21	
E		P.C.D.	376.6	415.8	527.9	
		Diameter of roller	—	Ø 35.4	Ø 41	
F		Tooth profile	—	7	8	
G			—	3.5	4	
H			R41.7	R17.7	R20.6	
I			R4.5	R6	R10	
J			—	—	62°	

MAINTENANCE STANDARDS OF UPPER ROLLER

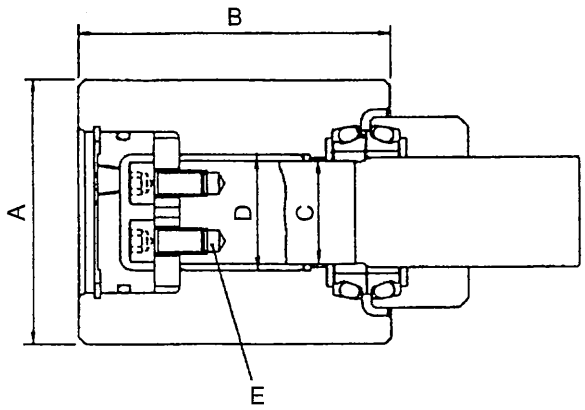


Unit : mm

Symbol	Item \ Model	SK30UR-2	Remedy
A	Standard values	Ø 75±0.5	Replace
	Repairable level	Ø 71	
	Service limit	Ø 69	
B	Standard values	98	
	Repairable level	—	
	Service limit	—	
C	Basic dimension	Ø 25	Replace shaft or bearing
	Interference	0.008~0.031	
	Repairable level (Interference)	0.008	
	Service limit (Interference)	—	
D	Basic dimension	Ø 52	Replace roller or bearing
	Interference	0.004~0.039	
	Repairable level (Interference)	0.004	
	Service limit (Interference)	—	
E	Basic dimension	Ø 45	Replace cover
	Interference	0.010~0.050	
	Repairable level (Interference)	0.010	
	Service limit (Interference)	—	
F	Basic dimension	Ø 63	
	Interference	0.074~0.140	
	Repairable level (Interference)	0.074	
	Service limit (Interference)	—	

A: Tread dia.
B: Tread width
C: Interference between shaft and bearing
D: Interference between roller and bearing
E: Interference between roller and cover
F: Interference between roller and cover

MAINTENANCE STANDARDS OF UPPER ROLLER

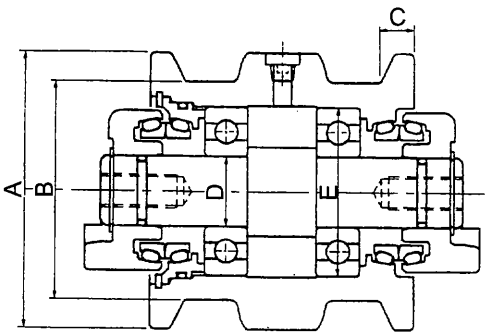


Unit : mm

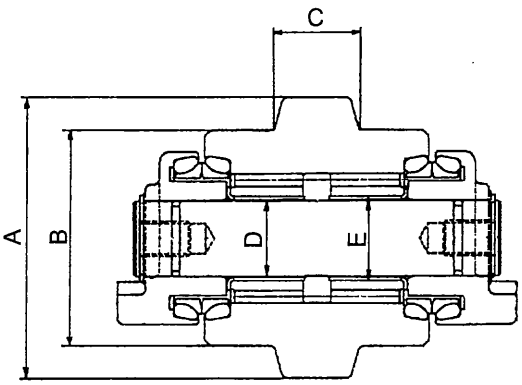
Symbol	Item \ Model	SK50UR-2	SK75UR-2	Remedy
A	Standard values	Ø 82	←	Replace
	Repairable level	Ø 73	←	
	Service limit	Ø 70	←	
B	Standard values	102	←	
	Repairable level	95	←	
	Service limit	92	←	
C	Basic dimension	Ø 32 $^{-0.060}_{-0.090}$	←	Replace bushing
	Repairable level (Clearance)	0.7	←	
	Service limit (Clearance)	1.0	←	
D	Basic dimension	Ø 36 $^{0}_{-0.03}$	←	
	Repairable level (Interference)	0	←	
	Service limit (Clearance)	0.01	←	
E	Tightening torque (kgf-m)	3.4±0.35	←	Apply Loctite #242

A: Tread dia.
B: Tread width
C: Clearance between shaft and bushing
D: Interference between roller and bushing

MAINTENANCE STANDARDS OF LOWER ROLLER



SK30UR-2



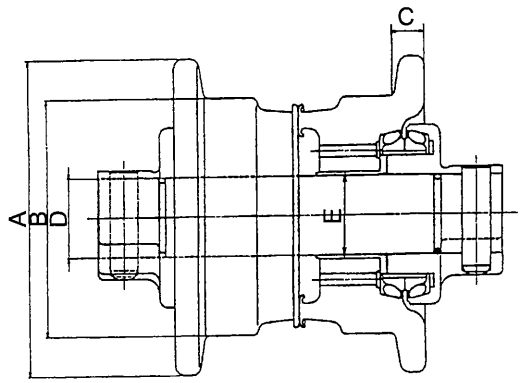
SK50UR-2

Unit : mm

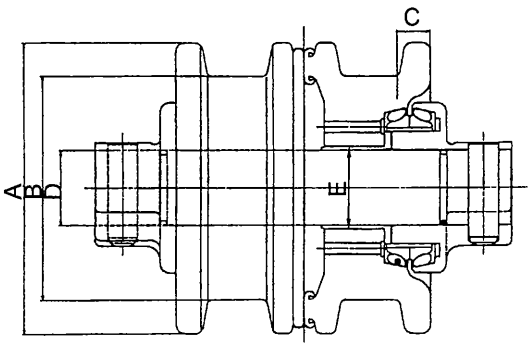
Symbol	Item \ Model	SK50UR-2	SK75UR-2	Remedy
A	Standard values	Ø 118	Ø 130	Repair by build-up welding or replace
	Repairable level	—	—	
	Service limit	—	—	
B	Standard values	Ø 93	Ø 100	
	Repairable level	Ø 87	Ø 94	
	Service limit	Ø 83	Ø 92	
C	Basic dimension	14.5	40	Replace bushing (SK50UR-2) Replace roller or bearing (SK30UR-2)
	Repairable level	—	36	
	Service limit	—	34	
D	Basic dimension	Ø 30 $^{+0.021}_{+0.008}$	Ø 35 $^{0}_{-0.025}$	
	Repairable level	(Interference) 0.008	0.7	
	Service limit	—	1.0	
E	Basic dimension	Ø 72 $^{-0.009}_{-0.033}$	Ø 39 $^{+0.025}_{0}$	
	Repairable level (Interference)	0.004	0	
	Service limit (Clearance)	—	0.01	
Engine oil API grade CD #30		Gear oil SAE #90 API class CL-4 70cc	70cc	Replenish

A: O.D. of flange
B: Tread dia.
C: Flange width
D: Clearance between shaft and bushing (Roll bushing) [SK50UR-2]
E: Interference between roller and bearing [SK30UR-2, SK50UR-2]

MAINTENANCE STANDARDS OF LOWER ROLLER



TYPE S



TYPE W

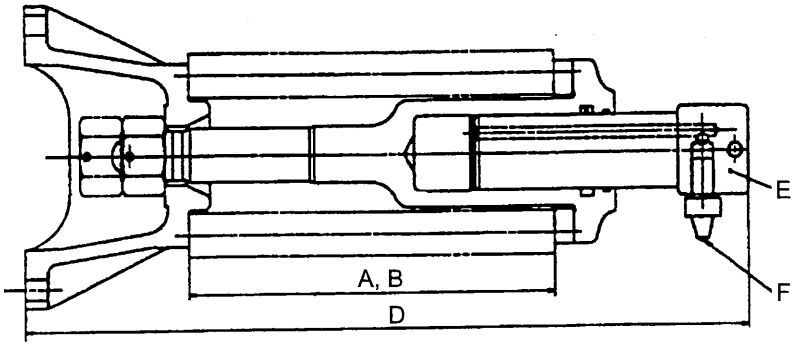
Unit : mm

Symbol	Item \ Model	TYPE S	TYPE W	Remedy
A	Standard values	Ø 160 (Ø 147)	Ø 130	Repair by build-up welding or replace
	Repairable level	Ø 144 (Ø 130)	Ø 140	
	Service limit	Ø 138 (Ø 125)	Ø 134	
B	Standard values	Ø 120 (Ø 120)	←	
	Repairable level	Ø 110 (Ø 110)	←	
	Service limit	Ø 106 (Ø 106)	←	
C	Basic dimension	18	←	
	Repairable level	12	←	
	Service limit	10	←	
D	Basic dimension	$Ø\ 40\ ^{-0.060}_{-0.090}$	←	Replace bushing
	Repairable level	0.7	←	
	Service limit	1.0	←	
E	Basic dimension	$Ø\ 44\ ^{+0.025}_{-0.020}$	←	
	Repairable level (Clearance)	0	←	
	Service limit (Clearance)	0.01	←	
Engine oil API grade CD #30		90cc	160cc	Replenish

Note: The values in ( ) show the value for iron crawler.

A: O.D. of flange
B: Tread dia.
C: Flange width
D: Clearance between shaft and bushing (Roll bushing)
E: Interference between roller and bearing

MAINTENANCE STANDARDS OF TRACK SPRING



Unit : mm

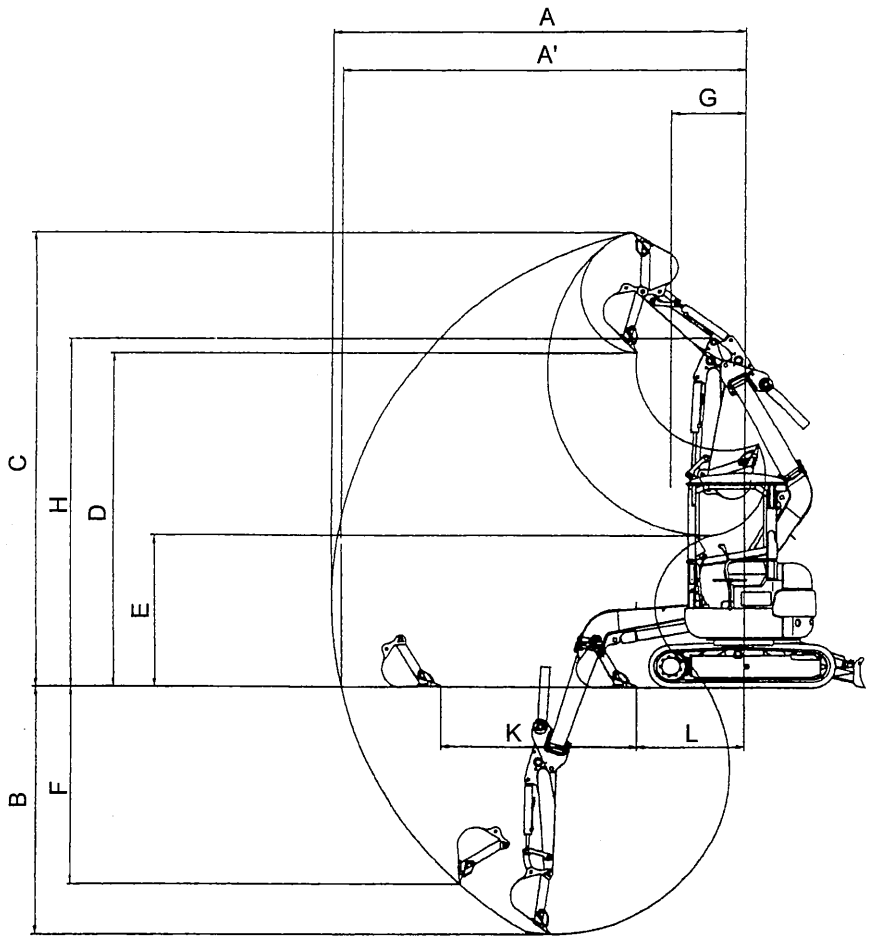
Symbol		SK30UR-2		SK50UR-2		SK75UR-2	
		Rubber	Iron	Rubber	Iron	Rubber	Iron
A	Installed length of spring	212		266	282	257	270
B	Free length of spring	256		336		320	
C	Stroke	23		14	30	22	35
D	Set length	—		—	—	505.5	495
E	Outer circumferences of piston	Nor scoring and rusting		←		←	
F	Tightening torque of grease nipple (kgf·m)	6kgf·m		←		←	

Note: Stroke C = Installed length — Spring compressed length

15. WORKING RANGE

■ BACKHOE ATTACHMENT

1.22M Arm



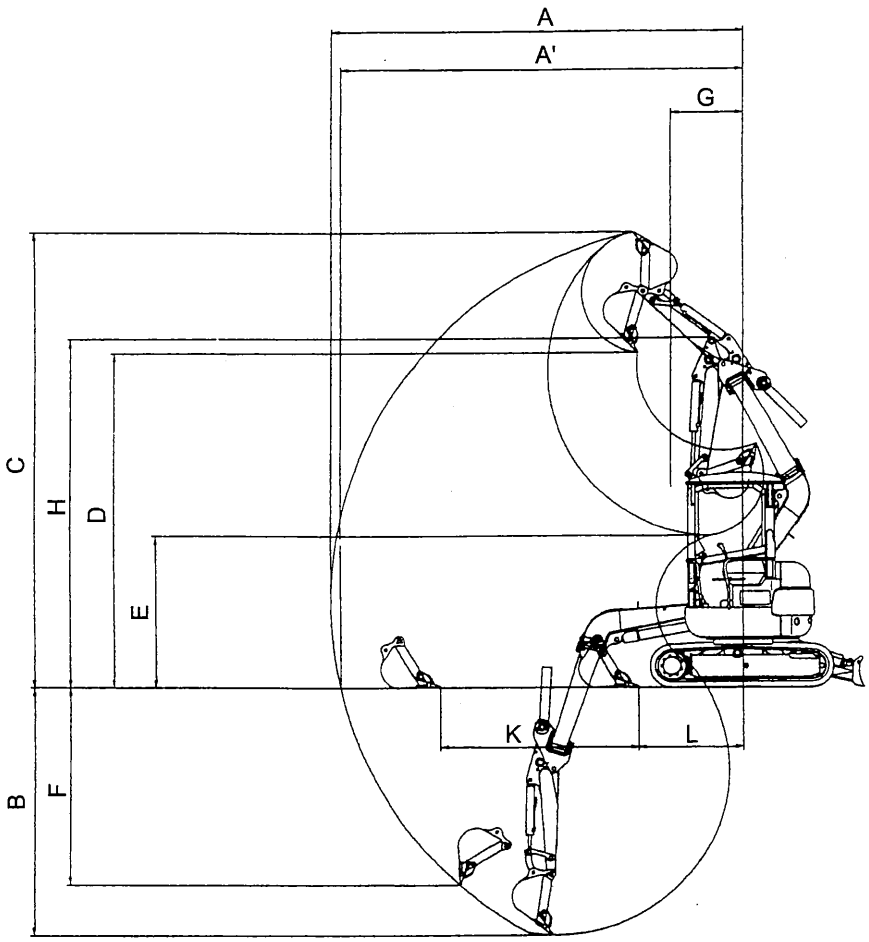
Unit : mm

Item			At neutral	At off-set right (Max. 860mm)	At off-set left (Max. 745mm)
			1.22m Arm +0.068m³ Bucket	1.22m Arm +0.068m³ Bucket	1.22m Arm +0.068m³ Bucket
A	Maximum digging reach		4.47	4.08	4.20
A'	Maximum reach at ground level		4.37	3.97	4.09
*B	Maximum digging depth		2.84	2.45	2.56
*C	Maximum digging height		5.09	4.74	4.84
*D	Maximum dumping clearance		3.72	3.38	3.48
*E	Minimum dumping clearance		1.67	1.33	1.43
*F	Vertical digging depth		2.28	1.90	2.01
G	Minimum swing radius		0.775	1.40	1.05
*H	Height at minimum swing radius		3.87	3.53	3.62
K	Horizontal digging stroke at ground level	Stroke	2.16	2.11	2.13
L		Minimum	1.15	0.81	0.91

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

1.58M Arm



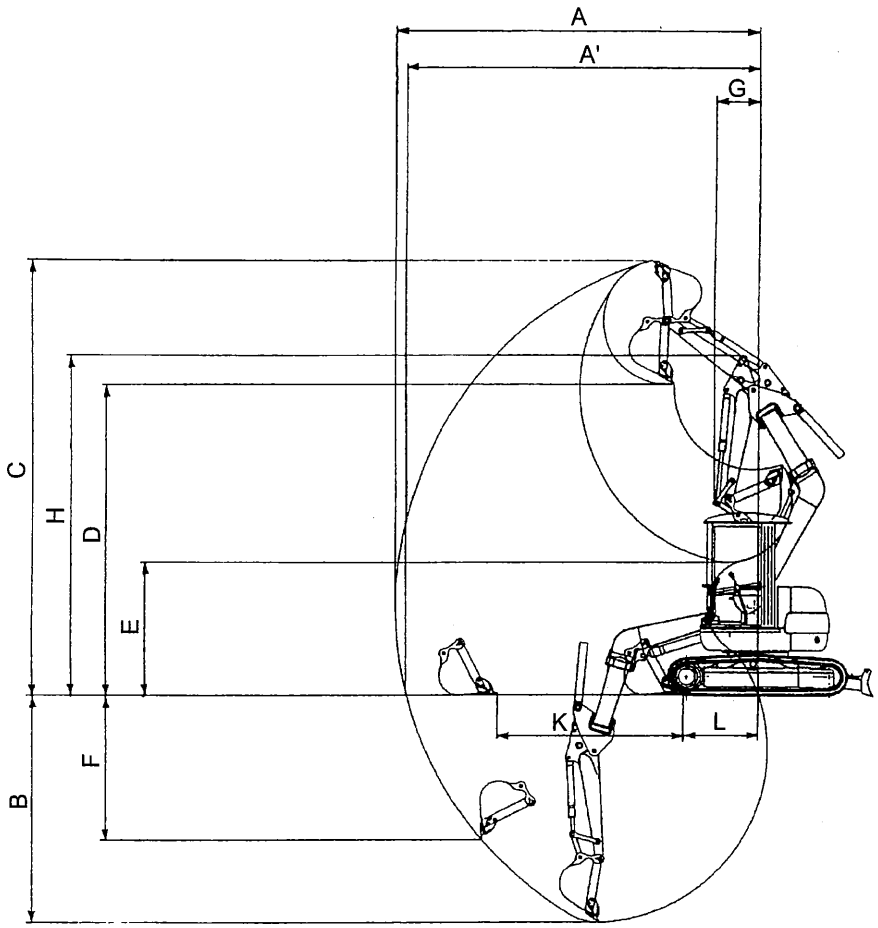
Unit : mm

Item			At neutral	At off-set right (Max. 860mm)	At off-set left (Max. 745mm)
			1.58m Arm +0.055m³ Bucket	1.58m Arm +0.055m³ Bucket	1.58m Arm +0.055m³ Bucket
A	Maximum digging reach		4.86	4.47	4.58
A'	Maximum reach at ground level		4.77	4.38	4.48
*B	Maximum digging depth		4.20	2.81	2.92
*C	Maximum digging height		5.46	5.12	5.21
*D	Maximum dumping clearance		4.10	3.76	3.85
*E	Minimum dumping clearance		1.37	1.02	1.12
*F	Vertical digging depth		2.87	2.47	2.58
G	Minimum swing radius		0.92	1.40	1.05
*H	Height at minimum swing radius		3.87	3.53	3.62
K	Horizontal digging stroke at ground level	Stroke	2.79	2.83	2.82
L		Minimum	0.91	0.48	0.60

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

1.53M Arm



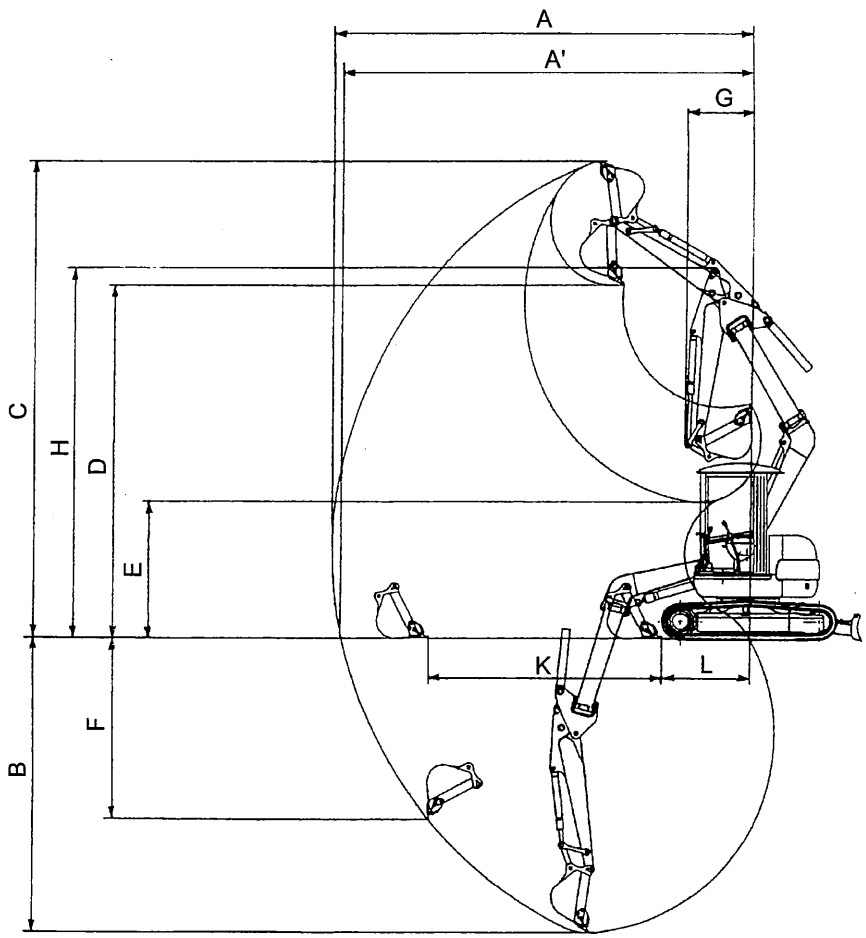
Unit : mm

Item			At neutral	At off-set right (Max. 1,205mm)	At off-set left (Max. 850mm)
			1.53m Arm +0.22m³ Bucket	1.53m Arm +0.22m³ Bucket	1.53m Arm +0.22m³ Bucket
A	Maximum digging reach		5.65	5.06	5.39
A'	Maximum reach at ground level		5.52	4.91	5.25
*B	Maximum digging depth		3.80	3.20	3.53
*C	Maximum digging height		6.53	6.01	6.30
*D	Maximum dumping clearance		4.80	4.28	4.57
*E	Minimum dumping clearance		2.35	1.84	2.12
*F	Vertical digging depth		2.56	2.04	2.33
G	Minimum swing radius		0.98	1.80	1.27
*H	Height at minimum swing radius		5.20	4.69	4.98
K	Horizontal digging stroke at ground level	Stroke	2.63	2.59	2.64
L		Minimum	1.60	1.03	1.33

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

1.91M Arm



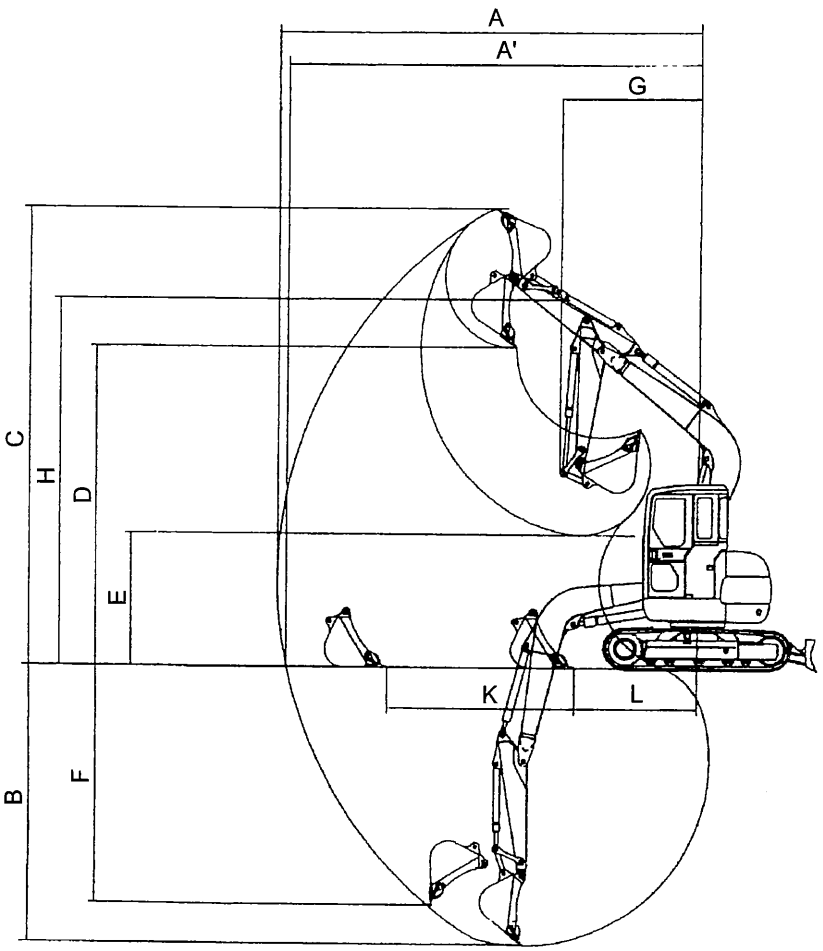
Unit : mm

Item \ Attachment Type			At neutral	At off-set right (Max. 1,205mm)	At off-set left (Max. 850mm)
			1.91m Arm +0.16m³ Bucket	1.91m Arm +0.16m³ Bucket	1.91m Arm +0.16m³ Bucket
A	Maximum digging reach		5.93	5.32	5.67
A'	Maximum reach at ground level		5.80	5.18	5.53
*B	Maximum digging depth		4.18	3.58	3.91
*C	Maximum digging height		6.67	6.16	6.45
*D	Maximum dumping clearance		4.96	4.44	4.73
*E	Minimum dumping clearance		1.96	1.45	1.74
*F	Vertical digging depth		2.60	2.11	2.38
G	Minimum swing radius		0.98	1.84	1.31
*H	Height at minimum swing radius		5.21	4.69	4.98
K	Horizontal digging stroke at ground level	Stroke	3.28	3.31	3.25
L		Minimum	1.25	0.71	1.01

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

1.76M Arm



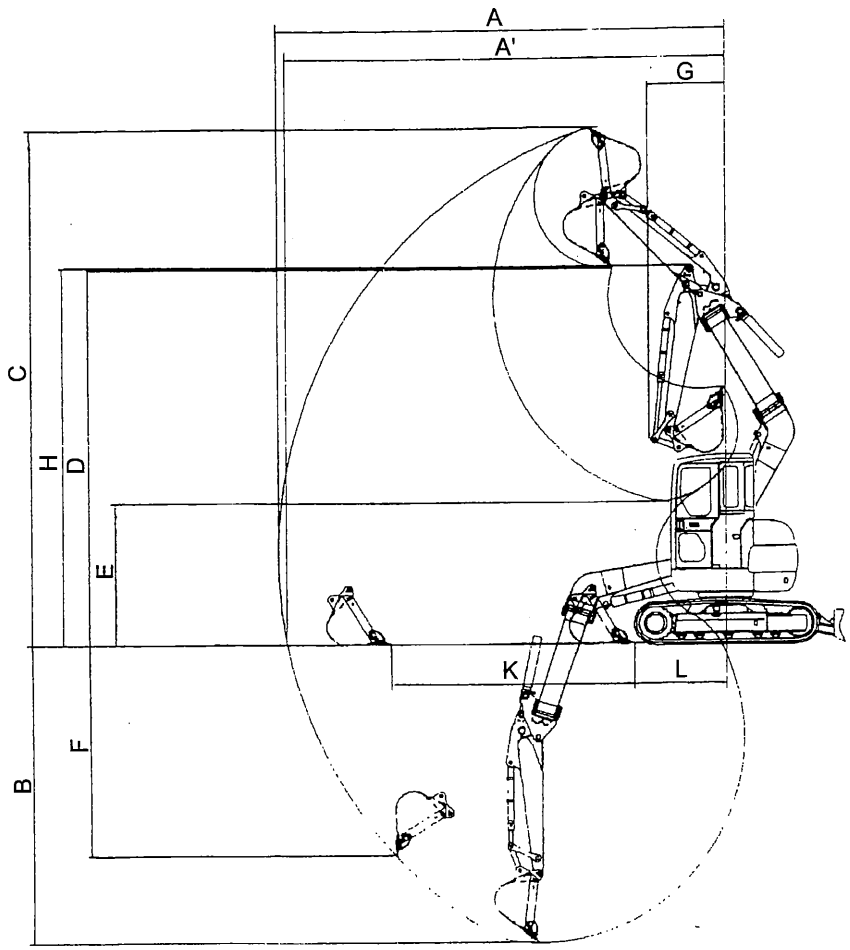
Unit : mm

Item \ Attachment Type			At neutral	At off-set right (Max. 1,370mm)	At off-set left (Max. 1,005mm)
			1.76m Arm +0.28m³ Bucket	1.76m Arm +0.28m³ Bucket	1.76m Arm +0.28m³ Bucket
A	Maximum digging reach		6.46	5.66	6.10
A'	Maximum reach at ground level		6.32	5.50	5.96
*B	Maximum digging depth		4.20	3.41	3.85
*C	Maximum digging height		7.43	6.72	7.12
*D	Maximum dumping clearance		5.38	4.67	5.06
*E	Minimum dumping clearance		2.41	1.71	2.10
*F	Vertical digging depth		3.01	2.22	2.61
G	Minimum swing radius		1.08	2.07	1.49
*H	Height at minimum swing radius		5.61	4.90	5.30
K	Horizontal digging stroke at ground level	Stroke	3.10	3.13	3.11
L		Minimum	1.64	0.91	1.27

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

2.06M Arm



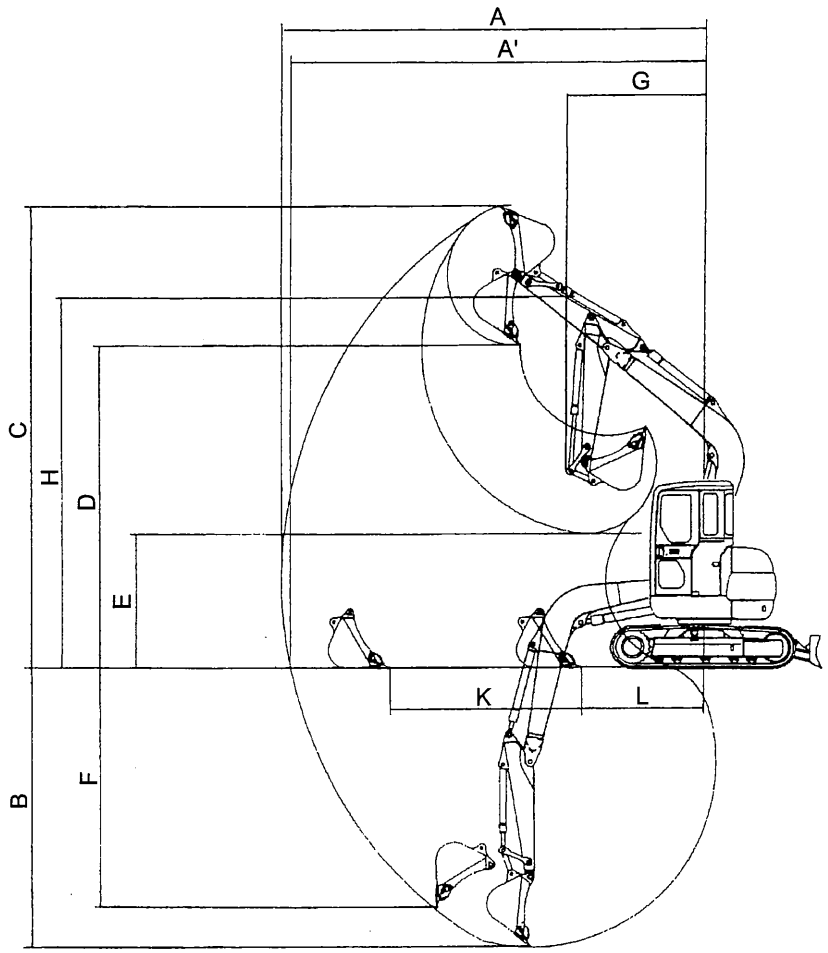
Unit : mm

Item \ Attachment Type			At neutral	At off-set right (Max. 1,370mm)	At off-set left (Max. 1,005mm)
			2.06m Arm +0.23m³ Bucket	2.06m Arm +0.23m³ Bucket	2.06m Arm +0.23m³ Bucket
A	Maximum digging reach		6.72	5.92	6.36
A'	Maximum reach at ground level		6.59	5.77	6.23
*B	Maximum digging depth		4.50	3.71	4.15
*C	Maximum digging height		7.64	6.94	7.33
*D	Maximum dumping clearance		5.59	4.88	5.28
*E	Minimum dumping clearance		2.12	1.41	1.81
*F	Vertical digging depth		3.20	2.49	2.88
G	Minimum swing radius		1.15	2.07	1.49
*H	Height at minimum swing radius		5.61	4.90	5.30
K	Horizontal digging stroke at ground level	Stroke	3.63	3.56	3.62
L		Minimum	1.39	0.64	1.03

NOTE : * marked dimensions don't include height of shoe lug.

■ BACKHOE ATTACHMENT

1.73M Arm



Unit : mm

Item			Attachment Type 1.73m Arm +0.28m³ Bucket
A	Maximum digging reach		6.39
A'	Maximum reach at ground level		6.26
*B	Maximum digging depth		4.19
*C	Maximum digging height		6.83
*D	Maximum dumping clearance		4.79
*E	Minimum dumping clearance		2.01
*F	Vertical digging depth		3.59
G	Minimum swing radius		2.06
*H	Height at minimum swing radius		5.49
K	Horizontal digging stroke at ground level	Stroke	2.88
L		Minimum	1.82

NOTE : * marked dimensions don't include height of shoe lug.

16. LIFTING CAPACITIES

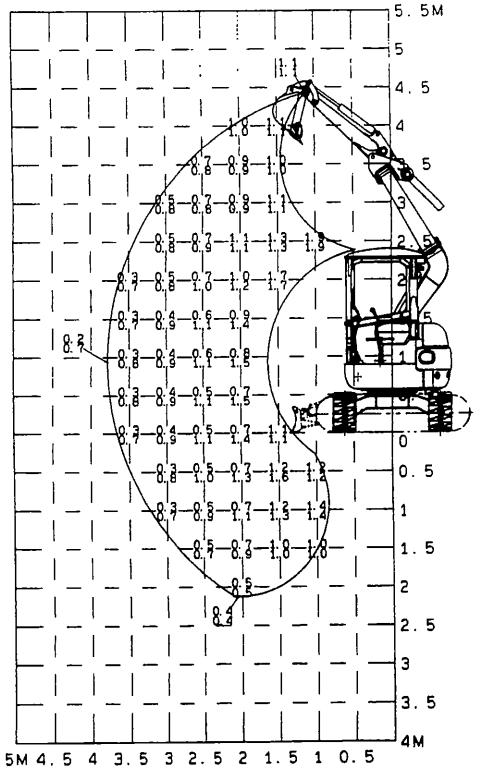
(1) Condition of Calculation

1) The lifting load shows the lower value either 87% or hydraulic lifting capacity or 75% of tipping load.
2) The load point is on the bucket supporting point, and the bucket position is a closed position.
3) The values in the upper rows show the lifting capacity of a machine facing sideways, and values in the lowerrows show a machine facing longitudinally.
4) Unit : ton Crawler : Rubber shoe

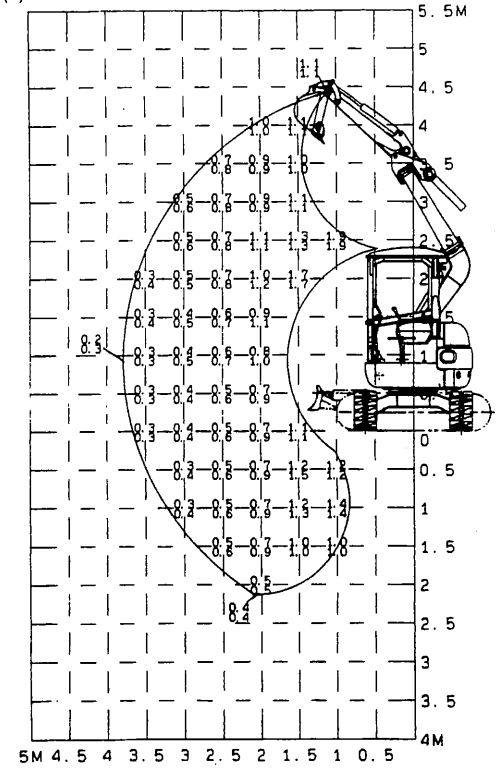
(2) Reference No. List of lifting diagram

Model	1.22m Arm + 0.08m³ Bucket		1.58m Arm + 0.055m³ Bucket	
	With dozer blade down	With dozer blade up	With dozer blade down	With dozer blade up
SK30UR-2	(1)	(2)	(3)	(4)

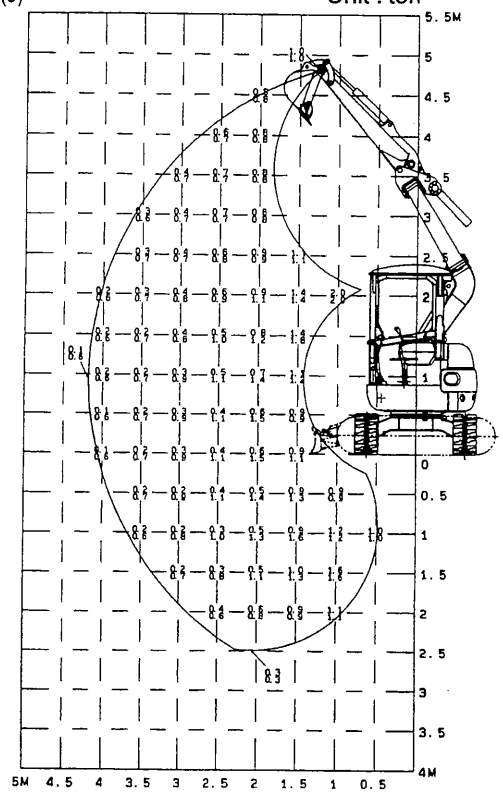
(1) Unit : ton



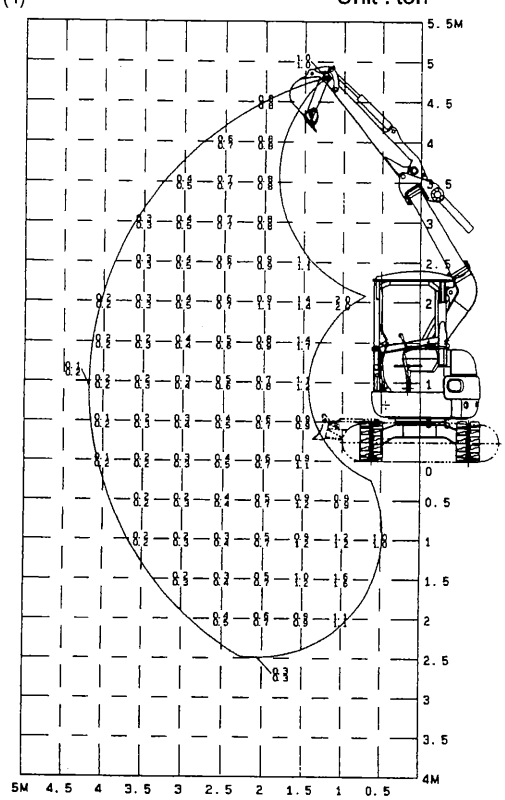
(2) Unit : ton



(3) Unit : ton



(4) Unit : ton



17. SOME CONVERSION UNITS

Units of weight :

From	Into	Multiply by
kg	lb	2.2
Lb	kg	0.454

Units of length :

From	Into	Multiply by	Divide by
meters	feet	3.28	
mm	inches		25.4
inches	mm	25.4	

Units of power :

From	Into	Multiply by
PS	kW	0.7355
kW	PS	1.360

Units of flow :

From	Into	Multiply by
Gal / min (US liq)	Lit / min	3.79
	Lit / sec	0.0631
	cm^3 / min	3785.4
	ft^3 / min	0.1337
Lit / min	ft^3 / min	0.0353
	Gal / min	0.264
	Gal / sec	0.004403
	$yard^3$ / min	0.001308

Units of torque :

From	Into	Multiply by
N-m	Lbf-ft	0.738
	kgf-m	0.1019716
	Lbf-ft	0.737561
	Lbf-in	8.85075
Lbf-ft	Kgf-m	0.1382552
	N-m	1.35582
	Lbf-in	12

Units of pressure :

From	Into	Multiply by
Kgf / cm^2	psi	14.223
	Pa (Pascal)	9.807
psi	Atm	0.06805
	Bars	0.06895
	Kgf / cm^2	0.0703
	Pa (Pascal)	6894.76
MPa (Mega Pascal)	psi	145.04

Units of volume :

From	Into	Multiply by
Liters	Gal (US liq)	0.264
	in^3	61.02
	$yard^3$	0.00131
	quarts	1.0567
	ounces (US)	33.81
$Yard^3$	m^3	0.765
	in^3	46656
	ft^3	27
	cm^3	764554.9
	liters	764.555

KOBELCO CONSTRUCTION MACHINERY CO., LTD.