KOBELCO

SHOP MANUAL

HYDRAULIC EXCAVATOR

SK15SR
SK20SR

S5PM0002E-02 NA

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SHOP MANUAL model SK15SR SK20SR

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GENERAL

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PM01

SPECIFICATION

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LOCATION AND WEIGHT OF COMPONENTS

PM03

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2. WEIGHT OF COMPONENTS (DRY WEIGHT)

Unit : kg (lbs)

Model	SK15SR		SK20SR	
Applicable Machines	PU06001~PU07000		PM02001~PM03500	
Item \ Spec.	Canopy	Cab	Canopy	Cab
Complete Machine	1580 (3480) [1640 (3620)]	1680 (3700) [1740 (3840)]	1900 (4190) [1950 (4300)]	2000 (4410) [2050 (4520)]
Upper frame assembly (including the following :)	823(1810)	923(2040)	1028(2270)	1128(2490)
Upper frame	153(340)	←	211(470)	←
Engine	100(220)	←	100(220)	←
Radiator	5(11)	←	5(11)	←
Hydraulic pump	14(250)	←	16(35)	←
Hyd. tank + Fuel tank	33(73)	←	33(73)	←
Control valve	19(42)	←	22(49)	←
Slewing motor	26(57)	←	26(57)	←
Canopy / Cab	40(88)	140(310)	40(88)	140(310)
Counterweight	127(280)	←	318(700)	←
Swing bracket	39(86)	←	40(88)	←
Swing cylinder	18(40)	←	21(46)	←
Lower frame assembly (including the following :)	530(1170)	←	600(1320)	←
Lower frame	163(360)	←	191(420)	←
Swivel joint	11(24)	←	11(24)	←
Slewing bearing	17(37)	←	25(55)	←
Crawler shoe	62(140)×2	←	71(160)×2	
Travel motor	19(42)×2	←	27(60)×2	←
Lower roller	4(9)×6	←	4(9)×6	←
Front idler	14(31)×2	←	14(31)×2	←
Sprocket	5(11)×2	←	5(11)×2	←
Track adjuster	9(20)×2	←	10(22)×2	←
Dozer blade	76(170)	←	80(180)	←
Dozer cylinder	15(33)	←	15(33)	←
Attachment (including the following / STD)	165(360)	←	210(460)	←
Boom	52(110)	←	61(130)	←
Arm	24(53)	←	29(64)	←
Bucket	33(73)	←	45(99)	←
Boom cylinder	13(29)	←	19(42)	←
Arm cylinder	13(29)	←	18(40)	←
Bucket cylinder	10(22)	←	12(26)	←
Lubricant and water (including the following :)	62(140)	←	62(140)	←
Hydraulic oil	45 ℓ (12gal)	←	45 ℓ (12gal)	←
Water	3.1 ℓ (0.8gal)	←	3.1 ℓ (0.8gal)	←
Engine oil	3.4 ℓ (0.9gal)	←	3.4 ℓ (0.9gal)	←
Fuel	21 ℓ (5.5gal)	←	21 ℓ (5.5gal)	←

NOTE : Numerical values enclosed in parentheses [ ] indicate steel crawler specifications.

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1. HOW TO READ CIRCUIT DIAGRAM AND HARNESS CONNECTION

1.1 Electrical Connection Diagram

(1) In the diagram, the number, size and color of harness are shown beside the wiring line. The standard size of the harness is to be 0.75 sq (square mm = mm²) unless otherwise there is another specification.

Example: 6 2 R

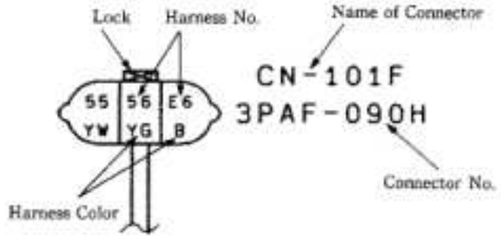
- R: Harness Color: Red
- 2: Harness Size: 2 sq (square mm = mm²)
- 6: Harness Number: 6

WIRING COLOR TABLE

ITEM	COLOR	ITEM	COLOR	ITEM	COLOR	ITEM	COLOR
B	BLACK	W	WHITE	Br	BROWN	V	PURPLE
G	GREEN	Y	YELLOW	Lg	LIGHT GREEN		
L	BLUE	P	PINK	Gy	GRAY		
R	RED	O	ORANGE	Sb	SKY BLUE		

1.2 Harness Connection

(1) Indication for Connector



1) The figure for the connector pin arrangement is shown by putting the lock (nail) to upper portion, and looking from the inlaying face.
2) The number in the connector shows the harness number, and alphabetical letter shows the harness color.
3) On the side face of connector, the name of connector and the connector number taken in series are indicated.
4) At the place indicated as "DOUBLE SPLICE," two harnesses are to be extracted from one pin.

(2) The connector is to be connected with engaging the male and female connectors of the same number.
Example: CN-101M and CN-101F
Where: M stands for Male, and F for Female.

(3) ⊣◀ mark means the connector with diode. The direction for diode is shown by the arrow.

(4) The AVSS harness is to be used for the size between 0.75sq and 1.25sq, and AVS harness between 2sq and 5sq.

(5) The harness size for which no specification is indicated is to be 0.75sq.

(6) The treatment for the harness end is to be as follows:
1) ═══ After roughly applying harness taping, install it in a corrugated tube.
2) ━━━ Apply harness taping by two plies.
3) ------ Make harness end bare.

(7) The length for the bared harness end is to be 30±10mm. (1.2±0.4 in)

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Problem	Main Causes	Remedy
Oil leakage at sliding surface of piston rod (Oil ring is formed on piston rod, and grown up to fall down oil drips).	• Foreign matter entrapped in bore of U-ring or wiper ring.	• Remove foreign matter.
	• Scar or other abnormality on bore of U-ring or wiper ring.	• Replace each part.
	• Scar on sliding surface of piston rod	• Smooth sliding surface with oil stone (1.6S or less). • If oil still leaks after smoothing of sliding surface, replace seal, such as U ring. • If oil still leaks after replacement of seal, replace piston rod.
	• Peeling off of hard chrome plating.	• Replate with hard chromium.
Oil leakage at outer circumference of cylinder head	• Damaged O-ring	• Replace part.
	• Damaged back-up ring	• Replace part.
Oil leakage at weld	• Damaged tube weld	• Replace part.
Natural fall of cylinder (Applicable if the maximum piston travel is 0.5㎜(0.02 in) or more for 10 minutes when static load equivalent to maximum operating pressure multiplied by the cylinder's area is applied to rod)	• Foreign matter entrapped on sliding surface of slide ring	• Remove foreign matter.
	• Scar or other abnormality on sliding surface of slide ring	• Replace part.
	• Scar on sliding surface of seal ring assy	• Replace part.
	• Damaged O-ring	• Replace part.

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INSTRUMENT HARNESS CONNECTION TABLE

電線 WIRE NO	電線色 WIRE COLOR	電線・サイズ WIRE SIZE	FROM	接続 CONNECTION	TO	機能 FUNCTION
1	B	AVS1.25SQ	CN-314F		CN-303M	FUSE BOX — CAB
2A	Y	AVS50.75SQ	CN-309F		CN-341F	TRAVEL 2-SPEED RELAY — A/C-BLUE
2B	Y	AVS50.75SQ	CN-309F		CN-341F	TRAVEL 2-SPEED RELAY — A/C-BLUE
2C	Y	AVS50.75SQ	CN-301M		CN-341F	CONTROL CUT S/S — A/C-BLUE
2D	Y	AVS50.75SQ	CN-313F		CN-341F	DECELE RELAY — A/C-BLUE
2E	Y	AVS0.75SQ	CN-330F		CN-341F	BUZZER — A/C-BLUE
2F	Y	AVS1.25SQ	CN-314F		CN-341F	FUSE BOX — A/C-BLUE
2G	Y	AVS50.75SQ	CN-320F		-	DIODE — JOINT SPLICE
2H	Y	AVS50.75SQ	CN-320F	WHEEL SPLICE	CN-310F	LIGHT RELAY — DIODE
3A	RW	AVS50.75SQ	CN-310F		CN-341F	LIGHT RELAY — A/C-BLUE
3B	RW	AVS50.75SQ	CN-301M		CN-341F	DECELE MOTOR — A/C-BLUE
3C	RW	AVS1.25SQ	CN-314F		CN-341F	FUSE BOX — A/C-BLUE
4	R	AVS50.75SQ	CN-314F		CN-301M	FUSE BOX — HORN SWITCH
5A	RL	AVS50.75SQ	CN-306F		CN-341F	TIMER UNIT — A/C-BLUE
5B	RL	AVS50.75SQ	CN-301M		CN-341F	E/G STOP SOL — A/C-BLUE
5C	RL	AVS5250	CN-308F		CN-341F	E/G STOP RELAY — A/C-BLUE
5D	RL	AVS250	CN-315F		CN-341F	FUSE BOX — A/C-BLUE
6A	WB	AVS50.75SQ	CN-311F		CN-341F	BATTERY RELAY — A/C-BLUE
6B	WG	AVS50.75SQ	CN-318F		CN-341F	CURRENT LIMITER — A/C-BLUE
6C	WG	AVS50.75SQ	CN-312F		CN-341F	CHARGE INDICATER RELAY — A/C-BLUE
6D	WG	AVS50.75SQ	CN-1F		CN-341F	CLUSTER GAUGE — A/C-BLUE
6E	WG	AVS50.75SQ	CN-3M		CN-341F	CLUSTER GAUGE — A/C-BLUE
6F	WG	AVS50.75SQ	CN-314F		CN-341F	FUSE BOX — A/C-BLUE
6G	WG	AVS50.75SQ	CN-314F		-	DIODE — JOINT SPLICE
7	RB	AVS3SQ	CN-317F		CN-315F	KEY SWITCH — FUSE BOX
8A	R	AVS2SQ	CN-311F		CN-316F	BATTERY RELAY — KEY SWITCH
8B	R	AVS2SQ	CN-315F		CN-316F	FUSE BOX — KEY SWITCH
8C	R	AVS2SQ	-		CN-318F	JOINT SPLICE — CURRENT LIMITER
8D	R	AVS5SQ	CN-302M		CN-317F	KEY SWITCH — FUSIBLE LINK
13	BW	AVS50.75SQ	CN-316F		CN-305F	KEY SWITCH — SAFETY RELAY
14	W	AVS2SQ	CN-305F		CN-302M	SAFETY RELAY — STARTER MOTOR
15A	Y	AVS50.75SQ	CN-319F	WHEEL SPLICE	CN-306F	DIODE — TIMER UNIT
15B	Y	AVS50.75SQ	CN-308F		CN-306F	E/G STOP RELAY — TIMER UNIT
16A	BW	AVS50.75SQ	CN-319F	WHEEL SPLICE	CN-306F	DIODE — TIMER UNIT
16B	BW	AVS50.75SQ	CN-308F		CN-306F	E/G STOP RELAY — TIMER UNIT
33A	O	AVS1.25SQ	CN-310F		CN-340F	LIGHT RELAY — A/C-BLUE
33B	O	AVS50.75SQ	CN-1F		CN-340F	CLUSTER GAUGE — A/C-BLUE
33C	O	AVS1.25SQ	CN-303M		CN-340F	WORKING LIGHT — A/C-BLUE
40A	BR	AVS50.75SQ	CN-2M		CN-310F	DIODE — CLUSTER GAUGE
40B	BR	AVS50.75SQ	CN-310F		CN-320F	DIODE — LIGHT RELAY
41	B/W	AVS50.75SQ	CN-309F		CN-301M	TRAVEL 2-SPEED RELAY — TRAVEL 2-SPEED SOL
43	LG	AVS50.75SQ	CN-2M		CN-309F	CLUSTER GAUGE — TRAVEL 2-SPEED RELAY
45	BW	AVS50.75SQ	CN-3M		CN-301M	CLUSTER GAUGE — TRAVEL 2-SPEED SWITCH
46	WB	AVS50.75SQ	CN-3M		CN-301M	CLUSTER GAUGE — TRAVEL 2-SPEED SWITCH
47A	L	AVS5SQ	CN-307F		-	GLOW RESISTER — JOINT SPLICE
47B	L	AVS5SQ	CN-317F	WHEEL SPLICE	CN-302M	KEY SWITCH — GLOW PLUG
47C	L	AVS50.75SQ	CN-317F		CN-1F	KEY SWITCH — CLUSTER GAUGE
48	LGB	AVS50.75SQ	CN-2M		CN-312F	CLUSTER GAUGE — INDICATER RELAY
50	GB	AVS50.75SQ	CN-1F		CN-301M	CLUSTER GAUGE — WIPER SWITCH
51	YB	AVS50.75SQ	CN-1F		CN-301M	CLUSTER GAUGE — E/G THERMO SWITCH
52	YR	AVS50.75SQ	CN-1F		CN-301M	CLUSTER GAUGE — E/G THERMO SENSOR
53	RG	AVS50.75SQ	CN-1F		CN-301M	CLUSTER GAUGE — AIR CLEANER ALARM SWITCH
55A	YW	AVS50.75SQ	CN-301M		CN-340F	FUEL SENSOR — A/C-BLUE
55B	YW	AVS50.75SQ	CN-1F		CN-340F	CLUSTER GAUGE — A/C-BLUE
55C	YW	AVS50.75SQ	CN-330F		CN-340F	BUZZER — A/C-BLUE
56	YG	AVS50.75SQ	CN-1F		CN-301M	CLUSTER GAUGE — FUEL SENSOR
60	GL	AVS50.75SQ	CN-301M		CN-313F	DECELE MOTOR — DECEL RELAY

電線 WIRE NO	電線色 WIRE COLOR	電線・サイズ WIRE SIZE	FROM	接続 CONNECTION	TO	機能 FUNCTION
61	LB	AVS50.75SQ	CN-2M		CN-313F	CLUSTER GAUGE — DECEL RELAY
63	BY	AVS50.75SQ	CN-301M		CN-313F	DECELE MOTOR — DECEL RELAY
64	L	AVS50.75SQ	CN-301M		CN-313F	DECELE MOTOR — DECEL RELAY
70	R	AVS250	CN-308F		CN-302M	E/G STOP RELAY — E/G STOP SOL
71	RW	AVS250	CN-315F		CN-311F	FUSE BOX — BATTERY RELAY
72	LGR	AVS1.25SQ	CN-316F		CN-315F	KEY SWITCH — FUSE BOX
81	Y	AVS50.75SQ	CN-312F		M-1	CHARGE INDICATER RELAY — CURRENT LIMITER
82	BY	AVS50.75SQ	CN-305F		CN-318F	SAFETY RELAY — CURRENT LIMITER
83	SB	AVS250	CN-318F		CN-303M	CURRENT LIMITER — GENERATOR
84	W	AVS250	CN-318F		CN-303M	CURRENT LIMITER — GENERATOR
85	BY	AVS5SQ	CN-317F		CN-307F	KEY SWITCH — GLOW RESISTER
E1	B	AVS50.75SQ	CN-305F		CN-340F	SAFETY RELAY — A/C-BLUE
E2	B	AVS50.75SQ	CN-306F		CN-340F	TIMER UNIT — A/C-BLUE
E3	B	AVS50.75SQ	CN-311F		CN-340F	BATTERY RELAY — A/C-BLUE
E4	B	AVS50.75SQ	CN-312F		CN-340F	CHARGE INDICATER RELAY — A/C-BLUE
E5	B	AVS50.75SQ	CN-312F		CN-340F	CHARGE INDICATER RELAY — A/C-BLUE
E7	B	AVS50.75SQ	CN-1F		CN-340F	CLUSTER GAUGE — A/C-BLUE
E8	B	AVS50.75SQ	CN-3M		CN-340F	CLUSTER GAUGE — A/C-BLUE
E9	B	AVS50.75SQ	CN-318F		CN-340F	CURRENT LIMITER — A/C-BLUE
E10	B	AVS1.25SQ	CN-303M		CN-340F	BODY EARTH — A/C-BLUE
E11	B	AVS1.25SQ	CN-303M		CN-340F	BODY EARTH — A/C-BLUE
E12	B	AVS1.25SQ	CN-330F		CN-340F	BUZZER — A/C-BLUE
E13	B	AVS1.25SQ	CN-321F		CN-340F	DIODE — A/C-BLUE

CONNECTORS SELECTION TABLE

コネクタ名（ピン数） CONNECTOR NAME (PINS NUM.)	メーカー MANUFAC.	品番 (PART NUMBER) ハウジング HOUSING	ターミナル TERMINAL	ホースシール HARNESS SEAL	リテーナ RETAINER ロックプレート LOCK PLATE	ウメ管	クリップ CLIP
2PAF-O	YAZAKI	7118-3250	7116-3250	187-6421-85			
2PAF-Y	YAZAKI	7123-3021	7116-3060				
3PAF	YAZAKI	7123-2237	7116-2090				
4PAF	YAZAKI	7123-2446	7116-2090				
4PAM-312	YAZAKI	7282-3040	7116-6041 7116-6042				
4PAF-312	YAZAKI	7283-3040	7116-6041 7116-6042				
4PAF-P&B	P&B	YCF7-1000					
	AMP		42281-1				
5PAF-P&B	P&B	YCF4-1003					
	PACKARD		12015885				
5PAM-MIC (BLACK)	AMP	172494-2	172777-1				
5PAM-MIC	AMP	172504-1	172777-1				
6PAF	YAZAKI	7123-2262	7116-2090				
11PAF-MIC	AMP	172487-1	172773-1				
CA104	YAZAKI	7120-8012	7113-1020				
A/C-BLUE	SUMITOMO	6400-9014 6498-9078	8240-4422				
2GPAM	SUMITOMO	6240-1035	8230-4502				

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