HYDRAULIC EXCAVATOR

SHOP MANUAL model SK330VI SK330LCVI SK330NLCVI

INDEX

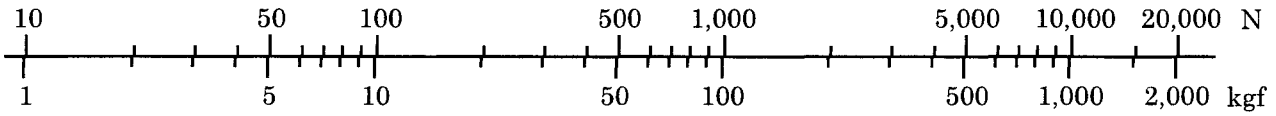
KOBELCO

Book code No. S5LC0007E③

(7) Unit conversion logarithmic chart

FORCE

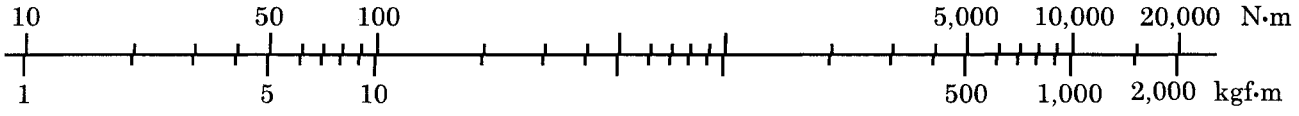
1N=0.102kgf



1kgf=9.807N

TORQUE

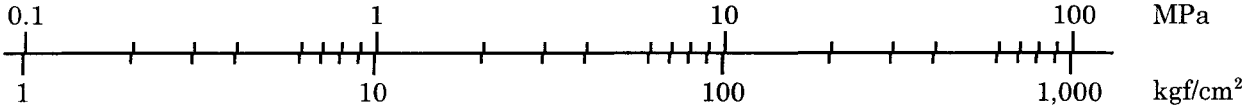
1N·m=0.102kgf·m



1kgf·m=9.807N·m

PRESSURE

1MPa=10.197kgf/cm^2



1kgf/cm^2=0.098MPa

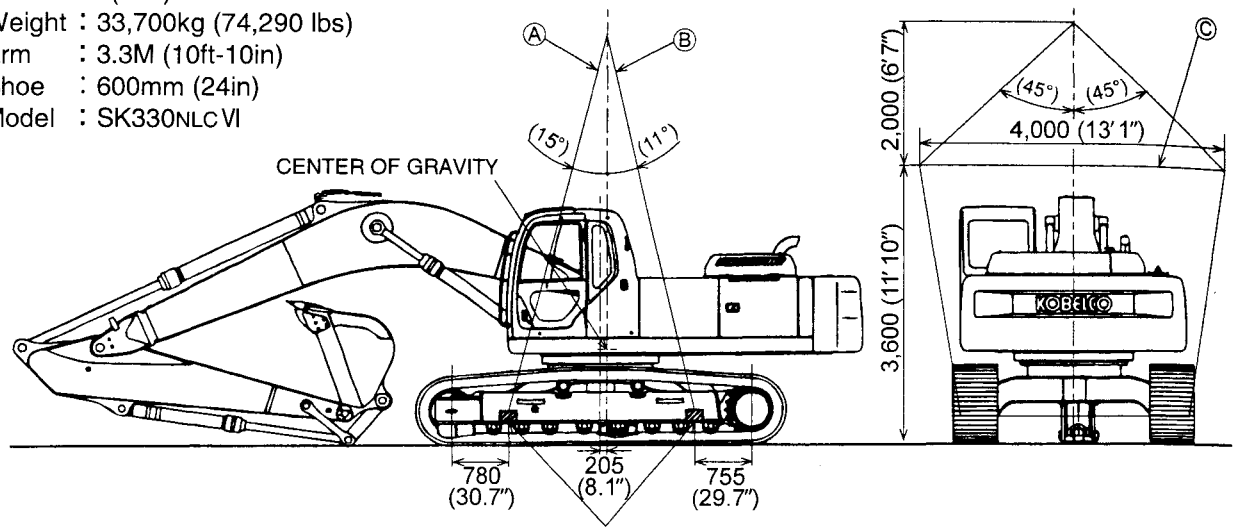
SK330NLC VI

NOTE :
Lifting machine with wider track shoes will tend to shift the Center of Gravity slightly forward, toward the center of the slewing ring.

● PROCEDURE (WITH ATTACHMENT)

Tools name	Remarks	
Cable Ⓐ	Ø45.0×15.7m	1pc.
Cable Ⓑ	Ø45.0×15.5m	1pc.
Spreader bars Ⓒ	4.0m	2pcs.

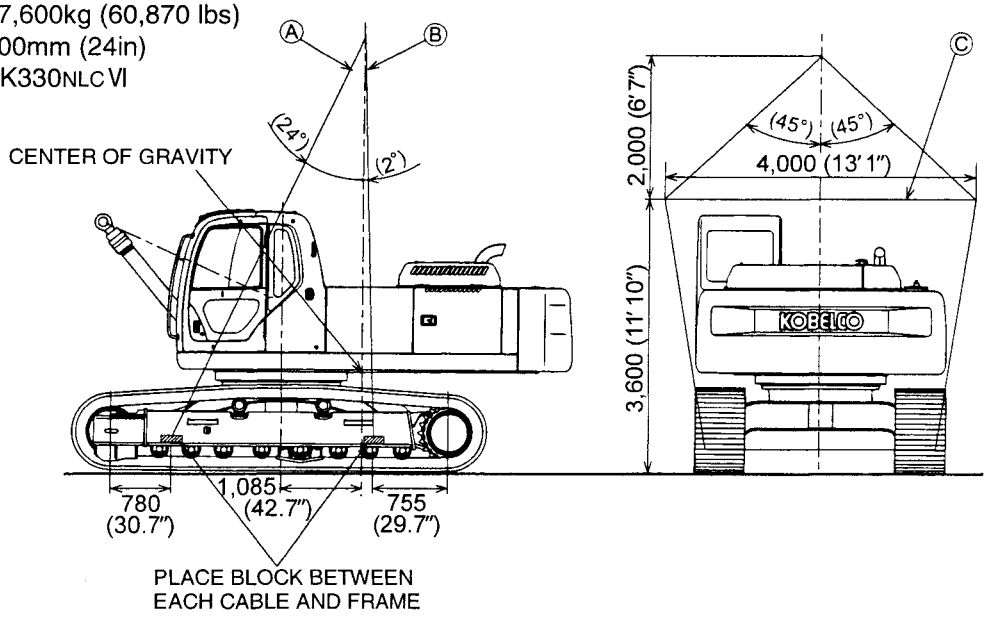
Unit : mm (ft-in)
Weight : 33,700kg (74,290 lbs)
Arm : 3.3M (10ft-10in)
Shoe : 600mm (24in)
Model : SK330NLC VI



● PROCEDURE (WITHOUT ATTACHMENT)

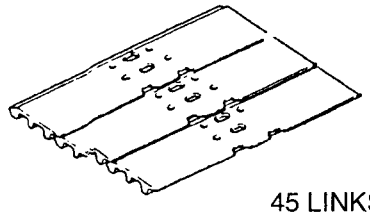
Tools name	Remarks	
Cable Ⓐ	Ø45.0×16.4m	1pc.
Cable Ⓑ	Ø45.0×15.2m	1pc.
Spreader bars Ⓒ	4.0m	2pcs.

Unit : mm (ft-in)
Weight : 27,600kg (60,870 lbs)
Shoe : 600mm (24in)
Model : SK330NLC VI

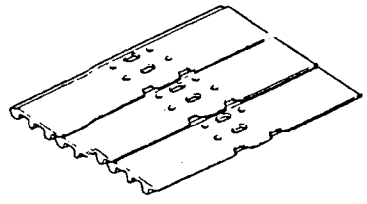


9. TYPE OF CRAWLER

9.1 NORMAL CRAWLER

Shape	Shoe width mm (in)	Overall width of crawler mm (ft-in)	Ground pressure kgf /cm^2 (psi)
Grouser shoe  45 LINKS	600 (24″)	3,200 (10′6″)	0.69 (9.81)
	800 (32″)	3,400 (11′2″)	0.53 (7.54)

9.2 LONG CRAWLER

Shape	Shoe width mm (in)		Overall width of crawler mm (ft-in)	Ground pressure kgf /cm^2 (psi)
Grouser shoe  48 LINKS	LC	600 (24″)	3,200 (10′6″)	0.65 (9.28)
		800 (32″)	3,400 (11′2″)	0.51 (7.25)
		900 (36″)	3,500 (11′6″)	0.45 (6.53)
	NLC	600 (24″)	3,000 (9′10″)	0.64 (9.13)
		800 (32″)	3,200 (10′6″)	0.50 (7.11)

NOTE :
Use grouser shoes on rough ground (areas covered with rocks and gravel). If you drive or excavate with other shoes, this may cause shoe bending, shoe bolt looseness, and track assembly (link, roller, etc.) damage.

3. BUCKET

3.1 BUCKET DIMENSIONAL DRAWING

(1) STD bucket

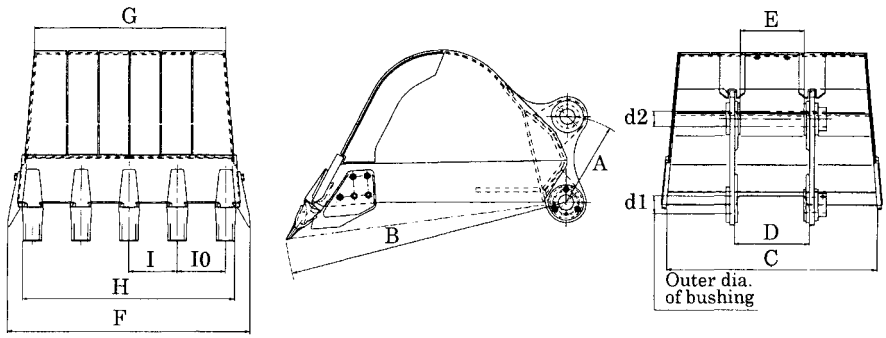


Fig. 3-1 Hoe bucket dimensional drawing

Table 3-1

No.	NAME	No.	NAME
A	Distance between pin and bracket	G	Outer width of bucket bottom
B	Distance between bucket pin and tooth end	H	Bucket outer width of teeth
C	Inner width of bucket end	I	Pitch between teeth
D	Inner width of lug	I0	Pitch between teeth
E	Inner width of bracket	d1	Outer dia. of bushing
F	Outer width of side cutter	d2	Pin dia.

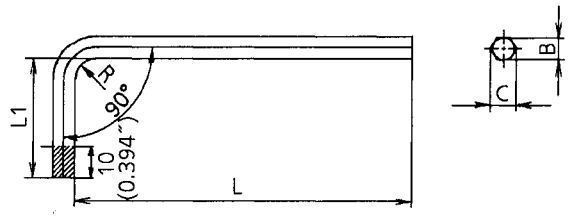
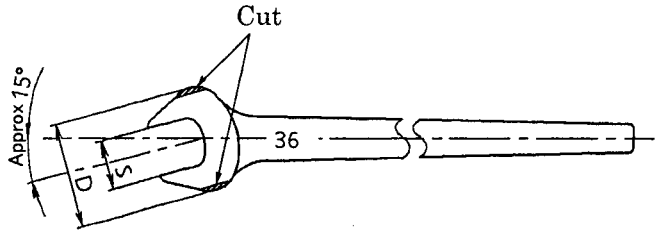
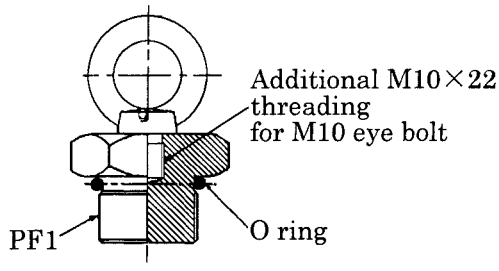
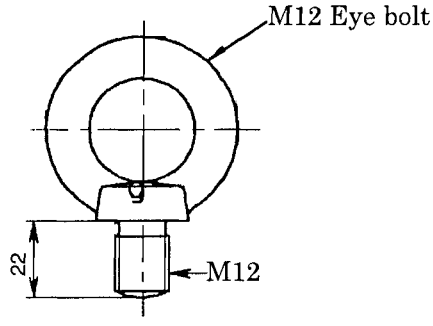
3.2 BUCKET DIMENSIONAL TABLE

Table 3-2 Unit : mm (ft-in)

Type	STD bucket			
Capacity	[STD] 1.40m³ (1.83cu·yd)	1.20m³ (1.57cu·yd)	1.60m³ (2.09cu·yd)	1.80m³ (2.35cu·yd)
Part No.	LC61B00014F1	LC61B00015F1	LC61B00016F1	LC61B00017F1
A	R513 (20.2″)	←	←	←
B	R1,690 (5′6″)	←	←	←
C	1,250 (4′1″)	1,060 (3′6″)	1,430 (4′8″)	1,620 (5′4″)
D	446 (17.6″)	←	←	←
E	382 (15″)	←	←	←
F	1,430 (4′8″)	1,240 (4′1″)	1,610 (5′3″)	1,683 (5′6″)
G	1,126 (3′8″)	936 (36.9″)	1,306 (4′3″)	1,496 (4′11″)
H	1,250 (4′1″)	1,060 (3′6″)	1,430 (4′8″)	1,620 (5′4″)
I	284 (11.2″)	316 (12.4″)	329 (13″)	377 (14.8″)
I0	284 (11.2″)	316 (12.4″)	329 (13″)	377 (14.8″)
d1	∅105 (4.13″)	←	←	←
d2	∅90 (3.54″)	←	←	←

6. SPECIAL TOOLS

Table 6-1

No.	Tools name	Tools No.	Shape	Applicable
1	Allen wrench Nominal B : 10 C : 11.3	ZT22A10000	 Commercial tool length (L1) − cut length = Required length 40(1.57") − 10(0.39") = 30(1.18")	Pump suction
2	Allen wrench Nominal B : 17 C : 19.1	ZT22A17000	General tools	Pump install
3	Spanner Nominal S : 36	ZT12A36000	 Commercial tool outer width (D) − cut length = Required length 81(3.19") − 16(0.63") = 65(2.56")	Swing motor A,B port
4	Plug PF1	ZE72X16000		For slinging the swing motor
5	Eye bolt M12×22	ZS91C01200 or commercial equivalent		For slinging the swing motor & Flare hose

Unit : Hour

Group	Location	Work to be done	Unit	Remark	SK330(LC)VI SK330NLCVI
109	Swivel joint	O/H	1 set	Removing and installing guard	3.6
	Other necessary works	Detach/attach	1 set	Lower piping	0.6
110	Multi control valve			15. Reference for multi C/V	
111	• Multi C/V ASSY	Detach/attach	1	After removing guard	1.7
112	Write hose name on multi C/V connecting hose	Detach/attach	1 set		0.3
113	• Piping	Detach/attach	1 set		0.5
114	• Mounting bolt	Detach/attach	1 set		0.3
115	• Cleaning	Cleaning	1 set		0.2
	Other necessary works	Detach/attach	1 set	Guard	0.4
120	Main control valve			16. Reference for control valve	
121	Main control valve ASSY	Detach/attach	1 pc.		2.2
122	• Attach tag to port name of pipe	Preparation	1 pc.		0.6
123	• Piping	Detach/attach	1 set		1.0
124	• Bracket mounting bolt	Detach/attach	1 pc.		0.1
125	• Valve slinging	Detach/attach	1 pc.		0.1
126	Main control valve ASSY	O/H	1 set		6.0
	Other necessary works	Detach/attach	1 set	Guard	0.4
130	Valve relation				
131	Solenoid valve ASSY	Detach/attach	1		1.0
132	• Attach tag to port name of pipe	Preparation	1		0.2
133	• Piping	Detach/attach	1 set		0.5
134	• Mounting bolt	Detach/attach	1		0.3
140	Engine (E/G) mounting relation			13. Reference for engine	
141	Engine ASSY	Detach/attach	1 pc.	After removing pump & radiator	2.7
142	• Harness connector & grounding & cable connection	Detach/attach	1 pc.		0.3
143	• Fuel hose	Detach/attach	1 pc.		0.1
144	• Others	Detach/attach	1 set		0.5
145	• Mounting bolt	Detach/attach	1 pc.		0.5
146	• Engine slinging	Detach/attach	1 set		0.3
147	• Cleaning	Cleaning	1 pc.		0.5
148	Engine	O/H	1 set	Reference for engine	
	Other necessary works	Detach/attach	1 set	Removing and installing guard	0.7
		Detach/attach	1 set	Removing and installing counter weight	0.9
		Detach/attach	1 set	Removing and installing pump	2.8
		Detach/attach	1 set	Removing and installing air cleaner	0.4
		Detach/attach	1 set	Removing and installing muffler	0.5
		Detach/attach	1 set	Removing and installing radiator	5.5
150	Upper frame			21. Reference for upper frame	
151	Upper frame ASSY	Detach/attach	1 pc.	After removing swivel joint	2.0
152	• Mounting bolt	Detach/attach	1 set		0.4
153	• Upper frame slinging	Detach/attach	1 pc.		0.6
154	• Cleaning	Cleaning	1 pc.		0.3
155	• Sealant	Apply	1 pc.		0.2
	Other necessary works	Detach/attach	1 set	Cab	1.2
		Detach/attach	1 set	Guard	0.4
		Detach/attach	1 set	Counter weight	0.9
		Detach/attach	1 set	Boom	2.1

Unit ; Hour

NAME OF WORK	NAME OF TROUBLE	MODEL 6D1 (6D16-TE)
Hydrostatic test of cylinder head. (1 set) (single)	Cylinder head is cracked. Cylinder head is blowholed. Cylinder head system in general is out of order.	1.5
Replacing cylinder head gasket (1 pc.) (On-machine) Incl. : Adjusting engine (A).	Water leaks from cylinder head. Oil leaks from cylinder head. Gas leaks from cylinder head. Cylinder head system in general is out of order.	7.0
Replacing cylinder head gasket. (one side) (On-machine) Incl. : Adjusting engine (A).	Water leaks from cylinder head gasket. Oil leaks from cylinder head gasket. Gas leaks from cylinder head gasket.	—
Retightening cylinder head bolts. (1 unit) (present machine) Incl. : Adjusting valve clearance.		2.3
Replacing pre-combustion chamber. (1 pc.) Excl.: Detaching/attaching head. Incl. : (1) Detaching/attaching and cleaning glow plug (1 pc.). (2) Adjusting nozzle (1 pc.) for each nozzle increased : Medium size 0.4hr. Large size 0.5hr.	Pre-combustion chamber is broken. Water leaks from pre-combustion chamber gasket.	1.0
Rocker cover 03−15		
Replacing rocker cover packing. (1 pc.) Increase 0.1hr. as one direct injection increases.	Rocker cover packing is cracked. Oil leaks from rocker cover packing.	0.6
Replacing rocker casing packing. (1 unit) Incl. : (1) Adjusting valve clearance. (2) Detaching/attaching rocker casing.	Oil leaks from rocker casing packing.	—
Cylinder block 03−20		
Replacing cylinder block Incl. : (1) Detaching and attaching engine. (2) Conditioning engine (B) and travel test. Excl. : Replacing associated parts		55.0
Replacing cylinder liners. (all Q'y on present vehicle) Incl. : (1) Conditioning engine (A). (2) Adjusting nozzle.		27.0
Replacing side cover packing. (front side)	Oil leaks from side cover gasket.	0.4
Replacing side cover packing. (left)	Oil leaks from side cover gasket.	—
Replacing side cover packing. (right) Increase 2.0hr. where injection pump is tilted.	Oil leaks from side cover gasket.	—

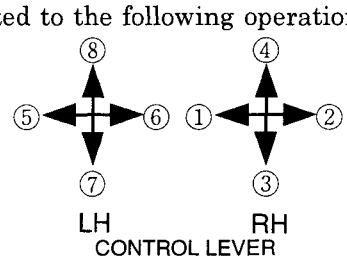
Table 1 (2/2)

Inspection Item		Measuring Posision			Stand-ard value	Hi	Lo	Unit	Adjusting Point	Measuring condition
		Position	Screen code							
Secondary pilot pressure circuit	P1 pump proportional valve & P2 pump proportional valve	C—2 Gauge cluster Multi display	Service diagnosis screen No.	No.24 No.25	6 (85)	+1.5 (20)	−1.5 (20)	kgf/cm² (psi)	Indicated Current value (mA) MIN 350	E/G Hi Lever on full When power shifting
				No.24 No.25	32 (460)	+0.5 (7)	−0.5 (7)		MAX 770	Lever on neutral position

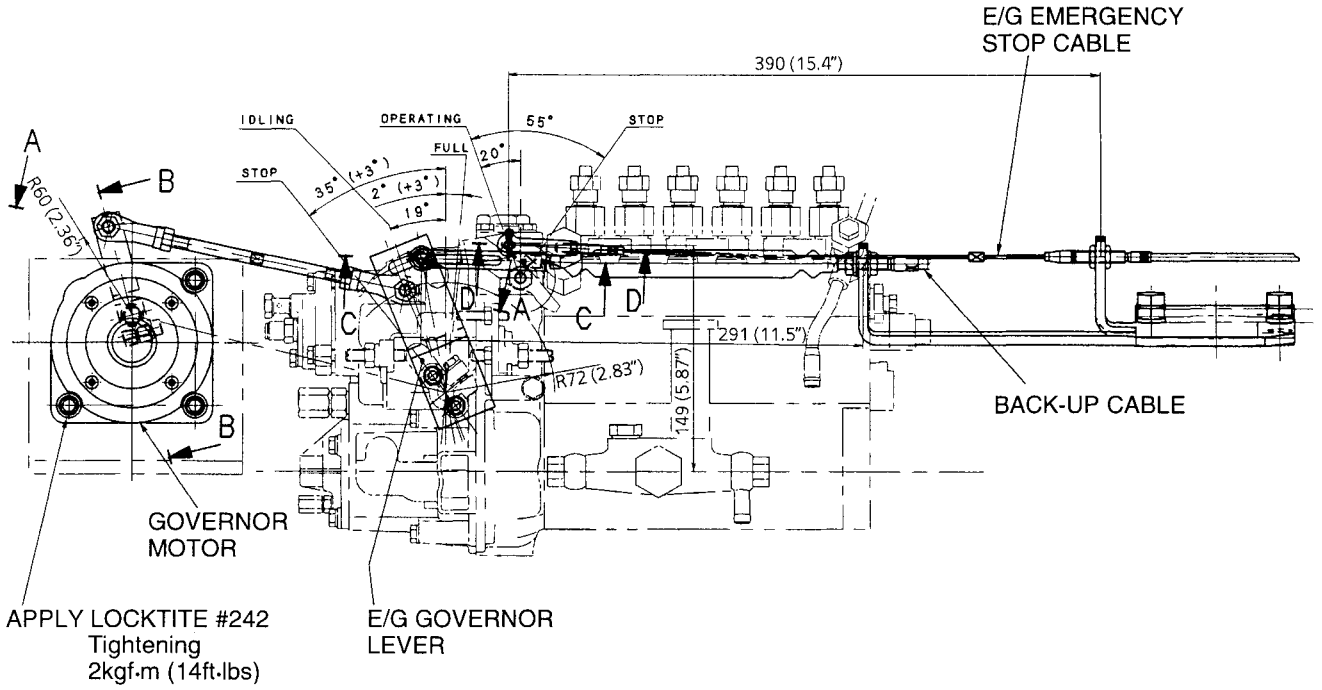
Inspection item					Standard value	Unit	
Operating speed	Track link revolution (RH,LH)	M mode	STD	1st speed	30.6～33.8	sec / 3 rev	M mode E/G HI idle
				2nd speed	17.7～19.7		
			LC	1st speed	32.7～35.9		
				2nd speed	18.9～20.9		
	Operating time of cylinder (At no load)	Boom		Raise	3.2～3.8	sec	
				Lower	3.1～3.7		
		Arm		In	5.0～5.8		
				Out	3.2～3.8		
		Bucket		Digging	2.8～3.4		
				Dumping	2.2～2.8		
		—		—	—		
				—	—		
		—		—	—		
				—	—		
	Swing speed (M mode STD)	Variable speed			—	sec / 3 rev	
		STD speed			19.5～21.5		
	Travel speed	1st speed		Rubber	—	sec / 20m	
				Iron	19.0～24.0		
		2nd speed		Rubber	—		
				Iron	11.7～13.7		
Performance	Amount of travel deviation	2nd speed			0～1.2	m / 20m	
	Parking brake drift	1 / 5 Gradient			0	mm / 5min	
	Performance of Swing brake	Neutral position after 180° full speed swing			55～95	degree	
	Performance of Swing parking brake	1 / 5 Gradient			0	mm (in)	
	ATT amount of drift	Tip of the bucket tooth			120	mm / 5min	(At no load)
		Boom cylinder			4		
		Arm cylinder			6		
		Dozer cylinder			—		
	Amount of horizontal play at the bucket tooth				25～50	mm	

⚠ The port relief valves No.OR1～OR8 on the control section are adjusted to the following operation numbers in advance.

①Bucket digging ②Bucket dumping ③Boom raise
④Boom lower ⑤Swing left ⑥Swing right
⑦Arm in ⑧Arm out

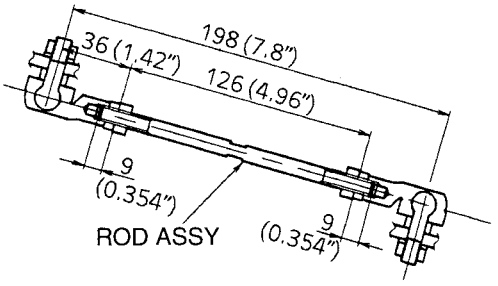


(3) Engine control

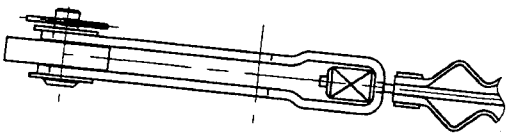


NOTE : BACK-UP CABLE ADJUSTING PROCEDURE

1. Pull knob in the cab about 60mm (2.36in) as far as it comes into contact with stopper while pushing button, and install cables having 0.5mm (0.0197in) clearance with stop bolt on Hi side.
2. Return knob to the original position, and make certain the cable has sufficient slack at governor stop position.



SECTION A—A



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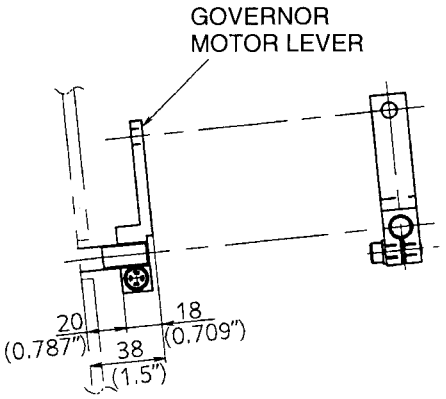
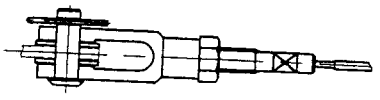


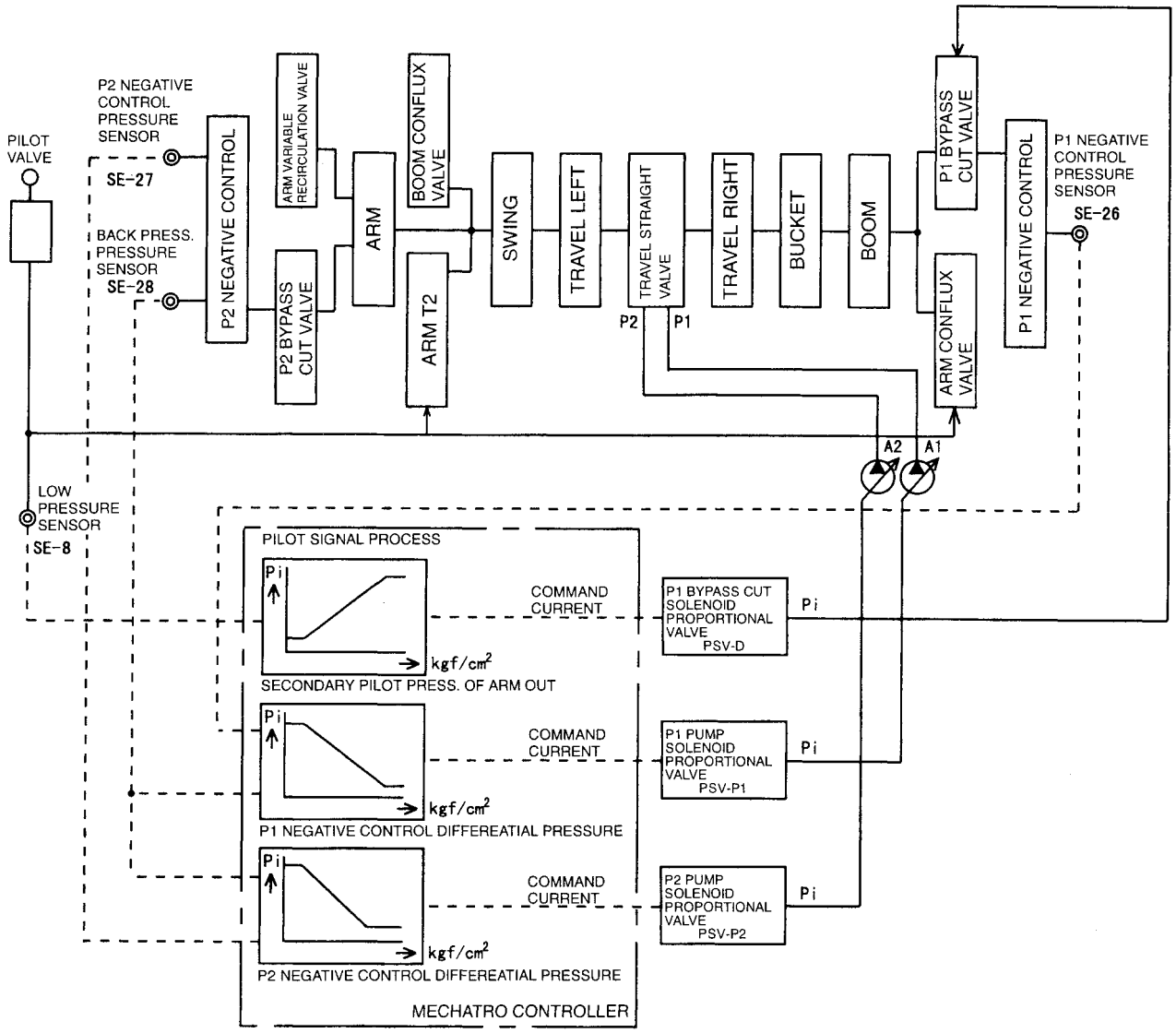
SECTION B—B



SECTION D—D

Fig. 38 E/G control

1.7 ARM OUT CONFLUX CONTROL

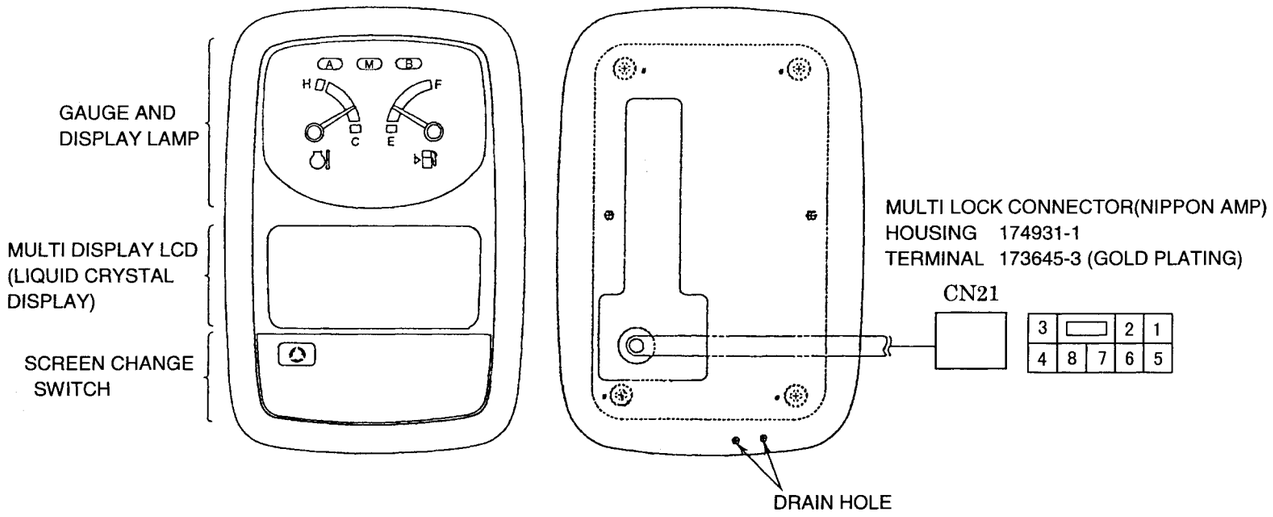


Arm out conflux

1) Start arm out operation simultaneously, and arm operation pilot pressure switches arm spool, arm T2 spool, arm conflux spool and is input into low pressure sensor.
2) The voltage output of the low pressure sensor enters the mechatro controller, processed internally and put out to the P1 bypass cut proportional valve as command current according to the input voltage.
3) The P1 bypass cut solenoid proportional valve puts out the secondary pilot pressure according to the current command from the mechatro controller and changes over the P1 bypass cut valve of the control valve.
4) The output voltage of the negative control pressure sensor and the back-pressure sensor is put into the mechatro controller, and negative control signal is processed internally. The controller then puts out current command to the P1/P2 pump solenoid proportional valves according to the input voltage.
5) The P1/P2 pump solenoid proportional valves put out secondary pressure for the proportional valves according to the command current levels from the mechatro controller, in order to change the delivery rates of the P1/P2 pumps.
6) If the P1 bypass cut valve is changed over, the oil delivered by the P1 pump is combined with the arm line during arm out operation.

(2) Gauge cluster (symbol C-2)

1) General view



2) Connector CN21

No.	Name	Wire color	No.	Name	Wire color
1	TXD 1 (Serial communication)	BrR	5	SHIELD	B
2	RXD 2 (Serial communication)	YR	6	GND	W
3	Engine coolant temp. sensor	R	7	Power supply (+24V)	B
4	Fuel sensor	W	8	GND	—

3) Function

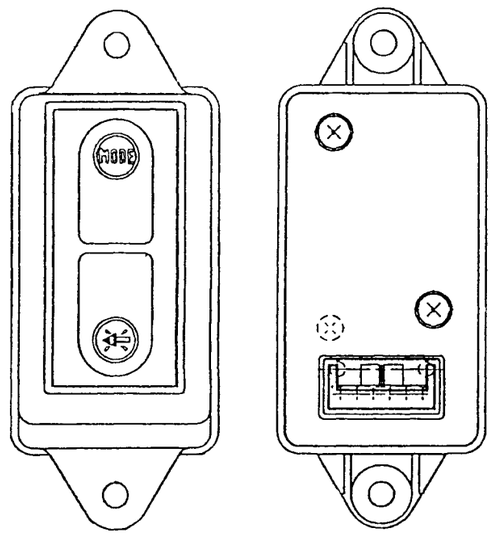
① It processes signals by communication between the gauge cluster and the mechatro controller, displays them in lamps, displays them in LCDs and actuates the buzzer.

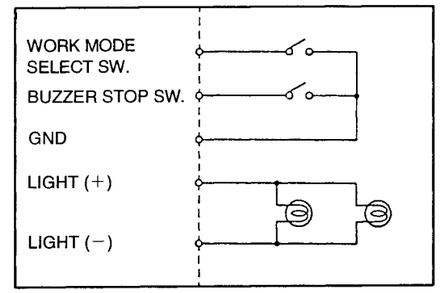
② It puts out coolant temperature signals, fuel level signals and panel switch signals to the mechatro controller through the communication port.

4) Display and summary of actuate item

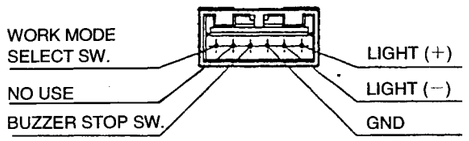
No.	Item name		Type
1	Monitor display		LCD dot 128×55
2	Gauge display (Coolant temp., Fuel level)		Tolerance coil
3	Mode display (A · M · B)		Lamp display (1.4W)
4	Warning buzzer		Piezoelectric type
5	Screen change switch		
6	Back light	For gauge	Lamp (2W)
		For SW, For LCD	LED

(3) Switch assy (SW-2)

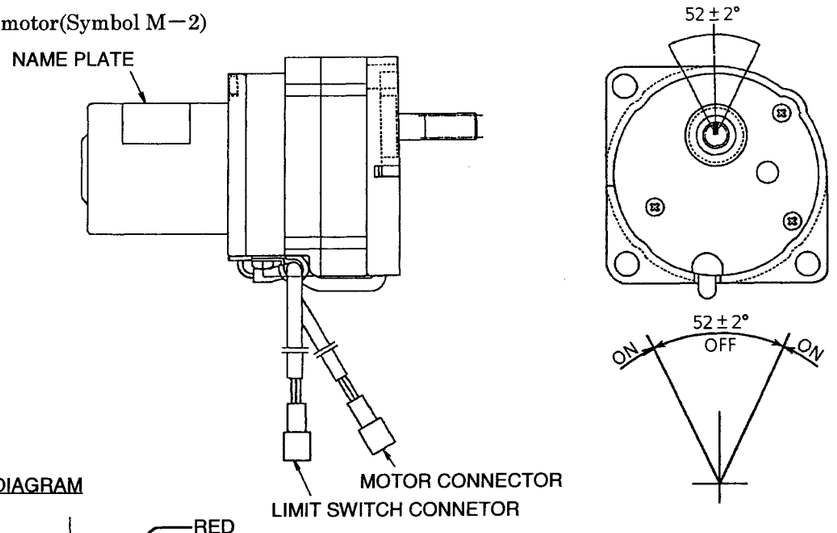




CIRCUIT DIAGRAM

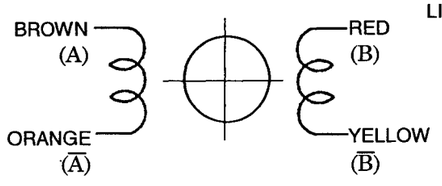


(4) Governor motor(Symbol M−2)

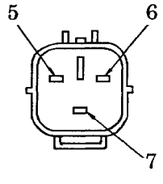


LIMIT SWITCH MOTION RANGE

CONNECTION DIAGRAM

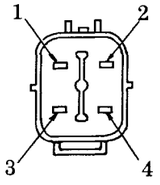


LIMIT SWITCH CONNECTOR WIRE TABLE

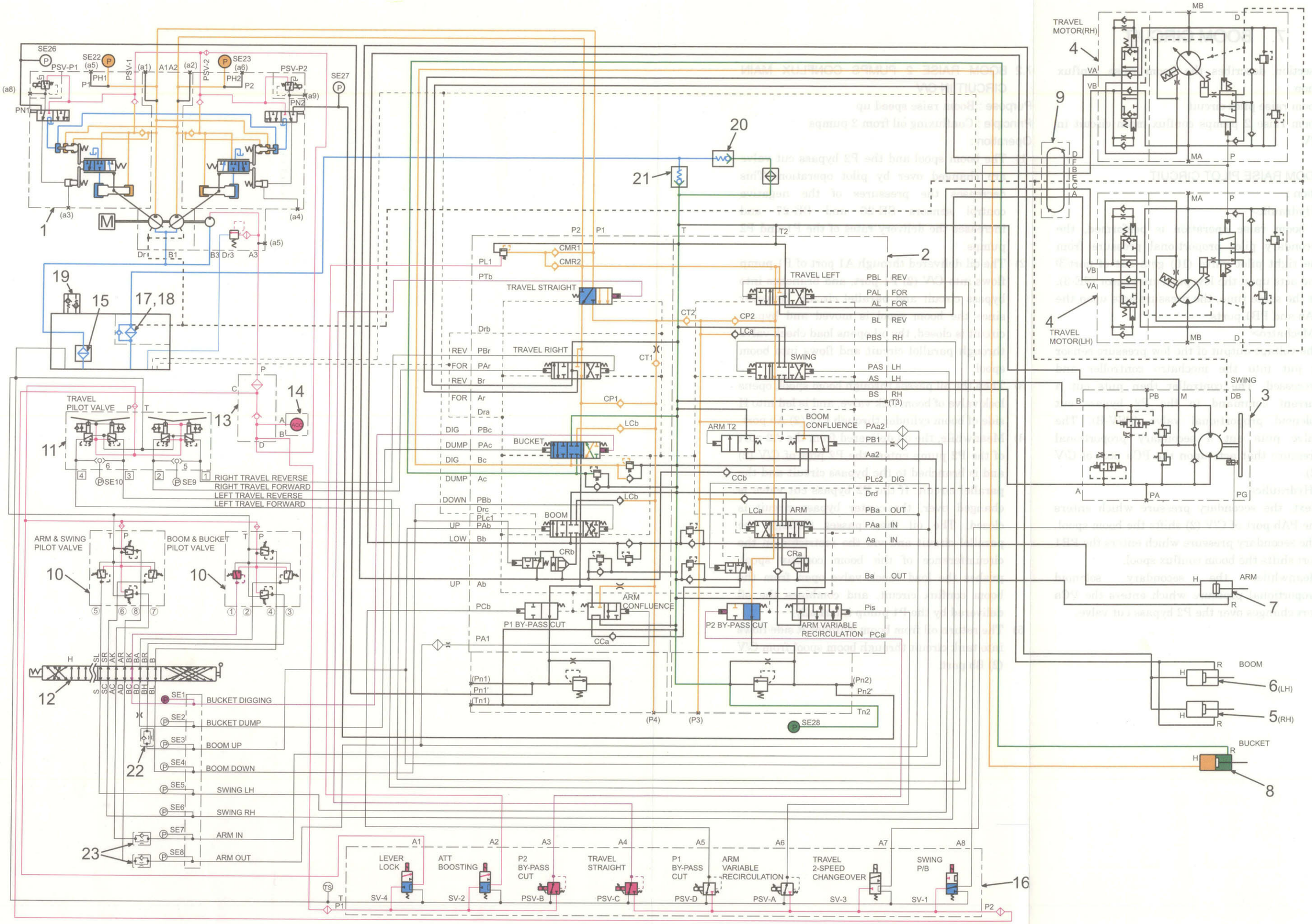


No.	Lead color	Connection
5	White	COM
6	Red	NO
7	Yellow	NC

MOTOR CONNECTOR WIRE TABLE



No.	Lead color	Connection
1	Brown	A
2	Orange	Ā
3	Red	B
4	Yellow	B̄



BUCKET CIRCUIT : Bucket digging, Confluence & ATT boost

10. COMBINED CIRCUIT

This section describes only the difference in combined operation.

1) Boom raise/travel, pilot circuit
2) Boom raise/travel, main circit

10.1 BOOM RAISE/TRAVEL, PILOT CIRCUIT

Operation :

<Pilot circuit other than independent operation>

<Mechatro>

1) If the mechatro controller processes signals, a current command is put out to two valves; the travel straight solenoid proportional valve (PSV-C) and the P2 bypass cut solenoid proportional valve (PSV-B). These valves put out secondary pressure which acts upon the PTb and the PCa ports of C/V (2).

<Hydraulic>

2) Next, the PTb port pressure changes over the travel straight valve.
   Meanwhile, the solenoid proportional valve which enters the PCa port of C/V (2) changes over the P2 bypass cut valve.

10.2 BOOM RAISE/TRAVEL, MAIN CIRCUIT

Purpose :

To insure straight travel movement during travel operation even if the attachment is operated.

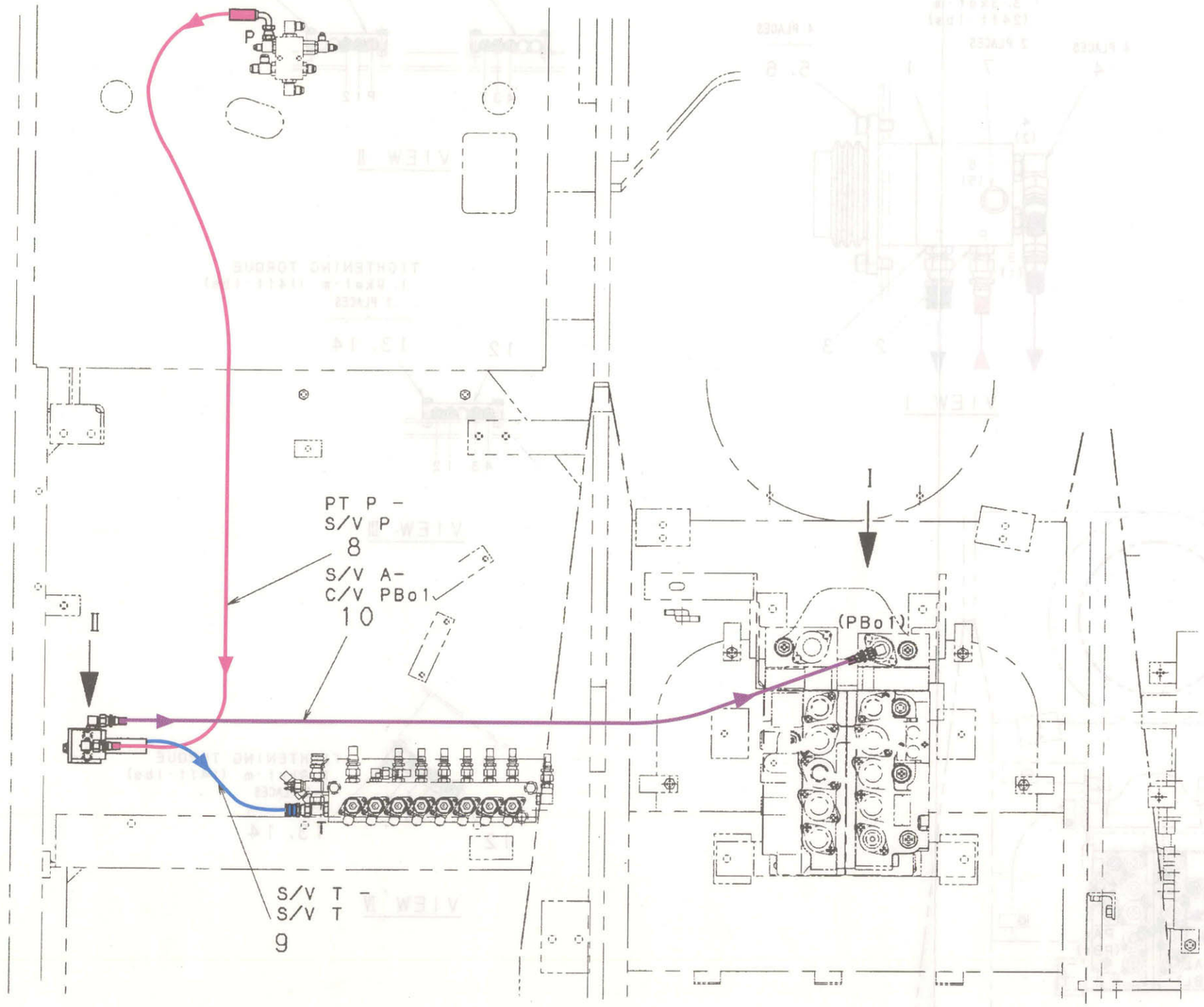
Principle :

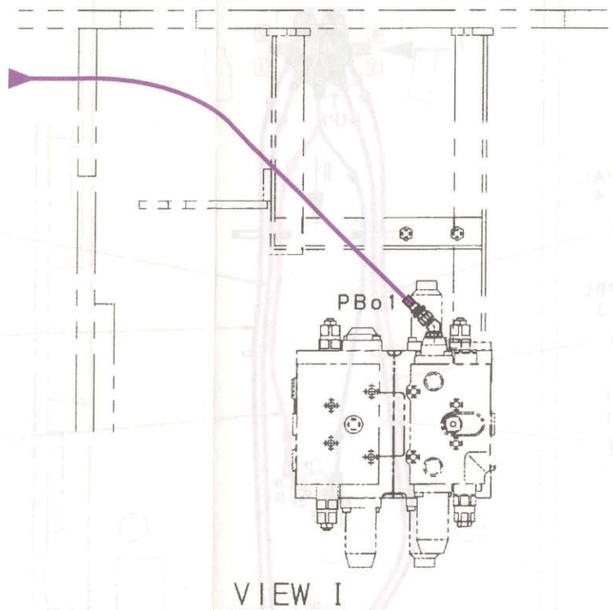
The travel action and the attachment action are actuated by separate pumps.

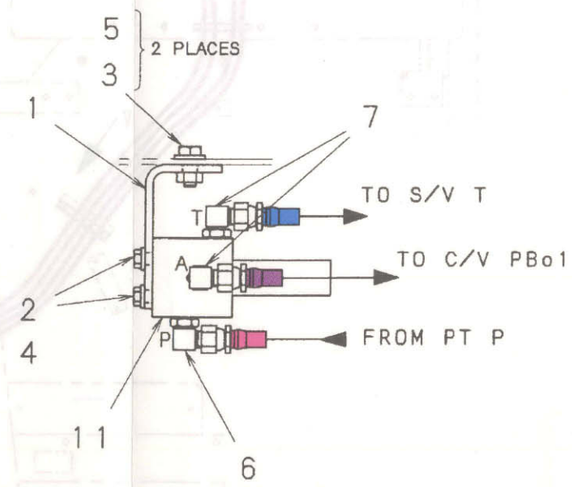
Operation :

1) The oil delivered by the P1 and P2 pumps runs into the travel straight section from the P1 and P2 ports of C/V (2). Since the travel straight spool is shifted, the oil delivered by the P2 pump is branched off to the P1 and P2 bypass lines.
   In the meantime, the oil delivered by the P1 pump are branched off to the P1 and P2 parallel circuits.
2) Next, since the travel right and left actions operate on the bypass circuits, the oil delivered by the P2 pump is used.
   Meantime, since the boom spool and other spools operate on the parallel circuits, the oil delivered by the P1 pump is used.

(8) Swing priority pilot lines ; LC64H00013F1 ; EU







VIEW II

Applicable Machines
LC06-05501～
YC06-02501～

Revision	Date of Issue	Remarks
First edition	March, 2000	S5LC2307E K

ASIA

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
1A	RY	AVSS0. 75sq	CN-5F		CN-8F	MECHATRO CONTROLLER ← FUSE BOX
1B	RY	AVSS0. 75sq	CN-53F		CN-8F	J/C-GRAY ← FUSE BOX
1C	RY	AVSS0. 75sq	CN-53F		CN-5F	J/C-GRAY ← MECHATRO CONTROLLER
1D	RY	AVSS0. 75sq	CN-53F		CN-20F	J/C-GRAY ← RESISTOR
2A	WY	AVSS0. 75sq	CN-53F		CN-8F	J/C-GRAY ← FUSE BOX
2B	WY	AVSS0. 75sq	CN-53F		CN-16F	J/C-GRAY → WORK LIGHT RELAY
2C	WY	AVSS0. 75sq	CN-53F		CN-17F	J/C-GRAY → TRAVEL ALARM RELAY
2D	WY	AVSS0. 75sq	CN-53F		CN-29F	J/C-GRAY → WIPER RELAY ASSY
2E	WY	AVSS0. 75sq	CN-53F		CN-39F	J/C-GRAY → NIBBLER OPEN RELAY
2F	WY	AVSS0. 75sq	CN-53F		CN-49F	J/C-GRAY → OPT WORK LIGHT RELAY
2G	WY	AVSS0. 75sq	CN-53F		CN-34F	J/C-GRAY → BUCKET CONTROL RELAY
3	YL	AVSS0. 75sq	CN-9M		CN-38M	FUSE BOX → CIGARETTE LIGHTER
4	YR	AVSS0. 75sq	CN-9M		CN-36M	FUSE BOX → TUNER AM&FM
5A	WG	AVSS0. 75sq	CN-9M		CN-27F	FUSE BOX → 15PAF-J/B
5B	WG	AVSS0. 75sq	CN-15F		CN-27F	HORN RELAY ← 15PAF-J/B
5C	WG	AVSS0. 75sq	CN-15F		CN-27F	HORN RELAY ← 15PAF-J/B
7	YG	AVSS0. 75sq	CN-9M		CN-5F	FUSE BOX → MECHATRO CONTROLLER
8	WV	AVSS0. 75sq	CN-9M		CN-38M	FUSE BOX → POWER WINDOW CONTROLLER
9A	YB	AVSS0. 75sq	CN-9M		CN-27F	FUSE BOX → 15PAF-J/B
9B	YB	AVSS0. 75sq	CN-54F		CN-27F	ROOM LIGHT → 15PAF-J/B
9C	YB	AVSS0. 75sq	CN-36M		CN-27F	TUNER AM&FM ← 15PAF-J/B
9D	YB	AVSS0. 75sq	CN-55F		CN-27F	CAREER DATA REC. SYSTEM ← 15PAF-J/B
10	WV	AVSS1. 25sq	CN-9M		CN-36M	FUSE BOX → KEY SW.
11	OL	AVSS0. 75sq	CN-9M		CN-42F	FUSE BOX → AUTO GREASE CONTROLLER
12A	RG	AVSS1. 25sq	CN-9M		CN-26F	FUSE BOX → 15PAF-J/B
12B	RG	AVSS0. 75sq	CN-17F		CN-26F	TRAVEL ALARM RELAY → 15PAF-J/B
12C	RG	AVSS0. 75sq	CN-41F		CN-26F	CAB → 15PAF-J/B
12D	RG	AVSS0. 75sq	CN-61F		CN-26F	ONE WAY CALL AMP → 15PAF-J/B
13A	W	AVSS0. 75sq	CN-9M		CN-27F	FUSE BOX → 15PAF-J/B
13B	W	AVSS0. 75sq	CN-38M		CN-27F	POWER WINDOW CONTROLLER → 15PAF-J/B
13C	W	AVSS0. 75sq	CN-38M		CN-27F	CLUSTER GAUGE → 15PAF-J/B
13D	W	AVSS0. 75sq	CN-34F		CN-27F	STROKE END PROXIMILITY SW. → 15PAF-J/B
14A	RB	AVSS1. 25sq	CN-9M		CN-26F	FUSE BOX → 15PAF-J/B
14B	RB	AVSS1. 25sq	CN-29F		CN-26F	WIPER RELAY ASSY ← 15PAF-J/B
14C	RB	AVSS0. 75sq	CN-44F		CN-26F	ROOF WIPER SW ← 15PAF-J/B
14D	RB	AVSS0. 75sq	CN-37F		CN-26F	ROOF WIPER MOTOR ← 15PAF-J/B
15A	WB	AVSS0. 75sq	CN-53F		CN-9M	J/C-GRAY → FUSE BOX
15B	WB	AVSS0. 75sq	CN-53F		CN-32M	J/C-GRAY ← LEVER LOCK SW.
15C	WB	AVSS0. 75sq	CN-53F		CN-13F	J/C-GRAY ← RESISTOR
15D	WB	AVSS0. 75sq	CN-53F		CN-34F	J/C-GRAY → ARM PUSH/PULL PORT SELECT SOL.
16	RW	AVSS1. 25sq	CN-9M		CN-16F	FUSE BOX → WORK LIGHT RELAY
17	WL	AVSS1. 25sq	CN-49F		CN-9M	OPT WORK LIGHT RELAY → FUSE BOX
18	WG	AVSS1. 25sq	CN-9M		CN-36M	FUSE BOX → AIR CINDITIONER AMP.
19	RL	AVSS0. 75sq	CN-9M		CN-36M	FUSE BOX → AIR CINDITIONER AMP.
20A	WR	AVSS1. 25sq	CN-9M	DOUBLE SPLICE	CN-43F	FUSE BOX → RESERVE
20B	WR	AVSS1. 25sq	CN-62F		CN-43F	RESERVE → RESERVE
30	G	AVSS0. 75sq	CN-12F		CN-30F	SAFETY RELAY ← ALTERNATOR
50	L	AVSS1. 25sq	CN-8F		CN-36M	FUSE BOX ← KEY SW.
51	W	AVS2sq	CN-8F		CN-30F	FUSE BOX ← BATTERY RELAY
52	R	AVS5sq	CN-8F		CN-33M	FUSE BOX ← BATTERY RELAY
53	Y	AVS5sq	CN-8F		CN-33M	FUSE BOX ← BATTERY RELAY
58A	P	AVSS0. 75sq	CN-27F		CN-36M	15PAF-J/B ← KEY SW.
58B	P	AVSS0. 75sq	CN-27F		CN-40F	15PAF-J/B ← DIODE
58C	P	AVSS0. 75sq	CN-27F		CN-30F	15PAF-J/B → GLOW RELAY
59A	W	AVSS0. 75sq	CN-30F		CN-26F	BATTERY RELAY → 15PAF-J/B
59B	W	AVSS0. 75sq	CN-46F		CN-26F	DIODE → 15PAF-J/B
59C	W	AVSS0. 75sq	CN-12F		CN-26F	SAFETY RELAY → 15PAF-J/B

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
60A	WL	AVSS0. 75sq	CN-27F		CN-46F	15PAF-J/B → DIODE
60B	WL	AVSS0. 75sq	CN-27F		CN-36M	15PAF-J/B ← KEY SW.
60C	WL	AVSS0. 75sq	CN-27F		CN-40F	15PAF-J/B ← DIODE
60D	WL	AVSS0. 75sq	CN-27F		CN-2F	15PAF-J/B → MECHATRO CONTROLLER
61A	GrB	AVSS0. 75sq	CN-26F		CN-36M	15PAF-J/B ← KEY SW.
61B	GrB	AVSS0. 75sq	CN-26F		CN-40F	15PAF-J/B → DIODE
61C	GrB	AVSS0. 75sq	CN-26F		CN-40F	15PAF-J/B → DIODE
61D	GrB	AVSS0. 75sq	CN-26F		CN-2F	15PAF-J/B → MECHATRO CONTROLLER
63	WY	AVSS0. 75sq	CN-38M		CN-30F	KEY SW. → STARTER RELAY
64	LW	AVSS0. 75sq	CN-12F		CN-30F	SAFETY RELAY ← STARTER RELAY
65A	WR	AVSS0. 75sq	CN-26F		CN-30F	15PAF-J/B ← ALTERNATOR
65B	WR	AVSS0. 75sq	CN-26F		CN-2F	15PAF-J/B → MECHATRO CONTROLLER
65C	WR	AVSS0. 75sq	CN-26F		CN-38M	15PAF-J/B → HOUR METER
65D	WR	AVSS0. 75sq	CN-26F		CN-42F	15PAF-J/B → AUTO GREASE CONTROLLER
65E	WR	AVSS0. 75sq	CN-26F		CN-12F	15PAF-J/B → SAFETY RELAY
80	GrR	AVSS0. 75sq	CN-29F		CN-38M	WIPER RELAY ASSY → WIPER MOTOR
81	GrB	AVSS0. 75sq	CN-29F		CN-38M	WIPER RELAY ASSY → WIPER MOTOR
82	GO	AVSS0. 75sq	CN-29F		CN-30F	WIPER RELAY ASSY → WASHER MOTOR
83	GO	AVSS0. 75sq	CN-30F		CN-15F	HORN LOW ← HORN RELAY
84A	WR	AVSS0. 75sq	CN-15F		CN-27F	HORN RELAY → 15PAF-J/B
84B	WR	AVSS0. 75sq	CN-36M		CN-27F	HORN SW. ← 15PAF-J/B
84C	WR	AVSS0. 75sq	CN-32M		CN-27F	HORN SW. ← 15PAF-J/B
85A	WB	AVSS1. 25sq	CN-26F		CN-16F	15PAF-J/B ← WORK LIGHT RELAY
85B	WB	AVSS1. 25sq	CN-26F		CN-30F	15PAF-J/B → BOOM WORKING LIGHT LEFT
85C	WB	AVSS0. 75sq	CN-26F		CN-31M	15PAF-J/B → SW. ASSY (MODE BUZZER STOP)
85D	WB	AVSS0. 75sq	CN-26F		CN-36M	15PAF-J/B → AIR CONDITIONER AMP.
85E	WB	AVSS0. 75sq	CN-26F		CN-38M	15PAF-J/B → SW. ASSY (WIPER WASHER LIGHT)
86A	OW	AVSS0. 75sq	CN-30F		CN-26F	TIMER → 15PAF-J/B
86B	OW	AVSS0. 75sq	CN-32M		CN-26F	OPERATING LEVER LOCK SOL. ← 15PAF-J/B
86C	OW	AVSS0. 75sq	CN-46F		CN-26F	DIODE ← 15PAF-J/B
86D	OW	AVSS0. 75sq	CN-39F		CN-26F	NIBBLER OPEN RELAY ← 15PAF-J/B
87	YV	AVSS0. 75sq	CN-7F		CN-32M	MECHATRO CONTROLLER ← LEVER LOCK SW.
88	PG	AVSS0. 75sq	CN-30F		CN-17F	TRAVEL ALARM ← TRAVEL ALARM RELAY
89	BrL	AVSS0. 75sq	CN-49F		CN-32M	OPT. WORK LIGHT RELAY ← OPT WORK LIGHT SW.
90A	RY	AVSS1. 25sq	F-1		CN-26F	CAB WORKING LIGHT → 15PAF-J/B
90B	RY	AVSS1. 25sq	CN-49F		CN-26F	OPT. WORK LIGHT RELAY → 15PAF-J/B
90C	RY	AVSS1. 25sq	F-3		CN-26F	CAB WORKING LIGHT LEFT ← 15PAF-J/B
90D	RY	AVSS0. 75sq	CN-30F		CN-26F	BOOM CYLINDER WORK LIGHT ← 15PAF-J/B
98	LW	AVSS0. 75sq	CN-38M		CN-25F	TUNER AM&FM → SPEAKER LEFT
99	Br	AVSS0. 75sq	CN-36M		CN-25F	TUNER AM&FM ← SPEAKER LEFT
100	LR	AVSS0. 75sq	CN-24F		CN-36M	SPEAKER RIGHT ← TUNER AM&FM
101	OB	AVSS0. 75sq	CN-24F		CN-36M	SPEAKER RIGHT → TUNER AM&FM
150	BP	AVSS0. 75sq	CN-36M		CN-30F	AIR CONDITIONER AMP. → RECEIVER DRIER
151	R	MVVS0. 75sq	CN-36M		CN-32M	AIR CONDITIONER AMP. → AIR CONDITIONER SW.
152	G	4 CORES SHIELD	CN-36M		CN-32M	AIR CONDITIONER AMP. → AIR CONDITIONER SW.
153	W		CN-36M		CN-32M	AIR CONDITIONER AMP. ← AIR CONDITIONER SW.
154	B		CN-36M		CN-32M	AIR CONDITIONER AMP. ← AIR CONDITIONER SW.
SH4	Gr		CN-36M		CN-32M	AIR CONDITIONER AMP. ← AIR CONDITIONER SW.
202	GR	AVSS0. 75sq	CN-22F		CN-38M	POWER WINDOW MOTOR ← POWER WINDOW CONTROLLER
203	GB	AVSS0. 75sq	CN-22F		CN-38M	POWER WINDOW MOTOR ← POWER WINDOW CONTROLLER
204	BL	AVSS0. 75sq	CN-38M		CN-23F	POWER WINDOW CONTROLLER → POWER WINDOW MOTOR
205	BP	AVSS0. 75sq	CN-38M		CN-23F	POWER WINDOW CONTROLLER ← POWER WINDOW MOTOR
210	LB	AVSS0. 75sq	CN-44F		CN-37F	ROOF WIPER SW. → ROOF WIPER MOTOR
211	LW	AVSS0. 75sq	CN-44F		CN-37F	ROOF WIPER SW. ← ROOF WIPER MOTOR
214	YG	AVSS0. 75sq	CN-18F		CN-19F	REVOLUTION RIGHT RELAY → REVOLUTION LEFT RELAY
215	GR	AVSS0. 75sq	CN-18F		CN-19F	REVOLUTION RIGHT RELAY ← REVOLUTION LEFT RELAY
216	O	AVSS0. 75sq	CN-18F		CN-35F	REVOLUTION RIGHT RELAY → REVOLUTION RIGHT SOL.
217A	LO	AVSS0. 75sq	CN-18F		CN-27F	REVOLUTION RIGHT RELAY → 15PAF-J/B
217B	LO	AVSS0. 75sq	CN-41F		CN-27F	DIODE → 15PAF-J/B
217C	LO	AVSS0. 75sq	CN-36M		CN-27F	REVOLUTION RIGHT SW. ← 15PAF-J/B

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
218	P	AVSS0. 75sq	CN-19F		CN-35F	REVOLUTION LEFT RELAY → REVOLUTION LEFT SOL.
219A	GY	AVSS0. 75sq	CN-27F		CN-19F	15PAF-J/B ← REVOLUTION LEFT RELAY
219B	GY	AVSS0. 75sq	CN-27F		CN-41F	15PAF-J/B ← DIODE
219C	GY	AVSS0. 75sq	CN-27F		CN-32M	15PAF-J/B → REVOLUTION LEFT SW.
220A	LW	AVSS0. 75sq	CN-46F		CN-26F	DIODE → 15PAF-J/B
220B	LW	AVSS0. 75sq	CN-18F		CN-26F	REVOLUTION RIGHT RELAY ← 15PAF-J/B
220C	LW	AVSS0. 75sq	CN-19F		CN-26F	REVOLUTION LEFT RELAY ← 15PAF-J/B
222	LW	AVSS0. 75sq	CN-44F		CN-34F	LMN/Bh SELECT SW. → ARM PUSH/PULL PORT SELECT SOL.
230	VR	AVSS0. 75sq	CN-42F		CN-30F	AUTO GEASE CONTROLLER → GREASE MOTOR
231	VY	AVSS0. 75sq	CN-42F		CN-30F	AUTO GEASE CONTROLLER ← GREASE MOTOR
232	Gr	AVSS0. 75sq	CN-42F		CN-30F	AUTO GREASE CONTROLLER → GREASE MOTOR
233	GrB	AVSS0. 75sq	CN-42F		CN-30F	AUTO GREASE CONTROLLER ← GREASE MOTOR
233	GrB	AVSS0. 75sq	CN-42F		CN-30F	AUTO GREASE CONTROLLER ← GREASE MOTOR
401	GR	AVSS0. 75sq	CN-41F		CN-40F	FLASHER RELAY ← SWING FLASHER & REAR WORKING LIGHT
402	YG	AVSS0. 75sq	CN-41F		CN-40F	FLASHER RELAY ← SWING FLASHER & REAR WORKING LIGHT
403	Br	AVSS0. 75sq	CN-41F		CN-40F	FLASHER RELAY ← SWING FLASHER & REAR WORKING LIGHT
500	LgR	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BUCKET DIGGING
501	LgW	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BUCKET DUMP
502	LgY	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BOOM RAISING
503	LO	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BOOM LOWERING
504	PG	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: ARM IN
505	PL	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: ARM OUT
506	VY	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: SWING RIGHT
507	VG	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: SWING LEFT
508	VY	AVSS0. 75sq	CN-1F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: TRAVEL RIGHT
509	Sb	AVSS0. 75sq	CN-1F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: TRAVEL LEFT
510	GR	AVSS0. 75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: P1 NEGA-CON.
511	LY	AVSS0. 75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: P2 NEGA-CON.
512	Sb	AVSS0. 75sq	CN-3F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BACK PRESS.
513	LgR	AVSS0. 75sq	CN-3F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: P1 OPT.
514	GO	AVSS0. 75sq	CN-3F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: P2 OPT.
515	V	AVSS0. 75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: PUMP P1
516	L	AVSS0. 75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: PUMP P2
517	P	AVSS0. 75sq	CN-1F		CN-36M	MECHATRO CONTROLLER ← PRESS. SENSOR: ACCEL POTENTIO
518	L	AVSS0. 75sq	CN-34F		CN-7F	BOOM POTENTIO → MECHATRO CONTROLLER
519	V	AVSS0. 75sq	CN-34F		CN-7F	ARM POTENTIO → MECHATRO CONTROLLER
520	LO	AVSS0. 75sq	CN-2F		CN-31M	MECHATRO CONTROLLER → MAINTENANCE CONNECTOR
524	WR	AVSS0. 75sq	CN-34F		CN-7F	INTER BOOM POTENTIO → MECHATRO CONTROLLER
525	WY	AVSS0. 75sq	CN-35F		CN-3F	F/R AND L/R CLINOMETER → MECHATRO CONTROLLER
526	LgY	AVSS0. 75sq	CN-35F		CN-3F	F/R AND L/R CLINOMETER ← MECHATRO CONTROLLER
541	PL	AVSS0. 75sq	CN-2F		CN-31M	MECHATRO CONTROLLER → TWO-SPEED SELECT SW.
542A	GrG	AVSS0. 75sq	CN-36M		CN-27F	POWER BOOST SW. ← 15PAF-J/B
542B	GrG	AVSS0. 75sq	CN-4F		CN-27F	MECHATRO CONTROLLER → 15PAF-J/B
542C	GrG	AVSS0. 75sq	CN-32M		CN-27F	POWER BOOST SW. ← 15PAF-J/B
544	GB	AVSS0. 75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → STEPPING MOTOR

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
30	G	AVSS0. 75sq	CN-206M		CN-30M	ALTERNATOR → SAFETY RELAY
51A	G	MVVS0. 75sq	CN-30M	DOUBLE SPLICE	CN-101M	FUSE BOX ← BATTERY RELAY
51B	R	4 CORES SHIELD	CN-30M		CN-101M	FUSE BOX ← BATTERY RELAY
E2	B		CN-30M			MECHATRO CONTROLLER
E3	W		CN-30M			MECHATRO CONTROLLER
SH3	Gr		UNCONNECTED	X		SHIELD
E18	B	AVSS1. 25sq	CN-105F			EARTH ← EARTH
52	R	AVS5sq	CN-33F		CN-102M	FUSE BOX ← BATTERY RELAY
53	Y	AVS5sq	CN-33F		CN-102M	FUSE BOX ← BATTERY RELAY
58	P	AVSS0. 75sq	CN-206M		CN-30M	GLOW RELAY ← KEY SW.
59	W	AVSS0. 75sq	CN-103F		CN-30M	BATTERY RELAY ← SAFETY RELAY
63	WY	AVSS0. 75sq	CN-206M		CN-30M	STARTER RELAY ← KEY SW.
64	LW	AVSS0. 75sq	CN-206M		CN-30M	STARTER RELAY ← SAFETY RELAY
65	WR	AVSS0. 75sq	CN-206M		CN-30M	ALTERNATOR ← SAFETY RELAY
82	GO	AVSS0. 75sq	CN-112F		CN-30M	WASHER MOTOR ← WINDOW WASHER MOTOR RELAY
83A	GO	AVSS0. 75sq	CN-108F	DOUBLE SPLICE	CN-30M	HORN LOW → HORN RELAY
83B	GO	AVSS0. 75sq	CN-108F		CN-106F	HORN LOW → HORN HIGH
85A	WB	AVSS1. 25sq	CN-110F	DOUBLE SPLICE	CN-30M	BOOM WORKING LIGHT → WORK LIGHT RELAY
85B	WB	AVSS0. 75sq	CN-110F		F-11	BOOM WORKING LIGHT → FRAME WORKING LIGHT RIGHT
86	OW	AVSS0. 75sq	CN-116F		CN-30M	OPERATING LEVER LOCK SOL → TIMER
88	PG	AVSS0. 75sq	CN-138F		CN-30M	TRAVEL ALARM ← TRAVEL ALARM RELAY
90	RY	AVSS0. 75sq	F-14		CN-30M	BOOM CYLINDER WORKING LIGHT → OPT. WORK LIGHT RELAY
150	BP	AVSS0. 75sq	CN-133F		CN-30M	RECEIVER DRIER → AIR CON. AMP.
155	BR	AVSS0. 75sq	CN-133F		CN-206M	RECEIVER DRIER → A/C CLUTCH
230	VR	AVSS0. 75sq	CN-145F		CN-30M	GREASE MOTOR → MECHATRO CONTROLLER
231	VY	AVSS0. 75sq	CN-145F		CN-30M	GREASE MOTOR → MECHATRO CONTROLLER
232	Gr	AVSS0. 75sq	CN-145F		CN-30M	GREASE MOTOR → MECHATRO CONTROLLER
233	GrB	AVSS0. 75sq	CN-145F		CN-30M	GREASE MOTOR → MECHATRO CONTROLLER
401A	GR	AVSS0. 75sq	CN-40M	DOUBLE SPLICE	CN-157F	FLASHER RELAY → SWING FLASHER RIGHT &REAR WORKING LIGHT
401B	GR	AVSS0. 75sq	CN-40M		CN-145F	FLASHER RELAY → SWING FLASHER LEFT &REAR WORKING LIGHT
402A	YG	AVSS0. 75sq	CN-40M	DOUBLE SPLICE	CN-157F	FLASHER RELAY → SWING FLASHER RIGHT &REAR WORKING LIGHT
402B	YG	AVSS0. 75sq	CN-40M		CN-145F	FLASHER RELAY → SWING FLASHER LEFT &REAR WORKING LIGHT
403A	Br	AVSS0. 75sq	CN-40M	DOUBLE SPLICE	CN-157F	FLASHER RELAY → SWING FLASHER RIGHT &REAR WORKING LIGHT
403B	Br	AVSS0. 75sq	CN-40M		CN-145F	FLASHER RELAY → SWING FLASHER LEFT &REAR WORKING LIGHT
500	LoR	AVSS0. 75sq	CN-124F		CN-30M	PRESS. SENSOR BUCKET DIGGING → MECHATRO CONTROLLER
501	LoW	AVSS0. 75sq	CN-125F		CN-30M	PRESS. SENSOR BUCKET DUMP → MECHATRO CONTROLLER
502	LoY	AVSS0. 75sq	CN-126F		CN-30M	PRESS. SENSOR BOOM RAISING → MECHATRO CONTROLLER
503	LO	AVSS0. 75sq	CN-127F		CN-30M	PRESS. SENSOR BOOM LOWERING → MECHATRO CONTROLLER
504	PG	AVSS0. 75sq	CN-130F		CN-30M	PRESS. SENSOR ARM IN → MECHATRO CONTROLLER
505	PL	AVSS0. 75sq	CN-131F		CN-30M	PRESS. SENSOR ARM OUT → MECHATRO CONTROLLER
506	VY	AVSS0. 75sq	CN-129F		CN-30M	PRESS. SENSOR SWING RIGHT → MECHATRO CONTROLLER
507	VG	AVSS0. 75sq	CN-128F		CN-30M	PRESS. SENSOR SWING LEFT → MECHATRO CONTROLLER
510	GR	AVSSX0. 75sq	CN-113F		CN-30M	PRESS. SENSOR P1 NEGA-CON. → MECHATRO CONTROLLER
511	LY	AVSSX0. 75sq	CN-115F		CN-30M	PRESS. SENSOR P2 NEGA-CON. → MECHATRO CONTROLLER
512	Sb	AVSS0. 75sq	CN-114F		CN-30M	PRESS. SENSOR BACK PRESS. → MECHATRO CONTROLLER
515	V	AVSSX0. 75sq	CN-139F		CN-30M	PRESS. SENSOR PUMP P1 → MECHATRO CONTROLLER
516	L	AVSSX0. 75sq	CN-140F		CN-30M	PRESS. SENSOR PUMP P2 → MECHATRO CONTROLLER
544	GB	AVSS0. 75sq	CN-134F		CN-30M	STEPPING MOTOR → MECHATRO CONTROLLER
547	GB	AVSS0. 75sq	CN-206M		CN-30M	ENG. WATER TEMP. SW. → MECHATRO CONTROLLER
548	GY	AVSS0. 75sq	F-15		CN-30M	ENG. OIL PRESS. SW. → MECHATRO CONTROLLER
549	Lo	AVSS0. 75sq	F-12		CN-30M	AIR FILTER RESTRICTION SW. → MECHATRO CONTROLLER
550	BG	AVSS0. 75sq	CN-143F		CN-30M	ENG. OIL LEVEL SW. → MECHATRO CONTROLLER
551	GL	AVSS0. 75sq	CN-132F		CN-30M	ENG. COOLANT LEVEL SW. → MECHATRO CONTROLLER
552	BrL	AVSS0. 75sq	CN-137F		CN-30M	HYD. FLUID LEVEL SW. → MECHATRO CONTROLLER
553	VW	AVSS0. 75sq	CN-104F		CN-30M	FUEL SENSOR → MECHATRO CONTROLLER

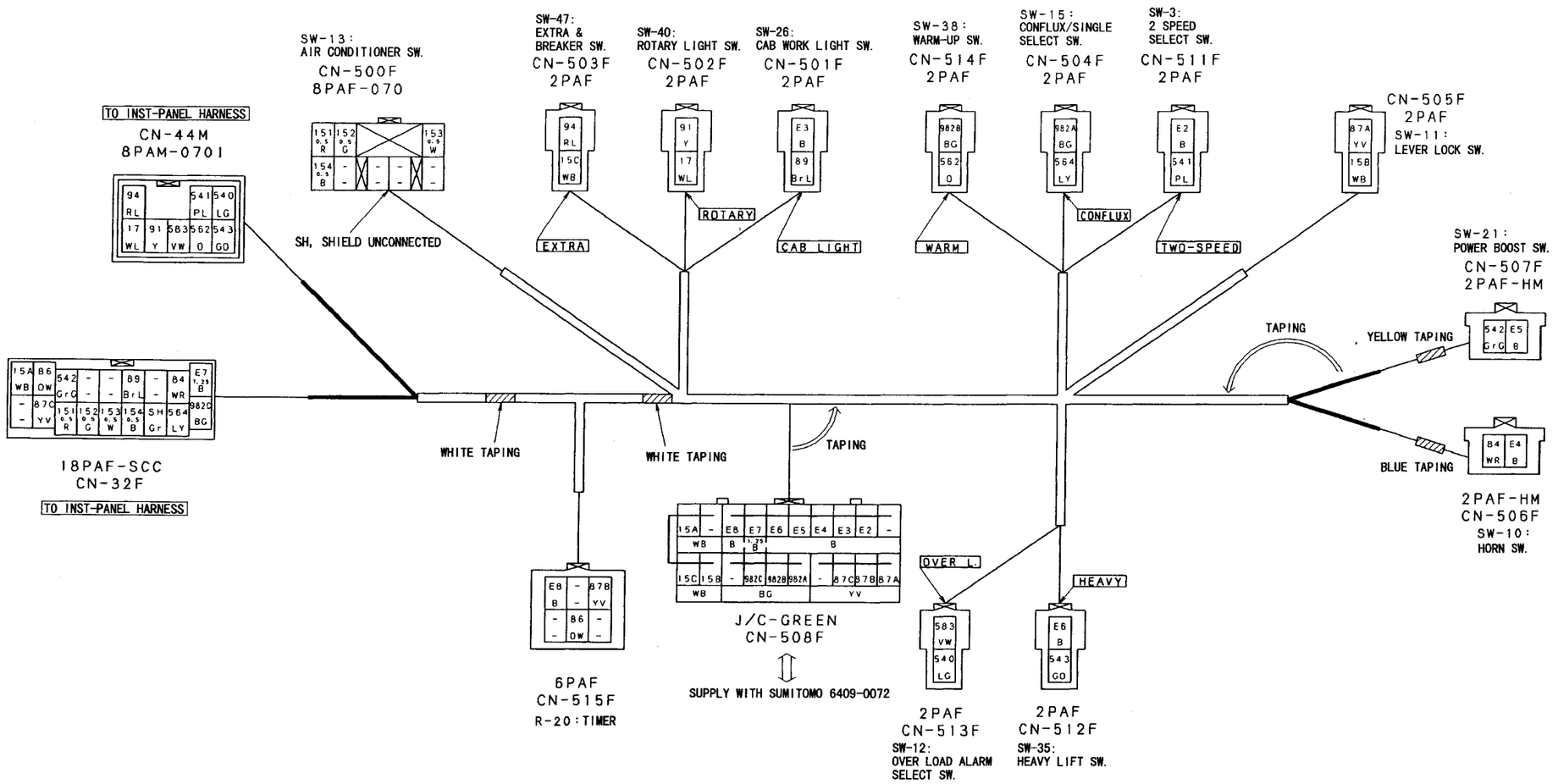
WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
563	O	AVSS0. 75sq	F-13		CN-30M	HYD. FLUID TEMP. SW. → MECHATRO CONTROLLER
566	LW	AVSS0. 75sq	CN-156F		CN-56M	ENG. OIL FILTER SW. → MECHATRO CONTROLLER
580	R	MVVS0. 75sq	CN-136F		CN-30M	ENG. REVOLUTION SENSOR → MECHATRO CONTROLLER
581	W	2 CORES SHIELD	CN-136F		CN-30M	ENG. REVOLUTION SENSOR → MECHATRO CONTROLLER
SH2	Gr		UNCONNECTED	X	CN-30M	SHIELD
600	YR	AVSS0. 75sq	CN-206M		CN-30M	COOLANT THERMO SENSOR → CLUSTER GAUGE CONTORLLER
601	BrR	AVSS0. 75sq	CN-104F		CN-30M	FUEL SENSOR → CLUSTER GAUGE CONTORLLER
700	WG	AVSS0. 75sq	CN-103F		CN-30M	BATTERY RELAY → MECHATRO CONTROLLER
702	LoB	AVSS0. 75sq	CN-122F		CN-30M	TWO-SPEED SELECT SOL. → MECHATRO CONTROLLER
703	P	AVSS0. 75sq	CN-117F		CN-30M	POWER BOOST SOL. → MECHATRO CONTROLLER
720	PB	AVSS0. 75sq	CN-123F		CN-30M	SWING PARKING BRAKE SOL → SWING PARKING RELEASE SW
740	BO	AVSS0. 75sq	CN-118F		CN-30M	P2 BY-PASS CUT PROPORTIONAL SOL → MECHATRO CONTROLLER
741	GrR	AVSS0. 75sq	CN-118F		CN-30M	P2 BY-PASS CUT PROPORTIONAL SOL → MECHATRO CONTROLLER
742	VR	AVSS0. 75sq	CN-119F		CN-30M	TRAVEL PRIORITY PROPORTIONAL SOL → MECHATRO CONTROLLER
743	GrB	AVSS0. 75sq	CN-119F		CN-30M	TRAVEL PRIORITY PROPORTIONAL SOL → MECHATRO CONTROLLER
744	BP	AVSS0. 75sq	CN-120F		CN-30M	P1 BY-PASS CUT PROPORTIONAL SOL → MECHATRO CONTROLLER
745	PW	AVSS0. 75sq	CN-120F		CN-30M	P1 BY-PASS CUT PROPORTIONAL SOL → MECHATRO CONTROLLER
746	BrG	AVSS0. 75sq	CN-121F		CN-30M	ARM VALVABLE RECIRCULATION PROPORTIONAL SOL → MECHATRO CONTROLLER
747	YV	AVSS0. 75sq	CN-121F		CN-30M	ARM VALVABLE RECIRCULATION PROPORTIONAL SOL → MECHATRO CONTROLLER
756	BrY	AVSSX0. 75sq	CN-141F		CN-30M	PUMP P1 PROPORTIONAL SOL → K. P. S. S MODE RELEASE SW.
757	RY	AVSSX0. 75sq	CN-141F		CN-30M	PUMP P1 PROPORTIONAL SOL → K. P. S. S MODE RELEASE SW.
758	BrB	AVSSX0. 75sq	CN-142F		CN-30M	PUMP P2 PROPORTIONAL SOL → K. P. S. S MODE RELEASE SW.
759	RL	AVSSX0. 75sq	CN-142F		CN-30M	PUMP P2 PROPORTIONAL SOL → K. P. S. S MODE RELEASE SW.
771	G	MVVS0. 75sq	CN-135F		CN-30M	STEPPING MOTOR → MECHATRO CONTROLLER
772	B	4 CORES SHIELD	CN-135F		CN-30M	STEPPING MOTOR → MECHATRO CONTROLLER
773	R		CN-135F		CN-30M	STEPPING MOTOR → MECHATRO CONTROLLER
774	W		CN-135F		CN-30M	STEPPING MOTOR → MECHATRO CONTROLLER
SH1	Gr		UNCONNECTED	X	CN-30M	SHIELD
900	RB	AVSS0. 75sq	CN-124F		CN-30M	PRESS. SENSOR BUCKET DIGGING → MECHATRO CONTROLLER
901	RL	AVSS0. 75sq	CN-125F		CN-30M	PRESS. SENSOR BUCKET DUMP → MECHATRO CONTROLLER
902	W	AVSS0. 75sq	CN-126F		CN-30M	PRESS. SENSPR BOOM RAISING → MECHATRO CONTROLLER
903	OB	AVSS0. 75sq	CN-127F		CN-30M	PRESS. SENSOR BOOM LOWERING → MECHATRO CONTROLLER
904	OL	AVSS0. 75sq	CN-130F		CN-30M	PRESS. SENSOR ARM IN → MECHATRO CONTROLLER
905	OW	AVSS0. 75sq	CN-131F		CN-30M	PRESS. SENSOR ARM OUT → MECHATRO CONTROLLER
906	YB	AVSS0. 75sq	CN-129F		CN-30M	PRESS. SENSOR SWING RIGHT → MECHATRO CONTROLLER
907	YG	AVSS0. 75sq	CN-128F		CN-30M	PRESS. SENSOR SWING LEFT → MECHATRO CONTROLLER
910	WY	AVSSX0. 75sq	CN-113F		CN-30M	PRESS. SENSOR P1 NEGA-CON. → MECHATRO CONTROLLER
911	RG	AVSSX0. 75sq	CN-115F		CN-30M	PRESS. SENSOR P2 NEGA-CON. → MECHATRO CONTROLLER
912	RW	AVSS0. 75sq	CN-114F		CN-30M	PRESS. SENSOR BACK PRESS. → MECHATRO CONTROLLER
915	YL	AVSSX0. 75sq	CN-139F		CN-30M	PRESS. SENSOR PUMP P1 → MECHATRO CONTROLLER
916	YR	AVSSX0. 75sq	CN-140F		CN-30M	PRESS. SENSOR PUMP P2 → MECHATRO CONTROLLER
950	BrR	AVSS0. 75sq	CN-124F		CN-30M	PRESS. SENSOR BUCKET DIGGING → MECHATRO CONTROLLER
951	BL	AVSS0. 75sq	CN-125F		CN-30M	PRESS. SENSOR BUCKET DUMP → MECHATRO CONTROLLER
952	BR	AVSS0. 75sq	CN-126F		CN-30M	PRESS. SENSOR BOOM RAISING → MECHATRO CONTROLLER
953	BrW	AVSS0. 75sq	CN-127F		CN-30M	PRESS. SENSOR BOOM LOWERING → MECHATRO CONTROLLER
954	BrL	AVSS0. 75sq	CN-130F		CN-30M	PRESS. SENSOR ARM IN → MECHATRO CONTROLLER
955	Gr	AVSS0. 75sq	CN-131F		CN-30M	PRESS. SENSOR ARM OUT → MECHATRO CONTROLLER
956	GrL	AVSS0. 75sq	CN-129F		CN-30M	PRESS. SENSOR SWING RIGHT → MECHATRO CONTROLLER
957	Br	AVSS0. 75sq	CN-128F		CN-30M	PRESS. SENSOR SWING LEFT → MECHATRO CONTROLLER
960	BY	AVSSX0. 75sq	CN-113F		CN-30M	PRESS. SENSOR P1 NEGA-CON. → MECHATRO CONTROLLER
961	BW	AVSSX0. 75sq	CN-115F		CN-30M	PRESS. SENSOR P2 NEGA-CON. → MECHATRO CONTROLLER

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
962	GrG	AVSS0. 75sq	CN-114F		CN-30M	PRESS. SENSOR BACK PRESS. → MECHATRO CONTROLLER
965	BrB	AVSSX0. 75sq	CN-139F		CN-30M	PRESS. SENSOR PUMP P1 → MECHATRO CONTROLLER
966	BrY	AVSSX0. 75sq	CN-140F		CN-30M	PRESS. SESOR PUMP P2 → MECHATRO CONTROLLER
E1	B	AVS5sq	P-11		CN-33F	EARTH → INST PANEL
E4	B	AVSS0. 75sq	CN-104F		CN-105F	FUEL SENSOR → 11PAF-GND
E5	B	AVSS0. 75sq	M-11		CN-105F	FRAME WORKING LIGHT RIGHT → 11PAF-GND
E6	B	AVSS0. 75sq	CN-107F		CN-105F	HORN HIGH → 11PAF-GND
E7	B	AVSS0. 75sq	CN-109F		CN-105F	HORN LOW → 11PAF-GND
E8	B	AVSS0. 75sq	CN-103F		CN-105F	BATTERY RELAY → 11PAF-GND
E9	B	AVSS0. 75sq	CN-116F		CN-111F	OPERATING LEVER LOCK SOL → 11PAF-GND
E10	B	AVSS0. 75sq	CN-117F		CN-111F	POWER BOOST SOL. → 11PAF-GND
E11	B	AVSS0. 75sq	CN-122F		CN-111F	TWO-SPEED SELECT SOL. → 11PAF-GND
E12	B	AVSS0. 75sq	CN-123F		CN-111F	SWING PARKING BRAKE SOL. → 11PAF-GND
E13	B	AVSS0. 75sq	M-12		CN-111F	AIR FILTER RESTRICTION SW. → 11PAF-GND
E14	B	AVSS0. 75sq	CN-138F		CN-105F	TRAVEL ALARM → 11PAF-GND
E15	B	AVSS0. 75sq	CN-112F		CN-111F	WASHER MOTOR → 11PAF-GND
E16	B	AVSS0. 75sq	CN-132F		CN-111F	ENG. COOLANT LEVEL SW. → 11PAF-GND
E17	B	AVSS0. 75sq	CN-134F		CN-111F	STEPPING MOTOR → 11PAF-GND
E19	B	AVSS0. 75sq	CN-143F		CN-111F	ENG. OIL LEVEL SW. → 11PAF-GND
E20	B	AVSS0. 75sq	CN-137F		CN-105F	HYD. FLUID LEVEL SW. → 11PAF-GND
E24	B	AVSS0. 75sq	CN-157F		CN-105F	SWING FLASHER RIGHT &REAR WORKING LIGHT → 11PAF-GND
E25	B	AVSS0. 75sq	CN-145F		CN-111F	SWING FLASHER LEFT &REAR WORKING LIGHT → 11PAF-GND
E30	B	AVSS0. 75sq	M-14		CN-105F	BOOM CYLINDER WORKING LIGHT → 11PAF-GND
E31	B	AVSS0. 75sq	F-16		CN-111F	HYD. FLUID TEMP. SW. → 11PAF-GND

3.8.14 INSTRUMENT PANEL LH HARNESS : YN13E01204P1, EU

CONNECTORS SELECTION TABLE

CONNECTOR NAME (PIN NUM.)	MANUFUC.	PART. NUMBER	
		HOUSING	TERMINAL
18PAF-SCC	AMP	6-178692-6	175266-2
			175269-1
8PAF-070	AMP	176113-6	173631-1
			173631-2
8PAM-0701	AMP	174931-1	173645-1
2PAF	YAZAKI	7123-2228	7116-2090
J/C-GREEN	SUMITOMO	6400-0013	8240-4422
		6409-0072	
2PAF-HM	SUMITOMO	6090-1001	8240-4422
6PAF	YAZAKI	7123-2262	7116-2090



WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
15A	WB	AVSS0.75sq	CN-508F		CN-32F	J/C-GREEN ← FUSE BOX
15B	WB	AVSS0.75sq	CN-508F		CN-505F	J/C-GREEN → LEVER LOCK SW.
15C	WB	AVSS0.75sq	CN-508F		CN-503F	J/C-GREEN → EXTRA & BREAKER SW.
17	WL	AVSS0.75sq	CN-44M		CN-502F	FUSE BOX → ROTARY LIGHT SW.
84	WR	AVSS0.75sq	CN-506F		CN-32F	HORN SW. ← HORN RELAY
86	OW	AVSS0.75sq	CN-515F		CN-32F	TIMER → OPERATING LEVER LOCK SOL.
87A	YV	AVSS0.75sq	CN-508F		CN-505F	J/C-GREEN → LEVER LOCK SW.
87B	YV	AVSS0.75sq	CN-508F		CN-515F	J/C-GREEN → TIMER
87C	YV	AVSS0.75sq	CN-508F		CN-32F	J/C-GREEN → MECHATRO CONTROLLER
89	BrL	AVSS0.75sq	CN-501F		CN-32F	CAB WORK LIGHT SW. ← OPT. WORK LIGHT RELAY
91	Y	AVSS0.75sq	CN-44M		CN-502F	LOTARY LIGHT → ROTARY LIGHT SW.
94	RL	AVSS0.75sq	CN-44M		CN-503F	EXTRA SOL. → EXTRA & BREAKER SW.
151	R	MVVS0.5sq 4 CORES SHIELD	CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP
152	G		CN-500F		CN-32F	AIR CONDITIONER SW. → AIR CONDITIONER AMP
153	W		CN-500F		CN-32F	AIR CONDITIONER SW. → AIR CONDITIONER AMP
154	B		CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP
SH	Gr		UNCONNECTED		CN-32F	SHIELD ← AIR CONDITIONER AMP

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
540	LG	AVSS0.75sq	CN-44M		CN-513F	MECHATRO CONTTOLLER → OVER LOAD ALARM SELECT SW.
541	PL	AVSS0.75sq	CN-44M		CN-511F	MECHATRO CONTTOLLER → TWO-SPEED SELECT SW.
542	GrG	AVSS0.75sq	CN-507F		CN-32F	ATT BOOST SW. ← MECHATRO CONTTOLLER
543	GO	AVSS0.75sq	CN-44M		CN-512F	MECHATRO CONTTOLLER → HEAVY LIFT SW.
562	O	AVSS0.75sq	CN-44M		CN-514F	SW. BOX ASSY → WARM-UP SW.
564	LY	AVSS0.75sq	CN-504F		CN-32F	CONFLUX/SINGLE SELECT SW. ← SW. BOX ASSY
583	VW	AVSS0.75sq	CN-44M		CN-513F	OVERLOAD ALARM DETECT SW. → OVER LOAD ALARM SELECT SW.
982A	BG	AVSS0.75sq	CN-508F		CN-504F	J/C-GREEN ← CONFLUX/SINGLE SELECT SW.
982B	BG	AVSS0.75sq	CN-508F		CN-514F	J/C-GREEN ← WARM-UP SW.
982C	BG	AVSS0.75sq	CN-508F		CN-32F	J/C-GREEN ← SW BOX ASSY
E2	B	AVSS0.75sq	CN-508F		CN-511F	J/C-GREEN ← TWO-SPEED SELECT SW.
E3	B	AVSS0.75sq	CN-508F		CN-501F	J/C-GREEN ← CAB WORK LIGHT SW.
E4	B	AVSS0.75sq	CN-508F		CN-506F	J/C-GREEN ← HORN SW.
E5	B	AVSS0.75sq	CN-508F		CN-507F	J/C-GREEN ← POWER BOOST SW.
E6	B	AVSS0.75sq	CN-508F		CN-512F	J/C-GREEN ← HEAVY LIFT SW.
E7	B	AVSS1.25sq	CN-508F		CN-32F	J/C-GREEN → EARTH
E8	B	AVSS0.75sq	CN-508F		CN-515F	J/C-GREEN → TIMER

Fig.20E Instrument panel left harness

Applicable Machines
LC06-05501～
YC06-02501～

Revision	Date of Issue	Remarks
First edition	March, 2000	S5LC2407E K
First revision	April, 2001	S5LC2407E① K

1.3.4 CAUSES OF FAULT RESULTING FROM REGULATOR

When trouble due to this regulator occurs, Disassemble and inspect it referring to "Chapter LC33".

(1) When the engine is overloaded,
Load every unit of pump, and check on pumps on the right and left sides for possible damages. When pumps on both sides are failed, check on them for the following failures 1), 2). When pump on the one side is failed, start checking from par. 3).

1) Check that the power shift command current I is normal.
2) The power shift pressure is low.
   • Check the dither of amp.
   • Replace solenoid proportional reducing valve.
3) Stick of compensating piston and compensating rod
   • Disassemble and clean it.
4) Stick of pin (898)
   • Disassemble and clean it.

(2) The max. flow rate is not delivered.

1) Check that pilot differential pressure Pi is normal.
2) Stick of pilot piston
   • Disassemble and clean it.
3) Stick of spool
   • Disassemble and clean it.

Note : When the damage of part is severe, replace the part with new one.

1) Adjusting the Outer Spring (See Fig. 1-9)
(At back-up control)
Adjust it by loosening lock nut (630) and by tightening adjust screw C (628) (or loosening it). Tightening the adjust screw shifts the control chart to the right and increases the input horsepower, as indicated in Fig.1-18.
Since turning the adjust screw C by N turns changes the setting of the inner spring, return the adjust screw (925) by 2.2N turns at first.

Adjust screw No.	628
No. of turns for tightening	1/4
Increase in delivery pressure kgf/cm² (psi)	17.8 (250)
Increase in input torque kgf·m (ft·lbs)	4.7 (34)

2) Adjusting the Inner Spring (See Fig. 1-9)
(At back-up control)
Adjust it by loosening nut (801) and by adjust screw (925) (or loosening it). Tightening the adjust screw increases the flow and then the input horsepower, as indicated in Fig.1-19. And the input torque raises.

Adjust screw No.	925
No. of turns for tightening	1/4
Increase in flow ℓ/min (gal/min)	18.4 (4.9)
Increase in input torque kgf·m (ft·lbs)	3.2 (23)

(4) Adjusting the flow control characteristics (See Fig. 1-9)
Adjust them by loosening nut (801) and socket screw (924) (or loosening it). Socket screw causes the control chart to move to the right as shown in Fig.1-20. Socket screw raises the flow control start pilot pressure. And the delivery rate increases.

Adjust screw No.	924
No. of turns for tightening	1/4
Increase Pilot pressure Pi kgf/cm² (psi) Increase input current I mA	1.3 (18) 21mA
Increase in delivery flow ℓ/min (gal/min)	13.0 (3.4)

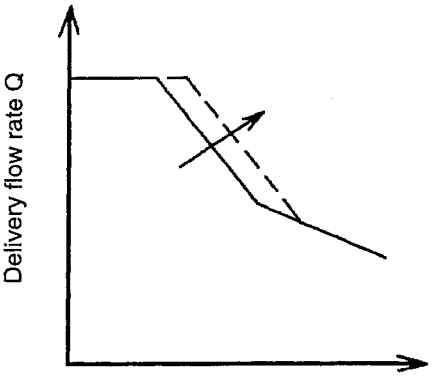


Fig.1-20 Adjusting the input horsepower (1)

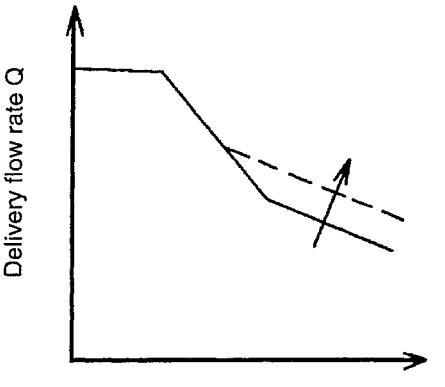


Fig.1-21 Adjusting the input horsepower (2)

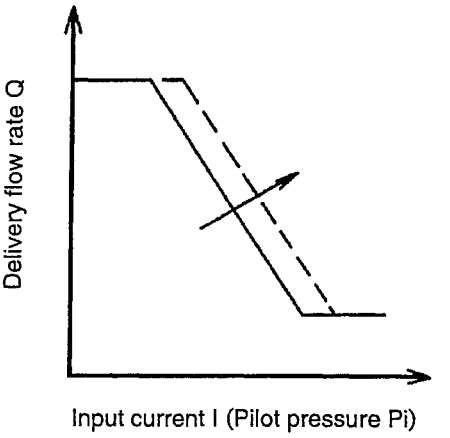


Fig.1-22 Adjusting the flow control characteristics

2.4 OPERATION

(1) Control valve in neutral

Purpose :

To reduce the pump flow rate by means of the negative control signal.

Principle :

The negative control signal pressure is output when the flow rate at the extreme down stream is raised.

Operation :

The oil delivered from the hydraulic pump P1 flows into P1 port of the control valve, passes through the travel spool (307) and main passage (51), is led into bypass circuit which passes through the travel right, bucket and boom control sections and P1 bypass cut spool (309).

The oil delivered passes through P1 bypass cut spool (309) and flows into negative control relief valve (N611) located in negative control relief valve block (212) because P1 bypass cut spool (309) is not switched.

The poppet section of negative control relief valve (N611) has many small holes, and the oil delivered passes these holes and returns into the tank port. Consequently the rise of flow rate causes the rise of Pn1 pressure and the negative control signal is output through Pn1 port or Pn1' port. When the pressure of the negative control valve rises higher than the specified pressure, the poppet opens and the oil is led into the tank port (T).

The oil delivered from the hydraulic pump P2 also passes through main passage (54) and is led into bypass circuit (55) which passes through the travel left, boom conflux and arm control sections and P2 bypass cut spool (309) like the oil delivered from the hydraulic pump P1. The oil delivered flows into negative control relief valve (N611) like P1 side, causes the rise of Pn2 pressure, and the negative control signal is output through Pn2 port or Pn2' port.

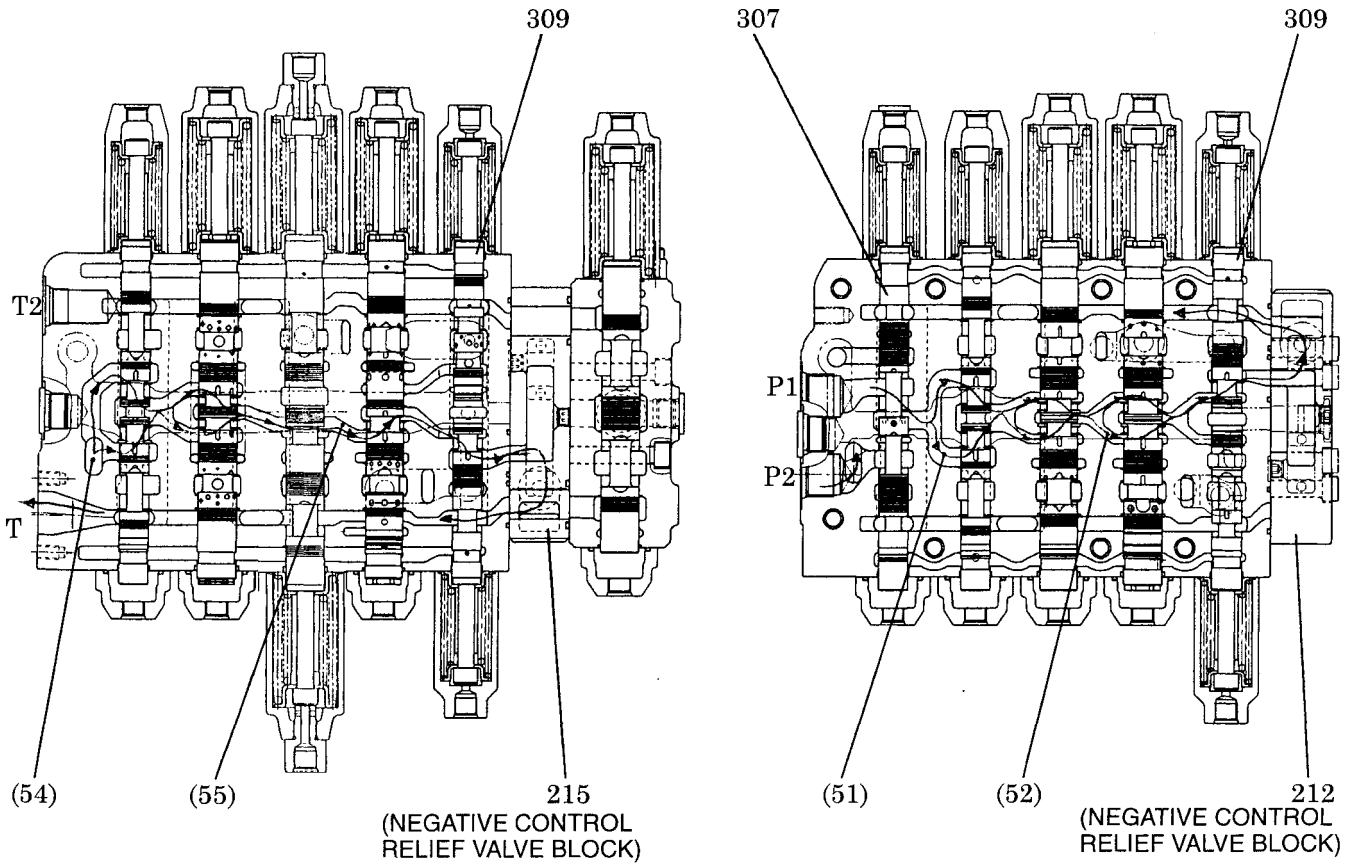


Fig. 2-14 Functions at neutral

3) When the arm is in (under light load)

Operation	C/V Port name		
	Pilot secondary pressure side	Solenoid proportional secondary pressure side	Main pressure oil supply side
Arm in (under light load)	PAa PLC2 —	— — Pis	Ab

Purpose :

Speed up of in operation and prevention of cavitation when operating the arm at light load.

Principle :

The return oil from the arm cylinder (R) side is recirculated into the cylinder (H) side in the C/V.

If the arm in operation is performed, the secondary pilot pressure coming out of port ④ of the pilot valve acts upon the PAa port of the control valve and the PLc2 port of the lock valve selector. This causes the arm spool (302) to move to the right and changes the lock valve selector spool (211).

The pressure oil delivered by the pump P2 flows into the bypass circuit (55) past the main passage (54), but since the bypass circuit (55) is blocked by the arm spool (302), the oil pressure pushes the check valve (CP2) open, flows into the parallel circuit (56), pushes the load check valve LCa (511) open, goes between the outer circumference of the arm spool (302) and the casing through the U-shaped passage and is supplied to the arm cylinder (H) side via port (Aa).

Meanwhile, the oil which has returned from the arm cylinder (R) enters the control valve through the port (Ba).

The lock valve poppet CRa (514) is located just before arm spool (302), but since the pilot secondary pressure acts on PLc2 port and the lock valve selector spool is switched, lock valve poppet (514) opens and the pressure is led into chamber AR. In addition, the return oil has sufficient pressure because of the weight of the arm, etc., consequently the secondary pressure is led in the arm spool.

Consequently, the return oil from the arm cylinder (R) side passes through the inside of arm spool and notches on the arm spool, and flows through recirculation circuit and led in arm recirculation spool (310).

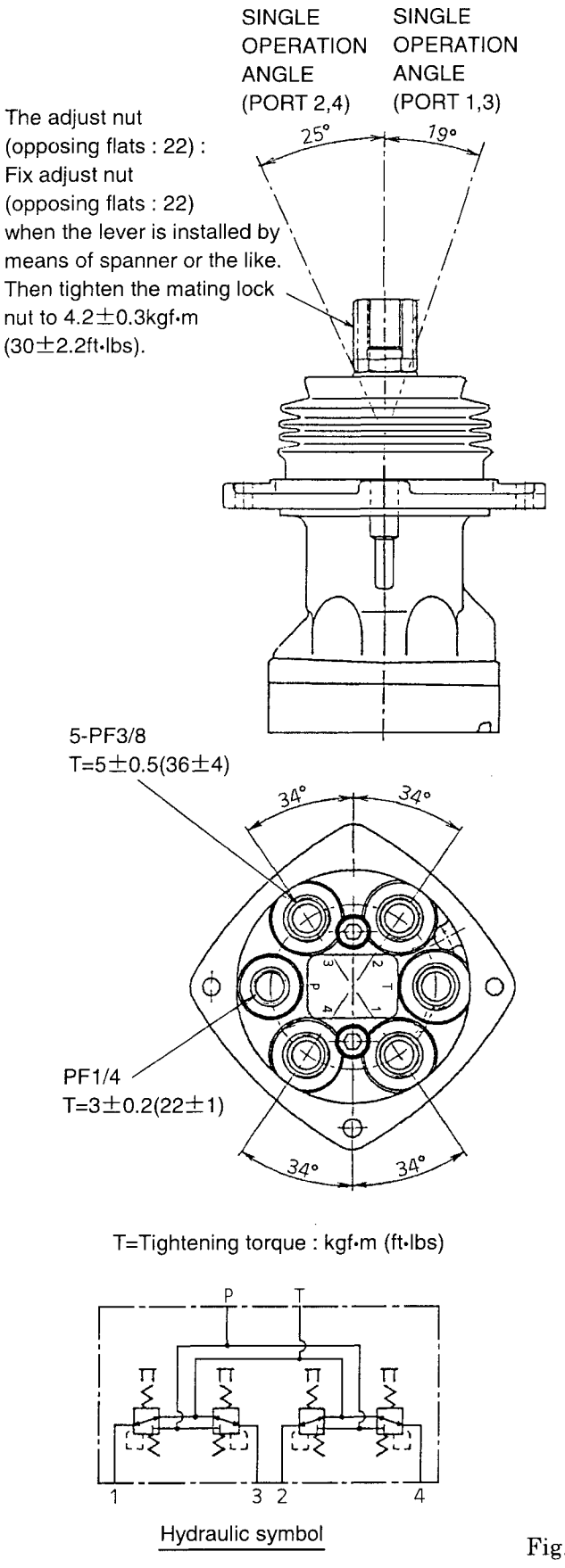
In that case, the secondary pressure of the solenoid proportional valve (Pis) is acting on the Pis port of the control valve and the arm recirculation spool is in position (II). Therefore, the oil pressure enters the passage (61) through the inside of the arm recirculation spool (310), pushes open the arm recirculation check valve poppet (512) and is supplied once again to the arm cylinder (H) as the operating oil for arm digging operation.

Part of the hydraulic oil admitted to arm recirculation spool (310) flows into tank port (T) from low pressure circuit (D) and returns to the hydraulic oil tank.

3. PILOT VALVE (ATT)

3.1 OUTLINE

(1) Outside view

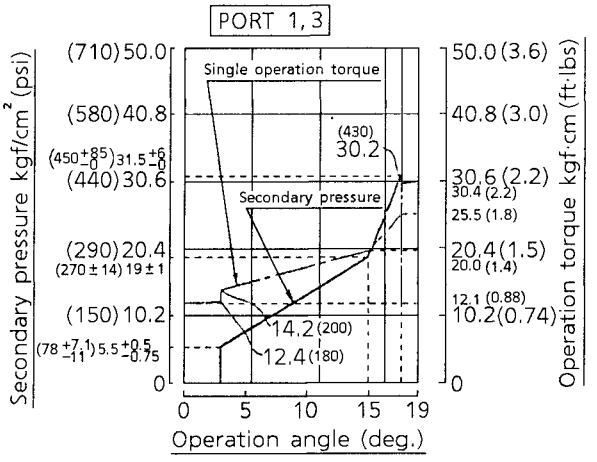


(2) Specification

Table 3-1

Item	Specification
Part No.	YT30V00008F2
Model	PV48K1008
Operating torque	Refer to the Fig. 3-1
Max. primary pressure	50kgf/cm^2 (710psi)
Primary pressure	50kgf/cm^2 (710psi)
Rated flow	20 ℓ /min (5.3gal/min)
Weight	Approx. 2kg (4 lbs)

(3) Performance characteristics



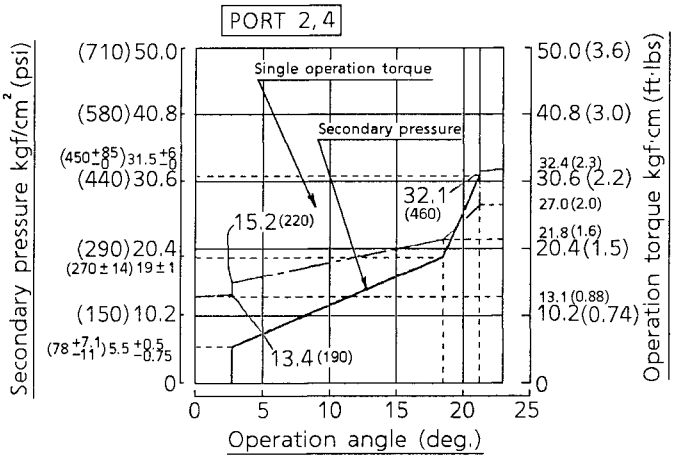


Fig. 3-1

(2) Specification

Swing motor unit part No.				LC15V00006F1
Hydraulic motor	Part No.			LC15V00003F1
	Type			M2X210CHB−10A−39M/280−197
	Displacement		cm^3 (cu·yd)	197 (260)
	Working pressure		kgf/cm^2 (psi)	300 (4270)
	Max. pressure		kgf/cm^2 (psi)	350 (4980)
	Working flow		ℓ /min (gal/min)	253 (67)
	Braking torque		kgf·m (ft·lbs)	89^{+25}_{0} (1270^{+360}_{0})
	Release pressure (Stroke end)		kgf/cm^2 (psi)	29^{+5}_{0} (410^{+71}_{0})
	Relief set pressure		kgf/cm^2 (psi)	280 (3980)
	Weight		kg (lbs)	74.5 (164)
	Swing shockless valve block	Part No.		YN22V00014F4
		Type		2KAR6P72/240-712
		Weight	kg (lbs)	2.5 (5.5)
	Hydraulic motor assy weight		kg (lbs)	77 (170)
Reduction unit	Part No.			—
	Speed reduction type			Planetary 2-stage
	Reduction ratio			23.385
	Lubicate oil			Gear oil SAE90 (API class GL−4 grade)
	Lubicate oil volume		(gal)	21.51 (5.7)
	Grease			Extreme pressure multipurpose grease
	Grease volume			A small amount
	Weight		kg (lbs)	411 (906)
Total weight			kg (lbs)	488 (1080)

(5) Brake valve

1) Spool
If the spool (2) is shifted, the oil discharged from the hydraulic motor is shut off and throttled automatically. The hydraulic motor performs holding, acceleration, stop and counterbalance actions.

2) Check valve (built in the spool)
It is the oil feeding passage to the hydraulic motor and locks the exhaust oil. Therefore, the check valve serves as the suction valve and the holding valve for the hydraulic motor.

3) Relief valve (built in the hydraulic motor)
When the pressure in the oil supply / discharge passage of the hydraulic motor reaches a set pressure value, it is relieved to the other low pressure passage to act as a safety valve of the circuit.

Spool select pressure	6.0～10kgf/cm^2 (85～140psi)
Check valve cracking pressure	0.1kgf/cm^2 (1.4psi)

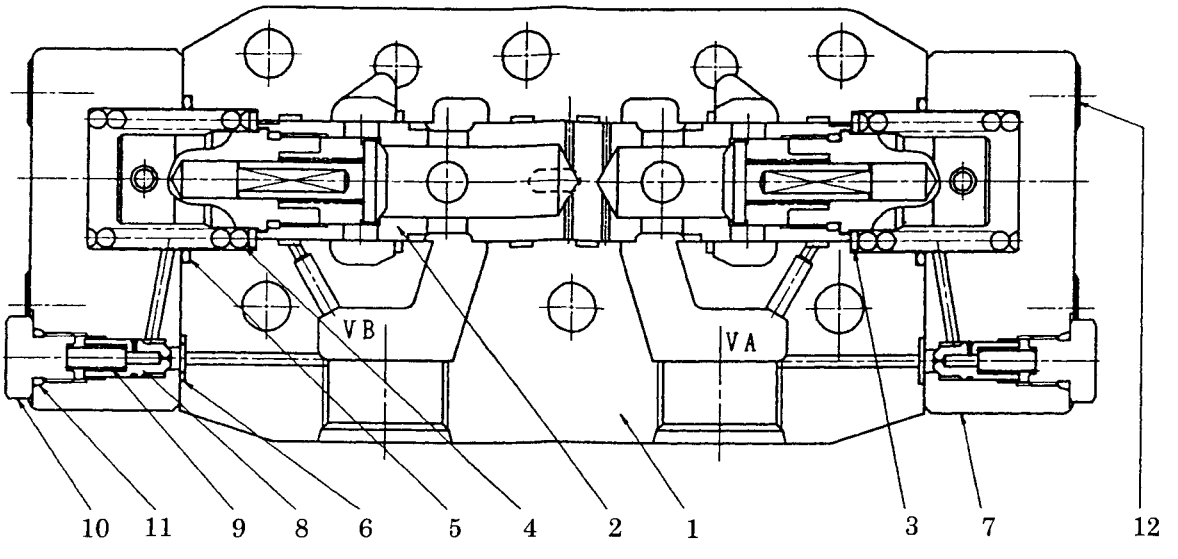


Fig. 6-5 Brake valve

No.	NAME	Q'TY	No.	NAME	Q'TY
1	BODY	1	9	SPRING	2
2	SPOOL ASSY	1	10	PLUG	2
3	SPRING SEAT	2	11	O RING ; 1B P11	4
4	SPRING	2	12	CAPSCREW ; M12×45	8
5	O RING ; 1B G40	2	13	O RING ; 1B G35	2
6	O RING ; 1B P9	3	14	CAPSCREW ; M12×80	6
7	COVER	2	15	PLUG	2
8	RESTRICTOR VALVE	2	17	O RING ; 1B P10	1

8.2 CONSTRUCTION

(1) Boom cylinder

T=Tightening torque ; kgf·m (ft·lbs)

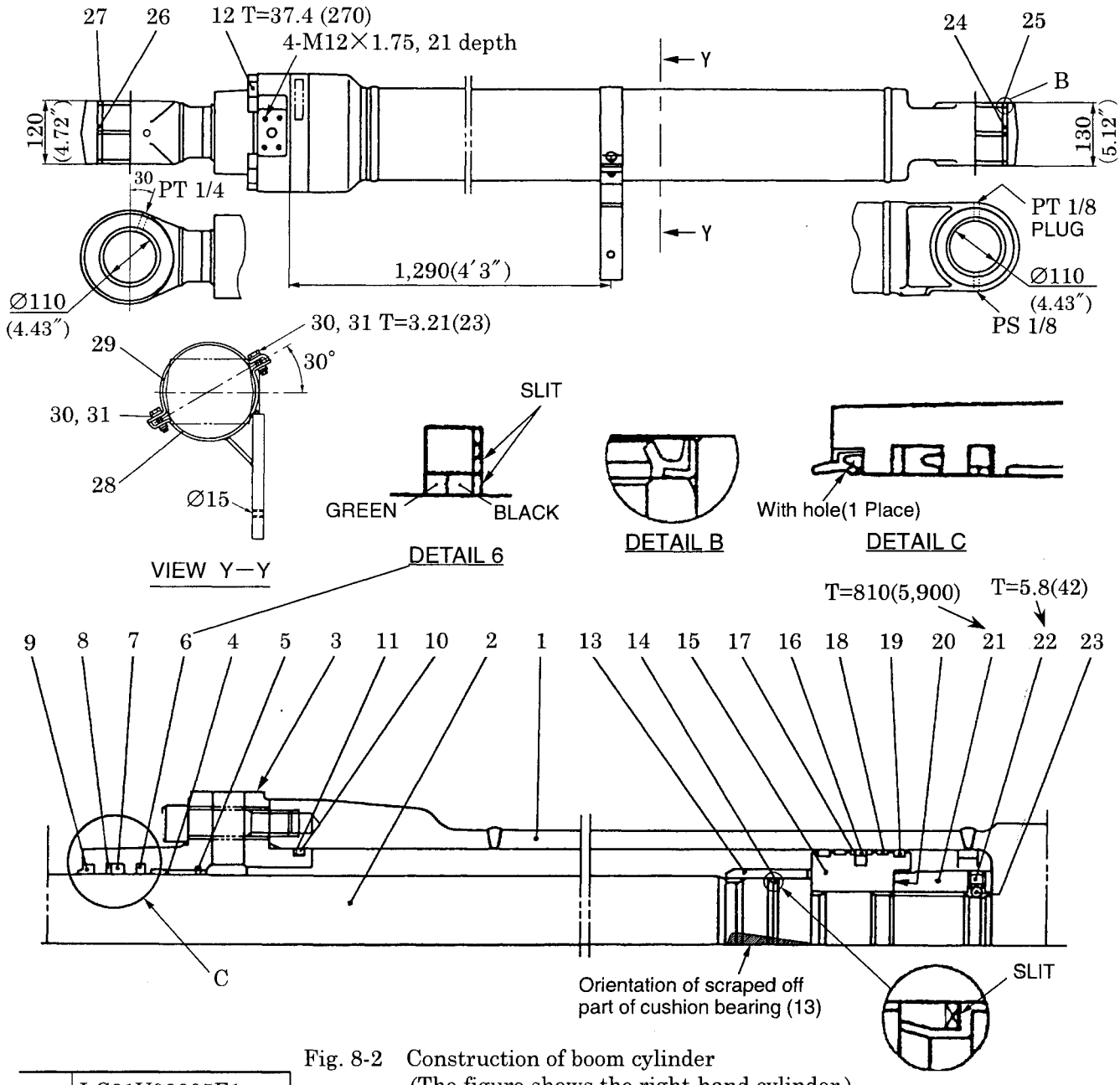
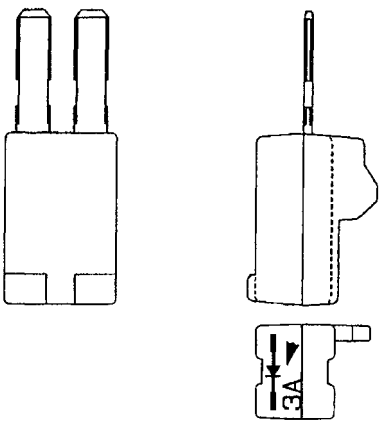
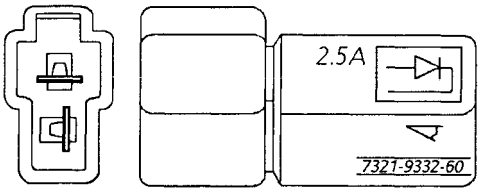
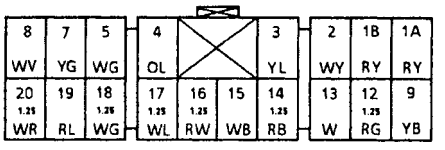
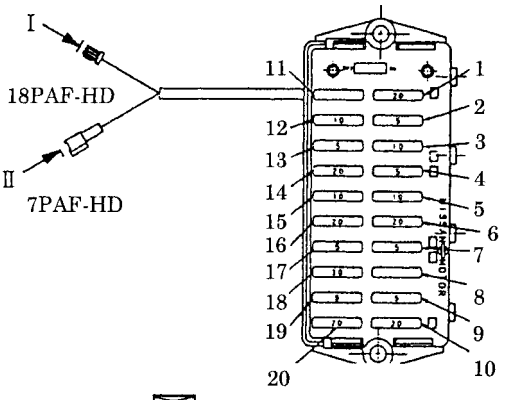
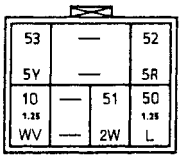


Fig. 8-2 Construction of boom cylinder
(The figure shows the right-hand cylinder.)

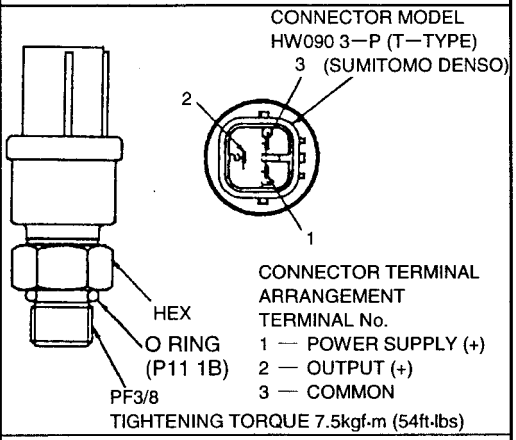
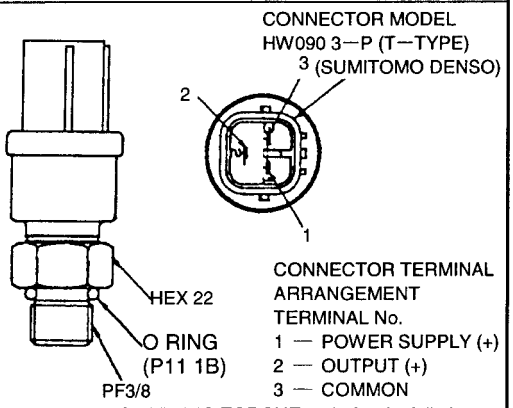
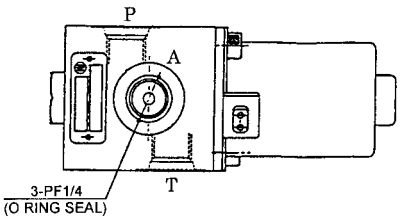
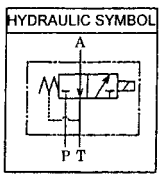
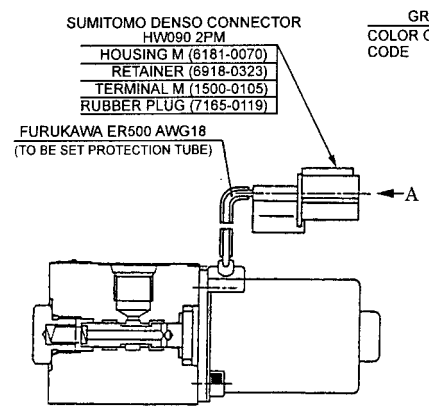
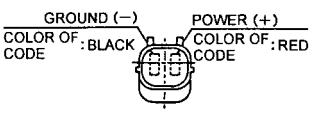
P/No.	LC01V00005F1 LC01V00006F1

No.	NAME	QTY	No.	NAME	QTY	No.	NAME	QTY
1	CYLINDER TUBE	1	12	SOCKET BOLT ; M18×80	12	23	STEEL BALL	1
2	PISTON ROD	1	13	CUSHION BEARING	1	24	PIN BUSHING	1
3	ROD COVER	1	14	CUSHION SEAL	1	25	WIPER RING	2
4	BUSHING	1	15	PISTON	1	26	PIN BUSHING	1
5	SNAP RING	1	16	SEAL RING	1	27	WIPER RING	2
6	BUFFER RING	1	17	BACKUP RING	2	28	BAND ASSY	1
7	U RING	1	18	SLIDE RING	2	29	BAND	1
8	BACKUP RING	1	19	SLIDE RING	2	30	CAPSCREW; M10	2
9	WIPER RING	1	20	SHIM	1	31	WASHER	2
10	O RING ; 1B G135	1	21	PISTON NUT ; M75×P2	1			
11	BACKUP RING	1	22	SET SCREW ; M14	1			

File No. Name of part Part No. Use Applicable Machine	Specification	Description
D−1,2,5~11 Diode YN02D01001P1 Key switch relay YX01001~, YV00101~ YH00101~, YY00101~ YF01-00101~, YU01-00101~ YN07-30001~, YQ07-03501~ LQ08-04501~, LL08-03001~ LC06-05501~, YC06-02501~	Maker's part No. 7321-9822 Peak reverse voltage 400V Mean output current 3A Surge current 200A	
D−3,4 Diode 2475R132 Starter relay Glow relay YX01001~, YV00101~ YH00101~, YY00101~ YF01-00101~, YU01-00101~ YN07-30001~, YQ07-03501~ LQ08-04501~, LL08-03001~ LC06-05501~, YC06-02501~	Part No. 7321-9332-60 Rated current 2.5A	
E−1 Fuse box YN73E00007F1 (EU) Fuse	Fuse capacity and circuit name	 18PAF-HD SUMITOMO HOUSING : 6098-0257 TERMINAL : 8240-4422   7PAF-HD SUMITOMO HOUSING : 6950-1030 TERMINAL : 8230-4050 8232-4238

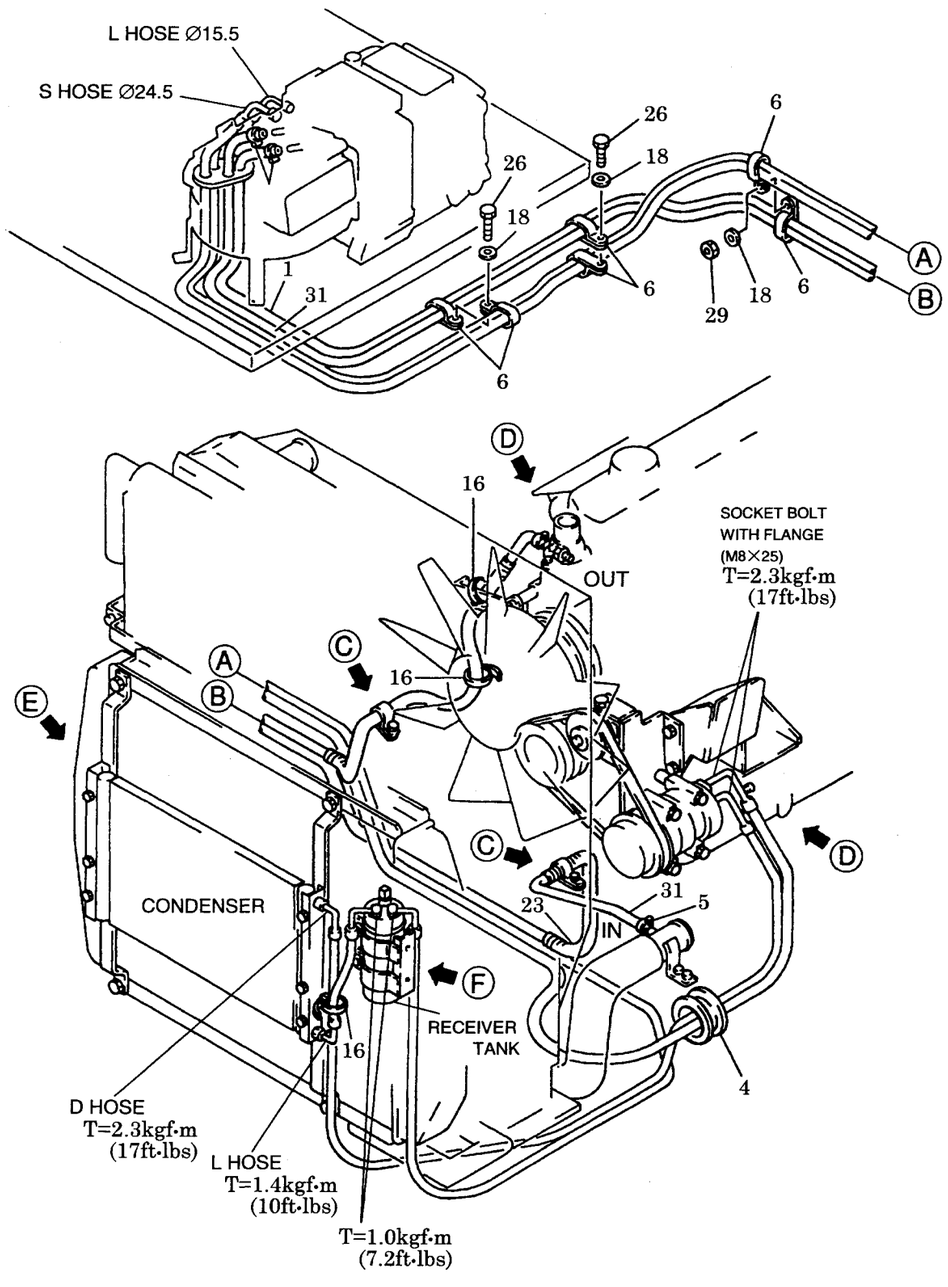
Fuse capacity and circuit name

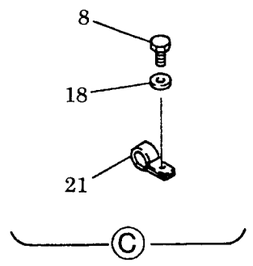
No.	Capacity	Name of circuit
①	20A	Mechatro controller
②	5A	Wiper / washer relay
③	10A	Cigarette lighter
④	10A	Converter
⑤	10A	Horn
⑥	—	—
⑦	5A	Controller back-up, Hour meter back-up
⑧	20A	Fuel suply pump
⑨	5A	Room lamp, Controller back-up
⑩	20A	Key switch
⑪	—	—
⑫	20A	Flasher, Work light, Alarm
⑬	5A	Gauge cluster, (Power window)
⑭	20A	Wiper, Washer
⑮	10A	Solenoid valve, Lever lock
⑯	20A	Work light (front)
⑰	20A	Cab
⑱	20A	Air conditioner, Heater (option)
⑲	5A	Air conditioner
⑳	20A	Spare

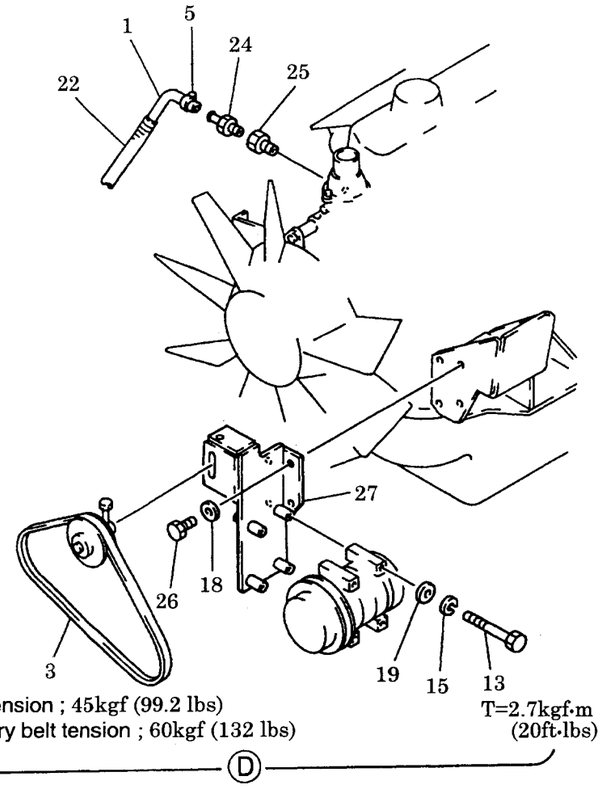
File No. Name of part Part No. Use Applicable Machine	Specification	Description
SE−22,23 Pressure sensor (low pressure) LC52S00001P1 P1 pump, P2 pump YX01001~ YN07-30001~ YQ07-03501~ LQ08-04501~, LL08-03001~ LC06-05501~, YC06-02501~	Pressure range: 0~500kgf/cm² (0~7110psi) Max. allowable press.: 270kgf/cm²(3840psi) Operating source voltage: 5±0.5V DC Load resistance: 10KΩ MIN Insulation resistance: More than 100MΩ	 TIGHTENING TORQUE 7.5kgf·m (54ft·lbs)
SE−26,27 Pressure sensor YN52S00016P1 P1 negative control P2 negative control YN07-30001~ YQ07-03501~ LQ08-04501~, LL08-03001~ LC06-05501~, YC06-02501~	Pressure range: 50kgf/cm² (710psi) Max. allowable press.: 525kgf/cm²(7470psi) Operating source voltage: 5±0.5V DC Load resistance: 10KΩ MIN Insulation resistance: More than 100MΩ	 TIGHTENING TORQUE 3.7kgf·m (27ft·lbs)
SV−11 Solenoid valve YN35V00010F1 Extra breaker YN07-30001~ YQ07-03501~ LQ08-04501~ LL08-03001~ LC06-05501~ YC06-02501~	Rated voltage: DC 24V Working pressure: 50kgf / cm² Max. flowrate: 16 ℓ/min	    VIEW A

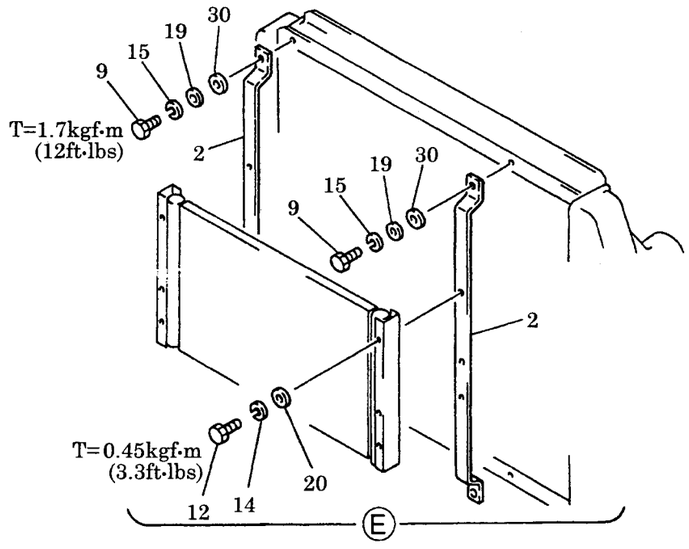
1.2 PIPING

NOTE :
1. Apply oil for refrigerant R134a to the O rings at all air-conditioner hose fittings.
2. Refrigerant volume : 1050±100g
3. T : Tightening torque









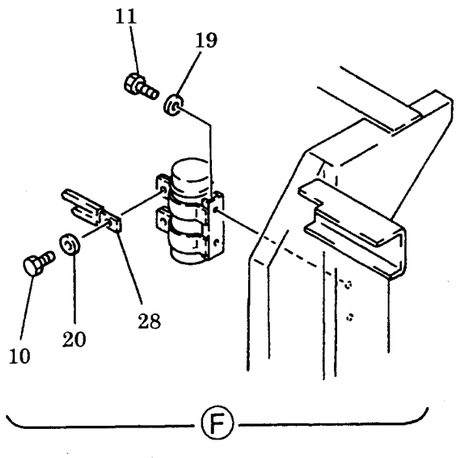


Fig. 2(1/2) Installing air conditioner and heater

4.2 REMOVAL AND INSTALLATION OF THE UNIT

(1) Removing the blower unit

1) Remove the connectors connected to the inner/outer air select motor actuator, the blower motor and the blower controller. Also remove the harness from the blower casing.

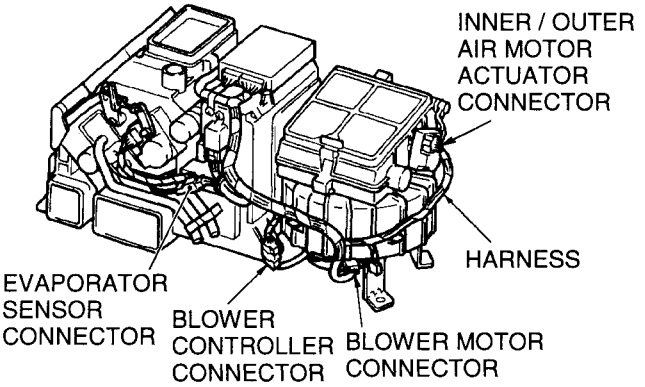


Fig. 14

2) Draw out the inner air filter from the intake casing. Remove four cross-recessed screws T5×14 (T1) from the top of the intake casing, using a screwdriver. Then remove the intake casing.

3) Remove three cross-recessed screws T5×14 (T1) fastening the blower casing with the unit casing. Then separate the blower unit from the air-conditioner unit.

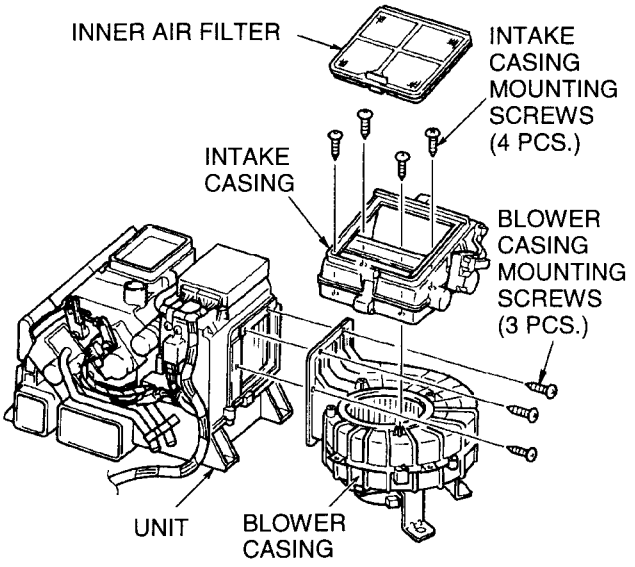


Fig. 15

(2) Replacing the blower motor

1) Disconnect the cooling hose that is connected between the blower motor and the blower casing.

2) Remove three cross-recessed screws N5×16 (W) fixed from the bottom of the blower unit casing. Then draw out the blower motor.

- Do not separate the fan from the blower motor.

3) Assembly is the reverse order of disassembly.

(3) Replacing the blower controller

1) Remove two cross-recessed screws T4×14 (T1) fixed from the bottom of the blower unit casing and draw out the blower controller.

2) Install a new blower controller in the reverse order of removal.

- Do not disassemble the blower controller in any circumstances.

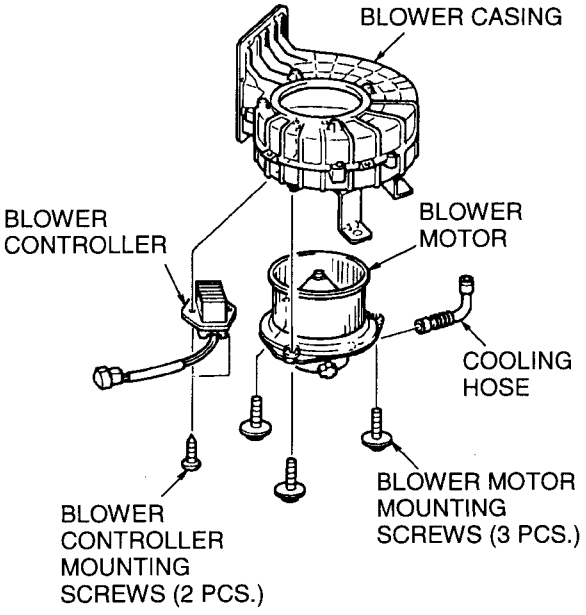


Fig. 16

6.2 INSPECTING FUNCTIONAL PARTS

(1) Relay (24—4PE)

1) Coil resistance : 320Ω (across 1 and 2)
2) Operating voltage : DC20~30V
3) The coil of the relay has polarity : Care is needed.
4) Turn on and off the power to the blower motor by controlling the controller.
5) Check: Check conductance across 3 and 4 in the following condition :
   Apply 20~30V across terminals 1 and 2 : continue
   No voltage applied across terminals 1 and 2 : not continue

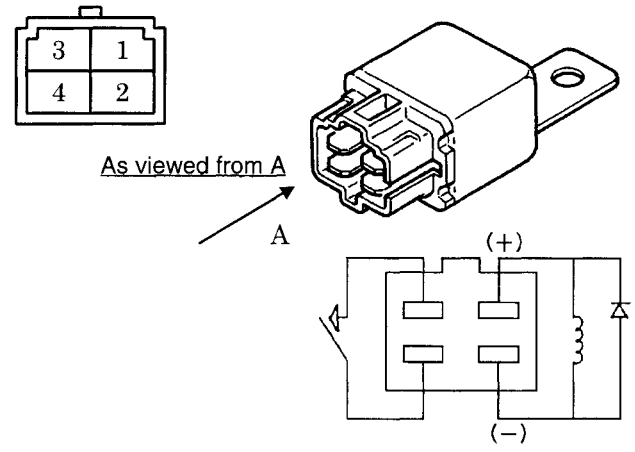


Fig. 33 Relay

(2) Inner air sensor (C44)

Resistance across terminals :

at 0℃ (32°F) : 7.2KΩ
at 25℃ (77°F) : 2.2KΩ

The inner air temperature sensor is installed to the sensor bracket under the operator's seat. The temperature in the cab is sensed by the thermistor. Changes in the resistance according to temperature variations are transmitted to the controller.

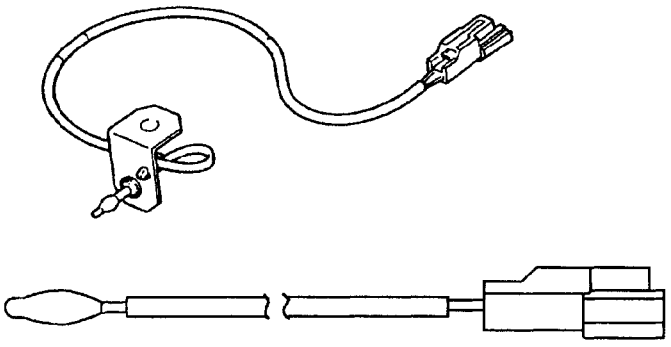


Fig. 34 Inner air temperature sensor

(3) Blower controller

The blower controller changes output voltages for the motor according to signals emitted by the controller.

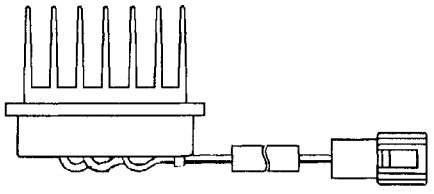


Fig. 35 Blower controller

(4) Motor actuator

1) Operating voltage : DC20~30V
2) Operating temperature range :
   −30℃(−22°F) to +75℃ (167°F)
   The motor is controlled by signals (pulses) put out by the controller.

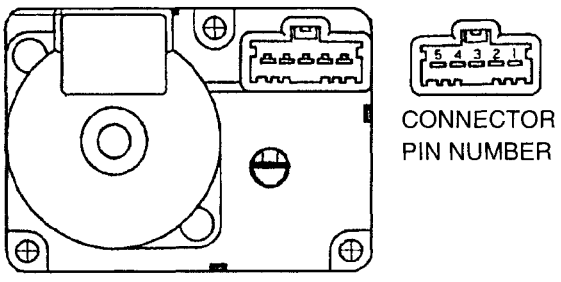
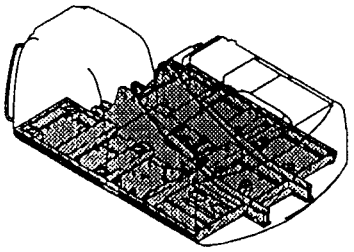
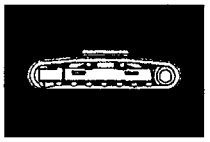


Fig. 36 Motor actuator

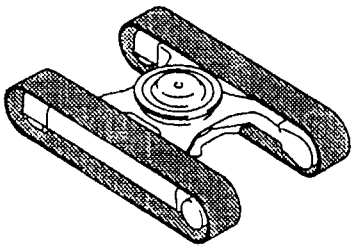
(21) Upper frame LC33— I —40



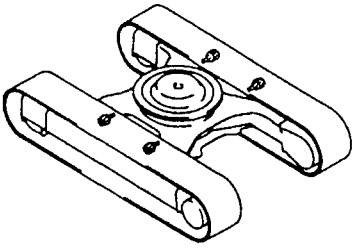
1.3 下部旋回体 UNDER CARRIAGE



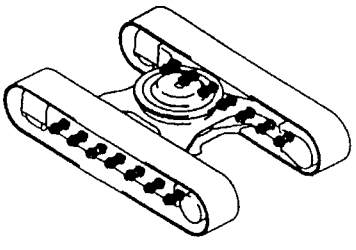
(1) Crawler LC34— I —1



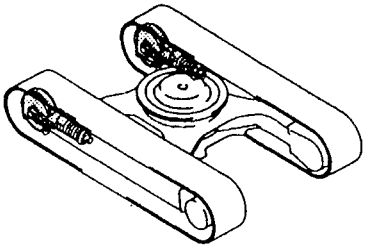
(2) Upper roller LC34— I —5



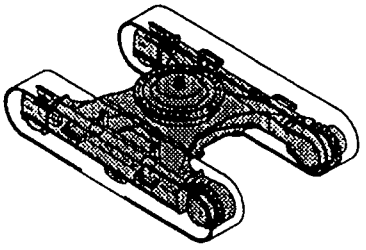
(3) Lower roller LC34— I —11



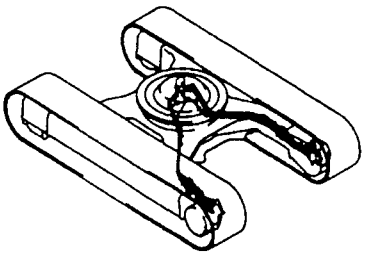
(4) Front idler LC34— I —18



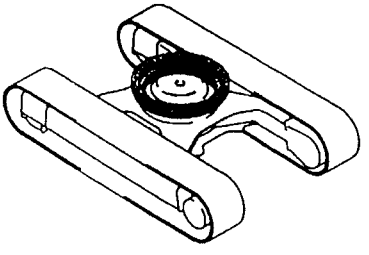
(5) Sprocket LC34— I —27



(6) Travel motor LC34— I —30



(7) Swing bearing LC34— I —32



1. CYLINDER

1.1 PREPARATION BEFORE DISASSEMBLY

Before assembly, secure a dust free workshop and necessary equipment and facilities.

1.1.1 WORKING SPACE

The work space must satisfy the following requirements.

(1) Enough space is obtained.
Before disassembling the hydraulic cylinder, the piston rod must be pulled out of the cylinder tube. First, the essential condition is to have enough space, and in addition the facility required for disassembly, cleaning, measuring, etc. is to be placed in a crosswise direction, to secure enough space to carry out the works.

(2) Optimum work environment
The hydraulic cylinder is manufactured in precision, using rubber and plastic products for seal, packing, etc. Check that it is free from dust, dirt, etc. especially sand, chip, weld slug, etc. which will adhere to cylinder.
If the cylinder tube, piston, etc. are installed without removing hard particles, the tube inner surface and rod surface may be damaged, resulting in making the operation impossible.
Particles may flaw the seal material and rod seal of piston, and causes the oil leak. So the work space is to be located at a distance from the grinding work shop to keep the space clean.

1.1.2 FACILITY

The following facilities are required for disassembly.

(1) Hoist or crane
Prepare the hoist or crane which has a capacity to carry the cylinder assy, and moves horizontally and linearly slinging the object to push/pull the piston rod in/out of the tube.

(2) Work bench
Prepare the work bench of which the length is equal to the retracted cylinder length or larger, and which has the strength and stiffness to withstand the reaction force against the tightening torque of cylinder head, piston nut, etc. The width is to be wider because a vise is attached on this work bench to carry out the disassembly and assembly.

(3) Support
Prepare the support to protect bushing, seal, etc. from damaging due to the rod weight when pulling the piston rod out of the installing pin side.

(4) Hydraulic pressure source
This pressure is used to disassemble and assemble the cylinder head, piston nut, etc. and also when carrying out the leak test after assembly.

(5) Compressed air source
This compressed air is used to remove oil on the surface of cylinder and to dry it after cleaning.

(6) Wash bath, Wash oil, detergent

(7) Oil pan, oil sump
Prepare an oil pan and an oil sump to pour the oil in the cylinder and to preserve the oil spilled on the bench and the waste oil.

(8) Others
Prepare a hose to drain oil, supporter, waste cloth, and saw dust to clean the spilled oil on the floor.

3) Turn up socket bolt (12). Match the bolt holes of the rod cover flange to the tapped holes in the cylinder assy, and screw in socket bolts (12) one by one. Tighten the bolts to a specified torque, taking care so the bolts may not be tightened unevenly.

:14mm,
Tightening torque :
37.4kgf·m (270ft·lbs)

⚠ Take care so as not to damage the rod surface by accidentally slip a wrench. Covering the rod surface with rag is recommended to prevent damage to it.
For the tightening torques, refer to "(Ⅱ-1-16)".

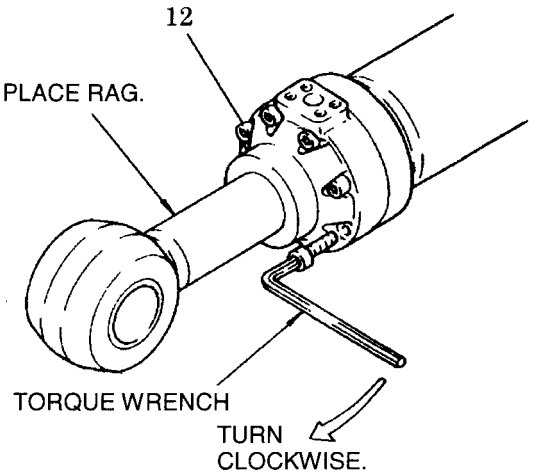


Fig. 1-33 Tightening socket bolts (12)

1.6 INSPECTION AFTER ASSEMBLY

(1) No-load functional test
Place the cylinder level at no load, operate the piston rod 5 to 6 strokes by the directional valve and make certain that it operates without fault.

⚠
- Do not raise the hydraulic pressure above the maximum pressure of 385kg/cm^2 (5470psi) for the cylinder of the machine.
- Grease coated on the O rings and the seals of the rod cover may ooze out. Wipe it off and retest the rod cover in such a case.

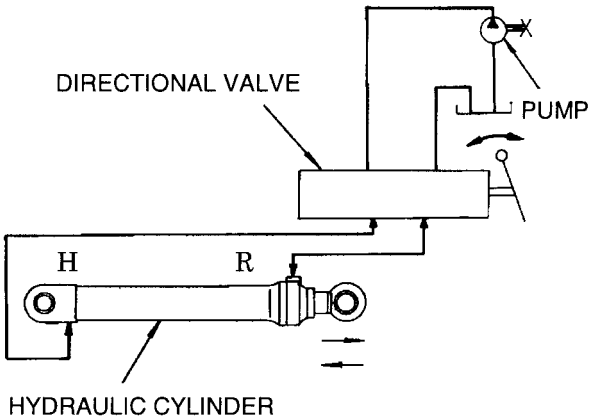


Fig. 1-34 External leak test

(2) Leak test (See Fig. 1-35)

1) Apply a test pressure to the retracting and extending sides of the cylinder for three minutes independently, and check that the rod section and the welds have external leaks and permanent deformation. For an internal leak test, connect the cylinder with a test unit.

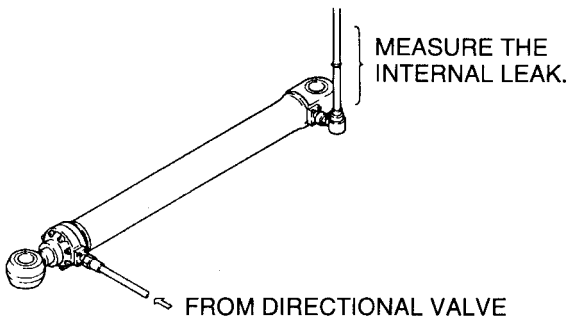


Fig. 1-35 Internal leak test

2) After completing the test, apply a plug to each port and store it (Fig. 1-36).

⚠ For storage, place the cylinder on wooden V-blocks and bring the cylinder to the most retracted condition.

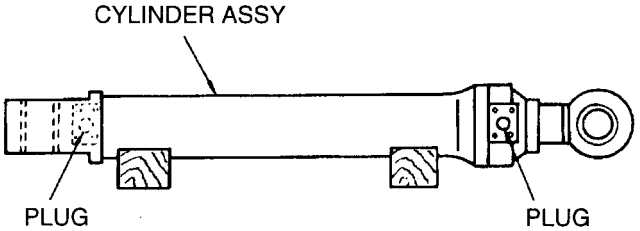


Fig. 1-36 How to store the cylinder

(4) Remove guard (10)
1) Remove four sems bolts (36) M12×30.
2) Remove guard (10).
: 19mm
Weight : 11kg (24 lbs)

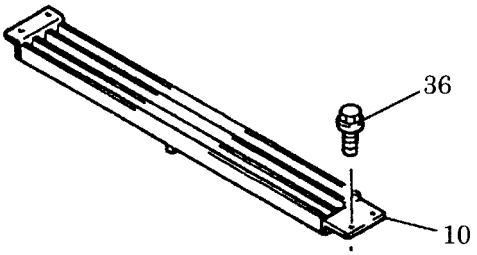


Fig. 4-5 Removeing guard (10)

(5) Remove stay (29)
1) Remove two sems bolts (35) M12×25.
2) Remove two sems bolts (37) M12×35.
3) Remove stay (29)
: 19mm
Weight : 11kg (24 lbs)

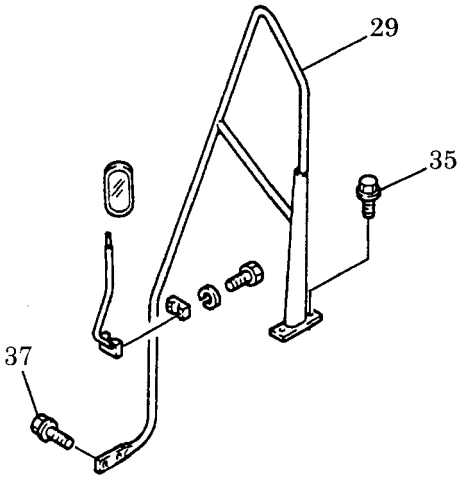


Fig. 4-6 Removing stay (29)

(6) Remove cover assy (7), guard (8)
1) Remove one of the sems bolts (35) M12×25 that fasten the guard (8) with the fuel tank.
2) Unlock the lock of cover assy (7) and open the cover.
3) Disconnect three connectors for the right-hand deck light and for the battery relays.
4) Remove four sems bolts (37) M12×35.
: 19mm
5) Remove cover assy (7) and guard (8) together as a set.
6) Remove two sems bolts (35) M12×25 that fasten guard (8) with cover assy (7). Then separate guard (8) from cover assy (7).
: 19mm
Weight : Cover assy (7) : 33kg (72 lbs)
Guard (8) : 7kg (15 lbs)

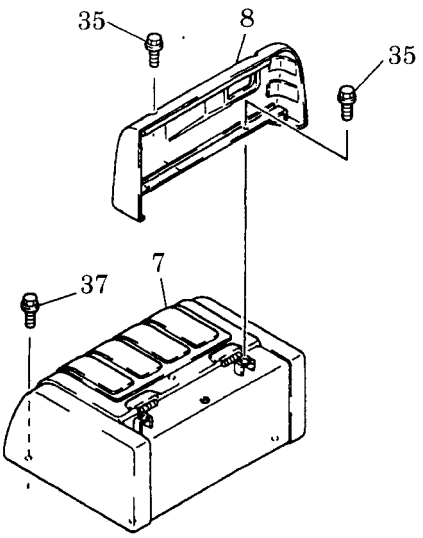


Fig. 4-7 Removing cover assy (7), guard (8)

(7) Remove panel assy (3)
1) Unlock the lock of panel assy (3) and open.
2) Remove four nuts (41) M10.
3) Remove panel assy (3).
: 17mm
Weight : 17kg (37 lbs)

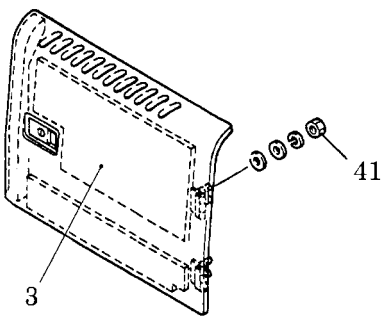


Fig. 4-8 Removing panel assy (3)

(6) Installing the pump
Lift the pump with bracket (1). Place coupling (5) in the groove of element (5-1) so as to receive aluminum insert (5-3).

(7) Coat twelve nut (3) with Locktite #262 and put them in place.
: 17mm,
Tightening torque : 4.0kgf·m (29ft·lbs)

(8) Fasten hoses (5), (6) on the discharge side with half clamp (10) and eight socket bolts (16) M10×35. (Refer to Fig.8-3.)
: 8mm

(9) Install suction hose (7) with four socket bolts M12×30. (See Fig. 8-3.)
: 10mm,
Tightening torque : 8.5kgf·m (61ft·lbs)

(10) Install the hydraulic piping by referring to "HYDRAULIC SYSTEM".

(11) Installing the hose

Port	Tool	Tightening torque kgf·m (ft·lbs)
Cap nut Pn1,2	19	3.0 (22)
Cap nut Dr3	19,22	5.0 (36)
Cap nut Psv1,2	19	3.0 (22)
Cap nut A3	19,22	3.0 (22)
Cap nut B3	36	12 (87)

(12) Installing pressure sensor connector and proportional valve connector.

(13) Remove suction stopper

(14) Install suction strainer

⚠ When the pump is replaced, replenish more than 1ℓ (0.26gal) of hydraulic oil from the drain port (Dr).

(15) Start engine and check it for oil leakage and noise.

(16) Bleed air in pump
Bleed air by loosening the oil filling port Dr.

⚠ Run the engine at low idling speed.

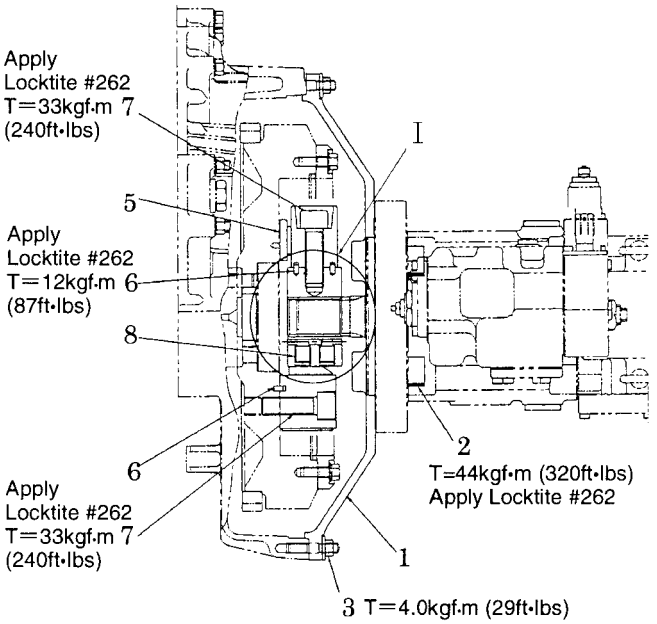
(17) Check hydraulic oil level.

(18) Attach drain down pipe under engine muffler.

(19) Install guards
(See Fig. 8-2) (See Fig. 4-13)

Tightening position	Tool	Tightening torque kgf·m (ft·lbs)
Sems bolt (35), (36)	19	8.5 (61)

T=Tightening torque



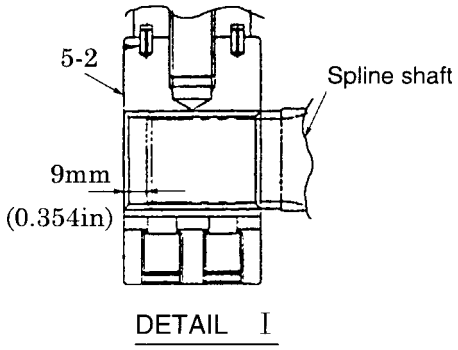


Fig. 8-7 Installing hydraulic pump

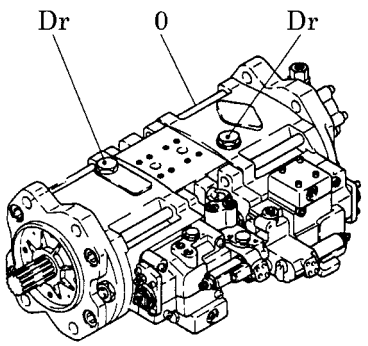


Fig. 8-8 Bleed air port (Dr) in pump

16. CONTROL VALVE

16.1 PREPARATION FOR REMOVAL

(1) Remove guard (12), (23) (Refer to 4. GUARD)
(2) Discharge inner pressure from the hydraulic circuit system.
(Refer to 8. HYDRAULIC PUMP)
(3) Install the suction stopper to the hydraulic tank.
(4) Remove the hoses located at the below ports :

⚠ Mark each hose with a port name before removing it.

16.2 REMOVAL

(1) Remove four capscrews (3) M12×35.
: 19mm
(2) Remove the control valve (A) with brackets (1), (2)
Weight : Approx. 175kg (386 lbs)

16.3 INSTALLATION

(1) Installing is done in the reverse order of remove.
: 19mm, Apply locktite #262
Tightening torque : 12.3kgf·m(89ft·lbs)
(2) Check for oil leakage and operation.

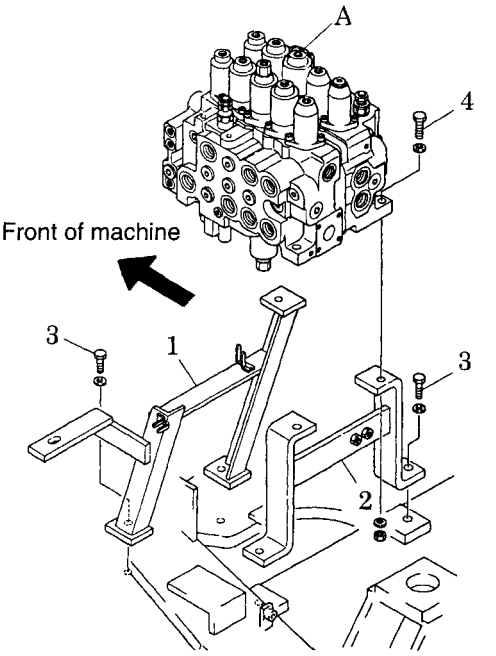
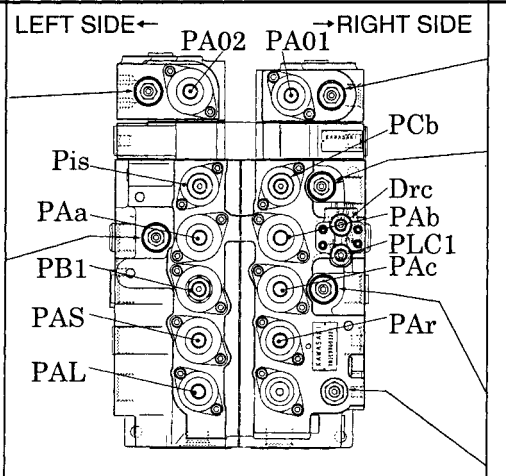
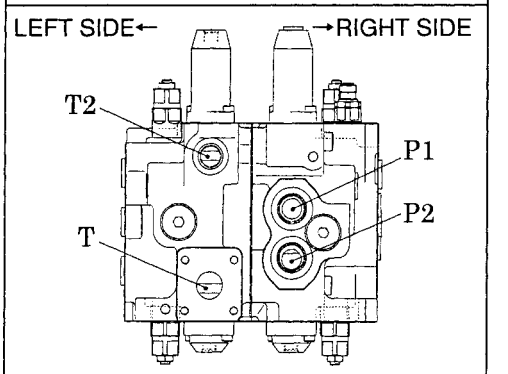


Fig. 16-1 Removing control valve

Functions	Ports	Ports on upper sides (on machine)	Ports	Functions
Opt.2 port	PA02		PA01	Opt.1 port
Opt.2 relief vlve	—		—	Opt.1 relief valve
Arm variable recirculation	PiS		PCb	P1 bypass cut
Arm in	PAa		—	Boom (H) relief valve
Arm (H) rilief valve	—		PAb	Boom up
Boom conflux	PB1		Drc	Boom lock drain
Swing left	PAS		PLC1	Boom down lock release
Travel left forward	PAL		PAc	Bucket dump
			—	Bucket (R) rilief valve
			PAr	Travel right forward
			—	Main rilief valve
		Ports on rear sides (on machine)		
Swing motor boost circuit	T2		P1	P1 pump
Tank return	T		P2	P2 pump

1.2 REGULATOR

1.2.1 STRUCTURAL EXPLODED VIEW

Applicable mahcines :
LC06-05501～05644
YC06-02501～02604

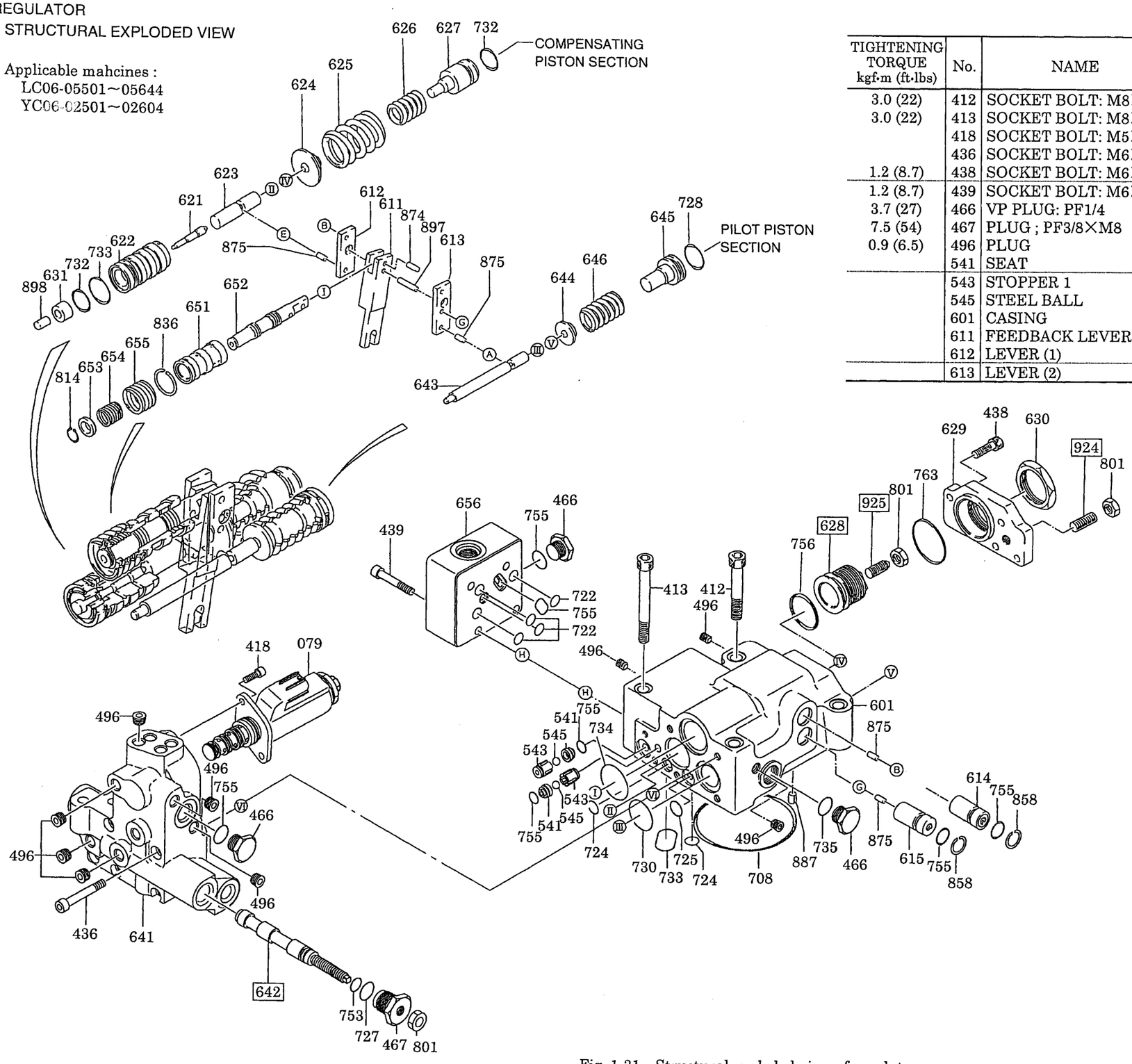


Fig. 1-31 Structural exploded view of regulator

Table 1-4

TIGHTENING TORQUE kgf·m (ft·lbs)	No.	NAME	Q'TY
3.0 (22)	412	SOCKET BOLT: M8×50	2
3.0 (22)	413	SOCKET BOLT: M8×70	2
	418	SOCKET BOLT: M5×12	2
	436	SOCKET BOLT: M6×50	5
1.2 (8.7)	438	SOCKET BOLT: M6×20	4
1.2 (8.7)	439	SOCKET BOLT: M6×40	4
3.7 (27)	466	VP PLUG: PF1/4	3
7.5 (54)	467	PLUG ; PF3/8×M8	1
0.9 (6.5)	496	PLUG	18
	541	SEAT	2
	543	STOPPER 1	2
	545	STEEL BALL	2
	601	CASING	1
	611	FEEDBACK LEVER	1
	612	LEVER (1)	1
	613	LEVER (2)	1

TIGHTENING TORQUE kgf·m (ft·lbs)	No.	NAME	Q'TY
	614	FULCRUM PLUG	1
	615	ADJUST PLUG	1
	621	COMPENSATING PISTON	1
	622	PISTON CASE	1
	623	COMPENSATING ROD	1
	624	SPRING SEAT	1
	625	OUTER SPRING	1
	626	INNER SPRING	1
	627	ADJUST STEM (C)	1
	628	ADJUST SCREW (C)	1
	629	COVER (C)	1
16 (120)	630	LOCK NUT: M30	1
	631	SLEEVE (For PF)	1
	641	PILOT COVER	1
	642	ROD	1
	643	PILOT PISTON	1
	644	SPRING SEAT (Q)	1
	645	ADJUST STEM (Q)	1
	646	PILOT SPRING	1
	651	SLEEVE	1
	652	SPOOL	1
	653	SPRING SEAT	1
	654	RETURN SPRING	1
	655	SET SPRING	1
	656	PORT PLATE	1
	708	O RING : 1B G75	1
	722	O RING : 1B P6	2
	724	O RING : 1B P8	12
	725	O RING : 1B P10	1
	727	O RING : 1B P14	1
	728	O RING : 1B P18	1
	730	O RING : 1B P22	1
	732	O RING : 1B P16	2
	733	O RING : 1B P20	2
	734	O RING : 1B P25	1
	753	O RING : 1B G9	1
	755	O RING : 1B P11	6
	756	O RING : 1B P26	2
	763	O RING : 1B G35	1
1.6 (12)	801	NUT : M8	3
	814	SNAP RING	1
	836	SNAP RING	1
	858	SNAP RING	2
	874	PIN ; Ø4×11.7L	1
	875	PIN ; Ø4×8L	4
	887	PIN	1
	897	PIN ; Ø4×19L	1
	898	PIN ; Ø6.5×9L	1
	924	SOCKET BOLT: M8×20	1
	925	ADJUST SCREW (Q1)	1
	079	SOLENOID PROPORTIONAL REDUCING VALVE	1

□ The codes in a rectangle represent adjust screws.
Do not tamper with the adjust screws as much as possible.

8) Remove seal cover (F)
Remove socket bolt (406) and seal cover F (261).
: 5mm

- The seal cover (F) may be drawn out with ease if it is taken out by tightening bolts in the tapped holes (M6 tap) of the seal cover (F).
- An oil seal is fitted to seal cover (F). Therefore, use care so as not to score the oil seal.

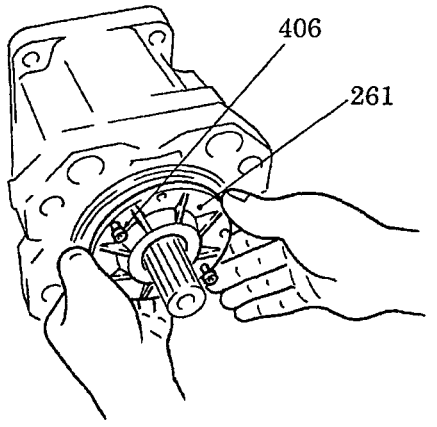


Fig. 1-6 Removing seal cover F (261)

9) Separating the swash plate support and the pump casing
Knock lightly on the mounting flange of swash plate support (251) from the pump casing (271) side and separate the swash plate support from the pump casing.

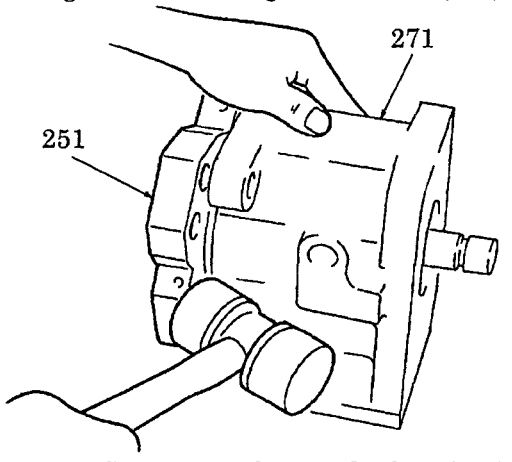


Fig. 1-7 Separating the swash plate (251) support and the pump casing (271)

10) Remove shoe and swash plate
Draw out shoe plate (211) and swash plate (212) from pump casing (271).

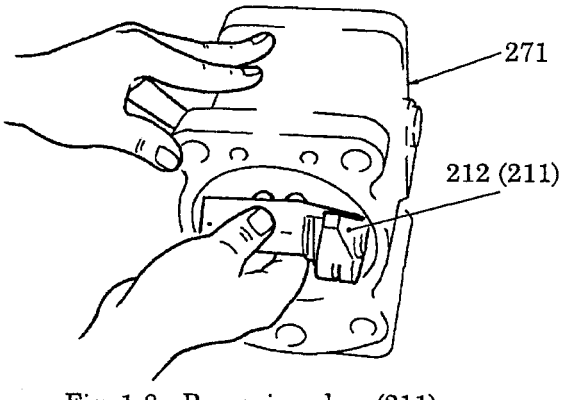


Fig. 1-8 Removing shoe (211) and swash plate (212)

11) Drawing out the shaft
Tap lightly the shaft end (111, 113) by means of a plastic hammer and draw out the shaft from the swash plate support.

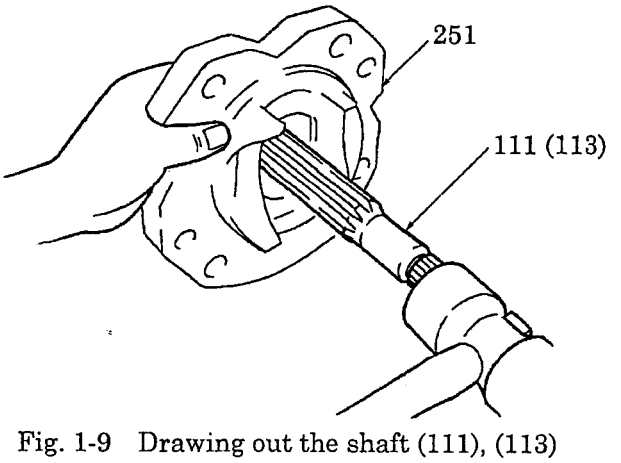


Fig. 1-9 Drawing out the shaft (111), (113)

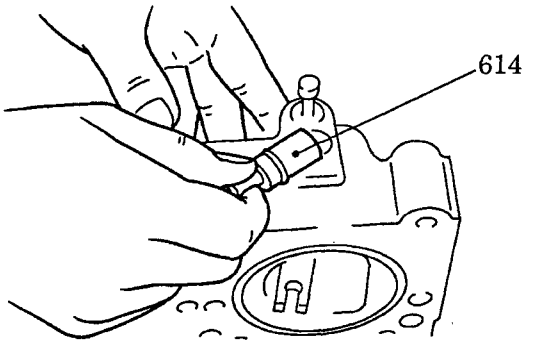


Fig. 1-27 Removing adjust plug (614) [2]

10) Remove lever
Remove lever 2 (613).
Do not draw out pin (875).

- The work is eased if tweezer is used.

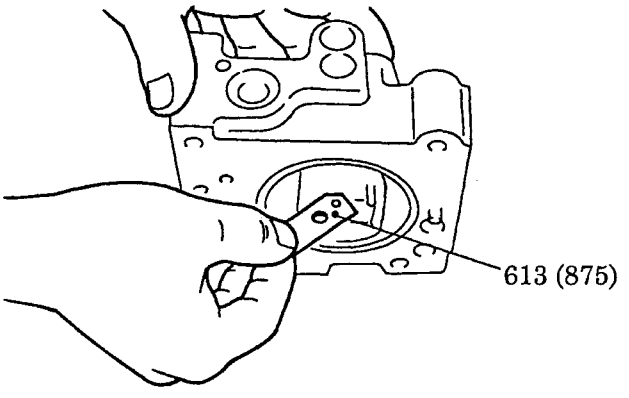


Fig. 1-28 Removing lever (613)

11) Remove feedback lever
Draw out pin (874) and remove feedback lever (611).

- Push out pin (874) [pin dia : Ø4mm (0.157in)] from above with a slender steel rod so as not to interfere with lever (612).

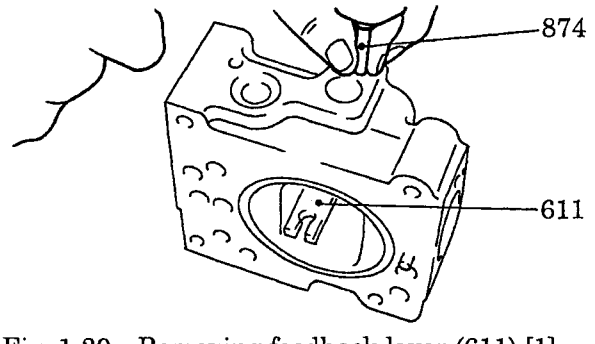


Fig. 1-29 Removing feedback lever (611) [1]

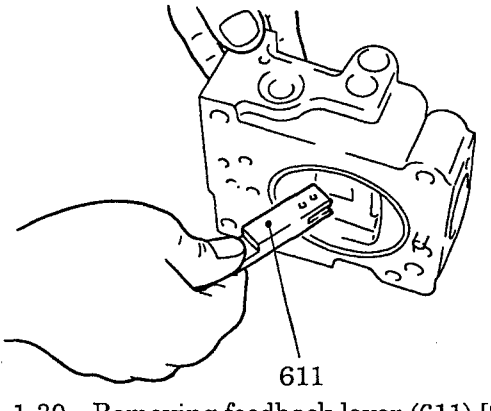


Fig. 1-30 Removing feedback lever (611) [2]

(5) Disassembling the boom spool

1) Loosen socket bolts (273) and remove spring cover (201) for boom and O ring (261).
: 6mm

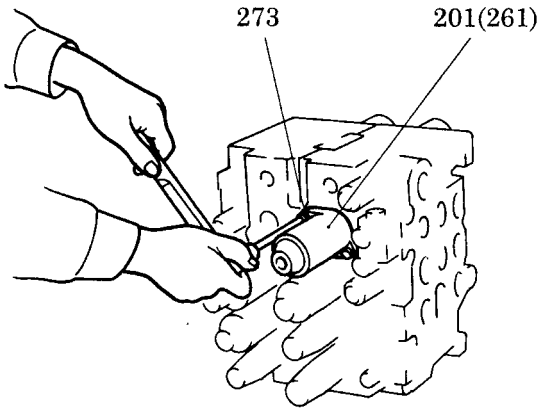


Fig. 2-14 Removing spring cover (201)

2) Draw out the assy of boom spool (301), spring seat (331), springs (321), (322), stopper (336) and bolt (333) from casing B (102).

⚠ When drawing out the spool assy, take care so as not to score casing B (102).

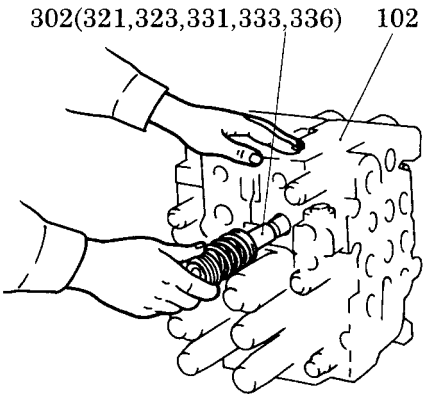


Fig. 2-15 Drawing out boom spool assy

3) Fix the boom spool assy with vise via a protective plate (aluminum plate, etc.) and remove bolt (333). Then separate spring seat (331), springs (321), (322) and stopper (336) from boom spool (301).

4) Do not disassemble arm spool (301) further unless there is special reason. In case it must be disassembled for indispensable reason, do as follows :

a) Place the middle of boom spool (301) in a vise fitted with mouth pieces and remove plug 1 (B352) and plug 2 (B353).
: 24mm

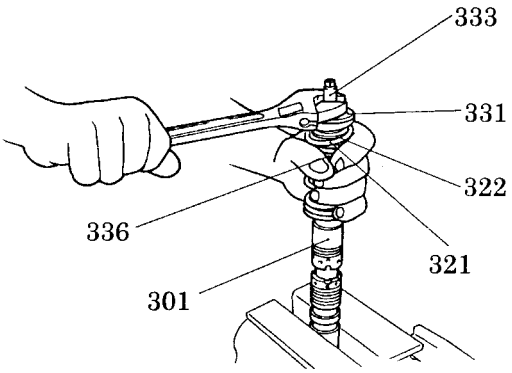


Fig. 2-16 Disassembling boom spool assy

b) Take out plunger 1 (B315), plunger 2 (B316), plunger 3 (B317), spring B1 (B320), spring B2 (B330) and spring B3 (B340) from boom spool (301).

⚠ Take care so as not to distort boom spool (301) by overtightening it in the vise.

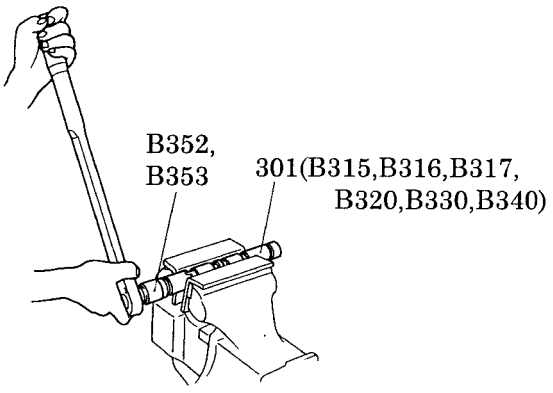


Fig. 2-17 Disassembling boom spool (301)

2.3.1 ASSEMBLING VALVES AND SPOOLS

(1) Assembling check valve

1) Load check valve, conflux check valve, etc. Fit poppet (511) and spring (521), put O ring (164) in plug (551) and fasten it to the specified torque. (8 places)

: 12mm,
Tightening torque :
22~26kgf·m (160~190ft·lbs)

2) Lock valve
Fix poppet (514) and spring (524), put O ring (164) in plug (556) and fasten it to the specified torque. (2 places)

: 12mm,
Tightening torque :
22~26kgf·m (160~190ft·lbs)

⚠ Plugs 1) and 2) look similar; use care of the parts combination and assembling position.

3) Travel straight and main relief sections
Fit poppets (512), (515) and spring (522), put O ring (562) in plug (552) and fasten it to the specified torque. [(512) four places and (515) one place limitted]

: 10mm,
Tightening torque :
12~16kgf·m (87~120ft·lbs)

⚠ Use care so special poppet (515) for travel straight is fixed in a correct position.

(2) Installing relief valve

1) Tighten main relief valve (601) and port relief valves (602), (603) to the specified torques in correct positions.

: 32mm,
Tightening torque :
7~8kgf·m (51~58ft·lbs)

⚠
- Overload relief valves (602) and (603) are the same in outer appearance. Therefore, reassemble them in correct positions by looking at tags attached at disassembly.
- Regarding the reassembly of the relief valve, refer to the (14), (15) on page Ⅱ−2−14.

(3) Assembling arm conflux spool

1) Put a protective plate (aluminum plate, etc.) in a vise. Hold the middle of arm conflux spool (308) in the vise, set spring seat (332), springs (325), (326) and stopper (337) and tighten bolts (334) to the specified torque.

: 10mm,
Tightening torque :
1.6~1.8kgf·m (12~13ft·lbs)

⚠
- Before tightening bolts (334), coat them with Locktite #262.
- Be careful so as not to distort arm conflux spool (308) by overtightening it in the vise.

2) Fix the arm conflux spool assy in par. 1) into casing B (102).

⚠ Fix the arm conflux spool assy into casing B (102) slowly and carefully and never force it in.

3) Attach spring cover (204) with O ring (262) to the spring side of the arm conflux spool assy. Then fasten socket bolts (273) to the specified torque.

: 6mm,
Tightening torque :
2.5~3.5kgf·m (18~25ft·lbs)

(2) Exploded view

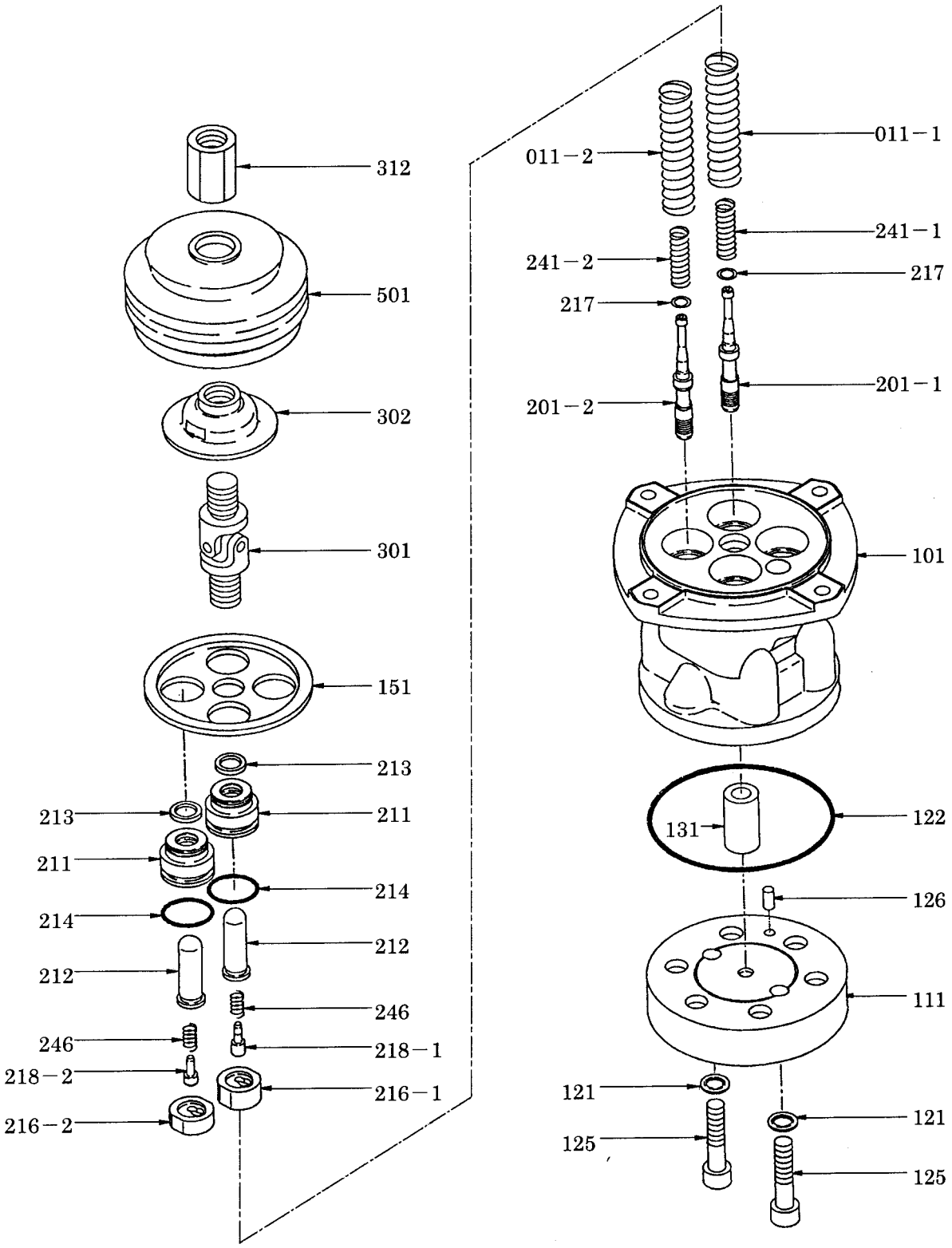


Fig. 3-2 Pilot valve (for ATT)

7. Assembly

- Clean and degrease parts before assembly. In particular, clean the body with a nylon brush. Foreign matter intruded into the valve causes functional faults to occur.
- Prepare new seals (O rings and U packings) and coat the surface with hydraulic oil or a thin film of grease.

8. Assembling the shuttle. (See Fig.4-7.)

(1) Put two balls (36) into body (5).

(2) Coat the screwed part of seat (2) with Locktite#262 and fit two of them to body (5).

: 5mm, Tightening torque : 1.5±0.1kgf·m(11±0.7ft·lbs)

(3) Set O rings (42) to socket plugs (25) and fasten two plugs to body (5).

: 6mm, Tightening torque : 2.5±0.2kgf·m (18±1.4ft·lbs)

9. Assembling the reducing valve spool assy (See Fig. 4-5.)

(1) Fix spool (4) in a vise. (Put protective plates against the mouth.) Set washer (29), shims (10), (11), spring (8) and sleeve (18), in that order, and tighten them with four socket flange bolts (27).

: 3mm, Tightening torque : 0.5±0.1 kgf·m (3.6±0.7ft·lbs)

- On that occasion, pair parts with the disassembled parts as sets, before performing assembly work. Incorrect pairing may change the secondary pressure.

10. Assembling the reducing valve (See Fig.4-8.)

(1) Fit four O rings (38), (40), parallel pins (32) and springs (7) to body (5).

(2) Fit four reducing valve spool assemblies and stoppers (6). On that occasion, use care as stopper (6) has a direction in which it should be installed; Place it so the concave surface of it faces down (reducing valve spool side).

(3) Set O rings (41) to socket plugs (24). Fasten three plugs to body (5).

: 5mm, Tightening torque : 1±0.1 kgf·m (7.2±0.7ft·lbs)

11. Assembling the damper (See Fig.4-3.)

(1) Fit four U packings (37) to cover (15).

- On that occasion, place the cover so the lip of the U packing faces down (damper chamber side).

(2) Insert four piston assemblies (44) into cover (15).

- In that case, make sure that each piston is set in the same hole where it was before disassembly.

The performances of the piston are not affected at all if it is placed in any direction on the circumference.

(3) Fit O ring (39) to guide (17). Install four guides to cover (15).

- Fix the guide in the same hole where it was set before disassembly.

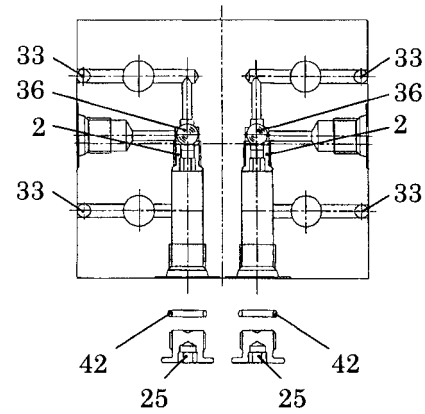


Fig. 4-7 Assembling the shuttle

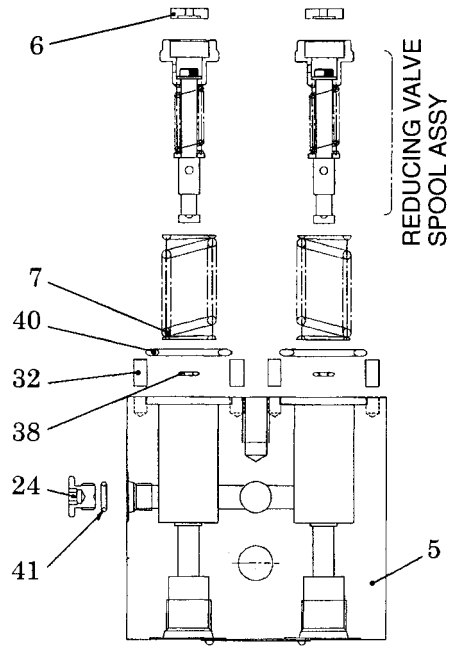
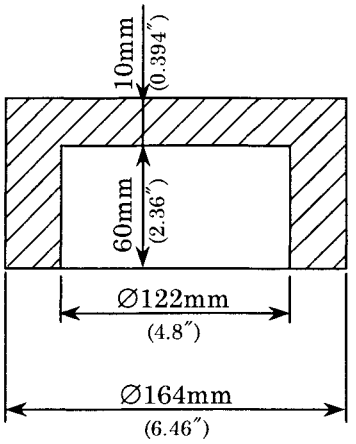
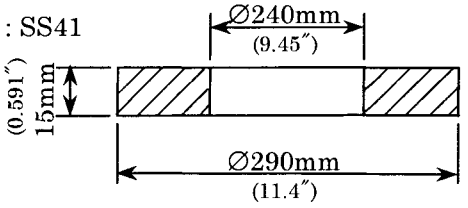
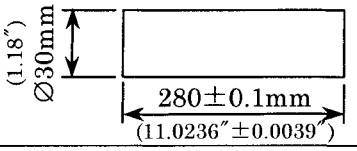


Fig. 4-8 Assembling the reducing valve

5.3 DISASSEMBLY AND ASSEMBLY OF SWING REDUCTION UNIT

5.3.1 TOOLS

Code	Tool name	Remarks
A	Jig (for press fitting bearing)	Material : SS41 
B	Snap ring plier	For shaft
C	Oil seal fitting jig	Material : SS41 
D	Torque wrench	Class 10kgf·m (72ft·lbs), 30kgf·m (220ft·lbs)
E	Plastic hammer (Wooden hammer)	
F	Press	Class 50ton (110000 lbs)
H	Flat screwdriver	
I	Metal bar	3 pcs. 
J	General tools	Allen wrench and steel rod
K	Screw lock compound	Locktite #242
	Sealing compound	Locktite #515

5.3.2 DISASSEMBLY

The numbers in parentheses correspond to the ones in construction drawings (Fig. 5-2).

(1) Preparation

1) Before disassembly, clean the outside of the reduction unit thoroughly and check for no damage and scoring.
2) Drain gear oil from the reduction unit.
3) Disconnect the drain hose.
4) Matching Mark
   To facilitate the reassembly of the unit, put matching mark on the joining parts of the housing before disassembly.

5.5 TROUBLESHOOTING

5.5.1 SWING MOTOR

(1) Hydraulic motor does not rotate.

Trouble	Cause	Remedy
Pressure does not rise.	1. Relief valve pressure in circuit is not adjusted correctly.	1. Set to correct value.
	2. Malfunction of relief valve.	2.
	2-1. Sticking plunger.	2-1. Correct the stuck areas or replace the plunger.
	2-2. Orifice on plunger is clogged.	2-2. Disassemble and clean.
	3. Plunger seat is faulty.	3. Check the seat surface and replace the plunger if scored.
	4. Swing shockless valve seat is faulty.	4. Replace the swing shockless valve cartridge or block.
Pressure rises.	1. Overload.	1. Lighten overload.
	2. Moving parts are seized.	2. Inspect and repair piston, shoe and cylinder valve plate.
	3. Brake release pressure is not working on the motor	3. Check circuit and correct it.
	4 Brake piston is stuck.	4. Disassemble and check.
	5. Friction plate is seized.	5. Disassemble, check and repair. Replace one that is seized.

(2) Rotating direction is opposite.

Trouble	Cause	Remedy
Rotating direction is opposite.	1. Motor's assembling direction is reversed.	1. Assemble correctly.
	2. Piping inlets and outlets are reversed.	2. Pipe correctly.

4. LOWER ROLLER (TRACK ROLLER)

4.1 LOWER ROLLER ASSY

ROLLER ASSY			Q'TY		REMARKS
	STD	LC64D00004F1			
	LC	LC64D00004F2			
ITEM	NAME				
1	LOW ROLLER		14	16	LC64D00005F1
2	CAPSCREW		56	64	M22×105

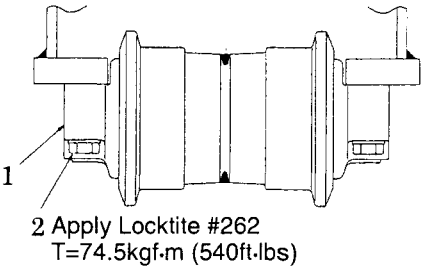


Fig. 4-1 Lower roller assy

4.2 REMOVAL

(1) Preparation for removal

1) Loosen the tension of the crawler, lift up the lower frame by the front attachment and stop the engine in that condition.
2) Place a safety block (wooden) at the front and back of the lower frame.

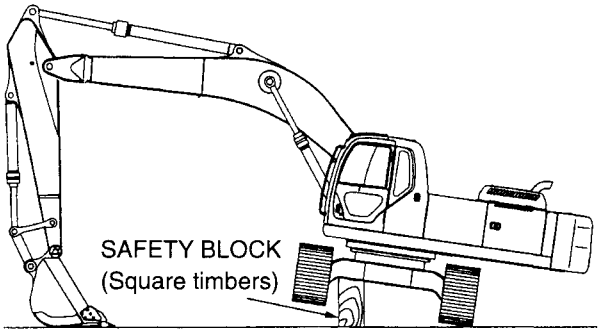


Fig. 4-2 Preparation for removal

(2) Removing track guide (See Fig. 4-3)
Remove capscrews (8) M24×60 and remove track guide (5).
: 36mm
Weight of track guide : Approx. 50kg (110 lbs)

(3) Remove lower roller
Remove capscrews (2) and remove lower roller (1).
: 32mm
Weight of lower roller : Approx. 57kg (126 lbs)

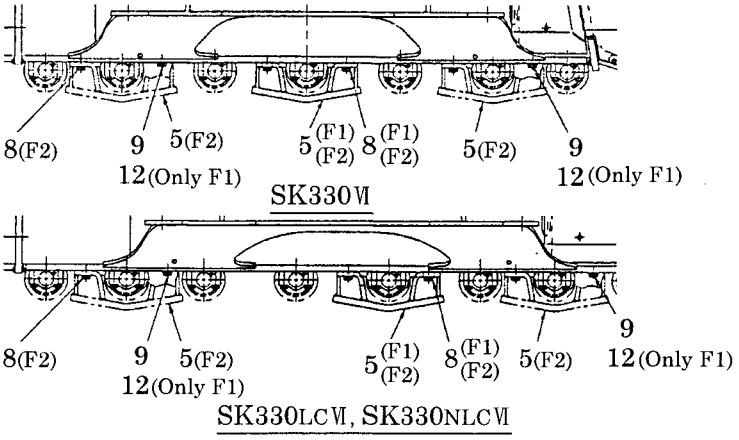


Fig. 4-3 Installing lower roller

4.3 INSTALLATION

(1) Installation of lower roller
Coat mounting capscrews (2) with Locktite #262 and fasten all four capscrews temporarily. Then tighten them to a specified torque.
: 32mm
Tightening torque : 74.5kgf·m (540ft·lbs)

(2) Installation of track guide
Capscrews (8) with Locktite #262 and fasten all four capscrews temporarily. Then tighten them to a specified torque.
: 36mm
Tightening torque : 95kgf·m (690ft·lbs)

(3) Adjusting tension of crawler.
Tighten grease nipple and fill it with grease.
: 19mm,
Tightening torque : 6kgf·m (43ft·lbs)

Table 4-1 Track guide part list

LOWER GROUP									
	SK330Ⅵ	STD	LC01F0001F1						
		HD	LC01F0001F2						
	SK330LCⅥ	STD	LC01F0003F1						
		HD	LC01F0003F2						
	SK330NLCⅥ	STD	LC01F0002F1						
		HD	LC01F0002F2						
No.	NAME			Q' TY					
5	TRACK GUIDE ; LC63DE00002P1			2	6	2	6	2	6
8	CAPSCREW; M24×60			8	24	8	24	8	24
9	CAPSCREW; M24×40			16	—	16	—	16	—
12	WASHER			16	—	16	—	16	—

6. SPROCKET

6.1 REMOVING

(1) Preparation for removal
Remove crawler referring to Section 2. "Crawler", lift up crawler frame with attachment, and put it on square timbers to float and stabilize.

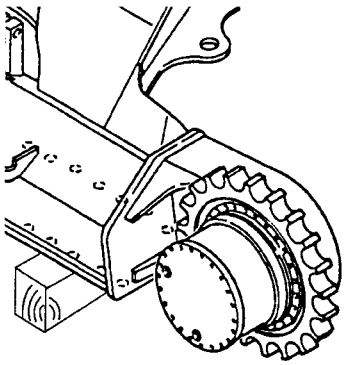


Fig. 6-1 Preparation for removal

(2) Removing sprocket
Loosen twenty six capscrews (3) M20×55, for the attaching of the sprocket by means of a socket and remove the sprocket (1).
Weight of sprocket : 77kg (170 lbs)

: 30mm

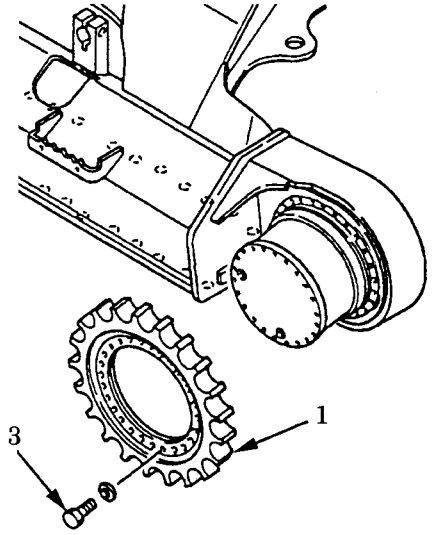


Fig. 6-2 Removing sprocket

6.2 INSTALLING

(1) Check before installing
Check the mating portion of the travel reduction unit and the sprocket, eliminate burrs and contamination thoroughly and install the sprocket.

(2) Securing sprocket temporarily
Coat the sprocket attaching capscrews (3) with Locktite #262 and fasten the sprocket temporarily.

(3) Securing sprocket completely
Remove the wooden blocks under the truck frame, bring the machine down on the ground and tighten the sprocket.

: 30mm,
Tightening torque : 55kgf·m (400ft·lbs)

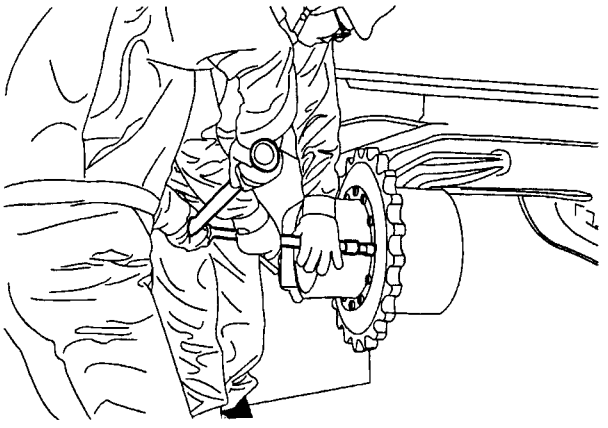


Fig. 6-3 Securing sprocket temporarily

2) Disassembling the motor

① Place the motor shaft level and remove socket bolts (32) except two vertically diagonal ones.
: 14mm

② Loosen two remaining bolts slowly at the same time.

③ Remove rear cover (2) and spring (29), taking care so cylinder block (3) does not come off with rear cover (2).

⚠ In that case, do not drop valve plate (8), brake spring (29) or O ring (36). If the cylinder block (3) comes to stick to the rear cover (2), use a stick of 5 ~ 8mm (0.2 ~ 0.3in) with a rounded point and, through the rear cover (2) oil hole, push on the cylinder block (3) (being careful not to damage the area) and pull off the rear cover (2).

④ Remove valve plate (8) so cylinder block (3) does come off together.

⚠ Put a matching mark on valve plate (8) and rear cover (2) so they are reassembled correctly. (so the face and the back are not reversed.)

⑤ Push in cylinder block (3), using removed socket bolt (32) in the holding-down metal so the cylinder block is not damaged, till the inner race of rear bearing (31) sticks out.

⑥ Remove the inner race of rear bearing (31) by putting the gear (bearing) puller in the inner race.

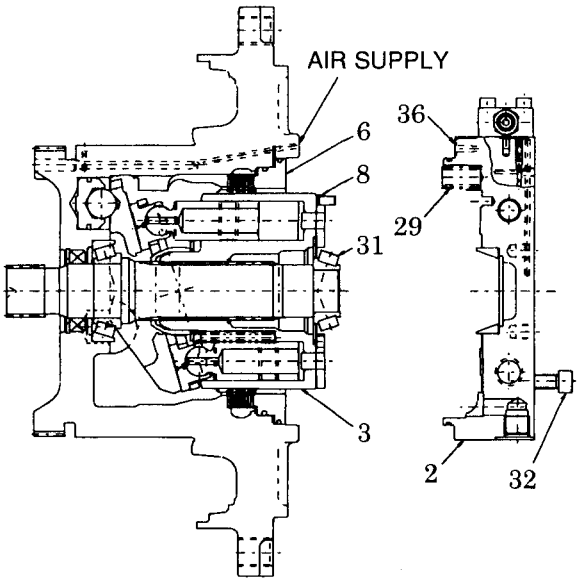


Fig.1-4 Removing the rear cover

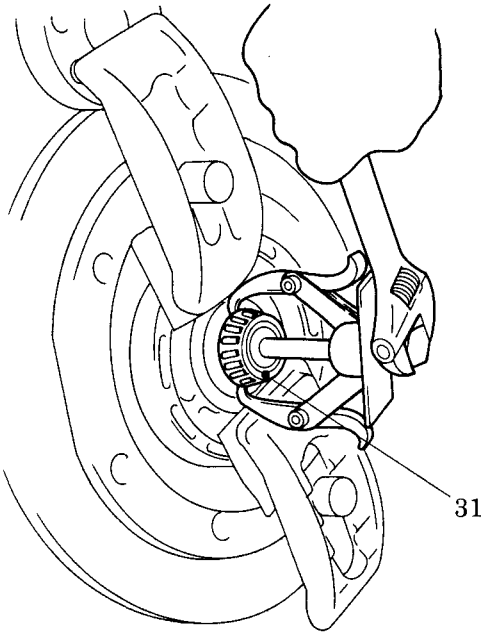
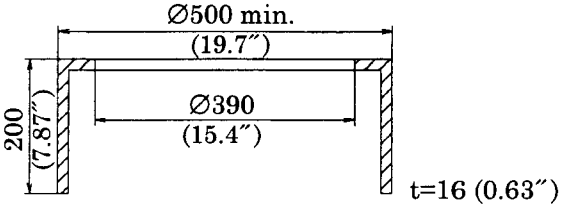


Fig.1-5 Removing the rear bearing

1.7 REDUCTION UNIT DISASSEMBLY

1.7.1 TOOLS

Before removal and installation, prepare tools, jigs and measuring instruments.

No.	Tools	Application
1	Torque wrench	0~50kgf·m
2	Allen wrench	Opposing flats 8mm, 14mm
3	Stand	
4	Micro depth meter	0~15mm
5	Caliper	0~150mm
6	Eye bolt	M10、M18 3pcs. each
7	Pin	Spring pin Ø3.5×75, Ø7×55
8	Press machine	It is used to insert the angular bearing and fix the lock washer. Capacity 3 tons (6610 lbs)
9	Others	Cleaning oil, Detergent, Gear oil, Grease, Locktite#242, #515, Seal tape, rag and others

1.7.2 DISASSEMBLY

(1) Preparation before removal

1) The travel unit removed from the machine has dust and mud. Wash them with cleaning oil.

2) Loosen drain or oil filling plug (26) and drain the oil out of the reduction unit.

⚠ When oil is hot, pressure is built up inside. Take care as the oil gushes out in some cases.

3) Putting matching marks
Put a matching mark on the outside of each matching surface so it may be installed where it was.

- The numbers in the parentheses after part names correspond to those in the assembly drawing on page II-2.

1. OUTLINE

Troubleshooting provides process locating for the cause of trouble in the order that trouble occurred. This manual describes how to solve the specific phenomenon systematically as early as possible. For troubleshooting concerning the inside of equipment, refer to troubleshooting for each manual of equipment.

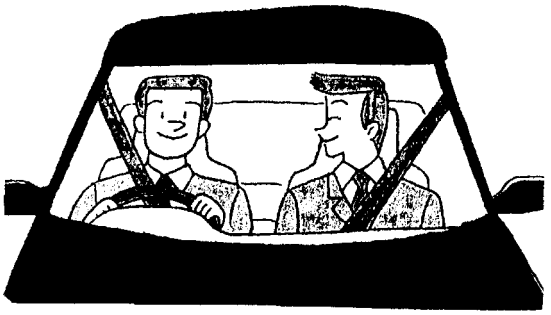
1.1 JUDGMENT OF ACTUAL THING AT SITE

(1) Get to the site as quickly as possible.
Verify model, serial number, situation of trouble and field, and notify person of arrival time.

(2) Verify background of trouble occurred
1) Model name and serial number
2) Kind of attachment
Check that the combination of attachment is proper or that the operating method is not unreasonable.
3) Operating time by hour-meter
4) History of trouble occurred and additional works.
5) Recurrence of past trouble, or problems on the additional works.

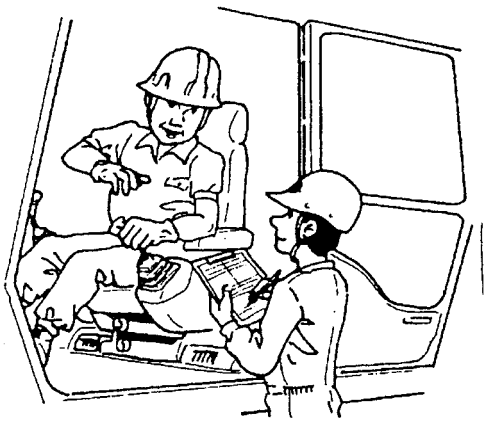
(3) How to diagnose trouble
1) Verify defective part
2) Make the condition of trouble again
3) Where defective parts can not be verified, surmise causes systematically.
4) Verify reasons for surmise
5) Report methods, procedure, and period for repairing to user.

(4) Explanation of the cause of trouble
1) Explain the cause of trouble to clients. For example, oil leak through piston is caused by flaws on the piston rod. And the method of using the machines should be explained so that the same kind of trouble does not reoccur.
2) Treatment of damaged parts
The damaged parts to be claimed and returned are evidence so they should be handled with care. Protect them from entry of water, soils, etc. into port of hydraulic unit, etc. and return them. And also use care not to flaw and damage those surfaces.



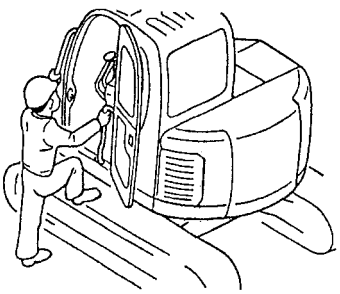
YR-B76

Attending the field to verify actual thing.



YR-B76

Verifying background of trouble occurred.



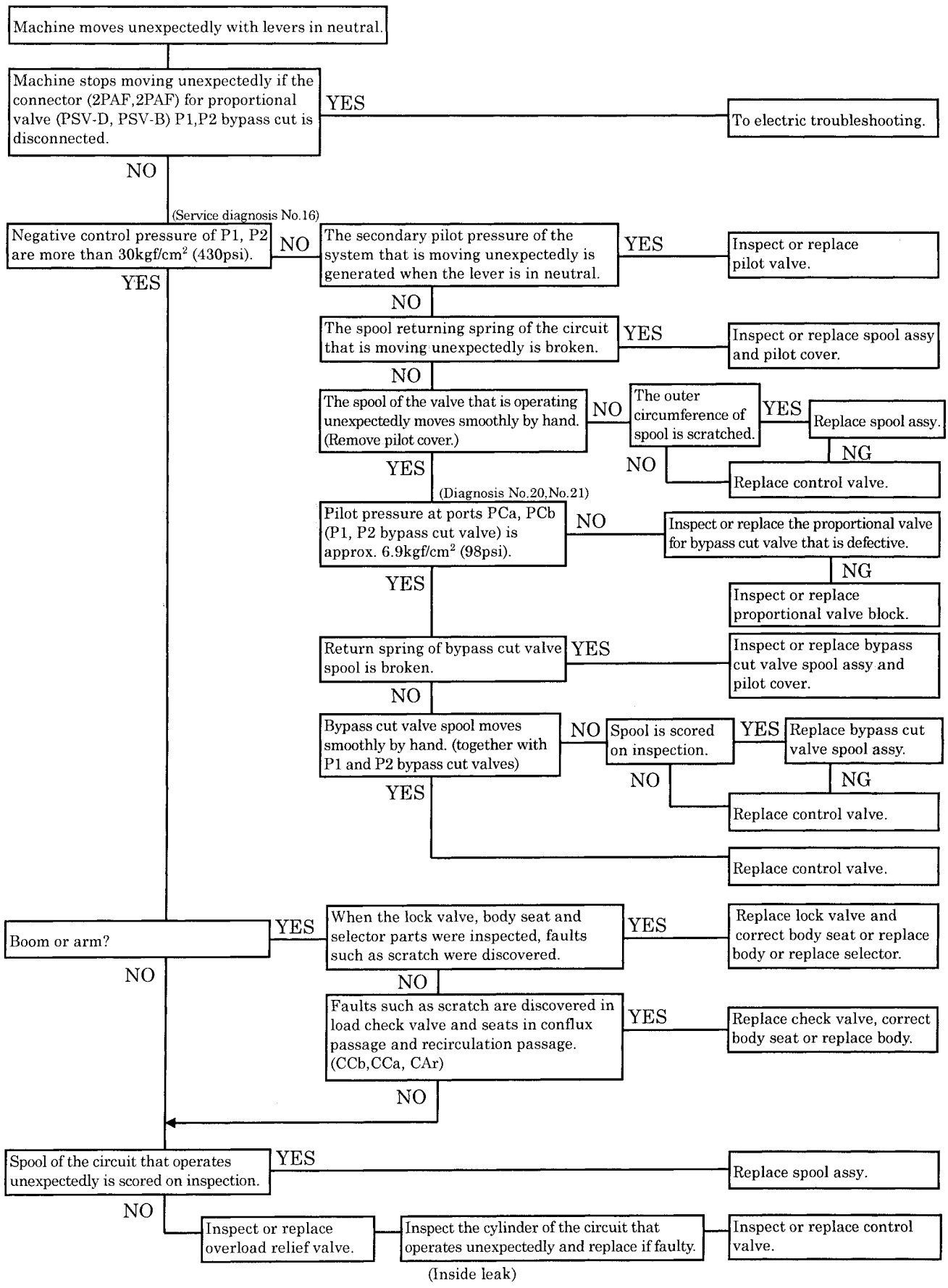
YT-B87

Confirm the symptoms of the trouble.

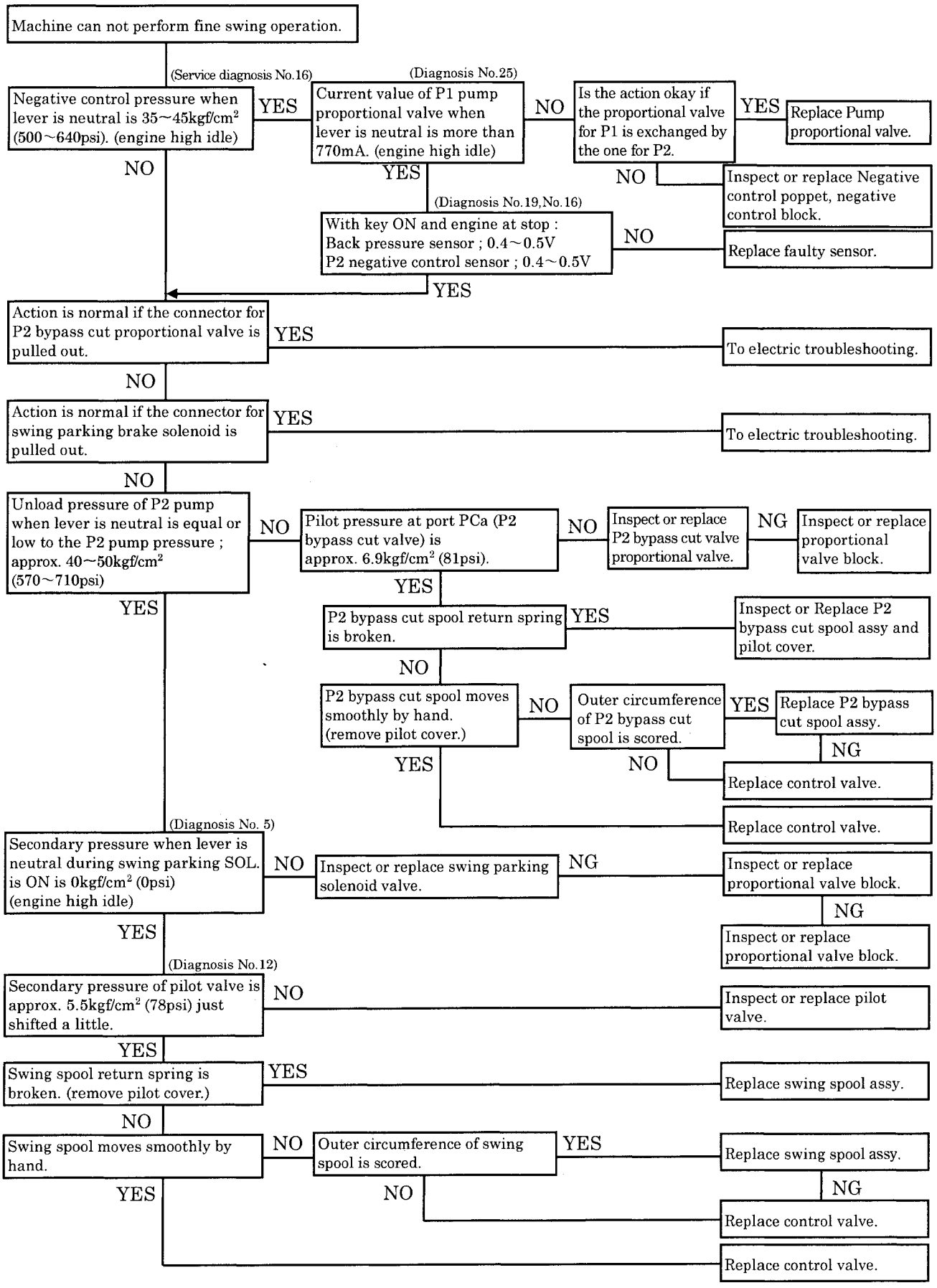
YR-B76

Diagnosing fail by means troubleshooting.

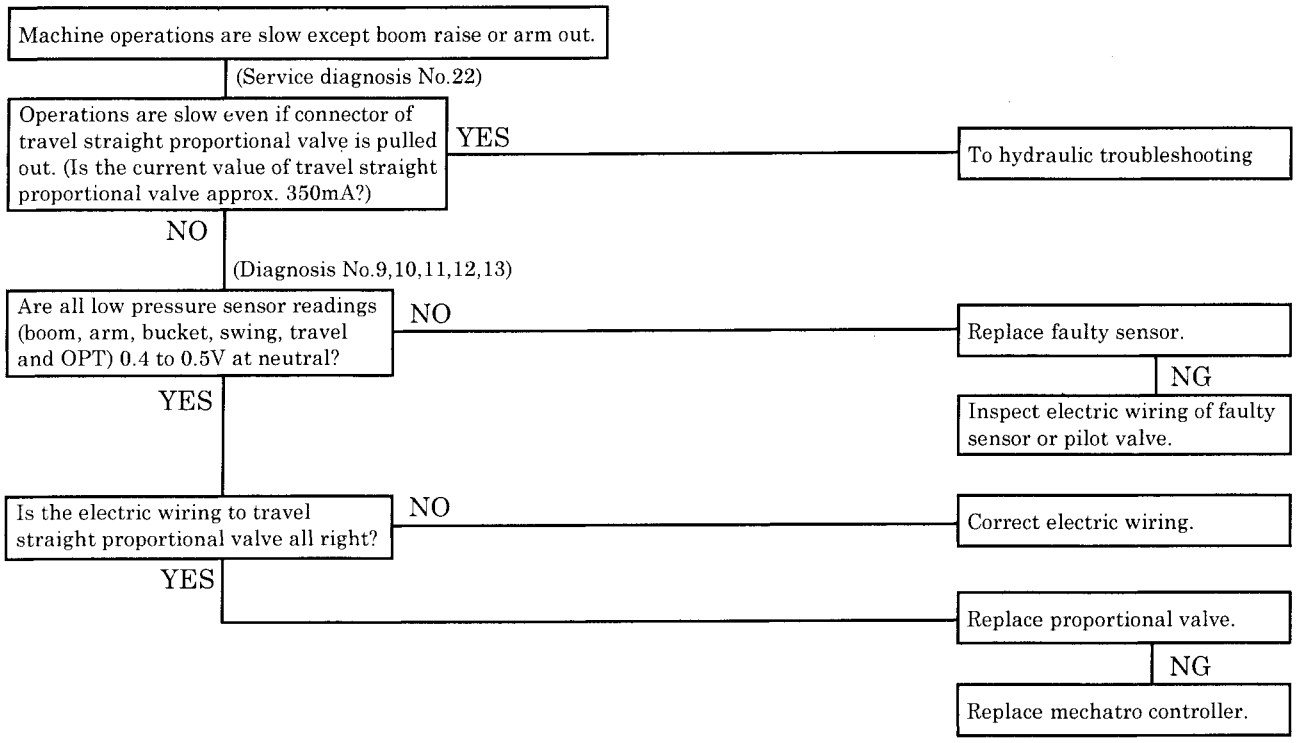
(1)-2


Machine moves unexpectedly with levers in neutral.
Machine stops moving unexpectedly if the connector (2PAF,2PAF) for proportional valve (PSV-D, PSV-B) P1,P2 bypass cut is disconnected.
YES
To electric troubleshooting.
NO
(Service diagnosis No.16)
Negative control pressure of P1, P2 are more than 30kgf/cm² (430psi).
NO
The secondary pilot pressure of the system that is moving unexpectedly is generated when the lever is in neutral.
YES
Inspect or replace pilot valve.
YES
NO
The spool returning spring of the circuit that is moving unexpectedly is broken.
YES
Inspect or replace spool assy and pilot cover.
NO
The spool of the valve that is operating unexpectedly moves smoothly by hand. (Remove pilot cover.)
NO
The outer circumference of spool is scratched.
YES
Replace spool assy.
NG
YES
NO
Replace control valve.
(Diagnosis No.20,No.21)
Pilot pressure at ports PCa, PCb (P1, P2 bypass cut valve) is approx. 6.9kgf/cm² (98psi).
NO
Inspect or replace the proportional valve for bypass cut valve that is defective.
NG
YES
Inspect or replace proportional valve block.
Return spring of bypass cut valve spool is broken.
YES
Inspect or replace bypass cut valve spool assy and pilot cover.
NO
Bypass cut valve spool moves smoothly by hand. (together with P1 and P2 bypass cut valves)
NO
Spool is scored on inspection.
YES
Replace bypass cut valve spool assy.
NG
YES
NO
Replace control valve.
Replace control valve.
Boom or arm?
YES
When the lock valve, body seat and selector parts were inspected, faults such as scratch were discovered.
YES
Replace lock valve and correct body seat or replace body or replace selector.
NO
NO
Faults such as scratch are discovered in load check valve and seats in conflux passage and recirculation passage. (CCb,CCa, CAr)
YES
Replace check valve, correct body seat or replace body.
NO
Spool of the circuit that operates unexpectedly is scored on inspection.
YES
Replace spool assy.
NO
Inspect or replace overload relief valve.
Inspect the cylinder of the circuit that operates unexpectedly and replace if faulty.
(Inside leak)
Inspect or replace control valve.

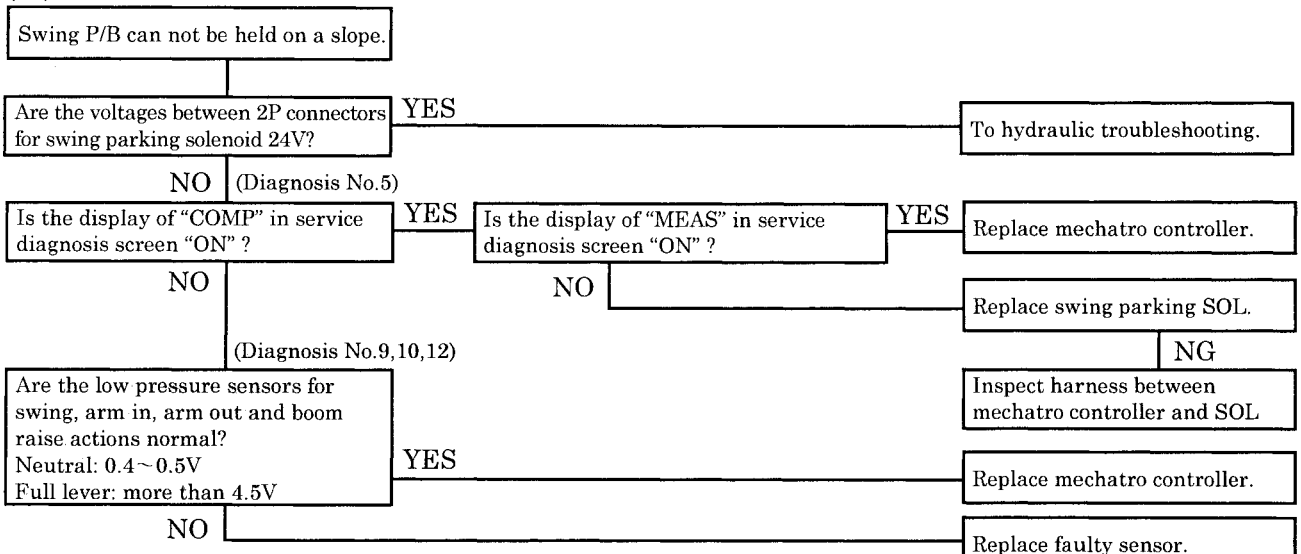
(4)-3


Machine can not perform fine swing operation.
(Service diagnosis No.16)
Negative control pressure when lever is neutral is 35~45kgf/cm² (500~640psi). (engine high idle)
YES
(Diagnosis No.25)
Current value of P1 pump proportional valve when lever is neutral is more than 770mA. (engine high idle)
NO
Is the action okay if the proportional valve for P1 is exchanged by the one for P2.
YES
Replace Pump proportional valve.
NO
Inspect or replace Negative control poppet, negative control block.
YES
(Diagnosis No.19,No.16)
With key ON and engine at stop :
Back pressure sensor ; 0.4~0.5V
P2 negative control sensor ; 0.4~0.5V
NO
Replace faulty sensor.
NO
YES
Action is normal if the connector for P2 bypass cut proportional valve is pulled out.
YES
To electric troubleshooting.
NO
Action is normal if the connector for swing parking brake solenoid is pulled out.
YES
To electric troubleshooting.
NO
Unload pressure of P2 pump when lever is neutral is equal or low to the P2 pump pressure ; approx. 40~50kgf/cm² (570~710psi)
NO
Pilot pressure at port PCa (P2 bypass cut valve) is approx. 6.9kgf/cm² (81psi).
NO
Inspect or replace P2 bypass cut valve proportional valve.
NG
Inspect or replace proportional valve block.
YES
P2 bypass cut spool return spring is broken.
YES
Inspect or Replace P2 bypass cut spool assy and pilot cover.
NO
P2 bypass cut spool moves smoothly by hand. (remove pilot cover.)
NO
Outer circumference of P2 bypass cut spool is scored.
YES
Replace P2 bypass cut spool assy.
NG
NO
Replace control valve.
YES
Replace control valve.
YES
(Diagnosis No. 5)
Secondary pressure when lever is neutral during swing parking SOL. is ON is 0kgf/cm² (0psi) (engine high idle)
NO
Inspect or replace swing parking solenoid valve.
NG
Inspect or replace proportional valve block.
NG
YES
Inspect or replace proportional valve block.
(Diagnosis No.12)
Secondary pressure of pilot valve is approx. 5.5kgf/cm² (78psi) just shifted a little.
NO
Inspect or replace pilot valve.
YES
Swing spool return spring is broken. (remove pilot cover.)
YES
Replace swing spool assy.
NO
Swing spool moves smoothly by hand.
NO
Outer circumference of swing spool is scored.
YES
Replace swing spool assy.
NG
YES
NO
Replace control valve.
Replace control valve.

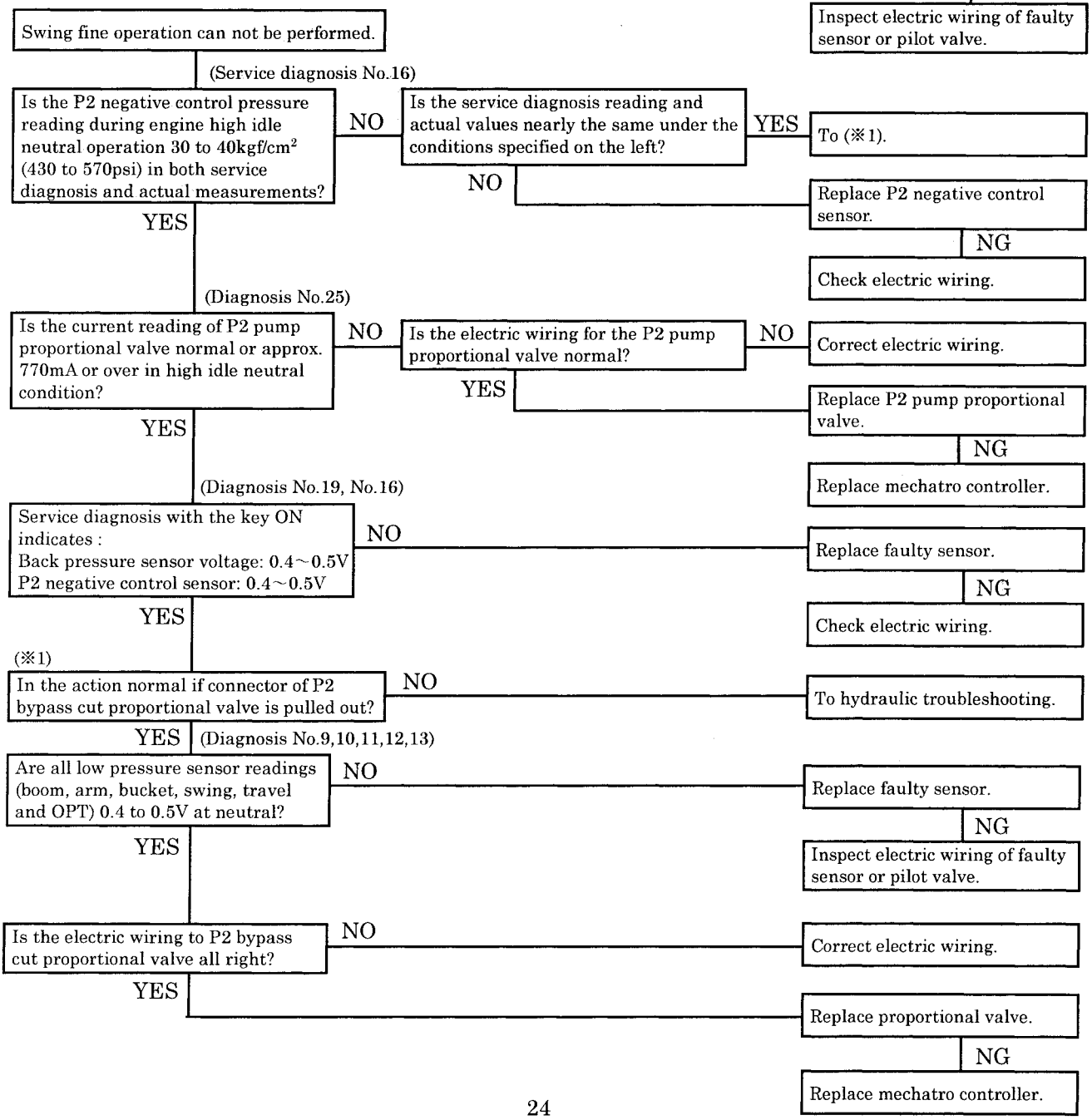
(2)-4


Machine operations are slow except boom raise or arm out.
(Service diagnosis No.22)
Operations are slow even if connector of travel straight proportional valve is pulled out. (Is the current value of travel straight proportional valve approx. 350mA?)
YES
To hydraulic troubleshooting
NO
(Diagnosis No.9,10,11,12,13)
Are all low pressure sensor readings (boom, arm, bucket, swing, travel and OPT) 0.4 to 0.5V at neutral?
NO
Replace faulty sensor.
NG
Inspect electric wiring of faulty sensor or pilot valve.
YES
Is the electric wiring to travel straight proportional valve all right?
NO
Correct electric wiring.
YES
Replace proportional valve.
NG
Replace mechatro controller.

(13)


Swing P/B can not be held on a slope.
Are the voltages between 2P connectors for swing parking solenoid 24V?
YES
To hydraulic troubleshooting.
NO
(Diagnosis No.5)
Is the display of "COMP" in service diagnosis screen "ON" ?
YES
Is the display of "MEAS" in service diagnosis screen "ON" ?
YES
Replace mechatro controller.
NO
NO
Replace swing parking SOL.
NG
(Diagnosis No.9,10,12)
Are the low pressure sensors for swing, arm in, arm out and boom raise actions normal?
Neutral: 0.4~0.5V
Full lever: more than 4.5V
Inspect harness between mechatro controller and SOL
YES
Replace mechatro controller.
NO
Replace faulty sensor.
NG
Inspect electric wiring of faulty sensor or pilot valve.

(14)


Swing fine operation can not be performed.
(Service diagnosis No.16)
Is the P2 negative control pressure reading during engine high idle neutral operation 30 to 40kgf/cm2 (430 to 570psi) in both service diagnosis and actual measurements?
NO
Is the service diagnosis reading and actual values nearly the same under the conditions specified on the left?
YES
To (※1).
NO
Replace P2 negative control sensor.
NG
Check electric wiring.
YES
(Diagnosis No.25)
Is the current reading of P2 pump proportional valve normal or approx. 770mA or over in high idle neutral condition?
NO
Is the electric wiring for the P2 pump proportional valve normal?
NO
Correct electric wiring.
YES
Replace P2 pump proportional valve.
NG
Replace mechatro controller.
YES
(Diagnosis No.19, No.16)
Service diagnosis with the key ON indicates :
Back pressure sensor voltage: 0.4~0.5V
P2 negative control sensor: 0.4~0.5V
NO
Replace faulty sensor.
NG
Check electric wiring.
YES
(※1)
In the action normal if connector of P2 bypass cut proportional valve is pulled out?
NO
To hydraulic troubleshooting.
YES
(Diagnosis No.9,10,11,12,13)
Are all low pressure sensor readings (boom, arm, bucket, swing, travel and OPT) 0.4 to 0.5V at neutral?
NO
Replace faulty sensor.
NG
Inspect electric wiring of faulty sensor or pilot valve.
YES
Is the electric wiring to P2 bypass cut proportional valve all right?
NO
Correct electric wiring.
YES
Replace proportional valve.
NG
Replace mechatro controller.

6D1

diesel engine

Shop Manual

(for industrial use)

FOREWORD

This Shop Manual is published for the information and guidance of personnel responsible for maintenance of Mitsubishi 6D1 series diesel engine, and includes procedures for adjustment and maintenance services.
We earnestly look forward to seeing that this manual is made full use of in order to perform correct service with no wastage.

For more details, please consult your nearest authorized Mitsubishi dealer or distributor.
Kindly note that the specifications and maintenance service figures are subject to change without prior notice in line with improvement which will be effected from time to time in the future.

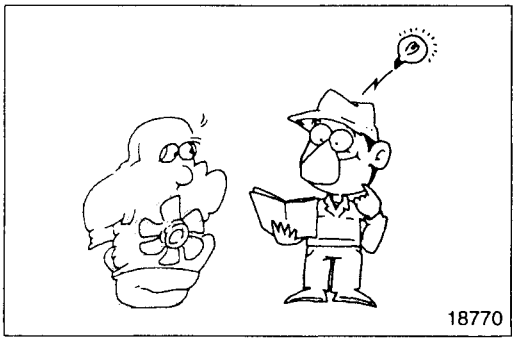
Applicable models

6D16-TLE1	ASIA, OCEANIA
6D16-TLUA	EU
6D16-TLEB	KAI

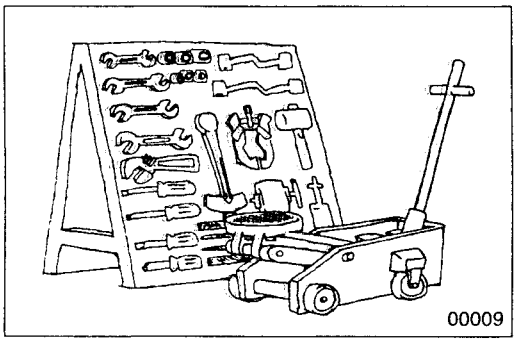
GROUP INDEX

PRECAUTIONS FOR MAINTENANCE OPERATION

In order to determine the condition of the vehicle adequately, attend the vehicle beforehand to find and keep record of the accumulated mileage, operating condition, what the customer's demand is, and other information that may be necessary. Prepare the steps to be taken and perform efficient and wasteless maintenance procedure.



Determine where the fault exists and check for the cause to see whether removal or disassembly of the part is necessary. Then follow the procedure specified by this manual.

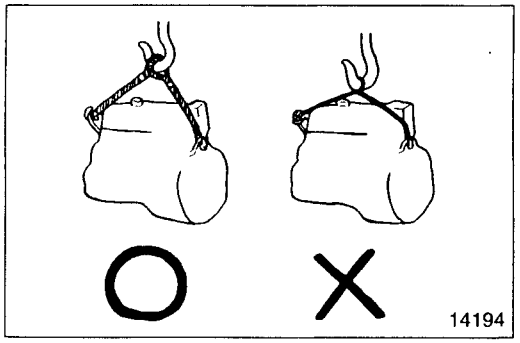


Perform maintenance work at a level area.
Prepare the following.

- Prepare general and special tools necessary for the maintenance work.

WARNING ⚠

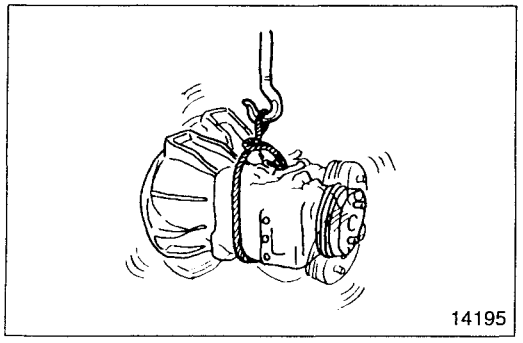
Do not attempt to use tools other than special tools where use of special tools is specified in this manual. This will avoid injury or damage.



Pay special attention to safety when removing or installing heavy items such as engines, transmissions.

When lifting up heavy items using cables, pay special attention to the following points:

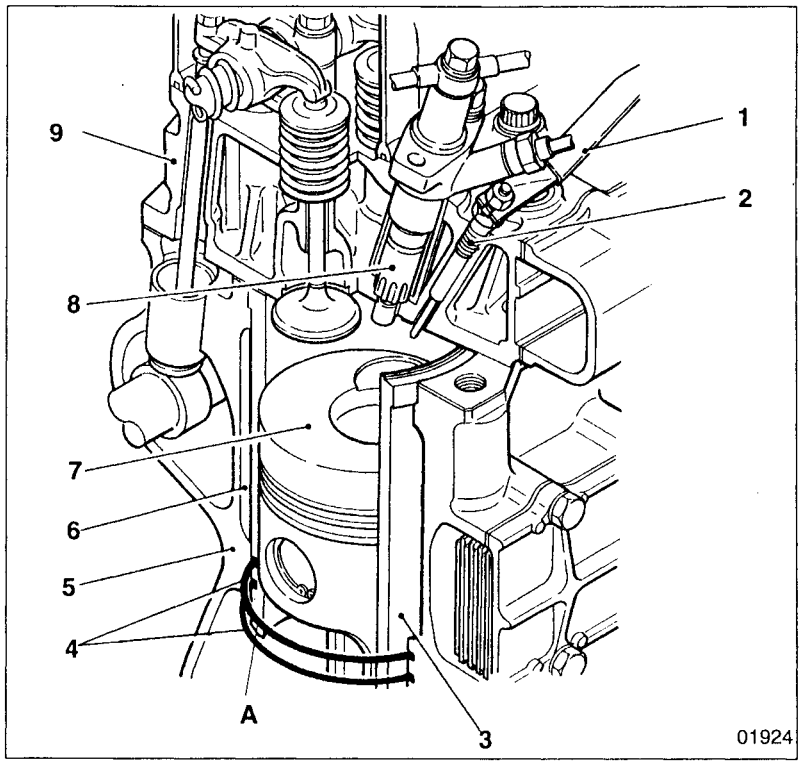
- Check the mass of the item to be lifted and use a cable capable of lifting that mass.



- If you do not have the specified lifting hanger, secure the item using cable taking the point-of-balance of the item into consideration.
- You must work in a position where you will not be injured even if the cable comes undone and the lifted item falls.

Cylinder Head and Crankcase

<Engines with wet type cylinder liners: 6D14, 14-T, 15-T>

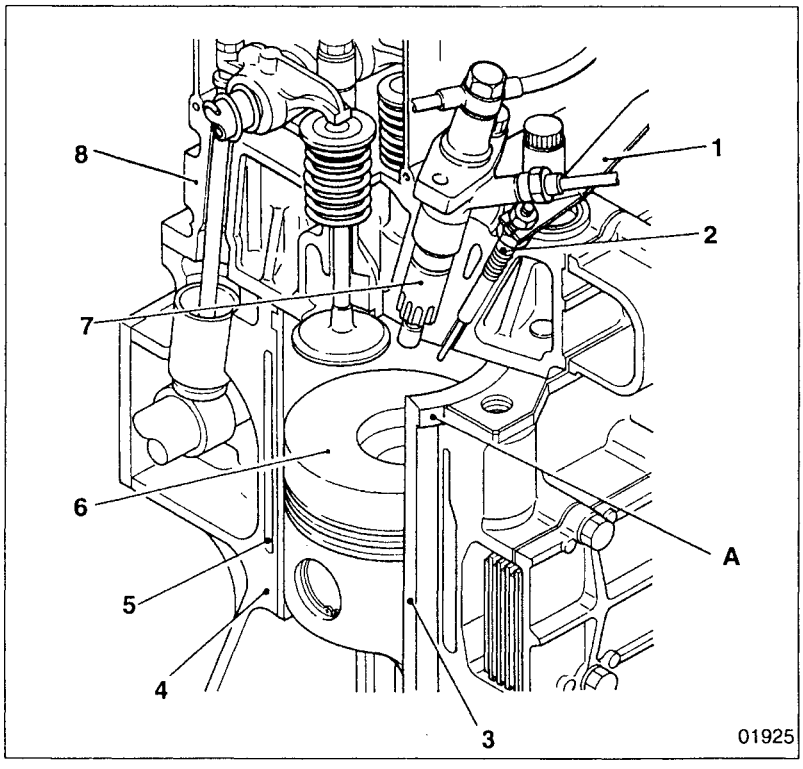


1 Connecting plate
2 Glow plug
3 Cylinder liner
4 O-ring
5 Crankcase
6 Water jacket
7 Piston
8 Injection nozzle
9 Cylinder head

A: Cylinder liner size mark: A, B, C

- The cylinder liners **3** are a removable wet type liners. They are press-fitted into the top of the crankcase **5** and the bottom of the water jacket **6**.
- The O-rings **4** are provided to prevent the ingress of coolant.
- The cylinder liners **3** and pistons **7** have size marks. The liner and piston that are paired should be of the same size mark.

<Engines with dry type cylinder liner: 6D16, 16-T, 16-TL>



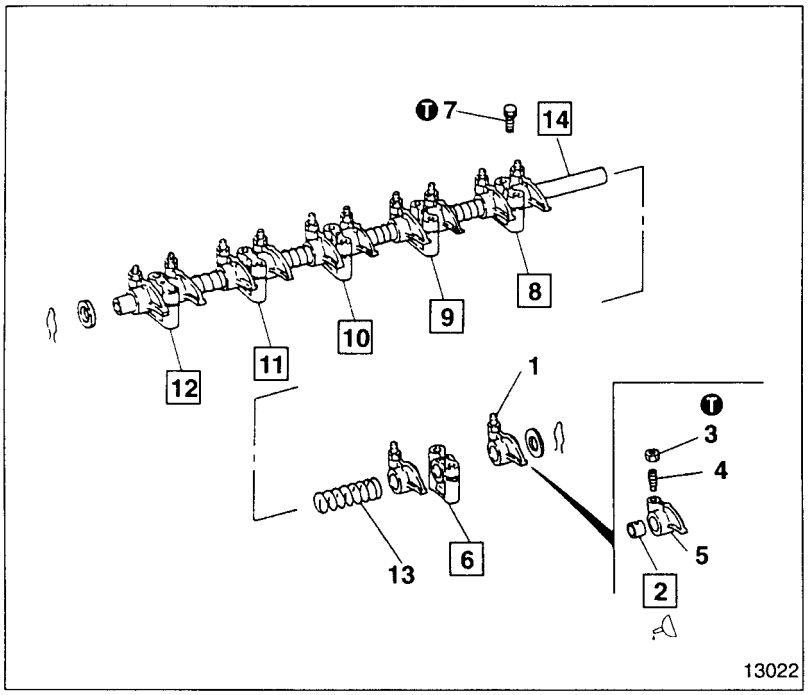
1 Connecting plate
2 Glow plug
3 Cylinder liner
4 Crankcase
5 Water jacket
6 Piston
7 Injection nozzle
8 Cylinder head

A: Cylinder liner size mark
Outer diameter mark: 1, 2, 3
Inner diameter mark: A, B

- The cylinder liners **3** are a dry type liners that are easier to remove than wet liners. Liners are press-fitted into the crankcase **4**.
- The cylinder liners **3**, crankcase **4**, and pistons **6** have size marks. They should be combined as specified according to the size marks. P.11-35

CYLINDER HEAD AND VALVE MECHANISM

Rocker and Bracket Assembly



● **Disassembly sequence**

1 Rocker assembly
2 Rocker bushing
3 Lock nut
4 Adjusting screw
5 Rocker
6 No. 6 rocker shaft bracket
7 Set screw
8 No. 5 rocker shaft bracket
9 No. 4 rocker shaft bracket
10 No. 3 rocker shaft bracket
11 No. 2 rocker shaft bracket
12 No. 1 rocker shaft bracket
13 Rocker shaft spring
14 Rocker shaft

● **Assembly sequence**

Reverse the order of disassembly.

Service standards

Unit: mm

Location	Maintenance item	Standard value (Basic diameter in [ ])	Limit	Remedy
2, 14	Rocker bushing-to-rocker shaft clearance	[24] 0.01 to 0.08	0.12	Replace

Ⓣ Tightening torques

Unit: N·m {kgf·m}

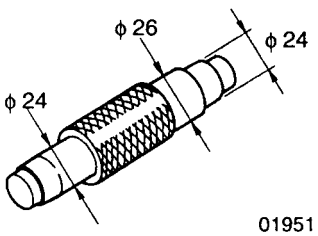
Location	Parts to be tightened	Tightening torque	Remarks
3	Adjusting screw lock nut	34 {3.5}	—
7	Rocker shaft set screw	3.9 {0.4}	—

Oils

Location	Points of application	Kinds	Quantity
2	Rocker bushing inner surface	Engine oil	As required

Special tools

Unit: mm

Location	Tool name and shape	Part No.	Application
2	Rocker Bushing Puller 	MH061777	Removing and installing rocker bushings

Tightening torques

Unit: N·m {kgf·m}

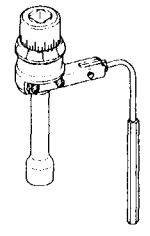
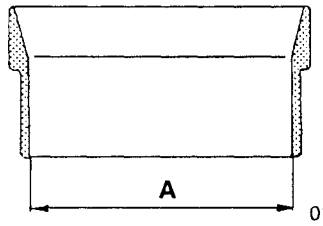
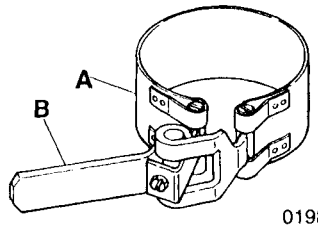
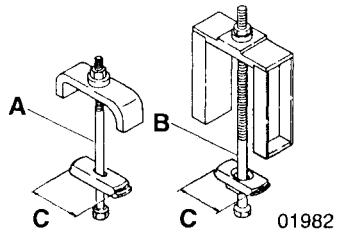
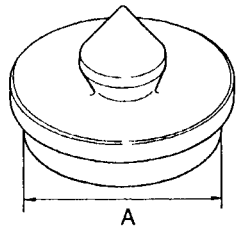
Location	Parts to be tightened	Tightening torque	Remarks
1	Bolt (connecting rod installation)	29 {3} + 90° ± 5°	Wet

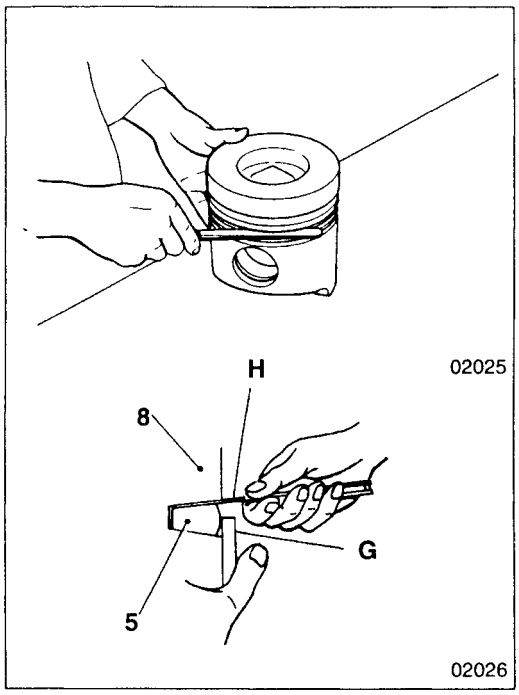
Oils

Location	Points of application	Kinds	Quantity
1	Bolt threads	Engine oil	As required
2, 4	Connecting rod bearing inside surface	Engine oil	As required
6	Cylinder liner outside surface	Engine oil	As required

Special tools

Unit: mm

Location	Tool name and shape	Part No.	Application
5	Socket Wrench  01984	MH061560	Installing piston and connecting rod assembly
5	Piston Guide A dimension: 6D14, 14-T: ϕ 110; 6D15-T: ϕ 113  01980	<6D14, 14-T> 30091-08200 <6D15-T> MH061327	Installing piston and connecting rod assembly
5	A: Piston Guide Clamp B: Piston Guide Lever  01981	<6D16, 16-T, 16-TL> A: MH061760 B: MH061658	
6	Cylinder Liner Extractor C dimension: 6D14, 14-T: ϕ 109.5; 6D15-T: ϕ 112.5; 6D16, 16-T, 16-TL: ϕ 117.5  01982	<6D14, 14-T> A: MH061719 <6D15-T> B: MH062003 <6D16, 16-T, 16-TL> B: MH061761	Removing cylinder liners
6	Cylinder Liner Installer A dimension: 6D15-T: ϕ 112.5; 6D16, 16-T, 16-TL: ϕ 117.5  01983	<6D15-T> MH062002 <6D16, 16-T, 16-TL> MH061771	Installing cylinder liners (dry type)



02025

02026

(2) Piston ring-to-piston ring groove clearance

- If any measurement exceeds the specified limit, replace the defective part(s).
- Measure the 1st compression ring **5** clearance with a thickness gauge **H** while pressing the ring against the piston **8** with a straight edge **G**.

NOTE

- **Remove any carbon deposits from the ring groove of the piston 8 and measure the clearance around the piston's entire periphery.**
- **Piston rings 5, 6, 7 must be replaced as a set. Never replace piston rings individually.**

Service standards

Unit: mm

Location	Maintenance item		Standard value (Basic diameter in [ ])	Limit	Remedy
—	Gear backlash	Between No. 1 idler gear and crankshaft gear	0.08 to 0.15	0.35	Replace
		Between No. 1 idler gear and No. 2 idler gear	0.07 to 0.15	0.35	Replace
		Between No. 1 idler gear and drive gear	0.07 to 0.15	0.35	Replace
		Between No. 2 idler gear and camshaft gear	0.08 to 0.16	0.35	Replace
2, 3	No. 1 idler shaft-to-gear bushing clearance		[37] 0.01 to 0.05	0.2	Replace
4, 12	Idler gear end play		0.05 to 0.15	0.3	Replace
11, 13	No. 2 idler gear bushing-to-shaft clearance		[32] 0.01 to 0.05	0.2	Replace

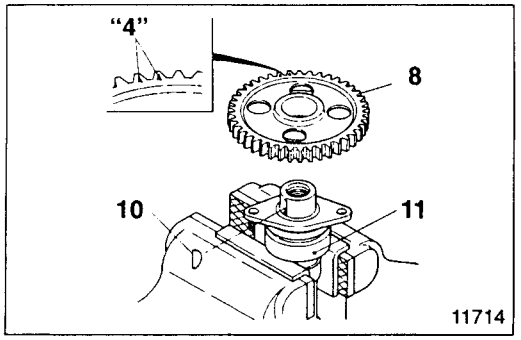
❶ Tightening torques

Unit: N·m {kgf·m}

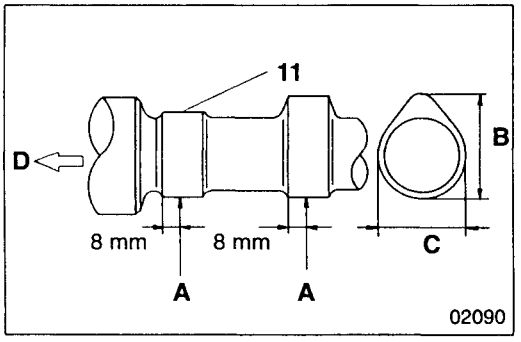
Location	Parts to be tightened	Tightening torque	Remarks
1	No. 1 idler gear mounting bolt	88 {9}	—
5	Collar mounting nut	82 {8.4}	—
9	No. 2 idler gear mounting bolt	95 {9.7}	—

Oils

Location	Points of application	Kinds	Quantity
6, 8	O-ring	Engine oil	As required



[Installation]
- Fit the camshaft gear 8 onto the camshaft **11** in the direction illustrated.
- Do not forget to fit the key **10**.



11 Inspecting camshaft

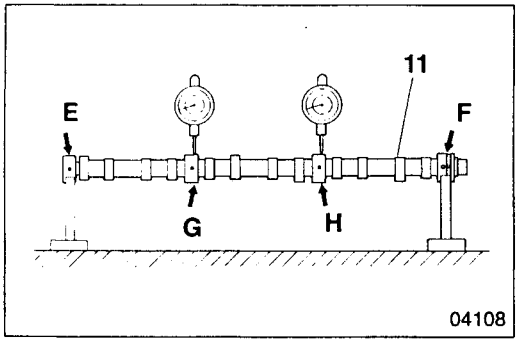
(1) Cam lift

If any base circle-to-lobe height difference is less than the required value, replace the camshaft **11**.

NOTE

Since the cams are tapered, they must be measured at the position A shown in the diagram.

B: Lobe height
C: Base circle diameter
D: Front of engine

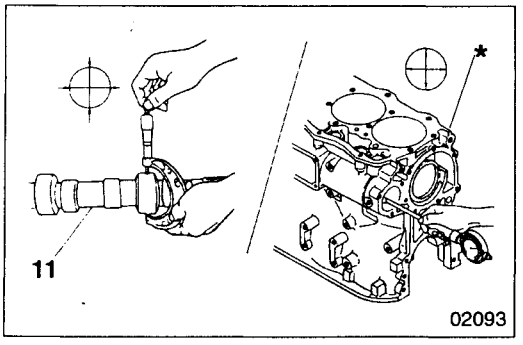


(2) Camshaft bend

Support the camshaft **11** at its No. 1 journal **E** and No. 4 journal **F**, then take measurements at the No. 2 journal **G** and No. 3 journal **H**. If either measurement exceeds the specified limit, replace the camshaft.

NOTE

Turn the camshaft 11 through one revolution. One-half of the dial indicator reading represents the camshaft's bend.



11 to 15 Camshaft and camshaft bushings

[Inspection]
If any clearance exceeds the specified limit, replace the defective part(s).

NOTE

Measure the camshaft bushings 12 to 15 with the camshaft installed in the crankcase*.

GROUP 12 LUBRICATION

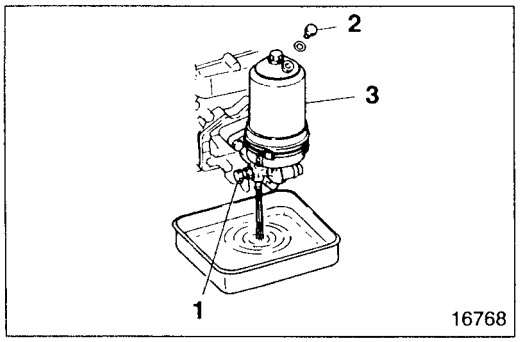
ON-VEHICLE INSPECTION AND ADJUSTMENT

<Replaceable-element type>

❶ Tightening torques

Unit: N·m {kgf·m}

Location	Parts to be tightened	Tightening torque	Remarks
1	Oil filter drain valve	29 ± 4.9 {3.0 ± 0.5}	—
4	Center bolt	54 ± 4.9 {5.5 ± 0.5}	—



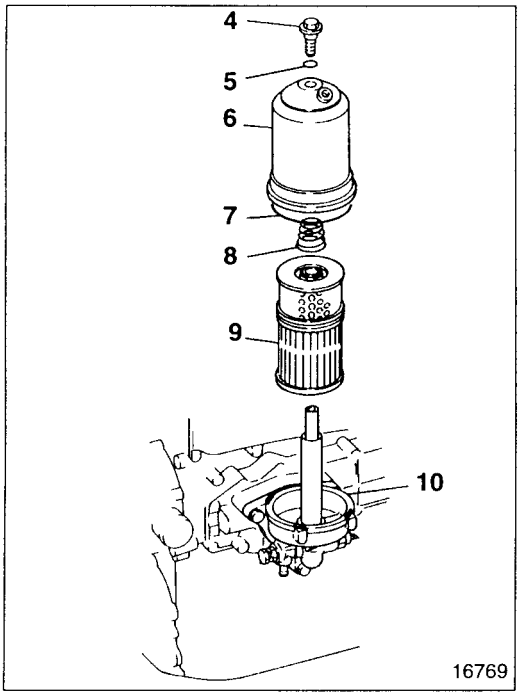
WARNING ⚠

- **Wipe up any spilled engine oil since it can cause a fire.**
- **Do not touch oil when the engine is hot since it can inflict severe burns.**

CAUTION ⚠

When pouring oil into the engine, take care not to spill any on the V-belts. Contact with oil could make the V-belts slip, rendering the cooling system less effective.

With a downward-facing oil filter, loosen drain valve plug **1** and air plug **2** in that order, then drain the oil out of filter **3**.



[Removal]

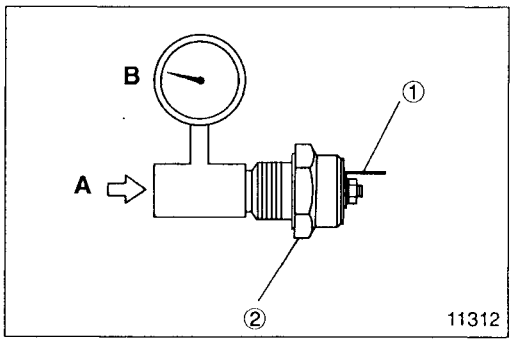
4 Center bolt
5 O-ring
6 Filter case
7 O-ring
8 Set spring
9 Element
10 Filter bracket

[Installation]

Wash all components other than the element in cleaning solvent, then fit the filter in the opposite order from that in which it was removed.

CAUTION ⚠

- **If O-ring 7 is twisted when fitted, it may be severed.**
- **Element 9 cannot be washed and reused.**



◆ Service procedure

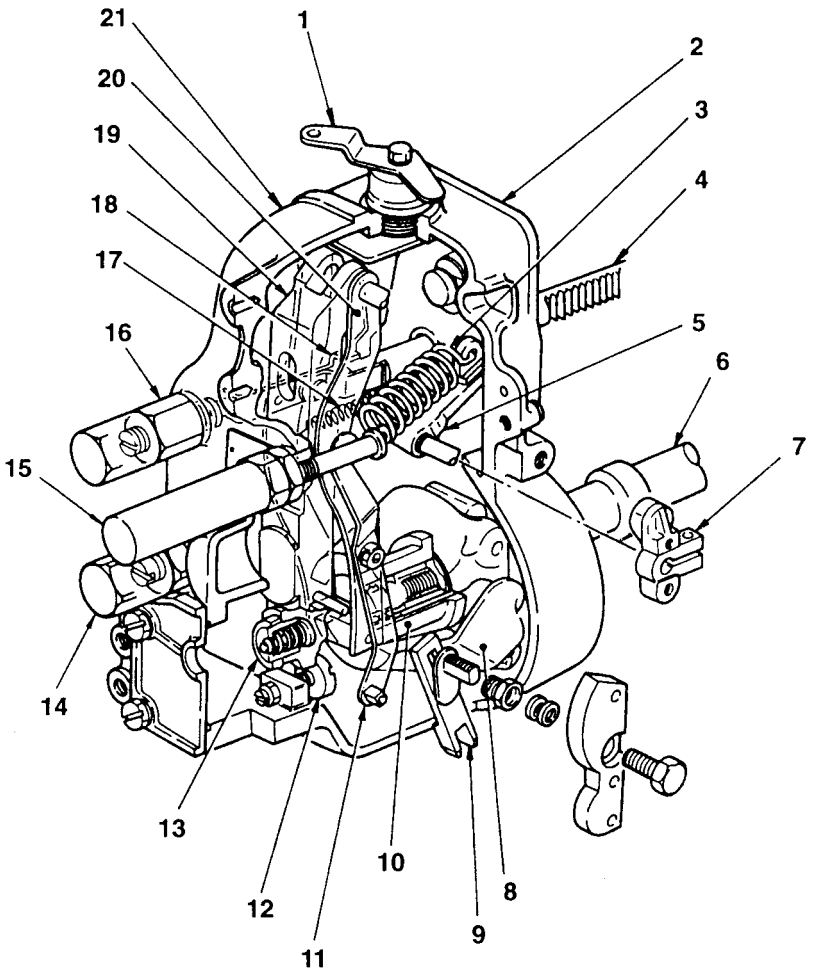
9 Inspection of engine oil bypass alarm switch

Carry out the following inspections and replace the engine oil bypass alarm switch **9** if the results are unsatisfactory:

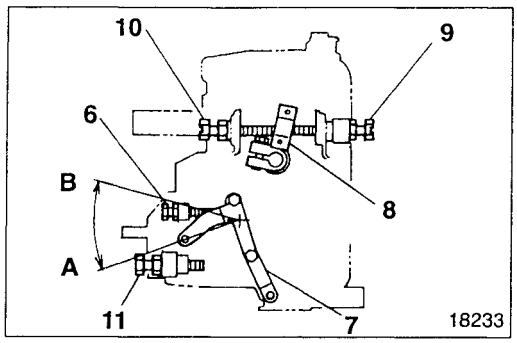
- With no air pressure **A** applied to engine oil bypass alarm switch **9**, check that there is no electrical continuity between the terminal ① and body ② of the engine oil bypass alarm switch.
- Starting with pressure of 0 kPa {0 kgf/cm^2}, gradually increase the air pressure **A** on engine oil bypass alarm switch **9**. Note the air pressure when electrical continuity appears between the terminal ① and body ②. Verify that this pressure conforms with the specified standard value.

B: Air pressure gauge

<RFD Type>



1 Stop lever
2 Governor housing
3 Governor spring
4 Control rack
5 Swivel lever
6 Camshaft
7 Speed control lever
8 Flyweight
9 Sliding lever
10 Sleeve
11 Floating lever
12 Stroke adjusting bolt
13 Idling spring
14 Torque spring
15 Smoke set assembly
16 Damper spring
17 Start spring
18 Floating lever link
19 Tension lever
20 Guide lever
21 Governor cover



● **No-load minimum speed**

[Inspection]
Confirm that the load control lever **7** is touching the idling set bolt **6**. Then check that the minimum speed is up to specification.

A: Idling position

[Adjustment]
If the minimum speed is out of specification, adjust it using the idling set bolt **6**.

● **No-load maximum speed**

[Inspection]
Move the load control lever **7** to the full-load position **B**. Then, check that the maximum speed is up to specification.

[Adjustment]
If the maximum speed is out of specification, adjust position of the speed control lever **8** using the maximum speed stopper bolt **9** and stopper bolt **10**.

NOTE

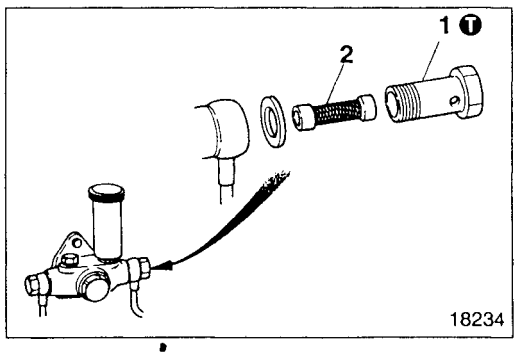
- **Do not alter the position of the full-load stopper bolt 11.**
- **Check that the engine does not stall and that no hunting occurs when the load control lever 7 is moved quickly from the full-load position to the idling position. If any abnormality is apparent, make adjustments within the specified range.**

Cleaning Fuel Feed Pump Gauze Filter

❶ Tightening torques

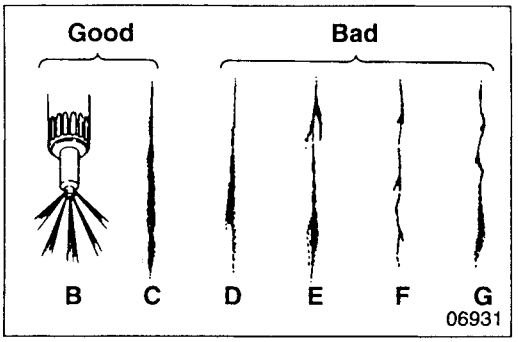
Unit: N·m {kgf·m}

Location	Parts to be tightened		Tightening torque	Remarks
1	Eyebolt	Zexel	20 to 29 {2 to 3}	—
		Nippondenso	15 to 20 {1.5 to 2}	—



- Remove the eyebolt **1** from the suction port side of the fuel feed pump.
- Remove the gauze filter **2** from the eyebolt **1**.
- Clean the gauze filter **2**.
- Refit the gauze filter **2** and eyebolt **1** in the opposite order to their removal.
- Bleed all air out of the fuel system.
- Start the engine and check for fuel leaks.

INJECTION NOZZLE <1-spring Type>



(2) Inspecting spray condition

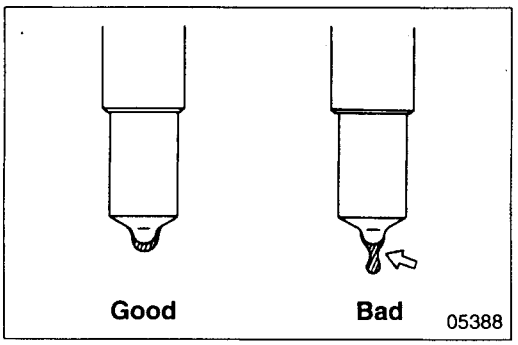
- Pump the lever on the nozzle tester **A** at a rate of about 1–2 seconds per stroke, and maintain a continuous spray.

  B: Even spray from all five injection orifices (Good)
  C: Even and symmetrical spray (Good)
  D: Asymmetrical spray (Bad)
  E: Branched spray (Bad)
  F: Thin spray (Bad)
  G: Irregular spray (Bad)

- If the spray is unsatisfactory, disassemble and clean the injection nozzle assembly **5**, then inspect the spray again. If the spray is still unsatisfactory, replace the injection nozzle assembly **5**.
- Check that no fuel drips from the nozzle after the spray is complete.

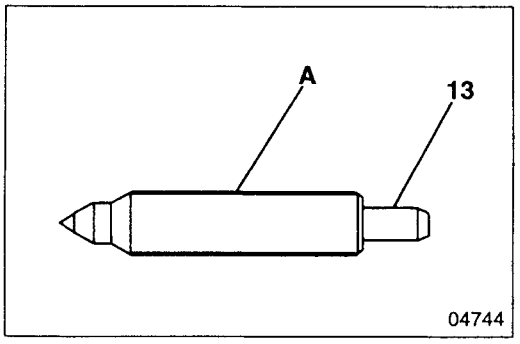
WARNING ⚠

Do not touch the spray that comes out of the nozzle.



(3) Inspecting for leaks

- Slowly increase the nozzle pressure to 1.96 MPa {20 kgf/cm^2} below the specified valve opening pressure. Maintain this pressure for 10 seconds and check that no fuel drips from the end of the nozzle.
- If the injection nozzle assembly **5** appears defective, disassemble and clean it, then inspect it again. If the injection nozzle assembly **5** still appears defective, it must be replaced.

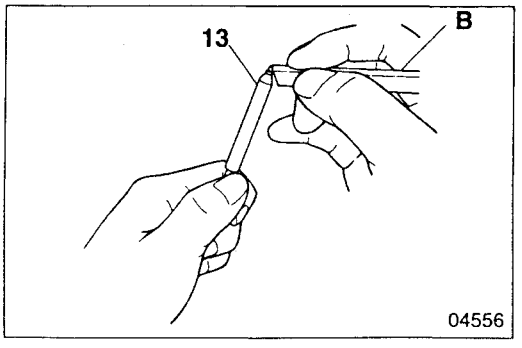


[5] Injection nozzle assembly

[Disassembly]

CAUTION ⚠

- **Do not touch the sliding parts A of the needle valve 7.**
- **Do not change the needle valve 13 and nozzle 12 combination on each cylinder.**



[Cleaning]

Wash the needle valve **13** and nozzle **12** in gas oil, then use the [C] Cleaning Tool Set to remove any carbon deposits in accordance with the following procedure.

- Remove carbon from the end of the needle valve **13** using the Cleaning Bar of the [C] Cleaning Tool Set.

CAUTION ⚠

Do not use a wire brush or any hard metallic object for cleaning.

MEMO

SPECIFICATIONS

Air cleaner element

Item	Specifications	
Type	Cyclone type, filter paper type	Cartridge type, filter paper type
Manufacturer	Nihon Donaldson	

Dust indicator

Item	Specifications
Type	Mechanical type
	Electrical type

Turbocharger

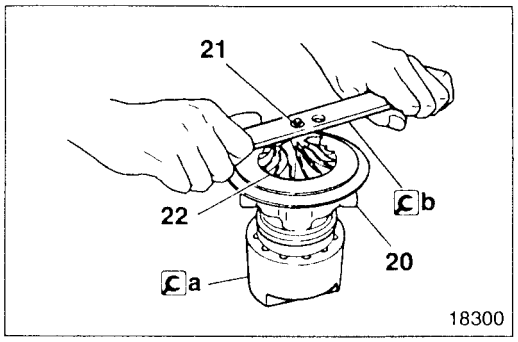
Item	Specifications		
Type	T04B	T04E	TF07
Manufacturer	Garret turbo		Mitsubishi Heavy Industries

Intercooler

Item	Specifications
Type	Tube & corrugated fin air cooled type

MEMO

TURBOCHARGER <T04E (6D16-TL)>



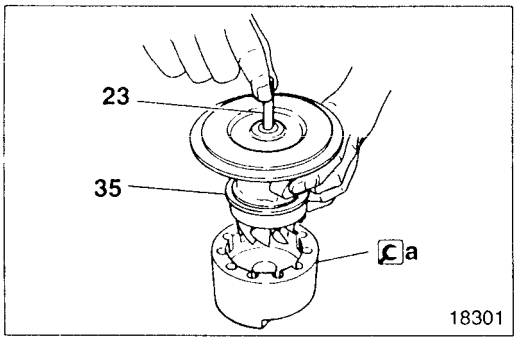
22 Compressor wheel

[Removal]

- Hold the a Holding Fixture in a vice, and slowly insert the center housing & rotating assembly **20**.
- Using the b T-handle, remove the lock nut **21** and slowly withdraw the compressor wheel **22** upward.

CAUTION

Use care to prevent bending the shaft of the turbine wheel 23.

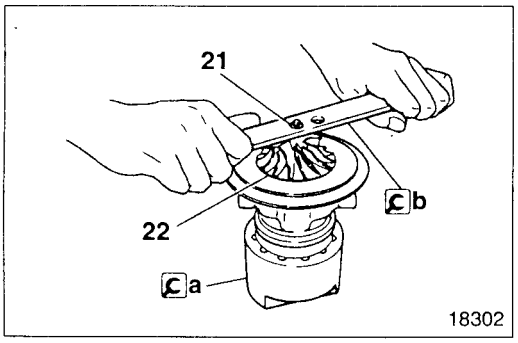


[Installation]

- Hold the shaft of the turbine wheel **23** and center housing **35** by hand, and slowly insert them into the a Holding Fixture.

CAUTION

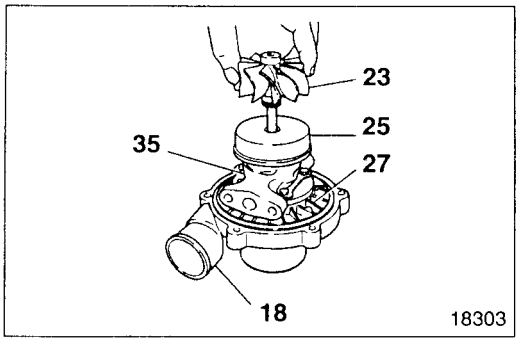
- **When they are inserted, use care to prevent damage to the blades of the turbine wheel 23.**
- **Do not release the shaft before insertion, as the turbine wheel 23 falls down.**



- Hold the a Holding Fixture in a vice and slowly insert the compressor wheel **22**.
- Using the b T-handle, tighten the lock nut **21** to the specified torque, and then turn it down 90°C to 110°C further from that position.

CAUTION

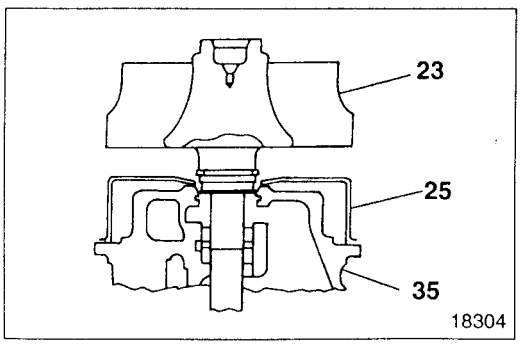
Use care to prevent bending the shaft of the turbine wheel 23.



23 25 Turbine wheel, wheel shroud

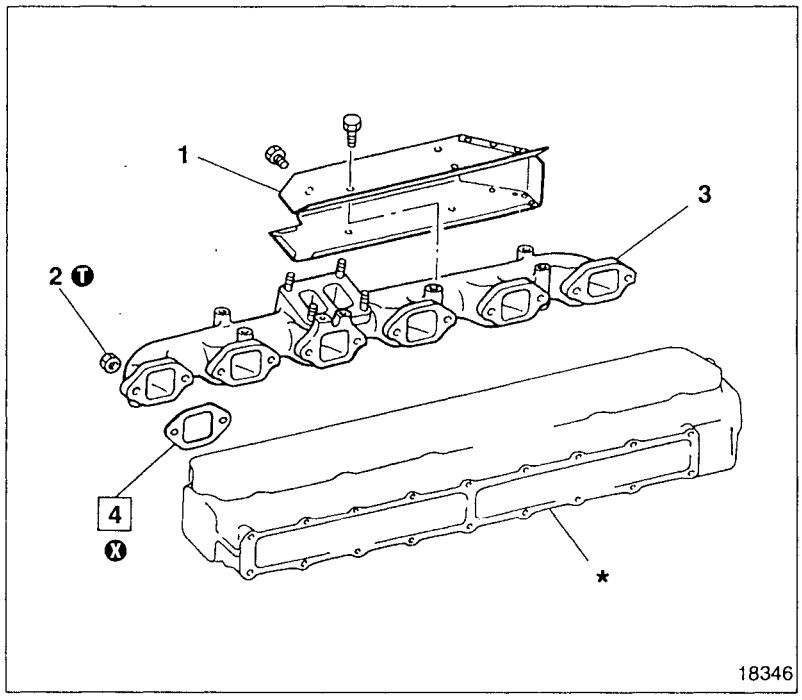
[Removal]

Place the back plate **27** of the center housing **35** on the compressor housing **18** removed beforehand, and remove the turbine wheel **23** and wheel shroud **25**.



[Installation]

After installation, lightly rotate the turbine wheel **23** by hand to check whether it continues to rotate. If it does not rotate lightly, re-perform the disassembly and reassembly procedures.



● **Disassembly sequence**

1 Cover
2 Nut
3 Exhaust manifold
4 Gasket

*: Cylinder head 🕮 Gr.11
X: Non-reusable part

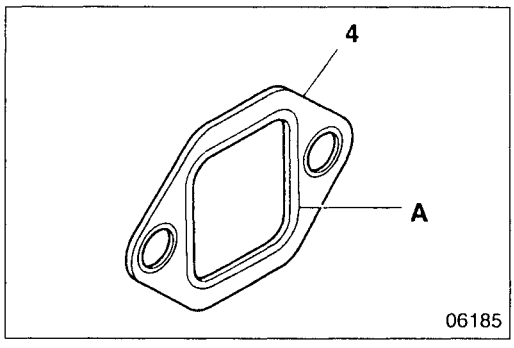
● **Reassembly sequence**

Reverse the order of disassembly.

T Tightening torque

Unit: N·m {kgf·m}

Location	Parts to be tightened	Tightening torque	Remarks
2	Nut (for mounting exhaust manifold)	41 {4.2}	—

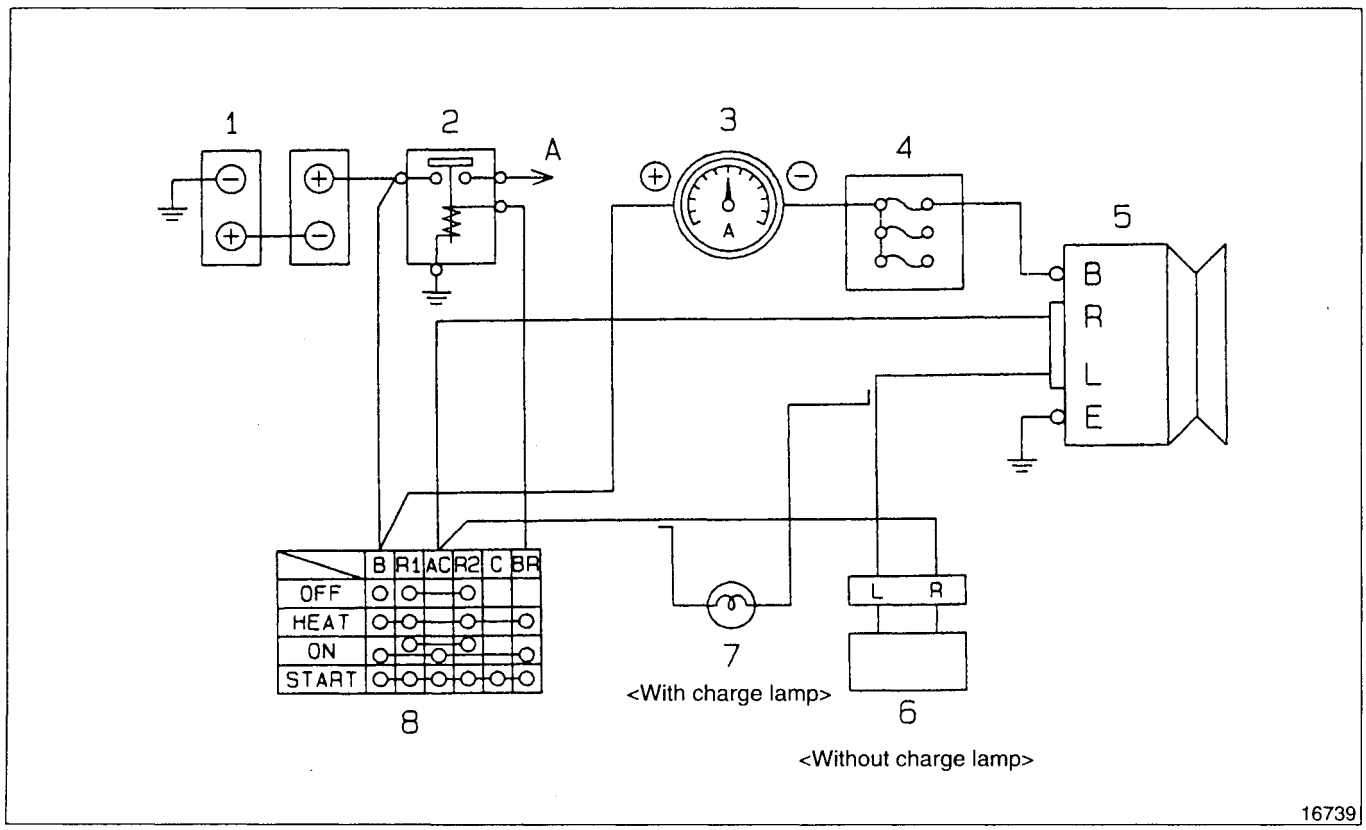


◆ Service procedure

4 Installation of gasket

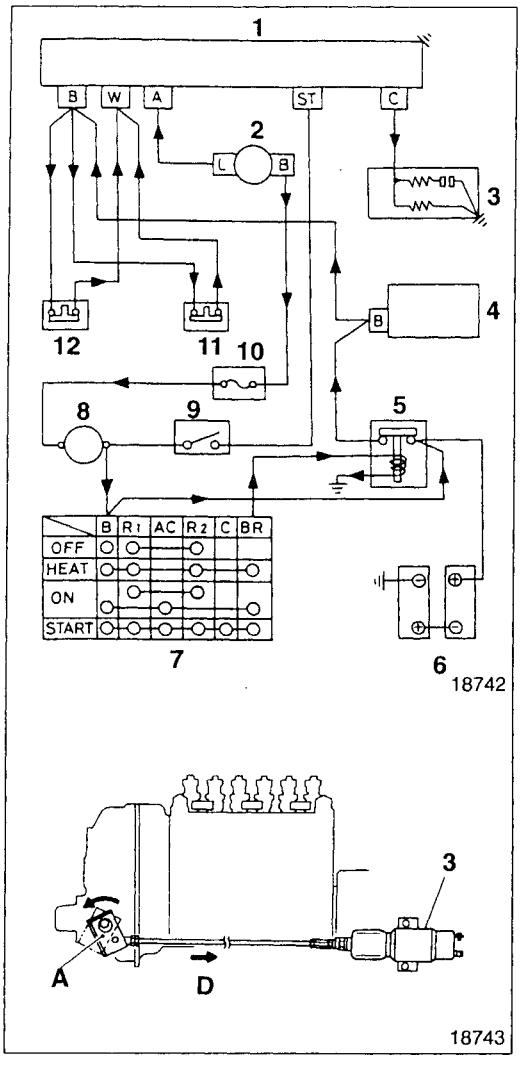
Install the gasket **4** with the grommet fold-back portion **A** toward the cylinder head.

Charging Circuit



1 Battery
2 Battery relay
3 Ammeter
4 Fuse box
5 Alternator
6 Safety relay <Circuit without charge lamp>
7 Charge lamp <Circuit with charge lamp>
8 Starter switch

A: To starter relay terminal B
B: Terminal B
E: Terminal E
L: Terminal L
R: Terminal R



When engine is automatically stopped

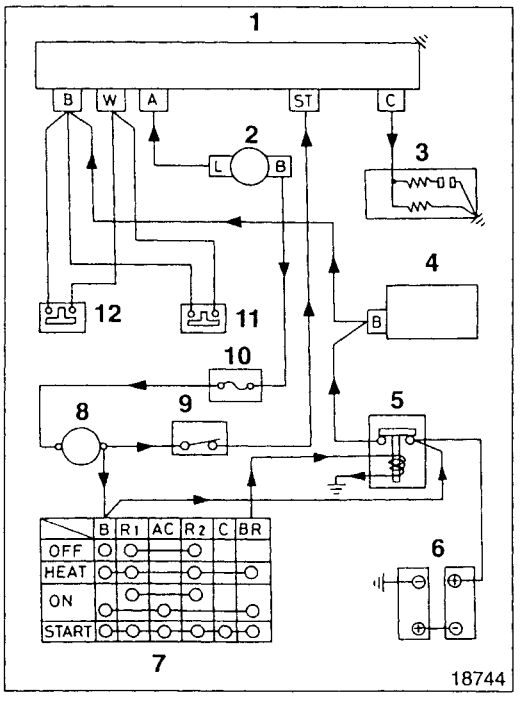
- When the oil pressure abnormally falls or the coolant temperature abnormally rises while the engine is running, engine oil pressure switch **11** or coolant temperature sensor (thermo switch) **12** turns on and current flows as described below.

6 → **5** → **7** (**B** → **BR**) → **5** (coil) → Earth
4 (**B**) → **1** (**B**) → **11** → **1** (**W**) → Earth
12

- At this point, the current from terminal **A** of the solenoid relay **1** is flowing the internal circuit, the switch in the relay is activated and the current flows as follows:

1 (**B**) → Internal switch of the relay → **1** (**C**) → **3** → Earth

- As a result, solenoid **3** is activated and pulls the stop lever **A** in direction **D** to stop the engine.
- Even after losing the generating voltage from the alternator **2**, the internal capacitor of the solenoid relay **1** keeps the solenoid **3** in position.



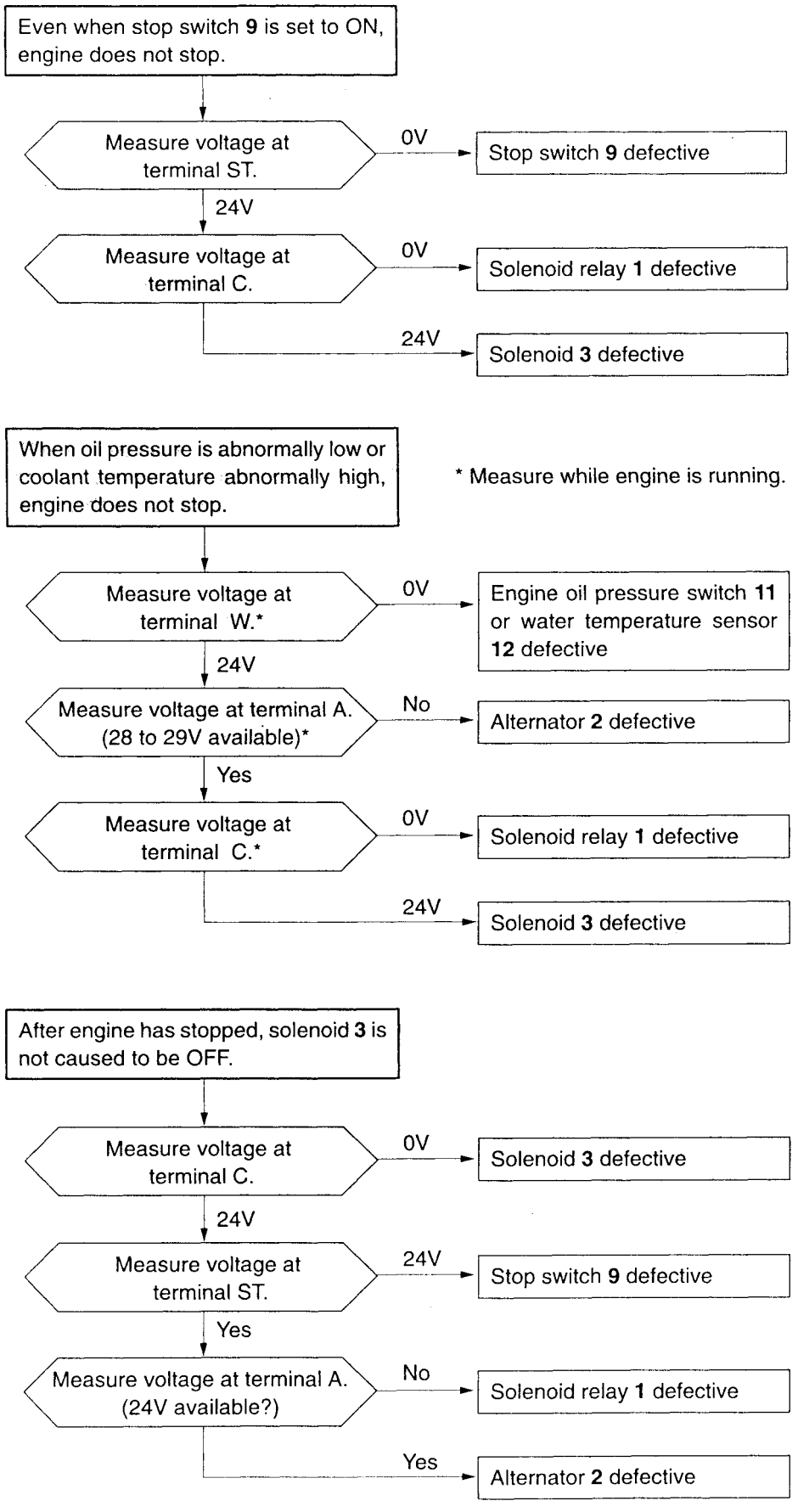
When engine is manually stopped

- Position of stop switch **9**: ON

Irrespective of the generating voltage of the alternator **2**, current from stop switch **9** flows to the internal circuit via ST-terminal of the solenoid relay **1** to activate the internal switch of the relay, and the current flows as follows:

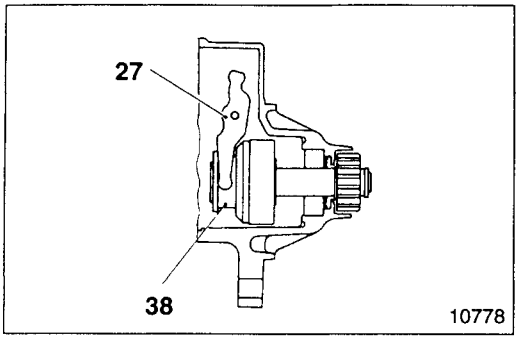
1 (**B**) → Internal switch of the relay → **1** (**C**) → **3** → Earth

- As a result, engine is stopped in the same way as the automatic stop.


Even when stop switch 9 is set to ON, engine does not stop.
Measure voltage at terminal ST.
0V
Stop switch 9 defective
24V
Measure voltage at terminal C.
0V
Solenoid relay 1 defective
24V
Solenoid 3 defective
When oil pressure is abnormally low or coolant temperature abnormally high, engine does not stop.
* Measure while engine is running.
Measure voltage at terminal W.*
0V
Engine oil pressure switch 11 or water temperature sensor 12 defective
24V
Measure voltage at terminal A. (28 to 29V available)*
No
Alternator 2 defective
Yes
Measure voltage at terminal C.*
0V
Solenoid relay 1 defective
24V
Solenoid 3 defective
After engine has stopped, solenoid 3 is not caused to be OFF.
Measure voltage at terminal C.
0V
Solenoid 3 defective
24V
Measure voltage at terminal ST.
24V
Stop switch 9 defective
Yes
Measure voltage at terminal A. (24V available?)
No
Solenoid relay 1 defective
Yes
Alternator 2 defective

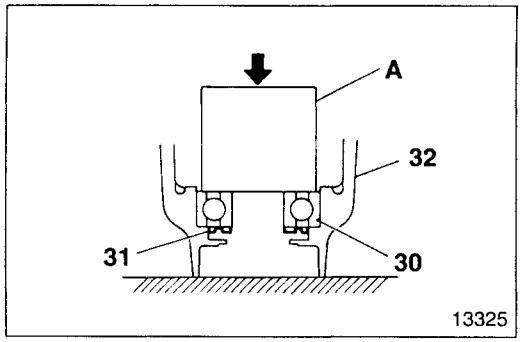
MEMO

Pages 54—52 to 54—93 are deleted as they are not in use.



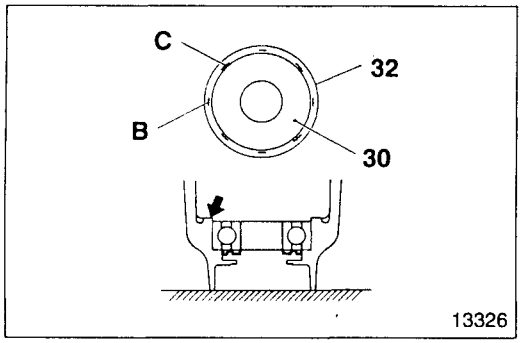
27 Installation of lever

Install the lever **27** in the illustrated direction on the overrunning clutch **38**.



30 Installation of front bearing

- Before the front bearing **30** is press-fitted, install the dust seal **31**.
- Press-fit the front bearing **30** in the front bracket with a press, using the pipe-like tool **A**.

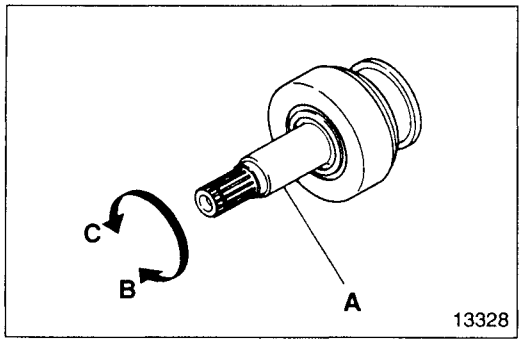


- Stake the front bracket **32** side.

CAUTION

Avoid staking the previously staked points B.

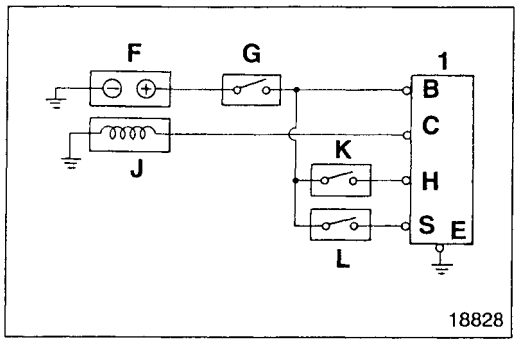
C: Staking points (4 places)



38 Inspection of overrunning clutch

Perform the following checks. If there is anything wrong, replace the overrunning clutch **38**.

- Check to ensure that when the shaft **A** is made to rotate in the direction **B**, it rotates smoothly.
- Check to ensure that when the shaft **A** is made to rotate in the direction **C**, it is locked.



◆ Service procedure

1 Solenoid relay

Wire as shown at left and perform the following checks.

F: Power supply
G: Switch
J: Solenoid (or coil load: 30 ± 3A)
K: Switch
L: Switch

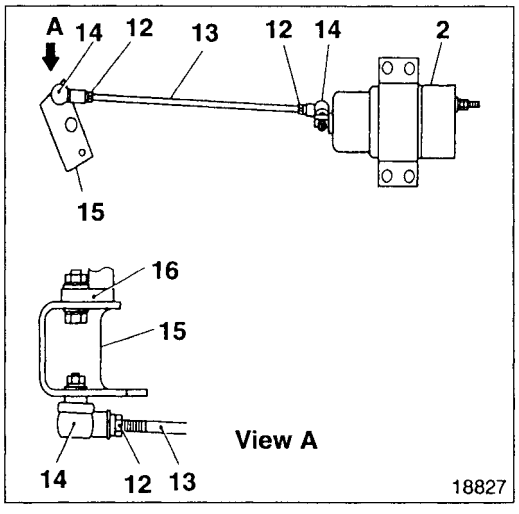
(1) Inspection of operation of solenoid relay 1 and delay time

- Check to ensure that when the switches **G** and **L** are set to ON, the solenoid **J** operates.
- Set the switch **L** to OFF and simultaneously measure the time required before the solenoid **J** is deactivated.

(2) Inspection of relay holding time

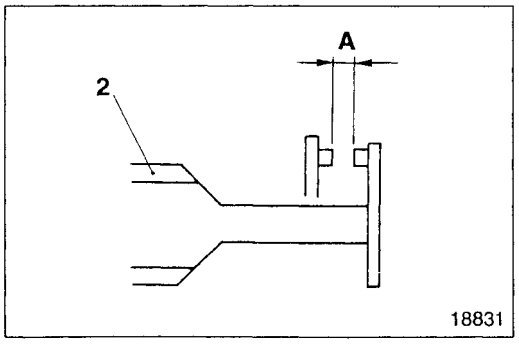
- Set the switches **G** and **L** to ON. After the solenoid **J** has operated, set the switch **K** to ON.
- Set the switch **L** to OFF and check to ensure that the solenoid **J** stays in the operating state for more than 30 seconds.
- After checking that the solenoid **J** is in the operating state, set the switch **K** to OFF to check that the solenoid is deactivated.

2 Solenoid



[Installation]

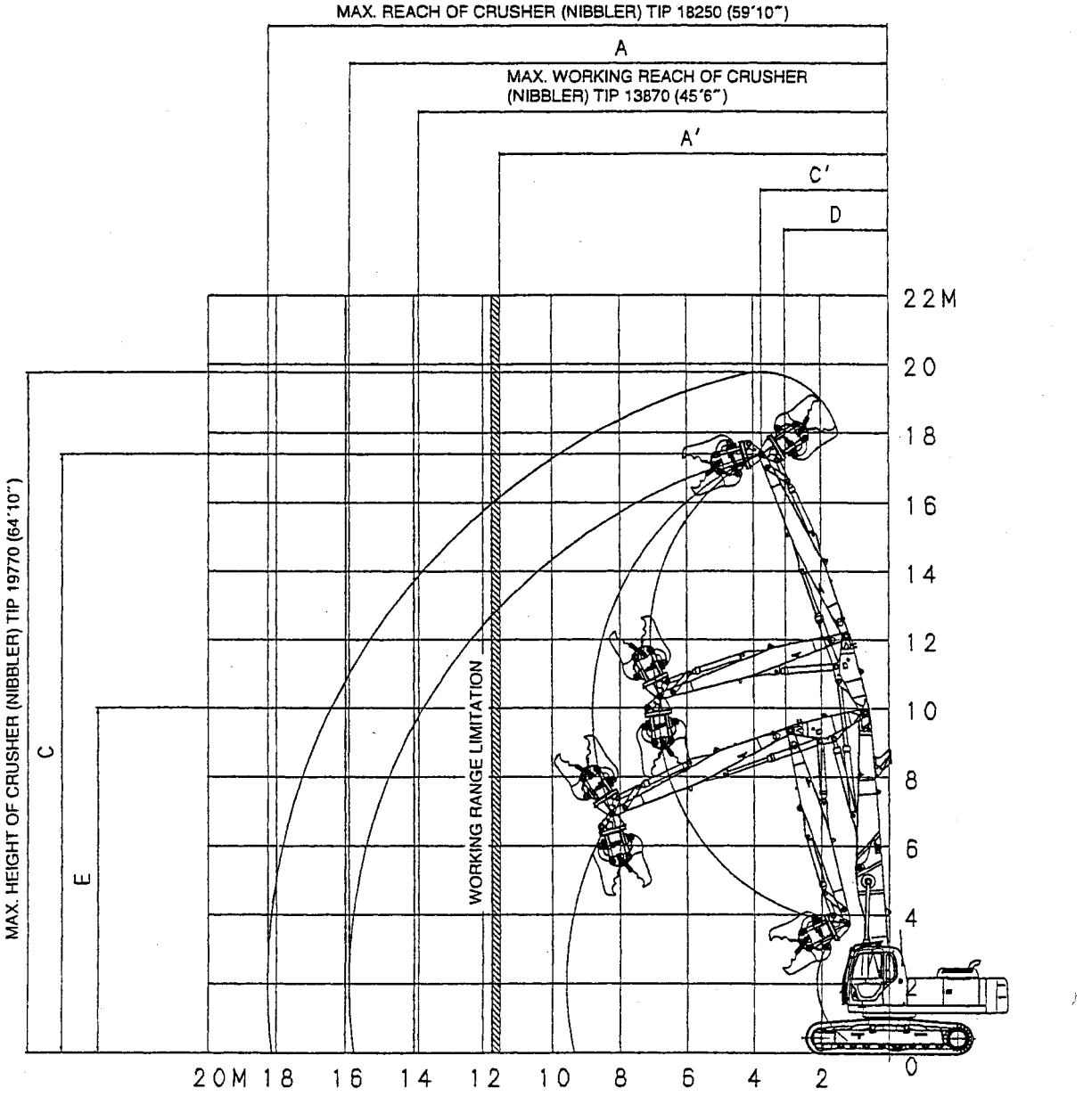
- Install the ball joint **14** to the rod **13** and temporary tighten with lock nut **12**.
- Check to ensure that the ball joint **14** moves smoothly.
- Install the solenoid **2** to the engine.
- With the stop lever **15** in the stop position, install the rod **13**. Adjust the rod length by turning it.



[Adjustment]

- Remove the cover of the solenoid **2**.
- Apply the specified voltage to solenoid **2** and energize the solenoid.
- Check that the clearance **A** between the pointers of the solenoid is within the standard value.

● 3 PIECE DEMOLITION ATT.
3.33M (10ft-11in) MAIN BOOM+4.485M (14ft-9in) FRONT BOOM+2.3M (7ft-7in)
INTER BOOM+5.85M (19ft-2in) ARM+ WITH KR850PR-2 CRUSHER (NIBBLER)



Unit : mm (ft-in)

ITEM	FUNCTION	STD VALUE
A	MAX. WORKING REACH	15,880 (52'1")
※※ A'	MAX. WORKING REACH IN SAFETY	11,500 (37'9")
※ C	MAX. WORKING HEIGHT	17,400 (57'1")
C'	REACH OF MAX. WORKING HEIGHT	3,750 (12'4")
D	MIN. SWING RADIUS	3,060 (10'10")
※ E	REACH OF MIN. SWING RADIUS	10,010 (32'10")
LIMIT WEIGHT OF CRUSHER		2,450kg (5,400 lb)

NOTE :
- The dimensions of mark ※ does not indicate the shoe lug height [37mm (1.46in)].
- This drawing shows the values when Japanese standard crusher (nibbler : KR850PR-2) is attached.

⚠ CAUTION

The values of mark ※※ shows the max. working reach on the flat and hard ground, and the operation on the area for the area larger than the values are unstable and may cause turning over.

● Stop valves attached to the attachment

1. LMN (Special demolition attachment)

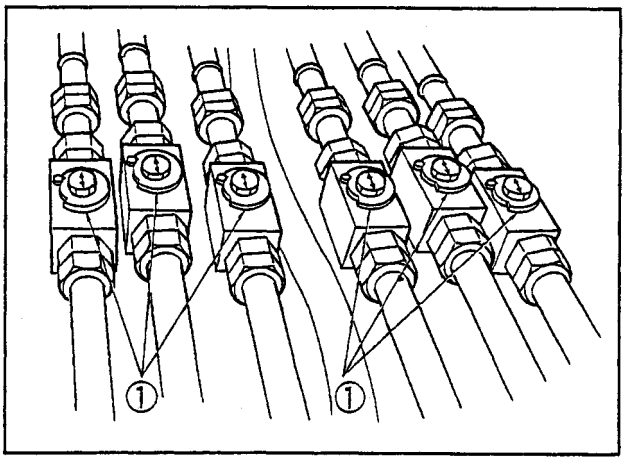
   Open the stop valves attached on the back face of the main boom, the back face of the insert boom and the back face of the arm as follows :

2. Backhoe

   Open the stop valves located at the tip of the boom as follows :

   Turn the stop valves ① to the specified position (⊖) by mean of a spanner.

   Tool used : Spanner (24mm)

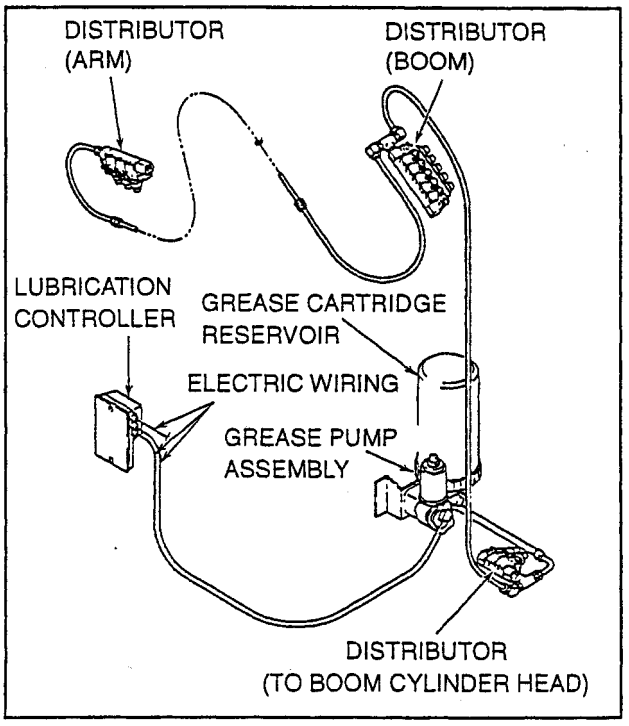


3.5 AUTO GREASER

(SEE OPERATION MANUAL SECTION III)

● Construction

The auto greaser consists of a grease pump assembly (including the grease cartridge) located at the front right of the slewing frame, a controller located at the inner rear part of the cab and distributors.



● Operation

1. Automatic operation

   If the engine is started, the controller is powered. All the indicating lamps light for several seconds. Part of the display flickers, and all lamps except the power lamp go out. Then the controller begins integrating the lubrication intervals.

   When the operating time of the machine reaches a preset lubrication interval, the grease pump starts automatically and performs a cycle consisting of pressurize, pressure hold (lubrication) and depressurize (filling grease into distributor for next lubrication). The pump stops automatically after greasing for a preset time.

2. Voluntary operation

   The grease pump starts at a desired time the moment the controller start switch is pressed (regardless of the integrated time) and stops automatically after one cycle of greasing is completed.

   In that case, the operating time being integrated is cancelled. Time integration is resumed the moment the grease pump has stopped automatically.

(5) LMN (Special demolition ATT. with rotating crusher) circuit : Crusher rotating action
[Electric system :
ATT operating lever grip switch action]

Switch operation	Crusher rotating direction
Press the RH lever rotating switch.	RH
Press the LH lever rotating switch.	LH

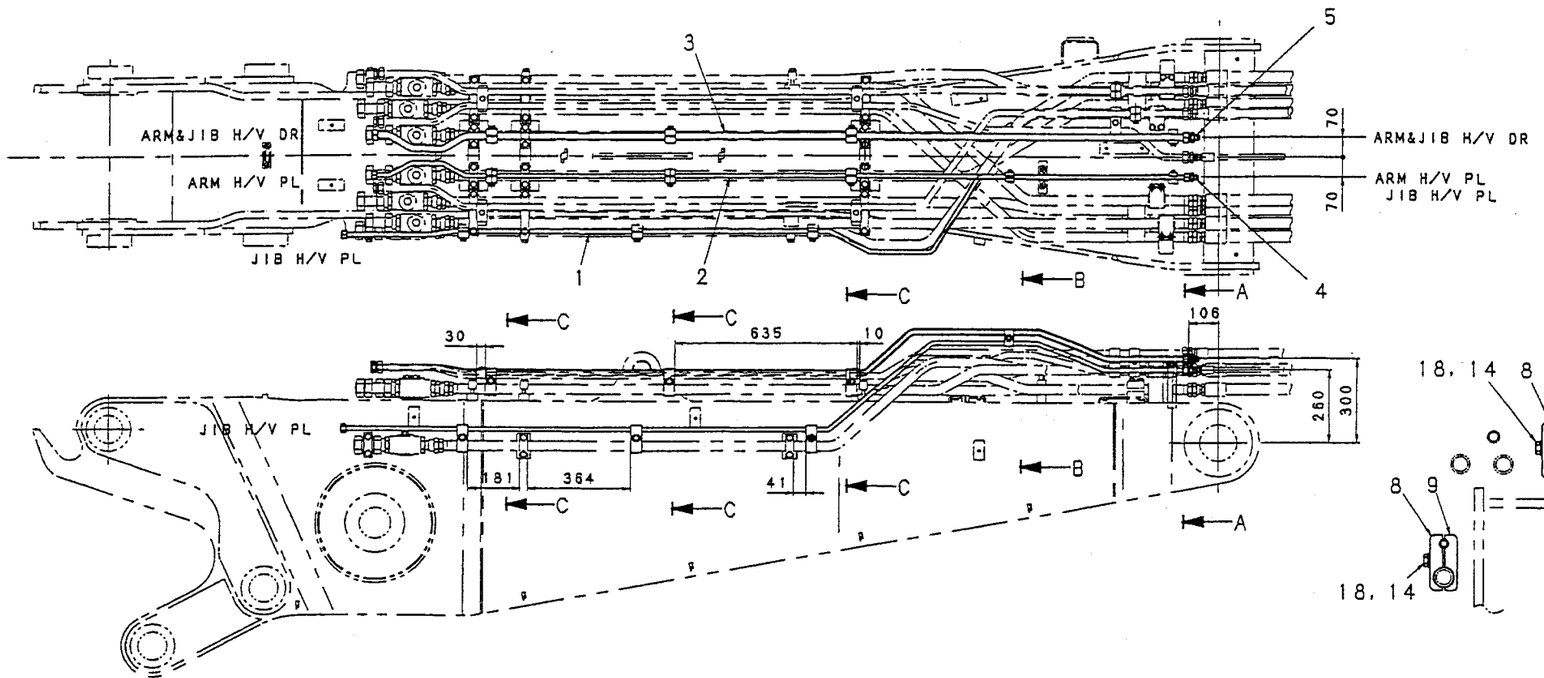
If the rotation switch is turned [ON], LH or RH rotation solenoid (SV-7 or SV-6) is energized.
This changes over the control valve (55) with a separate 1-stack solenoid.

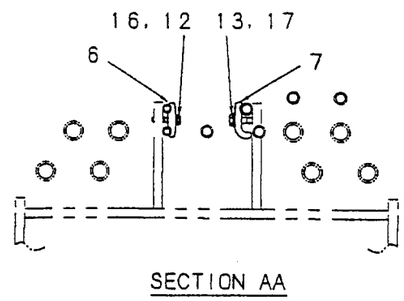
[Mechatro controller]
If the rotation switch is turned [ON], the mechatro controller detects it and energizes the P1 bypass cut solenoid proportional valve. Secondary pressure flows out of the solenoid proportional valve and switches over the P1 bypass cut valve.

[Main circuit]
1) If the P1 bypass cut valve is switched over, the oil flow of the P1 pump flows out of the P4 port of control valve (50) and is led to the P port of the separate 1-stack control valve (55). If the solenoid valve (SV-7 or SV-6) is switched over, the oil is supplied to the crusher (nibbler) rotating motor (57) from the A or B port of the 1-stack control valve.
2) The oil returning from the crusher (nibbler) rotating motor (57) returns directly to the tank by way of the 1-stack control valve (55).

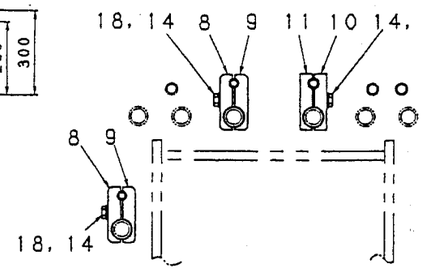
(10) ATT safety control lines

(10-1) Boom hyd. lines ; LC42H00068F1

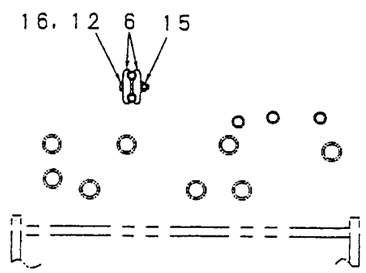




SECTION AA

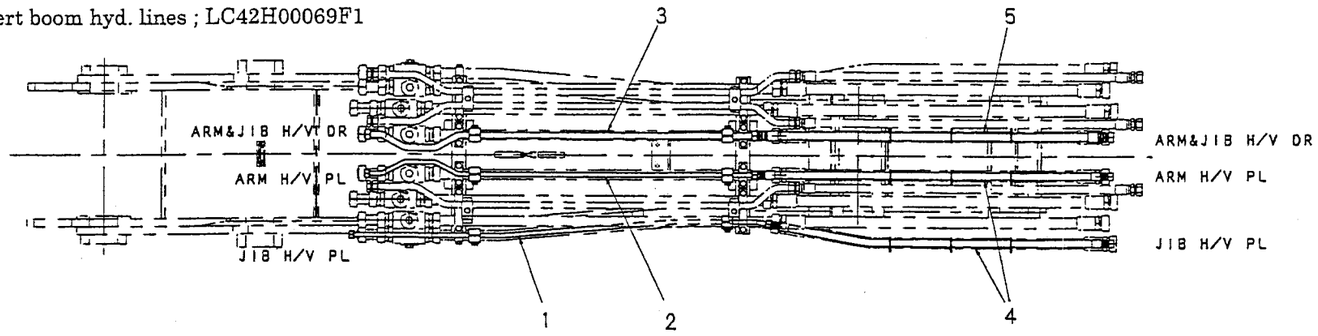


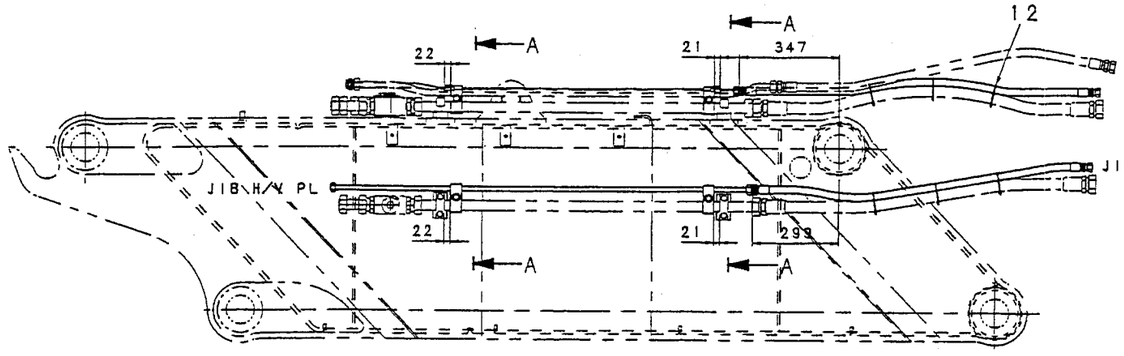
SECTION CC

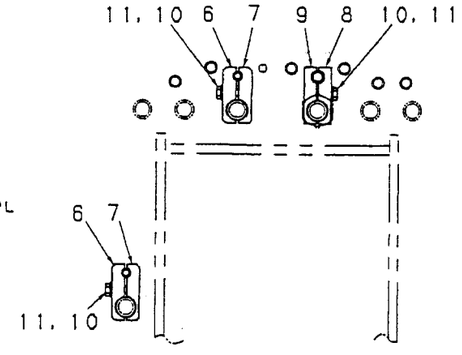


SECTION BB

(10-2) Insert boom hyd. lines ; LC42H00069F1







SECTION AA

NOTE

1 TIGHTENING TORQUE FOR M THREAD.

THREAD SIZE	TORQUE
M8	3.4kgf·m (24.6lbf·ft)
M10	6.7kgf·m (48.5lbf·ft)
M12	11.7kgf·m (84.6lbf·ft)

2 TIGHTENING TORQUES FOR NUTS AND SLEEVES.

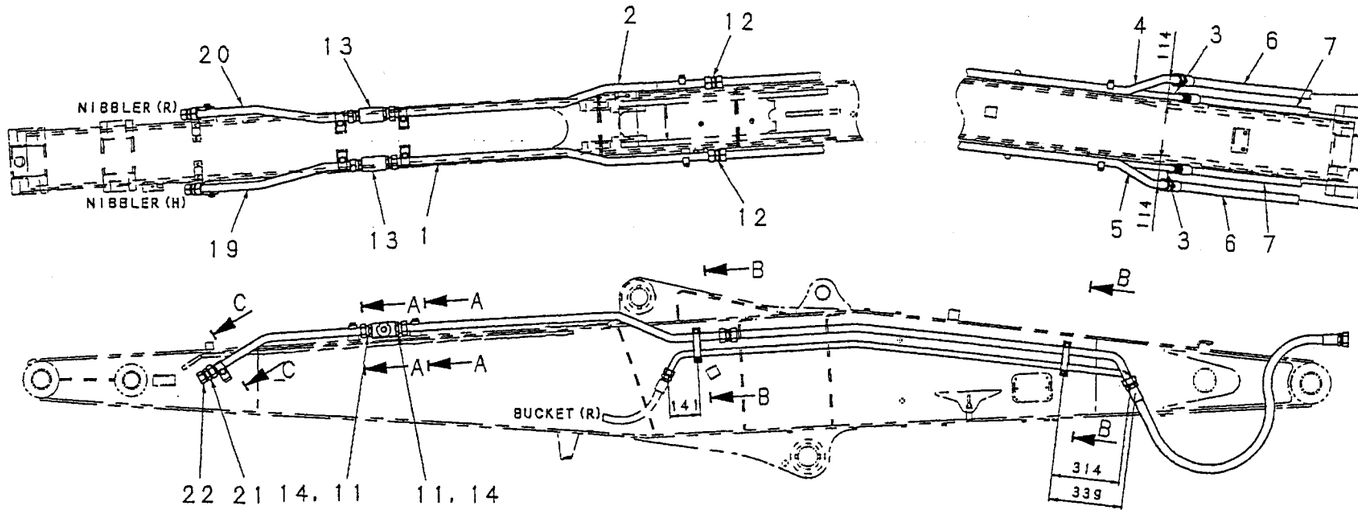
TUBE SIZE	
φ15×2.0	12.0kgf·m (86.8lbf·ft)
φ22×3.0	22.0kgf·m (159lbf·ft)

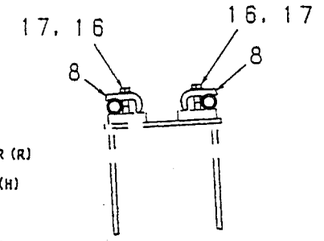
3 MAKE SURE NOT TO MISS O-RING AT ASSEMBLING.

4 APPLY LOCTITE #242 TO CLAMP ATTACHING BOLT.

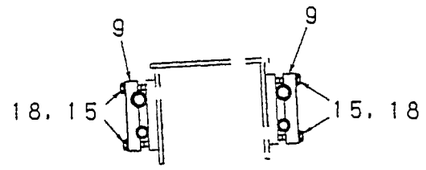
(1) ROTATING LMN & B ATT. HYD. LINES

(1-1) LMN & B arm hyd. lines ; LC43H00009F1

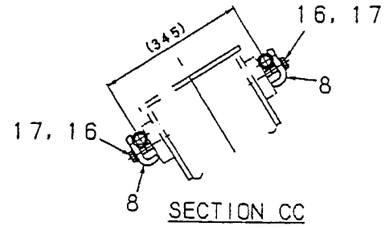




SECTION AA (2 PLACES)



SECTION BB



SECTION CC

NOTE

1 MAKE SURE NOT TO MISS O-RING AT ASSEMBLING.

2 TIGHTENING TORQUE FOR M THREAD.

THREAD SIZE	TORQUE
M12	11.7kgf·m (84.6lbf·ft)
M14	18.5kgf·m (134lbf·ft)

3 TIGHTENING TORQUE FOR PF, PT THREAD.

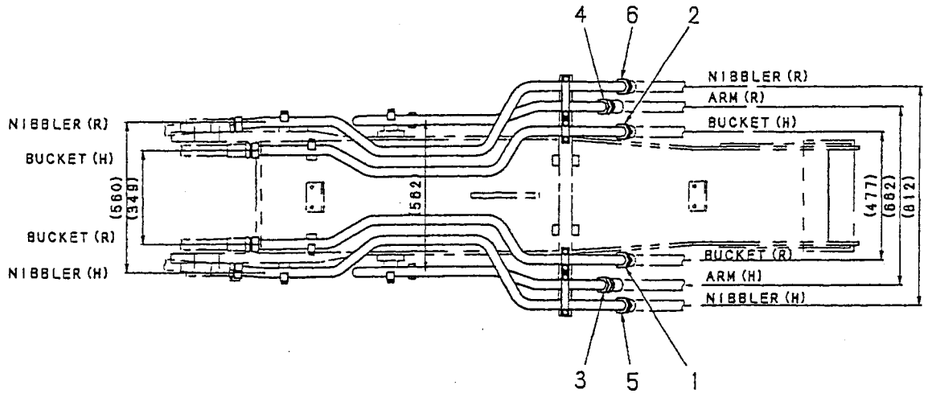
THREAD	TORQUE
1	26.0kgf·m (187lbf·ft)
1"1/4	40.0kgf·m (289lbf·ft)

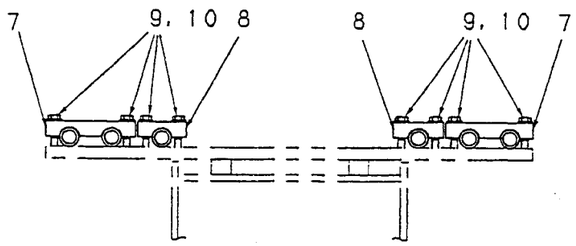
4 TIGHTENING TORQUES FOR NUTS AND SLEEVES.

TUBE SIZE	
ϕ35×5.0	45.0kgf·m (325lbf·ft)

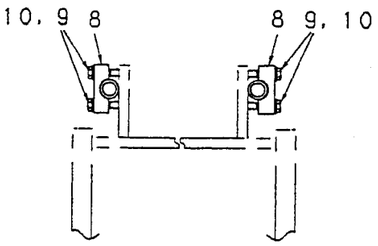
5 APPLY LOCTITE #242 TO CLAMP ATTACHING BOLT.

(1-2) Inter boom (JIB) hyd. lines ; LC42H00029F1

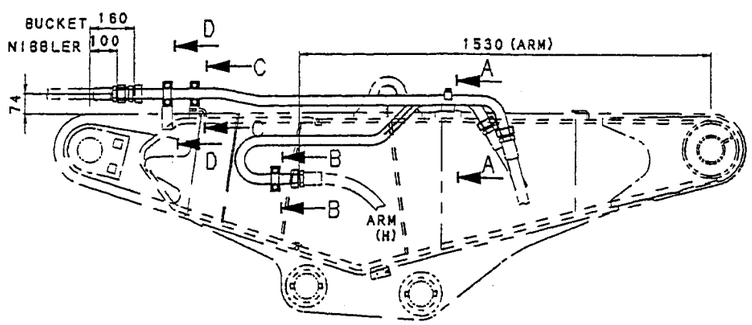


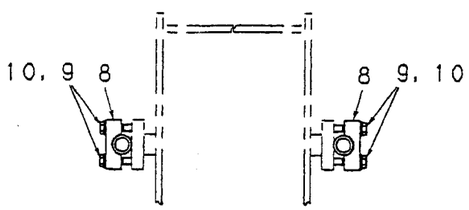


SECTION AA

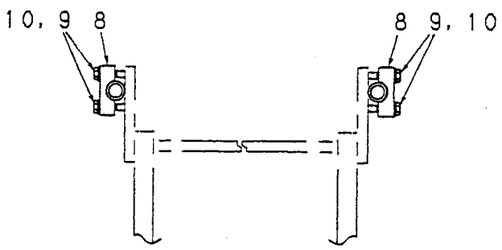


SECTION CC





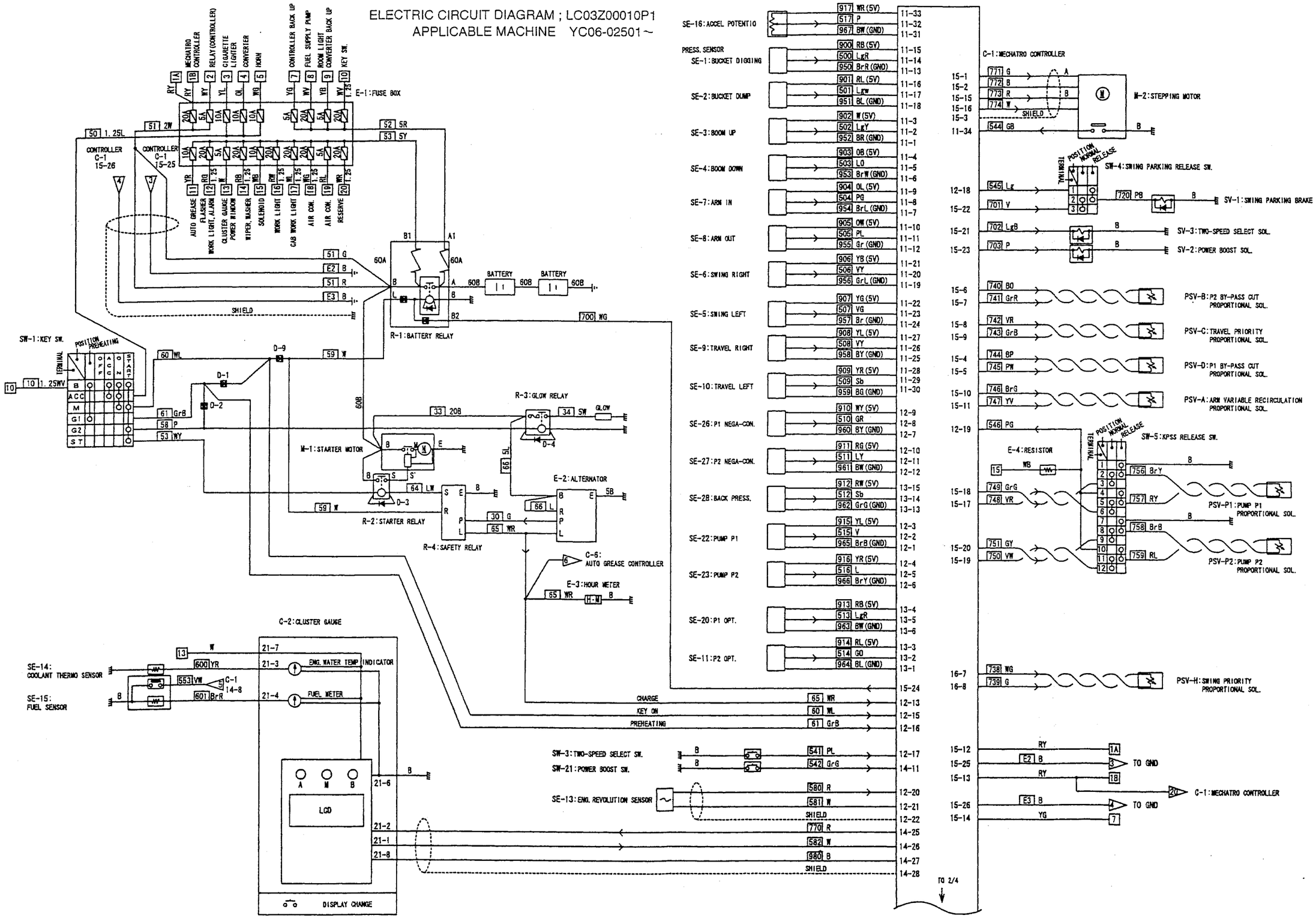
SECTION BB



SECTION DD

5. ELECTRIC SYSTEM

ELECTRIC CIRCUIT DIAGRAM ; LC03Z00010P1
APPLICABLE MACHINE YC06-02501~



WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
545	Lg	AVSS0.75sq	CN-2F		CN-10F	MECHATRO CONTROLLER → SWING PARKING RELEASE SW.
546A	PG	AVSS0.75sq	CN-26F		CN-2F	15PAF-J/B → MECHATRO CONTROLLER
546B	PG	AVSS0.75sq	CN-26F		CN-13F	15PAF-J/B → RESISTOR
546C	PG	AVSS0.75sq	CN-26F		CN-11F	15PAF-J/B → KPSS MODE RELEASE SW.
546D	PG	AVSS0.75sq	CN-26F		CN-11F	15PAF-J/B → KPSS MODE RELEASE SW.
547	GB	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → ENG. WATER TEMP. SW.
548	GY	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → ENG. OIL PRESS. SW.
549	Lg	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → AIR FILTER RESTRICTION SW.
550	BG	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → ENG. OIL LEVEL SW.
551	GL	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → ENG. COOLANT LEVEL SW.
552	BrL	AVSS0.75sq	CN-4F		CN-30F	MECHATRO CONTROLLER → HYD. FLUID LEVEL SW.
553A	VW	AVSS0.75sq	CN-27F		CN-30F	15PAF-J/B → FUEL SENSOR
553B	VW	AVSS0.75sq	CN-27F		CN-4F	15PAF-J/B → MECHATRO CONTROLLER
553C	VW	AVSS0.75sq	CN-27F		CN-20F	15PAF-J/B → RESISTOR
556	BrW	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER ← SW. BOX ASSY
557	L	AVSS0.75sq	CN-4F		CN-38M	MECHATRO CONTROLLER → WIPER MOTOR
558	G	AVSS0.75sq	CN-4F		CN-38M	MECHATRO CONTROLLER → WIPER MOTOR
559	PB	AVSS0.75sq	CN-60F		CN-7F	WIPER INTERLOCK SW. → MECHATRO CONTROLLER
560	LgY	AVSS0.75sq	CN-7F		CN-45F	MECHATRO CONTROLLER → SWING FRASHER SW.
562	O	AVS0.5sq	CN-52F		CN-32M	SW. BOX ASSY → WARM-UP SW.
563	O	AVSS0.75sq	CN-30F		CN-7F	HYD. FLUID TEMP SW. → MECHATRO CONTROLLER
564	LY	AVS0.5sq	CN-52F		CN-32M	SW. BOX ASSY → CONFLUX/SINGLE SELECT SW.
565	GR	AVS0.5sq	CN-34F		CN-52	※1 TO ARRANGE THE LENGTH OF INSERT ARROW ! → SW. BOX ASSY
566	LW	AVSS0.75sq	CN-6F		CN-30F	MECHATRO CONTROLLER ← ENGINE OIL FILTER
568	LgR	AVS0.5sq	CN-52F		CN-34F	SW. BOX ASSY → STROKE-END PROXIMILITY SW.
569	LO	AVS0.5sq	CN-52F		CN-39F	SW. BOX ASSY → NIBBLER OPEN SW.
570	YB	AVS0.5sq	CN-52F		CN-39F	SW. BOX ASSY → NIBBLER CLOSE SW.
571	YG	AVS0.5sq	CN-52F		CN-30F	SW. BOX ASSY → NIBBLER STOP SW.
572	GrG	AVS0.5sq	CN-52F		CN-31M	SW. BOX ASSY → SW. ASSY (MODE BUZZER STOP)
573	V	AVS0.5sq	CN-52F		CN-31M	SW. BOX ASSY → SW. ASSY (MODE BUZZER STOP)
574	PL	AVS0.5sq	CN-52F		CN-38M	SW. BOX ASSY → SW. ASSY (WIPER, WASHER, LIGHT)
575	LgB	AVS0.5sq	CN-52F		CN-38M	SW. BOX ASSY → SW. ASSY (WIPER, WASHER, LIGHT)
576	LB	AVS0.5sq	CN-52F		CN-38M	SW. BOX ASSY → SW. ASSY (WIPER, WASHER, LIGHT)
580	R	MVVS0.75sq 2 CORES SHIELD	CN-2F		CN-30F	MECHATRO CONTROLLER ← ENG. REVOLUTION SENSOR
581	W		CN-2F		CN-30F	MECHATRO CONTROLLER ← ENG. REVOLUTION SENSOR
SH2	Gr		CN-2F		CN-30F	MECHATRO CONTROLLER ← ENG. REVOLUTION SENSOR
582	W	MVVS0.75sq 3 CORES SHIELD	CN-4F		CN-38M	MECHATRO CONTROLLER ← CLUSTER GAUGE
770	R		CN-4F		CN-38M	MECHATRO CONTROLLER ← CLUSTER GAUGE
980	B		CN-4F		CN-38M	MECHATRO CONTROLLER ← CLUSTER GAUGE
SH3	Gr		CN-4F		CN-38M	MECHATRO CONTROLLER ← CLUSTER GAUGE
583	VW	AVSS0.75sq	CN-32M		CN-30F	OVER LOAD ALARM SELECT SW. ← OVER LOAD SW.
584	Br	AVSS0.75sq	CN-3F		CN-34F	MECHATRO CONTROLLER ← STROKE-END PROXIMILITY SW.
590	LY	AVS0.5sq	CN-21F		CN-52F	HEAVY LIFT SW. ← SW. BOX ASSY
600	YR	AVSS0.75sq	CN-38M		CN-30F	CLUSTER GAUGE ← COOLANT THERMO SENSOR
601	BrR	AVSS0.75sq	CN-38M		CN-30F	CLUSTER GAUGE ← FUEL SENSOR
610A	GrL	AVSS0.75sq	CN-27F		CN-7F	15PAF-J/B → MECHATRO CONTROLLER
610B	GrL	AVSS0.75sq	CN-27F		CN-55F	15PAF-J/B ← DIODE
610C	GrL	AVSS0.75sq	CN-27F		CN-55F	15PAF-J/B ← DIODE
611	LG	AVSS0.75sq	CN-4F		CN-34F	MECHATRO CONTROLLER → ARM PUSH/PULL PORT SELECT SOL.
700	WG	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → BATTERY RELAY
701	V	AVSS0.75sq	CN-5F		CN-10F	MECHATRO CONTROLLER → SWING PARKING RELEASE SW.
702	LgB	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → TWO-SPEED SELECT SOL.
703	P	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → POWER BOOST SOL.
704	LgR	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER → SW. BOX ASSY
705	LG	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER → SW. BOX ASSY
706	VW	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER → SW. BOX ASSY
707	LY	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER → SW. BOX ASSY
708	LR	AVSS0.75sq	CN-4F		CN-29F	MECHATRO CONTROLLER ← WIPER RELAY ASSY

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
709	GB	AVSS0.75sq	CN-4F		CN-29F	MECHATRO CONTROLLER ← WIPER RELAY ASSY
710	Gr	AVSS0.75sq	CN-4F		CN-29F	MECHATRO CONTROLLER ← WIPER RELAY ASSY
711	GrL	AVSS0.75sq	CN-4F		CN-29F	MECHATRO CONTROLLER ← WIPER RELAY ASSY
713	BrY	AVSS0.75sq	CN-4F		CN-16F	MECHATRO CONTROLLER ← WORK LIGHT RELAY
714	WB	AVSS0.75sq	CN-41F		CN-4F	FLASHER RELAY → MECHATRO CONTROLLER
715	GW	AVSS0.75sq	CN-41F		CN-7F	FLASHER RELAY → MECHATRO CONTROLLER
716	WV	AVSS0.75sq	CN-41F		CN-7F	FLASHER RELAY → MECHATRO CONTROLLER
718	OL	AVSS0.75sq	CN-7F		CN-34F	MECHATRO CONTROLLER → BUCKET CONTROL RELAY
720	PB	AVSS0.75sq	CN-10F		CN-30F	SWING PARKING RELEASE SW. → SWING PARKING BRAKE SOL.
738	WG	AVSS0.75sq	CN-6F		CN-30F	MECHATRO CONTROLLER → SWING PRIORITY PROPORTIONAL VALVE
739	G	AVSS0.75sq	CN-6F		CN-30F	MECHATRO CONTROLLER → SWING PRIORITY PROPORTIONAL VALVE
740	BO	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → P2 BY-PASS CUT PROPORTIONAL SOL.
741	GrR	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → P2 BY-PASS CUT PROPORTIONAL SOL.
742	VR	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → STRAIGHT TRAVEL PROPORTIONAL SOL.
743	GrB	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → STRAIGHT TRAVEL PROPORTIONAL SOL.
744	BP	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → P1 BY-PASS CUT PROPORTIONAL SOL.
745	PW	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → P1 BY-PASS CUT PROPORTIONAL SOL.
746	BrG	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → ARM VALVABLE RECIRCULATION PSV
747	YV	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → ARM VALVABLE RECIRCULATION PSV
748	VR	AVSS0.75sq	CN-5F		CN-11F	MECHATRO CONTROLLER → KPSS MODE RELEASE SW.
749	GrG	AVSS0.75sq	CN-5F		CN-11F	MECHATRO CONTROLLER → KPSS MODE RELEASE SW.
750	VW	AVSS0.75sq	CN-5F		CN-11F	MECHATRO CONTROLLER → KPSS MODE RELEASE SW.
751	GY	AVSS0.75sq	CN-5F		CN-11F	MECHATRO CONTROLLER → KPSS MODE RELEASE SW.
756	BrY	AVSS0.75sq	CN-11F		CN-30F	KPSS MODE RELEASE SW. → PUMP P1 PROPORTIONAL SOL.
757	RY	AVSS0.75sq	CN-11F		CN-30F	KPSS MODE RELEASE SW. → PUMP P1 PROPORTIONAL SOL.
758	BrB	AVSS0.75sq	CN-11F		CN-30F	KPSS MODE RELEASE SW. → PUMP P2 PROPORTIONAL SOL.
759	RL	AVSS0.75sq	CN-11F		CN-30F	KPSS MODE RELEASE SW. → PUMP P2 PROPORTIONAL SOL.
760	G	AVSS0.75sq	CN-7F		CN-39F	MECHATRO CONTROLLER → NIBBLER OPEN RELAY
761	GL	AVSS0.75sq	CN-7F		CN-39F	MECHATRO CONTROLLER → NIBBLER CLOSE RELAY
771	G	MVVS0.75sq 4 CORES SHIELD	CN-5F		CN-30F	MECHATRO CONTROLLER → STEPPING MOTOR
772	B		CN-5F		CN-30F	MECHATRO CONTROLLER → STEPPING MOTOR
773	R		CN-5F		CN-30F	MECHATRO CONTROLLER → STEPPING MOTOR
774	W		CN-5F		CN-30F	MECHATRO CONTROLLER → STEPPING MOTOR
SH1	Gr		CN-5F		CN-30F	MECHATRO CONTROLLER ← STEPPING MOTOR
900	RB	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: BUCKET DIGGING
901	RL	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: BUCKET DUMP
902	W	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: BOOM RAISING
903	OB	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: BOOM LOWERING
904	OL	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: ARM IN
905	OW	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: ARM OUT
906	YB	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: SWING RIGHT
907	YG	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: SWING LEFT
908	YL	AVSS0.75sq	CN-1F		CN-31M	MECHATRO CONTROLLER → PRESS. SENSOR: TRAVEL RIGHT
909	YR	AVSS0.75sq	CN-1F		CN-31M	MECHATRO CONTROLLER → PRESS. SENSOR: TRAVEL LEFT
910	WY	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: P1 MEGA-CON.
911	RG	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: P2 MEGA-CON.
912	RW	AVSS0.75sq	CN-3F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: BACK PRESS.
913	RB	AVSS0.75sq	CN-3F		CN-31M	MECHATRO CONTROLLER → PRESS. SENSOR: P1 OPT.
914	RL	AVSS0.75sq	CN-3F		CN-31M	MECHATRO CONTROLLER → PRESS. SENSOR: P2 OPT.
915	YL	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: PUMP P1
916	YR	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER → PRESS. SENSOR: PUMP P2
917	WR	AVSS0.75sq	CN-1F		CN-36M	MECHATRO CONTROLLER → PRESS. SENSOR: ACCEL POTENTIO
918	RG	AVSS0.75sq	CN-34F		CN-7F	BOOM POTENTIO ← MECHATRO CONTROLLER
930	RG	AVS0.5sq	CN-4F		CN-51F	MECHATRO CONTROLLER → SW. BOX ASSY
932	RL	AVSS0.75sq	CN-3F		CN-35F	MECHATRO CONTROLLER → F/R AND L/R CLINOMETER
950	BrR	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BUCKET DIGGING
951	BL	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BUCKET DUMP
952	BR	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BOOM RAISING

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
953	BrW	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BOOM LOWERING
954	BrL	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: ARM IN
955	Gr	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: ARM OUT
956	GrL	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: SWING RIGHT
957	Br	AVSS0.75sq	CN-1F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: SWING LEFT
958	BY	AVSS0.75sq	CN-1F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: TRAVEL RIGHT
959	BG	AVSS0.75sq	CN-1F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: TRAVEL LEFT
960	BY	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: P1 NEGA-CON.
961	BW	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: P2 NEGA-CON.
962	GrG	AVSS0.75sq	CN-3F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: BACK PRESS.
963	BW	AVSS0.75sq	CN-3F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: P1 OPT.
964	BL	AVSS0.75sq	CN-3F		CN-31M	MECHATRO CONTROLLER ← PRESS. SENSOR: P2 OPT.
965	BrB	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: PUMP P1
966	BrY	AVSS0.75sq	CN-2F		CN-30F	MECHATRO CONTROLLER ← PRESS. SENSOR: PUMP P2
967	BW	AVSS0.75sq	CN-1F		CN-36M	MECHATRO CONTROLLER ← PRESS. SENSOR: ACCEL POTENTIO
968	BL	AVSS0.75sq	CN-7F		CN-34F	MECHATRO CONTROLLER → BOOM POTENTIO.
970	BP	AVSS0.75sq	CN-3F		CN-35F	MECHATRO CONTROLLER ← F/R AND L/R CLINOMETER
981A	GW	AVSS0.75sq	CN-4F		CN-27F	MECHATRO CONTROLLER → 15PAF-J/B
981B	GW	AVSS0.75sq	CN-38M		CN-27F	SW. ASSY (WIPER, WASHER, LIGHT) → 15PAF-J/B
981C	GW	AVSS0.75sq	CN-31M		CN-27F	SW. ASSY (MODE, BUZZER STOP) → 15PAF-J/B
981D	GW	AVS0.5sq	CN-51F		CN-27F	SW. BOX ASSY → 15PAF-J/B
982A	BG	AVS0.5sq	CN-51F		CN-26F	SW. BOX ASSY → 15PAF-J/B
982B	BG	AVSS0.75sq	CN-32M		CN-26F	CONFLUX/SINGLE SELECT SW. → 15PAF-J/B
982C	BG	AVSS0.75sq	CN-39F		CN-26F	NIBBLER OPEN SW. → 15PAF-J/B
982D	BG	AVSS0.75sq	CN-30F		CN-26F	POWER SHIFT SW. → 15PAF-J/B
982E	BG	AVSS0.75sq	CN-34F		CN-26F	STROKE-END PROXIMILITY SW. → 15PAF-J/B
E1	B	AVS5sq	P-1	DOUBLE SPLICE	CN-33M	EARTH → EARTH
E15	B	AVSS0.75sq	P-1		CN-60F	EARTH → WIPER INTERLOCK SW.
E2	B	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → EARTH
E3	B	AVSS0.75sq	CN-5F		CN-30F	MECHATRO CONTROLLER → EARTH
E4	B	AVSS0.75sq	CN-31M		CN-28F	INST-PANEL R → 11PAF-GND
E5	B	AVSS1.25sq	CN-32M		CN-28F	INST-PANEL L → 11PAF-GND
E6	B	AVSS0.75sq	CN-44F		CN-28F	INST-PANEL L → 11PAF-GND
E7	B	AVSS0.75sq	CN-12F		CN-28F	SAEFTY RELAY → 11PAF-GND
E9	B	AVSS0.75sq	CN-42F		CN-28F	AUTO GREASE CONTROLLER → 11PAF-GND
E10	B	AVSS0.75sq	CN-11F		CN-28F	KPSS MODE RELEASE SW. → 11PAF-GND
E11	B	AVSS0.75sq	CN-11F		CN-28F	KPSS MODE RELEASE SW. → 11PAF-GND
E12	B	AVSS0.75sq	CN-29F		CN-28F	WIPER REALY ASSY → 11PAF-GND
E14	B	AVSS1.25sq	CN-36M		CN-28F	AIR CONDITIONER AMP. → 11PAF-GND
E16	B	AVSS1.25sq	M-2		CN-28F	CAB WORKING LIGHT LEFT → 11PAF-GND
E19	B	AVSS1.25sq	CN-43F	DOUBLE SPLICE	CN-28F	RESERVE → 11PAF-GND
E22	B	AVSS1.25sq	CN-43F		CN-62F	RESERVE → RESERVE
E17	B	AVSS0.75sq	CN-37F	DOUBLE SPLICE	P-2	ROOF WIPER MOTOR → EARTH
E13	B	AVS5sq	P-3	DOUBLE SPLICE	P-2	EARTH → EARTH
E18	B	AVSS1.25sq	P-3		M-1	EARTH → EARTH
E21	B	AVSS0.75sq	P-4	DOUBLE SPLICE	CN-61F	EARTH → ONE WAY CALL AMP.
E23	B	AVSS0.75sq	M-3		CN-61F	ROTARY LIGHT → ONE WAY CALL AMP.

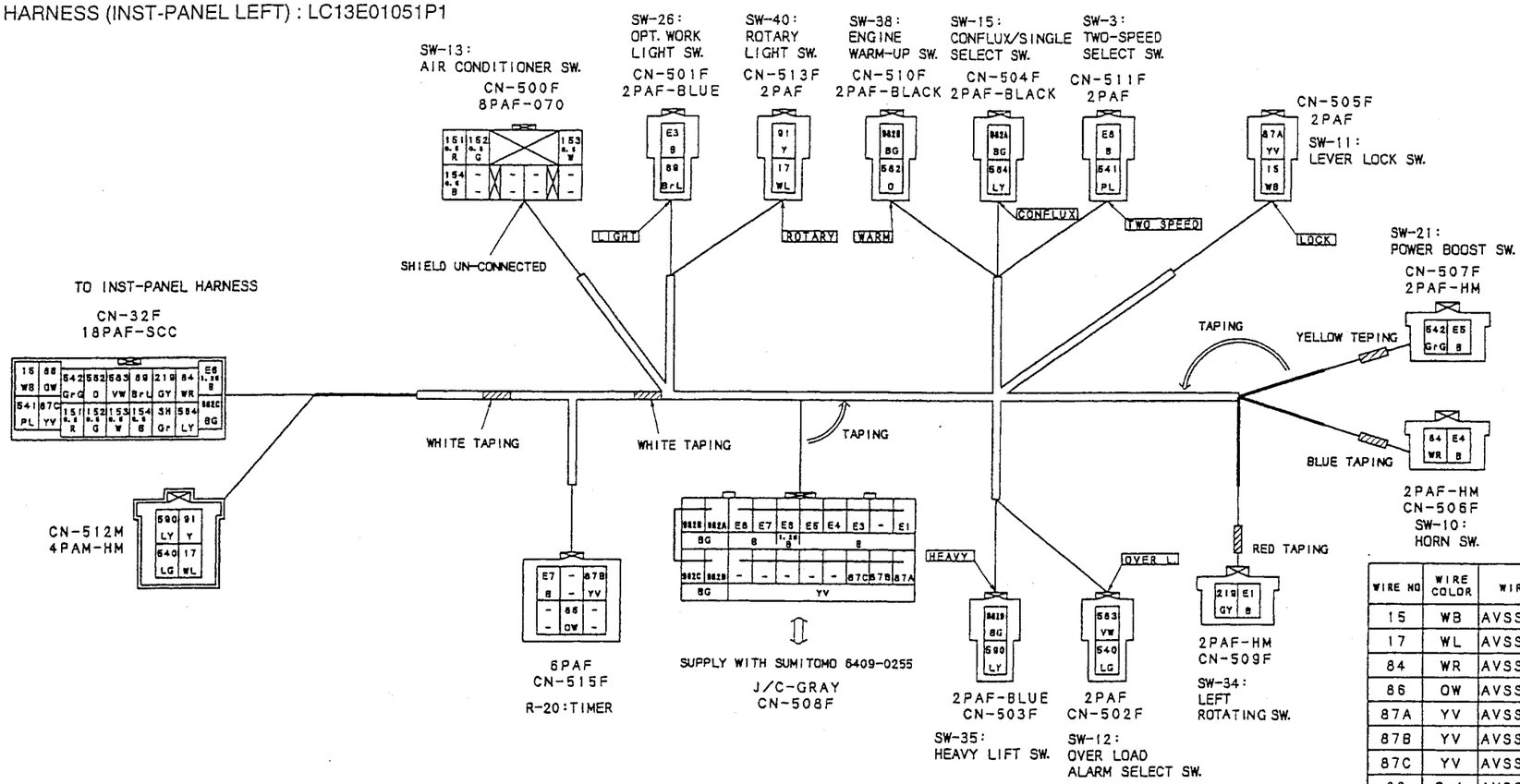


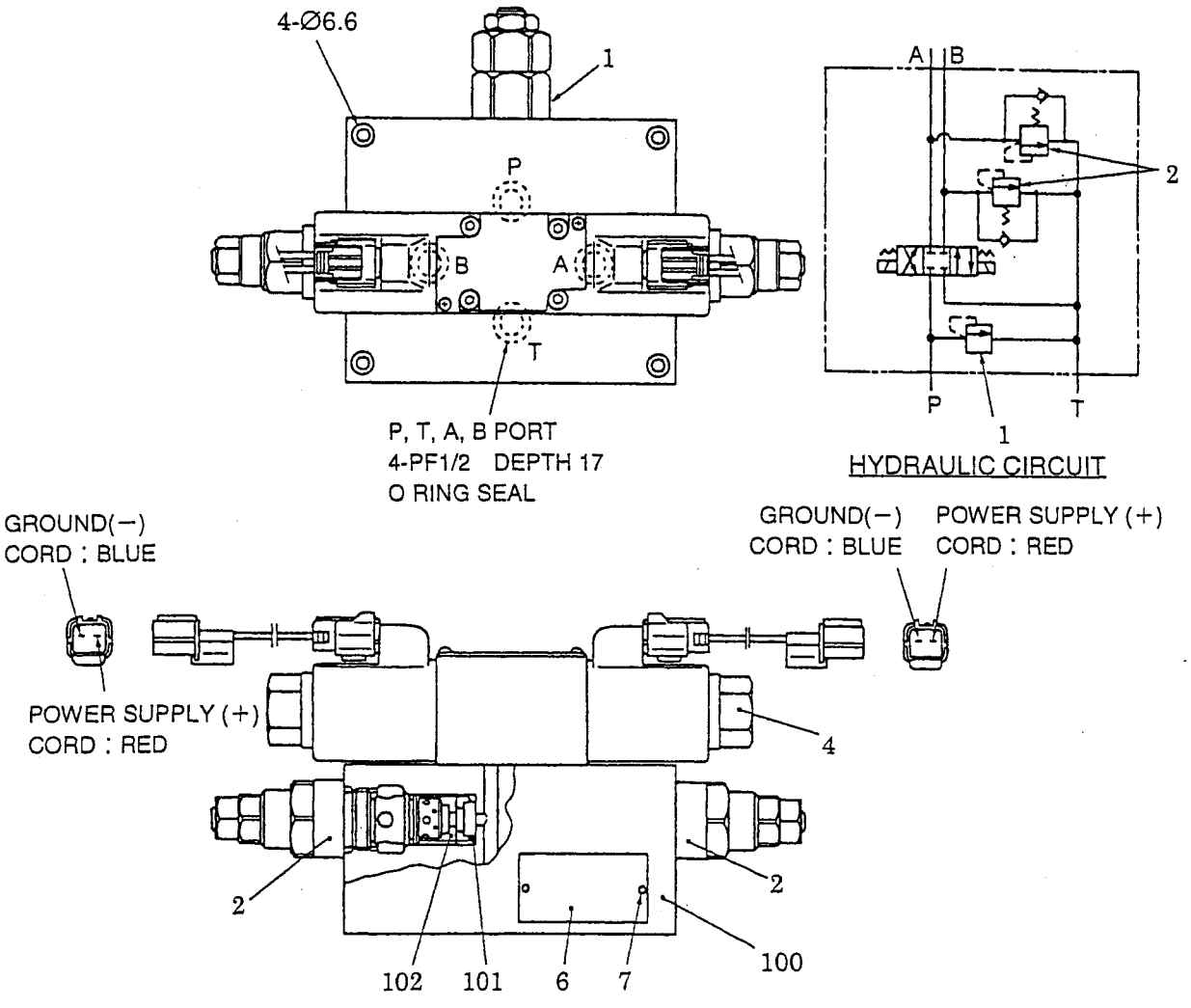
Fig. 5-16 Harness (Inst-panel left)

CONNECTORS SELECTION TABLE

CONNECTOR NAME (PIN NUM.)	MANUFUC.	PART. NUMBER	
		HOUSING	TERMINAL
18PAF-SCC	AMP	6-178692-6	175266-2 175269-1
8PAF-070	AMP	176113-6	173631-1 173631-2
2PAF-HM	SUMITOMO	6090-1001	8240-4422
4PAM-HM	SUMITOMO	6090-1041	8230-4262
2PAF	YAZAKI	7123-2228	7116-2090
2PAF-BLACK	YAZAKI	7123-2228-30	7116-2090
2PAF-BLUE	YAZAKI	7123-2228-90	7116-2090
J/C-GRAY	SUMITOMO	6400-0081 6409-0255	8240-4422
8PAF	YAZAKI	7123-2262	7116-2090

WIRE NO	WIRE COLOR	WIRE SIZE	FROM	CONNECTION	TO	FUNCTION
15	WB	AVSS0.75sq	CN-505F		CN-32F	LEVER LOCK SW. ← FUSE BOX
17	WL	AVSS0.75sq	CN-513F		CN-512M	ROTARY LIGHT SW. ← FUSE BOX
84	WR	AVSS0.75sq	CN-506F		CN-32F	HORN SW. ← HORN RELAY
86	OW	AVSS0.75sq	CN-515F		CN-32F	TIMER → OPERATING LEVER LOCK SOL.
87A	YV	AVSS0.75sq	CN-508F		CN-505F	J/C-GRAY → LEVER LOCK SW.
87B	YV	AVSS0.75sq	CN-508F		CN-515F	J/C-GRAY → TIMER
87C	YV	AVSS0.75sq	CN-508F		CN-32F	J/C-GRAY → MECHATRO CONTROLLER
89	BrL	AVSS0.75sq	CN-501F		CN-32F	OPT. WORKING LIGHT SW. ← OPT. WORKING LIGHT RELAY
91	Y	AVSS0.75sq	CN-513F		CN-512M	ROTARY LIGHT SW. → ROTARY LIGHT
151	R	MVVS0.5sq	CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP.
152	G		CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP.
153	W		CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP.
154	B		CN-500F		CN-32F	AIR CONDITIONER SW. ← AIR CONDITIONER AMP.
SH	Gr		UNCONNECTED		CN-32F	SHIELD ← AIR CONDITIONER AMP.
219	GY	AVSS0.75sq	CN-509F		CN-32F	REVOLUTION LEFT SW. ← REVOLUTION LEFT RELAY
540	LG	AVSS0.75sq	CN-502F		CN-512M	OVER LOAD ALARM SELECT SW. → XXXXX
541	PL	AVSS0.75sq	CN-511F		CN-32F	TWO-SPEED SELECT SW. ← MECHATRO CONTROLLER
542	GrG	AVSS0.75sq	CN-507F		CN-32F	POWER BOOST SW. ← MECHATRO CONTROLLER
562	O	AVSS0.75sq	CN-510F		CN-32F	WARM-UP SW. ← MECHATRO CONTROLLER
564	LY	AVSS0.75sq	CN-504F		CN-32F	CONFLUX/SINGLE SELECT SW ← SW BOX ASSY
583	VW	AVSS0.75sq	CN-32F		CN-502F	OVER LOAD SW. → OVER LOAD ALARM SELECT SW.
590	LY	AVSS0.75sq	CN-503F		CN-512M	HEAVY LIFT SW. → SWITCH ASSY
982A	BG	AVSS0.75sq	CN-508F		CN-504F	J/C-GRAY → CONFLUX/SINGLE SELECT SW
982B	BG	AVSS0.75sq	CN-508F		CN-510F	J/C-GRAY → WARM-UP SW.
982C	BG	AVSS0.75sq	CN-508F		CN-32F	J/C-GRAY → MECHATRO CONTROLLER
982D	BG	AVSS0.75sq	CN-508F		CN-503F	J/C-GRAY → HEAVY LIFT SW.
E1	B	AVSS0.75sq	CN-508F		CN-509F	J/C-GRAY ← REVOLUTION LEFT SW.
E3	B	AVSS0.75sq	CN-508F		CN-501F	J/C-GRAY ← OPT. WORKING LIGHT SW.
E4	B	AVSS0.75sq	CN-508F		CN-506F	J/C-GRAY ← HORN SW.
E5	B	AVSS0.75sq	CN-508F		CN-507F	J/C-GRAY ← POWER BOOST SW.
E6	B	AVSS1.25sq	CN-508F		CN-32F	J/C-GRAY → EARTH
E7	B	AVSS0.75sq	CN-508F		CN-515F	J/C-GRAY → TIMER
E8	B	AVSS0.75sq	CN-508F		CN-511F	J/C-GRAY → TWO-SPEED SELECT SW.

7.2 SOLENOID VALVE : FOR CRUSHER (NIBBLER) ROTATING (YN30V00013F1)



SPECIFICATIONS

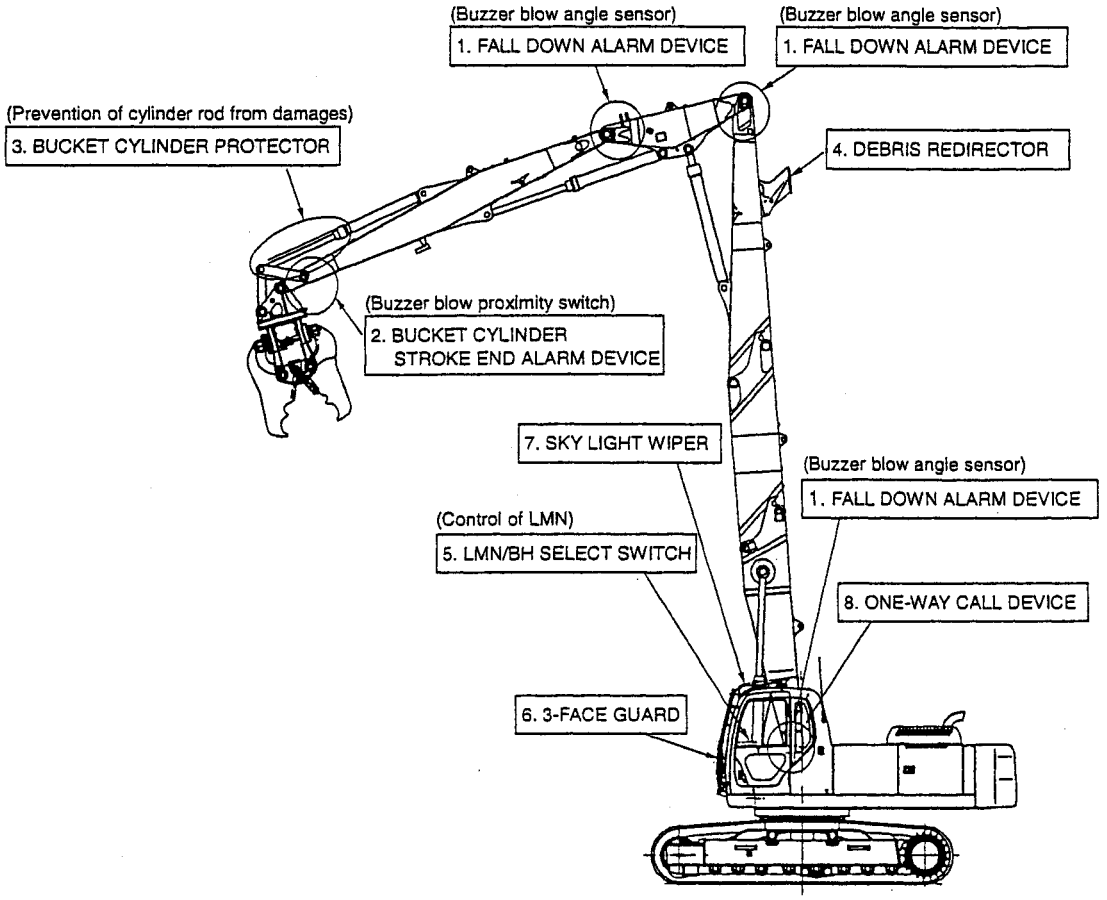
Main relief valve set pressure	kgf/cm² (psi) 1pc.	350 (4980) at 20ℓ/min (5.3gal/min)
Over load relief valve set pressure	kgf/cm² (psi) 2pcs.	210 (2990) at 20ℓ/min (5.3gal/min)
Rated flow	ℓ/min	20～30 (5.3～7.9gal/min)
Rated voltage	V	DC24

TIGHTENING TORQUE : kgf·m (lbf·ft)

NO. 1,2	8～10 (58～72)

NO.	PART NAME	Q'TY	NO.	PART NAME	Q'TY
100	MANIFOLD	1	2	OVER LOAD RELIEF VALVE	2
101	SPACER	2	4	SOLENOID	1
102	STOPPER	2	6	NAME PLATE	1
1	MAIN RELIEF VALVE	1	7	RIVET	2

8. SAFETY DEVICE



Alarm and safety protecting device

8.1 SUMMARY

The safety devices consist of an alarm device and a safety protection device.

(1) The buzzer of the alarm device sounds as below :

1) Fall down alarm device
   The buzzer sounds if the attachment goes beyond its safe operation limit range.
2) Bucket cylinder stroke end alarm device
   The buzzer sounds 50mm (1.97in) before the stroke end.

(2) The safe protection device operates as below :

1) Bucket cylinder protector
   A protector is provided to prevent the bucket cylinder rod from being damaged.
2) Debris redirector
   A redirector is provided to prevent debris from falling on the back of the boom.
3) LMN/BH select switch
   The switch that selects LMN (long mount crusher) and BH (backhoe) is located on the control stand at the left of the cab.
4) 3-face guard
   A protective guard is mounted to the front and the skylight of the cab to protect the operator from falling fragments.
5) Skylight wiper
   A wiper is installed in the skylight of the cab to get a clear view of the attachment.
6) One-way call device
   A microphone and speaker system is provided to enable the operator to communicate with outside people during operation.

N&B

No.	PART No.	NAME	Q'TY	REMARK	Applicable Machines
3	LC03H01037D1	• • HOSE	1		
4	LC03H01025D1	• • HOSE	1		
5	HH25R16016G2	• • CONNECTOR	1		
6	2444Z3203	• • ELBOW	1		
7	24100P2599F1	• • SELECTOR VALVE	1		
8	LC03H01064P1	• • SUPPORT	1		
9	LC03H01051P1	• • BRACKET	1		
10	LC03H01046P1	• • CLAMP	1		
11	LC03H01022D2	• • SPACER	1		
12	ZE13X16000	• • HALF CALMP	8		
13	ZD12P03400	• • O RING	5		
14	ZD12A02100	• • O RING	2		
15	ZS18C10030	• • CAPSCREW	4		
16	ZS18C12035	• • CAPSCREW	6		
17	ZS18C12070	• • CAPSCREW	1		
18	ZS28C12040	• • CAPSCREW	16		
19	ZW16H10000	• • WASHER	4		
20	ZW16H12000	• • WASHER	6		
21	2418T10357	• • WASHER	3		
22	ZW26K12000	• • LOCK WASHER	20		
23	ZN18C12010	• • NUT	1		
24	LC03H01070P1	• • SUPPORT	1		
25	YN32H01066P1	• • CLAMP	1		
26	YN03H01431P1	• • BUSHING	1		
27	ZS18C12055	• • CAPSCREW	1		
28	ZS28C12065	• • CAPSCREW	4		
	YN17M00010FK	• INSTRUMENT PANEL ASSY			
38	2479U1190F32	• • SWITCH	1	Single/conflux select	
	YN22T00167F2	• INSTALL OF THE NAME PLATE			
15	YY20T01039P1	• • LABEL	1		
16	PY20T01062P1	• • LABEL	1		
17	YT20T01054P1	• • LABEL	1		
18	YN20T01414P1	• • LABEL	1		

BREAKER

No.	PART No.	NAME	Q'TY	REMARK	Applicable Machines
	LC06H00001F3	• REMOTE CONTROL PIPING (MAIN)			
2	ZH22X04006	• • CONNECTOR	1		
5	ZH32X04006	• • ELBOW	1		
9	2444Z2336	• • TEE	1		
32	2444R1120D035	• • HOSE	1		
	LC03H00009F1	• UPPER HYDRAULIC PIPING			
1	LC03H01063P1	• • TUBE	1		
2	LC03H01071P1	• • TUBE	1		
3	LC03H01025D1	• • HOSE	1		
4	2444Z3203	• • ELBOW	1		
5	HH25R16016G2	• • CONNECTOR	1		
6	YN32H01066P1	• • CLAMP	1		
7	YN03H01431P1	• • BUSHING	1		
8	LC03H01064P1	• • SUPPORT	3		
9	LC03H01072P1	• • BRACKET	1		
10	LC03H01046P1	• • CLAMP	2		
11	LC03H01022D2	• • SPACER	1		
12	ZE13X16000	• • HALF CLAMP	4		
13	ZD12P03400	• • O RING	3		
14	ZD12A02100	• • O RING	2		
15	ZS18C12075	• • CAPSCREW	1		
16	ZS18C12035	• • CAPSCREW	6		
17	ZS18C12070	• • CAPSCREW	1		
18	ZS28C12040	• • CAPSCREW	12		
19	ZS18C12055	• • CAPSCREW	1		
20	ZW16H12000	• • WASHER	7		
21	2418T10357	• • WASHER	4		
22	ZW26K12000	• • LOCK WASHER	12		
23	ZN18C12010	• • NUT	2		
24	LC03H01070P1	• • SUPPORT	1		
25	YN42H01078P1	• • CLAMP	1		
26	ZE13Q16000	• • PLUG	1		
	YN22T00165F1	• INSTALL OF THE NAME PLATE			
18	YN20T01414P1	• • LABEL	1		

(2) Hydraulic circuit for Nibbler & Breaker at breaker operating OCEANIA & ASIA

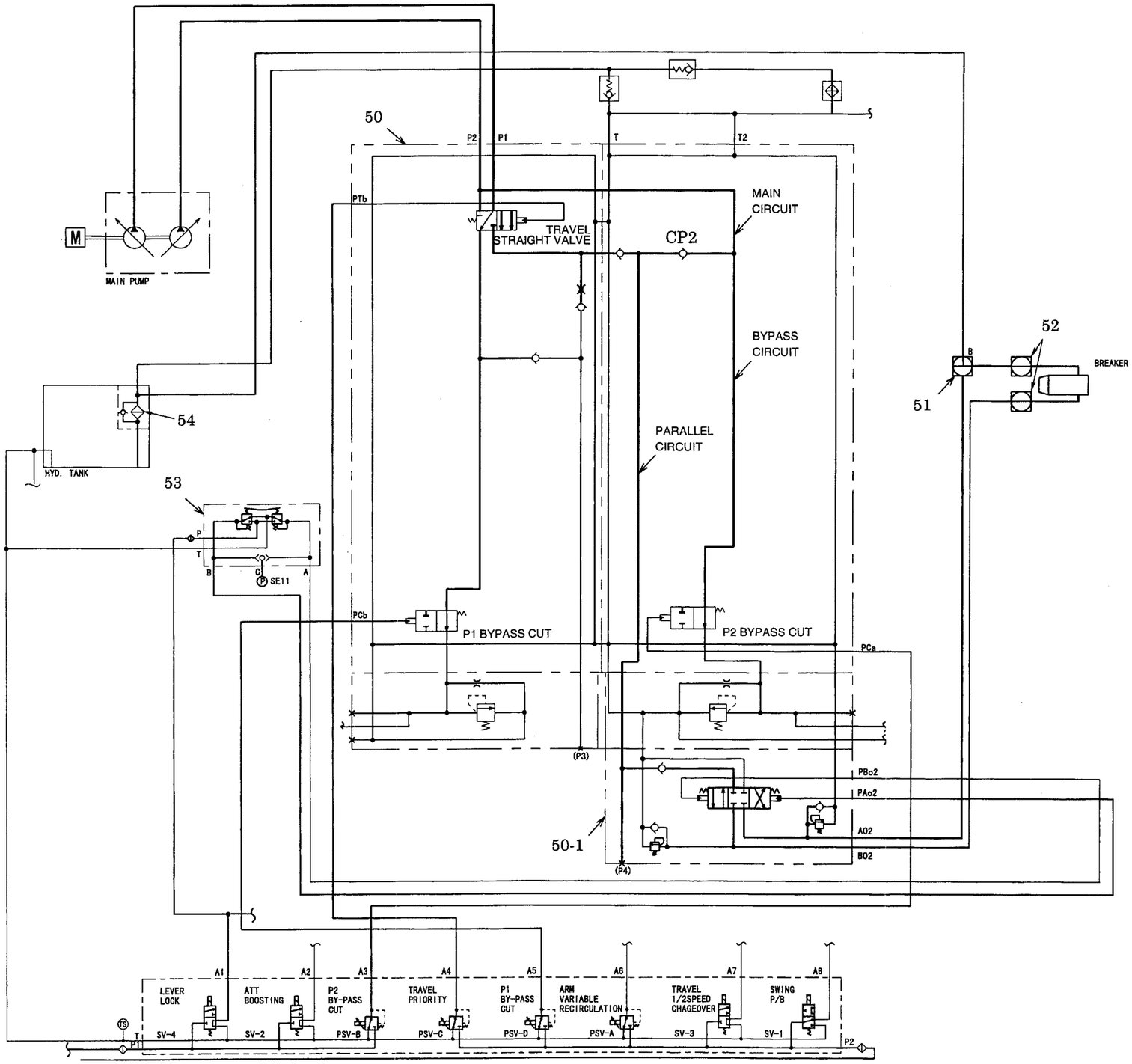


Fig. 4 Hydraulic circuit for Nibbler & Breaker at breaker operating

(3) Breaker

1) Nibbler & breaker pedal operation
If the operation is switched to the breaker mode (B mode) and the nibbler & breaker pedal is stepped on, secondary pilot pressure enters the low-pressure sensor (SE-11). The output voltage of the low-pressure sensor enters the mechatronic controller. The mechatronic controller then processes the pilot signal and puts out a command to the solenoid proportional valve for the P2 bypass cut valve according to the input voltage. Then the secondary pressure of the solenoid proportional valve changes the P2 bypass cut valve of the control valve.

2) Pilot circuit
If the nibbler & breaker pilot valve (53) is pressed by the toe, pressure enters from the B port to the PA02 port of the control valve to change the spool of the option valve.

3) Main circuit
The oil delivered by the P2 pump comes out of the A02 port of the control valve and is supplied to the breaker to give impact to the breaker. The oil returned from the breaker returned directly to the hydraulic tank via the control valve because the selector valve(51) is changed.
In the single breaker operation, the rate of the P2 pump rises only to a value set in the breaker mode.

Where the breaker and other attachments requires limitation to the maximum flow :
• Flow adjusting mode operation :
1) The flow adjusting mode is available if the starter switch is turned "ON" after the engine stops, the mode is turned to the B mode and the screen change switch is pressed for 3 to 10 seconds
2) If the engine is started, the flow reads 210ℓ/min. in the initial stage. It is stored and indicated from next time. If the mode switch is pushed one time, the flow increased by 10ℓ/min. If the buzzer stop switch is pressed, the flow decreases to 30ℓ/min.
3) To release the adjust mode, turn the screen select switch to "ON".

(2) Modification procedure (N&B) EU
Install the additional parts listed in Table 15, as shown in Fig. 14.

Table 15

REMOTE CONTROL PIPING ; C/V		LC06H00008F8				With B/A safety
		LC06H00008F5				With Boom safety
		LC06H00008F2				EU STD
No.	PART No.	NAME	Q'TY			REMARK
2	ZH22X04006	CONNECTOR	1	←	←	PF1/4-PF3/8
5	ZH32X04006	ELBOW	1	←	←	PF1/4-PF3/8

		O ring type coupling	Hydraulic hose (30° flare)
Thread size (PF)	Spanner (mm)	Tightening torque kgf-m (lbf-ft)	Tightening torque kgf-m (lbf-ft)
1/4	19	3.67 (26.8)	3.00 (21.7)
3/8	22	7.50 (54.2)	

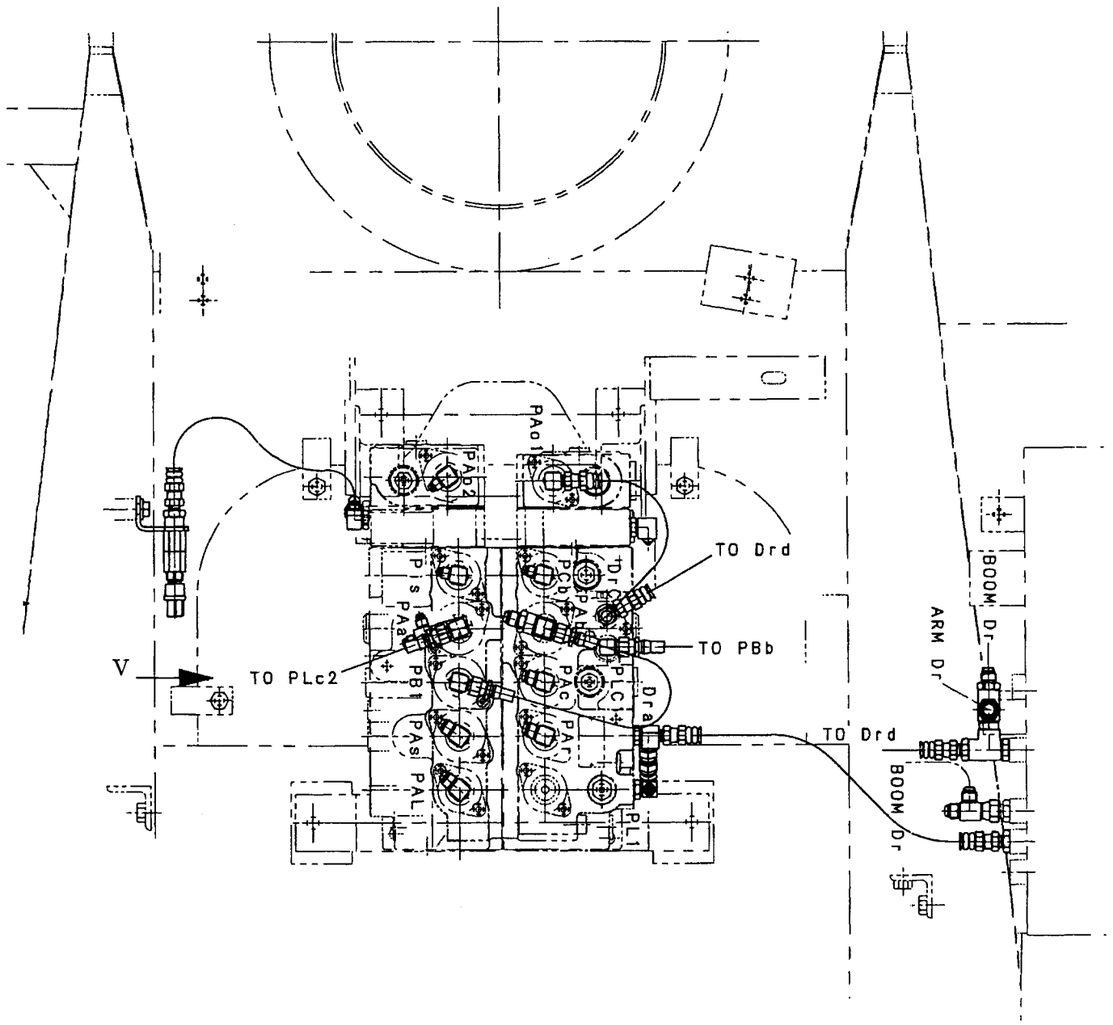


Fig. 14

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