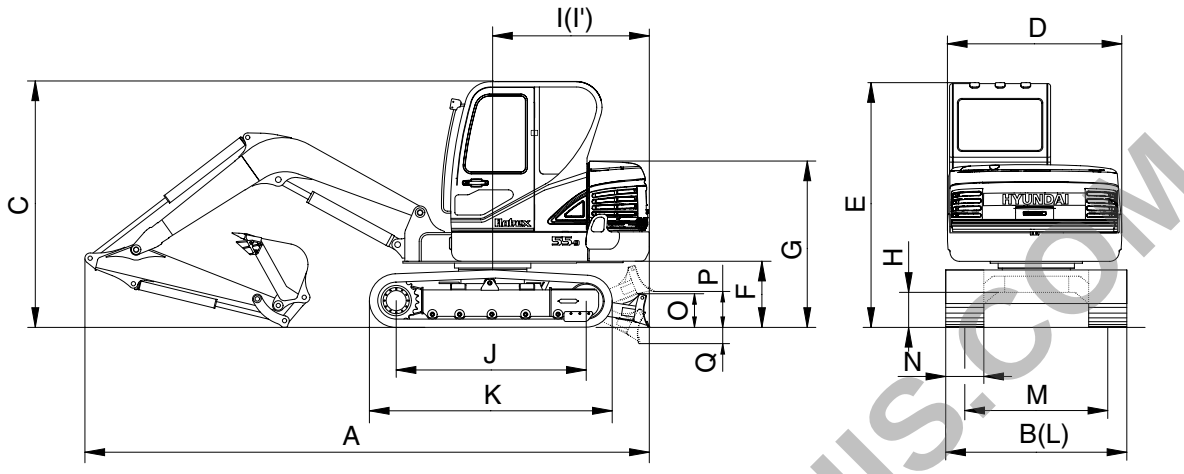
2. SPECIFICATIONS

1) 3.0 m (9'10") MONO BOOM, 1.6 m (5' 3") ARM, WITH BOOM SWING SYSTEM



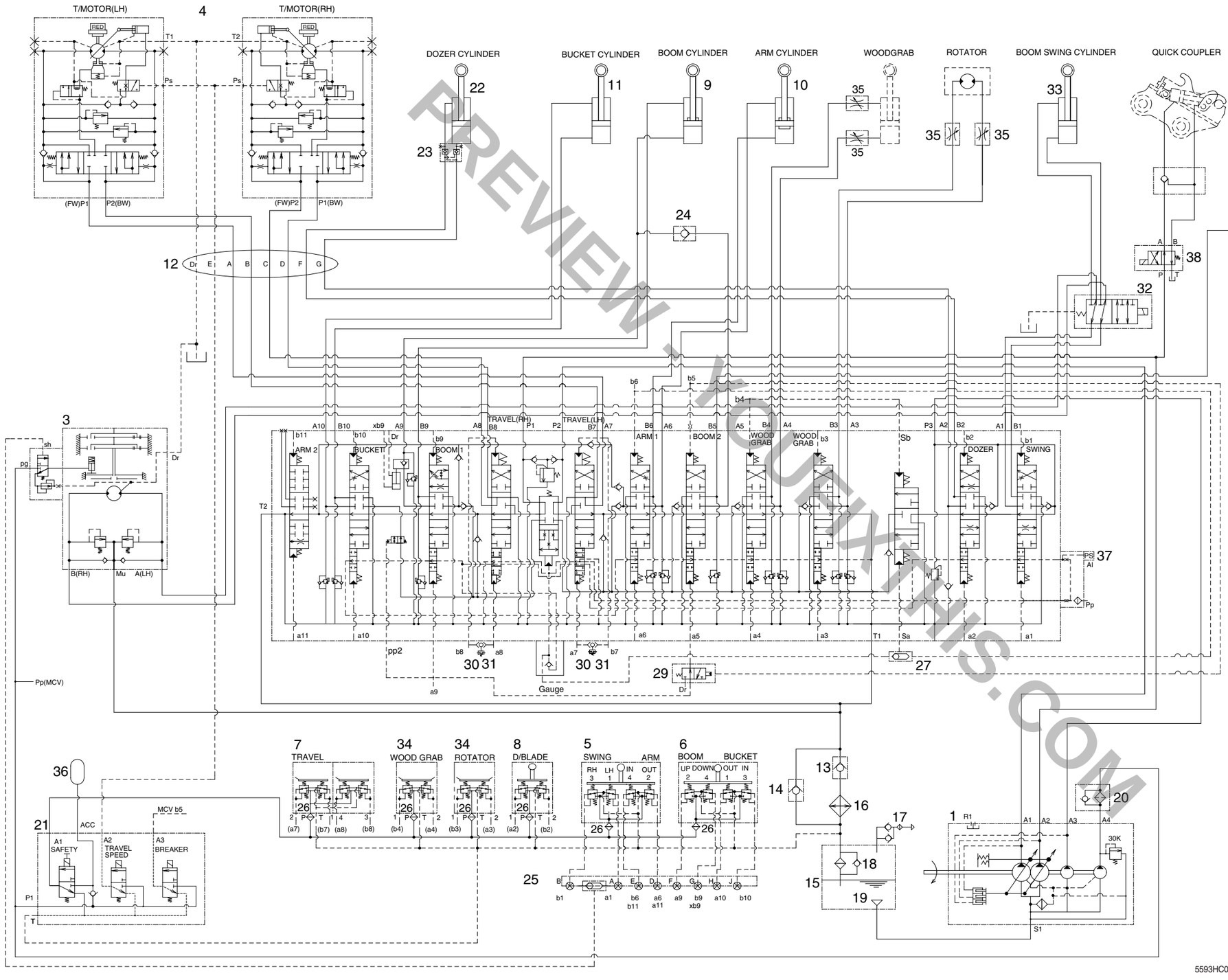
5592SP02

Description		Unit	Specification
Operating weight		kg (lb)	5650 (12460)
Bucket capacity (SAE heaped), standard		m^3 (yd^3)	0.18 (0.24)
Overall length	A	mm (ft-in)	5900 (19' 4")
Overall width, with 380 mm shoe	B		1920 (6' 4")
Overall height	C		2550 (8' 4")
Superstructure width	D		1850 (6' 1")
Overall height of cab	E		2550 (8' 4")
Ground clearance of counterweight	F		690 (2' 3")
Engine cover height	G		1690 (5' 7")
Minimum ground clearance	H		380 (1' 3")
Rear-end distance	I		1650 (5' 5")
Rear-end swing radius	I'		1650 (5' 5")
Distance between tumblers	J		1990 (6' 6")
Undercarriage length	K		2530 (8' 4")
Undercarriage width	L		1880 (6' 2")
Track gauge	M		1500 (4' 11")
Track shoe width, standard	N		380 (15")
Height of blade	O		350 (1' 2")
Ground clearance of blade up	P		410 (1' 4")
Depth of blade down	Q		560 (1' 10")
Travel speed (low/high)		km/hr (mph)	2.2/4.0 (1.4/2.5)
Swing speed		rpm	9.3
Gradeability		Degree (%)	35 (70)
Ground pressure (380 mm shoe)		kgf/cm^2(psi)	0.33 (4.69)
Max traction force		kg (lb)	5300 (11680)

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GROUP 1 HYDRAULIC CIRCUIT

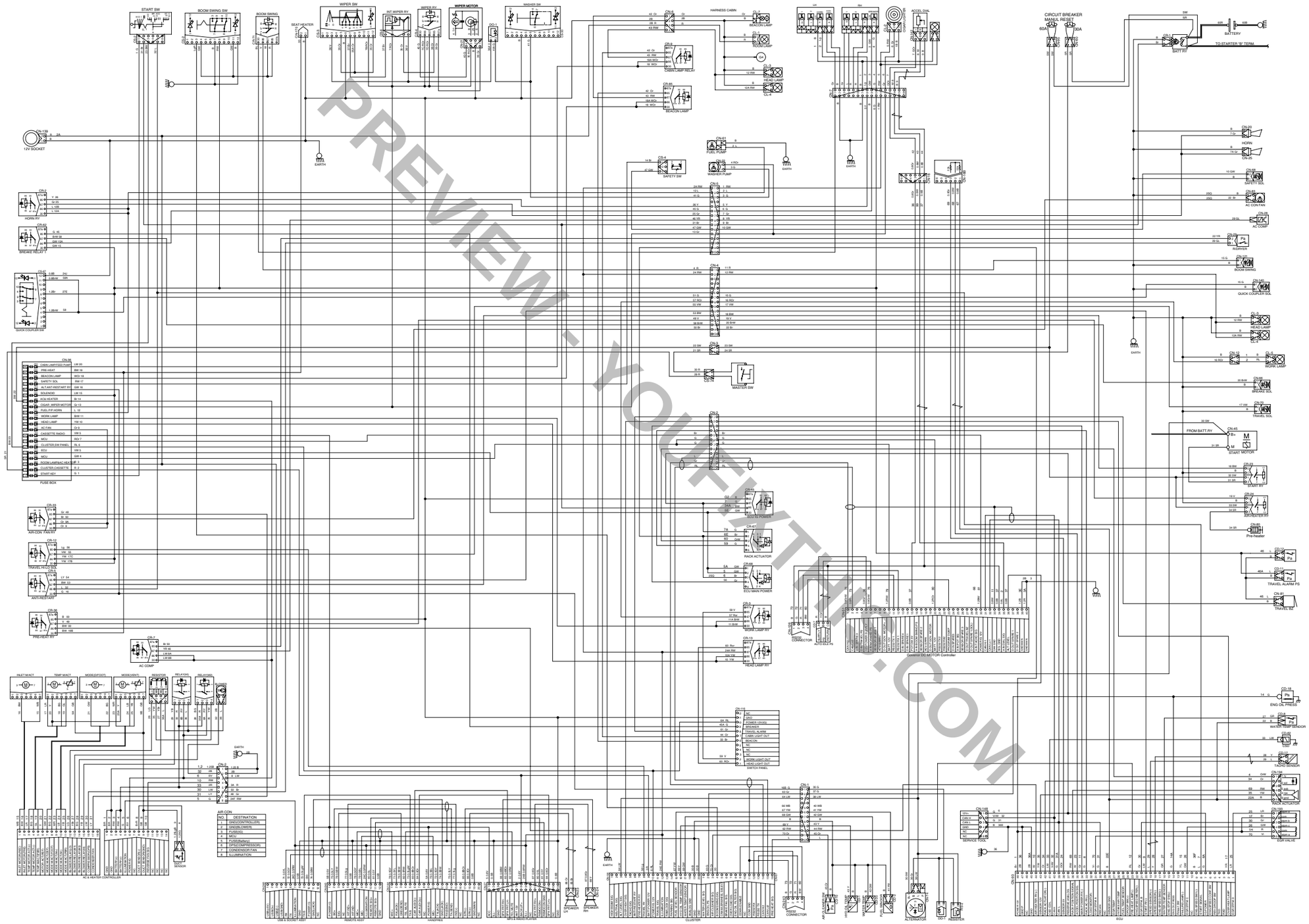


1 Main pump
2 Main control valve
3 Swing motor
4 Travel motor
5 RCV lever(LH)
6 RCV lever(RH)
7 RCV pedal
8 RCV dozer
9 Boom cylinder
10 Arm cylinder
11 Bucket cylinder
12 Turning joint
13 Check valve
14 Check valve
15 Hydraulic & fuel tank
16 Oil cooler
17 Air breather
18 Bypass valve & return element
19 Suction strainer
20 Pilot filter
21 Solenoid valve
22 Dozer cylinder
23 Check valve
24 Check valve
25 Terminal
26 Last guard filter
27 Shuttle valve
28 Stop valve
29 Selector valve
30 Pressure switch
31 Shuttle valve
32 Selector valve(Option)
33 Boom swing cylinder(Option)
34 Woodgrab pedal(Option)
35 Variable orifice(Option)
36 Accumulator(Option)
37 Pressure sensor
38 Solenoid valve(Option)

5593HC01

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5594EL01

GROUP 1 BEFORE TROUBLESHOOTING

1. INTRODUCTION

When a trouble is occurred in the machine, this section will help an operator to maintain the machine with easy.

The trouble of machine is parted Hydraulic & Mechanical system and Electrical system system.

At each system part, an operator can check the machine according to the troubleshooting process diagram.



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1. REMOVAL AND INSTALL

1) REMOVAL

(1) Lower the work equipment to the ground and stop the engine.

(2) Operate the control levers and pedals several times to release the remaining pressure in the hydraulic piping

(3) Loosen the breather slowly to release the pressure inside the hydraulic tank.

⚠ **Escaping fluid under pressure can penetrate the skin causing serious injury.**

(4) Loosen the drain plug under the hydraulic tank and drain the oil from the hydraulic tank.

- Hydraulic tank quantity : 70 ℓ (18.5 U.S.gal)

(5) Disconnect hydraulic hoses (22, 64, 65).

(6) Remove socket bolts (83) and disconnect pump suction pipe (10).

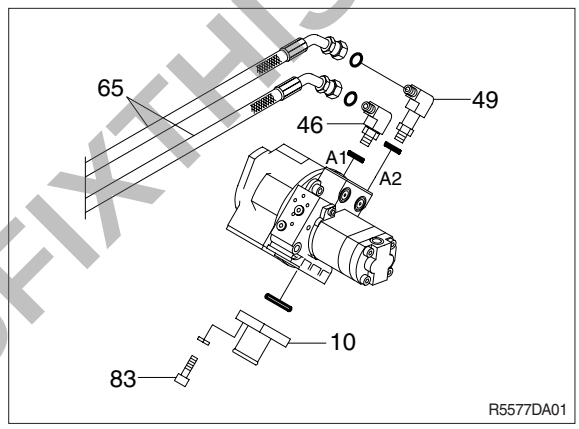
※ When pump suction pipe is disconnected, the oil inside the piping will flow out, so catch it in oil pan.

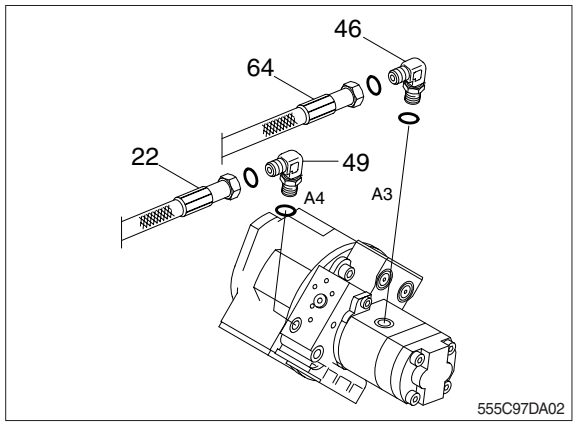
(7) Sling the pump assembly and remove the pump mounting bolts.

- Weight : 30 kg (70 lb)

※ Pull out the pump assembly from housing. When removing the pump assembly, check that all the hoses have been disconnected.







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GROUP 2 TIGHTENING TORQUE

1. MAJOR COMPONENTS

No.	Descriptions		Bolt size	Torque	
				kgf · m	lbf · ft
1	Engine	Engine mounting bolt(Engine-Bracket)	M10 × 1.5	6.9±1.0	50±7.2
2		Engine mounting bolt(Bracket-Frame)	M16 × 2.0	25±2.5	181±18.1
3		Radiator mounting bolt, nut	M10 × 1.5	6.9±1.4	50±10.0
4		Coupling mounting bolt	M10 × 1.5	6.0±1.0	43.4±7.2
5	Hydraulic system	Main pump mounting bolt	M12 × 1.75	12.3±3.0	92±22.0
6		Main control valve mounting bolt	M 8 × 1.25	2.5±0.5	18±3.6
7		Fuel tank mounting bolt	M16 × 2.0	29.7±4.5	215±33
8		Hydraulic oil tank mounting bolt	M16 × 2.0	29.7±4.5	215±33
9		Turning joint mounting bolt, nut	M12 × 1.75	12.8±3.0	92±22.0
10	Power train system	Swing motor mounting bolt	M16 × 2.0	29.7±4.5	215±33.0
11		Swing bearing upper mounting bolt	M16 × 2.0	29.7±4.5	215±33.0
12		Swing bearing lower mounting bolt	M16 × 2.0	29.7±4.5	215±33.0
13		Travel motor mounting bolt	M14 × 2.0	20±2.0	145±14.0
14		Sprocket mounting bolt	M14 × 2.0	19.6±2.9	142±21.0
15	Under carriage	Carrier roller mounting bolt, nut	M16 × 2.0	29.6±3.2	214±23.1
16		Track roller mounting bolt	M18 × 2.0	41±5.0	297±36.0
17		Track tension cylinder mounting bolt	M12 × 1.75	12.8±3.0	92±22.0
18		Track shoe mounting bolt, nut	1/2-20UNF	19.5±2.0	141±14.5
19		Track guard mounting bolt	M16 × 2.0	29.6±3.2	214±23.0
20	Others	Counter weight mounting bolt	M20 × 2.5	57.8±6.4	418±46.3
21		Cab mounting bolt, nut	M12 × 1.75	12.8±3.0	92±22.0
22		Operator's seat mounting bolt	M 8 × 1.25	1.17±0.1	8.5±0.7

※ **For tightening torque of engine and hydraulic components, see engine maintenance guide and service manual.**

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⑦ Machine fault code

Fault code		Description
HCESPN	FMI	
105	0	Working pressure sensor data above normal range (or open circuit)
	1	Working pressure sensor data below normal range
	2	Working pressure sensor data error
	4	Working pressure sensor circuit - voltage below normal, or shorted to low source
	14	Working pressure sensor circuit - special instructions
	16	Working pressure sensor circuit - voltage valid but above normal operational range
	18	Working pressure sensor circuit - voltage valid but below normal operational range
167	4	Travel speed solenoid circuit - voltage below normal, or shorted to low source (or open circuit)
	6	Travel speed solenoid circuit - current above normal
503	0	Brake pressure sensor data above normal range (or open circuit)
	1	Brake pressure sensor data below normal range
	2	Brake pressure sensor data error
	4	Brake pressure sensor data - voltage below normal, or shorted to low source
	16	Brake pressure sensor data - voltage valid but above normal operational range
	18	Brake pressure sensor data - voltage valid but below normal operational range
505	0	Working brake pressure sensor data above normal range (or open circuit)
	1	Working brake pressure sensor data below normal range
	2	Working brake pressure sensor data error
	4	Working brake pressure sensor circuit - voltage below normal, or shorted to low source
	16	Working brake pressure sensor circuit - voltage valid but above normal operational range
	18	Working brake pressure sensor circuit - voltage valid but below normal operational range
525	4	Ram lock solenoid circuit - voltage below normal, or shorted to low source (or open circuit)
	6	Ram lock solenoid circuit - current above normal
530	0	Travel fwd pilot pressure sensor data above normal range (or open circuit)
	1	Travel fwd pilot pressure sensor data below normal range
	2	Travel fwd pilot pressure sensor data error
	4	Travel fwd pilot pressure sensor circuit - voltage below normal, or shorted to low source
	14	Travel fwd pilot pressure sensor circuit - special instructions
	16	Travel fwd pilot pressure sensor circuit - voltage valid but above normal operational range
	18	Travel fwd pilot pressure sensor circuit - voltage valid but below normal operational range
701	4	Hour meter circuit - voltage below normal, or shorted to low source
705	0	MCU input voltage high
	1	MCU input voltage low
707	1	Alternator node I voltage low (or open circuit)
714	3	Acc. dial circuit - voltage above normal, or shorted to high source (or open circuit)
	4	Acc. dial circuit - voltage below normal, or shorted to low source
830	12	MCU internal memory error
840	2	Cluster communication data error
841	2	ECM communication data error
850	2	RMCU communication data error

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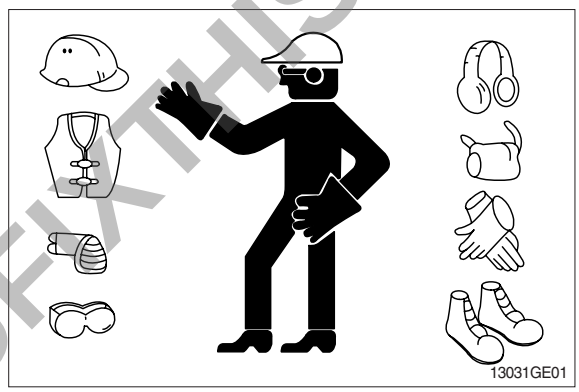
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

Unsafe work practices are dangerous. Understand service procedure before doing work; Do not attempt shortcuts.

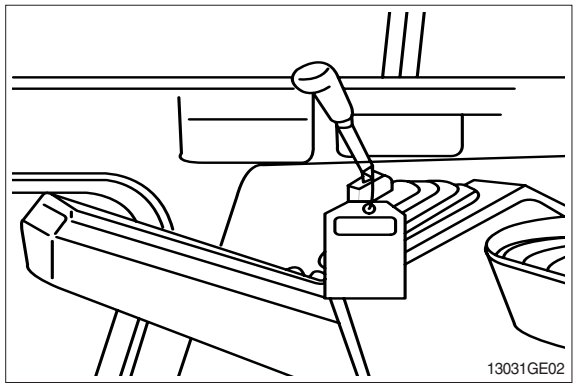
WEAR PROTECTIVE CLOTHING

Wear close fitting clothing and safety equipment appropriate to the job.



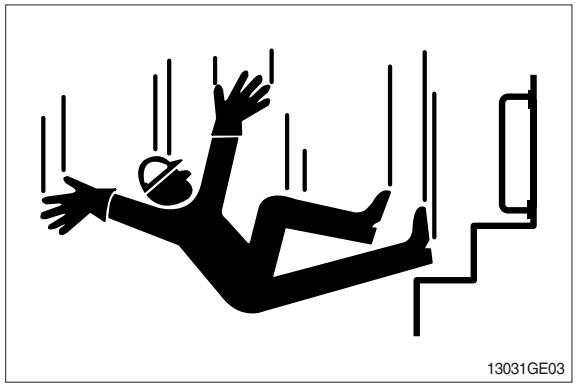
WARN OTHERS OF SERVICE WORK

Unexpected machine movement can cause serious injury.
Before performing any work on the excavator, attach a 「**Do Not Operate**」 tag on the right side control lever.



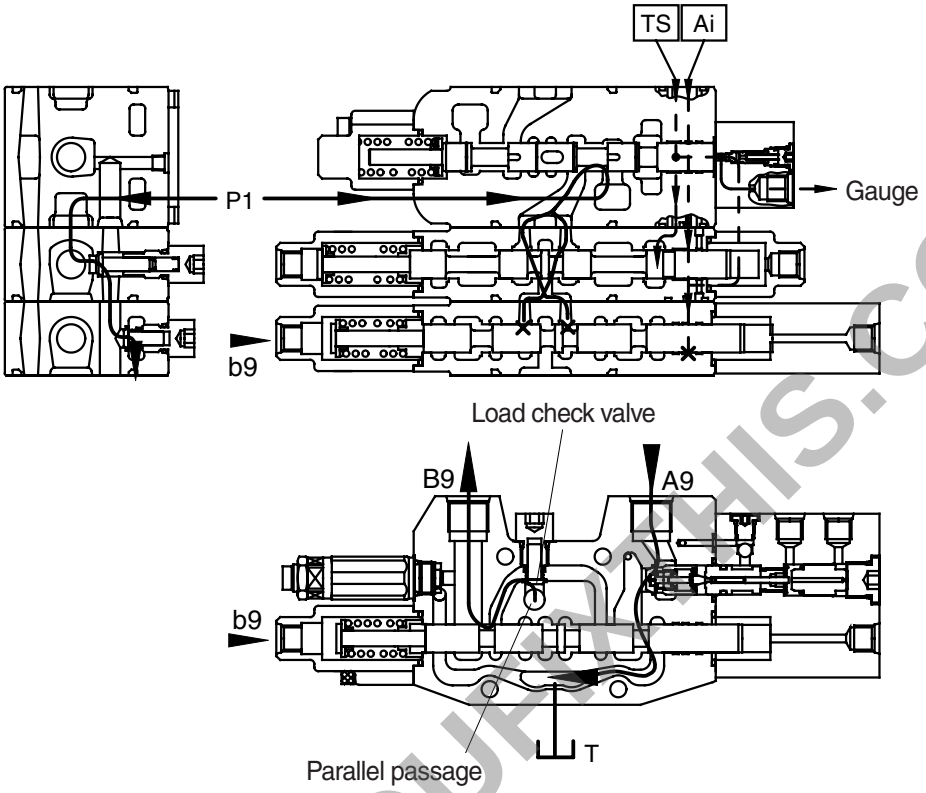
USE HANDHOLDS AND STEPS

Falling is one of the major causes of personal injury.
When you get on and off the machine, always maintain a three point contact with the steps and handrails and face the machine. Do not use any controls as handholds.
Never jump on or off the machine. Never mount or dismount a moving machine.
Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



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② **Boom down operation**



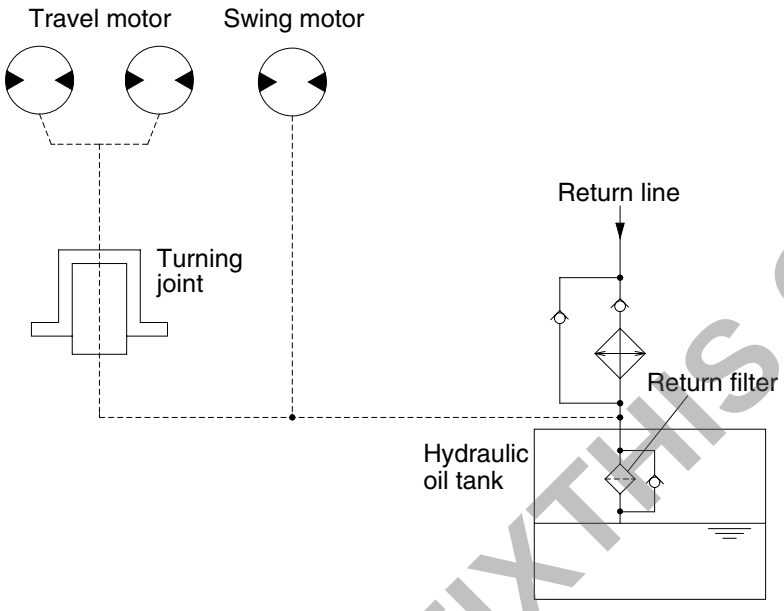
555C92MC10

- During the boom lowing operation, the pilot pressure from RCV is supplied to the port b9 and shift the boom 1 spool in the right direction.
  The hydraulic fluid from the pump P1 enters the parallel passage and is directed to the port B9 through the load check valve. Following this, it flows into the rod side of the boom cylinder.
  The return flow from the head side of the boom cylinder returns to the boom 1 spool through the port A9. Thereafter it is directed to the hydraulic oil tank through tank passage.
- The hydraulic oil flow from the Pp port is same as the boom up operation.

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3. DRAIN CIRCUIT



Besides internal leaks from the motors and main pump, the oil for lubrication circulates.

1) TRAVEL MOTOR DRAIN CIRCUIT

Oil leaked from the right and left travel motors comes out of the drain ports provided in the respective motor casing and join with each other. These oils pass through the turning joint and return to the hydraulic tank after being filtered by return filter.

2) SWING MOTOR DRAIN CIRCUIT

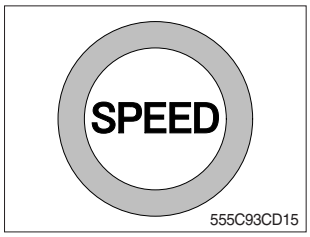
Oil leaked from the swing motor returns to the hydraulic tank passing through a return filter with oil drained from the travel circuit .

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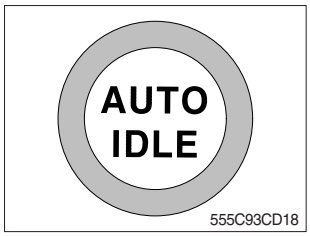
3) SWITCHES

(1) Travel speed control switch



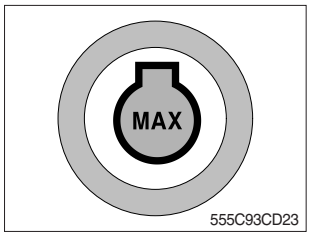
① This switch is to control the travel speed which is changed to high speed (rabbit mark) by pressing the switch and low speed (turtle mark) by pressing it again.

(2) Auto idle switch



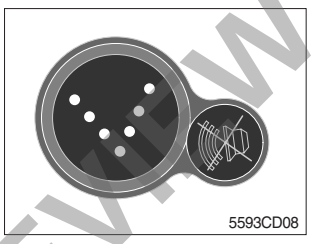
① This switch is used to actuate or cancel the auto idle function.
② When the switch actuated and all control levers and pedals are at neutral position, engine speed will be lowered automatically to save fuel consumption.

(3) M mode switch



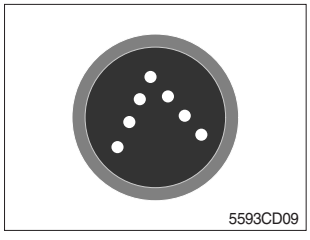
① This switch is used to maximum power.
② When this switch is pressed, the M mode pilot lamp is ON or OFF.

(4) Move (down) & buzzer stop switch



① When the starting switch is turned ON first, normally the alarm buzzer sounds for 6 seconds during lamp check operation.
② The lamp lights ON and the buzzer sounds when the machine has a problem.
In this case, press this switch and buzzer stops, but the lamp lights until the problem is cleared.
③ This switch is used to move down or decrease input value.
※ **Refer to page 4-11.**

(5) Move (up) switch

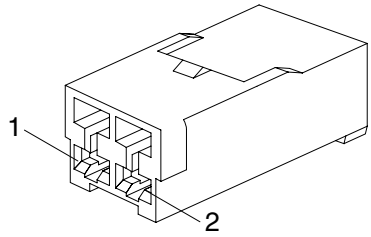


① This switch is used to move up or increase input value.
※ **Refer to page 4-11.**

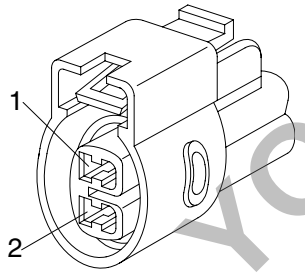
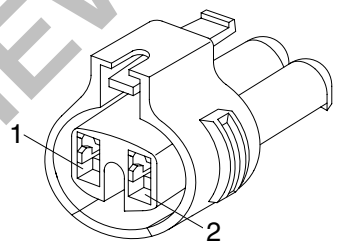
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11) KET 090 CONNECTOR

No. of pin	Receptacle connector (female)	Plug connector (male)
6	 MG610070	

12) KET 090 WP CONNECTORS

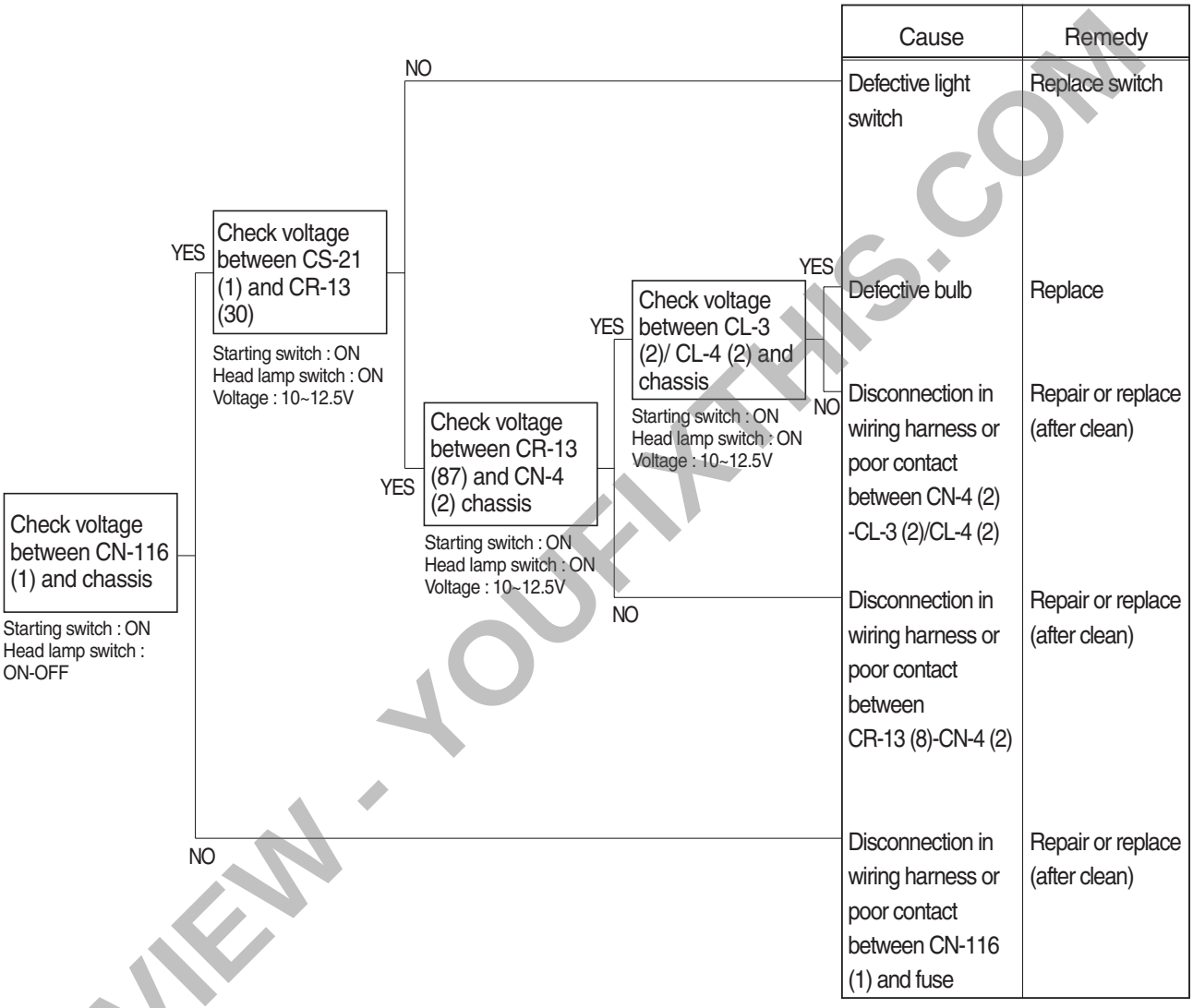
No. of pin	Receptacle connector (female)	Plug connector (male)
2	 MG640605	
2	 MG640795	

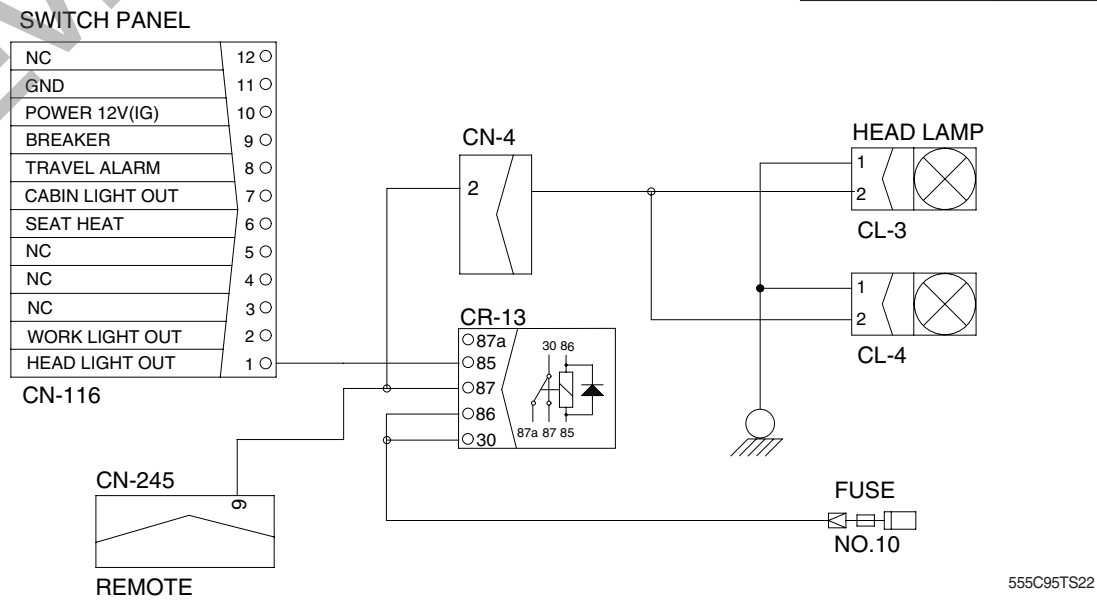
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12. WHEN STARTING SWITCH IS TURNED ON, HEAD LAMP DOES NOT LIGHTS UP

- Before disconnecting the connector, always turn the starting switch OFF.
- Before carrying out below procedure, check all the related connectors are properly inserted and short of fuse No.10.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.

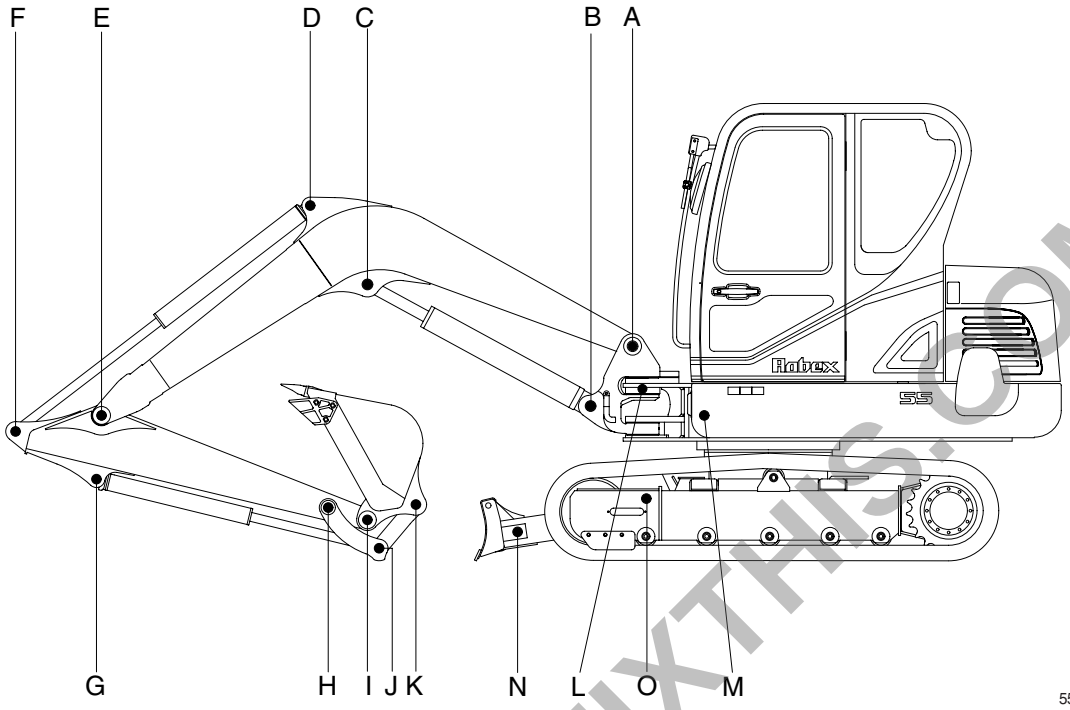




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6. WORK EQUIPMENT



5596MC01

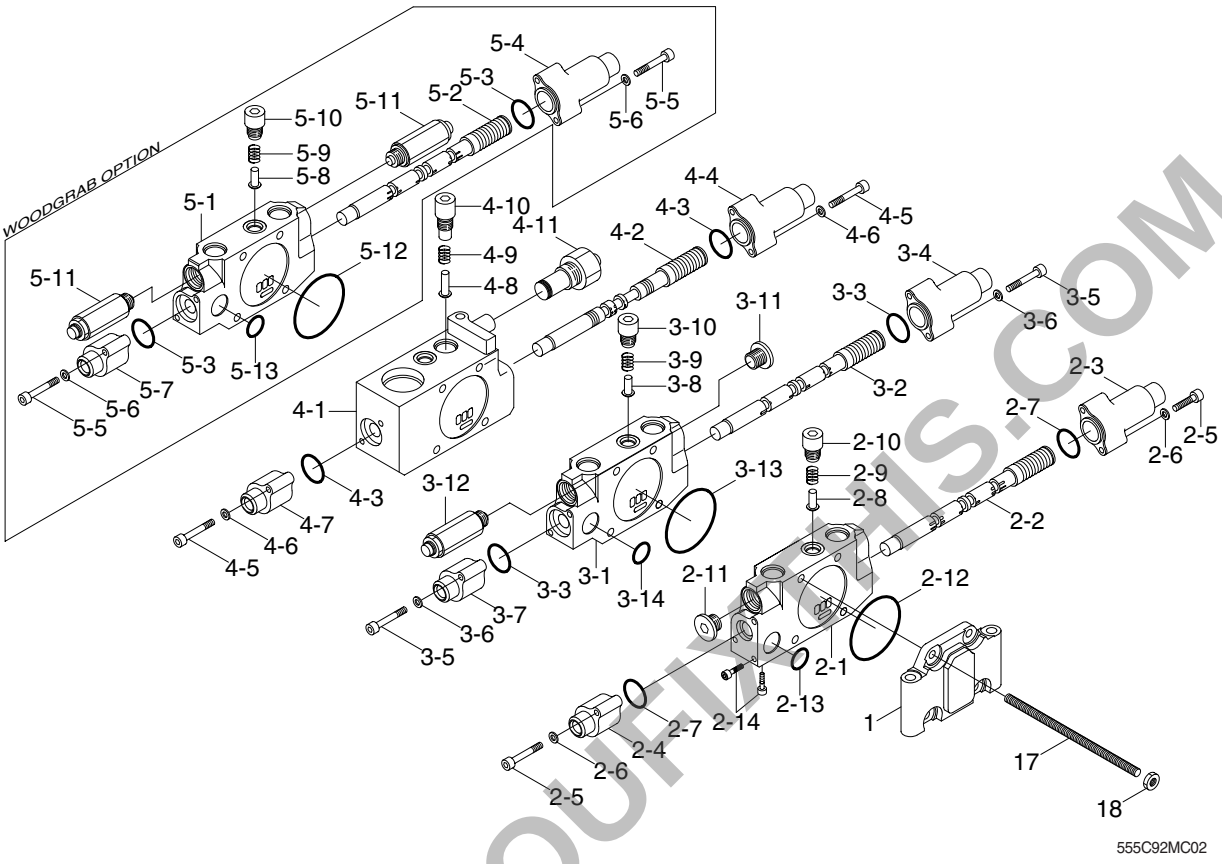
Unit : mm

Mark	Measuring point (pin and bushing)	Normal value	Pin		Bushing		Remedy & Remark
			Recomm. service limit	Limit of use	Recomm. service limit	Limit of use	
A	Boom Rear	50	49	48.5	50.5	51	Replace
B	Boom Cylinder Head	60	59	58.5	60.5	61	〃
C	Boom Cylinder Rod	60	59	58.5	60.5	61	〃
D	Arm Cylinder Head	50	49	48.5	50.5	51	〃
E	Boom Front	50	49	48.5	50.5	51	〃
F	Arm Cylinder Rod	50	49	48.5	50.5	51	〃
G	Bucket Cylinder Head	45	44	43.5	45.5	46	〃
H	Arm Link	45	44	43.5	45.5	46	〃
I	Bucket and Arm Link	45	44	43.5	45.5	46	〃
J	Bucket Cylinder Rod	45	44	43.5	45.5	46	〃
K	Bucket Link	45	44	43.5	45.5	46	〃
L	Boom swing post	110	109	108.5	110.5	111	〃
M	Boom swing cylinder	50	49	48.5	50.5	51	〃
N	Blade cylinder	55	54	53.5	55.5	56	〃
O	Blade and frame link	35	34	33.5	35.5	36	〃

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2. STRUCTURE (1/4)

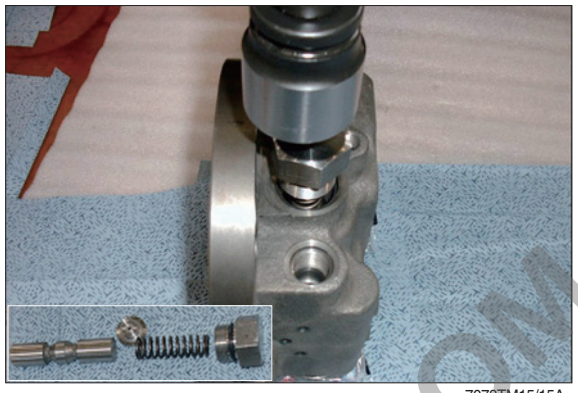


1	Cover	3-4	Pilot cap (A)	4-9	Check spring
2	Swing block	3-5	Wrench bolt	4-10	Plug
2-1	Block	3-6	Plain washer	4-11	Main relief valve
2-2	Swing spool assy	3-7	Cap	5	Swing block
2-3	Pilot cap (A)	3-8	Check poppet	5-1	Block
2-4	Pilot cap (B1)	3-9	Check spring	5-2	Swing spool assy
2-5	Wrench bolt	3-10	Plug	5-3	O-ring
2-6	Plain washer	3-11	Plug	5-4	Pilot cap (A)
2-7	O-ring	3-12	Check valve	5-5	Wrench bolt
2-8	Check poppet	3-13	O-ring	5-6	Plain washer
2-9	Check spring	3-14	O-ring	5-7	Pilot cap (B1)
2-10	Plug	4	Inlet block	5-8	Check poppet
2-11	Plug	4-1	Block	5-9	Check spring
2-12	O-ring	4-2	Inlet spool assy	5-10	Plug
2-13	O-ring	4-3	O-ring	5-11	Overload relief valve
2-14	Plug	4-4	Pilot cap (A)	5-12	O-ring
3	Dozer block	4-5	Wrench bolt	5-13	O-ring
3-1	Block	4-6	Plain washer	17	Tie bolt
3-2	Dozer spool assy	4-7	Pilot cap (B1)	18	Nut
3-3	O-ring	4-8	Check poppet		

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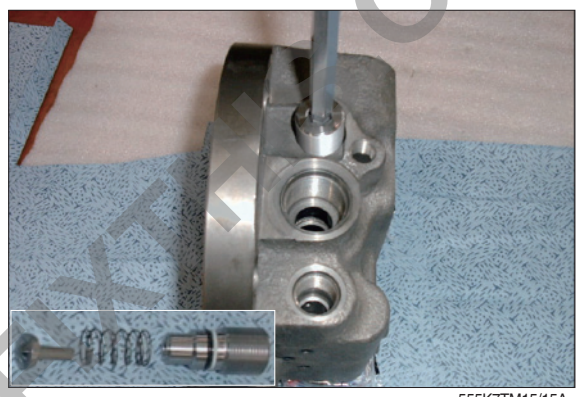
④ Using torque wrench, disassemble plug (44) and O-ring (45), spring (43), spring seat (42) and main spool (41) in that order.



7078TM15/15A

⑤ **Disassembly make up valve**

Using L-wrench, disassemble plug (38) and dissemble O-ring (36), back up ring (40) and spring (37) and then check (36) and spring (37) in that order.

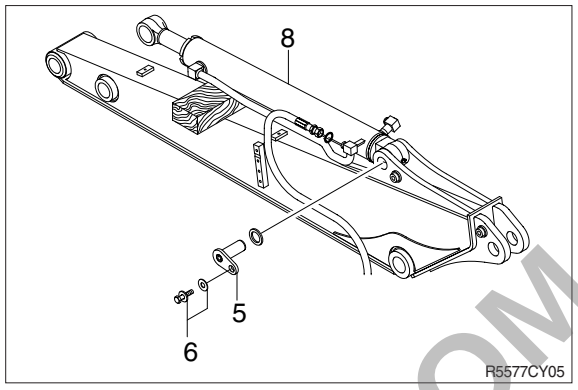


555K7TM15/15A

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④ Sling bucket cylinder assembly (8) and remove bolt (6) then pull out pin (5).
⑤ Remove bucket cylinder assembly (8).
· Weight : 30 kg (70 lb)



(2) Install

① Carry out installation in the reverse order to removal.

⚠ When aligning the mounting position of the pin, do not insert your fingers in the pin hole.

※ Bleed the air from the bucket cylinder.
※ Confirm the hydraulic oil level and check the hydraulic oil leak or not.

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