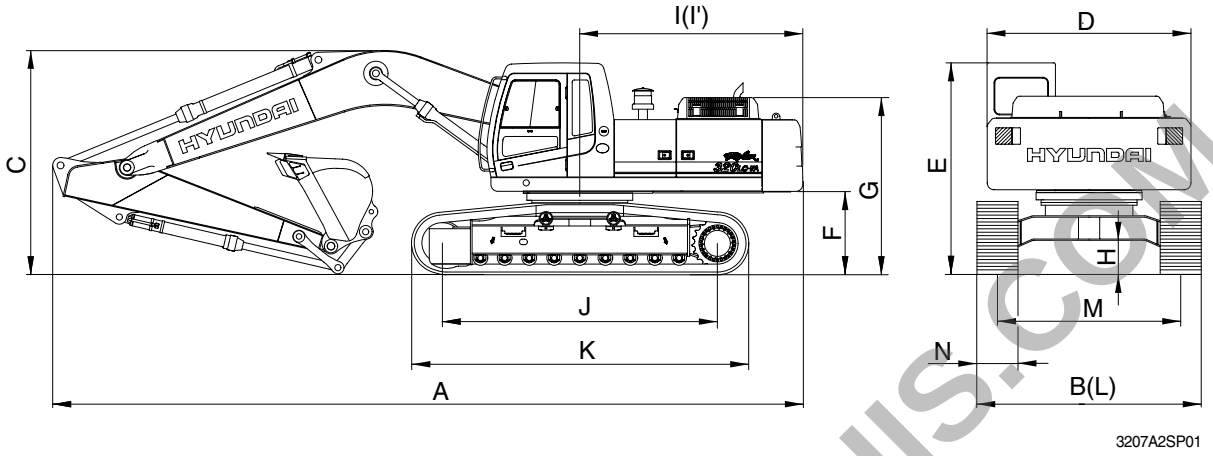
2. SPECIFICATIONS

1) R320LC-7A



Description		Unit	Specification
Operating weight		kg(lb)	32200(70990)
Bucket capacity SAE heaped), standard		$m^3(yd^3)$	1.44(1.88)
Overall length	A	mm(ft-in)	10980(36' 0")
Overall width, with 600mm shoe	B		3280(10' 9")
Overall height	C		3380(11' 1")
Superstructure width	D		2980(9' 9")
Overall height of cab	E		3090(10' 2")
Ground clearance of counterweight	F		1200(3' 11")
Engine cover height	G		2580(8' 6")
Minimum ground clearance	H		500(1' 8")
Rear-end distance	I		3265(10' 9")
Rear-end swing radius	I'		3330(10' 11")
Distance between tumblers	J		4030(13' 3")
Undercarriage length	K		4940(16' 2")
Undercarriage width	L		3280(10' 9")
Track gauge	M		2680(8' 10")
Track shoe width, standard	N		600(23.6")
Travel speed(Low/high)		km/hr(mph)	3.1/5.3(2.0/3.4)
Swing speed		rpm	9.1
Gradeability		Degree(%)	35(70)
Ground pressure(600mm shoe)		$kgf/cm^2(psi)$	0.62(8.82)

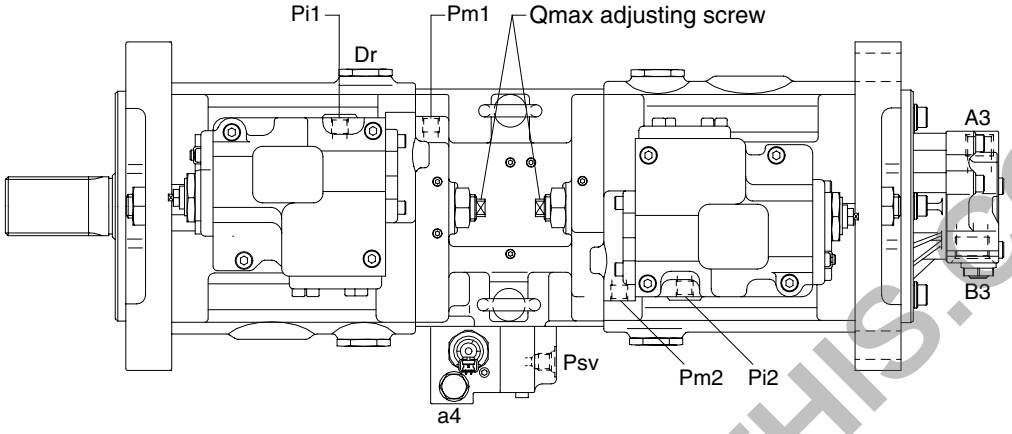
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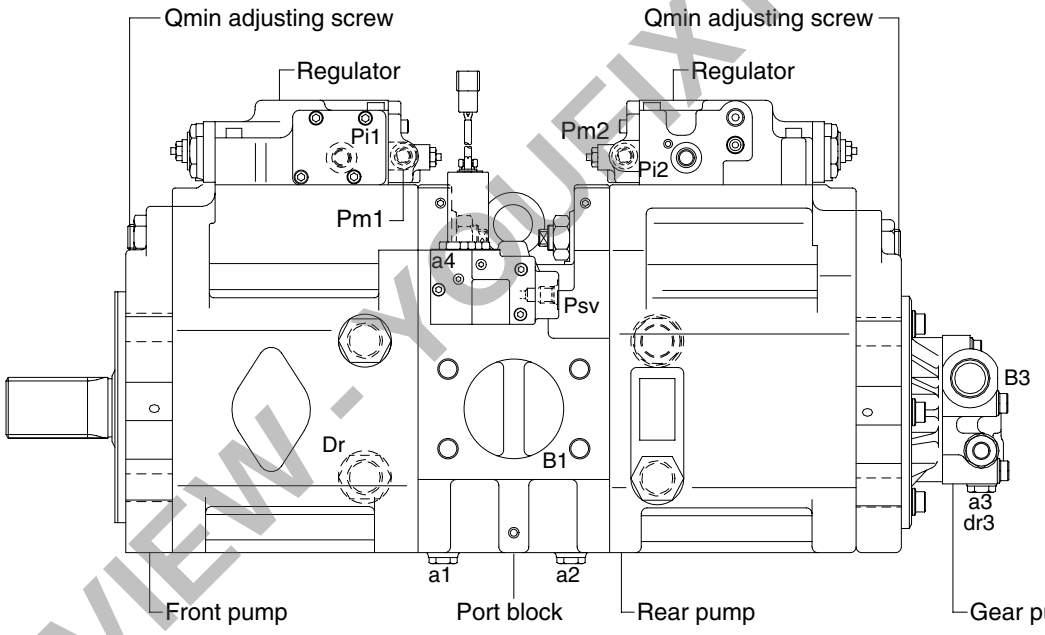
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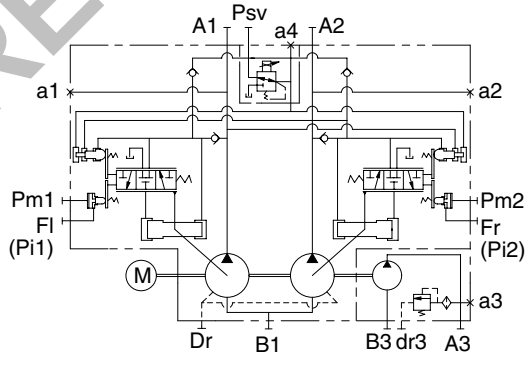
GROUP 1 PUMP DEVICE

1. STRUCTURE

The pump device consists of main pump, regulator and gear pump.







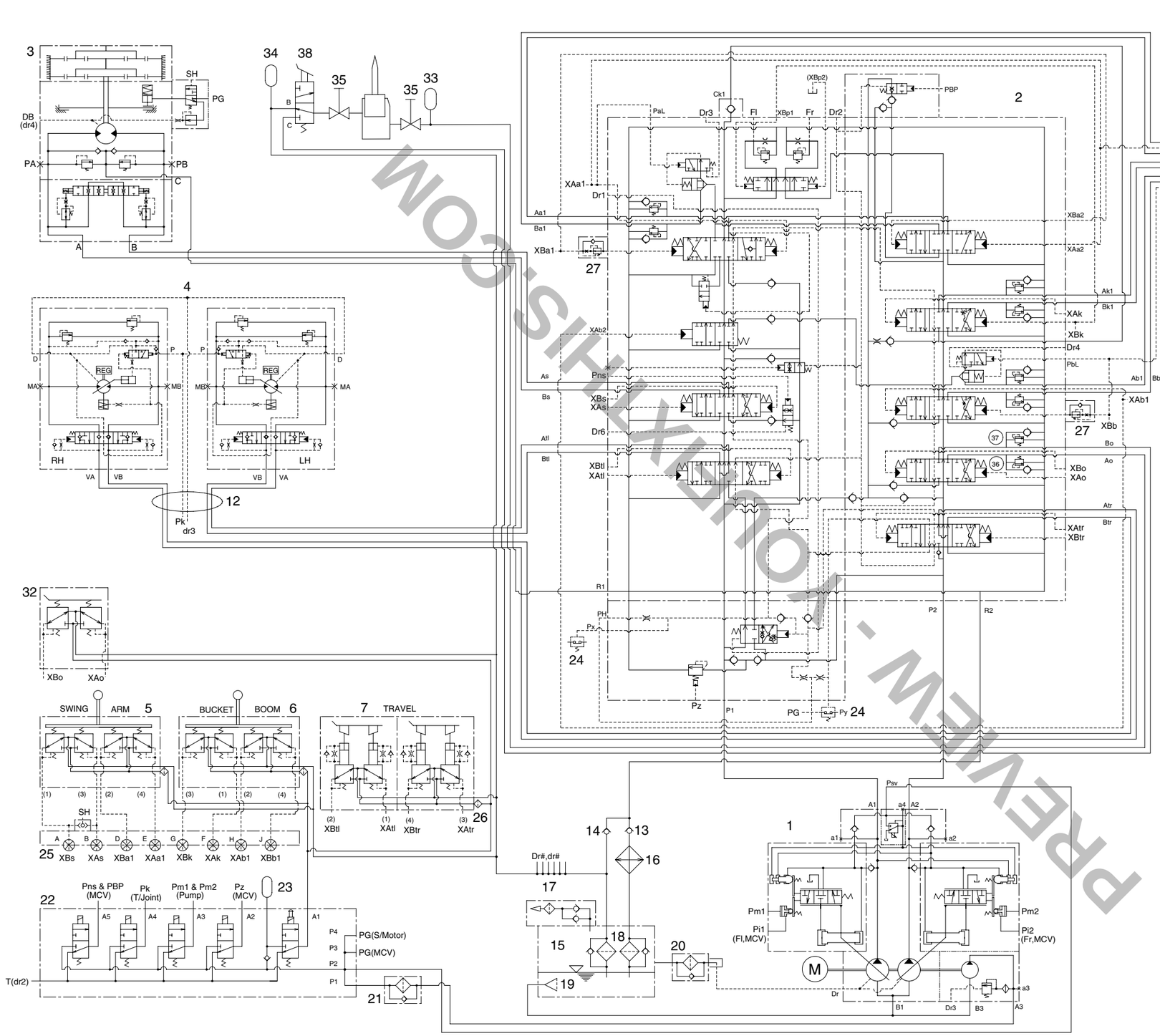
32072ST02

Port	Port name	Port size
A1,2	Delivery port	SAE6000psi 1"
B1	Suction port	SAE2500psi 3"
Dr	Drain port	PF 3/4 - 23
Pi1,i2	Pilot port	PF 1/4 - 15
Pm1,m2	Qmax cut port	PF 1/4 - 15
Psv	Servo assist port	PF 1/4 - 15
a1,2,4	Gauge port	PF 1/4 - 15
a3	Gauge port	PF 1/4 - 14
A3	Gear pump delivery port	PF 1/2 - 19
B3	Gear pump suction port	PF 3/4 - 20.5
dr3	Gear pump drain port	PF 3/8

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GROUP 1 HYDRAULIC CIRCUIT

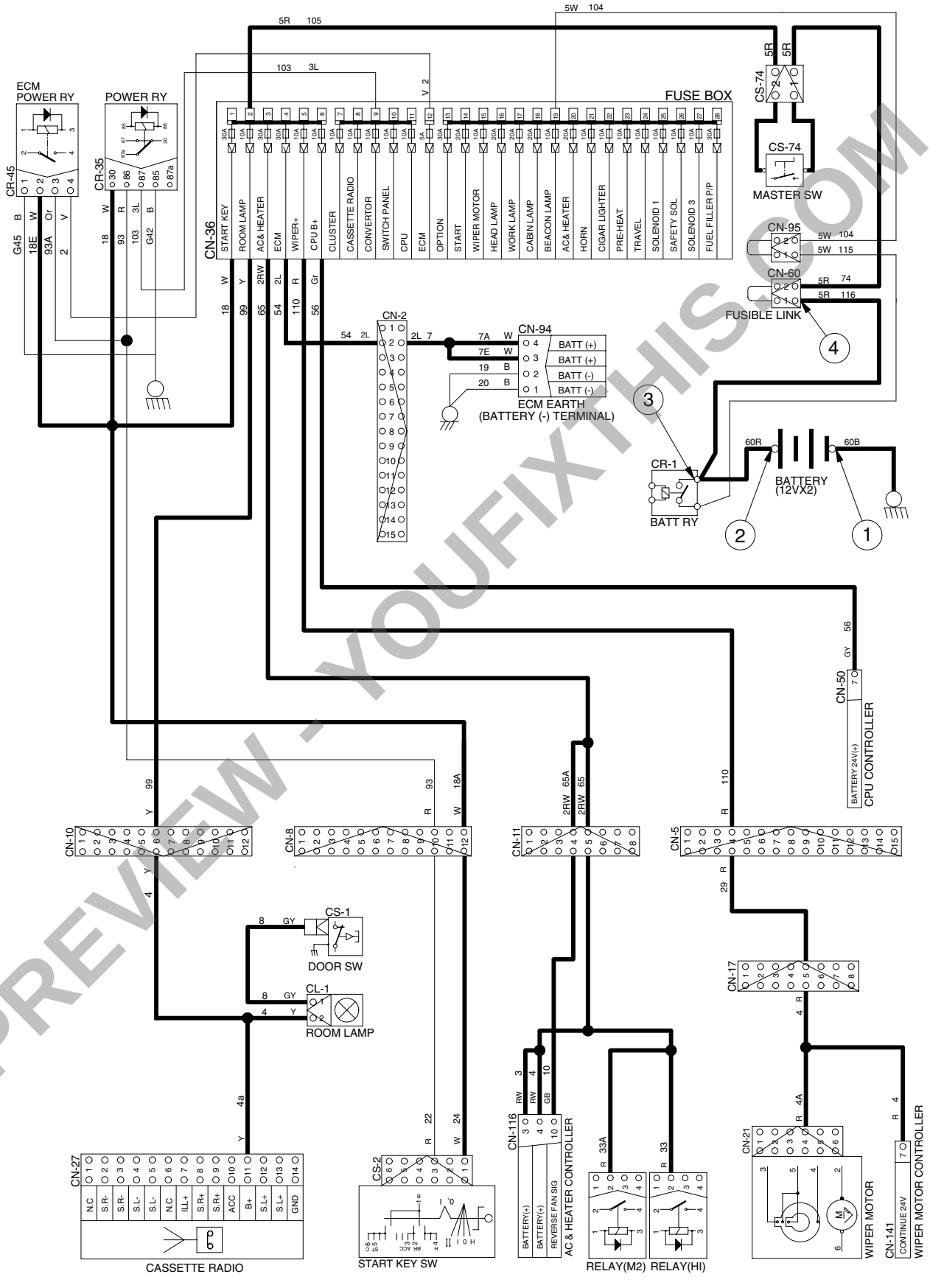


1 Main pump
2 Main control valve
3 Swing motor
4 Travel motor
5 RCV lever(LH)
6 RCV lever(RH)
7 RCV pedal
8 Boom cylinder(LH)
9 Boom cylinder(RH)
10 Arm cylinder
11 Bucket cylinder
12 Turning joint
13 Check valve
14 Check valve
15 Hydraulic tank
16 Oil cooler
17 Air breather
18 Return filter
19 Strainer
20 Spin filter
21 Line filter
22 5-cartridge valve
23 Accumulator
24 Pressure switch
25 Terminal
26 Last guard filter
27 Shockless valve
28 Safety lock valve
29 Safety lock valve
30 Pressure switch
31 Shut off valve
32 Option pedal
33 Accumulator
34 Accumulator
35 Stop valve
36 Port relief valve
37 Port relief valve
38 Selector valve

3207A3HC01

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POWER CIRCUIT



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5. ERROR CODES TABLE

Fault code No.	Description
1	Short circuit in governor motor system
2	Potentiometer circuit is shorted to Vcc(5V) or battery +
3	Short circuit in pump EPPR valve system
4	Short circuit in boom down EPPR valve system
5	Short circuit in travel speed solenoid system
6	Short circuit in power boost solenoid system
7	Short circuit in max flow solenoid system
10	Short circuit in hour-meter system
11	Accel dial circuit is shorted to Vcc(5V) or battery +
12	P1 pressure sensor circuit is shorted to power supply(24V) line
13	P2 pressure sensor circuit is shorted to power supply(24V) line
14	P3 pressure sensor circuit is shorted to power supply(24) line
15	Boom down pressure circuit is shorted to power supply(24V) line
16	Governor motor circuit is open or shorted to ground
17	Potentiometer circuit is open or shorted to ground
18	Pump EPPR valve circuit is open or shorted to ground
19	Boom down EPPR valve circuit is open or shorted to ground
20	Travel speed solenoid circuit is open or shorted to ground
21	Power boost solenoid circuit is open or shorted to ground
22	Max flow solenoid circuit is open or shorted to ground
25	Hour-meter circuit is open or shorted to ground
26	Accel dial circuit is open or shorted to ground
27	P1 pressure sensor circuit is open or shorted to ground
28	P2 pressure sensor circuit is open or shorted to ground
29	P3 pressure sensor circuit is open or shorted to ground
30	Boom down pressure sensor circuit is open or shorted to ground
31	Engine preheater circuit is open or shorted to ground
32	Travel alarm buzzer circuit is open or shorted to ground
33	Alternator circuit is open or shorted to ground
34	Controller input voltage is below 18V
35	Controller input voltage is over 38V
36	Communication error with cluster
37	Engine speed sensor circuit is open or shorted to ground
38	Anti-restart relay circuit is open or shorted to ground
39	Accel actuator does not stop at a target position
40	There is more than 500rpm difference between target speed and actual speed

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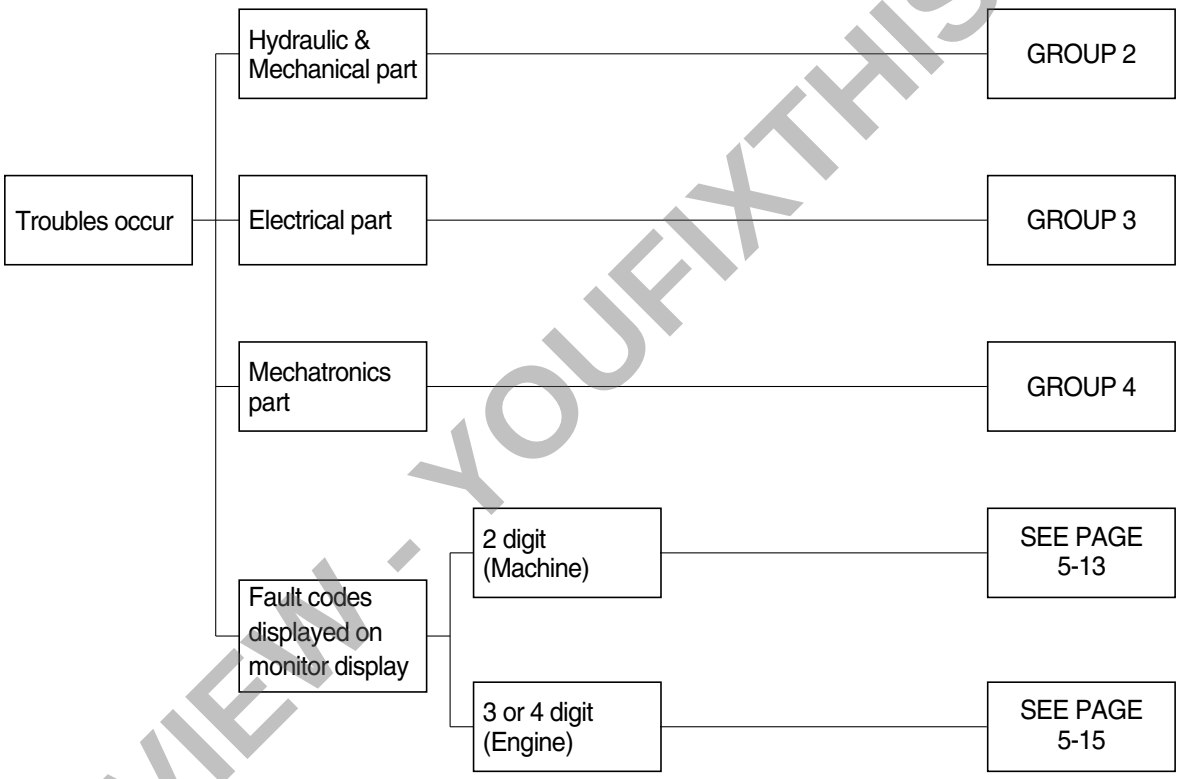
SECTION 6 TROUBLESHOOTING

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, Electrical system and Mechatronics 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) Loosen the breather slowly to release the pressure inside the hydraulic tank.

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

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

· Hydraulic tank quantity : 210 ℓ

(4) Remove bolts(13) and disconnect pipe (1,2).

(5) Disconnect pilot line hoses(4, 5, 6, 7, 8, 9, 10, 11).

(6) Remove bolts(12) and disconnect pump suction tube (3).

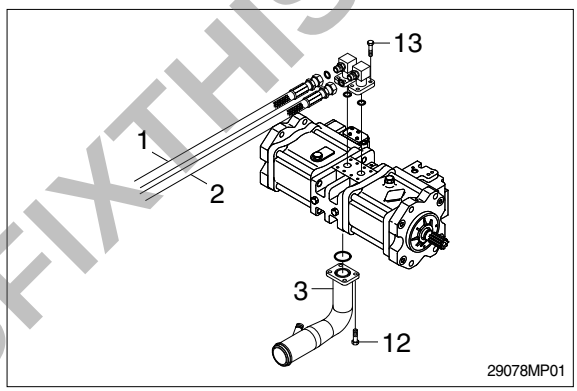
※ When pump suction tube is disconnected, the oil inside the piping will flow out, so catch it in oil pan.

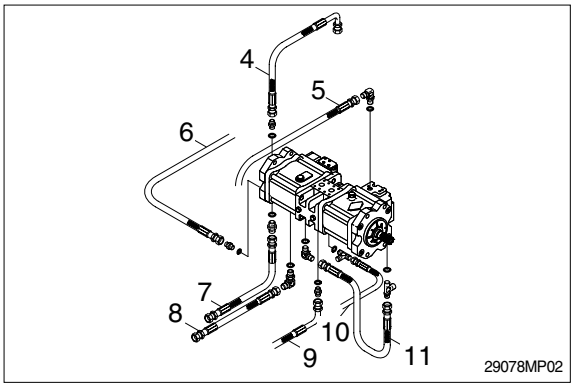
(7) Sling the pump assembly and remove the pump mounting bolts.

· Weight : 155kg(342lb)

※ 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, nut	M24 × 3.0	90 ± 7.0	651 ± 51
2		Radiator mounting bolt	M16 × 2.0	29.7 ± 4.5	215 ± 32.5
3		Coupling mounting socket bolt	M20 × 2.5	46.5 ± 2.5	336 ± 18.1
4		Main pump housing mounting bolt	M10 × 1.5	2.81 ± 0.3	20.3 ± 2.2
5	Hydraulic system	Main pump mounting socket bolt	M20 × 2.5	42 ± 4.5	304 ± 32.5
6		Main control valve mounting bolt	M12 × 1.75	12.3 ± 1.3	88.9 ± 9.4
7		Fuel tank mounting bolt	M20 × 2.5	46 ± 5.0	333 ± 36
8		Hydraulic oil tank mounting bolt	M20 × 2.5	46 ± 5.0	333 ± 36
9		Turning joint mounting bolt, nut	M12 × 1.75	12.3 ± 1.3	88.9 ± 9.4
10	Power train system	Swing motor mounting bolt	M20 × 2.5	58.4 ± 6.4	422 ± 46.3
11		Swing bearing upper part mounting bolt	M24 × 3.0	97.8 ± 10	707 ± 72.3
12		Swing bearing lower part mounting bolt	M24 × 3.0	97.8 ± 10	707 ± 72.3
13		Travel motor mounting bolt	M24 × 3.0	84 ± 8.0	607 ± 58
14		Sprocket mounting bolt	M20 × 2.5	57 ± 6.0	412 ± 43.4
15	Under carriage	Carrier roller mounting bolt, nut	M16 × 2.0	29.7 ± 4.4	215 ± 31.8
16		Track roller mounting bolt	M20 × 2.5	57.9 ± 8.6	419 ± 62.2
17		Track tension cylinder mounting bolt	M12 × 1.25	15 ± 5.0	108 ± 3.6
18		Track shoe mounting bolt, nut	M22 × 1.5	115 ± 5.0	831 ± 36
19		Track guard mounting bolt	M20 × 2.5	46 ± 5.0	333 ± 36
20	Others	Counter weight mounting bolt	M36 × 3.0	308 ± 46	2228 ± 333
21		Cab mounting bolt	M12 × 1.75	12.2 ± 1.3	88.2 ± 9.4
22		Operator's seat mounting bolt	M 8 × 1.25	2.5 ± 0.5	18.1 ± 3.6

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

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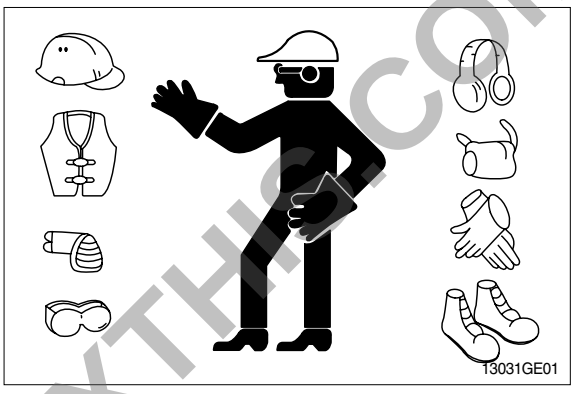
GROUP 1 SAFETY

FOLLOW SAFE PROCEDURE

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

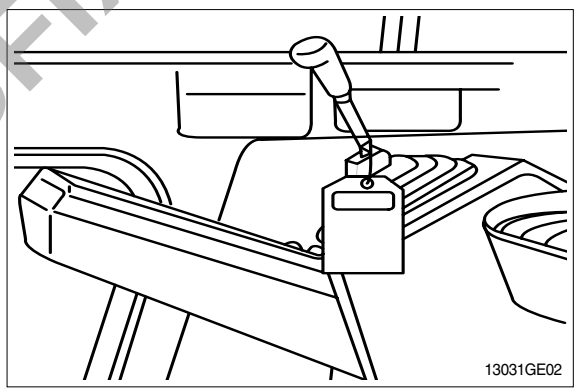
WEAR PROTECTIVE CLOTHING

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



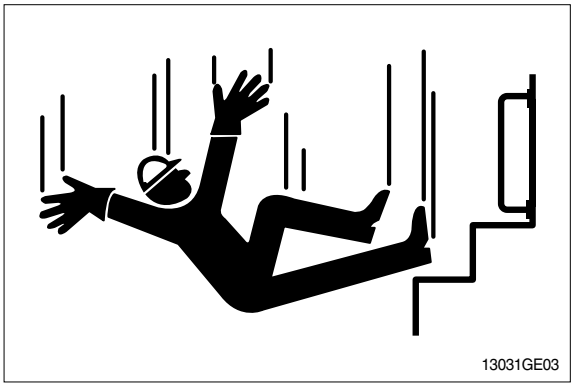
WARN OTHERS OF SERVICE WORK

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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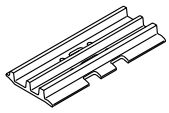
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7. UNDERCARRIAGE

1) TRACKS

X-leg type center frame is integrally welded with reinforced box-section track frames. The design includes dry tracks, lubricated rollers, idlers, sprockets, hydraulic track adjusters with shock absorbing springs and assembled track-type tractor shoes with triple grousers.

2) TYPES OF SHOES

Model	Shapes		Triple grouser			
						
R320LC-7A	Shoe width	mm(in)	600(24)	700(28)	800(32)	900(36)
	Operating weight	kg(lb)	32200(71000)	32800(72300)	33200(73200)	33600(74100)
	Ground pressure	kgf/cm²(psi)	0.62(8.82)	0.54(7.68)	0.48(6.83)	0.43(6' 11")
	Overall width	mm(ft-in)	3280(10' 9")	3380(11' 1")	3480(11' 5")	3580(11' 9")
R320NLC-7A	Shoe width	mm(in)	600(24)	-	-	-
	Operating weight	kg(lb)	32000(70500)	-	-	-
	Ground pressure	kgf/cm²(psi)	0.61(8.67)	-	-	-
	Overall width	mm(ft-in)	2990(9' 10")	-	-	-
R320LC-7A HIGH WALKER	Shoe width	mm(in)	600(24)	700(28)	800(32)	Double Grouser 710(28)
	Operating weight	kg(lb)	34700(76500)	35300(77800)	35700(78700)	35900(79100)
	Ground pressure	kgf/cm²(psi)	0.67(9.53)	0.58(8.25)	0.51(7.25)	0.58(8.25)
	Overall width	mm(ft-in)	3470(11' 5")	3570(11' 9")	3670(12' 0")	3580(11' 9")

3) NUMBER OF ROLLERS AND SHOES ON EACH SIDE

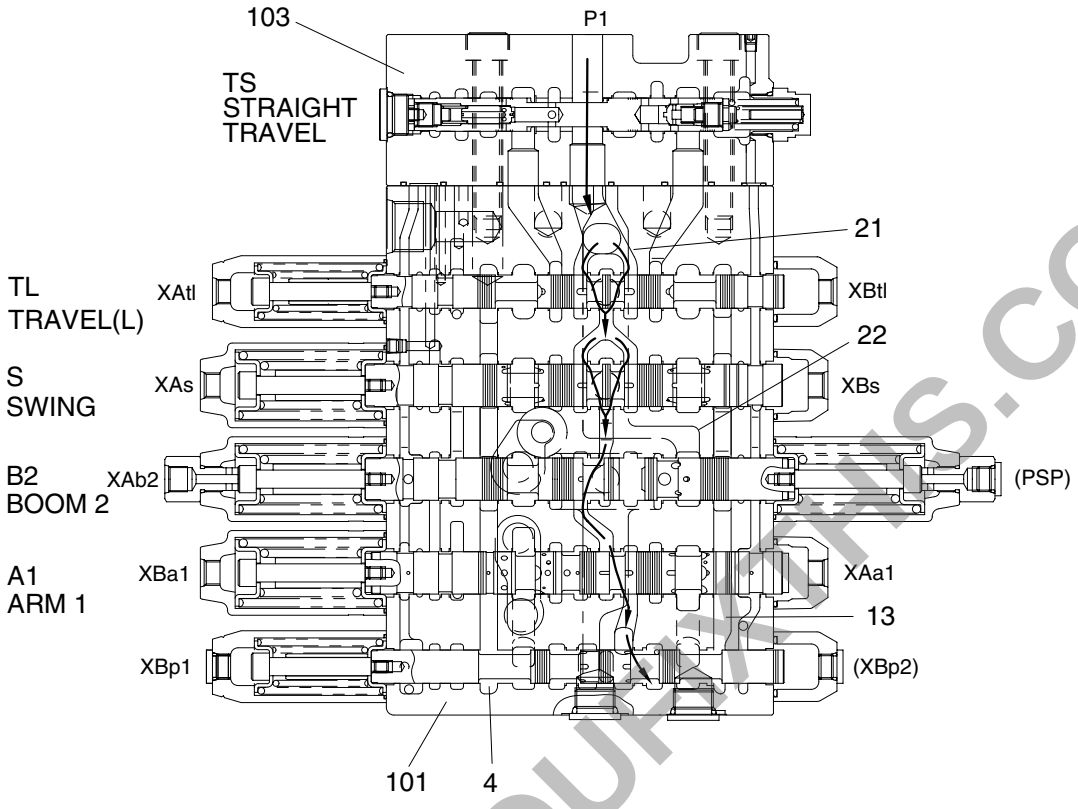
Item	Quantity
Carrier rollers	2EA
Track rollers	9EA
Track shoes	48EA

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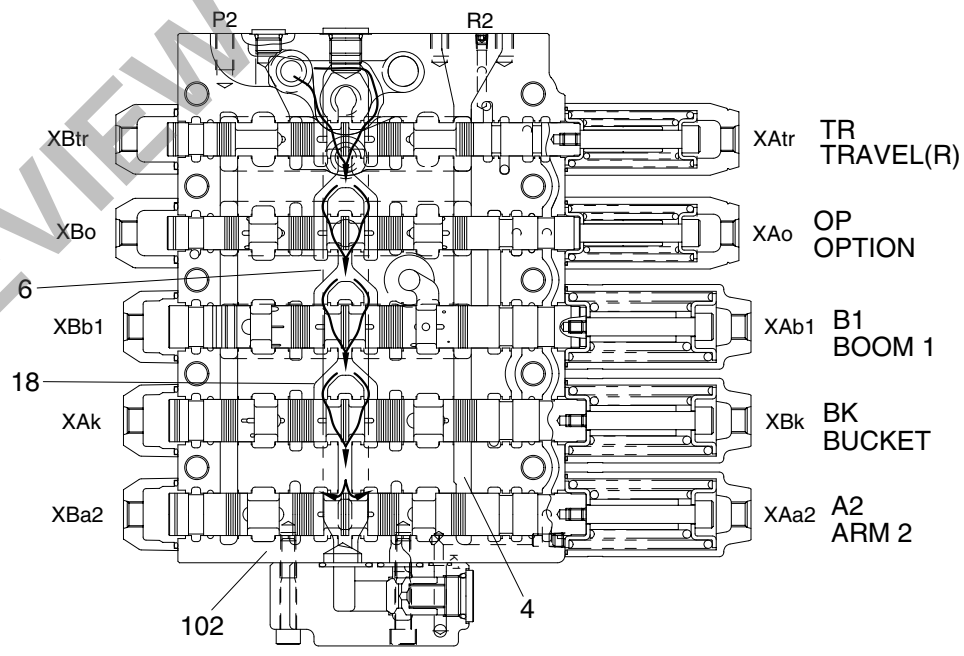
3. FUNCTION

1) CONTROL IN NEUTRAL POSITION



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SECTION A-A



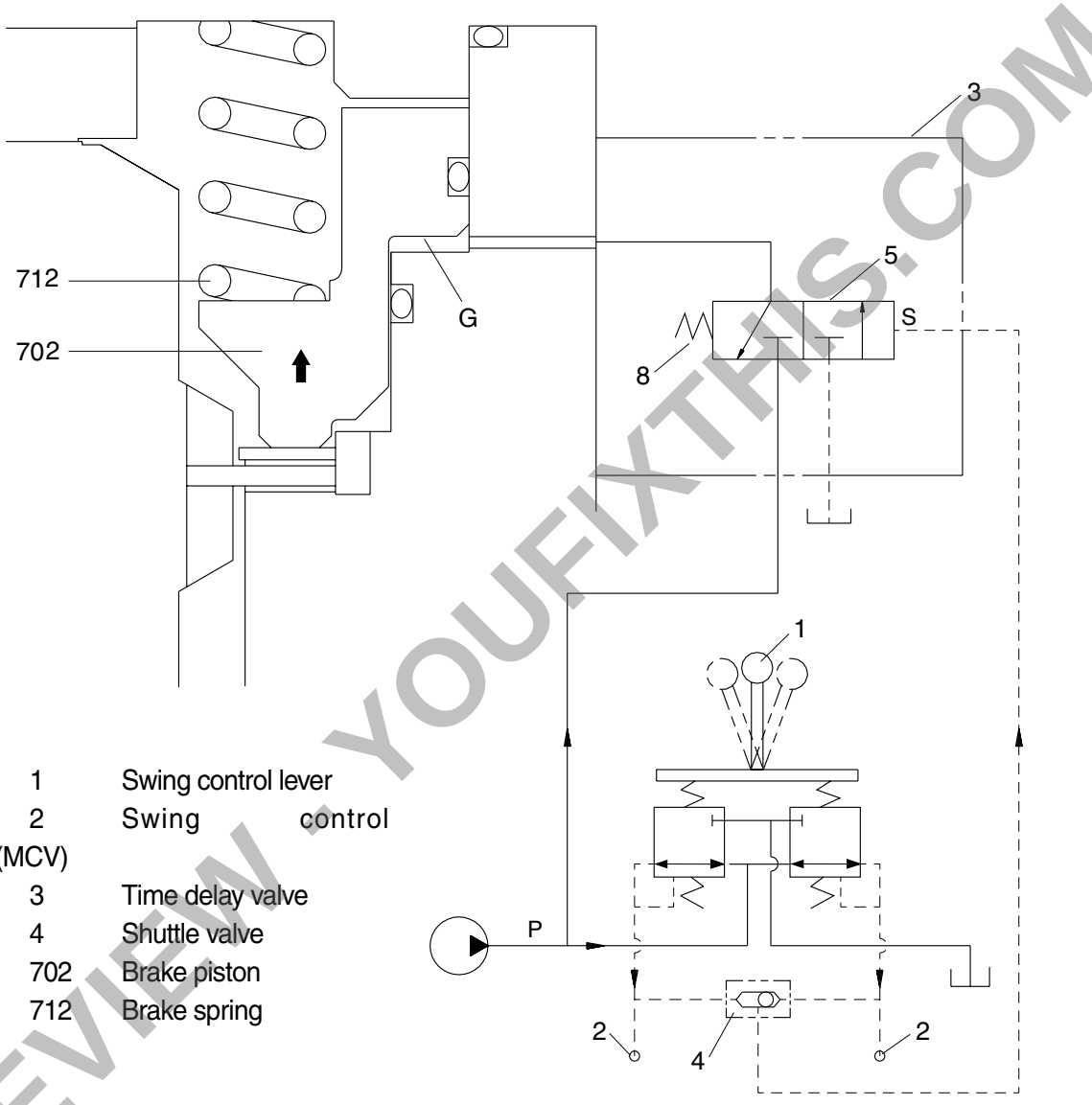
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SECTION B-B

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b. When the swing control lever(1) is set the neutral position, the time delay valve(3) shifts the neutral position and the pilot oil blocked chamber G.
Then, the piston(702) is moved lower by spring(712) force and the return oil from the chamber G is drain.



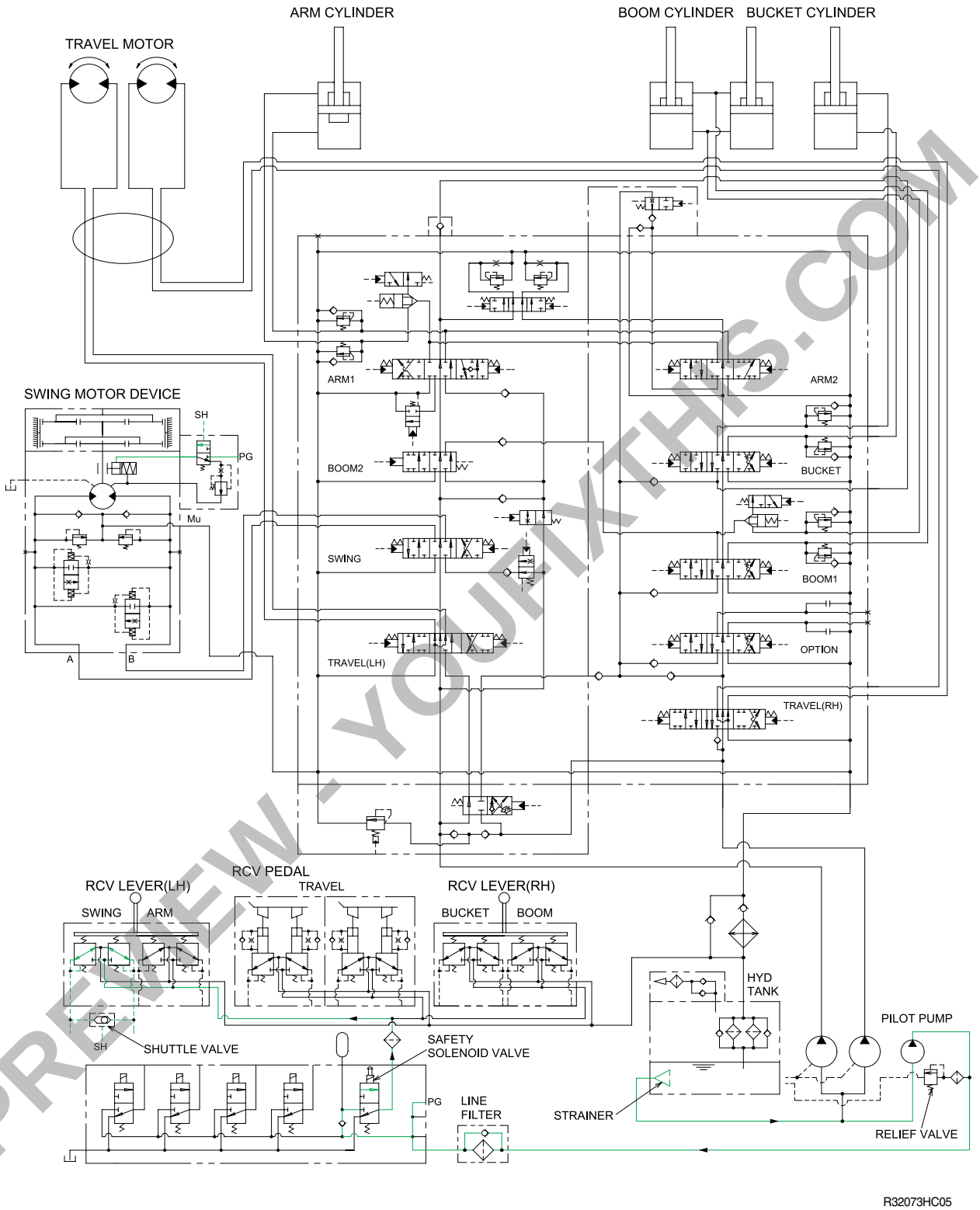
1 Swing control lever
2 Swing control valve(MCV)
3 Time delay valve
4 Shuttle valve
702 Brake piston
712 Brake spring

R290SM08(1)

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4. SWING PARKING BRAKE RELEASE



When the swing control lever is operated, the pilot oil flows to SH port of shuttle valve, this pressure move spool so, discharged oil from pilot pump flows to PG port.
This pressure is applied to swing motor disc cylinder, thus the brake released.
When the swing control lever is set neutral position, oil in the swing motor disc cylinder is drain, thus the brake is applied.

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4. HEAD AND WORK LIGHT CIRCUIT

1) OPERATING FLOW

Fuse box (No.16) → I/conn 〔CN-7(7)〕 → Switch panel 〔CN-116(9)〕
Fuse box (No.17) → I/conn 〔CN-7(8)〕 → Switch panel 〔CN-116(10,11)〕

(1) Head light switch ON

Head light switch ON 〔CN-116(1)〕 → I/conn 〔CN-7(1)] → Head light relay 〔CR-13(3)〕
- → Head light ON 〔CL-4(2)〕
- → I/conn 〔CN-10(2)〕 → Cassette radio & Remote controller illumination ON 〔CN-27(7), CN-114(9)〕
- → I/conn 〔CN-11(8)〕 → AC & Heater controller illumination ON
- → I/conn 〔CN-6(8)〕 → Cigarlight 〔CL-2〕

(2) Work light switch ON

Work light switch ON 〔CN-116(2,3)〕 → I/conn 〔CN-7(2)〕 → I/conn 〔CN-12(1)〕
→ Work light ON 〔CL-5(2), CL-6(2)〕

2) CHECK POINT

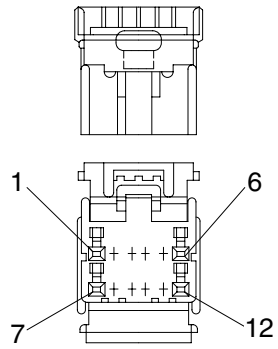
Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box) ② - GND(Switch power input) ③ - GND(Switch power output) ④ - GND(Head light relay)	20~25V
STOP	ON	⑤ - GND(Head light) ⑥ - GND(Fuse box) ⑦ - GND(Switch power input) ⑧ - GND(Switch power output) ⑨ - GND(Work light)	20~25V

※ GND : Ground

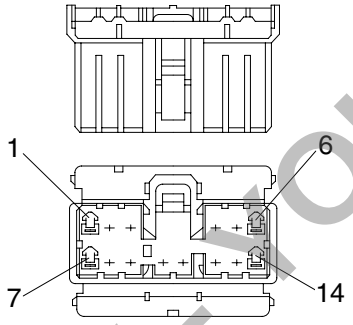
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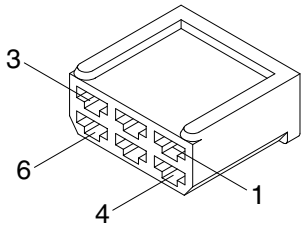
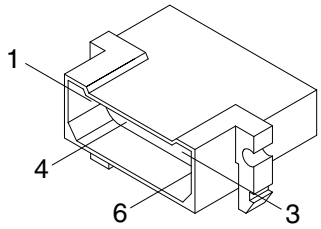
8) AMP 040 MULTILOCK CONNECTOR

No. of pin	Receptacle connector(Female)	Plug connector(Male)
12	 174045-2	

9) AMP 070 MULTILOCK CONNECTOR

No. of pin	Receptacle connector(Female)	Plug connector(Male)
14	 173852	

10) AMP FASTIN - FASTON CONNECTOR

No. of pin	Receptacle connector(Female)	Plug connector(Male)
6	 925276-0	 480003-9

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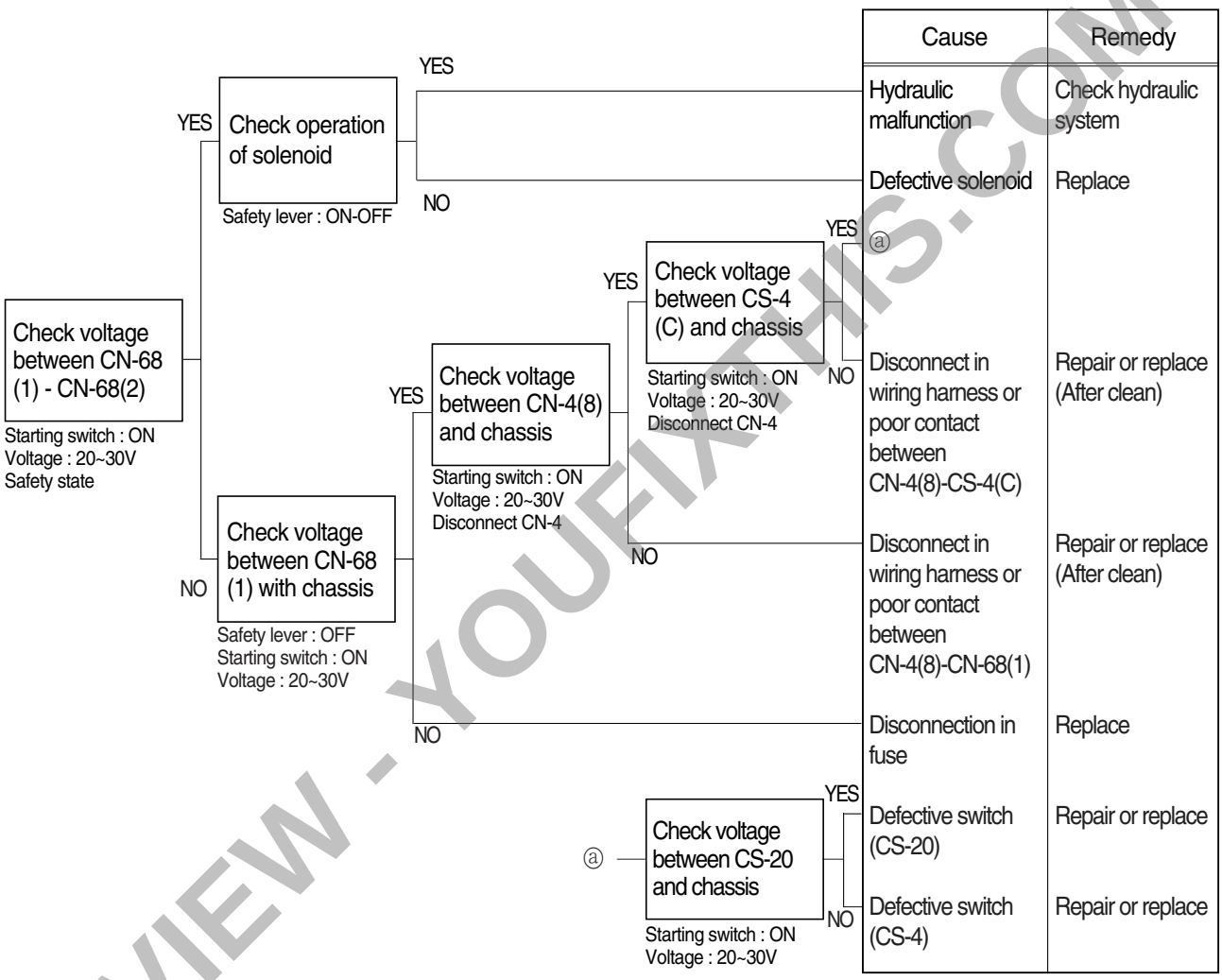
Fault code No.	Reason	Effect (only when fault code is active)
2557	Auxiliary PWM Driver 1 Circuit - Voltage Above Normal, or Shorted to High Source. High signal voltage detected at the analog torque circuit.	Cannot control transmission.
2558	Auxiliary PWM Driver 1 Circuit - Voltage Below Normal, or Shorted to Low Source. Low signal voltage detected at the analog torque circuit.	Power derate and possible engine shutdown if engine protection shutdown feature is enabled.
2973	Intake Manifold 1 Pressure - Data Erratic, Intermittent, or Incorrect. The ECM has detected an intake manifold pressure signal that is too high or low for current engine operating conditions.	

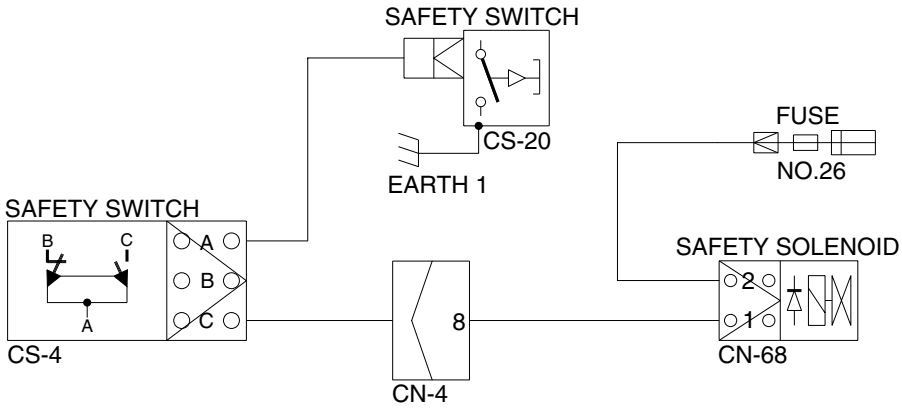
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10. WHEN SAFETY SOLENOID DOES NOT OPERATE

- 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.26.
- After checking, insert the disconnected connectors again immediately unless otherwise specified.





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12) CONTROL LEVER STROKE

(1) Measure each lever stroke at the lever top using a ruler.

※ When the lever has play, take a half of this value and add it to the measured stroke.

(2) Preparation

Keep the hydraulic oil temperature at 50±5°C.

(3) Measurement

① Stop the engine.

② Measure each lever stroke at the lever top from neutral to the stroke end using a ruler.

③ Repeat step ② three times and calculate the average values.

(4) Evaluation

The measured drift should be within the following specifications.

Unit : mm

Model	Kind of lever	Standard	Maximum allowable	Remarks
R320LC-7A	Boom lever	87±10	109	
	Arm lever	87±10	109	
	Bucket lever	87±10	109	
	Swing lever	87±10	109	
	Travel lever	142±10	178	

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(2) Tightening torque

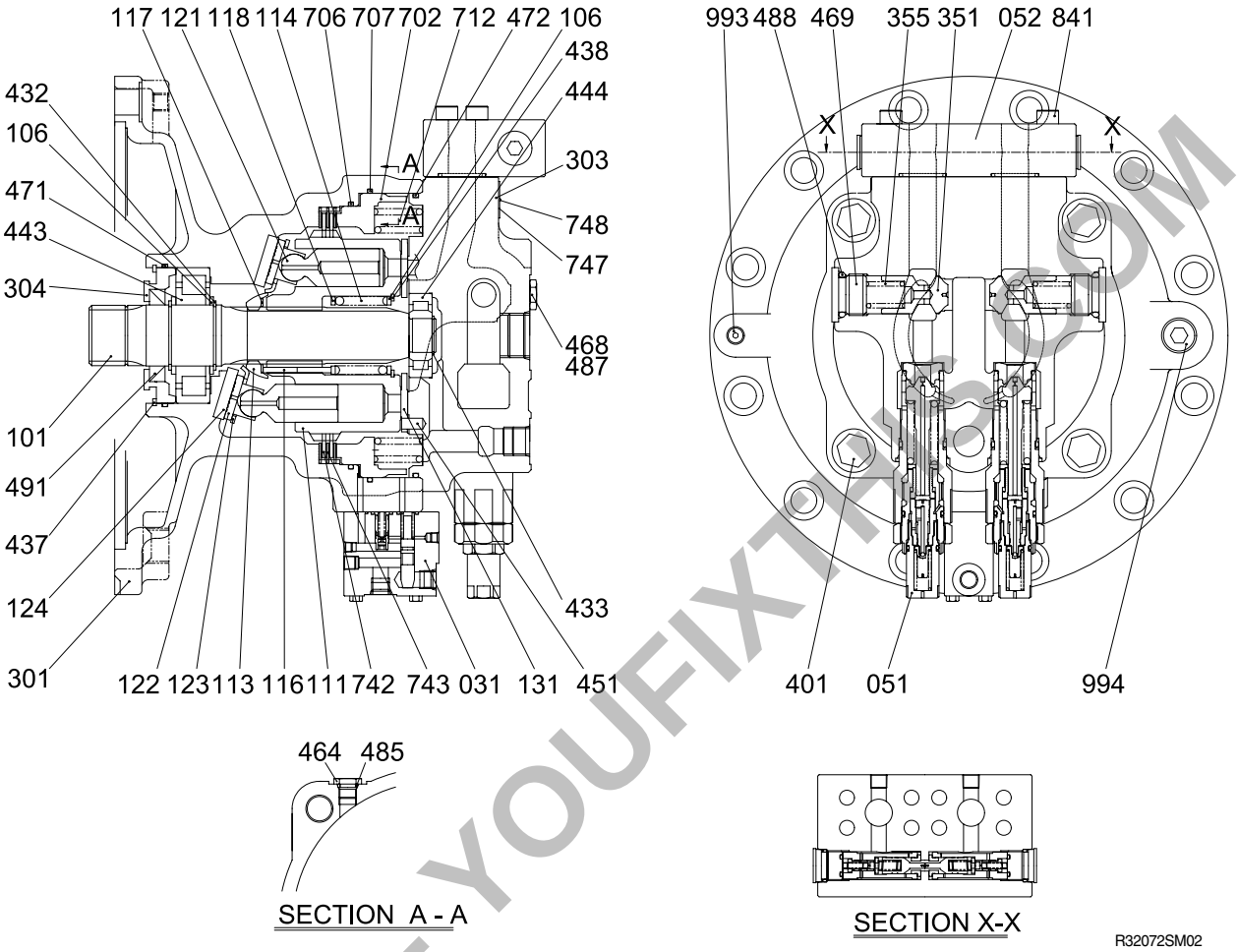
Part name	Bolt size	Torque		Wrench size	
		kgf · m	lbf · ft	in	mm
Hexagon socket head bolt (Material : SCM435)	M 5	0.7	5.1	0.16	4
	M 6	1.2	8.7	0.20	5
	M 8	3.0	21.7	0.24	6
	M10	5.8	42.0	0.31	8
	M12	10.0	72.3	0.39	10
	M14	16.0	115.7	0.47	12
	M16	24.0	173.6	0.55	14
	M18	34.0	245.9	0.55	14
	M20	44.0	318.3	0.67	17
PT plug(Material : S45C) ※ Wind a seal tape 1 1/2 to 2 turns round the plug	PT 1/16	0.7	5.1	0.16	4
	PT 1/ 8	1.05	7.59	0.20	5
	PT 1/ 4	1.75	12.66	0.24	6
	PT 3/ 8	3.5	25.3	0.31	8
	PT 1/ 2	5.0	36.2	0.39	10
PF plug(Material : S45C)	PF 1/ 4	3.0	21.7	0.24	6
	PF 1/ 2	10.0	72.3	0.39	10
	PF 3/ 4	15.0	108.5	0.55	14
	PF 1	19.0	137.4	0.67	17
	PF 1 1/4	27.0	195.3	0.67	17
	PF 1 1/2	28.0	202.5	0.67	17

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2. SWING MOTOR

1) STRUCTURE



031	Time delay valve	162	O-ring	468	Plug
051	Relief valve	163	O-ring	469	Plug
052	Valve assy	171	Hexagon screw	471	O-ring
101	Drive shaft	301	Casing	472	O-ring
106	Spacer	303	Casing	485	O-ring
111	Cylinder	304	Front cover	487	O-ring
113	Spherical bush	351	Plunger	488	O-ring
114	Spring	355	Spring	491	Oil seal
116	Push rod	401	Socket bolt	702	Piston
117	Spacer	432	Snap ring	706	O-ring
118	Spacer	433	Snap ring	707	O-ring
121	Piston	437	Snap ring	712	Brake spring
122	Shoe	438	Snap ring	742	Friction plate
123	Retainer	443	Roller bearing	743	Separate plate
124	Shoe plate	444	Needle bearing	841	Socket bolt
131	Valve plate	451	Spring pin	993	Plug
161	O-ring	464	Plug	994	Plug

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3) ASSEMBLING TRAVEL MOTOR

(1) Assemble the sub of a turning axis.

① After assembling bearing spacer(12) into a turning axis(11), have cylinder roller bearing(13) thermal-reacted.

a. In the thermal reaction of cylinder roller bearing, use and induction heating apparatus and adjust the temperature as about 100°C.

b. Deal moisturized copper part oil seal in a turning axis without any damage of it.



300072TM51
300072TM51A
300072TM51B

(2) Assemble ring stop(14) with a plier.

※ Be careful of the direction of ring stop.
(The direction of round is the side of bearing)



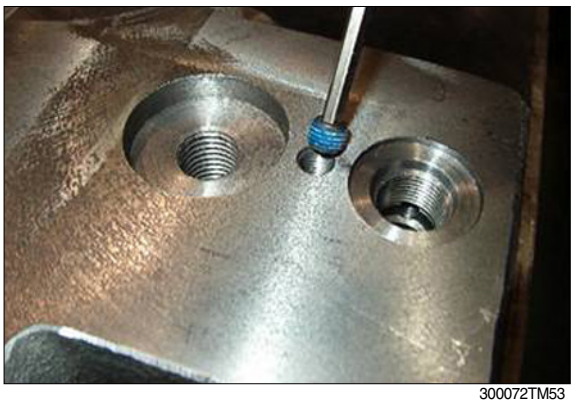
300072TM52

(3) Assemble valve casing sub.

① Bond seven pieces of plug(2) in valve casing(33) with standard torque.

② After taping plug with seal taper and spread rock tight, assemble it.

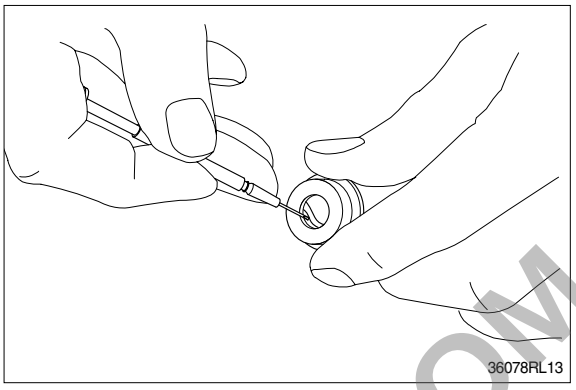
· Tightening torque : 7~11kgf · m
(50.63~79.5lbf · ft)



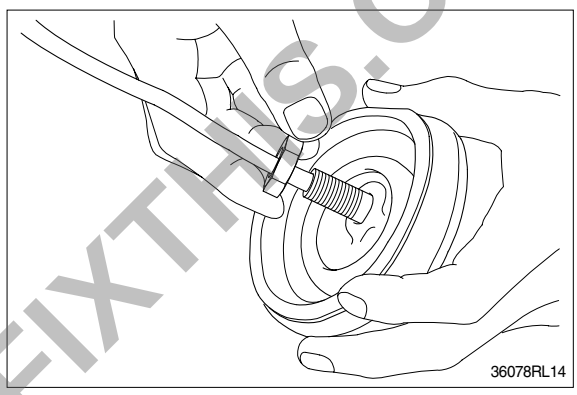
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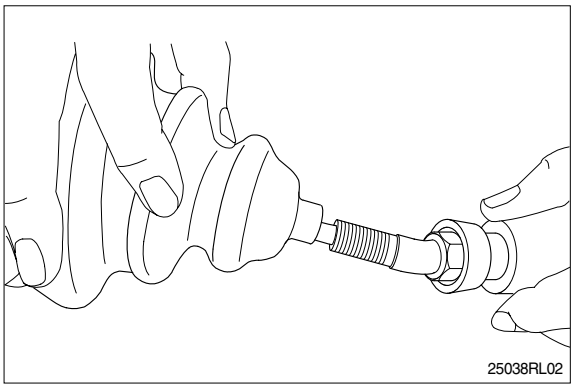
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(16) Remove lock nut(20) and then boot(25).





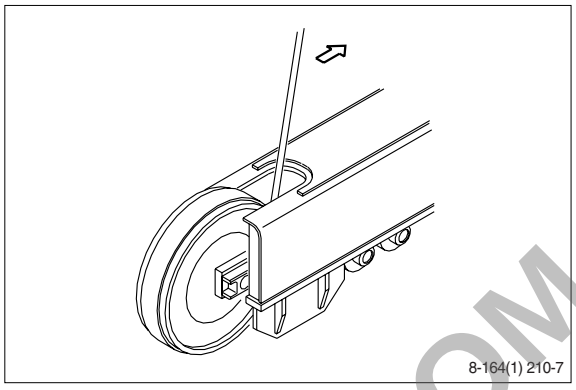
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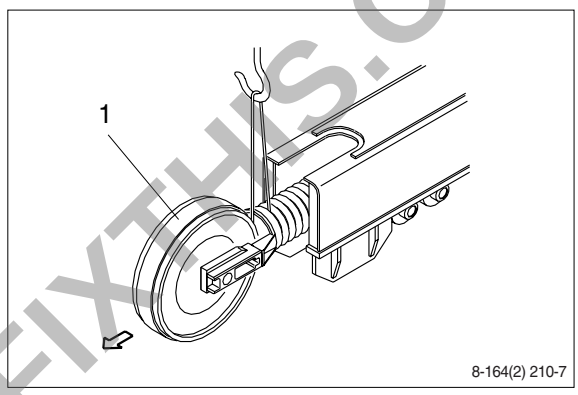
4. IDLER AND RECOIL SPRING

1) REMOVAL

(1) Remove the track link.
For detail, see **removal of track link**.

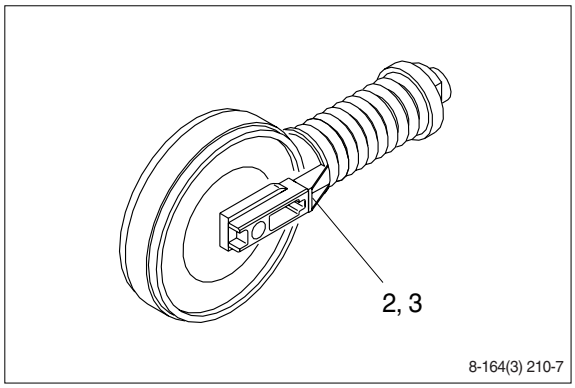

8-164(1) 210-7

(2) Sling the recoil spring(1) and pull out idler and recoil spring assembly from track frame, using a pry.
· Weight : 457kg(1010lb)



8-164(2) 210-7

(3) Remove the bolts(2), washers(3) and separate ilder from recoil spring.

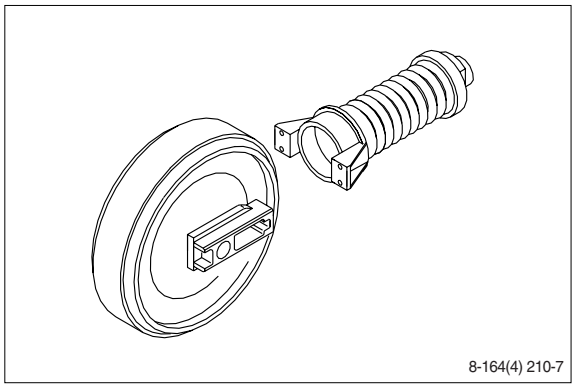


8-164(3) 210-7

2) INSTALL

(1) Carry out installation in the reverse order to removal.

※ Make sure that the boss on the end face of the recoil cylinder rod is in the hole of the track frame.


8-164(4) 210-7

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