CRAWLER EXCAVATOR

SERVICE MANUAL

R55W-7

HYUNDAI

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CONTENTS

SECTION 1 GENERAL

Group 1 Safety Hints 1-1
Group 2 Specifications 1-9

SECTION 2 STRUCTURE AND FUNCTION

Group 1 Pump Device 2-1
Group 2 Main Control Valve 2-9
Group 3 Swing Device 2-25
Group 4 Travel Device 2-35
Group 5 RCV Lever 2-41
Group 6 RCV pedal 2-48
Group 7 Brake pedal(Valve) 2-49
Group 8 Gear box 2-51
Group 9 Steering valve 2-54
Group 10 Axle 2-56

SECTION 3 HYDRAULIC SYSTEM

Group 1 Hydraulic Circuit 3-1
Group 2 Main Circuit 3-2
Group 3 Pilot Circuit 3-5
Group 4 Single Operation 3-10
Group 5 Combined Operation 3-25

SECTION 4 ELECTRICAL SYSTEM

Group 1 Component Location 4-1
Group 2 Monitoring system 4-3
Group 3 Electrical Circuit 4-11
Group 4 Electrical Component Specification 4-28
Group 5 Connectors 4-38

SECTION 5 TROUBLESHOOTING

Group 1 Before Trobleshooting 5-1
Group 2 Hydraulic and Mechanical System 5-4
Group 3 Electrical System 5-23

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SECTION 6 MAINTENANCE STANDARD

Group 1 Operational Performance Test 6-1
Group 2 Major Components 6-19

SECTION 7 DISASSEMBLY AND ASSEMBLY

Group 1 Precaution 7-1
Group 2 Tightening Torque 7-4
Group 3 Pump Device 7-7
Group 4 Main Control Valve 7-38
Group 5 Swing Device 7-53
Group 6 Travel Device 7-74
Group 7 Gear box 7-98
Group 8 Steering valve 7-126
Group 9 Front axle 7-147
Group 10 Rear axle 7-238
Group 11 RCV Lever 7-310
Group 12 Turning Joint 7-324
Group 13 Boom, Arm and Bucket Cylinder 7-329
Group 14 Work Equipment 7-348

SECTION 8 COMPONENT MOUNTING TORQUE

Group 1 Introduction Guide 8-1
Group 2 Engine System 8-2
Group 3 Electric System 8-4
Group 4 Hydraulic System 8-5
Group 5 Undercarriage 8-7
Group 6 Structure 8-8
Group 7 Work Equipment 8-10

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(2) 3TNV84

Engine name		Unit	3TNV84								
Engine specification class		-	CL		VM						
Type		-	Vertical, in-line, 4-cycle, water-cooled diesel engine								
Combustion chamber		-	Direct injection								
Number of cylinders		-	3								
Cylinder borexstroke		mmxmm	84x90								
Displacement		L	1.496								
Continuous rating	Revolving speed	Min^{-1}	1500	1800	-						
	Output	kW (hp)	11.3 (15.3)	13.5 (18.3)	-						
Rated output	Revolving speed	Min^{-1}	1500	1800	2000	2200	2400	2500	2600	2800	3000
	Output	kW (hp)	12.4 (16.8)	14.8 (20.1)	16.4 (22.3)	18.1 (24.6)	19.7 (26.8)	20.5 (27.9)	21.3 (29.0)	23.0 (31.3)	24.6 (33.5)
Max. no-load speed (±25)		min^{-1}	1600	1895	2180	2400	2590	2690	2810	2995	3210
Ignition order		-	1-3-2-1(No.1 cylinder on flywheel side)								
Power take off		-	Flywheel								
Direction of rotation		-	Counterclockwise (viewed from flywheel)								
Cooling system		-	Radiator								
Lubrication system		-	Forced lubrication with trochoid pump								
Starting system		-	Electric								
Applicable fuel		-	Diesel oil-ISO 8217 DMA, BS 2869 A1 or A2 (Cetane No.45 min.)								
Applicable lubricant		-	API grade class CD								
Lubricant capacity (oil pan) *	Total	L	6.7								
	Effective	L	1.9								
Coolant water capacity (engine only)		L	1.8								
Engine dimensions ** (with flywheel housing)	Overall length	mm	589		564						
	Overall width	mm	486								
	Overall height	mm	622								
Engine mass (dry) ** (with flywheel housing)		kg	161		155						
Cooling fan (std.)		mm	335 mm O/D, 6 blades pusher type								
Crankshaft V pulley diameter & Fun V pulley diameter (std.)		mm	120x90		110x110						

* Engine oil capacity may differ from the above depending on an engine installed on a machine unit.
** Engine mass and dimensions without radiator

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Cause \ Trouble symptom		Starting failure				Insufficient engine output			Poor exhaust color		High knocking sound during combustion	Abnormal engine sound	Uneven combustion sound	Hunting		Large engine vibration	Difficulty in returning to low speed	Excessive fuel consumption	Lubricating oil					Cooling water		Air intake		Exhaust temperature rise	Corrective action
			Engine starts but stops soon.			Exhaust color			During work																				
		Engine does not start.	Exhaust smoke											During idling	During work				Excessive consumption	Dilution by fuel oil	Mixture with water	Low L.O. pressure	Much blow-by gas	Overheat	Low water temperature	Pressure drop	Pressure rise		
			None	Little	Much	Ordinary	White	Black	White	Black																			
Cooling Water System	Excessive cooling effect of radiator								○									○							○				Defective thermostat (kept closed) (See 2.2.7 in Chapter2.)
	Insufficient cooling effect of radiator							○																○				○	Defective thermostat (kept opened)(See 2.2.7 in Chapter2.) or slipping fan belt (See 2.2.2-2) in Chapter2.)
	Insufficient coolant water level							○																○				○	Check water leakage from cooling water system. (See 2.2.1-4) in Chapter2.)
	Cracked water jacket																				○	○		○					Repair or replace.
	Slackened fan belt							○																○				○	Adjust the belt tension. (See 2.2.2-2) in Chapter2.)
	Defective thermostat							○	○															○	○				Check or replace. (See 2.2.7 in Chapter2.)
Lubricating System	Improper properties of lubricating oil	○	○			○													○			○	○						Use proper lubricating oil. (See 1.3.2 in Chapter1.)
	Leakage from lubricating oil piping system																		○			○							Repair.
	Insufficient delivery capacity of trochoid pump																					○							Check and repair. (See 5.5 in Chapter5.)
	Clogged lubricating oil filter																					○	○						Clean or replace.
	Defective pressure regulating valve																					○							Clean, adjust or replace.
	Insufficient lubricating oil level		○																			○							Add proper lubricating oil. (See 2.2.1-3) in Chapter2.)
Fuel system	Too early timing of fuel injection pump								○	○	○					○													Check and adjust. (See 2.2.7-4) in Chapter2.)
	Too late timing of fuel injection pump						○	○	○	○								○										○	Check and adjust. (See 2.2.7-4) in Chapter2.)
	Improper properties of fuel oil					○	○	○	○	○			○																Use proper fuel oil. (See 1.3.1 in Chapter1.)
	Water entrance in fuel system	○			○		○		○				○	○	○														Perform draining from the fuel filter. (See 2.2.3 and 2.2.5 in Chapter2.)
	Clogged fuel filter	○	○			○																							Clean or replace. (See 2.2.5 in Chapter2.)
	Air entrance in fuel system	○	○			○																							Perform air bleeding. (See 2.2.3 in Chapter2.)
	Clogged or cracked fuel pipe	○	○			○																							Clean or replace.
	Insufficient fuel supply to fuel injection pump	○	○			○																							Check the fuel tank cock, fuel filter, fuel pipe, and fuel feed pump.
	Uneven injection volume of fuel injection pump						○	○	○	○				○	○	○	○												○	Check and adjust.
	Excessive fuel injection volume									○									○	○			○	○			○	○	Check and adjust.
	Poor spray pattern from fuel injection nozzle						○	○	○	○				○	○	○	○		○										Check and adjust. (See 2.2.6 in Chapter2.)
	Priming failure	○																											Foreign matter trapped in the valve inside the priming pump. (Disassemble and clean.)
	Clogged strainer at feed pump inlet					○																							Clean the strainer.

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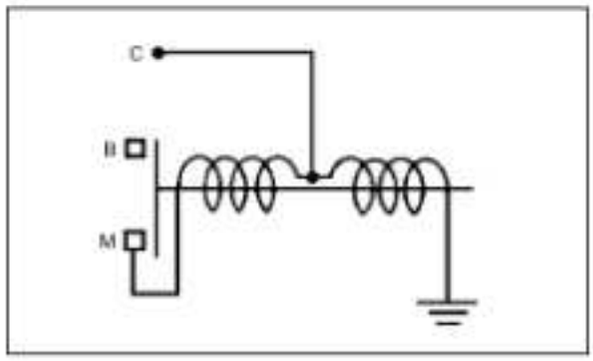
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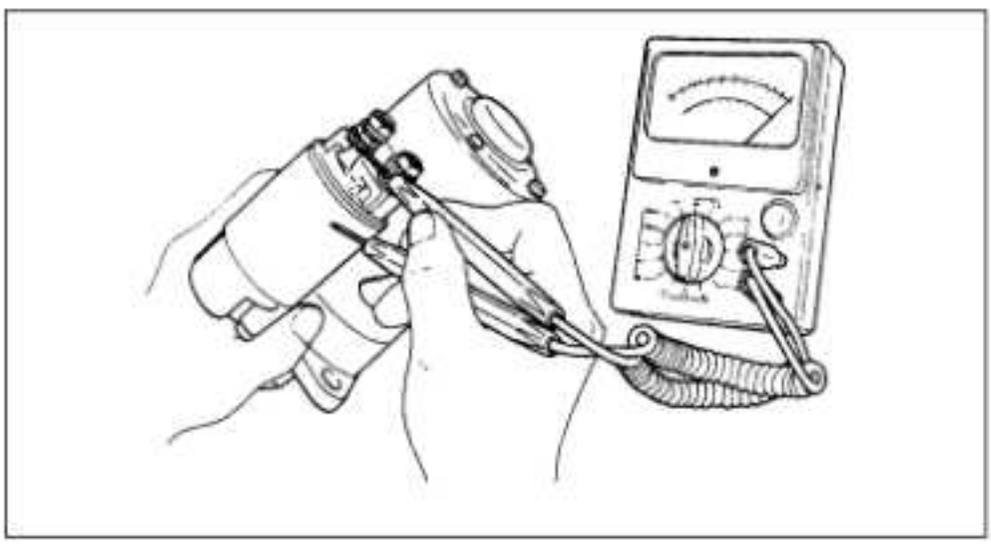
(4) Magnetic switch continuity test

Test type	Measurement point	Normal	Abnormal (cause)
Shunt coil	Between C and ground	Yes	None (open circuit)
Series coil	C and M	None	Yes (short-circuiting)

Replace if needed.

	S13-138
	Resistance (at 20°C)
Shunt coil	0.6
Series coil	0.218





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(5) Assembling the shaft

① Fit the shaft into the bearing(With the bearing in the bottom) by using the press machine and jig. If the press is not available, use the jig in the similar manner and drive the shaft into the bearing by knocking with a plastic hammer.



R55NWTHP53

② Install the C-type stop ring to fix the bearing.



R55NWTHP54

③ Assembling the shaft.
Assemble the shaft into the housing.
Knock the spline end lightly with a plastic hammer and fix the bearing outer ring firmly into the housing hole.



R55NWTHP55

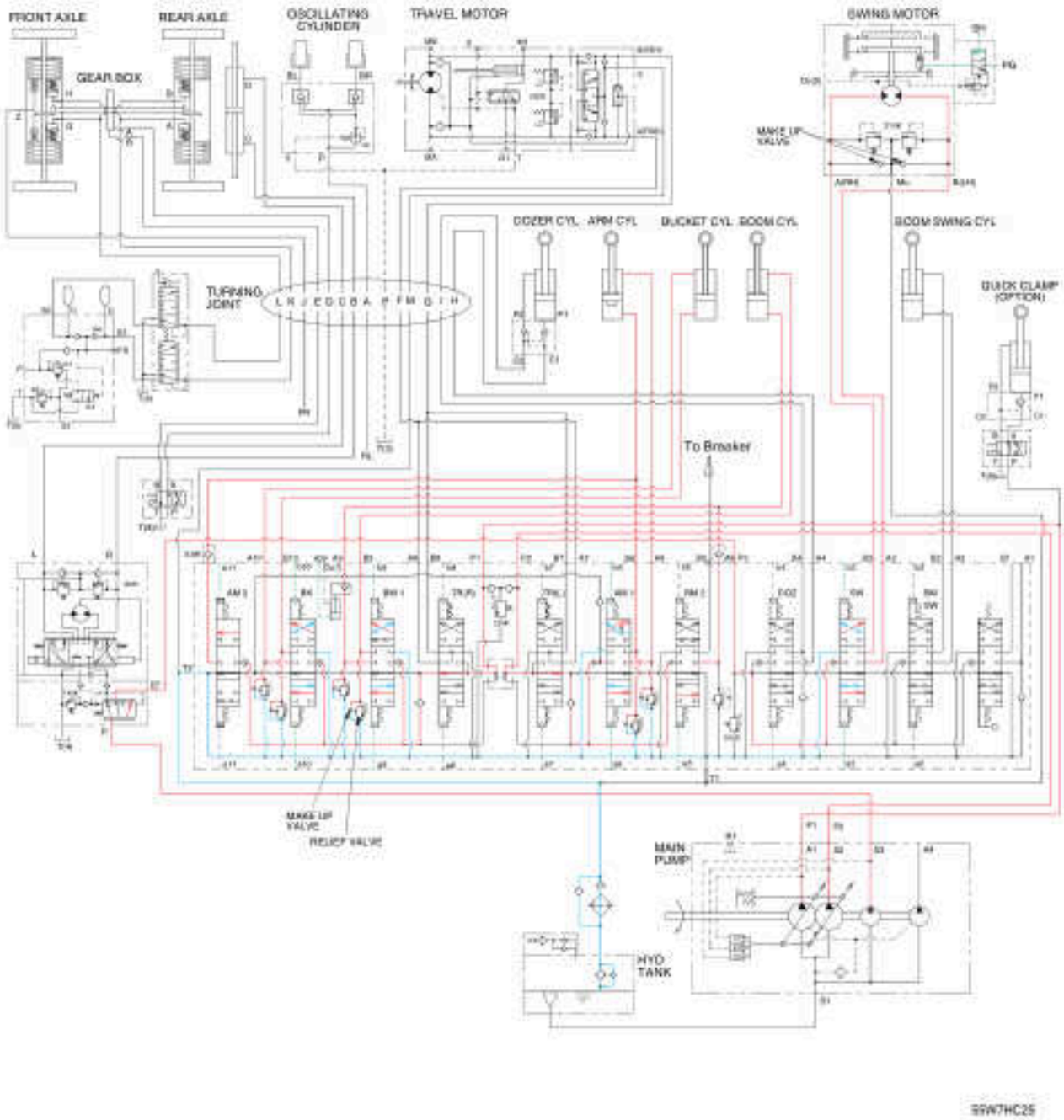
(6) Apply grease to the O-ring for assembling.



R55NWTHP56

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5. COMBINED SWING, BOOM, ARM AND BUCKET OPERATION



When the swing, boom, arm and bucket functions are operated, simultaneously each spool in the main control valve is moved to the functional position by the pilot oil pressure from the remote control valve.

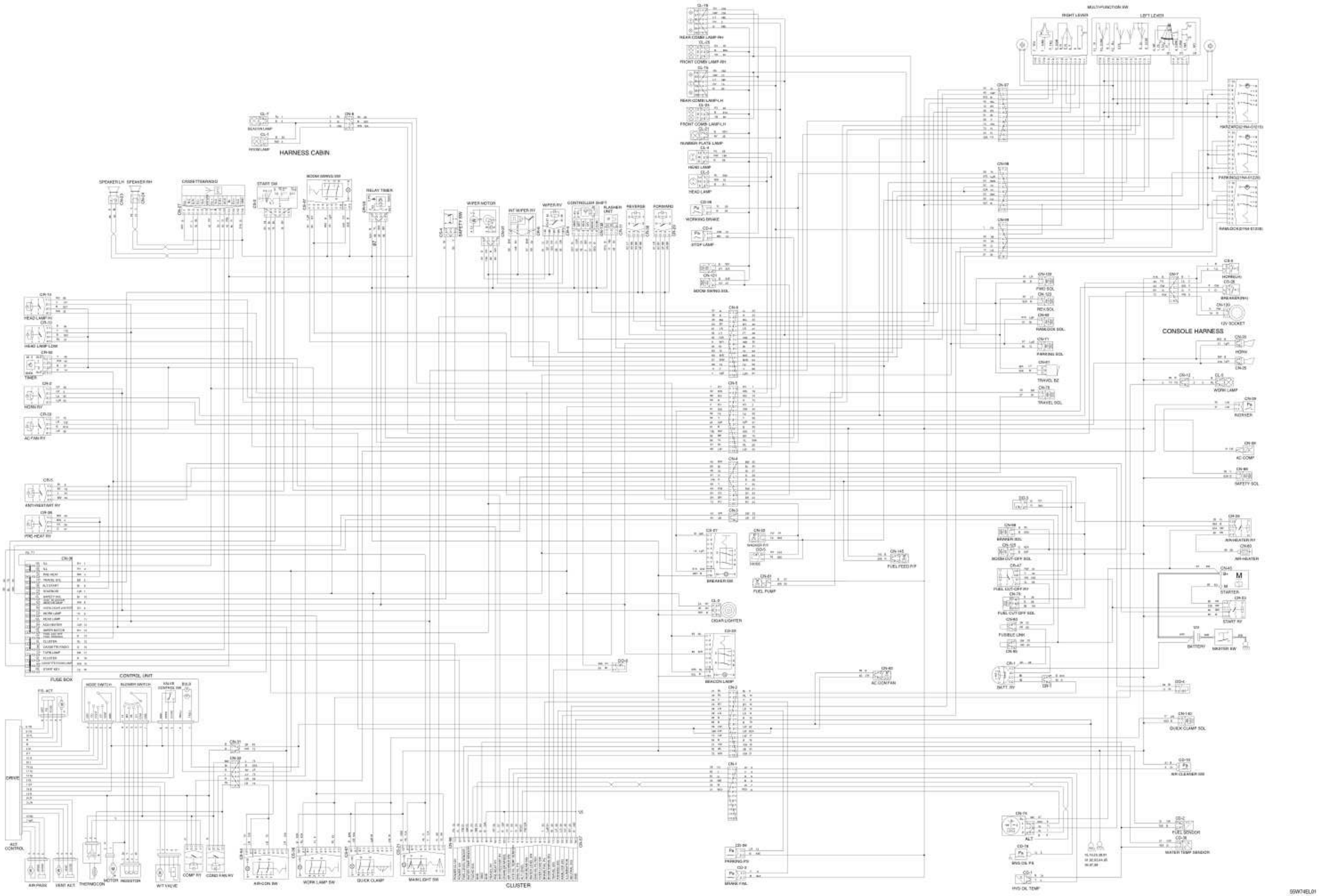
The oil from the P1 pump flows into the boom cylinder, arm cylinder and bucket cylinder through boom 1 spool, arm 2 spool, bucket spool.

The oil from the P2 pump flows into the boom cylinder and arm cylinder through the boom 2 spool and arm 1 spool.

The oil from the P3 pump flows into the swing motor through the swing spool.

The superstructure swings and the boom, arm and bucket are operated.

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