CRAWLER EXCAVATOR

SERVICE MANUAL

R60W-9S

HYUNDAI

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R60W-9S

Order the manual at mid-west-tech.com >

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 2-6
Group 3 Swing Device 2-27
Group 4 Travel Device 2-37
Group 5 RCV Lever 2-43
Group 6 Accelerator pedal 2-50
Group 7 Brake pedal (valve) 2-51
Group 8 Gear box 2-53
Group 9 Steering valve 2-56
Group 10 Axle 2-58

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 4-13
Group 4 Electrical Component Specification 4-31
Group 5 Connectors 4-39
Group 6 Fault codes 4-54

SECTION 5 TROUBLESHOOTING

Group 1 Before Troubleshooting 5-1
Group 2 Hydraulic and Mechanical System 5-4
Group 3 Electrical System 5-23
Group 4 Axle 5-37

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

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 7-133
Group 9 Axle 7-154
Group 10 RCV Lever 7-299
Group 11 Turning Joint 7-313
Group 12 Boom, Arm and Bucket Cylinder 7-318
Group 13 Work Equipment 7-337

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 Power Train 8-7
Group 6 Structure 8-8
Group 7 Work Equipment 8-11

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

7. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

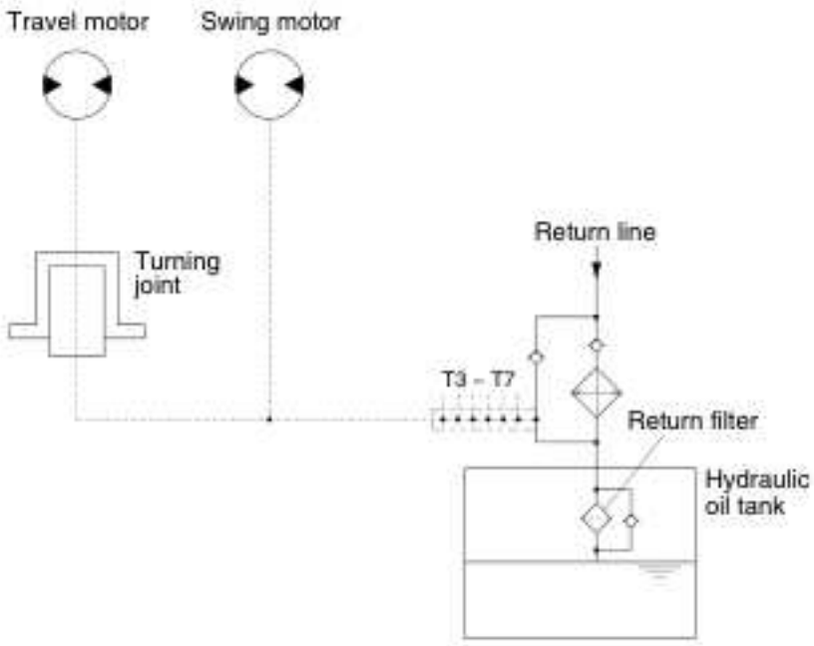
Item	Specification
Model	Yanmar 4TNV94L-PHYBY
Type	4-cycle diesel engine, low emission
Cooling method	Water cooling
Number of cylinders and arrangement	4 cylinders, in-line
Firing order	1-3-4-2
Combustion chamber type	Direct injection type
Cylinder bore × stroke	94 × 110 mm (3.7" × 4.3")
Piston displacement	3054 cc (186 cu in)
Compression ratio	19 : 1
Rated gross horse power(SAE J1995)	56 ps at 2400 rpm (41.2 kW at 2400 rpm)
Maximum torque at 1550rpm	20.4 kgf · m (148 lbf · ft)
Engine oil quantity	11.6 ℓ (3.1 U.S. gal)
Dry weight	280 kg (617 lb)
High idling speed	2400+ 50 rpm
Low idling speed	1000 ± 100 rpm
Rated fuel consumption	175 g/ps · hr at 2400 rpm
Starting motor	12V-3.0 kW
Alternator	12V-80A
Battery	1 × 12V × 100Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 25 cc/rev
Maximum pressure	220 kgf/cm² (3130 psi)
Rated oil flow	2 × 60 ℓ/min (15.9 U.S. gpm/ 13.2 U.K. gpm)
Rated speed	2400 rpm

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

3. DRAIN CIRCUIT



55W73C02

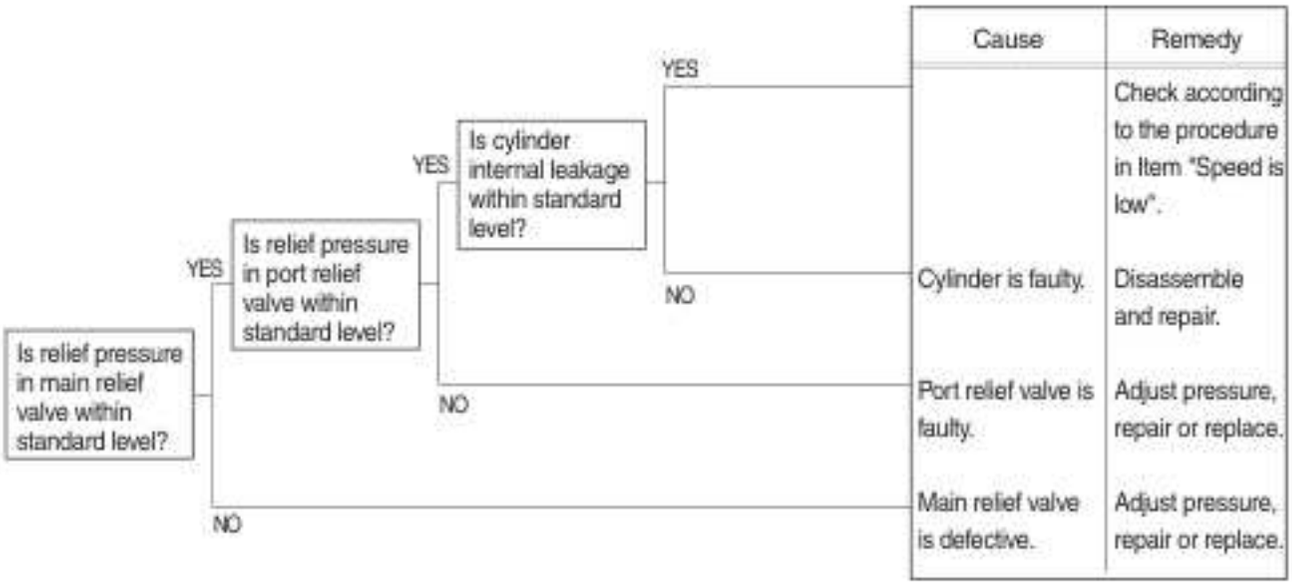
Besides internal leaks from the motors and main pump, the oil for lubrication circulates.

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.

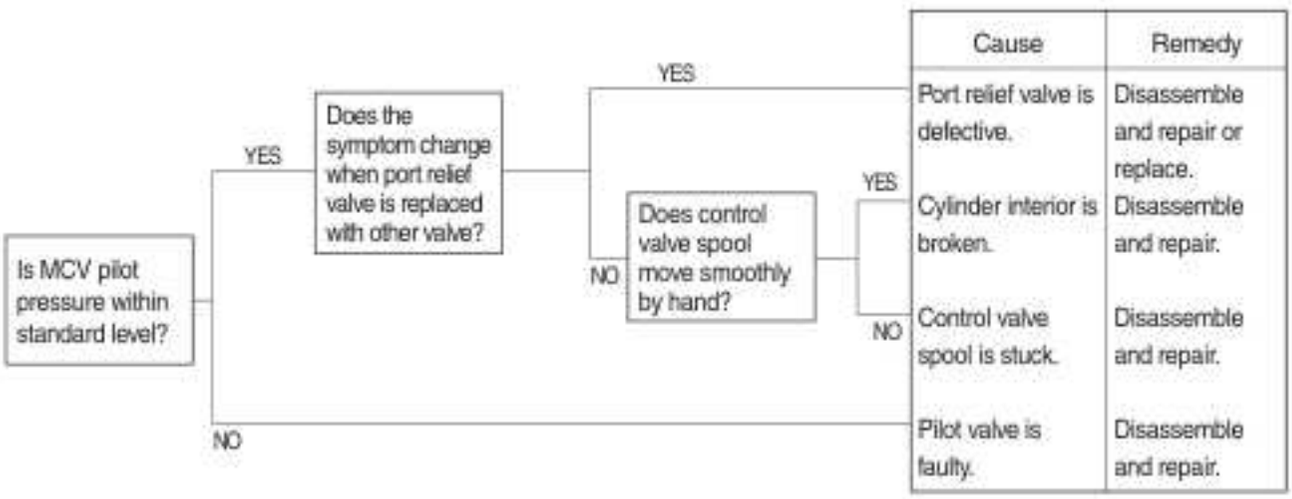
2) SWING MOTOR DRAIN CIRCUIT
   Oil leaked from the swing motor returns to the hydraulic tank passing through a return filter with oil drained from the travel circuit.

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

4) BOOM, ARM OR BUCKET POWER IS WEAK



5) ONLY BUCKET OPERATION IS TOTALLY IMPOSSIBLE



MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

(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.



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



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.

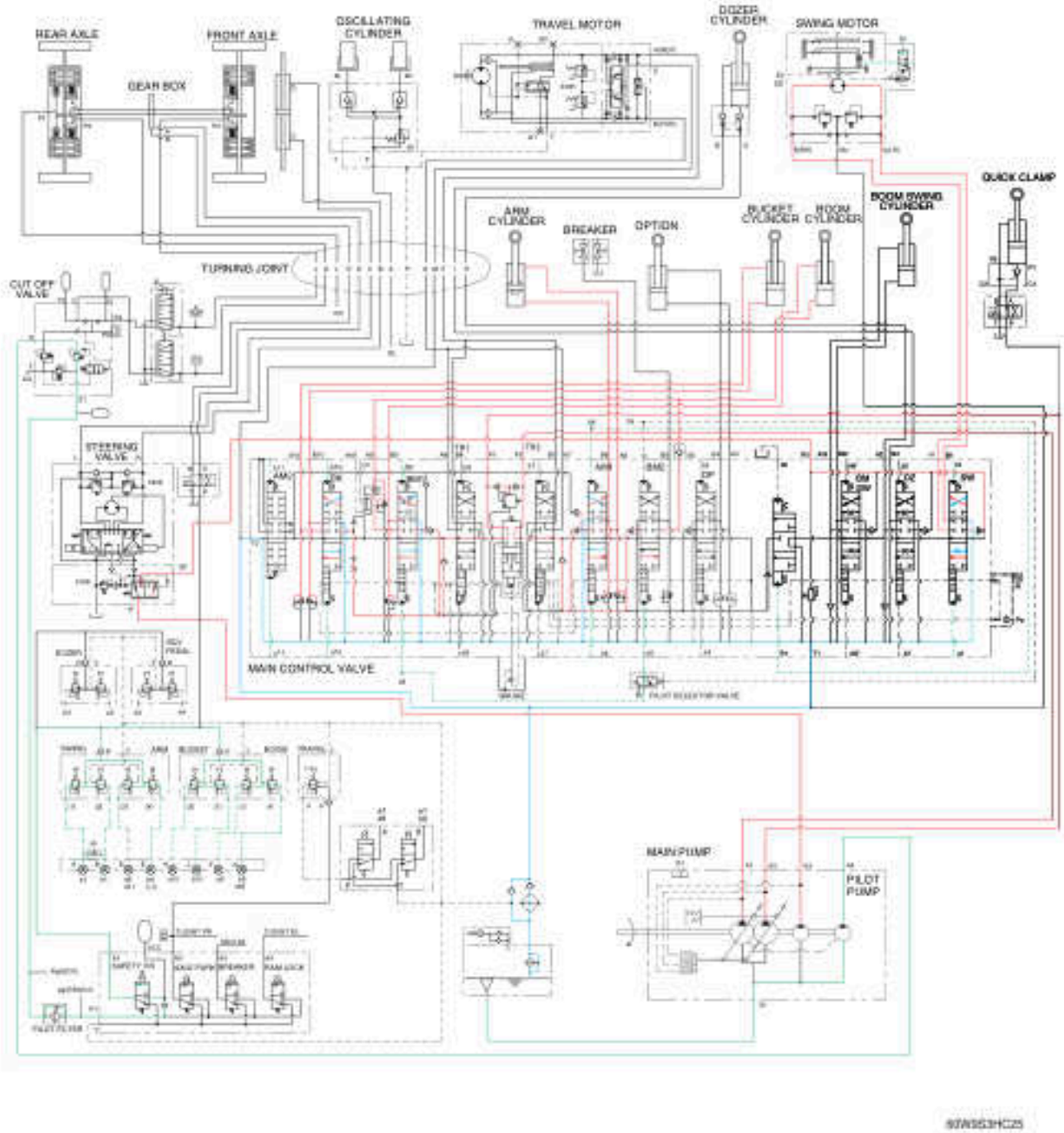


(6) Apply grease to the O-ring for assembling.



MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >

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.

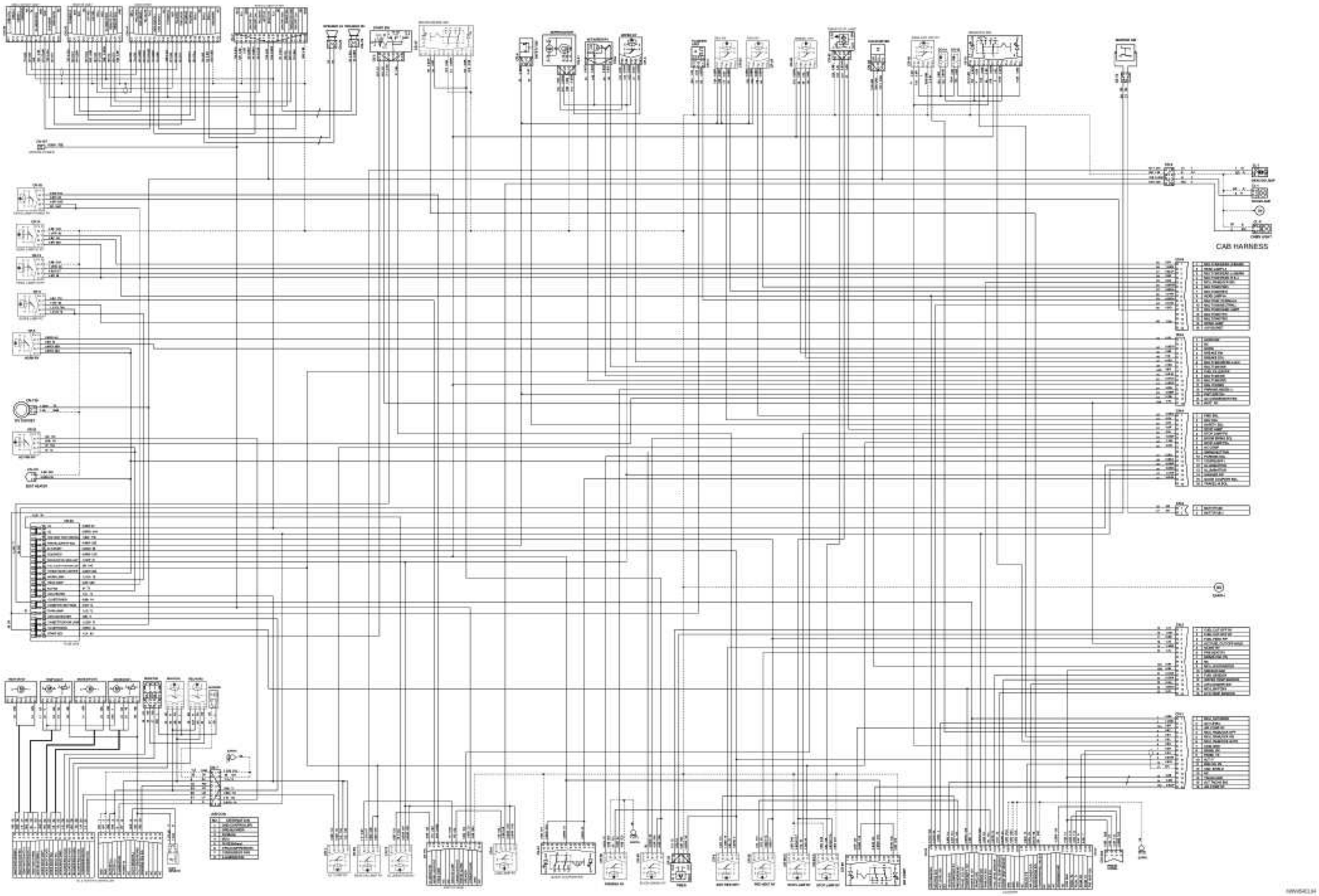
The oil from the A2 pump flows into the boom cylinder, arm cylinder and bucket cylinder through boom 1 spool, arm 2 spool, bucket spool.

The oil from the A1 pump flows into the boom cylinder and arm cylinder through the boom 2 spool and arm 1 spool.

The oil from the A3 pump flows into the swing motor through the swing spool.

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

MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R6... Order the manual at mid-west-tech.com >



MidWestTech | Hyundai R60W-9S Crawler Excavator Service Manual | Publication R60W-9S

Order the manual at mid-west-tech.com >