CRAWLER EXCAVATOR

SERVICE MANUAL

HX400L Tier 3

HYUNDAI

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publication HX...

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

CONTENTS

SECTION 1 GENERAL

Group 1 Safety Hints 1-1
Group 2 Specifications 1-10

SECTION 2 STRUCTURE AND FUNCTION

Group 1 Pump Device 2-1
Group 2 Main Control Valve 2-22
Group 3 Swing Device 2-56
Group 4 Travel Device 2-70
Group 5 RCV Lever 2-83
Group 6 RCV Pedal 2-90

SECTION 3 HYDRAULIC SYSTEM

Group 1 Hydraulic Circuit 3-1
Group 2 Main Circuit 3-3
Group 3 Pilot Circuit 3-6
Group 4 Single Operation 3-13
Group 5 Combined Operation 3-23

SECTION 4 ELECTRICAL SYSTEM

Group 1 Component Location 4-1
Group 2 Electric Circuit 4-3
Group 3 Electrical Component Specification 4-22
Group 4 Connectors 4-30

SECTION 5 MECHATRONICS SYSTEM

Group 1 Outline 5-1
Group 2 Mode selection System 5-3
Group 3 Automatic Deceleration System 5-6
Group 4 Power Boost System 5-7
Group 5 Travel Speed Control System 5-8
Group 6 Automatic Warming Up Function 5-9
Group 7 Engine Overheat Prevention Function 5-10
Group 8 Variable Power Control System 5-11

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

Group 9 Attachment Flow Control System 5-12
Group 10 Intelligent Power Control System 5-13
Group 11 Anti-Restart System 5-15
Group 12 Self-Diagnostic System 5-16
Group 13 Engine Control System 5-49
Group 14 EPPR (Electro Proportional Pressure Reducing) Valve 5-50
Group 15 Monitoring System 5-55
Group 16 Fuel Warmer System 5-89

SECTION 6 TROUBLESHOOTING

Group 1 Before Troubleshooting 6-1
Group 2 Hydraulic and Mechanical System 6-4
Group 3 Electrical System 6-25
Group 4 Mechatronics System 6-43
Group 5 Air conditioner and Heater System 6-72

SECTION 7 MAINTENANCE STANDARD

Group 1 Operational Performance Test 7-1
Group 2 Major Components 7-21
Group 3 Track and Work Equipment 7-30

SECTION 8 DISASSEMBLY AND ASSEMBLY

Group 1 Precaution 8-1
Group 2 Tightening Torque 8-4
Group 3 Pump Device 8-7
Group 4 Main Control Valve 8-33
Group 5 Swing Device 8-54
Group 6 Travel Device 8-87
Group 7 RCV Lever 8-119
Group 8 Turning Joint 8-133
Group 9 Boom, Arm and Bucket Cylinder 8-138
Group 10 Undercarriage 8-159
Group 11 Work Equipment 8-171

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

(2) 7500 kg counterweight



General bucket



Heavy duty
(with side cutter)



Rock heavy duty

Type	Capacity		Width	Weight	Tooth	MONO				
						Recommendation mm (ft-in)				
	SAE Heaped	CECE heaped	w/o side cutter			6.15 m (20' 2")	6.50 m (21' 4")			
	m^3 (yd^3)	m^3 (yd^3)	mm (in)	kg (lb)	EA	2.55 m (8' 4")	2.55 m (8' 4")	2.80 m (9' 2")	3.20 m (10' 6")	3.90 m (12' 10")
General bucket	1.46 (1.91)	1.28 (1.67)	1305 (51)	1400 (3,090)	4	●	●	●	●	◐
	1.62 (2.12)	1.42 (1.86)	1415 (56)	1500 (3,310)	5	●	●	◐	◐	■
	1.9 (2.49)	1.65 (2.16)	1600 (63)	1610 (3,550)	5	◐	◐	■	■	▲
	2.1 (2.75)	1.84 (2.41)	1735 (68)	1690 (3,730)	5	◐	■	■	▲	▲
	2.32 (3.03)	2.02 (2.64)	1885 (74)	1800 (3,970)	6	■	▲	▲	▲	X
Heavy duty	1.46 (1.91)	1.28 (1.67)	1305 (51)	1560 (3,440)	4	●	●	●	●	◐
	1.62 (2.12)	1.42 (1.86)	1415 (56)	1660 (3,660)	5	●	●	◐	◐	■
	1.9 (2.49)	1.65 (2.16)	1600 (63)	1790 (3,950)	5	◐	■	■	■	▲
	2.1 (2.75)	1.84 (2.41)	1735 (68)	1880 (4,140)	5	■	■	▲	▲	X
	2.5 (3.27)	2.22 (2.90)	1750 (69)	2020 (4,450)	5	▲	▲	▲	X	X
Rock heavy duty	1.46 (1.91)	1.28 (1.67)	1305 (51)	1750 (3,860)	4	●	●	●	◐	-
	1.62 (2.12)	1.42 (1.86)	1415 (56)	1850 (4,080)	5	●	◐	◐	◐	-
	1.9 (2.49)	1.65 (2.16)	1600 (63)	1990 (4,390)	5	◐	■	■	■	-
	2.1 (2.75)	1.84 (2.41)	1735 (68)	2090 (4,610)	5	■	■	▲	▲	-

● Applicable for materials with density of 2100 kg/m^3 (3500 lb/yd^3) or less
◐ Applicable for materials with density of 1800 kg/m^3 (3000 lb/yd^3) or less
■ Applicable for materials with density of 1500 kg/m^3 (2500 lb/yd^3) or less
▲ Applicable for materials with density of 1200 kg/m^3 (2000 lb/yd^3) or less
X Not recommended
- Not available

※ These recommendations are for general conditions and average use.
Work tools and ground conditions have effects on machine performance.
Select an optimum combination according to the working conditions and the type of work that is being done.
Consult with your local HD Hyundai Construction Equipment dealer for information on selecting the correct boom-arm-bucket combination.

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

3. MACHINE ERROR CODES TABLE

DTC		Diagnostic Criteria	Application		
HCESPN	FMI		G	C	W
101	3	10 seconds continuous, Hydraulic Oil Temp. Measurement Voltage > 3.8V	●		
	4	10 seconds continuous, Hydraulic Oil Temp. Measurement Voltage < 0.3V	●		
	(Results / Symptoms) 1. Monitor – Hydraulic oil temperature display failure 2. Control Function – Fan revolutions control failure (Checking list) 1. CD-1 (#2) – CN-52 (#24) Checking Open/Short 2. CD-1 (#1) – CN-51 (#11) Checking Open/Short				
105	0	10 seconds continuous, Working Press. Sensor Measurement Voltage > 5.2V	●		
	1	10 seconds continuous, 0.3V≤ Working Press. Sensor Measurement Voltage < 0.8V	●		
	4	10 seconds continuous, Working Press. Sensor Measurement Voltage < 0.3V	●		
	(Results / Symptoms) 1. Monitor – Working Press. display failure 2. Control Function – Auto Idle operation failure, Engine variable horse power control operation failure (Checking list) 1. CD-7 (#B) – CN-52 (#37) Checking Open/Short 2. CD-7 (#A) – CN-51 (#3) Checking Open/Short 3. CD-7 (#C) – CN-51 (#13) Checking Open/Short				
108	0	10 seconds continuous, Travel Oil Press. Sensor Measurement Voltage > 5.2V		●	
	1	10 seconds continuous, 0.3V ≤ Travel Oil Press. Sensor Measurement Voltage < 0.8V	●		
	4	10 seconds continuous, Travel Oil Press. Sensor Measurement Voltage < 0.3V	●		
	(Results / Symptoms) 1. Monitor – Travel Oil Press. display failure 2. Control Function – Auto Idle operation failure, Engine variable horse power control operation failure, IPC operation failure, Driving alarm operation failure (Checking list) 1. CD-6 (#B) – CN-52 (#38) Checking Open/Short 2. CD-6 (#A) – CN-51 (#3) Checking Open/Short 3. CD-6 (#C) – CN-51 (#13) Checking Open/Short				

※ Some error codes are not applied to this machine.

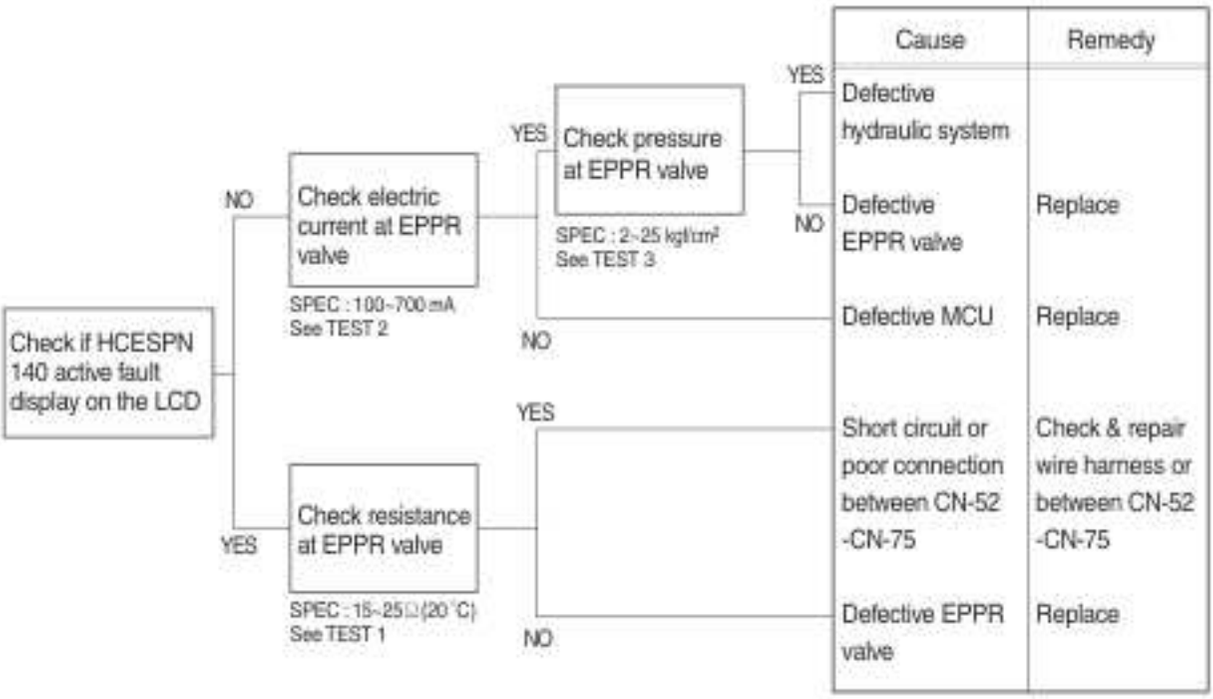
G : General C : Crawler Type W : Wheel Type

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

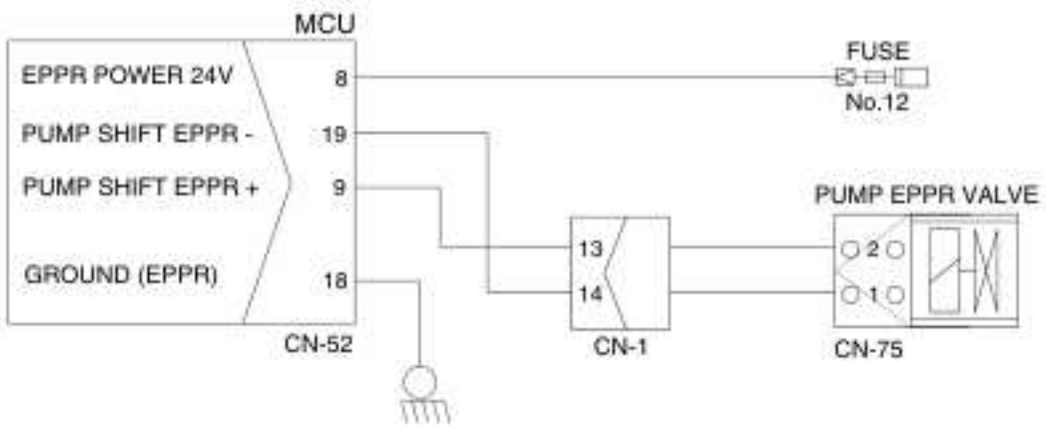
1. ALL ACTUATORS SPEED ARE SLOW

※ Boom, Arm, Bucket, Swing and travel speed are slow, but engine speed is good.
※ Spec : P-mode 1650 ± 50 rpm S -mode 1550 ± 50 rpm E-mode 1450 ± 50 rpm
※ Before carrying out below procedure, check all the related connectors are properly inserted and fault code on the cluster.

1) INSPECTION PROCEDURE



Wiring diagram



220SA9M551

MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

(8) Remove carrier 2 (6), with planetary gears 2 (13), sun gear 3 (11), etc. fitted.

※ Use M10 eyebolt. In this case, thrust ring (26) is removed simultaneously.



(9) Disassembling of carrier 2 sub-assembly

① Push in spring pin (36), and remove pin 2 (16), from carrier 2.

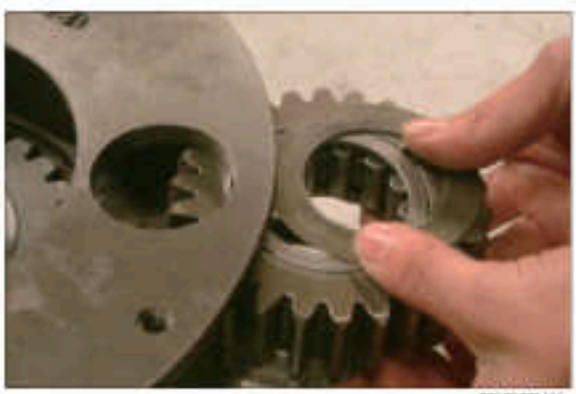
※ Carry out the following check in advance. If any abnormality should be found, carry out disassembling.

- Is there any crevice, crack or pitting on tooth surface of planetary gear?
- When turning planetary gear lightly, is there any abnormal noise or eccentric clearance? Carry out check similarly to the above for carrier 3.



② Remove side plate (20), planetary gear 2 (13), and needle bearing (22) from carrier 2.

③ Remove thrust ring (26).



④ Remove snap ring (46), and remove carrier 2 (6) from sun gear 3 (11).

⑤ Remove thrust ring (27) from sun gear 3 (11).



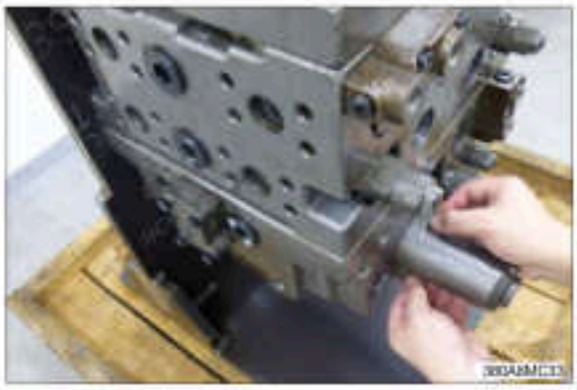
MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

(6) Disassembling of the bypass cut spool (310)

① Loosen hexagon socket head bolts (272) and remove the spring cover (202) and O-ring (262).
(hexagon key wrench 6 mm)

② Pull out the bypass cut spool (310), spring (323, 324), spring seats (331), stopper (334) and spacer bolt (333) in the spool assembly condition from casing C (103).

※ When pulling out the spool assembly from casing C (103), pay attention not to damage the casing.

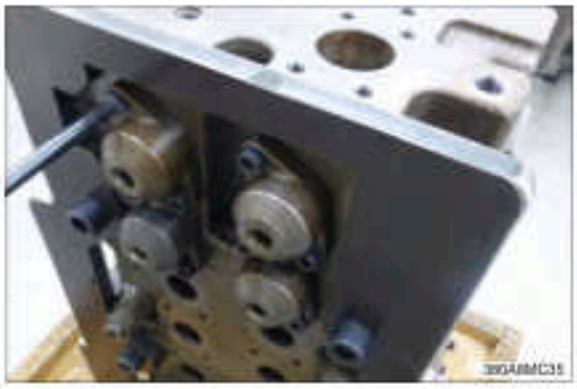


③ Hold the travel spool (310) in the mouthpiece-attached vise applying a protection plate (aluminum plate and the like) in between. Remove spacer bolt (333) and disassemble spring (323, 324), stopper (334) and spring seats (331).
(hexagon key wrench 10 mm)



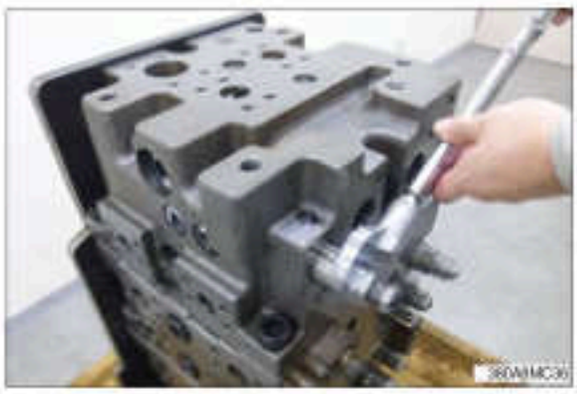
(7) Disassembly of spool covers (203, 205)

Loosen hexagon socket head bolts (271), and remove the spool cover (203, 205) and O-ring (261, 263).
(hexagon key wrench 8 mm)



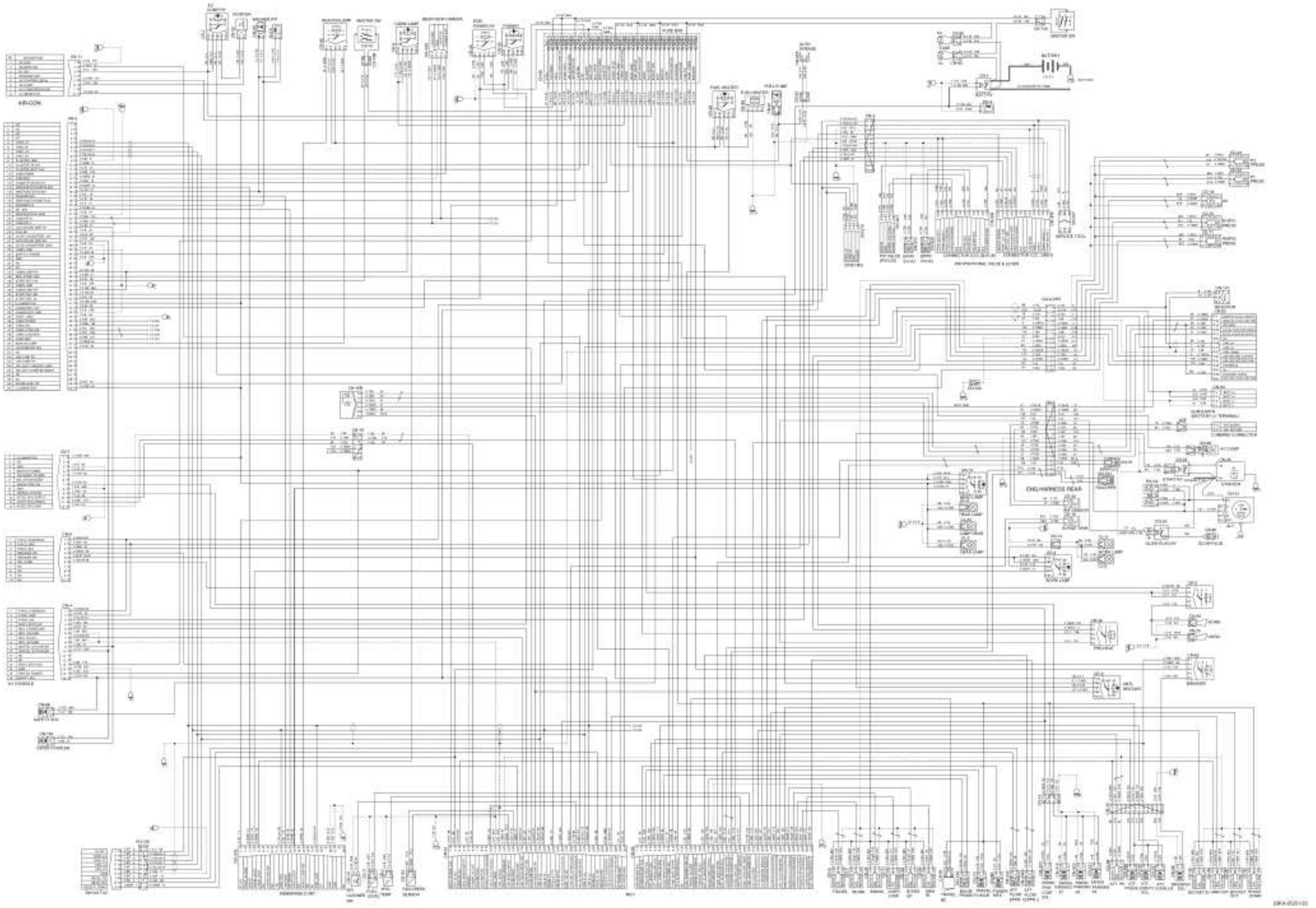
(8) Removal of the main relief valve (601) and the port relief valves (602, 605,606).
Remove the main relief valve (601) and the port relief valve (602, 605,606) from the casing.

Main relief valve (601) : spanner 32 mm
Port relief valve (602) : box wrench or spanner 36 mm
Port relief valve (605) : box wrench or spanner 36 mm
Port relief valve (606) : spanner 36 mm



MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publicatio... Order the manual at mid-west-tech.com >

ELECTRICAL CIRCUIT (1/2)



MidWestTech | Hyundai HX400L Tier 3 Crawler Excavator Service Manual | Publication HX400L Tier 3

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