CRAWLER EXCAVATOR

SERVICE MANUAL

R210LC-7A

HYUNDAI

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication R210...

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 2-21
Group 3 Swing Device 2-51
Group 4 Travel Device 2-60
Group 5 RCV Lever 2-67
Group 6 RCV Pedal 2-74

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 3-13
Group 5 Combined Operation 3-23

SECTION 4 ELECTRICAL SYSTEM

Group 1 Component Location 4-1
Group 2 Electrical Circuit 4-3
Group 3 Electrical Component Specification 4-20
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 Anti-Restart system 5-11

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

Group 9 Self-Diagnostic system 5-12
Group 10 Engine Control System 5-20
Group 11 EPPR(Electro Proportional Pressure Reducing) Valve 5-27
Group 12 Monitoring System 5-30

SECTION 6 TROUBLESHOOTING

Group 1 Before trobleshooting 6-1
Group 2 Hydraulic and Mechanical System 6-4
Group 3 Electrical System 6-24
Group 4 Mechatronics System 6-40

SECTION 7 MAINTENANCE STANDARD

Group 1 Operational Performance Test 7-1
Group 2 Major Components 7-21
Group 3 Track and Work Equipment 7-31

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 8-30
Group 5 Swing Device 8-43
Group 6 Travel Device 8-68
Group 7 RCV Lever 8-108
Group 8 Turning Joint 8-123
Group 9 Boom, Arm and Bucket Cylinder 8-128
Group 10 Undercarriage 8-145
Group 11 Work Equipment 8-157

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

SECTION 9 COMPONENT MOUNTING TORQUE

Group 1 Introduction guide 9-1
Group 2 Engine system 9-2
Group 3 Electric system 9-4
Group 4 Hydraulic system 9-6
Group 5 Undercarriage 9-10
Group 6 Structure 9-11
Group 7 Work equipment 9-14

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

8. SPECIFICATIONS FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins QSB6.7
Type	4-cycle turbocharged diesel engine, low emission
Cooling method	Water cooling
Number of cylinders and arrangement	6 cylinders, in-line
Firing order	1-5-3-6-2-4
Combustion chamber type	Direct injection type
Cylinder bore × stroke	104 × 132mm(4.09" × 5.20")
Piston displacement	6700cc(409cu in)
Compression ratio	17.2 : 1
Rated gross horse power(SAE J1995)	151Hp at 1900rpm(113kW at 1900rpm)
Maximum torque at 1500rpm	63.0kgf · m(456lbf · ft)
Engine oil quantity	24 ℓ (6.3U.S. gal)
Dry weight	556kg(1226lb)
High idling speed	2135 ± 50rpm
Low idling speed	700 ± 100rpm
Rated fuel consumption	163.2g/Hp · hr at 1900rpm
Starting motor	Nippon denso(24V-4.5kW)
Alternator	Delco Remy (24V-50A)
Battery	2 × 12V × 100Ah

2) MAIN PUMP

Item	Specification
Type	Variable displacement tandem axis piston pumps
Capacity	2 × 117cc/rev
Maximum pressure	330kgf/cm² (4694psi) [360kgf/cm² (5120psi)]
Rated oil flow	2 × 222 ℓ/min (58.6U.S. gpm/ 48.8U.K. gpm)
Rated speed	1900rpm

[ ] : Power boost

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

6. WIPER AND WASHER CIRCUIT

1) OPERATING FLOW

(1) Key switch ON

Fuse box (No.10) → I/conn [CN-7(5)] → Switch panel [CN-116(6)]

Fuse box (No.5) → I/conn [CN-5(4)] → I/conn [CN-17(5)] → Wiper motor controller [CN-141(7)]
→ Wiper motor [CN-21(4)]

Fuse box (No.15) → I/conn [CN-6(5)] → I/conn [CN-17(4)] → Wiper motor controller [CN-141(6)]
→ Washer pump [CN-22(2)]

(2) Wiper switch ON : 1st step(Intermittent)

Wiper switch ON [CN-116(15)] → I/conn[CN-9(4)] → I/conn[CN-6(10)] → I/conn[CN-17(8)]
→ Wiper motor controller [CN-141(10) → (3)] → Wiper motor intermittently operating [CN-21(6)]

(3) Wiper switch ON : 2nd step(Low speed)

Wiper switch ON [CN-116(4)] → I/conn [CN-7(3)] → I/conn [CN-6(9)] → I/conn[CN-17(2)]
→ Wiper motor controller [CN-141(2) → (4)] → Wiper motor operating [CN-21(2)]

(4) Washer switch ON

Washer switch ON [CN-116(12)] → I/conn [CN-7(9)] → I/conn [CN-5(1)] → I/conn [CN-17(7)]
→ Wiper motor controller [CN-141(9) → (8)] → I/conn [CN-17(6)] → I/conn [CN-6(11)]
→ Washer pump [CN-22(1)] → Washer operating

Wiper switch ON [CN-116(4)] → I/conn [CN-7(3)] → I/conn [CN-6(9)] → I/conn[CN-17(2)]
→ Wiper motor controller [CN-141(2) → (4)] → Wiper motor operating [CN-21(2)]

(5) Auto parking(When switch OFF)

Switch OFF [CN-116(4)] → Wiper motor parking position by wiper motor controller

2) CHECK POINT

Engine	Start switch	Check point	Voltage
STOP	ON	① - GND(Fuse box) ② - GND(Switch power input)	24V
		③ - GND(Switch power output) ④ - GND(Wiper Power input)	0 – 5V
		⑤ - GND(Wiper power output)	24V
		⑥ - GND(Wiper motor)	0 or 24V

※ GND : Ground

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

7. ENGINE FAULT CODE INFORMATION

Fault code No.	Reason	Effect (only when fault code is active)
111	Engine control module critical internal failure - Bad intelligent device or component. Error internal to the ECU related to memory hardware failures or internal ECU voltage supply circuits.	Possible no noticeable performance effects, engine dying, or hard starting.
115	Engine magnetic crankshaft speed/position lost both of two signals - Data erratic, intermittent, or incorrect. The ECU has detected that the primary engine speed sensor and the backup engine speed sensor signals are reversed.	Fueling to injectors is disabled and the engine can not be started.
122	Intake manifold 1 pressure sensor circuit - Voltage above normal, or shorted to high source. High signal voltage detected at the intake manifold pressure circuit.	Engine power derate.
123	Intake manifold 1 pressure sensor circuit - Voltage below normal, or shorted to low Source. Low signal voltage or open circuit detected at the intake manifold pressure circuit.	Engine power derate.
124	Intake manifold 1 pressure - Data valid but above normal operational range - Moderately severe level. Intake manifold pressure has exceeded the maximum limit for the given engine rating.	Engine power derate.
131	Accelerator pedal or lever position sensor 1 circuit - Voltage above normal, or shorted to high source. High voltage detected at accelerator pedal position circuit.	Severe derate in power output of the engine. Limp home power only.
132	Accelerator pedal or lever position sensor 1 circuit - Voltage below normal, or shorted to low source. Low voltage detected at accelerator pedal position signal circuit.	Severe derate in power output of the engine. Limp home power only.
133	Remote accelerator pedal or lever position sensor 1 circuit - Voltage above normal, or shorted to high source. High voltage detected at remote accelerator pedal position circuit.	Remote accelerator will not operate. Remote accelerator position will be set to zero percent.
134	Remote accelerator pedal or lever position sensor 1 circuit - Voltage below normal, or shorted to low source. Low voltage detected at remote accelerator pedal position signal circuit.	Remote accelerator will not operate. Remote accelerator position will be set to zero percent.
135	Engine oil rifle pressure 1 sensor circuit - Voltage above normal, or shorted to high source. High signal voltage detected at the engine oil pressure circuit.	None on performance. No engine protection for oil pressure.
141	Engine oil rifle pressure 1 sensor circuit - Voltage below normal, or shorted to low source. Low signal voltage detected at engine oil pressure circuit.	None on performance. No engine protection for oil pressure.
143	Engine oil rifle pressure - Data valid but below normal operational range - Moderately severe level.	None on performance.
144	Engine coolant temperature 1 sensor circuit - Voltage above normal, or shorted to high source. High signal voltage or open circuit detected at engine coolant temperature circuit.	Possible white smoke. Fan will stay ON if controlled by ECU. No engine protection for engine coolant temperature.

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

■ **Disassemble cylinder sub.**

9) Disassemble cylinder block assembly, piston assembly(9) and seat plate(M).





10) Disassemble ball guide(16), ring and pin(15) from cylinder block, respectively.

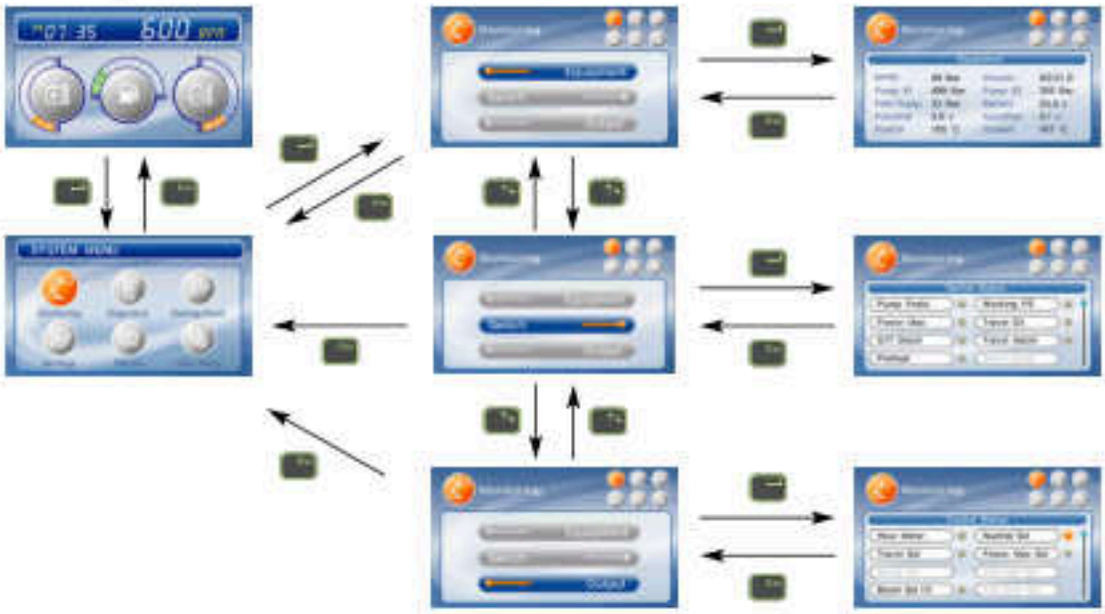




MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

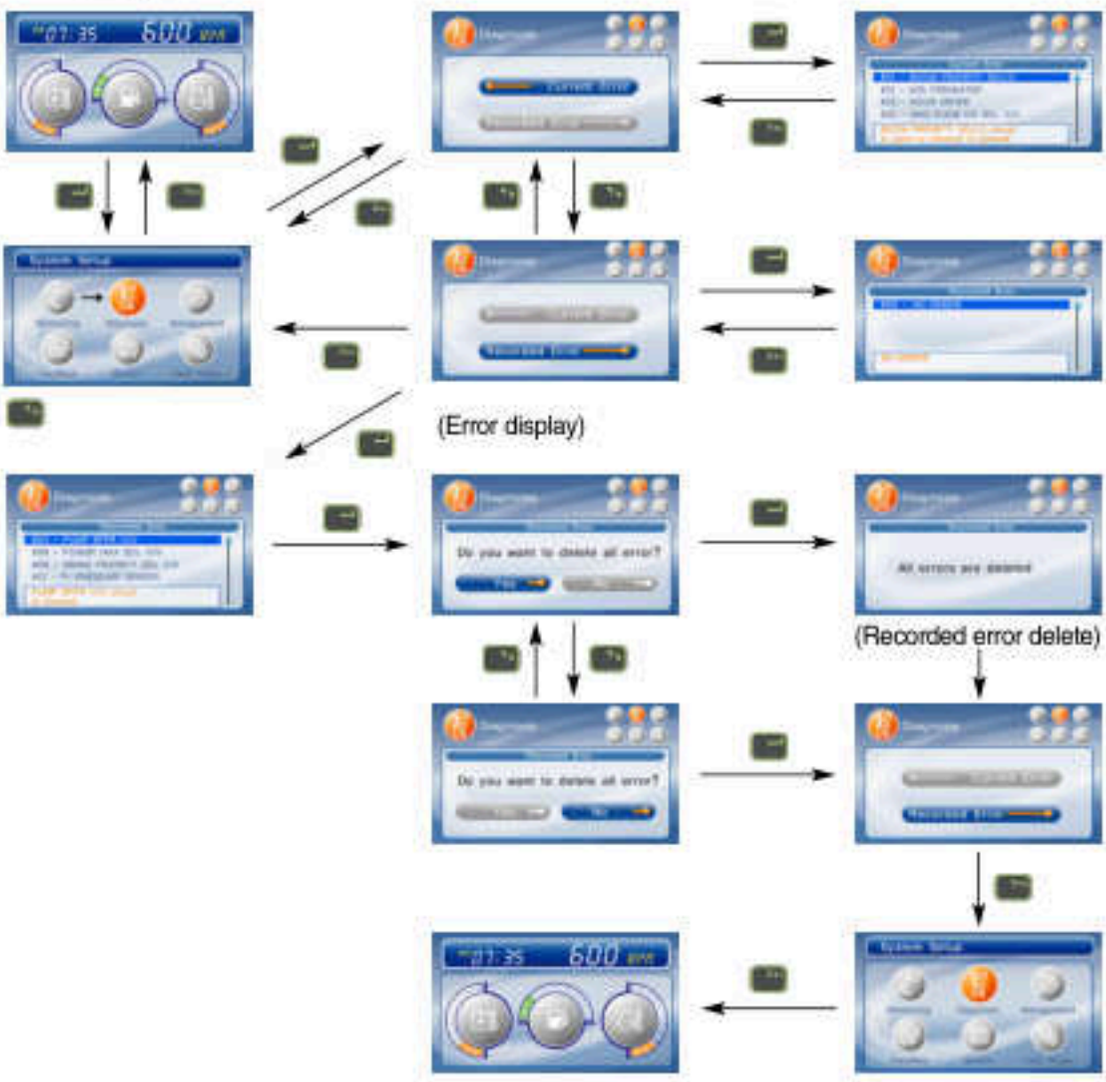
(2) Display map

① Monitoring



② Diagnosis

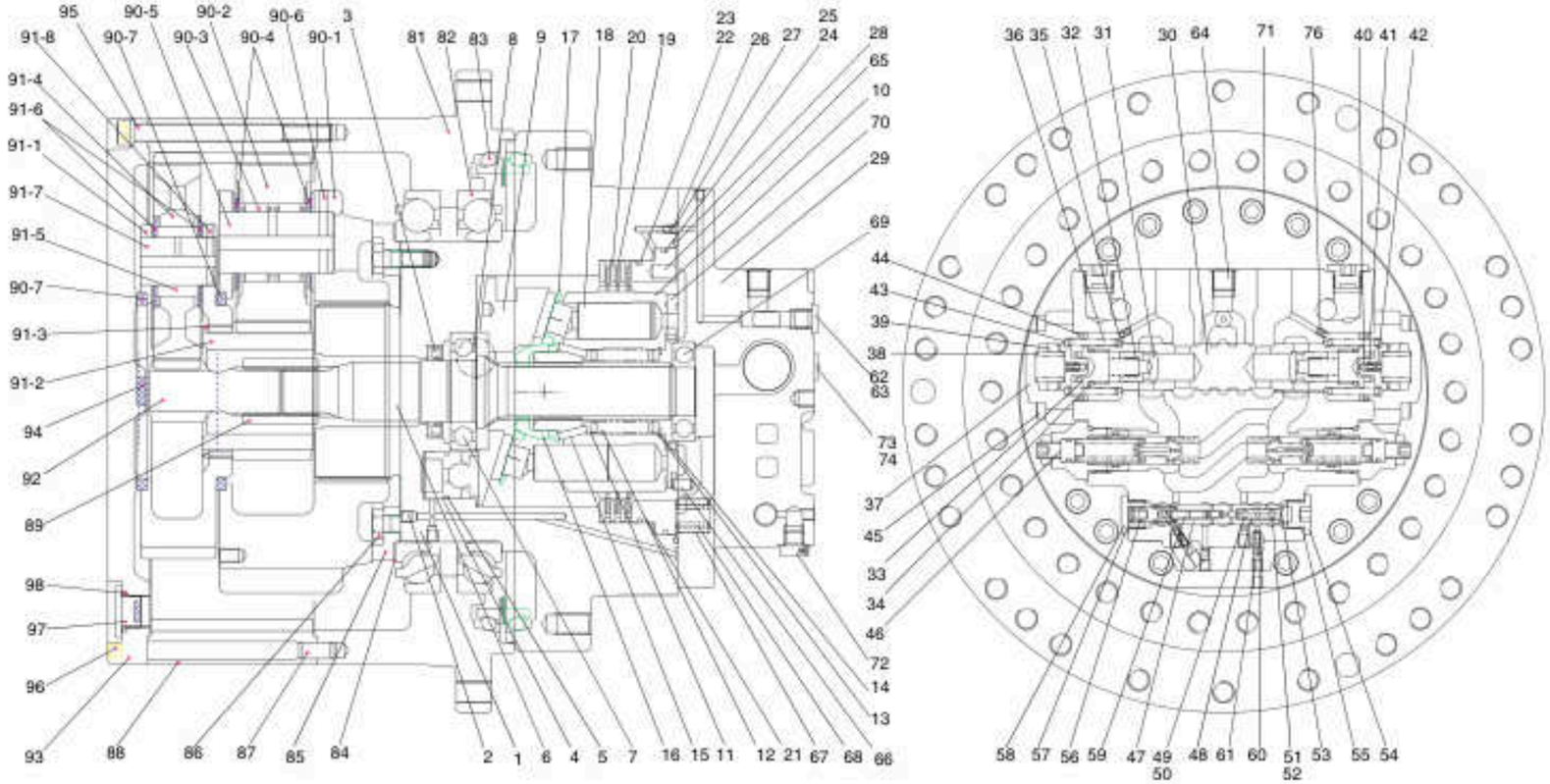
a. Protocol type 1



MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication... Order the manual at mid-west-tech.com >

2. TRAVEL MOTOR

1) STRUCTURE



1	Shaft casing	20	Plate	39	Spool	57	Spring seat	75	Seal kit	90-7	Thrust ring
2	Plug	21	Packing piston	40	Steel ball	58	Plug	76	Orifice	91	Carrier assy No.1
3	Oil seal	22	O-ring	41	Spring	59	Spool	81	Housing	91-1	Carrier No.1
4	Swash piston	23	Back up ring	42	Plug	60	Orifice	82	Main bearing	91-2	Sun-gear No.2
5	Piston ring	24	O-ring	43	Spring seat	61	Orifice	83	Floating seal	91-3	Retaining ring
6	Shaft	25	Back up ring	44	O-ring	62	Plug	84	Shim	91-4	Planetary gear No.1
7	Bearing	26	Orifice	45	Wrench bolt	63	O-ring	85	Retainer	91-5	Needle bearing No.1
8	Steel ball	27	O-ring	46	Relief valve assy	64	Plug	86	Hex head bolt	91-6	Thrust washer
9	Swash plate	28	O-ring	47	Spool	65	Pin	87	Parallel pin	91-7	Pin No.1
10	Cylinder block	29	Rear cover	48	Guide	66	Pin	88	Ring gear	91-8	Spring pin
11	Spring seat	30	Spool	49	O-ring	67	Spring	89	Coupling	92	Sun gear No.1
12	Spring	31	Check	50	Back up ring	68	Spring	90	Carrier assy No.2	93	Cover
13	End plate	32	Spring	51	O-ring	69	Bearing	90-1	Carrier No.2	94	Pad
14	Snap ring	33	Plug	52	Back up ring	70	Valve plate	90-2	Planetary gear No.2	95	Hex socket head bolt
15	Pin	34	O-ring	53	Snap ring	71	Wrench bolt	90-3	Needle bearing No.2	96	Hex socket Screw
16	Ball guide	35	Spring seat	54	plug	72	Plug	90-4	Thrsut washer	97	Hydraulic plug
17	Set plate	36	Spring	55	O-ring	73	Name plate	90-5	Pin No.2	98	O-ring
18	Piston assy	37	Cover	56	Spring	74	Rivet	90-6	Spring pin	99	Name plate
19	Friction plate	38	Spring								

MidWestTech | Hyundai R210LC-7A Crawler Excavator Service Manual | Publication R210LC-7A

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