WHEEL LOADER

SERVICE MANUAL

HL960

HYUNDAI

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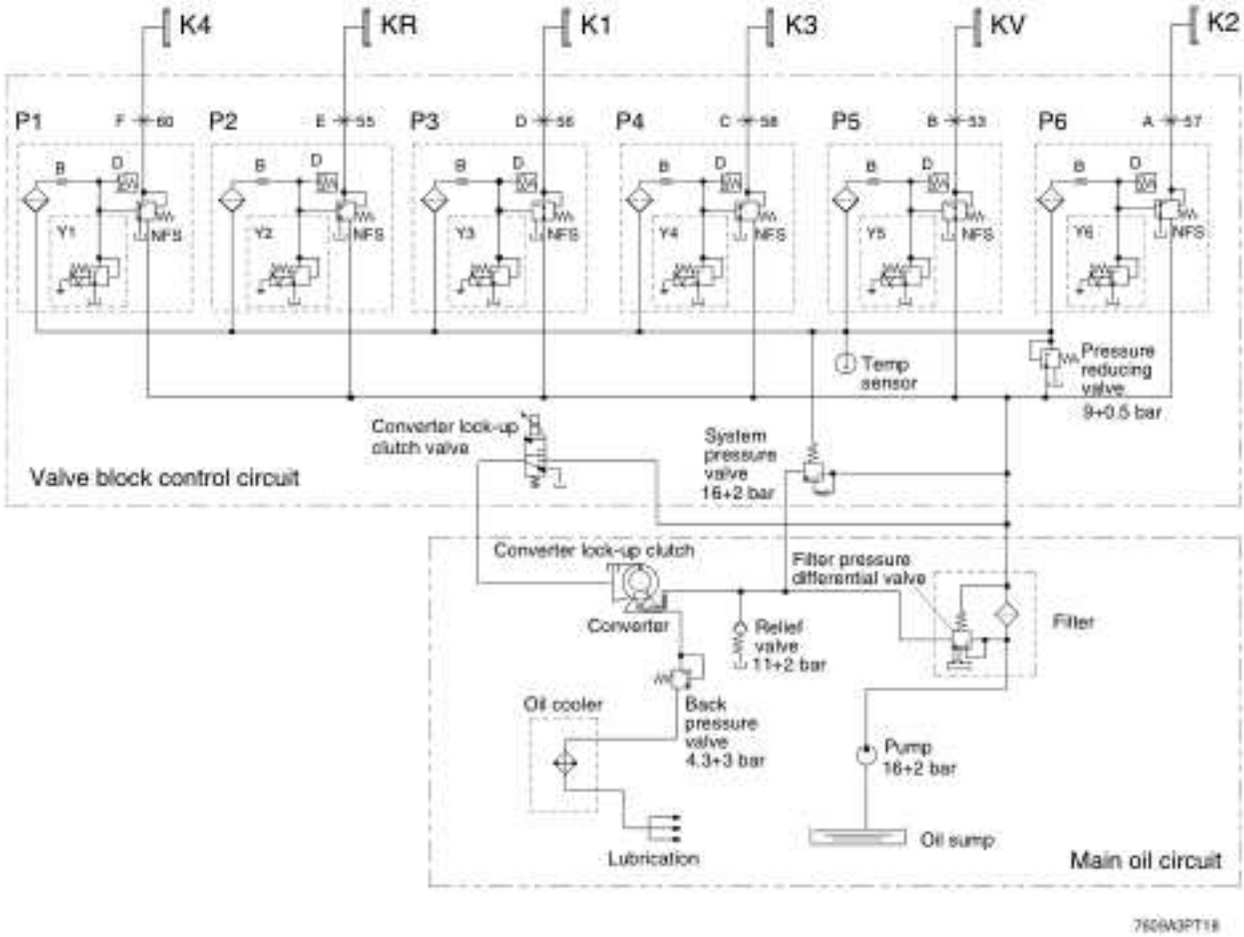
4. SPECIFICATION FOR MAJOR COMPONENTS

1) ENGINE

Item	Specification
Model	Cummins QSB6.7
Type	4-cycle turbocharged, charge air cooled diesel engine
Control type	Electronic control
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	107 × 124 mm (4.2" × 4.9")
Piston displacement	6700 cc (408 cu in)
Compression ratio	17.3 : 1
Rated horse power (Gross)	225 hp at 2200 rpm
Maximum torque (1500 rpm)	106 kgf · m (770 lbf · ft)
Engine oil quantity	18 ℓ (4.8 U.S. gal)
Wet weight	520 kg (1146 lb)
High idling speed	2230 ± 50 rpm
Low idling speed	800 ± 25 rpm
Rated fuel consumption (at rated)	213 g/kW · hr
Starting motor	Denso PA90L (24V-7.8kW)
Alternator	Denso, 24V-95Amp
Battery	2 × 12V × 160Ah

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HYDRAULIC CIRCUIT (5-speed transmission)



NFS	Follow-on slide	P3	Proportional valve clutch K1
D	Vibration damper	P4	Proportional valve clutch K3
B	Orifice	P5	Proportional valve clutch KV
P1	Proportional valve clutch K4	P6	Proportional valve clutch K2
P2	Proportional valve clutch KR	Y1~Y6	Pressure regulator

Speed	Forward					Reverse			Neutral	Engaged clutch	Positions on the valve block	Current No. of the measuring points
	1	2	3	4	5	1	2	3				
Y1			X		X					K4	F	60
Y2						X	X	X		KR	E	55
Y3	X					X				K1	D	56
Y4				X	X			X		K3	C	58
Y5	X	X		X						KV	B	53
Y6		X	X				X			K2	A	57
Engaged clutch	K1,KV	KV,K2	K2,K4	KV,K3	K3,K4	KR,K1	KR,K2	KR,K3		-	-	-

X : Pressure regulator under voltage

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2) ENGINE FAULT CODE

Fault code J1939 SPN J1939 FMI	Reason	Effect (only when fault code is active)
111 629 12	Engine control module critical internal failure - Bad intelligent device or component. Error internal to the ECM related to memory hardware failures or internal ECM voltage supply circuits.	Possible no noticeable performance effects, engine dying, or hard starting.
115 612 2	Engine magnetic crankshaft speed/position lost both of two signals - Data erratic, intermittent, or incorrect. The ECM has detected the primary and backup speed sensor signals are connected backwards.	The engine will shut down or will not start.
122 102 3	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.
123 102 4	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.
124 102 16	Intake manifold 1 pressure - Data valid but above normal operational range - Moderately severe level. Intake manifold pressure is above the maximum operating limit.	Engine power derate.
125 102 18	Intake Manifold 1 Pressure - Data valid but below normal operating range - Moderately severe level. Intake manifold pressure is below the minimum operating limit.	Engine power derate.
131 91 3	Accelerator pedal or lever position sensor 1 circuit - Voltage above normal, or shorted to high source. High voltage detected at accelerator pedal position number 1 circuit.	The engine will operate in limp home mode.
132 91 4	Accelerator pedal or lever position sensor 1 circuit - Voltage below normal, or shorted to low source. Low voltage detected at accelerator pedal position number 1 signal circuit.	The engine will operate in limp home mode.
133 974 3	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 signal circuit.	Remote accelerator will not operate.
134 974 4	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.
143 100 18	Engine oil rifle pressure - Data valid but below normal operational range - Moderately severe level. Engine oil pressure signal indicates engine oil pressure is below the engine protection warning limit.	Engine power derate.

※ Some fault codes are not applied to this machine.

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5) DISASSEMBLY AND ASSEMBLY

(1) Spool

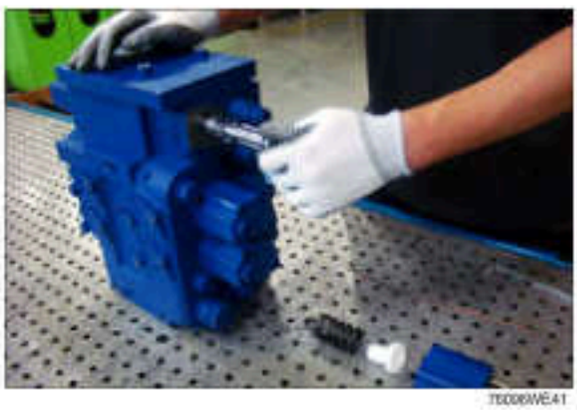
① Loosen the bolt (2EA).

- Tool : Wrench 5 mm
- Tightening torque : 0.85 kgf · m (6.1 lbf · ft)



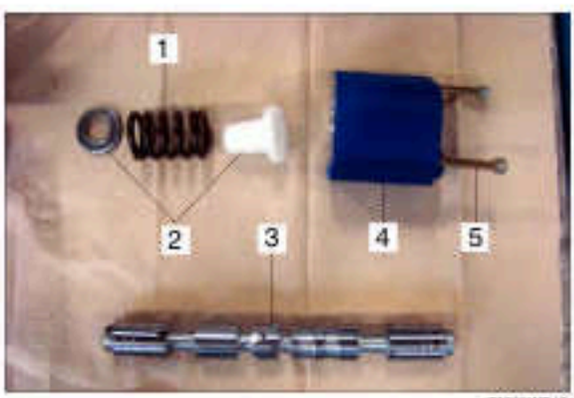
T609KWE40

② Remove the cover, spring retainer, spring and spool.



T609KWE41

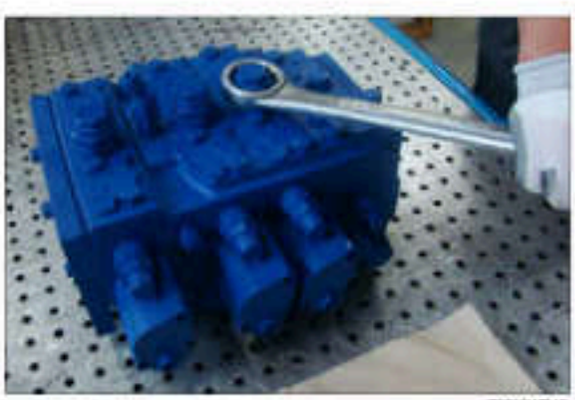
1 Spring
2 Spring ratainer
3 Spool
4 Cover
5 Bolt



T609KWE42

(2) Compensator valve

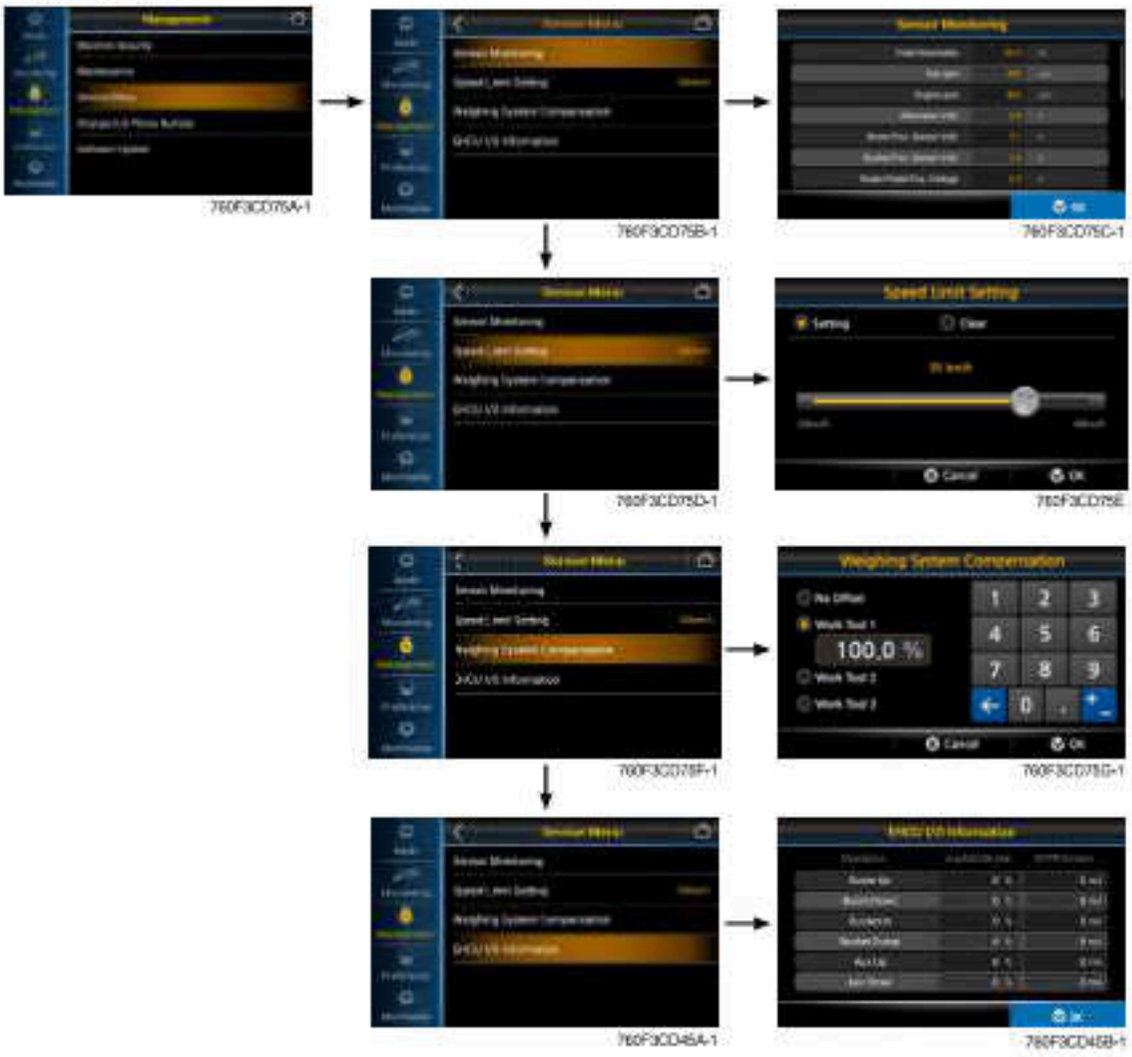
- Tool : Spanner 42 mm



T609KWE43

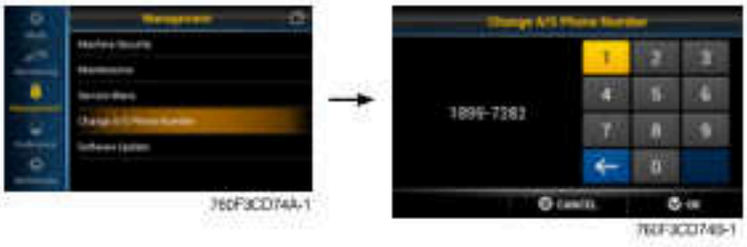
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③ Service menu



- **Sensor monitoring** : Display information of each sensors.
- **Speed limit setting** : 20~40 km/h (5 km/h intervals)
- **Weighing system compensation**
  - Calibration workload depending on work tool.
  - ※ **Only for the service person. Do not adjust arbitrary.**
- **EHCU I/O information**
  - Real time monitoring (joystick stroke, EPPR current).

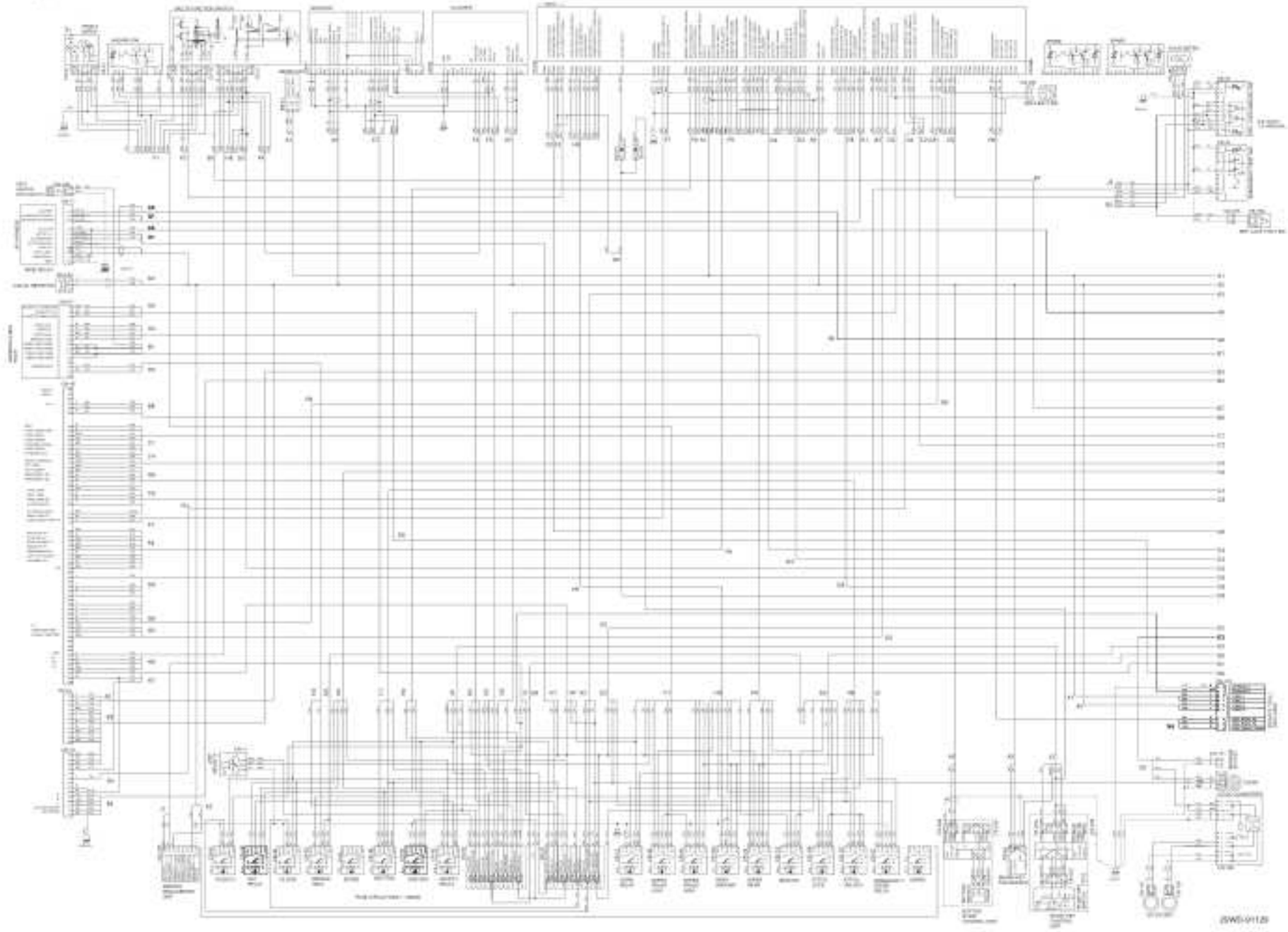
④ Change A/S phone number and software update



- Change A/S phone number : Check and change of contact information for customer service.
- Software update : Update file in USB memory.

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ELECTRICAL CIRCUIT (1/3, machine serial number : #0364~)



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