WHEEL LOADER

SERVICE MANUAL

HL965

HYUNDAI

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Fault code (Hex)	Meaning of the fault code possible reason for fault detection	Reaction of the TCU	Possible steps to repair
C6	O.C. at joystick status indicator TCU detected a wrong voltage at the output pin, that looks like a O.C. for this output pin · Cable is defective and has no connection to TCU · Joystick status indicator has an internal defect · Connector pin has no connection to TCU	No reaction OP mode : Normal	· Check the cable from TCU to joystick status indicator · Check the connectors from joystick status indicator to TCU · Check the resistance* of joystick status indicator * See page 3-74
D1	S.C. to battery voltage at power supply for sensors TCU measures more than 6V at the pin AU1 (5V sensor supply)	See fault codes No.21 to 2C	· Check cables and connectors to sensors, which are supplied from AU1 · Check the power supply at the pin AU1(Should be appx. 5V) · Fault codes No.21 to No.2C may be reaction of this fault
D2	S.C. to ground at power supply for sensors TCU measures less than 4V at the pin AU1 (5V sensor supply)	See fault codes No.21 to 2C	· Check cables and connectors to sensors, which are supplied from AU1 · Check the power supply at the pin AU1(Should be appx. 5V) · Fault codes No.21 to No.2C may be reaction of this fault
D3	Low voltage at battery Measured voltage at power supply is lower than 18V(24V device)	Shift to neutral OP mode : TCU shutdown	· Check power supply battery · Check cables from batteries to TCU · Check connectors from batteries to TCU
D4	High voltage at battery Measured voltage at power supply is higher than 32.5V(24V device)	Shift to neutral OP mode : TCU shutdown	· Check power supply battery · Check cables from batteries to TCU · Check connectors from batteries to TCU
D5	Error at valve power supply VPS1 TCU switched on VPS1 and measured VPS1 is off or TCU switched off VPS1 and measured VPS1 is still on · Cable or connectors are defect and are contacted to battery voltage · Cable or connectors are defect and are contacted to vehicle ground · Permanent power supply KL30 missing · TCU has an internal defect	Shift to neutral OP mode : TCU shutdown	· Check fuse · Check cables from gearbox to TCU · Check connectors from gearbox to TCU · Replace TCU
D6	Error at valve power supply VPS2 TCU switched on VPS2 and measured VPS2 is off or TCU switched off VPS2 and measured VPS2 is still on · Cable or connectors are defect and are contacted to battery voltage · Cable or connectors are defect and are contacted to vehicle ground · Permanent power supply KL30 missing · TCU has an internal defect	Shift to neutral OP mode : TCU shutdown	· Check fuse · Check cables from gearbox to TCU · Check connectors from gearbox to TCU · Replace TCU

※ Some fault codes are not applied to this machine.

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6. LOADER SYSTEM AND PORT RELIEF VALVE PRESSURE TEST

- SPECIFICATION

Oil temperature (40~50°C)

Relief valve	Engine speed	Relief pressure
System (M) LS relief valve	High	280 ± 5 kg/cm² (3980 ± 70 psi)
Boom raise (U)	Low	340 ± 10 kg/cm² (4840 ± 140 psi)
Boom down (W)	Low	340 ± 10 kg/cm² (4840 ± 140 psi)
Bucket rollback (R)	Low	340 ± 10 kg/cm² (4840 ± 140 psi)
Bucket dump (D)	Low	300 ± 10 kg/cm² (4270 ± 140 psi)

- Gauge and tool

Gauge 0~35 MPa (0~350 bar, 0~5000 psi)

M : System (main) relief valve

R : Bucket rollback relief

D : Bucket dump relief

U : Boom raise relief

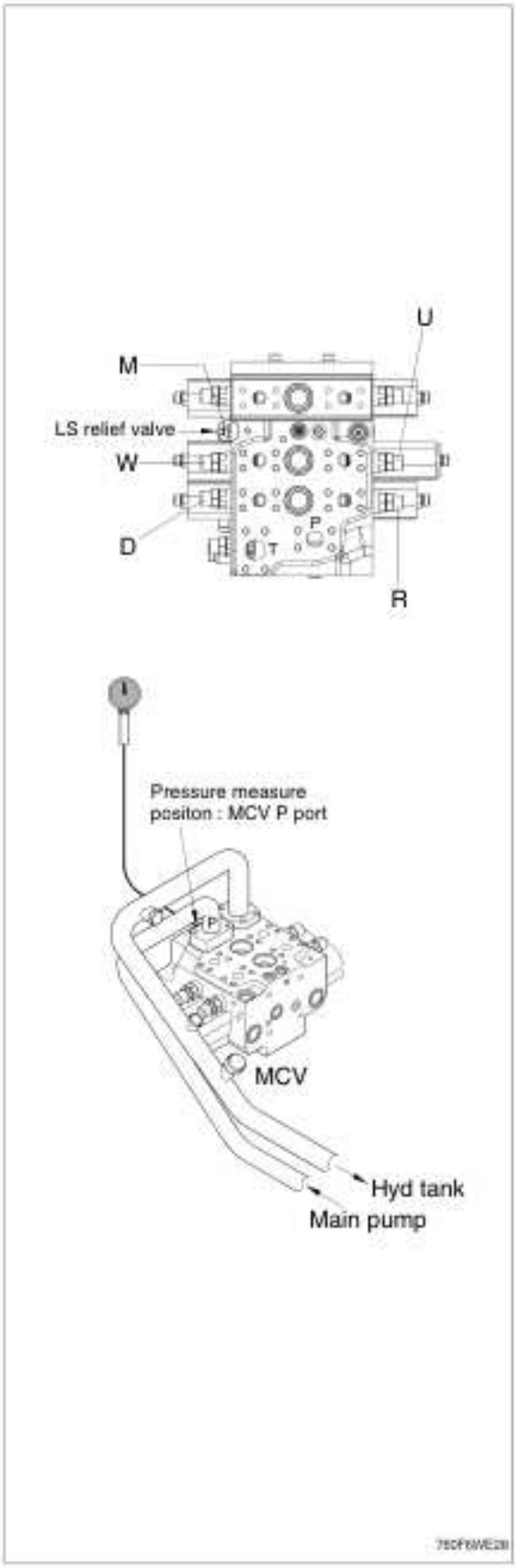
1) Install fitting and pressure gauge to test port in pump delivery line.

2) Install temperature reader.
(see temperature reader installation procedure in this group)

3) Heat hydraulic oil to specifications.
(see hydraulic oil warm up procedure in this group)

4) To check the system relief (M), run engine at high idle.
Lower boom to bottomed position.
Slowly activate boom down function while watching pressure gauge. If pressure is not to specification, loosen lock nut on system relief valve (M) and adjust to specification.

※ Do not adjust the system relief valve above 280 kg/cm² (3980 psi).
Damage to the pump will result from excessive pressure settings.



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Connector number	Type	No. of pin	Destination	Connector part No.	
				Female	Male
CN-177	DEUTSCH	2	Quick coupler unlock solenoid	DT06-2S-EP04	-
CN-177A	Econoseal J	3	I/conn (Front harness-Quick coupler harness)	S816-003002	S816-103002
CN-178	DEUTSCH	2	Quick coupler lock solenoid	DT06-2S-EP04	-
CN-196	PACKARD	4	Fuel heater	2-967325-3	-
CN-203	AMP	6	Rear wiper motor	936257-1	-
CN-246	KET	1	PTC power	-	MG620659-5
CN-249	DEUTSCH	4	Camera	DT06-4S	DT04-4P
CN-250	Econoseal J	4	Rear view camera	S816-004002	S816-104002
CN-252	TYCO	6	Differential lock	S816-006602	S816-106602
CN-399	AMP	4	DEF sensor	1-967325-1	-
CN-J2	DELPHI	96	ECM	13964572	-
CN-J5	DEUTSCH	3	CAN I resister	DT04-3P-EP10	-
CN-J7A	AMP	4	Nox sensor engine inlet	2-1418390-1	-
CN-J7B	AMP	4	Nox sensor turbo pipe	1-1418390-1	-
CN-J10	AMP	4	DOC temp sensor	4-1418390-1	-
CN-J26	AMP	4	DEF supply module	4-1418390-1	-
CN-J27	DEUTSCH	2	DEF heater valve	DT06-2S	-
CN-J28	DELPHI	2	Hose heating PR line	1-928-403-874	-
CN-J29	DELPHI	2	Hose heating back line	1-928-403-874	-
CN-J30	DELPHI	2	Hose heating suction line	1-928-403-874	-
CN-J31	DELPHI	2	DEF dosing injector valve	1-928-403-874	-
Relay					
CR-1	Ring term	-	Battery relay	S820-104002	-
CR-2	AMP	5	Horn relay	VCFM-1002	-
CR-3	AMP	5	Front work lamp relay	VCFM-1002	-
CR-4	AMP	5	Wiper relay (Hi)	VCFM-1002	-
CR-5	HELLA	5	Safety relay	8JA003526-001	-
CR-7	AMP	5	Aircon relay	VCFM-1002	-
CR-11	250	-	Flasher unit	S810-003702	-
CR-23	Ring term	-	Start relay	ST 710289-2	ST 710384-2
CR-24	Shur	1	Preheater relay	S822-014000	-
CR-25	AMP	5	Rear wiper relay	VCFM-1002	-
CR-26	AMP	5	Wiper relay (low)	VCFM-1002	-
CR-30	HELLA	5	ECM power relay	8JA003526-001	-
CR-36	AMP	5	Preheater relay	VCFM-1002	-
CR-39	DEUTSCH	2	Emergency steering pump relay	DT06-2S	DT06-2P
CR-40	KET	5	EHCU power relay	MG610047-1	-

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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)



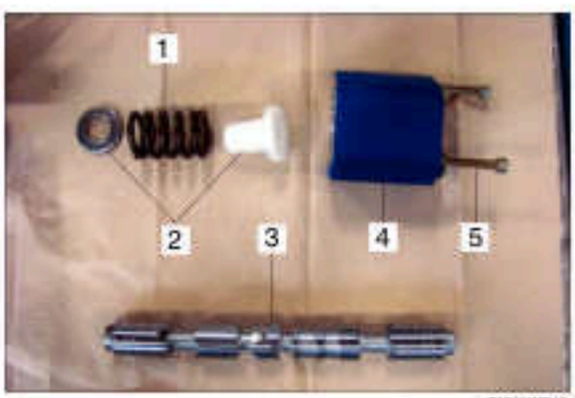
T6096WE40

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



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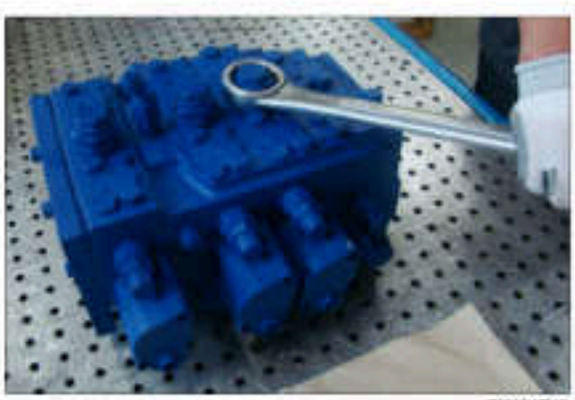
1 Spring
2 Spring ratainer
3 Spool
4 Cover
5 Bolt



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(2) Compensator valve

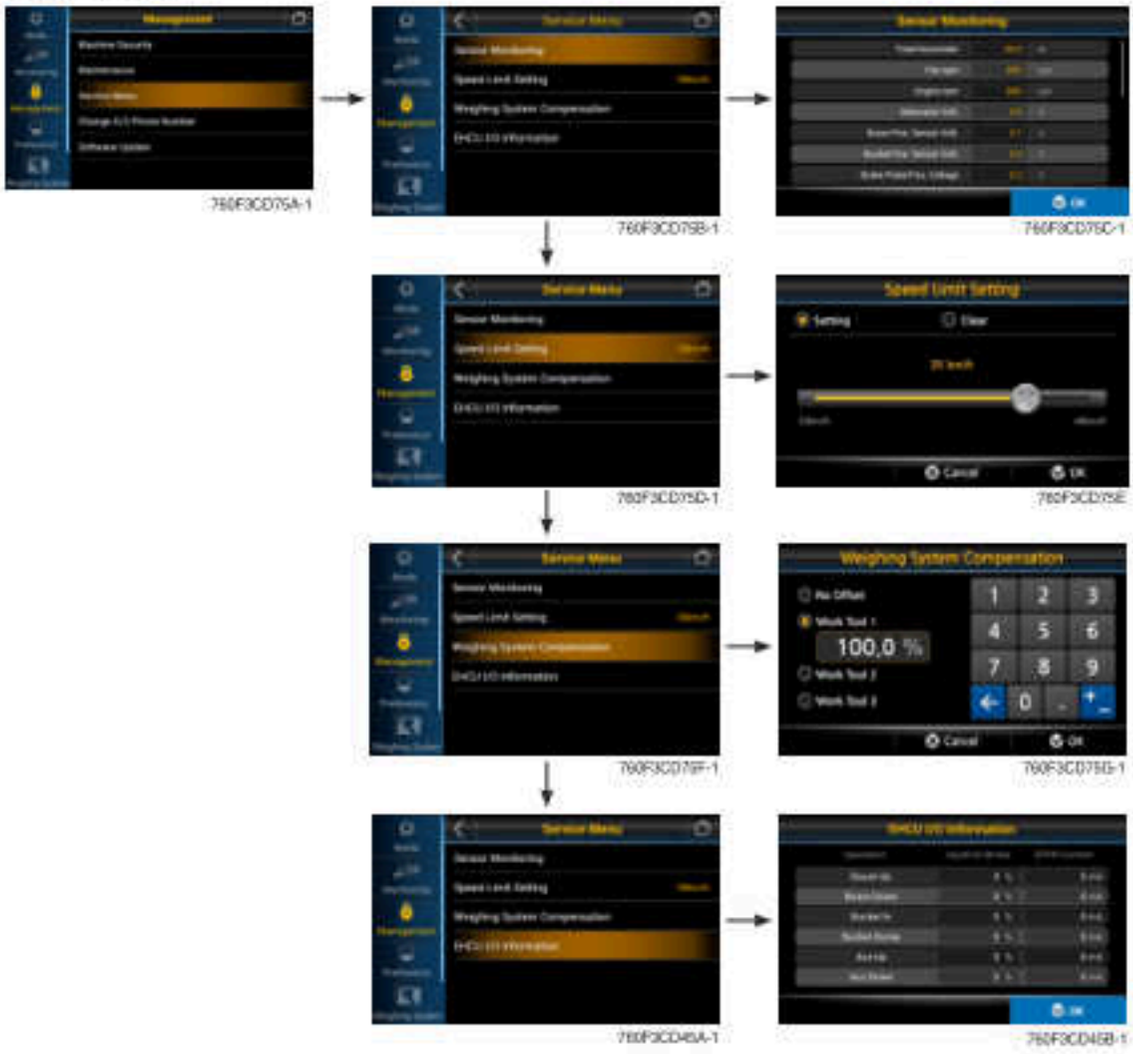
- Tool : Spanner 42 mm



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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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