1221F
Tier 4
Wheel Loader

SERVICE MANUAL

Part number 47544213

1st edition English

August 2013

CASE CONSTRUCTION

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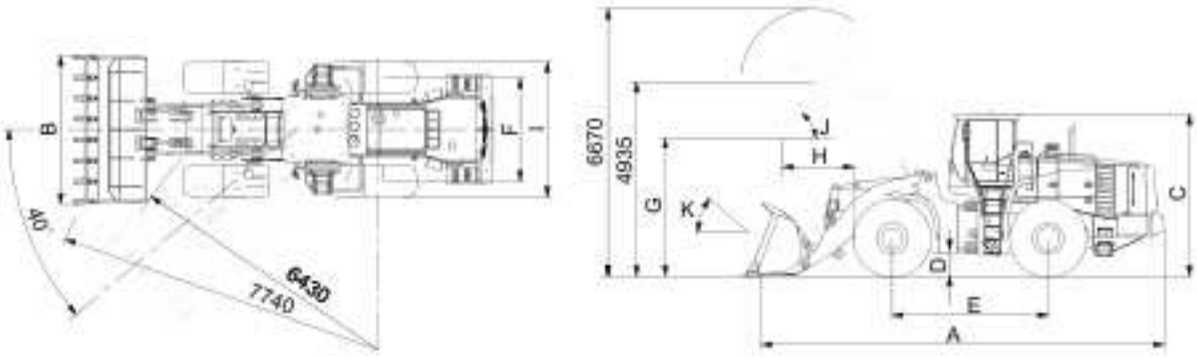
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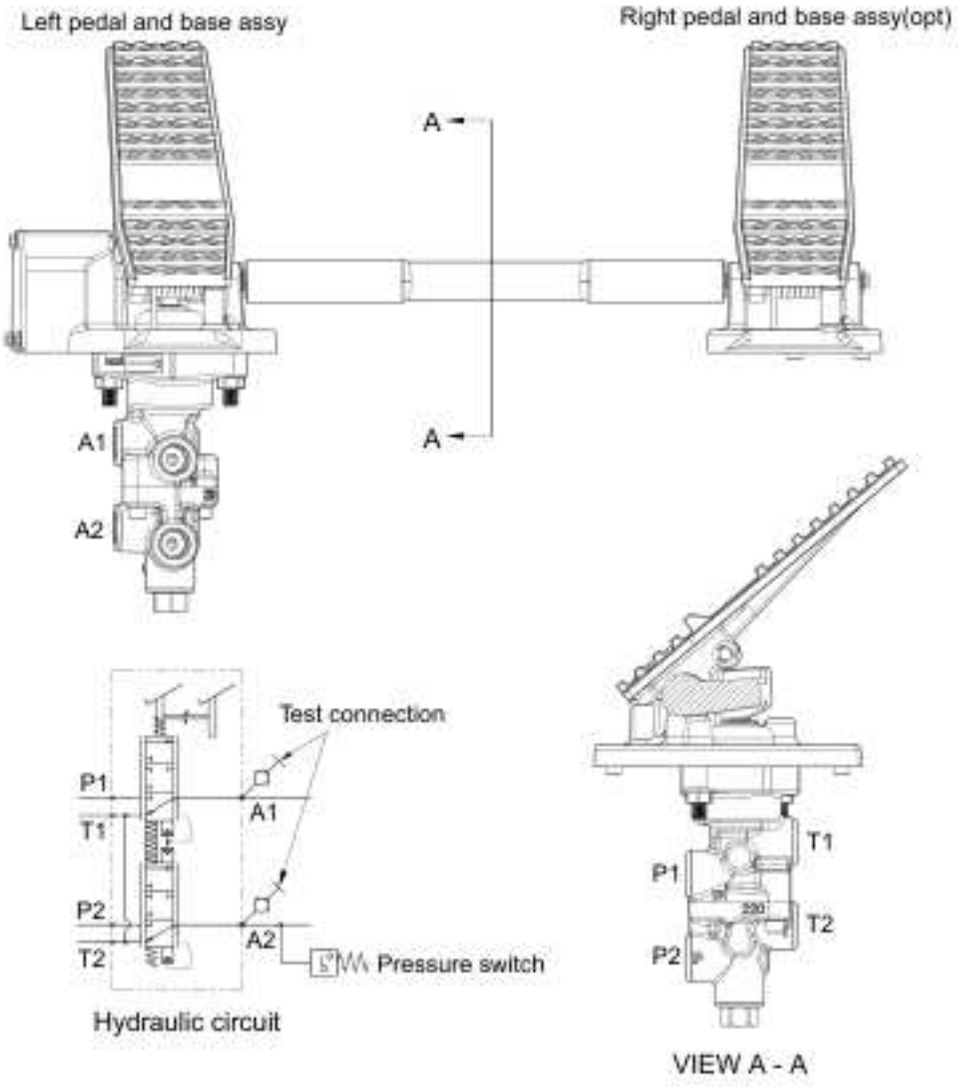
WITH TOOTH TYPE BUCKET (1221F XR)



Description		Unit	Specification
Operating weight		kg (lb)	31100 (68560)
Bucket capacity	Struck	m³ (yd³)	4.4 (5.8)
	Heaped		5.2 (6.8)
Overall length	A	mm (ft-in)	10250 (33' 8")
Overall width	B		3500 (11' 6")
Overall height	C		3865 (12' 8")
Ground clearance	D		495 (1' 7")
Wheelbase	E		3700 (12' 2")
Tread	F		2440 (8' 0")
Dump clearance at 45°	G		3520 (11' 7")
Dump reach (full lift)	H		1600 (5' 3")
Width over tires	I		3220 (10' 7")
Dump angle	J	degree (°)	47
Roll back angle (carry position)	K		49
Cycle time	Lift (with load)	sec	6.1
	Dump (with load)		1.4
	Lower (empty)		4.1
Maximum travel speed		km/hr (mph)	36.0 (22.4)
Braking distance		m (ft-in)	12 (39' 4")
Minimum turning radius (center of outside tire)			6.43 (21' 1")
Gradeability		degree (°)	30
Breakout force		kg (lb)	24630 (54300)
Travel speed	Forward - First gear	km/hr (mph)	6.1 (3.8)
	Forward - Second gear		11.4 (7.1)
	Forward - Third gear		17.9 (11.1)
	Forward - Fourth gear		36.0 (22.4)
	Reverse - First gear		6.1 (3.8)
	Reverse - Second gear		11.4 (7.1)
	Reverse - Third gear		24.8 (15.4)

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2) OPERATION



Port	Port name	Port size
P1, P2	Pressure port	3/4-16UNF
T1, T2	Return port	3/4-16UNF
A1, A2	Brake cylinder port	3/4-16UNF

4B508

· Brake pressure specification : 80 ± 5 bar (1160 ± 70 psi)

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2. TROUBLESHOOTING

※ Diagnose malfunction charts are arranged from most probable and simplest to verify, to least likely, more difficult to verify. Remember the following steps when troubleshooting a problem :

Step 1. Operational check out procedure (see section 1)
Step 2. Operational checks (see group 2)
Step 3. Troubleshooting
Step 4. Tests and adjustments (see group 3)

Problem	Cause	Remedy
Noisy hydraulic pump	Low oil supply or wrong viscosity.	Fill reservoir with recommended oil.
	Plugged or pinched suction line.	Clean or replace line.
	Air in oil.	Check for foamy oil. Tighten connections. Replace O-rings and or lines.
	Plugged suction strainer.	Inspect and clean strainer in reservoir.
	Loose or missing hydraulic line clamps.	Tighten or replace clamps.
	Hydraulic lines in contract with frame.	Inspect and repair.
	Worn or damaged pump.	Do hydraulic pump performance check in group 2. Do hydraulic pump flow test in group 3.
No or Slow hydraulic functions	Failed or worn hydraulic pump.	Do performance check.
	Cold oil.	Warm oil up.
	Slow engine speed.	Adjust engine speed. Check high idle speed.
	Suction line air leak.	Check for foamy oil.
	Low oil supply.	Add recommended oil.
	Wrong oil viscosity.	Use recommended oil.
	Oil leaking past cylinders or control valve.	Check cylinder drift in group 2.
	Blocked or damaged line.	Inspect lines.
	Faulty pilot control valve (RCV).	Do pilot control valve (RCV) pressure test in group 3.
	Binding loader control valve (MCV) spool.	Inspect valve.
	Faulty flow amplifier.	Check priority valve, orifice of flow amplifier specification.

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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)



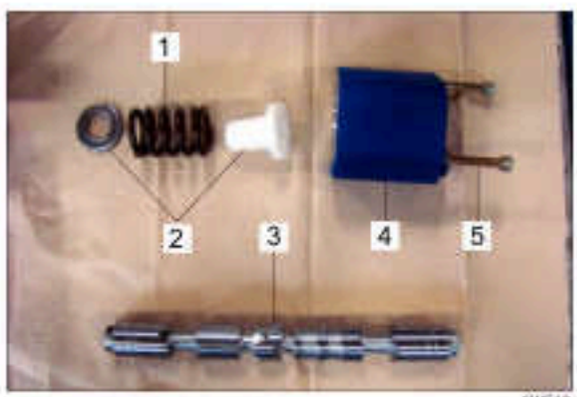
6WE40

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



6WE41

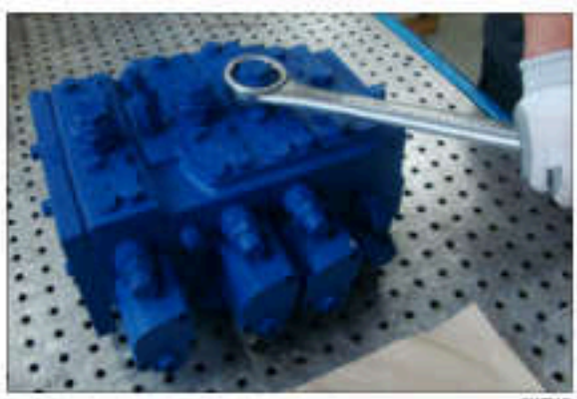
1 Spring
2 Spring retainer
3 Spool
4 Cover
5 Bolt



6WE42

(2) Compensator valve

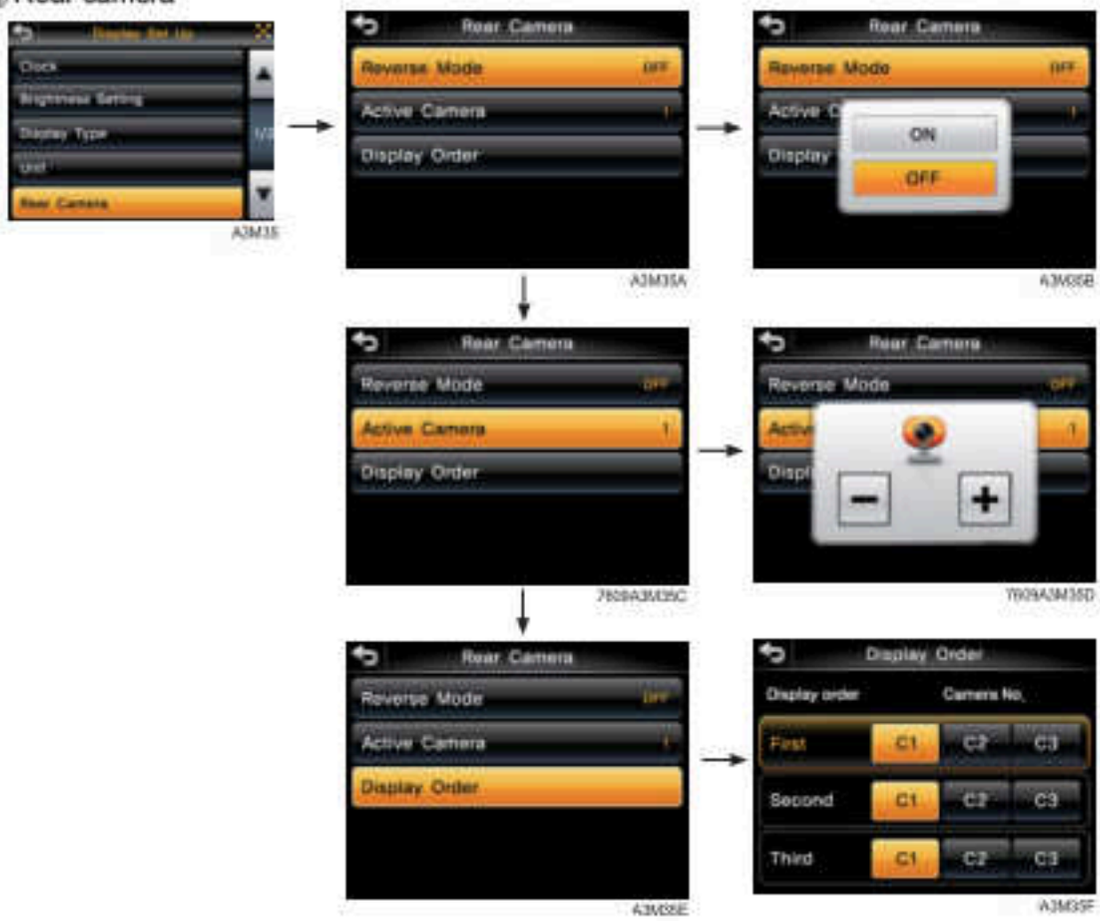
- Tool : Spanner 42 mm



6WE43

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⑤ Rear camera



- Reverse mode
  - If transmission engages the reverse gear (R1~R3), the camera mode is displayed automatically in main display.
- Active camera
  - Three cameras can be installed on the machine.
- Display order
  - If the machine is not equipped with a camera, disregard this menu.

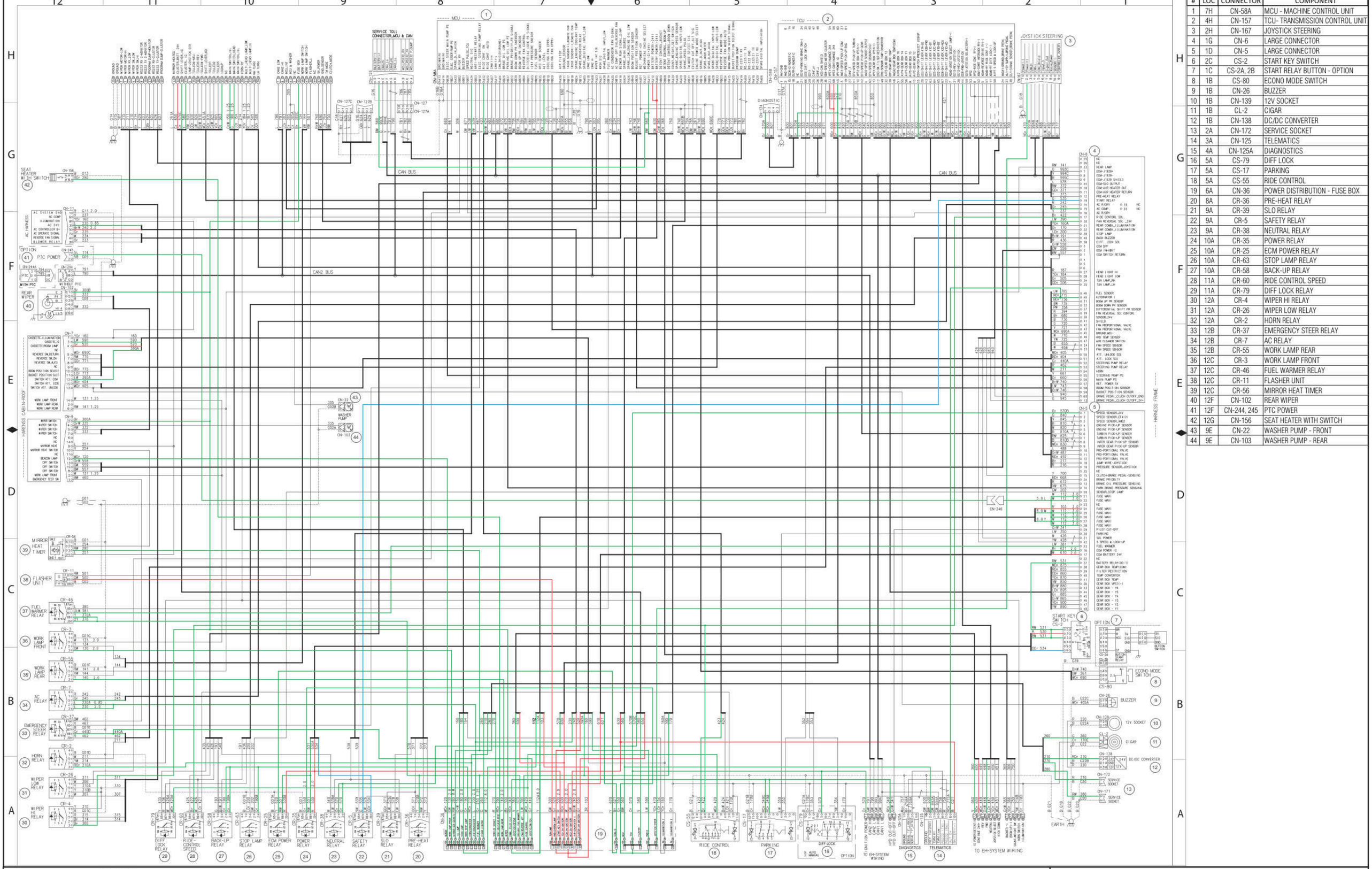
- If the camera was not equipped, this menu is not useful.
- In main display, if the ▣/ESC button is pushed, the first ordered display camera will be viewed.

⑥ Language



- User can select preferable language and all display are changed the selected language.
- 12 multi-language available.

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#	LOC	CONNECTOR	COMPONENT
1	7H	CN-58A	MCU - MACHINE CONTROL UNIT
2	4H	CN-157	TCU- TRANSMISSION CONTROL UNIT
3	2H	CN-167	JOYSTICK STEERING
4	1G	CN-6	LARGE CONNECTOR
5	1D	CN-5	LARGE CONNECTOR
6	2C	CS-2	START KEY SWITCH
7	1C	CS-2A, 2B	START RELAY BUTTON - OPTION
8	1B	CS-80	ECONO MODE SWITCH
9	1B	CN-26	BUZZER
10	1B	CN-139	12V SOCKET
11	1B	CL-2	CIGAR
12	1B	CN-138	DC/DC CONVERTER
13	2A	CN-172	SERVICE SOCKET
14	3A	CN-125	TELEMATICS
15	4A	CN-125A	DIAGNOSTICS
16	5A	CS-79	DIFF LOCK
17	5A	CS-17	PARKING
18	5A	CS-55	RIDE CONTROL
19	6A	CN-36	POWER DISTRIBUTION - FUSE BOX
20	8A	CR-36	PRE-HEAT RELAY
21	9A	CR-39	SLO RELAY
22	9A	CR-5	SAFETY RELAY
23	9A	CR-38	NEUTRAL RELAY
24	10A	CR-35	POWER RELAY
25	10A	CR-25	ECM POWER RELAY
26	10A	CR-63	STOP LAMP RELAY
27	10A	CR-58	BACK-UP RELAY
28	11A	CR-60	RIDE CONTROL SPEED
29	11A	CR-79	DIFF LOCK RELAY
30	12A	CR-4	WIPER HI RELAY
31	12A	CR-26	WIPER LOW RELAY
32	12A	CR-2	HORN RELAY
33	12B	CR-37	EMERGENCY STEER RELAY
34	12B	CR-7	AC RELAY
35	12B	CR-55	WORK LAMP REAR
36	12C	CR-3	WORK LAMP FRONT
37	12C	CR-46	FUEL WARMER RELAY
38	12C	CR-11	FLASHER UNIT
39	12C	CR-56	MIRROR HEAT TIMER
40	12F	CN-102	REAR WIPER
41	12F	CN-244, 245	PTC POWER
42	12G	CN-156	SEAT HEATER WITH SWITCH
43	9E	CN-22	WASHER PUMP - FRONT
44	9E	CN-103	WASHER PUMP - REAR

LEGEND

INDICATES CONSTANT POWER

INDICATES POWER WHEN KEY SWITCH IS ON

INDICATES POWER WHEN KEY SWITCH IS IN START POSITION

ELECTRICAL SCHEMATIC
1221F TIER 4 WHEEL LOADER

SIDE 1 of 3

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