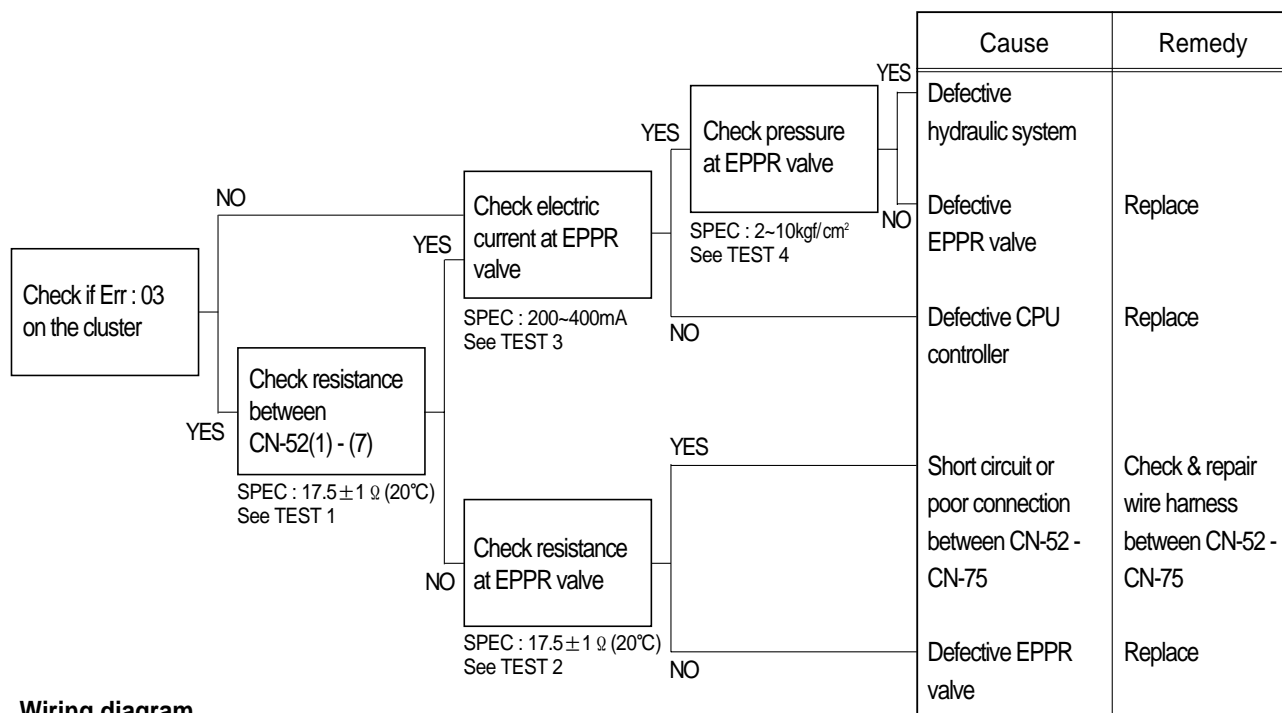


GROUP 4 MECHATRONICS SYSTEM

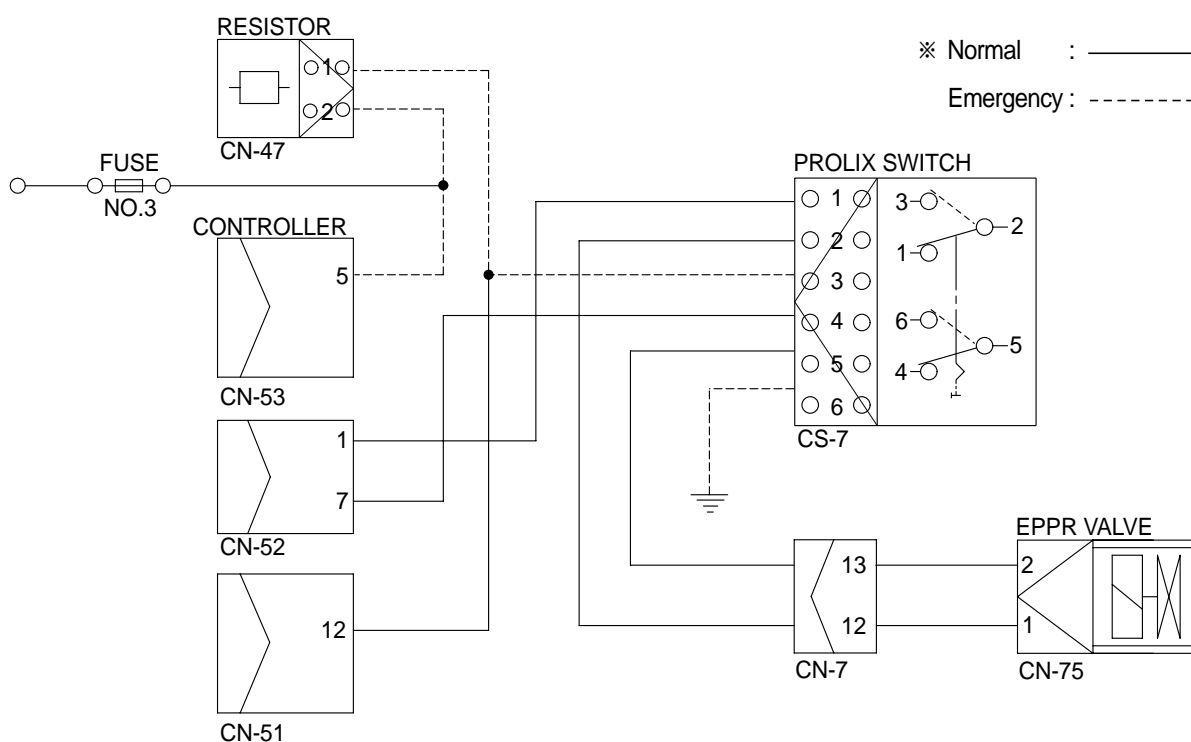
1. ALL ACTUATORS SPEED ARE SLOW

- ※ Boom, arm, bucket, swing and travel speed are slow, but engine speed is good.
- ※ Spec : H-mode 2240 ± 50rpm S-mode 2040 ± 50rpm
 L-mode 2040 ± 50rpm F-mode 1840 ± 50rpm
- ※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



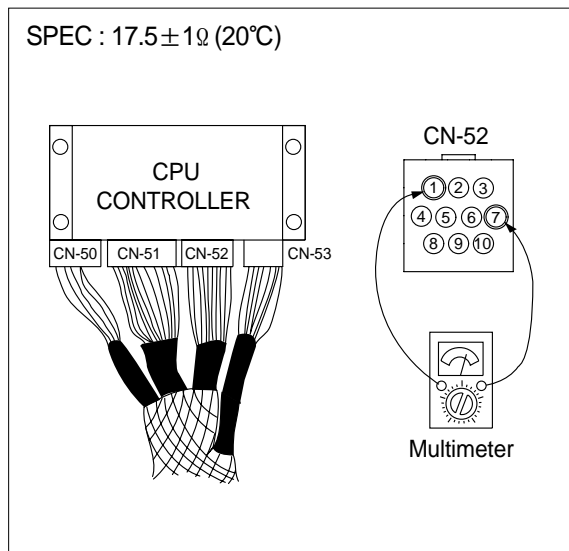
Wiring diagram



2) TEST PROCEDURE

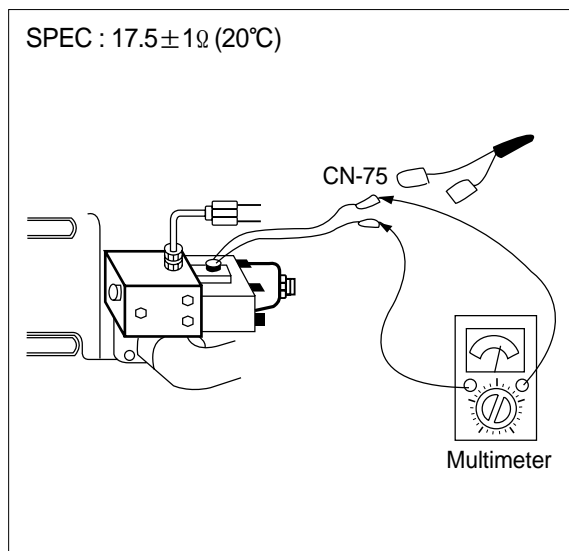
(1) **Test 1** : Check resistance at connector CN-52(1)-(7).

- ① Starting key OFF.
- ② Disconnect connector CN-52.
- ③ Check resistance between pin at connector CN-52(1)-(7).



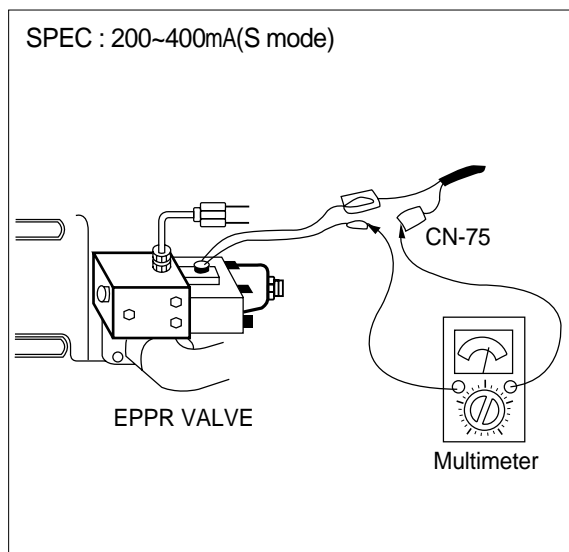
(2) **Test 2** : Check resistance at connector CN-75.

- ① Starting key OFF.
- ② Disconnect connector CN-75 from EPPR valve at main hydraulic pump.
- ③ Check resistance between 2 lines as figure.



(3) **Test 3** : Check electric current at EPPR valve.

- ① Install multimeter as figure.
- ② Start engine.
- ③ Set S-mode and cancel auto decel mode.
- ④ If tachometer show approx $2040 \pm 50\text{rpm}$, check electric current.



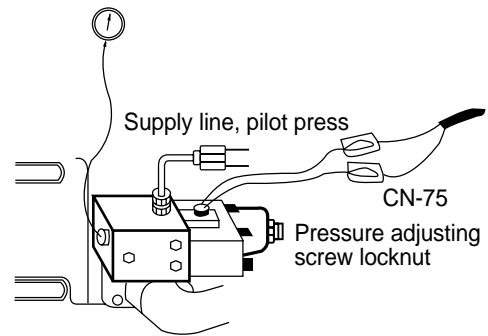
(2) **Test 4** : Check pressure at EPPR valve.

- ① Remove plug and connect pressure gauge as figure.

Gauge capacity : 0 to 40~50kgf/cm²
(0 to 570~710psi)

- ② Start engine.
③ Set S-mode and cancel auto decel mode.
④ If tachometer show approx 2040 ± 50rpm, check pressure.
⑤ If pressure is not correct, adjust it.
⑥ After adjust, test the machine.

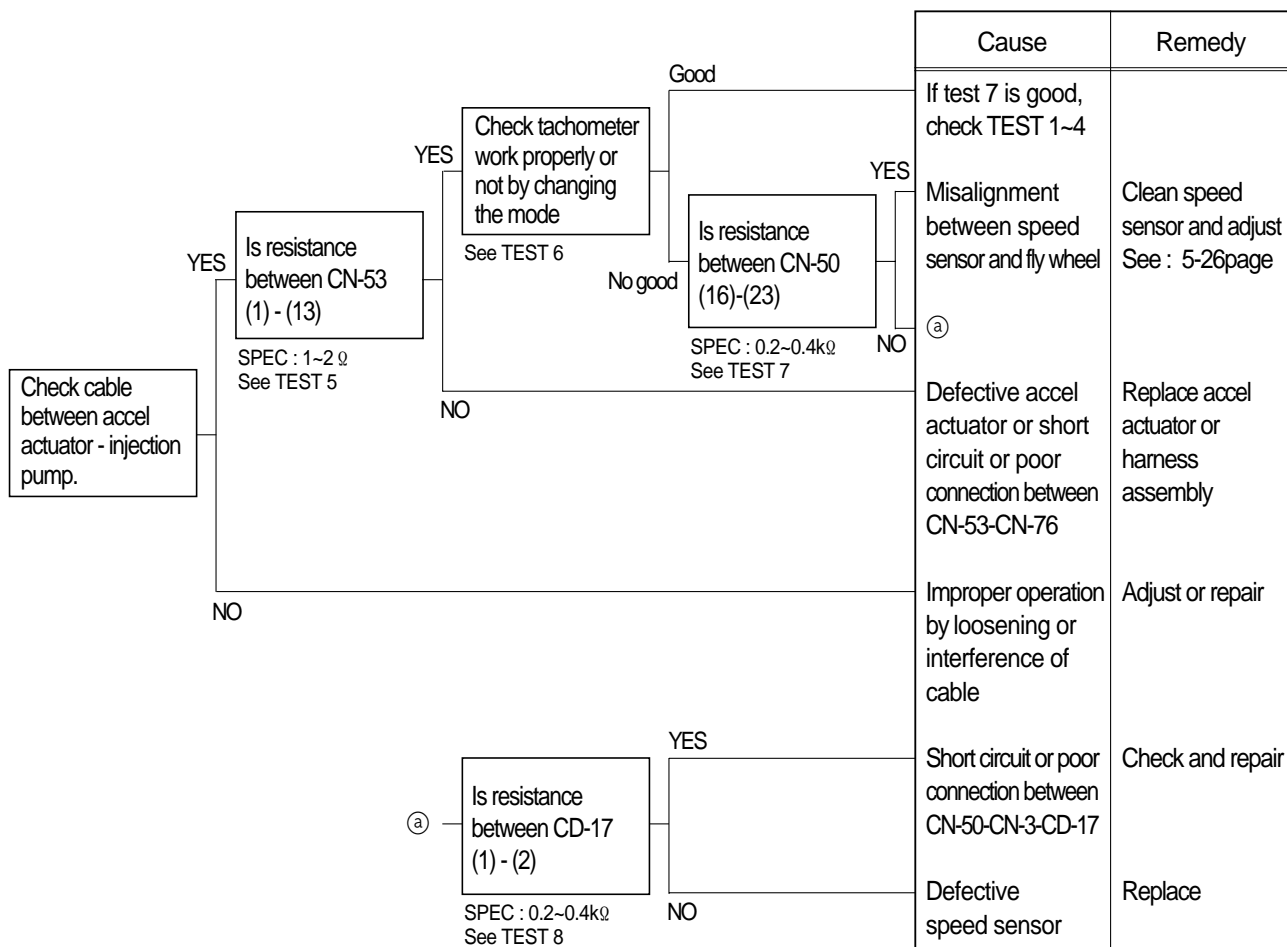
SPEC : 2~10kgf/cm²(30~140psi)



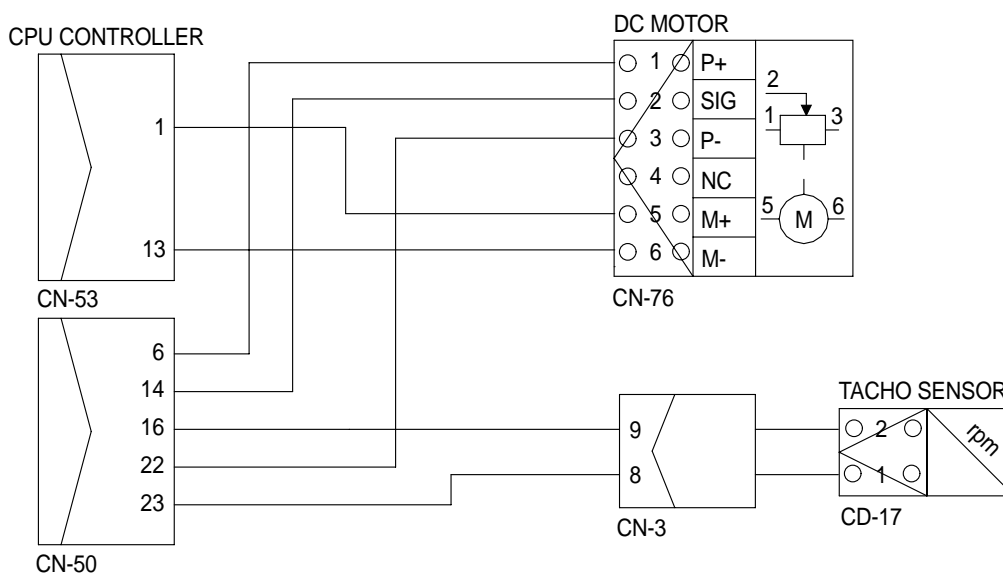
2. ENGINE SPEED IS SLOW AT ALL MODE

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



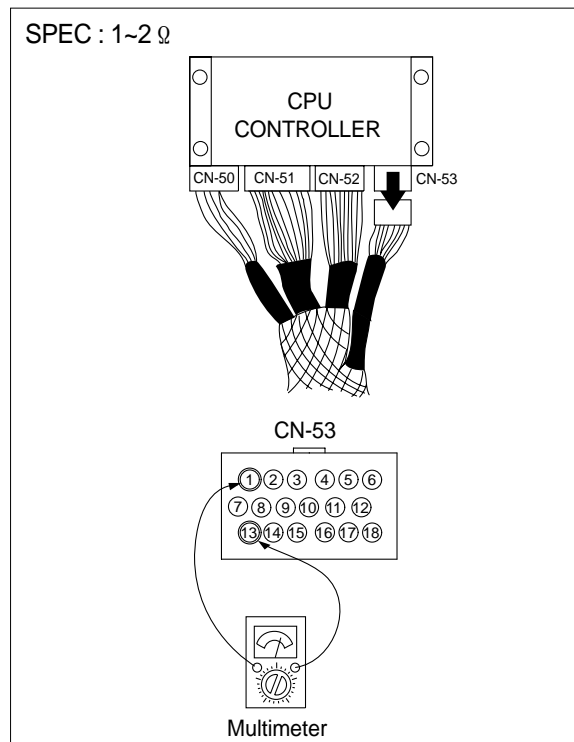
Wiring diagram



2) TEST PROCEDURE

(1) **Test 5** : Check resistance between CN-53 (1)-(13).

- ① Starting key OFF.
- ② Disconnect connector CN-53 from CPU controller.
- ③ Check resistance as figure.



(2) **Test 6** : Check tachometer(Work properly or not)

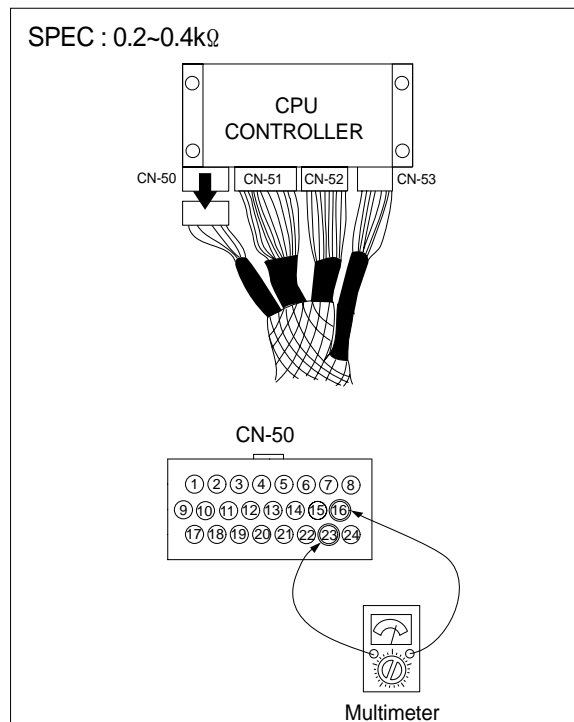
- ① Start engine.
- ② Check tachometer reading.

Unit : rpm

Spec		Remark
H-mode	2240 \pm 50rpm	Check rpm after cancel the Auto decel mode.
S-mode	2040 \pm 50rpm	
L-mode	2040 \pm 50rpm	
F-mode	1840 \pm 50rpm	

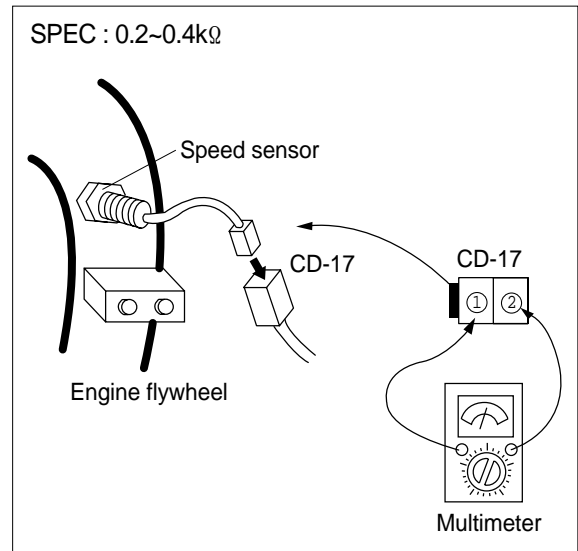
(3) **Test 7** : Check resistance between CN-50 (16) and CN-50(23).

- ① Starting key OFF.
- ② Disconnect connector CN-50 from CPU controller.
- ③ Check resistance as figure.



(4) **Test 8** : Check resistance at speed sensor.

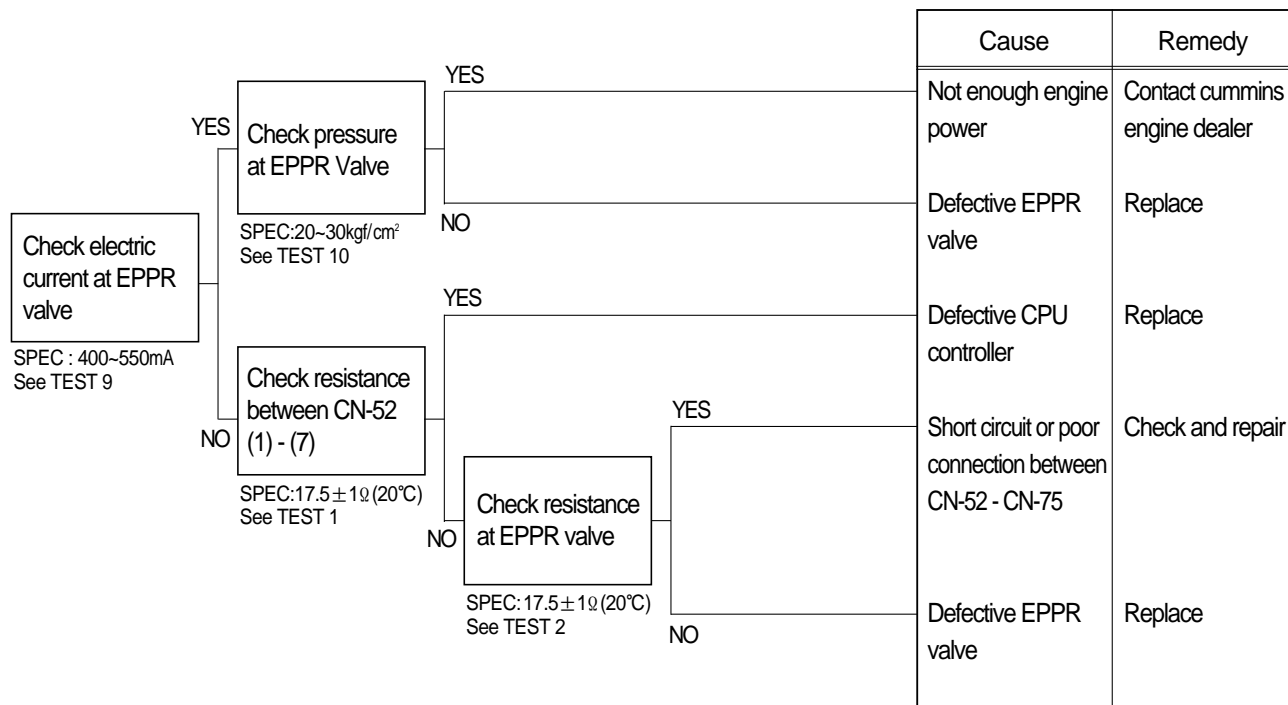
- ① Starting key OFF.
- ② Disconnect connector CD-17 of speed sensor at engine flywheel housing.
- ③ Check resistance as figure.



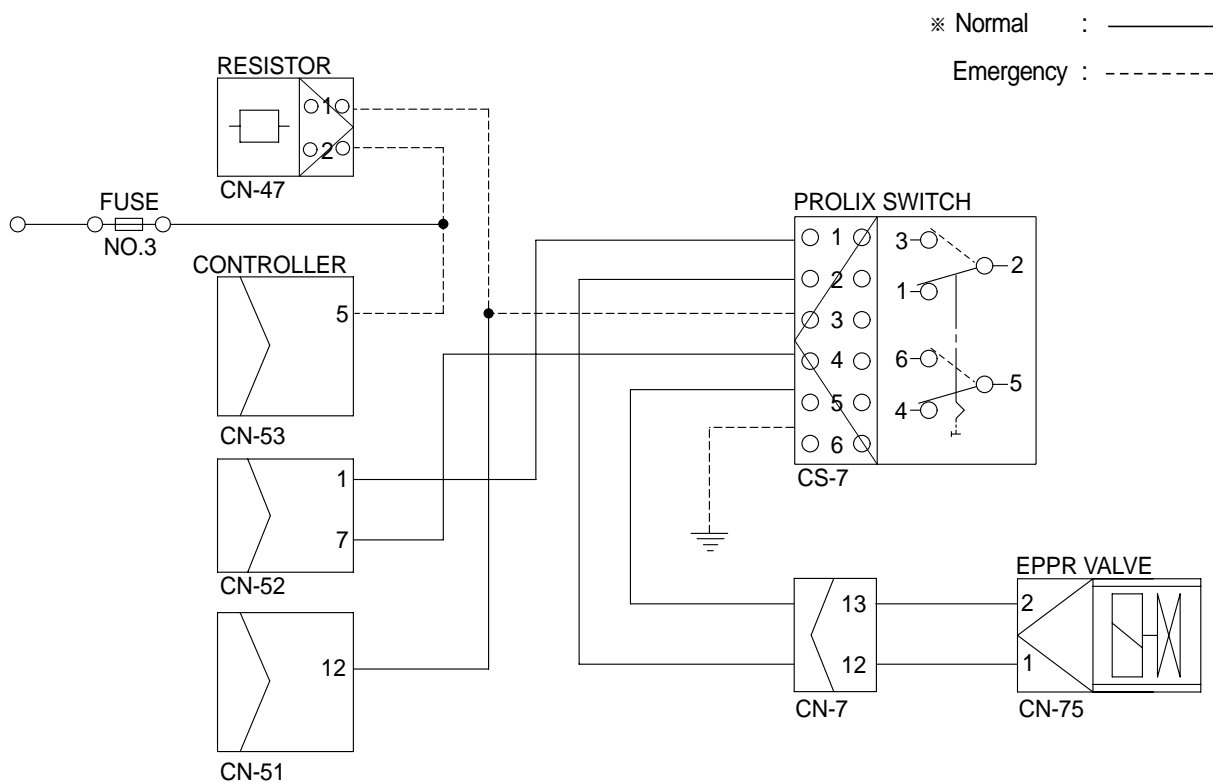
3. ENGINE STALL

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



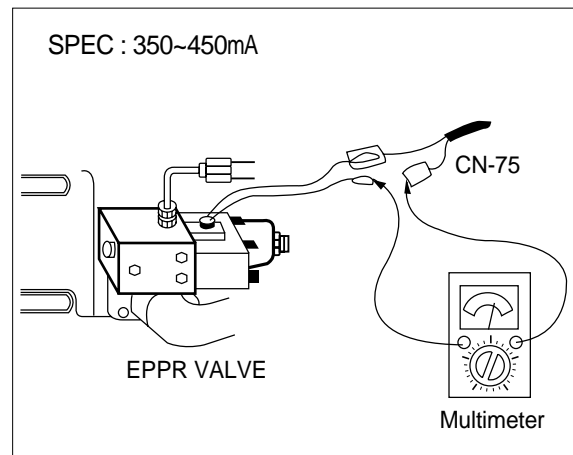
Wiring diagram



2) TEST PROCEDURE

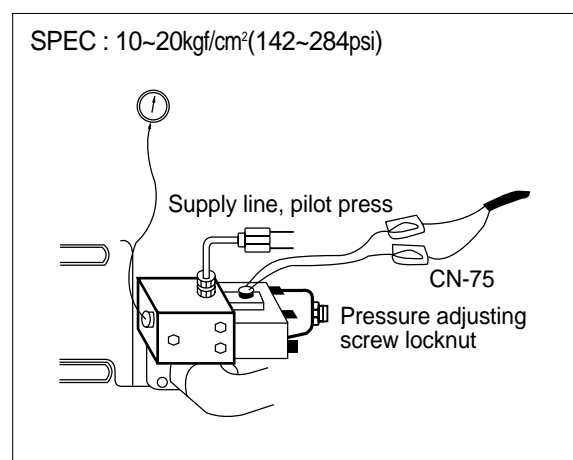
(1) **Test 9** : Check electric current at EPPR valve at F-mode

- ① Install multimeter as figure.
- ② Start engine.
- ③ Set F-mode with 1840 ± 50 rpm.
- ④ Check electric current.



(2) **Test 10** : Check pressure at EPPR valve at F-mode

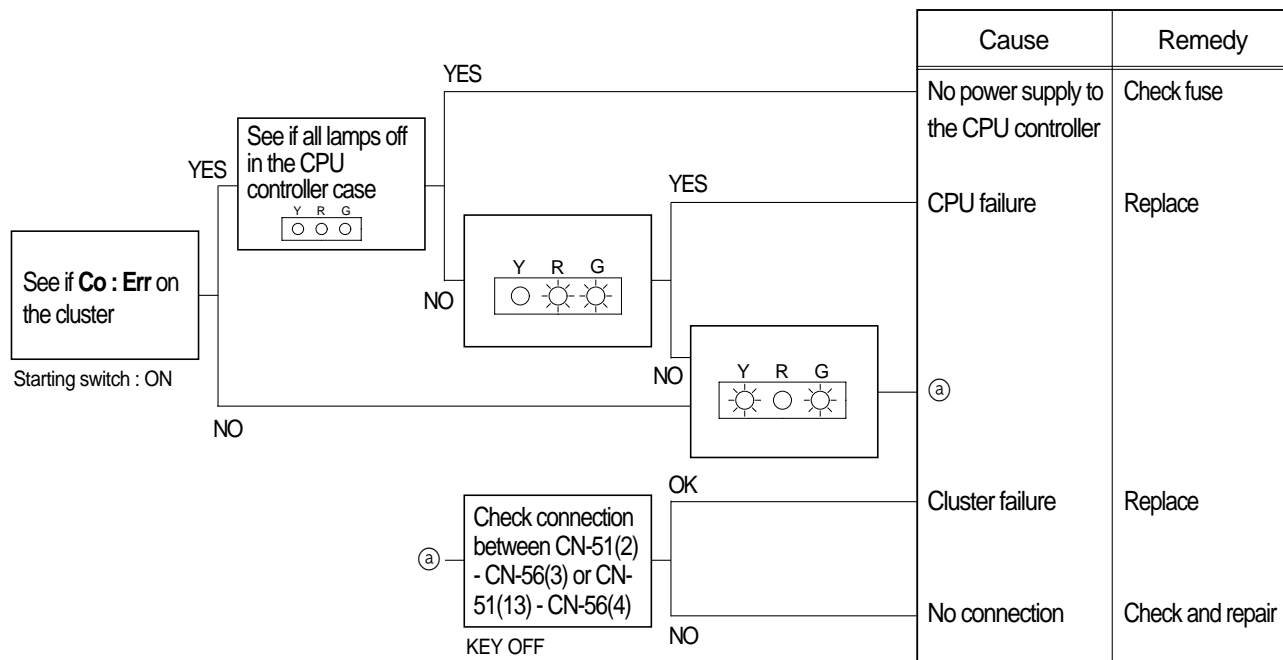
- ① Connect pressure gauge at EPPR valve.
- ② Start engine.
- ③ Set F-mode with 1840 ± 50 rpm.
- ④ Operate bucket lever completely push or pull.
- ⑤ Hold arm lever at the end of stroke.
- ⑥ Check pressure at relief position.



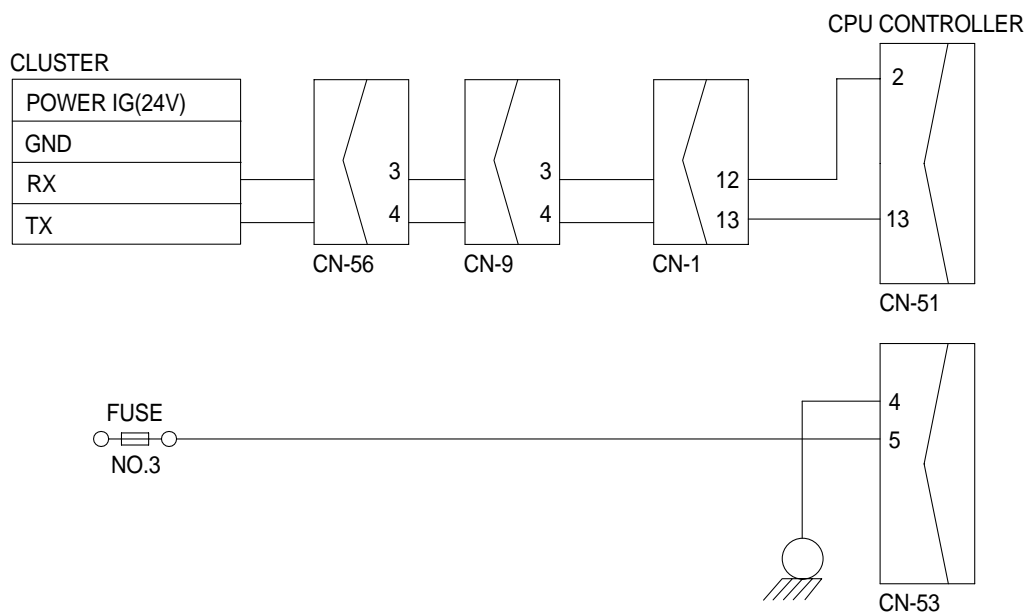
4. MALFUNCTION OF CLUSTER OR MODE SELECTION SYSTEM

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



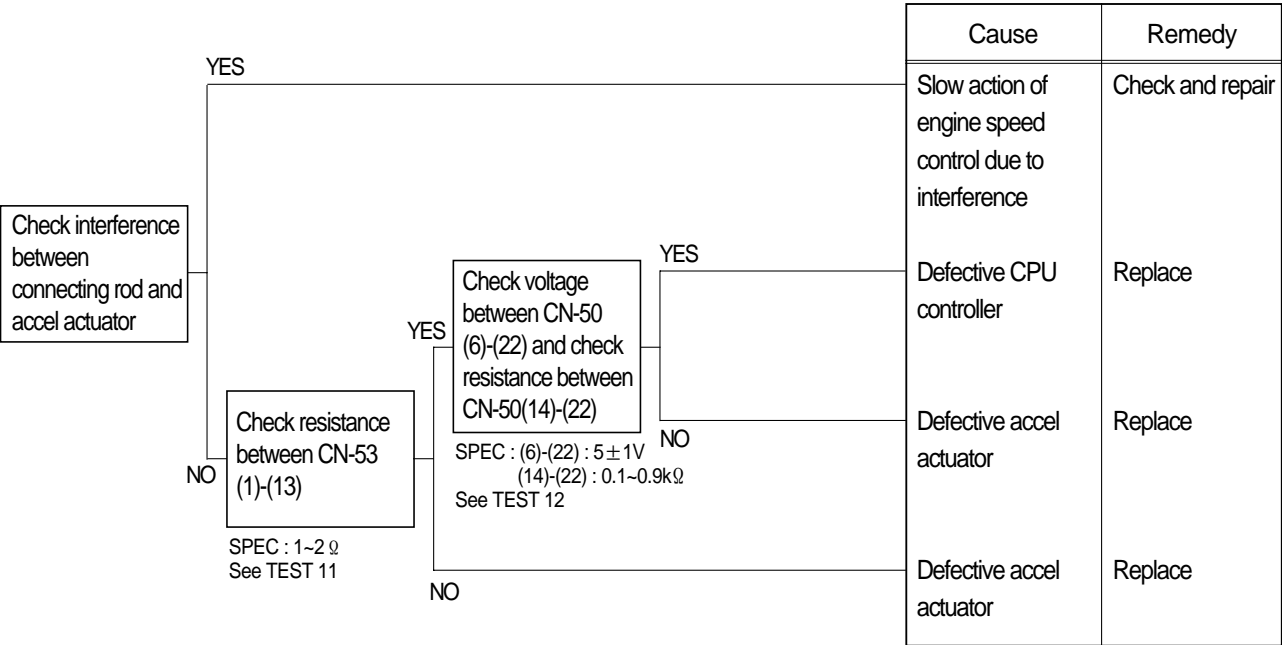
Wiring diagram



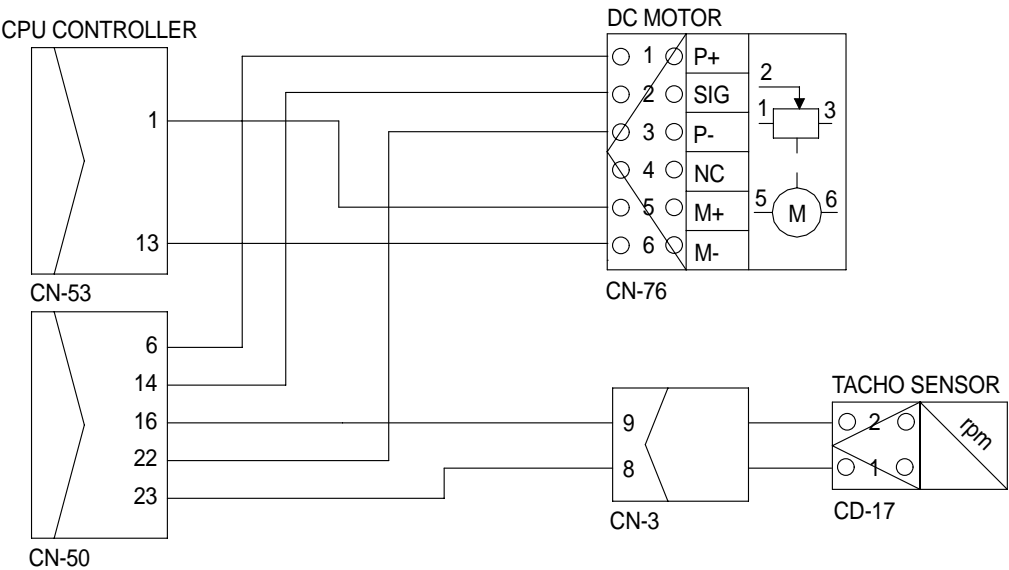
5. SLOW ACTION OF ENGINE SPEED CHANGE WHEN CHANGE THE MODE

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



Wiring diagram

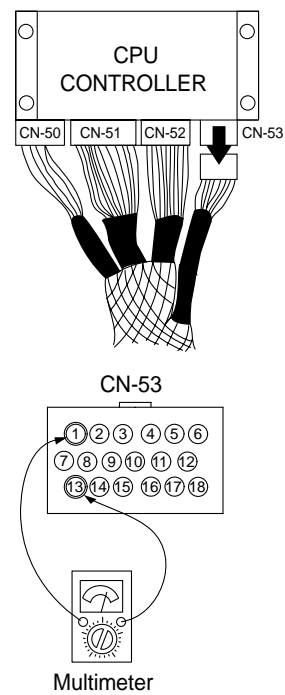


2) TEST PROCEDURE

(1) **Test 11** : Check resistance.

- ① Starting key OFF.
- ② Disconnect connector CN-53 from CPU controller.
- ③ Check resistance between CN-53(1)-(13) as figure.

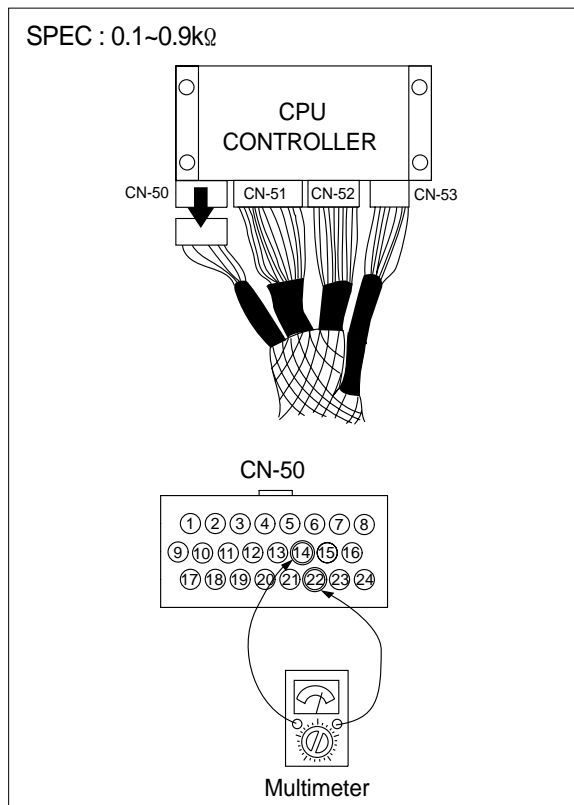
SPEC : 1~2 Ω



(2) **Test 12** : Check voltage and resistance.

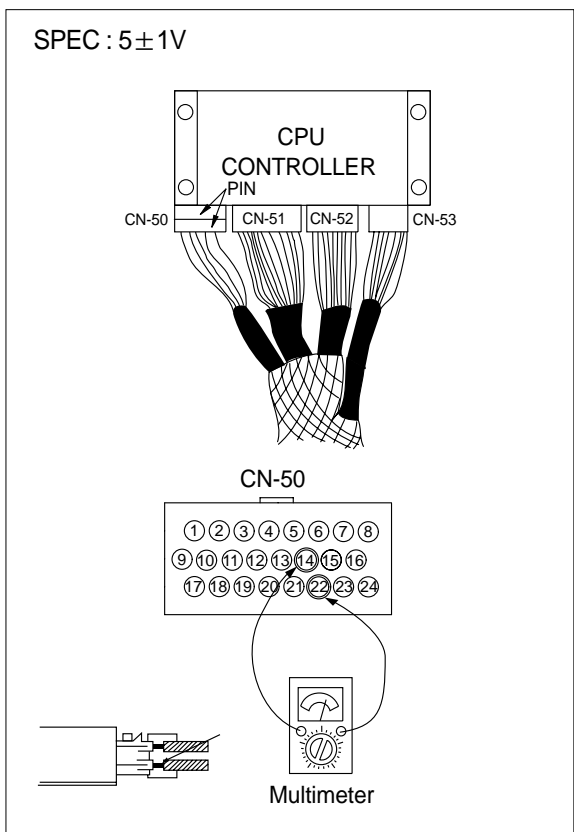
① Check resistance between CN-50(14)-(22).

- Starting key OFF.
- Disconnect connector CN-50 from CPU controller.
- Check resistance value with multimeter as figure.



② Check voltage between CN-50(6) and CN-50(22).

- Prepare 2 pieces of thin sharp pin, steel or copper.
- Starting key ON.
- Insert prepared pins to rear side of connectors : One pin to CN-50(6)
Other pin to CN-50(22)
- Check voltage.



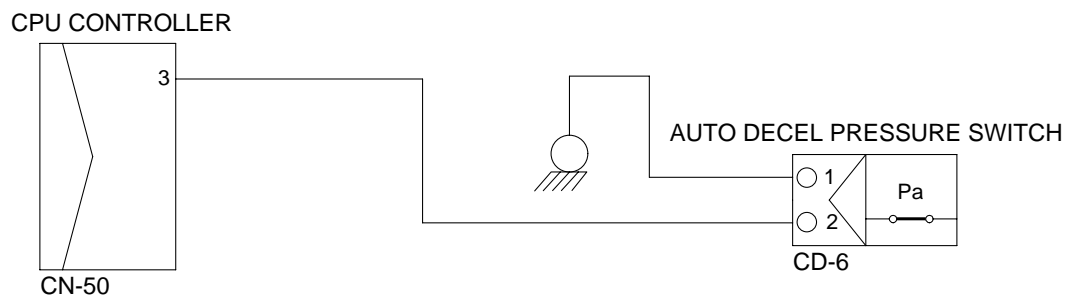
6. AUTO DECEL SYSTEM DOES NOT WORK

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE

		Cause	Remedy
<div>Check voltage between CN-50 (3)-GND</div> <div> SPEC : Actuator operating : 14~15V Actuator stop : 0~1V See TEST 13 </div>	YES	Defective CPU controller	Replace
	NO	Short circuit or poor connection between CN-50(3)-pressure switch	Replace or repair
	NO	Defective auto decel press switch	Repair

Wiring diagram

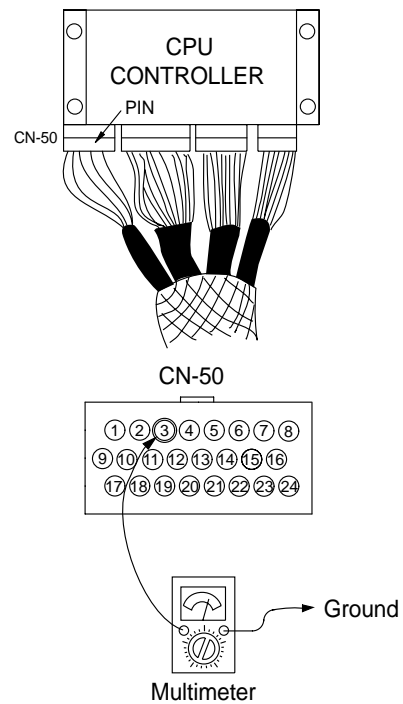


2) TEST PROCEDURE

(1) **Test 13** : Check voltage at CN-51(3) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Starting key ON.
- ③ Insert prepared pin to rear side of connectors : One pin to (3) of CN-50.
- ④ Check voltage as figure.

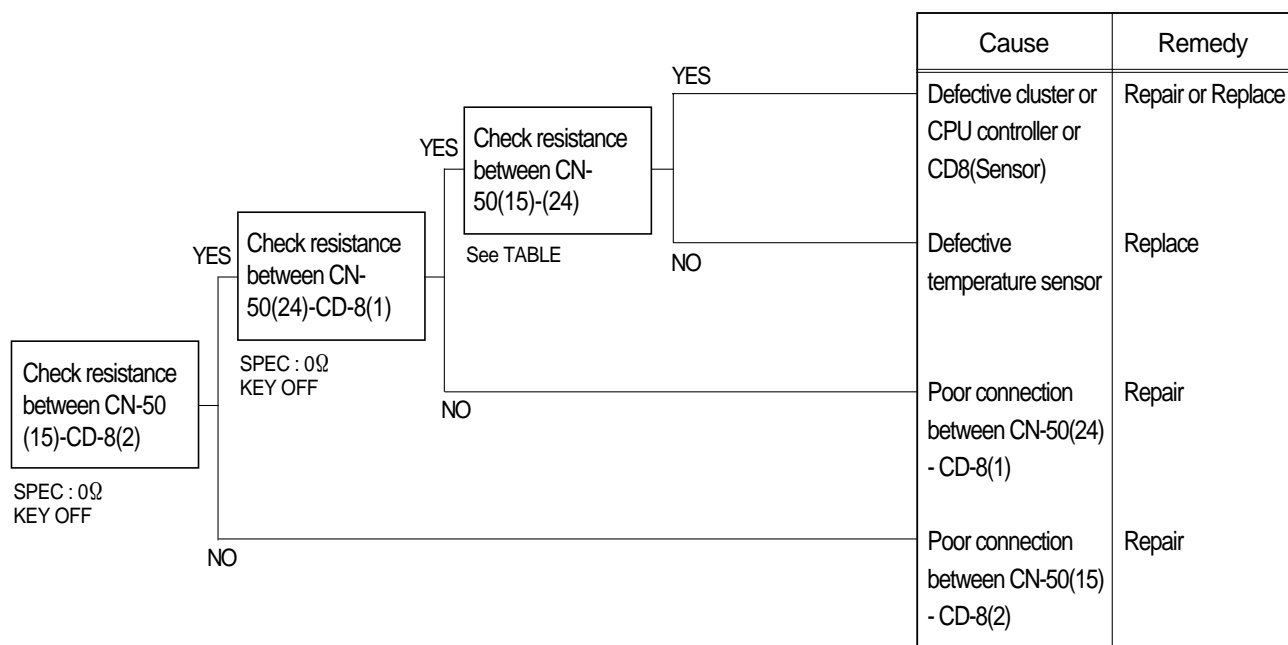
SPEC : Actuator stop : 4.5~5.5V
Actuator operating : 0~2V



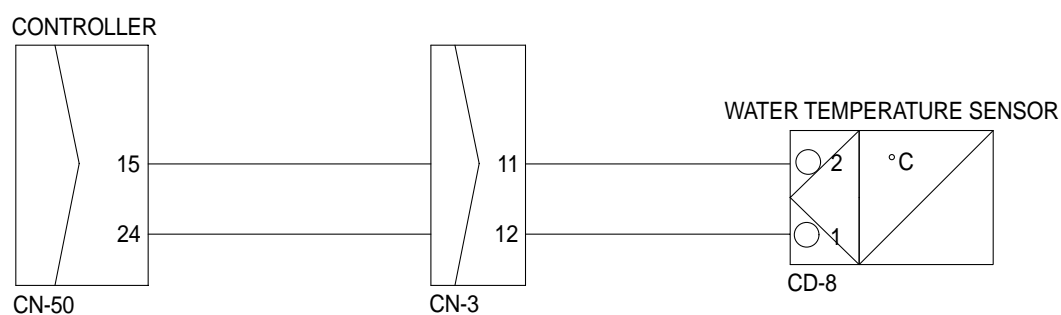
7. MALFUNCTION OF WARMING UP

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



Wiring diagram



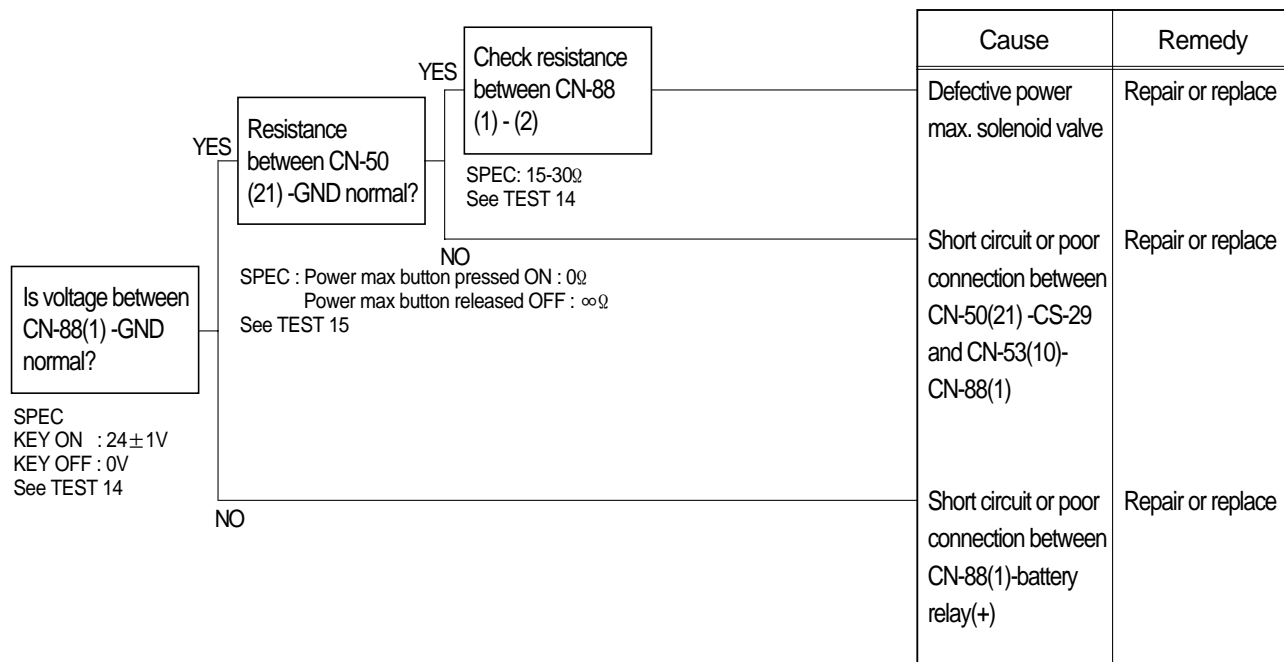
Table

Temp(°C)	-20° C	-10° C	0° C	15° C	30° C
Resistance	15kΩ	9kΩ	5.7kΩ	3kΩ	1.6kΩ
Tolerance	± 1.5kΩ	± 0.9kΩ	± 0.57kΩ	± 0.3kΩ	± 0.16kΩ

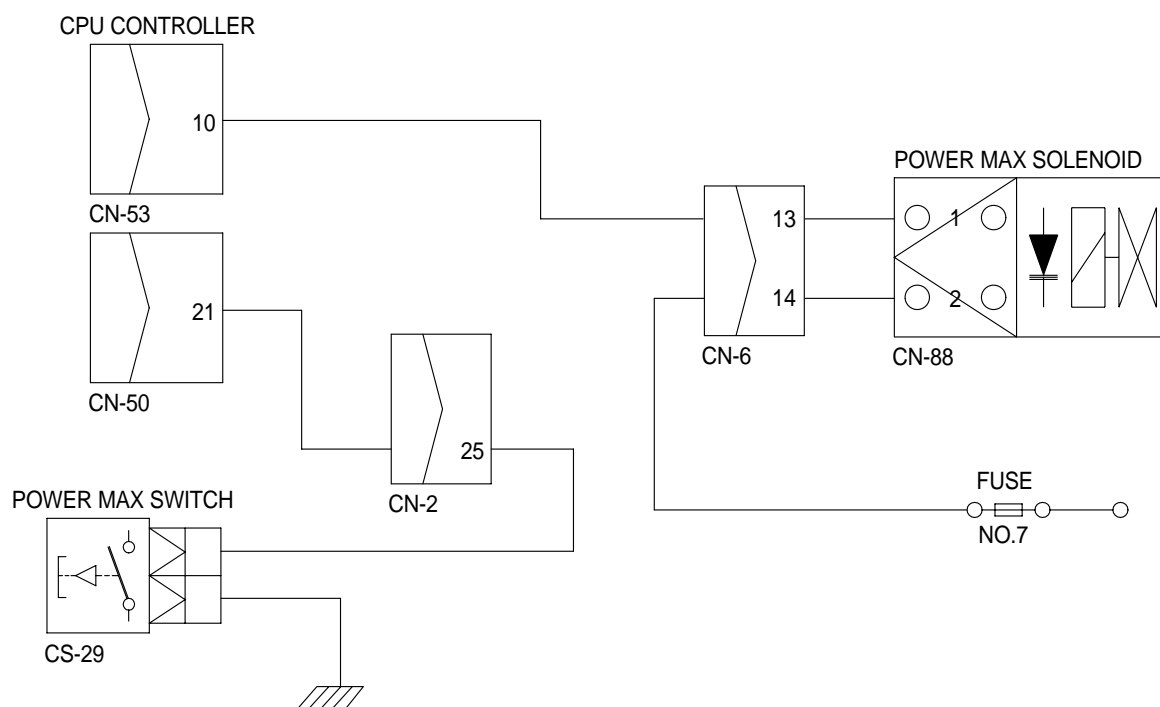
8. MALFUNCTION OF POWER MAX

※ Before carrying out below procedure, check all the related connectors are properly inserted.

1) INSPECTION PROCEDURE



Wiring diagram

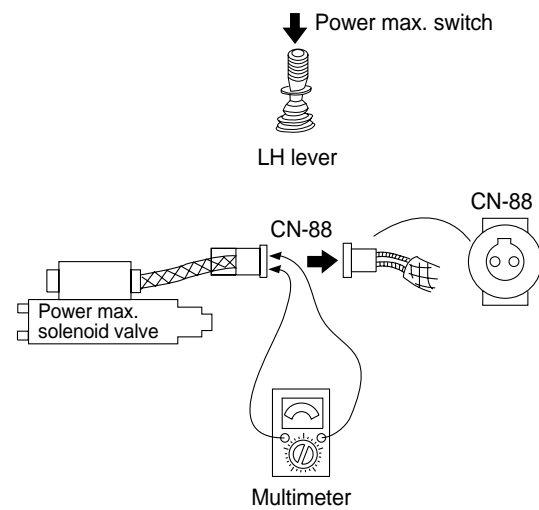


2) TEST PROCEDURE

(1) **Test 14** : Check voltage between connector CN-88 - GND.

- ① Start key ON.
- ② Disconnect connector CN-88 from power max solenoid valve.
- ③ Check voltage as figure.

SPEC : Key ON : $24 \pm 1V$
 Key OFF : 0V
 Resistance : 15~30 Ω



(2) **Test 15** : Check resistance between connector CN-50(21)-GND.

- ① Starting key OFF.
- ② Remove CPU controller and disconnect connector CN-50 from CPU controller.
- ③ Check resistance as figure.

SPEC : Power max button pressed ON : 0 Ω
 Power max button released OFF : $\infty \Omega$

