

GROUP 4 MECHATRONICS SYSTEM

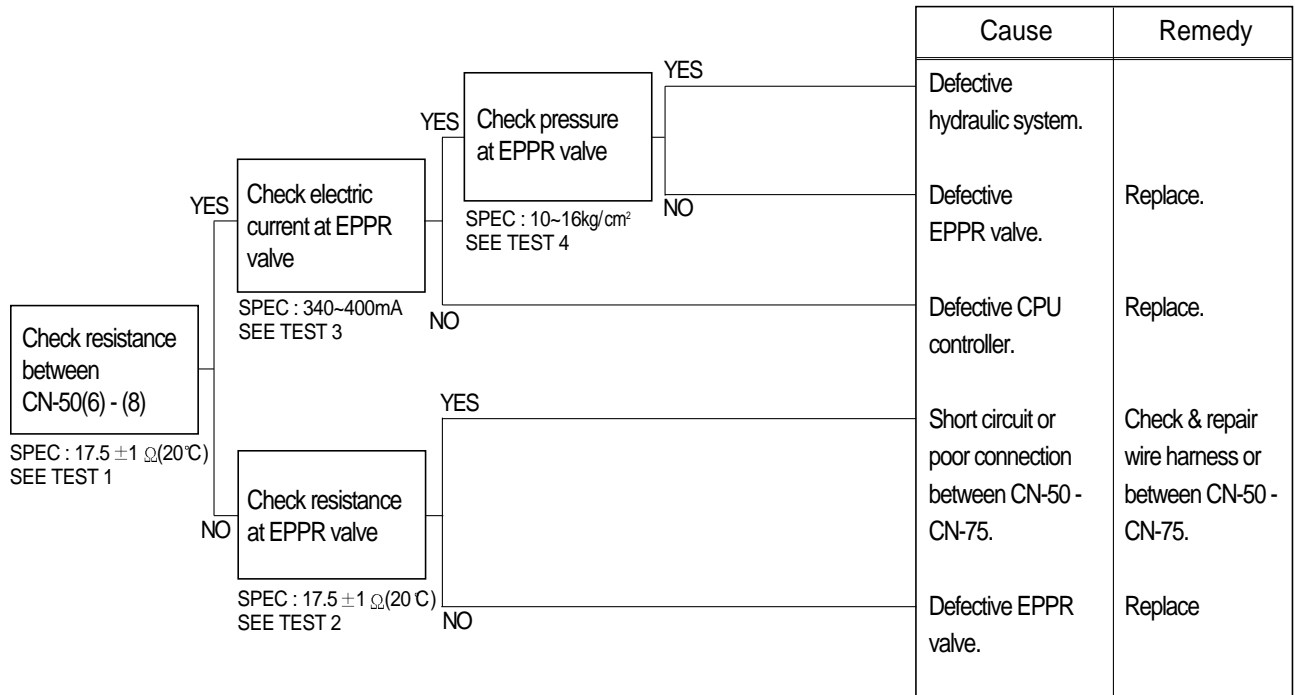
1. ALL SPEED ARE SLOW

※ Boom, arm, bucket, swing and travel but engine speed is good.

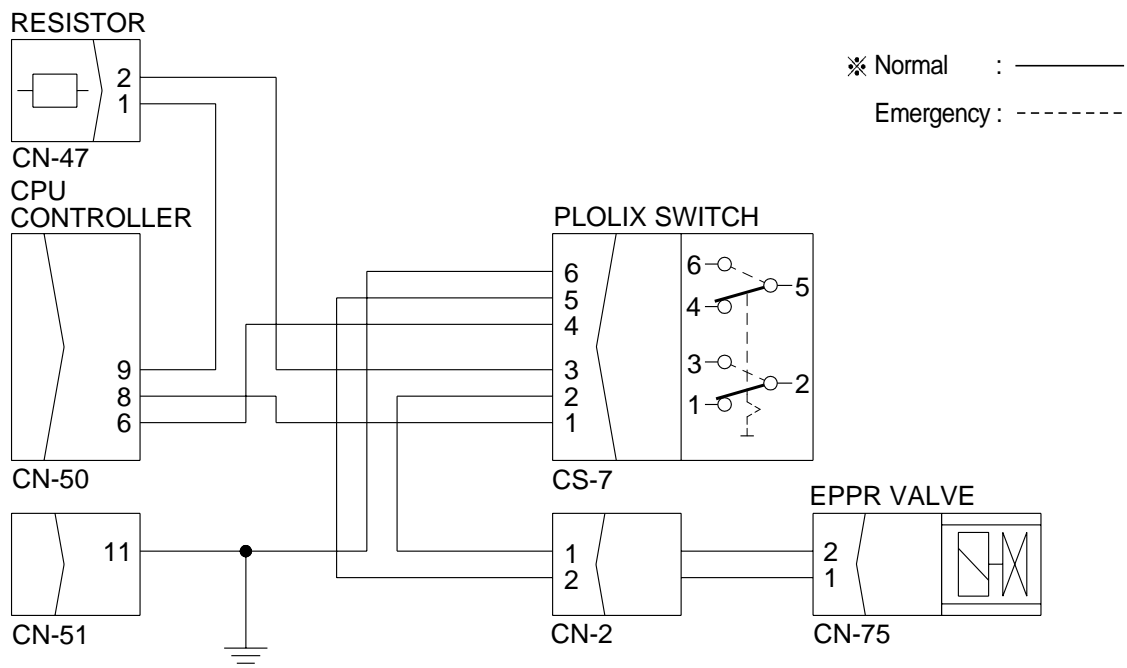
※ Spec : H-mode 2250 +50rpm S-mode 2250 +50rpm
 L-mode 2050 +50rpm F-mode 1850 +50rpm

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

1) INSPECTION PROCEDURE



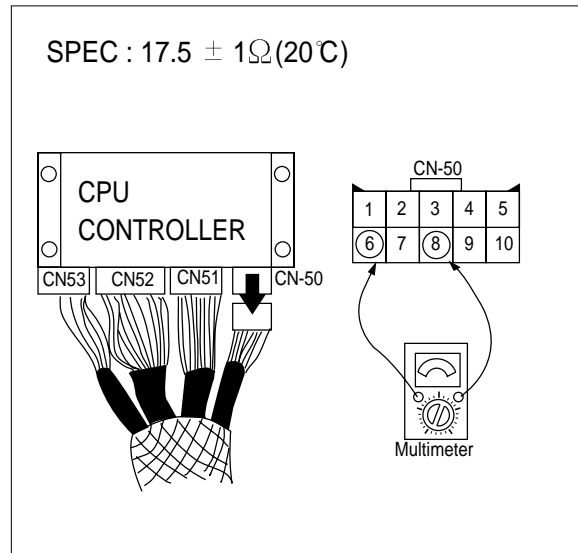
Wiring diagram



2) TEST PROCEDURE

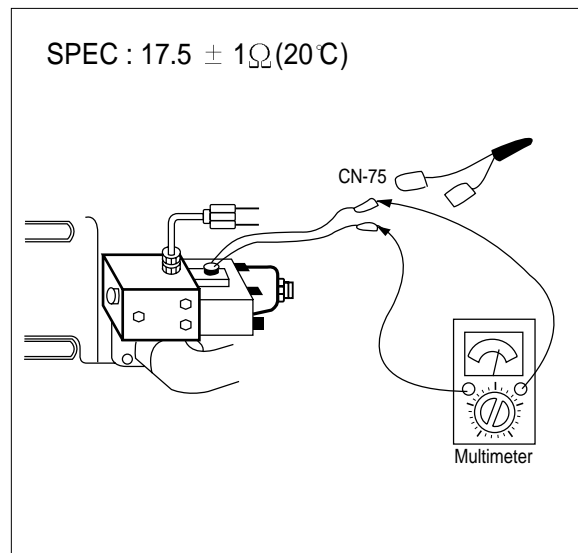
(1) **Test 1** : Check resistance at connector CN-50(6)-(8).

- ① Starting key OFF.
- ② Remove CPU controller and disconnect connector CN-50.
- ③ Check resistance between pin and at connector CN-50(6)-(8).



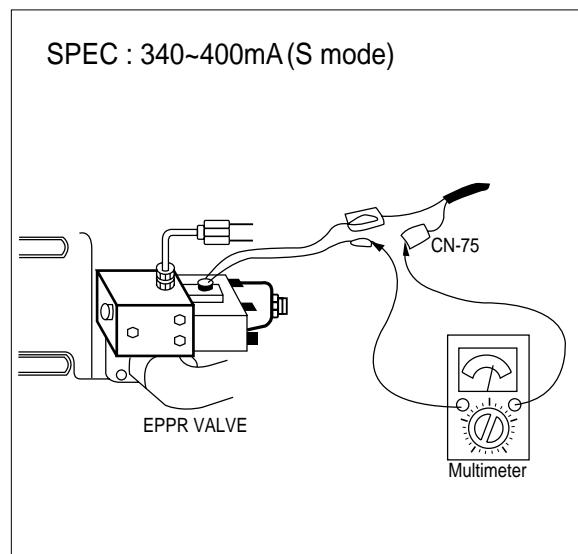
(2) **Test 2** : Check resistance at connector CN-75.

- 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 2250+50rpm, Check electric current.



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

① Remove plug and connect pressure gauge as figure.

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

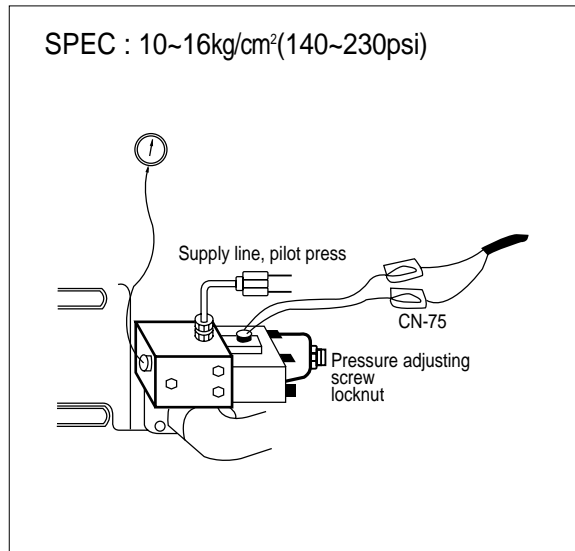
② Start engine.

③ Set S-mode and cancel auto decel mode.

④ If tachometer show approx. 2250+50rpm, check pressure.

⑤ If pressure is not correct, adjust it.

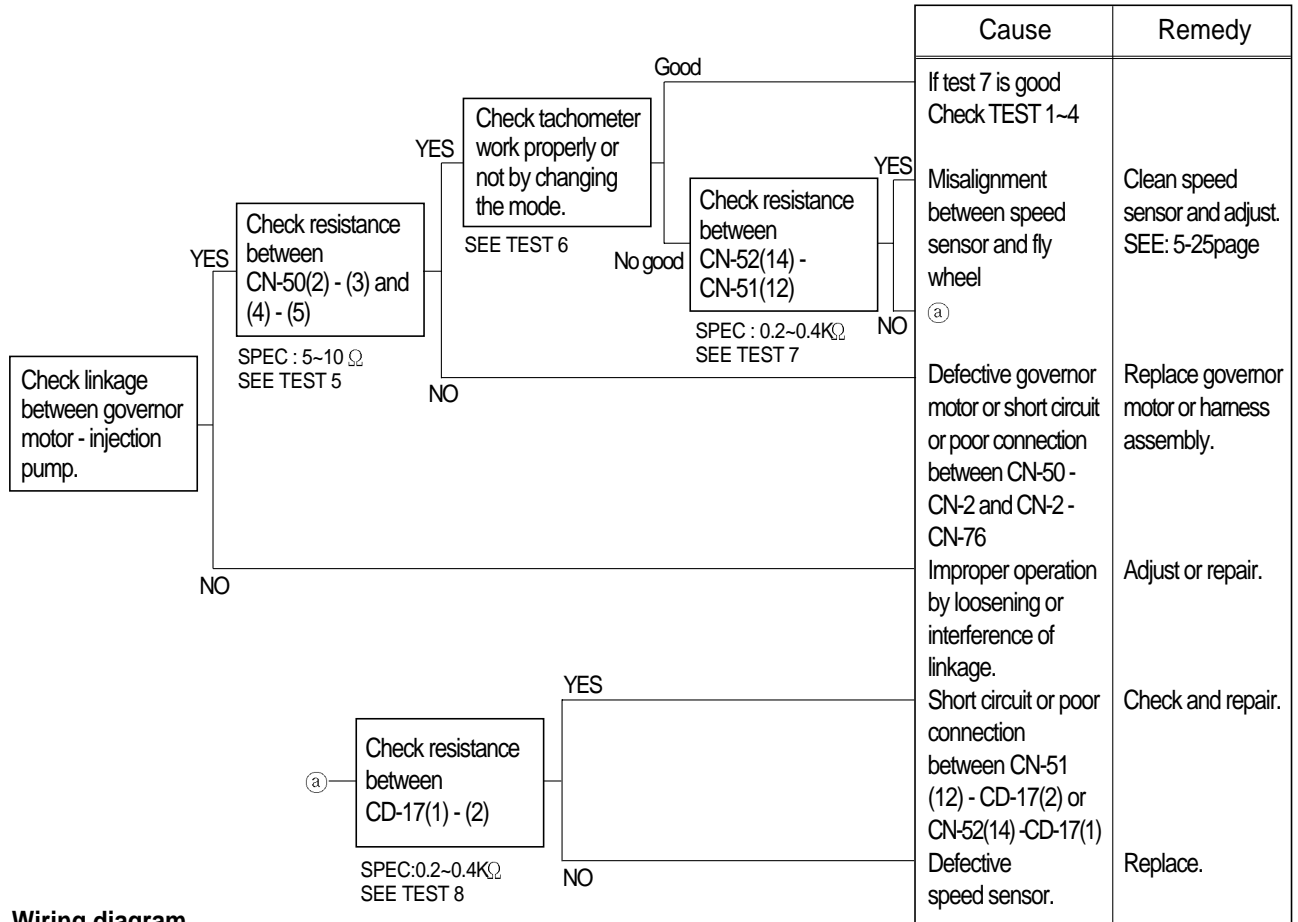
⑥ After adjust, test the machine.



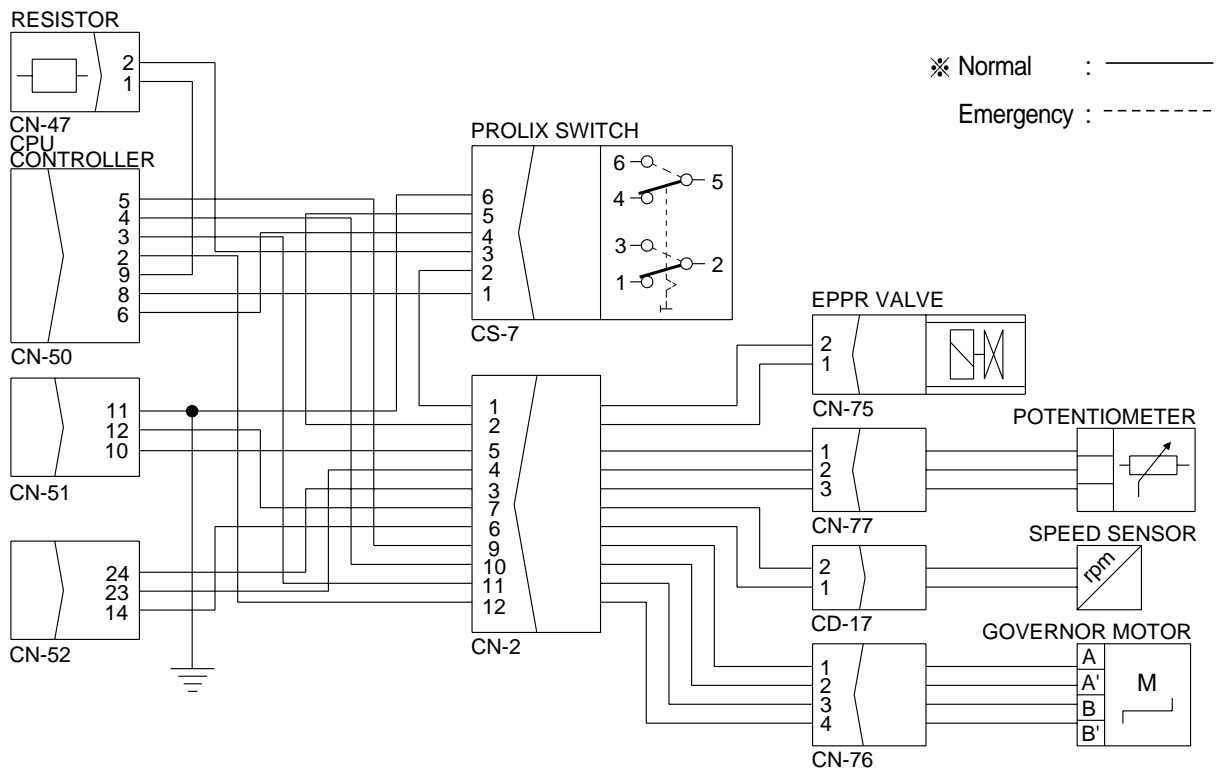
2. ENGINE SPEED IS SLOW AT ALL MODE

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

1) INSPECTION PROCEDURE



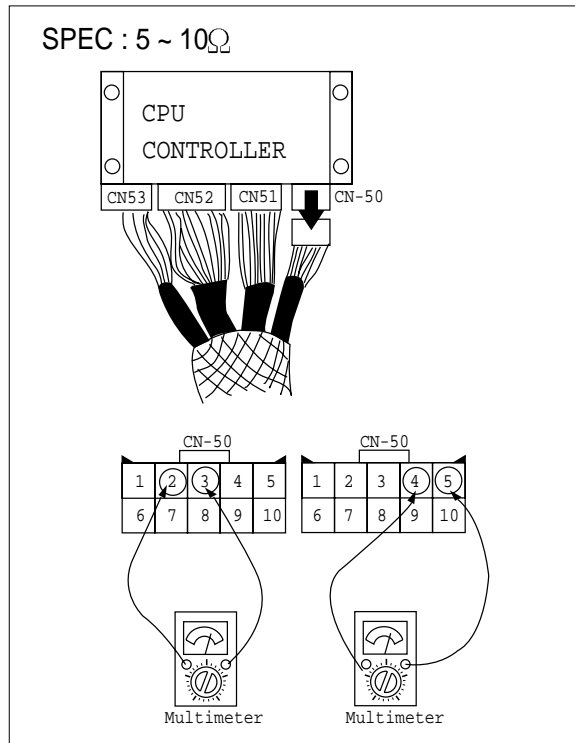
Wiring diagram



2) TEST PROCEDURE

(1) **Test 5** : Check resistance between CN-50(2)-(3) and CN-50(4)-(5).

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



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

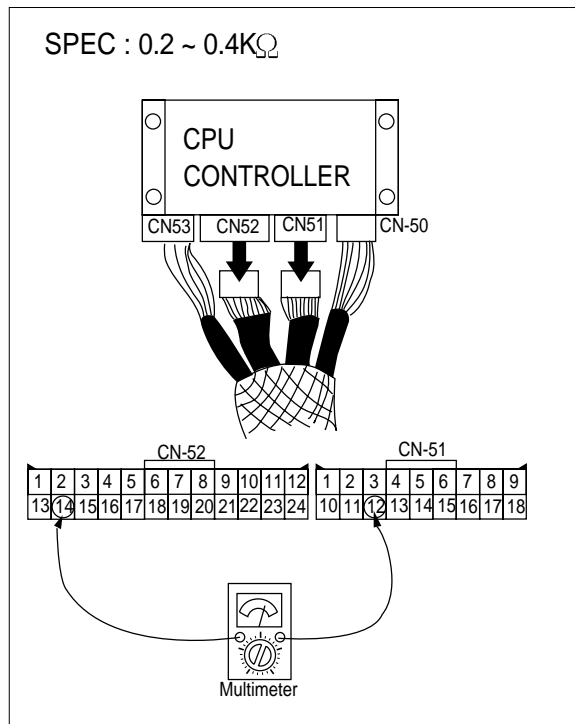
- ① Start engine.
- ② Check tachometer reading.

unit : rpm

Spec		Remark
H-mode	2250+50rpm	Check rpm after cancel the auto decel mode.
S-mode	2250+50rpm	
L-mode	2050+50rpm	
F-mode	1850+50rpm	

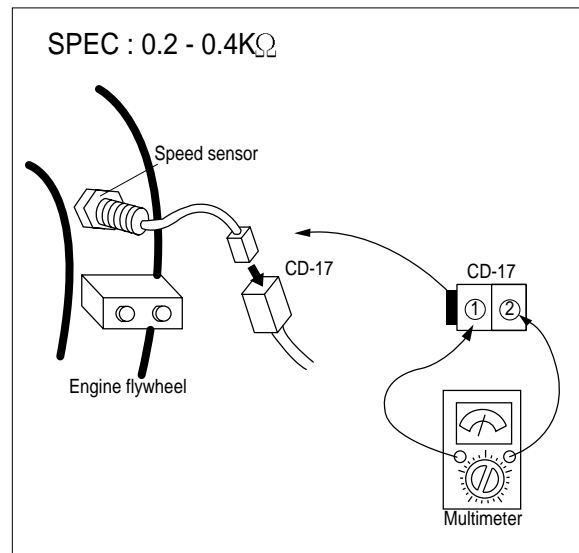
(3) **Test 7** : Check resistance between CN-52(14) and CN-51(12).

- ① Starting key OFF.
- ② Remove CPU controller and disconnect connector CN-51 and CN-52 from CPU controller.
- ③ Check resistance as figure.



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

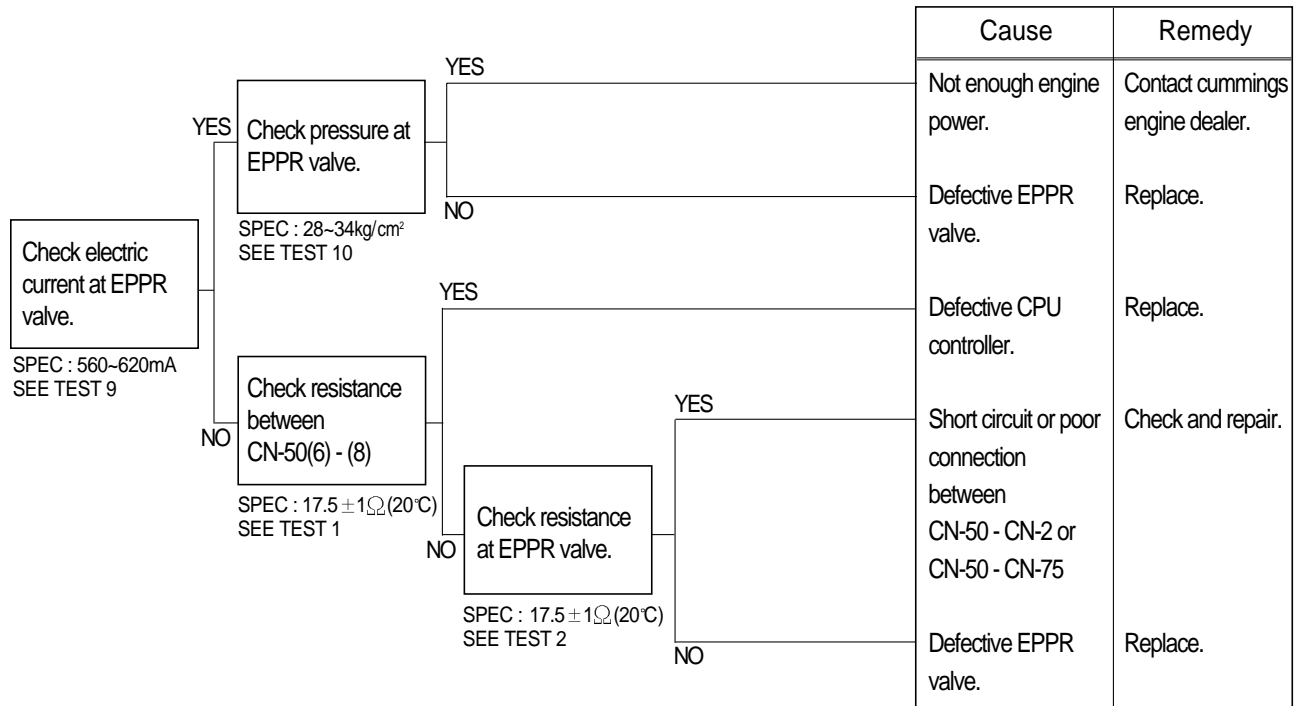
- ① Starting key OFF.
- ② Disconnect connector CD-17 of speed sensor at engine flywheel housing.
- ③ Check resistance as figure.



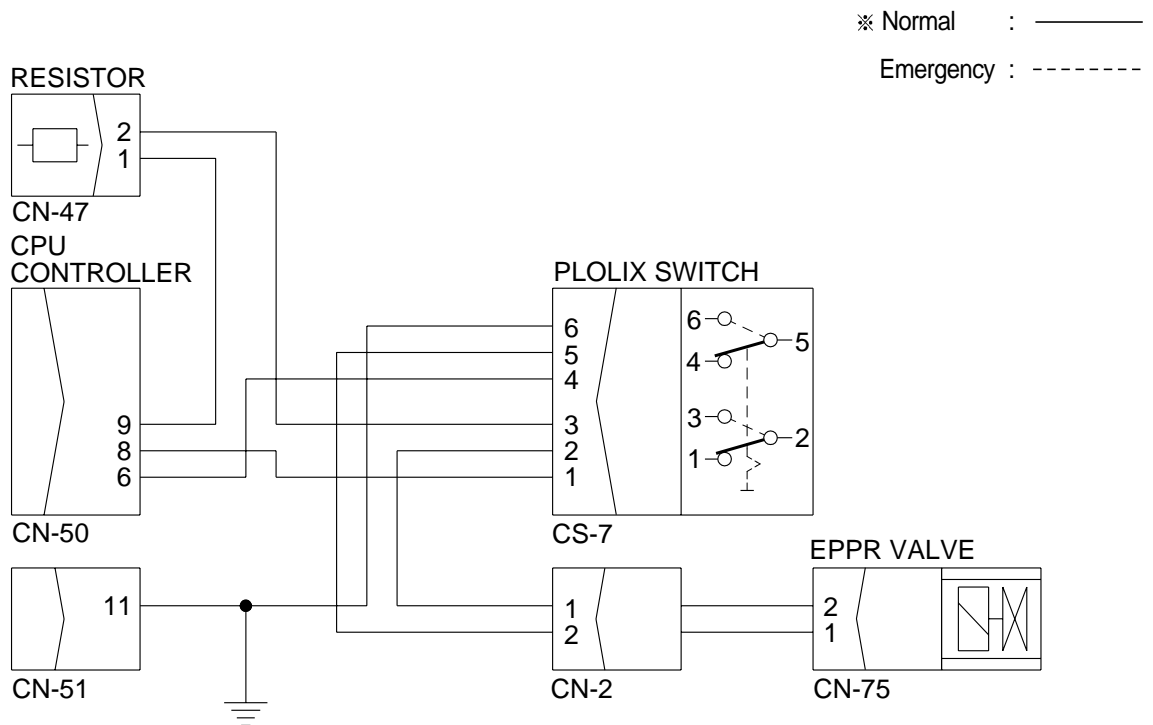
3. ENGINE STALL

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

1) INSPECTION PROCEDURE



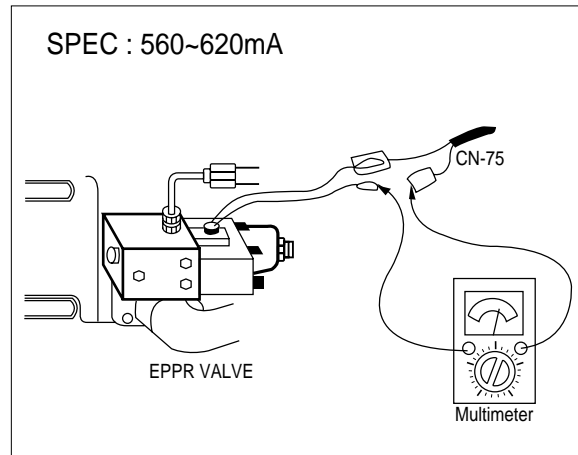
Wiring diagram



2) TEST PROCEDURE

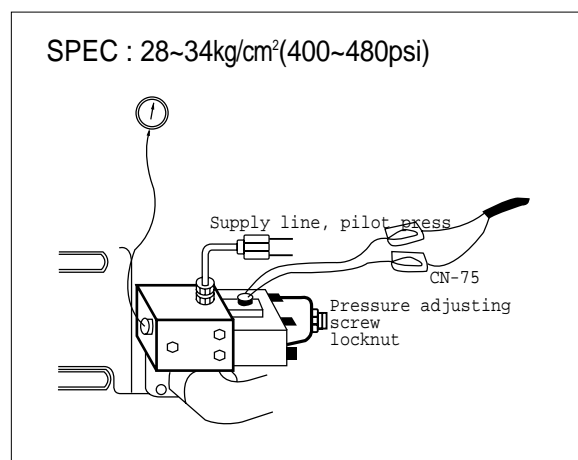
(1) **Test 9** : Check electric current at EPPR valve at F-mode

- ① Install multimeter as figure.
- ② Start engine.
- ③ Set F-mode with 1850+50rpm
- ④ Check electric current.



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

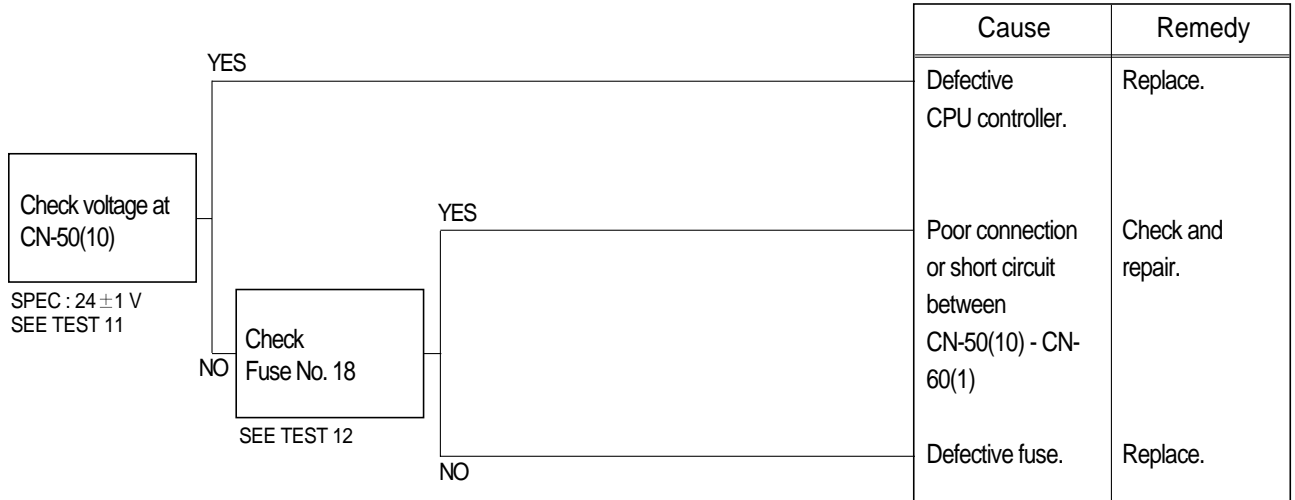
- ① Connect pressure gauge at EPPR valve.
- ② Start engine.
- ③ Set F-mode with 1850+50rpm
- ④ Operate bucket lever completely push or pull.
- ⑤ Hold arm lever at the end of stroke.
- ⑥ Check pressure at relief position.



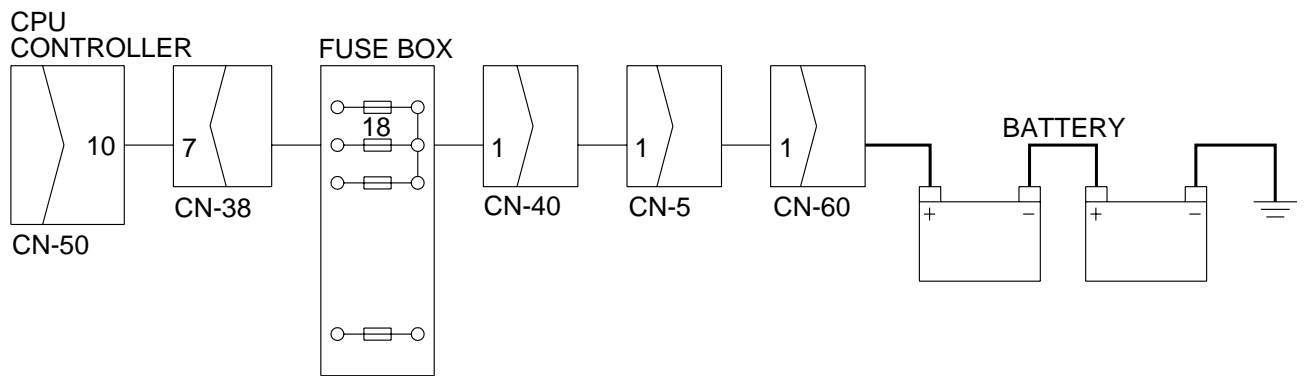
4. CLUSTER LAMPS ARE OFF IMMEDIATELY AFTER KEY SWITCH OFF

※ Before carrying out below procedure, check all the related connector are properly inserted.
 Normal condition : Lamps ON approx. 3-12 second after key switch OFF.

1) INSPECTION PROCEDURE



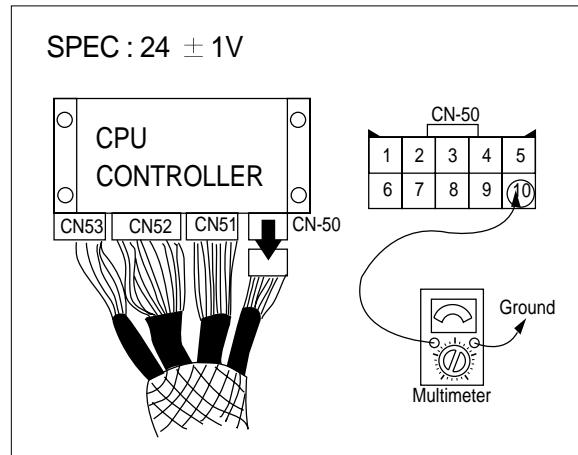
Wiring diagram



2) TEST PROCEDURE

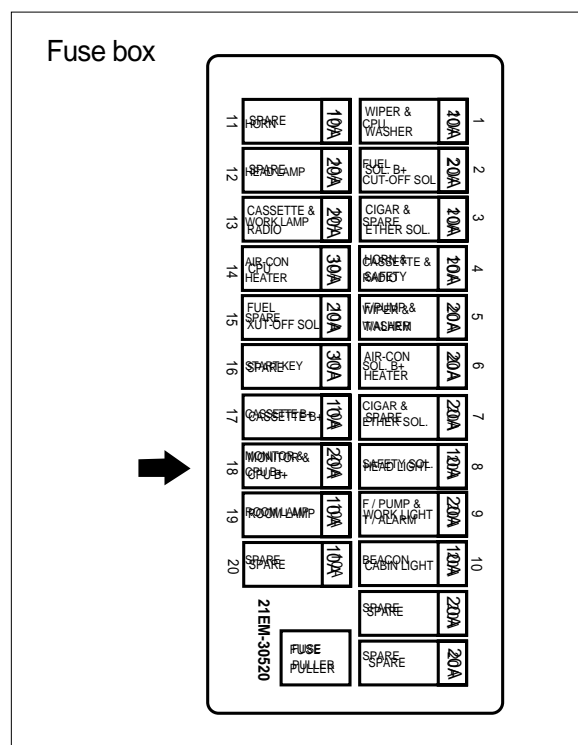
(1) **Test 11** : Check voltage at CN-50(10).

- ① Starting key OFF.
- ② Disconnect connector CN-50 from CPU controller.

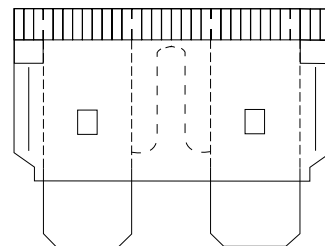


(2) **Test 12** : Check fuse at fuse box(18).

- ① Starting key OFF.
- ② Selecting the fuse at fuse box(18).
- ③ Check if the fuse is defective or not.



SPEC : 20A

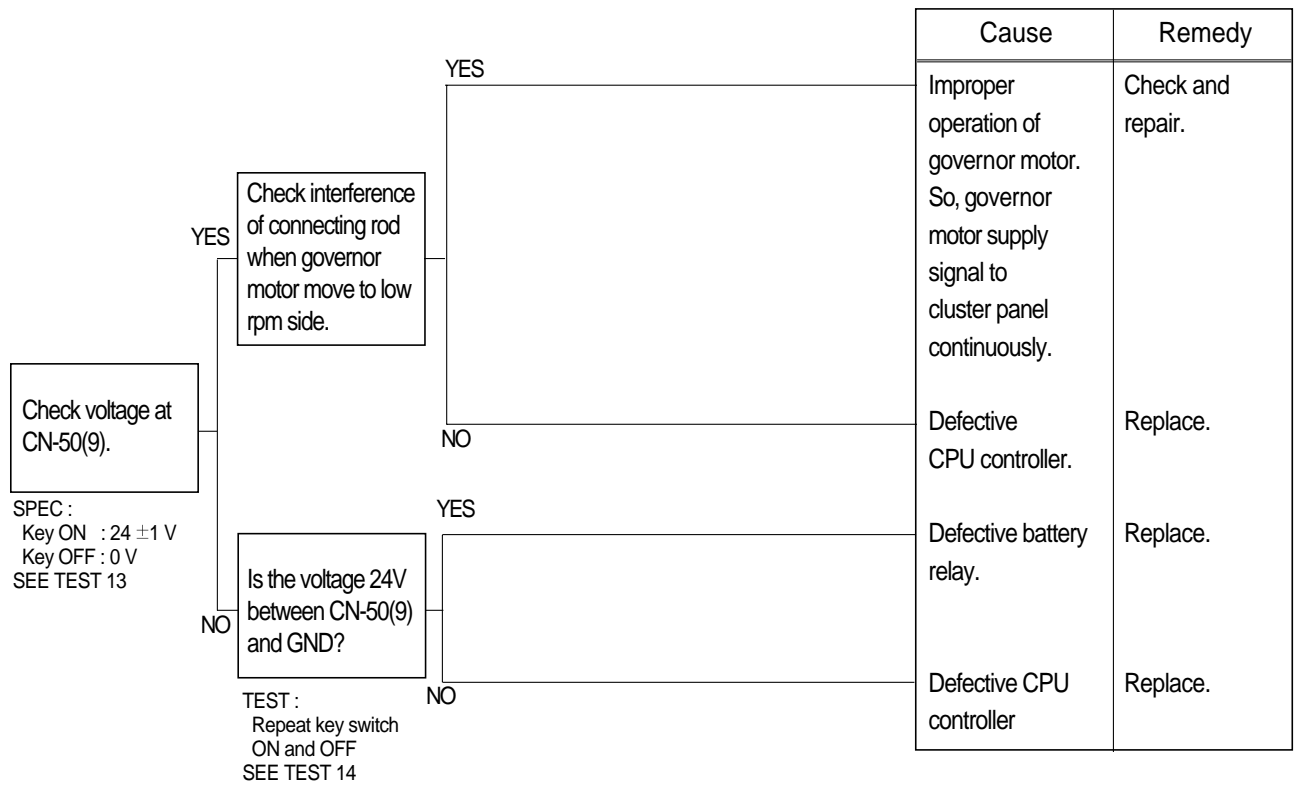


Fuse No. 18 for CPU B⁺

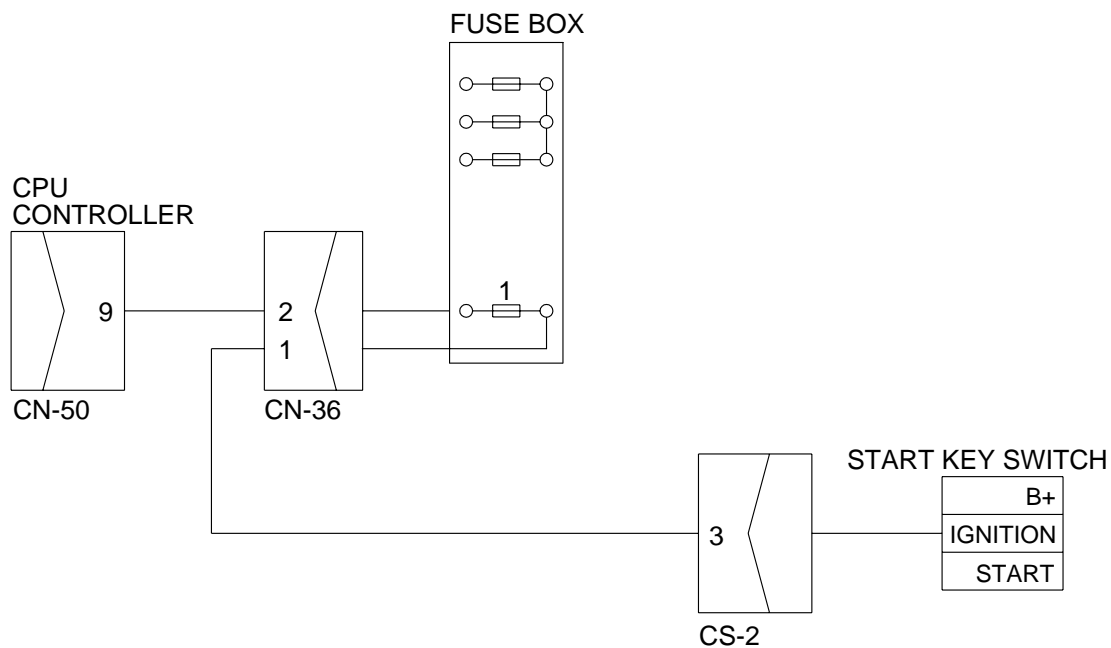
5. CLUSTER LAMPS ARE STILL ON AFTER STARTING KEY OFF

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

1) INSPECTION PROCEDURE



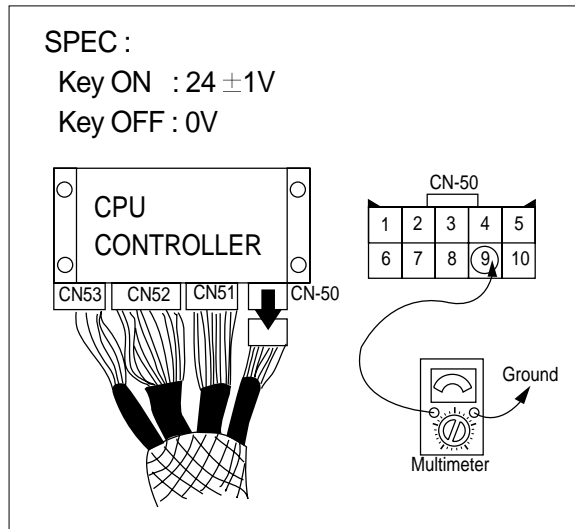
Wiring diagram



2) TEST PROCEDURE

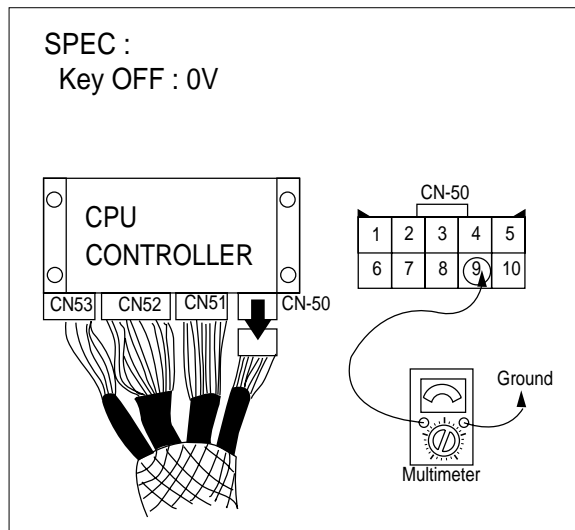
(1) **Test 13** : Check voltage at CN-50(9).

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



(2) **Test 14** : Check operating status of main power supply at CN-50(9).

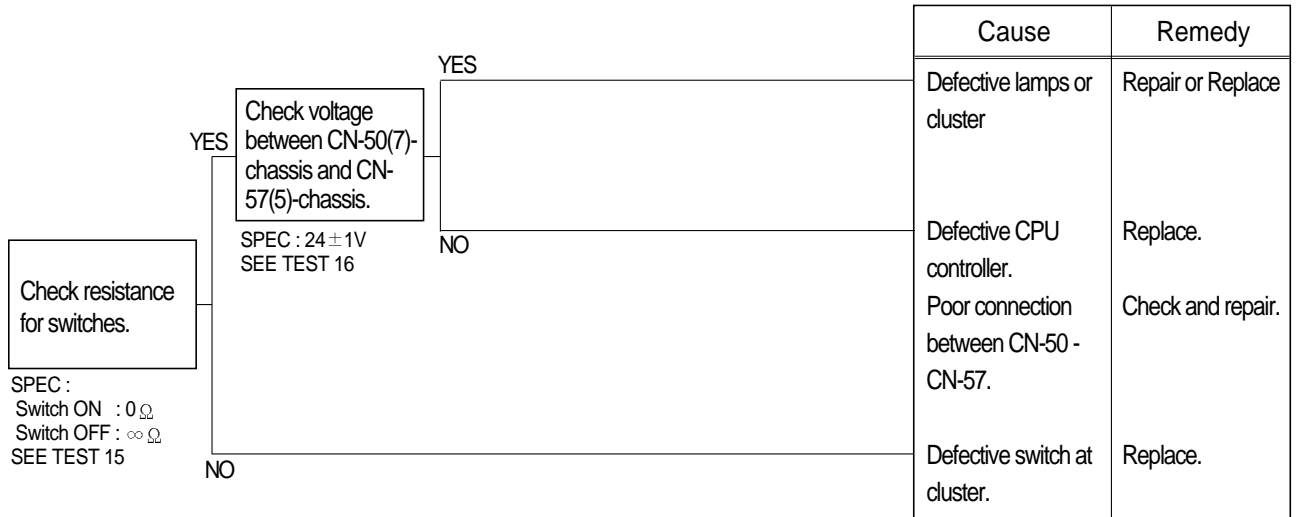
- ① Starting key ON.
 - ② Disconnect CN-50 from CPU controller.
 - ③ Check if the voltage remains at $24 \pm 1V$ inspire of operating key switch ON and OFF.
- ※ If there is certain amount of voltage, replace CPU controller.



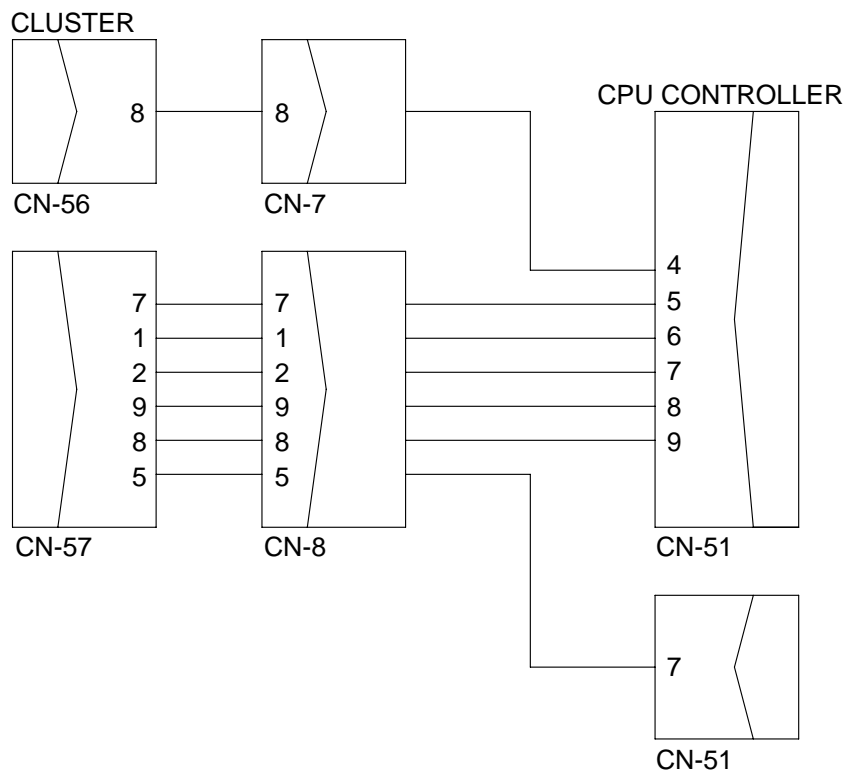
6. MALFUNCTION OF CLUSTER OR MODE SELECTION SYSTEM

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

1) INSPECTION PROCEDURE



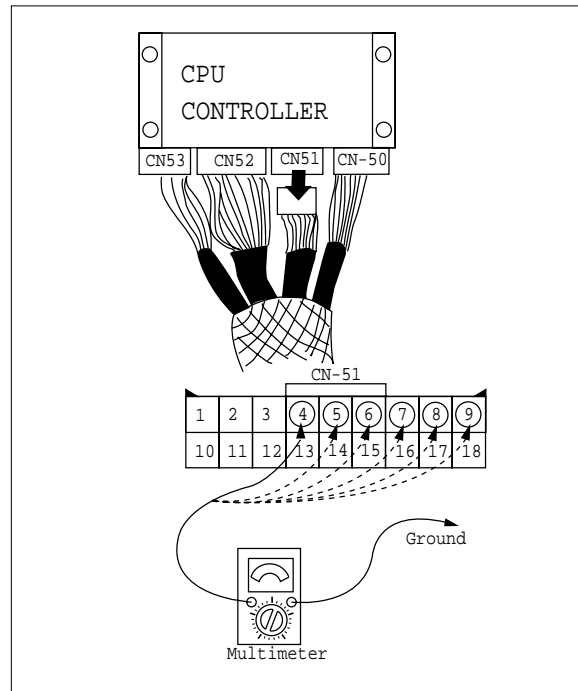
Wiring diagram



2) TEST PROCEDURE

(1) **Test 15** : Check resistance for switches.

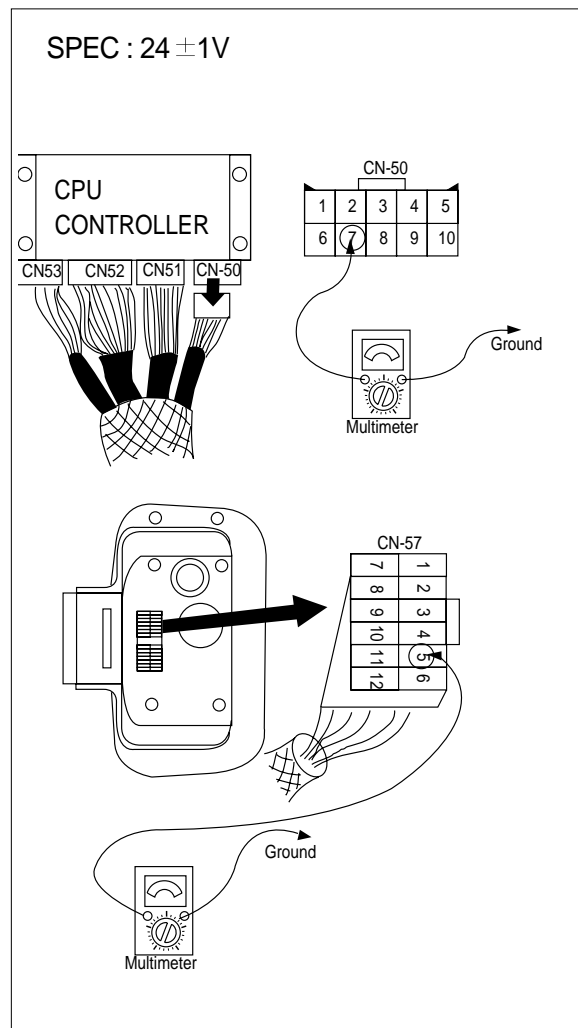
- ① Starting key OFF.
- ② Disconnect connector CN-51 from CPU controller.
- ③ Check resistance as figure.



(2) **Test 16** : Check voltage for CN-50, CN-57.

- CN-50:Output power(24 ± 1 volt)
- CN-57:Input power(24 ± 1 volt)

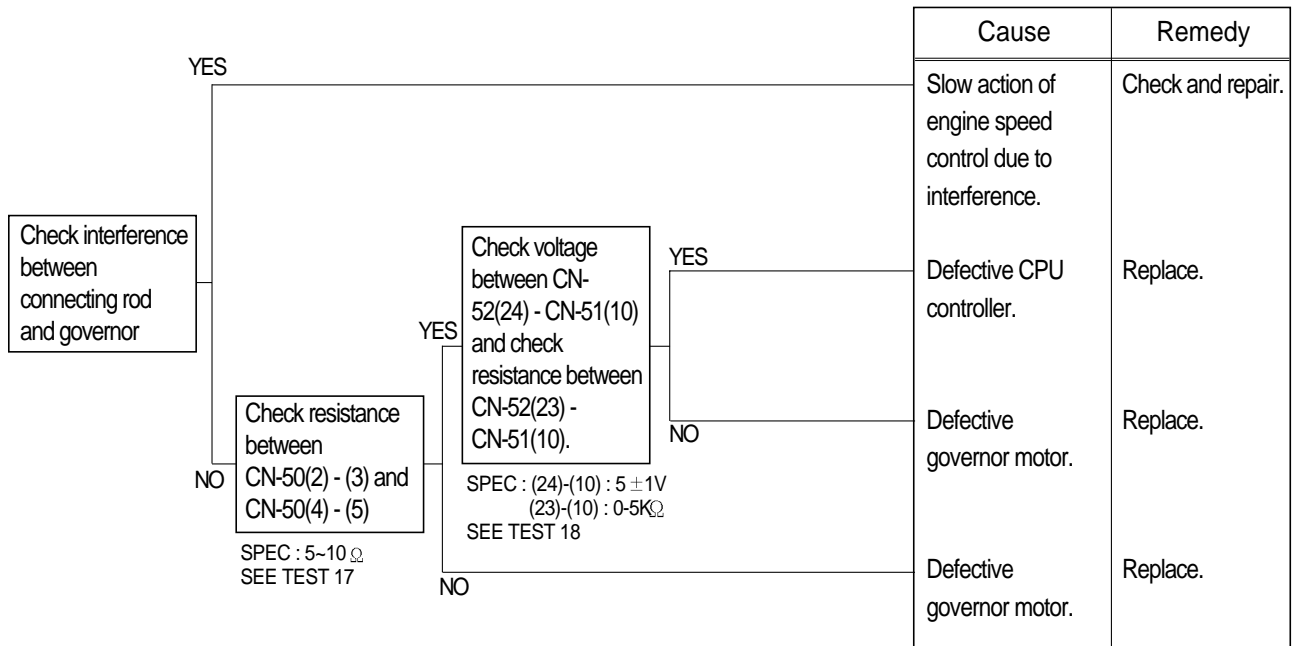
- ① Starting key ON.
- ② Remove cluster from panel.
- ※ Don't disconnect connector CN-50 from CPU controller.
- ③ Disconnect connector CN-57 from cluster.
- ④ Check voltage CN-50,CN-57 with ground as figure.



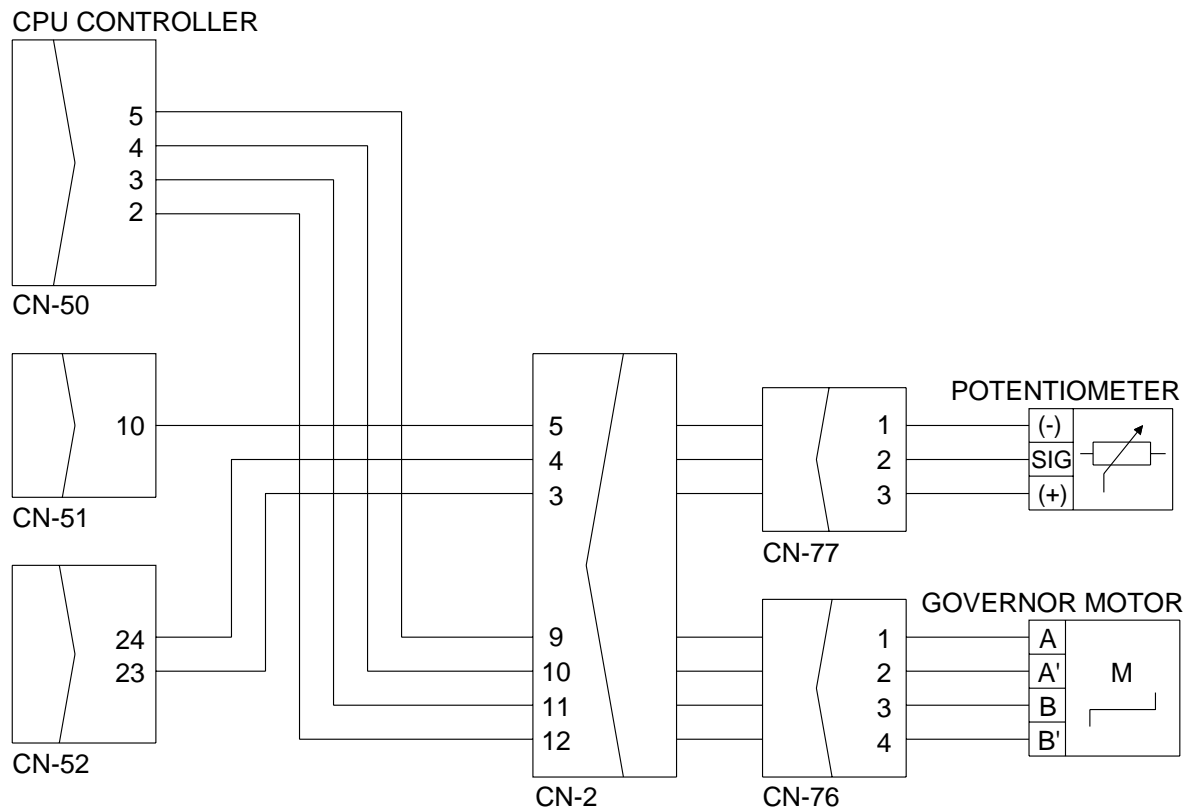
7. SLOW ACTION OF ENGINE SPEED CHANGE WHEN CHANGE THE MODE

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

1) INSPECTION PROCEDURE



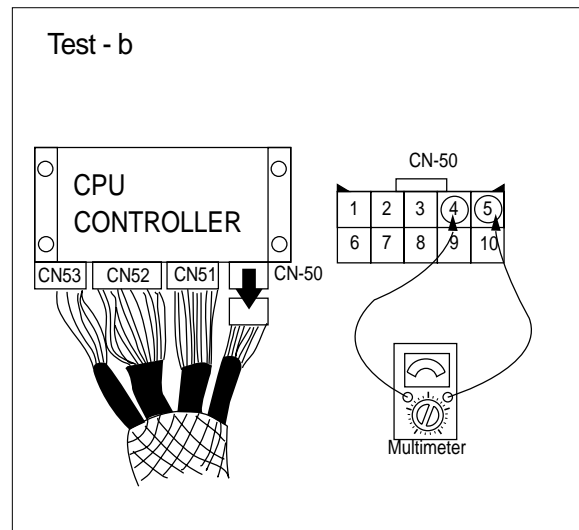
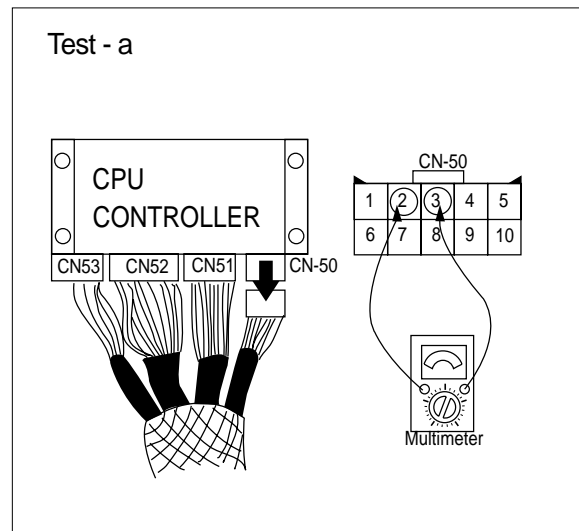
Wiring diagram



2) TEST PROCEDURE

(1) **Test 17** : Check resistance.

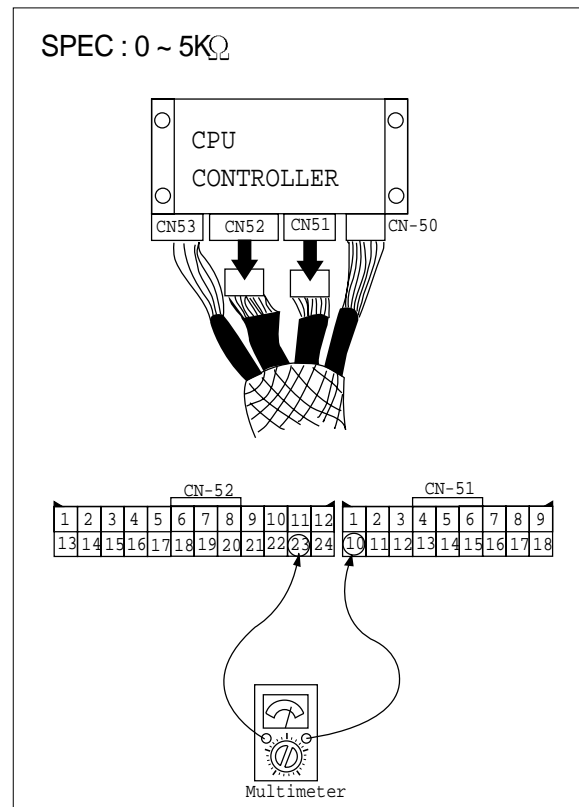
- ① Starting key OFF.
- ② Disconnect connector CN-50 from CPU controller.
- ③ Check resistance between CN-50(2)-(3), CN-50(4)-(5) as figure.



(2) **Test 18** : Check voltage and resistance.

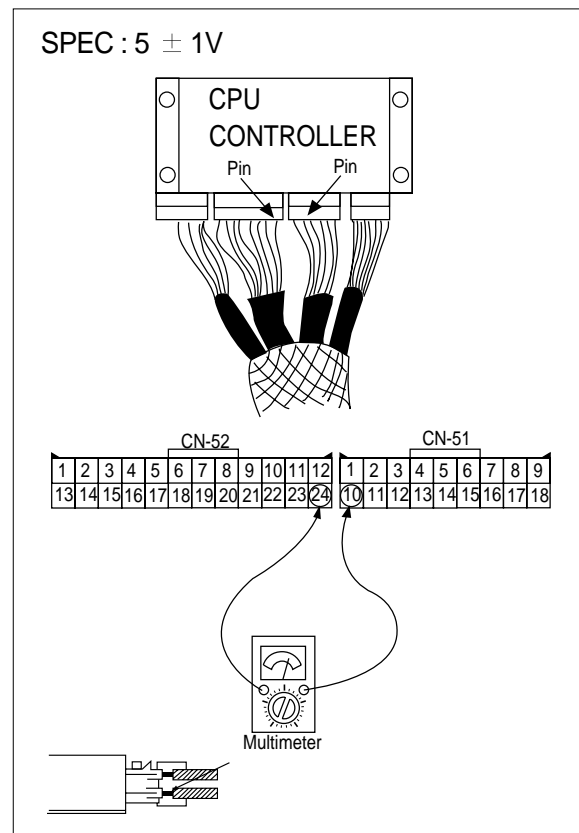
① Check resistance between CN-52(23) and CN-51(10).

- Starting key OFF.
- Disconnect connector CN-52 and CN-51 from CPU controller.
- Check resistance value with multimeter as figure.



② Check voltage between CN-52(24) and CN-51(10).

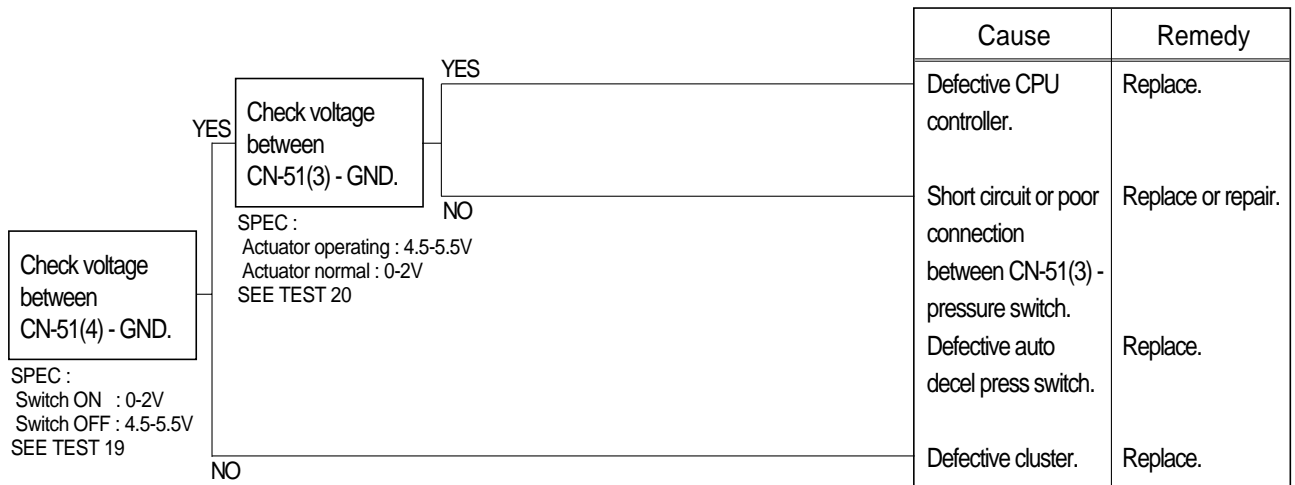
- Prepare 2 pieces of thin sharp pin, steel or copper.
- Starting key ON.
- Insert prepared pins to rear side of connectors :
 - One pin to CN-52(24)
 - Other pin to CN-51(10)
- Check voltage.



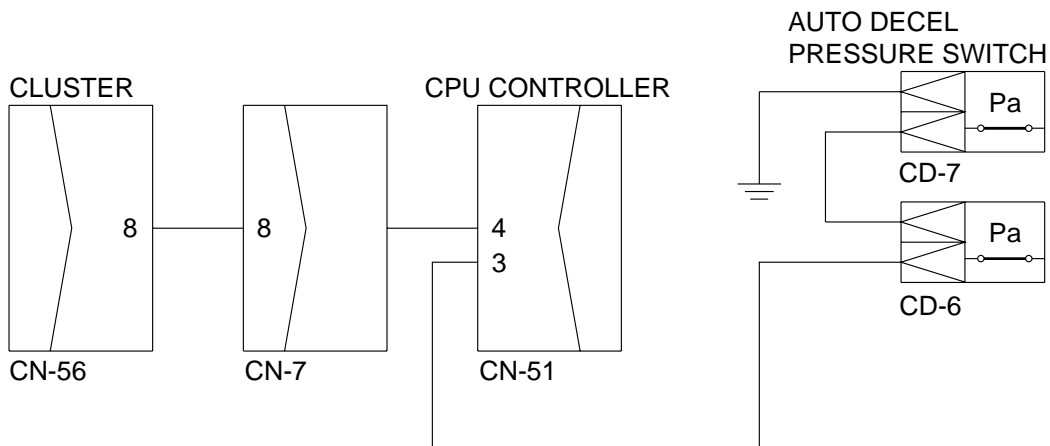
8. AUTO DECEL SYSTEM DOES NOT WORK

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

1) INSPECTION PROCEDURE



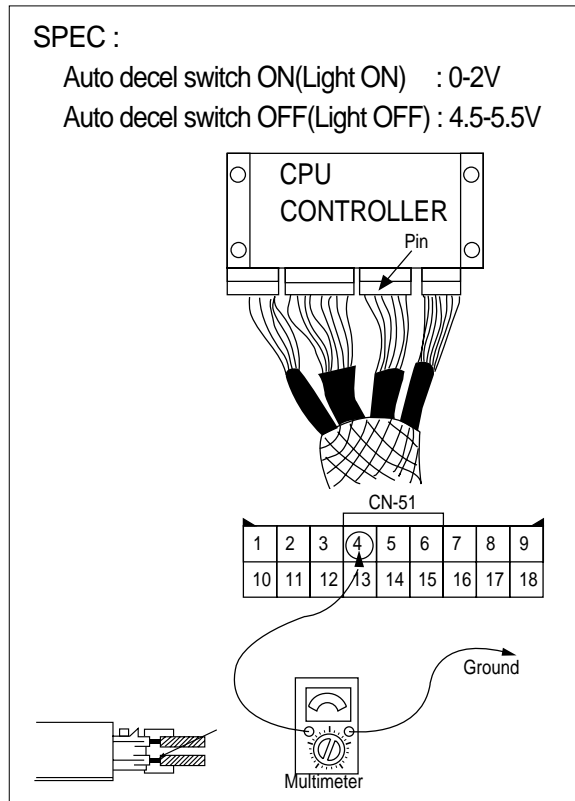
Wiring diagram



2) TEST PROCEDURE

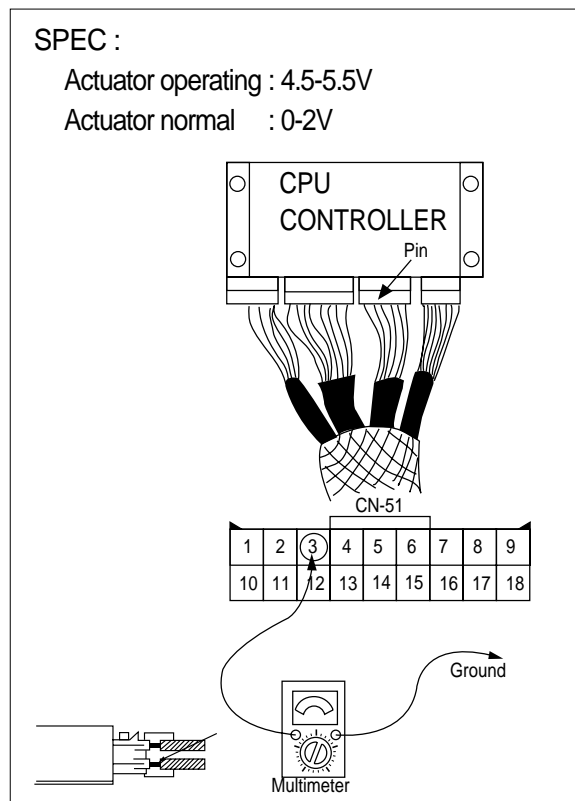
(1) **Test 19** : Check voltage at CN-51(4) and ground.

- ① Starting key OFF.
- ② Disconnect connector CN-51 from CPU controller.
- ③ Turn start key ON.
Check voltage as figure.



(2) **Test 20** : Check voltage at CN-51(3) and ground.

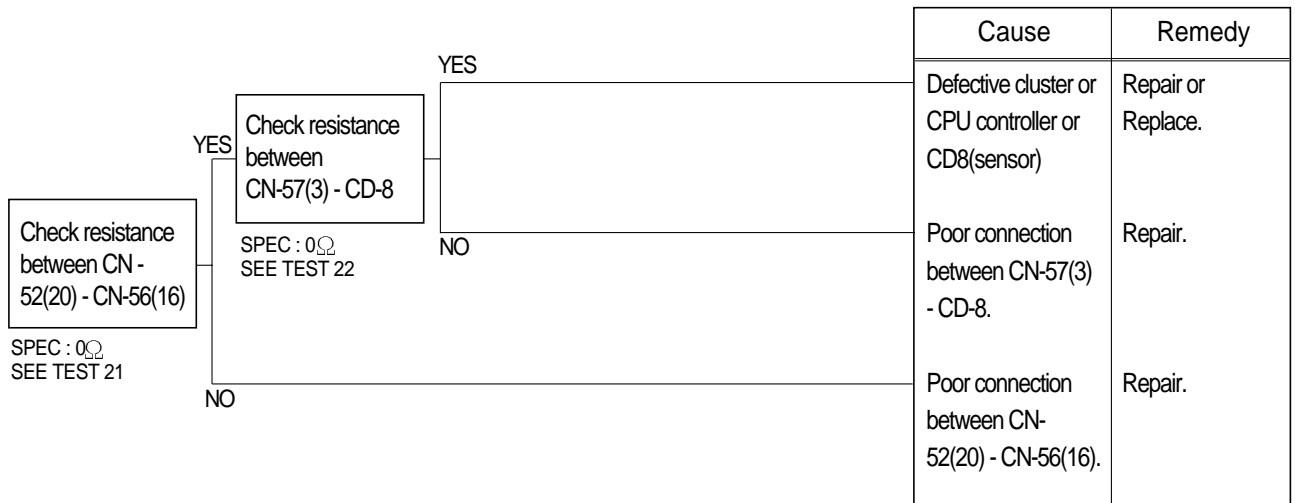
- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Starting key ON.
- ③ Insert prepared pin to rear side of connectors : One pin to (3) of CN-52.
Check voltage as figure.



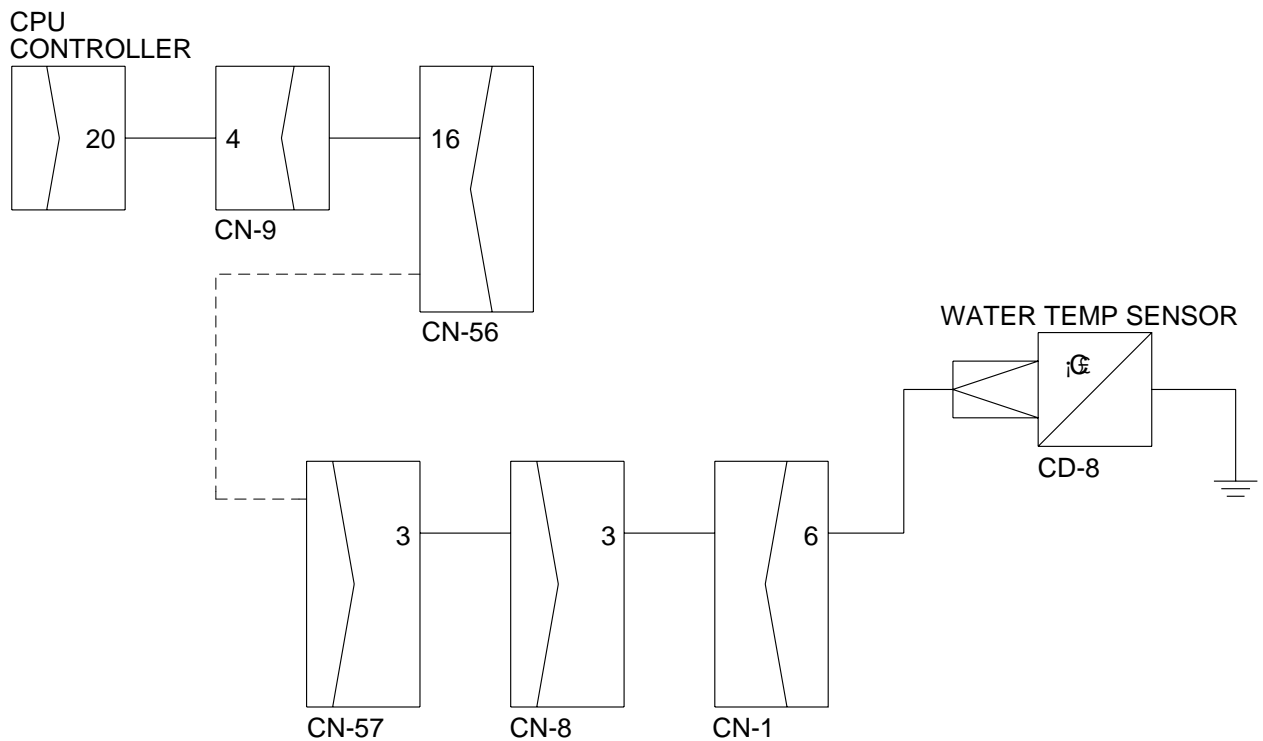
9. MALFUNCTION OF WARMING UP

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

1) INSPECTION PROCEDURE



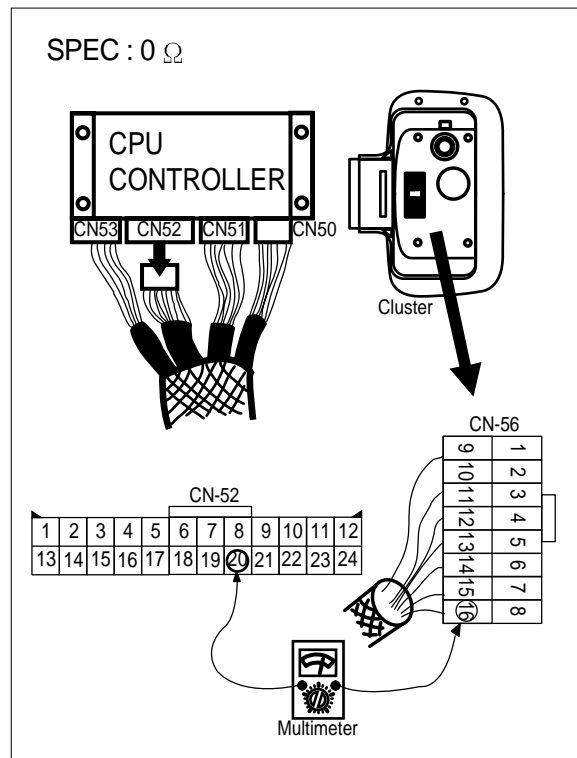
Wiring diagram



2) TEST PROCEDURE

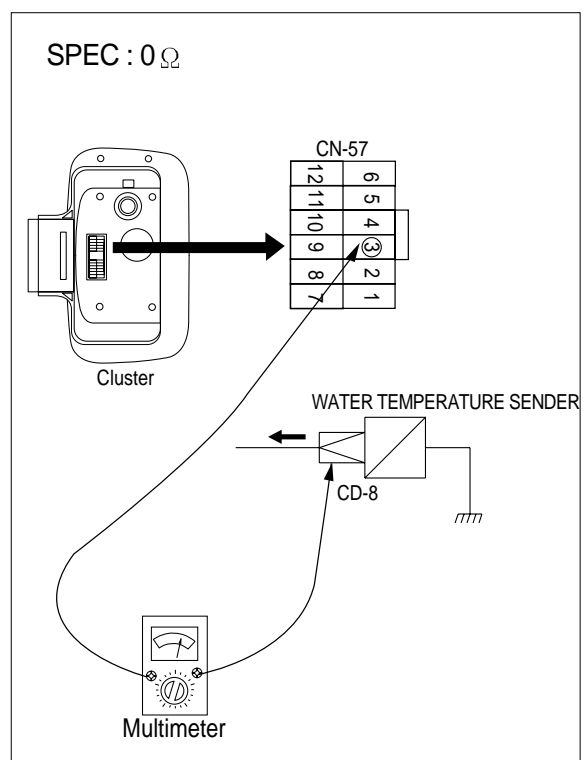
(1) **Test 21** : Check resistance between CN-52(20) and CN-56(16).

- ① Starting key OFF.
- ② Remove CPU controller and disconnect CN-52 from CPU controller.
- ③ Remove cluster and disconnect CN-56 from cluster.
- ④ Check resistance as figure.



(2) **Test 22** : Check resistance between CN-57(3) and CD-8.

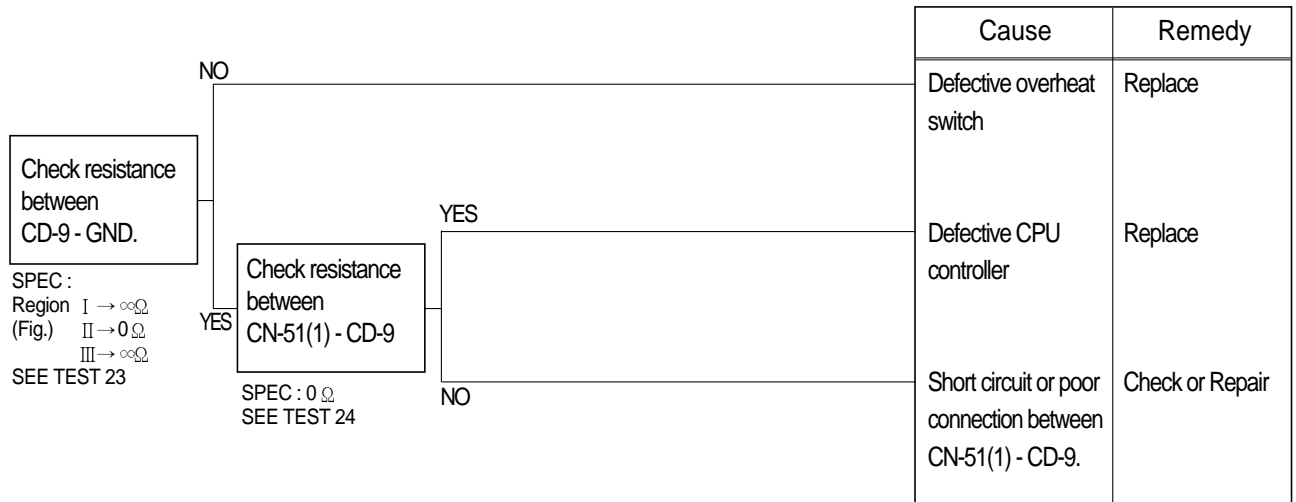
- ① Starting key OFF.
- ② Remove cluster and disconnect CN-57 from cluster.
- ③ Disconnect connector CD-8 of water temp sensor at engine head.
- ④ Check resistance as figure.



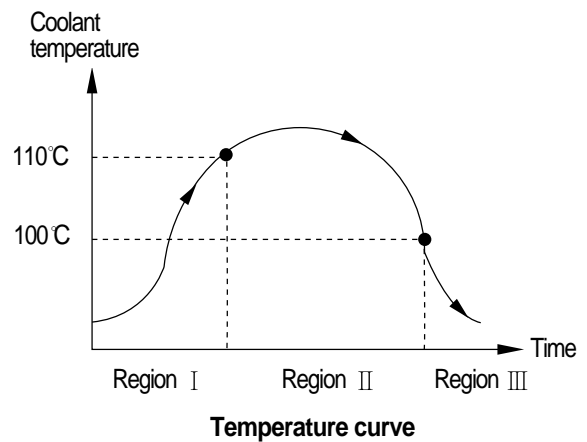
10. MALFUNCTION OF OVERHEAT

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

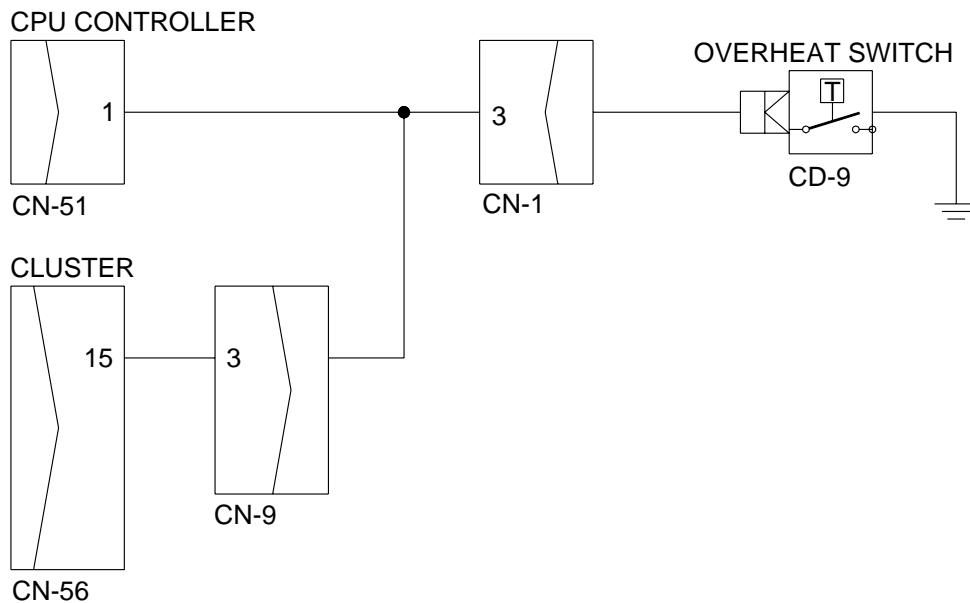
1) INSPECTION PROCEDURE



- ※ Overheat switch ON : Coolant temperature 110°C
- ※ Overheat switch OFF : Coolant temperature 100°C



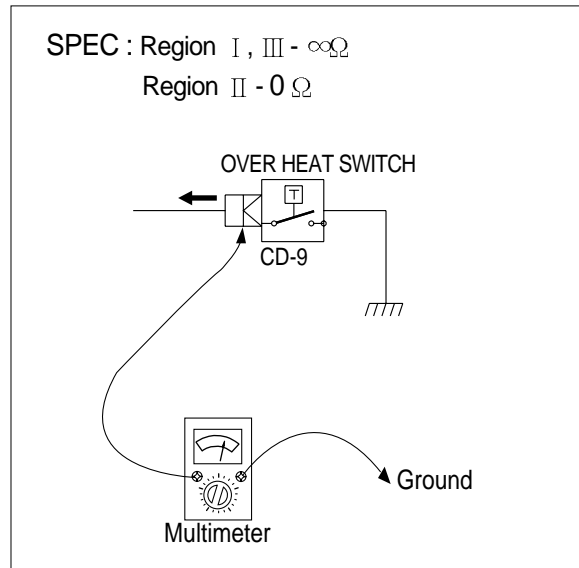
Wiring diagram



2) TEST PROCEDURE

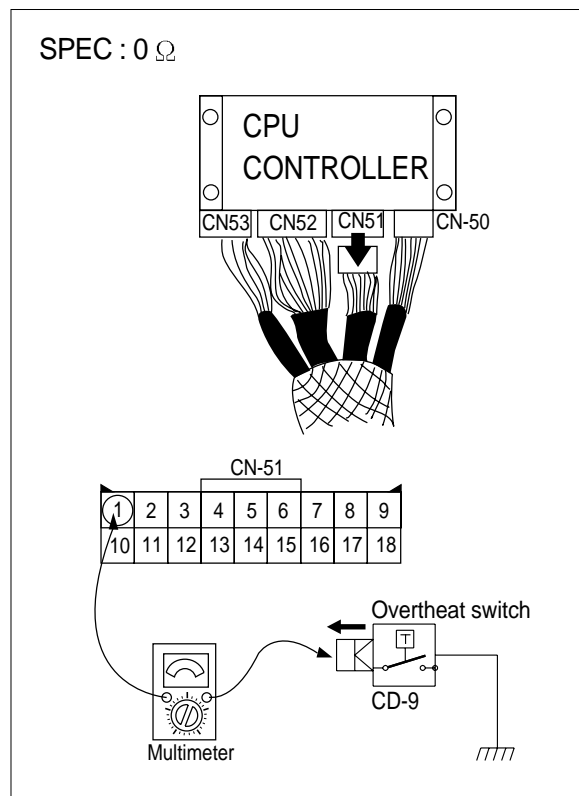
(1) **Test 23** : Check resistance between connector CD-9 - GND.

- ① Starting key OFF.
- ② Disconnect connector CD-9 of overheat switch at engine head.
- ③ Check resistance as figure.



(2) **Test 24** : Check resistance between connector (1) of CN-51 - CD-9.

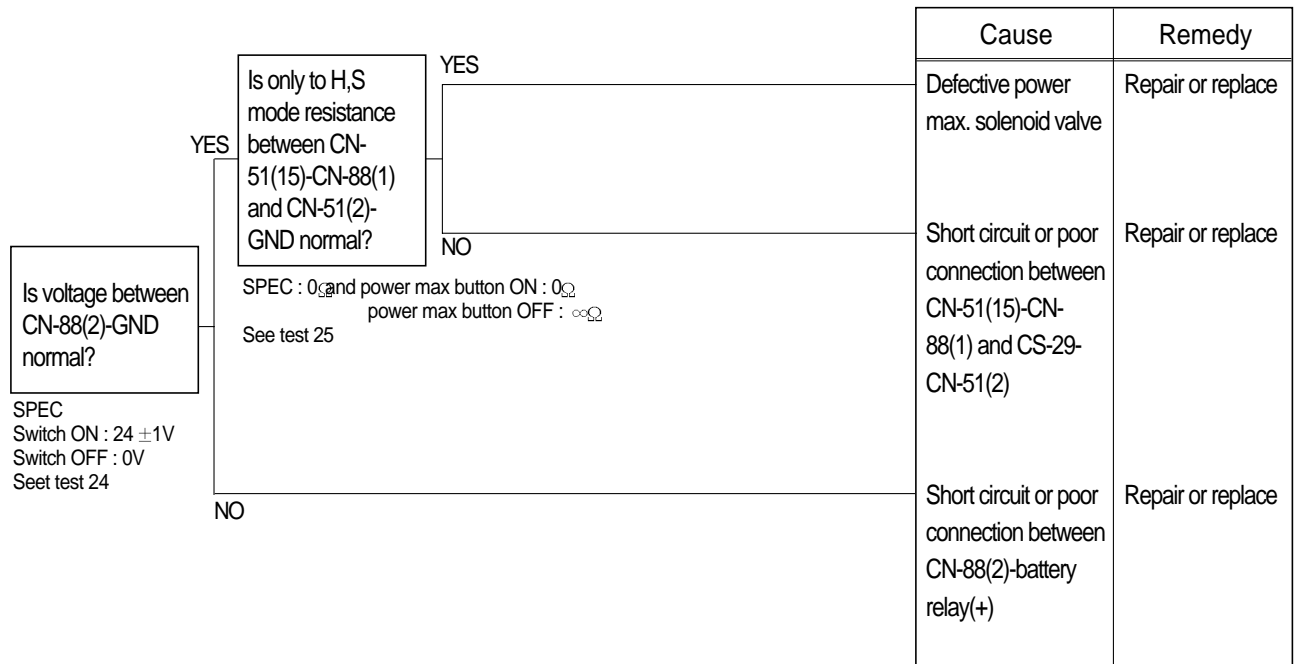
- ① Starting key OFF.
- ② Remove CPU controller and disconnect connector CN-51 from CPU controller.
- ③ Disconnect connector CD-9 of overheat switch at engine head.
- ④ Check resistance as figure.



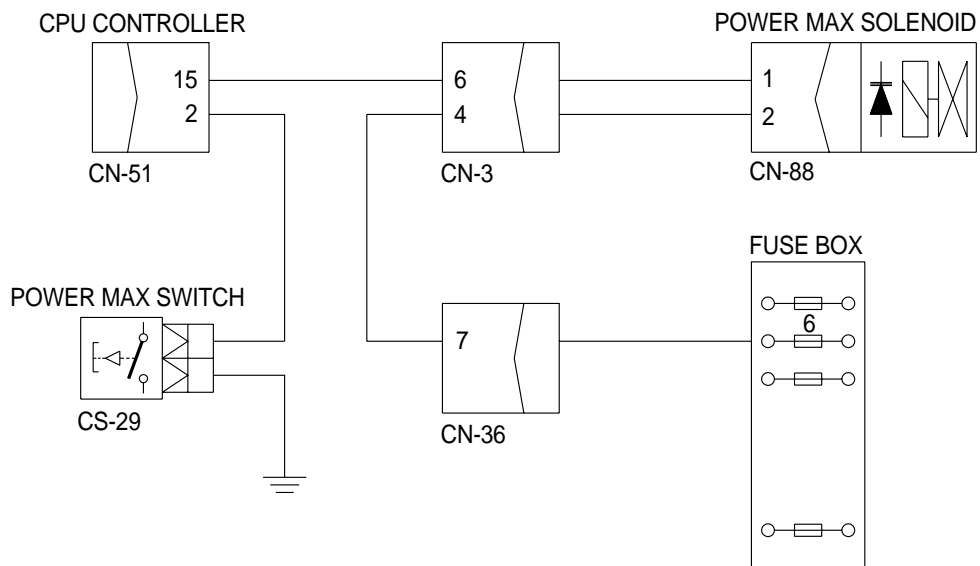
11. MALFUNCTION OF POWER MAX

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

1) INSPECTION PROCEDURE



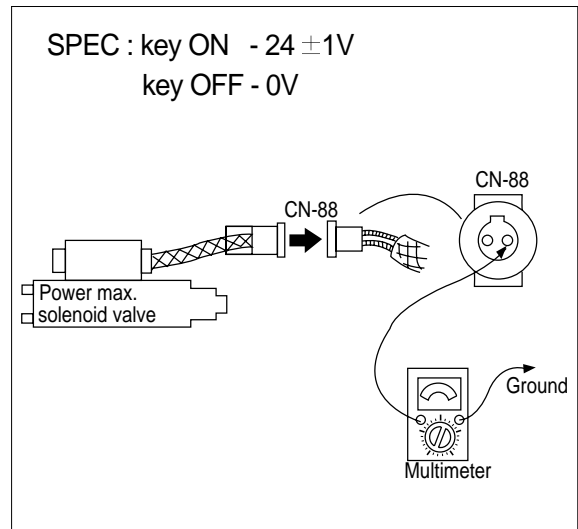
Wiring diagram



2) TEST PROCEDURE

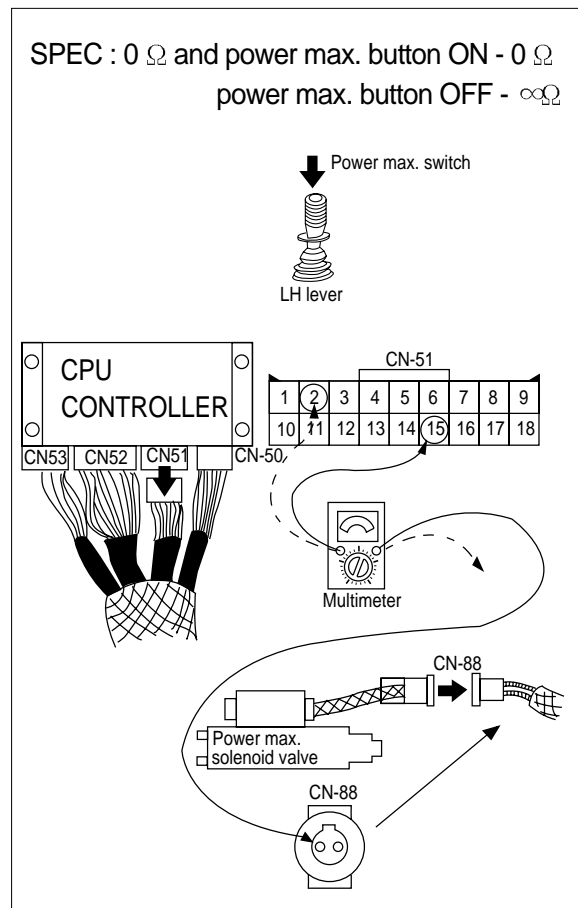
(1) **Test 24** : Check voltage at (2) of connector CN-88 - GND.

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



(2) **Test 25** : Check resistance between connector (15) of CN-51-(1) of CN-88 and CND-(2) of CN-51.

- ① Starting key OFF.
- ② Remove CPU controller and disconnect connector CN-51 from CPU controller.
- ③ Disconnect connector CN-88 from power max. solenoid valve.
- ④ Check resistance as figure.



12. OPEN OR SHORT CIRCUIT OF GOVERNOR MOTOR SYSTEM

- Before checking, check all the related connectors are properly inserted.
- Before carrying out next procedure, connect the disconnected connectors again immediately unless otherwise specified.

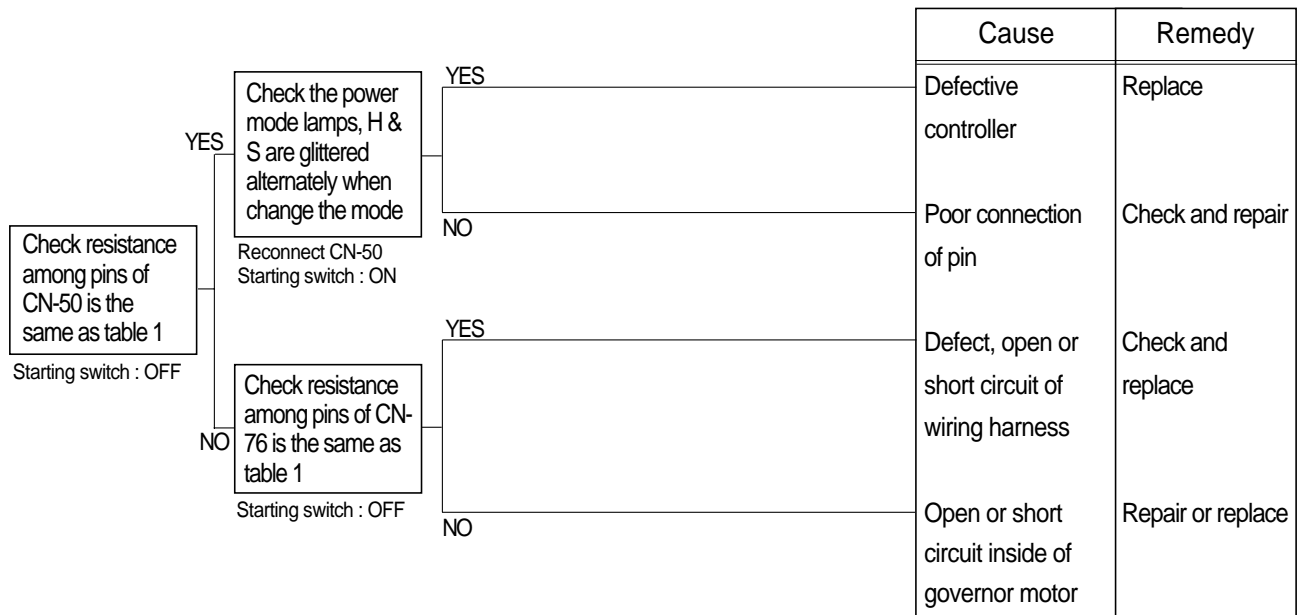
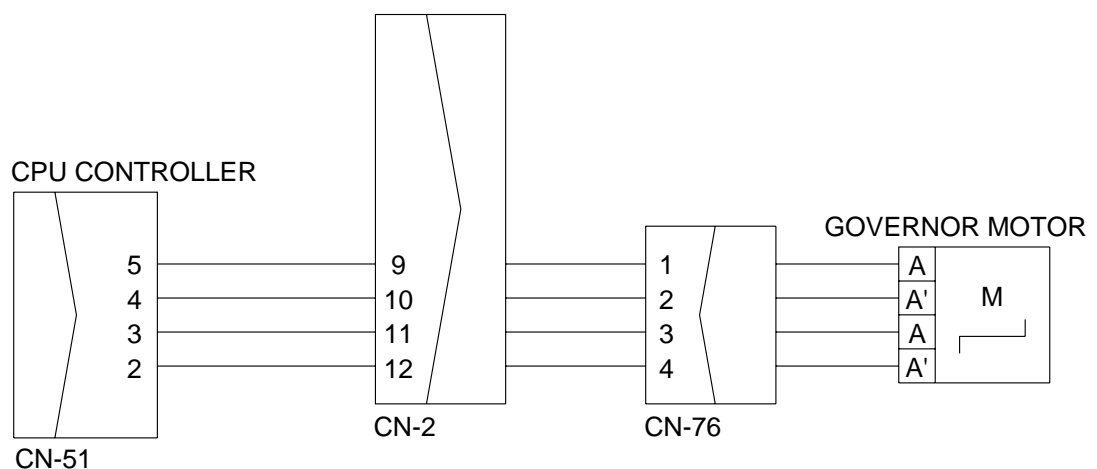


Table 1

CN-50(Female)	CN-76(Male)	Resistance
(5) - (4)	(1) - (2)	4 ~ 9 Ω
(3) - (2)	(3) - (4)	4 ~ 9 Ω
(5) - (3)	(1) - (3)	Min 1 MΩ
(5) - (2)	(1) - (4)	
Pin(2),(3),(4),(5) - chassis	Pin (1),(2),(3),(4) - chassis	



13. OPEN OR SHORT CIRCUIT OF POTENTIOMETER SYSTEM

- Before checking, check all the related connectors are properly inserted.
- Before carrying out next procedure, connect the disconnected connectors again immediately unless otherwise specified.

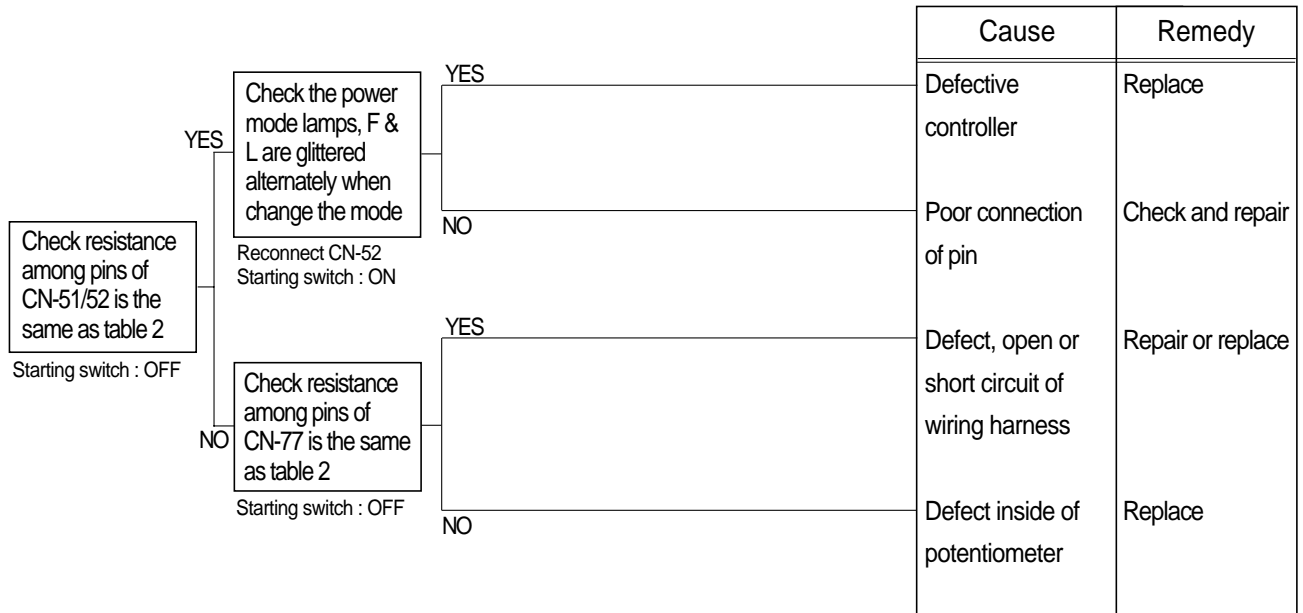


Table 2

CN51-52(Female)	CN-77(Male)	Resistance
(23) - (24)	(2) - (1)	0.25 ~ 6 K Ω
(23) - (10)	(2) - (3)	0.25 ~ 6 K Ω
(24) - (10)	(1) - (3)	4 ~ 6 K Ω

