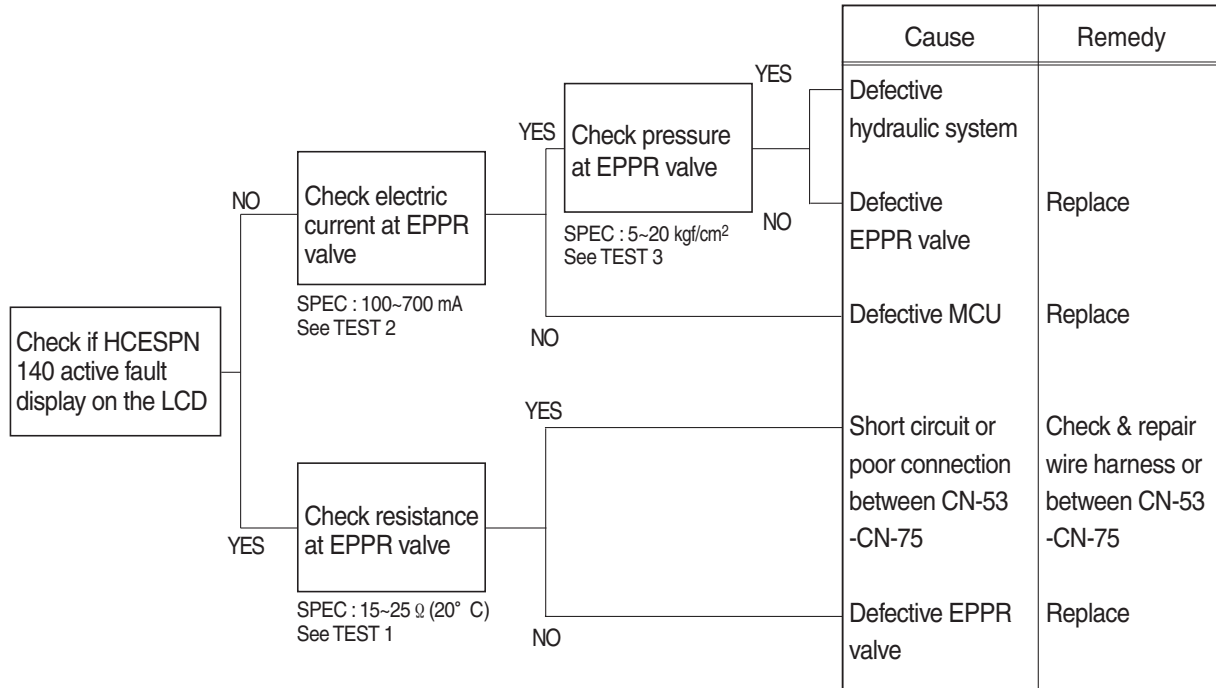


## GROUP 4 MECHATRONICS SYSTEM

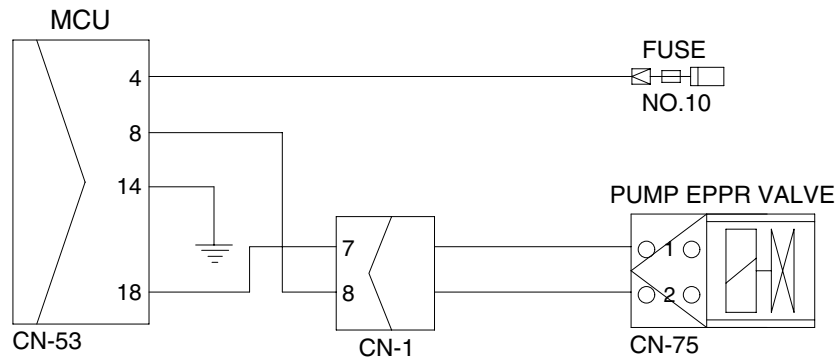
### 1. ALL ACTUATORS SPEED ARE SLOW

- ※ Boom, Arm, Bucket, Swing and travel speed are slow, but engine speed is good.
- ※ Spec : P-mode 1950 ± 50 rpm    S-mode 1750 ± 50 rpm    E-mode 1600 ± 50 rpm
- ※ Before carrying out below procedure, check all the related connectors are properly inserted and fault code on the cluster.

#### 1) INSPECTION PROCEDURE



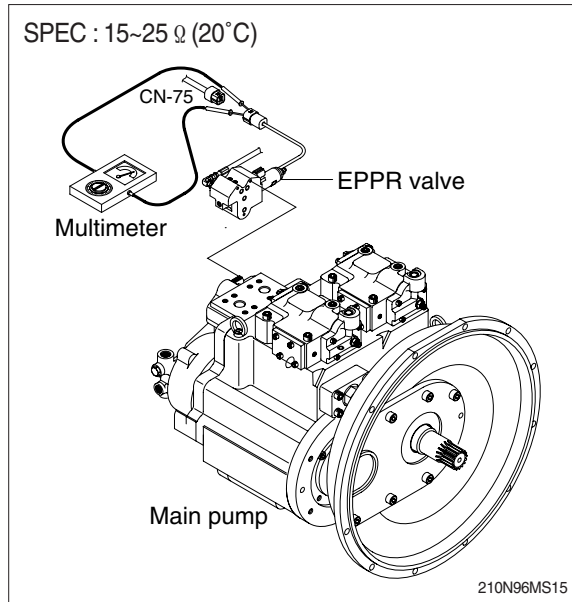
#### Wiring diagram



## 2) TEST PROCEDURE

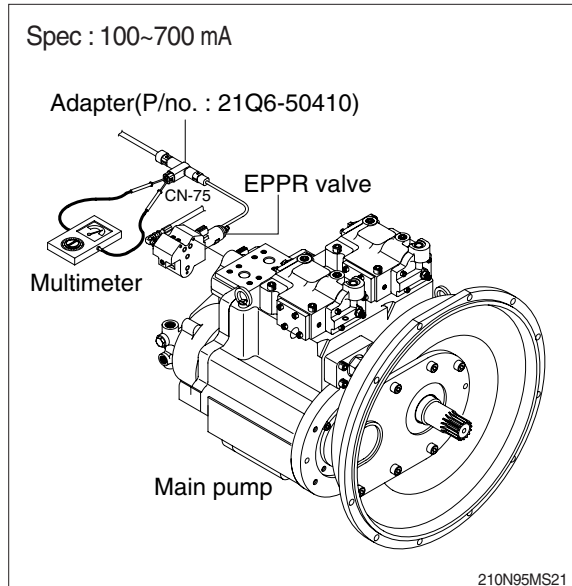
(1) **Test 1** : Check resistance at connector CN-75.

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



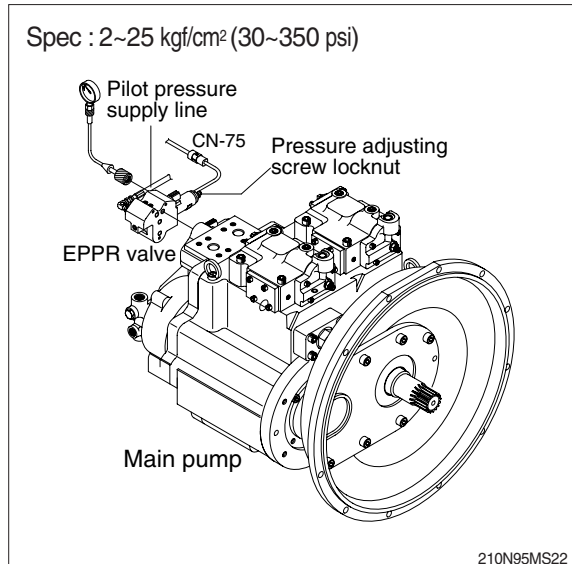
(2) **Test 2** : Check electric current at EPPR valve.

- ① Disconnect connector CN-75 from EPPR valve.
- ② Insert the adapter to CN-75 and install multimeter as figure.
- ③ Start engine.
- ④ Set S-mode and cancel auto decel mode.
- ⑤ Position the accel dial at 10.
- ⑥ If tachometer show approx  $1750 \pm 50$  rpm disconnect one wire harness from EPPR valve.
- ⑦ Check electric current at bucket circuit relief position.



(3) **Test 3** : Check pressure at EPPR valve.

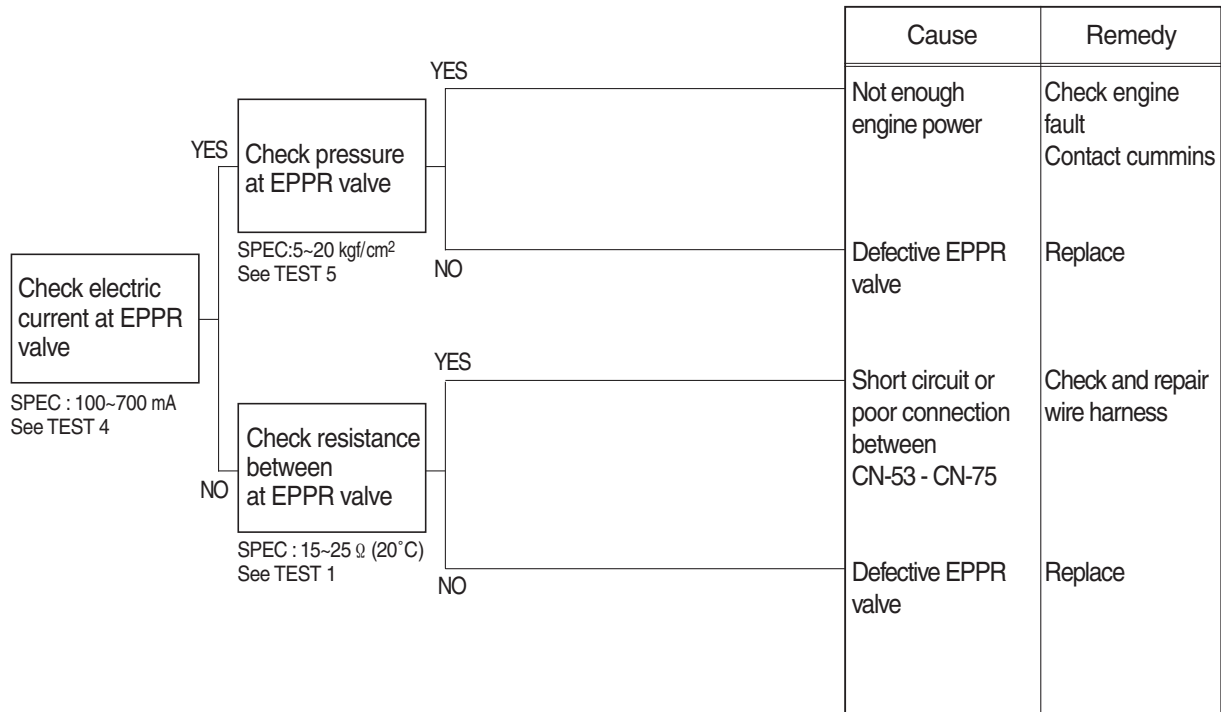
- ① Remove plug and connect pressure gauge as figure.
  - Gauge capacity : 0 to 50 kgf/cm<sup>2</sup> (0 to 710 psi)
- ② Start engine.
- ③ Set S-mode and cancel auto decel mode.
- ④ Position the accel dial at 10.
- ⑤ If tachometer show approx  $1750 \pm 50$  rpm check pressure at relief position of bucket circuit by operating bucket control lever.
- ⑥ If pressure is not correct, adjust it.
- ⑦ After adjust, test the machine.



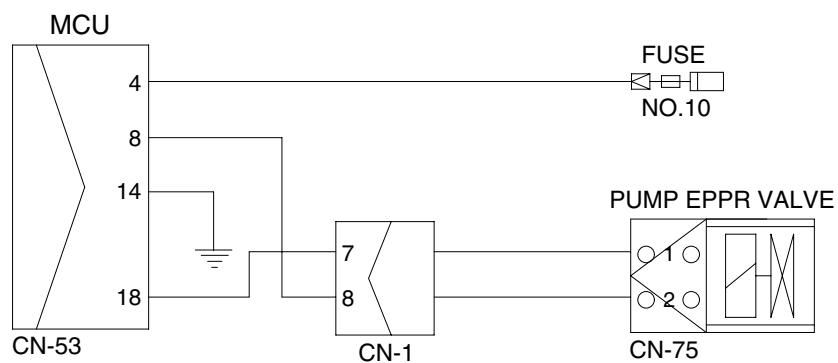
## 2. ENGINE STALL

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



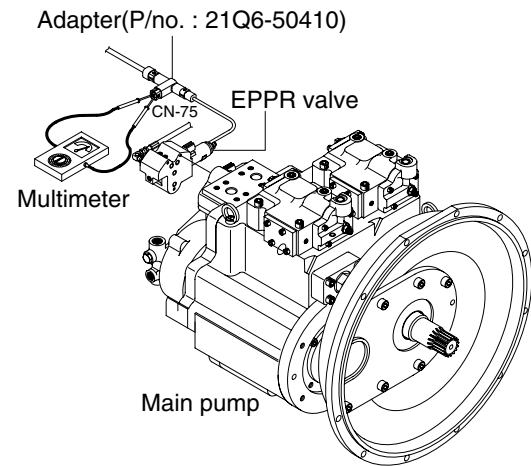
21096MS01

## 2) TEST PROCEDURE

### (1) Test 4 : Check electric current at EPPR valve at S-mode

- ① Install multimeter as figure.
- ② Start engine.
- ③ Set the accel dial at "10" (max)
- ④ Set S-mode with  $1750 \pm 50$  rpm.
- ⑤ Check electric current.

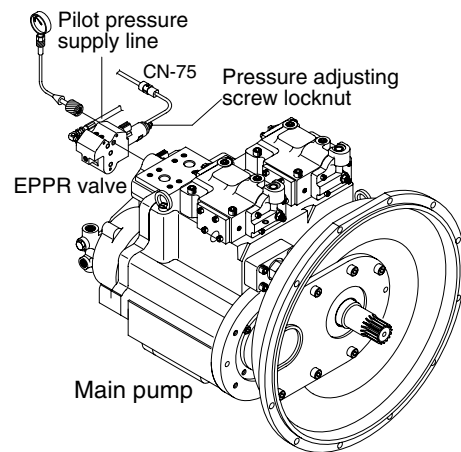
SPEC : 100~700 mA



### (2) Test 5 : Check pressure at EPPR valve at S-mode

- ① Connect pressure gauge at EPPR valve.
- ② Start engine.
- ③ Set the accel dial at "10" (max)
- ④ Set S-mode with  $1750 \pm 50$  rpm.
- ⑤ Operate bucket lever completely push or pull.
- ⑥ Hold arm lever at the end of stroke.
- ⑦ Check pressure at relief position.

SPEC : 2~25 kgf/cm<sup>2</sup> (30~350 psi)

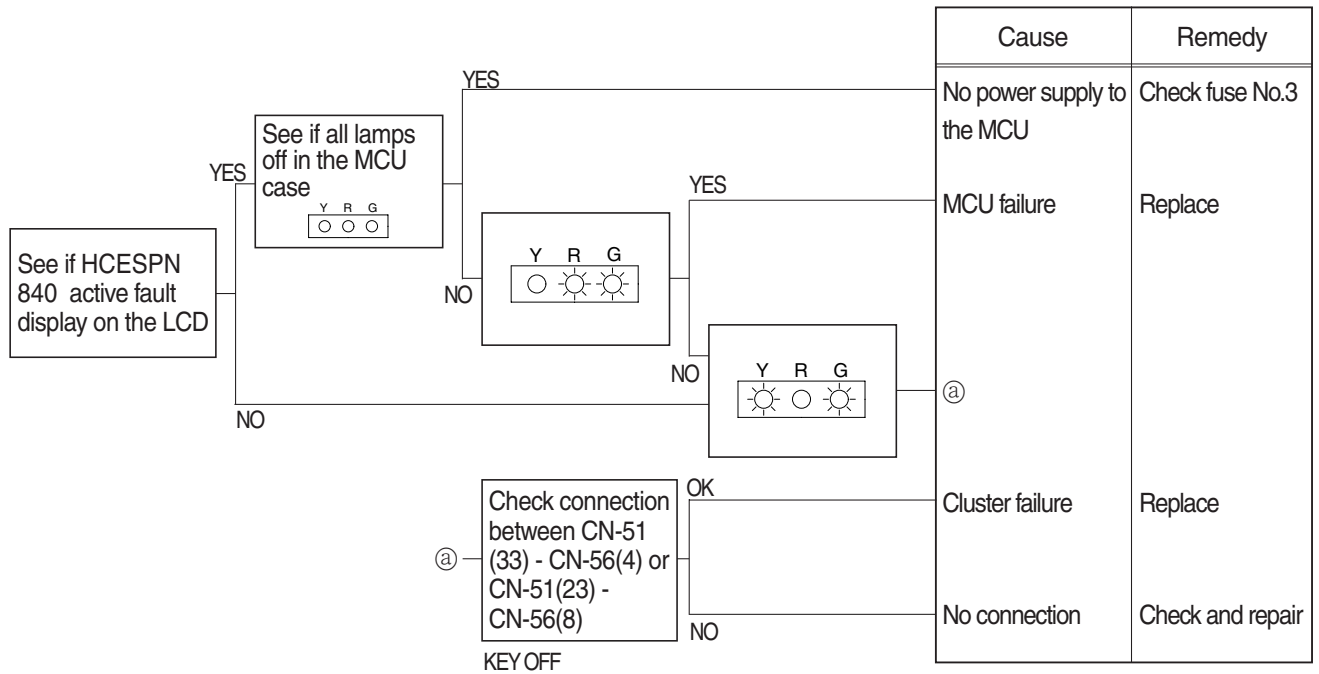


### 3. MALFUNCTION OF CLUSTER OR MODE SELECTION SYSTEM

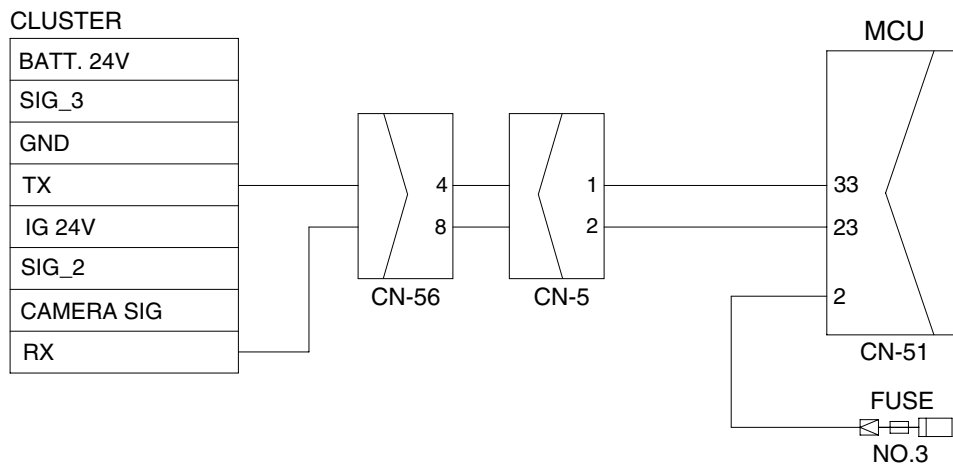
· Fault code : HCESPN 840, FMI 2

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

#### 1) INSPECTION PROCEDURE



#### Wiring diagram



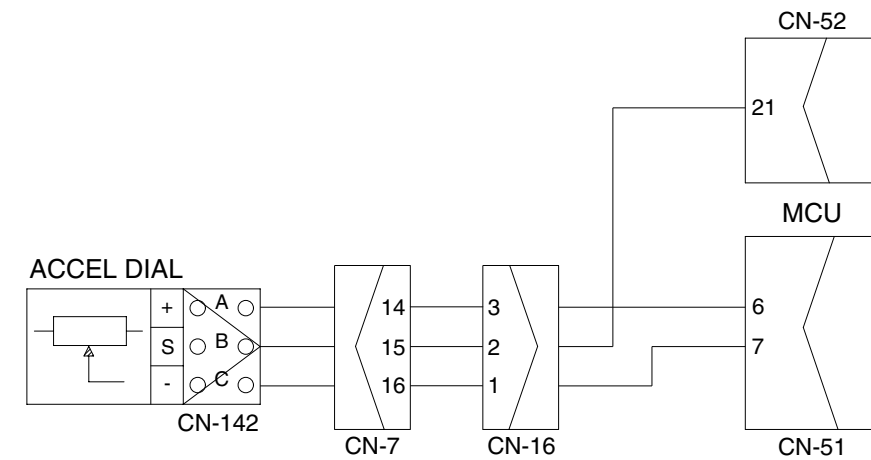
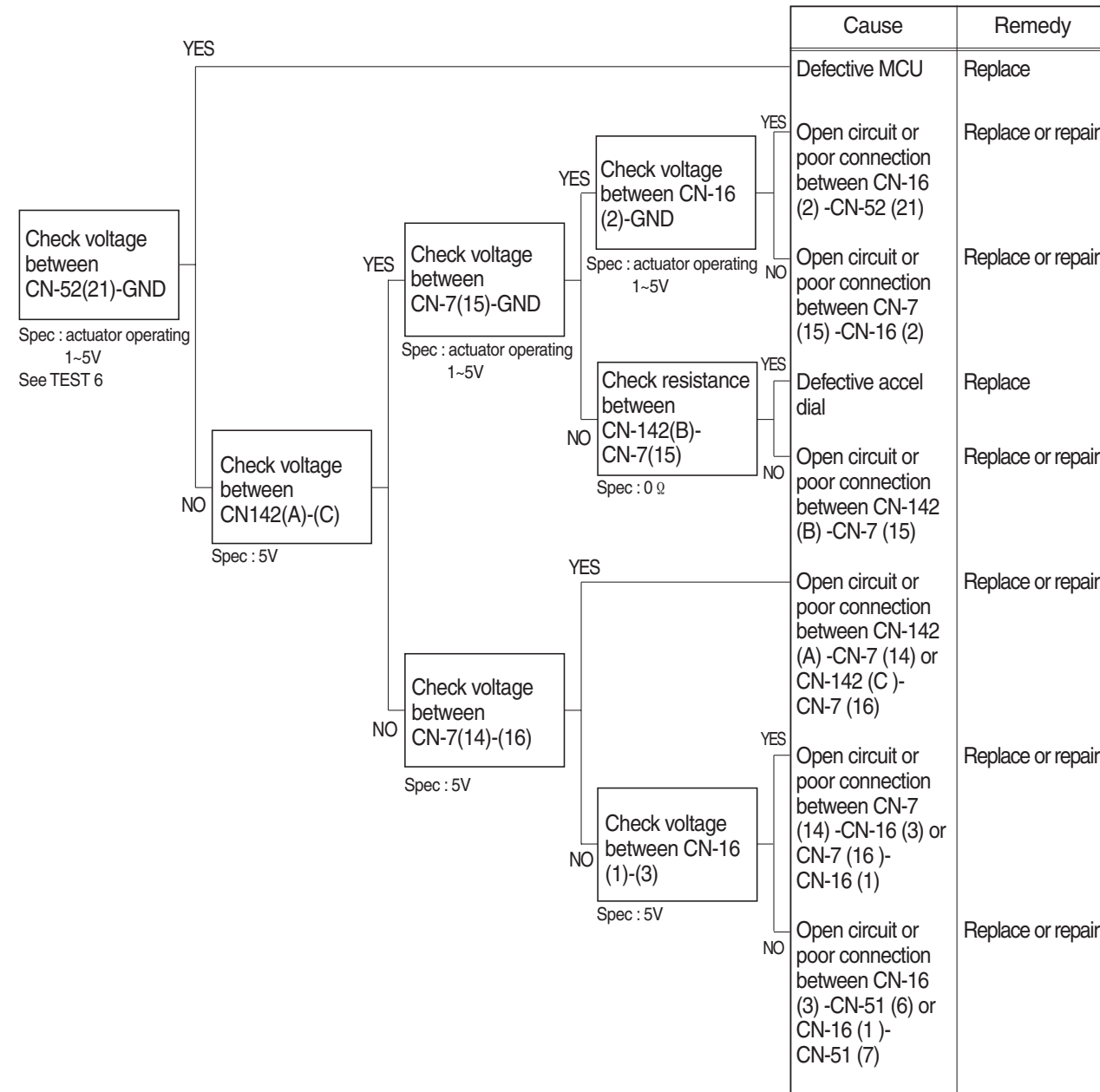
21096MS03

#### 4. MALFUNCTION OF ACCEL DIAL

· Fault code : HCESPN 714, FMI 3 or 4

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

##### 1) INSPECTION PROCEDURE

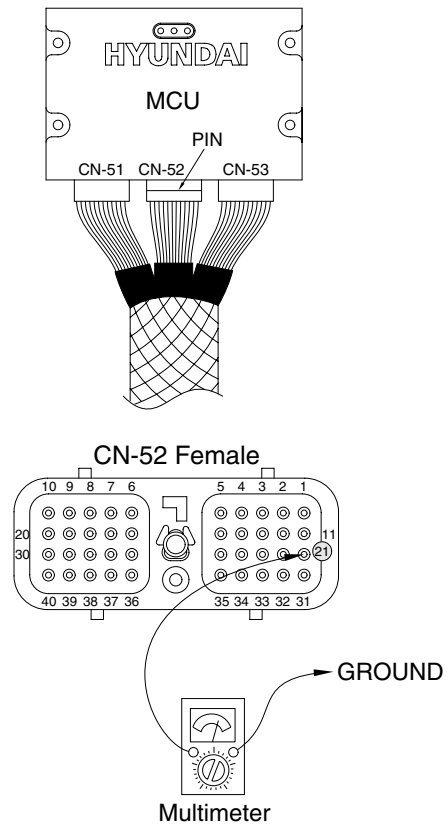


## 2) TEST PROCEDURE

(1) **Test 6** : Check voltage at CN-52(21) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (21) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



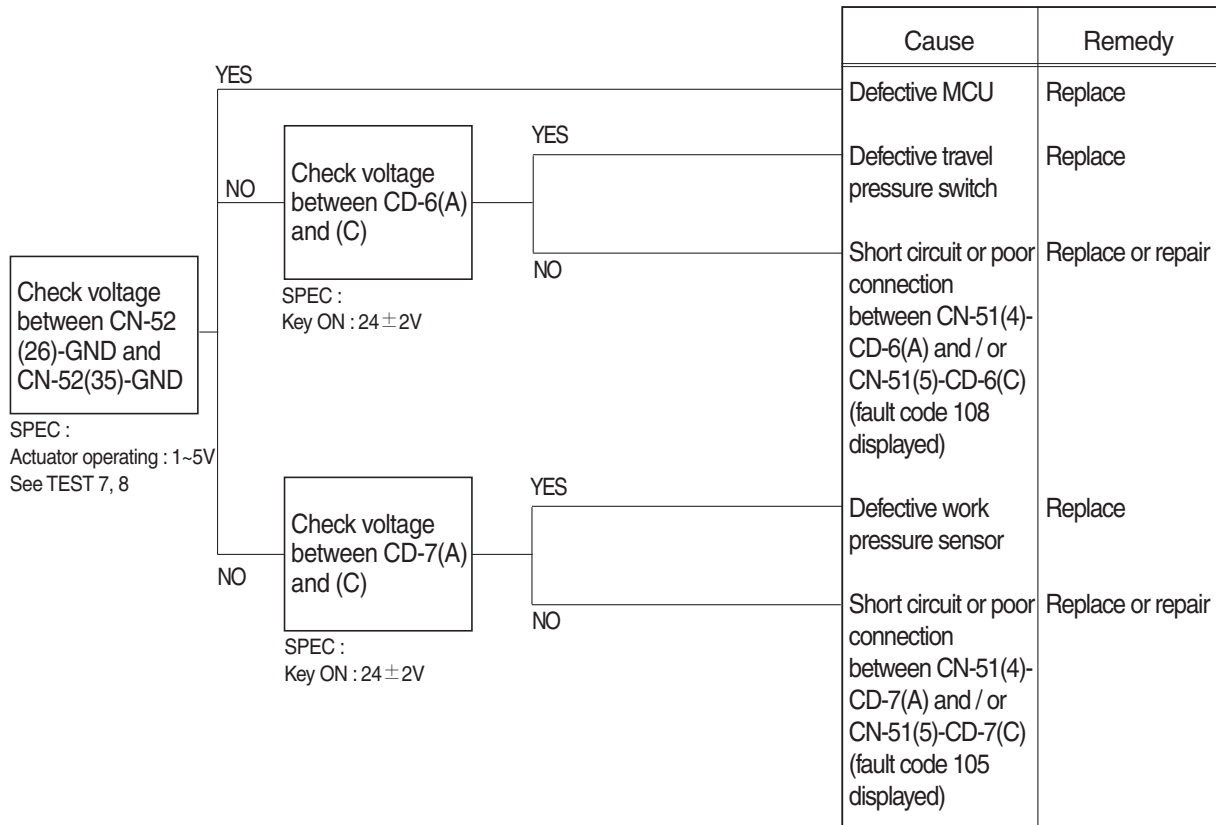
21096MS04A

## 5. AUTO DECEL SYSTEM DOES NOT WORK

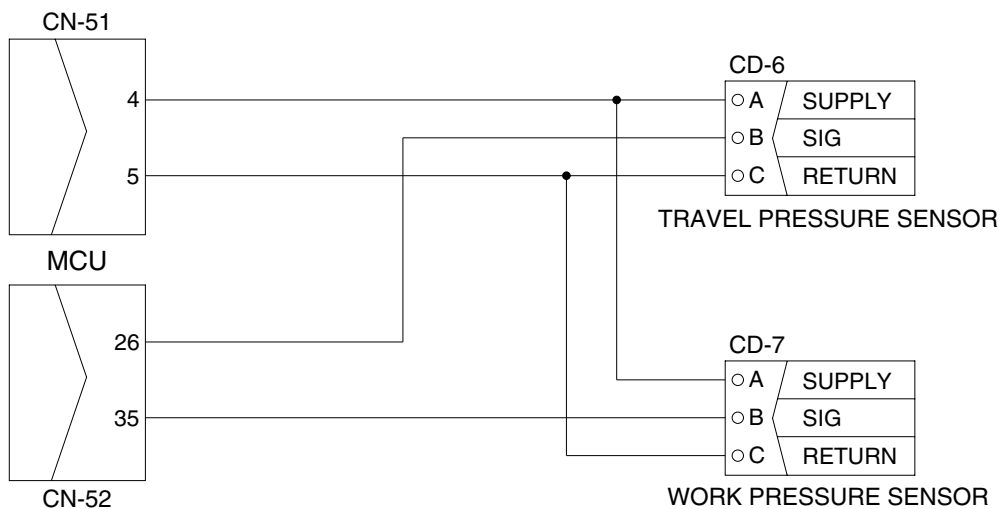
- Fault code : HCESPN 105, FMI 0~4 (work pressure sensor)  
HCESPN 108, FMI 0~4 (travel oil pressure sensor)

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



21096MS05



## 2) TEST PROCEDURE

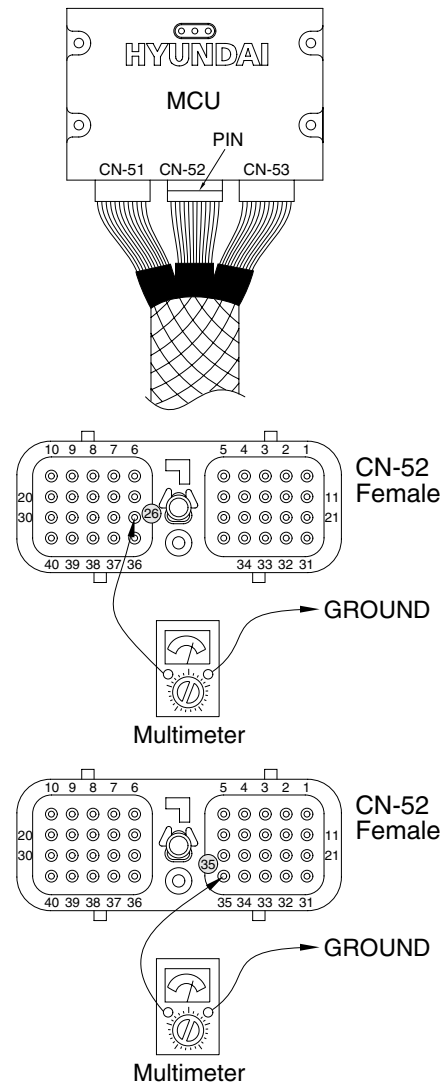
(1) **Test 7** : Check voltage at CN-52(26) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (26) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

(2) **Test 8** : Check voltage at CN-52(35) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper
- ② Insert prepared pin to rear side of connectors : One pin to (35) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V

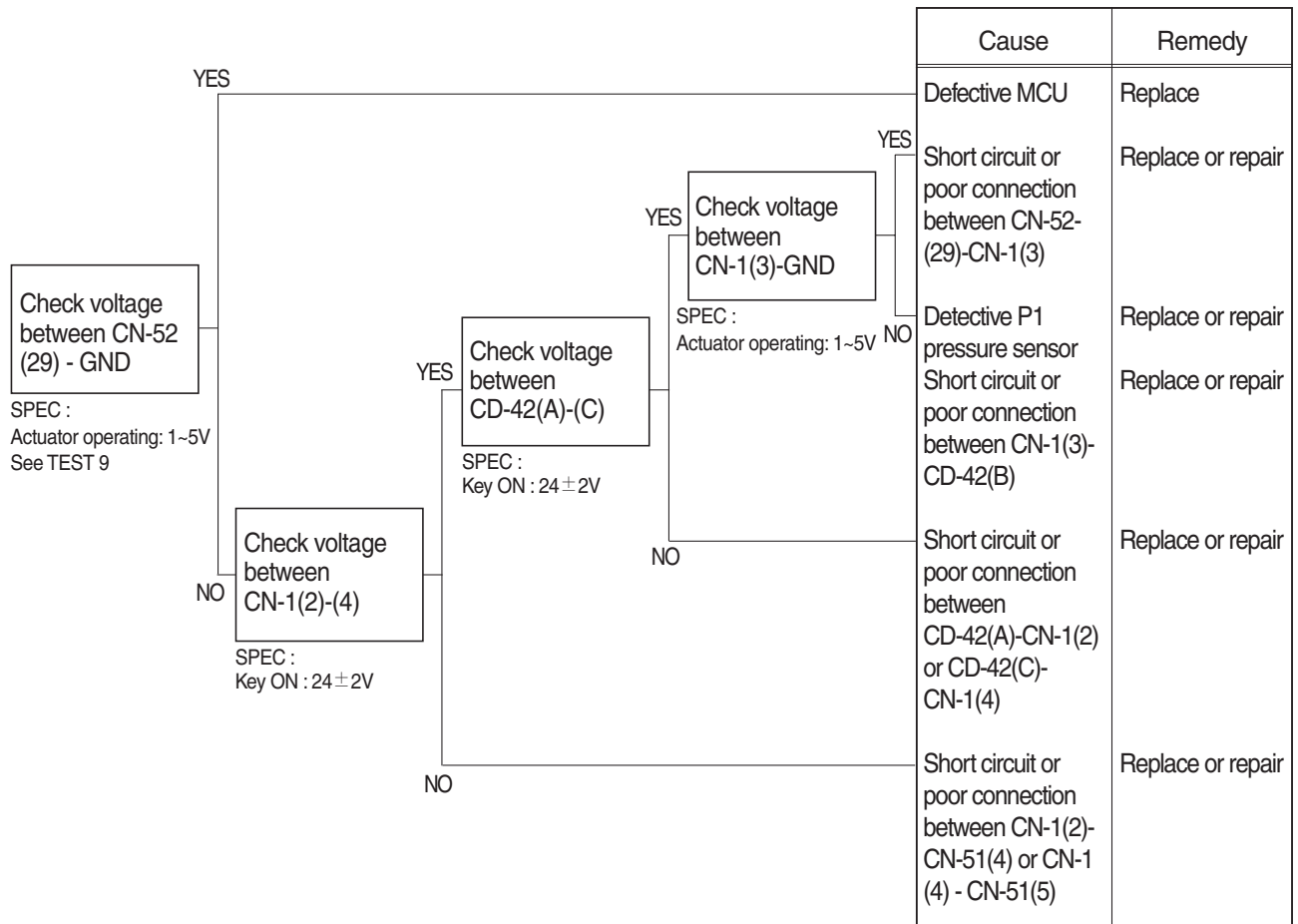


## 6. MALFUNCTION OF PUMP 1 PRESSURE SENSOR

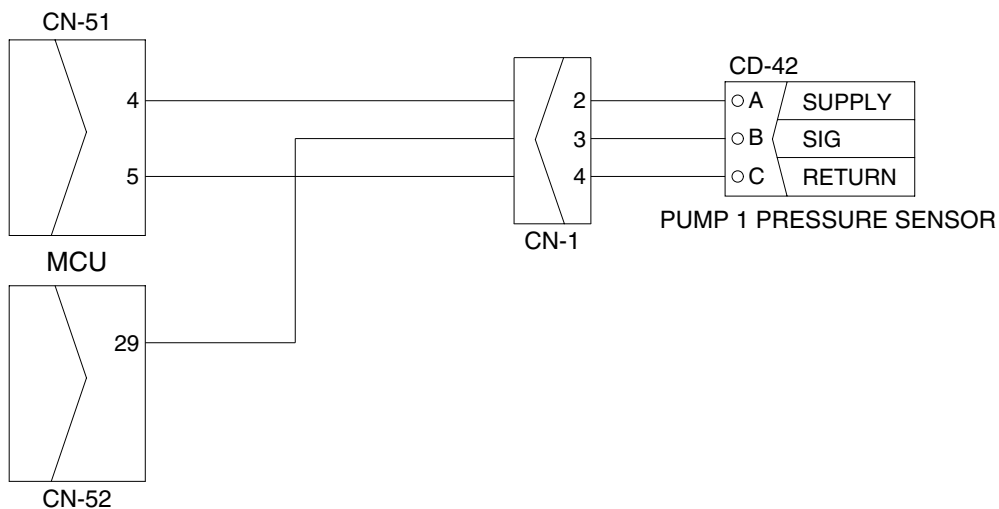
· Fault code : HCESPN 120, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



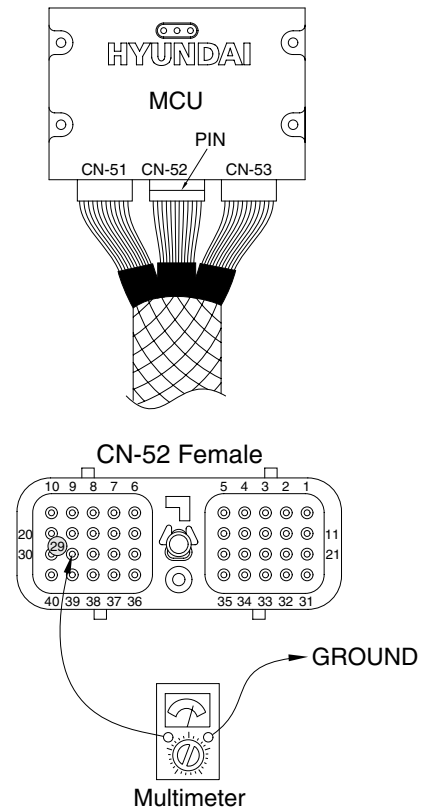
21096MS06

## 2) TEST PROCEDURE

(1) **Test 9** : Check voltage at CN-52(29) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (29) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



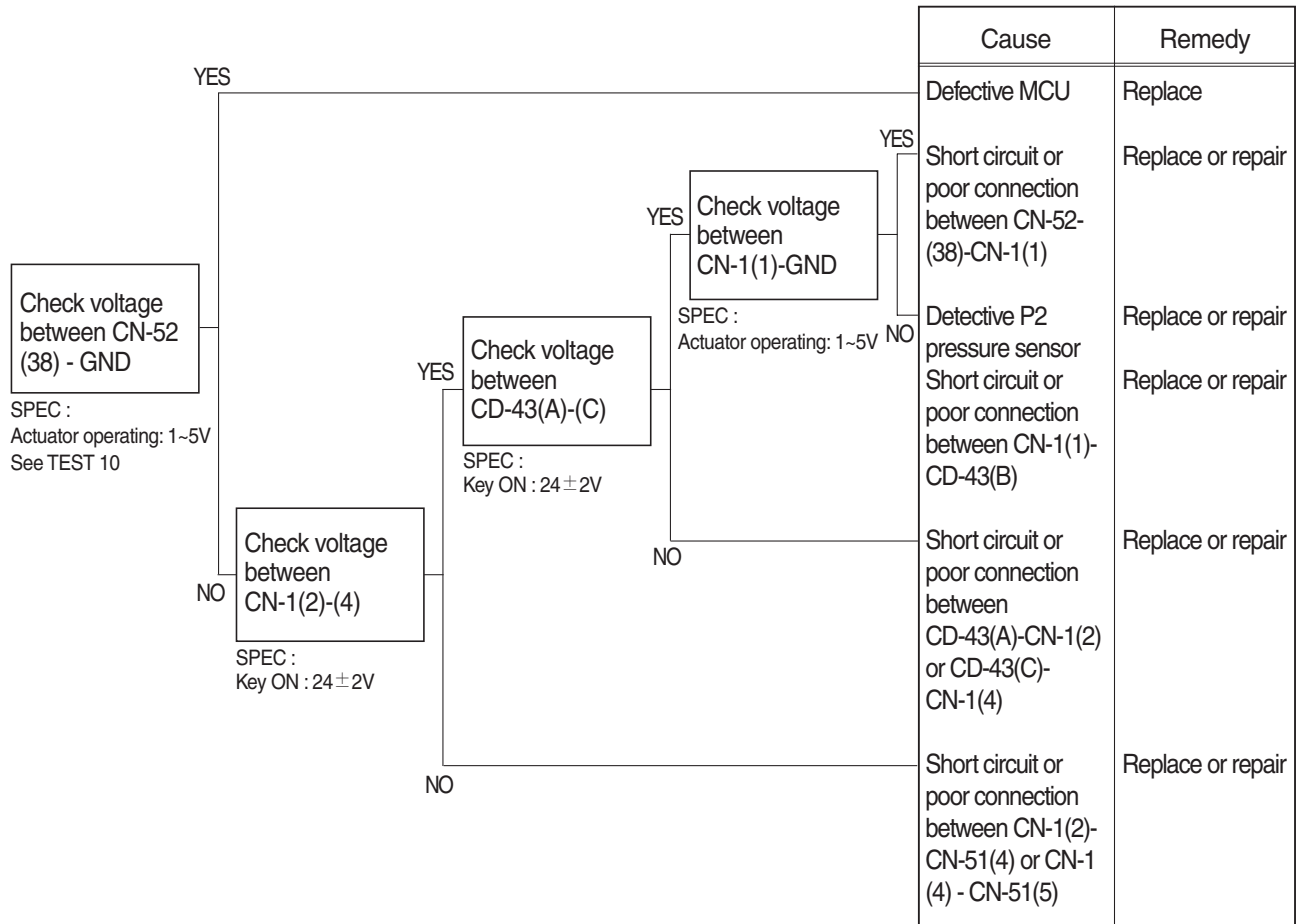
21096MS06A

## 7. MALFUNCTION OF PUMP 2 PRESSURE SENSOR

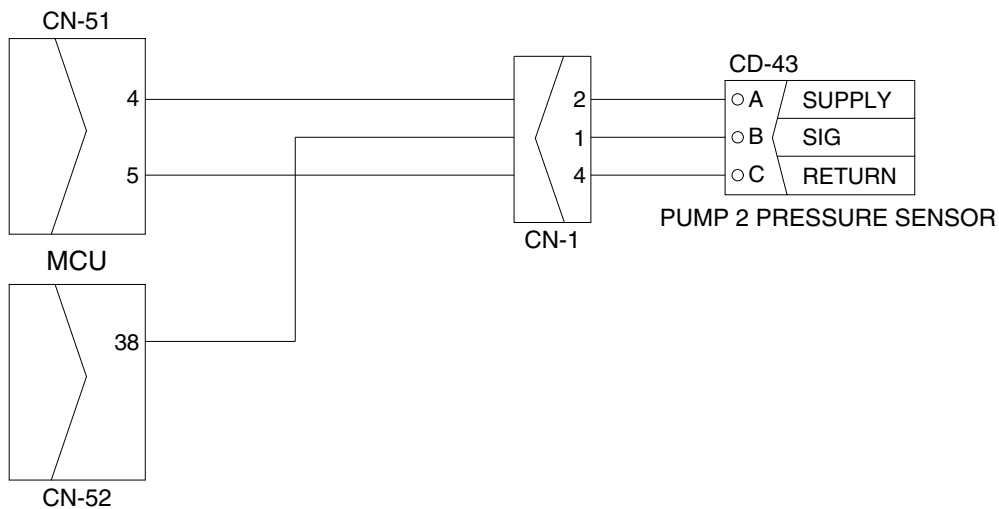
· Fault code : HCESPN 121, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



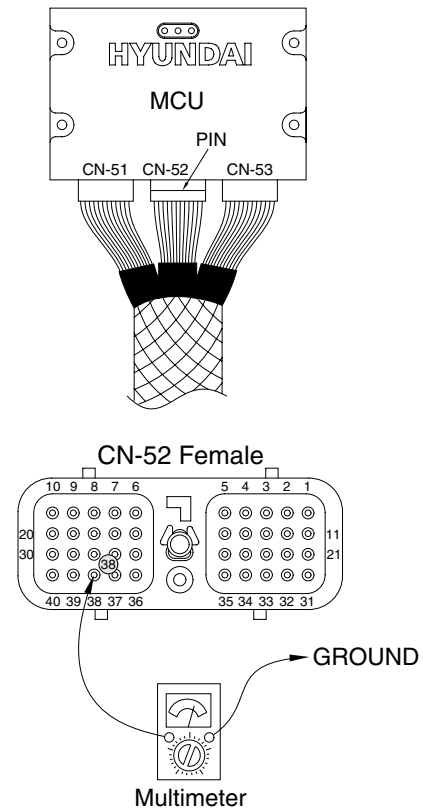
21096MS07

## 2) TEST PROCEDURE

(1) Test 10 : Check voltage at CN-52(38) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (38) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



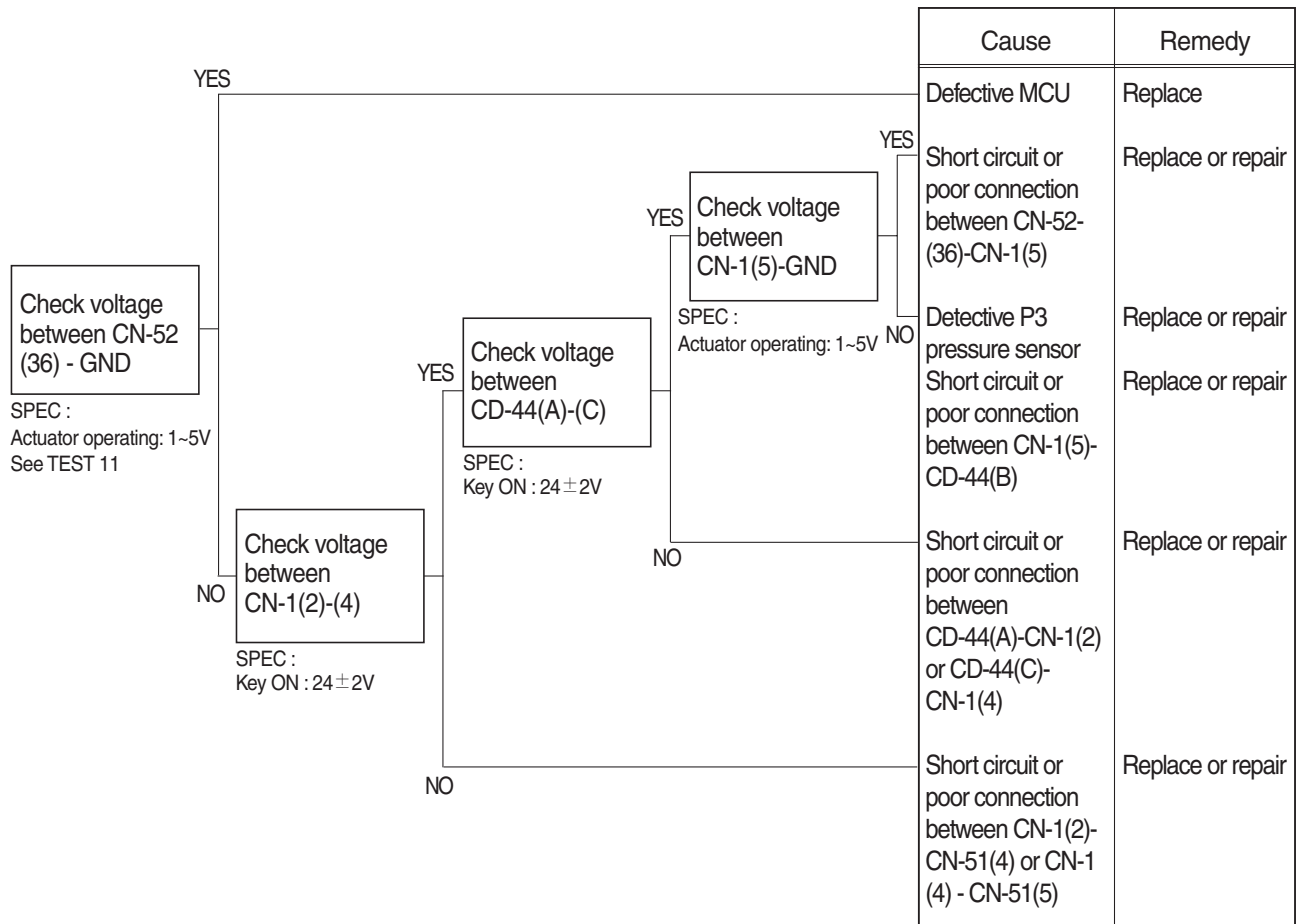
21096MS07A

## 8. MALFUNCTION OF PUMP 3 PRESSURE SENSOR

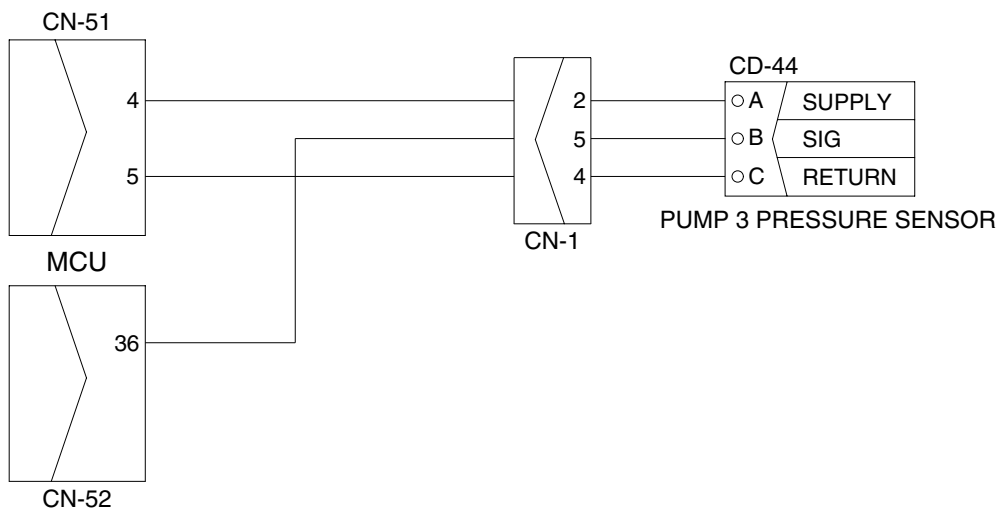
· Fault code : HCESPN 125, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



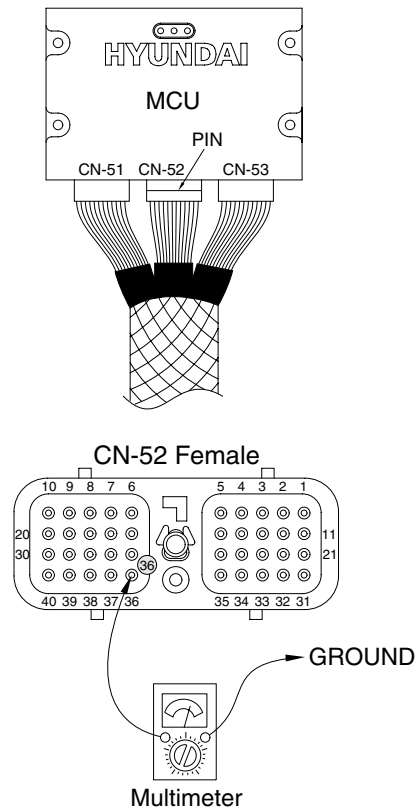
21096MS08

## 2) TEST PROCEDURE

(1) **Test 11** : Check voltage at CN-52(36) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (36) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



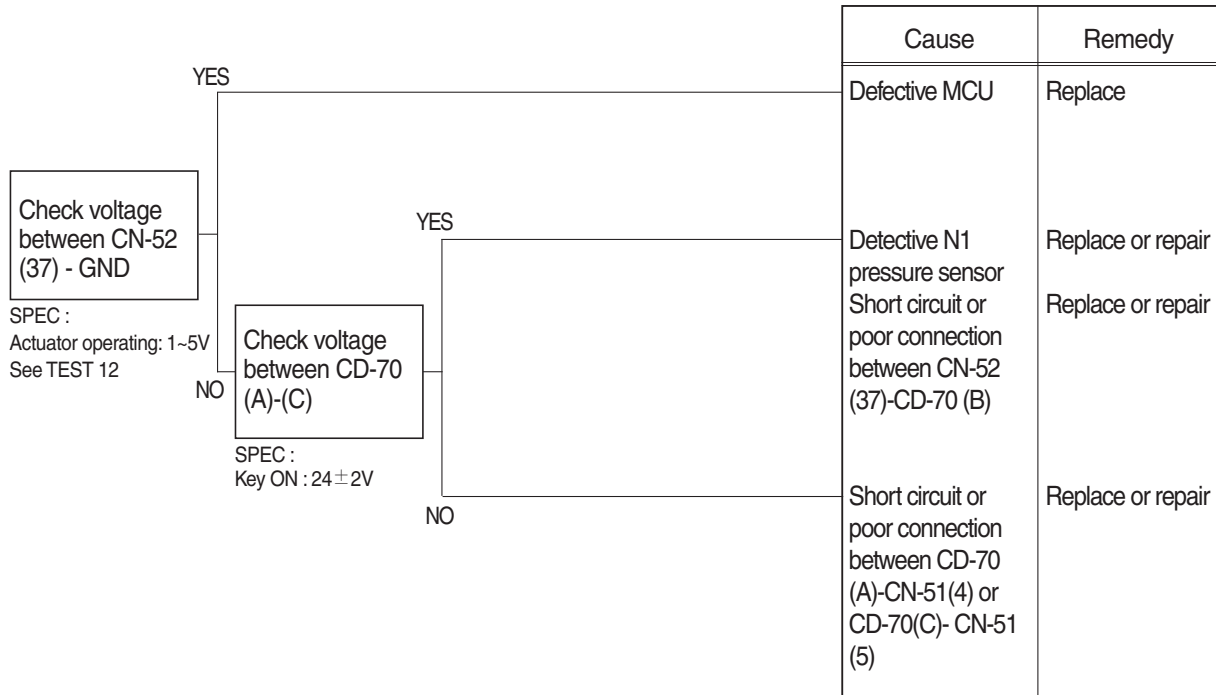
21096MS08A

## 9. MALFUNCTION OF NEGATIVE 1 PRESSURE SENSOR

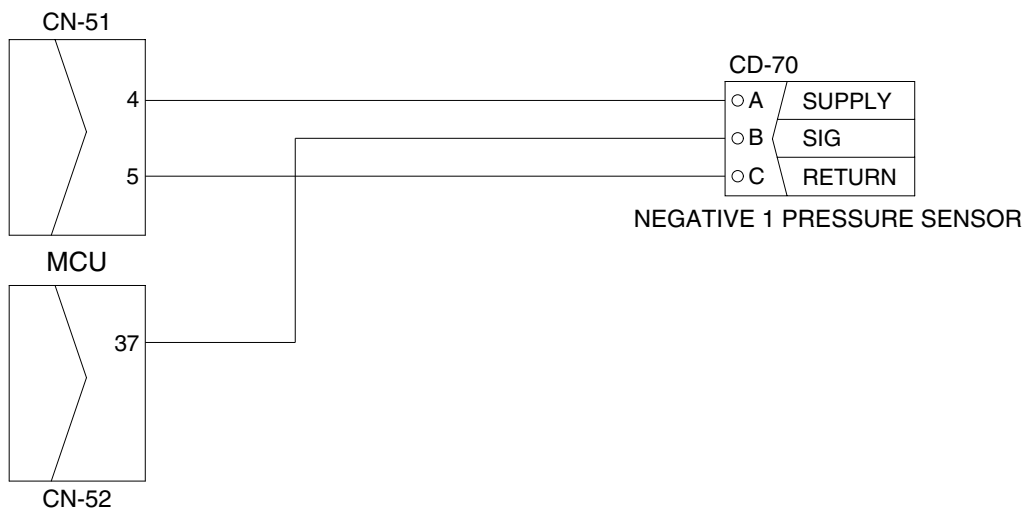
· Fault code : HCESPN 123, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



21096MS09

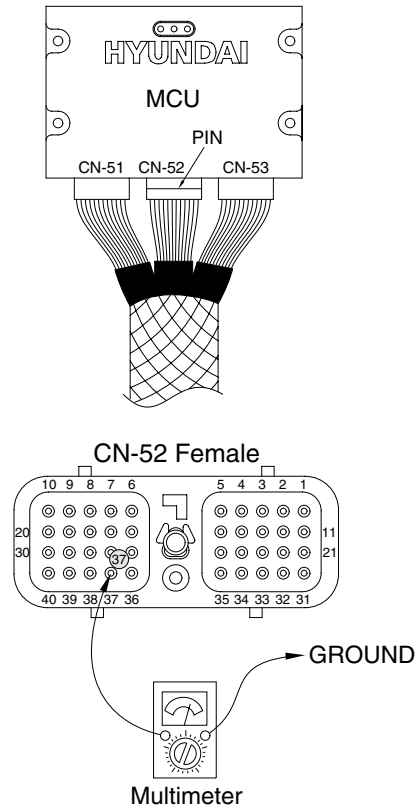


## 2) TEST PROCEDURE

(1) **Test 12** : Check voltage at CN-52(37) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (37) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



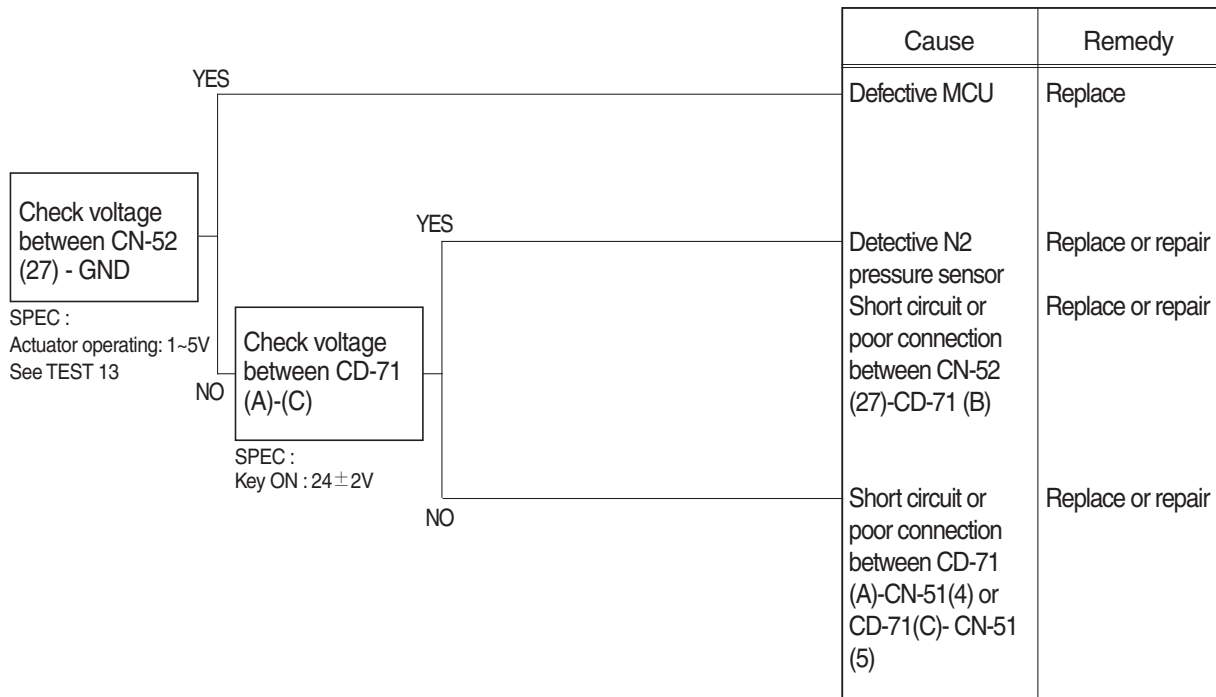
21096MS09A

## 10. MALFUNCTION OF NEGATIVE 2 PRESSURE SENSOR

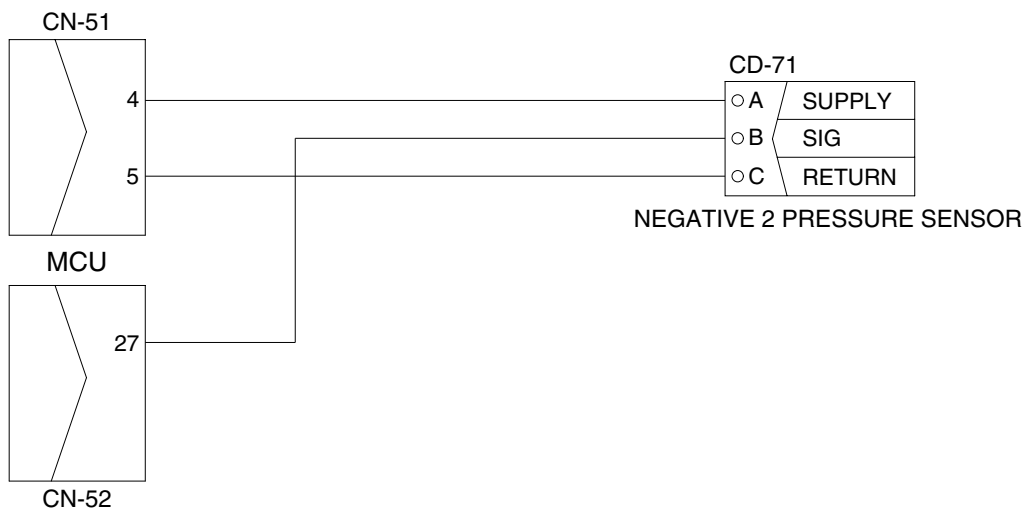
· Fault code : HCESPN 124, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



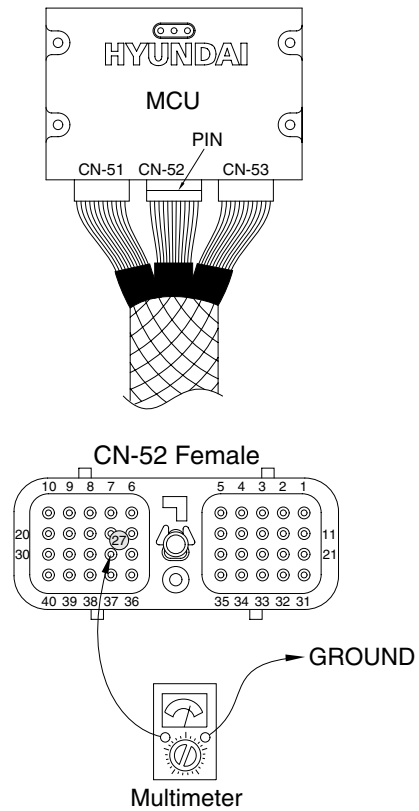
21096MS10

## 2) TEST PROCEDURE

(1) **Test 13** : Check voltage at CN-52(27) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (27) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



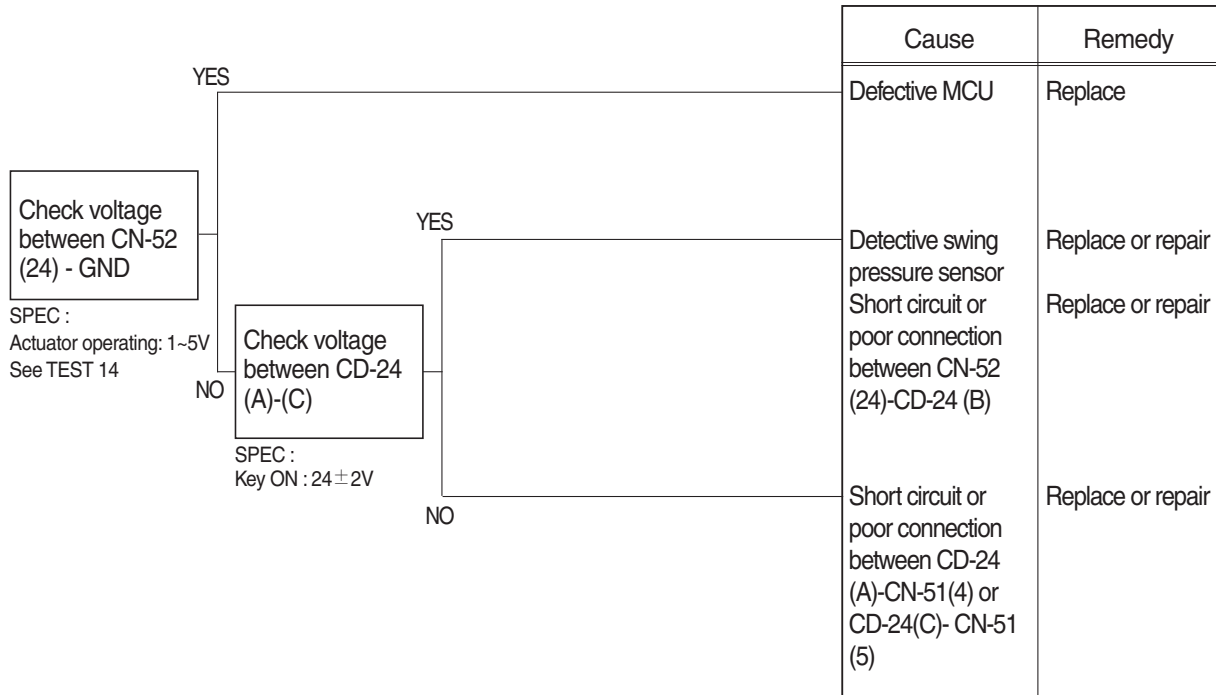
21096MS10A

## 11. MALFUNCTION OF SWING PRESSURE SENSOR

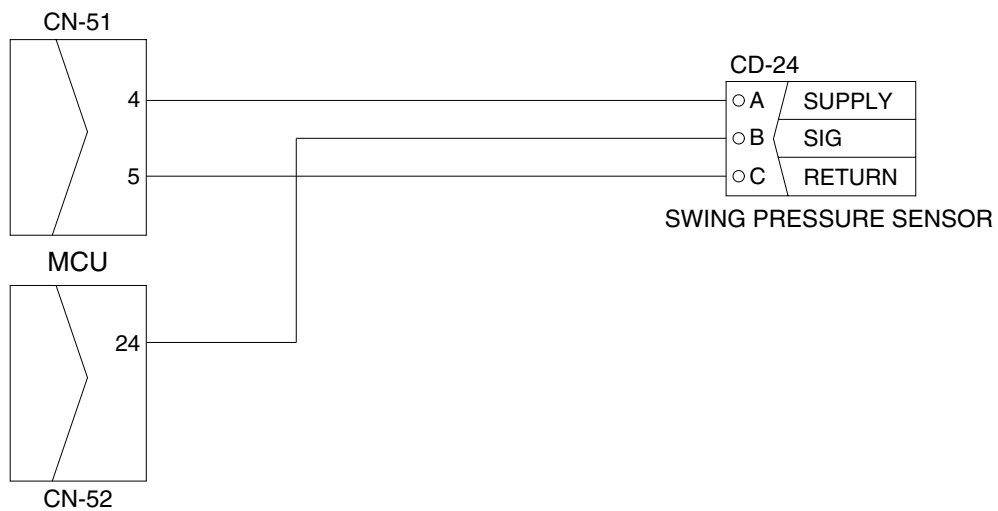
· Fault code : HCESPN 135, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



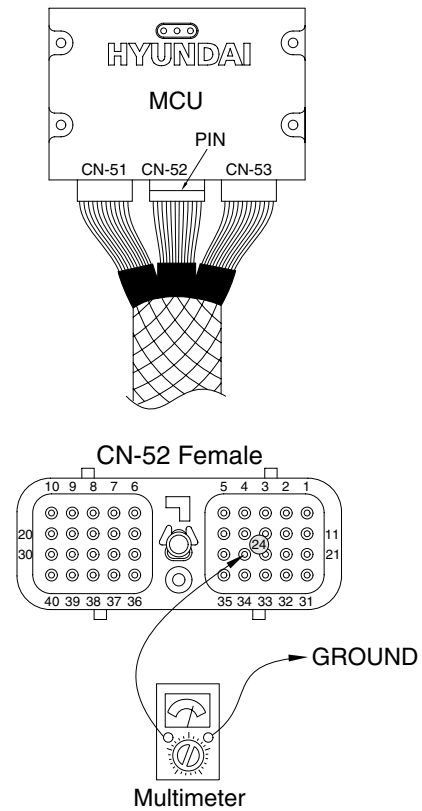
21096MS11

## 2) TEST PROCEDURE

(1) Test 14 : Check voltage at CN-52(24) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (24) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



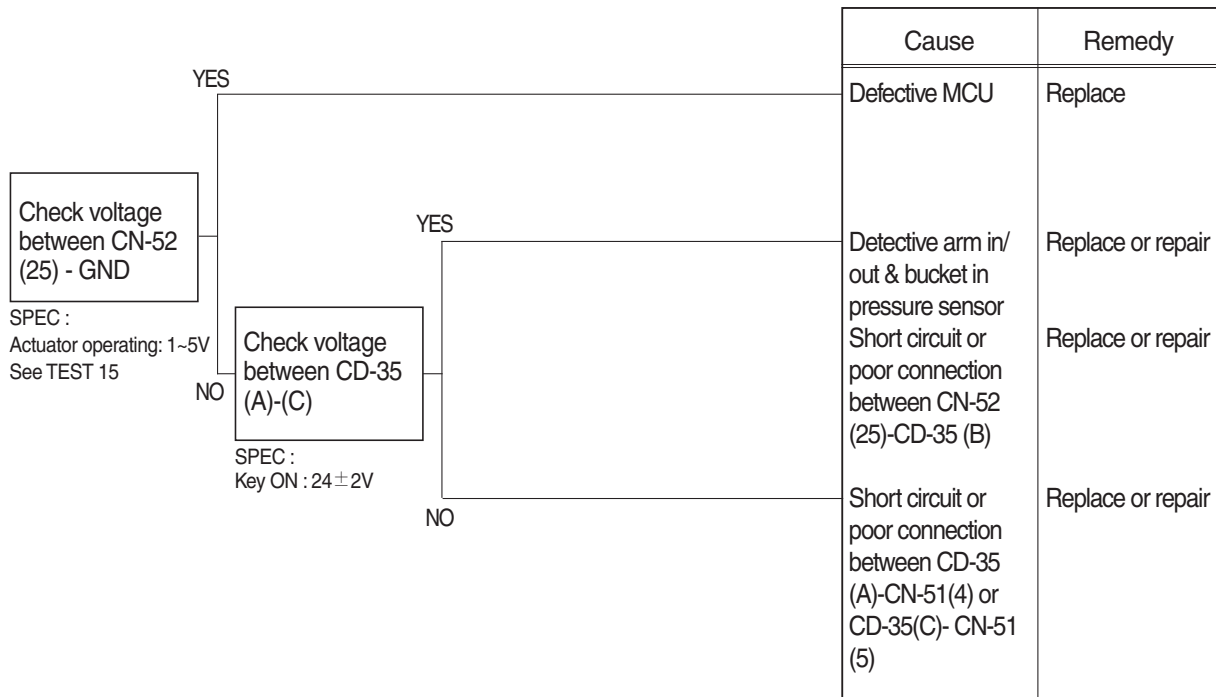
21096MS11A

## 12. MALFUNCTION OF ARM IN/OUT & BUCKET IN PRESSURE SENSOR

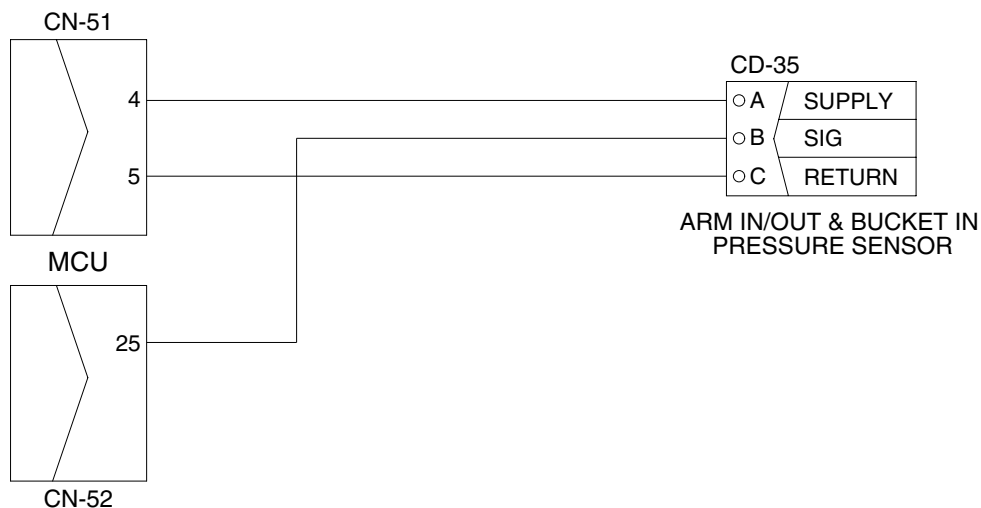
· Fault code : HCESPN 133, FMI 0~4

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



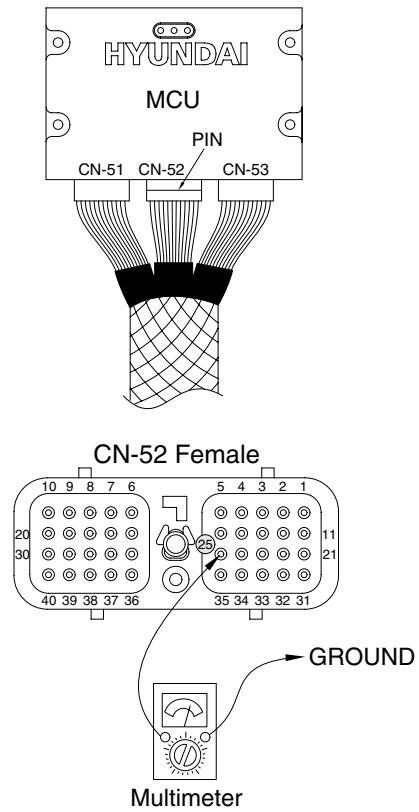
21096MS12

## 2) TEST PROCEDURE

(1) **Test 15** : Check voltage at CN-52(25) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (25) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



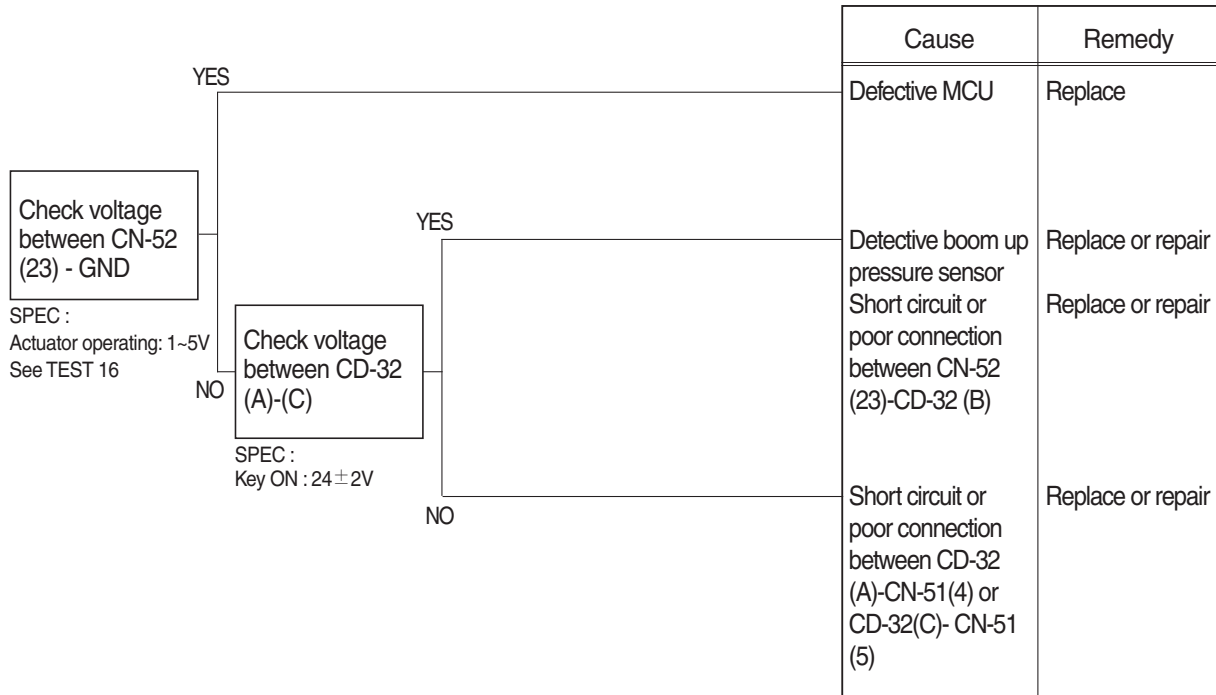
21096MS12A

### 13. MALFUNCTION OF BOOM UP PRESSURE SENSOR

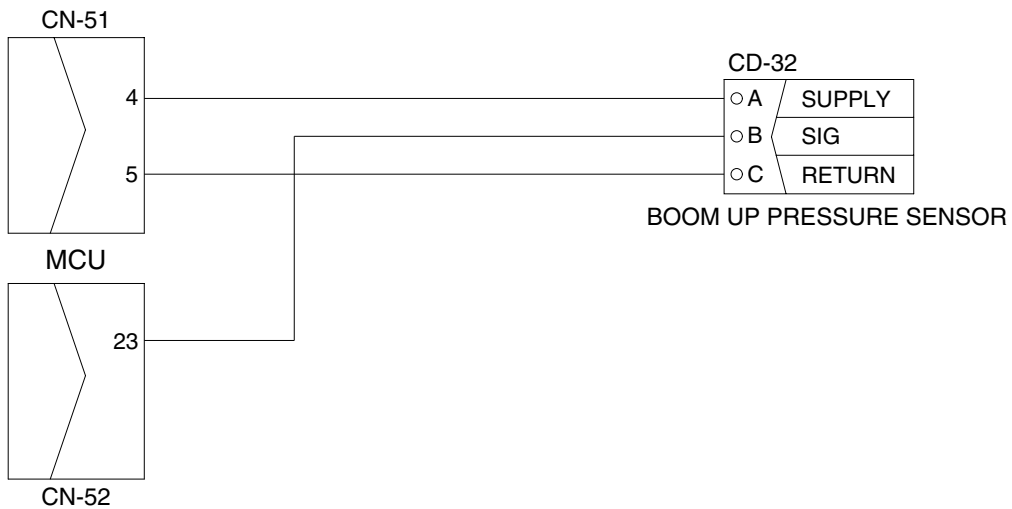
· Fault code : HCESPN 127, FMI 0~4

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

#### 1) INSPECTION PROCEDURE



#### Wiring diagram



21096MS13

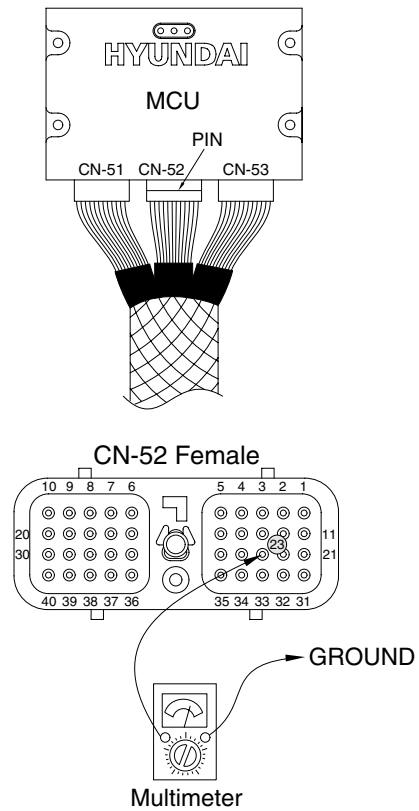


## 2) TEST PROCEDURE

(1) **Test 16** : Check voltage at CN-52(23) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (23) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Actuator operating : 1~5 V



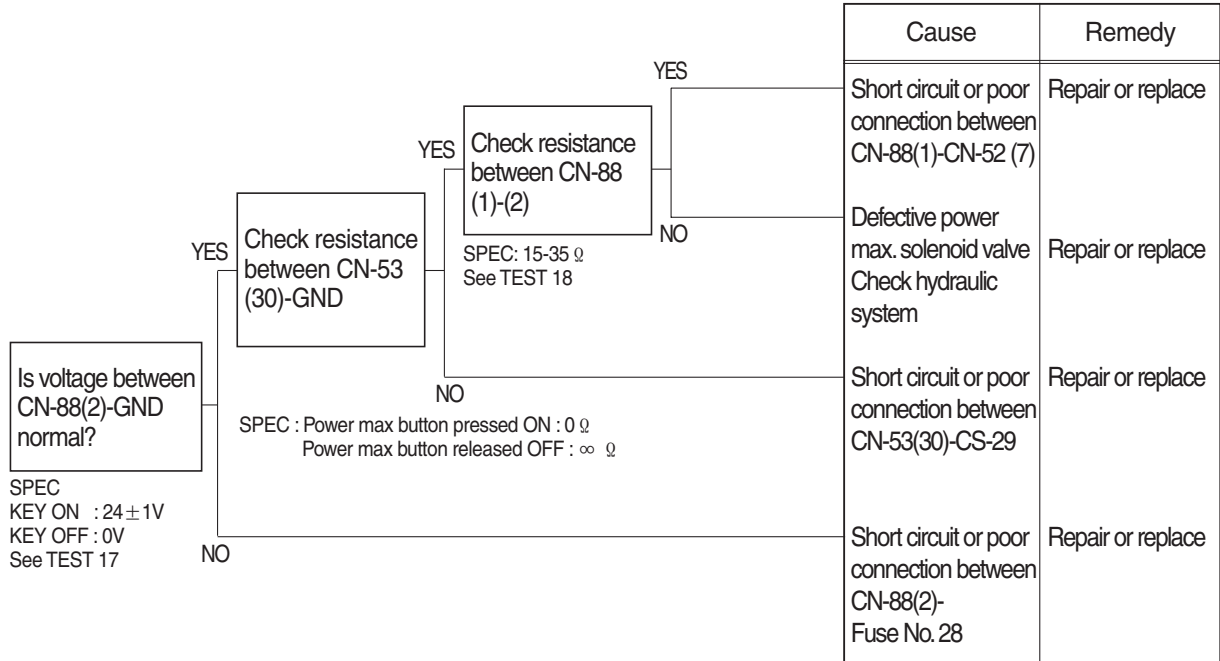
21096MS13A

## 14. MALFUNCTION OF POWER MAX

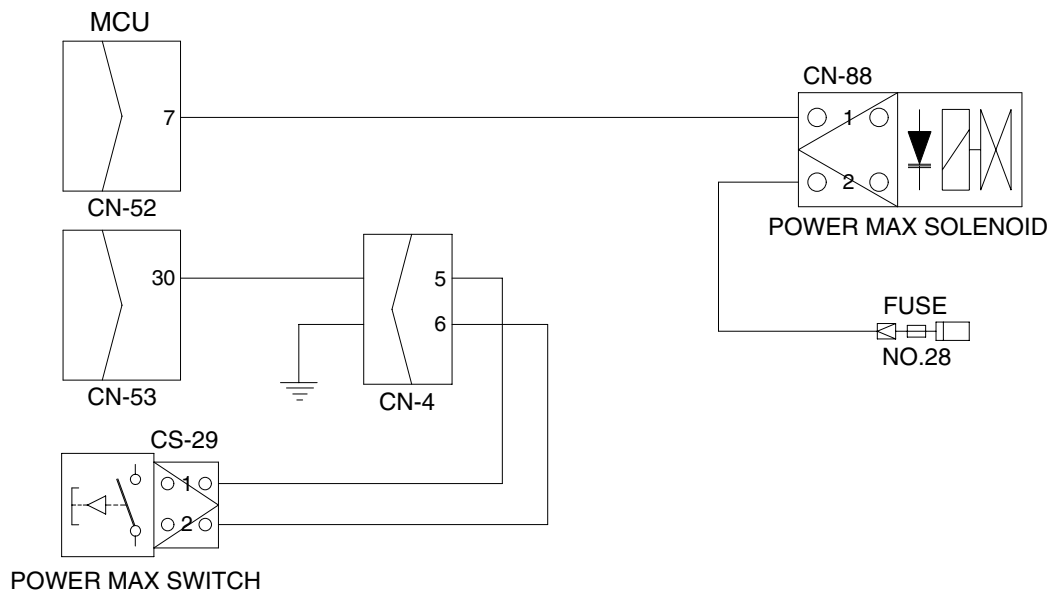
· Fault code : HCESPN 166, FMI 5 or 6

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



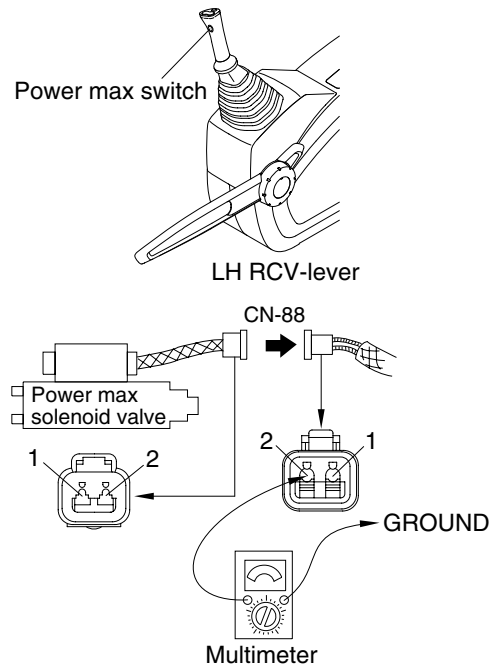
21096MS14

## 2) TEST PROCEDURE

(1) **Test 17:** Check voltage between connector CN-88(2) - GND.

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

SPEC : Key ON :  $24 \pm 1V$   
Key OFF : 0V

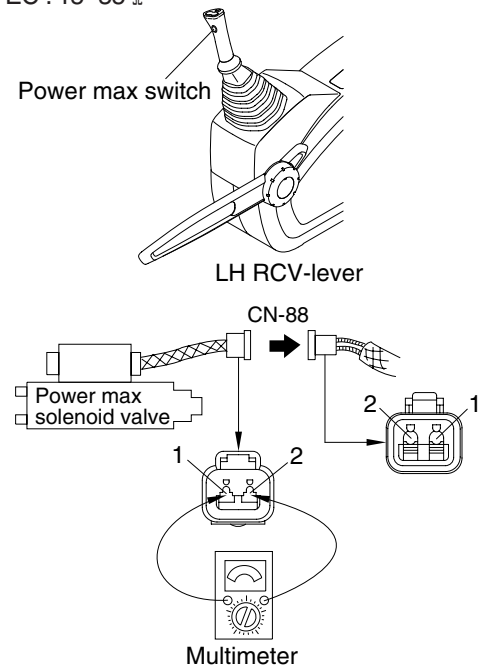


21096MS14A

(2) **Test 18:** Check resistance of the solenoid valve between CN-88(1)-(2).

- ① Starting key OFF.
- ② Disconnect connector CN-88 from power max solenoid valve.
- ③ Check resistance as figure.

SPEC : 15~35  $\Omega$



21096MS14B

## 15. MALFUNCTION OF BOOM PRIORITY EPPR VALVE

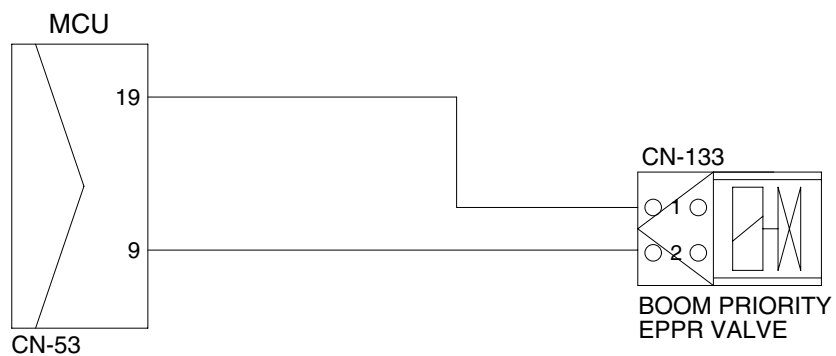
· Fault code : HCESPN 141, FMI 5 or 6

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



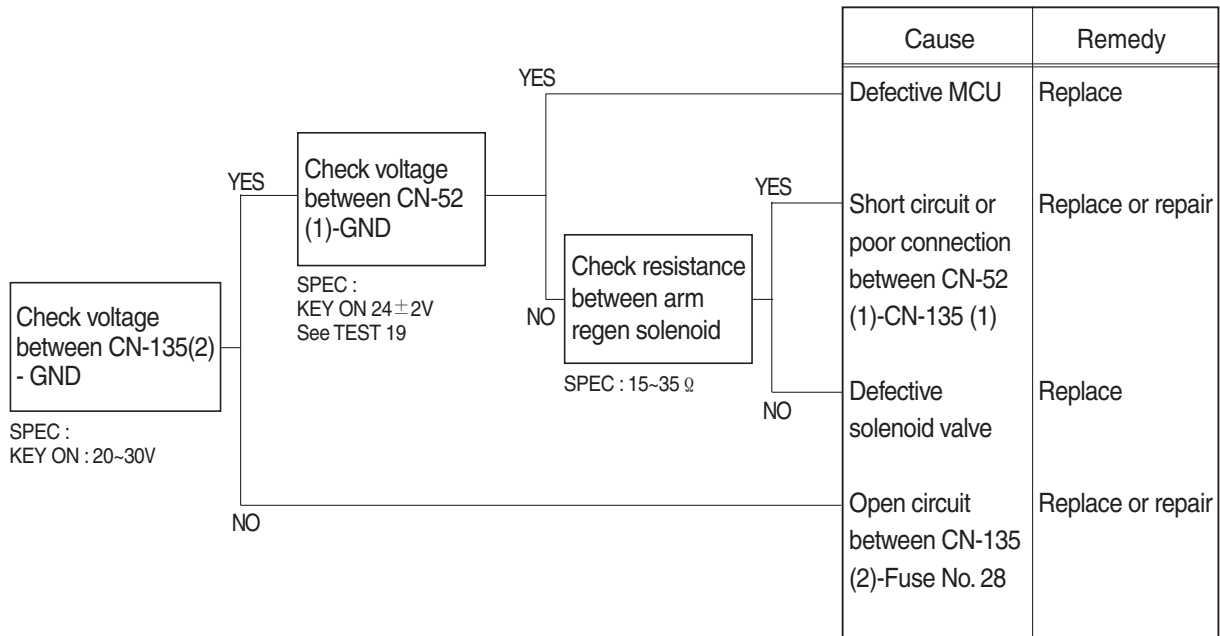
21096MS15

## 16. MALFUNCTION OF ARM REGENERATION SOLENOID

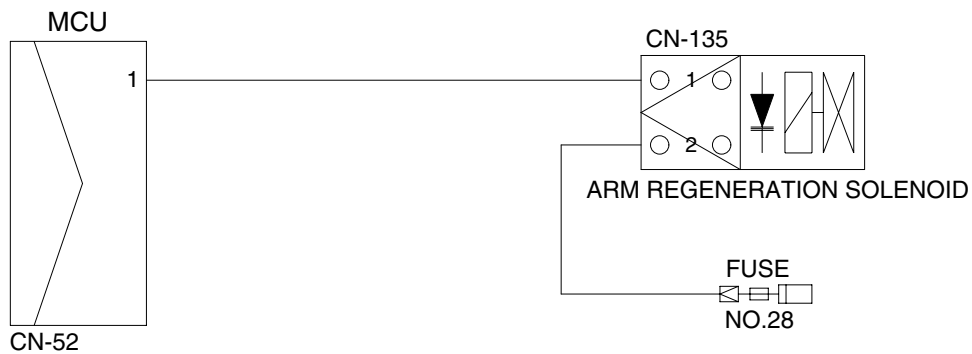
· Fault code : HCESPN 170, FMI 5 or 6

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

### 1) INSPECTION PROCEDURE



### Wiring diagram



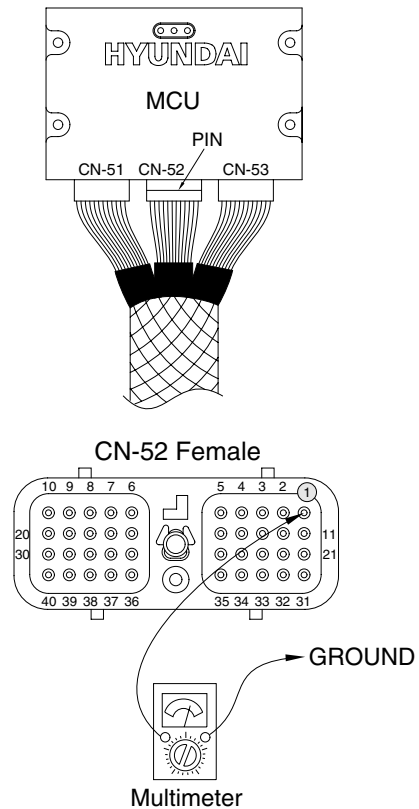
21096MS16

## 2) TEST PROCEDURE

(1) **Test 19** : Check voltage at CN-52(1) and ground.

- ① Prepare 1 piece of thin sharp pin, steel or copper.
- ② Insert prepared pin to rear side of connectors : One pin to (1) of CN-52.
- ③ Starting key ON.
- ④ Check voltage as figure.

SPEC : Key ON :  $24 \pm 2$  V



21096MS16A