

# **TILLÄGG FÖR MINISPAKAR (fr.o.m 2003)**

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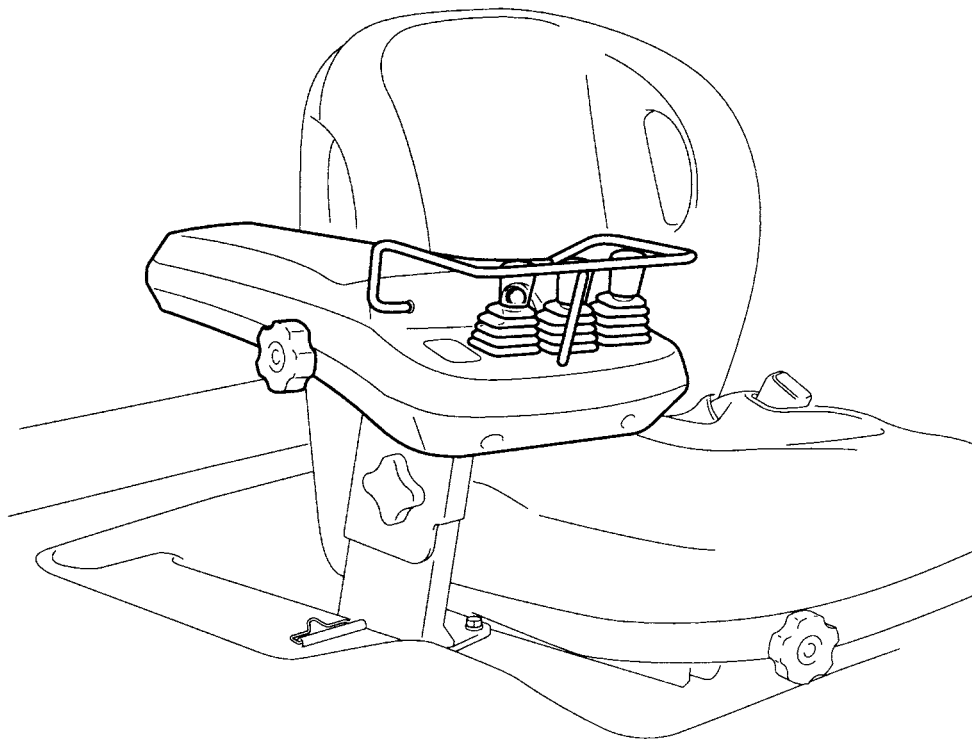
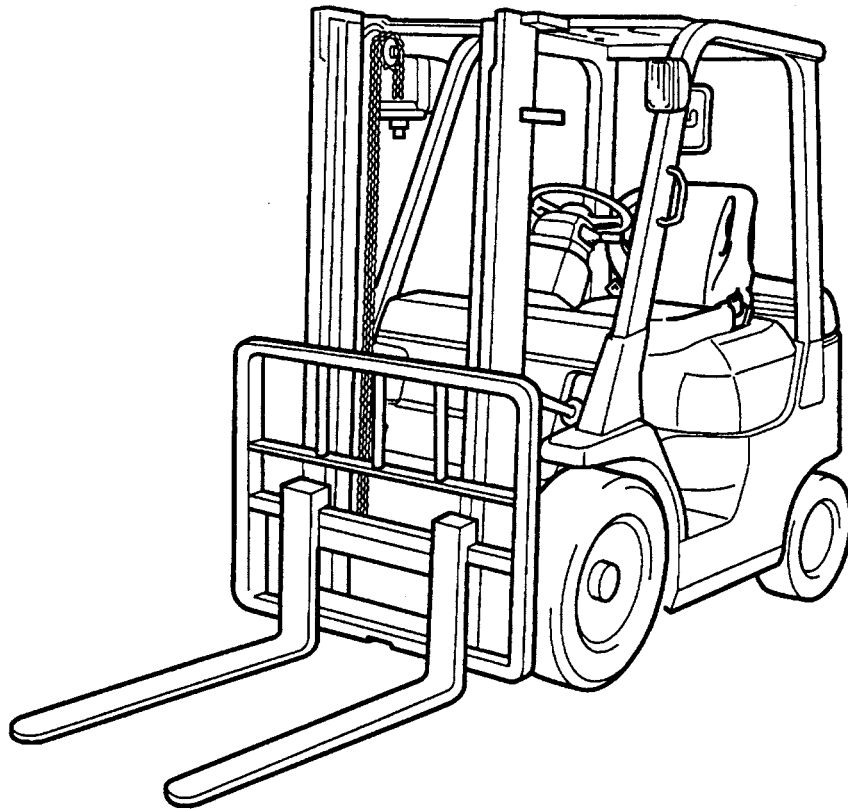
## GENERAL

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## EXTERIOR VIEWS



## PERIODIC MAINTENANCE

### INSPECTION METHOD

I : Inspection. Repair or replacement if required.  
 M : Measurement. Repair or adjustment if required.  
 T : Retightening C : Cleaning L : Lubrication  
 \* : For new vehicle \*1 : Flaw detector

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Item		Inspection Period	Every 1 month	Every 3 months	Every 6 months	Every 12 months
			Every 170 hours	Every 500 hours	Every 1000 hours	Every 2000 hours
SAFETY DEVICES, ETC.						
Seat	Loosening and damage of mounting		I	←	←	←
	Seatbelt damage and function		I	←	←	←
	Seat switch function (Mini lever spec.)		I	←	←	←

## MINI LEVER (OPTION)

### ■ STRUCTURE

The mini lever is provided as an optional feature.

The material handling levers formerly positioned above the instrument panel are moved to the front right-hand side of the seat and the lever stroke and operating force are decreased for easier operation and less fatigue.

The mini lever controller outputs commands to the electromagnetic control valve according to the input from the mini lever for material handling control.

Since each lever is a single shaft lever independent between the forward and backward directions as on the previous models, operation by changing from the previous models is easy without any sense of incongruity.

The fork automatic leveling switch is positioned on the rear side of the tilt lever.

When the button is pressed once, the internal mechanical lock mechanism holds the operated state to cause stopping with automatic leveling. (ON state)

When the button is pressed again, the locking is released to disable automatic leveling. (OFF state)

#### Note:

**Since automatic leveling is disabled with a load on the fork at a high fork position (about 2 m or more), forward tilting with the switch in the ON state is not possible.**

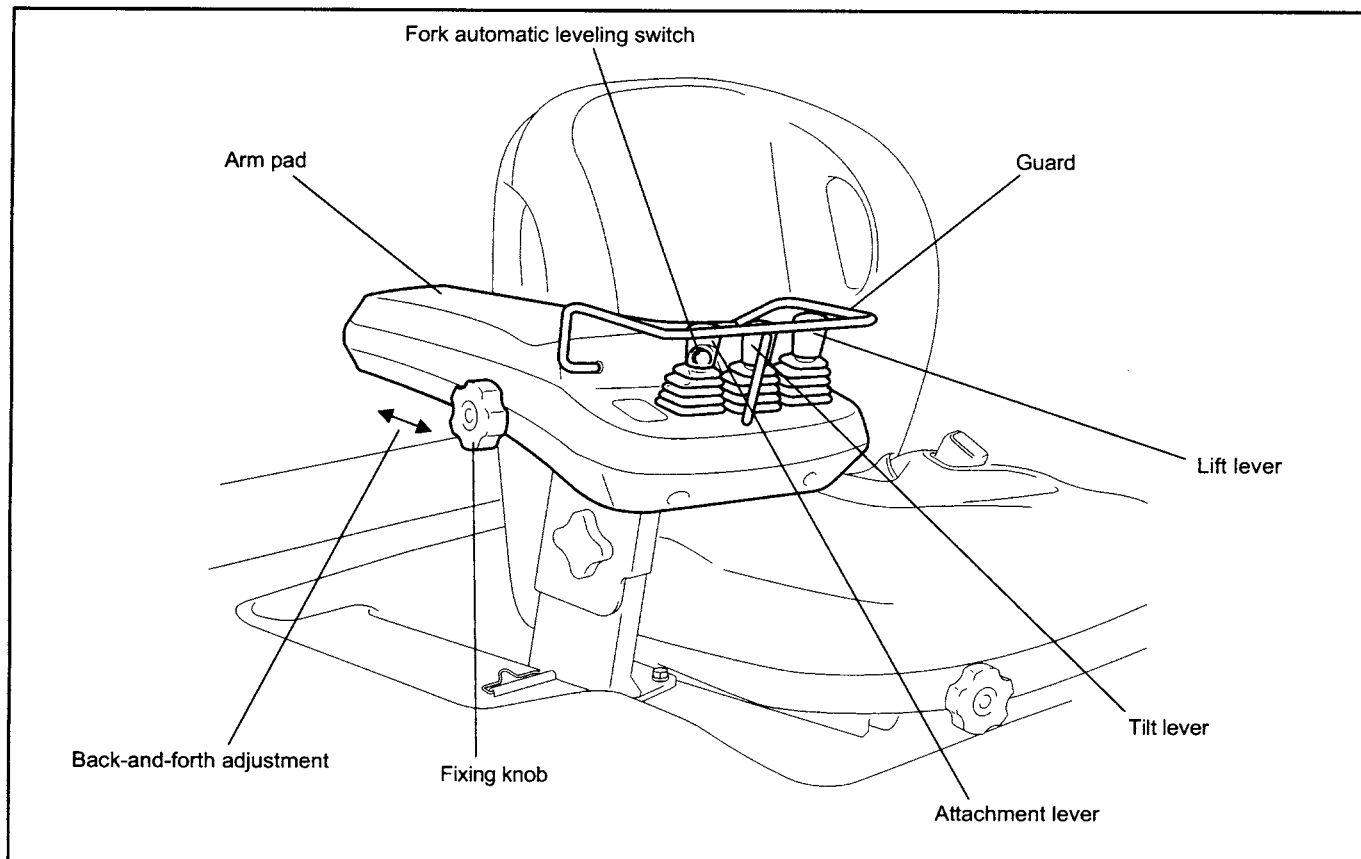
**Set the automatic leveling switch OFF when the automatic leveling function is not to be used.**

The lever position in the longitudinal direction is adjustable. Loosen the lever box fixing knob, move the box to the desired position and tighten the knob for fixing.

A guard is provided around the levers.

Material handling control is stopped when the operator is not on the seat.

### ■ NAMES OF MINI LEVER COMPONENTS



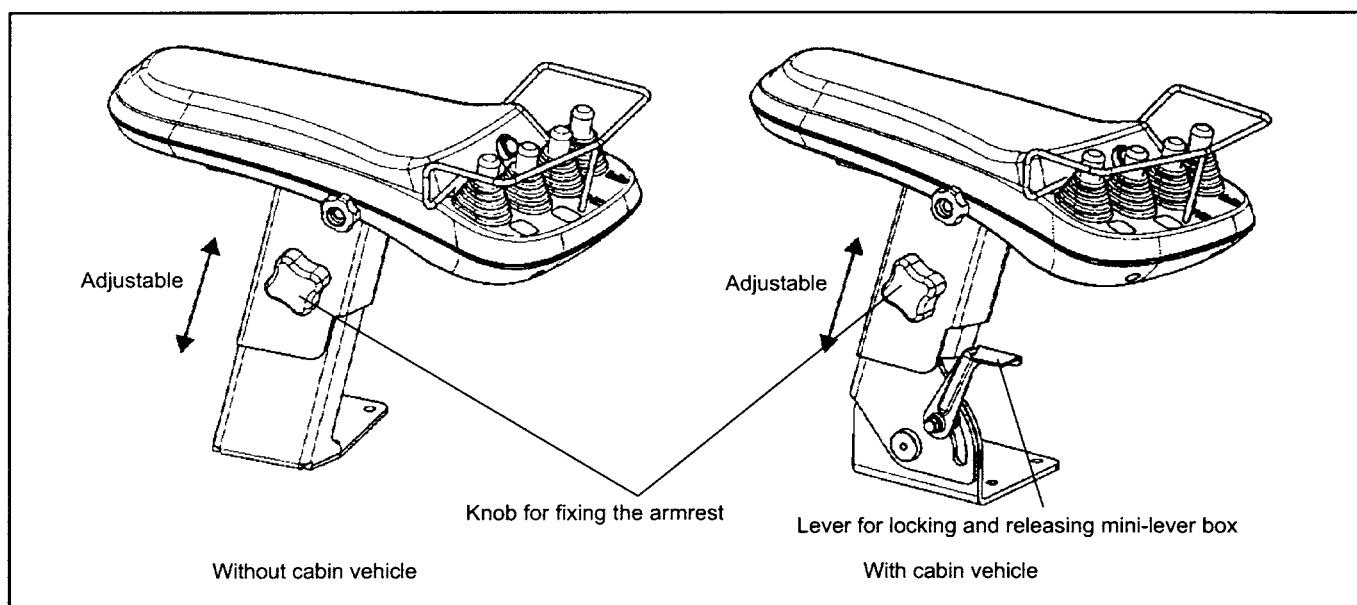
## ■ THE STRUCTURE OF ARMREST

Armrest is installed to lessen the operator's fatigue of right arm when driving the vehicle and operating hydraulic lever.

The material of the arm pad is polyurethane. It is soft and fits the arm and the palm.

Armrest is fixed on engine hood, and it does not move with seat slide. Therefore, by moving the seat backward for large operator whose legs and arms are long and by moving the seat forward for small operator whose legs and arms are short, all operators can take best position to operate load handling lever.

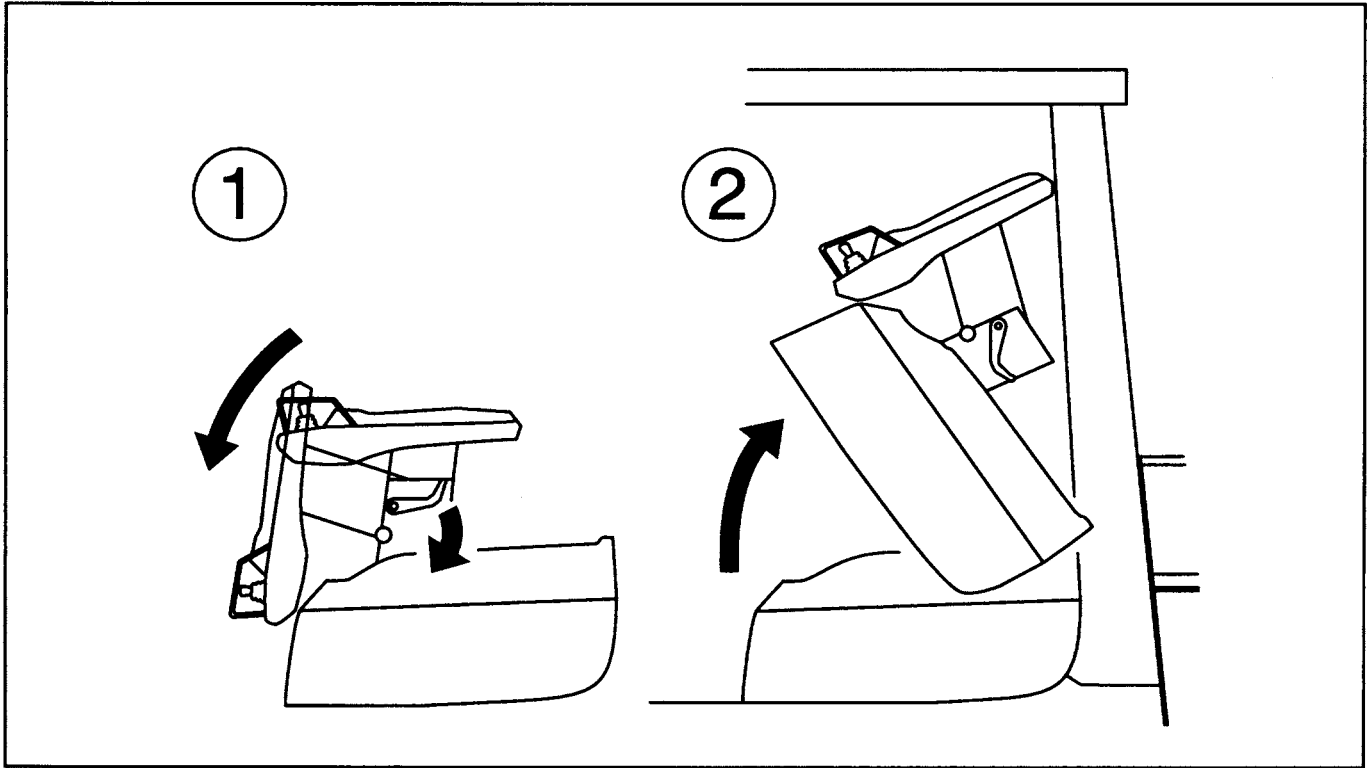
The height of the armrest is adjustable. Loosen the knob that fix armrest, and set the armrest at the position that operator prefer, and tighten the knob to fix armrest.



## ■ ENGINE HOOD OPENING PROCEDURE (CABIN VEHICLE)

Follow the procedure below when opening the engine hood for a cabin vehicle and a half cabin vehicle.

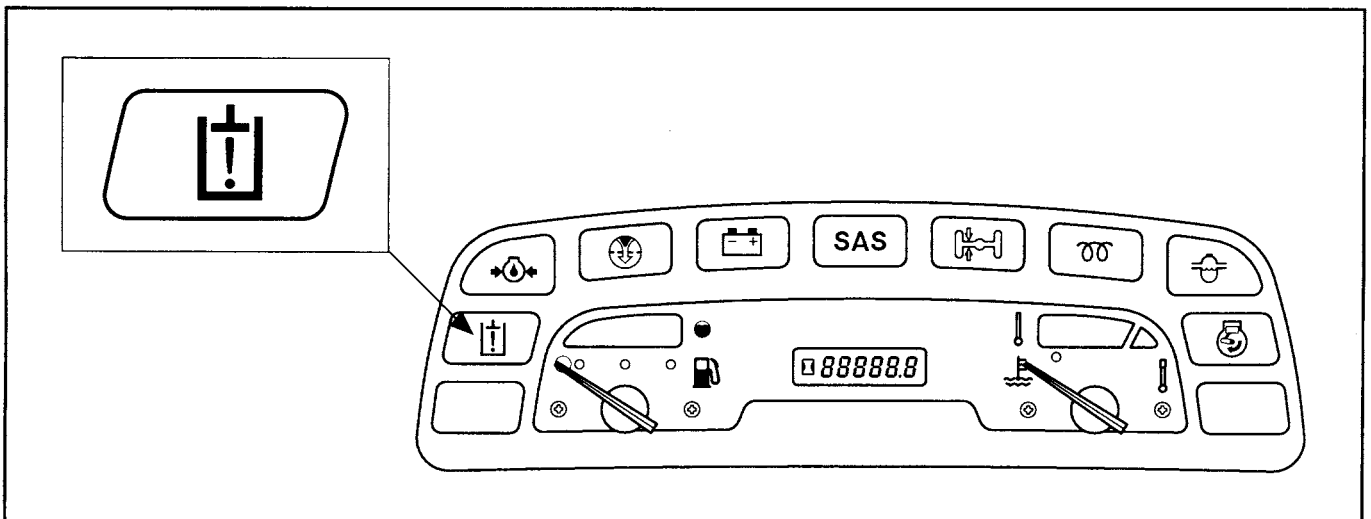
- ① Tilt the mini lever box forward.
- ② Open the engine hood.



## ■ MINI LEVER LAMP

The mini lever lamp is added in the combination meter.

It comes on when the mini lever system becomes abnormal and during lever matching operation. (Lights up for about 2 seconds after key switch ON.)



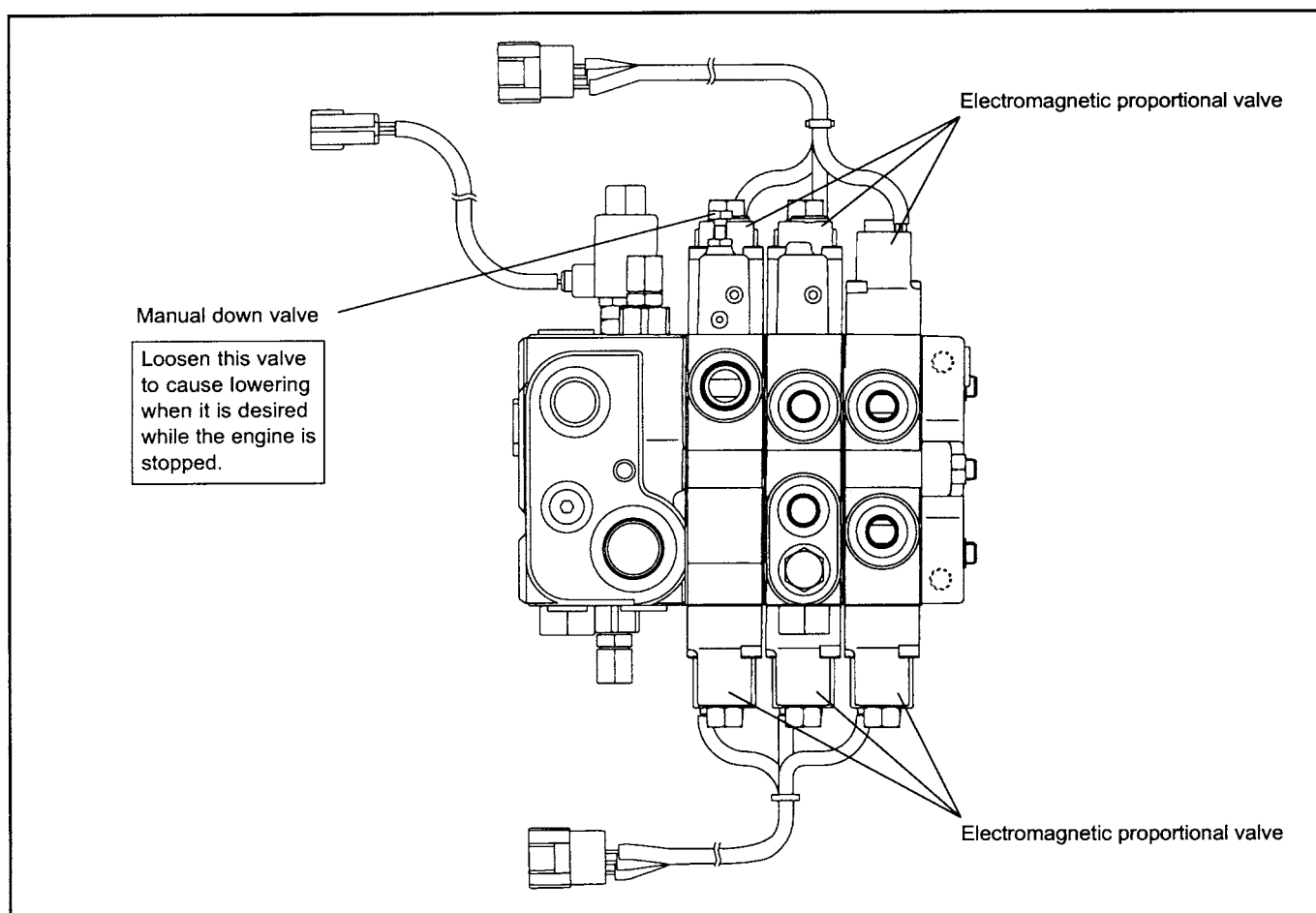
## ■ OIL CONTROL VALVE FOR MINI LEVER

### General

Electromagnetic proportional oil control valves for the mini lever system are newly adopted.

- A check valve and an electromagnetic proportional valve are installed in the tilt circuit to control mast tilting operation.
- A check valve and an electromagnetic proportional valve are installed in the lift circuit, and the key-OFF lift lock function is provided to prevent the fork from lowering in case the lift lever is touched to the down side while the key switch is OFF.
- The check valve in each of the lift and tilt circuits greatly reduces natural drop and natural forward tilting.

### Exterior View



### Note:

The check valve for locking in each of the lift and tilt circuits provided this time is unlocked when lowering or tilting operation starts when the engine is running to generate a hydraulic pressure. (Unlocking sound is heard at the start of operation.)

### Relief Pressure List

		1 ton series	2-3 ton series	J3.5 ton series
Relief pressure MPa (kgf/cm <sup>2</sup> ) [psi]	Lift	17.2 (175) [2490]	18.1 (185) [2630]	18.1 (185) [2630]
	Tilt	11.8 (120) [1710]	14.7 (150) [2130]	15.7 (160) [2280]

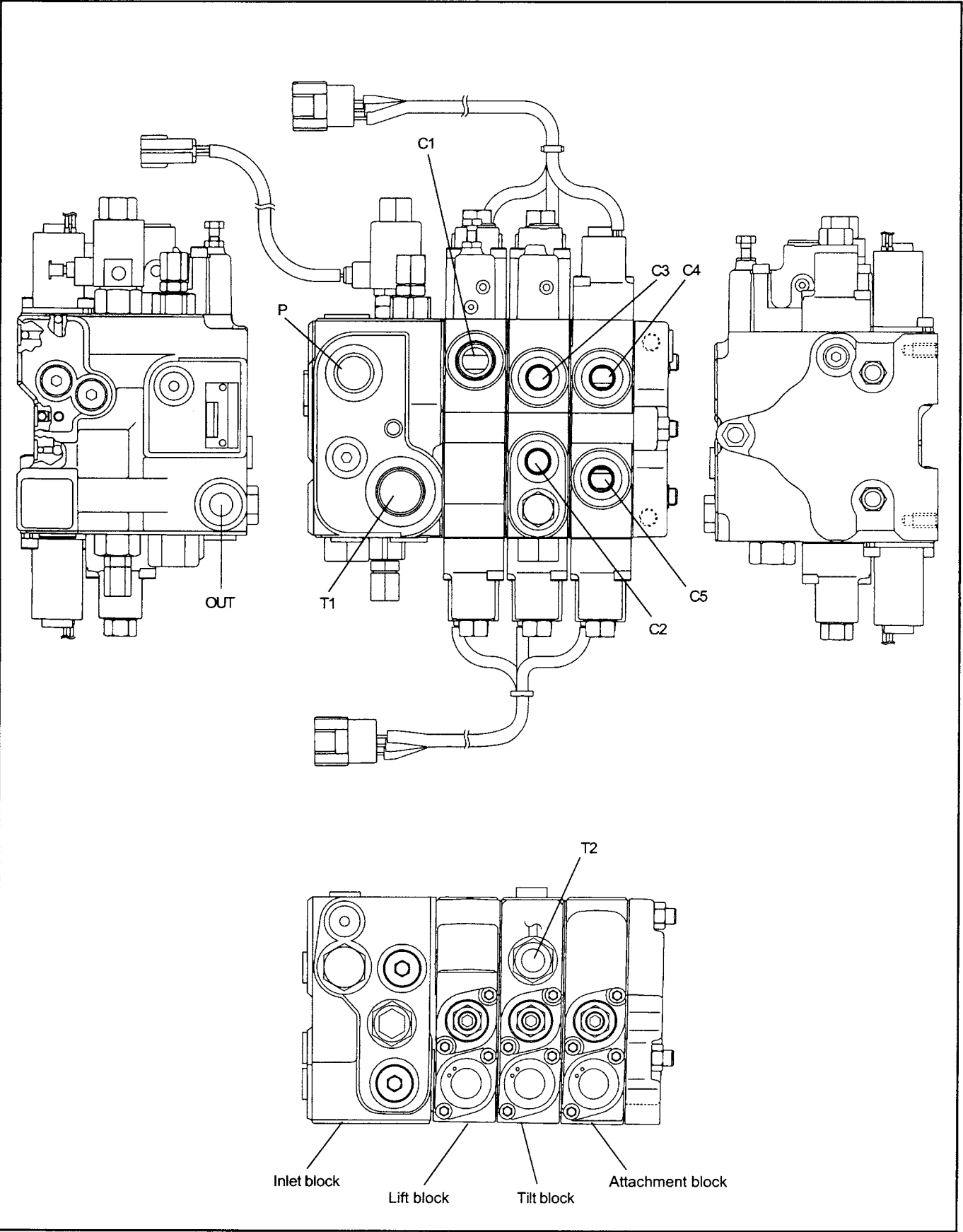


**OIL CONTROL VALVE  
(VEHICLE WITH MINI LEVER)**

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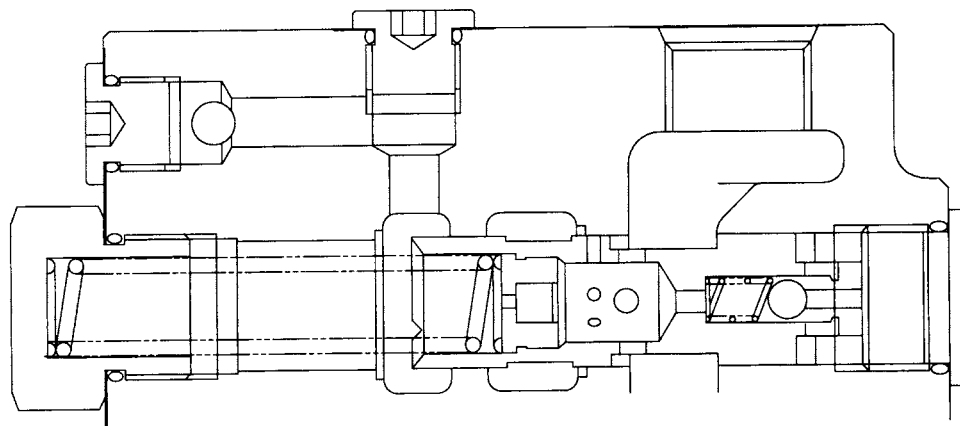
GENERAL

Oil Control Valve



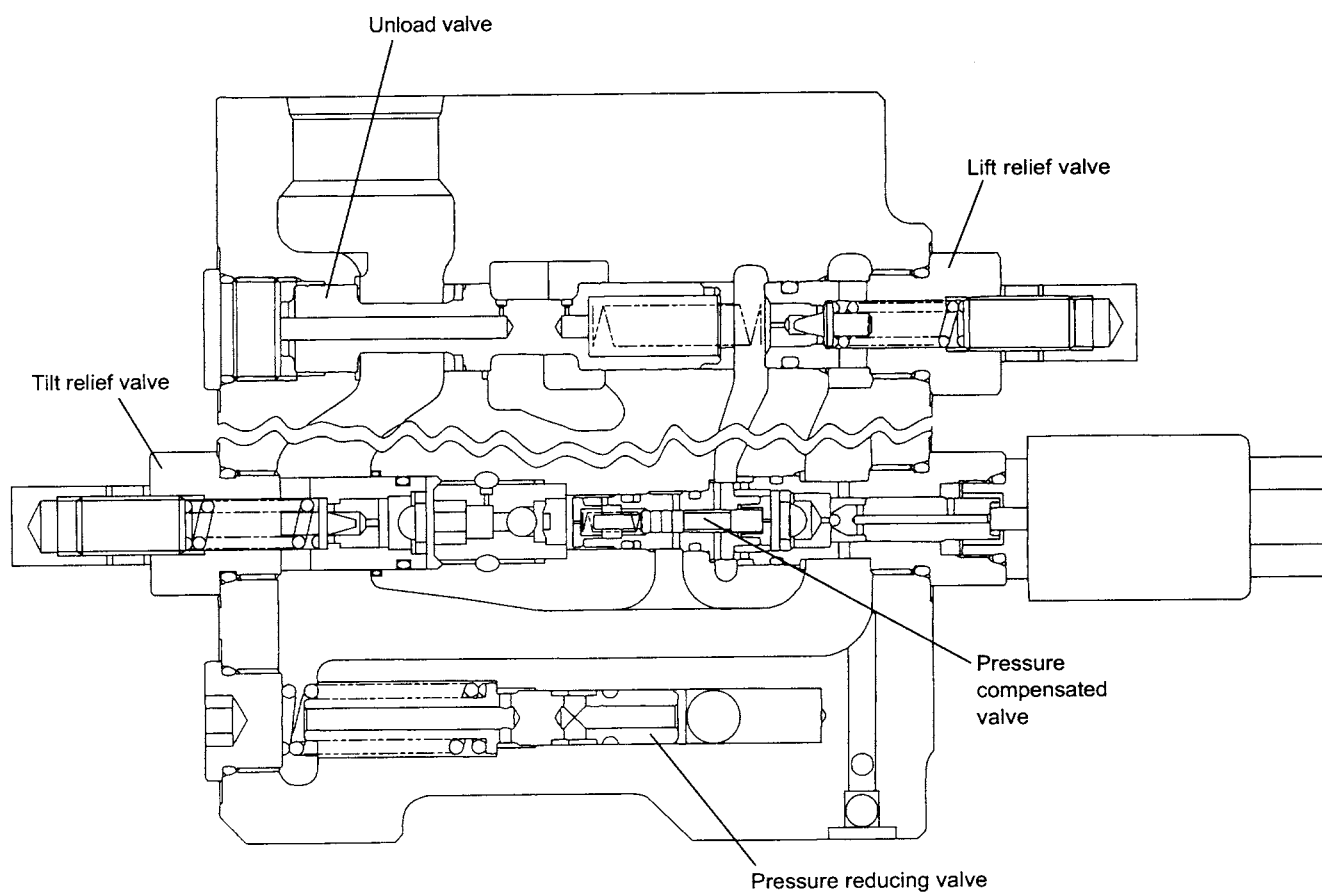
**Inlet Block Sectional View**

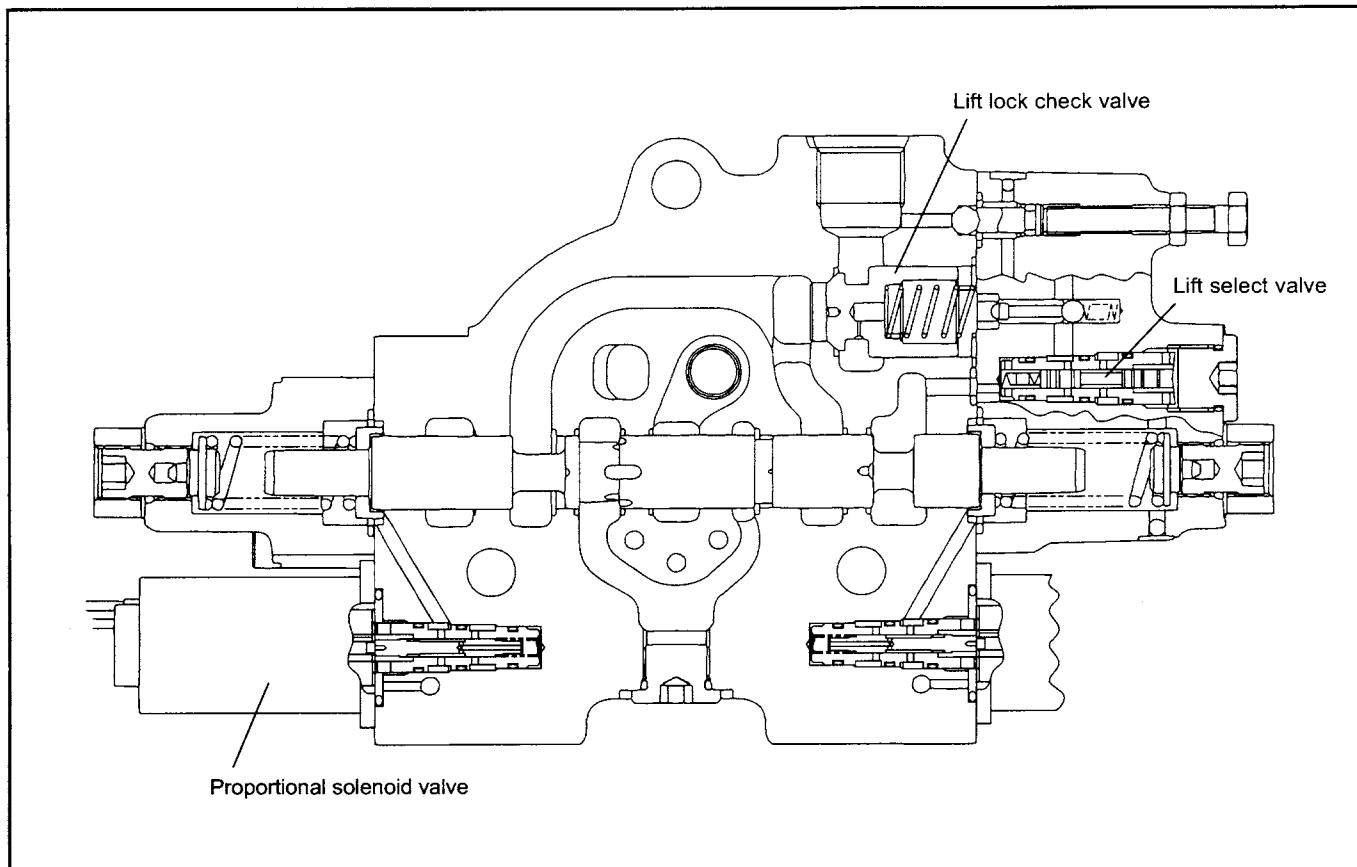
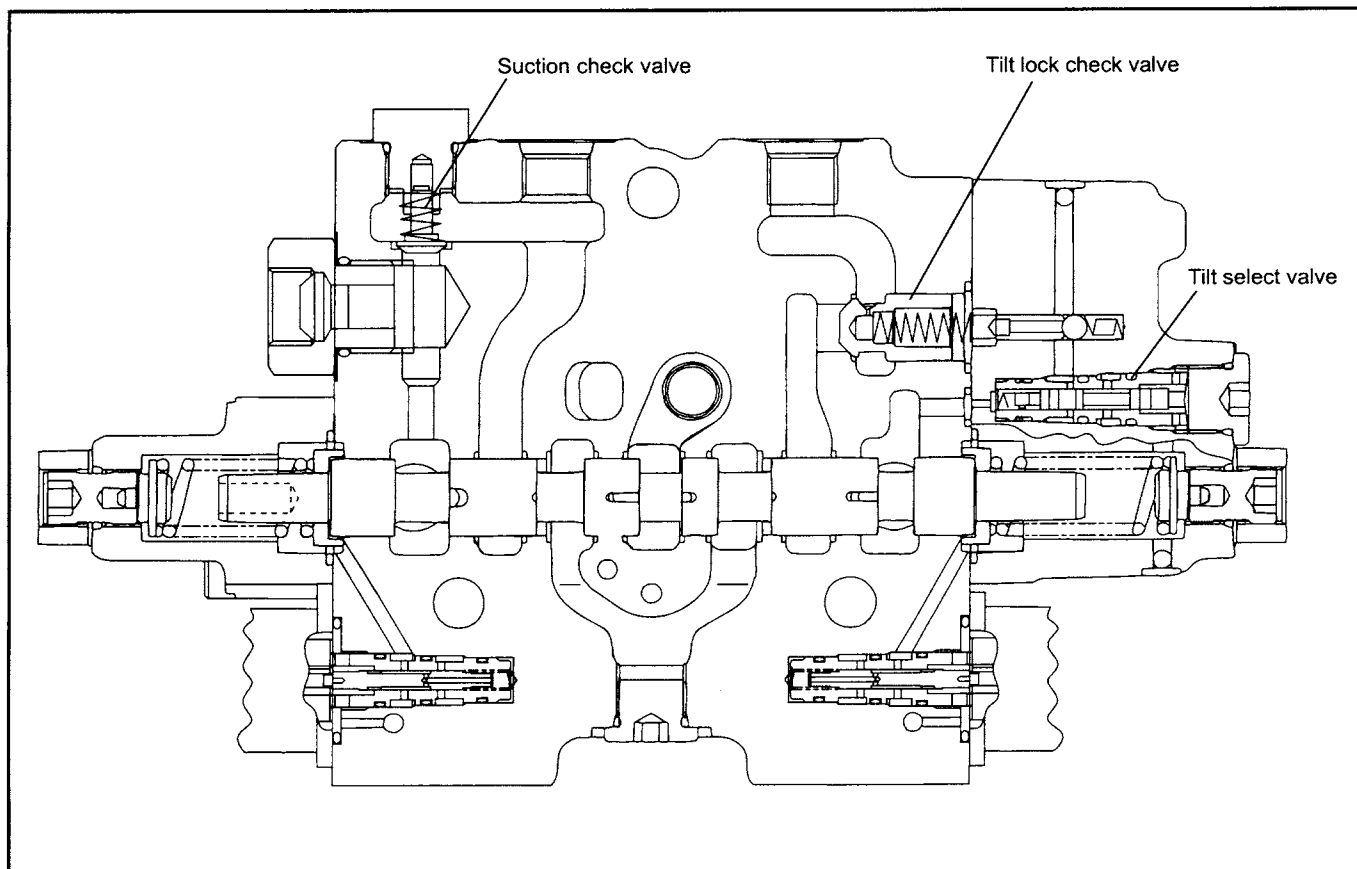
Flow divider valve

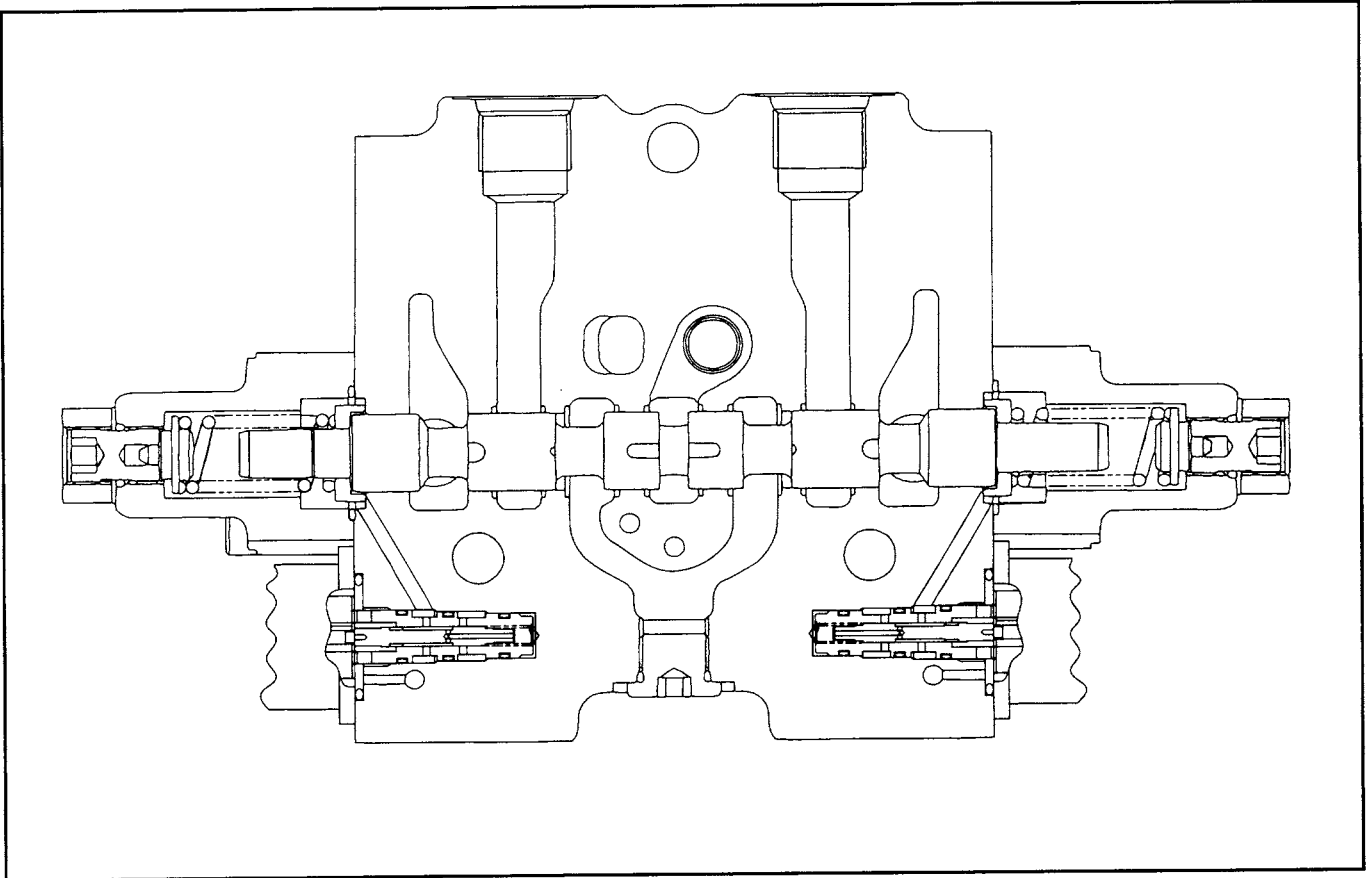


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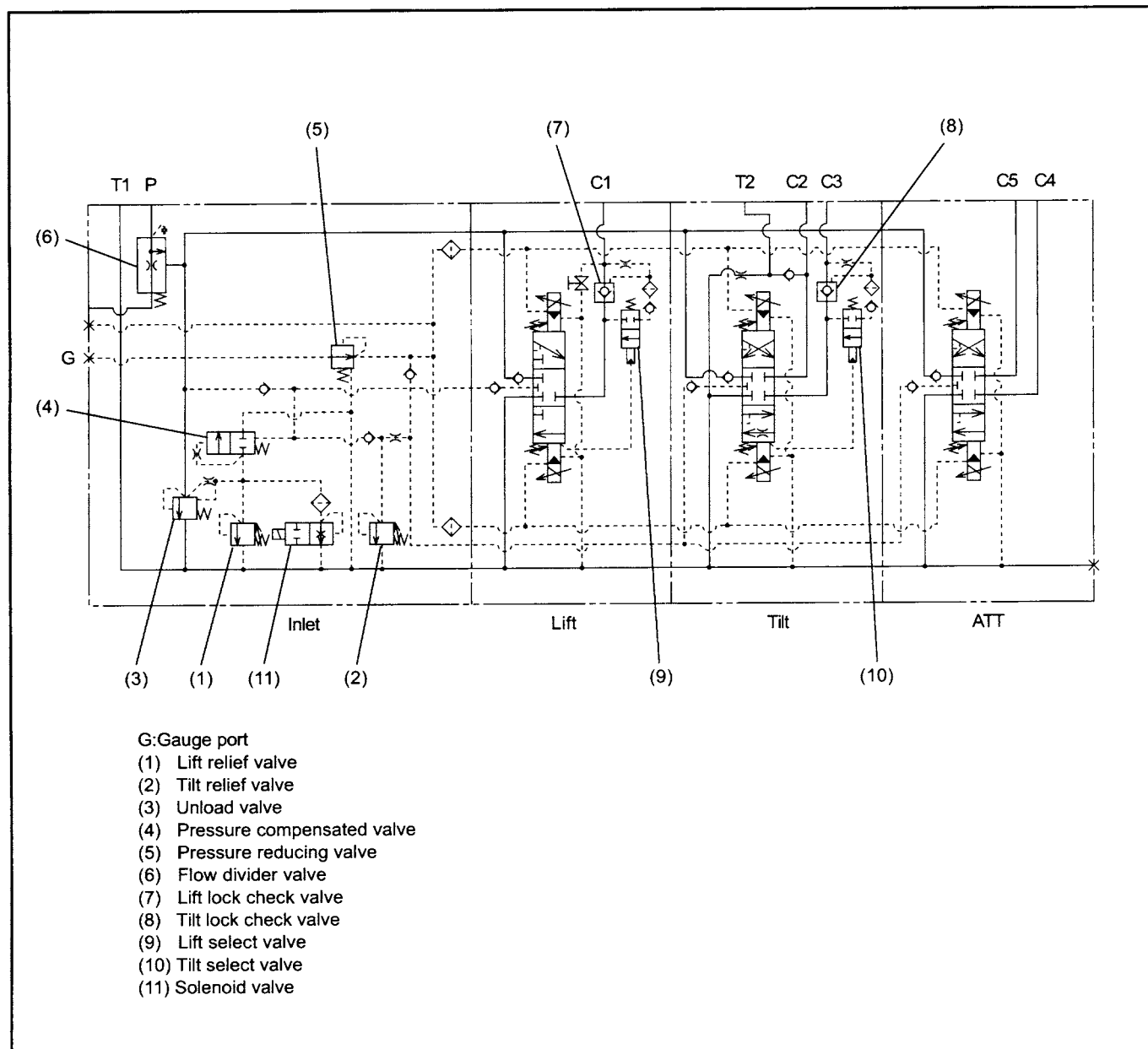
Relief valve



**Lift Block Sectional View****Tilt Block Sectional View**

**Attachment Block Sectional View**

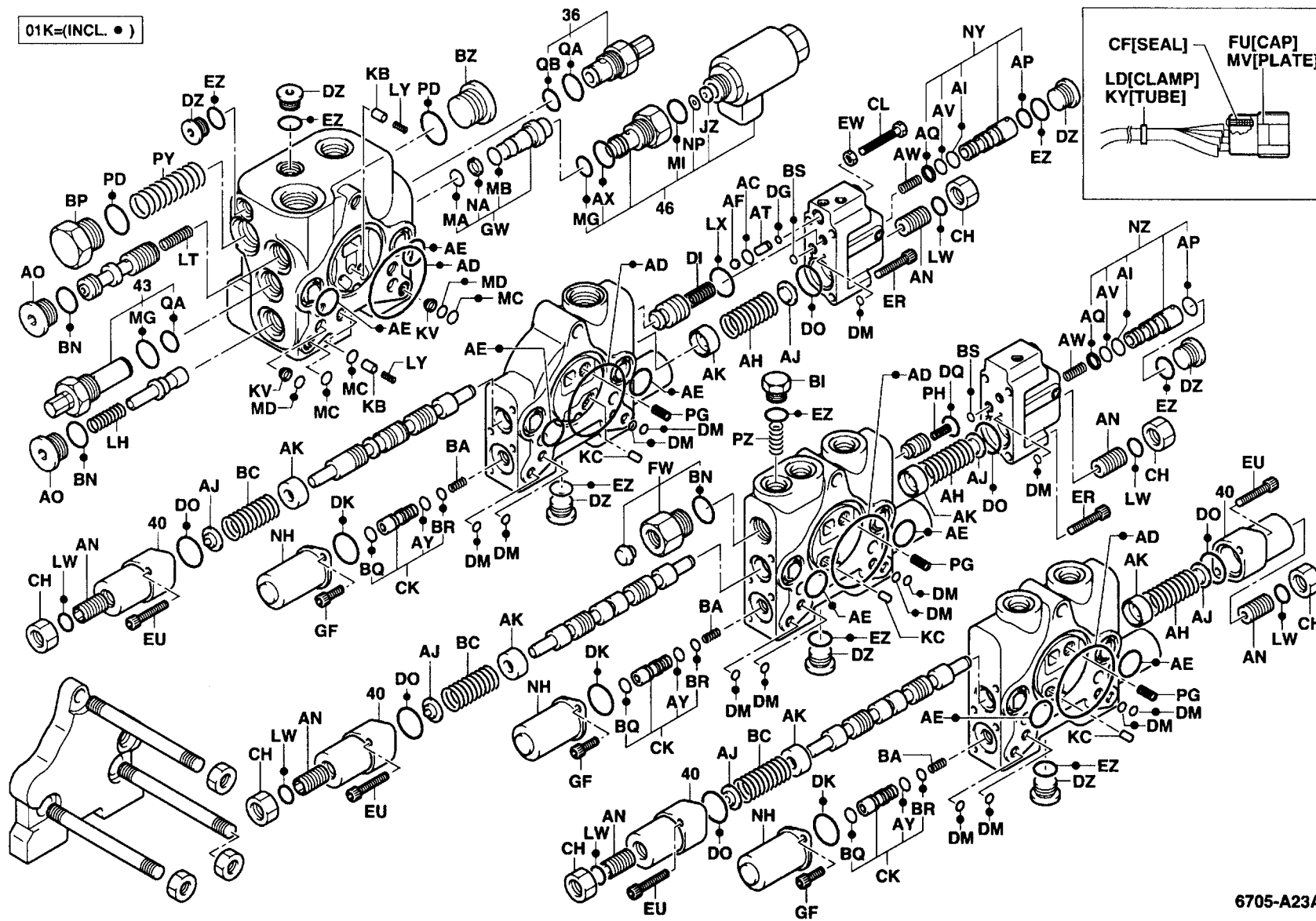
## Hydraulic Circuit Diagram



## SPECIFICATIONS

Vehicle model		1 ton series	2 ton series	3 ton series	J3.5 ton series
Item	Type	Add-on type			
Relief pressure kPa(kgf/cm <sup>2</sup> )[psi]	Lift	17160(175)[2490]	18140(185)[2630]	←	←
	Tilt	11770(120)[1710]	14710(150)[2130]	←	15690(160)[2280]
Flow divider valve flow rate ℓ/min (US gal/min)		13.0(3.43)	←	15.2(4.02)	←
Other		With flow divider valve			
		With proportional solenoid valve			

01K=(INCL. • )

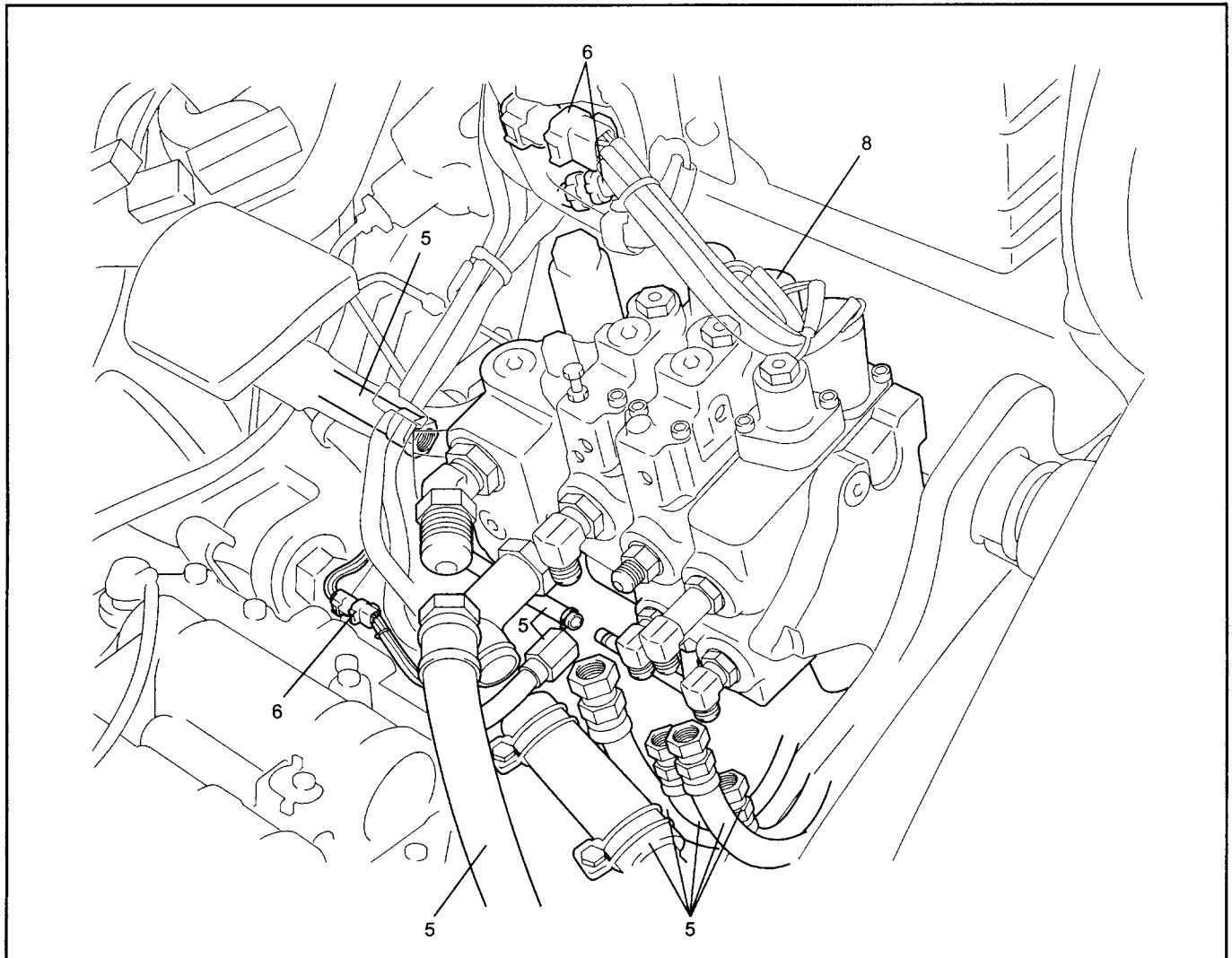


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## OIL CONTROL VALVE ASSY

### REMOVAL-INSTALLATION



#### Removal Procedure

- 1 Remove the toe board.
- 2 Remove the lower panel.
- 3 Remove the instrument panel RH.
- 4 Remove the mini lever controller. (See page 3-9)
- 5 Disconnect the piping.
- 6 Disconnect the connector.
- 7 Remove the oil control valve W/bracket. **[Point 1]**
- 8 Remove the oil control valve.
- 9 Remove the fitting.

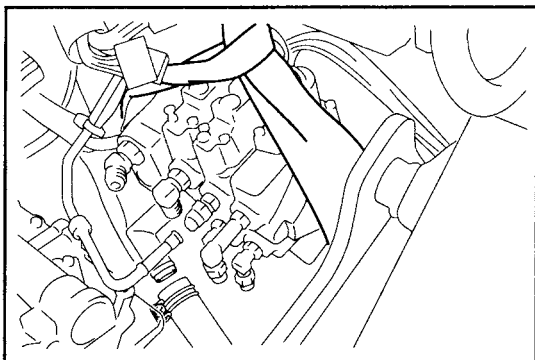
#### Installation Procedure

The installation procedure is the reverse of the removal procedure.

**Note:**

**After installation, check the hydraulic oil level, and if the level is too low, add more hydraulic oil.**





## Point Operation

### [Point 1]

#### Removal:

Use a fiber rope to hoist the oil control valve and then remove the set bolts.

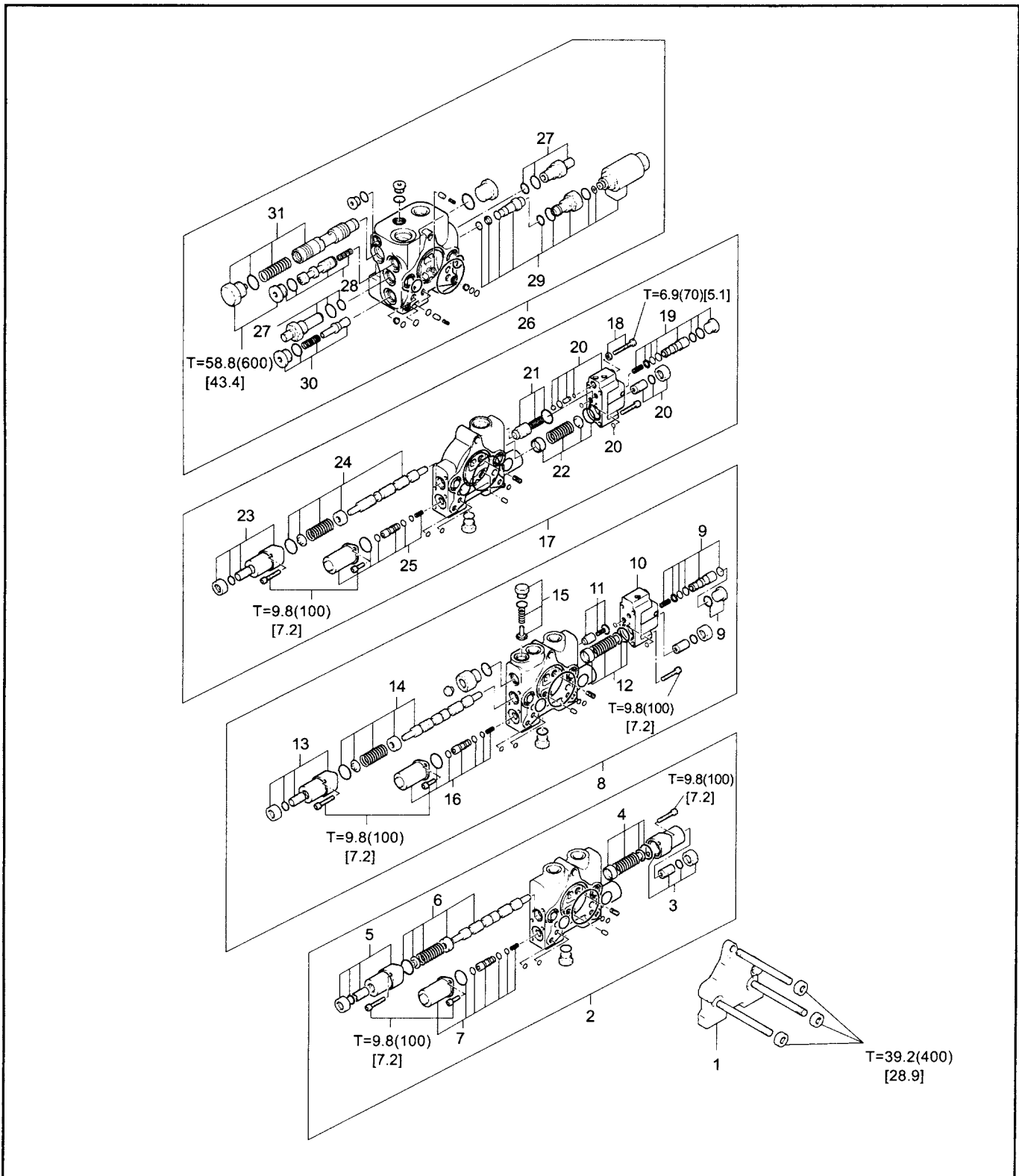
Be careful not to drop the oil control valve.

## DISASSEMBLY•INSPECTION•REASSEMBLY

### Note:

- Since parts are finished with high precision, carefully disassemble and reassemble them to prevent any damage.
- Use a clean location for the job.
- When disassembling the blocks, be careful not to lose the springs, pistons, and O-rings.

T = N·m (kgf·cm) [ft·lbf]



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## Disassembly Procedure

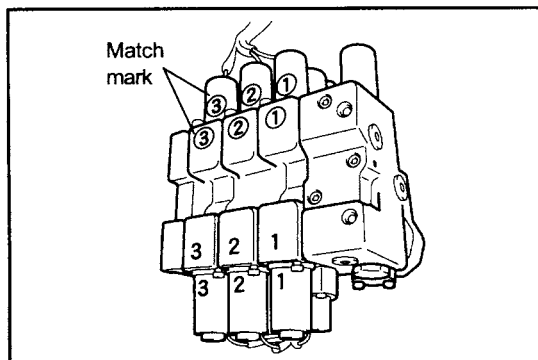
- 1 Remove the outlet housing. **[Point 1]**
- 2 Remove the ATT block ASSY.
- 3 Remove the spring cover W/adjusting screw. **[Point 2]**
- 4 Remove the spring set.
- 5 Remove the spring cover W/adjusting screw. **[Point 2]**
- 6 Remove the spring set and ATT spool. **[Point 3]**
- 7 Remove the proportional solenoid valve ASSY. **[Point 4]**
- 8 Remove the tilt block ASSY.
- 9 Remove the tilt select valve. **[Point 5]**
- 10 Remove the body W/adjusting screw. **[Point 2]**
- 11 Remove the tilt lock check valve. **[Point 6]**
- 12 Remove the spring set.
- 13 Remove the spring cover W/adjusting screw. **[Point 2]**
- 14 Remove the spring set and tilt spool. **[Point 3]**
- 15 Remove the suction check valve.
- 16 Remove the proportional solenoid valve ASSY. **[Point 4]**
- 17 Remove the lift block ASSY.
- 18 Remove the lift lock release bolt.
- 19 Remove the lift select valve. **[Point 5]**
- 20 Remove the body W/adjusting screw. **[Point 2]**
- 21 Remove the lift lock check valve. **[Point 6]**
- 22 Remove the spring set.
- 23 Remove the spring cover W/adjusting screw. **[Point 2]**
- 24 Remove the spring set and lift spool. **[Point 3]**
- 25 Remove the proportional solenoid valve ASSY. **[Point 4]**
- 26 Remove the inlet block ASSY.
- 27 Remove the lift relief valve and tilt relief valve. **[Point 7]**
- 28 Remove the unload valve. **[Point 3]**
- 29 Remove the inlet block solenoid valve and pressure compensated valve. **[Point 8]**
- 30 Remove the pressure reducing valve.
- 31 Remove the flow divider valve. **[Point 9]**

## Reassembly Procedure

The reassembly procedure is the reverse of the disassembly procedure.

### Note:

**Carefully clean all of the components, blow them with compressed air, apply hydraulic oil, and reassemble.**

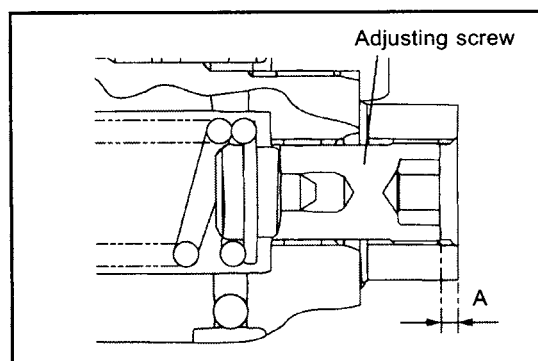


## Point Operations

### [Point 1]

Disassembly:

Put match marks to the solenoid valve.



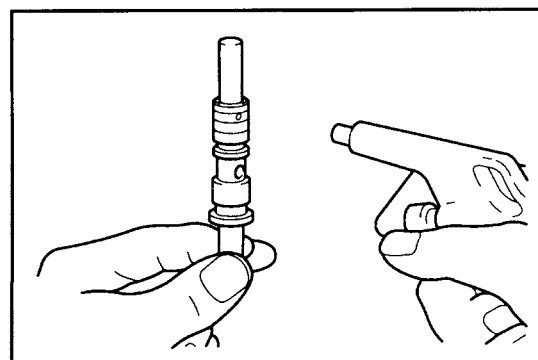
### [Point 2]

Reassembly:

Adjust the adjusting screw set dimension A to the following value.

**Standard: A = 1.8 mm (0.071 in)**

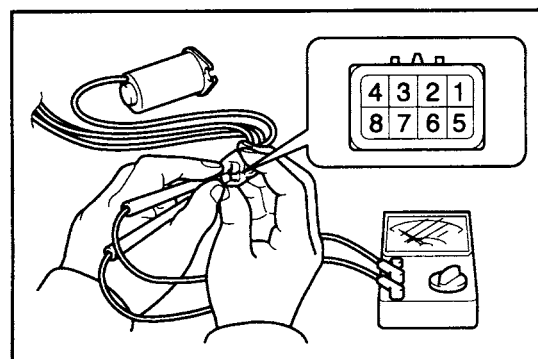
After installing the oil control valve ASSY in the vehicle, adjust the material handling operation start timing. (See page 7-15.)



### [Point 3]

Inspection:

Check to see if the orifice is clogged, and if it is, clean it out.



### [Point 4]

Inspection:

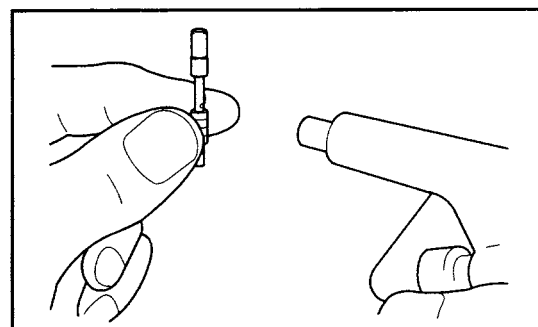
Check the solenoid valve continuity.

Between 4 and 8, 3 and 7, 2 and 6, 1 and 5.

**Standard: 7.3  $\Omega$**

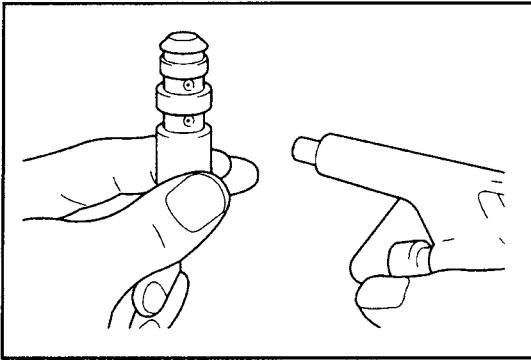
Reassembly:

Align the match marks at the time of reassembly.



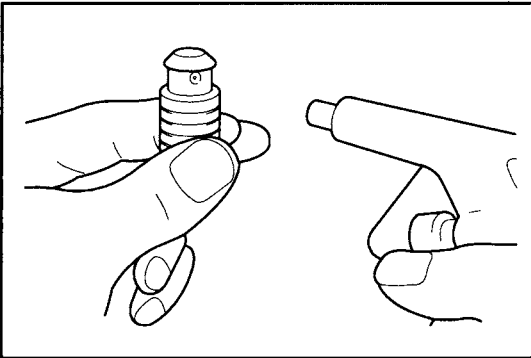
Inspection:

Check to see if the orifice is clogged, and if it is, clean it out.

**[Point 5]**

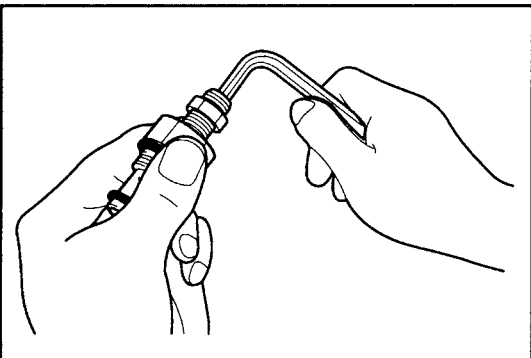
Inspection:

Check to see if the orifice is clogged, and if it is, clean it out.

**[Point 6]**

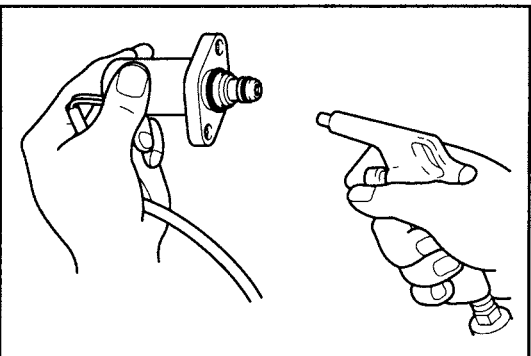
Inspection:

Check to see if the orifice is clogged, and if it is, clean it out.

**[Point 7]**

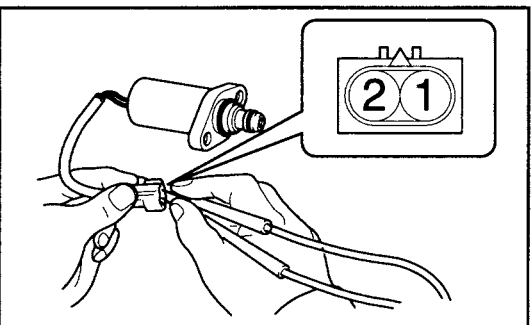
Reassembly:

When the relief valve is disassembled, leave the adjusting screw completely loosened.

**[Point 8]**

Inspection:

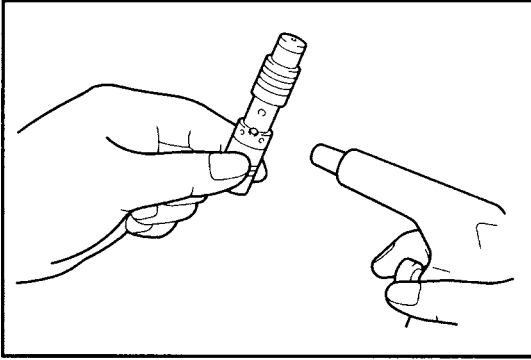
Check to see if the filter is clogged, and if it is, clean it out.



Inspection:

Inspect the inlet block solenoid valve continuity.

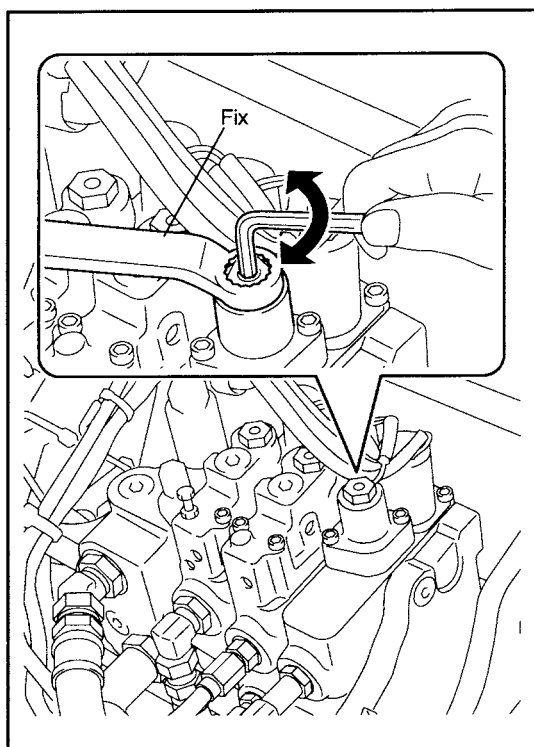
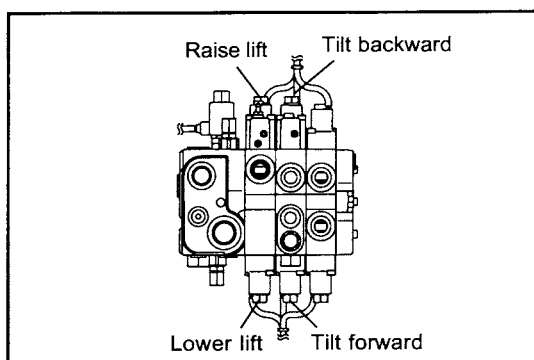
**Standard: Continuity exists**



**[Point 9]**

Inspection:

Check to see if the orifice is clogged, and if it is, clean it out.



## MATERIAL HANDLING OPERATION START TIMING ADJUSTMENT

### Note:

When the oil control valve is disassembled or a component is replaced, check and adjust the material handling operation start timing.

1. Slowly operate the lever, check each operation start timing, and adjust the timing when it is off.
2. Loosen the lock nuts on the end of each spool and turn the adjusting screw to adjust the material handling operation start timing.

Turn to the right (tightening side):

Delays the start timing.

Turn to the left (loosening side):

Advances the start timing.

### Note:

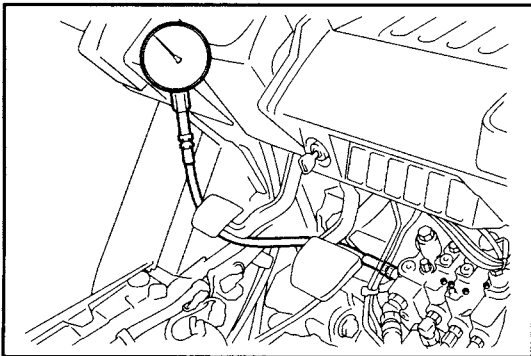
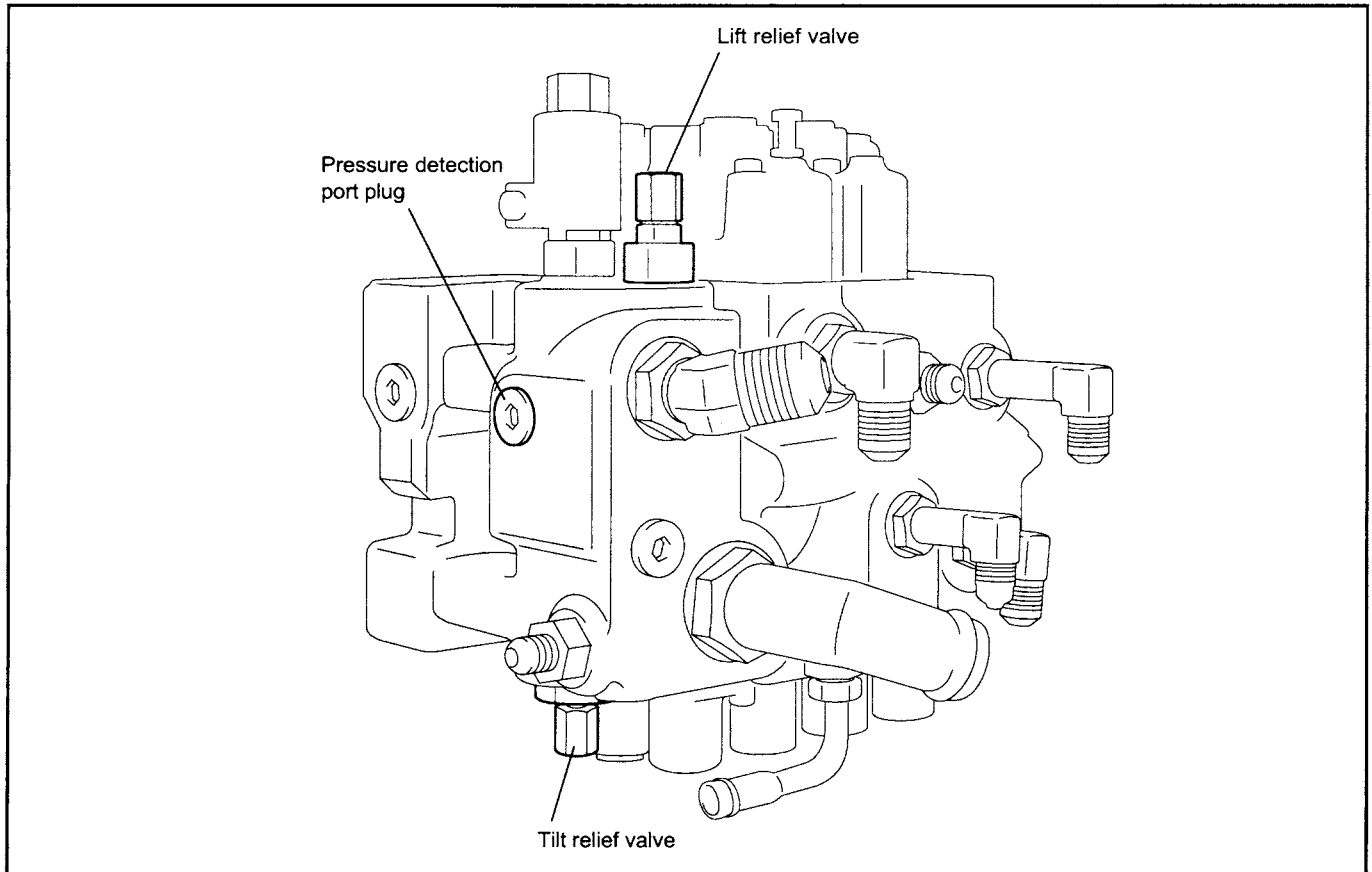
- For the screw turning angle, use  $\pm 45^\circ$  as a reference.
- If the adjusting screw is tightened too much, material handling speed will be slow with the lever full-stroke.
- If the adjusting screw is loosened too much, jolt will happen at the start of material handling operation.

3. Use the lock nut to lock the adjusting screw, and then check the timing again.

## RELIEF PRESSURE ADJUSTMENT

### Note:

- Always follow the procedure below for adjustment. Careless adjustment may cause high-pressure generation, resulting in damage to hydraulic units such as the oil pump.
- No adjustment is needed when the relief valve is not disassembled or is replaced with a new one.



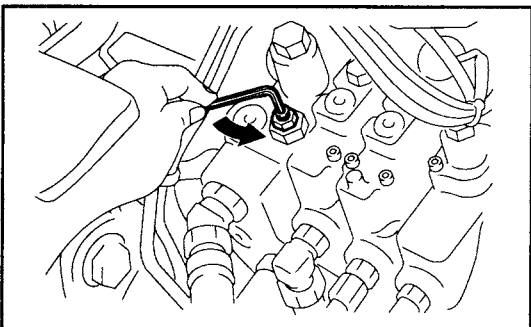
### 1. Install an oil pressure gauge.

- (1) Remove the oil pressure detection port plug (illustrated) installed on the side face of the oil control valve, and install the oil pressure gauge.

Pressure gauge:

Pressure resistance = 19600 kPa (200 kgf/cm<sup>2</sup>) [2844 psi] or above

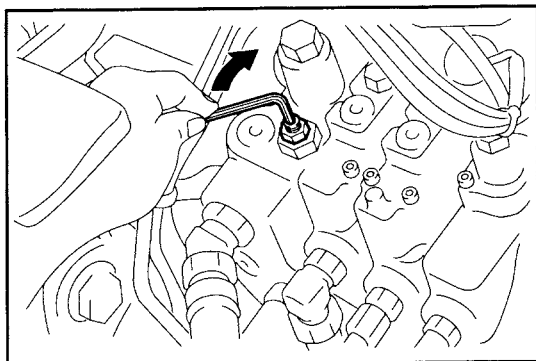
Plug size: 9/16-18UNF-2B



### 2. Loosen the lift relief valve adjusting screw

- (1) Remove the globe nut.
- (2) Loosen the lock nut and loosen the adjusting screw to just before the point where it comes off from the body.





3. Adjust the lift relief pressure.
  - (1) Run the engine.
  - (2) Slowly pull the lift lever and gradually tighten the adjusting screw until the fork starts to rise.
  - (3) Lift the fork fully and read the oil pressure at the position. Tighten the adjusting screw for the normal pressure reading.
  - (4) Tighten the lock nut and re-check the oil pressure.
  - (5) Install the globe nut.
4. Adjust the tilt relief valve oil pressure in the same way as for the lift relief valve.  
Tilt the mast fully backward in this case when measuring the oil pressure.
5. Remove the oil pressure gauge.
  - (1) Remove the oil pressure gauge and install the oil pressure detection port plug.

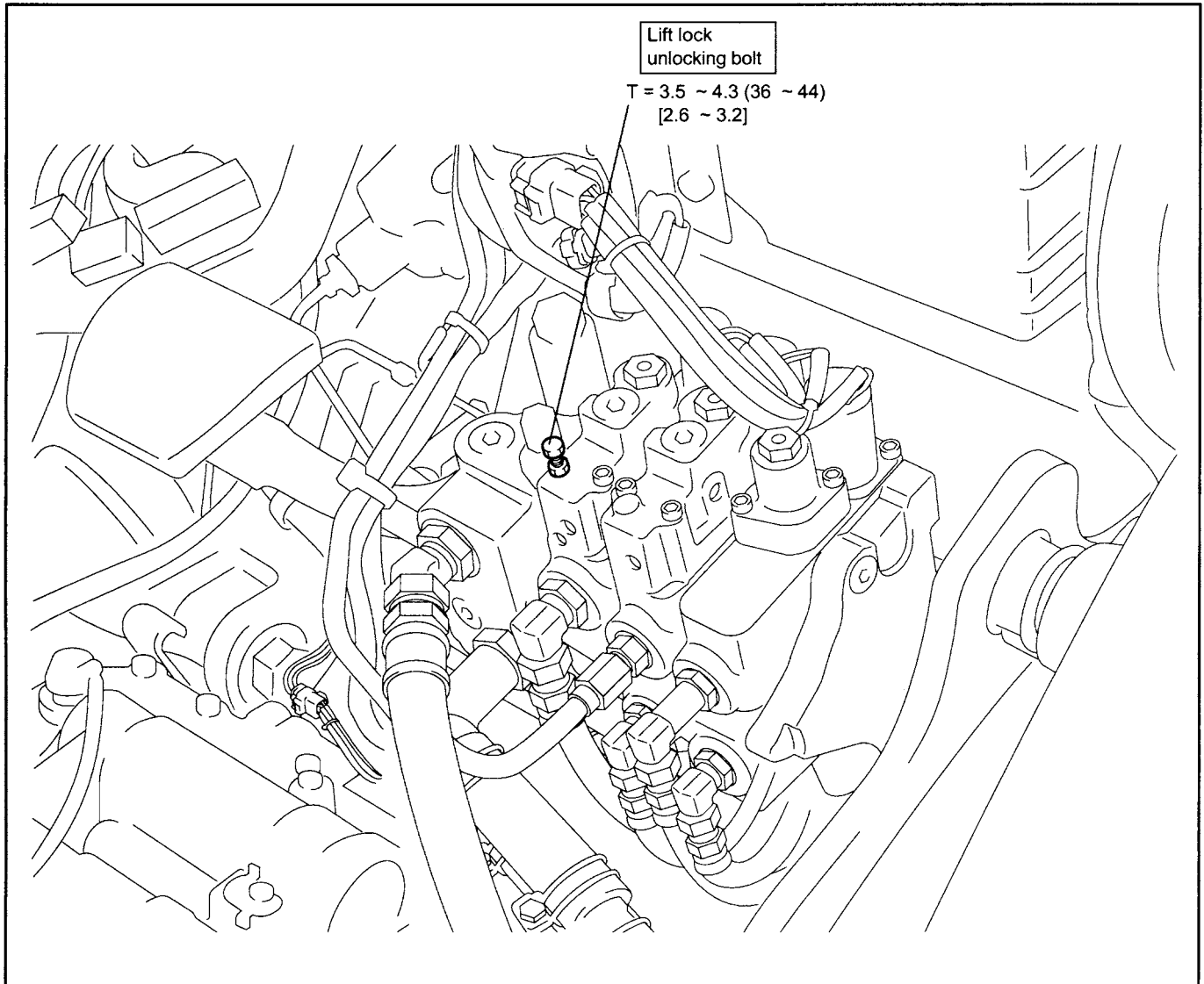
### Relief Pressure Standards

kPa (kgf/cm<sup>2</sup>) [psi]

		1 ton series	2.3 ton series	J3.5 ton series
Relief pressure	Lift	17160 <sup>+490</sup> <sub>0</sub> (175 <sup>+5</sup> <sub>0</sub> ) [2490 <sup>+70</sup> <sub>0</sub> ]	18140 <sup>+490</sup> <sub>0</sub> (185 <sup>+5</sup> <sub>0</sub> ) [2630 <sup>+70</sup> <sub>0</sub> ]	←
	Tilt	11770 <sup>+490</sup> <sub>0</sub> (120 <sup>+5</sup> <sub>0</sub> ) [1710 <sup>+70</sup> <sub>0</sub> ]	14710 <sup>+490</sup> <sub>0</sub> (150 <sup>+5</sup> <sub>0</sub> ) [2130 <sup>+70</sup> <sub>0</sub> ]	15690 <sup>+490</sup> <sub>0</sub> (160 <sup>+5</sup> <sub>0</sub> ) [2280 <sup>+70</sup> <sub>0</sub> ]

## LIFT LOCK RELEASE BOLT

T = N·m (kgf·cm) [ft·lbf]



When the forks do not descend, due to a malfunction or other cause, loosen the lift lock unlocking bolt to lower the forks in emergencies.

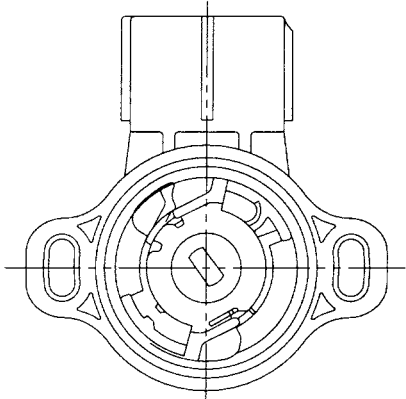
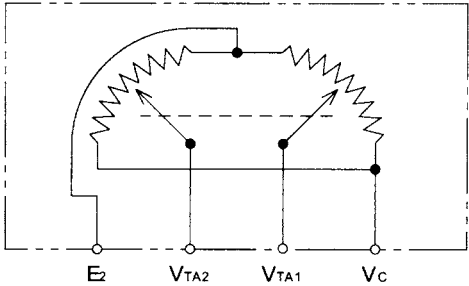
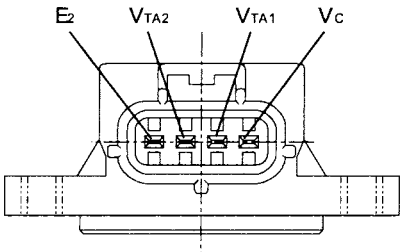
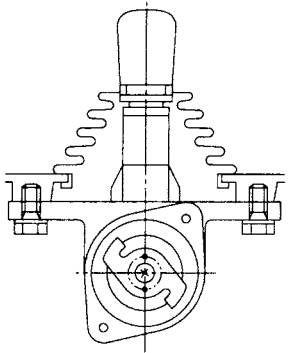
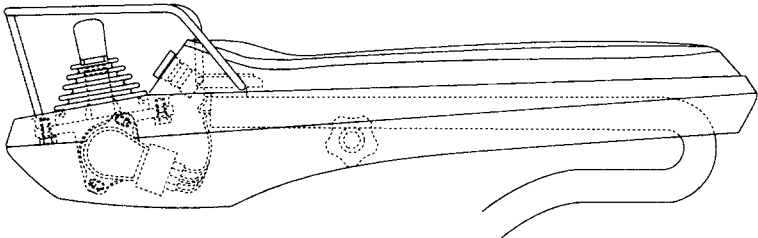
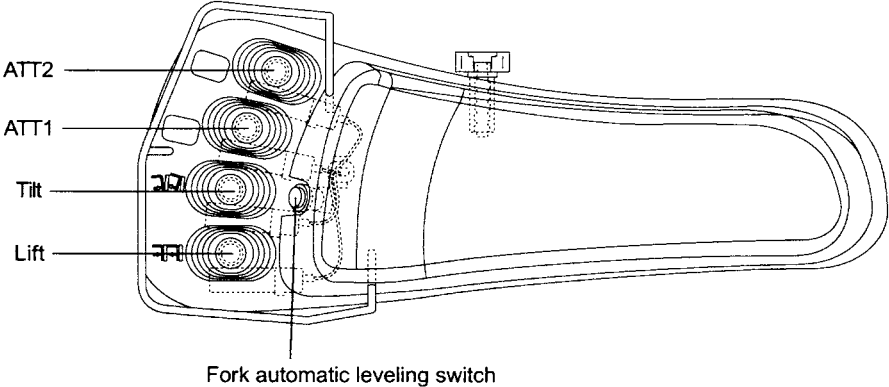
After making repairs, be sure to reinstall the lift lock unlocking bolt to the original position and tighten the lock nut.

## MINI LEVER (OPT)

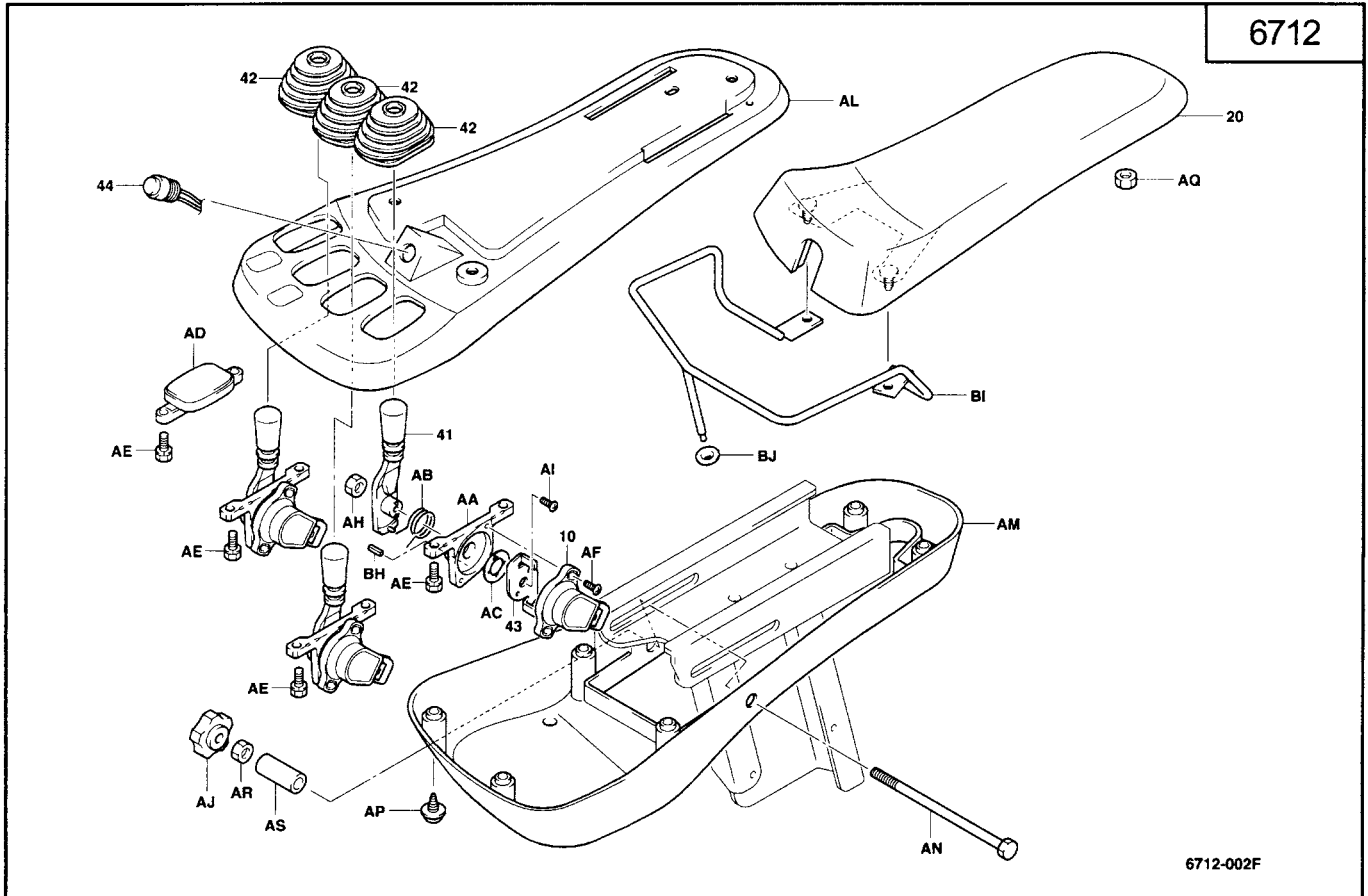
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<b>NO ERROR CODE DISPLAY .....</b>	<b>2-13</b>
<b>TROUBLESHOOTING</b>	
<b>(WITH ERROR CODE DISPLAY).....</b>	<b>2-14</b>
<b>TROUBLESHOOTING (NO ERROR CODE DISPLAY).....</b>	<b>2-66</b>
<b>WIRING DIAGRAM.....</b>	<b>2-72</b>
<b>CONNECTOR LAYOUT .....</b>	<b>2-73</b>
<b>CONNECTOR DIAGRAMS .....</b>	<b>2-74</b>
<b>F&amp;B brytare på armstödet.....</b>	<b>2-76</b>

GENERAL

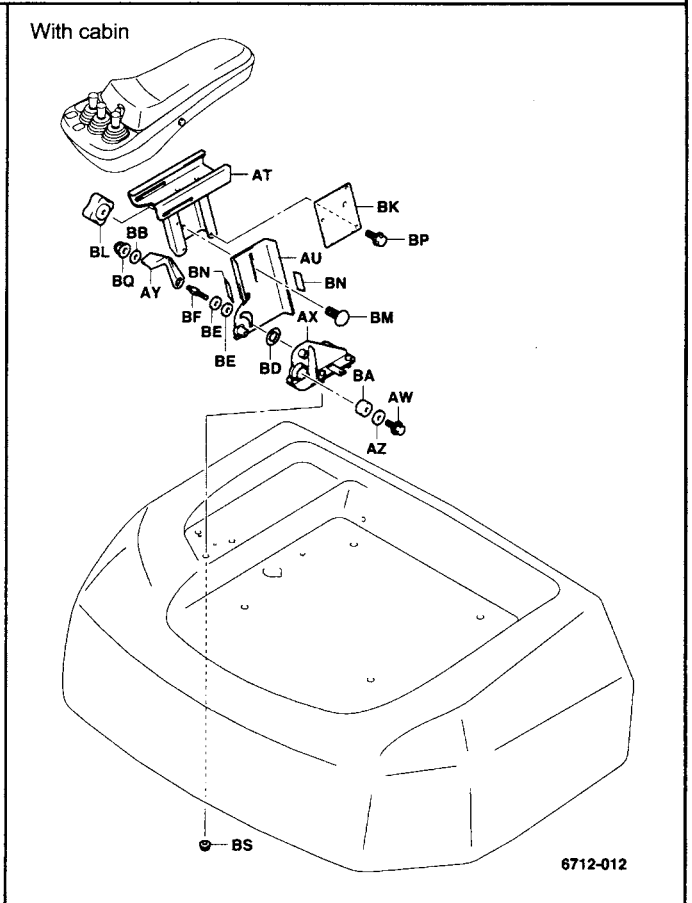
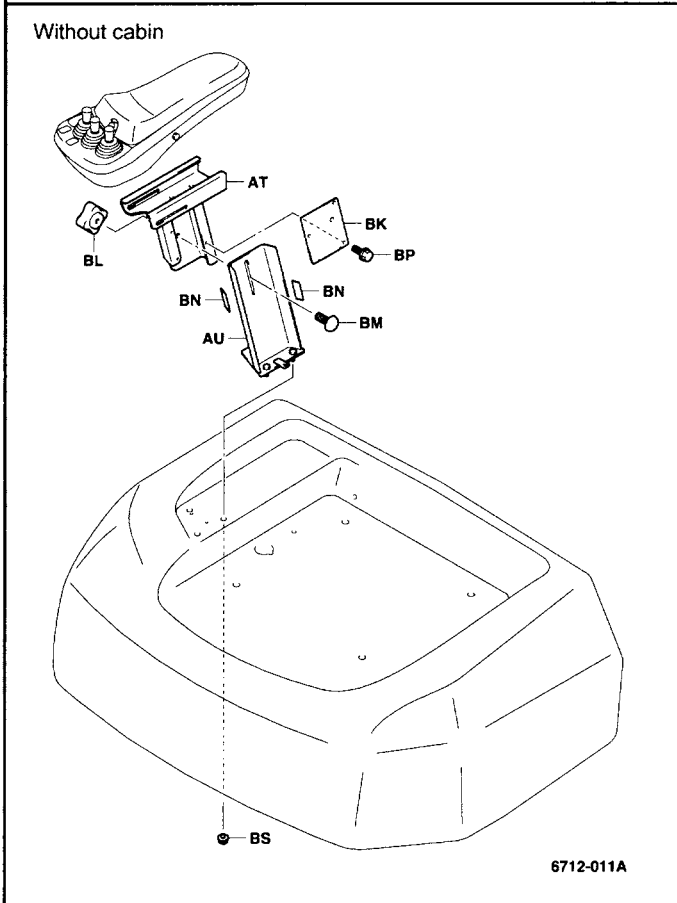
Mini Lever Box



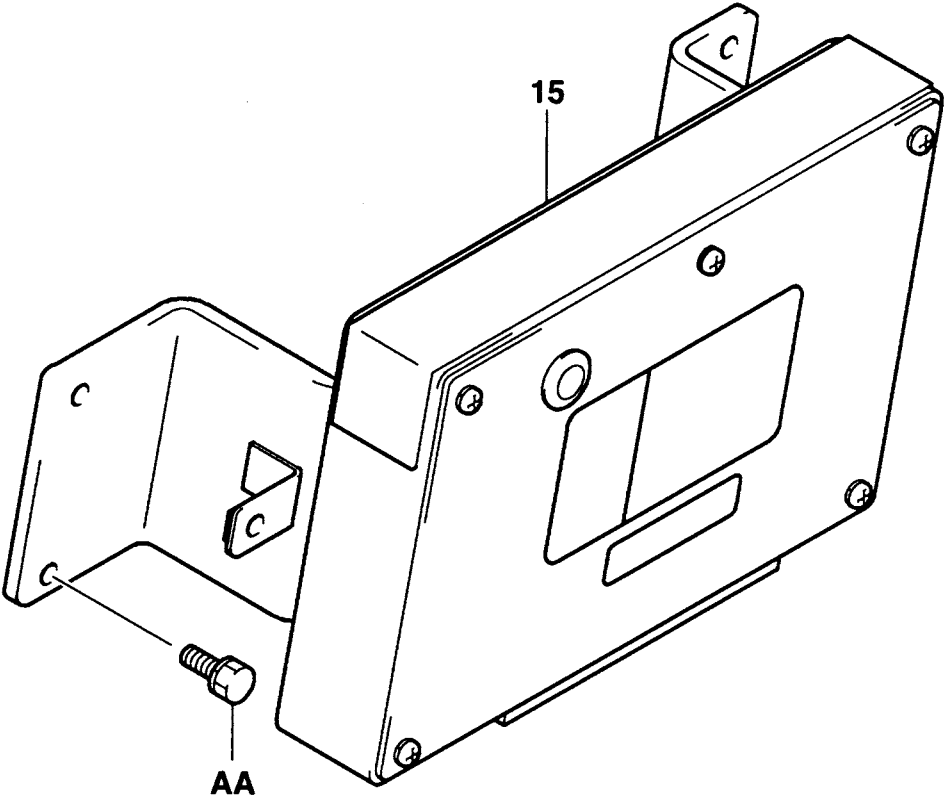
# COMPONENTS



2



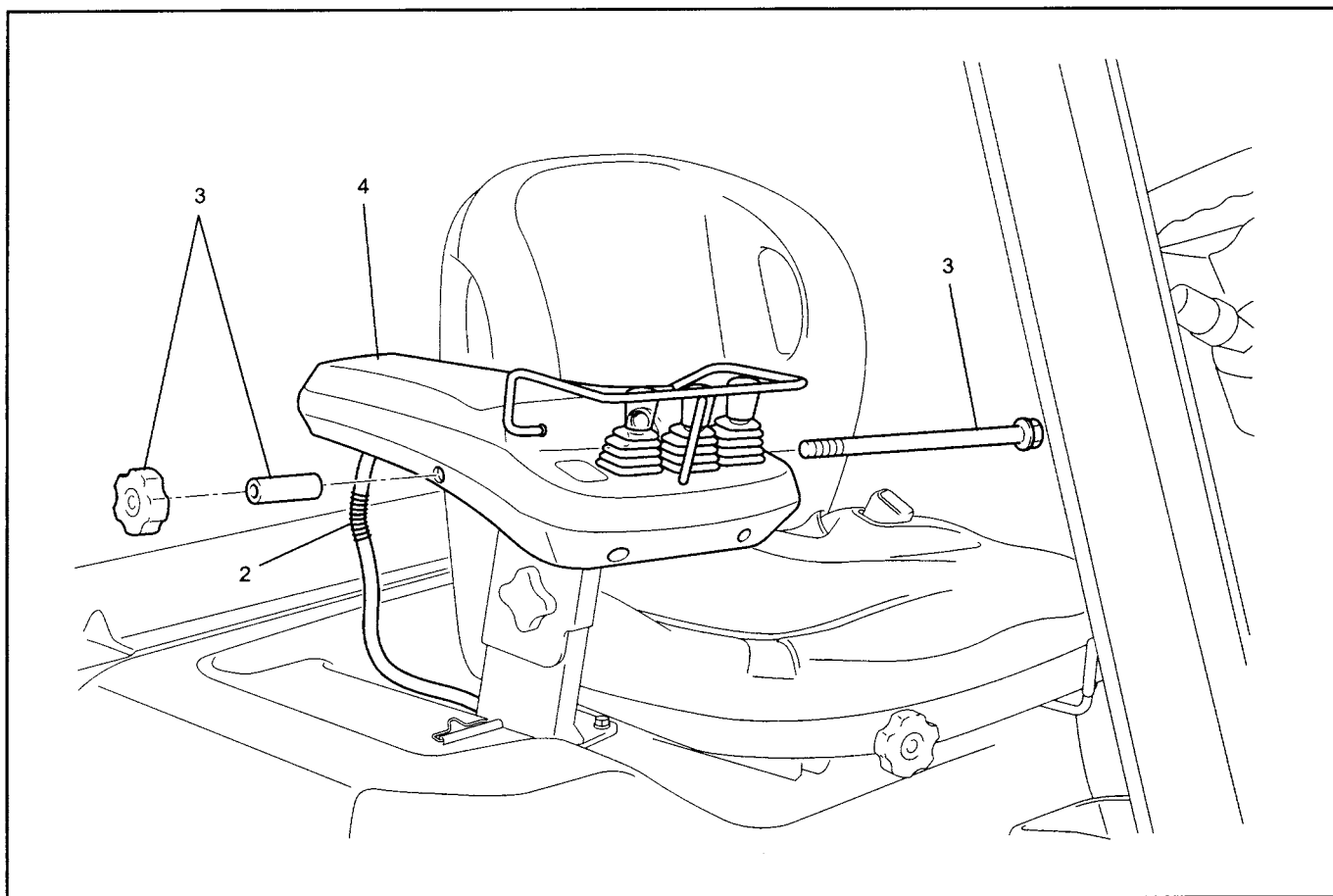
1910



1910-019

## MINI LEVER BOX

### REMOVAL-INSTALLATION

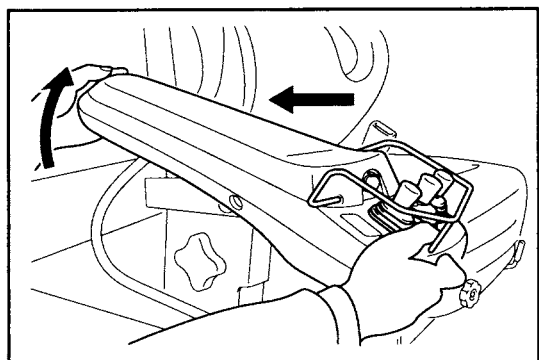


### Removal Procedure

- 1 Open the engine hood.
- 2 Remove the harness clamp and disconnect the wiring.
- 3 Close the engine hood and remove the knob, spacer, and slide adjusting bolt.
- 4 Remove the mini lever box. **[Point 1]**

### Installation Procedure

The installation procedure is the reverse of the removal procedure.



### Point Operation

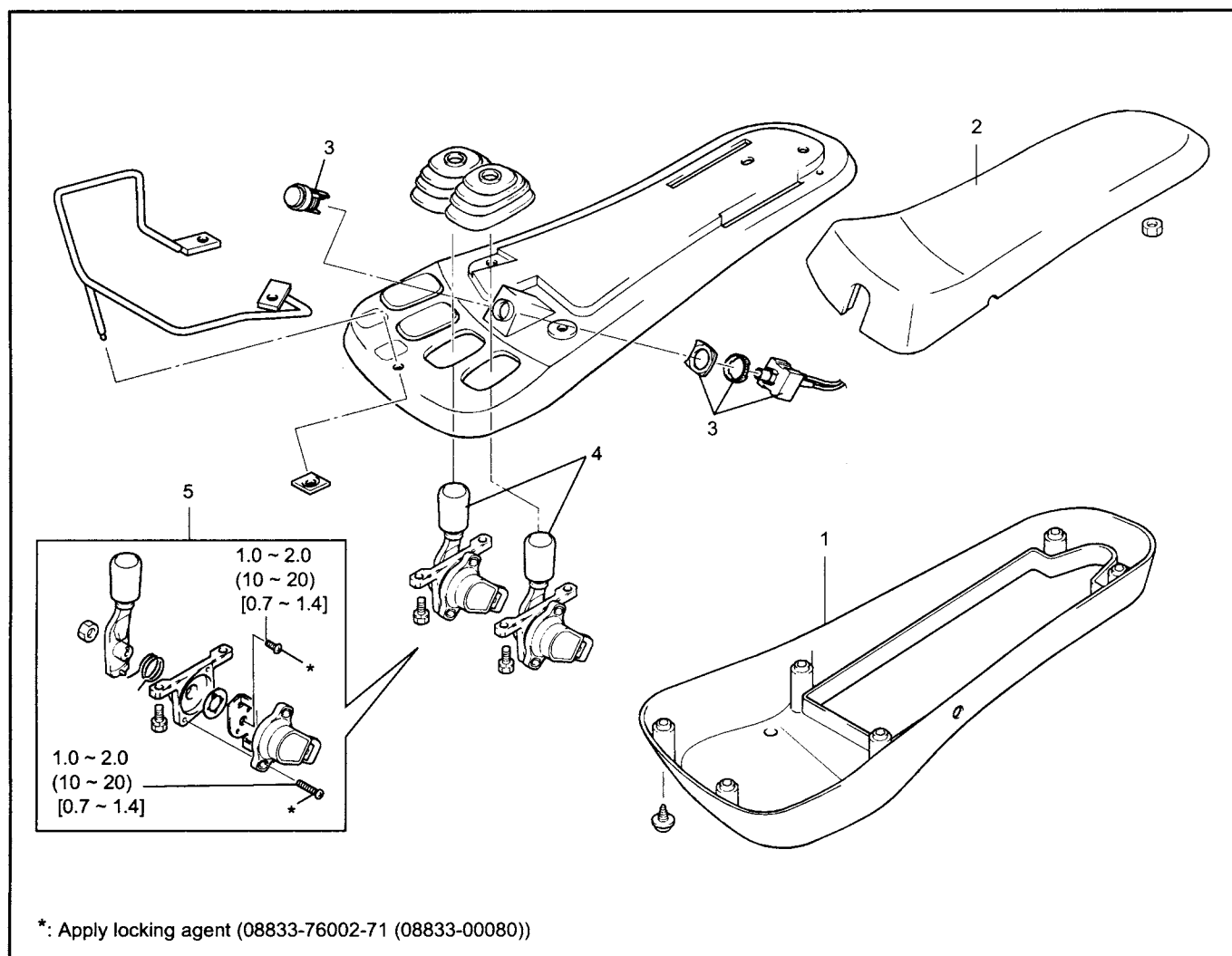
#### **[Point 1]**

Removal-Installation:

Slide the mini lever box to the rear, lift up the rear side, and remove the mini lever box.

## DISASSEMBLY•INSPECTION•REASSEMBLY

T = N·m (kgf·cm) [ft·lbf]



## Disassembly Procedure

- 1 Remove the lower box.
- 2 Remove the arm pad ASSY.
- 3 Disconnect the connector and remove the fork automatic leveling switch. **[Point 1]**
- 4 Disconnect the connector and remove the potentiometer. **[Point 2]**
- 5 Disassemble the potentiometer. **[Point 3]**

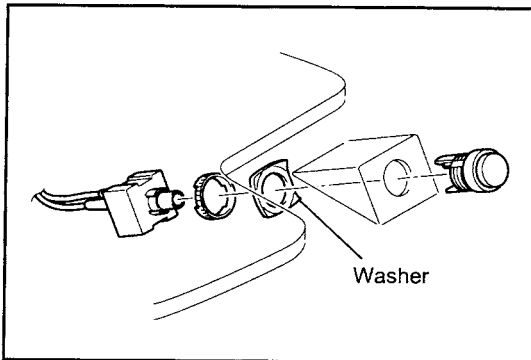
## Reassembly Procedure

The reassembly procedure is the reverse of the disassembly procedure.

## Note:

Conduct mini lever matching when removing, reinstalling, or replacing the lift lever potentiometer, tilt lever potentiometer, attachment lever 1 potentiometer, or attachment lever 2 potentiometer (OPT). (See page 2-10.)



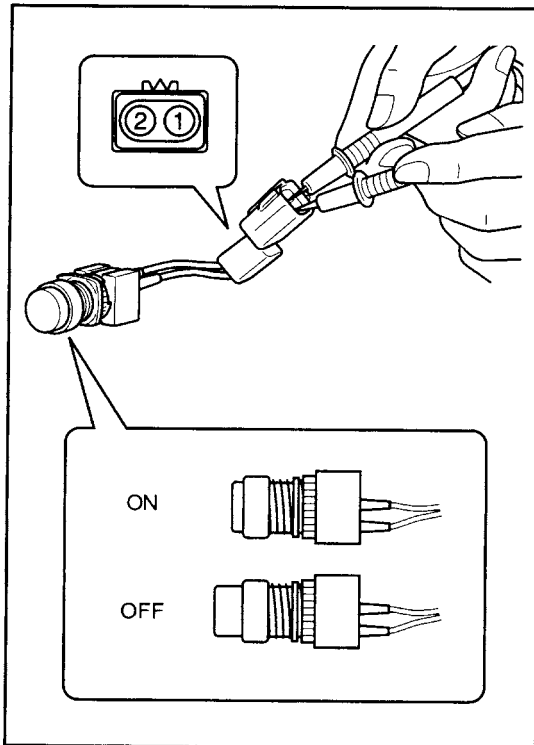


## Point Operations

### [Point 1]

#### Reassembly:

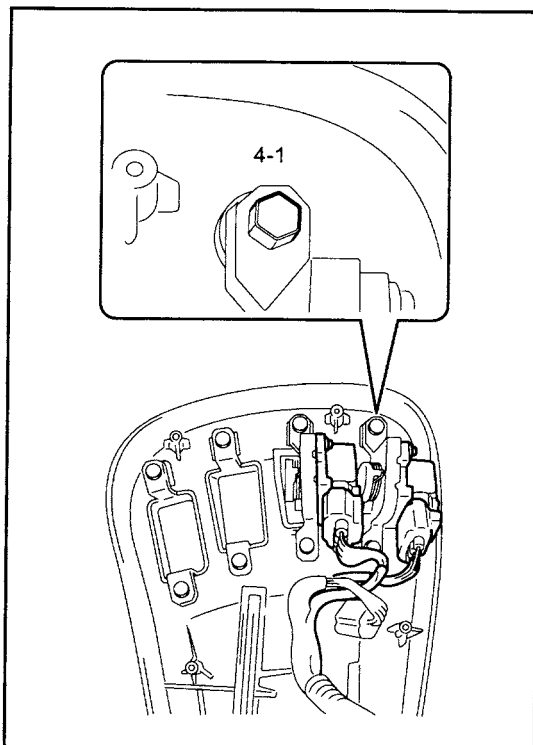
Orient the washer in the direction shown in the figure and then install the washer.



#### Inspection:

Check the continuity of the fork automatic leveling switch.

**Standard**    **ON** :  $0\ \Omega$   
                   **OFF** :  $\infty\Omega$



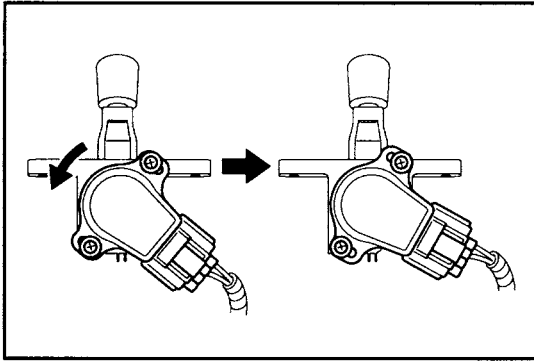
### [Point 2]

#### Disassembly:

Attach a number to the connector that matches the number of the upper box.

#### Reassembly:

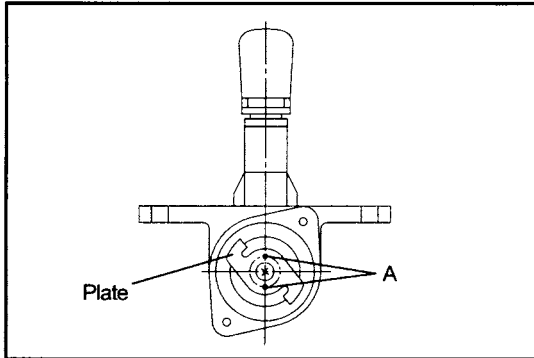
Be certain to make the correct wiring connections and connect the connectors to match the numbers.

**[Point 3]**

Reassembly:

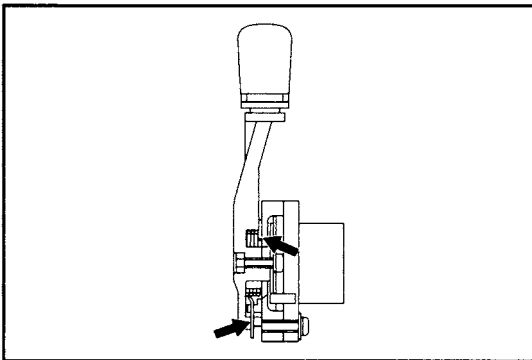
Reassemble according to the procedure below.

1. Loosely connect the potentiometer to the position shown in the figure.
2. Rotate the potentiometer all the way to the left and tighten the screw.
3. Check to see if the lever operates normally.



Reassembly:

Align the plate A hole with the lever body pin point and install the plate.



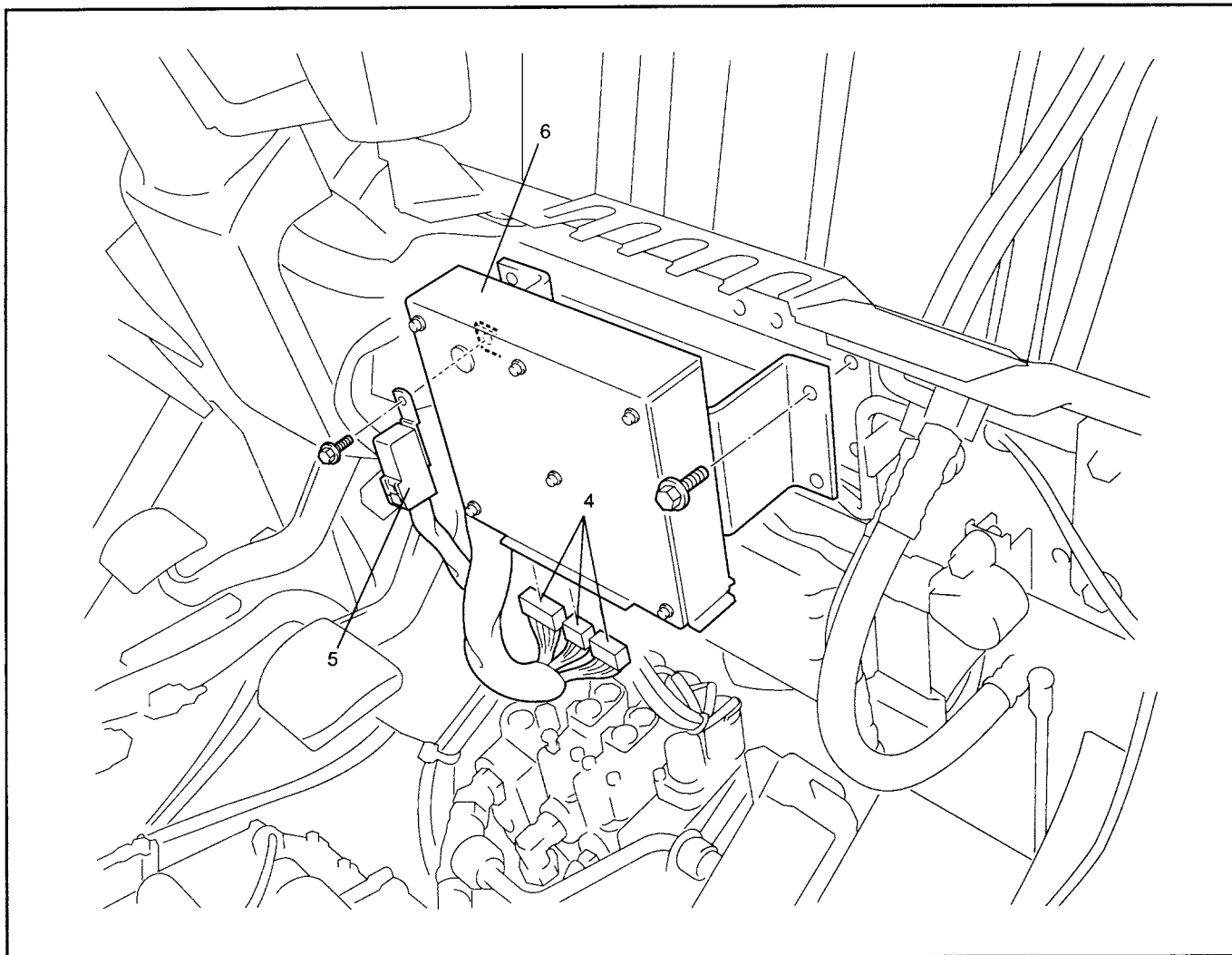
Reassembly:

Apply MP grease to the locations shown by arrows in the figure and install the component.

## MINI LEVER CONTROLLER

### REMOVAL-INSTALLATION

T = N·m (kgf·cm) [ft·lbf]



### Removal Procedure

- 1 Remove the toe board.
- 2 Remove the lower panel.
- 3 Remove the instrument panel RH
- 4 Disconnect the connectors.
- 5 Remove the relay.
- 6 Remove the mini lever controller.

### Installation procedure

The installation procedure is the reverse of the removal procedure.

#### Note:

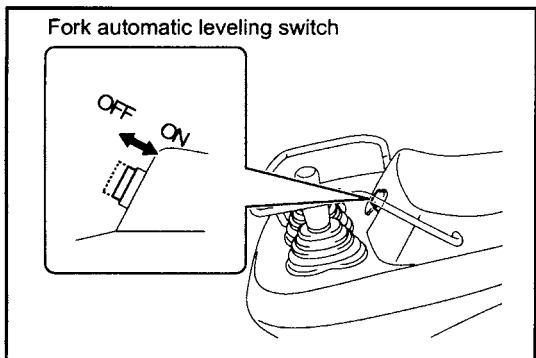
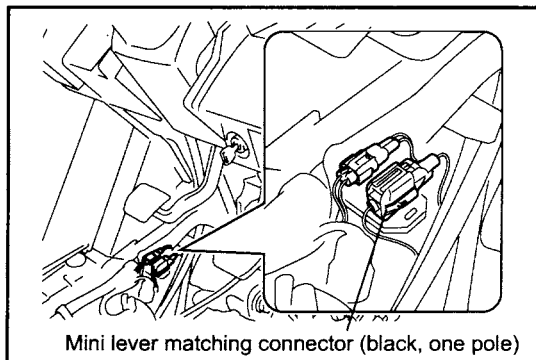
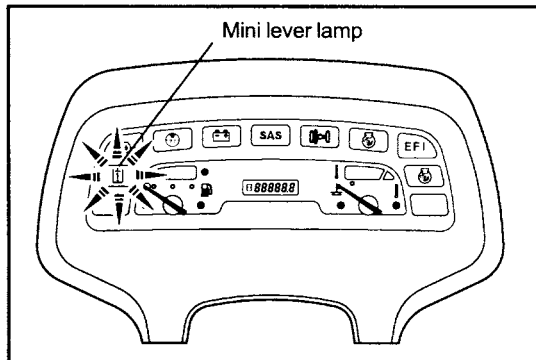
Perform mini lever matching after mini lever controller replacement. (See page 2-10)

## MINI LEVER MATCHING

### Note:

Before starting matching, be sure that the vehicle conditions are as follows:

1. All levers are in neutral positions.
2. The fork automatic leveling switch is OFF.
3. The mini lever matching connector is connected.



## MINI LEVER MATCHING PROCEDURE

1. Turn the key switch to ON.

### Note:

In case of initial matching, the mini lever lamp comes on for two seconds and then blinks at intervals of one second. If matching has been performed earlier, the lamp goes off after lighting for two seconds.

2. Disconnect the mini lever matching connector.  
The mini lever lamp blinks at intervals of 0.5 second.:

### Note:

Disconnecting the mini lever matching connector with the fork automatic leveling switch set to ON keeps the mini lever lamp lighting. In this case, turn the fork automatic leveling switch by pressing it once.

3. Turn the fork automatic leveling switch ON.  
The mini lever lamp goes off after lighting for two seconds. (Matching is completed.)

### Note:

Check neutral setting of all levers again, and turn the fork automatic leveling switch ON.

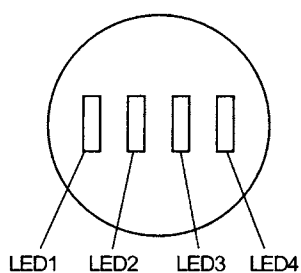
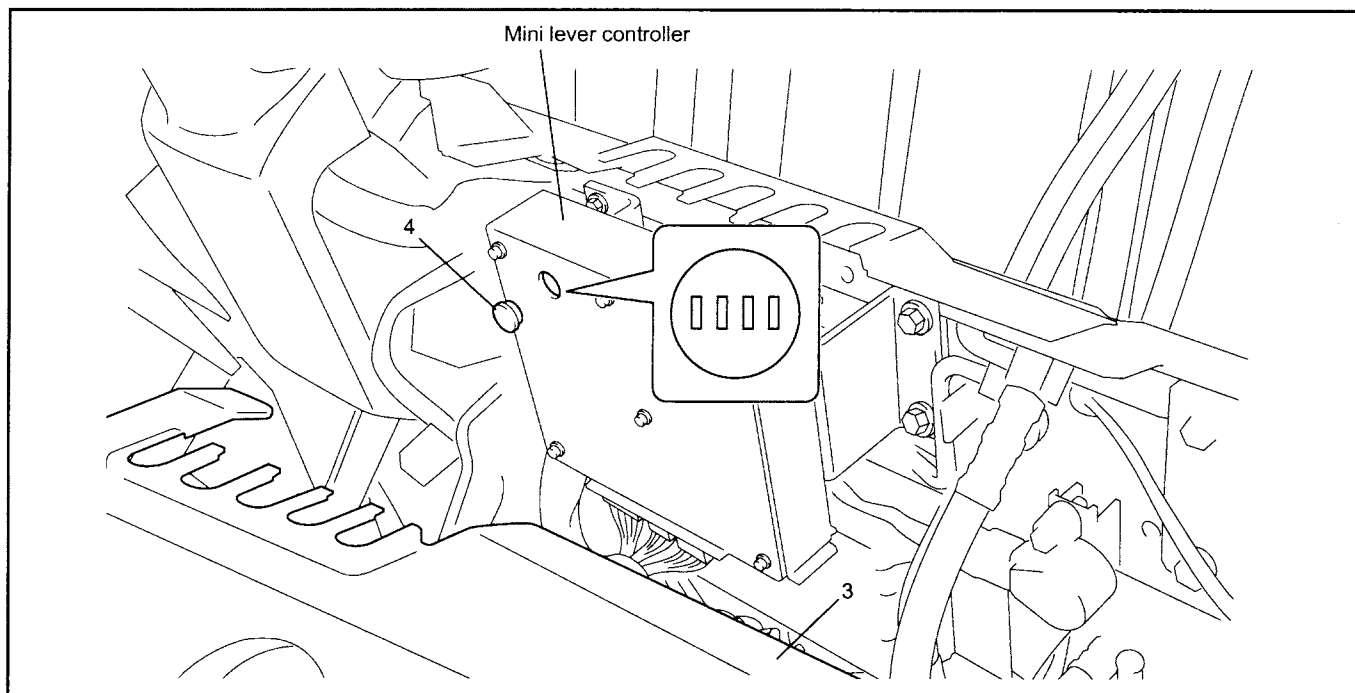
4. Turn the fork automatic leveling switch OFF.
5. Connect the mini lever matching connector and turn the key switch to OFF.

## MINI LEVER TROUBLESHOOTING

### EXPLANATION ON ERROR CODE

Check the error code as follows:

1. Remove the toe board.
2. Remove the lower panel.
3. Remove the instrument panel RH.
4. Remove the cap.



LED status	Felkod
Släckt	1
Tänd	2
Blinkar snabbt (2Hz)	3
Blinkar långsamt (0,5Hz)	4

#### Exempel

LED1 : Blinkar långsamt (0,5Hz)	→ 4
LED2 : Släckt	→ 1
LED3 : Blinkar snabbt (2Hz)	→ 3
LED4 : Tänd	→ 2



Felkod
4-1-3-2

## LIST OF DIAGNOSIS ERROR CODES

No.	Error code (LED)	Error description	Phenomenon on vehicle	Page
SOLA-1	3-1-1-1	Lift up solenoid open circuit	Lift operation stopped	2-14
SOLA-2	3-1-2-1	Lift down solenoid open circuit		2-15
SOLA-3	3-1-1-3	Backward tilting solenoid open circuit	Tilt operation stopped	2-16
SOLA-4	3-1-2-3	Forward tilting solenoid open circuit		2-17
SOLA-5	3-1-1-4	ATT1 backward tilting solenoid open circuit	ATT1 operation stopped	2-18
SOLA-6	3-1-2-4	ATT1 forward tilting solenoid open circuit		2-19
SOLA-7	3-1-1-2	ATT2 backward tilting open circuit	ATT2 operation stopped	2-20
SOLA-8	3-1-2-2	ATT2 forward tilting solenoid open circuit		2-21
SOLB-1	3-2-1-1	ON/OFF solenoid open circuit	All material handling operations stopped	2-22
POTA-1	4-1-1-1	Lift lever potentiometer 1 open circuit	Lift operation stopped	2-23
POTA-2	4-1-1-3	Tilt lever potentiometer 1 open circuit	Tilt operation stopped	2-24
POTA-3	4-1-1-4	ATT1 lever potentiometer 1 open circuit	ATT1 operation stopped	2-25
POTA-4	4-1-1-2	ATT2 lever potentiometer open circuit	ATT2 operation stopped	2-26
POTA-5	4-1-3-1	Lift lever potentiometer 1 short circuit	Lift operation stopped	2-27
POTA-6	4-1-3-3	Tilt lever potentiometer 1 short circuit	Tilt operation stopped	2-28
POTA-7	4-1-3-4	ATT1 lever potentiometer 1 short circuit	ATT1 operation stopped	2-29
POTA-8	4-1-3-2	ATT2 lever potentiometer 1 short circuit	ATT2 operation stopped	2-30
POTA-9	4-1-4-1	Lift lever potentiometer 2 open circuit	Lift operation stopped	2-31
POTA-10	4-1-4-3	Tile lever potentiometer 2 open circuit	Tilt operation stopped	2-32
POTA-11	4-1-4-4	ATT1 lever potentiometer 2 open circuit	ATT1 operation stopped	2-33
POTA-12	4-1-4-2	ATT2 lever potentiometer 2 open circuit	ATT2 operation stopped	2-34
POTA-13	4-1-2-1	Lift lever potentiometer 2 short circuit	Lift operation stopped	2-35
POTA-14	4-1-2-3	Tilt lever potentiometer 2 short circuit	Tilt operation stopped	2-36
POTA-15	4-1-2-4	ATT1 lever potentiometer 2 short circuit	ATT1 operation stopped	2-37
POTA-16	4-1-2-2	ATT2 lever potentiometer 2 short circuit	ATT2 operation stopped	2-38
POTB-1	4-2-1-1	Lift lever potentiometer value combination error	Lift operation stopped	2-39
POTB-2	4-2-1-3	Tilt lever potentiometer value combination error	Tilt operation stopped	2-40
POTB-3	4-2-1-4	ATT1 lever potentiometer value combination error	ATT1 operation stopped	2-41
POTB-4	4-2-1-2	ATT2 lever potentiometer value combination error	ATT2 operation stopped	2-42
POTB-5	4-2-3-1	Lift lever potentiometer neutral value abnormality	Lift operation stopped	2-43
POTB-6	4-2-3-3	Tilt lever potentiometer neutral value abnormality	Tilt operation stopped	2-45
POTB-7	4-2-3-4	ATT1 lever potentiometer neutral value abnormality	ATT1 operation stopped	2-47
POTB-8	4-2-3-2	ATT2 lever potentiometer neutral value abnormality	ATT2 operation stopped	2-49

No.	Error code (LED)	Error description	Phenomenon on vehicle	Page
POTB-9	4-2-4-1	Lift lever potentiometer neutral matching abnormality	Lift operation stopped	2-51
POTB-10	4-2-4-3	Tilt lever potentiometer neutral matching abnormality	Tilt operation stopped	2-52
POTB-11	4-2-4-4	ATT1 lever potentiometer neutral matching abnormality	ATT1 operation stopped	2-53
POTB-12	4-2-4-2	ATT2 lever potentiometer neutral matching abnormality	ATT2 operation stopped	2-54
POTB-13	4-2-2-1	Lift lever potentiometer incomplete matching	Lift operation stopped	2-55
POTB-14	4-2-2-3	Tilt lever potentiometer incomplete matching	Tilt operation stopped	2-56
POTB-15	4-2-2-4	ATT1 lever potentiometer incomplete matching	ATT1 operation stopped	2-57
POTB-16	4-2-2-2	ATT2 lever potentiometer incomplete matching	ATT2 operation stopped	2-58
MCN-1	2-1-1-1	Matching connector open circuit	No transition to matching mode (material handling operations are normal)	2-59
MCN-2	2-1-1-2	SAS matching connector open circuit	No transition to matching mode (material handling operations are normal)	2-60
ROM	2-2-1-1	Controller ROM abnormality	All material handling operations stopped	2-61
RAM	2-2-1-2	Controller RAM abnormality	All material handling operations stopped	2-62
AD	2-2-1-4	Controller AD abnormality	All material handling operations stopped	2-63
EEPROM-1	2-4-1-1	Controller EEPROM-1 abnormality	All material handling operations stopped	2-64
EEPROM-2	2-4-1-2	Controller EEPROM-2 abnormality	All material handling operations stopped	2-65

**Note:**

**POTB-1 through POTB-12 errors are not detected if matching is incomplete.**

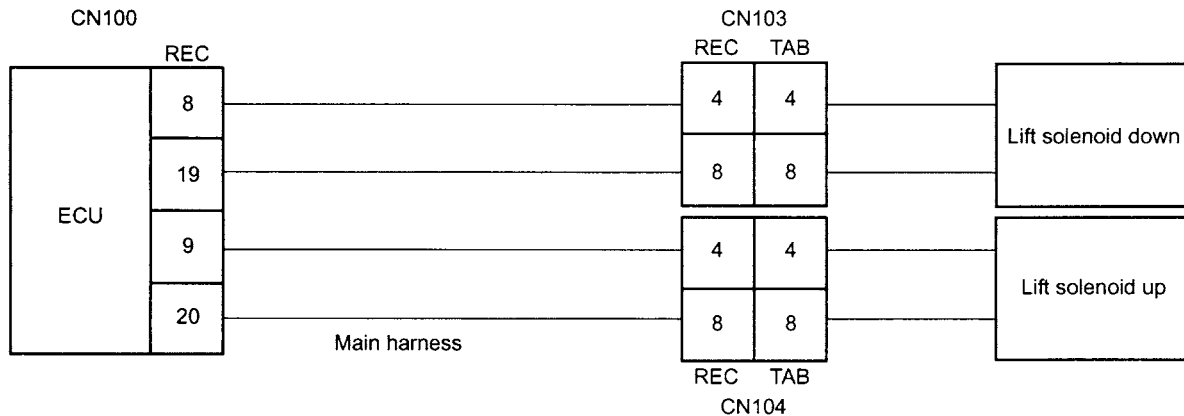
**NO ERROR CODE DISPLAY**

Description	Page
All material handling operations stopped	2-66
Lift up operation stopped	2-67
Forward tilt operation stopped	2-68
Backward tilt operation stopped	2-69
Fork automatic leveling, backward tilting speed restriction and forward tilting angle restriction are invalid.	2-70

## TROUBLESHOOTING (WITH ERROR CODE DISPLAY)

### 3-1-1-1 Lift up solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the lift up solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN 104, and check continuity between CN100(REC)-9 and CN104(REC)-4 and between CN100(REC)-20 and CN104(REC)-8 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-9 and CN100(REC)-20 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN104 and measure the resistance between CN104(TAB)-4 and CN104(TAB)-8 with a circuit tester.

Within  $5.8\ \Omega$  and  $9.0\ \Omega$  → [OK]

Other than above → [NG]

NG

Lift up solenoid abnormality

OK

Disconnect CN100 and check continuity between CN100(REC)-8 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Mini lever ECU defect and short circuit between harness and body

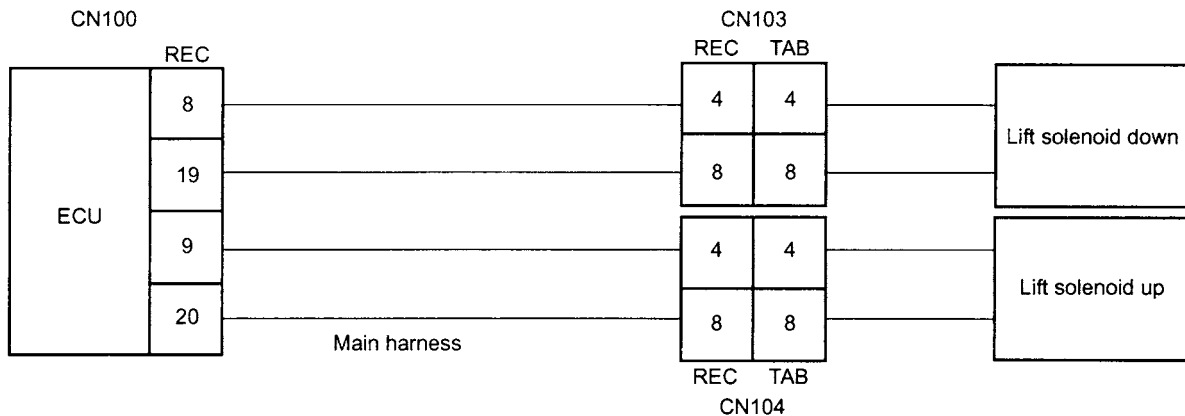
OK

Mini lever ECU defect



### 3-1-2-1 Lift down solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the lift down solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN 103, and check continuity between CN100(REC)-8 and CN103(REC)-4 and between CN100(REC)-19 and CN103(REC)-8 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-8 and CN100(REC)-19 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN103, and measure the resistance between CN103(TAB)-4 and CN103(TAB)-8 with a circuit tester.

Within 5.8  $\Omega$  and 9.0  $\Omega$  → [OK]

Other than above → [NG]

NG

Lift down solenoid abnormality

OK

Disconnect CN100 and check continuity between CN100(REC)-9 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

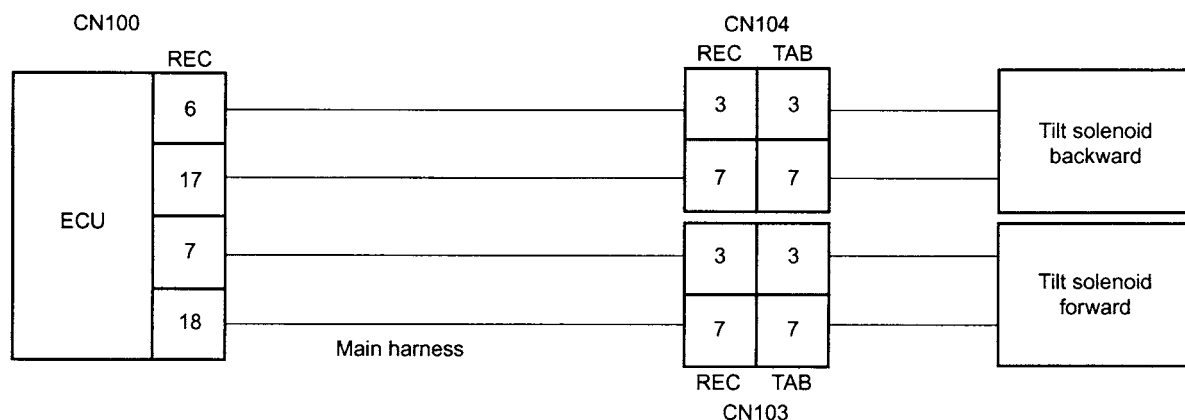
Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

### 3-1-1-3 Backward tilt solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the backward tilt solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN104, and check continuity between CN100(REC)-6 and CN104(REC)-3 and between CN100(REC)-17 and CN104(REC)-7 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-6 and CN100(REC)-17 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN104 and measure the resistance between CN104(TAB)-3 and CN104(TAB)-7 with a circuit tester.

Within  $5.8\ \Omega$  and  $9.0\ \Omega$  → [OK]

Other than above → [NG]

NG

Backward tilt solenoid abnormality

OK

Disconnect CN100 and check continuity between CN100(REC)-6 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

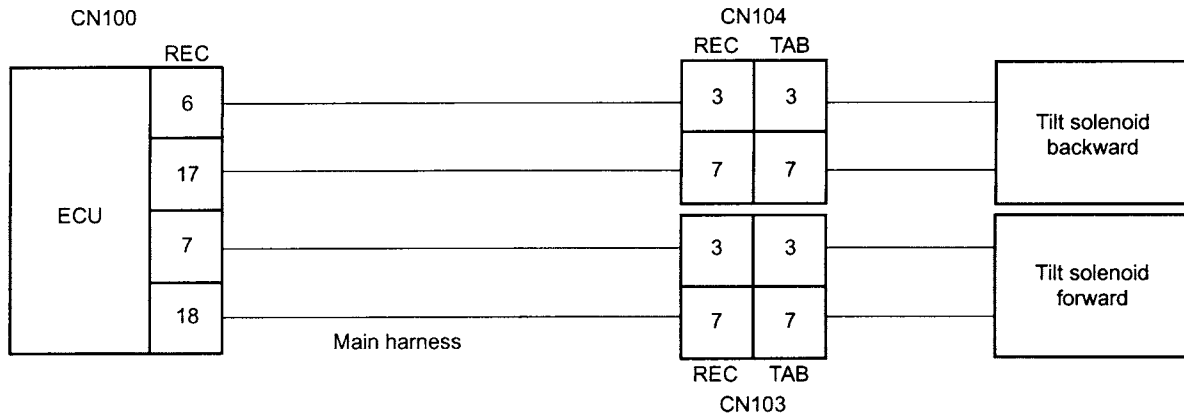
Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

### 3-1-2-3 Forward tilt solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the forward tilt solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN103, and check continuity between CN100(REC)-7 and CN103(REC)-3 and between CN100(REC)-18 and CN103(REC)-7 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-7 and CN100(REC)-18 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN103 and measure the resistance between CN103(TAB)-3 and CN103(TAB)-7 with a circuit tester.

Within  $5.8\ \Omega$  and  $9.0\ \Omega \rightarrow$  [OK]

Other than above  $\rightarrow$  [NG]

NG

Forward tilt solenoid abnormality

OK

Disconnect CN100 and check continuity between CN100(REC)-7 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

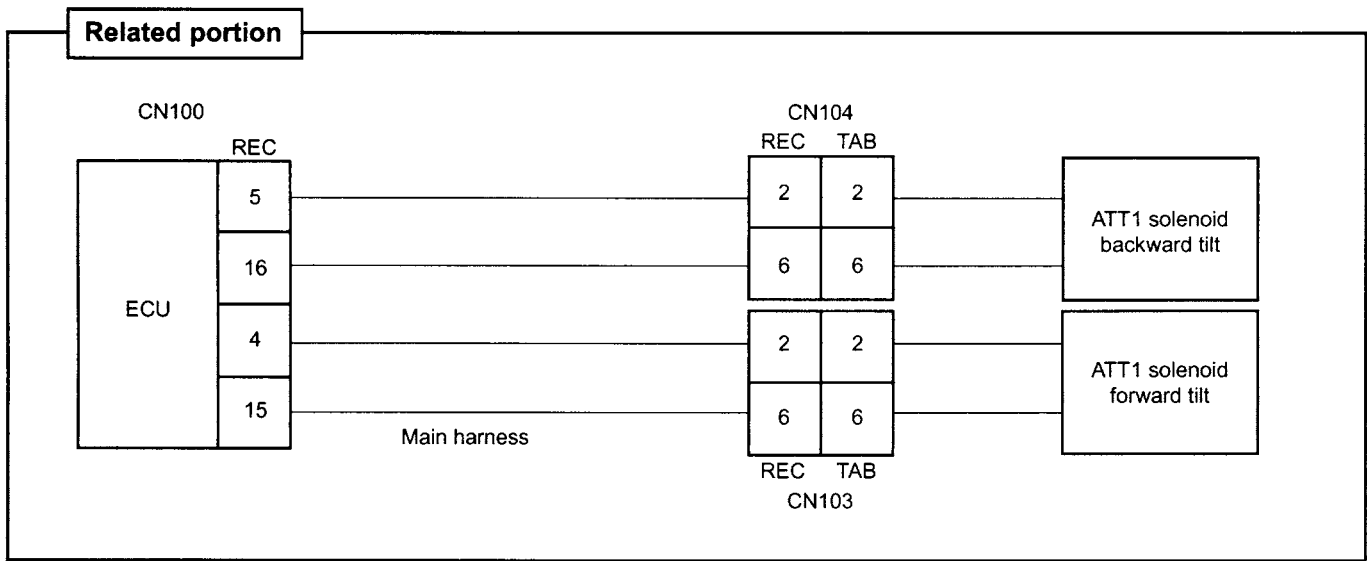
NG

Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

**3-1-1-4 ATT1 backward tilt solenoid open circuit**



**Condition for error detection**

Detected when the ATT1 backward tilt solenoid line is open.

Key switch: OFF  
 Disconnect CN100 and CN104, and check continuity between CN100(REC)-5 and CN104(REC)-2 and between CN100(REC)-16 and CN104(REC)-6 with a circuit tester.  
 [OK] Continuity, [NG] No continuity  
 Check continuity between CN100(REC)-5 and CN100(REC)-16 with a circuit tester.  
 [OK] No continuity, [NG] Continuity

NG → Main harness defect

OK

Key switch: OFF  
 Disconnect CN104 and measure the resistance between CN104(TAB)-2 and CN104(TAB)-6 with a circuit tester.  
 Within 5.8 Ω and 9.0 Ω → [OK]  
 Other than above → [NG]

NG → ATT1 backward tilt solenoid defect

OK

Disconnect CN100 and check continuity between CN100(REC)-16 and the body with a circuit tester.  
 [OK] No continuity, [NG] Continuity

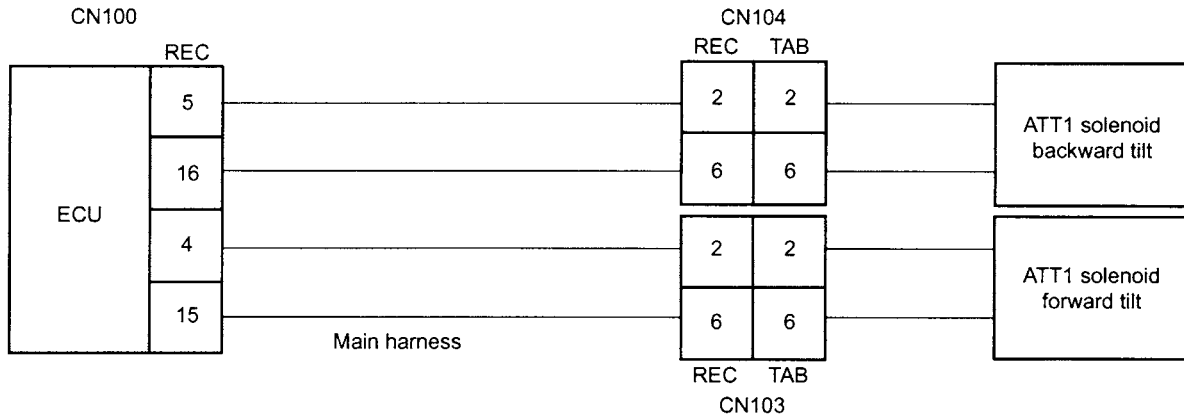
NG → Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

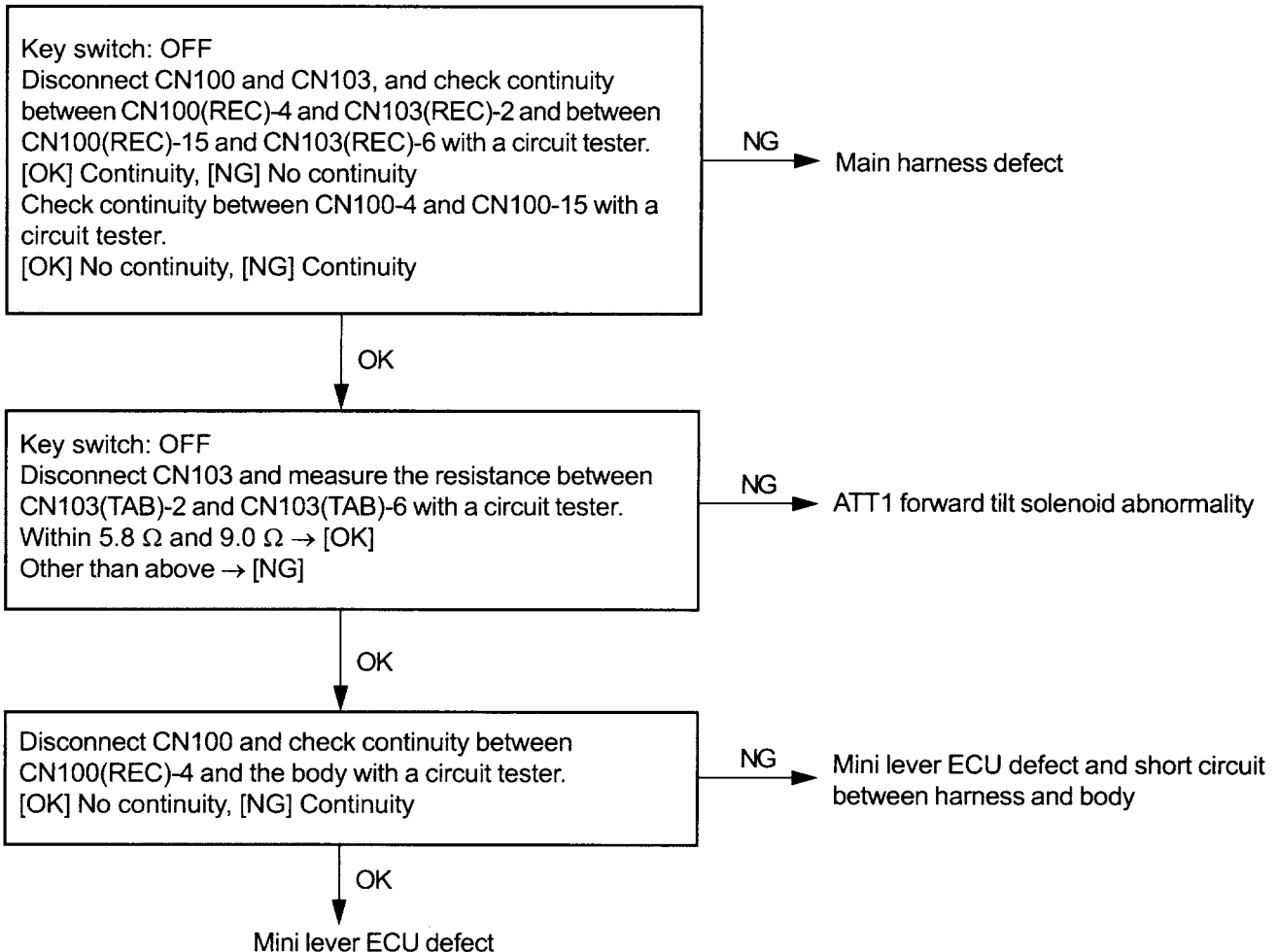
### 3-1-2-4 ATT1 forward tilt solenoid open circuit

#### Related portion



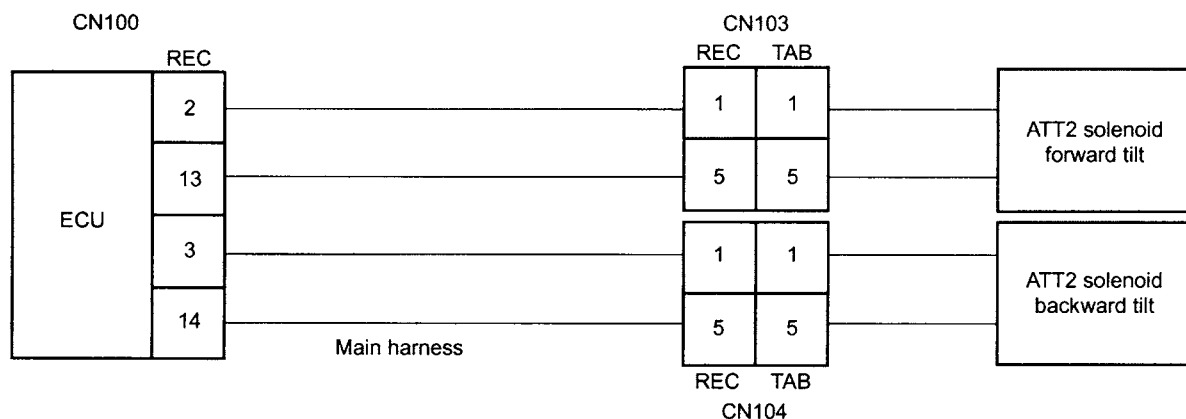
#### Condition for error detection

Detected when the ATT1 forward tilt solenoid line is open.



### 3-1-1-2 ATT2 backward tilt solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the ATT2 backward tilt solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN104, and check continuity between CN100(REC)-3 and CN104(REC)-1 and between CN100(REC)-14 and CN104(REC)-5 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-3 and CN100-14 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN104 and measure the resistance between CN104(TAB)-1 and CN104(TAB)-5 with a circuit tester.

Within 5.8  $\Omega$  and 9.0  $\Omega$  → [OK]

Other than above → [NG]

NG

ATT2 backward tilt solenoid defect

OK

Disconnect CN100 and check continuity between CN100(REC)-2 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

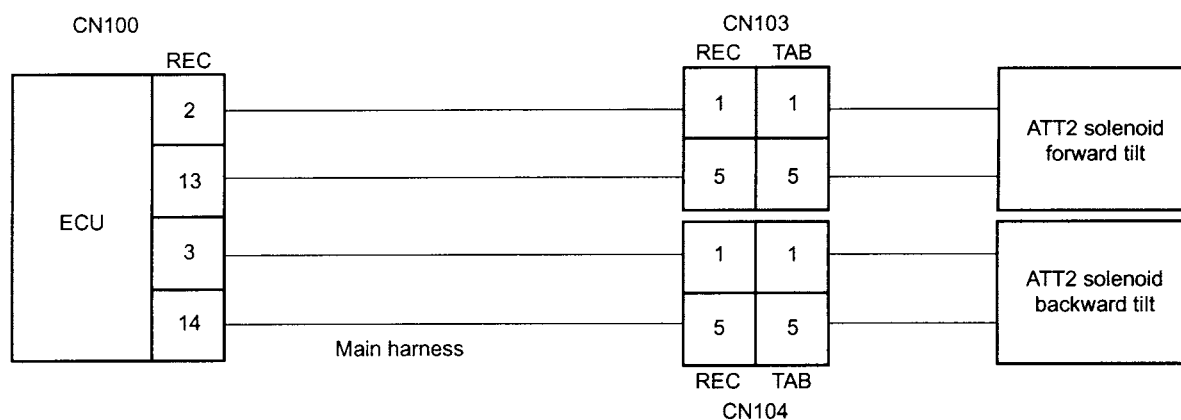
Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

### 3-1-2-2 ATT2 forward tilt solenoid open circuit

#### Related portion



#### Condition for error detection

Detected when the ATT2 forward tilt solenoid line is open.

Key switch: OFF

Disconnect CN100 and CN103, and continuity between CN100(REC)-2 and CN103(REC)-1 and between CN100(REC)-13 and CN103(REC)-5 check with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN100(REC)-2 and CN100(REC)-13 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

Main harness defect

OK

Key switch: OFF

Disconnect CN103 and measure the resistance between CN103(TAB)-1 and CN103(TAB)-5 with a circuit tester. Within 5.8  $\Omega$  and 9.0  $\Omega$  → [OK]

Other than above → [NG]

NG

ATT2 forward tilt solenoid defect

OK

Disconnect CN100 and check continuity between CN100(REC)-3 and the body with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

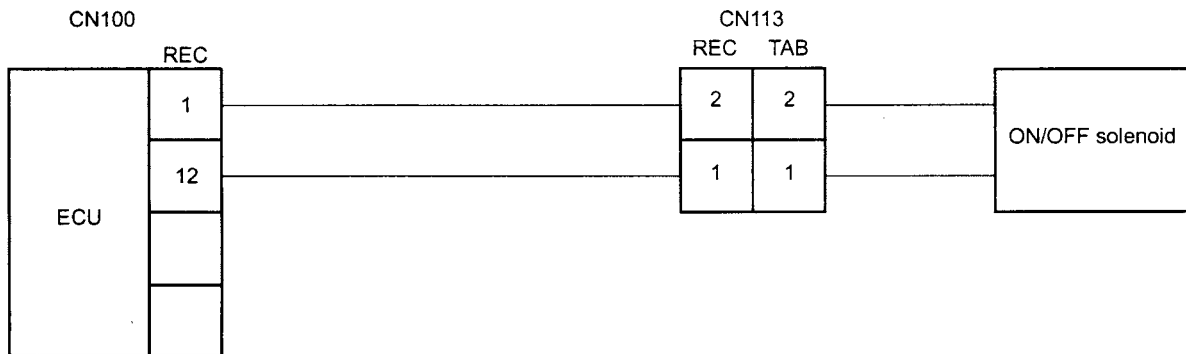
Mini lever ECU defect and short circuit between harness and body

OK

Mini lever ECU defect

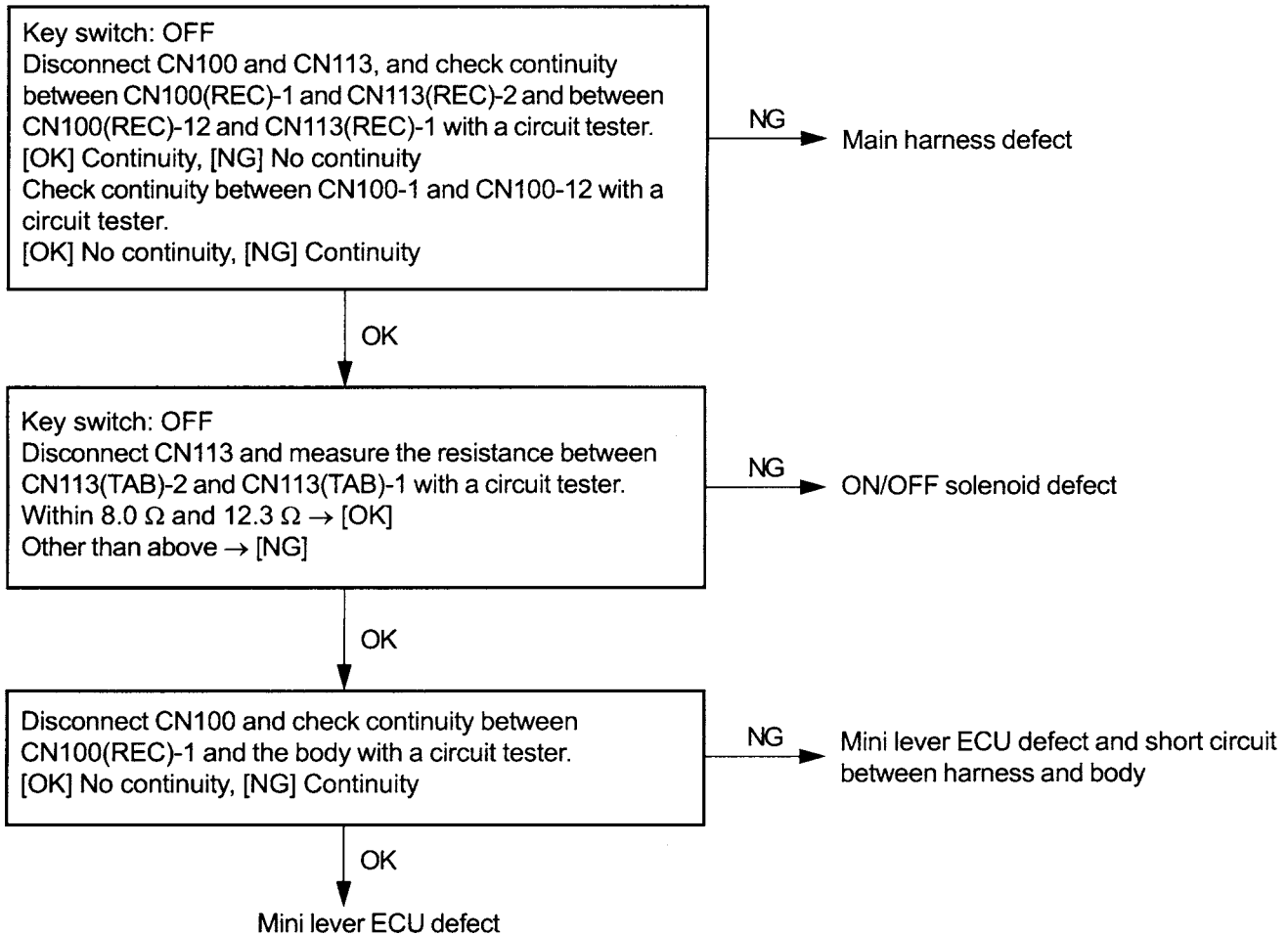
### 3-2-1-1 ON/OFF solenoid open circuit

#### Related portion



#### Condition for error detection

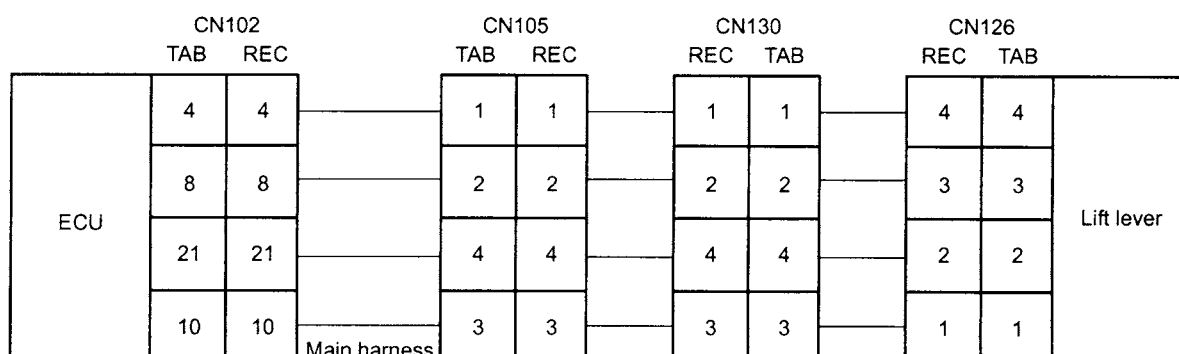
Detected when the ON/OFF solenoid line is open.





### 4-1-1-1 Lift lever potentiometer 1 open circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of lift lever potentiometer 1 is outside the specified range (open circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ Lift potentiometer defect

↓ 4-1-1-1 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN126, and check continuity between CN102(REC)-8 and CN126(REC)-3 and between CN102(REC)-4 and CN126(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-8 and CN102(REC)-10 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-2 and CN126(REC)-3 and between CN105(REC)-1 and CN126(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN105(REC)-2 and CN105(REC)-3.  
[OK] No continuity, [NG] Continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-2 and CN126(REC)-3 and between CN130(TAB)-1 and CN126(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN130(TAB)-4 and CN130(TAB)-3 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

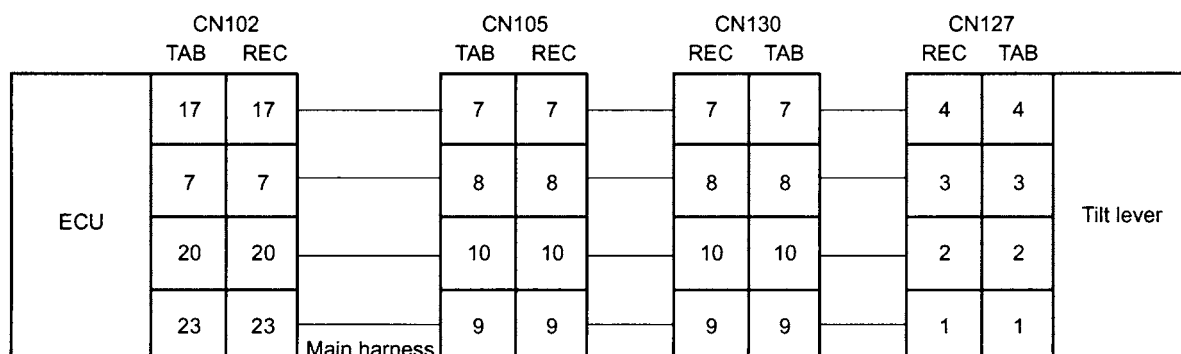
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN126

### 4-1-1-3 Tilt lever potentiometer 1 open circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of tilt lever potentiometer 1 is outside the specified range (open circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-1 (POTB-9) error occurrence

Tilt potentiometer defect

4-1-1-3 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN127, and check continuity between CN102(REC)-7 and CN127(REC)-3 and between CN102(REC)-17 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN102(REC)-7 and CN102(REC)-23 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

Mini lever ECU defect

NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-8 and CN127(REC)-3 and between CN105(REC)-7 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN105(REC)-9 and CN105(REC)-8 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

Main harness defect

NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-8 and CN127(REC)-3 and between CN130(TAB)-7 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN130(TAB)-9 and CN130(TAB)-8 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

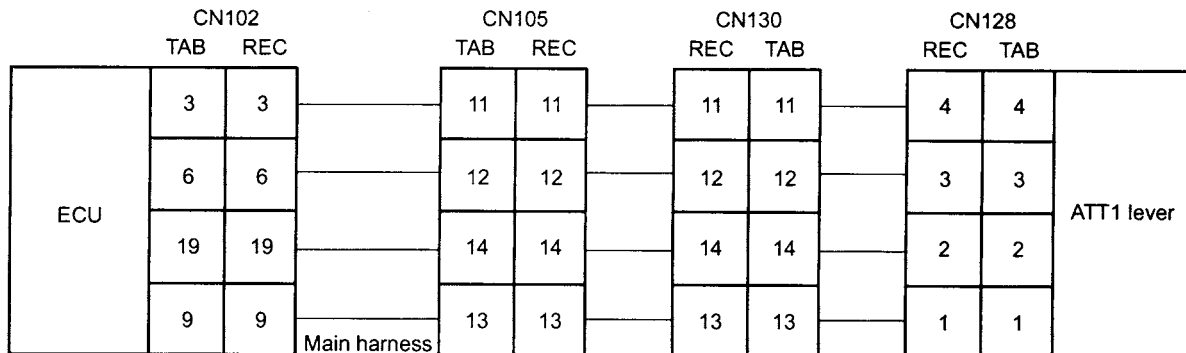
Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN127

#### 4-1-1-4 ATT1 lever potentiometer 1 open circuit

##### Related portion



##### Condition for error detection

Detected when the voltage of ATT1 lever potentiometer 1 is outside the specified range (open circuit)

Key switch: OFF  
Exchange the connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127) and turn the key switch to ON.  
Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ ATT1 potentiometer defect

↓ 4-1-1-4 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN128, and check continuity between CN102(REC)-6 and CN128(REC)-3 and between CN102(REC)-3 and CN128(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-6 and CN102(REC)-9 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK → Mini lever ECU defect

↓ NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-12 and CN128(REC)-3 and between CN105(REC)-11 and CN128(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN105(REC)-12 and CN105(REC)-13 with a circuit tester  
[OK] No continuity, [NG] Continuity

OK → Main harness defect

↓ NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-12 and CN128(REC)-3 and between CN130(TAB)-11 and CN128(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN130(TAB)-12 and CN130(TAB)-13 with a circuit tester.  
[OK] No continuity, [NG] Continuity

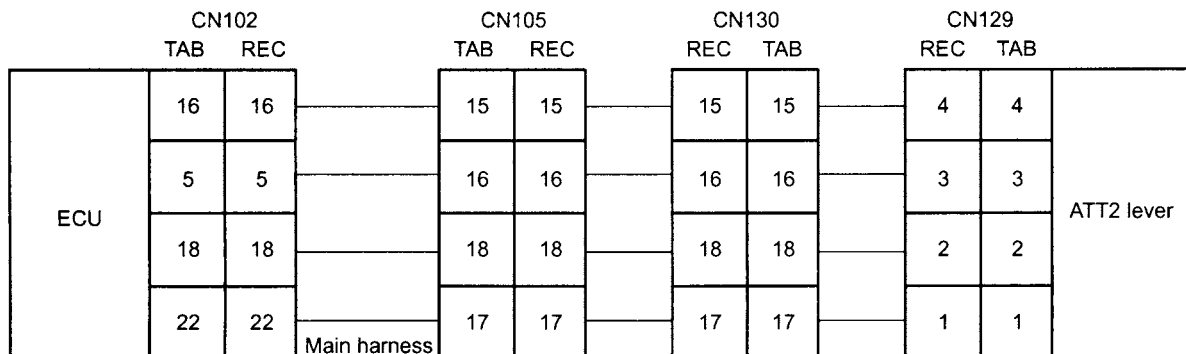
OK → Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN128

# 4-1-1-2 ATT2 lever potentiometer 1 open circuit

## Related portion



## Condition for error detection

Detected when the voltage of ATT2 lever potentiometer 1 is outside the specified range (open circuit)

Key switch: OFF  
Exchange the connections of the ATT1 lever connector (CN128) and ATT2 lever connector (CN129) and turn the key switch to ON.  
Matching execution

4-2-4-4 (POTB-11)  
error occurrence

→ ATT2 potentiometer defect

↓ 4-1-1-2 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN129, and check continuity between CN102(REC)-5 and CN129(REC)-3 and between CN102(REC)-16 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-22 and CN102(REC)-5 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-16 and CN129(REC)-3 and between CN105(REC)-15 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN105(REC)-16 and CN105(REC)-17 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-16 and CN129(REC)-3 and between CN130(TAB)-15 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN130(TAB)-17 and CN130(TAB)-16 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

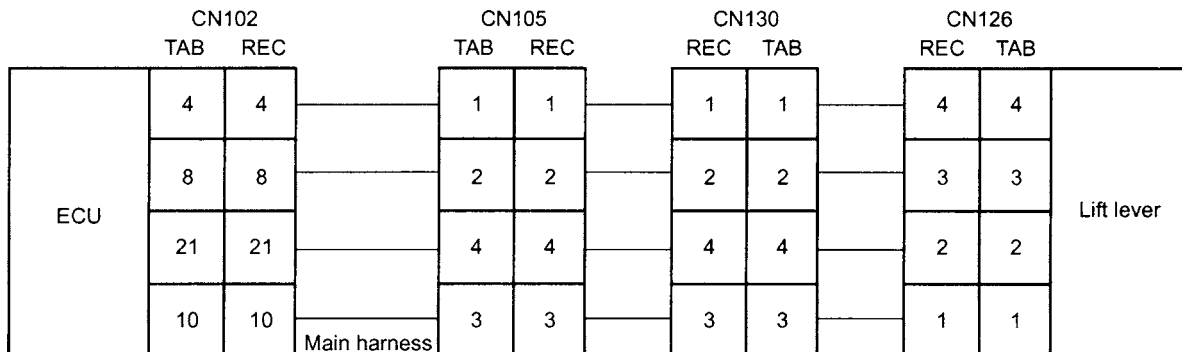
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN129

### 4-1-3-1 Lift lever potentiometer 1 short circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of lift lever potentiometer 1 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON.  
Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ Lift potentiometer defect

↓ 4-1-3-1 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN126, and check continuity between CN102(REC)-4 and CN102(REC)-8 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-10 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-1 and CN105(REC)-2 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-3 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-1 and CN130(TAB)-2 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-3 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

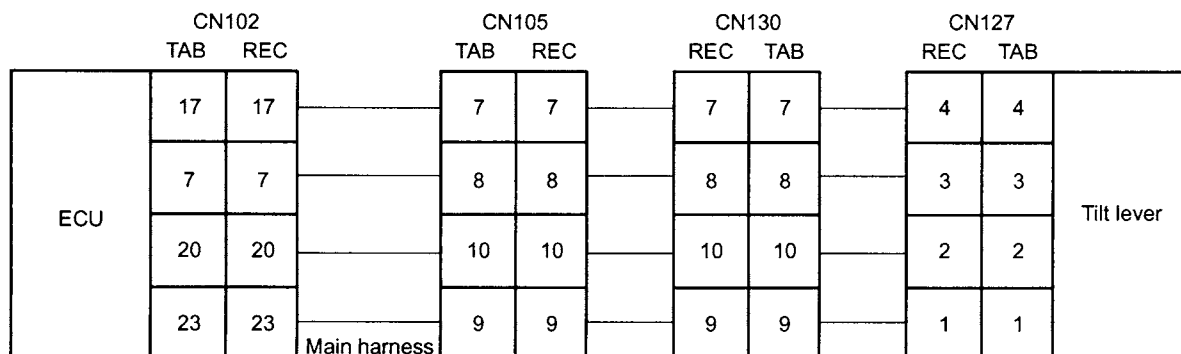
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN126

### 4-1-3-3 Tilt lever potentiometer 1 short circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of tilt lever potentiometer 1 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-1 (POTB-9) error occurrence

→ Tilt potentiometer defect

↓ 4-1-3-3 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN127, and check continuity between CN102(REC)-7 and CN102(REC)-17 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-23 and CN127(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-7 and CN105(REC)-8 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-9 and CN127(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-7 and CN130(TAB)-8 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-9 and CN127(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

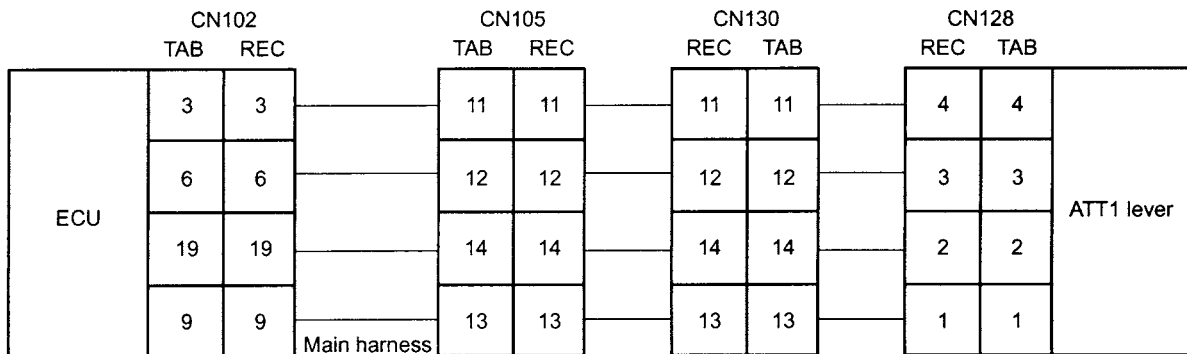
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN127

#### 4-1-3-4 ATT1 lever potentiometer 1 short circuit

##### Related portion



##### Condition for error detection

Detected when the voltage of ATT1 lever potentiometer 1 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ ATT1 potentiometer defect

↓ 4-1-3-4 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN128, and check continuity between CN102(REC)-3 and CN102(REC)-6 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-9 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-11 and CN105(REC)-12 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-13 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-11 and CN130(TAB)-12 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-13 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

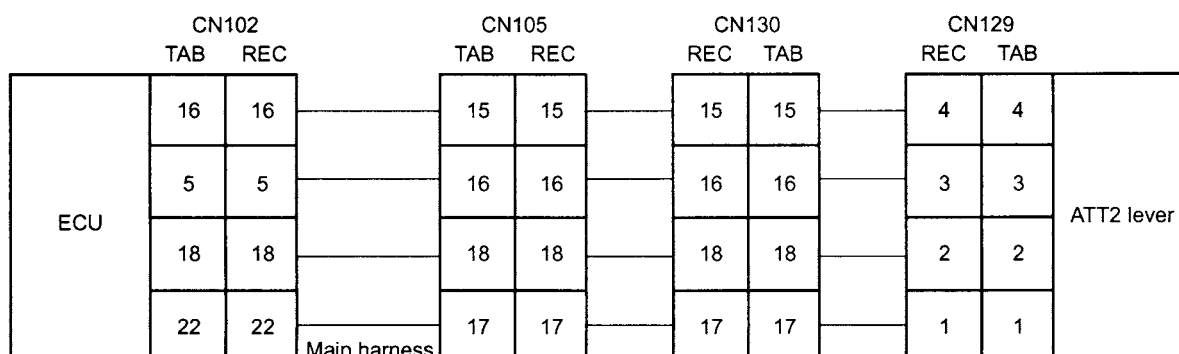
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN128

### 4-1-3-2 ATT2 lever potentiometer 1 short circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of ATT2 lever potentiometer 1 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the ATT1 lever connector (CN128) and ATT2 lever connector (CN129) and turn the key switch to ON. Matching execution

4-2-4-4 (POTB-11)  
error occurrence

→ ATT2 potentiometer defect

↓ 4-1-3-2 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN129, and check continuity between CN102(REC)-5 and CN102(REC)-16 with a circuit tester.

[OK] No continuity, [NG] Continuity  
Check continuity between CN102(REC)-22 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-15 and CN105(REC)-16 with a circuit tester.

[OK] No continuity, [NG] Continuity  
Check continuity between CN105(REC)-17 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-15 and CN130(TAB)-16 with a circuit tester.

[OK] No continuity, [NG] Continuity  
Check continuity between CN130(TAB)-17 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK

→ Defect of harness between CN105 and CN130

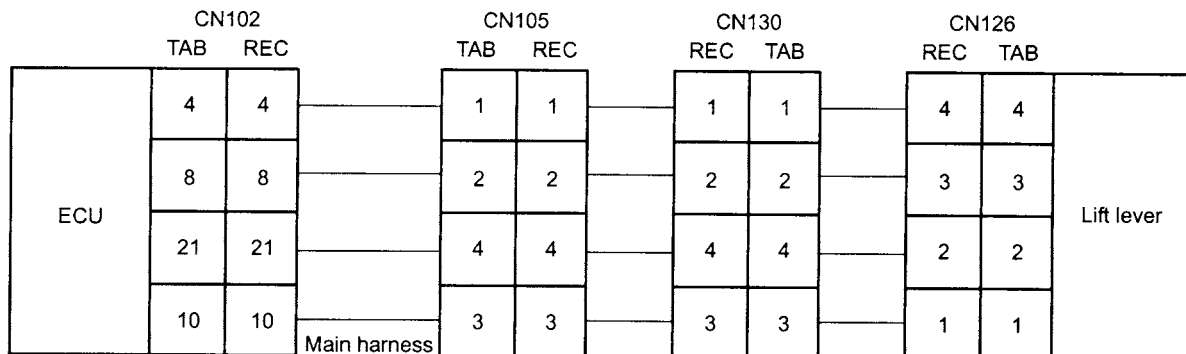
↓ NG

Defect of harness between CN130 and CN129



# 4-1-4-1 Lift lever potentiometer 2 open circuit

## Related portion



## Condition for error detection

Detected when the voltage of lift lever potentiometer 2 is outside the specified range (open circuit)

Key switch: OFF  
Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON.  
Matching execution

4-2-4-3 (POTB-10)  
error occurrence

Lift potentiometer defect

4-1-4-1 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN126, and check continuity between CN102(REC)-21 and CN126(REC)-2 and between CN102(REC)-4 and CN126(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-21 and CN102(REC)-10 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

Mini lever ECU defect

NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-4 and CN126(REC)-2 and between CN105(REC)-1 and CN126(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN105(REC)-4 and CN105(REC)-3 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

Main harness defect

NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-4 and CN126(REC)-2 and between CN130(TAB)-1 and CN126(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN130(TAB)-4 and CN130(TAB)-3 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

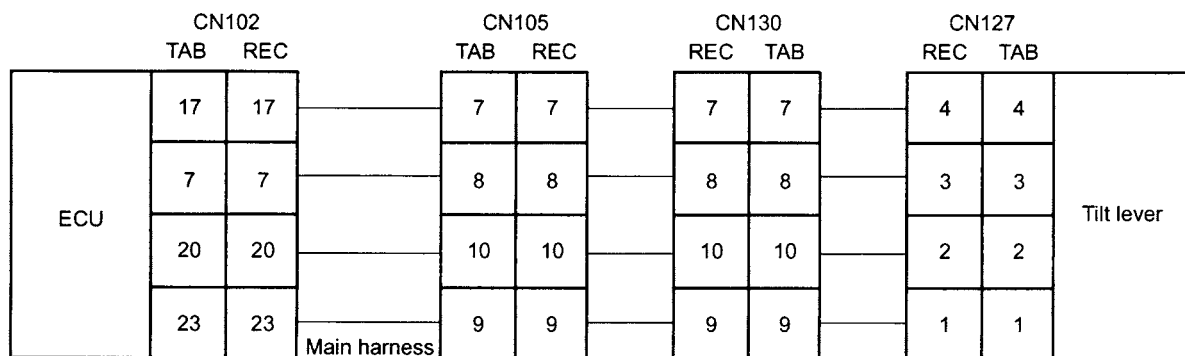
Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN126

### 4-1-4-3 Tilt lever potentiometer 2 open circuit

#### Related portion



#### Condition for error detection

Detected when the voltage of tilt lever potentiometer 2 is outside the specified range (open circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-1 (POTB-9) error occurrence

Tilt potentiometer defect

4-1-4-3 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN127, and check continuity between CN102(REC)-20 and CN127(REC)-2 and between CN102(REC)-17 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN102(REC)-20 and CN102(REC)-23 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

Mini lever ECU defect

NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-10 and CN127(REC)-2 and between CN105(REC)-7 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN105(REC)-10 and CN105(REC)-9 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

Main harness defect

NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-10 and CN127(REC)-2 and between CN130(TAB)-7 and CN127(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN130(TAB)-10 and CN130(TAB)-9 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

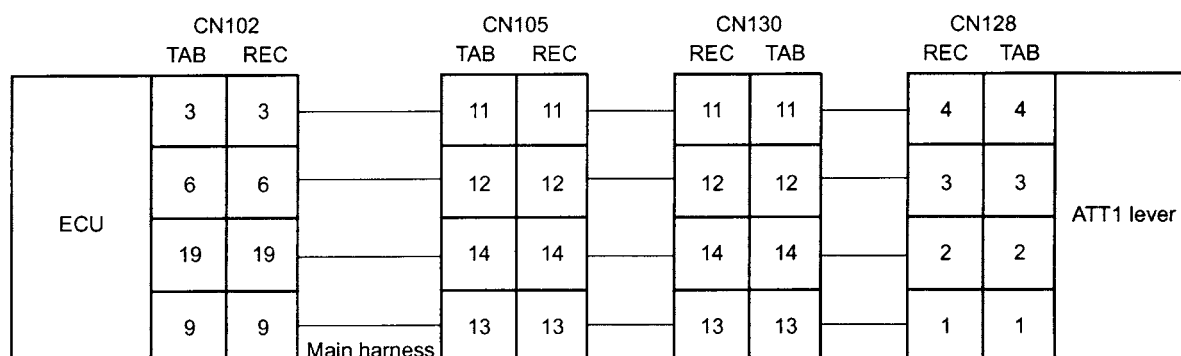
Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN127

#### 4-1-4-4 ATT1 lever potentiometer 2 open circuit

##### Related portion



##### Condition for error detection

Detected when the voltage of ATT1 lever potentiometer 2 is outside the specified range (open circuit)

Key switch: OFF

Exchange the connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ ATT1 potentiometer defect

↓ 4-1-4-4 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN128, and check continuity between CN102(REC)-19 and CN128(REC)-2 and between CN102(REC)-3 and CN128(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN102(REC)-19 and CN102(REC)-9 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-14 and CN128(REC)-2 and between CN105(REC)-11 and CN128(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN105(REC)-13 and CN105(REC)-14 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-14 and CN128(REC)-2 and between CN130(TAB)-11 and CN128(REC)-4 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN130(TAB)-14 and CN130(TAB)-13 with a circuit tester.

[OK] No continuity, [NG] Continuity

OK

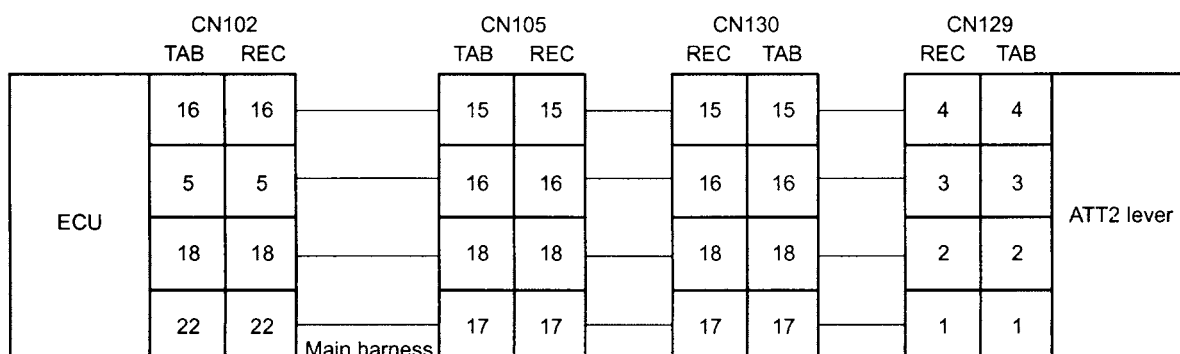
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN128

#### 4-1-4-2 ATT2 lever potentiometer 2 open circuit

##### Related portion



##### Condition for error detection

Detected when the voltage of ATT2 lever potentiometer 2 is outside the specified range (open circuit)

Key switch: OFF  
Exchange the connections of the ATT1 lever connector (CN128) and ATT2 lever connector (CN129) and turn the key switch to ON.  
Matching execution

4-2-4-4 (POTB-11)  
error occurrence

→ ATT2 potentiometer defect

↓ 4-1-4-2 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN129, and check continuity between CN102(REC)-18 and CN129(REC)-2 and between CN102(REC)-16 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-18 and CN102(REC)-22 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-18 and CN129(REC)-2 and between CN105(REC)-15 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN105(REC)-18 and CN105(REC)-17 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-18 and CN129(REC)-2 and between CN130(TAB)-15 and CN129(REC)-4 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN130(TAB)-18 and CN130(TAB)-17 with a circuit tester.  
[OK] No continuity, [NG] Continuity

OK

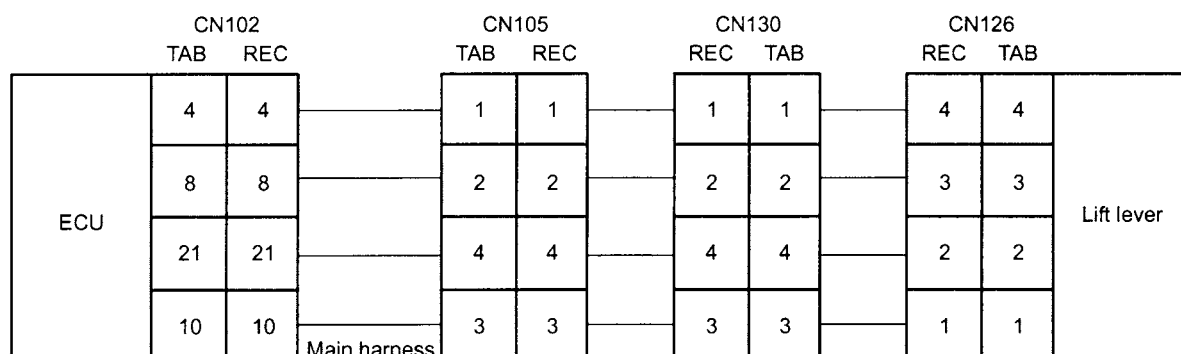
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN129

# 4-1-2-1 Lift lever potentiometer 2 short circuit

## Related portion



## Condition for error detection

Detected when the voltage of lift lever potentiometer 2 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the lift lever connector (CN126) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-3 (POTB-10)

error occurrence

→ Lift potentiometer defect

↓ 4-1-2-1 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN126, and check continuity between CN102(REC)-4 and CN102(REC)-21 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-10 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-1 and CN105(REC)-4 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-3 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-4 and CN130(TAB)-1 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-3 and CN126(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

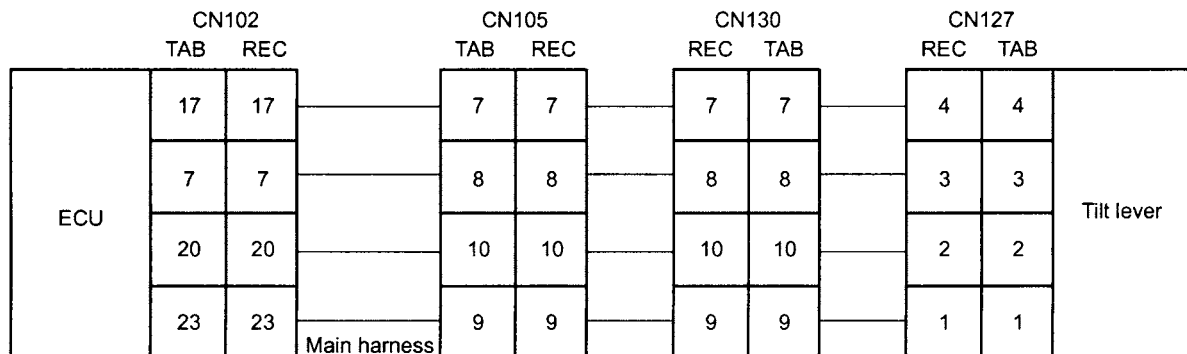
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN126

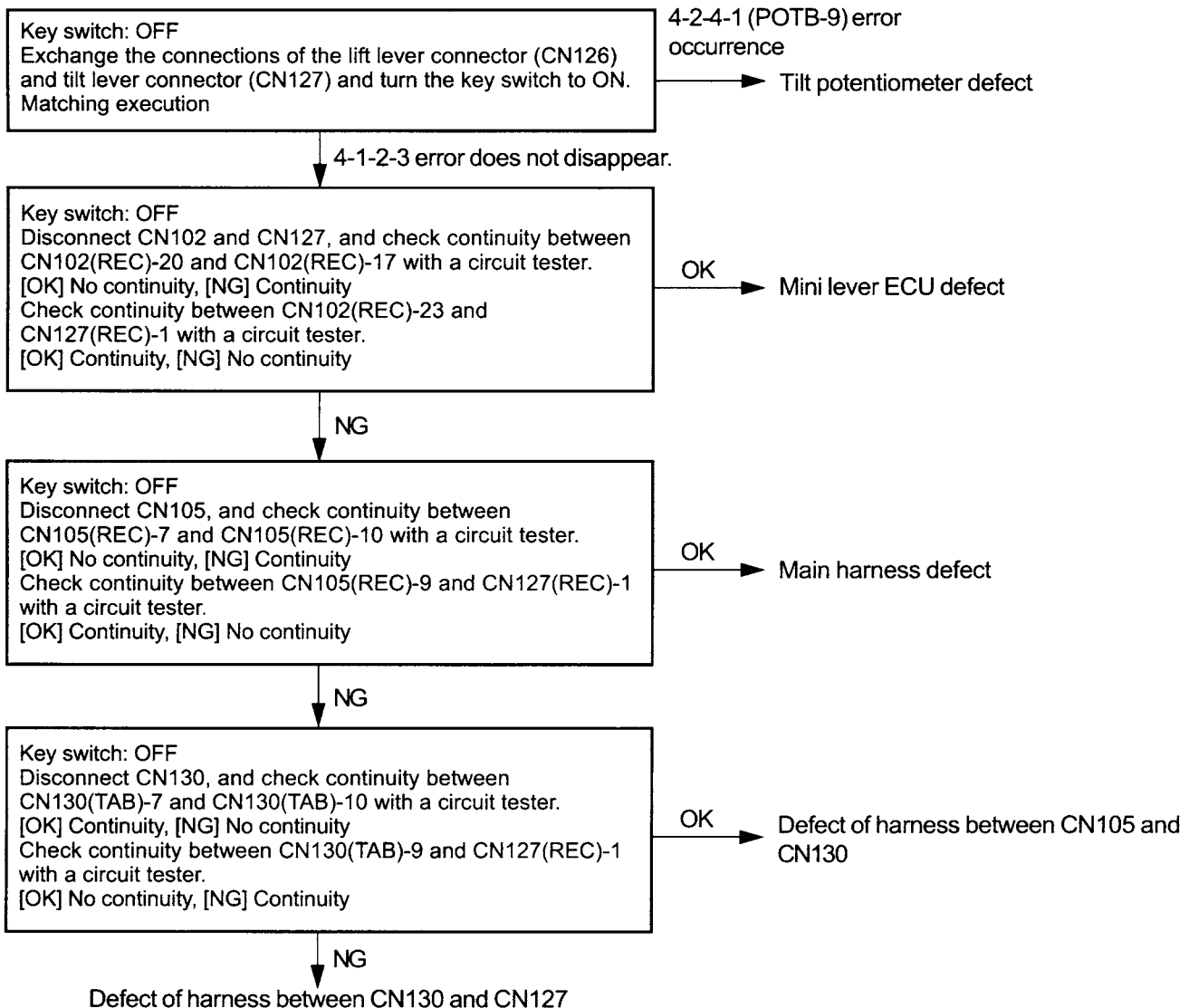
### 4-1-2-3 Tilt lever potentiometer 2 short circuit

#### Related portion



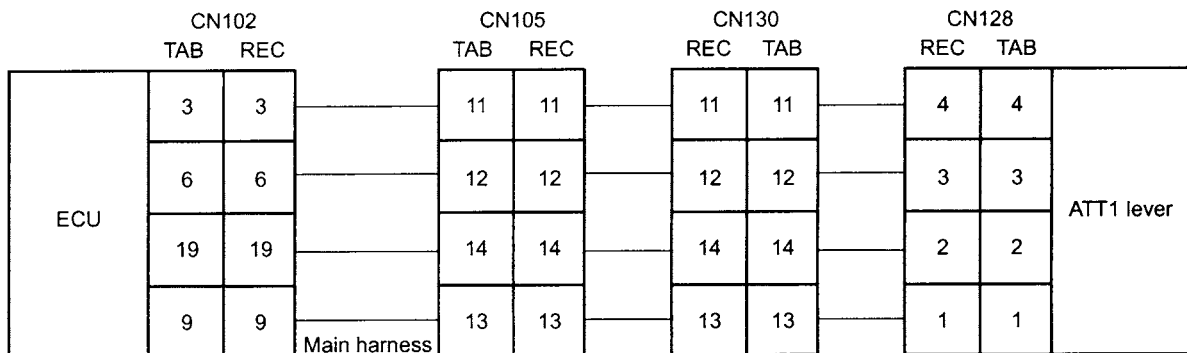
#### Condition for error detection

Detected when the voltage of tilt lever potentiometer 2 is outside the specified range (short circuit)



#### 4-1-2-4 ATT1 lever potentiometer 2 short circuit

##### Related portion



##### Condition for error detection

Detected when the voltage of ATT1 lever potentiometer 2 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127) and turn the key switch to ON. Matching execution

4-2-4-3 (POTB-10)  
error occurrence

→ ATT1 potentiometer defect

↓ 4-1-2-4 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN128, and check continuity between CN102(REC)-3 and CN102(REC)-19 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-9 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-11 and CN105(REC)-14 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-13 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-14 and CN130(TAB)-11 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-13 and CN128(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

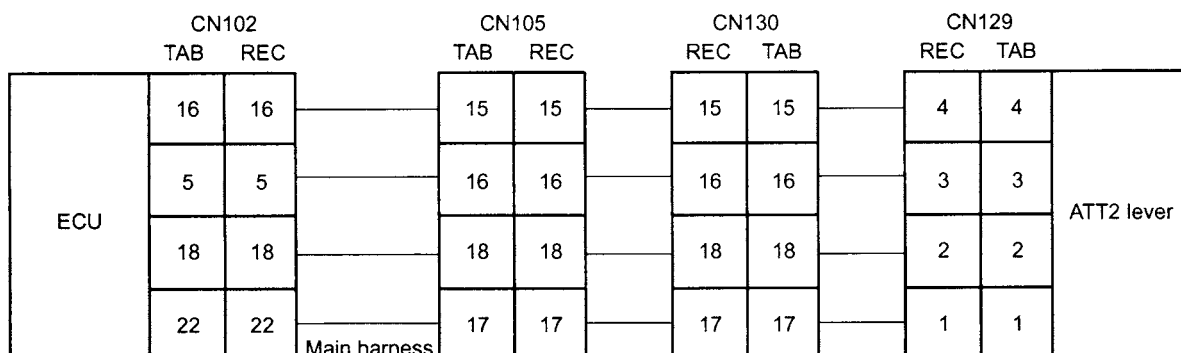
→ Defect of harness between CN105 and CN130

↓ NG

Defect of harness between CN130 and CN128

## 4-1-2-2 ATT2 lever potentiometer 2 short circuit

### Related portion



### Condition for error detection

Detected when the voltage of ATT2 lever potentiometer 2 is outside the specified range (short circuit)

Key switch: OFF

Exchange the connections of the ATT1 lever connector (CN128) and ATT2 lever connector (CN129) and turn the key switch to ON. Matching execution

4-2-4-4 (POTB-11)  
error occurrence

→ ATT2 potentiometer defect

↓ 4-1-2-2 error does not disappear.

Key switch: OFF

Disconnect CN102 and CN129, and check continuity between CN102(REC)-18 and CN102(REC)-16 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN102(REC)-22 and CN129(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN105, and check continuity between CN105(REC)-15 and CN105(REC)-18 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN105(REC)-17 and CN129(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Main harness defect

↓ NG

Key switch: OFF

Disconnect CN130, and check continuity between CN130(TAB)-15 and CN130(TAB)-18 with a circuit tester.

[OK] No continuity, [NG] Continuity

Check continuity between CN130(TAB)-17 and CN129(REC)-1 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

→ Defect of harness between CN105 and CN130

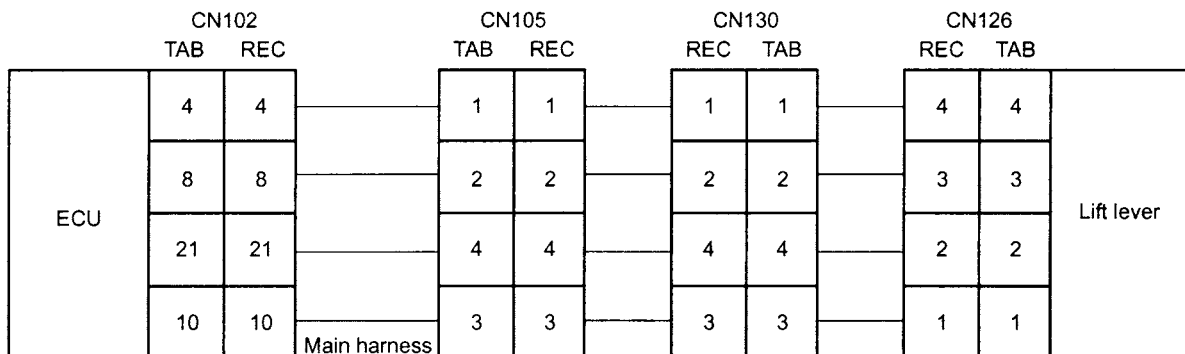
↓ NG

Defect of harness between CN130 and CN129



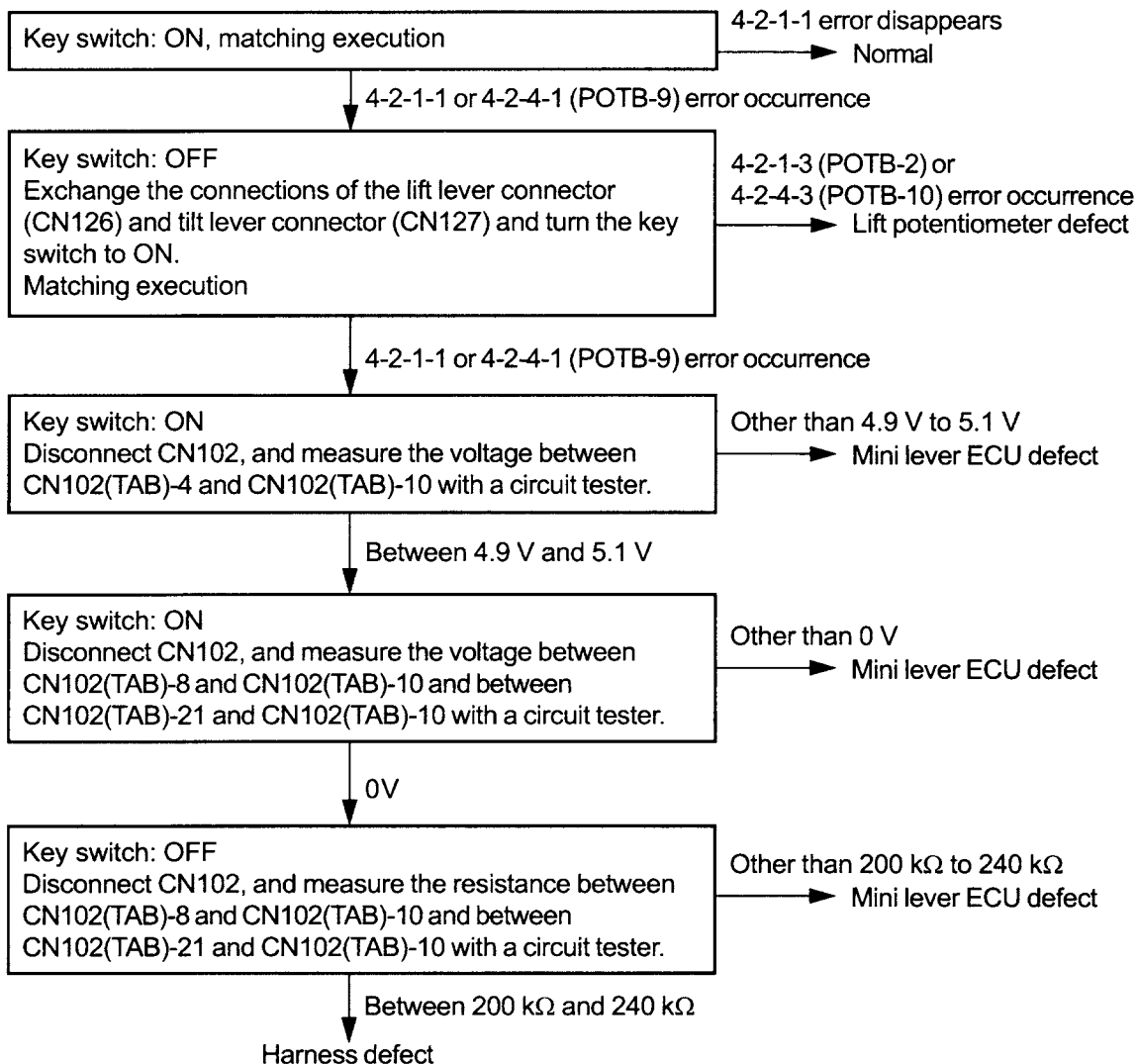
# 4-2-1-1 Lift lever potentiometer value combination abnormality

## Related portion



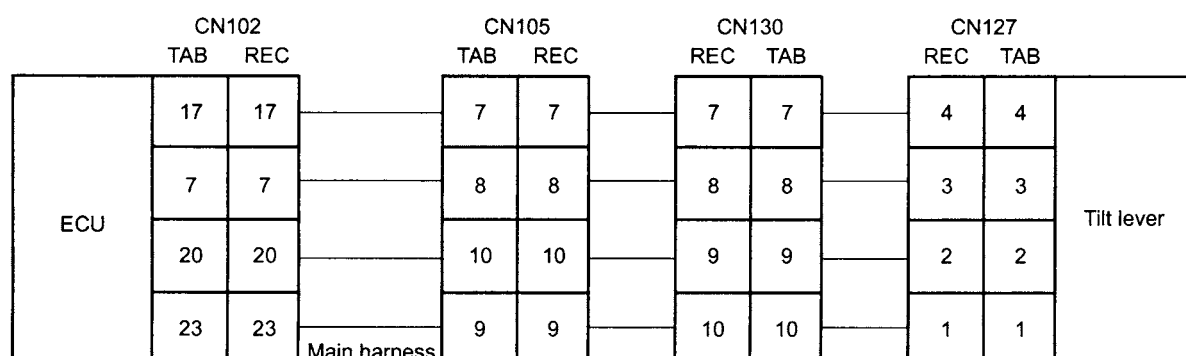
## Condition for error detection

Detected when either potentiometer 1 or 2 is in the neutral position and the sum of the values of potentiometers 1 and 2 exceeds the standard.



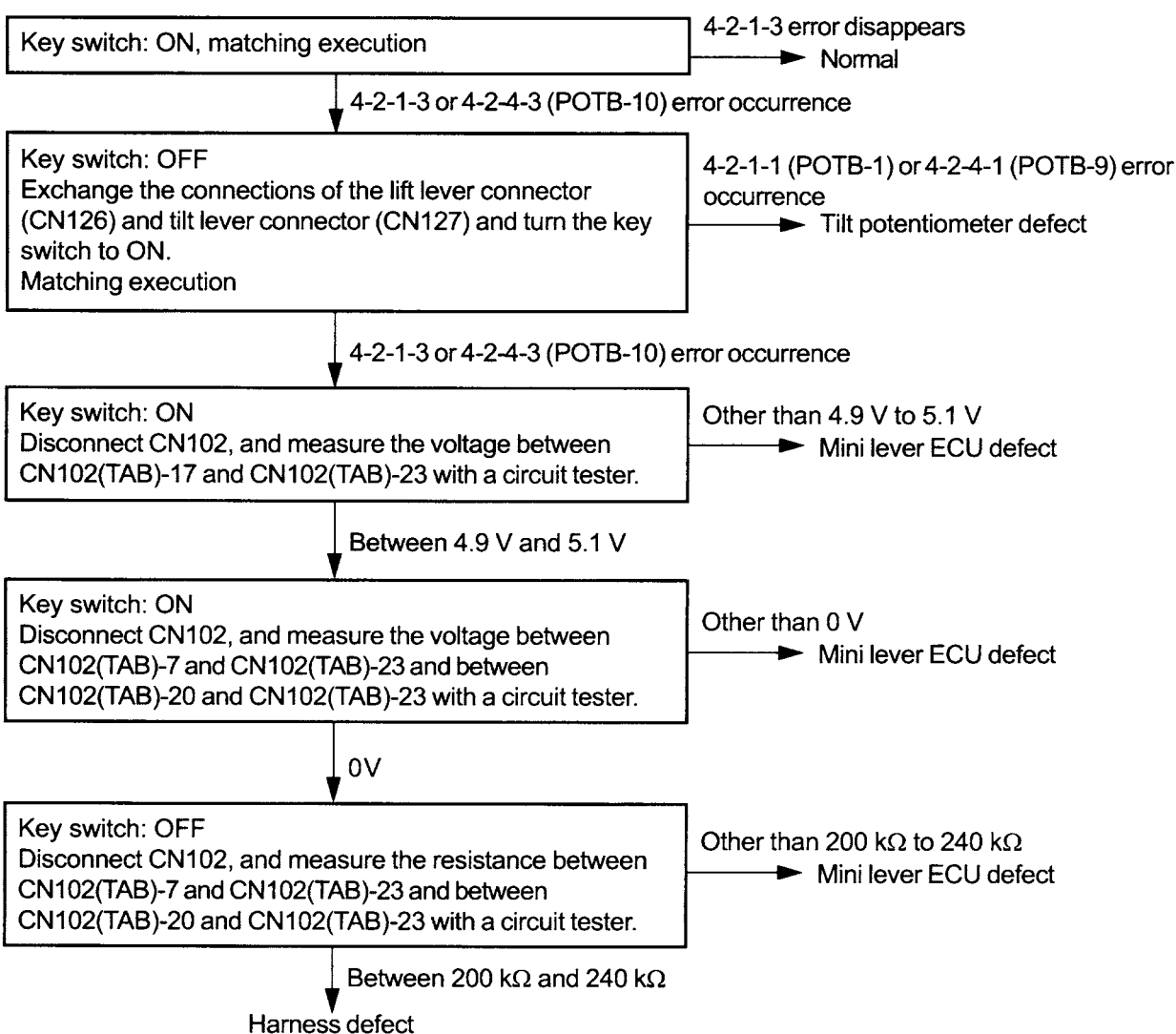
### 4-2-1-3 Tilt lever potentiometer value combination abnormality

#### Related portion



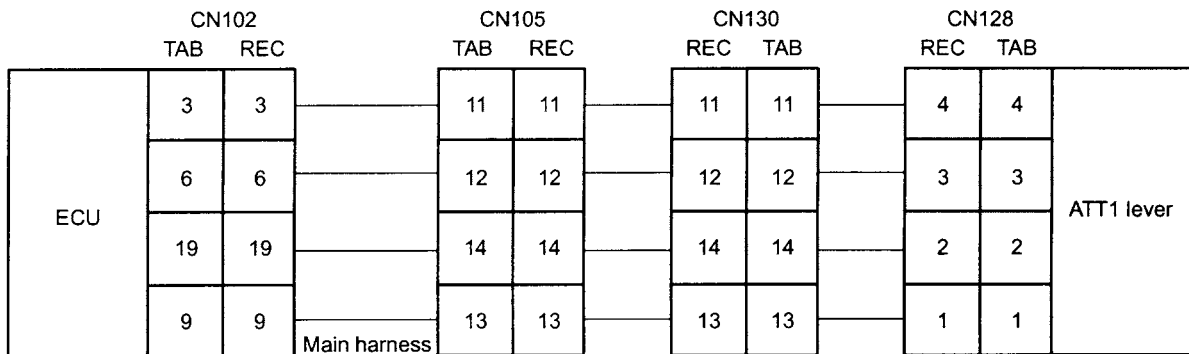
#### Condition for error detection

Detected when either potentiometer 1 or 2 is in the neutral position and the sum of the values of potentiometers 1 and 2 exceeds the standard.



#### 4-2-1-4 ATT1 lever potentiometer value combination abnormality

##### Related portion



##### Condition for error detection

Detected when either potentiometer 1 or 2 is in the neutral position and the sum of the values of potentiometers 1 and 2 exceeds the specified value.

Key switch: ON, matching execution

4-2-1-4 error disappears  
→ Normal

↓ 4-2-1-4 or 4-2-4-4 (POTB-11) error occurrence

Key switch: OFF  
Exchange the connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127) and turn the key switch to ON.  
Matching execution

4-2-1-3 (POTB-2) or 4-2-4-3 (POTB-10) error occurrence  
→ ATT1 potentiometer defect

↓ 4-2-1-4 or 4-2-4-4 (POTB-10) error occurrence

Key switch: ON  
Disconnect CN102, and measure the voltage between CN102(TAB)-3 and CN102(TAB)-9 with a circuit tester.

Other than 4.9 V to 5.1 V  
→ Mini lever ECU defect

↓ Between 4.9 V and 5.1 V

Key switch: ON  
Disconnect CN102, and measure the voltage between CN102(TAB)-6 and CN102(TAB)-9 and between CN102(TAB)-19 and CN102(TAB)-9 with a circuit tester.

Other than 0 V  
→ Mini lever ECU defect

↓ 0V

Key switch: OFF  
Disconnect CN102, and measure the resistance between CN102(TAB)-6 and CN102(TAB)-9 and between CN102(TAB)-19 and CN102(TAB)-9 with a circuit tester.

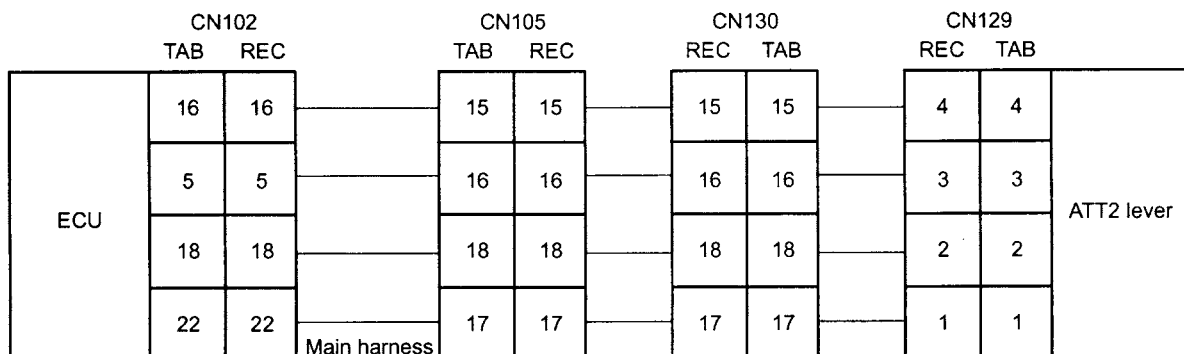
Other than 200 kΩ to 240 kΩ  
→ Mini lever ECU defect

↓ Between 200 kΩ and 240 kΩ

→ Harness defect

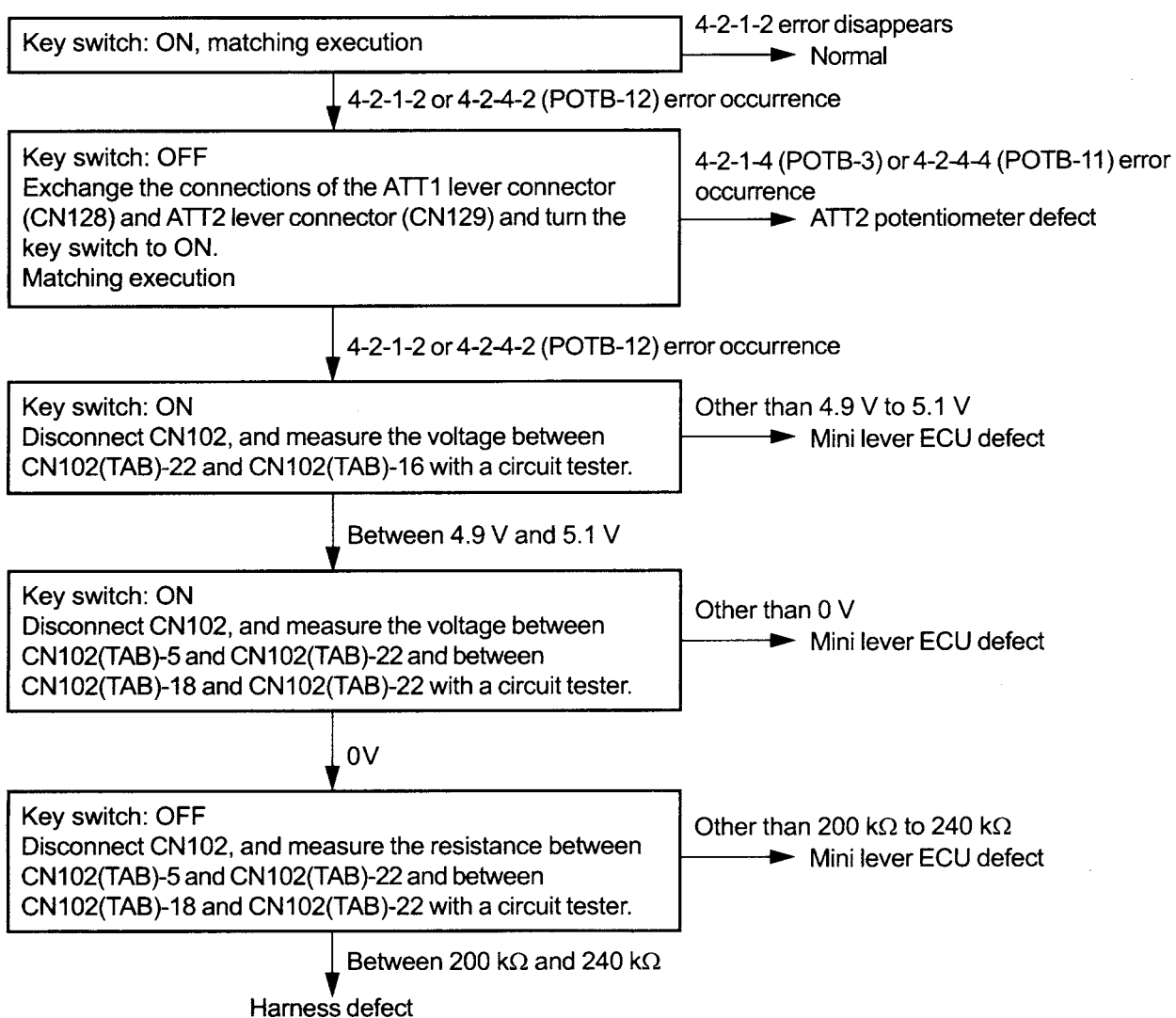
### 4-2-1-2 ATT2 lever potentiometer value combination abnormality

#### Related portion



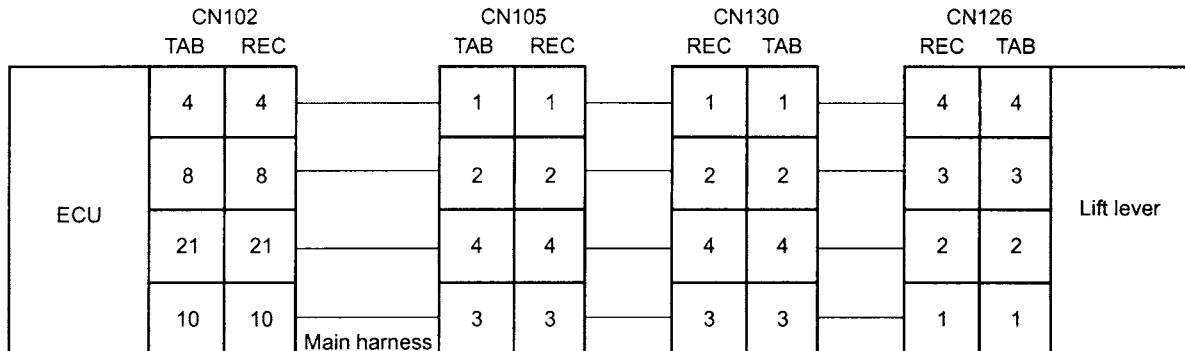
#### Condition for error detection

Detected when either potentiometer 1 or 2 is in the neutral position and the sum of the values of potentiometers 1 and 2 exceeds the specified value.



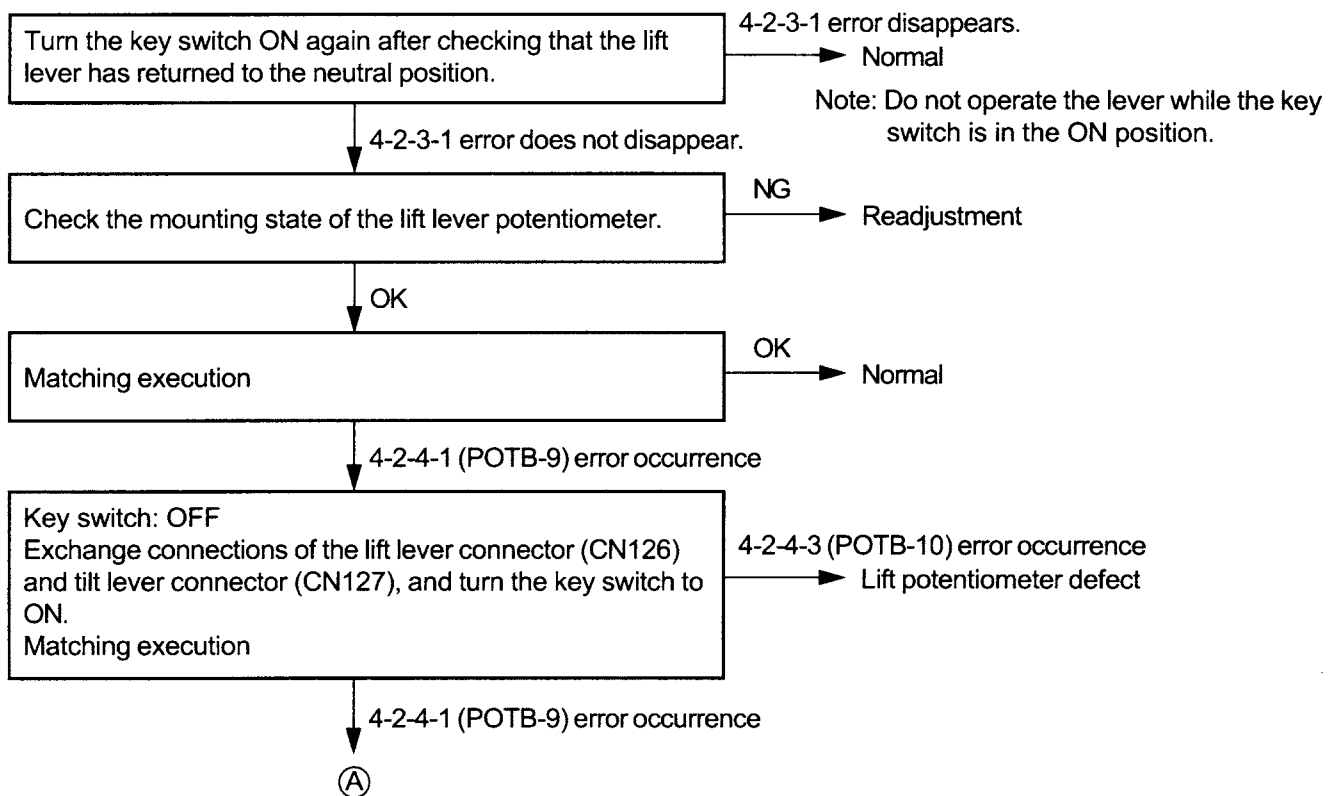
### 4-2-3-1 Lift lever potentiometer neutral value abnormality

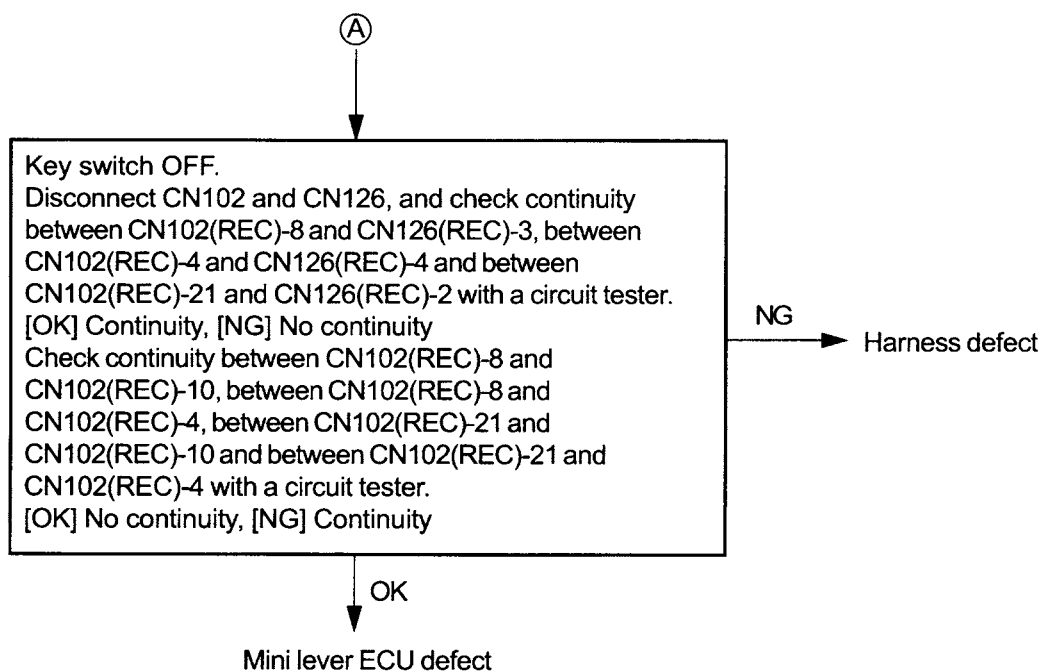
#### Related portion



#### Condition for error detection

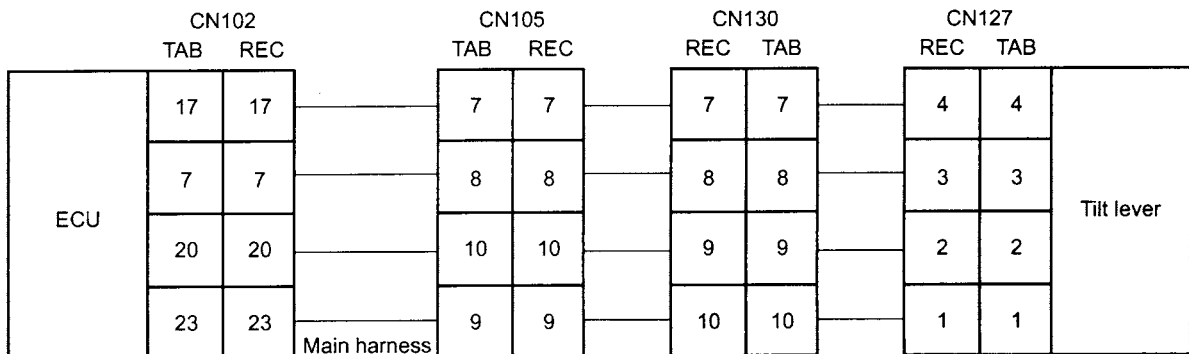
Detected when the lift lever voltage value upon key switch ON stays outside the neutral range continuously for 0.3 second or more (lever operated state)





### 4-2-3-3 Tilt lever potentiometer neutral value abnormality

#### Related portion



#### Condition for error detection

Detected when the tilt lever voltage value upon key switch ON stays outside the neutral range continuously for 0.3 second or more (lever operated state)

Turn the key switch ON again after checking that the tilt lever has returned to the neutral position.

4-2-3-3 error disappears.

Normal

Note: Do not operate the lever while the key switch is in the ON position.

4-2-3-3 error does not disappear.

Check the mounting state of the tilt lever potentiometer.

NG

Readjustment

OK

Matching execution

OK

Normal

4-2-4-3 (POTB-10) error occurrence

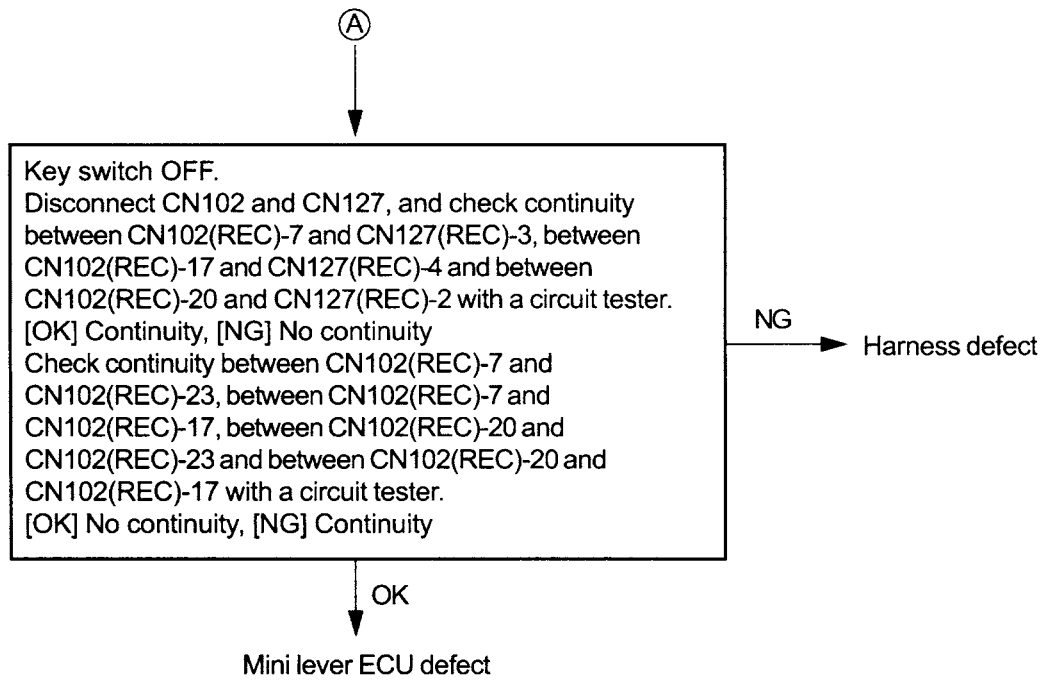
Key switch: OFF  
Exchange connections of the lift lever connector (CN126) and tilt lever connector (CN127), and turn the key switch to ON.  
Matching execution

4-2-4-1 (POTB-9) error occurrence

Tilt potentiometer defect

4-2-4-3 (POTB-10) error occurrence

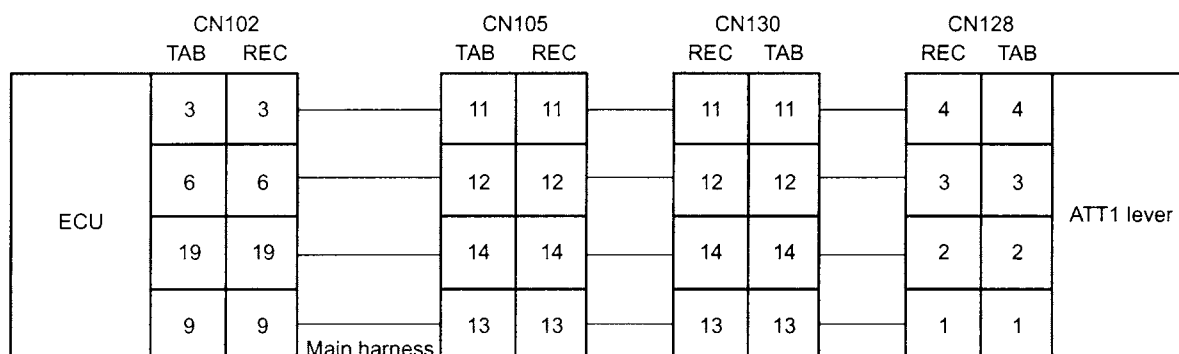
Ⓐ





#### 4-2-3-4 ATT1 lever potentiometer neutral value abnormality

##### Related portion



##### Condition for error detection

Detected when the ATT1 lever voltage value upon key switch ON stays outside the neutral range continuously for 0.3 second or more (lever operated state)

Turn the key switch ON again after checking that the ATT1 lever has returned to the neutral position.

4-2-3-4 error disappears.

Normal

Note: Do not operate the lever while the key switch is in the ON position.

4-2-3-4 error does not disappear.

Check the mounting state of the ATT1 lever potentiometer.

NG

Readjustment

OK

Matching execution

OK

Normal

4-2-4-4 (POTB-11) error occurrence

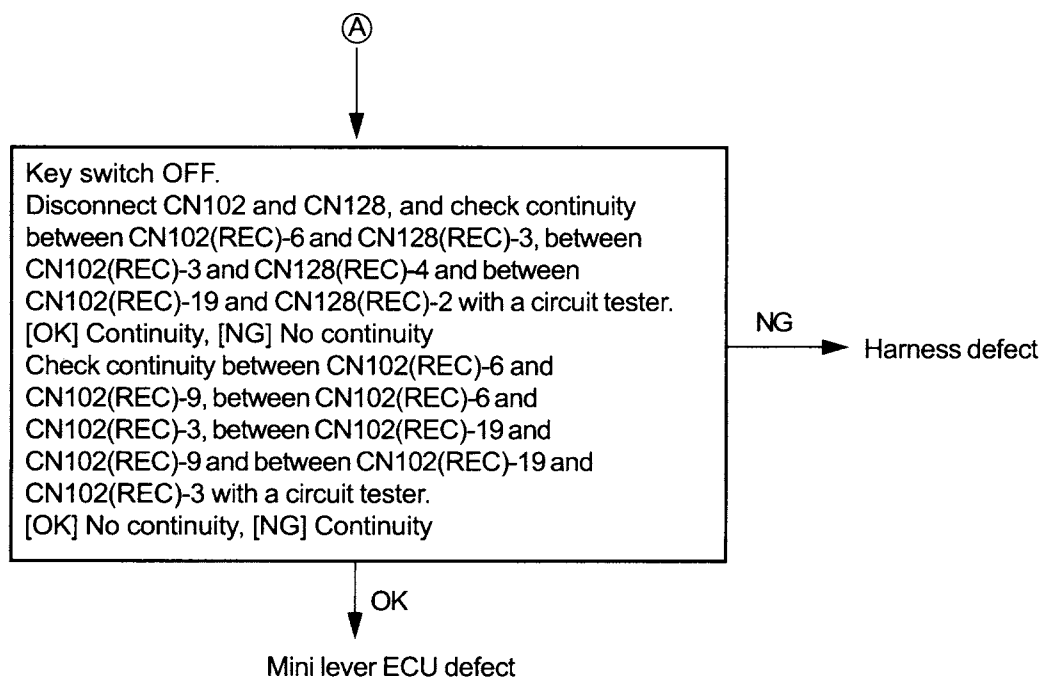
Key switch: OFF  
Exchange connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127), and turn the key switch to ON.  
Matching execution

4-2-4-3 (POTB-10) error occurrence

ATT1 potentiometer defect

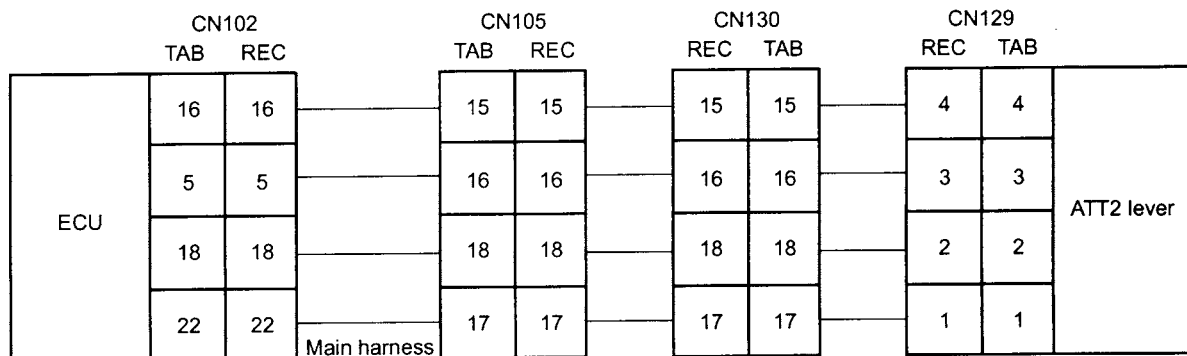
4-2-4-4 (POTB-11) error occurrence

Ⓐ



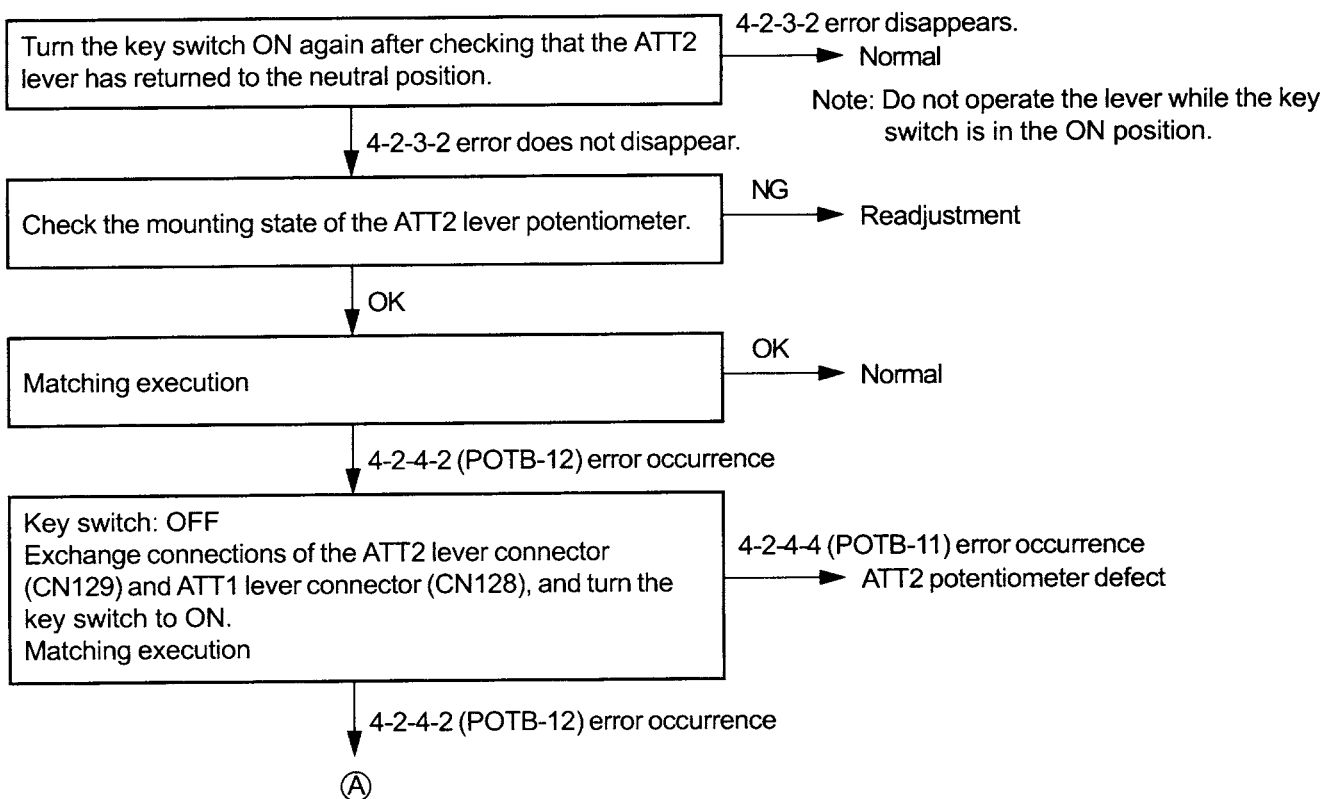
### 4-2-3-2 ATT2 lever potentiometer neutral value abnormality

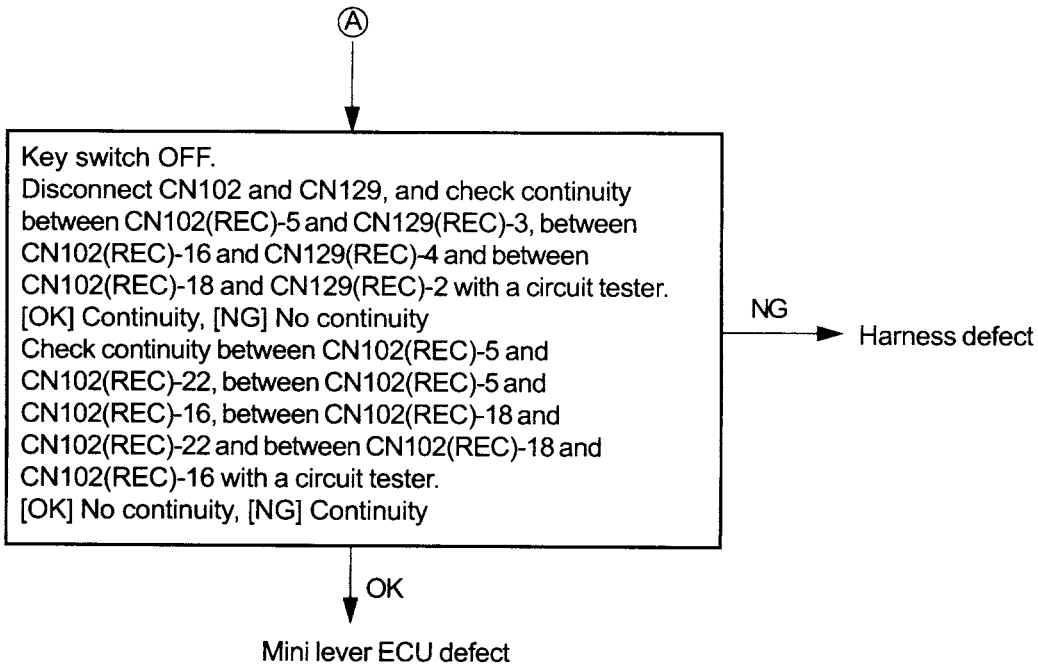
#### Related portion



#### Condition for error detection

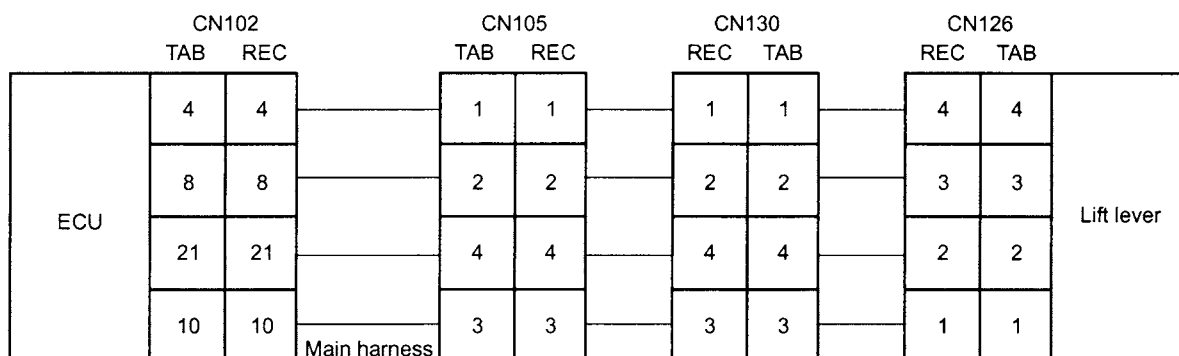
Detected when the ATT2 lever voltage value upon key switch ON stays outside the neutral range continuously for 0.3 second or more (lever operated state)





#### 4-2-4-1 Lift lever potentiometer neutral matching abnormality

##### Related portion



##### Condition for error detection

Detected when the lift lever neutral matching is outside the matching standard.

Key switch: ON, Matching execution

4-2-4-1 error disappears.

Normal

4-2-4-1 error does not disappear.

Check the mounting state of the lift lever potentiometer.

NG

Readjustment

OK

Key switch: OFF

Exchange connections of the lift lever connector (CN126) and tilt lever connector (CN127), and turn the key switch to ON.

Matching execution

4-2-4-3 (POTB-10) error occurrence

Lift potentiometer defect

4-2-4-1 error does not disappear.

Key switch OFF.

Disconnect CN102 and CN126, and check continuity between CN102(REC)-8 and CN126(REC)-3, between CN102(REC)-4 and CN126(REC)-4 and between CN102(REC)-21 and CN126(REC)-2 with a circuit tester.

[OK] Continuity, [NG] No continuity

Check continuity between CN102(REC)-8 and CN102(REC)-10, between CN102(REC)-8 and CN102(REC)-4, between CN102(REC)-21 and CN102(REC)-10 and between CN102(REC)-21 and CN102(REC)-4 with a circuit tester.

[OK] No continuity, [NG] Continuity

NG

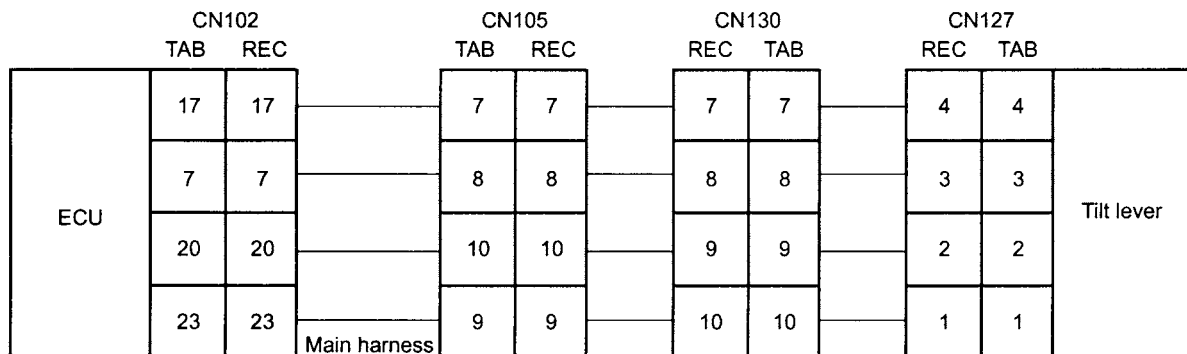
Harness defect

OK

Mini lever ECU defect

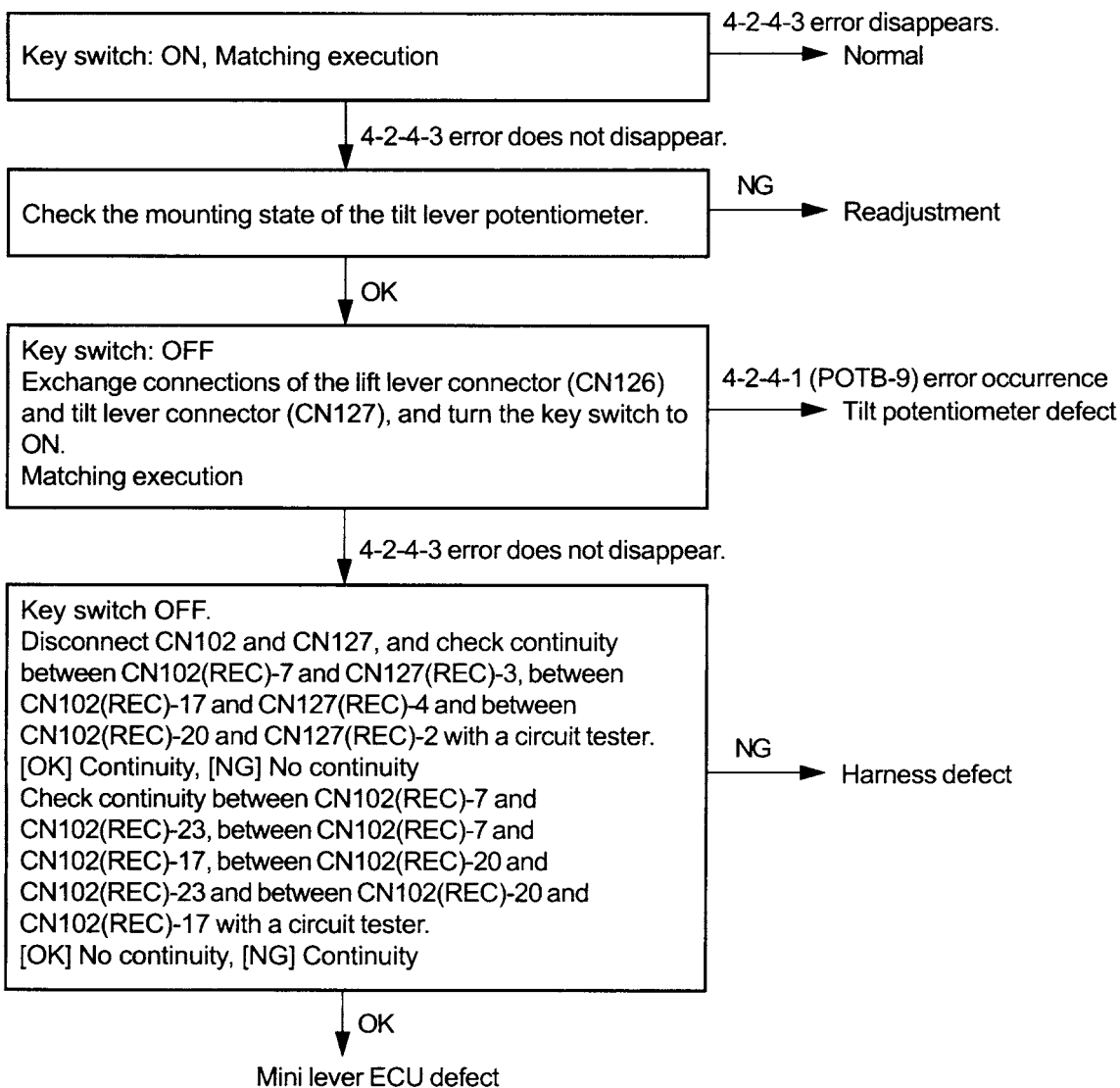
#### 4-2-4-3 Tilt lever potentiometer neutral matching abnormality

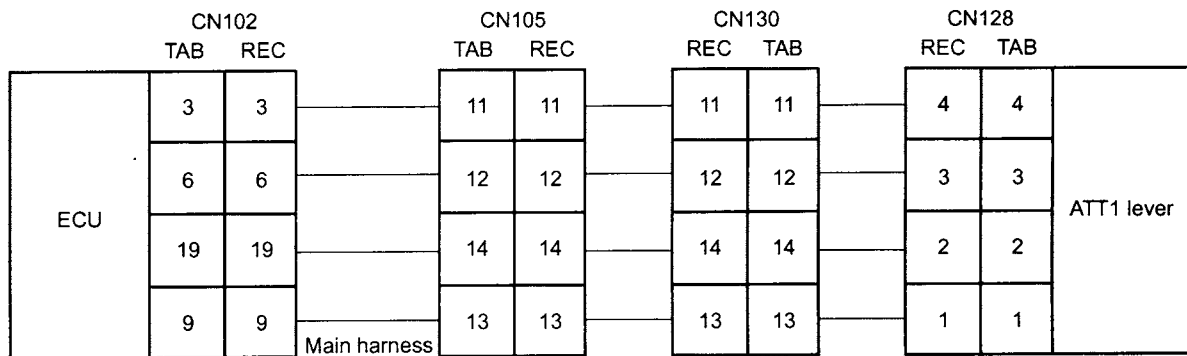
##### Related portion



##### Condition for error detection

Detected when the tilt lever neutral matching is outside the matching standard.



**4-2-4-4 ATT1 lever potentiometer neutral matching abnormality****Related portion****Condition for error detection**

Detected when the ATT1 lever neutral matching is outside the matching standard.

Key switch: ON, Matching execution

4-2-4-4 error disappears.

Normal

4-2-4-4 error does not disappear.

Check the mounting state of the ATT1 lever potentiometer.

NG

Readjustment

OK

Key switch: OFF  
Exchange connections of the ATT1 lever connector (CN128) and tilt lever connector (CN127), and turn the key switch to ON.  
Matching execution

4-2-4-3 (POTB-10) error occurrence  
ATT1 potentiometer defect

4-2-4-4 error does not disappear.

Key switch OFF.  
Disconnect CN102 and CN128, and check continuity between CN102(REC)-6 and CN128(REC)-3, between CN102(REC)-3 and CN128(REC)-4 and between CN102(REC)-19 and CN128(REC)-2 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-6 and CN102(REC)-9, between CN102(REC)-6 and CN102(REC)-3, between CN102(REC)-19 and CN102(REC)-9 and between CN102(REC)-19 and CN102(REC)-3 with a circuit tester.  
[OK] No continuity, [NG] Continuity

NG

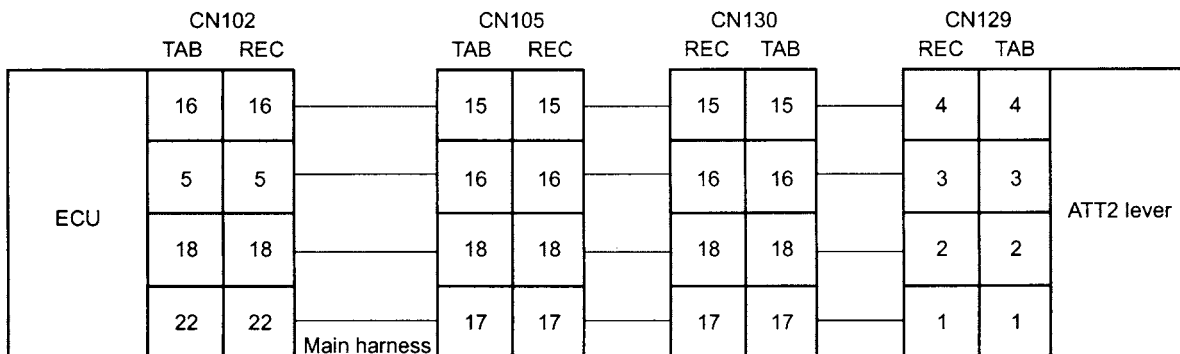
Harness defect

OK

Mini lever ECU defect

#### 4-2-4-2 ATT2 lever potentiometer neutral matching abnormality

##### Related portion



##### Condition for error detection

Detected when the ATT2 lever neutral matching is outside the matching standard.

Key switch: ON, Matching execution

4-2-4-2 error disappears.

Normal

4-2-4-2 error does not disappear.

Check the mounting state of the ATT2 lever potentiometer.

NG

Readjustment

OK

Key switch: OFF  
Exchange connections of the ATT1 lever connector (CN128) and ATT2 lever connector (CN129), and turn the key switch to ON.  
Matching execution

4-2-4-4 (POTB-11) error occurrence

ATT2 potentiometer defect

4-2-4-2 error does not disappear.

Key switch OFF.  
Disconnect CN102 and CN129, and check continuity between CN102(REC)-5 and CN129(REC)-3, between CN102(REC)-16 and CN129(REC)-4 and between CN102(REC)-18 and CN129(REC)-2 with a circuit tester.  
[OK] Continuity, [NG] No continuity  
Check continuity between CN102(REC)-5 and CN102(REC)-22, between CN102(REC)-5 and CN102(REC)-16, between CN102(REC)-18 and CN102(REC)-22 and between CN102(REC)-18 and CN102(REC)-16 with a circuit tester.  
[OK] No continuity, [NG] Continuity

NG

Harness defect

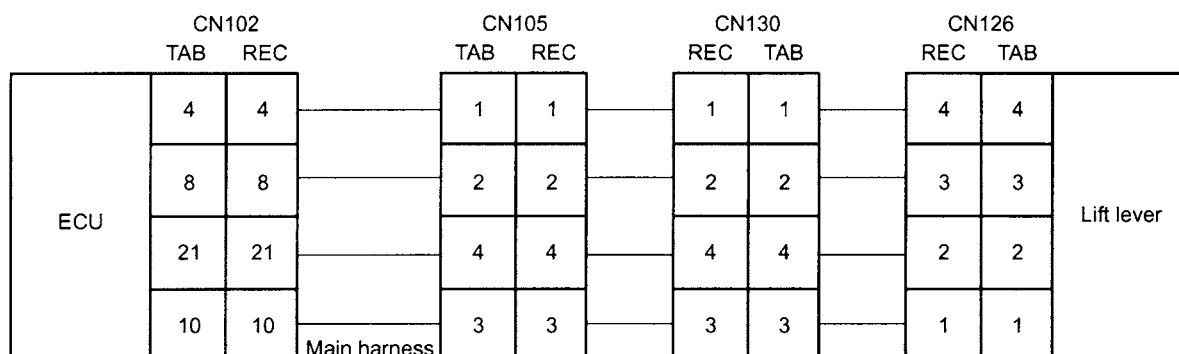
OK

Mini lever ECU defect



# 4-2-2-1 Lift lever potentiometer matching incomplete

## Related portion



## Condition for error detection

Lift lever neutral matching has not been done.

After checking harness and connector connections, turn the key switch ON and execute matching.

4-2-2-1 error disappears.  
→ Normal

4-2-2-1 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN126, and check continuity between CN102(REC)-4 and CN102(REC)-8 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN102(REC)-10 and CN126(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Mini lever ECU defect

NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-1 and CN105(REC)-2 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN105(REC)-3 and CN126(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Main harness defect

NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-1 and CN130(TAB)-2 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN130(TAB)-3 and CN126(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

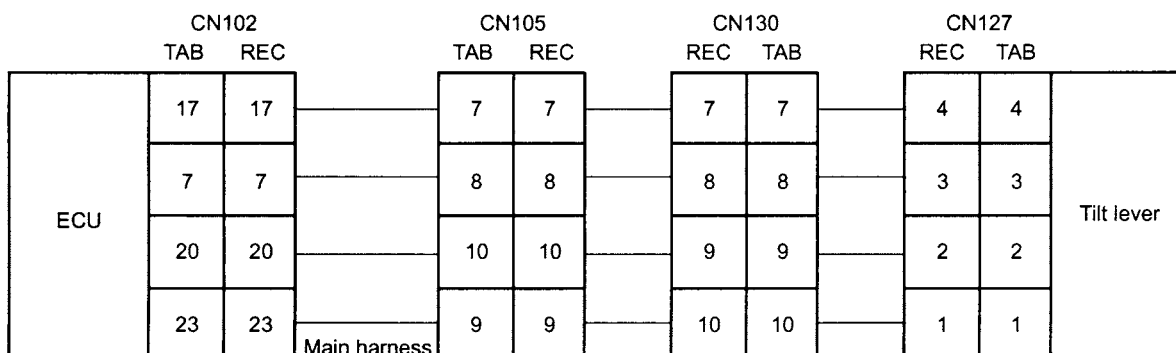
OK → Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN126

### 4-2-2-3 Tilt lever potentiometer matching incomplete

#### Related portion



#### Condition for error detection

Tilt lever neutral matching has not been done.

After checking harness and connector connections, turn the key switch ON and execute matching.

4-2-2-3 error disappears.

Normal

4-2-2-3 error does not disappear.

Key switch: OFF  
 Disconnect CN102 and CN127, and check continuity between CN102(REC)-7 and CN102(REC)-17 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN102(REC)-23 and CN127(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

Mini lever ECU defect

NG

Key switch: OFF  
 Disconnect CN105, and check continuity between CN105(REC)-7 and CN105(REC)-8 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN105(REC)-9 and CN127(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

Main harness defect

NG

Key switch: OFF  
 Disconnect CN130, and check continuity between CN130(TAB)-7 and CN130(TAB)-8 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN130(TAB)-9 and CN127(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

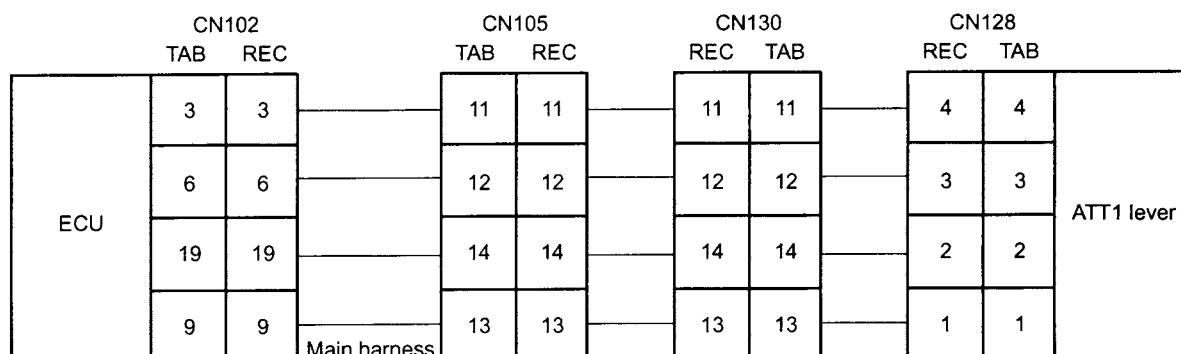
Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN127

#### 4-2-2-4 ATT1 lever potentiometer matching incomplete

##### Related portion



##### Condition for error detection

ATT1 lever neutral matching has not been done.

After checking harness and connector connections, turn the key switch ON and execute matching.

4-2-2-4 error disappears.

Normal

4-2-2-4 error does not disappear.

Key switch: OFF  
 Disconnect CN102 and CN128, and check continuity between CN102(REC)-3 and CN102(REC)-6 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN102(REC)-9 and CN128(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

Mini lever ECU defect

NG

Key switch: OFF  
 Disconnect CN105, and check continuity between CN105(REC)-11 and CN105(REC)-12 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN105(REC)-13 and CN128(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

Main harness defect

NG

Key switch: OFF  
 Disconnect CN130, and check continuity between CN130(TAB)-11 and CN130(TAB)-12 with a circuit tester.  
 [OK] No continuity, [NG] Continuity  
 Check continuity between CN130(TAB)-13 and CN128(REC)-1 with a circuit tester.  
 [OK] Continuity, [NG] No continuity

OK

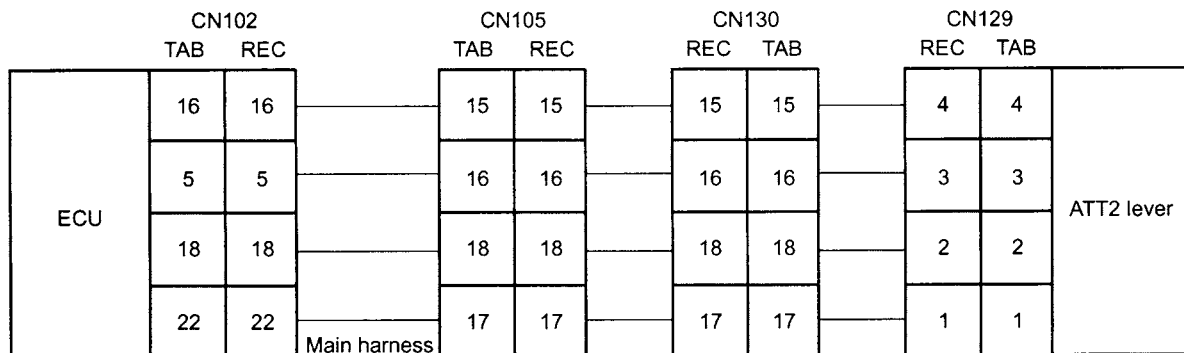
Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN128

# 4-2-2-2 ATT2 lever potentiometer matching incomplete

## Related portion



## Condition for error detection

ATT2 lever neutral matching has not been done.

After checking harness and connector connections, turn the key switch ON and execute matching.

4-2-2-2 error disappears.  
→ Normal

4-2-2-2 error does not disappear.

Key switch: OFF  
Disconnect CN102 and CN129, and check continuity between CN102(REC)-5 and CN102(REC)-16 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN102(REC)-22 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Mini lever ECU defect

NG

Key switch: OFF  
Disconnect CN105, and check continuity between CN105(REC)-15 and CN105(REC)-16 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN105(REC)-17 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Main harness defect

NG

Key switch: OFF  
Disconnect CN130, and check continuity between CN130(TAB)-15 and CN130(TAB)-16 with a circuit tester.  
[OK] No continuity, [NG] Continuity  
Check continuity between CN130(TAB)-17 and CN129(REC)-1 with a circuit tester.  
[OK] Continuity, [NG] No continuity

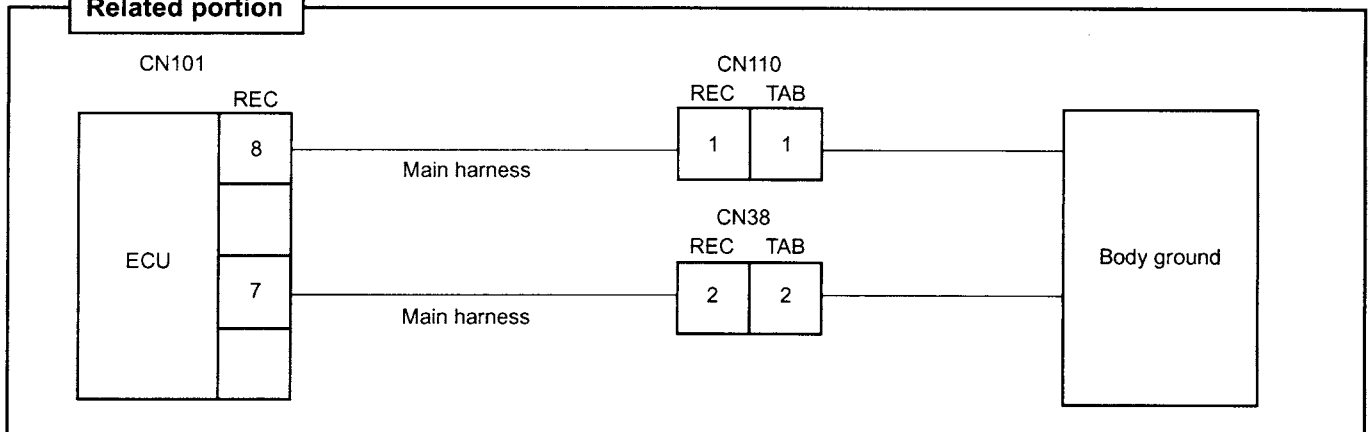
OK → Defect of harness between CN105 and CN130

NG

Defect of harness between CN130 and CN129

## 2-1-1-1 Matching connector open circuit

### Related portion



### Condition for error detection

Detected when the matching connector line is open.

Check connection of the matching connector.

2-1-1-1 error disappears.

Normal

2-1-1-1 error does not disappear.

Key switch: OFF

Check to see that matching connector CN110 is connected.

Disconnect CN101, and check continuity between CN101-8 and body ground with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

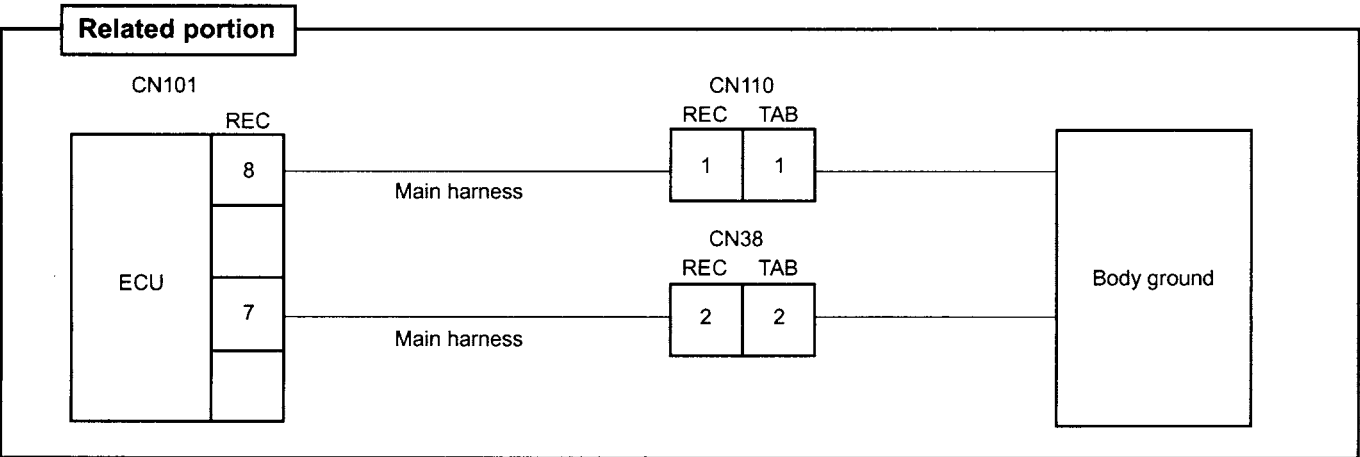
Mini lever ECU defect

NG

Main harness defect

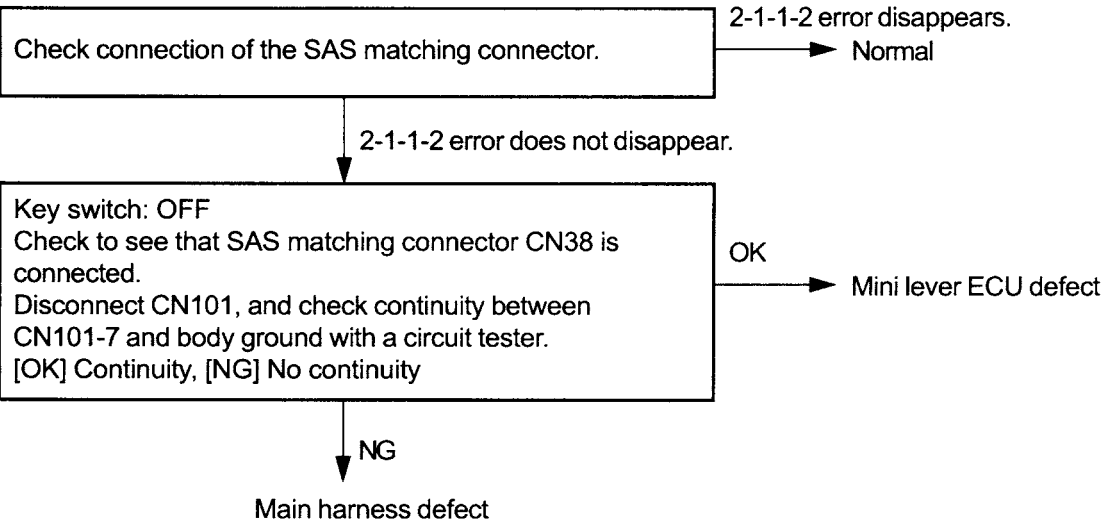
2-1-1-2

SAS matching connector open circuit



Condition for error detection

Detected when the SAS matching connector line is open.



**2-2-1-1    Controller ROM abnormality****Condition for error detection**

Mini lever controller is abnormal.

Turn the key switch OFF once and turn it ON then.

2-2-1-1 error disappears.

→ Normal

↓ 2-2-1-1 error does not disappear.

Mini lever ECU defect

<b>2-2-1-2</b>	<b>Controller RAM abnormality</b>
----------------	-----------------------------------

<b>Condition for error detection</b>
--------------------------------------

Mini lever controller is abnormal.
------------------------------------

Turn the key switch OFF once and turn it ON then.
---

2-2-1-2 error disappears.

→ Normal

↓ 2-2-1-2 error does not disappear.

Mini lever ECU defect



<b>2-2-1-4</b>	<b>Controller AD abnormality</b>
----------------	----------------------------------

<b>Condition for error detection</b>
--------------------------------------

Mini lever controller is abnormal.

Turn the key switch OFF once and turn it ON then.

2-2-1-4 error disappears.  
→ Normal

↓ 2-2-1-4 error does not disappear.  
Mini lever ECU defect

<b>2-4-1-1</b>	<b>Controller EEPROM-1 abnormality</b>
----------------	--

<b>Condition for error detection</b>
--------------------------------------

Mini lever controller is abnormal.
------------------------------------

Turn the key switch OFF once and turn it ON then.
---

2-4-1-1 error disappears.

→ Normal

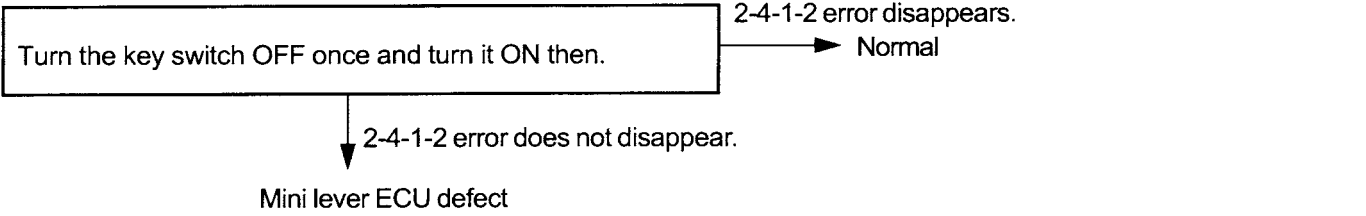
↓ 2-4-1-1 error does not disappear.

Mini lever ECU defect

<b>2-4-1-2</b>	<b>Controller EEPROM-2 abnormality</b>
----------------	--

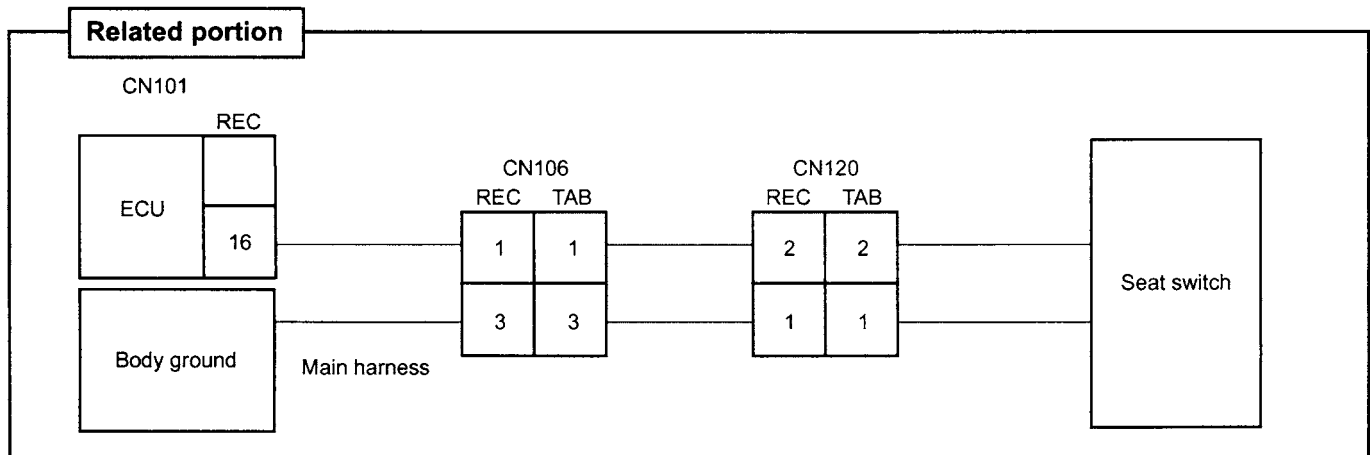
<b>Condition for error detection</b>
--------------------------------------

Mini lever controller is abnormal.



## TROUBLESHOOTING (NO ERROR CODE DISPLAY)

All material handling operations stopped (all levers invalid)



### Condition for error detection

- When the seat switch is OFF
- Matching mode in progress

Key switch: OFF

Check connection of the matching connector.  
Turn the key switch ON after returning all levers to the neutral positions and sitting on the seat.

Material handling operation is possible.  
→ Normal

↓ All material handling operations are stopped.

Key switch: OFF

Disconnect CN120, and check continuity between CN120(TAB)-1 and CN120(TAB)-2 with a circuit tester.  
When seated: [OK] continuity, [NG] No continuity  
When not seated: [OK] No continuity, [NG] Continuity

NG → Seat switch defect

↓ OK

Key switch: OFF

Disconnect CN101, and check continuity between CN101(REC)-16 and CN120(REC)-2 and between CN120(REC)-1 and body ground with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Mini lever ECU defect

↓ NG

Key switch: OFF

Disconnect CN106, and check continuity between CN106(TAB)-1 and CN120(REC)-2 and between CN106(REC)-3 and body ground with a circuit tester.  
[OK] Continuity, [NG] No continuity

OK → Main harness defect

↓ NG

Defect of harness between CN106 and CN120

**Lift up operation stopped****Condition for error detection**

SAS matching mode in progress

Set the key switch to OFF once, check connection of the SAS matching connector, and turn the key switch to ON then.

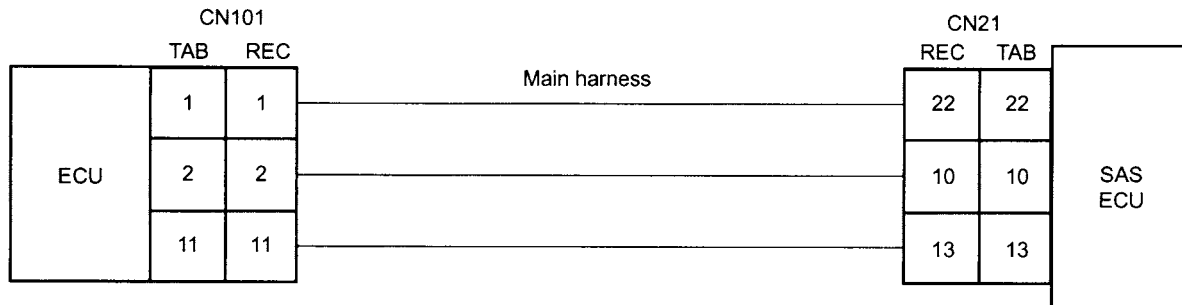
Lift up operation possible  
→ Normal

↓ 2-1-1-2 (MCN-2) error does not disappear.

Perform troubleshooting for 2-1-1-2.

## Forward tilt operation stopped

### Related portion



### Condition for error detection

- Stopped due to fork automatic leveling or forward tilting angle restriction (normal)
- Forward tilting simulation switch is not effective (harness open circuit)

Check that the reason is other than fork automatic leveling or forward tilting angle restriction.

Key switch: OFF

Disconnect CN101 and CN21, and check continuity between CN101(REC)-1 and CN21(REC)-22 and between CN101(REC)-2 and CN21(REC)-10 with a circuit tester.

[OK] Continuity, [NG] No continuity

NG

Main harness defect

OK

Key switch: ON

Connect CN101 and disconnect CN21. Perform forward tilting operation and check continuity between CN21(REC)-22 and CN21(REC)-10 with a circuit tester.

[OK] Continuity, [NG] No continuity

NG

Mini lever ECU defect

OK

Key switch: ON

Connect CN101 and CN21, perform forward tilting operation, and check continuity between CN21(REC)-22 and CN21(REC)-13 with a circuit tester.

[OK] Continuity, [NG] No continuity

OK

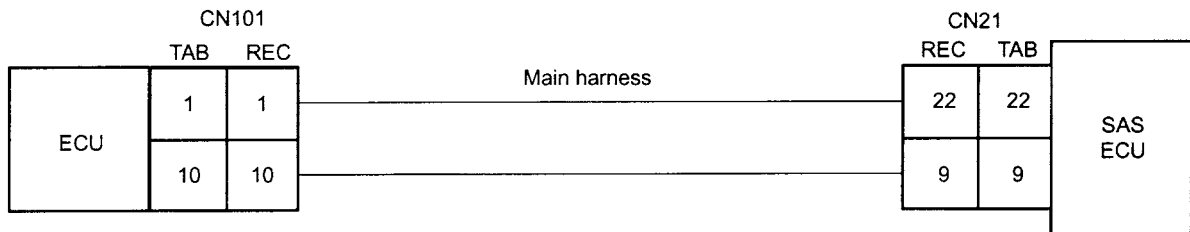
Mini lever defect

NG

SAS ECU defect

# Backward tilt operation stopped

## Related portion



## Condition for error detection

Backward tilting simulation switch is not effective (harness open circuit)

Key switch: OFF

Disconnect CN101 and CN21, and check continuity between CN101(REC)-1 and CN21(REC)-22 and between CN101(REC)-10 and CN21(REC)-9 with a circuit tester.

[OK] Continuity, [NG] No continuity

NG

Main harness defect

OK

Key switch: OFF

Connect CN101 and disconnect CN21. Perform backward tilting operation and check continuity between CN21(REC)-22 and CN21(REC)-9 with a circuit tester.

[OK] Continuity, [NG] No continuity

NG

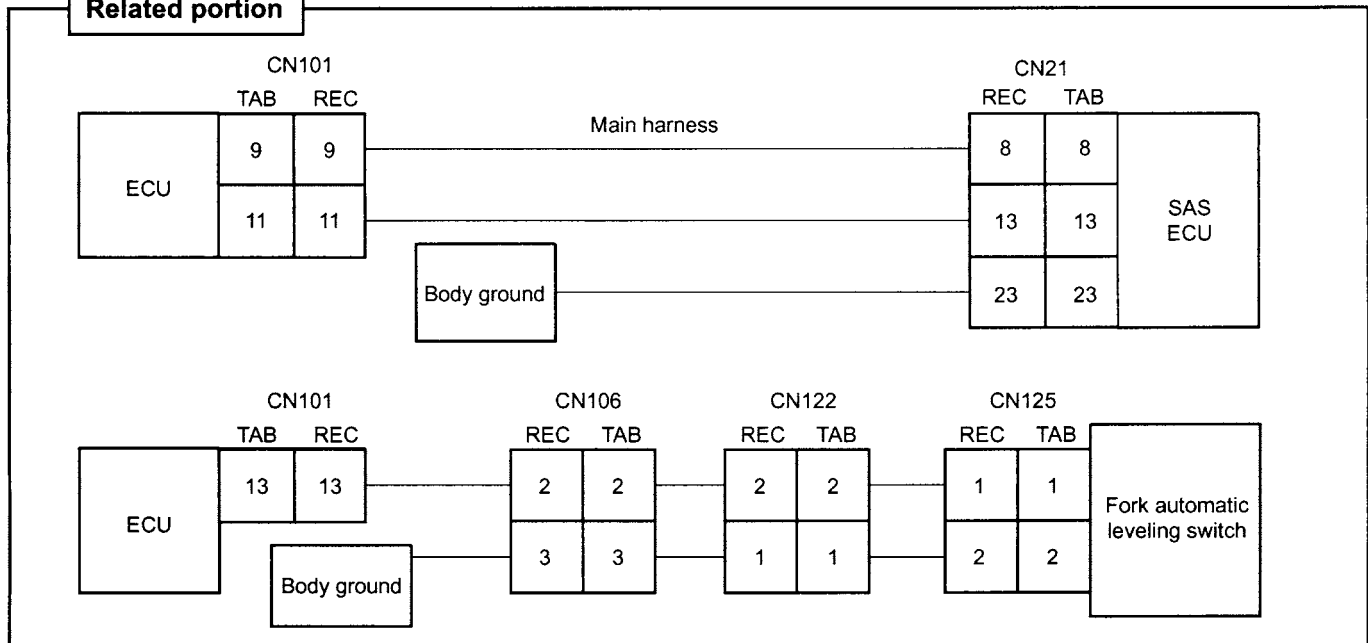
Mini lever ECU defect

OK

SAS ECU defect

Fork automatic leveling, backward tilting speed restriction and forward tilting angle restriction are invalid.

#### Related portion



#### Condition for error detection

- The automatic leveling switch simulation signal is not output (harness open circuit)
- The automatic leveling switch is open-circuited (harness open circuit)
- The SAS tilt control command is not output (SAS ECU defect)

Operate for forward tilting immediately after relief at the maximum lifting height without load, and check if the operation is stopped upon forward lifting by about 1°. (Slowly operate with the fork automatic leveling switch turned to OFF.)

NG

Refer to SAS troubleshooting (automatic leveling disabled).  
Check the tilt angle sensor operation.

OK

Key switch: OFF  
Disconnect CN101 and check continuity between CN101(REC)-9 and CN21(REC)-8, between CN101(REC)-11 and CN21(REC)-13, and between CN21(REC)-23 and body ground with a circuit tester.  
[OK] Continuity, [NG] No continuity

NG

Main harness defect

OK

Key switch: OFF  
Check continuity between CN101(REC)-13 and body ground with a circuit tester.  
When the automatic leveling switch is ON:  
[OK] Continuity, [NG] No continuity  
When the automatic leveling switch is OFF:  
[OK] No continuity, [NG] Continuity

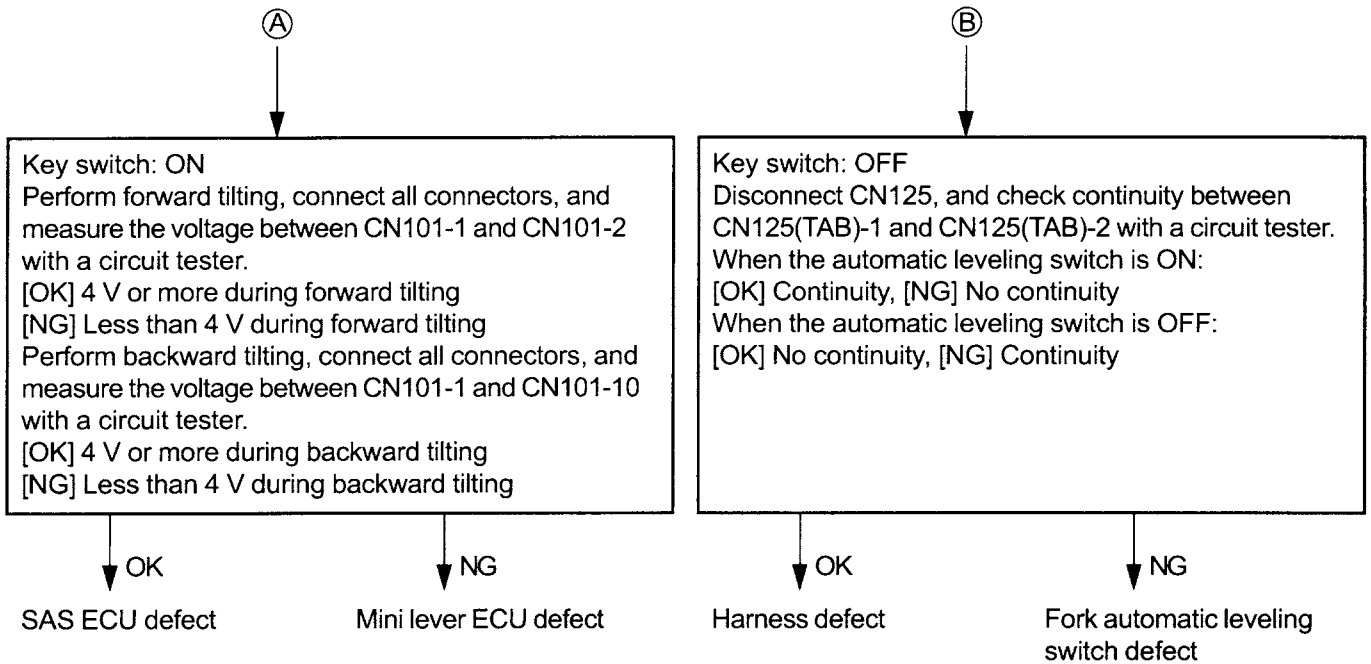
OK

Ⓐ

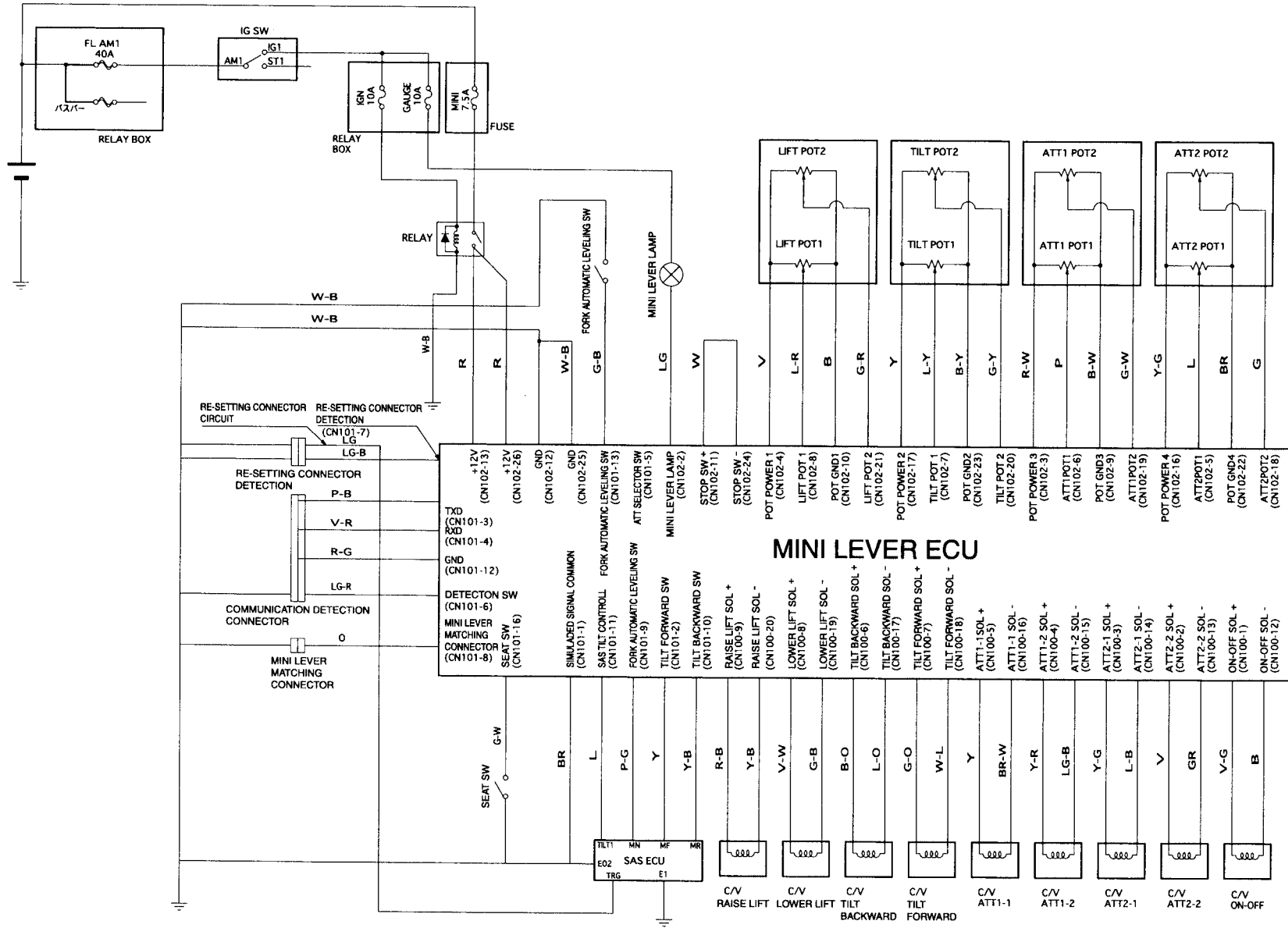
NG

Ⓑ

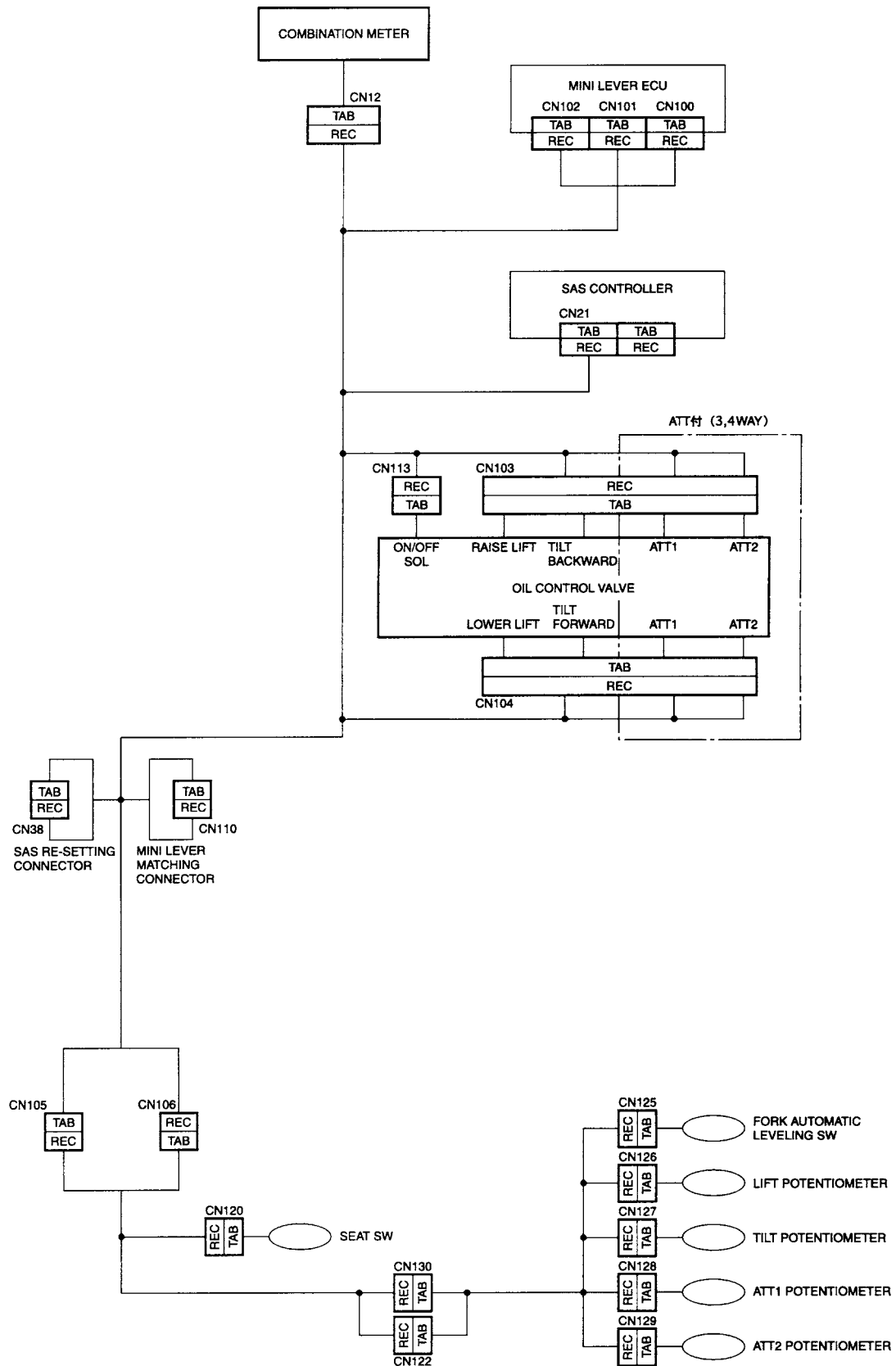




# WIRING DIAGRAM



## CONNECTOR LAYOUT

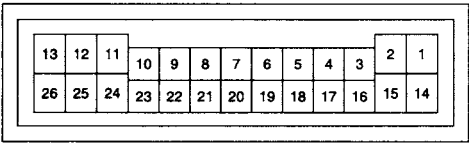


Note:

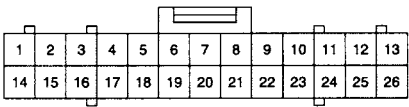
Connector Nos. are only for the mini lever, and they do not agree with the SAS connector Nos.

CONNECTOR DIAGRAMS

CN21

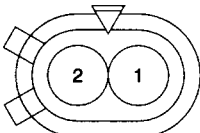


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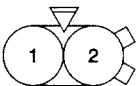


REC

CN38,CN122



TAB

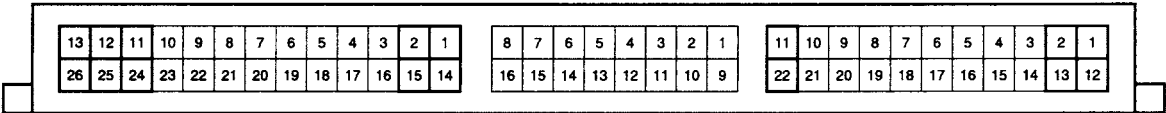


REC

CN102

CN101

CN100

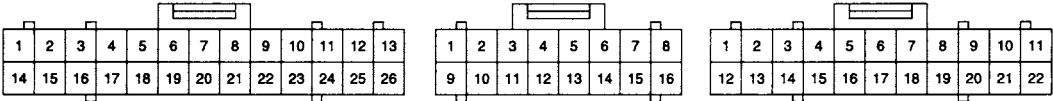


TAB

CN102

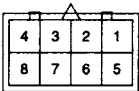
CN101

CN100

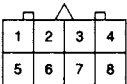


REC

CN103,CN104

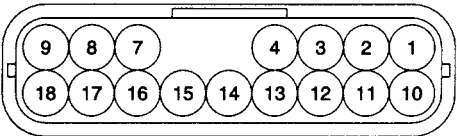


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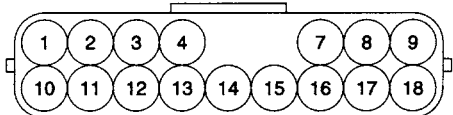


REC

CN105,CN130

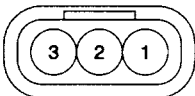


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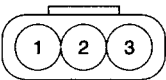


REC

CN106

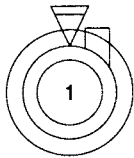


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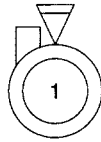


REC

CN110

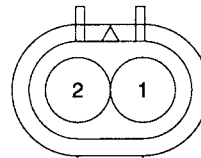


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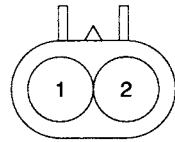


REC

CN113,CN120,CN125

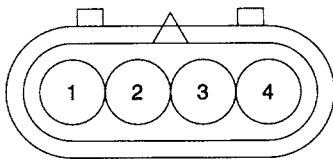


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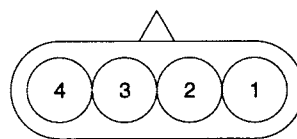


REC

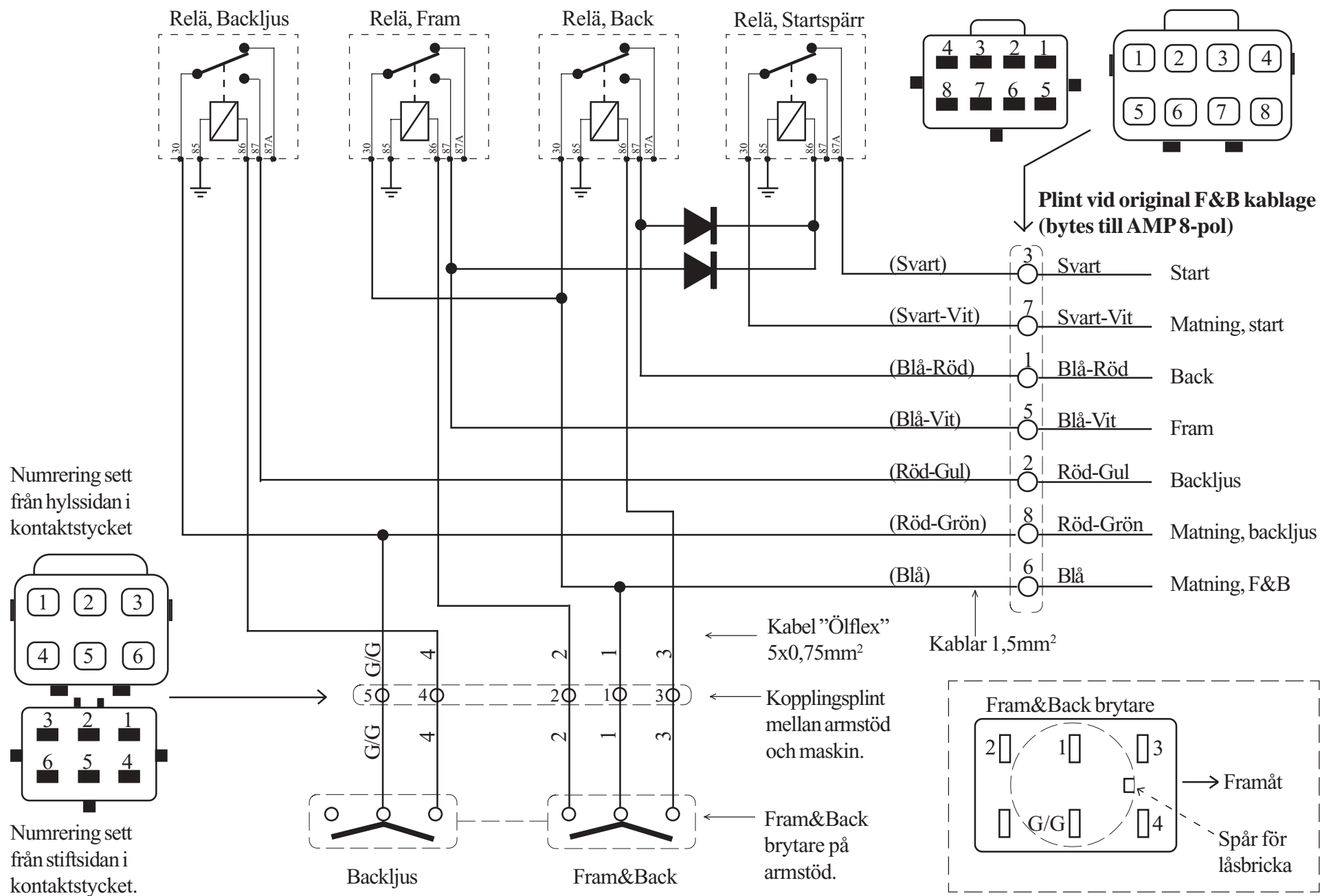
CN126,CN127,CN128,CN129



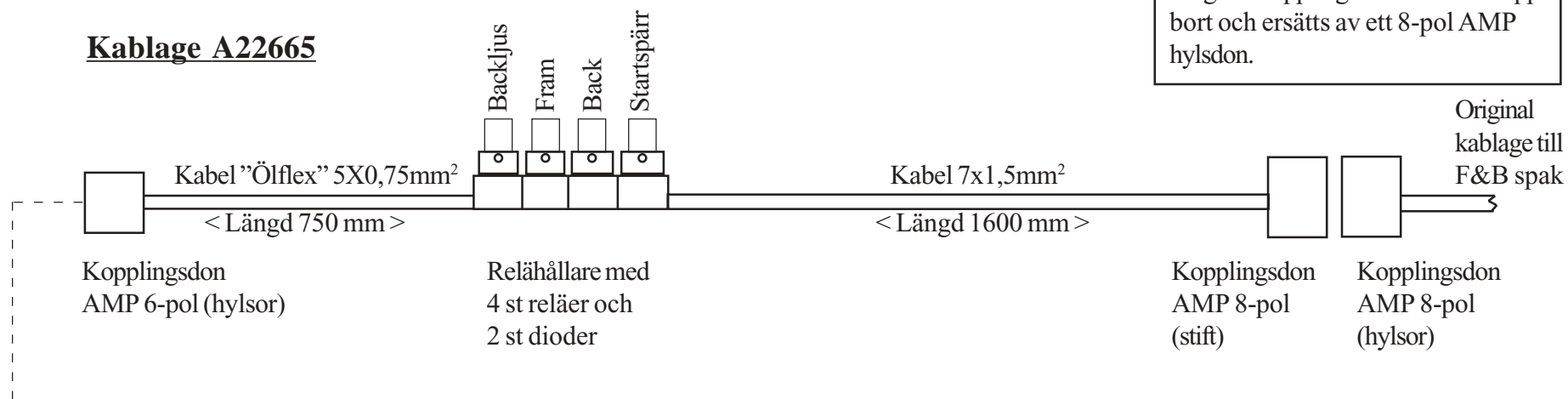
TAB



REC



### **Kablage A22665**



F&B brytare

### **Kablage A22600-002**

Kopplingsdon  
AMP 6-pol (stift)

**OBS! Brytaren på gasreglaget skall överbyglas!**

## SAS

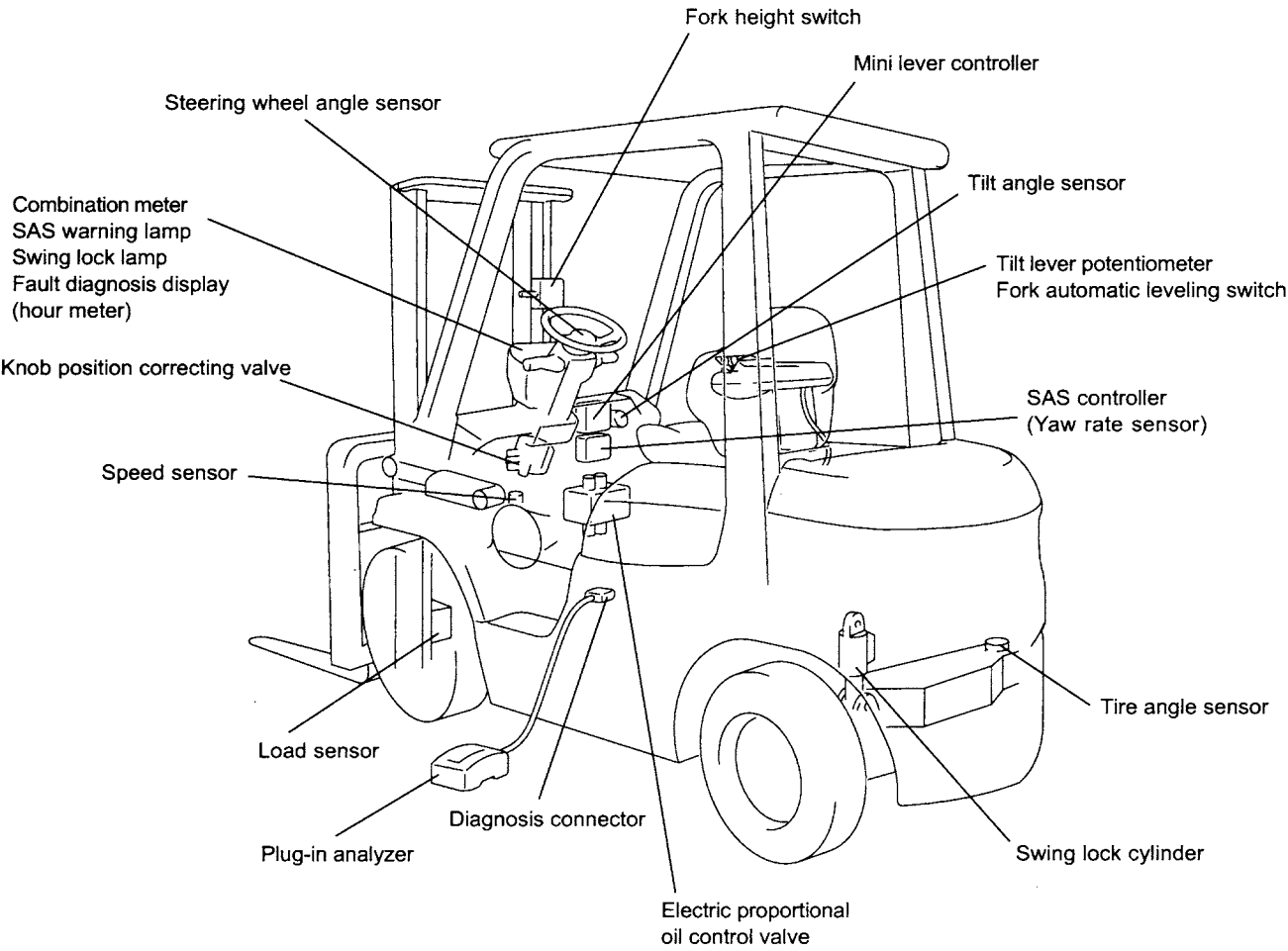
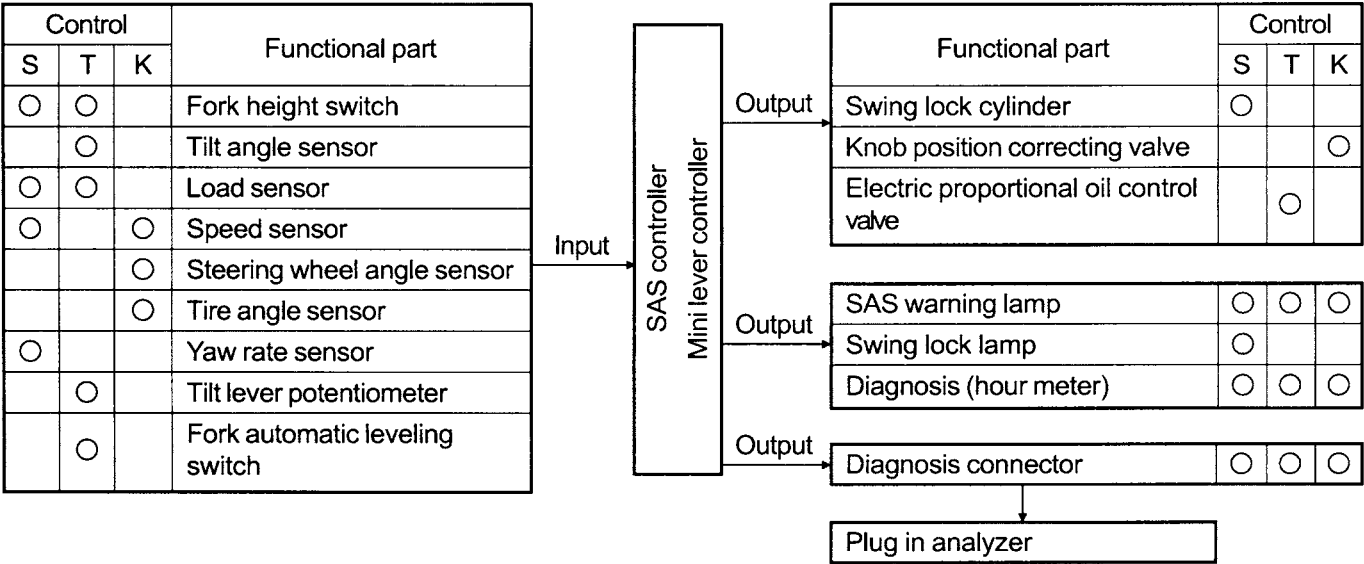
	Page
<b>GENERAL .....</b>	<b>3-2</b>
<b>RE-SETTING .....</b>	<b>3-3</b>
<b>RE-SETTING PROCEDURE     (VEHICLE WITH MINI LEVER) .....</b>	<b>3-3</b>
<b>CUSTOMIZE .....</b>	<b>3-5</b>
<b>CUSTOMIZE PROCEDURE     (VEHICLE WITH MINI LEVER) .....</b>	<b>3-5</b>



GENERAL

Composition of SAS (System of Active Stability) (Vehicle With Mini Lever)

This system performs rear wheel swing control (S), mast tilting control (T) and steering knob position control (K) by driving various actuators according to the vehicle movement signals sent to the SAS controller from the sensors and switches installed on necessary portions on the vehicle.



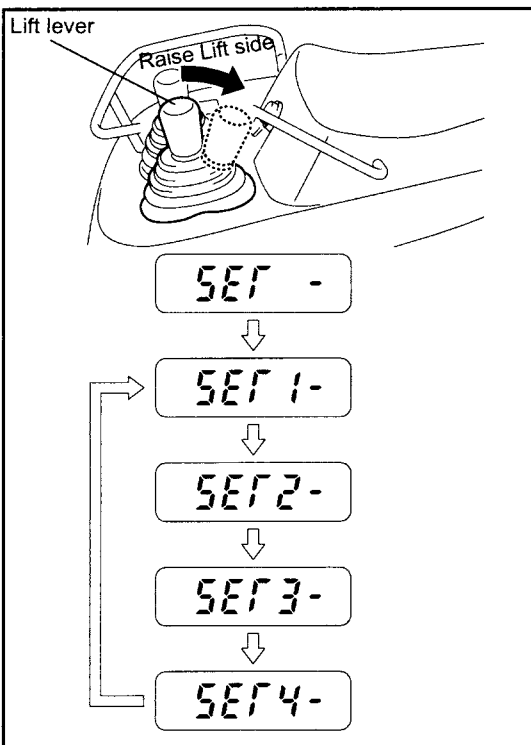
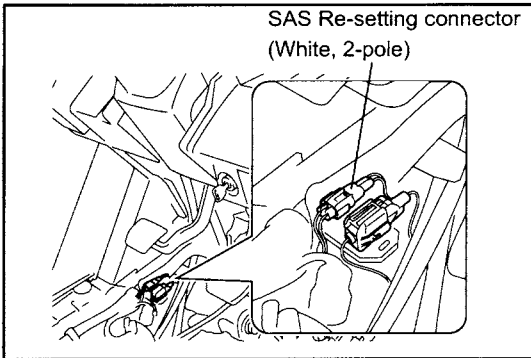
## RE-SETTING

Re-setting of the mini-lever specification vehicle is possible either by the hour meter and the lift lever or by the plug-in analyzer.

For the method by the plug-in analyzer, refer to page 15-40 in repair manual No. CE026.

This manual describes the method by the hour meter and the lift lever.

Refer to page 15-21 in repair manual No. CE026 for the standard vehicle conditions for the re-setting operation.



### RE-SETTING PROCEDURE (VEHICLE WITH MINI LEVER)

#### Note:

Turning the key switch ON (or starting engine) after disconnecting the re-setting connector causes an error (error code 41) to be displayed and stored to the controller, for which care must be taken.

1. Turn the key switch ON (or start the engine).
2. Disconnect the re-setting connector (white color).
  - (1) The hour meter display reads "SET" and the SAS lamp turns ON.

#### Note:

Upward lift operation is disabled after re-setting connector disconnection until the end of re-setting. (Downward lift operation is possible).

3. Operate the lift lever for 2 seconds or more in the up direction until the re-setting mode (SET1) is displayed.
4. Display the set number subject to the re-setting.
  - (1) Set number display changes sequentially each time the lift lever is operated (for less than 2 seconds) in the up direction.

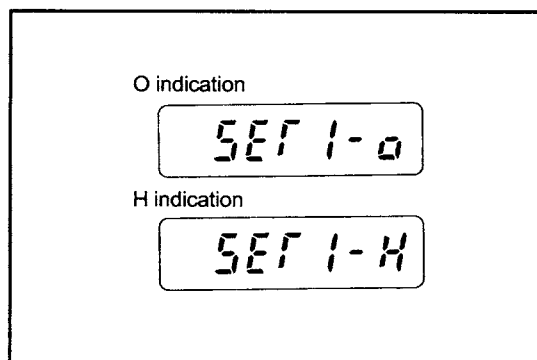
#### Note:

Be careful since re-setting starts if you operate the lift lever in the up direction for two seconds or more.

Set No.	Object of re-setting
SET1	Fork stop position with automatic leveling
SET2	Forward tilting limit position and no-load standard load
SET3	Tires in straight traveling position
SET4 <sup>*)</sup>	—

<sup>\*)</sup>: Indication may be made but actually it is not used.

5. Set the sensor of the display set number to the standard state (or check if it is in the standard state). (See page 15-21 in the Repair Manual (No. CE026))



6. Execute re-setting by operating the lift lever for 2 seconds or more in the up direction.

O indication: Re-setting is completed. (SAS lamp starts to blink)

H indication: Check for the sensor abnormality, disconnection of the harness and the short-circuit since the signal voltage value is outside the re-setting rang. (Read the troubleshooting section.)

**Note:**

- **For re-re-setting, repeat Step 6.**
- **To make a separate re-setting, repeat Steps 4 to 6.**

7. Connect the re-setting connector and turn the key switch OFF.

## CUSTOMIZE

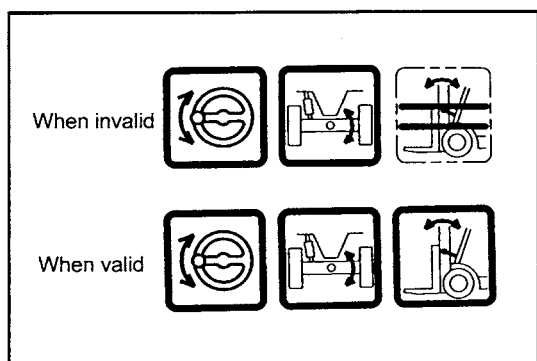
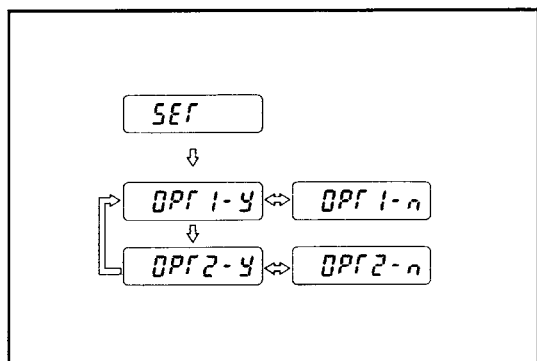
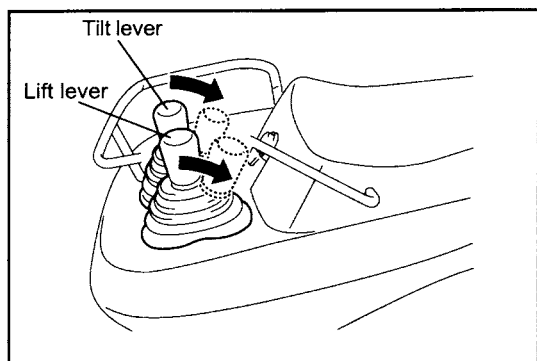
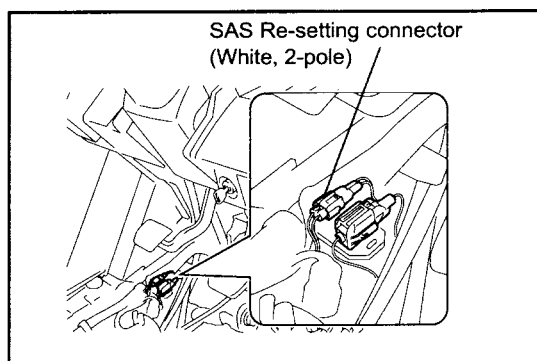
Customize operation of the mini-lever vehicle is possible either by the hour meter and the lift lever or by the plug-in analyzer.

Refer to page 15-42 in repair manual No. CE026 for the method by the plug-in analyzer.

This manual describes the method by the hour meter and the lift lever.

### Caution:

When the customize is changed, maintain the caution label of "CAUTION FOR OPERATION."



## CUSTOMIZE PROCEDURE (VEHICLE WITH MINI LEVER)

### Note:

Turning the key switch ON (or starting engine) after disconnecting the re-setting connector causes an error (error code 41) to be displayed and stored to the controller, for which care must be taken.

1. Turn the key switch ON (or start the engine).
2. Disconnect the re-setting connector. (white color)
  - (1) The hour meter display reads "SET" and the SAS lamp turns ON.

### Note:

Upward lifting is disabled after re-setting connector disconnection until the end of customize operation. (Downward lift operation is possible).

3. With the tilt lever kept operated for 5 seconds or more in the backward tilt direction, operate the lift lever in the up direction until the option set mode (OPT1) is displayed, and then return both levers.
4. Display the option number to change the option set.
  - (1) The displayed set No. changes each time the lift lever is operated (for less than 2 seconds) in the up direction.

Option No.	Control name
OPT1	Mast forward tilt angle control
OPT2*	—

\*:Displayed but not in use.

5. When the lift lever is operated for 2 seconds or more in the up direction until the SAS lamp blinks, the display changes from y to n (y→n) or from n to y (n→y).

y: Control valid

n: Control invalid

### Note:

Upward lifting is disabled after re-setting connector disconnection until the end of customize operation. (Downward lift operation is possible).

6. Connect the re-setting connector and turn the key switch OFF.
7. Perform the maintenance of caution label.
 

If the control is invalidated:  
Remove the pertinent validation indication to replace with invalid indication.

If the control is validated:  
Replace the caution label to indicate valid control.