

Manual No. : KM-18FE  
Vol.No. : TT18F-E-00

# **Technical Manual**

## **(Troubleshooting)**

# **EX1200-5D**

## **Excavator**

Service Manual (Manual No. KM-18FE) consists of the following three separate volumes;

Technical Manual (Operational Principle)	:Vol. No. TO18F-E
Technical Manual (Troubleshooting)	:Vol. No. TT18F-E
Workshop Manual	:Vol. No. W18F-E

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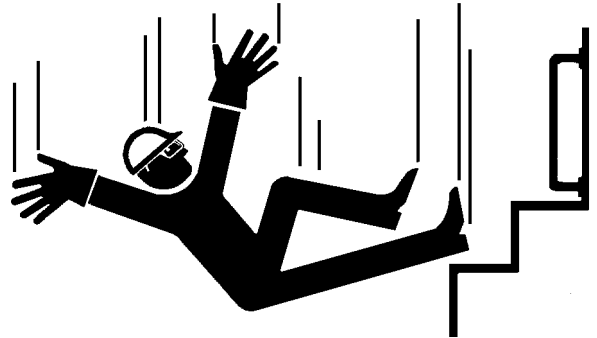
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## SAFETY

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### USE HANDHOLDS AND STEPS

- Falling is one of the major causes of personal injury.
  - When you get on and off the machine, always face the machine and maintain a three-point contact with the steps and handrails.
  - Do not use any controls as handholds.
  - Never jump on or off the machine. Never mount or dismount a moving machine.
  - Be careful of slippery conditions on platforms, steps, and handrails when leaving the machine.



SA-439

008-E01A-0439

### ADJUST THE OPERATOR'S SEAT

- A poorly adjusted seat for either the operator or for the work at hand may quickly fatigue the operator leading to misoperations.
  - The seat should be adjusted whenever changing the operator for the machine.
  - The operator should be able to fully depress the pedals and to correctly operate the control levers with his back against the seat back.
  - If not, move the seat forward or backward, and check again.



SA-378

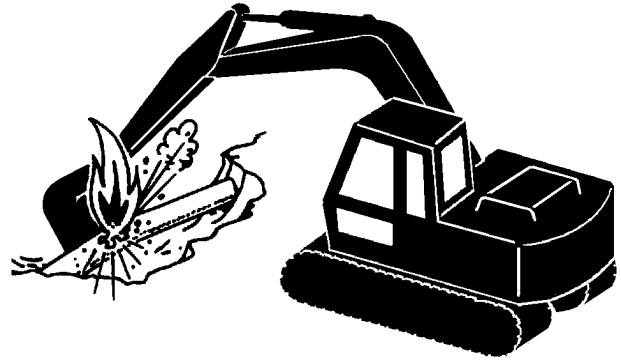
009-E01A-0378

# SAFETY

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## DIG WITH CAUTION

- Accidental severing of underground cables or gas lines may cause an explosion and/or fire, possibly resulting in serious injury or death.
  - Before digging check the location of cables, gas lines, and water lines.
  - Keep the minimum distance required, by law, from cables, gas lines, and water lines.
  - If a fiber optic cable should be accidentally severed, do not look into the end. Doing so may result in serious eye injury.
  - Contact your local “diggers hot line” if available in your area, and/or the utility companies directly. Have them mark all underground utilities.



SA-382

027-E01A-0382

## OPERATE WITH CAUTION

- If the front attachment or any other part of the machine hits against an overhead obstacle, such as a bridge, both the machine and the overhead obstacle will be damaged, and personal injury may result as well.
  - Take care to avoid hitting overhead obstacles with the boom or arm.

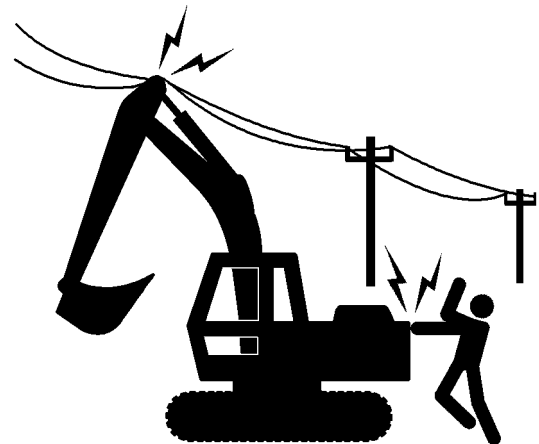


SA-389

028-E01A-0389

## AVOID POWER LINES

- Serious injury or death can result if the machine or front attachments are not kept a safe distance from electric lines.
  - When operating near an electric line, NEVER move any part of the machine or load closer than 3 m plus twice the line insulator length.
  - Check and comply with any local regulations that may apply.
  - Wet ground will expand the area that could cause any person on it to be affected by electric shock. Keep all bystanders or co-workers away from the site.



SA-381

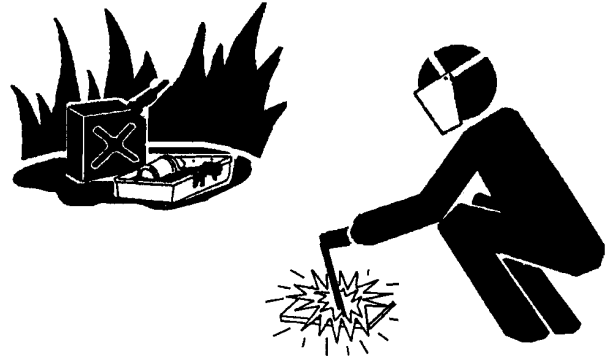
029-E01A-0381

## SAFETY

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### PRECAUTIONS FOR WELDING AND GRINDING

- Welding may generate gas and/or small fires.
  - Be sure to perform welding in a well ventilated and prepared area. Store flammable objects in a safe place before starting welding.
  - Only qualified personnel should perform welding. Never allow an unqualified person to perform welding.
- Grinding on the machine may create fire hazards. Store flammable objects in a safe place before starting grinding.
- After finishing welding and grinding, recheck that there are no abnormalities such as the area surrounding the welded area still smoldering.

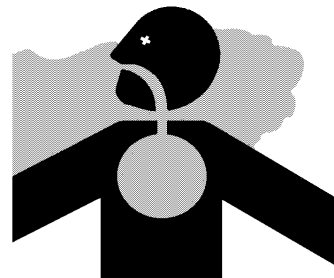


SA-818

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### BEWARE OF EXHAUST FUMES

- Prevent asphyxiation. Engine exhaust fumes can cause sickness or death.
  - If you must operate in a building, be sure there is adequate ventilation. Either use an exhaust pipe extension to remove the exhaust fumes or open doors and windows to bring enough outside air into the area.



509-E01A-0016


SA-016

## OPERATIONAL PERFORMANCE TEST / Standard

### OPERATIONAL PERFORMANCE STANDARD

The standard performance values are listed in the table below. Refer to the Groups 3 to 5 for performance test procedures. Values indicated in parentheses are reference values. The fuel lever shall be placed in the fast idle position and the hydraulic oil temperature is to be maintained at  $50 \pm 5$  °C ( $122 \pm 9$  °F) unless otherwise specified.

Performance Test	EX1200-5C (Standard Performance)	Remarks
ENGINE SPEED <span style="float: right;">min<sup>-1</sup></span>		Refer to T4-3-1
Fast Idle Speed	1850±50	
Slow Idle Speed	850±50	
Auto-Idle Speed	1400±100	
Quick Idle Speed	850±50	
TRAVEL SPEED <span style="float: right;">sec /20 m</span>		Refer to T4-4-1
Fast Speed Mode	21.3±1.6	
Slow Speed Mode	30.5±2.0	
TRACK REVOLUTION SPEED <span style="float: right;">sec /3 rev</span>		Refer to T4-4-2
Fast Speed Mode	42.0±4.0	
Slow Speed mode	61.0±4.0	
MISTRACK <span style="float: right;">mm /20 m</span> (in both fast and slow mode)	200 or less	Refer to T4-4-3
TRAVEL MOTOR DRIFT <span style="float: right;">mm /5 min</span>	0	Refer to T4-4-4
SWING SPEED <span style="float: right;">sec /3 rev</span>	30.0±2.0	Refer to T4-4-5
SWING FUNCTION DRIFT <span style="float: right;">mm /180°</span>		Refer to T4-4-6
(Backhoe)	1100 or less	
>Loading Shovel)	—	
SWING MOTOR DRIFT <span style="float: right;">mm /5 min</span>	0	Refer to T4-4-8
MAXIMUM SWINGABLE SLANT ANGLE <span style="float: right;">deg</span>		Refer to T4-4-9
(Backhoe)	12 or possibly more	
>Loading Shovel)	10 or possibly more	
SWING BEARING PLAY <span style="float: right;">mm</span>	2.0 or less	Allowable Limit: 6.3, Refer to T4-4-10

 **NOTE:** BH: Backhoe: With 5.0 m<sup>3</sup> (PCSA heaped) Bucket, 3.4 m Arm, 9.1 Boom  
LD: Loading Shovel: With 6.5 m<sup>3</sup> Bucket

## OPERATIONAL PERFORMANCE TEST / Excavator Test

### SWING SPEED

#### Summary:

Check the overall operational performance of the swing power system (between the hydraulic pumps and swing motors) by measuring time required for the machine upperstructure to make three complete turns.

#### Preparation:


1. Confirm that the swing gears and bearing are sufficiently greased.
2. Secure a space wide enough for the machine upperstructure to swing on a flat and firm surface. Never attempt to perform this test on a slope.
3. Empty the bucket and position the front attachment as described in the following.

##### Backhoe:


With the arm cylinders fully retracted and the bucket cylinders fully extended, position the arm top pin height flush with the boom foot pin height.

##### Loading shovel:

With the arm cylinder fully extended and the bucket cylinders fully extended, position the arm top pin height flush with the boom foot pin height.

 **NOTE:** In case it is difficult to secure the space wide enough, test the machine with the boom raised and the arm retracted.

4. Maintain the hydraulic oil temperature at  $50\pm 5$  °C ( $122\pm 9$  °F).

 **CAUTION:** Prevent personal injury. Always make sure that the area is clear and that coworkers are out of the swing area before starting the measurement.

#### Measurement:

1. Engine Control Dial : Maximum Position
2. Auto-Idle Switch : OFF
3. Operate the swing control lever at full stroke.
4. After the swing attains to constant speed, measure the time required for the upperstructure to rotate three times.
5. Measure in both directions (clockwise and counterclockwise).
6. Repeat steps (3) and (5) three times and calculate the average values.

#### Evaluation:

Refer to T4-2 Operational Performance Standard.

#### Remedy:

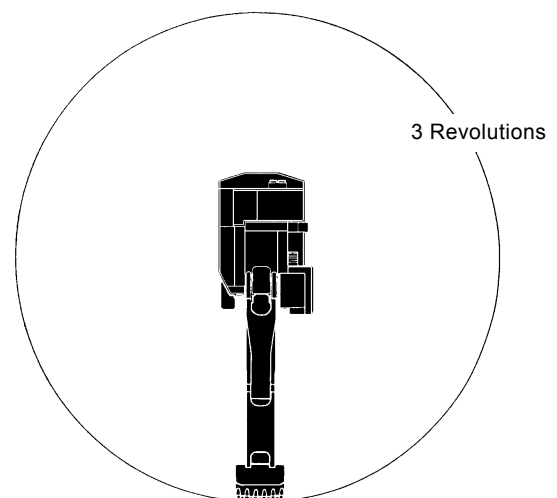
Refer to the T5-5 Troubleshooting B.



T145-05-03-007



T145-05-03-008



T145-05-03-009

## OPERATIONAL PERFORMANCE TEST / Excavator Test

### CONTROL LEVER OPERATING FORCE

#### Summary:

1. Use a spring scale to measure the maximum resistance of each control lever as illustrated.
2. Measure the maximum operating force of the front attachment control lever.
3. Measure the operating force at the grip center of each control lever.

#### Preparation:

Maintain the hydraulic oil temperature at  $50\pm 5$  °C ( $122\pm 9$  °F).

#### Measurement:

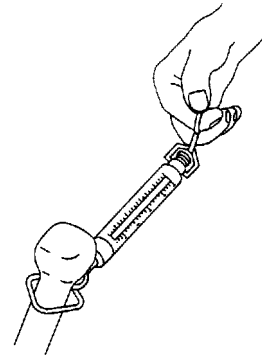
1. Measure all control levers.
2. Engine Control Dial : Maximum Position.

**CAUTION:** Prevent personal injury. Always make sure that the area is clear and that co-workers are out of the swing area before starting the measurement.

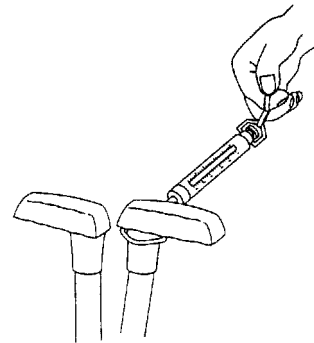
3. Operate each boom, arm, bucket and swing lever to at full stroke and measure the maximum operating force for each.
4. Lower the bucket to the ground to raise one track off the ground. Operate the travel lever to full stroke and measure the maximum operating force required. When finished, lower the track and then jack-up the other track.
5. Repeat steps 3. to 4. three times and calculate the average values.

#### Evaluation:

Refer to the Performance Standard Table in Group T4-2.



T107-06-03-003



T107-06-03-004

## OPERATIONAL PERFORMANCE TEST / Component Test

### MAIN PUMP DELIVERY PRESSURE

The main pump delivery pressure can also be measured with the built-in diagnosing system.

#### Preparation:

1. Stop the engine.



**CAUTION:** Do not quickly loosen the cap on the hydraulic oil tank. The cap may fly off due to internal pressure. Always turn the cap slowly to release any remaining pressure before removing it.

2. Slowly loosen the cap to release air from the hydraulic oil tank.
3. Remove the plug from the test port on the main pump delivery port. Connect adapter (ST 6069), hose (ST 6943), and pressure gauge (ST 6941) on the test port.
4. Start the engine. Check the pressure gauge connection for oil leaks.
5. Maintain the hydraulic oil temperature at  $50 \pm 5$  °C ( $122 \pm 41$  °F).

#### Measurement:

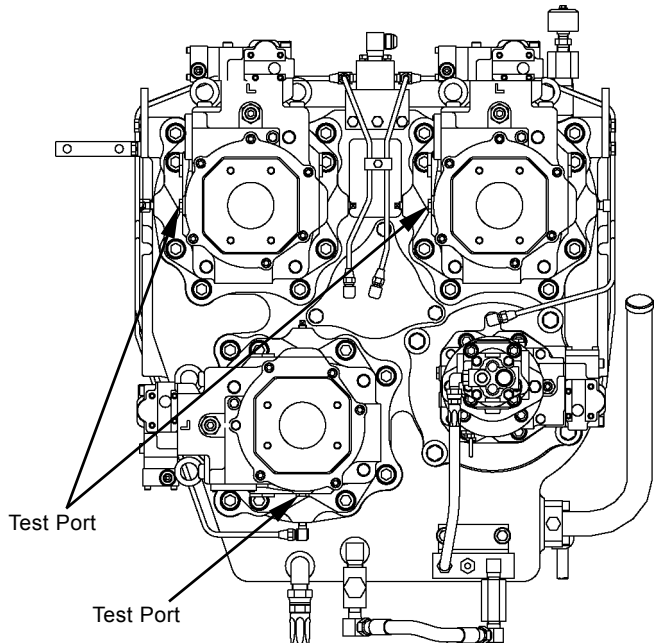
1. Engine Control Dial : Maximum Speed
2. Measure the pressure with the control levers in neutral.
3. Read the pressure gauge three times in total. Calculate the average value.

#### Evaluation:

Refer to the Operational Performance Standard group (T4-2).

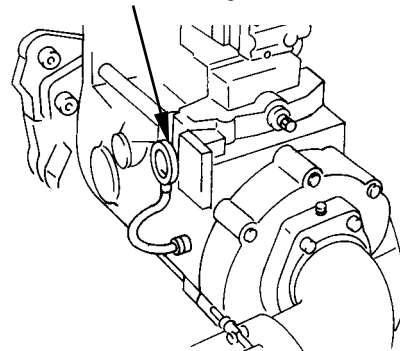
#### Remedy:

Refer to the Troubleshooting B group (T5-5).



Pressure Gauge

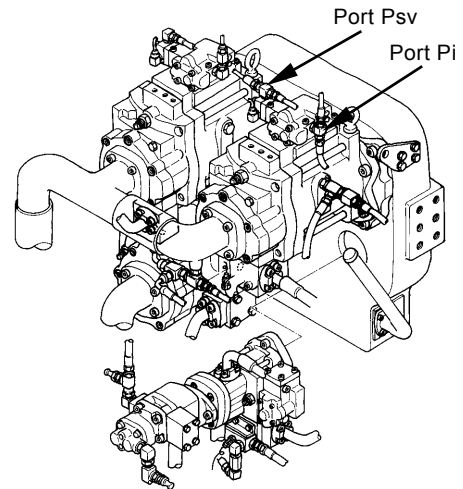
T183-04-04-002



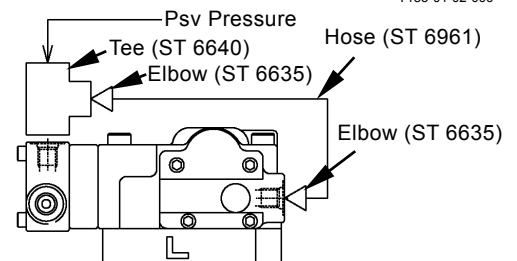
T183-04-04-003

## OPERATIONAL PERFORMANCE TEST / Component Test

5. Disconnect pipes from pump regulator ports Psv and Pi. Install tee (ST 6640) to port Psv. Connect tee (ST 6640) between port Psv and circuit Psv. Connect hose (ST 6961) and elbow (ST 6635, Code No. 0095) to tee (ST 6640). Connect the other end of hose (ST 6961) to port Pi using elbow (ST 6635, Code No. 0095). Install a plug to the pipe end disconnected from port Pi.  
(By connecting the pump servo assist pressure (Psv pressure) circuit to port Pi, the condition similar to the maximum pump flow rate (maximum Pi pressure at full stroke operation of the control lever) can be obtained.)
6. Disconnect the power increase solenoid valve connector and power decrease solenoid valve connector.
7. Fully open the loading valve of the hydraulic tester.
8. Start the engine. Check the line connections for any oil leaks. Select the monitor function on the built-in diagnosing system.



T183-01-02-006



T183-04-04-004

### Measurement:

1. Hydraulic oil temperature:  $50 \pm 5$  °C ( $122 \pm 41$  °F)
2. Engine Control Dial: Maximum speed
3. Slowly close the loading valve of the hydraulic tester to obtain the specified pressure on P-Q curve, and measure the pump flow rate and engine speed at each pressure. (Refer to T4-2-4)
4. Repeat the measurement three times and calculate the average values.

### Evaluation:

Convert the measured flow rates to the values at the specified pump speed using the following formulas:

$$QC = (NP \times Q) / (i \times Ne)$$

QC: Converted Flow Rate

Q: Measured Flow Rate

i: Pump Drive Gear Ratio (1.083)

NP: Specified Pump Speed ( $1787 \text{ min}^{-1}$ )

Ne: Measured Engine Speed

## **OPERATIONAL PERFORMANCE TEST / Component Test**

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# TROUBLESHOOTING / General

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## INTRODUCTION

Refer to the inspection and troubleshooting procedures after any machine trouble has occurred. The inspection and troubleshooting procedures are presented in an orderly fashion in this section to help you quickly find the cause and solution of the machine trouble.

The troubleshooting section in this manual consists of 8 groups; General, Cross Reference Table, Component Layout, Troubleshooting A (base machine diagnosis using the built-in diagnosing system's fault codes), Troubleshooting B (base machine diagnosis starting with inspection of abnormal operational status), Troubleshooting C (monitor diagnosis), Troubleshooting D (engine diagnosis indicated by the flashing pattern of indicator lights), and Electrical System Inspection.

- General
- Cross Reference Table
- Component Layout
- Troubleshooting A (base machine diagnosis using the built-in diagnosing system's fault codes)
- Troubleshooting B (base machine diagnosis starting with inspection of abnormal operational status)  
Refer to these procedures when troubleshooting by inspecting abnormal machine operational status.  
  
Example: Even if the fuel lever is operated, engine speed doesn't change.
- Troubleshooting C (monitor diagnosis)  
Refer to these procedures when gauges and/or indicators are malfunctioning.  
  
Example: The fuel gauge doesn't operate.
- Troubleshooting D (engine diagnosis relies on the flashing pattern of indicator lights)  
The engine is diagnosed by referring to the flashing pattern of the engine warning indicator.
- Electrical System Inspection  
Refer to this group when required to obtain precautions and/or information for the electrical system inspection.

Example: Fuse Inspection



## TROUBLESHOOTING / Cross Reference Table

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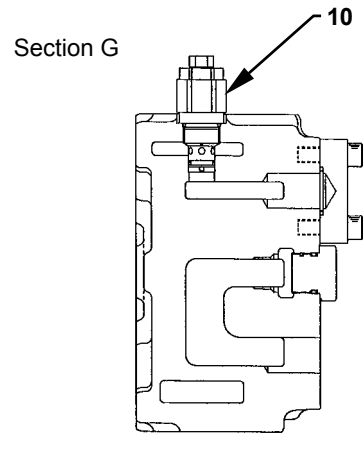
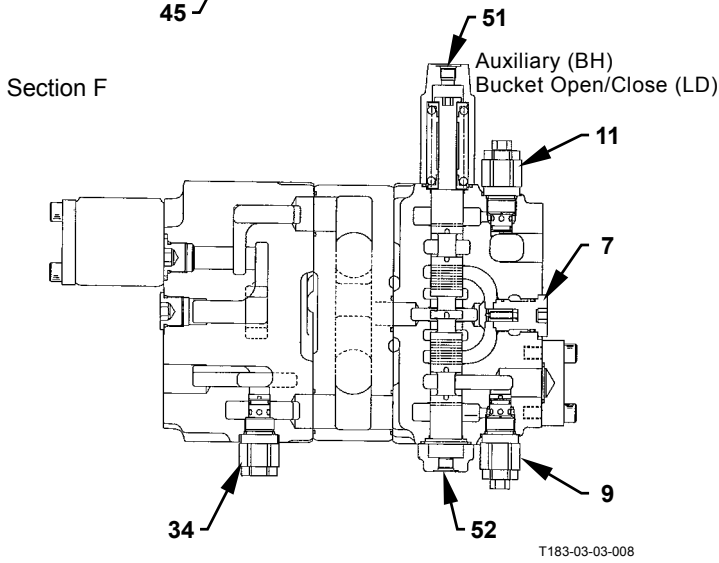
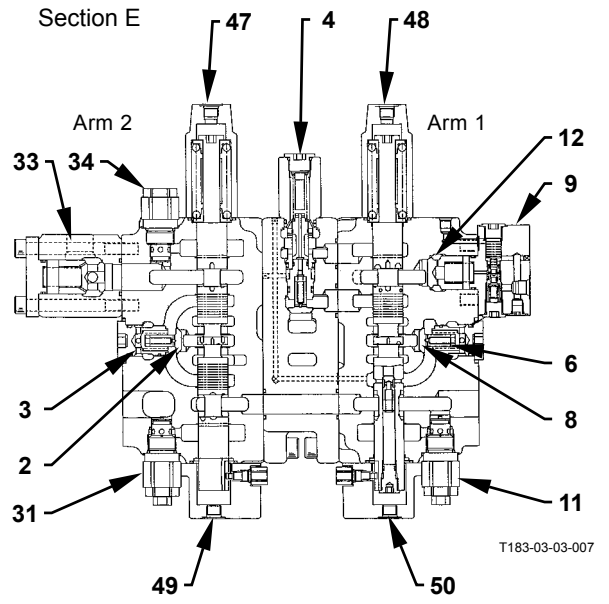
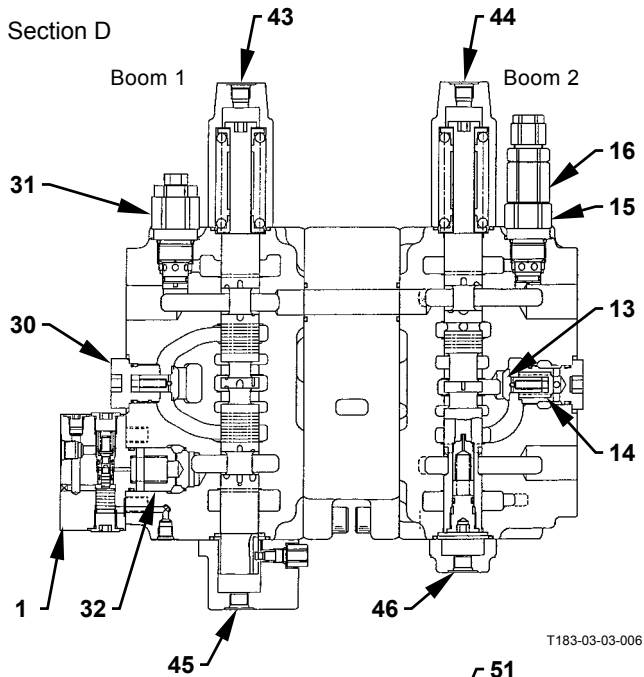
No.	Position	Component Name	Page	Item Number	Note
120	29G	Engine Oil Level Switch	T5-3-8	6	
121	29G	Grid Heater Relay 1	-	-	
122	29H	Grid Heater Relay 2	-	-	
123	31F	Coolant Temperature Sensor	T5-3-8	5	
124	30F	Starter 2	T5-3-2	15	
125	30G	Starter 1	T5-3-2	15	
126	31H	Engine Speed Sensor (Pump)	T5-3-2	19	
127	29J	ECM (Cummins)	T5-3-8	1	
128	9G	Work Light Relay 2 (R4)	T5-3-4	22	
129	9I	Main Controller A (MCX-A)	T5-3-4	15	
130	27F	Coolant Level Sensor	T5-3-2	12	

## **TROUBLESHOOTING / Component Layout**

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# TROUBLESHOOTING / Component Layout



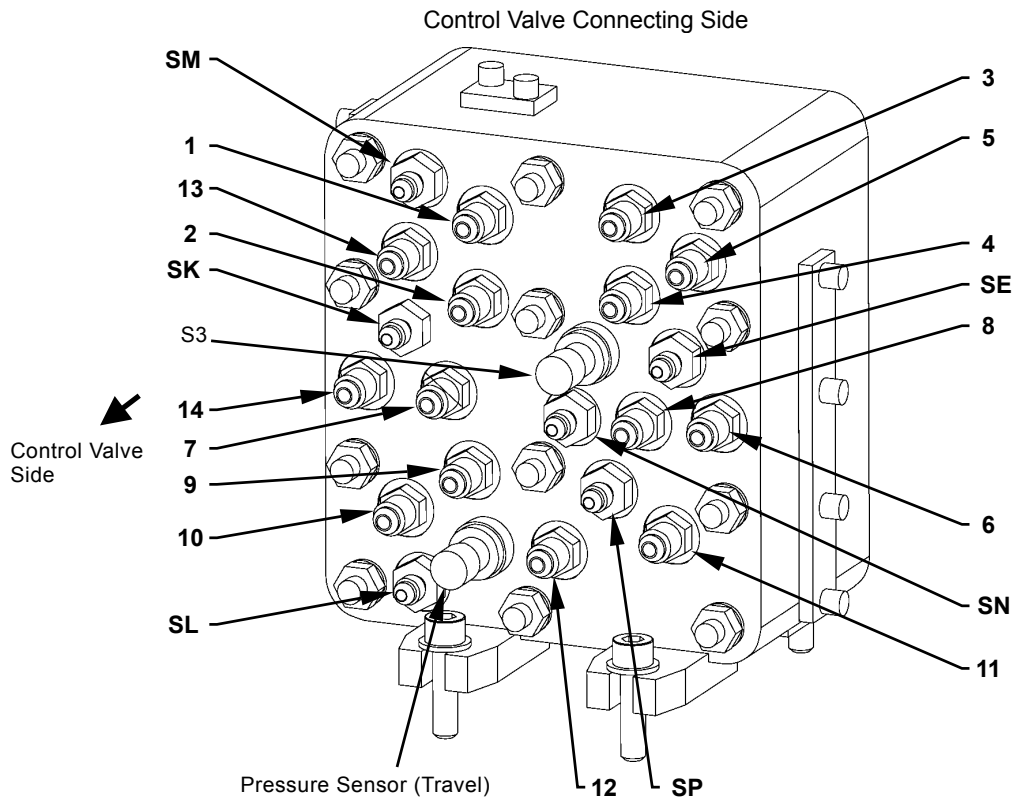
- 43 - Boom 1 (Lower) Port
- 44 - Boom 2 (Lower) Port
- 45 - Boom 1 (Raise) Port

- 46 - Boom 2 (Raise) Port
- 47 - BH: Arm 2 (Roll-Out) Port  
LD: Arm 2 (Retract) Port
- 48 - BH: Arm 1 (Roll-Out) Port  
LD: Arm 1 (Roll-In) Port

- 49 - BH: Arm 2 (Roll-In) Port  
LD: Arm 2 (Extend) Port
- 50 - BH: Arm 1 (Retract) Port  
LD: Arm 1 (Extend) Port

- 51 - BH: Auxiliary Port  
LD: Bucket (Open) Port
- 52 - BH: Auxiliary Port  
LD: Bucket (Open) Port

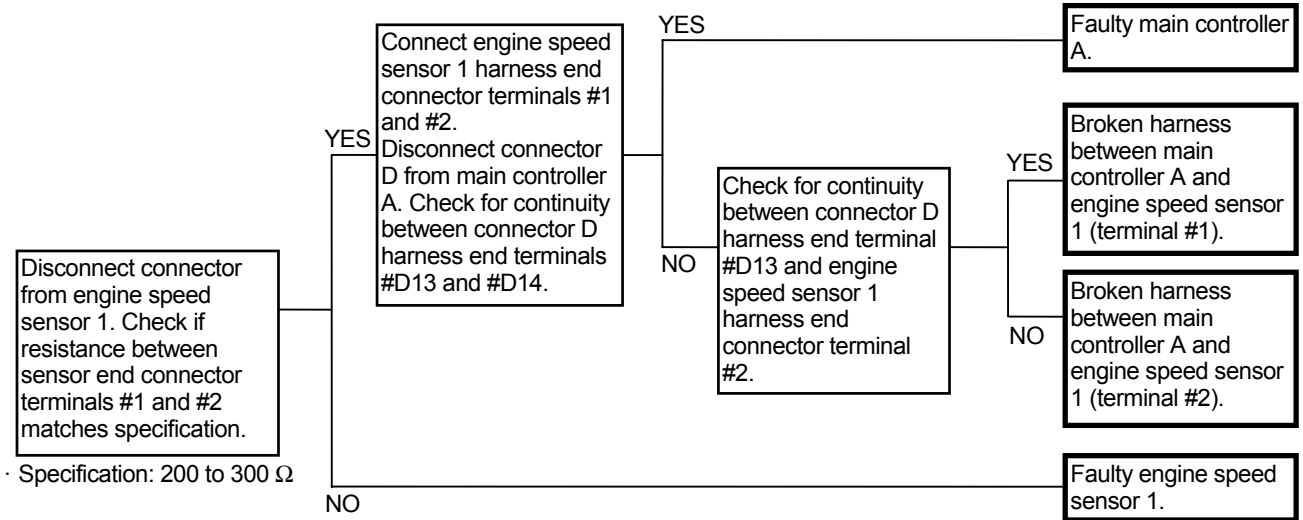
# TROUBLESHOOTING / Component Layout



T178-03-06-015

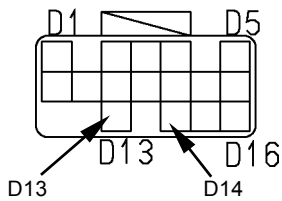
# TROUBLESHOOTING / Troubleshooting A

## FAULT CODE 05 ABNORMAL ENGINE SPEED



Connector (Harness End Connector Viewed from the Open End Side)

Main Controller A  
Connector D



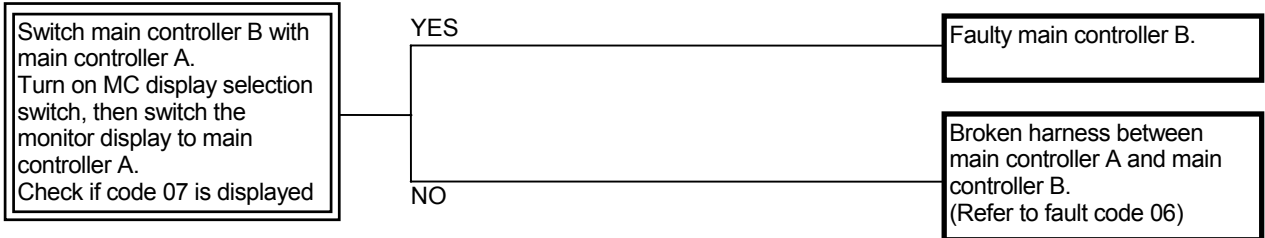
Engine Speed Sensor 1



## TROUBLESHOOTING / Troubleshooting A

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### FAULT CODE 37 ABNORMAL MAIN CONTROLLER B RECEPTION (BETWEEN MAIN CONTROLLER B AND BUILT-IN DIAGNOSING SYSTEM)



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## TROUBLESHOOTING / Troubleshooting B

 **NOTE:** The trouble symptoms in this table are described provided that each trouble occurs independently.

*In case more than one trouble occurs at the same time, find out all faulty components while checking all suspected components in each trouble symptom.*

F-5	F-6	F-7	F-8
Arm cylinder move unevenly at combined arm roll-out (BH)/arm retract (LD) and bucket roll-in (BH)/bucket tilt-in (LD), boom raise or swing operation.	Single arm roll-in (BH)/arm extend (LD), bucket roll-in (BH)/bucket tilt-in (LD) or boom raise operation is slow.	Heavy lift function does not operate.	Boom mode selection function does not operate.
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## TROUBLESHOOTING /Troubleshooting B

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## TROUBLESHOOTING /Troubleshooting B

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**E-9 Engine speed does not increase when a particular function is operated (with auto-idle ON)**

Speed does not increase only at certain operation.

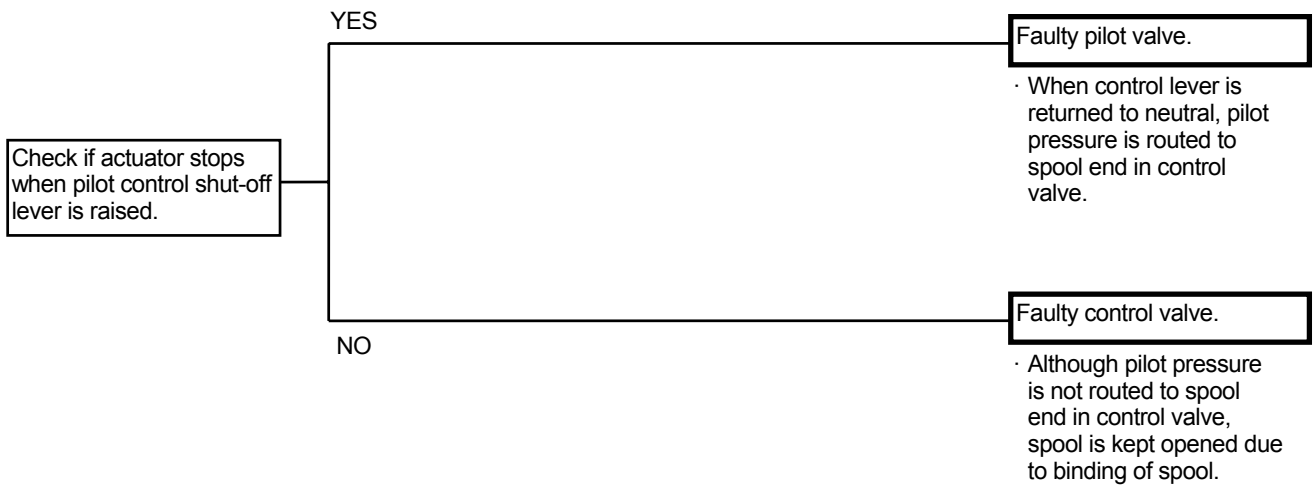
Faulty shuttle valve.

## TROUBLESHOOTING / Troubleshooting B

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### A-3 Actuator does not stop even if lever is returned to neutral.

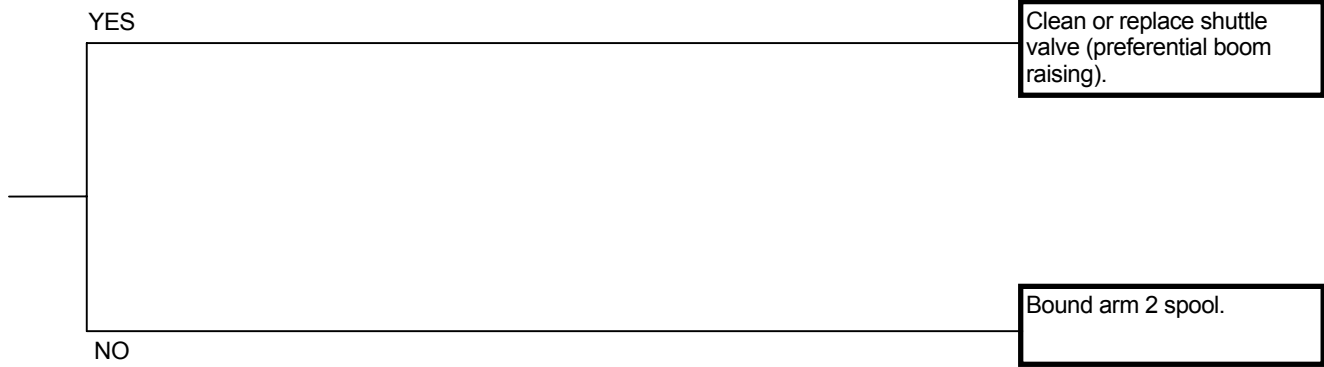
- Bound spool in the pilot valve or bound spool in the control valve is suspected.



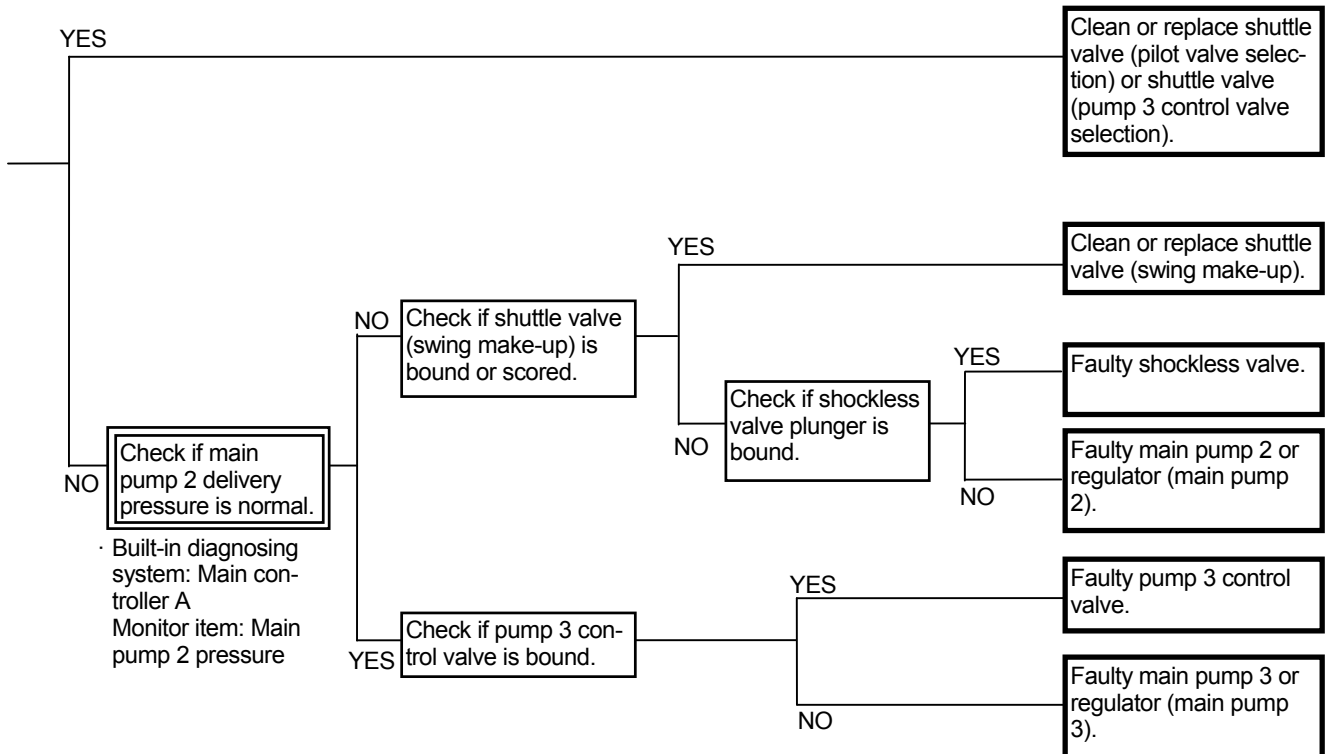
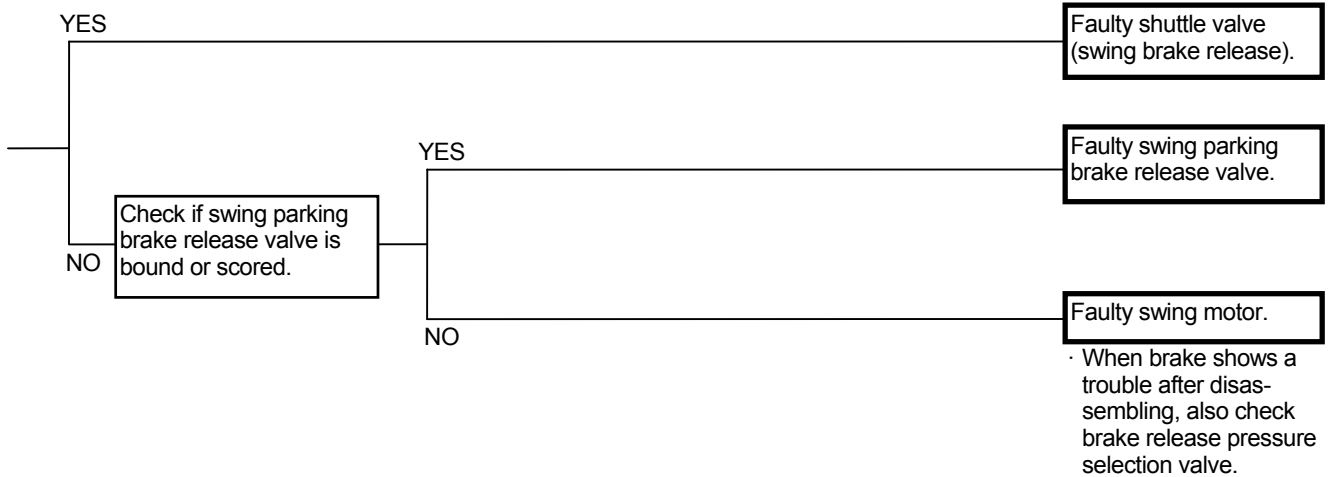
## TROUBLESHOOTING / Troubleshooting B

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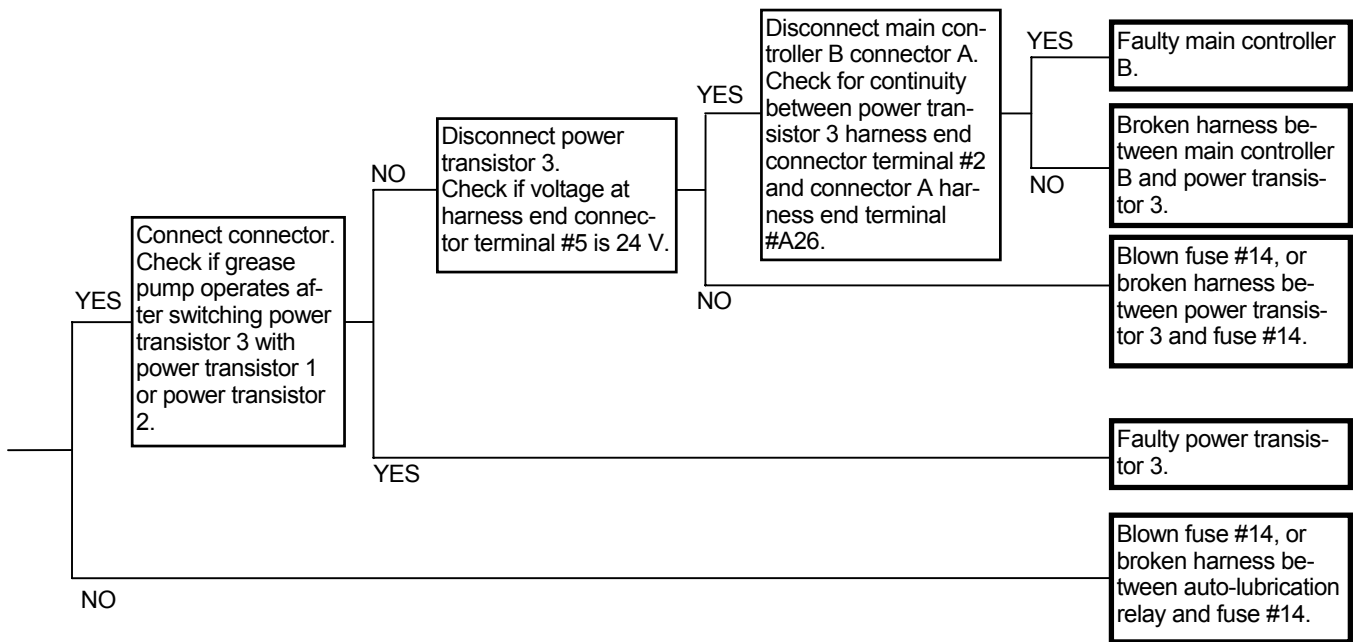
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## TROUBLESHOOTING / Troubleshooting B

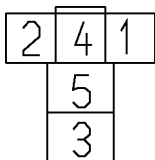


# TROUBLESHOOTING / Troubleshooting B



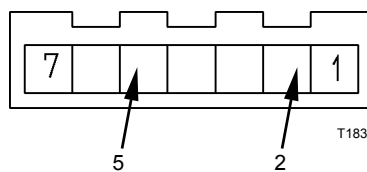
## Connector

Auto-Lubrication Relay



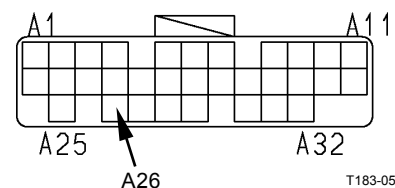
T183-05-04-003

Power Transistor 3



T183-05-04-011

Main Controller B Connector A



T183-05-04-008

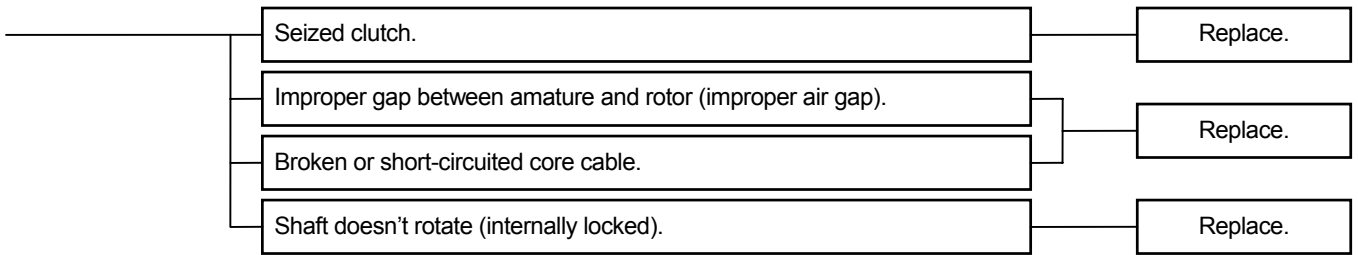
## **TROUBLESHOOTING / Troubleshooting B**

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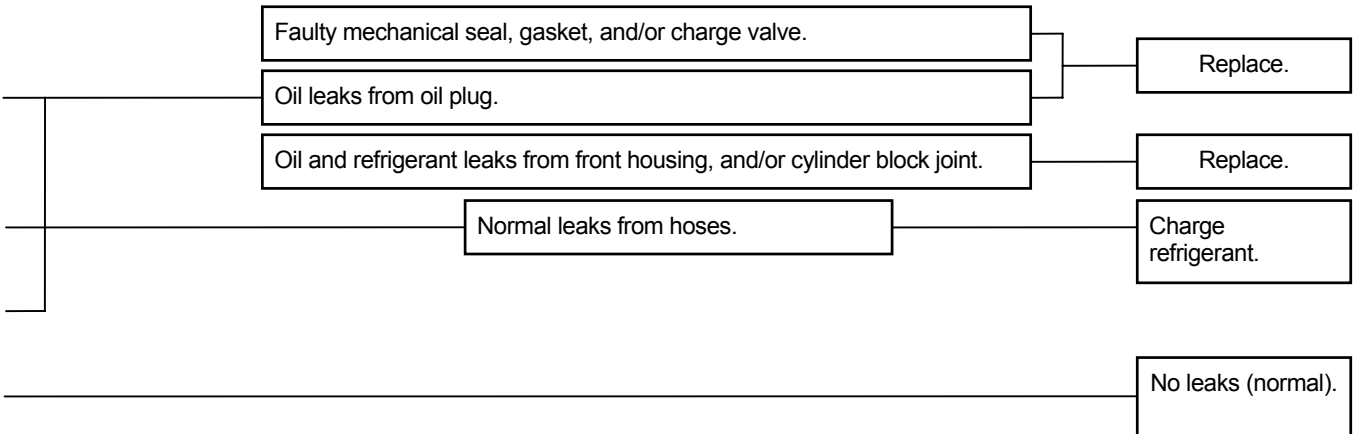
## TROUBLESHOOTING / Troubleshooting B

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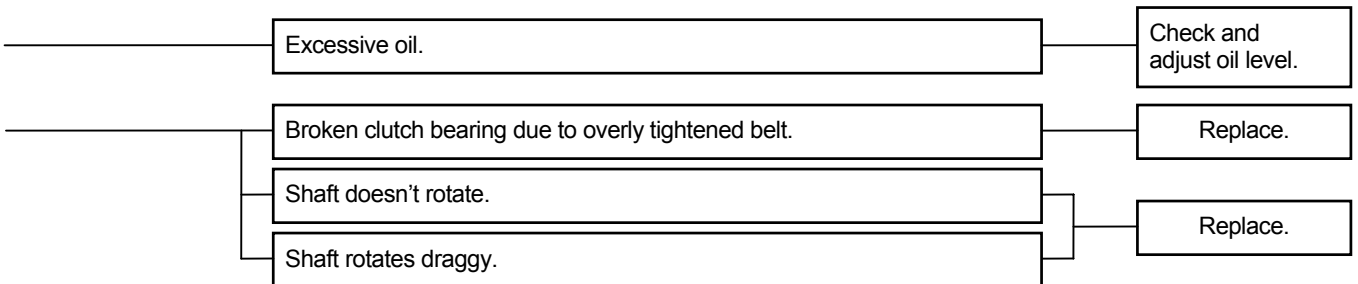
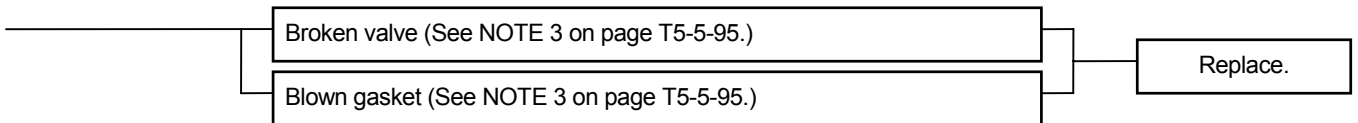


Faulty Electrical System.

Faulty Electrical System.



Refer to the Cooling Circuit Troubleshooting Table on page T5-5-84.



## TROUBLESHOOTING / Troubleshooting B

### Warm-up Operation

After charging the air conditioner, carry out warm-up operation five minute to lubricate system with compressor oil.

Operating Conditions of the Air Conditioner

Engine Speed : Slow Idle  
Cab Window : Fully Open  
Cooler Switch : ON  
Airflow Volume : Maximum  
Thermo Switch : Maximum

### Inspection

After warm-up operation, carry out gas leak check and performance check.

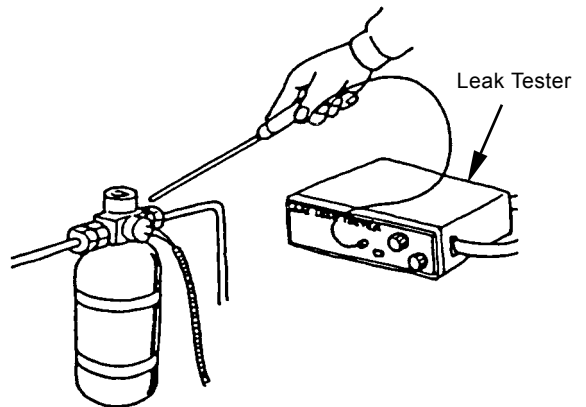
**⚠ CAUTION: Refrigerant will produce poisonous material if exposed to heat of 1000 °C (1800 °F) or more. Never bring refrigerant close to a fire.**

1. Check the air conditioner for gas leaks using a leak tester.
  - (1) Perform checking under well-ventilated conditions.
  - (2) Thoroughly wipe off dust from the charge hose connections of the compressor.
  - (3) Pay special attention to check the line connections.
  - (4) If any gas leaks are found, retighten the line connections.

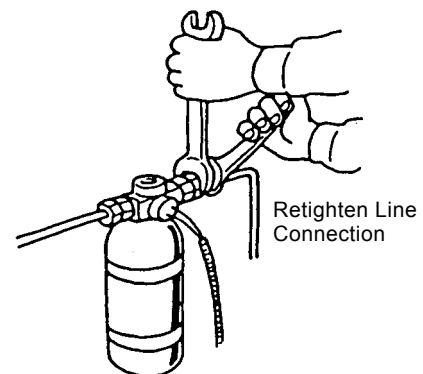
2. Performance Check

Carry out performance check of the air conditioner after checking each air conditioner component.

- (1) Check each component for abnormalities.
- (2) Carry out ON-OFF check of the compressor clutch.
- (3) Check compressor fan belt tension.
- (4) Check the coolant level in the radiator.
- (5) Operate the air conditioner and check the performance.



W115-02-10-013



W115-02-10-014

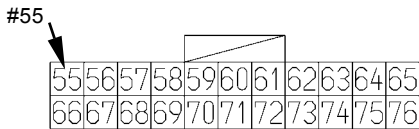


# TROUBLESHOOTING / Troubleshooting C

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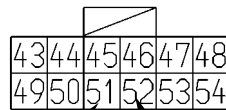
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Connector  
DLU Connector 76D



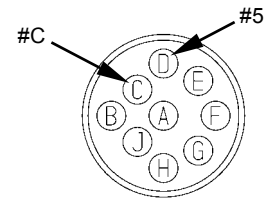
T18E-05-06-002

DLU Connector 76C



#51 #52 T18E-05-06-004

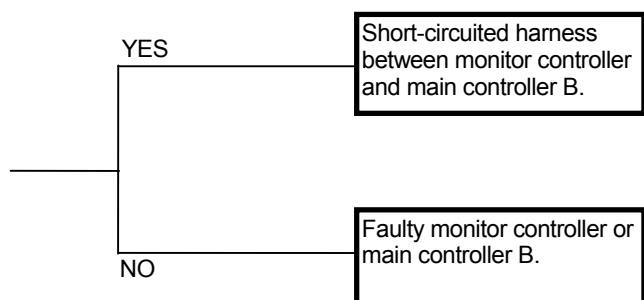
ECM Connector 9 Poles



T18E-05-06-003

## TROUBLESHOOTING / Troubleshooting C

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## TROUBLESHOOTING / Troubleshooting C

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## **TROUBLESHOOTING / Troubleshooting D**

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### **TROUBLESHOOTING D PROCEDURES**

Refer to Troubleshooting D if the engine stop indicator and the engine warning indicator in the cab start flashing by the ECM diagnosis system. Refer to the System section in the Technical Manual (Operational Principle).

## TROUBLESHOOTING / Troubleshooting D

FAULT CODE/ LAMP	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QST30	QSK45	QSK60
277 Yellow	S018 7	633 7	Fuel Injection Control Valve - mechanically stuck		X	X						
278 Yellow	P073 11	1075 11	Fuel Priming Pump Control Circuit - shorted high/low	X	X	X						
279 Yellow	S018 4	633 4	Fuel Injection Control Valve Circuit - shorted low		X	X						
281 Yellow	S126 7	1347 7	High Fuel Pressure Solenoid Valve #1 - mechanically stuck		X	X						
282 Yellow	S127 7	1348 7	High Fuel Pressure Solenoid Valve #2 - mechanically stuck		X	X						
283 Yellow	S221 3	1043 3	Engine Speed/Position Sensor #1 (Crankshaft) Supply Voltage Circuit - shorted high	X	X	X						
284 Yellow	S221 4	1043 4	Engine Speed/Position Sensor #1 (Crankshaft) Supply Voltage Circuit - shorted low	X	X	X		X				
285 Yellow	S231 9	639 9	SAE J1939 Multiplexing PGN Timeout Error	X	X	X	X	X				
286 Yellow	S231 13	639 13	SAE J1939 Multiplexing Configuration Error	X	X	X	X	X				
287 Red	P091 2	91 19	SAE J1939 Multiplexing Accelerator Pedal Sensor System Error	X	X	X	X	X				
288 Red	P029 2	974 19	SAE J1939 Multiplexing Remote Throttle Data Error	X	X	X	X	X				
292 White	P223 14	1083 14	Auxiliary Temperature Sensor Input # 1 Engine Protection - Critical						X		X	X
293 Yellow	S441 3	441 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high									
293 Yellow	P223 3	1083 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high						X		X	X
293 Yellow	S154 3	1083 3	Auxiliary Temperature Sensor Input # 1 Circuit – shorted high				X	X				
294 Yellow	S441 4	441 4	Auxiliary Temperature Sensor Input # 1 Circuit – shorted low									
294 Yellow	P223 4	1083 4	Auxiliary Temperature Sensor Input # 1 Circuit – shorted low						X		X	X

 NOTE: \*Denotes Cense Fault codes.

## TROUBLESHOOTING / Troubleshooting D


FAULT CODE/ LAMP	SID(S) PID(P) FMI	SPN FMI	DESCRIPTION	QSB	QSC	QSL9	QSM11	QSX15	QSK19	QST30	QSK45	QSK60
622* Yellow		1138 18	Low #2 LB Cylinder Power							X	X	X
623* Yellow		1139 18	Low #3 LB Cylinder Power							X	X	X
624* Yellow		1140 18	Low #4 LB Cylinder Power							X	X	X
625* Yellow		1141 18	Low #5 LB Cylinder Power							X	X	X
626* Yellow		1142 18	Low #6 LB Cylinder Power							X	X	X
627* Yellow		1143 18	Low #7 LB Cylinder Power									X
628* Yellow		1144 18	Low #8 LB Cylinder Power									X
631* Yellow		1143 (45) 1145 (60) 18	Low #1 RB Cylinder Power								X	X
631* Yellow		1329 1	Low #1 RB Cylinder Power							X		
632* Yellow		1144 (45) 1146 (60) 18	Low #2 RB Cylinder Power								X	X
632* Yellow		1329 1	Low #2 RB Cylinder Power							X		
633* Yellow		1145 (45) 1147 (60) 18	Low #3 RB Cylinder Power								X	X
633* Yellow		1329 1	Low #3 RB Cylinder Power							X		
634* Yellow		1146 (45) 1148 (60) 18	Low #4 RB Cylinder Power								X	X
634* Yellow		1329 1	Low #4 RB Cylinder Power							X		

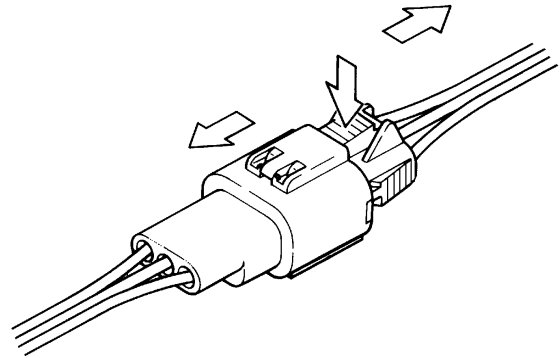
 NOTE: \*Denotes Cense Fault codes.

# TROUBLESHOOTING / Electrical System Inspection

## INSPECTIONS FOR DISCONNECTING CONNECTORS

1. Push the lock to disconnect.

-  **NOTE:** 1) Connectors may not be separated if the lock is pushed while the connectors are pulled. Be sure to push the lock first before pulling the connectors.
- 2) The lock is provided on the female connector (harness side).



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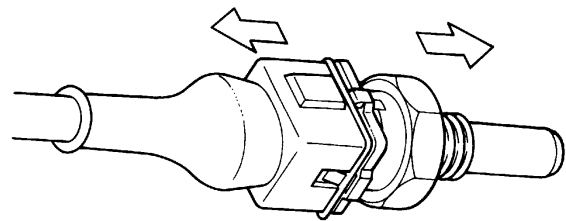
### Locations of This Type Connector

Hydraulic Oil Level Switch	Diode	Wiper Motor	Coolant Level Sensor
Proximity Switch	Front All Pressure Sensor	Flow Rate Decrease Solenoid Valve	Data Link
Washer	Starter Relay 2	Travel Pressure Sensor	Engine Diagnostic Switch
Boom Mode Selection Switch	Buzzer Cancel Switch	Heavy Lift Switch	Key Switch
Air Conditioner Clutch	Air Conditioner	Auto-Lubrication Timer Switch	DC-DC Controller
Governor Actuator	Pressure Switch	Air Conditioner Controller	Room Light
Monitor Controller	Air Conditioner Sensor	Air Conditioner Unit	ECM
Work Light	Air Compressor	Ambient Air Temperature Sensor	Engine Speed Sensor
Main Pump Delivery Pressure Sensor	Speaker	ECM Relay	Fuel Sensor
Oil Level Switch	Boost Pressure Sensor	Exhaust Gas Temperature Sensor	

2. Pull to disconnect.

### Locations of This Type Connector

Oil Pressure Sensor	Circulation Servo Motor
Air Vent Select Servo Motor	Preheat Switch
Switch Box	Power Transistor
Frash Memory	Hydraulic Oil Temperature Sensor
A/M Servo Motor	Thermo-Guard Switch
Radio	Step Light Switch
Fusible Link	Sun Exposure Sensor



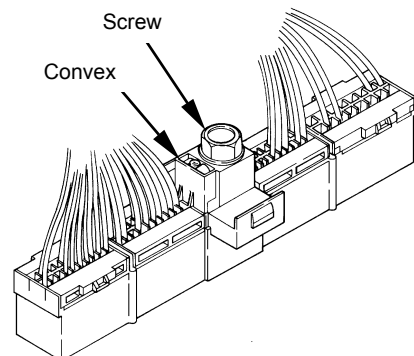
T107-04-05-004

3. Connector to pull apart

Use a 10 mm wrench to tighten the screw until the torque mark (convex) appears when re-tightening.

### Locations of This Type Connector

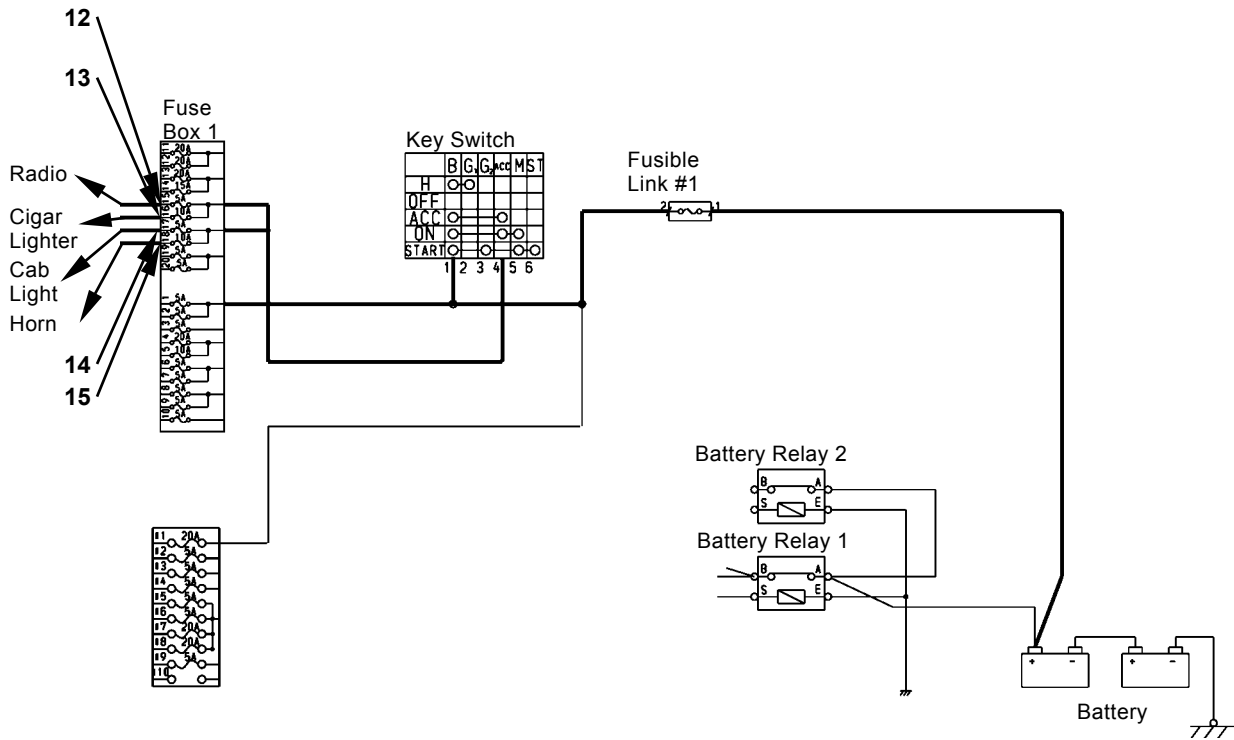
DLU



T107-04-05-005

# TROUBLESHOOTING / Electrical System Inspection

## Accessory Circuit



T18E-02-03-009

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