CASE

REPAIR MANUAL

Crawler Excavator

CX160B
CX180B

SM160BTOC-0EN

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CRAWLER EXCAVATOR CX160B-CX180B
SERVICE MANUAL

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TROUBLESHOOTING

1) General cautions

The following describes the corrective actions required when an abnormality is detected while using an axial piston pump motor.

Following are general cautions:

1] Points to consider before taking actions.

Before proceeding to troubleshooting, fully understand the property of the abnormality. Judge if the trouble is attributable to a circuitry problem or to regulator, attached valve. Think again if the pump motor is really in trouble.

2] Read the entire section below on the maintenance procedures, and follow the procedure for disassembly.

3] If the motor is to be disassembled even partially, prevent dust from entering the part.

4] Parts are precision-finished. Exercise care when handling them so that they are not damaged.

2) Procedure for inspecting motor unit problems

Pump is often installed with a regulator, auxiliary valves and pumps, which make it quite difficult to detect the cause of failure. However, if you check the following major inspection items, you may find the abnormal location:

1] Checking of filter and drain oil.

Check the filter elements. Check if abnormal impurities are detected in large quantity.

Minor portion of metal powder consisting of wear powder from the shoes and cylinder is usually found. If excessive quantity of metal powder is found on the filter, the trouble may possibly be attributable to a failure of shoe. Likewise, check the drain oil inside the pump casing.

2] Presence/absence of abnormal vibration and sounds.

Check the main body of pump for abnormal vibration and sound. Check if they are on regular frequencies such as from the hunting of regulator or relief hunting of attached valve. Abnormal vibration may be attributable to cavitation or internal damage of the pump.

3] When 2 pumps are used.

When 2 units of a single unit of pump or motor or double pumps are used in the circuit, check the piping of respective pumps. Consequently, it will become clear whether the pump is faulty or a problem is present with the circuit after the pump.

4] Measure pressure of respective components.

Do not rush into the overhaul inspection but measure pressure of the respective components first to locate the failed section.

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2. Heat Circuit (lever in neutral)

The pilot line is equipped with a heat circuit to prevent response delay at low temperatures.

When the remote control valve operation lever is set to neutral, the discharged oil from hydraulic pumps A1 and A2 goes from the control valve PR (P1) and PL (P2) ports through the center bypass oil path, and returns to the hydraulic oil tank.

The pressurized oil from the control valve R4 port is fed to the cushion valve R port and returns through the cushion spool to the hydraulic oil tank.

By circulating the oil inside the cushion spool, the temperature of the oil in the cushion valve is raised to improve heat performance.

1. Arm (in)
2. Arm (out)
3. Cushion valve
4. Remote control valve (arm, swing)
5. Lever lock
6. 5-stack solenoid valve
7. Control valve
8. Console lever lock switch
9. Hydraulic pump
10. Check valve
11. Oil cooler
12. Boom (up)
13. Boom (down)

Legend

- Pressure Line
- Tank line
- Pilot pressure line
- Pilot tank line
- Electric Line
- Heat Circuit

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c) Automatic 2-speed function

A. Motor low-speed (high-capacity) position

Figure 11 shows the state with the motor capacity fixed to the low-speed (high-capacity) position.

When the speed control switch is set to low speed and the pilot pressure acting on the Ps port is released to the tank, the motor capacity control valve built into the motor is fixed to the low-speed (high-capacity) position.

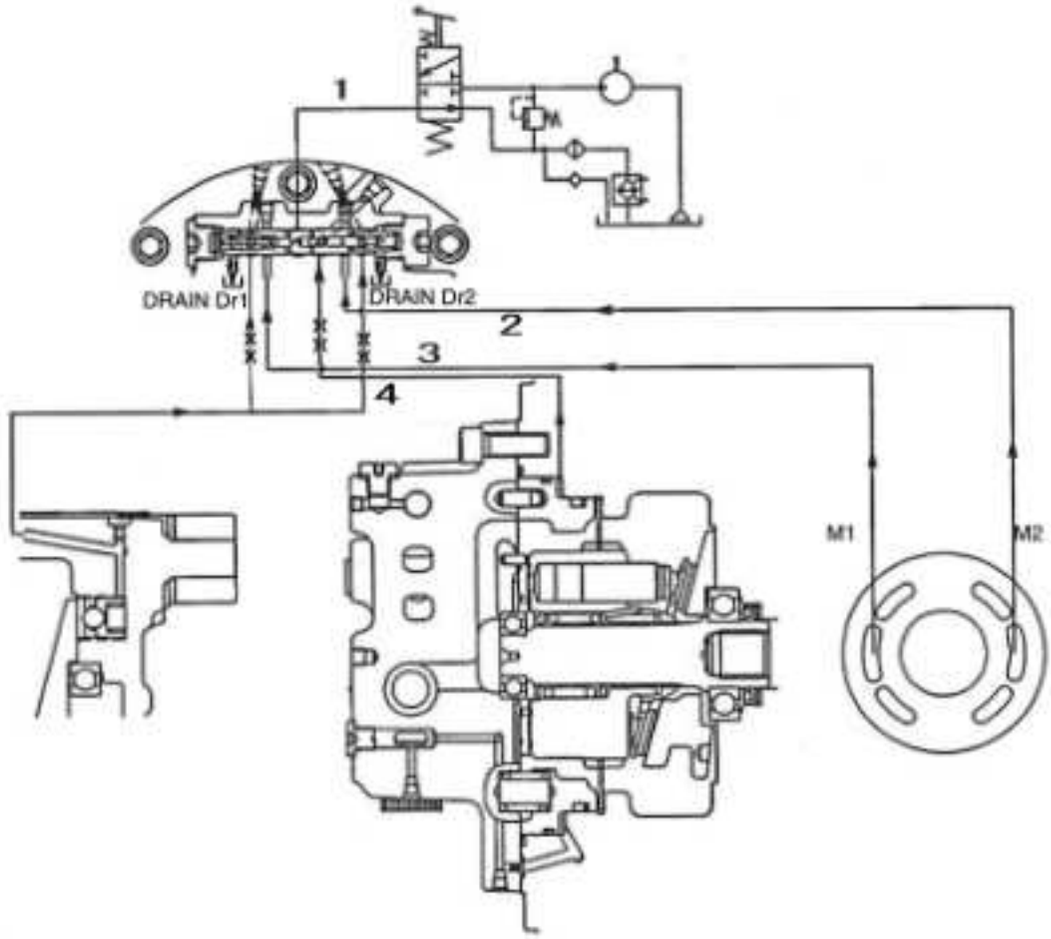


Figure 11 Motor low-speed (high-capacity) fixed mode

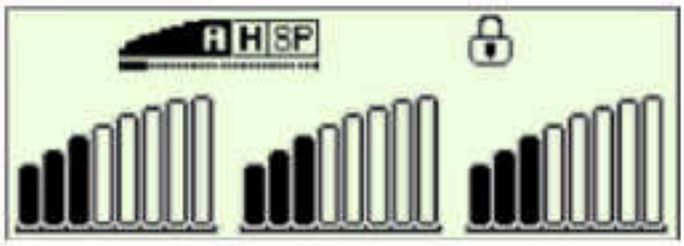
1	Pilot pressure
2	Pm2 pressure in motor
3	Pm1 pressure in motor
4	Pin motor load pressure

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B) Anti-theft function operation

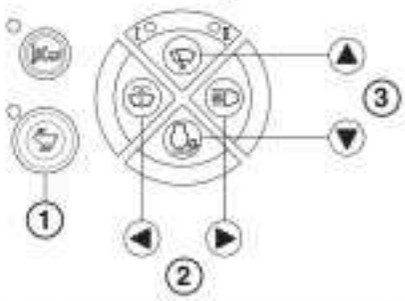
1) Enabling the anti-theft function

1. If the key is switched twice in a row ON => OFF => ON => OFF with the engine stopped, the anti-theft function is switched ON.
   (All the key switching operations must be done within 2 seconds)
2. When the anti-theft comes ON, the monitor buzzes and the "key" icon is displayed.
   (Once the anti-theft is switched ON, this icon is displayed while the power is OFF)



3. The next time the key is switched ON, the anti-theft operates and the password input screen is displayed.
   Input the password made up of 4 digits 0 to 9.
   Input by using the monitor switches below.
   If an incorrect number is input, "ERROR" is displayed and the buzzer buzzes.
   The key must be switched OFF, then ON again before the password can be re-input.



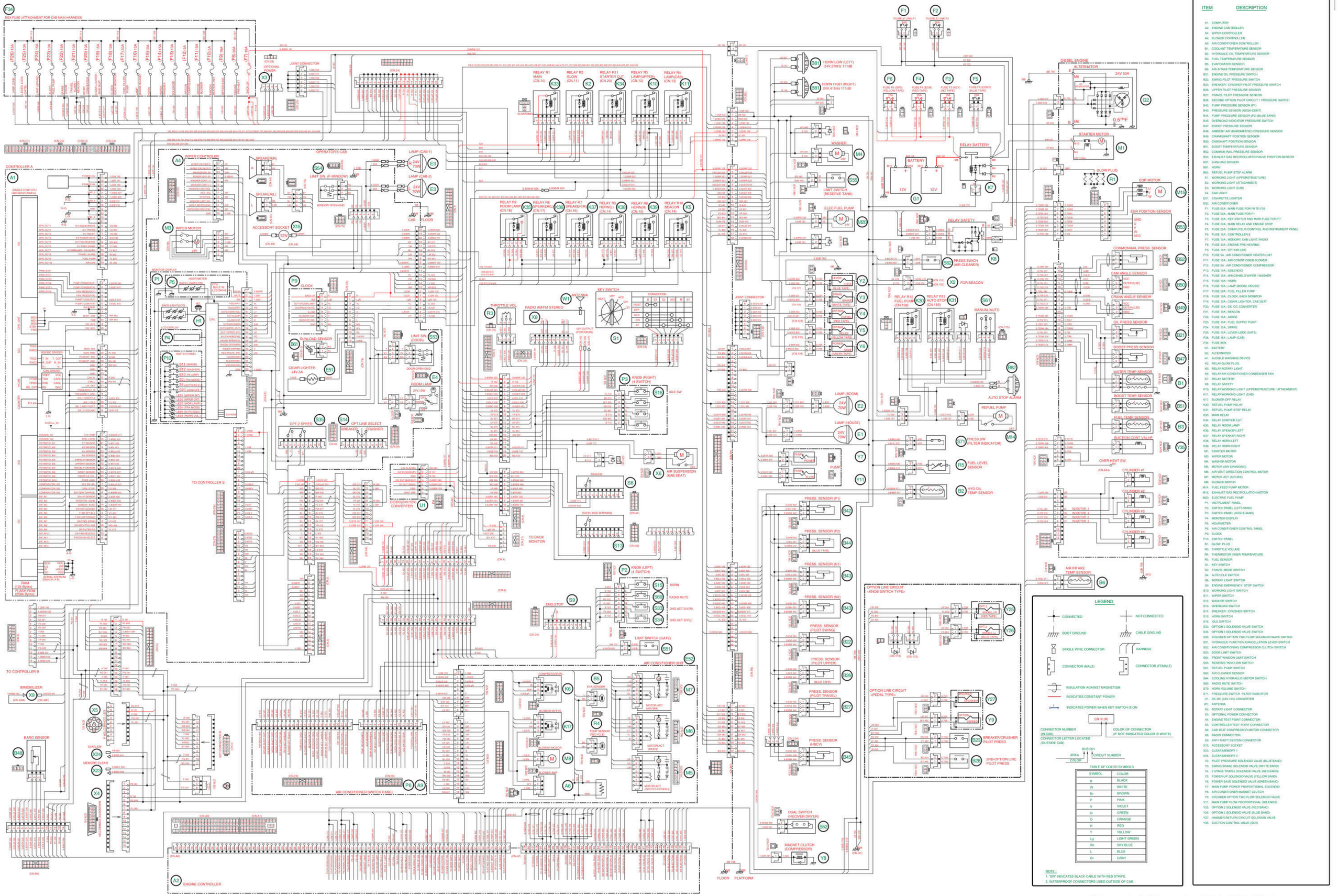


1	Enter	3	Numeric value increase / decrease
2	Cursor movement		

2) Disabling the anti-theft function

1. If the engine is stopped by switching OFF the key, the anti-theft function does not operate.
2. To disable the anti-theft function, disconnect the anti-theft knob terminals VG (purple/green) and BG (black/green). The registered password is canceled.

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ITEM DESCRIPTION

- A1. COMPUTER
- A2. ENGINE CONTROLLER
- A4. WIPER CONTROLLER
- A6. BLOWER CONTROLLER
- A9. AIR CONDITIONER CONTROLLER
- B1. COOLANT TEMPERATURE SENSOR
- B2. HYDRAULIC OIL TEMPERATURE SENSOR
- B3. FUEL TEMPERATURE SENSOR
- B5. EVAPORATOR SENSOR
- B6. AIR INTAKE TEMPERATURE SENSOR
- B21. ENGINE OIL PRESSURE SWITCH
- B22. SWING PILOT PRESSURE SWITCH
- B23. BREAKER / CRUSHER PILOT PRESSURE SWITCH
- B26. UPPER PILOT PRESSURE SENSOR
- B27. TRAVEL PILOT PRESSURE SENSOR
- B28. SECOND OPTION PILOT CIRCUIT ? PRESSURE SWITCH
- B42. PUMP PRESSURE SENSOR (P1)
- B43. PRESSURE SENSOR (NEGA-CONT)
- B44. PUMP PRESSURE SENSOR (P2) (BLUE BAND)
- B45. OVERLOAD INDICATOR PRESSURE SWITCH
- B47. BOOST PRESSURE SENSOR
- B48. AMBIENT AIR (BAROMETRIC) PRESSURE SENSOR
- B49. CRANKSHAFT POSITION SENSOR
- B50. CAMSHAFT POSITION SENSOR
- B51. BOOST TEMPERATURE SENSOR
- B52. COMMON RAIL PRESSURE SENSOR
- B53. EXHAUST GAS RECIRCULATION VALVE POSITION SENSOR
- B91. SUNLOAD SENSOR
- B91. HORN
- B62. REFUEL PUMP STOP ALARM
- E1. WORKING LIGHT (UPPERSTRUCTURE)
- E2. WORKING LIGHT (ATTACHMENT)
- E3. WORKING LIGHT (CAB)
- E4. CAB LIGHT
- ES1. CIGARETTE LIGHTER
- ES2. AIR CONDITIONER
- F1. FUSE 80A ; MAIN FUSE FOR F9 TO F25
- F2. FUSE 50A ; MAIN FUSE FOR F1
- F3. FUSE 15A ; KEY SWITCH AND MAIN FUSE FOR F7
- F4. FUSE 20A ; MAIN RELAY AND ENGINE STOP
- F5. FUSE 20A ; COMPUTEUR CONTROL AND INSTRUMENT PANEL
- F6. FUSE 15A ; CONTROLLER B
- F7. FUSE 10A ; MEMORY, CAB LIGHT, RADIO
- F8. FUSE 30A ; ENGINE PRE-HEATING
- F9. FUSE 10A ; OPTION LINE
- F10. FUSE 5A ; AIR CONDITIONER HEATER UNIT
- F11. FUSE 15A ; AIR CONDITIONER BLOWER
- F12. FUSE 5A ; AIR CONDITIONER COMPRESSOR
- F13. FUSE 10A ; SOLENOID
- F14. FUSE 15A ; WINDSHIELD WIPER / WASHER
- F15. FUSE 10A ; HORN
- F16. FUSE 15A ; LAMP (BOOM, HOUSE)
- F17. FUSE 20A ; FUEL FILLER PUMP
- F18. FUSE 10A ; CLOCK, BACK MONITOR
- F19. FUSE 15A ; CIGAR LIGHTER, CAB SEAT
- F20. FUSE 15A ; DC-DC CONVERTER
- F21. FUSE 10A ; BEACON
- F22. FUSE 15A ; SPARE
- F23. FUSE 10A ; FUEL SUPPLY PUMP
- F24. FUSE 15A ; SPARE
- F25. FUSE 10A ; LEVER LOCK (GATE)
- F26. FUSE 15A ; LAMP (CAB)
- F34. FUSE BOX
- G1. BATTERY
- G2. ALTERNATOR
- H1. AUDIBLE WARNING DEVICE
- K2. RELAY-GLOW PLUG
- K3. RELAY-ROTARY LIGHT
- K6. RELAY-AIR CONDITIONER CONDENSER FAN
- K7. RELAY BATTERY
- K8. RELAY SAFETY
- K10. RELAY-WORKING LIGHT (UPPERSTRUCTURE / ATTACHMENT)
- K11. RELAY-WORKING LIGHT (CAB)
- K17. BLOWER OFF RELAY
- K30. REFUEL PUMP RELAY
- K31. REFUEL PUMP STOP RELAY
- K33. MAIN RELAY
- K34. RELAY STARTER CUT
- K35. RELAY ROOM LAMP
- K36. RELAY SPEAKER LEFT
- K37. RELAY SPEAKER RIGHT
- K38. RELAY HORN LEFT
- K39. RELAY HORN RIGHT
- M1. STARTER MOTOR
- M3. WIPER MOTOR
- M4. WASHER MOTOR
- M5. MOTOR (AIR CHANGING)
- M6. AIR VENT DIRECTION CONTROL MOTOR
- M7. MOTOR ACT (AIR MIX)
- M8. BLOWER MOTOR
- M14. FUEL FEED PUMP MOTOR
- M15. EXHAUST GAS RECIRCULATION MOTOR
- MD0. ELECTRIC FUEL PUMP
- P1. INSTRUMENT PANEL
- P2. SWITCH PANEL (LEFT-HAND)
- P3. SWITCH PANEL (RIGHT-HAND)
- P4. MONITOR DISPLAY
- P5. HOURMETER
- P6. AIR CONDITIONER CONTROL PANEL
- P9. CLOCK
- P10. SWITCH PANEL
- R1. GLOW PLUG
- R3. THROTTLE VOLUME
- R4. THERMISTOR INNER TEMPERATURE
- R5. FUEL SENSOR
- S1. KEY SWITCH
- S2. TRAVEL MODE SWITCH
- S4. AUTO IDLE SWITCH
- S6. ROTARY LIGHT SWITCH
- S9. ENGINE EMERGENCY STOP SWITCH
- S10. WORKING LIGHT SWITCH
- S11. WIPER SWITCH
- S12. WASHER SWITCH
- S13. OVERLOAD SWITCH
- S14. BREAKER / CRUSHER SWITCH
- S15. HORN SWITCH
- S16. IDLE SWITCH
- S33. OPTION 2 SOLENOID VALVE SWITCH
- S34. OPTION 2 SOLENOID VALVE SWITCH
- S36. CRUSHER-OPTION TWO FLOW SOLENOID VALVE SWITCH
- S51. HYDRAULIC FUNCTION CANCELLATION LEVER SWITCH
- S52. AIR CONDITIONING COMPRESSOR CLUTCH SWITCH
- S53. DOOR LIMIT SWITCH
- S54. FRONT WINDOW LIMIT SWITCH
- S55. RESERVE TANK LOW SWITCH
- S61. REFUEL PUMP SWITCH
- S62. AIR CLEANER SENSOR
- S64. COOLING HYDRAULIC MOTOR SWITCH
- S69. RADIO MUTE SWITCH
- S70. HORN VOLUME SWITCH
- S71. PRESSURE SWITCH FILTER INDICATOR
- U1. DC-DC (24V-12V) CONVERTER
- W1. ANTENNA
- X2. ROTARY LIGHT CONNECTOR
- X3. OPTIONAL POWER CONNECTOR
- X4. ENGINE TEST POINT CONNECTOR
- X5. CONTROLLER TEST POINT CONNECTOR
- X6. CAB SEAT COMPRESSOR MOTOR CONNECTOR
- X8. RADIO CONNECTOR
- X9. ANTI-THEFT SYSTEM CONNECTOR
- X15. ACCESSORY SOCKET
- X23. CLEAR MEMORY 1
- X24. CLEAR MEMORY 2
- Y2. PILOT PRESSURE SOLENOID VALVE (BLUE BAND)
- Y3. SWING BRAKE SOLENOID VALVE (WHITE BAND)
- Y4. 2 STAGE TRAVEL SOLENOID VALVE (RED BAND)
- Y5. POWER-UP SOLENOID VALVE (YELLOW BAND)
- Y6. POWER SAVE SOLENOID VALVE (GREEN BAND)
- Y7. MAIN PUMP POWER PROPORTIONAL SOLENOID
- Y8. AIR CONDITIONER MAGNET CLUTCH
- Y9. CRUSHER-OPTION TWO FLOW SOLENOID VALVE
- Y11. MAIN PUMP FLOW PROPORTIONAL SOLENOID
- Y25. OPTION 2 SOLENOID VALVE (RED BAND)
- Y26. OPTION 2 SOLENOID VALVE (BLUE BAND)
- Y27. HAMMER RETURN CIRCUIT SOLENOID VALVE
- Y35. SUCTION CONTROL VALVE (SCV)

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