



HIRSCHMANN

PAT

LOAD MOMENT INDICATOR

DS 160



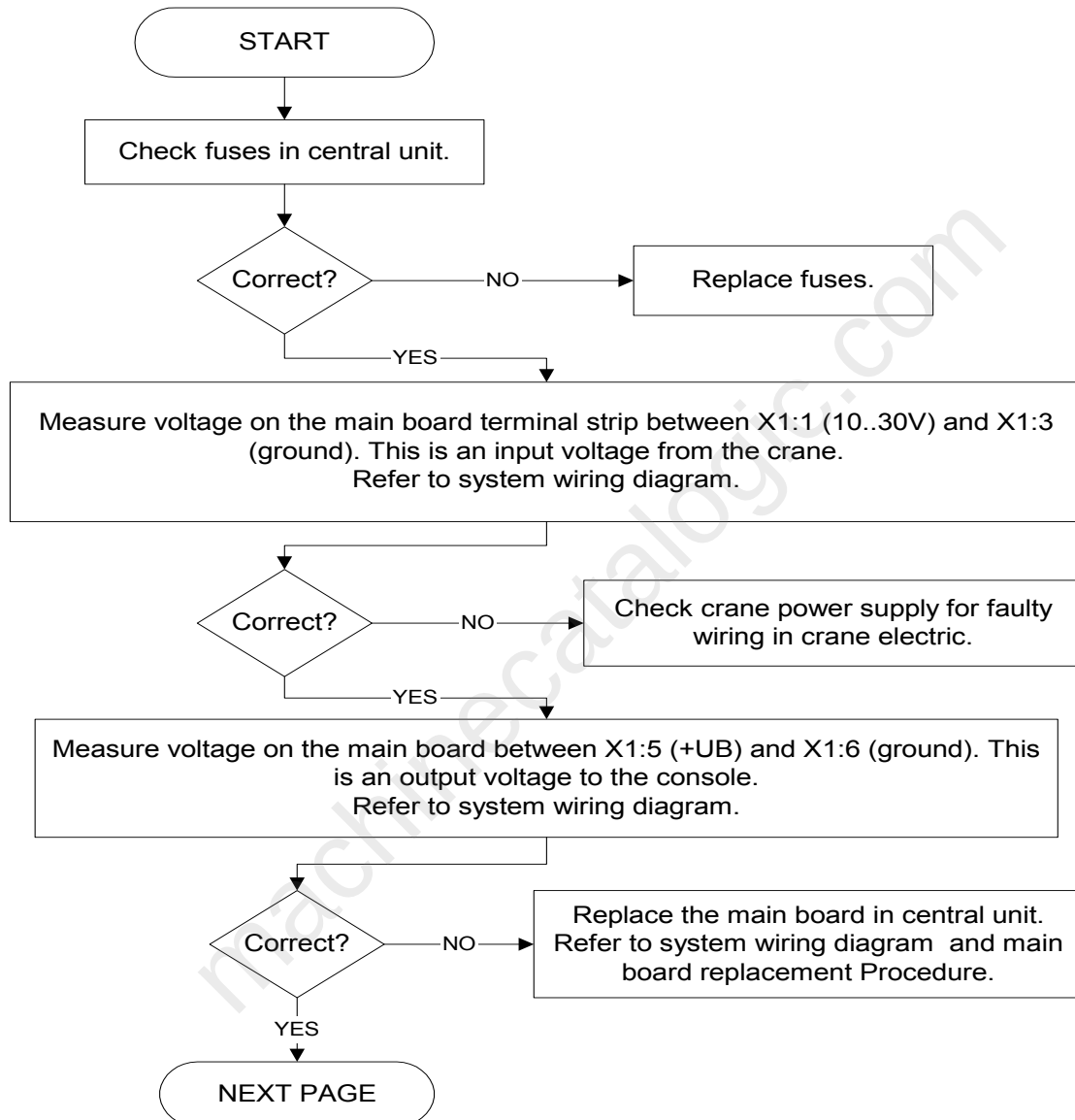
SERVICE MANUAL

P/N 031-300-190-142 REV. D, 05/26/2005

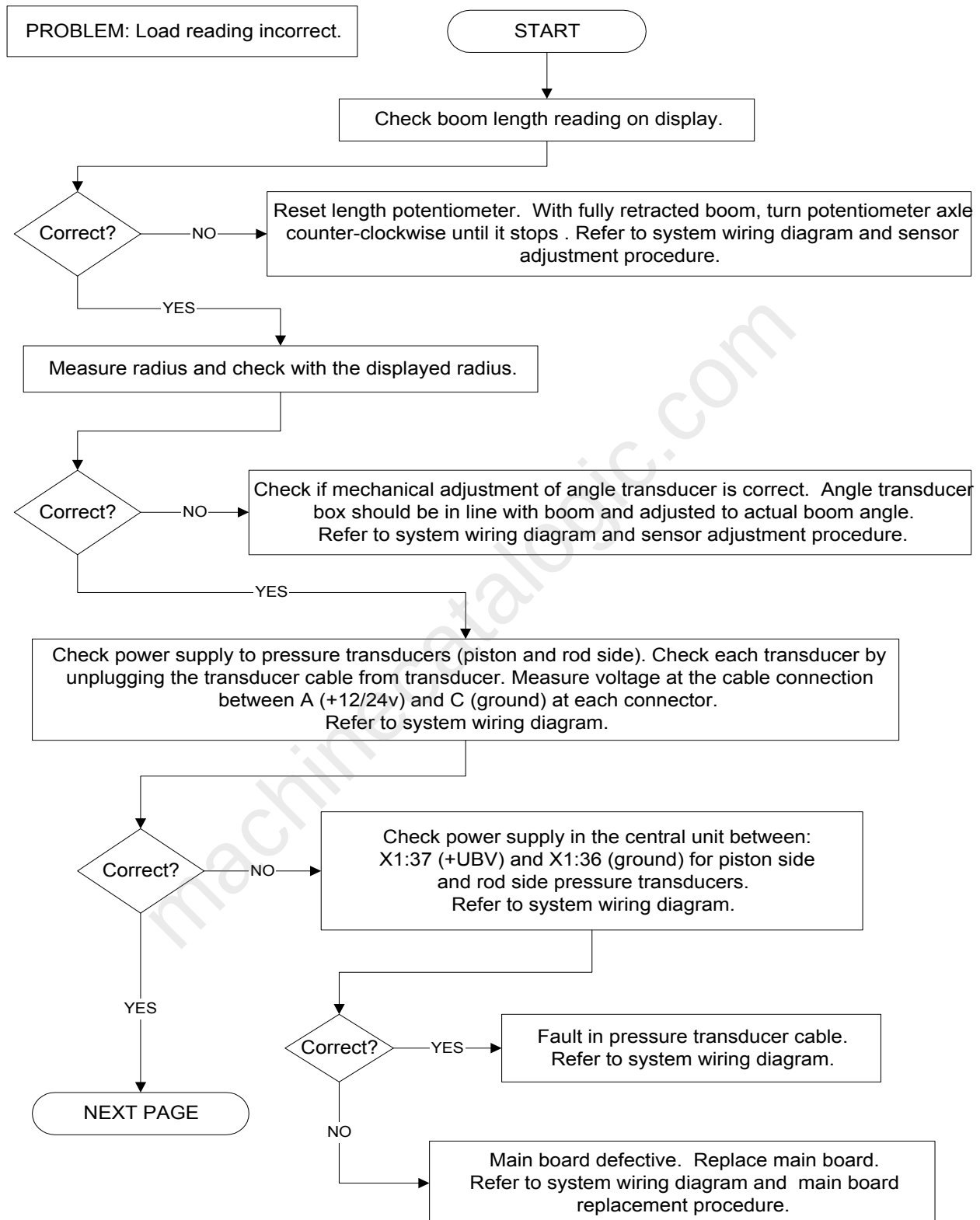
Error Code	Error	Cause	Elimination
E13	Fallen below lower limit value in the measuring channel "pressure rod side"	refer to E12	refer to E12
E23	Upper limit value in measuring channel "pressure rod side" has been exceeded.	refer to E12	refer to E12
E15	Fallen below lower limit value for the measuring channel "angle main boom".	- Angle sensor defective. - Electronic part in the measuring channel defective.	- Replace angle sensor. - Replace LMI board.
E25	Upper limit value in measuring channel "angle main boom" exceeded	refer to E15	refer to E15
E16	Fallen below lower limit value for the measuring channel "middle section".	- Angle sensor defective. - Electronic part in the measuring channel defective.	- Replace angle sensor. - Replace LMI board.
E26	Upper limit value in measuring channel "middle section" exceeded	refer to E16	refer to E16
E17	Fallen below lower limit value for the measuring channel "telescopic jib".	- Angle sensor defective. - Electronic part in the measuring channel defective.	- Replace angle sensor. - Replace LMI board.
E27	Upper limit value in measuring channel "telescopic jib" exceeded	refer to E17	refer to E17
E19	Reference and/or supply voltage defective	- The supply voltage is falsified by one of the sensors (DAV, LWG) - Electronic component is defective	- Check the voltages on the LMI main board (AGND = MP0). Check sensors, plugs and cable, replace, if need be. - Replace LMI board

7 NO DISPLAY

PROBLEM: Blank console display with no warning light shown. All crane moments have been stopped.



11 LOAD READING PROBLEM



15 TROUBLESHOOTING MOISTURE

The PAT DS 160 LMI contains electronic components in various locations, such as central unit, sensors, junction boxes etc. These internal components cannot be designed to withstand exposure to moisture over a longer period of time. For this reason, the housings of the components are water protected according to IP 65. If you find water or moisture inside any of the housings, the source for the water ingress has to be detected and corrected to ensure proper operation.

There are two major possibilities for the occurrence of excessive moisture inside an enclosure:

- 1) Water ingress
- 2) Condensation

This outline gives instructions for detecting the cause for excessive moisture by using simple troubleshooting methods and how to prevent the moisture ingress from happening again.

15.1.1 Water Ingress

There are 6 possibilities for water to enter an enclosure:

- 1) Spray Cleaning
- 2) Missing / Loose Screws
- 3) Bent Lid
- 4) Defective Gasket
- 5) Loose Strain Relieves
- 6) Water Entry Through External Cabling

It is possible to find out the source of water ingress by going through the following steps and ruling out one possibility after the other until the cause is identified:

1) Spray Cleaning

The enclosures used for the PAT DS 160 system are water protected to IP 65. This means protection against the environment, such as rain. However, through the use of spray cleaner at short distances, it is possible to force water through the gasket or strain relieves. For this reason, avoid spraying any components from short distances with spray cleaners. Convey this fact to any member of a maintenance crew.

2) Missing / Loose Screws

All screws have to be present and to be equally tight to ensure water protection of the enclosure. If there are screws missing, replace them. If no screw is missing, check the tightness. If any were loose, then open all screws and then re-tighten them equally.

3) Bent Lid

An enclosure will only seal correctly if the lid is not bent. To check this, loosen all screws of the lid, take the lid off the box and visually inspect it for deflection. If the lid is bent or damaged, it needs to be replaced. Try to determine what has caused the lid to be bent and eliminate the reason for that. Order a new lid through your PAT representative.

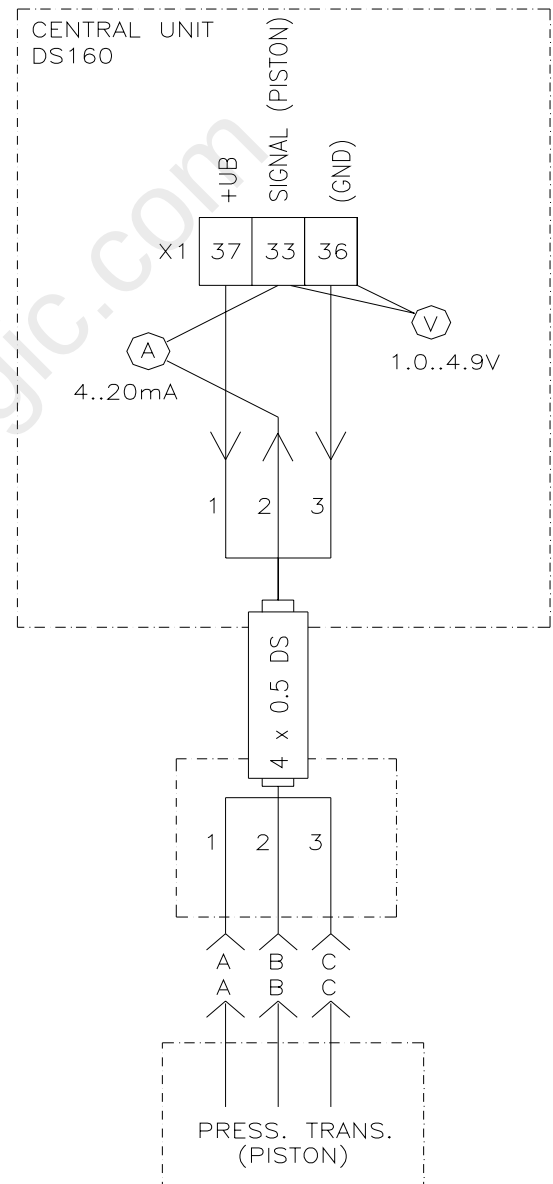
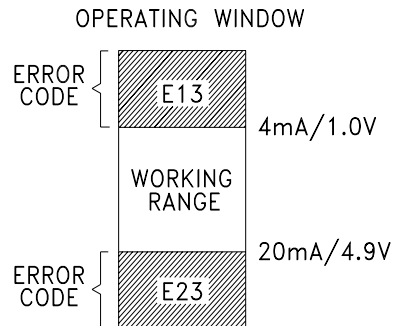
16.2 THEORY 2. OPERATION OF ROD SIDE LOAD SENSOR

Measuring current:

The ammeter (A) is used to measure current at the piston side input signal. Remove the wire from X1:33 terminal in the central unit and measure the current with the ammeter in series. The measurement should be between 4..20mA.

Measuring voltage:

The voltmeter (V) is used to measure voltage between pins X1:33 (rod side signal) and X1:36 (gnd) on the main board (024-050-300-030). The conversion of 4mA to the voltage of 1.0V is due to the resistor circuit on the main board.



Full Version Available

PAT DS 160 Load Moment Indicator Service Manual (031-300-190-142)

PAT DS 160 load moment indicator service manual with error codes, troubleshooting and upgrade procedures. 5 PDF files. Instant PDF download.

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