



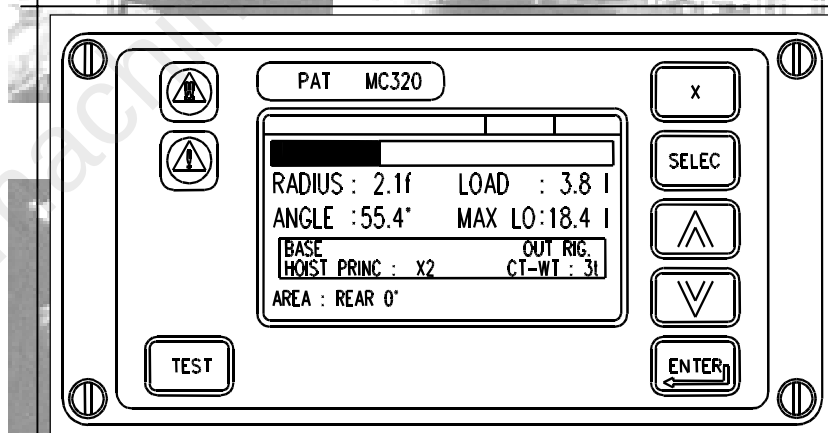
PAT

PAT

LOAD MOMENT INDICATOR

MC320

LMI for Hydraulic Boom Cranes



SERVICE MANUAL

P/N 031-300-190-121 Rev. -, 12/14/2000

1. MECHANICAL DESCRIPTION OF THE SYSTEM COMPONENTS

Pressure Transducer: The pressure transducer transforms hydraulic pressure into an electric analogue voltage signal. Two pressure transducers are connected, one to the rod side and one to the piston side of the lift cylinder. The pressure transducer is connected to the central unit with a four conductor, double shielded cable.

The power supply voltage is 24V.

The output signal is 4mA under 0 pressure to 20mA at max. pressure (4410psi)

The Length-Angle Transducer: The length-angle sensor (LWG) is a combination of two transducers in one box, fitted at the base section of the boom. It measures the length and the angle of the boom.

A reeling drum drives a potentiometer, which is the length transducer. Part of the length transducer circuit is the length cable on the drum, which is a two-conductor cable (screen and live). It is connected to the anti-two-block switch at the boom head and to a slip ring body in the LWG. The angle transducer is fitted in a small box filled with oil. A pendulum drives the axle of the angle potentiometer.

The power supply voltage for both is 5.00V

The output signal for the length transducer is: 0.500V up to 4.500V

The output signal for the angle transducer is: 1.875V up to 3.125V

Anti-Two-Block Switch: The anti-two-block switch monitors the load block and its relationship with the head of the boom. In working condition the switch is closed. When the hook block strikes the weight the circuit opens, disengaging a relay output to the lock out solenoid valves, where applicable. The weight at the anti-two-block switch keeps the switch closed until the hook block strikes it.

Console: The console displays all geometrical information such as length and angle of main boom, working radius and head height of the boom. It also displays the actual load and the maximum load permitted by load chart. Furthermore, it has an alarm horn, a warning light for overload, and a pre-warning light. The console is used to select crane configurations, which define a system operating mode. Selections include boom configuration, hoist, and reeving. It also has a warning light for anti-two-block conditions and an override switch for overload or anti-block condition. All the data of the crane are stored inside the console in EPROM's. The console gets all actual information of the crane sensors. This is computed against the reference data and the crane status continually monitored.

Duty Selection Switches (Digital Inputs): The system may have to be programmed for the lifting area configuration i.e. main boom, on outriggers, over front/rear, or over the side for 360 degrees. For this information, we use micro switches and slewing rails installed between the turret and superstructure, which is used to define specific slewing angle that are defined by the load chart. The digital inputs are define by software, use software documentation to define usage.

Junction Box: The junction box is mounted inside the cab and is a junction point for sensors, power, and console. The cables are led into the box through strain reliefs. An override switch is mounted on the junction box to override the LMI function. The system is protected by a 2 AMP fuse, which is mounted inside the box. The box is waterproof and sized to minimize moisture. The connection board is powered from the crane and supplies an output of 24, 12 and 5VDC to the console, sensors, and lock out functions. The signals from the sensors are then sent to the processor board in the console.

2.2 Definitions

BOOM LENGTH The straight line thru the centerline of boom pivot pin to the centerline of the boom point load hoist sheave pin measured along the longitudinal axis of the boom. (Indicator $\pm 2\%$)

BOOM ANGLE The angle between the longitudinal centerline of the boom base section and the horizontal plane. (Indicator 65° to 90° boom angle $+ 0^\circ/2^\circ$; less than 65° boom angle $+ 0^\circ/-3^\circ$)

RADIUS OF LOAD The horizontal distance from a vertical projection of the crane's center of rotation, to the center of the vertical hoist line or tackle with rated load applied. (Indicator 100% to 110%)

RATED LOAD The load value shown on the applicable load rating chart of the crane for the particular crane configuration, boom length, boom angle, or functions or these variables. For radii outside those shown on the load rating chart, the rated load is to be considered as zero.

ACTUAL LOAD The weight of the load being lifted and all additional equipment such as blocks, slings, sensors, etc. Also referred to as working load. (Indicator 100% to 110%)

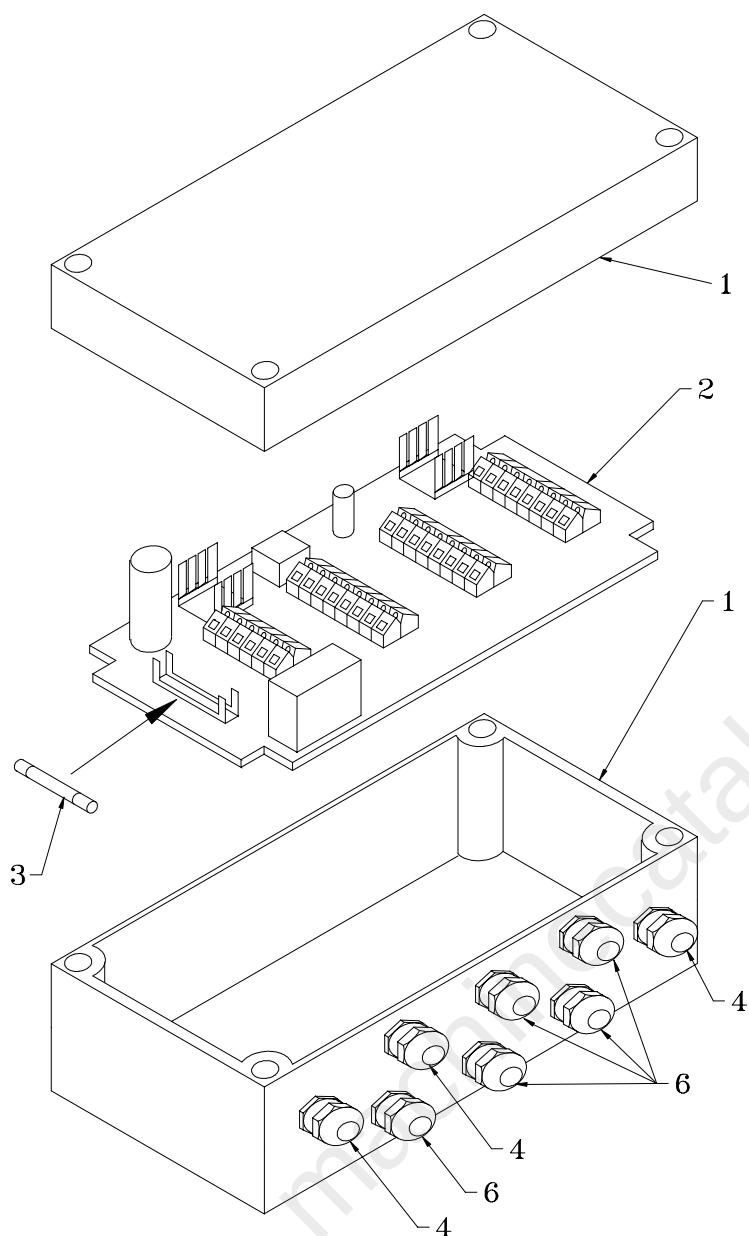
CRANE CONFIGURATION The physical arrangement of the crane as prepared for a particular operation in conformance with the manufacturer's operating instructions and load rating chart.

TWO-BLOCKING Contact of the lower load block or hook with the upper load block, boom point, or boom point machinery.

ANALOG Electrical signals that vary in proportion to the quantities they represent. (Boom length, angle, and pressure transducer)

DIGITAL Electrical signals of an on and off state (two different voltage levels) to represent some quantity of operation. (A2B, area definition switch)

3.6 Junction Box (P/N 031-300-060-257)

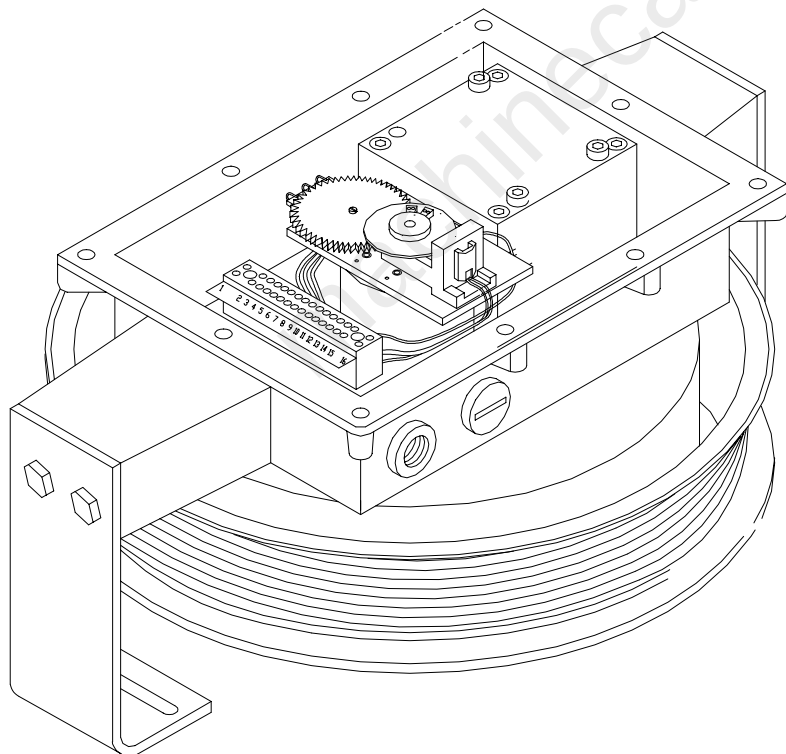


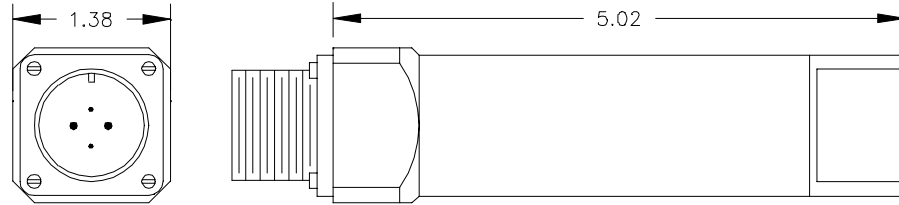
NO.	PART NO.	QTY	DESCRIPTION
01	031-300-110-104	1	JUNCTION BOX HOUSING
02	031-300-110-107	1	BOARD, CONNECTION MC320
03	123-429-917-860	1	FUSE, 2.5A 250V - 6,3X32
04	031-300-050-255	3	STRAIN RELIEF, PG11 GREEN (CABLE REEL)
*05	000-214-210-011	3	NUT, PG11
06	021-441-090-709	5	STRAIN RELIEF, PG9 BLK/WHT
*07	000-214-210-009	5	NUT, PG9
*08	031-300-110-105	1	KEYSWITCH
*09	031-300-110-106	1	KEY

* - Item not shown.

NO.	PART NO.	QTY	DESCRIPTION
01	006-710-006-002	1	SENSOR, LENGTH TRANS. LGE 100 (KT200/LWG208)
02	068-000-110-038	1	SENSOR ACCY, GEAR WHEEL, KT200 CABLE REEL
03	067-000-050-065	1	SENSOR ACCY, GEAR WHEEL, T=50 CENTER SHAFT
04	064-103-060-002	1	SENSOR, ANGLE WG103
05	002-050-206-012	2	SCREW, 6M X 12 SOCKET CAP
06	000-207-010-064	3	WASHER, FLAT 6MM
07	002-050-206-100	1	SCREW, 6M x 100M SOCKET CAP
08	000-208-040-083	1	WASHER, LOCK 6MM
09	068-000-100-064	1	SLIPRING, 2 CONDUCTOR (note 3 conductor slip ring maybe installed but only two conductors required.)
10	068-000-110-029	1	TERMINAL STRIP
11	068-000-110-010	1	SPRING PACK, W/ HOUSING KT200/LWG208/LWG221
12	068-000-110-011	1	CABLE REEL ACCY, CABLE DRUM,KT 200/ LWG208
13	000-673-020-002	139'	CABLE, LENGTH SENSOR, 1 CORE W/SHEILD (per ft)
14	006-800-005-058	1	BRACKET, MTG. CABLE REEL ARM, ONE SLOT
15	000-205-031-230	4	SCREW, 12mm x 30MM HEX HEAD
16	006-800-005-057	1	BRACKET, MTG. CABLE REEL ARM, TWO SLOTS
17	005-682-000-001	1	COVER, CABLE REEL, KT200
18	068-000-110-031	10	CABLE REEL ACCY, SCREW CABLE REEL COVER
19	021-441-131-013	1	STRAIN RELIEF, PG 13.5, 8-12mm RED+WHITE

3.8 Cable Reel LWG208

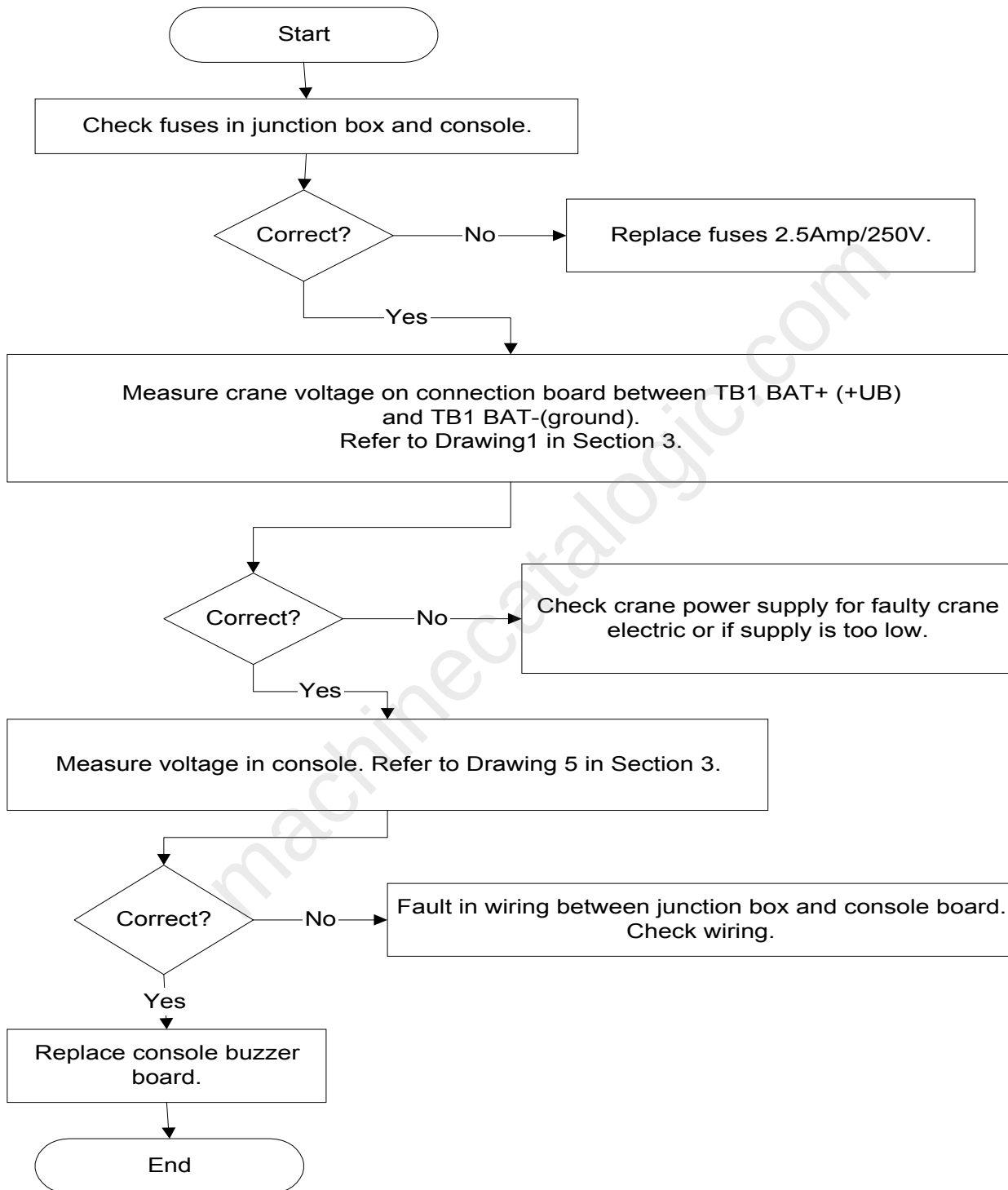


3.13 Pressure Transducer 044-314060-003**3.14 Pressure Transducer Cable Assembly 031-300-060-031 (16')**

16' pressure transducer cable

4.4 No Display

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



Full Version Available

PAT MC320 Load Moment Indicator Service Manual

PAT MC320 load moment indicator service manual with sensor adjustment, wiring diagrams and troubleshooting flowcharts. 37-page PDF. Instant PDF download.

VIEW THE FULL MANUAL

<https://machinecatalogic.com/pat-mc320-load-moment-indicator-service-manual/>

Book No: 031-300-190-121 · File Pages: 37 · File Count: 1 · File Language: English