DS-350 G/GW ERROR CODE TABLE

ERROR CODE	ERROR	CAUSE	ACTION
E01	Minimum radius or maximum angle range exceeded	Fallen below the minimum radius or above the angle given in the load chart due to raising the boom to far.	Lower boom back to a radius or angle given in the load chart.
E02	Maximum radius or minimum angle range exceeded	The maximum radius or minimum angle given in the load chart was exceeded due to lowering the boom too far.	Raise boom back to a radius or angle given in the load chart.
E03	Prohibited slewing range (no load area)	Slewing range prohibited with load.	Slew back into admissible range.
E04	Operating mode not available	Operating mode switch in the console set incorrectly. Operating mode is not permissible with actual crane configuration.	Set operating mode switch correctly to the code assigned to the operating mode of the crane.
E05	Length range not permitted	Boom has been extended too far or not far enough. Length sensor adjustment changed; i.e. length sensor cable slid off the cable drum.	Retract or extend boom to correct length given in the load chart.
E06	Fallen below angle range with luffing jib operation.	Fallen below the minimum jib angle specified n the respective load chart due to luffing out the jib too far.	Luff in the jib to a radius or angle specified in the load chart.
E07	No acknowledgment signal from overload relay (K1).	Overload relay is stuck, defective or not being selected.	Replace relay.
E08	No acknowledgment signal from Anti-Two-Block switch relay (K2).	Anti-Two-Block switch relay is defective or not being selected.	Replace relay.
E11	Fallen below limit for the measuring channel “length”.	a.) Cable between length sensor and central unit defective not connected or water in the connectors. b.)Length sensor Potentiometer defective. c.)Electronic board in the measuring channel defective.	a.)Check cable and connector as well and replace, if necessary. Section 6. b.)Replace and reset length sensor Potentiometer. See Section 6. c.)Replace main board and reset pressure channels.

ERROR CODE	ERROR	CAUSE	ACTION
E12	Fallen below lower limit value for the measuring channel “pressure transducer piston side”.	a.) Cable leading from the central unit to the pressure transducer defective, loose or water in the connector. b.)Pressure transducer on piston side defective. c.)Electronic component in the measuring channel defective.	a.)Check cable and connector as well and replace, if necessary. b.)Replace pressure transducer and reset pressure channel.. c.)Replace main board and reset pressure channels.
E13	Fallen below lower limit value for the measuring channel “pressure transducer rod side”.	a.)Cable leading from the central unit to the pressure transducer defective, loose or water in the connector. b.)Pressure transducer on rod side defective. c.)Electronic component in the measuring channel defective.	a.)Check cable and connectors as well and replace, if necessary. b.)Replace pressure transducer and reset pressure channel. c.)Replace main board and reset pressure channels..
E14	Fallen below lower limit value for the measuring channel “force”.	a.)Cable leading from the central unit to the pressure transducer defective, loose or water in the connector. b.)Force transducer defective. c.)Electronic component in the measuring channel defective.	a.)Check cable and connectors as well and replace, if necessary. b.)Replace force transducer. c.)Replace main board and reset pressure channels. .
E15	Fallen below lower limit value for the measuring channel “angle main boom”.	a.)Cable from central unit to the length/angle sensor defective or loose. b.)Angle sensor defective. c.)Electronic component in the measuring channel defective.	a.)Check cable. Replace if necessary. See Section 6 b.)Replace angle sensor and reset adjustment. c.)Replace main board and reset pressure channels. .
E16	Fallen below lower limit value for measuring channel “Luffing Jib Angle”.	a.)Cable from central unit to angle sensor defective or disconnected or water inside the plug. b.)Angle sensor defective. c.)Electronic component in the measuring channel defective.	a).Check cable as well as plug, replace if need be. b.)Replace angle sensor. c.)Replace Main board and reset pressure channels.

ERROR CODE	ERROR	CAUSE	ACTION
E17	Fallen below lower limit value for the measuring channel 7.	a.)Cable leading from the central unit to the sensor of channel 7 defective, loose or water in the connectors. b.)Sensor of channel 7 defective. c.)Electronic component in the measuring channel 7 defective.	a.)Check cable as well as connectors and replace, if necessary. b.)Replace sensor of channel 7 and reset adjustment. c.)Replace main board and reset pressure channels.
E19	Error in the reference voltage.	Electronic component on the main board defective.	Replace main board and reset pressure channels.
E20	No analog voltages	a.)The crane supply voltage is too low. b.)The voltage converter is defective or short circuit in the wiring.	a.)Check crane voltage. b.)Check supply voltages.
E21	Upper limiting value for the measuring channel “length” exceeded.	a.)Cable from central unit to the length/angle sensor defective or loose. b.)Length potentiometer defective. c.)Electronic component in the measuring channel defective on main board.	a.)Check cable. Replace if necessary. See Section 6. b.)Replace and reset length potentiometer. c.)Replace main board and reset pressure channels.
E22	Upper limiting value for the measuring channel “pressure piston side” exceeded.	a.)Cable from central unit to the pressure transducer defective, loose or water in the plug. b.)Pressure transducer on piston side defective. c.)Electronic component in the measuring channel defective on main board.	a.)Check cable as well as plug. Replace if necessary. b.)Replace pressure transducer and reset pressure channels. c.)Replace main board and reset pressure channels.
E23	Upper limit value for the measuring channel “pressure transducer rod side” exceeded.	a.) Cable from the central unit to press trans defective, not connected or water in the connectors. b.) Pressure transducer on rod side defective. c.) Electronic component in the measuring channel defective.	a.) Check cable and connectors as well and replace, if necessary. b.) Replace pressure transducer c.) Replace main board and reset pressure channels.

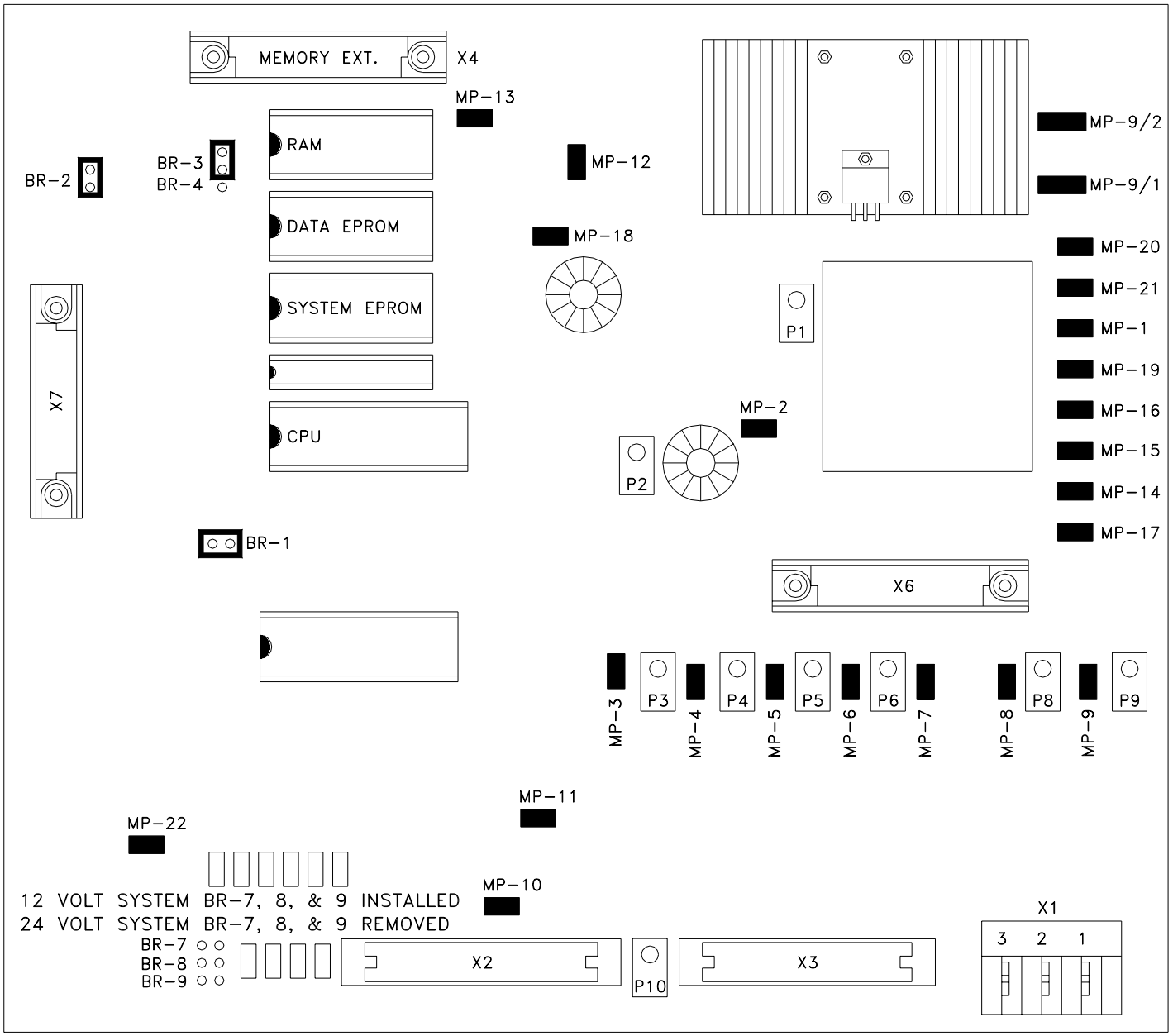
ERROR CODE	ERROR	CAUSE	ACTION
E24	Upper limit value for the measuring channel “force” exceeded.	a.) Cable leading from the central unit to the force transducer defective, not connected or water in the connectors. b.) Force transducer defective. c.) Electric component in the measuring channel defective.	a.) Check cable and connectors as well and replace, if necessary. b.) Replace force transducer. c.) Replace main board and reset pressure channels.
E25	Upper limit value for the measuring channel “angle main boom” exceeded.	a.) Cable leading from the central unit to the length/angle sensor defective, loose or water I the connectors. b.) Angle sensor defective c.) Electronic component in the measuring channel defective.	a.) Check cable as well as connectors and replace, if necessary. Section No. 6. b.) Replace angle sensor and reset adjustment. c.) Replace main board and reset pressure channels.
E26	Upper limit value for the measuring channel “Luffing Jib Angle” exceeded.	a.) Cable leading from the central unit to the jib angle sensor defective, loose or water in the connectors. b.) Jib angle sensor defective. c.) Electronic component in the measuring channel defective.	a.) Check cable as well as connectors and replace, if necessary. b.) Replace jib angle sensor and reset adjustment. c.) Replace main board and reset pressure channels.
E27	Upper limit value for the measuring channel 7 exceeded.	a.) Cable leading from the central unit to the sensor of channel 7 defective, loose or water in the connectors. b.) Sensor of channel 7 defective. c.) Electronic component in the measuring channel 7 defective.	a.) Check cable as well as connectors and replace, if necessary. b.) Replace sensor of channel 7 and reset adjustment. c.) Replace main board and reset pressure channels.
E29	Reference voltage defective.	a.) The total of the supply and the reference voltages on MP10 is more than 3.3V b.) A/D converter defective.	a.) Check supply voltages. b.) Replace main board and reset pressure channels.

ERROR CODE	ERROR	CAUSE	ACTION
E31	Error in the system program.	a.) EPROM with system program defective. b.) Electronic component on the main board defective.	a.) Replace system program EPROM b.) Replace main board and reset pressure channels.
E37	Error in the program run	a.) EPROM with system program defective. b.) Electronic component on the main board defective.	a.) Replace system program EPROM. b.) Replace main board and reset pressure channels. .
E38	Wrong system program in the LMI.	The system program in the LMI does not correspond to the programming in the data EPROM	Replace system program EPROM
E 41	Error in the external RAM.		Replace main board and reset pressure channels. Section7
E 42	Error in the external write/read memory (RAM).	Internal defect in digital part of CPU.	Exchange write/read memory (CMOS-RAM). Replace main board and reset pressure channels. See Section 7.
E 45	Error in internal communications.	Defective electronic component.	Replace main board and reset pressure channels. Section 7.
E 48	Malfunction in the monitored write/read memory.	Internal defect in digital part of CPU	Replace main board and reset pressure channels.
E 51	Error in data memory.	Data EPROM on the main board defective.	Replace Data EPROM. Make sure BR3 on the main board is installed.
E71	Incorrect acknowledgment of the 1. Relay on the terminal board A101.	a.) Anti Two-block relay is stuck or defective. b.) Anti Two-Block relay is not being selected due to a break on the terminal board A101, main board or ribbon cables.	a.) Replace 1. relay. b.) Check terminal board A101, main board and ribbon cables as well as replace defective part, if necessary.
E72 - E77	Analogous to E71 for the relays 2...7.	Analogous to E71 for the relays 2...7.	Analogous to E71 for the relays 2..7.

ERROR CODE	ERROR	CAUSE	ACTION
E89	Change of the operating code during lifting a load.	The operating mode switch in the console was used during lifting a load.	Lower the load and set the operating mode switch correctly to the code assigned to the actual operating mode of the crane.
E 91	No data transmission from console to central unit. (See Section 8 and 9)	a.)This causes no display. b.)Interruption or accidental ground in the line from console electronics to central unit. c.)Transmitter/receiver module defective.	a.)Check the connection between console electronics and central unit. b.)If you find an accidental ground, the transmitter module in the console electronics can be damaged. You should, therefore, replace the console electronics. Replace console electronics or main board respectively.
E92	Error in the data transmission from console to central unit. (See also Section 8 and 9)	a.) Temporary interruption of the data line from console electronics to central unit. b.) Transmitter/receiver module defective.	a.) Check the connection between console electronics and central unit.
E93	Error in the data transmission from central unit to console. (See also Section 8 and 9)	a.) Temporary interruption of the data line from console electronics to central unit. b.) Transmitter/receiver module defective.	a.) Check the connection between console electronics and central unit. b.) Replace console electronics or main board respectively.

ERROR CODE	ERROR	CAUSE	ACTION
E94	No data transmission from central unit to console.	a.) Interruption or accidental ground in the line from console electronics to central unit. b.) Transmitter/receiver module defective. c.) Data-EPROM defective. d.) CPU defective. e.) Electromagnetic interference (when switching contractors or valves)	a.) Check the connection between console electronics and central unit. If you find an accidental ground, the transmitter module in the console electronics can be damaged. Replace the console electronics. b.) Replace console electronics or main board respectively. c.)Check data EPROM. d.) Replace main board. e.) Eliminate interference source by inverse diodes or varistors.
E95	Error in the crane data EPROM	a.) Data EPROM defective b.) Position of jumper for the selection of the type of EPROM is wrong c.) Electronics component on the main board defective.	a.) Replace data EPROM b.) Check the jumper position c.) Replace main board and reset pressure channels.
E96	Error in the internal RAM of the CPU of the console	CPU or main board of the console defective	Replace console main board & Appendix A.
E97	Error in the external RAM of the CPU of the console	a.) External RAM of the console defective b.) Electronic component on the main board defective.	a.) Replace console main board b.) Replace console main board
E98	Wrong jumper position in the console	a.) The jumper position BR 9/BR 10 in the console does not correspond to the actual type of central unit. b.) Electronic component on the main board defective.	a.) Check the jumper position b.) Replace console main board.

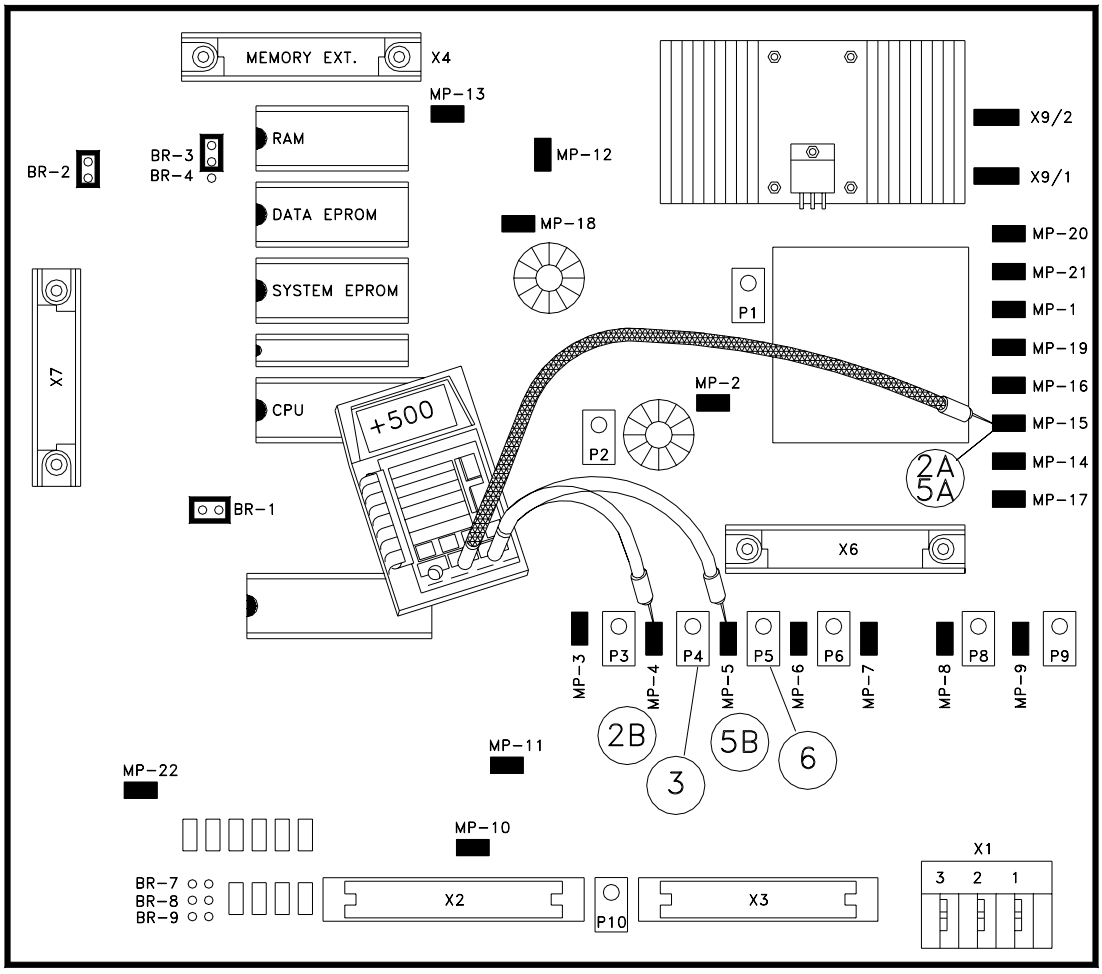
BASIC ADJUSTMENT AND VOLTAGE CHECKS



MP TEST POINTS

MP- 1 = +5V
MP- 2 = -5V
MP- 3 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 4 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 5 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 6 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 7 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 8 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP- 9 = ANALOG MEASURING CHANNEL REFERENCE SOFTWARE
MP-9/1 = COMPUTER GND
MP-9/2 = CRANE GND
MP-10 = +3V REFERENCE VOLTAGE
MP-11 = GROUND
MP-12 = +5V
MP-13 = DIGITAL GROUND
MP-14 = +9V
MP-15 = ANALOG GROUND
MP-16 = -9V
MP-17 = +5V
MP-18 = +5V
MP-19 = -5V
MP-20 = OPERATING VOLTAGE
MP-21 = INPUT VOLTAGE

Main Board - Piston & Rod Pressure Channel Zero Point Adjustment



1. LOWER BOOM ALL THE WAY DOWN (NO REST PRESSURE) THEN DISCONNECT HYDRAULIC HOSE FROM THE PISTON SIDE PRESSURE TRANSDUCER.
2. CONNECT A DIGITAL VOLTMETER TO MAIN P.C. BOARD
   A) BLACK (-) LEAD TO MP15
   B) RED (+) LEAD TO MP4
3. ADJUST P4 TO OBTAIN A READING OF 0.500 VOLTS (500MV) ON METER.
4. DISCONNECT HYDRAULIC HOSE FROM THE ROD SIDE PRESSURE TRANSDUCER.
5. CONNECT A DIGITAL VOLTMETER TO MAIN P.C. BOARD
   A) BLACK (-) LEAD TO MP15
   B) RED (+) LEAD TO MP5
6. ADJUST P5 TO OBTAIN A READING OF 0.500 VOLTS (500MV) ON METER.
7. RECONNECT HYDRAULIC HOSES TO PRESSURE TRANSDUCERS, THEN BLEED THE AIR FROM HYDRAULIC LINES.