1 THEORY

THEORY - OPERATION OF BOOM LENGTH SENSOR

The system sensors provide a 4 to 20mA output; however, due to a fixed resistor circuit in the central unit, the input signal can be measured using ammeter (current) or voltmeter (voltage). The input signal operating window is 4 to 20mA, measured in series at the analog input terminal OR 1.1 to 5.5V, measured in parallel between the analog input and ground (GND) terminals. At 4mA the voltage is 1.1V and at 20mA the voltage is 5.5V. When troubleshooting this system, a current or voltage needs to be measured to determine the status or condition of the sensor.

Measuring current:

The ammeter (A) is used to measure current at the length input signal. Remove the wire from X1:27 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 X1:27 (length signal) and X1:28 (gnd) on the main board (024-352-300-001 / 9333103287). The resistors are there to show that at 4mA the voltage is 1.1V because current multiplied with resistance equals voltage; therefore, 4mA x 275 ohms (total resistance) = 1.1V.