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# LOAD MOMENT INDICATOR

## iFLEX5


SERVICE MANUAL

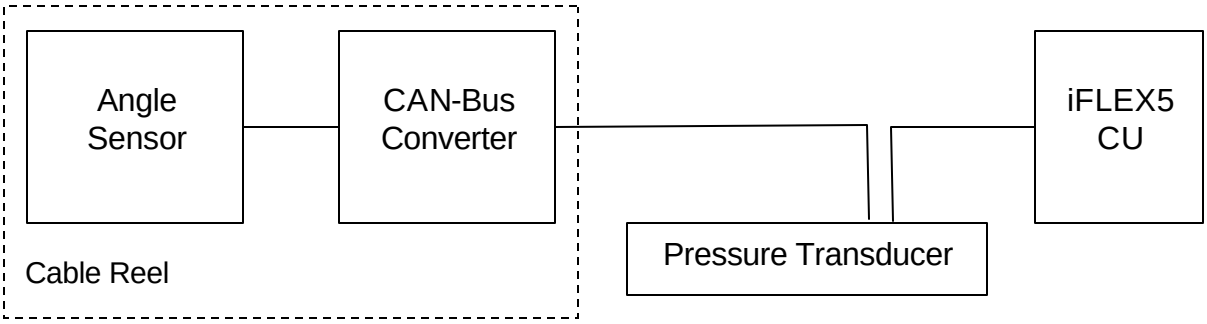
9333104048

P/N 031-300-190-154 REV F 07/29/2003

# 5 ANGLE SENSING

The System measures the angle of the main boom of the machine with an angle sensor. The angle sensor is contained within the cable reel, located on the left side of the main boom.

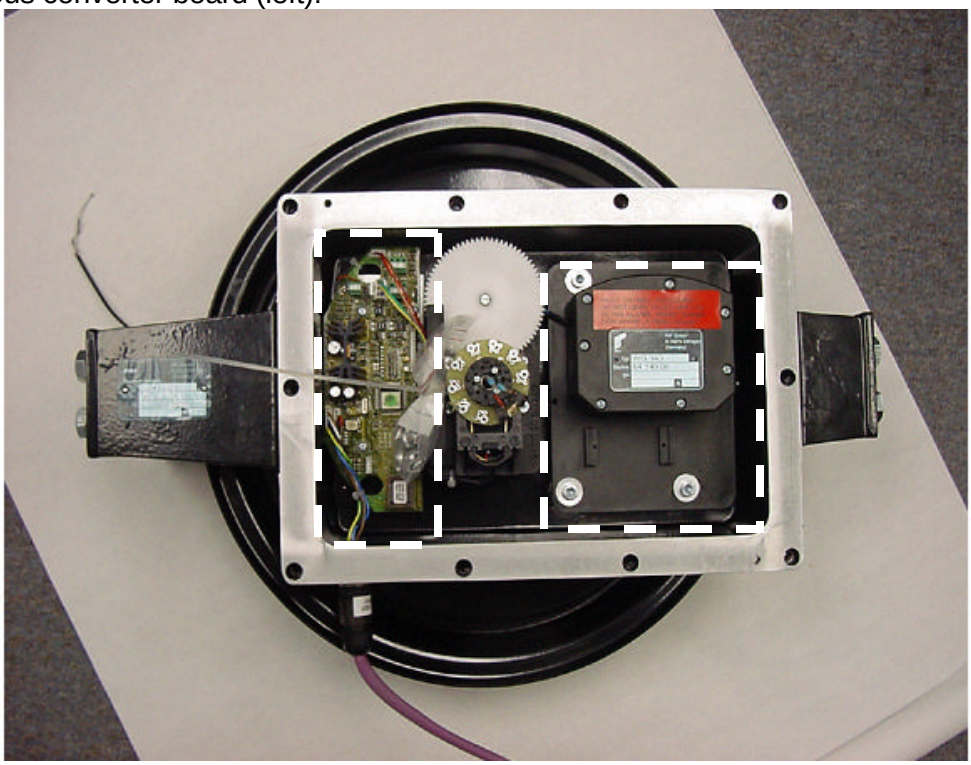
Block Diagram




The signal runs from the angle sensor to the Can-Bus converter board, both located in the cable reel. From there, it travels as digital information on the CAN-Bus to the pressure transducer, which acts as a T-connector to the main CAN-Bus running to the central unit.

So, what do you do when you are having a problem with your angle read-out?

Start by verifying the angle display. Refer to the section "Troubleshooting A Sensor Problem Using The Display" to call up the sensor signal on your console display. The CAN-Bus is digital and as such will either transmit the signal correctly or not at all. If your readings are off, you have to determine what is causing the problem. Start by opening the cable reel and locate the angle sensor (right) and the CAN-Bus converter board (left):



# 11 A2B PROBLEM

First, perform the following operations:

Are the control levers locked out and is the crane in an anti-two block condition?

YES, Lower the hook block and/or headache ball to correct two-block condition. If two (2) hoists are in use, both hooks must be lowered.

Is the anti-two block warning light on? Check Bypass plug installed, if not plug appropriate bypass plug into socket of junction box.

Is the Bypass plug installed and the anti-two block warning light on?

Turn power off, remove the bypass plug, and measure the resistance at the boom nose box between terminals 1 and 3 with an ohmmeter. This checks the function of the Anti-Two Block switch. Switch closed = 0Ohms (weight installed); Switch open => 1 Megaohm (weight removed) Ohmmeter reading are correct?

YES, Plug the bypass plug into the boom nose box and refer to system wiring to check wire connections in boom nose box. If wiring is correct, replace Anti-Two-Block switch.

Ensure the bypass plug is plugged into the boom nose box. Measure the A2B signal in the cable reel between X1:Brown and X2:Red wires on the slip ring with an ohmmeter. Switch closed =4700 ±500Ohms; Switch open => 1 Megaohm. Ohmmeter readings are correct?

NO, Check for damaged length cable and wiring. If broken length cable, refer to system wiring.

Measure the A2B signal in the cable reel between terminal 7 and 8 with an ohmmeter. Switch closed =4700 ±500Ohms; Switch open => 1 Megaohm. Ohmmeter readings are correct?

NO, Replace slip ring
Problem with wiring harness, cable reel length/angle board, and/or central unit.

## 14.4 RT9000E / RT800E IFLEX5 BCS DIGITAL OUTPUTS:

table 2

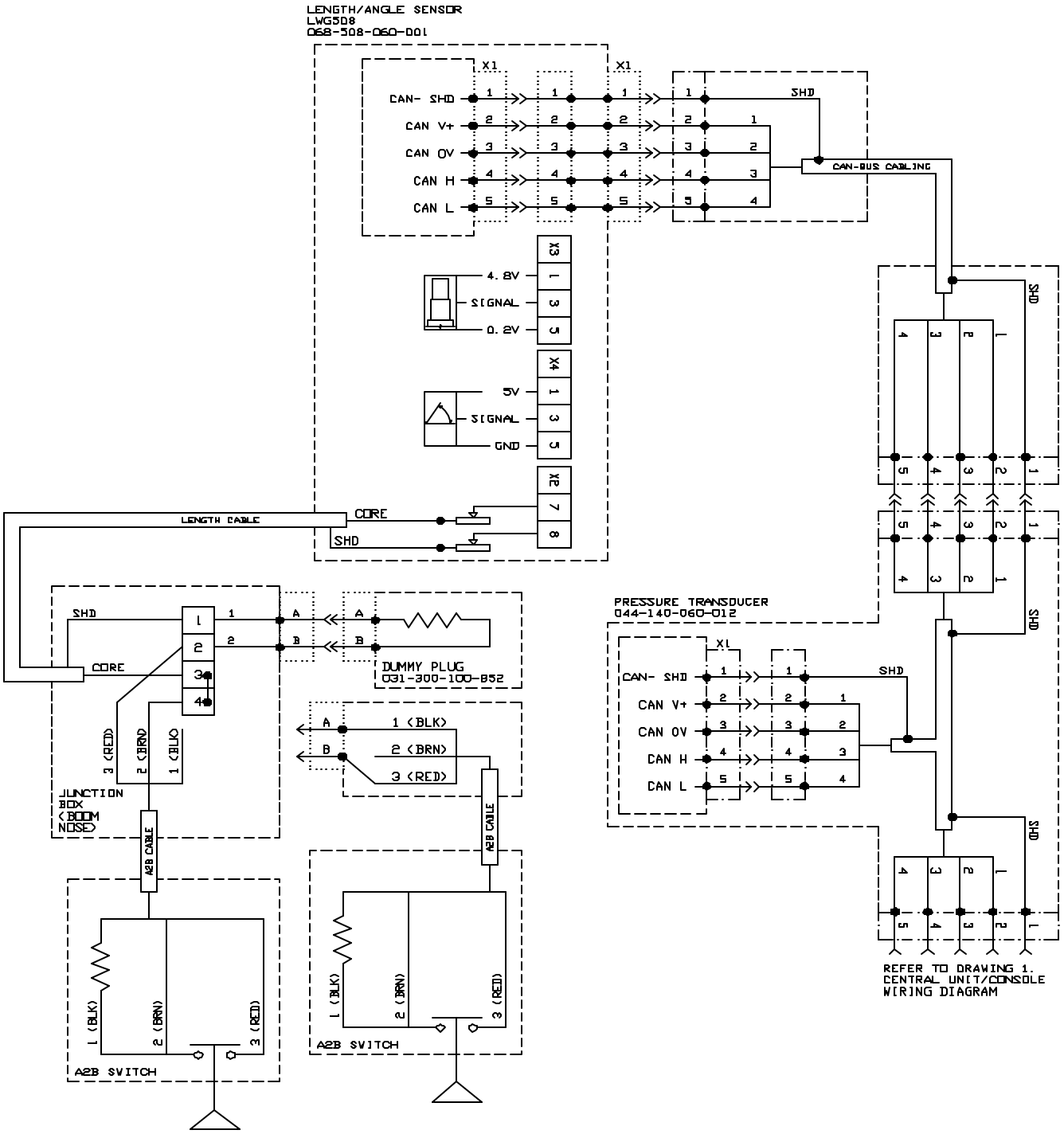
| Digital Output | Description | C.U. X2 Terminal |
|---|---|---|
| 1 | PWM 1 CM Proportional Solenoid | 2 |
| 2 | +UB CAN bus | 3 |
| 3 | PWM 2 IM Proportional Solenoid | 4 |
| 4 | +UB to Slew Potentiometer Electronics | 5 |
| 5 | PWM 3 Luffing Extension Proportional Solenoid | 6 |
| 6 | CM Extend Relay K1 Coil in Junction Box | 7 |
| 7 | PWM 4 Luffing Extension Proportional Solenoid | 8 |
| 8 | IM Extend Relay K2 Coil in Junction Box | 9 |
| 9 | Luffing Extension Raise Solenoid | 14 |
| 10 | External LMI Alarm, Option on Boom | 15 |
| 11 | Luffing Extension Lower Solenoid | 16 |
| 12 | Rear Axle Oscillate Signal | 17 |
| 13 | Tele Rod Drain Solenoid | 18 |
| 14 | Boom Out of Sequence Lamp | 19 |
| 15 | Tele Two Stage Relief Solenoid | 20 |

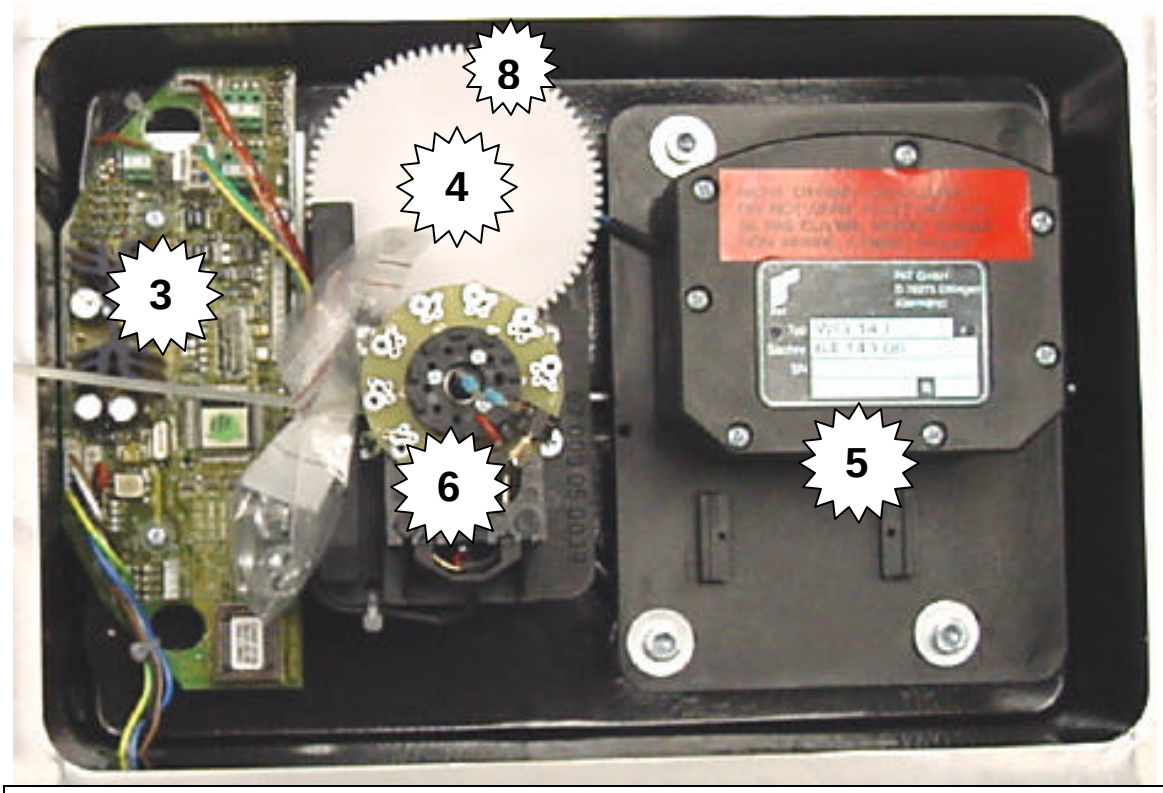
*C.U. = Central Unit

**MP = Measuring Point; i.e. R89 designates resistor number; see sketches below for specific location; Notes: must measure on bottom leg of the resistor.

DO 1 = PWM 1
DO 3 = PWM 2
DO 5 = PWM 3
DO 7 = PWM 4

## 15.3.2 Cable Reel (length/angle sensor) Wiring Diagram



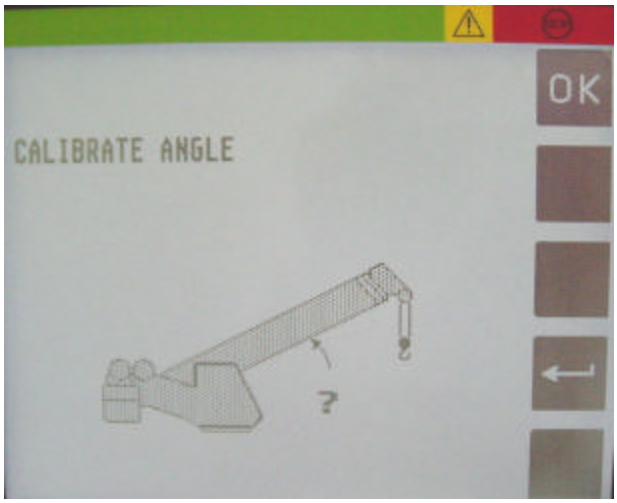


## 17.5 ANGLE SENSOR CALIBRATION PROCEDURE

Material required – calibrated inclinometer.

See section Activating the Service Screen for Sensor Calibration on how to access the angle sensor calibration screen.

Select the angle calibration by pressing “OK” at the calibrate angle screen.



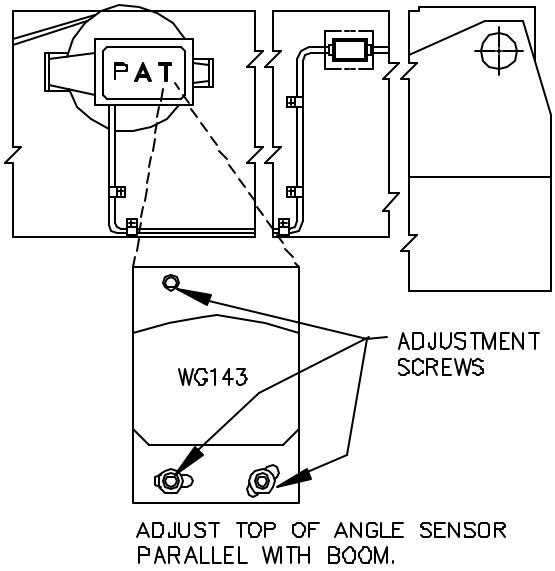

With fully retracted main boom, boom down to a flat angle close to zero degrees, making sure you stay within the allowed operating range.

Using the calibrated inclinometer placed flat on the main boom, verify that the indicated boom angle matches the measured boom angle within +/- 0.2 degrees.

If not, mechanically adjust the angle sensor.

The angle should be set to be +/-0.1 of the measured angle.

Press “OK” when the sensor is mechanically set.



| Error Code | Error | Possible Cause | Elimination |
|---|---|---|---|
| **EC0** | Prohibited area | • Boom is about to collide with the engine hood, switch off | • Move boom to permitted area |
| **EC1** | Approaching prohibited area | • Boom is about to collide with the engine hood, prewarning | • Move boom to permitted area |

Note:
If an error message is displayed which is not contained in above list, please contact the PAT service department.