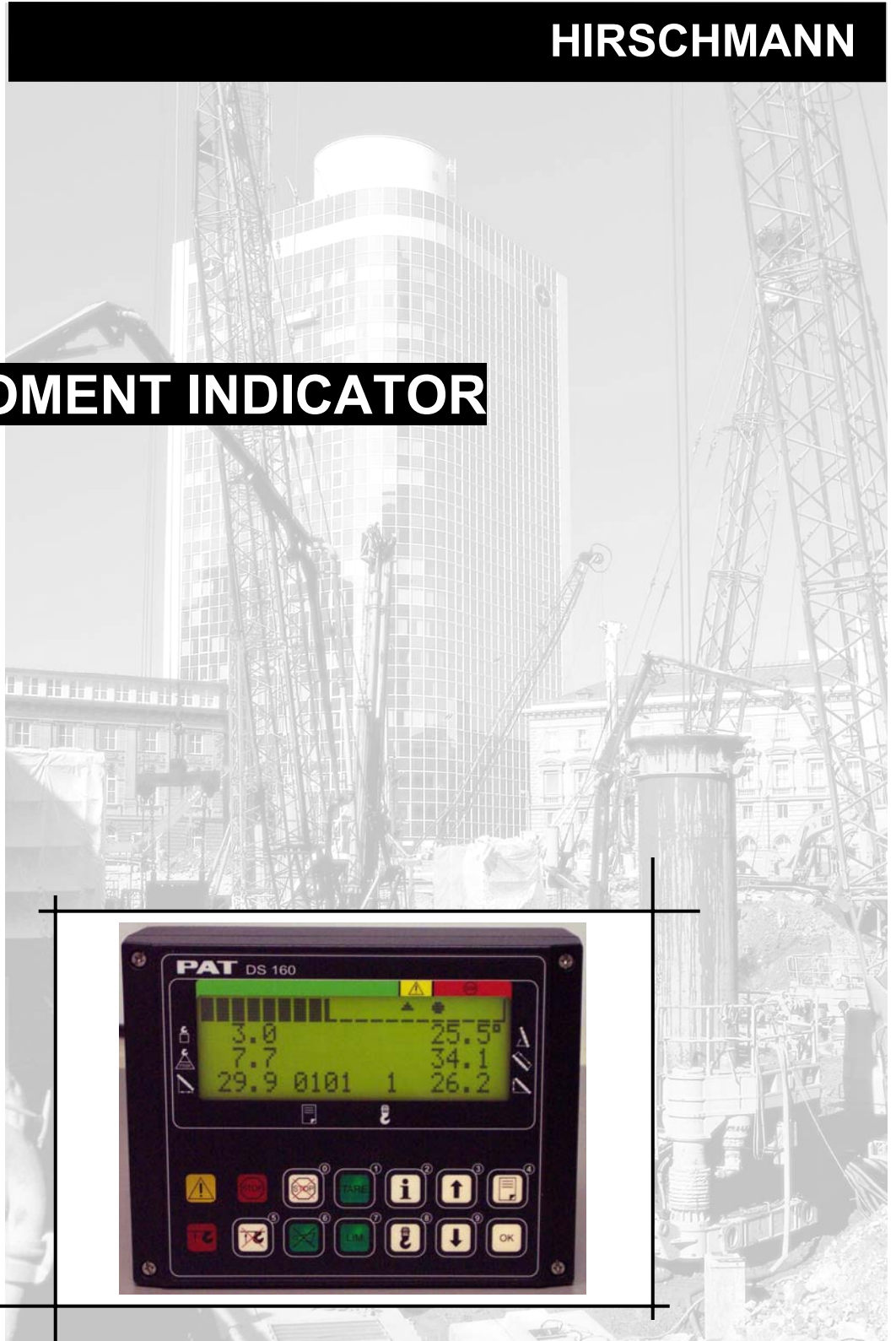




HIRSCHMANN

PAT
LOAD MOMENT INDICATOR

DS 160



SERVICE MANUAL

P/N 031-300-190-142 REV. G, 02/16/2006

NOTICE

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MANUAL REVISIONS

REV	DATE	NAME	DESCRIPTION
-	11/26/01	CSH	Service Manual created.
A	3/29/02	CSH	ECN 02-100
B	4/29/02	JRR	ECN 02-157
C	6/13/02	CSH	ECN 02-182
D	5/26/05	SB	ECN 05-102
E	9/26/05	MWS	ECN 05-175
F	11/10/05	MJ	ECN 05-208
G	02/16/06	SB	ECN 06-142

17 DS50C TO DS160 UPGRADE INSTALLATION

The following procedure is an installation guide for the DS160 system when upgrading from a DS50C system. The console and central unit are new installations. The cable reel internal components will be replaced with 4.20mA length and angle sensors. The new 4.20mA pressure transducer and adaptors will replace the existing passive pressure transducers.

031-300-101-552

KIT, DS160 BOOM UPGRADE DS50 TO LWG308

ITEM	PART NUMBER	QTY	DESCRIPTION
1	064-143-060-005	1.0	SENSOR, ANGLE WG143/5 90 DEG.W/MTG. FOR LWG308/1/2 4.20mA
2	000-205-020-616	3.0	SCREW, 6mm X 16mm SOCKET CAP
3	000-207-020-064	3.0	WASHER, FLAT 6mm S.SDIN 9021-ST-A2
4	068-000-300-018	1.0	SENSOR, LENGTH POT. LPE0018CURRENT AMP OUTPUT 4..20mA
5	092-000-060-202	1.0	CABLE, MODULAR LENGTH & ANGLESENSOR 3p 32cm
6	068-000-300-060	1.0	BOARD, TERMINAL W/EMC FILTERSFOR LG/LWG308 W/CURR. LOOP OUT
7	000-205-370-306	2.0	SCREW, 3mm x 6mm PH. PH.
8	000-212-010-325	4.0	HARDWARE, STANDOFF 3mm x 25 MF5mm HEX
9	002-060-100-301	4.0	NUT, 3MM HEX
10	000-208-030-030	4.0	WASHER, 3mm CONCAVE BELLVILLEFOR ELECTRONIC BOARDS
11	031-300-060-414	1.0	CABLE ASSY, 7COND 18' 7 PINPLUG, FOR CABLE REEL ASSEMBLY
12	123-429-907-910	5.0	WIRING ACCY, CRIMP FERRULE, 20AWG, INSULATED, WHITE
13	123-429-907-890	3.0	WIRING ACCY, CRIMP FERRULE, 14AWG, INSULATED, BLUE
14	031-300-050-255	1.0	STRAIN RELIEF, PG11 GREEN EMI/RFI 8-10.5mm
15	000-214-261-311	1.0	STRAIN RELIEF, PG13.5/PG11REDUCER
16	000-214-340-013	1.0	STRAIN RELIEF, PG13.5 HOLEPLUG

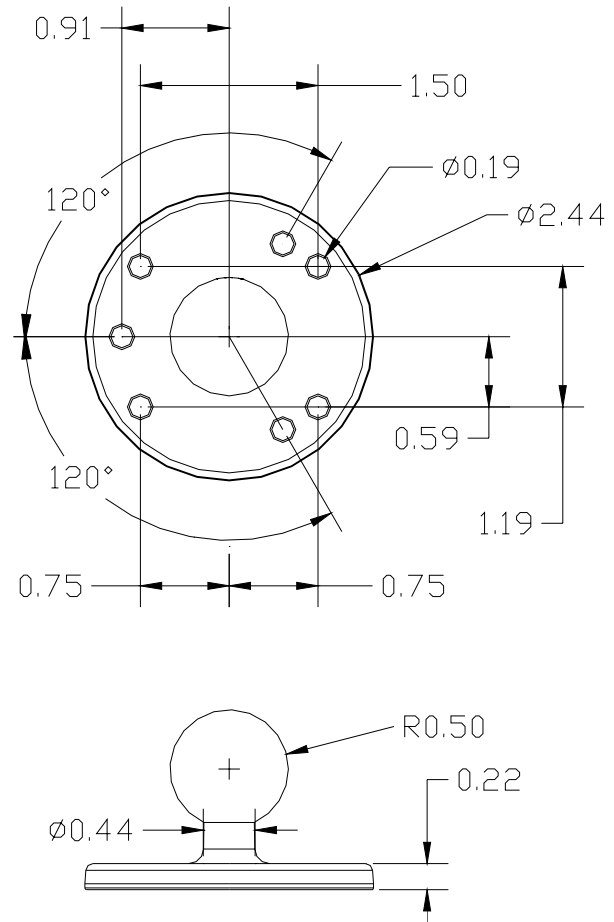
031-300-101-579

KIT, DS160 CU, CONSOLE, PT, & SOFTWARE, US BASE KIT

ITEM	PART NUMBER	QTY	DESCRIPTION
1	031-300-060-645	1.0	CENTRAL UNIT ASSY, DS160/0003RETRO W/90° CONSL CBL & H DAVS
2	031-300-060-362	1.0	CONSOLE ASSY, DS160 W/RAMMOUNT
3	031-300-050-589	1.0	CONSOLE ACCY, PCS30.5 MOUNTING1" BALL W/2.437" DIA PLATE
4	031-300-050-485	6.0	SCREW, #10-24 X 5/8 PH. PH. SSMACHINE SCREW
5	031-300-050-489	6.0	NUT, #10-24 LOCK NYLON INSERT
6	000-207-010-053	6.0	WASHER, FLAT #10
7	000-209-140-016	2.0	SENSOR ACCY, CUTTING RING DKA16 (PRESSURE TRANSDUCERS)
8	031-300-060-452	2.0	SENSOR, PRES.TRAN.DAVS300/34014.20mA,300 bar,M12,9/16-18
9	031-300-050-689	2.0	HYDR, ADAPTER, 9/16-18 UNF-2B;M16 X 1.5
10	021-441-110-811	1.0	STRAIN RELIEF, PG11 6mm, GREEN+WHITE INSERT
11	031-300-050-255	1.0	STRAIN RELIEF, PG11 GREEN EMI/RFI 8-10.5mm
12	031-300-190-139	1.0	MANUAL, OPER, DS160
13	031-300-190-142	1.0	MANUAL, SERV, DS160

17.1 Console Mounting

The console has a mount that allows the console to be swiveled into any direction and to be mounted in a variety of locations and on nearly any surface. Choose a location that is in line of site of the sensor and within reach of the operator. Securely attach the two RAM mount bases onto a solid surface for the left and right side operation. The console cable may not fit through goose neck/conduit as existing wiring; therefore, run the console cable to the outside of the conduit and insure there no interference. Refer to 13.6 Console DS160/0005 / Parts List.



17.2 Central Unit Mounting

Mount the central unit in covered but accessible location. You will need to remove the cover and access the EPROM's and main board. The central is supplied with 4 mounting weld tabs or can be bolted in place. Refer to 13.4 Central Unit Main Board Termination and Breakdown / Parts List for CU dimensions and 13.3 System Wiring Diagram.

17.3 Software

The existing software for the DS50C must be sent to Hirschmann Electronics. The data on the EPROM's will be reconfigured for the DS160. **Use the EPROM module supplied with the DS160.**

17.4 Pressure Transducer Replacement

Use the 031-300-050-689 hydraulic adapter (9/16-18 UNF-2B;M16 X 1.56-18 UNF-2B) to replace the existing passive pressure transducers with the new 4.20mA pressure transducer. Refer to 13.8 Pressure Transducer (DAVS300 / 3401)

17.5 DS160 COMPONENT INSTALLATION PROCEDURE

1. Retract the boom fully. Refer to the manufacturer's operator's manual and familiarize yourself with its operation and the LMI bypass. Lower the boom to gain access to the DS 50 system.
2. Switch crane power off.
3. Remove the cable reel cover face by loosening all 10 screws. The screws should remain secured in the lid.
4. Remove all connections located at X-1, X-2, X-7 and X-8.
5. Remove the two screws that secure the EPROM module and remove it.



(2) screws that secure the EPROM module

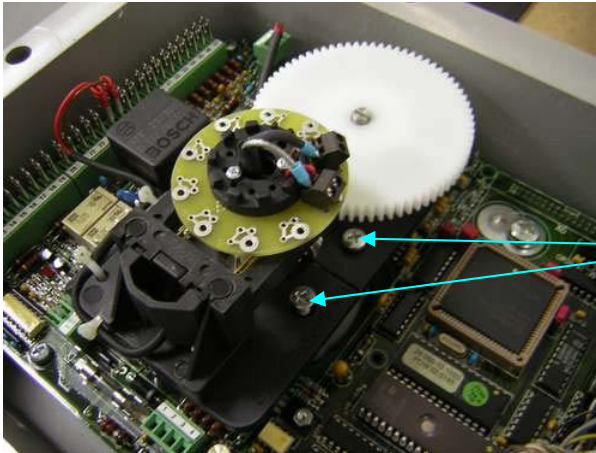
The EPROM is a sensitive device and can be damaged if not handled properly. To prevent damage, discharge any static electricity in your body before handling the EPROM's. This can be accomplished by touching a grounded surface.

WARNING: Do not re-use the DS50 EPROM module in the cable reel, as damage may occur to the DS160 system.

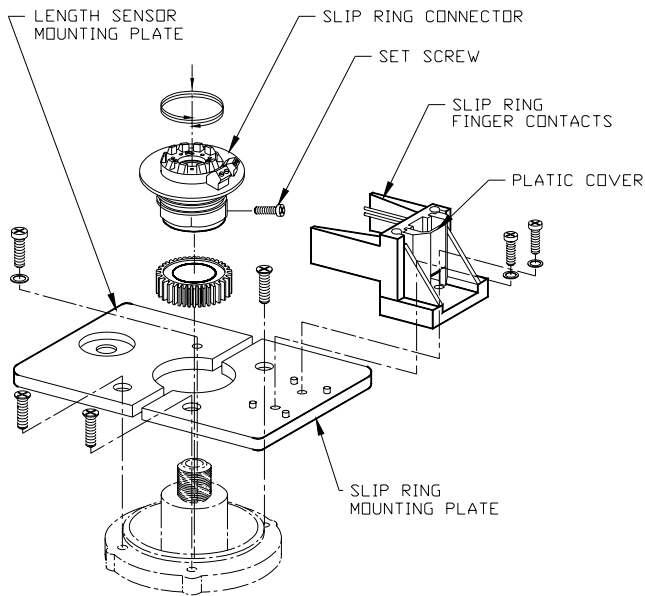
6. Remove the two screws that secure the gear wheel guardrail.



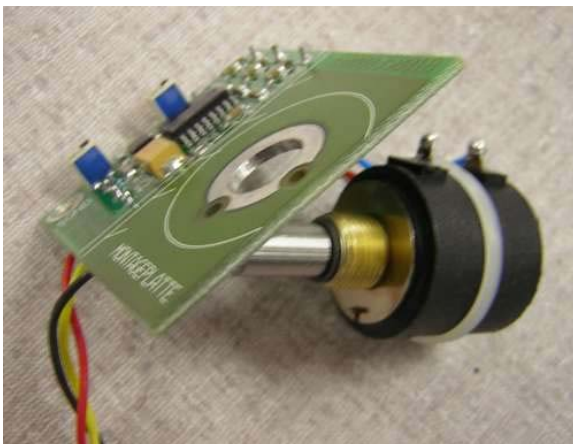
- Remove the (4) screws holding the slip ring/length sensor mounting plates and remove the slip ring and length sensor assemblies.



Mounting plate screws



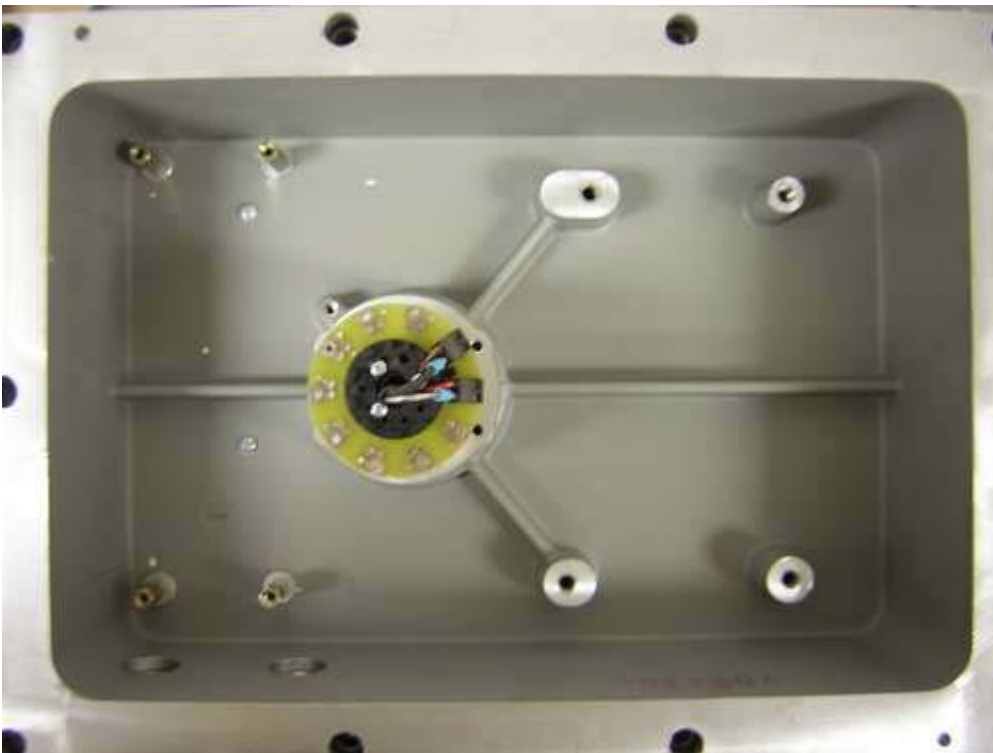
- Replace the length sensor potentiometer (068-000-300-018) with the pot + board and JST wire assembly provided. The length pot is keyed not to turn as shown below and should be installed in the plastic mounting plate.



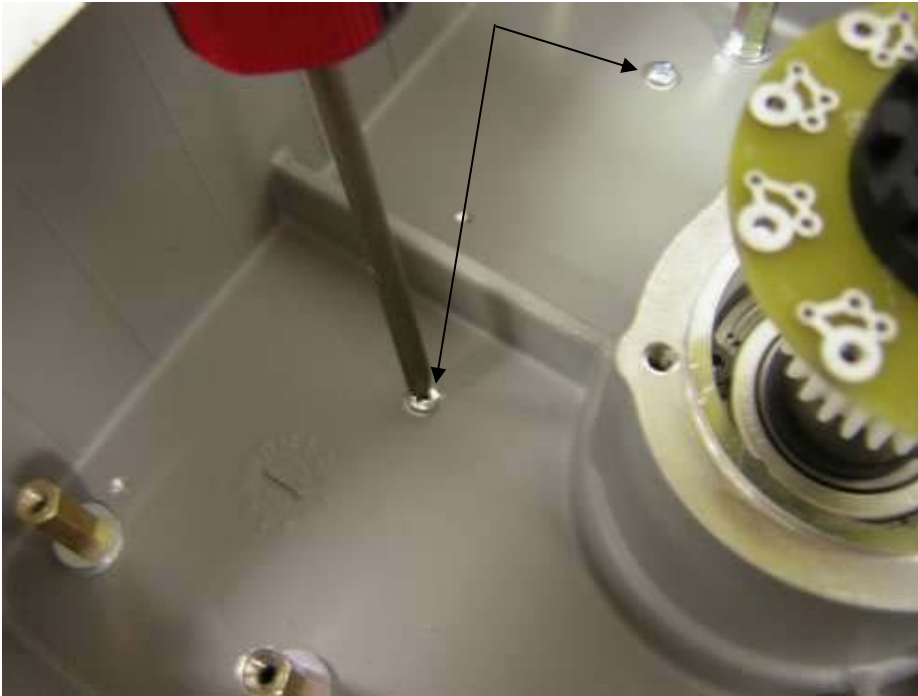
9. Locate the (8) Philips screws that secure the main board to the cable reel housing and carefully remove the screws.



10. Carefully remove the main board.



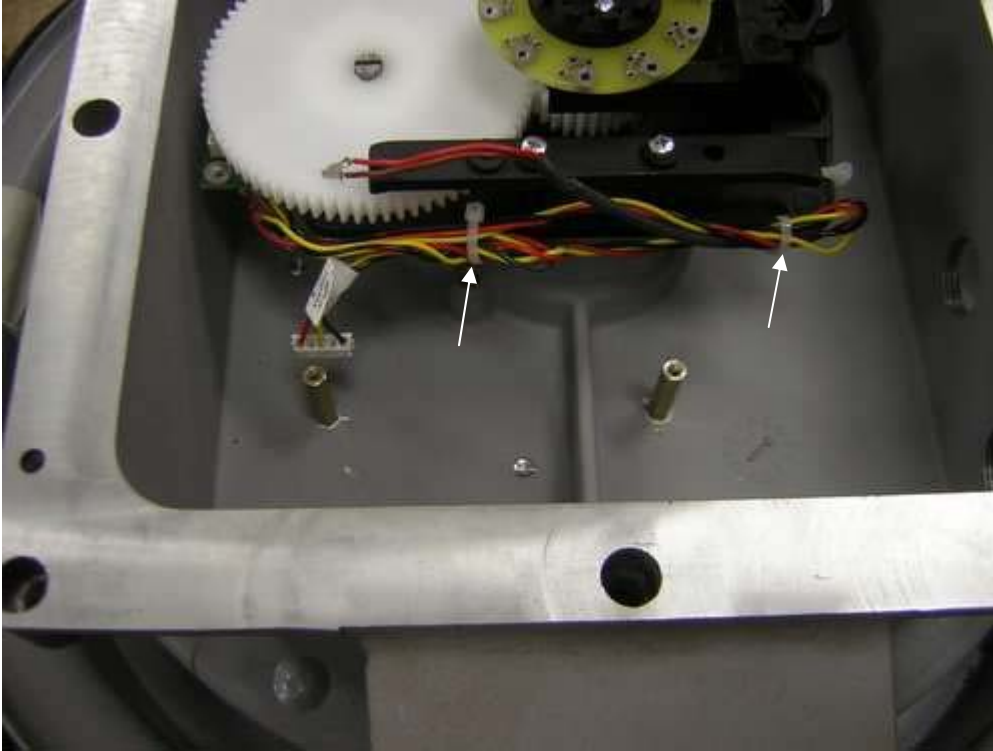
11. Remove (2) screws in the bottom of the cable reel as shown and install (2) M3 x 25mm standoffs as seen in the two photographs below.



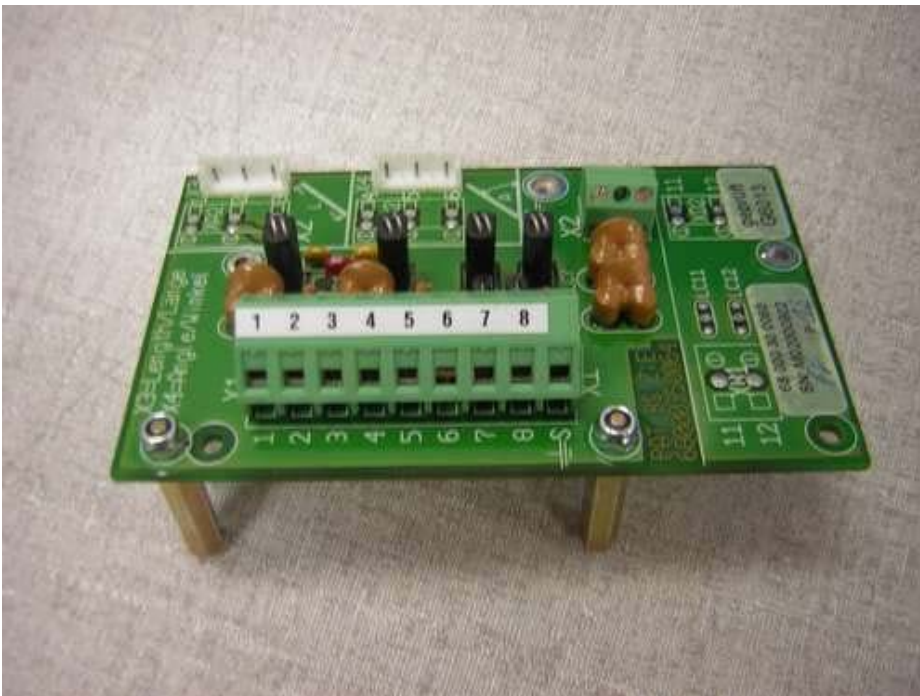
12. Reinstall the slip ring/length sensor and mounting plates (previously removed in step 7) into the cable reel and tighten the (4) screws.
13. Install angle sensor (064-143-060-005) into the cable reel using the (3) M6x16mm screws and washers provided in the kit.



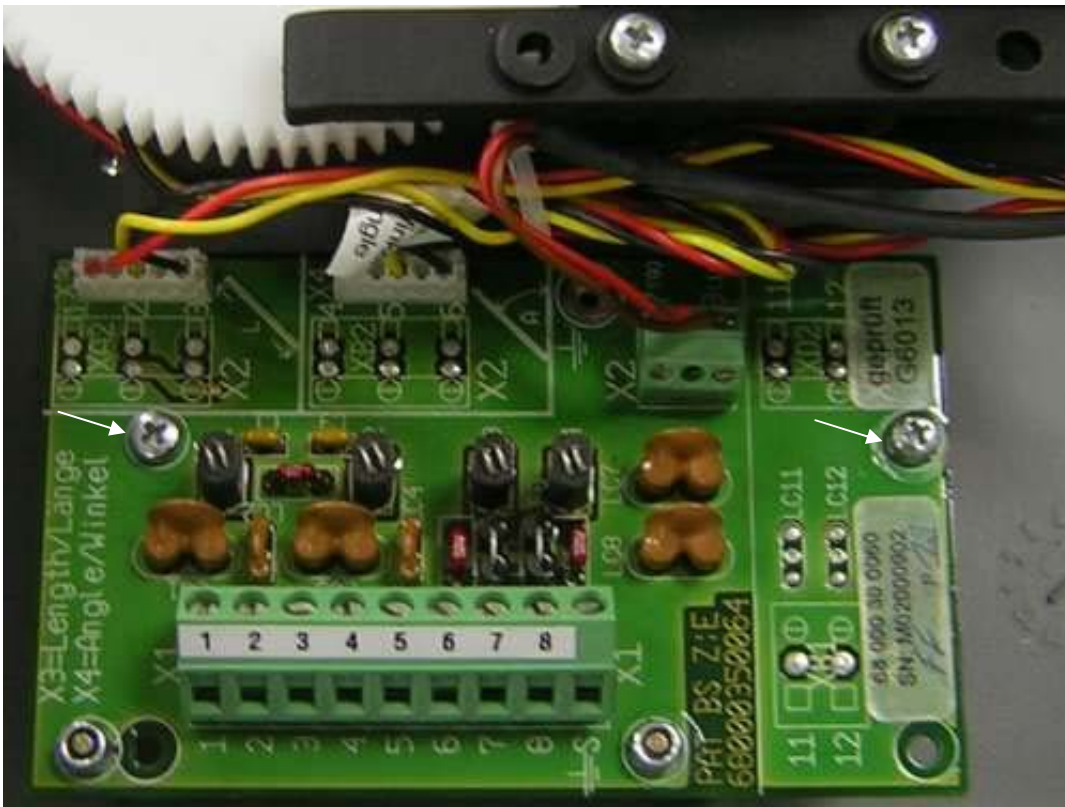
14. Install the gear wheel and guard rail. Tie wrap the wires as shown to prevent wires from getting wrapped in the gear wheels or slip ring.



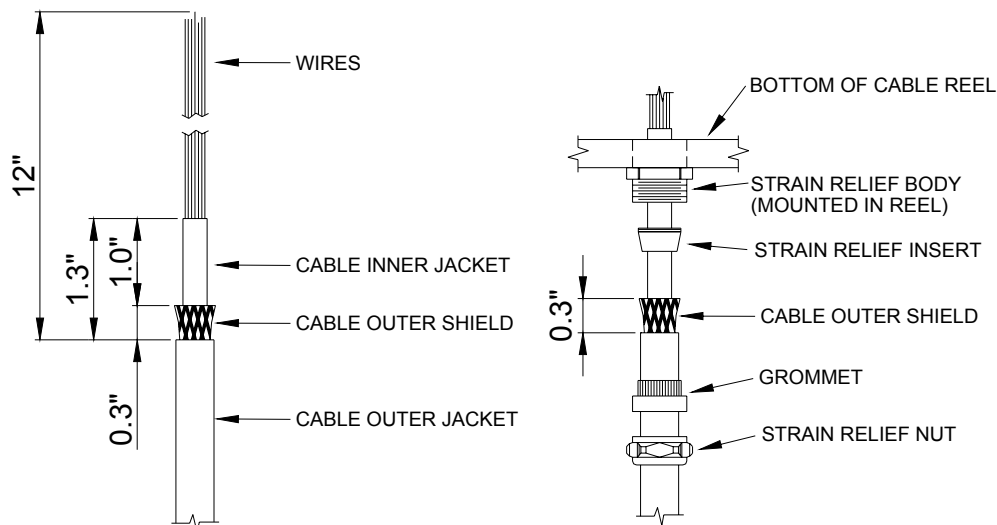
15. Install (2) M3 x 25mm standoffs in the 068-000-300-060 (labeled on board as 68 000 30 0060) using (2) 3mm hex nuts and (2) 3mm washers as shown below. These (2) standoffs serve as legs to support the board and are not attached to the reel.



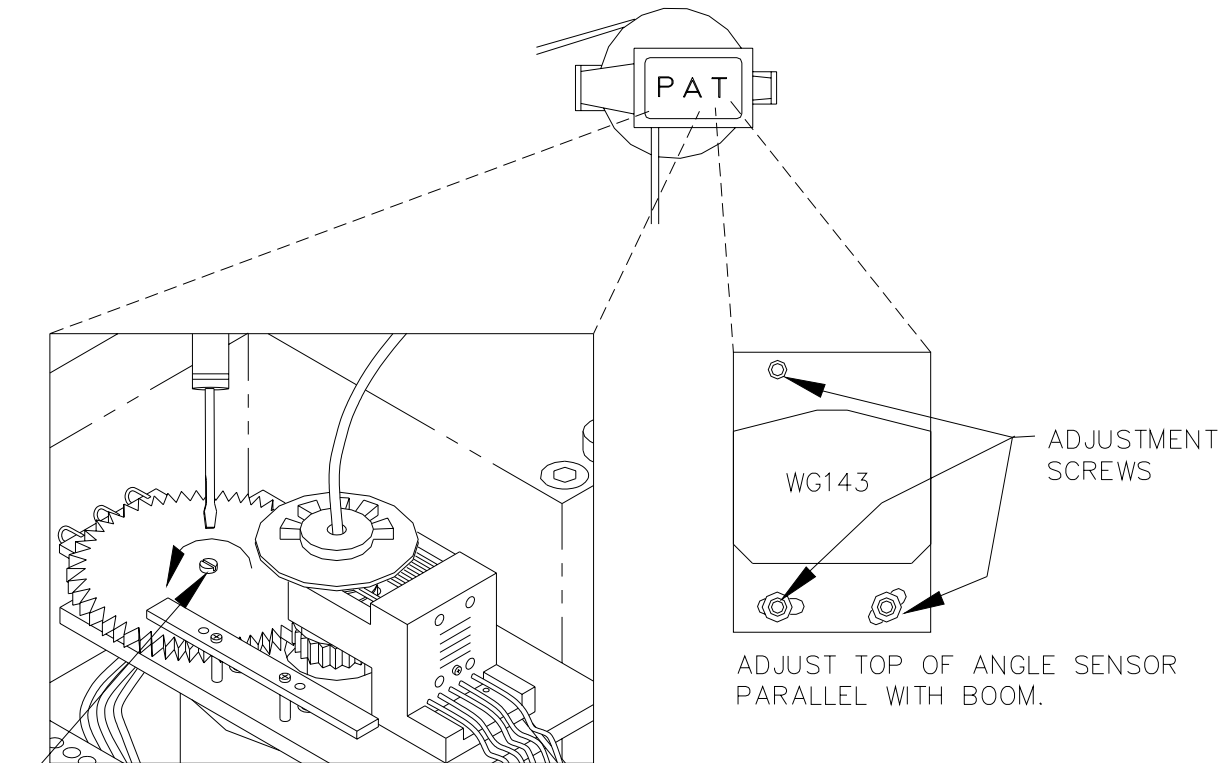
16. Install the board into the cable reel using (2) 3mm x 6mm screws and (2) 3mm washers. Connect the length JST connector to X3 and the angle sensor connector to X4. Strip the red and brown wires and connect red to X2:7 and brown to X2:8.



17. Connect cable assembly 031-300-060-414 (7 conductor x 18' long) to the cable assembly extending from the central unit. Route the cable up the boom to the cable reel. Allow a minimum 12" length to extend into the cable reel, then cutoff the excess cable. Strip the outer cable jacket, cut the outer shield, and install the cable into the reel through the PG11 green colored strain relief per the diagram below. For the wiring diagram to the board shown above, refer to the system wiring diagram on page 27 in this manual.



18. Install the PG13.5 hole plug in the other cable entry hole in the cable reel.
19. Adjust length and angle sensor.
 - a. Reset length potentiometer in length angle transducer (screw is located in center of white gear); with boom fully retracted, turn potentiometer carefully counter-clockwise until it stops.
 - b. Check the angle. Use a calibrated inclinometer to measure the main boom angle and compare with displayed angle on console. Adjust the angle sensor if necessary. Loosen the mounting screws holding the angle sensor in the reel. The plate is slotted which will allow the sensor to be adjusted in the reel until the displayed angle is equal to or 2 degrees less than the actual (measured) boom angle.
 - c. Verify A2B operation. Refer to Operator's Manual 031-300-190-139.



ADJUST LENGTH POTENTIOMETER, WITH BOOM FULLY RETRACTED
TURN THE CENTER SCREW COUNTER CLOCKWISE TO A SOFT STOP.

20. Replace cable reel cover and tight the cover bolt in a crossing pattern to 5.5N-m or 7ft-lbs.
21. Proceed to **Section 14.3** (page 35) for the **Calibration of Sensors Procedure**.

17.6 LMI SYSTEM TEST PROCEDURE

WARNING
Do not operate the crane outside the permissible operating range for the type of crane / capacity chart being tested.

- 1) Most crane manufacturer calibrate the cranes with the jib removed it is recommended that this is done to carry out the following test. However on some cranes this might not be the case, if in doubt contact the manufacturer.
- 2) For calibration verification a test load is to be employed for each of the following configuration;

NOTE: For safety reasons first measure the allowable radius for the load being used have a spotter to ensure the system stops the functions at or before this point.

- 3) Maximum Boom Length and Middle Radius (select a load that will lock out the functions about the middle of the load chart in the long boom length step)
- 4) The following test should be recorded signed and dated. A copy of this test sheet should be available at all times.
- 5) Test load to be applied by suspending known weights accurate to +/-1%. Weights of all additional equipment such as blocks, slings, sensors, etc., are included in the test load. The total load is to be known to an accuracy of +/-1%.

With extended boom and the load suspended, move the load smoothly from the short radius to overload lock out, measure and record radius, calculate cut off % see section 6. Ensure the appropriate functions are disabled.

- 6) Computations:
 For each radius measured in the above tests refer to the applicable load rating chart and determine the rated load. At radii intermediate to those on the load chart, rated load shall be determined by linear interpolation unless otherwise specified by the crane manufacturer.

The system accuracy is to be determined from the following formula:

$$\frac{\text{TEST LOAD}}{\text{RATED LOAD at cut off radius/angle}} \times 100 = \% \text{ OF RATED LOAD}$$

- 7) The actual load which activates the overload lock out is not less than 90% of the rated load nor more than 100% of the rated load for the corresponding actual load radius or boom angle.

Note: This is a general standard and variations may exist, if in doubt contact the crane manufacturer.

CALIBRATION TEST

CRANE S/N: _____

Op/ Mode	Parts of Line	Main / B Length	Main / B Angle	Jib / Ext Length	Jib Offset	Actual Load	Indicated Load	Actual Radius	Indicated Radius	Cutoff %