

Mega-Hard Load Moment Indicator Troubleshooting-Repair Manual



Rev 3 CME
2-9-12

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System Alarm Codes

Alarm Code 1 (Memory)

This code is caused due to the memory data within the HEAD Electronic is not reliable or corrupt. This fault is caused by a static discharge induced to the machine. Lighting Strike, Welding on the machine with power applied or jump starting the battery.

Actions to take;

1. *Cycle the power off and wait one minute and cycle power back on.*
2. *Press and release the Yellow horn pushbutton on the display to clear the memory fault code. See Figure 1.*
3. *Verify E2Prom is in the Head electronic socket is properly installed (located behind the operator seat). See Figure 2.*
4. *Call for service Electronic may require repair.*

Fig 1

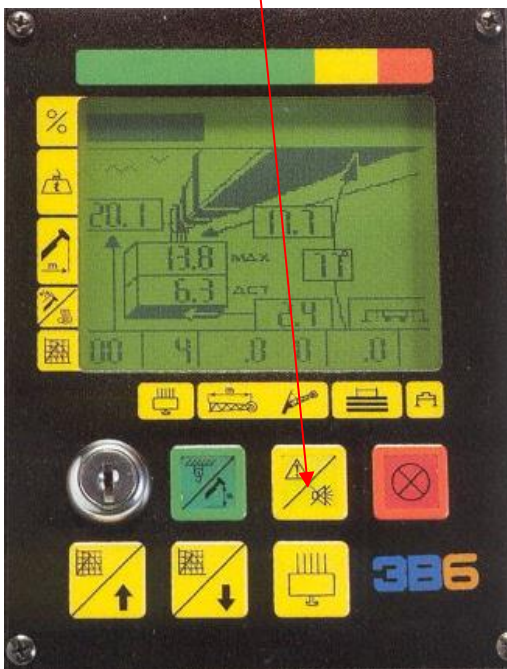
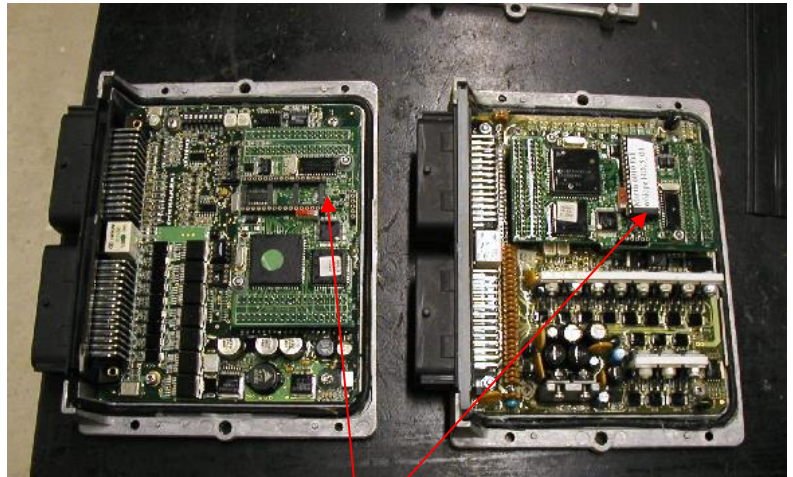


Fig 2



IC dimple direction for pin 1

System Alarm Codes

Alarm Code 2 or 3 (Angle Sensor)

This code is caused by the output voltage of the angle sensor is lower (code 2) than the minimum or higher (code 3) than the maximum voltage.

Actions to take; Level the chassis, Fully retract the boom and lower the angle to zero degrees using a angle finder to determine zero degrees. All wire color is the connection cable coming from the cab. See figure 3.

- 1. Remove the cover of the cable reel using a m3 allen wrench and check the +5.00vdc (Typically the voltage is about 4.94vdc) supply voltage (Brown wire) and the ground wire (white wire). See Fig 3. If the voltage is ok continue to step 2, if not check the wiring from the cable reel to the Head electronic and boom base connector for damage.*
- 2. Check the output of the angle sensor. The output of the angle when the boom is at zero degrees should be approximately 2.50vdc. (Green wire), (tolerance 2.46 to 2.54vdc is OK). If it is higher or lower check the wiring first for damage. If the wiring is ok, loosen the three screws (Fig 4) on the angle pot and adjust the pot until the display indicates what the angle finder indicates. Check the voltage and record this for later use.*
- 3. If adjusting the angle pot and the angle does not change on the display, remove the output (Green) wire and check if the voltage changes, if not change the angle pot and adjust the angle in step 2. Angle pot replacement see page*
- 4. Call for service if angle is still incorrect..*

Fig 3

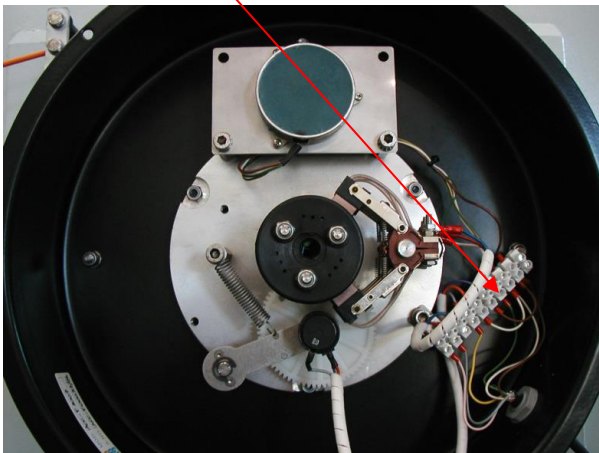
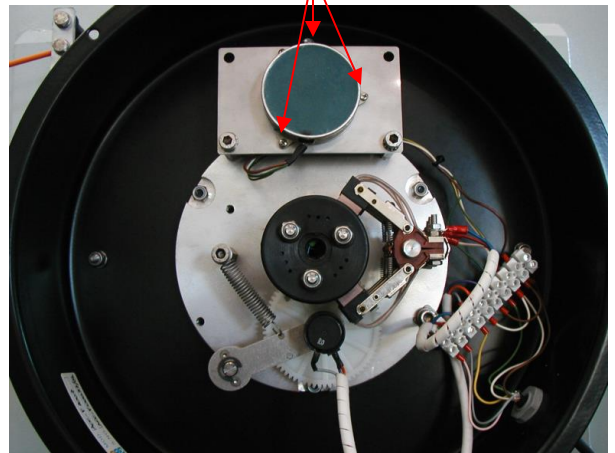


Fig 4



System Alarm Codes

Alarm Code 6 or 7 (Length Sensor)

This code is caused by the output voltage of the length sensor is lower (code 6) than the minimum or higher (code 7) than the maximum voltage.

Actions to take; Level the chassis, Fully retract the boom and lower the angle to zero degrees. All wire color is the connection cable coming from the cab. See figure 5.

- 1. Remove the cover of the cable reel using a m3 allen wrench and check the +5.00vdc (Typically the voltage is about 4.94vdc) supply voltage (Brown wire) and the ground wire (white wire). See Fig 5. If the voltage is ok continue to step 2, if not check the wiring from the cable reel to the Head electronic and boom base connector for damage.*
- 2. Check the output of the length sensor. The output of the length sensor when the boom is fully retracted should be approximately .250vdc.(Yellow wire), (tolerance .246 to .254vdc is OK). If it is higher or lower check the wiring first for damage. If the wiring is ok, press down on the length pot (Fig 6) and adjust the gear until the display indicates what the minimum boom length for that model of machine. Check the voltage and record this for later use.*
- 3. If adjusting the length gear assembly and the length does not change on the display, remove the output (Yellow) wire and check if the voltage changes, if not change the length pot and adjust the length in step 2. Length pot replacement see page*
- 4. Call for service if angle is still incorrect..*

Fig 5

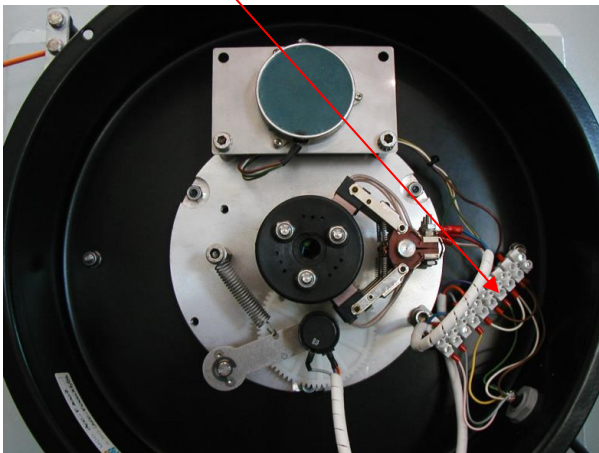
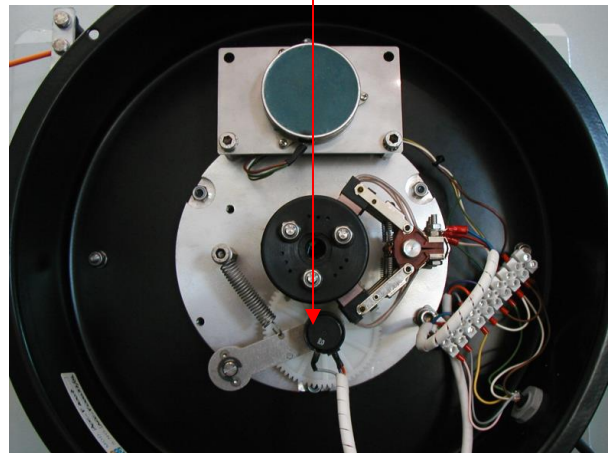


Fig 6



System Alarm Codes

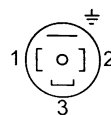
Alarm Code 8 or 9 (Piston Sensor)

This code is caused by the output voltage of the piston pressure sensor is lower (code 8) than the minimum or higher (code 9) than the maximum voltage.

Actions to take; Fully retract the boom and lower the angle to zero degrees. Pressure Sensors are located on the holding valves of the lift cylinders. See figure 7.

1. *Using a flat tip screwdriver loosen the screw on the connectors and switch the connector and see if the code changes to the opposite sensor, if it does check the wiring from the head electronic to the sensor and check that air is not creating the code by bleeding the sensor.*
2. *Check the supply voltage and ground at the connector end. See figure 7. If the code does not change and wiring is ok bleed pressure sensor or replace it.*
3. *Supply voltage for pressure sensors is 10-30vdc, Output with no load should be around .70 to .90vdc*
4. *Call for service if code is still present.*

Fig 7



PIN 3 Wires

- | | |
|---|----------------------------|
| 1 | +VB |
| 2 | output signal 0,5 .. 5,5 V |
| 3 | GND |

System Alarm Codes

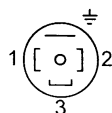
Alarm Code 10 or 11 (Rod Sensor)

This code is caused by the output voltage of the rod pressure sensor is lower (code 10) than the minimum or higher (code 11) than the maximum voltage.

Actions to take; Fully retract the boom and lower the angle to zero degrees. Pressure Sensors are located on the holding valves of the lift cylinders. See figure 8.

1. *Using a flat tip screwdriver loosen the screw on the connectors and switch the connector and see if the code changes to the opposite sensor, if it does check the wiring from the head electronic to the sensor and check that air is not creating the code by bleeding the sensor.*
2. *Check the supply voltage and ground at the connector end. See figure 8. If the code does not change and wiring is ok bleed pressure sensor or replace it.*
3. *Supply voltage for pressure sensors is 10-30vdc, Output with no load should be around .50 to .70vdc*
4. *Call for service if code is still present.*

Fig 8



PIN 3 Wires

- | | |
|---|----------------------------|
| 1 | +VB |
| 2 | output signal 0,5 .. 5,5 V |
| 3 | GND |

System Alarm Codes

Alarm Code 20 (Slope Sensor)

This code is caused by the data message from the slope sensor is not detected by the Head electronic.

Actions to take; See wiring diagram.

- 1. Check the wiring from the head electronic to the slope sensor for continuity.*
- 2. Check the supply voltage and ground at the connector end of the slope sensor.*
- 3. Check that 4 pin connector is connected to Slope sensor.*
- 4. Press and release the Yellow pushbutton on the display to see if alarm clears, if it clears it was a stored fault.*
- 5. Call for service if code is still present.*

NOTE

DO NOT CHECK WIRING WITH VOLTAGE APPLIED TO SYSTEM ON CAN LINE pin 3 and 4.

PIN 4 connector

A +VB (12vdc)

B -VB ground

C CAN L

D CAN H

System Fault Conditions

A-2-B alarm (A-2-B Switch)

This code is caused by an open circuit in the A-2-B switch.

Actions to take; Fully retract the boom and lower the angle to zero degrees.

1. *Check if the machine is in a A-2-B condition, lower hook block.*
2. *Check if the cable or connectors are damaged between the switch to the electronic in the cab.*
3. *Remove the four screws in the switch cover and check the micro-switch for continuity. or 10-30vdc supply voltage.*
4. *Check for moisture, dry and seal connector.*
5. *Replace the switch or cable.*
6. *Call for service if code is still present.*

Fig 9



System Fault Conditions

These are addition condition for faults and corrective actions. No alarm codes are present.

Condition; Display is blank with a single black line in the display. Figure 10

1. *Check the input voltage to the system. System operates on 10-30vdc input supply. Supply voltage will be below 9.00vdc when below condition appears.*
2. *Check the power supply and ground for the system. Connections are made in the access cover next to the operators right leg inside the cab. Verify the voltage is correct.*

Condition; Display is black or no data displayed. Figure 11

1. *Check the contrast knob on the bottom right hand corner of the display.*
2. *Check the temperature inside the cab, unit may have exceeded the temperature range of the display +158F.*
3. *Call Service if condition continues.*

Fig 10

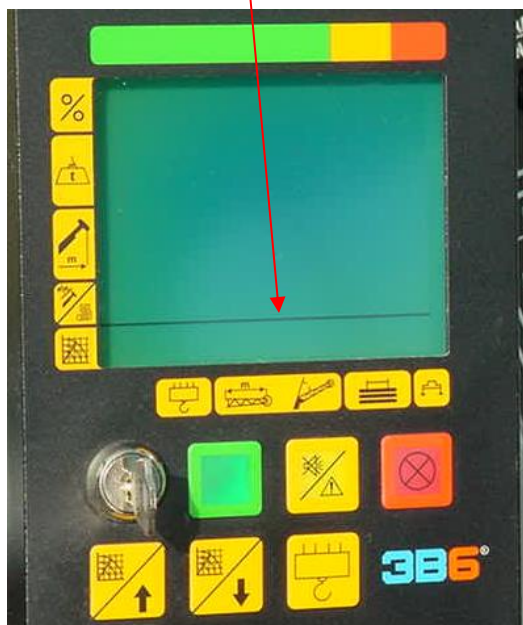


Fig 11



Cable replacement

Remove the four mounting bolts and remove the reel from the boom. Remove the cable reel cover by removing the four screws on the cover with a m3 Allen wrench (Fig 12). Then remove the cover (Fig 13).

Fig 12

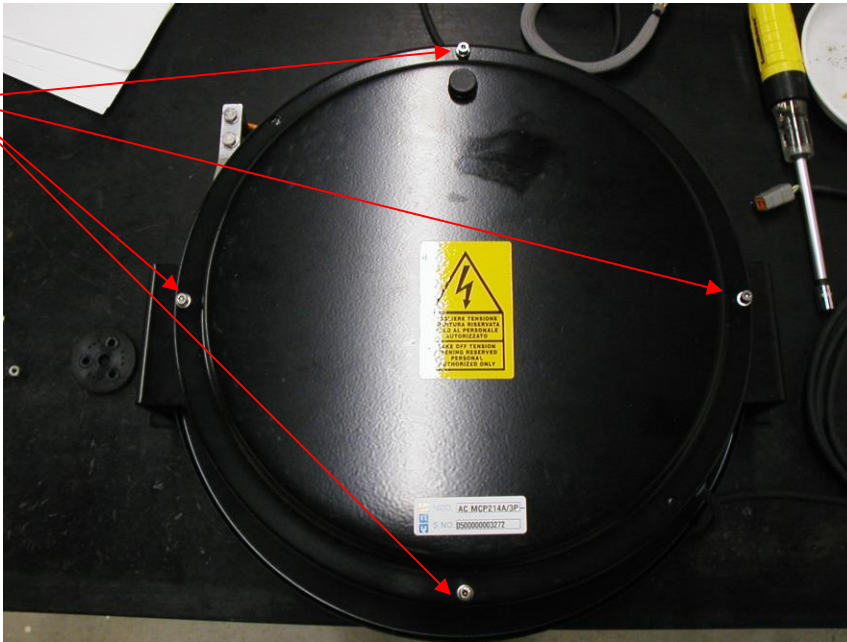
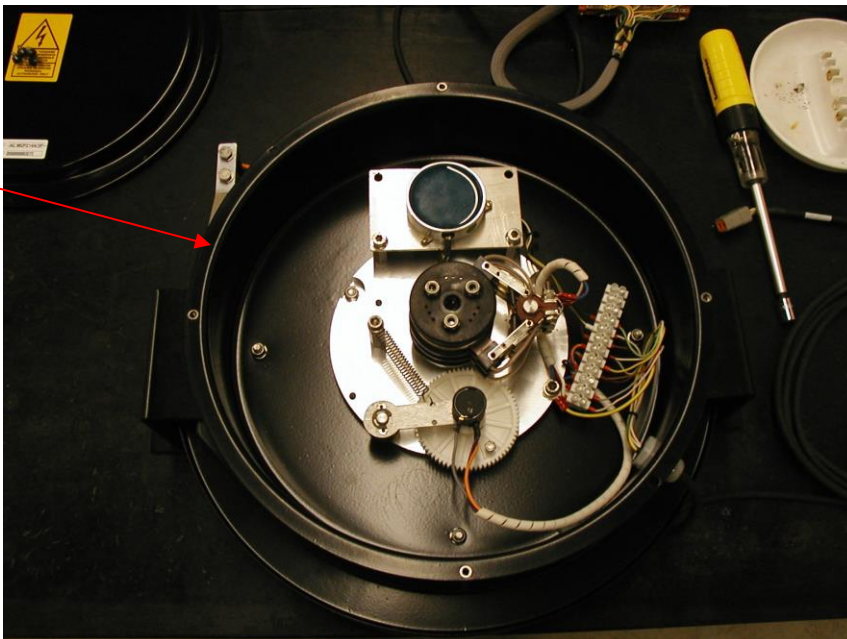


Fig 13



Cable replacement

Remove all tension from the cable reel to avoid injury or damage to the spring package of the cable reel.

First step to replace the three conductor cable is to remove the black connector from the end of the cable to reuse it later (Fig 14). Then we will need to remove the cable reel from the boom of the machine in order to replace the cable. Remove the four bolts from the bracket and set the reel on a surface that will not damage it (Fig 15).

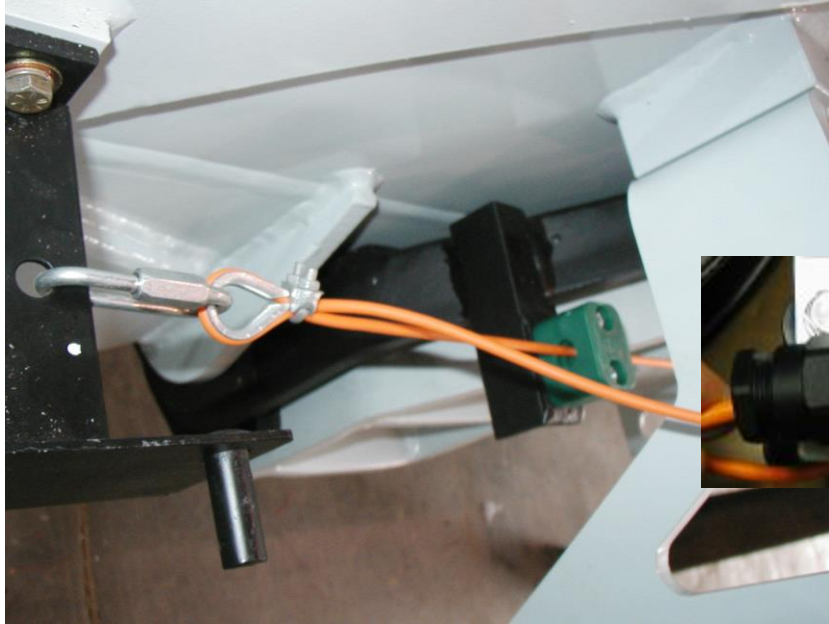


Fig 14

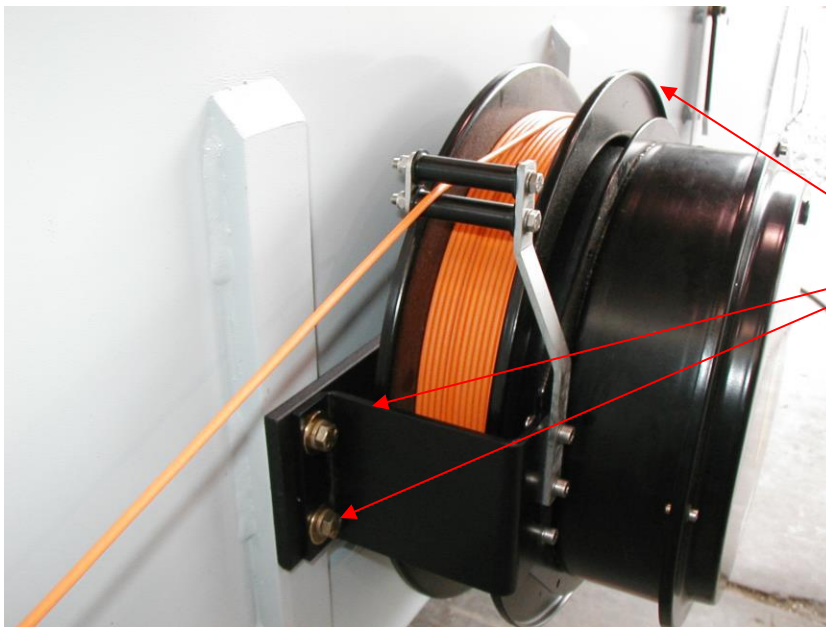


Fig 15

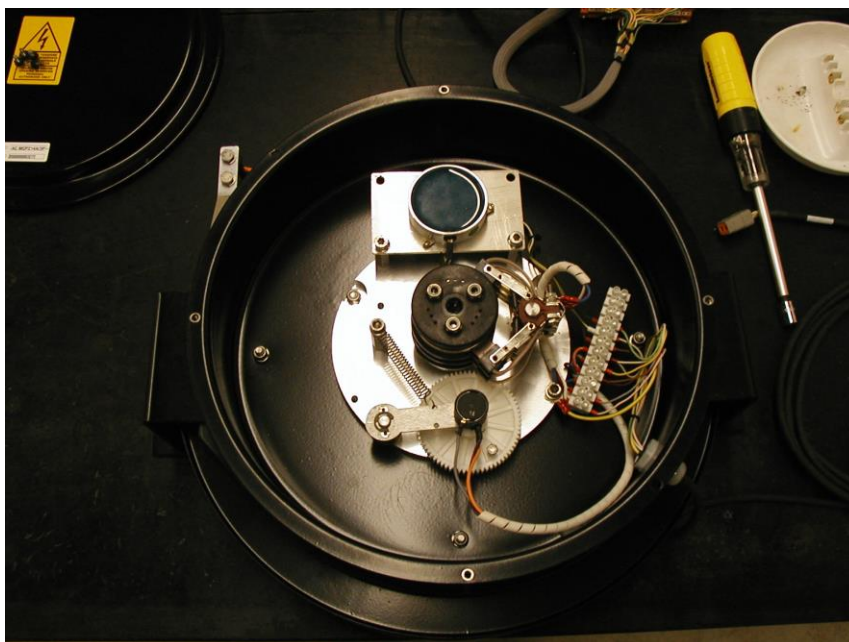
Cable replacement

Remove all the cable from the cable reel drum and push up the cable protective loom and cut it off at the back side of the cable reel (Fig 16). Lay the cable reel on its mounting bracket to access the front area (Fig 17).

Fig 16



Fig 17



Cable replacement

Remove three self locking nuts using a 10mm wrench (Fig 18). Carefully remove the plastic slip ring cover cap (Fig 19). You may require using a flat tip screwdriver to pry it . Insert the tip of the screwdriver just enough to catch the side of the cap. **DO NOT INSERT IT TO DEEP OR YOU CAN DAMAGE THE SLIPRING!**

Fig 18

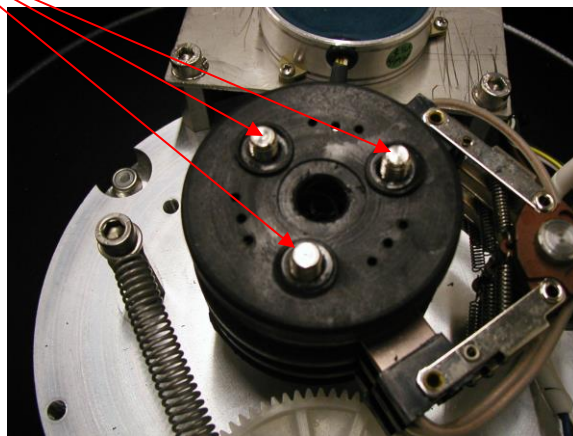
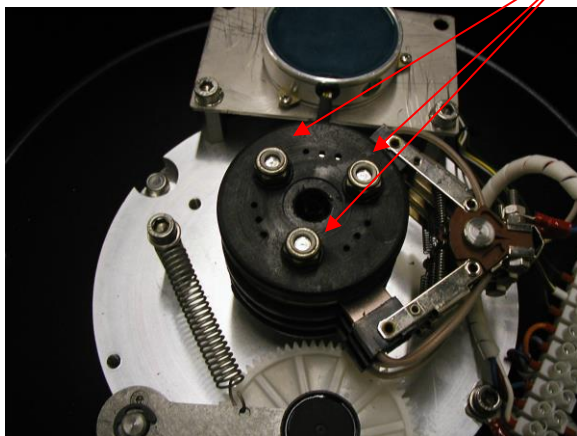
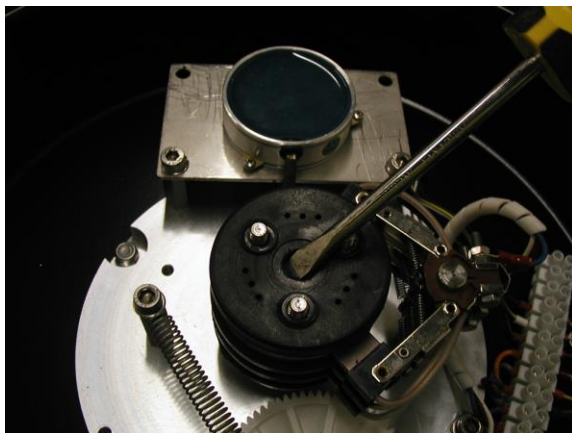
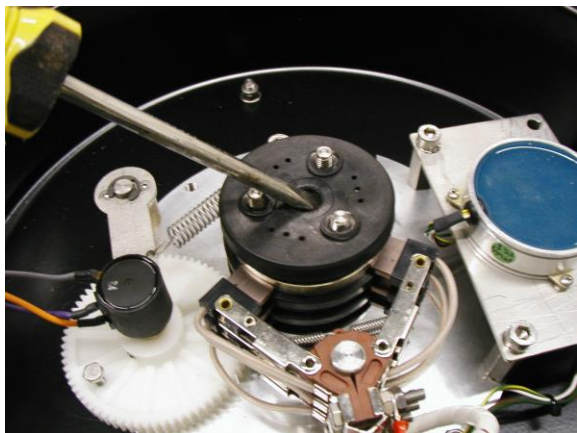


Fig 19

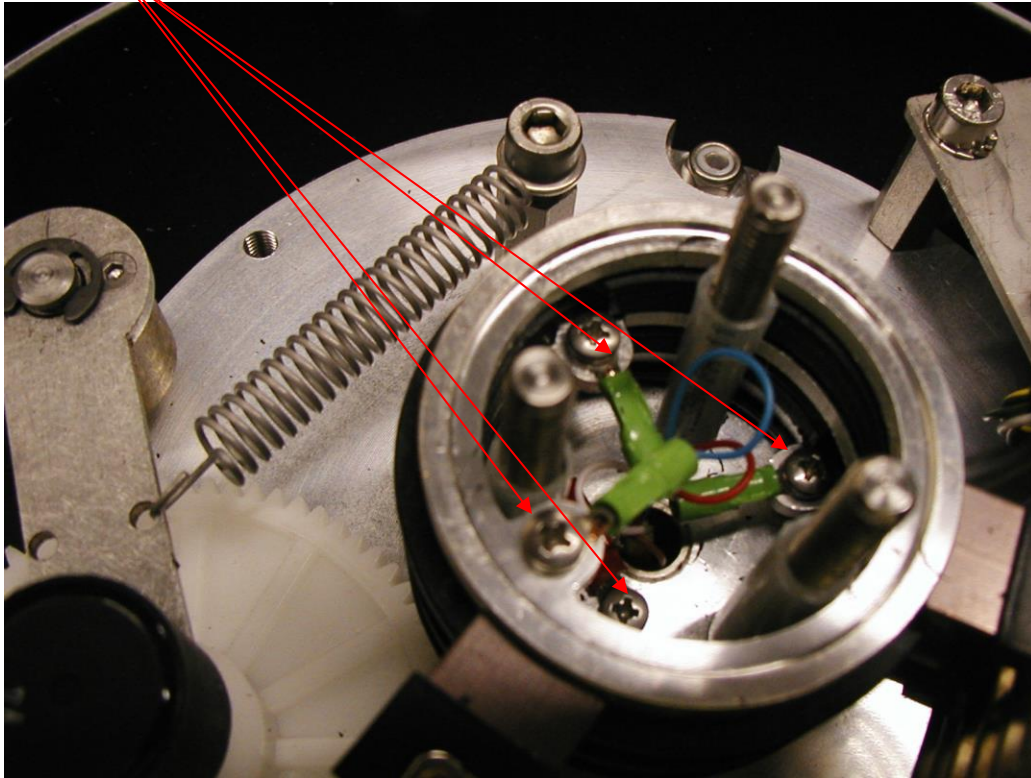
Using the screwdriver tip to carefully pry up the cap to access the wiring. Use the hardware as a lever for the screwdriver.



Cable replacement

Now that the cap is removed we can remove the existing cable. Remove the four Phillips head screws, noting the color code and location on the slip ring. Cut the ring terminals off. (Fig 20).

Fig 20

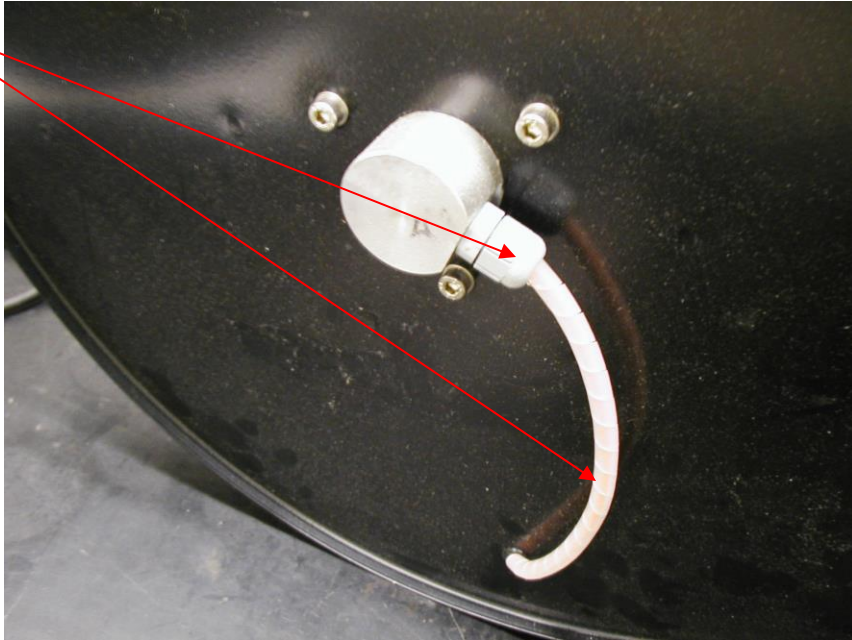


Wiring code
Collector

Bottom = White
Middle = Red
Top = Blue
Shield = base

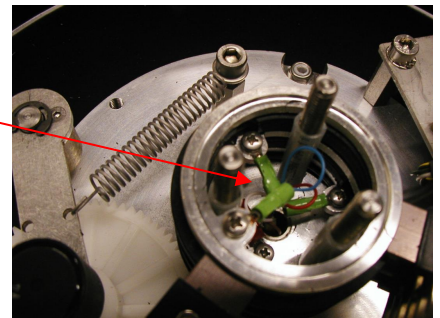
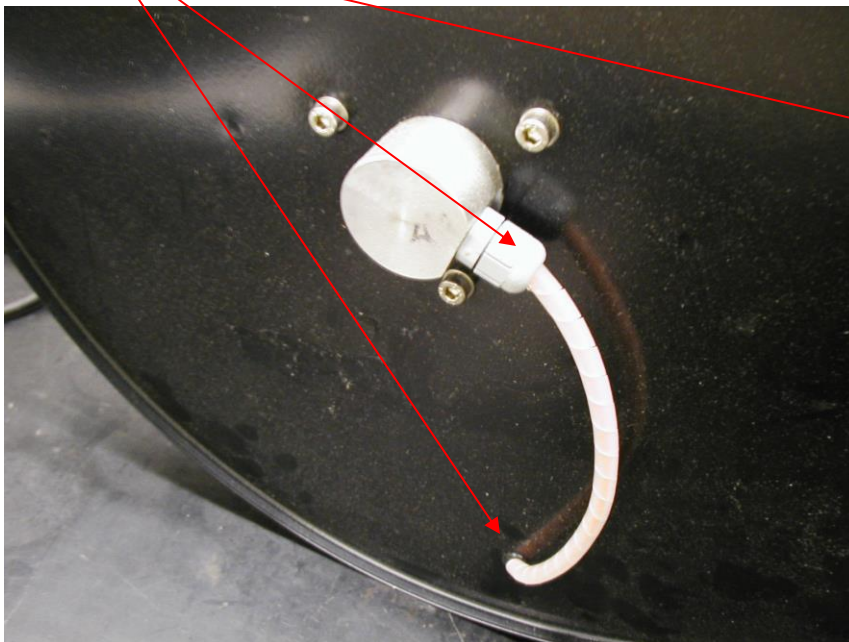
Cable replacement

Set the cable reel on its side, loosen the pg strain relief connector and remove the cable (Fig 21).



Strip back one end of the replacement cable the same length as the old cable or approximately 12 inches and feed it through the cable reel drum access hole from the inside of the drum area and then into the base connector and up into the slip ring collector (Fig 22).

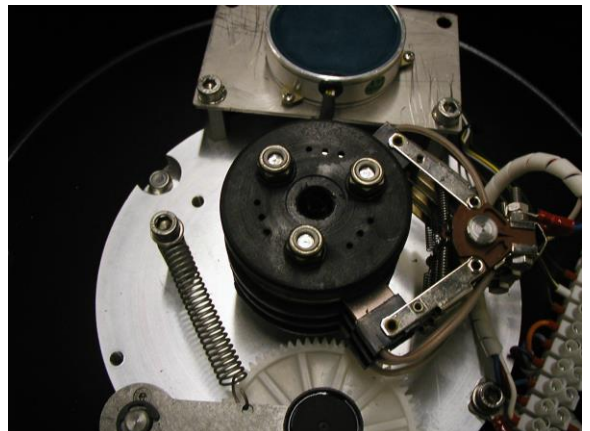
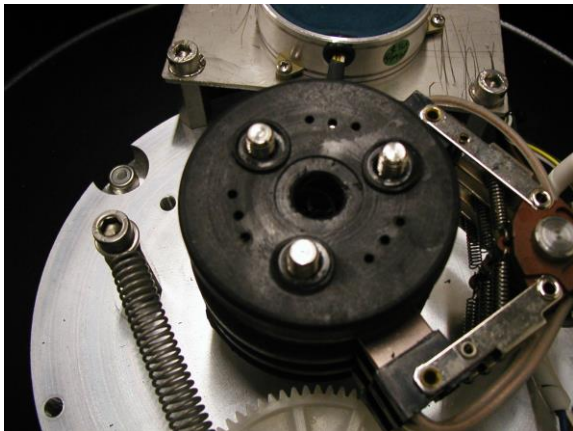
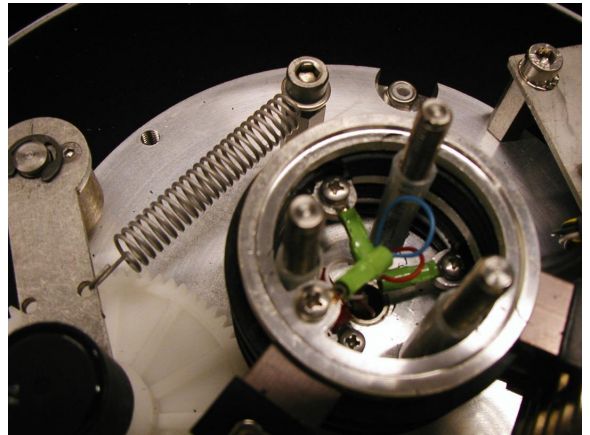
Fig 22



Cable replacement

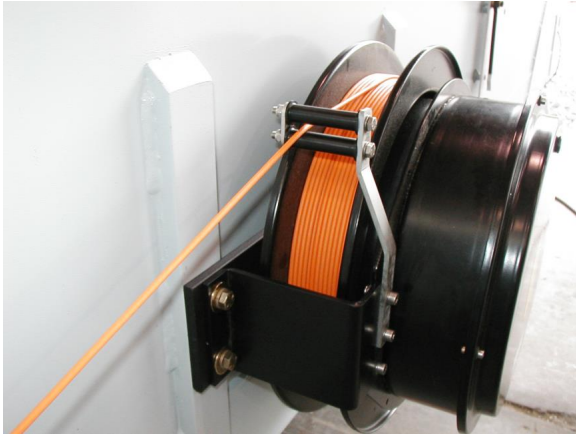
The cable inserted into the pg strain relief must have the outer jacket on in order for the strain relief to work. Tighten the pg connector strain relief nut. Cut off any access wire inside the slip ring and install the ring terminal and connect the wire to the proper terminal of the slip ring collector. See page 23 for wiring.

Tighten the phillips screws and replace the cap and self locking nuts.



Cable replacement

Install the replacement cable back onto the drum and install it back on the boom. Feed the cable through the guides to the boom tip and connect the strain relief and the black connector. The tension on the reel will be automatic when you pull out the cable. If not tension the reel 3 to 5 wraps and then route it to the boom tip.



See page 21 or 23 for wiring

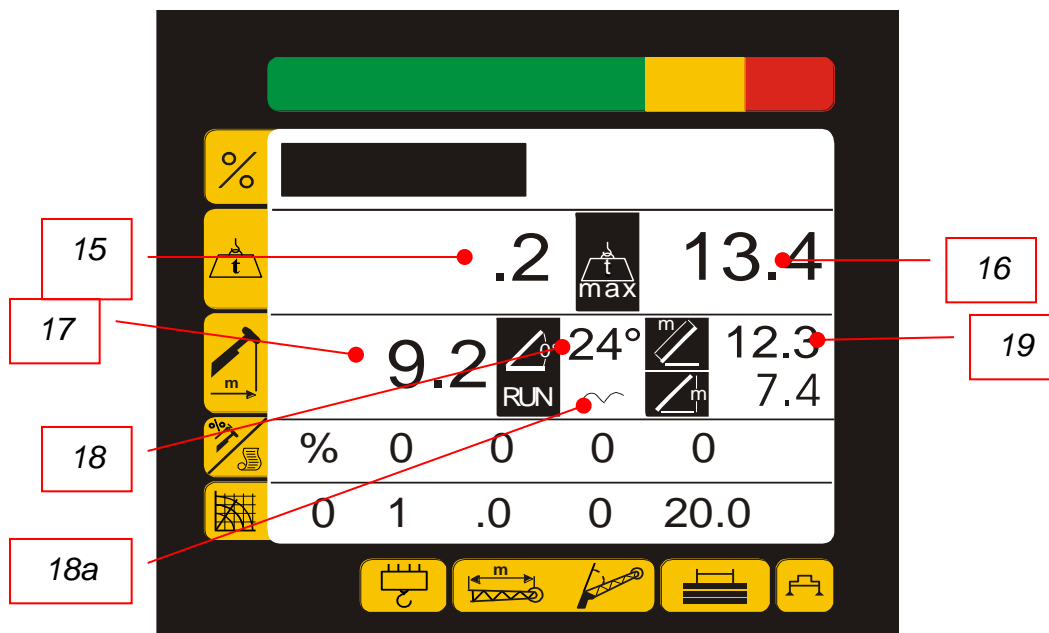


The length will require adjustment see next pages for angle or length adjustment.

System Set-up

Power up the system and machine Fully retract the boom and lower to zero degrees. Set the Program on the system to main boom and select the proper parts of line rigged.

First step will be to set the angle and length. The display will indicate the information based in degrees and feet and tenths of a foot. See below



15 **Actual Load;** Indicated in pounds

16 **Rated Load:** Indicated in pounds.

17 **Radius:** Indicated in feet and tenths.

18 **Main Boom Angle:** Indicated in degrees

18a **Run:** Indicates system is operating and communicating with electronics (symbol moves)

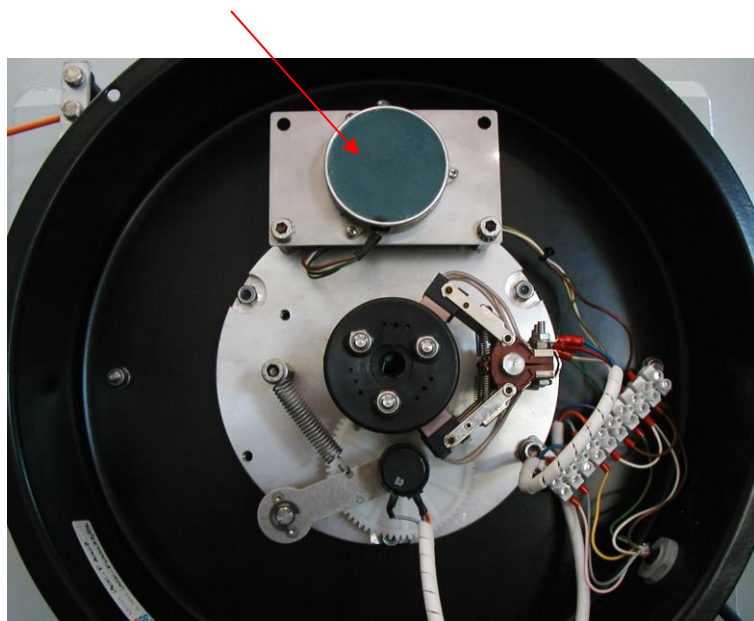
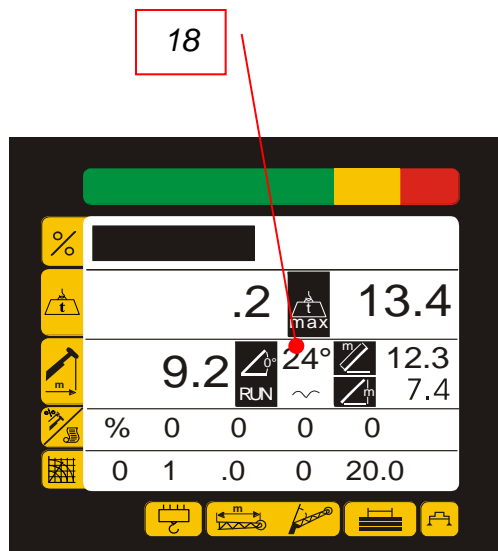
19 **Length:** Indicated in feet and tenths.

Angle adjustment

Fully retract the boom and lower the angle to zero degrees using a angle finder to determine zero degrees. Remove the cover of the cable reel and check the +5.00vdc (Typically the voltage is about 4.94vdc) supply voltage (Brown wire) and the ground wire (white wire). The output of the angle when at zero degrees should be approximately 2.50vdc. (Green wire), (tolerance 2.46 to 2.54vdc is OK). Check the angle indication on the display (18) for accuracy at zero degrees.

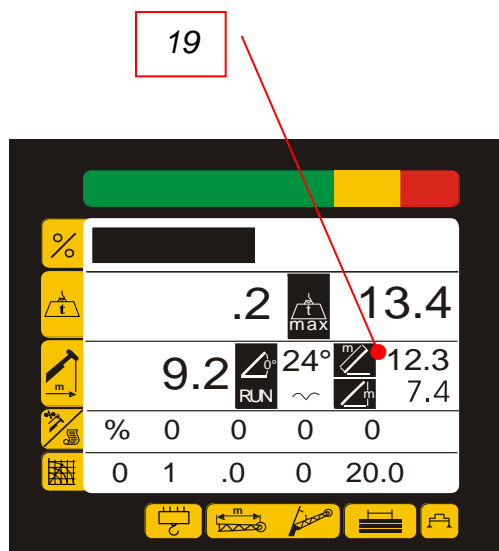
If it is not correct loosen the three mounting screws with a flat tip screwdriver and adjust the pot until the angle indicates zero degrees on the display. Tighten the screws and check it at other angles for accuracy.

Angle sensor (ASA)

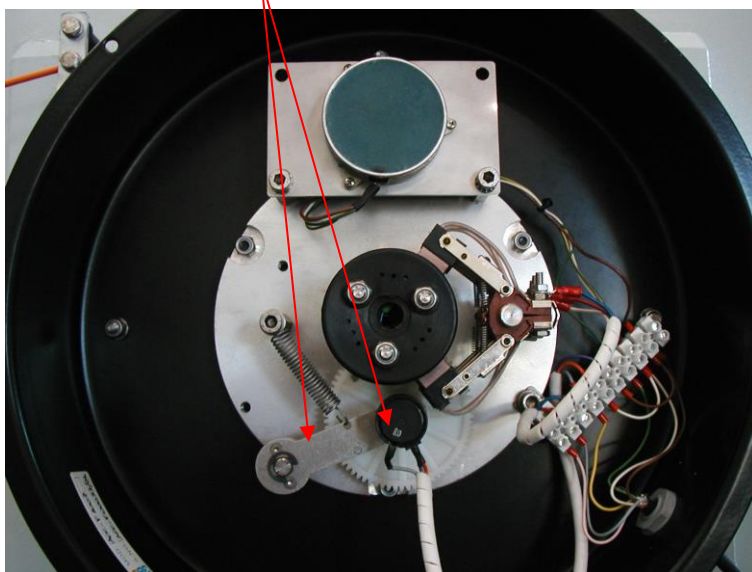


Length adjustment

Check the voltage output of the length pot is approximately .250vdc (yellow wire), (tolerance of .246 to .254) with fully retracted boom, if not adjust the length gear assembly until it is. Check the length indication on the display (19). If it is correct, extend the boom and check the fully extended length. The Brown wire (supply voltage) and White wire (Ground) used for the angle is the same supply voltage and ground for the length.



Length sensor and gear assembly



Length	Min	Max	
3612	29.3'	70'	Full Power
6010	32.6'	80'	Full Power
8012	39'	90'	Full Power

A-2-B wiring

The circuit is supplied at 10-30 vdc.

<i>A-2-B wire</i>	<i>terminal</i>	<i>Connector terminal</i>
-------------------	-----------------	---------------------------

<i>Yellow wire</i>	<i>22</i>	<i>N</i>
--------------------	-----------	----------

<i>White wire</i>	<i>21</i>	<i>L</i>
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Cable reel end.

<i>Cable reel wires</i>	<i>Connector wire terminals</i>
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<i>Red wire</i>	<i>N</i>
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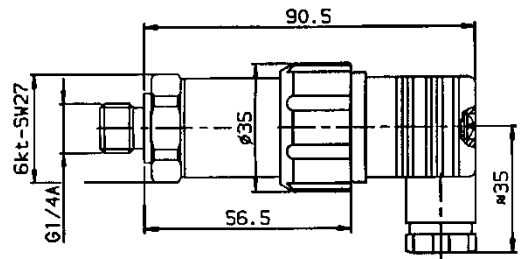
<i>White wire</i>	<i>L</i>
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Pressure sensors

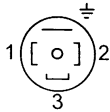
Troubleshooting the pressure sensors is used in the auto diagnostics in the operators manual.

Threads on pressure sensors are 1/4"BSPP



TECHNICAL SPECIFICATIONS

PIN CONNECTIONS



PIN 3 Wires

- 1 +VB
- 2 output signal 0,5 .. 5,5 V
- 3 GND

INPUT DATA

- Measuring ranges
- Overload ranges
- Max pressures
- Parts in contact with oil

350 bar
800 bar
2000 bar
Stainless steel ; Viton seal

OUTPUT DATA

- Output Signal

0,5 ... 5,5V

OTHER DATA

- Supply voltage
- Current consumption
- Life expectancy

0 - 12 ...30V
ca. 15mA
10⁶ load cycle

