OSS-463E OVERLOAD SHUTDOWN SYSTEM
MODEL TS-463E

SETUP

CALIBRATION

TROUBLESHOOTING

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FIGURES

OSS-463E OVERLOAD SHUTDOWN SYSTEM

The OSS-463E OVERLOAD SHUTDOWN SYSTEM is used in the operation of a crane to assist in preventing overload. The System employs audio and visual warning alarms and causes crane hoist motion shutdown when danger of overload is imminent.The System components include the TS-463E TEST SET and the OSS-463E UNIT. The following procedures are performed with the OSS-463E Unit on the crane.

SETUP

THE TS-463E TEST SET

Refer to Figures 1 and 2.

The TS-463E TEST SET, which is used during calibration of the OSS-463E OVERLOAD SHUTDOWN SYSTEM, is powered from an electronics box located in the OSS463E Unit. The Test Set displays the boom length and radius in 10ths of feet, the angle in + tenth degrees, and the load in pounds. The load changes in 50 lb.increments. A lock-out relay in the overload system activates when overload occurs causing the hoist motion to stop and the horn to sound. At the same time, the TEST SET display changes from “ALARM IS OFF” to “ALARM IS ON.” After the overload is removed, the relay unlocks in approximately five seconds and the alarm turns off.

The TS-463E TEST SET is in a weatherproof box and has a mounting bracket which allows tilting for easy viewing. It has no other adjustment control.

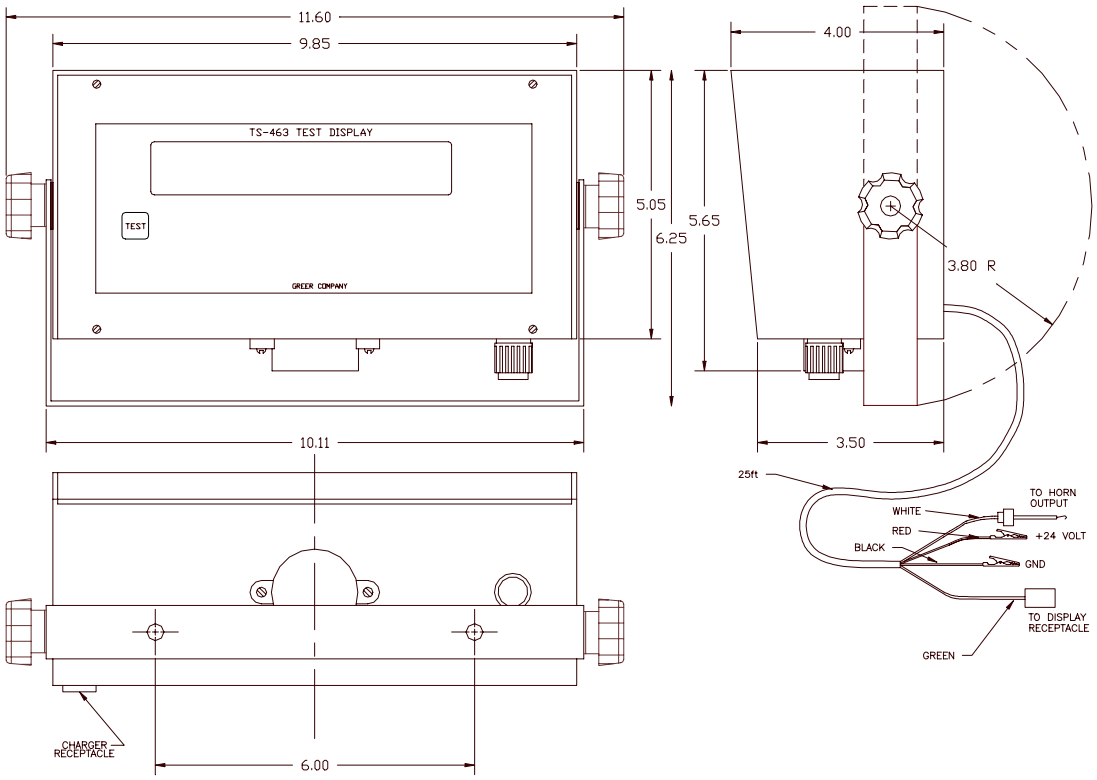

FIGURE 1: TS-463E TEST SET DISPLAY UNIT (A1)

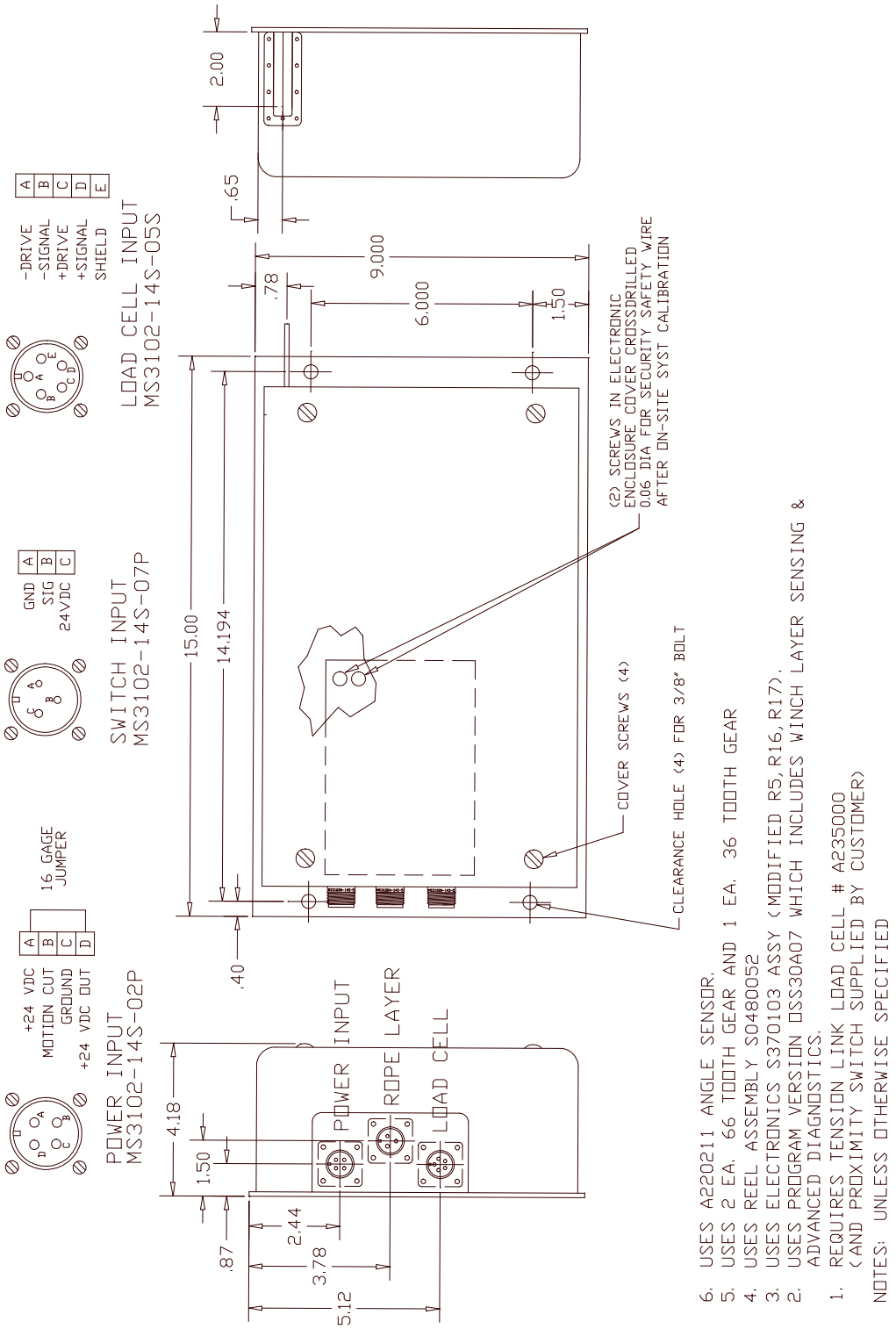

FIGURE 2: OSS-463E UNIT - INSTALLATION (A3)

CONNECTING THE TS-463E TEST SET TO THE OSS-463E UNIT MOUNTED ON THE CRANE

Refer to Figures 2 through 5.

1. Remove and set aside the four 1/4-20 truss head screws with special washer from the cover of the **OSS-463E Unit** (Figure 2). Grasp both ends of the cover and pull it straight out from the base.
2. Remove the four 4-40 cover screws and cover from the **electronics box** (Figure 3) inside the OSS-463E Unit. (An internal view of the electronics box is shown in Figure 4.)
3. Set the **TEST SET** where it will be used and uncoil the cable. Route the cable toward the electronic box. Position the cable to avoid the area where the crane picks up test loads.
4. Bring the clips of the cable up to the electronics box. Strap the cable with one or two nylon “tyraps” to the cover stand-off post beside the pot gear assembly (Figure 5).
   Note: This provides strain relief to keep the cable from being pulled loose during testing.
5. Push the data plug (Figure 4) on the six pin connector, with the white wire on pin 3. Clip the power leads on, as shown. ENSURE that the RED CLIP is on the OUTER END of R23. Connect the BLACK CLIP to the LEFT choke coil (Figure 4).

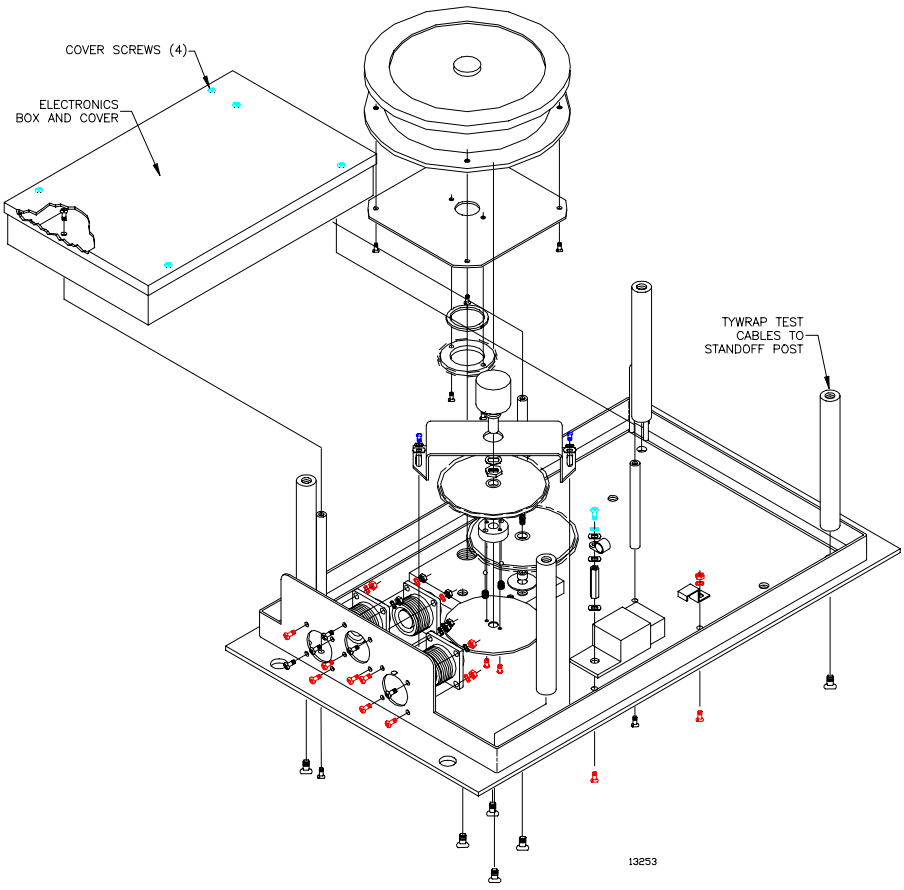

FIGURE 3: THE OSS-463E UNIT - EXPLODED VIEW (A9)

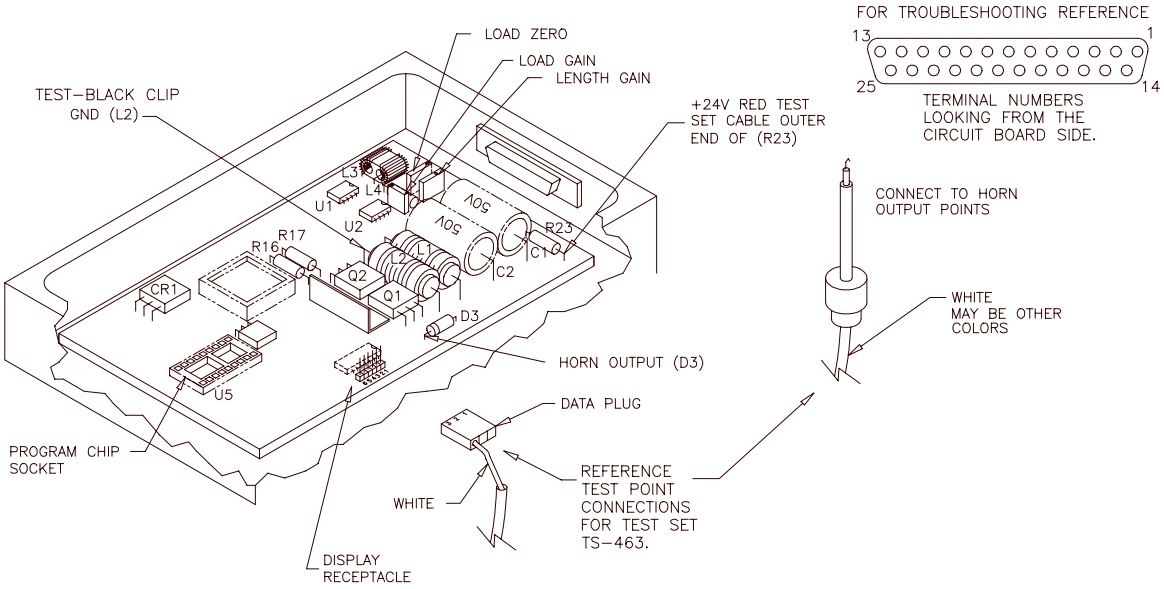

FIGURE 4: TS-463E CONNECTION TO OSS-463E (A7)

NOTE: When using the TEST SET, the red wire must be connected to the input power point, as shown, because it has an internal heater for cold weather use. The heater draws several amps and would blow the 4.7 ohm resistor (R23), if connected anywhere else on the board.

The heater turns on automatically at 0° centigrade and turns off again at approximately +5° centigrade.

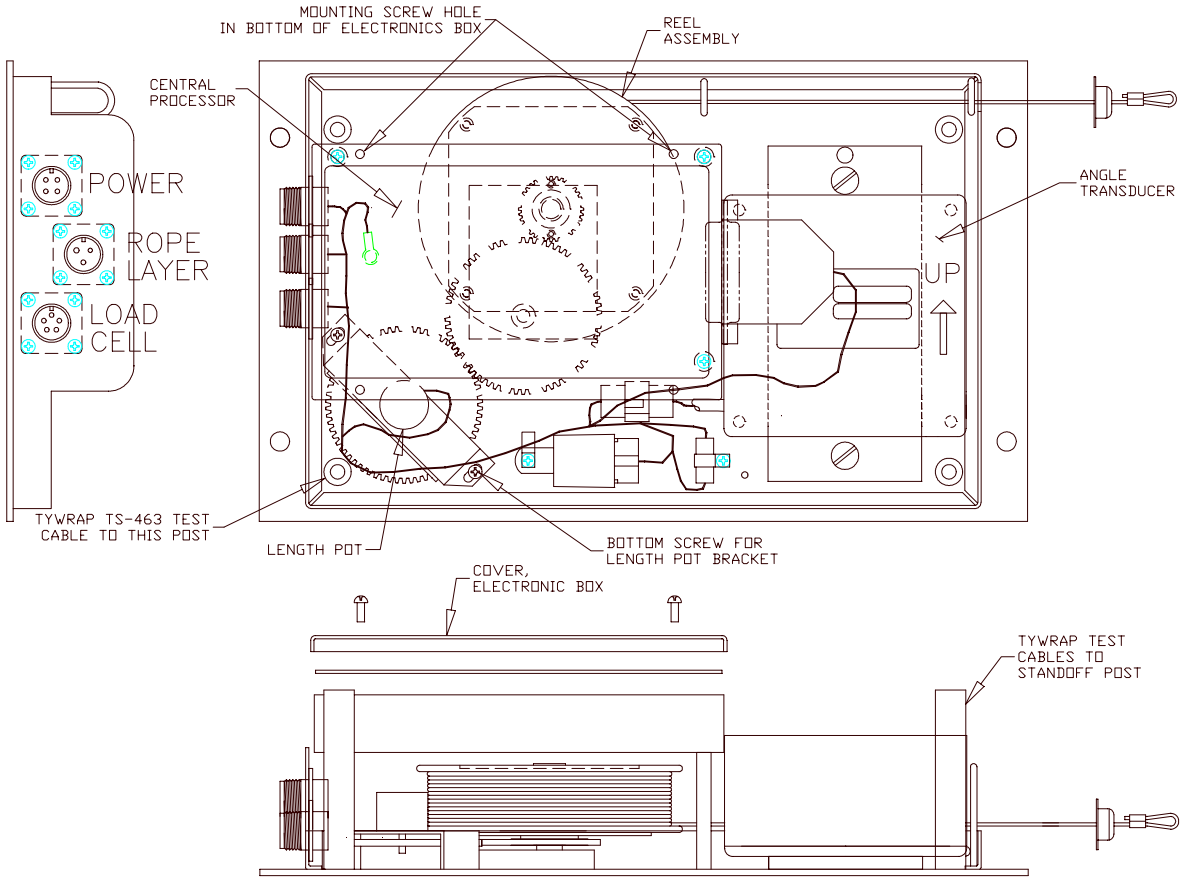

FIGURE 5: OSS-463E COMPONENT ASSEMBLY (A10)

READING THE DISPLAY

Refer to Figures 4 and 6.

With the crane power on, the display illuminates and numbers appear, if the red and black alligator clips are on the plus and minus voltage points in the electronics box and the data plug is in place. If the words are faint or do not appear, adjust the contrast control knob on the bottom of the TEST case for maximum visibility.

If no numbers appear, ensure that the HORN IS OFF. If the HORN IS ON, a 5 second delay must run out before numbers appear. If numbers still don't appear, ensure that the data plug is correctly installed (Figure 4). If the display does not light up, refer to DISPLAY DOES NOT LIGHT UP, page 10.

DISPLAY - SAMPLE OUTPUT

Refer to Figures 4 & 6.

LENGTH	7. 3 ft	=	retracted boom
ANGLE	0°	=	if crane and boom are horizontal
RADIUS	6.8 ft	=	maximum reach with retracted horizontal boom

LOAD	(about zero if hook is empty)=	factory setting of the load gain with a 0.5 millivolt/volt signal input. This is not necessarily the final setting.
ALARM IS OFF	=	Indicates that a GOOD load cell is plugged in and crane is NOT in overload.
LAYER SWITCH IS OFF	=	Indicates that at least two full layers of hoist rope are wound on the winch reel.

The above settings are factory preset when the units are shipped.

DISPLAY - RANGE OF WORKING READINGS

	MIN		MAX
LENGTH	7.3	to	18.42
RADIUS	4.00	to	18.2
ANGLE-	-30	to	60°
LOAD	0	to	11, 000 lbs

A 5% overload is allowed. This permits the rated loads to be picked up and moved.

DISPLAY - CRANE LIMITS

LENGTH	3.6	to	20.4 ft
RADIUS	3.4	to	20.2
ANGLE	-30	to	64°
LOAD	-501	to	12280 lbs.

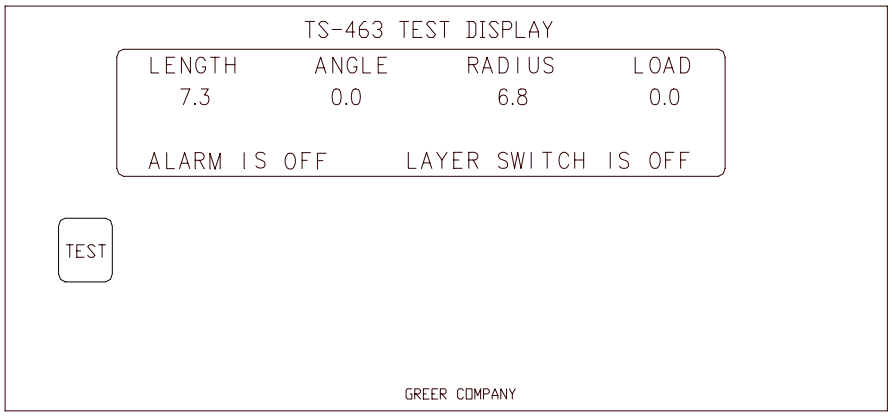

FIGURE 6: TS-463E SAMPLE OF DISPLAY SCREEN (A2)

DISPLAY DOES NOT LIGHT UP

1. Has the crane power and test stand power been turned on?
2. Has the power plug been installed in the OSS-463 receptacle?
3. Has the 4.7 ohm resistor blown out due to incorrect (reverse) connection of the red and black power clips?
4. Is there 24VDC on the clips themselves? Sometimes a clip will be clipped to the insulating jacket of the choke coil which prevents power from reaching the terminals.
5. If the clips have power but there is still no display activity, pull the insulation off the shank of the clips and check for broken wire inside the insulation with the clip still crimped to the wire insulation. Repair as necessary.
6. If still no display, check for 24 VDC where the red and black power wires solder in to the power board. If there is NO POWER, replace the cord. If there is POWER, return the TS-463 for exchange or repair.

CALIBRATING BOOM LENGTH (NEW OR REBUILT OSS-463E) ON THE CRANE

All units sent from the factory will have the “boom length” calibrated on the test bench. Because of manufacturing tolerances during production, the actual length of the boom, in varying extensions, will differ slightly. This sometimes makes it necessary to “fine tune” the OSS-463E to a particular crane. Often, a slight adjustment of the “Length Gain” will bring it in.

INSTALLING THE OSS-463E

Refer to Figure 5. Remove the top cover and the electronic cover. Mount the unit with three #6-32 x 3/8 screws. Connect the TS-463E Test Set (Figure 4). Plug in the load cell, rope layer switch, and power plug (Figure 5).

SETTING THE LENGTH POT TO MINIMUM

Set the “Length Gain” pot to minimum by turning it until the length stops getting smaller.
NOTE: A built-in clutch will allow the pot adjustment to continue to turn AFTER the length stops changing.

DISENGAGING THE POT GEAR

Refer to Figure 5. Loosen (about 1 turn) the 6-32 screw holding the bottom end of the length pot bracket. Pull the bracket down, toward the bottom, disengaging the pot gear from the idler gear.

TURNING GEAR BACK TO READ 3.6 FEET

Rotate the gear in the direction that will give a length reading of 3.6 ft. Gently push the bracket back up until the gears are fully engaged. Check the meter to ensure that it still reads 3.6’. Tighten the 6-32 screw.

TURNING LENGTH GAIN POT TO READ 7.3 FEET

Pull out the cable and connect to the 7.3 ft retracted boom anchor point on the boom. Turn the “LENGTH GAIN” pot to a reading of 7.3 ft. Always turn the pot from 7.2 toward 7.3; stop just as it trips to 7.3.

FULLY EXTEND BOOM (TO 18.4 FEET)

If LENGTH does not read 18.4 ft, adjust the “Length Gain” until it reads 18.4 ft.

FULLY RETRACT BOOM (TO 7.3 FEET)

- If the reading is still 7.3 feet, the “fine tuning” is complete.
- If the reading is +/- 7.3 feet, loosen the 6-32 screw and rotate the gear one tooth toward 7.3. Readjust the “Length Gain” slightly to 7.3 ft. (See TURN LENGTH GAIN POT TO READ 7.3 FEET, page 10.)

EXTEND BOOM TO 18.4 FEET

If needed, adjust to 18.4 feet and recheck at 7.3 ft. If necessary, readjust the gear one tooth up or down to get the 7.3 ft reading. With a little practice, length can be fine-tuned easily.

CALIBRATING THE OSS-463E SYSTEM ON THE TEST STAND

MOUNTING AND CONNECTING THE OSS-463E UNIT

1. Set the OSS-463E Unit on the two studs on the test stand and screw a nut on the left stud about two turns clockwise.
2. Pull out the cable and slip the loop over the 7.3 ft pin. The loop should fit easily without being oversized.
3. Connect the display and insert the three plugs in the receptacles at the back of the unit. Ensure that the red and black clips on the display cord are on the correct terminals. (If clipped on backwards, the 4.7 ohm resistor burns out). Plug the power cord in last to prevent sparking.

LENGTH CALIBRATION

1. With the length pot gear disengaged, roll the gear until the pot hits the stop. Then, turn the “length gain pot” fully counterclockwise.
2. Pull out the cable and hook it at the 7.3 ft. position.
3. Adjust the length gain pot clockwise until the display just clicks to 7.3 ft.
4. Move the cable to the 18.4 ft. position. If the display does not read 18.4 ft, adjust it to 18.4 ft.
5. Recheck the 7.3 ft. position by moving the cable to the 7.3 ft. position.

LENGTH ALARMS

1. Pull the cable out to about 20 ft. The alarm lamp must come on. Return the cable to less than 6.0 ft. The alarm lamp must come on again. Reset the cable on the 7.3 ft post.
2. If the display still reads 7.3 ft, ensure that the cable can be pushed down 2 or more inches before the display changes to 7.4 or 7.5 ft.
3. If the display reads 7.4 ft or almost 7.4 ft, disengage the gear and reset the length so that the display reads just 7.2 ft. Reset gain to 7.3 ft. Move the cable to the 18.4 ft position and adjust the gain to 18.4 ft. Return the cable to 7.3 ft and check. Push down on the cable to verify the 2 inch or more depression.

4. If after step 4 in LENGTH CALIBRATION, the display reads 7.2 ft, disengage the gear and adjust to 7.4 ft. Then reset the gain to read just 7.3 ft. Return the cable to the 18.4 ft position and check for 18.4 ft. If necessary, adjust the gain to get 18.4 ft. Return to 7.3 ft and check cable as in #2 this section, last page.

ANGLE CALIBRATION

1. Set the *test stand* to horizontal. The reading on the OSSE display should match the *digital angle meter* mounted on the test stand.
   Example: The *digital angle meter* reads 1.0° so the OSSE display can read from 0.6° to 1.4° (+/- .4° at zero)

   If the reading is outside this limit, the *angle pot* will need to be repositioned. (Remove the cover and loosen the three hold-down screws. Rotate the *angle pot* to within spec. Retighten the 3 hold-down screws. Don't install the cover yet.

2. Set the test stand to near 45° and compare the *digital angle meter* to the *display*.
   Example: If the *digital angle meter* reads 44.0° , the OSSE display can read from 43° to 44° (+/- 1° at 45°). If the reading is not correct, adjust the *trim pot*.

   Note: The *trimpot* will move the *zero set point* so it may be necessary to repeat Steps 1 and 2 several times.

3. Set the *test stand* to -25°. The OSSE display should read from -24° to -26°.

4. Tighten the *angle pot hold-down screws (3 each).* Reinstall the black plastic cover and tighten the mounting nuts holding the baseplate.

5. Recheck at -30°, 0°, 30°, and 60°. The reading should be within 1° over the entire range.

LOAD CALIBRATION

1. Set layer switch to "off." Adjust "load zero" from minus until it just trips to zero. Set the loadcell simulator to 1.2 mv/v. Adjust the load gain to read 12, 028 lbs.

2. Record the values of the load at 0.5, 0.4, 0.3, 0.2, or 0.1 mv/v. They should read 5055, 4039, 3022, 2006, 990, and 0 (zero).

3. Set the layer switch to "on" and record the loads at the same inputs. They should be 4861, 3884, 2906, 1929, 952, and 0 (zero).

4. If any of the values are off by +/- 50 lbs., try resetting the zero (0) and the 10424 setting.

5. Set the simulator to 1.0 mv/v. The meter should read 10424.

OVERLOAD, NO LOADCELL, ALARM DELAY

1. Note the seconds on the stopwatch and pull the loadcell plug from its receptacle. Immediately, push it back into its receptacle. The alarm lamp must come on and then go off after 5 to 7 seconds.

2. Note the stopwatch and switch the loadcell simulator to 1.3 mv/v. Immediately, switch it to 0.5 mv/v or less. Again, the alarm lamp must come on and then go off in 5 to 7 seconds.

LOAD CALIBRATION (TEST STAND)

1. Set the unit at an angle of about 5° in the test stand; set the length to 7.3 ft of boom and layer SW ON.
2. Plug in the load cell simulator and set it to “ZERO.” Adjust the load zero pot until the load output is ZERO.
3. Set the simulator to 1.0 mmv/v. Increase the load gain pot to a reading of just 10424 pounds.

ALARM CHECKS (TEST STAND)

1 Pull the cable in and out and watch for “under length alarm” at about 6.5 ft and “over length alarm” at about 20 ft. The alarms immediately turn off when the length returns to between 7.3 and 18.4 ft.

2 Pull the load simulator plug out of the unit and **immediately** reinsert it. The alarm should sound immediately and stay on for 5 to 7 seconds.

3 Set the simulator to 1.3 mv/v and back to 0.5 mv/v or less **immediately.** This is an overload test. The alarm should continue for 5 to 7 seconds.

4 Pull the layer switch plug from the unit. The LAYER SWITCH ON display turns to LAYER SWITCH OFF.

CRANE LOAD CALIBRATION

Grove procedures are available from the Grove factory. Various weights within 1% accuracy are used to check break points on the load table.

TROUBLESHOOTING

The OSS-463E Unit is designed to halt the winch when the load being lifted is approximately 5% over the load table.

STANDARD OVERLOAD LOCKOUT

The Army required that the system in overload, holds the lock-out for 6 +/- 1 seconds before hoist-up is released. If the overload has not been reduced to an allowed weight during the 6 second interval, the OSS-463 will automatically invoke another 6 second delay and will continue to do so until the load is reduced to an allowed size. This usually means that the load must be grounded. With the load grounded, the 6 second interval must run out before hoist up lock-out is released. The display reads: ALARM IS ON during lock-out.

STANDARD NO LOADCELL LOCKOUT

Pull the load cell or simulator plug from the -463 and immediately replace it. The “NO LOAD CELL” alarm also invokes the 6 second delay. The display reads: “ALARM IS ON.”

BOOM LENGTH LOCKOUT

If the boom length system says the boom length is less than 6.5 ft (possibly a broken cable) or is longer than 19 ft (possibly a cable caught on something), the winch is shut down.
The display **NEVER** reads:”**ALARM IS ON**.” There is no delay when the length returns to normal. The alarm unlocks immediately. The OSS-463 **CANNOT** LOCK WINCH LOWERING.

LOCKOUT MALFUNCTIONS/CORRECTIONS

There are two types of lockout malfunctions:1) the hoist locks on overload and will not unlock; and 2) the hoist doesn't lock on overload. Start by installing the TS-463 Test Set, if not already in place.

- **Does the display indicate that the unit is in ALARM MODE?**

  NOTE: When in ALARM MODE, the display is locked and does not respond to any inputs until the end of the delay period.

- **Does the weight of the load and the load table agree that it should be in alarm mode?** If yes, ground the load and **wait** the delay period. It should come out of alarm.

  NOTE: When in the alarm mode, the display is locked and does not respond to any inputs until the end of the delay period.

- **Is the lockout completely nonfunctional or just operating out of specification in some areas? Check with a load that must cause lockout.**

  If lockout is only in some areas, recheck the length, angle, and load zero and span calibrations.

  If lockout never operates, pick a load that must cause lockout and make the voltage measurements listed on pages 7 and 16 to determine where in the circuitry the signal is failing. Change parts as required, or replace the OSS-463E unit.

  If all voltages check out correctly, the problem is most likely in the crane system.

CONSIDER THE FOLLOWING:

1. Even if the load is immediately grounded, the display may still not show the load in "OVERLOAD" until the end of the delay period.
2. If an alarm condition still exists at the end of the ALARM period, the computer will unlock the data and instantly lock up again.
3. If an OVERLOAD is lifted quickly, the system will sense the overload and lock the winch before all data gets to the display and may read less than OVERLOAD. (The data is sent to the display in serial mode on a single wire rather than on 20 or 30 parallel lines.) Wait the 6 second delay for data to update. Load will then show true weight.
4. Let the delay run out at least once to find out if the alarm is true or false. (The display blinks at the end of the 6 second cycle.) If true, ground the load. At the end of the delay, the winch should unlock. If the winch is still locked or the hoist line is slack but the display reads OVERLOAD, the Unit may still be in the 6 second cycle.
5. Let it cycle once more (the data blinks) and if still locked, check the loadcell and winch mounts for binding. If clear, plug in an unmounted load cell or load cell simulator to bring the display to ZERO load. If the winch still won't hoist, locate the fault in the OSS-463 as outlined below.

HOIST LOCKS ON OVERLOAD AND WON'T UNLOCK

1. The signal for lockup travels from the computer to the transistor with the "horn output" label. From there it goes to the relay coil and then to the power plug. The relay contact power is supplied directly from the crane power bus.
2. See the relay socket back view in Figure 6.
3. Connect a voltmeter across the 1N4004 diode which is across the relay coil. If there is approximately 12 VDC across the relay coil, the load shows "Allowed Load" or "No Load" and the time delay has run out, the -463 is at fault. Ground the load to verify.
4. If there is no voltage on the relay coil, but the winch is still locked, check the voltage across the relay contacts.If there is no voltage, the relay contacts are stuck closed; replace the relays.
5. If there is a 24 VDC across the contacts, the relay is open, as it should be, and the fault is in the crane control section. Check for loose or poor connections.

HOIST DOESN'T LOCK OUT ON OVERLOAD

If hoist up doesn't lockout when an attempt is made to lift an overload, several areas must be checked to determine the cause.

POSSIBLE PROBLEM

1. Is the weight of the test load known to +/- 1%?
2. Is that weight less than a 5% overload for the boom length and boom angle?
3. Is the crane a couple of inches and/or degrees inside an area of the load table where a heavier load is allowed?

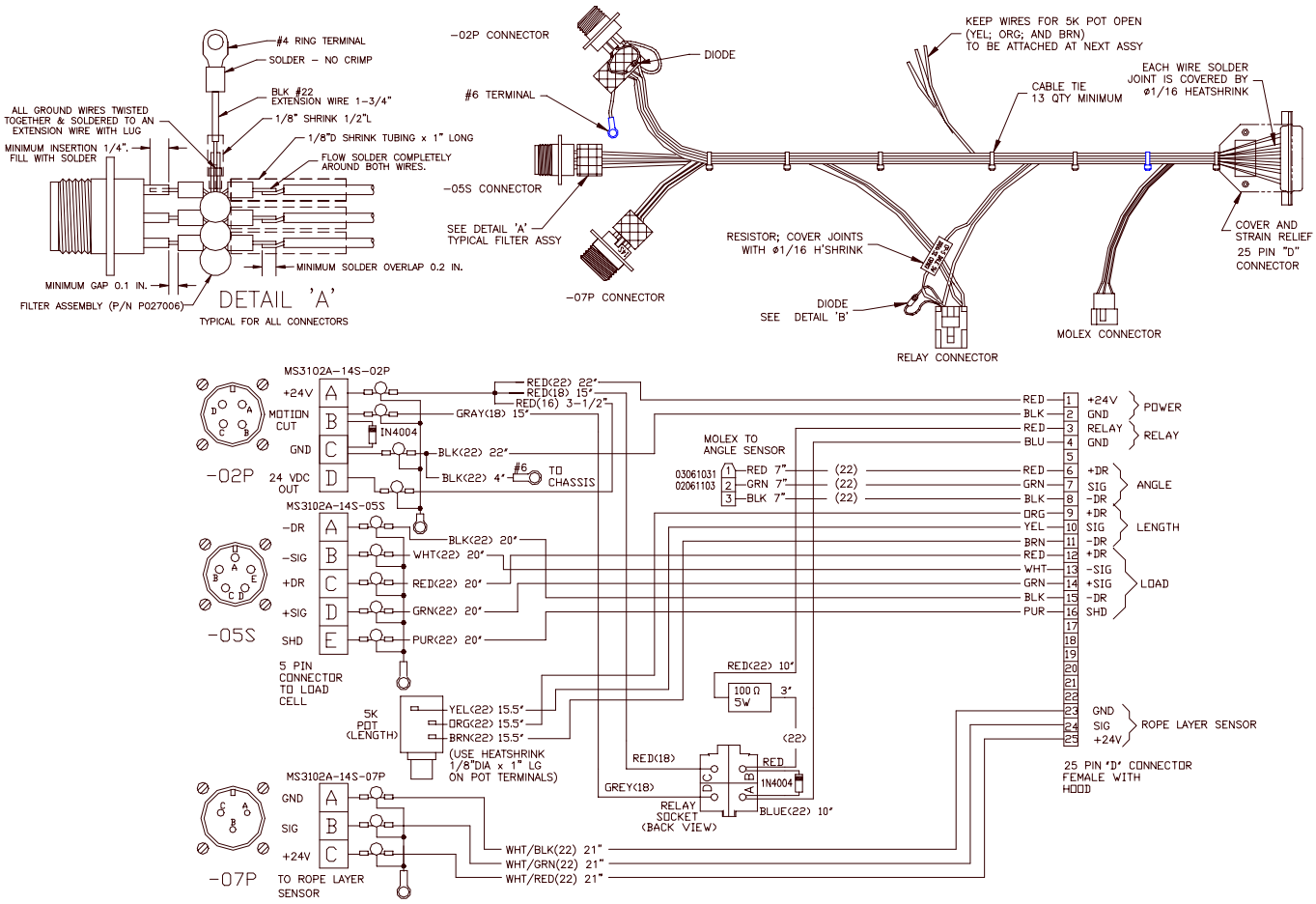

FIGURE 7: OSS-463E CABLE WIRING (A4)

ANGLE MALFUNCTION

NORMAL ANGLE OPERATION

The angle signal is provided by the A12 pendulum unit (Figure 8).

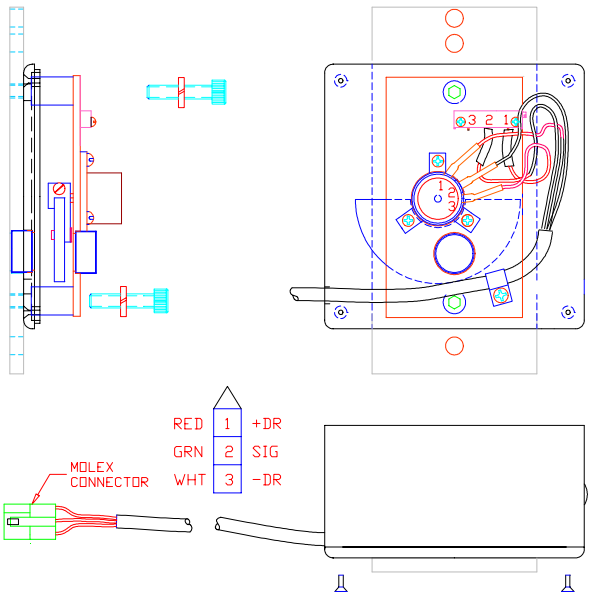

FIGURE 8: ANGLE SENSOR

TROUBLESHOOTING ANGLE MALFUNCTION

The A12 pendulum unit will measure angles from -30° to +64° in about 0.4° increments.

No over or under angle alarms are programmed into the System. At the minus 30° angle, the boom head is lowered close to the ground to allow personnel to work on the sheaves, cable, block, etc. without a ladder. The boom can be raised to about 60° mechanically. The overall accuracy of the A12 is +/- 1°.

If the angle reading does not change when the boom is raised or lowered, it almost always indicates that a that there is an open circuit in the angle channel wiring. (The pendulum is mounted on tape recorder grade bearings and very seldom hangs up.) Check out the wiring as shown in Figure 8 above and Figure 9 on page 20.

SYMPTOMS AND CAUSES

1. A constant reading of -30° or +64° is a broken +8VDC or a broken minus (-) VDC (ground) line. The break in the wiring could be inside the pot in the A12 case, the wiring inside the pendulum case, in the plugs connecting to the electrical harness, or in the soldering at DS25 plug. Refer to the Schematic Analog Board for Terminal Numbers, shown in Figure 9 on page 20.

2. If the angle reading is somewhere between -30° and +64° but doesn't change with boom up or boom down movement, the probable cause is an open signal wire. If the A12 pendulum is not plugged into the system it gives the same symptom.

3. When lockup is due to a fault in the OSS System, it will be in one or more of the following places:
   - The loadcell with its cable and connector disconnected.
   - Power cable and connector loose or broken wires.
   - The OSS-463 Assembly including the electronic box not fully plugged in.

When troubleshooting in the field, it is practical to replace the pendulum, length pot and electronics box, if they are causing the problems Observation and analysis can assist in diagnosing the source of the problem. Often the quickest repair is to change out the system. If the erratic behavior persists, check the crane electrical supply for loose connections, intermittent shorts, faulty circuit breakers, etc.

TROUBLESHOOTING WITH THE TEST SET MODEL TS463E

When connected to the System, the TS-463E display unit will show the length, angle, radius, and load being lifted. With this information, it is possible to quickly find which parameter is out of tolerance. The load chart in the manual provides the reference for allowable conditions.

Connect the TS-463E Unit as described on page 7. Use the TEST SET to determine the following types of faults

FAULT A: SYSTEM DOESN'T WORK

If the display is operating, the unit is getting power. If not see page 16 to locate the break in the power lines.

1. With the display operating, check with a tape measure, bubble protractor, and scale, the length, angle, radius, and weight of the load shown on the TS-463E display.

2. **If the values are correct,** increase the load or radius or reduce the boom angle until the display shows that the crane has reached the overload condition.

3. **The relay should have pulled in and shut down the hoist;** check the power to the relay across the diode in the relay plug. It should read between 12 and 16 VDC. If correct voltage is there, check the voltage across the other two relay terminals. If the relay contacts are closed, the voltage should be zero and the relay is OK. If it reads about 24 VDC, the relay is bad. Replace it. If voltage is zero (voltage OK) check the wiring and system for the fault. The crane relay or solenoid is not working.

4. **If the length reads long or short by more than plus or minus 1 ft.,**check the cable operation for smooth pullout and retraction. Operate the boom in and out to verify. Watch the length gear as the boom goes in and out. It should rotate smoothly without sticking or jumping. If it doesn't, change the OSS-463E. If it is smooth, try adjusting the length pot clutch to the correct length.

5. **Check the angle by setting the boom horizontal.** Verify with a level or bubble protractor.The display should read +/- 1/2 degree. Raise the boom to 30° or 40° and measure the angle accurately. Check the angle display. It should read +/- 1/2° . If possible, measure the boom angle to +/- 0.1° , otherwise the the display may read +/- 1° . The angle can be adjusted approximately 2° CCW and 2° CW by loosening the screws and rotating the case. Adjustments greater than these

indicate a defective pendulum or OSS-463E electronics. Substitute a new pendulum or replace the OSS-463E completely.

6. **Radius incorrect?** The radius is computed using the boom length and boom angle values displayed. Therefore, if length and angle are correct, the radius error may be caused by faulty computer operation. Measure the length, angle, and radius and verify that the radius is off more than +/- 1 ft. If it is, change the OSS-463E.

7. **Load weight displayed is incorrect**. If displayed weight is within +/- 100 lbs of the true weight, it is acceptable. Ground the load and check zero. It should read plus or minus 50 lbs. If zero and weight are outside of the tolerance, adjust the zero and span. Refer to Figure 4, page 7, for location of the load zero and load gain trimmers. If the zero and/or actual weight cannot be set with these controls, replace the load cell. If the load display still doesn't calibrate, change the OSS-463E.

FAULT B: CRANE IS LOCKED

1. **With the display plugged in, ensure that the length, angle, radius, and load are all reading according to the actual crane configuration and that the crane is not overloaded.** If the readings are correct, pull the power plug. If the crane remains locked, the problem is in the crane wiring or relays.

2. **If the crane unlocks when the power plug is pulled**, replace the plug and check the signal to the relay coil. Measure the voltage across the diode in the relay plug. **It should be zero**. If not, change the OSS-463E.

3. If the voltage is zero, check the voltage across the relay contacts (the other wires). It should be about 24 VDC, i.e., the contacts are open. If it is zero volts, replace the relays. The relay contacts are stuck or welded. Check for lock-up at overload.

SYSTEM LOCKS BELOW OR ABOVE RATED LOAD

The overload shutdown points are set at 5% above the rated load on the load chart. This is done so that the rated load can be picked up and moved slowly. The crane is still operating in a "safe" region of its capacity because of the safety factor deratings built into the load chart.

FAULT C: LOCKS BELOW RATED LOAD

1. Connect the TEST SET TS-463E to the electronic box (Figure 4, page 7). Measure the length, angle, and radius and verify that the correct measurements appear on the display. Preweigh the test load and compare with the display readout. The length and radius should be measured with a tape measure and the angle with a bubble protractor. Correct all incorrect numbers in the display as described on pages-8-9. Check the lock-up after corrections are made. If the corrections cannot be made, change the OSS-463E.

FAULT D: LOCKS ABOVE RATED LOAD

With the TS-463E connected as above, correct any incorrect values displayed. Check lock. If corrections cannot be made, change the OSS-463E.

LOCK OCCURS ERRATICALLY

As described on page 14, erratic locking is most often caused by loose electrical connections. Follow the procedure described on pages 18-19 to locate the fault. Connect the TS-463E to the electronic box during the search. Operate the crane until a random lock occurs.Check the display to see if one of the channels shows an incorrect reading. Check the wiring in that channel. If the fault cannot be found or the problem corrected, replace the OSS-463.

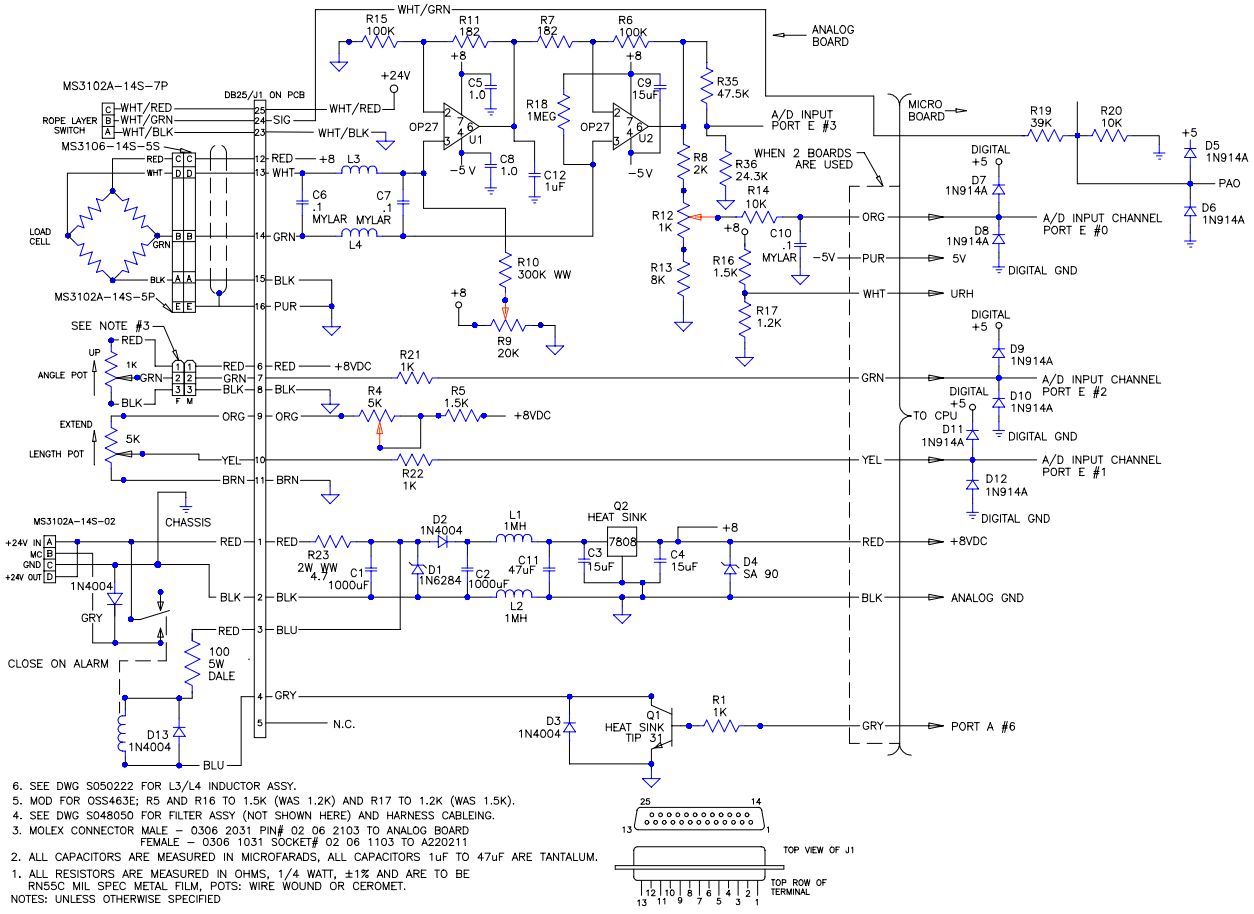

FIGURE 9: CIRCUIT BOARD DIAGRAM

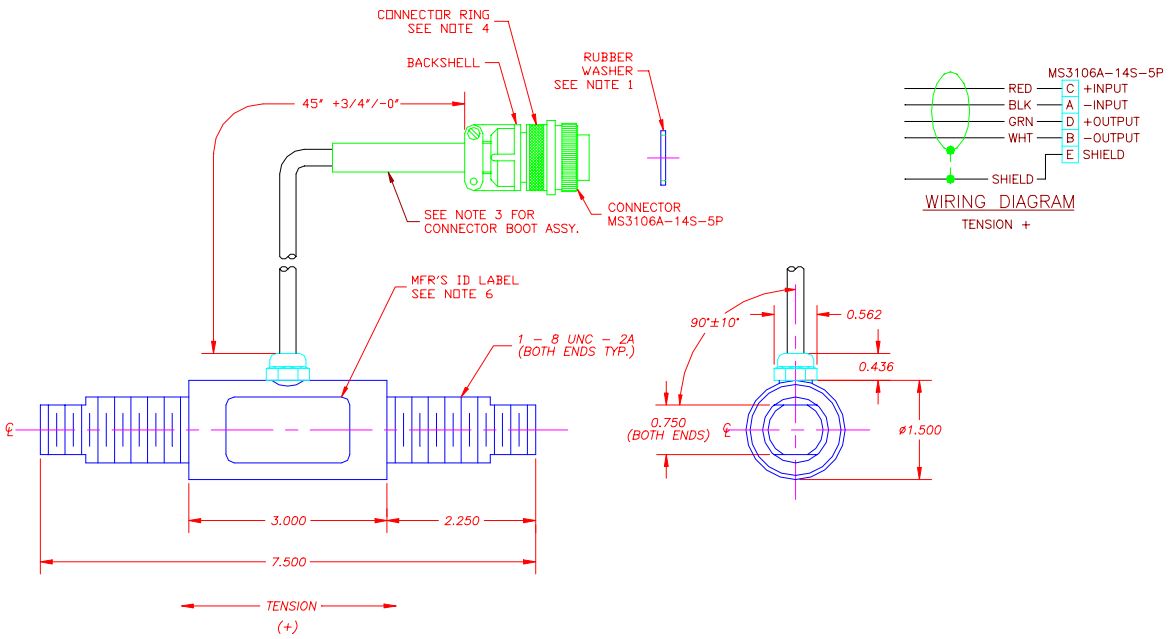

FIGURE 10: TENSION LINK LOADCELL


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