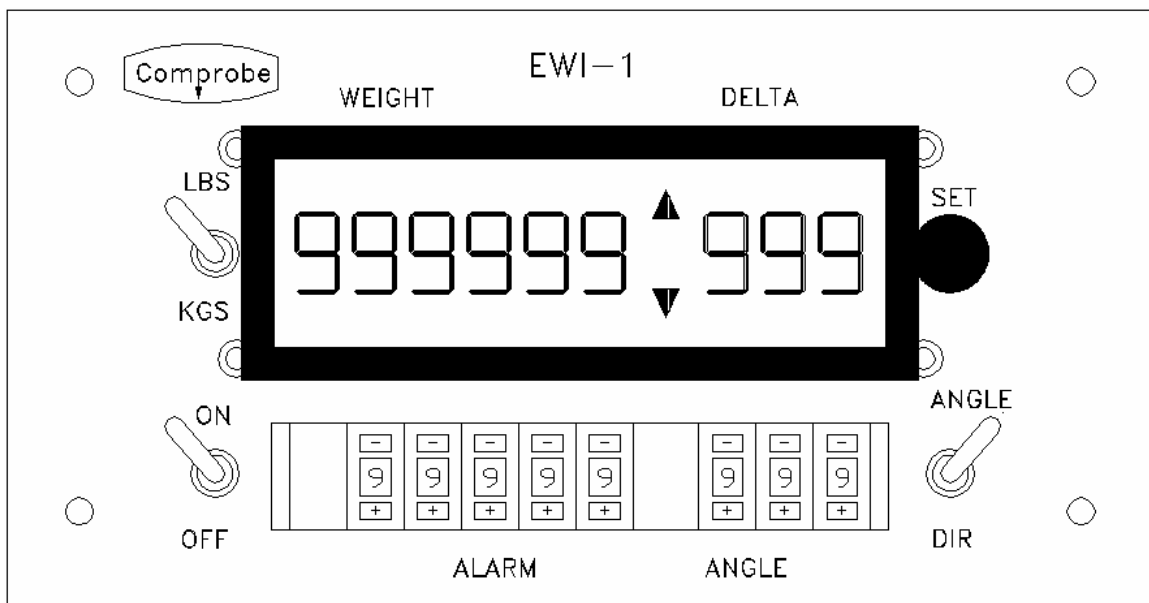


EWI-1

ELECTRONIC WEIGHT INDICATOR OPERATION MANUAL





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ADDENDUM TO EWI-1 MANUAL

The 1.6 version firmware is the current version for EWI-1 units manufactured after 06/01/2004.

The only difference between the older 1.5 version and the newer 1.6 version is that an alarm high or low feature has been added. If the **ALARM LO** setting is used, the unit will sound and disable the hoist if the displayed weight is lower than the thumb wheel weight and the **ALARM ON** switch is in the on position. If the **ALARM HI** setting is used, the unit will sound and disable the hoist if the displayed weight is higher than the thumb wheel weight and the **ALARM ON** switch is in the on position. This was the normal operating mode for the 1.5 version. As before in the 1.5 version, the unit will display the current setting at power up to remind the user of the current settings.

If the user wishes to change the current setting, he can simply do this by dialing 993 on the angle thumb wheels and depressing the **SET** button for at least 3 seconds. At this point the display will prompt the user to set the **ALARM**. This is accomplished by setting the **ALARM ON** switch to the **ON** position for the **ALARM HI** setting or setting the **ALARM ON** switch to the **OFF** position for the **ALARM LO** setting. Once the switch is properly set, the user should depress the **SET** button one more time until the unit sounds to indicate the setting has been accepted. At this point, the user can release the button and the unit display the accepted setting and resume normal operation.

DESCRIPTION & SPECIFICATIONS

DESCRIPTION -----

The ELECTRONIC WEIGHT INDICATOR – ONE (EWI-1) manufactured by Comprobe, Inc., Fort Worth, Texas, employs the latest in combined digital and analog technology to provide the user with precise LINE WEIGHT and SHEAVE WEIGHT readings.

EWI-1 Front Panel Controls and Features include LBS or KGS display selection, Alarm ON / OFF control with thumb wheel value select, Direct or Sheave Cable Angle control with thumb wheel angle value select and a Set Pushbutton for the Delta Display reading.

EWI-1 Rear Panel connections include +12VDC power, 4 pin sensor, 15 Pin External Wiring for external analog delta meter and Calibrate function and an insulated BNC for connection to the ANALOG TO DIGITAL PROCESSOR MODULE ADP-2 or the ELECTRONIC DEPTH COUNTER MODULE EDC-1.

Version 1.4 EWI-1's also use a pin located on the EXT connector for shutting down the hoist in case of accidental over pull.

SPECIFICATIONS -----

WEIGHT DISPLAY RANGE	:	00000 to 99999 LBS or KGS
WEIGHT ALARM RANGE	:	00000 to 99999 LBS or KGS
DELTA DISPLAY RANGE	:	+/- 999 LBS or KGS
ANGLE RANGE	:	0 TO 170 CABLE ANGLE DEGREES 10 DEGREE INCREMENTS. ERRORS ON INVALID ANGLE.
SENSOR TYPE	:	HOOK TYPE LOAD CELL OR *PRESSURE BRIDGE TYPE ELEMENT -5VDC TO -10VDC EXCITATION.
POWER SUPPLY	:	.500 AMPS +8 TO +25 VOLTS DC ONLY.

***NOTE:** AVAILABLE FOR USE WITH MARTIN DECKER TYPE LOAD CELLS.

OPERATING & PROGRAMMING INSTRUCTIONS

INSTALLATION - - - - -

Before the Power is applied to the EWI-1, all cables should be properly connected and checked for shorts.

Once a proper installation place has been established and cables are properly connected, insure that the D.C. Power Cables are not reversed before applying Power. Also, insure that the unit is solidly mounted into it's position.

OPERATION - - - - -

After Installation has been properly performed, the User is now ready for operations.

Now Apply Power to unit and wait for a beep with all of the leds in the display on. This gives the user a chance to test the display for a faulty segment that would give erroneous readings as well as a test of the beeper circuit that alarms the operator. After Power up test the unit will respond with the current Revision level of Firmware on the Display. This Revision number should be used when referring to this unit with the factory. After the Revision number is displayed, the unit will display the current gauge, offset setting and the hoist control polarity currently entered in the unit.

Next the user should select his mode of display by selecting LBS or KGS switch to the proper position. After Mode selection, the user could set a predetermined alarm value on the thumb wheel switched below the weight display. Enabling of the Alarm is accomplished by set the ON / OFF switch to the ON position. When Weight exceeds the current thumb wheel value the beeper alarm will sound and the display will flash at one second intervals until the ON / OFF switch is moved into the OFF position. If the unit is wired for Hoist shut down operations, the unit will also shut down the hoist to avoid cable pull out.

The next step in setting up the EWI-1 is selecting the cable angle value. Cable Angle value is set by entering the proper angle on the thumb wheel switches located below the Delta display. Angles are entered from 0 to 170 degrees in 10 degree increments with the last digit ignored. The toggle switch located next to the angle thumb wheel switch is used to select computed angle or direct sensor weight display. The display will produce an error message on any invalid angle with the angle switch activated.

To make use of the Delta display feature, the user should hit the set button when he is ready to take Delta reading from the current weight indicated. The Delta display located on the right of the unit will display the current indicated weight minus the indicated weight when the set button was depressed. Plus and minus readings are indicated by the two round leds that separate the weight and delta. Plus indications are indicated by the upper led and minus are indicated by the lower led. This feature could be used in tagging bottom or monitoring minute changes in weight.

OPERATING & PROGRAMMING INSTRUCTIONS

EWI-1 Control Descriptions - - - - -

Power up - - - - -

- (1) Upon Power-Up, all leds light up to check for missing or defective segment. If a segment of a digit is not on, this will cause a false reading during normal operation. If the beeper is not sounding during this two second test, there is a malfunction and no alerts will be given.
- (2) After power UP test the current revision level of firmware will be displayed.

Weight Display - - - - -

- (1) Displays the current Computed Angle Sheave or Direct Sensor Weight in Pounds or Kilograms.

Mode - - - - -

- (1) Setting this toggle switch to the LBS position causes the unit to operate and display in pounds.
- (2) Setting this toggle switch to the KGS position causes the unit to operate and display in Kilograms.

Alarm ON / OFF - - - - -

- (1) Setting this toggle switch to the ON position causes the unit to beep and flash the display if the indicated weights ever exceeds the current alarm thumb wheel setting. The Hoist Control pin 8 of the EXT connector will also go active with alarm. To relieve the alarm condition the operator should set the switch to the OFF position.
- (2) Setting this toggle switch to the OFF position cause the unit to operate without alarms and also resets a previous alarm condition.

Alarm Thumb Wheels - - - - -

- (1) These switches should be set to the desired Alarm and hoist shutoff value of weight.

Angle Thumb Wheels - - - - -

- (1) These switches should be set to the current cable angle applied to the sheave wheel.
- (2) Valid Angles include 0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 110, 120, 130 140, 150, 160 and 170 degrees. All other selections produce error to be displayed.

Angle/Dir - - - - -

- (1) When this toggle switch is set to the **ANGLE** position, the unit will display weight computed for a desired cable angle across a sheave wheel.
- (2) When this toggle switch is set to the **DIR** position, the unit will display direct sensor weight. This switch should remain in the **DIR** position for the Martin Decker Load Cell type units.

OPERATING & PROGRAMMING INSTRUCTIONS

(3) * CAUTION!!! *****

Unit may not necessarily display or alarm on proper weight indicated if angle setting is in error
ANGLE/DIR switch is in DIR position.

EXAMPLE:

Switch in ANGLE position with angle set to 000
while unit Indicates 5000 LBS.
Actual Boom weight + 10000 LBS.

Delta Display - - - - -

- (1) Displays the Current Indicated Weight in LBS or KGS minus the Indicated Weight when the Delta set button was hit.
- (2) Upper jumbo led on left of Delta display indicates +.
- (3) Lower jumbo led on left of Delta display indicates -.

Delta Set - - - - -

- (1) Depressing this push button causes the Indicated Weight to be latched for future computations to the Delta Display.

Hoist Shutoff Polarity Setup - - - - -

- (1) The operator can set the polarity of the TTL level used on pin 8 of the EXT D type connector located on the rear panel. This can be wired to a 110/220 VAC solid state relay, (for electric hoists), or a 12VDC coil relay, (for hydraulic hoists), used to shut off the hoist in case of accidental over pull. To set the proper polarity, the operator should set 992 on the angle thumb wheel with the angle switch in the DIR position and depress the Delta set button for at least 3 seconds until a beep is heard. At this point the unit will prompt the operator to set the proper polarity. This is accomplished by setting the alarm ON/OFF switch to the ON position if the operator wants the output to be on when the alarm is active. Or the operator should set the alarm ON/OFF to the OFF position if he desires the output to be off when the alarm is active. After the alarm ON/OFF switch is set, the operator should enter his setting by depressing the Delta set button until a beep is heard. After the beep is heard, the unit will display the setting accepted and return to normal operation. In most cases, the operator would select 'active off' for electric hoist operations and 'active on' for hydraulic hoist operations. In the case of hydraulic operations, the unit would activate a 12 VDC relay which would in turn activate a hydraulic dump valve to shut down the hoist.

Programming Gauge Full Scale - - - - -

- (1) The operator may change the Full Scale of his gauge by setting 990 on the angle thumb wheel with the angle switch in the Dir position and depressing the delta set button for at least 3 seconds until a beep is heard. After the unit sounds a beep, the operator should enter his gauge full scale value on the set of alarm thumb wheel switches. After this setting is verified, the operator should depress the Delta set button once again until a beep is heard. After this is done, the unit will respond with the full scale setting that is permanently stored in the unit.

OPERATING & PROGRAMMING INSTRUCTIONS

Programming Gauge Offset - - - - -

- (1) The operator may change the Offset of his gauge by setting 991 on the angle thumb wheel with the angle switch in the Dir position and depressing the Delta set button for at least 3 seconds until a beep is heard. After the unit sounds a beep, the operator should enter his gauge offset value on the set of alarm thumb wheels. Plus and minus selection is accomplished by setting the alarm ON/OFF switch to ON for plus and OFF for minus. After this setting is verified, the operator should depress the Delta set button once again until a beep is heard. After this is done, the unit will respond with the offset setting that is permanently stored in the unit.

Thumb Wheel Diagnostic Test - - - - -

- (1) The operator can verify proper operation of his thumb wheels by setting 980 on the angle thumb wheel with the angle switch in the Dir position and depressing the Delta set button for at least 3 seconds until a beep is heard. At this point the unit will display the current thumb wheel settings for each thumb wheel in corresponding display positions. Incrementing each switch through all 10 positions on each switch will verify proper operation.

EWI-1 CALIBRATION PROCEDURE

The following text will describe the steps required to perform the analog and digital calibration procedures on the EWI-1 running Version 1.4 Firmware. This procedure assumes the user to have a millivolt calibration box, 6 digit precision digital millivolt meter and a millivolt calibration sheet supplied by the load cell sensor manufacturer.

- (1) Select Program Resistor using the following formula remove cover and install on rear board located inside EWI-1.

$$\text{Resistor in ohms} = (50000 / (5000 / (\text{mv/v} * 10.0))) - 50.0$$

EXAMPLE:

2.6 to 2.9 Millivolt/Volt = 245 ohms for T-Hydrionics Hook Type Load Cell.

10 Millivolt/Volt = 470 ohms for Comprobe Pancake Type Hydraulic Load Cell, 515 PSI = 10000 lbs.

- (2) Connect Precision Digital Millivolt Meter to Millivolt Calibration Box.
- (3) Connect Millivolt Calibration Box to EWI-1 and power up.
- (4) Set the Angle/Dir Switch to the Dir Position.
- (5) Set the Gauge Full Scale Value of your Gauge in the Firmware.

The operator may change the Full Scale of his gauge by setting 990 on the angle thumb wheel with the angle switch in the Dir position and depressing the Delta set button for at least 3 seconds until a beep is heard. After the unit sounds a beep, the operator should enter his gauge full scale value on the set of alarm thumb wheels. After this setting is verified, the operator should depress the Delta set button once again until a beep is heard. After this is done, the unit will respond with the full scale setting that is permanently stored in the unit.

- (6) Set the Gauge Offset to 0 in the Firmware.

The operator may change the Offset of his gauge by setting 991 on the angle thumb wheel with the angle switch in the Dir position and depressing the Deltaset button for at least 3 seconds until a beep is heard. After the unit sounds a beep, the operator should enter his gauge offset value on the set of alarm thumb wheels. Plus and minus selection is accomplished by setting the alarm on/off switch to on for plus and off for minus. After this setting is verified, the operator should depress the Delta set button once again until a beep is heard. After this is done, the unit will respond with the offset setting that is permanently stored in the unit.

- (7) Set the Offset Adjustment to 0. on the rear board inside EWI-1.

Using the Offset Adjustment Pot on the rear board of the EWI-1 set the display to read 0000.0 with 0 millivolts dialed on the millivolt calibration box. This can be accomplished by turning the adjustment till a positive number appears in the display and then backing off the adjustment till 0 is obtained.

- (8) Set the Gain Adjustment on rear board inside the EWI-1.

Using the millivolt calibration sheet supplied by your manufacturer, dial in the full scale millivolt value on the millivolt calibration box. Using the Gain Adjustment Pot on the rear board of the EWI-1, set the display to read the full scale value of your gauge.

- (9) Repeat Steps 5 and 6 till both values are obtained.

ENVIRONMENTAL & ELECTRICAL CONDITIONS

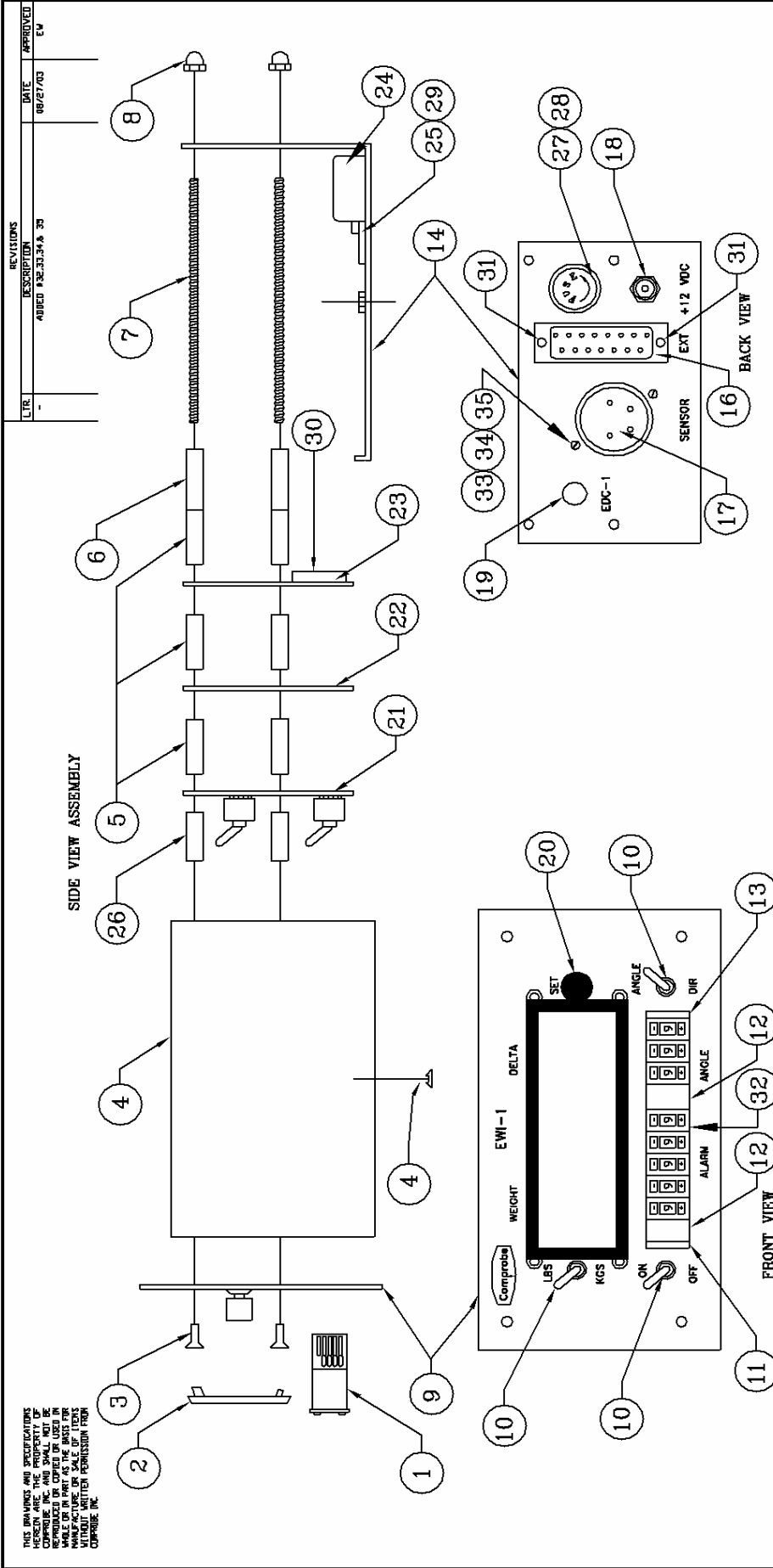
COMPROBE, INC. EWI-1 ELECTRONIC WEIGHT INDICATOR CONTAIN ELECTRONICS AND MUST BE KEPT DRY. THESE UNITS CONTAIN HIGH VISIBILITY READOUTS WITH SOFT KEY PRESET CONTROLS FOR VISUAL REFERENCE INDICATION. THESE FEATURES REQUIRE THESE UNITS TO BE MAINTAINED IN A DRY USE ENVIRONMENT. THE USE OF THE MEMBRANE PRESET CONTROL PLASTIC COVERS ARE REQUIRED TO PREVENT MOISTURE FROM ENTERING THE UNIT WITH WET HAND OPERATION. FAILURE TO USE THESE PLASTIC MEMBRANE COVERS WILL REDUCE COUNTER LIFE DUE TO INTERNAL CORROSION AND CAUSE ERRATIC DEPTH READOUT.

ELECTRICALLY THESE UNITS WORK ON POSITIVE 9 VOLTS DC TO 18 VOLTS DC. A SEPARATE CLEAN 2 WIRE CONNECTION DIRECT (FUSED) TO THE TRUCK BATTERY OR A 110 VOLTS AC TO 12 VOLTS DC, 1 AMP, SEPARATE REGULATED POWER SUPPLY IS AVAILABLE FOR GLITCH FREE OPERATION OF THESE UNITS.

EWI-1 DRAWING SUPPORT FILES

EWI-1 PARTS & ASSEMBLY	9000-027
EWI-1 ELECTRONIC SECTION BLOCK DIAGRAM	6001-009
HOOK TYPE LOAD CELL CABLE WIRING	6000-281
MEASURING HEAD TYPE LOAD CELL CABLE WIRING	6000-334
EWI/EDC COMBO PANEL ASSY. DRAWING & WIRING	6000-337
HOOK TYPE LOAD CELL ANGLE FORMULA	1001-095
OVERWEIGHT HOIST SHUT OFF SCHEMATIC	5000-579
EWI-1 CALIBRATION BOX SCHEMATIC	6000-335

TECHNICAL DRAWINGS



REF	PART #	DESCRIPTION	QTY
1	A5000-516	THUMB WHEEL SWITCH ASSY	8
2	260-0011	DISPLAY AND FILTER	1
3	680-0023	4-40 X 1/4" L F.H. SCREW	4
4	130-0026	BOX W/SPECIAL SCREW	1
5	725-0020	STAND OFF 3/4" L	12
6	725-0021	STAND OFF X 1" L (MODIFIED TO .975" L)	4
7	680-0174	4-40 ALL THREAD X 4 1/4" L	4
8	681-0023	4-40 CAP NUT, SPLIT LOCK WASHER & LOCKITE	4
9	B5000-289	EWI-1 FRONT PANEL	1
10	755-0078	TOGGLE SWITCH	3
11	755-0068	LEFT SWITCH SPACER	1
12	755-0071	CENTER SWITCH SPACER	2
13	755-0069	RIGHT SWITCH SPACER	1
14	B5000-291	BACK PANEL SLIDING ENCLOSURE	1
15	180-0197	15 PIN CONNECTOR	1
16	180-0044	D4F CONNECTOR	1
17	420-0016	12V JACK	1
18	180-0016	BNC	1
19	755-0067	PUSH BUTTON SWITCH	1
20	8900-095	DISPLAY BOARD	1
21	8900-097	PROCESSOR BOARD	1
22	8900-182	I/O BOARD	1
23	015-0004	BEEPER	1
24	615-0008	5V REG 7805	1
25	725-0003	3/4" L X 1/4" HEX X 4-40 SPACER (MOD. TO .725" L)	4
26	320-0002	FUSE HOLDER	1
27	315-0016	1 AMP GT3	1
28	140-0063	1.0UF CAPACITOR	1
29	180-0105	16 PIN CONNECTOR	2
30	725-0019	4-40 SPACER	2
31	205-0003	COVER	1
32	680-0023	4-40 X 1/4 100° F.H. SLOTTED SCREW (S.S.)	2
33	682-0005	#4 SPLIT LOCK WASHER	2
34	681-0004	4-40 S.S. NUT	2

NOTES:

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES

TOLERANCES: DECIMALS: X = .015, Y = .010, Z = .005
 ANGLES: 1/2, 1/32, FINISH MARK V=3Z
 FRACTIONS: 1/32, FINISH MARK V=3Z

NEXT ASSY. USED ON: _____
 PREPARED BY: 3-1-95 R.F.
 CHECKED BY: _____
 APPROVED BY: _____

DO NOT SCALE DRAWING SCALE: 1/2

DATE: 08/27/03
 APPROVED BY: EW

REV. 1

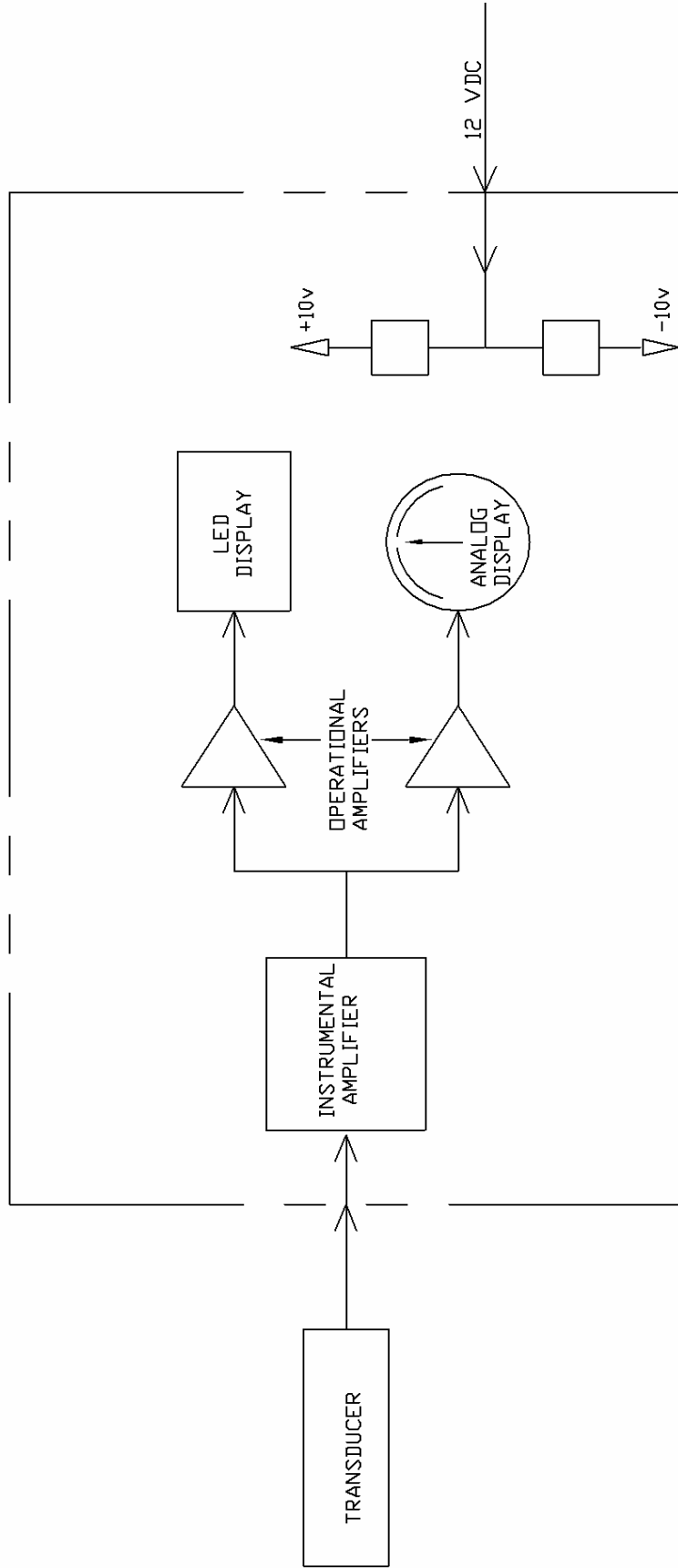
COMPROBE, INC.
 FURT WORTH, TX 817-293-7333 FAX 817-293-0963

TITLE: **EWI-1 (DIGITAL)**
ELECTRONIC WEIGHT INDICATOR ASSEMBLY DRAWING

DRAWING # 9000-027
 MATERIAL: _____
 FINISH: _____

REVISIONS		DATE	APPROVED
LTR.	DESCRIPTION		

EWI MODULE



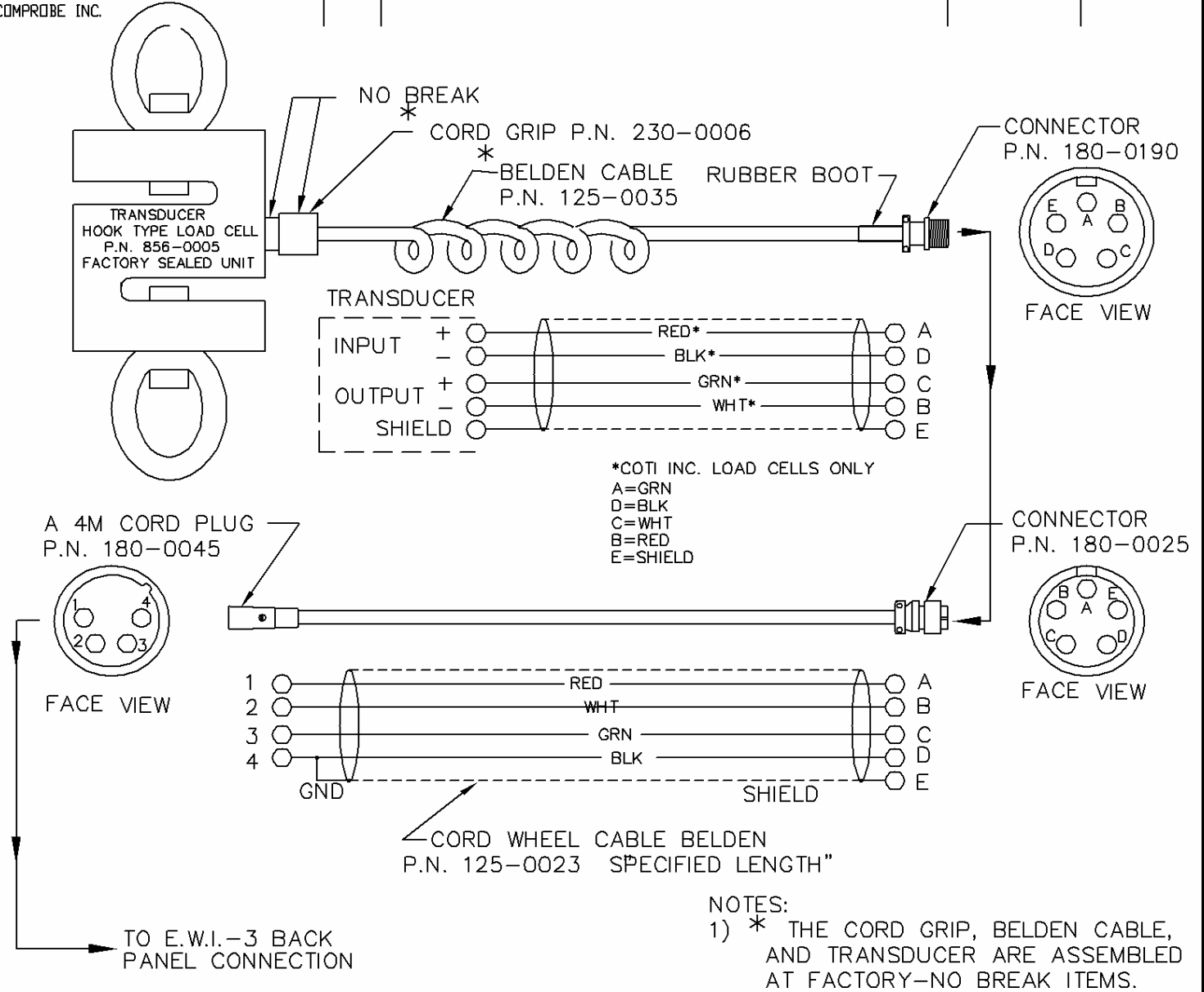
ELECTRONIC WEIGHT INDICATOR
MODEL # EWI-1
POWER REQUIREMENTS
VOLTAGE = +12VDC (POSITIVE)
CURRENT = .500 AMPS

PREPARED: 9-18-90	COMPROBE, INC.		
CHECKED:	FORT WORTH, TX. (817)293-7333 FAX# 817-293-0963		
APPROVED:	TITLE: EWI-1		
NEXT ASSY.	ELECTRONICS - SECTION		
USED ON	BLOCK DIAGRAM		
SIZE A	DRAWING # 6001-009	REV.	

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REVISIONS			
LTR.	DESCRIPTION	DATE	APPROVED

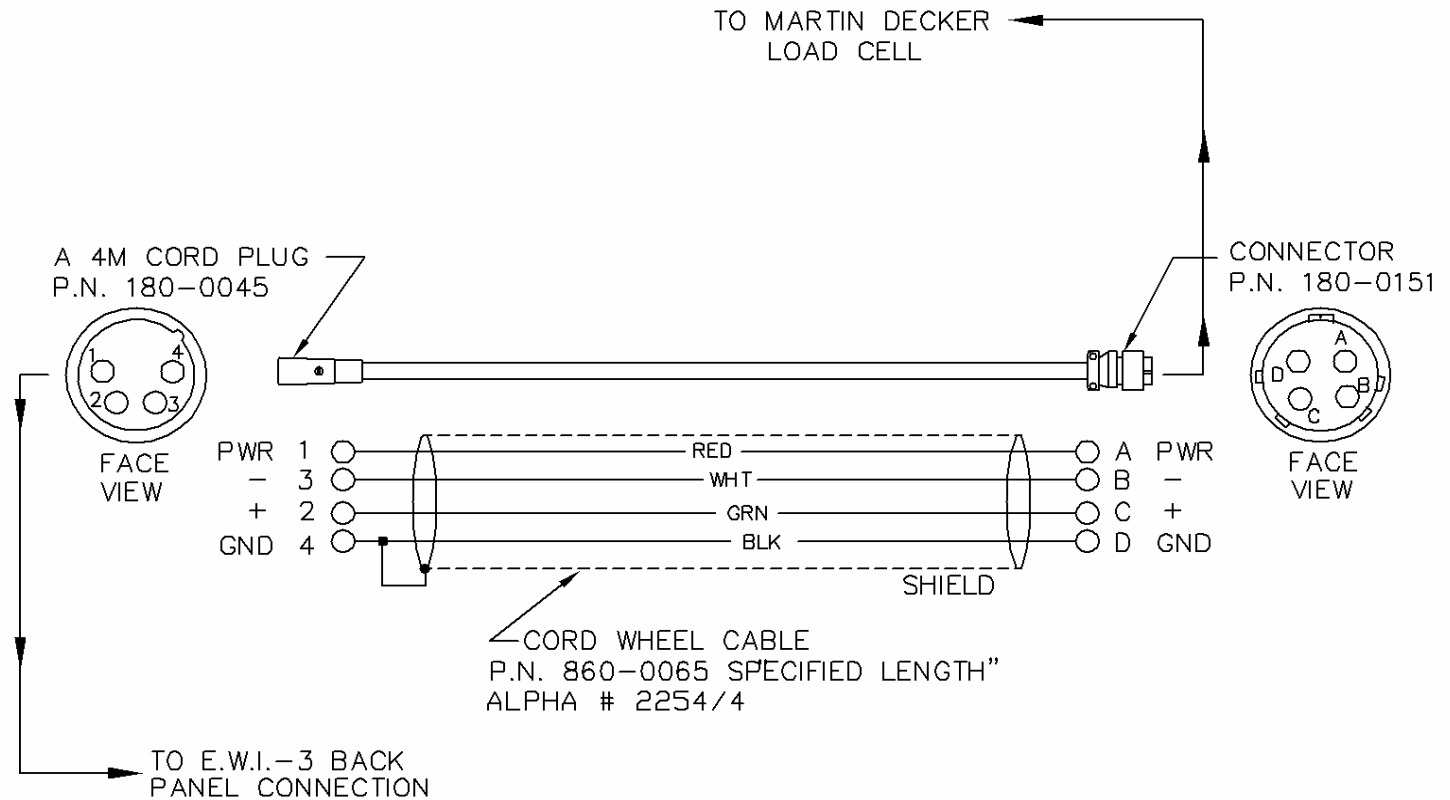


D5020-200		TOP DWG	PREPARED: 5-17-93 M.K.	COMPROBE, INC. FORT WORTH, TX. (817)293-7333 FAX# 817-293-0963	
NEXT ASSY.		USED ON	CHECKED:		
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES:			MATERIAL:	HOOK TYPE LOAD CELL HTLC WIRING FOR EWI/1	
DECIMALS: X= .015 XX= .010 XXX= .005			FINISH:		
FRACTIONS: 1/32 ANGLES: 1/2			SHT: OF: SCALE:		
FINISH MARK V=32			DO NOT SCALE DRAWING		
SIZE	DRAWING #		REV.	6000-281	
A					

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REVISIONS			
LTR.	DESCRIPTION	DATE	APPROVED
A	REVISED CONNECTOR 180-1051	06-03-96	VLB



NOTES

- 1) 6' UNLESS OTHERWISE SPECIFIED
- 2) 20' WHEN IN A CABINET

		PREPARED: 5-17-93 M.K.	COMPROBE, INC. FORT WORTH, TX. (817)293-7333 FAX# 817-293-0963	
D5020-200	TOP DWG	CHECKED:		
NEXT ASSY.	USED ON	APPROVED:	TITLE: <i>MHA-3 PRESSURE SENSOR WIRING-MARTIN DECKER- FOR EW1-1</i>	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES: DECIMALS: X= .015 XX= .010 XXX= .005 FRACTIONS: 1/32 ANGLES: 1/2 FINISH MARK V=32		MATERIAL:		
		FINISH:	SIZE DRAWING # 6000-334 REV. A	
		SHT: OF: SCALE:		
		DO NOT SCALE DRAWING		

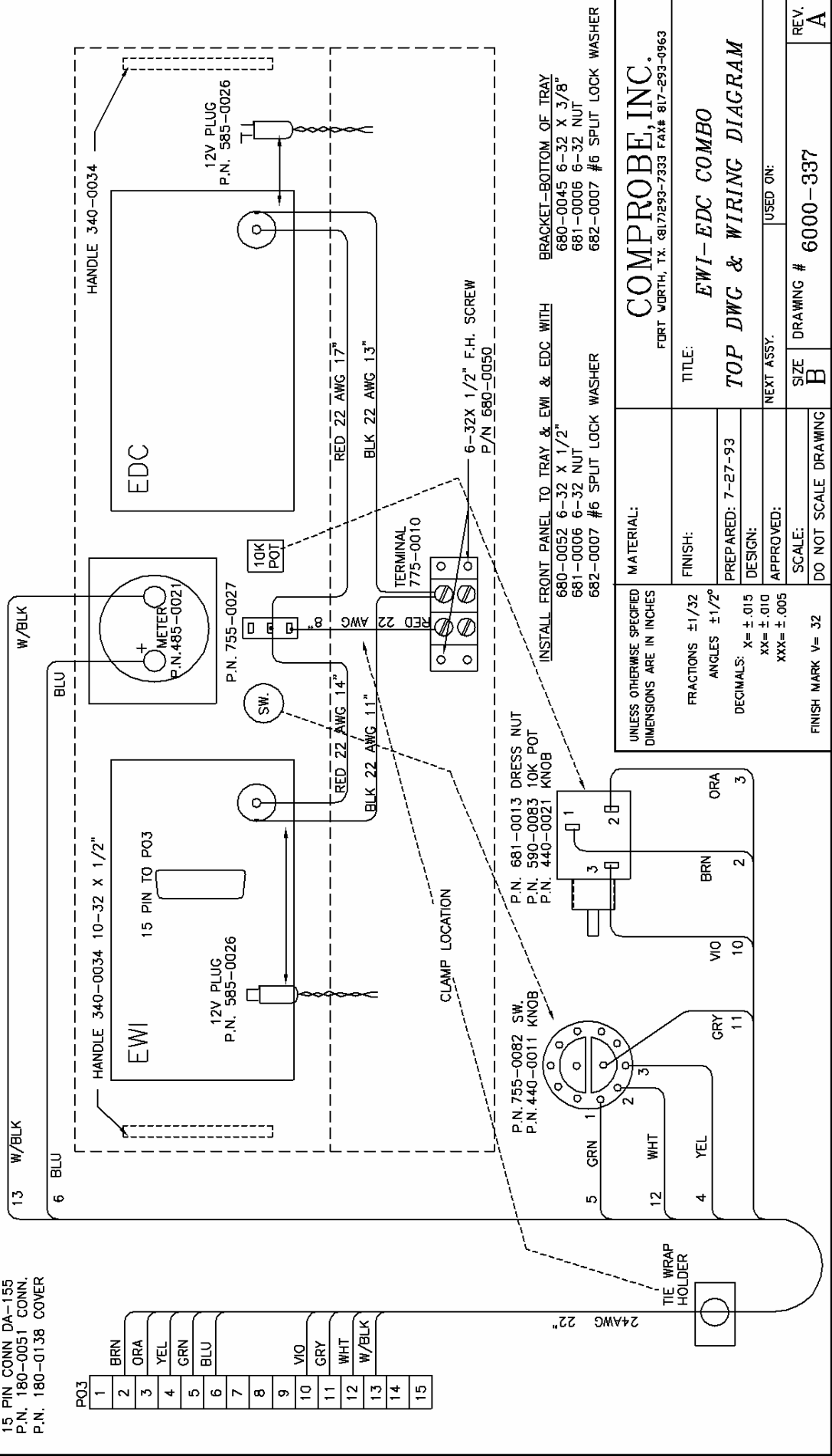
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COMPROBE, INC.

15 PIN CONN DA-155
P.N. 180-0051 CONN.
P.N. 180-0138 COVER

PO3	1	BRN
	2	ORA
	3	YEL
	4	GRN
	5	BLU
	6	
	7	
	8	
	9	VIO
	10	GRY
	11	WHT
	12	W/BLK
	13	
	14	
	15	

REVISIONS		
LTR.	DESCRIPTION	DATE
A	ADDED PART NO.	06/16/03 EW



BRACKET-BOTTOM OF TRAY
680-0045 6-32 X 3/8"
681-0006 6-32 NUT
682-0007 #6 SPLIT LOCK WASHER

INSTALL FRONT PANEL TO TRAY & EWI & EDC WITH
680-0052 6-32 X 1/2"
681-0006 6-32 NUT
682-0007 #6 SPLIT LOCK WASHER

MATERIAL:		COMPROBE, INC. FORT WORTH, TX. (817)293-7333 FAX# 817-293-0963	
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES	FINISH:	TITLE: EWI-EDC COMBO TOP DWG & WIRING DIAGRAM	
FRACTIONS ±1/32	ANGLES ±1/2°	NEXT ASSY. USED ON:	
DECIMALS: X= ±.015 XX= ±.010 XXX= ±.005	PREPARED: 7-27-93	SIZE	DRAWING # 6000-337
FINISH MARK V= 32	DESIGN: APPROVED:	SCALE:	DO NOT SCALE DRAWING
	SCALE:		REV. A

