

**INSTALLATION, OPERATION
AND MAINTENANCE MANUAL FOR THE
300 G-60 SERIES RETRACTABLE FLARE IGNITION SYSTEM**

Customer : ENCANA

Location : HYTHE GAS PLANT – 10-09-073-13 W6M

P.O. # : 0319338

Mactronic File #..... : 5998-03

Date : SEPTEMBER, 2003

For Parts and Service please contact:

Mactronic Enerflex

Enerflex Systems Ltd.

Red Deer, Alberta, Canada (403) 342-1822

1-800-36-FLARE (Canada & US)

24 hours

This Flare Ignition System must be installed by qualified personnel in accordance with applicable Electrical Code and this Installation Manual.

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- A) 'Mac Ignitor'® Head Assembly Instructions
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A) 'Mac Ignitor'® Head Assembly Instructions

Remove the Ignitor Head from the crate and mount it on the carrier, [unless already pre-set from the factory], with two (2) 3/8" x 2 1/2" bolts and nuts provided. The bolt on the longer carrier assembly will mount toward the venturi probes. (Dwg #92-110-TP). Check to make sure the Venturi Probe gap is 3/16". (Dwg #91-002-M).

NOTE: DO NOT AT ANY TIME PICK UP THE 'MAC IGNITOR'® BY THE VENTURI PROBES. DAMAGE MAY OCCUR WITHIN THE INSULATED HEAD AND ANY WARRANTY WILL BE VOID.

B) INSTALLATION OF THE SLIP STREAM IGNITION CHAMBER AND THE 'MAC IGNITOR'® HEAD RETRACTABILITY PACKAGE

The following is a typical installation procedure. If a Flare Stack or Flare Tip has been purchased with the Ignition Equipment then factory installation of a majority of the following components will have already been completed, go to Section 6.

View the flare stack and determine an area that has a clear path from the flare tip to the flare stack base for mounting the Retractability Package. It is best to locate the Ignition Equipment at 90° to the prevailing wind. If this location is not available then mount the Slip Stream down wind. Also keep an eye on where the winch will mount, at 45" from ground level, to insure that there will be no obstacles interfering with the winch handle. Once you have determined where to locate the Ignition Equipment, chalk a line from the flare tip to the base of the flare stack.

1) SLIP STREAM IGNITION CHAMBER (Dwg #92-180-IC)

Measure 20" down from the top of the flare stack and put a mark on the chalk line. This mark is the center of the hole for the pickup pipe to go through. Measure the size of the pickup pipe and cut an oblong hole as necessary. Once the hole has been cut, insert the pickup pipe and set the Ignition Chamber on top. The bottom end of the pickup pipe should be located in the center of the flare tip. If it is too long, remove it and cut it to length. Align the top of Ignition Chamber with the top of the flare stack as well as centered on the chalk line and tack weld in place. Once everything is lined up, finish weld the pickup pipe and the two (2) Ignition Chamber Gussets into place.

2) TOP SECTION OF 'MAC' TRACK (Dwg #C-300)

Measure 54" down from the bottom of the probe opening in the Slip Stream and put a mark on the flare stack. This is to be the top of the first full standoff. Tack standoffs to the flare stack. The centerline of the track must line up with the center line of the Slip Stream Ignition Chamber.

3) STRAIGHT SECTION OF 'MAC' TRACK (#C-300)

Butt the end of the straight track to the bottom end of the top track. Make sure the eyelets are on the right hand side of the track when viewed from the base of the flare stack. Align track to center line and tack the standoffs to the flare stack. Tack the center of the track

using a 'Mac' Clamp (Dwg #91-003-T). Now weld **all the way around**. This joint must be smooth on the inside edges because the roller assemblies on the 'Mac Ignitor'® fit the track closely and must not bind at this point. Do not burn through as this will affect the roller travel. Repeat as necessary for all sections of straight track and terminate last section of track at least 6'- 0" from grade level. Once the track is lined up straight, finish weld all the way around all of the standoffs to the flare stack.

4) UPPER PULLEY ASSEMBLY (Dwg #C-300)

This top of the pulley assembly mounts 30" above the top of the first full standoff and is aligned with the centre of the track. The small metal tab on one end of the assembly is mounted against the flare stack. This assembly supports the weight of the Ignitor so it should be welded securely on both sides with a 1/4" fillet weld.

5) WINCH (Dwg #C-300)

The winch is aligned to the right of centre of the track and is mounted approximately 45" from grade level. This is to ensure that the operator is not directly under the 'Mac' Track during raising and lowering of the 'Mac Ignitor'® Head.

6) DRAW CABLE (Dwg #C-300)

If the draw cable is not already mounted on the winch, the cable must first go through a hole in the side of the winch, then up through the eyelets on the standoffs to the back end of the dual pulley assembly. Thread through the upper pulley assembly and pull back down to the base of the Flare Stack.

NOTE: If the flare stack is laying on the ground, install the 'Mac Ignitor'® Head on the 'Mac' Track by inserting the assembly into the track at the base of the flare stack. Push the Ignitor the full length of the flare stack thus inspecting that the 'Mac' Track is properly aligned and that the carrier assembly does not catch on any of the welded joints. Allow the Ignitor to slide into the rest position at the top of the flare stack. At this position the Venturi Probes will enter the probe opening of the Slip Stream Ignition Chamber. The tips of the Venturi Probes should be in the center of the Slip Stream Ignition Chamber as well as the probe opening. 1" minimum clearance is required from the Venturi Probes to the side of the probe opening. This is necessary to prevent grounding of the Venturi Probes. If adjustment is necessary, first check the Venturi Probe height.

If the Venturi Probes are above or below the probe opening, the carrier assembly on the 'Mac Ignitor'® must be moved. If the Venturi Probes are too high, the carrier assembly will have to be moved up. If the Venturi Probes are too low, the carrier assembly will have to be moved down. If the Venturi Probes have to be moved either in or out of the Slip Stream Ignition Chamber, adjust the nuts on the Probe Stop Assembly. Remove 'Mac Ignitor'® Head before standing the Flare Stack.

C) INSTALLATION OF THE 'MAC IGNITOR'® HEAD

Connect the draw cable to the Ignitor Head by threading it through the eye bolt on the upper carrier assembly (Dwg #91-004-M) Using the Crosby clamps supplied, terminate the end of the draw cable within 3" of the eye bolt. **Be sure the Crosby clamps are secure.**

Slide the carrier assembly on the 'Mac Ignitor'® Head into the 'Mac' Track. Ensure that the draw cable from the upper pulley assembly to the Ignitor Head is between the Venturi Probes. Winch the 'Mac Ignitor'® Head up the Flare Stack inserting the cable carriers on the power harness into the 'Mac' Track as the Ignitor Head is being raised. (Dwg #91-005-M)

NOTE: ADHERENCE TO THE FOLLOWING INSTRUCTIONS IS ESPECIALLY IMPORTANT IF THE IGNITOR IS TO BE INSTALLED ON A FLARE STACK THAT IS ALREADY STANDING.

Once the Ignitor Head nears the top of the flare stack, a technician in a man basket must be sent up to watch the Venturi Probes to insure they will enter the Slip Stream Ignition Chamber. First check the Venturi probe height. If the Venturi Probes are above or below the probe opening in the Slip Stream Ignition Chamber the carrier assembly on the ignitor must be moved either up or down. If the Venturi Probes are too high the carrier assembly must be moved up; if they are too low they must be moved down. The Venturi Probes should be as close to the center of the probe opening as possible. **CAUTION: The Ignitor head is supported by the carrier assembly and will have to be lowered to the ground or supported by some other means in order to move the carrier assembly.** Second check to insure that the Venturi Probes are reaching the middle of the Slip Stream Ignition Chamber.

The Venturi probes can be moved in or out by adjusting the nuts on the probe stop assembly. Once the Ignitor Head is in position, tighten the draw cable to a reasonable tension.

NOTE:

AFTER THE 'MAC IGNITOR' HEAD HAS BEEN IN OPERATION FOR A MINIMUM OF TWO (2) WEEKS AND THE VENTURI PROBES HAVE BEEN SUBJECTED TO THE HEAT OF THE FLARE STACK, THE IGNITOR SHOULD BE LOWERED TO GROUND LEVEL AND THE VENTURI PROBE GAP CHECKED. THE GAP BETWEEN THE VENTURI PROBES MUST BE MAINTAINED AT 3/16" AT ALL TIMES. YOU MUST ADJUST THE REDUNDANT VENTURI PROBE TO SET THE GAP, NOT THE VENTURI PROBE WITH THE INSULATOR.

DO NOT AT ANY TIME PICK UP THE 'MAC IGNITOR' BY THE VENTURI PROBES. DAMAGE MAY OCCUR WITHIN THE INSULATED HEAD AND ANY WARRANTY WILL BE VOID.

D) CONTROL PANEL

All control panels are bench tested and are ready for hook up. All components are pre-set and in place. There should be no adjustments required. The arcing sequence from the Control Panel to the 'Mac Ignitor' ® Head is as follows:

The **Solar/12V DC Control Panel Model B-302** provides a 1 second arc every 30 seconds and is adjustable. Setting the timer below 30 seconds will cause unnecessary wear on parts, especially the **Transistor and Coil**.

Please refer to **Section F - Drawings** for the applicable Control Panel Wiring Diagram and the adjacent page for the Trouble Shooting Guide and Spare Parts List. **All Control Panels and Ignition Equipment are to be installed in a 'Standard Area' only unless the Control Panel comes in an Explosion proof Enclosure.**

TROUBLE SHOOTING THE CONTROL PANEL

To check out the control panel operation refer to Dwg #TF-CPW-022

- 1) The solar panel must be disconnected from the battery to get true readings. The solar panel, on a sunny day, when disconnected from the battery should put out 15V DC or more.
- 2) Check that the polarity on terminals #2 and #3 on terminal block TB1 are correct. (#2 - **POSITIVE**, #3 - **NEGATIVE**, 12 VDC).
- 3) Check that there is at least 10.5 VDC at this point, when the HOA switch is held in the HAND position. If not, battery service or replacement is required.
- 4) Check green LED on the 'Mac II' card to see if it is lighting on each arc or lit continuously when HOA switch is held in HAND position. If the green LED is not lighting, then the card is not operating. Check the inter-connecting wires and replace the card if necessary. These cards can be returned to **Mactronic** and in most cases repaired.
- 5) Lower the Ignitor and check that the gap between the probes is **3/16"**. This gap can be adjusted by bending the redundant probe only. **Be sure Control Panel is off and there is no power to the Ignitor during this procedure.**
- 6) If there is no arc present after completing the above, replace the **Transistor** and the **Isolation washer**. If, after replacement, there still is no arc, replace the **Coil** located in the Ignition Device Enclosure.

SPARE PARTS LIST

CONTROL PANEL MODEL B-302 & 'MAC IGNITOR' HEAD MODEL A-301

<u>Part Description</u>	<u>Part Number</u>
Transistor	E-118
'Mac II' Card	E-924
Key Switch / Contact Blocks	E-54/E-60/E-61
Terminal Block	E-17
Fuse	E-75
Coil	E-98
Venturi Electrodes	B-1
Solar Collector	E-300
Automatic Sequencing Charger	E-301

E) BI-ANNUAL MAINTENANCE PROCEDURE

A service man should visit the site at least once every six (6) months and perform the following:

- Switch the Ignitor **Off** at the Control Panel before starting check.
- Carefully winch the Ignitor Head down the Flare Stack. Check to see that the Ignitor retracts down smoothly. When the Ignitor Head reaches the bottom of the Stack, carefully remove it out of the track system.
- Inspect the Tips of the Venturi Probes for wear. If badly eroded, these probes should be changed.
- Use a wire or brush to clean the inside of the entire Venturi Probe and Air Aspiration Ports.
- Ensure that the gap between the Venturi Probes is 3/16". If not, you must move redundant probe, **not** the probe with the insulator.
- Determine that the draw cable connections on both the Ignitor Head and the winch are secure.
- Inspect 1/4" Stainless Steel Draw Cable for signs of wear.
- When these checks have been completed, align the Ignitor Head within the track and proceed to raise until the Venturi Probes are ready to enter the Slip Stream Ignition Chamber.
- Switch the Ignitor on at the Control Panel and observe the Ignitor operation to ensure a proper arc. **CAUTION:** When this check is being made, it is important that the Venturi Probes be clear of Draw Cables or other obstructions to avoid electrical shock or damage to the equipment.
- Turn the Ignitor **Off** at the Control Panel.

- Turn the Ignitor **Off** at the Control Panel.
- Run Ignitor up to normal operating position with Venturi Probes inside Slip Stream Ignition Chamber.
- Open the cover of the Control Panel and visually inspect the working parts of the Control Panel for wear. Make certain all electrical wires are secure.
- Refasten the Control Panel cover.
- Turn the Control Panel on.

F) DRAWINGS

- | | |
|-------------------|--|
| C-300 | - Retractability Package hardware placement. |
| 92-110-TP | - 'Mac Ignitor'® Head Model A-300/301. |
| TF-CPW-022 | - Control Panel Wiring Diagram. |
| 92-180-IC | - Slip Stream Ignition Chamber. |
| 91-002-M | - Overhead view of the Venturi Probes. |
| 91-004-M | - Draw Cable arrangement through Eye Bolt |
| 91-005-M | - Installation of cable carriers in 'Mac' Track. |

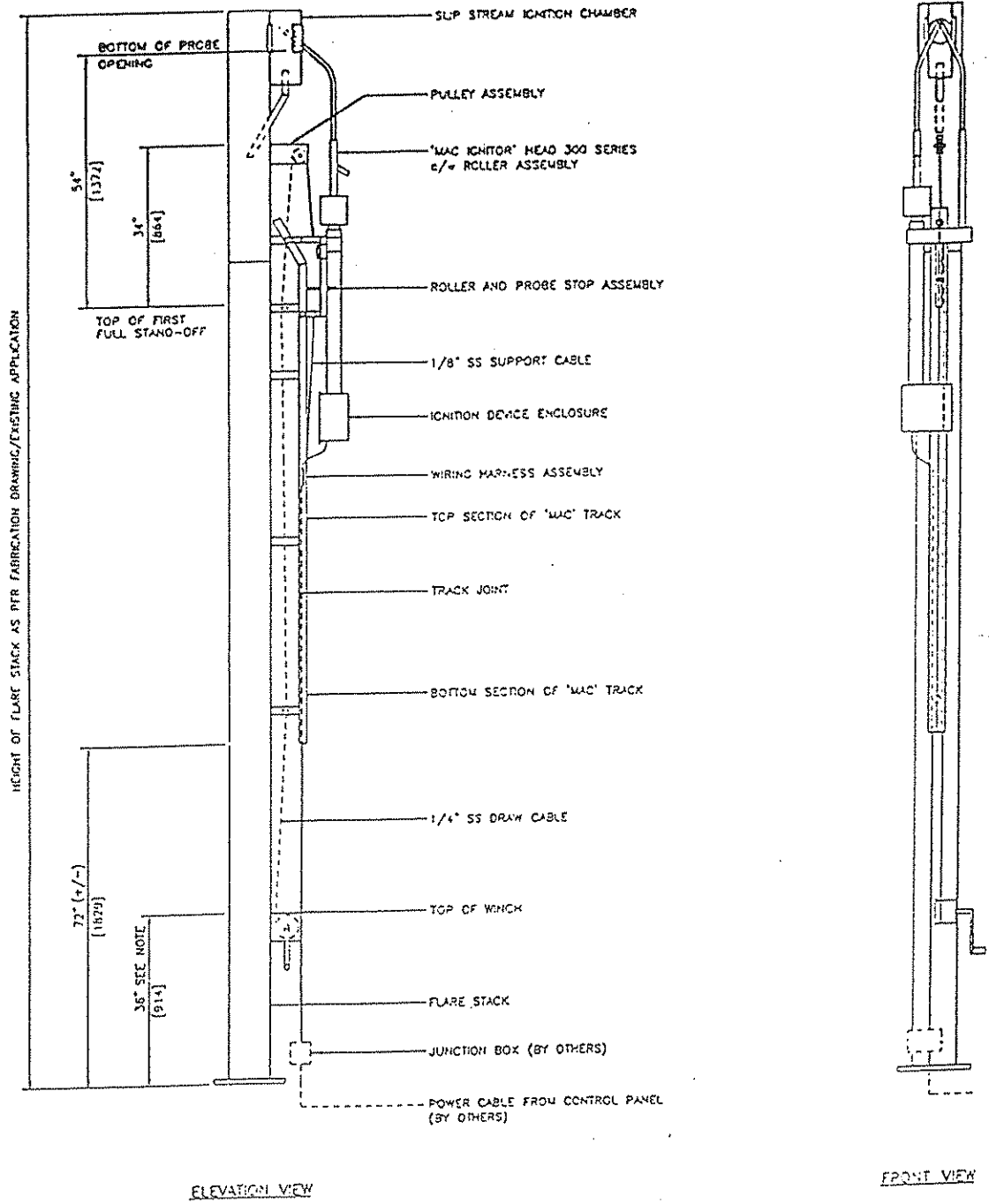
THE FOLLOWING IS ISSUED FOR ORDERS INCLUDING MACTRONIC PILOTS.

THE **MACTRONIC G-60** IGNITOR REQUIRES A SUPPLY OF 5 PSI OF NATURAL GAS.

THE **MACTRONIC ON-36** PILOT CONSUMES APPROX. 45 SCFH, AND REQUIRE 3-5 PSI AND THE **MACTRONIC REG + GAUGE ASSEMBLY** WILL BE FACTORY SET AT 3-5 PSI.


THE **MACTRONIC 800** SERIES PILOTS CONSUME APPROX. 45 SCFH AND REQUIRE 8-10 PSI AND THE **MACTRONIC REG + GAUGE ASSEMBLY** WILL BE FACTORY SET AT 8-10 PSI.

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NOTES:
TOP OF WINCH SHOULD BE APPROX. 45" ABOVE FINISHED GRADE

REVISION BLOCK			
REV	DATE	DESCRIPTION	BY
0	13-NOV-01	ISSUED FOR INFORMATION	MEL

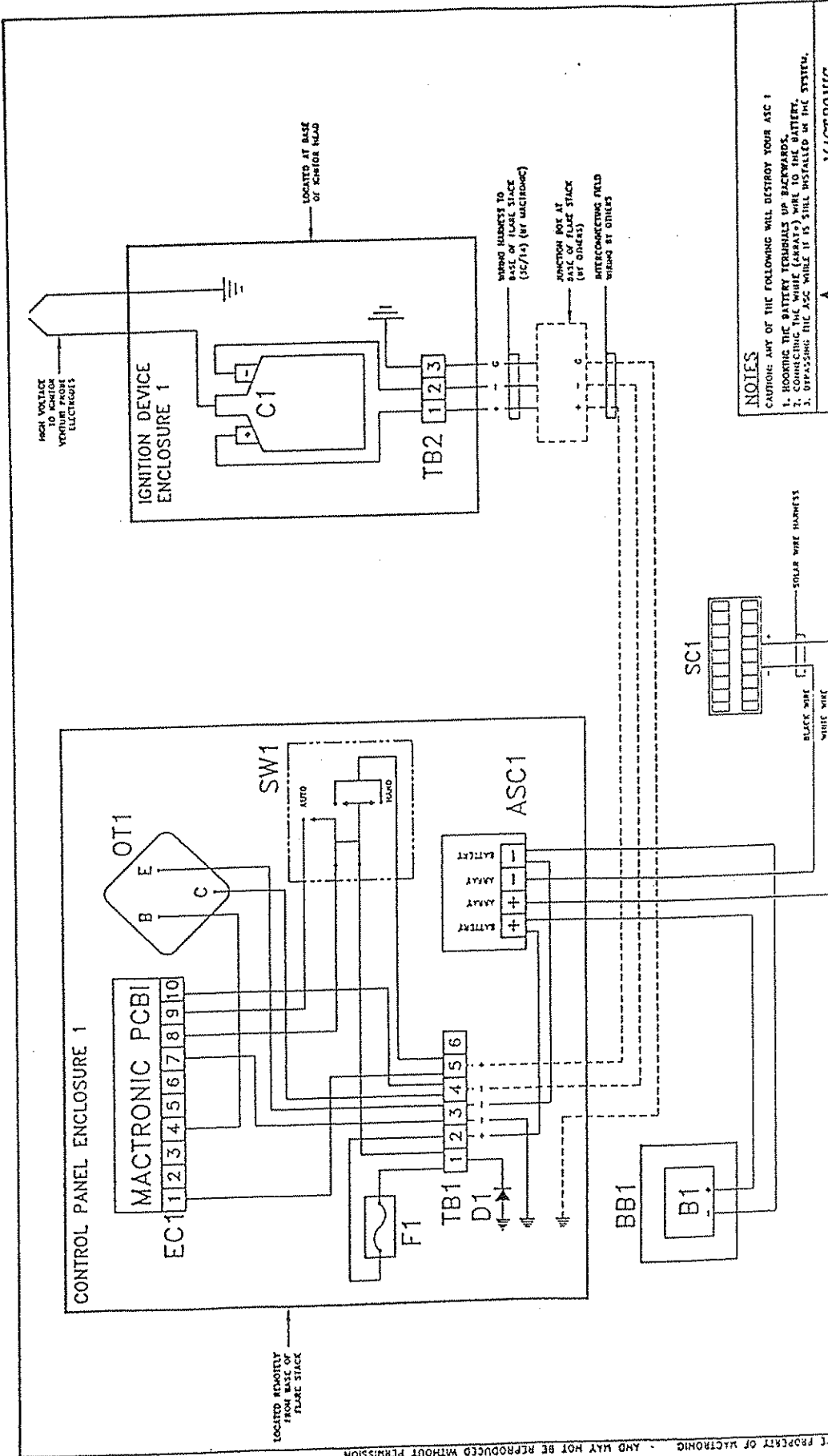


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T4N 5G6
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FAX: (403) 340-8560

A DIVISION OF PRESSON
MANUFACTURING LTD.

TITLE: 'MAC IGNITOR' HEAD RETRACTABILITY PACKAGE MODEL C-300			
DRAWN BY: MEL	CHECKED BY:	DATE: 13-NOV-01	
APP. BY:		SCALE: N.T.S.	
PROJECT NUMBER:	DRAWING NUMBER:	C-300	REV. 0



NOTES

CAUTION: ANY OF THE FOLLOWING WILL DESTROY YOUR ASC 1

1. HOORING THE BATTERY TERMINALS UP BACKWARDS.
2. CONNECTING THE WIRE (ARROWS) WIRE TO THE BATTERY.
3. DISPARASSING THE ASC WHILE IT IS STILL INSTALLED IN THE SYSTEM.

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CONTROL PANEL WIRING DIAGRAM
SOLAR/MODEL D-302 (12V DC) C/W ASC

DATE: 88 03 12
DRAWN BY: LCO
CHKD BY: [Signature]
APP. BY: [Signature]

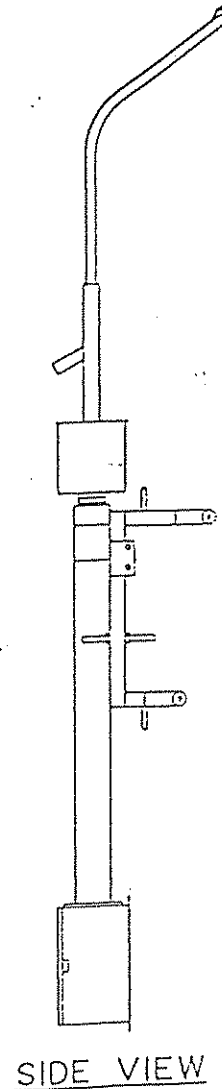
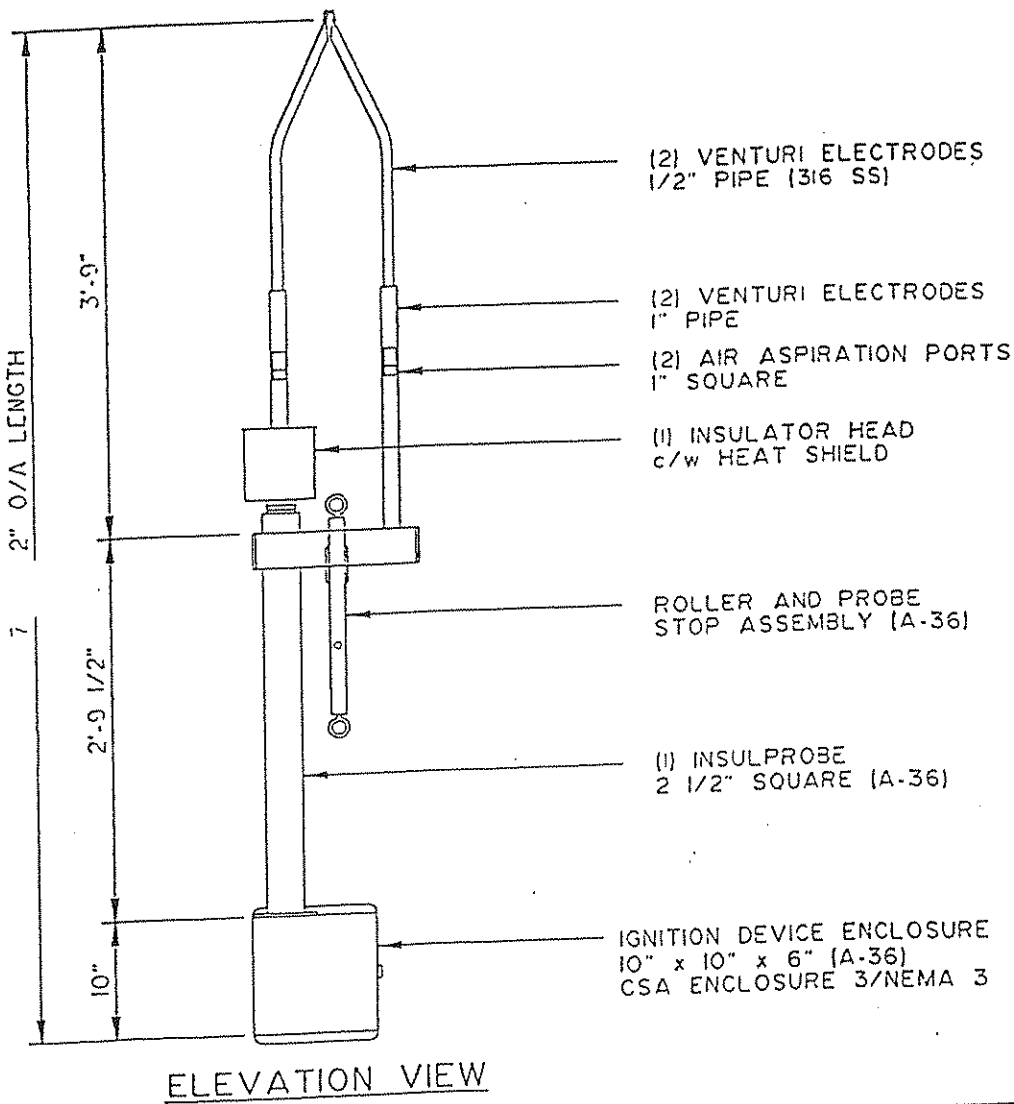
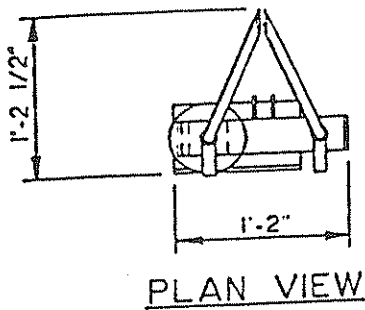
REV. 0
TF-CPW-022

LEGEND FOR LINES

--- SUPPLIED BY MACTRONIC
- - - SUPPLIED BY OTHERS
- - - - - COMPONENTS RECEIVED FROM OUTSIDE OF COMPANY PLANT

ITEM	DESCRIPTION	PART #	ITEM	DESCRIPTION	PART #	ITEM	DESCRIPTION	PART #
PCB1	MACTRONIC PCB CONTROL BOARD	1324	U1	12V/15VDC BLOCK	U1/C1	U1	12V/15VDC BLOCK	U1/C1
OT1	OUTPUT TRANSISTOR	CL18	ASC1	AUTOMATIC CHARGING CHARGER	CL01	ASC1	AUTOMATIC CHARGING CHARGER	CL01
SW1	KEY SWITCH/CONTACT BLOCK	13740/6	B1	BATTERY 12V DC	1103	B1	BATTERY 12V DC	1103
U1/2	TERMINAL BLOCK	CL17	BB1	BATTERY BOX (ENCLOSURE (HUMAS))	1117-10	BB1	BATTERY BOX (ENCLOSURE (HUMAS))	1117-10
CP-1	CONTROL PANEL ENCLOSURE (HUMAS)	11110-06	SC1	SOLAR CELL	CL00	SC1	SOLAR CELL	CL00
U1-1	IGNITION SOURCE ENCLOSURE (HUMAS)	101110-06						
U1-1	EDGE CONNECTION	U1303						
D1	DIODE	EL18						
C1	IGNITION COIL	CL0						

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NOTES:

TYPICAL



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CLIENT: **MACTRONIC
RED DEER, ALBERTA**

TITLE: **'MAC IGNITOR' HEAD ASSEMBLY
MODEL A-300/301/302**

DRAWN BY: *DDA*

DATE: 91-12-18

CHK'D BY: *[Signature]*

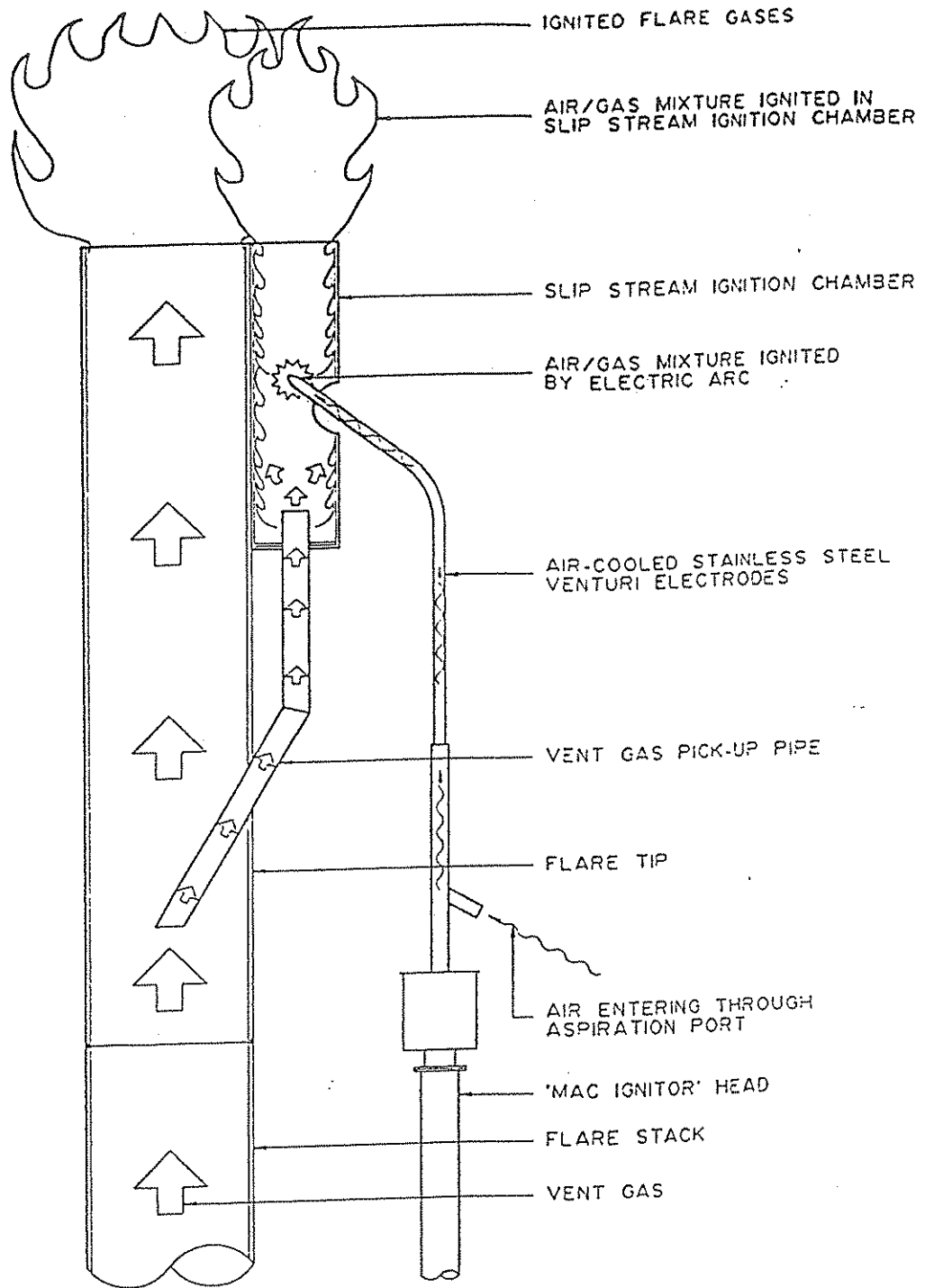
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PROJECT NO.: *[Signature]*

DWG NO: 92-110-TP

REV: 0

NO.	REVISION	DWN BY:	DATE
0	ISSUED FOR INFORMATION	DDA	91-12-18



NOTES:

TYPICAL
INSTALLATION



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CLIENT:

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RED DEER, ALBERTA

TITLE:

IGNITION PROCESS WITHIN THE
SLIP STREAM IGNITION CHAMBER

DRAWN BY:

DFH

DATE:

91-12-25

CHK'D BY:

[Signature]

SCALE:

NTS

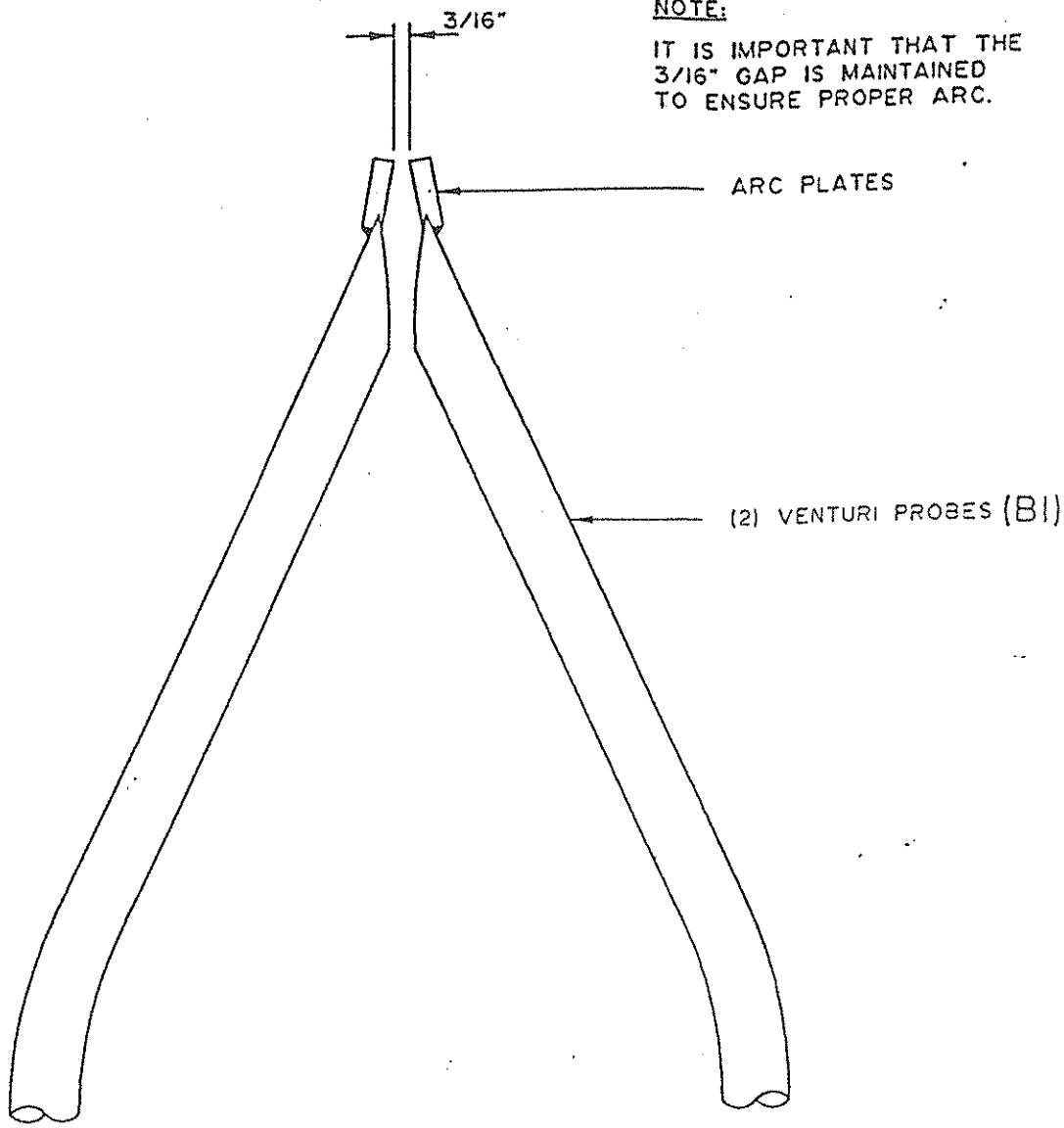
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DWG NO:

92-180-1C

REV: 3

NO.	REVISION	DWN. BY	DATE
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	GENERAL REVISION	DDA	94-2-14
	GENERAL REVISION	DDA	93-9-13
0	ISSUED FOR INFORMATION	DDA	91-12-25



NOTE:
IT IS IMPORTANT THAT THE
3/16" GAP IS MAINTAINED
TO ENSURE PROPER ARC.

NOTES:

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CLIENT: MACTRONIC
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TITLE: OVERHEAD VIEW OF
THE VENTURI PROBES

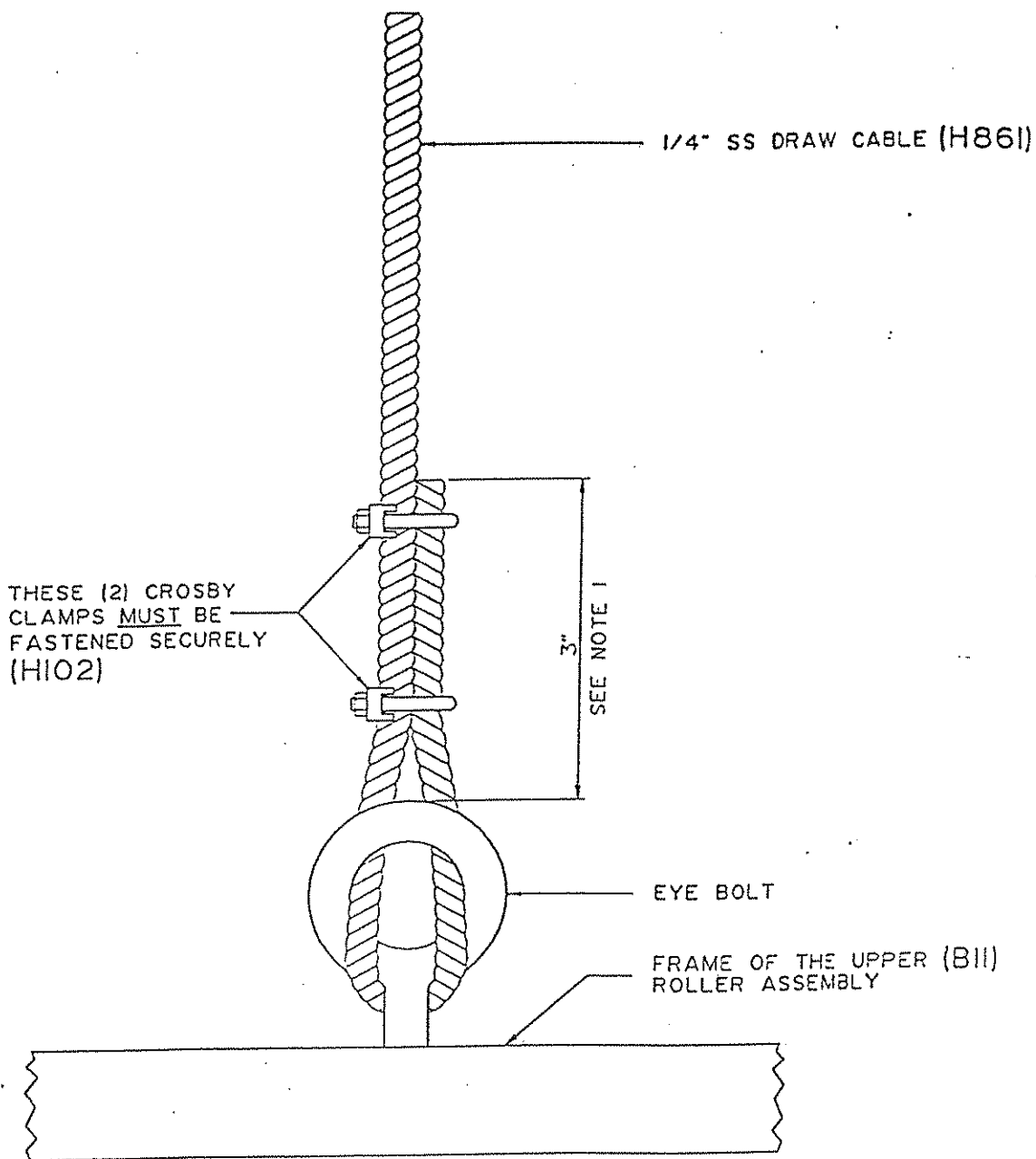
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CHK'D BY: [Signature] SCALE: NTS

PROJECT NO.: [Signature] DWG NO: 91-002-M REV: 0


NOTE: PART NUMBERS SHOWN IN BRACKETS.

NO.	REVISION	DWN BY:	DATE
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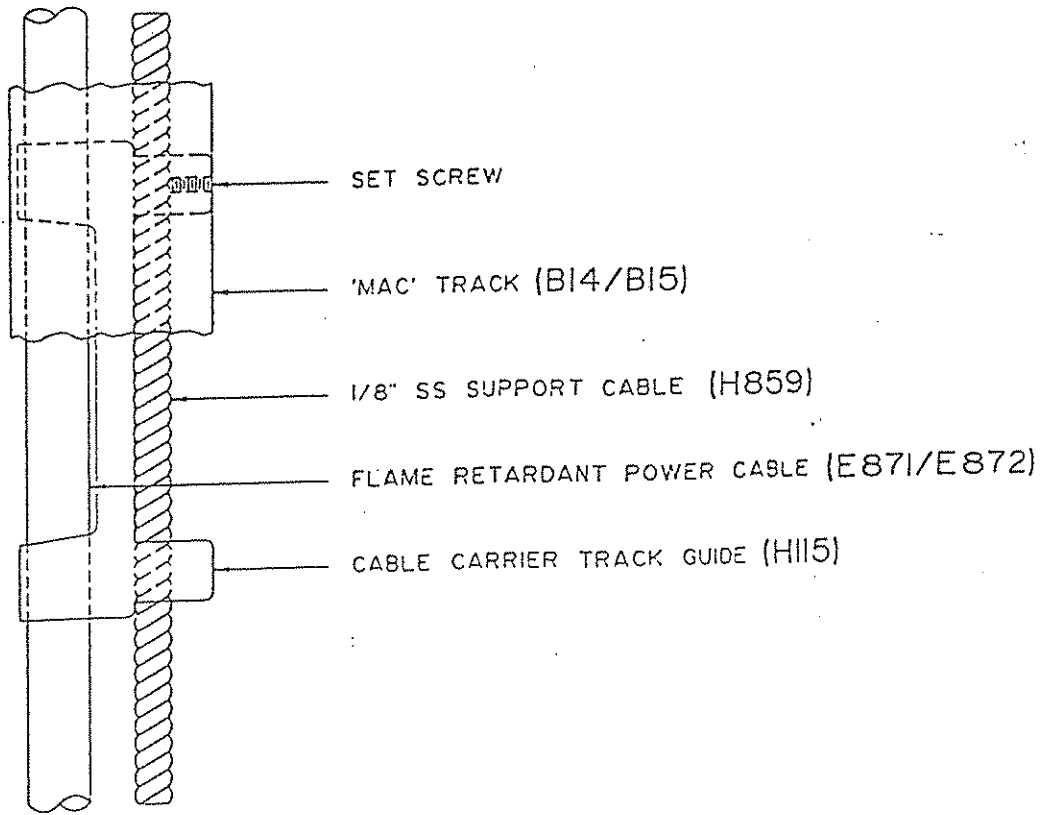
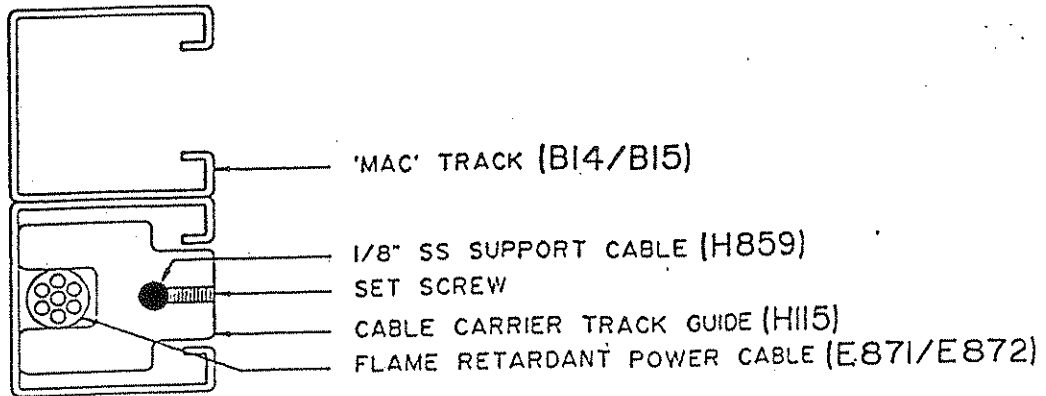


NOTES:

1. IT IS IMPORTANT THAT NO MORE THAN 3" OF THE DRAW CABLE BE LEFT BEYOND THE EYE BOLT TO ENSURE THE SMOOTH OPERATION OF THE 'MAC IGNITOR' HEAD.
2. PART NUMBERS SHOWN IN BRACKETS.


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CLIENT:		MACTRONIC RED DEER, ALBERTA	
TITLE:		DRAW CABLE TO EYE BOLT CONNECTION	
DRAWN BY:	PJS	DATE:	90-12-17
CHK'D BY:		SCALE:	NTS
PROJECT NO.:		DWG NO:	91-004-M REV: 1

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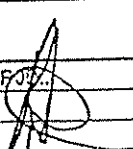


NOTES:

1. THE SPACING OF THE CABLE CARRIERS IS APPROXIMATELY 5'-0".
2. PART NUMBERS SHOWN IN BRACKETS.



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CLIENT:	MACTRONIC RED DEER, ALBERTA		
TITLE:	WIRING HARNESS ASSEMBLY		
DRAWN BY:	FOZ	DATE:	90-12-17
CHK'D BY:		SCALE:	NTS
PROJECT NO.:		DWG NO:	91-005-M
			REV: 1

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NOTES:

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