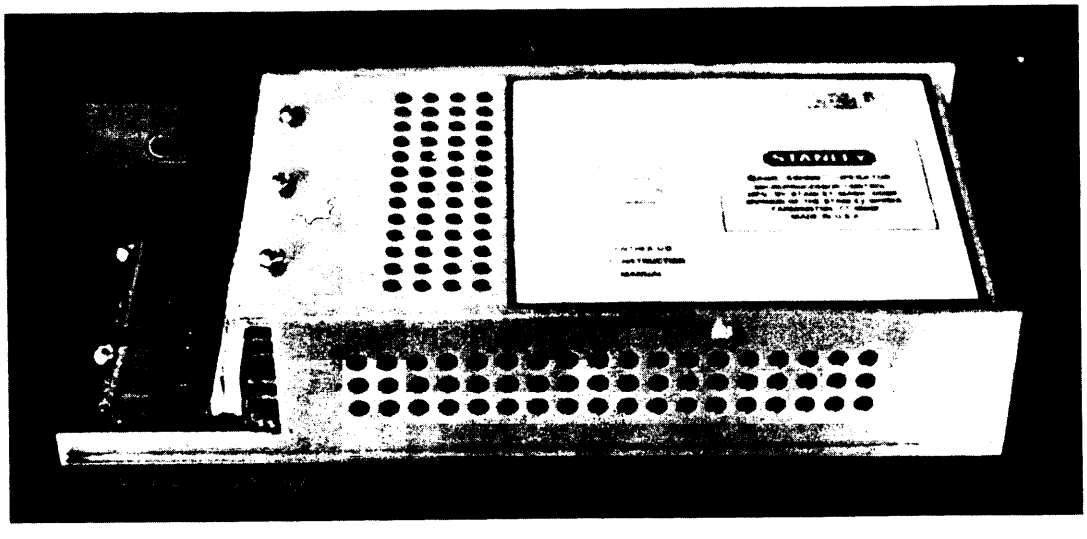
STANLEY®

Access Technologies

MAGIC-SWING MICROPROCESSOR CONTROL BOX



INSTRUCTION MANUAL

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CAUTION: **THIS OPERATOR CONTROL MUST BE ADJUSTED BY STANLEY TRAINED PERSONNEL AND IN ACCORDANCE WITH ANSI STANDARDS A156.10.**

I. Overview

The Magic-Swing control box has been redesigned to incorporate a microprocessor that allows the control box to do more while taking up less space. In addition, the Sentrex³ interface board can now be mounted inside the control box.

The new generation microprocessor control box has the following:

- New Features:
  1) Magic-Touch
  2) Reverse-on-Obstruction
  3) 2s Logic
  4) Bifold Safety Sensor Logic
- Internal Transformer / Power Supply for Stan-Ray and Sentrex
- Automatic Open-Check Calculation eliminates cam adjustment
- Internal Sentrex³ control (with the addition of a micro-Board).
  No big P.C. board in the bottom rail.
- Elimination of magnet and magnetic switch.

II. Operation

The microprocessor control box uses the encoder on the Magic-Swing motor to determine door position in both Sentrex and carpet applications. Door position data is required for the open check calculation and the built-in Magic-Touch feature.

When power is first applied and an open signal is received, the control box opens the door in "Learn Speed". "Learn Speed" is slightly faster than check speed and allows the door to learn the door size safely yet expediently.

The microprocessor control also provides a 1-second reverse-on-obstruction feature that reverses door motion if an obstruction is met.

The Magic-Touch feature allows door activation by manual action without the need for an approach sensor. Magic-Touch can be used with press plates or the radio control system, giving the system two time delays, one adjustable .2-30 seconds (operate input) and the other fixed at .5 seconds (Magic-Touch).

Magic-Swing software 712648G and higher includes a software feature for disabling the fold-side sensor while the doors are closing without the use of a Lock-Out Relay on a bifolding door.

A. Timer Mode Operation

— Stall Logic is intended for use with the Sentrex Sensor System. The door is stalled when an Operate and Stall Signal are received simultaneously.

... if the Stall Signal is removed with an Operate Signal present, the door will continue to open in check speed to full open.

... if the Operate Signal is removed and does not reactivate while a Stall Signal is present, the door will close upon expiration of the HOLD OPEN TIME DELAY setting.

— 2S Logic, Push switch to open door, push switch to close operation is optional in this mode.

B. Carpet Mode Operation

— Safety Plus (1.5 second) delay is activated when a safety carpet signal is received. This disables an operate cycle for 1.5 seconds. The hold open time in carpet mode has a minimum 1.5 second delay.

— If a safety carpet signal does not follow an operate signal, the door will remain open for a minimum delay of 12 seconds.

C. **The Bifold Door System has been enhanced with an overhead fold-side safety presence sensor and revised MP Control Box software (712648G). The system provides the following:**

1) **Door at full closed** – A fold-side safety signal applied with an open signal shall prevent the door(s) from opening.
2) **Door opening motion** – Once a door is in motion, the control system commits to the full open position in either open or open check speed (depending on door position).
3) **Door at full open** – A safety signal keeps the door in the full open position.
4) **Door closing motion** – Once the closing sequence is initiated, the signal from the fold-side safety sensor is disabled. The signal form the fold-side safety sensor is re-enabled after the door(s) reaches the fully closed position.
5) **Carpet logic is utilized with this enhanced sensor system.**

Reference SB600 Series Bifold Door System Manual #203916 for the Bifold sensor wiring diagram.

D. **Control Box Settings for Bifold Applications**

DIPSWITCH S2

Position 1 – ON/UPPER position for Carpet Mode.
Position 2 – CHOOSE – OFF/LOWER position for single-door, ON / UPPER position for dual door.
Position 3 – ON/UPPER position (in carpet mode) to cancel 12 second Safety Delay.
Position 4 – ON/UPPER position for BiFold Safety Sensor Logic.

DIPSWITCH S3

Position 1 – CHOOSE – OFF/LOWER position for LARGE Check Size, ON / UPPER position for SMALL Check Size.
Position 2 – OFF/LOWER position to disable Magic-Touch.

III. Electrical Connections

There are three connectors used for electrical input/output to the control box. (See figure 1)
See wiring diagrams for individual applications.

A. TB1 TB1 is used to connect the signal inputs as listed:

TB1 Position	Connection
1	Signal Common
2	Operate Input
3	Terminal location for connecting On/Off/Hold Open Switch — Violet and Switched Operate Signal
4	12 VAC for operate sensor (12 VAC Output Rated at 1 AMP Max.)
5	12 VAC for operate sensor
6	Auxiliary Input – Breakout status signal (software 712648 Rev. E and higher)
7	Stall / Safety (Sensor or Carpet) Signal
8	Signal Common

B. TB2 TB2 is used to connect the serial Sentrex3 sensor heads only. Older versions of Sentrex are connected through TB1. See wiring diagrams for older Sentrex system wiring.

TB2 Position	Connection
1	VSX (+) — Power for sensor heads
2	serial communication
3	serial communication
4	GND (–) — Ground for sensor heads

C. J1 J1 accepts the harness which connects the main power, the encoder(s), and the motor(s). The motor / encoder / power harness plugs directly into J1. When connecting the encoder and motor connectors for dual operators, match motor connector 1 and encoder connector 1 to one operator and motor connector 2 and encoder connector 2 to the second operator. In the case of a single door, there are connectors for 1 motor and 1 encoder.

D. Main Power

CAUTION: **TURN SERVICE PANEL POWER OFF BEFORE CONNECTING HARNESS J1 TO ELECTRICAL SERVICE.**

(Refer to pages 8 and 9 for System Schematic)

1. Connect the Ground Wire Assembly (P/N711527) to the Electrical Service Ground Wire using a wire nut provided.
2. Drill a hole for a #8 screw on the inside of the Header, preferably in a concealed location.
3. Place the ring terminal from the ground wire on to the #8 screw provided and screw into Header.
4. Drill a second hole for a #8 screw on the inside of the Header (concealed location).
5. Place the ring terminal from the Main Harness — J1 on to a #8 screw (provided) and screw into Header.
6. Connect the Power Pigtail Assembly (712846) to the Electrical Service, connecting line (black) to black and neutral (white) to white using wire nuts provided.
7. Plug the Power Pigtail into the Main Harness J1 power connection.

E. Breakout Status Switch

The Breakout Status Switch should be used if there is a situation of the door oscillating at the 0° position due to stack pressure, high winds, or a light spring operator application.

The Magic-Swing Microprocessor Control Box with software revision 712648E and higher is shipped with a jumper wire on TB1 across terminals 6 and 8. This jumper wire defeats the Breakout Status Signal Input.

The Auxiliary Switch (former Open Check Switch on the Operator Switch Plate) is the Breakout Status Signal Switch.

To wire the Breakout Status Signal:

1. Remove the jumper wire across TB1 terminals 6 and 8.
2. Remove the quick-connect terminal (brown wire) on the N.O. terminal of the former Open Check Limit Switch and install onto the N.C. terminal.
3. Install yellow jumper wire terminals located in hardware kit into positions 3 and 5 of the Magic-Swing Operator harness white connector.
4. Connect the stripped-end of each of these wires across terminals 6 and 8 of TB1 on the Magic-Swing Control Box.
5. Adjust the Auxiliary Cam (former Open Check Cam) so that it trips the corresponding Microswitch prior to activation of the Breakout Switch. (It should be set for approximately - 3° activation).
6. For a pair of doors, repeat steps 3 - 5 for the second Operator.
7. In the case of a pair of doors, the switch needs to be wired in-series to ensure that the Control Box will not open the doors if either breakout status switch is activated. To accomplish this, connect the stripped end of 1 yellow wire from each operator across TB1 terminals 6 and 8.

   Connect the remaining 2 wires (1 from each operator) together with a wire nut.

IV. Explanation of Adjustments (See Figure 1)

CAUTION: **TURN POWER SWITCH OFF BEFORE MAKING ANY ADJUSTMENTS**

A. LED Indicators

WD — Watchdog: Illuminated when power is applied and the control box is functioning properly. A flashing LED indicates a defective board.

E1 — Encoder 1, E2 — Encoder 2: Flashing LEDS with door motion indicate properly functioning encoders.

- A single door will cause only Encoder 1 LEDS to flash, Encoder 2 LEDS flash with a pair of doors.

B. Potentiometers

1. Time Delay — adjust .2-30 seconds, increase clockwise
2. Stall Speed — adjusts door holding power of control box when the door is stalled or set to hold open
3. Open Speed — adjusts opening door speed
4. Open Check Speed — adjusts opening door check speed

The operator speeds and check sizes must be adjusted as defined below to comply with ANSI A156.10.

OPERATING AREA:

Time Opening (from closed) to Back Check (0°-75°) not less than 1.5 seconds.
Back Check (75°-90°) not less than 1.0 seconds.
Closing (from full open) to Latch Check (90°-10°) 2.0-4.0 seconds. (see Table 1)
Latch Check to Full Closed (10°-0°) not less than 1.5 seconds.

TABLE 1 Swing Door Minimum Closing Times

inches (D)	(mm)	lbs. (W)	(kg)	Time (secs) (T)
36 & under	(914) to	100	(45)	2.0
36	(914) to	140	(64)	2.3
42	(1 067) to	110	(50)	2.3
42	(1 067) to	150	(68)	2.7
48	(211 9) to	120	(55)	2.8
48	(211 9) to	160	(73)	3.2

For doors of other weights and widths:

$$T = D\sqrt{\frac{W}{188}}$$

where: W = Weight of door in pounds.
D = Width of door in inches.
T = Closing time to latch check in seconds.

The following dipswitch adjustments must be made prior to powering on the control box.
To change any setting, turn power off, make the change, then turn power on again.

C. Dipswitch S2

Position 1: "on" = carpet logic, "off" = timer logic

Position 2: "on" = dual doors, "off" = single door

Position 3: "on" = 2S logic, "off" = normal operate

* In Carpet Logic applications which require 2-WAY traffic, SET DIPSWITCH S2 Position 3 to "ON". This will cancel the Safety Carpet Fail time delay which has a minimum delay of 12 seconds.

Position 4: "on" = Bifold Safety Sensor Logic, "off" = for Swing Door applications.

Note: Bifold Applications should have DIPSWITCH S2 POSITION 1 "ON", 3 "ON" and 4 "ON". Position 2 setting depends on the number of doors.

D. Dipswitch S3

"on" is towards arrow on switch

Position 1: "on" = normal open check size, "off" = large open check size
Position 2 : "on" = Magic-Touch, "off" = Magic-Touch

E. Dual Operator Mode Jumper Plug

There is a dual operator jumper plug located in the control box for the purpose of synchronizing the closing speeds on a pair of operators with a single control box.

Selecting this feature will increase the amount of manual opening force required to open either door in a pair. If the excessive force is undesirable, or if the doors need to be non-synchronized, remove jumper plug J3 (See Figure 1).

V. Troubleshooting Tips

1. **PROBLEM:** Control Box does not respond to a change in DIP Switch settings...

   CHECK: Turn the Power switch on the Control box off. Set the DIP switches as required. Turn power to the Control Box on. The DIP switch settings are "read" during power-up.

2. **PROBLEM:** The door stays in Learn Speed during consecutive cycles . . .

   CHECK:

   A. After the door completes the initialization cycle and gets to full-closed, count 2 seconds then re-cycle the door. The initial full-closed position is realized by the Control Box after the Encoder stops changing for 1.2 seconds - here the door positions are calculated.

   B. The Single/Dual DIP switch. If the switch is set for Dual and only one Encoder is connected, the Control Box thinks one Encoder is defective and remains in Learn Speed.

   C. If the application is dual operators, check that both Encoders are properly connected and that 4 LED's on the Control Box are flashing as the door is moving.

3. **PROBLEM:** The Control Box operates erratically — the door does not open when given an operate signal; the door closes regardless of a safety carpet signal; door position is lost and the Control Box goes through a reinitialization.

   CHECK: The ground wire must be connected to the Header. Additionally, the ground wire from the service panel must be connected to the Header, and must be a valid ground. Verify by measuring for 120VAC from the black power wire to the Control Box and ground. Use caution to prevent electrical shock.

4. **PROBLEM:** The Control Box jerks the door while opening and closes before reaching full-open...

   CHECK: Verify that the line voltage is between 90-132VAC. This is the designed operating range of the Control Box.

5. **PROBLEM:** The Control Box recycles the door without an operate signal...

   CHECK:

   (A) Ground connection as described in #4.

   (B) Unplug Terminal block TBI from the Control Box. This will disable any signals from sensors.

   (C) Separate Motor and Encoder wire harnesses if wrapped together.

   (D) Ensure that the Encoder is snug on the motor shaft. Remove the Encoder, check the magnetic rotor wheel for slipping action against the Motor shaft.

   (E) The connectors between the Encoder and the Control Box wire harnesses for mating pins pushing out of the connectors.

6. **PROBLEM:** 2-Way Traffic application with Carpet Logic, the Control Box holds the doors open for 15 seconds...what can be done?

   SOLUTION: The safety carpet fail timer is being activated on every cycle because the last signal the Control Box receives is an operate signal with 2-way traffic.

   With power to the Control Box off, set DIPSWITCH S2 position '3' to 'ON'. This will cancel the Safety Carpet Fail Delay in Carpet Logic for 2-Way traffic applications.

7. **PROBLEM:** The Magic-Swing Door is locked at night. In the morning, the On/Off/Hold Open switch is turned on, then the door is unlocked. The door stays closed.

   SOLUTION: The new Magic-Swing Microprocessor Control Box functions with a 1.2 second obstruction feature. If the Control Box is given an operate signal and held in a fixed position, it will go into "stall" mode. Set the on/off/hold open switch to off, unlock the door, and then switch to 'on'.

8. **PROBLEM:** The "WD" LED on the Control Box blinks...

   CHECK: Turn power off, wait a few seconds and then turn power back on. If "WD" continues to blink, replace the Control Box.

9. **PROBLEM:** The door opens with a Magic-Touch operation even though the On/Off Hold Open switch is off.

   SOLUTION: Yes. The Control Box does not monitor the On/Off/Hold Open switch status, and the door will operate.

VI. Applications for Magic-Swing Microprocessor Control Box with Previous Generations of Sentrex Auto-Tune and Sentrex^2

A. Mount the 4-channel encoder(s) to the motor(s).

B. Remove the 6 pin control box connector from the existing Sentrex power harness:

Connect the yellow wire to TB1 Terminal #1.

Connect the orange wire to TB1 Terminal #2.

Connect the red wire to TB1 Terminal #7.

C. Remove the larger size (1/4") quick-connects from the Sentrex power harness (brown & gray wires terminate at these ends).

— Strip wire ends and install both gray wires into TBI Terminal #4.

— Strip wire ends and install both brown wires into TBI Terminal #5.

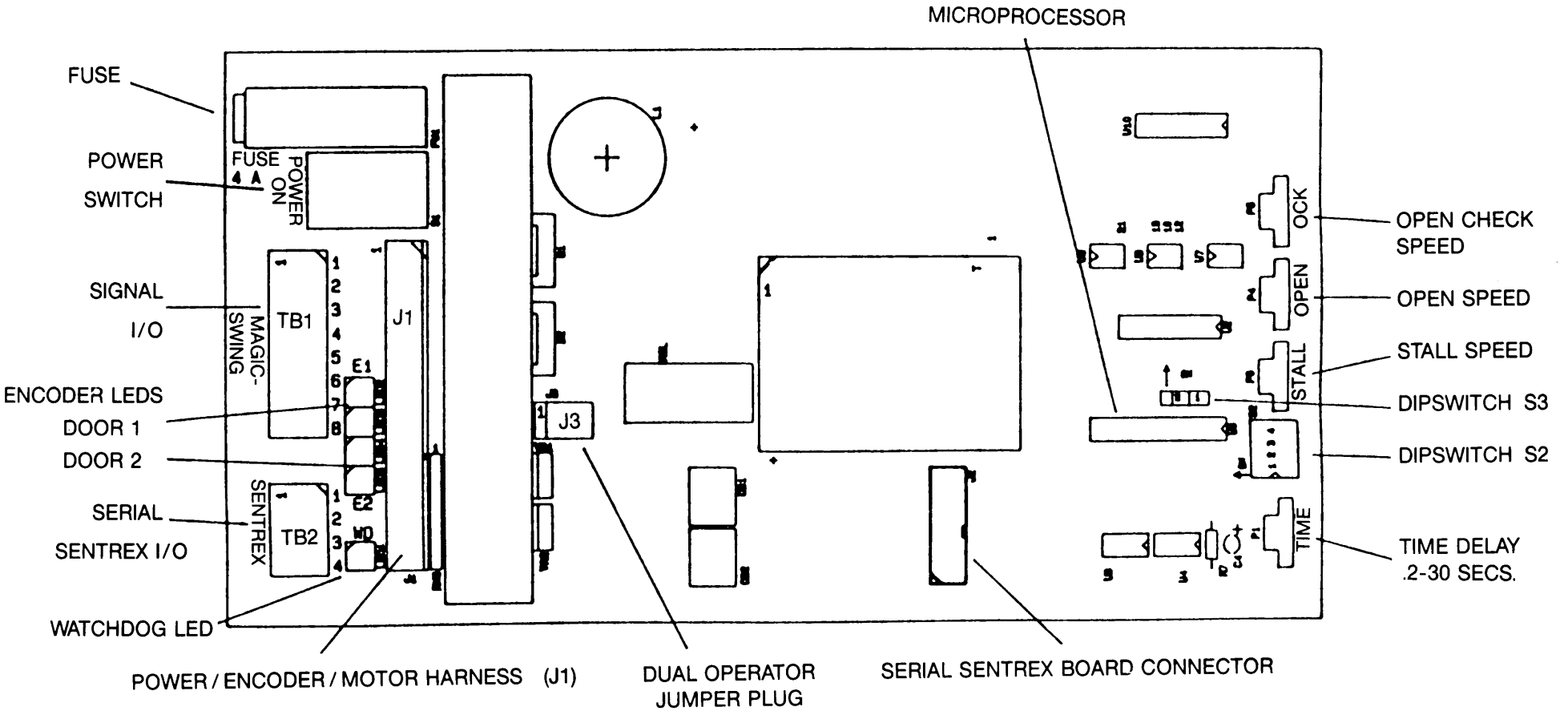
D. Connect the on/off/hold open switch to the existing Sentrex power harness.

E. Connect either Stan-Ray or push-plates to the 4-wire pigtail on the power harness.

F. Tune the Sentrex system using the appropriate Sentrex manual. For tuning the Magic-Swing microprocessor control box speeds, see Section IV.

FIGURE 1

VII. Magic-Swing Microprocessor Control Box Adjustments and Electrical Connections



MUST BE FREE FROM BURRS & ROUGH EDGES
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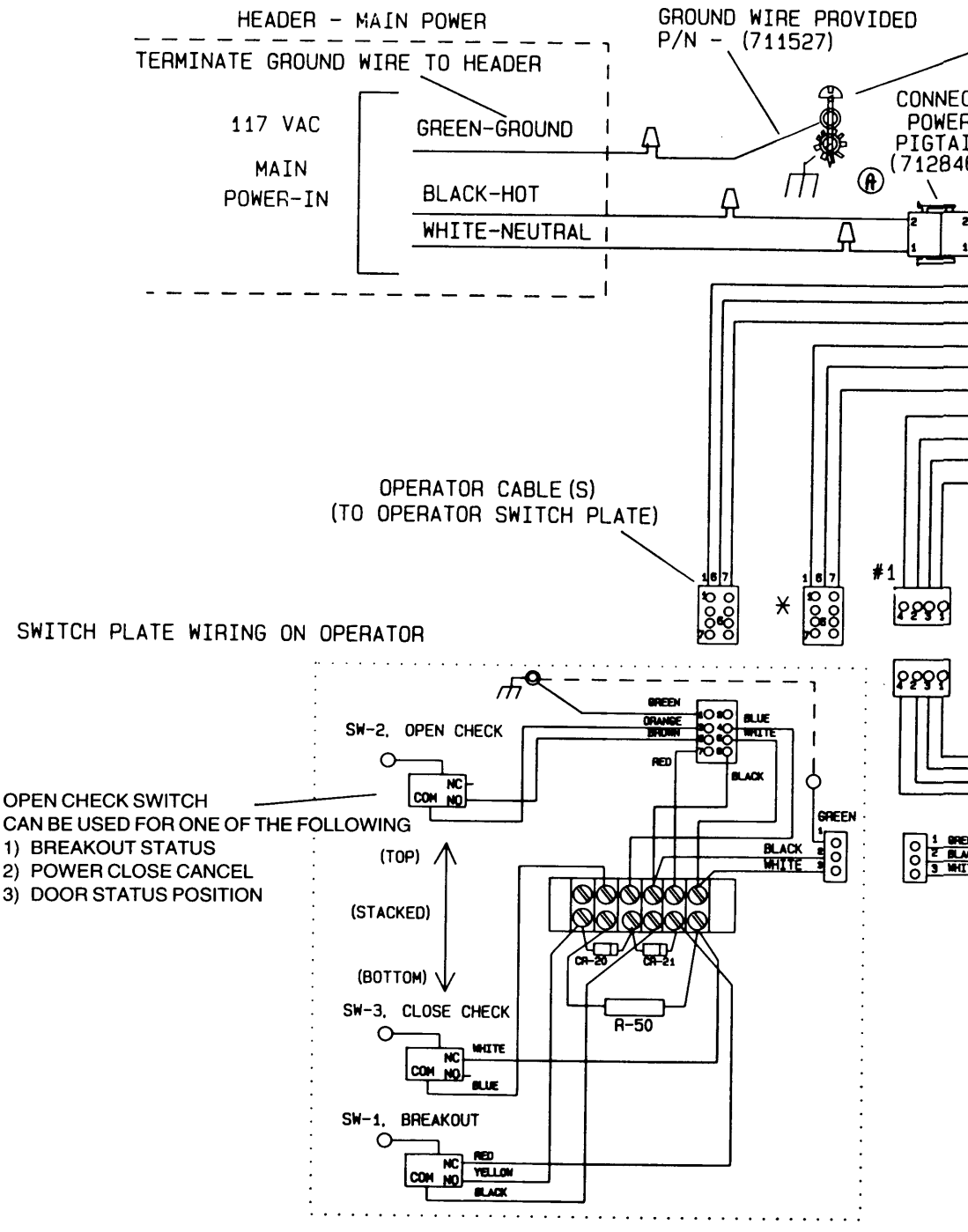
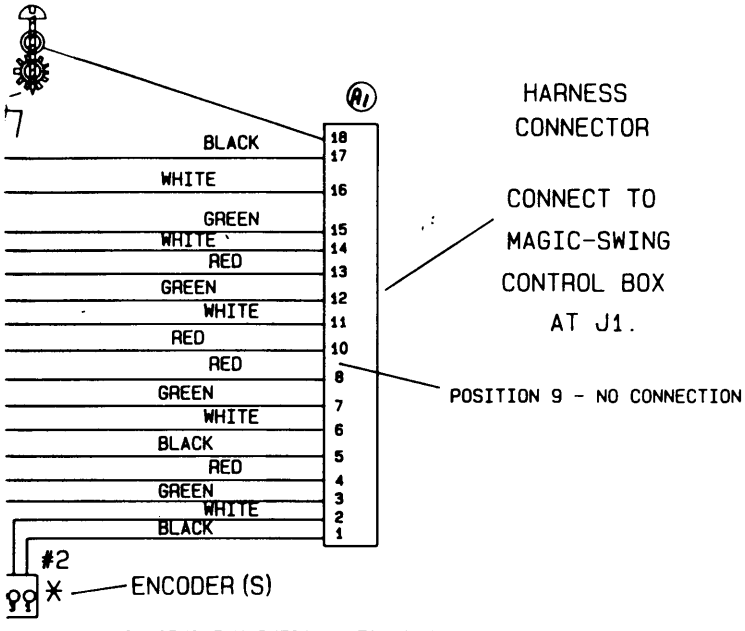
SYSTEM WIRING – MAIN POWER,



ASSEMBLIES	312167
312168	312252
312253	312722
312723	312879
312880	312881
312882	

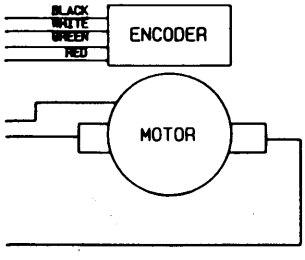
TOR (S), & ENCODER (S)

FASTEN TO HEADER WITH #8 SCREW P/N - (322731960)
AND #8 STARWASHER PROVIDED.



* - ON SINGLE HARNESS, MOTOR & ENCODER #2 WIRES NOT INSTALLED.

515743



ECN	DATE	REVISION	APP'D
92-20	3-12-92	A) CORRECT NUMBERING SEQUENCE ON CONNECTOR A) ADDED 712846	VR
		REVISED AND RELEASED	
		PILOT LOT RELEASE	

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3. TEMPER:	4. FINISH:
6.	

WIRING DIAGRAM - SYSTEM — MAGIC-SWING MICROPROCESSOR CONTROL

DRAWN PM	DATE 12-10-90	CHECKED VR	APP'D PM	SCALE ~

ECN 90-97-2
12-20-90

STANLEY MAGIC-DOOR

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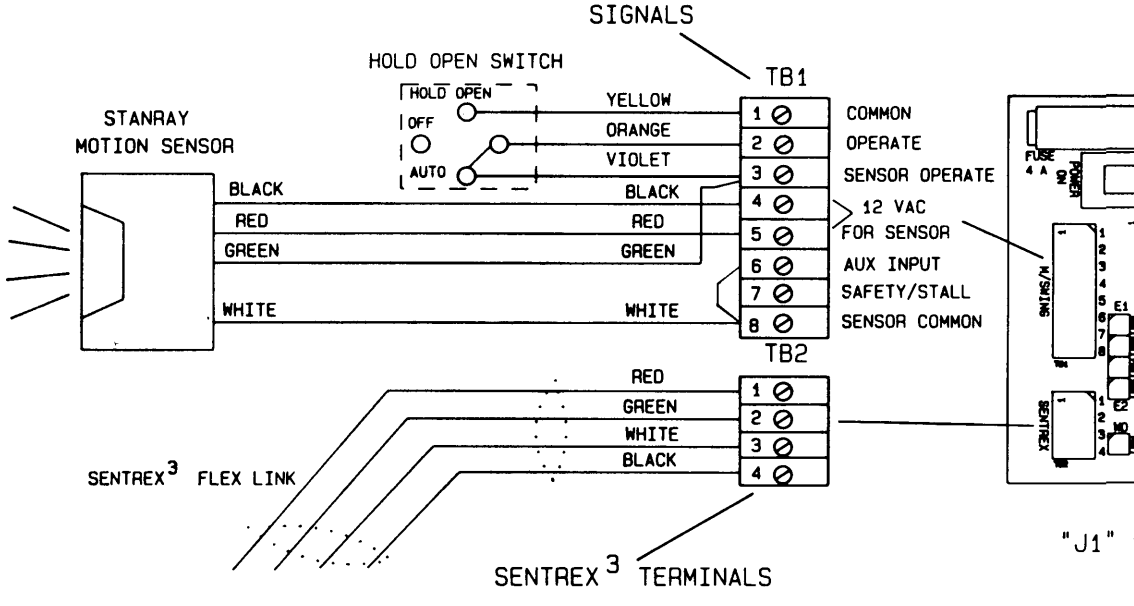
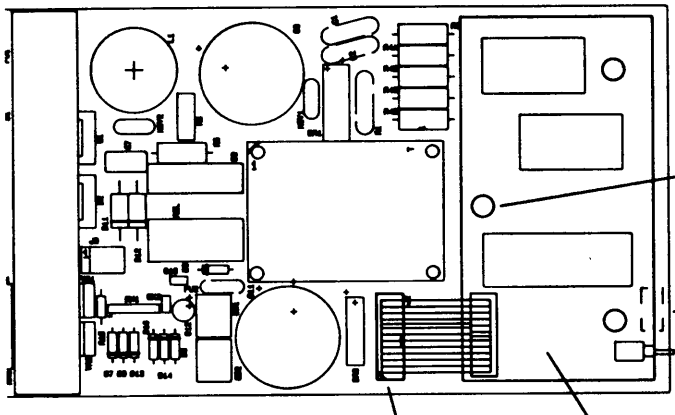
SIGNAL WIRING - MAGIC-SWING



ASSEMBLIES	

ICROPROCESSOR BOX WITH SENTREX^3

-MAGIC-SWING MICROPROCESSOR CONTROL PC BOARD-



MOUNT WITH #6-32 SCREWS

515744

SET DIP SWITCH POSITION #1 TO "OFF"
(TIMER MODE)

INESS CONNECTOR

INSTALL SENTREX MICRO-BOARD

CONNECT MICRO-BOARD RIBBON CONNECTOR

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WIRING DIAGRAM- M/S-SENTREX^3

MAGIC-SWING MICROPROCESSOR CONTROL

DRAWN	CAD PM	DATE	12/7/90	CHECKED		APP'D	PM	SCALE	NONE

ECN 90-97-2
12/26/90

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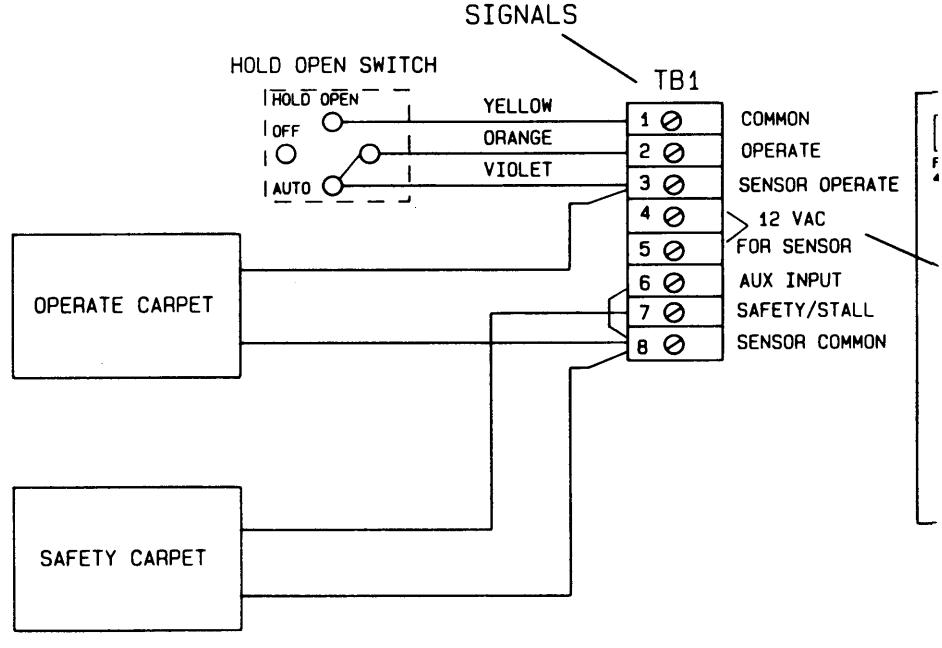
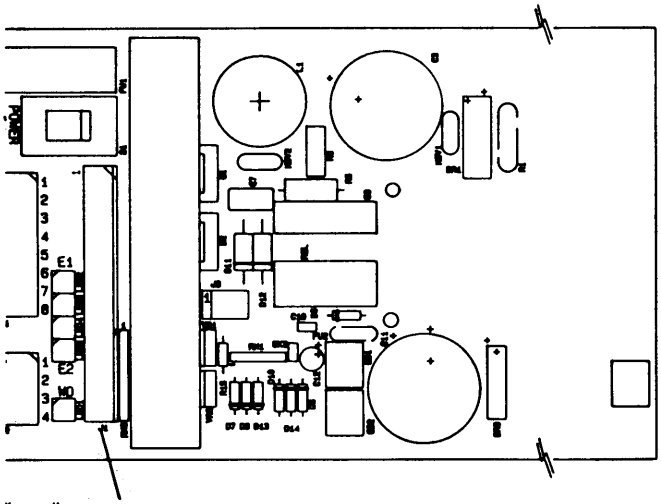
SIGNAL WIRING - MAGIC-SWING



ASSEMBLIES	

CROPROCESSOR BOX WITH CARPETS

MAGIC-SWING MICROPROCESSOR CONTROL PC BOARD



SET DIP SWITCH POSITION #1
TO "ON" (CARPET MODE)

"J1" HARNESS CONNECTOR

515745

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	PILOT LOT RELEASE	
DATE	REVISION	APP'D

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WIRING DIAGRAM - M/S Box w/ Carpets

DRAWN	DATE	CHECKED	APP'D	SCALE
RCAD PM	12/13/90		PM	NONE

MAGIC-SWING MICROPROCESSOR CONTROL

ECN 90-97-2
12/20/90

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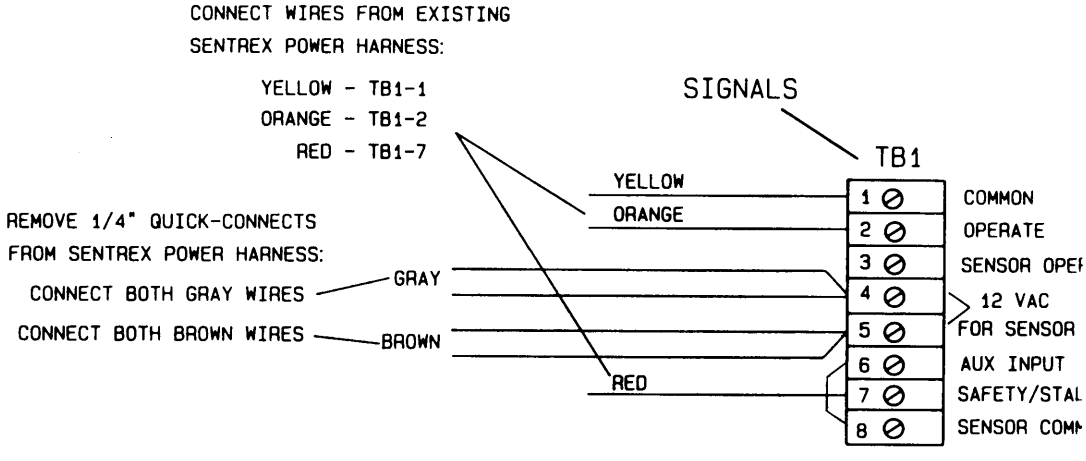
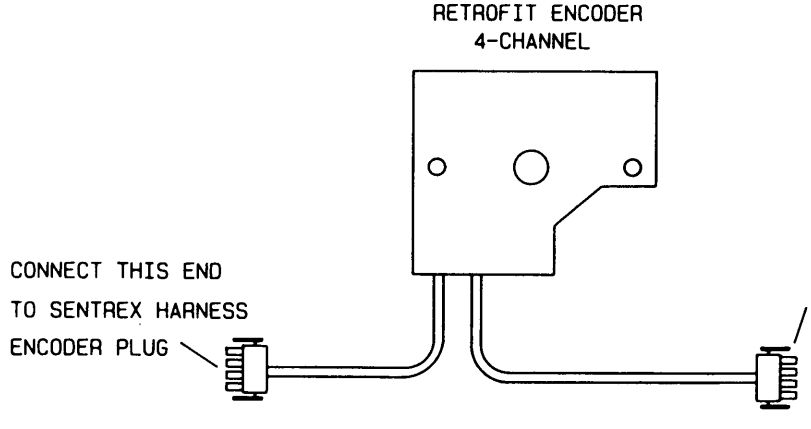
SIGNAL WIRING - MAGIC-SWING



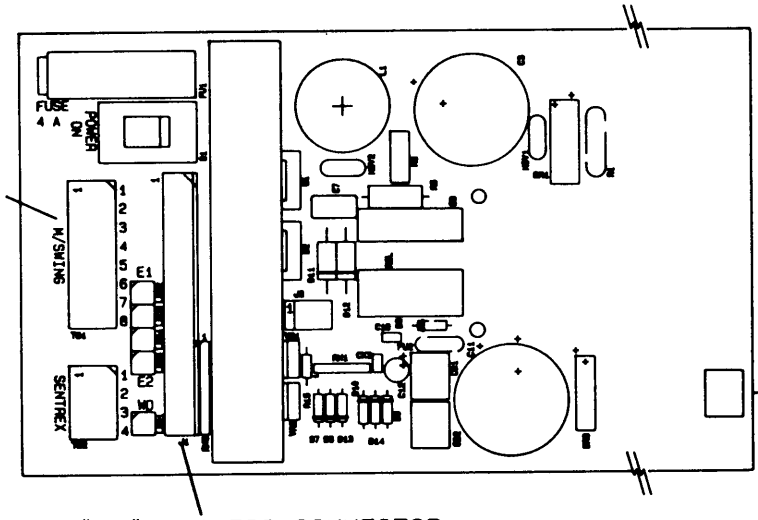


*NOTE: SINGLE RETROFIT APPLICATION SHOW
FOR A DUAL RETROFIT APPLICATION,

ASSEMBLIES	

ICROPROCESSOR CONTROL BOX WITH SENTREX A.T. OR SENTREX^2

MAGIC-SWING MICROPROCESSOR CONTROL PC BOARD



SET DIP SWITCH #1 TO "OFF"
(TIMER MODE)

515746

"J1" HARNESS CONNECTOR

NECT THIS END
MAGIC-SWING HARNESS
:ODER PLUG

RETROFIT ENCODERS ARE REQUIRED.

DATE	REVISION	APP'D
	REVISED AND RELEASED	
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WIRING DIAGRAM	M/S μP CONTROL – SENTREX^2 & A.T.	MAGIC-SWING MICROPROCESSOR CONTROL
DRAWN PCAD PM DATE 4/2/91	CHECKED APP'D P.M	SCALE ~

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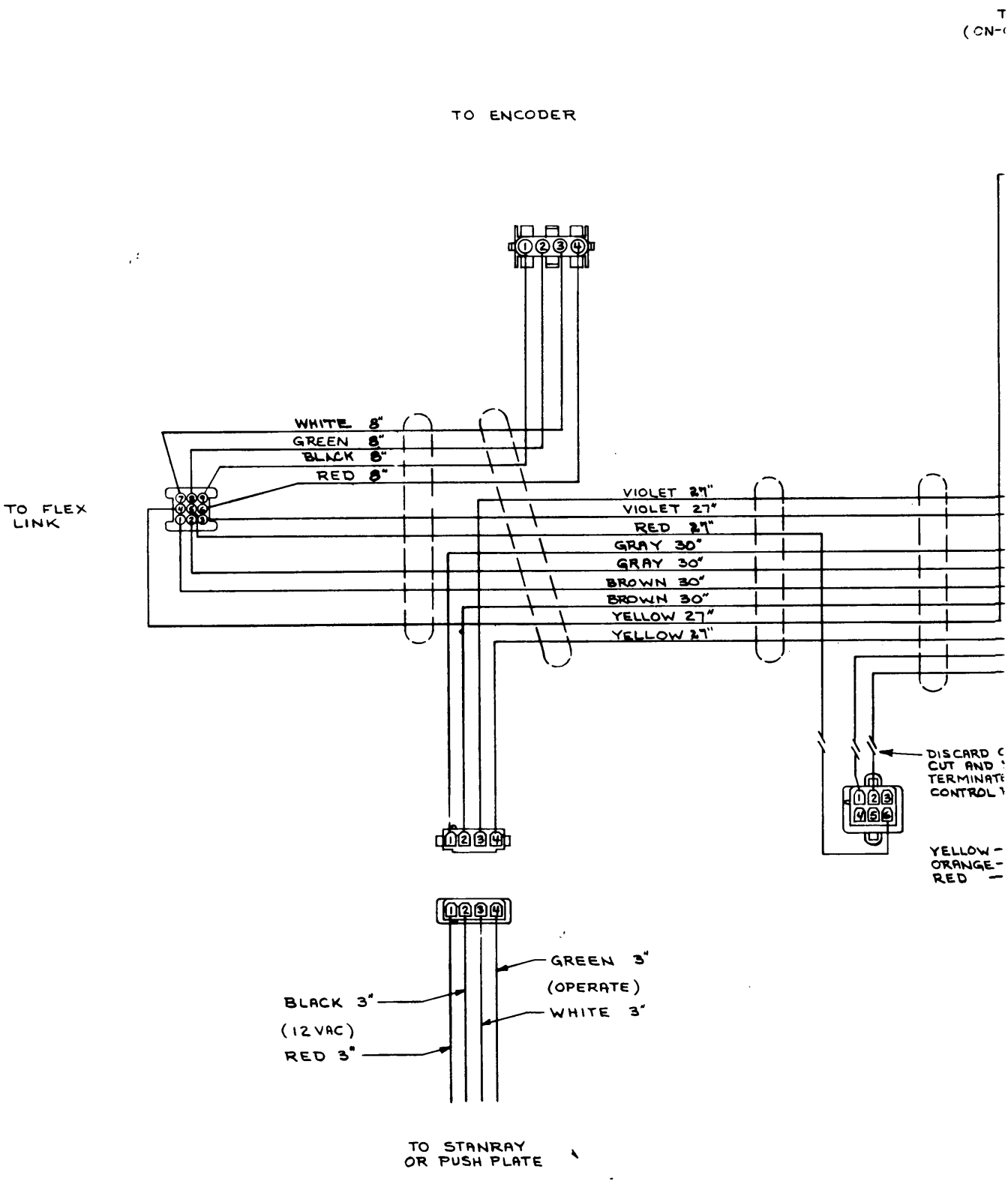
DIVISION OF THE STANLEY WORKS, FARMINGTON, CONN.

515746



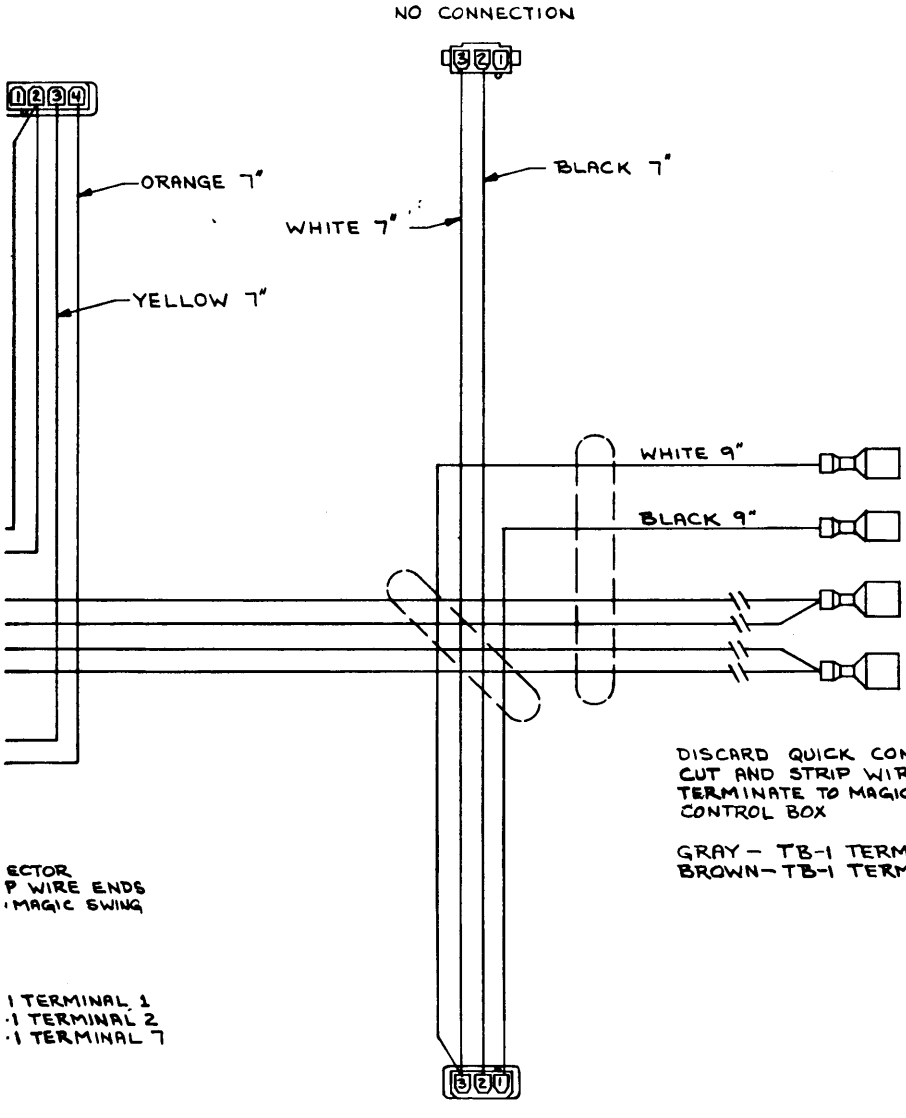
NOTE: THIS WIRING DIAGRAM IS NEEDED FOR INTERFACING SENTREX² OR SENTREX² A.T. TO MAGIC SWING MICROPROCESSOR CONTROL BOX

BRUNING 44-132 65318

DO NOT SCALE THIS DR

ASSEMBLIES	

SWITCH
- HOLD OPEN)



DISCARD QUICK CONNECTS
CUT AND STRIP WIRE ENDS
TERMINATE TO MAGIC SWING
CONTROL BOX

GRAY – TB-1 TERMINAL 4
BROWN – TB-1 TERMINAL 5

ECTOR
P WIRE ENDS
MAGIC SWING

1 TERMINAL 1
1 TERMINAL 2
1 TERMINAL 7

	REVISED AND RELEASED	
	PILOT LOT RELEASE	
DATE	REVISION	APP'D

SPEC. NO.:	1. MATL:
1. GRADE:	2. SIZE:
3. TEMPER:	4. FINISH:
6.	

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WIRING DIAGRAM

DRAWN YR 4-1-91 DATE | CHECKED | APP'D | SCALE ~

SENTREX² – SENTREX² A.T.

STANLEY MAGIC-DOOR

DIVISION OF THE STANLEY WORKS, FARMINGTON, CONN.

110303

MUST BE FREE FROM BURRS & ROUGH EDGES
TOLERANCES UNLESS OTHERWISE SPECIFIED – FRACTIONS ± .015, DECIMALS ± .005, ANGULAR ± 1°

helps you do things right.®

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