OWNER'S MANUAL

MODEL HT18 AUTOTOAST™ HORIZONTAL TOASTER

Model HT18 w/ Optional LED Control

Supplier Name:	**MARSHALL AIR SYSTEMS, INC**
Address:	419 Peachtree Drive South Charlotte, NC 28217
Model #:	_____
Serial #':	_____
Date Received:	_____
Date Installed:	_____
Telephone #:	704-525-6230
Fax #:	704-525-6229
Service Referral #	800-722-3474
Local Service:	_____
Local Service #:	_____

PRODUCT DESCRIPTION

The Marshall Model HT18 Horizontal Toaster produces caramelized buns hot and fast for building sandwiches to customer orders. This model has a slim horizontal footprint. Buns are loaded at the top and released onto a product slide at the bottom. The variable speed drive ranges from 20 seconds to 2 minutes. Heat controls are fully adjustable from 200°-565°F with the LED Control. Left and right side toasting temperatures can be zoned for flexibility.

All controls are located inside a secured cabinet, eliminating unauthorized tampering. The toaster is adjustable for various crown and heel bread thickness. The multi-control feature options of this toaster produce and deliver the hottest buns in the shortest time.

GENERAL SPECIFICATIONS

Model:	HT18 Horizontal Toaster
Height:	11.500"
Width:	25.000"
Depth:	23.375"
Options:	LED Control
Electrical:	208-240 VAC, 60Hz, 14-17A
Power Cord:	8.0 ft 3 wire ground type UL rated (MM2A,MM2H, MM2J, MM2B, MM2B-ARB, MM2BINTL, MM2BINTLCE, MM2-EP, MM2G, MM2GINTL)
Weight:	115 lbs.
Approvals:	ETL/CETL, CSA, CE and NSF

144328 RV031915

OWNER'S MANUAL

MODEL HT18 AUTOTOAST™ HORIZONTAL TOASTER

FOR YOUR SAFETY

DO NOT STORE OR USE GASOLINE OR OTHER

FLAMMABLE VAPORS OR LIQUIDS IN THE

VICINITY OF THIS OR ANY OTHER APPLIANCE

AVERTISSEMENT

Ne pas entreposer ni utiliser de l'essence ni d'autres vapeurs ou liquides inflammables dans le voisinage de cet appareil, ni de tout autre appareil.

WARNING: IMPROPER INSTALLATION, ADJUSTMENT, ALTERATION, OR MAINTENANCE CAN CAUSE PROPERTY DAMAGE, INJURY OR DEATH. READ THE INSTALLATION, OPERATION AND MAINTENANCE INSTRUCTIONS THOROUGHLY BEFORE INSTALLING OR SERVICING THIS EQUIPMENT.

AVERTISSEMENT: Une installation, un ajustement, une altération, un service ou un entretien non conforme aux normes peut causer des dommages à la propriété, des blessures ou la mort. Lisez attentivement les directives d'installation et d'opération et d'entretien avant de faire l'installation ou l'entretien de cet équipement

KEEP THIS MANUAL IN A SAFE PLACE AND RETAIN FOR FUTURE USE.

Toaster area must be kept free of combustible materials and the flow of ventilation air must not be obstructed. Operating personnel must not perform any maintenance or repair functions. Contact your Qualified Service Company.

144328 RV040414

OWNER'S MANUAL

MODEL HT18 AUTOTOAST™ HORIZONTAL TOASTER

TABLE OF CONTENTS

ILLUSTRATIONS

SCHEMATICS CONTROL GENERATION 1 (SEE PAGE 4)

144328 RV072214

SCHEMATICS CONTROL GENERATION 2 (SEE PAGE 4)

OWNER'S MANUAL

MODEL HT18 AUTOTOAST™ HORIZONTAL TOASTER

INSTALLATION

PRE-INSTALLATION

1. The toaster is packaged to minimize the risk of shipping damage. Immediately upon receipt, make certain to inspect the unit for damage. **FILE ALL CLAIMS WITH THE FREIGHT CARRIER.**

2. **It is necessary to check your voltage at the receptacle.** The voltage should match the toaster name plate. **CAUTION: DO NOT REMOVE THE ELECTRICAL CONTROL PANEL COVER ON THE RIGHT SIDE OF UNIT WITHOUT FIRST TURNING OFF THE TOASTER AND UNPLUGGING THE TOASTER.** See Figure 8 for instructions.

FINAL INSTALLATION

1. Place unit on a level surface. Be sure that location does not block the intake holes or slots at top of toaster.

2. Check that all covers are in place on the toaster.

3. Remove the plastic covering the top and sides.

4. Remove the conveyor carriage and wash with warm soapy water and sanitize.

5. Check that the toaster platen sheet is installed under the contact platens. The toaster platen sheet is installed by placing rods into arms of toaster. See Figure 4. Make sure seam is against platens (facing top of toaster). **USE ONLY MARSHALL APPROVED PLATEN SHEETS OR TOASTER WARRANTY IS VOID.**

6. Reinstall conveyor carriage and latch.

7. Connect the toaster to the power supply.

8. Press the on/off button and check for free movement of the two conveyor belts.

9. Unit is ready to use in approximately 15 minutes.

10. After warm up, insert buns into the toaster at the front of the unit. For proper operation, insert heels on the side of the toaster marked "Heel", and crown on the opposite side. **THE CUT SIDES OF THE HEEL AND CROWN MUST FACE UP.**

11. The toasted heel and crown will return to the toaster front together. Check the appearance of the toasted buns.

12. Adjust the gap between the conveyor and the toaster heat platens using the two knobs on top of the unit (see Figure 2 for knob locations). Both must be lowered at the same time. The knobs are labeled "HEEL" and "CROWN". The height gauges in the front indicate whether you are raising or lowering the platens. The Adjustment Ranges (except MM2B, G) are .625" – 1.438". The MM2B, MM2BINTLCE, MM2G range is .375" – 1.438".

    NOTE: For **MM2B-ARB** Models: Start with Crown @6, Heel @3.5-4. See detail A in Figure 1 for determination. Use the edge of the gauge metal not the scratched line from manufacturing.

13. The conveyor speed is preset at the factory. The approximate adjustable speed ranges for the MM2A unit

toaster belt is 8 – 70 seconds; the MM2B and MM2G series is 9 – 105 seconds.

14. Test at least 3 buns before putting the toaster into service. Uniform surface toasting and bun temperature are achieved when the gap described in step 12 is set correctly.

15. If necessary, the speed of the conveyor can be changed. The speed control is located behind a box on the front of the unit. (See Figure 2) which can be removed using a 5/32 Allen wrench through the hole in the front. Adjust as needed and reinstall box.

OPERATION (OPTIONAL PUSH BUTTON MM2A SERIES)

1. The toaster is operated by pressing and releasing the button on the right side of the unit.

2. Allow the toaster to heat up for at least 15 minutes prior to use.

3. For proper operation, insert heels cut side up on the side of the toaster marked "HEEL", and crowns on the opposite side.

4. To turn off, press and hold the button on right side of toaster for three (3) seconds. The toaster will cool enough to remove parts after at least 30 minutes.

OPERATION (OPTIONAL 3 DIGIT CONTROL)

1. The toaster is operated by pressing and releasing the "I/O" Button of the control. "Lo" will be displayed.

2. The display of the control will show "Rdy" once the toaster is up to temperature. (Approximately 15 minutes.)

3. For proper operation, insert heels cut side up on the side of the toaster marked "HEEL", and crowns on the opposite side.

4. To turn off, press and hold the "I/O" Button for three (3) seconds. "Hi" will be displayed which means unit is still too hot to remove any parts. Once the toaster has cooled (approximately 30 minutes), the display will show "Off."

5. The LED Control will indicate important information:

   A. Press and release either the Heat 1(Crown) or the Heat 2 (Booster) Button, the pre-programmed temperature settings will flash. This will display for 5 seconds or until another button is pressed.

   B. Press and hold either the Heat 1(Crown) or the Heat 2 (Booster) Button for 3 seconds, the actual platen temperatures will be displayed. This will display until another button is pressed.

6. Definitions of various displays:

"Off"	Unit is off and not operating.
"Lo"	Heater platens have not reached programmed set temperature.
"Rdy"	Unit has reached programmed set temperature and is ready to toast.
"Hi"	Unit is off and too hot to touch most removable parts.
"AL1"	This is an alarm message that indicates the Left Platen Probe is disconnected or defective. Contact your local qualified service agency.
"AL2"	This is an alarm message that indicates the Right Platen Probe is disconnected or defective. Contact your local qualified service agency.
"AL3"	This is an alarm message that indicates the Left Platen is too hot. Unit shuts off. Contact your local qualified service agency.

"AL4" This is an alarm message that indicates the Right Platen is too hot. Unit shuts off. Contact your local qualified service agency.

PREVENTIVE MAINTENANCE

DAILY CLEANING:

1. Remove conveyor carriage from toaster body. Take conveyor carriage to sink and spray with water.

2. Clean platen sheet three (3) times daily as listed below:
   a. After lunch rush – Clean sheet in place using a damp cloth or non-abrasive pad. If sheet has black butter buildup, it must be wiped off. Use Sizzle cleaner if necessary.
   b. After dinner rush – Clean sheet in place using a damp cloth or non-abrasive pad. If sheet has black butter buildup, it must be wiped off. Use Sizzle cleaner if necessary.
   c. After closing – Remove sheet from toaster. Place on a flat surface and clean using a damp cloth or non-abrasive pad. If sheet has black butter buildup, it must be wiped off. Make sure to install sheet seam again platen (facing top of toaster).

3. Wipe any blockages that may be in the upper slots and holes on the side of toaster.

4. While toaster is in upright position, wipe cooling fan discharge with a dry cloth or towel.

5. MM2B Series Only: Wipe the product slide sheet and the bun ramp sheets. Use a damp cloth or non-abrasive pad. If sheet has black butter buildup, it must be wiped off.

6. Reinstall all parts after drying.

WEEKLY MAINTENANCE:

1. Perform Daily Maintenance.

2. Replace any worn out toaster platen sheets with Marshall Part #503983 (4 pack). **USE ONLY MARSHALL APPROVED PLATEN SHEETS OR TOASTER WARRANTY IS VOID.**

MONTHLY MAINTENANCE:

1. Perform Daily Maintenance.

QUARTERLY MAINTENANCE:

1. Inspect motor brushes. Replace if ¼" in length or shorter.

2. Perform Daily, Weekly & Monthly Maintenance.

ANNUALLY MAINTENANCE:

1. Replace two (2) motor brushes.

TOASTER CONTROL DESIGNATION

Before any troubleshooting or replacement parts are ordered, it is necessary to determine the style of control that your toaster has. Generation 2 started in March 2014, but older toasters may or may not have been field upgraded from Generation 1 to Generation 2.

GENERATION 1
Buttons to the right of the LED display.

GENERATION 2
Buttons underneath the LED display.

TROUBLESHOOTING GUIDE

NOTE: **SERVICE MUST BE PERFORMED BY A QUALIFIED SERVICE COMPANY. THE TERM "QUALIFIED SERVICE COMPANY" MEANS ANY INDIVIDUAL, FIRM, CORPORATION OR COMPANY WHICH IS EITHER ENGAGED IN AND IS RESPONSIBLE FOR THE INSTALLATION OR REPLACEMENT OF ELECTRICAL COMPONENTS, OR THE CONNECTION, INSTALLATION OR REPAIR OF ELECTRICAL APPLIANCES, WHO IS EXPERIENCED IN SUCH WORK, FAMILIAR WITH ALL PRECAUTIONS REQUIRED, AND HAS COMPLIED WITH ALL THE REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.**

WARNING: **INSPECTION, TESTING, AND REPAIR OF ELECTRICAL EQUIPMENT SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. THE UNIT SHOULD BE UNPLUGGED WHEN SERVICING, EXCEPT WHEN ELECTRICAL TESTS ARE REQUIRED.**

DANGER: **USE EXTREME CARE DURING ELECTRICAL CIRCUIT TESTS. LIVE CIRCUITS WILL BE EXPOSED. WHERE TESTING INDICATES "WITH POWER OFF", BE SURE THAT THE TOASTER IS UNPLUGGED.**

1. PROBLEM: Toaster shuts off intermittently and/or no heat and conveyor belts do not move. (Will not turn on.)

SOLUTION:

OPERATOR CHECK:

A. Check that toaster is plugged in. Check condition of power cord and plug.
B. Check circuit breaker in main breaker panel. Reset if necessary.
C. **If LED control**, check for error message. "AL1" message is a defective left platen probe. "AL2" is a defective right platen probe. "AL3" is high temperature error of the left platen. "AL4" is high

a temperature error of the right platens. "AL3" and "AL4" alarms will turn unit off requiring a service call.

D. **If push button** is on side panel, check two wires to make sure they are tight.

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Check that there is power at receptacle. Verify voltage is correct based upon the voltage listed on the toaster nameplate.
B. **WITH UNIT UNPLUGGED,** check connections inside of plug. Remove right side panel and check wiring. Any wires or terminals with burns or discoloration from arcing should be replaced. All wiring, if replaced, should be same or higher rated wire.
C. Check sensors to see if OHM readings are correct. At room temperature (70°F), should be nominal 1.09K ohms. (NOTE: A defective sensor will not allow toaster to power on, but error messages are not visible if toaster is equipped with push button.)
D. *With toaster off,* check for continuity across the solid state relay terminals #1 and #2. Normal readings are in mega ohm range. If reading ohms, relay has failed closed and will not cycle.
E. Control Generation 2 if no LED on display, check for .5 amp transformer fuses. If fuses good, check for 208 volts on terminals 1 and 6, then 18 Vac on 11 and 12. If 208 volts is present and no 18 Vac output, replace transformer.

2. PROBLEM: Conveyor belts move but no heat.

SOLUTION:

QUALIFIED TECHNICIAN CHECK:

A. Check that there is power at receptacle. Verify voltage is correct based upon the voltage listed on the toaster nameplate.
B. Check for loose connections at terminal strip and temperature terminals (see schematic).
C. Verify that the heater and sensor wires are connected to the controller.
D. Replace all connections or components that have damaged terminals. Replace any damaged wiring with same or higher rated wire.
E. Check the resistance of the sensor(s). If sensor is open, replace. At room temperature (70°F), Ohms should be nominal 1.09K ohms.
F. Check voltage into solid-state relays. The voltage input from module should be approximately 5Vdc. Voltage to heater should be 208 or 240Vac.
G. Check the resistance of the heater platens: 24 ohms at room temperature
H. Control Generation 2 – Check for 24Vdc to the heater relay (R1, R2) from the control board. If getting 24Vdc from the control board, check for 208 volts on output side of relay. If no 208 volts then replace relay. If there is 208 volts, then possible solid state relay problem.

3. PROBLEM: Heater platens are hot, control says LO or RDY, conveyor belts do not move.

SOLUTION:

OPERATOR CHECK:

A. Make sure carriage is pushed completely in and latch is engaged.
B. Remove conveyor carriage and turn conveyors by hand and determine there is no binding due to dropping carriage.

C. Make sure all setscrews on gears are tight.
D. Check motor to make sure it is turning with carriage removed.

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Check that there is power at receptacle. Verify voltage is correct based upon the voltage listed on the toaster nameplate.
B. Check the fuses inside the right panel. Replace with type AGC 1.5 amp fuse if necessary. Check for red light on the speed board. If red light is lit, the motor is working too hard or in a stalled state.
C. Some speed boards have a green light. If green light is lit then power is going to the board.
D. Make sure the input voltage switch (es) of the speed board is set at 230V.
E. Check for DC voltage out of board to motor.
F. Check all wiring to motor for loose connectors.
G. Check motor ohms, should be approximately 50-80 ohm s.

4. PROBLEM: Variable Speed Motor Not Operating

SOLUTION:

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Verify correct voltage to unit and motor.
B. Check 1.5-amp fuses (#500061) inside right control panel. Replace if necessary.
C. Check for DC voltage to motor out of board (90VDC Motor).
D. Check motor ohms. Should be approximately 60 ohms.
E. If red light on board is on, disconnect load from motor by removing conveyor carriage. If it goes out, look for conveyor binding. If it stays lit, replace motor –there is probably a gearbox problem.
F. Check DC amp draws to motor by putting meter in series with motor. (Pull wire from A1 on board, put one lead to A1, other to wire pulled from A1.) When red LED on board is on, DC amp reading should be .3 amps approximately.
G. If green LED is on and red is not, make sure that there is varying DC voltage out of board to motor (terminals A1 & A2 on board) as speed control knob is increased or decreased.
H. Check for oil leaks on motor signifying bad seal or overheating that has taken place. In either case, motor should be replaced.

5. PROBLEM: Circuit Board not working properly. DO NOT ADJUST POTS ON BOARD!

SOLUTION:

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Verify AC voltage to board and DC voltage to motor from board. If there is AC voltage in, but no DC voltage out, replace board.
B. Check all connections on board and terminal strip.
C. Verify that board is wired correctly. (See schematic in Owner's Manual.)
D. Make sure that switch on board is in 230V position.
E. Make sure all wires are connected to potentiometer. A loose wire will make toaster run at single uncontrolled speed.

F. Control Generation 2 – Check for 24 Vdc from control board to motor relay (R3). If relay is getting 24 Vdc, check for 208 volts on output side of relay. If no 208 volts, replace relay.

6. PROBLEM: Product is over or under toasted.

SOLUTION:

OPERATOR CHECK:

A. Check the gap settings. There must be compression of the bun as it feeds into the toaster. Decreasing the gap will increase bun temperature and darken surface color. To lower (decrease gap) turn knob counter-clockwise; to raise (increase gap) turn knob clockwise.
B. Check toast time. Time should be 20 seconds nominal from start to finish.
C. Check conditions of toaster platen sheet and belts. Clean both as noted in this manual.
D. Make sure conveyor belts are not binding.
E. Check drive system for loose sprockets.

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Check that heaters are cycling. Do this by using an amp clamp on either of the wires from the controller to the platen. You are looking for cycling. Also verify that the temperature controller has power.
B. Check that the 3 wires from the speed board are hooked to the speed control.

7. PROBLEM: Buns do not feed properly into toaster.

SOLUTION:

OPERATOR CHECK:

A. Check condition of the toaster platen sheet to be sure buns are not sticking. Clean sheet as described in daily maintenance. Replace if needed. Sheet should be rotated daily.
B. Check toaster platen sheet installation.
C. Toaster gap set too close or too far. See instructions on Page 1, Number 12.

8. PROBLEM: Buns do not exit toaster.

SOLUTION:

OPERATOR CHECK:

A. Check condition of the toaster platen sheet to be sure buns are not sticking. Clean sheet as described in daily maintenance. Replace if needed. Sheet should be rotated daily.
B. Check toaster platen sheet installation.
C. Toaster platen gap set too close.

QUALIFIED SERVICE TECHNICIAN CHECK:

A. Check tension on lower conveyor. If too loose, buns will not exit. Tighten conveyor by adjusting the Plate Tension Assembly (See Figure 5).

9. PROBLEM: Gap setting knobs jammed.

SOLUTION:

OPERATOR CHECK:

A. Turn knobs counter-clockwise. Indicator is read using top edge.
B. Turn both knobs at same time. Platen sheet could be interfering.

10. PROBLEM: Conveyors turning intermittently.

SOLUTION:

OPERATOR CHECK:

A. Make sure carriage is pushed back and latch is engaged.
B. Check for bent parts on the carriage; for example, handle, back flange.
C. Check bottom rail flange for bending. Refer to the Technical Bulletin at the end of this manual for instructions.
D. Tighten latch mechanism. Use a screwdriver and 7/16" wrench. It is necessary to remove right side cover to access.
E. Conveyor bearings need replacing

11. PROBLEM: "Shim" required between latch and conveyor carriage to get conveyors to turn.

SOLUTION:

A. Latch is bent. Bend latch back to straight.

12. PROBLEM: Conveyors continue to run after unit is turned off.

SOLUTION:

A. Cycle On/Off again to see if motor stops.
B. Motor must be replaced.

13. PROBLEM: Motor Noisy/Chirping

SOLUTION:

A. Remove motor brushes and inspect. If ¼" less, replace with new.
B. If longer than ¼", replace brushes and tighten cap. Do not over tighten.

REPLACEMENT PARTS: **(See page 11 and 12 for electrical components)**
When ordering parts, make sure to specify the model number and serial number as shown by the label attached on the back of toaster. **WARNING: Use of Non Marshall approved parts will void warranty.**

It is necessary to determine control style before specifying any electrical components for replacement. See page 11 and page 12 for information.

PART NUMBER	DESCRIPTION	FIGURE
144074	Arm, Front Tensioning	4
144075	Arm, Rear Tensioning Right	4
144058	Arm, Rear Tensioning Left	4
149404	Bar, Chain Support, Kit Set of 2	5
149275	Bearing, Shaft, Kit Set of 8	5
504297	Belt Wrap, Conveyor (MM2B, MM2BINTL)	9
150886	Bracket, Foot Brace (MM2J)	10
148549	Brush, Motor Right Angle Kit	Schematic
150425	Butterwheel (MM2B, MM2BINTL, MM2F, MMM2-EP)	10
144444	Carriage, Conveyor Asby (MM2A, MM2G)	3, 5
150939	Carriage, Conveyor Asby (MM2H)	3, 5
150873	Carriage, Conveyor Asby (MM2B, MM2BINTL, MM2J)	3, 9
160726	Carriage, Conveyor Asby (MM2-EP)	3, 9
504015	Conveyor, Return	5
504001	Conveyor, Toaster	5
150878	Conveyor, Toaster (MM2B, MM2BINTL, MM2J, MM2-EP)	9
144436	Cover, Speed Control (serial no. 1036 and after)	3
500263	Foot, 4" Tall	10
149277	Gear, Return and Drive, Kit Set of 3	5, 6
144435	Guard, Front Heat	3
158456	Guard, Heat w/Butterwheel (MM2B, MM2BINTL)	10
144876	Guard, Reflector Heat (MM2B-ARB)	3
504016	Idler, 1.405 Dia. (2 Per)	5
501717	Jumper	Schematic
500392	Jumper (MM2BINTLCE-NC Only)	Schematic
161895	Kit, Toaster Foot for HT18 VT18 Toasters (Short)	Not Shown
504009	Knob, Adjustment	7
500088	Knob, Small (serial no. 1035 and before and 4692 & after)	Schematic
502147	Knob, Clear (serial no. 1036 – 4691)	3
501358	Nut, Adjustment Knob	7
164522	Pan, Crumb for Slide (MM2B-ARB Only)	10
144027	Plate, Cover (serial no. 1035 and before)	3
144402	Plate, Idler Tensioning (4 Per)	5
503981	Platen, 9" X 12" (2 Per)	7

REPLACEMENT PARTS CONT.: **(See page 11 and 12 for electrical components)**

PART NUMBER	DESCRIPTION	FIGURE
144077	Rod, Toaster Platen Sheet 18.250" (2 per)	4
144004	Shaft, Conveyor Drive (2 Per)	5
143749	Shaft, Idler (2 Per)	5
158195	Sheet, Product Return (MM2B, MM2BINTL, MM2-EP)	10
164652	Sheet, Product Return (MM2B-ARB)	10
150418	Sheet, Teflon Loading (MM2B, MM2BINTL, MM2H, MM2J)	9
149280	Sheet, Toaster Platen 4 Pack	4
158454	Slide, Product Return (MM2B, MM2BINTL, MM2BINTLCE, MM2J, MM2-EP) (Not MM2B-ARB)	10
164521	Slide, Product Return (MM2B-ARB Only)	10
144405	Spacer, Conveyor (6 Per)	5
503191	Spring, Extension	4
504002	Spring, Tension (2 Per) Lower	5
504046	Spring, Tension (2 Per) Upper	5
149276	Sprocket, Kit W/Idlers	5
144078	Sprocket, Conveyor Asby (2 Per)	5
158125	Support, Chain Belt Kit	5
150941	Wrap, Bun Tray (MM2H)	10

CONTROL GENERATION 1 ELECTRICAL REPLACEMENT PARTS
(NOTE: BUTTON LAYOUT TO RIGHT OF DISPLAY)

PART #	DESCRIPTION	FIGURE
504017	Circuit Board, 230V (MM2A, MM2H)	Schematic
504107	Circuit Board, 230V (MM2G, MM2GINTL, MM2J)	Schematic
143852	Control, 3 Digit	Schematic
144779	Control, ECM3 Module (MM2A)	Schematic
159718	Control, ECM3 Module (MM2B-1)	Schematic
148301	Control, ECM3 Module (MM2G, MM2-EP)	Schematic
157400	Control, ECM3 Module (MM2GINTL)	Schematic
158450	Control, ECM3 Module (MM2BINTL MM2BINTLCE)	Schematic
504011	Cord, 12/3 w/6-20 Plug (MM2A, MM2B, MM2B-ARB, MM2H, MM2J, MM2-EP)	Schematic
150483	Cord, 12/3 w/6-20 Plug (MM2G)	Schematic
504237	Cord Only, 12/3 Int'l (MM2BINTL)	Schematic
144139	Fan, Cooling 240 Vac	Schematic
500068	Fuse Holder	Schematic
500061	Fuse, 1.5 AMP	Schematic
161003	Kit, Sensor Replacement (2 per)	Schematic
500293	Lug, Ground	Schematic
503985	Motor, Right Angle Drive	6
144016	Panel, LH Side	3
150887	Panel, LH Side (MM2J)	3
150889	Panel, RH Side (MM2J)	3
144017	Panel, RH Side (MM2A)	3
150482	Panel, RH Side (MM2G, MM2H)	3
502892	Potentiometer, Rotary	Schematic
504023	Relay, Solid State 25A	Schematic
148545	Switch, Pushbutton Asby W/Boot	Schematic
500340	Terminal Strip	Schematic
148595	Wiring Harness Platens	Not Shown

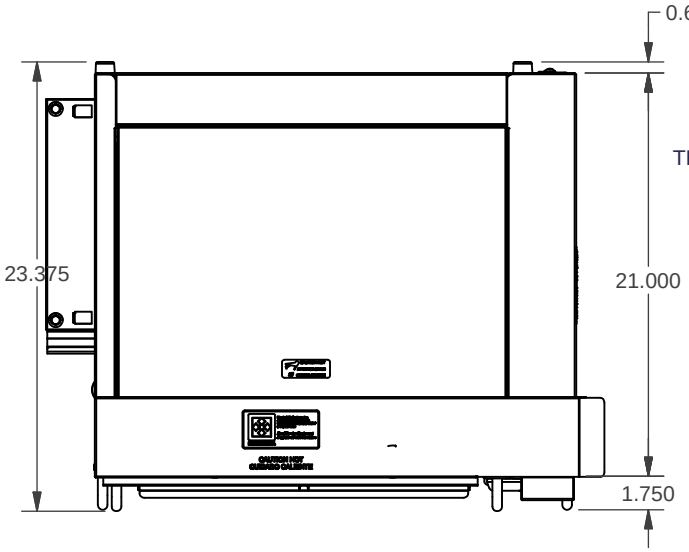
CONTROL GENERATION 2 ELECTRICAL REPLACEMENT PARTS

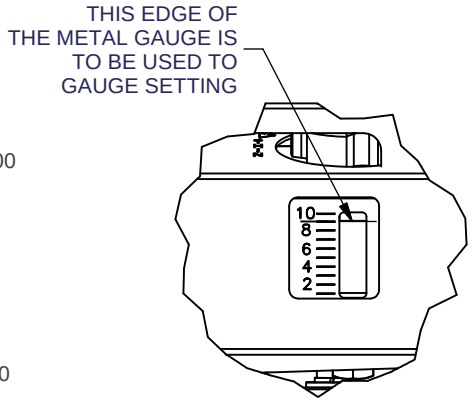
(NOTE: BUTTON LAYOUT UNDER DISPLAY)

PART #	DESCRIPTION	FIGURE
504017	Circuit Board, 230V (MM2A, MM2B, MM2B-ARB, MM2H)	Schematic
504107	Circuit Board, 230V (MM2G, MM2GINTL, MM2J)	Schematic
163975	Control Interface Board (LED Control)	Schematic
163582	Control I/O Board (MM2B-NC, MM2G-NC)	Schematic
164653	Control I/O Board (MM2B-ARB)	Schematic
164833	Control I/O Board (MM2BINTLCE-NC)	Schematic
164073	Control I/O Board (MM2GINTL-NC)	Schematic
504011	Cord, 12/3 w/6-20 Plug (MM2A, MM2B, MM2B-ARB, MM2G-NC, MM2H, MM2J, MM2-EP)	Schematic
150483	Cord, 12/3 w/6-20 Plug (MM2G)	Schematic
504237	Cord Only, 12/3 Int'l (MM2BINTL, MM2BINTLCE-NC, MM2GINTL-NC)	Schematic
144139	Fan, Cooling 240 Vac	Schematic
503574	Filter Noise ("CE" Units Only)	Schematic
500069	Fuse Block 2 Pole (MM2BINTLCE-NC)	Schematic
500068	Fuse Holder	Schematic
501139	Fuse, .5 AMP	Schematic
500061	Fuse, 1.5 AMP	Schematic
161003	Kit, Sensor Replacement (2 per)	Schematic
500293	Lug, Ground	Schematic
503985	Motor, Right Angle Drive	6, Schematic
502892	Potentiometer, Rotary	Schematic
504313	Relay, DC Coil Panel Mount 30A, 24VDC Coil	Schematic
504023	Relay, Solid State 25A	Schematic
502603	Tab, Ground (MM2BINTLCE-NC)	Schematic
500340	Terminal Strip	Schematic
164650	Top, Heat Shield (MM2B-ARB Only)	Not Shown
504314	Transformer	Schematic
148595	Wiring Harness Platens	Not Shown

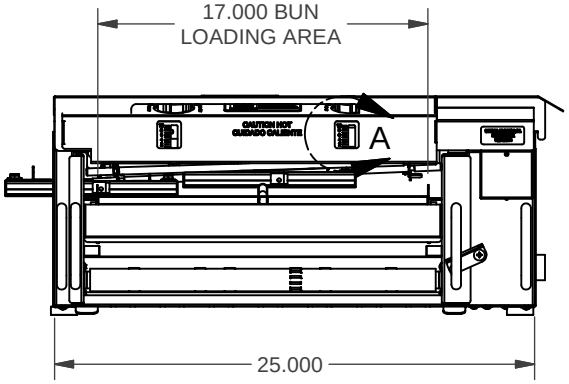
MODEL: HT18 W/ PUSHBUTTON
OVERALL DIMENSIONS

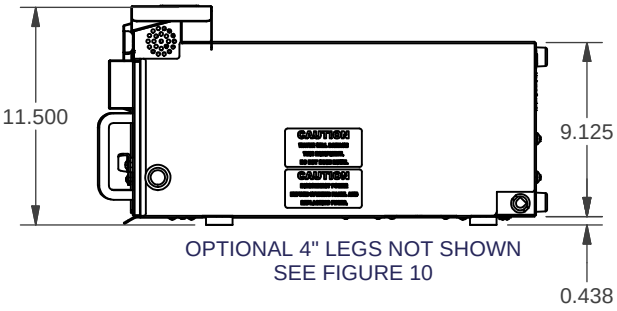
FIGURE 1



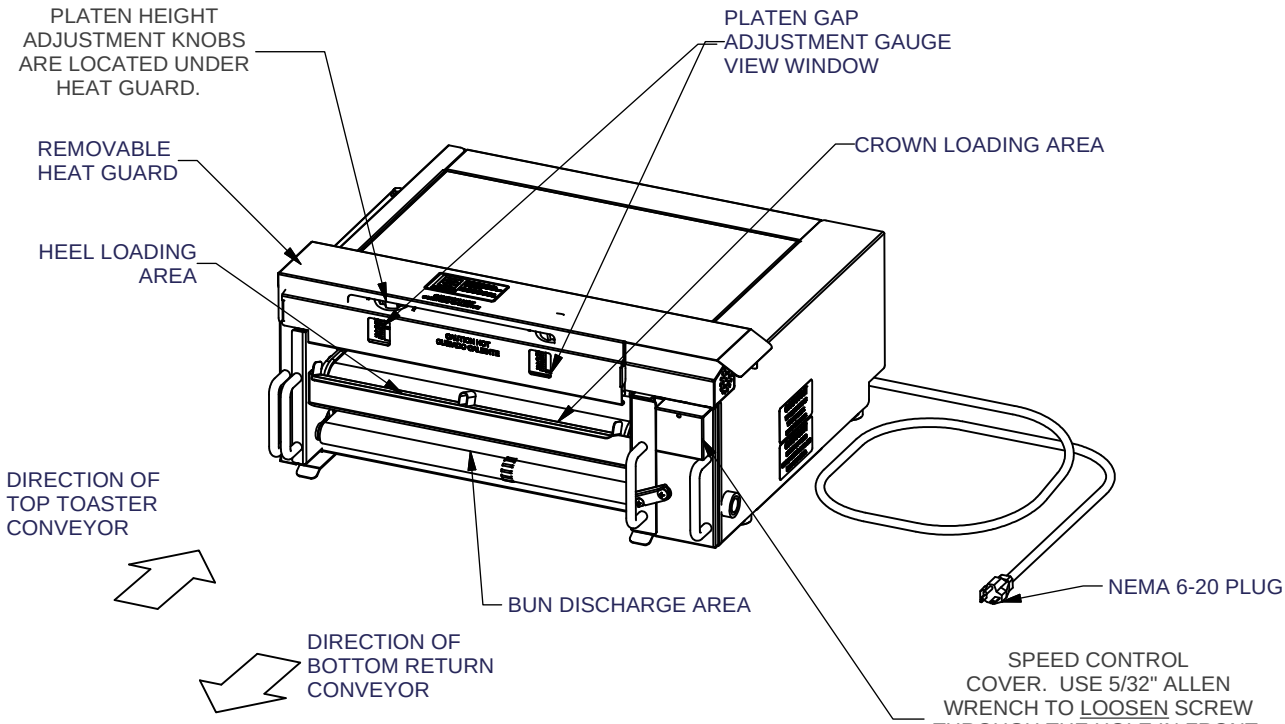


DETAIL A



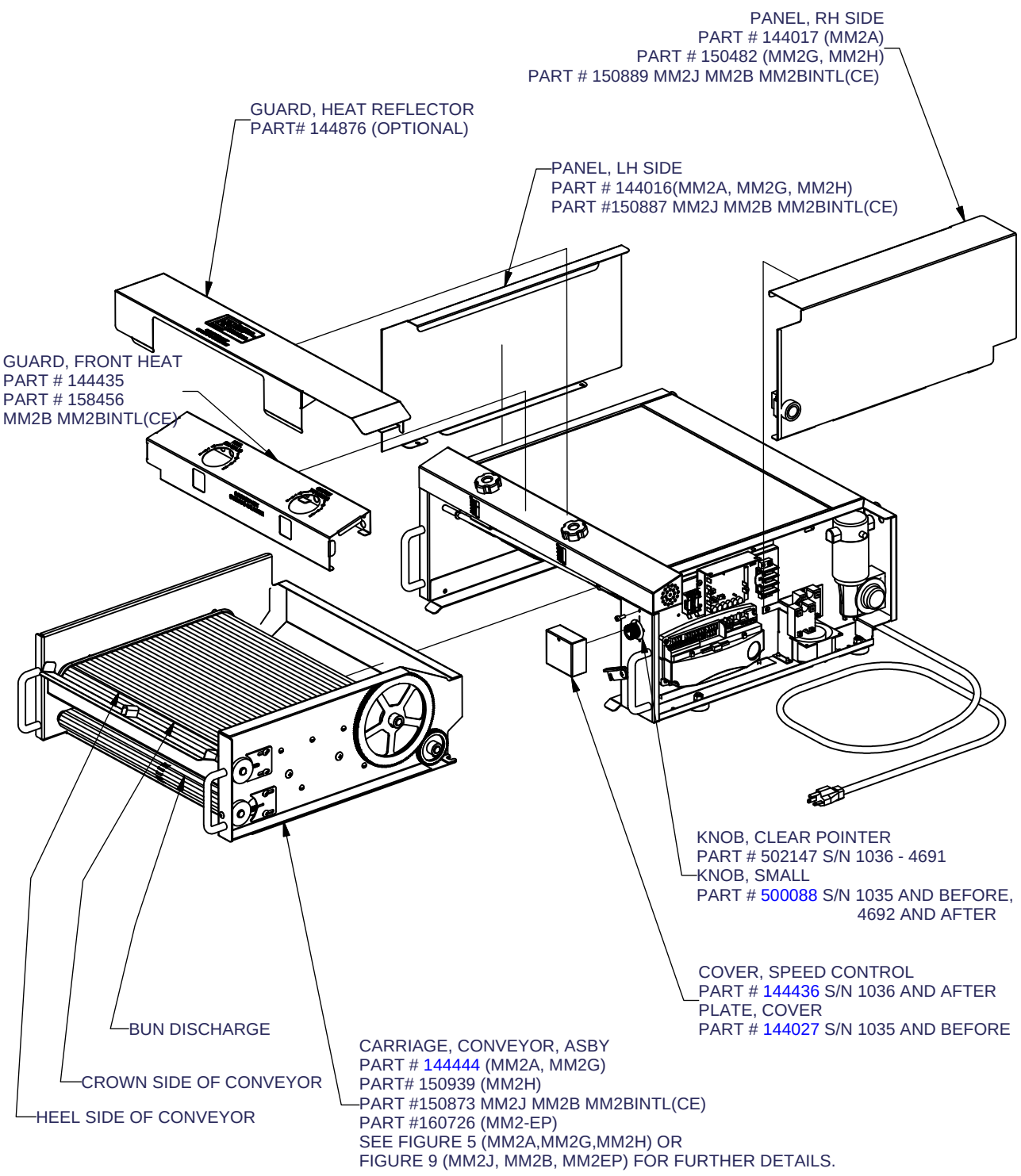


OPTIONAL 4" LEGS NOT SHOWN
SEE FIGURE 10



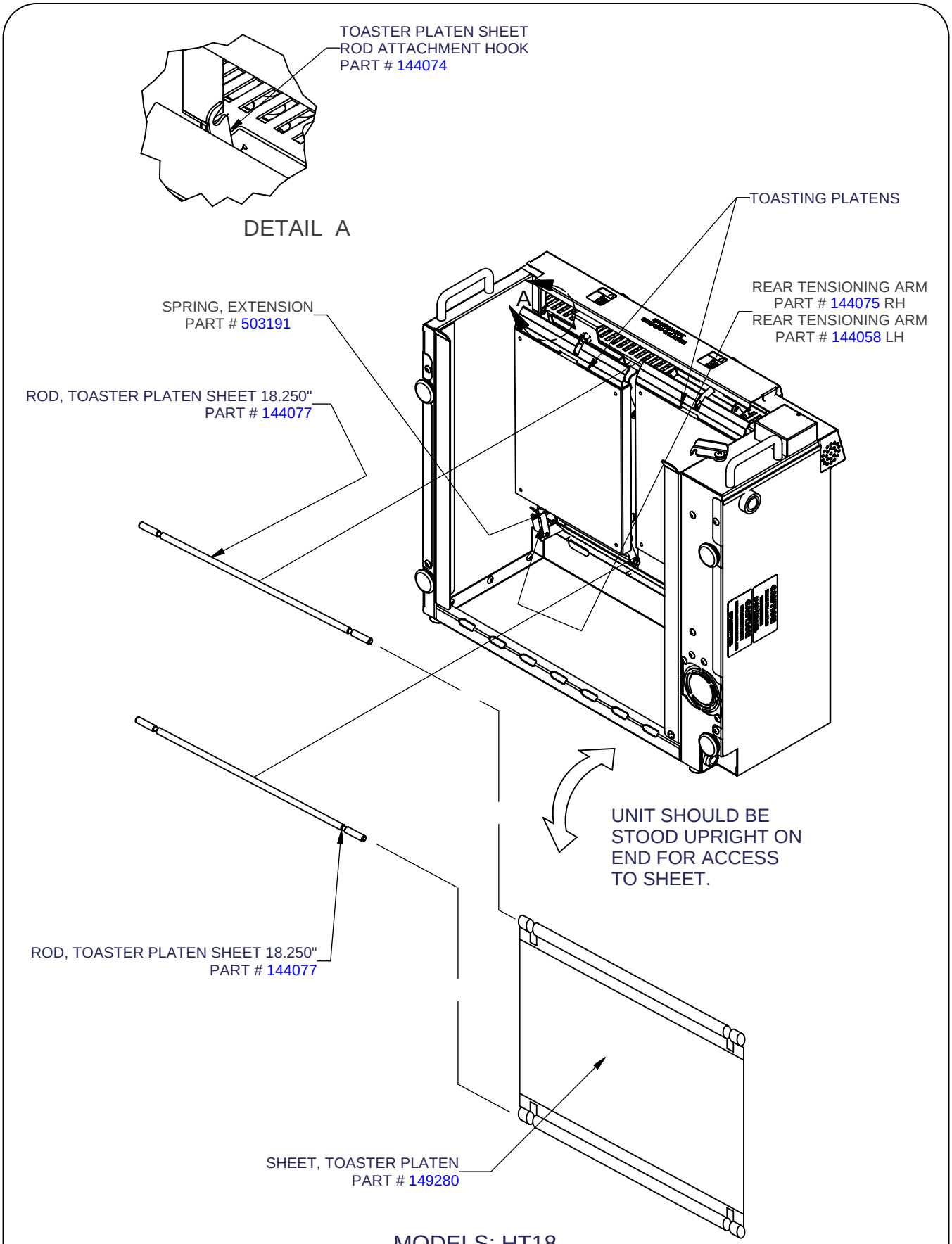
MODEL: HT18
OVERALL UNIT ISOMETRIC

FIGURE 2



MODEL: HT18
HANG-ON PARTS

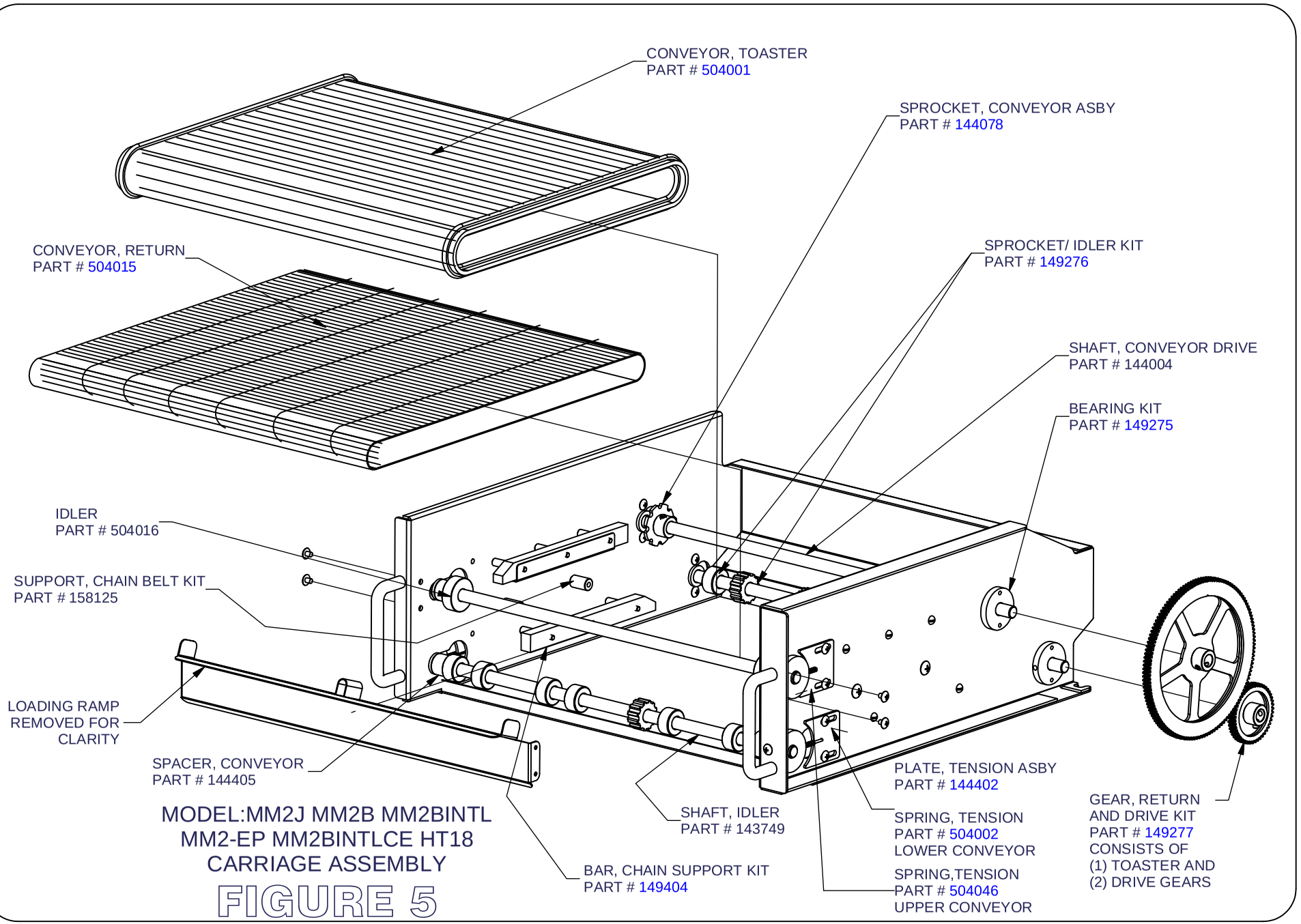
FIGURE 3



MODELS: HT18
TOASTER PLATEN SHEET

FIGURE 4

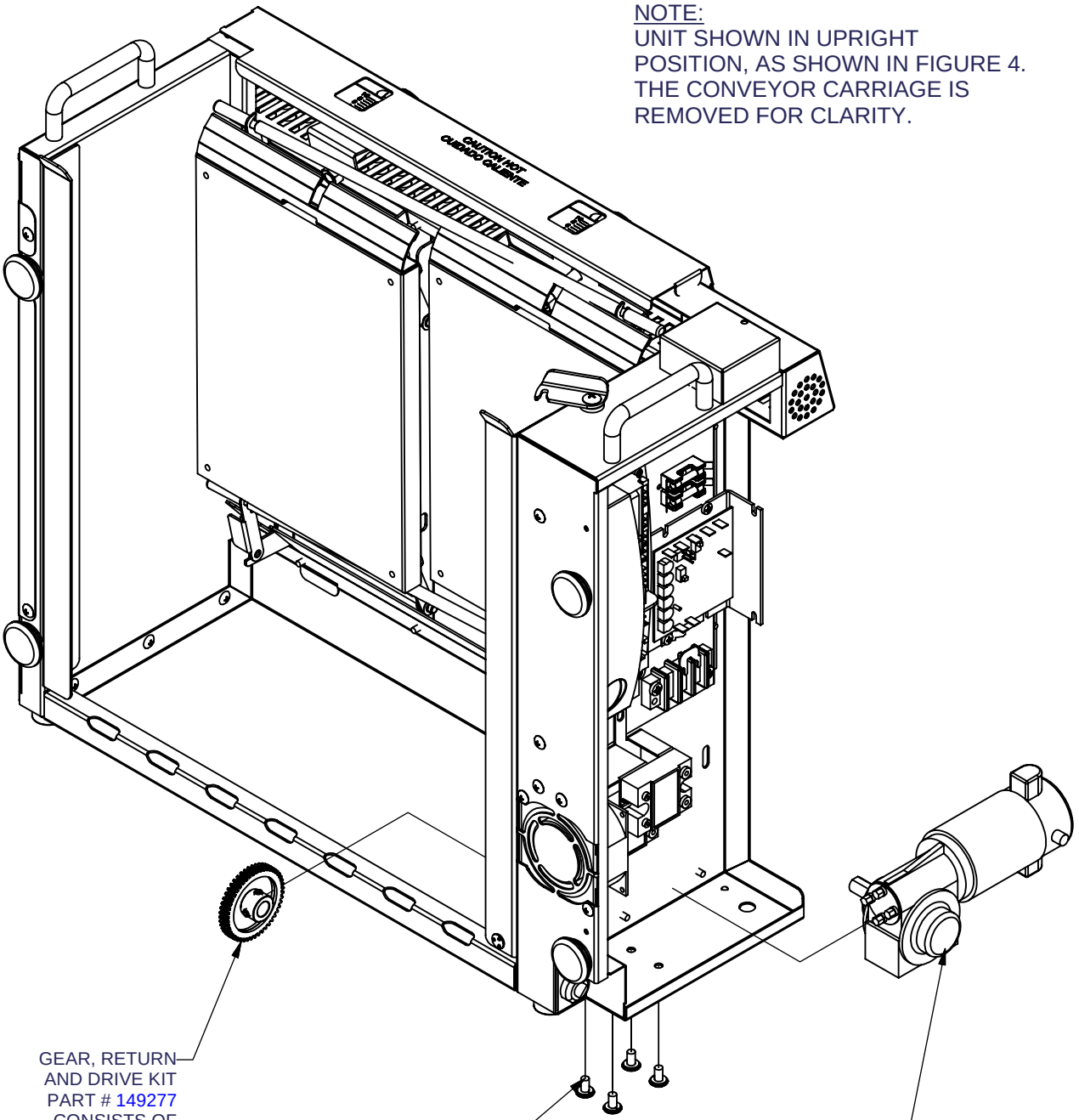
144328FIG4 RV010207



MODEL:MM2J MM2B MM2BINTL
MM2-EP MM2BINTLCE HT18
CARRIAGE ASSEMBLY

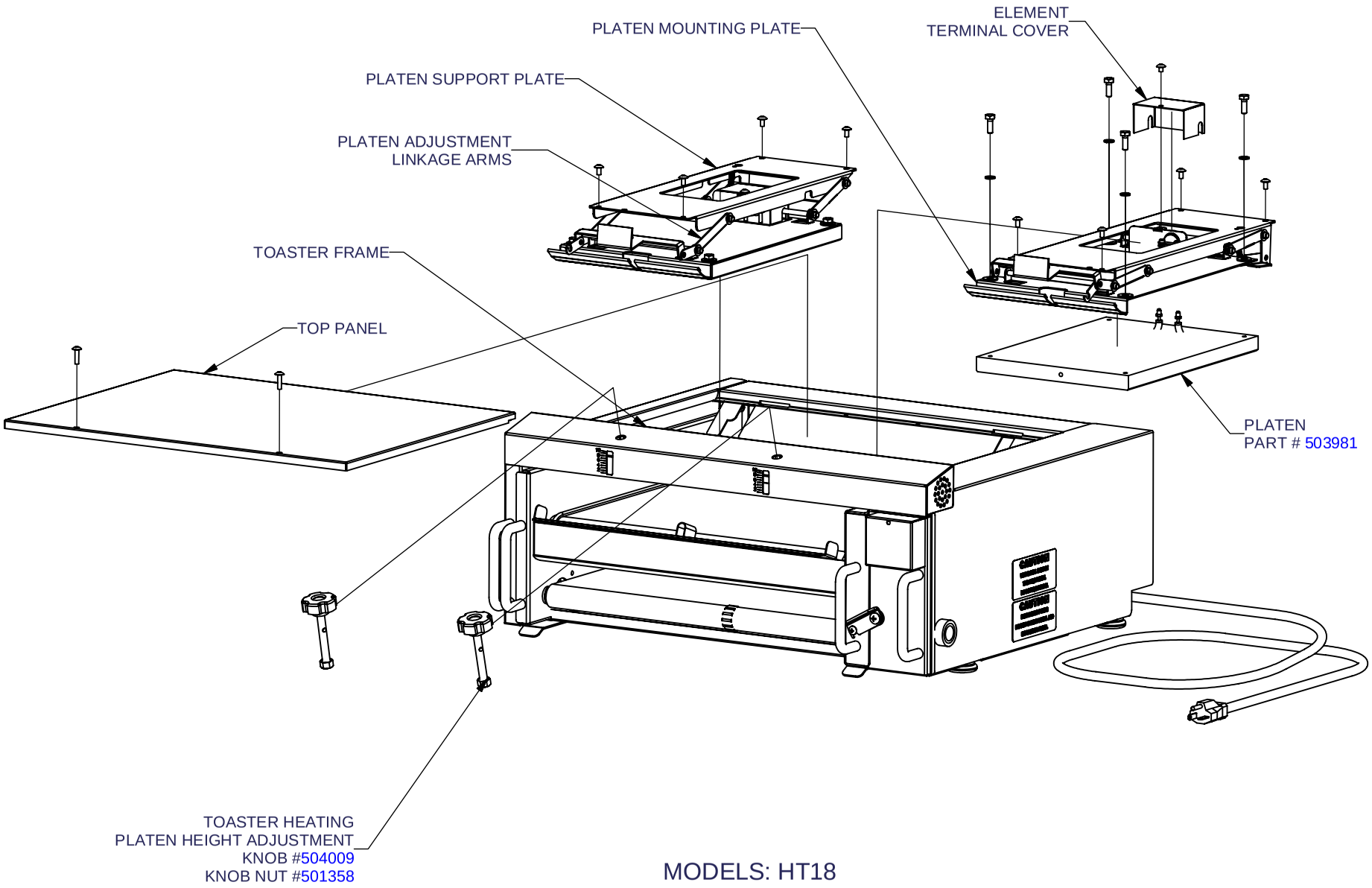
FIGURE 5

NOTE:
UNIT SHOWN IN UPRIGHT POSITION, AS SHOWN IN FIGURE 4. THE CONVEYOR CARRIAGE IS REMOVED FOR CLARITY.



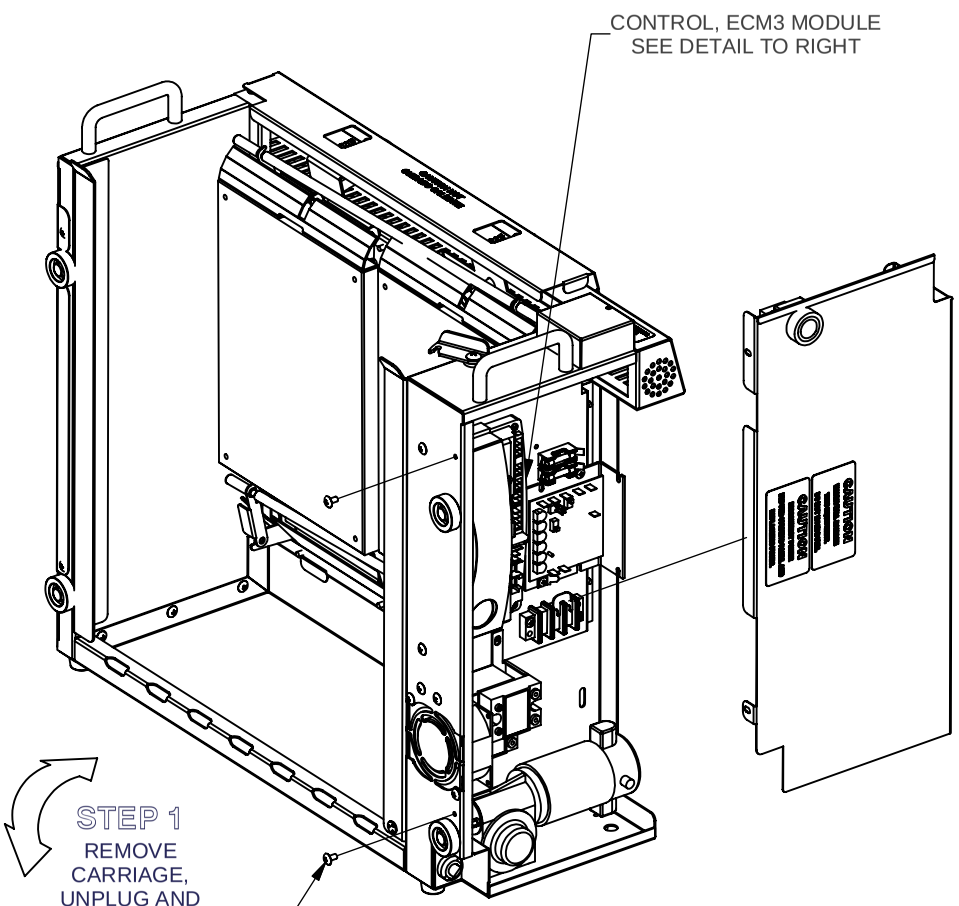
MODELS: HT18
DRIVE MOTOR ASSEMBLY

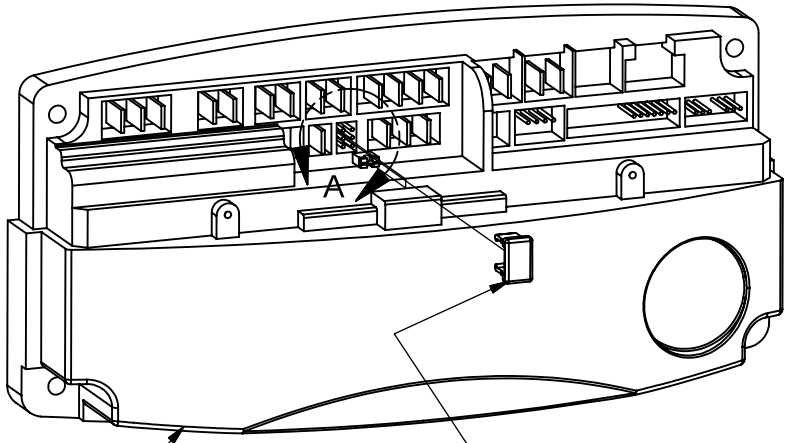
FIGURE 6



MODELS: HT18
HEATING PLATEN ASSEMBLY

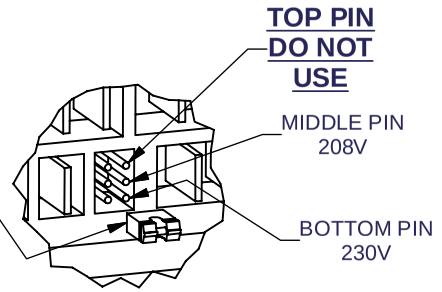
FIGURE 7





STEP 4

USING A SMALL FLAT HEAD SCREW DRIVER, REMOVE THE JUMPER FROM THE 208V PIN AND MOVE IT DOWN TO THE 230V PIN, DO NOT USE TOP PIN WITH 208 OR 230V OR DAMAGE WILL OCCUR.

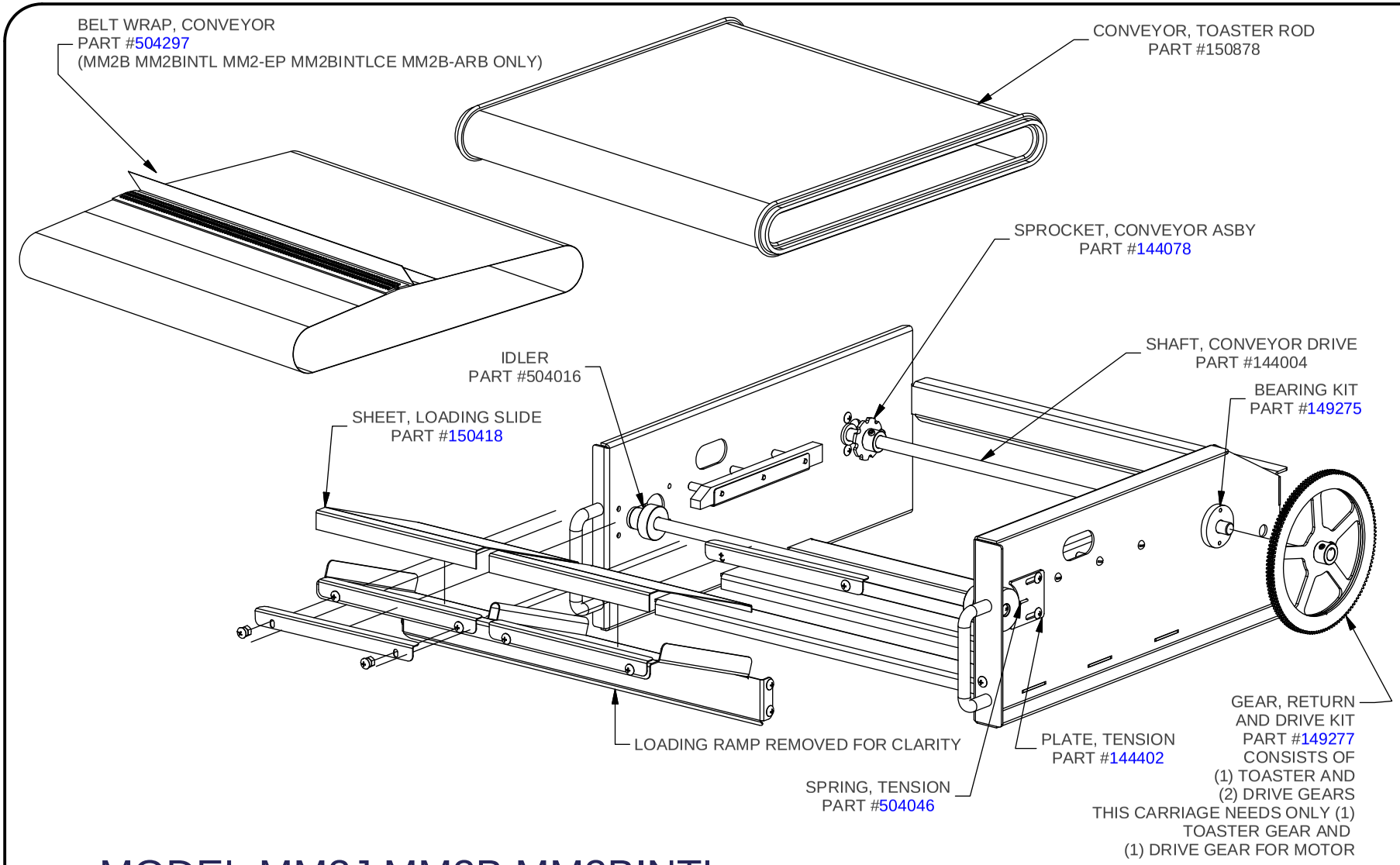


DETAIL A

!CAUTION!: BE SURE THE UNIT IS UNPLUGGED OR ELECTRICAL SHOCK MAY OCCUR.

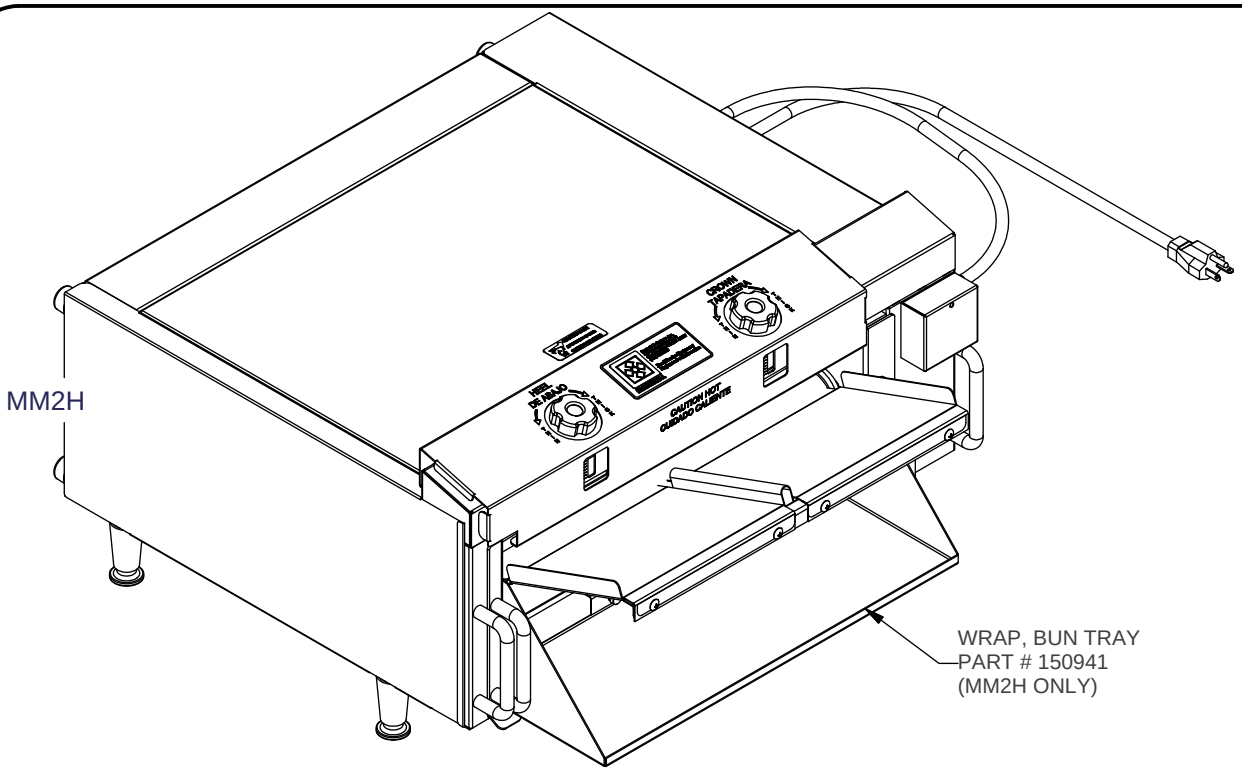
MODEL: HT18
CONTROLLER VOLTAGE
CONVERSION

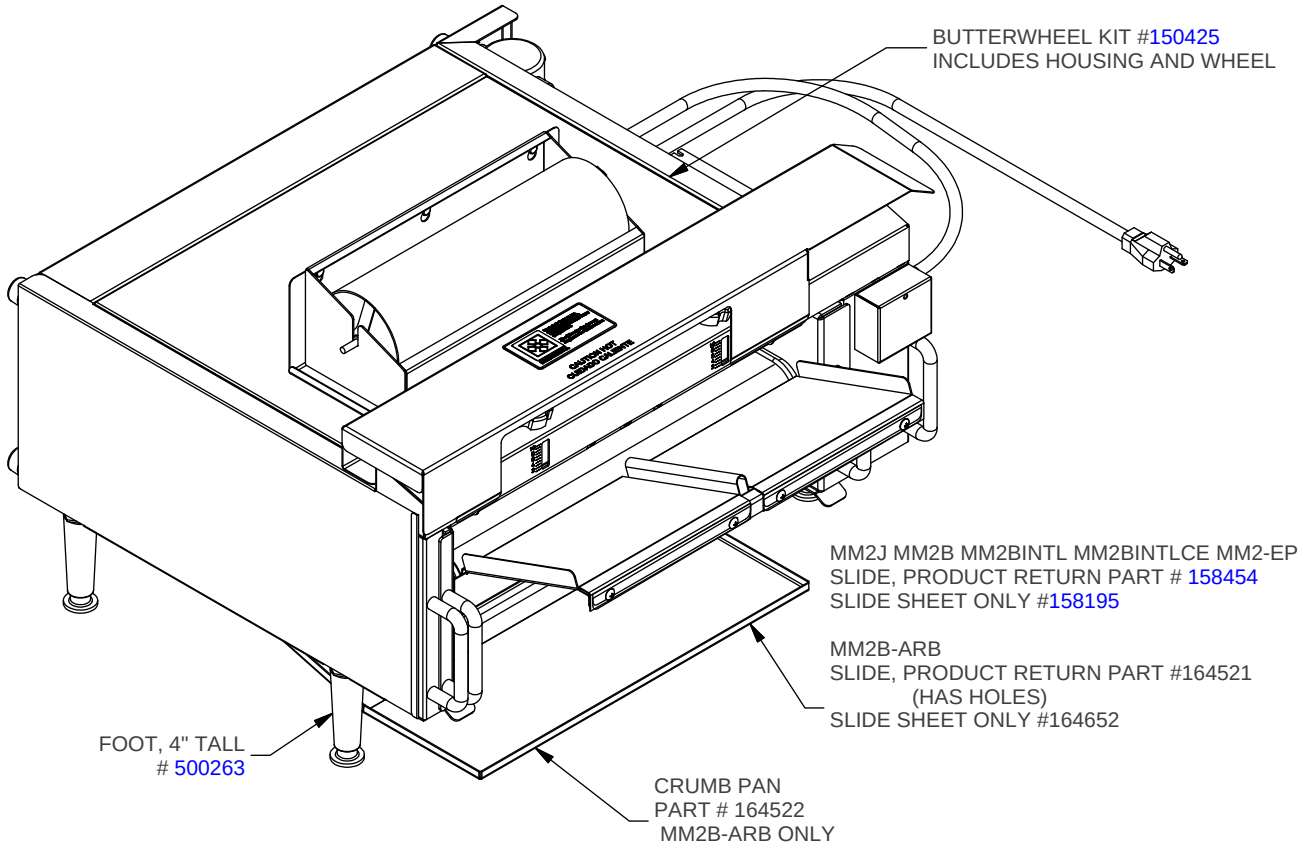
FIGURE 8



MODEL:MM2J MM2B MM2BINTL MM2-EP MM2BINTLCE MM2B-ARB HT18 CARRIAGE ASSEMBLY

FIGURE 9





MODEL: HT18 ADDITIONAL HANG-ON PARTS MM2H MM2J MM2B MM2B-ARB MM2BINTL MM2BINTLCE MM2-EP

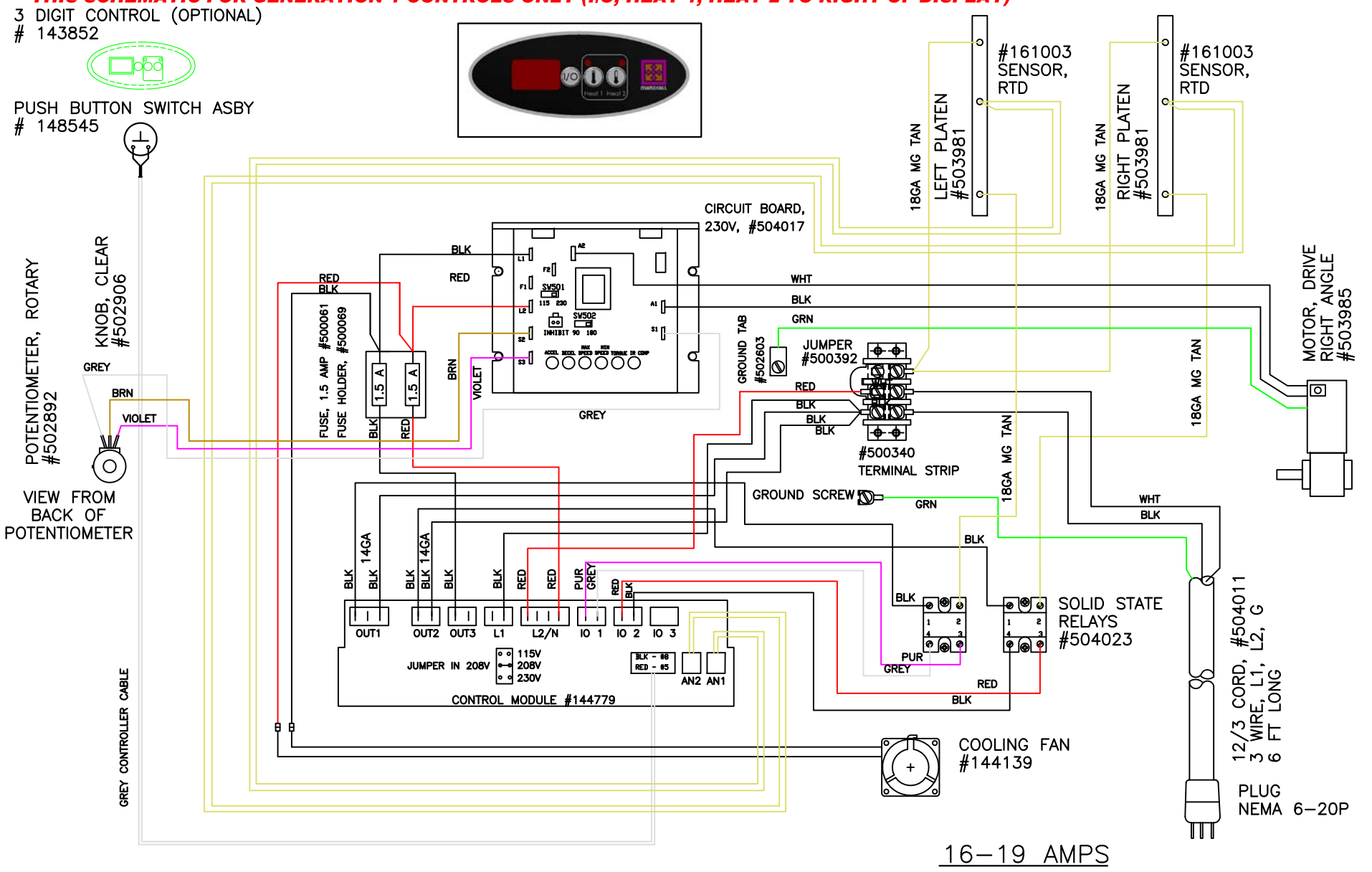
FIGURE 10

144328FIG10 RV072214

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

144046

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



16–19 AMPS

REV	DESCRIPTION	DATE	REV. BY
18	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW
17	#161003 WAS #503590	1/21/2013	S.A.
16	ADDED BUTTON WIRE DESIGNATION	05-OCT-2011	P.W.
15	CHG CIRC BOARD WIRING	25-SEP-2006	P.W.
14	CHG BUTTON SWITCH FROM 504062	04-MAY-2006	P.W.
13	UPDATE SPEED BOARD ILLUSTRATION	14-NOV-2005	C.M.

DRAWN BY: P.W. DATE: 09–JUN–2003 | REV DATE: –

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB | PRODUCT CLASS: TST

REFERENCE

___.____ X __.____

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 208 OR 240 1PH VARIABLE SPEED

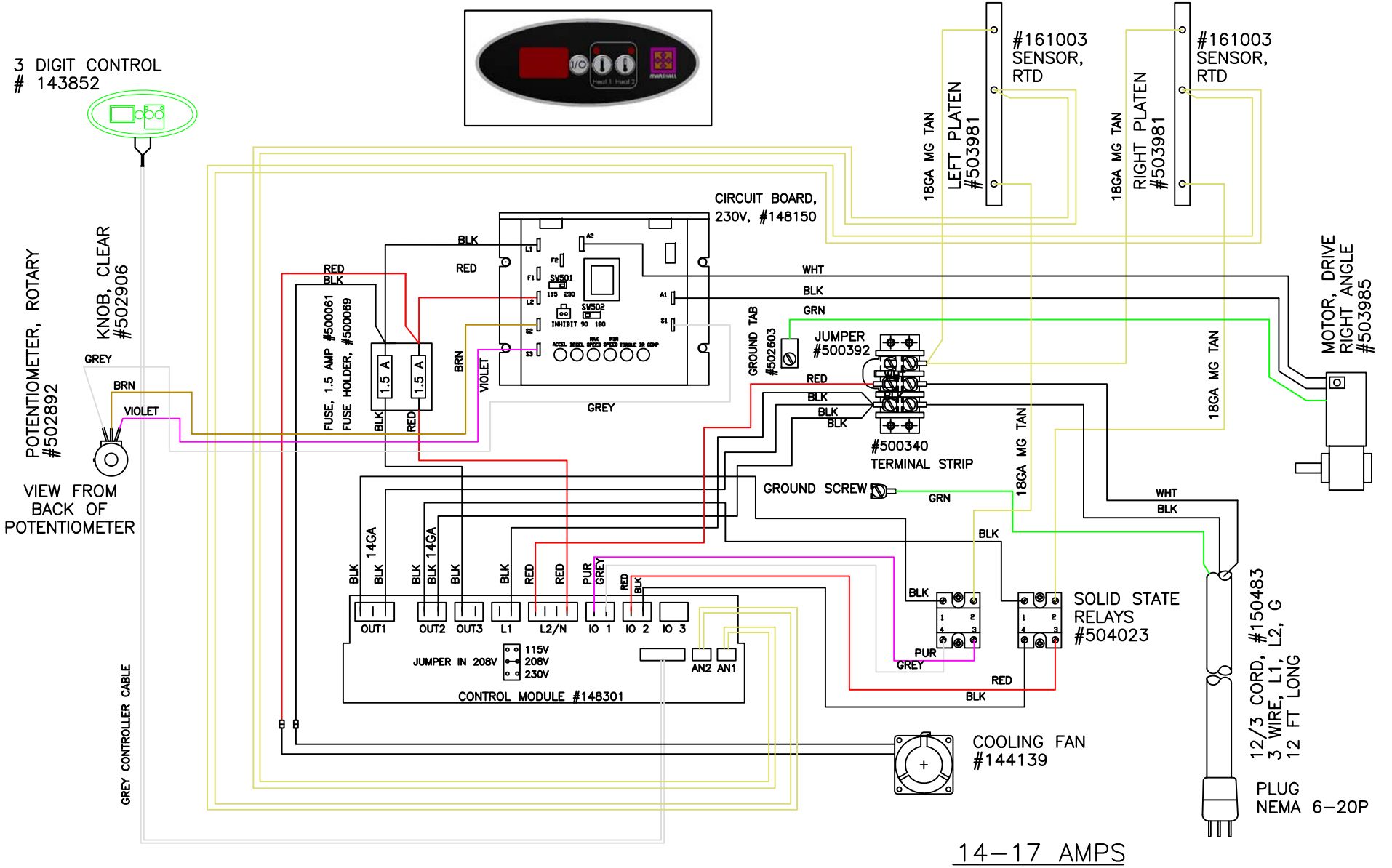
SIZE: A | ROUTE.: ELECT | DWG. NO.: 144046 | REV.: 18

SCALE: 1:1 | IMAGE MAY BE REDUCED NTS | CODE: MM2A

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

150484

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



14-17 AMPS

REV	DESCRIPTION	DATE	REV. BY
1	SWITCHED BLK WHT MOTOR WIRE	01/10/112	PW
2	#161003 WAS #503590	1/21/2013	S.A.
3	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: J.L.	DATE: 29-AUG-2007	REV DATE: -
GENERIC NAME: SCHEMATIC		
PRODUCT LINE: FAB	PRODUCT CLASS: TST	
REFERENCE		
__.___" X __.___"		

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18, 208 OR 240 1 PH W/ LED CONTROL, VARIABLE SPEED

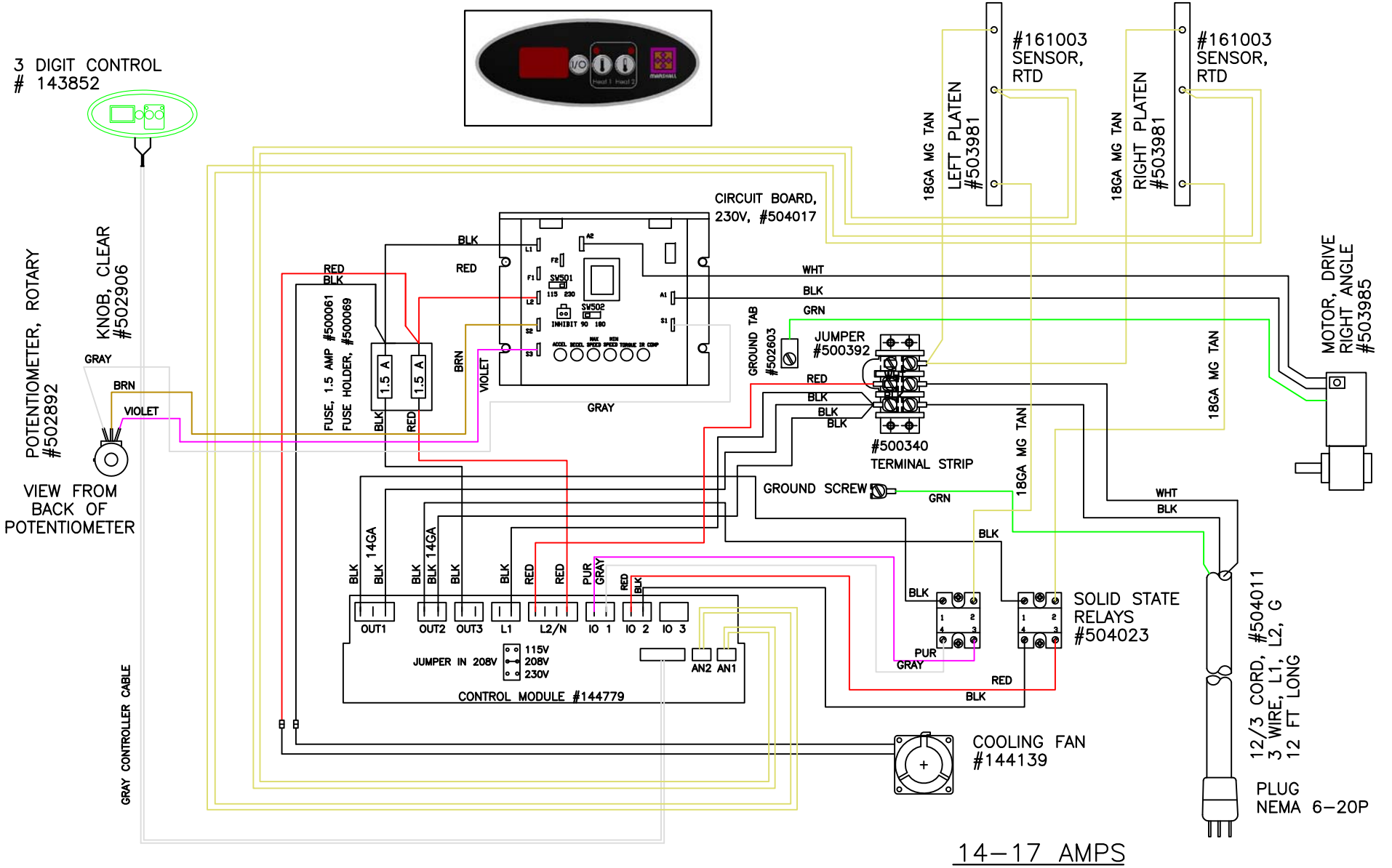
SIZE:	ROUTE:	DWG. NO.:	REV.:
A	ELECT	150484	3

SCALE: NTS IMAGE MAY BE REDUCED NTS CODE: MM2G

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

150891

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



14–17 AMPS

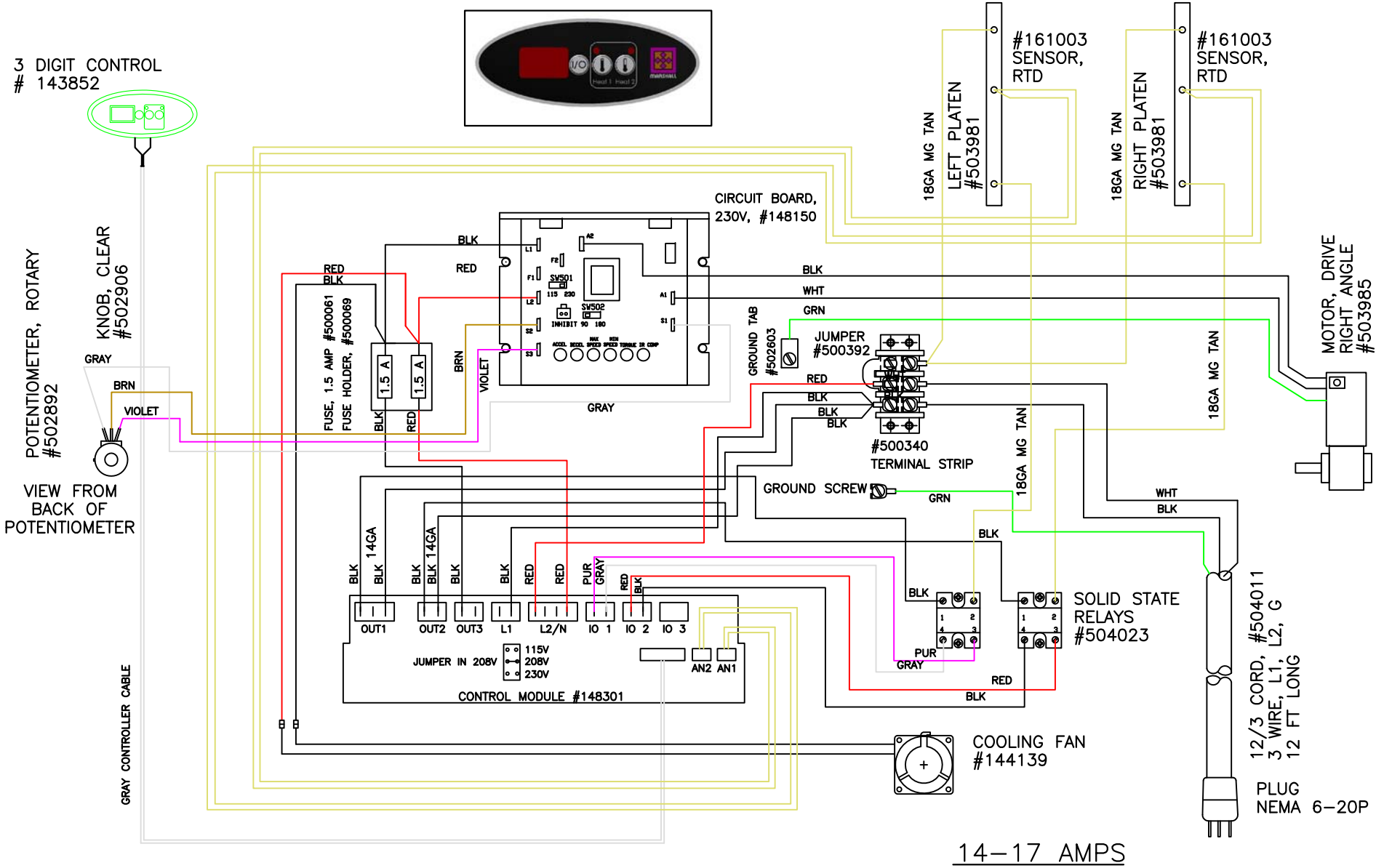
REV	DESCRIPTION	DATE	REV. BY
1	#161003 WAS #503590	1/21/2013	S.A.
2	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: J.L. DATE: 19-OCT-2007	MARSHALL AIR SYSTEMS, INC.
GENERIC NAME: SCHEMATIC	SCHEMATIC, HT18, 208 OR 240V 1 PH W/ LED CONTROL, VARIABLE SPEED
PRODUCT LINE: FAB / PRODUCT CLASS: TST	
MATERIAL: REFERENCE	SIZE: A / ROUTE.: ELECT / DWG. NO.: 150891 / REV.: 2
___.___" X ___.___"	SCALE: NTS / IMAGE MAY BE REDUCED NTS / CODE: MM2H

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

150881

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



14–17 AMPS

REV	DESCRIPTION	DATE	REV. BY
1	#161003 WAS #503590	1/22/2013	S.A.
2	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: J.L. DATE: 18-OCT-2007

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18, 208 OR 240V 1 PH W/ LED CONTROL, VARIABLE SPEED

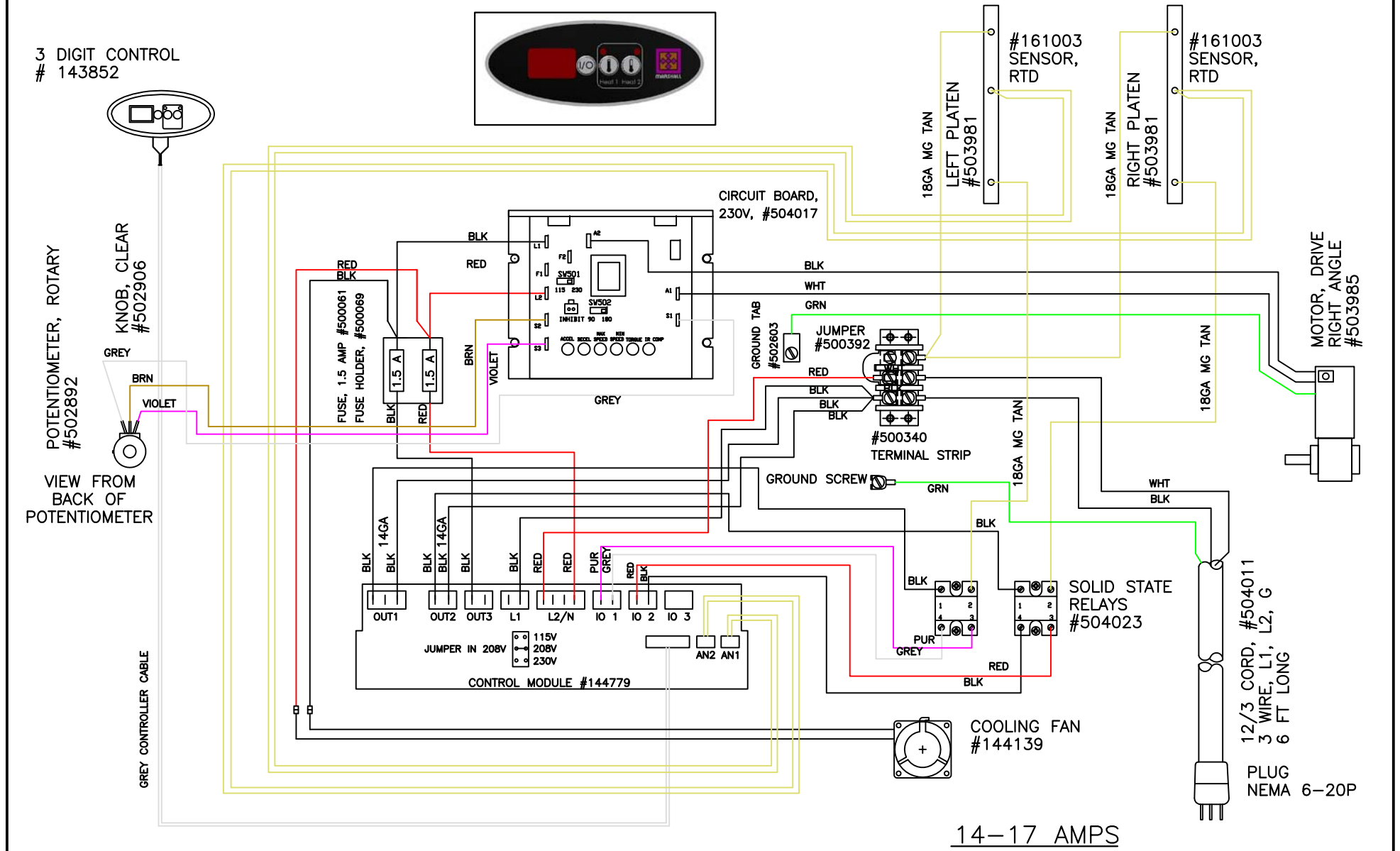
SIZE: A | ROUTE.: ELECT | DWG. NO.: 150881 | REV.: 2

SCALE: NTS IMAGE MAY BE REDUCED NTS | CODE: MM2J

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

152229

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



14-17 AMPS

REV	DESCRIPTION	DATE	REV. BY
1	SWAPED WHITE AND BLACK WIRE FROM A1 AND A2	7/18/2012	S.A.
2	#161003 WAS #503590	1/22/2013	S.A.
3	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: J.L. DATE: 06-OCT-2008

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, 208 OR 240V 1PH VARIABLE SPEED

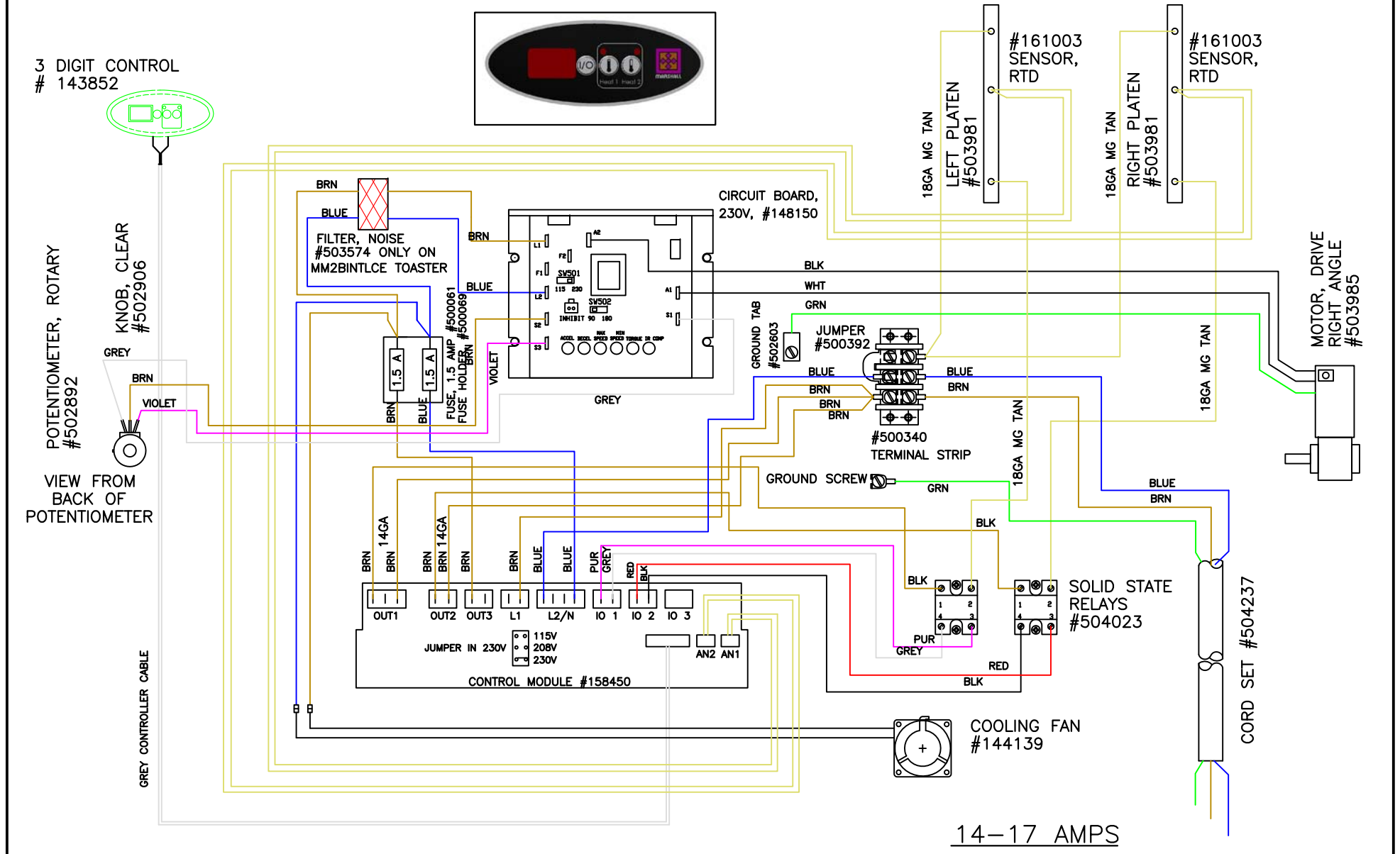
SIZE: A | ROUTE.: ASBY | DWG. NO.: 152229 | REV.: 3

SCALE: NTS | IMAGE MAY BE REDUCED NTS | CODE: MM2B MM2C MM2-EP

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

158451

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



REV	DESCRIPTION	DATE	REV. BY
1	#161003 WAS #503590	1/22/2013	S.A.
2	ADDED CE NOISE FILTER	7/17/2013	PW
3	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: PW DATE: 20–SEP–2011 REV DATE: –

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB PRODUCT CLASS: TST

REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 220–240 1PH VARIABLE SPEED

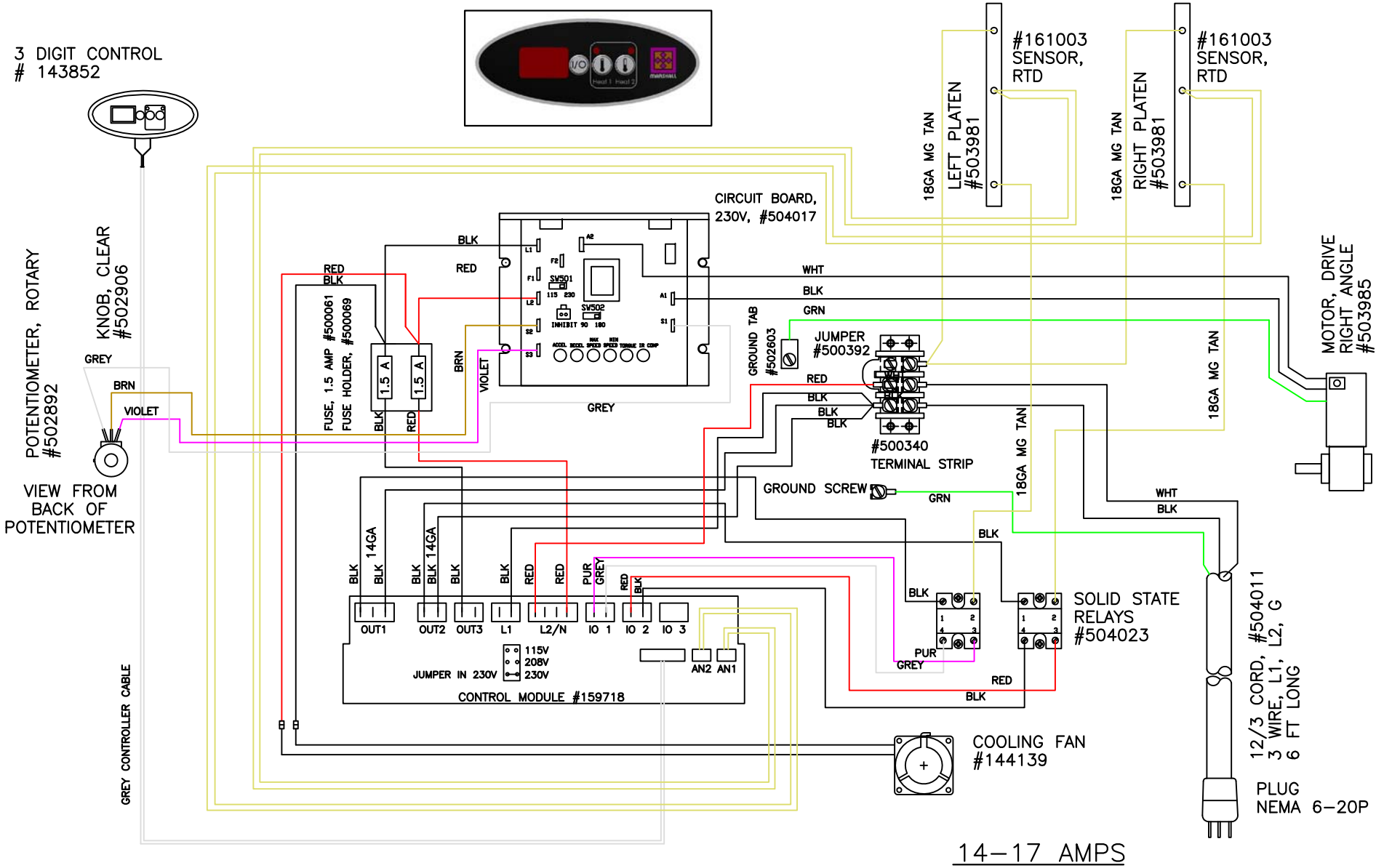
SIZE: A ROUTE.: ELECT DWG. NO.: 158451 REV.: 3

SCALE: NTS IMAGE MAY BE REDUCED NTS CODE: MM2BINTL MM2BINTLC

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

159717

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



14–17 AMPS

REV	DESCRIPTION	DATE	REV. BY
1	#161003 WAS #503590	1/22/2013	S.A.
2	ADDED CONTROL TYPE 1 NOTES	4/4/2014	PW

DRAWN BY: J.L.	DATE: 6/14/2012		
GENERIC NAME: SCHEMATIC			
PRODUCT LINE: FAB	PRODUCT CLASS: TST		
MATERIAL: REFERENCE	SIZE: A	ROUTE.: ASBY	DWG. NO.: 159717 REV.: 2
__.___" X __.___"	SCALE: NTS	IMAGE MAY BE REDUCED NTS	CODE: MM2B–1

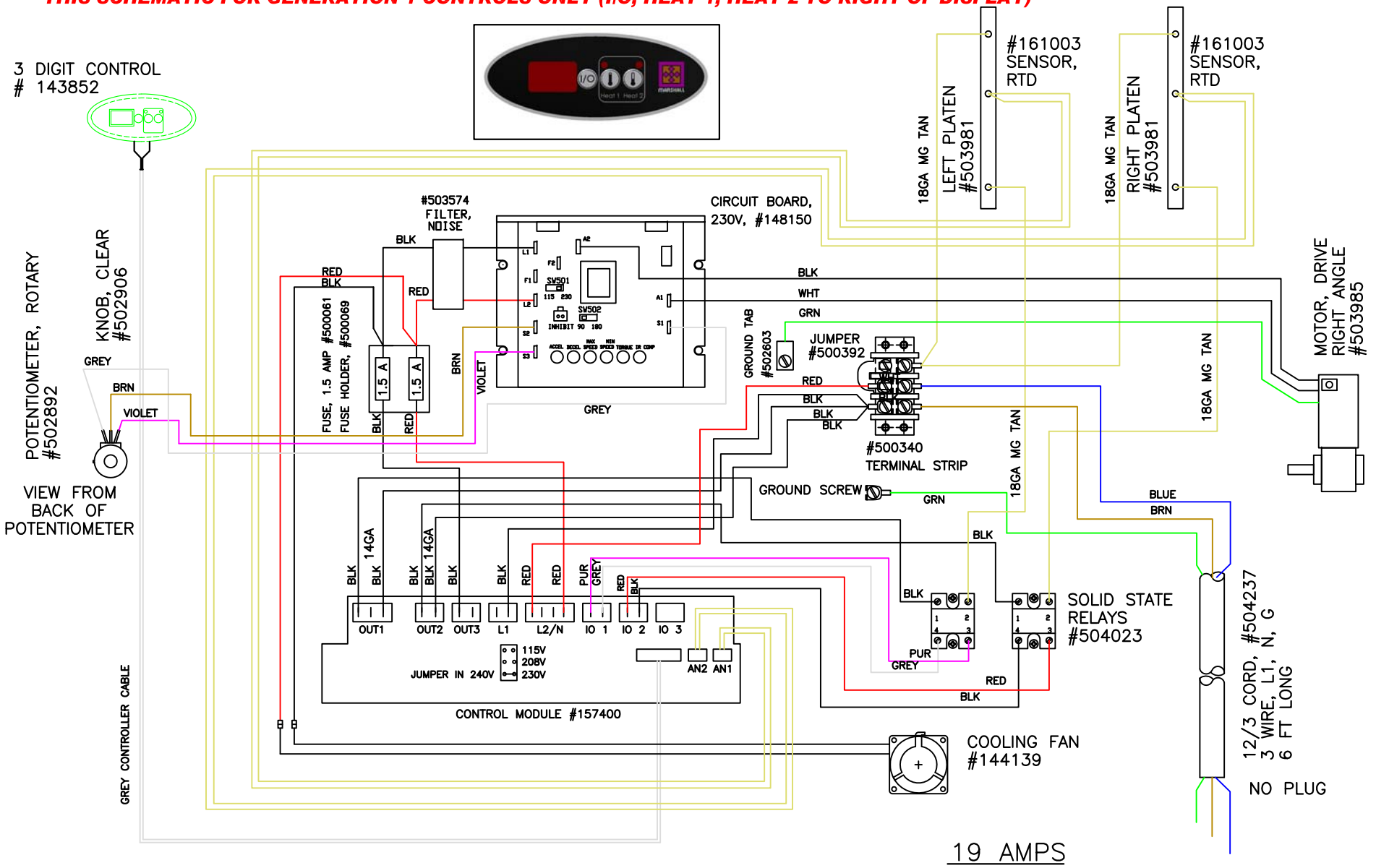
MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, 240V 1PH VARIABLE SPEED

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

157401

THIS SCHEMATIC FOR GENERATION 1 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 TO RIGHT OF DISPLAY)



19 AMPS

REV	DESCRIPTION	DATE	REV. BY
1	#161003 WAS #503590	1/21/2013	S.A.
2	ADDED CONTROL TYPE 1 NOTES	3/21/2014	PW

DRAWN BY: PW	DATE: 07-MAR-2011	REV DATE: -
GENERIC NAME: SCHEMATIC		
PRODUCT LINE: FAB	PRODUCT CLASS: TST	
REFERENCE		
___.___ X ___.___		

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 240V 1PH MM2FINTLCE MM2GINTL GENERATION 1

SIZE:	ROUTE.:	DWG. NO.:	REV.:
A	ELECT	157401	2

SCALE: 1:1 IMAGE MAY BE REDUCED NTS

CODE: MM2FINTLCE MM2GINTL

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

163997

THIS SCHEMATIC FOR GENERATION 2 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 UNDER DISPLAY)

H1 LEFT PLATEN #503981

RTD1 SENSOR #163580 WITH ALPHA SLEEVING #163583

H2 RIGHT PLATEN #503981

RTD2 SENSOR #163580 WITH ALPHA SLEEVING #163584

FB1 FUSEBLOCK #500069 (2) 1.5A FUSES #500061

POT1 POTENTIOMETER 10K #502892 FRONT VIEW SHOWN

SPBD1 CIRCUIT BOARD, 230V #148150

GROUND TAB #502603

TS1 TERMINAL STRIP #500340

JUMPER #500392

GROUND SCREW

MT1 MOTOR, DRIVE RIGHT ANGLE #503985

R1, LEFT PLATEN RELAY #504313

R2, RIGHT PLATEN RELAY #504313

L2 (WHT)

L1 (BLK)

GROUND (GRN)

FB2 FUSEBLOCK #500069 (2) .5A FUSES #501139

CT1 CONTROL #163582(NOT MM2B-ARB) #164653 MM2B-ARB I/O BOARD

GND J1 ANALOG IN

J2 DIGITAL I/O

XFM1 TRANSFORMER, #504314

J6 DISPLAY PORT

CT1 CONTROL #504312 RIBBON CABLE

CT1 CONTROL #163975 USER INTERFACE BOARD

J1

R3 MOTOR RELAY #504313

SSR1 LEFT PLATEN #504023

SSR2 RIGHT HEATER #504023

CORD, 12/3 #504011 6FT LONG NEMA 6-20P PLUG

208-240 VOLTS 14-17 AMPS

GROUND SCREW USE MOUNTING SCREW FROM XFM1

FN1 COOLING FAN #144139

NOTE:
1) SEE DRAWING #163581 FOR WIRE SET

REV	DESCRIPTION	DATE	REV. BY
1	UPDATED FOR NEW COMPONENT LAYOUT	4/16/2014	NG
2	RE-ORIENTED XFM1, CHG RELAYS GRAY WIRE ROUTING	5/16/2014	S.A.
3	ADDED MM2B-ARB CONTROL	7/22/2014	PW

DRAWN BY: PW DATE: 4/4/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 208 OR 240 1PH VARIABLE SPEED GENERATION 2

SIZE: A | ROUTE.: ELECT | DWG. NO.: 163997 | REV.: 3

SCALE: NTS IMAGE MAY BE REDUCED NTS

CODE: MM2B-NC MM2B-ARB

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

164834

THIS SCHEMATIC FOR GENERATION 2 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 UNDER DISPLAY)

H1
LEFT PLATEN
#503981

H2
RIGHT PLATEN
#503981

RTD1 SENSOR
#163580
WITH ALPHA SLEEVING
#163583

RTD2 SENSOR
#163580
WITH ALPHA SLEEVING
#163584

NOISE FILTER
"CE" UNITS ONLY
#503574

FB1
FUSEBLOCK
#500069
(2) 1.5A
FUSES
#500061

POT1
POTENTIOMETER 10K
#502892
FRONT VIEW SHOWN

SPBD1
CIRCUIT BOARD, 230V
#148150

GROUND TAB
#502603

TS1
TERMINAL STRIP
#500340

JUMPER
#500392

GROUND
SCREW

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

R1, LEFT PLATEN
RELAY #504313

R2, RIGHT PLATEN
RELAY #504313

L2 (WHT)

L1 (BLK)

GROUND (GRN)

FB2
FUSEBLOCK #500069
(2) .5A FUSES #501139

CT1
CONTROL #164833 MM2BINTLCE-NC
I/O BOARD

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

XFM1
TRANSFORMER, #504314

GROUND SCREW
USE MOUNTING SCREW FROM XFM1

R3
MOTOR RELAY
#504313

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

CORD, 12/3
#504237
3WIRE ONLY
NO PLUG
PROVIDED

208-240 VOLTS
14-17 AMPS

FN1
COOLING FAN
#144139

NOTE:
1) SEE DRAWING #163581 FOR WIRE SET

REV	DESCRIPTION	DATE	REV. BY
–	–	–	–

DRAWN BY: PW
DATE: 9/3/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

SIZE: A

ROUTE.: ELECT

DWG. NO.: 164834

REV.: 0

SCALE: NTS

IMAGE MAY BE REDUCED NTS

CODE: MM2BINTL/CE-NC

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 220-240 1PH VARIABLE SPEED GENERATION 2

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

166307

THIS SCHEMATIC FOR GENERATION 2 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 UNDER DISPLAY)

H1
LEFT PLATEN
#503981

H2
RIGHT PLATEN
#503981

RTD1 SENSOR
#163580
WITH ALPHA SLEEVING
#163583

RTD2 SENSOR
#163580
WITH ALPHA SLEEVING
#163584

WHT

BLK

GRN

GROUND TAB
#502603

FB1
FUSEBLOCK
#500069
(2) 1.5A
FUSES
#500061

POT1
POTENTIOMETER 10K
#502892
FRONT VIEW SHOWN

SPBD1
CIRCUIT BOARD, 230V
#148150

TS1
TERMINAL STRIP
#500340

JUMPER
#500392

GROUND
SCREW

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

R1, LEFT PLATEN
RELAY #504313

R2, RIGHT PLATEN
RELAY #504313

N (BLUE)

L1 (BRN)

GROUND (GRN)

FB2
FUSEBLOCK #500069
(2) .5A FUSES #501139

GND J1 ANALOG IN

CT1
CONTROL #164073 MM2GINTL-NC
I/O BOARD

J2 DIGITAL I/O

XFM1
TRANSFORMER, #504314

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

J1

R3
MOTOR RELAY
#504313

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

CORD, 12/3
#504237
BRN, BLUE,
GREEN
NO PLUG

208-240 VOLTS
14-17 AMPS

GROUND SCREW
USE MOUNTING SCREW FROM XFM1

NOTE:
1) SEE DRAWING #164837 164835 FOR WIRE SET

FN1
COOLING FAN
#144139

REV	DESCRIPTION	DATE	REV. BY
–	–	–	–

DRAWN BY: PW
DATE: 12/16/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 208 -240 1PH VARIABLE SPEED GENERATION 2

SIZE: A

ROUTE.: ELECT

DWG. NO.: 166307

REV.: 0

SCALE: NTS

IMAGE MAY BE REDUCED NTS

CODE: MM2GINTL

THIS SCHEMATIC IS FOR USE BY A QUALIFIED TECHNICIAN OR ELECTRICIAN ONLY.

166832

THIS SCHEMATIC FOR GENERATION 2 CONTROLS ONLY (I/O, HEAT 1, HEAT 2 UNDER DISPLAY)

H1
LEFT PLATEN
#503981

H2
RIGHT PLATEN
#503981

RTD1 SENSOR
#163580
WITH ALPHA SLEEVING
#163583

RTD2 SENSOR
#163580
WITH ALPHA SLEEVING
#163584

A
B

WHT
BLK
GRN

GROUND TAB
#502603

FB1
FUSEBLOCK
#500069
(2) 1.5A
FUSES
#500061

POT1
POTENTIOMETER 10K
#502892
FRONT VIEW SHOWN

SPBD1
CIRCUIT BOARD, 230V
#148150

TS1
TERMINAL STRIP
#500340

JUMPER
#500392

GROUND
SCREW

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

R1, LEFT PLATEN
RELAY #504313

R2, RIGHT PLATEN
RELAY #504313

N (BLUE)

L1 (BRN)

GROUND (GRN)

FB2
FUSEBLOCK #500069
(2) .5A FUSES #501139

GND J1 ANALOG IN

CT1
CONTROL #166832 MM2GI-NC
I/O BOARD

J2 DIGITAL I/O

XFM1
TRANSFORMER, #504314

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

J1

R3
MOTOR RELAY
#504313

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

CORD, 12/3
#504011
NEMA 6-20
PLUG

208-240 VOLTS
14-17 AMPS

GROUND SCREW
USE MOUNTING SCREW FROM XFM1

NOTE:
1) SEE DRAWING #164837 164835 FOR WIRE SET

FN1
COOLING FAN
#144139

REV	DESCRIPTION	DATE	REV. BY
–	–	–	–

DRAWN BY: PW
DATE: 3/19/2015

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, HT18 208 -240 1PH VARIABLE SPEED GENERATION 2

SIZE: A

ROUTE.: ELECT

DWG. NO.: 166832

REV.: 0

SCALE: NTS

IMAGE MAY BE REDUCED NTS

CODE: MM2G-NC