OWNER'S MANUAL

MODEL VT18 AUTOTOAST™ VERTICAL TOASTER

Model VT18

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 VT18 Vertical Toaster produces caramelized buns hot and fast for building sandwiches to customer orders. This model has a slim vertical 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. 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. The optional Bun Loader allows the user to load up to 6 buns for toasting.

GENERAL SPECIFICATIONS

Model:	VT18 Vertical Contact Toaster
Height:	22.000", 29.500" with Optional Loader
Width:	26.125"
Depth:	13.375, 16.000" with Optional Butter Wheel
Options:	Bun Loader Butter Wheel
Electrical:	208 VAC, 60Hz, 16 Amps 240 VAC, 50/60 HZ, 19 Amps
Power Cord:	8.0 ft 3 wire ground type UL rated Plug furnished by others on International units)
Weight:	103 lbs.
Approvals:	ETL/CETL, CSA, CE and NSF

148665 RV012615

OWNER'S MANUAL

MODEL VT18 AUTOTOAST™ VERTICAL 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.

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OWNER'S MANUAL

MODEL VT18 - VERTICAL CONTACT TOASTER

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OWNER'S MANUAL

MODEL VT18 - VERTICAL CONTACT TOASTER

PRE-INSTALLATION

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

2. Unpack toaster and remove all protective paper or plastic from metal parts.
   FILE ANY CONCEALED DAMAGE CLAIMS WITH THE FREIGHT CARRIER.

3. **INSPECTION, TESTING AND REPAIR OF ELECTRICAL EQUIPMENT SHOULD BE PERFORMED BY QUALIFIED SERVICE PERSONNEL. THE TOASTER SHOULD BE UNPLUGGED WHEN SERVICING, EXCEPT WHEN ELECTRICAL TEST ARE REQUIRED.**

4. **It is necessary to check your voltage at the receptacle.** The toaster is factory-shipped set at 208V for domestic and 240V for international service. If voltage at receptacle does not match rating label, it is necessary to simply change a jumper inside the toaster.
   CAUTION: DO NOT REMOVE THE ELECTRICAL CONTROL PANEL COVER ON THE RIGHT SIDE OF TOASTER WITHOUT FIRST TURNING OFF THE TOASTER AND UNPLUGGING THE CORD. Contact the factory for instructions.

INSTALLATION

1. Place toaster on a level surface.

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

3. Check that the toaster platen sheet is installed over 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.**

4. Check conveyor carriage making sure it is completely seated in saddles and on top pins.

5. Connect the toaster to the power supply.

6. Press and release the "I/O" button on the control. "Lo" will be displayed. Check for free movement of the conveyor belt.

7. Toaster is ready to use in approximately 15 minutes. Control will display "rdy".

8. After warm up, insert buns into the top of the toaster. 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 THE TOASTER PLATEN SHEET.**

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

10. Adjust the gap between the conveyor and the toaster heat platens using the two knobs on top of the toaster (see Figure 1 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.

11. The Adjustment Range is .625" – 1.438".

12. The conveyor speed is preset at the factory for 65 seconds. MM2F models set at 45 seconds. (Please note that the adjustable speed range is 9 to 105 seconds.)

13. 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 10 is set correctly.

14. If necessary, the speed of the conveyor can be changed. The speed control is located behind a cover on the side of the toaster (see Figure 1 for location). Adjust as needed and reinstall cover.

DAILY OPERATION AND CLEANING GUIDE

1. Press and release the "I/O" Button of the control to turn toaster on. "Lo" will be displayed. **CAUTION: DO NOT OPERATE TOASTER WITHOUT ALL PANELS AND COVERS INSTALLED.**

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 the "I/O" Button "Hi" will be displayed which means toaster 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. To see temperature settings, press and release either the Heat 1(Left Platen) or the Heat 2 (Right Platen) Button, the pre-programmed temperature settings will flash. This will display for 5 seconds or until another button is pressed.

   B. To see the actual temperature of heaters, press and hold either the Heat 1(Left Platen) or the Heat 2 (Right Platen) 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"	Toaster is off and not operating.
"Lo"	Heater platens have not reached programmed set temperature.
"Rdy"	Toaster has reached programmed set temperature and is ready to toast.
"Hi"	Toaster is off and too hot to touch all removable parts.
"AL1"	This is an alarm message that indicates the Left Platen Probe is disconnected or defective. Toaster automatically shuts off.
"AL2"	This is an alarm message that indicates the Right Platen Probe is disconnected or defective. Toaster automatically shuts off.
"AL3"	This is an alarm message that indicates the Left Platen is too hot. Toaster automatically shuts off.
"AL4"	This is an alarm message that indicates the Right Platen is too hot. Toaster automatically shuts off.

DAILY CLEANING

1. Turn toaster off and cool for 30 minutes.
2. Remove conveyor carriage from toaster frame.
3. Take conveyor carriage to sink and spray with water.
4. Clean platen sheet three (3) times daily as listed below.

   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.

   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.

   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 against platen (facing top of toaster).
5. Inspect platens for butter that has baked-on surface. Scrape off any buildup.
6. Wipe cooling fan louvers on side with a dry cloth or towel.
7. Reinstall all parts after drying.

WEEKLY MAINTENANCE

1. Review and perform Daily and Weekly Maintenance Procedures.
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. Review and perform Daily and Weekly Maintenance Procedures.

QUARTERLY MAINTENANCE

1. Adjust Belt Tension by Loosing Tension Brackets and pushing toward end of Carriage as you retighten screws. If tensioning brackets are at the end of adjustment, it is necessary to remove a link. Tension bracket is shown on Figure 5, see Note for instructions.
2. Check set screws on gears and conveyor sprockets for tightness. Snug these if loose. **DO NOT OVERTIGHTEN.**
3. Review and perform Daily, Weekly & Monthly Maintenance Procedures.

ANNUAL MAINTENANCE

1. Replace motor brushes (Kit #148549 consists of 2).

2. Perform Quarterly Maintenance.

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:

   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) 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 temperature error of the right platens. All alarms will turn toaster off requiring a service call.

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 POWER OFF 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 correct. At room temperature (70˚F), should be nominal 1.09K ohms.
D) *With toaster off*, check for continuity across the solid state relay terminals #1 and #2. Normal readings are in megohm 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 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 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), 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:

A) Make sure carriage is seated in saddles and top slots are around locator pins.
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.
E) Increase belt tensioning by loosening tension bracket screws, push toward end as you retighten screws. If bracket is at the end of adjustment, it is necessary to remove one conveyor link. See Figure 5.
F) Conveyor carriage has been dropped, bent. Replace carriage.

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.
C) Check for voltage to speed control board. Check for voltage to the motor.
D) Check for red light on the speed board. If red light is lit, the motor is working too hard or in a stalled state.
E) Some speed boards have a green light. If green light is lit then power is going to the board.
F) Make sure each voltage slide switch of the speed board is set at 230V and 90V as labeled on the speed board.
G) Check for DC voltage out of board to motor.
H) Check all wiring to motor for loose connectors.

4. PROBLEM: Variable Speed Motor Not Operating

SOLUTION:

QUALIFIED SERVICE TECHNICIAN CHECK:

A) Verify correct voltage to toaster 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) If red light on board is on, disconnect load from motor by removing conveyor carriage. If it goes out, look for conveyor or motor binding. If it stays lit, replace motor – there is probably a gearbox problem.
E) Check DC amp draw 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.
F) 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.
G) Check for oil leaks on motor signifying bad seal or overheating that has taken place. In either case, motor should be replaced.
H) Check ohm reading at motor cord plug (Range between 50-80 Ohms).

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 one slide switch on board is in 230V position and other is in 90V 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:

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 approximately 65 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 belt is 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 platen set temperatures by depressing each button briefly and then check actual temperatures by holding each button in for 3 seconds.
C) 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:

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 so that the end of the sheet that is at the bottom is at the top when re-installed.
B) Check toaster platen sheet installation.
C) Toaster gap set too close or too far. See instructions on Page 1, Number 10.

8. PROBLEM: Buns do not exit toaster.

SOLUTION:

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.

9. PROBLEM: Gap setting knobs jammed.

SOLUTION:

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:

A) Make sure carriage is seated in saddles and top slots are around locating pins.
B) Check for bent parts on the carriage.
C) Bearings worn and need replacing.

11. PROBLEM: Motor noisy/chirping.

SOLUTION:

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

REPLACEMENT PARTS (See page 9 and 10 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 9 and page 10 for information.

PART #	DESCRIPTION	FIGURE
144074	Arm, Front Tensioning	4
149404	Bar, Chain Support, Kit of 2	5
149278	Bearing, Shaft Rear, Front, Kit of 4	5
148105	Bracket, Motor Mounting	6
148549	Brush Replacement Kit, Motor Set of 2	Not Shown
150426	Butter Wheel (Optional)	3
150429	Butter Wheel Base (Optional)	3
150425	Butter Wheel Kit (Optional)	3
148120	Carriage, Conveyor Asby	3
504102	Conveyor, Toaster	5
148133	Cover, Front	3
150430	Cover, Front For Butter Wheel (Optional)	3
148119	Cover LH Side	3
148118	Cover RH Side (MM2D, MM2DINTLCE & MM2FINTLCE)	3
160837	Cover RH Side (MM2F Only)	3
149279	Gear, Toaster, Drive Kit of 2	5,6
148303	Guard, Heat	3
504016	Idler, 1.405 Dia. (2 Per)	5
161895	Kit, Toaster Foot for HT18 VT18 Toasters	Not Shown
504009	Knob, Adjustment	3
502906	Knob, Clear	Schematic
148142	Loader, (OPTIONAL) (MM2D Models)	3
131479	Loader, (MM2F Models)	3
144027	Plate, Cover	3
144402	Plate, Idler Tensioning (2 Per)	5
161452	Ramp, Heated Bun (MM2F Only)	3
144077	Rod, Toaster Platen Sheet 18.250" (1 Per)	4
504018	Screw, #10-32 x 1.500" SS	5
148317	Shaft, Conveyor Drive	5
148318	Shaft, Idler	5
149280	Sheet, Toaster Platen Package of 4	4
148127	Slide, Product (MM2D, MM2DINTLCE & MM2FINTLCE)	3
151097	Spacer, Conveyor Kit (3 Spacers)	5
504046	Spring, Tension (2 Per)	5
144078	Sprocket, Conveyor Asby (2 Per)	5

CONTROL GENERATION 1 ELECTRICAL REPLACEMENT PARTS

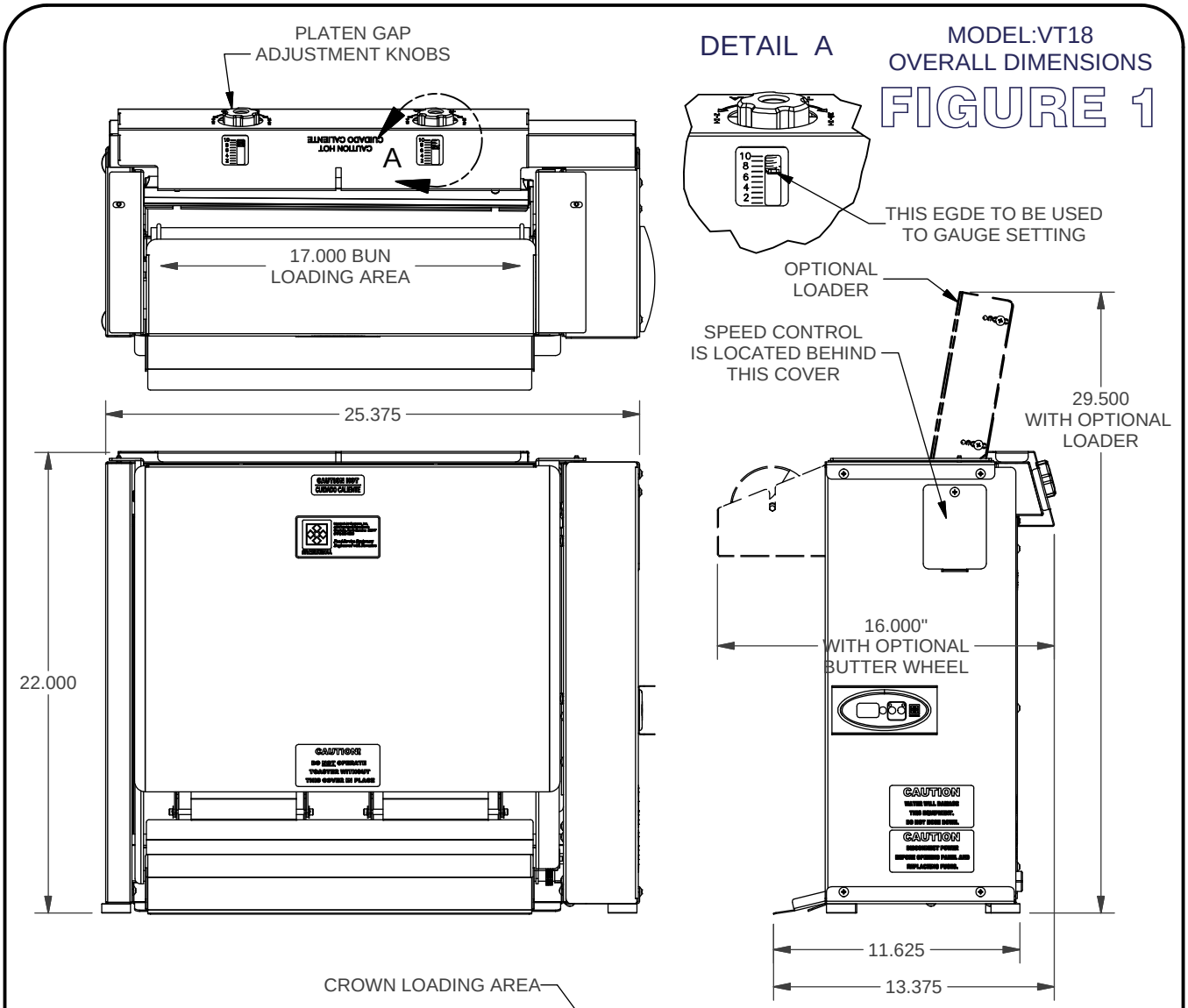
(NOTE BUTTON LAYOUT TO RIGHT OF DISPLAY)

PART #	DESCRIPTION	FIGURE
148150	Circuit Board 230V	Schematic
143852	Control, 3 Digit (Control Type 1 Only)	Schematic
148301	Control, Module (MM2D Only) (208V Units)	Schematic
157400	Control, Module (MM2FINTLCE only) SCHEMATIC	Schematic
150214	Control, Module (MM2D Intl, MM2FINTLCE)	Schematic
151246	Control, Module (MM2F)	Schematic
504011	Cord, 12/3 w/6-20 Plug (MM2D Only)	Schematic
504237	Cord, 12/3 3 Wire (MM2FINTLCE, MM2GINTLCE)	Schematic
504145	Cord, Set (MM2DINTL)	Schematic
144139	Fan, Cooling 240 Vac	Schematic
500069	Fuse Holder	Schematic
500061	Fuse, 1.5 AMP	Schematic
500392	Jumper	Schematic
503985	Motor, Right Angle Drive	6,Schematic
503981	Platen, 9" X 12" (2 Per)	6,Schematic
502892	Potentiometer, Rotary	Schematic
504313	Relay, Control	Schematic
504023	Relay, Solid State	Schematic
161003	Sensor, RTD (Note: 2 req'd per toaster)	Schematic
502080	Strain Relief for Cord	Not Shown
500340	Terminal Strip	Schematic
148595	Wiring Harness Platens	Not Shown

CONTROL GENERATION 2 ELECTRICAL REPLACEMENT PARTS

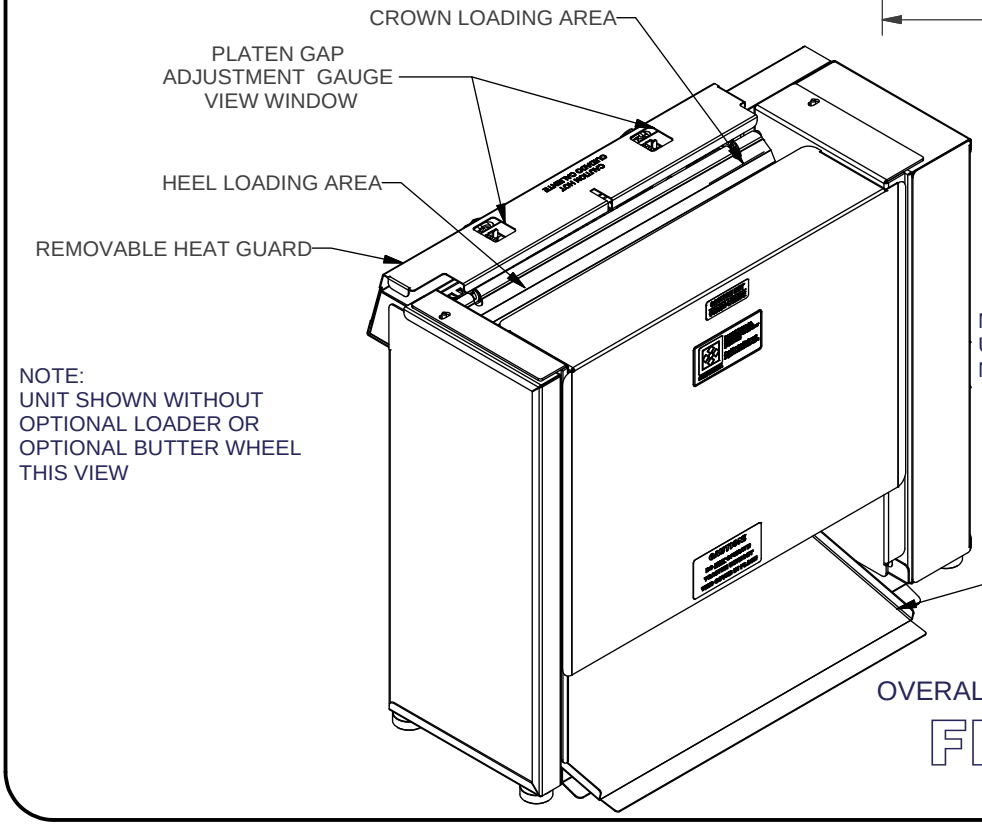
(NOTE BUTTON LAYOUT UNDER DISPLAY)

PART #	DESCRIPTION	FIGURE
148150	Circuit Board 230V	Schematic
163975	Control Interface Board (LED Control)	Schematic
163582	Control I/O Board (MM2F-NC, MM2D-NC)	Schematic
164073	Control I/O Board (MM2FINTLCE-NC)	Schematic
166249	Control I/O Board (MM2DINTL-NC, MM2DINTLCE-NC)	Schematic
504011	Cord, 12/3 w/6-20 Plug (MM2D-NC Only)	Schematic
504237	Cord, 12/3 3 Wire (MM2FINTLCE-NC, MM2GINTLCE-NC)	Schematic
504145	Cord, Set (MM2DINTL-NC)	Schematic
144139	Fan, Cooling 240 Vac	Schematic
500069	Fuse Holder	Schematic
501139	Fuse, .5 AMP	Schematic
500061	Fuse, 1.5 AMP	Schematic
500392	Jumper	Schematic
503985	Motor, Right Angle Drive	6,Schematic
503981	Platen, 9" X 12" (2 Per)	6,Schematic
502892	Potentiometer, Rotary	Schematic
504023	Relay, Solid State	Schematic
163580	Sensor, RTD	Schematic
502080	Strain Relief for Cord	Not Shown
500340	Terminal Strip	Schematic
504314	Transformer	Schematic
148595	Wiring Harness Platens	Not Shown



MODEL:VT18
OVERALL DIMENSIONS

FIGURE 1

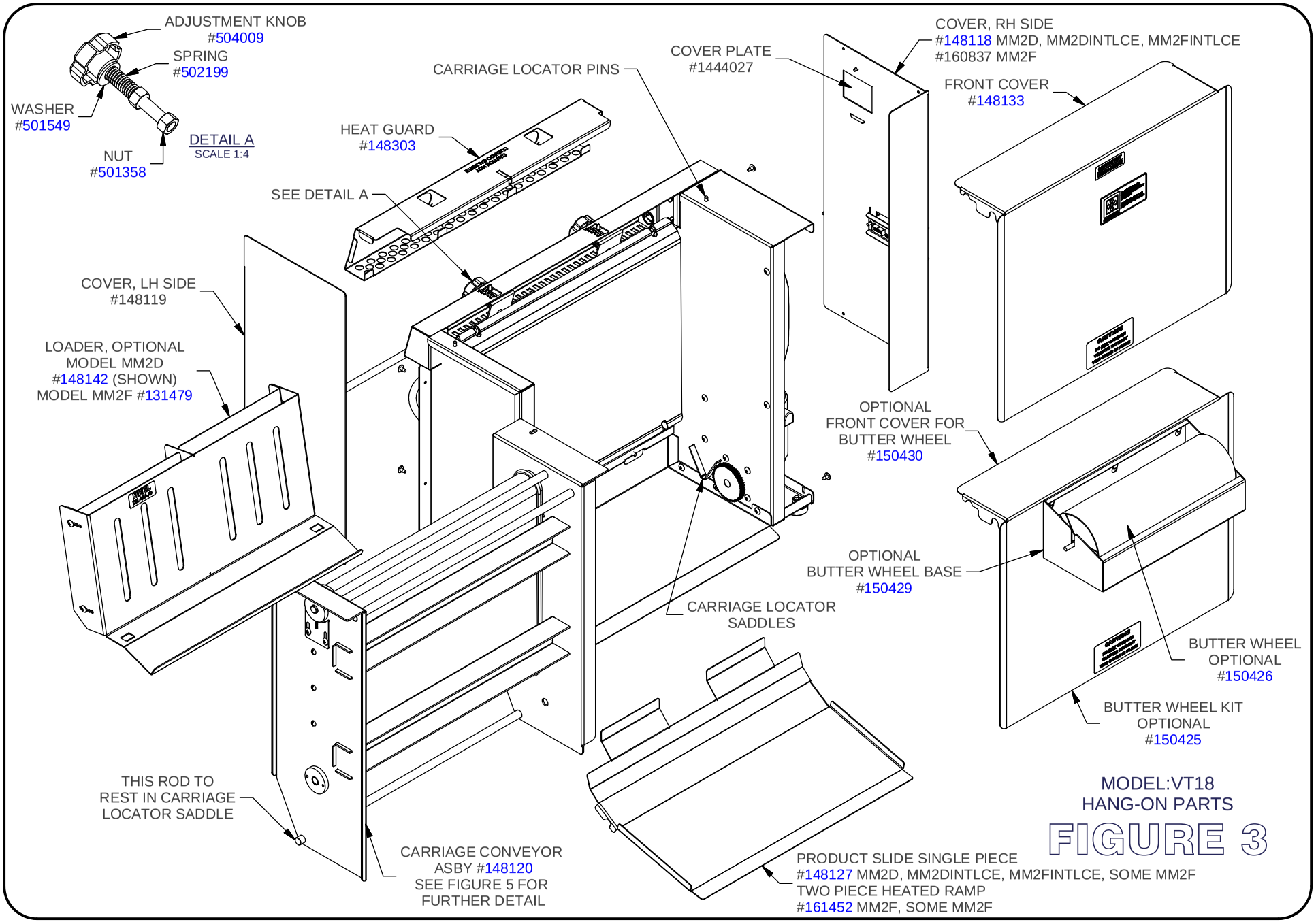


NOTE:
UNIT SHOWN WITHOUT
OPTIONAL LOADER OR
OPTIONAL BUTTER WHEEL
THIS VIEW

NOTE:
UNITS POWER CORD HAS A
NEMA 6-20 PLUG.

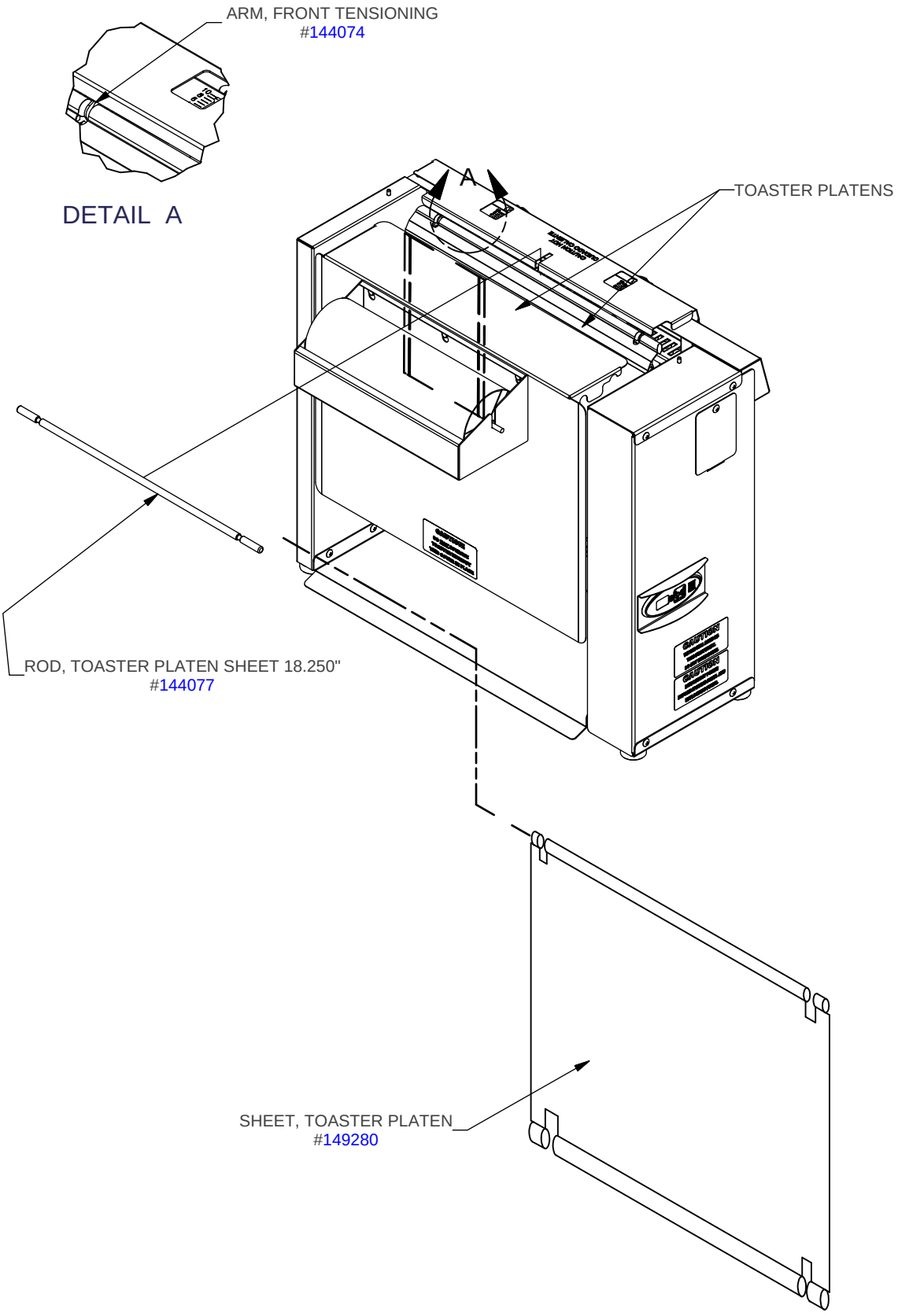
MODEL:VT18
OVERALL UNIT ISOMETRIC VIEW

FIGURE 2



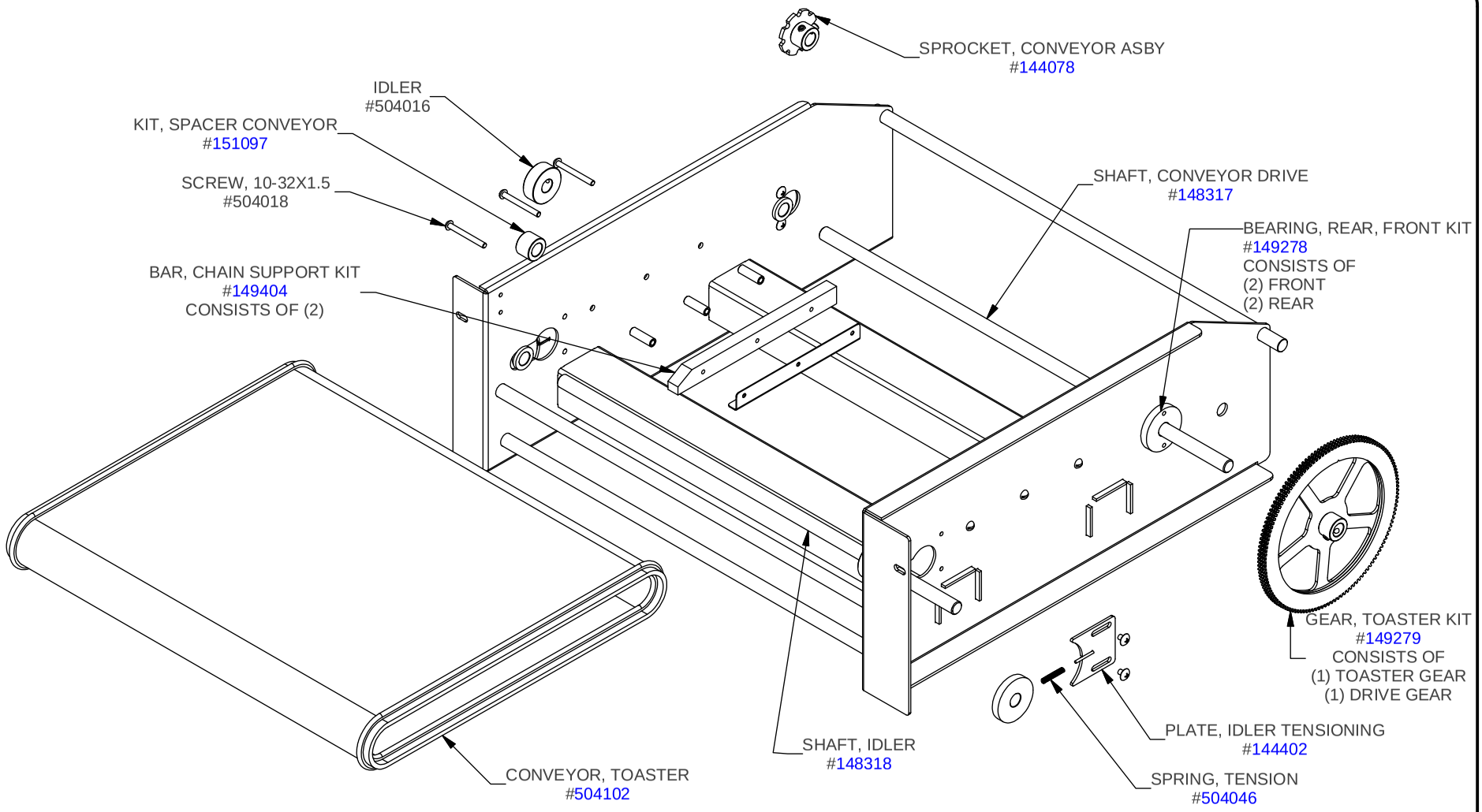
MODEL:VT18
HANG-ON PARTS

FIGURE 3



MODEL:VT18
TOASTER PLATEN SHEET

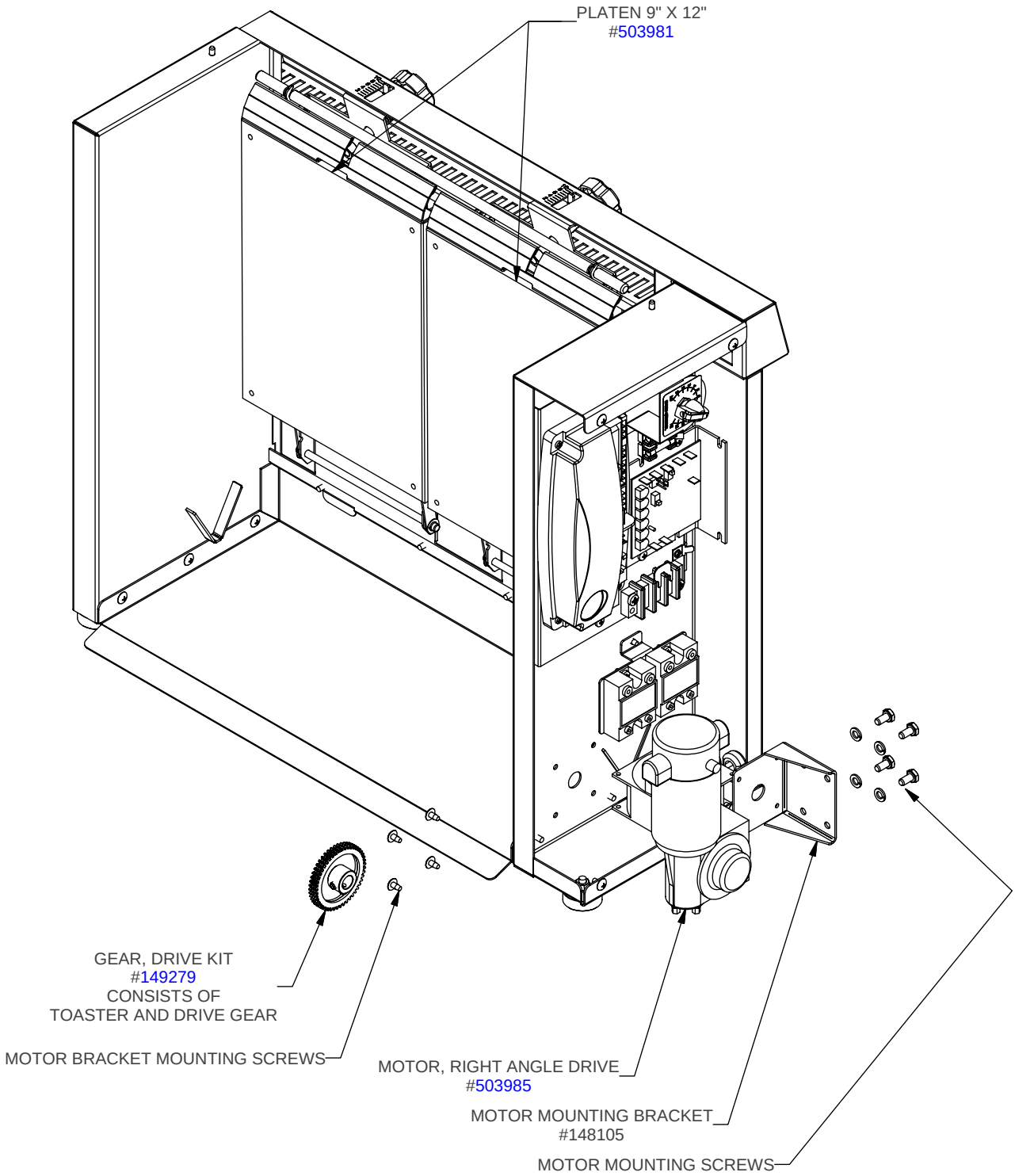
FIGURE 4



NOTE: TO RETENSION CONVEYOR
1. LOOSEN SCREWS
2. PUSH PLATE TOWARD FRONT OF CARRIAGE
3. RETIGHTEN SCREWS

MODEL:VT18
CARRIAGE ASSEMBLY

FIGURE 5



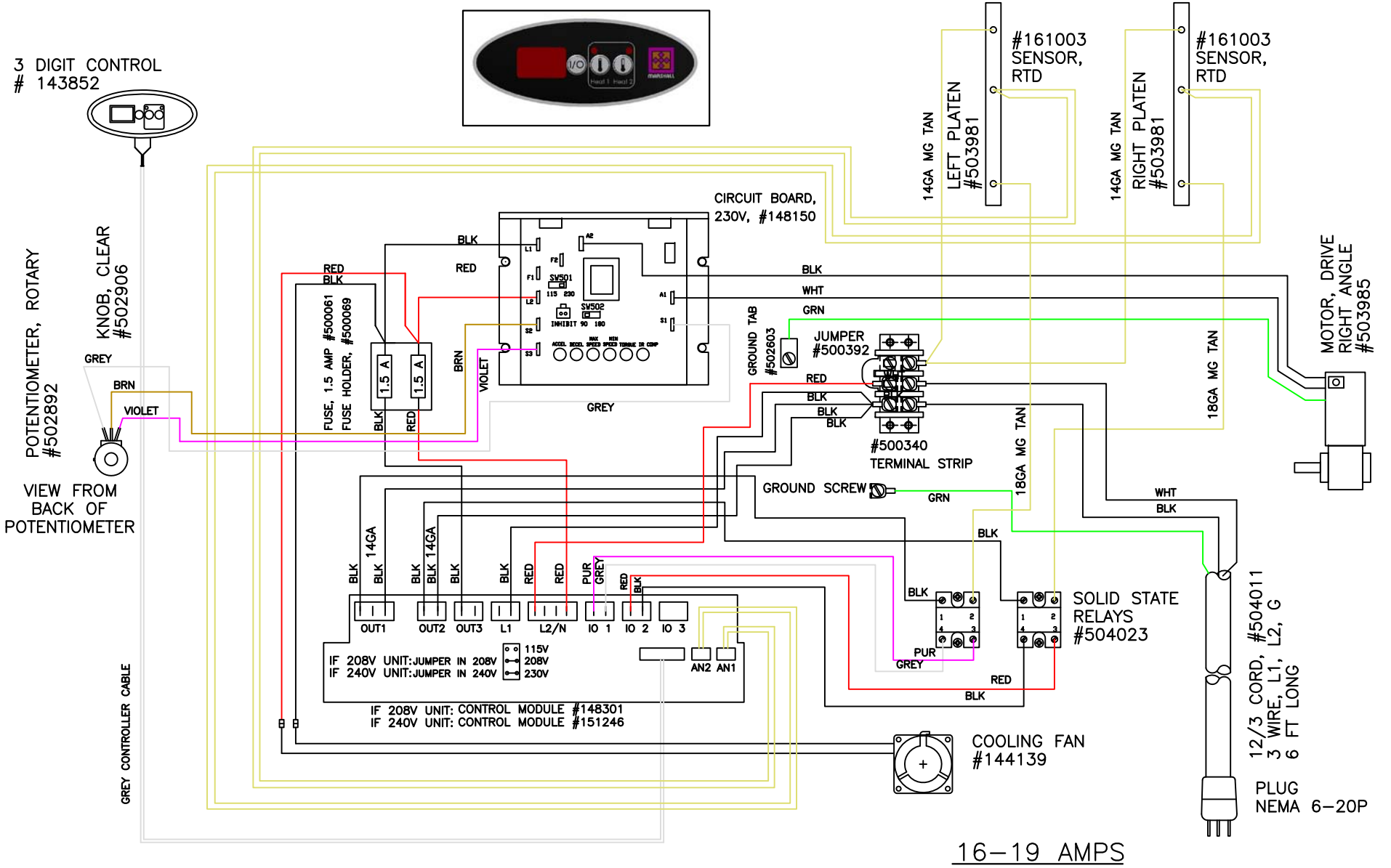
MODEL:VT18
DRIVE MOTOR ASSEMBLY

FIGURE 6

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

148302

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
1	CHG SPEED BOARD SWITCH TO 90	17-JUL-2006	PW
2	CHG SPEED BOARD WIRING	25-SEP-2006	PW
3	ADDED 240V CONTROL	14-FEB-2008	PW
4	#161003 WAS #503590	1/21/2013	S.A.
5	ADDED CONTROL TYPE 1 NOTES	3/21/2014	PW

DRAWN BY: J.L. DATE: 03–FEB–2006 REV DATE: –

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB PRODUCT CLASS: TST

REFERENCE

__.___ X __.___

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 208 OR 240 1PH
VARIABLE SPEED GENERATION 1

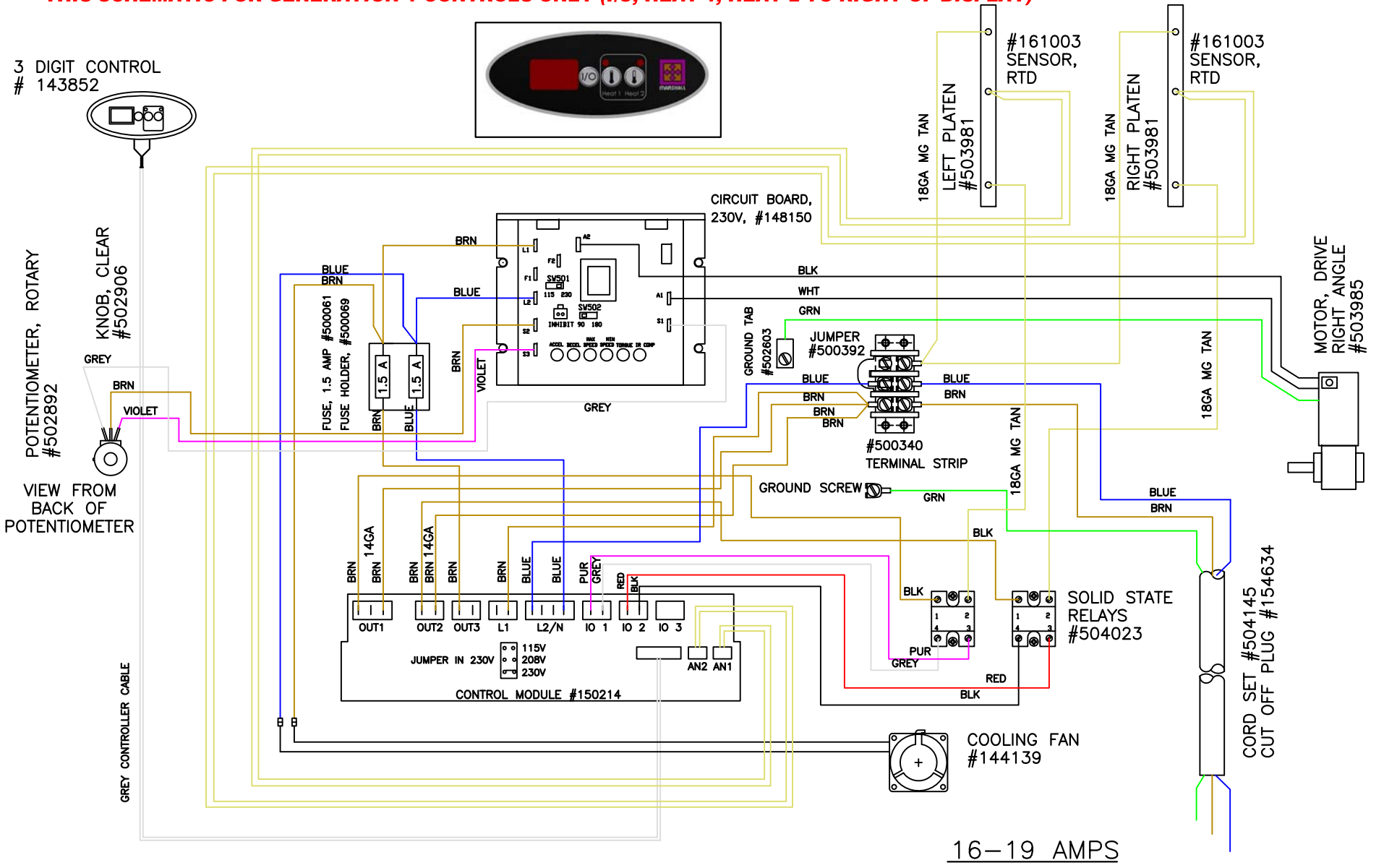
SIZE: A ROUTE.: ELECT DWG. NO.: 148302 REV.: 5

SCALE: 1:1 IMAGE MAY BE REDUCED NTS CODE: MM2D MM2F

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

150218

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
1	CORRECTED CONTROL MODULE P/N	31-JAN-2008	C.P.
2	UPDATED CORD	29-JUL-2009	PW
3	#504145 WAS #150217 (503350)	11-DEC-2009	WW
4	#161003 WAS #503590	1/21/2013	S.A.
5	ADDED CONTROL TYPE 1 NOTES	3/21/2014	PW

DRAWN BY: J.L. DATE: 11–JUN–2007 REV DATE: –

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB PRODUCT CLASS: TST

REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 220–240 1PH
VARIABLE SPEED GENERATION 1

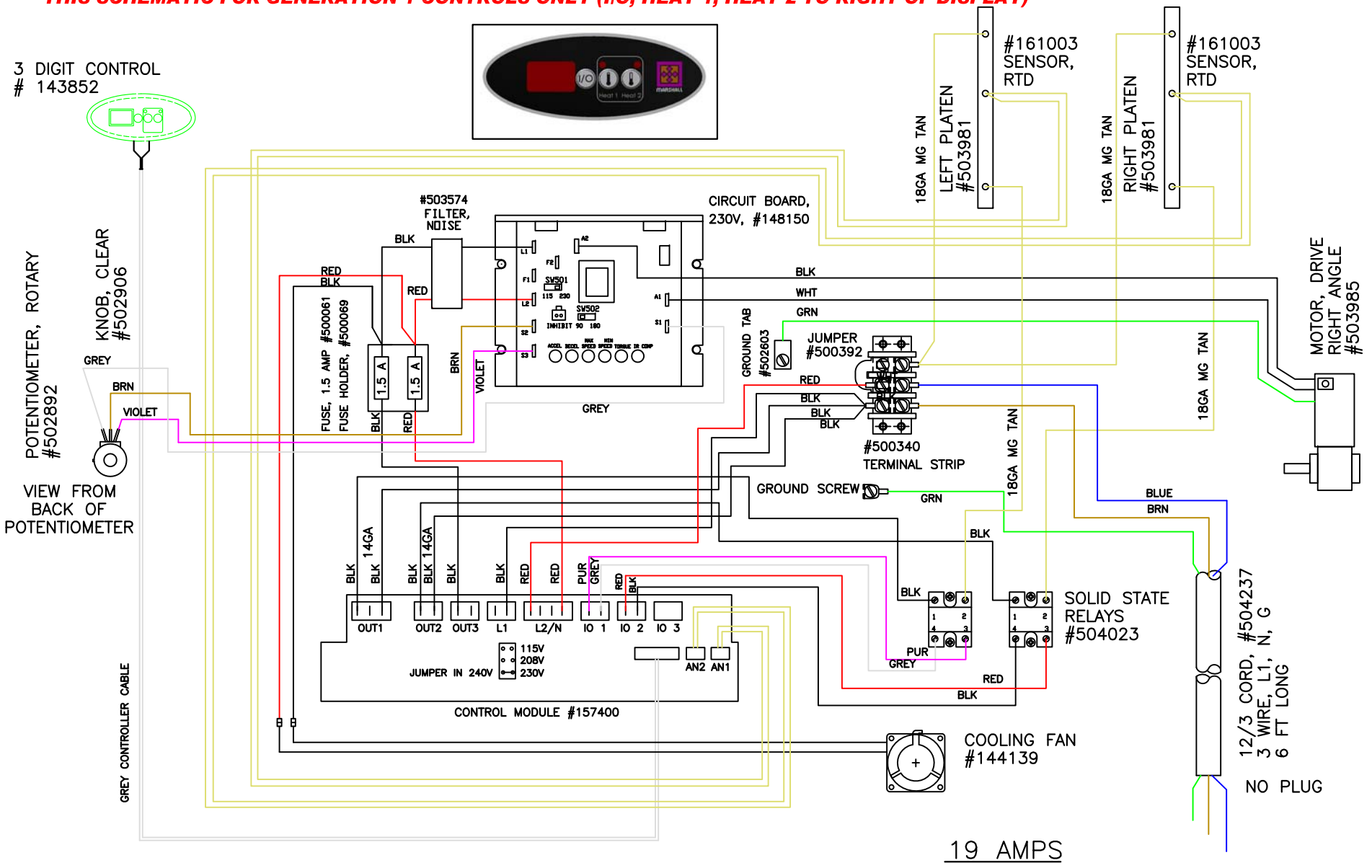
SIZE: A ROUTE.: ELECT DWG. NO.: 150218 REV.: 5

SCALE: NTS IMAGE MAY BE REDUCED NTS CODE: MM2DINTL

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)



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.

163579

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

BLK
WHT
GRN

GROUND TAB
#502603

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

POT1
POTENTIOMETER 10K
#502892
FRONT VIEW SHOWN

SPBD1
CIRCUIT BOARD, 230V
#148150

R1
LEFT PLATEN
RELAY
#504313

R2
RIGHT PLATEN
RELAY
#504313

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

TS1
TERMINAL STRIP #500340

JUMPER
#500392

L2 (WHT)

L1 (BLK)

GROUND
SCREW

GROUND (GRN)

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

GND J1 ANALOG IN

CT1
CONTROL #163582
I/O BOARD

J2 DIGITAL I/O

R3
MOTOR RELAY
#504313

XFM1
TRANSFORMER, #504314

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

J1

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

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

208-240 VOLTS
16-19 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	4/8/2014	S.A.
2	RE-ORIENTED XFM1 & CHG RELAYS GRAY WIRE ROUTING	5/16/2014	S.A.
3	CT1 CONTROL WAS #164073	1/26/2015	S.A.

DRAWN BY: S.A. DATE: 3/10/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 208 OR 240 1PH VARIABLE SPEED GENERATION 2

SIZE: A | ROUTE.: ELECT | DWG. NO.: 163579 | REV.: 3

SCALE: NTS IMAGE MAY BE REDUCED NTS

CODE: MM2D-NC, MM2F-NC

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

164071

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

NF1
#503574
NOISE FILTER
1 LINE 2
3 LOAD 4

BLK
WHT
GRN

GROUND TAB
#502603

SPBD1
CIRCUIT BOARD, 230V
#148150

R1
LEFT PLATEN
RELAY
#504313

R2
RIGHT PLATEN
RELAY
#504313

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

TS1
TERMINAL STRIP #500340

JUMPER
#500392

L2 (BLU)

L1 (BRN)

GROUND (GRN)

GROUND
SCREW

CORD, 12/3
#504237
6FT LONG
NO PLUG

220–240 VOLTS
14–17 AMPS

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

GND J1 ANALOG IN

CT1
CONTROL #164073
I/O BOARD

J2 DIGITAL I/O

R3
MOTOR RELAY
#504313

XFM1
TRANSFORMER, #504314

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

J1

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

GROUND SCREW
USE MOUNTING SCREW FROM XFM1

FN1
COOLING FAN
#144139

NOTE:
1) SEE DRAWING #164072 FOR WIRE SET

REV	DESCRIPTION	DATE	REV. BY
1	REPOSITIONNED COMPONENTS	4/7/2014	S.A.
2	RE-ORIENTED XFM1, CHG RELAYS GRAY WIRE ROUTING	5/16/2014	S.A.
2	AND SWITHED RED AND BLACK FILTER WIRES	5/16/2014	S.A.

DRAWN BY: NG DATE: 4/1/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

__.___" X __.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 220V OR 240V 1PH VARIABLE SPEED GENERATION 2

SIZE: A | ROUTE.: ELECT | DWG. NO.: 164071 | REV.: 2

SCALE: NTS IMAGE MAY BE REDUCED NTS

CODE: MM2FINTLCE–NC

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

166247

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

1 LINE 2
OPTIONAL
#503574
NOISE FILTER
ONLY "CE"
3 LOAD 4

SPBD1
CIRCUIT BOARD, 230V
#148150

BLK
WHT
GRN

GROUND TAB
#502603

R1
LEFT PLATEN
RELAY
#504313

R2
RIGHT PLATEN
RELAY
#504313

MT1
MOTOR, DRIVE
RIGHT ANGLE
#503985

TS1
TERMINAL STRIP #500340

JUMPER
#500392

L2 (BLU)

L1 (BRN)

GROUND (GRN)

GROUND
SCREW

CORD, 12/3
#504237
6FT LONG
NO PLUG

220–240 VOLTS
14–17 AMPS

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

GND J1 ANALOG IN

CT1
CONTROL #166249
I/O BOARD

J2 DIGITAL I/O

R3
MOTOR RELAY
#504313

XFM1
TRANSFORMER, #504314

J6 DISPLAY PORT

CT1
CONTROL #504312
RIBBON CABLE

CT1
CONTROL #163975
USER INTERFACE BOARD

J1

SSR1
LEFT PLATEN
#504023

SSR2
RIGHT HEATER
#504023

GROUND SCREW
USE MOUNTING SCREW FROM XFM1

FN1
COOLING FAN
#144139

REV	DESCRIPTION	DATE	REV. BY
–	–	–	– –

DRAWN BY: PW
DATE: 11/19/2014

GENERIC NAME: SCHEMATIC

PRODUCT LINE: FAB

PRODUCT CLASS: TST

MATERIAL: REFERENCE

___.___" X ___.___"

MARSHALL AIR SYSTEMS, INC.

SCHEMATIC, VT18 220V OR 240V 1PH VARIABLE SPEED GENERATION 2

SIZE: A

ROUTE.: ELECT

DWG. NO.: 166247

REV.: 0

SCALE: NTS

IMAGE MAY BE REDUCED NTS

CODE: MM2DINTL–NC MM2DIN