Go To Table Of Contents

419

-003 thru -006

Power Procedure Table

MIDMARK®

Service and Parts Manual

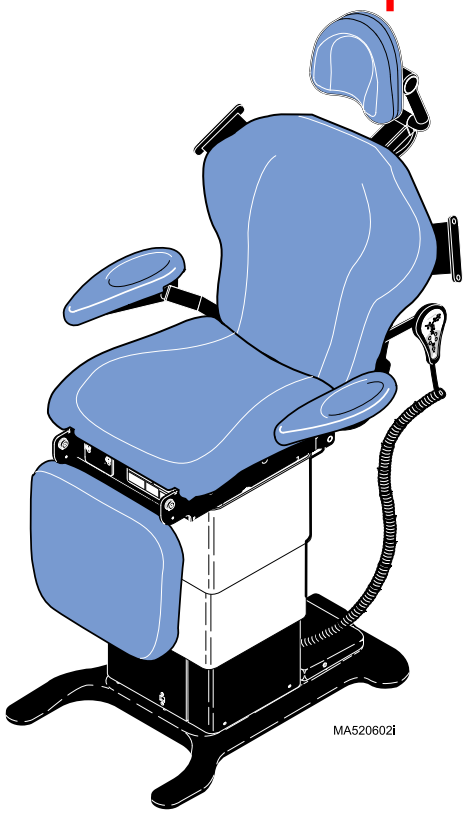
To purchase a printed copy of this manual, click on the "Place Order" button below.

Place Order

Serial Number Prefixes:
LM, LN, LP, LR & V

NO LONGER IN PRODUCTION

Some service parts may not be available for this production



419 -011 thru -006

FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

Go To Table Of Contents

TABLE OF CONTENTS

(*) Indicates that there has been a serial number break for the illustration and that there are additional point page(s) following the original page.

Printed in U.S.A.

Return To Table Of Contents

TABLE OF CONTENTS

(*) Indicates that there has been a serial number break for the illustration and that there are additional point page(s) following the original page.

Printed in U.S.A.

General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this table is maintained with the safety of the patient and staff in mind. To assure that services and repairs are completed safely and correctly, proceed as follows:

(1) Read this entire manual before performing any services or repairs on this table.

(2) Be sure you understand the instructions contained in this manual before attempting to service or repair this table.

Safety Alert Symbols

Throughout this manual are safety alert symbols that call attention to particular procedures. These items are used as follows:

DANGER

A DANGER is used for an imminently hazardous operating procedure, practice, or condition which, if not correctly followed, will result in loss of life or serious personal injury.

WARNING

A WARNING is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in loss of life or serious personal injury.

CAUTION

A CAUTION is used for a potentially hazardous operating procedure, practice, or condition which, if not correctly followed, could result in minor or moderate injury. It may also be used to alert against unsafe practices.

EQUIPMENT ALERT

An EQUIPMENT ALERT is used for an imminently or potentially hazardous operating procedure, practice, or condition which, if not correctly followed, will or could result in serious, moderate, or minor damage to unit.

NOTE

A NOTE is used to amplify an operating procedure, practice or condition.

Warranty Instructions

Refer to the Midmark “Limited Warranty” printed in the Installation and Operation Manual for warranty information. Failure to follow the guidelines listed below will void the warranty and/or render the 419 Power Procedure Table unsafe for operation.

- In the event of a malfunction, do not attempt to use the examination table until necessary repairs have been made.
- Do not attempt to disassemble table, replace malfunctioning or damaged components, or perform adjustments unless you are one of Midmark’s authorized service technicians.
- Do not substitute parts from another manufacturer when replacing inoperative or damaged components. Use only Midmark replacement parts.

Printed in U.S.A.

Return To Table Of Contents

TABLE OF CONTENTS

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

1.1 Scope of Manual

This manual contains detailed troubleshooting, scheduled maintenance, maintenance, service instructions, and a complete illustrated parts breakdown for the 419 (-003 thru -006) Power Procedure Table. This manual covers both programmable and non-programmable versions of this table. This manual is intended to be used by Midmark's authorized service technicians.

1.2 How to Use Manual

A. Manual Use When Performing Scheduled Maintenance.

(1) Perform inspections and services listed in Scheduled Maintenance Chart (Refer to para 3.1).

(2) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

B. Manual Use When Unit Is Malfunctioning And Cause Is Unknown.

(1) Perform an operational test on unit (Refer to para 2.1).

(2) Perform troubleshooting procedures listed in Troubleshooting Guide (Refer to para 2.2).

(3) If a component is discovered to be faulty or out of adjustment, replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

C. Manual Use When Damaged Component Is Known.

(1) Replace or adjust component in accordance with maintenance / service instructions (Refer to para 4.1).

1.3 Description Of 419 (-003 thru -006) Power Procedure Table

A. General Description (See Figure 1-1).

The 419 Power Procedure Table is a general purpose examination table designed specifically for performing general medical examinations and procedures. The table is available with or without programming. The programmable versions have additional features such as programmed positioning, a Home function, and audible warning signals.

Listed below are descriptions of the models available and their serial number prefixes:

419-003 (LM)	115 VAC without programming
419-004 (LN)	115 VAC with programming
419-005 (LP)	230 VAC without programming
419-006 (LR)	230 VAC with programming

The major serviceable components of the table are: the tilt actuator, tilt capacitor, back actuator, back capacitor, foot actuator, foot capacitor, base actuator, base capacitor, base down limit switch, base up limit switch, PC control board, foot & hand control inlet PC boards, chain assembly, column assembly, headrest assembly, non-programmable foot control which includes foot switches and foot control interface board ***or*** a programmable foot control which includes foot switches, a foot control interface board, indicator L.E.D.'s, and program control footswitches, and the Foot Extension Crash Protection Circuit which includes the foot actuator limit switch, foot rest extension limit switch, and base actuator limit switch. *The following serviceable components apply to programmable units only:* tilt position sensor, back position sensor, foot position sensor, and base reducer assembly which includes base position sensor. *The following serviceable components apply to the optional hand control:* hand control switch panel and hand control PC board.

Printed in U.S.A.

SECTION I
GENERAL INFORMATION

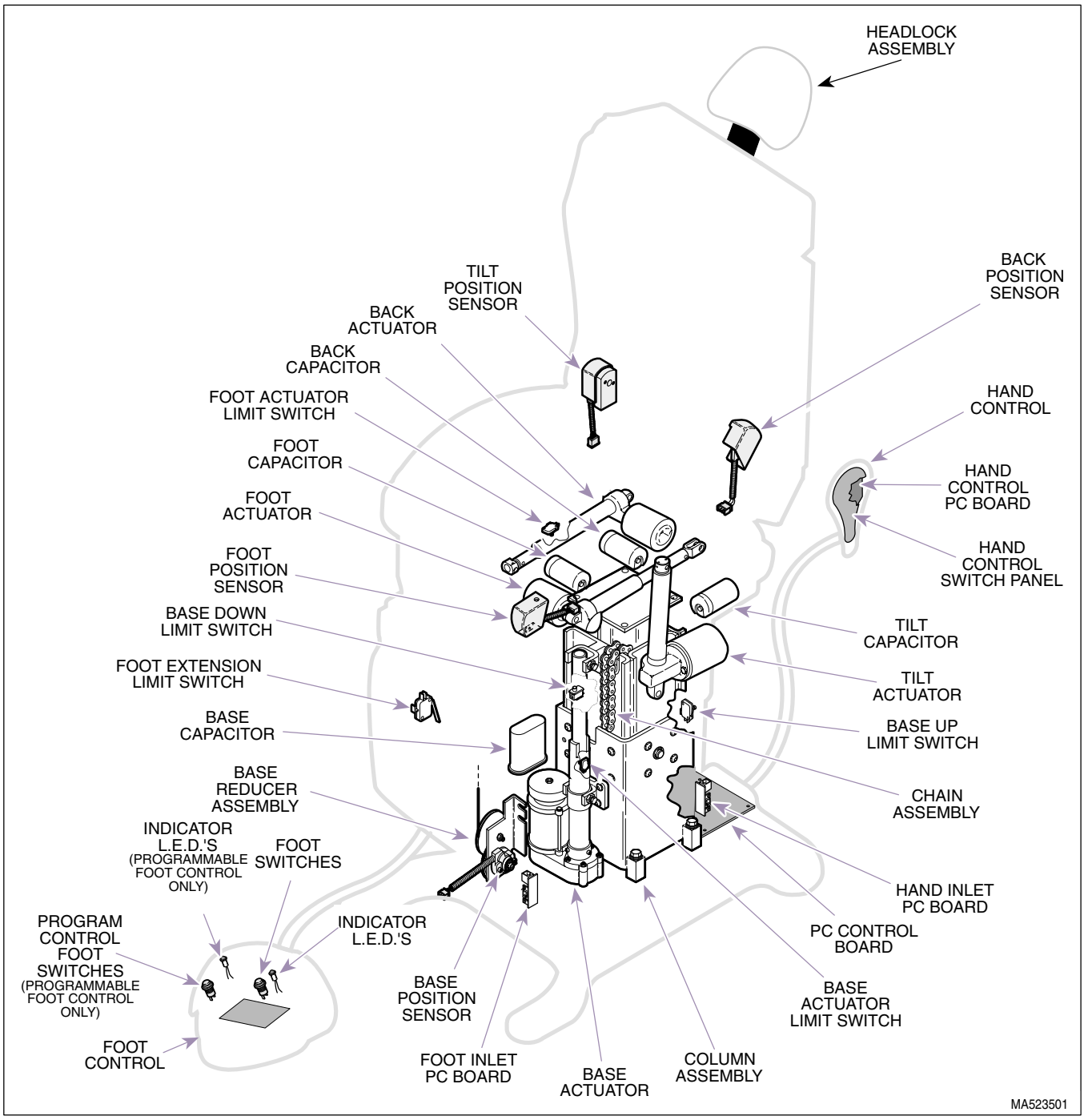


Figure 1-1. Major Components

Printed in U.S.A.

B. Standard Theory of Operation (See Figures 5-1 thru 5-6 for wiring diagram / electrical schematic)

Electrical power

Line voltage is supplied thru two main fuses to the table's PC control board. These fuses prevent possible damage to the PC control board due to excessive current draw. There is a transformer and associated follow-on circuitry on the PC control board which reduces the line voltage to 12 VDC. The 12 VDC provides power to operate the circuitry on the PC control board, foot control, and hand control.

Manual Operation of Tilt, Back, and Foot Actuator Assemblies:

When a function is selected using the foot control, the foot control sends a signal to the PC control board. The signal causes the appropriate relay on the PC control board to energize (i.e., if the TILT UP button is depressed on foot control, the Tilt Up relay on PC control board is energized). Line voltage is continuously supplied to all relays on PC control board. So, when a relay is energized, the line voltage flows thru the relay and is applied across the windings of the actuator motor, causing it to run. When the foot control button is released, the relay de-energizes, removing the line voltage from the windings of the actuator motor and causing it to stop running.

The Tilt, Back, and Foot actuators are ball screw driven. The actuator assemblies contain a pivot point on the end of the ball screw. If an actuator assembly is run to the end of its stroke, the ball screw shaft spins inside the nut, which allows the actuator assembly to run without damaging or advancing the nut.

The Tilt, Back, and Foot actuators have internal braking mechanisms which use friction to hold the actuator in place. When the actuator is run, the actuator overcomes the force of the friction, allowing it to move. When actuator is stopped, friction holds the actuator in place.

Manual Operation Of Base Actuator Assembly:

When a BASE UP or BASE DOWN function is selected using the foot control, the foot control sends a signal to the PC control board. The signal causes the base up or down relay, and the base brake relay on the PC control board to energize (i.e., if the BASE UP button is depressed on hand control, the base up and base brake relays on PC control board energize). Line voltage is continuously supplied to the relays on PC control board. So, when the base up or down relay is energized, the line voltage flows thru the relay and is applied across the windings of the actuator motor, causing it to run. At the same time, line voltage flows thru the brake relay and is applied across the solenoid coil of the base brake, causing the brake to disengage. When the foot control button is released, the relays de-energize, removing line voltage from the coils of the actuator motor, causing it to stop and at the same time, removing line voltage from the solenoid coil of the base actuator brake, causing the base brake to engage.

The base actuator is different from the other three actuators; it does not freewheel at the end of its stroke limit. This is because the base actuator operates under heavier loads. To prevent the base actuator from reaching its stroke limits, which could damage the actuator, two limit switches are used; a base down limit switch and a base up limit switch. These limit switches are normally closed (N.C.) switches. When the base actuator reaches the end of the travel (up or down), the appropriate limit switch is tripped, opening the circuit. The PC control board then de-energizes the motor relay and base brake relay, causing the base actuator motor to stop running and the base brake to engage.

Foot Extension Protection Circuit:

To prevent the foot extension from accidentally being run into the floor, three limit switches are used: the foot rest extension limit switch, foot actuator limit switch, and base actuator limit switch. These limit switches are connected in parallel and table functions will operate normally unless ***all three*** switches are **open**. If all three limit switch circuits are open, the PC control board will prevent movement of Tilt Down, Table Down, and Foot Down functions and illuminate the Foot Rest Extension lamp on the hand control until any (one or all) of the limit switches are closed.

The foot rest extension limit switch (located behind the foot slide weldment) is a normally open (N.O.) switch. However, when the foot rest extension is in its fully retracted position, the limit switch is tripped, creating a closed circuit.

The foot actuator limit switch (mounted on the foot actuator) is a normally closed (N.C.) switch. When the foot section is between -40° and -90°, the limit switch is tripped, resulting in an open circuit.

The base actuator limit switch (mounted on the base actuator) is a normally closed (N.C.) switch. When the base actuator is between full down and 1/2 way up, the limit switch is tripped resulting in an open circuit.

General Information:

All actuator motors have a thermal overload switch which will activate if the actuator is run continuously and overheats. The actuator motor is not designed for continuous operation; it is designed for intermittent operation. The normal cool off period for the thermal overload switches is 10 - 20 minutes.

Each actuator motor has a capacitor which provides start up power and motor run power.

There are two 0.10 amp Time Lag fuses providing over-current protection to the input of the PC control board on the non-programmable table and two 0.15 amp Time Lag fuses providing over-current protection to the input of the PC control board on the programmable table.

There is a 5 amp, “Slo-Blo” Time Lag fuse to provide over-current protection for each function's relays (i.e, Tilt fuse protects TILT UP and TILT DOWN relays).

C. Programmable Table Theory of Operation (See Figures 5-1 thru 5-6 for wiring diagram / electrical schematic) (Applies only to tables with programmed positioning)

Operation Of Programmable Software:

The previous paragraphs have outlined the theory of operation for manual functions on both the programmable and non-programmable tables. The following paragraphs will describe control system functions on the programmable tables.

When the table is powered up, the control system initializes the PC control board and then checks for inputs. There are two functions which can be initiated by the operator using the foot control; a function to initiate the “Calibration” mode and a function to initiate the “Clear Diagnostics Codes” mode. Also, the PC control board checks if error codes are stored in memory to determine if the “error” mode should be initiated.

Additionally, there are two functions that may be initiated by depressing switches mounted on the PC control board; a function to initiate the “Calibration/Clear Data” mode (SW 2 on PC board) and a function to initiate the “Program/Fault Clear ” mode (SW 1 on PC board)

The “Calibration” function **must** be initiated by the technician if a new PC control board or position sensor is installed, the position sensor is adjusted, the table is not moving to a programmed position properly, or the table begins acting erratically. When the calibration mode is initiated, the PC control board runs all actuators to their up and down limits and measures the voltage output of the position sensors at the limits. These voltage values are stored in the PC control board’s memory and used as the basis for storing programmed positions into memory. Also, the error codes for incorrect direction and no sensor output change are cleared from the PC control board’s memory. If the calibration procedure is not successful due to a position sensor reading being out of limits, the error code indicating why will be stored into the PC control board’s memory along with an error code indicating the table is not calibrated. The PC control board emits a 1 second warning beep at 1.5 second intervals to indicate to the operator that the calibration procedure is taking place. The calibration procedure is described in Section IV, Maintenance.

The “Clear Diagnostics Codes” function must be initiated to reset the PC Control Board, after the PC control board initiates any error code(s). The PC control board displays the error code(s) by alternately flashing the PROGRAM lamp and the FOOT REST EXTENSION lamp to form a code (See Diagnostic code [error code] operation later in this section). When the table is in the error code mode, only manual positioning of the table will work. To resume normal operation, the “Clear Diagnostic Codes” procedure must be completed. If the PC control board is replaced or the position sensor is replaced or adjusted, this procedure will not work; in this case, the “Program/Fault Clear” mode followed by the Calibration procedure must be performed. This step is described in the appropriate procedures in Section IV, Maintenance.

The “Calibration/Clear Data” mode is initiated when it is desired to clear the PC control board’s memory where the calibration data is stored. This step is described in the appropriate procedures in Section IV, Maintenance.

The “Program/Fault Clear” mode is initiated when it is desired to clear the PC control board’s memory where the error codes and program position data are stored. This function should be used if the PC control board seems locked up or if a position sensor is replaced / adjusted. The “Program/Fault Clear” function is described in the appropriate procedures in Section IV, Maintenance.

SECTION I
GENERAL INFORMATION

Operation of Home Position Function:

When the operator presses the Home position button, the PC control board lowers the base actuator until the base down limit switch is tripped. The Home position button can be pressed and released; it does not have to be held down to continue movement. If the base down limit switch is not detected as being tripped (open circuit) within 18 seconds from the time the Home position button was pressed, the PC control board de-energizes the base actuator. If Base Up function button is pressed while the table is moving toward the Home position, the Home position function is terminated and Base Up is initiated until button is released.

Stop Function Operation:

When the Stop button is pressed, the PC control board terminates all functions, stopping table movement. When the Stop button is released, the stop mode is cancelled and normal table operation may resume.

Program Mode Operation:

The Program Mode is used to allow the operator to program up to four different table top positions into memory. When the Program Mode button is pressed, the Program Mode function stays active for five seconds, or until the operator has pressed one of the four Programmed Position buttons, or the Stop button is pressed. Also, the Program Mode lamp is illuminated and stays illuminated until the 5 seconds are up or an action is taken. When a Programmed Position button is pressed, the PC control board stores the position sensor voltage values for each axis into its memory. Then, if the position was stored correctly, the PC control board flashes the Program Mode lamp three times.

Programmed Position Recall Mode:

To recall a program that is stored in memory, the operator selects one of the four Programmed Position Recall buttons. The button must be pressed and held to continue table movement. The PC control board determines which direction to run the actuators by comparing the current position sensor voltage output for each axis with the voltage values stored in memory for each axis. The PC control board energizes the relays for the actuators requiring movement and then monitors the position sensor voltage output for each axis. When the position sensor voltage output of each position sensor matches the value stored in the PC control board's memory, the PC control board de-energizes the actuator relays.

The PC control board has a maximum run time it allows for each actuator at any one time. This feature prevents damage to an actuator motor because of an actuator relay sticking. When a Programmed Position button is pressed, the PC control board starts a countdown of the maximum time allowed for that actuator. At the end of the countdown, if the button is still sensed by the PC control board as being pressed, and the actuator has not reached its limit, the PC control board de-energizes the relay for the actuator. The maximum run time for each function is:

- Base Up / Base Down - 18 seconds
- Back Up / Back Down - 25 seconds
- Foot Up / Foot Down - 25 seconds
- Tilt Up / Tilt Down - 25 seconds

During the Programmed Position Recall mode, the PC control board monitors for several error conditions:
If it is detected that a position sensor's voltage is increasing when it should be decreasing, decreasing when it should be increasing, or data input from a position sensor is invalid, the PC control board stops the table and sets an error code condition. An explanation of the error codes is given in para 5.2.
If data stored for the Programmed Position Recall button being pressed is invalid, the Program lamp will flash on and off until the button is released.
If the base down limit switch or base up limit switch is tripped (open circuit), the PC control board disables the Programmed Position Recall mode.
If the Foot Extension Crash Protection Circuit is open (*all three* limit switch circuits must be **open**), the PC control board disables the Program Positioning mode and the Foot Rest Extension lamp will flash on and off until the button is released.
If the Stop button is pressed, the Programmed Position Recall mode is disabled.

Manual Positioning Table Operation:

During manual positioning operation, the control system for the programmable table works like the control system for the non-programmable table except for some additional controls:
If there is invalid data inputs from any position sensor, the PC control board still allows manual positioning operation.
If conflicting functions are attempted such as Base Up and Base Down, the PC control board disables all functions until all buttons are released.

Printed in U.S.A.

Diagnostic Code (Error Code) Operation:

When the PC control board detects an error condition, it disables the Home position and Programmed Position functions. When these buttons are pressed, there is no movement. By unplugging the table power cord for a minimum of ten seconds, and then plugging it back in, the PC control board is put into the “diagnostic code” mode, described as follows: At power up, if an error code is stored in memory, the PC control board outputs the error code to the foot control in the form of a code. The Program Mode lamp flashes on and then off for the number of times equal to the first digit of the error code stored in memory. Then the Foot Extension lamp flashes on and then off for the number of times equal to the second digit of the error code stored into memory. The PC control board then waits one second, repeats the error code a second time, then waits one second and repeats the error code a third time. The next error code is also displayed three times consecutively. This is repeated until all error codes have been displayed. Then, the PC control board continuously displays the error codes on the foot control until a manual function is selected.

Position Sensor Operation:

There are position sensors mounted to pivot points on the Back, Tilt, and Foot axis and a position sensor mechanism (called a base reducer assembly) attached to the column assembly for the base function. As each axis moves, the corresponding position sensor’s inner wheel rotates with the axis. The position sensor is a variable resistor which changes resistance in a linear manner when rotated. So when the axis moves, the position sensor’s voltage output changes, due to its resistance change, based upon how far the axis has moved. The PC control board interprets the voltage value to determine the location of an axis. When a programmed position is programmed by the operator, the PC control board stores each sensor’s voltage value into memory. When the operator wishes to return to that stored position later, the programmed position button for the desired programmed position is depressed. The PC control board determines the current position the table based on the voltage output of the position sensors, and then determines which axis’ must be moved and in what direction. The PC control board energizes the relays for these actuators and moves the table section(s) to the desired programmed position. The PC control board stops the actuators when the voltage value of the position sensors matches the values stored in the PC control board’s memory.

1.4 Standard Torque Specifications

The following torque specifications in Table 1-1 apply to the various hardware used on the unit unless otherwise listed elsewhere in the service procedures or parts illustrations:

Table 1-1. Torque Specifications

Hardware Size	Torque Values
#6	11 to 21 inch / lbs. (1.2 to 2.3 N•m)
#8	20 to 30 inch / lbs. (2.2 to 3.3 N•m)
#10	32 to 42 inch / lbs. (3.6 to 4.8 N•m)
1/4 inch	75 to 85 inch / lbs. (8.5 to 9.6 N•m)
5/16 inch	18 to 22 ft. / lbs. (24.4 to 29.8 N•m)
3/8 inch	31 to 35 ft. / lbs. (42.0 to 47.5 N•m)
1/2 inch	50 to 60 ft. / lbs. (67.8 to 81.4 N•m)

1.5 Specifications

Factual data for the 419 Power Procedure Table is provided in Table 1-2. Also, see Figure 1-2.

Table 1-2. Specifications

Description	Data
Weight:	
Without Shipping Carton	515 lbs. (233.6 kg)
With Shipping Carton	550 lbs. (249.5 kg)
Shipping Carton:	54 in. "L" x 32 in. "W" x 33 in. "H" (137.1 cm x 81.2 cm x 83.8 cm)
Maximum Patient Load:	325 lbs. (147.4 kgs)
Dimensions (See Figure 1-2):	
Table Top Length (w/headrest retracted)	
(w/back down & foot up)	65.0 in. (165.1 cm)
(headrest extended)	
Dbl. Articulating Headrest	adds 11 in. (27.9 cm)
Triple Articulating Headrest	adds 15 in. (38.1 cm)
Footrest Extension (adjustable)	adds 0.0 in to 8.0 in (0 cm to 20.3 cm)
Table Top Width	23 in. (54.4 cm)
Overall Width	24 in. (61.0 cm)
Table Top Positioning:	
Table Top Height (Adjustable)	22 in. to 40 in. ±0.5 in. (55.9 ± 1.3 cm to 101.6 ± 1.3 cm)
Back Section	0° (horizontal) to +85° ±5°
Foot Section	0° (horizontal) to -90° ±5°
Tilt Range	0° (horizontal) to +30° ±5° (foot up)

SECTION I
GENERAL INFORMATION

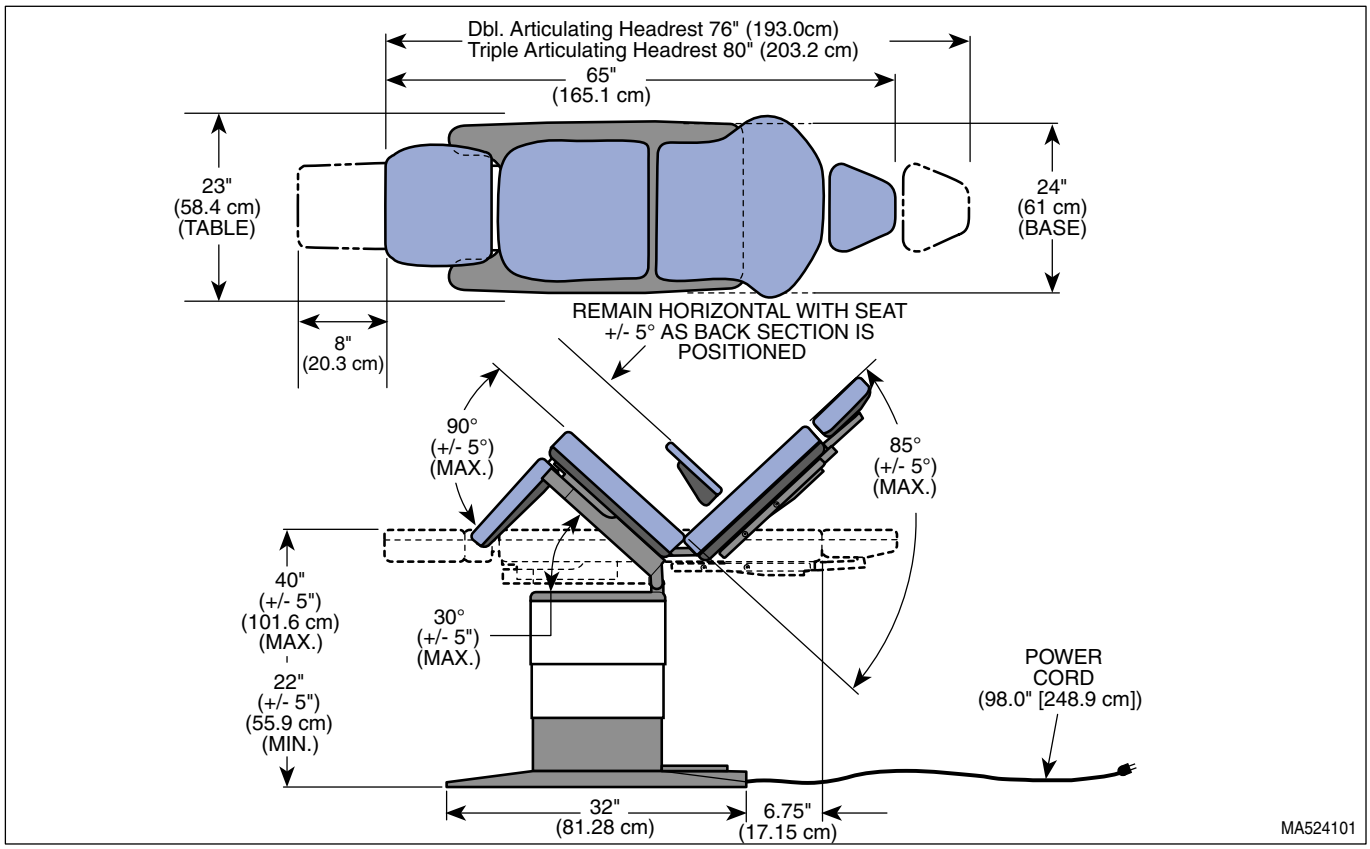


Figure 1-2. Dimensions

Table Speeds (@ 60 Hz):
- Base Up ..... 18 - 31.5 seconds ±3
- Back Up.....11 seconds ±3
- Tilt Up.....17 seconds ±3
- Foot Up .....8 seconds ±3

Power Cord:..... 98.0 in. (248.9 cm) long
A black jacketed molded cord to fit IEC appliance inlet with destination specific attachment plug

Electrical Requirements:

Model 419(-003 & -004)
115 VAC Units.....115 VAC ±10%, 50/60 Hz
12 amp, single phase

Model 419 (-005 & -006)
230 VAC Units.....230 VAC ±10%, 50/60 Hz
8 amp, single phase

Duty Cycle:..... Intermittent Operation
[15 seconds on/5 minutes off (motor run time)]

Recommended Circuit:
A separate (dedicated) circuit is recommended for this table. The table *should not* be connected to an electrical circuit with other appliances or equipment unless the circuit is rated for the additional load.

Classifications:..... Class 1, Type B, Applied Part, Ordinary Equipment, Intermittent Operation

Certifications:

Midmark Corporation ISO-9001 Certified

Model 419(-003 & -004)
115 VAC Units.....UL2601-1
CAN/CSA 22.2, #601.1-M90

Model 419 (-005 & -006)
230 VAC Unit..... Complies to the applicable revision of the MDD 93/42/EEC, Annex VII.
Complies to the applicable requirements of EN6060-1-1, EN60601-1-2, EN60601-4

Printed in U.S.A.

1.6 Parts Replacement Ordering

If a part replacement is required, order the part directly from the factory as follows:

(1) Refer to Figure 1-3 to determine the location of the model number and serial number of the unit and record this data.

(2) Refer to the Parts List to determine the item numbers of the parts, part numbers of the parts, descriptions of the parts, and quantities of parts needed and record this data (Refer to para 6.1).

NOTE
Ask the Purchasing Department of the company that owns the unit for this information. Otherwise, this information may be obtained from the dealer that sold the unit.

(3) Determine the installation date of the unit and record this data.

(4) Call Midmark with the recorded information and ask for the Medical Products Technical Services Department. See back cover of this manual for the phone number or use the Fax Order Form (See page 7-2 for Fax Order Form).

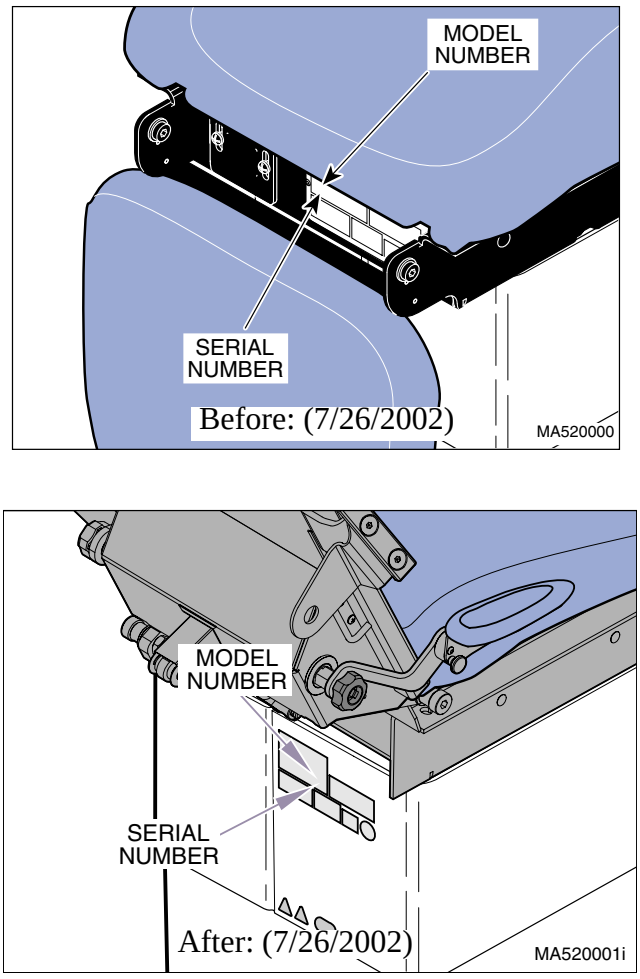


Figure 1-3. Model Number / Serial Number Location

1.7 Special Tools

Table 1-3 lists all of the special tools needed to repair the unit, how to obtain the special tools, and the purose of each special tool.

Description of Special Tool	Manufacturer's Name / Address / Phone	Manufacturer's Part Number	Purpose of Special Tool
Multimeter (with testing hooks) *	Commercially Available	Any Type	Used to perform continuity and voltage checks.
Protractor *	Commercially Available	Any Type	Used to check the angle of motion for all movable table top sections.
T15 Torx Wrench	Commercially Available	Any Type	Used to loosen / tighten the screws securing the position sensors, allowing adjustments to be made.
5/16 in. - 18 x 1-1/4 Bolt (Quantity of 2)	Midmark Corporation 60 Vista Drive Versailles, Ohio 45380 (937) 526-3662	505-702308	Used to remove tension from eccentric bearings so they may be adjusted.
Torque Wrench *	Commercially Available	Any Type	Used to tighten nuts or screws to specified values.
Sensor Holder Tool (tool comes with a position sensor kit).	Midmark Corporation 60 Vista Drive Versailles, Ohio 45380 (937) 526-3662	046-0008-00	Used to hold the 5/16" hex drive while a position sensor is being installed.
** Tool should be calibrated annually to ensure proper specifications are met.*			

SECTION II
TESTING AND TROUBLESHOOTING

2.1 Operational Test (See Figure 2-1, Sheets 1 and 2)

In order to effectively diagnose a malfunction of the 419, it may be necessary to perform an operational test as follows:

WARNING
Refer to the Operator Manual for complete instructions on operating the table. Failure to do so could result in personal injury.

NOTE
The Operational Test only describes what should happen when the table is operated. If the table does something other than described, a problem has been discovered. Refer to the Troubleshooting Guide to determine the cause of the problem and its correction.

(1) Plug the table power cord into a properly rated receptacle.

(2) Using the foot control, operate each table function *(Base Up &Down, Back Up & Down, Tilt Up & Down, Foot Up & Down)*

Observe. When a fucntion is initiated, the table should move accordingly. No section of the table top should drift after the foot control pedal is released. Actuator assembly should not make excessive squealing noises. Movement should be steady and should match the speeds and range of motions listed below:

Table Speeds (@ 60 Hz):
Base down to Base up ..... 18 - 31.5 ±3 seconds
Back down to Back up.....11 ±3 seconds
Tilt down to Tilt up .....17 ±3 seconds
Foot down to Foot up.....8 ±3 seconds

Range of Motion:
Base down to Base up .....22.38 to 40.38 in.±0.5 in.
(56.8 to 102.5 cm ±1.3 cm)
Back down to Back up..... 0° to +85° ±5°
Tilt down to Tilt up..... 0° to +30° ±5°
Foot down to Foot up .....-90° to 0° ±5°

(3) If the table has an optional hand control, repeat step 2 using the hand control.

(4) Raise foot section to the horizontal position; then squeeze foot rest extension release handle and pull foot rest extension out as far as it will go.

(5) Depress BASE UP, and TILT UP buttons on foot control and hold until each function reaches maximum height; then depress FOOT DOWN button and hold until foot section is approximately 1/2 way down.

(6) Depress BASE DOWN, FOOT DOWN, and TILT DOWN buttons on foot control and hold.

Observe. Table should go approximately 1/2 way down then BASE DOWN, FOOT DOWN, and TILT DOWN functions should stop and the Foot Rest Extension lamp on the foot control should flash.

(7) Squeeze foot rest extension handle and push foot rest extension inward until it locks into its stowed position; then depress BASE DOWN, FOOT DOWN, and TILT DOWN buttons on foot control and hold.

Observe. Foot Rest Extension lamp on foot control should go out and all functions should lower to their minimum heights.

(8) Place approximately 325 lbs. (147.4 kg) of weight on the seat section of the table top.

(9) Depress BASE UP button on foot control.

Observe. The base actuator should not squeal or make excessive noise when lifting the weight. The base actuator should be able to lift the weight. The base actuator should not hum or make any other type of noise when the table top reaches maximum height. The base up limit

switch should trip, stopping the base actuator from running. The base actuator brake should engage properly and hold the load without drifting down.

(10) Depress BASE DOWN button on foot control.

Observe. The base actuator should not squeal or make excessive noise when lowering the weight. The actuator assembly should not hum or make any other type of noise when the table top reaches its minimum height. The base down limit switch should trip, stopping the base actuator from running.

(11) Remove weight from seat section of table top.

(12) Using either the release button (old style), or release handle (new style) on the headrest, reposition headrest at each pivot point.

Observe. Headrest should release and move easily at each pivot point. Headrest should lock securely into position when button is released or handle is returned to locked position.

(13) Slide the headrest assembly in and out of the headrest slide mechanism releasing at various positions to observe.

Observe. Headrest assembly should not move out of position on its own, or require excessive force to be positioned.

(14) Pull outward on arm rest knob and rotate arm rest 180°.

Observe. Arm rest should rotate freely when release knob is pulled, and lock securely in place 180° from point of origin.

NOTE
The remaining steps apply to programmable units only. Refer to Figure 2-1 (Sheet 2 of 2) for these steps.

(15) Depress BASE UP button on foot control until table reaches its maximum height.

(16) Press the HOME POSITION button for one second and then release it. After the table top lowers halfway, press the STOP button.

Observe. When the HOME POSITION button is pressed, the table top should begin to lower. When the STOP button is pressed, the table top should stop lowering.

(17) Press the HOME POSITION button and allow the table top to lower completely.

Observe. When the table top is completely lowered, the base actuator should stop running automatically, indicating that the base down limit switch is tripped.

(18) If the table has an optional hand control, repeat steps 15 thru 17 using the hand control.

NOTE
After the PROGRAM button is pressed, the operator has approximately 5 seconds to press one of the four Program Position buttons. At the end of the 5 seconds, the PROGRAM MODE lamp turns off, indicating that the program mode has ended.

(19) Press the PROGRAM button and then within 5 seconds, press the Program Position “1” button.

Observe. When the PROGRAM button is pressed, the PROGRAM MODE lamp will illuminate. Then, when the Program Position “1” button is pressed, the PROGRAM MODE lamp will go off and then flash three times to indicate that the table position data was successfully stored into the PC control board’s memory.

(20) Use any of the foot control buttons to move the table top to a new position.

(21) Press and hold the Program Position “1” button until the table stops moving.

Observe. The table top should move back to the position programmed in step 19.

(22) Repeat steps 19 thru 21 three more times using Program Position buttons “2”, “3” and then “4”.

(23) If the table has an optional hand control, repeat steps 19 thru 21 using the hand control.

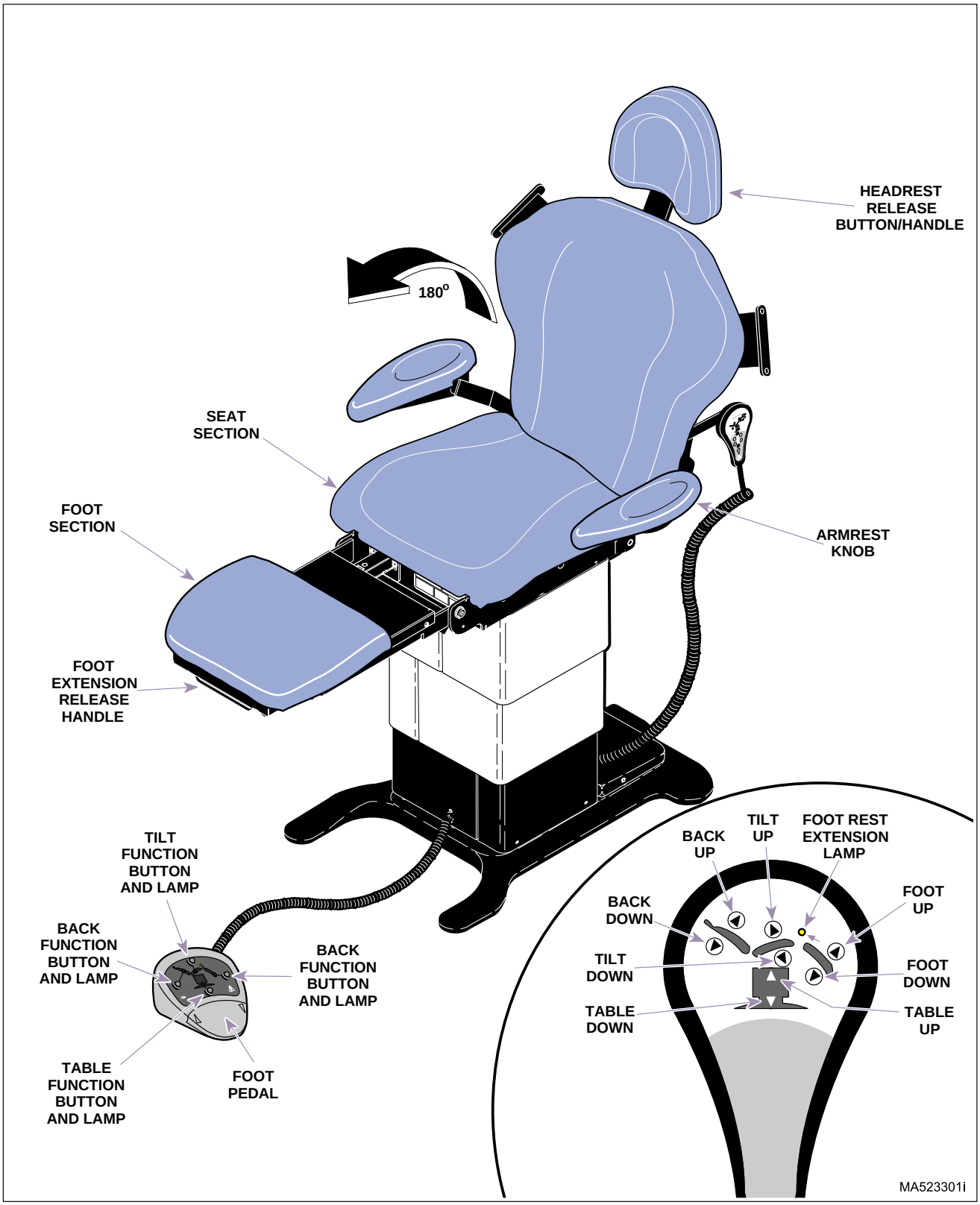


Figure 2-1. Operational Test (Sheet 1 of 2)

Printed in U.S.A.

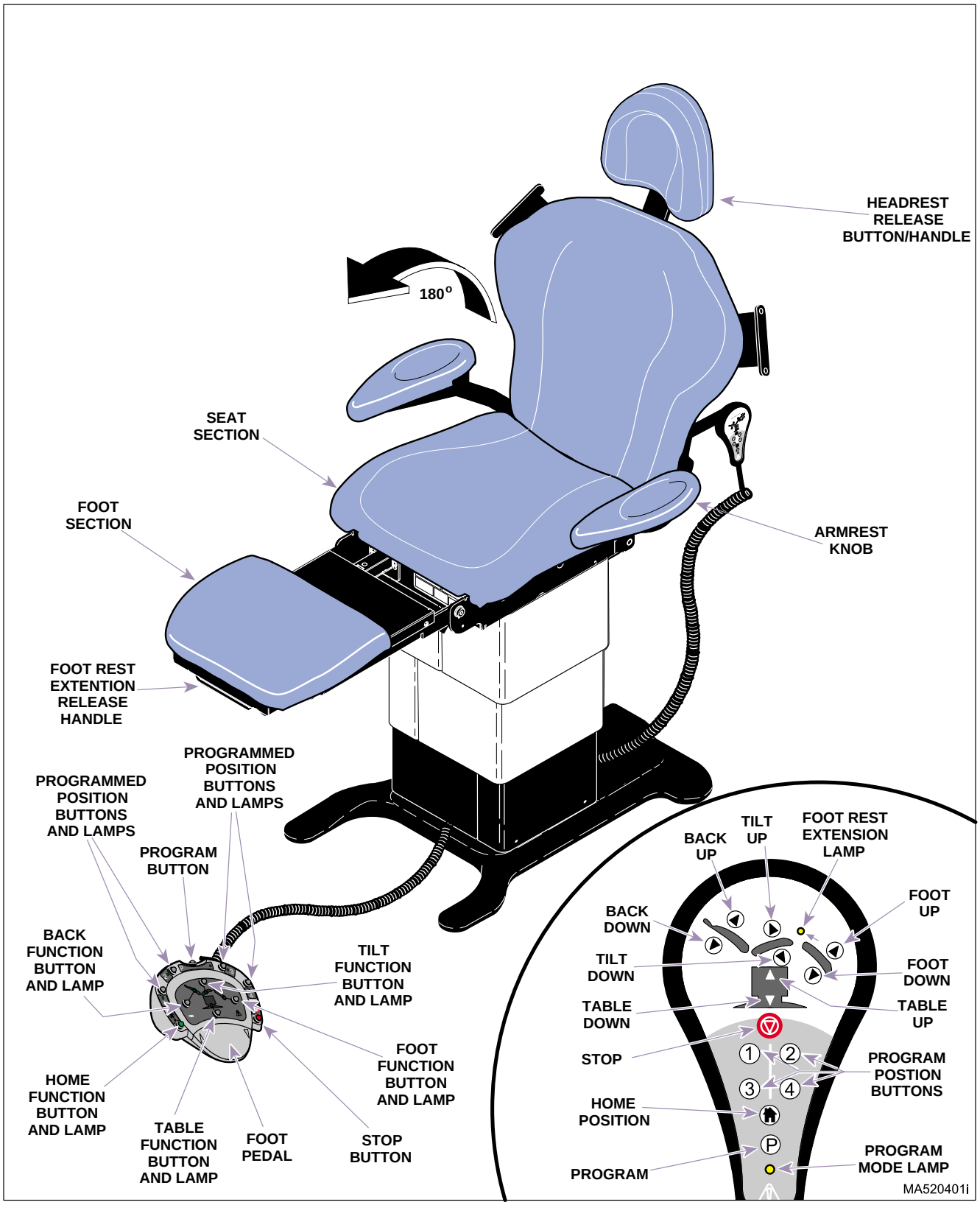


Figure 2-1. Programmable Units Operational Test (Sheet 2 of 2)

2.2 Troubleshooting Procedures

Table 2-1 is a Troubleshooting Guide which is used to determine the cause of the malfunction.

Table 2-1. Troubleshooting Guide

Problem	Symptom	Probable Cause	Check	Correction
Table will not operate when any of the functions on the foot control or hand control are selected.	When any foot/hand control button is pressed, nothing happens.	Power cord is not plugged into wall outlet and/or AC receptacle.	Check to see if power cord is plugged in.	Plug power cord into facility wall outlet and/or AC receptacle.
		Facility circuit breaker providing power to unit is tripped.	Check to see if facility circuit breaker for unit is tripped. One way of checking this is to plug a lamp into wall outlet that table was plugged into.	If facility circuit breaker is tripped, determine what caused the circuit breaker to trip, correct the problem, and then reset / replace the circuit breaker.
		Fuse(s) at power inlet blown.	Perform continuity check on fuses.	Replace blown fuse(s). Refer to para 5.2.
		Wire connections loose.	Check all wiring connections from power cord to terminal block. Perform continuity check on wires. Use multimeter to check for proper voltage levels. See Figures 5-1 thru 5-6.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Primary fuse(s) on PC control board is blown.	Refer to Figure 2-2 for this check. Perform continuity check on fuses.	Replace blown fuse(s). Refer to para 5.2.
		PC control board is malfunctioning.	Replace suspect PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
		Fuse holders malfunctioning.	Perform continuity check on fuse holder.	Replace fuse holder. Refer to para 4.33.
		AC receptacle malfunctioning.	Perform continuity check on AC inlet.	Replace AC receptacle. Refer to para 4.34
No actions can be initiated from hand control.	Table has power, but no functions can be initiated from hand control. Foot control works properly.	Coil cord is not plugged into hand control or receptacle on table properly.	Check if coil cord is plugged in properly.	Plug coil cord into hand control or receptacle on table. Clean any dirty connections.
		Hand control switch panel is malfunctioning.	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20
		Hand control PC board is malfunctioning.	Replace suspect hand control PC board with known working hand control PC board.	Replace hand control PC board. Refer to para 4.20.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
No actions can be initiated from hand control. - Continued	Table has power, but no functions can be initiated from hand control. Foot control works properly. - Continued	Control inlet PC board is malfunctioning.	Plug foot control into suspect control inlet PC board and check for proper operation	If necessary, replace control inlet PC board. Refer to para 4.19.
		Cord running from control inlet PC board to PC control board is disconnected or broken.	Check cord to see if it is properly connected. Replace suspect cord with known working cord or perform continuity check on cord.	Replace cord.
		PC control board is malfunctioning.	Replace suspect PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4..
One or more functions cannot be initiated from hand control.	Some functions may be initiated with hand control, but at least one may not.	Hand control switch panel is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		Hand control PC board is malfunctioning.	Plug foot control into suspect control inlet PC board and check for proper operation	If necessary, replace hand control PC board. Refer to para 4.20.
		Fuse for non-operating (suspect) function is blown.	Refer to Figure 2-2 for this check. Perform continuity check on suspect fuse.	Replace blown fuse(s). Refer to para 5.2.
		Relay for non-operating (suspect) function is malfunctioning.	Refer to Figure 2-2 for this check. When hand control button is pressed, observe relay L.E.D's on PC control board. The L.E.D. for the function which was selected should illuminate to indicate that its relay is operating correctly.	If relay L.E.D. does not illuminate properly, replace PC control board. Refer to para 4.3 or 4.4.
No actions can be initiated from foot control.	Table has power, but no functions can be initiated from foot control. Hand control works properly.	Coil cord is not plugged into foot control or receptacle on table properly.	Check if coil cord is plugged in properly.	Plug coil cord into foot control or receptacle on table. Clean any dirty connections.
		Foot control PC board is malfunctioning.	Plug hand control into suspect control inlet PC board and check for proper operation.	Replace foot control PC board. Refer to para 4.23.
		Control inlet PC board is malfunctioning.	Replace suspect control inlet PC board with known working control PC board.	Replace control inlet PC board. Refer to para 4.19.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
No actions can be initiated from foot control. - Continued	Table has power, but no functions can be initiated from foot control. Hand control works properly. - Continued	Cord running from control inlet PC board to PC control board is disconnected or broken.	Check cord to see if it is properly connected. Replace suspect cord with known working cord or perform continuity check on cord.	Replace cord.
		PC control board is malfunctioning.	Replace suspect PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
	Some functions may be initiated with foot control, but at least one may not.	A footswitch for a function is malfunctioning.	Perform a continuity check on footswitch.	Replace footswitch. Refer to para 4.25.
		Foot control PC board is malfunctioning.	Replace suspect foot control interface board with known working foot control interface board.	Replace foot control PC board. Refer to para 4.23.
		Fuse for non-operating (suspect) function is blown.	Refer to Figure 2-2 for this check. Perform continuity check on suspect fuse.	Replace blown fuse(s). Refer to para 5.2.
		Relay for non-operating (suspect) function is malfunctioning.	Refer to Figure 2-2 for this check. When a footswitch is depressed, observe relay L.E.D's on PC control board. The L.E.D. representing the function which was selected should illuminate to indicate its relay is operating correctly.	If relay L.E.D. does not illuminate properly, replace PC control board. Refer to para 4.3 or 4.4.
BACK UP and BACK DOWN functions do not work. All other functions work.	When BACK UP and BACK DOWN buttons are pressed, table will not move (all other functions work).	Back capacitor is weak or blown.	Replace suspect back capacitor with known working back capacitor.	Replace back capacitor. Refer to para 4.8.
		Thermal overload switch in back actuator motor is activated.	_	Wait 10 to 20 minutes to allow back actuator motor to cool.
		5 amp BACK fuse for BACK UP and BACK DOWN functions is blown.	Refer to Figure 2-2 for this check. Perform a continuity check on 5 amp BACK fuse.	Replace blown fuse(s). Refer to para 5.2.
		Wire connections loose.	Check all wiring connections to back actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Back actuator assembly is malfunctioning.	Replace suspect back actuator assembly with known working back actuator assembly.	Replace actuator motor or back actuator assembly. Refer to para 4.14 or 4.7.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
BACK UP and BACK DOWN functions do not work. All other functions work. - Continued	When BACK UP and BACK DOWN buttons are pressed, table will not move (all other functions work). - Continued	PC control board is malfunctioning.	Refer to Figure 2-2 for this check. Press BACK UP and then BACK DOWN button while observing the PC control board. The BACK UP L.E.D. should illuminate when the BACK UP button is pressed and the BACK DOWN L.E.D. should illuminate when the BACK DOWN button is pressed. If, not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
TILT UP and TILT DOWN functions do not work. All other functions work.	When TILT UP and TILT DOWN buttons are pressed, the table will not move (all other functions work).	Tilt capacitor is weak or blown.	Replace suspect tilt capacitor with known working tilt capacitor.	Replace tilt capacitor. Refer to para 4.6.
		Thermal overload switch in tilt actuator is activated.	_	Wait 10 to 20 minutes to allow tilt actuator motor to cool.
		5 amp TILT fuse for TILT UP and TILT DOWN functions is blown.	Refer to Figure 2-2 for this check. Perform continuity check on 5 amp TILT fuse.	Replace blown fuse(s). Refer to para 5.2.
		Wire connections loose.	Check all wiring connections to tilt actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Tilt actuator assembly is malfunctioning.	Replace suspect tilt actuator assembly with known working tilt actuator assembly.	Replace actuator motor or tilt actuator assembly. Refer to para 4.14 or 4.5.
		PC control board is malfunctioning.	Refer to Figure 2-2 for this check. Press TILT UP and then TILT DOWN button while observing the PC control board. The TILT UP L.E.D. should illuminate when the TILT UP button is pressed and the TILT DOWN L.E.D. should illuminate when the TILT DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
TABLE UP and TABLE DOWN functions do not work. All other functions work.	When TABLE UP and TABLE DOWN buttons are pressed, the table will not move (all other functions work).	Base capacitor is weak or blown.	Replace suspect base capacitor with known working base capacitor.	Replace base capacitor. Refer to para 4.12.
		Thermal overload switch in base actuator motor is activated.	_	Wait 10 to 20 minutes to allow base actuator to cool.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
TABLE UP and TABLE DOWN functions do not work. All other functions work. - Continued	When TABLE UP and TABLE DOWN buttons are pressed, the table will not move (all other functions work). - Continued	5 amp BRAKE/ BASE fuse for TABLE UP, TABLE DOWN, and base brake functions is blown.	Refer to Figure 2-2 for this check. Perform continuity check on 5 amp BRAKE/BASE fuse.	Replace blown fuse(s). Refer to para 5.2.
		Wire connections loose.	Check all wiring connections to base actuator assembly and base brake solenoid.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Base actuator assembly is malfunctioning.	Replace suspect base actuator assembly with known working base actuator assembly.	Replace base actuator assembly. Refer to para 4.11.
		PC control board is malfunctioning.	Refer to Figure 2-2 for this check. Press TABLE UP and then TABLE DOWN button while observing the PC control board. The TABLE UP L.E.D. and BRAKE/BASE L.E.D. should illuminate when the TABLE UP button is pressed and the TABLE DOWN L.E.D. and the BRAKE/BASE L.E.D. should illuminate when the TABLE DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
		Brake on base actuator is malfunctioning.	_	Replace base actuator. Refer to para 4.11.
FOOT UP and FOOT DOWN functions do not work. All other functions work.	When FOOT UP and FOOT DOWN buttons are pressed, the table will not move (all other functions work).	Foot capacitor is weak or blown.	Replace suspect foot capacitor with known working foot capacitor.	Replace foot capacitor. Refer to para 4.10.
		Thermal overload switch in foot actuator is activated.	_	Wait 10 to 20 minutes to allow foot actuator motor to cool.
		5 amp FOOT fuse for FOOT UP and FOOT DOWN functions is blown.	Refer to Figure 2-2 for this check. Perform continuity check on 5 amp FOOT fuse.	Replace blown fuse(s). Refer to para 5.2.
		Wire connections loose.	Check all wiring connections to foot actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Foot actuator assembly is malfunctioning.	Replace suspect foot actuator assembly with known working foot actuator assembly.	Replace actuator motor or foot actuator assembly. Refer to para 4.14 or 4.9.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
FOOT UP and FOOT DOWN functions do not work. All other functions work. - Continued	When FOOT UP and FOOT DOWN buttons are pressed, the table will not move (all other functions work). - Continued	PC control board is malfunctioning.	Refer to Figure 2-2 for this check. Press FOOT UP and then FOOT DOWN button while observing the PC control board. The FOOT UP L.E.D. should illuminate when the FOOT UP button is pressed and the FOOT DOWN L.E.D. should illuminate when the FOOT DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
BACK UP function works, but BACK DOWN function does not or BACK DOWN function works, but BACK UP function does not. All other functions work.	One function operates properly, but the other does not.	Wire connections loose.	Check all wiring connections to back actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Back actuator assembly is malfunctioning.	Replace suspect back actuator assembly with known working back actuator assembly.	Replace actuator motor or back actuator assembly. Refer to para 4.14 or 4.7.
		PC control board is malfunctioning (relay for up or down function is malfunctioning).	Refer to Figure 2-2 for this check. Press BACK UP and then BACK DOWN button while observing the PC control board. The BACK UP L.E.D. should illuminate when the BACK UP button is pressed and the BACK DOWN L.E.D. should illuminate when the BACK DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
		Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		BACK UP or BACK DOWN footswitch is malfunctioning.	Perform a continuity check on suspect foot switch.	Replace footswitch. Refer to para 4.25.
TILT UP function works but TILT DOWN function does not or TILT DOWN function works, but TILT UP function does not. All other functions work.	One function operates properly, but the other does not.	Wire connections loose.	Check all wiring connections to tilt actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Tilt actuator assembly is malfunctioning.	Replace suspect tilt actuator assembly with known working tilt actuator assembly.	Replace actuator motor or tilt actuator assembly. Refer to para 4.14 or 4.5.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
TILT UP function works but TILT DOWN function does not or TILT DOWN function works, but TILT UP function does not. All other functions work. - Continued	One function operates properly, but the other does not. - Continued	PC control board is malfunctioning (relay for up or down function is malfunctioning).	Refer to Figure 2-2 for this check. Press TILT UP and then TILT DOWN button while observing the PC control board. The TILT UP L.E.D. should illuminate when the TILT UP button is pressed and the TILT DOWN L.E.D. should illuminate when the TILT DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
		Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		TILT UP or TILT DOWN footswitch is malfunctioning.	Perform a continuity check on suspect footswitch.	Replace footswitch. Refer to para 4.25.
TABLE UP function works, but TABLE DOWN function does not or TABLE DOWN function works, but TABLE UP function does not. All other functions work.	One function operates properly, but the other does not.	Wire connections loose.	Check all wiring connections to base actuator.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Either base down limit switch or base up limit switch is malfunctioning.	Perform continuity check on N.C. limit switches (limit switch tripped = open).	Replace base up limit switch (Refer to para 4.16) or base down limit switch (Refer to para 4.15).
		Base actuator assembly is malfunctioning.	Replace suspect base actuator assembly with known working base actuator assembly.	Replace base actuator assembly. Refer to para 4.11.
		PC control board is malfunctioning (relay for up or down function is malfunctioning).	Refer to Figure 2-2 for this check. Press TABLE UP and then TABLE DOWN button while observing the PC control board. The TABLE UP L.E.D. and BRAKE/BASE L.E.D. should illuminate when the TABLE UP button is pressed and the TABLE DOWN L.E.D. and the BRAKE/BASE L.E.D. should illuminate when the TABLE DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
		Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control panel.	Replace hand control switch panel. Refer to para 4.20.

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
TABLE UP function works, but TABLE DOWN function does not or TABLE DOWN function works, but TABLE UP function does not. All other functions work. - Continued	One function operates properly, but the other does not. - Continued	TABLE UP or TABLE DOWN footswitch is malfunctioning.	Perform a continuity check on suspect footswitch.	Replace footswitch. Refer to para 4.25.
FOOT UP function works, but FOOT DOWN function does not or FOOT DOWN function works, but FOOT UP function does not. All other functions work.	One function operates properly, but the other does not.	Wire connections loose.	Check all wiring connections to foot actuator assembly.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Foot actuator assembly is malfunctioning.	Replace suspect foot actuator assembly with known working foot actuator assembly.	Replace actuator motor or foot actuator assembly. Refer to para 4.14 or 4.9.
		PC control board is malfunctioning (relay for up or down function is malfunctioning).	Refer to Figure 2-2 for this check. Press FOOT UP and then FOOT DOWN button while observing the PC control board. The FOOT UP L.E.D. should illuminate when the FOOT UP button is pressed and the FOOT DOWN L.E.D. should illuminate when the FOOT DOWN button is pressed. If not, the PC control board is malfunctioning.	Replace PC control board. Refer to para 4.3 or 4.4.
		Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		FOOT UP or FOOT DOWN footswitch is malfunctioning.	Perform a continuity check on suspect footswitch.	Replace footswitch. Refer to para 4.25.
TABLE DOWN, FOOT DOWN, AND TILT DOWN functions do not work. All other functions work.	When TABLE DOWN, FOOT DOWN, or TILT DOWN buttons are pressed, the table will not move (all other functions work). Foot Extension lamp on hand control illuminates.	Foot rest extension is not pushed in all the way.	Check that foot rest extension is pushed in all the way.	Push foot rest extension in all the way.
		Foot rest extension limit switch, foot actuator limit switch, and/or base actuator limit switch malfunctioning.	Perform continuity check on limit switches.	Replace limit switch(es). Refer to para 4.31, 4.32, or 4.33.
		PC control board is malfunctioning.	Replace suspect PC board with known working PC board.	Replace PC board. Refer to para 4.3 or 4.4.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
The Back, Tilt, or Foot function drifts by itself.	Function operates properly otherwise.	Actuator is malfunctioning.	Replace suspect actuator assembly with known working actuator assembly.	Replace actuator assembly. Refer to para 4.5, 4.7, 4.9, or 4.11..
Base function drifts by itself.	Base function operates properly otherwise.	Base brake is malfunctioning.	Replace suspect base actuator with known working base actuator.	Replace base actuator. Refer to para 4.11.
Table moves fine for light patient, but will not move or moves slowly for very heavy patient.	Heavy patients cause table to malfunction.	Low voltage is being supplied to table.	Check voltage at wall receptacle - should be: ***Applies to 419 (-003 & -004) only:*** 115 ±10% VAC ***Applies to 419 (-005 & -006) only:*** 230 ±10% VAC	Correct low voltage situation at wall receptacle.
		Table overloaded with too heavy of a patient.	Maximum weight capacity of table is 325 lbs (147.4 kg).	Inform table operator of weight limitation.
		Capacitor for suspect function is weak.	Replace suspect capacitor with known working capacitor.	Replace capacitor.
Whirling or squeaking noise is heard when an actuator assembly is being run.	Noisy actuator.	Foreign matter on ball screw threads and / or lack of lubricant.	Check for foreign matter on ball screw threads. Check for lack of lubricant on ball screw threads.	Clean all foreign matter off of ball screw threads. Coat ball screw threads with STP treatment oil or equivalent. If actuator assembly is still noisy, replace it.
Excessive sideways play of table top.	Table is not stable and can be moved from side to side.	Eccentric bearing(s) not tight or chain assemblies are loose.	Check for loose eccentric bearing(s) and check tension of chain assemblies.	Adjust eccentric bearing(s) or adjust tension of chain assembly. Refer to para 4.17.
		Base slide assembly is worn or deformed.	Check condition of base slide assembly.	Replace base slide assembly. Refer to para 18.
		Table base is not resting firmly on floor.	Check to verify all four leveling screws are contacting the floor.	Adjust the leveling screws; there is one located under each corner of the base.
Excessive sideways play of back section.	Back section feels loose and can be moved from side to side.	Back slide bearing(s) worn or missing.	Replace back slide bearing(s).	Replace back slide bearing(s). Refer to para 4.30.
Armrest is not operating properly.	Armrest does not lock into one of its two positions.	Armrest release knob is not returning due to dirt buildup, weak spring, or damaged components.	Check for dirt in mechanism. Check for weak spring or damaged components.	Clean mechanism. If necessary, replace weak spring, or damaged components. Refer to para 4.29.
Headrest is not operating properly.	Headrest assembly slides downward on its own or moves out of position too easily.	Headrest slide mechanism needs adjusted (tightened).	Check adjustment of headrest slide mechanism.	Adjust headrest slide mechanism. Refer to para 4.28.
	Headrest assembly takes excessive force to position.	Headrest slide mechanism needs adjusted (loosened).	Check adjustment of headrest slide mechanism.	Adjust headrest slide mechanism. Refer to para 4.28.
	Headrest joints move even though headlock release button has not been depressed.	Stop pins in headrest joints not creating a positive lock due to weak spring, dirt, or wear of components.	Check for weak springs or dirt. Also check for worn components such as a mushroomed stop pin or pin stop block.	Clean headrest components. Replace any worn or damaged componets. Lubricate components with a silicone based lubricant. Refer to para 4.27.

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
The Troubleshooting Guide entries below apply only to the programmable tables (419-004 and 419-006)				
HOME POSITION function does not operate properly. All other functions work.	Nothing happens when the HOME POSITION button is pressed.	Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		HOME POSITION footswitch is malfunctioning.	Perform continuity check on HOME POSITION footswitch.	Replace footswitch. Refer to para 4.25.
		Base down limit switch is tripped.	Table top is already lowered all the way down, tripping limit switch.	Inform operator of minimum height of table.
		Base down limit switch is malfunctioning - stuck closed.	Perform continuity check on base down limit switch (limit switch is N.C. when not tripped).	Replace base down limit switch. Refer to para 4.15.
		Base actuator is running so slow that the minimum table top height is not reached before the 18 second time limit stops the base actuator.	Replace the base actuator and / or base capacitor with known working components.	Replace base capacitor. Refer to para 4.12. If this does not correct the problem, replace the base actuator. Refer to para 4.11.
	When HOME POSITION button is pressed, the base actuator continues to run/ hum when the table top is completely lowered (for approximately another 7 - 10 seconds).	Base down limit switch is malfunctioning (stuck closed).	Perform continuity check on N.C. base down limit switch (tripped = open).	Replace base down limit switch. Refer to para 4.15. Because the base actuator does not freewheel, it may have been damaged. Check and replace if necessary. Refer to para 4.11.
		Base down limit switch is out of adjustment.	Check adjustment of base down limit switch.	Adjust base down limit switch. Refer to para 4.15.
Table cannot be programmed or moved to previously programmed position.	When operator attempts to store a position into the PC control board's memory, it is not successful.	Incorrect steps taken for entry of position.	Refer to the Operator's manual for proper procedure.	Refer the operator to the Operator's manual for proper procedure.
		Hand control switch panel of hand control is malfunctioning (a switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		Position "1", "2", "3", "4", or PROGRAM footswitch is malfunctioning.	Perform continuity check on suspect footswitch.	Replace footswitch. Refer to para 4.25.
		PC control board cannot read a position sensor correctly, resulting in an error code.	Unplug table for at least ten seconds, plug table back in, and then look for presence of error codes.	If error codes are displayed on hand control, use error code chart in Table 5-2 to determine cause of error or see below in this Troubleshooting Guide.
		PC control board is malfunctioning.	Replace suspect PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
		PC control board needs calibrated.	_	Perform calibration of PC control board. Refer to para 4.2.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Table cannot be programmed or moved to previously programmed position. - Continued	Table does not move to its correct programmed position when Position "1", "2", "3", or "4" button is pressed.	Foot rest extension is not pushed in all the way.	Check if the Foot Rest Extension lamp is flashing; will flash as long as a Position button remains pressed and foot extension is not stowed.	Push foot extension in all the way.
		No position was programmed into the PC control board's memory for that Position button.	Check if the PROGRAM MODE lamp is flashing; it will flash when a Program Position button is pressed which does not have a valid table position stored into its memory.	Inform the operator of the proper procedure for programming a table top position into memory for a Position button.
		The PC control board cannot read a position sensor correctly, resulting in an error code.	Unplug table, plug table back in, and then observe hand control for presence of error codes.	If error codes are displayed on hand control, use error code chart in Table 5-2 to determine cause of error.
		PC control board is malfunctioning.	Replace suspect PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
		Hand control switch panel of hand control is malfunctioning (a switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		Position "1", "2", "3", or "4" footswitch is malfunctioning.	Perform continuity check on suspect footswitch.	Replace footswitch. Refer to para 4.25.
		Foot Section Crash Protection Circuit limit switch(es) malfunctioning.	Check continuity of Foot Section Crash Protection Circuit limit switches.	Replace limit switch(es). Refer to para 4.31, 4.32, and/or 4.33.
	Table moves toward the correct programmed position, but one of the functions stops short.	The position sensor for the suspect function is out of adjustment; the position sensor travels past its limit and enters a "dead spot" (a dead spot is where the voltage output of the sensor does not change even when its associated function is moving).	Run the function to one of its limits and connect a multimeter to the Test Points for the suspect position sensor (Refer to para 4.37, 4.38, 4.39, or 4.40). Then, press a button for 1/10 second and observe multimeter reading to see if it has changed. If it hasn't, the position sensor is in a dead spot and must be readjusted. Repeat for functions other limit.	Adjust the position sensor for the suspect function. If the adjustment is not successful, replace the position sensor. Refer to para 4.37, 4.38, 4.39, and/or 4.40.
		Foot Extension Protection Circuit limit switch(es) malfunctioning.	Check continuity of Foot Extension Protection Circuit limit switches.	Replace limit switch(es). Refer to para 4.31, 4.32, and/or 4.33.

Printed in U.S.A.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
When Programmed Position button "1", "2", "3", or "4" is pressed, nothing happens. All other functions work properly.	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 11** (system calibration not completed due to error condition) is displayed on foot/hand control. See Table 5-2 for explanation of error codes and how to read them.	The PC control board has detected an error condition such as Foot Section Crash Protection Circuit is open, STOP button was pressed, etc., which has prevented the system calibration routine from completing successfully.	–	Perform a new system calibration. Refer to para 4.2.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 12** (invalid data received from foot/hand) is displayed on foot control. See Table 5-2 for explanation of error codes and how to read them.	The PC control board has detected a problem with the foot/hand control.	Check the foot control interface board and hand control PC board.	Replace foot control PC board (Refer to para 4.23) or hand control PC board (Refer to para 4.20).
		PC control board is malfunctioning.	Replace PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 21** (base position sensor output voltage did not change when expected during a position recall) is displayed on foot/hand control. See Table 5-2 for explanation of error codes and how to read them.	Base position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if base position sensor is adjusted correctly or if bolt is loose.	Adjust the base position sensor. Refer to para 4.40.
		Base position sensor is malfunctioning.	Replace base position sensor with known working base position sensor.	Replace base position sensor. Refer to para 4.40.
		Base reducer assembly is malfunctioning.	Check to see if the base reducer assembly is set up and operating properly.	Repair the base reducer assembly. Refer to para 4.40.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from base position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
When Programmed Position button “1”, “2”, “3”, or “4” is pressed, nothing happens. All other functions work properly. - Continued	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 22** (base position sensor output voltage did not increase or decrease as expected during system calibration or position recall) is displayed on foot/hand control. See Table 5-2 for explanation of error codes and how to read them.	Base position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if base position sensor is adjusted correctly or if bolt is loose.	Adjust the base position sensor. Refer to para 4.40.
		Base reducer assembly is malfunctioning.	Check to see if the base reducer assembly is set up and operating properly.	Repair the base reducer assembly. Refer to para 4.40.
		Base position sensor is malfunctioning.	Replace base position sensor with known working base position sensor.	Replace base position sensor. Refer to para 4.40.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from base position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 23** (program position not stored due to A/D conversion error reading base position sensor) is displayed on foot/hand control. See Table 5-2 for explanation of error codes and how to read them.	The PC control board is malfunctioning.	Replace PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 24** (tilt position sensor output voltage did not change when expected during a position recall) is displayed on foot/hand control. See Table 5-2 for explanation of error codes and how to read them.	Tilt position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if tilt position sensor is adjusted correctly or if bolt is loose.	Adjust the tilt position sensor. Refer to para 4.38.
		Tilt position sensor is malfunctioning.	Replace tilt position sensor with known working tilt position sensor.	Replace tilt position sensor. Refer to para 4.38.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from tilt position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
When Programmed Position button “1”, “2”, “3”, or “4” is pressed, nothing happens. All other functions work properly. - Continued	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 25** (tilt position sensor output voltage did not increase or decrease as expected during system calibration or position recall) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	Tilt position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if tilt position sensor is adjusted correctly or if bolt is loose.	Adjust the tilt position sensor. Refer to para 4.38.
		Tilt position sensor is malfunctioning.	Replace tilt position sensor with known working tilt position sensor.	Replace tilt position sensor. Refer to para 4.38.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from tilt position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 26** (program position not stored due to A/D conversion error reading tilt position sensor) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	The PC control board is malfunctioning.	Replace PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 31** (back position sensor output voltage did not change when expected during a position recall) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	Back position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if back position sensor is adjusted correctly or if bolt is loose.	Adjust the back position sensor. Refer to para 4.39.
		Back position sensor is malfunctioning.	Replace back position sensor with known working back position sensor.	Replace back position sensor. Refer to para 4.39.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from back position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

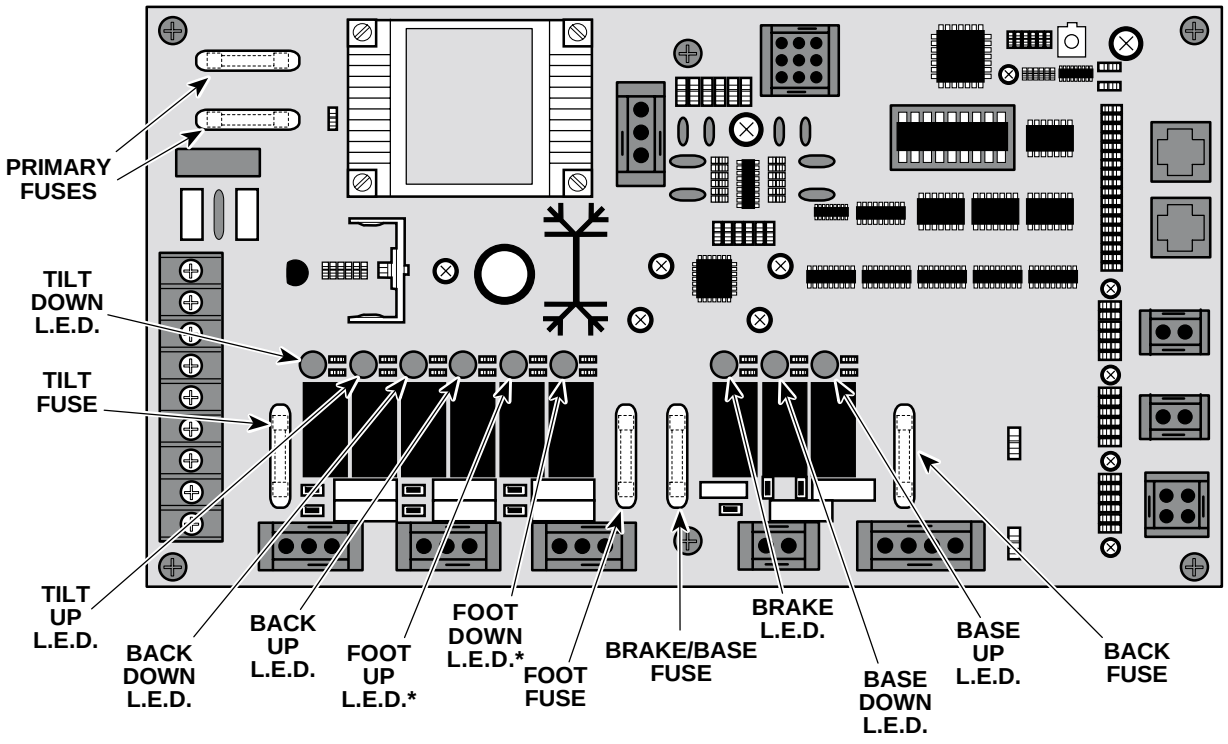
Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
When Programmed Position button “1”, “2”, “3”, or “4” is pressed, nothing happens. All other functions work properly. - Continued	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 32** (back position sensor output voltage did not increase or decrease as expected during system calibration or position recall) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	Back position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if back position sensor is adjusted correctly or if bolt is loose.	Adjust the back position sensor. Refer to para 4.39.
		Back position sensor is malfunctioning.	Replace back position sensor with known working back position sensor.	Replace back position sensor. Refer to para 4.39.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from back position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 33** (program position not stored due to A/D conversion error reading tilt position sensor) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	The PC control board is malfunctioning.	Replace PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 34** (foot position sensor output voltage did not change when expected during a position recall) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	Foot position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if foot position sensor is adjusted correctly or if bolt is loose.	Adjust the foot position sensor. Refer to para 4.37.
		Foot position sensor is malfunctioning.	Replace foot position sensor with known working foot position sensor.	Replace foot position sensor. Refer to para 4.37.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from foot position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
When Programmed Position button “1”, “2”, “3”, or “4” is pressed, nothing happens. All other functions work properly. - Continued	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 35** (foot position sensor output voltage did not increase or decrease as expected during system calibration or position recall) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	Foot position sensor is out of adjustment or bolt head to which position sensor is attached is loose and is not rotating properly.	Check to see if foot position sensor is adjusted correctly or if bolt is loose.	Adjust the foot position sensor. Refer to para 4.37.
		Foot position sensor is malfunctioning.	Replace foot position sensor with known working foot position sensor.	Replace foot position sensor. Refer to para 4.37.
		Wiring connections are dirty, torn, or loose.	Check all wiring connections from foot position sensor and PC control board.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	When table is unplugged (for at least ten seconds) and then plugged back in, **error code 36** (program position not stored due to A/D conversion error reading foot position sensor) is displayed on foot/hand control. See Table 5-1 for explanation of error codes and how to read them.	The PC control board is malfunctioning.	Replace PC control board with known working PC control board.	Replace PC control board. Refer to para 4.3 or 4.4.
STOP function does not operate properly. All other functions work.	Function does not stop when the STOP button is pressed.	Hand control switch panel of hand control is malfunctioning (switch membrane is malfunctioning).	Replace suspect hand control switch panel with known working hand control switch panel.	Replace hand control switch panel. Refer to para 4.20.
		STOP footswitch is malfunctioning.	Perform continuity check on STOP footswitch.	Replace footswitch. Refer to para 4.25.

PROGRAMMABLE PC CONTROL BOARD - 115/230 VAC



NON-PROGRAMMABLE PC CONTROL BOARD - 115/230 VAC

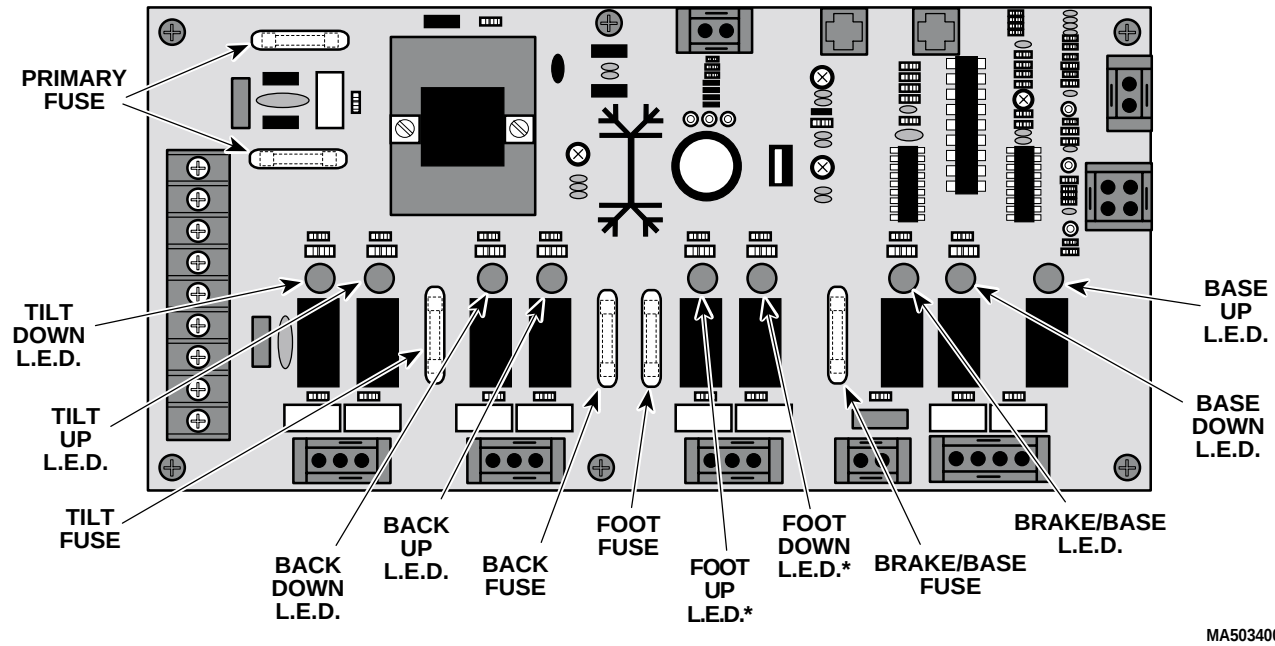


Figure 2-2. Fuse and Troubleshooting L.E.D. Location

**On some early units, the Foot Up and Foot Down relays are labeled incorrectly on the PC board (Foot Up relay labeled Foot Down / Foot Down relay labeled Foot Up). On later units the Foot Up/Down relays are identified by an adhesive label.*

SECTION III
SCHEDULED MAINTENANCE

3.1 Scheduled Maintenance

Table 3-1 is a Scheduled Maintenance Chart which lists the inspections and services that should be performed periodically on the 419 Power Procedure Table. These inspections and services should be performed as often as indicated in the chart.

Table 3-1. Scheduled Maintenance Chart

Interval	Inspection or Service	What to Do
Semi-annually	Obvious damage	Visually check condition of table for obvious damage such as: cracks in components, missing components, dents in components, or any other visible damage which would cause the table to be unsafe to operate or would compromise its performance. Repair table as necessary.
	Fasteners / hardware	Check table for missing or loose fasteners / hardware. Replace any missing hardware and tighten any loose hardware as necessary.
	Warning and instructional decals	Check for missing or illegible decals (see parts illustrations for decal locations and descriptions). Replace decals as necessary.
	Pivot points / moving parts / accessories	Lubricate all exposed pivot points, moving parts, and accessories with silicone based lubricant.
	Foot control	Check that foot control works correctly. Make sure all footswitches operate properly. Replace any malfunctioning footswitches. Refer to para. 4.24 or 4.25.
	Hand control (optional)	Check that hand control works correctly. Make sure all switch membranes work correctly. If necessary, replace hand control switch panel. Refer to para 4.20.
	Ball screws of actuator assemblies	Extend each actuator assembly and wipe ball screw threads down with a rag to remove foreign matter. Coat as much of the ball screw threads as possible with STP treatment oil or equivalent. Run each actuator assembly to both ends of its travel a couple of times to spread the oil evenly over all of the ball screw threads and then remove excess oil. If oil does not correct a squealing actuator assembly, replace actuator assembly.
	Drifting of actuator assemblies	Check each actuator assembly for drift. If drifting occurs, replace actuator assembly.
	Base actuator limit switches	Check that the base up limit switch and the base down limit switch stop the base actuator before it reaches its up or down limit; the base actuator does not freewheel and can be damaged if it reaches a limit. Adjust the limit switches if necessary. Refer to para 4.33.
	Foot rest extension	Check that foot extension can be easily extended. Make sure foot rest extension is latched securely in place when retracted.
	Foot Extension Protection Circuit	Raise the BASE, FOOT, and TILT sections to their maximum height; then pull foot extension out as far as it will go. Lower FOOT section approximately 1/2 way down, then depress BASE DOWN button on hand control. Base should lower approximately 1/2 way down then stop, and Foot Rest Extension lamp should flash. BASE DOWN, FOOT DOWN, and TILT DOWN functions should be inoperable, all other functions should work properly. If necessary, adjust or replace limit switches. Refer to para 4.31, 4.32, or 4.33.
	Excessive play in column assembly	Check that column assembly does not have excessive side to side play. If necessary, adjust eccentric bearings or tighten chain. Refer to para 4.18.
	Headrest Assembly	Check that headrest slide assembly can be positioned while having adequate friction to hold headrest assembly in place. If necessary, adjust friction setting of headrest slide assembly. Refer to para 4.28. ***Dbl Articulating:*** Check that headrest release button works properly and that headrest assembly locks securely in place at both pivot points. Replace headrest components as necessary. Refer to para 4.27. ***Triple Articulating:*** Check that headrest is adjusted properly. Place 45 lbs (20.4 kg) of static weight on headrest. Headrest should not drift down. Adjust headrest if necessay. Refer to para 4.xx.

Return To Table Of Contents

3-1. Scheduled Maintenance Chart

Interval	Inspection or Service	What to Do
Semi-annually	Arm Rests	Pull release knob and check that arm rests can be positioned easily and lock securely into two positions when knob is released. Replace arm rest components as necessary. Refer to para 4.29.
	Upholstery	Check all upholstery for rips, tears, or excessive wear. Replace cushions as necessary.
	Accessories	Check that all accessories have all of their components and that they function properly. If necessary, repair or replace the accessory.
	Operational Test	Perform an Operational Test to determine if the table is operating within its specifications (Refer to para 2.1). Replace or adjust any malfunctioning components.

Printed in U.S.A.

SECTION IV
MAINTENANCE / SERVICE INSTRUCTIONS

4.1 Introduction

WARNING
Refer to the Operator Manual for complete instructions on operating the table. Failure to do so could result in personal injury.

NOTE
Perform an operational test on the table after the repair is completed to confirm the repair was properly made and that all malfunctions were repaired.

The following paragraphs contain removal, installation, repair, and adjustment procedures for the table.

4.2 PC Control Board Calibration (Programmable Tables Only)

A. Clearing PC Control Board Error Code Memory.

NOTE
Be sure to record error code prior to performing clearing procedure. If necessary, refer to Section 5 - para 5.3.

(1) Unplug table power cord from outlet receptacle for at least ten seconds.

(2) Depress and hold the PROGRAM button (1, Figure 4-1) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp (2) and the FOOT REST EXTENSION lamp (3) will simultaneously illuminate for approximately 5 seconds and then go out.

(3) After the PROGRAM MODE lamp (2) and the FOOT REST EXTENSION lamp (3) go out, release the PROGRAM button (1).

Observe. After approximately 10 to 20 seconds, the PC control board will sound two beeps, indicating the error codes were successfully cleared from memory. If the two beeps do not sound, repeat the entire procedure

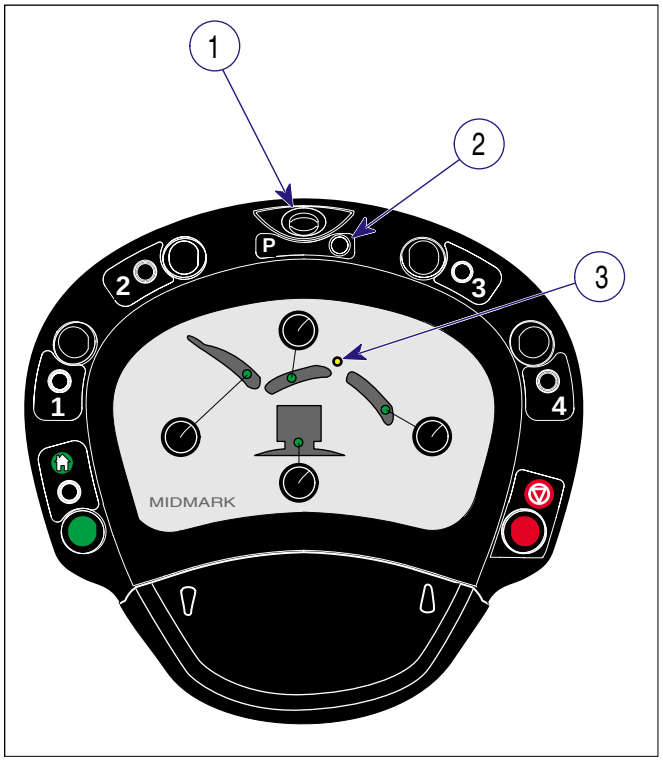


Figure 4-1. Clearing PC Control Board Memory

B. Calibrating PC Control Board.

(1) Unplug table power cord from outlet receptacle for at least ten seconds.

(2) Depress and hold the Position “1” button on foot/hand control (see Figure 4-2) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp (1, Figure 4-2) and the FOOT REST EXTENSION lamp (2) will illuminate for approximately three seconds and will then go out.

NOTE
When performing the following step, release the Position “1” button within three seconds after the PROGRAM MODE and FOOT REST EXTENSION lamps go out. Failure to do so will cause the calibration to fail.

(3) After the PROGRAM MODE lamp (1) and the FOOT REST EXTENSION lamp (2) go out, release Position "1" button.

NOTE
If performing calibration procedure using hand control, it is not necessary to press the DOWN button in the following step.

(4) Within 5 seconds, press and release the HOME position button (3) then immediately press and hold the DOWN pedal (4).

Observe. The PROGRAM MODE lamp (1) and FOOT REST EXTENSION lamp (2) will illuminate for three seconds and then go out.

(5) After the PROGRAM MODE lamp (1) and the FOOT REST EXTENSION lamp (2) go out, release DOWN button (4).

While table top moves through its calibration routine, apply a steady downward pressure on the back section to prevent it from "bouncing" which can cause the calibration to fail.

Observe. The table top will automatically begin to move; all functions will be run to their limits in the following order: Table Up, Foot Down, Foot Up, Tilt Up, Tilt Down, Back Down, Back Up, and Table Down. When the TABLE DOWN function is completely lowered, the calibration routine is complete. Also, the PC control board will sound a beep every two seconds, indicating a calibration routine is in progress.

(6) Check the foot/hand control; if the PROGRAM MODE lamp (1) and FOOT REST EXTENSION lamp (2) begin to flash, an error condition occurred which resulted in an unsuccessful calibration; repeat the entire procedure. If the PROGRAM MODE lamp and FOOT REST EXTENSION lamp do not begin to flash, the calibration was successful.

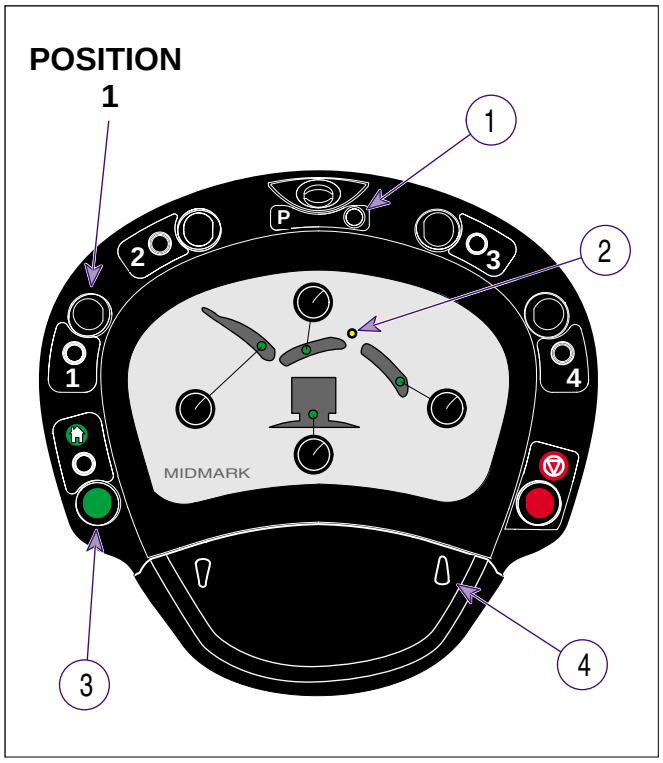


Figure 4-2. PC Control Board Calibration

4.3 PC Control Board Removal / Installation (Non-Programmable Tables Only)

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove two screws (1, Figure 4-3) and PC board cover (2) from base casting (3).

(3) Tag and disconnect eight wire harnesses (4) from PC control board (5).

(4) Tag and disconnect two modular cords (6) from PC control board (5).

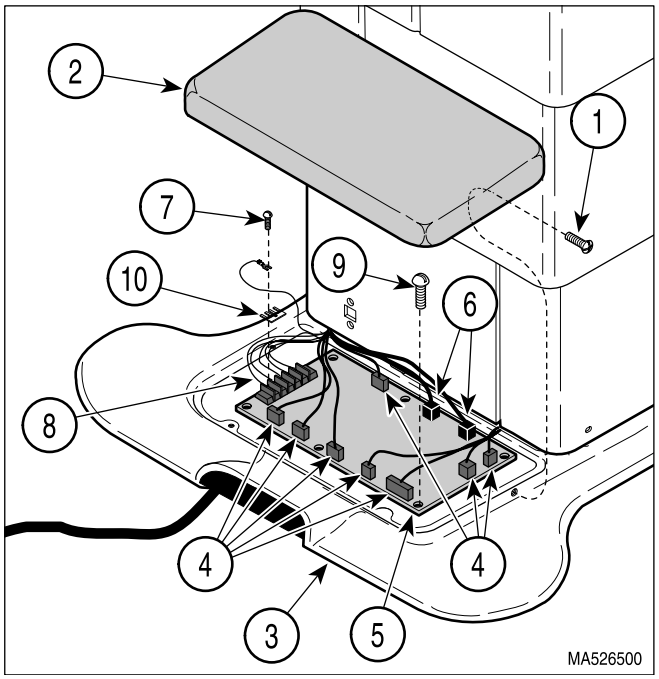


Figure 4-3. PC Control Board Removal / Installation (Non-programmable tables only)

(5) Loosen terminal screws (7); then tag and disconnect wires (8) from terminals of PC control board (5).

(6) Remove six screws (9) and PC control board (5) from base casting (3).

B. Installation

(1) Install PC control board (5) on base casting (3) and secure with six screws (9).

(2) Connect wires (8) to terminals of PC control board (5) and secure by tightening terminal screws (7). Make sure jumper strips (10) are installed.

(3) Connect two modular cords (6) to PC control board (5).

(4) Connect eight wire harnesses (4) to PC control board (5).

(5) Install PC board cover (2) on base casting (3) and secure with two screws (1).

(6) Plug table power cord into outlet receptacle.

4.4 PC Control Board Removal / Installation (Programmable Tables Only)

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove two screws (1, Figure 4-4) and PC board cover (2) from base casting (3).

(3) Tag and disconnect ten wire harnesses (4) from PC control board (5).

(4) Tag and disconnect two modular cords (6) from PC control board (5).

(5) Loosen terminal screws (7); then tag and disconnect wires (8) from terminals of PC control board (5).

(6) Remove six screws (9) and PC control board (5) from base casting (3).

B. Installation

(1) Install PC control board (5) on base casting (3) and secure with six screws (9).

(2) Connect wires (8) to terminals of PC control board (5) and secure by tightening terminal screws (7). Make sure jumper strips (10) are installed.

(3) Connect two modular cords (6) to PC control board (5).

(4) Connect ten wire harnesses (4) to PC control board (5).

(5) Depress and hold the PROGRAM / FAULT CLEAR button (11) while simultaneously plugging in the table power cord into the outlet receptacle.

Printed in U.S.A.

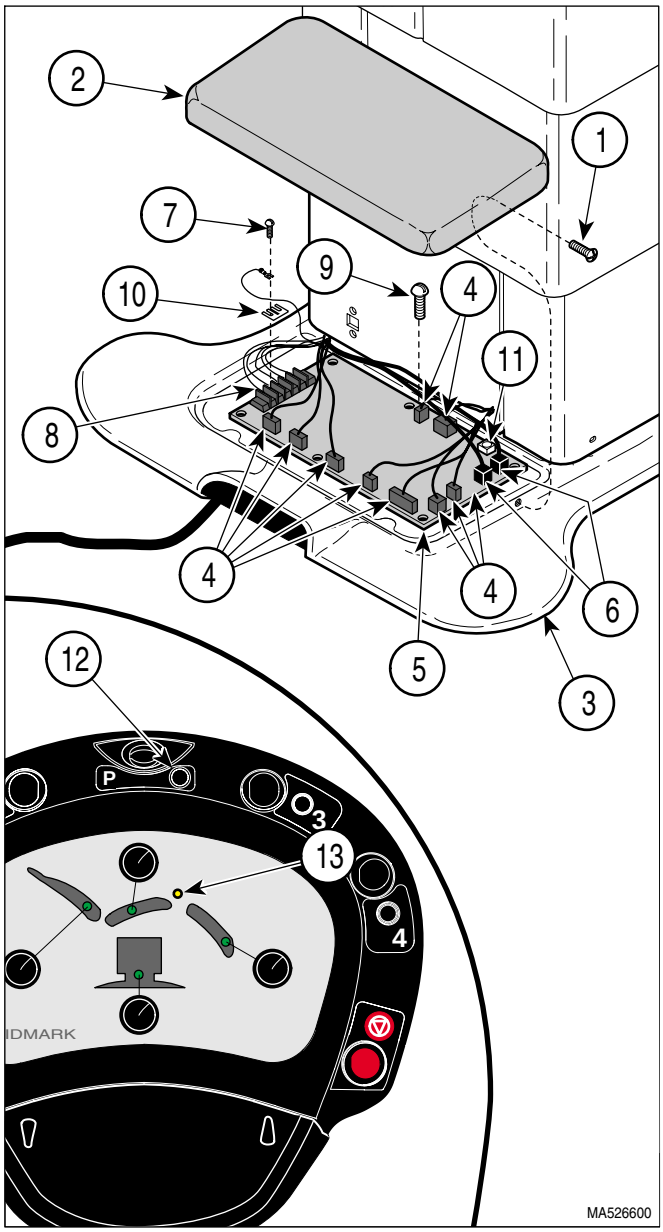


Figure 4-4. PC Control Board Removal / Installation (Programmable Tables Only)

Observe. The PROGRAM MODE lamp (12) and the FOOT REST EXTENSION lamp (13) will simultaneously illuminate for approximately three seconds and then go out.

(6) After the PROGRAM MODE lamp (12) and the FOOT REST EXTENSION lamp (13) go out, release the PROGRAM / FAULT CLEAR button (11).

Observe. After approximately 10 to 20 seconds, the PC control board will sound three beeps to indicate that the PC control board's memory has been successfully erased.

(7) Install PC board cover (2) on base casting (3) and secure with two screws (1).

(8) Calibrate the PC control board (Refer to para 4.2).

4.5 Tilt Actuator Removal / Installation

A. Removal

(1) Raise TABLE UP function all the way up.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-5) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(4) Lower middle outer shroud assembly (4) down out of way.

(5) Remove screw (1, Figure 4-6), ground wire (2), and lockwasher (3) from column adapter weldment (4).

(6) Cut two cable ties (A) securing actuator cable to tilt actuator assembly (5).

(7) Remove two screws (6) and connection cover (7) from column adapter weldment (4).

(8) Cut cable tie (B) securing wire harnesses to capacitor mounting bracket (8).

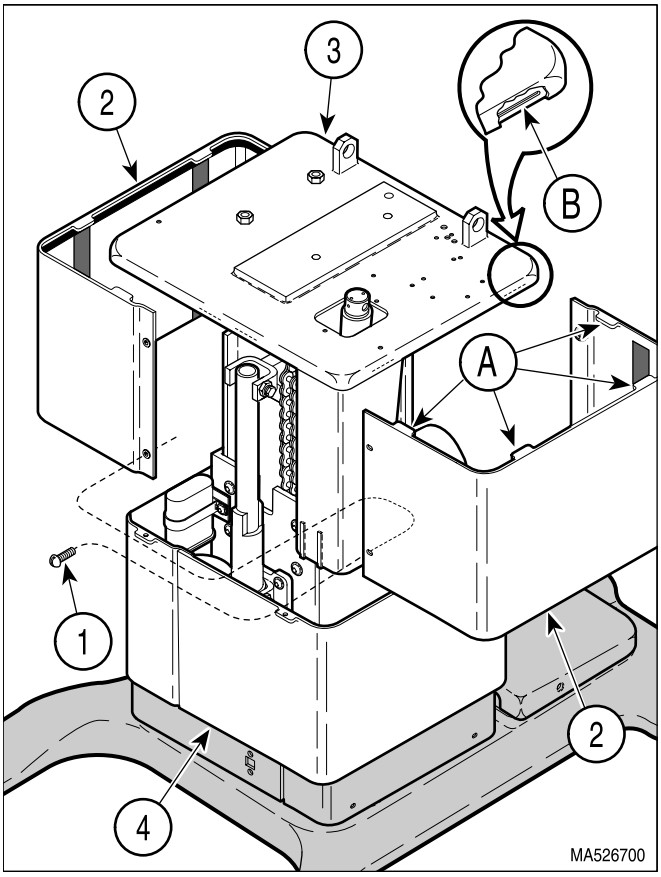


Figure 4-5. Shrouds Removal / Installation

(9) Disconnect actuator wire (9) from wire (10).

NOTE
Steps 10 thru 13 describe the procedure for 115 VAC units. Use these steps as a guide for 230 VAC units; the steps are similar.

(10) Using screwdriver, pry tab (C) of capacitor mounting bracket (8) outward; then remove tilt capacitor (11) from capacitor mounting bracket.

(11) Remove cap (12) from tilt capacitor (11).

DANGER
A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instruction could result in serious personal injury or death.

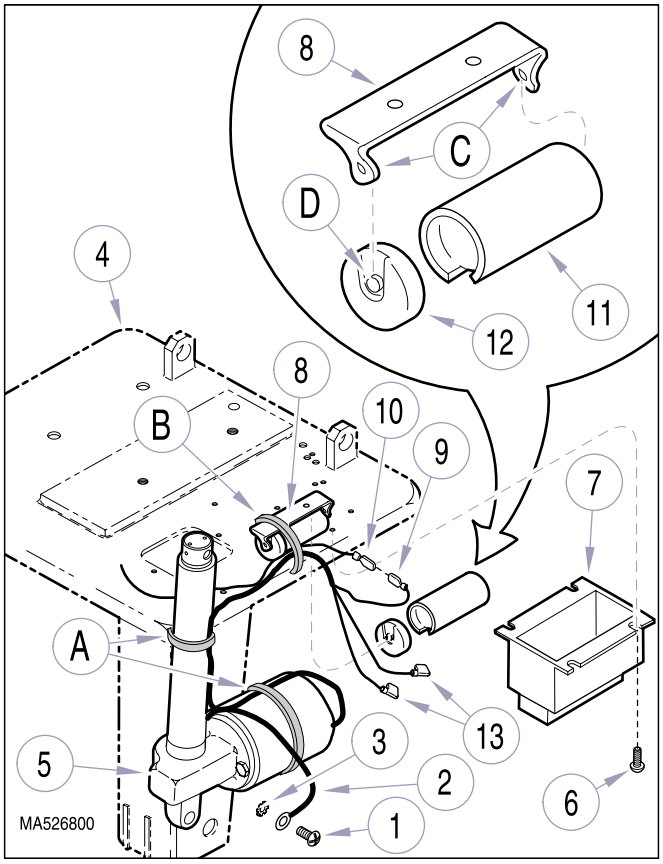


Figure 4-6. Tilt Actuator Wires Disconnection / Connection

(12) Discharge tilt capacitor (11).

(13) Tag and disconnect two actuator wires (13) from terminals of tilt capacitor (11); the yellow and orange wires do not need to be disconnected.

DANGER
Support foot end of table top while removing clevis pin to prevent foot end of table top from falling and striking technician. Failure to comply with these instructions could result in serious personal injury.

(14) Remove two e-rings (1, Figure 4-7) and clevis pin (2) securing base of tilt actuator (3) to column adapter weldment (4).

(15) Raise seat weldment (5) up far enough to get access to pivot pin (6). Using a block (A), support seat weldment in this position.

(16) Remove two e-rings (7) from pivot pin (6).

(17) Using a hammer and punch, drive pivot pin (6) out of seat weldment (5) and remove tilt actuator (3) from table.

(18) Remove nut (8) and ground wire (9) from tilt actuator (3).

B. Installation

(1) Install ground wire (9, Figure 4-7) on tilt actuator (3) and secure with nut (8).

(2) Install tilt actuator (3) on column adapter weldment (4) and secure with clevis pin (2) and two e-rings (1).

NOTE
Steps 3 thru 5 describe the procedure for 115 VAC units. Use these steps as a guide for 230 VAC units; the steps are similar.

(3) Connect two wires (13, Figure 4-6) to terminals of tilt capacitor (11).

(4) Install cap (12) on tilt capacitor (11).

(5) Position bottom of tilt capacitor (11) on capacitor mounting bracket (8) and then push the top of the capacitor inward. Using a screwdriver, force the tab (C) of the capacitor mounting bracket down over the catch (D) of the cap (12). Make sure tilt capacitor is held firmly in place.

(6) Connect actuator wire (9) to wire (10).

(7) Secure bundle of wire harnesses to capacitor mounting bracket (8) with cable tie (B).

(8) Install connection cover (7) on column adapter weldment (4) and secure with two screws (6).

(9) Secure actuator cable to tilt actuator (5) with two cable ties (A).

(10) Install lockwasher (3), and ground wire (2) on column adapter weldment (4) and secure with screw (1).

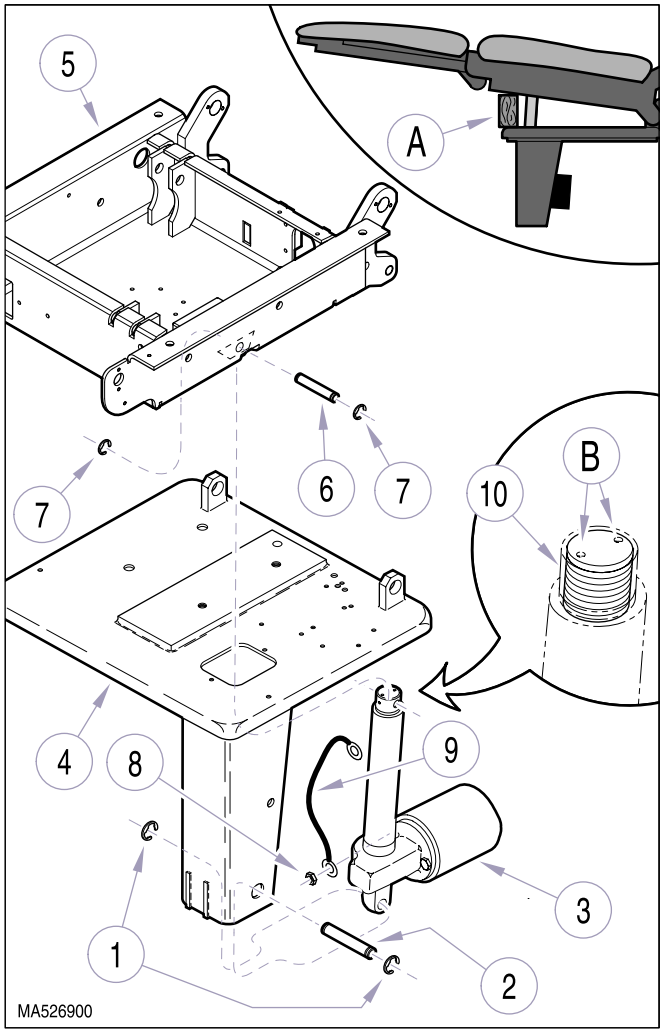


Figure 4-7. Tilt Actuator Removal / Installation

(11) Using spanner holes (B, Figure 4-7), unscrew adjustable clevis (10) until it is even with top of actuator rod.

(12) Plug table power cord into outlet receptacle.

(13) Run TILT UP function to extend rod of tilt actuator (3) 3 to 4 in. (7.6 to 10.2 cm).

(14) Remove support block (A); then temporarily connect tilt actuator (3) to seat weldment (5) with clevis pin (6).

CAUTION
If tilt actuator does not free wheel at end of stroke, seat weldment is hitting column adapter weldment. Do not allow this condition to exist: premature failure of tilt actuator will result.

(15) Lower TILT DOWN function all the way down (until tilt actuator can be heard free wheeling).

(16) **Observe.** Seat weldment (5) should be parallel with top of column weldment adapter (4). If seat weldment is parallel with top of column weldment adapter, go to step 21. If seat weldment is not parallel with top of column weldment adapter, go to step 17.

(17) Extend TILT UP function 3 to 4 in. (7.6 to 10.2 cm).

(18) Remove clevis pin (6) and block seat weldment (5) in this position.

(19) Using spanner holes (B), screw adjustable clevis (10) in or out as determined necessary in step 16.

(20) Repeat steps 16 thru 19 until seat weldment (5) is parallel with top of column adapter weldment (4) when tilt actuator (3) is free wheeling at the end of its down stroke.

(21) Secure clevis pin (6) in place with two e-rings (7).

(22) Install tabs (A, Figure 4-5) of R.H. and L.H. outer shrouds (2) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (4) is captured by R.H. and L.H. outer shrouds (2).

4.6 Tilt Capacitor Removal / Installation

A. Removal

(1) Raise TABLE UP function all the way up.

WARNING

Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-8) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(4) Lower middle outer shroud assembly (4) down out of way.

(5) Remove two screws (5) and connection cover (6) from column adapter weldment (3).

(6) Cut cable tie (A) securing wire harnesses to capacitor mounting bracket (7).

(7) Using screwdriver, pry tab (B) of capacitor mounting bracket (7) outward; then remove tilt capacitor (8) from capacitor mounting bracket.

NOTE

Steps 8 thru 10 describe the procedure for 115 VAC units. Use these steps as a guide for 230 VAC units; the steps are similar.

(8) Remove cap (9) from tilt capacitor (8).

DANGER

A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(9) Discharge tilt capacitor (8).

(10) Tag and disconnect four wires (10) from terminals of tilt capacitor (8); then remove tilt capacitor.

B. Installation

(1) Connect four wires (10) to terminals of tilt capacitor (8).

(2) Install cap (9) on tilt capacitor (8).

(3) Position bottom of tilt capacitor (8) on capacitor mounting bracket (7) and then push the top of the capacitor inward. Using a screwdriver, force the tab (B) of the capacitor mounting bracket down over the catch (C) of cap (9). Make sure tilt capacitor is held firmly in place.

(4) Secure bundle of wire harnesses to capacitor mounting bracket (7) with cable tie (A).

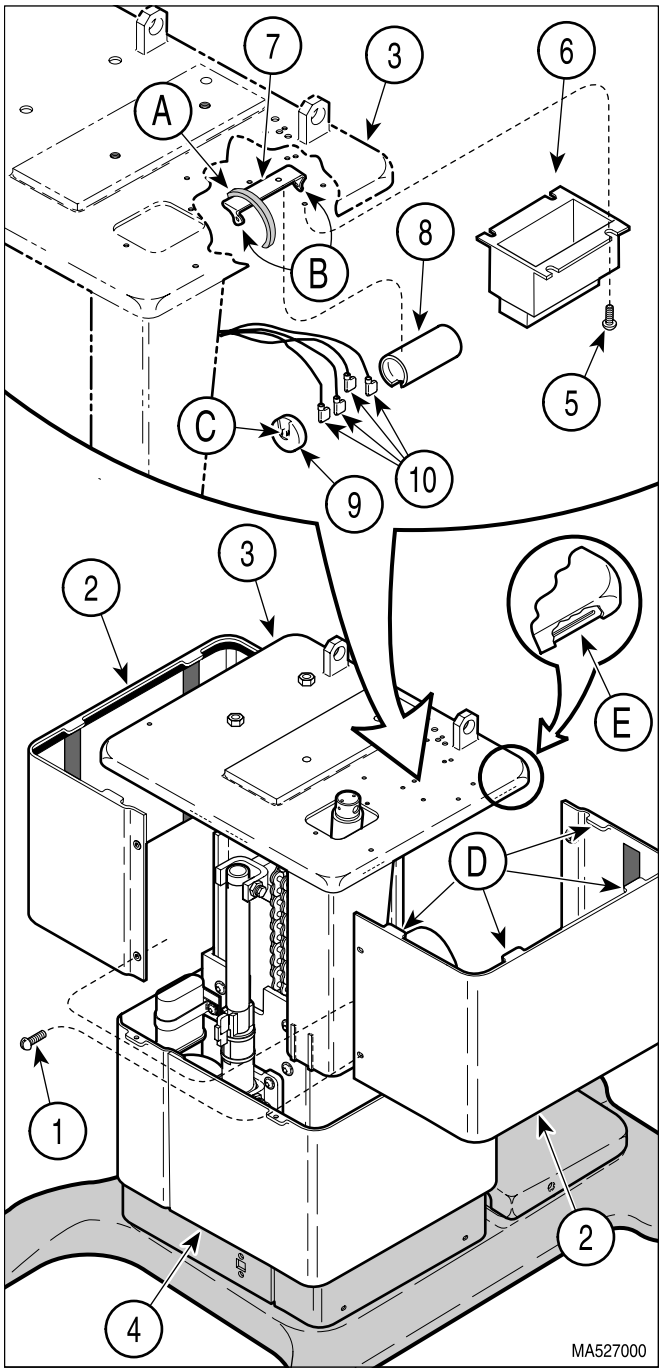


Figure 4-8. Tilt Capacitor Removal / Installation

(5) Install connection cover (6) on column adapter weldment (3) and secure with two screws (5).

(6) Install tabs (D) of R.H. and L.H. outer shrouds (2) in slots (E) column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (4) is captured by R.H. and L.H. outer shrouds (2).

(7) Plug table power cord into outlet receptacle.

4.7 Back Actuator Removal / Installation

A. Removal

(1) If possible, raise back section of table all the way up.

WARNING
The back section of the table is very heavy and will fall backward when clevis pin is removed. Use supports or an assistant to support back section when performing the following steps. Failure to comply with these instructions could result in serious personal injury or death.

(2) While supporting back section, remove bolt (1, Figure 4-9), and clevis pin (2) securing back actuator (3) to back weldment (4).

(3) Measure and record distance (A); then remove two set screws (5), and clevis (6) from back actuator (3).

(4) Using foot/hand control, retract back actuator as far as it will go; then lower back section.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in serious personal injury or death.

(5) Unplug table power cord from outlet receptacle.

(6) Remove four knobs (1, Figure 4-10) and seat upholstery (2).

(7) Remove two screws (3) and electrical cover (4).

(8) Remove screw (5) and wire clamp (6).

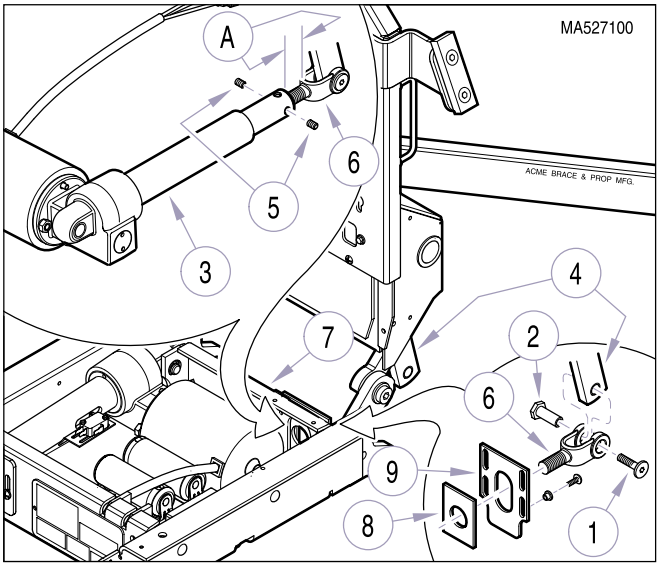


Figure 4-9. Back Actuator Removal/Installation

(9) Disconnect foot sensor wire harness (7) from wire harness (8); then pull foot sensor wire harness out thru access hole (A).

EQUIPMENT ALERT

Be sure all wires are clear of access hole (A) before driving clevis pin out. Failure to do so could result in damage to wiring harnesses.

(10) Remove two e-rings (9); then using a hammer and punch, drive clevis pin (10) outward thru access hole (A).

(11) Remove nut (11) and ground wire (12) from back actuator (13).

(12) Cut two cable ties (B); then disconnect back actuator wire (14) from wire (15).

(13) Using a screwdriver, pry tab (C) of mounting bracket (16) outward; then remove back capacitor (17) from mounting bracket.

(14) Remove cap (18) from back capacitor (17).

DANGER

A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(15) Discharge back capacitor (17).

(16) Tag and disconnect two actuator wires (19) from terminals of back capacitor (17); then remove back actuator (13).

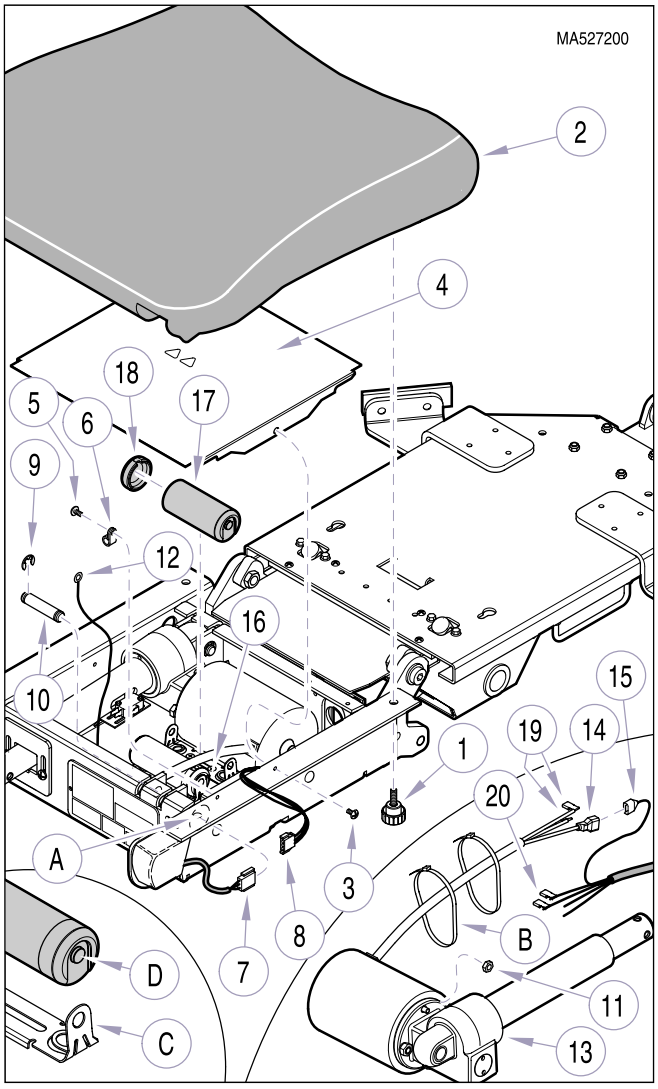


Figure 4-10. Back Actuator Removal/Installation

B. Installation

(1) Loosen two set screws (5, Figure 4-9); then remove clevis (6) from new back actuator (3).

(2) Install shaft of back actuator (3) thru seat weldment (7), inner cover (8), and outer cover (9).

(3) Connect two actuator wires (19, Figure 4-10) to terminals of back capacitor (17); then connect actuator wire (14) to wire (15).

(4) Install cap (18) on back capacitor (17).

(5) Position bottom of back capacitor (17) on mounting bracket (16); then push top of capacitor inward. Using a screwdriver, force tab (C) of mounting bracket over the catch (D) of cap (18). Make sure capacitor is held firmly in place.

(6) Install ground wire (12) on back actuator (13) and secure with nut (11).

(7) Install clevis pin (10) and secure with two e-rings (9).

(8) Insert foot sensor wire harness (7) thru access hole (A); then connect foot sensor wire harness to wire harness (8).

(9) Install wire clamp (6) and secure with screw (5).

(10) Secure wires together as a bundle using two or more cable ties (B).

(11) Install electrical cover (4) and secure with two screws (3).

(12) Install seat upholstery (2) and secure with four knobs (1).

WARNING
The back section of the table is very heavy and will fall backward when performing the following steps. Use supports or an assistant to support back section. Failure to comply with these instructions could result in serious personal injury or death.

(13) Raise back section; then while supporting back section, screw clevis (6, Figure 4-9) into back actuator (3) in until distance (A) is met; then tighten two set screws (5).

(14) Plug table power cord into wall outlet.

NOTE
To align clevis with back section, it may be necessary to extend back actuator by depressing BACK UP button on hand control.

(15) Secure clevis (6) to back weldment (4) with bolt (1), and clevis pin (2).

(16) Lower back section until back actuator can be heard freewheeling.

(17) **Observe.** Back section should be parallel with seat section. If back weldment is not parallel with seat section, go to step 18.

(18) While supporting back section, remove bolt (1), and clevis pin (2).

(19) Screw clevis (6) inward or outward as determined necessary in step 17.

(20) Secure clevis (6) to back weldment (3) with bolt (1), and clevis pin (2).

(21) Repeat steps 16 thru 20 until back section is parallel with seat section.

4.8 Back Capacitor Removal / Installation

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers / shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove four knobs (1, Figure 4-11) and seat upholstery (2).

(3) Remove two screws (3) and electrical cover (4).

(4) Cut two cable ties (5); then using a screwdriver, pry tab (A) of mounting bracket (6) outward; then remove back capacitor (7) from mounting bracket.

(5) Remove cap (8) from back capacitor (7).

DANGER
A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(6) Discharge back capacitor (7).

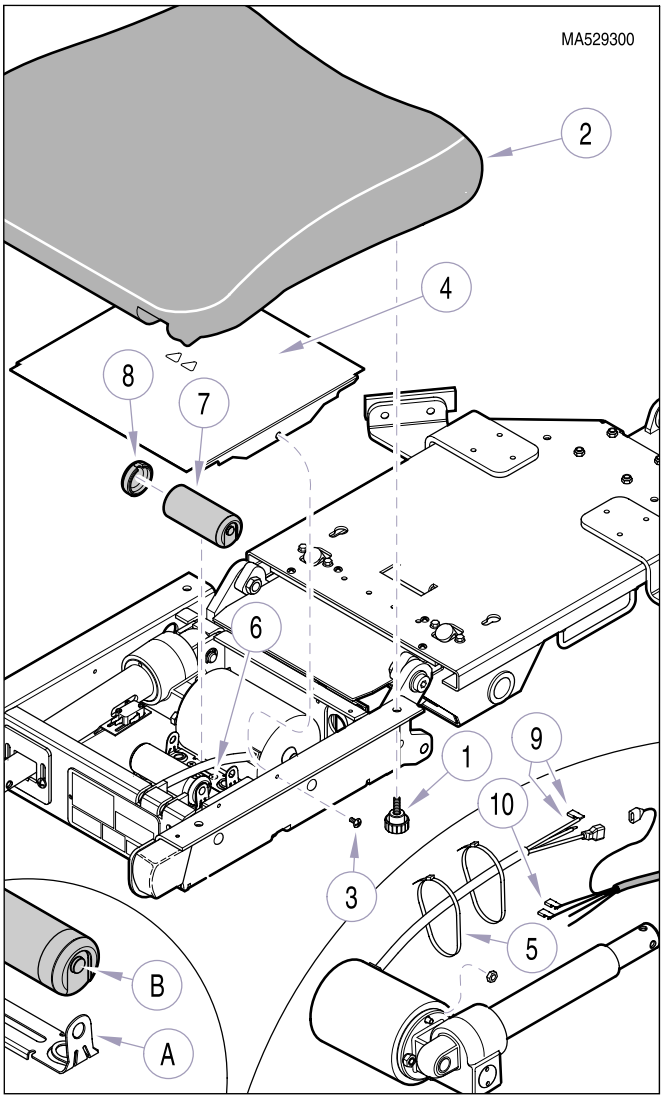


Figure 4-11. Back Capacitor Removal / Installation

(7) Tag and disconnect two actuator wires (9), and two wires (10) from terminals of back capacitor (7); then remove back capacitor from table.

B. Installation

(1) Connect two actuator wires (9), and two wires (10) to terminals of back capacitor (7).

(2) Install cap (8) on back capacitor (7).

(3) Position bottom of back capacitor (7) on mounting bracket (6); then push top of capacitor inward. Using a screwdriver, force tab (A) of mounting bracket over the catch (B) of cap (8). Make sure capacitor is held firmly in place.

(4) Secure wires together as a bundle using two or more cable ties (5).

(5) Install electrical cover (4) and secure with two screws (3).

(6) Install seat upholstery (2) and secure with four knobs (1).

4.9 Foot Actuator Removal / Installation

A. Removal

(1) If possible, raise foot section to its maximum height; then place supports (A, Figure 4-12) under foot section.

NOTE
If foot section is in its lowest position and will not raise, it may be necessary to remove screw (B) and shoulder spacer (C) before performing step 2.

(2) Remove two klip-rings (1) and clevis pin (2).

(3) Using foot/hand control, retract foot actuator (3) .

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers / shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

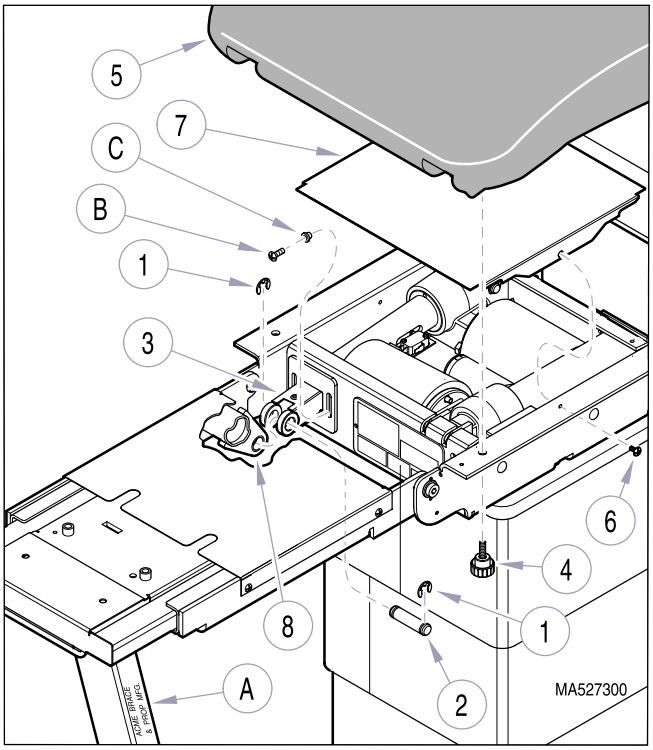


Figure 4-12. Foot Actuator Removal / Installation

(4) Unplug table from wall outlet.

(5) Remove four knobs (4) and seat upholstery (5).

(6) Remove two screws (6) and electrical cover (7).

(7) Cut two cable ties (1, Figure 4-13); then tag and disconnect two wires (2) from terminals of limit switch (3).

(8) Remove hole plug (4) and two klip-rings (5); then using a hammer and punch, drive clevis pin (6) out thru hole (A).

(9) Remove nut (7) and ground wire (8) from foot actuator (9).

(10) Disconnect foot actuator wire (10) from wire (11).

(11) Using a screwdriver, pry tab (B) of mounting bracket (12) outward; then remove foot capacitor (13) from mounting bracket.

(12) Remove cap (14) from foot capacitor (13).

DANGER

A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(13) Discharge foot capacitor (13).

(14) Tag and disconnect two actuator wires (15) from terminals of foot capacitor (13).

(15) Remove foot actuator (9); then remove two screws (16), two nuts (17), and limit switch (3) from foot actuator.

(16) Remove screw (18), nutsert (19), top clevis cover (20), and bottom clevis cover (21).

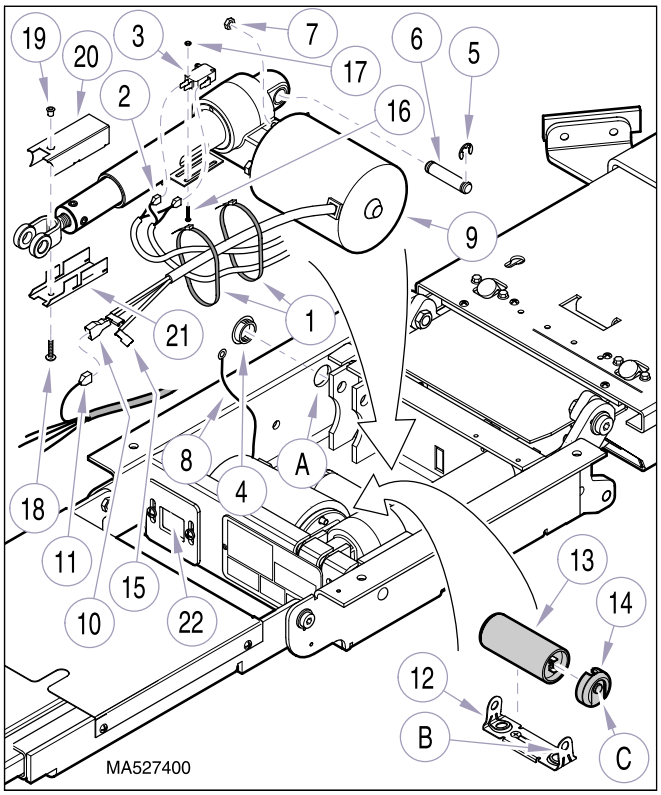


Figure 4-13. Foot Actuator Removal / Installation

B. Installation

(1) Install bottom clevis cover (21), top clevis cover (20), and nutsert (19); then secure with screw (18).

(2) Install limit switch (3) on foot actuator (9); then secure with two screws (16), and two nuts (17).

(3) Insert shaft of foot actuator (9) thru hole in seat weldment (22).

(4) Connect two actuator wires (15) to terminals of foot capacitor (13).

(5) Install cap (14) on foot capacitor (13).

(6) Position bottom of foot capacitor (13) on mounting bracket (12); then push top of capacitor inward. Using a screwdriver, force tab (B) of mounting bracket over the catch (C) of cap (14). Make sure capacitor is held firmly in place.

(7) Connect foot actuator wire (10) to wire (11).

(8) Install ground wire (8) onto foot actuator (9) and secure with nut (7).

(9) Connect two wires (2) to proper terminals of limit switch (3).

(10) Secure wires together as a bundle using two or more cable ties (1).

(11) Install clevis pin (6) and secure with two klip-rings (5); then install hole plug (4).

(12) Install electrical cover (7, Figure 4-12) and secure with two screws (6).

(13) Plug table power cord into wall outlet.

(14) Using foot/hand control, extend foot actuator (3) until actuator shaft aligns with foot section weldment (8).

(15) Install clevis pin (2) thru foot actuator (3) and foot section weldment (8) and secure with two klip-rings (1); then remove supports (A).

(16) Install seat upholstery (5) and secure with four knobs (4).

4.10 Foot Capacitor Removal / Installation

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers / shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove four knobs (1, Figure 4-14) and seat upholstery (2).

(3) Remove two screws (3) and electrical cover (4).

(4) Cut two cable ties (5); then using a screwdriver, pry tab (A) of mounting bracket (6) outward; then remove foot capacitor (7) from mounting bracket.

(5) Remove cap (8) from foot capacitor (7).

DANGER
A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(6) Discharge foot capacitor (7).

(7) Tag and disconnect two wires (9) and two wires (10) from terminals of foot capacitor (7); then remove foot capacitor from table.

B. Installation

(1) Connect two wires (9) and two wires (10) to terminals of foot capacitor (7).

(2) Install cap (8) on foot capacitor (7).

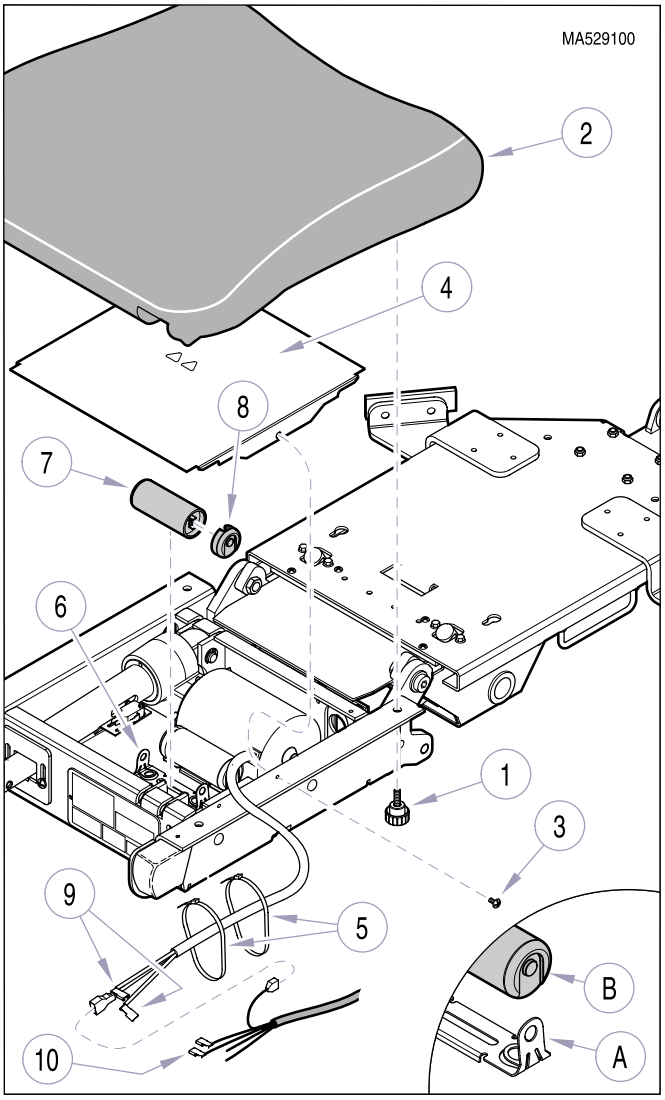


Figure 4-14. Foot Capacitor Removal / Installation

(3) Position bottom of foot capacitor (7) on mounting bracket (6); then push top of capacitor inward. Using a screwdriver, force tab (A) of mounting bracket over the catch (B) of cap (8). Make sure capacitor is held firmly in place.

(4) Secure wires together as a bundle using two or more cable ties (5).

(5) Install electrical cover (4) and secure with two screws (3).

(6) Install seat upholstery (2) and secure with four knobs (1).

4.11 Base Actuator Removal / Installation

A. Removal

(1) Run BASE UP function until table reaches its maximum height.

(2) Run TILT, FOOT, and BACK functions to level table top.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(3) Unplug table power cord from outlet receptacle.

(4) Remove four screws (1, Figure 4-15) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(5) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(6) Disconnect two modular cords (6) from two inlet PC boards (7).

(7) Remove four screws (8), and four screws (9); then partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(8) Place supports (A) under back section (B) and foot section (C).

(9) Remove two screws (1, Figure 4-16) and PC board cover (2) from base casting (3).

(10) Remove screw (4) and cable strap (A) from base casting (3). Cut cable strap.

(11) Cut all cable ties (B) securing base actuator wires to other wires.

(12) Remove plastic wrapping (5) from around wires.

(13) Disconnect base wire harness (6) and brake wire harness (7) from PC control board (8).

(14) Loosen screw (9).

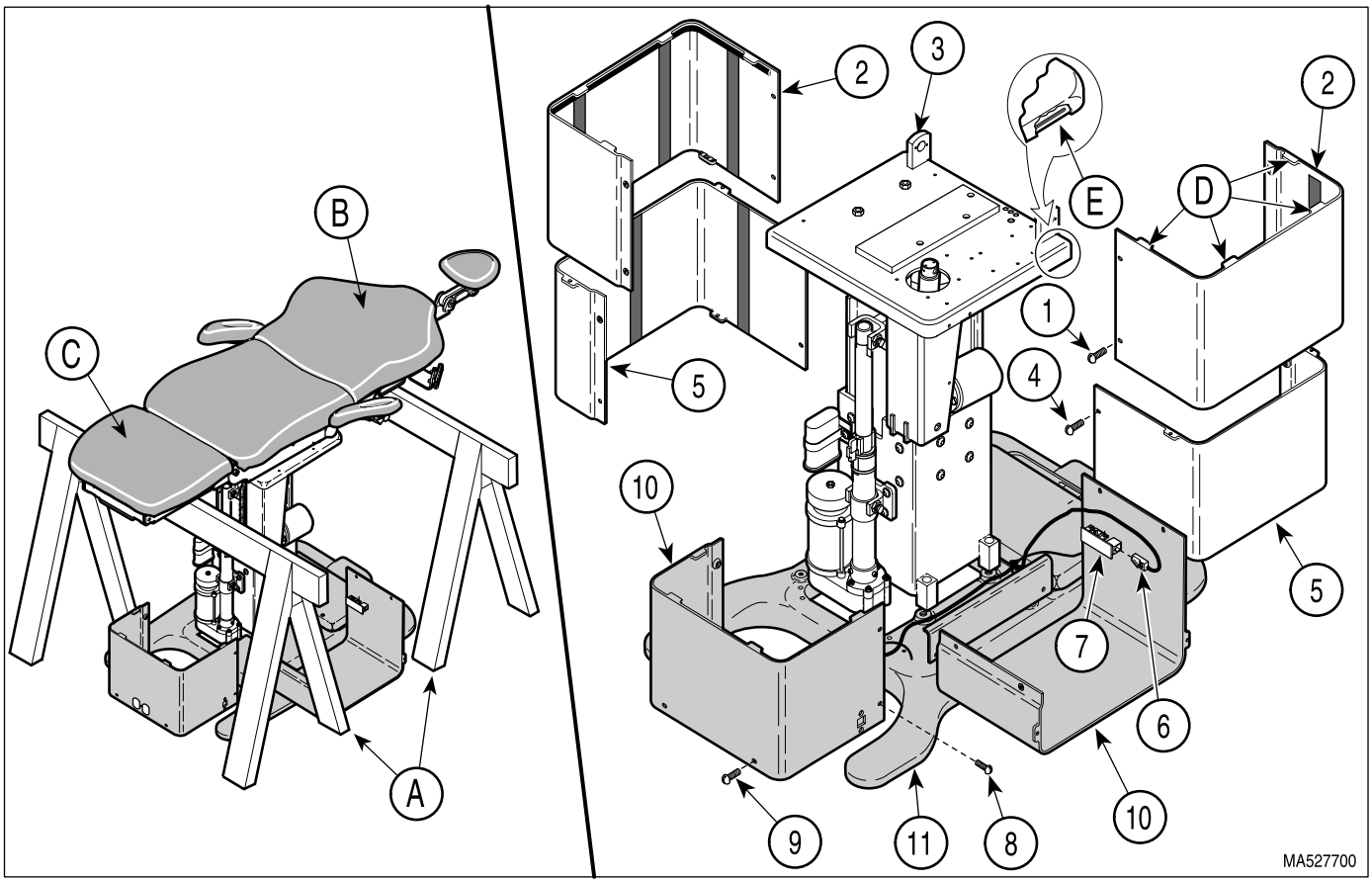


Figure 4-15. Base Shrouds Removal / Installation

(15) Push base capacitor (10) out of capacitor strap (11).

DANGER
A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instruction could result in serious personal injury or death.

(16) Discharge base capacitor (10).

(17) Tag and disconnect two actuator wires (12) from terminals of base capacitor (10).

(18) Cut two wire ties (13); then remove limit switch bracket (14) from base actuator (15).

(19) On programmable tables only, remove screw (16) and cable bracket (17) from pivot screw (18).

(20) Loosen two jam nuts (19).

DANGER
Make sure table top is securely held by supports to prevent it from falling once pivot screws are removed. Failure to do so could result in serious personal injury or death.

(21) Remove two pivot screws (20) securing base actuator (15) to column assembly (21).

(22) Loosen two jam nuts (22).

(23) Remove two pivot screws (18) and base actuator (15) from column assembly (21).

(24) Loosen three screws (23).

B. Installation

(1) Remove jam nuts (19 and 22, Figure 4-16) from pivot screws (18 and 20).

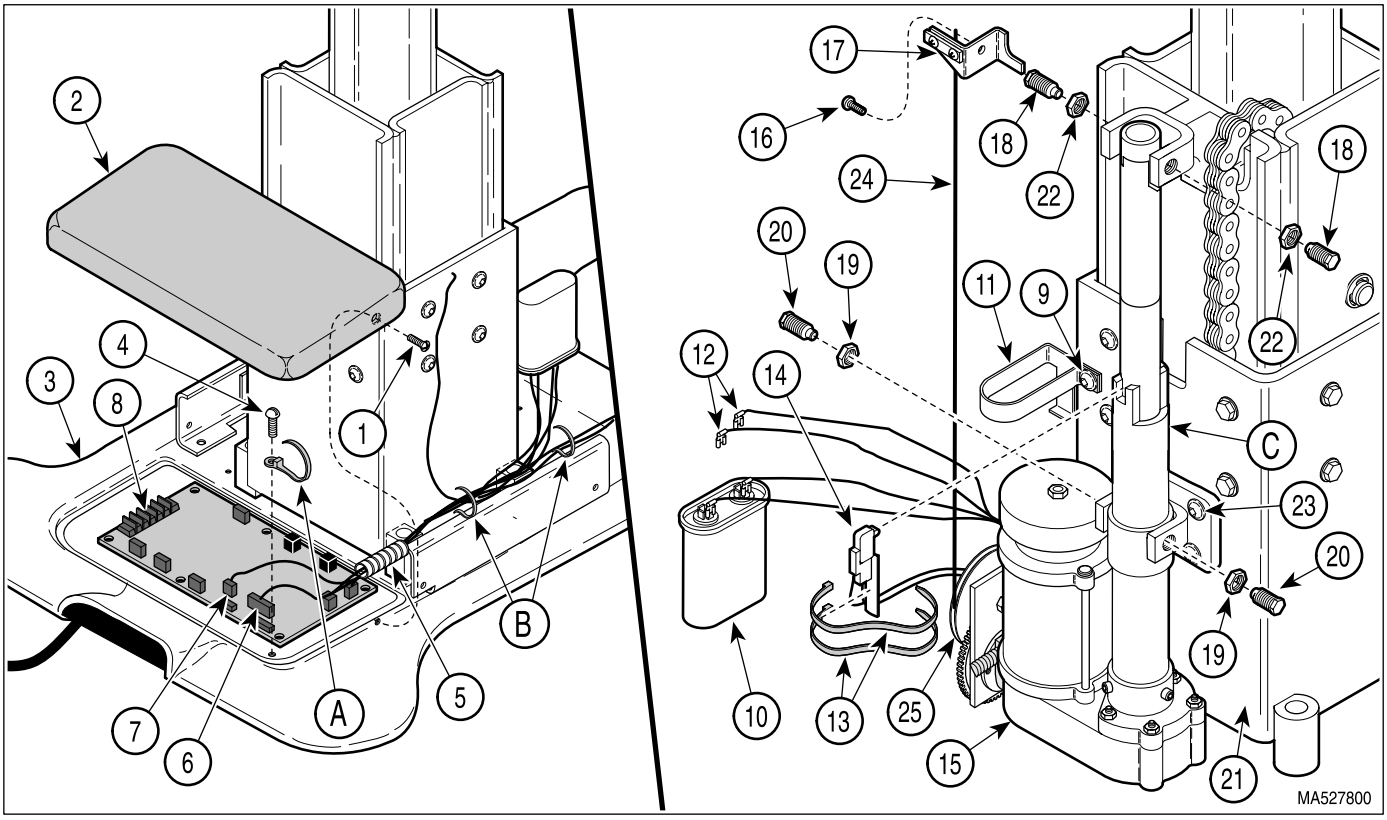


Figure 4-16. Base Actuator Removal / Installation

(2) Clean adhesive residue from threads of four pivot screws (18 and 20).

(3) Screw jam nuts (19 and 22) on pivot screws (18 and 20) fully.

(4) Coat the threads of two pivot screws (20), which are located directly in front of jam nuts (19), with permanent threadlocking adhesive (Loctite 262).

NOTE
When installing pivot screws, adjust pivot screws until shaft (C) of base actuator (15) is centered in bracket.

(5) Install base actuator (15) on column assembly (21) and secure with two pivot screws (20). Tighten pivot screws to 50 to 60 in-lbs. (5.6 to 6.8 N•m).

(6) Tighten two jam nuts (19) to 45 - 55 ft-lbs. (61 to 74.6 N•m).

(7) Install plastic wrapping (5) around base actuator wires.

(8) Connect brake wire harness (7) and base wire harness (6) to PC control board (8).

(9) Connect two actuator wires (12) to terminals of base capacitor (10).

(10) Slide base capacitor (10) into capacitor strap (11) and secure by tightening screw (9).

(11) Secure wires together with cable strap (A). Secure cable strap to base casting (3) with screw (4).

(12) Secure wires together as a bundle with two or more cable ties (B).

(13) Install PC board cover (2) on base casting (3) and secure with two screws (1).

(14) Plug one modular cord (6, Figure 4-15) into each inlet PC board (7).

(15) Plug table power cord into outlet receptacle.

EQUIPMENT ALERT
On programmable tables, make sure cable bracket (17, Figure 4-16) is clear of the column assembly. Failure to do so could result in the cable bracket being damaged.

(16) Run BASE UP and / or BASE DOWN function until shaft (C, Figure 4-16) of base actuator (15) is aligned with bracket of column assembly (21).

(17) Coat threads of two pivot screws (18), which are directly in front of jam nuts (22), with permanent threadlocking adhesive (Loctite 262).

NOTE
When installing pivot screws, adjust pivot screws (18) until shaft (C) of base actuator (15) is centered in bracket.

(18) Secure shaft (C) of base actuator (15) on column assembly (21) and secure with two pivot screws (18). Tighten pivot screws to 50 to 60 in-lbs. (5.6 to 6.8 N•m).

(19) Tighten two jam nuts (22) to 45 - 55 ft-lbs. (61 to 74.6 N•m).

(20) Tighten three screws (23) to 23 - 27 ft-lbs (31 - 36 N•m).

(21) On programmable tables, install cable bracket (17) on R.H. pivot screw (18) and secure with screw (16). Do not wrap cable (24) around pulley (25) at this time.

(22) Run BASE UP function until table top is off of supports (A, Figure 4-15); then remove supports from under table top.

(23) Lower BASE DOWN function all the way down.

NOTE
If necessary, the pulley (25, Figure 4-16) can be rotated back and forth up to 1/2 turn to assist in getting the cable (24) on the pulley.

(24) On programmable tables, wrap cable (24, Figure 4-16) around pulley (25) in direction shown in illustration until all cable slack is removed. Cable should be able to be wrapped around pulley 2-1/2 to 3 times.

(25) Raise BASE UP function to its maximum height.

(26) Clean shaft (A, Figure 4-17) of base actuator (1) and inside of limit switch stop (2) with degreaser.

EQUIPMENT ALERT
Once applied, double sided tape is very difficult to remove. Be sure to position double sided tape at the top of limit switch stop as shown in Figure 4-17. Failure to do so could result in damage to base actuator limit switch.

(27) Peel off one side of backing, and apply double sided tape (3) to the inside of limit switch stop (2); then peel backing from other side of tape.

EQUIPMENT ALERT
Be sure to install limit switch stop in the position shown in Figure 4-17. Improper positioning could allow foot rest extension to collide with floor.

(28) Install limit switch stop (2) on shaft (A) of base actuator (1) so that edges (B and C) are approximately 1/16 in. (1.6 mm) from pivot screws (4 and 5).

(29) Clean tube (D) of base actuator (1) with degreaser.

NOTE
Once applied, double sided tape is very difficult to remove. Be sure to apply double sided tape in the position shown in Figure 4-17.

(30) Peel off one side of backing, and apply double sided tape (6) to tube (D) of base actuator (1); then peel backing from other side of tape.

EQUIPMENT ALERT
Be sure to install limit switch bracket in the position shown in Figure 4-17. Improper positioning could allow foot rest extension to collide with floor.

(31) Position limit switch bracket (7) on double sided tape (6) so that roller (8) of limit switch is even with the highest edge of tube (D).

(32) Plug table power cord into wall outlet.

(33) Run BASE UP function to its maximum height; then pull foot rest extension (1, Figure 4-18) out as far as it will go.

(34) Run FOOT DOWN, and TILT DOWN functions to their lowest positions.

(35) Depress BASE DOWN button on foot/hand control.

Observe. Table should go approximately 1/2 way down then stop; Foot Rest Extension lamp on the hand control should flash. There should

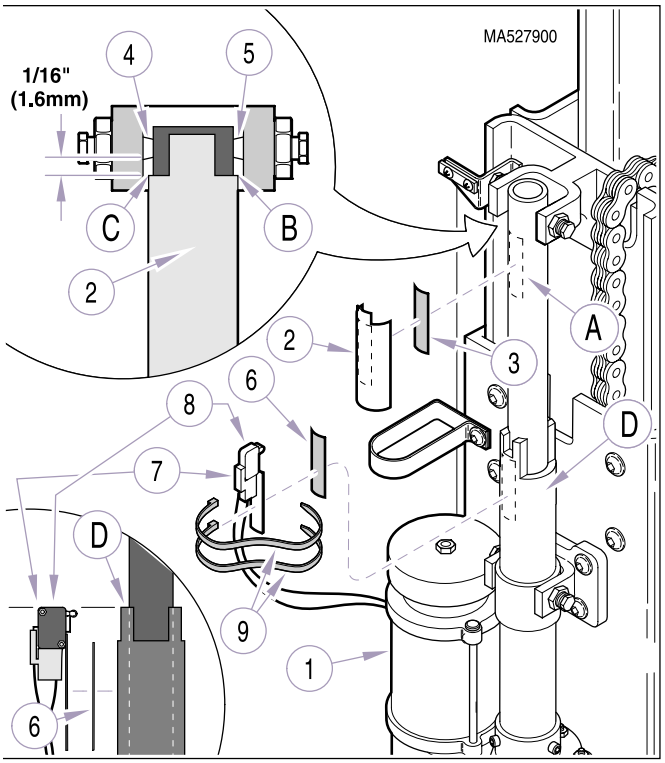


Figure 4-17. Base Limit Switch / Limit Switch Stop Removal / Installation

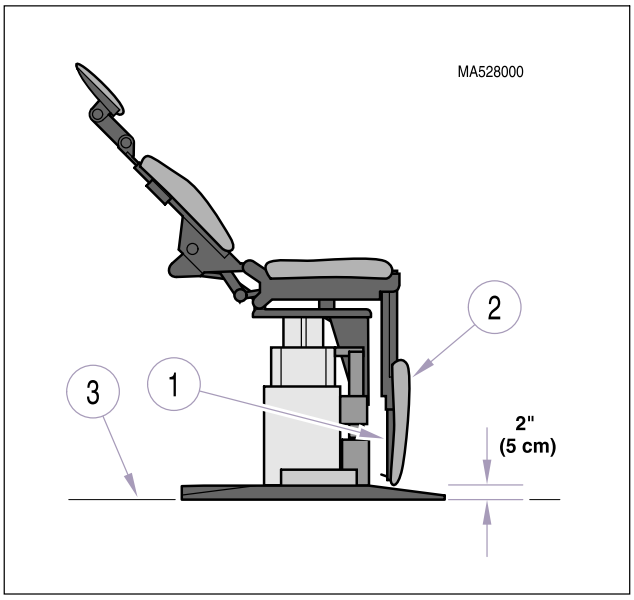


Figure 4-18. Minimum Clearance Requirement

be a ***minimum*** of 2.0 in. (5.0 cm) clearance between the foot section upholstery (2) and the floor (3). If minimum clearance is met, go to step 36. If clearance is ***less*** than 2.0 in. (5.0 cm) go to step 35.

(36) If there is ***less*** than 2.0 in. (5.0 cm) of clearance between foot section upholstery (2) and floor (3), adjust as follows:

Remove limit switch bracket (7, Figure 4-17) from double sided tape (6); then move limit switch bracket upward on tube (D) of base actuator (1) and repeat steps 33 thru 34.

(37) Secure limit switch bracket (7) to base actuator (1) with two wire ties (8).

EQUIPMENT ALERT
When installing shrouds, make sure all bumpers and snap-on glides are in place. Failure to do so could result in damage to shrouds and grinding sounds when table is raised and lowered.

(38) Install R.H. and L.H. inner shrouds (12, Figure 4-15) on base casting (13) and secure with four screws (9), and four screws (8).

(39) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (12) with four screws (4).

(40) Install tabs (D) of R.H. and L.H. outer shrouds (2) in slots (E) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

(41) On programmable tables, calibrate the PC control board (Refer to para 4.2).

4.12 Base Capacitor Removal / Installation

A. Removal

(1) Run BASE UP function to its maximum height.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-19) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(4) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(5) Disconnect two modular cords (6) from two inlet PC boards (7).

(6) Remove four screws (8),and four screws (9); then partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(7) Loosen screw (12).

(8) Push base capacitor (13) out of capacitor strap (14).

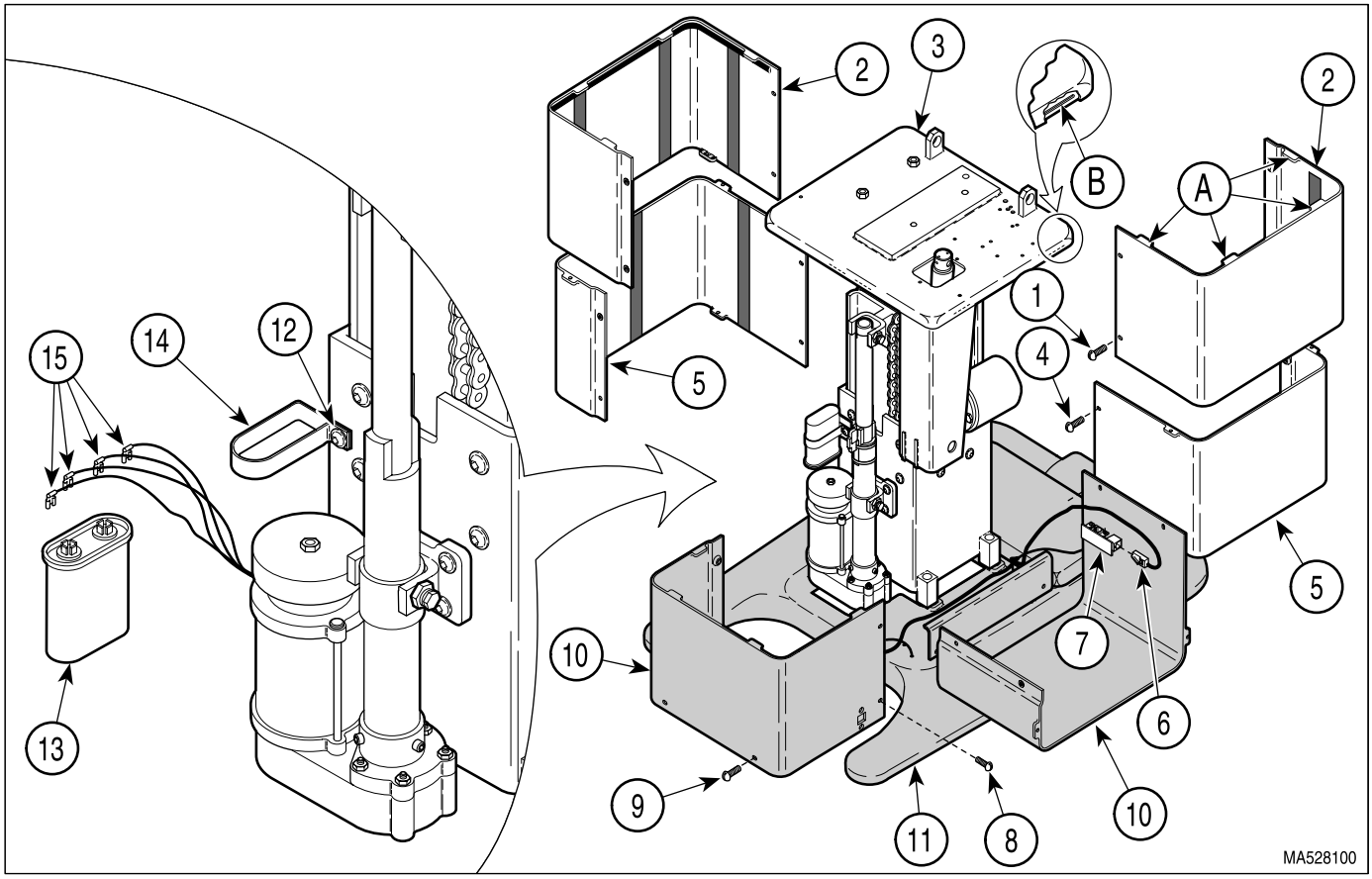


Figure 4-19. Base Capacitor Removal / Installation

DANGER
A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instruction could result in serious personal injury or death.

(9) Discharge base capacitor (13).

(10) Tag and disconnect four wires (15) from terminals of base capacitor (13).

B. Installation

(1) Connect four wires (15) to terminals of base capacitor (13).

(2) Slide base capacitor (13) into capacitor strap (14) and secure by tightening screw (12).

(3) Connect two modular cords (6) to two inlet PC boards (7).

(4) Install R.H. and L.H. inner shrouds (10) on base casting (11) and secure with four screws (9), and four screws (8).

(5) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) with four screws (4).

(6) Install tabs (A) of R.H. and L.H. outer shrouds (2) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

4.13 Column Assembly Removal / Installation

A. Removal

(1) Run BASE UP function to its maximum height.

(2) Run TILT, FOOT, and BACK functions to level table top.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(3) Unplug table power cord from outlet receptacle.

(4) Remove four screws (1, Figure 4-20) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(5) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(6) Disconnect two modular cords (6) from two inlet PC boards (7).

(7) Remove four screws (8), four screws (9) and partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(8) Place supports (A) under back section (B) and foot section (C).

NOTE
Steps 9 thru 12 apply only to programmable tables.

(9) Remove screw (1, Figure 4-21) and cable bracket (2) from R.H. pivot screw (3).

(10) Cut cable tie (A) securing base sensor harness (4) to capacitor strap (5).

(11) Disconnect base sensor harness (4) from harness (6).

(12) Remove two screws (7) and base reducer assembly (8) from column weldment assembly (9).

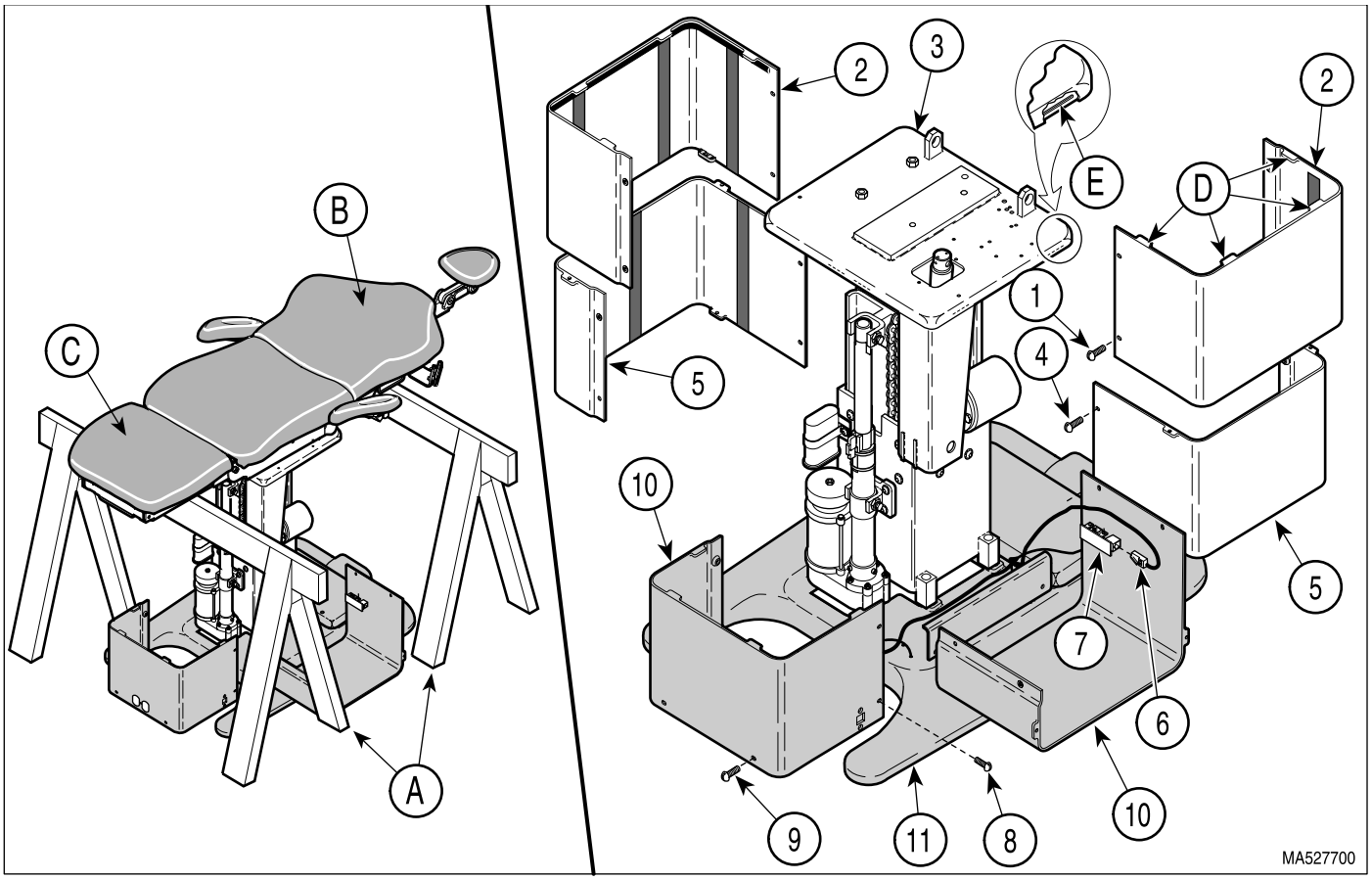


Figure 4-20. Base Shrouds Removal / Installation

(13) Cut cable tie (B) securing wire harness (10) to base actuator limit switch (11); then disconnect wire harness from terminals of base actuator limit switch.

(14) Remove screw (1, Figure 4-22), capacitor strap (2), and base capacitor (3) from column assembly (4). Set base capacitor aside.

DANGER

A capacitor contains stored electricity. Never touch terminals of a capacitor, even if power has been shut off or disconnected. Always discharge capacitor before touching capacitor terminals or wires. Failure to comply with these instructions could result in serious personal injury or death.

(15) Discharge base capacitor (3).

(16) Loosen two jam nuts (5).

DANGER

Make sure table top is securely supported by supports to prevent it from falling once pivot screws are removed. Failure to do so could result in serious personal injury or death.

(17) Remove two pivot screws (6) securing base actuator (7) to column assembly (4).

(18) Loosen two jam nuts (8).

(19) Remove two pivot screws (9) and partially remove base actuator (7) from column assembly (4). Set base actuator aside.

(20) Loosen three screws (10).

Printed in U.S.A.

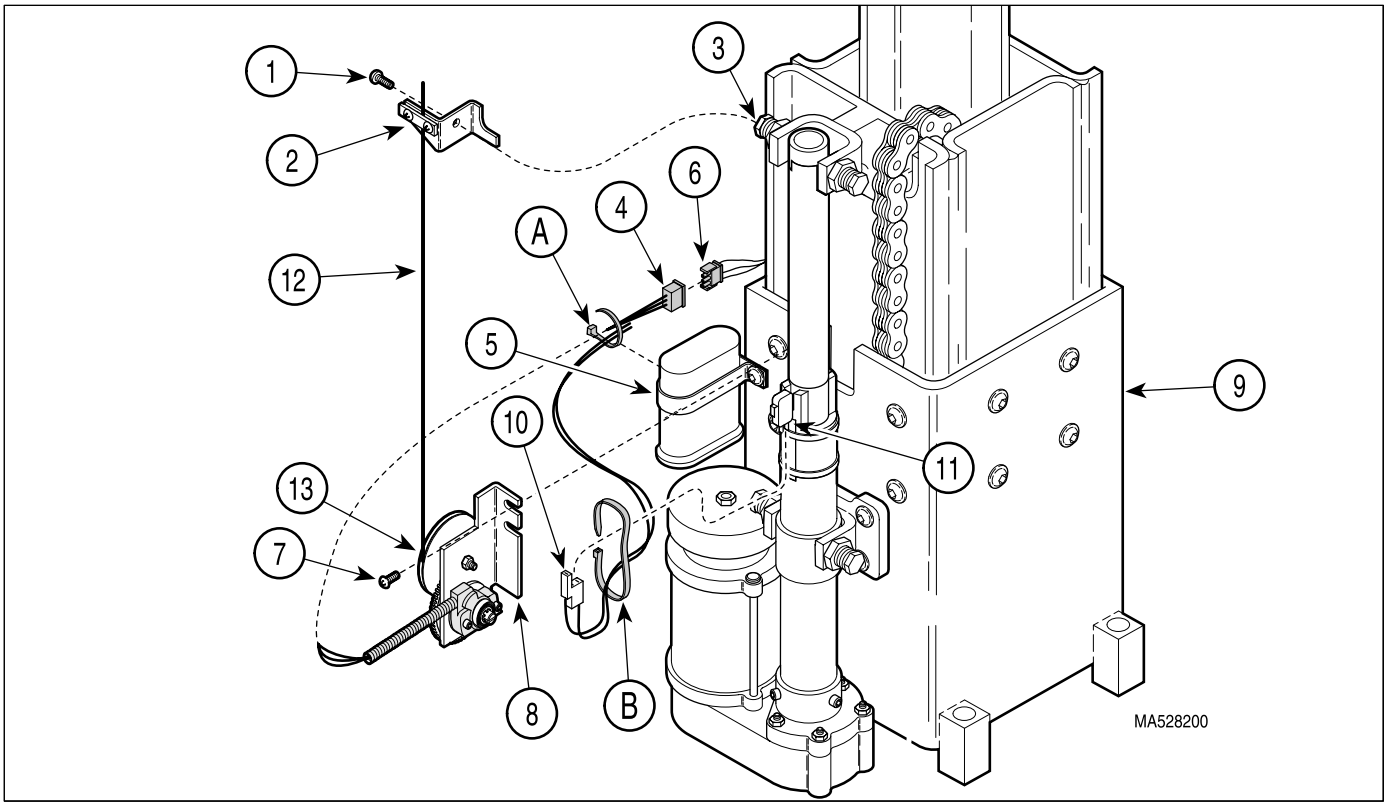


Figure 4-21. Base Reducer Components Removal / Installation

(21) Remove two screws (1, Figure 4-23), lockwashers (2), and base up limit switch assembly (3) from column assembly (4).

(22) Remove two screws (5), lockwashers (6), and base down limit switch assembly (7) from column assembly (4).

(23) Remove two locknuts (8) and four screws (9) which secure column assembly (4) to column adapter weldment (10).

(24) Remove four screws (11) and four washers (12) securing column assembly (4) to base weldment (13).

(25) Remove column assembly (4) from base weldment (13).

B. Installation

(1) Position column assembly (4, Figure 4-23) on base weldment (13) and secure with four washers (12) and four screws (11). Tighten four screws (11) to 50 to 60 ft-lbs (67.8 to 81.4 N•m).

(2) Remove jam nuts (5 and 8, Figure 4-22) from pivot screws (6 and 9).

(3) Clean adhesive residue from threads of pivot screws (6 and 9).

(4) Screw jam nuts (5 and 8) on pivot screws (6 and 9) fully.

(5) Coat the threads of two pivot screws (9), which are located directly in front of jam nuts (8), with permanent threadlocking adhesive (Loctite 262).

NOTE
When installing pivot screws, adjust pivot screws until shaft (A) of base actuator is centered in bracket.

(6) Install base actuator (7) on column assembly (4) and secure with two pivot screws (9). Tighten pivot screws to 50 to 60 in-lbs (5.6 to 6.8 N•m).

(7) Tighten two jam nuts (8) to 45 to 55 ft-lbs. (61 to 74.6 N•m).

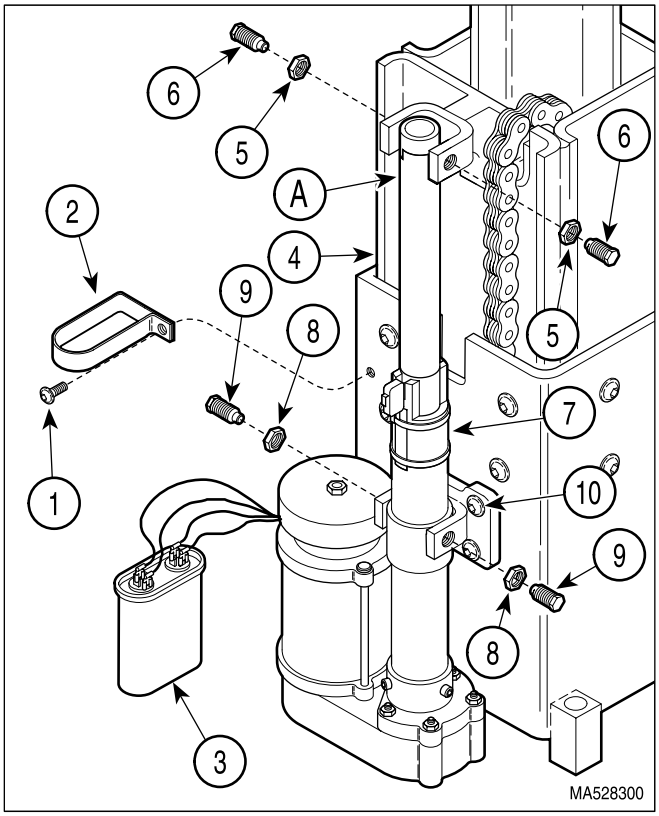


Figure 4-22. Base Actuator Removal / Installation

(8) Install base capacitor (3) and capacitor strap (2) on column assembly (4) and secure with screw (1).

(9) Plug table power cord into outlet receptacle.

(10) Connect two modular cords (6, Figure 4-20) to two inlet PC boards (7).

EQUIPMENT ALERT
Watch all disconnected components when moving the column in the following step. Failure to do so could result in damage due to crushing or pulling.

(11) Run BASE UP or BASE DOWN function until shaft (A, Figure 4-22) of base actuator (7) is aligned with bracket of column assembly (4).

(12) Coat the threads of two pivot screws (6), which are located directly in front of jam nuts (5), with permanent threadlocking adhesive (Loctite 262).

NOTE
When installing pivot screws, adjust pivot screws until shaft (A) of base actuator is centered in bracket.

(13) Secure shaft (A) of base actuator (7) to column assembly (4) and secure with two pivot screws (6). Tighten pivot screws to 50 to 60 in-lbs. (5.6 to 6.8 N•m).

(14) Tighten two jam nuts (5) to 45 to 55 ft-lbs. (61 to 74.6 N•m).

(15) Tighten three screws (10) to 17 - 20 ft-lbs (23 - 27.1 N•m).

(16) Run BASE UP function to align column assembly (4, Figure 4-23) with column adapter weldment (10).

(17) Secure column assembly (4) to column adapter weldment (10) with four screws (9) and two locknuts (8). Tighten screws (9) to 50 - 60 ft-lbs. (67.5 - 81.0 N•m).

(18) Run BASE UP function until weight is off of supports; then remove supports (A, Figure 4-20) from under table top.

(19) Install base down limit switch assembly (7, figure 4-23) on column assembly (4) and secure with two lockwashers (6) and screws (5).

(20) Adjust base down limit switch (Refer to para 4.15).

(21) Install base up limit switch assembly (3) on column assembly (4) and secure with two lockwashers (2) and screws (1).

(22) Adjust base up limit switch (Refer to para 4.16).

(23) Connect wire harness (10, Figure 4-21) to base actuator limit switch (11) and secure with cable tie (B).

NOTE
Steps 24 thru 29 apply only to programmable tables.

(24) Install base reducer assembly (8) on column weldment assembly (9) and secure with two screws (7).

(25) Connect base sensor harness (4) to harness (6).

(26) Secure base sensor harness (4) and limit switch wire harness (10) to capacitor strap (5) with cable tie (A).

(27) Install cable bracket (2) on R.H. pivot screw (3) and secure with screw (1). Do not wrap cable (12) around pulley (13) at this time.

(28) Run BASE DOWN function all the way down.

NOTE
If necessary, the pulley (13) can be rotated back and forth up to 1/2 turn to assist in getting the cable (12) on the pulley.

(29) Wrap cable (12) around pulley (13) in direction shown in illustration until all cable slack is removed. Cable should be able to be wrapped around pulley 2-1/2 to 3 times.

(30) Connect two modular cords (6, Figure 4-20) to two inlet PC boards (7).

(31) Install R.H. and L.H. inner shrouds (10) on base casting (11) and secure with four screws (9), and four screws (8).

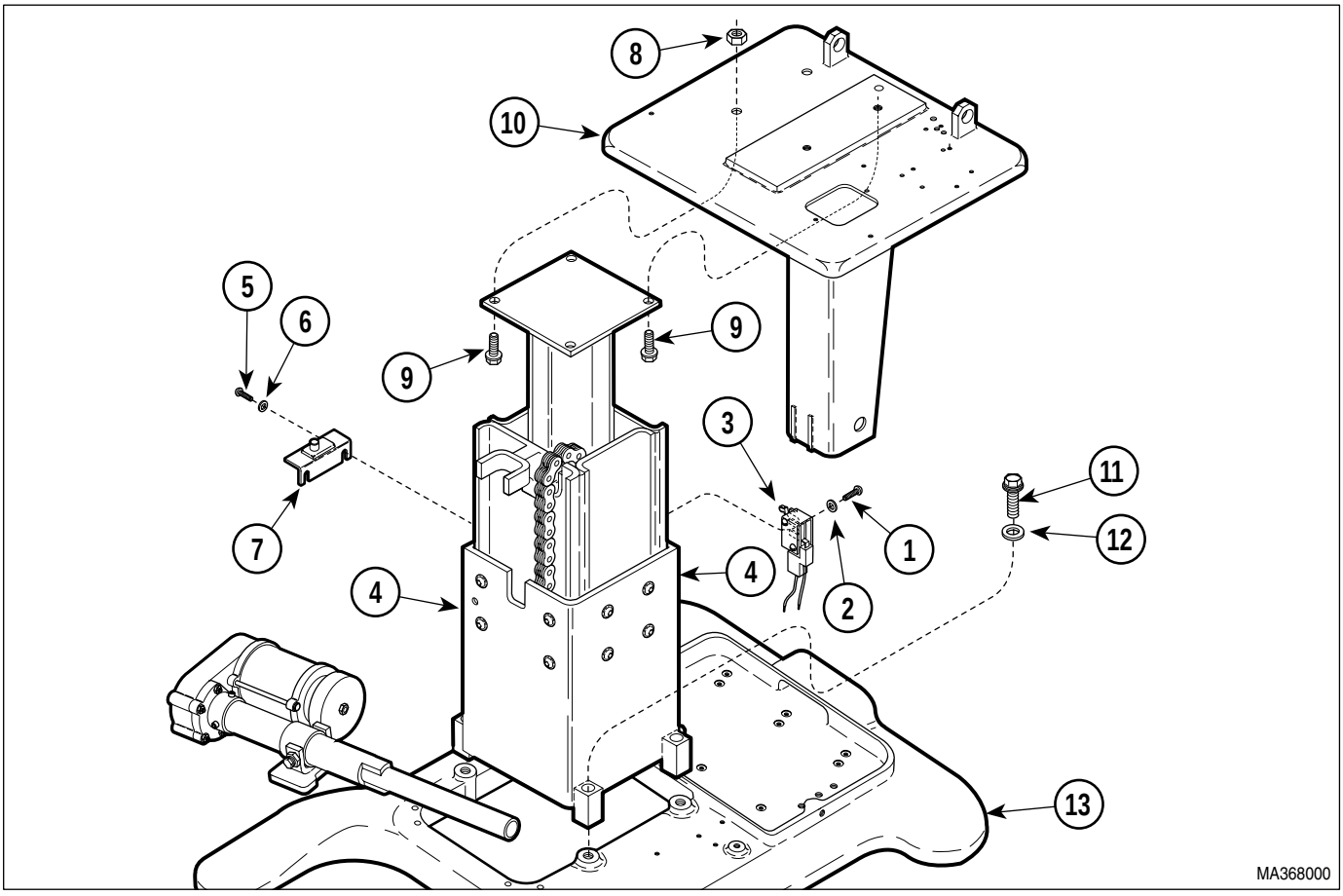


Figure 4-23. Column Assembly Removal / Installation

(32) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) with four screws (4).

(33) Install tabs (D) of R.H. and L.H. outer shrouds (2) in slots (E) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

(34) On programmable tables, adjust the base position sensor (Refer to para 4.36).

(35) On programmable tables, calibrate the PC control board (Refer to para 4.2).

4.14 Typical Actuator Motor Removal / Installation (Applies To All Actuators, Except Base Actuator)

A. Removal

(1) Remove malfunctioning actuator assembly:
Tilt actuator assembly (Refer to para 4.5).
Back actuator assembly (Refer to para 4.7).
Foot actuator assembly (Refer to para 4.9).

(2) Remove four nuts (1, Figure 4-24), actuator motor (2), and isolation washer (3) from actuator mechanism (4).

(3) Remove three shoulder washers (5) from actuator mechanism (4).

(4) Remove motor coupler (6) from shaft of actuator motor (2).

B. Installation

(1) Install motor coupler (6) on shaft of actuator motor assembly (2); then install isolation washer (3) onto motor assembly.

(2) Install three shoulder washers (5) in actuator mechanism (4).

(3) Align keys (A) of actuator mechanism (4) with key slots (B) of motor coupler (6) and then install actuator motor (2) on actuator mechanism and secure with four nuts (1).

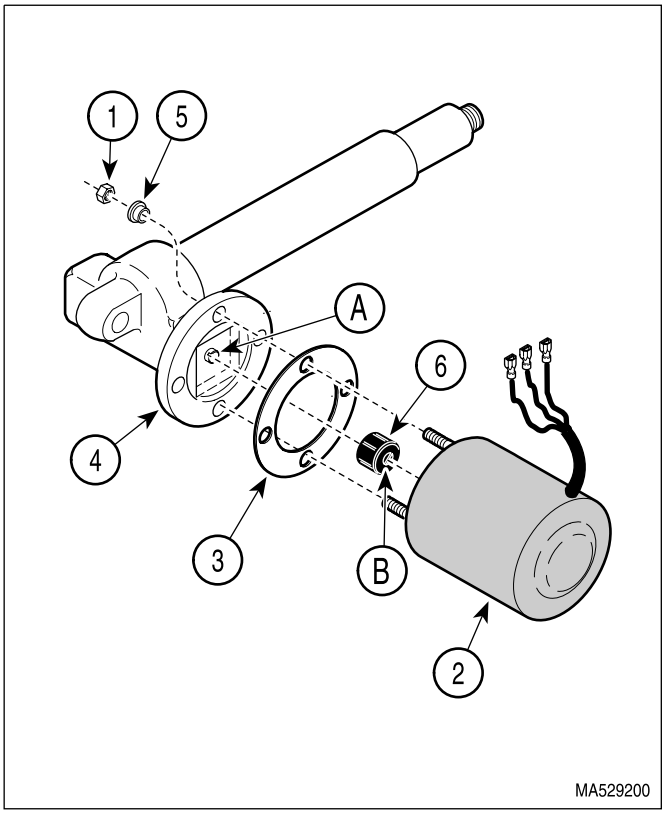


Figure 4-24. Actuator Motor Removal / Installation

(4) Install actuator assembly:
Tilt actuator assembly (Refer to para 4.5).
Back actuator assembly (Refer to para 4.7).
Foot actuator assembly (Refer to para 4.9).

(5) Check actuator assembly for proper operation. The actuator assembly should run normally and should not make a grinding noise. A grinding noise indicates that key slots (B) of motor coupler (6) were not aligned properly with keys (A) of actuator mechanism (3) (a grinding noise also indicates that the motor coupler is being damaged).

4.15 Base Down Limit Switch Removal / Installation / Adjustment

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove four screws (1, Figure 4-25) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(3) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(4) Remove two screws (6), two washers (7), and partially remove switch bracket (8) from column weldment (9).

(5) Tag and disconnect two wires (10) from terminals of base down limit switch (11).

(6) While simultaneously pressing on two locking tabs (A) of base down limit switch (11), push switch out of switch bracket (8)

B. Installation

(1) Push base down limit switch (11) into switch bracket (8) until switch "snaps" into place.

(2) Connect two wires (10) to terminals of base down limit switch (11).

(3) Install switch bracket (8) on column weldment (9) and secure with two washers (7) and screws (6).

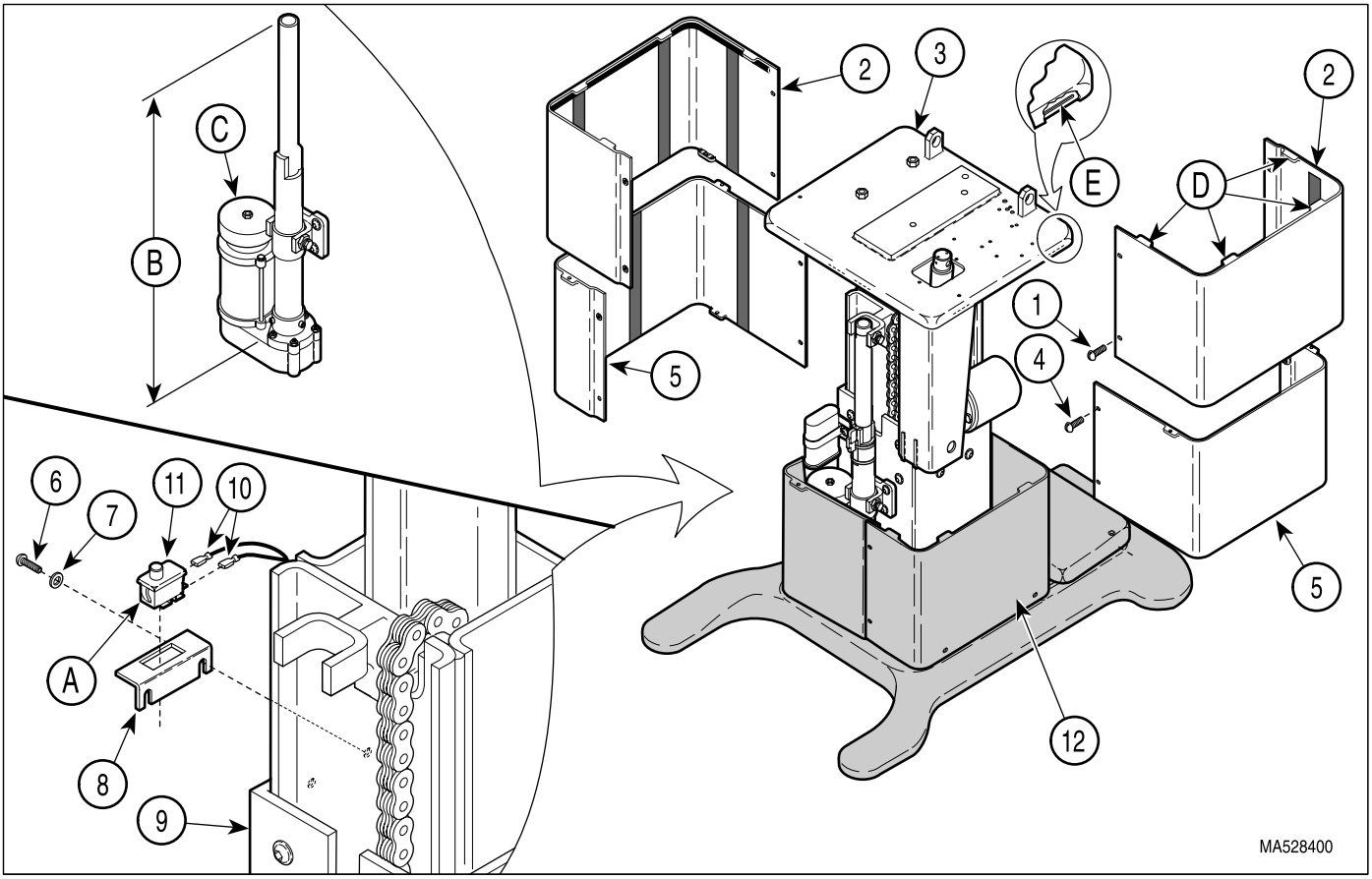


Figure 4-25. Base Down Limit Switch Removal / Installation / Adjustment

(4) Plug table power cord into outlet receptacle.

(5) Run BASE DOWN function until base down limit switch is tripped and stops the table.

EQUIPMENT ALERT
At its lowest height, Distance B should be 12.55 to 12.61 in. (31.9 to 32.0 cm). Damage will occur to base actuator (C) if Distance B is less than 12.55 (31.9 cm). The base actuator (C) does not free wheel. Running the base actuator to its limit will damage the base actuator.

(6) Measure Distance B on base actuator.

(7) If Distance B is between 12.55 to 12.61 in. (31.9 to 32.0 cm), go to step 11.
If Distance B is not between 12.55 to 12.61 in. (31.9 to 32.0 cm), go to step 8.

(8) Raise BASE UP function until access to base down limit switch (11) is possible.

NOTE
Moving base down limit switch upward will lessen Distance B. Moving base down limit switch downward will increase Distance B.

(9) Loosen two screws (6); then adjust switch bracket (8) up or down as determined necessary in step 7. Tighten two screws (6).

(10) Repeat steps 5 thru 9 until Distance B is between 12.55 to 12.61 in. (31.9 to 32.0 cm). when base actuator is fully retracted (stopped by base down limit switch).

(11) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (12) and secure with four screws (4).

(12) Install tabs (D) of R.H. and L.H. outer shrouds (2) in slots (E) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

C. Adjustment Only

(1) If not already done, perform steps 1 thru 3 of para 4.15A.

(2) Perform steps 4 thru 12 of para 4.15B.

4.16 Base Up Limit Switch Removal / Installation / Adjustment

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove four screws (1, Figure 4-26) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(3) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(4) Disconnect two modular cords (6) from two inlet PC boards (7).

(5) Remove four screws (8),and four screws (9); then partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(6) Remove two screws (12), washers (13), and partially remove limit switch bracket (14) from column weldment (15).

(7) Cut cable tie (A) securing wire harness (16) to base up limit switch (17).

(8) Disconnect wire harness (16) from terminals of base up limit switch (17).

(9) Remove two nuts (18), two screws (19), and base up limit switch (17) from limit switch bracket (14).

B. Installation

(1) Install base up limit switch (17) on limit switch bracket (14) and secure with two screws (19) and nuts (18).

(2) Connect wire harness (16) to terminals of base up limit switch (17).

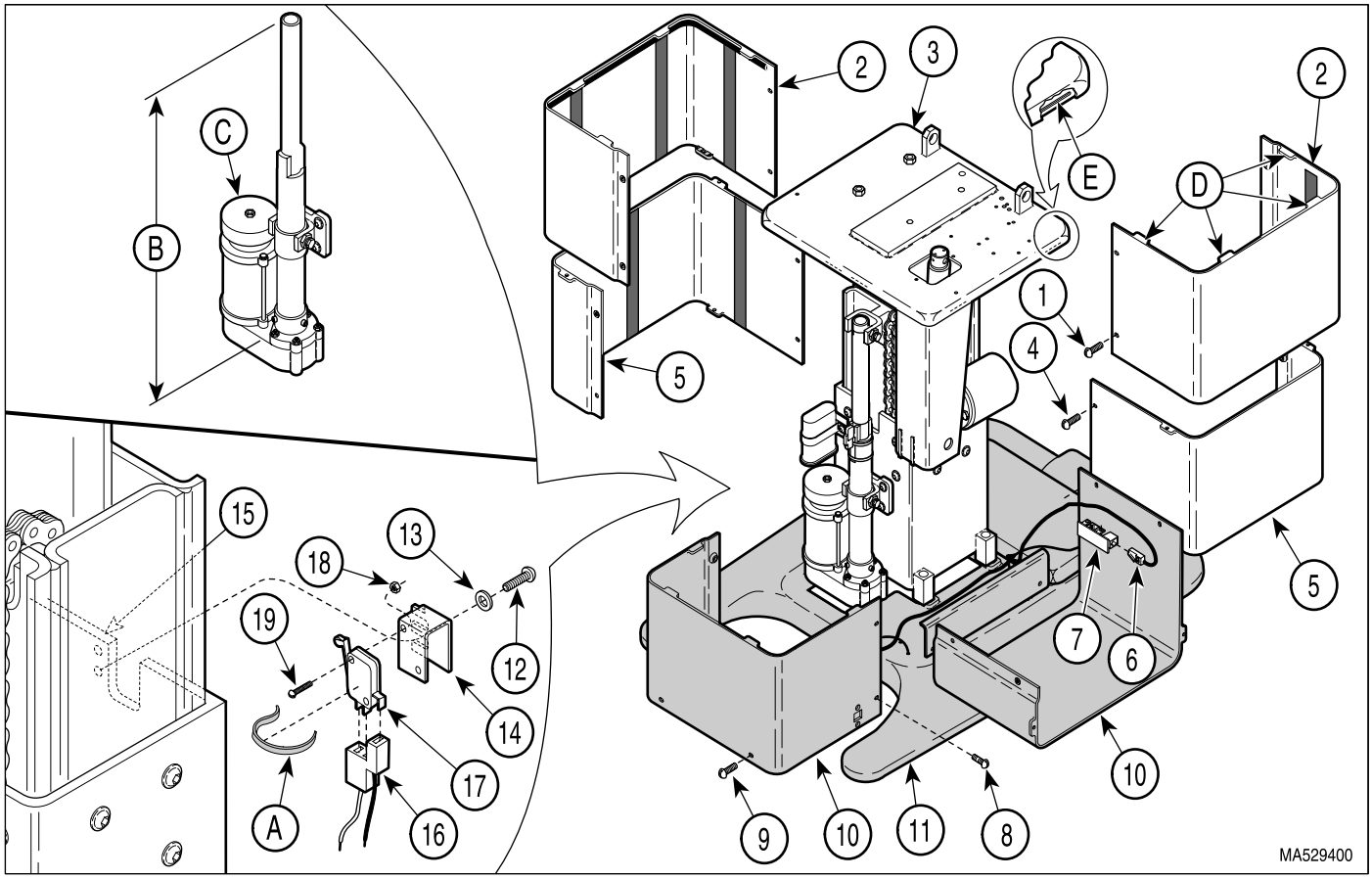


Figure 4-26. Base Up Limit Switch Removal / Installation

(3) Secure wire harness (16) to base up limit switch (17) with cable tie (A).

(4) Install switch bracket (14) on column weldment (15) and secure with two washers (13) and screws (12).

(5) Connect one modular cord (6) to each inlet PC board (7).

(6) Plug table power cord into outlet receptacle.

(7) Run BASE UP function until base up limit switch is tripped and stops the table).

EQUIPMENT ALERT
At its fullest extension, Distance B should be 21.48 to 21.55 in. (54.5 to 54.7 cm). Damage will occur to base actuator (C) if Distance B is greater than 21.55 (54.7 cm). The base actuator does not free wheel. Running the base actuator to its limit will damage the base actuator.

(8) Measure Distance B on base actuator.

(9) If Distance B is between 21.48 to 21.55 in. (54.5 to 54.7 cm), go to step 13.
If Distance B is not between 21.48 to 21.55 in. (54.5 to 54.7 cm), go to step 10.

(10) Lower BASE DOWN function approximately 3 in. (7.6 cm).

NOTE
Moving base up limit switch upward / outward will increase Distance B. Moving base down limit switch inward / downward will decrease Distance B.

(11) Loosen two screws (12); then adjust switch bracket (14) upward/outward or downward/inward as determined necessary in step 9. Tighten two screws (12).

(12) Repeat steps 7 thru 11 until Distance B is between 21.48 to 21.55 in. (54.5 to 54.7 cm). when base actuator (C) is fully extended (stopped by base up limit switch).

(13) Install R.H. and L.H. inner shrouds (10) on base casting (11) and secure with four screws (9), and four screws (8).

(14) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) with four screws (4).

(15) Install tabs (D) of R.H. and L.H. outer shrouds (2) in slots (E) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

C. Adjustment Only

(1) If not already done, perform steps 1 thru 5 of para 4.16A.

(2) Perform steps 6 thru 15 of para 4.16B.

4.17 Chain Tension Check / Adjustment

A. Tension Check / Adjustment

(1) Raise BASE UP function all the way up.

(2) Operate table top until it is in a horizontal position.

(3) Place supports under foot section and back section of table top. Lower BASE DOWN function slightly until weight of table top is resting on supports.

(4) Unplug table power cord from outlet receptacle.

WARNING

Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

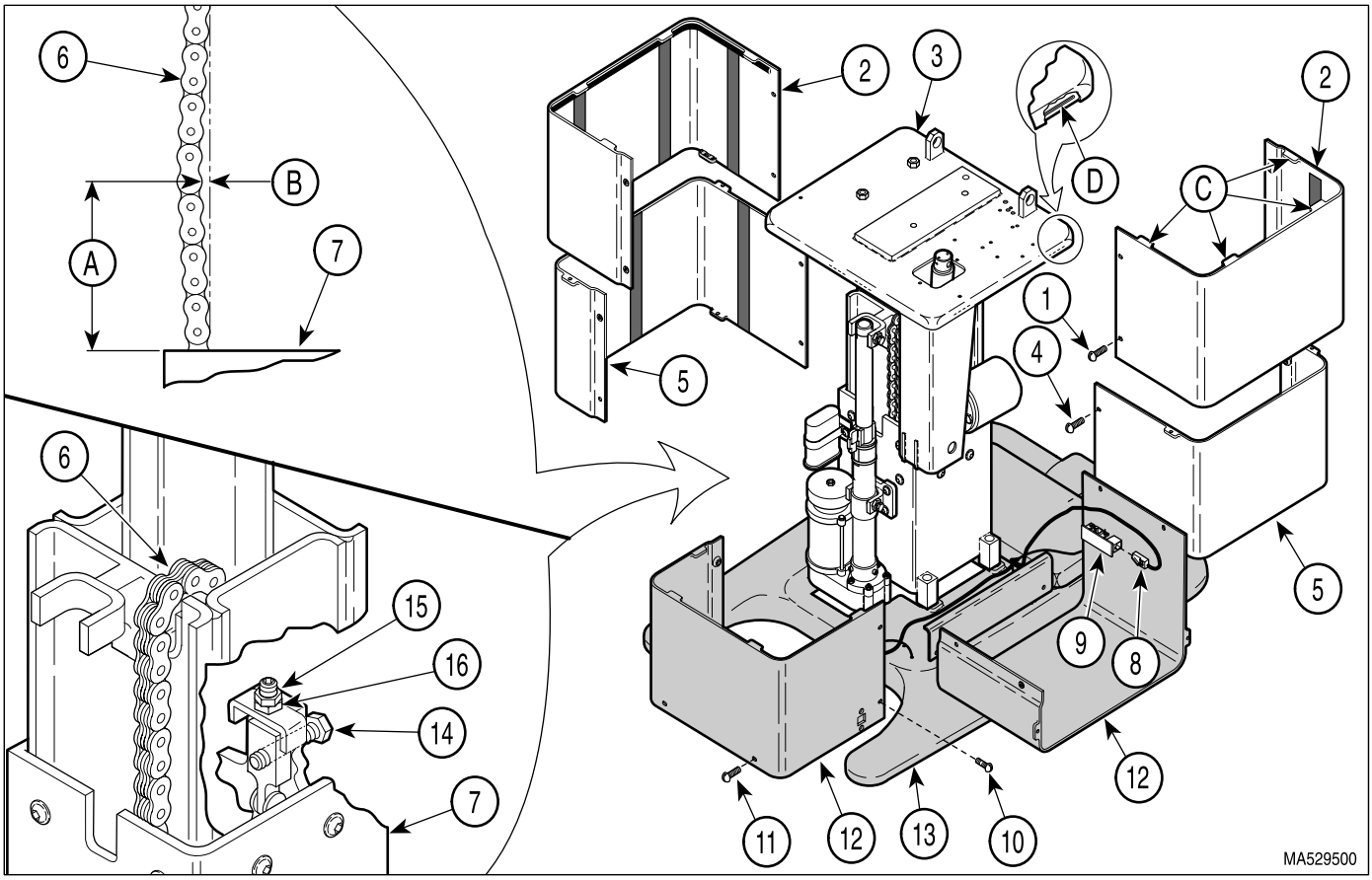


Figure 4-27. Chain Tension Check / Adjustment

(5) Remove four screws (1, Figure 4-27) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(6) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(7) Measure slack (measurement B) in chain (6) at a point 1 3/4 to 2 1/4 in. (4.4 to 5.7 cm) above top of outer slide weldment (7) (measurement A).

(8) If slack in chain (6) is between 1/16 to 3/16 in. (1.6 to 4.8 mm), go to step 18. See measurement B.
If slack in chain (6) is not between 1/16 to 3/16 in. (1.6 to 4.8 mm), go to step 9. See measurement B.

(9) Disconnect two modular cords (8) from two inlet PC boards (9).

(10) Remove four screws (10),and four screws (11); then partially remove R.H. and L.H. inner shrouds (12) from base casting (13).

(11) Loosen locking screw (14).

(12) Loosen jam nut (15).

(13) Tighten adjusting nut (16) until slack in chain (6) is between 1/16 to 3/16 in. (1.6 to 4.8 mm). See measurement B.

(14) Repeat entire procedure to ensure correct adjustment.

(15) Coat threads of jam nut (15) with permanent threadlocking adhesive (Loctite 262).

(16) Tighten jam nut (15).

(17) Tighten locking screw (14).

(18) Connect modular cords (8) to inlet PC boards (9).

(19) Install R.H. and L.H. inner shrouds (12) on base casting (13) and secure with four screws (10), and four screws (11).

(20) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (12) and secure with four screws (4).

(21) Install tabs (C) of R.H. and L.H. outer shrouds (2) in slots (D) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

4.18 Eccentric Bearings Adjustment

A. Adjustment

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from outlet receptacle.

(2) Remove four screws (1, Figure 4-28) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(3) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(4) Disconnect two modular cords (6) from two inlet PC boards (7).

(5) Remove four screws (8), four screws (9), and partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

NOTE
The eccentric bearings are divided into four groups for purposes of adjustment. Only one group of bearings can be adjusted at one time. For identification purposes, the left side of table is labeled “L.S.O.T.” and the head end of table is labeled “H.E.O.T.”. Also, the column assembly has two types of bearing assemblies: the concentric tire bearing assembly “C.T.B.A.” and the eccentric tire bearing assembly “E.T.B.A.” The concentric tire bearings are not adjustable, so the following steps refer only to the eccentric tire bearings.

(6) Run BASE UP and BASE DOWN function while observing all eccentric bearings (1, Figure 4-29).

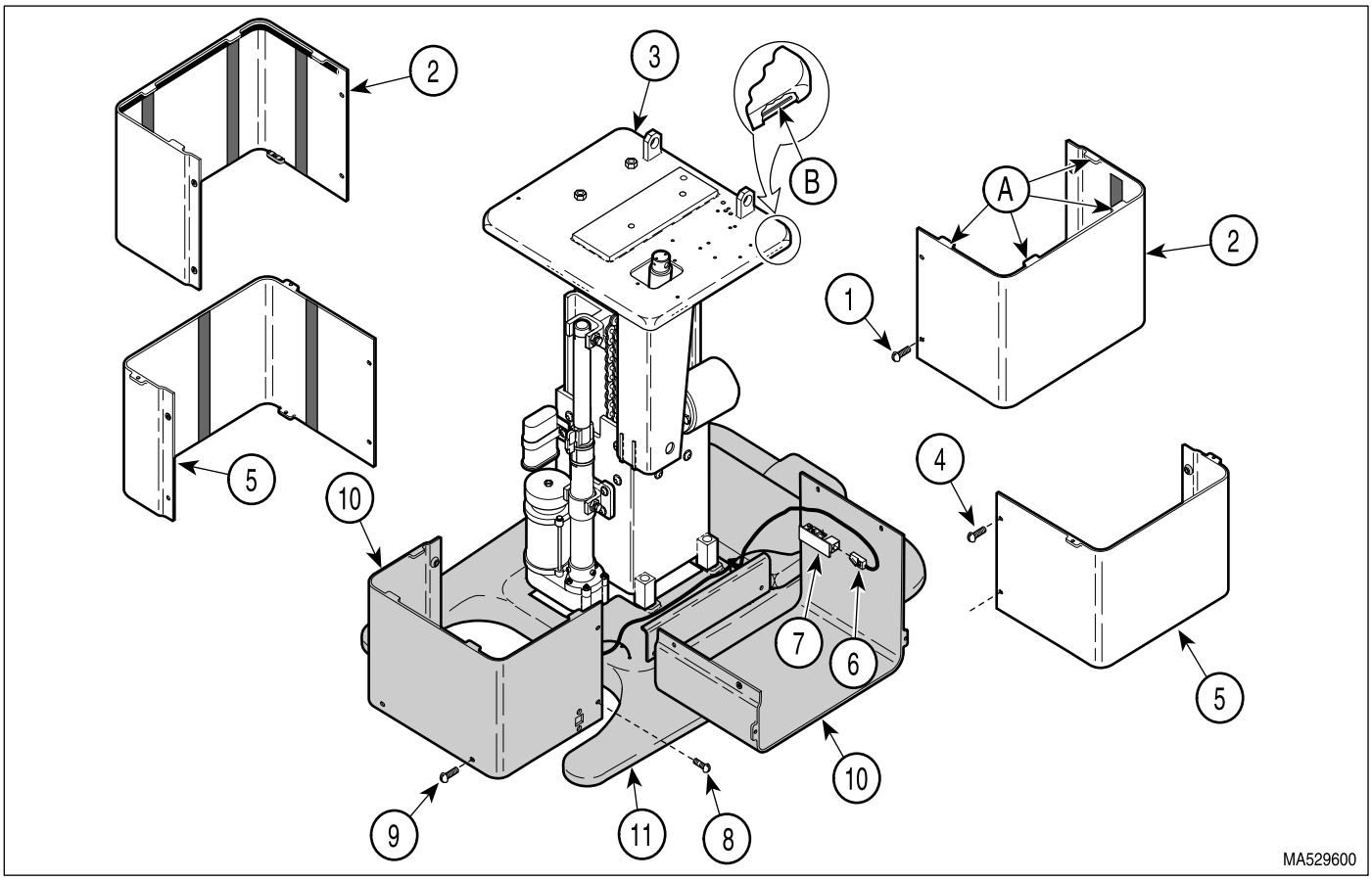


Figure 4-28. Base Shrouds Removal / Installation

(7) Note which eccentric bearings (1) do not rotate during entire movement of column assembly; these are the bearings which need adjusted.

(8) Determine what letter group the eccentric bearing you need to adjust is in; Group A1, Group B1, Group C1, or Group D1.

(9) Install 5/16 - 18 x 1-1/4 Bolt(s) (E) in the Tension hole(s) which matches the letter group of eccentric bearing being adjusted; for Group A1, bolt is installed in Tension Hole A2, for Group B1, bolt is installed in Tension Hole B2, for Group C1, bolts are installed in Tension Holes C2, for Group D1, bolts are installed in Tension Holes D2. Refer to Table 1-2 for special tool.

(10) Tighten 5/16 - 18 x 1-1/4 Bolt(s) (E) until tension is relieved from the eccentric bearing (1) being adjusted.

(11) Loosen screw (2) of appropriate eccentric bearing.

(12) Rotate outer tire (3) of eccentric bearing (1) in a clockwise direction (as viewed from outside of column) until eccentric bearing becomes harder / or impossible to rotate (meaning the eccentric spindle (4) in the eccentric bearing is forcing the outer tire against the column weldment rail as desired). Secure eccentric bearing in this position by tightening screw (2) to 23 to 27 ft-lbs. (28.8 to 36.4 N•m).

(13) Remove 5/16 - 18 x 1-1/4 Bolt(s) (E) from Tension hole.

(14) Repeat step 6 thru 13 until all eccentric bearings are properly adjusted.

(15) Connect modular cords (6, Figure 4-28) to inlet PC boards (7).

(16) Install R.H. and L.H. inner shrouds (10) on base casting (11) and secure with four screws (9), and four screws (8).

Printed in U.S.A.

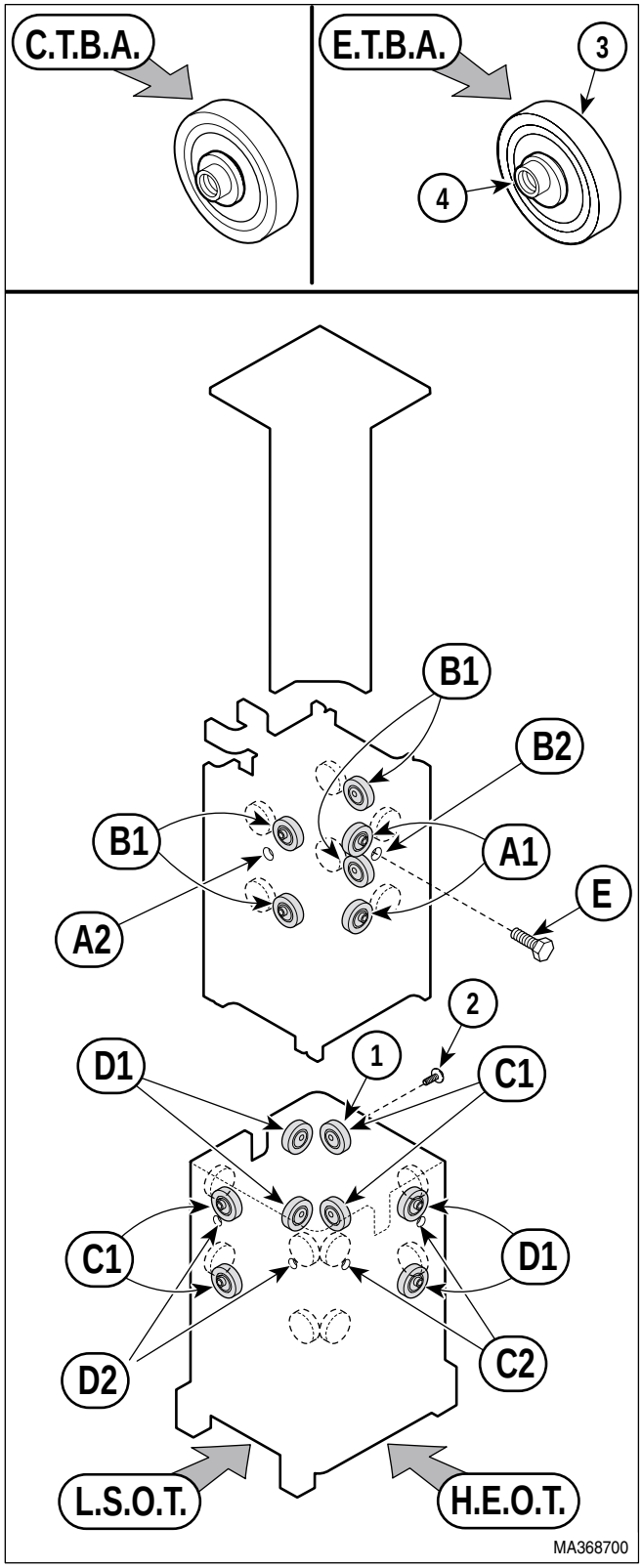


Figure 4-29. Eccentric Bearings Adjustment

(17) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) and secure with four screws (4).

(18) Install tabs (A) of R.H. and L.H. outer shrouds (2) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

4.19 Hand / Foot Control Inlet PC Board Removal / Installation

A. Removal

(1) Raise base and foot sections to their maximum height.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-30) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(4) Lower middle outer shroud assembly (4) down out of way.

(5) Unplug modular cord (5) from port of inlet PC board (6).

(6) Remove screw (7), ground wire (8), and star-washer (9) from base casting (10).

(7) Remove two screws (11), inlet board cover (12), and inlet PC board (6) from inner shroud (13).

B. Installation

(1) Install inlet PC board (6) on inside of inner shroud (13), and inlet board cover (12) on outside of inner shroud and secure with two screws (11).

Printed in U.S.A.

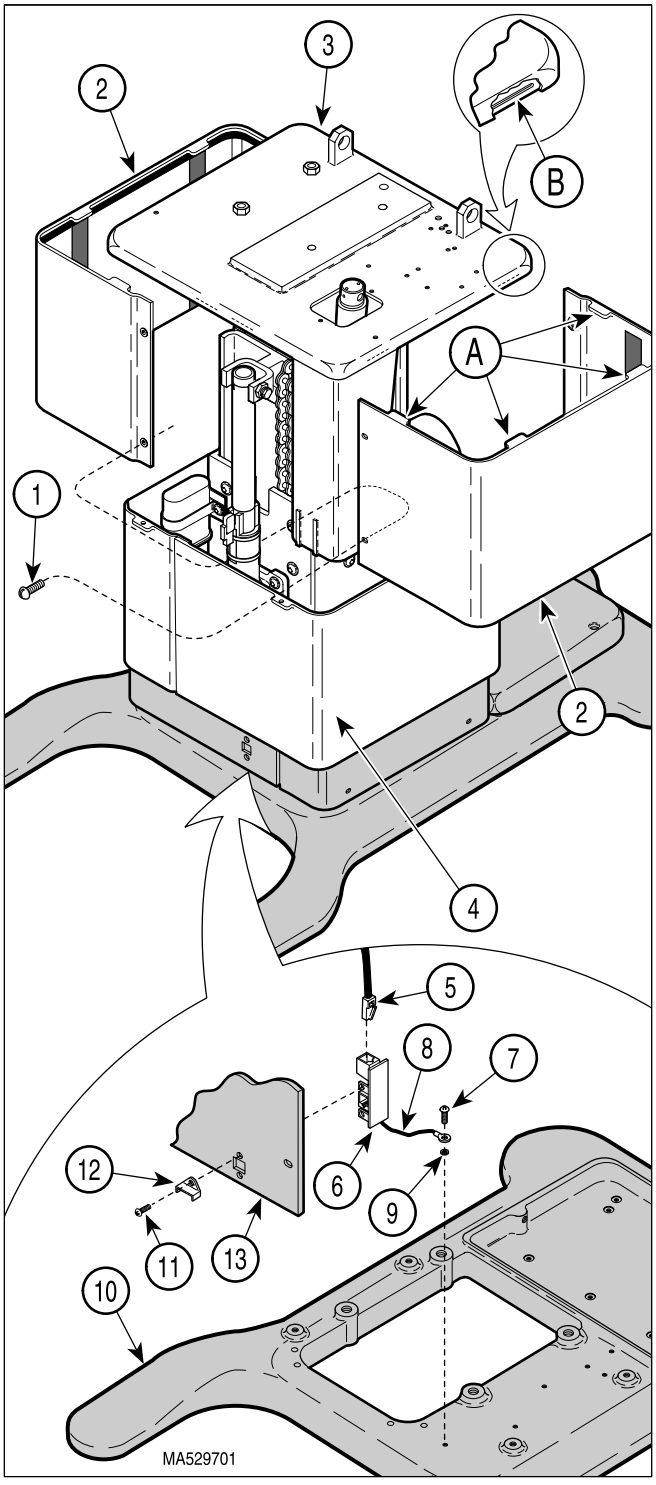


Figure 4-30. Control Inlet PC Board Removal / Installation

(2) Secure starwasher (9) and ground wire (8) to base casting (10) with screw (7).

(3) Plug modular cord (5) into port of inlet PC board (6).

(4) Install tabs (A) of R.H. and L.H. outer shrouds (2) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (4) is captured by R.H. and L.H. outer shrouds (2).

4.20 Hand Control PC Board Removal / Installation

A. Removal

(1) Disconnect coil cord (1, Figure 4-31) from table.

(2) Remove four screws (2) and hand control bottom (3) from hand control top (4).

(3) Disconnect coil cord (1) from PC board (5).

(4) Disconnect ribbon conector (6) from PC board (5)

NOTE
To remove hand control switch panel, peel adhesive switch panel from hand control top; then pull ribbon connector thru slot in hand control top.

(5) Using a flat-bladed screwdriver, pry upward on two retaining rings (7) until they separate from two standoffs (8); then remove PC board (5).

B. Installation

NOTE
To install hand control switch panel, peel backing from switch panel, insert ribbon connector thru slot in hand control top; then position switch panel on hand control top and apply pressure.

(1) Connect ribbon connector (6) to PC board (5).

NOTE
Be sure to push two retaining rings all the way down against PC board.

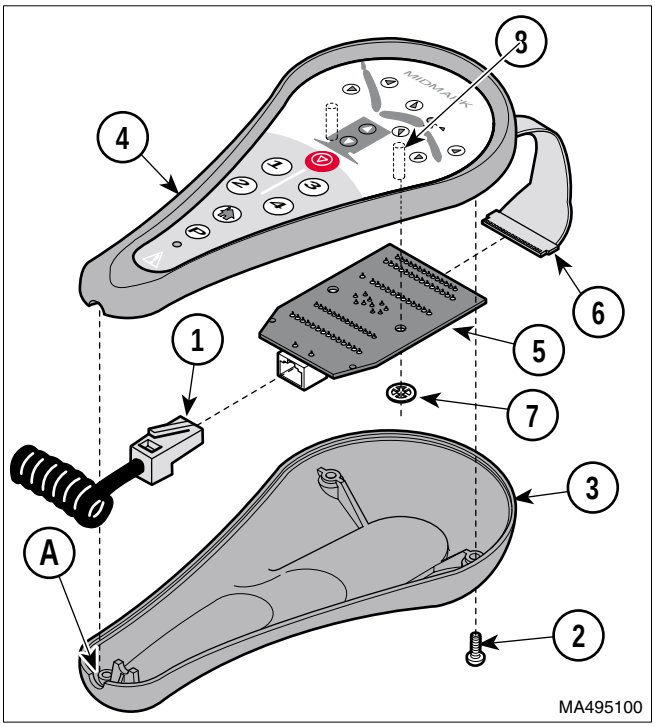


Figure 4-31. Hand Control PC Board Removal / Installation

(2) Install PC board (5) on two standoffs (8) and secure with two retaining rings (7).

(3) Connect coil cord (1) to PC board (5).

EQUIPMENT ALERT
Be sure to align coil cord (1) with notch (A) in hand control bottom (3). Failure to do so could result in damage to coil cord.

(4) Install hand control bottom (3) on hand control top (4) and secure with four screws (2).

(5) Connect coil cord (1) to table.

4.21 Foot Control Top Removal / Installation (Non-Programmable)

A. Removal

(1) Disconnect coil cord (1, Figure 4-32) from table.

(2) Remove two screws (2) and strain relief bracket (3).

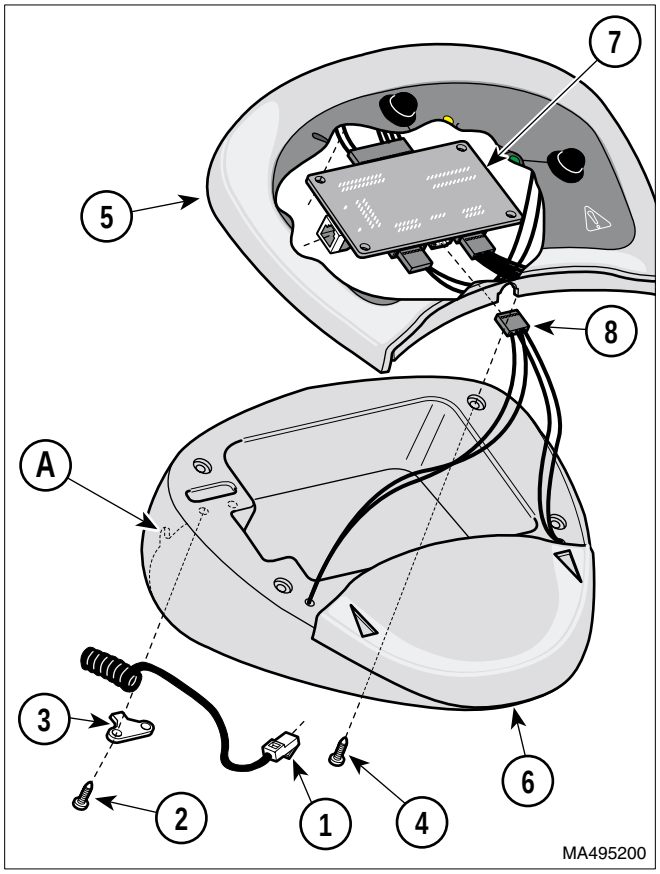


Figure 4-32. Foot Control Top Removal / Installation (Non-Programmable)

(3) Remove four screws (4) and partially separate foot control top (5) from foot control base (6).

(4) Disconnect coil cord (1) from PC board (7).

(5) Disconnect wire harness (8) from PC board (7) and remove foot control top (5).

B. Installation

(1) Connect wire harness (8) to PC board (7).

(2) Connect coil cord (1) to PC board (7).

(3) Install foot control top (5) onto foot control base (6) and secure with four screws (4).

(4) Place coil cord (1) into notch (A) of foot control base (6); then install strain relief bracket (3) and secure with two screws (2).

4.22 Foot Control Top Removal / Installation (Programmable)

A. Removal

(1) Disconnect coil cord (1, Figure 4-33) from table.

(2) Remove four screws (2), four screws (3) and bottom cover (4).

(3) Remove two screws (5), and strain relief bracket (6).

(4) Disconnect coil cord (1) from PC board (7).

(5) Disconnect wire harness (8) from PC board (7) and remove foot control top (9) from foot control base (10).

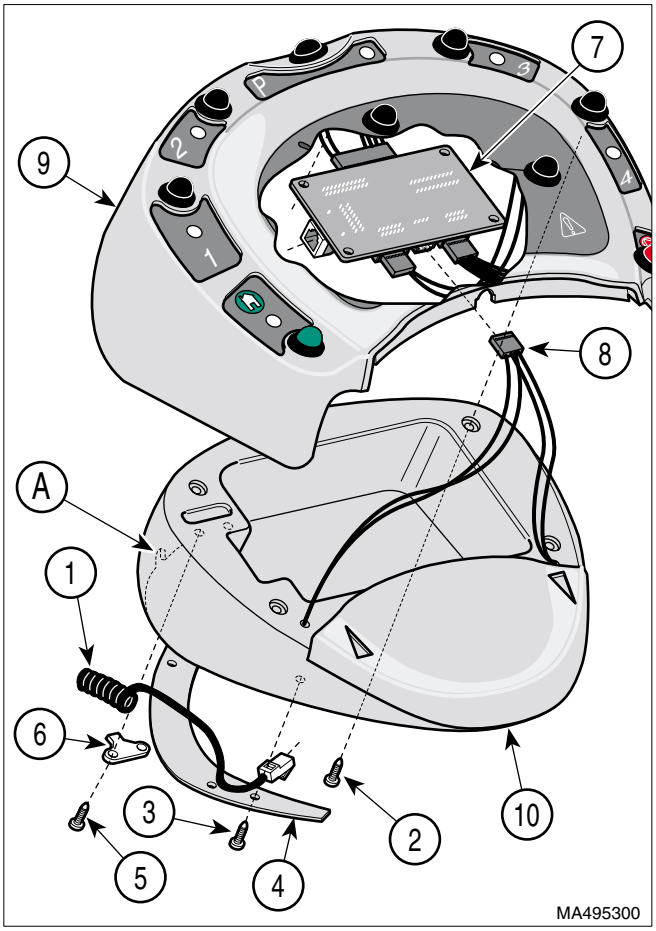


Figure 4-33. Foot Control Top Removal / Installation (Programmable)

B. Installation

(1) Connect wire harness (8) to PC board (7).

(2) Install foot control top (9) onto foot control base (10) and secure with four screws (2).

(3) Connect coil cord (1) to PC board (7).

(4) Place coil cord (1) into notch (A) of foot control base (10); then install strain relief bracket (6) and secure with two screws (5).

(5) Install bottom cover (4) and secure with four screws (3).

4.23 Foot Control PC Board Removal / Installation

A. Removal

(1) Remove foot control top. (Refer to para 4.21 ***or*** 4.22).

(2) Disconnect three wire harnesses (1, Figure 4-34) from PC board (2).

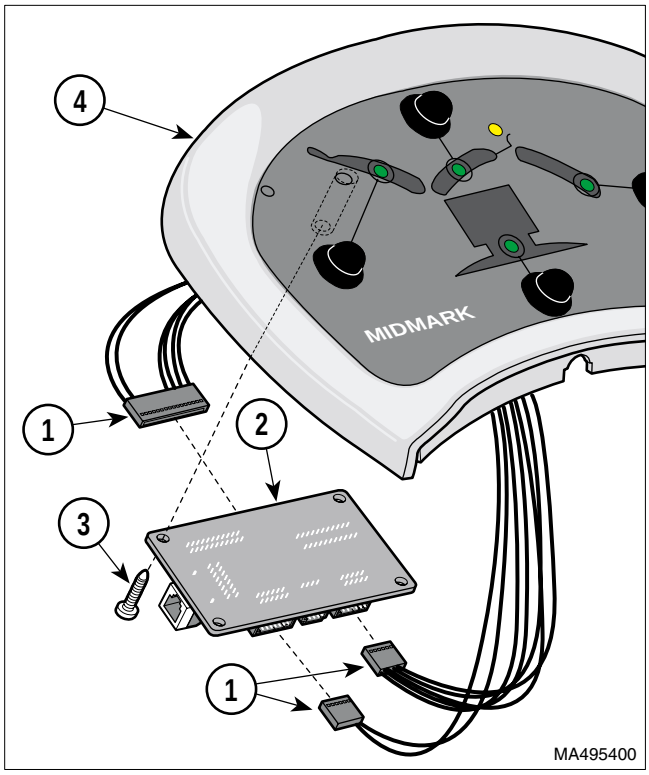


Figure 4-34. Foot Control PC Board Removal / Installation

(3) Remove four screws (3) and PC board (2) from foot control top (4).

B. Installation

(1) Install PC board (2) and secure to foot control top (4) with four screws (3).

(2) Connect three wire harnesses (1) to PC board (2).

(3) Install foot control top. (Refer to para 4.21 ***or*** 4.22).

4.24 Typical Foot Control *Foot Pedal* Switch Removal / Installation

A. Removal

(1) Remove foot control top. (Refer to para 4.21 ***or*** 4.22).

(2) Remove four screws (1, Figure 4-35), two pedal caps (2), foot control pedal (3) and two springs (4) from foot control base (5).

(3) Tag switch lead (6) with position; then using an instrument with a sharp point, gently depress release tab (A) and pull lead from wire harness connector (7). Repeat this procedure for the second switch lead.

(4) Remove two screws (8) and switch cover (9).

(5) Pull two switch leads (6) thru hole (B).

(6) Remove nut (10), lockwasher (11) and switch (12) from foot control base (5).

B. Installation

EQUIPMENT ALERT
The soldered connections at the switch are very delicate. Use caution when tightening nut (10). Failure to do so could result in broken connections at the switch.

(1) Install switch (12) into foot control base (5) and secure with lockwasher (11) and nut (10).

(2) Feed two switch leads (6) up thru hole (B).

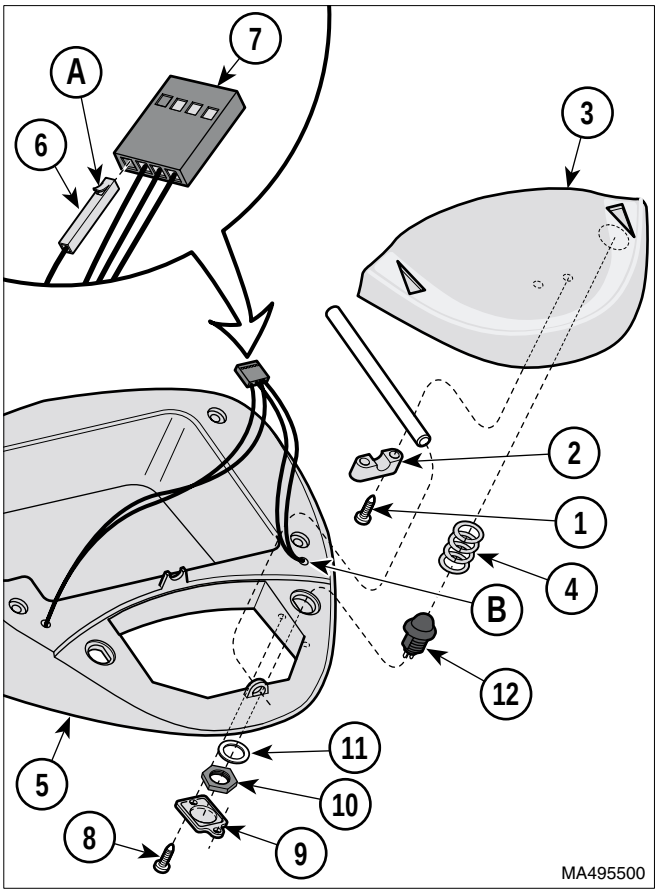


Figure 4-35. Foot Control *Foot Pedal* Switch Removal / Installation

(3) Check release tabs (A) of two switch leads (6). If they are not angled upward slightly as shown, use a small tool to bend them upward.

(4) Insert switch leads (6) into wire harness connector (7), making sure each release tab (A) of lead is oriented so it will latch securely into place. Very gently pull on switch leads to ensure they are secure.

(5) Install switch cover (9) and secure with two screws (8).

(6) Install two springs (4), foot control pedal (3) and two pedal caps (2) and secure with four screws (1).

(7) Install foot control top. (Refer to para 4.21 ***or*** 4.22).

4.25 Typical Foot Control *Function Button* Switch Removal / Installation

A. Removal

(1) Remove foot control top. (Refer to para 4.21 ***or*** 4.22).

(2) Remove four screws (1, Figure 4-36) and partially separate PC board (2) from foot control top (3).

NOTE
Be sure to trace switch leads from faulty switch to proper wire harness connector at PC board.

(3) Disconnect wire harness connector (4) from PC board (2).

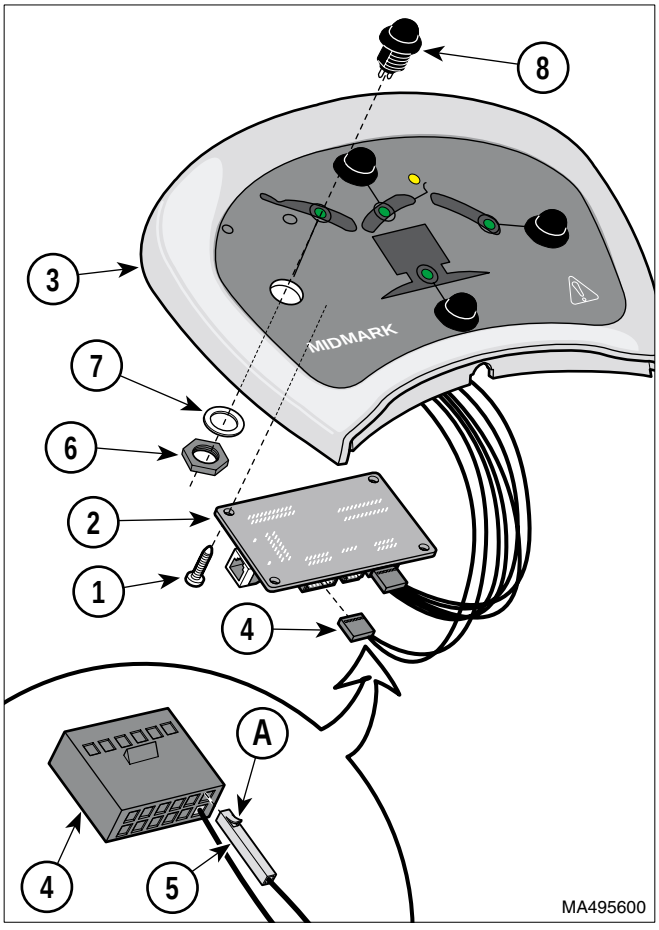


Figure 4-36. Typical Foot Control *Function Button* Switch Removal / Installation.

(4) Tag switch lead (5) with position; then using an instrument with a sharp point, gently depress release tab (A) of switch lead and pull switch lead out of wire harness connector. Repeat this procedure for second switch lead.

(5) Remove nut (6), lockwasher (7) and switch (8) from foot control top (3).

B. Installation

EQUIPMENT ALERT
The soldered connections at the switch are very delicate. Use caution when tightening nut (6). Failure to do so could result in broken connections at the switch.

(1) Install switch (8) into foot control top (3) and secure with lockwasher (7) and nut (6).

(2) Check release tabs (A) of two switch leads (5). If they are not angled upward slightly as shown, use a small tool to bend them upward.

(3) Insert two switch leads (5) into wire harness connector (4), making sure each release tab (A) is oriented so it will latch securely into place. Very gently pull on switch leads to ensure they are secure.

(4) Connect wire harness connector (4) to PC board (2).

(5) Secure PC board (2) to foot control top (3) with four screws (1).

(6) Install foot control top. (Refer to para 4.21 ***or*** 4.22).

4.26 Typical Foot Control Lamp Removal / Installation (Programmable)

A. Removal

(1) Remove foot control top. (Refer to para 4.21 ***or*** 4.22).

(2) Remove bulb socket (1, Figure 4-37) from foot control top (2).

(3) Remove bulb (3) from bulb socket (1).

Printed in U.S.A.

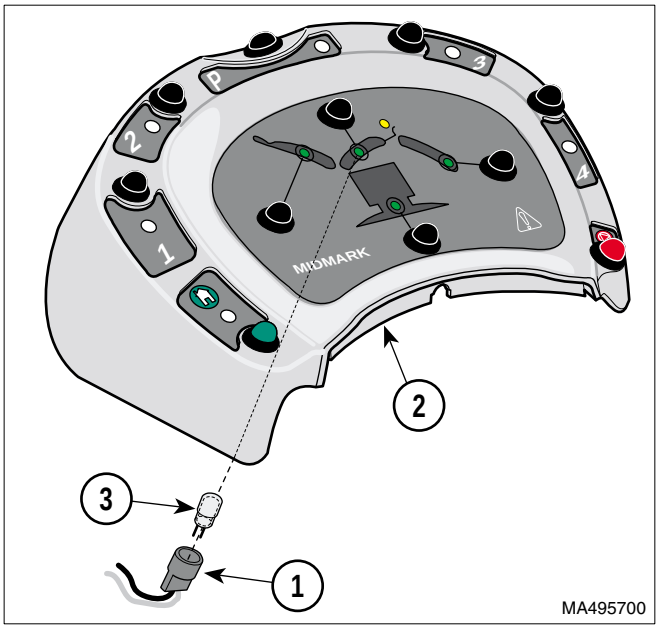


Figure 4-37. Typical Foot Control Lamp Removal / Installation

B. Installation

(1) Install bulb (3) into bulb socket (1).

(2) Insert bulb socket (1) thru hole in foot control top (2).

(3) Install foot control top. (Refer to para 4.21 ***or*** 4.22).

4.27 Headrest Assembly Stop Pin Removal / Installation

A. Removal

(1) Pull headrest assembly (1, Figure 4-38) out of headrest slide mechanism (2).

(2) Remove two knobs (3) and headrest upholstery (4).

(3) Loosen two set screws (1, Figure 4-39) and remove two pin stop blocks (2).

(4) Remove two pivot pins (3).

(5) Push release button (4) and remove headrest housing (5) and tang weldment (6) from pin/spring housing assembly (7).

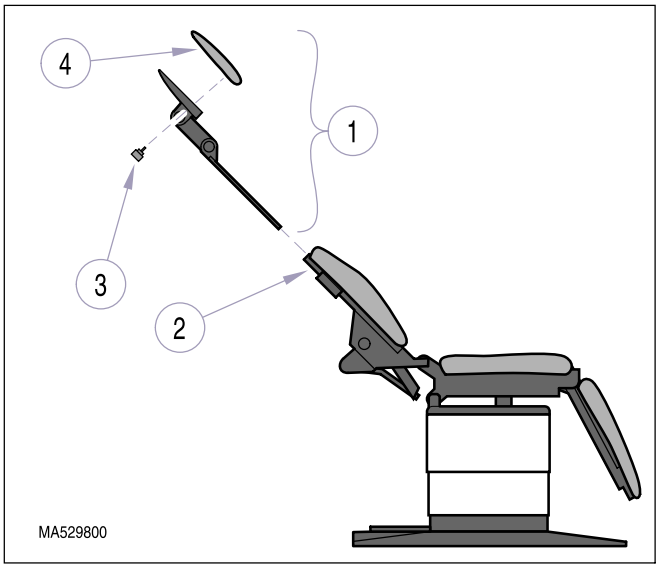


Figure 4-38. Headrest Assembly Removal / Installation

(6) Remove two screws (8); then separate spring housing (9) from pin housing (10).

(7) Remove stop pin(s) (11) and spring(s) (12).

B. Installation

NOTE
Be sure to lubricate stop pins with silicone based lubricant or white lithium grease before installing.

(1) Insert stop pin(s) (11) thru pin housing assembly (10); then install spring(s) (12) onto stop pin(s).

(2) Install spring housing (9) onto pin housing (10) making sure springs (12) and stop pins (11) align with holes in spring housing.

NOTE
Before tightening screws (8), use pivot pins (3) to align spring housing (9) with pin housing (10). Be sure stop pins (11) move freely after tightening screws (8).

(3) Secure spring housing (9) to pin housing (10) with two screws (8).

Printed in U.S.A.

(4) Push release button (4) to retract stop pins (11); then slide pin/spring housing assembly (7) into tang weldment (6).

NOTE
When installing pin stop block, be sure to align hole in pin stop block with set screw.

(5) Insert pivot pin (3) thru tang weldment (6) and pin/spring housing assembly (7); then install pin stop block (2).

(6) Hold pin stop block (2) so that it is flush with tang weldment (9); then tighten set screw (1).

(7) Push release button (4) to retract stop pins (11); then slide headrest housing (5) over pin / spring housing assembly (7).

NOTE
When installing pin stop block, be sure to align hole in pin stop block with set screw.

(8) Insert pivot pin (3) thru headrest housing (5) and pin/spring housing assembly (7); then install pin stop block (2).

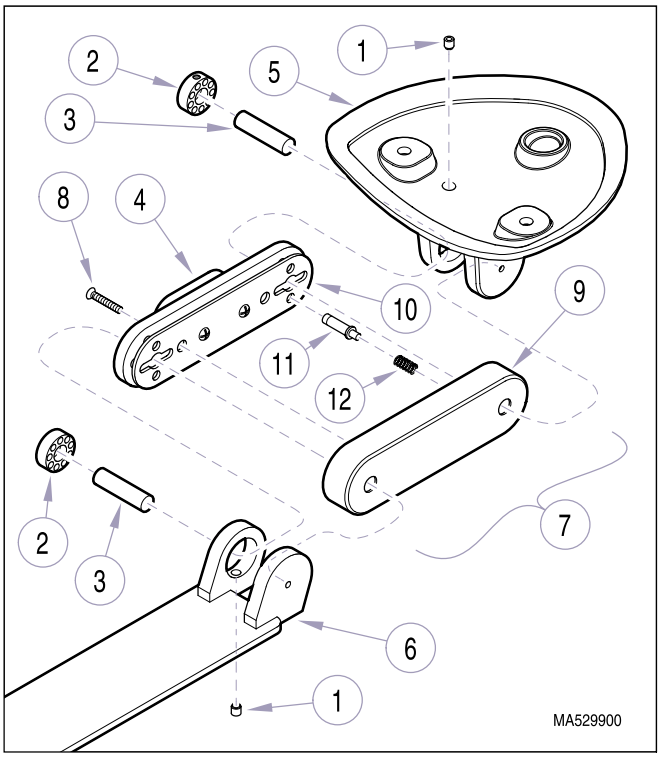


Figure 4-39. Headrest Assembly Stop Pin Removal / Installation

(9) Hold pin stop block (2) so that it is flush with headrest housing (5); then tighten set screw (1).

NOTE
To ensure stop pins are seated correctly, hold release button and rotate each pivot point back and forth several times before installing headrest assembly.

(10) Install headrest upholstery (4, Figure 4-38) and secure with two knobs (3).

(11) Insert headrest assembly (1) into headrest slide mechanism (2).

4.28 Headrest Slide Mechanism Adjustment

A. To *decrease* friction setting of headrest slide mechanism, adjust as follows:

(1) Loosen screw (1, Figure 4-40) until desired friction setting is achieved.

B. To *increase* friction setting of headrest slide mechanism, adjust as follows:

(1) Tighten screw (1) until desired friction setting is achieved.

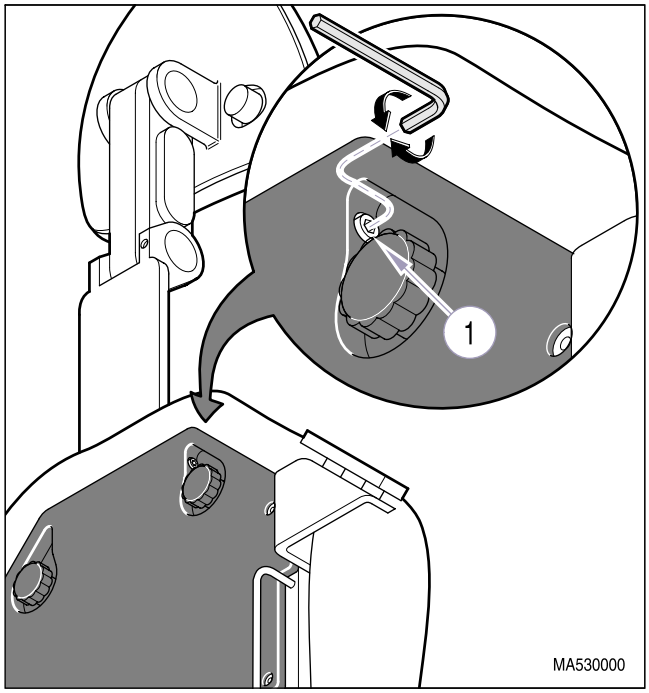


Figure 4-40. Headrest Slide Mechanism Adjustment

4.29 Arm Rest Locking Mechanism Removal / Installation

A. Removal

(1) Remove two knobs (1, Figure 4-41) and arm pad (2).

(2) Remove screw (3) and upholstery mount (4) from arm weldment (5).

(3) Remove three screws (6), arm boss (7), and knob assembly (8) from upholstery mount (4).

(4) Remove knob (9), flanged bushing (10), spring (11), and index plunger (12) from knob assembly (8).

B. Installation

(1) Slide spring (11), and flanged bushing (10) onto index plunger (12); then install knob (9).

NOTE
When aligning arm boss with index pin, be sure countersink in center of arm boss is facing outward.

(2) Insert knob assembly (8) thru upholstery mount (4); then align index hole in arm boss (7) with index plunger (12).

(3) Coat threads of three screws (6) with removeable threadlocking adhesive (Loctite 262).

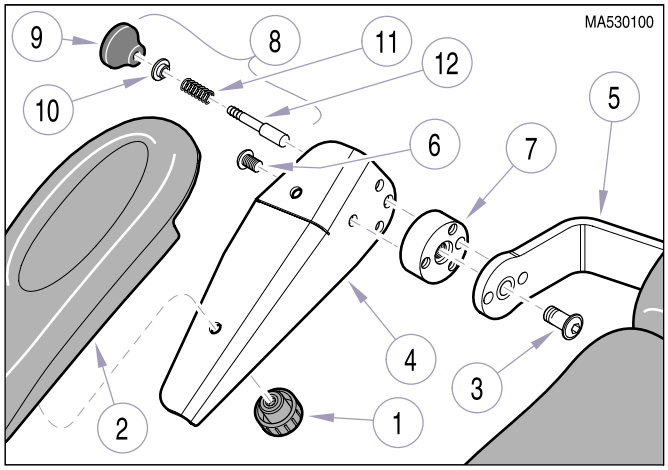


Figure 4-41. Arm Rest Locking Mechanism Removal / Installation

(4) Secure arm boss (7) to upholstery mount (4) with three screws (6).

(5) Coat threads of screw (3) with removeable threadlocking adhesive (Loctite 262).

(6) Install upholstery mount (4) onto arm weldment (5) and secure with screw (3).

(7) Install arm pad (2) and secure with two knobs (1).

4.30 Back Slide Bearing Removal / Installation

A. Removal

(1) Raise back section to its maximum height.

(2) Remove headrest assembly (1, Figure 4-42).

(3) Remove two knobs (2) and back section upholstery (3).

(4) Remove four bolts (4), four screws (5), slide retainer (6), sliding cover assembly (7).

(5) Lower back section to its minimum height.

NOTE
If sliding back weldment contacts link pistons (11) when performing the following step, raise back section slightly.

(6) Pull sliding back weldment (8) toward head end of table and remove from back weldment (9).

(7) Remove four back slide bearings (10) from back weldment (9).

B. Installation

(1) Insert four back slide bearings (10) into notches on back weldment (9).

NOTE
It may be necessary to raise back section slightly in order to rotate link pistons.

(2) Rotate two link pistons (11) so that sliding back weldment (8) will not contact link pins (12) when installed.

(3) Install sliding back weldment (8) onto back weldment (9) so that link pistons (11) are visible thru two holes (A) in sliding back weldment.

WARNING
Sliding back weldment is heavy and will slide down quickly if not held securely during the following step. Use an assistant if necessary when performing the following steps. Failure to comply could result in serious personal injury.

(4) While supporting sliding back weldment (10), depress BACK UP button on hand control until the two link pistons (11) raise thru the holes (A) in sliding back weldment. Continue to raise back section while moving sliding back weldment up (keep link pistons aligned with holes in sliding back weldment) until access to two link pins (12) can be achieved.

(5) Hold sliding back weldment (8) in place; then align two link pins (12), flat sides **up**, with four holes (B) in sliding back weldment (8) and secure with four bolts (4).

(6) Install sliding cover assembly (7) and secure with two screws (5).

(7) Install slide retainer (6) and secure with two screws (5).

(8) Install back section upholstery (3) and secure with two knobs (2).

(9) Install headrest assembly (1).

4.31 Foot Rest Extension Limit Switch Removal / Installation

A. Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(1) Unplug table power cord from wall outlet.

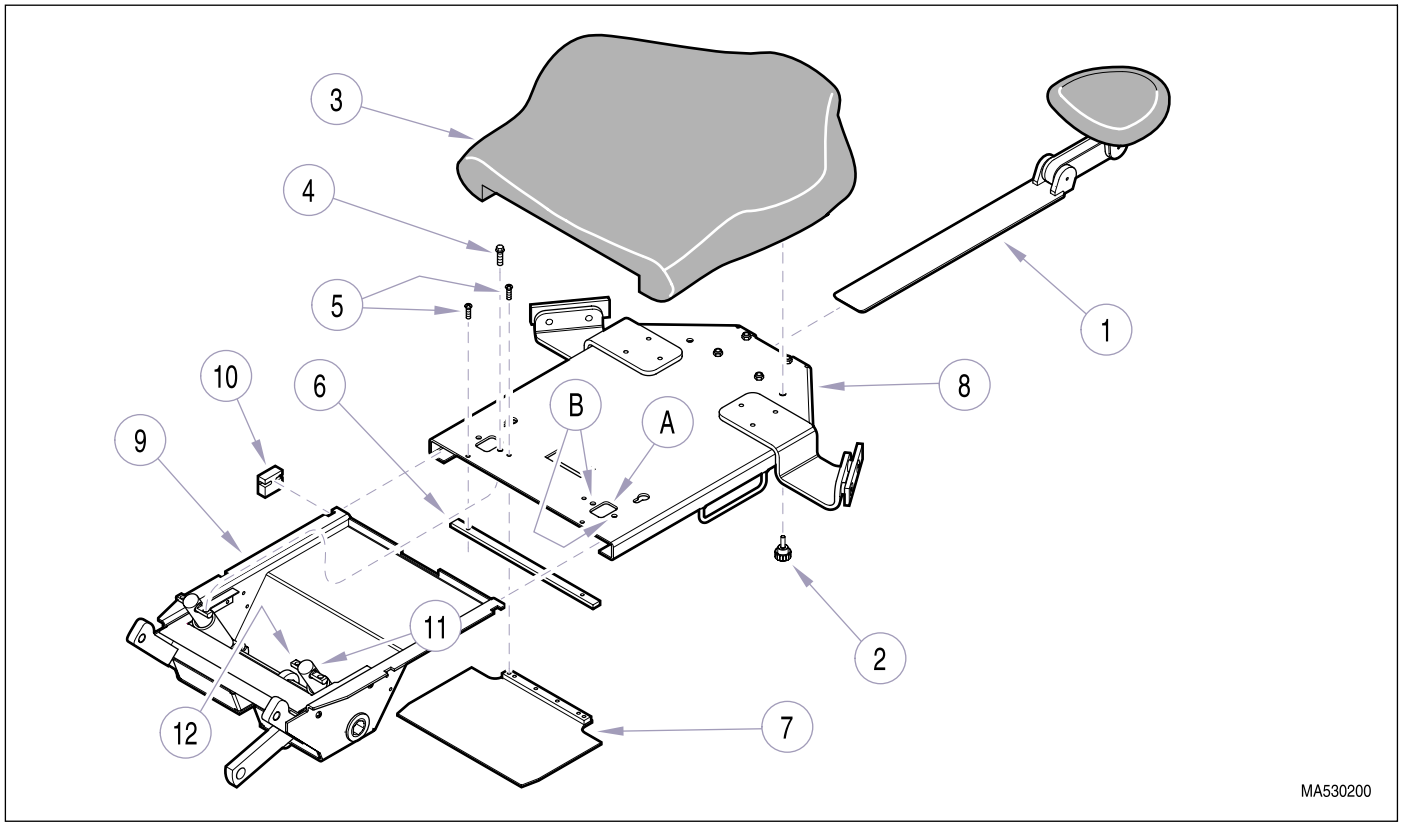


Figure 4-42. Back Slide Bearing Removal / Installation

(2) Pull foot rest extension out as far as it will go.

(3) Remove four knobs (1, Figure 4-43) and foot rest upholstery (2).

(4) Remove four screws (3) and foot weldment cover (4) from foot section weldment (5).

(5) Tag and disconnect two wires (6) from terminals of limit switch (7).

(6) Depress two tabs (A) and remove limit switch (7) from limit switch bracket (8).

B. Installation

(1) Partially insert limit switch (7) thru hole in limit switch bracket (8).

(2) Connect two wires (6) to proper terminals of limit switch (7).

(3) Push limit switch (7) thru hole in limit switch bracket (8) until it locks into place.

(4) Install foot weldment cover (4) and secure with four screws (3).

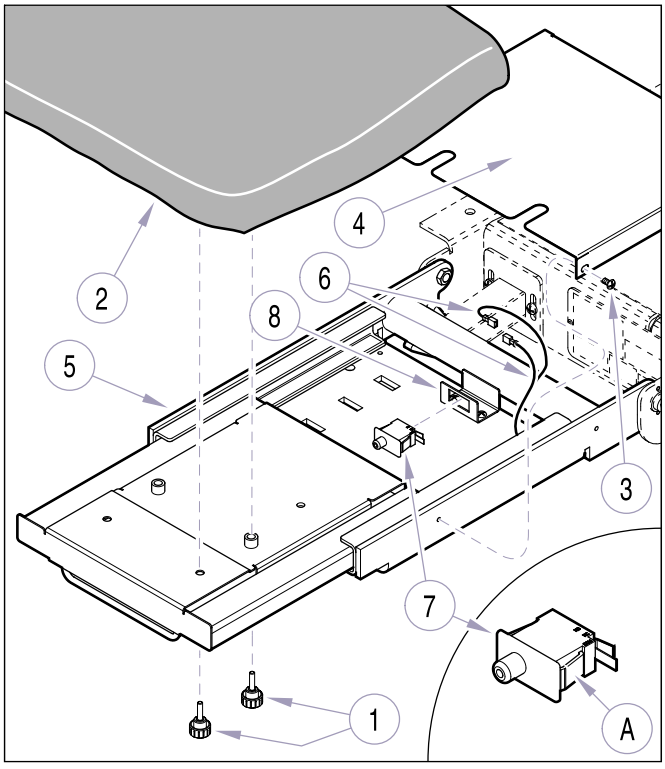


Figure 4-43. Foot Rest Extension Limit Switch Removal / Installation

(5) Install foot rest upholstery (2) and secure with four knobs (1).

4.32 Foot Actuator Limit Switch Removal / Installation

A. Removal

(1) Raise foot section to its maximum height; then place supports (A, Figure 4-44) under foot section.

(2) Remove two klip-rings (1) and clevis pin (2).

(3) Run FOOT DOWN function to retract foot actuator (3) as far as it will go.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(4) Unplug table power cord from wall outlet.

(5) Remove four knobs (4) and seat upholstery (5).

(6) Remove two screws (6) and electrical cover (7).

(7) Cut two wire ties (1, Figure 4-45); then tag and disconnect two wires (2) from terminals of limit switch (3).

(8) Remove hole plug (4) and two klip-rings (5);

(9) Using a hammer and punch, drive clevis pin (6) out thru hole (A).

(10) Remove nut (7) securing ground wire (8) to foot actuator (9).

EQUIPMENT ALERT
When performing the following step, do not attempt to completely remove actuator; some wires are still connected. Failure to comply will result in damage to the actuator and/or wiring connections.

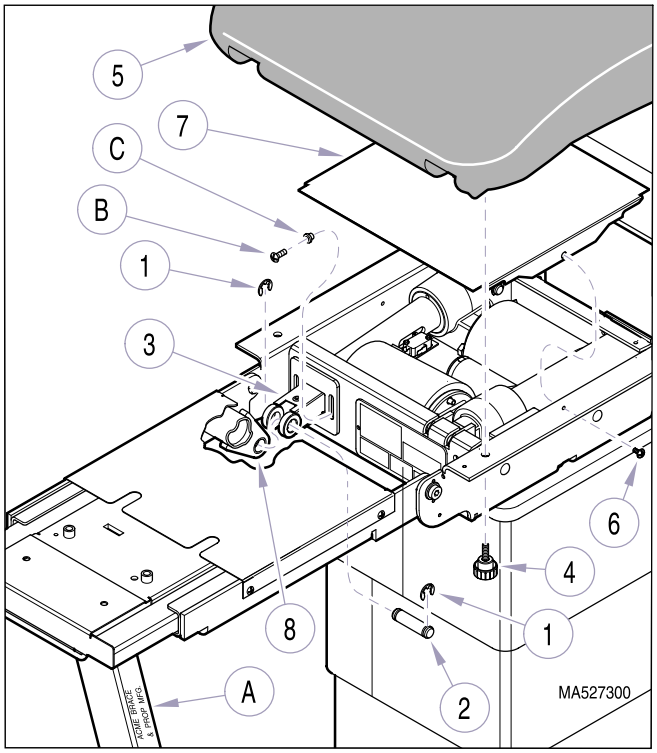


Figure 4-44. Foot Actuator Limit Switch Removal / Installation

(11) Pull shaft end of foot actuator (9) thru hole in seat weldment (10) and rotate actuator to access bottom of limit switch bracket (11).

(12) Remove two screws (12), two nuts (13), and limit switch (3) from limit switch bracket (11).

B. Installation

EQUIPMENT ALERT

If the limit switch is postioned too far toward the head end of the limit switch bracket, the foot section will move lower than 40° below horizontal before limit switch is tripped. When the Base and Tilt funtions are in their lowest positions, this can allow the foot section to collide with the floor. Use a protractor to ensure the limit switch is tripped when the foot section is 40° below horizontal. Failure to comply could result in damage to the accessories or the table.

(1) Install limit switch (3) onto limit switch bracket (11) and secure with two screws (12) and two nuts (13).

(2) Insert shaft end of foot actuator (9) thru hole in seat weldment (10).

(3) Install clevis pin (6) and secure with two klip-rings (5); then install hole plug (4).

(4) Connect two wires (2) to proper terminals of limit switch (3).

(5) Secure ground wire (8) to foot actuator (9) with nut (7); then bundle wires and secure with two wire ties (1).

(6) Install electrical cover (7, Figure 4-44), but do not secure at this time.

(7) Plug table power cord into wall outlet.

(8) Run FOOT UP function to extend foot actuator (3) until actuator shaft aligns with foot section weldment (8).

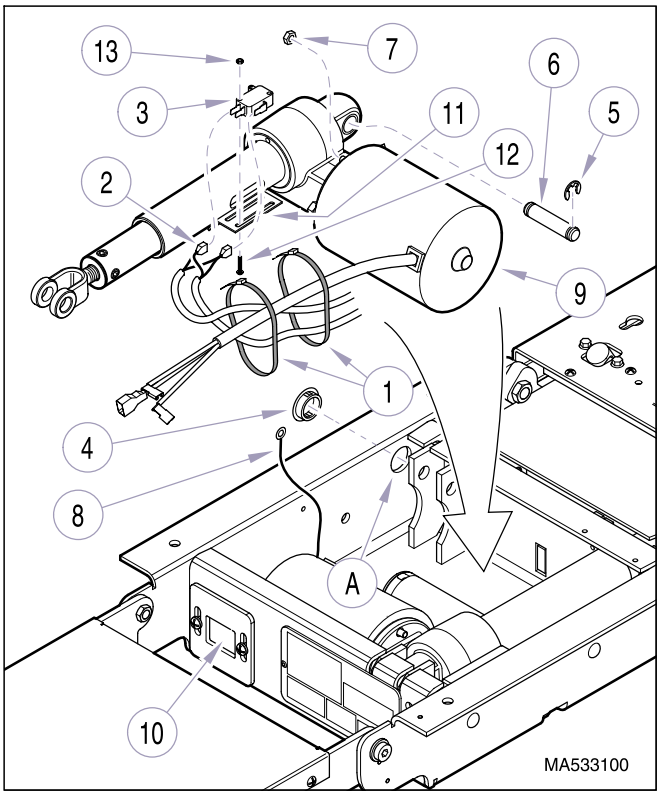


Figure 4-45. Foot Actuator Limit Switch Removal / Installation

(9) Install clevis pin (2) thru foot actuator (3) and foot section weldment (8); then secure clevis pin with two klip-rings (1).

(10) Check for proper operation. (Refer to steps 4 thru 7 of Operational Test, para 2.1). Reposition limit switch (3, Figure 4-45) on limit switch bracket (11) if necessary.

(11) Secure electrical cover (7, Figure 4-44) with two screws (6).

(12) Install seat upholstery (5) and secure with four knobs (4).

4.33 Base Actuator Limit Switch Removal / Installation

A. Removal

(1) Raise BASE UP function all the way up.

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-46) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

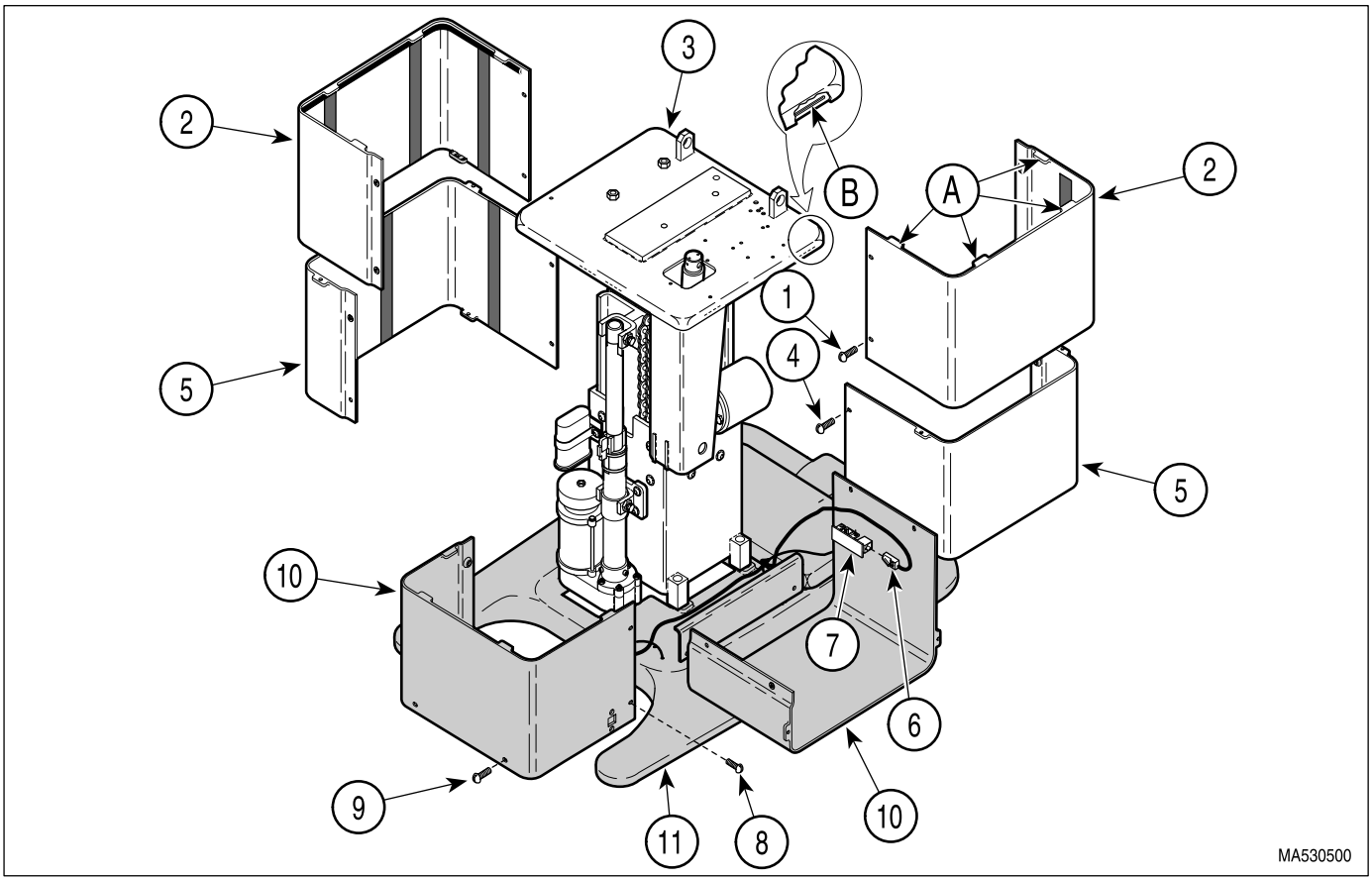


Figure 4-46. Base Shrouds Removal / Installation

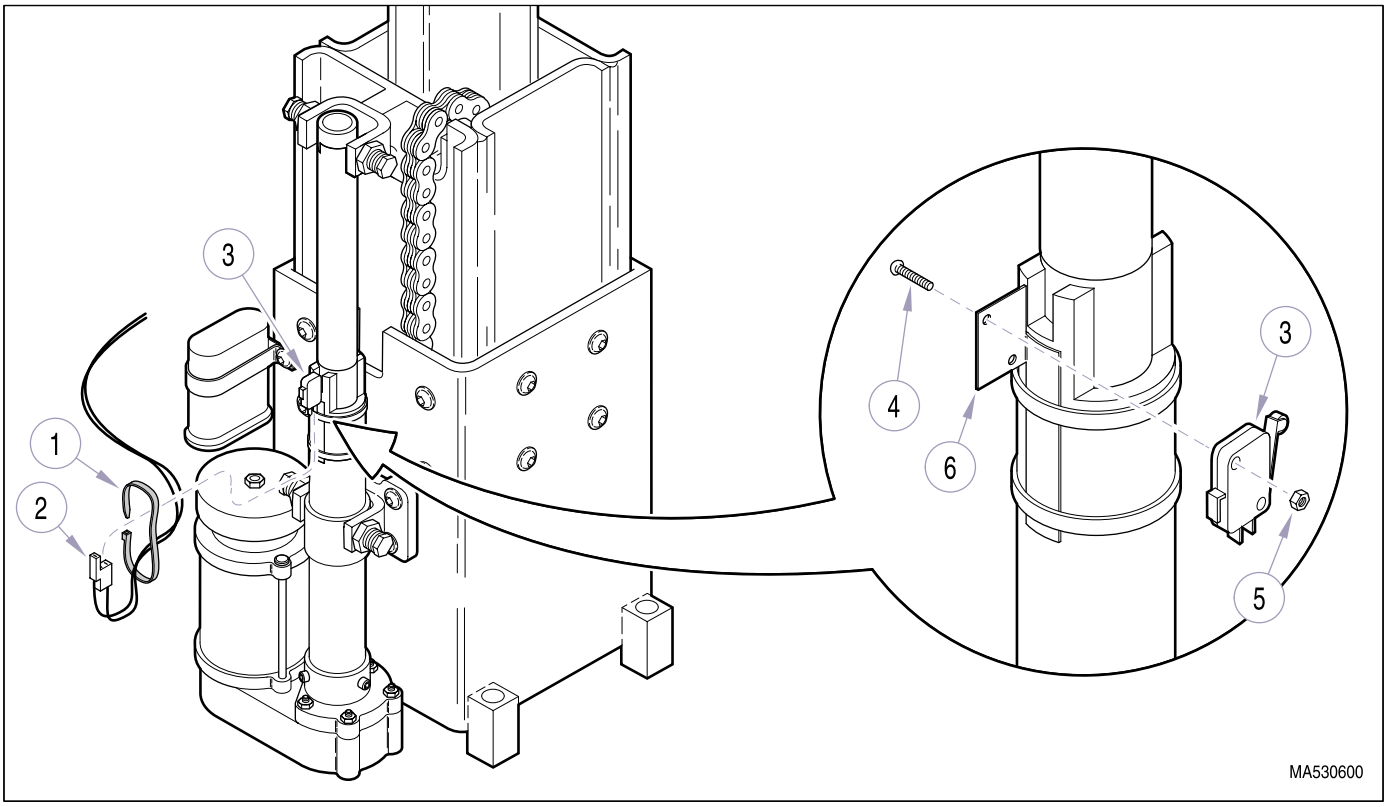


Figure 4-47. Base Actuator Limit Switch Removal / Installation

(4) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(5) Disconnect two modular cords (6) from two inlet PC boards (7).

(6) Remove four screws (8),and four screws (9); then partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(7) Cut wire tie (1, Figure 4-47); then disconnect wire harness (2) from terminals of limit switch (3).

(8) Remove two screws (4), two nuts (5), and limit switch (3) from limit switch bracket (6).

B. Installation

(1) Install limit switch (3) on limit switch bracket (6) and secure with two screws (4) and two nuts (5).

(2) Connect wire harness (2) to terminals of limit switch (3).

(3) Install R.H. and L.H. inner shrouds (10, Figure 4-46) on base casting (11) and secure with four screws (9), and four screws (8).

(4) Connect two modular cords (6) to two inlet PC boards (7).

(5) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) and secure with four screws (4).

(6) Install tabs (A) of R.H. and L.H. outer shrouds (2) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

4.34 AC Receptacle Removal / Installation Removal

WARNING
Always disconnect the power cord from the outlet receptacle before removing any of the table's covers/shrouds or making any repairs to prevent the possibility of electrical shock. Failure to comply with these instructions could result in severe personal injury or death.

A. Removal

(1) Remove two screws (1, Figure 4-48) and PC board cover (2) from base casting (3).

(2) Loosen two terminal screws (4); then tag and disconnect two wires (5) from terminals of PC board (6).

(3) Remove screw (7) and ground wire (8) from base casting (3).

WARNING
The table weighs 515 lbs. (233 kgs). You will need an assistant to perform the following step. Failure to comply could result in serious personal injury or back strain.

EQUIPMENT ALERT
Remove chair arms and any accessories attatched to the table. Failure to comply could result in damage to the accessories or the table.

(4) Lay table on its side.

(5) Remove two screws (9) and power inlet bracket (10) from bottom of base casting (3).

(6) Tag and disconnect two wires (1, Figure 4-49) and ground wire (2) from terminals of AC receptacle (3).

(7) Disconnect two wires (1, Figure 4-49) and ground wire (2) from AC receptacle (3).

(8) Depress tabs (A); then remove AC receptacle (3) from power inlet bracket (4).

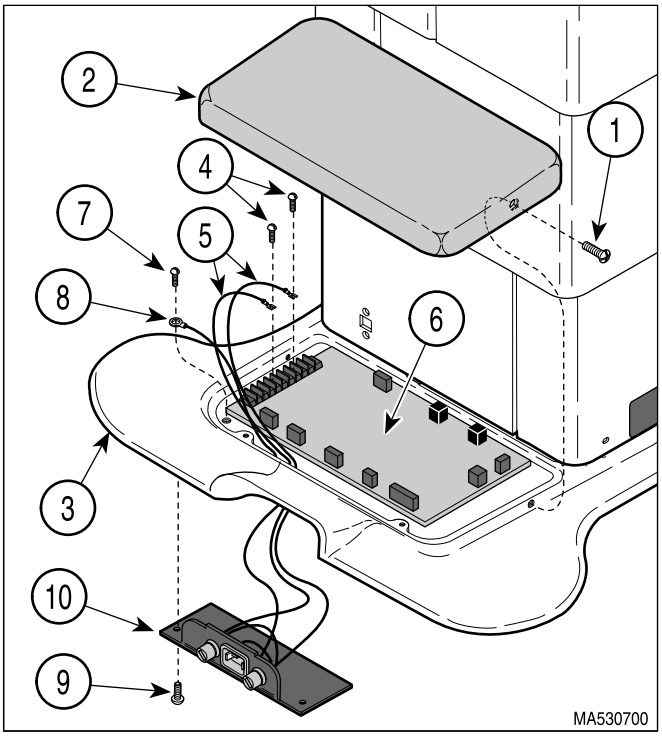


Figure 4-48. Power Inlet Bracket Removal / Installation

B. Installation

(1) Insert AC receptacle (3) thru hole in power inlet bracket (4); then push inward until it locks into place.

(2) Connect two wires (1) and ground wire (2) to proper terminals of AC receptacle (3).

(3) Install power inlet bracket (10, Figure 4-48) on bottom of base casting (3) and secure with two screws (9).

WARNING
The table weighs 515 lbs. (233 kgs). You will need an assistant to perform the following step. Failure to comply could result in serious personal injury or back strain.

(4) Stand table upright.

(5) Secure ground wire (8) to base casting (3) with screw (7).

Printed in U.S.A.

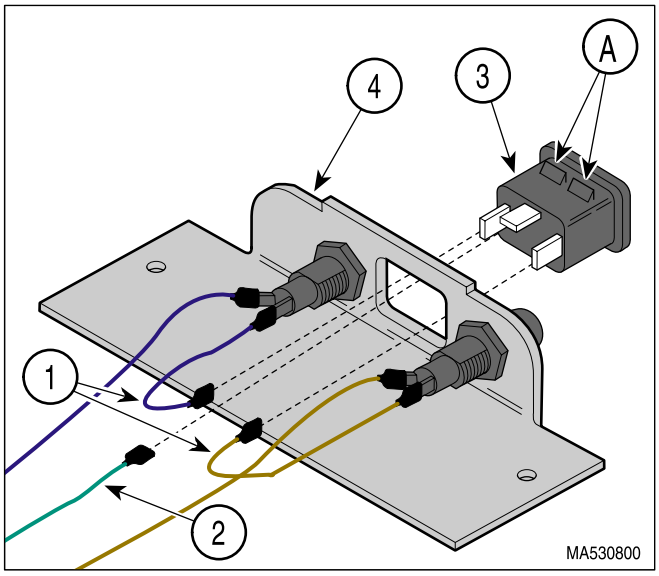


Figure 4-49. AC Receptacle Removal / Installation

(6) Connect two wires (5) to proper terminals of PC board (6) and secure by tightening two terminal screws (4).

(7) Install PC board cover (2) on base casting (3) and secure with two screws (1).

4.35 Fuse Holder Removal / Installation Removal

A. Removal

(1) Remove power inlet bracket. (Refer to: Removal - steps 1 thru 5 of para 4.34).

(2) Tag and disconnect two wires (1, Figure 4-50) from terminals of fuse holder (2).

(3) Remove nut (3), lockwasher (4), and fuse holder (2) from power inlet bracket (5).

(4) Remove gasket (6) from fuse holder (2).

B. Installation

(1) Install gasket (6) on fuse holder (2).

(2) Insert fuse holder (2) thru hole in power inlet bracket (5) and secure with lockwasher (4) and nut (3).

(3) Connect two wires (1) to terminals of fuse holder (2).

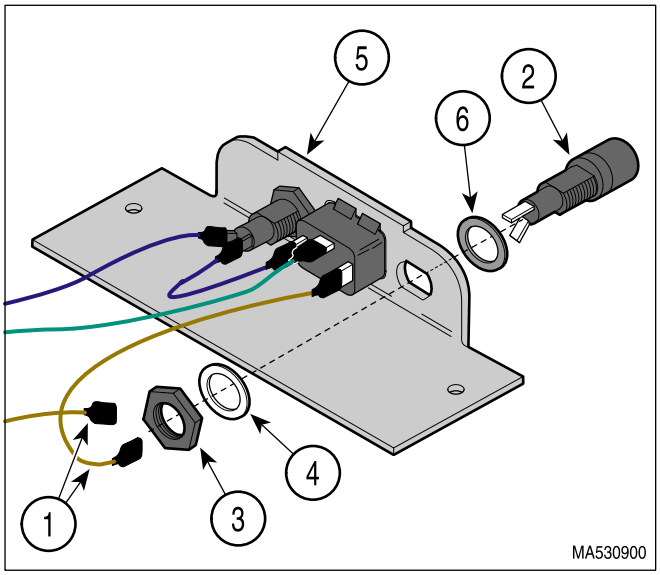


Figure 4-50. Fuse Holder Removal / Installation

(4) Install power inlet bracket. (Refer to: Installation - steps 3 thru 7 of para 4.34).

4.36 Foot Rest Extension Latch Spring Removal / Installation

A. Removal

(1) Run FOOT UP function to its maximum height.

(2) Loosen screw (1, Figure 4-51); then squeeze release handle (2) and remove foot slide weldment (3) from foot section weldment (4).

(3) Using a small flat-bladed screwdriver, pry latch spring (5) from detent latch (6).

B. Installation

(1) Position top of latch spring (5) under detent latch (6); then slide bottom of latch spring over alignment bump (A).

(2) Install foot slide weldment (3) into foot section weldment (4); then install screw (1).

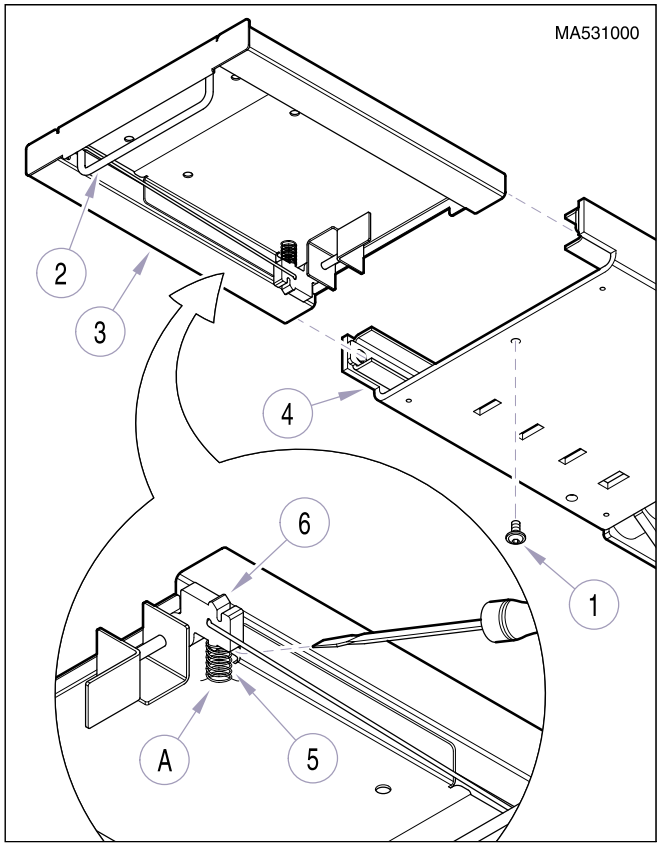


Figure 4-51. Foot Rest Latch Spring Removal / Installation

4.37 Foot Position Sensor Removal / Installation / Adjustment (Programmable Units Only)

A. Removal

(1) Run FOOT DOWN function all the way down.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four knobs (1, Figure 4-52) and seat upholstery (2).

(4) Remove two screws (3) and electrical cover (4).

(5) Disconnect foot sensor harness (5) from harness (6); then pull foot sensor harness thru access hole (A) in seat weldment (7).

(6) Remove two screws (1, Figure 4-53) and foot sensor cover (2) from position sensor mount (3).

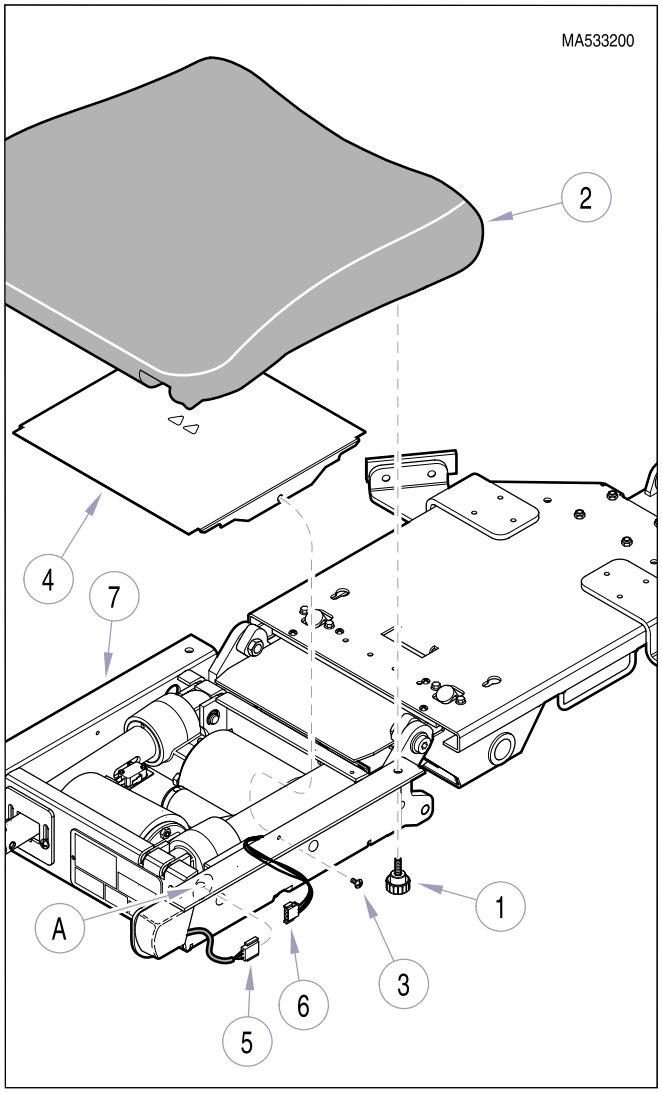


Figure 4-52. Foot Position Sensor Removal / Installation

(7) Using a T15 torx wrench, remove two screws (4), backing plate (5), and foot position sensor (6) from position sensor mount (3).

(8) Remove 5/16” hex drive (7) from head of screw (8).

B. Installation

(1) Remove two screws (9, Figure 4-53) and PC board cover (10) from base casting (11).

NOTE
Use multimeter leads with testing hooks; it is very difficult to do with testing probes.

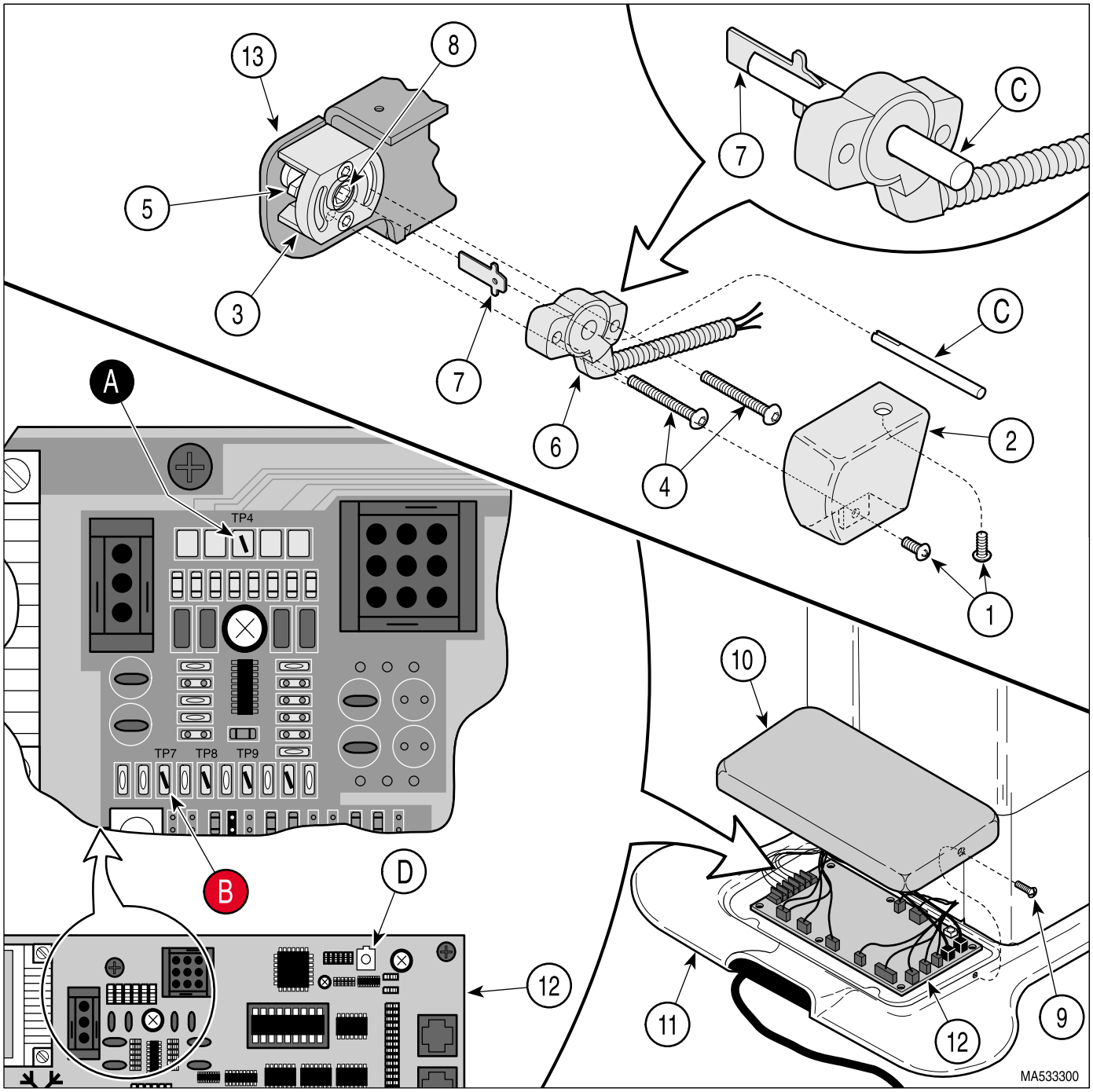


Figure 4-53. Foot Position Sensor Removal / Installation / Adjustment

(2) Connect negative (black) lead of multimeter to TP4 (A, Figure 4-53) and positive (red) lead of multimeter to TP7 (B) on PC control board (12).

(3) Set multimeter to VDC setting. Then, set the voltage range of the multimeter to the 0-20 VDC range.

(4) Feed foot sensor harness (5, Figure 4-52) thru access hole (A) in seat weldment (7).

(5) Connect foot sensor harness (5) to harness (6).

(6) Plug table power cord into outlet receptacle.

(7) Run FOOT UP function all the way up.

(8) Slide sensor holder tool (C, Figure 4-53) thru the center hole of foot position sensor (6).

(9) Insert 5/16" hex drive (7) into slot of sensor holder tool (C).

(10) Pull on sensor holder tool (C) until 5/16" hex drive (7) is engaged with foot position sensor (6). Then, rotate sensor holder tool slightly to apply friction on 5/16" hex drive and prevent it from "popping" out as foot position sensor is installed. The 5/16" hex drive is properly engaged when spring tension is felt as the sensor holder tool is rotated. Also, the multimeter should read approximately 0.5 to 0.7 VDC and the reading should change as the tool is rotated.

EQUIPMENT ALERT

Make sure the 5/16" hex drive remains in position in foot position sensor while foot position sensor is being installed. If hex drive does not stay fully seated in foot position sensor, the foot position sensor can be damaged.

(11) While applying slight rotational pressure and gentle back pressure on sensor holder tool (C) to keep 5/16" hex drive (7) in position, install foot position sensor (6) on position sensor mount (3). Move foot position sensor around as necessary while pushing foot position sensor inward until it is fully seated.

(12) Coat threads of two screws (4) with removable threadlocking adhesive (Loctite 242); then secure the foot position sensor (6) on position sensor mount (3) with backing plate (5) and two screws (4). Tighten screws very lightly, so that the foot position sensor may be rotated for adjustment, but do not let sensor pop out of mounting position.

(13) Pull sensor holder tool (C) from foot position sensor (6).

(14) Rotate foot position sensor (6) until multimeter reads approximately 0.50 VDC ± 0.2 VDC; then tighten two screws (4) to secure foot position sensor in place.

(15) Lower FOOT DOWN function all the way down (until it freewheels) while observing the multimeter reading; the reading should increase steadily during the table movement. If the voltage reading stops increasing before the actuator reaches its end of travel and freewheels, the foot position sensor (6) has reached the dead spot at the end of its range. If this happens, return to step 14 and readjust the foot position sensor as determined necessary to eliminate the dead spot.

(16) Run FOOT UP function for approximately 1/10 second (the minimum amount of time the button can be pressed and still have the table move slightly). Then, run FOOT UP function all the way up and repeat step using the FOOT DOWN function.

Observe. The multimeter reading should change slightly; if it doesn't change, then the foot position sensor (6) must be readjusted (it is in "dead spot" at end of travel).

(17) Run FOOT UP function all the way up (until foot actuator freewheels). The multimeter reading should be approximately 0.50 VDC ±0.2 VDC and no dead spot should be observed. If not, repeat entire procedure.

(18) Remove multimeter leads from TP4 (A) and TP7 (B) of PC control board (12).

(19) Install foot sensor cover (2) on seat weldment (13) and secure with two screws (1).

(20) Install electrical cover (4, Figure 4-52) and secure with two screws (3).

(21) Install seat upholstery (2) and secure with four knobs (1).

(22) Unplug table power cord from outlet receptacle.

(23) Depress and hold the PROGRAM / FAULT CLEAR button (D, Figure 4-53) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp and the FOOT REST EXTENSION lamp of the foot/hand control will illuminate and then go out.

(24) After the PROGRAM MODE lamp and FOOT REST EXTENSION lamp of the foot/hand control go out, release the PROGRAM / FAULT CLEAR button (D).

Observe. After approximately 10 to 20 seconds, the PC control board (12) will sound three warning beeps to indicate the memory is cleared.

(25) Install PC board cover (10) on base casting (11) and secure with two screws (9).

(26) Calibrate the PC control board (Refer to para 4.2).

(27) Program the table and check for proper operation.

C. Adjustment Only

(1) Perform steps 6 thru 8 of para 4.37, Removal.

(2) Perform steps 1, 2, 3, 7 thru 19, and 22 thru 27 of para 4.37, Installation.

4.38 Tilt Position Sensor Removal / Installation / Adjustment (Programmable Units Only)

A. Removal

(1) Run BASE UP function all the way up.

(2) Remove four screws (1, Figure 4-54) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(3) Lower middle outer shroud assembly (4) down out of way.

(4) Remove two nuts (5) and sensor wire cover (6) from connection cover (7).

(5) Cut any cable ties (8) securing tilt sensor harness (9) to other harnesses.

(6) Disconnect tilt sensor harness (9) from harness (10).

(7) Run TILT DOWN function all the way down.

(8) Run BACK UP function all the way up.

(9) Unplug table power cord from outlet receptacle.

(10) Remove screw (1, Figure 4-55) and tilt sensor cover (2) from column adapter weldment (3).

(11) Using a T15 torx wrench, remove two screws (4), backing plate (5), and tilt position sensor (6) from position sensor mount (7).

(12) Remove 5/16” hex drive (8) from head of screw (9).

B. Installation

(1) Remove two screws (10) and PC board cover (11) from base casting (12).

NOTE
Use multimeter leads with testing hooks; it is very difficult to do with testing probes.

(2) Connect negative (black) lead of multimeter to TP4 (A, Figure 4-55) and positive (red) lead of multimeter to TP8 (B) of PC control board (13).

(3) Set multimeter to VDC setting. Then set the voltage range of the multimeter to the 0-20 VDC range.

(4) Feed tilt sensor harness (9, Figure 4-54) thru wire hole (A).

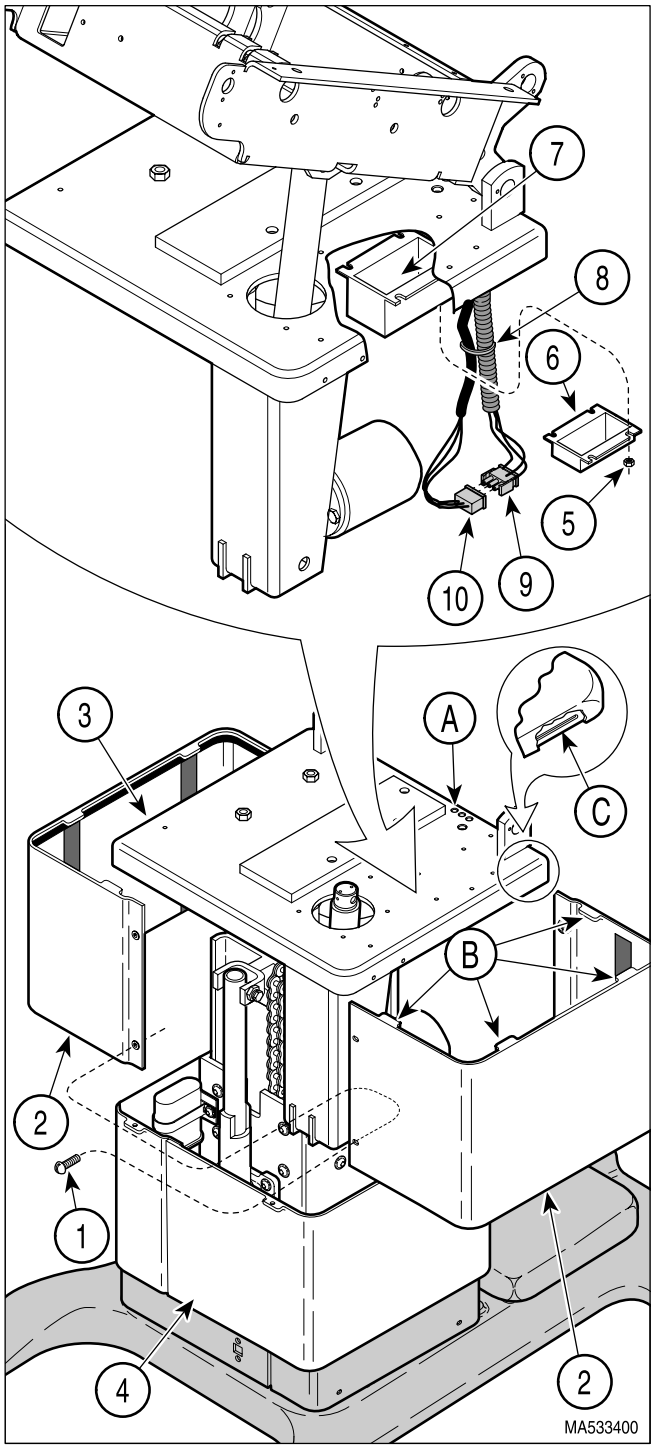


Figure 4-54. Tilt Sensor Harness Disconnection / Connection

(5) Connect tilt sensor harness (9) to harness (10).

(6) Secure tilt sensor harness (9) to other harnesses with cable tie (8).

(7) Install sensor wire cover (6) on connection cover (7) and secure with two nuts (5), making sure harnesses (9 and 10) are tucked into the sensor wire cover.

(8) Install tabs (B) of R.H. and L.H. outer shrouds (2) in slots (C) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (4) is captured by R.H. and L.H. outer shrouds (2).

(9) Plug table power cord into outlet receptacle.

(10) Run TILT DOWN function all the way down.

(11) Slide sensor holder tool (C, Figure 4-55) thru the center hole of tilt position sensor (6).

(12) Insert 5/16" hex drive (8) into slot of sensor holder tool (C).

(13) Pull on holder sensor tool (C) until 5/16" hex drive (8) is engaged with tilt position sensor (6). Then, rotate sensor holder tool slightly to apply friction on 5/16" hex drive and prevent it from "popping" out as tilt position sensor is installed. The 5/16" hex drive is properly engaged when spring tension is felt as the sensor holder tool is rotated. Also, the multimeter should read approximately 0.04 to 0.08 VDC and the reading should change as the tool is rotated.

EQUIPMENT ALERT

Make sure the 5/16" hex drive remains in position in tilt position sensor while tilt position sensor is being installed. If hex drive does not stay fully seated in tilt position sensor, the tilt position sensor can be damaged.

(14) While applying slight rotational pressure and gentle back pressure on sensor holder tool (C) to keep 5/16" hex drive (8) in position, install tilt position sensor (6) on position sensor mount (7). Move tilt position sensor around as necessary while pushing tilt position sensor inward until it is fully seated.

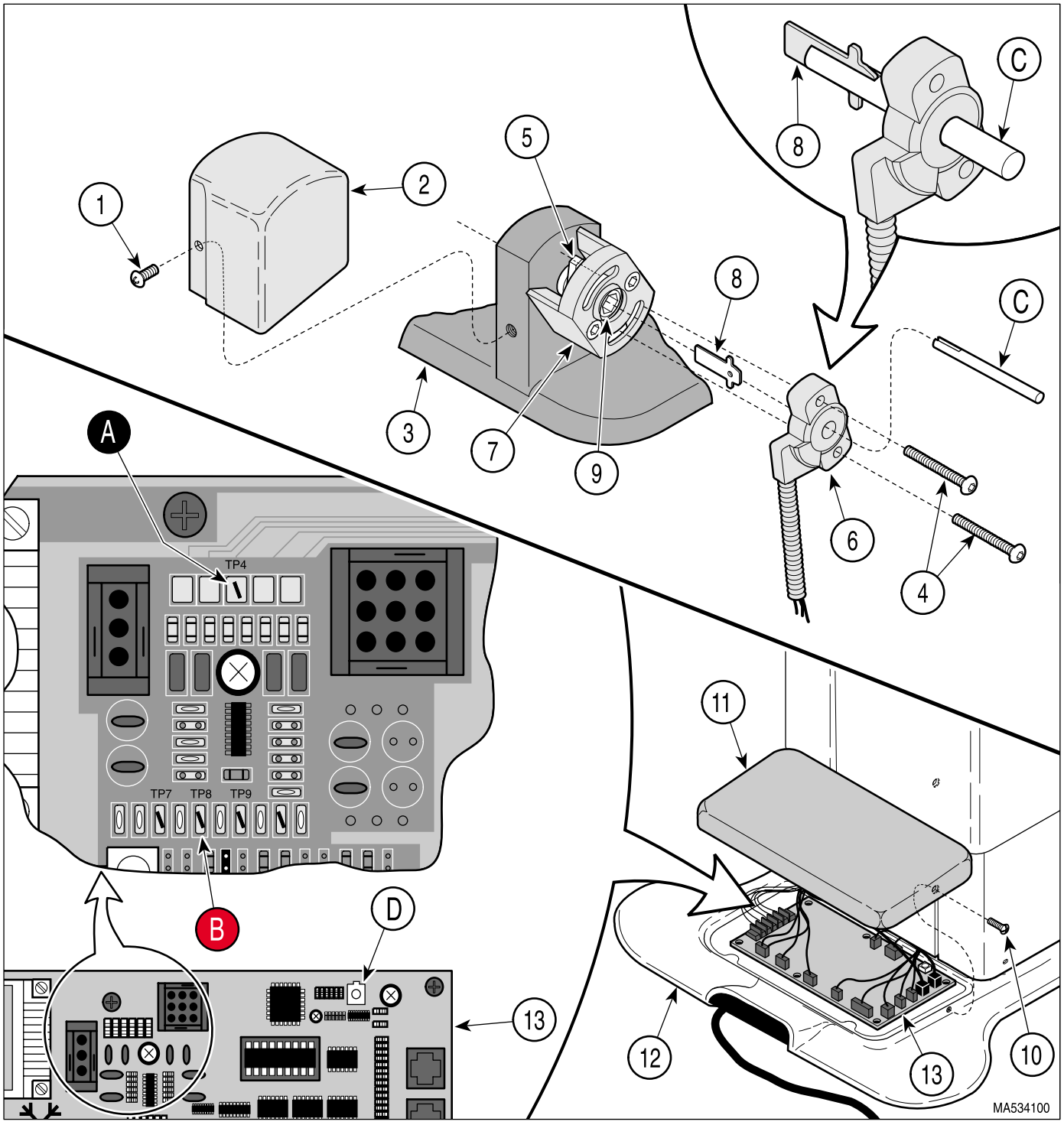


Figure 4-55. Tilt Position Sensor Removal / Installation / Adjustment

(15) Coat threads of two screws (4) with removable threadlocking adhesive (Loctite 242); then secure the tilt position sensor (6) on position sensor mount (7) with backing plate (5) and two screws (4). Tighten screws very lightly, so that the tilt position sensor may be rotated for adjustment, but do not let sensor pop out of mounting position.

(16) Pull sensor holder tool (C) from tilt position sensor (6).

(17) Rotate tilt position sensor (6) until multimeter reads 0.05 VDC ± 0.01 VDC; then tighten two screws (4) to secure tilt position sensor in place.

(18) Run TILT UP function all the way up (until tilt actuator freewheels) while observing the multimeter reading; the reading should increase steadily during the table movement. If the voltage reading stops increasing before the tilt actuator reaches its end of travel and freewheels, the tilt position sensor (6) has reached the dead spot at the end of its range. If this happens, return to step 17 and readjust the tilt position sensor as determined necessary to eliminate the dead spot.

(19) Run TILT DOWN function for approximately 1/10 second (the minimum amount of time the button can be pressed and still have the table move slightly). Then, run TILT DOWN function all the way down and repeat step using the TILT UP function.

Observe. The multimeter reading should change slightly; if it doesn't change, then the tilt position sensor (6) must be readjusted (it is in "dead spot" at end of travel).

(20) Run the TILT DOWN function all the way down (until tilt actuator freewheels). The multimeter reading should be approx. 0.05 VDC ±0.01 VDC and no dead spot should be observed. If not, repeat entire procedure.

(21) Remove multimeter leads from TP4 (A) and TP8 (B) of PC control board (13).

(22) Install tilt sensor cover (2) on column adapter weldment (3) and secure with screw (1).

(23) Unplug table power cord from outlet receptacle.

(24) Depress and hold the PROGRAM / FAULT CLEAR button (D) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp and the FOOT REST EXTENSION lamp of the foot/hand control will illuminate and then go out.

(25) After the PROGRAM MODE lamp and FOOT REST EXTENSION lamp of the foot/hand control go out, release the PROGRAM / FAULT CLEAR button (D).

Observe. After approximately 10 to 20 seconds, the PC control board (13) will sound three warning beeps to indicate the memory is cleared.

(26) Install PC board cover (11) on base casting (12) and secure with two screws (10).

(27) Calibrate the PC control board (Refer to para 4.2).

(28) Program the table and check for proper operation.

C. Adjustment Only

(1) Perform steps 7 thru 12 of para 4.38, Removal.

(2) Perform steps 1, 2, 3 and 9 thru 28 of para 4.38, Installation.

4.39 Back Position Sensor Removal / Installation / Adjustment (Programmable Units Only)

A. Removal

(1) Run BACK UP function all the way up.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four knobs (1, Figure 4-56) and seat upholstery (2).

(4) Remove two screws (3) and electrical cover (4).

(5) Cut cable tie (5) securing back sensor harness (6) to seat weldment (7).

(6) Disconnect back sensor harness (6) from harness (8); then pull back sensor harness out thru access hole (A).

(7) Remove screw (1, Figure 4-57) and back sensor cover (2) from seat weldment (3).

(8) Using a T15 torx wrench, remove two screws (4), backing plate (5), and back position sensor (6) from position sensor mount (7).

(9) Remove 5/16" hex drive (8) from head of screw (9).

B. Installation

(1) Remove two screws (10) and PC board cover (11) from base casting (12).

NOTE
Use multimeter leads with testing hooks; it is very difficult to do with testing probes.

(2) Connect negative (black) lead of multimeter to TP4 (A, Figure 4-57) and positive (red) lead of multimeter to TP9 (B) of PC control board (13).

(3) Set multimeter to VDC setting. Then set the voltage range of the multimeter to the 0-20 VDC range.

(4) Feed back sensor harness (6, Figure 4-56) thru access hole (A) in seat weldment (7).

(5) Connect back sensor harness (6) to harness (8).

(6) Secure back sensor harness (6) to seat weldment (7) with cable tie (5).

(7) Install seat upholstery (2) and secure with four knobs (1).

(8) Plug table power cord into outlet receptacle.

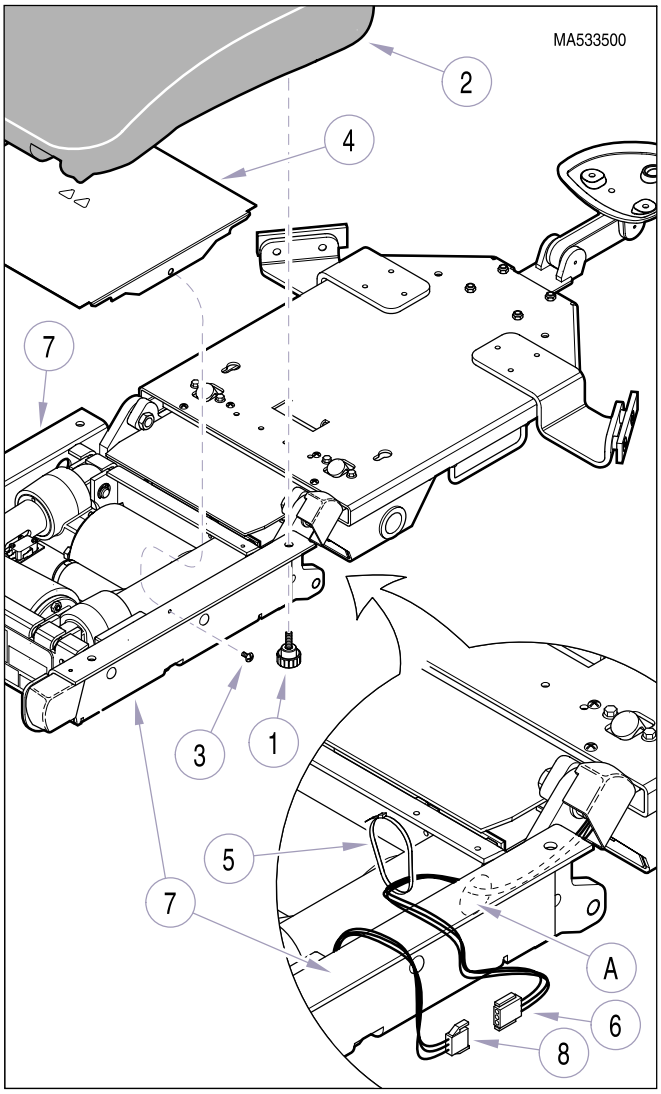


Figure 4-56. Back Sensor Harness Disconnection / Connection

(9) Run BACK DOWN function all the way down.

(10) Slide sensor holder tool (C, Figure 4-57) thru the center hole of back position sensor (6).

(11) Insert 5/16" hex drive (8) into slot of sensor holder tool (C).

(12) Pull on holder sensor tool (C) until 5/16" hex drive (8) is engaged with back position sensor (6). Then, rotate sensor holder tool slightly to apply friction on 5/16" hex drive and prevent it from "popping" out as back position sensor is installed. The 5/16" hex drive is properly engaged when spring tension is felt as the sensor holder tool is rotated. Also, the multimeter

should read approximately 0.5 to 0.7 VDC and the reading should change as the tool is rotated.

EQUIPMENT ALERT
Make sure the 5/16" hex drive remains in position in back position sensor while back position sensor is being installed. If hex drive does not stay fully seated in back position sensor, the back position sensor can be damaged.

(13) While applying slight rotational pressure and gentle back pressure on sensor holder tool (C) to keep 5/16" hex drive (8) in position, install back position sensor (6) on position sensor mount (7). Move back position sensor around as necessary while pushing back position sensor inward until it is fully seated.

(14) Coat threads of two screws (4) with removable threadlocking adhesive (Loctite 242); then secure the back position sensor (6) on position sensor mount (7) with backing plate (5) and two screws (4). Tighten screws very lightly, so that the back position sensor may be rotated for adjustment, but do not let sensor pop out of mounting position.

(15) Pull sensor holder tool (C) from back position sensor (6).

(16) Rotate back position sensor (6) until multimeter reads approximatley 0.50 VDC ± 0.2 VDC; then tighten two screws (4) to secure back position sensor in place.

(17) Run BACK UP function all the way up (until it freewheels) while observing the multimeter reading; the reading should increase steadily during the table movement. If the voltage reading stops increasing before the actuator reaches its end of travel and freewheels, the back position sensor (6) has reached the dead spot at the end of its range. If this happens, return to step 16 and readjust the back position sensor as determined necessary to eliminate the dead spot.

(18) Run BACK DOWN function for approximately 1/10 second (the minimum amount of time the button can be pressed and still have the table move slightly). Then, run BACK DOWN function all the way down and repeat step using the BACK UP function.

Observe. The multimeter reading should change slightly; if it doesn't change, then the tilt position sensor (6) must be readjusted (it is in "dead spot" at end of travel).

(19) Run the BACK DOWN function all the way down (until back actuator freewheels). The multimeter reading should be approximately 0.50 VDC ±0.2 VDC and no dead spot should be observed. If not, repeat entire procedure.

(20) Remove multimeter leads from TP4 (A) and TP9 (B) of PC control board (13).

(21) Run BACK UP function all the way up.

(22) Install back sensor cover (2) on seat weldment (3) and secure with screw (1).

(23) Unplug table power cord from outlet receptacle.

(24) Depress and hold the PROGRAM / FAULT CLEAR button (D) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp and the FOOT REST EXTENSION lamp of the foot/hand control will illuminate and then go out.

(25) After the PROGRAM MODE lamp and FOOT REST EXTENSION lamp of the foot/hand control go out, release the PROGRAM / FAULT CLEAR button (D).

Observe. After approximately 10 to 20 seconds, the PC control board (13) will sound three warning beeps to indicate the memory is cleared.

(26) Install PC board cover (11) on base casting (12) and secure with two screws (10).

(27) Calibrate the PC control board (Refer to para 4.2).

(28) Program the table and check for proper operation.

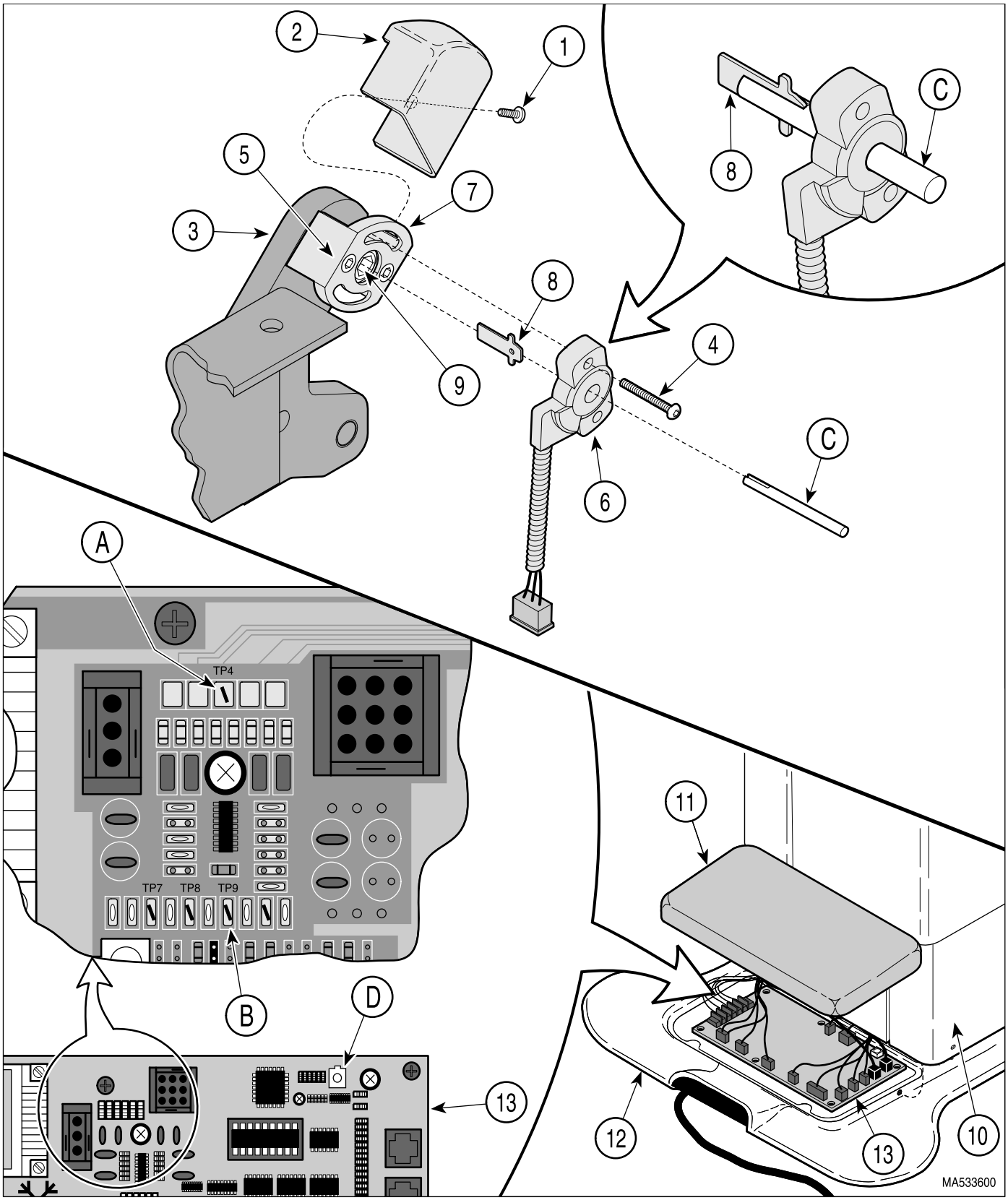


Figure 4-57. Back Position Sensor Removal / Installation / Adjustment

C. Adjustment Only

(1) Perform steps 1, 2, 7, 8, and 9 of para 4.39, Removal.

(2) Perform steps 1, 2, 3 and 8 thru 28 of para 4.39, Installation.

4.40 Base Position Sensor Removal / Installation / Adjustment (Programmable Units Only)

A. Removal

(1) Run BASE UP function all the way up.

(2) Unplug table power cord from outlet receptacle.

(3) Remove four screws (1, Figure 4-58) and R.H. and L.H. outer shrouds (2) from column adapter weldment (3).

(4) Remove four screws (4) and R.H. and L.H. middle shrouds (5).

(5) Disconnect one modular cord (6) from each inlet PC board (7).

(6) Remove four screws (8), four screws (9) and partially remove R.H. and L.H. inner shrouds (10) from base casting (11).

(7) Cut cable tie (1, Figure 4-59) securing base sensor harness (2) to capacitor strap (3).

(8) Disconnect base sensor harness (2) from harness (4).

(9) While holding cable (5), remove two screws (6) and cable clamp (7) from cable bracket (8).

(10) Unloop end of cable (5) from around grommet bumper (9) and then slowly release tension from cable.

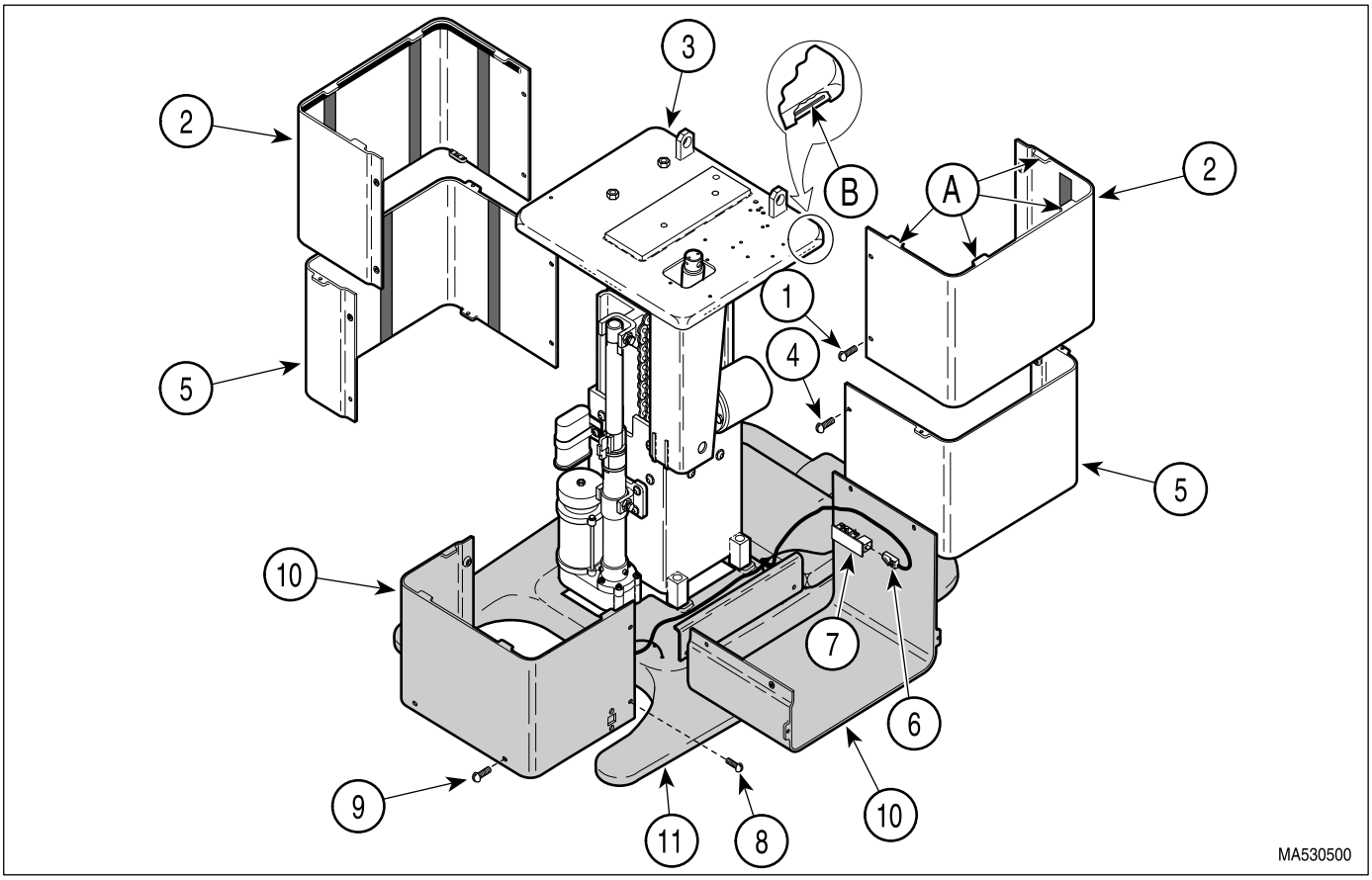


Figure 4-58. Base Shrouds Removal / Installation

(11) Remove two screws (10) and base reducer assembly (11) from column assembly (12).

DANGER
Use care when removing the torsion spring. The torsion spring is under tension and can become a projectile if not controlled. Failure to do so could result in serious personal injury to face or eyes.

(12) Remove circular push-on (1, Figure 4-60) and torsion spring (2) from gear shaft (3).

(13) Remove two screws (4) and base position sensor (5) from gear shaft (3).

B. Installation

(1) Remove two screws (13, Figure 4-59) and PC board cover (14) from base casting (15).

NOTE
Use multimeter leads with testing hooks; it is very difficult to do with testing probes.

(2) Connect negative (black) lead of multimeter to TP4 (A, Figure 4-56) and positive (red) lead of multimeter to Test Point (B) of PC control board (16).

(3) Set multimeter to VDC setting. Then set the voltage range of the multimeter to the 0-20 VDC range.

(4) Coat threads of two screws (4, Figure 4-60) with removable threadlocking adhesive (Loctite 242).

(5) Install base position sensor (5) on gear shaft (3) and secure with two screws (4).

(6) Install torsion spring (2) in slot (A) on end of gear shaft (3) while pushing tab (B) of torsion spring under head of screw (4).

(7) Secure torsion spring (2) on gear shaft (3) with circular push-on (1).

(8) If installing new cable (6), loosen screw (7) and remove old cable. Then, wrap one end of new cable (6) around screw (7) 1-1/2 times and secure in this place by tightening screw. Cut off any excess cable (6).

(9) Install base reducer assembly (11, Figure 4-56) on column assembly (12) and secure with two screws (10).

(10) Rotate pulley (8, Figure 4-60) in a clockwise direction until resistance is met. Then, check position of screw (7); it should be ± 30° of the position shown on illustration. If not, remove screw (9), remove and rotate pulley (8) to correct orientation, and then reinstall with screw (9).

(11) Connect base sensor harness (2, Figure 4-59) to harness (4).

(12) Secure base sensor harness (2) to capacitor strap (3) with a cable tie (1).

(13) Plug table power cord into outlet receptacle.

(14) Wrap cable (5) around pulley (C) three times in direction shown.

NOTE
The BASE UP function must be completely raised before performing the following step.

(15) While observing the multimeter reading, wrap free end of cable (5) around grommet bumper (9). Continue to pull cable until multimeter reading does not change (base position sensor is saturated- approximately 4.61 VDC.)

(16) Slowly release cable (5) until the voltage reading starts to decrease (base position sensor is no longer in saturation - approximately 4.58 VDC). Then, making sure cable (5) is wrapped around grommet bumper 1-1/2 times, secure cable on grommet bumper by installing cable clamp (7) and two screws (6).

(17) Run BASE DOWN function all the way down (until base down limit switch stops the base actuator) while observing the multimeter reading; the reading should decrease steadily during the table movement. If the voltage reading stops decreasing before the base actuator is

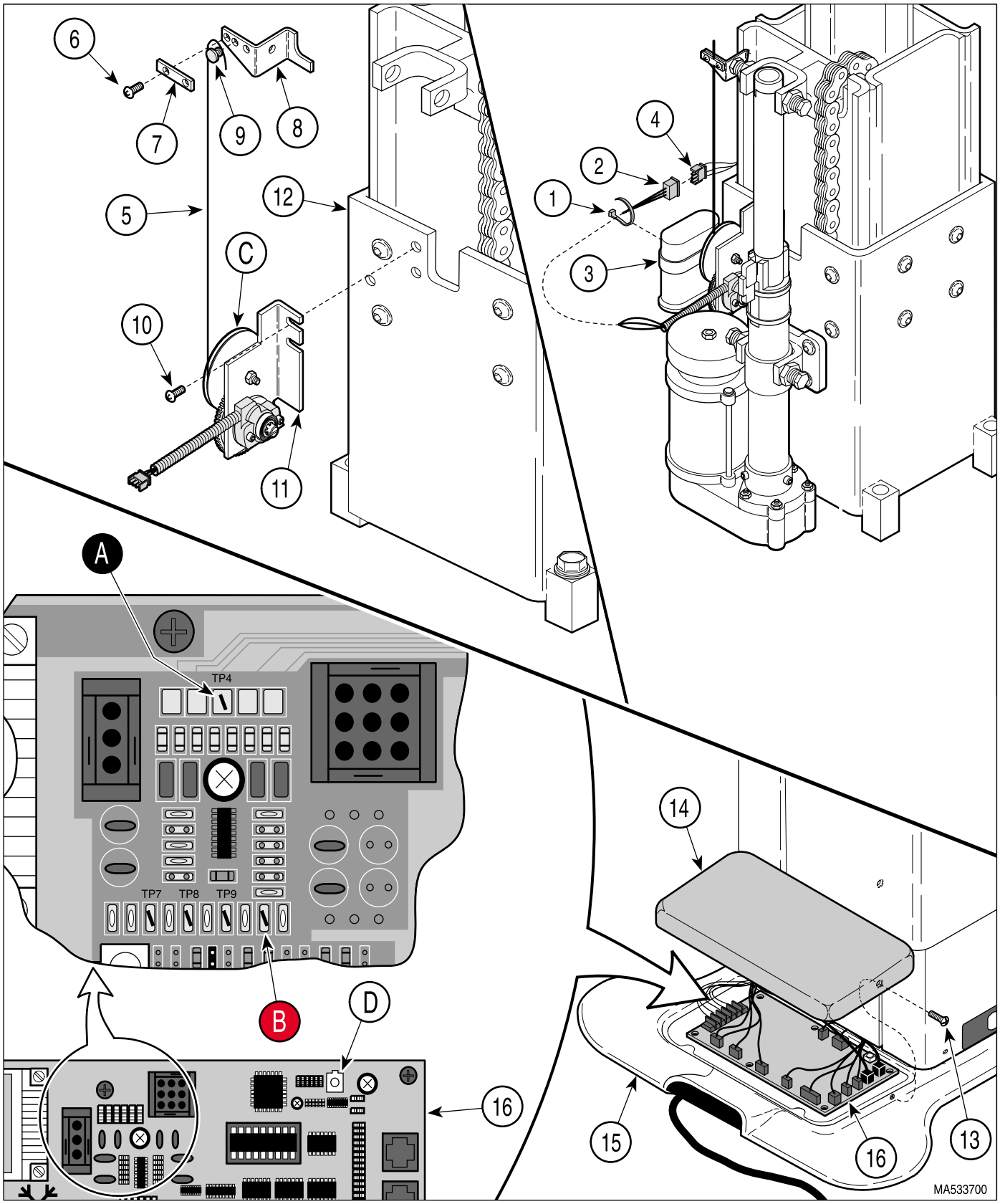


Figure 4-59. Base Reducer Assembly Removal / Installation

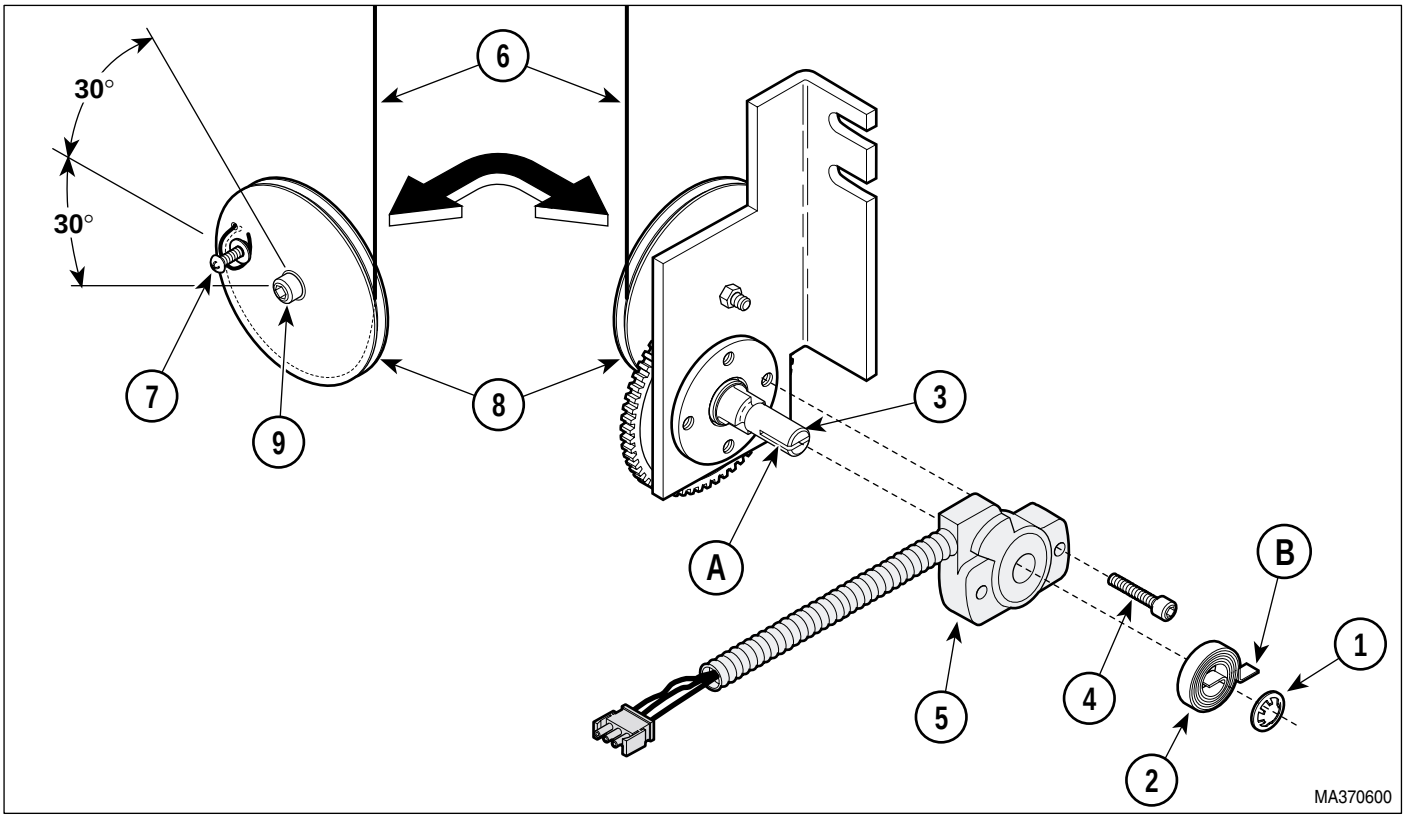


Figure 4-60. Base Position Sensor Removal / Insallation

stopped by the base down limit switch, the base position sensor was installed incorrectly, the cable (5) is loose, or the base position sensor has reached a dead spot at the end of its range. If this happens, return to step 16 and readjust the base position sensor as determined necessary to eliminate the dead spot.

(18) Run the BASE UP function all the way Up (until base down limit switch stops the base actuator). The multimeter reading should match the reading observed in step 16 and no dead spot should be observed. If not, repeat entire procedure.

(19) Cut off any excess cable (5) length.

(20) Install R.H. and L.H. inner shrouds (10, Figure 4-58) on base casting (11) and secure with four screws (9), and four screws (8).

(21) Connect one modular cord (6) to each inlet PC board (7).

(22) Assemble R.H. and L.H. middle shrouds (5) around inner shrouds (10) with four screws (4).

(23) Install tabs (A) of R.H. and L.H. outer shrouds (10) in slots (B) of column adapter weldment (3) and secure with four screws (1), making sure middle outer shroud assembly (5) is captured by R.H. and L.H. outer shrouds (2).

(24) Remove multimeter leads from TP4 (A, Figure 4-59) and Test Point (B) of PC control board (16).

(25) Unplug table power cord from outlet receptacle.

(26) Depress and hold the PROGRAM / FAULT CLEAR button (D, Figure 4-59) while simultaneously plugging the table power cord into the outlet receptacle.

Observe. The PROGRAM MODE lamp and the FOOT REST EXTENSION lamp of the foot/hand control will illuminate and then go out.

(27) After the PROGRAM MODE lamp and FOOT REST EXTENSION lamp of the foot/hand control go out, release the PROGRAM / FAULT CLEAR button (D).

Observe. After approximately 10 to 20 seconds, the PC control board (16) will sound three warning beeps to indicate the memory is cleared.

(28) Install PC board cover (14) on base casting (15) and secure with two screws (13).

(29) Calibrate the PC control board (Refer to para 4.2).

(30) Program the table and check for proper operation.

C. Adjustment

(1) Perform steps 1 thru 6 of para 4.40, Removal.

(2) Loosen two screws (6, Figure 4-59).

(3) Perform steps 1, 2, 3 and 15 thru 30 of para 4.40, Installation.

SECTION V
SCHEMATICS AND DIAGRAMS

5.1 Electrical Schematics / Wiring Diagrams

Figures 5-1 through 5-6 illustrate the logic / current flow between the electrical components in the 419 Series Power Procedure Table.

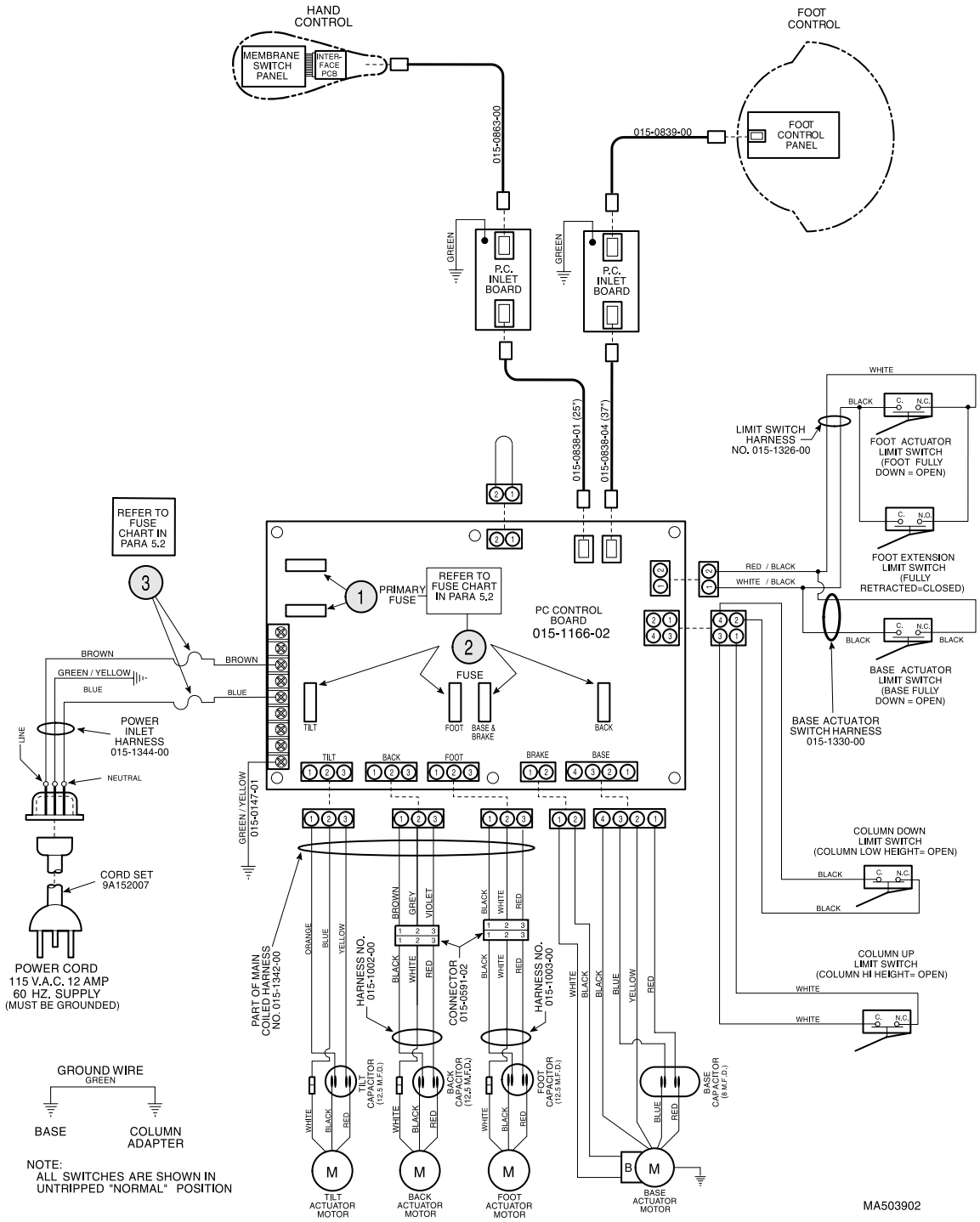


Figure 5-1. 115 VAC Non-Programmable Table Electrical Schematic / Wiring Diagram (419-003) (Applies to units with serial numbers LM1000 thru LM1049)

SECTION V
SCHEMATICS AND DIAGRAMS

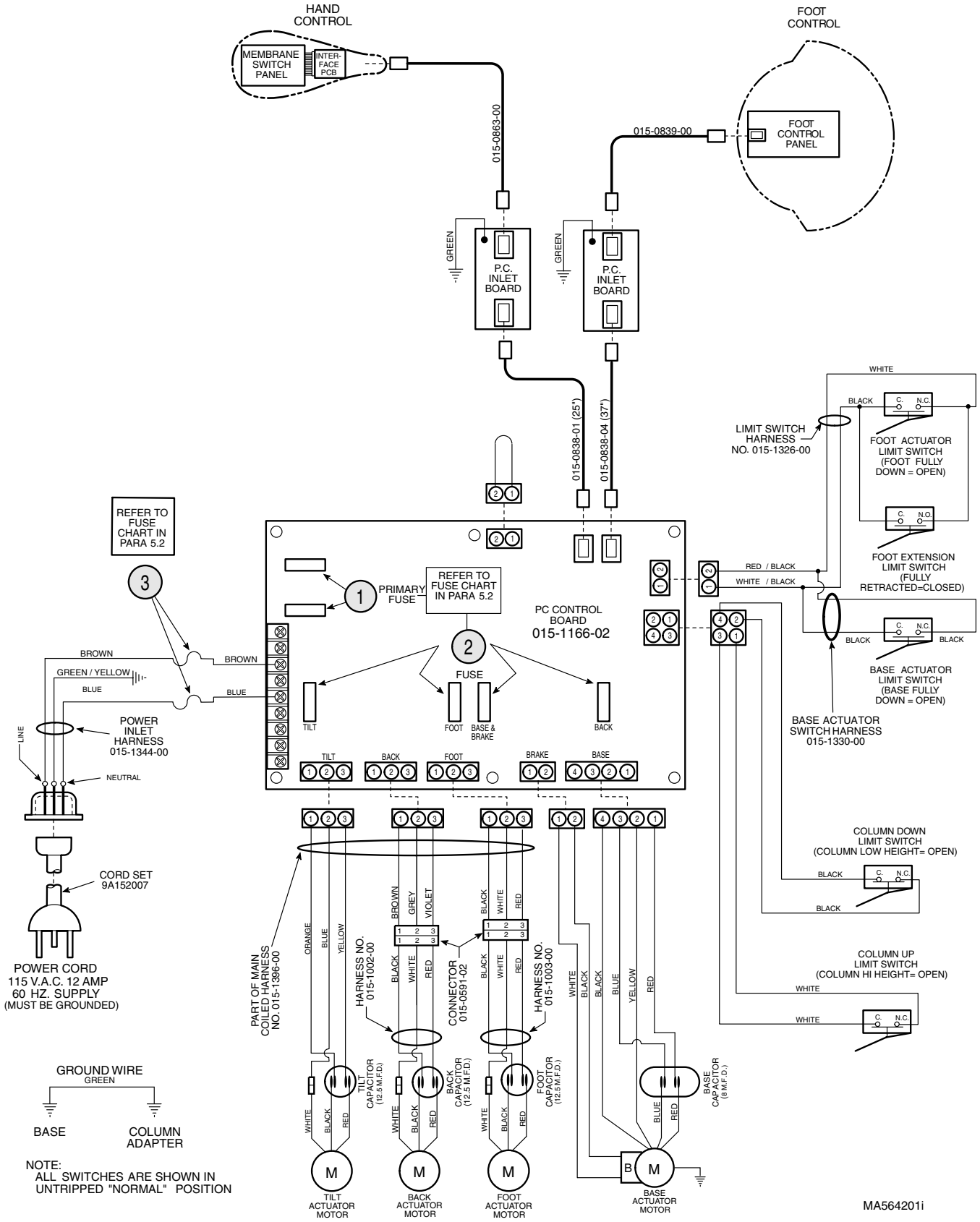


Figure 5-1.1 115 VAC Non-Programmable Table Electrical Schematic / Wiring Diagram (419-003)
(Applies to units with serial numbers LM1050 thru Present)

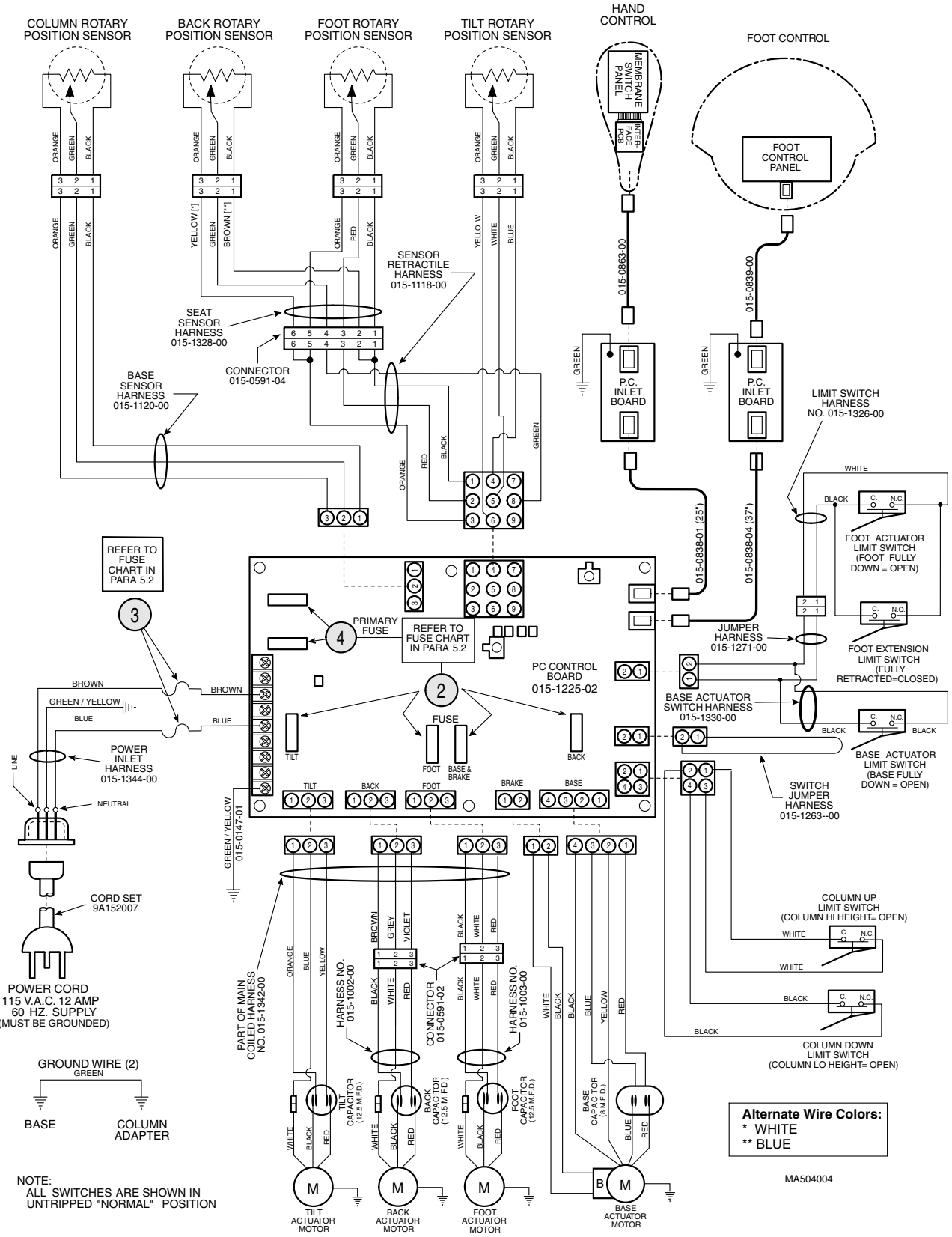


Figure 5-2. 115 VAC Programmable Table Electrical Schematic / Wiring Diagram (419-004)
(Applies to units with serial numbers LN1000 thru LN1062)

SECTION V
SCHEMATICS AND DIAGRAMS

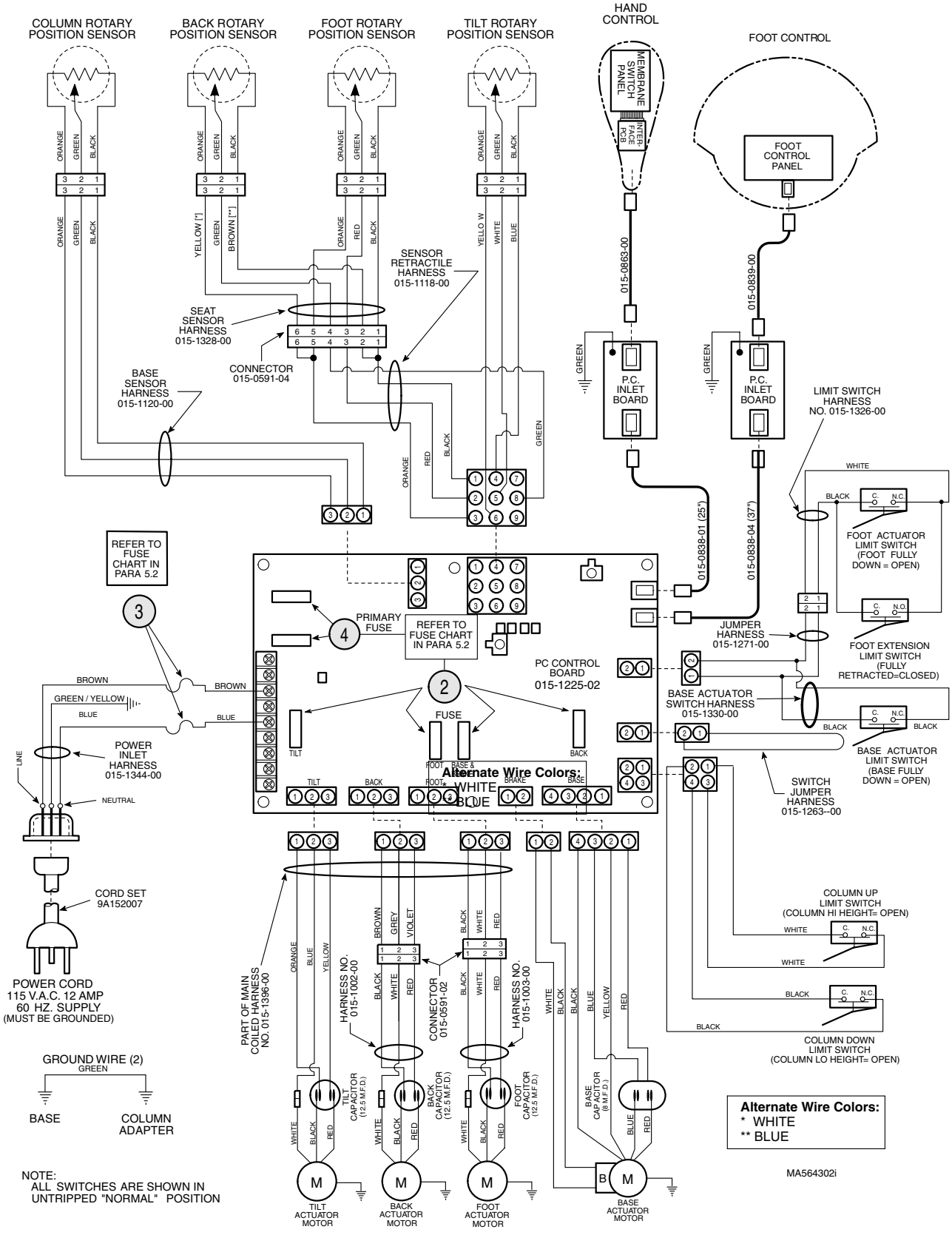


Figure 5-2.1 115 VAC Programmable Table Electrical Schematic / Wiring Diagram (419-004)
(Applies to units with serial numbers LN1063 thru Present)

Printed in U.S.A.

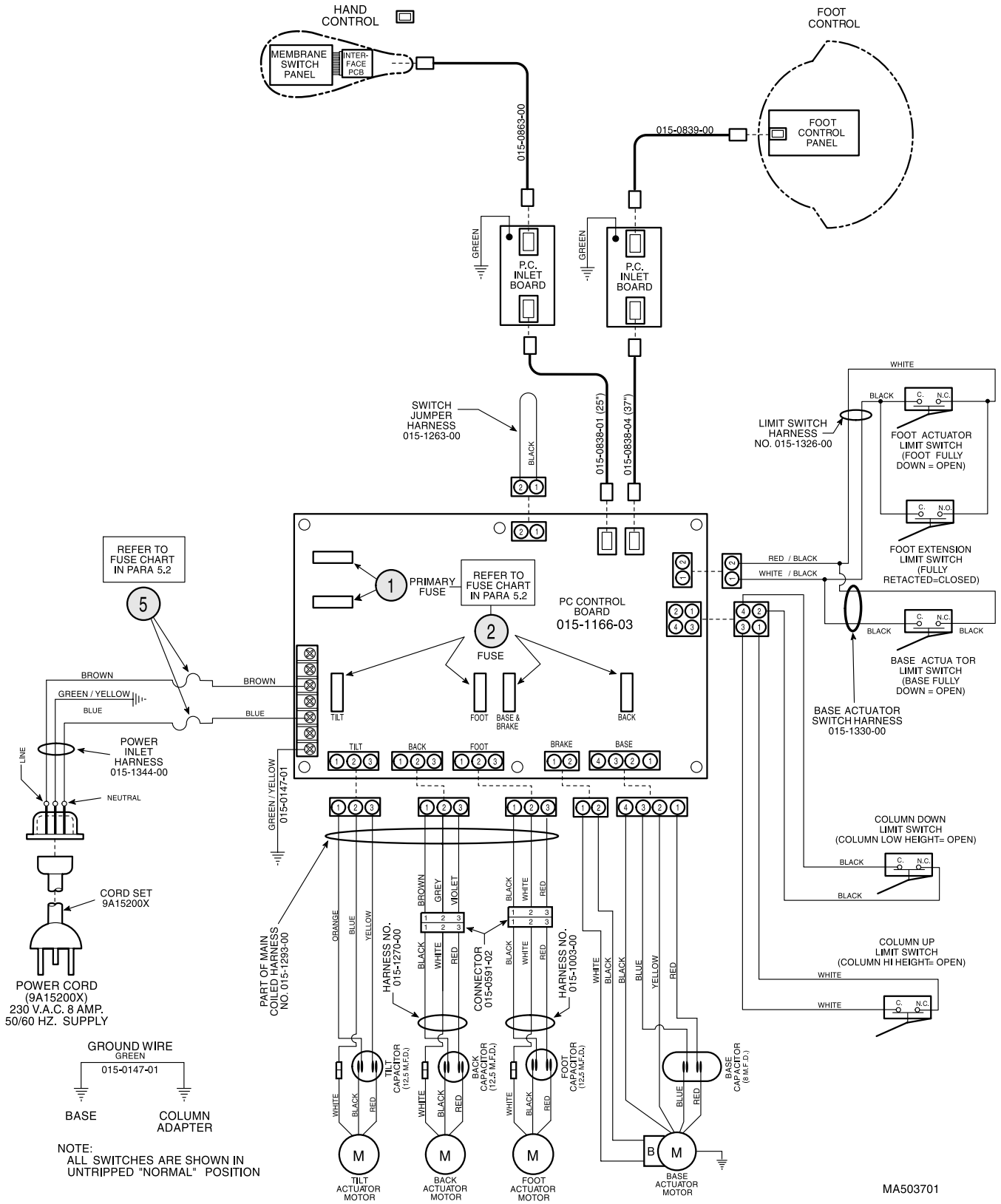


Figure 5-3. 230 VAC Non-Programmable Table Electrical Schematic / Wiring Diagram (419-005)
(Applies to units with serial numbers LP1000 thru LP1001)

SECTION V
SCHEMATICS AND DIAGRAMS

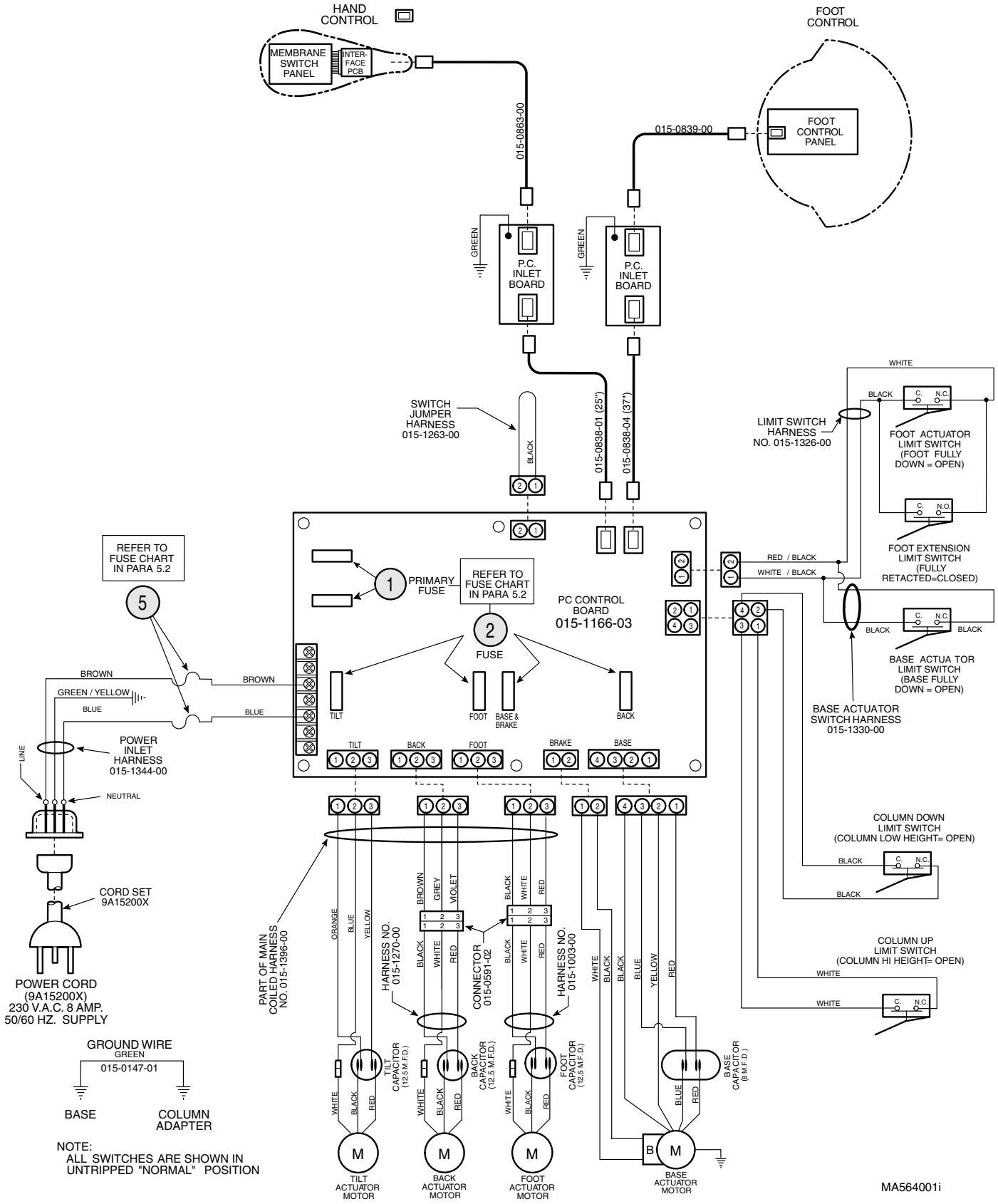


Figure 5-3.1 230 VAC Non-Programmable Table Electrical Schematic / Wiring Diagram (419-005)
(Applies to units with serial numbers LP1002 thru Present)

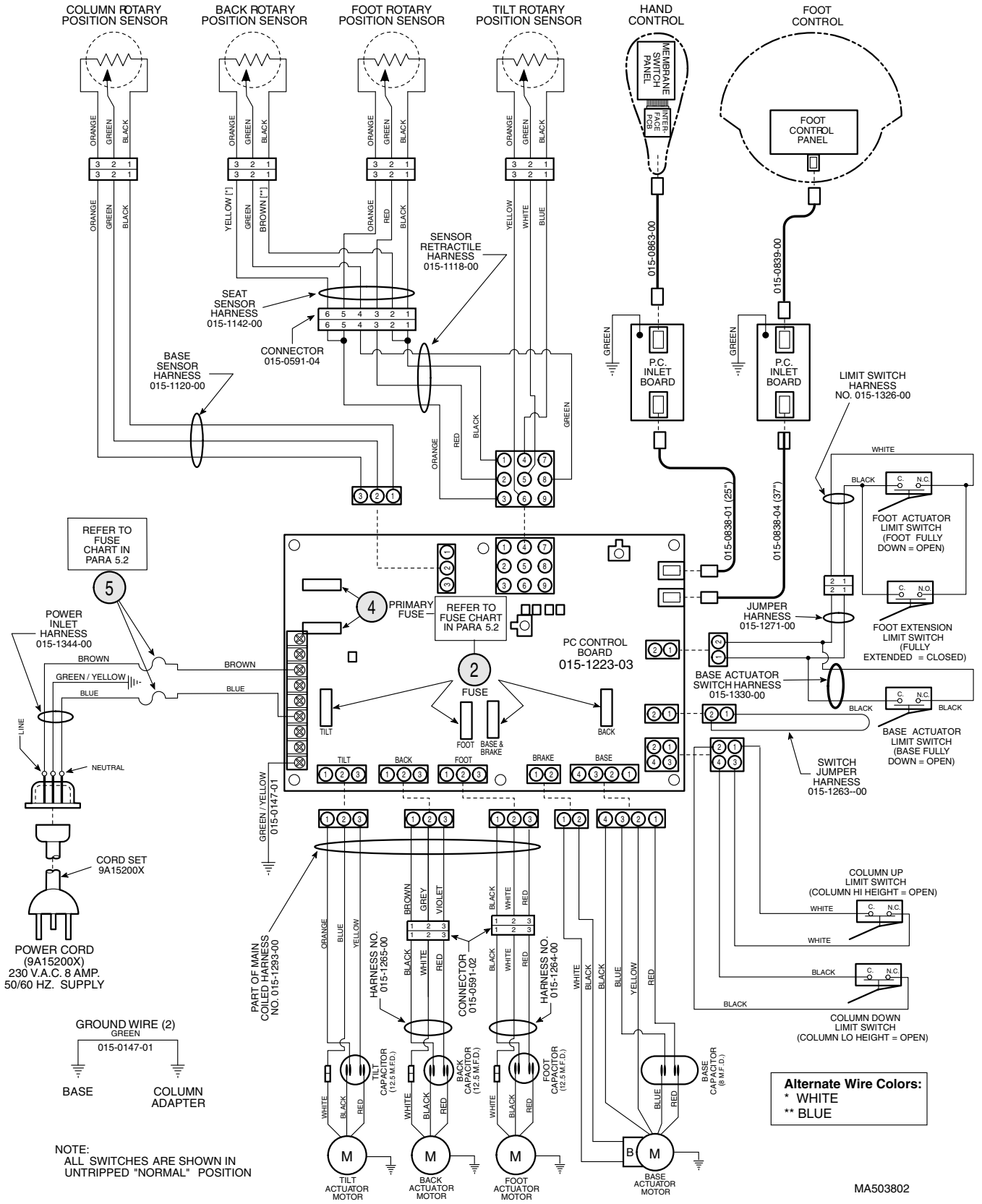


Figure 5-4. 230 Programmable Table Electrical Schematic / Wiring Diagram (419-006)
(Applies to units with serial numbers LR1000 thru LR1001)

SECTION V
SCHEMATICS AND DIAGRAMS

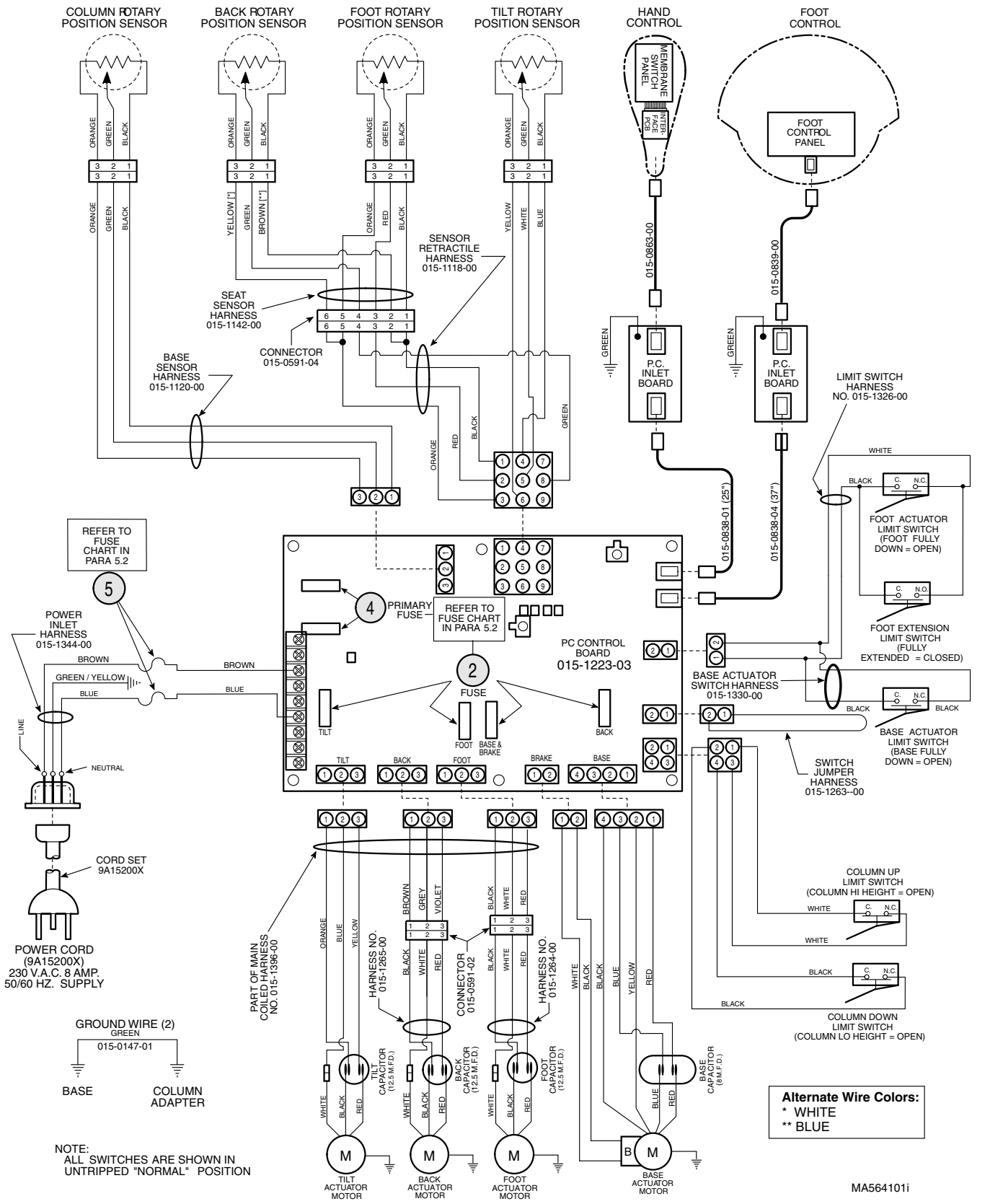


Figure 5-4.1 230 Programmable Table Electrical Schematic / Wiring Diagram (419-006)
(Applies to units with serial numbers LR1002 thru Present)

Printed in U.S.A.

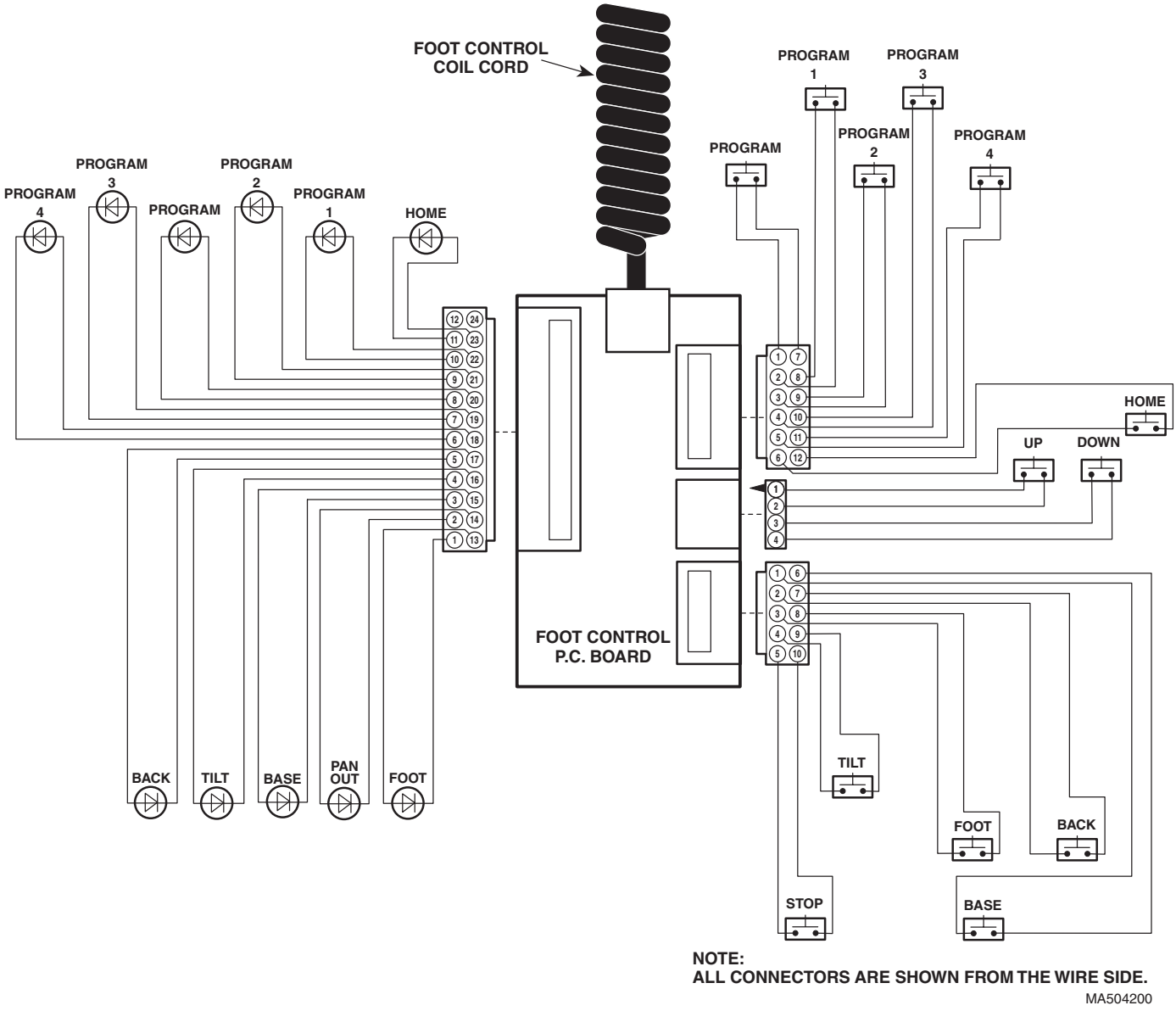


Figure 5-6. Foot Control Electrical Schematic / Wiring Diagram
(Programmable Units With Serial Numbers: LN1000 & LR1000 thru Present)

SECTION V
SCHEMATICS AND DIAGRAMS

5.2 Fuse Specifications

Figure 5-7 shows all of the table's fuse locations while Table 5-1 lists Midmark's P/N for the fuse and the generic fuse specifications.

Table 5-1. Fuse Specifications

Item	Midmark P/N	Fuse Specification
1	015-0346-21	250 VAC, 0.10 amp, 5mm x 20mm, Time Lag *(Non-Programmable models only)*
2	015-0346-22	250 VAC, 5 amp, 5mm x 20mm, "Slo-Blo" Time Lag *(All models)*
3	015-0346-27	250 VAC, 12 amps, 1/4 x 1 1/4 in., Time Lag *(115 VAC models only)*
4	015-0346-24	250 VAC, 0.15 amp, 5mm x 20mm, Time Lag *(Programmable models only)*
5	015-0346-19	250 VAC, 8 amps, 5mm x 20mm, Type T "Slo-Blo" *(230 VAC models only)*

5.3 Error Codes Chart (Applies To Programmable Tables Only)

Table 5-2 lists all of the error codes which may be displayed on the programmable hand control. When nothing happens after a Position "1", "2", "3", or "4" button is pressed, perform the following steps to view the error codes on the hand control.

A. Using Table's Diagnostic Mode To View Error Codes And Repair Table

(1) Unplug the table power cord from outlet receptacle and wait five seconds before going to next step.

NOTE
If the PROGRAM MODE lamp does not begin to flash on and off, then the PC control board is not in the error code mode and no error codes will be displayed.

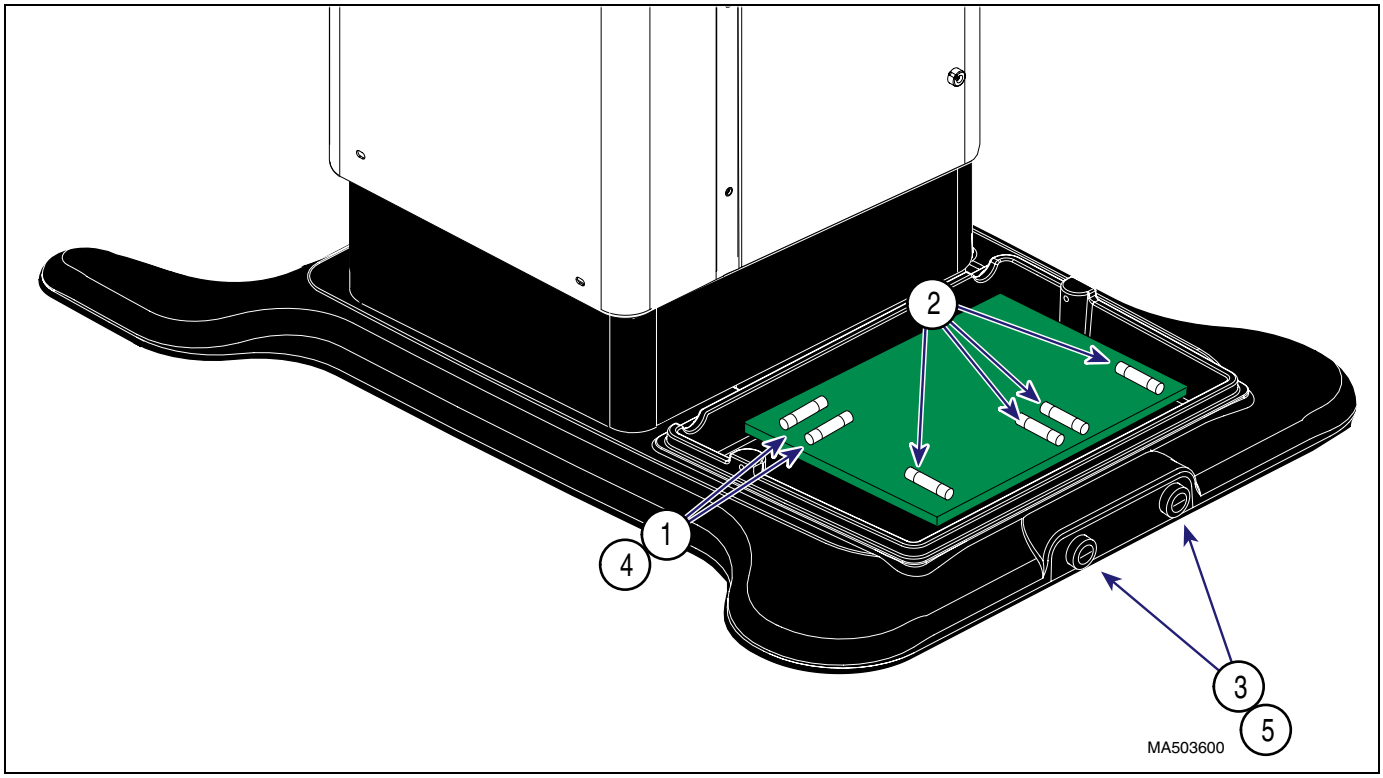


Figure 5-7. Fuse Location

Printed in U.S.A.

(2) Plug the table power cord into outlet receptacle while observing the PROGRAM MODE and FOOT REST EXTENSION lamps.

Observe. The PROGRAM MODE lamp will flash on and then off for the number of times equal to the first digit of the error code stored in memory. Then, the FOOT REST EXTENSION lamp will flash on and off for the number of times equal to the second digit of the error code. Then, the PC control board will pause for one second, repeat the error code a second time, pause one second, and repeat the error code a third time. If there are additional error codes, they are also displayed three time consecutively with a one second pause in between. This is repeated until all error codes in the PC control board's memory have been displayed. Then, the PC control board continuously cycles the error codes on the hand control.

(3) Look up the error code(s) in Table 5-2 to get a description of the error code(s). Also, the error codes and their remedies can be found in Table 2-1 Troubleshooting Guide.

(4) Once the problem has been repaired, calibrate the table to clear the error codes and allow the table program recall feature to be used again (Refer to para 4.2).

Table 5-2. Error Code Chart

Error Code	Description Of Error Code
11	System calibration not completed due to error condition.
12	Invalid data received from following user interface(s): hand control or foot control.
13 - 19	Reserved.
20	Not Used.
21	Base position sensor output voltage did not change during Position Recall mode.
22	Base position sensor output voltage is increasing or decreasing incorrectly during Calibration mode or Position Recall mode.
23	Programmed Position was not stored due to Analog-to-Digital conversion error when reading Base position sensor.
24	Tilt position sensor output voltage did not change during Position Recall mode.
25	Tilt position sensor output voltage is increasing or decreasing incorrectly during Calibration mode or Position Recall mode.
26	Programmed Position was not stored due to Analog-to-Digital conversion error when reading Tilt position sensor.
27 - 29	Reserved.
30	Not Used.
31	Back position sensor output voltage did not change during Position Recall mode.
32	Back position sensor output voltage is increasing or decreasing incorrectly during Calibration mode or Position Recall mode.
33	Programmed Position was not stored due to Analog-to-Digital conversion error when reading Back position sensor.
34	Foot position sensor output voltage did not change during Position Recall mode.
35	Foot position sensor output voltage is increasing or decreasing incorrectly during Calibration mode or Position Recall mode.
36	Programmed Position was not stored due to Analog-to-Digital conversion error when reading Foot position sensor.
37 - 39	Reserved.

Printed in U.S.A.

SECTION V
SCHEMATICS AND DIAGRAMS

Printed in U.S.A.

\ SECTION VI
PARTS LIST

6.1 Introduction

The illustrated parts list provides information for identifying and ordering the parts necessary to maintain the unit in peak operating condition. Refer to paragraph 1.6 for parts ordering information.

6.2 Description of Columns

The Item column of the parts list gives a component its own unique number. The same number is given to the component in the parts illustration. This allows a part number of a component to be found if the technician can visually spot the part on the illustration. The technician simply finds the component in question on the illustration and notes the item number of that component. Then, he finds that item number in the parts list. The row corresponding to the item number gives the technician the part number, a description of the component, and quantity of parts per subassembly. Also, if a part number is known, the location of that component can be determined by looking for the item number of the component on the illustration.

The Part No. column lists the Midmark part number for that component.

The Description column provides a physical description of the component.

The Qty. column lists the number of units of a particular component that is required for the subassembly. The letters “AR” denote “as required” when quantities of a particular component cannot be determined, such as: adhesive.

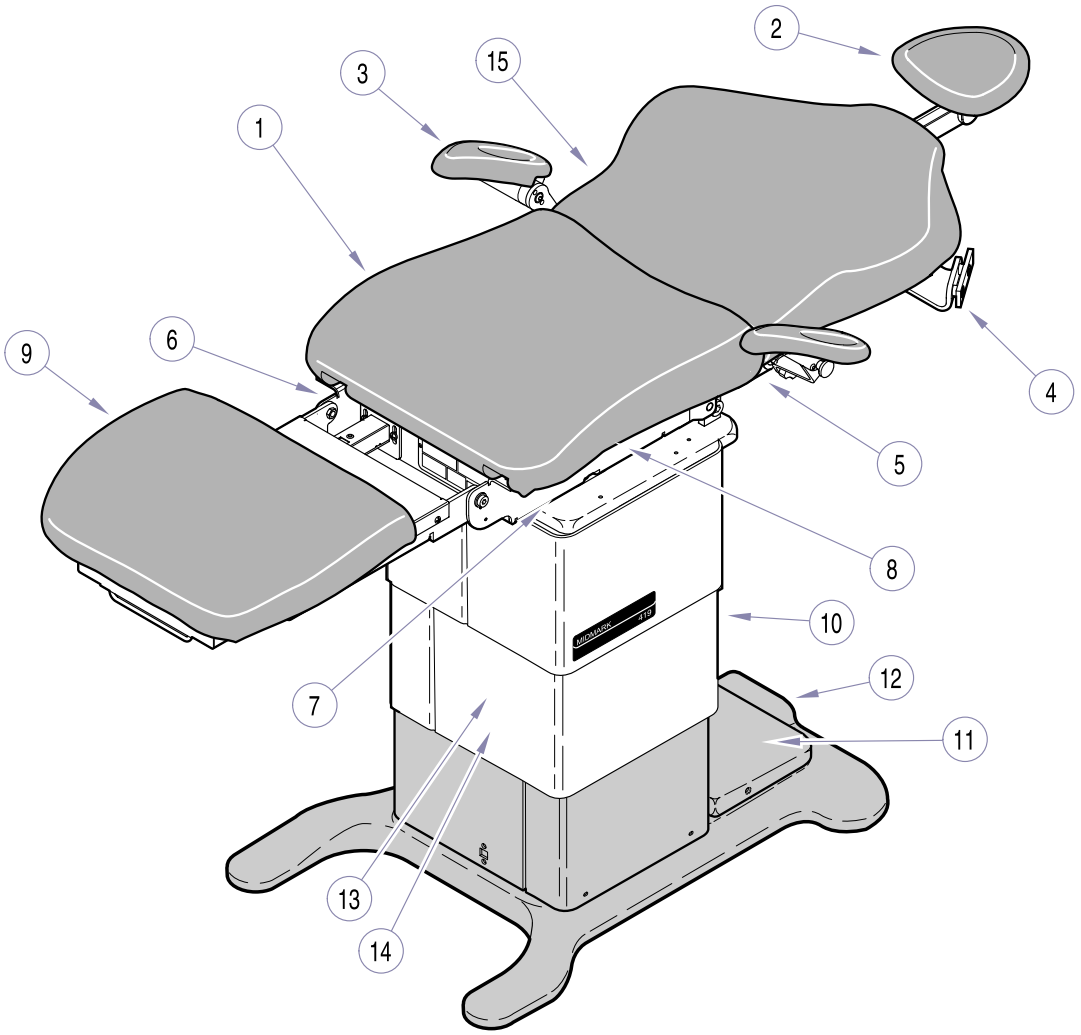
Bullets { • } in the Part No. column and the Description column show the indenture level of a component. If a component does not have a bullet, it is a main component of that illustration. If a component has a bullet, it is a subcomponent of the next component listed higher in the parts list than itself that does not have a bullet. Likewise, if a component has two bullets, it is a subcomponent of the next component listed higher in the parts list than itself that has only one bullet.

6.3 Torque Specifications and Important Assembly Notes

When specific assembly torque specifications, measurements, or procedures have been identified, by our engineering department, as required to assure proper function of the unit, those torque specifications measurements, and procedures will be noted on the parts illustrations. Adherence to these requirements is essential.

Pictorial Index

Return To Table Of Contents



MA519900

Used on units with Serial Number LM1000 thru LM1014

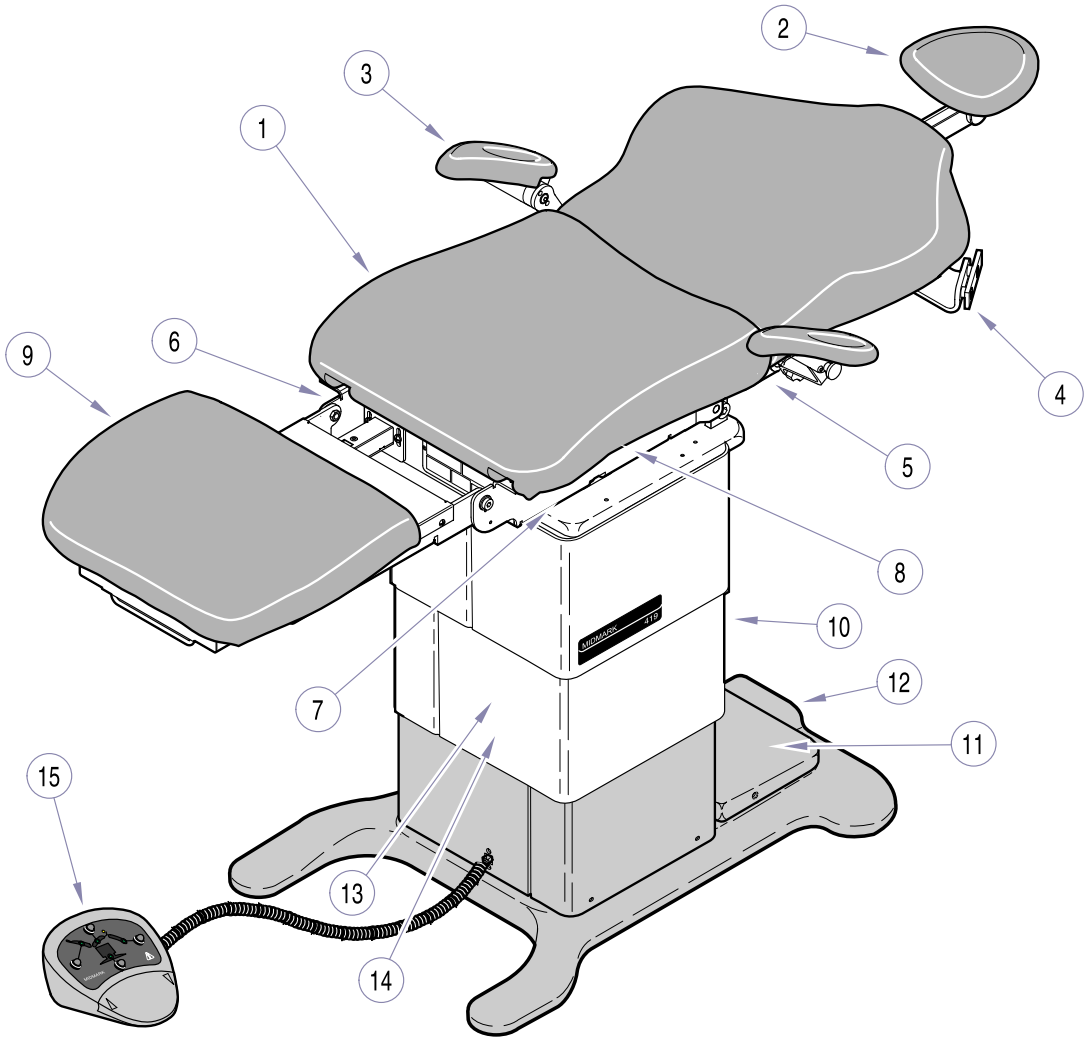
Item	Part No.	Description	Page
	419-003	419 Non-Programmable Procedure Table [115 V.] (Serial No. Prefix="LM")	6-2
1		• Upholstery Kit	6-6
2		• Articulated Headrest Assembly	6-7
3		• Arm Rest	6-8
4		• Backrest Assembly	6-9
5		• Arm Linkage Components	6-10
6		• Seat Components	6-11
7		• Top to Base Connections	6-12
8		• Top Electrical Components (115 V.)	6-13
9		• Foot Assembly	6-15
10		• Base Cover Components	6-21
11		• Base Electrical Comp. (115 V)	6-22
12		• • Power Inlet Components	6-24
13		• Column Components	6-25
14		• • Column Assembly	6-26
15		• Hand Control Assembly	6-27
		OPTIONAL ACCESSORIES	
	Refer to MEDICAL ACCESSORY BOOK {004-0096-00}		
16	9A77001	I.V. Pole	9A77

Item	Part No.	Description	Page
17	9A78001	Vision Block Screen	9A78
18	9A81001	Articulating Armboard	9A81
19	9A82001	Hand Procedures Armboard	9A82
20	9A152xxx	Cordset	9A152
21	9A179002	Fixed Armboard Assembly	9A179
22	9A182001	Welch Allyn Hanger	9A182
23	9A213001	Caster Base Assembly	9A213
24	9A252001	Foot Control Assembly	9A252
25	9A25400x	Seat Rails	9A254
26	9A255xxx	Non Articulating Headrest Assy.	9A255
27	9A26500x	Restraint Straps	9A265
28	9A266xxx	Large Headrest Pillow	9A266
29	9A26700x	Instrument Tray (Dbl./Single Arm)	9A267
30	9A268001	Instrument Tray	9A268
31	9A27200x	Base Rails	9A272
32	9A273001	Knee Crutch Assembly	9A273
33	9A278002	Wrist Rest (Only Used on 9A310)	9A278
34	9A303001	Paper Roll Holder	9A303
35	9A310xxx	Double Articulating Head Rest	9A310
36	9A311001	Wrist Rest (Only Used on 9A312)	9A311
37	9A312xxx	Triple Articulating Head Rest	9A312

Always Specify Model & Serial Number

Pictorial Index

Return To Table Of Contents



MA519902i

Used on units with Serial Number LM1015 thru LM1295

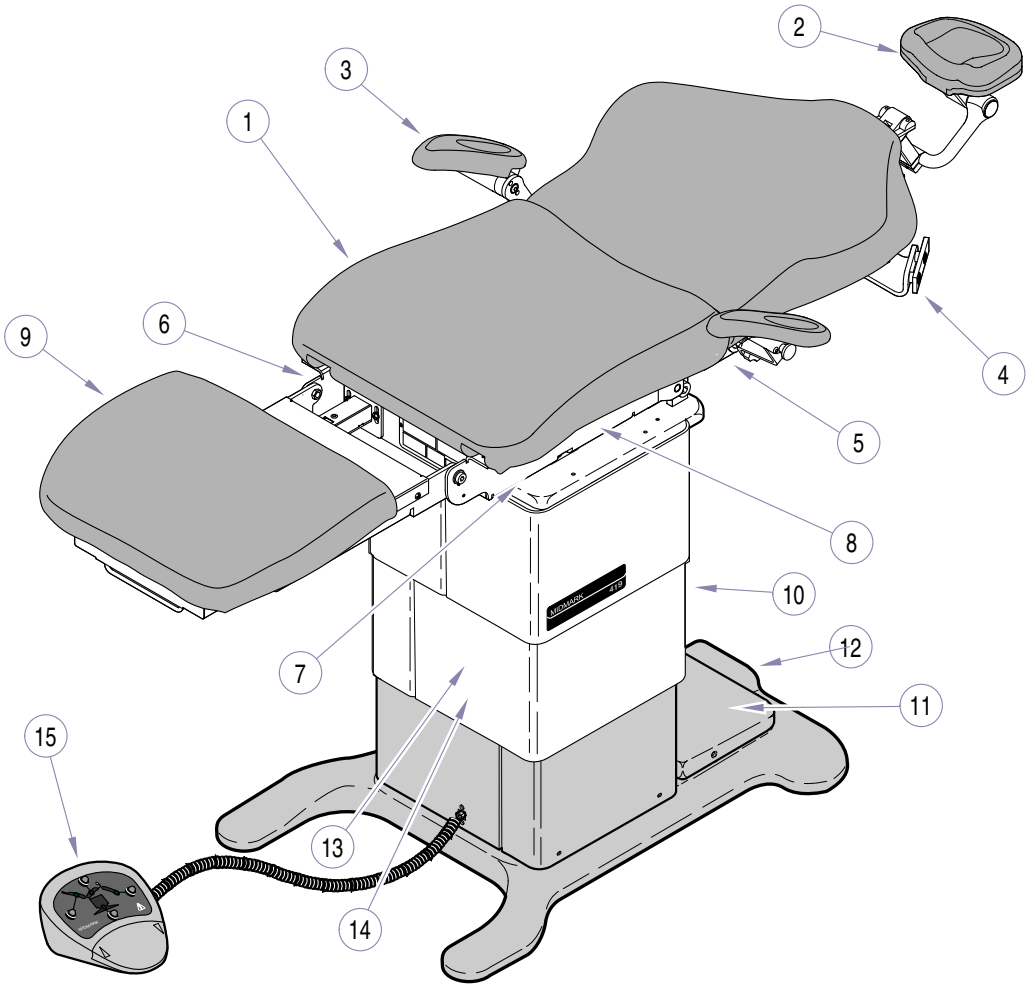
Item	Part No.	Description	Page
	419-003	419 Non-Programmable Procedure Table [115 V.] (Serial No. Prefix="LM")	6-2
1		• Upholstery Kit	6-6
2		• Articulated Headrest Assembly	6-7
3		• Arm Rest	6-8
4		• Backrest Assembly	6-9
5		• Arm Linkage Components	6-10
6		• Seat Components	6-11
7		• Top to Base Connections	6-12
8		• Top Electrical Components (115 V.)	6-13
9		• Foot Assembly	6-15
10		• Base Cover Components	6-21
11		• Base Electrical Comp. (115 V)	6-22
12		• • Power Inlet Components	6-24
13		• Column Components	6-25
14		• • Column Assembly	6-26
15		• Foot Control Assembly	6-29
		OPTIONAL ACCESSORIES	
	Refer to MEDICAL ACCESSORY BOOK {004-0096-00}		
16	9A77001	I.V. Pole	9A77

Item	Part No.	Description	Page
17	9A78001	Vision Block Screen	9A78
18	9A81001	Articulating Armboard	9A81
19	9A82001	Hand Procedures Armboard	9A82
20	9A152xxx	Cordset	9A152
21	9A179002	Fixed Armboard Assembly	9A179
22	9A182001	Welch Allyn Hanger	9A182
23	9A213001	Caster Base Assembly	9A213
24	9A25400x	Seat Rails	9A254
25	9A255xxx	Non Articulating Headrest Assy.	9A255
26	9A26500x	Restraint Straps	9A265
27	9A266xxx	Large Headrest Pillow	9A266
28	9A26700x	Instrument Tray (Dbl./Single Arm)	9A267
29	9A268001	Instrument Tray	9A268
30	9A27200x	Base Rails	9A272
31	9A273001	Knee Crutch Assembly	9A273
32	9A276001	Hand Control Assembly	9A276
33	9A278002	Wrist Rest (Only Used on 9A310)	9A278
34	9A303001	Paper Roll Holder	9A303
35	9A310xxx	Double Articulating Head Rest	9A310
36	9A311001	Wrist Rest (Only Used on 9A312)	9A311
37	9A312xxx	Triple Articulating Head Rest	9A312

Always Specify Model & Serial Number

Pictorial Index

Return To Table Of Contents



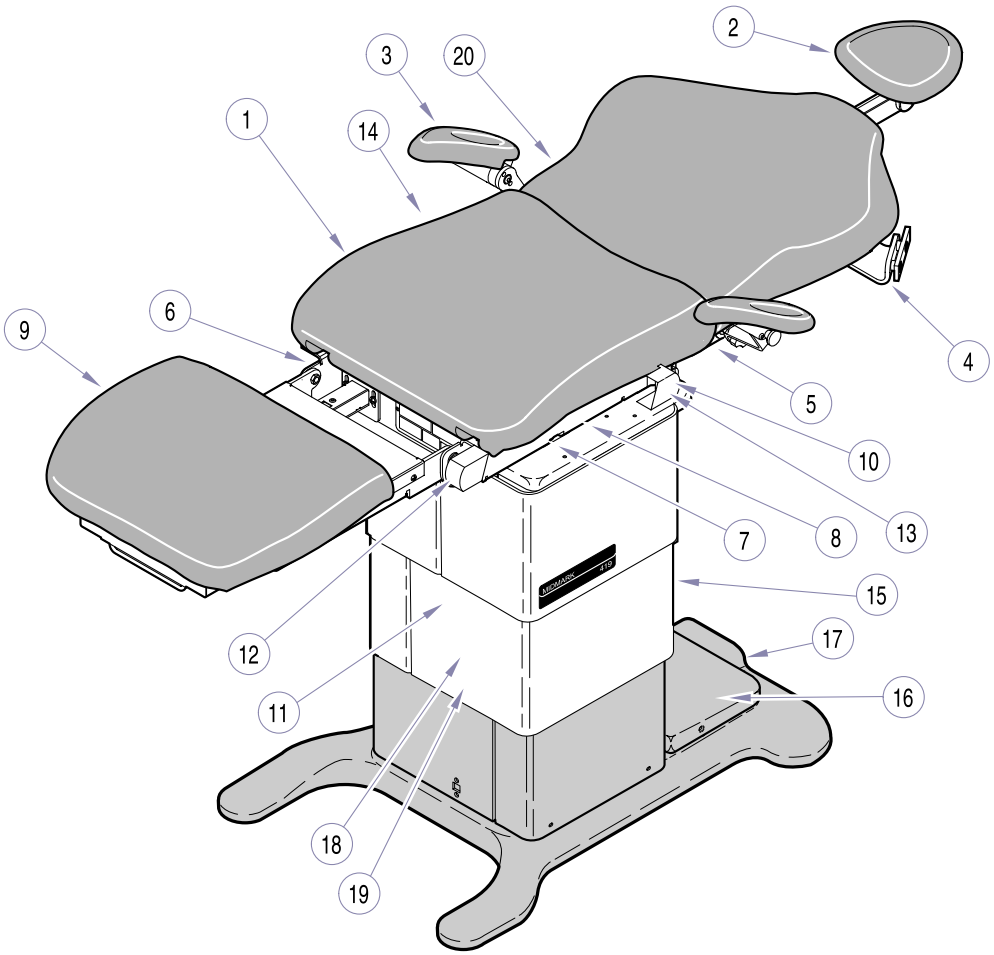
MA519902i

Used on units with Serial Number LM1296 thru Present
Used on units with Serial Number V2200 thru Present

Always Specify Model & Serial Number

Pictorial Index

Return To Table Of Contents



MA519901

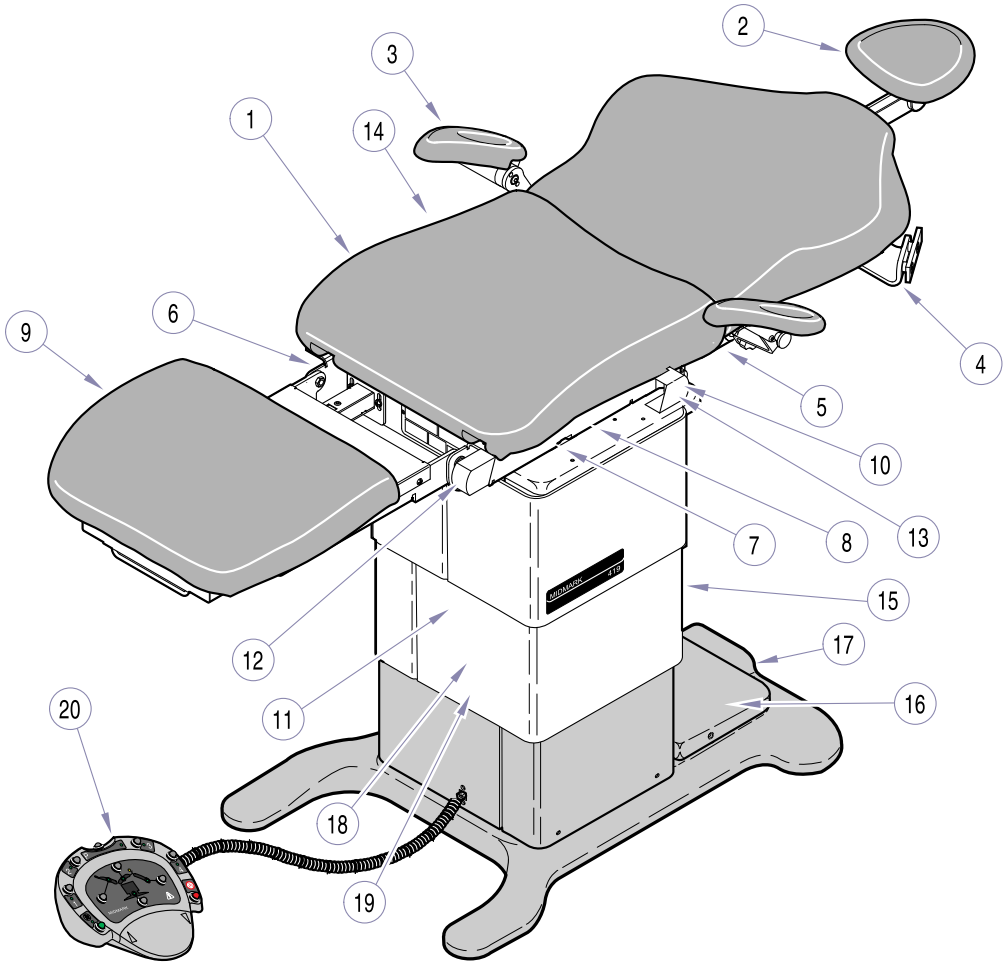
Used on units with Serial Number LN1000 thru LN1026

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519903i

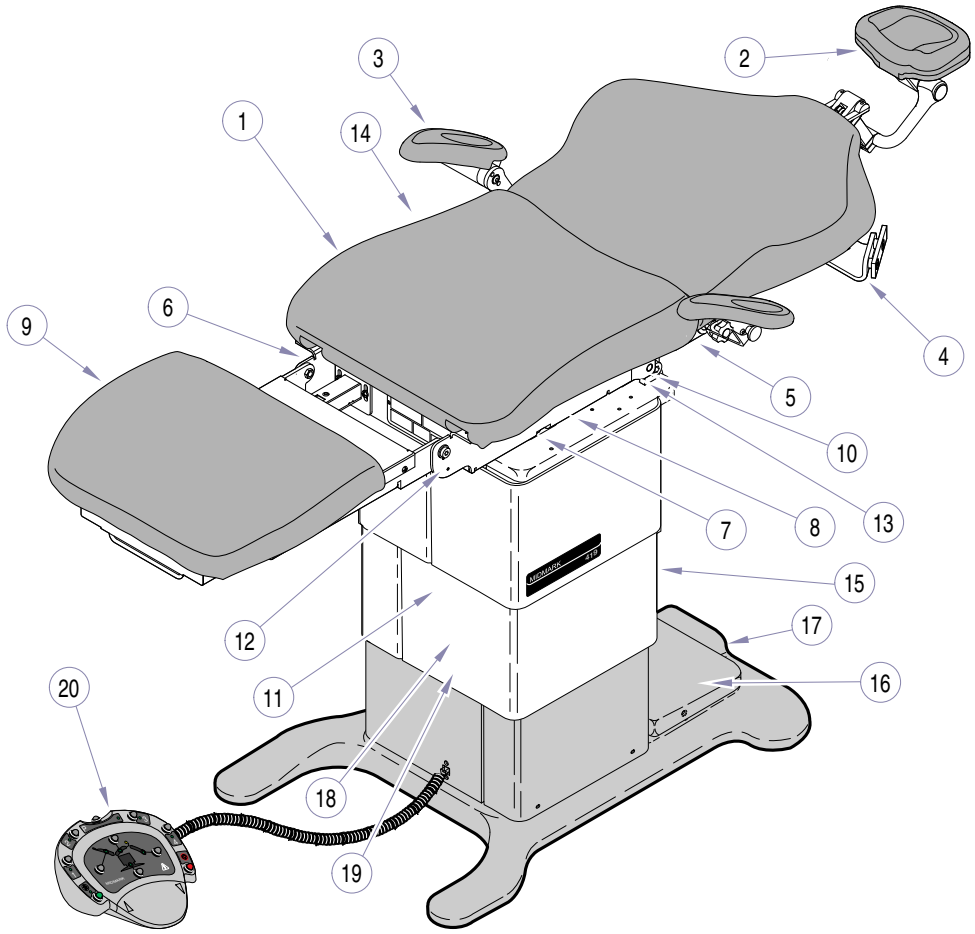
Used on units with Serial Number LN1027 thru LN1386

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519903i

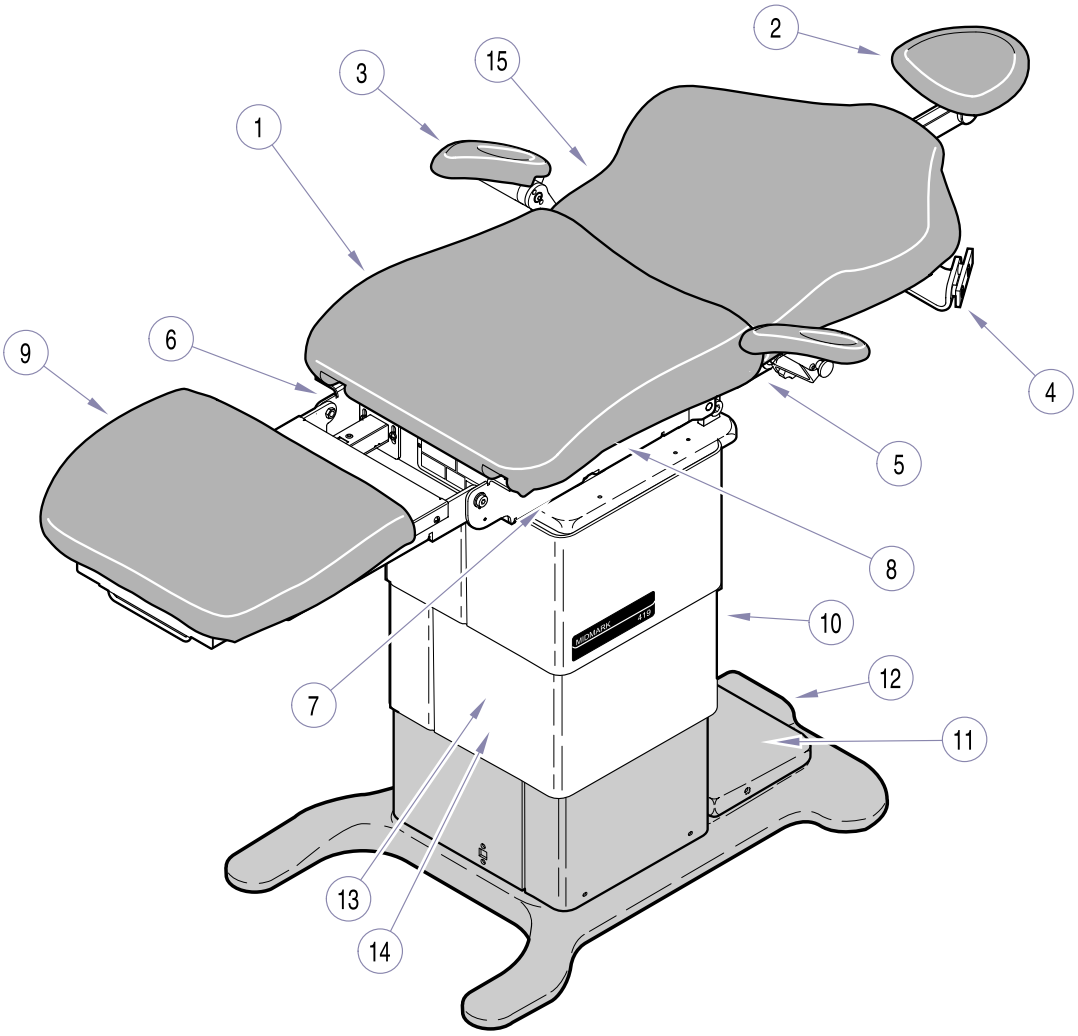
Used on units with Serial Number LN1387 thru Present
Used on units with Serial Number V2200 thru Present

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519900

Used on units with Serial Number LP1000

Item	Part No.	DescriptionPage
	419-005	419 Non-Programmable Procedure Table [230 V] (Serial No. Prefix="LP") 6-4
1		• Upholstery Kit 6-6
2		• Articulated Headrest Assembly 6-7
3		• Arm Rest 6-8
4		• Backrest Assembly 6-9
5		• Arm Linkage Components 6-10
6		• Seat Components 6-11
7		• Top to Base Connections 6-12
8		• Top Electrical Components (230 V.) 6-14
9		• Foot Assembly 6-15
10		• Base Cover Components 6-21
11		• Base Electrical Comp. (230 V) 6-23
12		• • Power Inlet Components 6-24
13		• Column Components 6-25
14		• • Column Assembly 6-26
15		• Hand Control Assembly 6-27
		OPTIONAL ACCESSORIES
	Refer to MEDICAL ACCESSORY BOOK {004-0096-00}	
16	9A77001	I.V. Pole 9A77

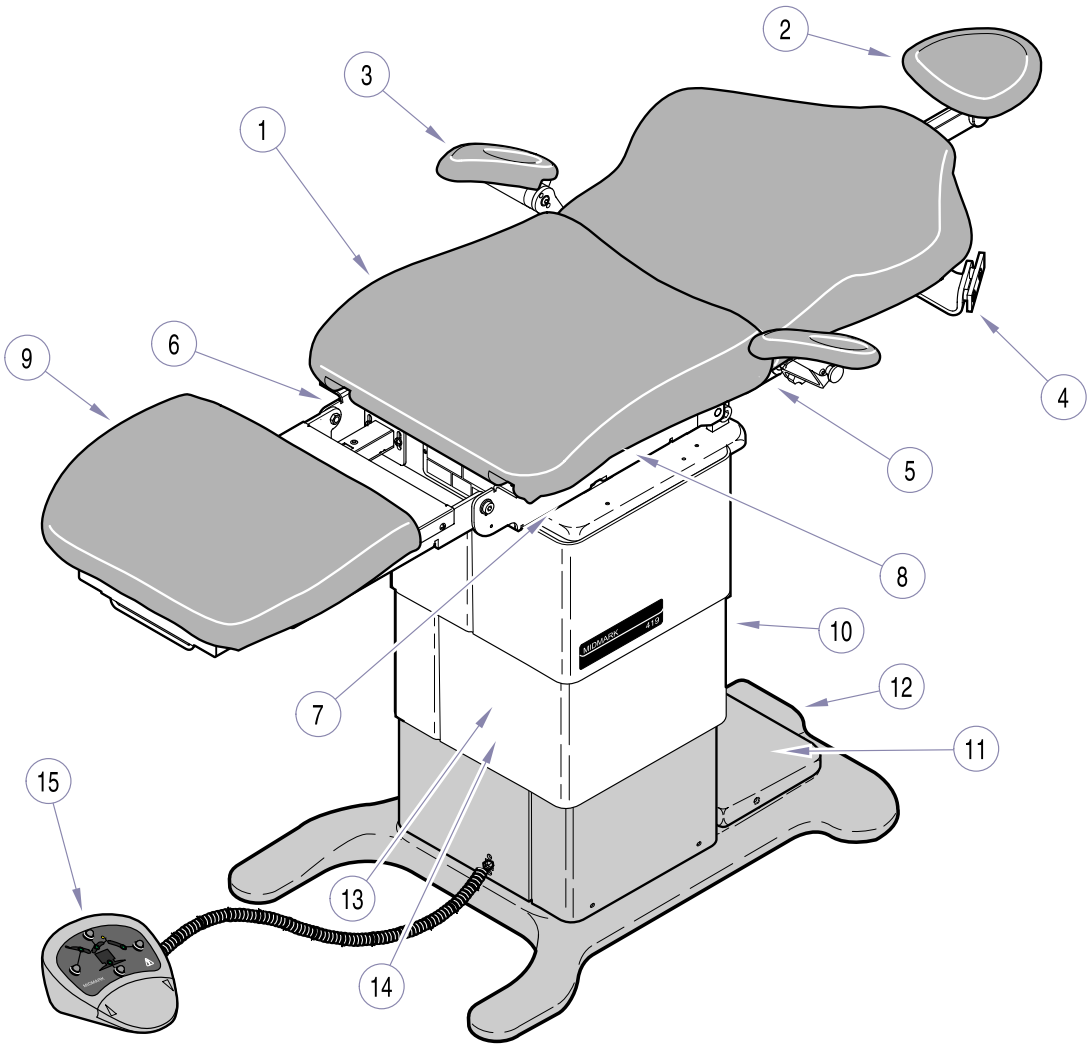
Item	Part No.	DescriptionPage
17	9A78001	Vision Block Screen 9A78
18	9A81001	Articulating Armboard 9A81
19	9A82001	Hand Procedures Armboard 9A82
20	9A152xxx	Cordset 9A152
21	9A179002	Fixed Armboard Assembly 9A179
22	9A182001	Welch Allyn Hanger 9A182
23	9A213001	Caster Base Assembly 9A213
24	9A252001	Foot Control Assembly 9A252
25	9A25400x	Seat Rails 9A254
26	9A255xxx	Non Articulating Headrest Assy. ... 9A255
27	9A26500x	Restraint Straps 9A265
28	9A266xxx	Large Headrest Pillow 9A266
29	9A26700x	Instrument Tray (Dbl/Single Arm) . 9A267
30	9A268001	Instrument Tray 9A268
31	9A27200x	Base Rails 9A272
32	9A273001	Knee Crutch Assembly 9A273
38	9A278002	Wrist Rest (Only Used on 9A310). 9A278
39	9A303001	Paper Roll Holder 9A303
40	9A310xxx	Double Articulating Head Rest 9A310
41	9A311001	Wrist Rest (Only Used on 9A312). 9A311
42	9A312xxx	Triple Articulating Head Rest 9A312

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519900

Used on units with Serial Number LP1001 thru LP1017

Item	Part No.	Description	Page
	419-005	419 Non-Programmable Procedure Table [230 V] (Serial No. Prefix="LP")	6-4
1		• Upholstery Kit	6-6
2		• Articulated Headrest Assembly	6-7
3		• Arm Rest	6-8
4		• Backrest Assembly	6-9
5		• Arm Linkage Components	6-10
6		• Seat Components	6-11
7		• Top to Base Connections	6-12
8		• Top Electrical Components (230 V.)	6-14
9		• Foot Assembly	6-15
10		• Base Cover Components	6-21
11		• Base Electrical Comp. (230 V)	6-23
12		• • Power Inlet Components	6-24
13		• Column Components	6-25
14		• • Column Assembly	6-26
15		• Foot Control Assembly	6-29
		OPTIONAL ACCESSORIES	
	Refer to MEDICAL ACCESSORY BOOK {004-0096-00}		
16	9A77001	I.V. Pole	9A77

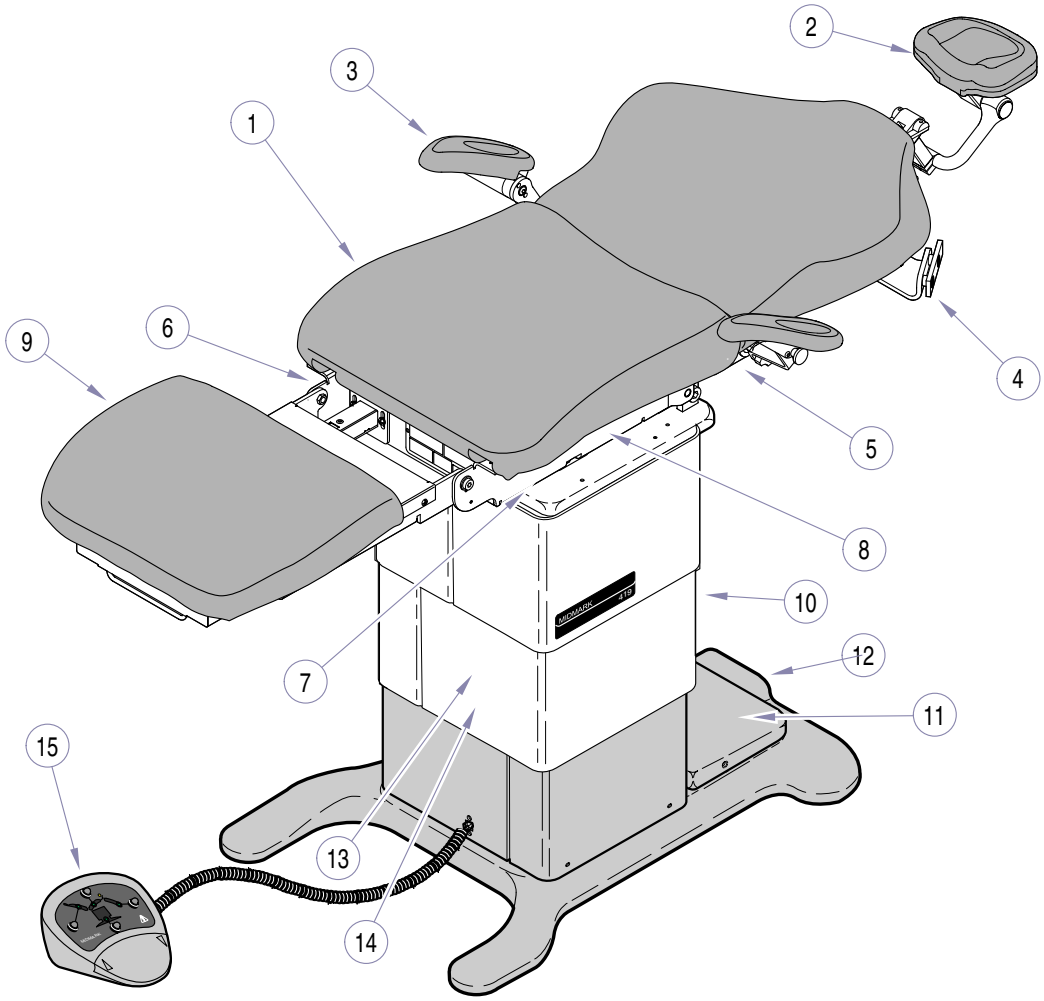
Item	Part No.	Description	Page
17	9A78001	Vision Block Screen	9A78
18	9A81001	Articulating Armboard	9A81
19	9A82001	Hand Procedures Armboard	9A82
20	9A152xxx	Cordset	9A152
21	9A179002	Fixed Armboard Assembly	9A179
22	9A182001	Welch Allyn Hanger	9A182
23	9A213001	Caster Base Assembly	9A213
24	9A25400x	Seat Rails	9A254
25	9A255xxx	Non Articulating Headrest Assy.	9A255
26	9A26500x	Restraint Straps	9A265
27	9A266xxx	Large Headrest Pillow	9A266
28	9A26700x	Instrument Tray (Dbl/Single Arm)	9A267
29	9A268001	Instrument Tray	9A268
30	9A27200x	Base Rails	9A272
31	9A273001	Knee Crutch Assembly	9A273
32	9A276001	Hand Control Assembly	9A276
33	9A278002	Wrist Rest (Only Used on 9A310)	9A278
34	9A303001	Paper Roll Holder	9A303
35	9A310xxx	Double Articulating Head Rest	9A310
36	9A311001	Wrist Rest (Only Used on 9A312)	9A311
37	9A312xxx	Triple Articulating Head Rest	9A312

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519902i

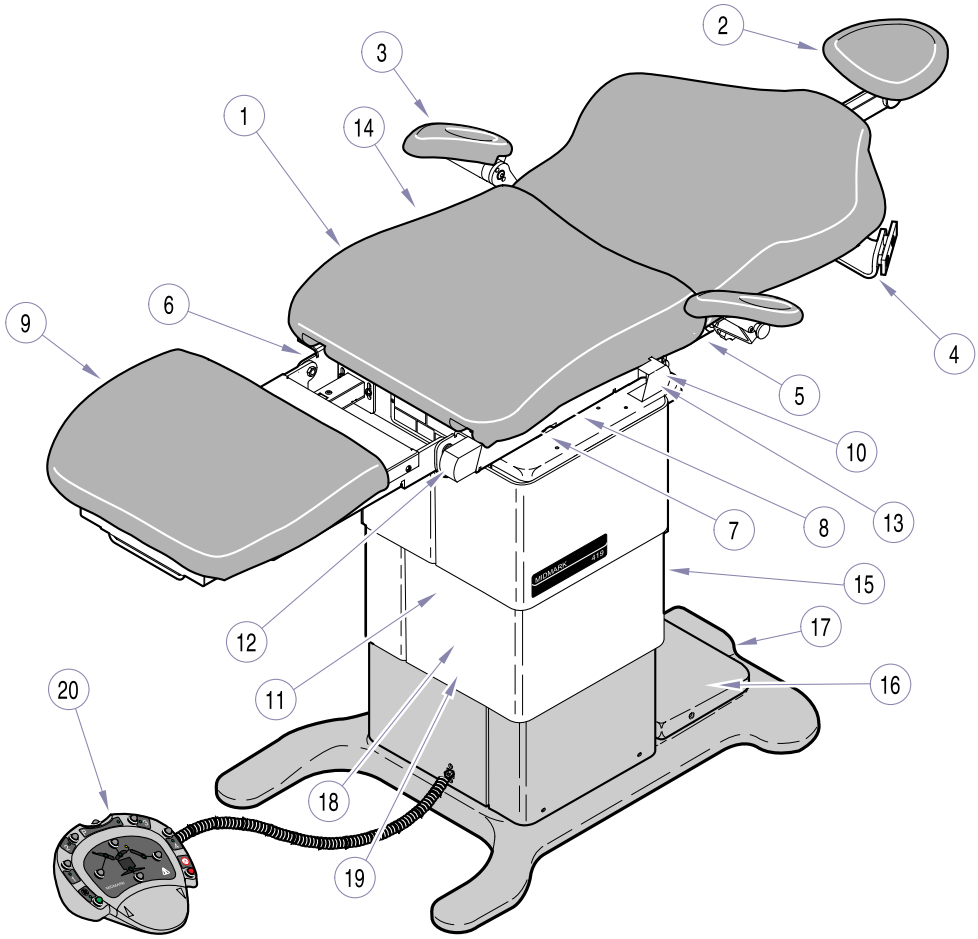
Used on units with Serial Number LP1018 thru Present
Used on units with Serial Number V2200 thru Present

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



MA519901

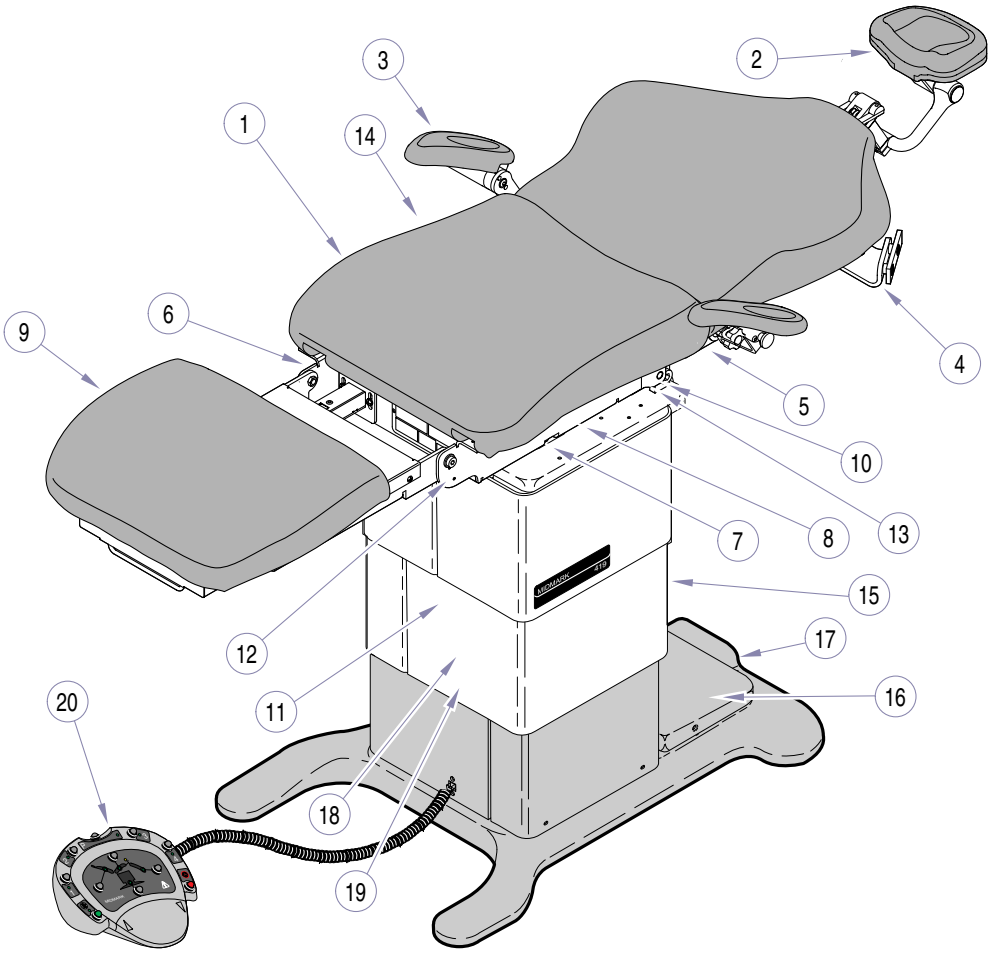
Used on units with Serial Number LR1000 thru LR1009

Always Specify Model & Serial Number

Printed in U.S.A.

Pictorial Index

Return To Table Of Contents



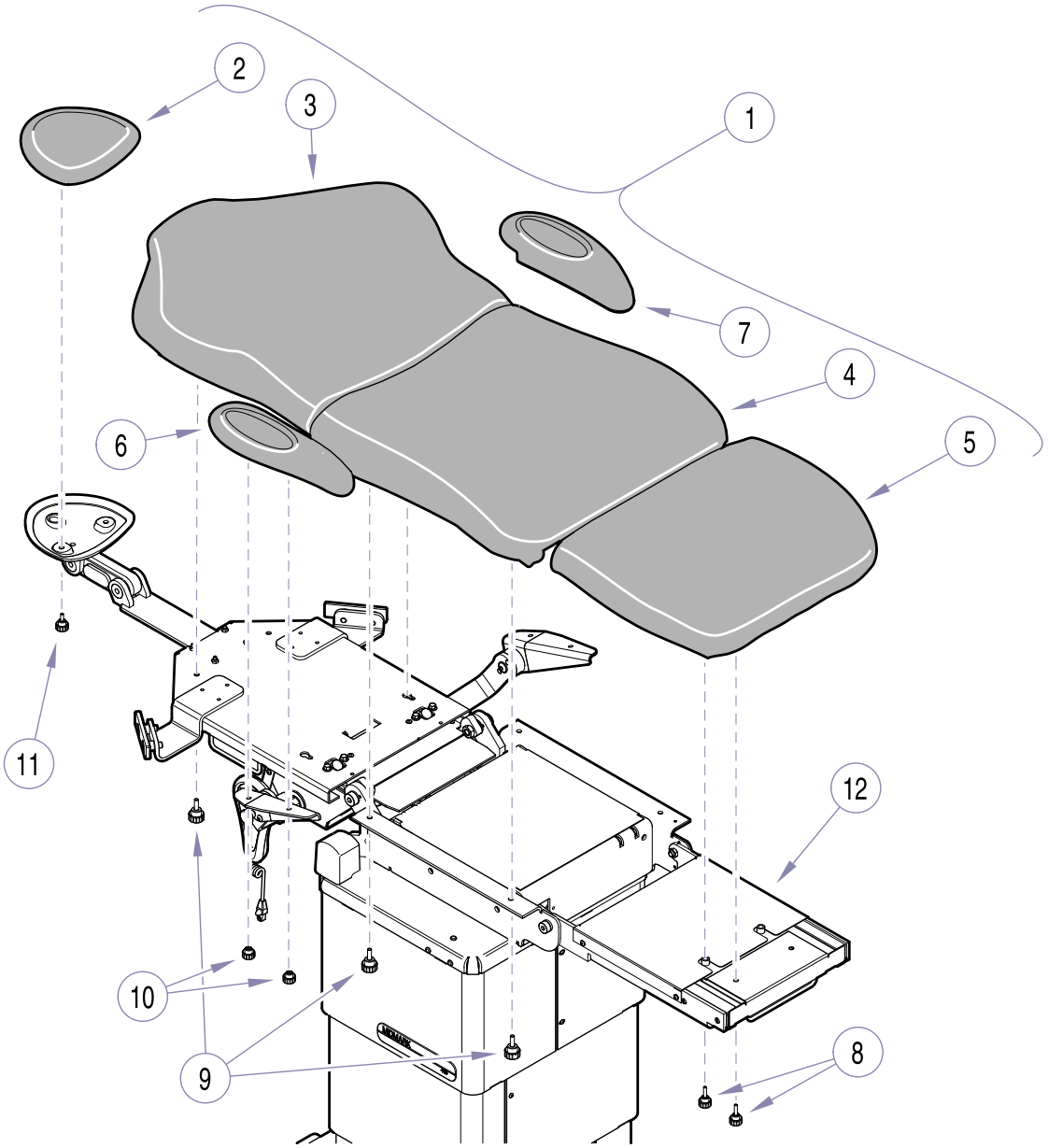
MA519903

Used on units with Serial Number LR1010 thru Present
Used on units with Serial Number V2200 thru Present

Always Specify Model & Serial Number

Printed in U.S.A.

Upholstery Kit



Color Selector.....www.midmark.com

MA519700

Used on units with Serial Number LM1000 thru LM1295, LN1000 thru LN1386, LP1000 thru LP1017 and LR1000 thru LR1009

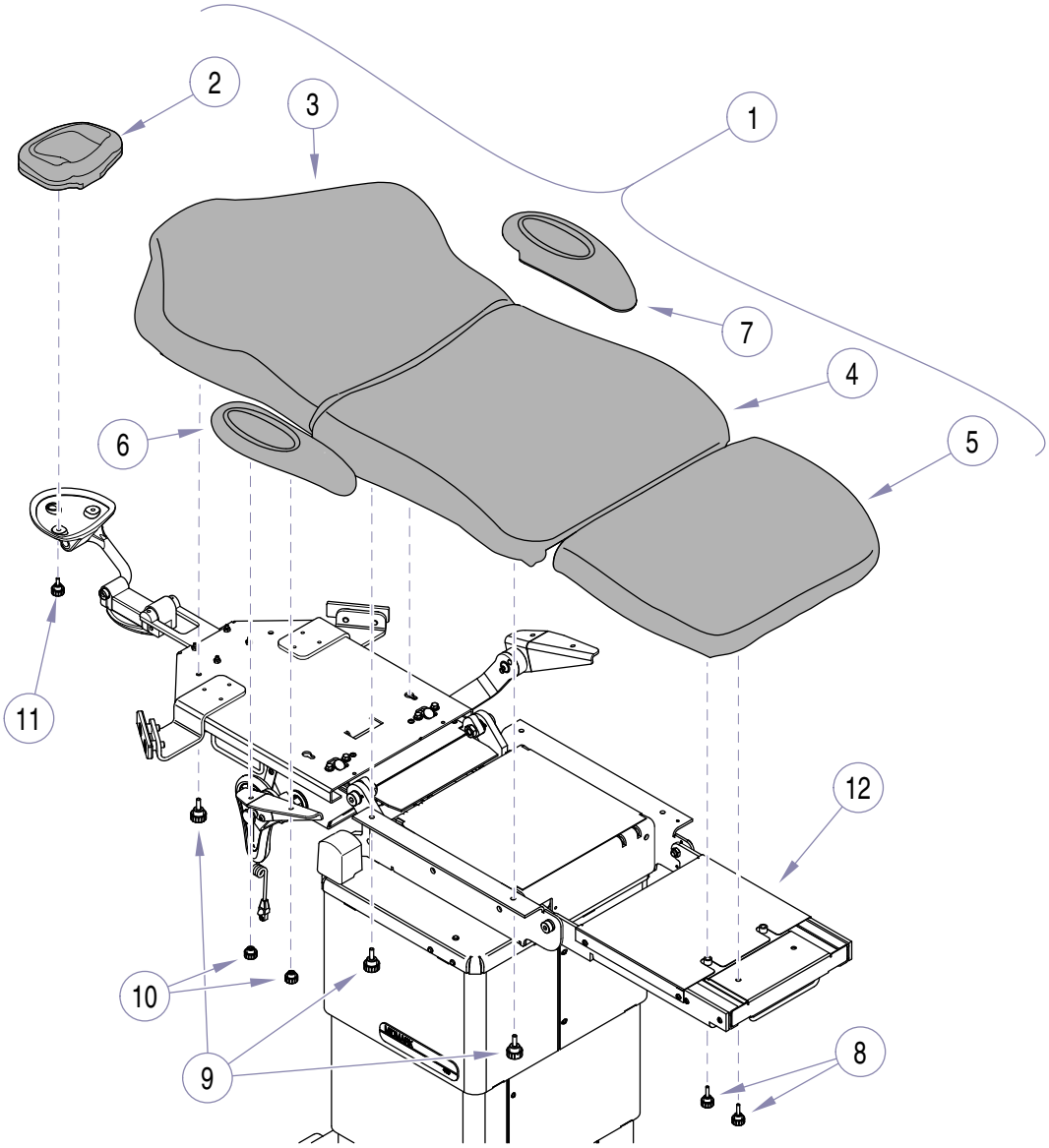
Item	Part No.	Description	Qty.
	002-0607-xxx	Upholstery Kit (Includes Items 1 thru 11) {*Specify Color}	1
1	• 029-2250-xxx	• Upholstery (Includes Items 2 thru 7) {*Specify Color}	1
2	• • 028-0487-xxx	• • Upholstered Headrest {*Specify Color}	1
3	• • 028-0483-xxx	• • Back Upholstery {*Specify Color}	1
4	• • 028-0484-xxx	• • Seat Upholstery {*Specify Color}	1
5	• • 028-0485-xxx	• • Upholstered Footrest {*Specify}	1
6	• • 028-0489-xxx	• • Right-Hand Armpad {*Specify Color}	1
7	• • 028-0486-xxx	• • Left-Hand Armpad {Specify Color}	1
8	• 016-0798-02	• Knob	4
9	• 016-0798-03	• Knob	6
10	• 016-0798-00	• Knob	4
11	• 016-0798-01	• Knob	2
12		Table Top (Refer to Pages Elsewhere)	1

* Click on the Color Selector link above to *see available colors.

Always Specify Model & Serial Number

Upholstery Kit

Return To Table Of Contents



Color Selector.....www.midmark.com

MA519701i

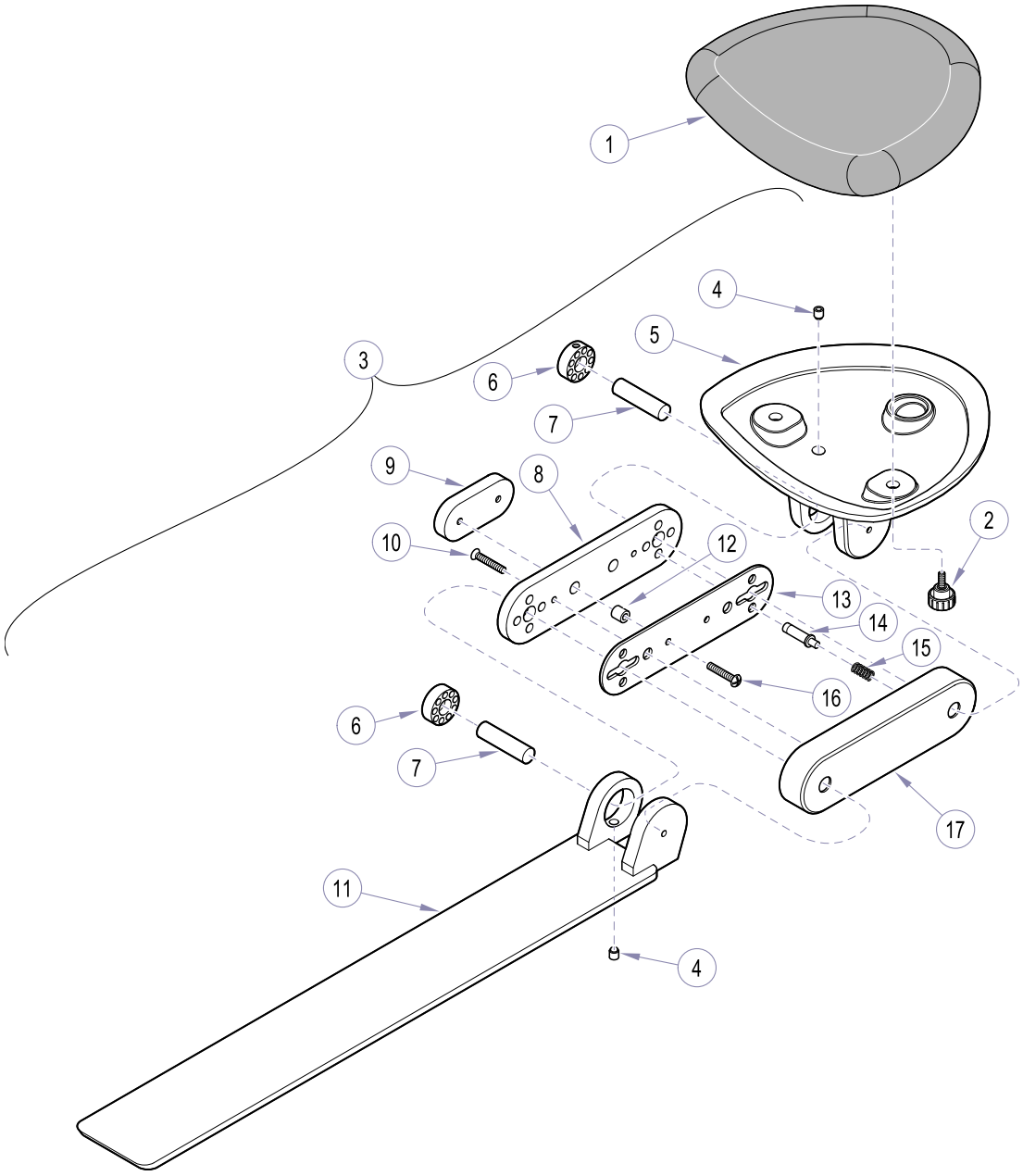
Used on units with Serial Number LM1296, LN1387, LP1018 and LR1010 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	002-0607-xxx	Upholstery Kit (Includes Items 1 thru 11) {*Specify Color}	1
1	• 029-2250-xxx	• Upholstery (Includes Items 2 thru 7) {*Specify Color}	1
2	• • 028-0525-xxx	• • Upholstered Headrest {*Specify Color}	1
3	• • 028-0483-xxx	• • Back Upholstery {*Specify Color}	1
4	• • 028-0484-xxx	• • Seat Upholstery {*Specify Color}	1
5	• • 028-0485-xxx	• • Upholstered Footrest {*Specify Color}	1
6	• • 028-0489-xxx	• • Right-Hand Armpad {*Specify Color}	1
7	• • 028-0486-xxx	• • Left-Hand Armpad {*Specify Color}	1
8	• 016-0798-02	• Knob	4
9	• 016-0798-03	• Knob	6
10	• 016-0798-00	• Knob	4
11	• 016-0798-01	• Knob	2
12		Table Top (Refer to Pages Elsewhere)	1

* Click on the Color Selector link above to *see available colors.

Always Specify Model & Serial Number

Articulated Headrest Assembly



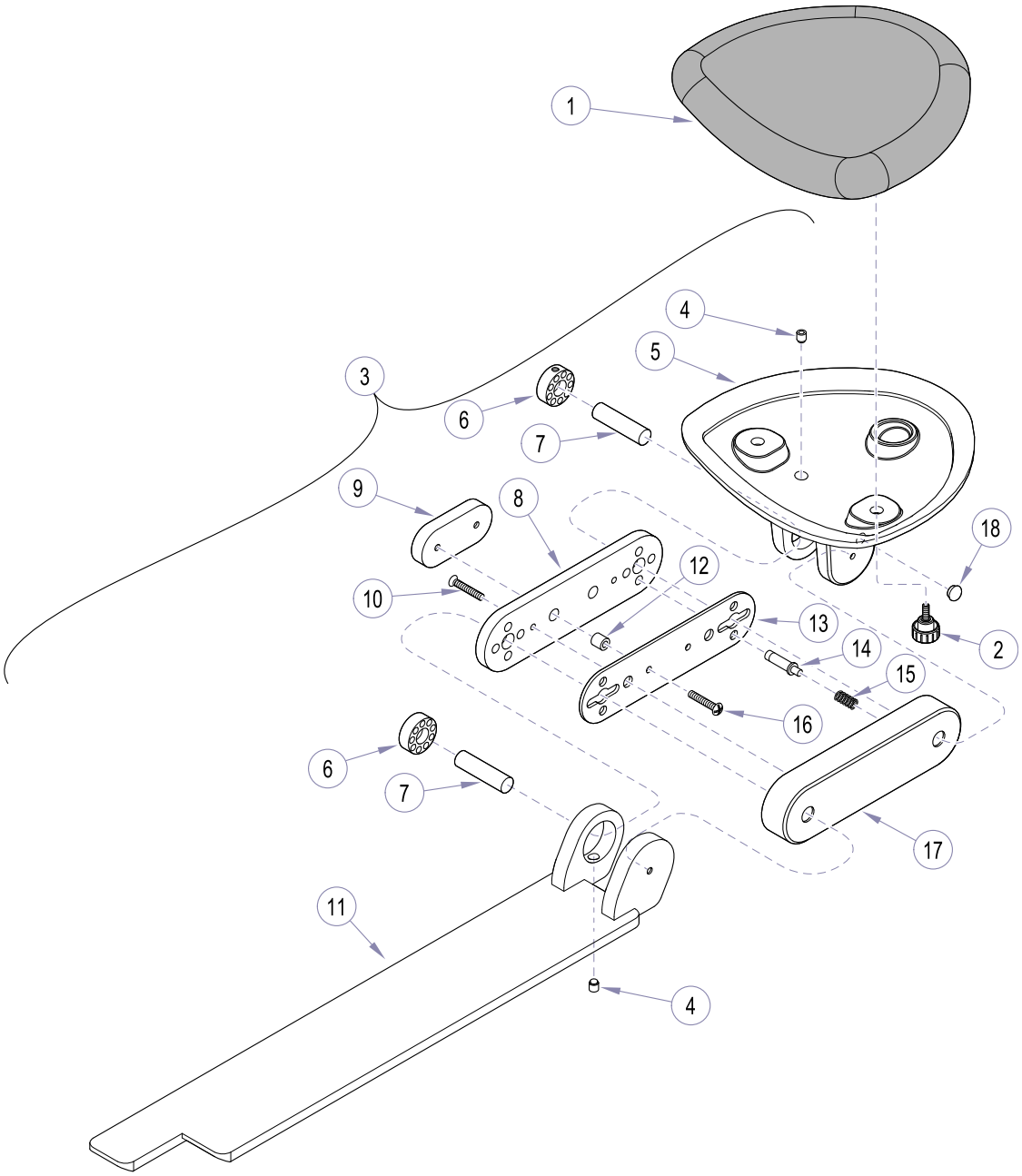
MA515901i

Used on units with Serial Number LM1000 thru LM1034, LN1000 thru LN1050, LP1000 thru LP1001 and LR1000 thru LR1001

Item	Part No.	Description	Qty.
	~~9A310xxx~~	Headlock Assembly w/upholstery (includes items 1 thru 17) {**Specify Color**-refer to "Upholstery Kit"}	
1	•	• Upholstered Headrest (Refer to "Upholstery Kit")	Ref
2	•	• Knob (Refer to "Upholstery Kit")	Ref
3	• ~~029-2279-00~~	• Headlock Assembly (includes items 4 thru 17)	1
4	• • ~~040-0250-21~~	• • Set Screw	2
5	• • ~~020-0191-00~~	• • Housing	1
6	• • ~~057-0507-00~~	• • Pin Stop Block	2
7	• • ~~057-0509-00~~	• • Pivot Pin	2
8	• • ~~051-0877-00~~	• • Pin Housing	1
9	• • ~~051-0879-00~~	• • Release Button	1
10	• • ~~040-0006-92~~	• • Screw	2
11	• • ~~030-1197-00~~	• • Tang Weldment	1
12	• • 016-0138-19	• • Spacer	2
13	• • 050-4291-00	• • Release Plate	1
14	• • ~~057-0508-00~~	• • Stop Pin	8
15	• • ~~025-0059-00~~	• • Spring	8
16	• • 040-0006-93	• • Screw	2
17	• • ~~051-0878-00~~	• • Spring Housing	1

Always Specify Model & Serial Number

Articulated Headrest Assembly



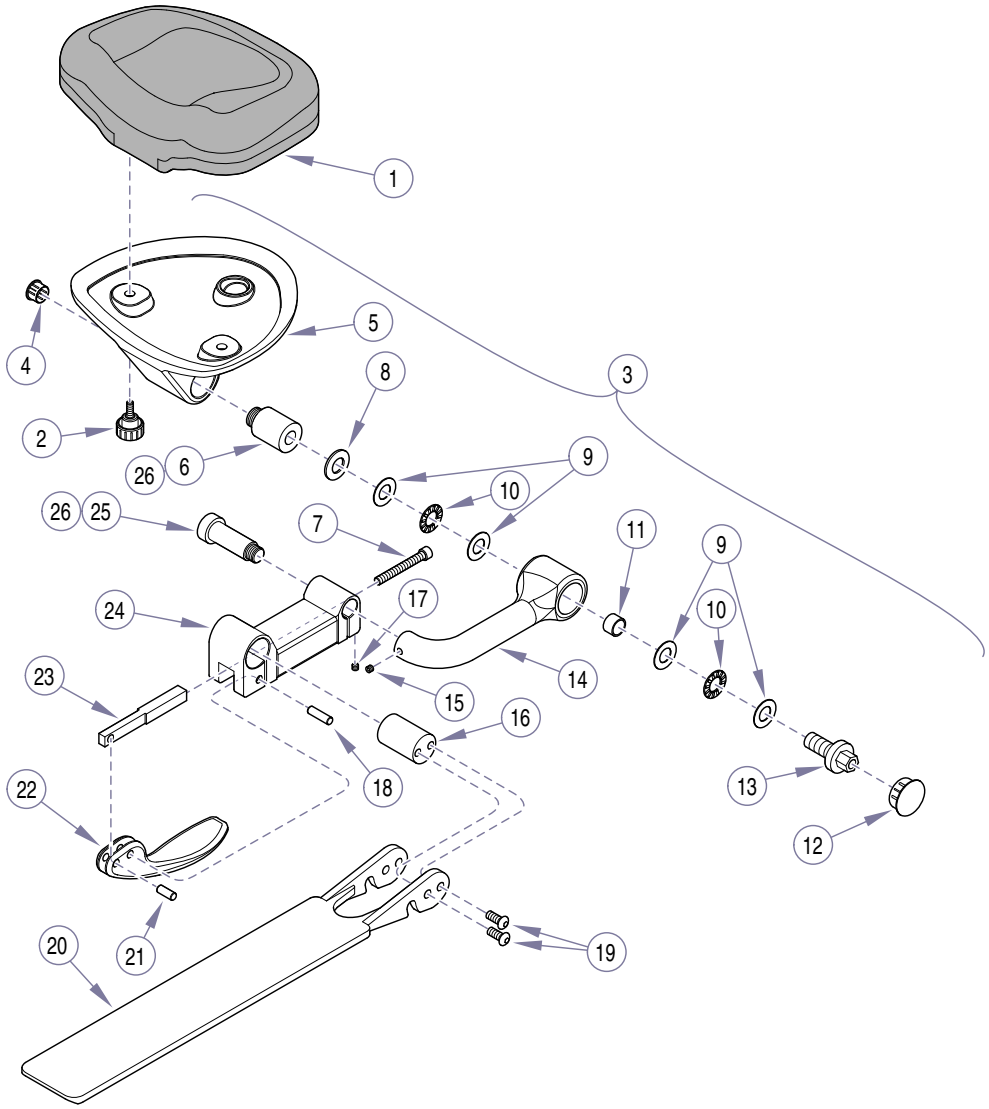
MA515903i

Used on units with Serial Number LM1035 thru LM1295, LN1051 thru LN1386, LP1002 thru LP1017 and LR1002 thru LR1010

Item	Part No.	Description	Qty.
	~~9A310xxx~~	Headlock Assembly w/upholstery (includes items 1 thru 18) {**Specify Color**-refer to "Upholstery Kit"}	
1	•	• Upholstered Headrest (Refer to "Upholstery Kit")	Ref
2	•	• Knob (Refer to "Upholstery Kit")	Ref
3	• ~~029-2279-00~~	• Headlock Assembly (includes items 4 thru 18)	1
4	• • ~~040-0250-21~~	• • Set Screw	2
5	• • ~~020-0191-02~~	• • Housing	1
6	• • ~~057-0507-00~~	• • Pin Stop Block	2
7	• • ~~057-0509-00~~	• • Pivot Pin	2
8	• • ~~051-0877-00~~	• • Pin Housing	1
9	• • ~~051-0879-00~~	• • Release Button	1
10	• • ~~040-0006-92~~	• • Screw	2
11	• • ~~030-1253-00~~	• • Tang Weldment	1
12	• • 016-0138-19	• • Spacer	2
13	• • 050-4291-00	• • Release Plate	1
14	• • ~~057-0508-00~~	• • Stop Pin	8
15	• • ~~025-0059-00~~	• • Spring	8
16	• • 040-0006-93	• • Screw	2
17	• • ~~051-0878-00~~	• • Spring Housing	1
18	• • 053-0050-12	• • Hole Plug	1

Always Specify Model & Serial Number

Triple Articulating HeadRest



MA596100i

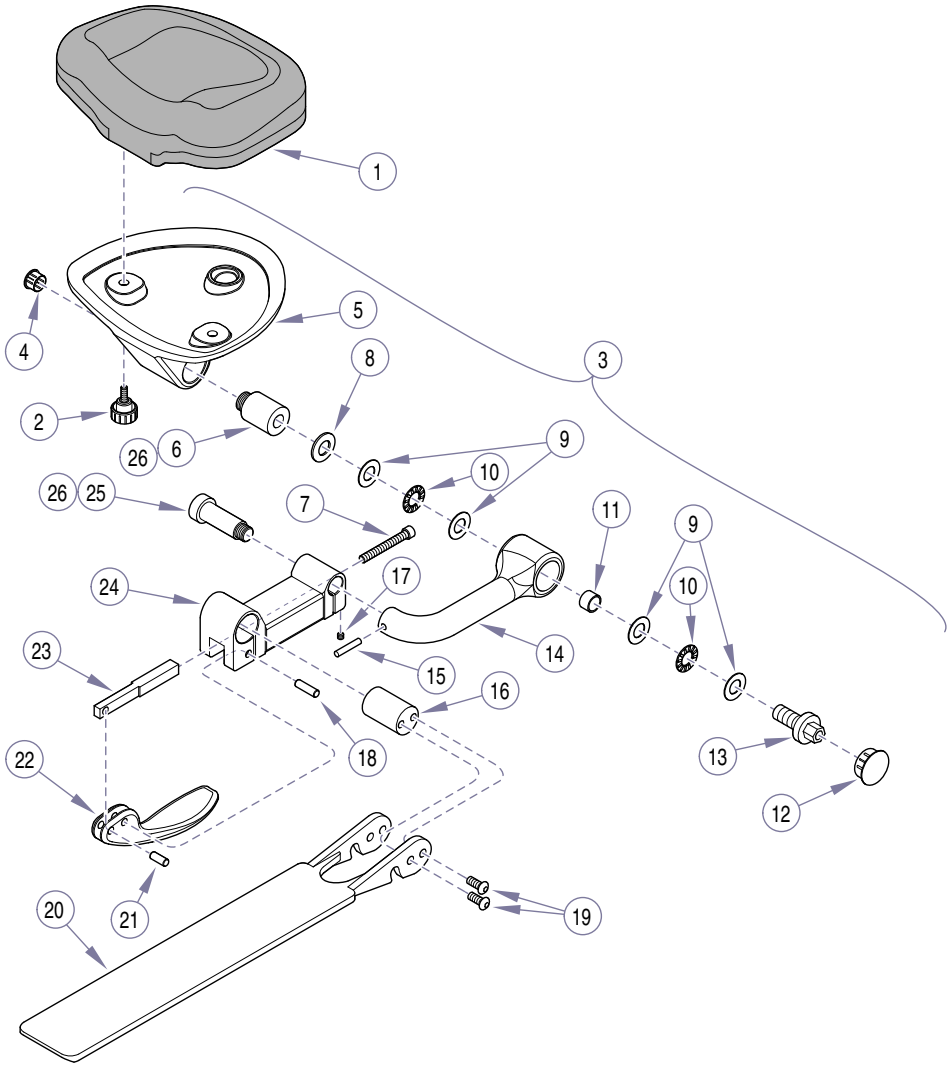
Used on units with Serial Number LM1296 thru LM1380, LN1387 thru LN1431 and LP1018

Item	Part No.	Description	Qty
	~~9A312xxx~~	Headlock Assembly w/upholstery (includes items 1 thru 24) {**Specify Color**-refer to "Upholstery Kit"}	
1	•	• Upholstered Headrest (Refer to "Upholstery Kit")	Ref
2	•	• Knob (Refer to "Upholstery Kit")	Ref
3	• ~~029-2772-00~~	• Triple Articulating Headrest (Includes Items 4 thru 24)	Ref
4	• • 053-0050-01	• • Hole Plug	1
5	• • ~~020-0191-03~~	• • Articulating Headrest Housing	1
6	• • ~~057-0699-00~~	• • Headrest Casting Adapter	1
7	• • *(N.S.P.)*	• • Screw	1
8	• • 045-0001-126	• • Belleville Spring Washer	1
9	• • 120712	• • Washer	4
10	• • 110207	• • Needle Thrust Bearing	2
11	• • 016-0076-00	• • Bushing	1
12	• • 053-0050-02	• • Hole Plug	1
13	• • ~~057-0700-00~~	• • Double Articulating Headrest Pivot	1
14	• • ~~020-0234-00~~	• • Headrest Link	1
15	• • ~~040-0010-155~~	• • Set Screw	1
16	• • 057-0048-01	• • Pivot Bar	1
17	• • *(N.S.P.)*	• • Set Screw	1
18	• • *(N.S.P.)*	• • Dowel Pin	2
19	• • 040-0250-79	• • Screw	4
20	• • *(N.S.P.)*	• • Headrest Tang	1
21	• • *(N.S.P.)*	• • Dowel Pin	1
22	• • *(N.S.P.)*	• • Head Over Center Handle	1
23	• • *(N.S.P.)*	• • Draw Bar	1
24	• • ~~030-1347-00~~	• • Lock Weldment	1
25	• • ~~057-0715-00~~	• • Head Lock Pivot Pin	1
26	• • K906111	• • Adhesive	AR
27	• • 046-0002-00	• • Allen Wrench (Not Shown)	1

(N.S.P.) Denotes "Non Servicable Part"

Always Specify Model & Serial Number

Triple Articulating HeadRest



MA596101i

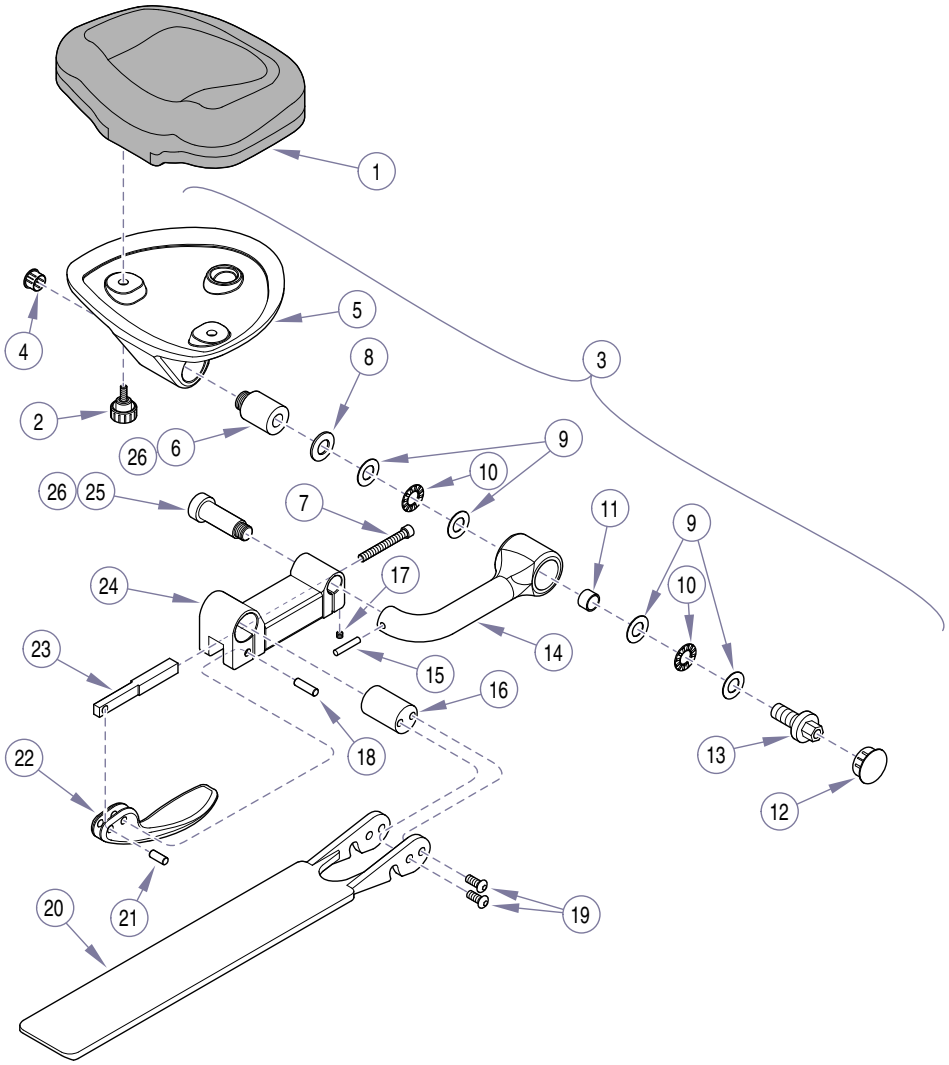
Used on units with Serial Number LM1381 thru LM1474, LN1432 thru LN1544, LP1019 thru LP1025 and LR1010 thru LR1012

Item	Part No.	Description	Qty
	~~9A312xxx~~	Headlock Assembly w/upholstery (includes items 1 thru 24) {**Specify Color**-refer to "Upholstery Kit"}	
1	•	• Upholstered Headrest (Refer to "Upholstery Kit")	Ref
2	•	• Knob (Refer to "Upholstery Kit")	Ref
3	• ~~029-2772-00~~	• Triple Articulating Headrest (Includes Items 4 thru 24)	Ref
4	• • 053-0050-01	• • Hole Plug	1
5	• • ~~020-0191-03~~	• • Articulating Headrest Housing	1
6	• • ~~057-0699-00~~	• • Headrest Casting Adapter	1
7	• • *(N.S.P.)*	• • Screw	1
8	• • 045-0001-126	• • Belleville Spring Washer	1
9	• • 120712	• • Washer	4
10	• • 110207	• • Needle Thrust Bearing	2
11	• • 016-0076-00	• • Bushing	1
12	• • 053-0050-02	• • Hole Plug	1
13	• • ~~057-0700-00~~	• • Double Articulating Headrest Pivot	1
14	• • ~~020-0234-00~~	• • Headrest Link	1
15	• • ~~042-0011-06~~	• • Roll Pin	1
16	• • 057-0048-01	• • Pivot Bar	1
17	• • *(N.S.P.)*	• • Set Screw	1
18	• • *(N.S.P.)*	• • Dowel Pin	2
19	• • 040-0250-79	• • Screw	4
20	• • ~~030-1412-00~~	• • Headrest Tang	1
21	• • *(N.S.P.)*	• • Dowel Pin	1
22	• • *(N.S.P.)*	• • Head Over Center Handle	1
23	• • *(N.S.P.)*	• • Draw Bar	1
24	• • *(N.S.P.)*	• • Lock Weldment	1
25	• • ~~057-0715-00~~	• • Head Lock Pivot Pin	1
26	• • K906111	• • Adhesive	AR
27	• • 046-0002-00	• • Allen Wrench (Not Shown)	1

(N.S.P.) Denotes "Non Servicable Part"

Always Specify Model & Serial Number

Triple Articulating HeadRest



MA596101i

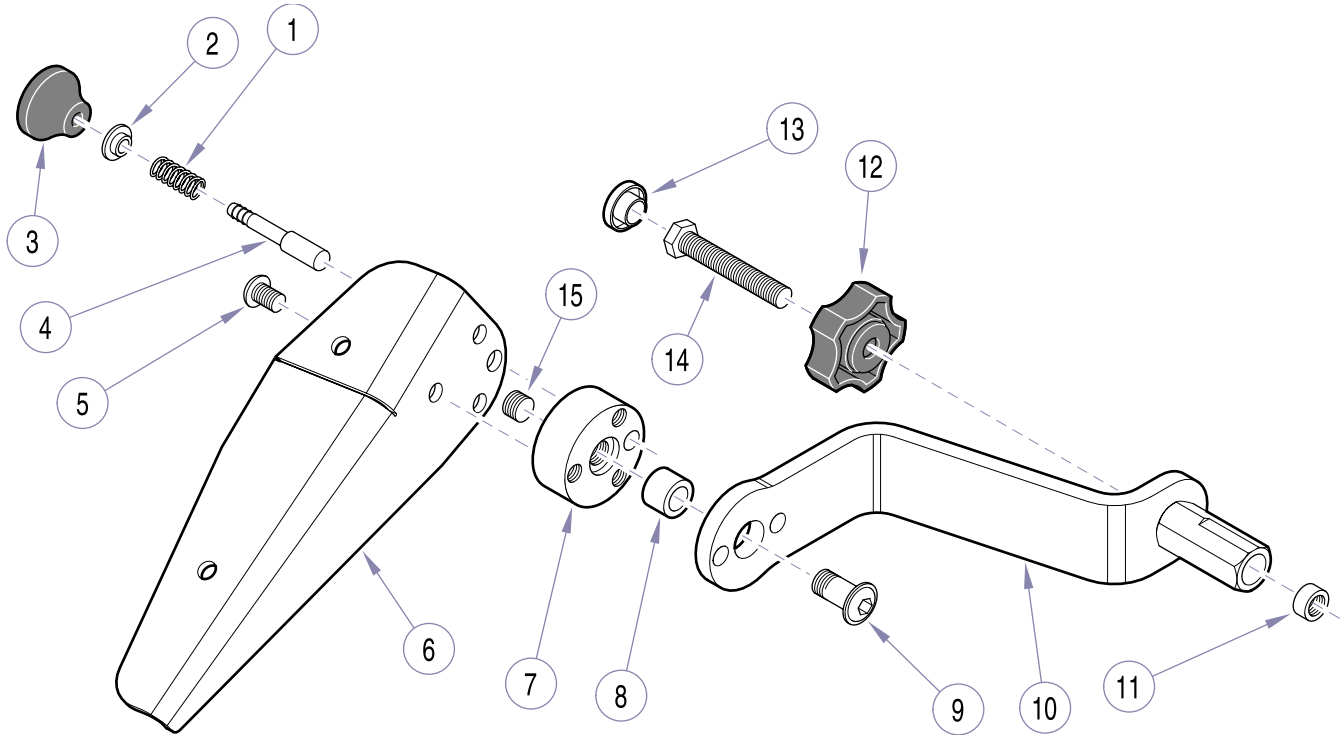
Used on units with Serial Number LM1475, LN1545, LP1026 and LR1013 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty
	~~9A312xxx~~	Headlock Assembly w/upholstery (includes items 1 thru 24) {**Specify Color**-refer to "Upholstery Kit"}	
1	•	• Upholstered Headrest (Refer to "Upholstery Kit")	Ref
2	•	• Knob (Refer to "Upholstery Kit")	Ref
3	• ~~029-2772-00~~	• Triple Articulating Headrest (Includes Items 4 thru 24)	Ref
4	• • 053-0050-01	• • Hole Plug	1
5	• • ~~020-0191-03~~	• • Articulating Headrest Housing	1
6	• • ~~057-0699-00~~	• • Headrest Casting Adapter	1
7	• • *(N.S.P.)*	• • Screw	1
8	• • 045-0001-126	• • Belleville Spring Washer	1
9	• • 120712	• • Washer	4
10	• • 110207	• • Needle Thrust Bearing	2
11	• • 016-0076-00	• • Bushing	1
12	• • 053-0050-02	• • Hole Plug	1
13	• • ~~057-0700-00~~	• • Double Articulating Headrest Pivot	1
14	• • ~~020-0234-00~~	• • Headrest Link	1
15	• • ~~042-0011-06~~	• • Roll Pin	1
16	• • 057-0048-01	• • Pivot Bar	1
17	• • *(N.S.P.)*	• • Set Screw	1
18	• • *(N.S.P.)*	• • Dowel Pin	2
19	• • 040-0250-79	• • Screw	4
20	• • ~~030-1412-00~~	• • Headrest Tang	1
21	• • *(N.S.P.)*	• • Dowel Pin	1
22	• • *(N.S.P.)*	• • Head Over Center Handle	1
23	• • *(N.S.P.)*	• • Draw Bar	1
24	• • *(N.S.P.)*	• • Lock Weldment	1
25	• • ~~057-0715-00~~	• • Head Lock Pivot Pin	1
26	• • K906111	• • Adhesive	AR
27	• • 046-0002-00	• • Allen Wrench (Not Shown)	1

(N.S.P.) Denotes "Non Servicable Part"

Always Specify Model & Serial Number

Arm Rest



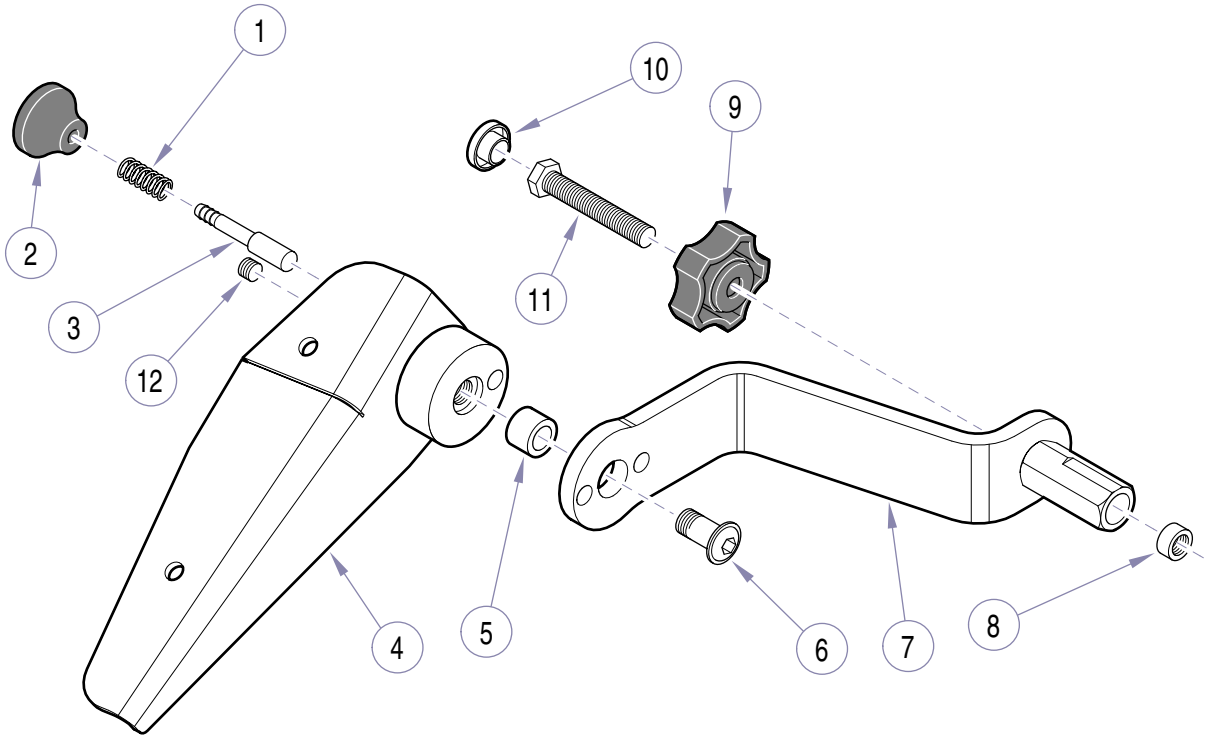
MA516500

Used on units with Serial Number LM1000 thru LM1465, LN1000 thru LN1525, LP1000 thru LP1024 and LR1000 thru LR1012

Item	Part No.	Description	Qty.
	029-2278-00	Right Hand Arm Assembly (Includes Items 1 thru 15)	1
	029-2278-01	Left Hand Arm Assembly (Includes Items 1 thru 15)	1
1	• 025-0071-00	• Spring	1
2	• 016-0131-17	• Flanged Bushing	1
3	• 053-0986-00	• Knob	1
4	• 057-0504-00	• Index Plunger	1
5	• 040-0250-153	• Screw	3
6	• 050-4200-00	• Upholstery Mount (Right Hand)	1
	• 050-4200-01	• Upholstery Mount (Left Hand)	1
7	• 057-0503-00	• Arm Boss	1
8	• 016-0149-17	• Sleeve Bearing	1
9	• 040-0375-74	• Screw (Apply 042-0025-00 Loctite)	1
10	• 030-1183-00	• Arm Weldment	1
11	• 057-0524-00	• Bolt Retainer (Apply 042-0025-00 Loctite)	1
12	• 016-0818-00	• Knob (Includes item 13)	1
13	• •	• • Cap	1
14	• 040-0312-19	• Bolt	1
15	• 040-0375-51	• Set Screw	1

Always Specify Model & Serial Number

Arm Rest



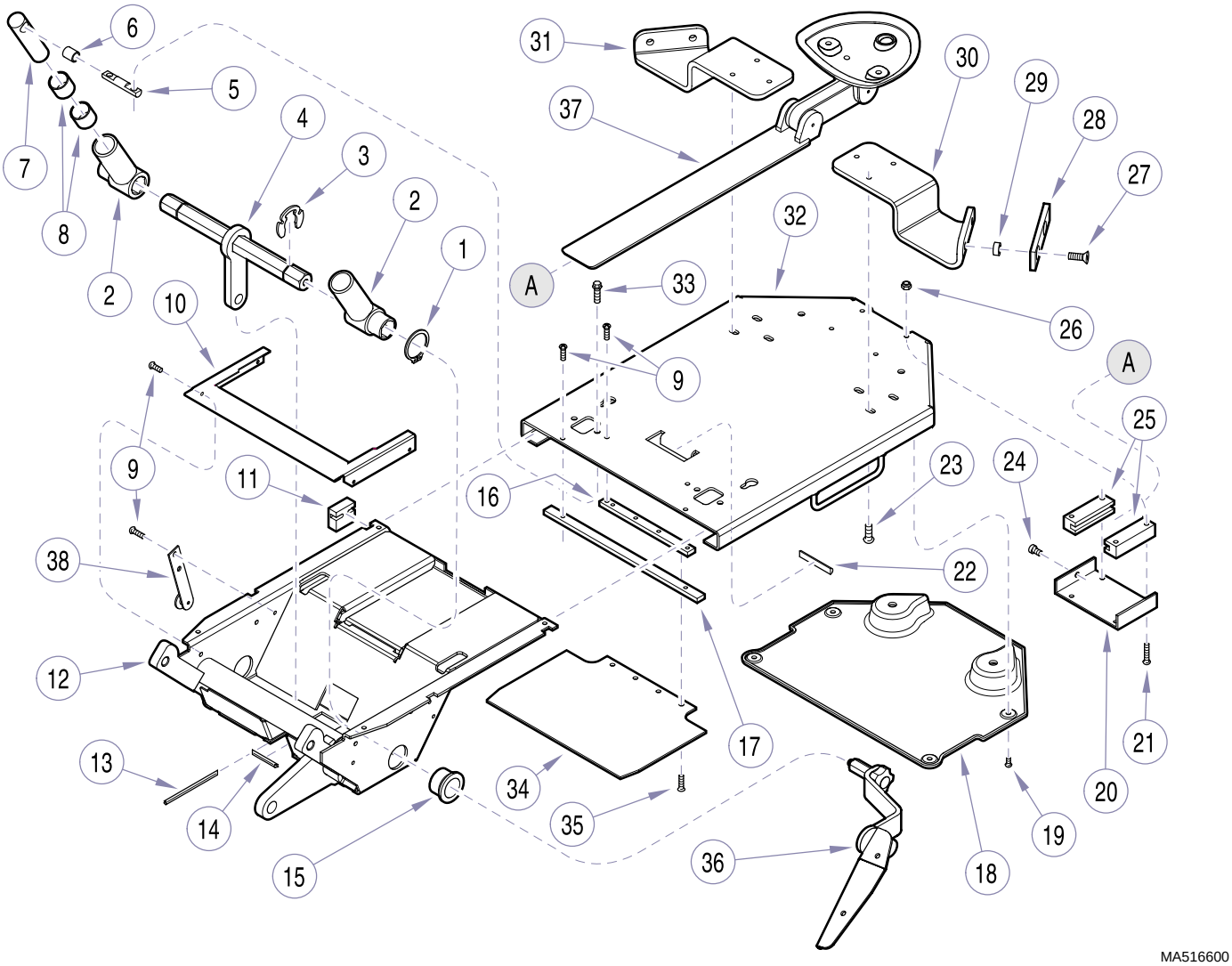
MA516501

Used on units with Serial Number LM11466, LN1526, LP1025 and LR1013 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	029-3136-00	Right Hand Arm Assembly (Includes Items 1 thru 12)	1
	029-3136-01	Left Hand Arm Assembly (Includes Items 1 thru 12)	1
1	• 025-0071-00	• Spring	1
2	• 053-0986-00	• Knob	1
3	• 057-0504-00	• Index Plunger	1
4	• 030-1483-00	• R.H. Upholstery Mount (Shown)	1
	• 030-1483-01	• L.H. Upholstery Mount (Opposite)	1
5	• 016-0149-17	• Sleeve Bearing	1
6	• 040-0375-74	• Screw (Apply 042-0025-00 Loctite)	1
7	• 030-1183-00	• Arm Weldment	1
8	• 057-0524-00	• Bolt Retainer (Apply 042-0025-00 Loctite)	1
9	• 016-0818-00	• Knob (Includes item 10)	1
10	• •	• • Cap	1
11	• 040-0312-19	• Bolt	1
12	• 040-0375-69	• Set Screw	1

Always Specify Model & Serial Number

Backrest Assembly



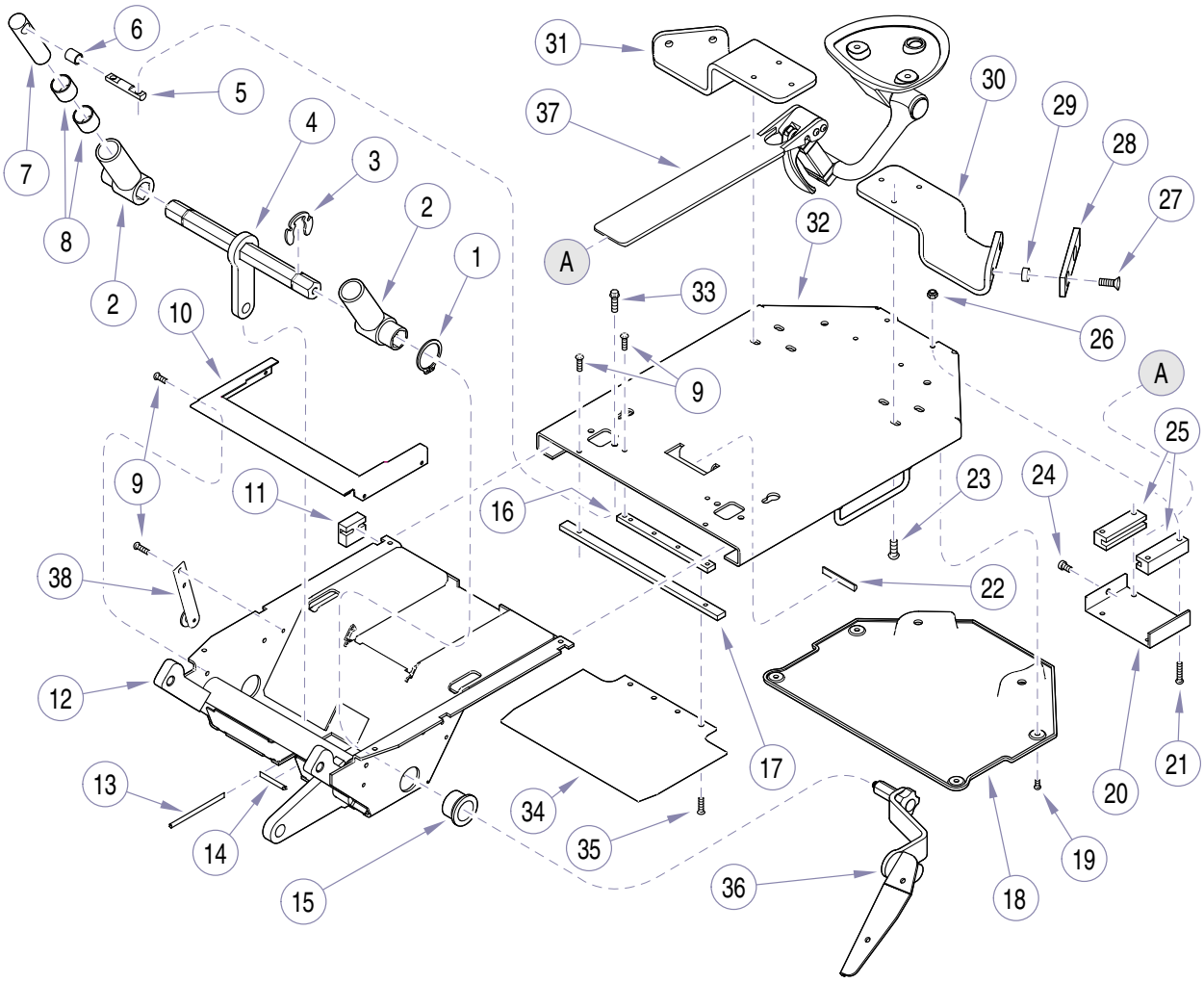
MA516600

Used on units with Serial Number LM1000 thru LM1034, LN1000 thru LN1050, LP1000 thru LP1001 and LR1000 thru LR1001

Item	Part No.	Description	Qty.
	029-2252-00	Backrest Assembly (Includes Items 1 thru 35)	1
1	• 042-0056-11	• Retaining Ring	2
2	• 030-1191-00	• Cylinder Weldment	2
3	• 042-0065-06	• Klipring	2
4	• 030-1192-00	• Drag Link Weldment	1
5	• 057-0499-00	• Link Pin	2
6	• 016-0076-29	• Bushing	2
7	• 057-0500-00	• Link Piston	2
8	• 016-0076-05	• Bushing	4
9	• 040-0010-47	• Screw	10
10	• 050-4441-00	• Bottom Filler	1
11	• 053-0977-00	• Back Slide Bearing	4
12	• 030-1178-00	• Back Weldment	1
13	• 053-0665-19	• Frame Edge Protection	2
14	• 053-0665-18	• Frame Edge Protection	1
15	• 016-0781-00	• Flange Bearing	2
16	• 050-4444-00	• Slide Plate Mounting Bracket	1
17	• 051-0890-00	• Slide Retainer	1
18	• 053-1032-00	• Sliding Back Cover	1
19	• 040-0008-97	• Screw	4
20	• 030-1221-00	• Adjustment Bracket Weldment	1
21	• 040-0010-13	• Screw	4
22	• 053-0717-00	• Outer Shroud Seal	AR
23	• 040-0250-153	• Screw	6
24	• 040-0250-85	• Screw	1
25	• 053-0981-00	• Head Lock Slide	2
26	• 041-0010-02	• Lock Nut	4
27	• 040-0375-45	• Screw	4
28	• 051-0874-00	• Accessory Rail	2
29	• 052-0115-02	• Spacer	4
30	• 050-4416-00	• Left-Hand Accessory Rail Bracket	1
31	• 050-4416-01	• Right-Hand Accessory Rail Bracket	1
32	• 030-1213-00	• Sliding Back Weldment	1
33	• 040-0250-88	• Screw	4
34	• 053-1040-00	• Sliding Cover	1
35	• 040-0010-55	• Screw	4
36		Arm Rest (See “Arm Rest” Elsewhere)	2
37		Articulated Headrest (See “Articulated Headrest Assembly” Elsewhere)	1
38	029-2272-00	Hand Control Mount Bracket Assy. ([Used only with Optional Hand Control])	1

Always Specify Model & Serial Number

Backrest Assembly



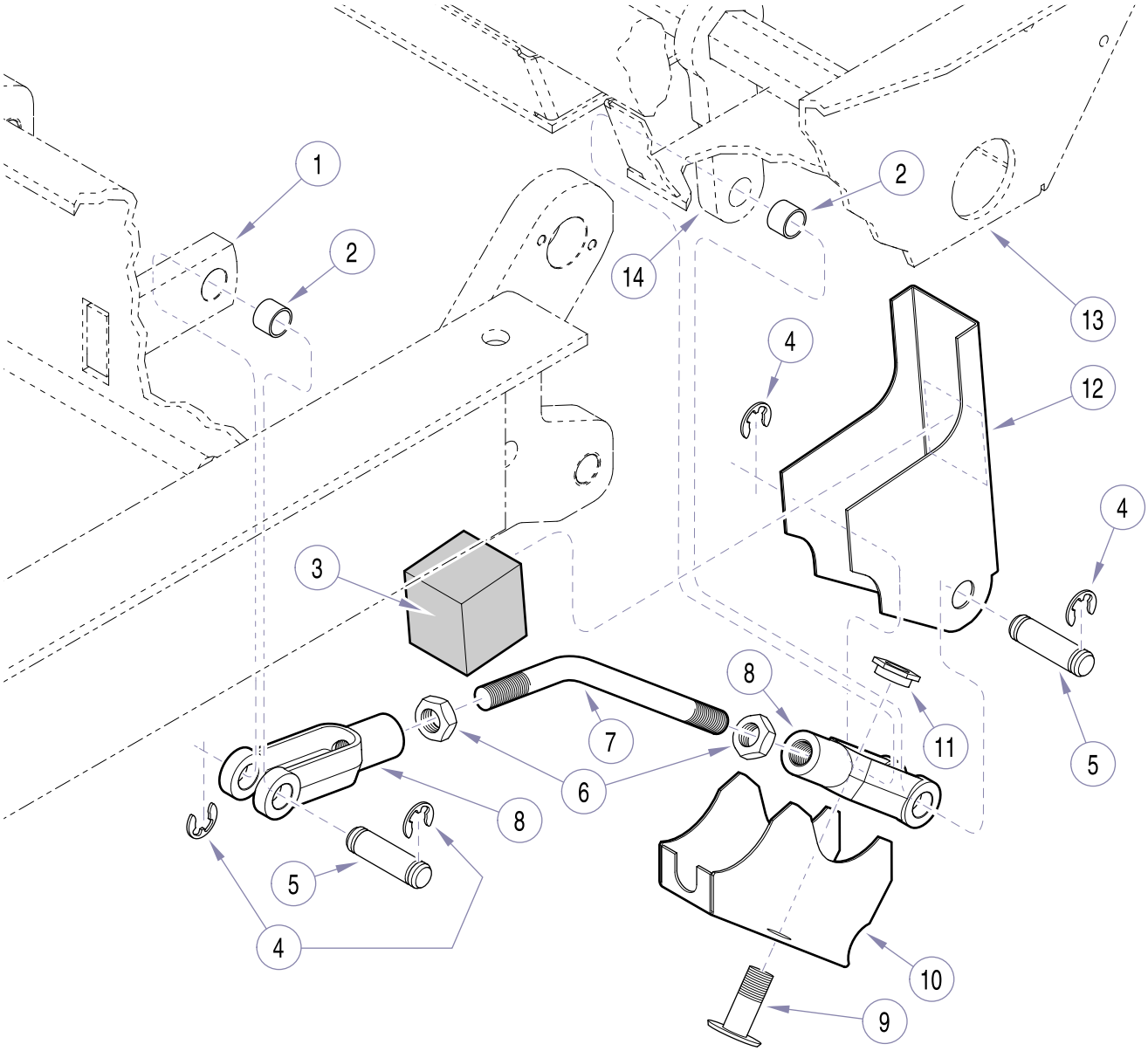
MA516601i

Used on units with Serial Number LM1035, LN1051, LP1002 and LR1002 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	029-2252-00	Backrest Assembly (Includes Items 1 thru 35)	1
1	• 042-0056-11	• Retaining Ring	2
2	• 030-1191-00	• Cylinder Weldment	2
3	• 042-0065-06	• Klipring	2
4	• 030-1192-00	• Drag Link Weldment	1
5	• 057-0499-00	• Link Pin	2
6	• 016-0076-29	• Bushing	2
7	• 057-0500-00	• Link Piston	2
8	• 016-0076-05	• Bushing	4
9	• 040-0010-47	• Screw	12
10	• 050-4441-00	• Bottom Filler	1
11	• 053-0977-00	• Back Slide Bearing	4
12	• 030-1178-00	• Back Weldment	1
13	• 053-0665-19	• Frame Edge Protection	2
14	• 053-0665-18	• Frame Edge Protection	1
15	• 016-0781-00	• Flange Bearing	2
16	• 050-4444-00	• Slide Plate Mounting Bracket	1
17	• 051-0890-00	• Slide Retainer	1
18	• 053-1032-00	• Sliding Back Cover	1
19	• 040-0008-97	• Screw	4
20	• 030-1221-00	• Adjustment Bracket Weldment	1
21	• 040-0010-13	• Screw	4
22	• 053-0717-00	• Outer Shroud Seal	AR
23	• 040-0250-153	• Screw	6
24	• 040-0250-85	• Screw	1
25	• 053-0981-00	• Head Lock Slide	2
26	• 041-0010-02	• Lock Nut	4
27	• 040-0375-45	• Screw	4
28	• 051-0874-00	• Accessory Rail	2
29	• 052-0115-02	• Spacer	4
30	• 050-4416-00	• Left-Hand Accessory Rail Bracket	1
31	• 050-4416-01	• Right-Hand Accessory Rail Bracket	1
32	• 030-1254-00	• Sliding Back Weldment	1
33	• 040-0250-88	• Screw	4
34	• 053-1040-00	• Sliding Cover	1
35	• 040-0010-55	• Screw	4
36		Arm Rest (See “Arm Rest” Elsewhere)	2
37		Triple Articulated HR (See “Triple Articulated HR Assy” Elsewhere)	1
38	029-2272-00	Hand Control Mount Bracket Assy. ([Used only with Optional Hand Control])	1

Always Specify Model & Serial Number

Arm Linkage Components



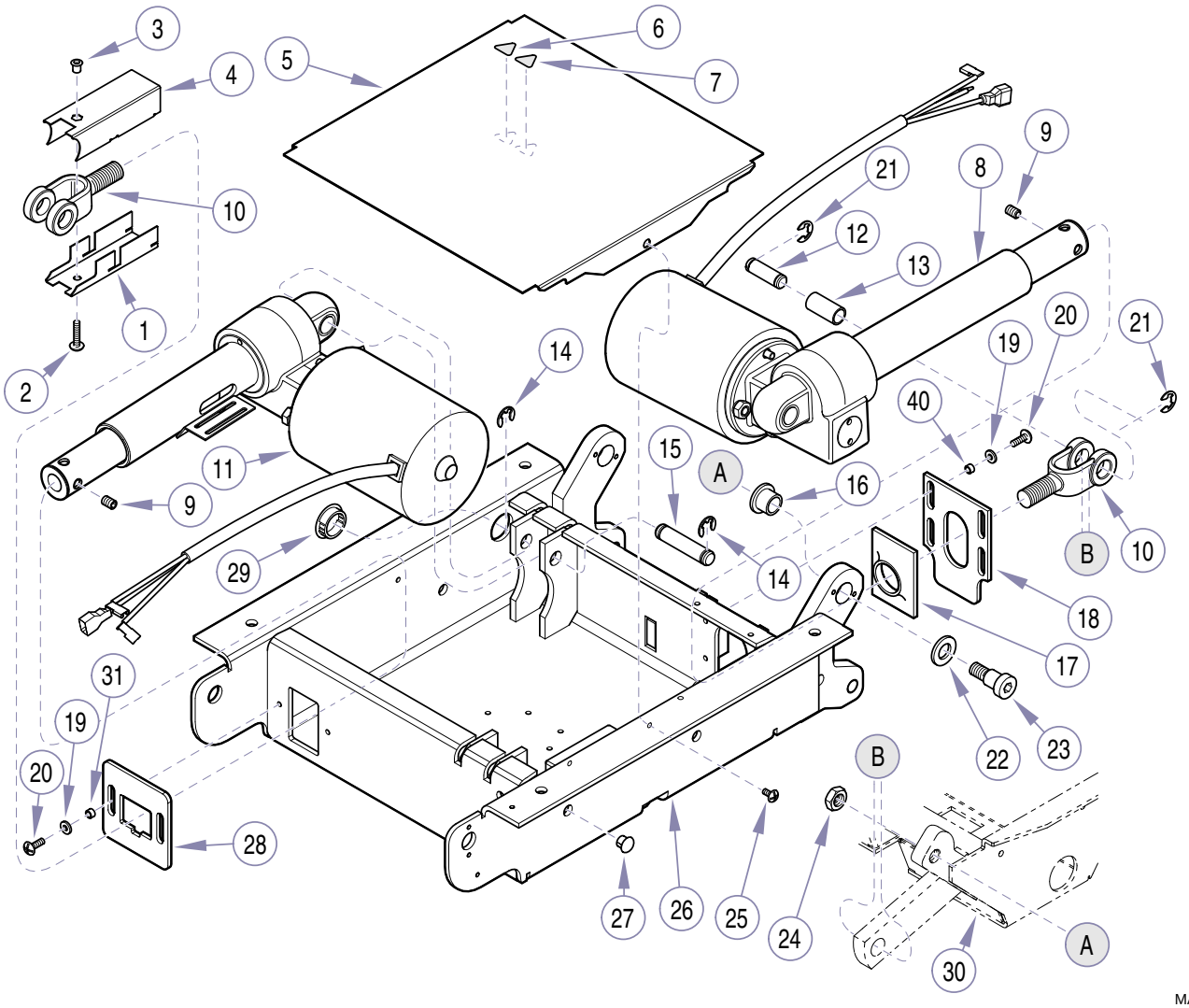
MA519600

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1		Seat Weldment (Refer to "Seat Components" Elsewhere)	1
2	016-0076-04	Bushing	2
3	054-0126-00	Bumper	1
4	042-0007-00	E-Ring	4
5	042-0006-07	Clevis Pin	2
6	041-0375-08	Nut	2
7	057-0515-00	Bent Rod	1
8	016-0809-00	Clevis	2
9	042-0059-06	JC Bolt	1
10	050-4359-00	Link Cover	1
11	041-0250-13	Flange Nut	1
12	050-4358-00	Arm Cover	1
13		Back Weldment (Refer to "Backrest Assembly" Elsewhere)	1
14		Drag Link Weldment (Refer to "Backrest Assembly" Elsewhere)	1

Always Specify Model & Serial Number

Seat Components



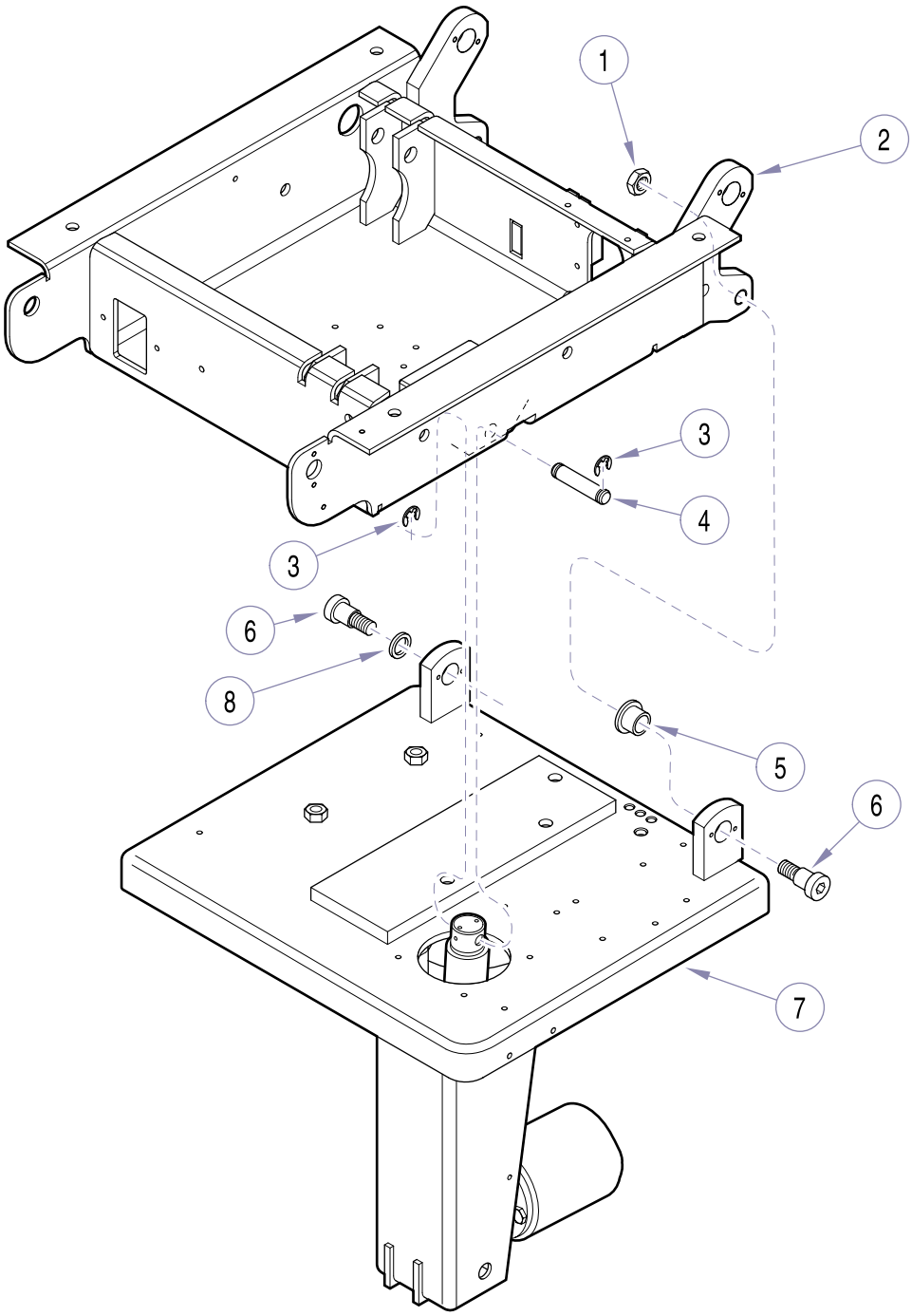
MA519203

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	050-4476-00	Bottom Clevis Cover	1
2	040-0010-44	Screw	1
3	042-0045-16	Nutsert	1
4	050-4474-00	Top Clevis Cover	1
5	050-4293-00	Seat Electrical Cover	1
6	061-0654-00	Caution Label	1
7	061-0650-00	Dangerous Voltage Label	1
8		Back Actuator Assembly (Refer to “Top Electrical Components” Elsewhere) (Includes Items 9 and 10)	1
9	• 040-0312-60	• Set Screw (2 per Actuator)	4
10	• 016-0689-00	• Clevis (1 per Actuator)	2
11		Foot Actuator Assembly (Refer to “Top Electrical Components” Elsewhere) (Includes Items 9 and 10)	1
12	042-0048-01	Clevis Pin	1
13	016-0149-09	Sleeve Bearing	1
14	042-0007-02	E-Ring	4
15	042-0048-00	Clevis Pin	2
16	016-0131-04	Flange Bearing	2
17	053-1042-00	Back Actuator Inner Cover	1
18	053-1043-00	Back Actuator Outer Cover	1
19	045-0001-00	Washer	6
20	040-0010-129	Screw	6
21	042-0007-02	E-Clip	2
22	053-0858-00	Nylon Washer	1
23	042-0014-05	Shoulder Screw(Apply 042-0025-00 Loctite)	2
24	041-0500-00	Nut	2
25	040-0010-47	Screw	2
26	030-1179-00	Seat Weldment	1
27	053-0050-05	Small Hole Plug	4
28	053-1041-00	Foot Actuator Sliding Cover	1
29	053-0050-02	Large Hole Plug (Programmable Units)	1
		(Non-Programmable Units)	3
30		Back Weldment (Refer to “Backrest Assembly” Elsewhere)	1
31	016-0138-20	Spacer	6

Always Specify Model & Serial Number

Top to Base Connections



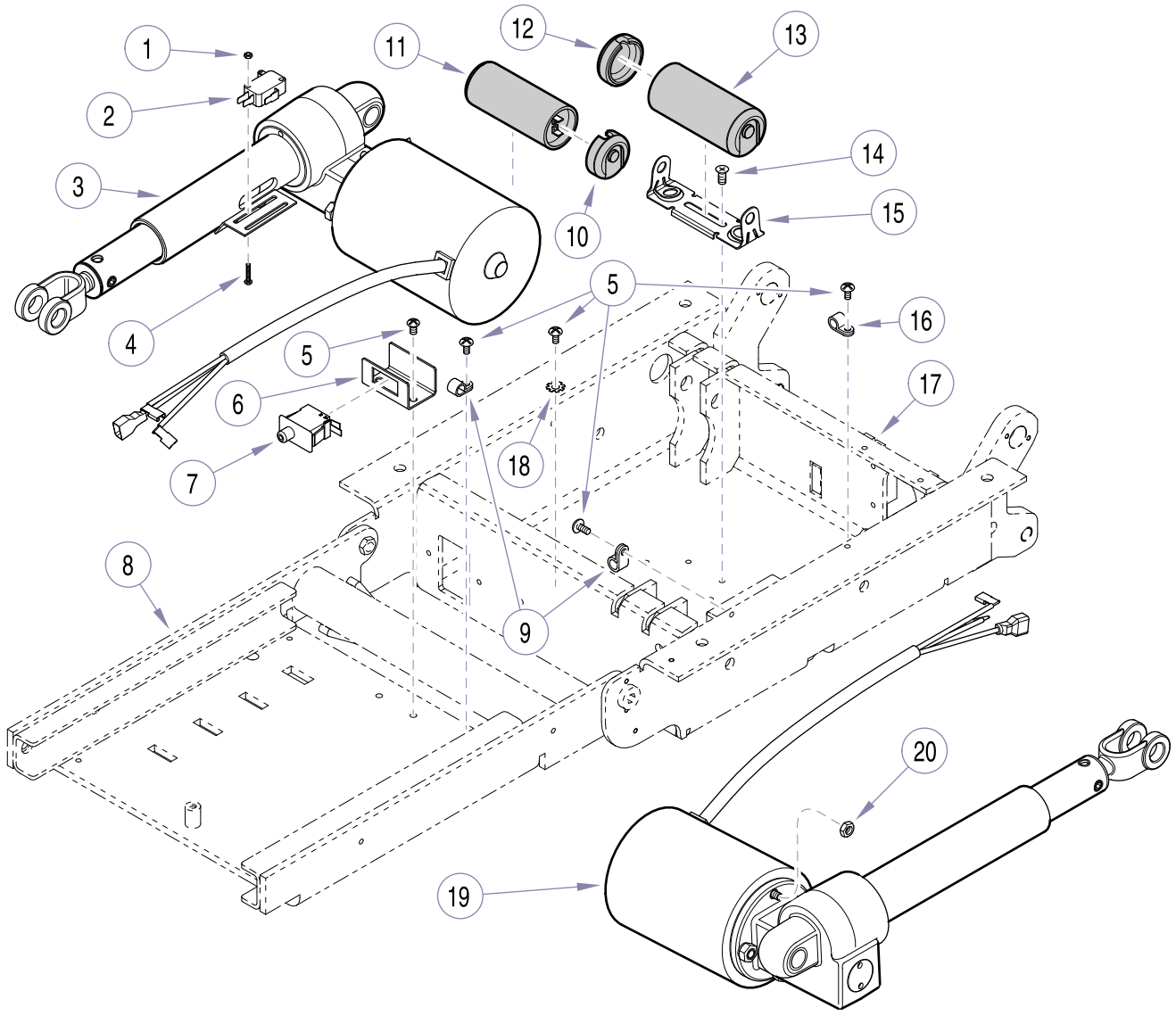
MA520700

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	041-0500-00	Nut	2	5	016-0131-04	Flange Bearing	2
2		Seat Weldment (Refer to “Seat Components” Elsewhere)	1	6	042-0014-05	Shoulder Screw	2
3	042-0007-02	E-Ring	2	7		Column Adapter Weldment (Refer to “Column Components” Elsewhere)	1
4	042-0048-02	Clevis Pin	1	8	053-0858-00	Nylon Washer	1

Always Specify Model & Serial Number

Top Electrical Components (115-Volt)



MA519500

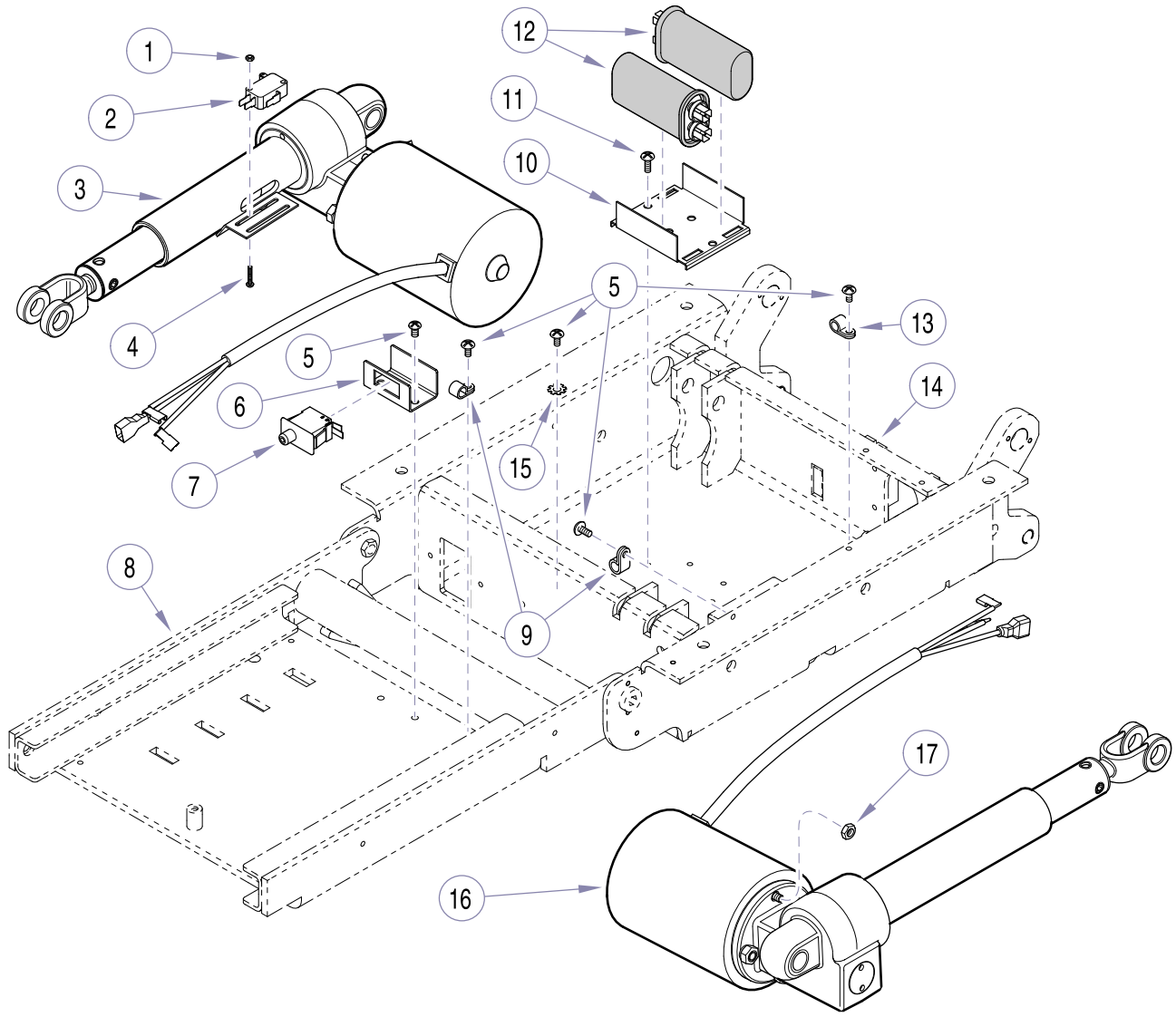
Used on units with Serial Number LM1000 and LN1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	041-0004-01	Nut	2
2	015-0476-00	Micro Switch	1
3	002-0564-08	Foot Actuator Assembly (115 V)	1
	• 015-1085-00	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
4	040-0004-09	Screw	2
5	040-0010-47	Screw	6
6	050-4232-00	Limit Switch Bracket	1
7	015-1055-00	Limit Switch	1
8		Foot Section Weldment (Refer to “Foot Assembly” Elsewhere)	1
9	015-0014-02	Cable Clamp(3/16”)	2
10	015-0413-00	Capacitor Cap	1
11	015-0437-04	Capacitor	1
12	015-0413-01	Capacitor Cap	1

Item	Part No.	Description	Qty.
13	015-0437-03	Capacitor	1
14	040-0010-62	Screw	4
15	015-0412-00	Capacitor Bracket	2
16	015-0371-00	Wire Clip	1
17		Seat Weldment (Refer to “Seat Components” Elsewhere)	1
18	045-0001-31	Lockwasher	1
19	002-0564-06	Back Actuator Assembly (115 V)	1
	• 015-1085-00	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
20	041-0010-10	Locknut	2
21	015-0013-02	Cable Tie (Not Shown) (Non-Programmable Units)	5
		(Programmable Units)	9
22	015-0013-04	Cable Tie (Not Shown)	4

Always Specify Model & Serial Number

Top Electrical Components (230-Volt)



MA519800

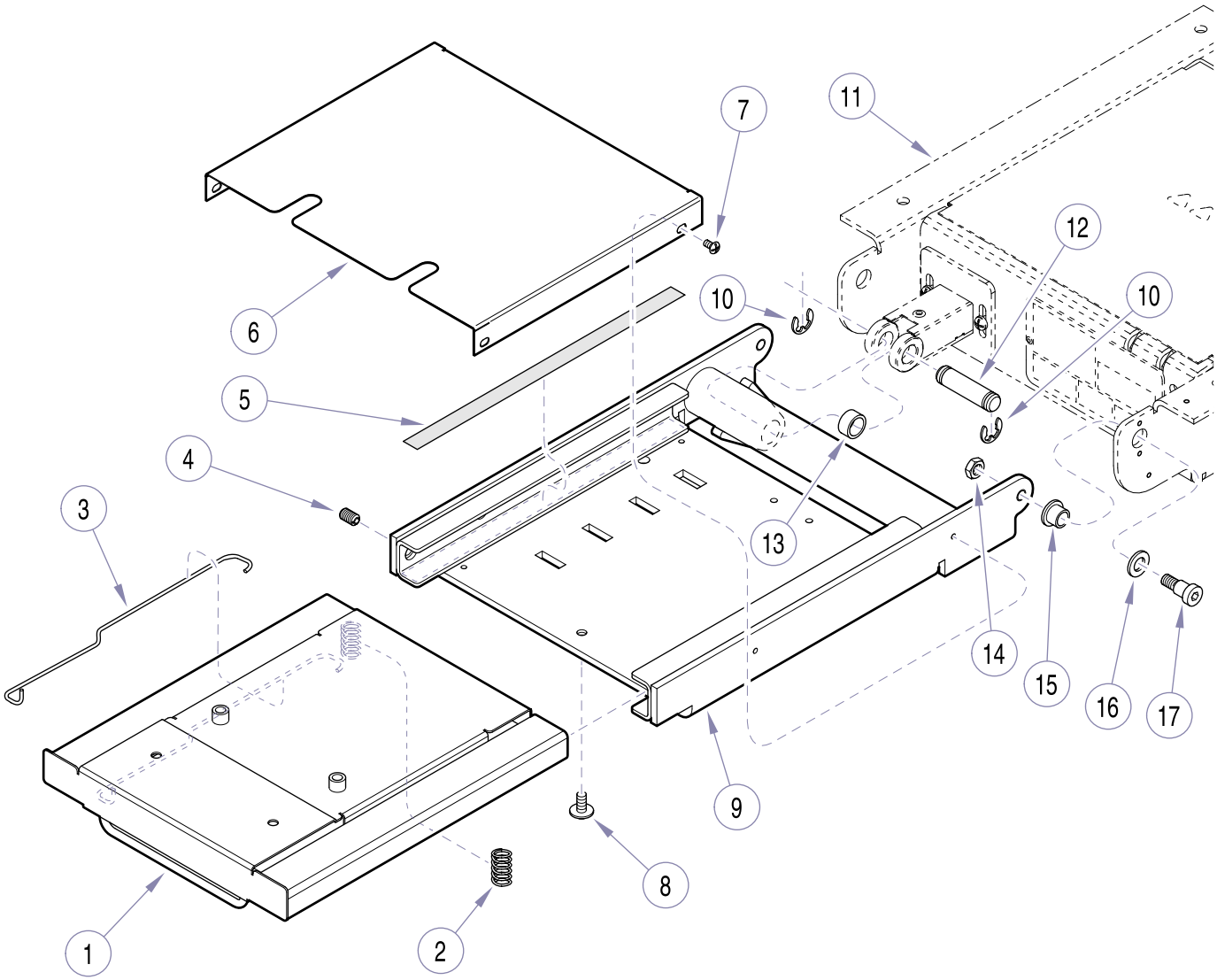
Used on units with Serial Number LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	041-0004-01	Nut	2
2	015-0476-00	Micro Switch	1
3	002-0564-09	Foot Actuator Assembly (230 V)	1
	• 015-1085-02	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
4	040-0004-09	Screw	2
5	040-0010-47	Screw	6
6	050-4232-00	Limit Switch Bracket	1
7	015-1055-00	Limit Switch	1
8		Foot Section Weldment (Refer to “Foot Assembly” Elsewhere)	1
9	015-0014-02	Cable Clamp(3/16”)	2
10	050-4337-00	Capacitor Bracket	1
11	040-0010-129	Screw	2
12	015-0723-00	Capacitor	2
13	015-0371-00	Wire Clip	1
14		Seat Weldment (Refer to “Seat Components” Elsewhere)	1
15	045-0001-31	Lockwasher	1
16	002-0564-07	Back Actuator Assembly (230 V)	1
	• 015-1085-02	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
17	041-0010-10	Locknut	2
18	015-0013-02	Cable Tie (Not Shown) (Non-Programmable Units)	5
		(Programmable Units)	9
19	015-0013-04	Cable Tie (Not Shown)	4
20	015-0016-00	Cable Tie (Not Shown)	2

Always Specify Model & Serial Number

Foot Assembly

Return To Table Of Contents



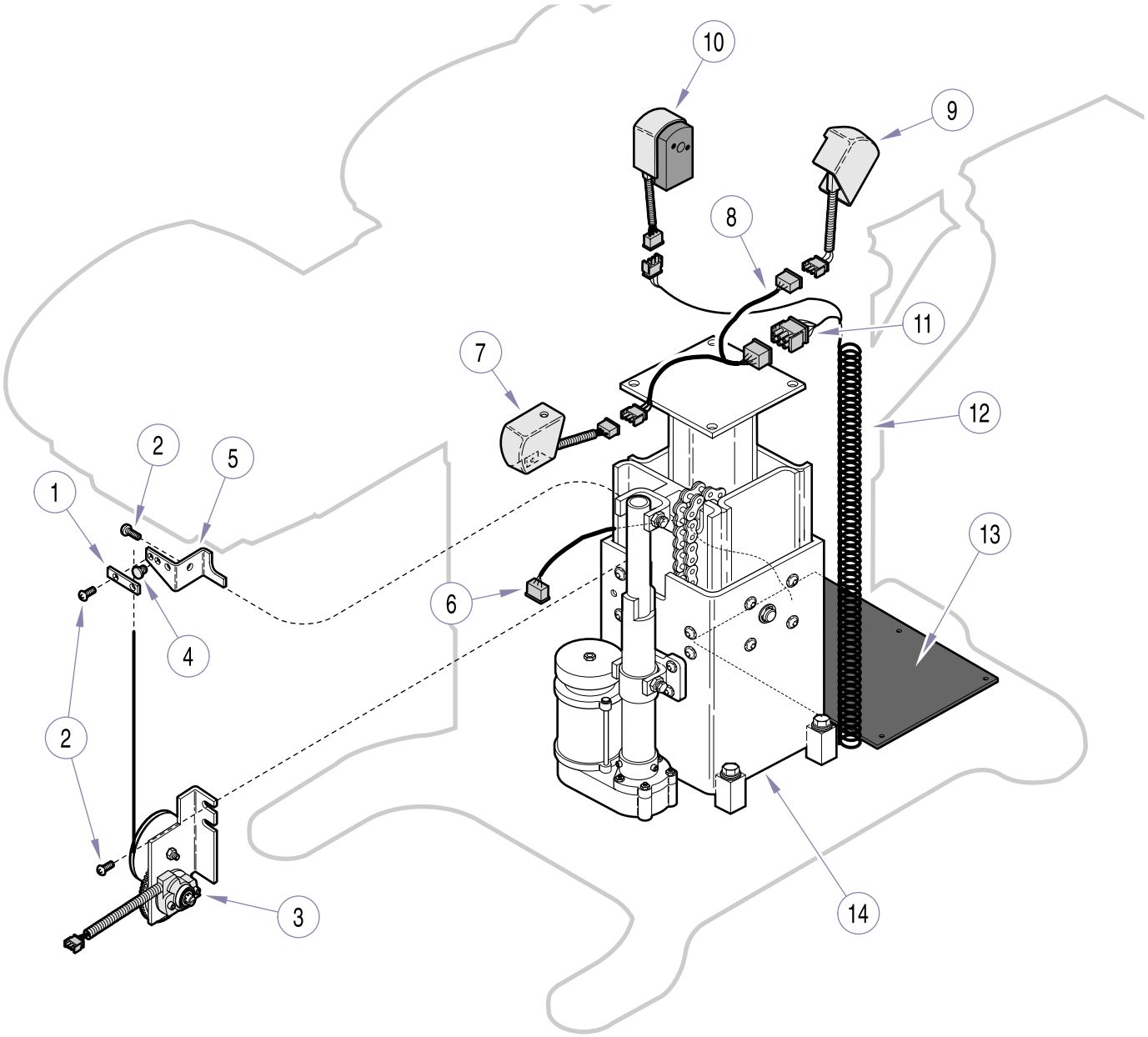
MA519100

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	030-1189-00	Foot Slide Weldment (Includes Items 2 and 3)	1
2	• 025-0049-01	• Spring	1
3	• 016-0803-00	• Detent Linkage	1
4	016-0768-00	Ball Plunger (Apply 042-0076-00 Loctite)	2
5	053-0018-00	Nylo-Tape (Apply 042-0188-00 Dbl-Back Tape)	AR
6	050-4309-00	Foot Weldment Cover	1
7	040-0010-47	Screw	4
8	040-0375-74	Screw	1
9	030-1175-00	Foot Section Weldment	1
10	042-0007-02	E-Ring	2
11		Seat Section (Refer to “Seat Components” Elsewhere)	1
12	042-0048-01	Clevis Pin	1
13	016-0149-09	Bearing	1
14	041-0375-05	Nut	2
15	016-0131-13	Flange Bearing	2
16	053-0858-01	Washer	1
17	042-0014-00	Shoulder Screw (Apply 042-0025-00 Loctite)	2

Always Specify Model & Serial Number

Program Position Components



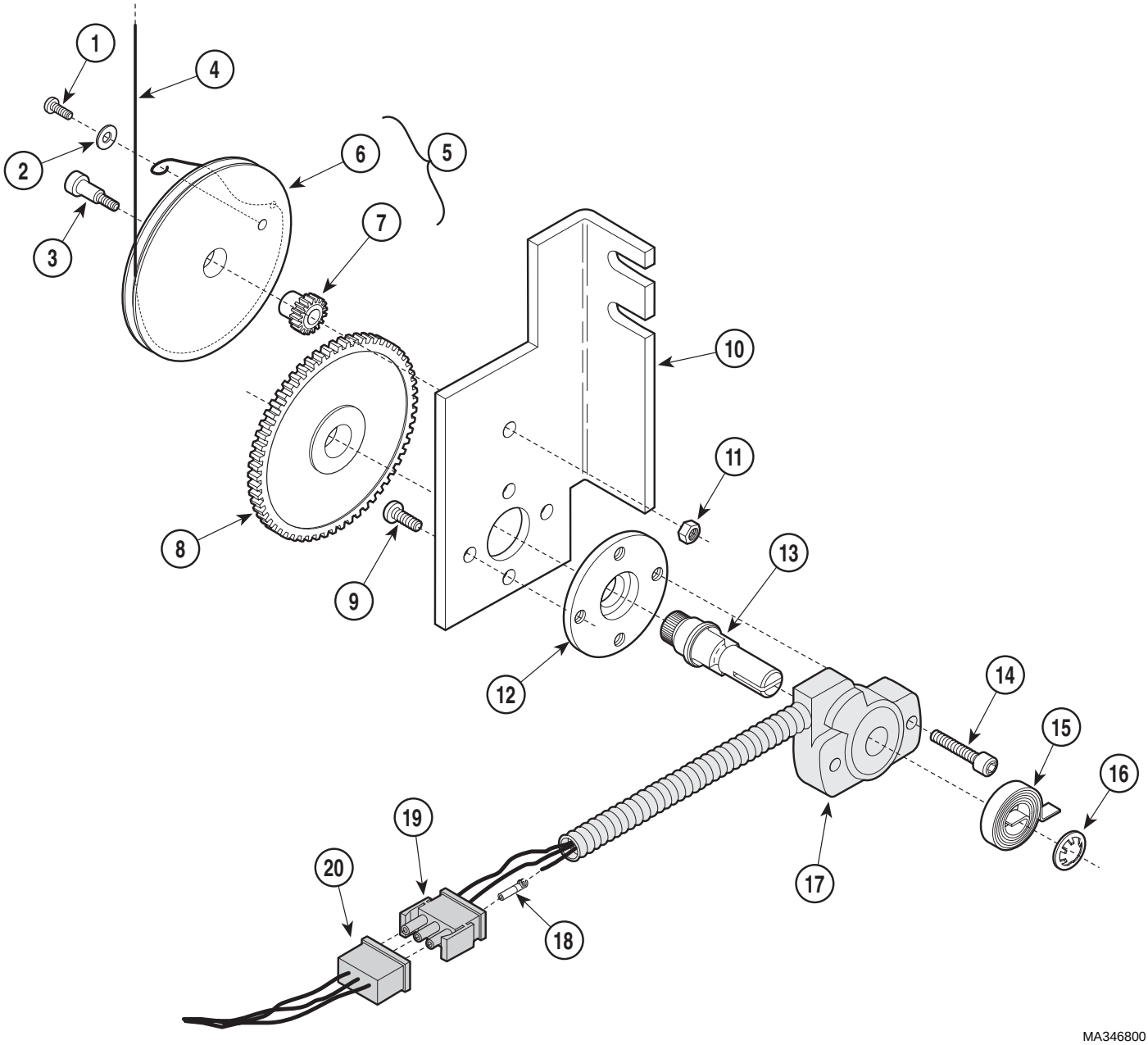
MA520100

Used on units with Serial Number LN1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	050-3748-00	Cable Clamp	1
2	040-0010-47	Screw	5
3		Reducer Assembly (Refer to “Base Reducer Assembly” Elsewhere)	Ref
4	053-0871-00	Grommet Bumper	1
5	050-3724-00	Cable Bracket	1
6		Column Sensor Harness (Refer to “Wiring Diagram” Elsewhere)	Ref
7		Foot Sensor (Refer to “Foot Sensor Components” Elsewhere)	Ref
8		Seat Sensor Harness (Refer to “Wiring Diagram” Elsewhere)	Ref
9		Back Sensor (Refer to “Back Sensor Components” Elsewhere)	Ref
10		Tilt Sensor (Refer to “Tilt Sensor Components” Elsewhere)	Ref
11	015-0512-04	Connector (6 Circuit)	1
12		Sensor Retractile Harness (Refer to “Wiring Diagram” Elsewhere)	Ref
13		P.C. Board (Refer to “Base Electrical Components” Elsewhere)	Ref
14		Column Assembly (Refer to “Column Components” Elsewhere)	Ref
15	015-0013-02	Cable Tie (3.87” {Not Shown})	13
16	015-0014-02	3/16” Cable Clamp (Not Shown)	3
17	015-0014-04	1/4” Cable Clamp (Not Shown)	1

Always Specify Model & Serial Number

Base Reducer Assembly



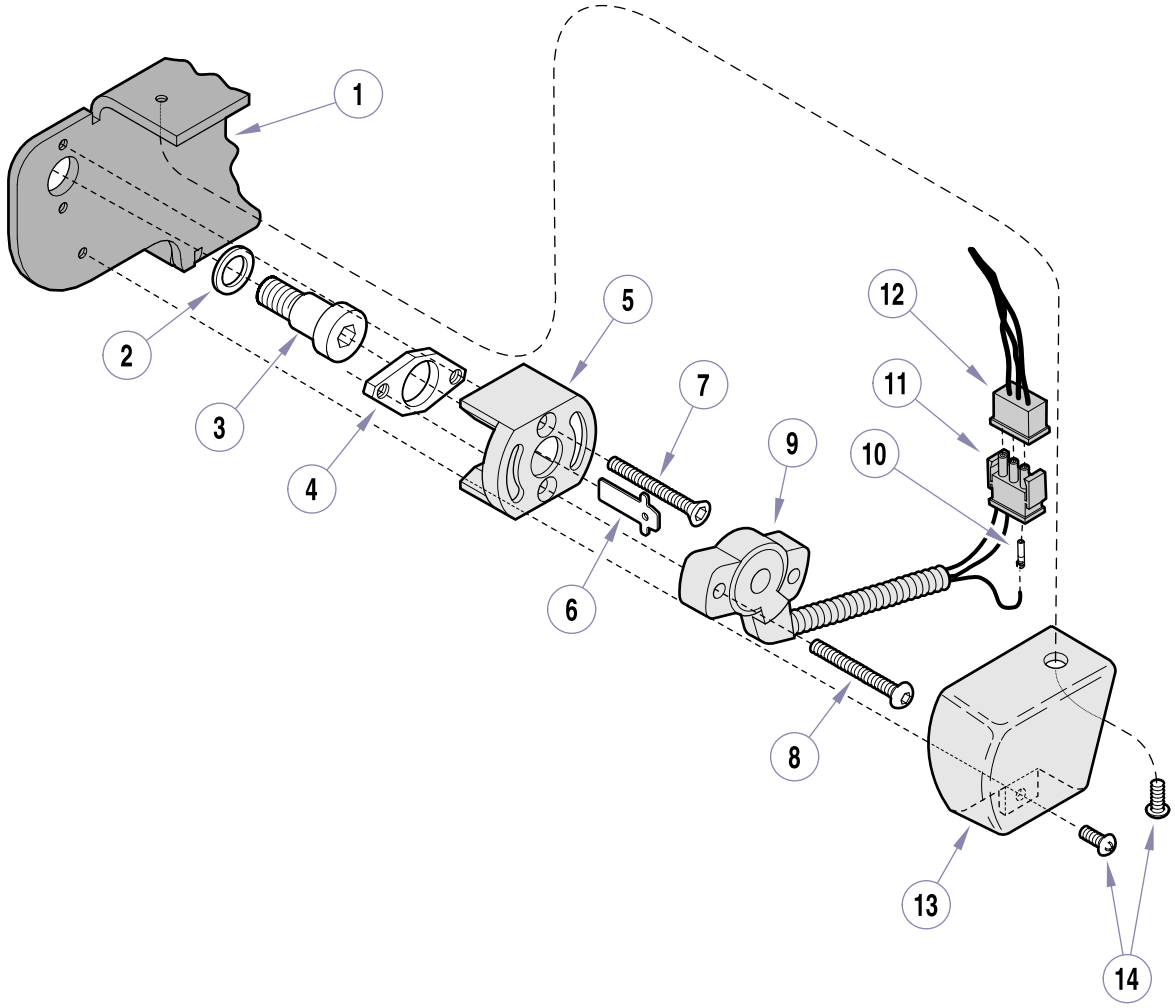
MA346800

Used on units with Serial Number LN1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	040-0006-06	Screw	1
2	045-0001-93	Nylon Washer	1
3	040-0010-29	Shoulder Screw	1
4	016-0695-00	Stainless Steel Cable (Qty = Inches)	26
5	029-2016-00	Pulley Pinion Assembly (Includes Items 6 and 7)	1
6	• 053-0866-00	• Pulley	1
7	• 016-0694-00	• Pinion	1
8	053-0865-00	Gear	2
9	040-0008-29	Screw	2
10	050-3723-10	Base Reducer Angle	1
11	041-0010-02	Nylock Hex Nut	1
12	057-0449-00	Base Reducer Hub	1
13	057-0448-00	Gear Shaft	1
14	040-0008-30	Screw (Apply Loctite #042-0024-02)	2
15	016-0693-00	Torsion Spring	1
16	042-0072-03	Circular Push On	1
17	002-0563-00	Rotary Position Sensor Assembly (Includes Items 18 and 19)	1
18	• 015-0513-00	• Pin Terminal	3
19	• 015-0512-02	• Connector (3 Circuit)	1
20		Sensor Wiring Harness (Refer to “Wiring Diagram” Elsewhere)	Ref

Always Specify Model & Serial Number

Foot Sensor Components



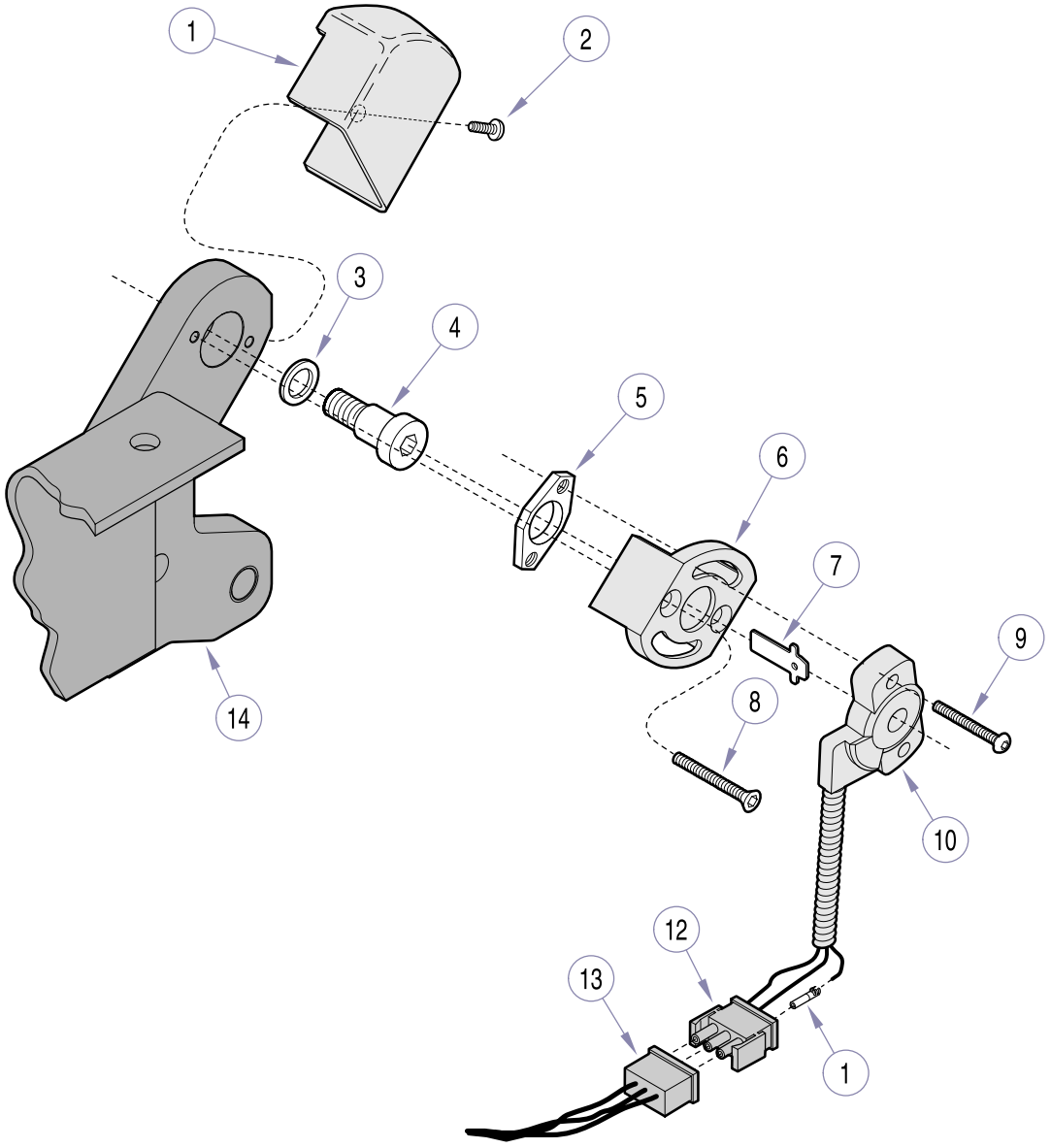
MA520200

Used on units with Serial Number LN1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1		Seat Weldment (Refer to “Seat Components” Elsewhere)	Ref
2		Nylon Washer (Refer to “Foot Assembly” Elsewhere)	1
3		Shoulder Screw (Refer to “Foot Assembly” Elsewhere)	1
4	050-3870-00	Sensor Mount Plate	1
5	053-0853-00	Position Sensor Mount	1
6	050-3695-01	1/4 in. Hex Drive	1
7	040-0008-49	Screw (Apply Loctite #042-0024-02)	2
8	040-0008-93	Screw (Apply Loctite #042-0024-02)	2
9	002-0563-00	Rotary Position Sensor Assembly (Includes Items 10 and 11)	1
10	• 015-0513-00	• Pin Terminal	3
11	• 015-0512-02	• Connector (3 Circuit)	1
12		Sensor Wiring Harness (Refer to “Wiring Diagram” Elsewhere)	Ref
13	053-0855-00	Tilt Sensor Cover	1
14	040-0010-47	Screw	2

Always Specify Model & Serial Number

Back Sensor Components



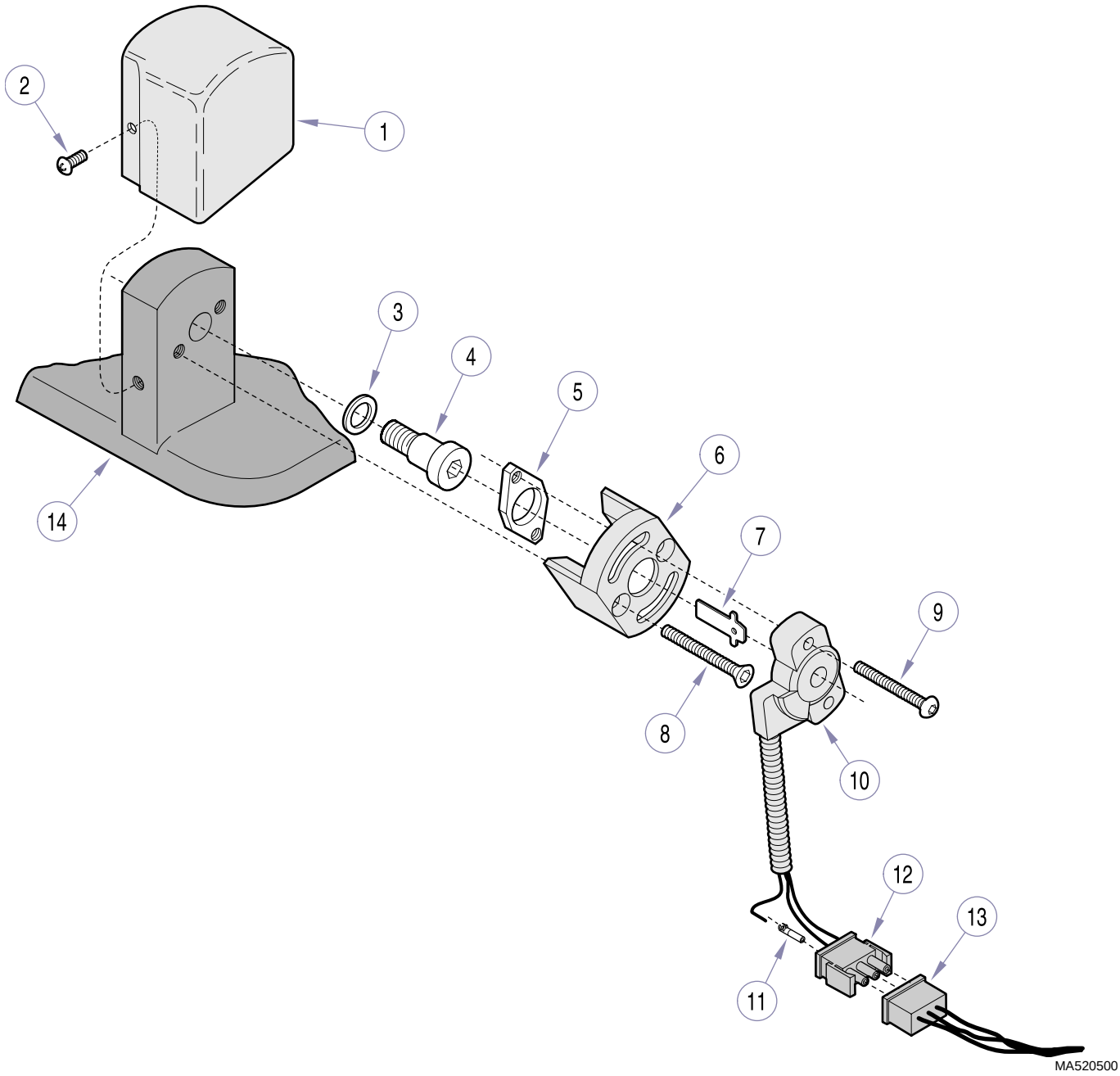
MA520300

Used on units with Serial Number LN1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	053-0855-01	Back Sensor Cover	1
2	040-0010-47	Screw	1
3		Nylon Washer (Refer to Seat Components" Elsewhere)	1
4		Shoulder Screw (Refer to Seat Components" Elsewhere)	1
5	050-3870-00	Sensor Mount Plate	1
6	053-0853-00	Position Sensor Mount	1
7	050-3695-00	5/16 Hex Drive	1
8	040-0008-49	Screw (Apply Loctite #042-0024-02)	2
9	040-0008-93	Screw (Apply Loctite #042-0024-02)	2
10	002-0563-00	Rotary Position Sensor Assembly (Includes Items 11 and 12)	1
11	• 015-0513-00	• Pin Terminal	3
12	• 015-0512-02	• Connector (3 Circuit)	1
13		Sensor Wiring Harness (Refer to "Wiring Diagram" Elsewhere)	Ref
14		Seat Weldment (Refer to "Seat Components" Elsewhere)	Ref

Always Specify Model & Serial Number

Tilt Sensor Components



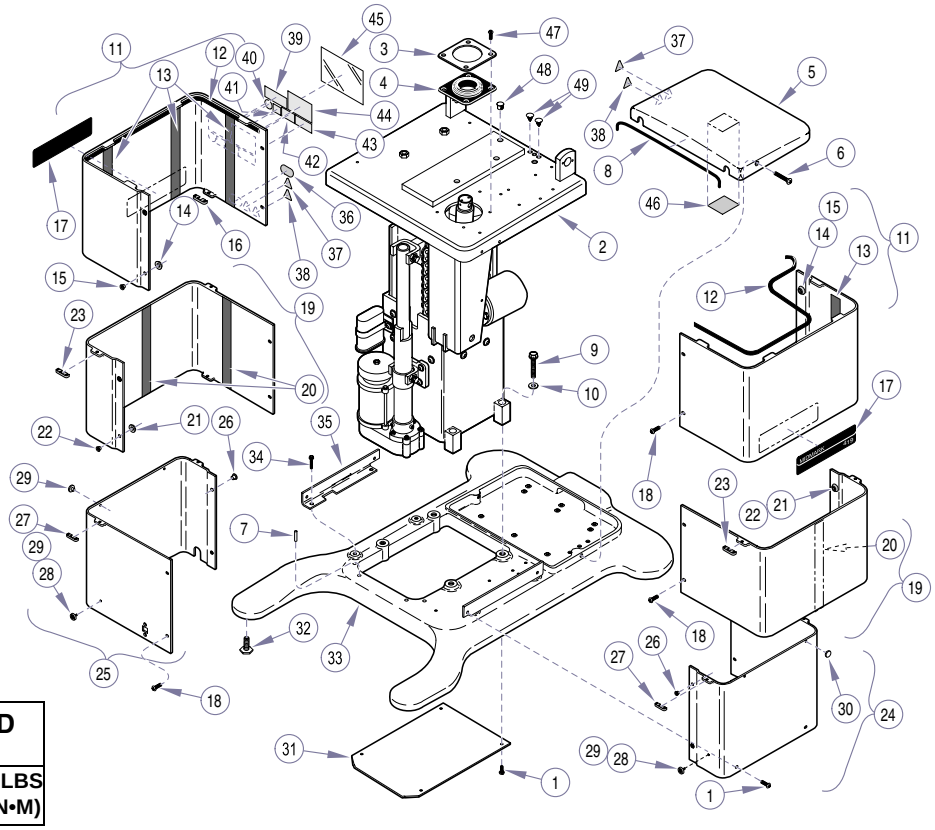
MA520500

Used on units with Serial Number LN1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	053-0854-01	Tilt Sensor Cover	1
2	040-0010-47	Screw	1
3		Nylon Washer (Refer to “Top to Base Connections” Elsewhere)	1
4		Shoulder Screw (Refer to “Top to Base Connections” Elsewhere)	1
5	050-3870-00	Sensor Mount Plate	1
6	053-0853-00	Position Sensor Mount	1
7	050-3695-00	5/16 in. Hex Drive	1
8	040-0008-49	Screw (Apply Loctite #042-0024-02)	2
9	040-0008-93	Screw (Apply Loctite #042-0024-02)	2
10	002-0563-00	Rotary Position Sensor Assembly (Includes Items 11 and 12)	1
11	• 015-0513-00	• Pin Terminal	3
12	• 015-0512-02	• Connector (3 Circuit)	1
13		Sensor Wiring Harness (Refer to “Wiring Diagram” Elsewhere)	Ref
14		Column Adapter Weldment (Refer to “Column Components” Elsewhere)	Ref

Always Specify Model & Serial Number

Base Cover Components



MA509701

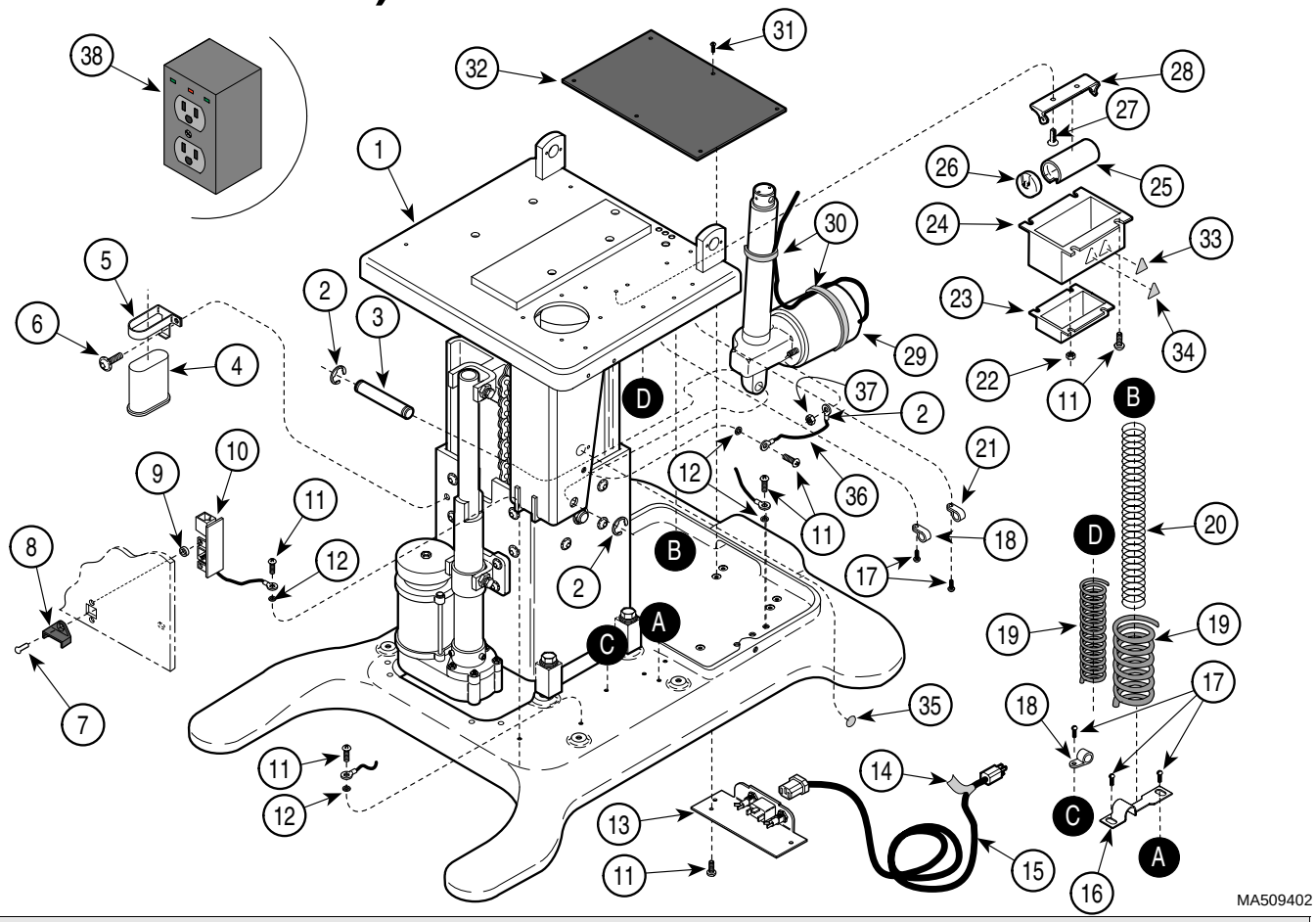
TORQUE LEGEND	
ITEM#	TORQUE
9	50 - 60 FT-LBS (67.5 - 81 N•M)

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	040-0010-47	Screw	8
2		Column (Refer to "Column Assembly" Elsewhere)	Ref
3	050-4246-00	Bellows Plate	1
4	053-0978-00	Bellows	2
5	050-3676-00	P.C. Board Cover	1
6	040-0010-129	Screw	2
7	042-0001-05	Roll Pin	2
8	053-0717-00	Outer Shroud Seal (Qty. = Feet)	2
9	040-0500-25	Screw	4
10	045-0001-95	Washer	4
11	029-2040-02	Outer Shroud Assembly (Includes Items 12 thru 16 [Qtys. for {1} Shroud])	2
12	• 053-0717-00	• Outer Shroud Seal (Qty. = Total Feet)	5
13	• 053-0105-40	• Velcro Loop	3
14	• 053-0755-00	• Nutsert Glide	2
15	• 042-0045-02	• Nutsert	2
16	• 053-0752-00	• Snap-on Glide	2
17	053-0297-19	419 Nameplate	2
18	040-0008-78	Screw	12
19	029-1848-00	Middle Shroud Assembly (Includes Items 20 thru 23 [Qtys. for {1} Shroud])	2
20	• 053-0105-40	• Velcro Loop	2
21	• 053-0755-00	• Nutsert Glide	2
22	• 042-0045-02	• Nutsert	2
23	• 053-0752-00	• Snap-on Glide	2
24	029-1847-02	R.H. Inner Shroud Assembly (Includes Items 26 thru 30 [Qtys. for {1} Shroud])	1
25	029-1847-03	L.H. Inner Shroud Assembly (Includes Items 26 thru 30 [Qtys. for {1} Shroud])	1
26	• 042-0045-02	• Nutsert	2
27	• 053-0752-00	• Snap-on Glide	2
28	• 053-0796-00	• Bumper	2
29	• 040-0006-76	• Screw (Not Shown)	2
30	• 053-0001-00	• Nylon Stem Bumper	2
31	050-3981-10	Bottom Cover	1
32	016-0001-01	Leveling Screw	4
33	020-0170-00	Machined Base	1
34	040-0250-88	Screw	4
35	050-4336-10	Shroud Mounting Bracket	2
36	061-0739-00	Duty Cycle Label	1
37	061-0654-00	Caution Label	2
38	061-0650-00	Dangerous Voltage Label	2
39	061-0735-00	ETL Label (115 V Units)	1
	061-0661-00	CE Representative Label (230 V Units)	1
40	061-0652-00	Type B Equipment Label	1
41	061-0665-00	CE Label	1
42	061-0292-00	Patent Pending Label	1
43	061-0291-00	Patent Numbers Label	1
44	061-0417-00	Midmark Serial Number Label	1
45	061-0741-00	Clear Cover Label	1
46	061-0671-00	Fuse Label-115 V (Non-Prog. Units)	1
	061-0641-00	Fuse Label-115 V (Program. Units)	1
	061-0675-00	Fuse Label-230 V (Non-Prog. Units)	1
	061-0686-00	Fuse Label-230 V (Program. Units)	1
47	040-0010-129	Screw	4
48	053-0050-05	Hole Plug	1
49	042-0187-00	Push Fastener (Non-Prog. Units)	2

Always Specify Model & Serial Number

Base Electrical Components (115 VAC Units)



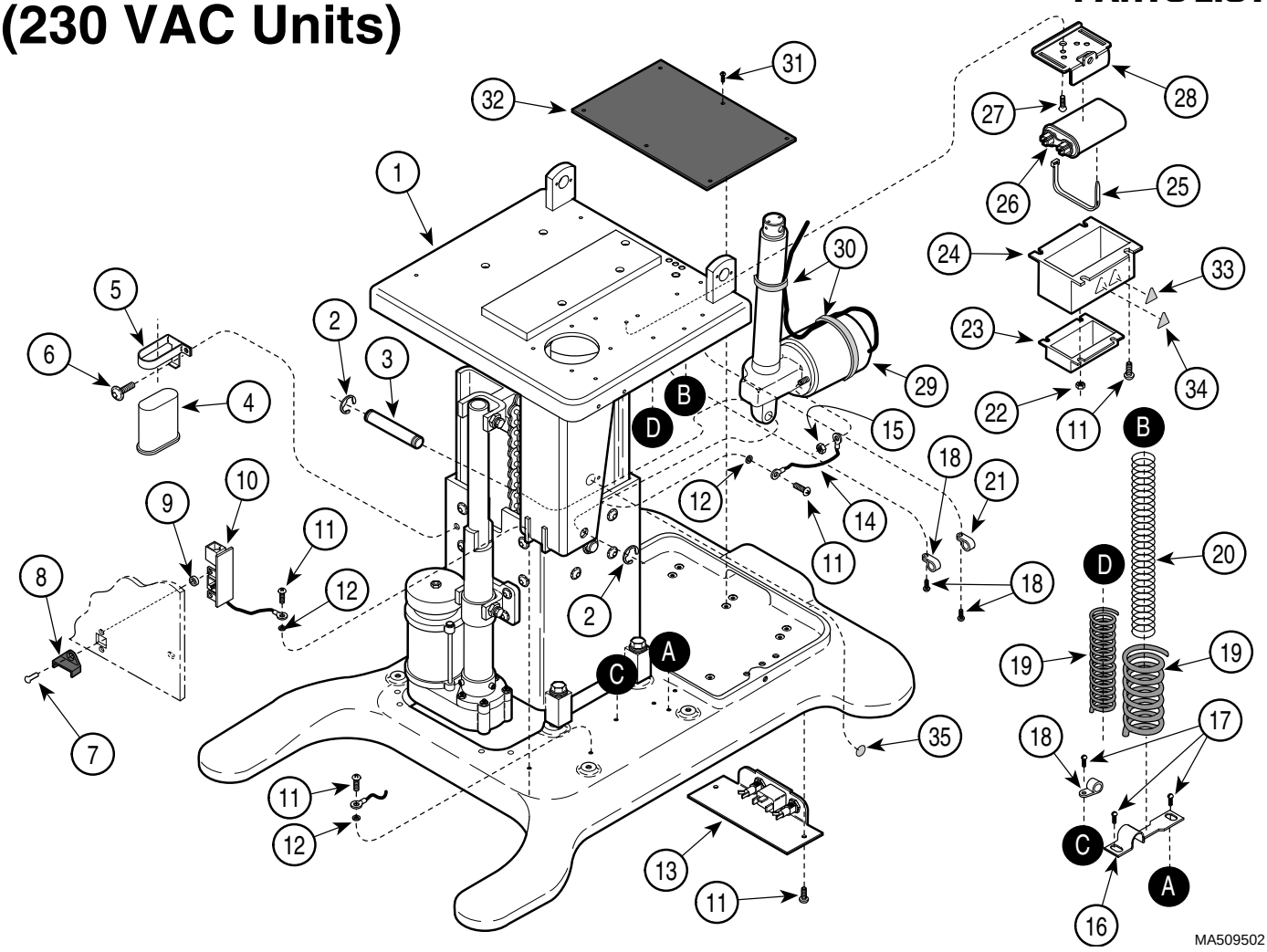
Used on units with Serial Number LM1000 and LN1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1		Column Assembly (Refer to “Column Components” Elsewhere)	1
2	042-0007-02	E-Ring	2
3	042-0048-11	Clevis Pin	1
4	015-0723-03	Motor Run Capacitor	1
5	050-3323-00	Capacitor Strap	1
6	042-0151-00	Screw	1
7	040-0008-79	Screw	4
8	016-0750-00	Inlet Board Cover	2
9	016-0138-09	Spacer	4
10	015-1173-00	Control Inlet P.C. Board	2
11	040-0010-47	Screw	26
12	045-0001-31	Lockwasher	6
13		Power Inlet Bracket (Refer to “Power Inlet Components” Elsewhere)	Ref
14	061-0743-00	Cord Tag	1
15	015-1338-00	Cord Assembly	1
16	050-3394-00	Spring Bracket (Early units only)	2
17	040-0010-47	Screw	4
18	015-0014-02	Cable Clamp (3/16”)	8
19		Harness (Refer to “Wiring Diagram”)	Ref
20	525-0055-03	Extension Spring	1
21	015-0014-04	Cable Clamp (1/4”)	1
22	041-0008-02	Nylock Nut (Program. Only)	2
23	050-3863-00	Sensor Wire Cover (Program. Only)	1
24	050-3871-00	Connection Cover (Program. Only)	1
	050-3332-00	Connection Cover (Non-Program. Only)	1
25	015-0437-02	Capacitor	1
26	015-0413-00	Capacitor Cap	1
27	040-0010-62	Screw	2
28	015-0412-00	Capacitor Bracket	1
29	002-0498-02	Tilt Actuator	1
	• 015-1085-04	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
30	015-0013-01	Cable Tie (14.5” Long)	3
31	040-0008-94	Screw	6
32	015-1225-02	P.C. Board Assembly (Programmable)	1
	015-1166-02	P.C. Board Assembly (Non-Program.)	1
	•	• Fuse (Refer to “Fuse Specifications-Table 5-1” In Section 5 for Part No’s.)	AR
33	061-0650-00	Dangerous Voltage Label	1
34	061-0654-00	Caution Label	1
35	061-0653-00	Earth (Ground) Label	1
36	015-0082-04	Grounding Braid	1
37	041-0010-01	Locknut	1
38	002-0909-00	Surge Suppressor Kit (optional)	1
39	015-0013-02	Cable Tie (3.87” {Not Shown})	17
40	015-0017-00	Cable Tie w/ Mtg. Hole (Not Shown)	3
41	015-0010-04	4” Spiral Wrap (Not Shown)	3

Always Specify Model & Serial Number

Printed in U.S.A.

Base Electrical Components (230 VAC Units)

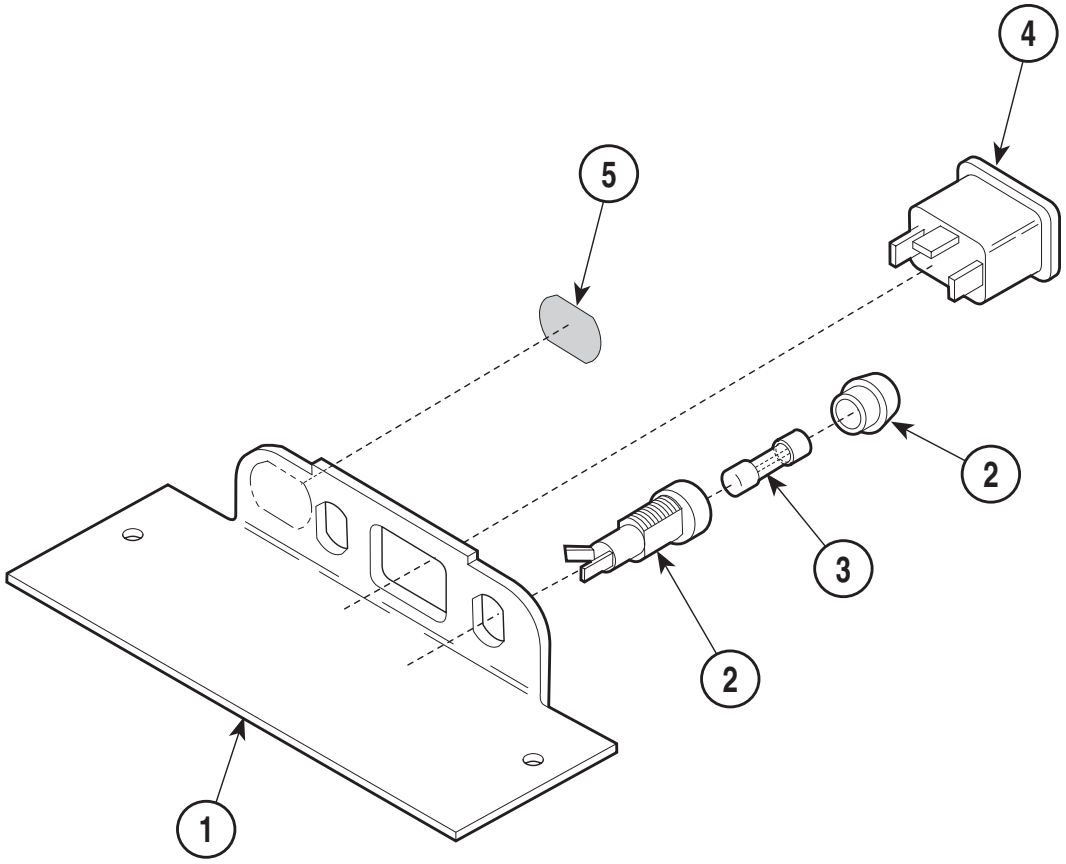


Used on units with Serial Number LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1		Column Assembly (Refer to “Column Components” Elsewhere)	1
2	042-0007-02	E-Ring	2
3	042-0048-11	Clevis Pin	1
4	015-0723-02	Motor Run Capacitor	1
5	050-3477-00	Capacitor Strap	1
6	042-0151-00	Screw	1
7	040-0008-79	Screw	4
8	016-0750-00	Inlet Board Cover	2
9	016-0138-09	Spacer	4
10	015-1173-00	Control Inlet P.C. Board	2
11	040-0010-47	Screw	27
12	045-0001-31	Lockwasher	7
13		Power Inlet Bracket (Refer to “Power Inlet Components” Elsewhere)	Ref
14	015-0082-04	Grounding Braid	1
15	041-0010-01	Locknut	1
16	050-3394-00	Spring Bracket (Early units only)	2
17	040-0010-47	Screw	4
18	015-0014-02	Cable Clamp (3/16”)	8
19		Harness (Refer to “Wiring Diagram”)	Ref
20	525-0055-03	Extension Spring	1
21	015-0014-04	Cable Clamp (1/4”)	1
22	041-0008-02	Nylock Nut (Program. Only)	2
23	050-3863-00	Sensor Wire Cover (Program. Only)	1
24	050-3871-00	Connection Cover (Program. Only)	1
	050-3332-00	Connection Cover (Non-Program. Only)	1
25	015-0016-00	Cable Tie (11.5” Long)	1
26	015-0723-00	Capacitor	1
27	040-0010-62	Screw	2
28	050-4453-00	Oval Capacitor Mounting Bracket	1
29	002-0498-03	Tilt Actuator	1
	• 015-1085-05	• Actuator Motor (only)	1
	• 016-0662-00	• Motor Coupler (only)	1
30	015-0013-01	Cable Tie (14.5” Long)	3
31	040-0008-94	Screw	6
32	015-1225-03	P.C. Board Assembly (Programmable)	1
	015-1166-03	P.C. Board Assembly (Non-Program.)	1
	•	• Fuse (Refer to “Fuse Specifications-Table 5-1” In Section 5 for Part No’s.)	AR
33	061-0650-00	Dangerous Voltage Label	1
34	061-0654-00	Caution Label	1
35	061-0653-00	Earth (Ground) Label	1
36	015-0013-02	Cable Tie (3.87” {Not Shown})	17
37	015-0017-00	Cable Tie w/ Mtg. Hole (Not Shown)	3
38	015-0010-04	4” Spiral Wrap (Not Shown)	3

Always Specify Model & Serial Number

Power Inlet Components



MA489501

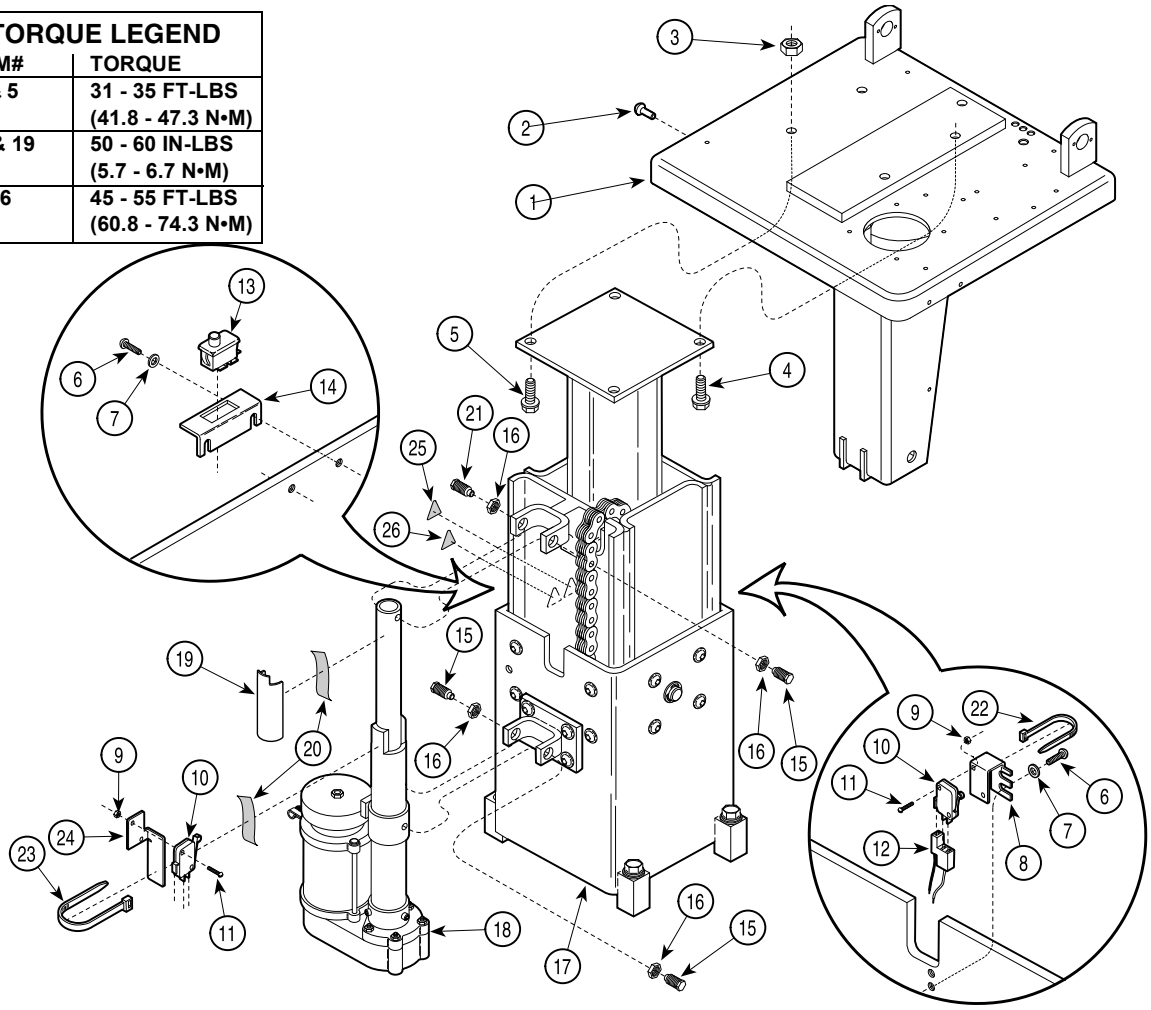
Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	050-4184-00	Power Inlet Bracket	1
2	015-1259-02	Fuseholder (115 V Units Only)	2
	015-1259-01	Fuseholder (230 V Units Only)	2
3		Fuse (Refer to “Fuse Specifications-Table 5-1” in Section 5 for Part No’s.)	AR
4	015-0639-00	AC Connector Receptacle	1
5	061-0736-00	Fuse Replacement Label (115 V Units Only)	1
	061-0737-00	Fuse Replacement Label (230 V Units Only)	1

Always Specify Model & Serial Number

Column Components

TORQUE LEGEND	
ITEM#	TORQUE
4 & 5	31 - 35 FT-LBS (41.8 - 47.3 N•M)
15 & 19	50 - 60 IN-LBS (5.7 - 6.7 N•M)
16	45 - 55 FT-LBS (60.8 - 74.3 N•M)



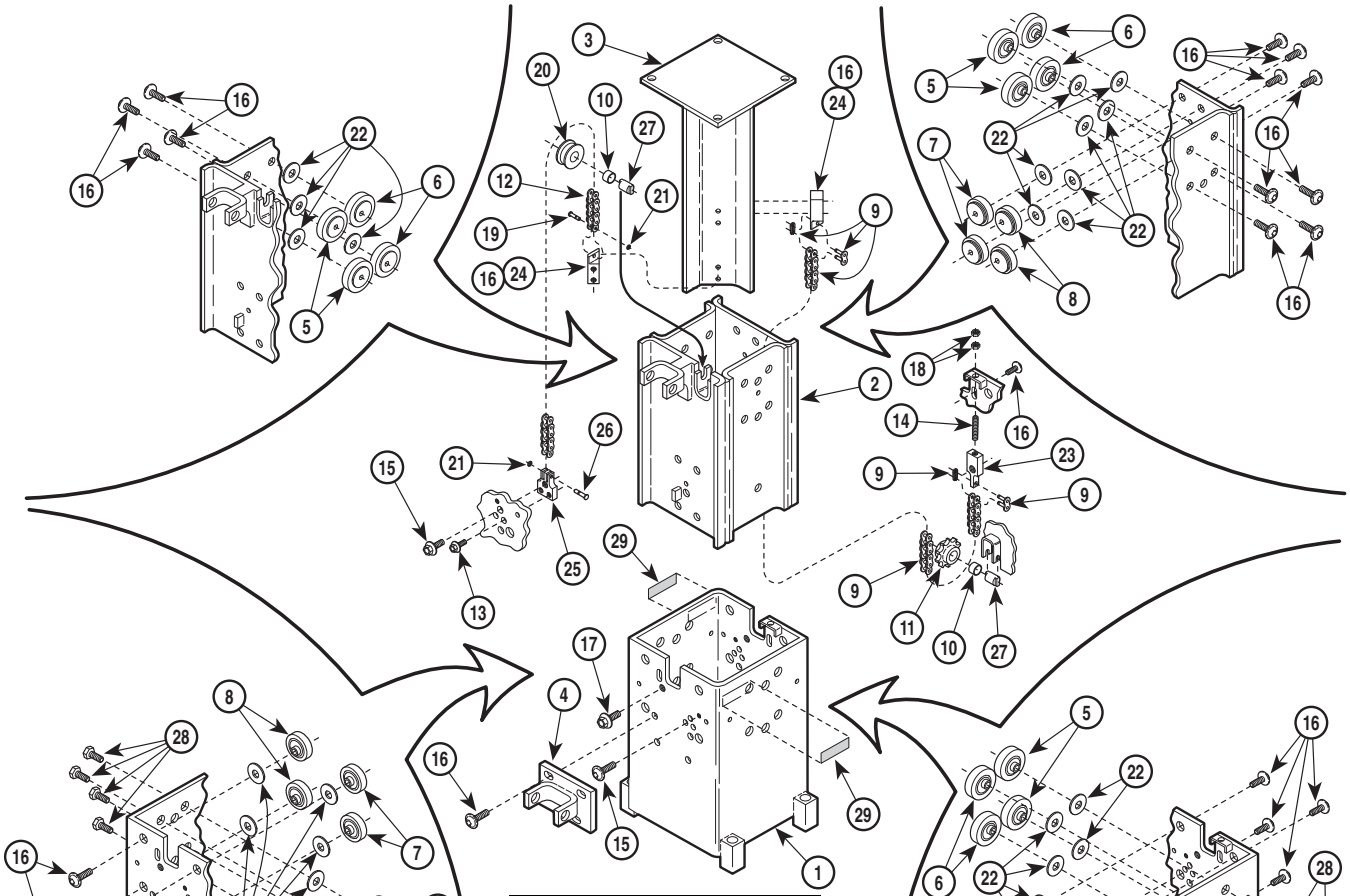
MA515000

Used on units with Serial Number LM1000, LN1000, LR1000 and LP1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	030-1180-00	Column Adapter Weldment	1
2	042-0153-00	Drive Rivet	6
3	041-0375-10	Nut	2
4	040-0375-38	Screw (Apply Loctite #042-0025-00)	2
5	040-0375-38	Screw	2
6	040-0010-47	Screw	4
7	045-0001-00	Lockwasher	4
8	050-3329-10	Limit Switch Bracket	1
9	041-0001-01	Nut	4
10	015-0476-00	Switch	2
11	040-0004-09	Screw	4
12		Limit Switch Wiring (Refer to “Wiring Diagram” Elsewhere)	Ref
13	015-1055-00	Panel Mount Switch	1
14	050-3328-10	Switch Bracket	1
15	051-0769-00	Zinc Pivot Screw (Apply Loctite #042-0025-00)	3
16	041-0625-01	Jam Nut	4
17	*(N.L.A.)*	120V Domestic Column Kit (Refer to “Column Assembly” Elsewhere [Includes Capacitor and Actuator])	Ref
	(N.L.A.)	240V Export Column Kit (Refer to “Column Assembly” Elsewhere [Includes Capacitor and Actuator])	Ref
	002-0589-00	Column Kit (Refer to “Column Assembly” Elsewhere [w/o Capacitor-Actuator])	Ref
18	002-0627-00	120V Base Actuator (Incl. Items19 and 20)	1
	(N.L.A.)	230V Base Actuator (Incl Items 19 and 20)	1
19	• 050-4323-00	• Limit Switch Stop	1
20	• 042-0123-00	• Double Faced Tape	2
21	051-0769-02	Zinc Pivot Screw w/Hole (Apply Loctite #042-0025-00)	1
22	015-0013-02	Cable Tie	1
23	015-0013-00	Cable Tie	3
24	050-4322-00	Limit Switch Bracket	1
25	061-0654-00	Caution Label	1
26	061-0650-00	Dangerous Voltage Label	1

N.L.A. denotes “No Longer Available”
Always Specify Model & Serial Number

Column Assembly



TORQUE LEGEND	
ITEM#	TORQUE
13	8 - 10 FT-LBS (10.8 - 13.6 N•M)
15	17 - 20 FT-LBS (23 - 27.1 N•M)
16 & 28	23 - 27 FT-LBS) (28.8 - 36.4 N•M) (With Actuator Installed)
17	17 - 20 FT-LBS (23 - 27.1 N•M)

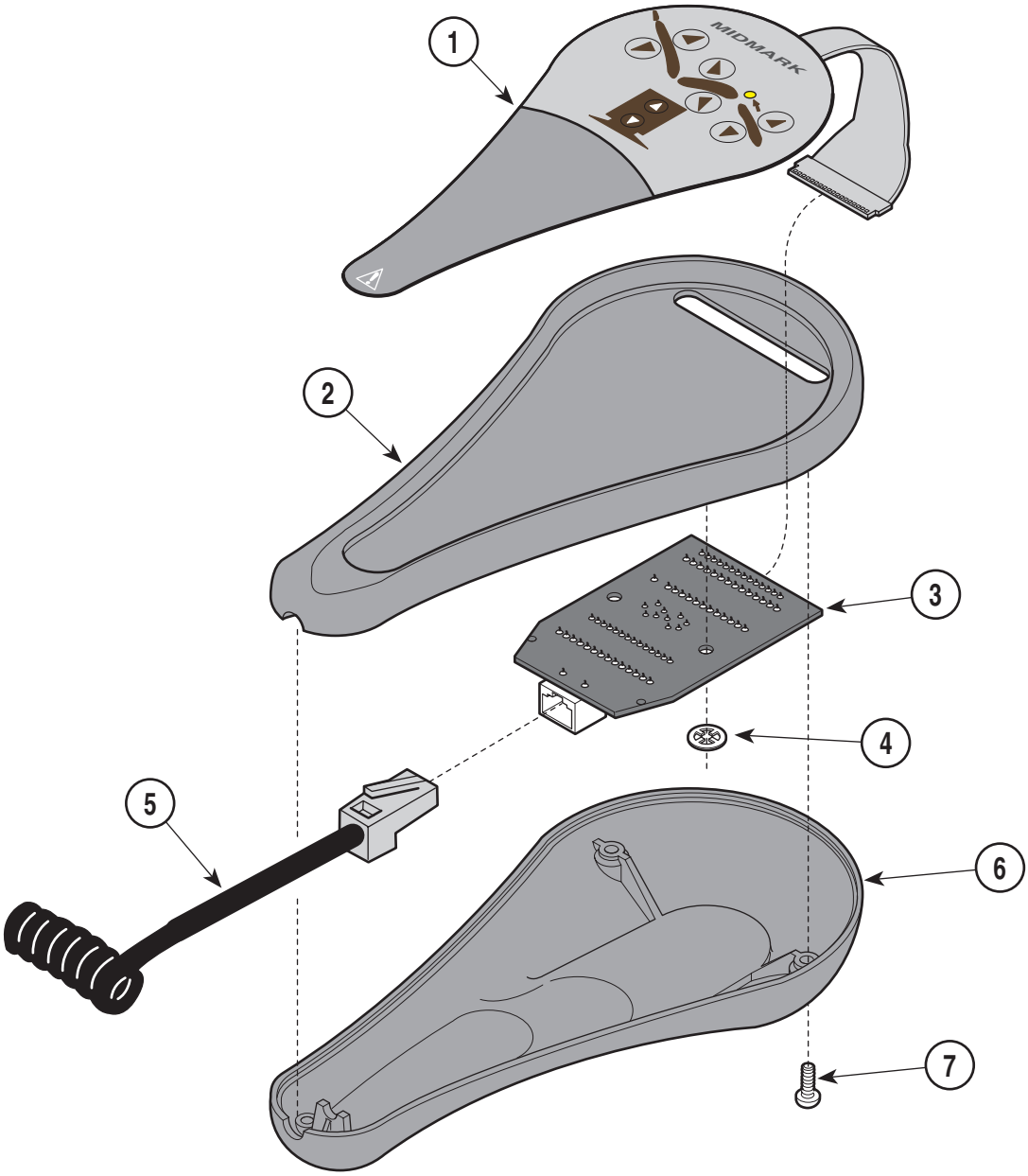
MA345901

Used on units with Serial Number LM1000, LN1000, LP1000 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
		Column Assembly (Includes Items 1 thru 28)	1
1	• 030-0903-10	• Outer Slide Weldment	1
2	• 030-0902-10	• Middle Slide Weldment	1
3	• 030-0901-10	• Inner Slide Weldment	1
4	• 030-0931-10	• Lower Actuator Support	1
5	• 029-1798-00	• Tire / Spindle Bearing Assembly	8
6	• 029-1798-01	• Tire / Spindle Bearing Assembly	8
7	• 029-1798-02	• Tire / Spindle Bearing Assembly	6
8	• 029-1798-03	• Tire / Spindle Bearing Assembly	6
9	• 016-0047-00	• Chain Assembly (Incl. Connectors)	1
10	• • 016-0149-00	• • Sleeve Bearing	2
11	• 029-3036-00	• Sprocket (Includes Item 10)	1
12	• 016-0454-00	• Leaf Chain	1
13	• 040-0250-95	• Screw	2
14	• 040-0312-20	• Set Screw	1
15	• 040-0312-24	• Screw	2
16	• 042-0151-00	• Screw	27
17	• 040-0375-38	• Screw	1
18	• 041-0312-06	• Jam Nut (Apply Loctite #042-0025-00)	2
19	• 057-0400-00	• Chain Pin	1
20	• 057-0401-00	• Chain Roller	1
21	• 042-0101-02	• Retaining Ring - External	2
22	• 045-0001-89	• Washer	28
23	• 051-0720-00	• Drawbolt Chain End	1
24	• 051-0765-00	• 45° Chain End	1
25	• 051-0766-00	• Leaf Chain End	1
26	• 057-0400-02	• Chain Pin	1
27	• 057-0384-00	• Sprocket Hub	2
28	• 040-0312-59	• Screw	10
29	061-0045-00	Caution Label	2

Always Specify Model & Serial Number

Hand Control Assembly (Non-Programmable)



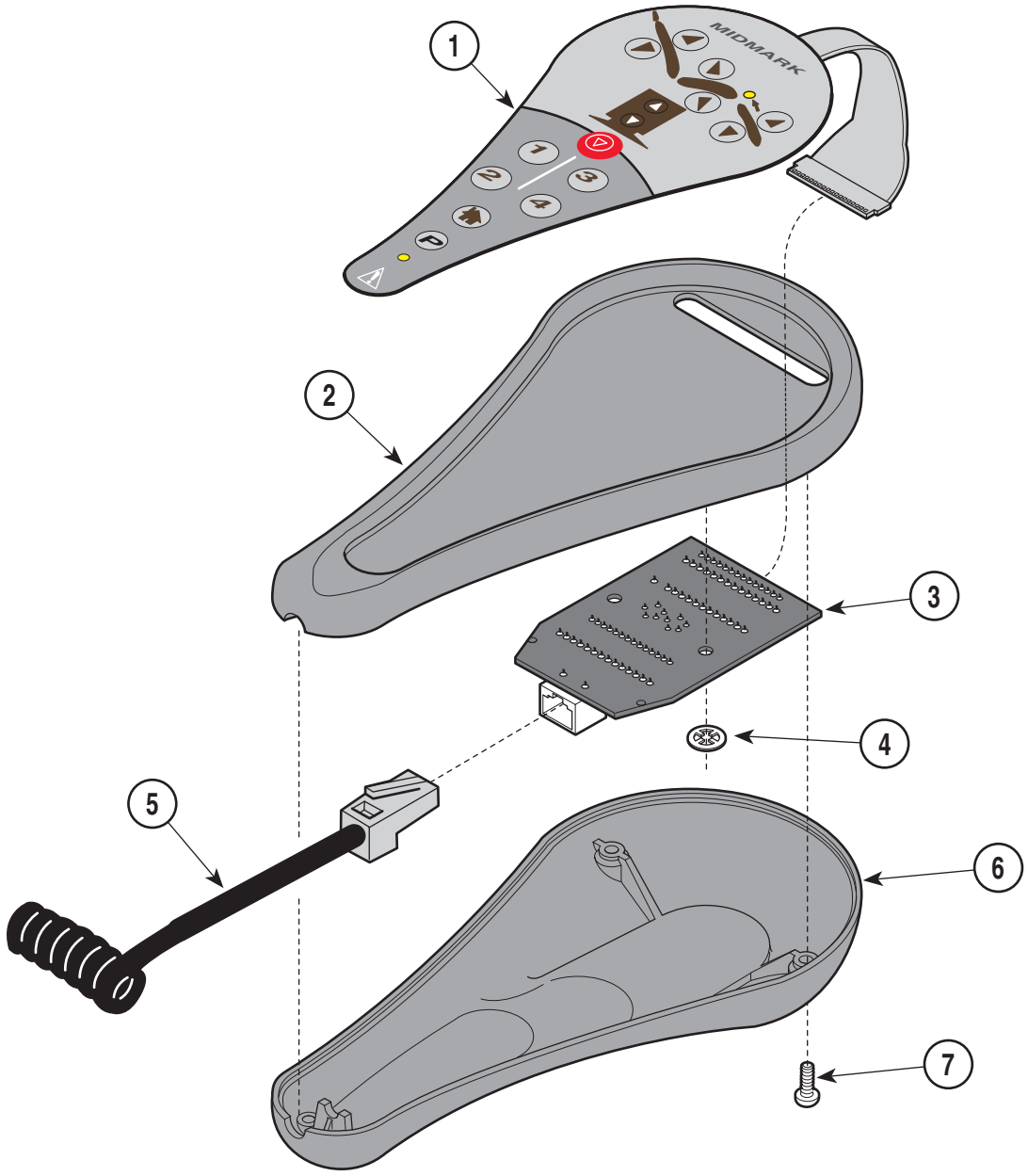
MA519400

Standard on units with Serial Number LM1000 thru LM1014 and LP1000

Item	Part No.	Description	Qty.
	9A276001	Non-Programmable Hand Control Assembly (Includes Items 1 thru 7)	1
1	• 015-1288-00	• Membrane Switch Panel	1
2	• 053-0867-00	• Hand Control Top	1
3	• 015-1291-00	• Hand Control PC Board	1
4	• 042-0159-01	• Push-On Retaining Ring	2
5	• 015-0839-00	• Coiled Coil Set Assembly	1
6	• 053-0868-00	• Hand Control Bottom	1
7	• 042-0168-00	• Screw	4

Always Specify Model & Serial Number

Hand Control Assembly (Programmable)



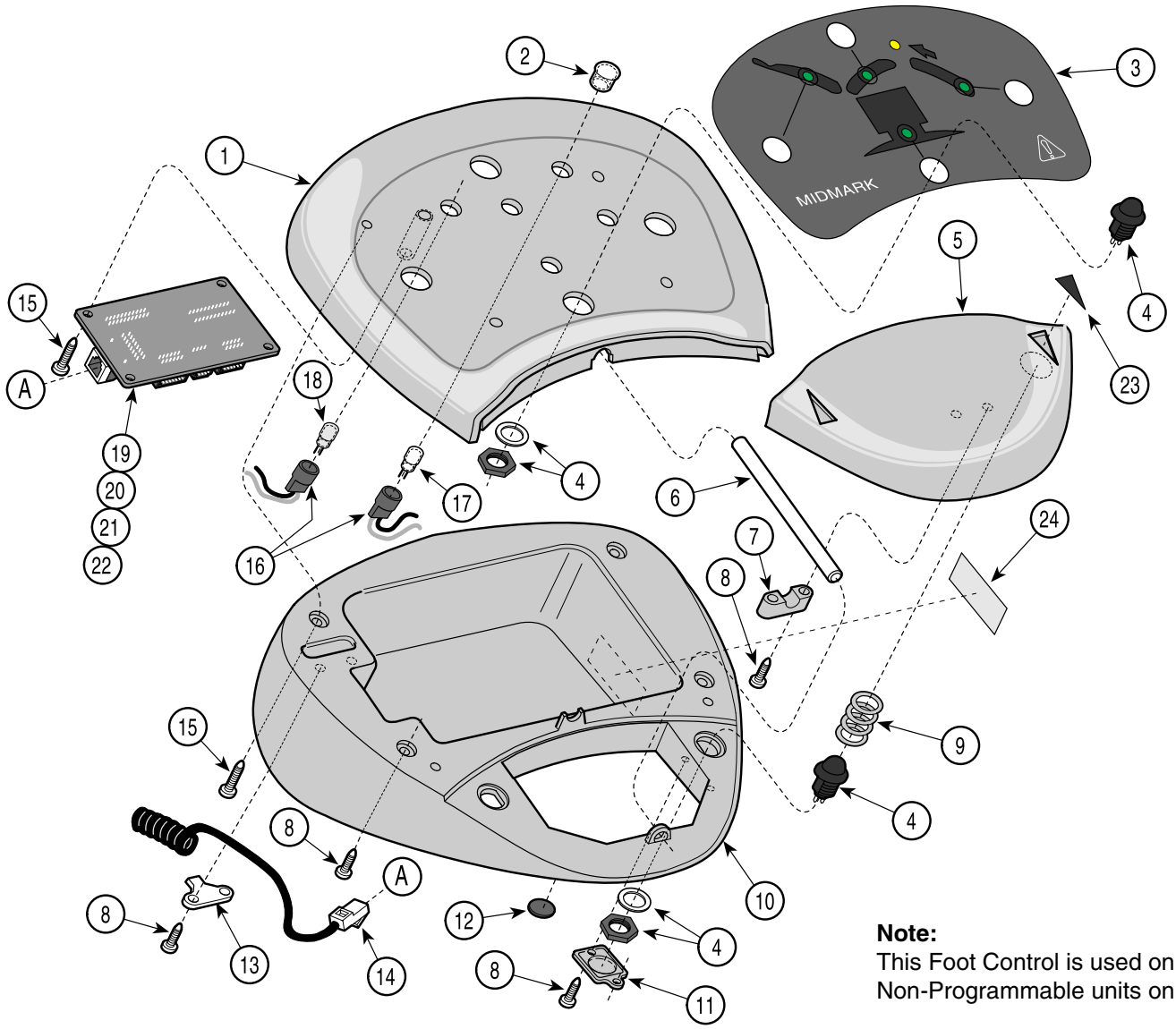
MA519300

Standard on units with Serial Number LN1000 thru LN1026

Item	Part No.	Description	Qty.
	9A277001	Programmable Hand Control Assembly (Includes Items 1 thru 7)	1
1	• 015-1289-00	• Membrane Switch Panel	1
2	• 053-0867-00	• Hand Control Top	1
3	• 015-1066-00	• Hand Control PC Board	1
4	• 042-0159-01	• Push-On Retaining Ring	2
5	• 015-0839-00	• Coiled Coil Set Assembly	1
6	• 053-0868-00	• Hand Control Bottom	1
7	• 042-0168-00	• Screw	4

Always Specify Model & Serial Number

Footswitch Assembly (Non-Programmable)



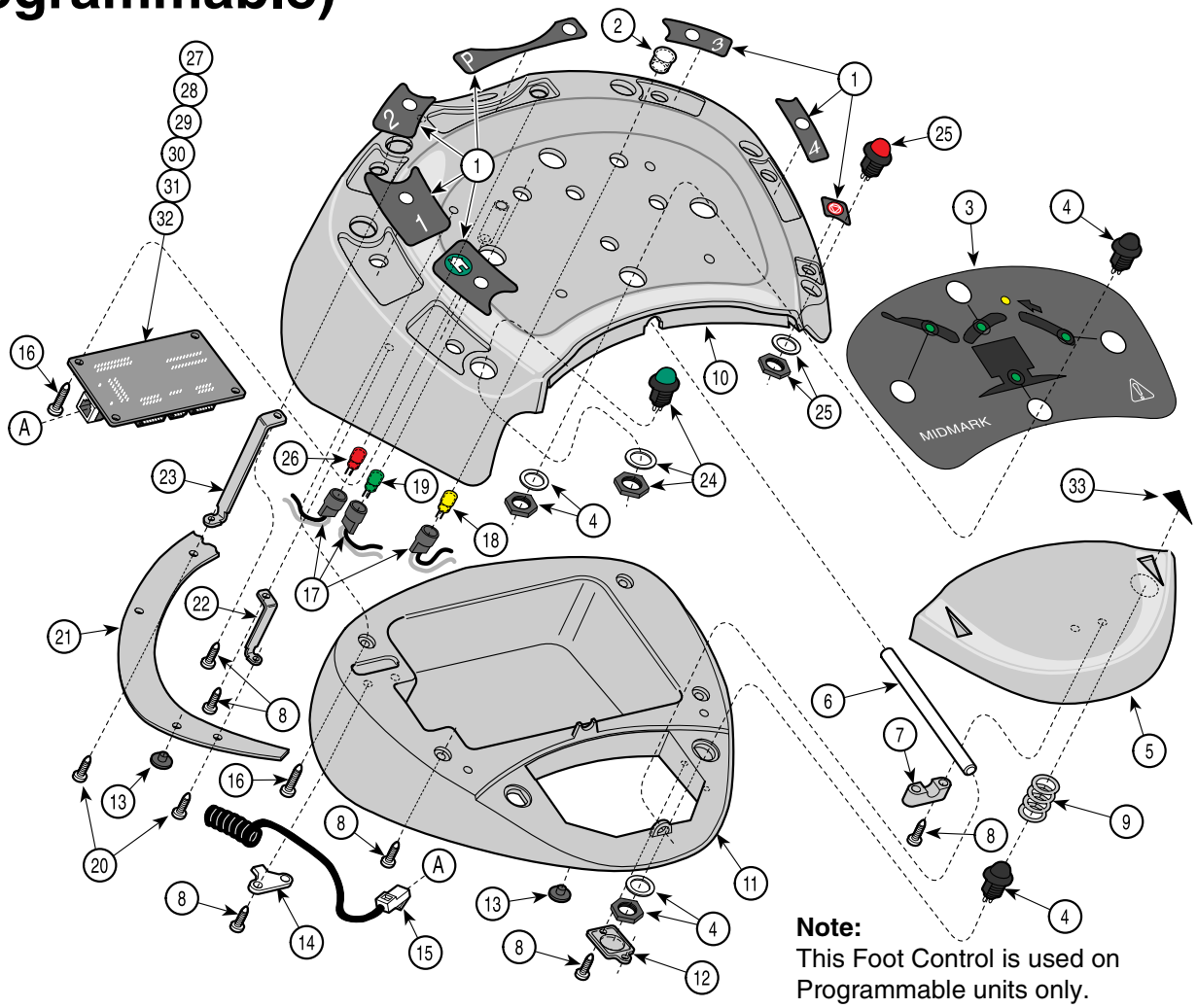
MA520900

Standard on units with Serial Number LM1015 and LP1001 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	9A252001	4 Position Footswitch Non-Programmable (Includes Items 1 thru 24)	1
1	• 053-0919-00	• Foot Control Top	1
2	• 015-1211-00	• Conxrite Lens	5
3	• 061-0723-00	• Foot Switch Label	1
4	• 015-1230-02	• Switch-Black [7" Leads] (Inc. Nut)	6
	• • 015-1205-03	• • Black Cap	1
5	• 053-0918-00	• Foot Control Pedal	1
6	• 057-0468-00	• Pivot Shaft	1
7	• 053-0921-00	• Pedal Cap	2
8	• 042-0168-00	• Screw	12
9	• 025-0054-01	• Compression Spring	2
10	• 053-0917-00	• Foot Control Base	1
11	• 053-0940-00	• Switch Cover	2
12	• 053-0947-00	• Stem Bumper	8
13	• 050-4028-00	• Strain Relief Bracket	1
14	• 015-0839-00	• Cord Set	1
15	• 042-0168-01	• Screw	6
16	• 015-1218-00	• Conxrite Connector Assy. [4" Leads]	5
17	• 015-1235-01	• Yellow LED	1
18	• 015-1235-00	• Green LED	4
19	• 015-1168-01	• Programmable Foot Control PC Board	1
20	• 015-0865-01	• 10 Position Connector (Not Shown)	1
21	• 015-0865-03	• 24 Position Connector (Not Shown)	1
22	• 015-1231-00	• 4 Position Recept. Hsg. (Not Shown)	1
23	• 061-0716-00	• 10 Position Connector (Not Shown)	2
24	•	• Serial Number Tag	1

Always Specify Model & Serial Number

Footswitch Assembly (Programmable)



MA524000

Standard on units with Serial Number LN1027 and LR1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	9A253001	4 Position Footswitch Programmable (Includes Items 1 thru 33)	1
1	• 061-0674-00	• Footswitch Decal Set	1
2	• 015-1211-00	• Conxrite Lens	11
3	• 061-0723-00	• Foot Switch Label	1
4	• 015-1230-02	• Switch-Black [7” Leads] (Inc. Nut)	11
	• • 015-1205-03	• • Black Cap	1
5	• 053-0918-00	• Foot Control Pedal	1
6	• 057-0468-00	• Pivot Shaft	1
7	• 053-0921-00	• Pedal Cap	2
8	• 042-0168-00	• Screw	16
9	• 025-0054-01	• Compression Spring	2
10	• 053-0920-00	• Programmable Foot Control Top	1
11	• 053-0917-00	• Foot Control Base	1
12	• 053-0940-00	• Switch Cover	2
13	• 053-0947-00	• Stem Bumper	13
14	• 050-4028-00	• Strain Relief Bracket	1
15	• 015-0839-00	• Cord Set	1
16	• 042-0168-01	• Screw	6
17	• 015-1218-00	• Conxrite Connector Assy. [4” Leads]	7
	• 015-1218-01	• Conxrite Connector Assy. [8” Leads]	4
18	• 015-1235-01	• Yellow LED	1
19	• 015-1235-00	• Green LED	9
20	• 040-0006-76	• Screw	4
21	• 050-4077-00	• Bottom Cover	1
22	• 050-4075-00	• Side Bracket	2
23	• 050-4076-00	• L.H. Front Bracket (Shown)	1
	• 050-4076-01	• R.H. Front Bracket (Not Shown)	1
24	• 015-1230-04	• Switch-Green [5” Leads] (Inc. Nut)	1
	• • 015-1205-05	• • Green Cap	1
25	• 015-1230-03	• Switch-Red [5” Leads] (Inc. Nut)	1
	• • 015-1205-04	• • Red Cap	1
26	• 015-1235-02	• Red LED	1
27	• 015-1168-03	• Programmable Foot Control PC Board	1
28	• 015-0865-01	• 10 Position Connector (Not Shown)	1
29	• 015-0865-02	• 12 Position Connector (Not Shown)	1
30	• 015-0865-03	• 24 Position Connector (Not Shown)	1
31	• 015-1231-00	• 4 Position Recept. Hsg. (Not Shown)	1
32	• 015-0013-02	• Cable Tie (Not Shown)	1
33	• 061-0716-00	• Up / Down Arrow Label	2

Always Specify Model & Serial Number

Return To Table Of Contents

COMMENTS

The Technical Publications Department of Midmark Corporation takes pride in its publications. We are sure that our manuals will fill all of your needs when you are performing scheduled maintenance, servicing, or repairs on a Midmark product.

However, if you find any errors or feel that there should be a change, addition, or deletion to a manual, please let us know!

Page(s) and Paragraph(s) Needing Changed:

Description of Error or Desired Change:

Please fax or mail a copy of this completed comment sheet to:

Midmark Corporation
ATTN: Technical Publications Department
60 Vista Drive
Versailles, Ohio 45380
Fax: (937) 526-5542

Printed in U.S.A.

Return To Table Of Contents

FAX ORDERING FORM

(SERVICE PARTS ONLY)

NOTES:

- ALL **BLOCKED** AREAS MUST BE COMPLETED.
- USE FOR NON-WARRANTY FAX ORDERS ONLY. WARRANTY ORDERS MUST BE TELEPHONED IN (1-800-MIDMARK).

ATTENTION: SERVICE DEPARTMENT FAX#: 877-249-1793

ACCT #: ____________ P.O. #: ____________ DATE: ____________

NAME: ____________ SHIP TO: ____________

ADDRESS: ____________ ____________

CITY, ST.: ____________ ____________

CONTACT: ____________ ____________

PHONE: ____________ ____________

☐ NON-EMERGENCY ORDER - TO SHIP WITHIN 72 HOURS IF PART(S) IN STOCK.

☐ EMERGENCY ORDER - TO SHIP WITHIN 24 HOURS IF PART(S) IN STOCK (IF ORDER IS RECEIVED BEFORE 1:00 P.M. E.S.T).

SEND NOTIFICATION IF PARTS ARE NOT AVAILABLE TO SHIP WITHIN 24 HOURS VIA E-MAIL OR FAX TO: ____________

METHOD OF SHIPMENT

UPS	FED EX	OTHER
☐ NEXT DAY A.M.	☐ NEXT DAY A.M.	____________
☐ NEXT DAY P.M.	☐ NEXT DAY P.M.	
☐ 2ND DAY	☐ 2ND DAY	
☐ GROUND	☐ ECONOMY	

QTY.	PART #	DESCRIPTION (SPECIFY COLOR OF ITEM IF APPLICABLE)	COLOR CODE	PRICE/PER
			TOTAL COST: $	

Return To Table Of Contents

Return To Table Of Contents

Midmark Corporation
60 Vista Drive
P.O. Box 286
Versailles, Ohio 45380-0286
937-526-3662
Fax 937-526-5542
midmark.com

Because we care.

Subject to change without notice.
Refer to www.Documark.com for latest revision.

Printed in U.S.A.