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317 -001

Ritter® by MIDMARK

Power Examination Table

Service and Parts Manual

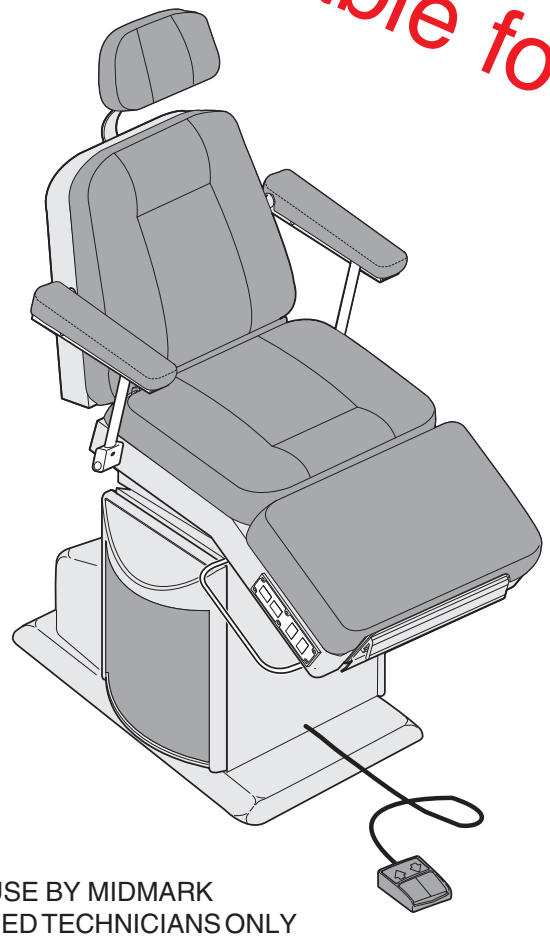
Serial Number Prefix:
KM & V

NO LONGER IN PRODUCTION

Some service parts may not be available for this product!

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

Place Order



FOR USE BY MIDMARK TRAINED TECHNICIANS ONLY

SF-1568

Part No. 004-0074-00 Rev. J (8/20/12)

Style B

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

IMPORTANT INSTRUCTIONS

General Safety Instructions

Safety First: The primary concern of Midmark Corporation is that this Power Podiatry Chair 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 chair.

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

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 on the back cover of the Installation and Operation Manual for warranty information. Failure to follow the guidelines listed below will void the warranty and/or render the 317 Power Podiatry Chair unsafe for operation.

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

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SECTION I
GENERAL INFORMATION

1.1 Scope of Manual

This manual contains detailed troubleshooting, scheduled maintenance, maintenance, and service instructions for 317 Power Podiatry Chair. 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 Chair Is Malfunctioning And Cause Is Unknown.

(1) Perform an operational test on chair (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 317 Power Podiatry Chair

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

The 317 Power Podiatry Chair is an examination chair designed specifically for performing general podiatric procedures (Podiatry - treatment of foot ailments).

The major serviceable components of the chair are the motor pump which includes an up functions relief valve, down functions relief valve, up functions shuttle valve, down function shuttle valve, and anti-cavitation solenoid valve, two capacitors, isolation transformer (export units only), tilt down limit switch, base down limit switch, control panel assembly which includes a manual functions relay (CR1), auto return relay (CR2), time delay relay, and terminal blocks, BACK UP / DOWN switches (RH and LH), TILT UP / DOWN switches (RH and LH), AUTO RETURN "RETURN" switches (RH and LH), AUTO RETURN "STOP" switches (RH and LH), foot control which includes TABLE UP switches and TABLE DOWN switches, tilt cylinder, back cylinder, needle valve (older units only) base cylinder, reclining arm mechanism, foot section brake, base slide assembly, and chain assembly.

B. Theory of Operation (See Figure 5-1, Sheets 1 and 2 for wiring diagrams, Figure 5-2 for electrical schematics, and Figures 5-3 and 5-4 for hydraulic flow diagrams)

Electrical Power:

Line voltage is supplied directly to the switches of the chair.

Up Functions Electrical Operation:

Line voltage is continuously supplied to line side terminals of all switches. Then, when a TILT UP, BACK UP, or BASE UP switch is pressed, the current flows thru the two poles of the selected switch. One pole of switch allows current to flow across the cylinder's solenoid valve and time delay relay, energizing the cylinder solenoid valve. The time delay relay delays current flow across the coil of the cylinder solenoid valve for 1/10 of a second, which allows time for the motor pump to develop hydraulic pressure. This prevents the selected function from drifting downward before starting to raise up and prevents a jerky start. The other pole of the switch allows current to flow across the manual functions relay (CR1), energizing the relay. When the manual functions relay (CR1) is energized, three subswitches within the relay are switched, the normally open (N.O.) subswitch CR1-A, the normally closed (N.C.) subswitch CR1-B, and the

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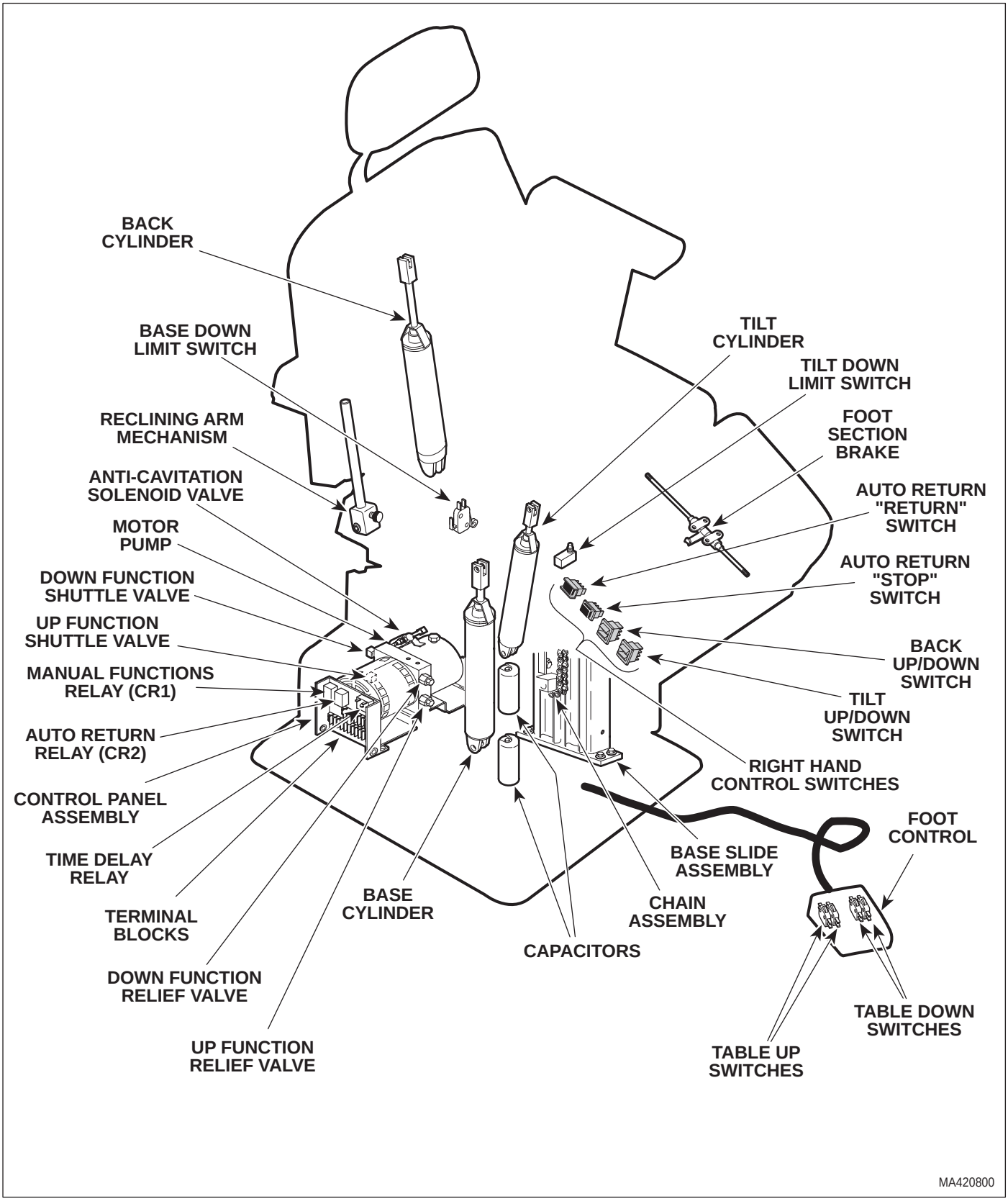

Figure 1-1. Major Components

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N.C. subswitch CR1-C. If a subswitch was a normally open (N.O.) switch, it then switches to closed position (current can flow). If a subswitch was a normally closed (N.C.) switch, it then switches to an open position (current cannot flow).

The N.O. subswitch CR1-A closes, which applies current across the coil of the motor pump, causing the pump to run and supply pressure for the selected UP function. There are two capacitors in the motor pumps circuit which provide motor start and motor run power. Current is also applied across the coil of the anti-cavitation solenoid valve, energizing the valve and causing it to open. The N.C. subswitch CR1-B opens, which disables all DOWN functions while an UP function button is depressed. This prevents the motor pump from being run in the forward and reverse directions simultaneously, possibly damaging it. The N.C. subswitch CR1-C opens, which disables the AUTO RETURN "RETURN" and "STOP" buttons, the tilt down limit switch, and the base down limit switch. This also prevents the motor pump from being run in the forward and reverse directions simultaneously, possibly damaging it.

Up Functions Hydraulic Operation:

When the motor pump starts pumping, suction is created by the rotating pump gears, which allows oil to defeat the reservoir check valve and flow into the pump gears. The pump gears pressurize the oil which flows to the up function shuttle valve. The check ball and shuttle in the up function shuttle valve are pushed to the open position by the oil, allowing oil to flow through the shuttle valve by flowing around the check ball (with the shuttle in the open position, oil is prevented from flowing through the reservoir ports and returning to the reservoir). The oil then flows through the open cylinder solenoid valve at the base of the selected cylinder, extending the cylinder rod. When the cylinder rod extends, oil is forced out of the rod end of the cylinder, through the open anti-cavitation solenoid valve and to the down function shuttle valve. The check ball and the shuttle in the down function shuttle valve are pushed to the closed position by the oil, which prevents oil from flowing through the shuttle valve and into the motor pump, but allows the oil to flow through the newly uncovered reservoir ports into the reservoir. When the cylinder rod reaches the end of its travel, the up function relief valve opens when the pressure reaches 525 - 600 PSI (36.2 - 41.4 BARS) and allows the oil to return to the reservoir. This prevents the motor pump from developing pressures that are too high and damaging the hydraulic system components, hoses, or the motor pump itself.

When the operator releases the selected function's switch, the motor pump shuts down and the anti-cavitation solenoid valve and the cylinder solenoid valve de-energize, causing the valves to close.

Down Functions Electrical Operation:

Line voltage is continuously supplied to line side terminals of all switches. Then, when a TILT DOWN, BACK DOWN, or BASE DOWN switch is pressed, the current flows thru the two poles of the selected switch. One pole of switch allows current to flow across the cylinder's solenoid valve and time delay relay, energizing the cylinder solenoid valve. The time delay relay delays current flow across the coil of the cylinder solenoid valve for 1/10 of a second, which allows time for the motor pump to develop hydraulic pressure. This prevents the selected function from drifting before starting to move and also prevents a jerky start. The other pole of the switch allows current to flow thru the N.C. subswitch CR1-B and then across the coil of the motor pump, causing the pump to run and supply pressure for the selected DOWN function. There are two capacitors in the motor pumps circuit which provide motor start and motor run power.

Down Functions Hydraulic Operation:

When the motor pump starts pumping, suction is created by the rotating pump gears, which allows oil to defeat the reservoir check valve and flow into the pump gears. The pump gears pressurize the oil which flows to the down function shuttle valve. The check ball and shuttle in the down function shuttle valve are pushed to the open position by the oil, allowing oil to flow through the shuttle valve by flowing around the check ball (with the shuttle in the open position, oil is prevented from flowing through the reservoir ports and returning to the reservoir). The oil then flows through the anti-cavitation solenoid valve and into the rod end of the cylinder, causing the cylinder rod to retract. When the cylinder rod retracts, oil is forced out of the base of the cylinder, through the open cylinder solenoid valve to the up function shuttle valve. The check ball and the shuttle in the up function shuttle valve are pushed to the closed position by the oil, which prevents oil from flowing through the shuttle valve and into the motor pump, but allows the oil to flow through the newly uncovered

reservoir ports into the reservoir. When the cylinder rod reaches the end of its travel, the down functions relief valve opens when the pressure reaches 250 - 325 PSI (17.2 - 22.4 BARS) and allows the oil to return to the reservoir. This prevents the motor pump from developing pressures that are too high and damaging the hydraulic system components, hoses, or the motor pump itself.

When the operator releases the selected function's switch, the motor pump shuts down and the cylinder solenoid valve de-energizes, causing the valve to close.

Auto Return Function Operation:

When the operator presses one of the two AUTO RETURN "RETURN" buttons, current is applied across the normally closed contacts of the tilt down limit switch and base down limit switch and then across the coil of the auto return relay (CR2), energizing the relay. When the auto return relay (CR2) is energized, three subswitches within the relay are switched; the N.O. subswitch CR2-A, the N.O. subswitch CR2-B, and the N.O. subswitch CR2-C.

When subswitch CR2-A switches, current now flows across the N.C. AUTO RETURN "STOP" switches and the coil of the auto return relay (CR2), keeping the relay energized even after the operator has released the AUTO RETURN "RETURN" switch. This also allows the STOP buttons to become functional. Pressing a STOP button will open the circuit, which will de-energize the auto return relay (CR2), thereby stopping the auto return function. When subswitch CR2-B switches, current flows across the tilt cylinder's solenoid valve and the time delay relay, energizing the tilt cylinder solenoid valve. The time delay relay delays current flow across the coil of the tilt cylinder solenoid valve for 1/10 of a second, which allows time for the motor pump to develop hydraulic pressure. This prevents the selected function from drifting before starting to move and also prevents a jerky start. When subswitch CR2-C switches, current flows across the coil of the motor pump, causing the pump to run and supply pressure for the AUTO RETURN sequence. There are two capacitors in the motor pump circuit which provide motor start and motor run power.

The TILT function lowers until the tilt down limit switch is tripped. There are three sets of contacts in the tilt down limit switch. When the tilt down limit switch is tripped, one contact set (terminals 3 and 4) opens, de-energizing the tilt cylinder solenoid valve. The second contact set (terminals 5 and 6) closes, energizing the base cylinder solenoid valve. The third contact set (terminals 7 and 8) opens, leaving the base down limit switch as the sole source of power for the auto return relay (CR2). When the base cylinder solenoid valve is energized, the base function lowers until the base down limit switch is tripped. There are two sets of contacts in the base down limit switch. When the base down limit switch is tripped, one contact set (terminals 3 and 4) opens, de-energizing the base cylinder solenoid valve. The second contact set (terminals 7 and 8) opens, opening the auto return relay (CR2) and causing the relay to de-energize. The auto return sequence is now complete.

If the operator needs to stop the table top from lowering for any reason, one of the two AUTO RETURN "STOP" buttons can be pressed. When one of N.C. "STOP" buttons is pressed, the circuit to the auto return relay (CR2) is opened, removing current flow from the coil of the auto return relay (CR2) and causing it to de-energize. Current flow to the coil of the cylinder solenoid valve and motor pump is stopped, causing the auto return function to stop.

General Information:

The anti-cavitation solenoid valve is in the hydraulic system to prevent oil from escaping out of the rod end of a cylinder while the chair is not being moved. Otherwise, a cylinder rod would be able to extend on its own if upward pressure was placed on that function of the chair top by the doctor or patient.

The cylinder solenoid valves are in the hydraulic system to prevent oil from escaping out of the base of the cylinder assemblies. Otherwise, a cylinder assembly could retract on its own, allowing the table top to drift.

On some older units, there is a needle valve attached to the rod end of the back cylinder. On these units, the needle valve is used to adjust the speed of the back cylinder.

The motor has a thermal overload switch which automatically activates if motor becomes overheated, shutting the motor down. The motor is designed for intermittent, not continuous duty. Running the motor continuously will cause the overload switch to activate.

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1.4 Specifications

Factual data for the 317 Power Podiatry Chair is provided in Table 1-1. Also, see Figure 1-2.

Table 1-1. Specifications

Description	Data
Weight:	
Without Shipping Carton	392 lb (177.8 kg)
With Shipping Carton	475 lb (215.5 kg)
Shipping Carton	74.25 in. "L" x 29 in. "W" x 33 in. "H" (188.6 cm x 73.66 cm x 83.8 cm)
Dimensions (See Figure 1-2):	
Table Top Length (w/o headrest)	59 in. (149.9 cm)
Table Top Length (min)	68 in. (172.7 cm)
Table Top Length (w/ headrest & foot section extended)	96 in. (243.8 cm)
Table Top Width (w/ armrests)	26 in. (66.0 cm)
Overall Width	26 in. (66.0 cm)
Table Positioning:	
Tilt Section	0 - 27°
Back Section	0 - 85°
Table Top Height (Adjustable):	26.0 in. to 42.0 in. (66.0 cm to 106.7 cm)
Table Speeds (@ 60 Hz.):	
Base Up	9 ±1 seconds
Back Up	9 ±1 seconds
Tilt Up	5 ±1 seconds
Weight Capacity (Maximum)	300 lb. (136.0 kg)
Oil Used In Hydraulic System	Light Grade Medicinal Mineral Oil
Oil Capacity	Approx. 2.5 quarts (2.4 liters)
Motor Pump Reservoir Capacitor	1 quart (0.946 liter)
Electrical Requirements:	
115 VAC Unit	110 - 120 VAC, 60 HZ, 8 amp, single phase
Power Consumption:	
115 VAC Unit	1440 WATTS, 8 amps @ 120 VAC

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.

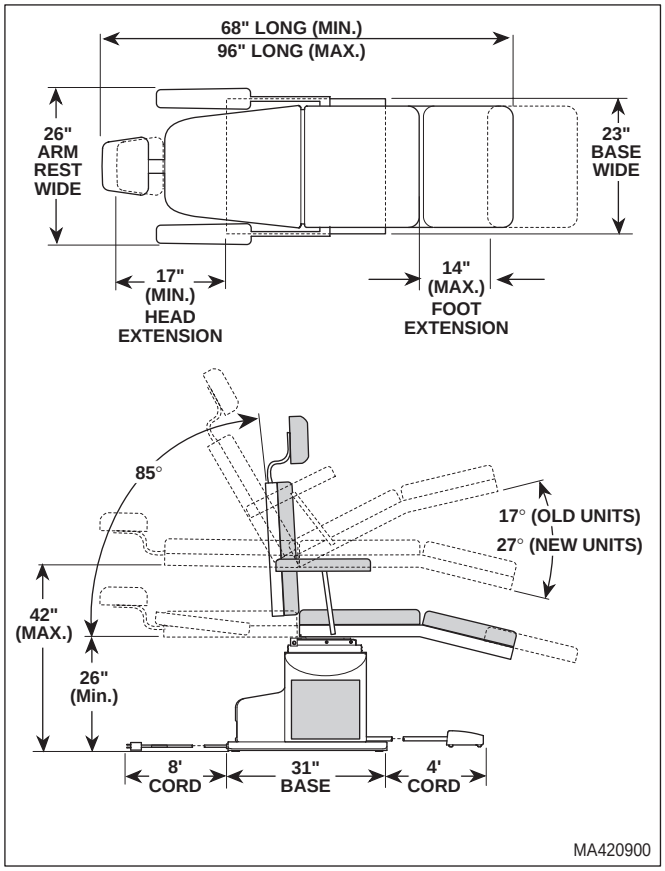

Figure 1-2. Table Dimensions

SECTION I
GENERAL INFORMATION

1.5 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 chair and record this data.

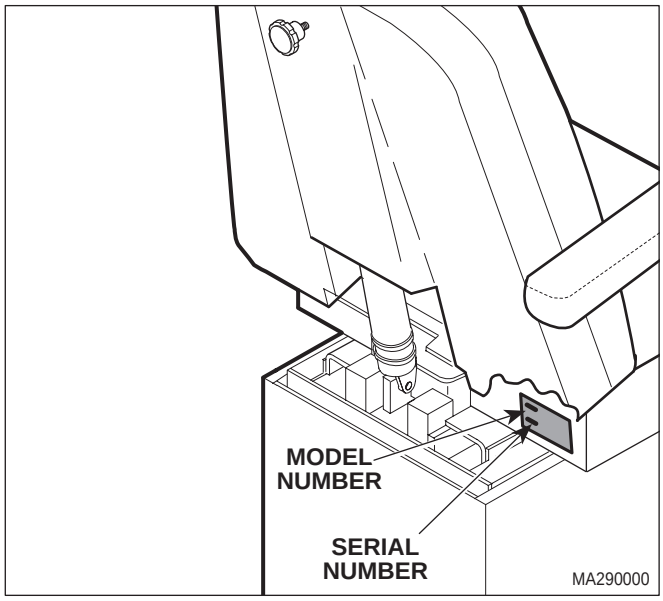

Figure 1-3. Model Number / Serial Number Location

(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 chair for this information. Otherwise, this information may be obtained from the dealer that sold the chair.

(3) Determine the installation date of the chair 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).

1.6 Special Tools

Table 1-2 lists all of the special tools needed to repair the chair, how to obtain the special tools, and the purpose of each special tool.

Table 1-2. Special Tool List

Description of Special Tool	Manufacturer's Name / Address / Phone	Manufacturer's Part Number	Purpose of Special Tool
Multimeter	Commercially Available	Any Type	Used to perform continuity and voltage checks.
Torque Wrench	Commercially Available	Any Type	Used to tighten hardware to specified torque values.

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SECTION II
TESTING AND TROUBLESHOOTING

2.1 Operational Test

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

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

NOTE
The Operational Test, for the most part, only describes what should happen when the chair is operated. If the chair 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 chair into a grounded, non-isolated, correctly polarized outlet, that has the proper voltage output for the chair.

(2) Depress TABLE UP and TABLE DOWN foot switches on the foot control. Depress the BACK UP / DOWN switch to the UP and DOWN positions. Depress the TILT UP / DOWN switch to the UP and DOWN positions.

(3) Observe. The table top should move in the direction corresponding to the footswitch / switch which is being depressed. The range of movement should match the ranges listed below:

Table Positioning:
- Tilt Section ..... 0 - 27°
- Back Section ..... 0 - 85°
- Table Top Height (Adjustable): ..... 26.0 in. to 42.0 in. (66.0 cm to 106.7 cm)

No section of the table top should drift on its own after a footswitch / switch is released. Movement should be steady and should match the speeds listed below:

Table Speeds (@ 60 Hz.):
- Base Up ..... 9 ±1 seconds
- Back Up ..... 9 ±1 seconds
- Tilt Up ..... 5 ±1 seconds

(4) Raise TABLE UP and TILT UP function all the way up.

(5) Press one of the AUTO RETURN "RETURN" switches. After table top starts to move, press one of the AUTO RETURN "STOP" switches.

(6) Observe. When the AUTO RETURN "RETURN" switch is pressed, the tilt function should begin to lower (and should keep lowering even after the RETURN switch is released). When the AUTO RETURN "STOP" switch is pressed, the table top should stop lowering.

(7) Press one of the AUTO RETURN "RETURN" switches and allow the auto return sequence to finish.

(8) Observe. The tilt function should lower completely and stop; then the base down function should lower all the way down and stop. The motor pump should stop running, indicating that the base down limit switch has been tripped.

(9) Repeat steps 2 thru 8 using the function switches on the other side of the chair.

(10) Push down on right side or pull up on left side of brake handle and then slide foot section assembly in and out. Release brake handle.

(11) Observe. When brake handle is depressed, the foot section assembly should be able to be moved in and out freely. When the brake handle is released, the foot section assembly should be locked in place securely.

NOTE
The release plunger may not automatically return to the locked position by itself. It may need to be worked into its locked position.

(12) Pull release plunger out and move reclining arm up and down. Lower reclining arm all the way and allow release plunger to lock into position.

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SECTION II
TESTING AND TROUBLESHOOTING

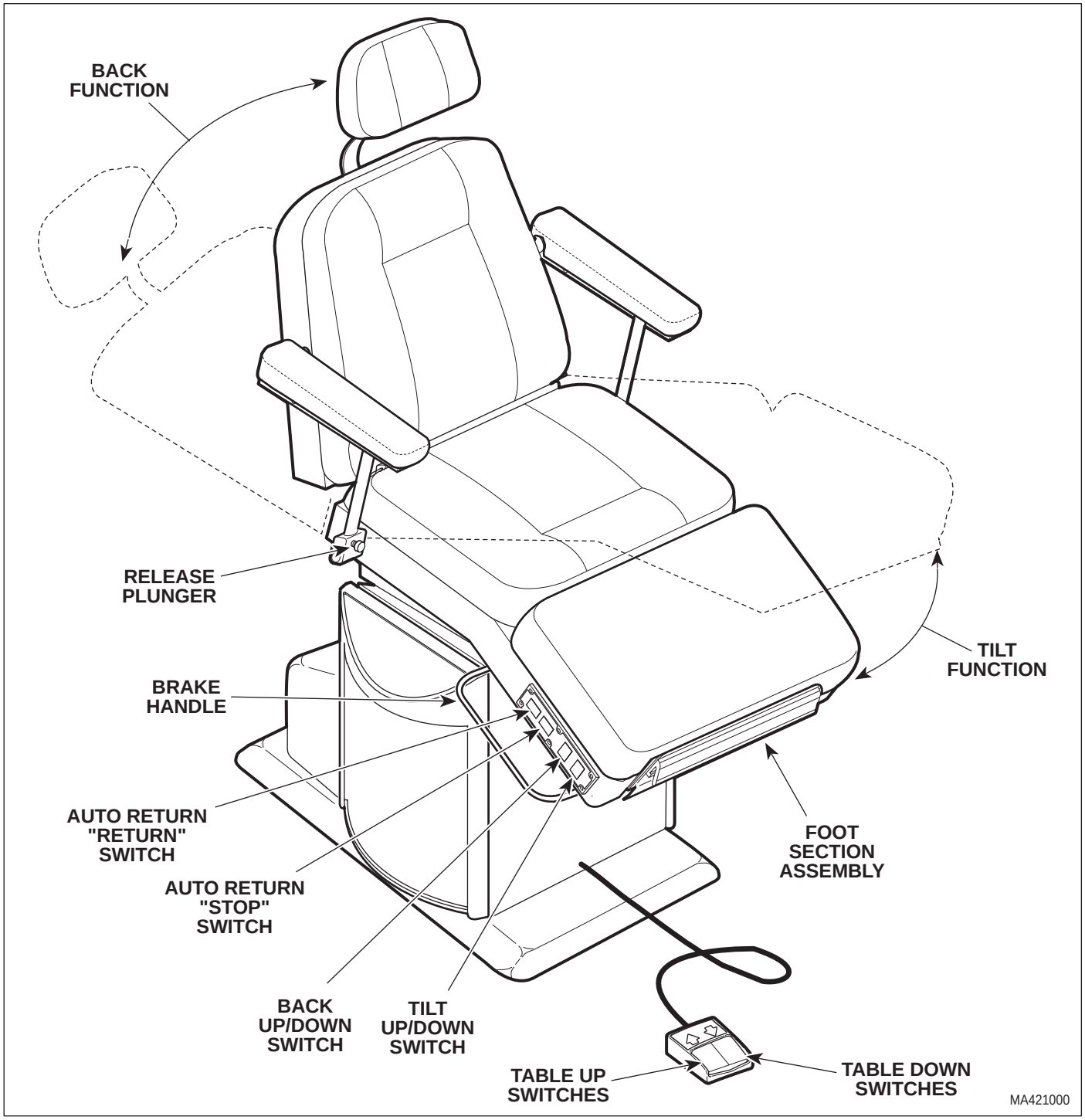

Figure 2-1. Operational Test

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(13) Observe. When the release plunger is pulled out, the reclining arm is unlocked and can be moved. When the reclining arm is lowered completely and the release plunger is released, the release plunger should lock the reclining arm in place.

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
Chair will not operate when any of the six up or down functions or auto return function is selected.	When any footswitch / switch is depressed, motor pump does not run and cylinder solenoid(s) cannot be heard being energized (audible click).	Power cord is not plugged into facility wall outlet, or on export models, power cord is not plugged into connector receptacle on chair.	Check to see if power cord is plugged in.	Plug power cord into facility wall outlet and / or connector receptacle on chair.
		Facility circuit breaker providing power to chair is tripped.	Check to see if facility circuit breaker is tripped.	If circuit breaker is tripped, correct the problem, then reset circuit breaker.
		Fuse(s) in AC connector receptacle is blown (export units only).	Perform continuity check on fuses.	Replace fuse(s).
		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.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Isolation transformer is malfunctioning (export units only).	Check input and output voltage of isolation transformer.	If isolation transformer is receiving proper input voltage but is not supplying 115 VAC output, replace isolation transformer.
	When any footswitch / switch is depressed, motor pump does not run, but cylinder solenoid(s) energizes (audible click).	Capacitor(s) is blown (motor pump may be humming).	Replace suspect capacitor(s) with known working capacitor(s).	Replace capacitor(s). Refer to para 4.19.
		Motor thermal overload switch is activated because motor pump overheated.	Wait 15 to 20 minutes.	Allow motor pump to cool and then try to operate chair. If motor pump does not run now, replace motor pump. Refer to para 4.9, or 4.10.
		Motor pump is burned out.	Replace suspect motor pump.	Replace motor pump. Refer to para 4.9, or 4.10.
		Wire connections loose.	Check wiring from terminal block to motor pump.	Clean dirty connections. Repair loose / damaged connections.

SECTION II
TESTING AND TROUBLESHOOTING

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Chair will not operate when any of the six up or down functions or auto return function is selected - Continued.	When any footswitch / switch is depressed, motor pump runs, but table top does not move.	Time delay relay is malfunctioning.	Use a jumper wire to bypass time delay relay. If table moves, relay is malfunctioning. Put a multimeter in line w/time delay relay and run each cylinder one at a time.	A multimeter reading >1.2 amps indicates a malfunctioning cylinder has caused the relay to fail. Replace the malfunctioning cylinder ***and*** the time delay relay. If reading is <1.2 amps, replace time delay relay ***only***. Refer to para 4.18.
	When any footswitch / switch is depressed, motor pump runs and solenoid can be heard energizing.	Hydraulic system is low on mineral oil.	Check oil level in reservoir.	If necessary, add oil to reservoir. Refer to para 4.3.
	When any footswitch / switch is depressed, motor pump hums, but does not run.	Capacitor(s) is blown.	Replace suspect capacitor(s) with known working capacitor(s).	Replace capacitor(s). Refer to para 4.19.
		Motor pump is locked up or burned out.	Replace suspect motor pump with known working motor pump.	Replace motor pump. Refer to para 4.9, or 4.10.
The TABLE UP, TILT UP, and BACK UP functions do not work, but TABLE DOWN, TILT DOWN, and BACK DOWN functions do.	Motor pump runs when an up function footswitch / switch is depressed, but table top does not move.	Anti-cavitation solenoid valve is malfunctioning.	Check for slight magnetism on bottom side of anti-cavitation solenoid valve, indicating solenoid is not burned out or replace suspect anti-cavitation solenoid valve with known working anti-cavitation solenoid valve.	Replace anti-cavitation solenoid valve. Refer to para 4.6.
		Wire connections loose.	Check all wiring connections from terminal block to anti-cavitation solenoid valve. Use multimeter to check for proper voltage levels.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Up function shuttle valve is malfunctioning.	Check to see if check ball is loose in up function shuttle valve or adjacent elbow (check ball should be held in shuttle valve by metal ring).	Replace up function shuttle valve. Refer to para 4.4.

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Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
The TABLE UP, TILT UP, and BACK UP functions do not work, but TABLE DOWN, TILT DOWN, and BACK DOWN functions do - Continued.	Motor pump runs when an up function footswitch / switch is depressed, but table top does not move - Continued.	Up functions relief valve is malfunctioning (popping relief too early).	Replace suspect up functions relief valve with known working relief valve.	Replace up functions relief valve. Refer to para 4.7.
		Motor pump is defective.	Replace suspect motor pump with known working motor pump.	Replace motor pump. Refer to para 4.9, or 4.10.
		Wire connections loose.	Check all wiring connections from terminal block to motor pump. Use multimeter to check for proper voltage levels.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	Motor pump does not run when an up function is selected, but does when a down function is selected.	Motor pump is defective	Replace suspect motor pump with known working motor pump.	Replace motor pump. Refer to para 4.9, or 4.10.
		Wire connections loose.	Check all wiring connections from terminal block to motor pump.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Manual functions relay (CR1) is malfunctioning.	Check to see if manual functions relay (CR1) is energizing when an up function is selected. Also, check to see if there is voltage at terminal 4 of subswitch CR1-A when manual functions relay (CR1) is energized.	If manual functions relay (CR1) will not energize or if subswitch CR1-A does not close when CR1 is energized, then replace manual functions relay (CR1). Refer to para 4.20.
The TABLE DOWN, TILT DOWN, and BACK DOWN functions do not work, but TABLE UP, TILT UP, and BACK UP functions do.	Motor pump runs when a down function footswitch / switch is depressed, but table top does not move.	Down function shuttle valve is malfunctioning.	Check to see if check ball is loose in down function shuttle valve or adjacent elbow (check ball should be held in shuttle valve by metal ring).	Replace down function shuttle valve. Refer to para 4.5.
		Down functions relief valve is malfunctioning (popping relief too early).	Replace suspect down functions relief valve with known working relief valve.	Replace down functions relief valve. Refer to para 4.8.
		Motor pump is defective.	Replace suspect motor pump with known working motor pump.	Replace motor pump. Refer to para 4.9, and 4.10.
		Wire connections loose.	Check all wiring connections from terminal block to motor pump.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
The TABLE DOWN, TILT DOWN, and BACK DOWN functions do not work, but TABLE UP, TILT UP, and BACK UP functions do - Continued.	Motor pump does not run when a down function is selected, but runs when an up function is selected.	Motor pump is defective.	Replace suspect motor pump with known working motor pump.	Replace motor pump. Refer to para 4.9, or 4.10.
		Wire connections loose.	Check all wiring connections from terminal block to motor pump.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Subswitch CR1-B of manual functions relay (CR1) is malfunctioning - contacts are stuck open .	Check to see if contacts of subswitch N.C. CR1-B are closed when manual function relay (CR1) is not energized. There should be continuity between terminals 2 and 8 of subswitch CR1-B when CR1 is not energized.	If there is no continuity between terminals 2 and 8 of subswitch CR1-B when CR1 is not energized, replace manual function relay (CR1). Refer to para 4.20.
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.	Motor pump runs but base cylinder solenoid valve does not energize or vice versa.	TABLE UP / DOWN footswitch(es) are out of adjustment.	Check adjustment of TABLE UP / DOWN footswitches.	Adjust TABLE UP / DOWN footswitches. Refer to para 4.17.
		One of TABLE UP / DOWN footswitches is malfunctioning.	Perform a continuity check on suspect footswitch in ON and OFF positions or replace suspect footswitch with known working footswitch.	Replace footswitch. Refer to para 4.17.
		Wire connection to footswitch is loose.	Check all wiring connections on suspect footswitch.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
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.	Motor pump does not run and back cylinder solenoid valve does not energize.	BACK UP / DOWN switch is malfunctioning.	See Figure 2-2 (page 2-11) for this check. Perform a continuity check on BACK UP / DOWN switch as follows: Press BACK UP / DOWN switch to DOWN and then check for continuity across contact points A and B. Press BACK UP / DOWN switch to UP and then check for continuity across contact points C and D.	If continuity check fails, replace BACK UP / DOWN switch. Refer to para 4.20.
	Motor pump runs but back cylinder solenoid valve does not energize or vice versa.	Wire connection to BACK UP / DOWN switch is loose.	Check all wiring connections on suspect BACK UP / DOWN switch.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

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Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
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 - Continued.	Motor pump runs but back cylinder solenoid valve does not energize or vice versa - Continued.	BACK UP / DOWN switch is malfunctioning.	See Figure 2-2 (page 2-11) for this check. Perform a continuity check on BACK UP / DOWN switch as follows: Press BACK UP / DOWN switch to DOWN and then check for continuity across contact points A and B. Press BACK UP / DOWN switch to UP and then check for continuity across contact points C and D.	If continuity check fails, replace BACK UP / DOWN switch. Refer to para 4.16.
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.	Motor pump does not run and tilt cylinder solenoid valve does not energize.	TILT UP / DOWN switch is malfunctioning.	See Figure 2-2 (page 2-11) for this check. Perform a continuity check on TILT UP / DOWN switch as follows: Press TILT UP / DOWN switch to DOWN and then check for continuity across contact points A and B. Press TILT UP / DOWN switch to UP and then check for continuity across contact points C and D.	If continuity check fails, replace TILT UP / DOWN switch. Refer to para 4.16.
	Motor pump runs but tilt cylinder solenoid valve does not energize or vice versa.	Wire connection to TILT UP / DOWN switch is loose.	Check all wiring connections on suspect TILT UP / DOWN switch.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		TILT UP / DOWN switch is malfunctioning.	See Figure 2-2 (page 2-11) for this check. Perform a continuity check on TILT UP / DOWN switch as follows: Press TILT UP / DOWN switch to DOWN and then check for continuity across contact points A and B. Press TILT UP / DOWN switch to UP and then check for continuity across contact points C and D.	If continuity check fails, replace TILT UP / DOWN switch. Refer to para 4.16.
TABLE UP and TABLE DOWN functions do not work. All other functions work.	Motor pump runs when TABLE UP or TABLE DOWN foot pedal is depressed, but table top does not move.	Base cylinder solenoid valve is malfunctioning.	Check to see if base cylinder solenoid valve energizes (audible click) when TABLE UP or TABLE DOWN footswitch is depressed.	Replace base cylinder. Refer to para 4.14.
		Wire running from terminal block to base cylinder solenoid valve is broken or disconnected.	Check continuity of wire and connections.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
	Motor pump does not run when TABLE UP or TABLE DOWN foot pedal is depressed.	White wire which is running to a pole on each footswitch is broken or disconnected.	Check continuity of white wire and connections.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

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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.	Motor pump runs when BACK UP or BACK DOWN function is selected, but table top does not move.	Back cylinder solenoid valve is malfunctioning.	Check to see if back cylinder solenoid valve energizes (audible click) when BACK UP or BACK DOWN function is selected.	Replace back cylinder. Refer to para 4.12.
		Wire running from terminal block to back cylinder solenoid valve is broken or disconnected.	Check continuity of wire and connections.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
TILT UP and TILT DOWN functions do not work. All other functions work.	Motor pump runs when TILT UP or TILT DOWN function is selected, but table top does not move.	Tilt cylinder solenoid valve is malfunctioning.	Check to see if tilt cylinder solenoid valve energizes (audible click) when TILT UP or TILT DOWN function is selected.	Replace tilt cylinder. Refer to para 4.13.
		Wire running from terminal block to tilt cylinder solenoid valve is broken or disconnected.	Check continuity of wire and connections.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
Auto return function does not operate properly.	Nothing happens when the AUTO RETURN "RETURN" switch is pressed.	AUTO RETURN "RETURN" switch is malfunctioning.	Perform continuity check on AUTO RETURN "RETURN" switch. When switch is depressed, there should be continuity.	Replace AUTO RETURN "RETURN" switch. Refer to para 4.15.
		AUTO RETURN “STOP” switch is malfunctioning - stuck open.	Perform continuity check on AUTO RETURN “STOP” switch. When switch is not depressed, there should be continuity.	Replace AUTO RETURN “STOP” switch. Refer to para 4.15.
		Auto return relay (CR2) is malfunctioning - not energizing.	Check to see if auto return relay (CR2) is energizing when AUTO RETURN “RETURN” button is depressed.	If auto return relay (CR2) will not energize, replace auto return relay (CR2). Refer to para 4.20.
		Base down limit switch is tripped.	Chair is already lowered all the way down, tripping limit switch or base down limit switch is out of adjustment, causing base down limit switch to remain tripped or to trip earlier than desired.	Adjust base down limit switch. Refer to para 4.22.
		Tilt down limit switch is tripped.	Chair is already lowered all the way down, tripping limit switch or tilt down limit switch is out of adjustment, causing tilt down limit switch to remain tripped or to trip earlier than desired.	Adjust tilt down limit switch. Refer to para 4.21.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Auto return function does not operate properly - Continued.	When the AUTO RETURN "RETURN" switch is pressed, motor pump runs, but table top does not move.	Subswitch CR2-B of auto return relay (CR2) is malfunctioning - contacts are stuck open.	Check to see if contacts of N.O. subswitch CR2-B are closed when auto return relay (CR2) is energized. There should be 115 VAC at terminal 4 of subswitch CR2-B when relay CR2 is energized.	If 115 VAC is not present at terminal 4 of subswitch CR2-B when relay CR2 is energized, replace auto return relay (CR2). Refer to para 4.20.
		Wire connections loose.	Check wire connections. Perform continuity check on wires. Use multimeter to check for proper voltage levels.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.
		Tilt down limit switch is malfunctioning.	When tilt down limit switch is untripped, there should be continuity between terminals 3 and 4 of limit switch.	If there is no continuity between terminals 3 and 4 of tilt down limit switch when switch is in untripped state, replace tilt down limit switch. Refer to para 4.21.
		Tilt down limit switch is malfunctioning.	When tilt down limit switch is tripped, there should be continuity between terminals 5 and 6 of limit switch.	If there is no continuity between terminals 5 and 6 of tilt down limit switch when switch is tripped, replace tilt down limit switch. Refer to para 4.21.
	When the AUTO RETURN "RETURN" switch is pressed, tilt or base cylinder solenoid valve energizes (audible click), but motor pump does not run.	Subswitch CR2-C of auto return relay (CR2) is malfunctioning - contacts are stuck open.	Check to see if contacts of N.O. subswitch CR2-C are closed when auto return relay (CR2) is energized. There should be 115 VAC at terminal 6 of subswitch CR2-C when CR2 is energized.	If 115 VAC is not present at terminal 6 of subswitch CR2-C when relay CR2 is energized, replace auto return relay (CR2). Refer to para 4.20.
	Auto return function stops when operator releases the AUTO RETURN "RETURN" button.	One of the two N.C. AUTO RETURN "STOP" switches are stuck open.	Perform continuity check on N.C. AUTO RETURN "STOP" switch. Should be continuity across switch when switch is not depressed.	Replace AUTO RETURN "STOP" switch. Refer to para 4.15.
		N.O. subswitch CR2-A of auto return relay (CR2) does not close.	Perform check on N.O. subswitch CR2-A. There should be 115 VAC at terminal 8 of auto return relay (CR2), when AUTO RETURN "RETURN" button is pressed.	If 115 VAC is not present at terminal 8 of subswitch CR2-A when relay CR2 is energized, replace auto return relay (CR2). Refer to para 4.20.
		Wire connections loose.	Check wire connections to terminals 5 and 8 of auto return relay (CR2). Perform continuity check on wires. Use multimeter to check for proper voltage levels.	Clean any dirty connections. Tighten any loose connections. Replace any damaged connections.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Auto return function does not operate properly - Continued.	Motor pump continues to run after table top is completely lowered.	Base down limit switch is out of adjustment.	Check adjustment of base down limit switch.	Adjust base down limit switch. Refer to para 4.22.
		Tilt down limit switch is malfunctioning.	See Figure 5-1 for this check. There should not be continuity between terminals 7 and 8 of tilt down limit switch when limit switch is tripped.	Replace tilt down limit switch. Refer to para 4.21.
		Base down limit switch is malfunctioning.	See Figure 5-1 for this check. There should not be continuity between terminals 7 and 8 of base down limit switch when switch when limit switch is tripped.	Replace base down limit switch. Refer to para 4.22.
		Auto return relay (CR2) is malfunctioning - stuck in energized position.	See Figure 5-1 for this check. Perform continuity check on all subswitch contacts.	Replace auto return relay (CR2). Refer to para 4.20.
	Auto return function does not stop when one of the AUTO RETURN "STOP" buttons are pressed.	The AUTO RETURN "STOP" button is malfunctioning - contacts are broken open.	Perform continuity check on AUTO RETURN "STOP" button.	Replace AUTO RETURN "STOP" button. Refer to para 4.15.
		N.O. subswitch CR2-A of auto return relay (CR2) is stuck closed.	Perform check on N.O. subswitch CR2-A. There should not be 115 VAC at terminal 8 of auto return relay (CR2) after a STOP button has been pressed.	If 115 VAC is present at terminal 8 of subswitch CR2-A after STOP button has been pressed, replace auto return relay (CR2). Refer to para 4.20.
Any of the three functions drift by themselves.	Chair functions properly otherwise.	A cylinder solenoid valve is stuck in open position or is malfunctioning.	Try to flush foreign objects out of cylinder solenoid valve by running oil through cylinder in both directions ten times.	Replace malfunctioning cylinder assembly.
		A footswitch / switch is malfunctioning and holding cylinder solenoid valve in the open position.	Perform continuity check on suspect function's footswitch / switch.	Replace footswitch or switch.
Back section of table top may be lifted by hand or tilt function may drift by itself.	Chair functions properly otherwise.	Anti-cavitation solenoid valve is malfunctioning.	Replace suspect anti-cavitation solenoid valve with known working anti-cavitation solenoid valve.	Replace anti-cavitation solenoid valve. Refer to para 4.6.

Table 2-1. Troubleshooting Guide - Continued

Problem	Symptom	Probable Cause	Check	Correction
Chair moves fine for light patient, but will not move or moves slowly for very heavy patient.	Occurs for both the up and down functions.	Hydraulic system is low on mineral oil.	Check oil level in reservoir.	If necessary, add oil to reservoir. Refer to para 4.3.
		Up functions and down functions relief valves are malfunctioning.	Replace suspect relief valves with known working relief valves.	Replace up functions and down functions relief valves. Refer to paras 4.7 and 4.8.
	Occurs for up functions only.	Up functions relief valve is malfunctioning.	Replace suspect up functions relief valve with known working relief valve.	Replace up functions relief valve. Refer to para 4.7.
	Occurs for down functions only.	Down function relief valve is malfunctioning.	Replace suspect down functions relief valve with known working relief valve.	Replace down functions relief valve. Refer to para 4.8.
Excessive sideways play of chair top.	Chair is not stable and can be moved from side to side.	Chain assemblies are loose.	Check tension of chain assemblies.	Adjust tension of chain assemblies. Refer to para 4.23.
		Base slide assembly is worn or deformed.	Check condition of base slide assembly.	Replace base slide assembly. Refer to para 4.24.

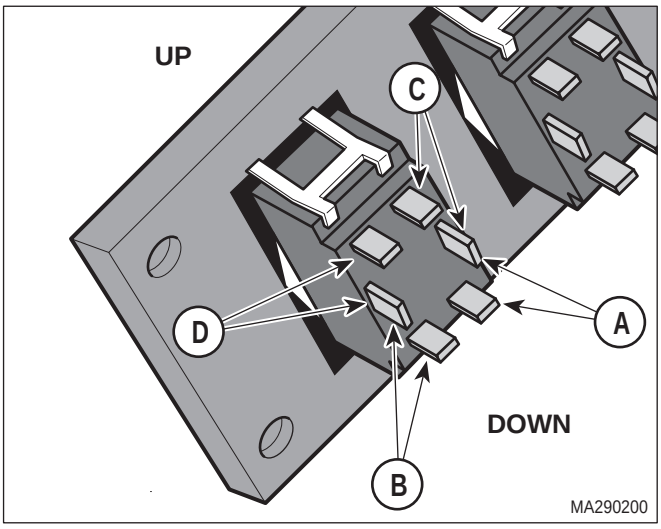

Figure 2-2. Continuity Check of Switch

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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 chair. 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 chair for obvious damage such as: cracks in components, missing components, dents in components, leaking oil, or any other visible damage which would cause chair to be unsafe to operate or would compromise its performance. Repair chair as necessary.
	Fasteners / hardware	Check chair 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. Replace decals as necessary.
	Pivot points / moving parts / accessories	Lubricate all exposed pivot points, moving parts, and accessories with silicone based lubricant.
	Hydraulic hoses and fittings	Check all hydraulic hoses and fittings for leaks. Replace any components causing leaks. Replace any hoses which have kinks, cuts, holes, or other damage.
	Foot control	Check that foot control works correctly. Make sure foot pedals contact switches properly. Adjust foot switches if necessary. Refer to para 4.17.
	Hydraulic functions	Check that all three functions operate properly. If not, refer to the Troubleshooting Guide to determine the cause of the problem. Clean or replace components as necessary.
	Cylinders	Inspect all cylinders for signs of internal leaking or for weak operation. Replace cylinders as necessary.
	Drift in chair	Check each cylinder to see if it drifts. Replace cylinder if necessary.
	Oil level	Check oil level in motor pump. Add oil to motor pump if necessary. Refer to para 4.3.
	Excessive sideways play of chair top	Check that chair top does not have excessive side play. Adjust chain assembly if necessary. Refer to para 4.23.
	Anti-cavitation solenoid valve	Check to see if back section may be lifted by hand or if the tilt function drifts by itself. If so, replace anti-cavitation solenoid valve. Refer to para 4.6.
	Auto return function	Check both AUTO RETURN "RETURN" buttons and both AUTO RETURN "STOP" buttons for proper operation. If necessary, replace buttons. Refer to para 4.15. Check that the auto return function operates properly.
	Upholstery	Check all upholstery for rips, tears, or excessive wear. Replace cushions as necessary.
	Reclining arm	Check reclining arm for proper operation. Make sure retaining plunger hold reclining arm in position when used. Repair as necessary.
	Foot section brake	Check to see if brake for foot section assembly is locking and releasing correctly. Replace brake if 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 chair is operating within its specifications (Refer to para 2.1). Replace or adjust any malfunctioning components.

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SECTION IV
MAINTENANCE / SERVICE INSTRUCTIONS

4.1 Introduction

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

NOTE
Perform an operational test on the chair 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 chair.

4.2 Motor Cover Assembly Removal / Installation

A. Removal

WARNING
Always disconnect the power cord from the wall outlet before removing any of the chair'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 power cord from wall outlet.

(2) Remove six screws (1, Figure 4-1) and motor cover assembly (2) from back outer shroud (3).

B. Installation

(1) Install motor cover assembly (2) against back outer shroud (3) and secure with six screws (1), making sure top edge of motor cover assembly is inserted behind lip (A) of back outer shroud.

(2) Plug power cord into wall outlet.

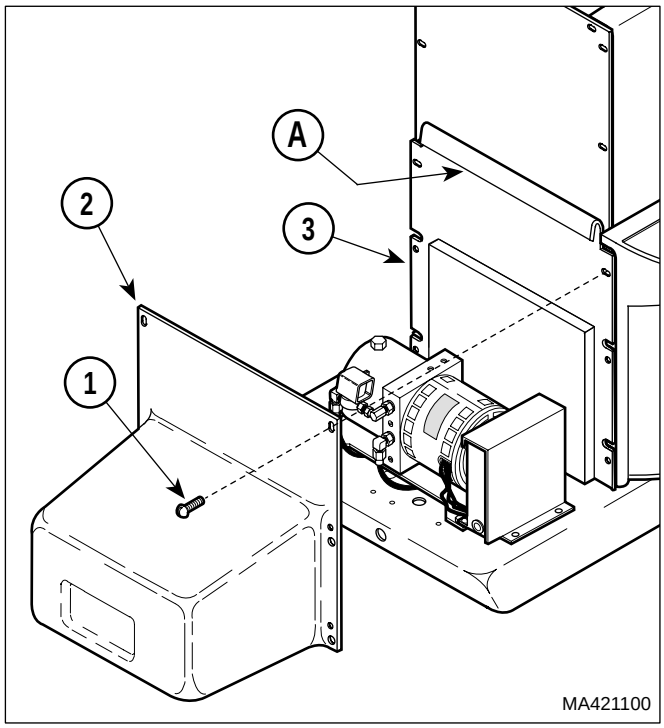

Figure 4-1. Motor Cover Assembly Removal / Installation

4.3 Checking / Adding Oil To Motor Pump

A. Checking / Adding Oil

(1) Move the TABLE DOWN, BACK DOWN, and TILT DOWN functions all the way down.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove filler cap (1, Figure 4-2) from motor pump (2).

NOTE
Newer models do not have oil level check hole (A) or screw (3). Check oil level thru fill port.

(4) Remove screw (3) and gasket (4) from motor pump (2).

(5) Check oil level. If oil level in reservoir is not even with oil level check hole (A), oil must be added.

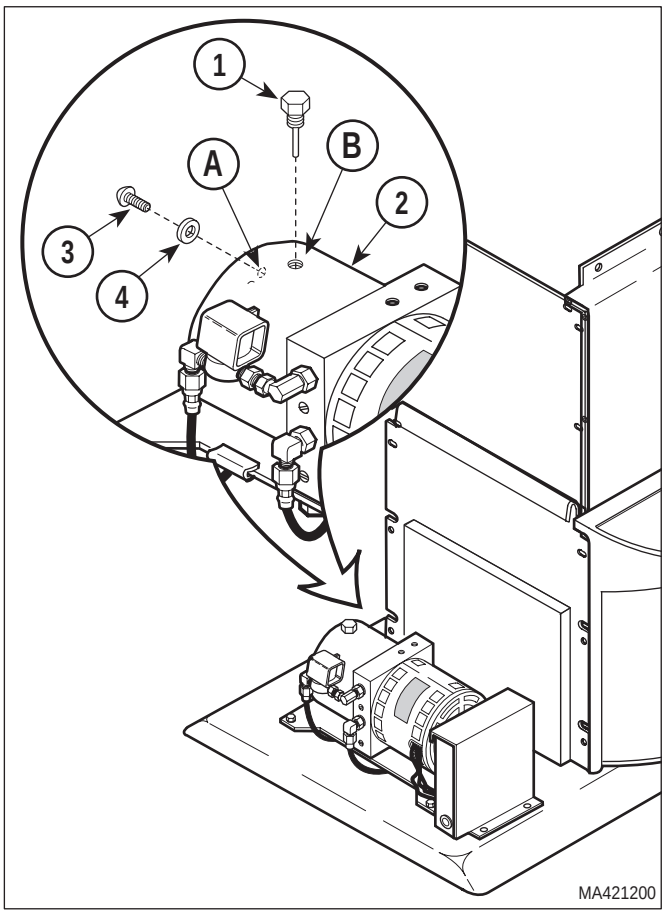

Figure 4-2. Checking / Adding Oil To Motor Pump

(6) Place a rag under oil level check hole (A).

EQUIPMENT ALERT
Hydraulic system is designed for use with light grade mineral oil only. Failure to comply could result in hydraulic system failure.

(7) Add oil to fill hole (B) until oil starts to run out of oil level check hole (A).

(8) Install gasket (4) and screw (3) on motor pump (2).

(9) Install filler cap (1) on motor pump (2).

(10) Move each function to its up and down limit several times. Then repeat steps 1 thru 9.

(11) Install motor cover assembly (Refer to para 4.2).

(12) Dispose of used oil in accordance with local regulations.

4.4 Up Functions Shuttle Valve Removal / Installation

A. Removal

WARNING
Always disconnect the power cord from the wall outlet before removing any of the chair'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 power cord from wall outlet.

(2) Remove motor cover (Refer to para 4.2).

NOTE
The up functions shuttle valve is lower than the oil level in the motor pump reservoir and oil will flow out of the up functions shuttle valve once the hose assembly is disconnected.

(3) Place drain pan (A) under up functions shuttle valve (1, Figure 4-3).

(4) Disconnect hose assembly (2) from elbow (B) of up functions shuttle valve (1).

(5) Remove up functions shuttle valve (1) from motor pump (3).

B. Installation

(1) Coat two o-rings (C) on up functions shuttle valve (1) with mineral oil or vaseline.

(2) Install up functions shuttle valve (1) in motor pump (3).

(3) Connect hose assembly (2) to elbow (B) of up functions shuttle valve (1).

(4) If necessary, add oil to motor pump (Refer to para 4.3).

(5) Install motor cover assembly (Refer to para 4.2).

(6) Plug power cord into wall outlet.

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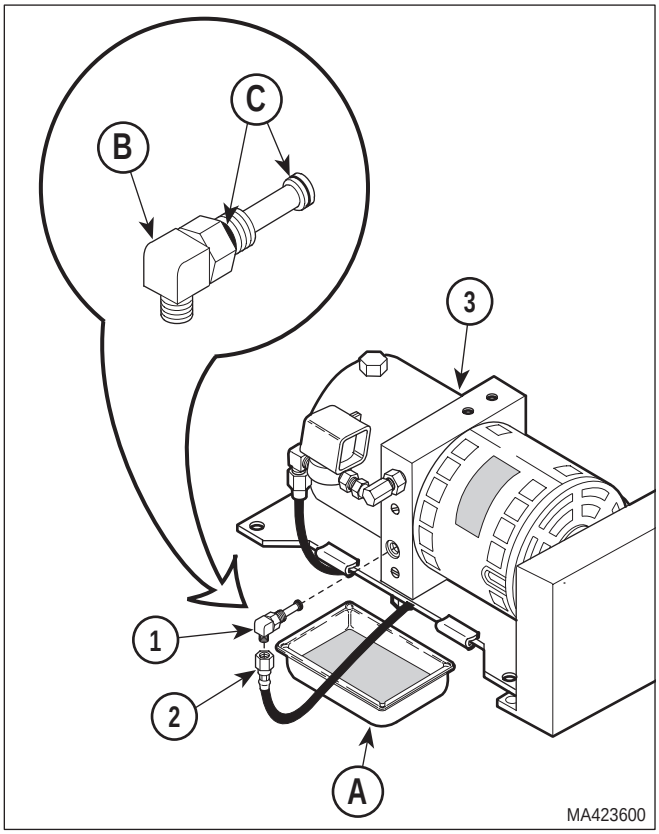

Figure 4-3. Up Functions Shuttle Valve Removal / Installation

(7) Dispose of used oil in accordance with local regulations.

4.5 Down Functions Shuttle Valve Removal / Installation

A. Removal

WARNING

Always disconnect the power cord from the wall outlet before removing any of the chair'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 power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

NOTE

The down functions shuttle valve is slightly lower than the oil level in the motor pump reservoir and oil will flow out of the down functions shuttle valve once the hose assembly is disconnected.

(3) Place rags or drain pan (A) under down functions shuttle valve (1, Figure 4-4).

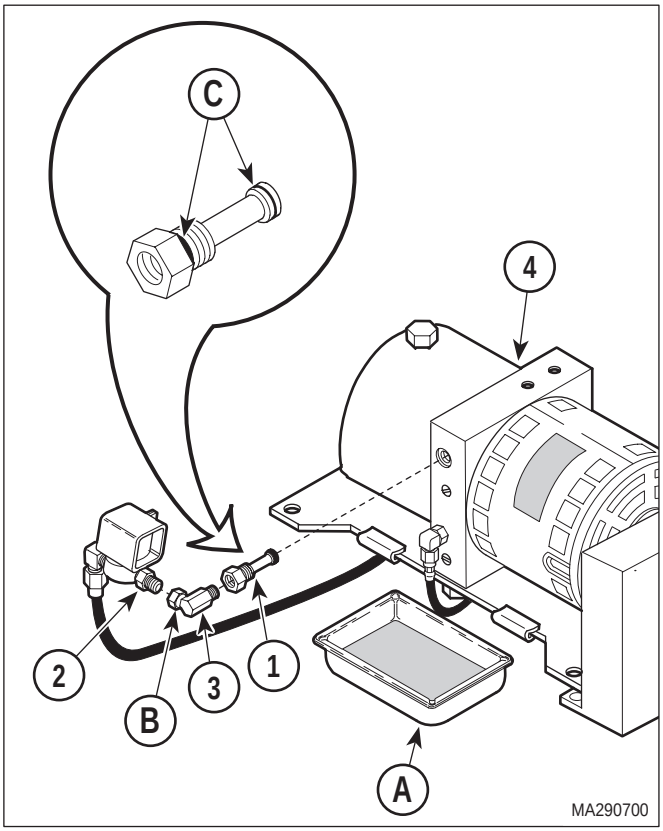

Figure 4-4 Down Functions Shuttle Valve Removal / Installation

(4) Using a wrench to hold male connector (2) stationary, loosen jam nut (B) of elbow (3). Disconnect elbow from male connector.

(5) Remove elbow (3) from down function shuttle valve (1).

(6) Remove down functions shuttle valve (1) from motor pump (4).

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B. Installation

NOTE
The down functions shuttle valve is sent from factory with an elbow installed on it. Remove it per step 1.

(1) Remove elbow from down function shuttle valve (1). Discard elbow.

(2) Coat two o-rings on down functions shuttle valve (1) with mineral oil or vaseline.

(3) Install down functions shuttle valve (1) in motor pump (4).

(4) Coat threads of male connector (2) and elbow (3) with pipe thread tape or sealant.

(5) Install elbow (3) on down functions shuttle valve (1).

(6) Connect elbow (3) to male connector (2) and secure by tightening jam nut (B).

(7) If necessary, add oil to motor pump (Refer to para 4.3).

(8) Install motor cover assembly (Refer to para 4.2).

(9) Plug power cord into wall outlet.

(10) Dispose of used oil in accordance with local regulations.

4.6 Anti-Cavitation Solenoid Valve Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove two screws (1, Figure 4-5) and control cover (2) from control panel (3).

(4) Loosen two terminal screws (A); then tag and disconnect anti-cavitation solenoid valve wires (4) from terminal block (5).

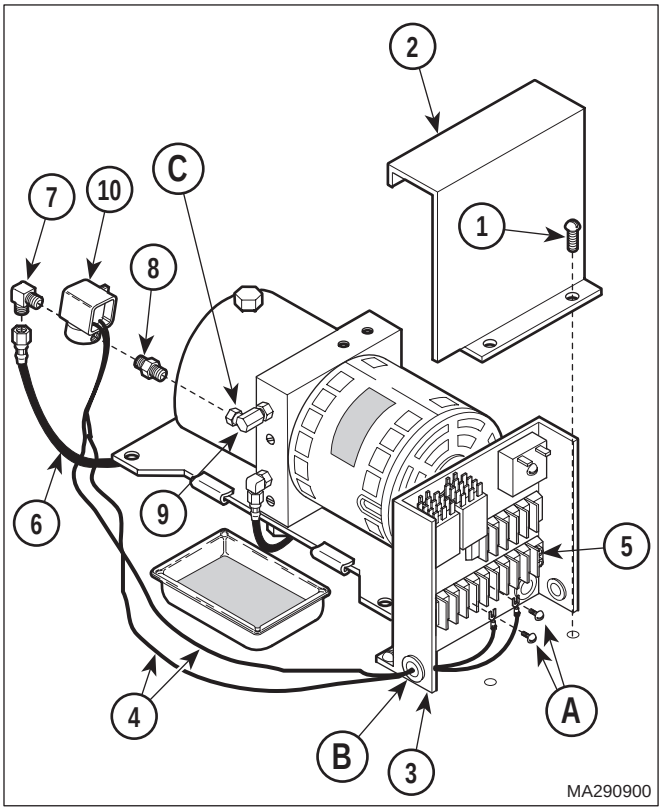

Figure 4-5 Anti-cavitation Solenoid Valve Removal / Installation

(5) Pull anti-cavitation solenoid valve wires (4) out thru wire hole (B).

(6) Disconnect hose assembly (6) from elbow (7).

(7) Using a wrench to hold male connector (8) stationary, loosen jam nut (C) of elbow (9). Disconnect male connector from elbow (9).

(8) Remove elbow (7) and male connector (8) from anti-cavitation solenoid valve (10).

B. Installation

EQUIPMENT ALERT
Do not coat last two threads of elbow (7) and male connector (8) with teflon tape or sealant. Otherwise, little particles of the tape / sealant can break loose and can contaminate hydraulic system.

(1) Coat threads of elbow (7) and male connector (8) with pipe thread tape or sealant.

(2) Install elbow (7) and male connector (8) on anti-cavitation solenoid valve (10).

(3) Connect hose assembly (6) to elbow (7).

(4) Coat threads of male connector (8) with pipe thread tape or sealant.

(5) Connect elbow (9) to male connector (8) and secure by tightening jam nut.

(6) Feed two anti-cavitation solenoid valve wires (4) thru wire hole (B).

(7) Connect two anti-cavitation solenoid valve wires (4) to terminal block (5) and secure by tightening two terminal screws (A).

(8) Install control cover (2) on control panel (3) and secure with two screws (1).

(9) Install motor cover assembly (Refer to para 4.2).

(10) Plug power cord into wall outlet.

4.7 Up Functions Relief Valve Removal / Installation

A. Removal

(1) If possible, raise TABLE UP function all the way up.

(2) Unplug power cord from wall outlet.

(3) Remove motor cover assembly (Refer to para 4.2).

(4) Remove four screws (1, Figure 4-6) and back outer shroud (2) from left and right hand outer shrouds (3).

NOTE
The back inner shroud must be removed if it will obstruct removal of up functions relief valve.

(5) If necessary, remove eight screws (4) and back inner shroud (5) from left and right hand inner shrouds (6).

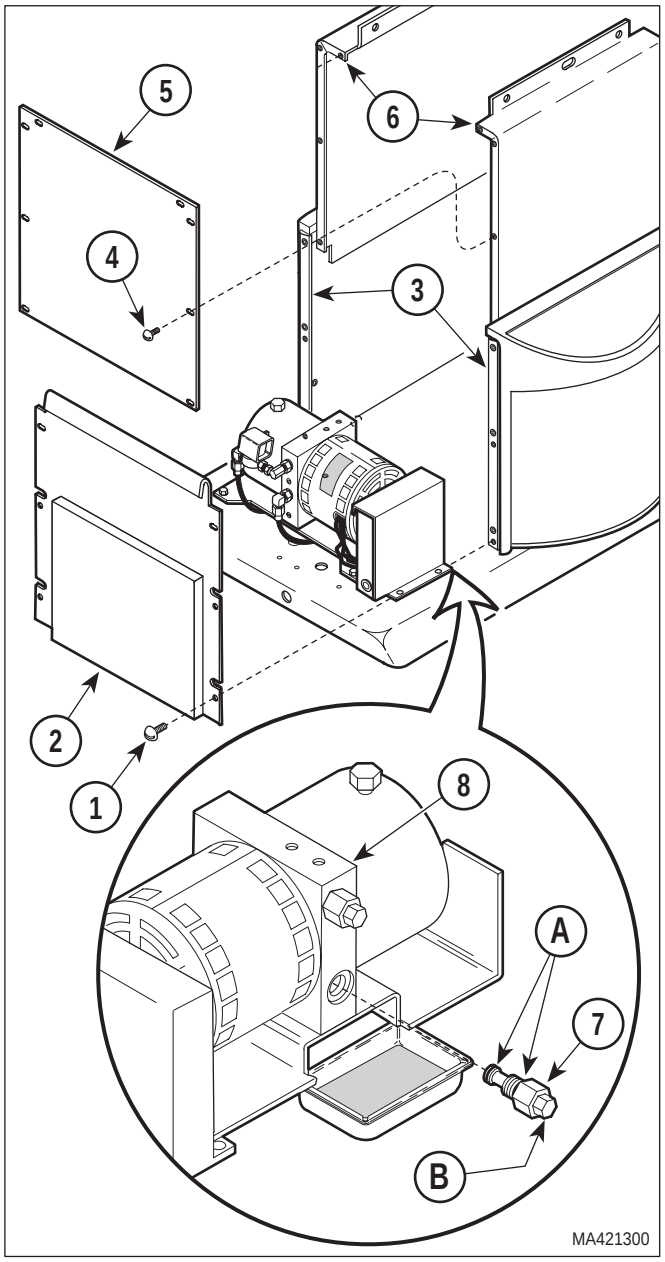

Figure 4-6. Up Functions Relief Valve Removal / Installation

NOTE
Oil will flow out of relief valve port when up functions relief valve is removed. Either have the new up functions relief valve ready to install or place a drain pan under relief valve port to catch oil.

(6) Remove up functions relief valve (7) from motor pump (8).

B. Installation

(1) Coat two o-rings (A) on up functions relief valve (7) with mineral oil or vaseline.

EQUIPMENT ALERT
Make sure relief valve (B) has "600" stamped on its hex head; it *must not* be stamped "L2". Failure to install proper relief valve will result in faulty table performance.

(2) Install up functions relief valve (7) in motor pump (8).

(3) If removed, install back inner shroud (5) on left and right inner shrouds (6) and secure with eight screws (4).

(4) Install back outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(5) If necessary, add oil to motor pump (Refer to para 4.3).

(6) Install motor cover assembly (Refer to para 4.2).

(7) Plug power cord into wall outlet.

(8) Dispose of used oil in accordance with local regulations.

4.8 Down Functions Relief Valve Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove four screws (1, Figure 4-7) and back outer shroud (2) from left and right hand outer shrouds (3).

NOTE
The back inner shroud must be removed if it will obstruct removal of down functions relief valve.

(4) If necessary, remove eight screws (4) and back inner shroud (5) from left and right hand inner shrouds (6).

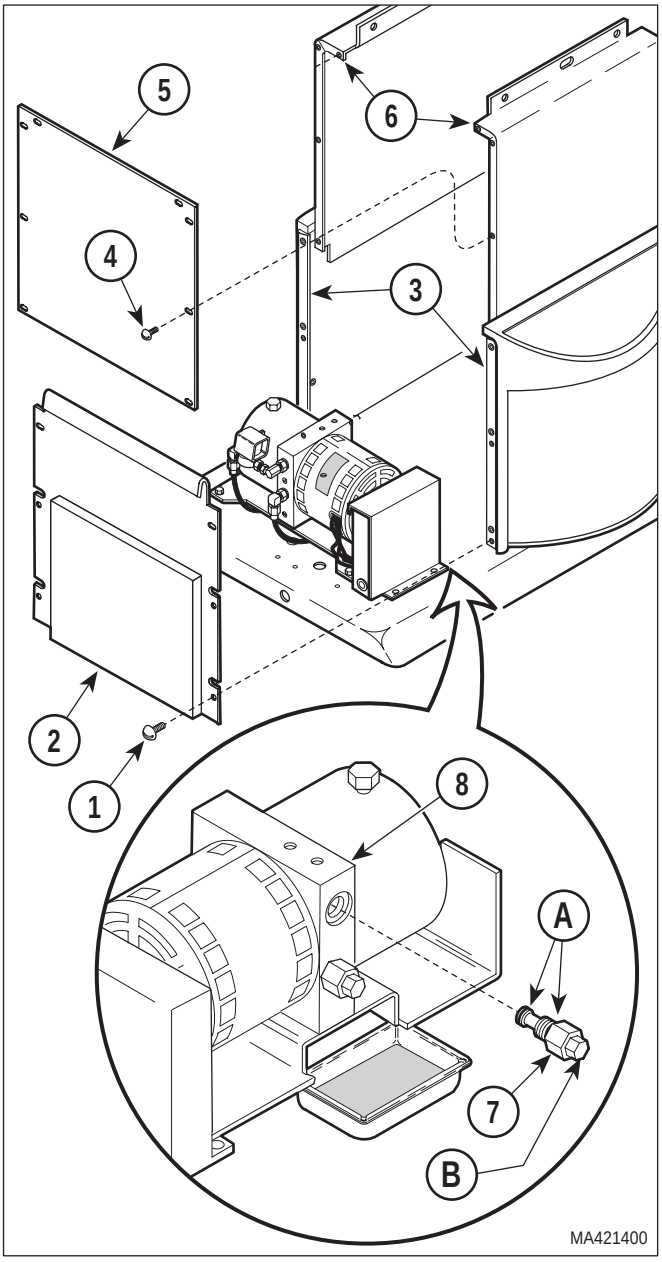

Figure 4-7. Down Functions Relief Valve Removal / Installation

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NOTE
Oil will flow out of relief valve port when down functions relief valve is removed. Either have the new down functions relief valve ready to install or place a drain pan under relief valve port to catch oil.

(5) Remove down functions relief valve (7) from motor pump (8).

B. Installation

(1) Coat two o-rings (A) on down functions relief valve (7) with mineral oil or vaseline.

EQUIPMENT ALERT
Make sure relief valve (B) has "L2" stamped on its hex head; it *must not* be stamped "600". Failure to install proper relief valve will result in faulty table performance.

(2) Install down functions relief valve (7) in motor pump (8).

(3) If removed, install back inner shroud (5) on left and right inner shrouds (6) and secure with eight screws (4).

(4) Install back outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(5) If necessary, add oil to motor pump (Refer to para 4.3).

(6) Install motor cover (Refer to para 4.2).

(7) Plug power cord into wall outlet.

(8) Dispose of used oil in accordance with local regulations.

4.9 Motor Pump Assembly - Complete Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover (Refer to para 4.2).

(3) Remove four screws (1, Figure 4-8) and back outer shroud (2) from left and right hand outer shrouds (3).

(4) Remove two screws (4) and control cover (5) from control panel (6).

(5) Loosen three terminal screws (A); then tag and disconnect three motor pump wires (7) from terminal block (8).

(6) Pull motor pump wires (7) out thru wire hole (B).

(7) Loosen two terminal screws; then tag and disconnect anti-cavitation solenoid valve wires (9) from terminal block (8).

(8) Pull anti-cavitation solenoid valve wires (9) out thru wire hole (B).

(9) Remove four nuts (10) from four motor mounts (11).

(10) Disconnect hose assembly (12) from male elbow (13).

(11) Place a drain pan under elbow (14).

(12) Disconnect hose assembly (15) from elbow (14). Allow oil to drain into drain pan.

(13) Remove motor pump assembly (16) from four motor mounts (11).

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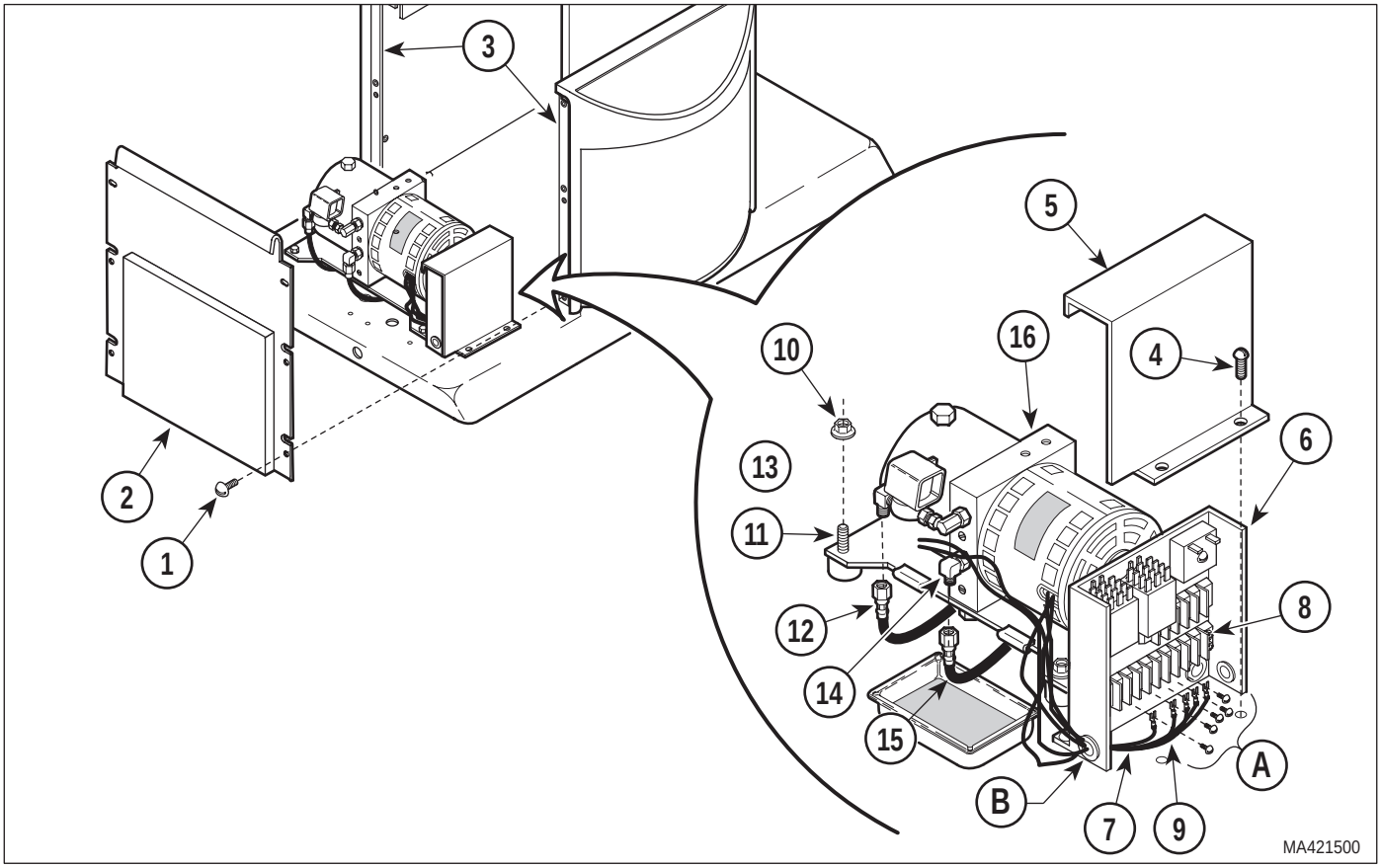

Figure 4-8. Motor Pump Assembly - Complete Removal / Installation

B. Installation

(1) Install motor pump assembly (16) on four motor mounts (11) and secure with four nuts (10).

(2) Connect hose assembly (15) to elbow (14).

(3) Connect hose assembly (12) to male elbow (13).

(4) Feed two anti-cavitation solenoid valve wires (9) thru wire hole (B).

(5) Connect two anti-cavitation solenoid valve wires (9) to terminal block (8) and secure by tightening two terminal screws (A).

(6) Feed three motor pump wires (7) thru wire hole (B).

(7) Connect three motor pump wires (7) to terminal block (8) and secure by tightening three terminal screws.

(8) Install control cover (5) on control panel (6) and secure with two screws (4).

(9) Install back outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(10) Add oil to motor pump (Refer to para 4.3).

(11) Install motor cover assembly (Refer to para 4.2).

(12) Plug power cord into wall outlet.

(13) Dispose of used oil in accordance with local regulations.

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4.10 Motor Pump Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor pump assembly - Complete (Refer to para 4.9).

(3) Remove filler cap (A) and drain any remaining oil into drain pan (See Figure 4-9).

(4) Using a wrench to hold male connector (1, Figure 4-12) stationary, loosen jam nut (B) of elbow (2). Disconnect male connector (1) of anti-cavitation solenoid valve (C) from elbow (2).

(5) Remove down functions shuttle valve (3) and up functions shuttle valve (4) from motor pump (5).

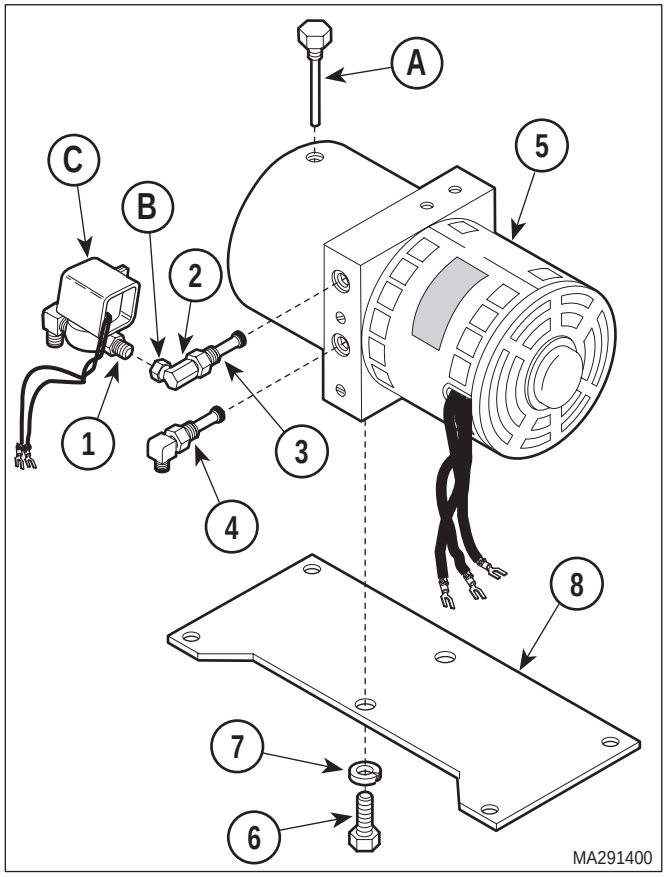

Figure 4-9. Motor Pump Removal / Installation

(6) Remove two screws (6), lockwashers (7), and motor base (8) from motor pump (5).

B. Installation

(1) Install motor base (8) on motor pump (5) and secure with two lockwashers (7) and screws (6).

(2) Coat o-rings of up functions shuttle valve (4) and down functions shuttle valve (3) with mineral oil or vaseline.

(3) Install up functions shuttle valve (4) and down functions shuttle valve (3) on motor pump (5).

(4) Coat threads of male connector (1) with pipe thread tape or sealant.

(5) Connect male connector (1) of anti-cavitation solenoid valve (C) to elbow (2) and secure by tightening jam nut (B).

(6) Install motor pump assembly (Refer to para 4.11).

(7) Plug power cord into wall outlet.

4.11 Motor Shaft Seal Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor pump (Refer to para 4.10).

NOTE
Reservoir is difficult to remove. Use a screwdriver to pry reservoir off of manifold block, but make sure not to damage o-ring (A).

(3) Remove four screws (1, Figure 4-11) and reservoir (2) from manifold block (3).

(4) Remove magnet (4) from strainer (5).

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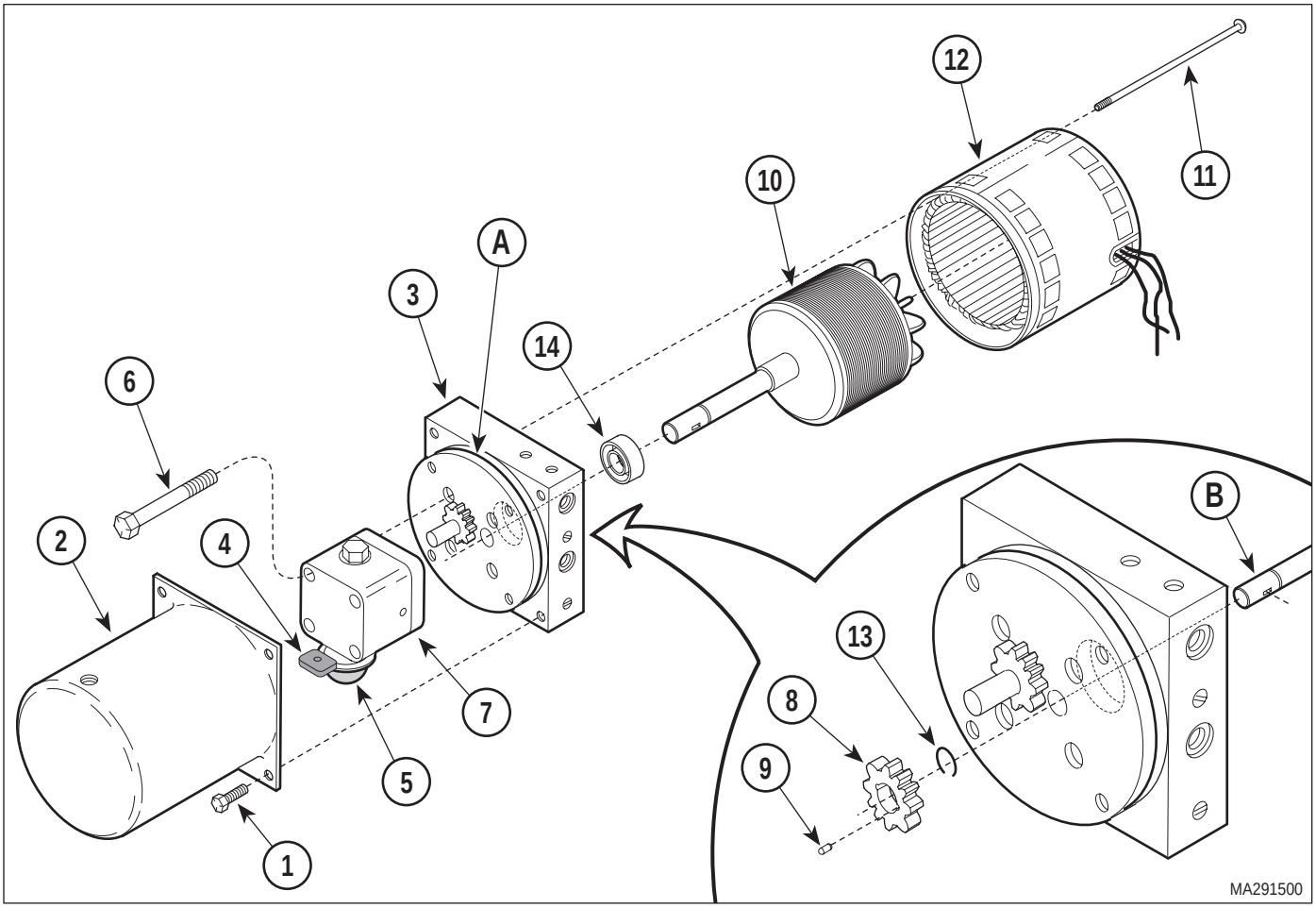

Figure 4-10. Motor Shaft Seal Removal / Installation

(5) Remove four screws (6) and pump housing (7) from manifold block (3).

(6) Remove pump gear (8) and woodruff key (9) from shaft of rotor assembly (10).

(7) Remove four screws (11) and motor housing (12) from manifold block (3).

(8) Push rotor assembly (10) inward toward manifold block (3); then remove retaining ring (13) from end of rotor assembly shaft.

(9) Remove rotor assembly (10) from manifold block (3).

(10) Using a screwdriver, pry motor shaft seal (14) out of manifold block (3).

B. Installation

(1) Clean all metal shavings off of all components.

(2) Coat new motor shaft seal (14) with vaseline or mineral oil.

EQUIPMENT ALERT
Do not allow motor shaft seal (B) to become cocked during installation or it will become impossible to install without damaging it.

(3) Using a hammer and 3/4 inch socket, install motor shaft seal (14) in manifold block (3).

(4) Slide shaft of rotor assembly (10) thru manifold block (3) and secure in place by installing retaining ring (13) on end of rotor assembly shaft.

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(5) Install motor housing (12) on manifold block (3) and secure with four screws (11).

(6) Install woodruff key (9) and pump gear (8) on shaft of rotor assembly (10).

(7) Install pump housing (7) on manifold block (3) and secure with four screws (6).

(8) Install magnet (4) on strainer (5).

(9) Make sure o-ring (A) on manifold block is present and clean. Coat o-ring with mineral oil.

NOTE
Strainer (5) may get in way when reservoir is being installed. If so, rotate strainer out of the way.

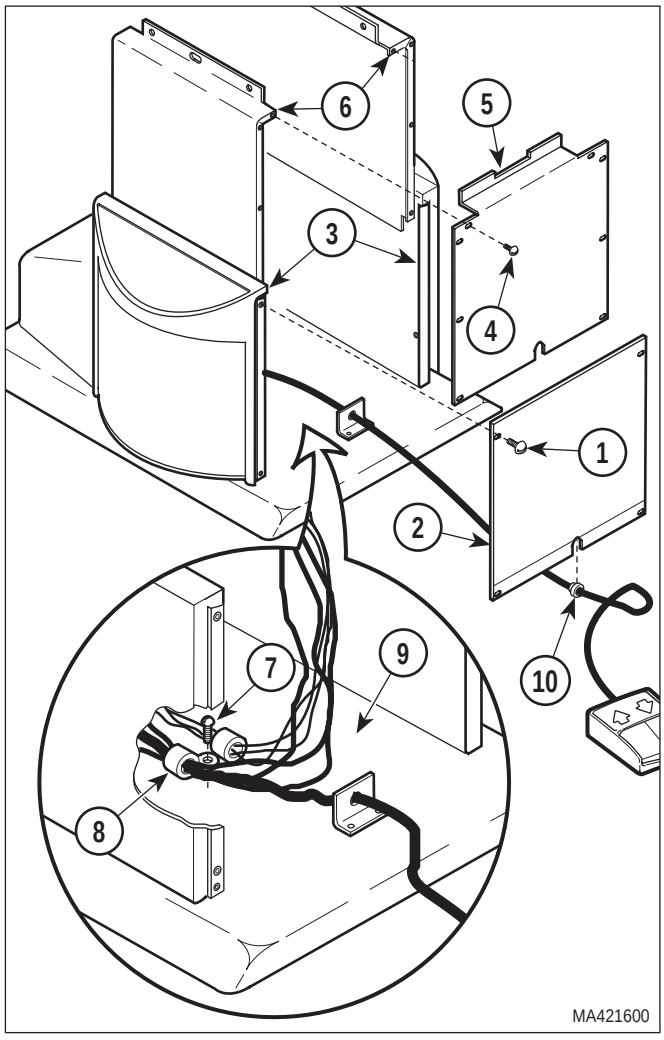

Figure 4-11. Table Access

(10) Install reservoir (2) on manifold block (3) and secure with four screws (1).

(11) Install motor pump (Refer to para 4.13).

(12) Plug power cord into wall outlet.

4.12 Back Cylinder Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove four screws (1, Figure 4-11) and front outer shroud (2) from left and right hand outer shrouds (3).

(3) Remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(4) Remove screw (7) and wire clip (8) securing wires and hoses to base weldment (9).

(5) Remove motor cover assembly (Refer to para 4.2).

(6) Remove two screws (1, Figure 4-12) and control cover (2) from control panel (3).

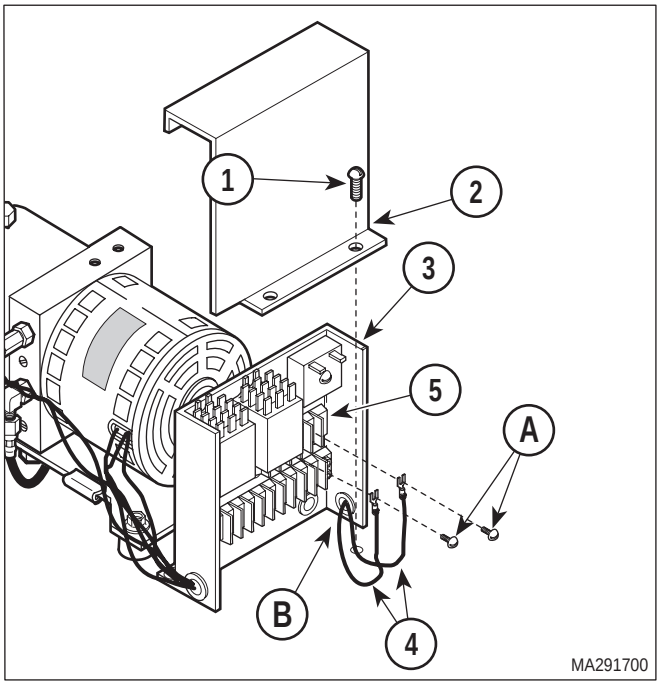

Figure 4-12. Back Cylinder Wires Disconnection / Connection

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(7) Loosen two terminal screws (A); then tag and disconnect back cylinder wires (4) from terminal block (5).

(8) Pull back cylinder wires (4) out wire hole (B).

(9) Remove locking knob (1, Figure 4-13) from back weldment (2).

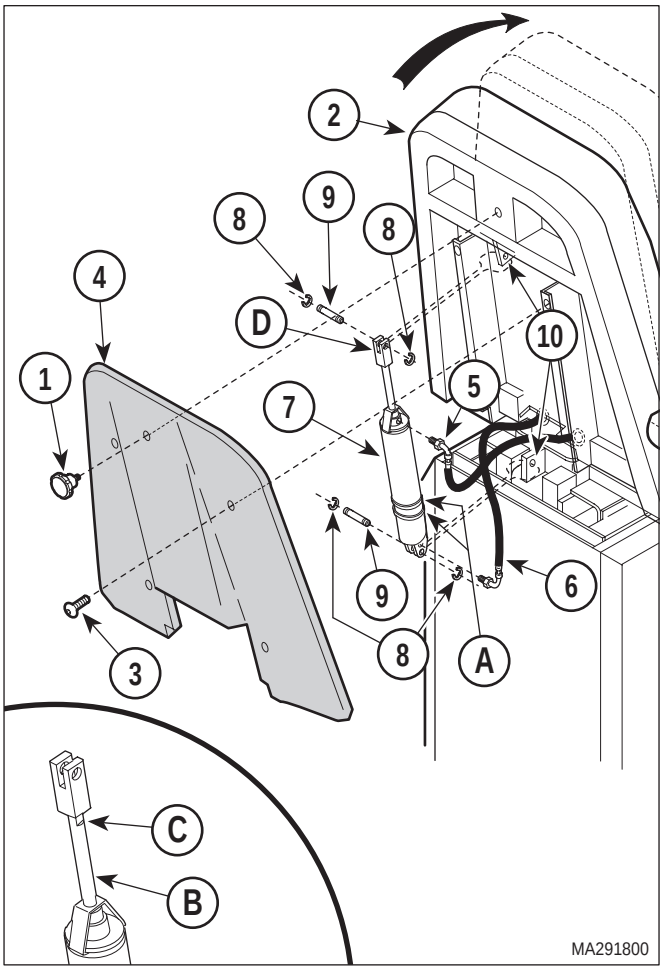

Figure 4-13. Back Cylinder Removal / Installation

(10) Remove four screws (3) and back cover (4) from back weldment (2).

(11) Cut two cable ties (A) which are securing hose assemblies (5 and 6) to back cylinder (7).

(12) While supporting back weldment (2), remove four E-rings (8), two clevis pins (9), and partially separate back cylinder (7) from cylinder brackets (10). Fold back section over onto seat section.

(13) Tag hose assemblies (5 and 6).

(14) Disconnect hose assembly (5) from back cylinder (7).

(15) Disconnect hose assembly (6) from back cylinder (7).

(16) Cut necessary cable ties (A) and remove back cylinder (7) from chair.

B. Installation

NOTE
No sealant is required when connecting hose assemblies. The back cylinder has an o-ring in each port which seals the hose assemblies.

(1) Connect hose assembly (6, Figure 4-13) to back cylinder (7).

(2) Connect hose assembly (5) to back cylinder (7).

(3) Install back cylinder (7) on cylinder brackets (10) and secure with two clevis pins (9) and four E-rings (8).

(4) Secure hose assemblies (5 and 6) to back cylinder (7) with two cable ties (A).

(5) Route back cylinder wires (4, Figure 4-12) thru chair.

(6) Feed back cylinder wires (4) thru wire hole (B).

(7) Connect two back cylinder wires (4) to terminal block (5) and secure by tightening two terminal screws (A).

(8) Re-secure back cylinder wire harness as necessary with cable ties (B).

(9) Install control cover (2) on control panel (3) and secure with two or six screws (1).

(10) Secure wires and hoses to base weldment (9, Figure 4-11) with wire clip (8) and screw (7). Install any cable ties removed during removal.

(11) Install front inner shroud (5) on left and right hand outer shrouds (6) and secure with eight screws (4).

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(12) Install front outer shroud (2) on left and right hand inner shrouds (3) and secure with four screws (1).

(13) Make sure strain relief bushing (10) is installed in front outer shroud (2).

(14) Plug power cord into wall outlet.

(15) Lower TILT DOWN function all the way down.

(16) Lower BACK DOWN function all the way down.

EQUIPMENT ALERT
TILT DOWN function must be completely lowered for following step. Failure to do so will result in incorrect adjustment.

(17) If back section *is not* level with floor when the BACK DOWN function is completely lowered, perform steps 18 thru 20. If back section *is* level when the BACK DOWN function is completely lowered, go to step 21. See Figure 4-13.

EQUIPMENT ALERT
The cylinder rod (B) must be partially extended before performing step 19. If the cylinder rod is fully extended or retracted when step 19 is being performed, damage to seals will occur.

(18) Raise BACK UP function up until cylinder rod is extended halfway.

(19) Place a wrench on adjusting seats (C) of cylinder rod and use it to rotate cylinder rod to adjust clevis (D) up or down as necessary. See Figure 4-16.

(20) Repeat steps 16 thru 19 until back section is level when BACK DOWN function is completely lowered.

(21) Install back cover (4, Figure 4-13) on back weldment (2) and secure with four screws (3).

(22) Install locking knob (1) on back weldment (2).

(23) If necessary, add oil to motor pump (Refer to para 4.3).

(24) Install motor cover assembly (Refer to para 4.2).

4.13 Tilt Cylinder Removal / Installation

A. Removal

(1) If possible, lower TILT DOWN function all the way down.

(2) Unplug power cord from wall outlet.

(3) Remove motor cover assembly (Refer to para 4.2).

(4) Remove two screws (1, Figure 4-14) and control cover (2) from control panel (3).

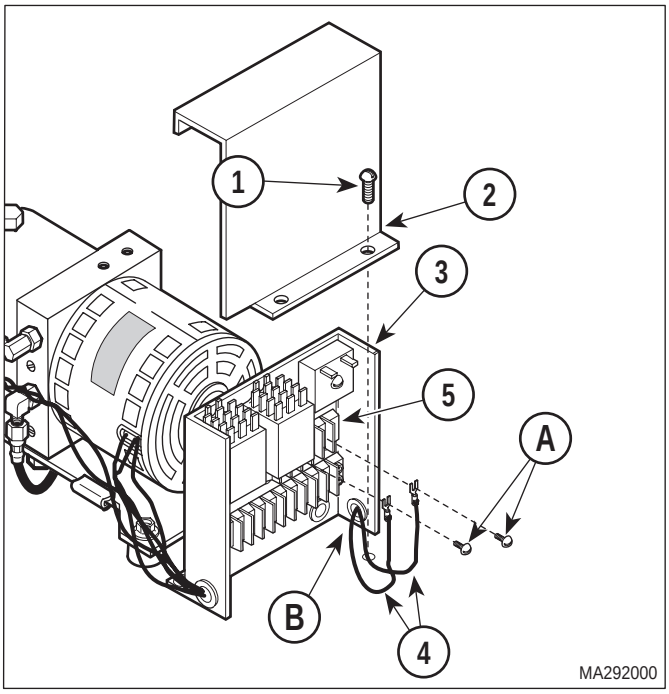

Figure 4-14. Tilt Cylinder Wire Disconnection / Connection

(5) Loosen two terminal screws (A) ; then tag and disconnect two tilt cylinder wires (4) from terminal block (5).

(6) Pull tilt cylinder wires (4) out thru wire hole (B).

(7) Remove four screws (1, Figure 4-15) and front outer shroud (2) from left and right hand outer shrouds (3).

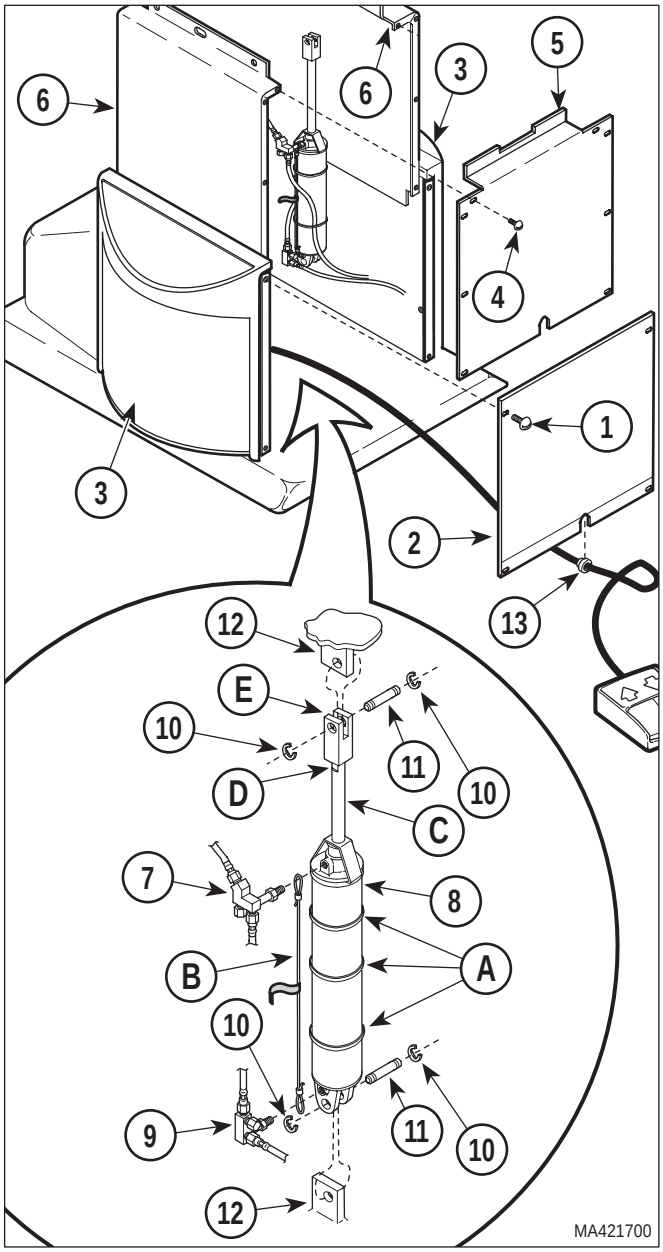

Figure 4-15. Tilt Cylinder Removal / Installation

(8) Remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(9) Disconnect return manifold (7) from rod end of tilt cylinder (8).

(10) Disconnect power manifold (9) from base of tilt cylinder (8).

(11) Cut cable ties (A)which secure hose assemblies and wire harnesses to tilt cylinder (8).

WARNING
The foot end of table top must be supported while removing tilt cylinder. Failure to do will allow table top to fall which could result in serious personal injury.

NOTE
Cut cable ties (A) as required to remove tilt cylinder.

(12) While supporting foot end of table top, remove four E-rings (10), two clevis pins (11), and tilt cylinder (8) from brackets (12).

B. Installation

(1) Install tilt cylinder (8, Figure 4-15) on brackets (12) and secure with two clevis pins (11) and four E-rings (10).

WARNING
Make sure the safety cable (B) is properly installed on the return and power manifolds. Failure to do so could result in serious personal injury to patient or operator.

(2) Connect power manifold (9) to base of tilt cylinder (8).

(3) Connect return manifold (7) to rod end of tilt cylinder (8).

(4) Secure wire harnesses and hose assemblies to tilt cylinder (8) with cable ties (A).

(5) Route tilt cylinder wires (4, Figure 4-14) thru table.

(6) Feed tilt cylinder wires (4) thru wire hole (B) in control panel (3).

(7) Connect two tilt cylinder wires (4) to terminal block (5) and secure by tightening two terminal screws (A).

(8) Install control cover (2) on control panel (3) and secure with two or six screws (1).

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(9) Install any cable ties (A) which were removed.

(10) Plug power cord into wall outlet.

(11) Lower TILT DOWN function all the way down.

(12) If seat section *is not* level with floor when the TILT DOWN function *is* completely lowered, perform steps 13 thru 15. If seat section is level when the TILT DOWN function is completely lowered, go to step 16.

EQUIPMENT ALERT
The cylinder rod (C) must be partially extended before performing step 14. If the cylinder rod is fully extended or retracted when step 14 is being performed, damage to seals will occur.

(13) Raise TILT UP function up until cylinder rod (C) is extended halfway.

(14) Place a wrench on adjusting seats (D) of cylinder rod and use it to rotate cylinder rod to adjust clevis (E) up or down as necessary. See Figure 4-19.

(15) Repeat steps 11 thru 14 until seat section is level when TILT DOWN function is completely lowered.

(16) Install front inner shroud (5, Figure 4-19) on left and right hand inner shrouds (6) and secure with eight screws (4).

(17) Install front outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(18) Make sure strain relief bushing (13) is installed on front outer shroud (2).

(19) If necessary, add oil to motor pump (Refer to para 4.3).

(20) Install motor cover assembly (Refer to para 4.2).

4.14 Base Cylinder Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove four screws (1, Figure 4-16) and back outer shroud (2) from left and right hand outer shrouds (3).

(4) Remove eight screws (4) and back inner shroud (5) from left and right hand inner shrouds (6).

(5) Remove four screws (7) and brace (8) from base slide assembly (9).

(6) Plug power cord into wall outlet.

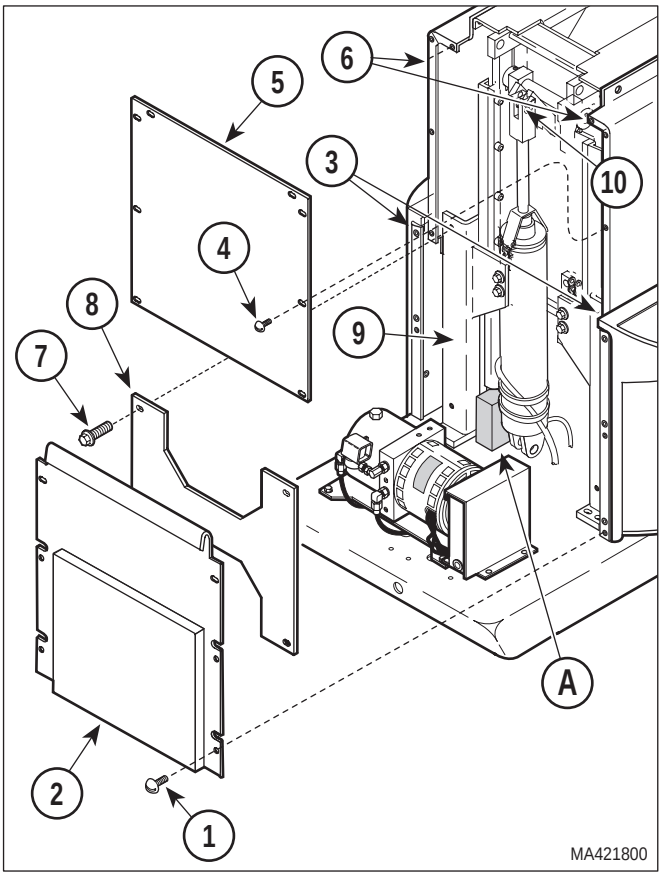

Figure 4-16. Base Cylinder Access

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(7) If TABLE DOWN function is operable, place a block under middle slide of base slide assembly (9). Then lower the TABLE DOWN function until the middle slide of the base slide assembly is resting on block (A) and pressure is off clevis pin (10). If TABLE DOWN function is not operable, move table top to a horizontal position and place supports under each end of table.

(8) Remove two screws (1, Figure 4-17) and control cover (2) from control panel (3).

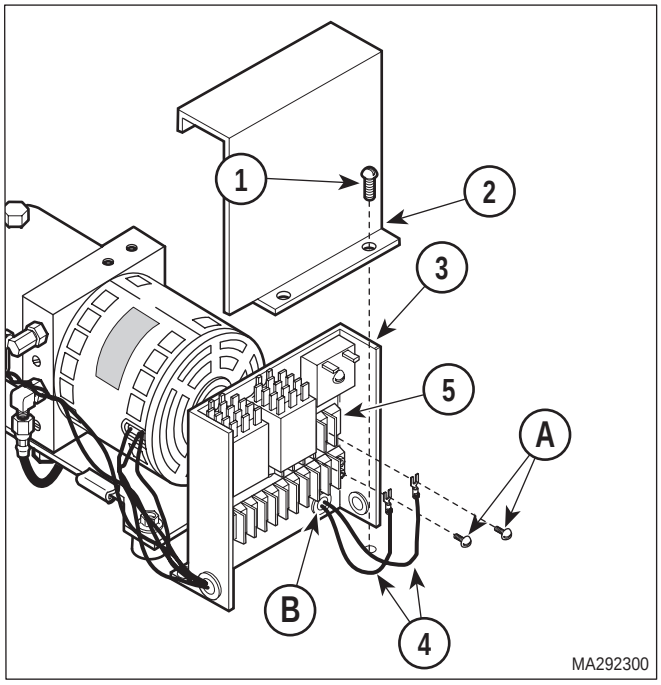

Figure 4-17. Base Cylinder Wires Disconnection / Connection

(9) Loosen two terminal screws(A); then tag and disconnect base cylinder wires (4) from terminal block (5).

(10) Pull base cylinder wires (4) out wire hole (B).

WARNING

Make sure table top is properly secured from lowering or tipping over when base cylinder is disconnected from table top. Clevis pin (2, Figure 4-18) should not have any weight on it if table top is supported properly. Failure to have table top properly secured could result in serious personal injury or death.

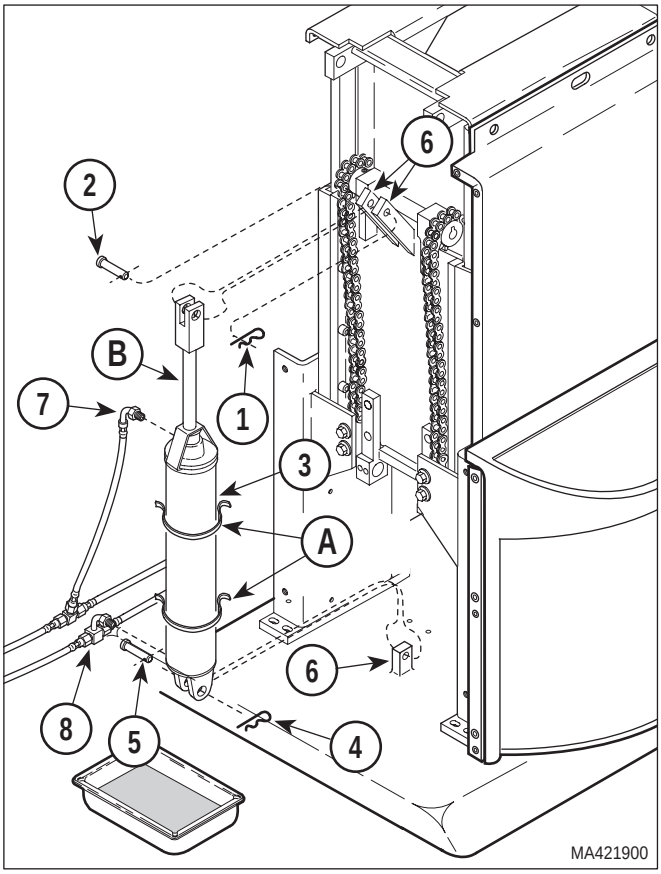

Figure 4-18. Base Cylinder Removal / Installation

(11) Remove hitch pin clip (1, Figure 4-18) and clevis pin (2) from rod end of base cylinder (3).

(12) Remove hitch pin clip (4), clevis pin (5), and partially separate base cylinder (3) from brackets (6).

(13) Cut two cable ties (A) securing hose assembly (7) to base cylinder (3).

(14) Disconnect hose assembly (7) from base cylinder (3).

(15) Place rags under base tee (8).

NOTE

When base tee is disconnected from base cylinder, oil will be free to flow out of the motor pump thru the base tee. Either be ready to install the new base cylinder or have drain pan and rags ready to catch the oil.

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(16) Disconnect base tee (8) from base cylinder (3). Remove base cylinder from table.

B. Installation

(1) Position base cylinder (3, Figure 4-18) on table.

(2) Connect base tee (8) to base cylinder (3).

(3) Connect hose assembly (7) to base cylinder (3).

(4) Secure hose assembly (7) to base cylinder (3) with two cable ties (A).

(5) Install base cylinder (3) on brackets (6) and secure with clevis pins (2 and 5) and hitch pin clips (1 and 4).

(6) Feed base cylinder wires (4, Figure 4-17) thru wire hole (B).

(7) Connect two base cylinder wires (4) to terminal block (5) and secure by tightening two terminal screws (A).

(8) Install control cover (2) on control panel (3) and secure with two or six screws (1).

(9) Plug power cord into wall outlet.

(10) See Figure 4-16. Raise TABLE UP function slightly and remove block (A) from under middle slide of base slide assembly (9) or remove supports from under table top.

(11) Lower TABLE DOWN function all the way down.

(12) See Figure 4-19. If there *is not* a 1/16 to 1/8 inch (1.6 to 3.2 mm) gap (A) between inner member weldment (B) and top of middle slide (C) when the TABLE DOWN function is completely lowered (it is especially important that the inner member weldment does not come into contact with the top of the middle slide), perform steps 13 thru 15. If gap is correct when the TABLE DOWN function is completely lowered, go to step 16.

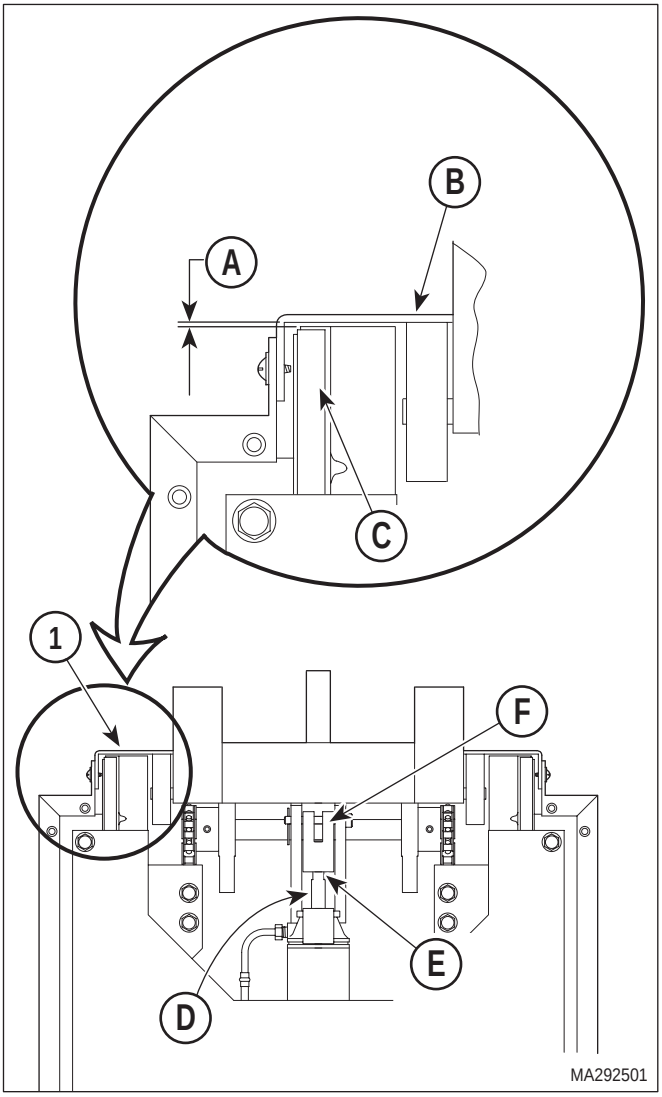

Figure 4-19. Base Cylinder Clevis Adjustment

EQUIPMENT ALERT

The cylinder rod (D) must be partially extended before performing step 14. If the cylinder rod is fully extended or retracted when step 14 is being performed, damage to seals will occur.

(13) Raise TABLE UP function up until cylinder rod (D) is extended halfway.

(14) Place a wrench on adjusting seats (E) of cylinder rod and use it to rotate cylinder rod to adjust clevis (F) up or down as necessary.

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(15) Repeat steps 11 thru 14 until there *is* a 1/16 to 1/8 inch (1.6 to 3.2 mm) gap (A) between inner member weldment (B) and middle slide (C) of base slide assembly when the TABLE DOWN function is completely lowered.

(16) Install brace (8, Figure 4-16) on base slide assembly (9) and secure with four screws (7).

(17) Install any cable ties removed during removal.

(18) Install back inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(19) Install back outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(20) If necessary, add oil to motor pump (Refer to para 4.3).

(21) Install motor cover assembly (Refer to para 4.2).

4.15 AUTO RETURN "RETURN" or "STOP" Switch Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove six screws (1, Figure 4-20) and separate switch plate (2) from seat weldment (3).

(3) Disconnect two wires (4) from "RETURN" (A) or "STOP" (B) switch (5).

(4) Depress four tabs (C) of "RETURN" or "STOP" switch (5), while simultaneously pulling the switch out of switch plate (2).

B. Installation

(1) Push "RETURN" (A) or "STOP" (B) switch (5) into switch plate (2) until it "pops" into place.

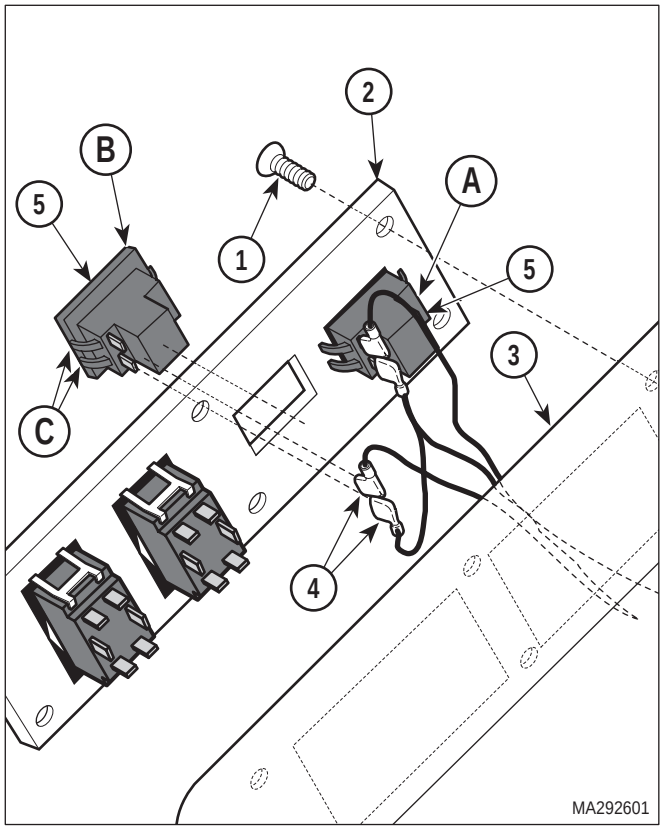

Figure 4-20. AUTO RETURN "RETURN" or "STOP" Switch Removal / Installation

(2) Connect two wires (4) to terminals of "RETURN" (A) or "STOP" (B) switch (5).

(3) Install switch plate (2) on seat weldment (3) and secure with six screws (1).

(4) Plug power cord into wall outlet.

4.16 BACK UP / DOWN or TILT UP / DOWN Switch Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove six screws (1, Figure 4-21) and separate switch plate (2) from seat weldment (3).

(3) Disconnect six wires (4) from switch (5).

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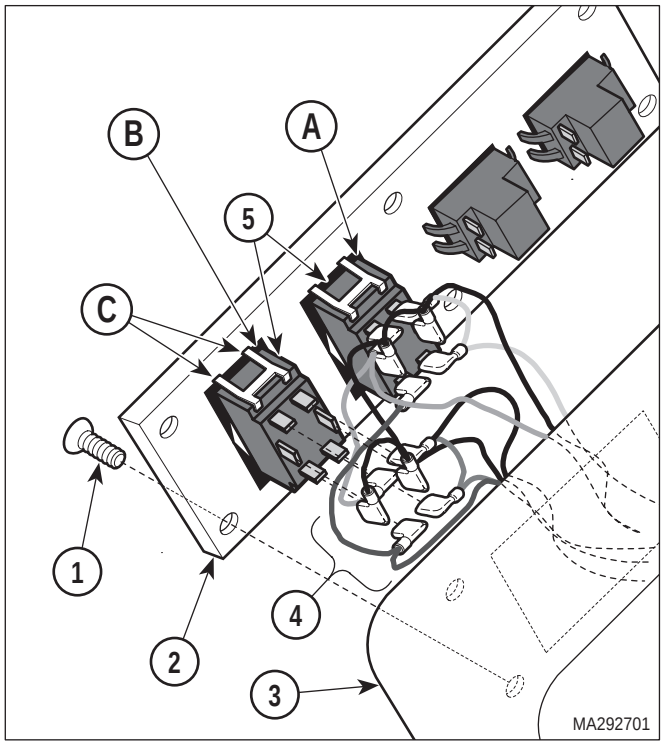

Figure 4-21. BACK UP / DOWN (A) or TILT UP / DOWN (B) Switch Removal / Installation

(4) Depress four tabs (C) of switch (5), while simultaneously pulling the switch out of switch plate (2).

B. Installation

(1) Push switch (5) into switch plate (2) until it "pops" into place.

(2) Connect six wires (4) to terminals of switch (5).

(3) Install switch plate (2) on seat weldment (3) and secure with six screws (1).

(4) Plug power cord into wall outlet.

4.17 TABLE UP or TABLE DOWN Switches Removal / Installation / Adjustment

A. Removal

(1) Unplug power cord from wall outlet.

NOTE
The procedure & illustration describes the removal / installation of the TABLE UP switches (A). Removal of the TABLE DOWN switches (B) is the same.

(2) Remove screw (1, Figure 4-22), lockwasher (2), and foot pedal (3) from foot control housing (4).

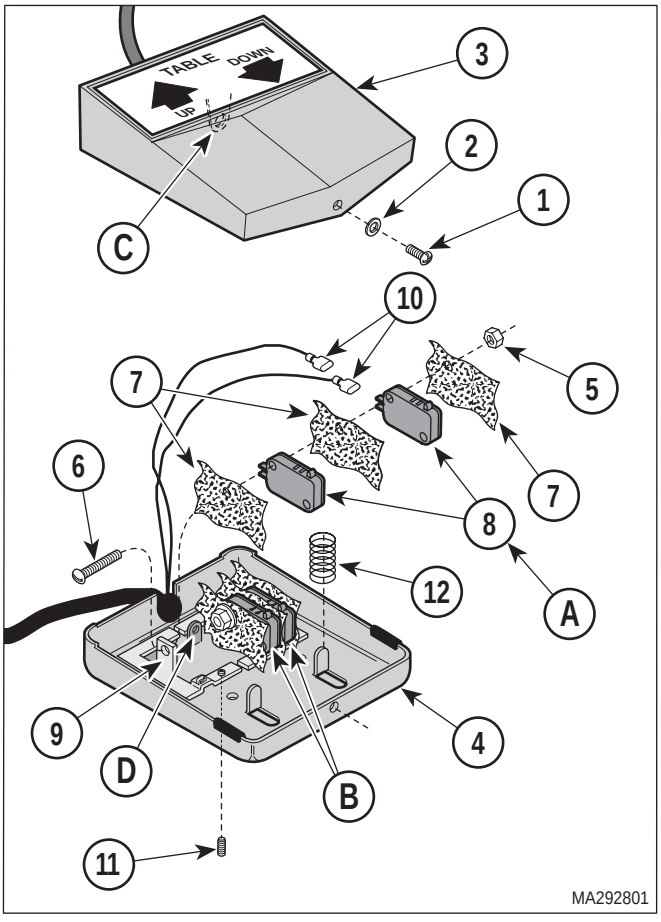

Figure 4-22. TABLE UP or TABLE DOWN Switches Removal / Installation / Adjustment

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NOTE
The inside switch is the switch that activates the base cylinder solenoid valve while the outside switch is the switch which activates the motor pump. This is true for both the TABLE UP (A) and the TABLE DOWN (B) sets of switches.

(3) Remove locknut (5), screw (6), three insulators (7), and two switches (8) from mounting plate (9).

(4) Disconnect two wires (10) from switch (8) being removed.

B. Installation / Adjustment

NOTE
If adjusting switches only, perform steps 1 and 2 of removal and then steps 2 thru 11 of installation / adjustment

(1) Connect two wires (10) to terminals of switch (8).

(2) Unscrew setscrew (11) as far as it will go without removing it.

NOTE
Make sure the inside switch is pushed down as far as it will go before tightening locknut (5). This is necessary because the inside switch must be down all the way so it can be adjusted properly.

(3) Install switches (8) on mounting plate (9) and secure with three insulators (7), screw (6), and locknut (5), making sure outside switch is secured by tab of mounting plate.

(4) Ensure springs (12) are in position and have not fallen off.

(5) Install foot pedal (3) on foot control housing (4) and secure with lockwasher (2) and screw (1), making sure pivot tab (C) of foot pedal is inserted in pivot socket (D) of foot control housing.

(6) Tighten setscrew (11) just until it comes into contact with inside switch (8).

(7) Plug power cord into wall outlet.

(8) Slowly depress foot pedal to activate function which needs adjustment and observe.

(9) Observe. A light touch should cause the motor pump to activate followed closely by the base cylinder solenoid valve.
If adjustment is necessary, go to step 10.

NOTE
Tightening setscrew will cause the base cylinder solenoid valve to activate sooner.

(10) Tighten setscrew (11) approximately 1/4 turn at a time.

(11) Repeat steps 8 thru 10 until inner switch is adjusted properly.

4.18 Time Delay Relay Removal / Installation

EQUIPMENT ALERT
Put a multimeter in line w/time delay relay and run each cylinder one at a time. A reading >1.2 amps indicates a malfunctioning cylinder. Replace the cylinder before replacing the relay. Failure to do so will result in damage to new relay.

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove two screws (1, Figure 4-23) and control cover (2) from control panel (3).

(4) Tag and disconnect two wires (4) from terminals of time delay relay (5).

(5) Remove nut (6), screw (7), washer (8), and time delay relay (5) from control panel (3).

B. Installation

(1) Install time delay relay (5) on control panel (3) and secure with washer (8), screw (7), and nut (6).

(2) Connect two wires (4) to terminals of time delay relay (5).

(3) Install control cover (2) on control panel (3) and secure with two screws (1).

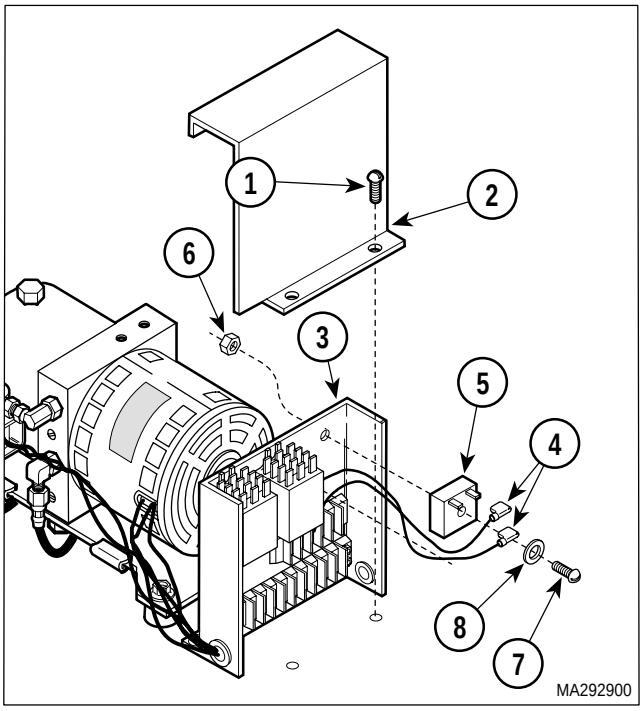

Figure 4-23. Time Delay Relay Removal / Installation

(4) Install motor cover assembly (Refer to para 4.2).

(5) Plug power cord into wall outlet.

4.19 Capacitors Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove four screws (1, Figure 4-24) and front outer shroud (2) from left and right hand outer shrouds (3).

(3) If necessary to gain access to capacitors, remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(4) Cut cable tie (A) securing wires to capacitor (7).

(5) Using a screwdriver, pry tab (B) of capacitor mounting bracket (8) upward and remove capacitor (7) from capacitor mounting bracket.

(6) Remove capacitor cap (9) from capacitor (7).

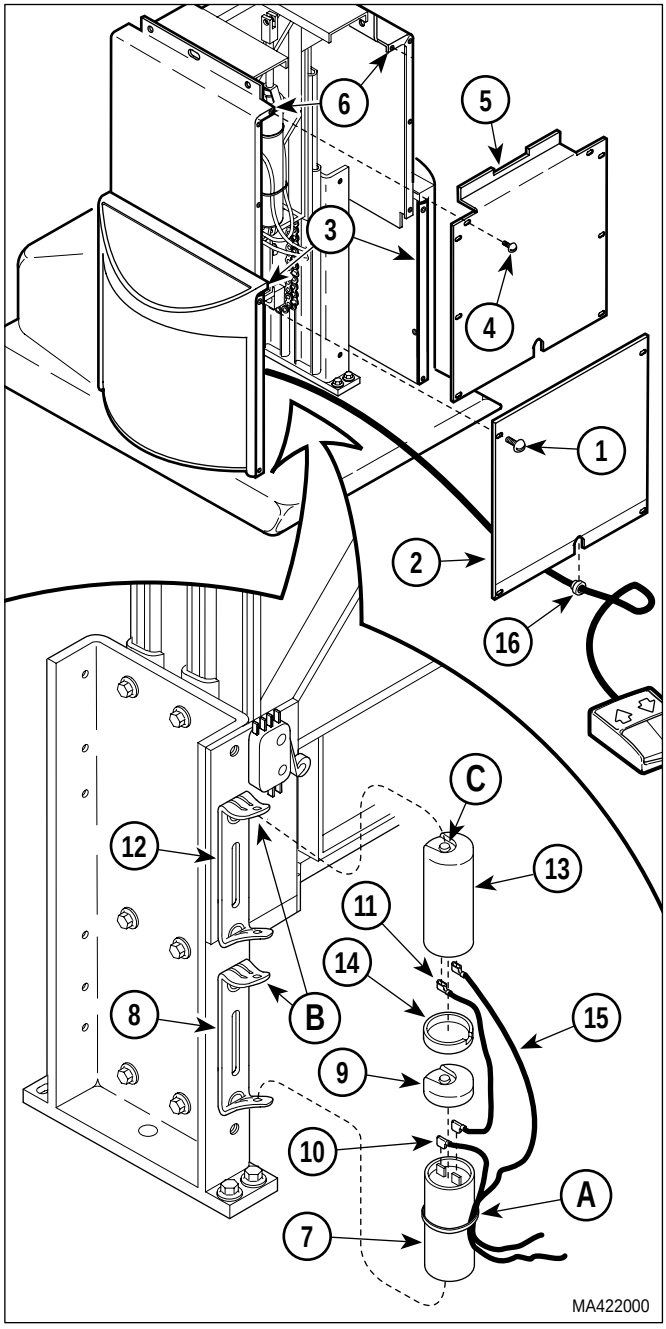

Figure 4-24. Capacitors Removal / Installation

WARNING

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.

(7) Discharge capacitor (7).

(8) Disconnect wires (10 and 11) from terminals of capacitor (7).

(9) Using a screwdriver, pry tab (B) of capacitor mounting bracket (12) upward and remove capacitor (13) from capacitor mounting bracket.

(10) Remove capacitor cap (14) from capacitor (13).

WARNING
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.

(11) Discharge capacitor (13).

(12) Disconnect wires (11 and 15) from terminals of capacitor (13).

B. Installation

(1) Connect capacitor wires (11 and 15) to terminals of capacitor (13).

(2) Install capacitor cap (14) on capacitor (13).

(3) Position bottom of capacitor (13) on capacitor mounting bracket (12) and then push the top of the capacitor in. Using a screwdriver, force tab (B) of capacitor mounting bracket (12) down over catch (C).

(4) Connect capacitor wires (10 and 11) to terminals of capacitor (7).

(5) Install capacitor cap (9) on capacitor (7).

(6) Position bottom of capacitor (7) on capacitor mounting bracket (8) and then push the top of the capacitor in. Using a screwdriver, force tab (B) of capacitor mounting bracket (8) down over catch (C).

(7) Install cable tie to secure wire to capacitor (7).

(8) If removed, install front inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(9) Install front outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(10) Make sure strain relief bushing (16) is installed in front outer shroud (2).

(11) Plug power cord into wall outlet.

4.20 Auto Return Relay [CR2] or Manual Functions Relay [CR1] Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove two screws (1, Figure 4-25) and control cover (2) from control panel (3).

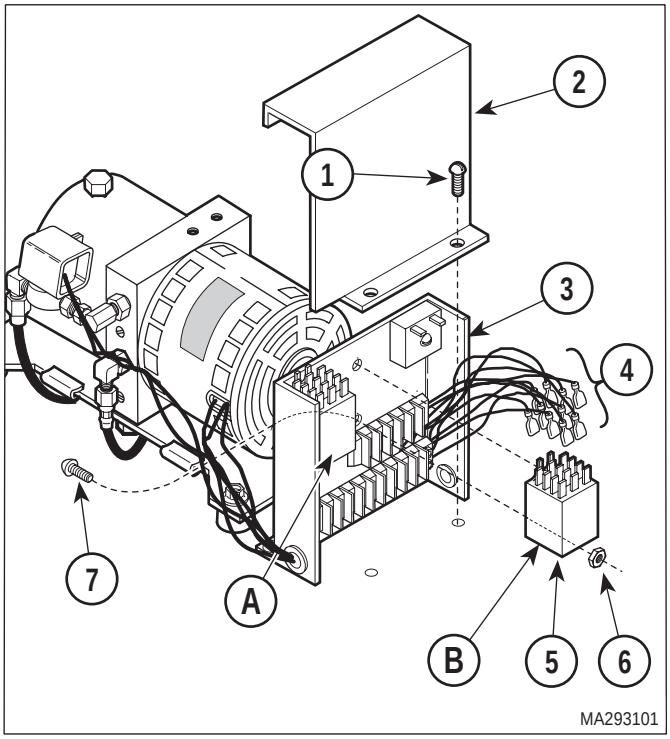

Figure 4-25. Auto Return Relay [CR2] or Manual Functions Relay [CR1] Removal / Installation

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(4) Tag and disconnect eight wires (4) from relay [CR1] (A) or [CR2] (B/5).

(5) Remove two nuts (6), screws (7), and relay [CR1] (A) or [CR2] (B/5) from control panel (3).

B. Installation

(1) Install relay [CR1] (A) or [CR2] (B/5) on control panel (3) and secure with two screws (7) and nuts (6).

(2) Connect eight wires (4) to relay [CR1] (A) or [CR2] (B/5).

(3) Install control cover (2) on control panel (3) and secure with two screws (1).

(4) Install motor cover assembly (Refer to para 4.2).

(5) Plug power cord into wall outlet.

4.21 Tilt Down Limit Switch Removal / Installation

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove four screws (1, Figure 4-26) and front outer shroud (2) from left and right hand outer shrouds (3)

(3) Remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(4) Remove nut (7), lockwasher (8), and tilt down limit switch (9) from inner member (10).

(5) Tag and disconnect five wires (11) from terminals of tilt down limit switch (9).

B. Installation / Adjustment

NOTE
If performing adjustment only, perform steps 1 thru 3 of removal and then perform steps 4 thru 12 of installation / adjustment.

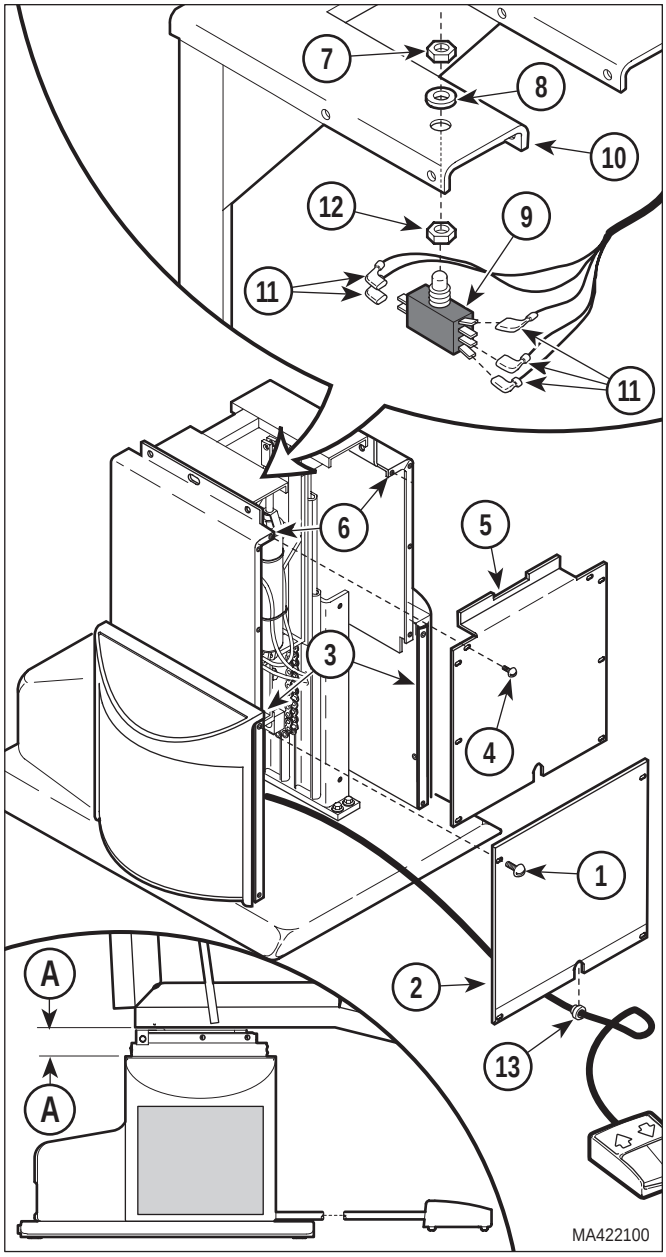

Figure 4-26. Tilt Down Limit Switch Removal / Installation

(1) Connect five wires (11) to terminals of tilt down limit switch (9).

(2) Screw nut (12) all the way on tilt down limit switch (9).

(3) Install tilt down limit switch (9) on inner member (10) and secure with lockwasher (8) and nut (7).

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(4) Plug power cord into wall outlet.

(5) Run TILT DOWN function all the way down.

(6) If seat weldment is level with top of inner member, no adjustment is necessary. Go to step 10.
If seat weldment is not level with top of inner member, adjustment is necessary. Go to step 7.

(7) Raise TILT UP function all the way up.

(8) Loosen nut (7). Then adjust nut (12) as deemed necessary. Then tighten nut (7).

(9) Repeat steps 5 thru 8 until seat weldment is level with top of inner member when TILT DOWN function is all the way down.

(10) Install front inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(11) Install front outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(12) Make sure strain relief bushing (13) is installed on front outer shroud (2).

4.22 Base Down Limit Switch Removal / Installation / Adjustment

A. Removal

(1) Unplug power cord from wall outlet.

(2) Remove four screws (1, Figure 4-27) and front outer shroud (2) from left and right hand outer shrouds (3).

(3) Remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(4) Tag and disconnect four wires (7) from terminals of base down limit switch (8).

(5) Remove two nuts (9), lockwashers (10), screws (11), and base down limit switch (8) from auto return bracket (12).

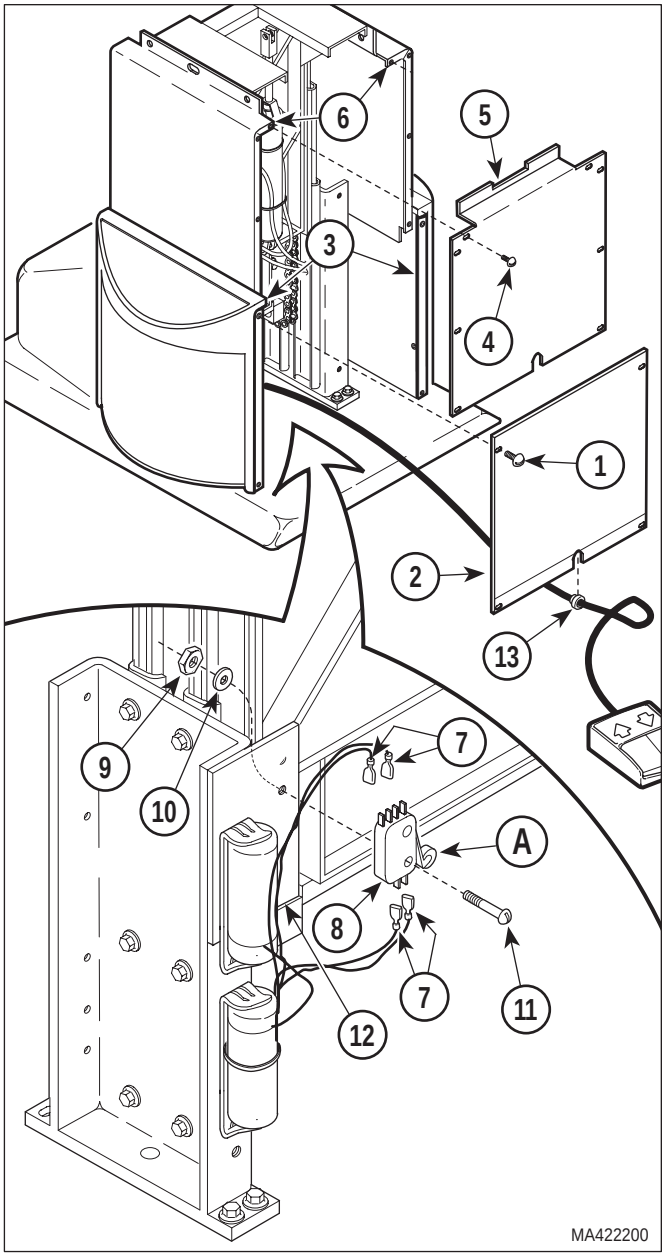

Figure 4-27. Base Down Limit Switch Removal / Installation / Adjustment

B. Installation

(1) Install base down limit switch (8) on auto return bracket (12) and secure with two screws (11), lockwashers (10), and two nuts (9).

(2) Connect four wires (7) to terminals of base down limit switch (8).

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C. Adjustment

(1) If base down limit switch was not replaced and is only being adjusted, perform steps 1 thru 3 of removal to gain access to base down limit switch.

NOTE
If the motor pump continues to run after the AUTO RETURN function has lowered the table top all the way down, the base down limit switch must be adjusted so its trip arm (A) contacts the trip plate before the table top is completely lowered.

(2) Loosen two nuts (9) and adjust base down limit switch (8) as necessary so trip arm (A) of base down limit switch is getting tripped by trip plate just before the AUTO RETURN function lowers the table top all the way down.

WARNING
Do not touch any bare wires or electrical shock could occur. Do not place hands or head inside base area of table while it is being lowered. Failure to follow these safety precautions could result in serious personal injury or death.

(3) Plug power cord into wall outlet.

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

(5) Press AUTO RETURN "RETURN" button.

(6) If the motor pump automatically shuts off when AUTO RETURN function stops, base down limit switch is adjusted properly. If the motor pump continues to run after table top is completely lowered, repeat steps 2 thru 6 again.

(7) Install front inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(8) Install front outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(9) Make sure strain relief bushing (13) is installed on front outer shroud (2).

4.23 Chain Assembly Adjustment

A. Adjustment

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

(2) Unplug power cord from wall outlet.

(3) Remove four screws (1, Figure 4-28) and front outer shroud (2) from left and right hand outer shrouds (3).

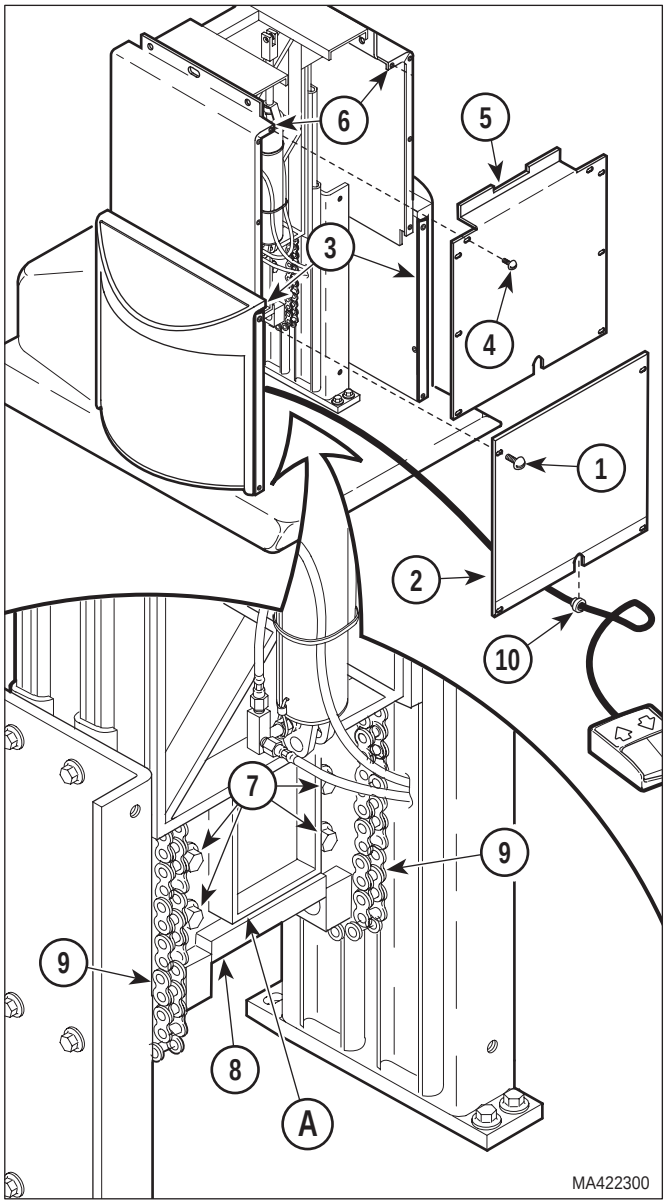

Figure 4-28. Chain Assembly Adjustment

(4) Remove eight screws (4) and front inner shroud (5) from left and right hand inner shrouds (6).

(5) Loosen four screws (7).

EQUIPMENT ALERT
Adjust chains so they are tight, yet have a slight spring back. Also, adjust chains so there is an equal amount of tension on each chain. Failure to do so will result in chains loosening earlier and uneven wear.

(6) Insert a pry bar or large screwdriver into adjustment gap (A) and pry downward on idler adjustment weldment (8) until chains (9) are tight, but not drum tight. Tighten four screws (7).

(7) Install front inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(8) Install front outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

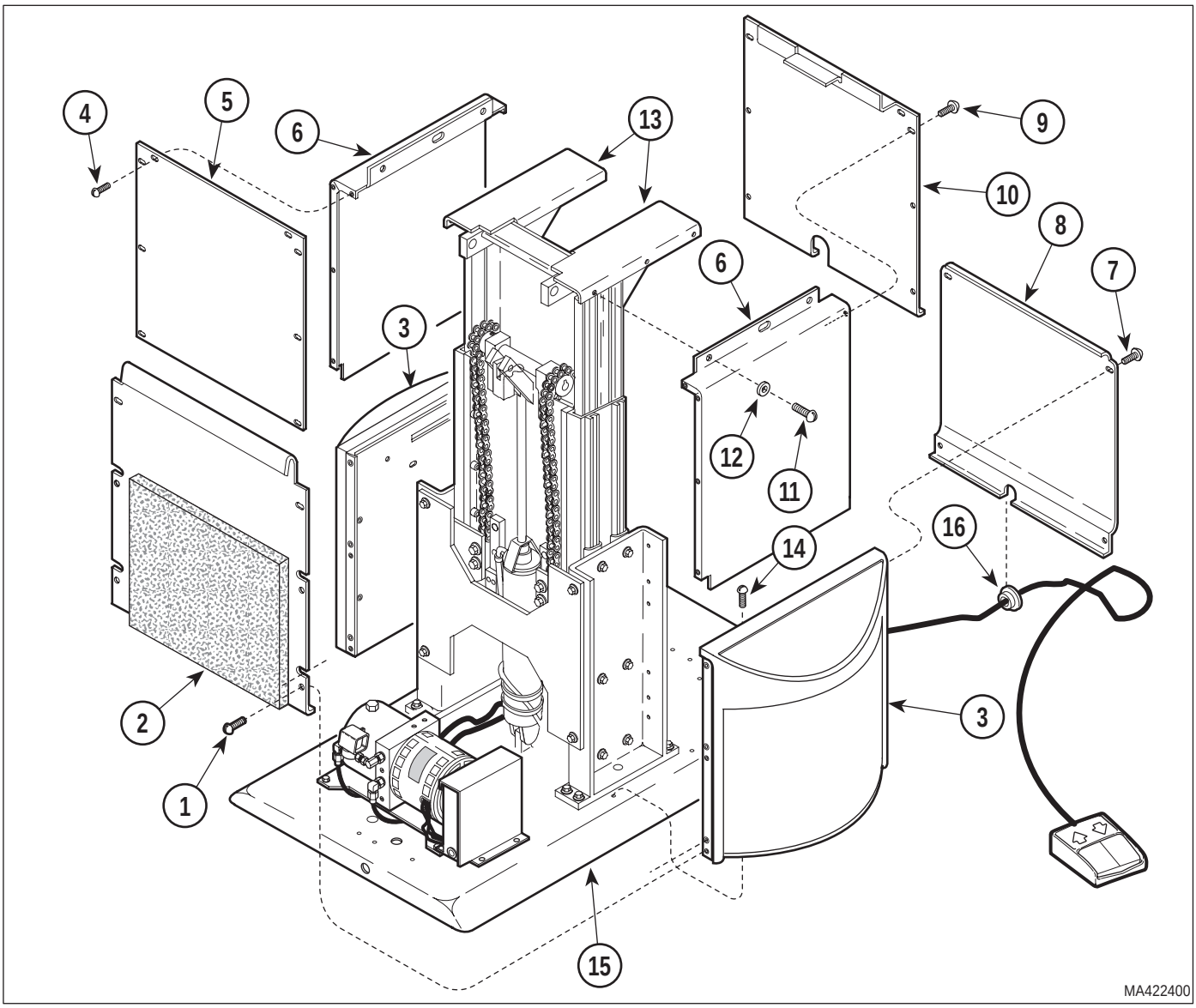

Figure 4-29. Shrouds Removal / Installation

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(9) Plug power cord into wall outlet.

(10) Make sure strain relief bushing (10) is installed on front outer shroud (2).

4.24 Base Slide Assembly Removal / Installation

A. Removal

(1) If possible, raise TABLE UP function all the way up.

(2) Move the back and seat sections of the table top to a horizontal position.

(3) Unplug power cord from wall outlet.

(4) Remove motor cover assembly (Refer to para 4.2).

(5) Remove four screws (1, Figure 4-29) and back outer shroud (2) from left and right hand outer shrouds (3).

(6) Remove eight screws (4) and back inner shroud (5) from left and right hand inner shrouds (6).

(7) Remove four screws (7) and front outer shroud (8) from left and right hand outer shrouds (3).

(8) Remove eight screws (9) and front inner shroud (10) from left and right hand inner shrouds (6).

(9) Remove six screws (11), washers (12), and left and right hand inner shrouds (6) from base slide assembly (13).

(10) Remove six screws (14) and partially separate left and right hand outer shrouds (3) from base weldment (15).

WARNING

The supports must be capable of holding up table top after table top is disconnected from base slide assembly and the base slide assembly is removed. Failure to support table top properly could result in table top falling out-of-control which could result in serious personal injury or death.

(11) Place supports (A, Figure 4-30) under seat section (B) and back section (C) of table top, making sure weight of table top is being supported by supports. If necessary, plug power cord into outlet and lower table top onto supports. Unplug power cord from outlet.

(12) Remove two E-rings (1, Figure 4-30), clevis pin (2), and separate tilt cylinder (3) from bracket (4).

(13) Loosen four setscrews (5). Remove two tilt pivot pins (6) from base slide assembly (7).

WARNING

Make sure table top is properly supported for the following step. Table top will rest only on supports after this step. Also do not touch any wires inside of table when power cord is plugged in. This could result in electrical shock. Failure to comply with this warning could result in serious personal injury or death.

(14) Plug power cord into wall outlet. Lower TABLE DOWN function all the way down. Unplug power cord from wall outlet.

WARNING

Make sure base slide assembly is fully retracted (collapsed) before disconnecting base cylinder. Failure to do so will result in base slide assembly collapsing after base cylinder is disconnected which could result in serious personal injury.

(15) Remove hitch pin clip (8), clevis pin (9), and separate rod of base cylinder (10) from bracket (11).

(16) Remove capacitors (D) Refer to para 4.19).

(17) Remove five nuts (12), four screws (13), one screw (14), two capacitor mounting brackets (15), and partially separate auto return bracket assembly (16) from base slide assembly (7). Lay auto return bracket assembly out of the way on base weldment (17).

(18) Disconnect spring (18) from base slide assembly (7).

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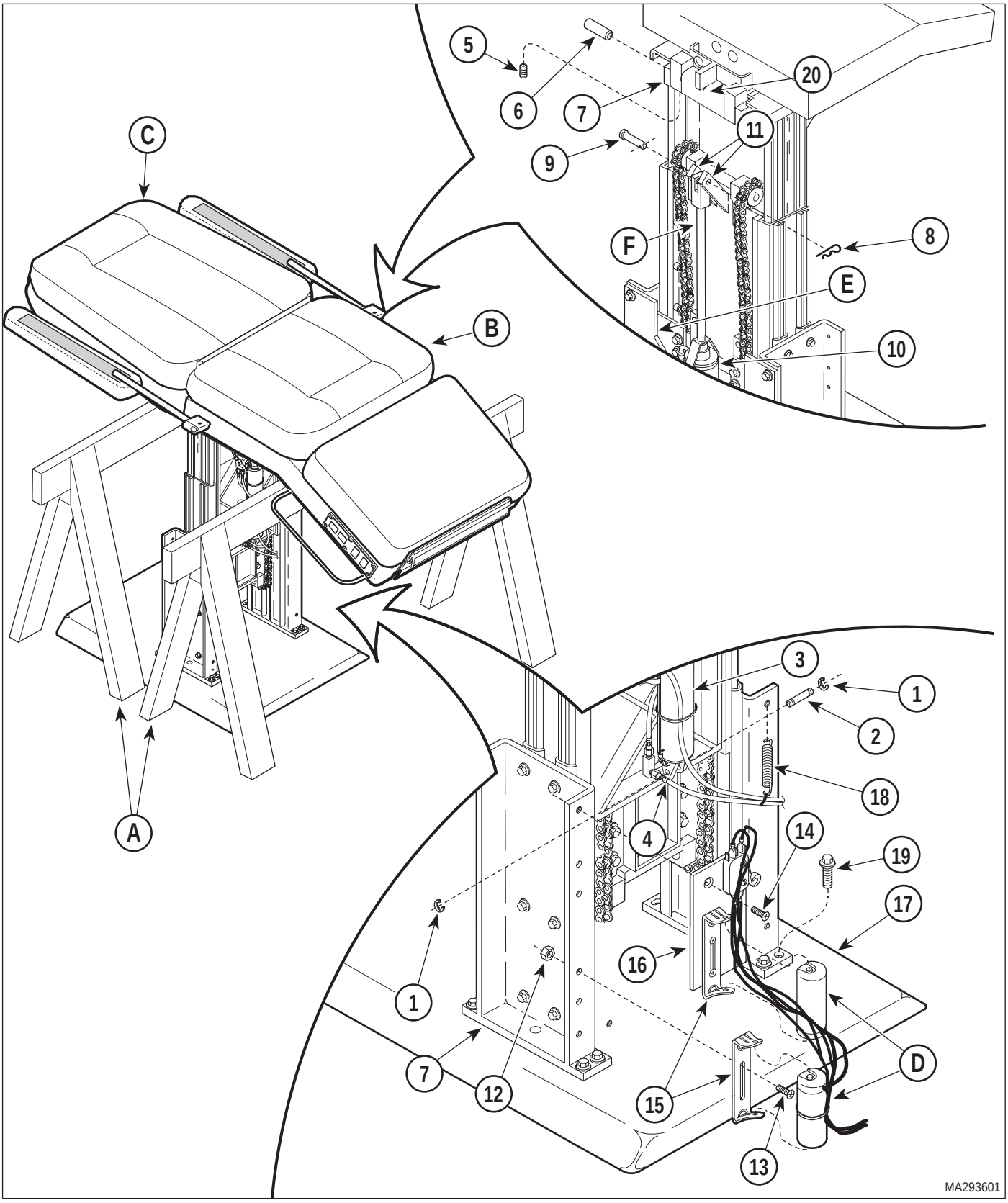

Figure 4-30. Base Slide Assembly Removal / Installation

(19) Remove eight screws (19) from base slide assembly (7).

NOTE
If necessary, remove four screws and brace (E) to allow base slide assembly to be pulled over base cylinder.

(20) With the help of an assistant, remove base slide assembly (7) from base weldment (17).

B. Installation

(1) With the help of an assistant, install base slide assembly (7, Figure 4-30) on base weldment (17), making sure base cylinder (10) gets inserted between brace (E) and base slide assembly.

(2) Secure base slide assembly (7) on base weldment (17) with eight screws (19).

(3) Connect spring (18) to base slide assembly (7).

(4) Install auto return bracket assembly (16) and two capacitor mounting brackets (15) on base slide assembly (7) and secure with one screw (14), four screws (13), and five nuts (12).

(5) Install capacitors (Refer to para 4.19).

(6) Install rod (F) end of base cylinder (10) on bracket (11) and secure with clevis pin (9) and hitch pin clip (8).

NOTE
Install beveled edge of tilt pivot pins first. The beveled edge allows the tilt pivot pins to be started more easily.

(7) Raise TABLE UP function until base slide assembly (7) is aligned with seat weldment (20). Secure base slide assembly to seat weldment with two tilt pivot pins (6).

(8) Secure tilt pivot pins (6) in place by tightening four setscrews (5).

(9) Install base of tilt cylinder (3) on bracket (4) and secure with clevis pin (2) and two E-rings (1).

(10) Remove supports (A) from under head section (C) and seat section (B) of table top.

(11) If necessary, adjust base down limit switch (Refer to para 4.22).

(12) Install left and right hand outer shrouds (3, Figure 4-29) on base weldment (15) and secure with six screws (14).

(13) Install left and right hand inner shrouds (6) on base slide assembly (13) and secure with six washers (12) and screws (11).

(14) Install front inner shroud (10) on left and right hand inner shrouds (6) and secure with eight screws (9).

(15) Install front outer shroud (8) on left and right hand outer shrouds (3) and secure with four screws (7).

(16) Install back inner shroud (5) on left and right hand inner shrouds (6) and secure with eight screws (4).

(17) Install back outer shroud (2) on left and right hand outer shrouds (3) and secure with four screws (1).

(18) Make sure strain relief bushing (16) is installed on front outer shroud (8).

(19) Install motor cover assembly (Refer to para 4.2).

(20) Plug power cord into wall outlet.

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4.25 Reclining Arm Adjustment

A. Adjustment

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

NOTE
When correctly adjusted, the left and right reclining arms (1) will be level (A) with the seat section and the reclining arms will also be even with each other.

(3) Loosen jam nut (1, Figure 4-31) on reclining arm (2).

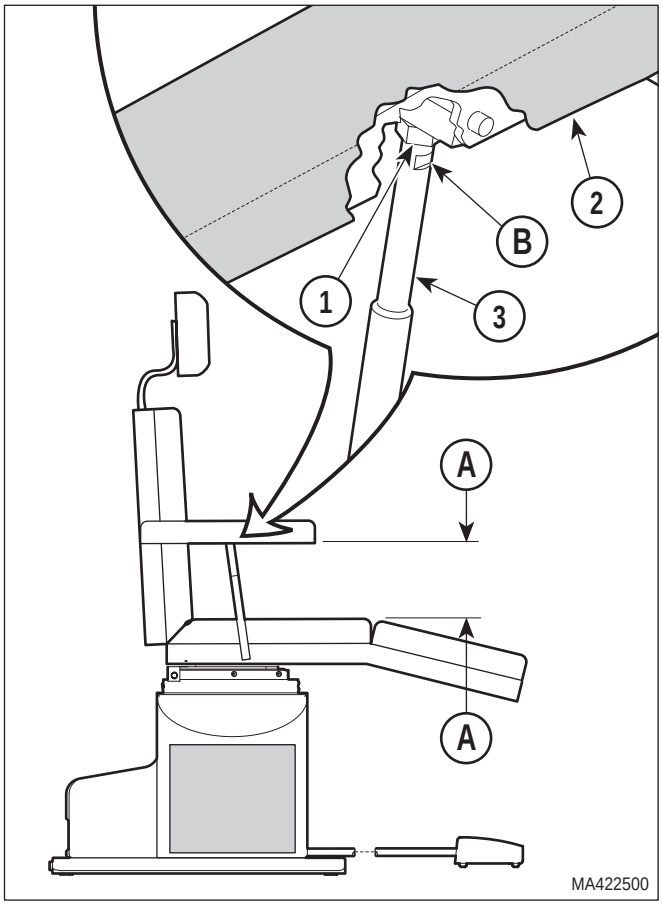

Figure 4-31. Reclining Arm Adjustment

(4) Using wrench on adjusting seat (B), adjust inner rod (3) up or down until reclining arm (2) is level with seat section.

(5) Tighten jam nut (1).

(6) Repeat steps (3) thru (5) for other reclining arm (2), except, adjust this reclining arm so it is even with first reclining arm adjusted.

4.26 Hydraulic System Flushing Procedure

NOTE
The following procedure is recommended when:

- The hydraulic system is excessively contaminated with dirt particles or water, causing repeated malfunctions of hydraulic components.
- An oil other than light weight mineral oil has been added to the hydraulic system, causing the table to malfunction or perform erratically.

A. Flushing Procedure

(1) Lower TABLE DOWN**,** BACK DOWN**,** and TILT DOWN functions all the way down.

(2) Remove motor cover assembly (Refer to para 4.2).

(3) Remove filler cap (1, Figure 4-32) from reservoir (2).

(4) Get a suitable drain pan (C) with a capacity of approximately 2 quarts (1.9 liters).

(5) Using a syringe or suction device, remove all oil from the reservoir (2).

(6) Refill reservoir (2) with light grade mineral oil.

(7) Disconnect hose (A) from down functions shuttle valve (3) and place end of hose in drain pan.

(8) Raise TABLE UP**,** BACK UP**,** and TILT UP functions all the way up, while making sure to keep refilling reservoir (2) with light grade mineral oil as necessary.

(9) Connect hose (A) to down functions shuttle valve (3).

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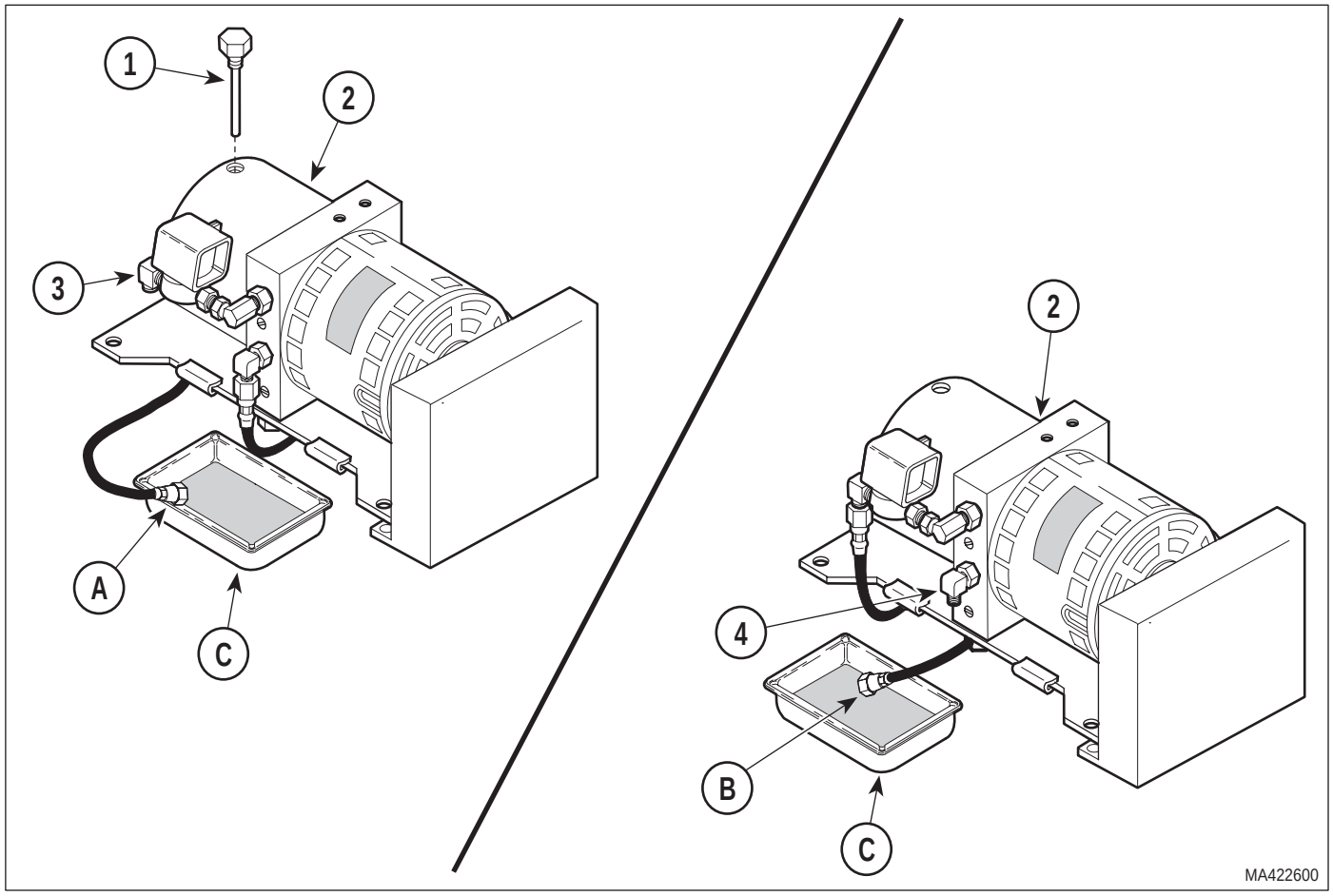

Figure 4-32. Hydraulic System Flushing Procedure

(10) Disconnect hose (B) from up functions shuttle valve (4) and place end of hose in drain pan.

(11) Lower TABLE DOWN, BACK DOWN, and TILT DOWN functions all the way down, while making sure to keep refilling reservoir (2) with light grade mineral oil as necessary.

(12) Connect hose (B) to up functions shuttle valve (4).

(13) Repeat steps 7 thru 12 until oil being removed is clear and contains no dirt particles.

(14) Run all the functions up and down until all air is purged from the hydraulic system.

(15) Lower all functions; then check oil level and add or remove oil as necessary (Refer to para 4.3).

(16) Install motor cover assembly (Refer to para 4.2).

(17) Dispose of used oil in accordance with local regulations.

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SECTION V
SCHEMATICS AND DIAGRAMS

5.1 Electrical Schematics / Wiring Diagrams

Figures 5-1 and 5-2 illustrate the logic/current flow and wiring connections between the electrical components in the table.

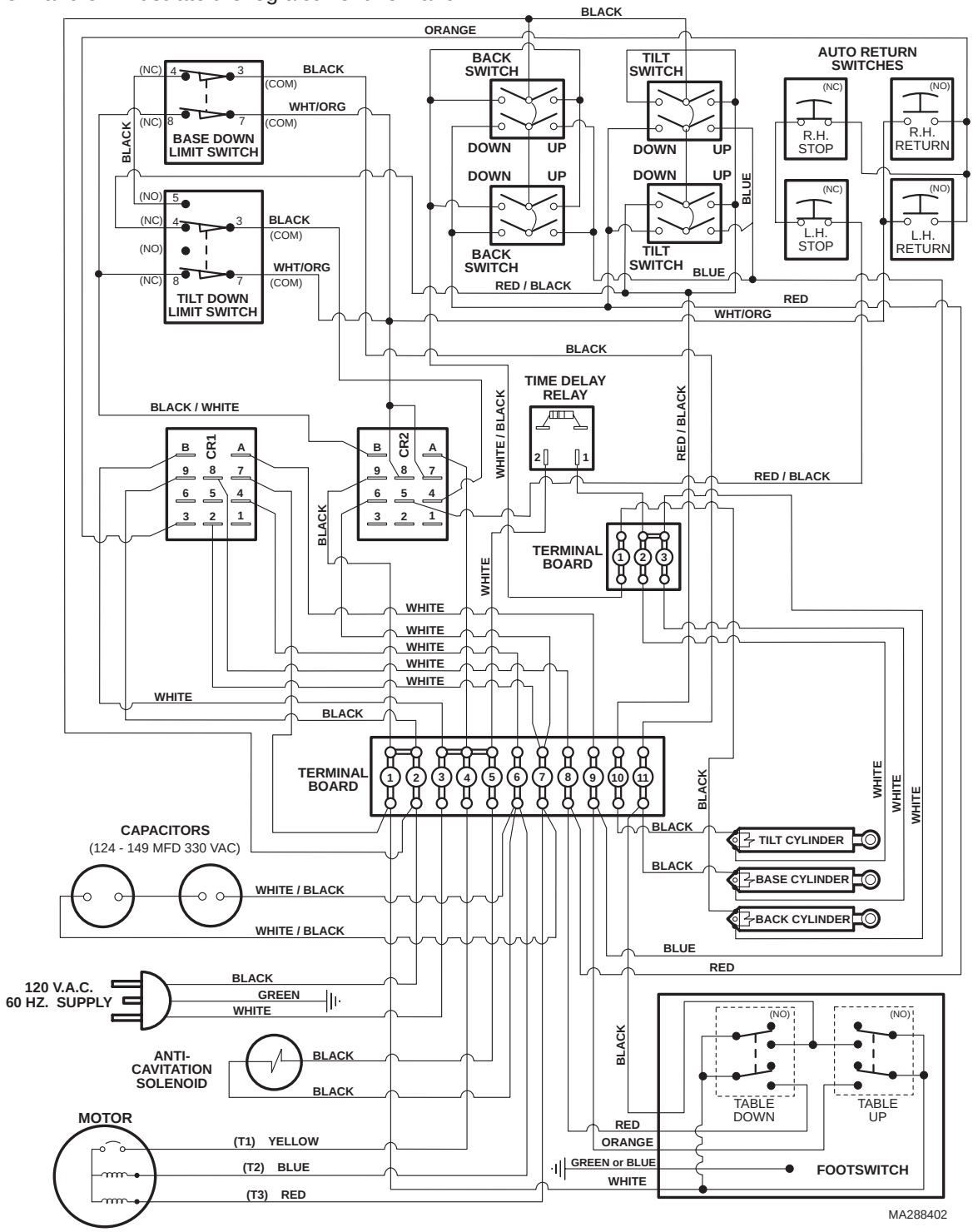

Figure 5-1. Wiring Diagram

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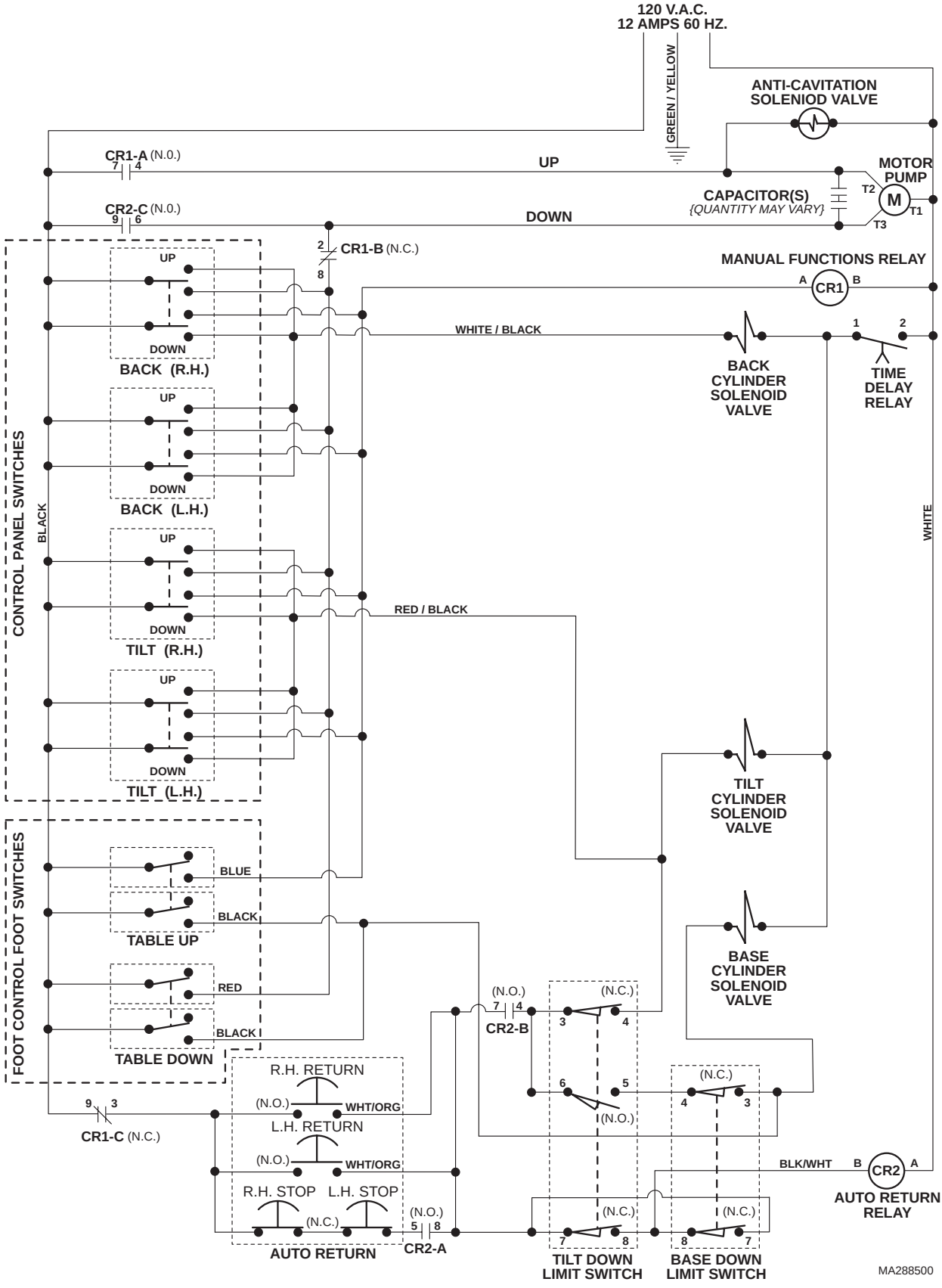

Figure 5-2. Electrical Schematic

5.2 Hydraulic Flow Diagrams

Figure 5-3 illustrates the hydraulic oil flow through the chair when an up function is selected. Figure 5-4 illustrates the hydraulic oil flow through the chair when a down function is selected.

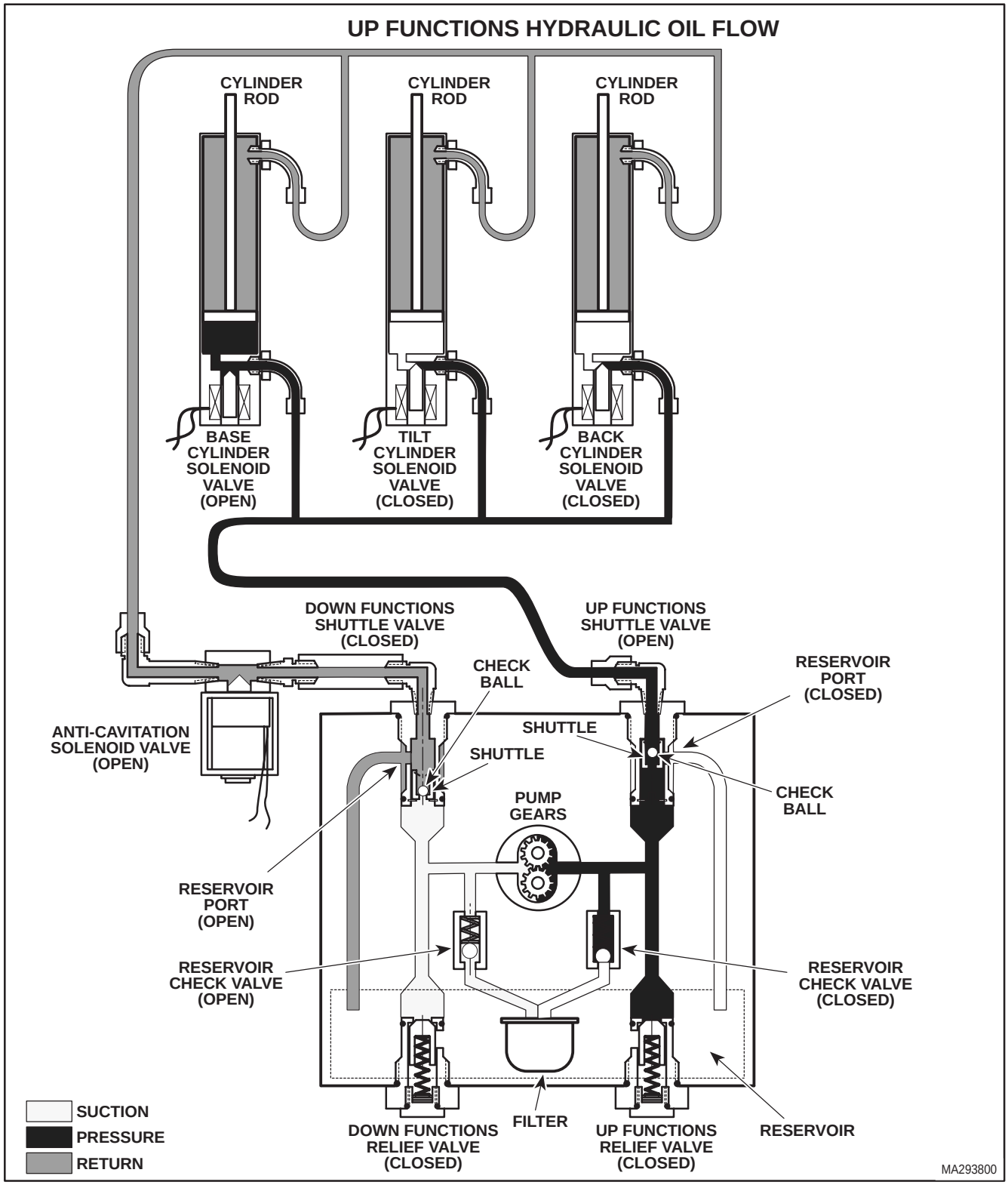

Figure 5-3. Up Functions Hydraulic Flow Diagram

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SCHEMATICS AND DIAGRAMS

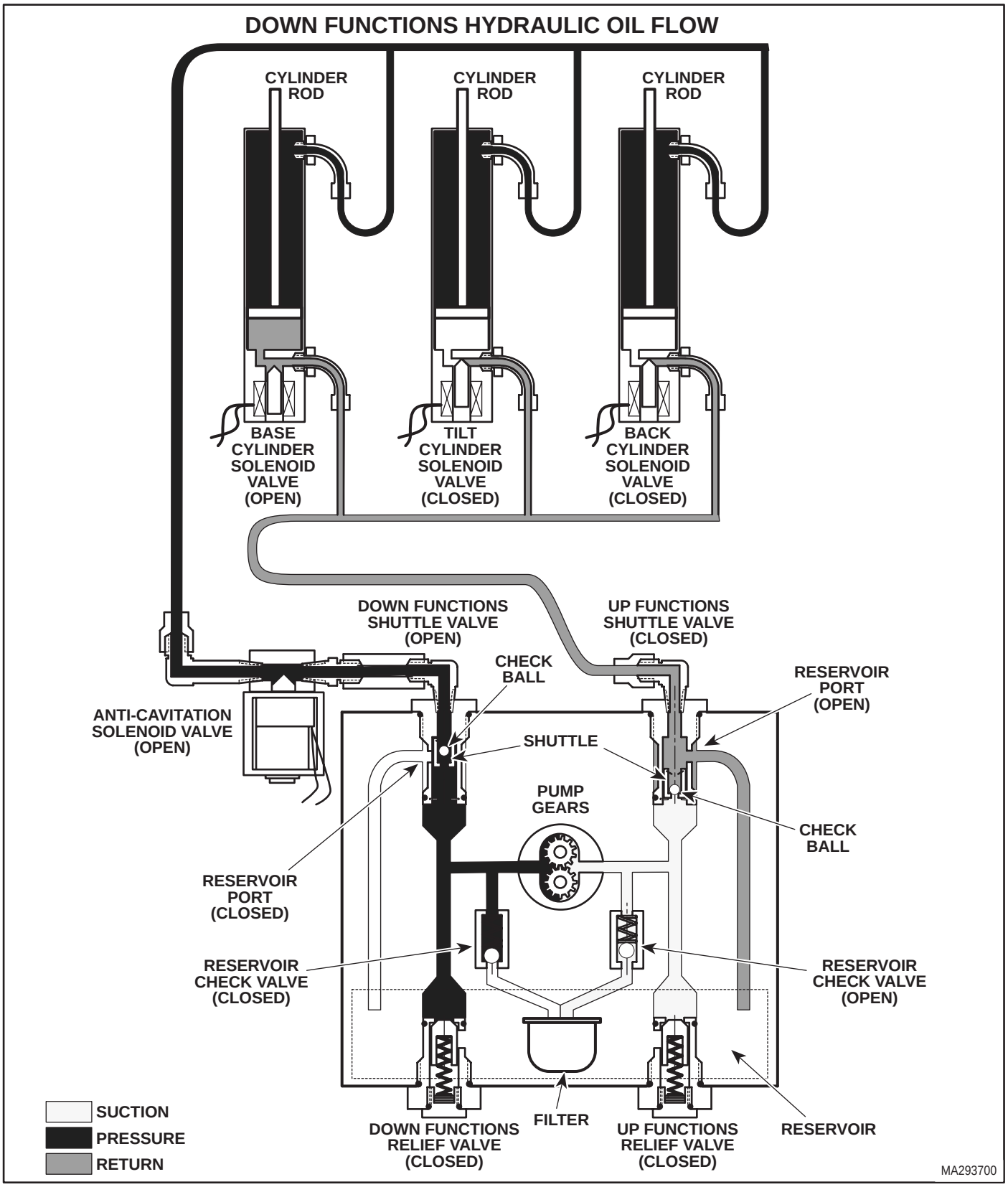

Figure 5-4. Down Functions Hydraulic Flow Diagram

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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 1.5 for parts ordering information.

The parts list also illustrates disassembly and assembly relationships of parts.

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.

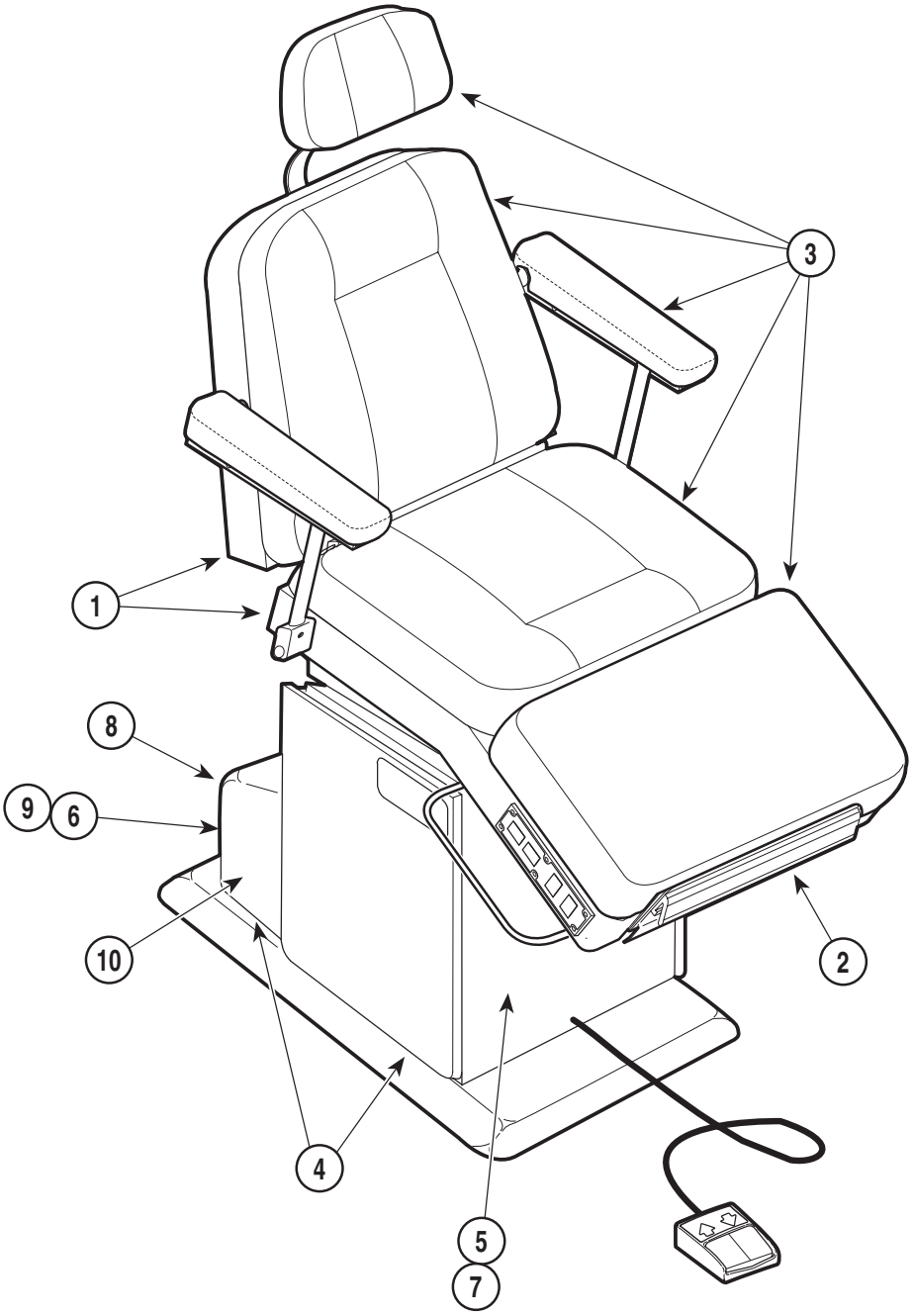
The *Qty.* column lists the number of units of a particular component that is required for the subassembly. The letters “AR” denote “as required” when quantities of a particular component cannot be determined, such as: adhesive.

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



MA288200

Used on units with Serial Numbers KM-1000 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Page
		317 Power Podiatry Table	
1	•	• Back and Seat Components	6-3
2	•	• Leg Components	6-4
3	•	• Upholstery Set	6-5
4	•	• Base Cover and Enclosures	6-6
5	•	• Base Mechanical Components	6-7
6	•	• Hydraulic System	6-8
7	•	• Base Slide Assembly	6-9
8	•	• Base Electrical Comp.-Domestic	6-10
9	•	• Motor / Pump Components	6-11
10	•	• Control Panel Assembly	6-12

Item	Part No.	Description	Page
		OPTIONAL ACCESSORIES	
		Refer to MEDICAL ACCESSORY BOOK {004-0096-00}	
11	• 9A6400X	• Vision Block Screen	9A64
12	• 9A75001	• Caster Base Assembly	9A75
13	• 9A83001	• Instrument Tray	9A83
14	• 9A18400X	• Base Rail Kit	9A184
15	• 9A197001	• Swivel Wheel Caster Accessory	9A197
16	• 003-0906-00	• Installation & Operation Manual (Not Shown)	N/S

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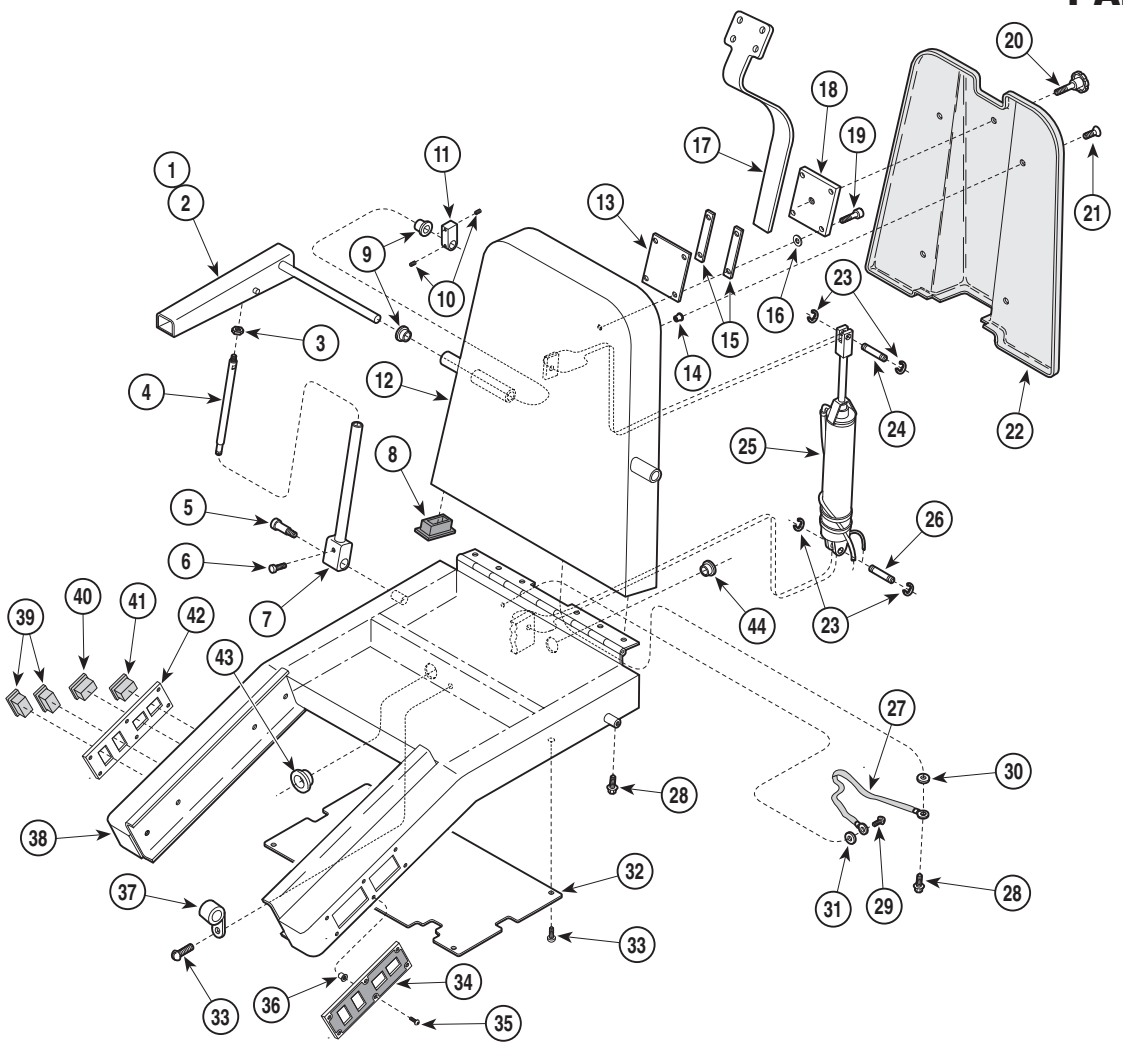
Back and Seat Components



MA287800

Used on units with Serial Numbers KM-1000 thru KM-1571

Item	Part No.	Description	Qty.
1	030-0300-00	Reclining Arm - R.H. (Shown)	1
2	030-0300-02	Reclining Arm - L.H. (Opposite)	1
3	041-0375-02	Jam Nut	2
4	057-0120-00	Inner Rod	2
5	042-0014-03	Shoulder Screw	2
6	016-0335-00	Spring Plunger	2
7	030-0322-00	Outer Arm Weldment - R.H. (Shown)	1
	030-0322-02	Outer Arm Weldment - L.H. (Opposite)	1
8	053-0115-01	Rectangular Plug	4
9	016-0131-02	Bushing	4
10	040-0250-05	Set Screw	4
11	051-0271-00	Arm Stop	2
12	030-0297-40	Back Weldment	1
13	050-0907-00	Spacer	1
14	042-0045-01	Nutsert	4
15	051-0264-00	Guide Bar	2
16	045-0001-13	Spring Washer	4
17	051-0808-00	Headrest Bar	1
18	050-0908-00	Lock Plate	1
19	040-0250-33	Screw	4
20	016-0175-00	Knob	1
21	040-0010-28	Screw	4
22	053-0147-02	Back Cover	1
23	042-0007-00	E-Ring	4
24	042-0006-00	Clevis Pin	1
25		Back Cylinder (Refer to "Hydraulic System" Elsewhere)	1
26	042-0006-01	Clevis Pin	1
27	015-0082-02	Grounding Braid	1
28	040-0250-88	Screw	6
29	040-0010-04	Screw	1
30	045-0001-05	Lockwasher	1
31	045-0001-31	Lockwasher	1
32	050-3504-40	Seat Cover	1
33	040-0010-47	Screw	5
34	050-3596-30	Switchplate	1
	~~061-0613-01~~	Switch Label - L.H. (Not Shown)	1
35	040-0008-28	Screw	12
36	042-0045-02	Nutsert	12
37	015-0001-02	Wire Clip	1
38	030-0999-40	Seat Weldment	1
39	015-0408-00	Rocker Switch	4
40	015-0376-00	Stop Switch	2
41	015-0424-00	Auto Return Switch	2
42	050-3596-30	Switchplate	1
	~~061-0613-00~~	Switch Label - R.H. (Not Shown)	1
43	053-0068-06	Snap Bushing	4
44	053-0068-08	Snap Bushing	2

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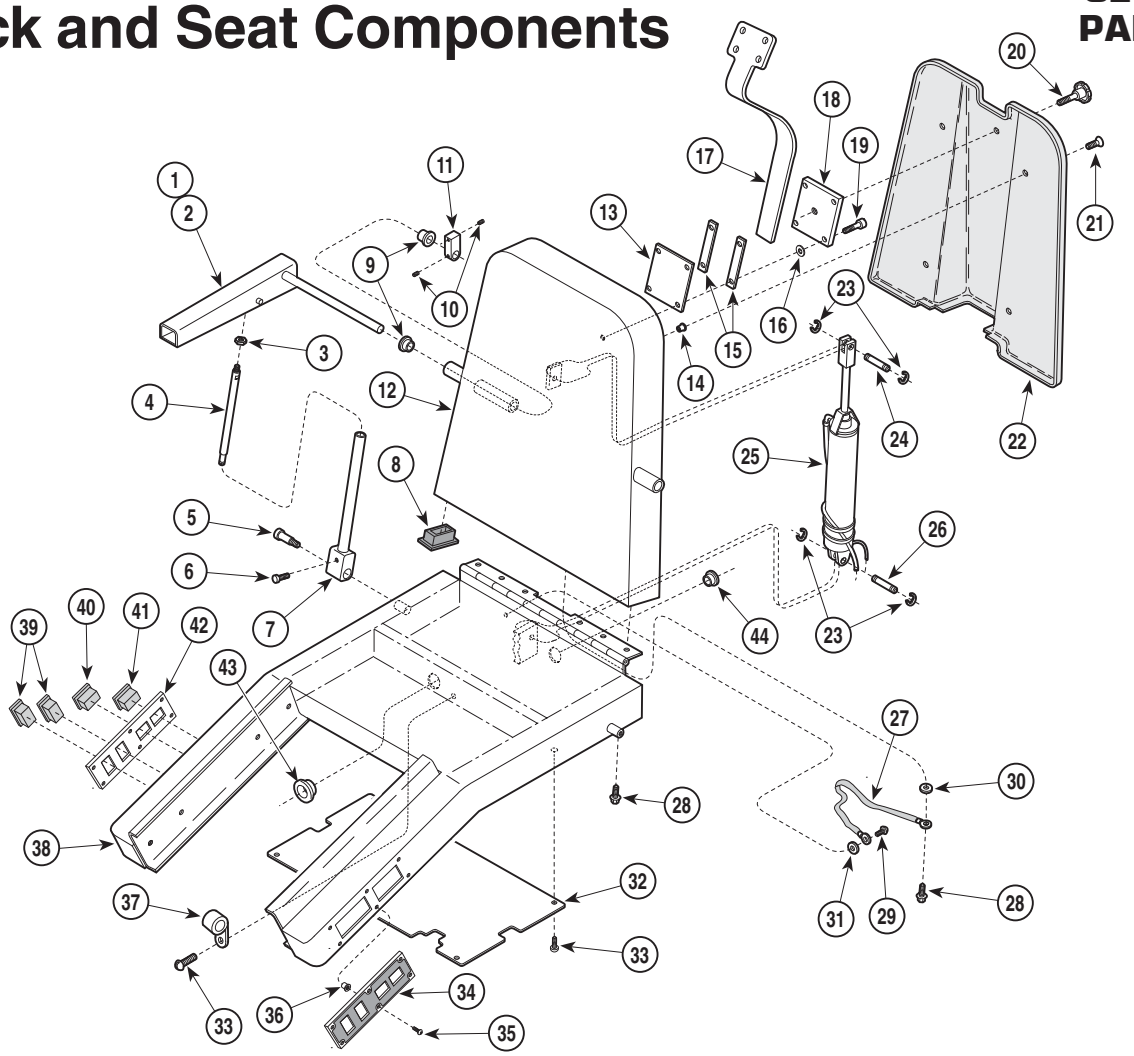
Back and Seat Components



MA287800

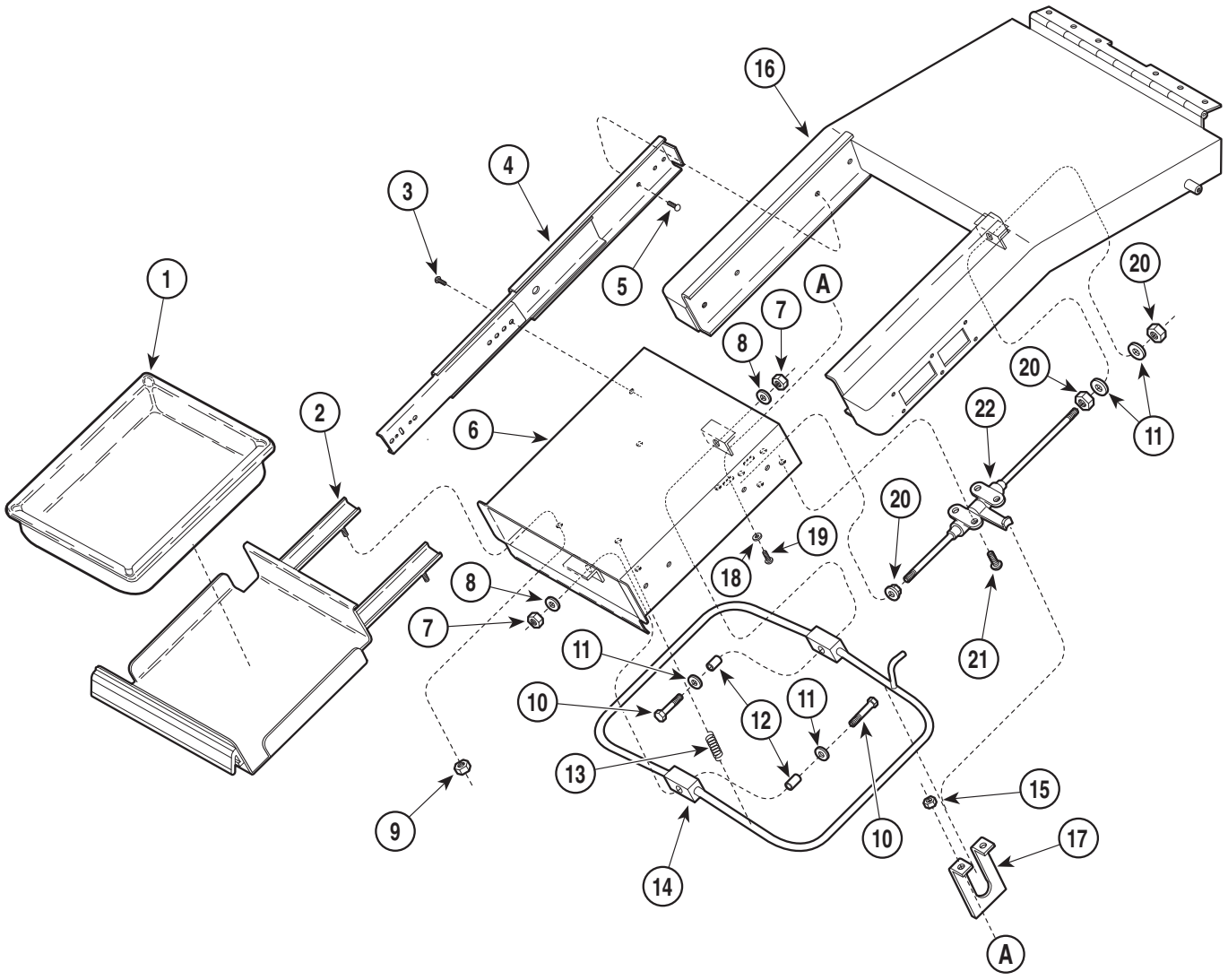
Used on units with Serial Numbers KM-1572 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	030-0300-00	Reclining Arm - R.H. (Shown)	1
2	030-0300-02	Reclining Arm - L.H. (Opposite)	1
3	041-0375-02	Jam Nut	2
4	057-0120-00	Inner Rod	2
5	042-0014-03	Shoulder Screw	2
6	016-0335-00	Spring Plunger	2
7	030-0322-00	Outer Arm Weldment - R.H. (Shown)	1
	030-0322-02	Outer Arm Weldment - L.H. (Opposite)	1
8	053-0115-01	Rectangular Plug	4
9	016-0131-02	Bushing	4
10	040-0250-05	Set Screw	4
11	051-0271-00	Arm Stop	2
12	030-1390-40	Back Weldment	1
13	050-0907-00	Spacer	1
14	042-0045-01	Nutsert	4
15	051-0264-00	Guide Bar	2
16	045-0001-13	Spring Washer	4
17	*N.L.A.*	Headrest Bar	1
18	050-0908-00	Lock Plate	1
19	040-0250-33	Screw	4
20	016-0175-00	Knob	1
21	040-0010-28	Screw	4
22	053-0147-02	Back Cover	1
23	042-0007-00	E-Ring	4
24	042-0006-02	Clevis Pin	1
25		Back Cylinder (Refer to "Hydraulic System" Elsewhere)	1
26	042-0006-01	Clevis Pin	1
27	015-0082-02	Grounding Braid	1
28	040-0250-88	Screw	6
29	040-0010-04	Screw	1
30	045-0001-05	Lockwasher	1
31	045-0001-31	Lockwasher	1
32	050-3504-40	Seat Cover	1
33	040-0010-47	Screw	5
34	050-3596-30	Switchplate	1
	~~061-0613-01~~	Switch Label - L.H. (Not Shown)	1
35	040-0008-28	Screw	12
36	042-0045-02	Nutsert	12
37	015-0001-02	Wire Clip	1
38	030-1389-40	Seat Weldment	1
39	015-0408-00	Rocker Switch	4
40	015-0376-00	Stop Switch	2
41	015-0424-00	Auto Return Switch	2
42	050-3596-30	Switchplate	1
	~~061-0613-00~~	Switch Label - R.H. (Not Shown)	1
43	053-0068-06	Snap Bushing	4
44	053-0068-08	Snap Bushing	2

N.L.A. Denotes "No Longer Available"

Always Specify Model & Serial Number

Leg Components



MA286301

Item	Part No.	Description	Qty.
1	016-0373-00	Pan	1
2	029-0421-02	Pan Holder Assembly	1
3	040-0010-21	Screw (Apply Loctite #042-0024-00)	8
4	016-0192-00	Slide	2
5	040-0010-55	Screw (Apply Loctite #042-0024-00)	8
6	030-0338-40	Footrest Weldment	1
7	041-0375-04	Nut	2
8	045-0001-24	Lockwasher	2
9	041-0008-02	Nut	4
10	040-0375-21	Screw	2
11	045-0001-40	Washer	4
12	052-0080-00	Pivot Tube (Apply Petroleum Jelly #064-0001-00 to O.D. & I.D.)	2
13	025-0027-00	Extension Spring	1
14	030-0339-42	Handle Weldment	1
15	041-0010-02	Nut	2
16		Seat Weldment (Refer to "Back and Seat Components" Elsewhere)	Ref
17	050-1010-40	Handle Stop	1
18	045-0001-15	Washer	2
19	040-0010-23	Screw	2
20	041-0375-13	Nut	3
21	040-0010-47	Screw	4
22	016-0191-00	Mechanical Lock	1

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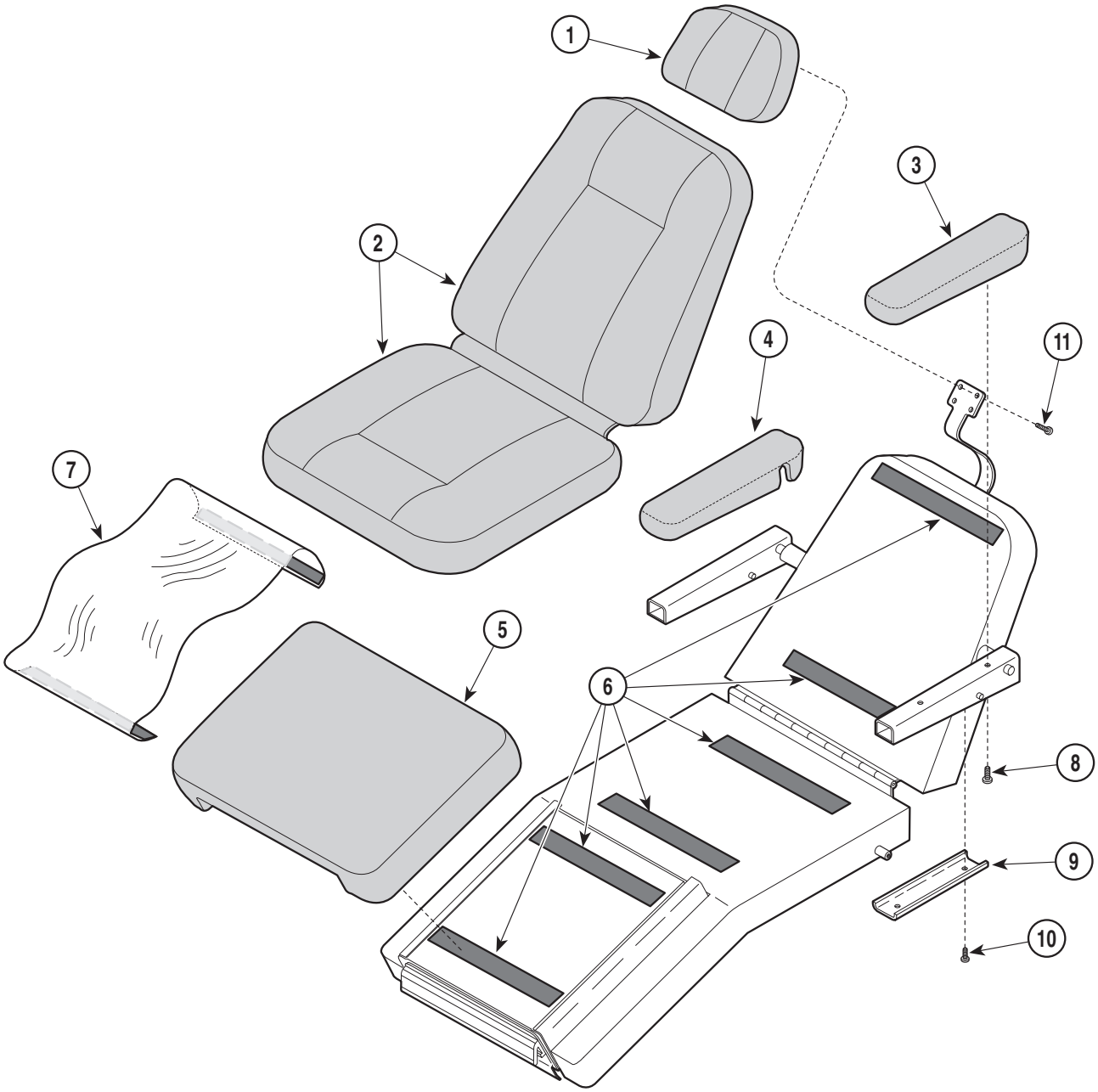
Upholstery Set



Color Selector.....www.midmark.com

MA286400

Used on units with Serial Numbers KM1000 thru KM1614

Item	Part No.	Description	Qty.
	027-0107-99	Upholstery Set (Includes Items 1 thru 5 {*Specify Color})	1
1	• 028-0075-99	• Headrest Cushion {*Specify Color}	1
2	• 028-0095-00	• Back & Seat Cushion {*Specify Color}	1
3	• 028-0104-00	• L.H. Arm Cushion {*Specify Color}	1
4	• 028-0103-00	• R.H. Arm Cushion {*Specify Color}	1
5	• 028-0096-00	• Foot Section Cushion {*Specify Color}	1
6	053-0131-02	Velcro Hook Tape	6
7	029-0423-00	Clear Vinyl Foot Cover	1
8	040-0010-46	Screw	4
9	050-0928-40	Arm Cover	2
10	040-0006-21	Screw	4
11	040-0010-51	Screw	4

* Click on the Color Selector link above to see available colors.

N.L.A. Denotes "No Longer Available"
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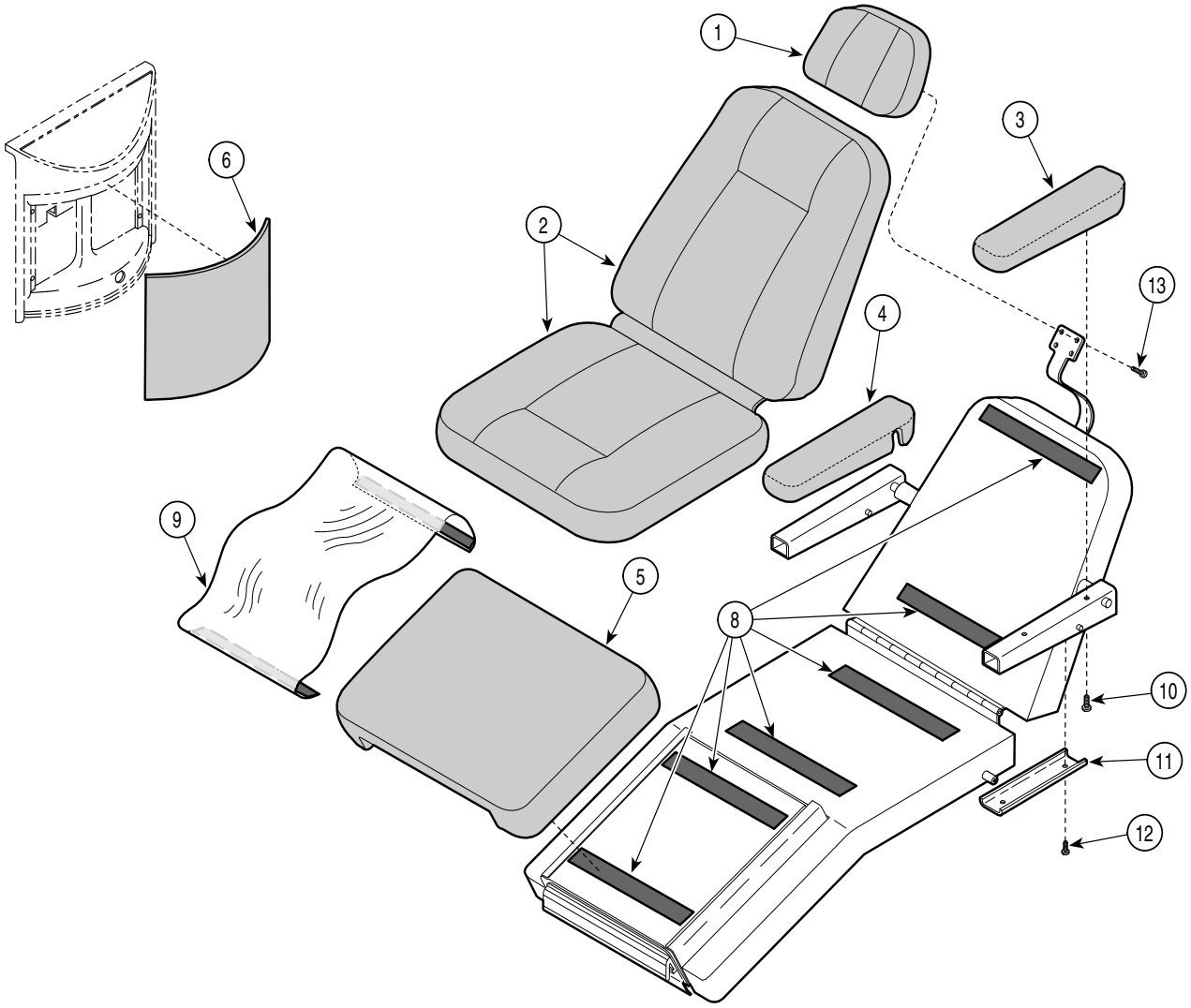
Upholstery Set



Color Selector.....www.midmark.com

MA286401i

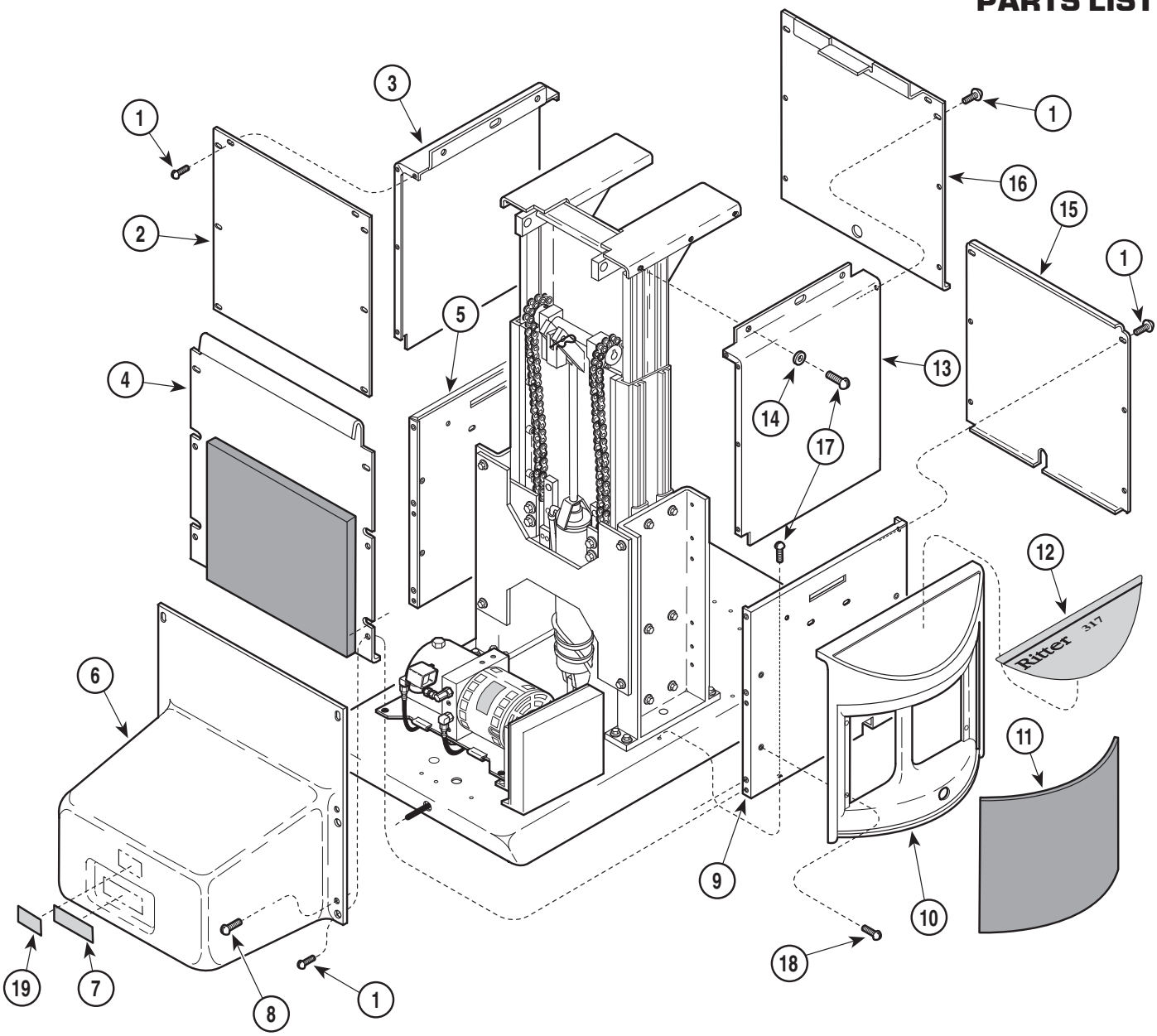
Used on units with Serial Numbers KM1615 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
	027-0107-99	Upholstery Kit (Includes Items 1 thru 5 {*Specify Color)	1
1	• 028-0075-99	• Headrest Cushion {Specify Color}	1
2	• 028-0095-00	• Back & Seat Cushion {Specify Color}	1
3	• 028-0104-00	• L.H. Arm Cushion {Specify Color}	1
4	• 028-0103-00	• R.H. Arm Cushion {Specify Color}	1
5	• 028-0096-00	• Foot Section Cushion {Specify Color}	1
6	050-2483-01	Color Insert Panel {Specify Color})	2
7	003-1300-00	Installation Instructions (Not Shown)	1
8	053-0131-02	Velcro Hook Tape	6
9	029-0423-00	Clear Vinyl Foot Cover	1
10	040-0010-46	Screw	4
11	050-0928-40	Arm Cover	2
12	040-0006-21	Screw	4
13	040-0010-51	Screw	4

* Click on the Color Selector link above to see available colors.

N.L.A. Denotes "No Longer Available"
Always Specify Model & Serial Number

Base Covers And Enclosures



Color Selector.....www.midmark.com

MA373309

Item	Part No.	Description	Qty.
1	040-0008-29	Screw	24
2	050-2677-40	Back Inner Shroud	1
3	050-0947-41	L.H. Inner Shroud (Less Nutserts)	1
	• 042-0045-02	• Nutsert	8
4	029-1585-01	Back Outer Shroud Assembly	1
5	050-2639-41	L.H. Outer Shroud (Less Nutserts)	1
	• 042-0045-01	• Nutsert	7
	• 042-0045-02	• Nutsert	4
6	029-1586-01	Motor Cover Assembly	1
7	061-0293-00	Caution Label	1
8	040-0010-34	Screw	6
9	050-2639-40	R.H. Outer Shroud (Less Nutserts)	1
	• 042-0045-01	• Nutsert	7
	• 042-0045-02	• Nutsert	4
10	053-0516-01	Side Panel	2
11	050-2483-XX	Side Panel Insert (*Specify Color)	2
12	061-0640-03	Nameplate Decal (317)	2
13	050-0947-40	R.H. Inner Shroud (Less Nutsert)	1
	• 042-0045-02	• Nutsert	8
14	045-0001-15	Washer	6
15	050-2617-40	Front Outer Shroud	1
16	050-0463-40	Front Inner Shroud	1
17	040-0010-47	Screw	12
18	040-0010-23	Screw	8
19	061-0295-00	Cord Tag	1

* Click on the Color Selector link above to see available colors.

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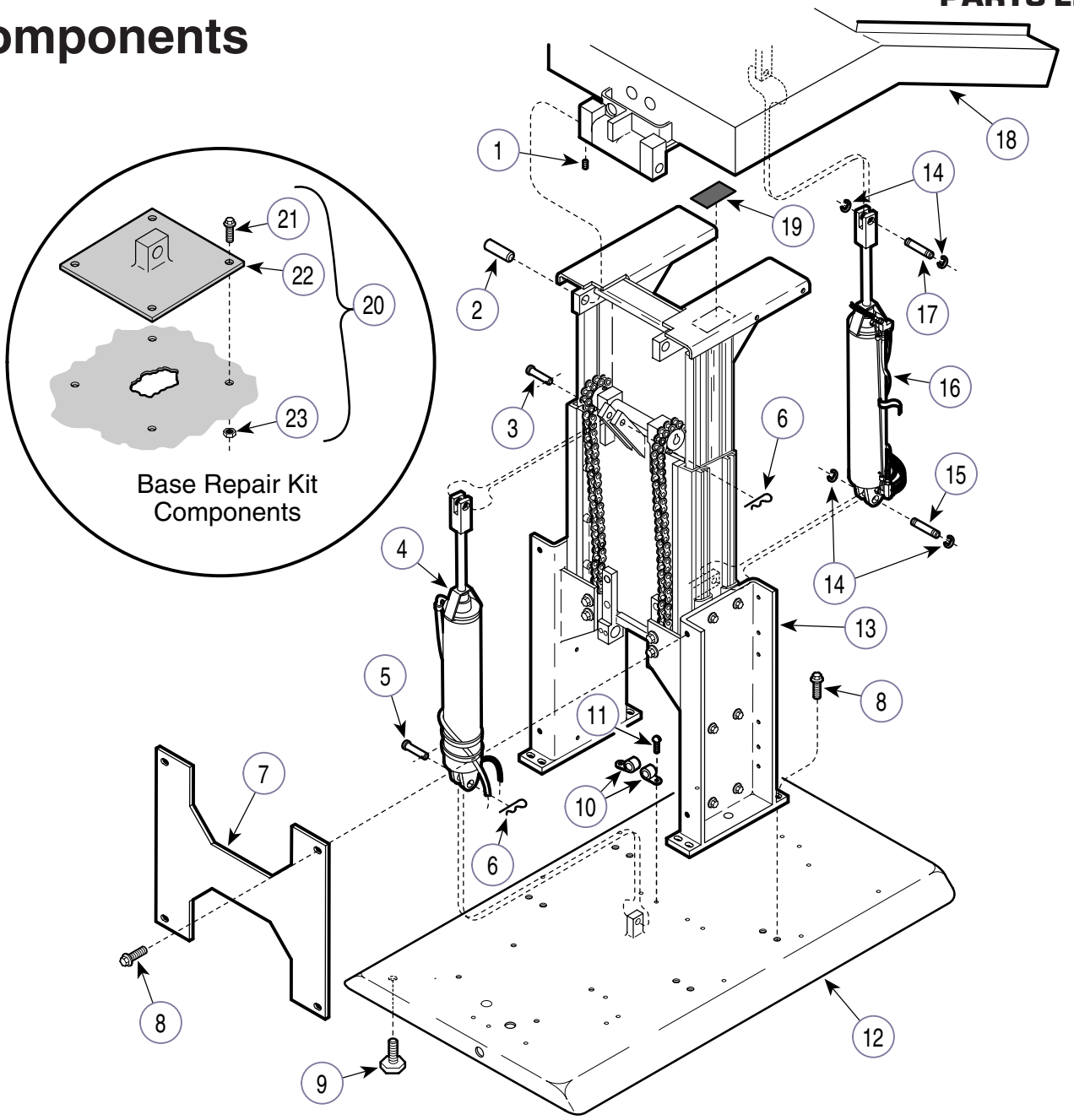
Base Mechanical Components



MA286503

Used on units with Serial Numbers KM-1000 thru KM-X1571

Item	Part No.	Description	Qty.	Item	Part No.	Description	Qty.
1	040-0250-04	Set Screw	4	13		Base Slide Assembly (Refer to Breakdown Elsewhere)	Ref
2	057-0027-00	Tilt Pivot Pin (Apply Petroleum Jelly #064-0001-00)	2	14	042-0007-00	E-Ring	4
3	042-0005-03	Clevis Pin	1	15	042-0006-01	Clevis Pin	1
4		Base Cylinder (Refer to "Hydraulic System" Elsewhere)	Ref	16		Tilt Cylinder Assembly (Refer to "Hydraulic System" Elsewhere)	Ref
5	042-0005-01	Clevis Pin	1	17	042-0006-00	Clevis Pin	1
6	042-0004-00	Hitch Pin Clip	2	18		Seat Weldment (Refer to "Seat Components" Elsewhere)	Ref
7	050-1475-40	Brace	1	19	061-0620-00	U/L Label	1
8	040-0375-00	Screw	12	20	002-0514-00	Base Repair Kit (Includes Items 21 thru 23)	
9	016-0001-00	Leveling Screw	4	21	• 040-0250-89	• Screw	4
10	015-0001-00	Wire Clip	2	22	•030-1010-00	• Base Cylinder Mount Weldment	1
11	040-0010-04	Screw	2	23	• 041-0250-13	• Nut	4
12	030-1057-00	Stationary Base Weldment	1				

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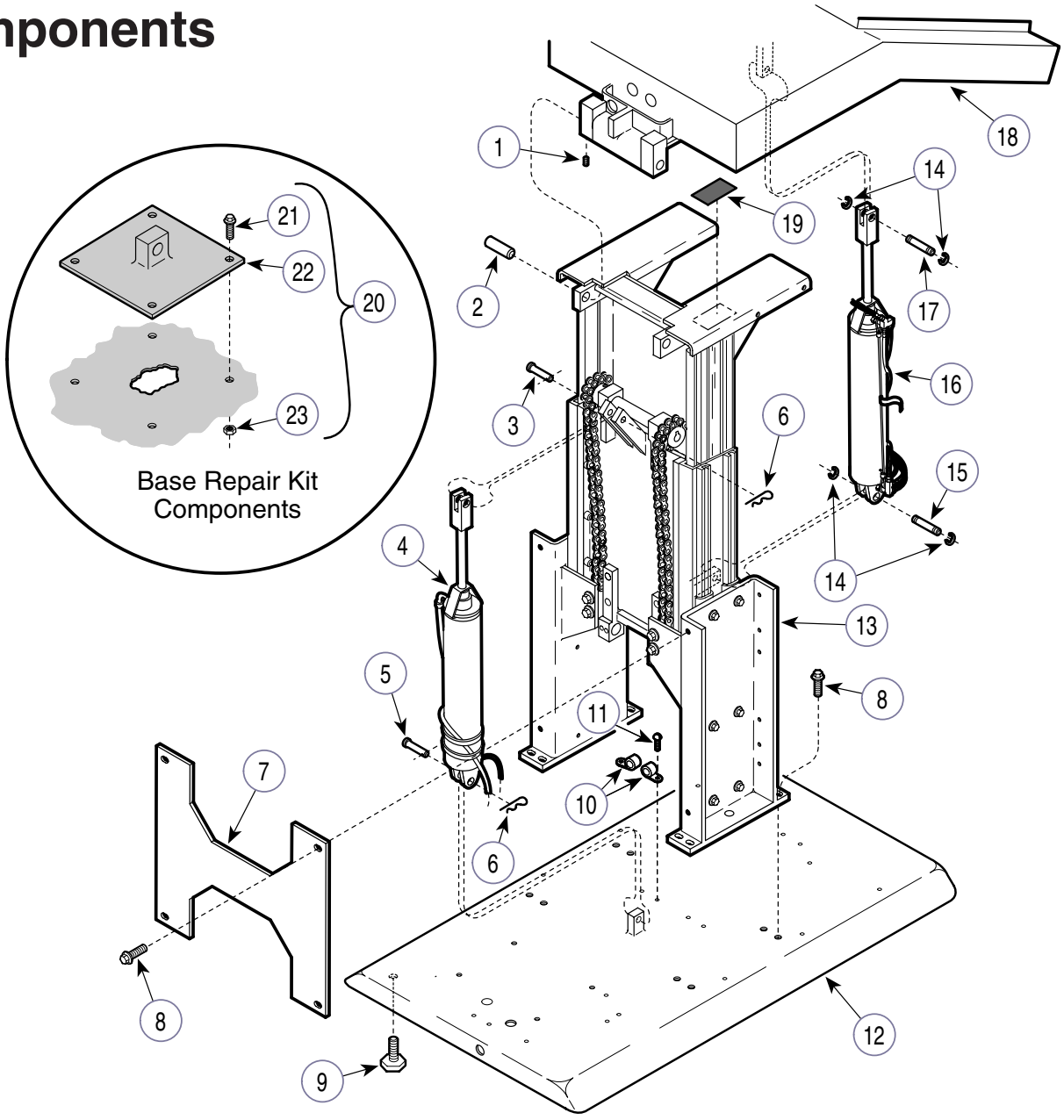
Base Mechanical Components



MA286501

Used on units with Serial Numbers KM-1572 thru Present
Used on units with Serial Number V2200 thru Present

Item	Part No.	Description	Qty.
1	040-0250-04	Set Screw	4
2	057-0027-00	Tilt Pivot Pin (Apply Petroleum Jelly #064-0001-00)	2
3	042-0005-03	Clevis Pin	1
4		Base Cylinder (Refer to "Hydraulic System" Elsewhere)	Ref
5	042-0005-01	Clevis Pin	1
6	042-0004-00	Hitch Pin Clip	2
7	050-1475-40	Brace	1
8	040-0375-00	Screw	12
9	016-0001-00	Leveling Screw	4
10	015-0001-00	Wire Clip	2
11	040-0010-04	Screw	2
12	030-1057-00	Stationary Base Weldment	1
13		Base Slide Assembly (Refer to Breakdown Elsewhere)	Ref
14	042-0007-00	E-Ring	4
15	042-0006-01	Clevis Pin	1
16		Tilt Cylinder Assembly (Refer to "Hydraulic System" Elsewhere)	Ref
17	042-0006-02	Clevis Pin	1
18		Seat Weldment (Refer to "Seat Components" Elsewhere)	Ref
19	061-0620-00	U/L Label	1
20	002-0514-00	Base Repair Kit (Includes Items 21 thru 23)	
21	• 040-0250-89	• Screw	4
22	• 030-1010-00	• Base Cylinder Mount Weldment	1
23	• 041-0250-13	• Nut	4

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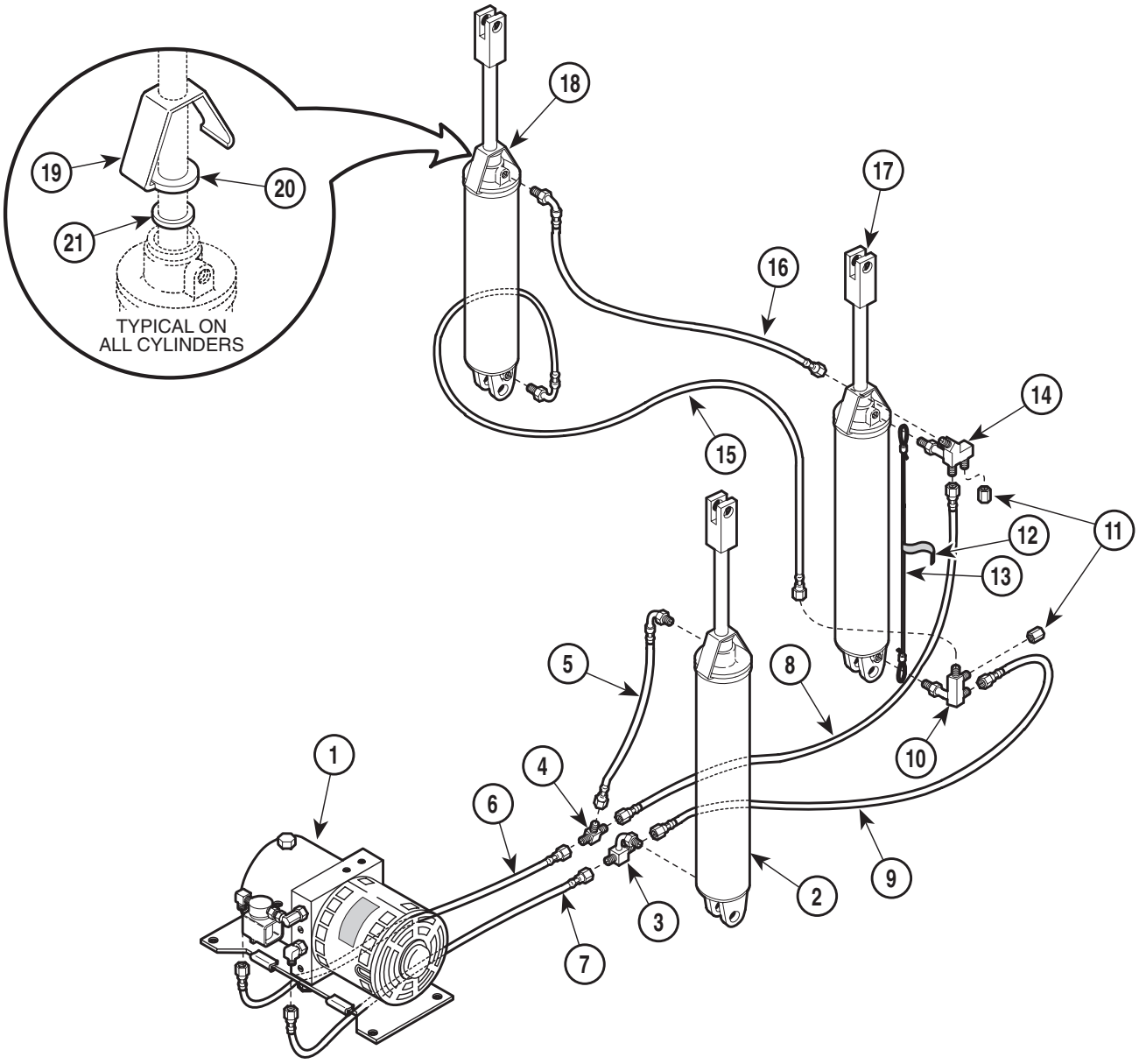
Hydraulic System



MA288001

Item	Part No.	Description	Qty.
1		Motor / Pump Assembly (Refer to "Motor / Pump Components" Elsewhere)	Ref
2	002-0001-00	Base Cylinder Kit	1
3	014-0135-00	Base Tee	1
4	014-0098-00	Union Tee	1
5	002-0122-00	Hose Assembly Kit	1
6	002-0120-00	Hose Assembly Kit	1
7	002-0119-00	Hose Assembly Kit	1
8	002-0122-00	Hose Assembly Kit	1
9	002-0121-00	Hose Assembly Kit	1
10	014-0136-00	Tilt Power Manifold	1
11	014-0179-00	Manifold Cap	2
12	061-0113-00	Safety Cable Label	1
13	016-0161-00	Safety Cable	1
14	014-0137-00	Return Manifold	1
15	002-0125-00	Hose Assembly Kit	1
16	002-0126-00	Hose Assembly Kit	1
17	002-0271-00	Tilt Cylinder Kit	1
18	002-0346-00	Back Cylinder Kit	1
19	025-0032-00	Rod Wiper Bracket	AR
20	054-0109-00	Felt Wiper (1")	AR
21	054-0108-00	Felt Wiper (11/16")	AR
22	015-0013-00	Cable Tie (Not Shown)	AR
23	015-0013-02	Cable Tie (Not Shown)	AR
24	015-0016-00	Cable Tie (Not Shown)	AR
25	015-0017-00	Cable Tie (Not Shown)	AR

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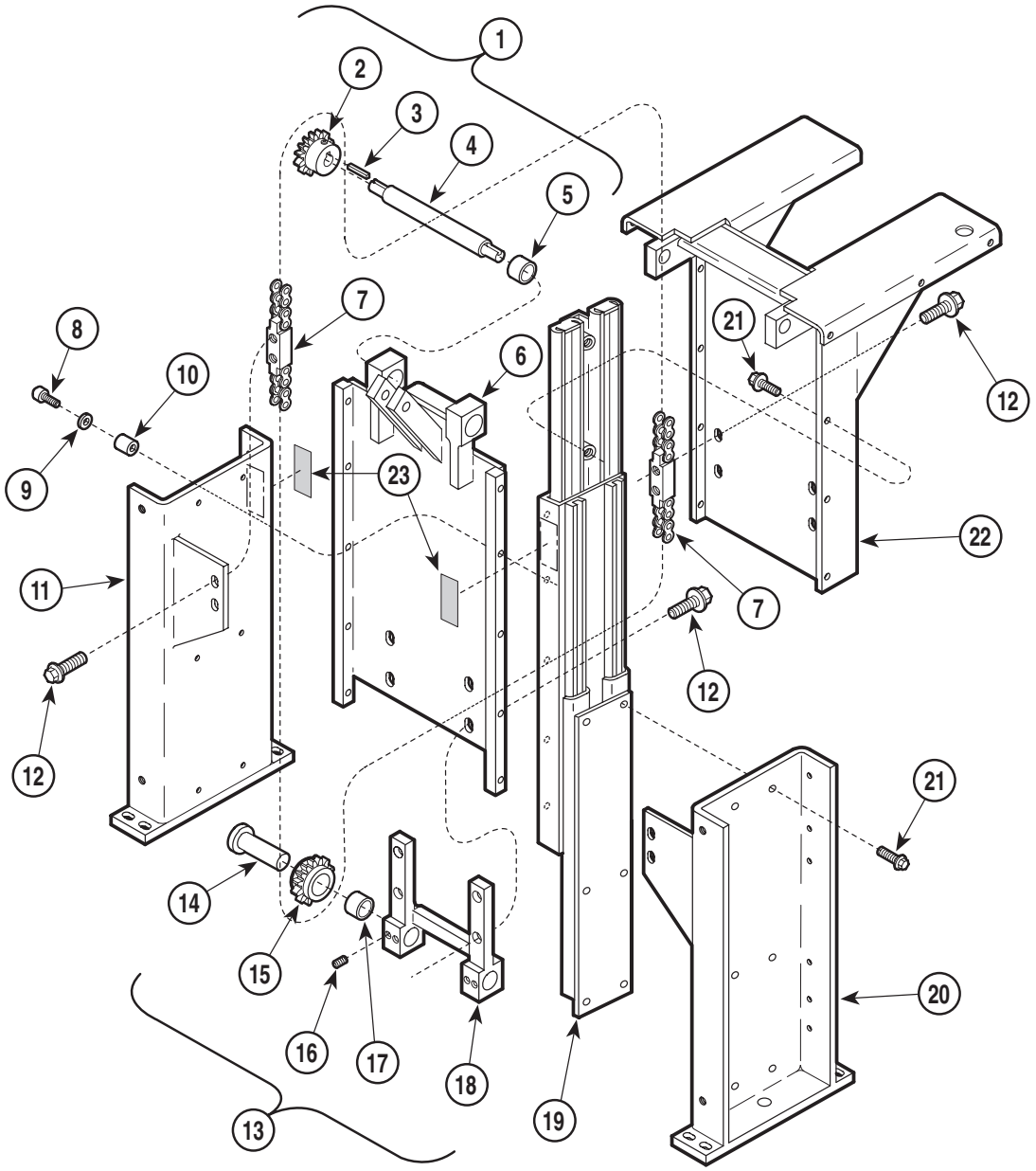
Base Slide Assembly

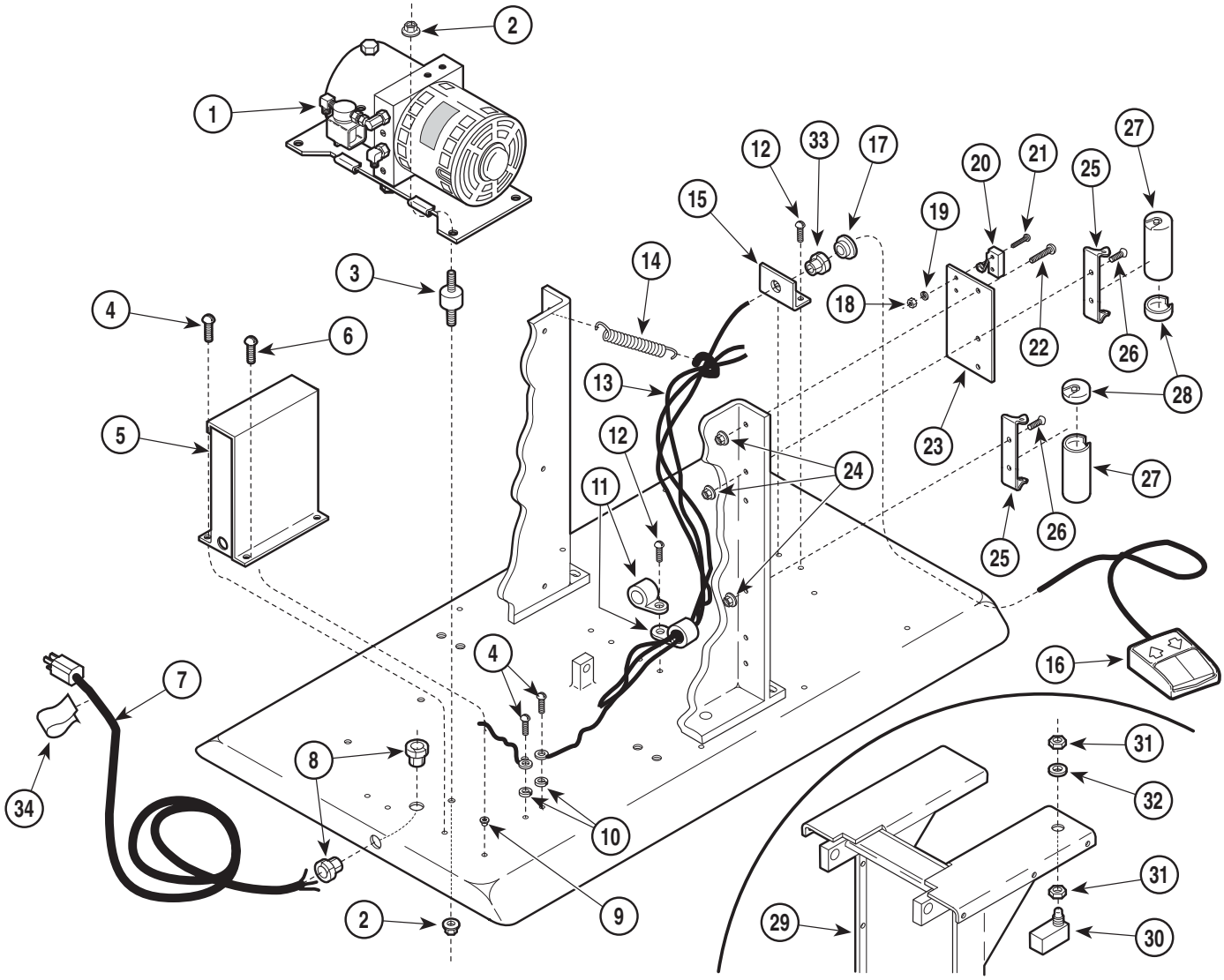


MA286601

Item	Part No.	Description	Qty.
	029-0069-05	Base Slide Assembly (Includes Items 1 thru 22)	1
1	• 029-0072-05	• Middle Member Assembly (Includes Items 2 thru 6)	1
2	• • 016-0151-00	• • Sprocket (Includes Set Screw)	2
3	• • 042-0008-00	• • Machine Key	2
4	• • 057-0105-00	• • Axle	1
5	• • 016-0149-00	• • Bearing	2
6	• • 030-0094-40	• • Middle Member Weldment	1
7	• 029-0070-00	• Chain Assembly	2
8	• 040-0008-30	• Screw	10
9	• 045-0001-10	• Lockwasher	10
10	• 052-0015-00	• Spacer	10
11	• 030-0092-41	• L.H. Support Channel Weldment	1
12	• 040-0375-00	• Screw	12
13	• 029-0071-05	• Idler Adjuster Assembly (Includes Items 14 thru 18)	1
14	• • 030-0274-00	• • Journal Weldment	1
15	• • 029-3036-00	• • Sprocket (Includes Item 17)	2
16	• • 040-0250-04	• • Set Screw	4
17	• • • 016-0149-00	• • • Bearing	2
18	• • 030-0273-40	• • Idler Adjuster Weldment	1
19	• 016-0234-01	• L.H. Base Slide (Opposite)	1
	• 016-0234-00	• R.H. Base Slide (Shown)	1
20	• 030-0092-40	• R.H. Support Channel Weldment	1
21	• 040-0250-88	• Screw	20
22	• 030-0917-41	• Inner Member Weldment	1
23	061-0045-00	Cover Caution Label	2

Always Specify Model & Serial Number

Base Electrical Components - Domestic



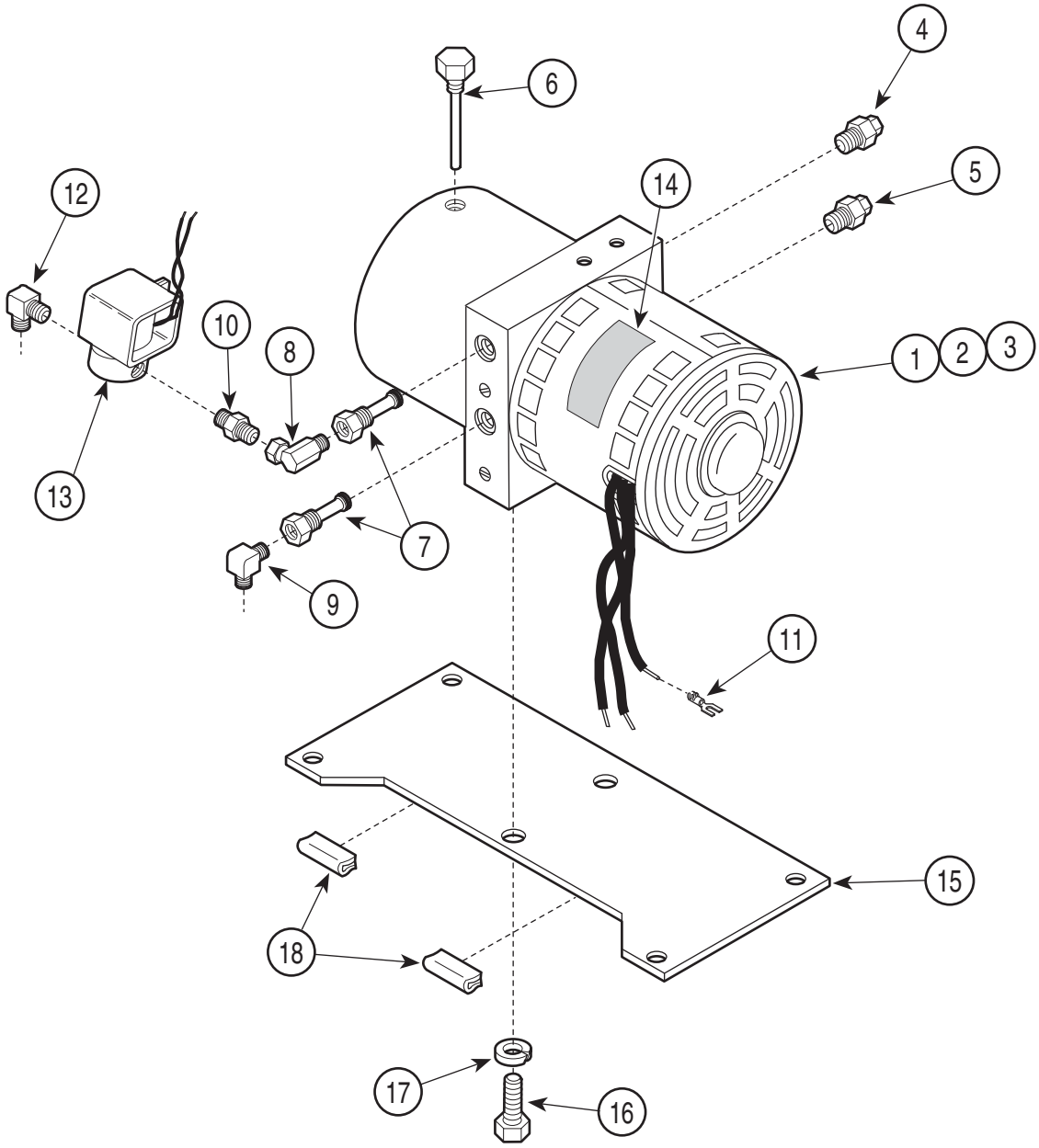
MA287702

Item	Part No.	Description	Qty.
1		Motor / Pump Assembly (Refer to "Pump / Motor Components" Elsewhere)	1
2	041-0250-13	Nut	8
3	053-0051-00	Motor Mount	4
4	040-0010-47	Screw	4
5		Control Panel (Refer to "Control Panel Assembly" Elsewhere)	1
6	040-0010-34	Screw	2
7	002-0040-00	Power Cord Set Kit	1
8	015-0002-01	Strain Relief Bushing	2
9	042-0045-01	Nutsert	4
10	045-0001-31	Lockwasher	2
11	015-0014-00	Wire Clip	1
12	040-0010-04	Screw	3
13	015-1079-00	Wiriring Harness Assembly	1
14	025-0025-00	Spring	1
15	050-0957-01	Strain Relief Bracket	1
16	015-0404-01	Footswitch Assembly	1
	• 002-0101-00	• Foot Control Switch Kit	1

Item	Part No.	Description	Qty.
17	053-0068-10	Snap Bushing	1
18	041-0004-00	Nut	2
19	045-0001-43	Lockwasher	2
20	~~015-0421-00~~	Limit Switch	1
21	040-0004-07	Screw	2
22	040-0010-12	Screw	1
23	050-0952-40	Auto Return Bracket	2
24	041-0010-02	Nut	5
25	015-0412-02	Capacitor Mounting Bracket	2
26	040-0010-28	Screw	4
27	002-0044-00	Capacitor Kit (Includes Item 28)	2
28	• 015-0413-01	• Capacitor Cap	2
29		Inner Member Weldment (Refer to "Base Slide Assembly" Elsewhere)	Ref
30	015-0422-00	Limit Switch	1
31	041-0375-09	Panel Nut	2
32	045-0001-30	Lockwasher	1
33	015-0002-00	Strain Relief Bushing	1
34	061-0295-00	Cord Tag	1

Always Specify Model & Serial Number

Motor / Pump Components



MA531300

Item	Part No.	Description	Qty.
1	002-0444-00	Motor / Pump Assembly (Includes Items 2 thru 11)	1
2	• 014-0169-00	• Motor Shaft Seal (Not Shown)	1
3	• 014-0262-02	• O-Ring (Not Shown)	1
4	• 014-0248-00	• Relief Valve (Low Pressure)	1
5	• 014-0249-00	• Relief Valve (High Pressure)	1
6	• 014-0262-01	• Filler Cap	1
7	• 014-0168-00	• Shuttle Valve	2
8	• 014-0260-00	• Elbow	1
9	• 014-0096-00	• Elbow	1
10	• 014-0045-00	• Connector	1
11	• 015-0018-03	• Spring Spade Terminal	3
12	014-0096-00	Elbow	1
13	002-0038-00	Anticavitation Solenoid Valve	1
14	061-0135-00	Motor Caution Label	1
15	050-2662-40	Motor Base	1
16	040-0500-02	Screw	2
17	045-0001-33	Lockwasher	2
18	016-0360-00	Trim Lock (Specify Length - 2")	2

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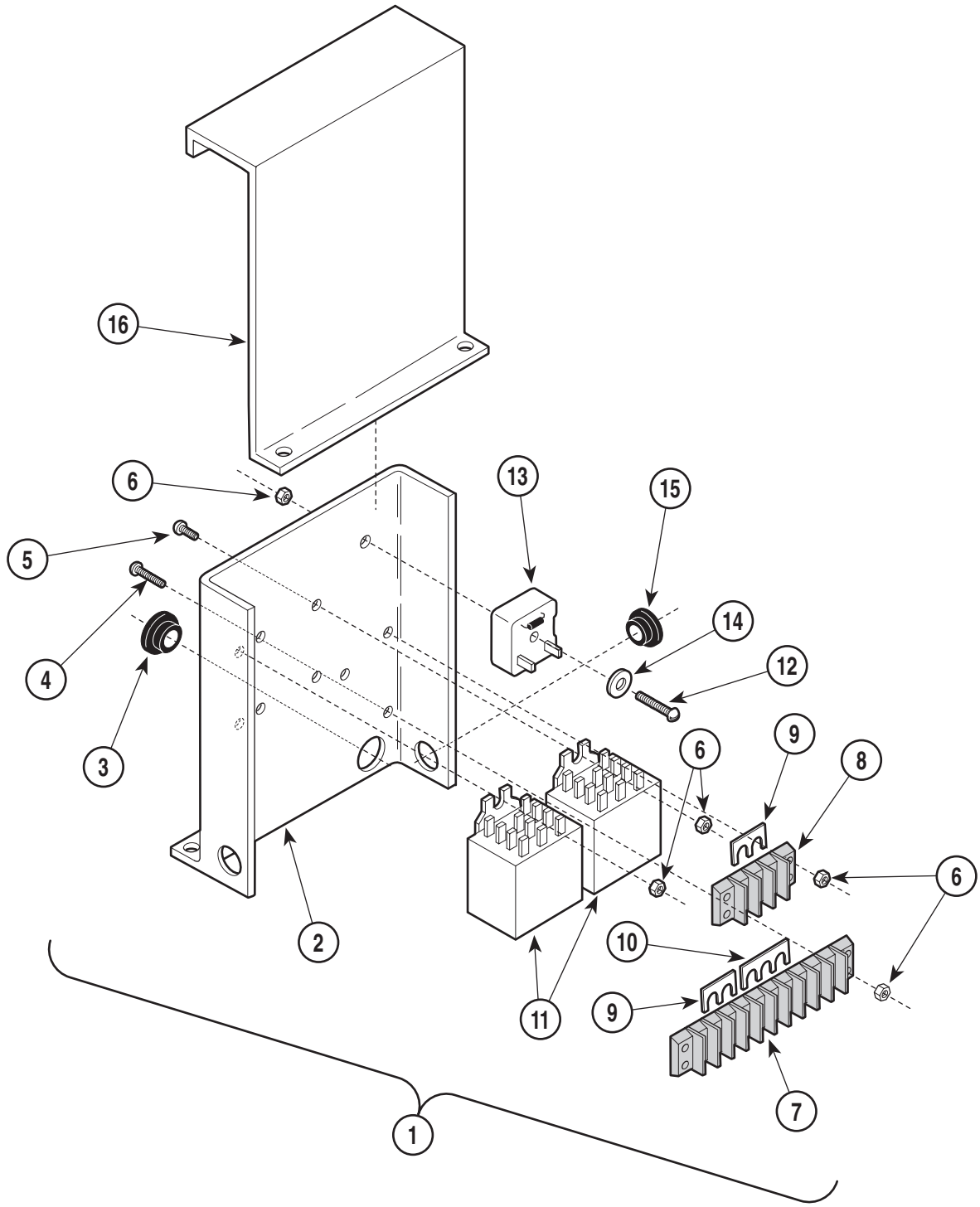
Control Panel Assembly



MA287601

Item	Part No.	Description	Qty.
1	029-1918-01	Control Panel Assembly (Includes Items 2 thru 15)	1
2	• 050-1532-40	• Control Panel Weldment	1
3	• 053-0068-06	• Snap Bushing	1
4	• 040-0006-33	• Screw	4
5	• 040-0006-10	• Screw	4
6	• 041-0006-01	• Nut	9
7	• 015-0009-01	• Terminal Block	1
8	• 015-0009-05	• Terminal Block	1
9	• 015-0022-01	• Jumper	2
10	• 015-0022-00	• Jumper	1
11	• 015-0374-00	• Relay	2
12	• 040-0006-11	• Screw	1
13	• 002-0041-00	• Time Delay Relay	1
14	• 045-0001-21	• Washer	1
15	• 053-0068-09	• Snap Bushing	2
16	050-1533-40	Control Cover	1

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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: ____________

ADDRESS: ____________

CITY, ST.: ____________

CONTACT: ____________

PHONE: ____________

SHIP TO: ____________

☐ 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: $	

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