
**U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL
FORT SAM HOUSTON, TEXAS 78234-6100**



OPERATING ROOM TABLE

SUBCOURSE MD0370 EDITION 100

DEVELOPMENT

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**CORRESPONDENCE COURSE OF
THE U.S. ARMY MEDICAL DEPARTMENT CENTER AND SCHOOL**

SUBCOURSE MD0370

OPERATING ROOM TABLE

INTRODUCTION

As a Medical Equipment Repairer, it is your job to ensure that the field operating table functions properly and that its operation is safe for both patients and equipment operators. One way that you accomplish this crucial objective is to isolate malfunctions and make the required repairs.

Subcourse Components:

This subcourse consists of one lesson and an appendix.

Lesson 1, Operating Room Table

Appendix, Operating Room Table Troubleshooting Guide.

Here are some suggestions that may be helpful to you in completing this subcourse:

--Read and study each lesson carefully.

--Complete the subcourse lesson by lesson. After completing each lesson, work the exercises at the end of the lesson, marking your answers in this booklet.

--After completing each set of lesson exercises, compare your answers with those on the solution sheet that follows the exercises. If you have answered an exercise incorrectly, check the reference cited after the answer on the solution sheet to determine why your response was not the correct one.

Credit Awarded:

Upon successful completion of the examination for this subcourse, you will be awarded 4 credit hours.

To receive credit hours, you must be officially enrolled and complete an examination furnished by the Nonresident Instruction Branch at Fort Sam Houston, Texas.

You can enroll by going to the web site <http://atrrs.army.mil> and enrolling under "Self Development" (School Code 555).

A listing of correspondence courses and subcourses available through the Nonresident Instruction Section is found in Chapter 4 of DA Pamphlet 350-59, Army Correspondence Course Program Catalog. The DA PAM is available at the following website: <http://www.usapa.army.mil/pdffiles/p350-59.pdf>.

LESSON ASSIGNMENT

LESSON 1

Operating Room Table.

TEXT ASSIGNMENT

Paragraphs 1-1 through 1-7 and Appendix.

LESSON OBJECTIVES

After completing this lesson, you should be able to:

- 1-1. Unpack and prepare the operating room table for use.
- 1-2. Disassemble and inspect the table.
- 1-3. Isolate malfunctions of the table.
- 1-4. Replace parts of the operating room table, to include the x-ray tops; head section; leg sections; back section; back lift assembly; lateral and drive screw assemblies; seat section, trunnion, and bearing; vertical gear box assembly; and column assembly.

SUGGESTION

After completing the assignment, complete the exercises at the end of this lesson. These exercises will help you to achieve the lesson objectives.

LESSON 1

OPERATING ROOM TABLE

Section I. OPERATING PROCEDURES

1-1. GENERAL

a. The field operating room table, Model E 99-001, is a compact, easily transportable unit. It is specifically designed for field use and has all the features necessary for performing major surgical operations. When folded for storage or shipment, the operating table and its accessory table are conveniently and securely strapped into the shipping container furnished with the unit.

b. The operating table is completely mechanical. It contains no electrical, hydraulic, or pneumatic elements. All controls and locking devices are hand-operated and easily accessible. The all-weld base is designed to be water-filled for maximum stability. It is also equipped with four large caster wheels for mobility and four retractable foot pads for stationary positioning during surgery.

1-2. UNPACK THE UNIT

Use the following procedures to unpack the operating table. Refer to figure 1-1 for illustrations of the shipping and storage cases.

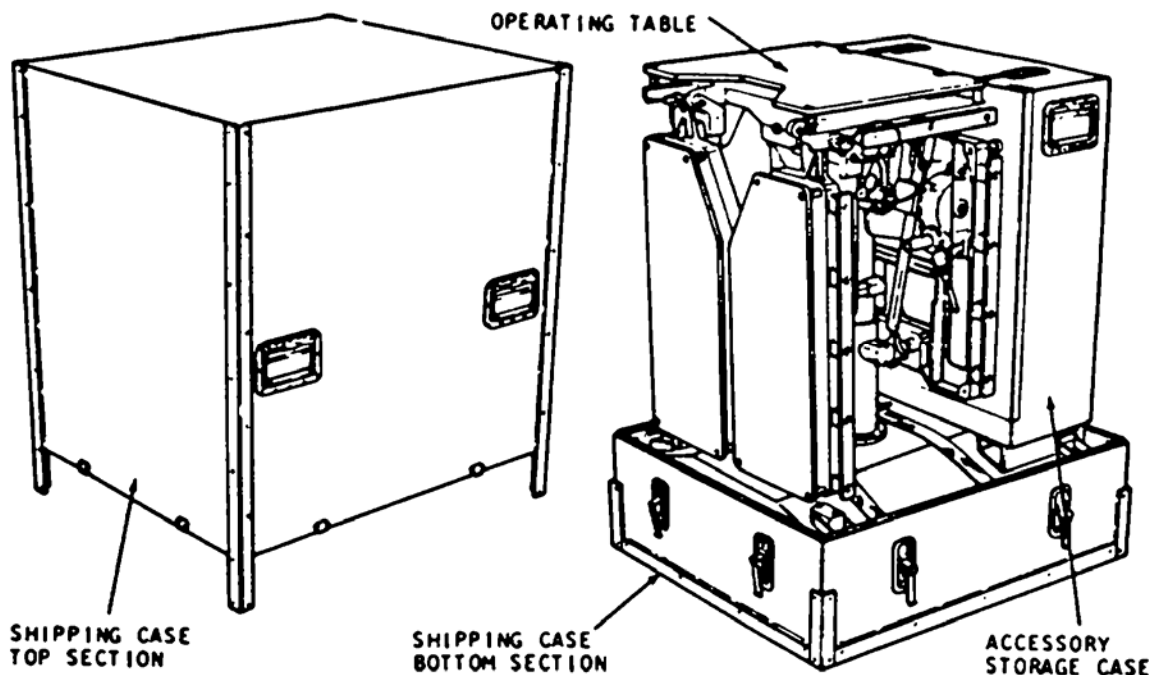


Figure 1-1. Shipping and storage cases.

- a. Unlatch and remove the shipping case top.

NOTE: Place latch clips in the down position to prevent accidental injury to the lower leg or ankle.

- b. Remove the accessory storage case and set it aside.

- c. Unfasten the hold-down straps which secure the base of the operating table to the bottom of the shipping case. Lift the operating table out of the bottom of the shipping case.

NOTE: The operating table weighs approximately 225 pounds. At least four people may be required to remove it from the bottom case.

- d. The foot pads should be in the raised position when the unit was removed from the case. If they are in the down position, lift the U-handles to raise them. The unit should now be resting on all four casters. Roll the unit to the desired location and then depress the U-handles to lower the foot pads. The unit is now in its stationary position.

- e. If used, remove the tape straps which secure the release pins to the operating table.

1-3. PREPARE THE UNIT FOR USE

Before operating the operating table, perform the following procedures. Refer to figure 1-2 for an illustration of the major components.

- a. Lift the back section of the table until the release pins can be inserted into the holes of the V-shaped cast hangers and the pivot holes of the back link adjustment assemblies

- b. Raise each leg assembly to the horizontal position. Use a ratchet assembly to set the leg sections to any desired position.

- c. Check to see if the drain plug is present and tightened.

- d. Remove the filler plug and fill the base with water. Re-install and hand tighten the filler plug.

- e. Open the accessory storage case. Remove the head section.

NOTE: Carefully observe how the accessories are placed in the storage case. The accessories must be repacked in the reverse order that you removed them to ensure that the accessory case lid closes properly.

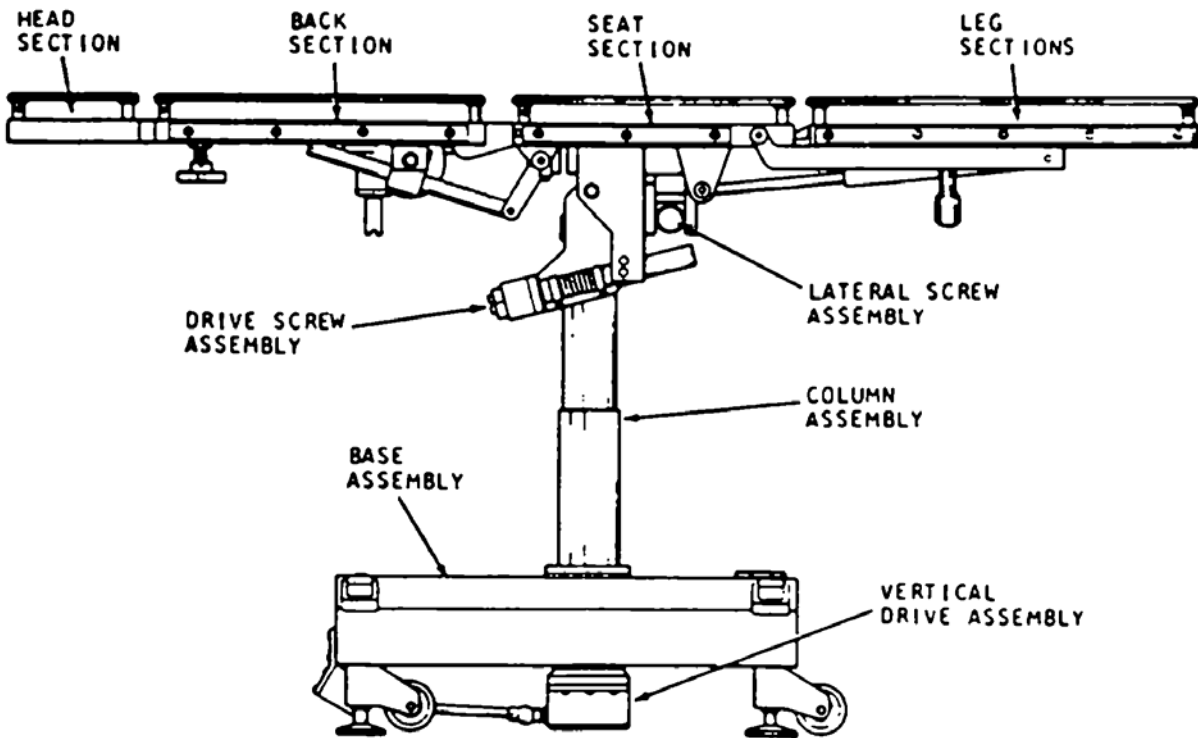


Figure 1-2. Major components.

f. Loosen the clamp knobs beneath the front end of the back section. Guide the head extender rods into the bearing holes at the front end of the back section. Slide the head section rods all the way in. Hand tighten the clamp knobs.

g. Remove the mattress pads from the storage case. Turn the pads over so the elastic bands are facing up. Carefully remove the Formica x-ray tops from each table top section. Lay the tops face down (mount pins up). Pull the elastic straps up and over each pin.

CAUTION: USE EXTREME CAUTION when removing the x-rays tops. They are made of Formica and can be easily broken.

h. Remove the remaining parts from the storage case and install them on the side rails of the table top.

1-4. PERFORM OPERATIONAL CHECK-OUT PROCEDURES

To ensure that the table operates properly, perform the following procedures.

a. Visually inspect the condition of the operating table for loose, broken, or missing parts.

- b. When water is added, check for leakage at the drain plug.
- c. Raise the column to the full up position. Check the column to make certain it is clean and properly lubricated.
- d. Check the stability of the unit with the foot pads down. Then, raise the foot pads and check the clearance between each raised caster wheel and the floor. It should be 1/8th inch. If not, the clearance can be adjusted by grasping the pad and turning the jack shaft into or out of the base.
- e. Insert each handle assembly. Operate each section of the table top to ensure proper operation.

1-5. OPERATIONAL DESCRIPTION

There are nine table positions and articulations (see figure 1-3). Figure 1-4 shows the controls of the operating table. Use the following procedures to operate the controls of the operating table.

a. **Foot Pad Control.** Use the U-shaped pedals located on the four corners of the base to raise and lower the foot pads.

- (1) Ensure that when the pedals are down, the foot pads rest on the floor.
- (2) Ensure that when the pedals are up, all four casters clear the floor by approximately 1/8 inch.

b. **Elevation Control.** Adjust the height of the operating table by engaging the long Trendelenburg handle in the head end of the base.

- (1) Turn the crank clockwise to raise the table.
- (2) Turn the crank counterclockwise to lower the table.

c. **Trendelenburg Control.** Adjust the Trendelenburg by placing the long Trendelenburg handle in the drive screw control.

- (1) Turn the crank in the counterclockwise direction to adjust the head down.
- (2) Turn the crank in the clockwise direction to adjust the head up.

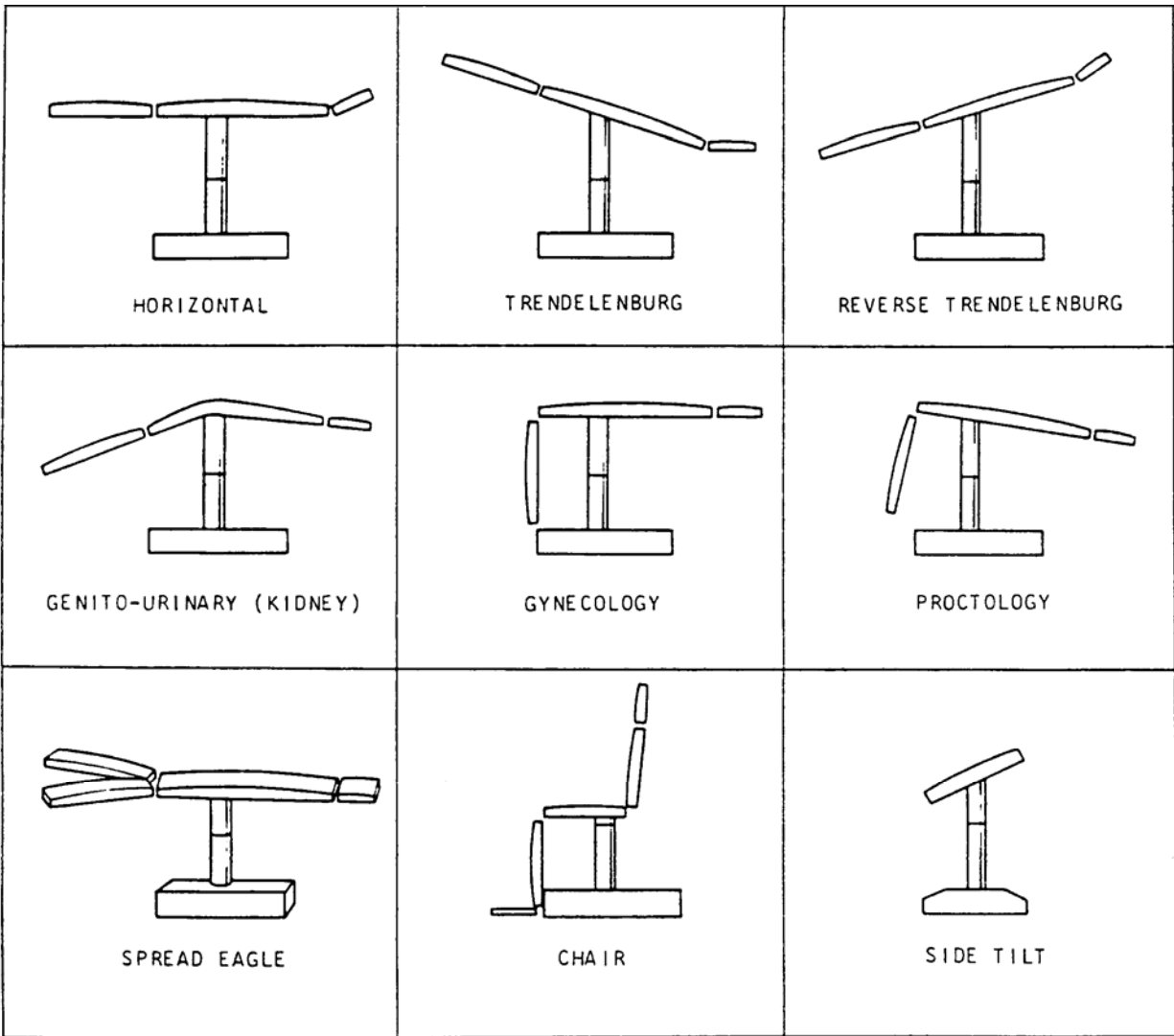


Figure 1-3. Table positions and articulations.

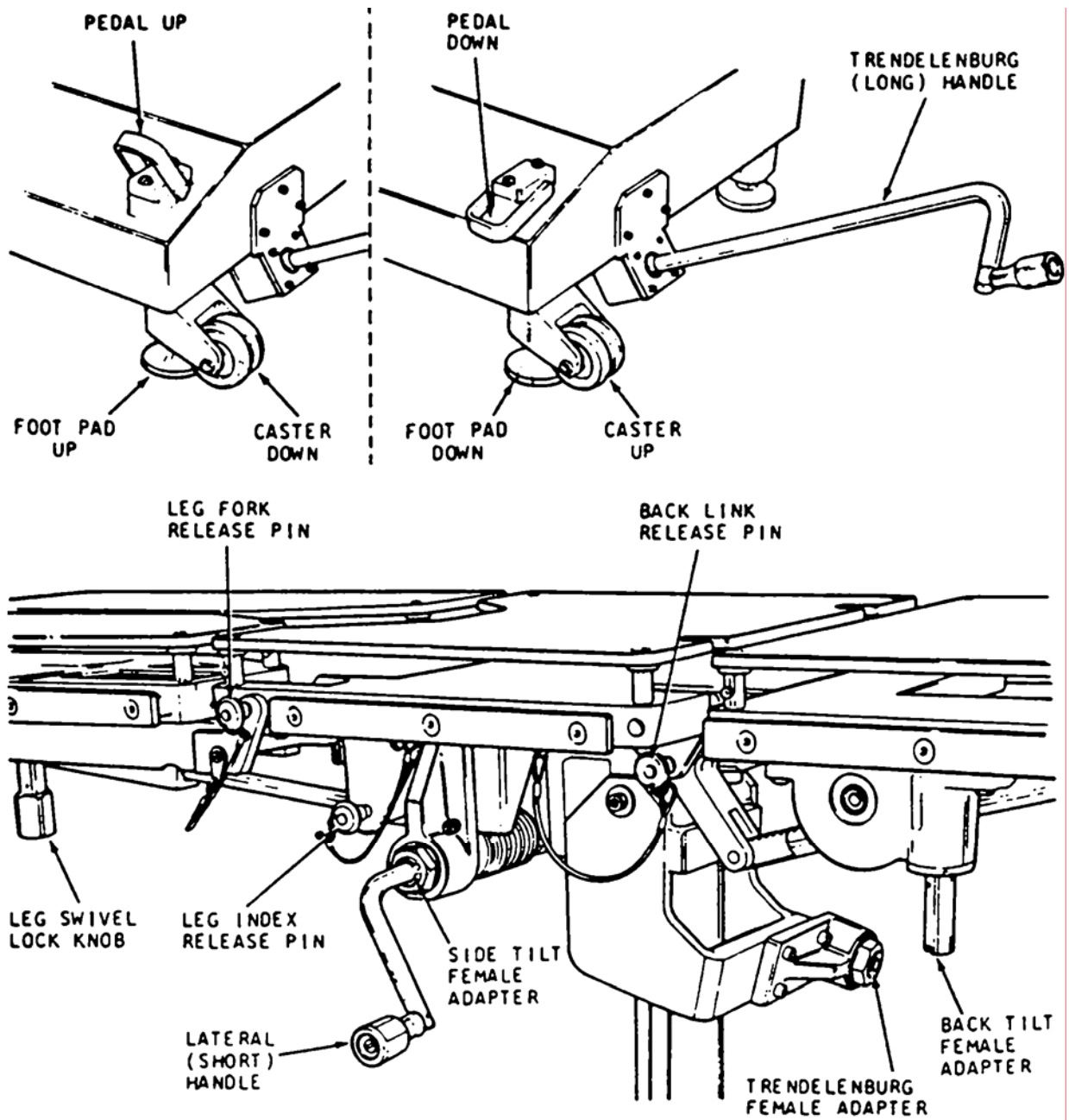


Figure 1-4. Controls of the operating table.

d. **Lateral Control.** Adjust the side-to-side tilt by engaging the short lateral handle in the side tilt control.

- (1) Turn clockwise for left tilt.
- (2) Turn counterclockwise for right tilt.

e. **Head Section Control.** Adjust the head section by depressing the release plate located underneath the head.

- (1) From the horizontal position, you can move the head section up 45 degrees or down 45 degrees.
- (2) You can extend the head section by unscrewing the clamp knobs and moving the head to the desired position, then tighten the clamps.

f. **Leg Section Control.**

- (1) To raise the leg section, pull up on each leg until you achieve the desired position.
- (2) To lower the leg section, depress the release latch underneath each section. You can stop at any position by releasing the release latch.
- (3) To spread the legs, unscrew the lock knob under each section and move it to the desired position.
- (4) Tighten each knob after it has been moved.

Section II. MALFUNCTIONING COMPONENTS

1-6. TROUBLESHOOTING PROCEDURES

You use a troubleshooting guide to help isolate the cause of malfunctions. First, locate the symptom listed in the guide, and then check the probable causes until you locate the cause of the malfunction. Refer to the troubleshooting guide in the appendix. Also, refer to figure 1-2 and figures 1-5 through 1-13 for identification of parts.

1-7. REPLACING MAJOR COMPONENTS

Use the procedures described in the following paragraphs to replace defective parts. Reverse these procedures to reassemble the components.

a. **Replace x-ray Tops.** Refer to figure 1-2 for an illustration of the major components. To replace the x-ray tops, perform the following steps:

- (1) Depress the release plungers of the two locking posts.
- (2) Lift off the x-ray tops.
- (3) Reverse the steps to replace the tops. Slide the tops into the holes.

b. **Replace the Head Section.** To replace the head section (figure 1-13), perform the following steps:

- (1) Refer to figure 1-5. Loosen the knob assembly (part 1) on the underside of the back section to release the head extension rods.
- (2) Withdraw the head section from the mount holes.
- (3) Reinstall in the reverse order.

c. **Replace the Leg Section.** To replace the leg section, perform the following procedures.

- (1) Raise the leg section to the horizontal lock position.
- (2) Refer to figure 1-6. Remove the release pin (part 1) and release handle (part 4) which secures the end of the leg index rod.
- (3) Refer to figure 1-6. Support the leg assembly while withdrawing the pivot pin (part 17) that secures the leg yoke to the seat section of the table.
- (4) Lift off the leg section.
- (5) Reinstall in the reverse order.

d. **Replace the Back Section.** To replace the back section, perform the following procedures:

- (1) Raise the back section to the full upright position.
- (2) Remove the two back link release pins which are inserted in each pivot of the back link assemblies (figure 1-5, part 5).

(3) Lean the back section down on a protective mat or cloth to prevent marring the finish of the back or seat assemblies.

(4) Loosen the two set screws located underneath the seat and below the back link pivot pins.

(5) Drive out the pivot pins using a brass or soft metal drift punch.

(6) Lift off the back section.

(7) Reinstall in the reverse order.

e. **Replace the Lift Assembly.** To replace the lift assembly, perform the following procedures:

(1) Raise the back section to the straight up position.

(2) Drive out the dowel pin which secures each gear rack to its back link assembly (figure 1-6, part 39).

(3) Support the back lift assembly firmly while removing the four capscrews (Figure 1-6, part 36) at the gear box housing end and the two longer capscrews (figure 1-6, part 6) at the opposite end.

(4) Carefully lift the assembly from the back section.

(5) Reinstall in the reverse order.

f. **Replace the Lateral and Drive Screw Assemblies.** To replace the lateral and drive screw assemblies, perform the following procedures:

(1) Remove the four hex nuts and capscrews that secure the support block of the drive assembly to the support plate of the seat section. These screws go through part 24 in figure 1-7.

(2) Loosen the two clamp screws and, while supporting the drive assembly, pry out the two adjusting pins. Refer to figure 1-8.

(3) Lift the drive assembly from the seat section and trunnion.

(4) Reinstall in the reverse order.

g. Replace the Seat Section, Trunnion, and Bearing. To replace the seat section, trunnion and bearing, perform the following procedures:

- (1) Remove the leg sections, back section, and lateral screw assemblies.
- (2) Support the seat section while removing the four capscrews and two bearing blocks.
- (3) Lift off the seat frame and remove the drive screw assembly.
- (4) Remove the two retaining rings, nylon washers, and remove the Trendelenburg pin.
- (5) With an assistant supporting the trunnion, remove the two capscrews and washers. Drive out the lateral pin.
- (6) Lift off the trunnion. Take care not to lose the nylon washer located between the hanger arm of the trunnion and the support arm of the drive screw bracket.
- (7) Remove the four capscrews which fasten the drive screw bracket to the top of the column. Remove the bracket.
- (8) Remove the four capscrews which fasten the drive screw bracket to the top of the column.

h. Replace the Vertical Gear Box Assembly. To replace the vertical gear box assembly (figure 1-11), perform the following procedures:

- (1) With the aid of two or three assistants, carefully turn the operating table on its side.

NOTE: Lay the table top on the mats to prevent damage.

- (2) Drive out the spring steel pin that secures the universal joint to the end of the vertical drive gear shaft. Discard the old pin and use a new pin during reassembly. Remove the four capscrews and the gear box cover (Figure 1-9, part 5).
- (3) From inside the gear box, remove the three machine screws that secure the gear box housing to the bearing retainer at the lower end of the sliding column (Figure 1-10, part 8).
- (4) Remove the five capscrews that secure the gear box housing to the underside of the base (Figure 1-8, part 15).
- (5) Carefully remove the vertical gear box.

(6) Reinstall in the reverse order.

NOTE: Ensure the retaining ring (figure 1-9, part 11) is firmly in the retaining ring slot to prevent the worm gear from slipping (figure 1-9, part 12). If the retaining ring is not in place, the worm gear will slip out of place allowing the entire column to drop during raising or lowering.

NOTE: Some units have been modified by the manufacturer using a sheer pin in place of the retaining ring. Consult your shop modification work orders for the pin type and placement.

i. **Replace the Column Assembly.** To replace the column assembly (figure 1-12), perform the following procedures:

(1) Remove the head and leg sections.

(2) With two or three assistants steadying the assembled back and seat sections, remove the four capscrews which secure the drive screw bracket to the top of the column (figure 1-9, part 29).

(3) Remove the entire assembly, as a unit, from the column.

(4) Remove the vertical gear box.

(5) Remove the six capscrews (figure 1-8, part 17) which secure the mounting flange to the top of the base assembly (figure 1-8, part 18).

(6) Lift out the column assembly.

(7) Reinstall in the reverse order.

NUMBERS IN FIGURE	PART NO.	DESCRIPTION							UNITS PER ASSY	USEABLE ON CODE
		1	2	3	4	5	6	7		
COMPLETE LIFT AND BACK SECTION										
	No Number	LIFT AND BACK SECTION, Complete							REF	
-1	E99-349	KNOB ASSEMBLY, Head Locking							2	
-2	AN505C516R10	SCREW, Machine (81490 P/N E99-303)							8	
-3	E99-123	RAIL, Back							2	
-4	E99-326	PIN, Dowel, CRES, 3/8 inch diameter by 1 1/2 inch							2	
-5	E99-126	LINK ASSEMBLY, Back							2	
-6	E99-485	CAPSCREW, Socket head, 5/16-18 by 1-3/4 inch							2	
-7	E99-575	CAPSCREW, Socket head, 5/16-18 by 3/4 inch							4	
-8	E99-141	FRAME ASSEMBLY, Back							1	
-9	E99-167	BACK LIFT ASSEMBLY, Complete							1	
-10	E99-273	CAPSCREW, Socket head, 10-24 by 3/8 inch							3	
-11	E99-140	RETAINER, Bearing							1	
-12	MS9047-106	PIN, Spring (24617 P/N 455862)							1	
-13	E99-586	ADAPTER, Crank handle							1	
-14	7102-KR	BEARING, Ball (38443) (81490 P/N E99-329)							1	
-15	E99-142	SPACER, Sleeve							1	
-16	20201	BEARING, Ball (43334) (81490 P/N E99-321)							1	
-17	E99-144	SPACER, Sleeve							1	
-18	E99-283	WORM GEAR							1	
-19	E99-275	KEY, Square, 1/8 by 1/8 by 7/8 inch							1	
-20	MS16624-3050	RING, Retaining, (81490 P/N E99-287)							1	

Figure 1-5. Complete lift and back section--legend (continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	1 2 3 4 5 6 7							UNITS PER ASSY	USEABLE ON CODE			
			COMPLETE LIFT AND BACK SECTION											
-21	E99-150	SHAFT, Worm gear											1	
-22	P17S	PLUG, Expansion (72741) (81490 P/N E99-332)											1	
-23	E99-148	BLOCK, Support											1	
-24	E99-454	SPACER, Sleeve											1	
-25	M-10121	BEARING, Roller (60380) (81490 P/N E99-333)											1	
-26	E99-268	CAPSCREW, Socket head, 1/4-20 by 1/2 inch											4	
-27	E99-344	HOUSING, Gear box											1	
-28	M-10121	BEARING, Roller (60380) (81490 P/N E99-333)											1	
-29	AN565EC416H4	SETSCREW (81490 P/N E99-453)											2	
-30	E99-143	GEAR, worm wheel											1	
-31	E99-336	KEY, Square, 3/16 by 3/16 by 1 inch											1	
-32	E99-345	COVER, Gear box											1	
-33	B-107	BEARING, Roller (60380) (81490 P/N E99-333)											1	
-34	141153	PIN, Dowel, 3/16 inch diameter by 5/8 inch (24617)											2	
-35	E99-147	SPACER, Sleeve											1	
-36	E99-268	CAPSCREW, Socket head, 1/4-20 by 1/2 inch											8	
-37	E99-452	HOUSING ASSEMBLY, Gear rack											2	
-37A	7102-KR	BEARING, Sleeve (altered 71041 P/N B-1013-4)											1	
-37B	E99-104	HOUSING, Gear rack											1	
-38	E99-456	RACK AND BEARING ASSEMBLY, Gear											2	
-38A	B-68-4	BEARING, Sleeve (71041) (81490 P/N E99-469)											1	
-38B	E99-105	RACK, Gear											1	

Figure 1-5. Complete lift and back section--legend (continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	UNITS							USEABLE ON CODE
			1	2	3	4	5	6	7	
COMPLETE LIFT AND BACK SECTION										
-39	MS9047-172	PIN, Spring (24617 P/N 456693)		2						
-40	E99-149	Gear, Spur		2						
-41	E99-336	KEY, Square, 3/16 by 3/16 by 1 inch		2						
-42	E99-150	SHAFT, Worm gear		2						
-42A	P17S	PLUG, Expansion (72741) (81490 P/N E99-332)		1						
-42B	E99-148	BLOCK, Support		1						
-43	141153	PIN, Dowel, 3/16 inch diameter by 5/8 inch (24617)		4						
-44	E99-146	SPACER, Sleeve		2						
-45	E99-113	SHAFT, Pinion		1						

Figure 1-5. Complete lift and back section--legend (concluded).

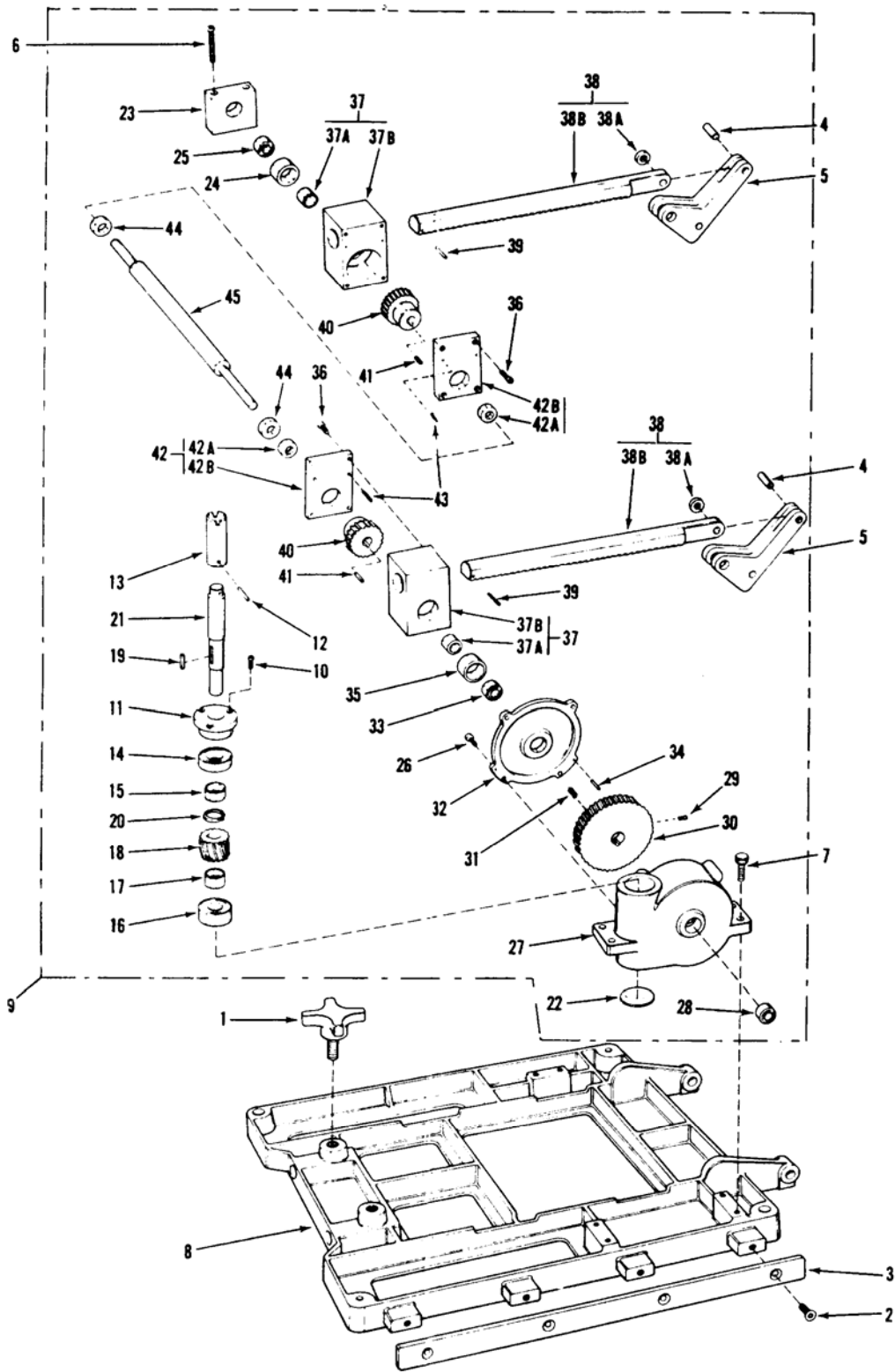


Figure 1-6. Complete lift and back section--diagram.

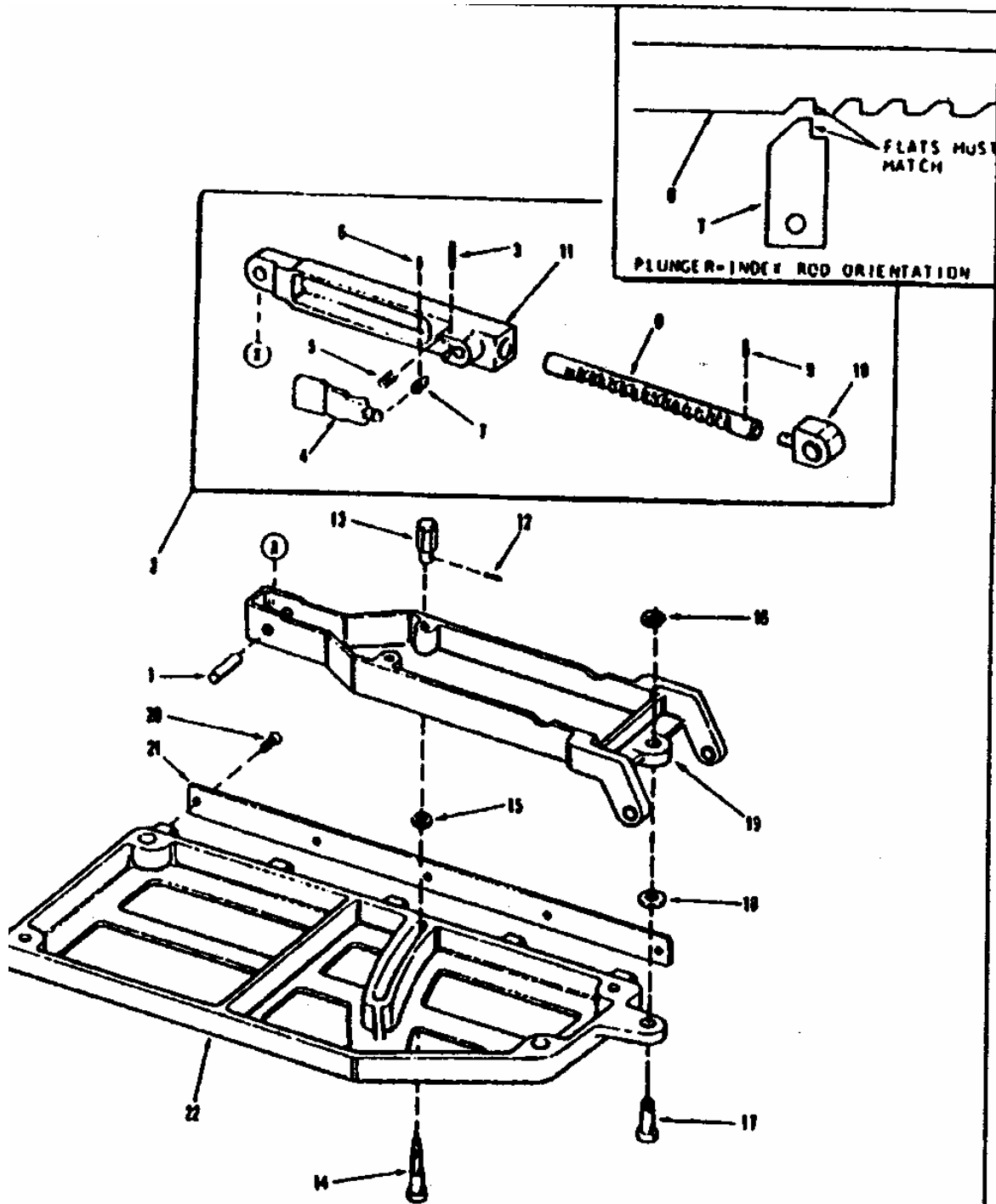


Figure 1-7. Right and left hand leg and index assemblies (continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION							UNITS PER ASSY	USEABLE ON CODE
		1	2	3	4	5	6	7		
RIGHT AND LEFT HAND LEG AND INDEX ASSEMBLIES										
CODE A-L.H. LEG ASSEMBLY ONLY CODE B-R.H. LEG ASSEMBLY ONLY										
	No Number	LEG AND INDEX ASSEMBLY, L.H.							REF	A
	No Number	LEG AND INDEX ASSEMBLY, R.H.							REF	B
-1	E99-323	PIN, Dowel							1	
-2	E99-004	INDEX ASSEMBLY, Leg							1	
-3	MS9047-172	PIN, Spring (24617 P/N 456693)							1	
-4	E99-347	HANDLE, Release							1	
-5	E99-156	SPRING, Compression							1	
-6	MS9047-099	PIN, Spring (24617 P/N 456335)							1	
-7	E99-107	PLUNGER							1	
-8	E99-129	ROD, Index							1	
-9	MS9047-164	PIN, Spring (81490 P/N E99-369)							1	
-10	E99-116	BLOCK, Pivot							1	
-11	E99-365	HOUSING ASSEMBLY, Index							1	
-12	MS9047-106	PIN, Spring (24617 P/N 455682)							1	
-13	E99-536	KNOB, Swivel lock							1	
-14	E99-145	SCREW, Clamp							1	
-15	E99-051	WASHER, Nylon							1	
-16	5131-50H	RING, Retaining, (79136) (81490 P/N E99-110)							1	
-17	E99-158	PIN, Pivot							1	
-18	E99-051	WASHER, Nylon							1	
-19	E99-362	SUPPORT ASSEMBLY, Leg							1	
-20	AN505C516R10	SCREW, Machine (81490 P/N E99-303)							5	
-21	E99-121	RAIL, Leg							1	
-22	E99-363	LEG ASSEMBLY, L.H.							1	A
-22	E99-364	LEG ASSEMBLY, R.H.							1	B
-23	No Number	WASHER, Nylon								

Figure 1-7. Right and left hand leg and index assemblies (Concluded).

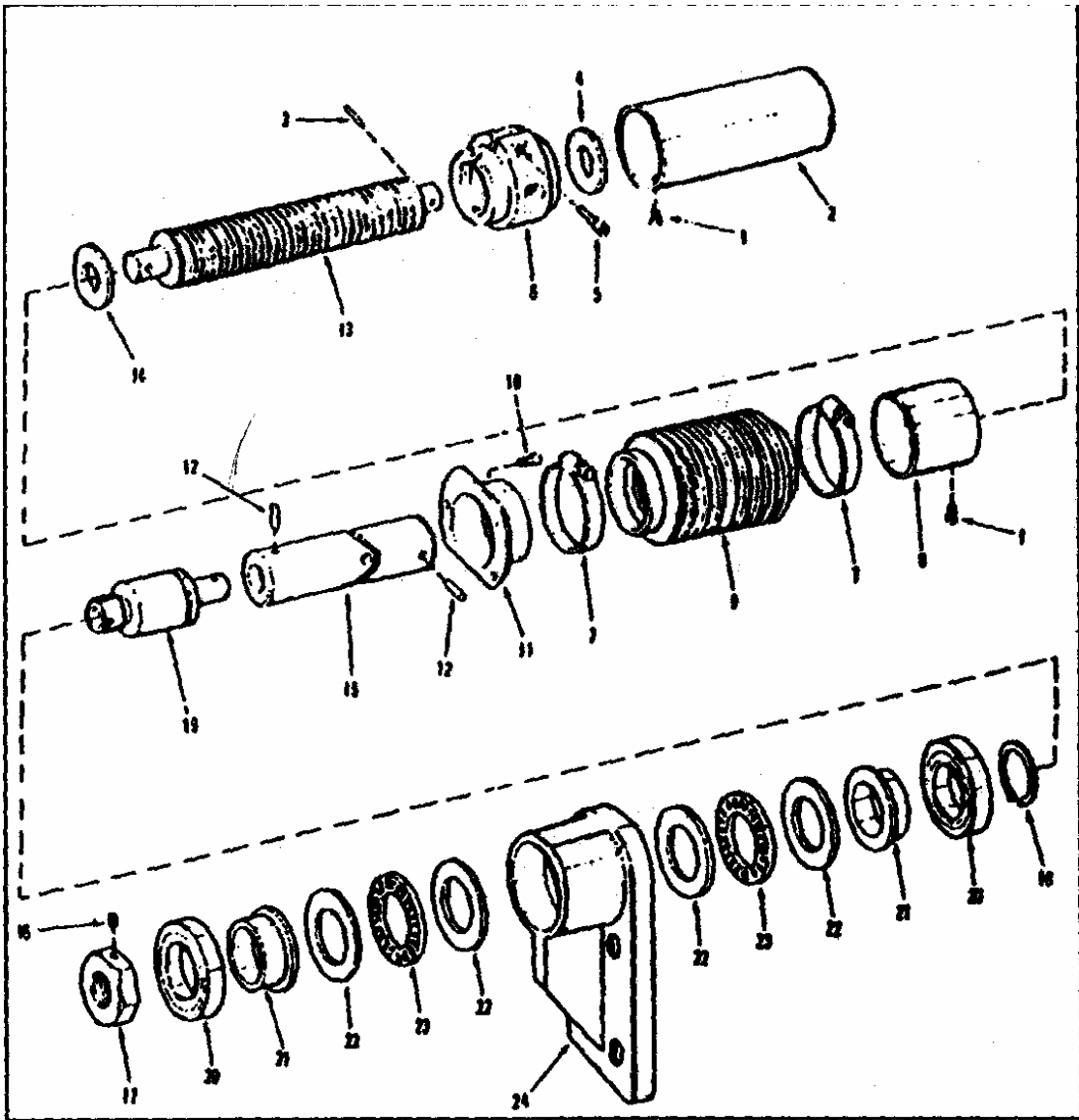


Figure 1-8. Drive and lateral screw assemblies (continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	UNITS							USEABLE ON CODE
			1	2	3	4	5	6	7	
DRIVE AND LATERAL SCREW ASSEMBLIES										
CODE A-USED ON LATERAL SCREW ASSEMBLY ONLY										
CODE B-USED ON DRIVE SCREW ASSEMBLY ONLY										
	E99-509	SCREW ASSEMBLY, Drive							REF	A
	E99-590	SCREW ASSEMBLY, Lateral							REF	B
-1	E99-256	CAPSCREW, Socket head, 5-40 by 3/16 inch							2	
-2	E99-112	COVER, Boot, closed end							1	A
-2	E99-087	COVER, Boot, closed end							1	B
-3	MS9047-168	PIN, Spring (96906) (24617 P/N 456652)							1	
-4	E99-065	WASHER, Flat							1	
-5	E99-327	CAPSCREW, Socket head, 8-32 by 1/2 inch							1	
-6	E99-055	NUT, Adjustment							1	
-7	QS-100-MS	CLAMP, Hose (73862) (81490 P/N E99-258)							2	
-8	E99-070	COVER, Boot, straight							1	
-9	E99-066	COVER, Expandable							1	
-10	E99-256	CAPSCREW, Socket head, 5-40 by 3/16 inch							3	
-11	E99-071	COVER, Boot, flanged							1	
-12	141159	PIN, Dowel, 3/16 inch diameter by 1 inch (24617)							2	
-13	E99-060	LEADSCREW							1	
-14	E00-065	WASHER							1	
-15	E99-589	UNIVERSAL JOINT							1	A
-15	E99-189	UNIVERSAL JOINT							1	B
-16	AN565DC416114	SETSCREW, Hex socket head (81490 P/N E99-315)							1	
-17	E99-063	NUT, Lock							1	
-18	5100-112H	RING, Retaining, (79H36) (81490 P/N E99-561)							1	
-19	E99-029	SHAFT, Adjustment							1	A
-19	E99-069	SHAFT, Adjustment							1	B

Figure 1-8. Drive and lateral screw assemblies (Continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION					UNITS PER ASSY	USEABLE ON CODE
		1	2	3	4	5 6 7		
DRIVE AND LATERAL SCREW ASSEMBLIES								
CODE A-USED ON LATERAL SCREW ASSEMBLY ONLY								
CODE B-USED ON DRIVE SCREW ASSEMBLY ONLY								
	E99-509	SCREW ASSEMBLY, Drive					REF	A
	E99-590	SCREW ASSEMBLY, Lateral					REF	B
-20	B-512-DD	BEARING, Ball (21335) (81490 P/N E99-262)					2	
-21	E99-527	SPACER, Bearing					2	
-22	TRB-1828	RACE, Thrust (60380) (81490 P/N E99-480)					4	
-23	NTA-1828	BEARING, Thrust (60380) (81490 P/N E99-511)					2	
-24	E99-150	BRACKET, Bearing					1	

Figure 1-8. Drive and lateral screw assemblies (concluded).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION							UNITS PER ASSY	USEABLE ON CODE
		1	2	3	4	5	6	7		
OPERATING TABLE COMPONENTS										
-1	MS9047-133	PIN, Spring (24617 P/N 454516)							3	
-2	300-10-B	UNIVERSAL JOINT (03705) (81490 P/N E99-193)							1	
-3	E99-0125	ROD, Transfer							1	
-4	E99-499	CAPSCREW, Socket head, 1/4-20 by 3/4 inch							5	
-5	MS35223-79	SCREW, Machine (81490 P/N E99-068)							8	
-6	E99-062	BRACKET, Bearing block to base side							1	
-7	E99-111	BRACKET, Bearing block to base bottom							1	
-8	E99-087	BLOCK, Bearing							1	
-9	MS9047-137	PIN, Spring (81490 P/N E99-369)							1	
-10	300-10-B	UNIVERSAL JOINT (03705) (81490 P/N E99-193)							2	
-11	105-KSZZ	BEARING, Ball (38443) (81490 P/N E99-064)							2	
-12	5108-100	RING, Retaining, (79136) (81490 P/N E99-560)							2	
-13	E99-026	ADAPTER, Lift crank							1	
-14	MS35223-79	SCREW, Machine (81490 P/N E99-068)							3	
-15	E99-499	CAPSCREW, Socket head, 1/4-20 by 3/4 inch							5	
-16	E99-515	GEAR BOX ASSEMBLY, Vertical (see Figure 8 for replacement parts)							1	
-17	E99-499	CAPSCREW, Socket head, 1/4-20 by 3/4 inch							6	
-18	E99-061	COLUMN ASSEMBLY, (see Figure 9 for replacement parts)							1	
-19	S-142	PLUG, Tank inlet (86343) (81490 P/N E99-089)							1	
-20	E99-091	GASKET, Inlet plug							1	

Figure 1-9. Operating table components--legend (continued).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	1 2 3 4 5 6 7							UNITS PER ASSY	USEABLE ON CODE	
			COMPLETE LIFT AND BACK SECTION									
-21	S-102	PLUG, Tank drain (86343) (81490 P/N E99-090)									1	
-22	E99-092	GASKET, Drain plug									1	
	E99-012	BASE AND CASTERASSEMBLY									1	
-23	E99-539	CAPSCREW, Hex washer head, 1/4-20 by 1 inch									8	
-24	E99-479	CAP, Caster									4	
-25	E99-491	PEDAL AND LINK ASSEMBLY									4	
-26	E99-522	SLEEVE, Nylon, split									8	
-27	E99-484	RETAINER, Spring									4	
-28	E99-099	SPRING, Compression									4	
-29	E99-097	WASHER, Thrust									4	
-30	E99-487	SCREW, Machine, flat head 5/8-11 by 1 3/4 inch									4	
-31	E99-044	PAD, Foot									4	
-32	E99-043	SHAFT, Jack									4	
-33	124925	NUT, Hex jam, 3/8-24 by 3 inches (24617)									4	
-34	124128	BOLT, Hex head, 3/8-24 by 3 inches (24617)									4	
-35	E99-495	WHEEL, Caster									4	
-36	E99-540	SLEEVE, Caster wheel									4	
-37	E99-494	RING, retaining									4	
-38	E99-489	FORK ASSEMBLY, Caster									4	
-39	E99-038	SHAFT, Vertical									4	
-40	1612	RACE, Roller bearing (60380) (81490 P/N E99-478)									8	
-41	E99-490	SPACER, Sleeve									4	
-42	E99-073	BASE ASSEMBLY, Welded									1	

Figure 1-9. Operating table components--legend (Concluded).

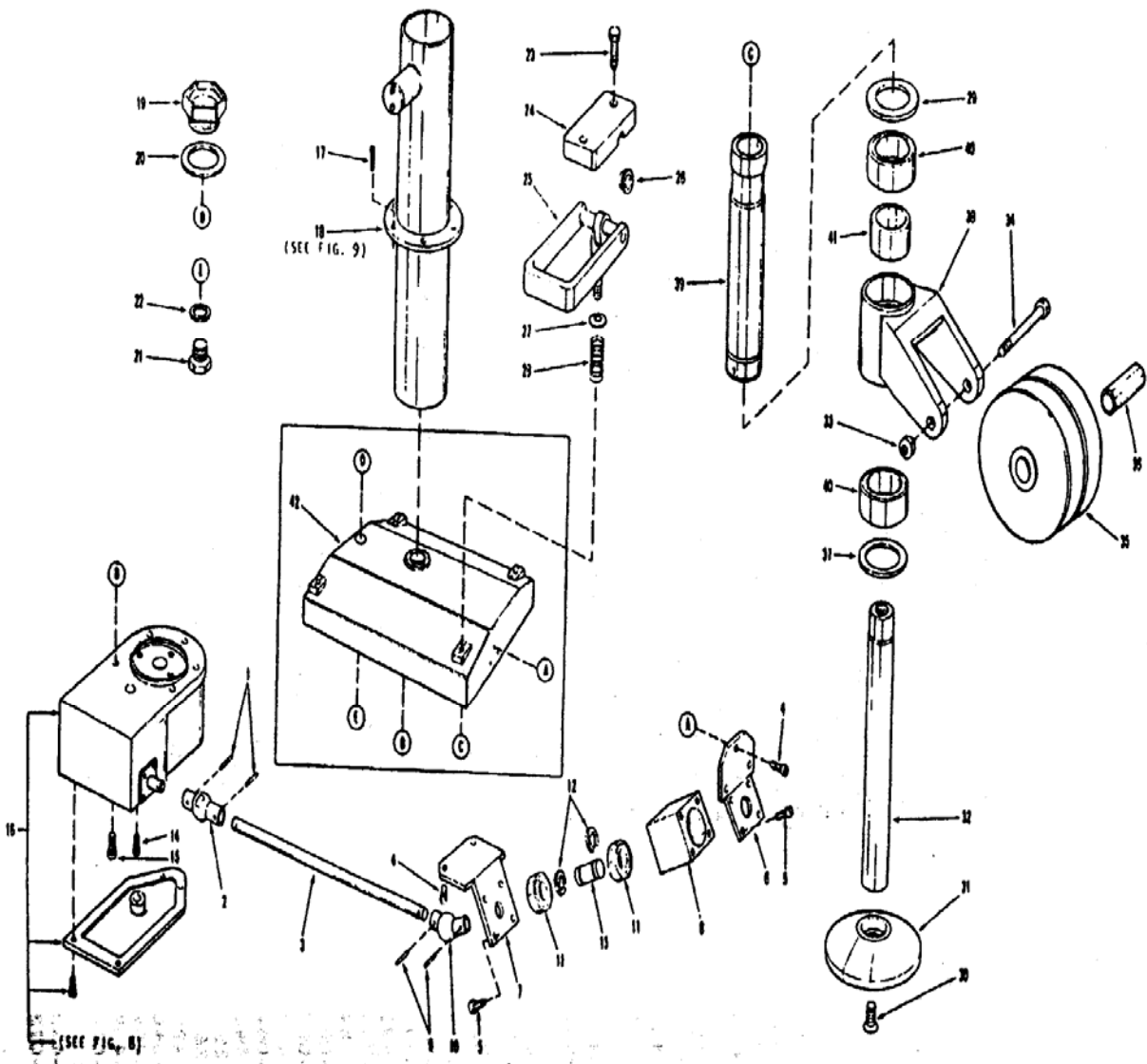


Figure 1-10. Operating table components--diagram.

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	UNITS							USEABLE ON CODE
			1	2	3	4	5	6	7	
VERTICAL GEAR BOX ASSEMBLY										
	E99-515	GEAR BOX ASSEMBLY, Vertical							REF	
-1	E99-273	CAPSCREW, Socket head, 10-24 by 3/8 inch							4	
-2	E99-379	COVER, Gear box							1	
-3	141155	PIN, Dowel, 3/16 inch diameter by 3/4 inch (24617)							2	
-4	M-6101	BEARING, Roller (60380) (81490 P/N E99-269)							1	
-5	E99-541	CAPSCREW, Socket head, 10-24 by 5/8 inch							4	
-6	E99-013	RETAINER, Bearing							1	
-7	E99-500	LOCKNUT, Special							1	
-8	E99-501	LOCKWASHER, Special							1	
-9	E99-007	SHAFT, Worm							1	
-10	5202-SBKF	BEARING, Ball (38443) (81490 P/N E99-282)							1	
-11	MS16624-3050	RING, Retaining, (81490 P/N E99-287)							1	
-12	E99-283	WORM GEAR							1	
-13	E99-275	KEY, Square, 1/8 by 1/8 by 7/8 inch							1	
-14	8121	BEARING, Roller (60380) (81490 P/N E99-267)							1	
-15	E99-008	SHAFT, Gear							1	
-16	TRB-613	RACE, Thrust (60380) (81490 P/N E99-276)							2	
-17	E99-541	CAPSCREW, Socket head, 10-24 by 5/8 inch							4	
-18	E99-009	GEAR, Worm							1	
-19	E99-0010	GEAR, Spur							1	
-20	M-65	BEARING, Roller (60380) (81490 P/N E99-265)							1	
-21	E99-378	HOUSING, Gear							1	

Figure 1-11. Vertical gear box assembly (continued).

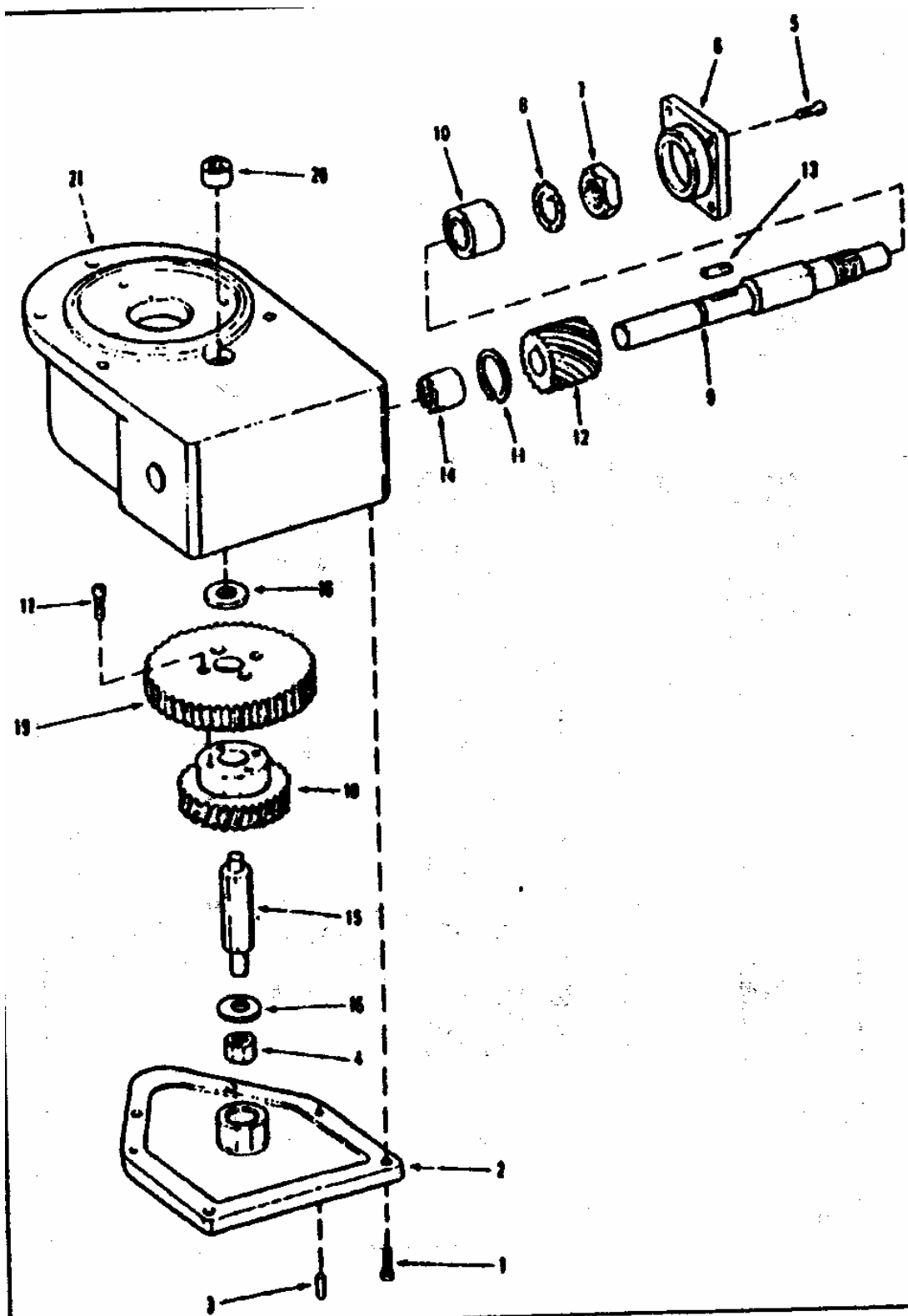


Figure 1-11. Vertical gear box assembly (concluded).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION	1 2 3 4 5 6 7							UNITS PER ASSY	USEABLE ON CODE	
			COLUMN ASSEMBLY									
	E99-061	COLUMN ASSEMBLY									REF	
-1	E99-272	SCREW, Machine, pan head 10-32 by 1/2 inch									2	
-2	E99-020	COVER, Housing									1	
-3	E99-188	SPRING, Compression									1	
-4	E99-021	KEY, Column									1	
-5	MS16624-3050	RING, Retaining, (81490 P/N E99-287)									1	
-6	E99-011	GEAR, Worm									1	
-7	E99-507	KEY, Square, 1/8 by 1/8 by 7/16 inch									1	
-8	TD-812	WASHER, Thrust (60380) (81490 P/N E99-290)									1	
-9	E99-463	RETAINER, Bearing									1	
-10	TRD-815	RACE, Thrust (60380) (81490 P/N E99-284)									2	
-11	NTA-815	BEARING, (60380) (81490 P/N E99-288)									1	
-12	E99-512	COLUMN ASSEMBLY, Sliding									1	
-13	E99-504	COLUMN ASSEMBLY, Outer									1	

Figure 1-12. Column assembly (continued).

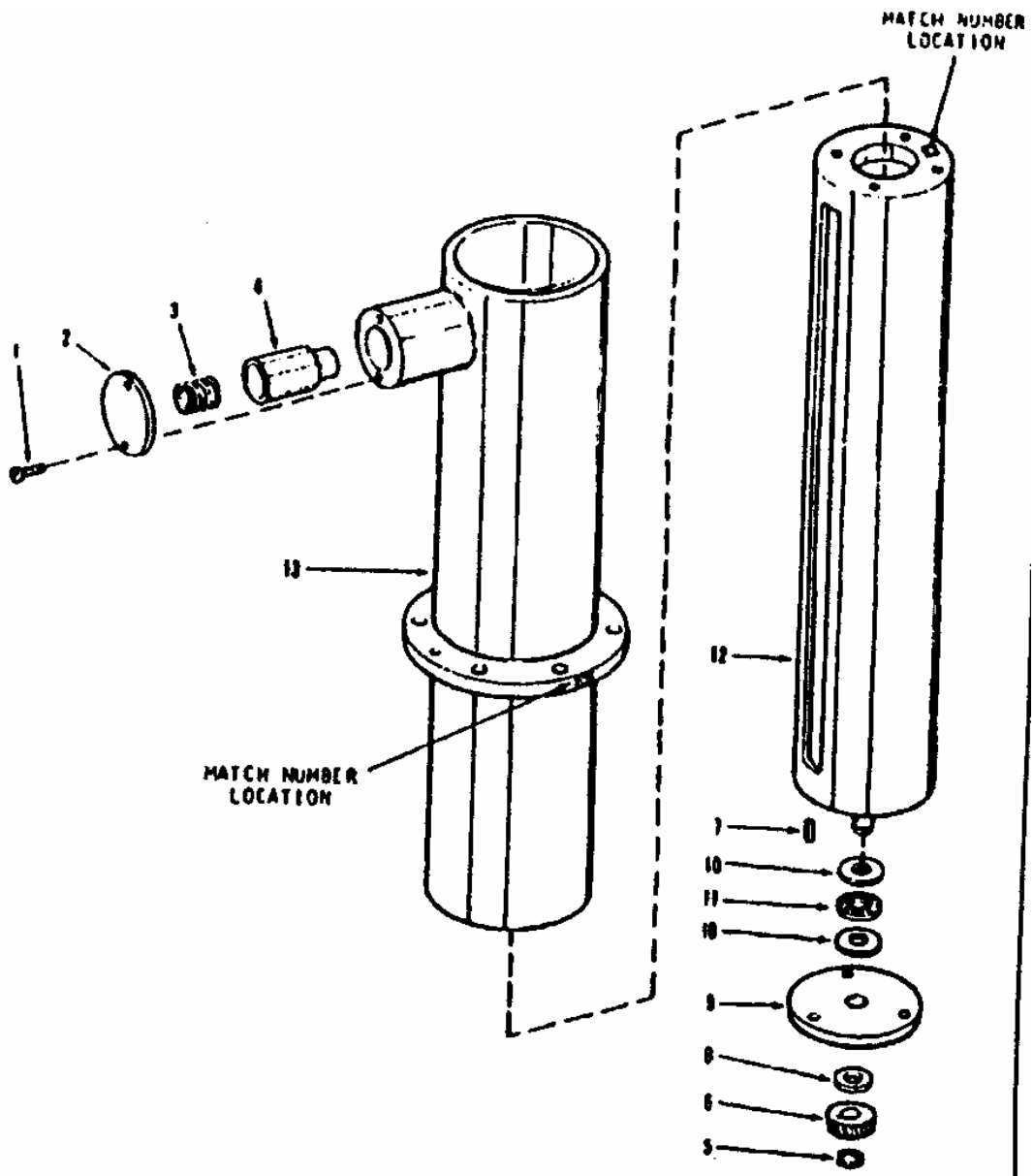


Figure 1-12. Column assembly (concluded).

NUMBERS IN FIGURE	PART NO.	DESCRIPTION							UNITS PER ASSY	USEABLE ON CODE
		1	2	3	4	5	6	7		
HEAD SECTION ASSEMBLY										
	E99-553	HEAD SECTION ASSEMBLY							REF	
-1	E99-272	SCREW, Machine, pan head 10-32 by 1/2 inch							4	
-2	E99-596	PLATE, Ratchet release							1	
-3	E99-272	SCREW, Machine, pan head 10-32 by 1/2 inch							4	
-4	E99-591	PLATE, Pivot retainer							2	
-5	E99-594	BAR, Actuator							2	
-6	490132	SPRING, Compression (24617)							2	
-7	E99-028	WASHER, Nylon							2	
-8	E99-593	ROD, Pivot							1	
-9	AN565AC8112	SETSCREW, Hex socket flat Point (81490 P/N E99-024)							2	
-10	E99-592	PAWL, Actuator							2	
-11	E99-316	PIN, Dowel, CRES 3/16 inch diameter by 1 1/4 inch							2	
-12	AN565AC1032H3	SETSCREW, Hex socket flat Point (81490 P/N E99-022)							2	
-13	E99-595	SHAFT, Head pivot							1	
-14	E99-341	PIVOT, Head frame							1	
-15	E99-597	RATCHET, Head							2	
-16	E99-023	KEY, Square, 3/16 inch by 3/4 inch long							2	
-17	E99-316	PIN, Dowel, CRES, 3/16 inch diameter by 1 1/4 inch							2	
-18	E99-101	ROD, Head extension							2	
-19	E99-027	NUT, Castle, 1/2 -13NC							2	
-20	E99-470	BEARING ASSEMBLY, Pivot							2	
-20A	AA-710-19	BEARING, Sleeve (71041) (81490 P/N E99-309)							1	
-20B	E99-151	BLOCK, Bearing							1	
-21	E99-339	FRAME, Head							1	

Figure 1-13. Head section assembly (continued).

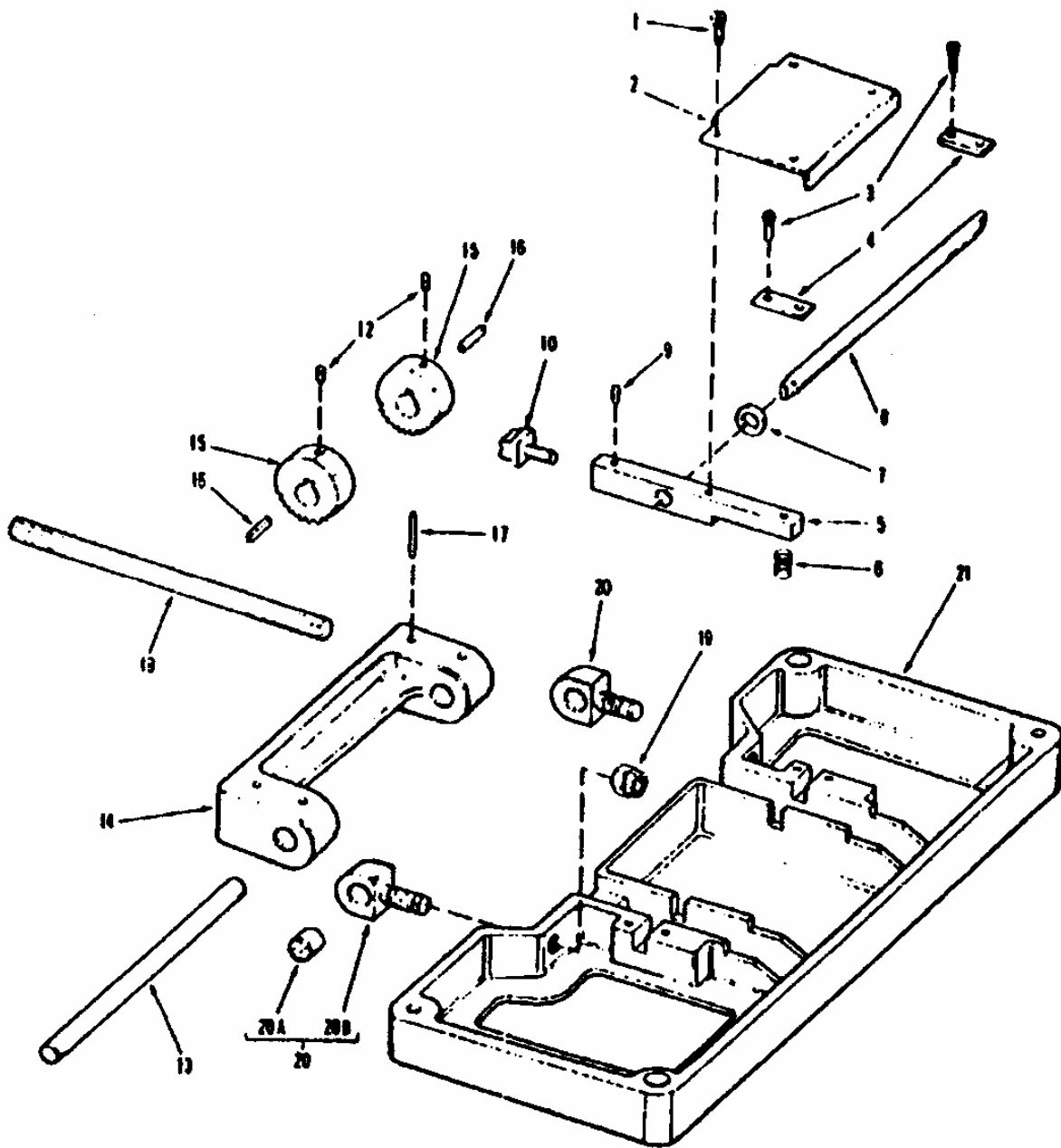


Figure 1-13. Head section assembly (concluded).

Continue with Exercises

EXERCISES, LESSON 1

INSTRUCTIONS: Answer the following items by completing the statement or by writing the answer in the space provided at the end of the item.

After you have completed all of these items, turn to "Solutions to Exercises" at the end of the lesson and check your answers with the solutions.

1. You are adjusting the lateral control for right tilt. You do this by:
 - a. Raising the lateral handle.
 - b. Lowering the lateral handle.
 - c. Turning the lateral handle clockwise.
 - d. Turning the lateral handle counterclockwise.

2. You are adjusting the head section. Before you move the head section up or down, you:
 - a. Lower the leg sections.
 - b. Adjust the Trendelenburg (head-on).
 - c. Adjust the height of the operating table.
 - d. Depress the release plate located underneath the head to tilt the head section.

3. You isolated the cause of a malfunction and are replacing the x-ray tops. Which items do you depress?
 - a. Back left gear racks.
 - b. The U-handles to lower the foot pads.
 - c. The release plungers of the two locking posts.
 - d. The two clamp knobs on the underside of the back section.

4. You are using the troubleshooting guide (refer to the appendix) to isolate the cause of a malfunction. The lateral controls are not operable. What is the probable cause of this malfunction?
 - a. Transfer rod is not secured with set screws (figure 1-8).
 - b. Worm gear in the column assembly is worn or stripped (figure 1-10).
 - c. Female left crank adapter is stripped (figure 1-8).
 - d. Female adapter collar is stripped (figure 1-7).

5. You are using the troubleshooting guide (refer to the appendix) to isolate the cause of a malfunction. What would probably cause the back to get stuck in the lowest position and not rise?
 - a. The square key (Part 41) is sheared or missing (figure 1-5).
 - b. The square key (Part 31) is sheared or missing (figure 1-5).
 - c. The set screw (Part 39) is missing (figure 1-5).
 - d. The female left crank adapter is stripped (figure 1-8).

6. You are replacing the head section. Before you withdraw the head section from the mount holes, you:
 - a. Loosen the clamp knobs on the underside of the back section.
 - b. Depress the release plungers of the locking posts.
 - c. Loosen the two set screws located underneath.
 - d. Adjust the table vertically.

7. You are replacing the defective lateral drive screw assemblies. After you remove the four hex nuts and capscrews that secure the support block, you:
 - a. Adjust the gears.
 - b. Lift the drive assembly from the seat section and trunnion.
 - c. Loosen the two clamp screws and, while supporting the drive assembly, pry out the two adjusting pins
 - d. Remove the leg sections, back section, and lateral screw assemblies.

8. You are replacing the back lift assembly. After you raise the back section to the straight up position, you:
 - a. Drive out the dowel pin securing the gear racks to the back link assemblies.
 - b. Withdraw the release pin securing the leg yoke to the seat section
 - c. Remove the release pin securing the end of the leg index rod.
 - d. Support the back section while withdrawing the release pin.

Check Your Answers on Next Page

SOLUTIONS TO EXERCISES, LESSON 1.

1. d (para 1-5d(2))
2. d (para 1-5e)
3. c (para 1-7a(1))
4. d (Appendix, Troubleshooting Guide)
5. b (Appendix, Troubleshooting Guide)
6. a (para 1-7b(1))
7. c (para 1-7f(2))
8. a (para 1-7e(2))

End of Lesson 1

APPENDIX

OPERATING ROOM TABLE TROUBLESHOOTING GUIDE

SYMPTOM	POSSIBLE CAUSE
01. The head will not stay in place.	<ol style="list-style-type: none">1. Actuator pawls in the head section assembly are maladjusted. (figure 1-11)2. Pivot retainer plate in the head section assembly will not move. (figure 1-11)3. Square key (part 16) in the head section assembly is missing. (figure 1-11)4. Set screws (part 12) in the head section assembly are missing. (figure 1-11)
02. The table will not raise or lower, but the crank handle turns freely.	<ol style="list-style-type: none">1. Transfer rod in not secured with set screws. (figure 1-8)2. Square key (part 13) is missing. (figure 1-9)
03. The table will not raise.	<ol style="list-style-type: none">1. Worm gear (part 6) in the column assembly is worn or stripped. (figure 1-10)2. Worm gear (part 12) in the vertical gear box assembly is worn or stripped. (figure 1-9)3. Cap screws (part 17) in the vertical gear box assembly are not installed. (figure 1-9)4. Worm shaft (part 9) in the vertical gear box assembly is broken. (figure 1-9)5. Spring pin (part 9) is broken. (figure 1-8)6. Worm gear (part 18) in the vertical gear box assembly is stripped. figure 1-9)7. Spring pin (part 1) is broken or missing. (figure 1-8)

APPENDIX (CONTINUED)

SYMPTOM	POSSIBLE CAUSE
04. The table is stuck in the down position and will not raise.	Female lift crank adaptor is stripped. (figure 1-8)
05. The casters are stuck in the down position.	Caster cap in not secured. (figure 1-8)
06. The casters will not raise or lower.	Jack shaft is not secured to the pedal and link assembly. (figure 1-8)
07. There is no lateral control.	U-joint (part 15) is broken. (figure 1-7)
08. The table's lateral controls are not operable.	Female adapter collar is stripped. figure 1-7)
09. The back will not raise or lower.	Set screw (part 29) is missing. (figure 1-5)
10. Only one side of the back section will raise or lower.	<ol style="list-style-type: none"> 1. The square key (part 41) is sheared or missing. (figure 1-5) 2. Spring pin (part 39) is broken. (figure 1-5)
11. The back is stuck in the lowest position and will not raise.	Square key (part 31) is missing or broken. (figure1-5)
12. The back will not raise.	<ol style="list-style-type: none"> 1. Worm gear (part 18) is worn smooth. (figure 1-5) 2. Spring pin (part 12) is sheared. (figure 1-5) 3. Square key (part 19) is broken. (figure 1-5) 4. Female crank handle adapter is stripped. (figure 1-5)

APPENDIX (CONTINUED)

SYMPTOM	POSSIBLE CAUSE
13. Only one side of the back section will rise.	Dowel pin (part 4) is missing. (figure 1-5)
14. The leg will not stay in place when positioned.	<ol style="list-style-type: none"> 1. Screw clamp (part 14) is stripped. (figure 1-6) 2. Plunger (part 7) has a broken tooth. (figure 1-6) 3. Spring pin (part 12) has fallen out. (figure 1-6) 4. Spring pin (part 6) is sheared. (figure 1-6)
15. The table will not go into the Trendelenburg position.	<ol style="list-style-type: none"> 1. Female adapter collar is stripped. (figure 1-7) 2. U-joint is broken. (figure 1-7) 3. Spring pin (part 3) is broken. (figure 1-7)
16. The head will not move to the desired position.	Ratchet heads are installed 180 degrees out of alignment. (figure 1-11)
17. The table will not go into the reverse of forward Trendelenburg position.	Dowel pin (part 12) is sheared. (figure 1-7)
18. The lateral movement function is not working.	Spring pin (part 3) is sheared. (figure 1-7)

End of Appendix