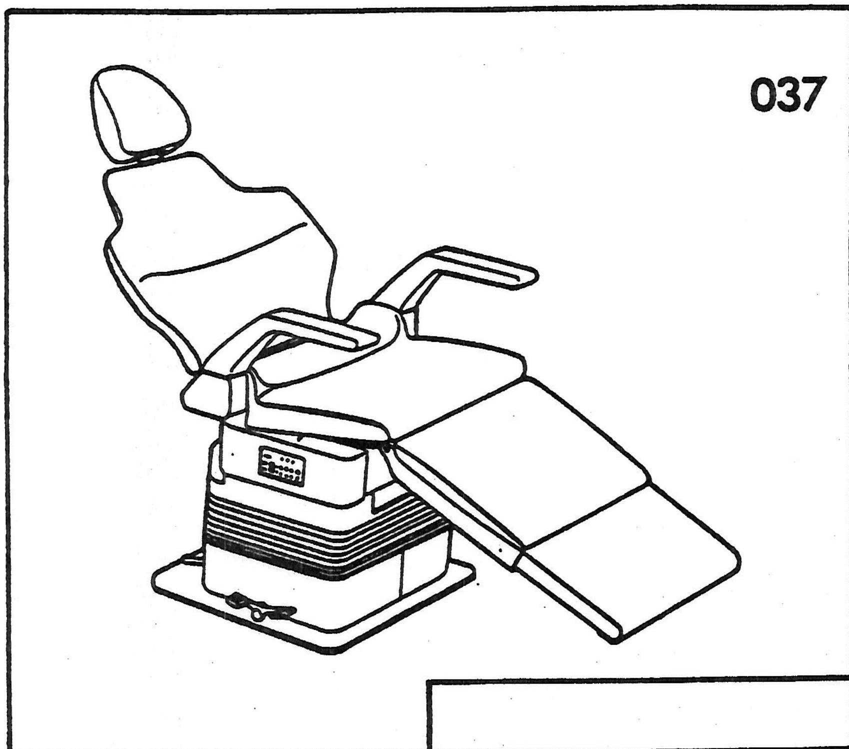
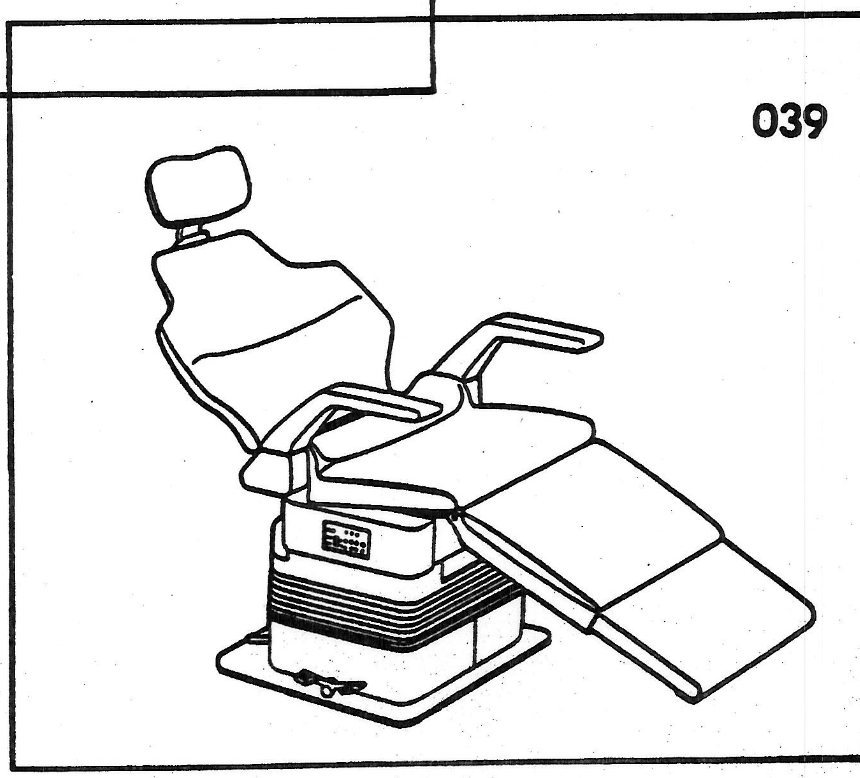
Belmont®

037/039
DENTAL CHAIR





Belmont Equipment
A Division of Takara Belmont USA, Inc.
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2076 S. Sheridan Way, Mississauga, Ont., Canada (416) 822-2755

SERVICE MANUAL

9/94

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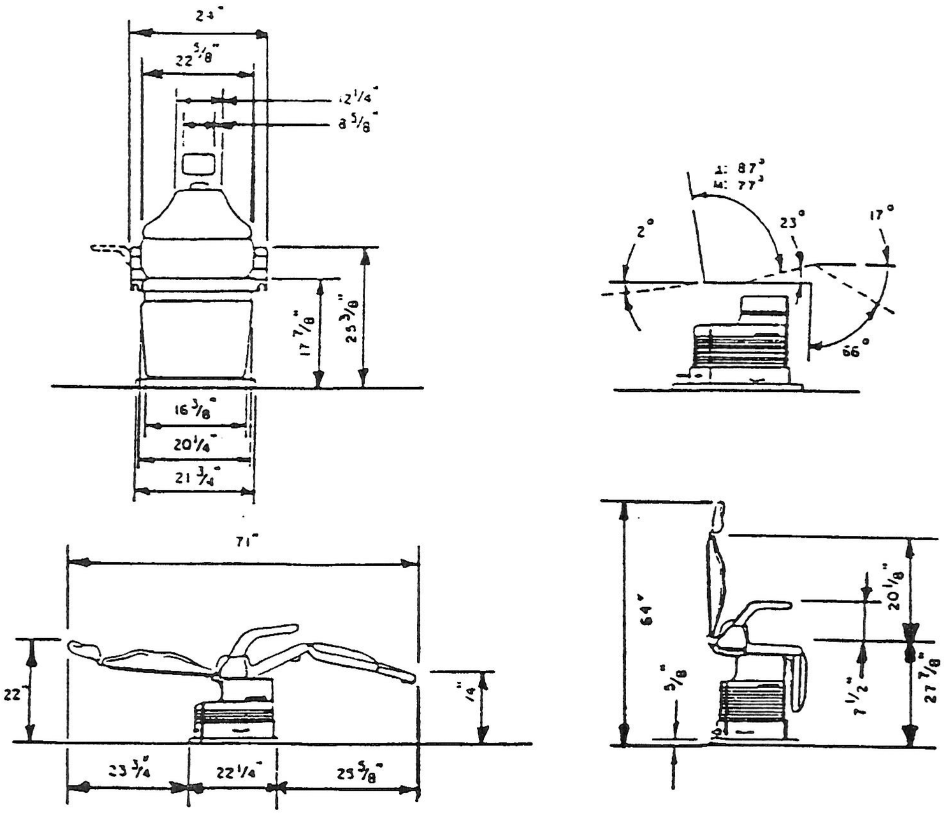
037/039 CHAIR DIMENSIONS & GENERAL SPECIFICATIONS



CHAIR WEIGHT: 037...............................330 lbs.
039...............................339 lbs.

BASE DIMENSIONS:.............................21-3/4"x 22-1/4"x 5/8"

INITIAL HEIGHT:..............................17-7/8"

STROKE:......................................10-1/4"

ROTATION:....................................220 DEG. TOTAL
(110 deg. left & right)

MOTOR PUMP:..................................Type 5LP

PUMPING CAPACITY:............................0.72 l/min. (.19 gal./min.)

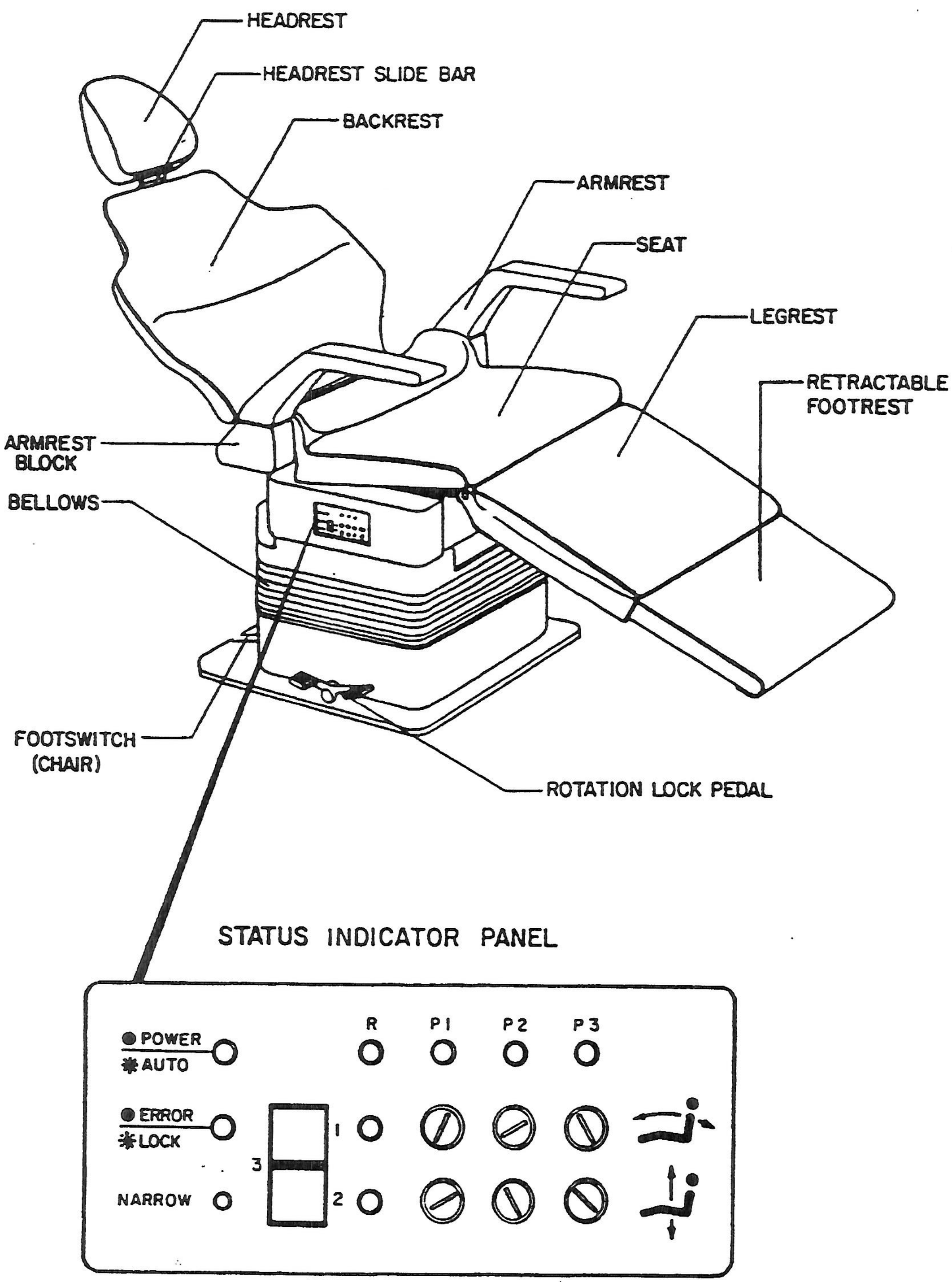
OPERATING PRESSURE:..........................850 PSI

FLUID CAPACITY:..............................900 cc, 10w non-detergent hydraulic oil. (30 fl.oz.)

POWER CONSUMPTION:...........................200w

POWER REQUIRED:..............................115 VAC, 50/60 Hz, 5 AMP grounded supply.

037/039 CHAIR OVERALL VIEW
GENERAL PARTS IDENTIFICATION



IMPORTANT: 037/039 GENERAL SERVICE GUIDELINES

The control boards used on these chairs are by nature one of the most reliable components of a chair and are RARELY the cause of difficulty, however chair malfunctions are frequently erroneously attributed to these boards. Various difficulties which can appear to be caused by defective boards are more often due to relatively simple misadjustments or connection problems in the control wiring. When faced with a difficulty, keep the following points in mind:

1) BE METHODICAL. When checking out the chair, follow the trouble shooting diagrams in sequence, don't skip around. When making limit adjustments, verify all six settings before proceeding further.

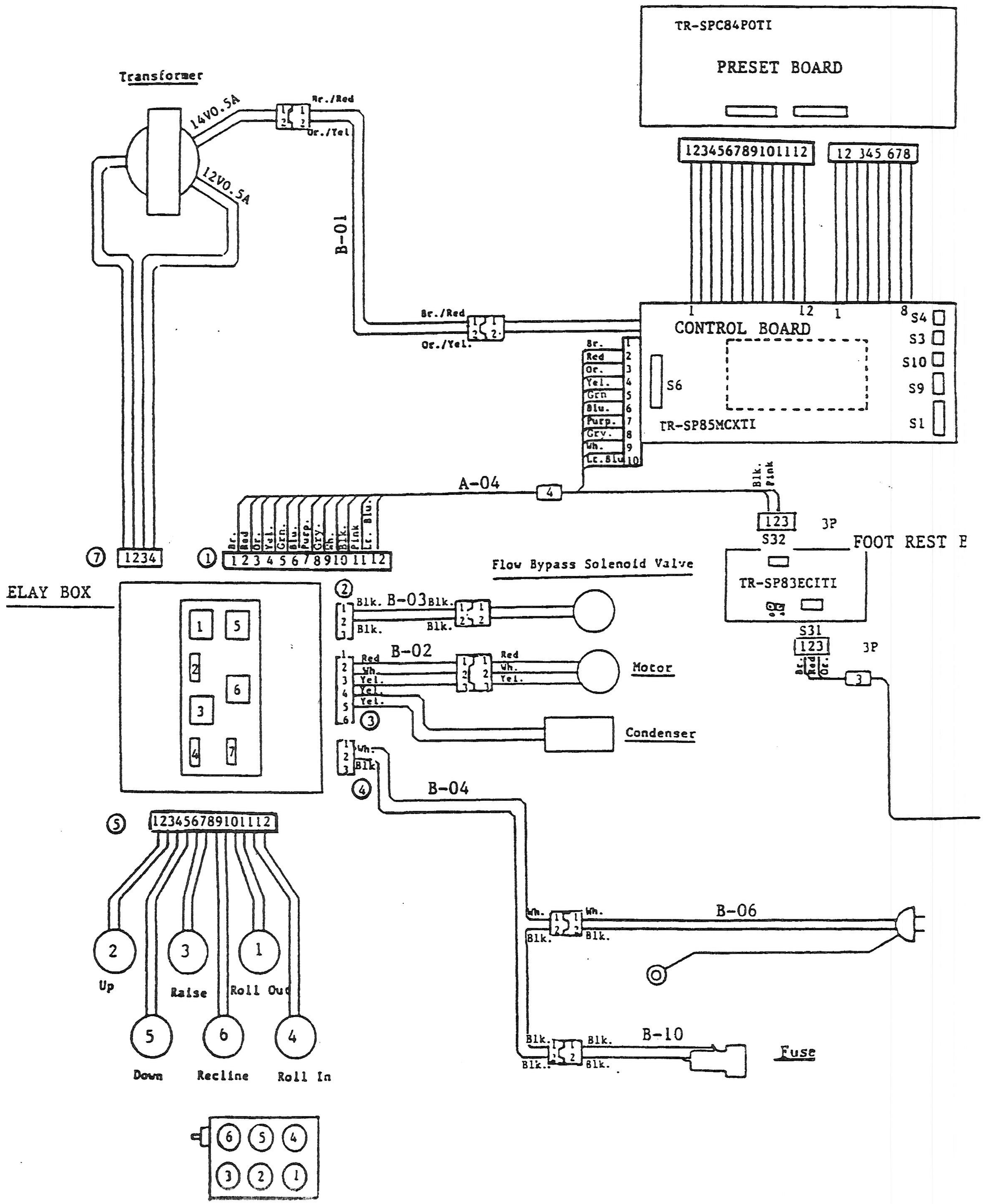
2) Try the identical control on the other side of the chair and the foot control, if equipped. If the function operates there, the difficulty is in the switch itself or the wiring to the center harness, not in the boards.

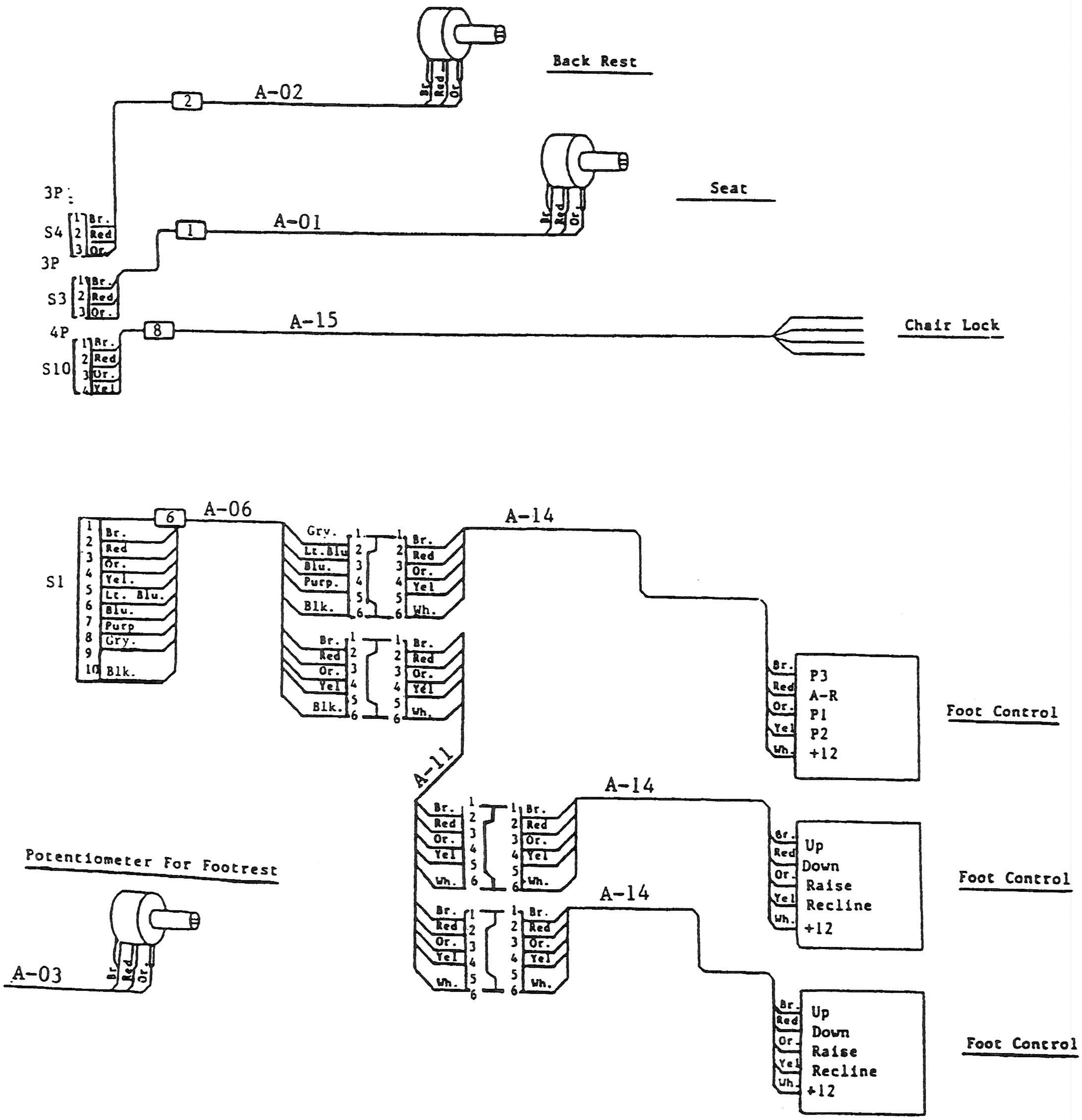
3) The molded plastic connectors at the relay box and elsewhere consist of separate metal pins which snap into the connector body. Always confirm by pushing that all wires are fully seated into the connector.

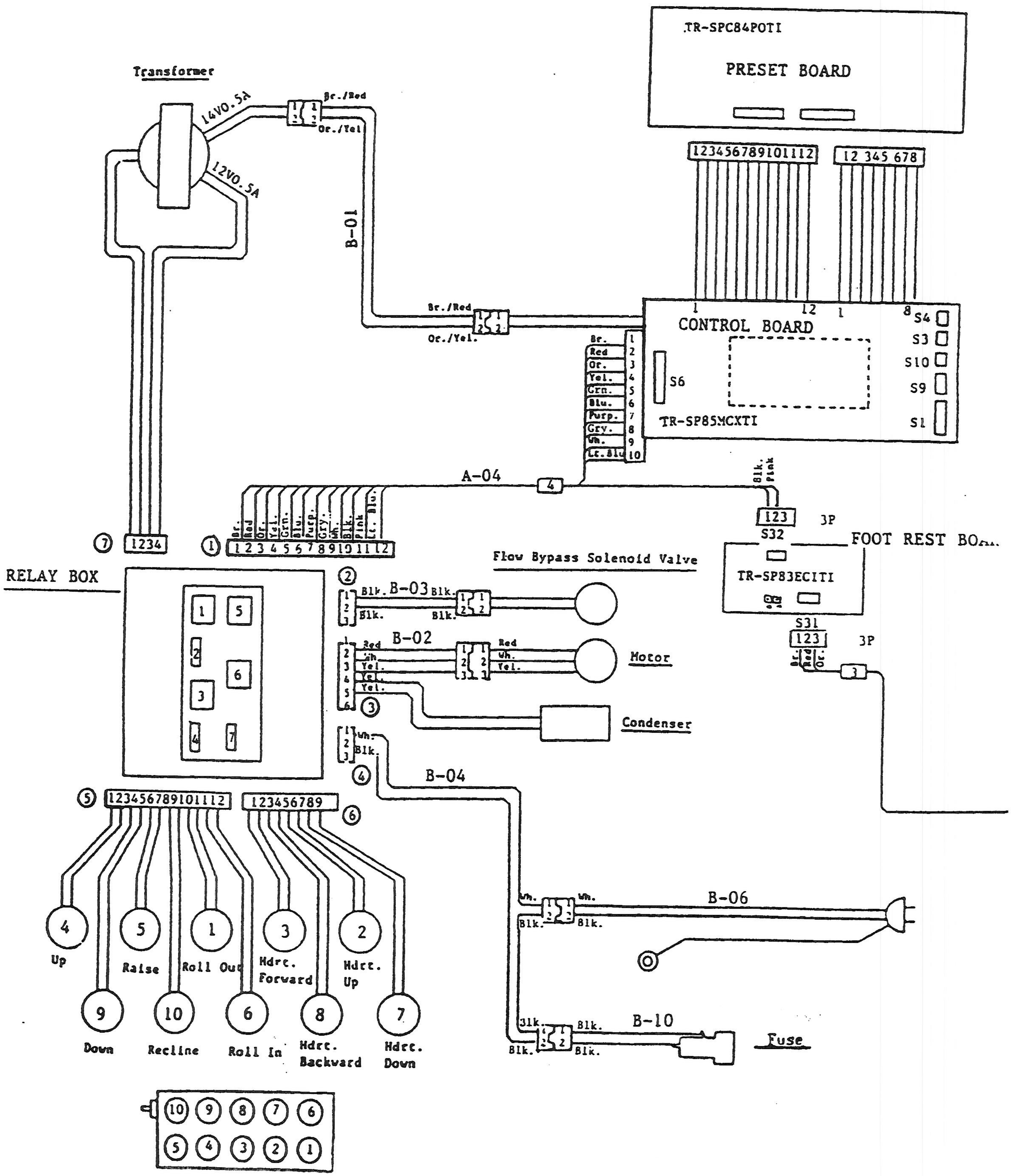
4) If the preset does not work properly, be sure that the preset adjustments are set within the proper operating range of the chair.

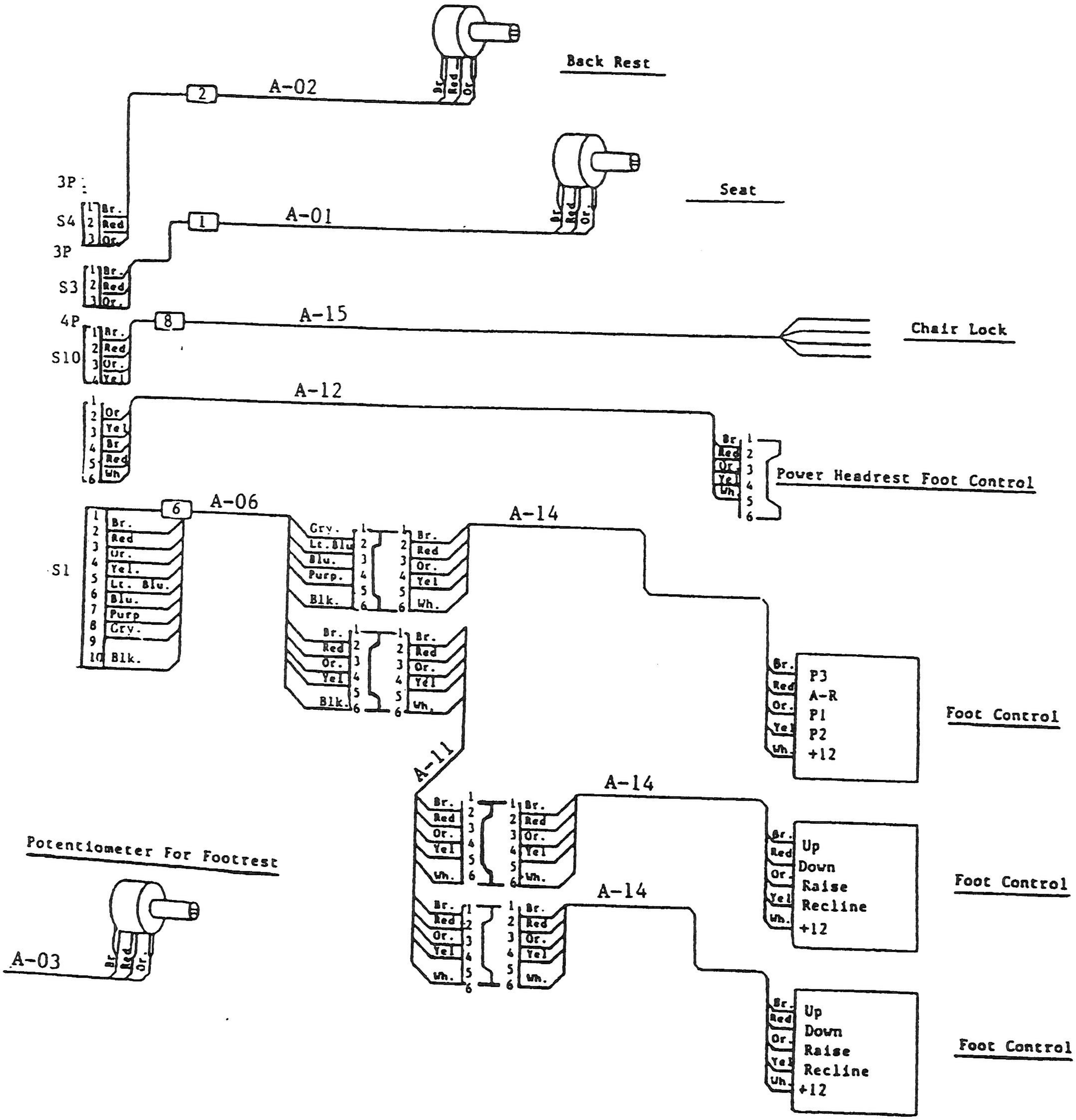
5) When faced with erratic or inoperative functions, always follow the Limit Control Adjustment Procedure. Follow this in sequence and complete all six adjustments before concluding that there is a circuit board or other hardware problem.

6) Erratic preset or auto return performance can be caused by loose Position-Sensing Rheostats or bad connections to them.

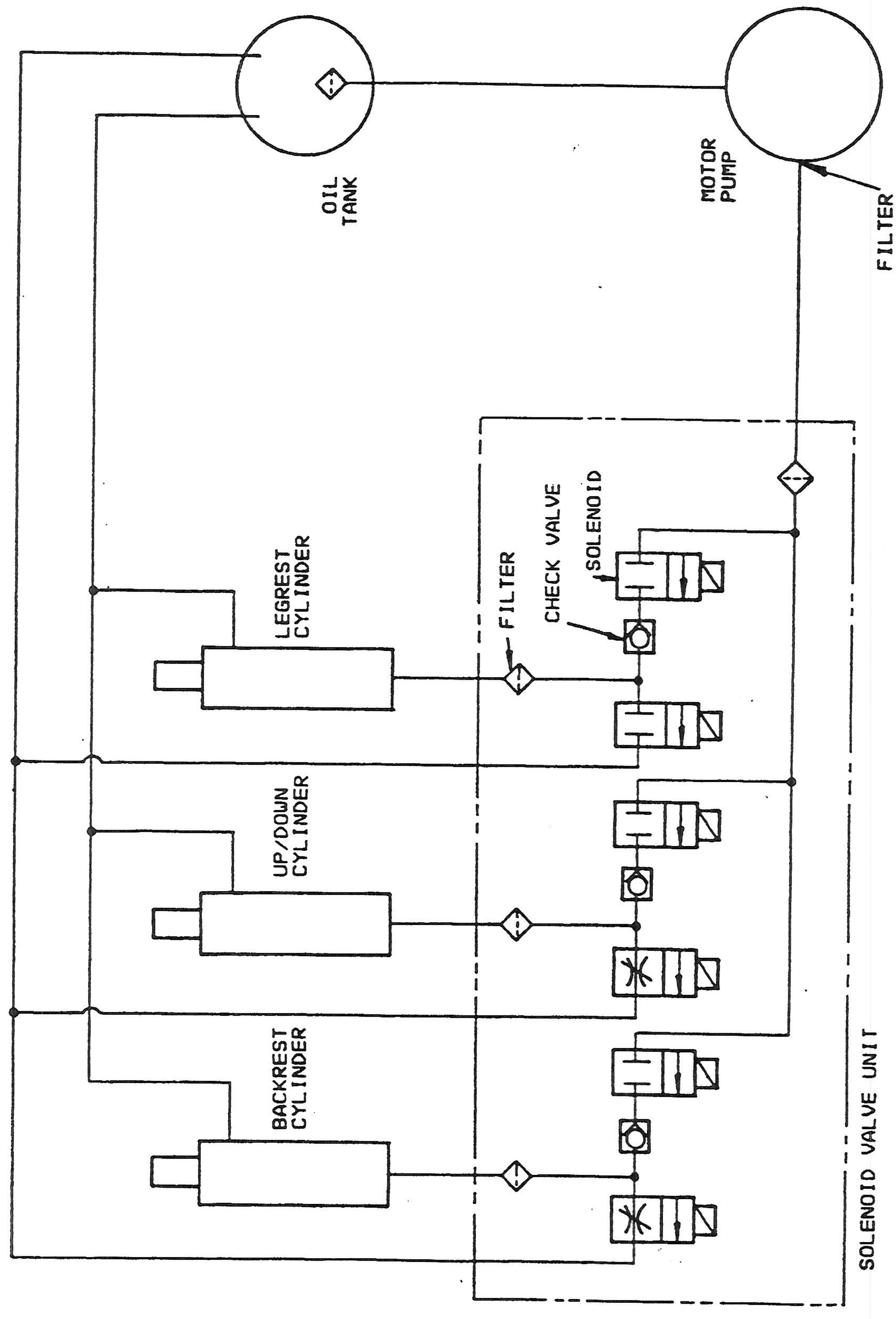

TR-SPC84POTI
PRESET BOARD
Transformer
14V0.5A
12V0.5A
Br./Red
Or./Yel.
B-01
123456789101112
12 345 678
1
12
1
8
CONTROL BOARD
S4
S3
S10
S9
S1
S6
TR-SP85MCXTI
Br.
Red
Or.
Yel.
Grn
Blu.
Purp.
Gry.
Wh.
Lt.Blu
A-04
4
Blk.
Pink
123
3P
S32
FOOT REST B
TR-SP83ECITI
S31
123
3P
Br.
Red
Or.
3
7
1234
1
123456789101112
Lt. Blu.
ELAY BOX
1
5
2
6
3
4
7
Flow Bypass Solenoid Valve
Blk.
B-03
Blk.
B-02
Motor
Red
Wh.
Yel.
Condenser
B-04
5
123456789101112
2
Up
3
Raise
1
Roll Out
5
Down
6
Recline
4
Roll In
B-06
B-10
Fuse
6 5 4
3 2 1


Back Rest
A-02
2
Br.
Red
Or.
Seat
A-01
1
3P
S4
3P
S3
4P
S10
A-15
8
Chair Lock
S1
A-06
6
Br.
Red
Or.
Yel.
Lt. Blu.
Blu.
Purp
Gry.
Blk.
Gry.
Lt.Blu
Blu.
Purp.
Blk.
A-14
Yel
Wh.
P3
A-R
P1
P2
+12
Foot Control
A-11
A-14
Up
Down
Raise
Recline
+12
Foot Control
A-14
Up
Down
Raise
Recline
+12
Foot Control
Potentiometer For Footrest
A-03

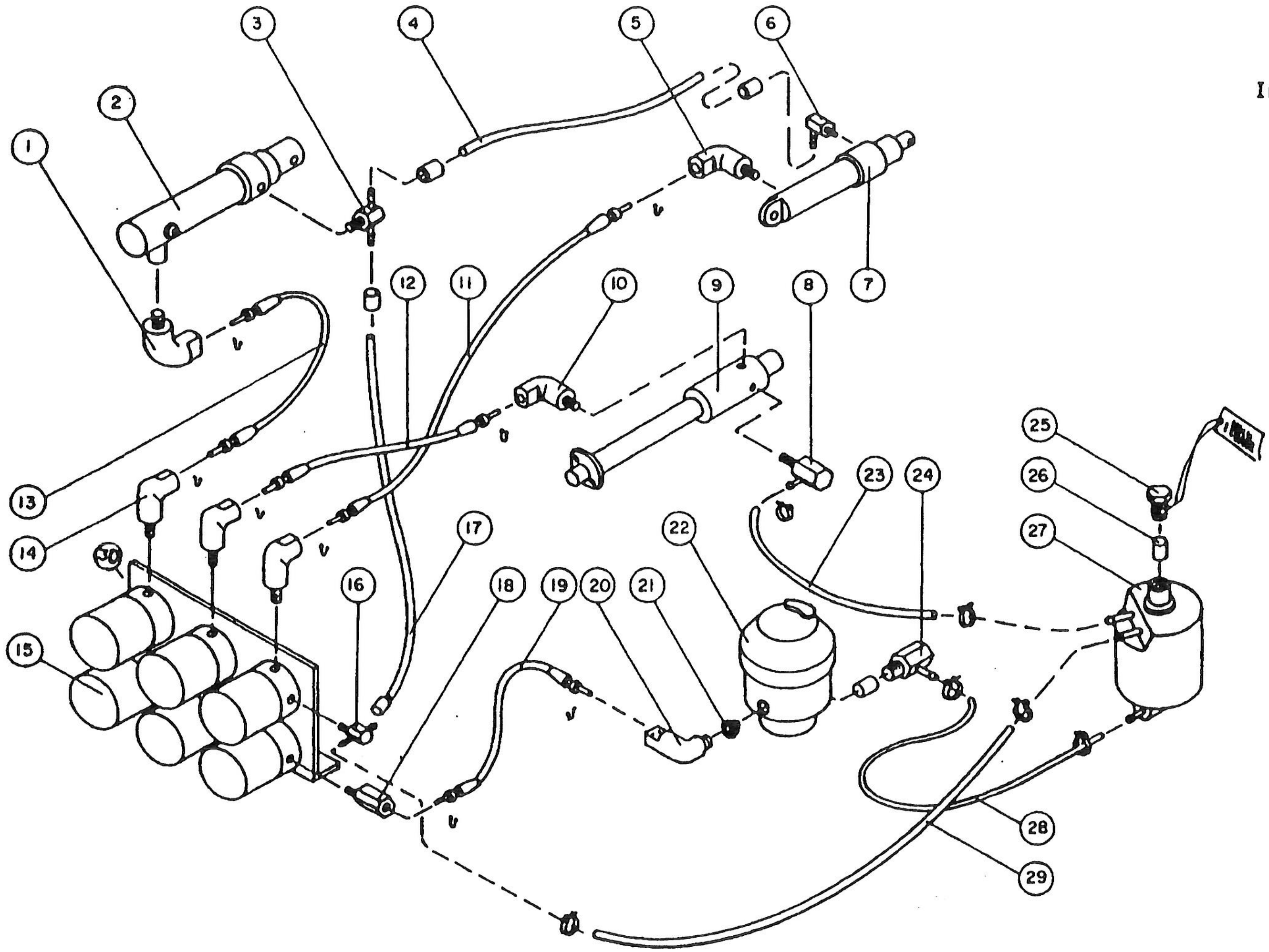

TR-SPC84POTI
PRESET BOARD
Transformer
14V0.5A
12V0.5A
Br./Red
Or./Yel
B-01
CONTROL BOARD
TR-SP85MCXTI
S6
S4
S3
S10
S9
S1
A-04
Blk.
Pink
123
3P
S32
FOOT REST BO...
TR-SP83ECITI
S31
123
3P
RELAY BOX
Flow Bypass Solenoid Valve
B-03
B-02
Motor
Condenser
B-04
B-06
B-10
Fuse
Up
Raise
Roll Out
Hdrc. Forward
Hdrc. Up
Down
Recline
Roll In
Hdrc. Backward
Hdrc. Down


Back Rest
A-02
Seat
A-01
3P
S4
3P
S3
4P
S10
A-15
Chair Lock
A-12
Power Headrest Foot Control
S1
A-06
A-14
Foot Control
P3
A-R
P1
P2
+12
A-11
A-14
Foot Control
Up
Down
Raise
Recline
+12
A-14
Foot Control
Up
Down
Raise
Recline
+12
Potentiometer For Footrest
A-03

037 HYDRAULIC SYSTEM FLOW CHART

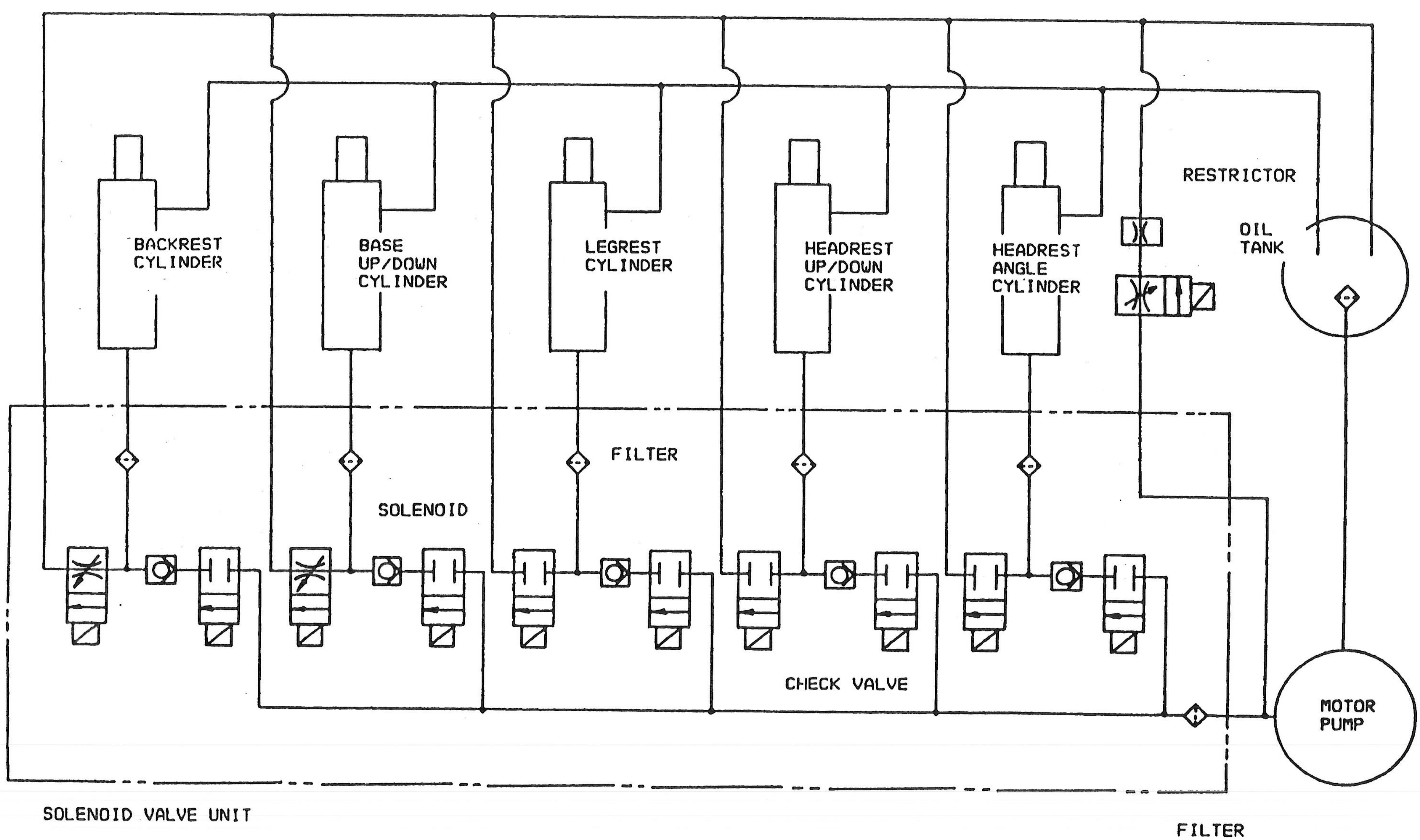


037 HYDRAULIC SYSTEM COMPONENTS

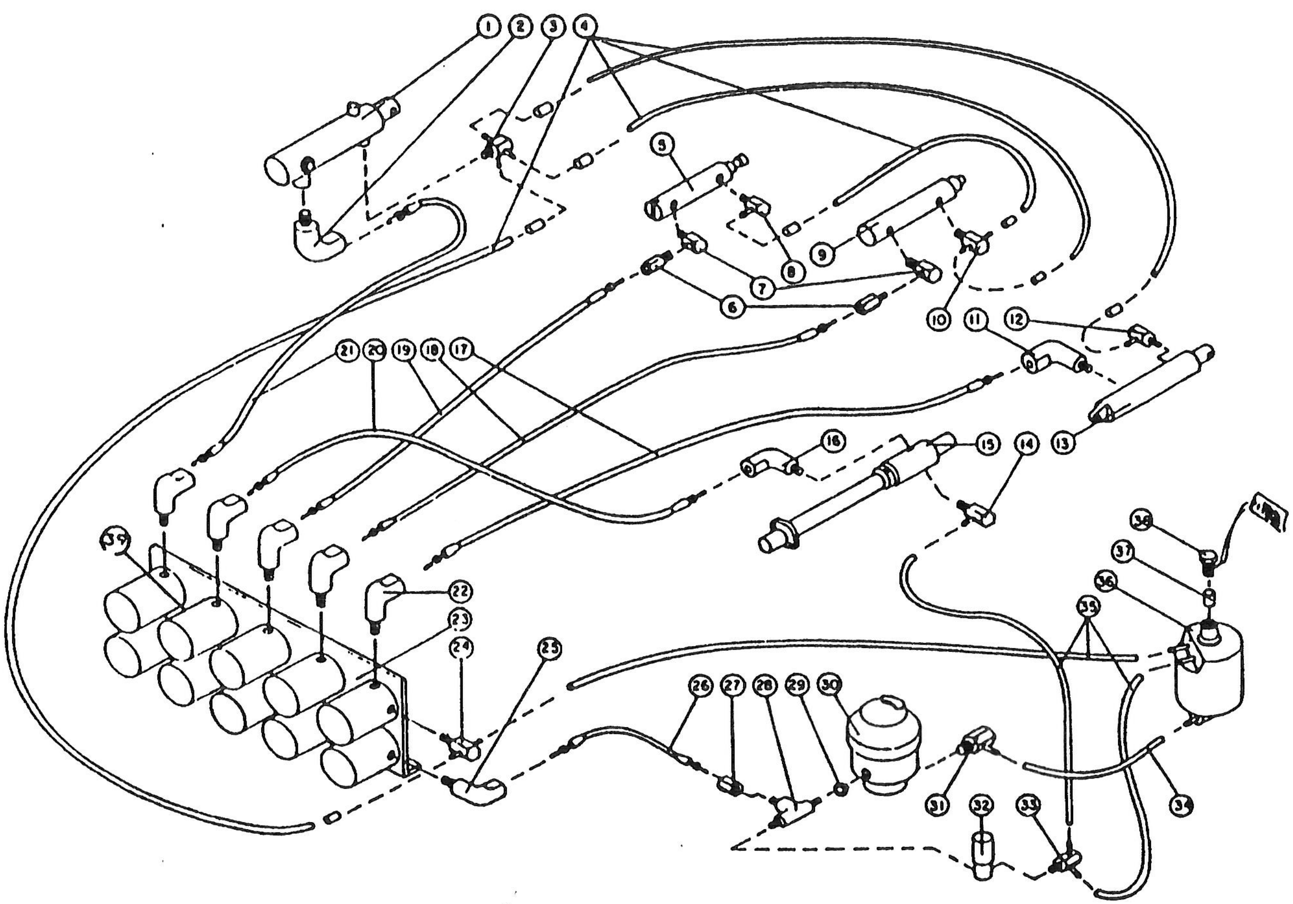


Index No.	Description
1	Hose Elbow
2	Reclining Cylinder
3	Mini 2-way Elbow
4	Ø4 Hylon Tube
5	Hose Elbow
6	Hose Nipple (recline)
7	Legrest Cylinder
8	L-Shaped Hose Nipple
9	Base Up/Down Cylinder
10	Hose Elbow
11	Hylon Hose -1400mm
12	Hylon Hose - 250mm
13	Hylon Hose -1150mm
14	Hose Elbow (Sm.)
15	Solenoid Valve Unit
16	Barb Fitting
17	Ø4 Hylon Tube
18	Hose Elbow (Sm.)
19	Hylon Hose - 580mm
20	Hose Elbow
21	Strainer
22	Motor Pump
23	Ø5 Overflow Hose
24	L-Shaped Nipple (Motor)
25	Rubber Plug
26	Filter
27	Oil Reservoir
28	Ø8 Overflow Hose
29	Ø5 Overflow Hose
30	Check Valve

039 HYDRAULIC SYSTEM FLOW CHART



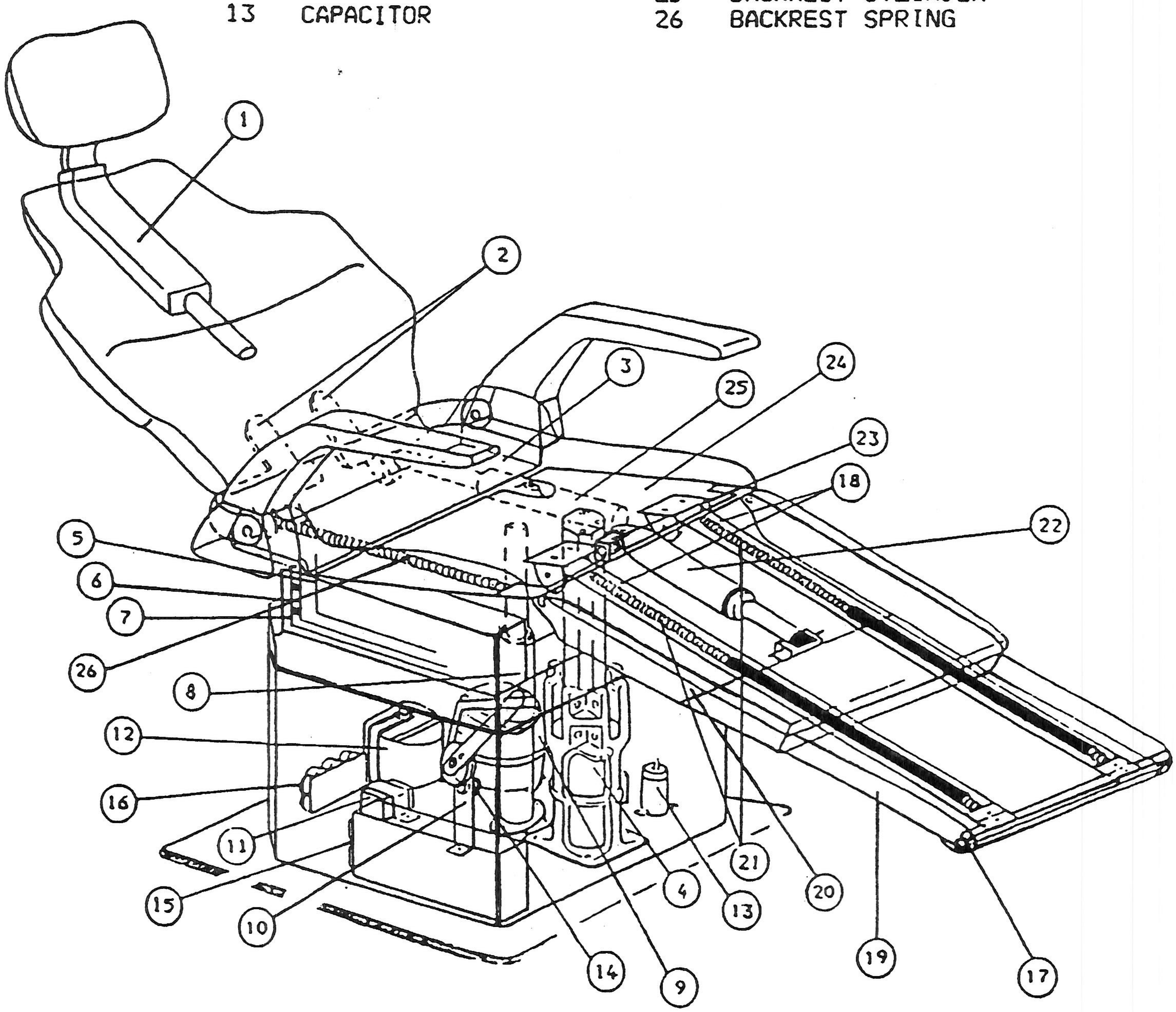
039 HYDRAULIC SYSTEM COMPONENTS



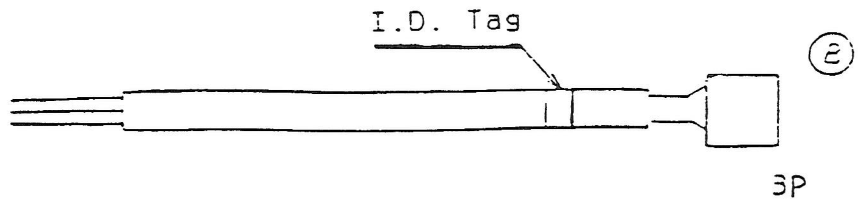
Index No.	Description
1	Reclining Cylinder
2	Hose Elbow
3	Mini 3-way Elbow
4	04 Hylon Tube
5	Headrest Angle Cylinder
6	Mini Hose Nipple
7	Hose Nipple (Headrest)
8	One-sided Nipple
9	Headrest Up/Down Cylinder
10	Double-ended Nipple
11	Hose Elbow
12	Hose Nipple (recline)
13	Legrest Cylinder
14	L-Shaped Hose Nipple
15	Base Up/Down Cylinder
16	Hose Elbow
17	Hylon Hose -1200mm
18	Hylon Hose -1300mm
19	Hylon Hose -1800mm
20	Hylon Hose - 250mm
21	Hylon Hose -1150mm
22	Hose Elbow (sm.)
23	Solenoid Valve Assy.
24	Barb Fitting
25	Hose Elbow (sm.)
26	Hylon Hose - 580mm
27	Mini-Hose Nipple
28	T-Fitting
29	Strainer
30	Motor Pump
31	L-Type Nipple (motor)
32	Solenoid Valve
33	Hose Nipple w/Orifice
34	08 Overflow Hose
35	05 Overflow Hose
36	Oil Reservoir
37	Filter
38	Rubber Plug
39	Check Valve

INTERNAL VIEW OF MAJOR COMPONENTS

1	HEADREST SLIDE BAR	14	RHEOSTAT (BASE CYLINDER)
2	BACKREST SUPPORT	15	RELAY BOX
3	SEATPLATE "A"	16	SOLENOID VALVES
4	GUIDE SHAFT	17	LEGREST PIPE
5	CONTROL P.C. BOARD	18	CONSTANT TENSION SPRING
6	PRESET P.C. BOARD	19	ROLL-UP LEGREST FRAME
7	INDICATOR PANEL	20	LEGREST FRAME
8	BASE CYLINDER	21	LEGREST SPRING
9	MOTOR PUMP	22	LEGREST CYLINDER
10	LINK BRACKET	23	RHEOSTAT (LEGREST CYLINDER)
11	TRANSFOMER	24	SEATPLATE "B"
12	OIL RESERVOIR	25	BACKREST CYLINDER
13	CAPACITOR	26	BACKREST SPRING

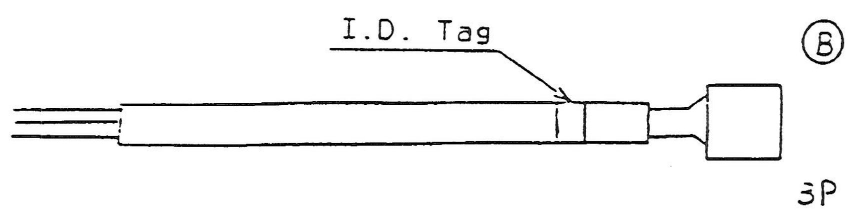


A-01 VARIABLE RHEOSTAT FOR SEAT-CONTROL BOARD



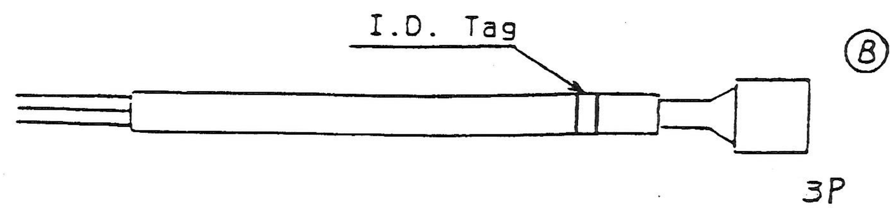
FUNCTION	COLOR	POTENTIOMETER	TAB NO. B
	BROWN	3	1
	RED	2	2
	ORANGE	1	3

A-02 VR FOR BACKREST - CONTROL BOARD



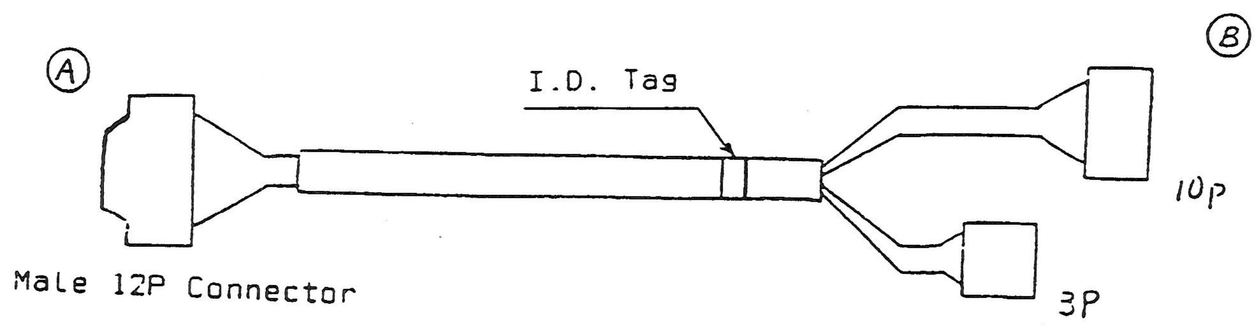
FUNCTION	COLOR	POTENTIOMETER	TAB NO. B
	BROWN	1	1
	RED	2	2
	ORANGE	3	3

A-03 VR FOR FOOTREST - EC BOARD



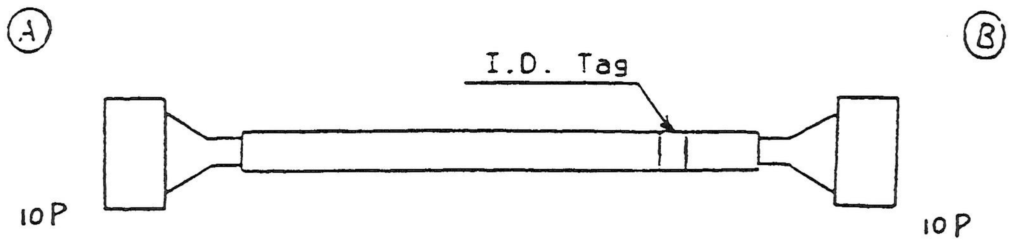
FUNCTION	COLOR	POTENTIOMETERTAB NO.	B
	BROWN	1	1
	RED	2	2
	ORANGE	3	3

A-04 RELAY BOX - CONTROL BOARD & EC BOARD



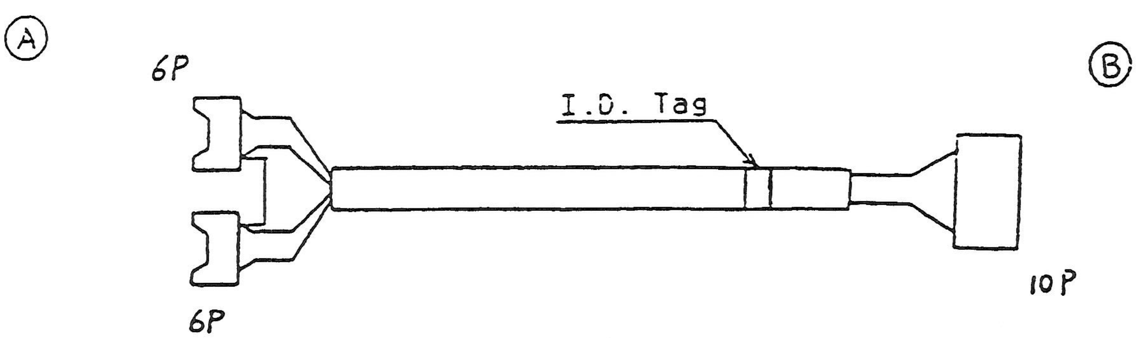
FUNCTION	COLOR	A	B
MOTOR	BROWN	1	10P-1
BASE UP	BROWN	2	10P-2
BASE DOWN	ORANGE	3	10P-3
BACK UP	YELLOW	4	10P-4
BACK DOWN	GREEN	5	10P-5
HEADREST FOWARD	BLUE	6	10P-6
HEADREST BACKWARD	PURPLE	7	10P-7
HEADREST UP	GRAY	8	10P-8
HEADREST DOWN	WHITE	9	10P-9
LEGREST OUT	BLACK	10	3P-1
LEGREST IN	PINK	11	3P-2
GND	LIGHT BLUE	12	10P-10

A-05 COMBINATION PC BOARD - CONTROL BOARD



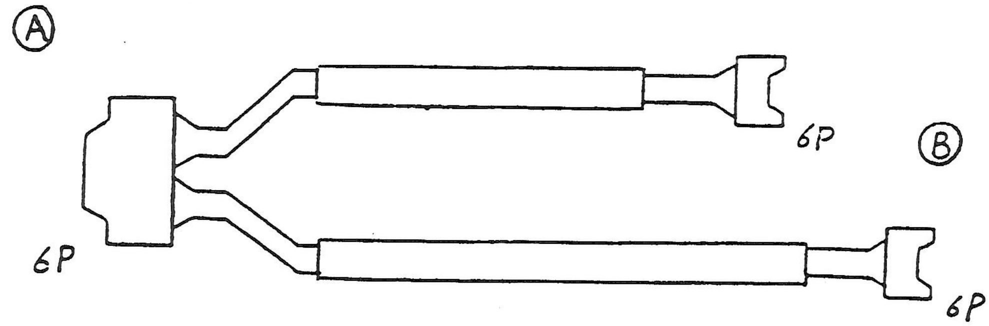
FUNCTION	COLOR	A	B
BASE UP	BROWN	1	1
BASE DOWN	RED	2	2
BACK UP	ORANGE	3	3
BACK DOWN	YELLOW	4	4
AR	SKY BLUE	5	5
P1	BLUE	6	6
P2	PURPLE	7	7
P3	GRAY	8	8
GND	WHITE	9	9
+12 V.	BLACK	10	10

A-06 FOOT CONTROL - CONTROL BOARD



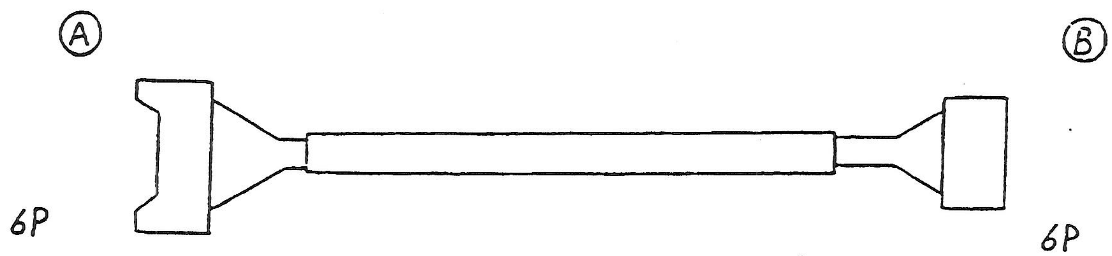
FUNCTION	COLOR	A	B
BASE UP	BROWN	NO 1-1	1
BASE DOWN	RED	NO 1-2	2
BACK UP	ORANGE	NO 1-3	3
BACK DOWN	YELLOW	NO 1-4	4
AR	SKY BLUE	NO 2-2	5
P1	BLUE	NO 2-3	6
P2	PURPLE	NO 2-4	7
P3	GRAY	NO 2-1	8
+12 V.	BLACK	NO 1-6	10
+12V.	BLACK	NO 2-6	10

A-11 CONNECTOR FOR INCREASING FOOT CONTROLS



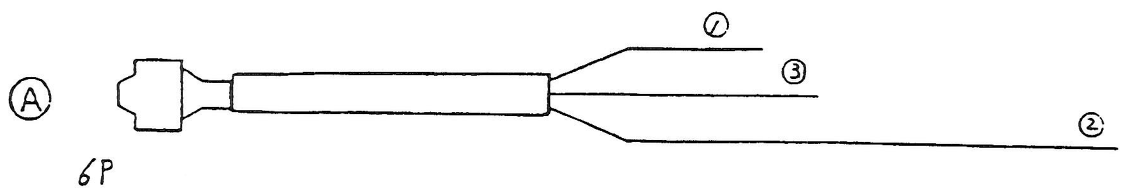
FUNCTION	COLOR	A	B
BASE UP	BROWN	1	1
BASE DOWN	RED	2	2
BACK UP	ORANGE	3	3
BACK DOWN	YELLOW	4	4
+12 V.	WHITE	6	6

A-12 HEADREST FOOT CONTROL CONNECTOR LINE



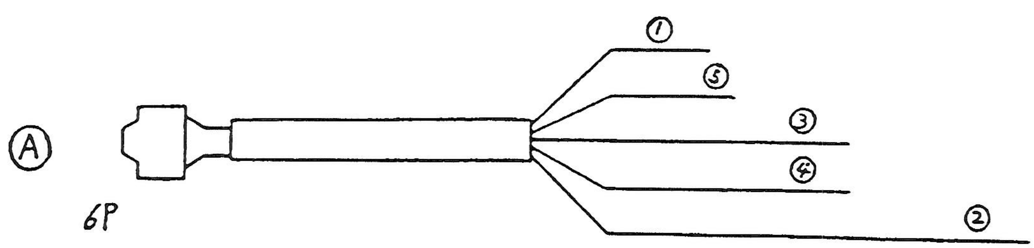
FUNCTION	COLOR	A	B
HEADREST UP	BROWN	1	3
HEADREST DOWN	RED	2	4
HEADREST FOWARD	ORANGE	3	1
HEADREST BACKWARD	YELLOW	4	2
+12 V.	WHITE	5	6

A-13 FOOT CONTROL LINE NO.2



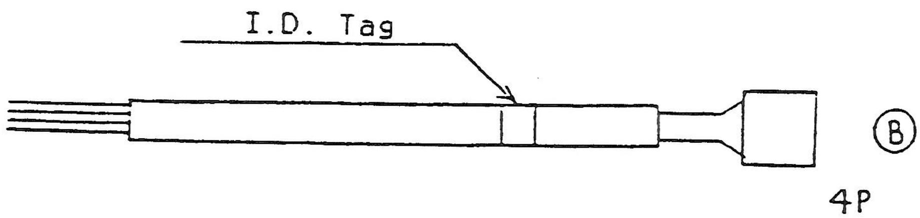
FUNCTION	COLOR	A	B
P3	BROWN	1	1
AR	RED	2	2
+12V.	ORANGE	6	3

A-14 FOOT CONTROL LINE NO.1



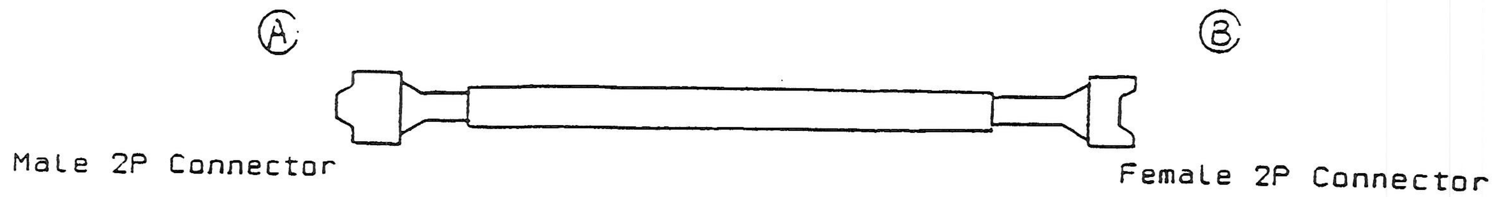
FUNCTION	COLOR	A	B
BASE UP	BROWN	1	1
BASE DOWN	RED	2	2
BACK UP	ORANGE	3	3
BACK DOWN	YELLOW	4	4
+12 V.	WHITE	6	5

A-15 CONNECTOR LINE FOR CHAIR LOCK



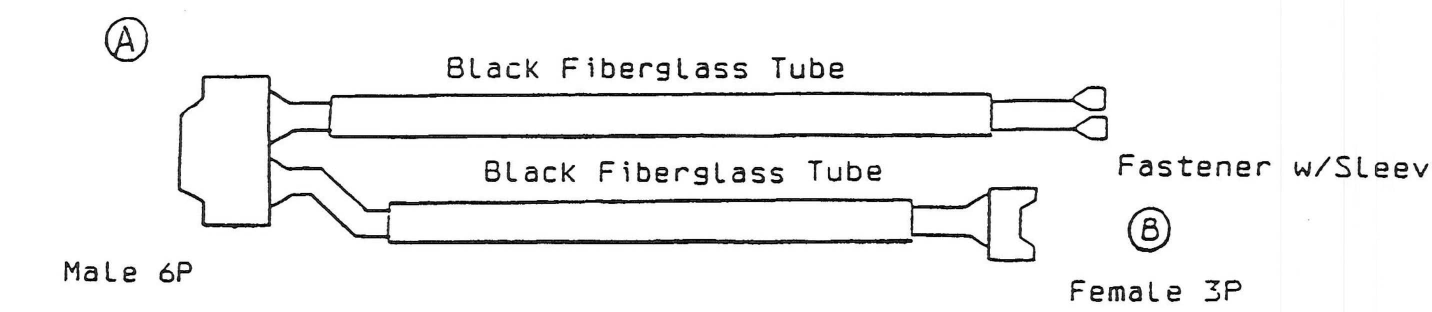
FUNCTION	COLOR	A	B
+12 V.	BROWN		1
BASE DOWN LIMIT	RED		2
+12 V.	ORANGE		3
FULL MOVEMENT LIMIT	YELLOW		4

B-01 TRANSFORMER - CONTROL BOARD



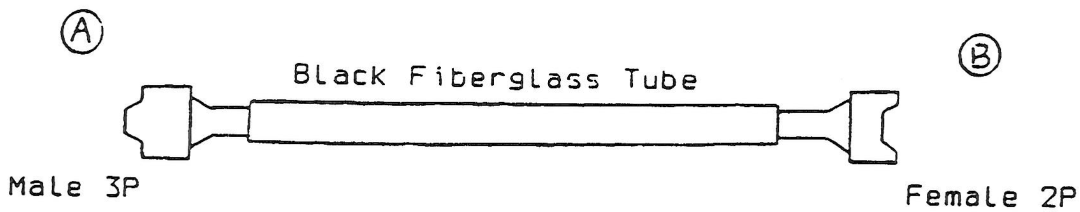
FUNCTION	COLOR	A	B
	BROWN/RED	1	1
	ORANGE/YELLOW	2	2

B-02 RELAY BOX - MOTOR & CONDENSER



FUNCTION	COLOR	A	B
	RED	1	1
	WHITE	2	2
	YELLOW	3	3
CONDENSER	YELLOW	4	FASTENER ATTACHMENT
CONDENSER	YELLOW	5	FASTENER ATTACHMENT

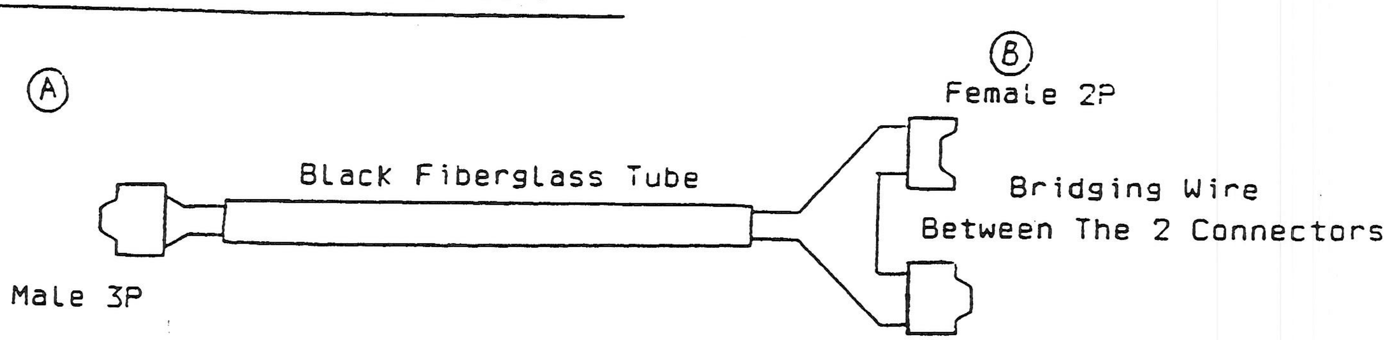
B-03 RELAY BOX - FLOW BYPASS SOLENOID VALVE



FUNCTION	COLOR	A	B
	BLACK	1	1
	BLACK	2	2

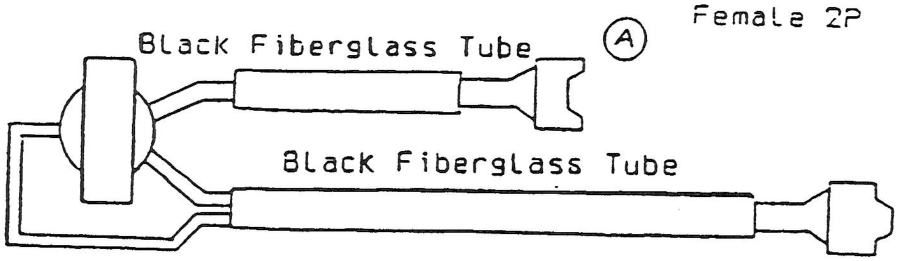
POLARITY NOT CRITICAL

B-04 RELAY BOX - POWER CORD



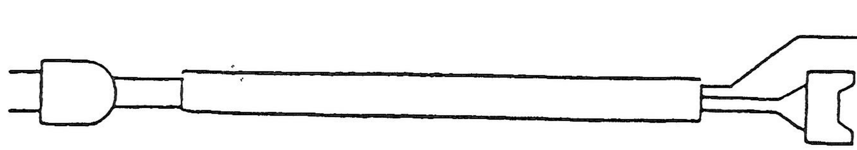
FUNCTION	COLOR	A	B
	WHITE	1	MALE 1
	BLACK	2	FEMALE 2
BRIDGING WIRE	BLACK	MALE 2	FEMALE 1

B-05 TRANSFORMER



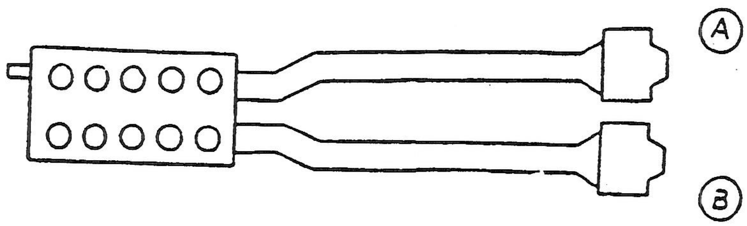
FUNCTION	COLOR	A	B
SECONDARY 14V		1	
SECONDARY 14V		2	
PRIMARY			1
PRIMARY			2
SECONDARY 14V			3
SECONDARY 12V			4

B-06 ELECTRICAL CORD



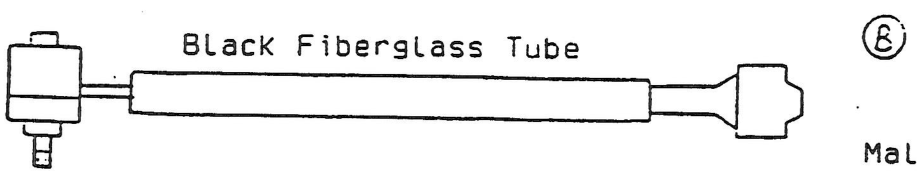
FUNCTION	COLOR	A	B
	WHITE		1
	BLACK		2

8-07 SOLENOID VALVES (10)



FUNCTION	COLOR	A	B
BASE UP		1&2	
BASE DOWN		3&4	
BACK UP		5&6	
BACK DOWN		7&8	
LEGREST ROLLOUT		9&10	
LEGREST ROLLIN		11&12	
HEADREST FORWARD			1&2
HEADREST BACKWARD			3&4
HEADREST UP			5&6
HEADREST DOWN			7&8

8-08 FLOW BYPASS SOLENOID VALVE



FUNCTION	COLOR	A	B
			1
			2

POLARITY NOT CRITICAL

B-09 FOOT CONTROL COMMON LINE NO.1

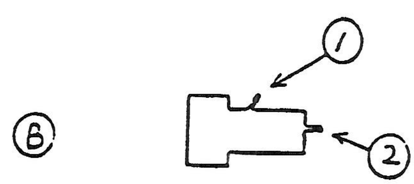
Fastener (w/sleeve)

Fastener Terminal

FUNCTION	COLOR	A	B
	ORANGE		

B-10 FUSE HOLDER

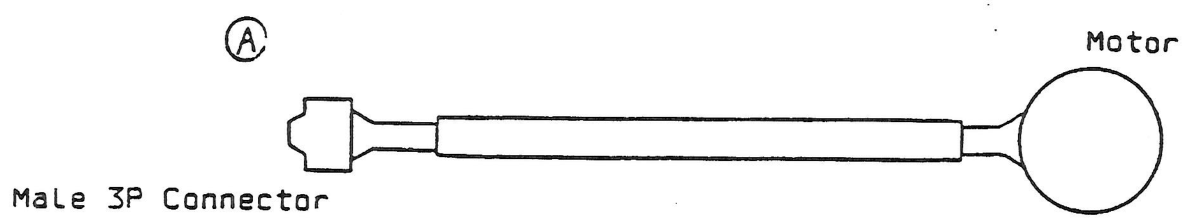
w/sleeve



2P Connector

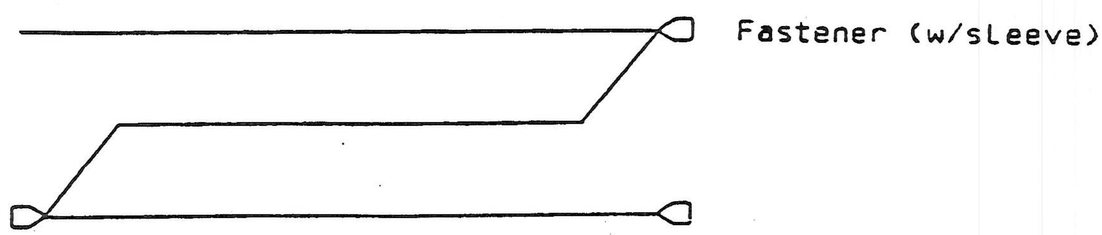
FUNCTION	COLOR	A	B
	BLACK		1
	BLACK		2

B-11 MOTOR



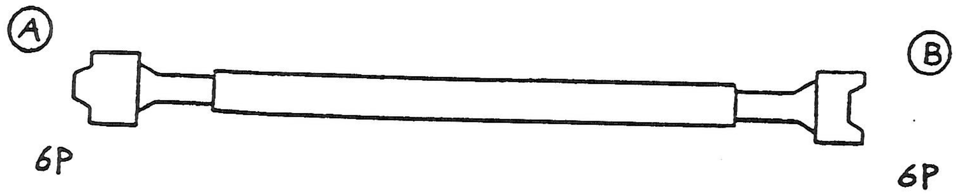
FUNCTION	COLOR	A	B
	RED	1	
	WHITE	2	
	YELLOW	3	

B-12 FOOT CONTROL COMMON LINE NO.2



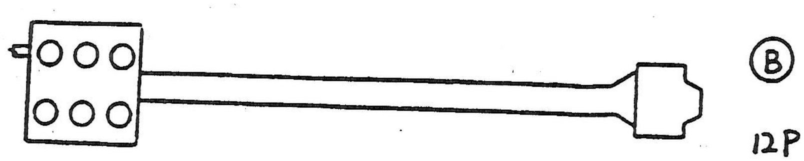
FUNCTION	COLOR	A	B
	WHITE		

B-15 FOOT CONTROL CONNECTOR LINE TYPE (AXIS-90)



FUNCTION	COLOR	A	B
UP	BROWN	1	1
DOWN	RED	2	2
RAISE	ORANGE	3	3
RECLINE	YELLOW	4	4
+12V	WHITE	6	5

B-18 SOLENOID UNIT (6)



FUNCTION	COLOR	A	B
BASE UP		1&2	
BASE DOWN		3&4	
BACK RAISE		5&6	
BACK RECLINE		7&8	
ROLL-OUT		9&10	
ROLL-IN		11&12	

VOLTAGE CHECK PROCEDURES FOR TROUBLESHOOTING

A) INCOMING LINE VOLTAGE CHECK TO RELAY BOX.

Remove 2-wire connector from fuse at relay box and using an AC voltmeter, check incoming voltage from this line (should be 110-115 VAC).

B) HIGH VOLTAGE CHECK FROM RELAY BOX TO TRANSFORMER.

Using an AC voltmeter, check voltage to transformer at relay box by removing 4-wire transformer connector and measuring voltage across terminals #1 & #2 (should be 110-115 VAC).

C) LOW VOLTAGE CHECK FROM TRANSFORMER TO RELAY BOX.

Disconnect the 4-wire transformer connector at the relay box and insert jumper wires from terminals #1 & #2 to supply power to transformer. Using an AC voltmeter, check low voltage across terminals #3 & #4 coming from the transformer (should be 12-15 VAC).

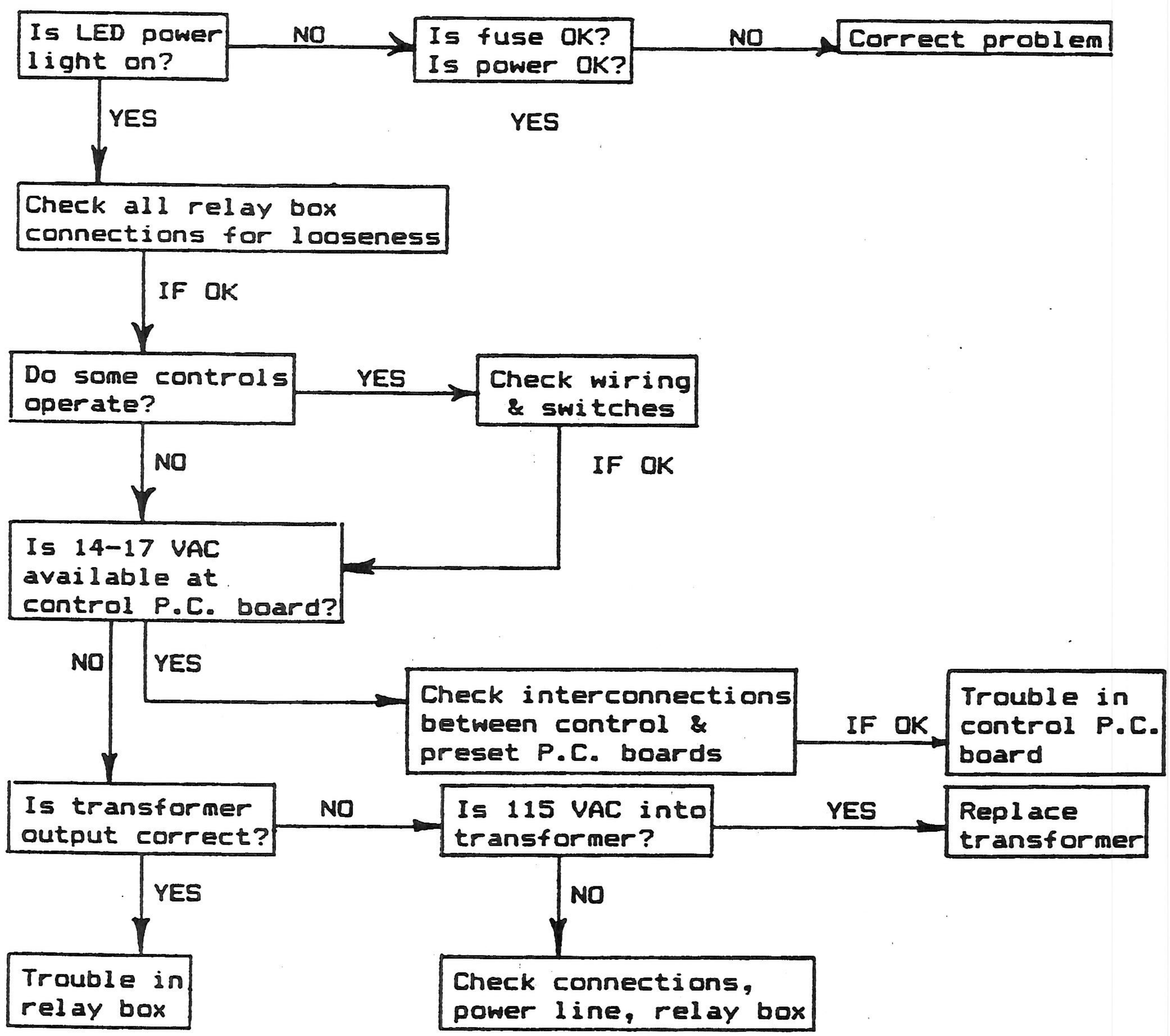
D) LOW VOLTAGE CHECK FROM TRANSFORMER TO CONTROL P.C. BOARD

Disconnect the 2-wire connector supplying power to the control P.C. board and using an AC voltmeter measure incoming voltage across terminals #1 & #2 (should be 14-17 VAC).

E) LOW VOLTAGE CHECK FROM CONTROL P.C. BOARD TO PRESET P.C. BOARD

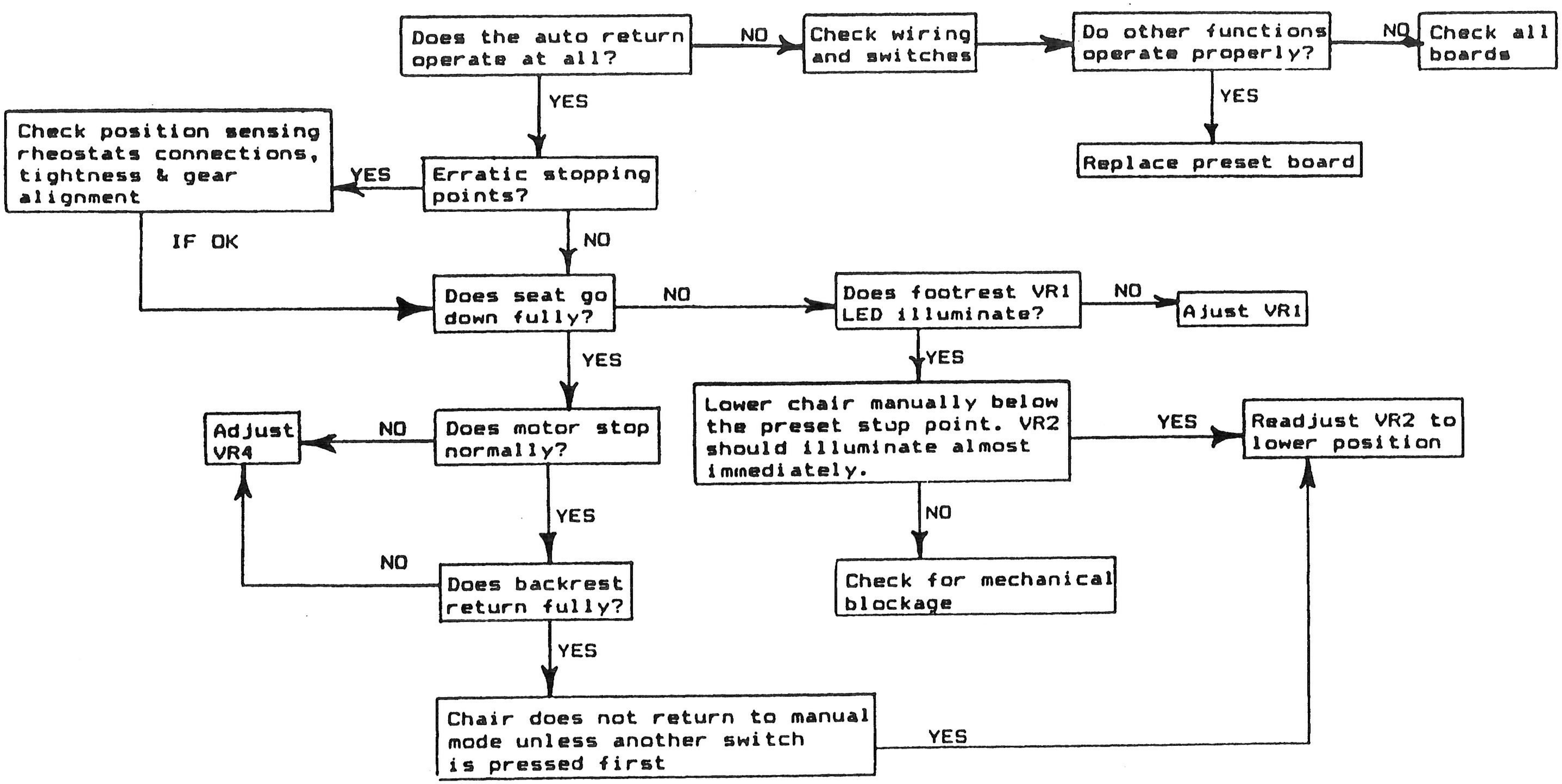
The preset P.C. board must be removed from it's mounted position to allow removal of interconnecting wire harnesses. There are two harnesses (one 8-wire & one 12-wire). After removal, incoming voltage can be measured using a DC voltmeter and measuring across terminals #1 (POSITIVE) & #8 (GRD) of the 8-wire connector (should be 12.6 VDC).

NO MOVEMENT OF CHAIR

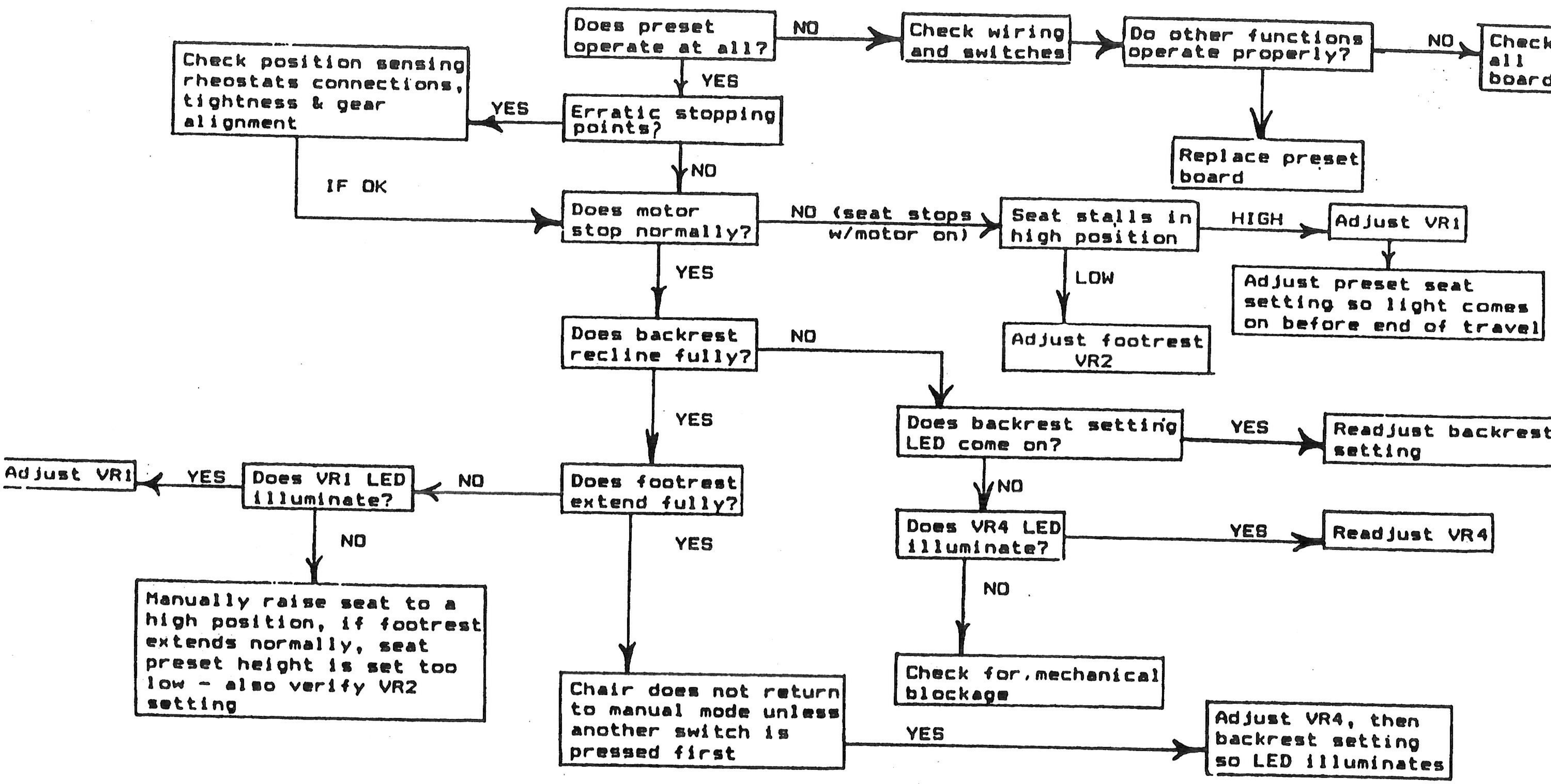


037/039 TROUBLESHOOTING

AUTO RETURN PROBLEMS

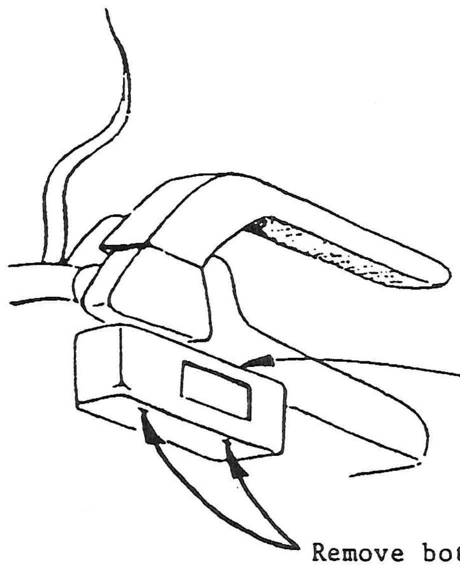


PRESET PROBLEMS



Limit Control Adjustments

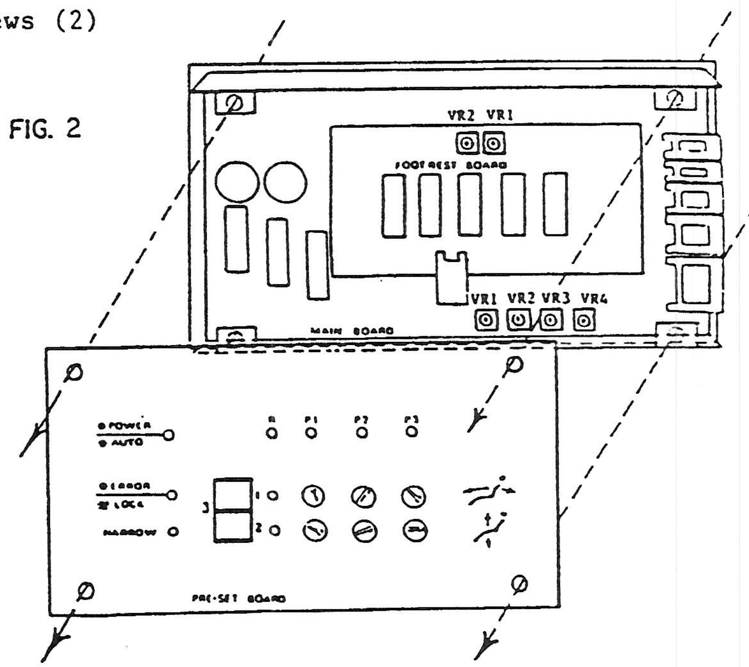
FIG. 1



Remove top screw holding side cover.

Remove bottom screws (2) on side cover.

FIG. 2



VR1	BASE SECTION UP
VR2	BASE SECTION DOWN
VR3	BACKREST UP
VR4	BACKREST DOWN
VR1	LEGREST RETRACT
VR2	LEGREST EXTEND

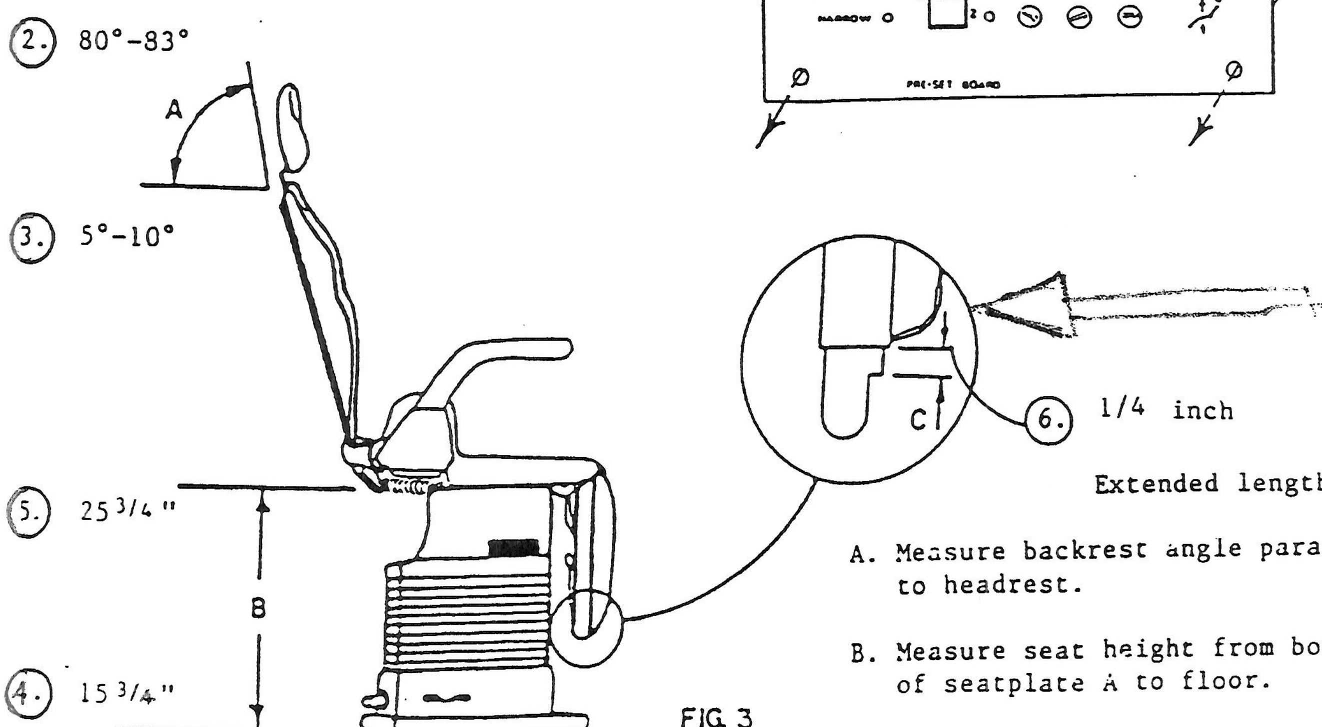


FIG. 3

Extended length 9 inches

A. Measure backrest angle parallel to headrest.

B. Measure seat height from bottom of seatplate A to floor.

C. Measure points for extension of footrest.

LIMIT CONTROL ADJUSTMENTS

Limit settings on the Belmont 037 and 039 chairs are integral with the motion control system. There are no separate mechanical or mercury limit switches. All adjustments to limit settings are accomplished on the main and footrest control boards.

IMPORTANT NOTE: Whenever the chair does not seem to behave properly, go through the following steps IN SEQUENCE before attempting to replace circuit boards etc. Misadjustments in these settings can have somewhat unexpected effects on chair performance.

1) Remove the circuit board cover on the right hand side of the chair. Carefully remove the outer (preset board) assembly for access to the 6 miniature variable resistors (VR), two on the footrest control board and four on the main control board.

2) Raise the backrest to an angle of 80 to 83 degrees (dimension A) and adjust VR3 until the corresponding LED (light) just illuminates. This indicates that the limit is activated at that position.

3) Recline the backrest to an angle of 5 to 10 degrees and adjust VR4 similarly.

4) Activate auto-return then base down to get the chair base to height of 15 3/4 inches (dimension B). Set VR2

5) Raise base to height of 25 3/4 inches and adjust VR1

NOTE: After changing the setting, cycle the chair again to confirm that function stops at correct point.

6) Activate auto-return. Check measurement C(1/4") to confirm that the foot rest retracts to the correct position AND that the LED turns on at this point. Adjust VR1 on the FOOTREST CONTROL BOARD to this setting.

7) Activate a preset function. Confirm that the extension is as specified and the LED illuminates 9". Adjust VR2 on the footrest control board as necessary.

9

NOTE: After each change of the footrest settings, cycle the chair through a preset and auto-return cycle to recheck the settings.

PROCEDURES FOR SERVICING MAJOR COMPONENTS

1.) REMOVING/REPLACING MOTOR PUMP ASSEMBLY

PROTECT FLOOR FROM POSSIBLE OIL SPILLAGE

A. Raise chair base to highest position, UNPLUG POWER SUPPLY.
B. Disengage bellows by unhooking from plastic housing around seat plate. Remove pump covers - Loosen 4 phillips screws on front, and back, and unscrew foot switch pedals.
C. Remove 1 M6 phillips screw securing front portion of motor clamp to base, bend clamp out-of-way.
D. Disconnect power supply to motor by disconnecting 3-wire connector.
E. Loosen 10mm wire clamp and disconnect low pressure hose. NOTE: Secure hose end higher than reservoir to avoid spillage.
F. Extract U-pin from mini-hose connector and disconnect high pressure hose.
G. Remove brass fittings from motor pump and re-use these fittings on new motor.

Install motor in reverse order.

2.) REMOVING/REPLACING OIL RESERVOIR

PROTECT FLOOR FROM POSSIBLE OIL SPILLAGE

A. Raise chair base to highest position and raise backrest to full upright position, UNPLUG POWER SUPPLY.
B. Lower bellows. (procedure 1-B)
C. Remove M26 hex nut securing reservoir to mounting bracket.
D. Remove M8 phillips screw securing mounting bracket to chair base. Position bracket onto replacement reservoir and attach with M26 nut.
E. Angling reservoir so oil is away from 10mm hose, remove hose and attach to replacement reservoir.
F. Using a small, thin screwdriver, remove breather from replacement reservoir and drain remaining oil from old reservoir into replacement. Replace filter.
G. Remove 2 5mm hoses from old reservoir and secure to replacement.
H. Attach reservoir mounting bracket to chair base.
I. Inspect hydraulic system to insure there is sufficient oil for chair operations. (procedure 3)

3.) REMOVING FOOT PEDALS

A. Peel back rubber grip edge to expose jam nut.
B. Loosen jam nut and unscrew pedal assembly from switch.

4.) REMOVING/REPLACING RELAY BOX

A. Lower bellows. (procedure 1-B)
B. UNPLUG CHAIR POWER SUPPLY
C. Disconnect the molex connectors connecting the relay box into the chair circuitry.
D. Unscrew 2 M5 phillips screws securing the relay box onto the chair base, lift relay box from base assembly.

Installation in reverse order.

5.) RELAY BOARD CHECKOUT

A. Disconnect wire harness A04 from relay box.
B. Verify operation of relay in question by jumping between pin 12 (light blue lead attachment) and appropriate connection.

6.) REMOVING/REPLACING SOLENOID VALVE UNIT

PROTECT FLOOR FROM POSSIBLE OIL SPILLAGE

A. Lower chair to lowest position and backrest to full recline.
B. Remove pump cover. (procedure 1-B)
C. UNPLUG CHAIR POWER SUPPLY
D. Disconnect the molex connector that wires the solenoid valve unit to the relay box.
E. Label all hose connections prior to disassembly for identification when reassembling.
F. Extract U-pins securing high pressure hoses and disconnect.
G. Unscrew 2 M5 phillips screws securing solenoid mounting bracket to chair base and remove solenoid valve unit.

Installation in reverse order.

7.) REPLACING SOLENOID VALVE INTERNAL COMPONENTS

NOTE: Solenoid coils can be replaced without danger of oil spillage.

A. TO REPLACE ONLY THE COIL:Unscrew M5 hex screw securing solenoid cap to stem and remove cap, coil, and coil retaining washer.

B. Remove the coil from the cap, cut the twopower leads to the coil and remove the rubber grommet. Slip the rubber grommet onto the power leads of the new coil and insert the coil into the cap. Splice the power leads onto the leads from the relay box.

PROTECT FLOOR FROM POSSIBLE OIL SPILLAGE

A. Remove solenoid valve unit. (procedures 6A - G)

B. To replace the stem, spring, plunger & "O"-ring: (a 17mm spanner wrench is required), Remove the solenoid cap as described in procedure 7B. Using the spanner wrench unscrew stem from valve base and remove the spring, plunger and "O"-ring.

8.) REPLACING INTERCONNECTING NIPPLES, "O"-RINGS, SPRINGS, NYLON NEEDLE VALVES & PRESSURE PLATES ON THE SOLENOID VALVE UNIT

PROTECT FLOOR FROM POSSIBLE OIL SPILLAGE

NOTE: The following procedure is for an 037 chair with 6 valves. Procedure for an 039 chair is similiar with the addition of 4 valves. (#1-#5 and #6-#10).

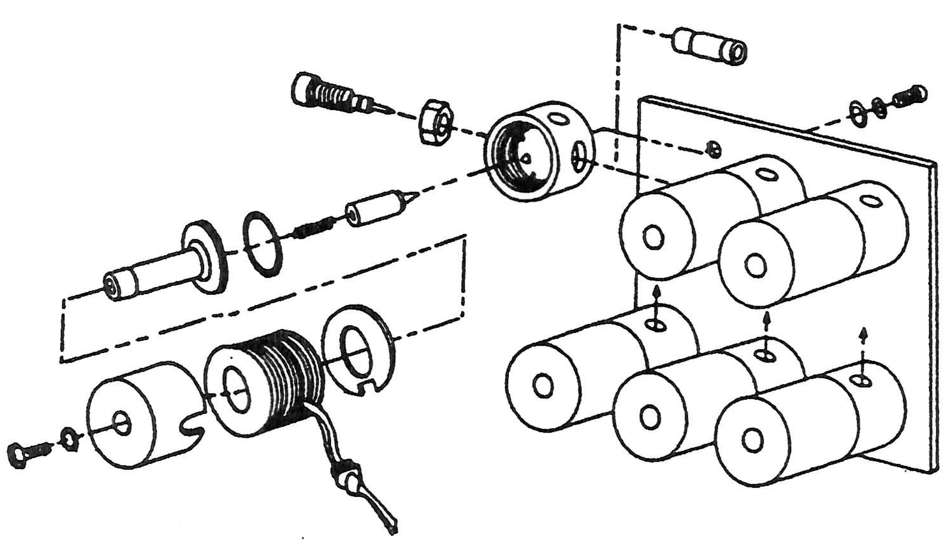
A. Remove the solenoid valve unit from the chair base as described in procedures 6A - G.

B. Unscrew the M3 phillips screws securing valves #4 - #6 to the mounting plate.

C. Holding valves #4 - #6 as a single assembly, pull the valves away from valves #1 - #3.

D. Remove nipples from solenoid valves and disassemble "O"-rings, springs, nylon needle valves and pressure plates.

E. To facilitate reassembly: Place "O"-rings onto nipples and insert nipples into solenoid valves #1 - #3. Arrange the nylon needle valves, springs, and pressure plates into the nipples. Holding valves #4 - #6 as a single unit, simultaneously insert valves onto nipples.



9.) BLEEDING THE HYDRAULIC SYSTEM

Air trapped in hydraulic system can cause excessive noise and erratic performance including sponginess and jumpy motion. To purge system of air, proceed as follows.

A. Raise base to maximum height with seatback fully forward. Confirm that there is still about 1" of oil in the reservoir. Add oil if necessary.

B. Remove seat cushion. Loosen bleed valve on backrest cylinder slightly with 4 mm hex key. Slowly push backrest (by hand) to the recline position while watching the bleed screw. When no more bubbles are coming out (just oil) then air is removed from this cylinder. Securely retighten valve.

NOTE: Some oil spillage can occur during this operation.

C. Cycle the chair through about 10 complete cycles. If excessive noise persists at this point, the motor pump is likely defective.

10.) REPLACEMENT OF BACKREST POSITIONING RHEOSTAT

(See Backrest Recline Assy. Exploded View for location of rheostat)

A. Raise chair base to highest position and UNPLUG POWER SUPPLY.
B. Remove slip-tie securing rheostat wiring in position.
C. Unsolder wires from rheostat tabs.
D. Remove 2 M6 phillips screws securing the rheostat mounting bracket to flange.
E. Loosen set screw securing drive gear to rheostat shaft and remove gear.
F. Unscrew locking nut on the rheostat shaft and remove rheostat from bracket.
G. Rewire replacement rheostat per wiring diagram.
H. Reset limit control adjustment.(for procedure refer to pg.32)

NOTE: After the replacement rheostat has been installed, adjustment of the pinion gears is required to insure proper operation of the preset mode. To adjust, follow procedure #11.

11.) ADJUSTMENT OF THE BACKREST PRESET POSITIONING RHEOSTAT

(See Backrest Recline Assy. Exploded View for location of rheostat)

NOTE: Normally, rheostats do not need adjustment as they are preset at the factory. Adjusting is necessary only after a major disassembly or if the rheostat needs to be replaced.

A. Raise chair base and backrest to highest position.
B. Rotate any backrest preset adjustment screw fully counter clockwise to its allowable limit. (located on side indicator panel)
C. Using a 2.5mm allen key, loosen the set screw securing the rheostat drive gear.
D. Rotate the drive gear, either left or right, until the positioning indicator lamp is illuminated.
E. Tighten the allen set screw securing the drive gear.
F. Reset limit control adjustment.(for procedure refer to pg.32)

12.) REPLACEMENT OF THE BASE HEIGHT RHEOSTAT

(See Base Section Exploded View for location of rheostat)

A. Raise chair base to highest position and UNPLUG POWER SUPPLY.
B. Remove the front flange cover.
C. Remove slip-tie securing rheostat wiring in position.
D. Remove 2 M5 phillips screws securing the rheostat mounting bracket to flange and lower the rheostat.
E. Unsolder wires from rheostat tabs.
F. Loosen set screw securing drive gear to rheostat shaft and remove gear.
G. Unscrew locking nut on the rheostat shaft and remove rheostat from bracket.
H. Rewire replacement rheostat per wiring diagram.

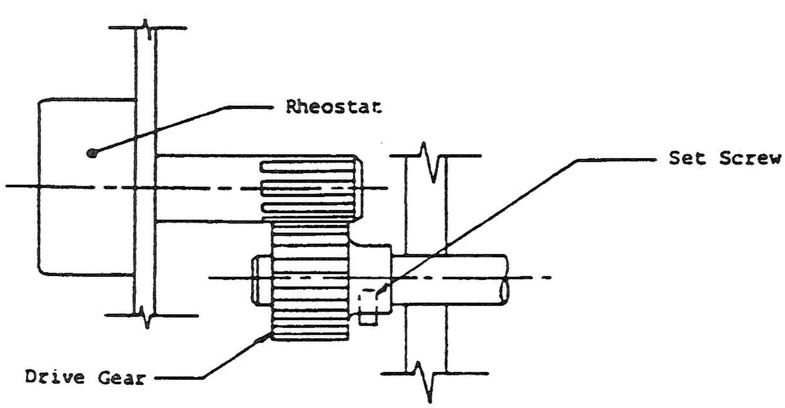
NOTE: After the replacement rheostat has been installed, adjustment of the pinion gears is required to insure proper operation of the preset mode. To adjust, follow procedure #13.

13.) ADJUSTMENT OF THE BASE HEIGHT RHEOSTAT

(See Base Section Exploded View for location of rheostat)

NOTE: Normally, rheostats do not need adjustment as they are preset at the factory. Adjusting is necessary only after a major disassembly or if the rheostat needs to be replaced.

A. Raise chair base and backrest to highest position.
B. Rotate the base height preset adjustment screw fully counter clockwise to its allowable limit. (located on side indicator panel)
C. Using a 2.5mm allen key, loosen the set screw securing the rheostat drive gear.
D. Rotate the drive gear, either left or right, until the positioning indicator lamp is illuminated.
E. Tighten the allen set screw securing the drive gear.



14.) REPLACEMENT OF THE LEGREST POSITIONING RHEOSTAT

(See Legrest Assy. Exploded View for location of rheostat)

A. Raise chair base to highest position and UNPLUG POWER SUPPLY.
B. Remove slip-tie securing rheostat wiring in position.
C. Unsolder wires from rheostat tabs.
D. Lift up seat cushion and remove 2 M6 phillips screws securing the rheostat mounting bracket to seat plate.
E. Loosen set screw securing drive gear to rheostat shaft and remove gear.
F. Unscrew locking nut on the rheostat shaft and remove rheostat from bracket.
G. Rewire replacement rheostat per wiring diagram.
H. Reset limit control adjustment. (for procedure refer to pg.32)

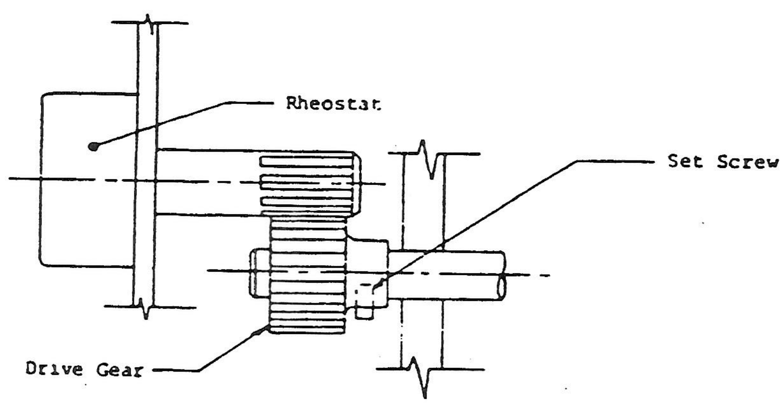
NOTE: After the replacement rheostat has been installed, adjustment of the pinion gears is required to insure proper operation of the preset mode. To adjust, follow procedure #15.

15.) ADJUSTMENT OF THE LEGREST POSITIONING RHEOSTAT

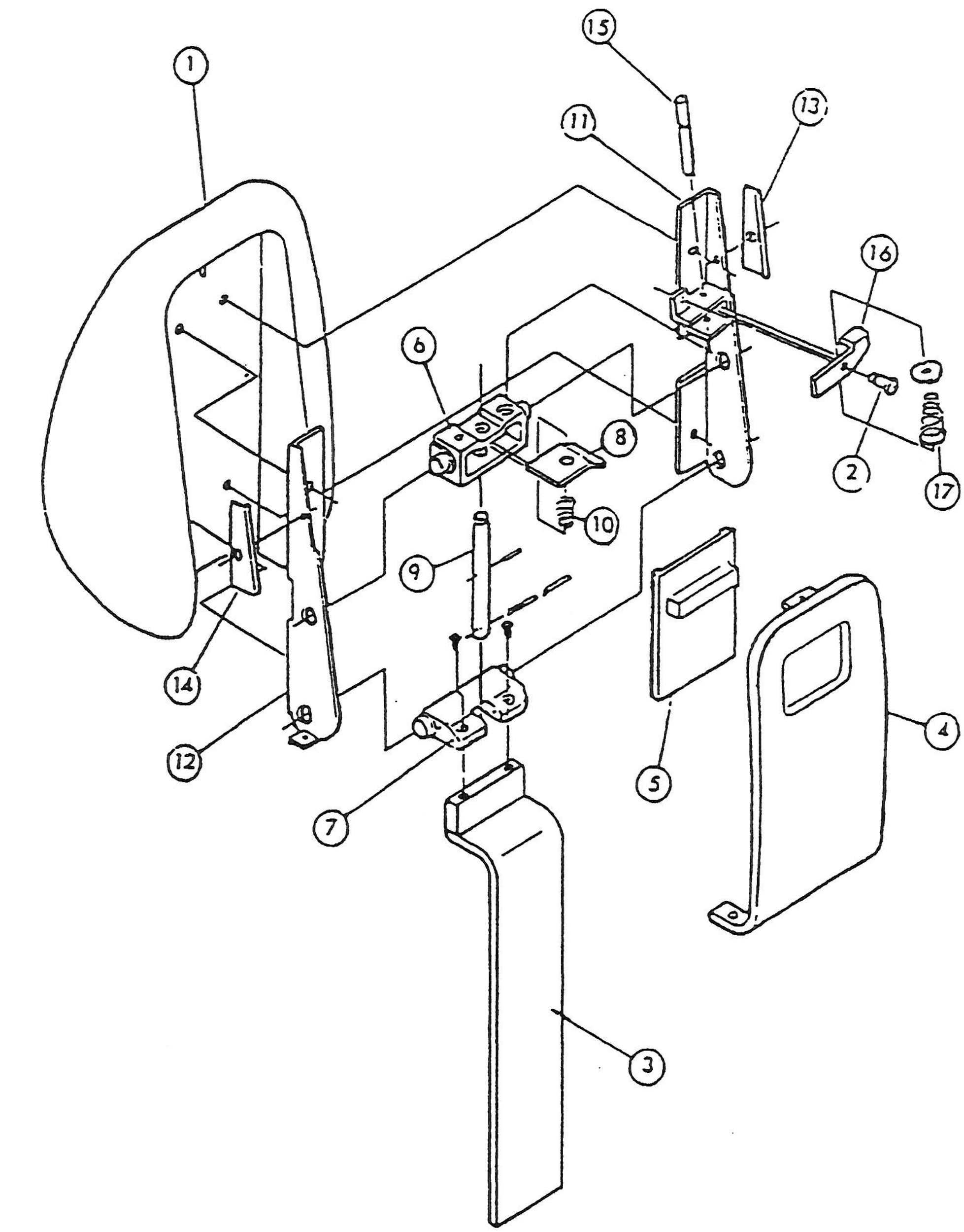
(See Legrest Assy. Exploded View for location of rheostat)

NOTE: Normally, rheostats do not need adjustment as they are preset at the factory. Adjusting is necessary only after a major disassembly or if the rheostat needs to be replaced.

A. Raise chair base and backrest to highest position with legrest extended.
B. Remove the circuit board cover to gain access to the preset P.C. board and turn VR5 adjuster approx. 3/4 range clockwise.
C. Using a 2.5mm allen key, loosen the set screw securing the rheostat drive gear.
D. Rotate the drive gear, either left or right, until the VR5 indicator lamp is illuminated.
E. Tighten the allen set screw securing the drive gear.
F. Reset limit control adjustment. (for procedure refer to pg.32)

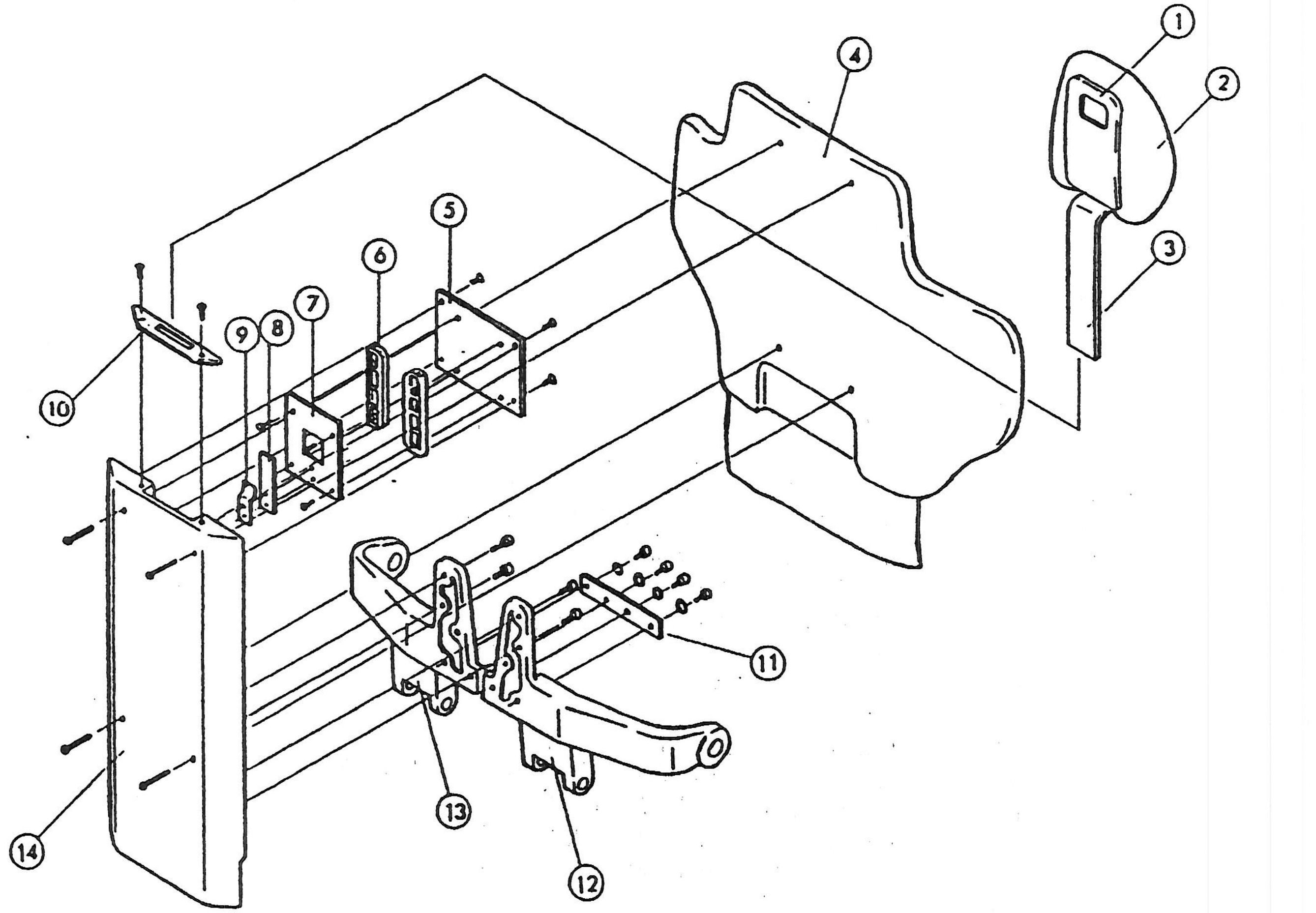


ARTICULATING HEADREST ASSEMBLY EXPLODED VIEW -(037)



BL7-30000A ARTICULATING HEADREST ASSEMBLY 037

INDEX NO.	PARTS NO.	DESCRIPTION	QTY.
1	BL7-20130	HEADREST CUSHION	1
2	037-40370	SCREW	2
3	BL7-20160	HEADREST BAR	1
4	BL7-20150	HEADREST COVER [ART TYPE]	1
5	BL-20151	SLIDE PLATE	1
6	523-30042	HEADREST ADJUSTMENT CASTING	1
7	037-40400	HEADREST MECHANISM CASTING	1
8	523-30044	LOCK PLATE	1
9	523-30045	LOCK SHAFT	1
10	037-40410	SPRING	1
11	523-30047	HEADREST MOUNT BRACKET (RIGHT)	1
12	523-30048	HEADREST MOUNT BRACKET (LEFT)	1
13	523-30049	SLIDE PLATE BRACKET (LEFT)	1
14	523-30050	SLIDE PLATE BRACKET (RIGHT)	1
15	037-40420	PIN	2
16	037-40430	RELEASE LEVER	2



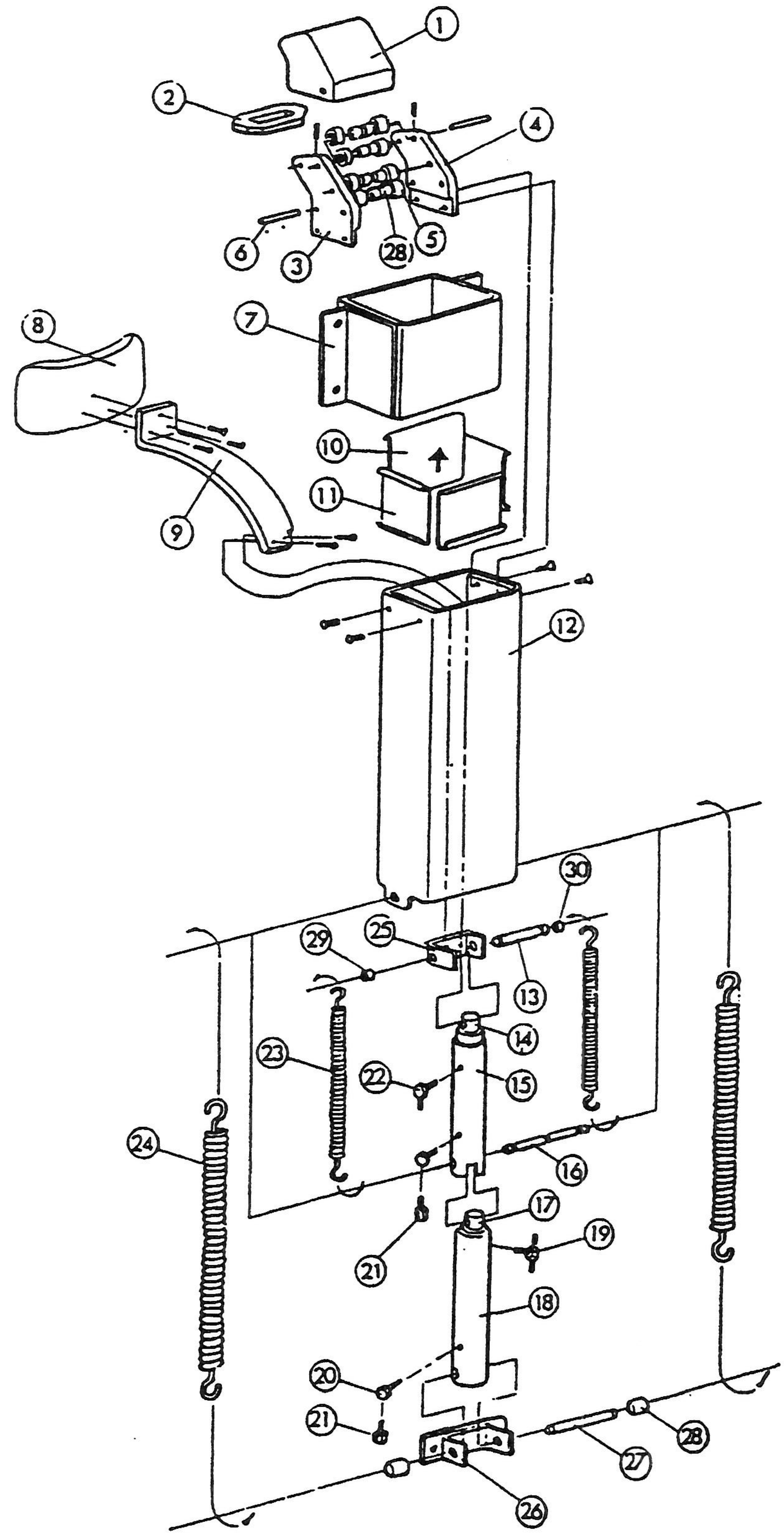
037 BACKREST ASSEMBLY

Index No.	Part No.	Description	Quantity
1	BL7-20150S	HEADREST COVER [NOT SHOWN] (SEE HEADREST DETAIL VIEW FOR INTERNAL COMPONENTS OF OPTIONAL 037 ARTICULATING HEADREST)	1
2	BL7-20130	HEADREST CUSHION	1
3	BL7-20160	HEADREST BAR	1
4	037-40010	BACKREST (UPHOLSTERED)	1
5	037-20100	HEADREST BAR BRACKET	1
6	BL7-20040	HEADREST BAR GUIDE (PLASTIC)	1
7	BL7-20060	HEADREST BAR BACK PLATE	1
8	BL7-20070	HEADREST BAR ADJUSTING BOARD	1
9	BL7-20080	HEADREST BAR ADJUSTING SPRING	1
10	037-40020	HEADREST BAR TRIM PLATE	1
11	037-40030	BRACKET	1
12	037-40040	BACKREST SUPPORT (RIGHT)	1
13	037-40050	BACKREST SUPPORT (LEFT)	1
14	037-40060	BACKREST COVER	1

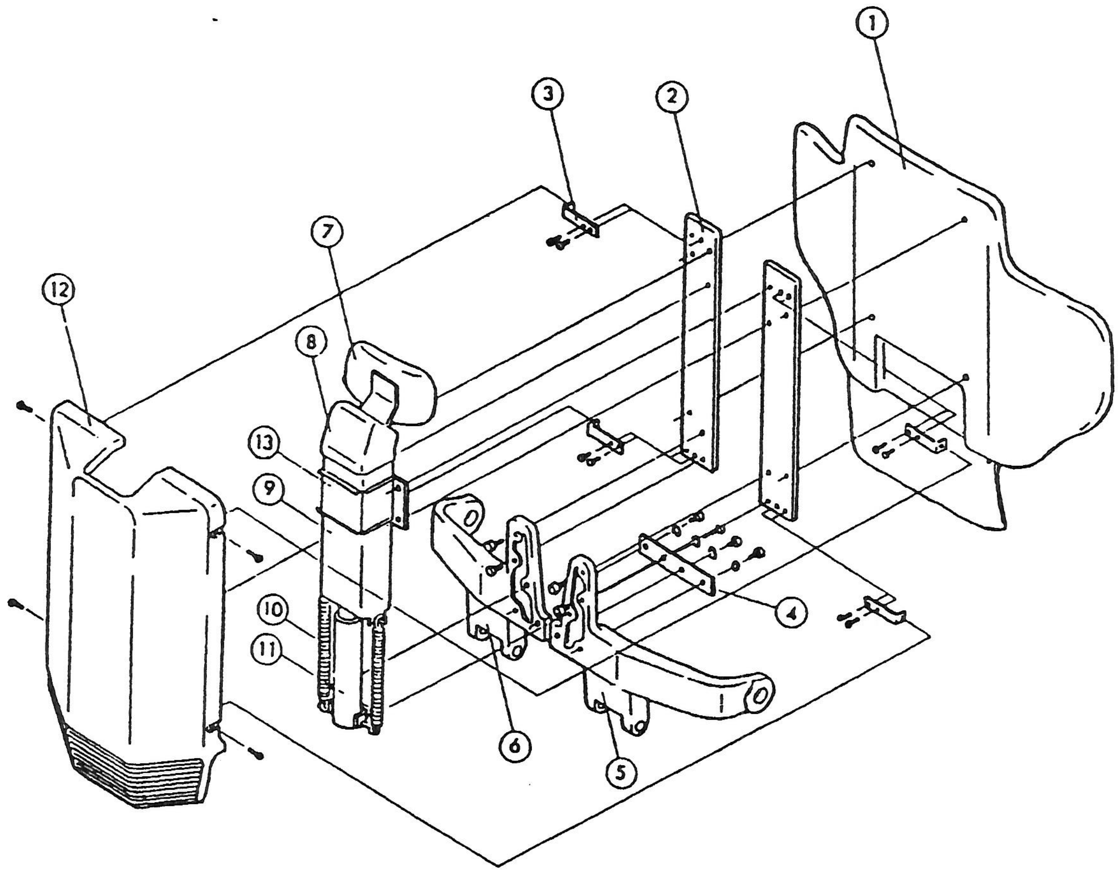
POWER HEADREST ASSEMBLY 039

INDEX NO.	PARTS NO.	DESCRIPTION	QTY.
1	090-41100	HEADREST EXTENSION BAR COVER	1
	090-41101	HEADREST BEARING ASSEMBLY	1
2	090-50100	HEADREST BAR GUIDE RUBBER	1
3	090-50200	HEADREST SUPPORTING PLATE (LEFT)	1
4	090-50300	HEADREST SUPPORTING PLATE (RIGHT)	1
5	090-52400	NEEDLE BEARING FJ69	
6	090-50500	HEADREST BEARING SHAFT	2
7	090-41200	HEADREST EXTENSION BAR GUIDE A	1
8	090-41000	HEADREST CUSION (SPECIFY COLOR)	1
9	090-50600	HEADREST BAR	1
10	090-50700	SLIDING PLATE (LARGE)	2
11	090-50800	SLIDING PLATE (SMALL)	2
12	090-41300	HEADREST EXTENSION BAR GUIDE B	1
13	090-50900	HEADREST ROD PIN (SMALL)	1
15	090-51100	CYLINDER + FITTINGS (COMPLETE)	1
16	090-51200	HEADREST ROD PIN (LARGE)	1
17	090-51300	HEADREST RAM	1
18	090-41500	HEADREST EXTENSION & FITTINGS (COMPLETE)	1
19	090-51400	NIPPLE FOR HEADREST CYLINDER	1
20	090-51500	CONNECTOR FOR HEADREST	2
21	090-51600	MINI-HOSE CONNECTOR F	2
22	090-51700	NIPPLE	1
23	090-51800	HEADREST ANGLE CONTROL SPRING	2
24	039-40060	HEADREST RETRACTION SPRING	2
25	090-52000	BRACKET A FOR HEADREST CYLINDER	1
26	090-52100	BRACKET B FOR HEADREST CYLINDER	1
27	090-52200	HEADREST ROD PIN (LONG)	1
28	090-52300	SPACER ISL.	16

POWER HEADREST ASSEMBLY EXPLODED VIEW -(039)



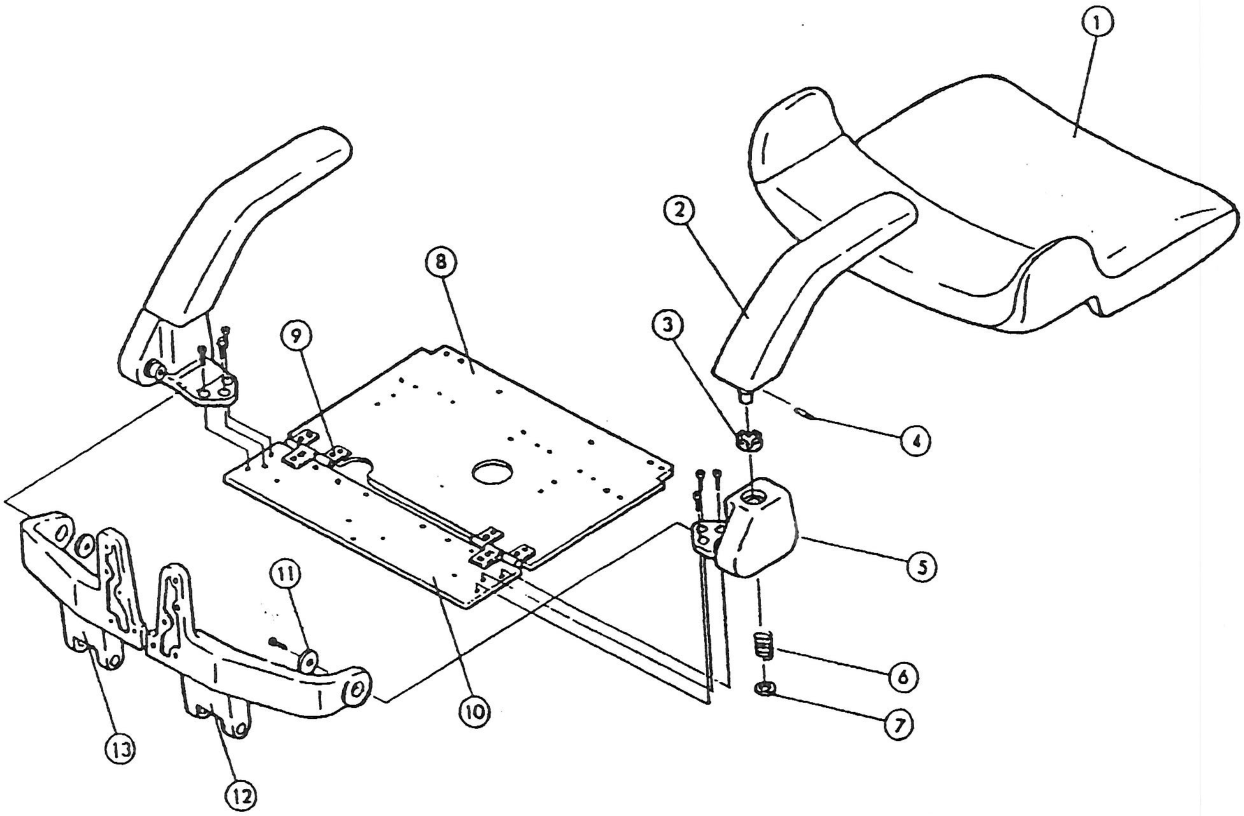
BACKREST ASSEMBLY EXPLODED VIEW -(039)



039 BACKREST ASSEMBLY

Index No.	Part No.	Description	QUANTITY
1	039-40010	BACKREST (UPHOLSTERED)	1
2	039-40020	BACKREST SUPPORT PLATE	2
3	039-40030	BACKREST COVER BRACKET	2
4	037-40030	BRACKET	1
5	037-40040	BACKREST SUPPORT (RIGHT)	1
6	037-40050	BACKREST SUPPORT (LEFT)	1
7	090-41000	HEADREST CUSHION (SPEC. COLOR)	1
8	090-41100	HEADREST EXTENSION BAR COVER	1
9	090-41300	HEADREST EXTENSION BAR GUIDE	1
10	039-40060	HEADREST RETRACTION SPRING	2
11	090-41500	HEADREST EXTENSION + FITTINGS	1
12	090-40070	BACKREST COVER	1
13	090-41200	HEADREST EXTENSION BAR GUIDE A	1

ARMREST & SEAT ASSEMBLY EXPLODED VIEW



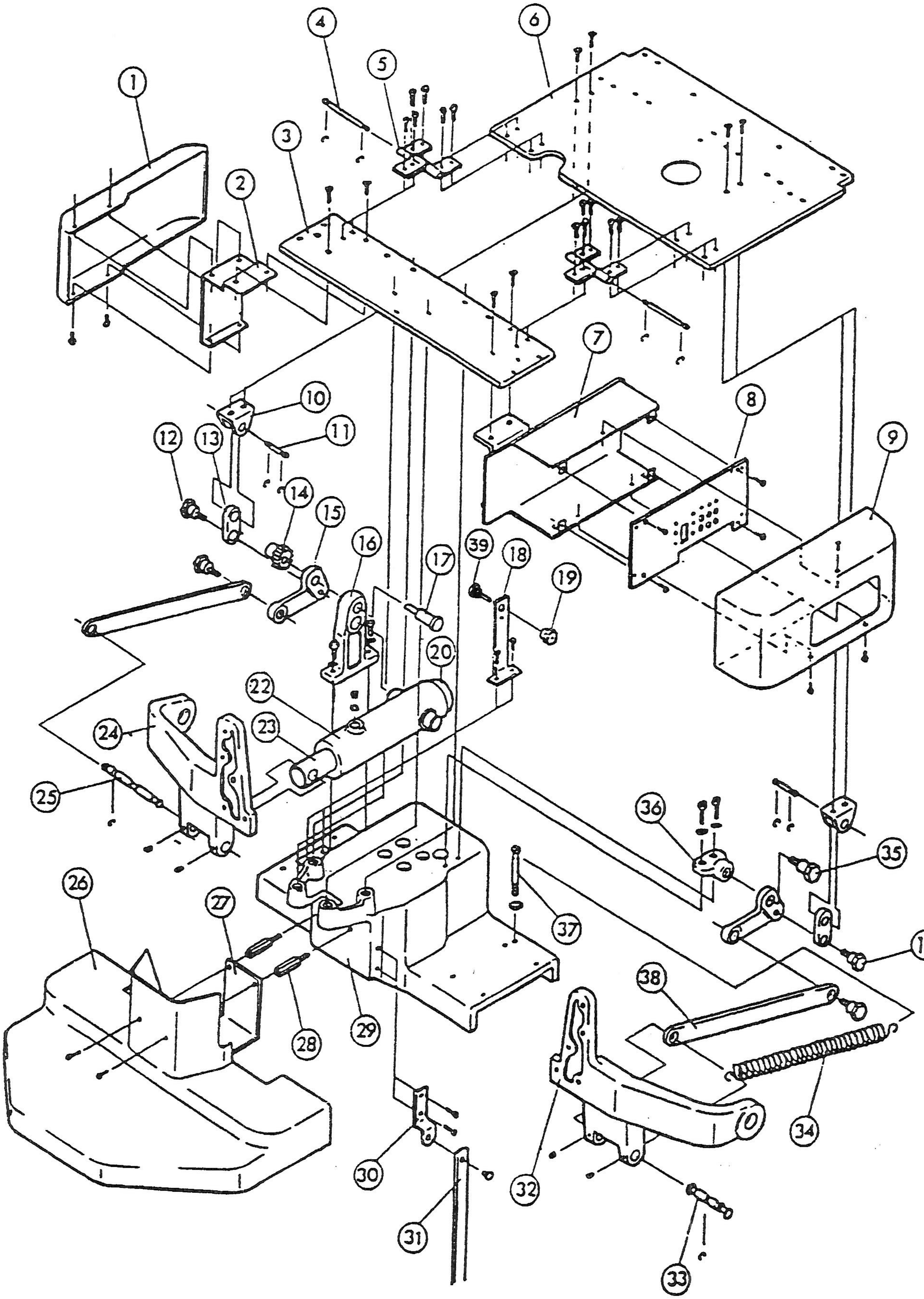
ARMREST + SEAT ASSEMBLY

INDEX NO.	PARTS NO.	DESCRIPTION	QTY.
1	037-30020	SEAT	1
2	BL7-30010	ARMREST	2
3	BL7-30030	CAM FOR ARMREST	2
4	BL7-30020	GROOVED PIN	2
5	037-30030	ARMREST BRACKET RIGHT	1
5	037-30040	ARMREST BRACKET LEFT	1
6	BL7-30040	ARMREST SPRING	2
7	BL7-30050	ARMREST WASHER	2
8	037-40500	SEATPLATE B	1
9	037-40490	LEGREST HINGE	6
10	037-40470	SEATPLATE A	1
11	037-30050	WASHER	2
12	037-40040	BACKREST SUPPORT RIGHT	1
13	037-40050	BACKREST SUPPORT LEFT	1

SEATPLATE RECLINE ASSEMBLY

Index No.	Part No.	Description	Quantity
1	037-40450	SIDE COVER	1
2	037-40460	SIDE COVER BRACKET	1
3	037-40470	SEAT PLATE--A	1
4	037-40480	HINGE PIN	2
5	037-40490	LEGREST HINGE	6
6	037-40500	SEAT PLATE--B	1
7	037-40070	PC BOARD HOUSING	1
8	037-40080	PRESET BOARD FACE PLATE	1
9	037-40090	PC BOARD COVER	1
10	037-40100	TILT BRACKET	2
11	037-40110	TILT PIN	2
12	036-31200	SHOULDER BOLT	4
13	037-40120	TILT LINK--B	2
14	037-40130	PINION GEAR	1
15	037-40140	TILT LINK--A	2
16	037-40150	CYLINDER BRACKET	1
17	037-40160	TILT PIN	1
18	037-40170	RHEOSTAT BRACKET	1
19	037-40180	PINION GEAR	1
20	037-40190	RECLINE CYLINDER(BODY)	
22	037-40200	RECLINE CYLINDER COMPLETE	1
23	037-40210	RECLINE CYLINDER PISTON	
24	037-40050	BACKREST SUPPORT (LEFT)	1
25	037-40240	PIN	1
26	037-10480	SEAT PLATE COVER (REAR)	1
27	037-40250	BRACKET (SEAT PLATE COVER)	1
28	037-40260	EXTENSION	2
29	037-40270	DOME CASTING	1
30	037-40280	LINK BRACKET	1
31	037-40290	HOSE LINK (UPPER)	1
32	037-40040	BACKREST SUPPORT (RIGHT)	1
33	037-40310	LINK PIN	1
34	037-40320	RECLINE SPRING	1
35	037-40330	LINK PIN	1
36	037-40340	TILT LINK BRACKET	1
37	037-40350	SPRING RETAINER	1
38	037-40360	LINK	1
39	SP6-E1001	RHEOSTAT(RECLINE)	1

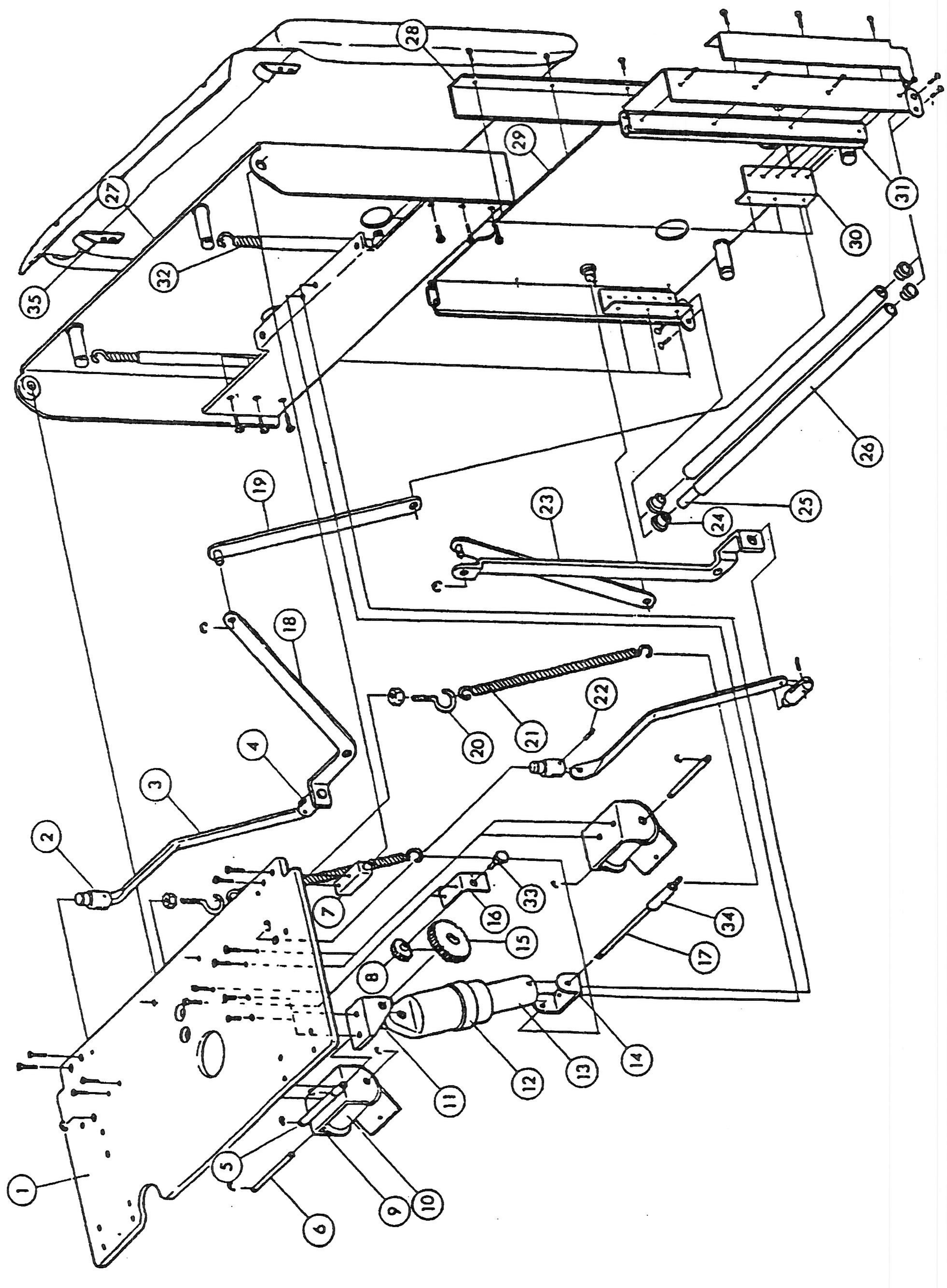
Seat Plate Recline Assembly Exploded View



LEGREST ASSEMBLY PARTS LIST

Index No.	Part No.	Description	Quantity
1	037-40500	Seat Plate-B	1
2	037-20201	Legrest Shaft-A	2
3	037-20300	Connecting Bar	2
4	037-20202	Legrest Shaft-B	2
5	037-20400	Legrest Cylinder Pin	1
6	037-20500	Constant Tension Spring Shaft	2
7	037-20600	Legrest Bracket	2
8	037-12701	Pinion Gear BA	1
9	037-20700	Constant Tension Spring Holder	2
10	037-20800	Constant Tension Spring	2
11	037-20900	Legrest Cylinder Bracket	1
12	037-21000	Legrest Cylinder Assembly	1
	037-21001	Legrest Cylinder Body	1
	037-21002	Seal Kit for Legrest Cylinder	1
13	037-21003	Legrest Cylinder Ram	1
14	037-21100	Ram Mount Bracket	1
15	037-12703	Pinion Gear-LA	1
16	037-21200	Rheostat Bracket-D	1
17	037-21300	Legrest Ram Pin	1
18	037-21401	Link-A Left	1
19	037-21500	Link-B	2
20	037-30010	Spring Hook	2
21	037-52400	Legrest Spring	2
22	037-21600	Pin for Connecting Bar	4
23	037-21402	Link-A Right	1
24	037-21700	Legrest Roller	2
25	037-21800	Legrest Bar	1
26	037-21900	Legrest Pipe	2
27	037-22000	Legrest Frame	1
28	037-22101	Legrest Frame Cover-Left	1
	037-22102	Legrest Frame Cover-Right	1
29	037-22200	Roll-Up Legrest Frame	1
30	037-22300	Bearing Bracket	2
31	037-22400	Pillar Slide	2
32	037-22500	Legrest Spring	2
33	037-E1001	Rheostat 5 Kilo Ohm	1
34	037-22600	Collar for Legrest Ram Pin	1
35	037-22700	Legrest Holder Bracket	2

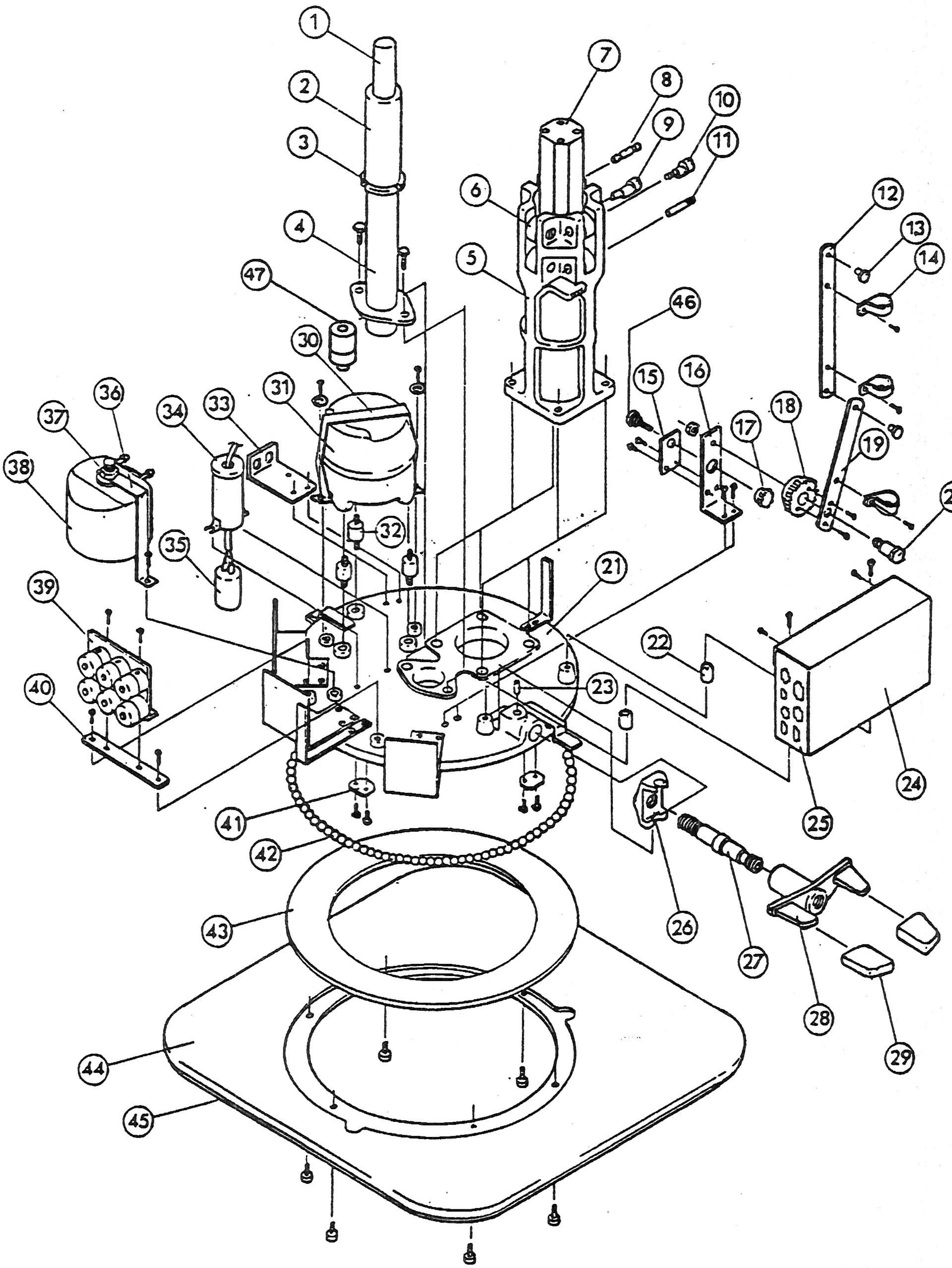
LEGREST ASSEMBLY EXPLODED VIEW



BASE SECTION PARTS LIST

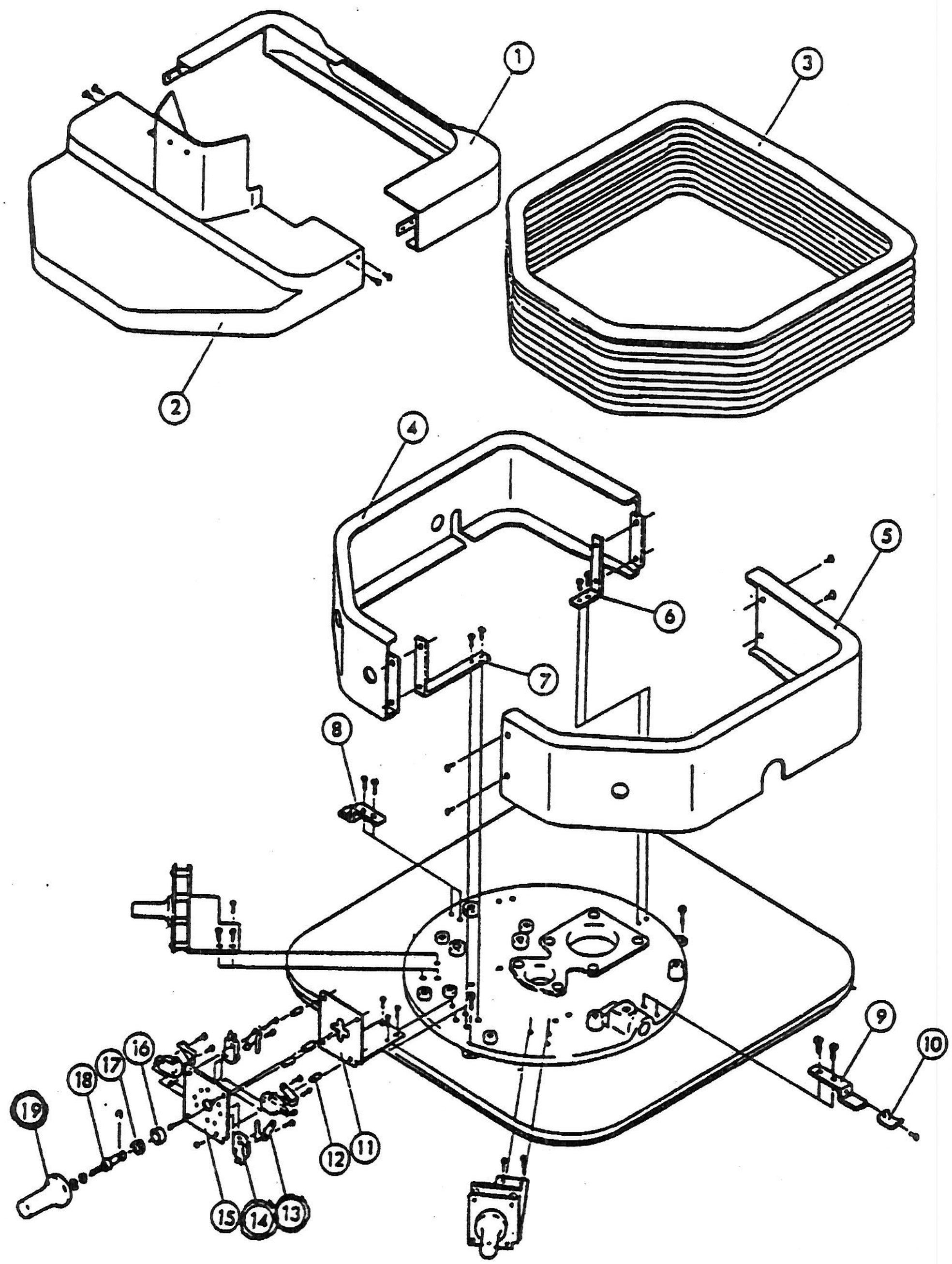
Index No.	Part No.	Description	Quantity
1	037-10010	Ram	1
2	037-10020	Cylinder Body	1
3	037-10030	Cylinder Body Adjuster Nut	1
4	037-10040	Cylinder Pipe	1
5	526-00010	Guide Cylinder	1
6	519-10023	Guide Roller	8
7	037-10050	Guide Shaft	1
8	523-10080	Guide Roller Straight Shaft	2
9	523-10100	Guide Roller Adjuster Screw	2
10	523-10090	Grooved Guide Roller Adj. Screw	2
11	535-10031	Fixed Guide Roller Shaft	2
12	037-10060	Hose Link (Upper)	1
13	037-10070	Rivet	2
14	037-10080	Clamp	3
15	037-10090	Rheostat Bracket	1
16	037-10100	Link Bracket	1
17	SP6-12701	Pinion Gear (18)	1
18	037-10110	Pinion Gear (50)	1
19	037-10120	Hose Link (Lower)	1
20	037-10130	Bolt	1
21	037-10140	Rotator	1
22	037-10150	Spacer	2
23	037-10160	Lock Pin	1
24	037-10170	Relay Box Cover	1
25	037-10180	Relay Box	1
26	090-20500	Lock Shoe	1
27	090-20400	Lock Shaft	1
28	037-10190	Swivel Lock Lever	1
29	090-20202	Swivel Lock Lever Pad	1 set
30	090-11100	Motor Band (sm.)	1
31	090-11700	Motor Pump Assembly	1
32	090-12100	Motor Mount	3
34	037-10200	Capacitor Cap	1
35	090-12700	Capacitor	1
36	037-10210	Bracket for Oil Reservoir	1
37	037-10220	Oil Tank Nut	1
38	037-10230	Oil Reservoir	1
39	037-10240	037 Solenoid Valve Unit Assy.	1 set
	037-10240	(037 shown)	
	039-10240	039 Solenoid Valve Unit Assy.	1 set
	090-12201	Replacement Seal Kit 037/039	
	090-12202	Replacement Coil037/039	
40	037-10290	Support Bracket	1
41	036-11200	Support Plate for Rotator	3
42	090-20700	Ball Bearing	139
43	036-10900	Rotation Ring	1
44	037-10260	Chair Base Mat	1
45	037-10280	Chair Base Plate	1
46	SP6-E1001	Rheostat 5 Kilo Ohm	1
47	090-12000	Bypass Solenoid Valve (039 only)	1

BASE SECTION EXPLODED VIEW



BASE PUMP COVER/FOOT SWITCH

Index No.	Part No.	Description	Quantity
1	037-10300	SEAT PLATE COVER (FRONT)	1
	037-10305	" " FOR LH UNIT MOUNT	
2	037-10480	SEAT PLATE COVER (REAR)	1
3	037-10310	BELLOWS	1
4	037-10320	PUMP COVER (LEFT)	1
5	037-10330	PUMP COVER (RIGHT)	1
6	037-10340	PUMP COVER BRACKET (FRONT)	1
7	037-10350	PUMP COVER BRACKET (REAR)	1
8	037-10360	PUMP COVER BRACKET (LEFT)	1
9	037-10370	ROTATION STOP	1
10	037-10380	PUMP COVER BRACKET (RIGHT)	1



037-10485 COMPLETE SWITCH ASSEMBLY (CONSISTS OF ITEMS 11-19)

11	037-10390	FOOT SWITCH BRACKET	3
12	037-10400	SPACER	12
13	037-10410	SPRING	12
14	037-10420	SWITCH	12
15	037-10430	SWITCH PLATE	3
16	037-10440	ROLLER	3
17	037-10450	COIL SPRING	3
18	037-10460	FOOT SWITCH SHAFT	3
19	037-10470	FOOT SWITCH PEDAL (RUBBER)	3