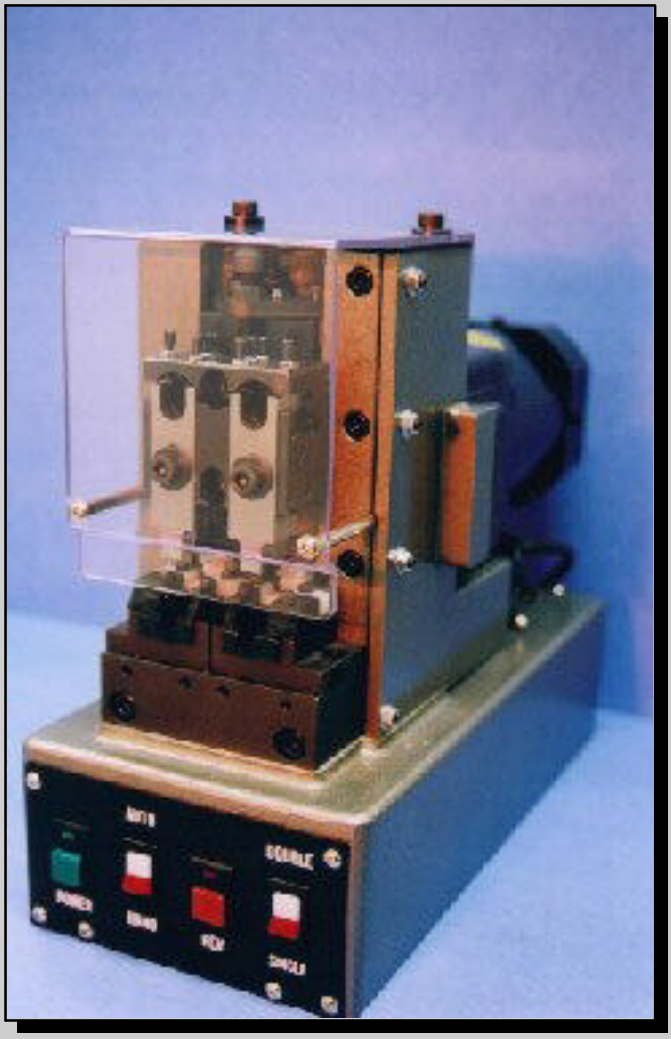
SENTINEL™

Connector Systems Inc.



SS-20 MACHINE MANUAL

Sentinel Connector Systems, Inc.
1953 Stanton Street
York, PA. 17404
(717) 843-4240
(717) 848-1949 Fax


AUTO
DOUBLE
POWER
HAND
REV
SINGLE

INTRODUCTION

Your SS-20 machine comes to you fully equipped and set up to terminate the style of plug you have requested.

Our SS-20N will accommodate those small connector configurations such as 4 position, 4 contacts (4x4); 6 position, 2 contacts (2x6); 6 position, 4 contacts (4x6); and 6 position, 6 contacts (6x6).

Our SS-20NS will accommodate both small and large connectors alike, easy changeover from one to the other.

Our SS-20 NS10 will accommodate those large jobs when the 10 position connectors are needed. This will also terminate all of the above (tooling is supplied with this).

All of the above machines are electrically powered and do not require high-pressure airlines. They are portable enough to be moved around easily and their straightforward design allows setup people to make changes in minutes.

All machines have full test capability with the cable tests performed as part of the termination procedure.

SPECIFICATIONS FOR SS-20 MODEL CRIMPING MACHINES

Crimping machine portion.

1. Usable connectors… … … … … … … Recommended Sentinel Connectors
   4x4, 2x6, 4x6, 6x6, 8x8, 10x10 & Cat 5

2. Function … … … … … … … … … … .. Crimping modular connectors onto cable.

3. Power Source … … … … … … … … .. AC 100v, 50/60Hz, 5Amp
   (Transformer is prepared for 115v or 220v)

4. Driving System … … … … … … … … Single phase induction motor with gear head

   Power consumption … … … … … 90w
   Rated current … … … … … … … .. 0.75A
   Starting current … … … … … … .. 1.9A
   Gear head reduction ratio … … 1.25

5. Electric Brake … … … … … … … … .. 3A (for 0.5 sec.)

6. Mechanical power … … … … … … .. Punch pressure 130Kg
   Punch stroke 16mm

7. Operation speed … … … … … … … . Machine cycle time … … 1.5 sec. (1.1 sec. of Crimping + 0.5 sec. of electrical check under 10 ft. cable)

8. Emergency release function … … Reversing motor by "Rev" switch

9. Fuse … … … … … … … … … … … … … 5 A

10. Size … … … … … … … … … … … … .. 5.5"(w) x 10 ¼ (h) x 13 1/8 (d)

11. Weight … … … … … … … … … … … . 15.5Kg

MANUAL FOR SS-20 PRESS

I. Set-up

A) Refer to page 7 for a pictorial view while following instructions.
B) Plug press into the transformer provided.
C) Plug cable tester into 100 volts outlet.
D) Attach cables (supplied) to press and cable tester as labeled.
E) Select proper combination of switches on press.

1) "Auto/Hand" (on press)
2) "Double/Single" (on press)
3) With a "known good cable" set-up a signature (on tester).

II. Ready to run

With the signature cable, insert into the nest(s). When the plug reaches proper depth, a micro switch in rear of nest actuates a single rotation of the press. When a single plug is required, only the left nest can be utilized.
CAUTION: When using both nests, make sure the selector switch is on double!

After ram on press has returned to top position, a solenoid located behind the nests will actuate, bringing down the testers to check continuity, shorts and correct polarity of plugs to wire. This solenoid will remain energized as long as plugs remain in the nests. Once the plug moves away from the micro switch in rear of nest, the testers will return.

III. Adjustments

A) Nests

Both nests can be individually adjusted or can be adjusted as a unit.

1) Individually – There are three cap screws that hold the nests into place and an adjusting bolt. When, for instance, only the right side is in need of movement, loosen the setscrews in the front (item #30), and make a small adjustment on the screw on the right side of machine (item #22).

2) As a unit – In order to move the unit from left to right, loosen screw (item #20), then loosen unit hold down screws found in the front (item #28) and adjust left or right as needed.
3) Nest removal – To remove nests from the machine loosen two screws that hold the nests in place (item #31) and remove 25mm cap screws (1 ea.) that fix the nests in place to holder. Remove nests and reverse this process when replacing.
4) Plug adjustment – To tighten or loosen the plug fit, use the two 20mm set-screws located on the side of nests for adjusting the spring tension of the ball bearings that hold the plugs in place.

B) Punch holder assembly

The punches can also be adjusted as a unit or individually.

To move punches as a unit, loosen the two 5mm cap screws in the front of the head (item #32), move the head up or down using the screw on top (item #24) for adjusting, and retighten screws when proper position is located.

C) Punches

1) On 4x4, 2x6, 4x6 and 6x6 presses, only blade driver and crimp punch are individually adjustable. There are small slotted screws on the top (item #5) of punch holder assembly. To make an adjustment first loosen screw (item #23) in front and the setscrew on the side of punch holder assembly (item #27). Make the desired adjustments (NOTE: one complete turn of #5 screw is equivalent to .020 or 5mm). When the movement is made, push tooling up while lightly snuggling the setscrews on the side (item #27); then tighten the screws in front (item #23).
2) No adjustment left to right is necessary for punches because the location is set by the setscrews in #1. Any adjustment required can be made by adjusting the nest (only if absolutely necessary).
3) Strip the jacket cord, trim the conductor to length, place a plug on both ends of cord and insert the plugs into the nests.
4) The motor starts to run when both plugs are inserted to the depth far enough to actuatethe micro switches located in the innermost of the nests. When actuated, the ram with tooling moves downward to crimp the contacts, latch and conductor bar. NOTE: The machine will not actuate (when double switch is selected) unless both plugs are properly seated and both micro switches are made.
5) When a cycle is made the test fingers will come down and test for shorts, continuity and miswires. If the product is ok and meets the desired signature, the tester will display a “good reading”.

6) If there is a short or other problem, a tone will be heard and "error" will be displayed on the screen. Test fingers will stay down, touching the contacts, until at least one of the plugs has been removed from the nest, deactivating the micro switch.
7) If for some reason the ram does not return to its original position after crimping, turn the switch (labeled rev) on to return the ram manually. When ram is at the top, turn rev switch off before

TERMINATION INSTRUCTIONS

These instructions are intended for use with the SS-20 in conjunction with Sentinel Connectors modular plugs.

This product comes to you in single assemblies with contacts pre-inserted. Please refer to product manual for details on determining which of Sentinel's plugs will work the best for your application. Any further help may be obtained by contacting Sentinel direct and obtaining the proper guides.

Once you have determined which combination is best suited, strip the cable back far enough to allow the individual conductors to be inserted into the plug while also maintaining the outer jacket positioned under the jacket lock on the plug. Position the conductors, as desired, and insert them into the plug, making sure the conductors, as desired, and insert them into the plug, making sure the conductors are securely positioned against the front of the plastic, to ensure the contacts penetrate properly.

After preparing cables with connectors, you are ready for termination. If only one plug is required to be terminated, switch machine to single. If both are desired, switch the button to double. This will allow you to properly align both connectors before the ram cycles down. After the ram completes the cycle, (keeping the plugs positioned in the nests) the test leads will come down, testing for continuity, shorts and opens. If the tested cable is defective, the tester will indicate exactly what the defect is. For further instructions on the tester, refer to the tester manual provided.

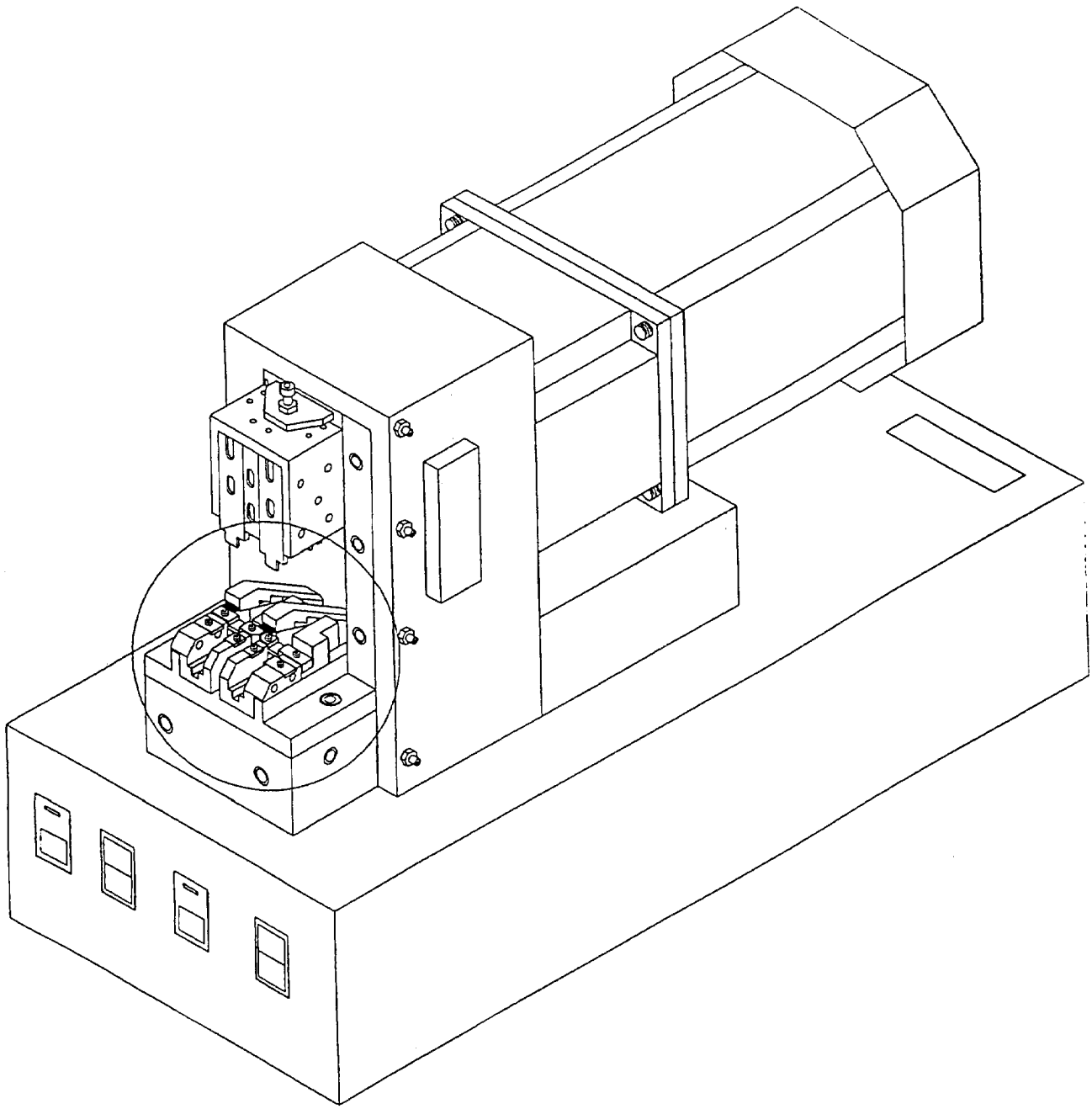
Once the cable is completed, a contact height check is necessary to maintain compliance with FCC, which is .237 +/- .005 from the bottom of the plug base (not including the tab) to the top of the contacts. This is roughly .023 from the top of the plug to the contacts at a nominal tolerance.

The tooling can be replaced relatively simply and quickly for short down time. Each tool can be adjusted individually or as a unit depending on what the need is.

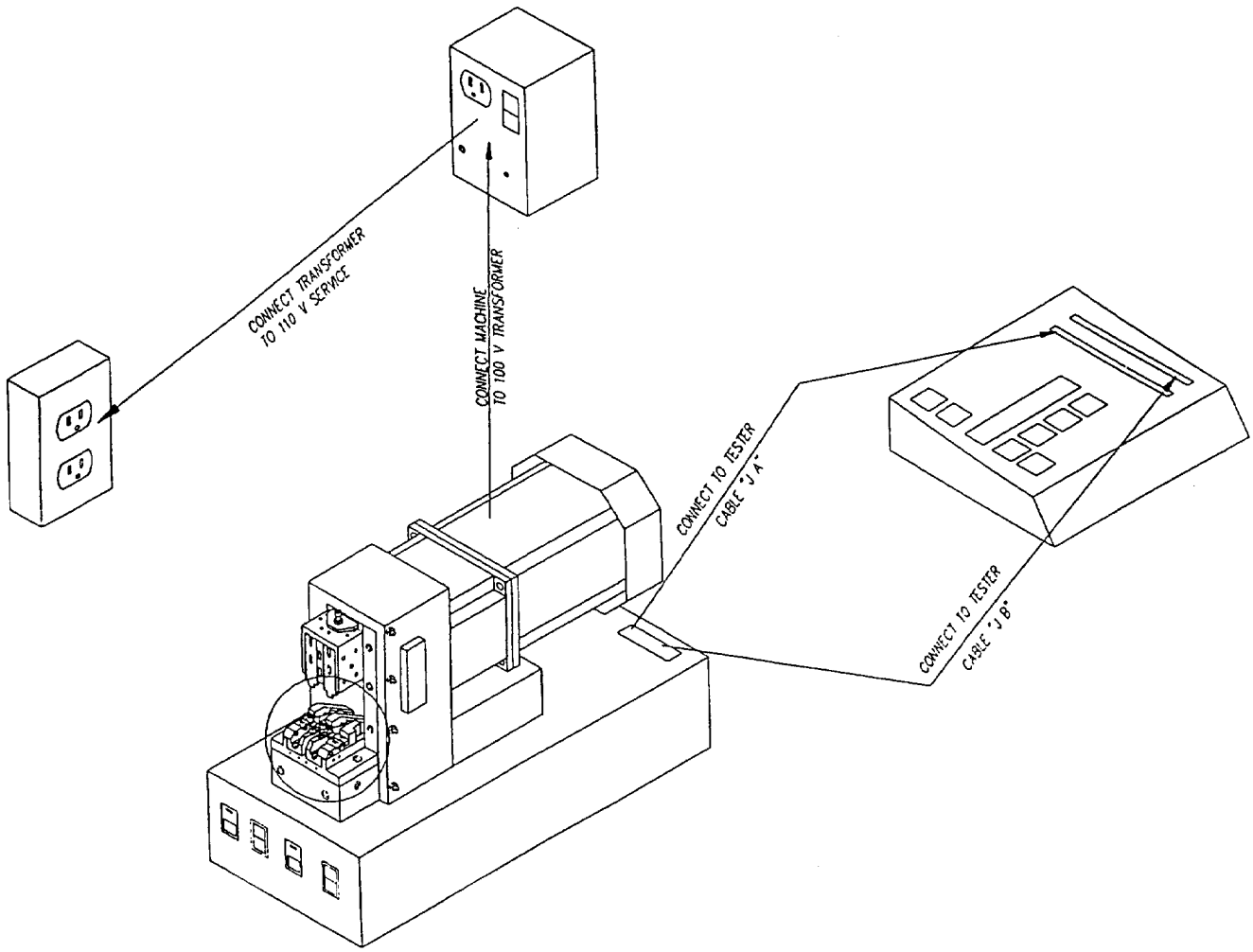
The machine can be adjusted manually by removing guard to obtain access. Then turn the power off and place an Allen wrench into the screw in rear of machine behind motor. Now rotate wrench (clockwise or counter clockwise) until ram comes down to a plug inserted into the nest for any adjustment necessary. After making the adjustment, continue rotating the wrench either way until the ram reaches the top and makes contact with the micro switch.

CAUTION: Remove Allen wrench before resuming power.

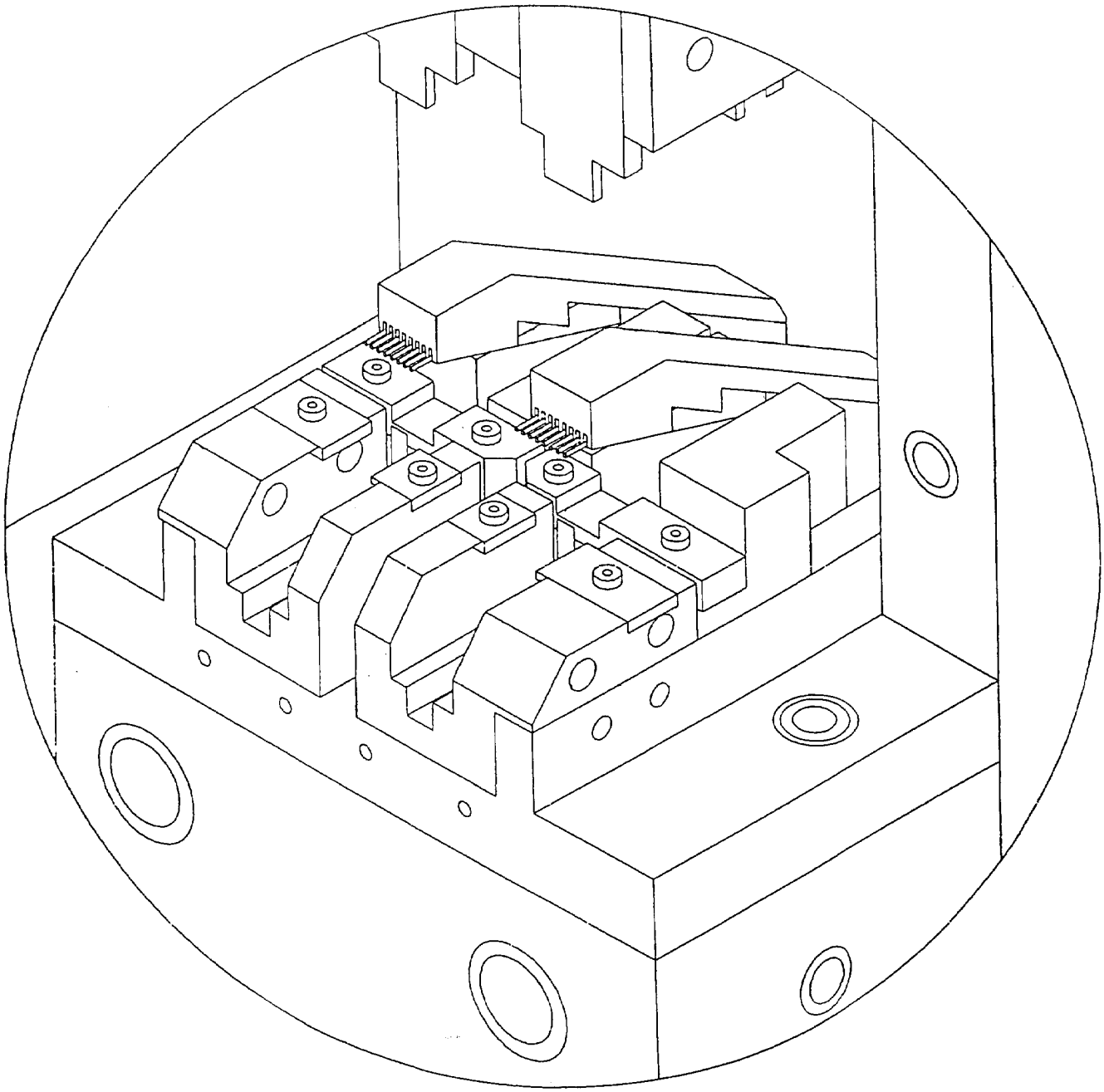
BASIC MACHINE



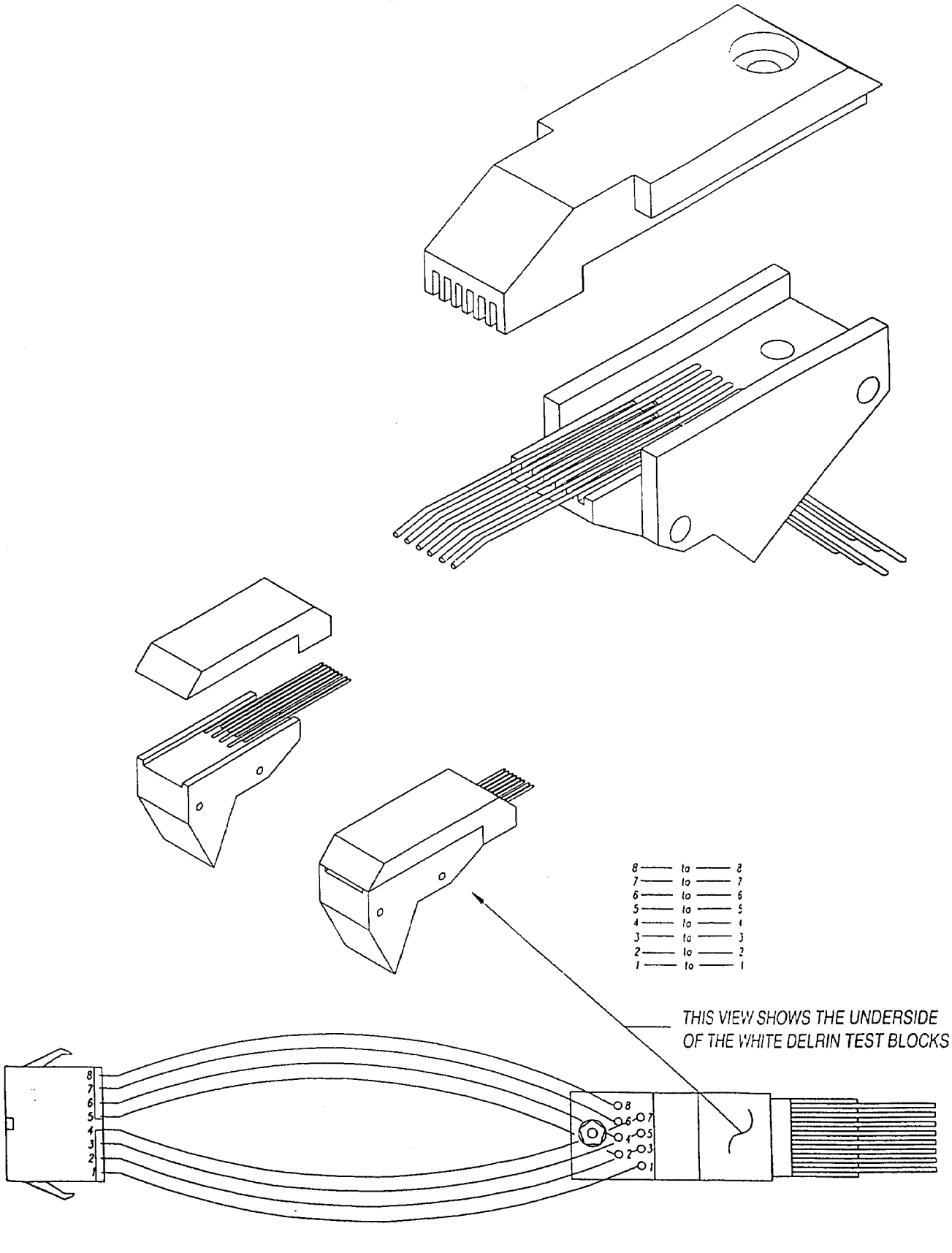
MACHINE AND TESTER SET-UP



NEST ASSEMBLY (CLOSE-UP)



TEST BLOCK ASSEMBLY



RECEIVING INSPECTION

This machine has been thoroughly inspected before leaving our facility. This provides the assurance that the machine produces good termination and Is ready to use. However, the following points should be reviewed to verify that no problems have occurred during shipment.

1. Carefully uncrate the machine and place it on a sturdy bench and examine it against the report sent with machine.
2. Inspect the entire machine for evidence of damage that may have occurred during transit. If in fact the machine shows signs of damage, contact Sentinel Connector Systems, Inc. immediately.
3. Check all components to be certain they are secure. Don't operate machine until all loose tooling has been tightened down safely.

SS-20 SPARE TOOLING

Suggested Spare tooling for the SS-20 machine are as follows:

A. **One** each machine - 901300 break pack

B. **Two** each machine - 901306 micro switch

C. **One** complete set of tester leads – 8 male (901307), 8 female (901308)

D. **One** pair of contact punches on most used product

10-position 901054 contact driver

8-position 901053 contact driver

6-position 901052 contact driver

4-position 901051 contact driver

SS-20 SPARE PARTS – ELECTRICAL ITEMS

ITEM #	PART #	DESCRIPTION
1	901300	Brake pack SB31-1N
2	901301	MY2 Relay
3	901302	H3Y-2 Relay
4	901303	LY-4 Relay
5	901304	Circuit Board
6	901306	Micro Switch SS-SGL
7	901307	Tester Leads – Male
8	901308	Tester Leads – Female
9	901309	6 Position Test Block – Delrin
10	901310	8 Position Test Block – Delrin
11	901311	10 Position Test Block – Delrin
12	901312	6 Position Test Block Set – Male
13	901313	6 Position Test Block Set – Female
14	901314	8 Position Test Block Set – Male
15	901315	8 Position Test Block Set – Female
16	901316	10 Position Test Block Set – Male
17	901317	10 Position Test Block Set – Female
18	901319	Tester Coil
19	901324	MY-4 Relay
20	901326	KD-600 Transformer
21	901325	KN-6 Transformer
22	SEE NOTE	Motor – **Contact Factory**
23	SEE NOTE	Gear Box – **Contact Factory**
24	901345	Induction Motor
25	901346	Gear Head
26	901368	Push Button Switch
27	901369	Push Button Switch
28	901370	Rocker Switch (DS-308)
29	901371	Fuse Holder
30	901372	Midget Fuse
31	901373	Power Cord
32	901374	20 Pin Gold Socket
33	901375	20 Pin Header – Right Angle
34	901376	Lock Ejector
35	901379	Rocket Switch – Hand/Auto

SS-20 SPARE TERMINATING PUNCHES

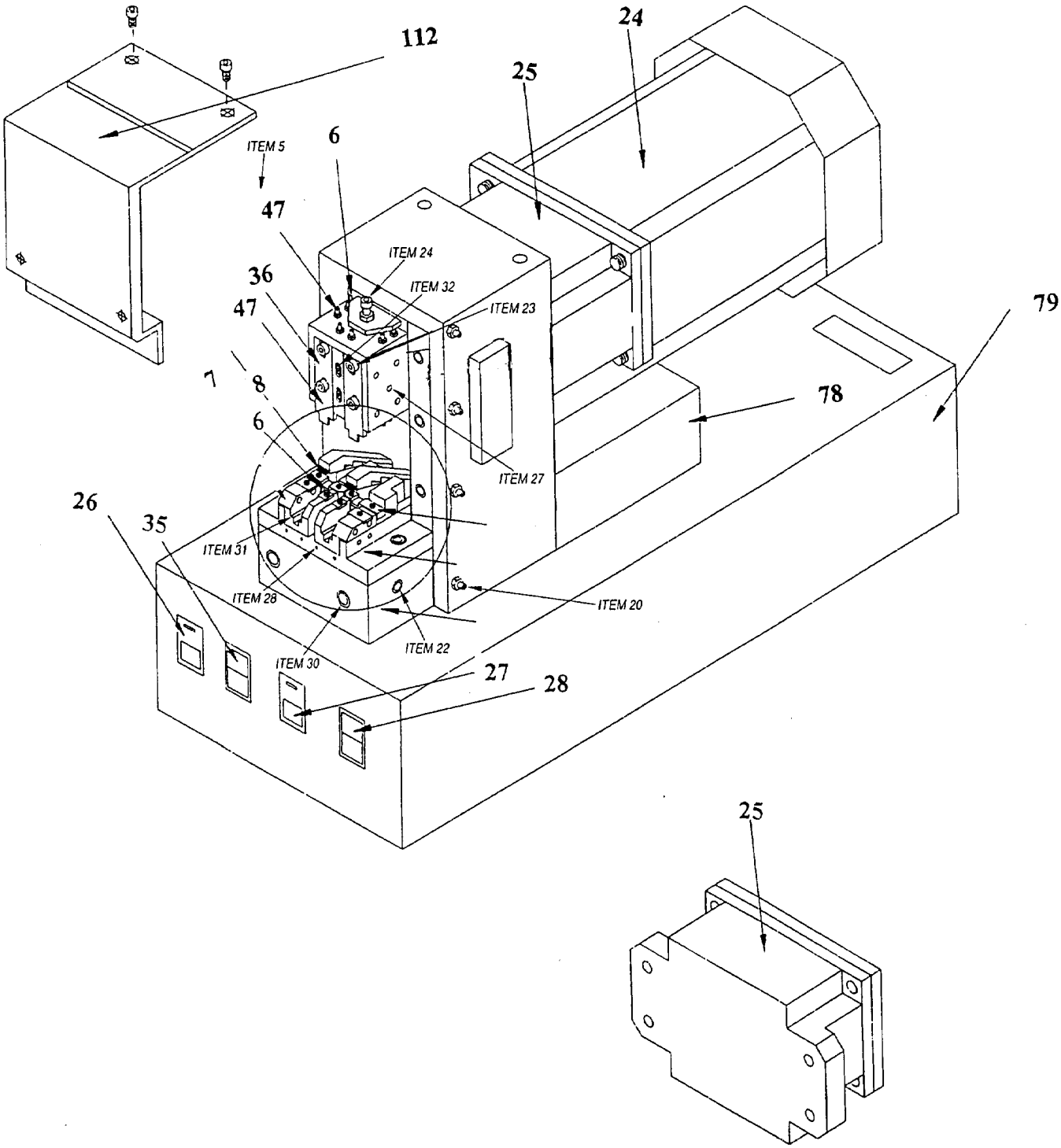
ITEM #	PART #	DESCRIPTION
36	901051	CD-4 (4 Position Contact Driver)
37	901052	CD-6 (6 Position Contact Driver)
38	901053	CD-8 (8 Position Contact Driver)
39	901054	CD-10 (10 Position Contact Driver)
40	901055	CB-4 (4 Position Conductor Bar Punch)
41	901056	CB-6 (6 Position Conductor Bar Punch)
42	901057	CB-8/10 (8 & 10 Position Conductor Bar Punch)
43	901058	LC-4/6 (4 & 6 Position Latch Crimp Punch)
44	901059	LC-8/10 (8 & 10 Position Latch Crimp Punch)
45	901061	Spacer Block For SL Plug
46	901062	Conductor Bar Spacer For Cat 5
47	901200	Punch Adjusting Screw & Nut

SS-20 SPARE NESTS & ACCESSORIES

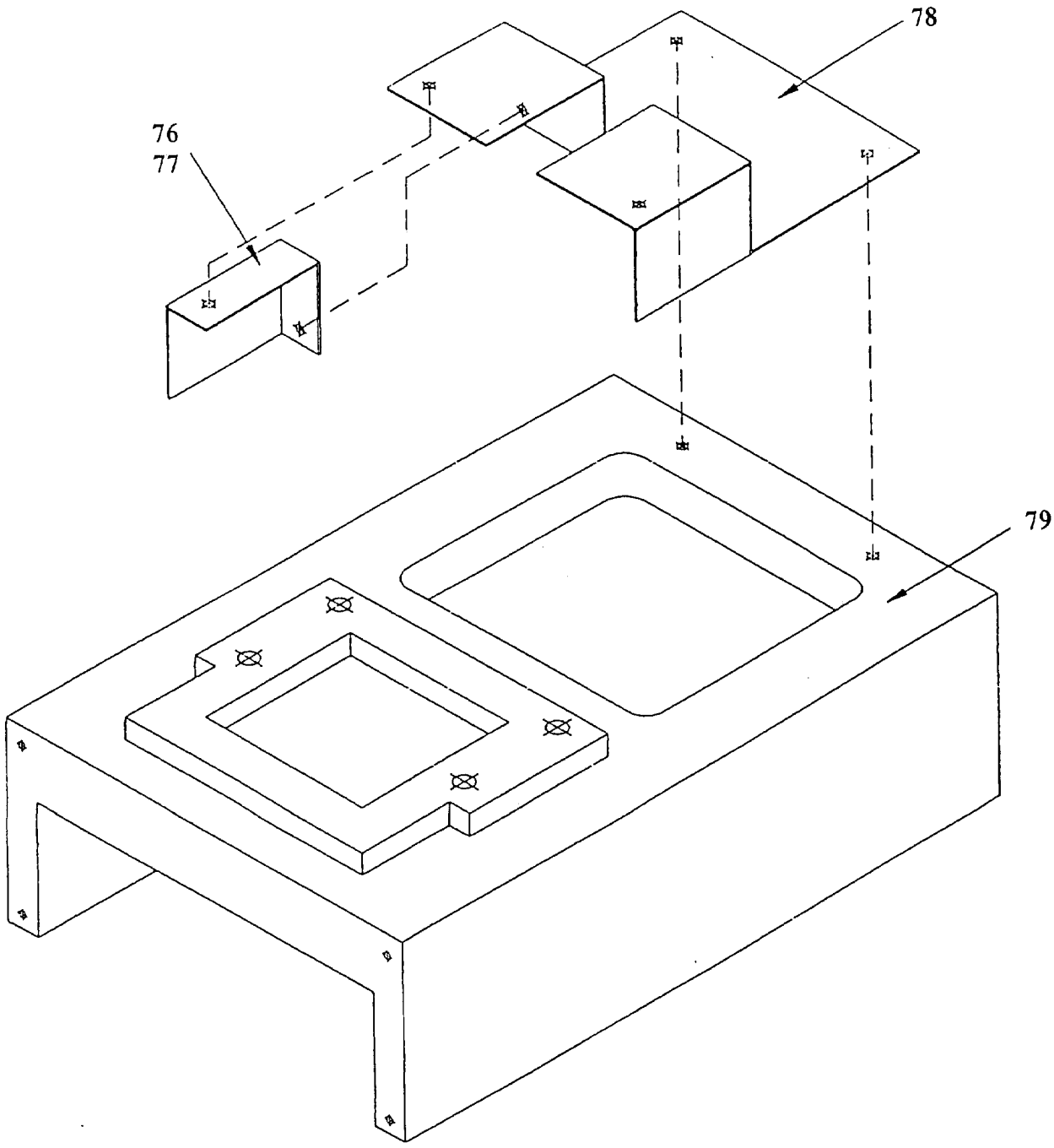
ITEM #	PART #	DESCRIPTION
48	901100	4 Position Nest – Left Hand
49	901101	4 Position Nest – Right Hand
50	901102	Left Clip, Left Side, Left Nest 4-Pos.
51	901103	Left Clip, Right Side, Left Nest 4-Pos.
52	901104	Right Clip, Right Side, Right Nest 4-Pos.
53	901105	Right Clip, Left Side, Right Nest 4-Pos.
54	901106	6 Position Nest – Left Hand
55	901107	6 Position – Right Hand
56	901108	Left Clip, Left Side, Left Nest 6-Pos.
57	901109	Left Clip, Right Side, Left Nest 6-Pos.
58	901110	Right Clip, Left Side, Right Nest 6-Pos.
59	901111	Right Clip, Right Side, Right Nest 6-Pos.
60	901112	8/10 Position Nest – Left Hand
61	901113	8/10 Position Nest – Right Hand
62	901114	Left Clip, Left Side, Left Nest 8/10 Pos.
63	901115	Left Clip, Right Side, Left Nest 8/10 Pos.
64	901116	Right Clip, Right Side, Right Nest 8/10 Pos.
65	901117	Right Clip, Left Side, Right Nest 8/10 Pos.
66	901118	8/10 Position Shielded Nest – Left Hand
67	901119	8/10 Position Shielded Nest – Right Hand
68	901120	8/10 Position Winged Nest – Left Hand
69	901121	8/10 Position Winged Nest – Right Hand
70	901122	Ball Bearings For Nest
71	901123	Springs For Nest
72	901124	Set-Screws For Nests
73	901125	Vileres For Nests

SS-20 MACHINE COMPONENTS

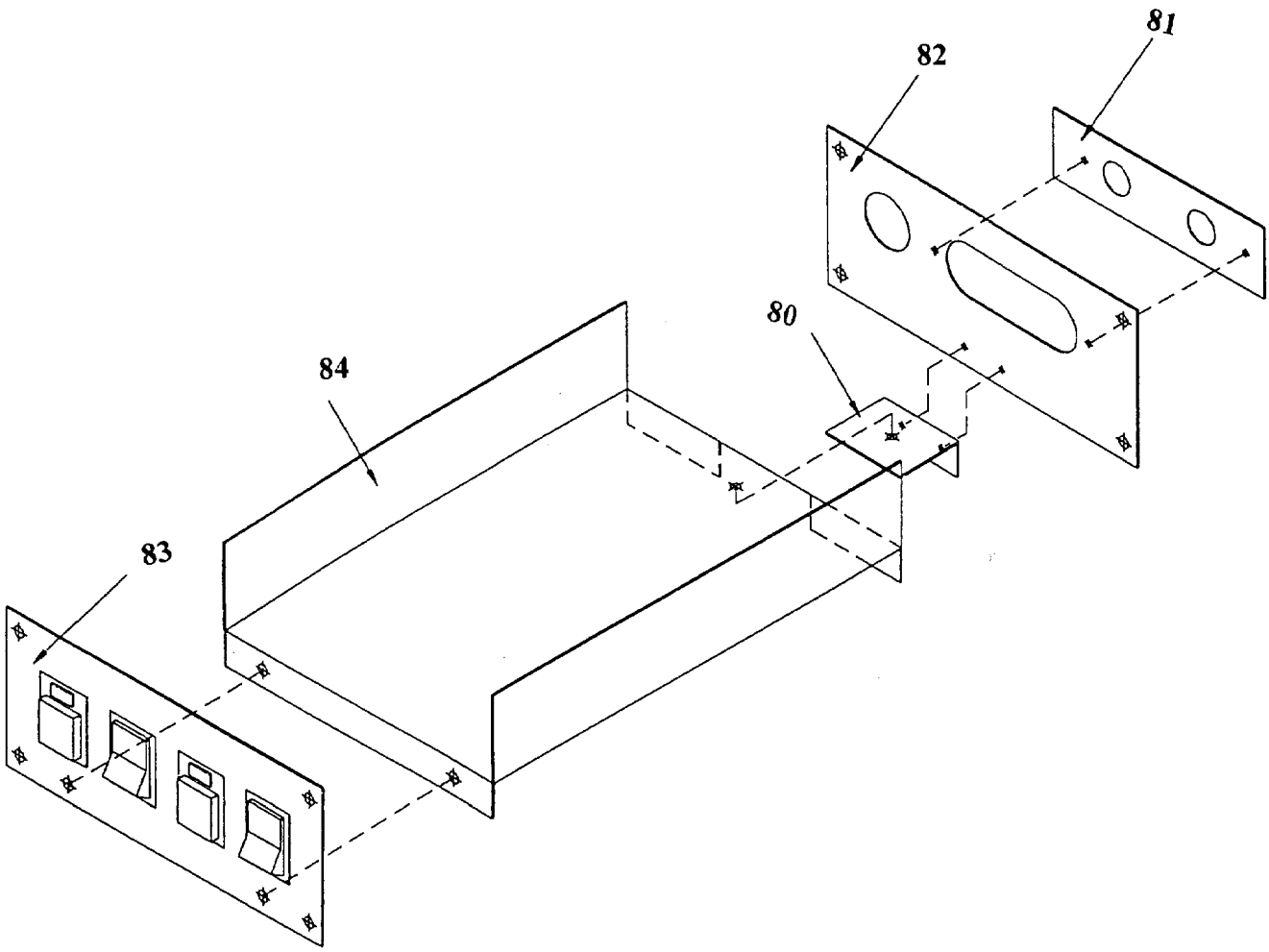
ITEM #	PART #	DESCRIPTION
75	901318	Brass Ram Bushing
76	901329	Left Side Cover
77	901330	Right Side Cover
78	901331	Rear Cover
79	901332	Machine Base
80	901333	Bracket Base
81	901334	Cord Holder Plate
82	901335	Rear Panel
83	901336	Front Panel
84	901337	Chassis
85	901338	Pin #1
86	901339	Positioning Bolt
87	901340	Left Plug Stop
88	901341	Right Plug Stop
89	901342	Left Nest Holder
90	901343	Right Nest Holder
91	901344	Anvil
92	901347	Parallel Key
93	901348	Bearings
94	901349	Eccentric Shaft
95	901350	Guide
96	901351	Pedestal
97	901352	Slider Block
98	901353	Metal Guide
99	901354	Slide Stop
100	901355	6 Position Punch Holder
101	901357	8 Position Punch Holder
102	901358	(M3 X 45mm) Round Joint Screw
103	901359	Spacer (Acryl, Black)
104	901360	Limit Switch Bracket
105	901361	Spring
106	901362	Collar
107	901363	Bracket
108	901364	Pin #2
109	901365	Pin #3
110	901366	Clevis
111	901367	Arm
112	901600	Main Guard For Machine


112
24
25
ITEM 5
6
47
ITEM 24
ITEM 32
36
47
ITEM 23
79
7
8
6
78
ITEM 27
26
35
ITEM 31
ITEM 28
ITEM 20
ITEM 22
ITEM 30
27
28
25

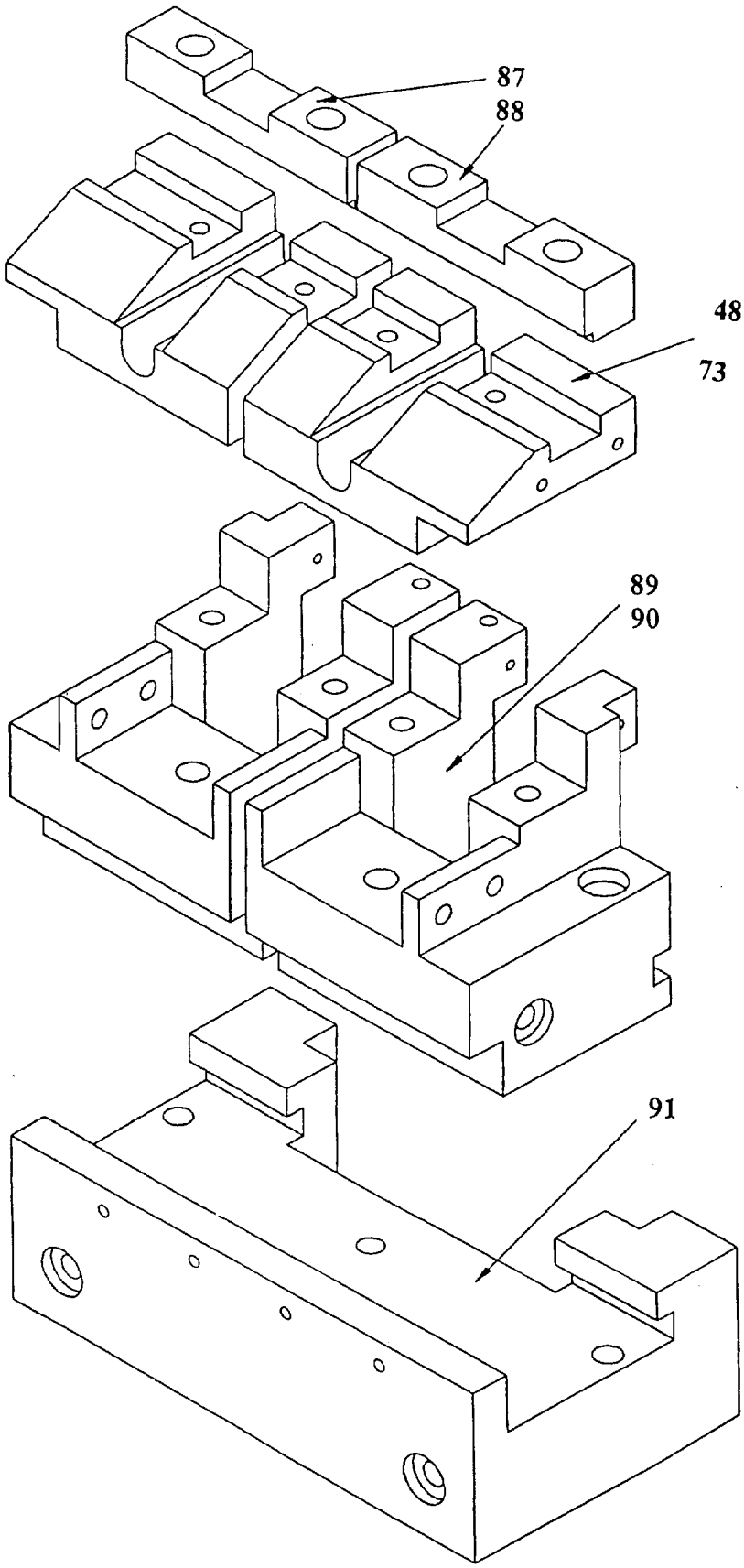
MACHINE BASE ASSEMBLY



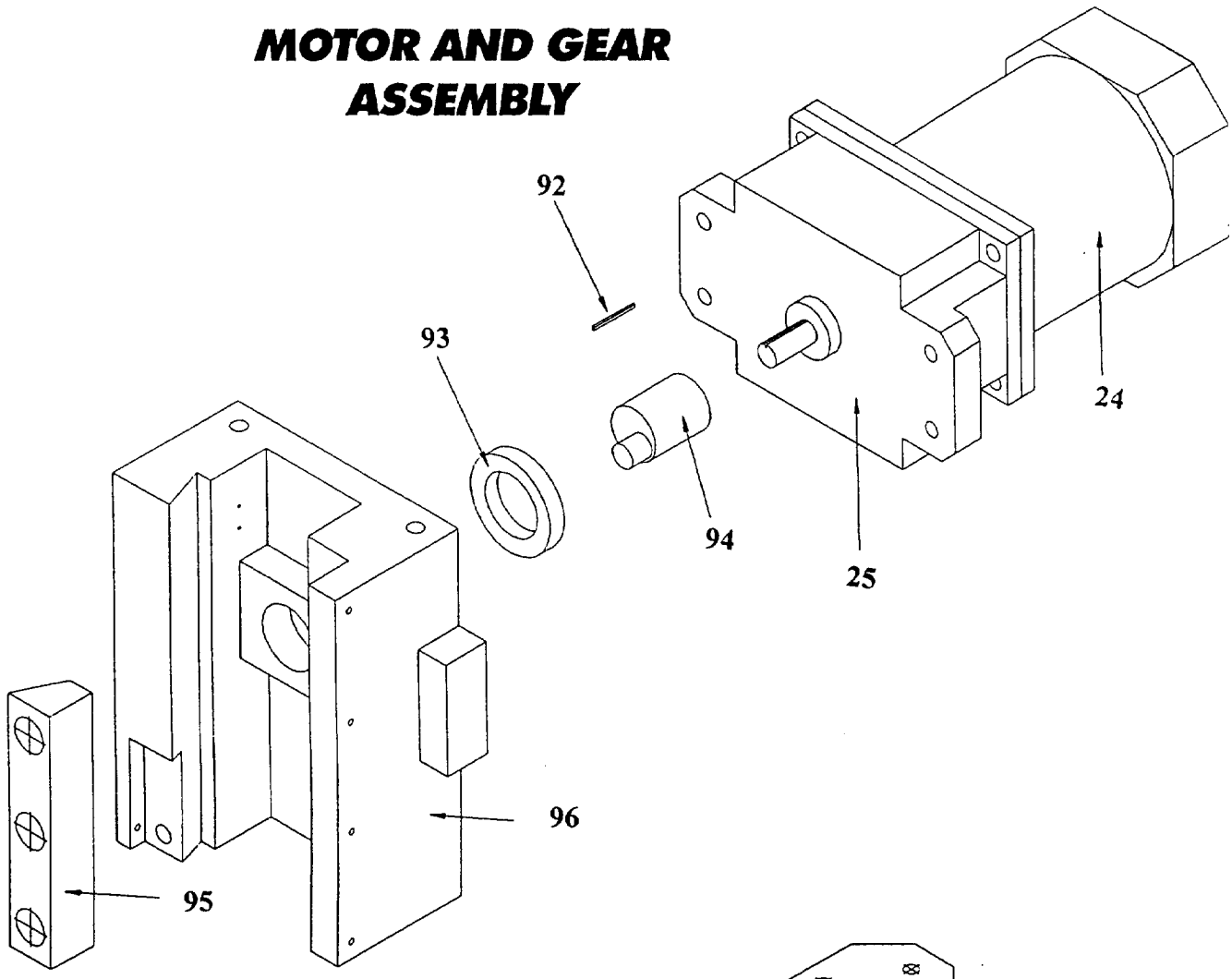
PANELS AND CHASSIS



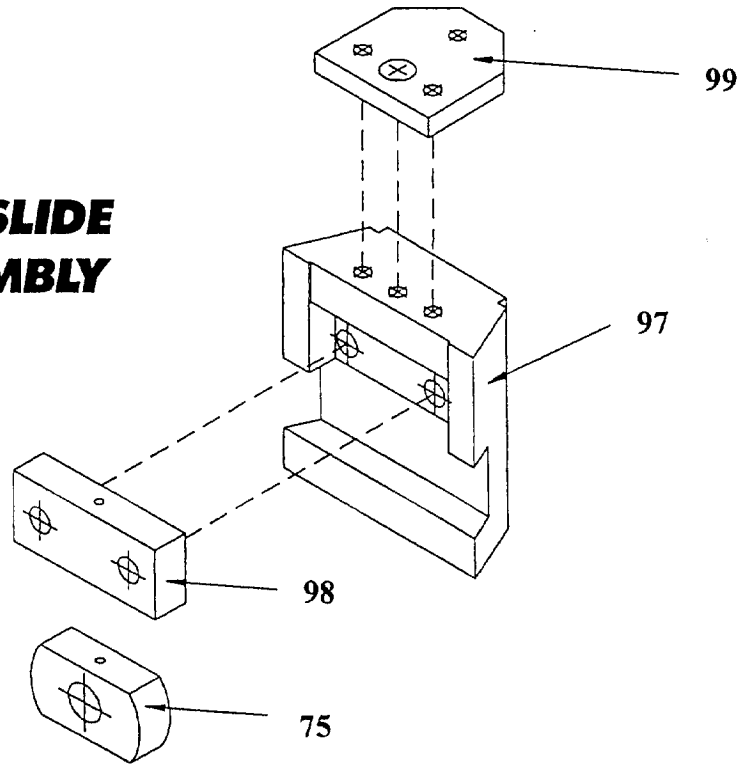
ANVIL ASSEMBLY INCLUDING NESTS



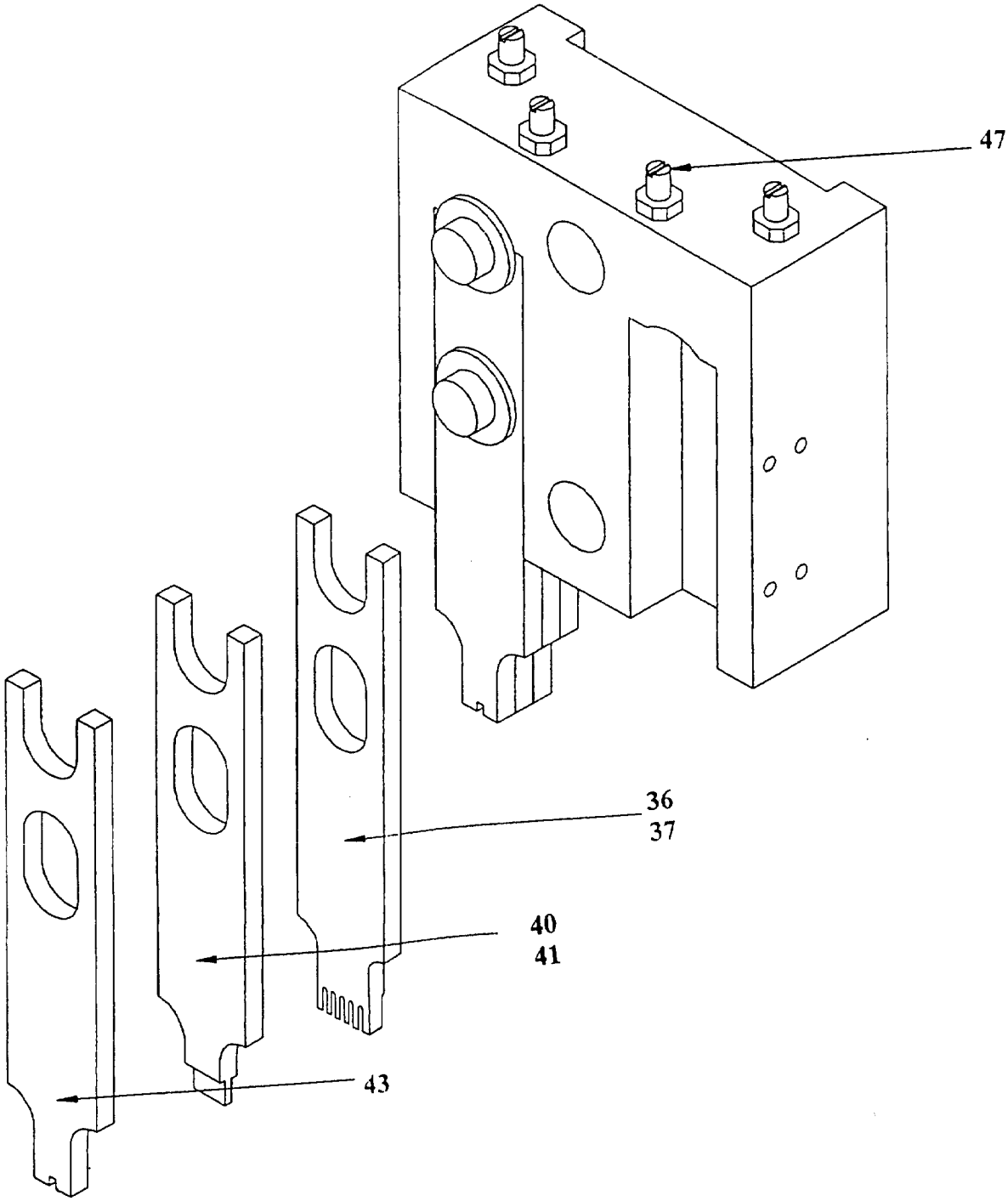
MOTOR AND GEAR ASSEMBLY



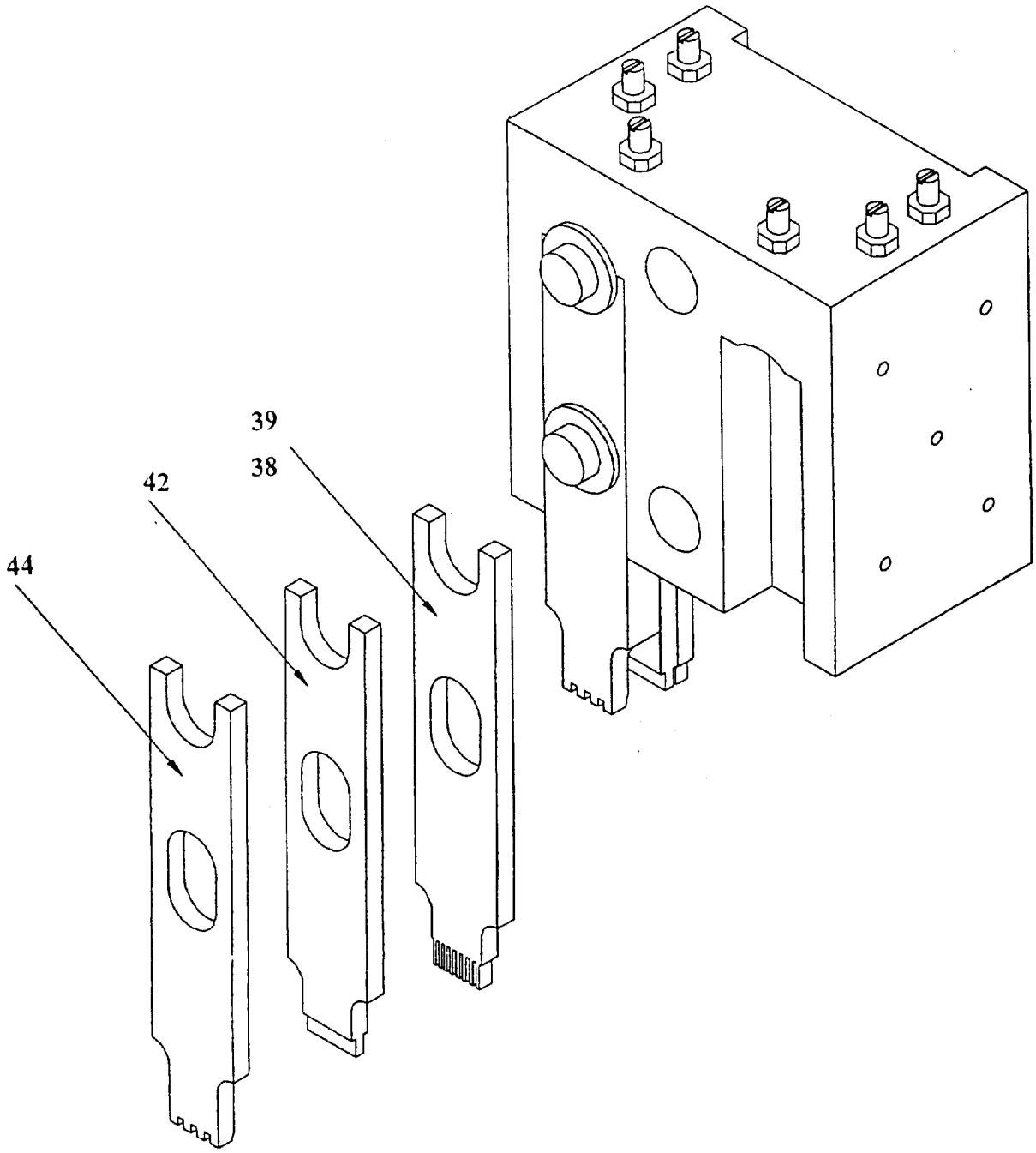
RAM SLIDE ASSEMBLY



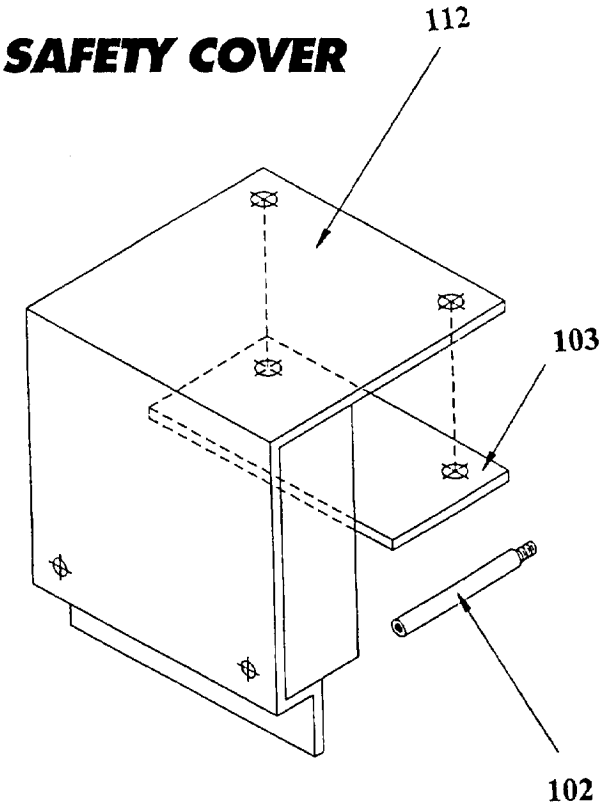
PUNCH HOLDER ASSEMBLY (4 & 6-POSITION)



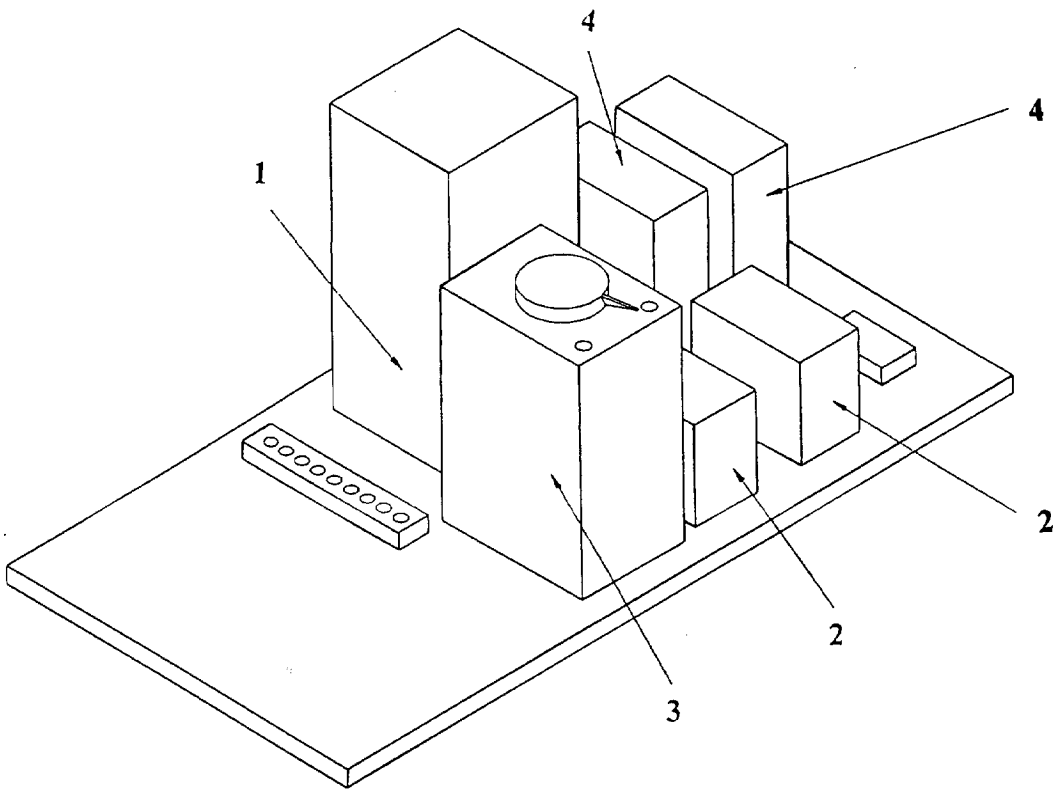
PUNCH HOLDER ASSEMBLY (8 & 10-POSITION)



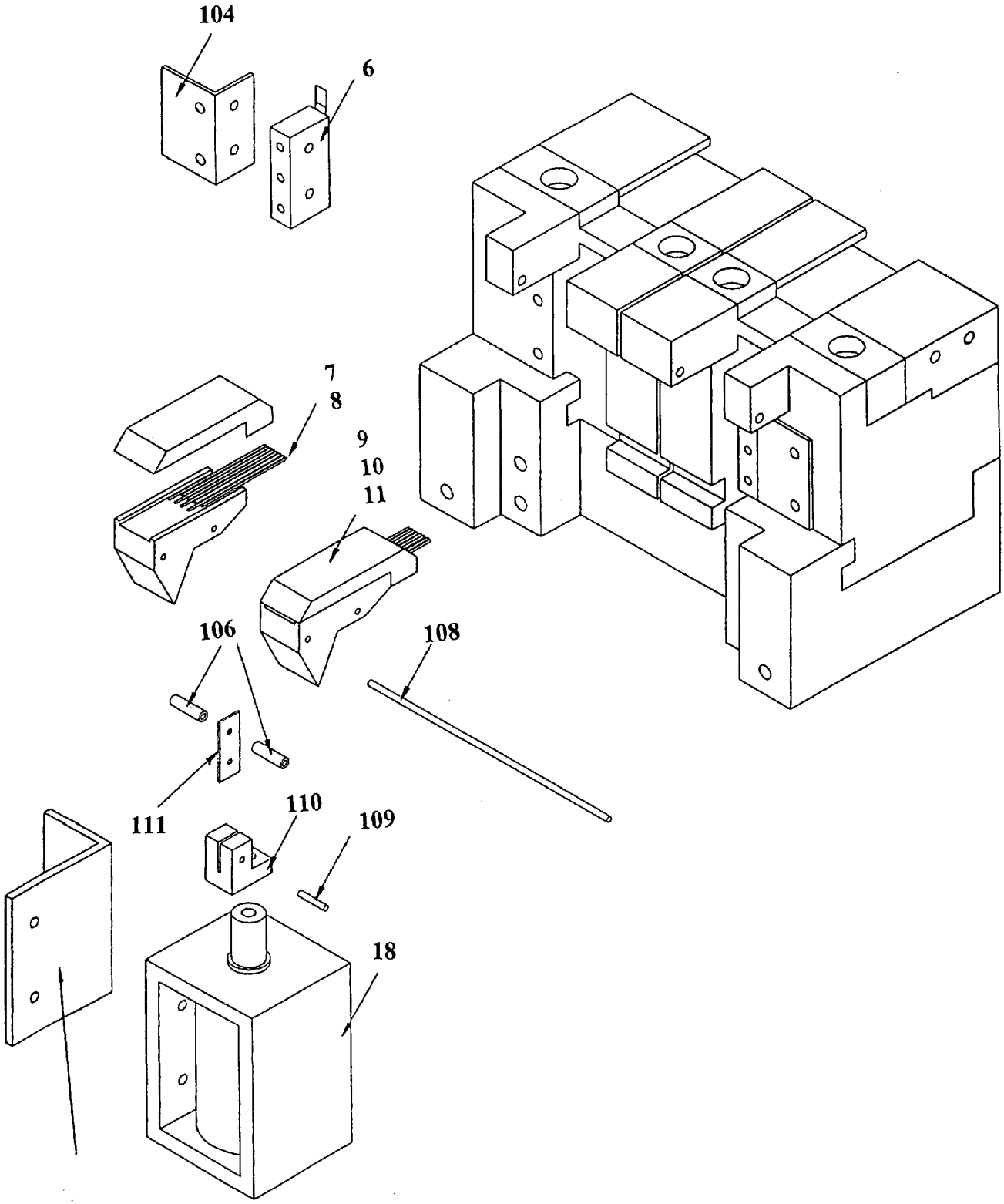
SAFETY COVER



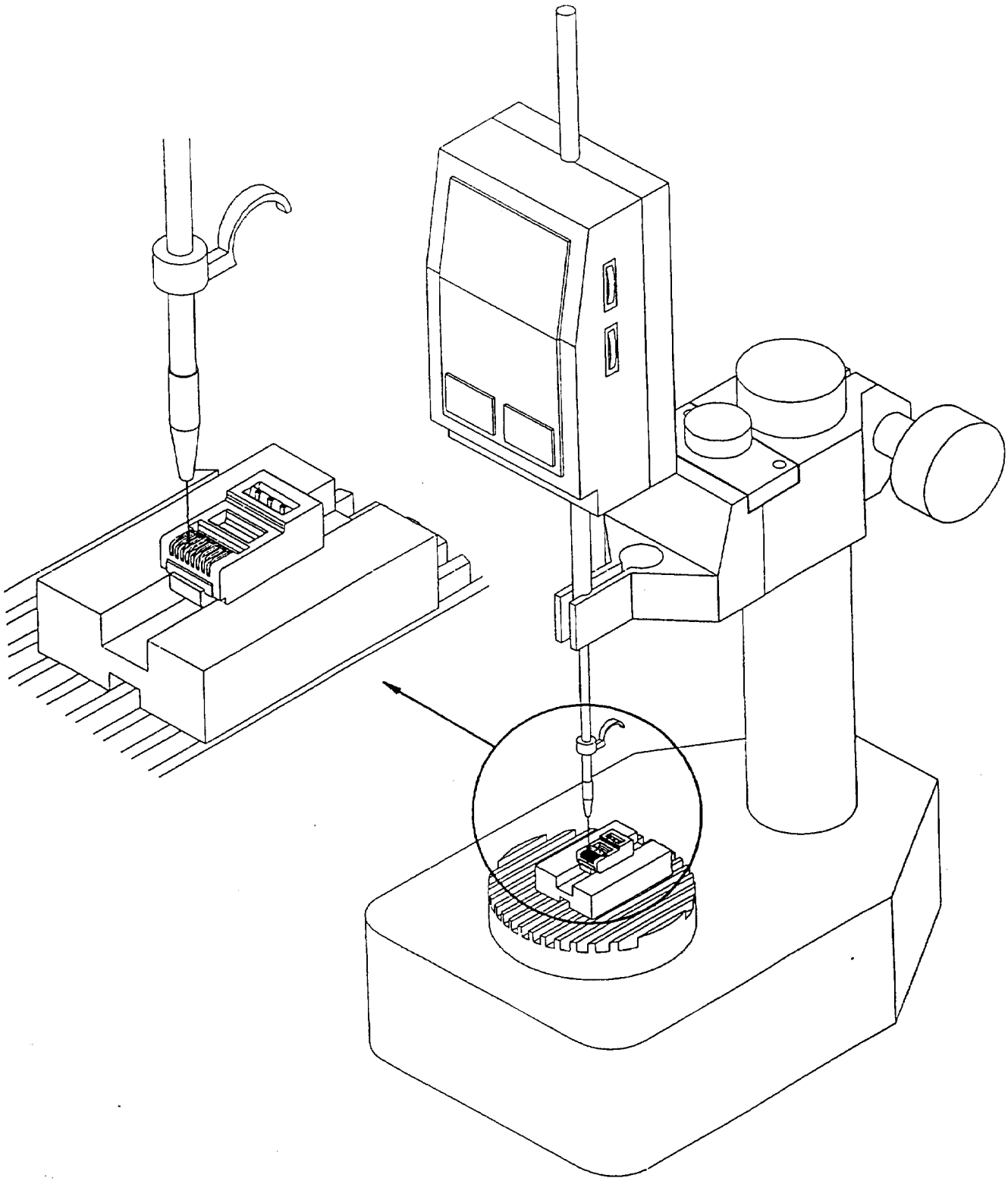
CIRCUIT BOARD RELAYS



TEST FINGER ASSEMBLY



FCC TEST FIXTURE



TROUBLE SHOOTING TIPS

Motor will not run	Check the relays in rear of machine. They may have come loose during shipment.
Ram cycling continuously up and down	Check the micro switch at the top of machine for proper placement and/or not working. Check break pac relay to ensure it is working properly.
No cycle on auto	Micro switch in nest may be faulty, or may be pushed too far. There maybe lint build-up. Check both nests.
Reverse light continuing to stay on	Remove rear cover and listen for a relay kicking in when machine is turned on. This could be a circuit board problem. Consult a factory representative.
Testing displaying error; product looks fine	Tooling may be out of adjustment, causing plastic skiving of the ribs which insulates the test probes from the contacts. If test leads don't have enough bend on the front, they may not snap down between the ribs to make continuity with the contacts in the plug.

MAINTENANCE FOR SS-20

1. Use a soft brush to lightly remove any debris that may build up on machine. Always keep the nest cavity clean.

2. Grease machine at the top, once a month or every 500 hours of service. With the machine off, take a cloth underneath the ram and remove excess grease. This should be done from time to time between greasings to assure that grease does not come in contact with product.

3. When replacing tooling, store unused tooling in plastic or wax paper after being lightly sprayed with light oil. When replacing tooling, lightly brush off tooling working surfaces and wipe oil clean from tooling. Do not oil the gibbs, as this will break down the grease that has been placed in them from the factory.

4. A maintenance program should be established for service on a regular basis. The amount of usage will determine whether this should be performed daily, weekly or monthly.

5. Take extra care that no chemicals remain in the nest portion of the machine when resuming production. This will prevent any possible chemical reaction.

6. Contact a service representative for any further information.

WARNING! When maintenance is being performed, please make sure power is off!

Signature 1000M/2000

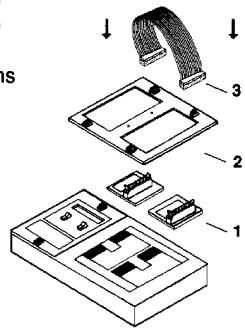
Quick Reference Card

STEP 1: Preparing your test setup

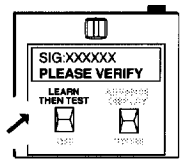
1. Set the option *LOCK ON LEARN* to *OFF.*

NOTE: If you do not know how to set options, see "Selecting options and changing settings."

2. Turn off analyzer:
(1) install adapters
(2) replace cover plate
(3) attach sample cable.

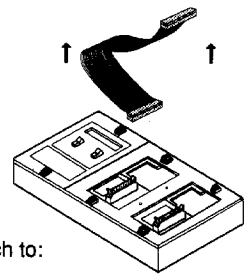


3. Turn on analyzer and wait for the display to prompt "Please Verify."

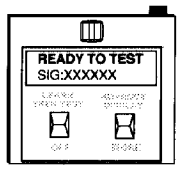


To verify the cable, press the Advance Display switch to:
1. Identify Adapters
2. Scroll through wire list

4. Remove the sample cable.

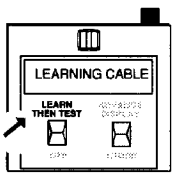


5. Display will prompt "Ready to Test."

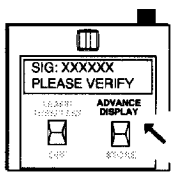


STEP 2: Documenting cables

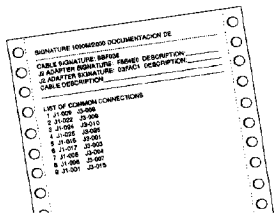
1. Prepare test setup and learn cable as in Step 1.



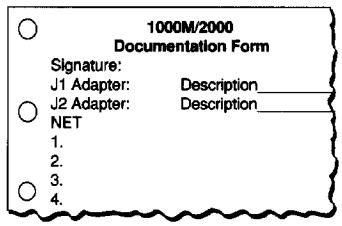
2. When the analyzer prompts "Please Verify," press the Advance/Display switch to document.



Option A: With a printer
If you have a printer connected to the analyzer, documentation prints automatically.

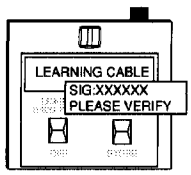


Option B: Without a printer
Press Advance Display to prompt wire list. Transcribe prompts to a blank documentation form.

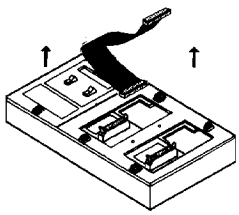


STEP 3: Testing cables

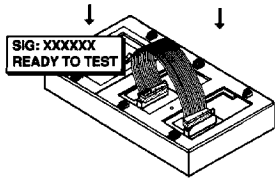
1. Prepare test setup and verify cable as in Steps 1 and 2.



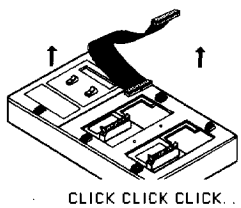
2. Remove cable used in preparing setup.



3. When display prompts "Ready to Test," attach new cable.

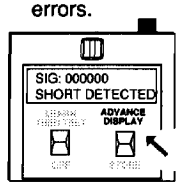


4. If cable is good, remove it and attach another one.



CLICK CLICK CLICK. . .

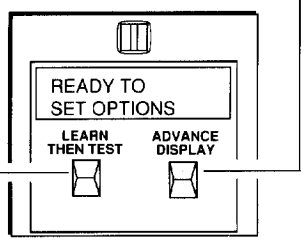
5. If cable is bad, press Advance Display to locate errors.



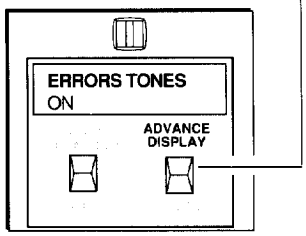
Selecting options and changing settings

1. Press and hold in the Advance Display switch as . . .

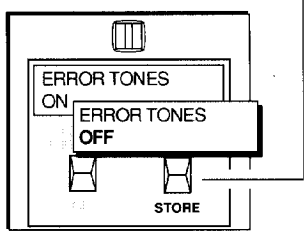
2. . . . you press the Learn Then Test switch to turn on analyzer.



3. Then release the Advance Display switch. The analyzer prompts the first option.

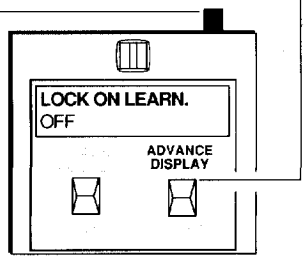


4. Press Store to change the option setting.



5. Press Advance Display to see next option.

Memory button



NOTE: Holding in the Memory button as you press the Advance Display switch reverses the order that options and settings appear.

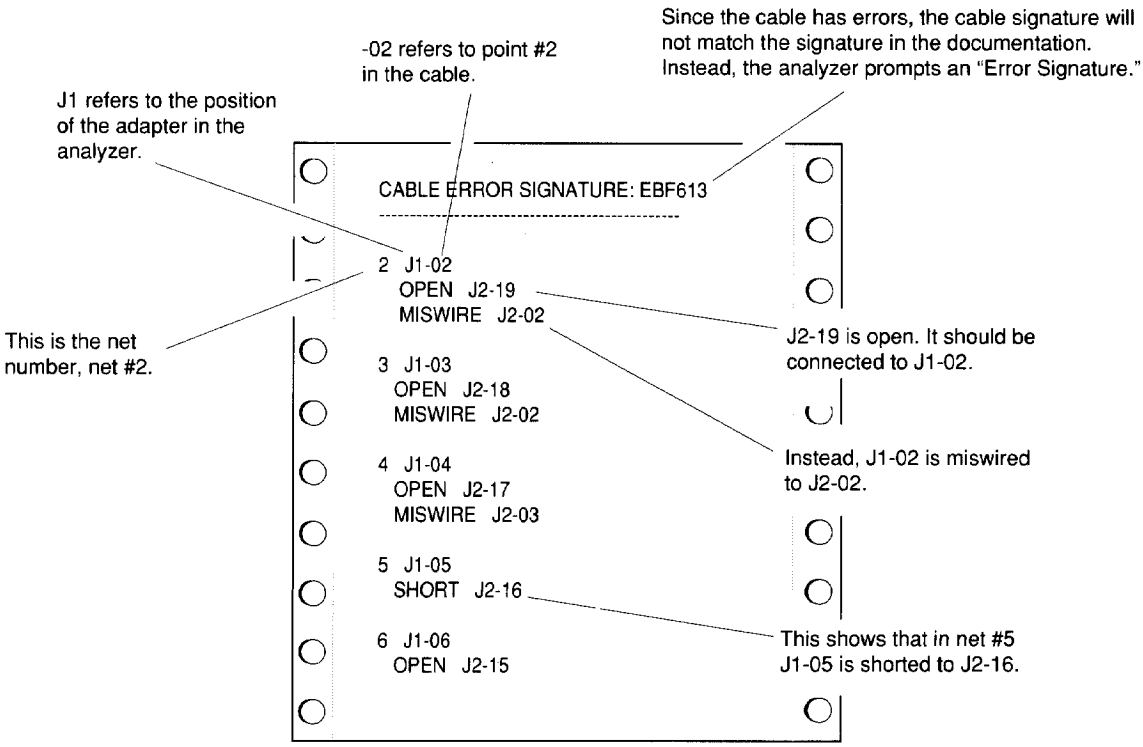
Name of Option	Explanation
ERROR TONES ON	• When the analyzer detects errors it emits a series of sharp beeps. This option lets you turn off the beeps to do rework or guided assembly.
LOCK ON LEARN OFF	• When set to ON, the analyzer always uses the last learned wire list for testing. This allows you to learn a cable, then lock the test so it will only test that cable.
TEST DELAY MEDIUM	• With this option you change the analyzer's test speed for testing short, medium, and long cables.
IGNORE UNUSED OFF	• When set to ON, the analyzer only scans those positions that have connector adapters installed in them and ignores the unused positions. When set to OFF, the analyzer scans all pins.
SORTED WIRE LIST ON	• When set to ON, this option orders pins from lowest to highest in a net. When set to OFF, pin order within a net follows the wire position of the connector.
COUNT ALL CABLES ON	• When set to ON, printouts show the total number of cables tested for a sample cable since it was learned. When set to OFF, the printout shows only the number of good cables tested.
AUTO PRINT ON	• When set to ON, a line prints out after each test indicating if the cable is good or bad. When set to OFF, the analyzer only prompts in the display if an assembly is good or bad.

Interpreting the analyzer's display

Display	Condition	Comment
SIG:XXXXXX GOOD CABLE	**Good cable**	• Wire list matches that of cable used for test setup. The cable is good. Remove cable and test another one.
SIG:OOOOOO OPEN DETECTED	**Open**	• Wire list does not match that of cable used for test setup. The analyzer detects a missing connection. Press Advance Display to prompt the net(s) with the error(s).
SIG:OOOOOO SHORT DETECTED	**Short**	• Wire list does not match that of cable used for test setup. The analyzer detects shorted points. Press Advance Display to prompt the net(s) with the error(s).
SIG:OOOOOO ERRORS	**Errors**	• "ERRORS" indicates a combination of shorts and opens. Press Advance Display to prompt all errors.

Interpreting an error list

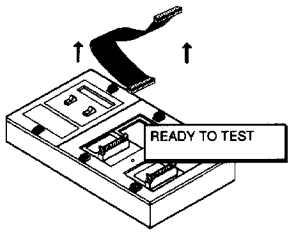
Below is an example of a typical error list created by a printer connected to the analyzer. If you don't have a printer connected to your analyzer, you can still create an error list by pressing the Advance Display switch each time the analyzer detects an error. You then transcribe the information prompted in the analyzer's display.



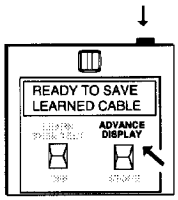
Using the analyzer's memory

Storing wire lists

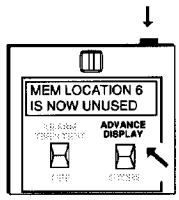
1. Remove cable. Display will prompt "Ready to Test."



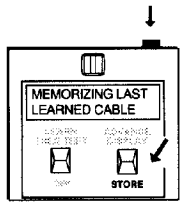
2. Press in and hold Memory button as you press Advance Display.



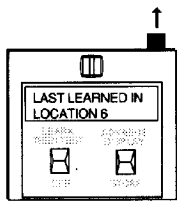
3. Continue pressing Advance Display to scroll through memory locations.



4. Press Store to store wire list in unused location.

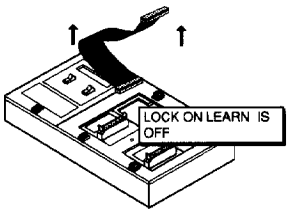


5. Release Memory button.

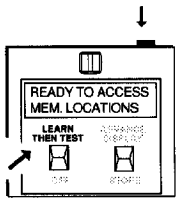


Retrieving wire lists

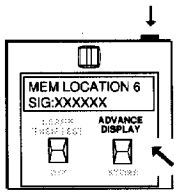
1. Remove any cables, then set the option *LOCK ON LEARN* to *OFF*.



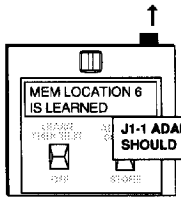
2. Press and hold Memory button as you turn on analyzer.



3. Press Advance Display to select wire list in memory.



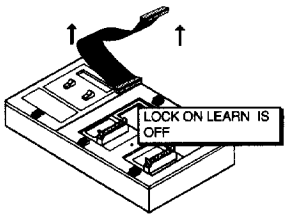
4. Release Memory button.



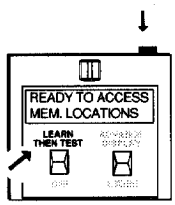
NOTE: If the wrong adapters are installed, the analyzer prompts correct ones.

Deleting wire lists

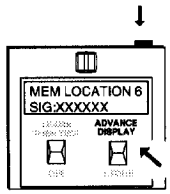
1. Remove any cables, then set the option *LOCK ON LEARN* to *OFF*.



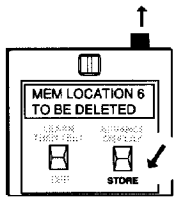
2. Press and hold Memory button as you turn on analyzer.



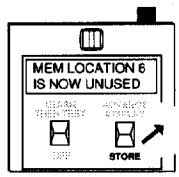
3. Press Advance Display to select wire list in memory.



4. Press Store and hold as you release Memory button.



5. Release Store.



Version 1.0

Cirris Systems Corp.
1991 Parkway Blvd.
SLC, Utah 84119
801-973-4600

Printed in the U.S.A.