



APT-1

Service Manual

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NOTE: Design details may change without notice

1. SYSTEM COMPONENTS AND DETAILS

1.1. *APT-1* unit (Figure 1)

1. Operator panel
2. Angle release knob
3. Angle securing knob
4. Crank-arm
5. Power input socket

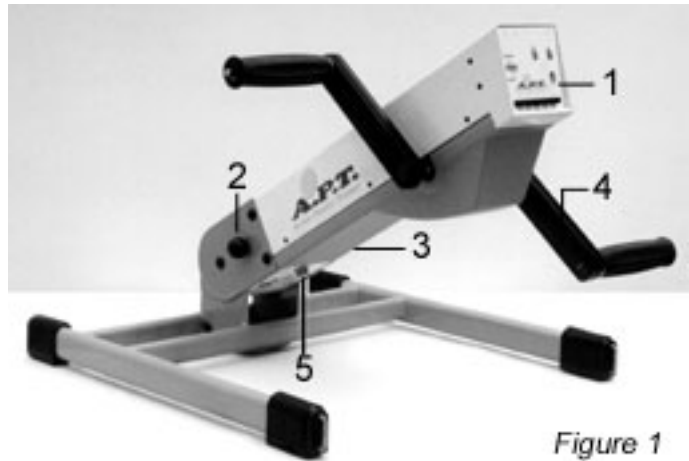


Figure 1

1.2. Components (Figure 2)

1. Power supply unit
2. Straight hand-grips
3. Footrests
4. Finger protection disks
5. Securing straps

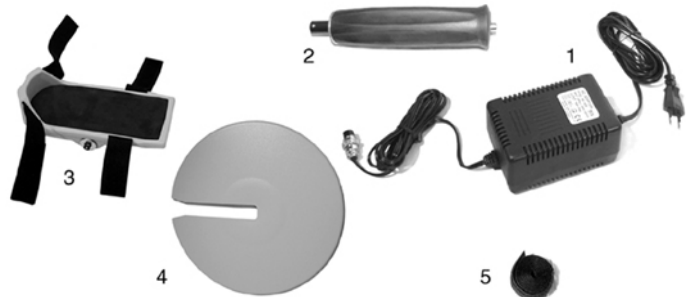


Figure 2

2. GENERAL MAINTENANCE AND INSPECTIONS

The rugged design of the **Active Passive Trainer** and the use of selected, modern materials ensure minimal requirements for care and maintenance.

NOTE: Improper handling or neglect in the care of the **Active Passive Trainer** may reduce or cancel the coverage of the manufacturer's warranty.

2.1. Regular care

- Inspect Power supply cables and plug for visible damages.
- Check power-input connector for visible damage or insecure fastening.
- On a regular basis check that all screws and components are fastened tightly.
- Ensure that the anti-slip pads under the base are always kept clean.

CAUTION: If any damage is detected – do not use **APT-1**. Please contact your authorized dealer. Only authorized personnel may carry out repairs.

2.2. Cleaning instructions

- Disconnect Power Supply and wipe dry with clean cloth.
CAUTION: For safe disconnection of the **APT-1** *always* take the mains plug out of the wall socket **before** removing the connector from the **APT-1** power socket.
- Take care not to allow water to enter the unit. Keep cables and electric components away from water and humidity.

2.3. Storage

- Store Active Passive Trainer between –20 and +40 degrees C and between 10% and 80% humidity

3. REPLACEMENT INSTRUCTIONS

CAUTION: Disconnect Power Supply unit before replacement of any part of the **APT-1**. For safe disconnection of the **APT-1** always take the mains plug out of the wall socket before removing the connector from the **APT-1** power socket.

3.1. Body Cover

Kit Number: A0-00-1-001

Tools:

Allen Key 2 mm

1. Partially unscrew three Screws (3-A) on each side of underbody (no need to remove screws completely)
2. Remove cover and replace
3. Tighten Screws (3-A)

NOTE: Do not over-tighten screws

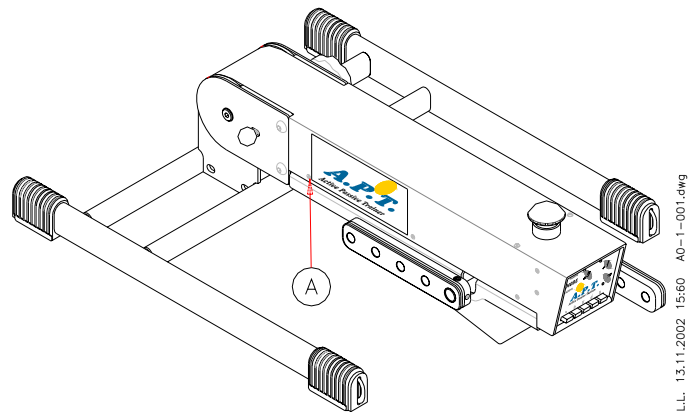


Figure 3

3.2. Control Panel

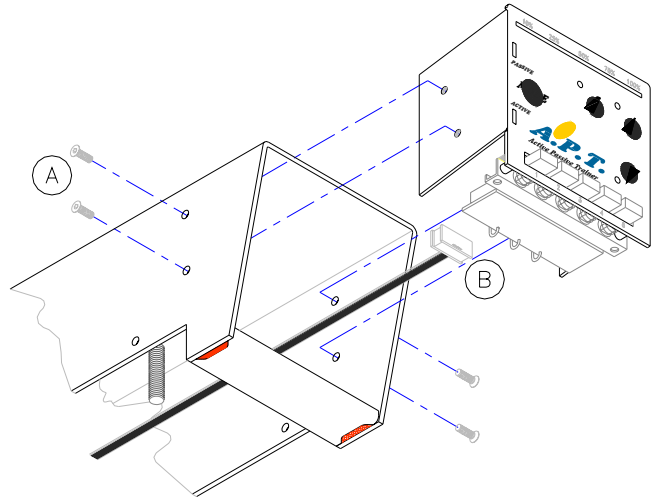
Kit Number: A0-00-1-005

A0-00-1-006 (for remote control)

Tools:

Allen Key 2 mm

1. Remove four Screws (4-A) from each side of Control Panel
 2. Gently pull out Panel and disconnect Flat Cable Connector (4-B) from socket on rear side of Control Panel
 3. Connect Flat Cable securely to new Control Panel and replace Screws (4-A)
- NOTE: Do not over-tighten Screws



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Figure 4

3.3. Gear Motor with crank-arms

Kit Number: A0-00-1-003

Tools:

Allen Key 2 mm

Socket Wrench 10 mm

1. Secure **APT-1** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Disconnect Motor wire spade connectors (5-A) from Motor terminals
4. Remove four Nuts (5-B) that secure Gear Motor to **APT-1** body.
5. Lift out Gear Motor with crank-arms and replace with new one.
NOTE: Ensure that Wires do not get 'pinched' under Motor.
6. Secure Motor with Nuts (5-B).
NOTE: Do not overtighten Nuts (B) as this may detach Studs from body or cause paint on top of Body to crack.
7. Reassemble Underbody Cover, see 3.1

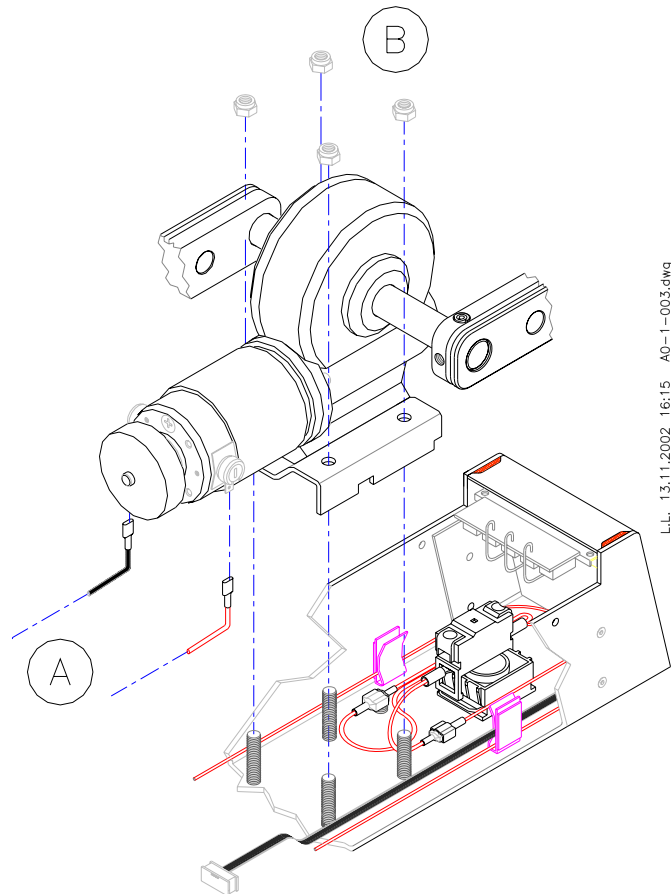


Figure 5

3.4. Controller Circuit Board

Kit Number: A0-00-1-004

Tools:

Allen Key 2 mm

Allen "T"-Key 2.5 mm

Small Flat Blade Screwdriver

Silicone Heat-sink Compound

1. Secure **APT-1** in flat position upside-down on clean table.
2. Remove Underbody cover, see 3.1
3. Carefully disconnect Flat Cable Connector (6-A) from socket on Controller board.
4. Disconnect Power Connector (6-B) from Controller Board while releasing tab of Socket (6-C) with screwdriver.
5. Disconnect Motor wire Spade Connectors (6-D) from Motor Terminals.
6. Remove Screws (6-E) and Washers (6-F) connecting Controller Board to **APT-1** body.
7. Lift Controller Board from **APT-1** body with aid of screwdriver. Silicone compound is used between board and **APT-1** body – take care not to get hands or **APT-1** parts dirty.
8. Replace with new Controller board. Add Silicone compound if needed.
9. Secure Controller Board with Washers (6-F) and Screws (6-E)
10. Connect Motor wire Spade Connectors (6-D) to Motor Terminals: red wire to positive/red terminal, black wire to negative/black terminal
11. Connect Power Connector (6-B) to Socket (6-C)
12. Connect Flat Cable Connector (6-A) to socket on Controller board
13. Reassemble Underbody Cover, see 3.1

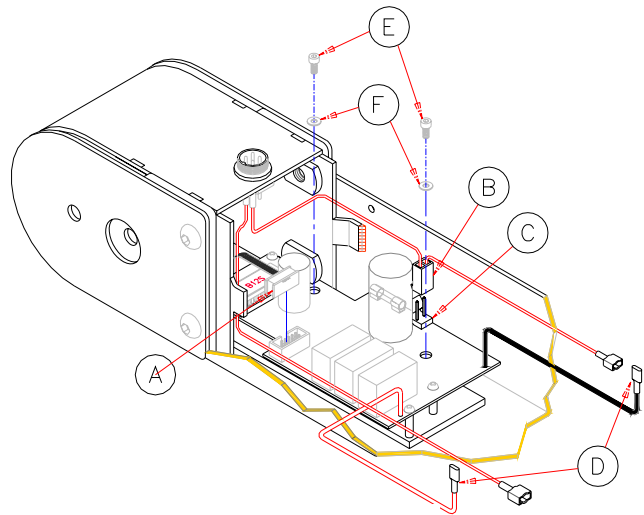


Figure 6

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3.5. Power Cable (+ Male Plug)

Kit Number: A0-00-1-007

Tools:

Allen Key 2 mm

Small Flat Blade Screwdriver

Open End Wrench 19 mm

1. Secure **APT-1** in flat position upside-down on clean table.
2. Remove Underbody Cover, see 3.1
3. Detach Connectors (7-A) from Stop Switch and remove Wires from Cable Clips (7-B)
4. Disconnect Power Connector (8-A) from Controller Board while releasing tab of socket with screwdriver.
5. Unscrew Nut (8-B)
6. Remove Nut (8-B) and Spring Washer (8-C)
7. Remove Plug (8-D) with attached Power Cable and insert new one
8. Place Spring Washer (8-C) and secure Plug (8-D) with Nut (8-B)
9. Connect Power Connector (8-A) to Controller Board
10. Guide Wires through Cable Clips (7-B)
11. Attach Connectors (7-A) to Stop Switch
12. Reassemble Underbody Cover, see 3.1

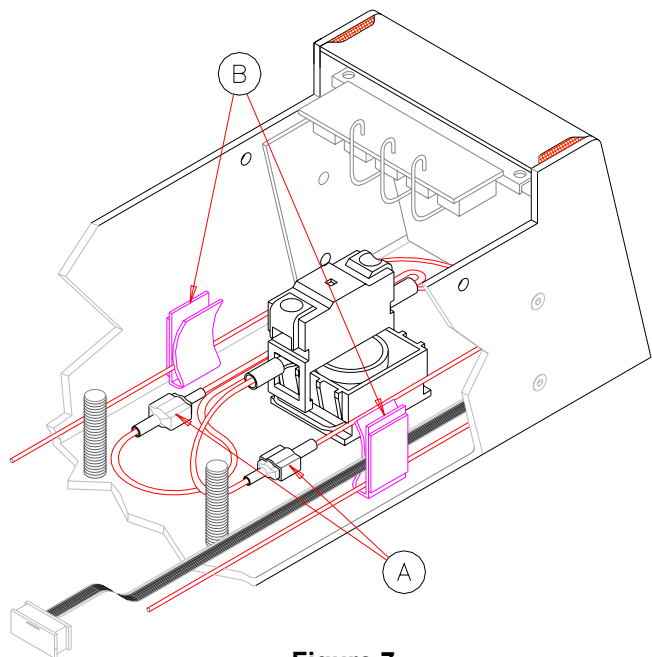


Figure 7

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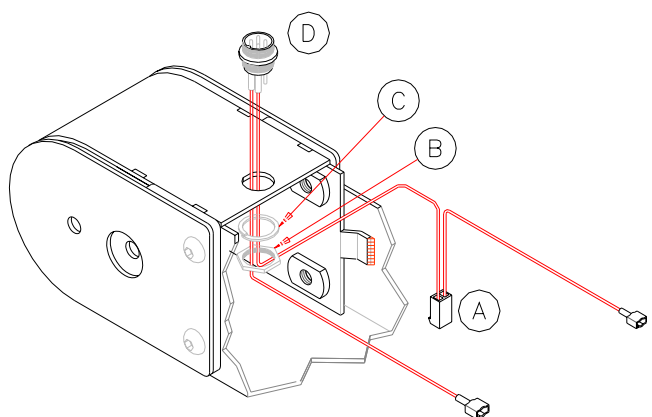


Figure 8

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3.6. Stop Switch

Kit Number: A0-00-1-034

Tools:

Allen Key 2 mm

Flat Blade Screwdriver

Long Nosed Pliers

1. Secure **APT-1** in flat position upside-down on clean table
2. Remove Underbody Cover, see 3.1
3. Disconnect Wires (9-A) from Power Cable (9-B)
4. Open Retaining Spring (9-C) slightly and remove Stop Switch Body
NOTE: Be careful not to remove Spring (9-C) from its Housing
5. Unscrew Nut (9-E) with Long Nosed Pliers
6. Remove Knob (9-G) and Washer (9-F) and insert new one
7. Secure Knob (9-G) with Nut (9-E)
8. Place Stop Switch Body and secure it with Retaining Spring (9-C)
9. Connect Wires (9-A) to Power Cable (9-B)
10. Reassemble Underbody Cover, see 3.1

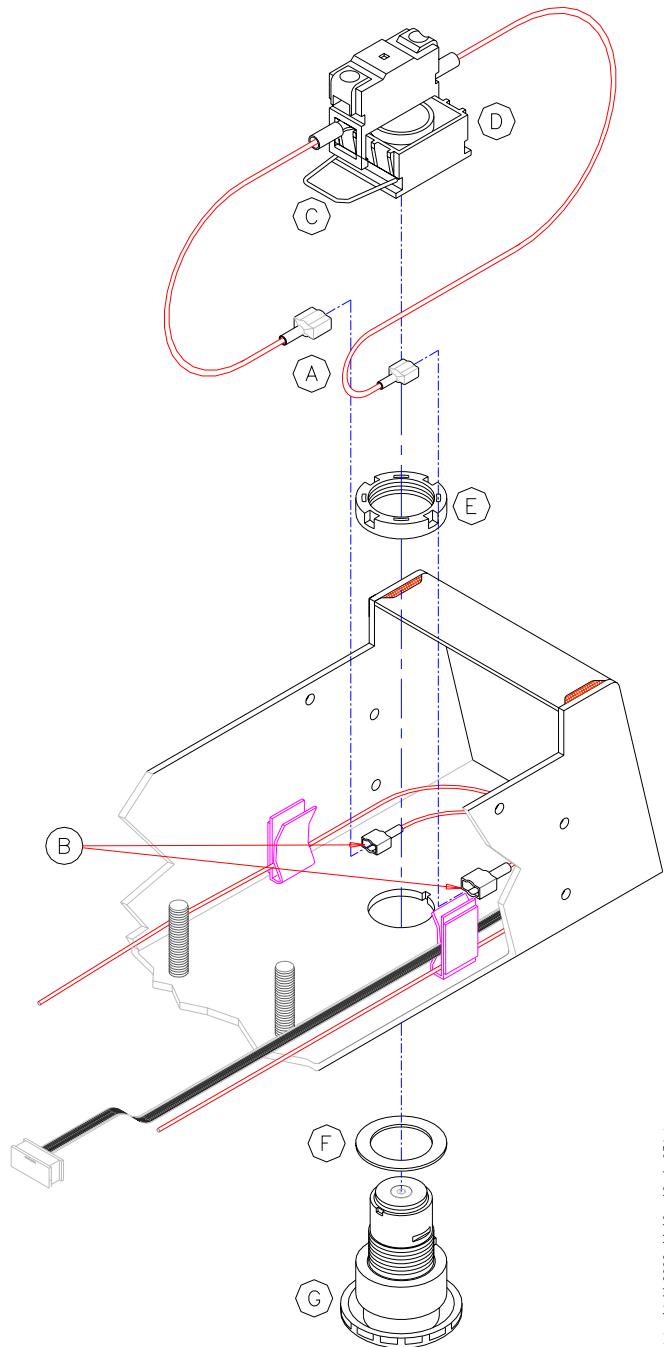


Figure 9

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3.7. Base Support

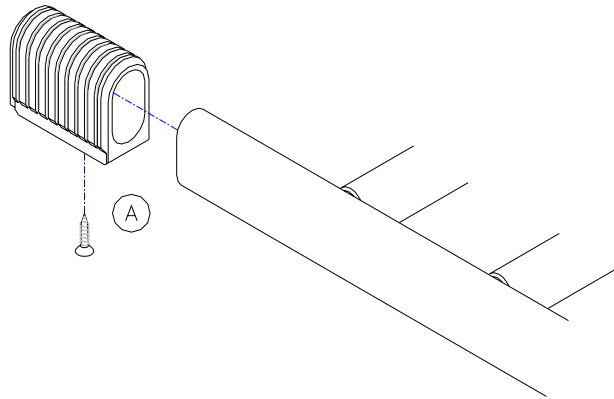
Kit Number: A0-00-1-022 (Rear Base Support)
A0-00-1-023 (Front Base Support)

Tools:

Phillips #1 Screwdriver

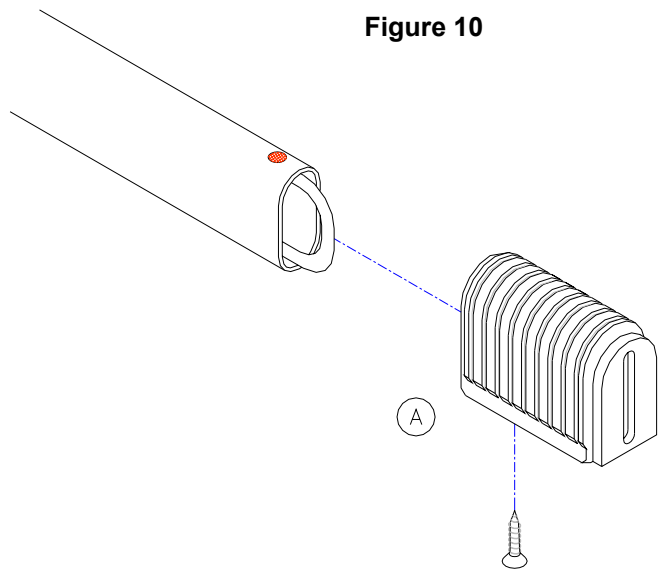
Figure 10 shows Rear Base Support, Figure 11 shows Front Base Support

1. Remove Screw (10/11-A) from underside of Base Support
2. Pull off Support from Base tube
3. Replace with new Base Support
4. Secure Base Support with Screw (10/11-A)



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Figure 10



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Figure 11

3.8. Base (incl. Supports)

Kit Number: A0-00-1-024

Tools:

Allen Key 2 mm

Allen Key 5 mm

Open End Wrench 13 mm

Loctite Adhesive #242 (1312)

NOTE: These instructions can also be followed to transfer an **APT-1** unit from a base to a stand or the other way round.

1. Secure **APT-1** in flat position upside-down on table
2. Remove Underbody cover, see 3.1
3. Hold Nylock Nut (12-A) on inner side of Securing Knob (12-B) with wrench
4. Remove Securing Knob (12-B) by unscrewing (turning counter-clockwise) from Nut (12-A) and **APT-1** body and remove Washer (12-C)

NOTE: Keep parts for reassembly

5. Open Axis Nuts (12-C) on each side of **APT-1** and remove. Base can now be separated from Body
6. Assemble new Base on Body
7. Secure assembly with Axis Nuts (12-D)
8. Place Washer (12-C) on Securing Knob (12-B)
9. Hold Nylock Nut (12-A) with wrench and screw Securing Knob (12-B) on Nut
10. Reassemble Underbody Cover, see 3.1

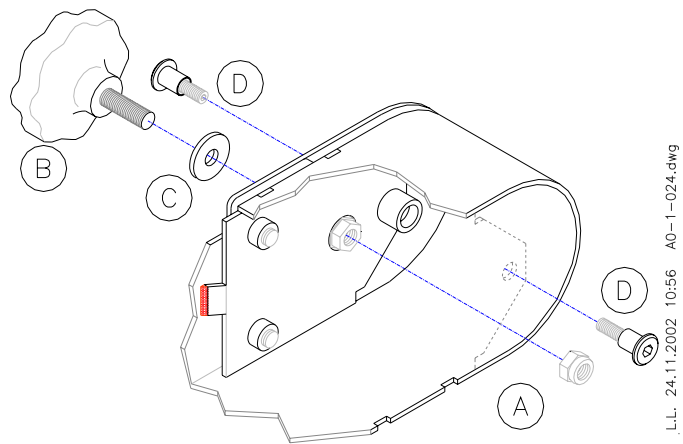


Figure 12

3.9. Body Assembly

Kit Number: A0-00-1-026

Tools:

Allen Key 2 mm

Allen "T"-Key 2.5 mm

Allen Key 5 mm

Small Flat Blade Screwdriver

Socket Wrench 10 mm

Open End Wrench 13 mm

Silicone Heat-sink Compound

Loctite Adhesive #242 (1312)

1. Remove following parts as described above:
 - a. Control Panel assembly
 - b. Under-body cover
 - c. Gear Motor with crank-arms
 - d. Controller circuit board
 - e. Base from **APT-1** body
2. Assemble components to new body in opposite order.

3.10. Cable + Pulley for Stand

Kit Number: A0-00-1-043 – Cable & Pulley

Kit Number: A0-00-1-049 – Trolley

Tools

Allen Key 5 mm

Omnifit M100 Adhesive

Rod 130 cm with securing clip

Wrench 10 mm

Open End Wrench 17 mm

1. Remove **APT-1** from Stand, see instruction 3.8
2. Open four Screws (13-A) and remove Transformer (13-B)
3. Open three Screws (13-C) and remove Transformer Holder (13-D)
4. Carefully remove Cable (13-E) from Stud (13-F) and prevent it from being pulled in Stand, see Figure 14
5. If necessary, remove Pulley (13-G) and replace by new one

NOTE: When Cable does not need be replaced, reassemble Transformer, see instruction 16 and onwards

6. Lead Cable (13-E) carefully into Stand
CAUTION: The Cable is connected to a powerful Spring (13-H) that will pull it inwards; be careful when releasing Cable into Stand

7. Open Nut (13-L) on one side and remove Rod (13-K)
8. Remove Cable (13-E) from Hook (13-M)
9. Pull out Tube (13-J) and Spring (13-H) with Cable (13-E)
10. Attach new Cable (13-E) to Hook (13-M), insert other end with Spring (13-H) in Stand and pull out on other side
11. Insert long Rod (15-A) (must be at least 130 cm long) with Securing Clip (15-B) in Stand and attach it to Cable

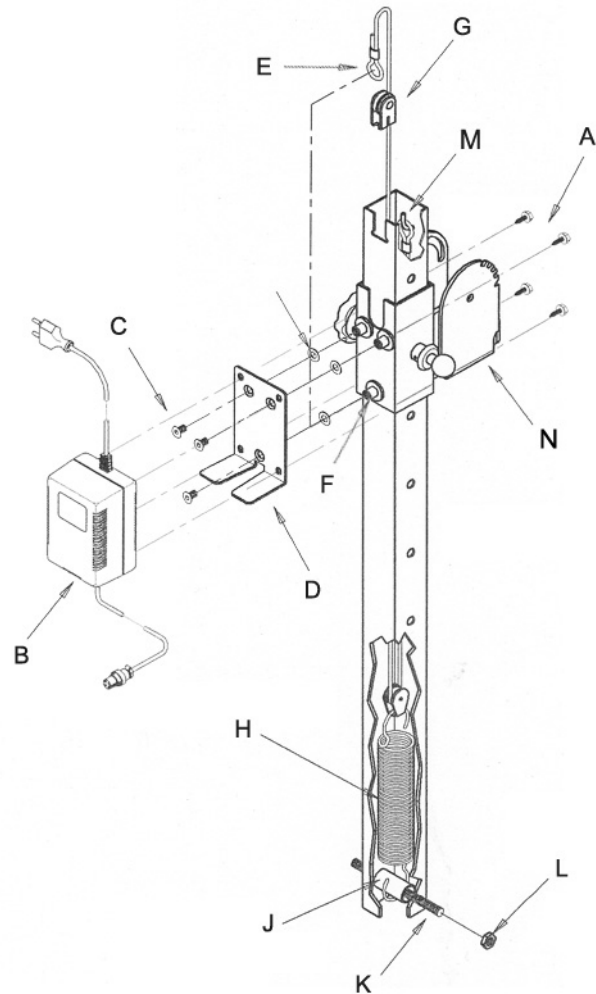


Figure 13

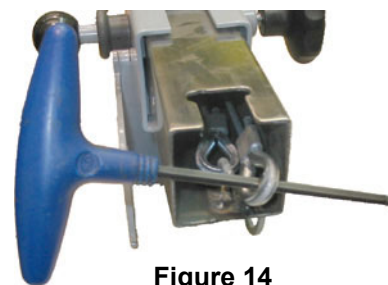


Figure 14

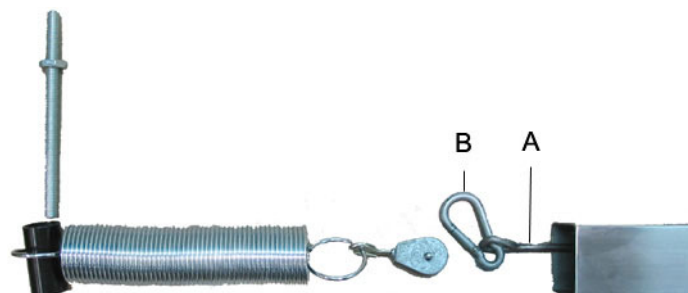


Figure 15

12. Gently pull Cable (13-E) in Stand, while Tube (13-J) is inserted in Spring (13-H), see also Fig. 3
13. Align Tube (13-J) with hole in Stand insert Rod (13-K) and secure with Nut (13-L)
14. Ensure that Trolley (13-N) is in its lowest position (closest to Spring)
NOTE: Attaching the Cable to the Trolley when it is in its top position seems easier but will give trouble later during use
15. Pull Cable (13-E) out of Stand by using the long rod
16. Attach eye of Cable (13-E) to Stud (13-F); ensure that Cable (13-E) runs smoothly over Pulley (13-G) and that the eye of Cable (13-E) sits secure over Stud (13-F)
17. Secure Transformer Holder (13-D) to Trolley (13-N) with three Screw (13-C)
18. Place Transformer (13-B) on Holder (13-D) and secure with four Screws (13-A)
19. Reassemble **APT-1** on Stand

3.11. Straps for Footrest

Kit Number: A0-00-1-050

1. Remove Straps
2. Insert new Straps, see Figure 16

NOTE: Ensure that the 50 cm strap is in the rear slots and the 40 cm strap in the front slots



Figure 16

4. INSTALLATION OF STAND

Tools:

Allen Key 5 mm

Open End Wrench 17 mm (2x)

1. Insert the four floor guides (17-F) into the *Left and Right Hand Base Frames*
2. Align the *Left and Right Hand Base Frames* on either side of the *Front Vertical Frame* (see Fig. 16)
3. Slide the *Threaded Bar* on the *Front Vertical Frame* into the front hole (17-A) of the *Left Hand Base Frame*, place the *Washer* in position and screw on the *Cap Nut* (do not tighten at this stage)
4. Repeat this procedure with hole (17-B) on the *Right Hand Base Frame*
5. Align the holes at the bottom of the *Rear Vertical Frame* with rear holes in the *Left and Right Hand Base Frames* (17-D & E)
6. Slide the *Threaded Bar* (17-G) through the holes, place the two *Washers* in position on either side and screw on the two *Cap Nuts*
7. Tip the *Rear and Front Vertical Frames* enough towards the back to slide the two tongues at the top of the *Rear Vertical Frame* into the top of the *Front Vertical Frame*. Straighten both frames
8. Tighten the set screw (17-C) with a 5 mm Allen Key by turning it in a clockwise direction
9. Ensure that all frame members are aligned correctly and finally tighten all four *Cap Nuts* using two 17 mm open end wrenches
10. Adjust the four floor guides (17-F) to level and stabilize the base
11. Adjust height of APT by releasing the locking pin on the left hand side; secure positioning by tightening the knob on the right hand side

NOTE: Inside the *Vertical Frame* is a spring that pulls the APT upwards.

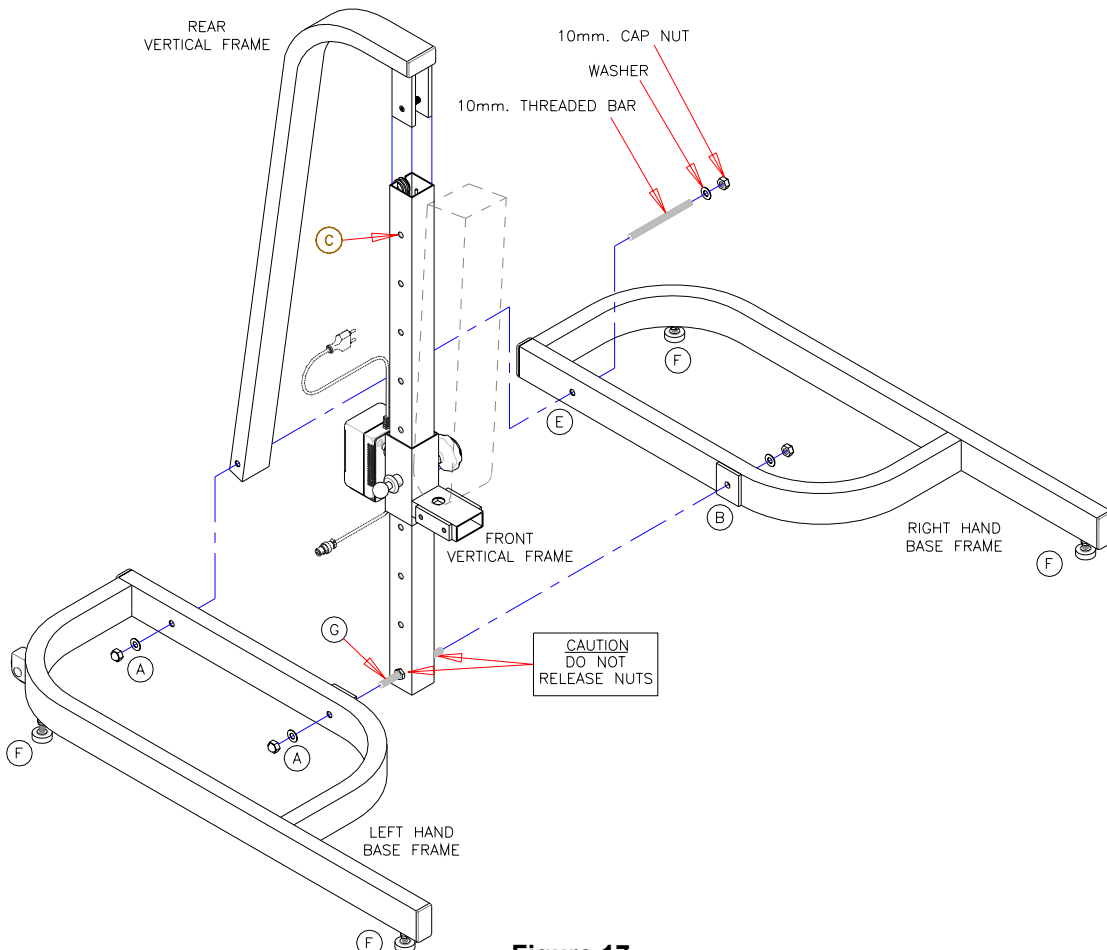


Figure 17

.L.L. 26.02.2002 08:50 Stand Assembly.dwg

5. FAULT FINDING

Tzora Active Systems provides for profound training in Fault Finding to the major distributors of the **APT-1**. Please contact the authorized Tzora Distributor in your country or Tzora for more information.

6. SPARE PARTS LIST

	Description	Part Number	Page
1	Control Panel Assembly	A0-00-1-005	8
	Control Panel Assembly for Remote Control	A0-00-1-006	
2	Body Cover	A0-00-1-001	7
3	Gear Motor with Crank-arms	A0-00-1-003	9
4	Controller Circuit Board	A0-00-1-004	10
5	Rear Base Support	A0-00-1-022	13
6	Front Base Support	A0-00-1-023	13
7	Base (including Supports)	A0-00-1-024	14
8	Body Assembly	A0-00-1-026	15
9	Power Supply 110V	A0-00-1-016	-
9a	Power Supply 110V for Stand	A0-00-1-017	-
10	Stop Switch	A0-00-1-034	12
11	Remote Control (not shown)	A0-00-1-018	-
12	Power Cable (+ male plug) (not shown)	A0-00-1-007	11
13	4P Female Plug (not shown)	A0-00-1-020	-
14	Finger protection disks (not shown)	A0-00-1-025	-
15	Cable + Pulley for Stand (not shown)	A0-00-1-043	16
	Trolley for Stand (not shown)	A0-00-1-049	
16	Straps for Footrest (Pair) (not shown)	A0-00-1-050	18

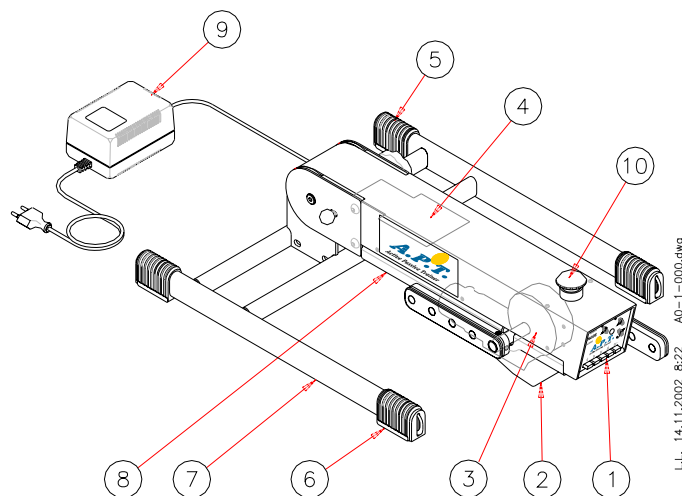


Figure 18

7. LIST OF TOOL TYPES

Screwdrivers:

Phillips #1

Flat Blade

Small Flat Blade

Allen Keys:

2 mm

2.5 mm ("T"-Key)

5 mm

Wrenches:

Socket Wrench 10 mm

Open End Wrench 13 mm

Open End Wrench 19 mm

Other Tools:

Long Nosed Pliers

Loctite Adhesive #242 (1312)

Silicone Heat-sink Compound

For safety and for warranty assurance reasons, any modifications and repair of the **APT-1** or its components must be performed exclusively by authorized personnel and exclusively with original spare parts.

The **APT-1** Active Passive Trainer and its accessories have been designed and manufactured in accordance with the specification of the following:

DIRECTIVE: Medical devices 93/42 EEC (Annex V)



Manufactured by:



Kibbutz Tzora 99803, ISRAEL
Web site: www.tzora.com

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