A.P.T.™

Active Passive Trainer

APT-5

Service Manual

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NOTE: Design details may change without notice

1. SYSTEM COMPONENTS AND DETAILS

1.1. *APT-5* unit (Figure 1)

1. Operator panel
2. Angle release knob
3. Angle securing knob (hidden)
4. Crank-arm
5. Power input socket
6. Heart Rate receiver 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
6. Remote Control

Figure 2

GENERAL MAINTENANCE AND INSPECTIONS

The rugged design of the **Active Passive Trainer 5** 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 5** may reduce or cancel the coverage of the manufacturer's warranty.

1.3. 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-5*****.** Please contact your authorized dealer. Only authorized personnel may carry out repairs.

1.4. Cleaning instructions

- Disconnect Power Supply and wipe dry with clean cloth.
  CAUTION: For safe disconnection of the ***APT-5 always*** take the mains plug out of the wall socket ***before*** removing the connector from the ***APT-5*** power socket.
- Take care not to allow water to enter the unit. Keep cables and electric components away from water and humidity.

1.5. Storage

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

2. REPLACEMENT INSTRUCTIONS

CAUTION: Disconnect Power Supply unit before replacement of any part of the ***APT-5***. For safe disconnection of the ***APT-5*** always take the mains plug out of the wall socket before removing the connector from the ***APT-5*** power socket.

2.1. Body Cover

Kit Number: A0-00-5-001

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 (3-B) and replace
   NOTE: Ensure that the Connection Ribbon on Control Panel (Fig. 4-*) does not get pinched
3. Tighten Screws (3-A)
   NOTE: Do not over-tighten screws

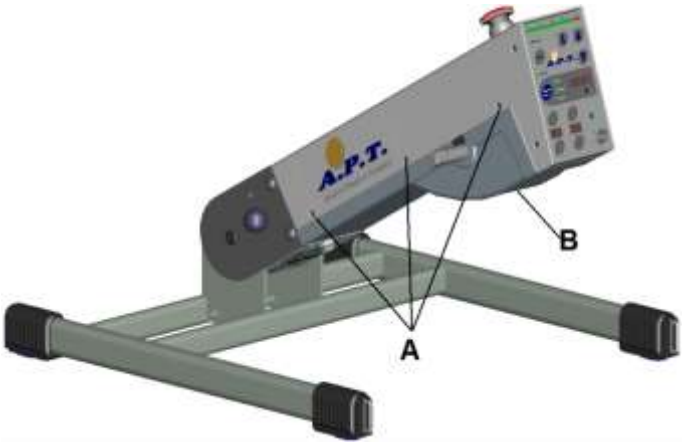

Figure 3

2.2. Control Panel

Kit Number: A0-00-5-003

Tools:
Allen Key 2 mm

1. Remove four Screws (4-A) from each side of Control Panel
2. Gently pull out Panel (4-B) and disconnect Control Cable Connector (4-C) and Heart Rate Connector Cable Socket (4-D) from sockets on rear side of Control Panel
3. Connect Control Cable and Heart Rate Connector Cable securely to new Control Panel
4. Secure Control Panel (4-B) with Screws (4-A)
   NOTE: Do not over-tighten Screws

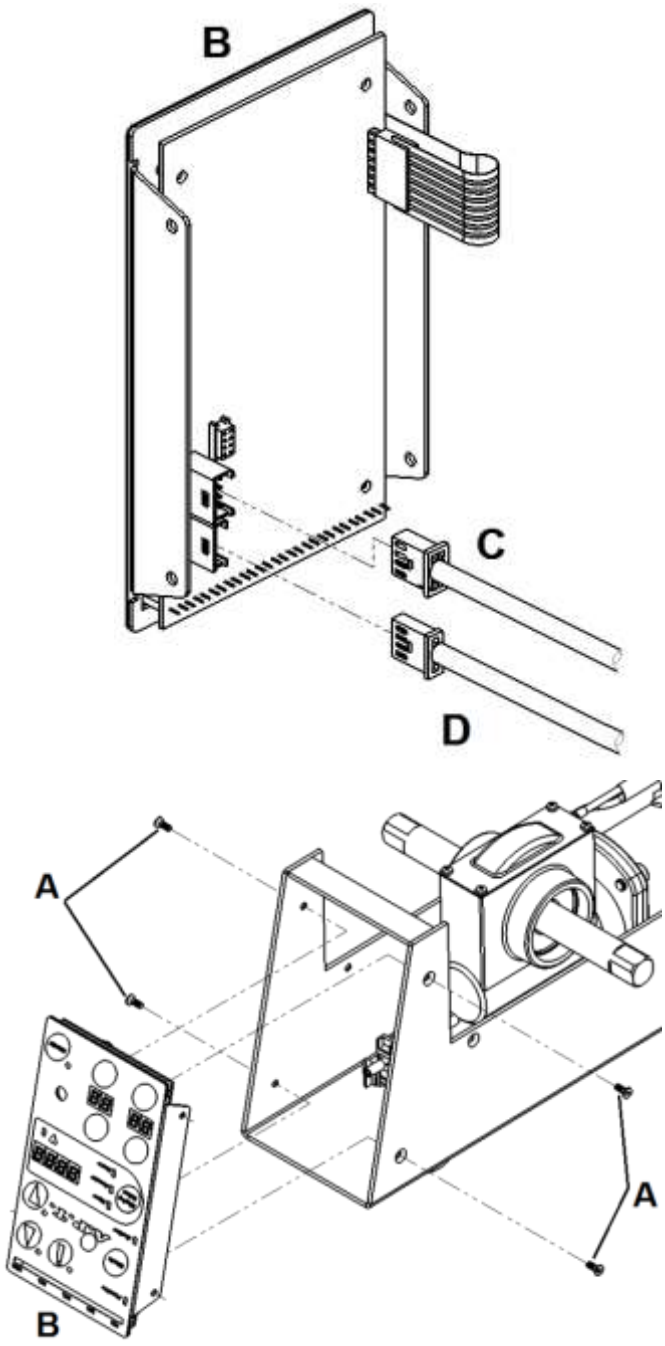

Figure 4

2.3. Gear Motor

Kit Number: A0-00-5-033

Tools:
Allen Key 2 mm
Socket Wrench 10 mm

1. Place ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Disconnect Motor wires (5-A) from Power PCB (5-B)
4. Disconnect Encoder connector (5-C) from Power PCB (5-D)
5. Remove four Nuts (5-E) that secure Gear Motor to ***APT-5*** body.
6. Lift out Gear Motor with crank-arms (5-F)
7. Secure new Gear Motor (5-F) to ***APT-5*** body with four Nuts (5-E)
   NOTE: Ensure that Wires do not get 'pinched' under Motor.
   NOTE: Do not overtighten Nuts (5-E) as this may detach Studs from body or cause paint on top of Body to crack.
8. Connect Encoder connector (5-C) to Power PCB (5-D) and Motor wires (5-A) to Power PCB (5-B)
9. Reassemble Underbody Cover, see 3.1

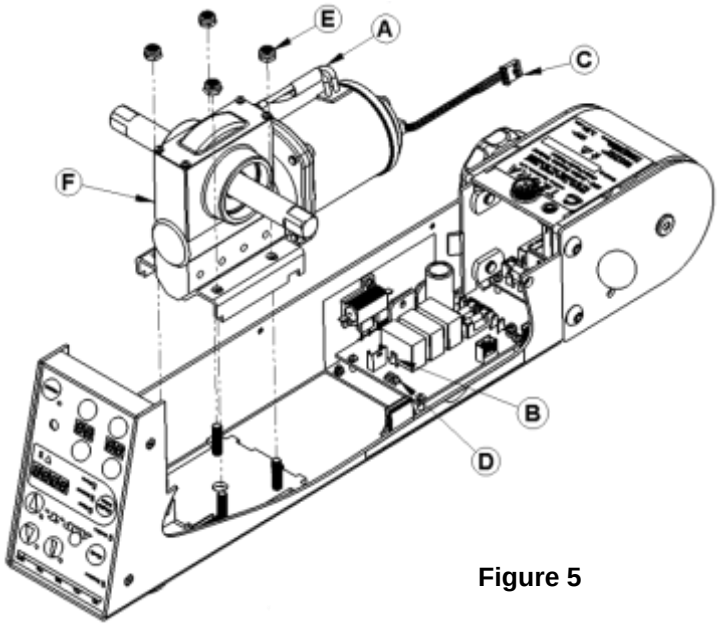

Figure 5

2.3. Power PCB

Kit Number: A0-00-5-006

Tools:
Allen Key 2 mm
Allen "T"-Key 2.5 mm
Socket Wrench 5.5 mm
Silicone Heat-sink Compound

1. Place ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Remove 3 Screws (6-A) and Underbody Cover Holder (6-B) on left hand side
4. Carefully disconnect from sockets/tabs on Power PCB:
   a. Encoder Connector (7-A)
   b. Motor Wires (7-B,C)
   c. Control Cable Connector (7-D)
   d. DC Cable Connectors (7-E)
   e. AC/Power Cable Connectors (7-F)
5. Remove Nuts (7-G) connecting Power PCB (7-H) to ***APT-5*** body
6. Lift Power PCB (7-H) from ***APT-5*** body, replace with new one and secure with Nuts (7-G)
7. Connect to sockets/tabs on Power PCB
   a. AC/Power Cable Connectors (7-F)
   b. DC Cable Connectors (7-E); ensure that red Cable is connected to tab indicated + and black Cable – to tab indicated -
   c. Control Cable Connector (7-D)
   d. Red Motor Wire (7-B) to tab indicated with red lable, black Motor Wire (7-C) to other tab
   e. Encoder Connector (7-A)
8. Secure Underbody Cover Holder (6-B) with Screws(6-A) to body
9. Reassemble Underbody Cover, see 3.1

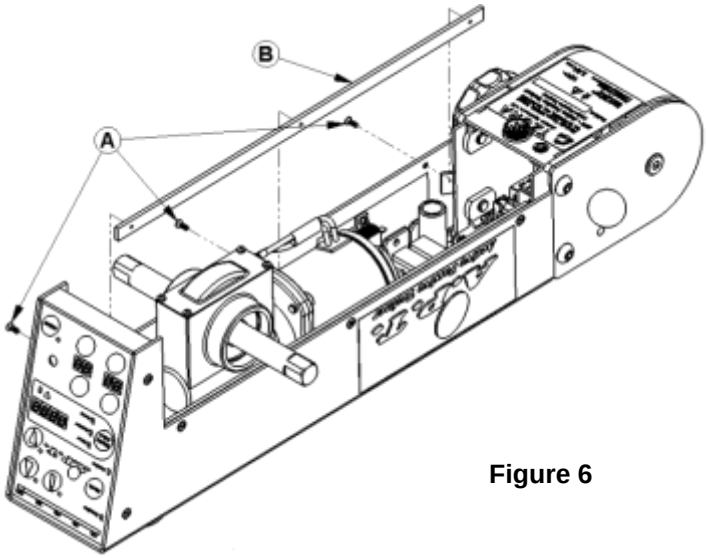

Figure 6

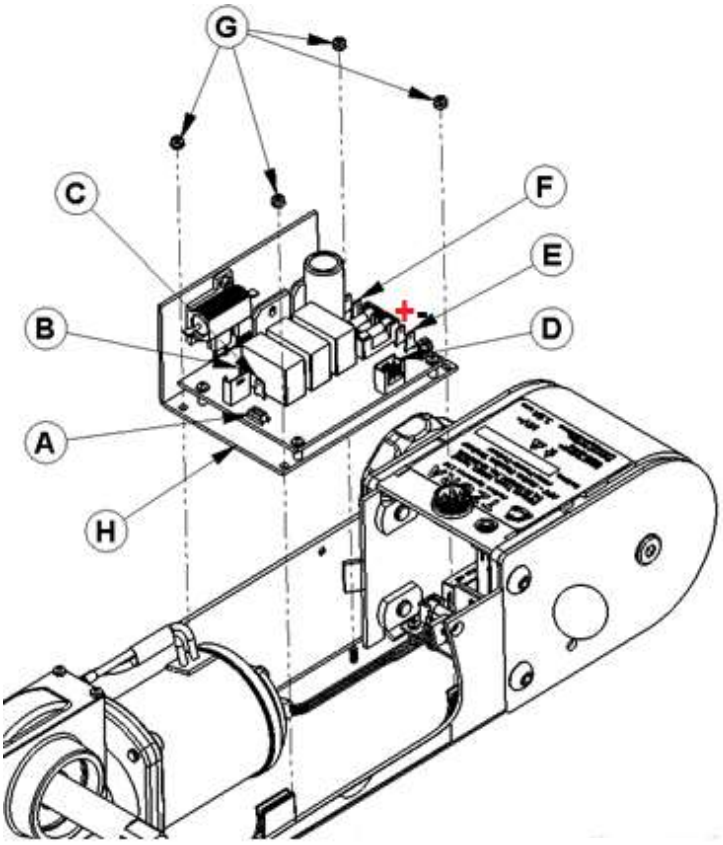

Figure 7

2.4. Fuses

Fuse 1.25A ***Kit Number A0-00-5-014***

Fuse 10A ***Kit Number A0-00-5-015***

Tool

Allen Key 2 mm

1. Place ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Remove Fuse (A = 1.25A, B = 10A)
4. Place new Fuse
5. Reassemble Underbody Cover, see 3.1

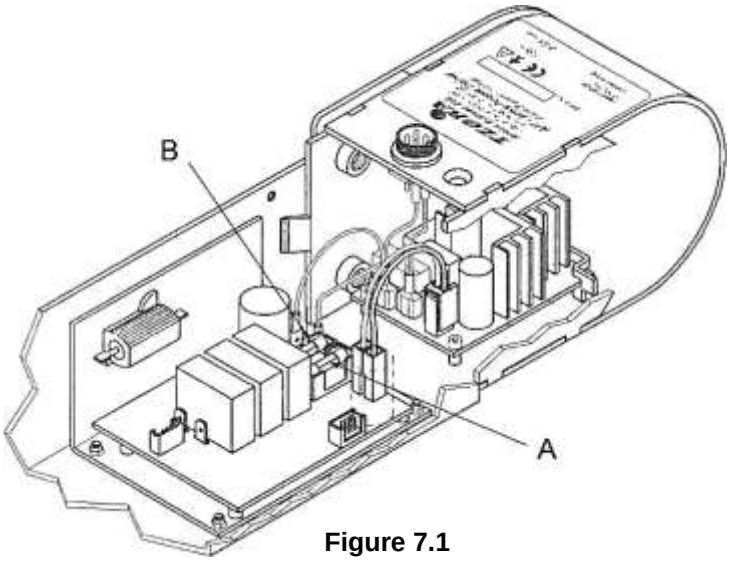

Figure 7.1

2.5. Transformer Circuit Board

Kit Number: A0-00-5-007

Tools:
Allen Key 2 mm
Allen Key 2.5 mm (Ball-end)
Loctite Adhesive # 262 (8219)

1. Secure ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Carefully disconnect DC Cable Connectors (8-A) and AC/Power Cable Connectors (8-B) from Transformer Circuit Board (8-C)
4. Unscrew Screws (8-D)
5. Carefully remove Transformer Circuit Board (8-C) and slide new one in slots (8-E) on both sides of body
6. Apply a drop of Loctite to Screws (8-D) and secure Transformer Circuit Board (8-C) to Body
7. Connect AC/Power Cable Connectors (8-B) and DC Cable Connectors (8-A) to Transformer Circuit Board (8-C); ensure that red DC Cable is connected to tab indicated with red lable
8. Reassemble Underbody Cover, see 3.1

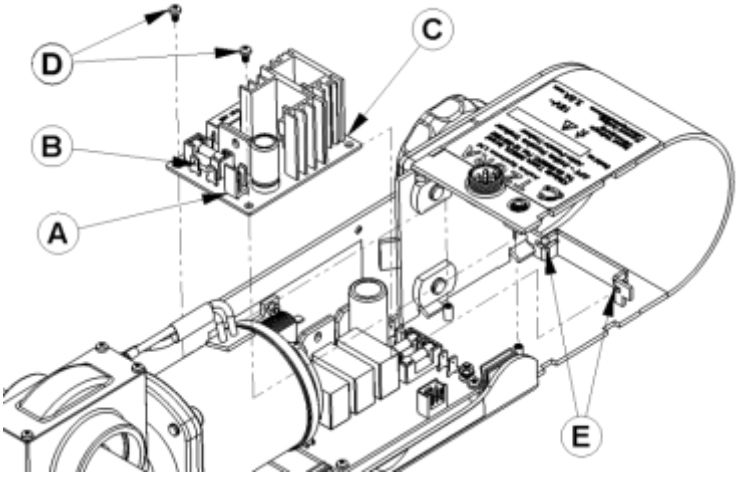

Figure 8

2.6. Control Cable

Kit Number: A0-00-5-008

Tools:

Allen Key 2 mm

1. Place ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody cover, see 3.1
3. Disconnect Control Cable Connectors from sockets on Control Panel (9-A) and Power PCB (9-B)
4. Remove Control Cable (9-C) from Cable Clips (9-D) and replace with new one
5. Connect Control Cable Connectors to sockets on Control Panel (9-A) and Power PCB (9-B)
6. Reassemble Underbody Cover, see 3.1

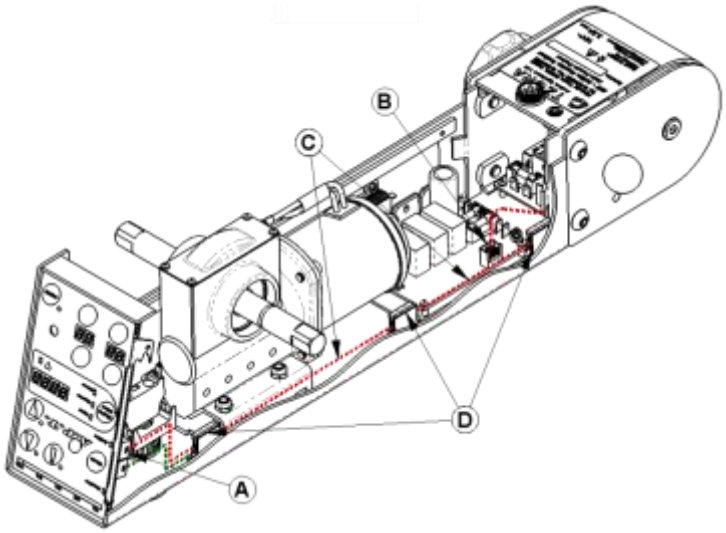

Figure 9

2.7. Power Cable (+ Male Plug)

Kit Number: A0-00-5-011

Tools:
Allen Key 2 mm
Philips #2 Screwdriver
Open End Wrench 19 mm

1. Place ***APT-5*** in flat position upside-down on clean table.
2. Remove Underbody Cover, see 3.1
3. Disconnect Power Connector from Transformer Circuit Board (10-A) and Power PCB (10-B)
4. Detach Wire Terminal (10-C) from Stop Switch and remove Wire from Cable Clips (10-D)
5. Unscrew Nut (10-E)
6. Remove Nut (10-E) and Spring Washer (10-F)
7. Remove Plug (10-G) with attached Power Cable and insert new one
8. Place Spring Wacher (10-F) and secure Plug (10-G) with Nut (10-E)
9. Connect Power Connector to Transformer Circuit Board (10-A) and Power PCB (10-B)
10. Guide Wire through Cable Clips (10-D)
11. Attach Wire Terminal (10-C) to Stop Switch and secure with Screw
12. Reassemble Underbody Cover, see 3.1

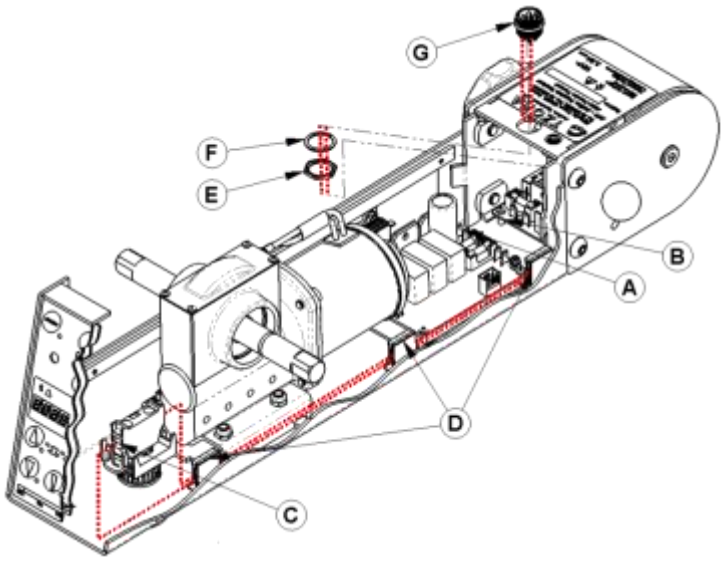

Figure 10

2.8. Heart Rate Connector + Cable

Kit Number: A0-00-5-009

Tools:
Allen Key 2 mm
Needle Nosed Pliers

1. Place ***APT-5*** in flat position upside-down on clean table.
2. Remove Underbody Cover, see 3.1
3. Disconnect Cable Connector (11-A) from socket on Control Panel
4. Remove Cable from Cable Clips (11-B)
5. Unscrew Nut (11-C) and remove Socket (11-D)
6. Secure new Socket (11-D) to body with Nut (11-C)
7. Guide Cable through Cable Clips (11-B)
8. Connect Cable Connector (11-A) in socket on Control Panel
9. Reassemble Underbody Cover, see 3.1

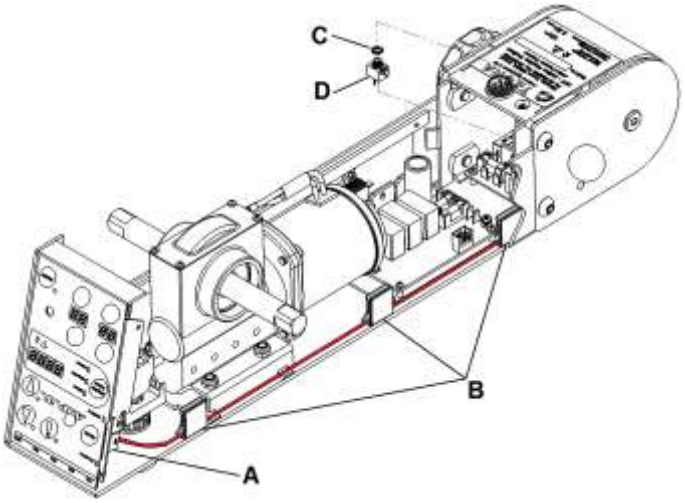

Figure 11

2.9. Stop Switch

Kit Number: A0-00-5-012

Tools:
Allen Key 2 mm
Screwdriver
Long Nosed Pliers

1. Place ***APT-5*** in flat position upside-down on clean table
2. Remove Underbody Cover, see 3.1
3. Slightly unscrew Screws (12-A) and disconnect Cable Terminals (12-B) from Stop Switch Body (12-C)
   NOTE: There is no need to remove Screws (12-A)
4. Open Retaining Lever (12-D) and remove Stop Switch Body (12-C)
5. Unscrew Nut (12-E) with Long Nosed Pliers
6. Remove Knob (12-G) and Washer (12-F) and insert new one
7. Secure Knob (12-G) with Nut (12-E)
8. Position Stop Switch Body in place and secure it with Retaining Lever (12-D)
9. Connect Cable Terminals (12-B) to Stop Switch Body (12-C) and secure with Screws (12-A)
10. Reassemble Underbody Cover, see 3.1

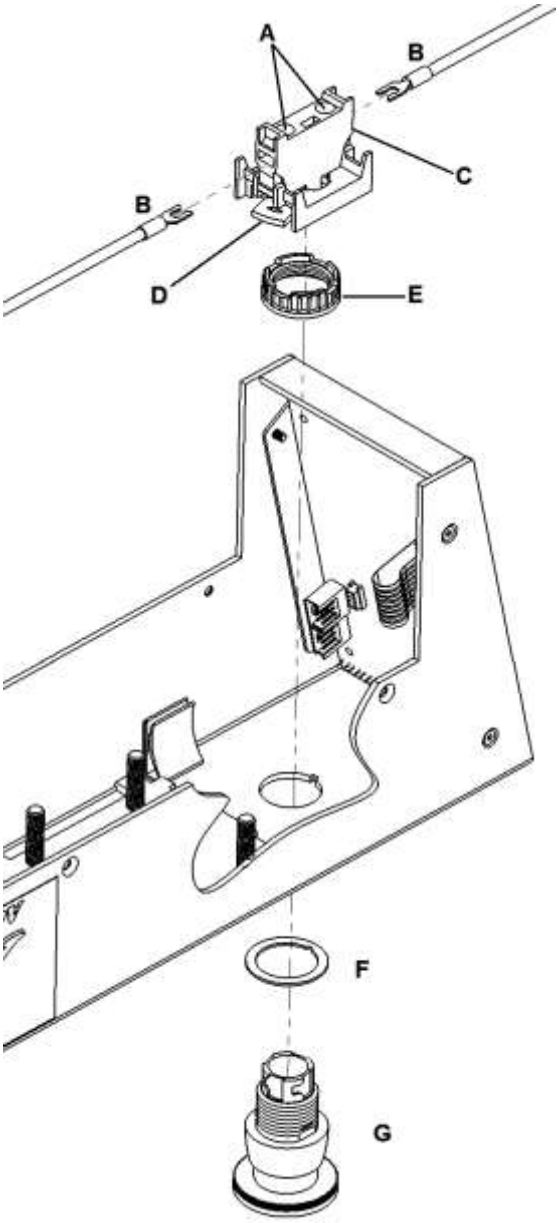

Figure 12

2.10. Base Support

Rear Base Support ***Kit Number: A0-00-1-022***

Front Base Support ***Kit Number: A0-00-1-023***

Tools:

Phillips #1 Screwdriver

Figure 13 shows Rear Base Support, Figure 14 shows Front Base Support

1. Remove Screw (13/14-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 (13/14-A)

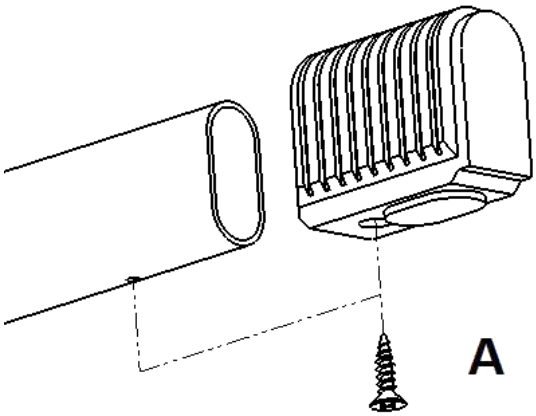

Figure 13

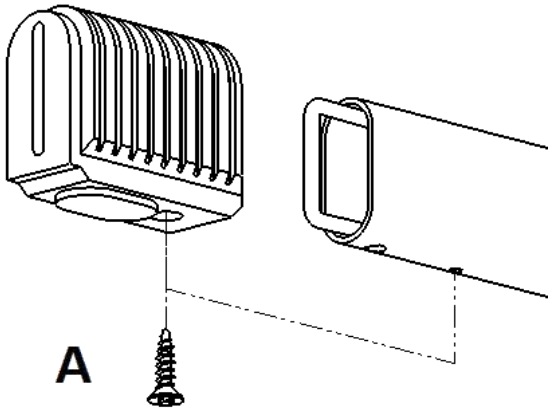

Figure 14

2.11. Base (incl. Supports)

Kit Number: A0-00-1-024

Tools:
Allen Key 2 mm
Allen Key 5 mm
Long Nosed Pliers
Loctite Adhesive #242 (1312)

NOTE: These instructions can also be followed to transfer an ***APT-5*** unit from a base to a stand or the other way round.

1. Place ***APT-5*** in flat position upside-down on table
2. Remove Underbody cover, see 3.1
3. Hold Nylock Nut (15-A) on inner side of Securing Knob (15-B) with pliers
4. Remove Securing Knob (15-B) by unscrewing (turning counter-clockwise) from Nut (15-A) and ***APT-5*** body and remove Washer (15-C)
   NOTE: Keep parts for reassembly
5. Open Axis Nuts (15-D) on each side of ***APT-5*** and remove. Base can now be separated from Body
6. Assemble new Base on Body
7. Secure assembly with Axis Nuts (15-D)
8. Place Washer (15-C) on Securing Knob (15-B)
9. Hold Nylock Nut (15-A) with pliers and screw Securing Knob (15-B) on Nut
10. Reassemble Underbody Cover, see 3.1

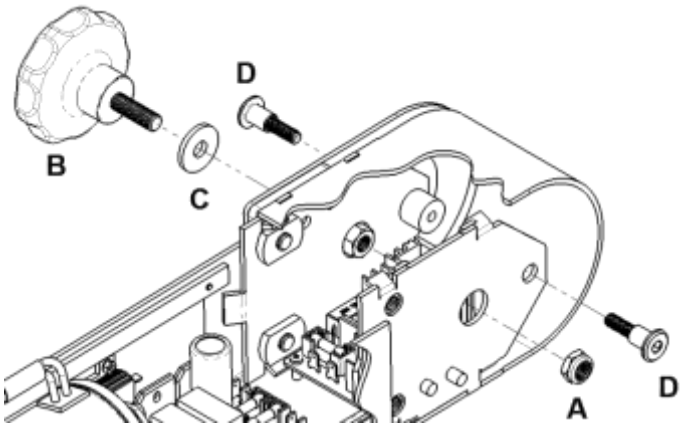

Figure 15

2.12. Body Assembly

Kit Number: A0-00-5-002

Tools:
Allen Key 2 mm
Allen “T”-Key 2.5 mm
Allen Key 5 mm
Small Screwdriver
Socket Wrench 5.5 mm
Socket Wrench 10 mm
Long Nosed Pliers
Needle Nosed Pliers
Silicone Heat-sink Compound
Loctite Adhesive #242 (1312)
Loctite Adhesive # 262 (8219)

1. Remove following parts as described above:
    a. Control Panel assembly
    b. Under-body cover
    c. Gear Motor with crank-arms
    d. Power PCB
    e. Transformer Circuit Board
    f. Base from ***APT-5*** body
2. Assemble components on new body in reverse order.

2.13. Trolley, Cable + Pulley for Stand

Kit Number: A0-00-1-043 Cable + Pulley

Kit Number: A0-00-1-062 Carriage

Tools

Allen Key 5 mm

Loctite #242 Adhesive

Rod 130 cm with securing clip

Wrench 10 mm

Open End Wrench 17 mm

1. Remove ***APT-5*** from Stand, see instruction 3.12
2. Remove the Transformer (16-A) held in place with “Velcro” patches.
3. Open three Screws (16-B) and remove Transformer Holder (16-C) and Washers (16-D).
4. Carefully remove Cable (16-E) from Stud (16-F) and prevent it from being pulled in Stand, see Figure 17
5. If necessary, remove Pulley (16-G) and replace with new one.
   NOTE: When Cable does not need be replaced, reassemble Transformer, see instruction 16 and onwards
6. Lead Cable (16-E) carefully into Stand
   CAUTION: The Cable is connected to a powerful Spring (16-H) that will pull it inwards; be careful when releasing Cable into Stand
7. Open Nut (16-L) on one side and remove Rod (16-K)
8. Remove Cable (16-E) from Hook (16-M)
9. Pull out Tube (16-J) and Spring (16-H) with Cable (16-E)
10. Attach new Cable (16-E) to Hook (16-M), insert other end with Spring (16-H) in Stand and pull out on other side
11. Insert long Rod (18-A) (must be at least 130 cm long) with Securing Clip (18-B) in Stand and attach it to Cable

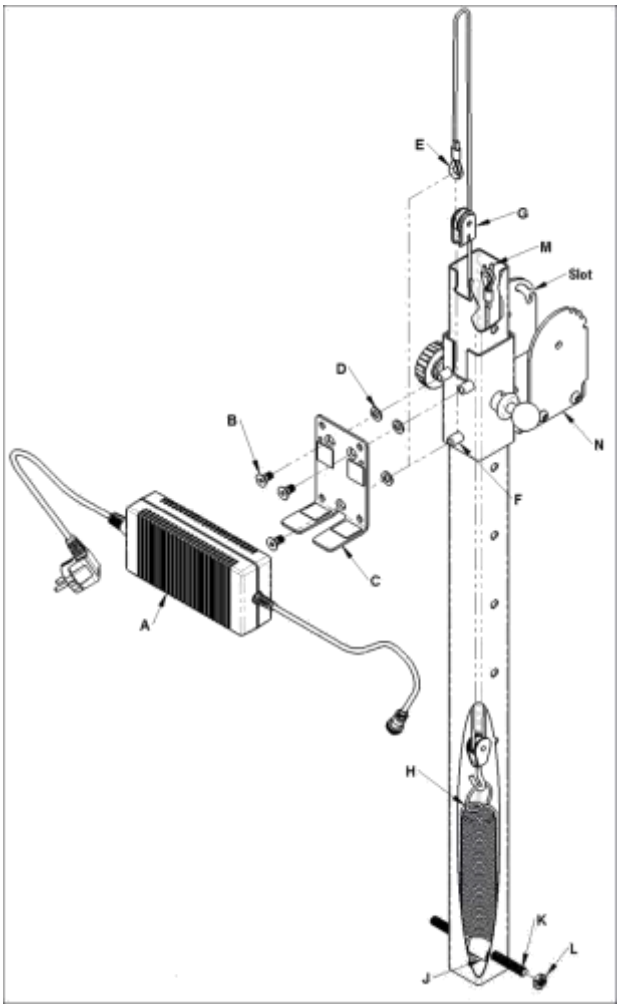

Figure 16

Figure 17

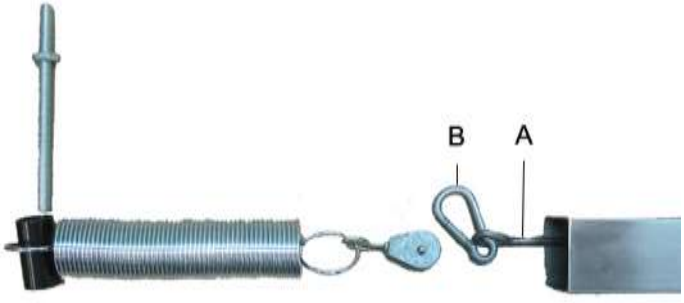

Figure 18

12. Gently pull Cable (16-E) in Stand, while Tube (16-J) is inserted in Spring (16-H), see also Fig. 3
13. Align Tube (16-J) with hole in Stand insert Rod (16-K) and secure with Nut (16-L)
14. Ensure that Trolley (16-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 (16-E) out of Stand by using the long rod
16. Attach eye of Cable (16-E) to Stud (16-F); ensure that Cable (16-E) runs smoothly over Pulley (16-G) and that the eye of Cable (16-E) sits secure over Stud (16-F)
17. Secure Transformer Holder (16-C) to Trolley (16-N) with three Screws (16-C) and Washers (16-D)
18. Place Transformer (16-A) on Holder (16-C) and secure with Velcro patches.
19. Reassemble ***APT-5*** on Stand

2.14. Straps for Footrest

Kit Number: A0-00-1-018 Rear Long Strap (50 cm.)
A0-00-1-049 Front Short Strap (40 cm.)

1. Remove old Straps
2. Insert new Straps.
   NOTE: Ensure that the 50 cm strap is in the rear slots (Figure 19-A) and the 40 cm strap in the front slots (Figure 19-B)

Figure 19

3. INSTALLATION OF STAND

Tools:

Allen Key 5 mm

Open End Wrench 17 mm (2x)

1. Insert the four floor guides (20-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. 20)
3. Slide the *Threaded Bar* on the *Front Vertical Frame* into the front hole (20-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 (20-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* (20-D & E)
6. Slide the *Threaded Bar* (20-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 (20-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 (20-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.

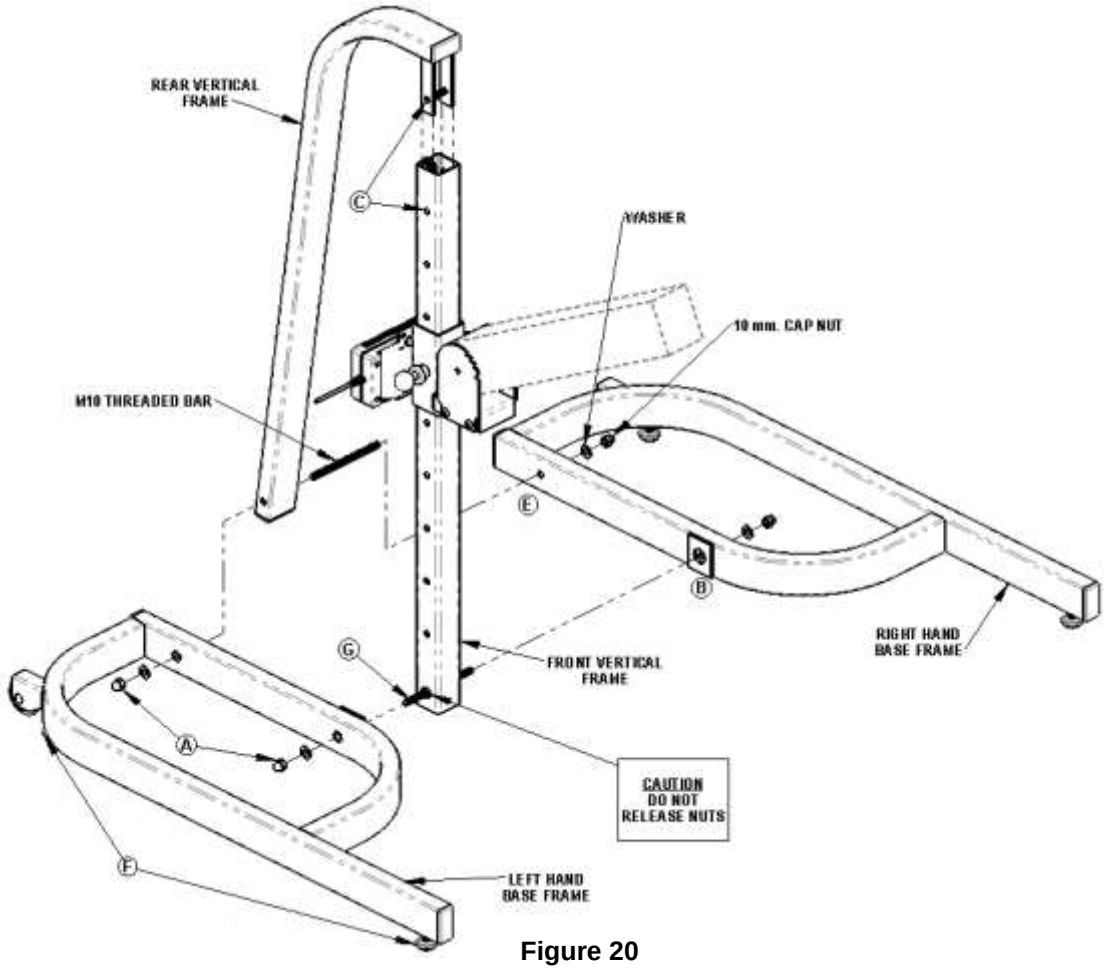

Figure 20

4. FAULT FINDING

Tzora Active Systems provides for profound training in Fault Finding to the major distributors of the ***APT-5***. Please contact the authorized Tzora Distributor in your country or Tzora for more information.

5. SPARE PARTS LIST

Part Number	Description	Page
A0-00-5-001	Body cover	8
A0-00-1-003	Control Panel Assembly	9
A0-00-5-032	Gear Motor with crank-arms	-
A0-00-5-033	Gear Motor	10
A0-00-5-006	Power PCB	11
A0-00-5-014	Fuse 1.25A	12
A0-00-5-015	Fuse 10A	12
A0-00-5-007	Transformer Circuit Board	13
A0-00-5-008	Control Cable	14
A0-00-5-031	Power Cable (+ Male Plug)	15
A0-00-5-009	Heart Rate Connector + Cable	16
A0-00-5-012	Stop Switch	17
A0-00-1-022	Rear Base Support	18
A0-00-1-023	Front Base Support	18
A0-00-1-024	Base (including Supports)	19
A0-00-5-002	Body Assembly	20
A0-00-1-043	Cable + Pulley for Stand	21
A0-00-1-062	Carriage for Stand	21
A0-00-1-018	Rear Long Strap for Footrest & Calf Support (50 cm)	23
A0-00-1-019	Front Short Strap for Footrest (40 cm)	23
A0-00-1-050	Straps for Footrest	23
A0-00-1-015	Power-supply 230V	5
A0-00-1-017	Power-supply 230V for Stand	5
A0-00-1-020	4P Female Plug for Power Supply	-
A0-00-1-025	Finger protection disks	5

6. 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 5.5 mm
Socket Wrench 10 mm
Open End Wrench 13 mm
Open End Wrench 17 mm
Open End Wrench 19 mm

Other Tools:

Long Nosed Pliers
Needle Nosed Pliers

Loctite Adhesive #242
Silicone Heat-sink Compound

For safety and for warranty assurance reasons, any modifications and repair of the ***APT-5*** or its components must be performed exclusively by authorized personnel and exclusively with original spare parts.

The ***APT-5*** 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)

CE 0123

TZORA Active Systems Ltd

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

EC REP

MDI Europa GmbH
Langenhagener Straße 71,
D-30855 Langenhagen,
Germany