



Huntleigh
A K R O N



AKRON[®]
ATP9 Traction Machine
Model
ATP9

SERVICE MANUAL

794-022

Huntleigh Akron ATP9 Traction Machine

Maintenance and Service Manual

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ATP9 Traction Machine

1. Specification

Self contained traction unit with standard footprint providing seven programmes:

1. Static
2. Progressive - Regressive, Static
3. Intermittent
4. Regressive with Stepped Intermittent
5. Regressive Intermittent
6. Cyclic Intermittent
7. Cyclic with Static

The unit is self checking and self diagnostic (fault codes are explained on page 12)

The unit has user-defined options:

Treatment Time	0-99 mins
Hold Time	0-99 seconds
Rest Time	0-99 seconds
High Force	2-100 Kg
Low Force	0-98 Kg

The force scale of the unit is:

- 1 Kg increments between 1 and 20 Kg
- 2 Kg increments between 20 and 100 Kg

If the force is set above 20 Kg an audible warning activates. In addition there is also a patient safety switch and audible alarm function.

Dimensions:	Width 26 cm
	Length 43 cm
	Height 16.5 cm
	Weight 12 Kg

Electrical Information:	230 volts & 115volts Current - 100VA
	Classification - Class I Type B
	Fuse rating -2 x 3.15A (T) HRC

The unit provides protection against electric shock and is a Class I earthed appliance.

NOTE: All electrical checks MUST be carried out as part of regular maintenance by a suitably qualified person.

**“The CE Mark on this product demonstrates conformity
with the EC Directive 93/42/EEC.”**

1.1 Product Description

The ATP9 traction machine mounts on Akron traction tables and mobile traction stand. The traction force is applied to the patient using Akron traction harnesses.

The design consists of a low voltage DC motor and gearbox assembly, which drives a rope drum via a mechanical clutch to provide the traction force. This is mounted in a rigid steel chassis.

Mounted at the back of the chassis is a strain gauge beam assembly to which is attached the rope pulley. The traction rope which is fastened to the rope drum, passing over the pulley attached to the strain gauge beam and then out of the front of the chassis. The free traction rope end is fitted with a hook, which is attached to the Akron traction harnesses. As the motor drives the rope drum, the traction rope is wound on it. When all the slack in the traction rope is taken up the tension increases, applying traction force to the patient via the harnesses. The force is then measured by the strain gauge beam assembly and this value is then passed to the electronic control system. The primary control of the equipment is microprocessor based.

All functions carried out by the unit are determined by the microprocessor, with the exception of the patient interrupt switch and the safety rundown systems.

The safety rundown system acts as part of an independent secondary safety system in the event of a catastrophic microprocessor failure.

The microprocessor system embodies a series of checks on the tension set by the user and the actual tension recorded by a dual strain gauge system to ensure adequate control under all conditions.

The electronic hardware comprises three circuit boards, two of which contain all of the operational electronics, the third being an EMC filter for the motor.

The unit is powered from an AC Mains supply and is transformer isolated from the supply.

The ATP9 traction machine has been designed for use within the hospital / private clinic environment and has a planned working life of ten years.

The ATP9 may only be sold to professional qualified users and a comprehensive User Manual is provided.

1.2 Functional Design

The unit is microprocessor controlled with 3 PCB's. The main control board is placed on the LHS of the unit and incorporates the power regulator, the strain gauge amplifier, the micro controller, the motor drivers and display board interface. The display board is mounted beneath the control panel and a small suppresser PCB is mounted on the drive motor.

The transformer and mains suppresser are positioned at the right hand rear of the chassis. The Mains switch is positioned at the front of the chassis.

- a) Automatic zero calibration of strain gauges at zero tension occur at every start-up.
- b) Speed regulation is under software control.
- c) A power failure run-down feature is provided. The principle is that if the harness is under tension and a power supply failure is detected, the motor runs down for a pre-determined period. A re-chargeable battery is incorporated into the design to facilitate this.
- d) When treatment time reaches zero, the programme will immediately enter the rundown portion of the selected programme and the treatment time indicator change to PE (programme end). When zero tension is reached, the indication goes to 00 and the bleeper sounds to confirm that treatment is complete.
- e) A patient interrupt and call switch is fitted which returns the system to rest and calls the therapist under all conditions.
- f) Calibration mode is only accessible from inside machine.

1.3 Features and attributes

Front Panel - Controls and Indicators

- a) The low and high force setting is by means of front panel mounted potentiometers.
- b) All other control functions are by push button switch of a 'membrane' type built into the front panel.
- c) A 'bar graph' style display, shows the instantaneous force.
- d) The set force and the actual force are displayed by 60 segment bar indicators. The first 20 Kgs in 1 Kg divisions, the remaining 40 divisions are 2 Kg each. An audible indicator sounds when above 20 Kgs force is set.

- e) 7 programmes are available for front panel selection. Selection is by means of a single press switch which steps sequentially through the choices available.
- f) Hold and rest times range from 1 to 99 seconds and count down from their pre-set figure each time the function is called. The display is by 7 segment LED's. The Hold and Rest times settings are set by push buttons.
- g) The treatment timer ranges from 1 to 99 minutes and counts down from its pre-set figure during the treatment cycle. The display is by 7 segment LED's. When the treatment timer reaches zero, the programme immediately enters the rundown portion of the selected programme and the treatment timer indicator changes to display PE. When zero tension is reached, the indication goes to 00 and the bleeper sounds to confirm that treatment is complete.
- h) The mains switch/indicator is located below the front panel.

1.4 Safety Features

- a) A single tension cell with two full bridge strain gauges, each with separate amplifier.
- b) Watchdog system to reset microprocessor and blank front panel if attempting to execute 'nonsense' programme due to abnormal conditions.
- c) Half second delay on Start button to prevent accidental starting of treatment.
- d) Warning bleep when High-force is set above 20 Kg or 40 lbs.
- e) Comprehensive microprocessor based fault checking system to monitor operation and indicate the presence of the following faults:
 - i. Fault in range of High-force or Low-force controls, which could allow undefined strain to be applied.
 - ii. Excessive differences in strain gauge outputs indicating (impending) failure or overdue re-calibration.
 - iii. Excessive zero-offset in one or both strain gauge outputs, indicating (impending) failure or overdue re-calibration.
 - iv. Failure of motor to provide power or stop when instructed to do so.
 - v. Failure of rope to slacken when reduced tension required or vice-versa.
 - vi. Unintentional increase of High-force setting during treatment.
- f). Independent hardware based monitoring system overrides the microprocessor in case of failure and respond to:
 - i. Excess tension (using High-force setting as reference)

- ii. Patient Interruption (which fails safe when disconnected.)
- iii. Battery operated run-down of rope tension in the event of power failure.

2. Maintenance

All maintenance MUST be carried out by a qualified service engineer. Safety and calibration should be checked every six months. The battery for motor rundown function should be replaced every 12 months. Akron part No 182-060A

2.1 Safety Checks - Electrical

Disconnect machine from main supply.

The mains cable and plug should be examined for deterioration. Plug tops opened, connections and fuse ratings checked where applicable. Insulation resistance, earth continuity and Earth leakage current and enclosure leakage tests should be carried out using a PAT tester.

2.2 Safety Checks - Mechanical

2.2.1 Disconnect machine from main supply.

2.2.2 Remove cover by undoing the 10-M3 pan head screws.

2.2.3 Remove earth connection to cover.

2.2.4 Check the bottom bolt holding the mounting bracket to the chassis for tightness - tighten as necessary. The two bolts holding the strain gauge beam to the chassis are tightened to 15 ft/lbs and should not be adjusted.

2.2.5 Check the set screws holding the two bearing brackets to the chassis are tight - tighten if required.

2.2.6 Check the retaining screw and operating knob are tight on the clutch operating shaft - tighten if required.

2.2.7 Check bolt holding spring motor to the chassis - tighten if required.

2.2.8 Check bolts holding transformer to chassis - tighten if required.

2.2.9 Check correct operation of the clutch. If it is not free in action, oil lightly the shaft on which the clutch slides. The action should require firm pressure on the operating knob with no tension on the cord. If the action is still sticking or over tight, the clutch plate must be removed and the key way and key checked for burrs.

- 2.2.10 Check the cord drum clutch plate is secured firmly to the cord drum. If the retaining screws are loose, the clutch bearing bracket and operating mechanism must be removed, so that the four screws holding the clutch plate to the cord drum can be tightened. Re-assemble, lightly oiling the shaft under the sliding clutch plate boss.
- 2.2.11 Lightly oil both cord drum shaft bearings and clutch operating mechanism.
- 2.2.12 Check that the three screws securing the cord roller block to the front of the chassis are tight - tighten if required.
- 2.2.13 Check the two setscrews holding the top guide roller shaft are tight - tighten if necessary.
- 2.2.14 Check the two extension shafts are tight on the bottom guide roller shaft and tighten if necessary.
- 2.2.15 Inspect the traction cord for wear; if unduly frayed it should be replaced.

NOTE:- Only a genuine replacement traction cord should be fitted to this machine to maintain the safety and accuracy. (See Traction Cord Replacement - Section 6)

- 2.2.16 Fully extend the traction cord and reverse wind half a turn. Using a calibrated spring balance apply a **STEADY & INCREASING** tension to the rope in a straight line perpendicular to the front surface of the machine. The tension at which the clutch automatically disengages should be less than 4kgs.

NOTE:- It is essential for safe use of the ATP9 that the clutch mechanism operates correctly.

2.3 Calibration Check

- 2.3.1 A spring balance or measuring gauge of 100 Kgs (200 lbs) capacity and a resolution of 0.5 Kg (1 lb) is required).
- 2.3.2. Ensure the ATP9 traction machine is securely clamped to a table.
- 2.3.3. Attach the spring balance or measuring gauge securely to the traction table in a position which will allow the traction cord to be extended a minimum of 25 cm (12 ins).
- 2.3.4. Using the clutch, extend the traction cord and attach to the spring balance or measuring gauge.
- 2.3.5. Using the clutch, remove the slack from the traction cord; ensure that the traction cord is extended parallel to the ATP9 traction machine - if not, reposition the measuring device.

- 2.3.6. Connect the ATP9 traction machine to the mains supply and switch the supply and machine on.
- 2.3.7. To warm up the machine, select programme 3, set 'High Force' control to 60 Kgs (120 lbs), set 'Low Force' control to 10 Kgs (20 lbs), set 'Treatment Timer' to 10 minutes, set 'Hold Timer' to 10 seconds and 'Rest Timer' to 10 seconds.
- 2.3.8. Check ATP9 traction machine and measuring device is secure, press and hold 'Start/Cancel' button for 1 second.
- 2.3.9. The ATP9 traction machine should run the intermittent programme between 10 Kgs (20 lbs) and 60 Kgs (120 lbs) holding at the high force of 10 seconds and resting at the low force for 10 seconds. Allow the ATP9 traction machine to run for the 10 minutes set on the Treatment Timer.
- 2.3.10. Reset the treatment timer to 20 minutes. Set the 'Low Force' control to zero, set the 'High Force' control to 10 Kgs (20 lbs). Ensure that the measuring device is set to zero, press and hold the 'Start/Cancel' button for 1 second.
- 2.3.11. Observe the force reading on the measuring device - increase the 'Hold Timer' control if required to make high force reading.
- 2.3.12. Press both 'Treatment Timer' increase and decrease buttons simultaneously whilst increasing the 'High Force' setting by 10 Kgs (20 lbs).
- 2.3.13. Observe the force reading on the measuring device.
- 2.3.14. Repeat steps 11. and 12. until the full range of High Force settings have been checked.
- 2.3.15. Increase the 'Low Force' control in 5 Kgs (10 lbs) steps for the first 20 Kgs (40 lbs), observing the low force reading on the measuring device. If required, increase the 'Rest Timer' setting to allow time to obtain the reading.
- 2.3.16. The ATP9 traction machine should be checked with various combinations of Low and High Force settings, remembering to press the treatment time increase and decrease buttons simultaneously whilst increasing the High Force setting.
- 2.3.17. Force readings obtained should be within 5% of the force values set.
- 2.3.18. If readings with a variance of over 5% are recorded, check the following before re-testing:
 - (a) The traction cord comes straight out and is both parallel horizontally to the base and side of the ATP9 traction machine. The cord should not rub on top or bottom guide roller or on either side.

- (b) Ensure that the calibration of the measuring device is valid.
- (c) Ensure that the measuring device is correctly zero-ed.
- (d) Ensure that the traction cord goes straight to the measuring device and not around a pulley.

2.3.19. Re-check calibration as per section (6. - 16.) if variances over 5% are still obtained - refer to Re-calibration of Strain Measurement. (Section 3).

3. Re-calibration of Strain Measurement

3.1 Equipment Required:

- 3.1.1 Digital Volt Meter (DVM) with resolution of greater than 1mV below 1volt.
- 3.1.2 Spring Balance or Tension Measuring Gauge of 100 Kgs (200 lbs) capacity and a resolution of 0.5 Kg (1lb.)
- 3.1.3 Connector to short pins 1 to 2 and 3 - 4 on PL8
- 3.1.4 Potentiometer adjustment tool
- 3.1.5 Suitable method of securing the traction machine.

3.2 Re-calibration Procedure

The procedure is in two parts:

- 3.2.1 Adjusting the strain gauge system at zero tension.
- 3.2.2 Calibrating the system at a known tension.
- 3.2.3 Entering Calibration mode.
- 3.2.4 The control board is hinged at the lower end to allow it to be rotated to the horizontal position after removing the top retaining nut. All of the adjustment potentiometers are located along the outer edge.
- 3.2.5 On PL8 both the pins 1 - 2 and pins 3 - 4 should be shorted.
- 3.2.6 Ensure that the rope is completely slake.
- 3.2.7 Hold the push button on the control board and switch on the unit.

3.2.8 Keep the button depressed until the LED's on the front panel have flashed on and off.

3.2.9 Release the button.

3.2.10 At this point the traction machine is in calibration mode.
The front panel display will show the two strain gauge readings in the hold time windows. The treatment timer window will show “ t _“

3.3 Zero force adjustment.

3.3.1 Connect the DMV negative to TP9

3.3.2 Measure at TP7 and adjust VR1 to give a reading of $0V \pm 1mV$

3.3.3 Measure at TP10 and adjust VR4 to give a reading of $0V \pm 1mV$

3.3.4 Measure at TP8 and adjust VR3 to give a reading of approximately 0.16V
(0.15V to 0.17V would be adequate)

3.3.5 Measure at TP11 and adjust VR6 to give a reading of approximately 0.16V

3.3.6 Remove the connection from PL8 on the control board.

3.3.7 The front panel display will show gauge readings of near zero.

3.3.8 Adjust VR3 to set the left hand display to zero with decimal point just flickering

3.3.9 Adjust VR6 to set the right hand display to zero with the decimal point just flickering

3.4 Calibrating to a known tension

3.4.1 Connect the rope to a tension measuring system.

3.4.2 Set the “High Force” control fully clockwise.

3.4.3 The “Timer Up/Down” buttons will run the motor to increase and decrease the rope tension.

Note: The next calibration step has to be carried out fairly quickly. The method is to set a known tension on the rope and to adjust VR2 until the left hand display registers the correct tension. As the machine is not in direct control of this tension, it will gradually reduce as the rope and pulley system react to the applied force. Also, to avoid hysteresis effects from the rope, it is necessary that the tension on the rope is

increased from zero to the required value and not decrease to it. If for some reason the tension is set too high and has to be reduced it should be reduced to zero before again being increased to the required value.

- 3.4.4 Using the “Timer Up” button run the motor to increase the rope tension. Aim for a tension in whole Kg between 50Kgs & 60 Kg. eg 51,52,53 etc.
- 3.4.5 When a suitable tension has been achieved, as quickly as possible, adjust VR2 until the left hand display records that tension.
- 3.4.6 Having adjusted the first strain gauge, it doesn’t matter if the tension gradually changes.
- 3.4.7 Carefully adjust VR5 until the right hand display accurately matches the left hand display.
- 3.4.8 Check that the “Timer display” is indicating “t---”
- 3.4.9 Switch off the machine and check that it displays “AC” and runs the motor to reduce the tension to zero.

4. Fuse Functions

4.1 Mains Fuses

These are wired in the mains input circuitry and protect the transformer primary winding and mains wiring from fault conditions. Under all but the most severe fault conditions, these fuses should remain intact. Connecting a 115-volt machine to a 240V supply will cause these two fuses to blow fairly instantly, as witnessed by obvious blackening on the inside of the cartridge.

Mains Fuses 230v - Fuse Rating – 2 x 3.15A (T) HRC

115v - Fuse Rating – 2 x 3.15A (T) HRC

4.2 Internal Fuse Values

F1 = 8A (F) Battery Fuse

F2 = T8A (T) Main DC supply fuse

F3 = 4A (F) Motor supply fuse

F4 = 2A (T) Electronics supply fuse

5. Guide to Fault Codes

The unit has a built-in fault-reporting system that provides an indication of any abnormal conditions detected. The indication takes the form of a flashing ‘F’

alternating with a flashing number, displayed in place of the treatment time. The numbers that could be displayed are listed below, together with checks that can be made to identify associated problems.

The sounding alarm accompanying a fault indication can be cancelled by a single press of the START/CANCEL button.

1 - EPROM Checksum Failure (Audible “pip” only. No code can be displayed)

One or more bytes of EPROM data are corrupt.

Possible causes :

1. Wrong EPROM.
2. Damaged EPROM.
3. Data corruption due to data/ address bus fault.

2 - RAM Failure (Audible 2 “pips” only. No code can be displayed)

One or more bytes of RAM have failed a write/ read test.

Possible causes :

1. Damaged RAM.
2. Data corruption due to data/ address bus fault.

03 - Power up reset or ADC reference Failure.

Failure of the power up reset generator or the ADC reference.

04 - Power Supply Failure.

The +8V and/ or -10V supplies are out of limits.

05 - CPU reset.

CPU reset occurring since normal power on. May indicate an imminent machine failure or could be by excessive outside interference.

06 - Motor Bridge drive supply voltage too low.

Failure of the supply circuit. Could also be caused by excessively low Mains voltage.

AC - AC Mains Failure.

The mains has failed or been turned off during the treatment cycle. The internal battery will maintain operation until the rope tension has been released.

08 - Motor Power Supply Failure.

Failure of a component in the motor drive supply including fuse F3. If F3 has blown, investigation is required into the motor drive system.

09 - Battery Failure.

The battery is out of limits or fuse F1 has blown.

Possible causes :

1. Charging circuit faulty cause the battery to become discharged.

2. Battery failure.
3. If F1 has blown it would indicate a component failure requiring further investigation.

PI - PATIENT-INTERRUPT control activated.

Although not a fault as such, this indication is provided when the PATIENT INTERRUPT control is operated as a reminder that further operation of the unit is not possible without first performing a power-up reset.

20 - Safety system activated.

The independent safety system has removed control from the CPU and enacted a tension release. It can have a variety of causes.

Note: It is possible for this condition to occur if the high force control is turned down rapidly during a treatment cycle.

30 - Excess Tension detector activated.

Detection of a tension in excess of that set for longer than a preset period. This has a variety of causes. The note above also applies.

HF - Change to High Force Setting during treatment cycle.

This is a normal action of the machine if the high force setting is changed to a higher force during a treatment cycle.

35 - High Force control setting failure.

The signal from the control is outside the valid limits. Indicates a failure of the control or associated components.

40 - Strain-gauge mismatch - Channel 1 < channel 2.

This indicates either that one or both of the channels are wildly out of adjustment or that channel 1 has failed in some way. It could also indicate that the cord was positioned on its pulley in such a way that the strain-gauge beam was being twisted, thus applying more stress to one channel than the other.

41 - Strain-gauge mismatch - Channel 1 > channel 2.

This indicates either that one or both of the channels are wildly out of adjustment or that channel 1 has failed in some way. It could also indicate that the cord was positioned on its pulley in such a way that the strain-gauge beam was being twisted, thus applying more stress to one channel than the other.

45 - Strain-gauge fault - Channel 1 excessive offset.

46 - Strain-gauge fault - Channel 2 excessive offset.

50 - Ext. zero-tension detector fail - threshold too high.

51 - Ext. zero-tension detector fail - threshold too low.

The occurrence of either of these two faults indicates that the zero-tension detector has failed to operate at the point expected as the cord tension varies at low values.

60 - Motor running when set to off.

Possible causes:

1. Motor drive bridge
2. Drive feedback system.

61 - Excessive Motor current.

Generally caused by a mechanical failure causing a stalled rotor condition.

62 - Zero Motor current when set to on.

Possible causes:

1. Worn motor brushes.
2. Failed fuses.
3. Failed wiring.

70 - Reverse - tension change.

The system is seeing a reverse change in tension i.e. a decrease when an increase is expected or a increase when a decrease ins expected.

Possible causes:

1. Motor connected incorrectly; check that the polarised plug on the control board has not been forced on incorrectly.
2. A mechanical problem where by the rope is being wrapped around the capstan in the reverse direction.

71 - Cord drive fault - tension not changing.

The tension is not changing even though the motor appears to be running.

Possible causes:

1. Excessive slack rope at the beginning of a treatment cycle.
2. Failure of the mechanical drive system.

6. Traction Cord Replacement

6.1 Only replace with genuine Akron Traction Cord & Hook assemble Part No 2H7101Z .

6.2 First fully extend existing cord and cut off traction hook.

6.3 Temporarily join the cut end of the existing cord to the end of the new cord, binding them together with sewing thread.

6.4 Cut the old cord at its attachment point to the cord drum and gently pull the old cord through the traction machine, drawing the new cord through the rollers and round the cord pulley.

6.5 Remove old cord completely by undoing thread and feed new cord through hole inside of cord drum, first having removed the knot from the old cord.

6.6 Draw new cord out through side of pulley and tie firmly a knot close to the end.

6.7 Trim cord to within half an inch of knot, seat knot in edge of cord drum, by gradually increasing tension in the traction cord.

6.8 Check end of cord is tucked well into the edge of the cord drum with the knot.

6.9 Holding the cord hook, release the clutch and gradually let the cord retract - check for free movement of the cord in both directions.

WARNING

DO NOT use the ATP9 Traction Unit if red marker on cord is visible.

DO NOT pull rope out beyond the red marker as this could cause malfunction.

The red marker on the rope indicates the maximum rope length.

7. Repair

First-line maintenance of these units is generally confined to re-calibration and fuse replacement. In addition, an ability to interpret the fault-code indications is helpful in determining whether an alleged fault is due to a spurious or operator-induced condition, rather than a genuine failure of the unit.

If fault codes cannot be cleared or the machine brought within calibration using the re-calibration procedure, it is strongly recommended that repair is carried out by the replacement of complete modules. When the Strain Gauge Beam, Control Board or Display Board is replaced, the ATP9 traction machine must be re-calibrated.

Return faulty parts to Huntleigh Akron for repair, with details of the problem which caused the module to be replaced.

8. Battery Replacement

The battery which operates the motor run-down feature when mains failure is detected, should be replaced every 12 months, Akron Part No 182-060A

8.1 Note battery terminal positions. Remove both 'push on' battery connections from the terminals.

8.2 Cut cable tie and remove battery from holder.

8.3 Place new battery in holder and secure with new cable tie.

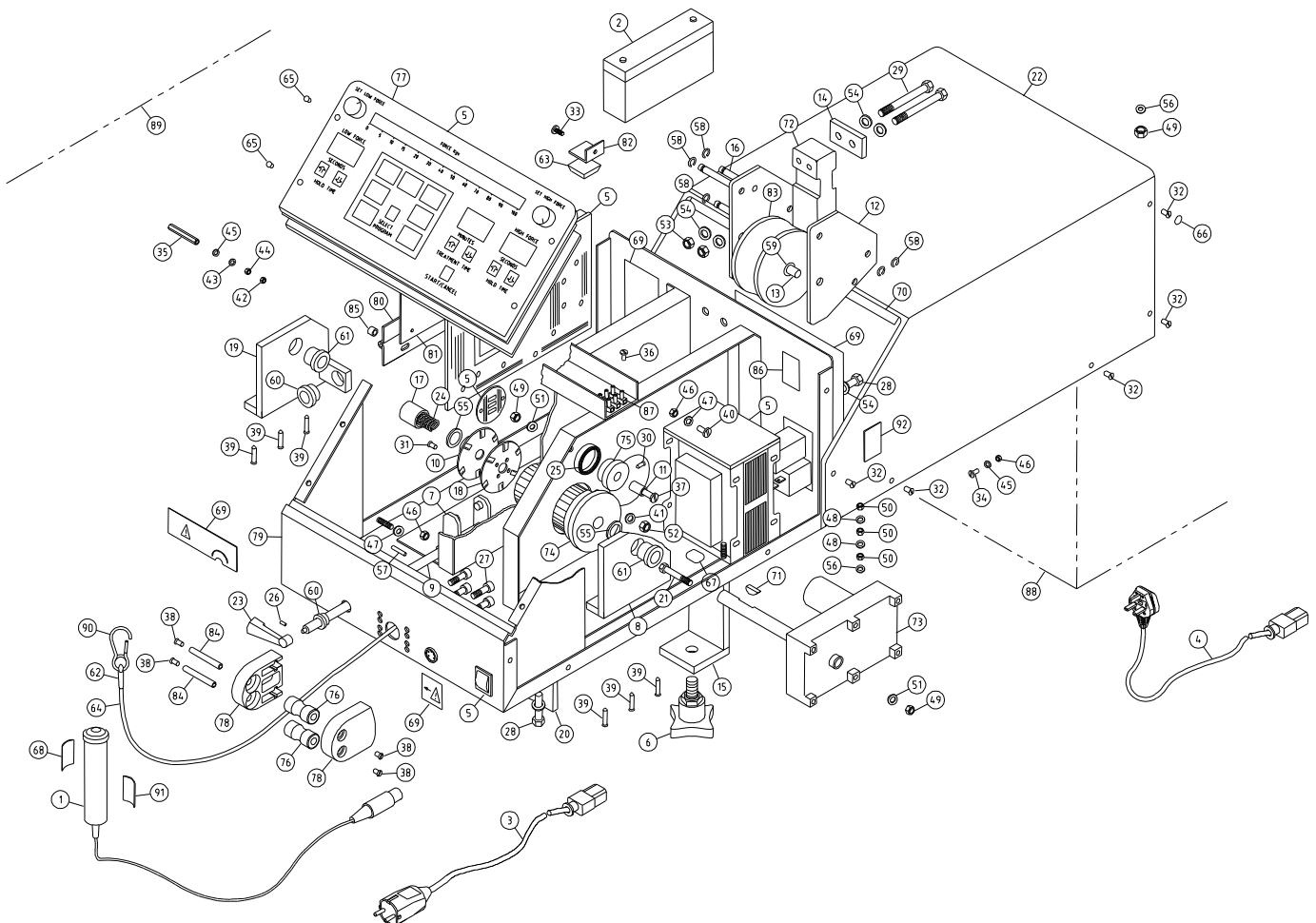
8.4 Replace battery connection on terminals, checking polarity.

- 8.5 Check Mains failure detection and motor rundown, by removing mains power supply from socket, with tension still in traction cord. With the plug removed, the battery should remove all tension in the cord and run out some slack.

9. ATP9 Chassis Electrical Components Kit 182-803F

<u>Part No</u>	<u>Description</u>
182-802B	Front Panel assembly
182-801D	Control Board Assembly
182-027C	Mains Isolating Transformer
182-055D	Mains Cable form - for transformer & inlet socket
182-056A	Chassis mounting socket & Cable form for patient switch
182-057A	Mains switch
182-058A	Bridge rectifier
182-804A	Motor Filter

10. ATP9 Mechanical Parts Assembly Illustration (ISSUE 3)



10. ATP9 Mechanical Parts List (ISSUE 6)

Ref	Description	Qty	Stock No.	Issue Status
1	Patient Push Button Switch Electric	1	182-059	A
2	Battery 12 volts 1.2 Ah	1	182-060	A
3	Schuko Mains Lead IEC 4M	1	182-062	A
4	UK Mains Lead	1	182-063	A
5	ATP9 Electrical Components	1 set	182-803	F
6	Star Knob Assembly	1	2J5077Z	0
7	Clutch Release Yoke	1	3A7101Z	1
8	Motor Support Bracket	1	3A7103Z	1
9	Clutch Release Shaft	1	3A7104Z	3
10	Clutch Plate & Boss	1	3A7105Z	0
11	Spring Drum Spindle	1	3A7106Z	0
12	Pulley Side Cheek	2	3A7107Z	5
13	Pulley Spindle	1	3A7108Z	1
14	Spacer	1	3A7109Z	1
15	Chassis Fixing Bracket	1	3A7110Z	0
16	Grooved Pin (5X0038Z/2)	3	3A7117Z	2
17	Spacer Tube	1	3A7118Z	1
18	Clutch Plate with Holes	1	3A7119Z	1
19	Motor Clutch Shaft Support Bracket	1	3A7122Z	0
20	Traction Clamp	1	3A7123Z	1
21	Threaded Spacer (5X0088Z/1)	1	3A7124Z	1
22	Traction Unit Lid (5X0073Z/4)	1	3A7125Z	4
23	Clutch Release Lever (5N5585R)	1	3F7120Z	0
24	Clutch Release Spring	1	5G6700Z	1
25	Spring Motor SR105	1	5G6800Z	0
26	4BA x $\frac{3}{16}$ " Grub Screw	1	5J4602J	0
27	M6 x 20mm Cap Head Screw	4	5J7658R	0
28	M8 x 25mm Hex Set Screw	3	5J7859N	0
29	M8 x 60mm Hex Bolt	2	5J7866A	0
30	No.6 x $\frac{3}{8}$ " Pan Head Self Tapping Screw	1	5K0205X	0
31	No.6 x $\frac{3}{4}$ " Countersunk Self Tapping Screw	4	5K0209Z	0
32	M3 x 6mm Brass Countersunk Nickel Plated Screw	10	5K1032L	0
33	M3 x 6mm Pan Head Posidrive Screw	1	5K1032N	0
34	M3 x 10mm Pan Head Screw	2	5K1034N	0
35	M3 x 20mm Hex Pillar	1	5K1037H	0
36	M3 x 16mm Pan Head Screw	2	5K1045R	0
37	M5 x 25mm Pan Head Screw	1	5K1138U	0
38	M4 x 12mm Countersunk Black Socket Screw	4	5K1835B	0
39	M4 x 12mm Countersunk Screw	6	5K1835K	0
40	M4 x 12mm Pan Head Screw	3	5K1835T	0
41	$\frac{1}{4}$ " Flat Washer	1	5L0362V	0
42	M3 Nyloc Nut	7	5L2619C	0
43	M3 Shakeproof Washer	6	5L2655K	0
44	M3 Wing Nut	1	5L2669J	0
45	M3 Locking Washer	2	5L2675G	0
46	M4 Nyloc Nut	8	5L2719C	0

Ref	Description	Qty	Stock No.	Issue Status
47	M4 Flat Washer	11	5L2762K	0
48	M5 Full Nut	3	5L2819B	0
49	M5 Nyloc Nut	2	5L2819C	0
50	M5 Spring Washer	2	5L2851K	0
51	M5 Flat Washer	2	5L2865K	0
52	M6 Nyloc Nut	1	5L2919C	0
53	M8 Nyloc Nut	3	5L3119C	0
54	M8 Flat Washer	6	5L3162K	0
55	Washer NGS 0.515" x 0.902	2	5L4584R	0
56	2BA Shakeproof Washer	2	5L5355K	0
57	1/8" x 3/4" Seloc Pin	1	5M0206A	0
58	Circlip	7	5M2234S	0
59	Needle Roller Bearing	2	5P8204E	0
60	M10 Flanged Nylon Bush	2	5P8827Z	0
61	12 x 24 x 15.6 Headed Bush	2	5P8922Z	0
62	Heatshrink Sleeving	0.03	5S0347Z	0
63	Black Bumpon Stop – 3M SJ5023	1	5T2900Z	0
64	4mm Aramide Rope	1	5T7200Z	0
65	Push in Panel Popper	4	5T7300Z	0
66	Tamper Proof Label	1	5U1043Z	0
67	Earth Label RS 504-978	1	5U1044Z	0
68	Patient Handswitch Label	1	5U1064Z	1
69	ATP9 Product Label Set of 4	1	5U1098Z	1
70	Copper Beryllium Strip	0.5	5X0025Z	0
71	1/8" x 1/2" Woodruff Key	1	5X0052Z	0
72	Strain Gauge Beam Assembly	1	5X0060Z	1
73	Motor Gearbox 4305-1B0	1	5X0061Z	2
74	Rope Drum	1	5X0080Z	3
75	Spring Drum	1	5X0082Z	0
76	Traction Roller	2	5X0095Z	2
77	Front Panel (KGs)	1	5X0101Z	0
78	Roller Bracket (Moulded Plastic)	2	5X0103Z	0
79	Traction Chassis	1	5X0104Z	0
80	Chassis Hinge	1	5X0105Z	0
81	Chassis PCB Mounting Plate	1	5X0106Z	0
82	Battery Retainer	1	5X0107Z	0
83	Pulley Wheel	1	5X0108Z	0
84	Short Roller Spindle	2	5X0110Z	0
85	3/16" Nylon Spacer	3	5X0111Z	0
86	Flash Label	1	5X0116Z	0
87	3 Way Terminal Block 0.75sq mm inlet	1	5X0117Z	0
88	Instapak Fittings	1	5Z0061Z	1
89	Traction Carton	1	5Z0062Z	0
90	Carbine Hook	1	8A4000Z	0
91	Velcro Loop 20mm Self Adhesive	0.03	8A7400Z	0
92	Velcro Hook 20mm Self Adhesive	0.03	8A7500Z	0

11. Manufacturers Details

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12. Revision History

PAGE	ISSUE / DCN No.	SIGNED	DATE
All	794-022-01 DCN 882	S. Rees	19/11/98
Pages 16, 17	794-022-02 DCN 902	S. Rees	20/05/99
Pages 16, 17	794-022-03 DCN 953	S. Rees	02/10/00
Page 16	794-022-04 DCN 962	S. Rees	15/12/00
Pages 7, 14,16 &17	794-022-05 DCN 965	S. Rees	20/02/01