PRO-MATIC

Safety and Operating Instructions

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SAFETY INSTRUCTIONS

Before connecting this machine to any power source or switching it on, the user must read the operating instructions carefully.

Clay target launchers can be dangerous and must be treated with great care at all times to avoid accidents. You must treat a clay target launcher with the same respect that you would treat a loaded gun.

Never place any bodily part into the path of any mechanical piece whilst the machine is in motion or likely to be so.

SAFETY FENCING AND GUARDS SHOULD ALWAYS BE ERECTED AROUND THE MACHINE WHEN IN USE

Assume at all times that a clay target launcher is cocked or loaded and treat it accordingly.

Never approach the machine from the front or sides. Approach **only** from behind.

Always disarm the machine before carrying out reloading or adjustment.

Reloading with clays should be carried out from the rear of the machine.

Re-arm/cock the machine only when all personnel are either behind or at a safe distance away.

Ensure that the machine is stable and cannot fall over.

Ensure that the machine is sited in a way that will prevent people from being struck by either the clay in flight, or broken bits of clay being ejected **sideways** from the machine.

Never allow members of the public or untrained personnel to approach or touch the machine.

Be aware of the fall zone of both broken and unbroken clays and that changes in wind direction will affect this. This is particularly important with teal and driven birds.

Never move a cocked/loaded machine. Remove the main throwing spring before transport.

Never place yourself or any bodily part into the path of the casting arm or the clay when the machine is operating.

Special Hazardous Conditions

In the rare event that the release of the casting arm is blocked or jammed by a piece of clay, or, in the event of immovable blockage, release the spring by winding the adjusting nut off, whilst keeping all bodily parts back and away from the spring as it jumps towards the front of the machine upon release.

Think very carefully about the result that your actions will produce before proceeding.

INSTALLATION INSTRUCTIONS

In most instances, these machines will not be used in a permanent situation, but whether the installation is permanent or temporary, the following advice is still applicable.

1. Site the machine in a way which allows free and uncramped access all around, paying particular attention to the ease of disarming/arming and reloading.

2. Ensure that there are no obstructions to the path of the arm and that the machine cannot change its position due to vibration or reaction.

3. Ensure that the power supply can be easily disconnected.

4. Ensure that cables are laid in such a way that they cannot become entangled in the mechanism.

5.Ensure that access is only available to the machine by qualified, trained personnel.

6. Although the spring tension can be wound on to the maximium amount possible, it is advisable to leave at least a couple of mm clearance between the end of the spring and the locking nut. This will allow the spring to move freely when the machine is fired.

OPERATING INSTRUCTIONS

COLT, SUPERCOLT AND SOLO MACHINES

Read these instructions before attempting to operate the machine.

1. The Colt machine must be placed on a flat surface and secured by either screwing down onto a wooden surface or pushing ground pegs through the holes in the base.

   The Solo machine must be assembled on its trolley, which is done as follows.

   (a) Fit the two wheels to the ‘A frame’ part of the trolley base, with a brass washer and circlip securing each wheel to the axle.
   (b) Bolt the ‘A frame’ (with the tow ball hitch facing upwards) and the centre section of the trolley base (this is the part with the battery tray on, facing upwards) to each other. Note that the tow ball hitch is facing the centre section of the trolley base. See photo below.
   (c) Fit the handle part of the trolley base to the centre section, lining up the holes in the two parts with each other.
   (d) Insert the threaded end of the spike up through the hole in both parts of the trolley base and tighten up the nylock nut supplied.
   (e) The Solo mainframe can now be mounted on the tow ball hitch on the trolley base, and the 24mm locking bolt tightened.

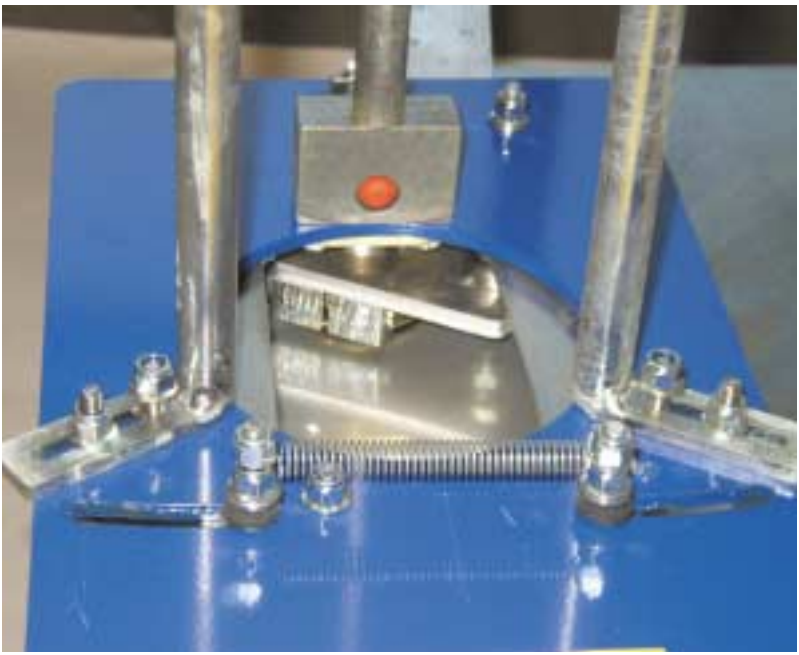
PHOTO, SOLO TROLLEY ASSEMBLED

(f) The magazine can now be fitted, as explained below.

2. Assemble the magazine on the Colt, Super Colt or Solo by screwing the plain rod into the mounting block that contains the tip of the Brass Plunger at the front of the machine. Fit the two rear rods onto the top plate of the machine using the screws and nuts provided. The hopper rods have a slotted bracket on either end of the rod. The end with the longer slotted bracket fits onto the top plate at the bottom of the magazine.

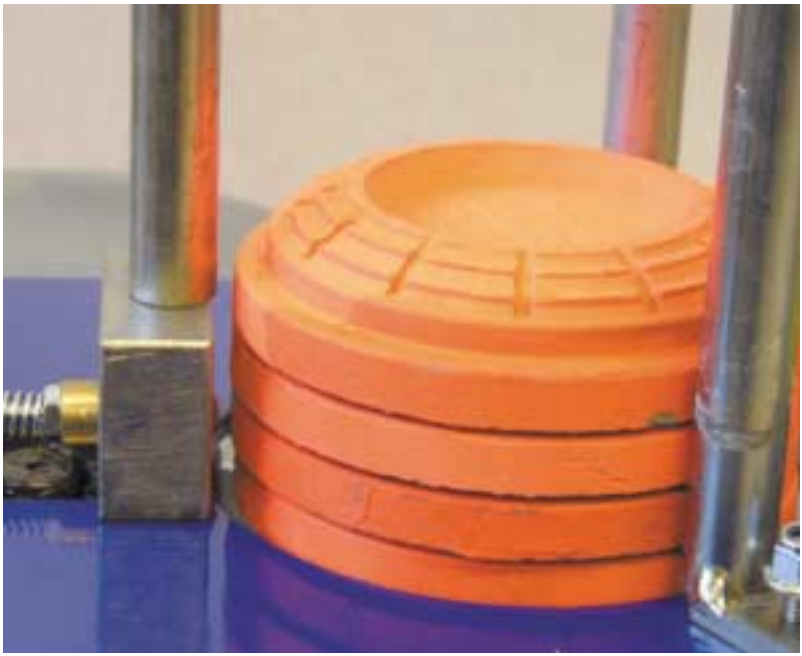
   Fit the horse-shoe to the top of the hopper rods. Set the magazine by moving the two rear rods all the way in for 90mm Midi targets and

all the way out for 110mm Standard targets. Tighten the locking nuts and bolts to hold the magazine in the correct position required. See photo below.



PHOTO, COLT HOPPER RODS FITTED ON TOP PLATE

3. Check the clay loading operation by placing 3 or 4 clays into the magazine, with the clays pushed towards the two rear hopper rods. There should be a visible gap between the second clay up in the stack and the red polyurethane plunger. The gap should be about 1-2mm and can be adjusted if required using the nylock nut on the end of the plunger shaft at the front of the machine.



PHOTO, COLT CLAYS IN MAGAZINE

4. Fit the spring by hooking it over the nylon roller underneath the machine and passing the stud through the boss at the rear. Wind tension on with a 19mm spanner until, with the arm fully forward, the coils have at least 0.5 mm gap between them. Tighten the front nut against the boss. Throwing distance can be increased by winding on more tension later. Set the elevation of the machine by adjusting the slotted bar on the side of the base plate and mainframe. A 13mm spanner is required. See photo overleaf.

PHOTO, COLT SIDE VIEW WITH SPRING FITTED

5. Ensure that the switch at the rear of the machine is in the central position and attach the battery, keeping it well to the rear of the machine and plug in the command cable using the duraplugs attached to the trap and to the end of the command cable.

6. Partially fill the magazine with clays.

7. Check that the throwing arm will not hit anything as it rotates. **Remain behind the machine at all times**.

8. From behind the machine, press the toggle switch down. The throwing arm will rotate to the 'armed' position, tension the spring and drop a clay onto the casting plate. In this condition the machine must be treated with extreme caution.

9. The machine will now fire if either the push button next to the toggle switch or the command cable button is pressed. Ensure that it is safe to do so.

10. To disarm the trap prior to reloading clays or to make it safe to touch or carry - from rear of the machine - press the test fire button next to the toggle switch. Immediately the machine fires, flick the toggle switch upwards to its centre position.

The trap will not rearm and by pushing the toggle switch further upwards from the centre position, the motor will run in reverse allowing the throwing arm to come fully forwards.

The machine is now safe to reload, from the rear.

For transport or adjustment, remove the battery to prevent accidentally switching the machine to the 'armed' position.

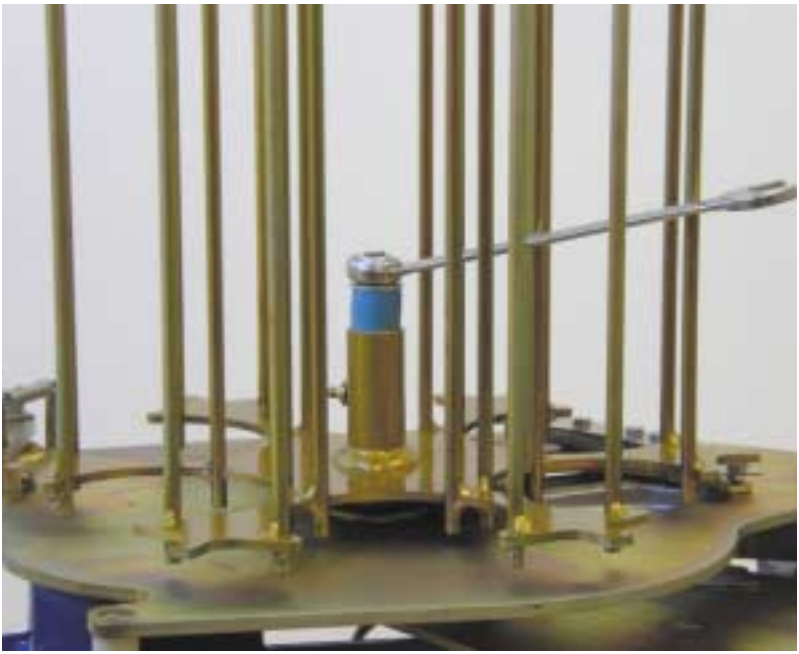
Removal of, or tensioning of, the spring can be carried out only in the disarmed condition.

To rearm, press the toggle switch down.

OPERATING INSTRUCTIONS

SUPER SPORTER AND RANGER MACHINES

If your machine has been supplied ready for operation, then proceed to the next instruction. If your machine is supplied in a box without its carousel fitted, it will need to be fitted using the centre pin, nut and washers provided on the top plate. Tighten the 19mm nylock nut down on to the blue plastic damping spacer. The nut should be tight enough for the carousel to turn but not spin freely. It is best to keep turning the nylock until the blue damping spacer starts to squash up slightly.

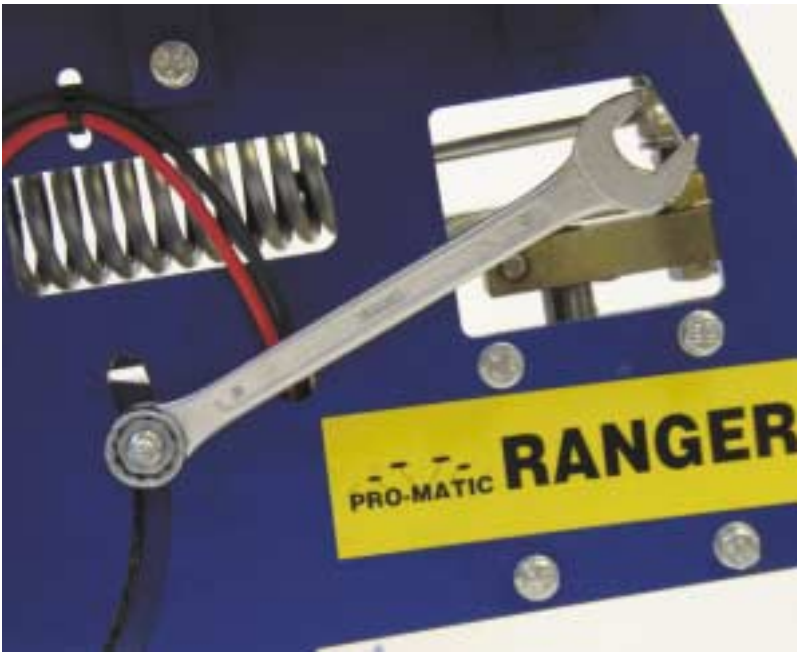


PHOTO, CAROUSEL FITTED ON TOP PLATE

It is advisable to put a fixing bolt or ground peg through the front hole in the base of the machine. Loosening the clamping nut on the elevation slot and possibly the cross pivot and height adjusting bolts to raise the front of the machine will allow you to insert a bolt or peg into the front hole.

Leave this bolt or peg reasonably loose so that the rear of the trap can be moved to adjust the trajectory of the clay.

Lower the machine to about 15-20° of elevation and tighten the nut on the height adjusting slot lightly. See photo below.



PHOTO, HEIGHT ADJUSTMENT

Unwind the power and command cables at the back of the machine and lay them out on the ground. Do not connect the duraplug connection at this stage.

Check that the on/off/nudge toggle switch on the control box at the rear of the machine is in the OFF position. This switch is on a short 1 metre cable with remote box on Sporter Teal and Ranger Traps.

Place the incoming power connector or battery leads to the right hand side of the machine, slightly to the rear of the control box, and at a distance which will allow some slack in the cables running back to the machine.

Plug in or make the battery connections ensuring a good contact. With battery connections it is essential **NOT** to hammer the connections on or to over tighten them.

Check visually from the rear of the machine that the motion of the casting arm is not restricted or blocked in any way.

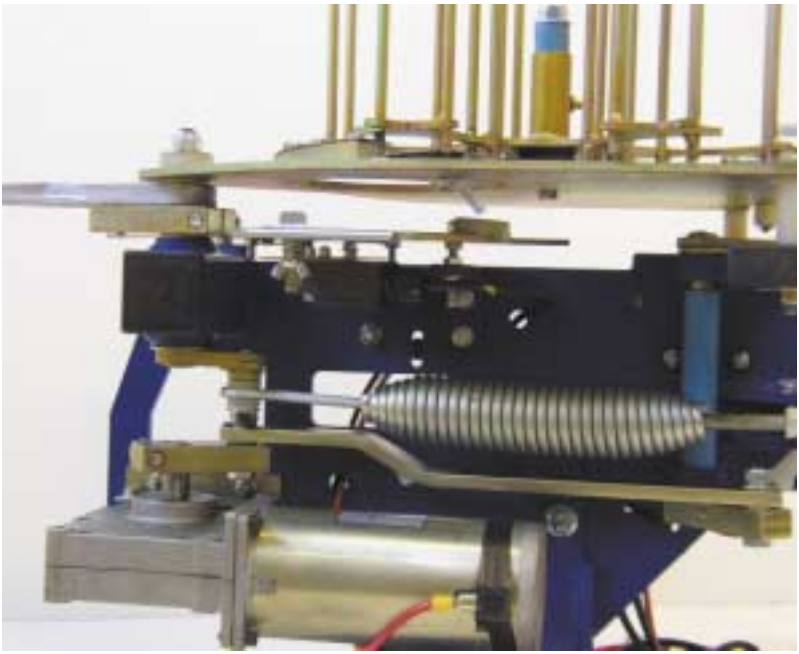
Always operate only from the **REAR** and **NEVER** from the front or sides. From this stage on, do not lean on the machine and touch it with only one hand.

On 12 volt Super Sporter traps switch the trip/isolator on the side of the control box to the 'ON' position, so that the red telltale does not show. With 240 volt or 110 volt mains machines, ensure that the power is on line.

From the back of the machine push the on/off/nudge toggle switch into the 'NUDGE' position for about half a second only and release it. The switch is spring-loaded and will return automatically to the 'OFF' position.

The casting arm will now be static and visible to the right side of the machine and the machine will still be in a safe condition.

If your trap was delivered without its mainspring fitted, now is the time to fit it. The arm can now be moved by hand until it sticks directly out of the front of the trap away from the operator. The mainspring would now normally be at its shortest length and can therefore be fitted to the machine.



PHOTO, ARM IN FRONT OF TRAP, SPRING FITTED

DO NOT LOAD CLAYS YET.

Ensure that nothing will restrict the further motion of the arm.

Press the toggle switch down to the ‘ON’ position.

The machine will cycle and stop in the armed position and **MUST BE TREATED WITH EXTREME CAUTION.**

Push the toggle switch to the ‘OFF’ position.

It is now necessary to fire the trap but **NOT** allow it to re-cock so that clays can be loaded. This is done by pushing the toggle to the 'NUDGE' position for about half a second and release it so that it returns to the 'OFF' position as before.

The trap will immediately fire but not re-arm. The casting arm will be visible and stationary on the left hand side of the machine.

The machine is now in the disarmed or **SAFE** state.

To further remove the risk of accidental re-cocking, it is advisable to unplug the power supply on a mains powered machine or disconnect the battery on a 12volt machine.

(Remember to reconnect after loading clays! This is often forgotten in the rush to re-load during shoots.)

The magazine can now be filled and it is advisable to place only a small quantity of clays in each column initially.

Ensure that the clays about to be thrown are going into a safe area.

Press the toggle switch to 'ON'. The machine will load a clay and come to the cocked position and is now ready to fire.

To check for clay flight and direction, fire the trap using the 'NUDGE' toggle switch exactly as before so that the machine fires **ONCE** but **does not re-arm** until the switch is returned to the 'ON' position.

With the trap in the **DIS-ARMED/SAFE** position, move the rear of the trap to adjust the direction of the clay flight to suit and elevation if required.

Insert further bolts or ground pegs to fix the position and fill the magazine if required.

Should the clay have a tendency to peel off, either left or right of stable flat flight, this can be corrected by tipping the whole machine sideways to compensate and bring the flight level. This method is used for machines in temporary settings.

However the Super Sporter machine has an inbuilt list to the right viewed from behind and an adjusting/jacking bolt on the bottom of the main frame on the right hand side. In permanent settings with the machine on a level base, this bolt can be screwed in to cause the machine to straighten and then move left until flat flight is achieved.

WARNING: It is essential to slacken both the nut on the height adjusting slot and pivot cross bolt **BEFORE AND DURING** the process of winding the jacking bolt in. If this is not done, the jacking bolt will exact an enormous leverage and could cause damage to the base casting. Such damage is **NOT** covered under warranty.

All Super Sporter Machines have an adjustable rear clay guide rail on the casting plate. By slackening and moving this rail either forward or backwards by **small** increments, and then re-tightening, it is possible to adjust the direction of throw of the clay by up to 30° **without** moving the complete machine. It is not recommended that this facility is used in temporary sporting settings.

Increasing or decreasing the distance that the clay is thrown is achieved by winding tension on or off the spring. This can be done with the machine in the disarmed/safe condition for small adjustments. After adjustment of the main spring to set the correct throwing distance, the nuts on the spring stud must be tightened against each other.

The command cable or radio release can now be connected to the command cable duraplug.

The machine can now be switched on for normal use by pressing the toggle down to ‘ON’ to cock the machine.

The machine will fire and re-cock each time that the fire button on either the command cable or radio remote is pressed. Super Sporter machines have a ‘**test fire**’ button on the electrical box which also fires the trap.

No loading or adjustment to the machine should be carried out unless the machine is disarmed/safe.

After use, the machine must be left in the disarmed/safe condition and the power supply removed. It is **not** necessary to relieve the remaining spring tension.

OPERATING INSTRUCTIONS

RABBIT MACHINES

It is advisable to put a fixing bolt or ground peg through the holes in the base of the machine leaving them reasonably loose so that the trap can be moved to adjust the trajectory of the clay.

Unwind the power and command cables at the back of the machine and lay them out on the ground. Do not connect the command cable to the duraplug connection at this stage.

Check that the on/off/nudge toggle switch on the control box on the side of the machine is in the OFF position.

Plug in or make the battery connections ensuring a good contact. With battery connections it is essential not to either hammer the connections on or to over tighten them.

Check visually from the rear of the machine that the motion of the throwing arm is not restricted or blocked in any way.

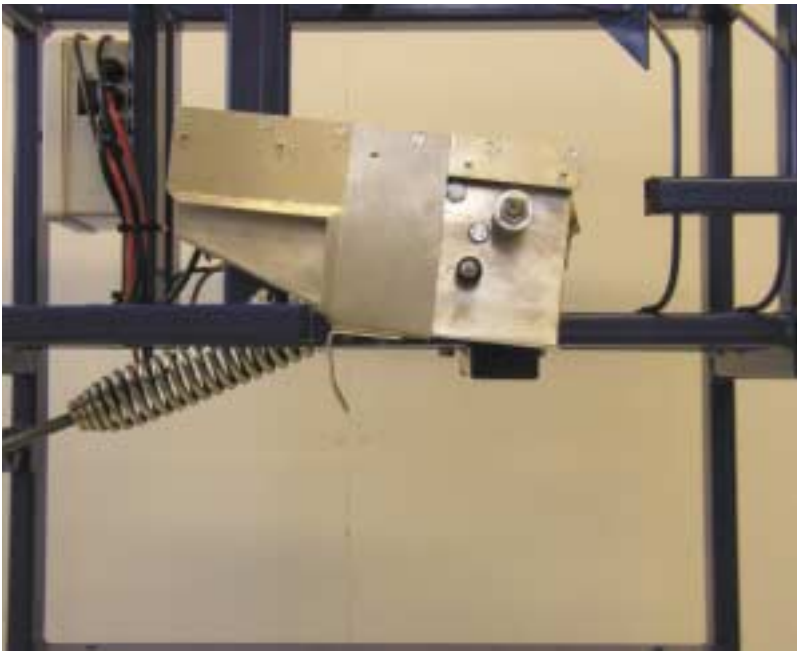
Always operate only from the **REAR** and **NEVER** from the front or sides. From this stage on, do not lean on the machine and touch it with only one hand.

On 12 volt machines switch the trip-isolator on the side of the control box to the ‘ON’ position, so that the red telltale does not show. With 240 volt mains machines, ensure that the power is on line. From the back of the machine push the on/off/nudge toggle switch into the ‘NUDGE’ position for about half a second only to release it. The motor should turn a few degrees.

Ensure that nothing will restrict the further motion of the arm.

Press the toggle switch down to the ‘ON’ position.

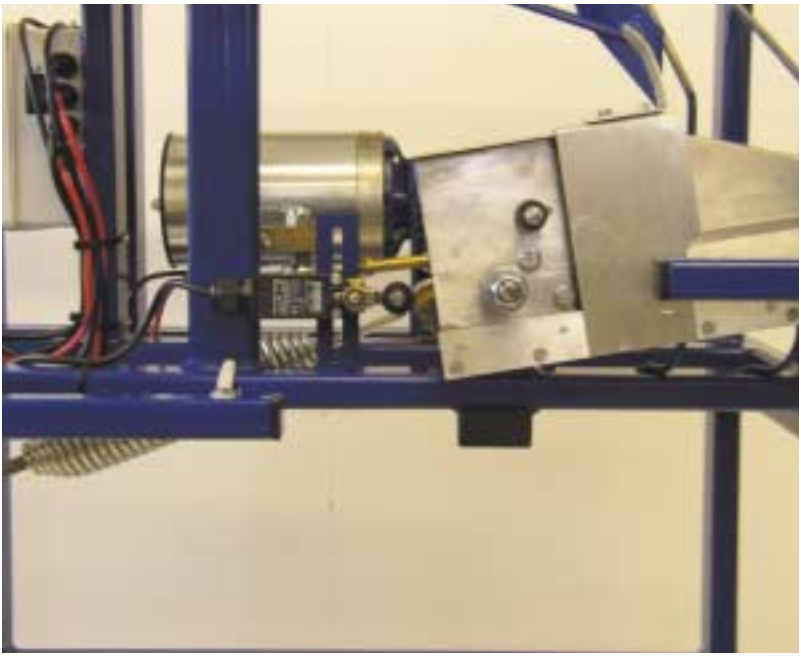
The machine will cycle and stop in the armed position and **MUST BE TREATED WITH EXTREME CAUTION**. See photo below. Push the toggle switch to the ‘OFF’ position.



PHOTO, RABBIT SIDE VIEW ARMED.

It is now necessary to fire the trap but **NOT** allow it to re-cock so that clays can be loaded. This is done by pushing the toggle to the ‘NUDGE’ position for about half a second and release it so that it returns to the ‘OFF’ position as before. The trap will immediately fire but not re-arm.

The machine is now in the disarmed or **SAFE** state. See photo below.



PHOTO, RABBIT SIDE VIEW DISARMED

To further remove the risk of accidental re-cocking, it is advisable to unplug the power supply on a mains powered machine or disconnect the battery on a 12 volt machine.

(Remember to reconnect after loading clays! This is often forgotten in the rush to re-load during shoots.) The magazine can now be filled and it is advisable to place only a small quantity of clays in each column initially.

Ensure that the clays about to be thrown are going into a safe area. Press the toggle switch to ‘ON’. The machine will load a clay and come to the cocked position and is now ready to fire.

To check for clays exit direction, fire the trap using the ‘NUDGE’ toggle switch exactly as before so that the machine fires **ONCE** but **does not re-arm** until the switch is returned to the ‘ON’ position.

With the trap in the **DIS-ARMED/SAFE** position, move the rear of the trap to adjust the direction of the clays exit if required. Insert the ground pegs. It is advisable to put a fixing bolt or ground peg through the front hole in the base of the machine.

Leave this bolt or peg reasonably loose so that the rear of the trap can be moved to adjust the trajectory of the clay.

Fix the position and fill the magazine if required.

Should the clay have a tendency to roll off line, either to the left or right, it can be corrected by tipping the whole machine sideways to compensate.

All rabbit machines have an adjustable rear clay stop in the throwing arm. See photo below. By slackening and moving this stop forward or backward in **small** increments, and then re-tightening, it is possible to adjust the angle at which the clay leaves the machine. Increasing or decreasing the distance that the clay is thrown is achieved by winding tension on or off the spring. This can be done with the machine in the disarmed/safe condition.

PHOTO, RABBIT ARM RUBBER STOP

After adjustment of the main spring to set the correct throwing distance, the nuts on the spring stud must be tightened against each other.

The command cable or radio release can now be connected to the command cable duraplug. The machine should be switched on for normal use by pressing the toggle down to ‘ON’ to cock the machine. The machine will fire and re-cock each time that the fire button on either the command cable or radio remote is pressed. Rabbit machines have a ‘**test fire**’ button on the electrical box which also fires the trap.

No loading or adjustment to the machine should be carried out unless the machine is disarmed/safe.

After use, the machine must be left in the disarmed/safe condition and the power supply removed. It is **not** necessary to relieve the remaining spring tension.

OPERATING INSTRUCTIONS

CHONDEL MACHINES

Ensure that the machine is set on level ground.

Check the height / clearance of the knife-edges by placing a clay in the carousel and rotating the carousel so that the clay passes through the knife edges cleanly. Tilt the machine to its maximum position forward, ensuring that the locking screw is locked tightly into appropriate hole. Pass a clay through the knife edges again and if necessary adjust knives to suit.
Repeat with machine in maximum position tilted to the rear.

Check that the on / off nudge switch on the control box on the side of the machine is in the off position.

Put some clays in the carousel and set angle of elevation to suit.

If using standard clays remove rabbit deflector from side guard.

Unwind the power and command cables at the back of the machine and lay them out on the ground.

Attach the battery connections to the battery ensuring a good contact. Do not connect the command cable to the duraplug at this stage.

Ensure that the clays about to be thrown are aimed into a safe area. Press the toggle switch to on. Press the fire button and check the clays exit elevation and distance.

If necessary adjust the main spring tension to give the correct throwing distance. Ensure that the nuts on the spring stud are tightened against each other.

Repeat the procedure for rabbits making sure that deflector plate is in place.

The command cable or radio release can now be connected to the duraplug.

No loading or adjustment to the machine should be carried out unless the machine is disarmed / safe. **To disarm the machine push the toggle switch to the nudge position allowing the machine to throw the last clay before the toggle springs back to its OFF position**.

After use the machine must be left in the disarmed / safe condition and the power supply removed.

OPERATING INSTRUCTIONS

DTL & ABT/WOBBLE MACHINES (SPORTING USE ONLY)

ANGLE ADJUSTMENT

This section concentrates on the setting of the angles of the machine, it covers both Ranger ABT and Sporter ABT versions. Please also read the **SUPER SPORTER AND RANGER MACHINES** section prior to this.

The DTL and ABT machines have additional control motors to allow the machine to oscillate from side to side and on ABT up and down as well. The amount of angle can be adjusted as follows.

With the trap in the **DIS-ARMED/SAFE** position, undo the crank bolt (which is situated on the oscillating disc on the small gearbox, bolted to the base of the machine) and remove from the hole in the disc. The disc has several threaded holes in it spiralling out from the centre of the disc. The further out the hole the greater the angle of oscillation. Put the crank bolt back in to the required hole and tighten.

On ABT versions there is also an extra control motor fitted for up and down movement. The same applies for adjustment as on the side to side control motor. By placing the crank bolt in a different hole on the disc the angle of elevation can be adjusted. The further out the hole on the disc, the more up and down movement is achieved.

The oscillating control switches on the DTL and ABT machines have three positions. The centre position is the off position. The forward momentary position is for inching the machine a few degrees at a time and the rear on position holds the motor on so allowing the oscillating motor to oscillate continuously while the machine is in use.

All DTL and ABT machines are fitted with a variable timer. This makes it impossible for the shooter to “read” the targets being thrown from the machine. The timer allows the oscillating motors to run for a random amount of time then stop briefly and then run again. The timer then shuts down the oscillating motors if the machine stops being fired, so saving battery power.

Inch control (either hard wire or radio) automatically bypasses the timer unit if either control motor is switched on from the inch hand control box. This means that the oscillating motors will continue to oscillate until they are switched off at the inch hand control box.

OPERATING INSTRUCTIONS

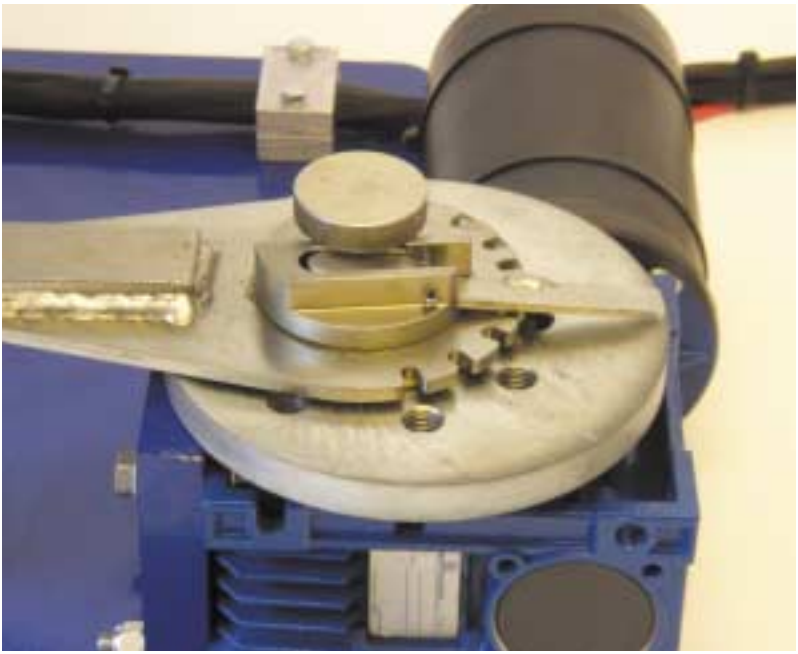
DTL/ATA & ABT MACHINES (SOLENOID RELEASE)

ANGLE ADJUSTMENT

DTL/ATA and ABT machines fitted with solenoid release are adjustable for different types of angles just as on the sporting versions, so before carrying out any adjustment read the previous section. Angles are altered in exactly the same way as on the sporting type machines, but there are additional features included that are not found on the normal sporting versions of these machines. These features are used as described below.

Once an ATA/DTL or ABT machine is installed in the trap house the side to side angle needs to be set. For example on a DTL machine, 20 degrees either side of centre is required. It may be that the machine is throwing the targets 25 degrees to the left and only 15 degrees to the right. So the ‘field’ needs to be moved to the right so evening up the angles.

It is done as follows. With the trap in the **DIS-ARMED/SAFE** position remove the knurled locking bolt from the rotation disc on the back of the machine. Reposition the machine and screw the knurled locking bolt back in to the centre hole of the rotation disc. Check that the locking lever (which is on the crank bar on the rotation disc under the knurled locking bolt) is in the centre slot.



PHOTO, ABT ROTATION DISC

DO NOT LOAD CLAYS YET.

Ensure that nothing will restrict the further motion of the arm (including the sides of the trap house).

Press the toggle switch down to the ‘ON’ position.

The machine will cycle and stop in the armed position and **MUST BE TREATED WITH EXTREME CAUTION**.

Push the toggle switch to the ‘OFF’ position.

It is now necessary to fire the trap but **NOT** allow it to re-cock so that clays can be loaded. This is done by pushing the toggle to the ‘NUDGE’ position for about half a second and release it so that it returns to the ‘OFF’ position as before.

The trap will immediately fire but not re-arm. The casting arm will be visible and stationary on the left hand side of the machine.

The machine is now in the disarmed or **SAFE** state.

To further remove the risk of accidental re-cocking, it is advisable to unplug the power supply on a mains powered machine or disconnect the battery/transformer on a 12volt machine.

(Remember to reconnect after loading clays! This is often forgotten in the rush to re-load during shoots.)

The magazine can now be filled and it is advisable to place only a small quantity of clays in each column initially.

Ensure that the clays about to be thrown are going into a safe area.

Press the toggle switch to ‘ON’. The machine will load a clay and come to the cocked position and is now ready to fire.

To check for clay flight and direction, fire the trap using the ‘NUDGE’ toggle switch exactly as before so that the machine fires **ONCE** but **does not re-arm** until the switch is returned to the ‘ON’ position.

With the trap in the **DIS-ARMED/SAFE** position, move to the rear of the trap to adjust the direction of the clay flight to suit and elevation if required. The clay flight should be straight down the centre of the ‘field’ with the knurled locking bolt screwed in to the centre of the rotation disc. If it is not then the turnbuckle that is fitted in between the rotation disc and the swivel block at the base of the mainframe needs to be adjusted. The turnbuckle (a hexagonal bar approx 80mm long) has a locking nut on either side of it. Undo the two locking nuts with a 19mm spanner and twist the turnbuckle one way or the other, depending on which way the ‘field’ needs to be moved. From the rear of the machine twisting the turnbuckle clockwise moves the ‘field’ to the right. Counter-clockwise moves the ‘field’ to the left. Adjust one or two turns and than fire another clay as described above. Keep adjusting the turnbuckle until the desired direction of flight is achieved.

Once the machine is throwing a clay down the centre line of the ‘field’, make the machine safe by disarming it and tighten the two locking nuts on the turnbuckle. It should not be necessary to adjust the turnbuckle at any time afterwards.

If it is necessary to adjust the ‘field’ at a later date (due to a cross wind), it can be adjusted with out moving the turnbuckle.

Place the knurled locking bolt in the centre of the rotation disc and fire a clay. If the clay is off centre one way or the other, the lever underneath the knurled locking nut should be moved across to the next slot. There is a choice of four slots on either side. The further the lever is moved the more the ‘field’ is moved.

With the machine now centred, remove the knurled locking bolt from the centre hole of the disc and place in the desired hole. (refer to the label on the base plate for angle settings)

On ABT machines the elevation angle is adjusted in much the same way, except that there is no threaded hole in the centre of the elevation disc. A turnbuckle is fitted, which as on the rotation motor does not alter the amount of degrees but allows the whole minimum to maximum throw be moved higher or lower. See photo below.

PHOTO, ABT ELEVATION DISC & TURNBUCKLE

For example, an ABT is set to throw at a height of between one and a half metres and three and a half metres at ten metres out (as per the I. S. S. F regulations for Autotrap discipline). If the machine is throwing between one metre and three metres, then adjusting the turnbuckle will move the machine to the correct height. As on the rotation turnbuckle there is a locknut on either side of the turnbuckle which will need to be re-tightened when set.

If the machine is throwing between one and a half metres and four metres then the knurled locking bolt needs to be removed from the threaded hole in the elevation disc and placed in another threaded hole. As on the rotation disc, the further out from the centre the threaded holes in the disc are, the greater the angle of oscillation.

FAULT FINDING

It is Pro-matic's policy to upgrade or modify any of its products if they are ever proved suspect. Problems which do occur usually revolve around the clay pigeons themselves or the variation in their sizes between the different manufacturers. Poor maintenance and cleaning or physical damage caused during transportation of the machine are the other normal causes. Items that should be treated with great care are the throwing arm, casting plate and electrical box.

WARNING: At no time should you put yourself at risk by placing any bodily part within the area of operation of moving mechanical parts.

Fault Finding (Electrical) Mains 240 or 110 volt AC.

Any electrical fault finding or maintenance work on 240 volt or 110 volt mains machines must only be carried out by a qualified electrician.

Fault Finding (Electrical) 12volt DC. Sporter and Ranger.

1. **Machine does not cock** (i.e. come to the loaded position.)

Check :

(a) Battery is charged and that connections are tight.

(b) Magnetic trip switch on Super Sporter models is in the 'ON' position.

(c) Toggle switch is in the down 'ON' position.

(d) Arm is clear of roller limit switch under casting plate. If not, then press toggle up to 'NUDGE' until the arm is clear, then back down to the 'ON' position.

2. **Machine still does not cock.**

(a) Check all connections are tight including those inside the electrical box. Check for broken wires and damaged connections.

(b) If there are no broken connections (battery connected, all switches on) press toggle up to 'NUDGE', listen and watch for the 12 v **relay operation** in the control box.

(c) If the **relay operates** but the motor does **not** turn - short across the 2 large contacts on the relay with a screw driver or piece of wire.

If the motor does not turn - then the motor is suspect.
If the motor does turn - then the relay is faulty. Contacts may be dirty or worn out.

(d) If the relay does not operate - short across contacts on back of trip switch on Super Sporter models. Try toggle switch in ‘NUDGE’ and ‘ON’ positions.

If the motor turns - then the trip switch is faulty.

(e) If the motor does not turn - then short the brown wire to the yellow/green wire on the back of the toggle switch with the switch in the ‘NUDGE’ position.

If the relay operates and the motor turns - then the toggle switch is faulty.

If the relay still does not operate then it is faulty.

3. **Machine runs in ‘NUDGE’ position, but not in ‘ON’ position.**

(a) If the arm is clear of the roller limit switch then the roller limit switch is faulty.

Check that the roller arm is not seized. If so, strip, clean and re-assemble. Otherwise replace the switch.

4. **Machine cocks, but will not fire on command cable button.**

(a) Either the connections, cable or command push button are faulty. Disconnect the duraplug on the command cable and short the 2 outer sockets (do not put anything into the centre socket - this carries continuous +12v for radio use and is unfused.)

If the trap does not fire then there is a broken wire in the cable or a bad connection in the duraplug or control box.

(b) If the trap does fire then reconnect the command cable, remove the cover on the push button box and short across the two spade connectors.

If the trap fires - then the push button is faulty.

If the trap does not fire - then there is a broken wire in the command cable or a bad connection in the duraplug.

5. **Trap fires by itself!**

(a) Disconnect the command cable and switch the trap back on.

If the trap cocks normally - then the command cable is damaged or shorted out. Alternatively, the push button switch is stuck in or faulty.

(b) If the trap **continues to fire** - then check the arm to crank timing relationship as described on page 80 in this manual. If the above relationship is correct then, **after having put the trap into the disarmed/safe position**, move the roller limit switch away from main frame along the slotted bracket to its maximum. If the machine now cocks normally - then move the limit switch back to within 5mm of its original position. If the trap now fires by itself again then move the switch to 10mm of its original position and so on until the trap cocks normally under all conditions.

(c) If the machine **still fires** by itself - check if the relay contacts have stuck together, and if so replace. If the relay operates correctly, but the trap still fires by itself, then the roller limit switch is faulty and should be replaced.

Fault Finding (Electrical) 12volt DC. Rabbit & Chondel.

WARNING: At no time should you put yourself at risk by placing any bodily part within the area of operation of moving mechanical parts.

Fault Finding (Electrical) 12 volt DC.

1. **Machine does not cock** (i.e. come to the loaded position)
Check:

(a) Battery is charged and that connections are tight.
(b) Magnetic trip switch is in the ON position.
(c) Toggle switch is in the down ON position.
(d) Arm is clear of roller limit switch. If not, then press toggle up to NUDGE until the arm is clear, then back down to the ON position.

2. **Machine still does not cock**.

(a) Check all connections are tight including those inside the electrical box.
Check for broken wires and damaged connections.
(b) If there are no broken connections (battery connected, all switches on) press toggle up to NUDGE, listen and watch for the 12v relay operation in the control box.
(c) If the relay operates but the motor does not turn - short across the two large contacts on the relay with a screwdriver or piece of wire.
If the motor does not turn- then the motor is suspect.
If the motor does turn- then the relay is faulty. Contacts may be dirty or worn.
(d) If the relay does not operate- short across contacts on back of trip switch. Try toggle switch in NUDGE and ON positions.
If the motor turns - then the trip switch is faulty.
If the motor does not turn - then short the brown wire to the yellow / green wire on the back of the toggle switch with the switch in the NUDGE position.

If the motor does not turn- then the toggle switch is faulty.
If the relay still does not operate then it is faulty.

3. **Machine runs in NUDGE position, but not in ON position.**

(a) If the arm is clear of the roller limit switch then the roller limit switch is faulty.
Check that the roller arm is not seized. If so, strip, clean and re-assemble. Otherwise replace the switch.

4. **Machine cocks, but will not fire on command cable button.**

(a) Either the connections, cable or command push button are faulty.
Disconnect the duraplug on the command cable and short the two outer sockets (do not put anything into the centre socket as this carries continuous 12v for radio use.)
If the trap does not fire then there is a broken wire in the cable or a bad connection in the duraplug or control box.

(b) If the trap does fire then reconnect the command cable, remove the cover on the push button box and short across the two spade connectors.
If the trap fires, then the push button is faulty.
If the trap does not fire- then there is a broken wire in the command cable or a bad connection in the duraplug.

5. **Trap fires by itself.**

(a) Disconnect the command cable and switch the trap back on.
If the trap cocks normally- then the command cable is damaged or shorted out. Alternatively, the push button switch is stuck in or faulty.

(b) If the trap continues to fire then check the arm to crank timing relationship as described on page 6.
If the above relationship is correct then, after having put the trap into disarmed / safe position, move the roller limit switch down the slotted bracket to its maximum. If the machine now cocks normally,

move the limit switch back to within 5mm of its original position. If the trap now fires by itself again then move the switch to within 10mm of its original position and so on until the trap cocks under all conditions.

(c) If the machine still fires by itself then check to see if the relay contacts have stuck together and if so replace them.
If the relay operates correctly, but the trap still fires by itself, then the roller limit switch is faulty and needs to be replaced.

Fault Finding (Electrical) 12volt DC. Colt, Super Colt and Solo.

1. **Machine does not cock** (i.e. come to the loaded position.)

Check :

(a) Battery is charged and that connections are tight.

(b) Toggle switch is in the down 'ON' position.

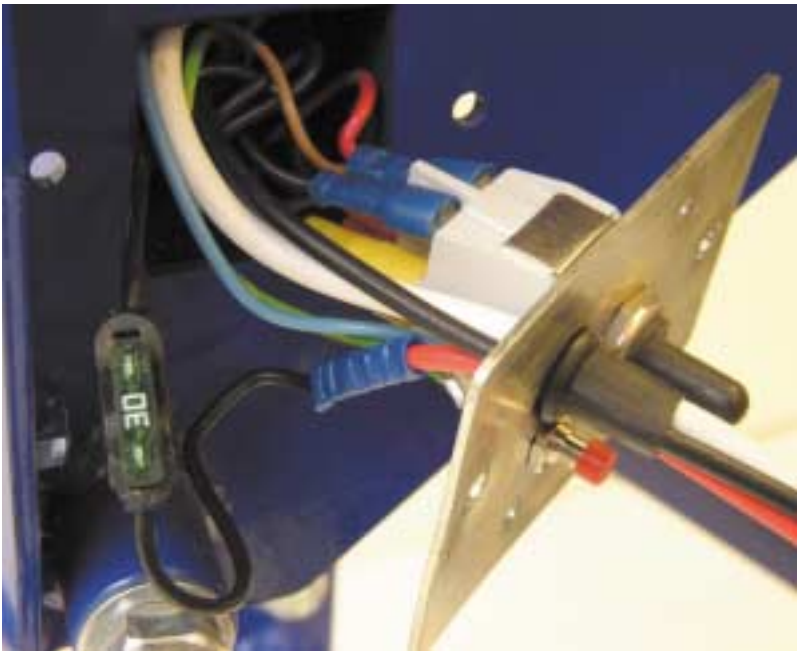
(c) Arm is clear of roller switch under casting plate. If not, then press toggle up to 'DISARM' until the arm is clear, then back down to the 'ON' position. When in the toggle switch is in the disarm position the motor reverses the arm backwards.

2. **Machine still does not cock.**

(a) Check all connections are tight. Check for broken wires and damaged connections.

(b) If there are no broken connections (battery connected, all switches on) press toggle up to "DISARM" position. If the motor does not turn then check the fuse in the wiring loom, this is located inside the mainframe of the machine and can be accessed by removing the

plate that holds the toggle switch and test fire button on the rear of the machine. See photo below.



PHOTO, COLT REAR PLATE REMOVED SHOWING FUSE.

3. **Machine runs in ‘DISARM’ position, but not in ‘ON’ position.**

(a) If the arm is clear of the roller switch then this switch is faulty. Move wheel on the end of the roller switch from side to side and check to see if it returns to the central position, also check the two wires inside the switch are both connected.

4. **Machine cocks, but will not fire on command cable button.**

(a) Either the connections, cable or command push button are faulty. Disconnect the duraplug on the command cable and short the 2 outer sockets (**do not** put anything into the centre socket - this carries continuous +12v for radio use and is unfused.)

If the trap **does not** fire then it may be necessary to change the wiring loom or repair it.

(b) If the trap **does** fire then reconnect the command cable, remove the cover on the push button box and short across the two spade connectors.

If the trap fires - then the push button is faulty.

If the trap does not fire - then there is a broken wire in the command cable or a bad connection in the duraplug.

5. **Trap fires by itself!**

(a) Disconnect the command cable and switch the trap back on.

If the trap cocks normally - then the command cable is damaged or shorted out. Alternatively, the push button switch is stuck in or faulty.

(b) If the trap **continues to fire** - then check the arm to crank timing relationship as described later in this manual. If the above relationship is correct then, **after having put the trap into the disarmed/safe position**, move the roller switch **away** from main frame (from behind the machine to the right) along the slotted bracket to its maximum. See photo below. If the machine now cocks normally - then move limit switch back to within 2mm of its original

position. If the trap now fires by itself again then move the switch to 4mm of its original position and so on until the trap cocks normally under all conditions.

PHOTO, COLT ROLLER SWITCH

(c) If the machine **still fires** by itself then the Roller switch is faulty and must be replaced.

Fault Finding (Mechanical) Sporter and Ranger.

1. **Carousel does not rotate.**

Check :

(a) The Carousel pusher arm is not jammed with broken clays or dirt.

(b) The pusher return spring is broken or missing.

(c) With the pusher arm withdrawn, the carousel should be free to rotate with a small amount of friction. This is adjusted by tensioning the locking nut holding the carousel on against the plastic sleeve underneath it.

(d) Carousel pusher **timing** is correct, i.e. when the gearbox crank and connecting rod are **in line at maximum extension**, (see photo below) the rollers on the bottom of the carousel pusher arm should be 1 mm clear of the carousel plate at maximum travel. If this is not the case then the clamp on the rear pusher shaft should be adjusted accordingly.
It must be **tightened** before operation of the machine.

PHOTO, CRANK SETTING FOR PUSHER ADJUSTMENT

2. **Machine will not throw clays.**

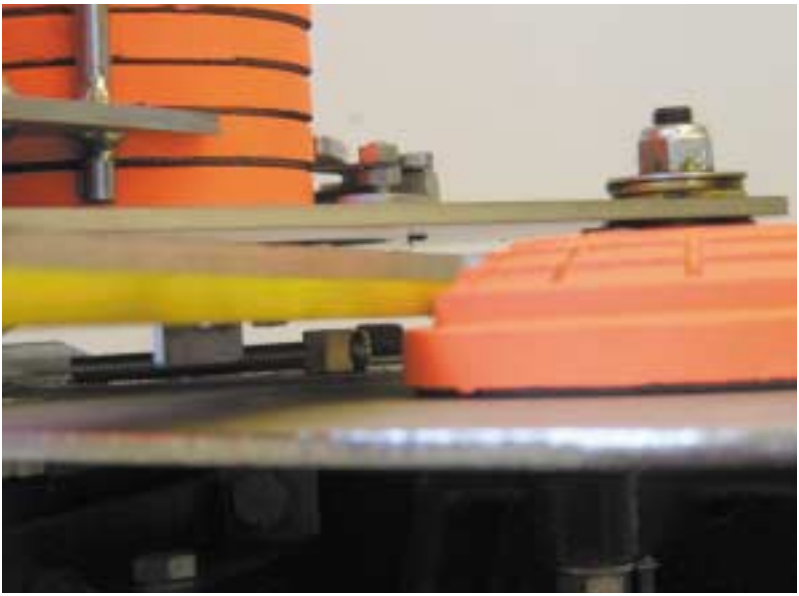
It is usually obvious what is wrong with a machine which does not throw clays at all. It is more likely that the following situation arises:

Machine throws clay <u>but</u>:

(a) **The clay flicks up in the air.**
The arm is probably bent down or the casting plate bent up, squeezing the clay between them. The arm or plate should be replaced or straightened.

(b) The clay goes no distance (even though the main spring is wound up tight).
The arm is probably bent upwards causing clay to go under it at its tip. This will also cause clays to break. The solution is to straighten the arm.

(c) **The clays are inconsistent in direction.**
The clay is being jammed under the arm towards the end. This is usually caused either by the arm being bent down, then the tip bent up or more likely clays varying in thickness. The solution if the arm is bent is to straighten it. If it is the clay thickness then lower the casting plate to accommodate the thickest one you can find. Adjust each nut **<u>exactly</u>** the same amount, until 1 to 1.5 mm clearance is achieved between the bottom of the friction strip and the clay. See photo overleaf.



PHOTO, RANGER/S/SP ARM CLEARANCE

3. **The Machine breaks clays!**

A point to consider here is that if you have other traps which have suddenly started to break clays, then it is probably the clays which are at fault. Particularly soft clays can be accommodated by fitting a ‘soft fall’ plate to the machine (all machines manufactured after January 98 are fitted with a soft fall plate), but sometimes the clay will be unable to absorb the actual throwing forces consistently. The maximum acceptable level of no birds is 5%, but should in practice be less.

A simple process should be followed which differentiates between the **loading** of the clay prior to throwing and the **throwing** of that same clay.

Check **loading cycle** first:

(a) Check that clays in the magazine are intact, not chipped or cracked. If in doubt, remove suspect clays and refill with ones known to be intact.

(b) With the machine switched 'OFF', rotate the magazine by hand, removing each clay as it drops onto the casting plate. Check for cracks and chips. If the clays arrive on the plate intact, then move on to the throwing section below.

(c) If they arrive chipped or cracked then remove the magazine and check that the thickest clay you can find slides easily under both inner and outer knife edges, i.e. just free enough not to be squeezed onto the carousel plate. Check of course that the knife edges are not excessively high, although this would tend to shave the bottom off the next clay, not break it. Adjust both knife edges accordingly.

(d) If damaging contact occurs on all columns then the knife edge is damaged and must be realigned by refitting or possibly filing or grinding to give minimal clearance. The knife edges are adjustable with a 10 mm spanner. Each knife edge has three slotted holes for ease of adjustment.

(e) Check each clay and if all are unchipped or uncracked, remove the cloth and repeat the process. This time if any of the clays break or crack as they land on the casting plate, then the clay is unsuitable or too soft.

(d) Check that there are no tight spots in any of the carousel pockets. Occasionally machines can suffer slight damage in shipping to the carousel. This can be easily adjusted with a suitable piece of wood or the handle of a hammer. See photo below. Ensure that a handful of clays move up and down each of the pockets once adjusted. If the clays arrive on the plate intact, then the fault lies in the throwing cycle.

PHOTO, CAROUSEL ADJUSTMENT

Check **throwing cycle** next:

(a) Check arm for straightness, for chunks missing from the rubber/plastic friction strip or any other physical damage to the arm. If the arm cannot be straightened then it should be replaced. A new friction strip can be fitted to an old arm if necessary.

(b) Check for damage to the casting plate especially the front edge of the plate in case it has been dented, bent or burred. Check for flatness, ensure that no screw heads protrude and that there are no other obstructions to the clay's path.

(c) Check the height of the arm over the plate across its whole surface to ensure that the clay fits under the friction strip with about 1 mm clearance. Any more than 3 mm clearance will cause the arm to break the clay by riding over it.

(d) Check that the bolt holding the arm to its clamp block is tight.

(e) Check the **arm-crank timing relationship**. If this relationship is incorrect the trap will definitely break clays when throwing. **The timing can be adjusted to the diagram found in this manual.**

As each of the above elements is checked, something incorrect should be discovered. If the machine still breaks clays, then there is one final check.

Slacken the main spring to its minimum extension, i.e. with the throwing arm in the forward position the coils are just open. Operate the trap a few times in this mode which puts hardly any stress into the clay because of the slack mainspring. If the clays still break then it is very likely that the actual clays are sub standard and a new batch should be obtained.

Fault Finding (Mechanical) Rabbit.

1. **Carousel does not rotate.**

Check:

(a) The carousel pusher arm is not jammed with broken clays or dirt.

(b) The pusher return spring is broken or missing.

(c) With the pusher arm withdrawn the carousel should be free to rotate with a small amount of friction. This is adjusted by tensioning the locking nut holding the carousel on against the plastic sleeve underneath it.

(d) Carousel pusher timing is correct, i.e., use the NUDGE switch to move the gearbox crank and connecting rod until they are in line at maximum extension. See photo below. In this position the rear pusher shaft should be against the rear of the right hand side of the top plate (viewed from behind the machine). If this is not the case then the clamp on the rear pusher shaft should be undone with a 19mm spanner and the rear pusher shaft adjusted accordingly. It must be tightened before operation of the machine.

PHOTO, RABBIT CRANK

2. The machine breaks clays!

A point to consider here is that if you have other traps which have suddenly started to break clays, then it is probably the clays which are at fault.

A simple process should be followed which differentiates between the **loading** of the clay prior to **throwing** of that same clay.

Check **loading cycle** first:

(a) Check that clays in the magazine are intact, not chipped or cracked. If in doubt, remove suspect clays and refill with ones known to be intact.

(b) With the machine switch 'OFF', rotate the magazine by hand, removing each clay as it drops into the throwing arm. Check for cracks and chips. If the clays arrive in the throwing arm intact, then move on to the throwing section below.

(c) If they arrive chipped or cracked then remove the magazine and check that the thickest clay you can find slides easily under both inner and outer knife edges, i.e., just free enough not to be squeezed onto the carousel plate. Check of course that the knife edges are not excessively high, although this would tend to shave the bottom of the next clay, not break it. Adjust both knife edges accordingly.

(d) Replace the magazine and place one clay in each column. Rotate the magazine by hand allowing each clay to fall through the loading port. As each clay passes through the knife edges, watch for anywhere that either knife edge bites into the side of the clay. If this occurs on any column then the carousel may be damaged. To check and repair take a handful of clays and pass up and down each of the eight pockets of the carousel. Adjust any pockets of the carousel as on previous carousel adjustment photo.
When this has been achieved on all columns, the carousel should be re-fitted and a single clay placed in each column. The carousel is now

rotated holding each clay back against the driving rod and noting its position relative to the inner and outer knife edges, then removing it as it passes through the loading port and into the throwing arm. Bending the pushing rods further **in** will move the clay away from the outer knife edge and closer to the inner and vice versa.

Once all columns are consistently accurate in adjustment it may be necessary to adjust the clearance on one, or the other knife edge, if there is contact between the knife edge and the side of the clay. Clearance should be the same on either side of the clay with a correctly adjusted carousel and it is very unusual to have to file or grind one or the other knife edge. The knife edge blades can be adjusted with a 10mm spanner

If damaging contact occurs on **all** columns then the knife edge is damaged and must be realigned by refitting or possible filing or grinding to give minimal clearance.

If all the clays arrive in the throwing arm intact, then the fault lies in the throwing cycle.

Check **throwing cycle** next:

(a) Check the construction of the throwing arm and for chunks missing from the rubber strip or any other physical damage. If the arm is faulty in any way then it should be replaced. A new rubber strip can be fitted to an old arm if necessary.

(b) Check for damage to the bars which the clay slides down and that there are no other obstructions as the clay falls into the arm.

(c) Check that the bolt holding the arm to its clamp block is tight.

(d) Check the **arm-crank timing relationship.**

Immediately after the trap fires a clay the throwing arm should come to rest in the horizontal or slightly above horizontal position. This can be adjusted by loosening the cap head bolt which secures the arm clamp block to the main shaft, adjusting the position of the arm and re-tightening. The trap must then be fired again, with a clay, and the new stopping position checked.

(e) Check the **arm friction damping.**

As the trap fires a clay the throwing arm should only oscillate up and down 2 or 3 times after the clay leaves before coming to rest. If this oscillation is more than this then the bevelled washers on the main shaft need to be compressed to slow the arms excess movement. This is done by loosening the cap head bolt which secures the arm clamp block to the main shaft, being careful to maintain the position of the arm on the shaft and tightening the nut on the end of the main shaft to compress the bevel washers. The cap head bolt must be re-tightened and the trap fired again, with a clay, to check the new setting.

Fault Finding (Mechanical) Chondel.

1. **Carousel does not rotate.**

Check:
(a) The carousel pusher arm is not jammed with broken clays or dirt.

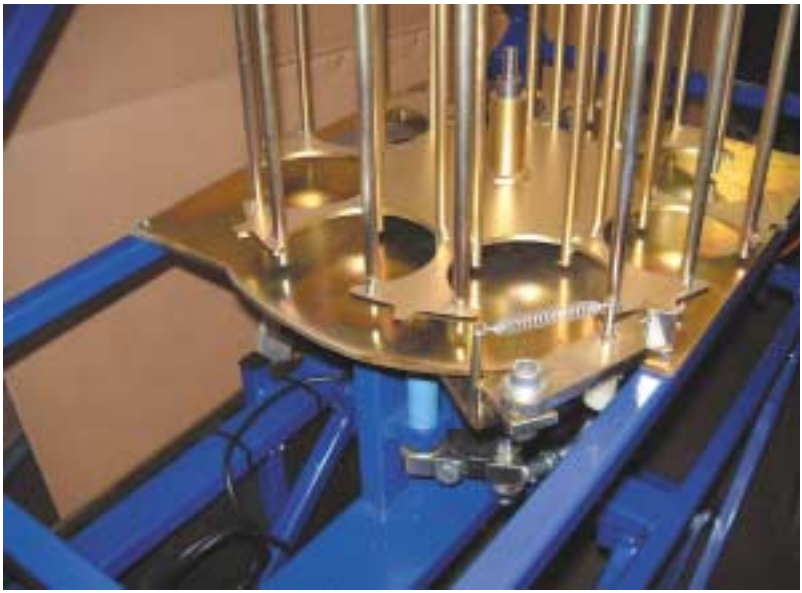
(b) The carousel pusher return spring is broken or missing.

(c) With the pusher arm withdrawn, the carousel should be free to rotate with a small amount of friction. This is adjusted by tensioning the locking nut holding the carousel against the plastic sleeve underneath it.

(d) Carousel pusher timing is correct. Looking at the side of the machine with the pusher to the left check that the rectangular block on the gearbox is horizontal and facing the rear of the machine to the right. Referring to photo below, rotate the machine to position the clamp block on the gearbox shaft to point to the rear of the machine as shown.

PHOTO, CHONDEL REAR PUSHER CRANK

With the clamp block in this position, the carousel pusher arm should be as far to the right as possible as shown in the photo below. If not adjust the other clamp block on the vertical rear pusher shaft making sure it is tightened before operating the machine. Do not adjust the clamp block on the gearbox.



PHOTO, CHONDEL REAR PUSHER

2. **Machine will not throw clays.**

It is usually obvious what is wrong with the machine, which does not Throw clays at all. It is more likely that the following situation arises,

Machine throws clays but:-

(a) **The clay flicks up in the air.**
The arm is probably bent down squeezing the clay against the casting plate. The arm should be straightened or replaced.

(b) **The clay goes no distance** (even though the main spring is wound up tight).

The arm is probably bent upwards causing clay to go under at its tip. This will also cause clay to break. The arm should be straightened or replaced.

(c) **The clays are inconsistent in direction.**
The clay is being jammed under the arm towards the end. This is usually caused either by the arm or more likely the clays varying in thickness. The solution is if the arm is bent is to straighten it. To check if it is the clay thickness put a clay against the casting plate and check the clearance with the arm all the way around the throwing cycle. Inserting or removing brass washers behind the arm clamp block on the main shaft can adjust the distance between the arm and casting plate.
Check arm timing relationship (see diagram).
Refit and tension spring. Refit outer guard making sure it is set to the correct gap (see instructions).

3. **The machine breaks clays.**

A point to consider here is that if you have other traps, which have suddenly started to break clays, then it is probably the clays which are faulty. The maximum acceptable level of no birds is 5%, but should in practice be less.
A simple process should be followed which differentiates between the **loading** of the clay prior to the **throwing** of the same clay.

4. **Check loading cycle first:**

(a) Check that the clays in the carousel are intact, not chipped or cracked.

(b) If in doubt , remove suspect clays and refill with ones known to be intact.

(c) With the machine switched off, rotate the carousel by hand, removing each clay as it drops onto the loading chute. Check for cracks and chips, if the clays arrive onto the chute intact, then move onto the throwing section below.

(d) If they arrive chipped or cracked then remove the carousel and check that the thickest clay you can find slides easily under both inner and outer knife edges, i.e. just free enough not to be squeezed onto the carousel plate. Check of course that the knife-edges are not excessively high, although this would tend to shave the bottom off the next clay, not break it. Adjust both knife-edges accordingly.

(e) Replace the carousel and place one clay in each column. Tilt the machine backwards as far as it will go and rotate the carousel by hand allowing each clay to fall through the loading port. As each clay passes through the knife-edges, watch for anywhere that either knife-edge bites into the side of the clay. If this occurs on any column then the carousel may be damaged. To check and repair, remove the carousel and phone the dealer/ manufacturer for instructions.
Tilt the machine to its forward position and repeat above.
If damaging contact occurs on all columns then the knife edge is damaged and must be realigned by refitting or possibly filing / grinding to give minimal clearance.
If the clays arrive on the loading chute intact, then the fault lies in the throwing cycle.

5. **Check throwing cycle next:**

(a) Check arm for straightness, for chunks missing from the rubber / plastic friction strip or any other physical damage to the arm.
If the arm cannot be straightened then it should be replaced.
A new friction strip can be fitted to an old arm if necessary.

(b) Check for damage to the casting plate, for flatness ,dents and burrs etc. Ensure that no screw heads protrude above the plate and that there are no other obstructions to the clays path.

(c) Check the height of the arm over the casting plate across its whole surface to ensure that the clay fits under the friction strip with about 1mm clearance.
If the height needs adjusting see paragraph 2c.

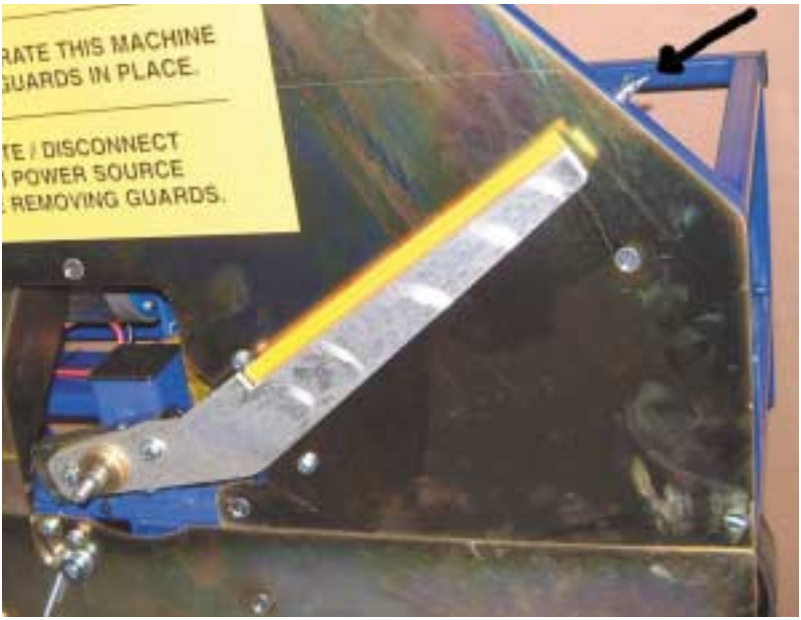
(d) Check that the bolt holding the throwing arm to its clamp block is tight.

(e) Check the arm - crank timing relationship. If this relationship is incorrect the trap will definitely break clays when throwing.

(f) Referring to the photo below, rotate the machine to position the main spring and the shaft crank arm with its nylon roller to the position shown.

PHOTO, CHONDEL ARM AND SPRING POSITION

In this position the tip of the throwing arm should be on the timing mark or in line with the wing nut used to attach the guard as shown in the photo below. If not then adjust the throwing arm clamp block on the shaft making sure it is tightened before operating the machine.



PHOTO, CHONDEL ARM POSITION

ADDITIONAL INSTRUCTIONS FOR CHONDEL MACHINES SOLD IN THE U S A

Machines sold in the USA from February 2002 are supplied with 2 throwing arms.
The reason for this is that USA type rabbit clays are flat with no location/throwing band. A different clearance is therefore required between the arm and the throwing plate to enable the machine to throw rabbit clays.

Rabbit Arm:-

Fitted to the machine as supplied from the factory throws Rabbit clays.
(The additional Rabbit deflector plate must also be fitted)

Conventional Arm:-

To throw conventional clays as loopers is supplied separately with the machine. The arm can be exchanged by **first removing the main spring for safety reasons**, the top guard and lower plate. The arm is attached to its mounting block by 2 screws. **Do not** move the mounting block position on the main shaft or machine timing will be lost and have to be reset.

The previous picture above shows the machine with the guards removed ready to change the arm.

Fault Finding (Mechanical) Colt, Super Colt and Solo.

1. **Machine will not throw clays.**
   It is usually obvious what is wrong with a machine which does not throw clays at all. It is more likely that the following situation arises;

Machine throws clay but:

(a) **The clay flicks up in the air.**
The arm is probably bent down or the casting plate bent up, squeezing the clay between them. The arm or plate should be replaced or straightened.

(b) **The clay goes no distance** (even though the main spring is wound up tight.)
The arm is probably bent upwards causing clay to go under it at its tip. This will also cause clays to break. The solution is to straighten the arm.

(c) **The clays are inconsistent in direction.**
The clay is being jammed under the arm towards the end. This is usually caused either by the arm being bent down, then the tip bent up or more likely clays varying in thickness.

The solution if the arm is bent is to straighten it. If it is the clay thickness that is the problem then adjust the arm to accommodate the thickest one you can find. See photo overleaf.

PHOTO, COLT ARM CLEARANCE

3. **The Machine breaks clays!**

A point to consider here is that if you have other traps which have suddenly started to break clays, then it is probably the clays which are at fault. Particularly soft clays can be accommodated by fitting a ‘soft fall’ plate to the machine, but sometimes the clay will be unable to absorb the actual throwing forces consistently. The maximum acceptable level of no birds is 5%, but should in practice be less.

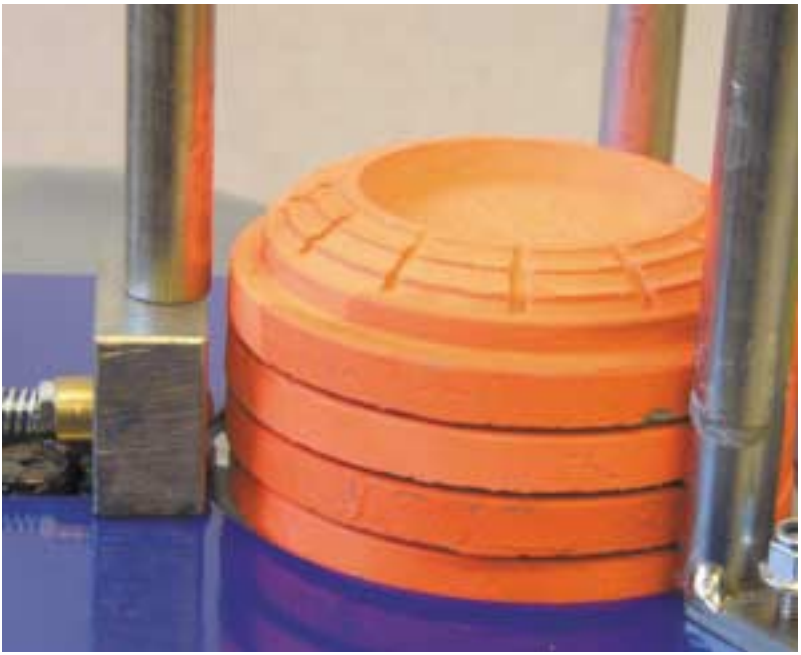
A simple process should be followed which differentiates between the **loading** of the clay prior to throwing and the **throwing** of that same clay.

Check **loading cycle** first:

(a) Check that clays in the magazine are intact, not chipped or cracked. If in doubt, remove suspect clays and use ones known to be intact.

(b) Place two clays at the bottom of the magazine. Check that the tip of the brass plunger (the red rubber tip) is about 1mm away from the top clay. If the gap is any larger, you may experience problems with the machine feeding two or more clays at a time. If there is no gap and the clay cannot fall past the plunger, then this will cause problems as well.

To adjust the plunger, two 10mm combination spanners are required. Put the open ended side of the spanner onto the 1/2 nut which is locked against the brass plunger. Put the other 10mm spanner on the M6 nylock nut which sits at the other end of the plunger, behind the aluminium bracket. By turning the nylock whilst holding the 1/2 nut, the plunger can be made to move in and out of the plunger hole. This is how the distance is set between the tip of the plunger and the side of the clay. Set the correct gap as necessary to 1mm and no more. See photo overleaf. Once this is set, fill the magazine with clays. The machine can now be cycled to check that the clays arrive on the throwing plate intact. If this is the case then the fault lies in the throwing cycle.



PHOTO, COLT PLUNGER

Check **throwing cycle** next:-

(a) Check arm for straightness, for chunks missing from the rubber/plastic friction strip or any other physical damage to the arm. If the arm cannot be straightened then it should be replaced. A new friction strip can be fitted to an old arm if necessary.

(b) Check for damage to the casting plate especially the front edge of the plate in case it has been dented, bent or burred. Check for flatness, ensure that no screw heads protrude and that there are no other obstructions to the clays path.

(c) Check the height of the arm over the plate across its whole surface to ensure that the clay fits under the friction strip with about 1 mm clearance. Any more than 3 mm clearance will cause the arm to break the clay by riding over it. See photo 1 (c) above.

(d) Check that the bolt holding the arm to its clamp block is tight.

(e) Check the **arm-crank timing relationship**. If this relationship is incorrect the trap will definitely break clays when throwing. **The timing can be adjusted to the diagram found in this manual.**

As each of the above elements are checked, something incorrect should be discovered. If the machine still breaks clays, then there is one final check.

Slacken the main spring to its minimum extension, i.e. with the throwing arm in the forward position the coils are just open. Operate the trap a few times in this mode which puts hardly any stress into the clay because of the slack mainspring. If the clays still break then it is very likely that the actual clays are sub standard and a new batch should be obtained.

Fault Finding (Mechanical) Solenoid Release Machines.

This section deals specifically with how to check and adjust the solenoid release mechanism and explains how it works compared to a normal release system on machines not fitted with solenoid release. It does not matter if the machine is a Skeet machine DTL/ATA or ABT the principle is exactly the same. If a machine is breaking targets, or not loading etc, the previous fault finding sections on Sporter machines still apply and must also be read.

SOLENOID RELEASE, A BRIEF DESCRIPTION

Solenoid release mechanisms are used on machines where an instantaneous release of the target is required. For example on two Skeet machines throwing registered/competition targets, the standard release on normal Rangers and Sporters is not quite fast enough, so solenoid release is fitted.

The solenoid release mechanism consists of a pin fitted to the throwing arm, a trigger assembly which pivots on a bar mounted on a bracket and a solenoid to move the trigger out of the way to allow the pin on the arm to move past it when the trap is fired.

When the machine is turned on and arms itself, the motor drives the arm in a counter-clockwise direction up to the solenoid trigger. The arm reaches ‘top dead centre’ (tdc) when the pin on the arm is about 30mm (1¼") away from the trigger. See photo below. As the arm reaches ‘tdc’, the spring is stretched to its to its maximum. As the arm then passes over ‘tdc’ the spring takes over and pulls the arm around, but the arm comes to rest on the trigger and can go no further. The trigger stops the arm in the cocked position waiting to be fired. The motor is set with the roller switch, to stop just as the arm gets to ‘tdc’, so that there is no chance of the motor driving the arm on to the trigger to far. So as the arm goes over ‘tdc’ the motor stops and the spring tension pulls the arm on to the trigger the last bit.

PHOTO, ARM TDC, PIN 30MM FROM TRIGGER

If set correctly, when the fire button is pressed, the solenoid moves the trigger out of the way of the pin on the arm in a fraction of a second. The arm is then free to move and because it is already past ‘tdc’ it fires immediately.
On non-solenoid machines the roller switch causes the motor to stop the arm just before ‘tdc’. When the fire button is pressed the roller switch circuit is bypassed, the motor starts, pushes the arm over ‘tdc’ and then the spring takes over and fires the trap. This is why there is a slight delay on non solenoid release machines as the motor has to push the arm up to and just over ‘tdc’ for the arm to then fire. The roller switch can be set so that the arm stops just at the point of firing so the delay is hardly noticeable. It is best to do this when the machine has warmed up.

Solenoid Release Adjustment

Adjustment of the solenoid release set-up is done as follows.

With the trap in the **DIS-ARMED/SAFE** position, standing at the rear of the trap, adjust the roller switch out to the left side of the machine as far as it will go.

Press the toggle switch to ‘ON’. The machine will load a clay and come to the cocked position and is now ready to fire. Note that the throwing arm has stopped short of the trigger .

Press the toggle switch to ‘OFF’ but do not disarm. The machine should still be armed and treated with **EXTREME CAUTION**.

From behind the machine slowly and carefully push the tip of the arm towards the trigger assembly on the side of the machine. If the arm timing is correctly set, when the arm is about 30mm (1¼") from the trigger it will go over ‘tdc’ with the spring pulling the arm on to the trigger. If the arm goes over ‘tdc’ more than 30mm away from the trigger or it does not go over ‘tdc’ before touching the trigger, then the arm timing will need to be adjusted.

To adjust the arm timing, the machine must be in the **DIS-ARMED/SAFE** position. Undo the 19mm bolt on the arm clamp block so that the arm can be moved on the shaft. Be careful not to move the arm while undoing the bolt.

If the arm goes over ‘tdc’ to early i.e. 40mm before it gets to the trigger, move the arm counter-clockwise about 10mm (½") at the tip and retighten the arm clamp block bolt.

Press the toggle switch to ‘ON’. The machine will load a clay and come to the cocked position again it will be short of the trigger.

Press the toggle switch to ‘OFF’ but do not disarm. The machine should still be armed.

As before from behind the machine push the tip of the arm towards the trigger and note where it goes over ‘tdc’. If the arm still goes over ‘tdc’ in the wrong place adjust the arm timing again as before.

With the arm timing set correctly, the roller switch needs to be adjusted back in to the correct position. Before making any adjustment ensure that the machine is in the **DIS-ARMED/SAFE** position. It is best to move the roller switch back in towards the trap about 2-3mm (⅛") at a time. The motor needs to be stopping just as the arm goes over centre, so that when the arm and motor have both stopped there is a gap of about 3mm (⅛") between the base of the main shaft (under the nylon spring roller that the spring hooks to) and the 10mm Allen key bolt (that drives the base of the main shaft). See photo below.

PHOTO, GAP BETWEEN SHAFT AND ALLEN BOLT

Once set, the motor should stop the arm in the same position every time, it is also important that the spring finger (clay locator) is pushing the clay against the arm.

Spring Finger Adjustment

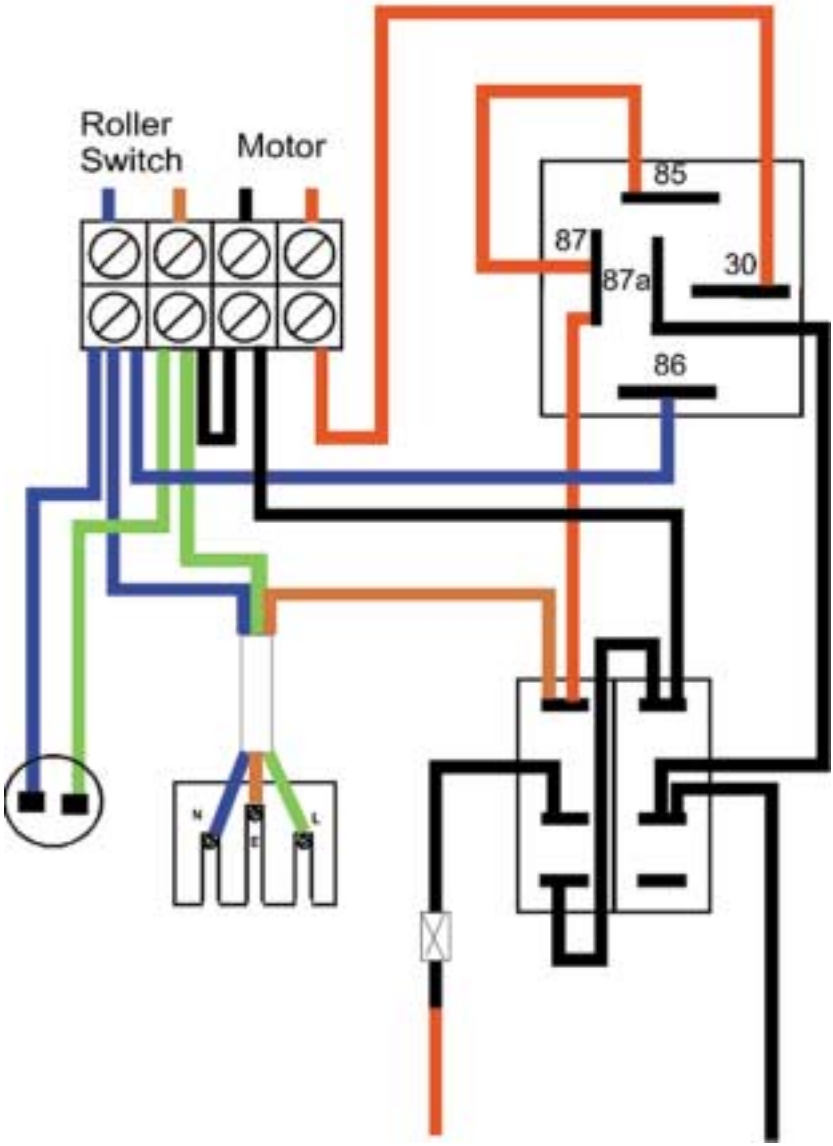
Unfortunately the only way to check if a spring finger is working correctly is to watch from the **REAR** of the machine while it loads a clay and arms itself.

Once loaded and armed the clay should be resting against the arm and the back rail. If there is a gap of more than a few mm, the arm is more likely to break the clay when it is released. The reason for this, is because the arm is already past ‘tdc’ when it is armed. As soon as the solenoid releases the arm, it fires in to the clay. The further away the clay is from the arm, the more momentum the arm has when it makes contact with the clay. So the arm smashes in to the clay and therefore breaks it.

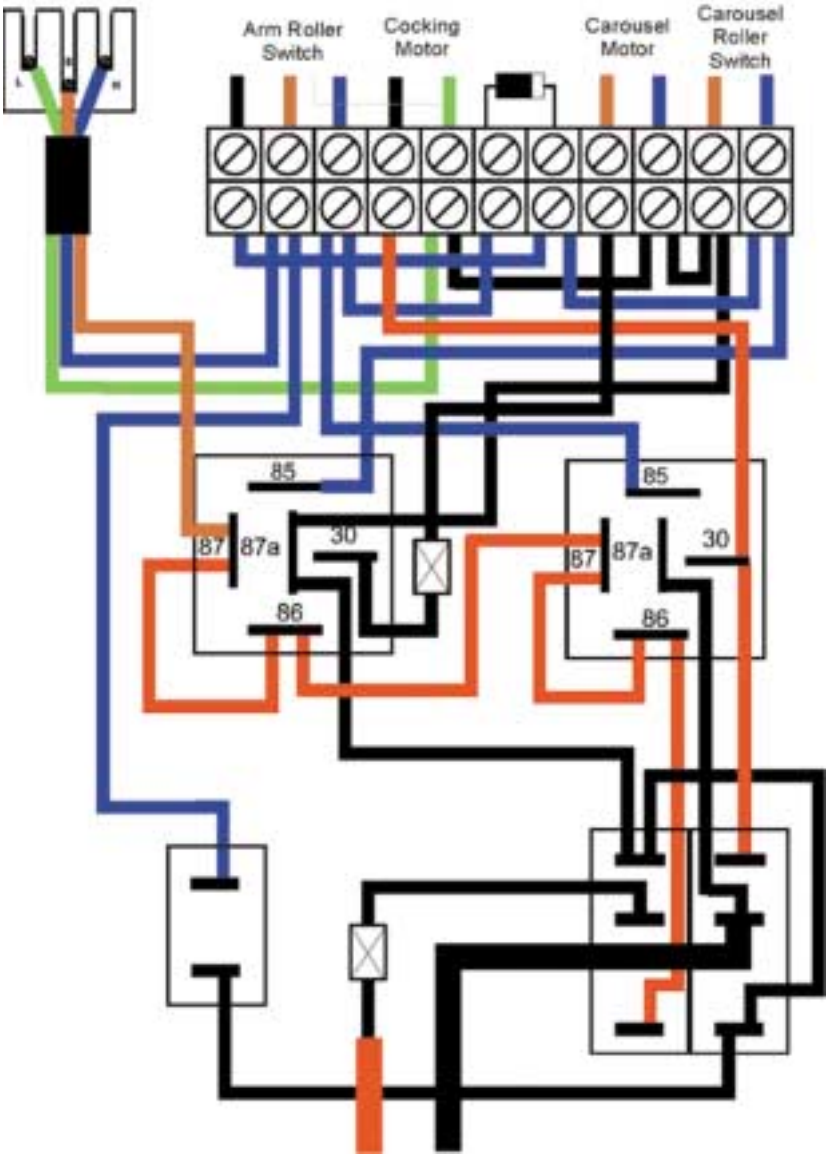
If the clay is not up against the arm disarm the machine and check the condition of the spring finger. It is also important that the finger is in the correct position. It needs to be as close to the underside of the hole in the top plate as possible. So looking directly down through the hole in the top plate the spring finger should not be visible. If it is visible then the clay will fall on top of the finger when it drops through the hole. Too far away from the side of the hole and the finger will not push the clay against the arm when the machine is cocked.

To adjust, the machine must be in the **DIS-ARMED/SAFE** position. Undo the spring finger where it attaches to the casting plate with a 10mm spanner. Rotate the finger to the correct position and retighten the fixing nut.
The spring can be removed from the holder using a Phillips screwdriver and replaced if necessary.

Colt Loom



Super Six


Arm Roller Switch
Cocking Motor
Carousel Motor
Carousel Roller Switch
85
87
87a
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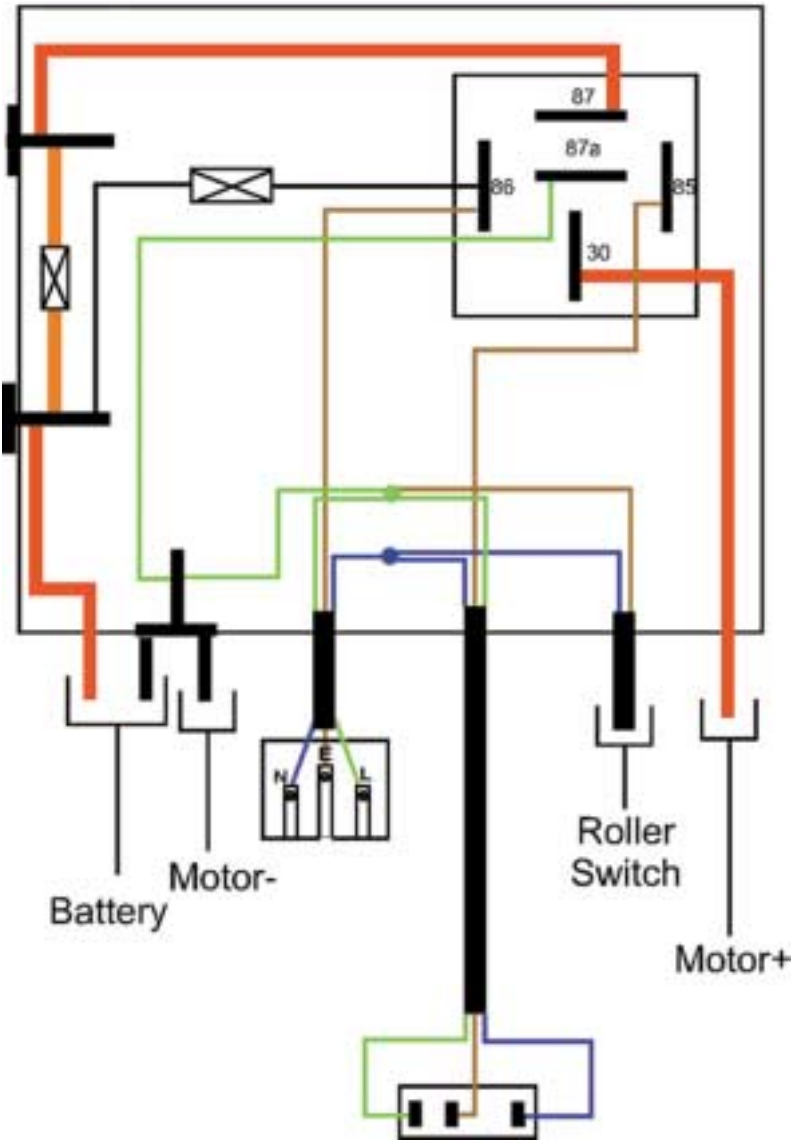
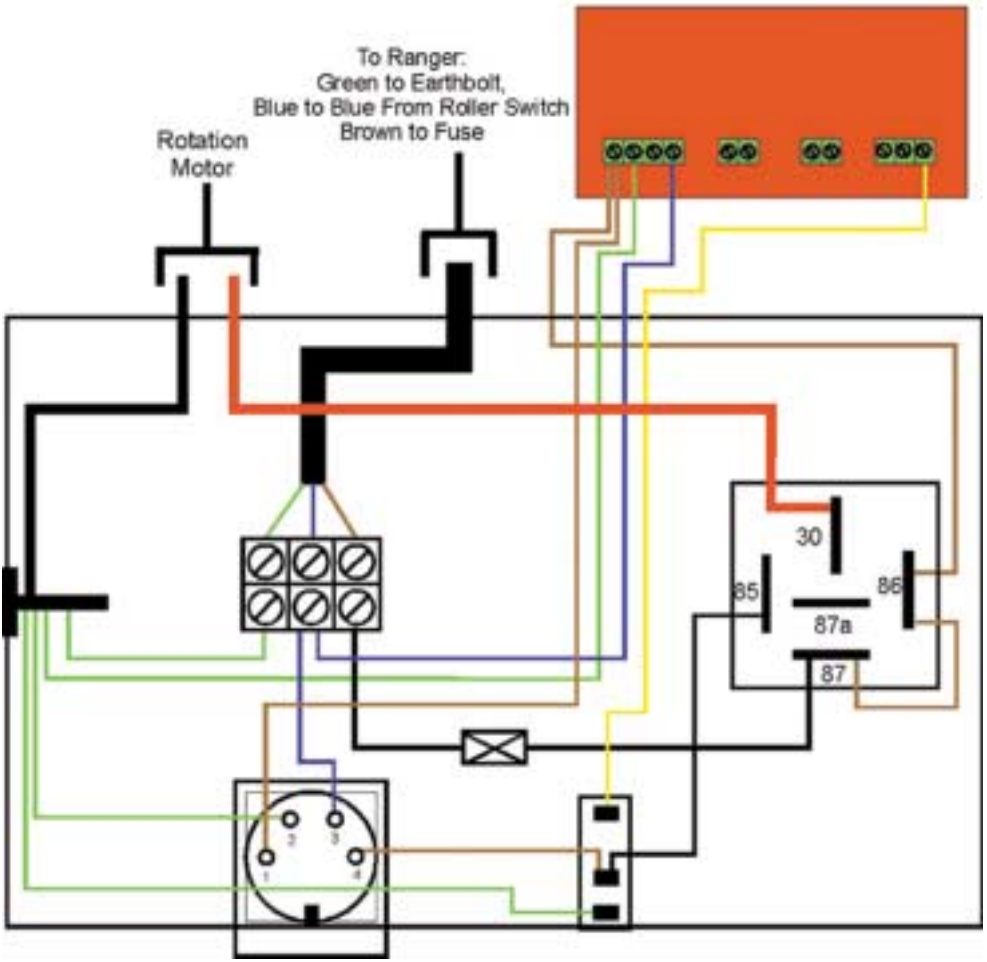
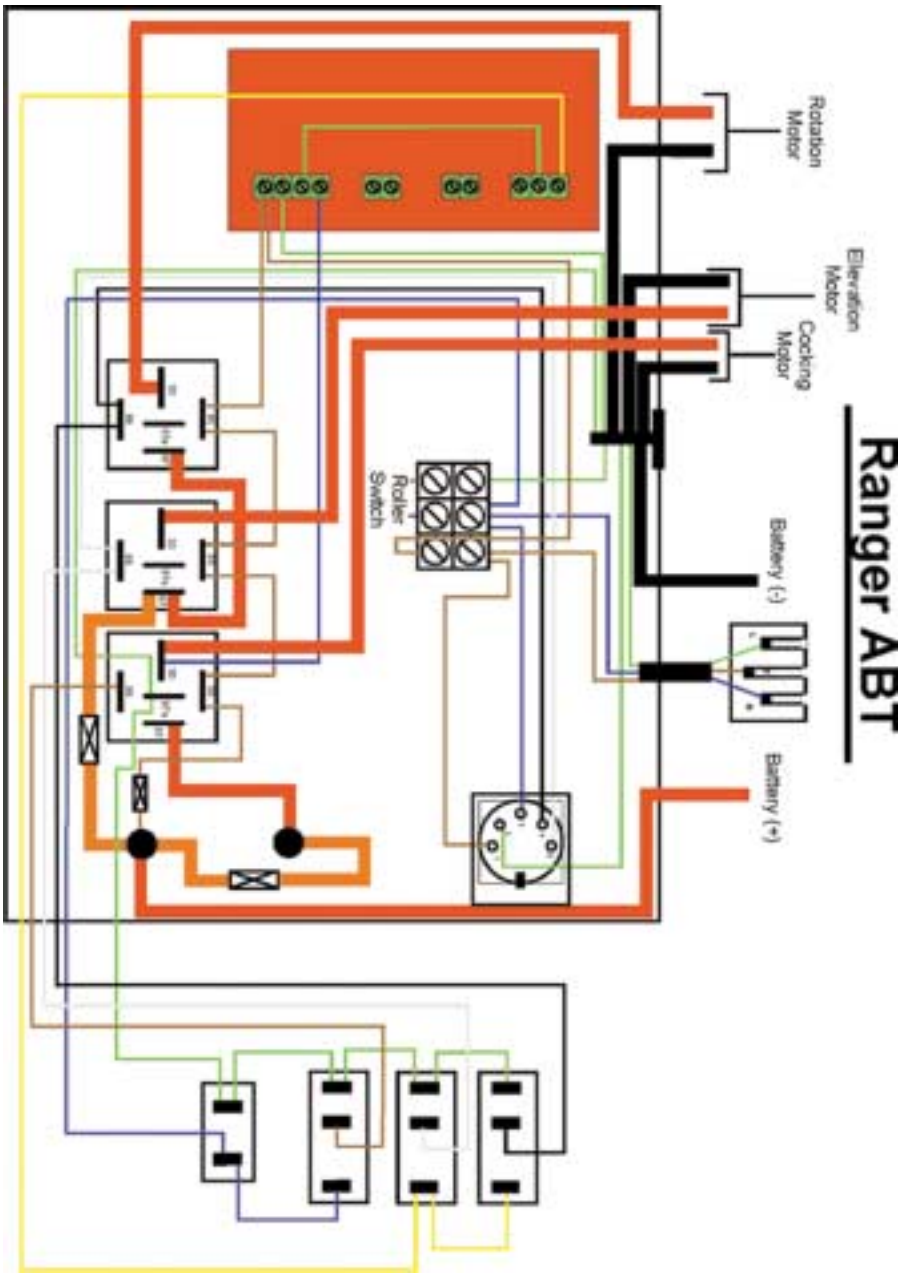
85
87
87a
30
86

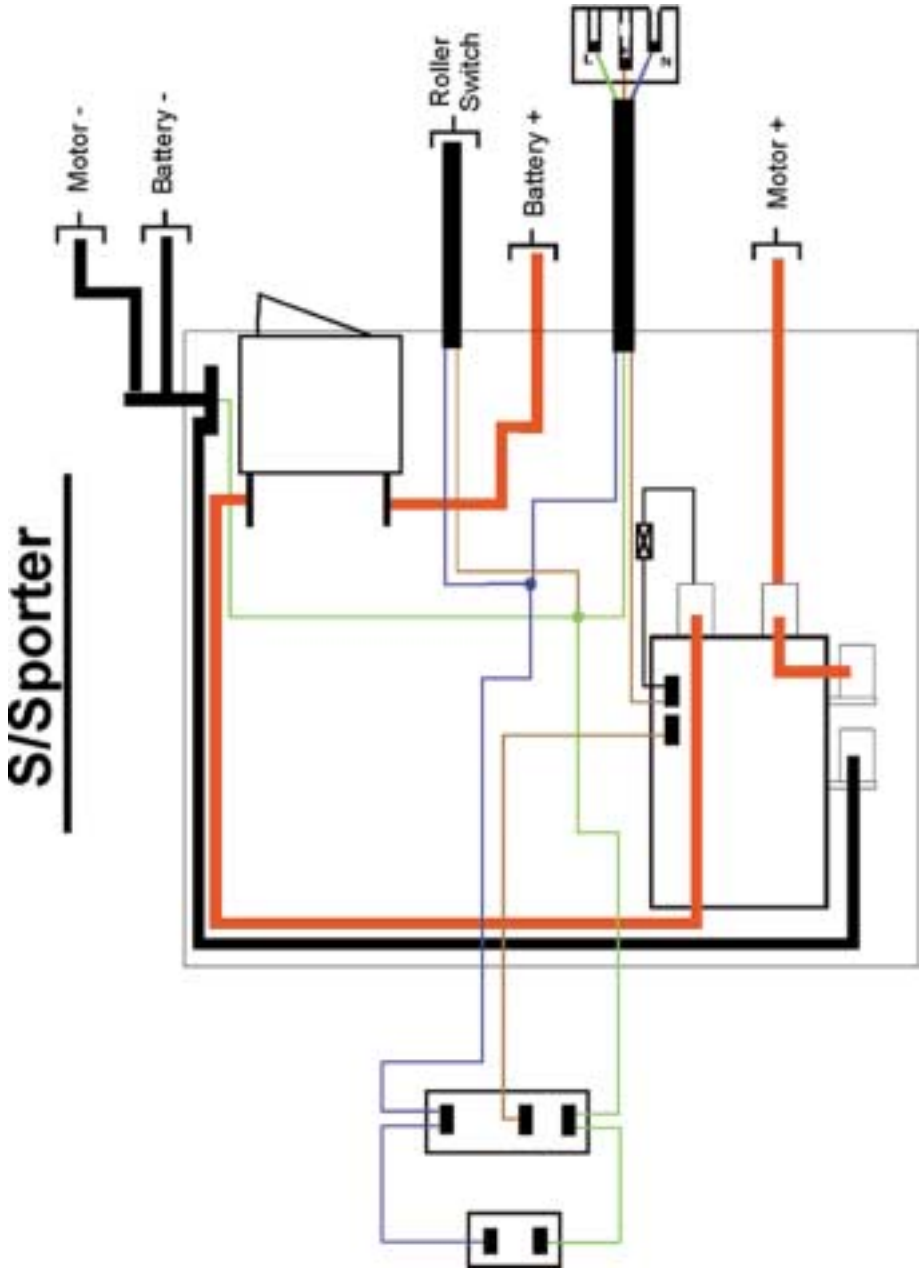
Ranger / Ranger 8

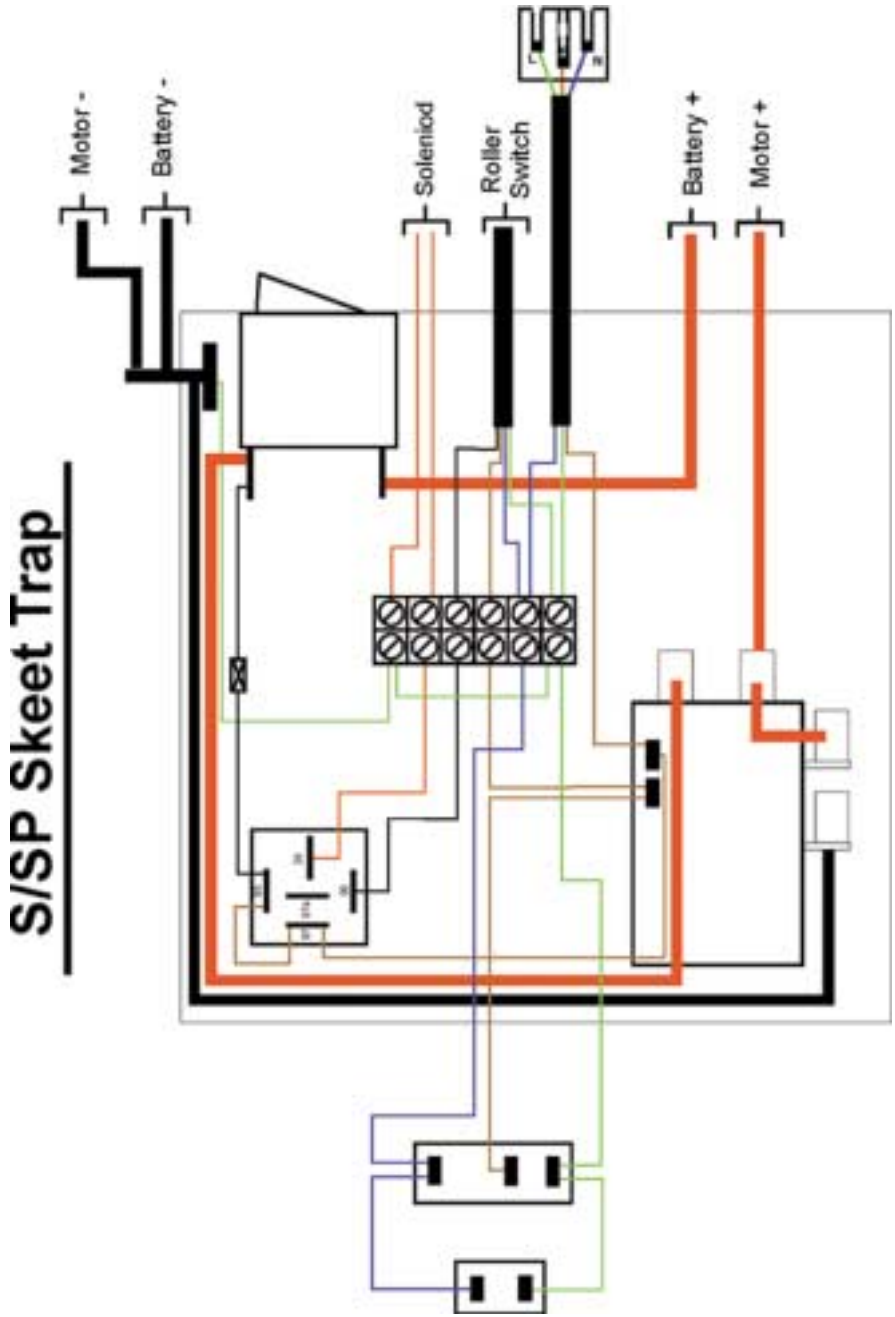


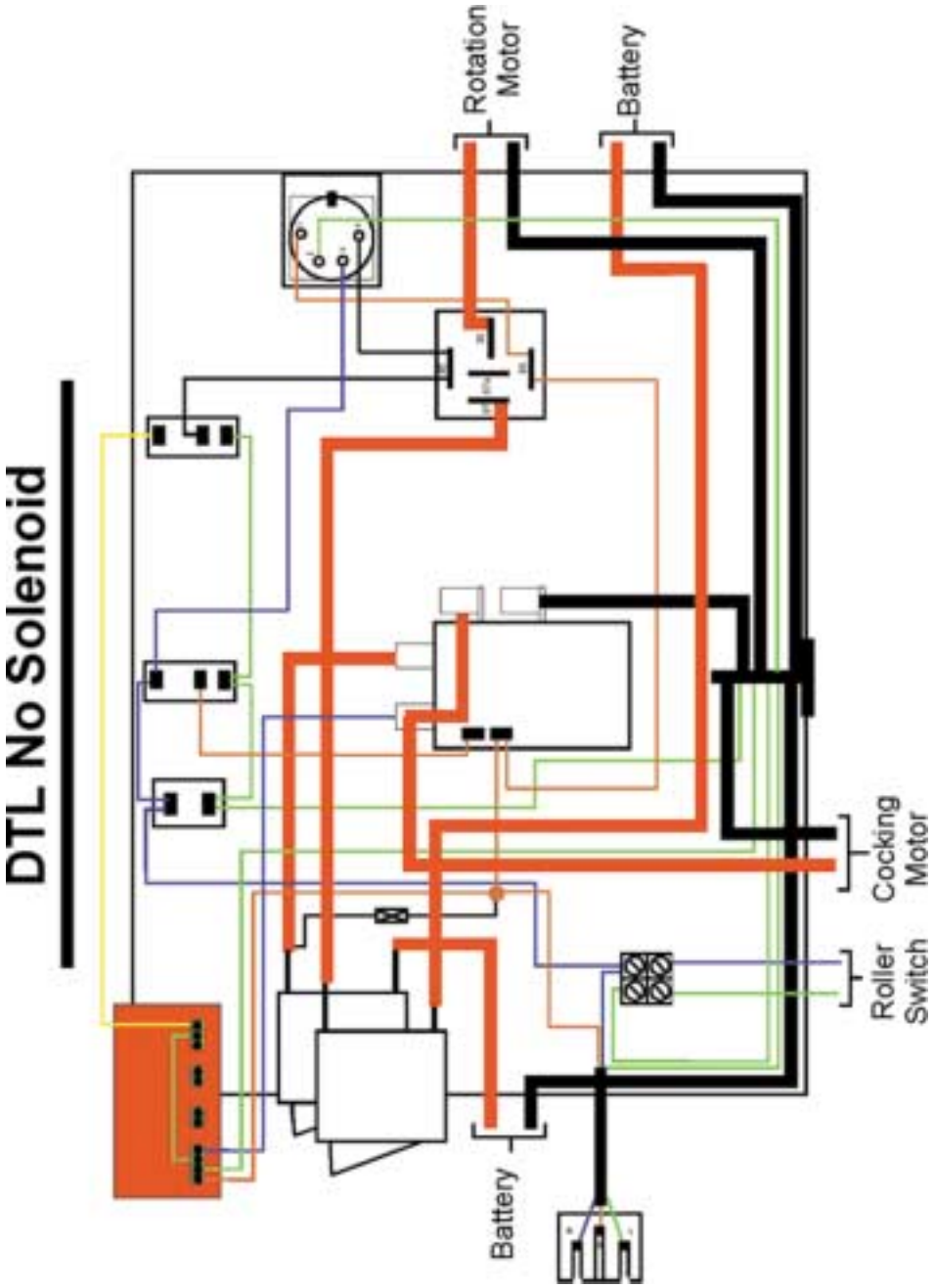
Ranger DTL


To Ranger:
Green to Earthbolt,
Blue to Blue From Roller Switch
Brown to Fuse
Rotation
Motor
30
85
86
87a
87

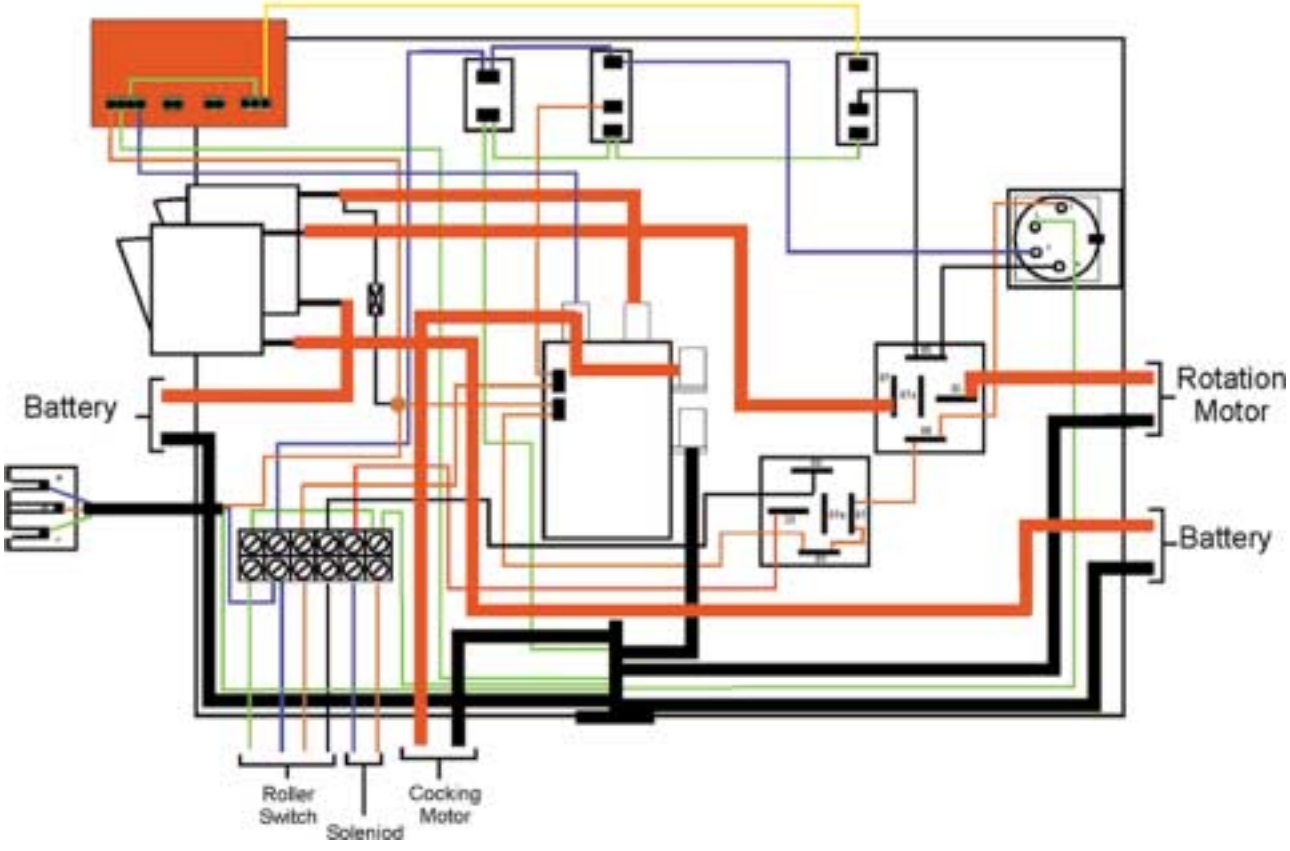

Ranger ABT
Rotation Motor
Elevation Motor
Cocking Motor
Roller Switch
Battery (-)
Battery (+)

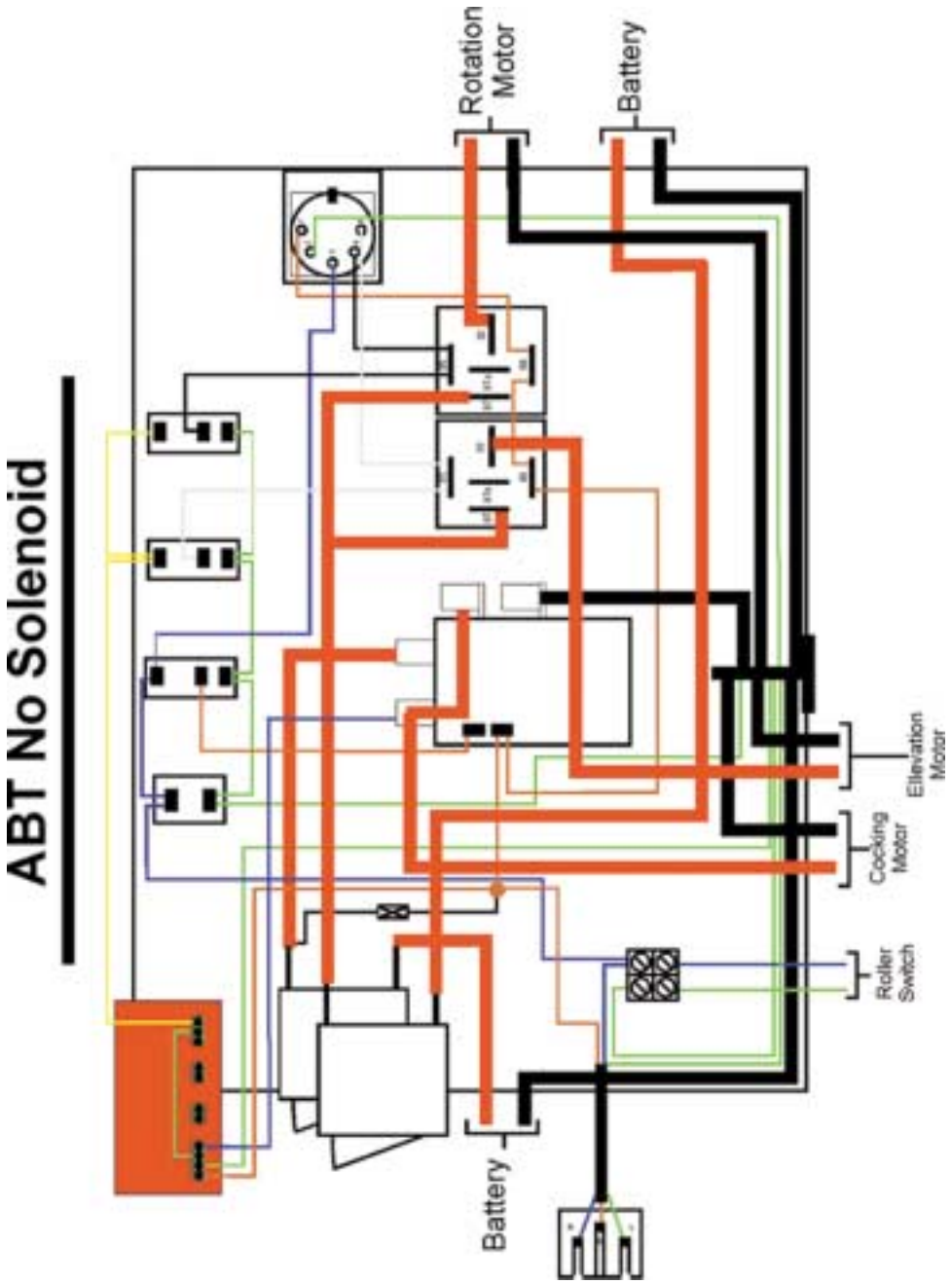

S/Sporter
Motor -
Battery -
Roller Switch
Battery +
Motor +


S/SP Skeet Trap
Motor -
Battery -
Soleniod
Roller Switch
Battery +
Motor +

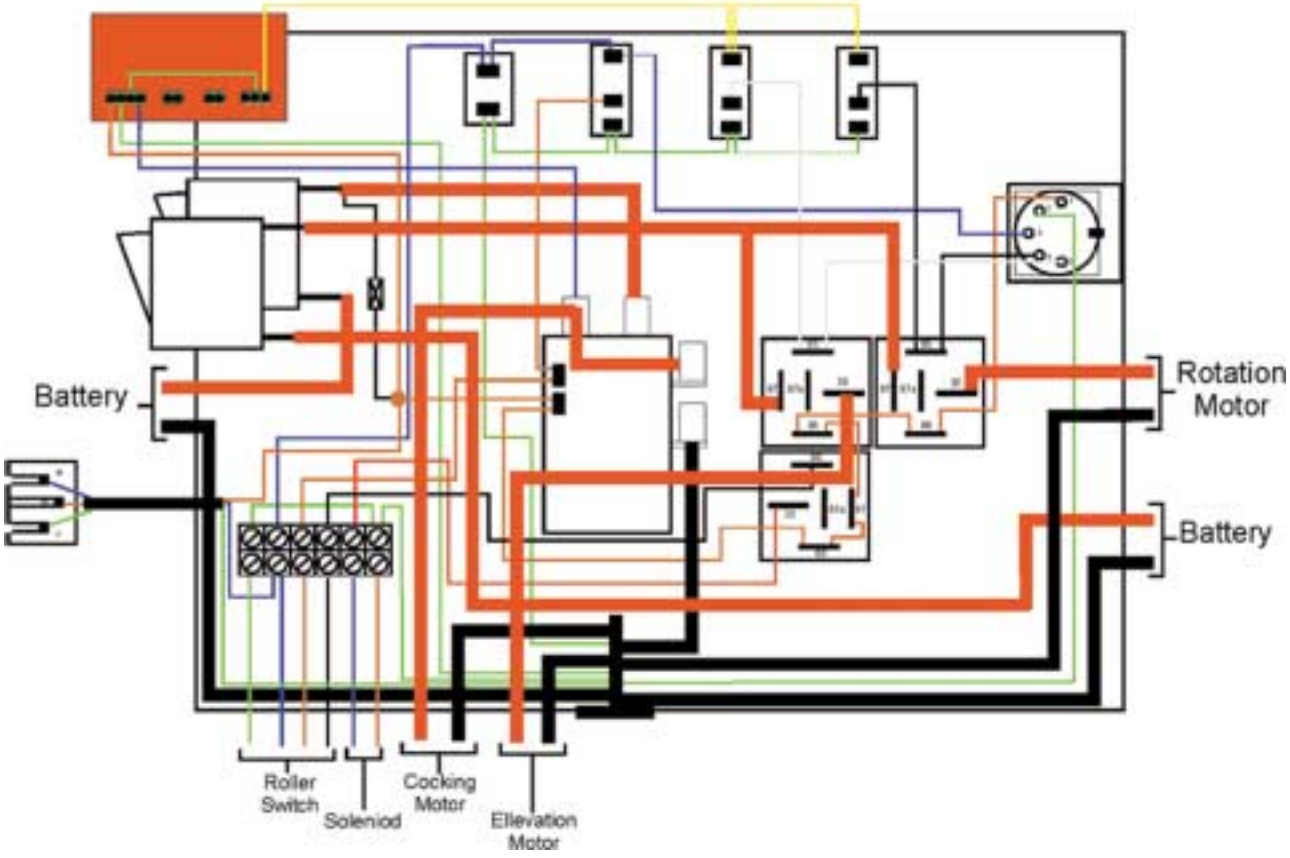

DTL No Solenoid
Rotation Motor
Battery
Cocking Motor
Roller Switch
Battery

DTL Solenoid Release

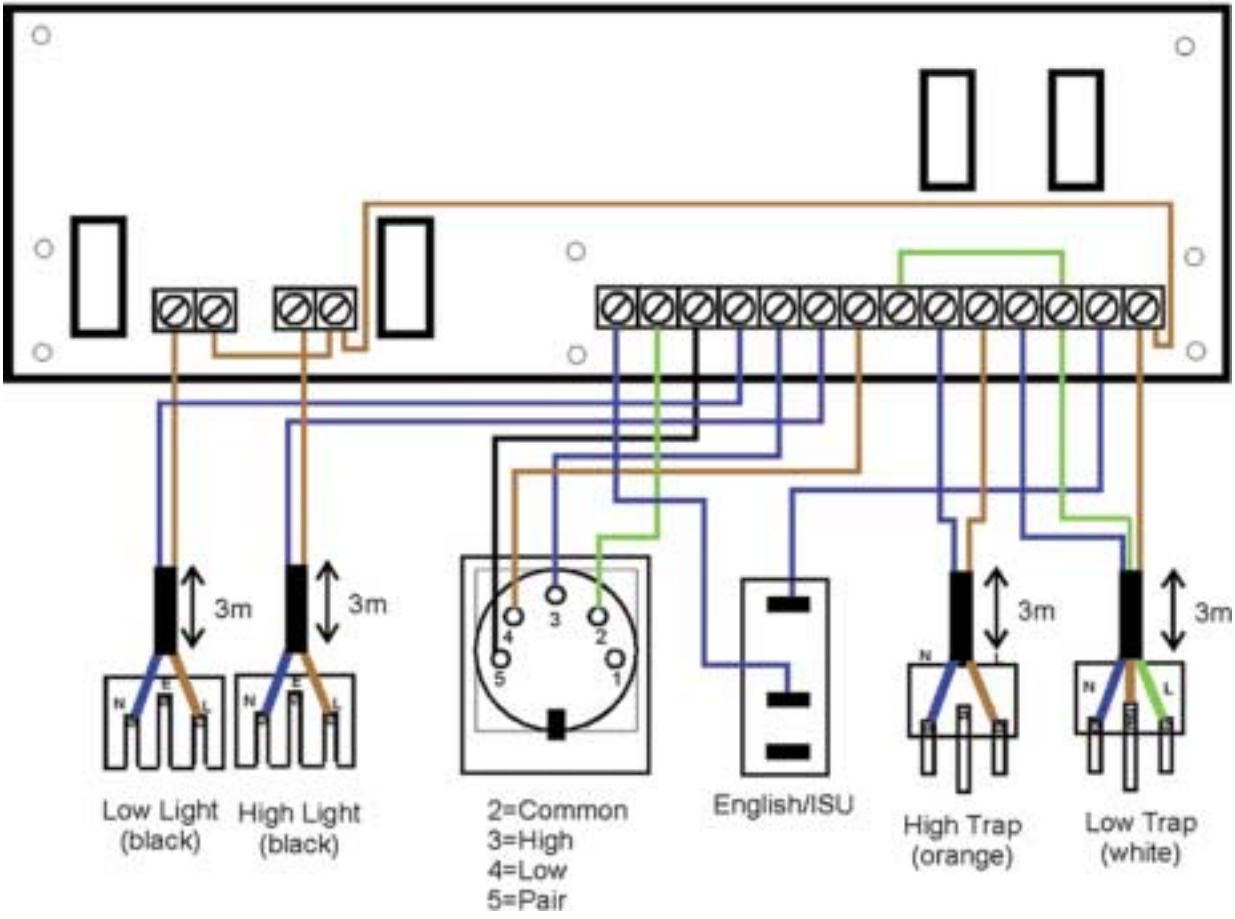



ABT No Solenoid
Rotation Motor
Battery
Elleviation Motor
Cocking Motor
Roller Switch
Battery

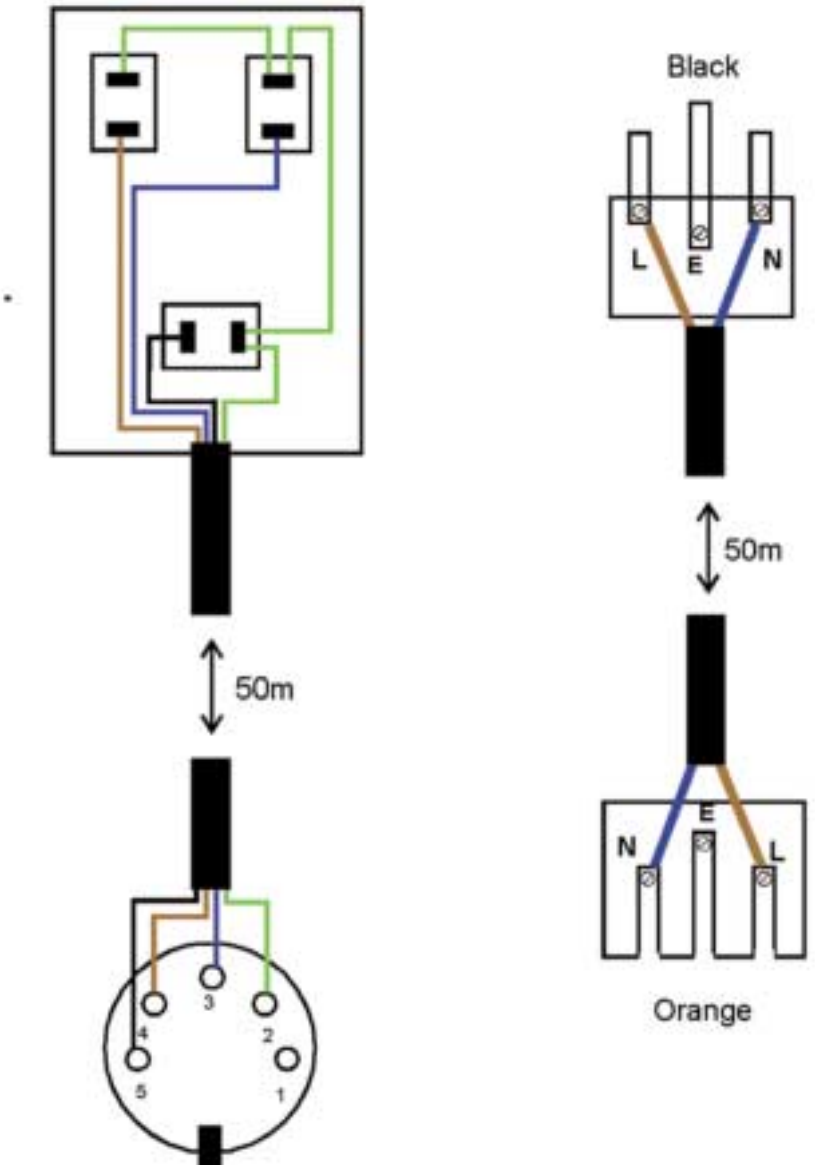
ABT Solenoid Release



ISU Skeet

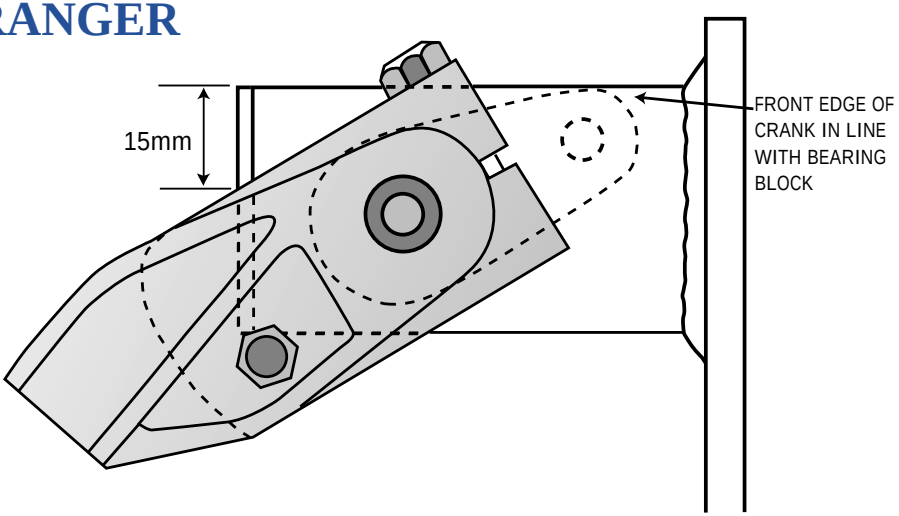

3m
3m
3m
3m
N
E
L
Low Light
(black)
High Light
(black)
2=Common
3=High
4=Low
5=Pair
English/ISU
High Trap
(orange)
Low Trap
(white)

ISU Hand Control & Extension Lead

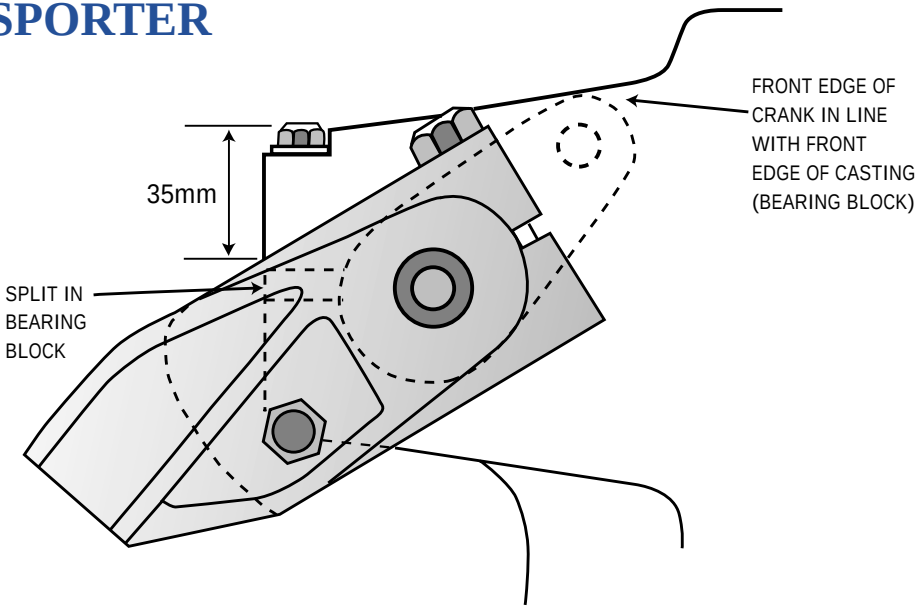


ARM TIMING DIAGRAM

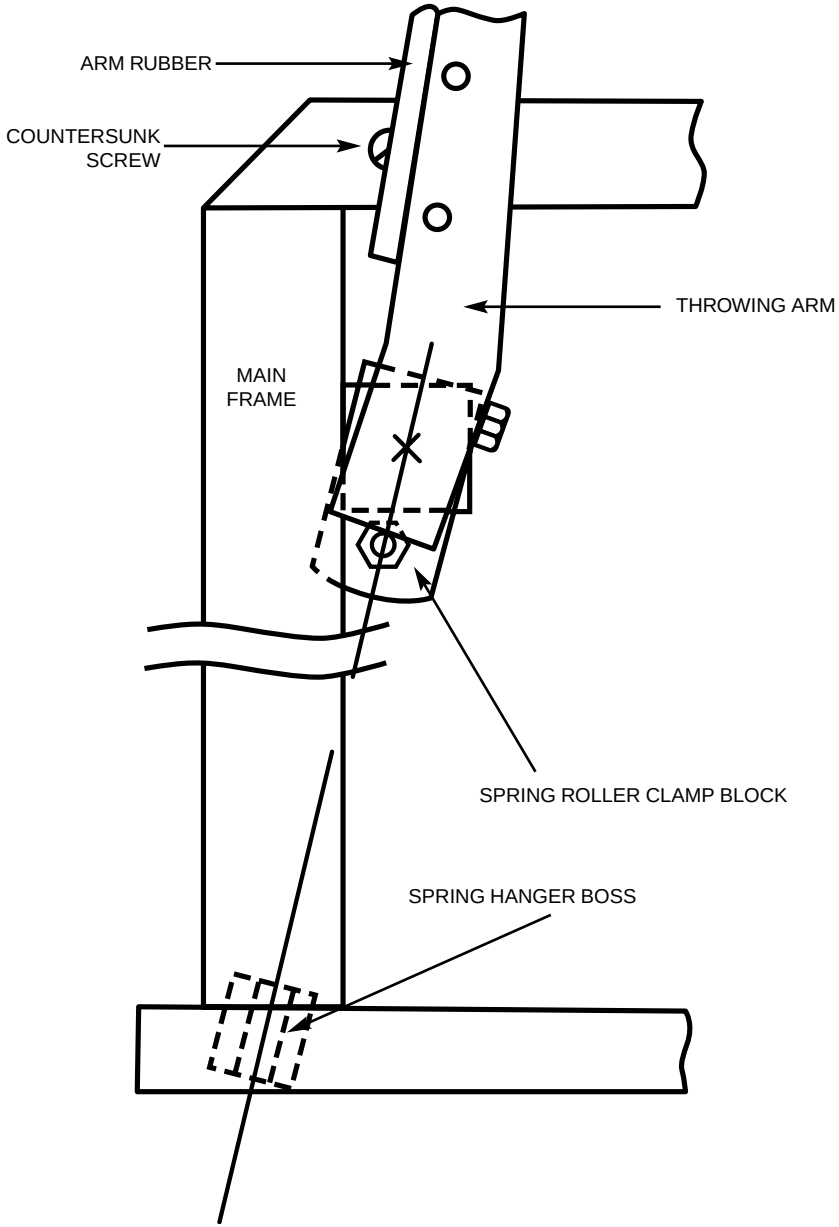
RANGER



SPORTER

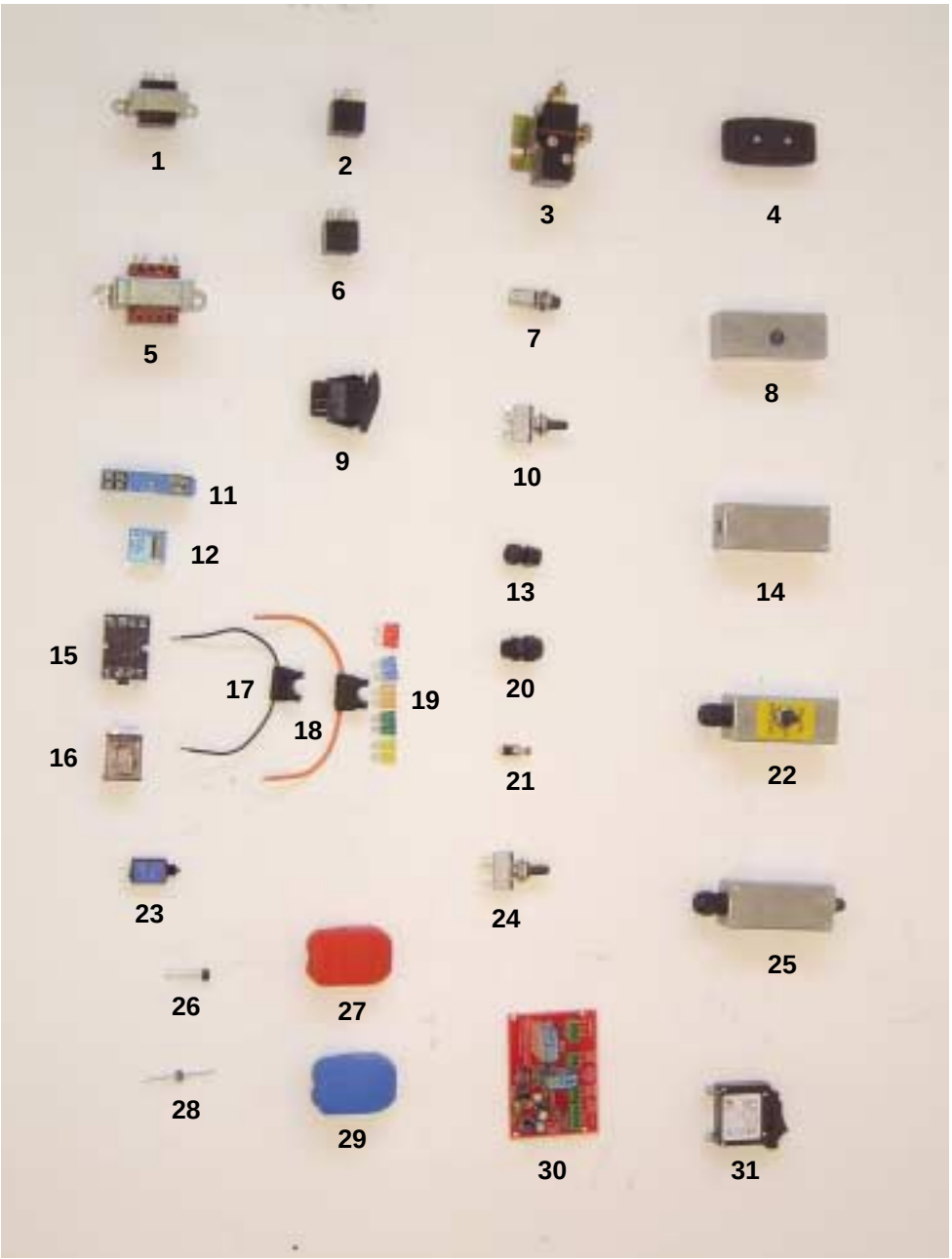


ARM TIMING DIAGRAM
COLT, SUPERCOLT AND SOLO



ELECTRICAL SPARE PARTS

Number	Part No	Description
1	7405	6va Transformer
2	7550	5 Pin Relay
3	7560	12v Relay (Solenoid)
4	7850	Duraplug
5	7410	12va Tansformer
6	7555	4 Pin Relay (Replaced with 5 Pin & Terminals)
7	7600	Fire Button
8	7155	Remote Disarm Box
9	7650	Rocker Switch - Double Pole
10	7655	Toggle Switch - Screw Terminals
11	7570	Small Mains Relay Base
12	7565	Small Relay (Old Mains trap)
13	7155	Command Button Box
15	7580	Large Mains Relay Base
16	7575	Large Mains Relay
17	7750	Black Fuse Holder
18	7755	Orange Fuse Holder
19	7760 - 5	5a Blade Fuse
	7760 - 10	10a Blade Fuse
	7760 - 15	15a Blade Fuse
	7760 - 20	20a Blade Fuse
	7760 - 30	30a Blade Fuse
20	7805	20mm Gland
21	7605	Fire Button (Colt / Junior)
22	7200	Remote Disarm - Complete
23	7700 - 3	Mains Trip 3a
	7700 - 4	Mainst Trip 4a
	7700 - 5	Mains Trip 5a
	7700 - 6	Mains Trip 6a
	7700 - 10	Mains Trip 10a
24	7660	Toggle Switch - Spade Terminal
25	7150	Command Button Box Complete
26	7860	Silicone Bridge Rectifier
27	7500	Red Battery Terminal
28	7870	Diode (Super 6)
29	7505	Blue Battery Terminal
30	7880	Rotation / Elevation Timer
31	7665	12v Trip Switch (50a)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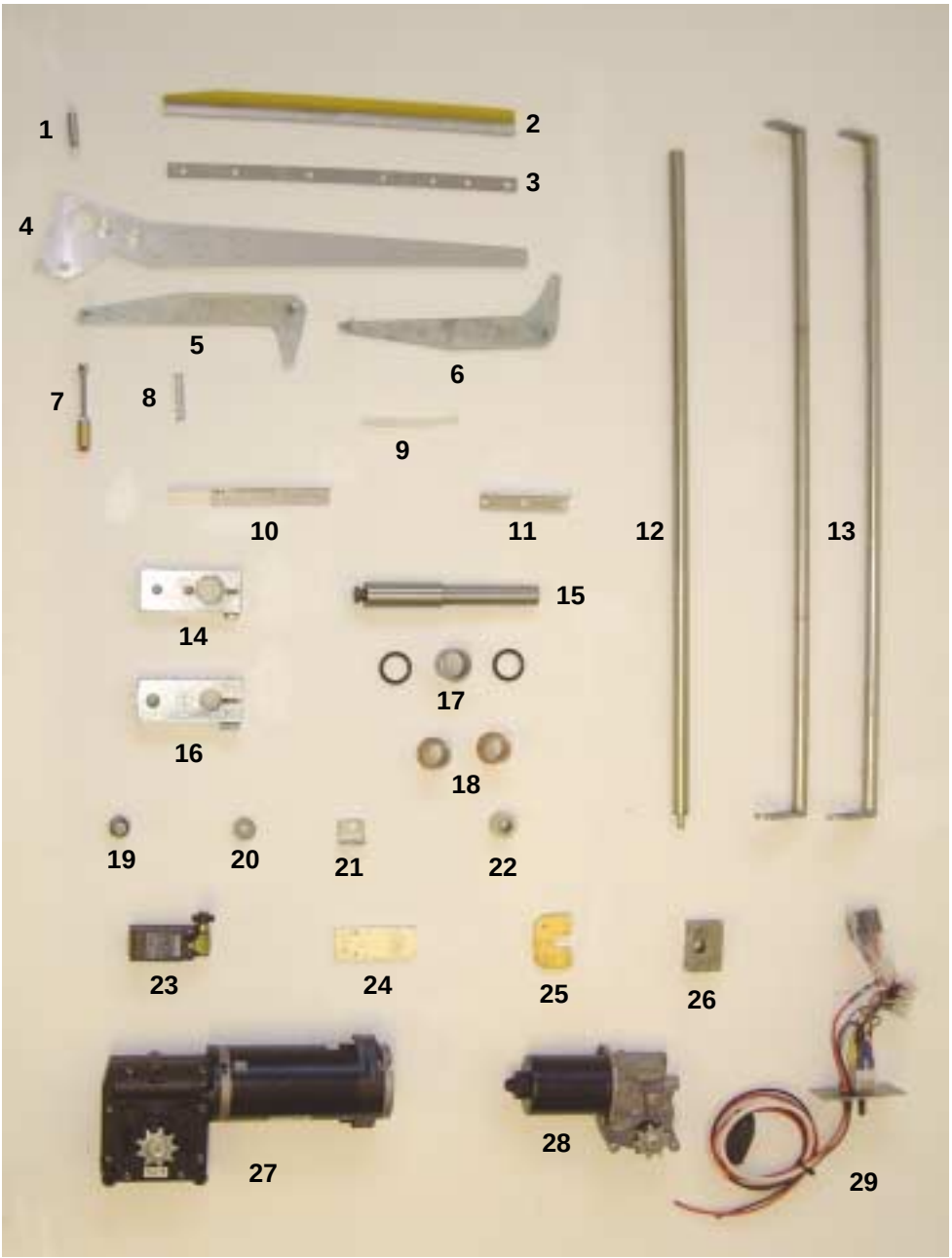
COLT SPARE PARTS

Number	Part No	Description
1	6480	Iris Spring
2	2012	Friction Strip
3	2013	Arm Spacer Strip
4	2011	Arm
5	3600	Left Iris
6	3650	Right Iris
7	3660	Brass Plunger
8	6450	Plunger Spring
9	3550	Teal Finger
10	3500	Backrail
11	2200	Clay Sweeper
12	1400	Front Hopper Rod
13	1450	Rear Hopper Rod
14	2100	Arm Clamp Block
15	2150	Main Shaft
16	4200	Lower Clamp Block
17	6020	Bearing Set 2
18	6070	Phos. Bronze Bush
19	3760	Linkage Cam
20	6180	Linkage Bearing
21	3670	Plunger Support
22	3770	Spring Roller
23	7300	Roller Switch
24	3700	Roller Switch Spacer
25	3750	Brass Block
26	3665	Plunger Block
27	8015	Motor & Gearbox (EMD)
28	8010	Motor & Gearbox (Stegman)
29	7250	Wiring Loom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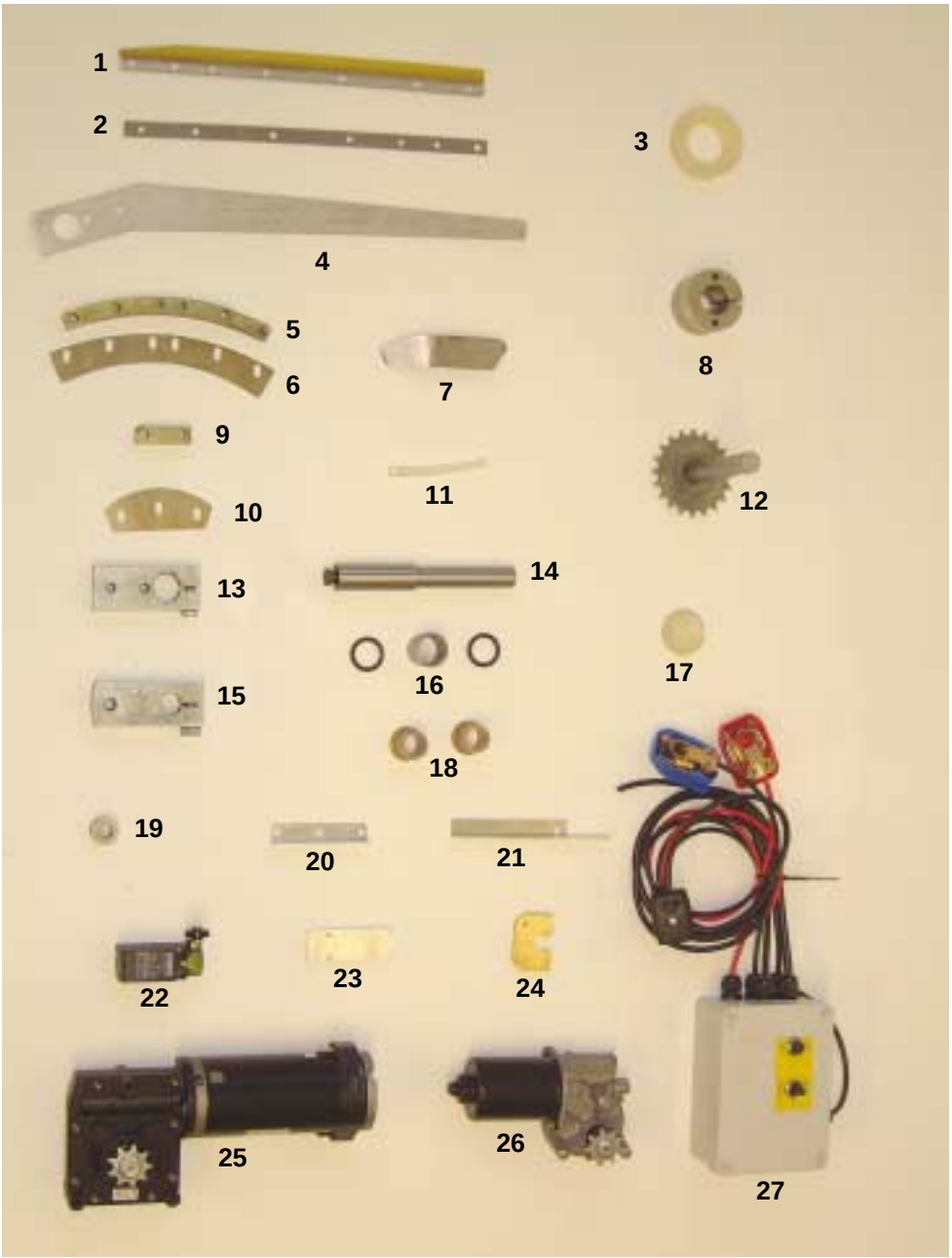
SUPER 6 SPARE PARTS

Number	Part No	Description
1	2012	Friction Strip
2	2013	Arm Spacer Strip
3	3800	Nylon Top Plate Spacer
4	2021	Arm
5	3250	Outer Knife Block
6	3200	Outer Knife Edge
7	3450	Let Down Ramp
8	1550	Carousel Clamp Block A & B
9	3350	Inner Knife Edge Block
10	3300	Inner Knife Edge
11	3550	Teal Finger
12	1200	Carousel Drive Shaft
13	2100	Arm Clamp Block
14	2065	Main Shaft
15	4200	Lower Clamp Block
16	6020	Bearing Set 2
17	3810	Chain Tensioner
18	6070	Phos. Bronze Brush
19	3770	Spring Roller
20	2070	Clay Sweeper
21	3500	Backrail
22	7300	Roller Switch
23	3700	Roller Switch Spacer
24	3750	Brass Block
25	8015	Motor & Gearbox (EMD)
26	8010	Motor & Gearbox (Stegman)
27	7015	Electric Box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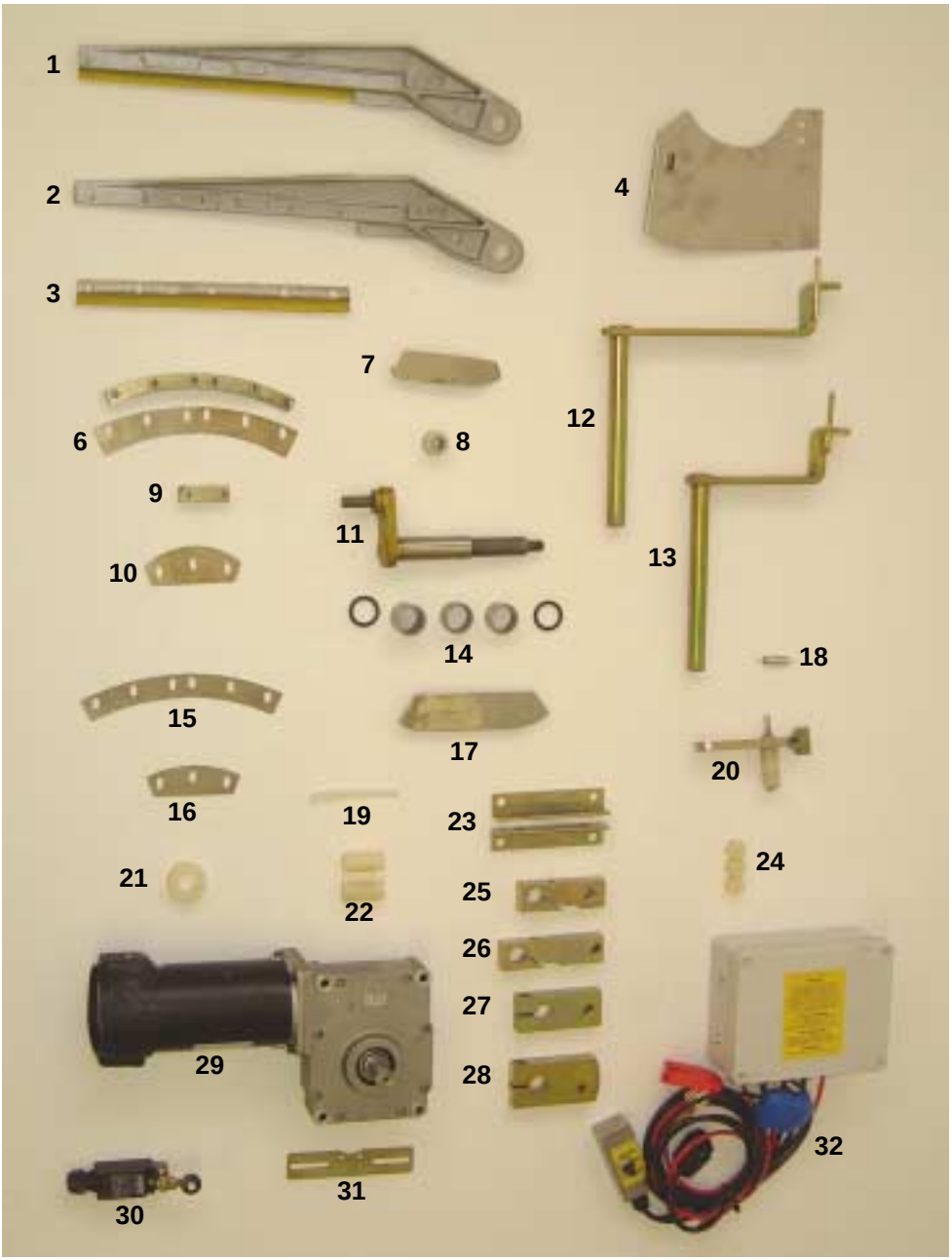
RANGER SPARE PARTS

Number	Part No	Description
1	2015	Arm Complete
2	2016	Arm
3	2017	Friction Strip
4	3400	Soft Fall Plate
5	3260	Outer Knife Edge Block
6	3210	Outer Knife Edge
7	3465	Let Down Ramp
8	3770	Spring Roller
9	3360	Inner Knife Edge Block
10	3310	Inner Knife Edge
11	4050	Main Shaft
12	1260	Rear Pusher Shaft (Ranger 8)
13	1265	Rear Pusher Shaft
14	6010	Bearing Set 1
15	3210	Outer Knife Edges (Ranger 8)
16	3310	Inner Knife Edges (Ranger 8)
17	3460	Let Down Ramp
18	6460	Rear Pusher Spring
19	3550	Teal Finger
20	1300	Rear Pusher Top Half
21	4550	Gearbox Shaft Spacer
22	3865	Rear Top Plate Support
23	4255	Motor Mount Brackets
24	1302	Rear Pusher Rollers
25	1355	Rear Pusher Clamp Block
26	1360	Rear Pusher Clamp Block (Ranger 8)
27	4155	Gearbox Clamp Block
28	2105	Arm Clamp Block
29	8020	Motor Gearbox ZYT90
30	7305	Roller Switch & Gland
31	3710	Roller Switch Bracket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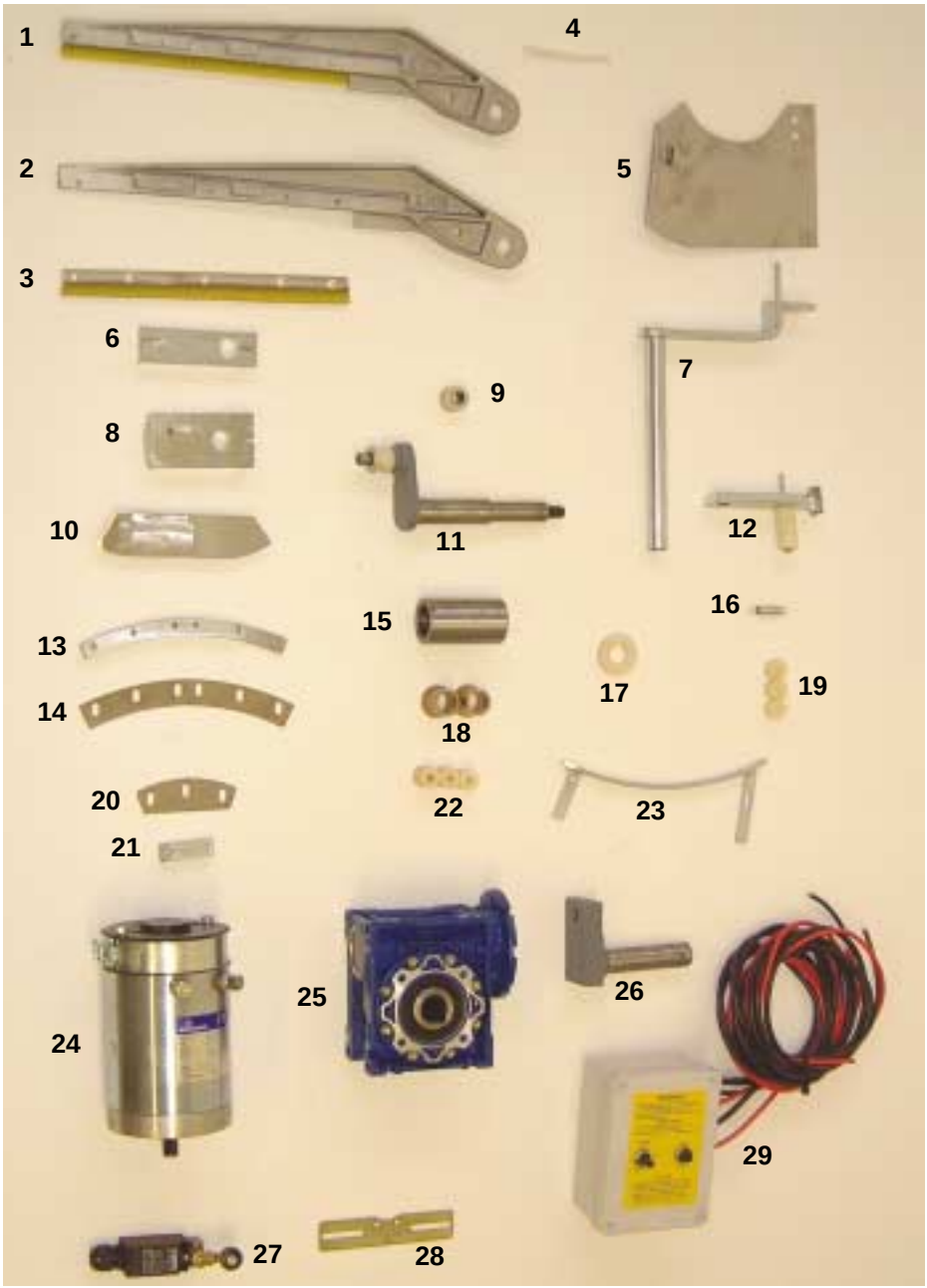
SPORTER SPARE PARTS

Number	Part No	Description
1	2015	Arm Complete
2	2016	Arm
3	2017	Friction Strip
4	3550	Teal Finger
5	3400	Soft Fall Plate
5	3260	Outer Knife Edge Block
6	1350	Rear Pusher Clamp Block
7	1250	Rear Pusher Shaft
8	2105	Arm Clamp Block
9	3770	Spring Roller
10	3460	Let Down Ramp
11	4050	Main Shaft
12	1300	Rear Pusher Top Half
13	3255	Outer Knife Edge Block
14	3205	Outer Knife Edge
15	4500	Bearing Sleeve
16	6460	Rear Pusher Spring
17	4550	Gearbox Shaft Spacer
18	6060	Phos. Bronze Bushes
19	1302	Rear Pusher Rollers
20	3305	Inner Knife Edge
21	3355	Inner Knife Edge Block
22	3860	Rear Top Plate Supports
23	3505	Backrail
24	8100	12v CFR Motor
25	8025	NMRV50 50:1 Gearbox
26	4010	Gearbox Shaft
27	7305	Roller Switch & Gland
28	3710	Roller Switch Bracket
29	7050	Electric Box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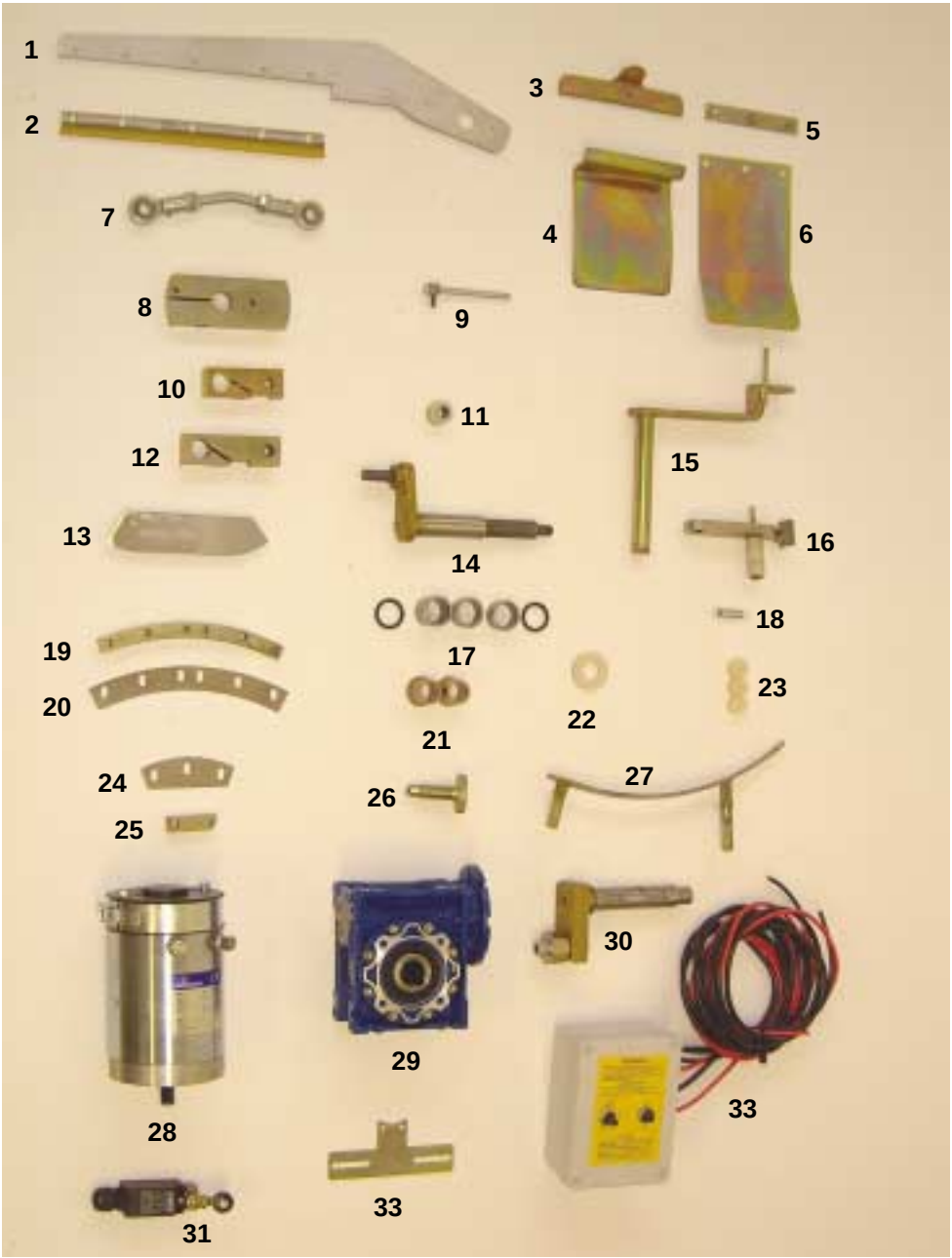
CHONDEL SPARE PARTS

Number	Part No	Description
1	2031	Arm
2	2017	Friction Strip
3	5500	Rabbit Deflector Holder
4	5505	Rabbit Deflector
5	5510	Chandel Deflector Holder
6	5515	Chondel Deflector
7	4350	Rose Joints Assy.
8	2110	Arm Clamp Block
9	3870	Spring Finger
10	4150	Gearbox Clamp Block
11	3770	Spring Roller
12	1360	Rear Pusher Clamp Block
13	3460	Lew Down Ramp
14	4050	Main Shaft
15	1255	Rear Pusher Shaft
16	1300	Rear Pusher Top Half
17	6010	Bearing Set 1
18	6460	Rear Pusher Spring
19	3255	Outer Knife Edge Block
20	3205	Outer Knife Edge
21	6050	Phos. Bronze Bushes
22	4550	Gearbox Shaft Spacer
23	1302	Rear Pusher Rollers
24	3305	Inner Knife Edge
25	3355	Inner Knife Edge Block
26	5550	Location Pin
27	3510	Backrail
28	8100	12v CFR Motor
29	8030	NMRV50 60:1 Gearbox
30	4015	Gearbox Shaft
31	7305	Roller Switch & Gland
32	3715	Roller Switch Bracket
33	7095	Electric Box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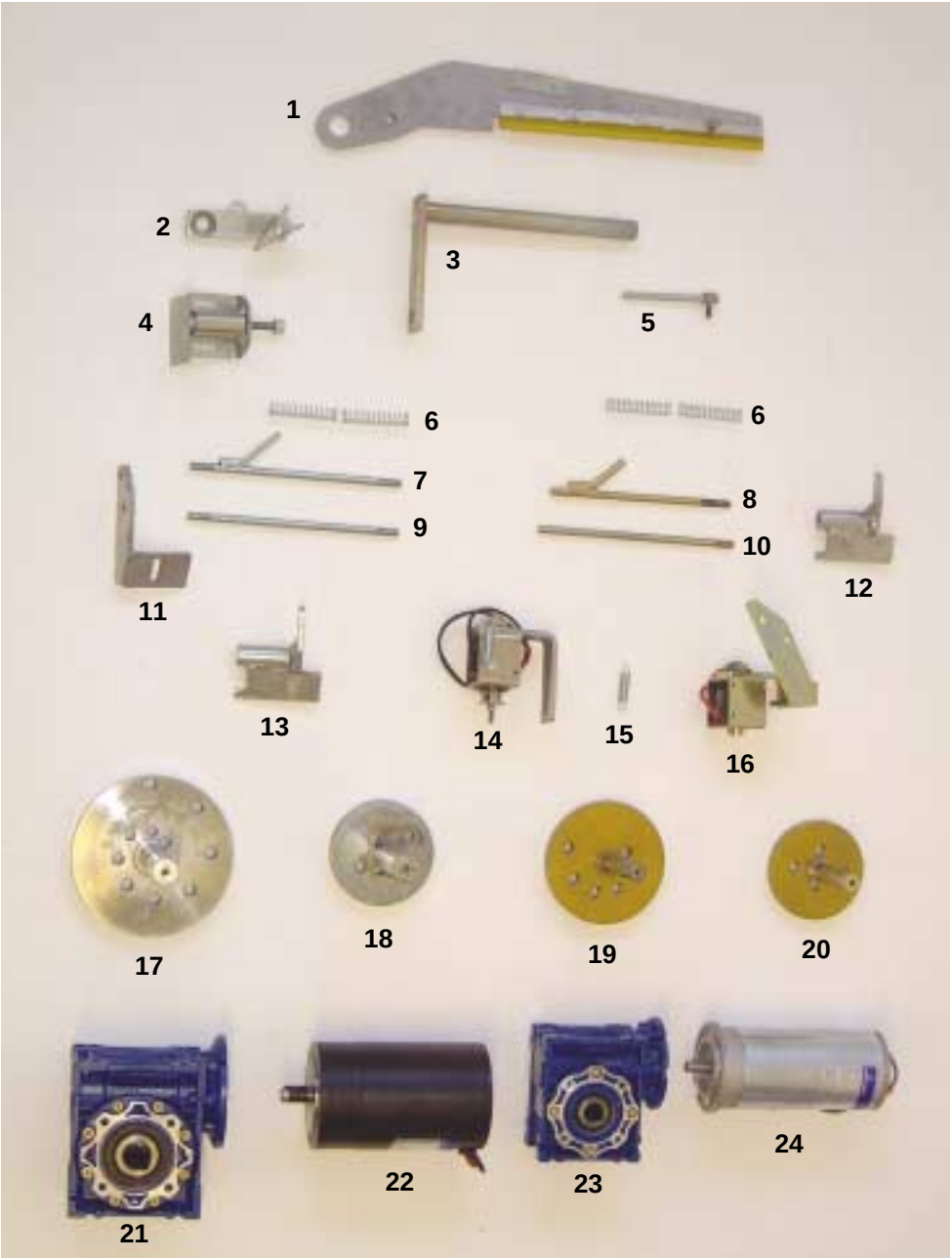
DTL/ABT SPARE PARTS

Number	Part No	Description
1	2025	Arm Complete
2	1305	Rear Pusher Top Half
3	1270	Rear Pusher Shaft
4	3720	Roller Switch Bracket
5	3870	Spring Finger
6	6470	Solenoid Spring
7	5400	Failsafe Bar (Sporter)
8	5405	Failsafe Bar (Ranger)
9	5410	Pivot Bar (Sporter)
10	5415	Pivot Bar (Ranger)
11	5420	Bar Support Bracker (S. Sporter)
12	5425	Solenoid Trigger (Ranger)
13	5430	Solenoid trigger (Sporter)
14	5450	Solenoid & Bracker Assy. (S. Sporter)
15	6475	Solenoid Return Spring
16	5455	Solenoid & Bracket Assy. (Ranger)
17	4100	Rotation Disc (Sporter)
18	4120	Elevation Disc (Sporter)
19	4105	Rotation Disc (Ranger)
20	4125	Elevation Disc (Ranger
21	8035	Gearbox NMRV50 80:1
	8040	Gearbox NMRV50 100:1
22	8105	Oscilating Motor MP102
23	8045	Gearbox NMRV40 60:1
	8050	Gearbox NMRV40 80:1
24	8110	Oscilating Motor MP080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