

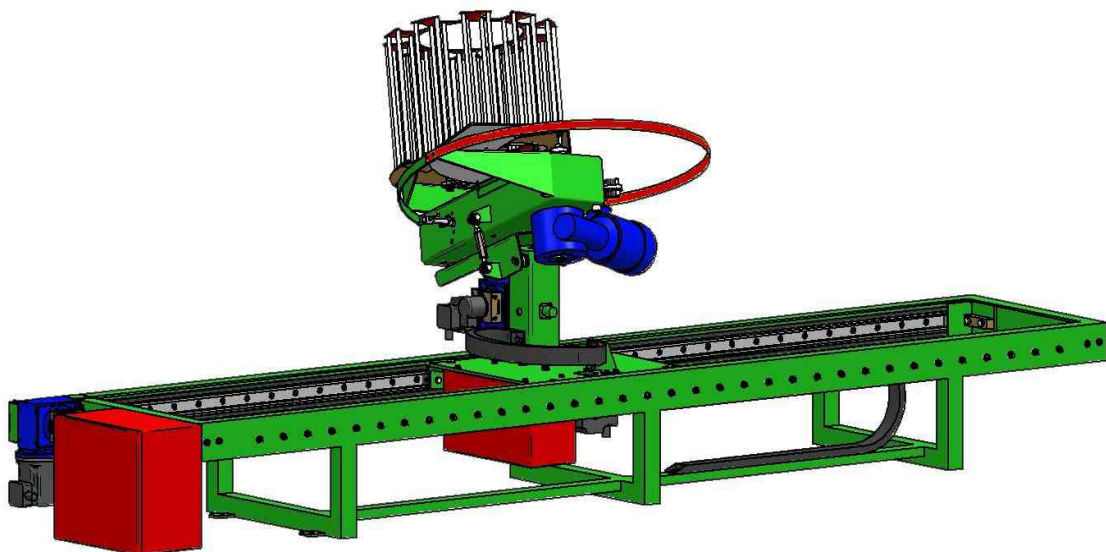


AUTO TRENCH™

Owners Manual

New Zealand and Australia.

www.canterburytrap.co.nz



Canterbury Auto Trench

Patent No.: US 8,677,983 B2

Canterbury Trap International Ltd
PO Box 14035
Christchurch 8544
New Zealand
Tel: + 64 3 3844524
Fax: + 64 3 3484285
[Email: cti@prometal.co.nz](mailto:cti@prometal.co.nz)

July 2015 Revision 6

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SYMBOLS USED IN THIS MANUAL.

The following symbols are used in this manual to explain procedures, restrictions, handling precautions, and instructions that should be observed for safety.



Indicates a warning concerning operations that may lead to death or injury to persons if not performed correctly. To use the machine safely, always pay attention to these warnings.



Indicates a warning concerning operation that may lead to injury to persons, or damage to this equipment if not performed correctly. To use the machine safely, always pay attention to these warnings.



Indicates a Caution concerning operation that may lead to injury to persons, or damage to property if not performed correctly. To use the machine safely, always pay attention to these warnings.



Indicates a warning concerning operation that may lead to injury to persons. Ensure you never enter any areas displaying these warnings as death may result.



Be careful. Do not lift heavy loads without assistance.

It is recommended that correct lifting apparatus and methods be employed at all times to prevent injury.



Indicates a warning concerning flying objects that may lead to injury to persons. Eye protection must be worn at all times.



Indicates a warning concerning electrical hazards that may lead to injury to persons or equipment, read instructions carefully.

Failure to comply with the safety precautions and instructions and/or tampering with the machine will relieve Canterbury Trap International LTD of any liability for damages and accidents to property and/or injury to people. The user must read and fully understand the whole manual before operating the machine.

The user is also responsible for complying with the prevailing accident prevention standards in the countries in which the machine is installed as well as all the guidelines contained in this instruction manual.

IMPORTANT SAFETY INSTRUCTIONS



Never approach the bunker without first turning off the voice release on either the referee's hand piece or on the console (**Voice release**). Then for additional safety turn off the '**pwr**' button on the speaker stand pod.



Never enter the bunker or walk in front of the Auto Trench without using the remote safety release switch to switch off the blade motor and release the blade and any target.



Whenever any person is inside the bunker to load, service or maintain the Auto Trench the machine must be switched off at the main switch, and the remote safety control (AT53) must be inside the bunker under that person's control.



Whenever any person wishes to enter the bunker, the Auto Trench must be switched off at the remote safety and the blade released.



If for any reason, including a power failure and a person is inside the bunker and the blade is in the cocked position, it can be manually released by pulling the rod (CT45) at the rear of the machine. However, before releasing the blade using this manual release, ensure that the remote safety is turned **off** and that the control box is **off** also. Ensure that all persons are clear from the front of the Auto Trench and bunker.



Please be aware, when releasing targets that some may be cracked or broken and may shatter into many pieces. If you are in the bunker Safety glasses must be worn by all persons in the bunker whenever targets are being released.



The blade arc guide rail, is NOT a safety device. It purely indicates the outside radius of the throwing blade. At ALL TIMES, any person, part of a person or their clothing, or any object whatsoever, **MUST** be kept outside of this guide rail.



Whenever the Auto Trench is being serviced or having routine maintenance, the trap must be isolated on the main control box by having the POWER switch turned '**off**' and the blade must be in the fully released position.



The Auto Trench has many moving parts and pinch points, use extreme caution at all times. Any person, part of a person or their clothing, or any object whatsoever, **MUST** be kept clear at all time.



If there is a problem in releasing the trap via the remote release, e.g. an electrical fault, then turn the remote safety switch to '**off**'. Carefully enter the bunker (we recommend one person only enter the bunker and not to walk in front of the Auto Trench) and switch the Auto Trench off at the control box. Then manually release the blade by pulling the manual release rod (CT45) at the rear of the trap.



This equipment is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use it safely. Young children should be supervised to ensure that they do not play with the equipment.

Dear Customer

The Auto Trench system was designed primarily for competitors who enjoy practice shooting but dislike the amount of time and work involved with changing from one trench program to another. With this system a shooter can easily shoot all nine programs in one day on his own. With the traditional 15 trap layout this is just not possible.

The Canterbury Auto Trench system will emulate the traditional 15 trap layouts of the past, with one safe auto loading machine. The system uses the trusted Crusader trap for target delivery along with specialized software to drive the 3 axis motion system to achieve all the required height, angle and target release positions required by the ISSF rule book 2013.

One person operation is a feature of the system, so practice on your own is now a reality.

Once you have completed the initial setup using simple push button controls you can select and shoot any one of the 9 ISSF programs with the simple push of a button.

The control console will handle up to 6 shooters at a time, fully emulating competition conditions.

In Trench mode the system will cycle through all 25 targets in random order or in practice mode you can select a specific trap number to practice a difficult height and angle combination.

The target is released on the shooters call using the latest Canterbury wireless voice release technology, and it's also compatible with Canterbury's coin token system.

We are confident that you and your fellow shooters will get many years of trouble free enjoyment with your Auto Trench system. The Auto Trench has been designed and engineered to be almost maintenance free and very reliable under extreme conditions.



Please read through and fully understand this manual and follow all the safety instructions. If you have any questions feel free to call your nearest Canterbury Distributor for help.

Warranty:

Canterbury Trap International Ltd warrants the trap machines you have purchased to be free of material defects and workmanship for Two years from the date of shipment from the factory. All electronic components are only warranted for One year from the date of shipment from the factory.

This warranty is exclusive of improper use, failure to provide proper care and maintenance, accidents, abuse or misuse, unauthorized adjustments, repairs or modifications or damage caused by any "Act of God", Flood, Fire, or damage caused by Storms, Water and Lightning to the electrical and electronic components and equipment and normal wear and tear.

Canterbury Trap International Ltd or its authorized agents shall be the sole judge of warranty claims. The responsibility rests on the purchaser to advise the Company in writing within the warranty period, of any faults or defects covered within the scope of the warranty.

If you have a warranty claim, contact your nearest Canterbury Distributor for instructions.

What is excluded from this warranty?

Canterbury Trap does not guarantee parts subject to wear, such as but not limited to Driving rails and Mainsprings, any parts considered consumables are excluded from this warranty.

Canterbury Trap excludes and will not pay incidental or consequential damages under this warranty. By this we mean any loss, expense or damages other than to repair the defects in the Trap or replace the Trap. No implied warranties extend beyond the term of this written warranty.

Register on line www.canterburytrap.co.nz

Trap House Preparation

Before you start the installation check that the height from the floor to the underside of the roof is at least 2 metres.



Ensure that the electrical wiring in the trap houses conforms to all local electrical requirements. A single phase 240V 50hz 20Amp RCD protected supply is required or single phase 110V 60hz 20Amp RCD protected supply is required.

Tools & Supplies



Ensure that you have adequate personnel on hand when you need to move the trap. The Auto Trench is very heavy, **Please refer to the safety instructions.** The complete Auto Trench weighs approx 300kg,

A good hammer drill for drilling into concrete and an assortment of bits up to 12mm Dia.

A metric socket set and some crescent wrenches, flat and Phillips screwdrivers, hammer and pliers would all be handy.

Buy a can of outdoor silicone spray lubricant. This is a non-sticky lube for things like the mainspring crank. Don't goop up your machine with grease or oil and do follow the maintenance instructions in this manual.

Trap Assembly

If you are reading this you have already opened the shipping crate and found the Owners Manual for the enclosed Auto Trench. Please read through and ensure that you have read and fully understand the safety instructions in this manual before you start.

The Auto Trench is a fundamentally simple machine, yet having some basic information will assist you with the installation, operation and ultimately your enjoyment in using your new machine.

Unbolt the sides of the crate and remove the hopper and the 4 bolts holding the carriage base frame onto the pallet.



Remove all tape and packing material from the machine. Remove the bolts which secure the trap to the temporary transport bracket and carefully remove the trap from inside the carriage base frame and place to one side.

Refer to safety instructions relating to lifting.

Look over the trap making sure nothing was damaged in transit.

You will also need to remove the temporary transport bracket that held the trap in transit to the carriage base frame, once removed this bracket is no longer required.

Remove the two wall mounting brackets (AT55 and AT56) from the crate, these will need to be mounted onto the front wall of the bunker as described on page 33.

Unpack the control console and voice release equipment their installation is covered on page 8

IMPORTANT INFORMATION

ISSF rules state.

6.3.19.1.1 Standards for Olympic Trap Ranges.

6.3.19.3 Rule states. The trap must be installed in the pit so that the pivot point of the throwing arm is 0.50m (+/- 0.10 m) below the top surface of the roof of the trap pit and set back 0.50 m (+/- 0.10 m) from the front edge of the roof when the trap is set at the 2 M elevation. This is defined as the Throwing Point.

To ensure that your Auto Trench installation conforms to the ISSF standards relating to rule 6.3.19.3 please ensure that the mounting brackets are set at 1.4M down from the ceiling. Assuming the roof is 0.10M thick this will give you a distance of 0.6M from the top of the roof to the pivot point of the throwing arm. With the mounting brackets fixed to the front wall and assuming that the front wall is 0.10M thick this will give you a distance of 0.40M from the outside of the front wall to the pivot point of the throwing arm when the trap is set at the 2.0M elevation. Assuming that the roof of the bunker extends 0.10M beyond the front wall, this will give you a distance of 0.50M from the pivot point of the throwing arm to the front edge of the roof. Please refer to page 34 for more details.

Installation of Trap

The first step is to mount the two wall mounting brackets onto the front wall of the bunker. Care should be taken with the positioning of these brackets to ensure that the targets exit from the center of the house when the trap is in the middle position. The brackets should be mounted on the inside front wall of the bunker at 2M centers and offset 280mm to the left of center when viewed from the rear, ref to page 33 for more details. Make sure that you mount each of the brackets with the 2 small lugs on the top face and pointing to the outside. You will have been supplied one left hand (AT55) and one right hand (AT56) bracket. The brackets should be mounted using appropriate mounting bolts to carry a total mass of 300Kg. Please see bolt manufactures recommendations. Use the four slotted holes first as this will give you some height adjustment. The distance from the underside of the roof or the lowest position of the opening in the front wall to the top of the wall mounting brackets is also important. This will ensure that all targets exit the bunker without clipping the underside of the roof or opening. The distance from the roof to the top of the wall mounting brackets should be 1.4M. Once you are happy with the positioning put the last four bolts into the other four holes and tighten to the manufactures recommendations.



If the roof overhang in front of the house is greater than 100mm this may require the mounting brackets to be set lower than the above dimensions. Please refer to pages 34 and 35 for more details.

Once the wall mounting brackets are in place, check that they are level between the two of them left to right, and from front to back using a spirit level. If the wall is out of plumb you may need to put some packers between the wall and the wall mounting brackets. They need to be level or the base frame will twist when attached, restricting its smooth movement.



The next step is to mount the carriage base frame (AT1) onto the wall mounting brackets. **Please refer to the safety instructions.** Make sure that the frame is the correct way around, with the red control box (AT21) at the right hand end when viewed from the back. If the wall mounting brackets have been installed correctly the four bolt holes in the base frame should line up with the holes in the brackets. Fit the four M12 x 40 bolts supplied along with the washers and Nyloc nuts. Check that the base frame is parallel to the front wall before tightening the four bolts. Tighten to manufactures recommendations.



The trap can now be installed onto the windage frame (AT41). Remove the two M10 pivot bolts from the windage frame and set aside.

Referring to the safety instructions lift the trap into position onto the windage frame, positioning the two 10mm windage pivot rod ends (CT158) on the trap below the two pivot lugs on the windage frame, then re-install the two M10 bolts, washers and Nyloc nuts. Now attach the (CT40) R/H rod end of the windage adjustment turnbuckle onto the lug on the side of the trap using the M12 bolt and washers supplied.



The final thing to do is to plug the trap wiring loom into the socket on the front of the angles post (AT42).

Don't force the plug, there are locating key way's inside the plug and care should be taken to ensure the correct orientation.

Fit the blade guide rail (CT137) securely using 4 x M8 bolts supplied.



Engage the mainspring (CT81) by carefully rotating the arm counter clockwise, until the connector rod hook's into the fork on the spring.



**IF YOU GO TOO FAR, DO NOT ATTEMPT TO REVERSE THE ARM.
CONTINUE AROUND AGAIN UNTIL YOU CAN HOOK UP THE SPRING!!**

Push the arm forward about 5cm to tighten it against the spring.



The blade cam (CT89) must be engaged onto the cam plate (CT60) to hold the spring (CT159) under the flip-flop plate (CT61) down when installing the hopper back onto the trap.

Hopper installation



Once assembled the hopper (Refer to page 22) **also refer to safety instructions on lifting** can be placed on top by locating the bolt thread at the front of the hopper base plate into the recess in the Allen screw head, which is on the pivot point of the blade. Now locate the two pins at the rear of the hopper base plate (CT7) that extend underneath and lock them into position using the 2 R pins supplied.

Pendent holders

Mount the holder's (CT116) for the remote safety (AT53) and the trap angle/height adjustment pendent (AT54) onto the wall of the trap house out of shotgun range, but in a position that can be easily reached when entering or leaving the house. We suggest that you mount them on the right hand end of the bunker close to the control box and main power switch.

Main Control box features (AT21)

Main isolation switch:

Target counter: Records the total number of targets thrown.

Target count will also be displayed on the Control console (AT 44) on power up.

It can also be displayed by de-selecting all modes on the Control console
and pressing the Manual (+) button.

One digit will be shown at a time beginning with a C - - - - -

Connecting the control leads.



WARNING: This is a self powered 12V DC control system.
Under no circumstances should external voltage be
connected to any sockets on the control box AT21.



WARNING: " NEVER" connect any remote release leads (voice or push button) to the control box until you have totally finished setting up the trap. With this lead connected and the remote safety switched on it could be possible for the trap to be released unexpectedly via the remote release by somebody outside the trap house..

The supplied 33M data cable (AT52) which runs between the Auto Trench console AT44 and the main control box AT21 will need to be run under ground between the bunker and the referee and operator stand. This cable will plug between the main control box in the bunker (AT21) into socket marked ("Console") and the other end will plug into the Auto Trench console (AT44) at the referee and operator stand into the socket marked ("Main"). This cable supplies power and data to the console AT44.

Lost target hooter.

Connect the lost target hooter (AT57) to the back of the Control console (AT44) into the socket marked ("Lost target hooter") These wires can be extended to allow mounting of the hooter on an outside wall if required.

When the (L) button on the referee's hand piece (AT45) is pressed the hooter will sound to indicate a lost target, it will also sound momentarily when the trap is in position for the next shot.

PLEASE NOTE: The Voice release must be switched on for this to work.

Voice Release assembly.

Shooters speaker stand and Transceiver Pod:

Assemble the two halves of the stand (AT49) and (AT50) and then attach this to the base plate (AT51). Install four AA batteries (not included) into the Voice Release transmitter pod (AT47). To fit the batteries, remove the top of the transceiver by undoing the two hex nuts on either side, located approximately halfway down the housing. These nuts are captive and will not fall out. You will now see the four (4) battery clips on the circuit board. Insert each battery into place with correct positive and negative alignment. This is identified by the markings on the circuit board. You can now re-fit the top of the transceiver case. Do not over tighten the two hex nuts when re-assembling.

Mount the transceiver pod (AT47) and speaker (AT48) onto the stand. Connect the cable from the pod (AT47) to the base of the speaker (AT48). Turn the pod on by pressing the **PWR** button to check that the batteries are installed correctly and charged, **PWR** light will flash red when on. **LO BATT** light will flash red if batteries are running low. **SIGNAL** light will stay off if working correctly or will flash red if no signal is received from the Transmitter (AT47).



Make sure it is then turned off.

We recommend using non-rechargeable alkaline batteries. Alkaline batteries will give about 200 hours of shooting. Zinc carbon batteries will give about 100 hours use. These are not recommended, as they tend to leak corrosive fluid and cause damage when fully discharged. e2 or Lithium may give up to 300 hours. Rechargeable NiCd or Ni-MH will give 200 to 300 hours shooting respectively, however while these will work perfectly they are probably not cost effective. Much design effort has gone into maximizing battery life and you should expect around 200 hour's use from each set of 4 batteries.

Base station stand and receiver Pod:

Attach the bottom half of a stand (AT50) to the base plate (AT51) and mount the pod (AT46) into the bracket. Connect the cable from the pod (AT50) to the console (AT44), into the socket marked (**Voice Release**). There are no batteries in the base station pod as it is powered from the Console (AT44). The **STAND BY** light will be solid red when working correctly. **SIGNAL** light does nothing.

Important note: When in use the base station pod (AT50) must be mounted in the stand, standing upright and in clear line of sight of the shooting station transceiver pod (AT47).

Referee's Hand Piece:

Remove the rear battery compartment cover and install a 9V battery (not included).

Insert the battery into place with correct positive and negative alignment, there are two different sized slots in the bottom of the battery compartment. The smaller + terminal pin goes on the left hand side and should match the smaller of the two slots in the end of the battery compartment and then replace the cover and screws.

Once a shooting mode (Trench,Practice,Balltrap) is selected you will then be able turn the voice release on using the (**V**) button, if no mode is selected you will not be able to turn the voice release on. In Trench mode the red light relating to the shooting station 1 to 5 will be RED to indicate which stations turn it is to shoot. In practice mode no shooting station lights are used, if using the voice release only the (**V**) light will be Red once selected, if the voice release is off and you are using the (+) button to release targets manually no lights are used.

The hand piece lights will go to sleep after 5 minutes of inactivity to conserve battery power, pressing any button will wake it from sleep mode.



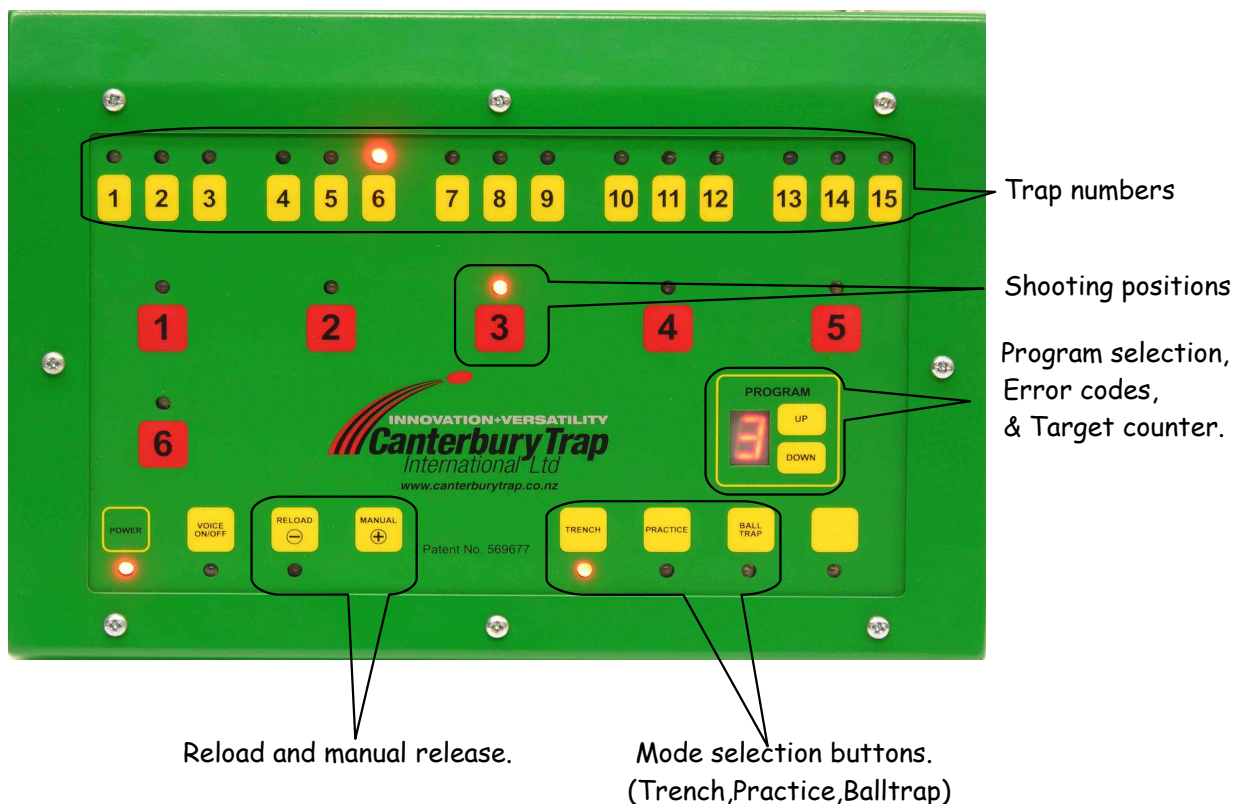
Setting up the Auto Trench Console (AT44)

The console is powered from the Auto Trench system via the 33M data cable (AT52) from the bunker. You need to have the main switch turned **ON** at the main control box (AT21) in the bunker to get power to the console.



Ensure that the Remote Safety (AT53) in the bunker is switched ('off') to ensure the trap doesn't cock during setup. When the main power switch is turned on there will be lights on the console (AT44) to indicate it is connected correctly. Also check that the Voice Release base station receiver (AT46) is plugged into the console as well.

Auto Trench Control Console (AT44)



Target count will be displayed on the Control console (AT 44) on power up.

It can also be displayed by de-selecting all modes on the Control console and pressing the Manual (+) button. Maximum of 6 digit number.

One digit will be shown at a time beginning with **C** - - - - -

Preparing your Auto Trench for operation.

PLEASE NOTE: First time operation



Each time the Auto Trench is switched on the carriage moves to its reference position which is the right hand end of the frame and the trap angle rotates to the 45° left. Once this is complete the trap will automatically move to the center of the base frame (AT1) which is the target setup position and wait for the operator to adjust the spring tension (CT66) for target distance, straight away target, and the 3.5M and 1.5M reference targets heights using the height/angles adjustment pendent (AT54).



Before you turn the system on for the first time, ensure that the remote safety (AT53) is switched ("OFF"). This will prevent the trap from cocking while you are working on it.



WARNING: Don't turn the main POWER switch on yet.

Pull the trap blade (CT16) counter clockwise so that it is positioned at 9 O'clock viewed from the rear of the trap. This activates the micro switch, located inside the chassis. The arm is now in a position that when the power is turned on the blade will be driven into the cocked position by the motor.



IF THE MACHINE IS NOW SWITCHED ON AT THE MAIN CONTROL AND THE SAFETY REMOTE, **IT WILL OPERATE** - ENSURE YOU HAVE READ AND FULLY UNDERSTOOD THE SAFETY INSTRUCTIONS IN THIS MANUAL BEFORE PROCEEDING FURTHER.



Ensure that all cables are safely out of the way. Ensure that the main data cable (AT52) between the trap control box (AT21) and the Auto Trench console (AT44) is connected, or the system will not work. Check that the two emergency stop switches on the base frame are released. Plug the power lead into the wall socket and turn the main switch to ("ON") at the trap control box (AT21). The trap will start moving to its reference position. The system moves at a reduced speed while moving to the reference position. Once this is complete the trap will move at normal speed to the target setup position and wait for the operator to set the straight away and 3.5M and 1.5M reference targets using the height/angles adjustment pendent (AT54).

Once the trap is at the setup position, you now need to check the 1.7M target reference height. The default machine height is 1.7M when at the setup position. Release some targets using the remote safety pendent (AT53) at the 1.7M mark on the height peg (10M in front of the house). Adjust the turnbuckle (CT144) in or out if required until the targets pass the peg at the 1.7M height mark. This only needs to be done once on initial installation. Once you have the targets at the correct height re-tighten the lock nuts on the adjustment turnbuckle. Minor adjustments for weather conditions can be made using the angle/height adjustment pendent (AT54). (ref to page 16)

General operation,

Height adjustment.

The other thing to check is that the targets exit the bunker without clipping the ceiling. The height and angle combination to use when testing this is practice mode program 9 trap 1. This is a 3.0M high 40deg right target. If the target exits the bunker at this combination then all the others will be fine. If you find that the target has clipped the ceiling then you will have to lower the wall mounting brackets accordingly. This problem can arise when the thickness of the roof and the overhang of the roof in front of the bunkers front wall is more than 100mm. Before you alter anything re check that your height pole is set correctly, if the pole is too high you will be trying to throw the targets too high and this will cause them to clip the ceiling.

FINAL INSTALLATION TESTING OF THE AUTO TRENCH.

CHECK LIST.

- All cables connected.
- Mainspring connected and Arm in correct position.
- Hopper installed and loaded with targets to ISSF specifications.
- Ensure that the Remote safety (AT53) is switched '**OFF**' to prevent the trap cocking
- Main power switch on control box (AT21) is '**ON**'.
- With one observer in the bunker and one person at the Console, both following all safety instructions. Select practice mode on the console (AT44), then press each of the 15 yellow trap buttons along the top of the main console, the Auto trench will move to each of the 15 trap positions in the program that you have selected. Person in the bunker to confirm the trap is moving on command.



Please allow sufficient time between each button press for the trap to move to its next position - up to 7 seconds.

- On exiting the bunker switch the Remote Safety (AT53) '**ON**'.
- Check that the '**red**' LED light on the Voice release base station (AT46) is '**ON**'
- Turn the shooting station Voice Release Pod on by pressing the '**pwr**' button.
- From the shooting station, turn the Voice release **ON** by pressing the **V** button on the Referees hand piece.
- Pressing the **+** on the Referees hand piece will release a target and advance the program to confirm the Referee's hand piece is operating correctly. Using the **-** will force the trap to go back one step.
- Pressing the **L** button will sound the lost target hooter.
- From the shooting station, using the Voice release call for a target to confirm correct operation. The trap will not advance to the next position unless a report is heard. Tapping the base of a spent shell on the microphone after the call will do the trick.

Once all these checks are confirmed your Auto Trench is ready for operation.

GENERAL OPERATION

SELECTING A PROGRAMME

The program selection controls are on the right hand side of the console (AT44). Using the 'UP' or 'DOWN' buttons, to select one of the 9 designated programs of Olympic Trench (Bunker).

SELECT THE NUMBER OF SHOOTERS IN THE SQUAD.

The system defaults to one shooter at shooting position 1, this is indicated by a Red "LED" being lit up at position 1 on the control console (AT44) 25 targets will now be released on the shooters call. Additional shooters can be added by selecting another RED shooting position button up to a maximum of 6 shooters in the squad. 25 additional targets will be thrown for each additional shooter. The squad size MUST be set before pressing the Trench button. Once the Trench button has been pressed only the first shooting position Red "LED" will be on indicating which shooter starts.

TO START THE SHOOTING SEQUENCE

Please note: You must de- select one mode button before selecting another.

Select the 'Trench' button. The light beneath the Trench button will now be illuminated and the trap will move to the first shooting position.

Overview of the Auto Trench operation

Once the program you wish to shoot has been selected, and the number of shooters and start position has been selected you then need to press the Trench button on the console (AT44) to start the shooting sequence.

On the call of the shooter a target is released from one of three possible trap positions in front of the shooter. Each time a target is called for, and a report is heard by the microphone the trap will move to the next position and select at random which of the three trap positions it will emulate. The last target hooter will sound momentarily once the trap is in position. The red LED under the (V) button on the referees hand piece (AT45) will come back on also after 7 seconds.

By the end of the 25 target round the shooter or shooter's will have had ten targets off the left position, ten from the right, and five from the center position. During this process the trap is also changing angle and height to emulate the traditional 15 trap layout.

If a broken target is released and a shot is not fired the system will not advance, so on the shooters next call the target will be repeated. If a shot was fired and you wish to repeat the target, press the (-) button on the referee's hand piece (AT45) and the trap will move back to that position and repeat the target on the call of the shooter. By pressing the (+) button the system will advance one position.

TO OPERATE IN BALLTRAP MODE

Select the '**Balltrap**' button on the console (AT44) the red "LED" light under the button will now be illuminated. The trap will move to the center position and oscillate continuously left, right, up and down. The oscillation goes to sleep after 2 minutes of inactivity, it will start oscillating again once the first target is called for or by releasing a target using the (+) button on the referee's hand piece . The Auto Trench will now deliver targets on the shooters call. The system also has a unreadable interrupt when in Balltrap mode.

4 additional speakers (AT48), pods (AT47) and stands (AT49, AT50, AT51) are required when shooting Balltrap. Contact your Canterbury agent for more details.

TO OPERATE IN PRACTICE MODE

Press the '**Practice**' button once on the console - the trap 8 red "LED" light will come on. Select the program (1 to 9) that holds the single trap position that you wish to practice on. Select one of the 15 trap buttons along the top of the console that you wish to practice, the light will now be illuminated to show which Trap is going to release.

By pressing the '**Practice**' button again on the console, the trap 1 red "LED" light will come on. The system will now cycle through all the left hand trap targets (1, 4, 7, 10, 13).

By pressing the '**Practice**' button again on the console, the trap 2 red "LED" light will come on. The system will now cycle through all the center trap targets (2, 5, 8, 11, 14).

By pressing the '**Practice**' button again on the console, the trap 3 red "LED" light will come on. The system will now cycle through all the right hand trap targets (3, 6, 9, 12, 15).

Pressing the '**Practice**' button again will de-select practice mode.

TO SWITCH THE VOICE RELEASE ON AND OFF



Before turning the Voice Release system on ensure that no one is in the bunker, and all persons are behind the shooter. Only turn the voice release on when you are ready to shoot. No one should ever be in or approach the bunker unless all shooting modes are de selected on the console (AT44), the Voice Release is off and the 'pwr' button on the Speaker Stand pod is 'Off' and you also have control of the Referees remote

You can turn the Voice Release on by using either the button '**Voice Release**' on the console or the button on the Referee's hand piece (**V**). The red light will come on when this is engaged.

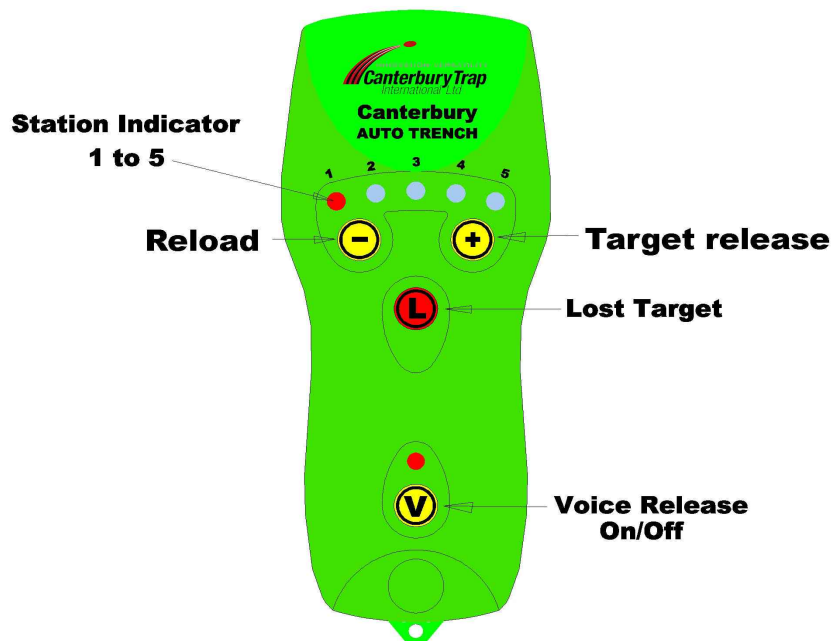
The base station transceiver will already be powered up via the cable from the console. Check that this unit has power on, by viewing its '**standby**' LED, it should be solid Red.

Now the wireless microphone pod will need to be switched on. Press the '**pwr**' button on the pod and the red LED will come on.

The Referee's hand piece (AT45) (held by the referee if there is a squad shooting - or secured on the microphone stand if you are practicing by yourself) can also enable or disable the microphone. Pressing the '**V**' button will turn the voice release system **On/Off** red LED lit when on.

When the trap is in position the lost target hooter will sound momentarily and the voice release lights on the referees hand piece and console will come back on.

Referee's hand piece (AT45)



Wireless referee's hand piece

Station Indicator: Shows which station is being simulated.

Target Release (+): This button can be used by the Referee as a manual release. Each time the button is pressed a target is released and the system will advance to the next position.

Re-load (-) : Pressing this button will force the system to repeat the previous target. If a broken target is released and a shot is fired the system will advance to the next position. By pressing the (-) button the system will repeat the previous target. By pressing the (-) button multiple times it is possible to repeat the last 5 targets.

Lost target (L): The referee would press this button when a target is deemed lost. The hooter connected to the control console will sound when the button is pressed.

Voice Release (V): Toggles the Voice Release ON / OFF. Voice Release active when light on.

Initial Start Up

Although your trap was thoroughly tested in our workshop before dispatch we recommend that before you load the hopper for the first time that you cycle the trap 20 to 30 times to check that everything is working as it should.



The hopper must to be installed onto the trap before doing this test.

This is carried out by positioning yourself at the rear of the machine in the bunker, turn on the remote safety (AT53) power **SWITCH** and by pressing the **RED** release button on the remote safety pendent. Each time you press the release button on the remote safety the trap will release the blade and the reloading cycle will start. Check the hopper is indexing and that the blade is cocking and releasing correctly. These small checks may save you the trouble of unloading the hopper if some damage has occurred in transit.

Loading the hopper



NEVER LOAD THE HOPPER WITH THE POWER ON OR WITH THE BLADE IN THE COCKED POSITION. SWITCH THE REMOTE SAFETY OFF AND RELEASE THE BLADE THEN TURN THE POWER SWITCH "OFF" AT THE CONTROL BOX.

For ease of loading the hopper may be rotated counter clockwise so that loading can be carried out from the rear of the machine. Target's will feed down the flipflop plate (CT61) each time the hopper is indexed. Remove any of these targets as they are fed, to prevent any chance of a jamb up. **Targets must be to ISSF specification, DTL targets are not recommended as they are prone to shattering on release.**

Height pole

It is important to check that the target height pole is set correctly to ISSF regulations. The regulations state that the target height must be measured 10M in front of the bunker. The high reference target should be 3.5M above the bunker roof and station level and the low reference target should be 1.5M above the bunker roof and station level. Check that the pole is 10M from the front of the bunker and that the 1.5M mark and the 3.5M mark are correct in reference to the bunker roof. If the 3.5M mark is not correct, and in fact too high there is the chance that some targets will hit the ceiling of the bunker when exiting.

General operation.



Ensure that the remote safety (AT53) is switched "**OFF**".

Turn the main switch to ("**ON**") on the trap control box (AT21) and the trap will start moving to its reference position. The system moves at a reduced speed while moving to the reference position. Once this is complete the trap will move at normal speed to the target setup position and wait for the operator to set the distance, straight away and the 3.5M and the 1.5M reference targets using the height /angles adjustment pendent (AT54).

Setting Targets



These adjustments require that targets be thrown to assure correct target height and angle. Ensure that the target exit zone is clear and all personal are behind the trap machine.



Please be aware when releasing targets that if cracked or broken targets are released they may shatter into many pieces. Safety glasses must be worn by all personal in the bunker whenever targets are being released.

Target curl / windage adjustment.

Target curl or windage can be reduced by adjusting the turnbuckle (CT144). Adjusting the turnbuckle in or out will level the target in flight, reducing any target curl at the end of the target trajectory. This adjustment may need to be done daily depending on the wind conditions.

Adjusting target distance for Trench.

Increasing or decreasing the tension of the main spring (CT81) by turning the adjuster handle (CT66) adjusts target distance. Clockwise increases distance, counter clockwise decreases distance. This adjustment must be done with the trap in the 1.7M height position which is the default setup position. The trap will move to this position when first turned on, or by pressing the LEFT and RIGHT buttons on the angle/height pendent (AT54) at the same time the trap will move to the setup position and give you a straightaway target at 1.7M high. Release targets by pressing the Green button on the Remote safety pendent (AT53) and adjust the spring tension as required to achieve the required distance. (76M +/- 1M)

Adjusting target distance for Ball Trap

Target distance for Ball Trap is set at the 2.0M height. Press the 1.5M UP and DOWN buttons on the angle/height pendent at the same time to move the trap to this setup position. Adjust the distance the same as for Trench.

Straightaway target adjustment.

Set the straightaway target by releasing targets (using the remote safety pendent AT53) at the reference height peg. Use the LEFT and RIGHT buttons on the angle/height adjustment pendent (AT54) to move the target trajectory left or right until you are happy with the straightaway. The system will remember this position and use it as it's reference for all of the required angle positions.

Target height adjustment

The Auto Trench system needs two height reference's 1.5M and 3.5M for correct operation. Set the two heights by releasing targets (using the remote safety pendent AT53) and using the UP and DOWN buttons on the angle/height pendent (AT54) to make any adjustments. There are two sets of up and down button for setting both 1.5M and 3.5M targets.

Use the UP and DOWN button that relates to each height setting.

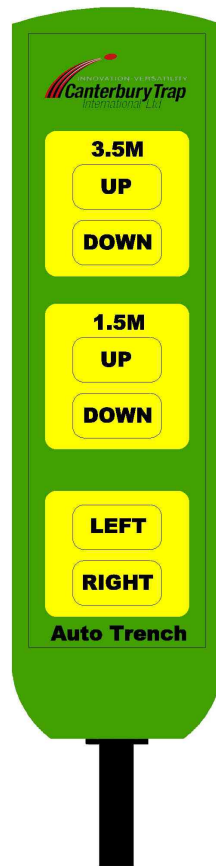
To move between the high and low target positions, press the 'UP' button (once) that relates to the height position that you wish to adjust.

Once you have set these heights the system will remember them and use them as it's reference for all of the required height positions, even once the power is turned off.

Use these buttons to set the 3.5M height.

Use these buttons to set the 1.5M height.

Use these buttons to set the straightaway target.



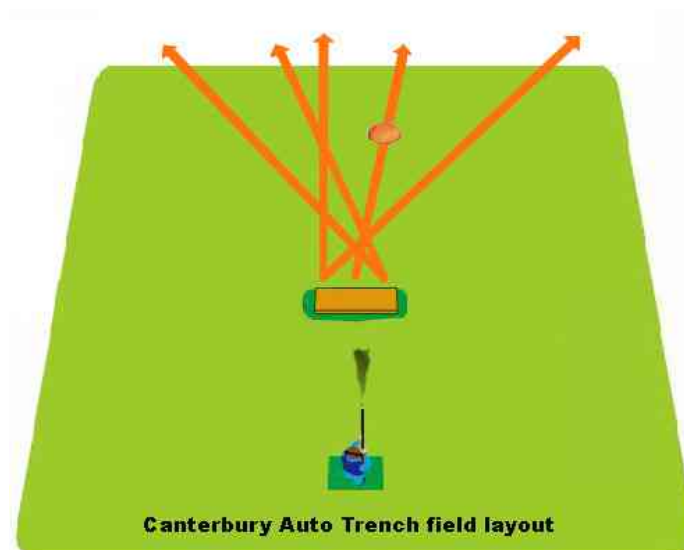
Pressing these two buttons at the same time will reset factory defaults for height and angle.

Pressing these two buttons at the same time will move the trap to the Ball Trap setup height position 2.0M.

Pressing these two buttons at the same time will move the trap to the Trench setup height position 1.7M.

Angle and Height adjustment pendent (AT54)

If you need to adjust the height or angles at any stage during the day simply press the LEFT and RIGHT buttons on the pendent simultaneously and the trap will move to the setup position.



FAQ

Q 1/ THE TRAP WILL NOT OPERATE

Check that the power lead is plugged in and that the power switch on the Main control box (AT21) is turned on. Check that the two emergency stop switches on the front of the base frame are released.

Check the display on the console for error numbers.

Check that the remote safety is switched on. The red LED in the hand-piece must be illuminated. If not the hand-piece is faulty.

There is a circuit breaker inside the Main control box (AT21) it will trip if there is an electrical fault. Remove the Auto Trench Main power plug from the wall socket, then remove the cover from the control box and check to see if the circuit breaker has tripped. Re-set if required, if problem persists contact a qualified electrician to assess the problem.

If the blade motor does not operate check the position of the throwing arm . It must be between the 7 o'clock and 10 o'clock position as viewed from the rear of the trap. This will activate the micro-switch that starts up the motor. If it still does not operate, check the thermal overload button on top of the terminal box of the blade motor. Push down the plunger to reset it .

Check that the Voice Release is turned (ON). The light above the (V) button on the referees hand piece should be RED and the PWR ON light on the transceiver (AT47) should be flashing RED. Once you have released a target thru the speaker the RED voice release light on the referees hand piece will go out until the trap is in the next position approx 7 seconds. This indicates the voice release is working correctly and the fault may be at the trap. If there are no lights working on the hand piece (AT45) you may need to replace the battery.

Q2/ TARGET DOES NOT FEED PROPERLY

The hopper may not be rotating far enough to drop the target thru the opening cleanly. Caused by a build up of target dust inside the hopper, making it too stiff to turn freely.

The splitter blade may be bent or misaligned creating excessive resistance on the target.

The targets may be of mixed brands. All targets have different dimensions and some will lock together due to mis-matched tolerances. DON'T MIX BRANDS in the hopper.

The finger adjustments on the flip-flop plate have to be set for your particular brand of target . The target must have 1-2mm (1/16 inch) clearance between it and the driving rubber on the blade, when the blade is in the parked or battery position.

Q3/ TARGET DOES NOT FLY PROPERLY

The target may be getting pinched by the blade due to a higher outer ring on the brand of target you have changed to. You can shim the runway down at the front studs to give it more clearance.

Check the windage adjustment to level up the target in flight.

Check the condition of the blade rubber CT17 on the throwing arm. Especially at the tip and replace if necessary.

Also check that the splitter blade is not misaligned for your brand of target and is not breaking a piece out of each good target.

Q4/ BROKEN TARGETS

Some brands of targets manufactured for DTL and Skeet will break on release, this can be due to the extra spring tension required to throw the targets the correct distance for Trench.

If you are having problems with breaking targets ensure that they are manufactured to ISSF specifications for Trench.

Maintenance.



Your new Auto Trench has been designed to provide you and your club with years of trouble free service. However, like all machinery it needs some minimal maintenance to perform at its best, year after year.

A touch of grease on the carriage chain (AT4) and into the four rail sliders (AT23 and AT24) annually, and the cocking lever face (CT79) every 20,000 targets is recommended.

The adjustment turnbuckles may need to be sprayed with silicone once a year to assure ease of movement. If you live in a high humidity area, Bi-monthly application of silicone may be in order to prevent corrosion. The spring tension adjustment (CT66) trigger shaft (CT49) and the spring pin (CT24) need an annual shot of silicone lube as well.

The motor and gear boxes are sealed units and need no lubrication or servicing, unless oil is seen leaking from the gearboxes. In this case please contact your Canterbury agent.

The hopper needs no service other than to periodically check for any undue wear or damage.

There are no owner or user serviceable parts inside any of the control boxes. Call your dealer if problems arise. Keeping connectors clean, dry and coated with light conductive grease will ensure many years of service.

Clean any broken target fragments and dust away from all moving parts on a regular basis.

Helpful Suggestions:

Make sure the Auto Trench remains securely mounted in the house. A stable trap throws stable targets.

The mainspring adjustment is a bit sensitive. Use $\frac{1}{4}$ turn adjustments when setting target distance.

Use the windage adjustment on the machine to level the straightaway target. All other targets will be good, providing the straightaway is level.



Protect all electronic equipment from moisture. Prevent all moisture from entering any of the electronic components.

ENJOY YOUR SHOOTING

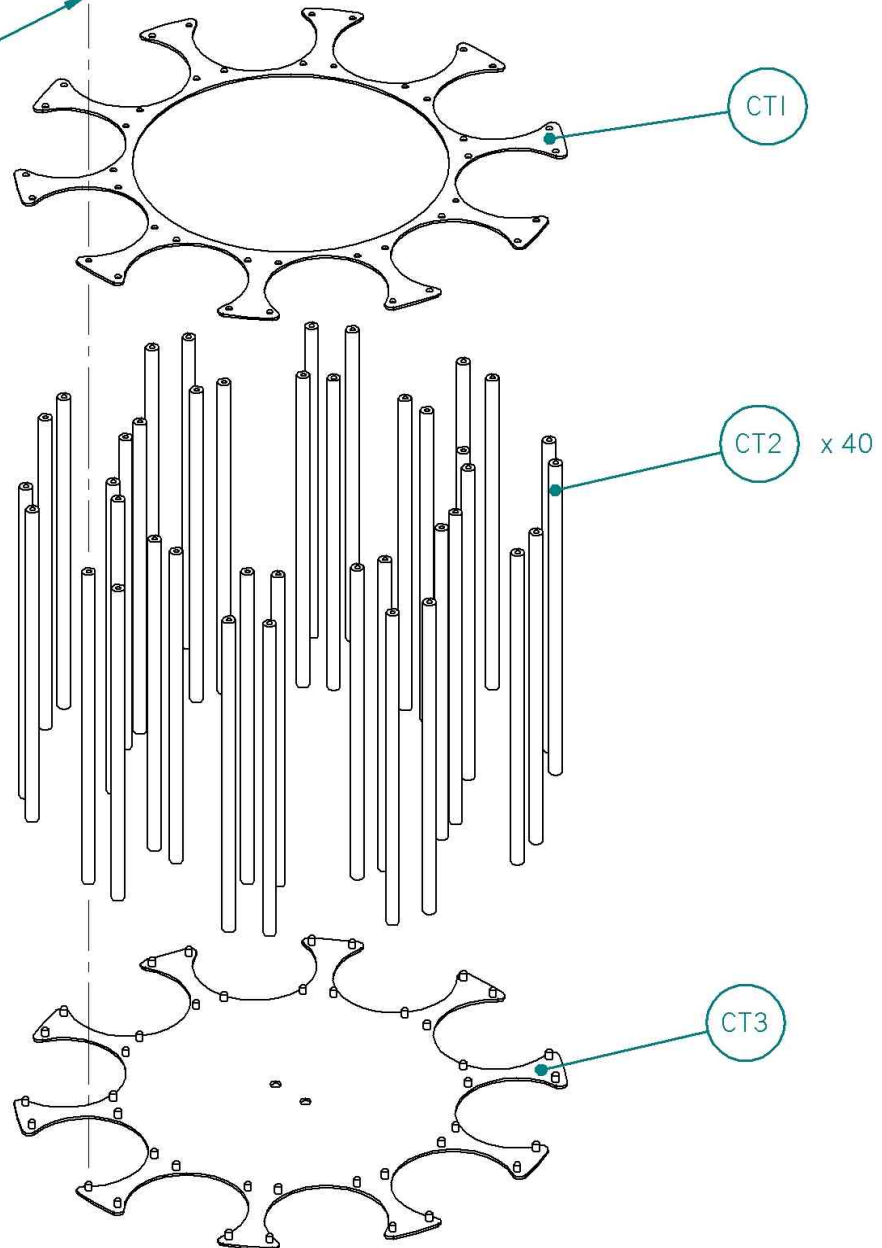
PART#	PART DESCRIPTION	Qty	PART#	PART DESCRIPTION	Qty
AT1	Carriage base frame	1	AT56	Right hand wall mounting bracket	1
AT2	Linear rail RULC43	1	AT57	Transverse - Limit Switch loom	1
AT3	Linear rail RKL43	1	AT58	Auto Trench Trap loom - Crusader	1
AT4	Transverse drive chain	1	AT59	Stepper - Angles loom	1
AT5	Idler shaft	1	AT60	Transverse - Encoder loom	1
AT6	Idler sprocket	1	AT61	Angles pivot shaft end cap	1
AT7	Idler bearings 6202	2	AT62	Angles pivot shaft capscrew	1
AT8	Idler guard	1	AT63	M6 x 23mm S/S stud	2
AT9	Carriage stop bracket	2	AT64	M6 x 30mm S/S stud	1
AT10	Carriage stop bumper	2	AT65	Lost Target Hooter	1
AT11	Drag chain main loom	1	AT66	Ball Trap Speaker Set	4
AT12	Transverse gearbox 20:1	1	AT67	Windage adjust tumbuckle 70mm	1
AT13	Transverse motor	1	AT68	E Stop	2
AT14	Transverse gearbox mount	1	AT69	Angles encoder guard	1
AT15	Drive sprocket	1	AT70	Ball joint RH male 12mm grease nipple	1
AT16	Drag sprocket shaft	1			
AT17	Encoder mounting bracket	3			
AT18	Encoder support bracket	3			
AT19	Encoder flex coupling	3			
AT20	Rotary encoder	3			
AT21	Main control box	1			
AT22	Height & angles control box	1			
AT23	Rail slider RNK43	2			
AT24	Rail slider RNU43	2			
AT25	Bearing to plate bracket K	1			
AT26	Bearing to plate bracket U	1			
AT27	Transverse carriage mounting plate	1			
AT28	Bearing and housing	1			
AT29	Drag chain mounting bracket	1			
AT30	Drag chain Trap loom	1			
AT31	Angles gearbox mounting plate spacers	6			
AT32	Torsion spring	1			
AT33	Torsion spring arm	1			
AT34	Angles motor/gearbox mounting plate	1			
AT35	Angles gearbox 50:1	1			
AT36	Angles motor adapter plate	1			
AT37	Stepper motor	2			
AT38	Height gearbox adapter plate	1			
AT39	Height gearbox 50:1	1			
AT40	Height cam shaft	1			
AT41	Windage frame	1			
AT42	Angles post	1			
AT43	Height pivot shaft	1			
AT44	Console	1			
AT45	Referee's hand piece	1			
AT46	Voice release base station pod	1			
AT47	Voice release shooting station pod	1			
AT48	Speaker	1			
AT49	Speaker stand top	1			
AT50	Speaker stand bottom	2			
AT51	Speaker stand base plate	2			
AT52	33M data cable	1			
AT53	Remote safety	1			
AT54	Angles/Height adjustment pendent	1			
AT55	Left hand wall mounting bracket	1			

CT 11	Hopper thrust plate	1	CT 79	Cocking lever	1
CT 12	Hopper index plate	1	CT 80	Chassis	1
CT 13	Circlip 8mm external	1	CT 81	Main leaf spring	1
CT 16	Trap blade	1	CT 82	Safety plate	1
CT 17	Blade rubber red	1	CT 83	Target runway	1
CT 19	Blade retaining washer	1	CT 87	Support plate	1
CT 20	Blade dowel pins	2	CT 88	Blade shim 0.9mm	1
CT 21	New sprag clutch assembly	1	CT 89	Blade cam	1
CT 22	Bearing retainer	1	CT 91	Micro switch and cover	1
CT 23	Connecting rod bearing	1	CT 93	Hopper indexing stop bracket	1
CT 24	Main spring pin	1	CT 94	Cocking pin	1
CT 25	Connecting rod	1	CT111	Solenoid 110 volt	1
CT 26	Cocking lever roller	1	CT112G	Mainshaft gearbox 70:1	1
CT 27	Circlip	1	CT112M	Mainshaft motor 110 volt	1
CT 29	Ball joint LH 12mm	2	CT 114	Mainshaft shoulder washer	1
CT 40	Ball joint RH 12mm	2	CT 116	Remote & Windage mounting Brk	2
CT 43	Trigger return spring	1	CT 134	Hopper shim 1.5mm	1
CT 44	Trigger	1	CT 137	Blade guide rail	1
CT 45	Trigger release rod	1	CT 138	Target deflector	1
CT 46	Spacer	2	CT 144	Hex adjuster 90mm	1
CT 47	Solenoid linkage	1	CT 158	Ball joint RH 10mm	2
CT 48	Solenoid 230 volt	1	CT 159	Flip flop spring	1
CT 49	Trigger pivot shaft	1	TM 159	Height pivot bushes	2
CT 50	Trigger plate	1	CT165	Trigger roller	1
CT 51	Clevis pin	1	CT166	Trigger roller pin	1
CT 52	Clevis	1	CT 169	Shouldered sleeve 13.5mm	1
CT 53	Actuating shaft bush x2	2	CT 170	Shouldered sleeve 10mm	1
CT 54	Hopper actuating shaft	1			
CT 55	Plunger spring	1			
CT 56	Hopper index plunger	1			
CT 57	Circlip	1			
CT 58	Flip flop finger (long)	1			
CT 59	Flip flop plate hinge	2			
CT 60	Flip flop cam plate	1			
CT 61	Flip flop plate	1			
CT 62	Flip flop finger (short)	1			
CT 63	Adjuster housing	1			
CT 64	Adjuster shaft	1			
CT 65	Adjuster cushion spring	1			
CT 66	Adjuster handle	1			
CT 69	Bolt	1			

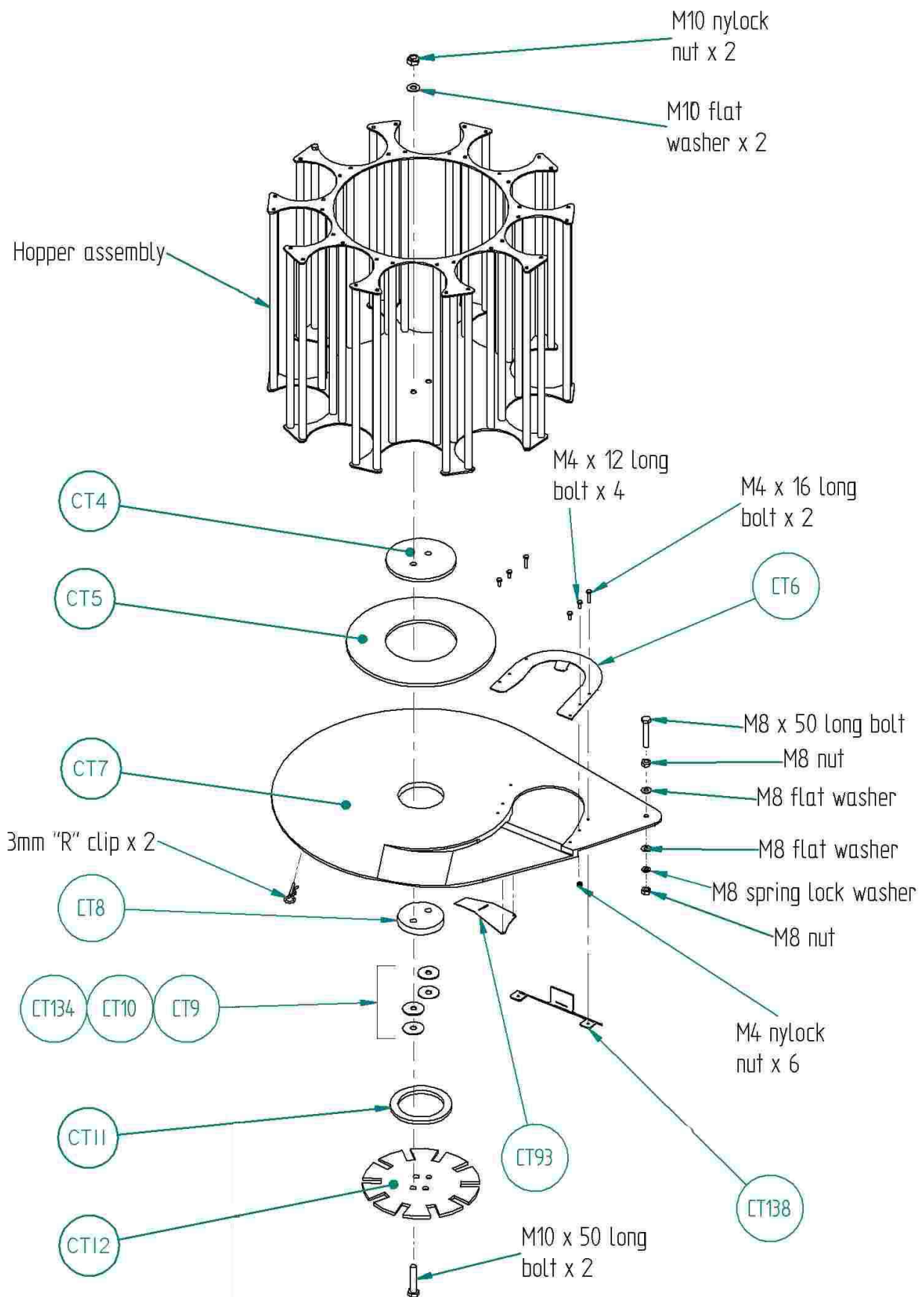
HOPPER ASSEMBLY

M6 x 12 Long
bolt x 40

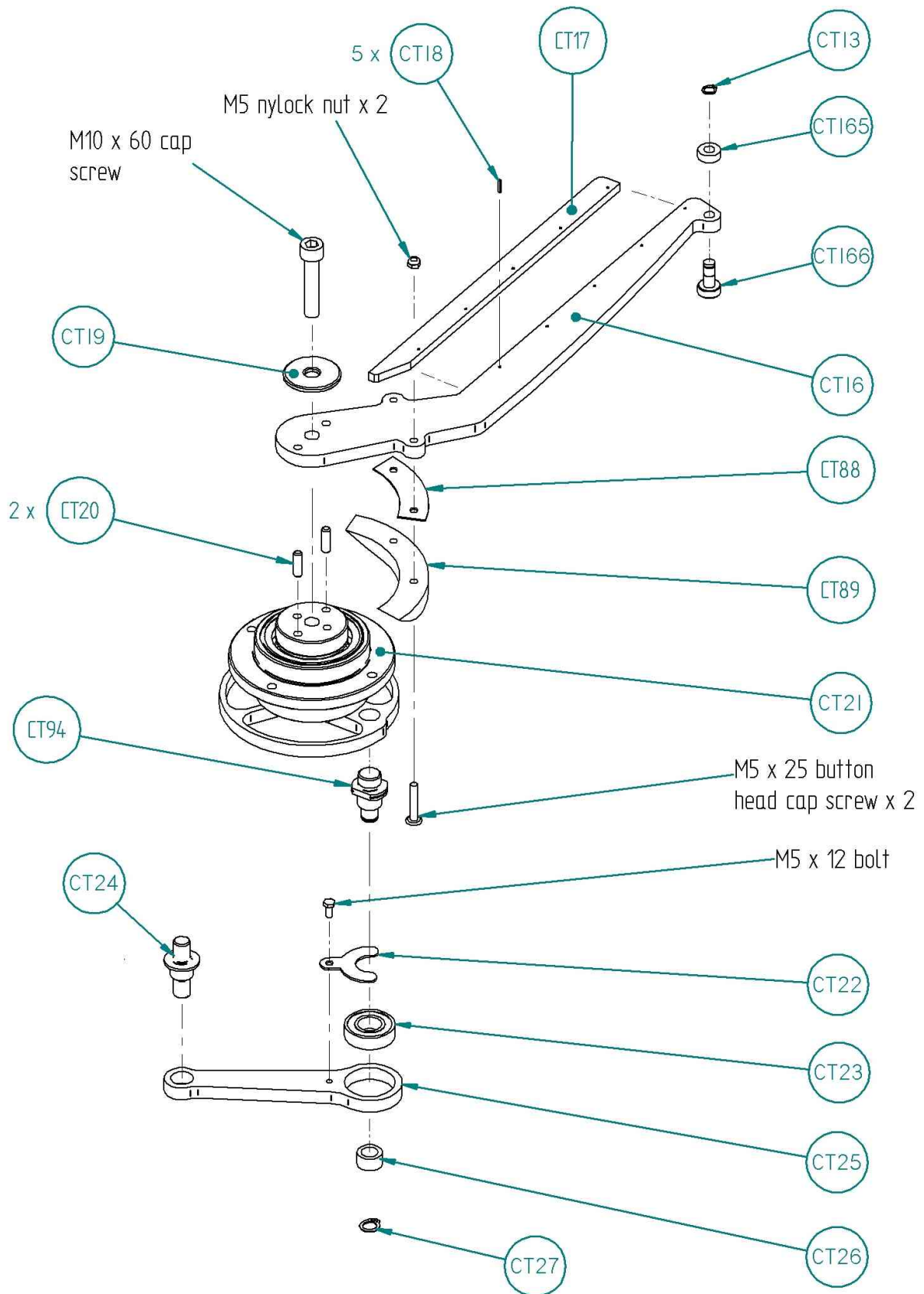
M6 spring lock
washer x 40

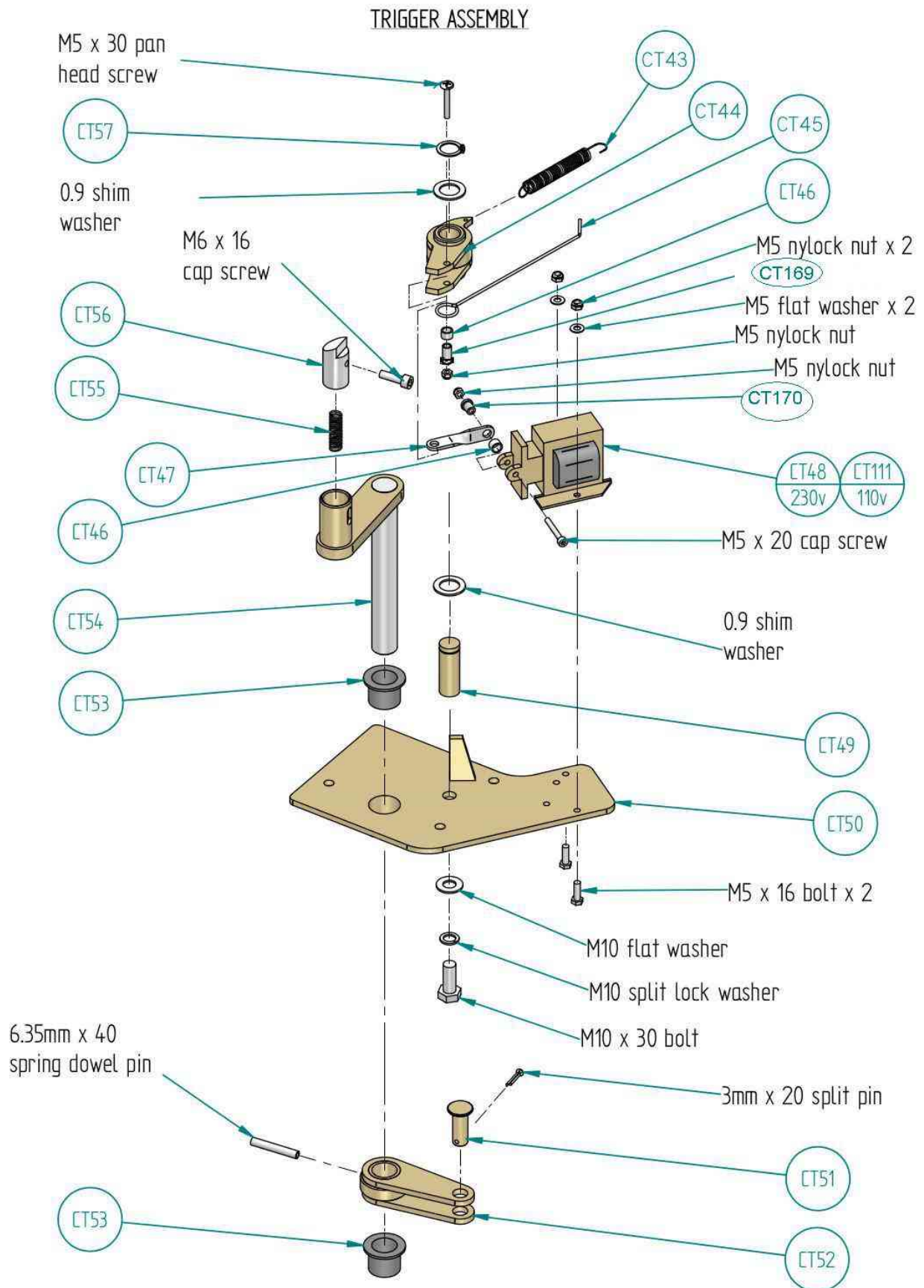


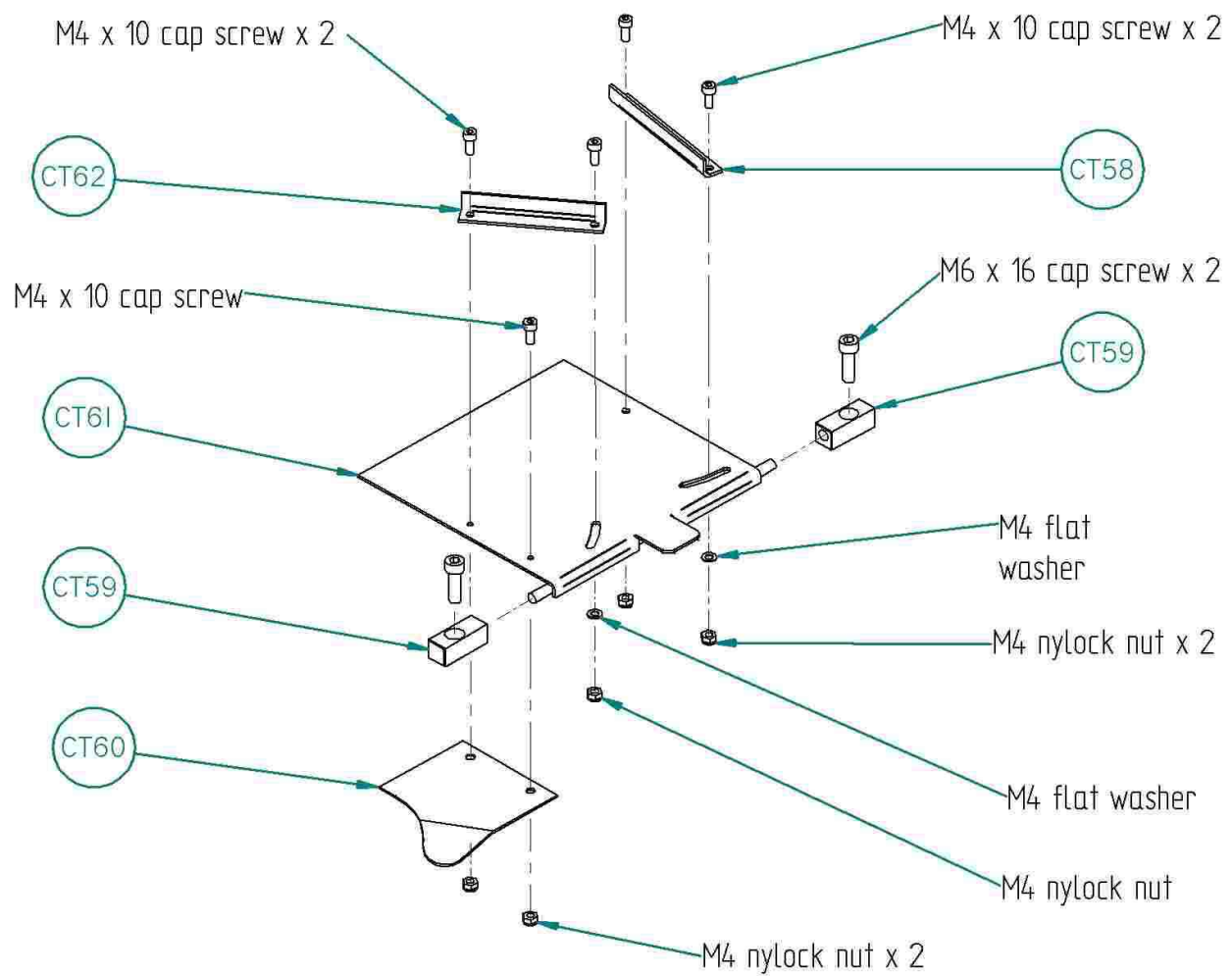
HOPPER ASSEMBLY



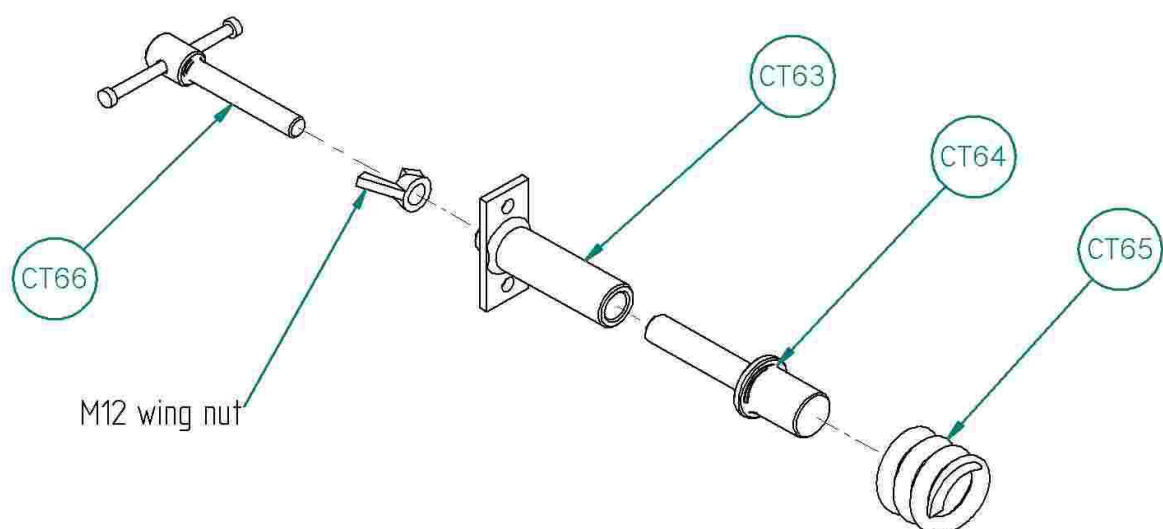
SPRAG BEARING AND THROWING ARM ASSEMBLY



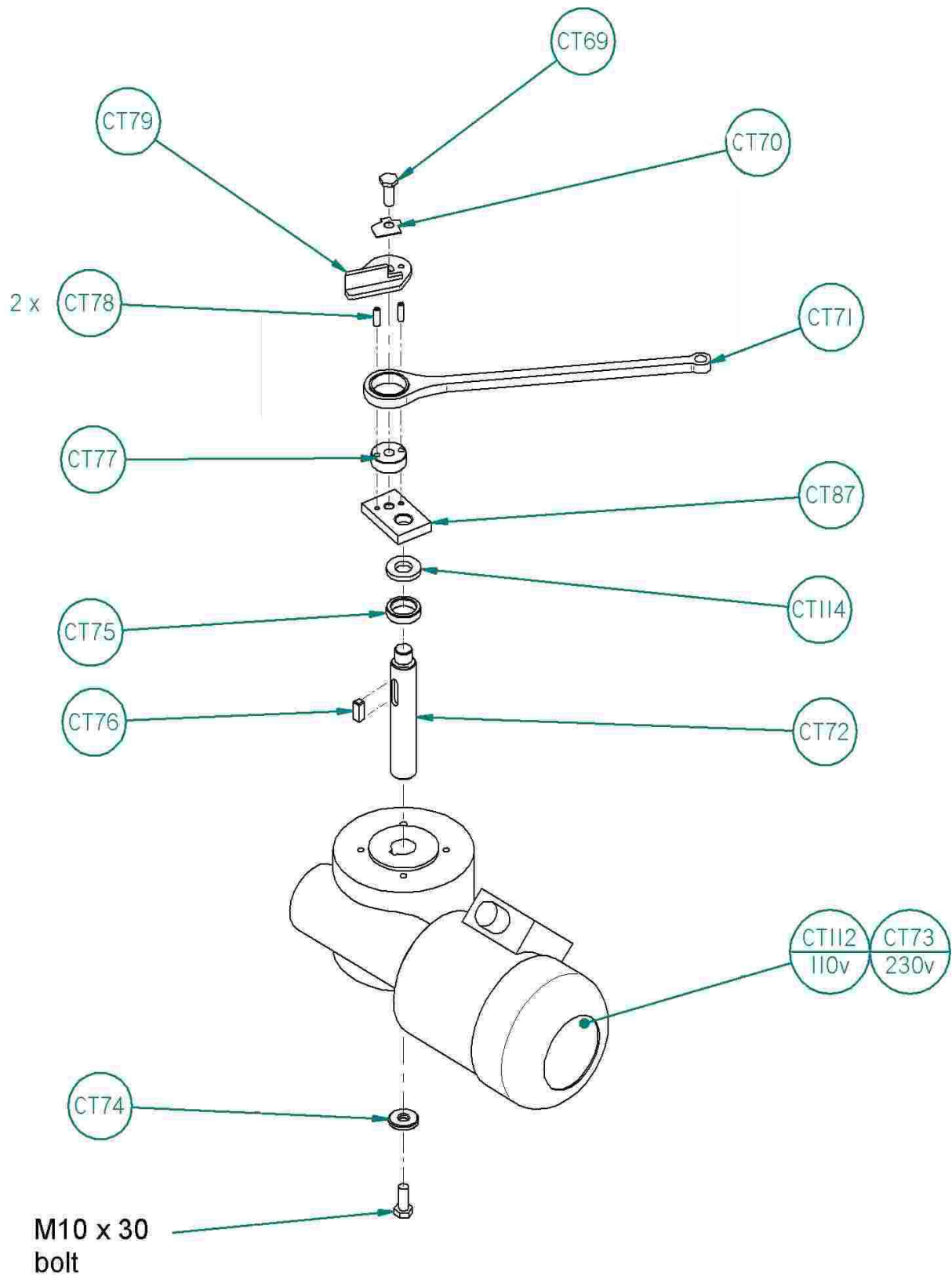




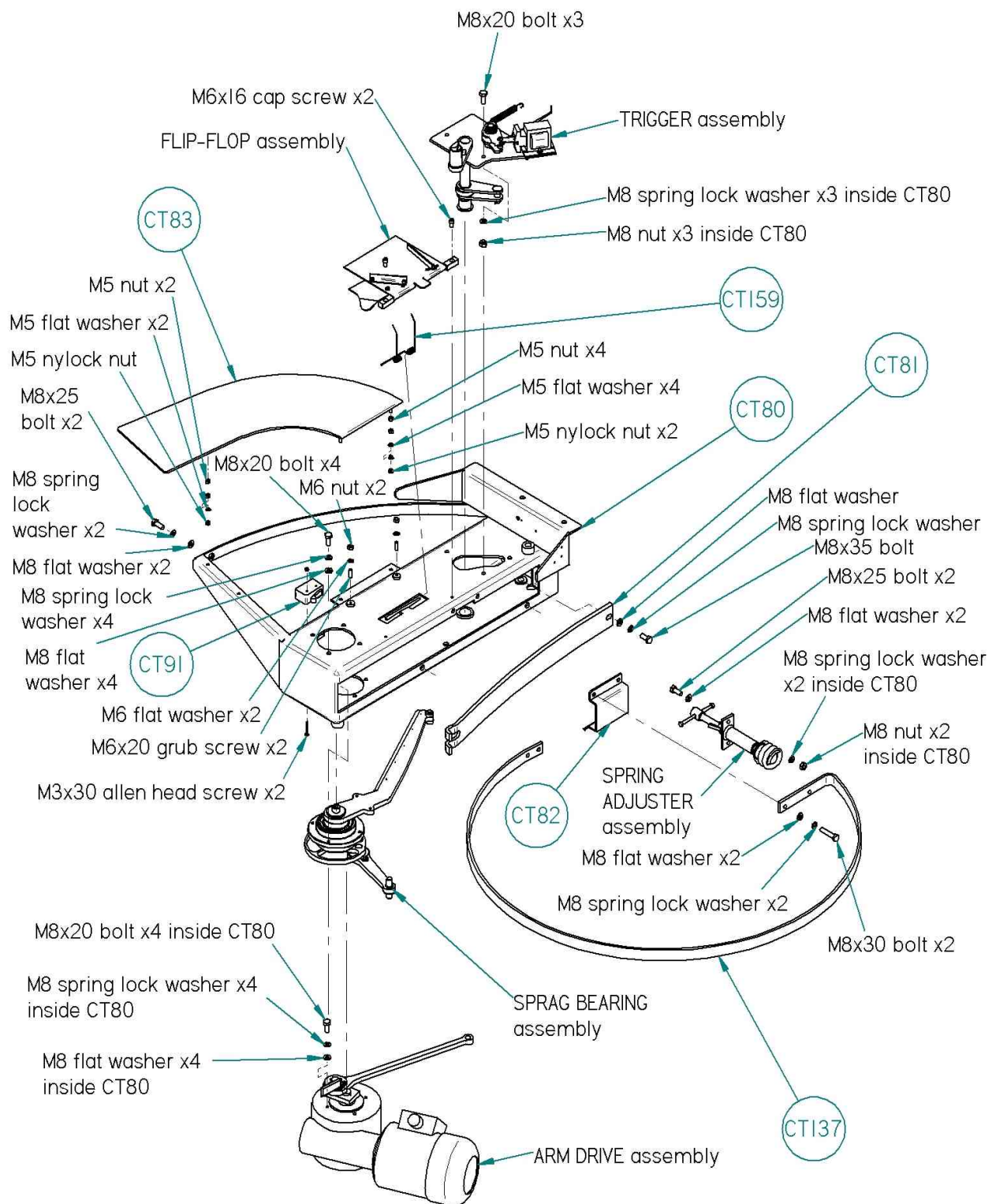
SPRING ADJUSTER ASSEMBLY



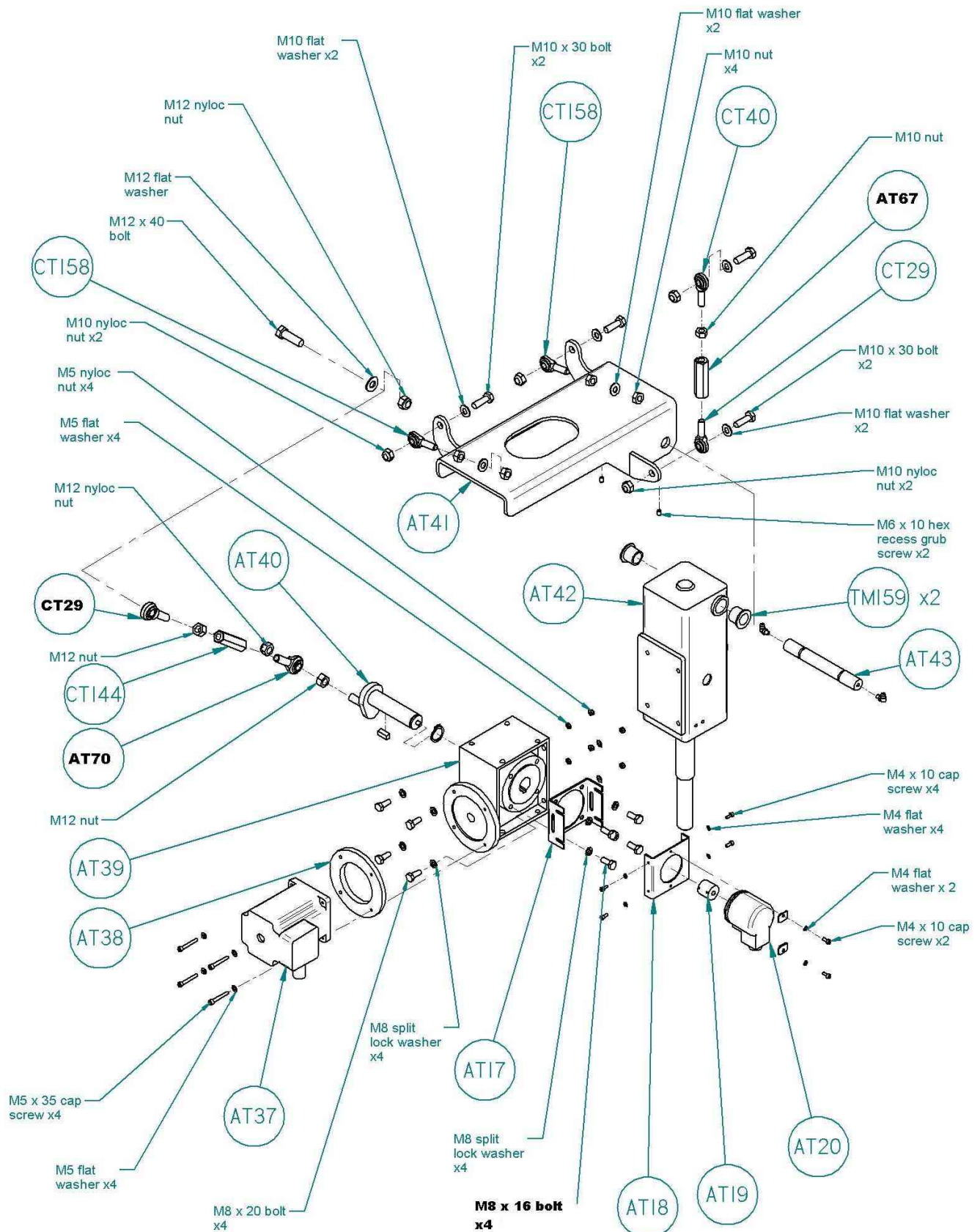
ARM DRIVE ASSEMBLY



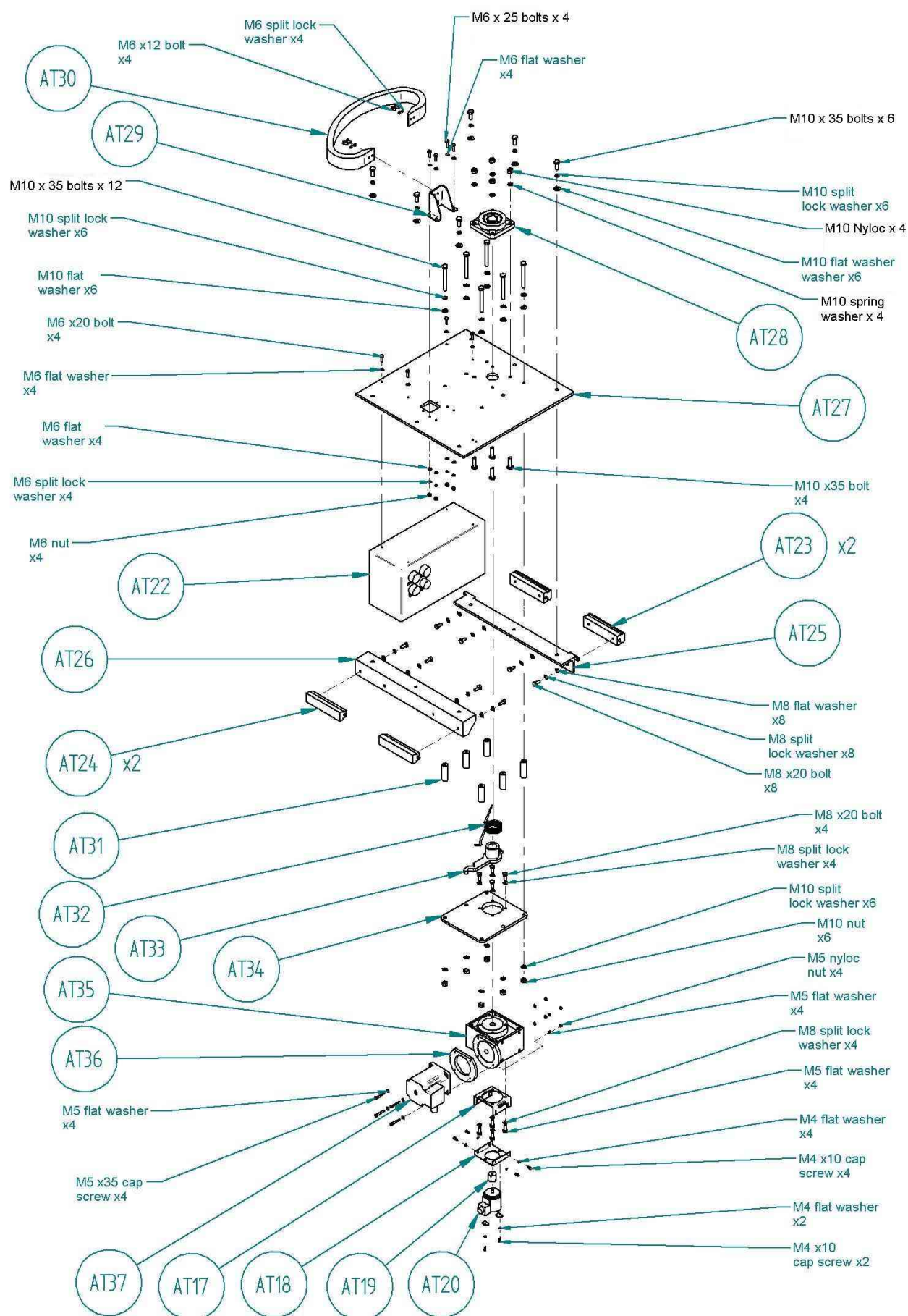
FRAME ASSEMBLY



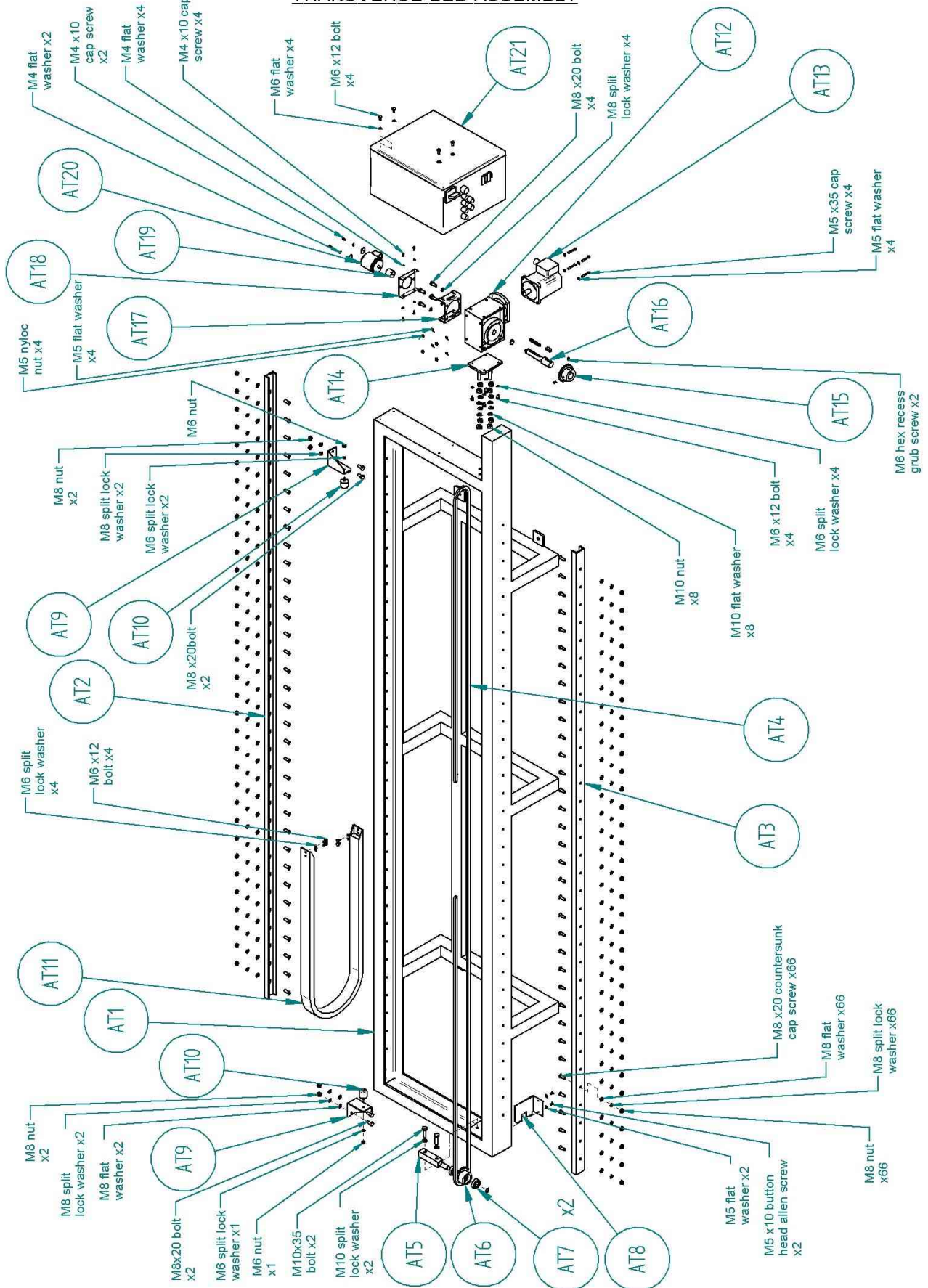
ANGLES PEDESTAL ASSEMBLY



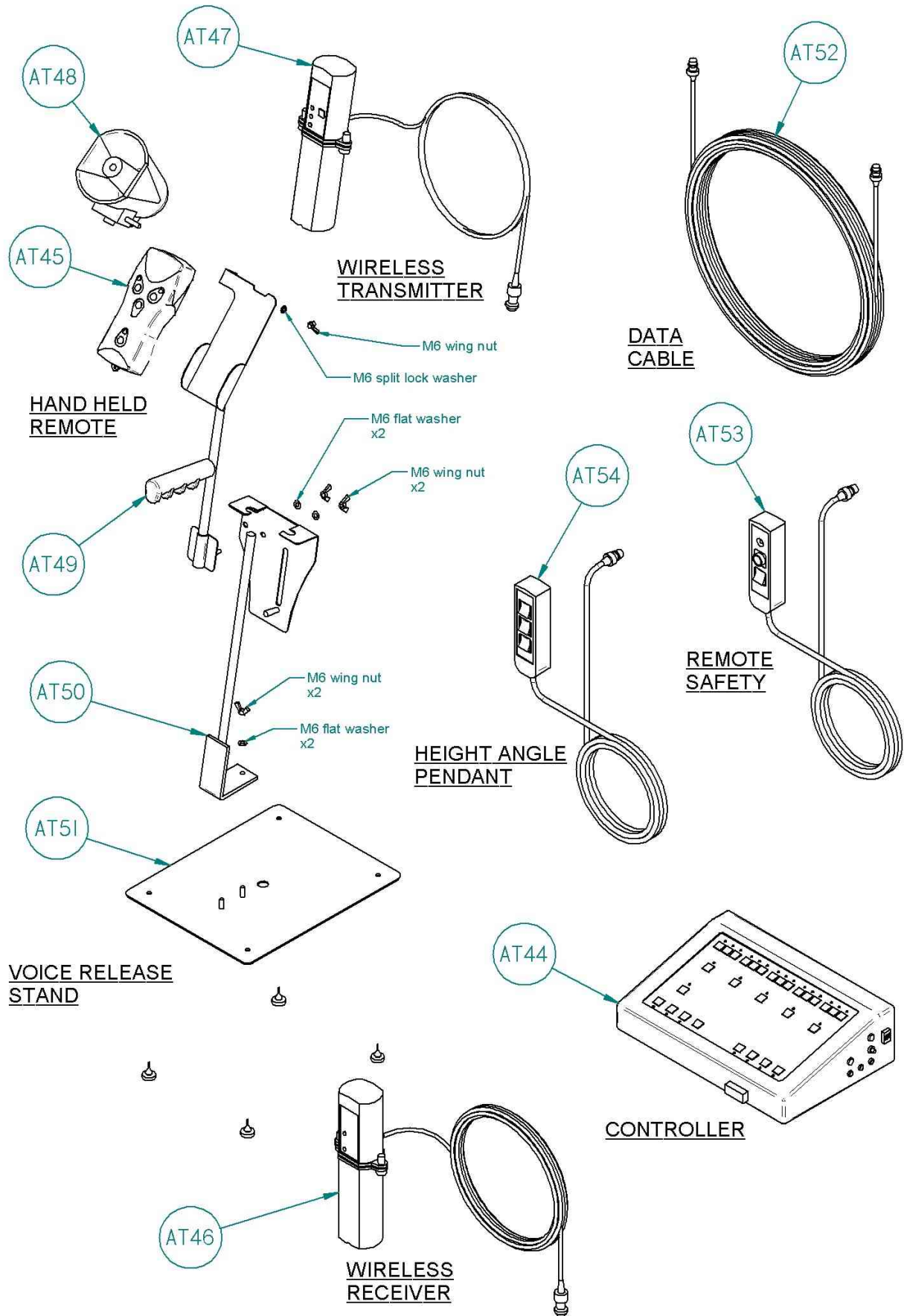
TRANSVERSE CARRIAGE ASSEMBLY



TRANSVERSE BED ASSEMBLY

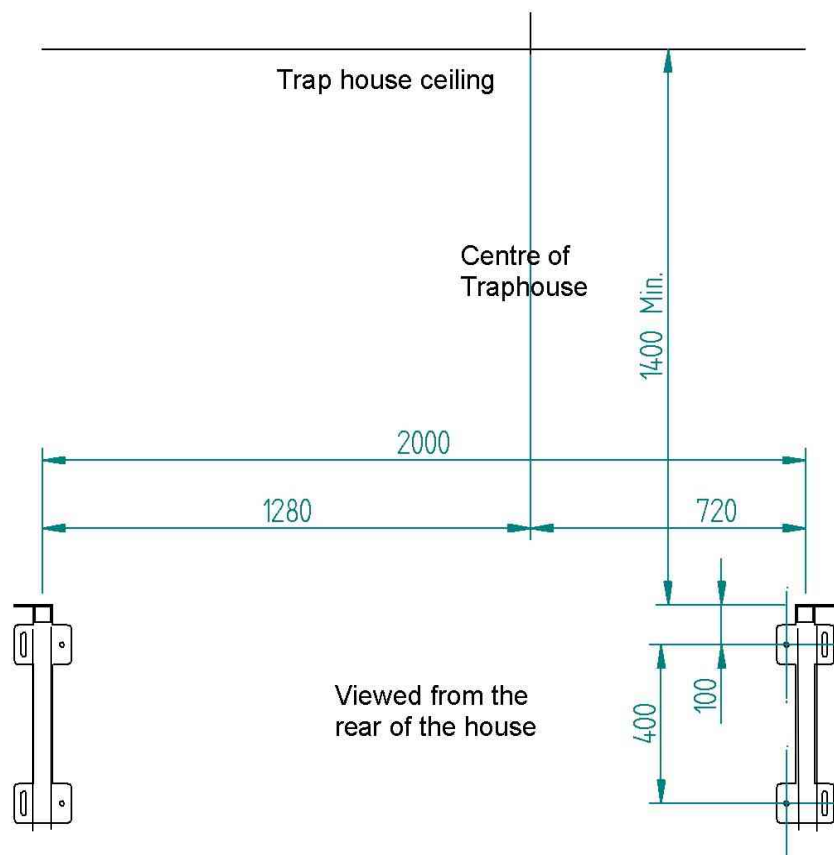
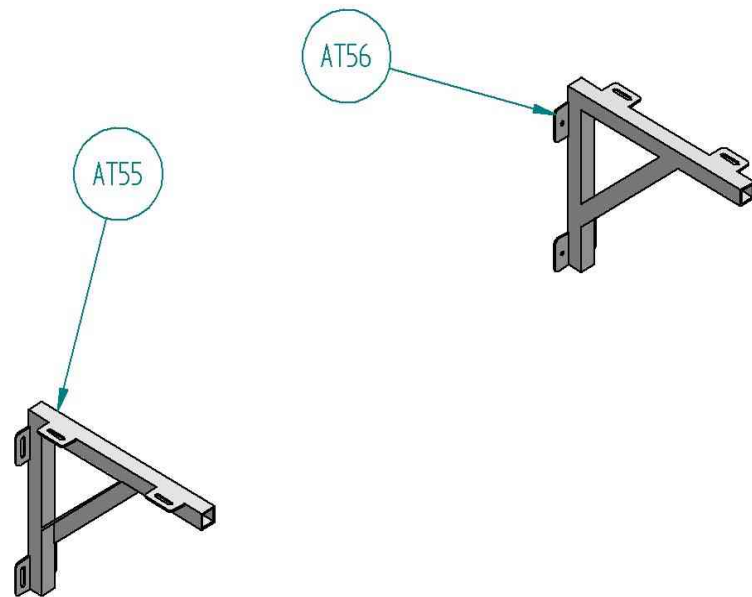


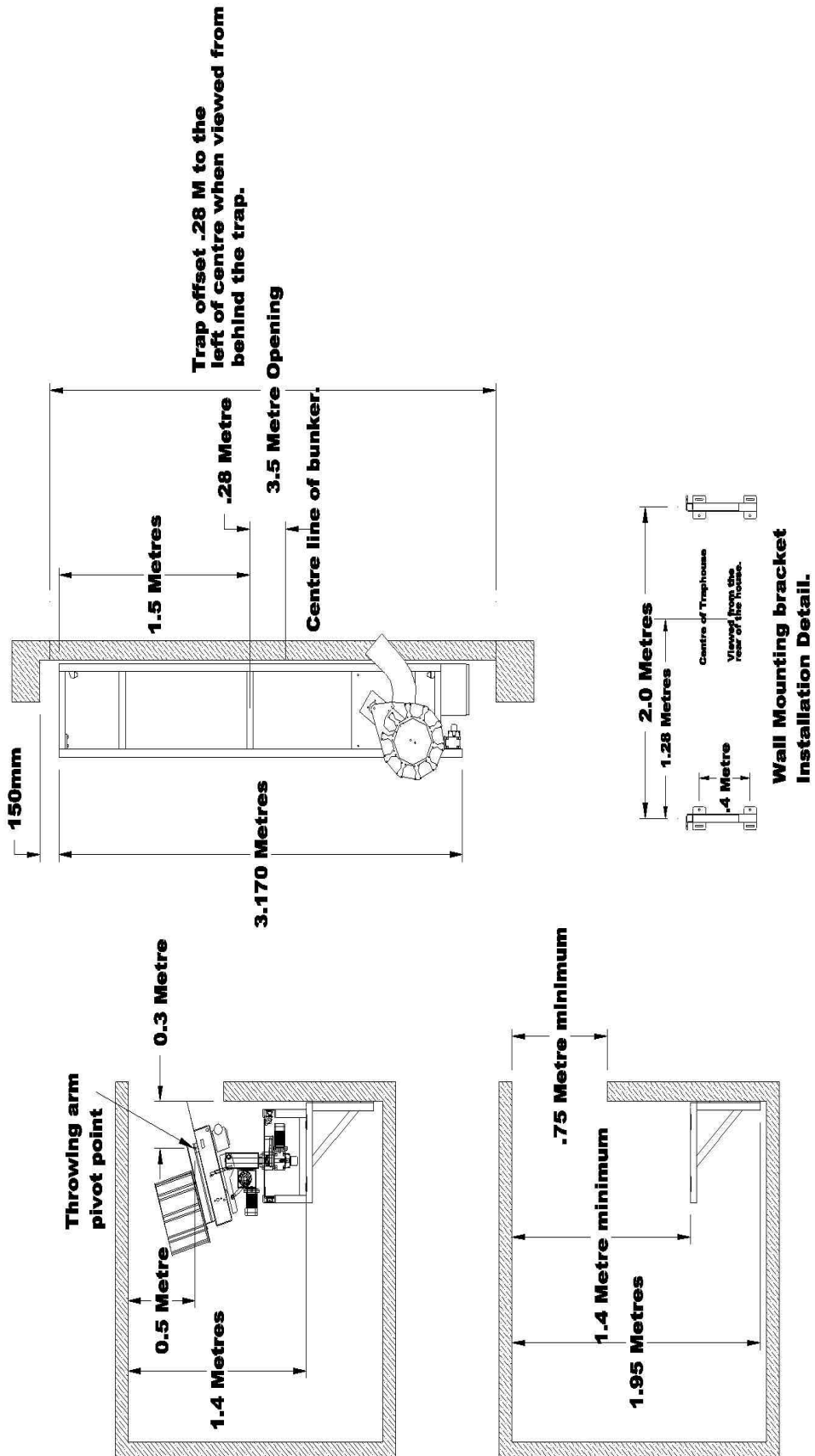
CONTROLLER, VOICE RELEASE AND CONTROLS

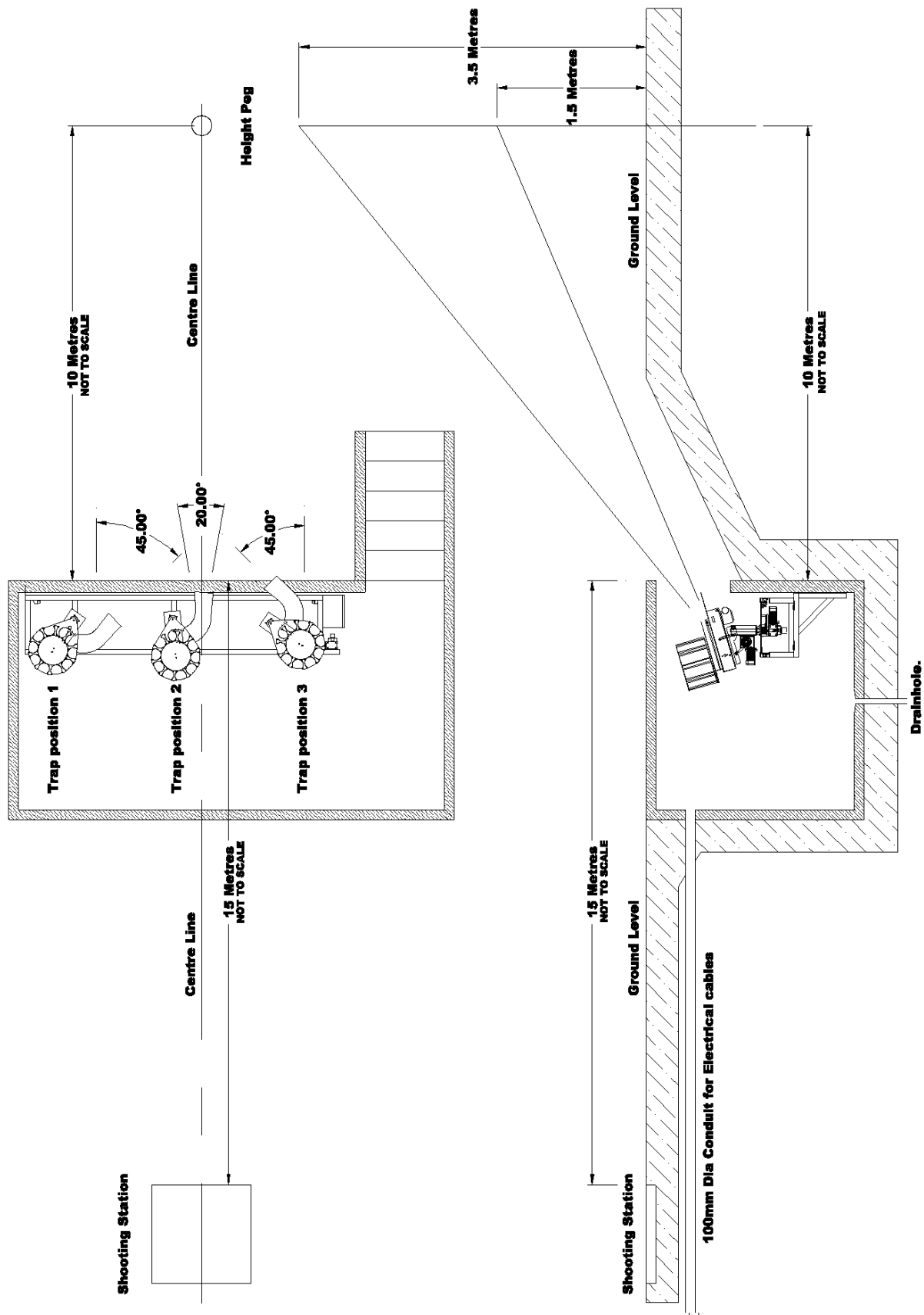


WALL MOUNTING BRACKETS

Dimensions mm.







Canterbury Auto Trench Field Layout.

(AT58) Auto Trench Crusader Wiring Loom March 2010				
Pin #	Electrical	Description	Female Plug	Male Plug
1	N	Arm Motor	Blue	Blue
2	Ph	Arm Motor	Brown	Brown
3	E	Arm Motor	Green	Green
5	Ph	Solenoid	Red/Yellow	Red
6	N	Solenoid	Black/Yellow	Black

Auto Trench error messages.

Error codes will be displayed on the Control Console LCD display.

Only one digit will be displayed at a time.

Press either the up or down arrow on the console to clear the error message.

Code	Fault	Possible cause and remedy
10	Can bus Fault	Check that all leads and plugs are secure. Check cables for wear and damage. If fault persists contact Canterbury Trap.
20	Transverse Unknown Fault	Contact Canterbury Trap.
21	Transverse Timeout	Check that all leads and plugs are secure.
22	Transverse Unexpected Limit signal	Check for Possible debris on Proximity switch, Check switch mounting and cable for damage, Check Encoder cable for damage.
23	Transverse Motor Stall	Check for obstructions with transverse movement.
40	Stepper Unknown Fault	Contact Canterbury Trap.
41	Stepper Timeout	Check that all leads and plugs are secure.
42	Angle Motor Stall	Check for obstructions with Angles movement. Check angles and height cables are plugged in correct outlets. Contact Canterbury Trap if Fault persists
43	Height Motor Stall	Check for obstructions with Height movement. Check angles and height cables are plugged in correct outlets. Contact Canterbury Trap if Fault persists
44	Internal power module Fault	Contact Canterbury Trap with details.
45	Internal power module Fault	Contact Canterbury Trap with details.
46	Internal power module Fault	Contact Canterbury Trap with details.

With power switched off check each cable for wear and damage. Check all plugs are correctly inserted and in correct outlet, taking particular care with the height and angles cables. If fault persist contact Canterbury trap. Please have the following information handy, system history, events leading up to fault condition, environmental conditions at the time i.e. approximate Temperature etc.



Auto Trench

Warranty Registration

Name:
Address:
City:
State:
Country:
e-mail:
Date of purchase: / /
Product Name: Auto Trench
Model: AT 100
Trap serial No:

Canterbury Trap International reserves the right to alter or amend any specification on it's products at any time without notice.

Register on line : www.canterburytrap.co.nz

Please fax to +64 3 3484285
or
Canterbury Trap International.
PO box 14035,
Christchurch 8544
New Zealand

NB! This form must be returned within thirty days of purchase.