

45 Trencher Operations And Maintenance Manual



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IMPORTANT

Read and understand sections 1,2 and 3. **ENSURE** that you are fully aware of the functions of each control before starting the engine.



SECTION 1

SAFETY INSTRUCTIONS FOR THE OPERATOR

TO BE ADHERED TO AT ALL TIMES

RSEC1-2

SAFETY INSTRUCTIONS

BEFORE STARTING THE TRACTOR OR CONNECTING THE TRENCHER

- 1. The trencher must only be operated by a competent tractor driver and only fitted onto a tractor rated by its manufacturers as less than 34kW (45HP).
- 2. Ensure that the tractor will safely carry the weight of the trencher and its attachments (See page Rsec5-2a). If the front of the tractor is too light, the steering may be impaired and there is a risk of tipping backwards.
- 3. WARNING: All guards must be in position and secure. This is not only for safety. Some of the guards form part of the structure of the trencher and leaving them off will cause damage (See Rsec1-6a). Unless a conveyor is fitted, the swinging guard must have the lower half fitted and must be bolted in place with the guard clamp.
- 4. If guards are removed for maintenance or the removal of obstructions, they must be replaced before restarting the tractor.
- 5. Know how to stop the tractor in an emergency (See section 2 and your tractor manual).
- 6. Know and understand the function of each control (See Section 2).
- 7. Read Section 2 on connecting and disconnecting the trencher and tractor.
- 8. The trencher must be operated only whilst seated on the tractor seat. NEVER climb into the gap between the tractor and the trencher, climb under the trencher or touch any parts, other than control levers, unless the tractor engine is stopped and the trencher is securely supported.
- 9. WARNING: If maintenance or repair is to be carried out, upon the trencher, ensure that it is securely supported and that the tractor engine is stopped.
- 10. Wear protective gloves and safety boots especially when changing teeth or chains.
- 11. Wear overalls or clothes that will protect you from dust, created by the trencher especially whilst working in dry conditions. All loose items such as scarves, ties, long hair etc must be constrained.
- 12. Wear eye protection at all times and a dust mask if dust is visible in the air.
- 13. Tests in use indicate noise levels of 95db may be produced, ear protection should be worn.
- 14. Check hydraulic hoses for chaffing and other damage daily (See section 3).
- 15. Ensure that all control and safety labels are in good condition and replace if necessary.
- 16. Many parts of the trencher are designed for a safety purpose, which may not be obvious. Use only genuine A F T Trenchers Limited replacement parts.
- 17. Keep the trencher/conveyor/wizz wheel well maintained and regularly tighten all nuts and bolts to ensure they are not working loose (See Rsec3-3b).

MOVING THE TRACTOR AROUND WITH THE TRENCHER FITTED

- 1. Drive only from the tractor seat.
- 2. Keep the digging boom or wizz wheel, whichever is fitted, as near to the ground as practical to avoid any tipping.
- 3. Allow clearance behind when turning for the digging boom to swing round.
- 4. NEVER allow other people to ride on the trencher.
- 5. **WARNING**: Before moving, other than when trenching, ensure that the high lift conveyor (if fitted) is lifted back into the transport position, firmly held with the catch, secured with the turnbuckle and that the turnbuckle lock nut is tightened (See Rsec2-5b). It is dangerous to drive the tractor around with the high lift conveyor in the lower "in use" position and damage is likely to occur.

USING THE TRENCHER – ALL ATTACHMENTS

- 1. **WARNING**: BEFORE STARTING make sure anyone watching or working nearby is at a safe distance from the tractor and trencher a minimum of 5 metres as debris will be thrown out during trenching. If people could stray into the proposed working area, cordon it off.
- 2. **WARNING**: NEVER leave the driving seat whilst the engine is running.
- 3. DO NOT try to operate the trencher by reaching across from the ground
- 4. DO NOT allow anybody to stand in the trench behind the trencher.
- 5. **WARNING**: Take great care when starting the conveyor to ensure that nobody is standing nearby as both soil and stones will be thrown several metres beyond the trencher's discharge end.
- 6. **WARNING**: Check the route along the trench for underground cables and pipes and mark their position. The trenching machine will break any service that crosses the trench. If working in military areas or on battlefield sites, check for unexploded munitions.
- 7. Alongside a road where work may interfere with normal traffic, notify the police and put up road works signs. Mark off an area with traffic cones to give free access all round the trencher and to allow for any spoil which may fall onto the road. Always work with the auger or high lift conveyor (whichever is fitted) pointing towards the verge.
- 8. Do not run the digging chain, wizz wheel or conveyor except when needed.
- 9. Do not back the tractor with the digging boom lowered into the ground as this puts very heavy loads onto the structure of the trencher.
- 10. **WARNING**: Before removing or fitting digging chains or teeth see RSec3-5a and before replacing wizz wheel teeth see RSec2-14a.

RSEC1-4b

MAKING ADJUSTMENTS OR CLEARING OBSTRUCTIONS

- 1. **WARNING:** If it is necessary to adjust or remove obstructions from ANY part, ALWAYS stop the engine and use the correct tools. Any guards removed must be replaced.
- 2. All adjustments or repairs should be carried out with the engine stopped and the boom or wizz wheel on the ground as they may fall if the hydraulics are opened.
- 3. Do not adjust or remove hydraulic hoses under pressure.
- 4. Many machine parts are heavy; if necessary, get help to lift them.
- 5. When handling or removing a digging chain, blades or digging teeth, beware that the chain can drop and move in unexpected ways. Always release the chain tension before splitting it and avoid handling the chain, except at the ends, as it can double over and nip your hands.
- 6. WARNING: If it is necessary to raise the swinging guard or if fitted, the high lift conveyor, ensure that they are firmly held with their catches in the uppermost position and that the high lift conveyor (if fitted) is secured with the turnbuckle.

LEAVING THE MACHINE

Lower the digging boom/wizz wheel onto the ground and disengage the POWER TAKE OFF SHAFT DRIVE (PTO). Return all hydraulic control levers to the neutral position. Apply the tractor hand brake, stop the engine and remove the ignition key. Check all guards (as shown in Rsec1-6a) are in place for the configuration that you are using. If a conveyor is fitted put it into the transport position and secure it with the turnbuckle and lock nut (See page Rsec2-5b), otherwise leave the swinging guard bolted down in the lower position.



RSEC1-5b

RSEC1-6a







GUARDS WITH CONVEYER ALL OTHER GUARDS AS ABOVE

GUARDS WITH THE WIZZ WHEEL ALL OTHER GUARDS AS ABOVE

LEFT SIDE

RIGHT SIDE





SECTION 2

USES FOR THE TRENCHER

The trencher is used to dig trenches varying from narrow, shallow slits to trenches 1220mm deep and 200mm wide in soil. The soil so dug is moved sideways by the auger so that it does not fall back into the trench or alternatively raised by the high lift conveyor and loaded onto a trailer to be taken away. This is the only use for which the trencher is designed. It is not for digging roads, concrete, rock or any other hard material. It should not be used where there are boulders, which cannot be raised through the width of the trench or where the digging teeth bounce over obstructions in the trench without being able to excavate them. It should not be used where there are cables, pipes or other items under the ground, which may be damaged.

OPERATING THE TRENCHER

This section must be read in conjunction with the relevant tractor operation manual. MOST of the controls are part of the tractor.

GENERAL

The trencher may be fitted with various options and these have different controls.

The principle options are (A) the chain trencher, where the digging chain runs on an arm called the digging boom, which is raised and lowered by the boom depth ram, (B) the wizz wheel where the digging boom and chain are replaced by a digging wheel (See Rsec2-3a) and (C) the conveyor which may be used in conjunction with (A) or (B) (See Rsec2-3a).



The digging mechanism is driven by the tractor power take off through the PTO shaft to the right angle gearbox on the trencher. (Refer to the tractor manual).

STOPPING THE TRENCHER

All controls, which stop the trencher, are on the tractor. To stop the trencher disengage the tractor PTO. Stopping the tractor engine will stop the conveyor and lock the boom depth ram.

ATTACHMENT OF TRENCHER TO TRACTOR

- 1. Fit counterbalance weights to front of tractor if required (See Rsec5-2a).
- 2. Check that the tractor and trencher are fitted with matching hydraulic pipe connectors (See Rsec1-5b)
- 3. Centralise the tractor in front of the trencher so that the tree-point linkage arms are lined up with the trencher's bottom tree-point linkage connector pins. Reverse up to the trencher and stop with the lower three-point linkage arms in line with these pins. Apply the brakes, put the tractor in neutral and stop the engine. Ensure that the power take off control and hydraulic valves on the tractor are in neutral (See Rsec1-5b)
- 4. Connect the power take off shaft. Check that it is the correct length (SeeRSec2-4a)

RSEC2-2a

- 5. Connect the two lower three-point linkage arms and the single, top three-point linkage arm. Lock them in position with the pins provided with the tractor (See RSec1-5b).
- 6. Connect the hydraulic hoses to the tractor hydraulics valve outlet (See Rsec1-5b).

NOTE:

- a) If no conveyor is fitted to the trencher, the tractor valve will operate the raising and lowering of the digging boom or wizz wheel (whichever is fitted) directly.
- b) If the trencher is fitted with a conveyor, ideally the tractor needs two pairs of hydraulic connections, operated from a single hydraulic pump, the trencher and the conveyor can be used but care must be exercised to ensure the conveyor is kept running as much as possible. If the conveyor is stopped from running by the operation of the depth control valve, the depth control must then be done in short quick movements with the forward motion of the tractor stopped. Digging with the conveyor stopped will quickly overload and stall the conveyor and therefore must be restricted to short periods.

If the tractor has only one pair of hydraulic connections, AFT can supply a control valve, code ZR24 (See Rsec3-6 and Rsec6-19c). The trencher boom or wizz wheel is then raised and lowered using the lever marked "depth control" on the AFT valve. The conveyor runs whenever the valve on the tractor is operated and is stopped by using the tractor valve. A non-return valve is fitted to ensure that the conveyor cannot be reversed and connection must be made as shown in circuit diagram RSec3-6.



- 7. Adjust the length of the top link so that the back plate of the trencher is vertical when the trencher is lowered to the digging position.
- 8. Adjust the check chains or restraining arms on the tractor bottom linkage arms to limit

sideways movement. Leave some play to facilitate steering and so that the wizz wheel follows its own line.

9. **WARNING:** Raise the whole machine slowly on the three-point linkage and ensure that no part of the trencher will damage any part of the tractor and that the PTO shaft neither goes solid nor separates beyond the limits shown below.



The maximum working length is normally when the trencher mainframe is on the ground or when fully lifted on the three-point linkage and is measured as shown from cruciform pivot to cruciform pivot. The minimum overlap is then this maximum length divided by 6.

EXAMPLE:

Maximum working length = 980mm

Overlap = 980/6 = 163mm

RSEC2-4a

REMOVING THE TRENCHER FROM THE TRACTOR

- 1. Select a level area of ground.
- 2. Place a piece of timber approximately 50 x 200mm by 1 metre long under the front edge of the mainframe and lower the trencher onto this block. Lower the digging boom to the ground and press it down until it takes the weight off of the three-point linkage arm.



3. WARNING: Raise the conveyor, if fitted, back into the transport position, secure it by the catch on the swinging guard and lock it in place by tightening the turnbuckle once put over the hook. Tighten the lock nut. Failure to raise the conveyor may make the trencher unstable and cause it to fall over sideways.



- 4. Apply the handbrake, put the tractor in neutral, ensure that all the hydraulic controls are in the neutral position and stop the engine.
- 5. Disconnect the hydraulic pipes, PTO shaft and the three-point linkage.
- 6. The tractor should be free to drive away but do so slowly, checking that nothing is still attached to the trencher.

OPERATING THE CHAIN TRENCHER WITH AN AUGER



STARTING TO TRENCH

- 1. **WARNING**: Mark out the trench line that you want to follow. Check for cables and underground services. Do not dig unless you know that the trench route is clear.
- 2. **WARNING**: Ensure that the swinging guard is in the lowered position in order to guard the auger and this must be locked into position with the guard clamp (See Rsec1-6a). Stop the engine before this is done.
- 3. Reverse the tractor and trencher to the starting point and put the tractor transmission into neutral.
- 4. Lower the trencher using the three-point linkage until it is hanging about 50 mm above the ground.
- 5. Apply the foot brake
- 6. Engage the tractor PTO drive (540rpm) TO START the digging chain.
- 7. **WARNING**: Using the tractor valve, lower the digging boom slowly into the ground. If you are starting at a ditch or hole you can go straight down. If starting in open ground it will be necessary to engage forward drive, to move forward slowly, as you go deeper to let the crumber end to follow the chain down. Lower the digging boom to the required depth. When lowering the digging boom into the ground it may grab and try to pull the tractor backwards and this is why the foot brake **MUST** be applied.
- 8. Use the tractor controls to increase forward speed. This can be increased or decreased to suit the soil conditions and the size of trench being cut. Check the depth being dug carefully for the first few metres.
- 9. Raising or lowering the three-point linkage will increase or decrease the ground clearance under the auger. The closer the auger is to the ground, the less soil it will leave close to the trench.

10. To control the position of the pile of dug soil, the auger can be moved in or out along the RSEC2-6b

auger tube and either one or two augers fitted. To move or remove an auger, loosen the clamp bolts and slide the auger along the auger tube to the required position, but do not fit an auger so that it overlaps the end of the auger tube. Re-tighten the clamp bolts. Ensure the tractor engine is switched off before making any such adjustments (See Rsec2-6b).

STOPPING TRENCHING

- 1. CF WARNING: Raise the digging boom clear of the ground and disengage the PTO drive at once. It is dangerous to continue driving the trenching chain once it is clear of the ground.
- 2. Raise the trencher on the three-point linkage to give more ground clearance. The normal tractor transmission can now be re-engaged and used to manoeuvre to the next trench.

OPERATING THE CHAIN TRENCHER WITH THE CONVEYOR



Lower the conveyor to the in use position and secure it in place with the swinging guard catch. Lock it with the turnbuckle and tighten the lock nut. Obtain help when lowering or raising the conveyor - **it is heavy.** If an AFT control valve is fitted, operation is the same as operation without the conveyor except that the conveyor will run all the time that the tractor hydraulic valve is engaged and the AFT valve must be used to control the boom depth ram.

If you have a twin valve system on the tractor, the conveyor should be kept running whilst the trencher is working. If it is necessary to stop it, to lower the digging boom or vary the depth, these stops must be of short duration to avoid overloading and stalling the conveyor.

Before trying to trench, run the conveyor at slow engine revs to ensure that all is correct.

It may be necessary to adjust the clean up chutes. They should be placed so that the edge of the rubber drag sheet is about 25 mm clear of the teeth. If adjustment is needed, lower the trencher and the boom to the ground and **stop the tractor** before touching anything. Undo the four bolts, two per side and move the chutes. Note that the left-hand chute is fitted to the left of the mainframe plate. When digging, adjust the forward speed with an eye to the load on the conveyor. **Speed should be adjusted so as not to overload the conveyor.**

RSEC2-8b

It is most important that the soil collection trailer does not run into the conveyor, as this may cause damage. Furthermore, do not back the trencher with the clean up chutes close to the ground as they may dig in and be bent.

NOTE:

The top roller drives the conveyor and for this drive to work effectively the belt tension must be kept correct. The belt is adjusted by four tension bolts at the motor end of the conveyor. In order to adjust the belt, loosen the four M10 clamp nuts, which hold the roller and motor support plates and tighten the four tension nuts evenly on the tension bolts. Tension is correct when, with the conveyor in the 'in use' position, pulling hard on a flight at point 'A', the belt can be raised so that the flight just reaches the top edge of the conveyor box. **ALWAYS** switch off the tractor engine before making any sort of adjustment. Do not over tighten the belt otherwise excessive wear may be caused.

WARNING: Do not run the conveyor if anyone is within range of its

discharge. They should be **at least** 5 metres away. Anyone working on a dumper or tractor collecting soil should be protected from the discharge and wear eye protection at all times. If conditions are dusty, in that airborne dust is clearly visible, a suitable breathing mask should also be worn.

If the three-point linkage sinks whilst working, a check chain may be fitted from the strong point (See Rsec2-8b) on the front of the trencher mainframe to a suitable point, as nearly vertical as possible, on the tractor. The conveyor should not be dragged along the ground as this may cause damage.

OPERATING THE WIZZ WHEEL WITH THE CONVEYOR

Operation is the same as operating with the chain trencher except that the wizz wheel can only be lowered to the stop.

NOTE that the left- hand chute is fitted to the right of the mainframe plate and that it's top edge is tapered to miss the underside of the wizz wheel chain case.



Do not continue to try and lower the wizz wheel once this stop has been reached.

To obtain a clean trench the correct width of crumber face must be fitted to suit the trench width and the rubber strips behind the crumber face must be adjusted to fit the trench closely (See Rsec6-21a). To do this, loosen the bolts and push the first rubber one way and the second an equal amount the other. Re- tighten the bolts.



 $\square \square \square$ WARNING: The foot guard must be fitted with the wizz wheel.

WARNING: Before changing teeth See Rsec2-14a

ATTACHING THE CONVEYOR

1. To attach the conveyor first remove the auger, auger tube and the auger drive pins (See Rsec6-14b). Note that the drive sprocket is now not held firmly in position so take care that it does not fall. Fit the shorter drive pins with the sprocket keep and M24 bolts supplied with the conveyor (See Rsec6-18d, items 40, 39 and 38). Remove the lower part of the swinging guard, loosen the clamp and raise the guard. Pick up the conveyor with a crane so that it balances with the lower part parallel and close to the ground. Swing the conveyor into position under the trencher and join the to the mainframe with the four bolts provided (See below and Rsec6-18d, items 14, 15, 19, 20 and 33). Take care to ensure that the conveyor hinge does not close and nip anybody or anything.



- 2. The conveyor hinges at 'A' and is held either in the up position for transport or down for when working by hooking the swing guard into the appropriate catch 'B' or 'C'. When moving the conveyor between these two positions **get help** to support the weight. Ensure that the conveyor is not allowed to drop onto its lower stop position as this may cause damage. Use the turnbuckle to secure the conveyor in either position to ensure that it cannot come free (See Rsec2-5b). Be sure to tighten the lock nut.
- 3. If the tractor does not have enough hydraulic valves an AFT trencher mounted valve, part number ZR24, **must** be used. Bolt the valve bracket, part number 004974, (See Rsec6-19c, item 5) onto the back of the trencher and connect the valve to the lock valve (See Circuit Diagram Rsec3-6 and Rsec6-12b)
- 4. Fit the clean up chutes if required. First fit the chute pivot in position in the slots 'D', securing it with two split pins (See Rsec6-15b) and then position the clean up chutes as described in Rsec2-8b.
- 5. Removing the conveyor is the reserve of the above.
- 6. **WARNING:** The lowest half of the swinging guard must be replaced and the swinging guard clamped into position with the swing guard clamp.

CHANGING THE CHAIN ASSEMBLY AND THE WIZZ WHEEL

The boom and chain or wizz wheel, whichever is fitted, are **heavy.** Help or lifting equipment to lift them is essential.

First remove the right-hand clean up chute (See Rsec2-11c), if fitted. Do not remove the auger.

TO REMOVE THE BOOM AND CHAIN (See Rsec2-13a)

Lower the boom until the teeth are just clear of the ground. Slacken the three nuts on the bolts (See Rsec2-13a, part numbers 106217 and 106218). Remove the "R" pin (See Rsec3-4a) which locks the tension screw and turn it to slacken the chain. Split the chain by removing one tooth or side plate (depending on chain type) (SeeRSec2-13a, parts numbers 106217 and 106218), which hold the boom in place and remove the boom, complete with adjuster screw. Remove the two stone guard plates and the boom block with its bolt. Leave the main bolts in place and retain the bolt (from the boom block) and the tree nuts for use later. Undo the two crumber bolts and remove them. Put all loose bolts back into their respective holes and loosely put on the nuts for safekeeping.

TO REMOVE THE AUGER (See Rsec2-13a)

WARNING: If an auger is fitted, knock back the locking tab (596173), undo the M24 bolt (at the bottom of the auger tube) and pull the auger free. Note that the auger should be removed after the chain because its removal frees the drive sprocket which, with the weight of the chain, may fall unexpectedly.

REFITTING (See Rsec2-13a)

Re-fitting the boom, chain and auger is the reverse of the above. The bolts (106217) and (106218) must be fitted the correct way round and MUST be genuine AFT Trenchers Limited parts. They are not simple bolts. Also, care should be taken to ensure that the auger locking tab (596173) is formed firmly around the M24 auger bolt.

TENSIONING THE DIGGING CHAIN

Tighten the chain tension screw (See Rsec3-4a) until the gap between the chain and the boom at the underside of the boom is about 70 mm. Run the digging chain for a few seconds to ensure free running, then recheck the adjustment. Replace the ''R'' pin.

BOOM INSTALATION DIAGRAM



RSEC2-13a

TO REMOVE OR FIT THE WIZZ WHEEL (See Rsec2-15)

1 Remove the crumber and then the crumber support. The crumber support hangs on bearings on the digging wheel shaft locked by grub screws which must be loosened. The crumber support is made of spring steel and may be fixed sideways by pulling at point (A). This frees the bearing. The same procedure on the opposite side frees the crumber support. The check chain will also have to

be disconnected. 2 Undo the four nuts (B) that hold the wheel guard (C) to the Wizz Wheel koom 3

- (D) and remove the guard. Undo the four nuts and remove the digging wheel from the hub (E), 4
- Loosen 3 boom bolts D2 and F, remove "R' clip and slacken boom adjuster bolt (H) far side.
- 5 Undo and remove 2 boom bolts and Wizz Wheel Boom Cover (F). 6
- Next split the drive chain at the joining link and remove the chain. Undo the one remaining boom bolt (D2) and remove the boom assembly (D1) together with stone guards (see Rsec6-20) Items 20 and 29.

CAUTION: When dismantling the Wizz Wheel assemblies remember these are heavy, oet help!

SPECIAL NOTE: If you intend to refit the Digging Boom, Chain and Crumber the Digging Sprocket (G) and Drive Pins Items 10 and 12 (Rsec6-20) must be changed to items 19-Digging Sprocket (809068) and 20-Drive Pins (753868 with Auger or 753877 with Conveyor) on Rsec6-8.

TO REFIT

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Refit in reverse order.

FITTING OR REPLACING WIZZ WHEEL TEETH

To remove the teeth use a 9mm diameter (3/8') Punch to knock out the inner and outer tooth retaining tension pins as a pair (see Rsec6-22), Knock the tooth out from the wheel pocket. Fit a new tooth and using new pins first knock the outer pin into the hole in the tooth through the pocket slot (with an equal amount of the pin showing on each side). Then knock the inner pin through the whole in the centre of the outer pin.

WARNING: Both inner and outer tension pins (which must both be new) must be used to hold the teeth safely in place. NDTE: Standard steel teeth are reversible and can be fitted either way round but carbide teeth are not reversible and must be fitted pointing as shown.



RSEC2-14b

BOOM FOR THE WIZZ WHEEL



RSEC2-15



SECTION 3

ROUTINE SERVICING

Lubrication Chart Maintenance Schedule Maintenance Procedure Circuit Diagram

LUBRICANT RECOMMENDATIONS:

Bevel Gearbox: SAE90/140 Grease – High melting point, general purpose, lithium based.



GREASE – Use High melting point general-purpose lithium based grease. OIL – Use SAE 90/140 gear oil.

Grease and oil at the time schedules as indicated as above.

HYDRAULIC OIL – All hydraulics are driven from the tractor – refer to the tractor manual.

DAILY CHECKS

Check all hydraulic hoses daily and replace if there are any signs of damage, for example cuts or chaffing, to the hose or if the end fittings are damaged or bent in any way.

Safety and control labels should be replaced if defaced.

Check that all nuts and bolts are tight with particular attention to those securing the PTO guard, the boom, the boom side plate, the auger, the crumber, the crumber support and all those securing the blades to the chain. (See above, Rsec3-3b and Rsec3-4a).

Many parts are designed for a safety purpose, which may not be obvious. Use only A F T Trenchers Limited Replacement parts. Check all parts at least once a week and replace if they are damaged

All surplus oil must be disposed of according to the appropriate regulations.

RSEC3-2b



RSEC3-3b



DIGGING BOOM ASSEMBLY

RSEC3-4a

GENERAL

Lubrication, checking bolts for tightness and boom/chain/teeth maintenance are the most frequently required; but all parts of a trenching machine are subjected to heavy loads and should be inspected at least weekly and replaced if damaged.

DIGGING BOOM ASSEMBLY

The digging chain and all the digging boom components on which it runs, work underground and are subject to wear. They should be inspected regularly and all damaged or very worn parts should be replaced.

DIGGING CHAIN AND TEETH

Worn teeth greatly reduce the digging efficiency and should be replaced. When working, heavy and uneven loads are applied to the chain rollers. Inspection will show greater wear on the roller and side plates under each tooth's rear edge. To achieve maximum life expectancy from digging chain, it is recommended that, when replacing teeth, as far as possible (whilst still keeping the teeth pattern) the teeth are fitted to the lesser-worn parts of the chain. It is a good idea to remove the chain from the boom, **remove all teeth and turn the chain round end for end and turn it over, fitting the teeth as previously.** All teeth simply bolt on to the chain but always check that the nuts securing them are tight.

IMPORTANT: The leading (cutting) edge of the teeth is the widest part, which then tapers back. When fitting the chain to the boom or new teeth to the chain, fit them this way round. The fitting of teeth the wrong way round is a common fault in trenching operations.

The 44.5mm pitch digging chain can be fitted with four widths of tooth; 100mm, 125mm, 150mm and 200mm. The 63.5mm pitch digging chain can be fitted with three widths of tooth; 125mm, 150mm and 200mm. For the correct tooth layout, refer to the digging chain assembly sequence charts (See Rsec6-2 to Rsec6-7).

Digging chain length can be lengthened or shortened to suit all boom lengths my adding or removing the appropriate number of links.

CHANGING TEETH AND REMOVING THE DIGGING CHAIN

See above and also refer to RSec2-12a

CHANGING THE WIZZ WHEEL TEETH

Refer to RSec2-14a

TORQUE OF THE PTO CLUTCH

WARNING: Adjustments to the PTO clutch must only be made when the trencher is disconnected from the tractor. It is dangerous to touch the adjustment nuts if there is a chance that the PTO shaft may turn under power. The PTO clutch is to protect your tractor and you should set it accordingly. Tighten or loosen (See Rsec3-2a) the nuts (reachable through the slot) as required. All nuts on the clutch should be turned the same amount. It will be necessary to turn the PTO and this can be done by hand.









RSEC3-6



SECTION 4

FAULT DIAGNOSIS

RSEC4-1

PERFORMANCE FAULTS – BASIC TRENCHER AND CHAIN ATTACHMENT

Too much soil left in the bottom of the trench.	 a) Check the width of the crumber and increase it if required. b) Forward speed too great – slow down. c) Soil falling into the trench from the heaps at the side – adjust the augers sideways (See Rsec2-6b). d) Increase digging chain speed (engine speed). e) Boom is too long.
Trench depth irregular.	 a) If using a long boom to excavate a shallow trench, fit a shorter boom. b) On irregular surfaces – compensate by raising the boom as the front of the tractor rises and lowering the boom as the front of the tractor drops down. c) Fit a grading attachment if very level trenches are required. d) Forward speed is too great.
Trenches not straight	a) Check the digging teeth for excessive or uneven wear on either side.b) Check that the boom is not bent or out of line with the tractor centre line.c) Check that the lower boom bearing and sprocket are not badly worn.
Boom will not move properly.	 a) Check the relief valve setting on the tractor (See Rsec5-2a). b) Grease the pivot housing (SeeRSec3-2b). c) If an AFT valve (ZR24) is fitted (to drive the conveyor) adjust the relief valve on the ZR24 so that the boom just moves.
Engine stalls or dies under normal working conditions.	a) Increase the throttle setting.b) Slow down the forward trenching speed.c) Worn blades.d) The chain is too tight.
Excavated soil is too near the trench edge.	a) Re-set the augers (See Rsec2-6b).b) Trencher too high off of the ground.
The main PTO clutch slips.	 a) Plates worn. b) Ensure that your tractor is not more than 34kW (45HP). c) Adjust the PTO clutch (See Rsec3-5a). d) The chain is too tight.
The boom will not penetrate hard ground.	a) Worn blades.b) Fit some carbide teeth (See Rsec6-2).c) Blades on back to front.

PERFORMANCE FAULTS – CONVEYOR

Conveyor drive slips.	a) Check the conveyor belt tension (See Rsec2-9b).
Soil not coming through onto the conveyor.	a) Clear the throat between the chain/wizz wheel and the conveyor. (Stop the engine first).
Large Stones and clods roll back down the conveyor.	a) Fit the blanket, item 18, part number 700094 with its associated clamps (See Rsec6-17b). The part number of all required parts is ZR27.

PERFORMANCE FAULTS – WIZZ WHEEL

The wizz wheel bounces on hard ground.	a) Fit a stabilising wheel, part number ZR23A.b) Blades are worn.c) Fit carbide teeth.
Too much soil left in the trench.	 a) Adjust the crumber rubber strips (See Rsec2-10a). b) Slow down the forward speed. c) Torn or worn out box flaps, part numbers 700079, 700086 and 700088 (See Rsec2-10a). Replace if necessary. d) The rubber drag sheets nee adjusting or replacing (See Rsec2-8b)
Teeth wear too fast.	a) Fit some carbide teeth (See Rsec6-22b).
Spilling soil beside the trench.	a) Trencher carried too high off the ground.
Wizz Wheel goes crab-wise/wide trench.	a) Check the chains on the tractor are not too tight pulling the wizz wheel out of line.



SECTION 5

SPECIFICATION OF THE 45 TRENCHER

RSEC5-1

DIMENSIONS

Overall length (from linkage pin) with 1000 mm boom	
Overall length without boom and crumber	
Overall length with wizz wheel	
Overall width (with swinging guard down)	
Overall width (with swinging guard up)900 to 1000 m	m depending on auger position
Overall width with wizz wheel	
Overall width with conveyor up	
Overall height with conveyor up	

WEIGHTS (For guidance only).

Trencher with digging boom, depending on boom length	approx 380 – 400kg
Trencher with wizz wheel	approx 410kg
Additional weight of the conveyor	approx 105kg

TRENCHER SPECIFICATION

DIGGING CHAIN: 63.5 mm pitch, heavy duty. 44.5 mm pitch, heavy duty.

DIGGING BLADES: Austempered spring steel cutting edges.

DEPTH CONTROL: Hydraulic with powered boom lift and lower, complete with lock valves to maintain a constant depth.

DIGGING CHAIN DRIVE: Driven by the tractor PTO by PTO shaft fitted with a torquelimiter for shock load protection.

CENTRE OF GRAVITY: 750 mm behind the three-point linkage connections on the trencher.

TRACTOR REQUIREMENTS

POWER: 19-34kW (25 – 45hp).

THREE POINT LINKAGE: Category 1 or 2.

HYDRAULICS: The tractor must be fitted with at least one hydraulic valve with reversible flow and two connection points and provide between 140 and 210 bar (2000 and 3000 psi).

BALANCE WEIGHTS: Tractor balance weights may be requires and will depend on the type and specification of the tractor being used. They should be assessed from the total weight of the trencher system and the overhang from the tractor rear axle.

RSEC5-2



SECTION 6

SPARES LIST

Unless all components in a diagram are required DO NOT quote the assembly number.

The type and serial number of your trencher, shown on the nameplate MUST be quoted when ordering parts.

For reference, fill in this information in the space provided below.

To ensure prompt and accurate service, the following information must be given : -

- 1. Part number, description and quantity.
- 2. Method and urgency of despatch.

ALL HANDED SPARES ARE DESIGNATED AS BELOW



RSEC6-1



ZR68 800mm Chain And Carbides Only Complete	ZR65 800mm Chain, Blades And Carbides Complete	ZR62 800mm Chain And Blades Only Complete	ZR67 600mm Chain And Carbides Only Complete	ZR64 600mm Chain, Blades And Carbides Complete	ZR61 600mm Chain And Blades Only Complete		50 m
137960	137960	137960	137961	137961	137961	Complete Welded Chain No.	Slittin nm Or
42	42	42	36	36	36	Number Of Pitches	g Ch 72 r
1 37947	137945	137943	137946	137944	137942	Chain And Blade No. Complete	ain Dig nm And
	σ	σ		IJ	UT	Soil Blade RH 597074	ging ∛i 84 m
	σ	σι		თ	ப	Soil Blade LH 597075	η α+μ
9	ы		7	N		Carbide RH 003498	
ى	بر)		7	N		Carbide LH 003499	



Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	386127	EQUAL UNION	2	9	BM16065	METRIC BOLT	4
2	008039	45 LIFT FRAME GUA	RD 1	10	BM16090	METRIC BOLT	2
З	385191	HYDRAULIC HOSE	1	11	NM16SL	LOCK NUT	6
4	729014	BONDED SEAL	2	12	003523	45 VALVE BRACKET	1
5	353300	45 CONVEYOR LIFT	RAM 1	13	004974	LOWER VALVE BRACKET	1
6	385288	HYDRAULIC HOSE	1	14	SM10020	10 X 20 SET SCREW	1
7	386164	UNEQUAL UNION	2	15	353344	FLOW CONTROLLER C/W	1
8	/29015	BUNDED SEAL	2			CHECK VALVE	

RSEC6-3a

IMPORTANT NOTICE

Placement Of Rubber Flap Part No. 700078 In Relation To 004966 Right Hand Soil Guard



This is a view of the incorrect way for the Rubber flap (700078) to be placed. Which allows spoils as shown, due to the soil falling between the Rubber Flap (700078), and the Soil Guard (004966).



The view above is the correct way to place the Rubber Flap (700078), as there are no spoils on the outside of the Soil Guard (004966), due to the Rubber Flap (700078) being placed on the inside of the Soil Guard (004966).

ZR26 Laser Linkage (AFT45)







SUBSTITUTE CARBIDE TEETH FOR NORMAL TEETH (SIZE FOR SIZE) AS CONDITIONS REQUIRE.

CARBIDE TEETH LAST MUCH LONGER BUT USE MORE POWER AND IN WET CONDITIONS DO NOT PRODUCE SUCH A CLEAN TRENCH.

ltem	Part No	Description	ltem	Part No	Description
1	595055	125mm Tooth — LH	8	137354	Half Link Complete
	595057	150mm Tooth — LH	9	NM16SL	16mm Self Lock Nut
	595059	200mm Tooth — LH	10	004418	Staright Carbide Tooth
2	595054	125mm Tooth — RH		004420	125mm Carbide Tooth — RH
	595056	150mm Tooth — RH		004422	150mm Carbide Tooth — RH
	595058	200mm Tooth — RH		004424	200mm Carbide Tooth — RH
3	137355	Outer Pin Side Plate	11	004419	Stariaht Carbide Tooth
4	137356	Inner Roller Link		004421	125mm Carbide Tooth — LH
5	137357	Outer Side Plate		004423	150mm Carbide Tooth — LH
6	137358	Chain Spacer		004425	200mm Carbide Tooth — LH
7	WM16SP	16mm Spring Washe	r		

RSEC6-7a

Blades And Carbides In AFT45 Chain

-	-	-	-	-	-	0	0	0	
2 Me	2 Me	2 Me	0 Me	0 Me	0 Me	8 Me	8 Me	8 Me	
tre x	tre x	tre x	tre x	tre x	tre x	tre x	tre x	tre x	
200	150	125	200	150	125	200	150	125	
mm	mm	mn	mm	mm	mm	mm	mm	mm	
- Cha	1 Cha	1 Cha	- Cha	1 Cha	Cha	1 Cha	- Cha	1 Cha	
5	, D,	5	3.	3	5	5	3.	3	
13764	13764	13763	13763	13763	13763	13763	13763	13763	Chain
6	0	9 6	08 07	7 5	თ თ	5	4	3 4	P:
ð	ő	ŏ	Ň	Ň	Ň	4	4	4	
υ	σ	7	4	4	တ	3	3	σ	59505
ഗ	رب ا	7	4	4	თ	8	3	σ	395032 × 13.5 cm
	ы			4			ы		3933 - 2.5 CA BIOGO
	ப			4			ы		39505 Cm Ca
S			4			3			3930 September 1
ഗ			4			ε			39302 30 cm la p
<u> </u>	-						-	-	COA 20 CID BACK
	-		-	-		-	-	-	COA TO CONTROL DID COA
		2			2			2	COARS CONTRO CONDICE
		2			2			2	COTATION COTOLOGICA
	2			2			2		OP IS CARD
	2			2			2		COTTO
2			2			2			COT IS CARDING IN
2			2			2			OD 4 4 30 C 13 C C 1 B C 6 B
	_	_							No Contraction
									Certor Pit

For tooth set only: Add suffix "A" to the digging chain part number - eg 137633 A is the tooth set only for the 125 mm x 800 mm deep digging chain. For chain only (NO teeth): Add suffix "C" to the digging chain part number - eg 137633 C is the digging chain only for the 125 mm x 800 mm deep digging chain.

PARTS FOR DIGGING CHAIN ASSEMBLIES 63.5 mm PITCH

Chain Size	Pitch	Part No	125 mm Tooth Qty		150 mm Tooth Qty		200 mm Tooth Qty		Nuts	Washers	Spacers
			595054	595055	595056	595057	595058	595059	NM16SL	WM16SP	137358
Boom No 800 mm											
125 mm x 800 mm Deep		137565	5	5					44	44	24
150 mm x 800 mm Deep	44	137566	5	5	5	5			44	44	4
200 mm x 800 mm Deep		137567	5	5			5	5	44	44	4
Boom No 1000 mm											
125 mm x 1000 mm Deep		137569	6	6					52	52	28
150 mm x 1000 mm Deep	52	137570	6	6	6	6			52	52	4
200 mm x 1000 mm Deep		137571	6	6			6	6	52	52	4
Boom No 1200 mm											
125 mm x 1200 mm Deep		137573	7	7					60	60	32
150 mm x 1200 mm Deep	60	137574	7	7	7	7			60	60	4
200 mm x 1200 mm Deep		137575	7	7			7	7	60	60	4

For tooth set only: Add suffix "A" to the digging chain part number – eg 137565A is the tooth set only for the 125 mm x 800 mm deep digging chain.

For chain only (NO teeth): Add suffix "C" to the digging chain part number – eg 137565C is the digging chain only for the 125 mm x 800 mm deep digging chain.

BOOM AND CRUMBER



RSEC6-8c

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GUARDS AND LINKS



RSEC6-10a

GUARDS AND LINKS CONTINUED



Item	Part No	Description	Qty	ltem	Part No	Description	Qty
1	SM10030	BOLT	1	9	700078	LOADING SKIRT	1
2	NM10SL	NUT	4	10	004662	MAIN FRAME	1
3	596219	GUARD STOP	1	11	426032	DANGER	1
4	740038	SPRING PIN	1	12	SM10025	BOLT	1
5	SM08025	BOLT	7	13	596042	BLANKING PLATE	1
6	NMOBSL	NUT	7	14	177572	CATEGORY 2 BUSH	2
7	004877	FLAP SUPPORT	1	15	004894	LIFTING GUARD	1
8	596004	SKIRT CLAMP	1	16		PLASTIC CAP	2
				17	795009	SPLIT PIN	2

RSEC6-11a

MAIN FRAME ASSEMBLY



	DITTOLVV						-
З	BM16140	BOLT 16 × 140	1	22	577001	"R" PIN	1
4	595918	TORSION FRAME	1	23	106201	BOLT	1
5	801025	DISC SPRING WASHER	5	24	505010	GREASE NIPPLE	1
6	NM16SL	NUT THIN	5	25	004664	PI∨OT HOUSING	1
7	BM16040	BOLT	1	26	004672	INNER STONE GUARD	1
8	WM16A	WASHER	8	27	NM12SL	NUT	5
9	SM16025	BOLT	8	28	595920	BOOM BLOCK	1
10	NM10SL	NUT	7	29	CM10020	CAPHEAD SCREW	2
11	BM10030	BOLT	3	30	WM12A	WASHER	5
12	WM16SP	WASHER	1	31	SM12040	BOLT	5
13	008015	COMPLETE GEAR BOX	1	32	177584	SHIM AS REQUIR	ED
14	WM10A	WASHER	4	33	004673	DUTER STONE GUARD	2
15	801035	WASHER	3	34	BM10040	BOLT	6
16	SM10025	BOLT	4	35	WM10SHI	WASHER	6
17	065154	PI∨OT BEARING	1	36	595921	CLAMP RING	2
18	004663	GEAR BOX HOUSING	1				
19	004671	CRUMBER SUPPORT	1				

RSEC6-12a

STANDARD HYDRAULICS



Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	353223	LOCK VALVE	1	11	385277	HDSE	2
2	WM05A	WASHER	2	12	729016	BONDED SEAL	2
3	NM05SL	NUT	2	13	386062	Q R COUPLING	2
4	729014	BONDED SEAL	10	14	NM16SL	NUT	1
5	BM05040	BOLT	2	15	881255	RAM SUPPERT	1
6	386127	ADAPTOR	2	16	BM16120	BOLT	1
7	386272	BANJO BOLT	4	17	386269	HOSE CLAMP	1
8	385288	HOSE	2	18	353212	RAM	1
9	386014	ADAPTOR	2	19	145004	CIRCLIP	1
10	BM08040	8mm BOLT	1	20	WM16A	16mm FLAT WASHER	L
10	VM08SP	8mm SPRING WASHER	1				

RSEC6-13a

ANGLE GEAR BOX



SECTION THROUGH BOX

Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	753880	PINION AND SHAFT	1	13	595937	GEARBOX CO∨ER	1
2	729163	PINION SEAL	1	14	CM08010	LEVEL PLUG	1
3	065169	FRONT PINION BEARI	NG 1	15	20080M2	BOLT	4
4	004663	GEAR BOX HOUSING	1	16	CM10030	CAP HEAD BOLT	2
5	065170	REAR PINION BEARING	51	17	329018	GEAR BOX	1
6	753866	MAIN SHAFT	1	18	881261	BEARING SLEEVE	1
7	729161	MAIN SEAL	1	19	353221	FILLER BREATHER	1
8	065153	MAIN BEARING	2	20	353222	DRAIN PLUG	З
9	177559	BEARING SPACER	1	21	177568	SHIM	0+
		THICKNESS TO SUIT				QUANTITY TO SUIT	
		BEARING CLEARANCE				GEAR CLEARANCE	
10	065172	DUTER SHAFT BEARIN	NG 1	22	809072	CROWN WHEEL	1
11	177570	WASHER	1	23	WM08SP	WASHER	4
12	NM24SLT	NUT	1				

RSEC6-14a

AUGER



Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	004675	AUGER	2	5	004674	AUGER TUBE	1
2	SM12040	BOLT	3	6	801066	WASHER	1
З	NM12SL	NUT	З	7	596173	TAB WASHER	1
4	753868	AUGER DRI∨E PIN	4	8	BM24080	BOLT	1



1

RSEC6-15a

COMPLETE

184092

SOIL CLEAN UP CHUTES FOR THE CHAIN



Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	004883	L H CUTE	1	7	NM06PF	PLAIN NUT	14
2	004963	CHUTE PIVOT	1	8	CBM06020	BOLT	14
З	WM16A	WASHER	3	9	004966	R H CHUTE	1
4	795012	SPLIT PIN	2	10	CBM1235	CARRIAGE BOLT	4
5	700096	CHUTE FLAP	2	11	WM12SP	SPRING WASHER	4
6	596165	FLAP CLAMP	2	12	058905	CHUTE RUNNER	1
				13	NM12PF	12 mm PLAIN NUT	4

RSEC6-16b

SOIL CLEAN UP CHUTES FOR THE WIZZ WHEEL



Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	004884	L H CUTE	1	8	CBM06015	BOLT	12
2	004963	CHUTE PIVOT	1	9	004695	R H CHUTE	1
З	WM16A	WASHER	3	10	CBM1235	BOLT	6
4	795012	SPLIT PIN	2	11	WM12SP	WASHER	6
5	700081	L H CHUTE FLAP	1	12	058905	CHUTE RUNNER	2
6	596002	FLAP CLAMP	1	13	596165	FLAP CLAMP	1
7	NM06PF	PLAIN NUT	12	14	700096	CHUTE FLAP	1
				15	NM12PF	PLAIN NUT M12	4

RSEC6-17b





RSEC6-19a

CONVEYOR HYDRAULICS



10

RSEC6-20a

NEW WIZZ WHEEL



60mm DIA BEARING

INNER BOOM KEEP

REAR GUARD

CLAMP STRIP

DIGGING WHEEL HUB

WIZZ WHEEL CRUMBER



RSEC6-22a



TEETH MAY BE MIXED USING SOME HARDEN STEEL TEETH WITH ANY EVEN QUANTITY OF TUNGSTEN CARBIDE TEETH UP TO A FULL SET

FOR 70mm TRENCHES USE TWO 40mm TEETH ON OPPOSITE SIDES OF THE WHEEL TO CUT THE CENTRE

Item	Part No	Description	Qty	Item	Part No	Description	Qty
1	004902	POCKET WHEEL	1	5	TUNGSTEN	CARBIDE TOOTH	
2	REVERSIB	LE STEEL TOOTH			QUANTITY	TO SUIT SOIL CONDI	TION
	596050	FOR 40mm TRENCH	12		004905R	FOR 40mm TRENCH RH	4
	596051	FOR 50mm TRENCH	12		004905L	FOR 40mm TRENCH LH	H
	596052	FOR 60mm TRENCH	12		004906R	FOR 50mm TRENCH RH	4
	596053	FOR 70mm TRENCH	12		004906L	FOR 50mm TRENCH LH	4
	596054	FOR 100mm TRENCH	8		004907R	FOR 60mm TRENCH RH	4
		+ 4 OFF 596050			004907L	FOR 60mm TRENCH LH	4
З	740037	TENSION PIN	12		004908R	FOR 70mm TRENCH RH	H
4	740038	INNER TENSION PIN	12		004908L	FOR 70mm TRENCH LH	4
					004909R	FOR 100mm TRENCH R	Н
					004909L	FOR 100mm TRENCH L	Н

6 110003 PUNCH TOOL

RSEC6-23a

EC DECLARATION OF CONFORMITY

A F T Trenchers Ltd 16/17 Addison Road Chilton Industrial Estate Subury, Suffolk CO10 2YW

Declares that:-

Trenching attachment type AFT45 (with conveyor if fitted)

Serial No.

Manufactured:



Designed to attach to agricultural style tractors between 19 and 34 kW (25 and 45HP) conforms with:

- The essential Health and Safety requirements of the Supply of Machinery (Safety) Regualtions 1992 (SI 1992/3073) as amended (SI 1994/2063)
- BS EN 474-10: 1998 in as far as it applies to a trenching attachment
- EC machinery directive 89/392 EEC (as amended).

Signed by H M Jurgens Managing Director