Scorpion Root Cutter

Series IV

Operators Manual

Scorpion Root Cutter Series IV

Congratulations on your new Scorpion Root Cutter purchase!

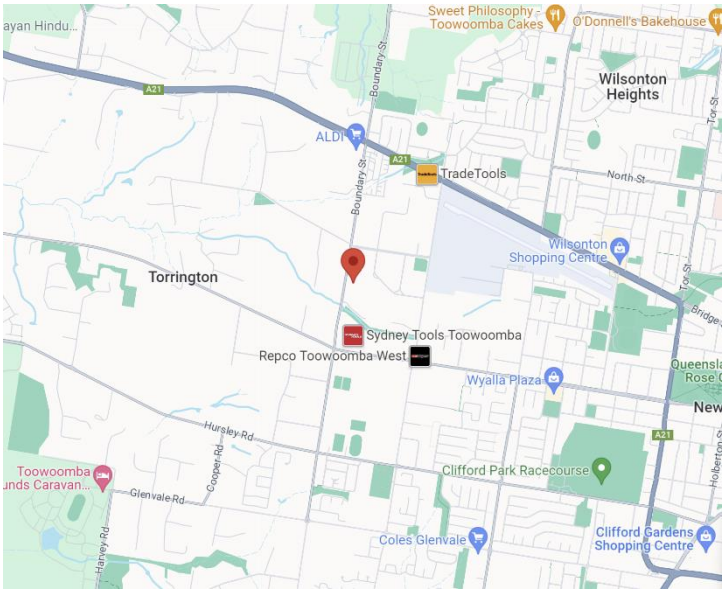
With correct care and maintenance, the Scorpion will provide you with many years of valuable and dependable service.

Serial No: ----------

Configuration – ----------

Contact Details

TTQ
488-492 Boundary Street
Toowoomba Qld 4350
Ph: 07 4634 0800
Email: admin@ttq.net.au
Web: www.ttq.net.au



Safety

Be sure to read this manual carefully to ensure accurate and safe operation of your machine.

It is your responsibility to ensure that the utmost care is taken when in charge of the machinery.

The following procedures must be followed during start-up, operation and maintenance of your Scorpion Root Cutter.

Never ride, sit or stand on the machine whilst in operation or switched on. Nor allow any other person to do likewise.

Never put hands or feet between the cutter spindles whilst the machine is switched on or in operation.

Never assume that someone else has checked the safety requirements of the machine.

In the event of a hydraulic hose split or failure, never attempt to stem the oil flow by putting hands or fingers over the damaged area. Skin rupture and oil penetration could cause serious injury or death.

Always switch off the hydraulics and the mulcher (if applicable), before cleaning, carrying out maintenance or changing the cutter discs.

Always turn off the hydraulics and the PTO when dismounting from the tractor cab.

Always depressurise the accumulator system at the end of each work program.

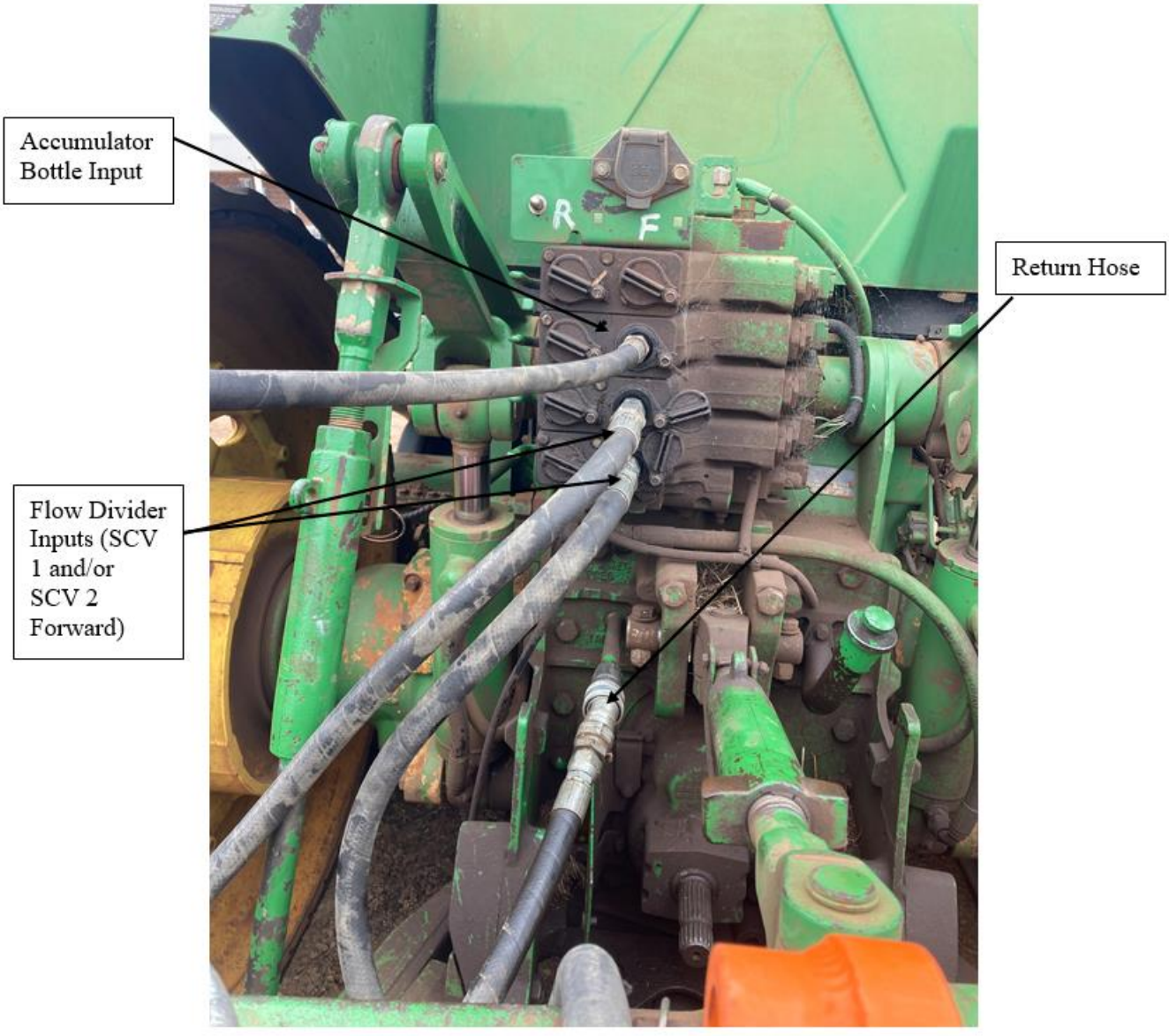
Failure to comply with these procedures could cause serious injury or death.

Initial Set-Up of Hydraulics

With the toolbar hooked up to the tractor, connect the hydraulic hoses to the remotes following the appropriate diagram. Please note, the return hose must be into a no-pressure return fitting on the tractor to ensure smooth operation.

Engage the hydraulics on Root Cutters using only low flow, it may take a little while before all units are spinning at the same speed.

Once spinning evenly, you can adjust the speed to the estimated working speed, e.g. start at around half or 50% of the oil flow.



Initial Start-Up Check

Check that the hydraulic hoses are properly connected to the remotes and that the return line is connected to the SCV dump facility, via a larger SCV coupler (size ¾”).

Check that all hose fittings are tight.

Check all bolts, nuts and clamps for tightness.

Connect accumulator bottle hose to tractor, open line tap and pressurise to approx. 850-950psi. Please use low-volume oil, to flow through the remote.

Bleed all jump cylinders to ensure that all air is expunged from the system.

To do this start at the number one displacement cylinder, bleed the hose fitting first, then the cylinder bleed screw, until no air comes out with the oil. Once all the cylinders are done, bleed air out of the fittings at the pressure gauge.

Note that you may need someone in the tractor to keep system pressure above 750 psi. After jump cylinders are bled, then bleed the Accumulator bottle. Please ensure the supplied ‘Bleed Hose’ is used whilst undertaking the bleeding process.

Check that the cutter discs are overlapping at least 25-30mm (1”–1¼”) and are just touching occasionally. Never have disc binding as this will cause spindle speed to fluctuate and could cause intermittent cutting. Refer to the disc set-up image on page 8.

Check that all spindle-bearing housings are fully greased. Grease until it bleeds from the bleeder nipple at the bottom of the spindle body.

Pre-set spring tension until spring compresses 15mm of travel and adjust as necessary to suit the conditions. Note that you do not always need spring pressure.

If applicable, read the mulcher manual for start-up procedures in conjunction with this manual.

During Operation

After the First Hour of Operation

1. Shut down the tractor engine.
2. Check all the bolts, nuts and hydraulic fittings for tightness.
3. Check that the cutter discs are spinning freely and that they are in the correct position.
4. Clean away any trash that may be around the spindles.
5. Check the spring tension for ground pressure.

Re-check all the above procedures after four hours. Also grease all the bearings and pivot areas.

Service machine after every twelve hours of operation, grease all the bearings and pivot points.

General Comments

The suggested speed of operation if the Mulcher is mounted is 10-14km/hr (5-8mph). For Toolbars the suggested speed of operation is 14-20km/hr (8½–12½mph).

The hydraulic oil flow required is 30 litres (8 gal) p/min per pair.

4 row – 60lts (16 gal)

6 row – 90lts (24 gal)

8 row – 120lts (32 gal)

12 row – 180lts (47 ½ gal)

i.e. 4 row = 38 l/pm and 8 row = 76l/pm (this is the minimum required).

The disc cutter speed is approximately 130-150rpm (10%+ more than ground speed).

The breakaway working pressure would range between 750-900psi depending on the soil conditions, trash density and stalk toughness.

Field Testing & Set Up

Toolbar Mounted

Mount the root cutters to the tractor linkage and ensure that the hydraulic hoses are correctly connected to the remotes. The return dump valve, depending on the number of units, the oil return should go into the non-pressure return port, preferably not the remote return.

Engage the root cutters until all discs are spinning at the same speed, adjust to an estimated 50-60% of the hydraulic remote flow.

Move slowly forward and lower the discs into the ground, travel a short distance, stop and reset the discs to the required depth (30–63mm or 1½–2½”), check the roots for cutting quality (refer to page 8).

Mulcher Mounted

The mulcher should be set at approximately 75mm or 2½–3” above the ground with the root cutters set to penetrate approximately 40-50mm (1½–2”) into the ground.

Start the mulcher and wind up to speed, then engage the root cutters, wait until all the discs are spinning at the same speed. Move forward, slowly lowering the mulcher into working position.

Establish the correct working depths before continuing.

Troubleshooting

If a motor is slow or stopping:

- Check that all the hoses are correctly plumbed and connected;
- Check if there are any leaks;
- Check the discs are not binding or flipped, if flipped or binding repair the damage to the discs and reset;
- Check the bearings for damage; and
- If all the above is correct, please call for further diagnosis checks and procedures.

If the disc penetration is poor:

- Check the pitch and angle as it may be necessary to adjust, to suit the soil conditions, by either the front spring pivot or TPL top link; or
- Run the machine level and adjust the gauge wheels for the required depth.

If the discs are not cutting all the roots:

- Check the disc setup e.g. overlap the disc pinch position (1–1¼”/25–31mm);
- Check the pinch point alignment to the stalk row, it is best to have the stalk hitting the non-driven disc first by ½” or 10–12mm;
- Check the jump pressure is 750-850psi;
- Check if the jump pressure is correct. If still not cutting, check for a leak or air in the accumulator system;
- Check for disc damage;
- Check that the root cutters are in the soil at a reasonable depth. The root cutters work best if they are not too shallow.

Remember, the optimum working speed for the Mulcher/Root Cutter Combo is 8-12 km/hr. (5-7½mph) and for Toolbar rigs it is 14-20 km/hr (9–12mph).

Optimal Pitch Set Up

The top disc leading edge is set so it is just touching the lower disc leading edge. When the pitch is set correctly, the top disc should be touching approximately 8-10mm of the lower disc. The inside of the bevel of the top disc should be just above the lower disc. This will ensure a clean cut, not a pinch cut. To check this, you can simply look at how the cotton stalk is being cut (see diagram below).

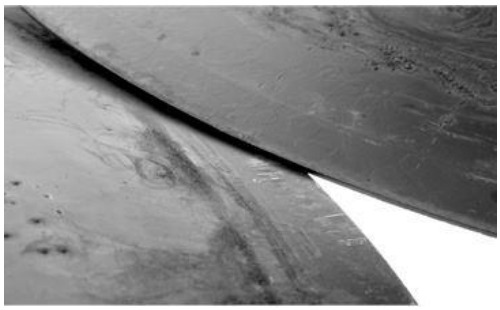
INCORRECT CUT

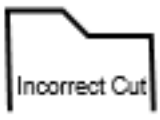
If the cut is stepped this means it is pinch cutting or something else could be wrong.

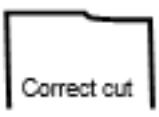
e.g. Bearings, pivot bolt, loose bolts etc.

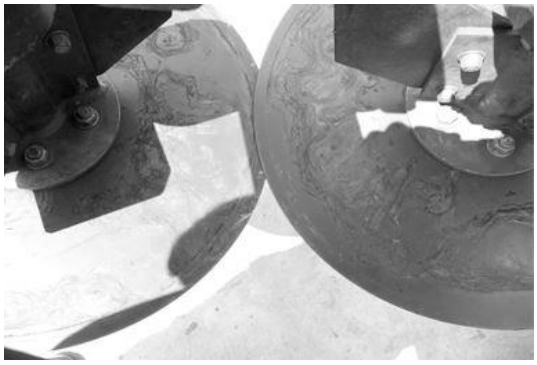
CORRECT CUT

Little to no step-in cut.



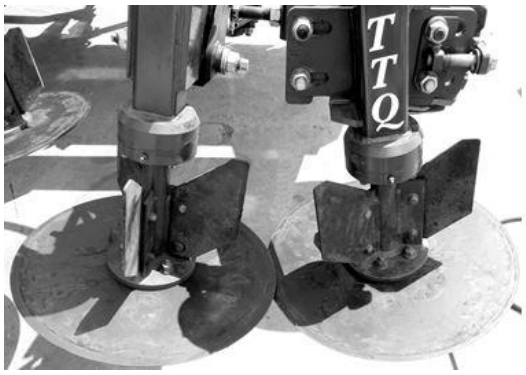




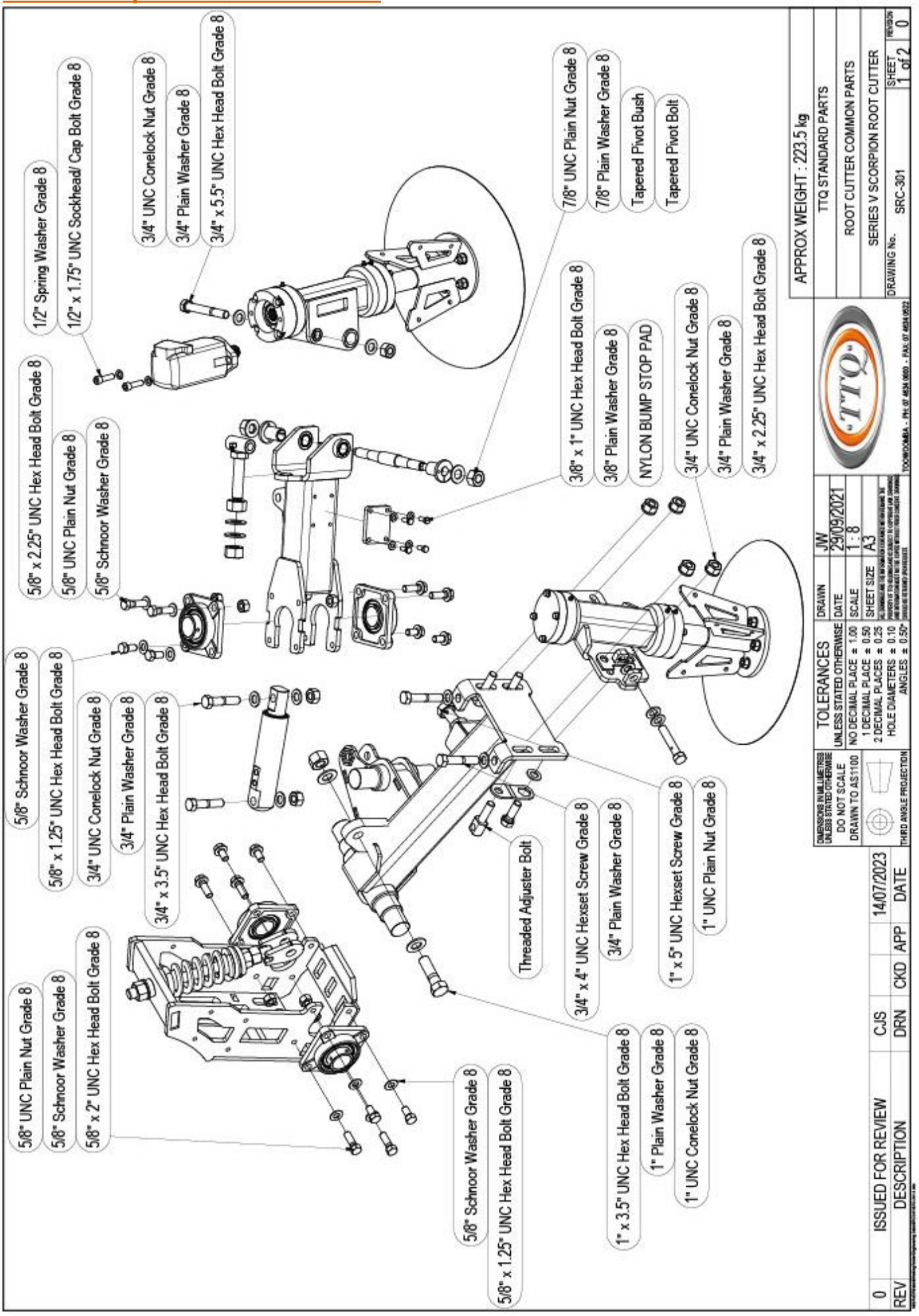


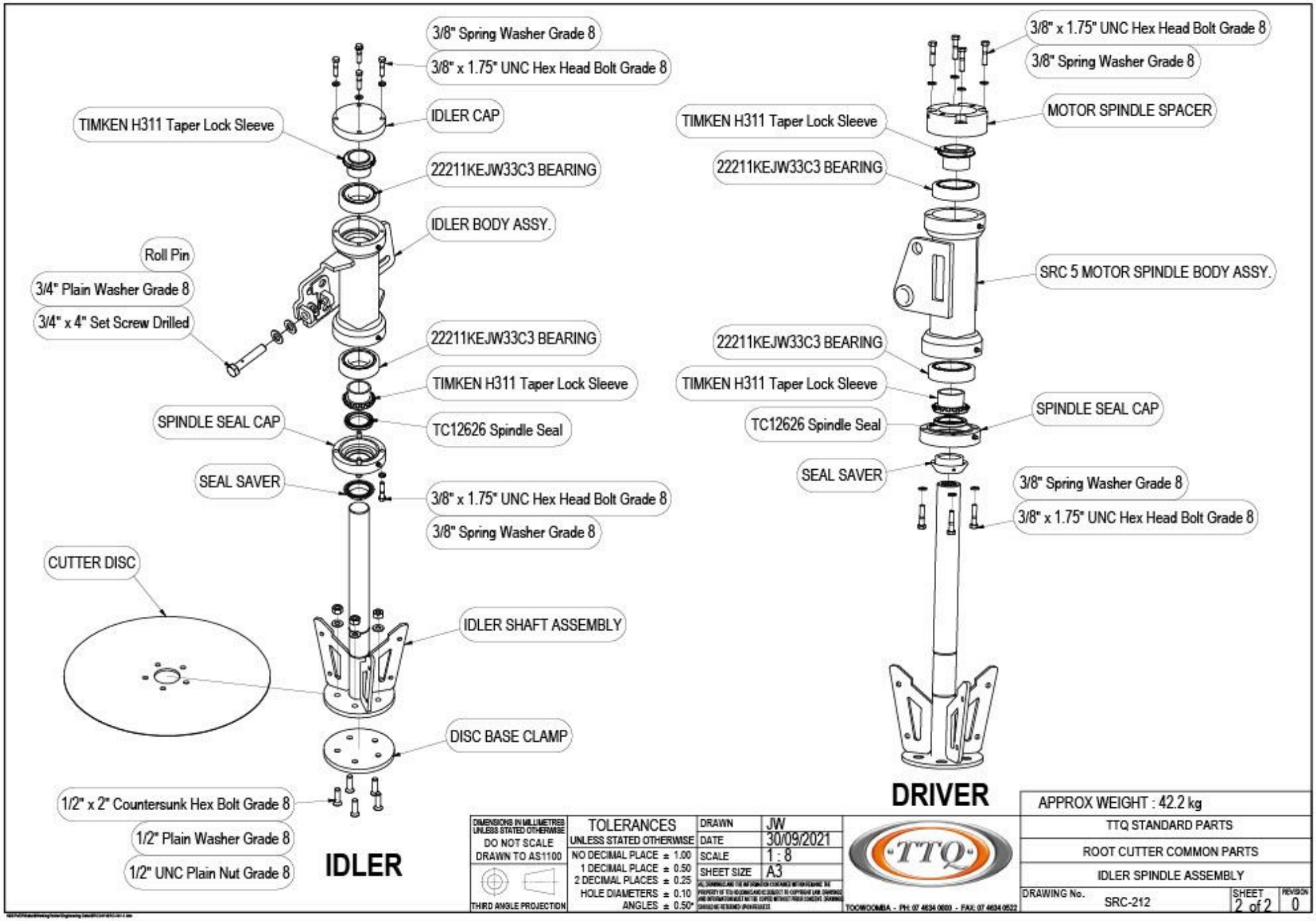
This shows overlap: generally, no less than 20mm and no more than 30mm. As discs wear, take note of which disc is wearing faster. This will be a guide as to which disc to adjust. e.g. Do not just adjust from the bump stop bolt, as you will end up with your cutting point misaligned to the required row spacing.

New disc set up starting position; the above descriptions will get you back to your original row spacing if the complete unit has not been moved. These two plates (shown below) should be flush with each other first. Then adjust the bump stop bolt height. Most of the time the pitch should remain correct, but you should re-check once your overlap is set.



SRC Unit Exploded Parts Overview




3/8" Spring Washer Grade 8
3/8" x 1.75" UNC Hex Head Bolt Grade 8
TIMKEN H311 Taper Lock Sleeve
IDLER CAP
22211KEJW33C3 BEARING
IDLER BODY ASSY.
Roll Pin
3/4" Plain Washer Grade 8
3/4" x 4" Set Screw Drilled
22211KEJW33C3 BEARING
TIMKEN H311 Taper Lock Sleeve
SPINDLE SEAL CAP
TC12626 Spindle Seal
SEAL SAVER
3/8" x 1.75" UNC Hex Head Bolt Grade 8
3/8" Spring Washer Grade 8
CUTTER DISC
IDLER SHAFT ASSEMBLY
DISC BASE CLAMP
1/2" x 2" Countersunk Hex Bolt Grade 8
1/2" Plain Washer Grade 8
1/2" UNC Plain Nut Grade 8
IDLER
3/8" x 1.75" UNC Hex Head Bolt Grade 8
3/8" Spring Washer Grade 8
TIMKEN H311 Taper Lock Sleeve
MOTOR SPINDLE SPACER
22211KEJW33C3 BEARING
SRC 5 MOTOR SPINDLE BODY ASSY.
22211KEJW33C3 BEARING
TIMKEN H311 Taper Lock Sleeve
SPINDLE SEAL CAP
TC12626 Spindle Seal
SEAL SAVER
3/8" Spring Washer Grade 8
3/8" x 1.75" UNC Hex Head Bolt Grade 8
DRIVER
DIMENSIONS IN MILLIMETRES UNLESS STATED OTHERWISE
DO NOT SCALE
DRAWN TO AS1100
THIRD ANGLE PROJECTION
TOLERANCES
UNLESS STATED OTHERWISE
NO DECIMAL PLACE ± 1.00
1 DECIMAL PLACE ± 0.50
2 DECIMAL PLACES ± 0.25
HOLE DIAMETERS ± 0.10
ANGLES ± 0.50°
DRAWN JW
DATE 30/09/2021
SCALE 1 : 8
SHEET SIZE A3
TOOWOOMBA - PH: 07 4634 0600 - FAX: 07 4634 0522
APPROX WEIGHT : 42.2 kg
TTQ STANDARD PARTS
ROOT CUTTER COMMON PARTS
IDLER SPINDLE ASSEMBLY
DRAWING No. SRC-212
SHEET 2 of 2
REVISION 0