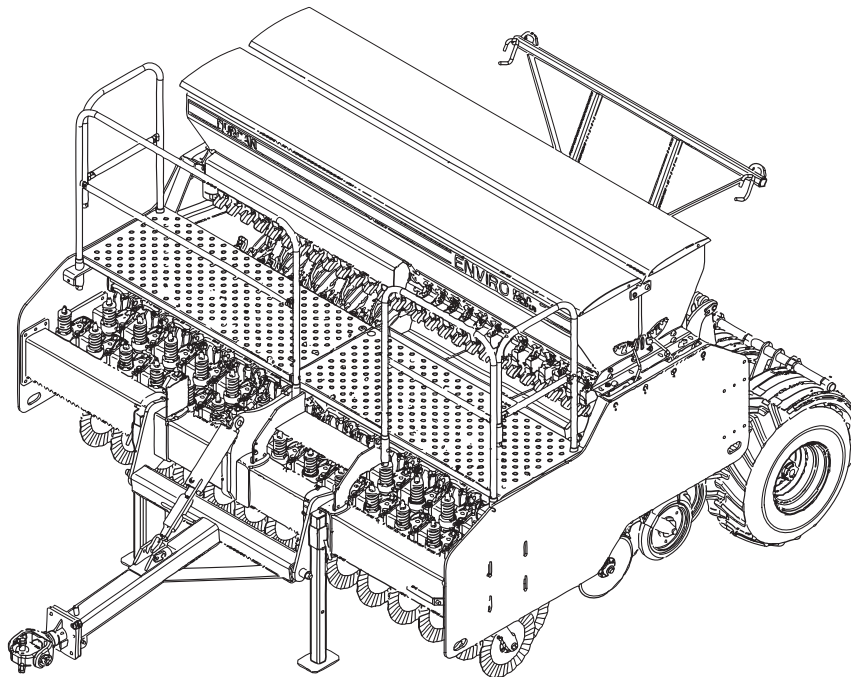


Owners Manual

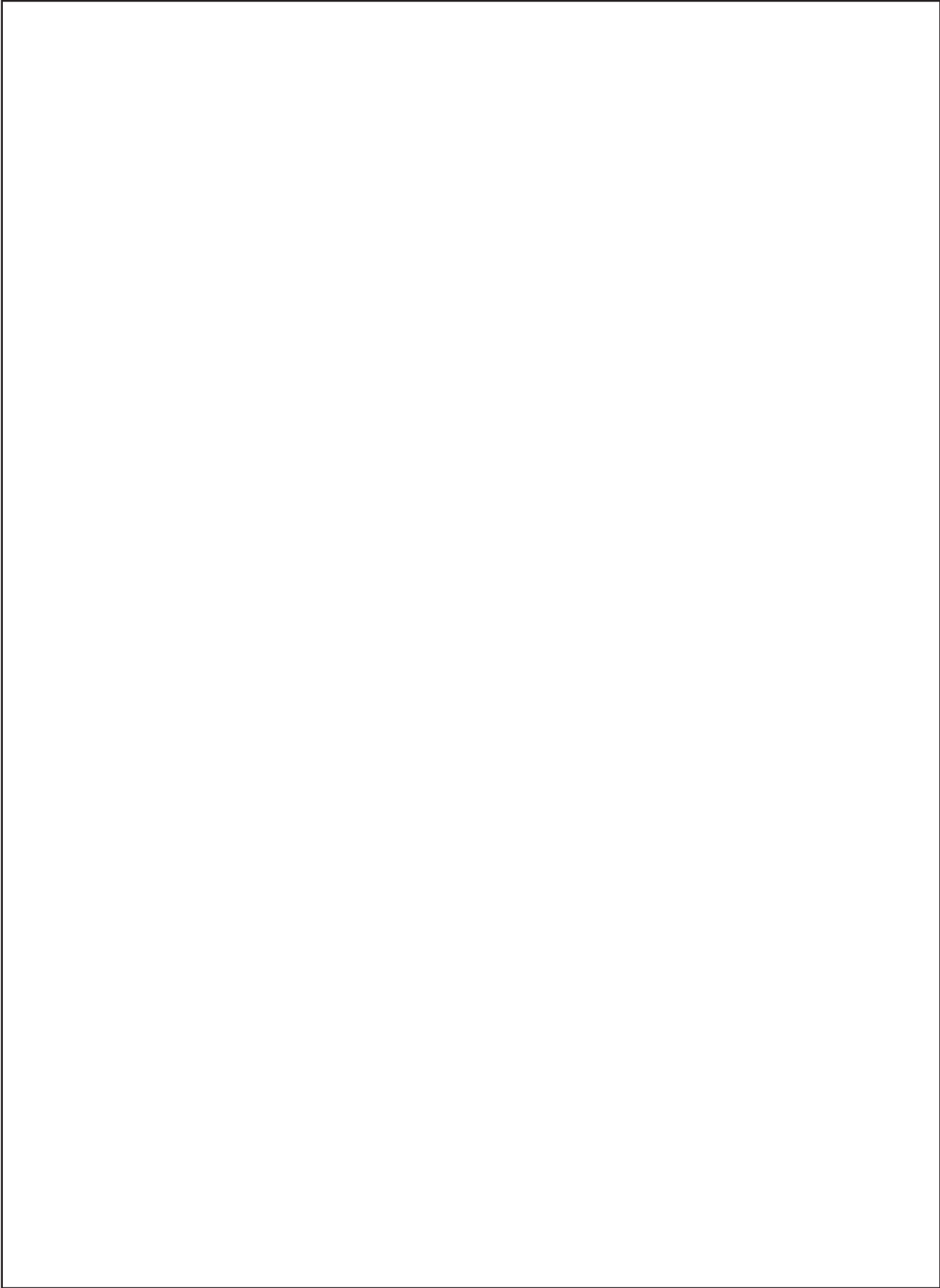


Enviro 3000e Mk2 Seed Drill



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Enviro 3000e Seed Drill Contents

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Introduction

Acquisition & Warranty

On delivery of your new Duncan 3000e please check that the machine is not damaged. In cases of shipping damage, please ask your dealer to arrange for the appropriate claim to be lodged immediately. Assemble any parts supplied loose and inspect your machine with the aid of this manual to familiarise yourself with its features. If you have any queries ask your dealer straight away. The machine is covered by our 12 month warranty on faulty parts, subject to normal use.



Record below the serial number of your machine and keep it in a secure place to help trace the machine and assist us when you order parts.

| |
|-----------------------------|
| Model: |
| Serial No: |
| Owner: |
| |
| |
| Delivery Date: |
| Dealer: |
| |
| |

| |
|--|
| This Document contains the Original Operating Instructions for this machine and are verified by the Manufacturer, Signed:..... Product Development Manager |
|--|

The Owner's Manual

Your new Duncan 3000e will give long and efficient service if given normal care and operated properly.

This owner's manual is provided so that you can become thoroughly familiar with the design of the machine and to furnish information on correct operation, adjustment and maintenance. **Only persons well acquainted with these guidelines should be allowed to use the equipment.**

A separate illustrated parts section has been provided so that if any parts are required your dealer will be able to supply them by reference to part numbers.

The manual is considered as part of your machine and must remain with the machine when it is sold.

Right and left hand references in this manual are determined by standing behind the machine and facing in the direction of travel.

| |
|--|
| Disclaimer Every effort has been made to ensure that the information in this manual was accurate and up to date at the time of going to press. Clough Agriculture reserves the right to make subsequent changes to the machine, where necessary, without notification. The Company will not be responsible for any damage or consequential loss arising out of misinterpretation or failure to follow recommended procedures. Nor will it be liable for any damage caused by or arising out of modification or misuse of its product. The owner has a responsibility to protect himself and others by observing all safety information and by ensuring all operators are well acquainted with the safety information, trained in the correct use of the machine and applying safe work practices. |
|--|

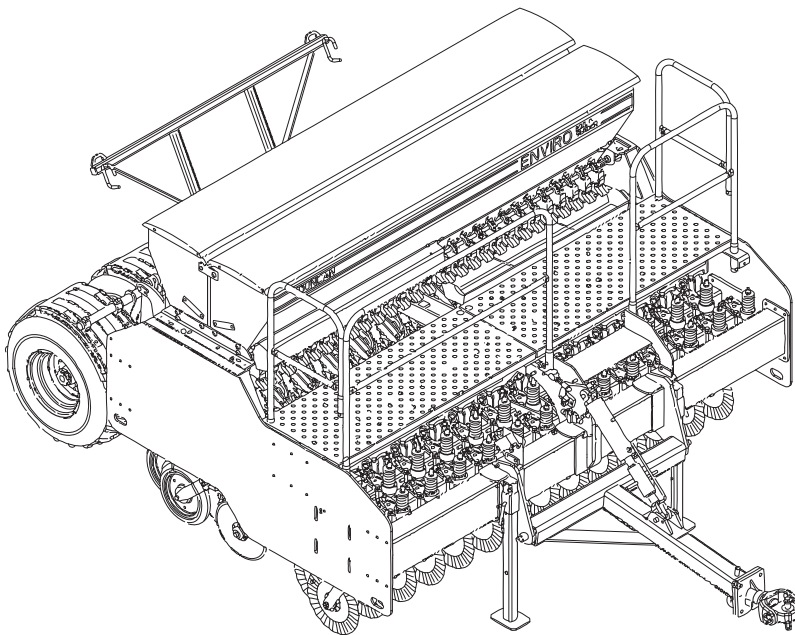


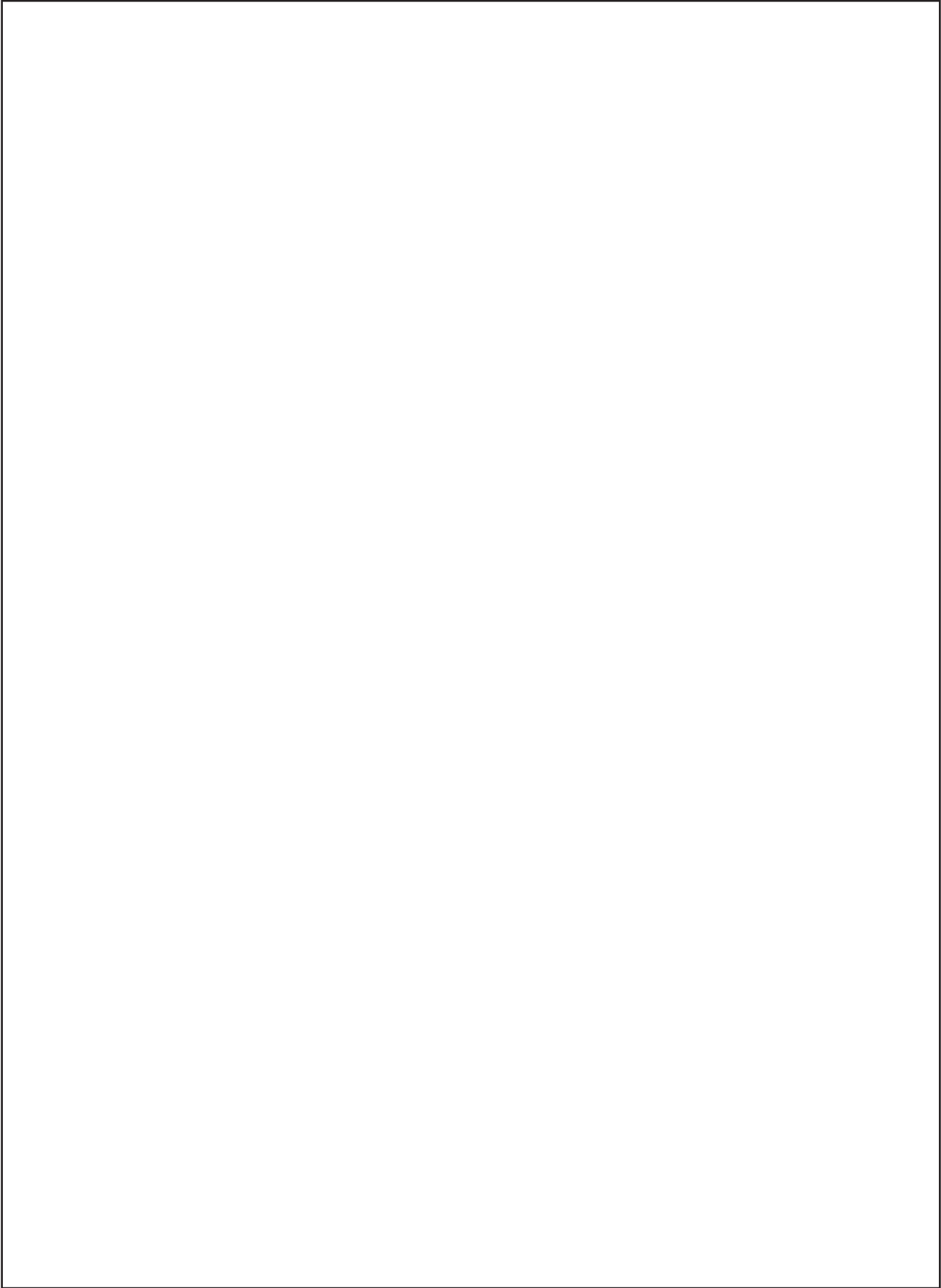
Description of Machine

The Duncan Enviro 3000e is a triple disc direct drill. It has as standard two boxes for either seed combinations or traditional seed fertiliser mixes, with the option of one or two extra small seed boxes. The boxes are mounted on a heavy duty frame accommodating large rear mounted wheels which are hydraulically operated, allowing adjustable sowing pressure and good transport clearance. Both opening discs and double discs are independently sprung, giving good contour following ability. Sowing depth is controlled by adjustable rubber tyred depth wheels. The quality European type peg roller seeder system handles all seeds from turnip and rape through to peas and maize. The seeder drive is electric via a reduction gearbox to the seeder shaft. Ground speed is sensed via ground radar with seed rates controlled proportionally to ground speed. Seeding ceases automatically when the machine is raised into the transport position.

Working Principle

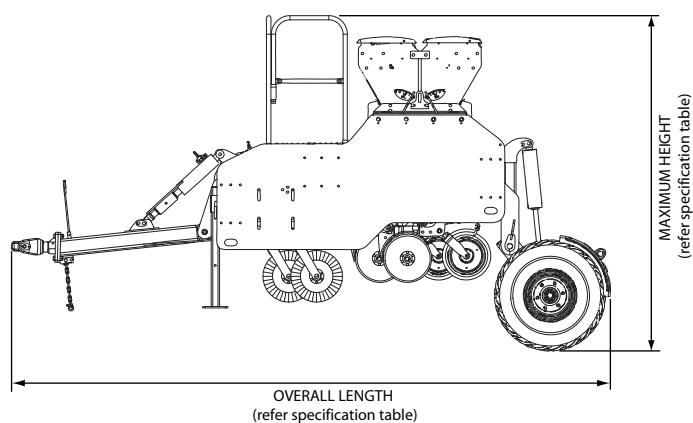
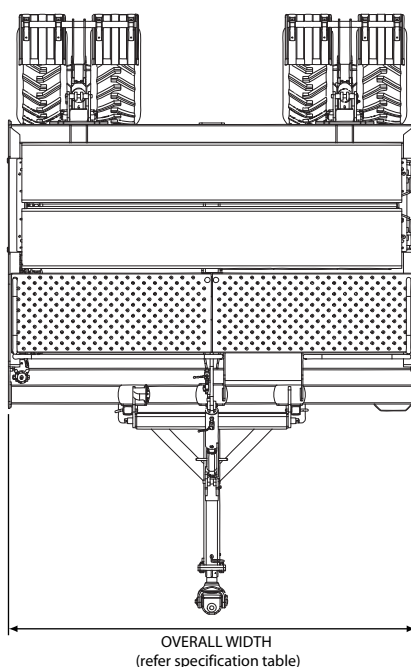
The seed box slides, seeder flaps and seeding rate are set to give the required seed delivery. The front disc precuts the ground surface, followed by the double disc which creates the seed bed. Seed/fertiliser is metered down the flexible convolute tubes from the boxes to the double disc unit and fed into the prepared seed bed. A suitably profiled depth wheel maintains the double discs at a predetermined depth, closing and compacting the soil over the deposited seed.





Dimensions & Capacities

| Dimensions & Capacities | 23 Run | 27 Run |
|-------------------------------|-------------------------------|--------|
| Width (overall /mm) | 3225 | |
| Length (overall /mm) | 4867 (max) / 4718 (transport) | |
| Height (transport max /mm) | 2650 | |
| Weight (unladen /kg) | 4760 | 5200 |
| Tyre Size/rating | 400/60 - 15.5 (143/A8) | |
| Recommended Tyre Pressure | 4.5 bar (65 psi) | |
| Maximum speed (km/hr) | 30km/hr | |
| Row Spacing | 135 | 115 |
| Effective Sowing Width | 3105 | |
| Box Capacity (litres per box) | 650 | |



SAFETY - General

N.B. Throughout this manual important safety information is indicated by these symbols in the margin:



A prohibition should be observed under all circumstances.



A warning indicates a hazard that could cause death or injury if the warning is ignored.



A caution indicates a hazard that may cause damage to property if the caution is ignored.

This section of the manual offers general guidelines for the safe operation of machinery. It does not replace local safety regulations. These guidelines were current at the time of publication, but may be superseded by later regulations.

Clough Agriculture has made every effort to highlight all risks to personnel or property. Owners and operators have a responsibility to exercise care and safe work practices at all times in the vicinity of the machine.

Owners are advised to keep up to date on safety issues and to communicate these to all users of the machine.

Contact the Occupational Safety and Health Service (OSH) for further information about general safety aspects. If you have safety concerns specifically related to this machine, contact your dealer immediately.

Operator Safety

Read this manual carefully before operating new equipment. Learn how to use this machine safely. Be thoroughly familiar with the controls and the proper use of the equipment before using it.

Take careful note of all safety instructions both in this manual and on the machine itself. Failure to comply with instructions could result in personal injury and/or damage to the machine.

Replace missing or damaged safety signs on the machine and ensure that these remain clearly visible.

It is the owner's responsibility to ensure that anyone who operates, adjusts, lubricates, maintains, cleans or uses the machine in any way has had suitable instruction and is familiar with the information in this manual (particularly with regard to safety aspects).

Operators and other users of the machine should be aware of potential hazards and operating limitations.

Be Prepared for Emergencies

Keep a first aid kit and fire extinguisher handy.

Keep emergency numbers for doctors, ambulance, hospital and fire department near your telephone.



! ATTENTION

On the machine important safety information is indicated by these symbols.

These highlight general safety aspects in regard to the machine rather than specific hazards.



Do not ride or allow passengers on the machine.

Under no circumstances are passengers to be permitted on the machine while it is in operation or being transported. Any footboards and/or footsteps are provided solely for the purpose of preparing the machine for use.



Keep clothing and body extremities well clear of pinch points while the machine is operating (seeding or calibrating). Keep well clear of moving parts at all times.

These signs typically occur wherever trapping points exist. These include drive chains, sprockets, shafts, wheels, discs, pivot points, etc. Guards are provided with the machine for safety reasons (where practical without compromising machine performance). Ensure these are always fitted during operation.



Always exercise extreme caution in the vicinity of sharp edges and points.

Where possible guards are provided with the machine for safety reasons (where practical without compromising machine performance). Ensure these are always fitted during operation.



Footboards, footsteps, drawbars and other machine surfaces may be slippery when wet.

Apply extra caution in wet conditions and in the early morning when surfaces are wet.

KEEP CLEAR

Keep Clear. (It is dangerous to be in this area when the machine is operating.)

SAFETY - General (Continued)



Appropriate Dress

Wear close fitting clothing and avoid rings or other forms of jewellery which could become caught in the machinery.

People with long hair must have it securely fixed and confined close to the head.

Refer to local safety standards for protective clothing and recommended safety equipment.



Transport This Machine Safely

Ensure that all linkage pins and security clips are fitted correctly. With trailing machines tow with the drawbar only, as this is the only safe towing point on the machine.

Always check that bystanders (especially children) are well clear (front and rear) before starting and moving the tractor and the machine.

Plan safe routes of travel, and be aware of power lines and other roadside hazards. Take particular care when towing implements on hillsides.

Do not ride or allow passengers on the machine.

This machine is not designed to carry passengers, and no riders are permitted.

Road transport

On public roads,

- A speed of 30km/h must not be exceeded.
- Do not operate during the hours of darkness unless standard lights are fitted and clearly visible. (This also applies when visibility is limited, e.g., in foggy conditions.)

See the guidelines in the *Vehicle Dimensions and Mass Rule*, issued by the Land & Transport Safety Authority.

Avoid tip-overs

Avoid holes, ditches and obstructions which may cause the machine to tip over, especially on hillsides. Never drive near the edge of a gully or steep embankment - it might cave in. Slow down for hillsides, rough ground and sharp turns.



SAFETY - General (Continued)

Handle Agricultural Chemicals Safely

All farm chemicals should be stored, used, handled and disposed of safely and in accordance with the supplier's/manufacturer's recommendations.



Read the product label before using, noting any warnings or special cautions, including any protective clothing or equipment that may be required, ie. respirator.

Do not eat or smoke while handling sprays, fertilisers, coated seeds, etc. Afterwards, always wash your hands and face before you eat, drink, smoke, or use the toilet.



Store sprays, fertilisers, coated seeds, etc. out of reach of children and pets, and away from food and animal feeds.

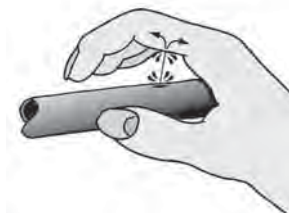
Any symptoms of illness during or after using chemicals should be treated according to the supplier's/manufacturer's recommendations. If severe, **call a physician or get the patient to hospital immediately.** Keep the container and/or label for reference.

Avoid High Pressure Fluids

Avoid any contact with fluids leaking under pressure, because the fluids can penetrate the skin surface.



Any fluid which penetrates the skin, will need to be **removed immediately by a medical expert.** Seek specialist advice on this type of injury.



Relieve the pressure before disconnecting any hydraulic or other lines. Make all repairs and tighten all fittings before re-connection to pressurised fluid.

Keep your hands and body away from any pinholes or high pressure jets. Search for leaks with a piece of cardboard instead of using your hand directly.

Safe Work Practices

All farm machinery is potentially dangerous and should be treated with caution and respect.



Before starting the machine, ensure that all controls are placed in neutral and that bystanders are well clear. Check that the guards have been securely fitted and that any adjustments have been made correctly.

Where possible, disconnect or isolate the drive mechanism to the implement. Lower the machine onto the ground when not in use.

SAFETY - General (Continued)



Practise Safe Maintenance

Keep the machine in safe working condition. Routine maintenance and regular servicing will help reduce risks and prolong the life of the machine.

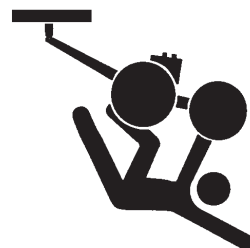
General Maintenance

Accidents occur most frequently during servicing and repair. The following general rules must be followed when maintaining or working with machinery:

- All operating and maintenance manuals must be read before and referred to while using or servicing any piece of equipment.
- Turn off all machinery power sources and isolate the machine before making adjustments, doing lubrication, repairs or any other maintenance on the machine.
- Ensure that the machine hydraulics are disconnected from the power source.
- Wear gloves when handling components with cutting edges, such as any ground cutting components.
- Beware of hazards created by springs under tension or compression when dismantling or maintaining the machine.
- It is recommended that you clean the machine with a water blaster or similar apparatus before commencing maintenance.

Make Sure the Machine is Well Supported

When machinery is fitted with hydraulics, do not rely on the hydraulics to support the machine. During maintenance or while making adjustments under the machine, always lock the hydraulics and support the machine securely. Place blocks or other stable supports under elevated parts before working on these.



Electrical Maintenance

Disconnect the electrical supply from the tractor before doing any electrical maintenance.



Welding

With electronic equipment in modern tractors it is advisable to disconnect the machine from the tractor, or at least disconnect the alternator and battery before attempting any welding.



Use Only Genuine Spare Parts

Unauthorised modifications or non-genuine spare parts may be hazardous and impair the safe operation and working life of the machine.

Excess lubricants must be disposed of safely so as not to become a hazard.

SAFETY - Machine Specific

This section of the manual gives specific guidelines for the safe operation of the 3000e.

These guidelines were current at the time of publication, but may be superseded by later circumstances. They do not necessarily cover every possible hazard and must be read in conjunction with the **SAFETY - General** section (Page 4 - 8).

Hazard Points on the 3000e

The lists below are not all-inclusive and serve only to highlight the more obvious areas of risk.



The decals attached to the machine are a general reminder that there are hazardous areas on the machine, rather than specifically highlighting all possible hazards.

For decal locations on machine, refer Page 13.



No Ride

Passengers are not permitted anywhere on the machine.



Pinch Points/Moving Parts

Hazardous areas include:

- Agitator drive units (LH side).
- Agitator shaft inside the boxes.
- Seeder units, box shaft and shaft connectors.
- Adjacent dragbars and coulter arms.
- Wheel legs and main frame assemblies
- Between discs and other sub-assembly parts.
- Wheel legs
- Springs - front coulter, double disc and press wheel.
- Press wheel assemblies (where fitted).



**Slippery
When
Wet**

Slippery When Wet

Hazardous areas include:

- Footboards and footstep.
- All smooth surfaces on the frame structure.

KEEP CLEAR

Keep Clear

Hazardous areas include:

- Between the tractor and Duncan 3000e.
- Immediately beside the Duncan 3000e.
- Behind the Duncan 3000e.

SAFETY - Machine Specific (Continued)



Hazard Points on the 3000e (Continued)

Calibrating

Be particularly careful when calibrating the seeding rate. At this time, the calibration trays have been removed and are no longer covering the rotating seeder units. See **Pinch Points/ Moving Parts** for hazardous areas.

Transport

The wheels on the back of the machine are for controlling the maximum loading on the dragbars and coulter. They are also used to support the machine during transport.



Important - Refer to safety cautions in the **Transport** section of the manual.

Ensure that all linkage pins and security clips are fitted correctly.

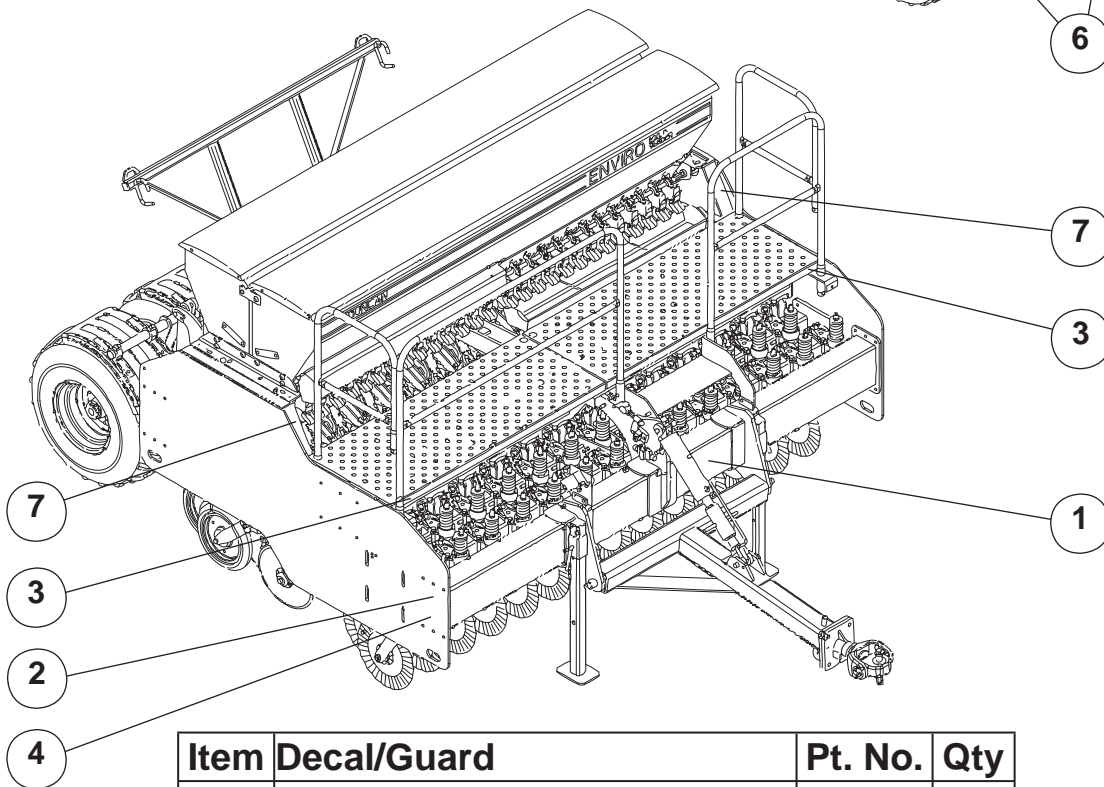
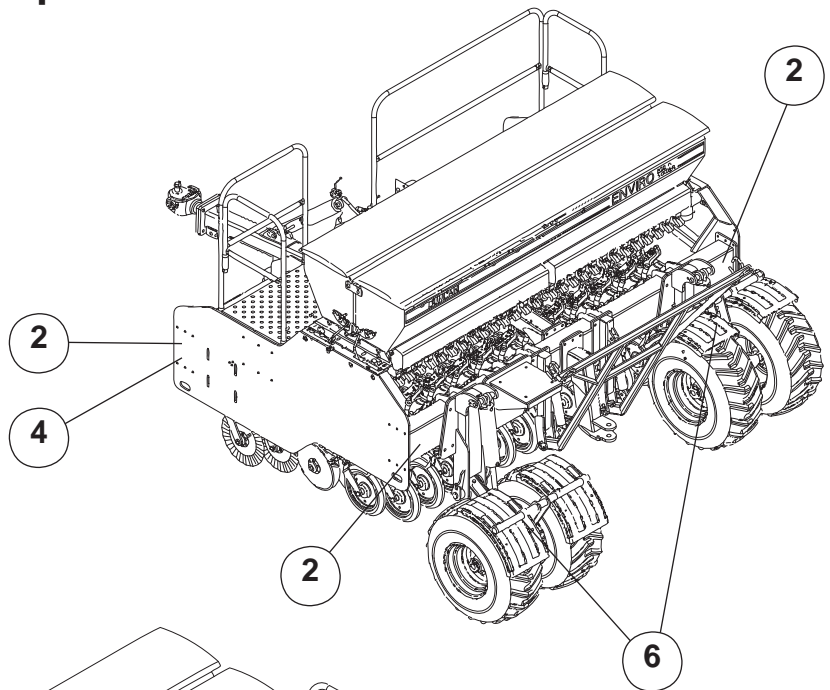
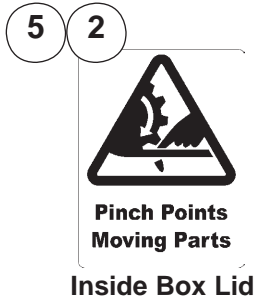
Maintenance

Refer to the **Maintenance and Care** section of the manual.

Lubrication

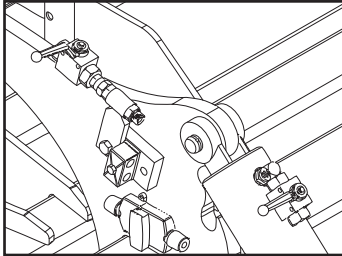
Refer to the **Maintenance and Care** section of the manual.

SAFETY - Machine Specific (Continued)



| Item | Decal/Guard | Pt. No. | Qty |
|------|------------------------------|---------|-----|
| 1 | 'No Ride' | 43900 | 3 |
| 2 | 'Pinch Point/Moving Parts' | 43901 | 5 |
| 3 | 'Slippery When Wet' | 43902 | 2 |
| 4 | 'Keep Clear' | 43904 | 2 |
| 5 | Arrows (Inside Box Lid) | 43905 | 4 |
| 6 | 'Check Wheel Nuts Regularly' | 43708 | 1 |
| 7 | '30 km/hr' | 43913 | 2 |

Transport

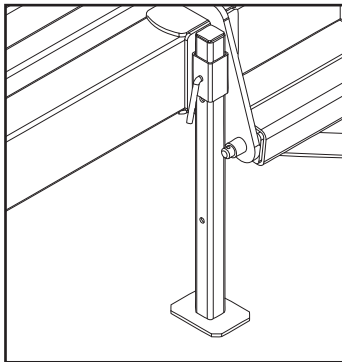


1 Raise the drill into the transport position and hold at the full extent of the rams for 30 seconds to allow cylinders to rephase/equalise.

2 **Important** - To avoid machine damage due to drill lowering during transport, always close the hydraulic valves for the wheels and drawbar. Move the handles to a position at 90° to the hydraulic line as shown.

3 Locate jack stand in transport position.

4 Ensure lighting and oversize warning requirements meet recommendations published by the local Land Transport Authority or equivalent.



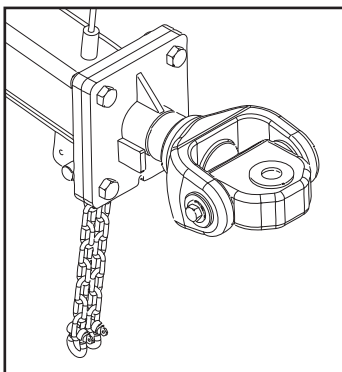
5 **Maximum towing speed for the drill is 30 km/hr.**

For countries other than New Zealand, greater speed restrictions may apply. Please refer to your local transport authority.

Ensure towing vehicle requirements are adequate for the towed vehicle e.g. mass, brakes. Refer to recommendations published by the local Land Transport Authority or equivalent.

Braking when towing can cause the load to jackknife. Use extra care when towing in adverse conditions such as mud, inclines and sharp bends.

Lower towing speeds are recommended on farm roads/tracks and where one wheel is on or over a road verge.



6 **Attach safety chains to tractor.**

Safety chains must be crossed over underneath the coupling and attached to the towing vehicle. The attachment points must be as close as practical to the towing coupling and one each side. The towbar on the towing vehicle must be rated for the towed mass. **Do not remove or replace the safety chains provided with any other than those specified in the parts manual.**

Note: The safety chains are provided with sufficient length to cater for all towing vehicles. Safety chains must be shortened by cutting off excess length so that if the coupling fails the drawbar will not hit the ground.

7 If the machine is fitted with row markers or other vertical extensions check clearance under power lines en route.

Operation

General Operation Guidelines

- 1 Use a sufficiently powerful tractor which is heavy enough to tow the drill safely.
- 2 Operate the drill at a speed of 6-12 km/hr (4-8 mph). In stony and uneven ground conditions a lower speed is more appropriate.
- 3 Check that the drill is level during calibration and while seeding.
- 4 Adjust the individual depth wheels to the required sowing depth.
- 5 Check tyre pressure before seeding.
- 6 Double check seed rates before seeding.
- 7 Do not turn with discs in the ground. When making any turns, make sure the drill is fully raised out of the ground.
- 8 Raise the drill out of the ground before backing up.
- 9 After prolonged storage, check to see that all drive mechanisms and hydraulic equipment are functioning correctly. Check that the seed tubes are not perished or blocked.

Sowing Speed

Typical travel speeds when sowing range from 6-12 km/hr in good conditions. In stony and uneven ground conditions a lower speed is recommended to minimise rapid part deterioration.

Sowing too fast can result in:

- 1 Poor contour following and uneven sowing depth.
- 2 Impact damage to:
 - a Ground engaging components.
 - b Bearings, housings and axles.
 - c Fasteners & structural components.
- 3 More extreme conditions will result in greater vibration and uneven seed flow at low seeding rates.

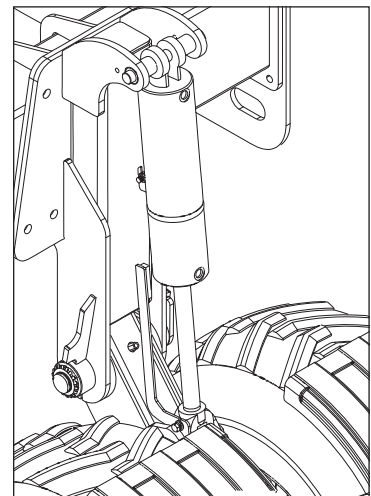
Front Coulters & Dragbar Loading

The height of the drill when in the drilling position is determined by the laden weight and the number and size of the depth collars on the master cylinder shaft. This in turn determines the pressure on the discs.

In very soft conditions where downward pressure may alter seed depth, there may be a compromise between downward pressure and total contour following abilities.

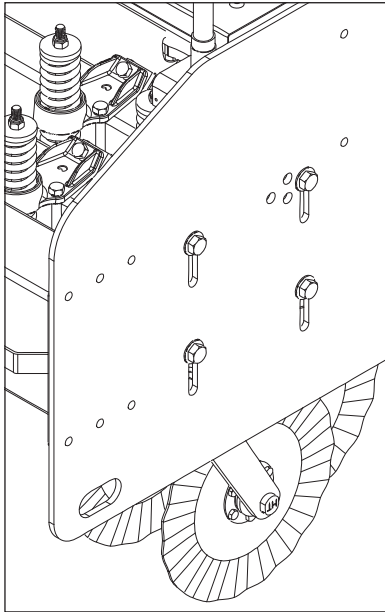
Magnetic Cut-out Sensor

To enable seeding to start and stop when coulters are lowered into and lifted out of the ground, a magnetic cut-out sensor is mounted on the RH wheel arm hydraulic ram. To minimise seed wastage during raising and lowering the coulters, the sensor should be adjusted up or down on the ram to suit the sowing depth and ground conditions. Moving the sensor down the ram stops the seeding later and starts the seeding earlier, and vice versa. The sensor can be moved by slackening the metal hose clip. It is better to experiment with the sensor position for various depth settings to get the response required.



Transport Position

When in the transport position the hydraulic cylinders are fully extended. In this position the cylinders fully equalise by allowing oil to bypass the master cylinder piston. To ensure the cylinder rods are equally extended and to minimise variations in sowing depth, raise the drill into the transport position regularly to counteract the effects of oil leakage past the piston. It is recommended to raise the drill into the transport position when turning at headlands.



Coulter Penetration Depth

To create the ideal seed bed the front coulters disc should cut approximately 20mm below the double discs. If more undercut is required or the ground is particularly hard or the discs have become worn, the front coulters beam can be lowered. This is done by undoing the four bolts at each end of the beam on the outside of the sideplates, connecting the hydraulic hoses for the rams to the supply and operating them until the beam is level and the discs are at the required height. Retighten the bolts and disconnect the hydraulic hoses.

The system is factory set at the highest level. When the beam is moved down, there are three holes 20mm apart for intermediate settings, in which an M20 bolt can be fixed as a stop. Choose the hole to give the best position. An M20 bolt for this purpose is stored at the top front of each of the side plates.

Note: The front coulters blades will sharpen with initial use and therefore penetration ability will improve.

Double Disc Sowing Depth

The penetration depth of the double discs is dependent on two aspects.

- 1 The weight applied from the machine's mass.
- 2 The press wheel adjustment.

If the ground is hard and the double discs are not penetrating to the desired depth the press wheels will not be in contact with the ground. To increase the weight applied, refer to "Front Coulters & Dragbar Loading"

Where the loading applied to the double discs exceeds the ground resistance the remaining load is transferred to the press wheels. The running height of the press wheel in relation to the double discs controls the sowing depth. See "Press Wheel Adjustment" (below).

Note: Ground penetration ability will increase as the double discs sharpen and the paint wears off.

Press Wheel Adjustment

Press wheels are used to control the seeding depth and compact the soil after sowing to give good seed/soil contact. To adjust the press wheel setting, reposition the jaw lock pin in the desired notch.

Double Disc Scrapers

Scrapers are fitted to the rear of the double discs and prevent soil buildup on the inside face of the disc. The scrapers will need to be adjusted as the discs wear (reduce in diameter). If not adjusted the scrapers will overhang the disc edge and wear unevenly. Scrapers are factory set in the correct initial operating position and don't require adjustment before drill use.

Press Wheel Scrapers

A minimum clearance of 2mm is recommended between the scraper and the press wheel. Check the scraper clearance on full circumference regularly as press wheels can be eccentric. Best scraper performance may be dependent on the ground conditions.

Level Drill

Use the drawbar ram to tilt the drill so it is sitting level. An adjustment may be required after a short period of use because of oil leakage.

Electric Drive

Refer to the separate Electric Drive Operating Manual.

Enviro 3000e Seed Drill Sowing Chart

Sowing Rates at Recommended Settings*

| Seed Type | Default Calibration Factor (kg/rev) | Sowing Rate kg/ha (max) at 6 kph | Sowing Rate kg/ha (min) at 6 kph | Sowing Rate kg/ha (max) at 8 kph | Sowing Rate kg/ha (min) at 8 kph | Sowing Rate kg/ha (max) at 10 kph | Sowing Rate kg/ha (min) at 10 kph |
|-----------------|-------------------------------------|----------------------------------|----------------------------------|----------------------------------|----------------------------------|-----------------------------------|-----------------------------------|
| Grass | 0.28 | 227 | 1.35 | 170 | 1.01 | 136 | 0.81 |
| Grass Mix | 0.30 | 243 | 1.45 | 182.5 | 1.09 | 146 | 0.87 |
| Wheat | 0.70 | 568 | 3.38 | 426 | 2.54 | 340.5 | 2.03 |
| Barley | 0.69 | 560 | 3.33 | 420 | 2.5 | 336 | 2.00 |
| Oats | 0.69 | 560 | 3.33 | 420 | 2.5 | 336 | 2.00 |
| Peas | 1.00 | 811 | 4.83 | 608.5 | 3.62 | 486 | 2.90 |
| Kale | 0.092 | 74 | 0.44 | 56 | 0.33 | 44.5 | 0.27 |
| Rape | 0.09 | 73 | 0.43 | 54.5 | 0.33 | 43.5 | 0.26 |
| Swede | 0.093 | 75.5 | 0.45 | 56.5 | 0.34 | 45 | 0.27 |
| Turnip | 0.093 | 75.5 | 0.45 | 56.5 | 0.34 | 45 | 0.27 |
| Lucerne | 0.10 | 81 | 0.48 | 60.5 | 0.36 | 48.5 | 0.29 |
| White Clover | 0.094 | 76 | 0.45 | 57 | 0.34 | 45.5 | 0.27 |
| Red Clover | 0.094 | 76 | 0.45 | 57 | 0.34 | 45.5 | 0.27 |
| Urea | 0.70 | 568 | 3.38 | 426 | 2.54 | 340.5 | 2.03 |
| Super Phosphate | 1.20 | 974 | 5.80 | 730 | 4.35 | 584 | 3.48 |
| DAP Granules | 0.94 | 763 | 4.54 | 572 | 3.41 | 457.5 | 2.73 |

*SOWING RATES These are based on the maximum and minimum electric motor speeds, which are independent of ground speed

Recommended Settings

| Seed Type | Shutter Slide ¹ | Bottom Flap ² | Metering Wheel ³ | Agitator ⁴ | Calibration Amount |
|-----------------|----------------------------|--------------------------|-----------------------------|-----------------------|--------------------|
| Grass | Full | 3 | N | E | 1.0 kg |
| Grass Mix | Full | 3 | N | E | 1.0 kg |
| Wheat | 3/4 | 3 | N | E | 2.0 kg |
| Barley | Full | 3 | N | E | 2.0 kg |
| Oats | Full | 3 | N | E | 2.0 kg |
| Peas | 3/4 | 3 | N | D | 2.0 kg |
| Kale | 3/4 | 1 | F | D | 0.5 kg |
| Rape | 3/4 | 1 | F | D | 0.5 kg |
| Swede | 3/4 | 1 | F | D | 0.5 kg |
| Turnip | 3/4 | 1 | F | D | 0.5 kg |
| Lucerne | 3/4 | 1 | F | D | 0.5 kg |
| White Clover | 3/4 | 1 | F | D | 0.5 kg |
| Red Clover | 3/4 | 1 | F | D | 0.5 kg |
| Urea | Full | 3 | N | E | 2.5 kg |
| Super Phosphate | Full | 3 | N | E | 2.5 kg |
| DAP Granules | Full | 3 | N | E | 2.5 kg |

NOTES

- SHUTTER SLIDE**
For grain, opening the shutter slide to Full gives 10-15% more flow.
- BOTTOM FLAP**
The values shown were the optimum test settings.
Decreasing the gap may cause seed damage.
Too large a gap will give intermittent flow rates.
Flaps are spring loaded to cope with small variations in seed/granule size.
- METERING WHEEL**
N = Normal metering wheel
F = Fine metering wheel only
- AGITATOR**
E = Engaged
D = Disengaged

Basic Calibration Procedure

Setting Seeder Shutter Slides

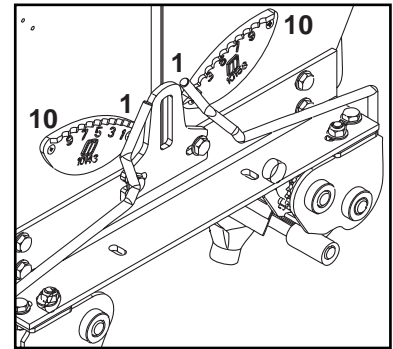
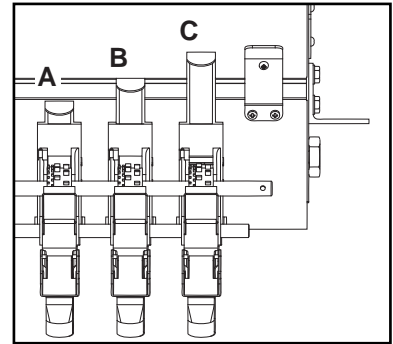
The varying flow properties of seeds require different shutter slide positions which may be found in the Sowing Chart for the individual type of seed. This corresponds to one of the three settings as shown.

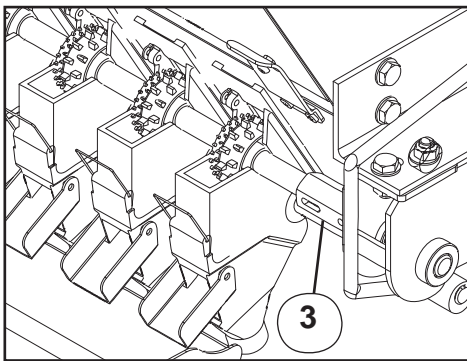
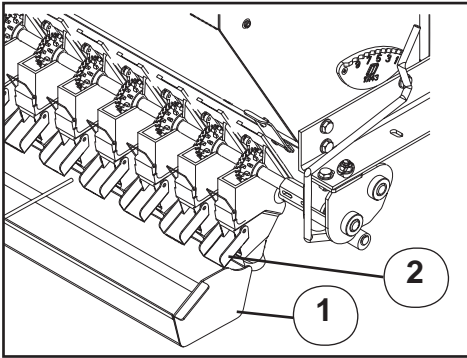
| A | B | C |
|--------|----------|------------|
| Closed | 3/4 Open | Fully Open |

Bottom Flap Settings

The various seed sizes require matching bottom flap clearances below the metering wheel. The adjusting plate allows for 10 different settings. The required position for the seed type may be found in the Sowing Chart. The control levers are located on the LH end of the seedbox, (opposite end to the gearbox).

Number "1" corresponds to the minimum (closed) position and "10" the maximum gap.





Seed Calibration

The calibration test should be done to confirm the required seed rate to be sown and is done with the drill stationary and level.

Seed Calibration Procedures

- 1 Remove the calibration trays from the brackets on the seedbox. Place the trays on the calibration tray brackets below the seeders.
- 2 Push down all the clear plastic seed directors to redirect the seed into the calibration trays, 1.
- 3 Make sure **all the shutters** are open and set to the position indicated in the seed chart for the seed being sown.
- 4 Agitator Shaft - Check the Seed Chart "Hints" whether to connect or disconnect the shaft by removing the M6 bolt (3) during seeding.
- 5 For the test, half fill the box with seed. If this is not possible make sure the seed is evenly distributed over all seeders in the box.
- 6 Now refer to the calibration procedures in the Electric Drive Operating Manual.

Note The amount of product to be dispensed during calibration is entered when initiating the calibration procedure (refer Electric Drive Operating Manual). Suggested amounts are specified on the Seeding Chart. The greater the amount of product dispensed, the more accurate the process.

- 7 To check weigh the seed, scales must be setting level and out of any wind. Scale accuracy must be to at least two grams.

Calibration Deviations

Deviations Between the Calibration Test and the Actual Seed Rate

Changes in the flowing properties of seed during sowing often cause changes in the relationship between the calibration test and the seed rate. These changes in flowing properties generally result from reactions of the dressing agents to temperature, humidity or abrasion. Such changes will become even more obvious when the bottom flaps are incorrectly set. If the setting of these flaps leaves too large a gap, an uncontrollable flow of additional seed can occur during sowing, especially when the drill bounces (a condition not simulated during the calibration tests). For this reason the basic setting of the bottom flaps should be checked at regular intervals. When the flap handle setting is at "1", the clearance between the metering wheel and the flap should be set to 0.5mm.

Residues from the seed dressing on the bottom flaps and metering wheels can also influence the flowing properties of seed and hence the seed rate. In such cases a balance will occur only after a period of time, and it is recommended that the calibration test be repeated, nominally when the seed box is half empty, to confirm the seed rate after 2-3 seedbox fillings. Only then will a balance occur and the seed rate stabilise.

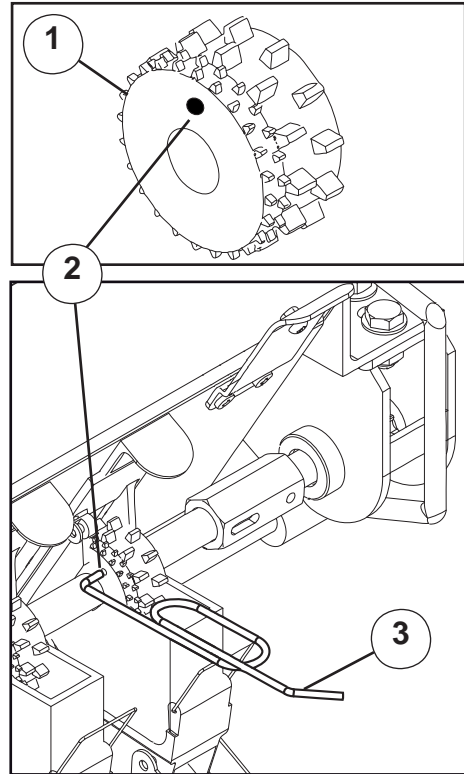
When calibrating the speed ground sensor (radar), it is important for the drill to be at the same angle as when sowing. A variation in position will result in a variation between the application rate and the required rate. Refer to the Electric Drive section of this manual.

Sowing Fine Seeds

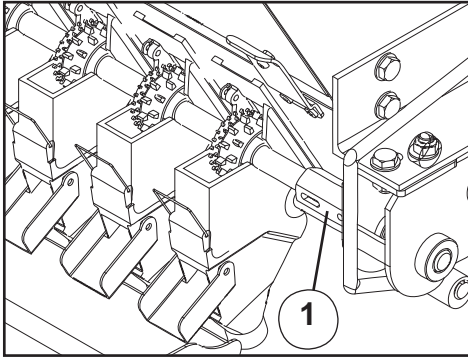
For sowing fine seeds the Enviro 3000e is equipped as standard with a combined normal and fine seed "Elite" metering wheel, 1. During grain sowing and other larger varieties of seed both the normal and fine seed metering wheels are coupled and both rotate. In order to convert the seed drill to sow fine seed, rotate the box shaft clockwise until the holes of the fine seed wheel, 2, are visible. Using the tool supplied, 3, disengage the the pin inside the hole so that the normal metering wheel rotates freely on the metering shaft.

At this time it would be advisable to close any shutter slides not required for the fine seed sowing.

When seed is to be sown again using the normal metering wheel press the pin, from the normal metering wheel side (opposite direction to before), using the tool, back into the hole of the fine seed wheel thus reconnecting the drive between the two.



Small Seeds Calibration with Disconnected Agitator Shaft



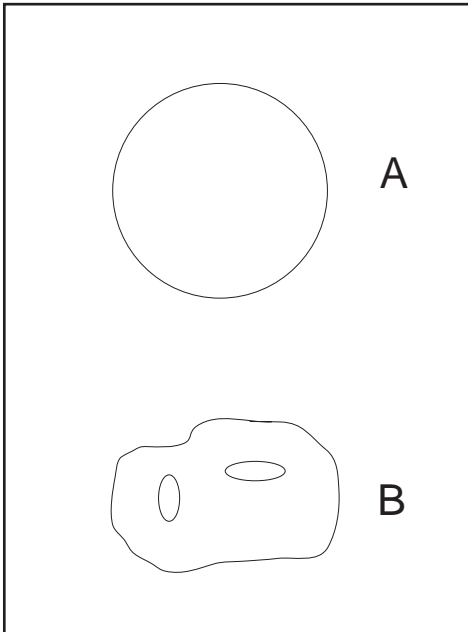
The small seed metering wheel used in Duncan Drills is especially well suited for sowing small seeds such as rape, turnips and clover.

Due to the intensive action caused by the agitator the seeds can adhere to each other, or be damaged, causing irregular sowing/germination. **Therefore it is recommended that when sowing small seeds, especially oil seeds and thin shelled seeds, the drive to the agitator is disconnected.**

To do this remove the linch pin or bolt, 1.

Deviations between the calibrated and actual seed rate can occur when residual dressing agent sticks to the bottom flaps and thus slows the flow of seed. Before beginning the actual calibration test fill the calibration trays. This will cause an immediate buildup of the dressing agent on the flaps. Return the contents of the calibration trays to the seed box and proceed with the actual calibration. Due to the residue buildup on the flaps your calibration will now reflect accurately the required seed rate.

Note - Remember to reconnect the agitator shaft as required for other seeds otherwise the consistency of seed rate will be affected.



Sowing Peas

Peas having the size and shape as illustrated in A (e.g. White Field Peas), can be sown in all Duncan Drills with this type of metering wheel.

The flap should be set to a gap of at least "3" on the flap setting lever. With these peas it should not be necessary to run the agitator shaft.

Peas having the size and shape as illustrated in B (e.g. Green or Garden Peas), tend to bridge inside the seedbox and do not flow freely.

This multi-faceted pea requires agitation for sowing.

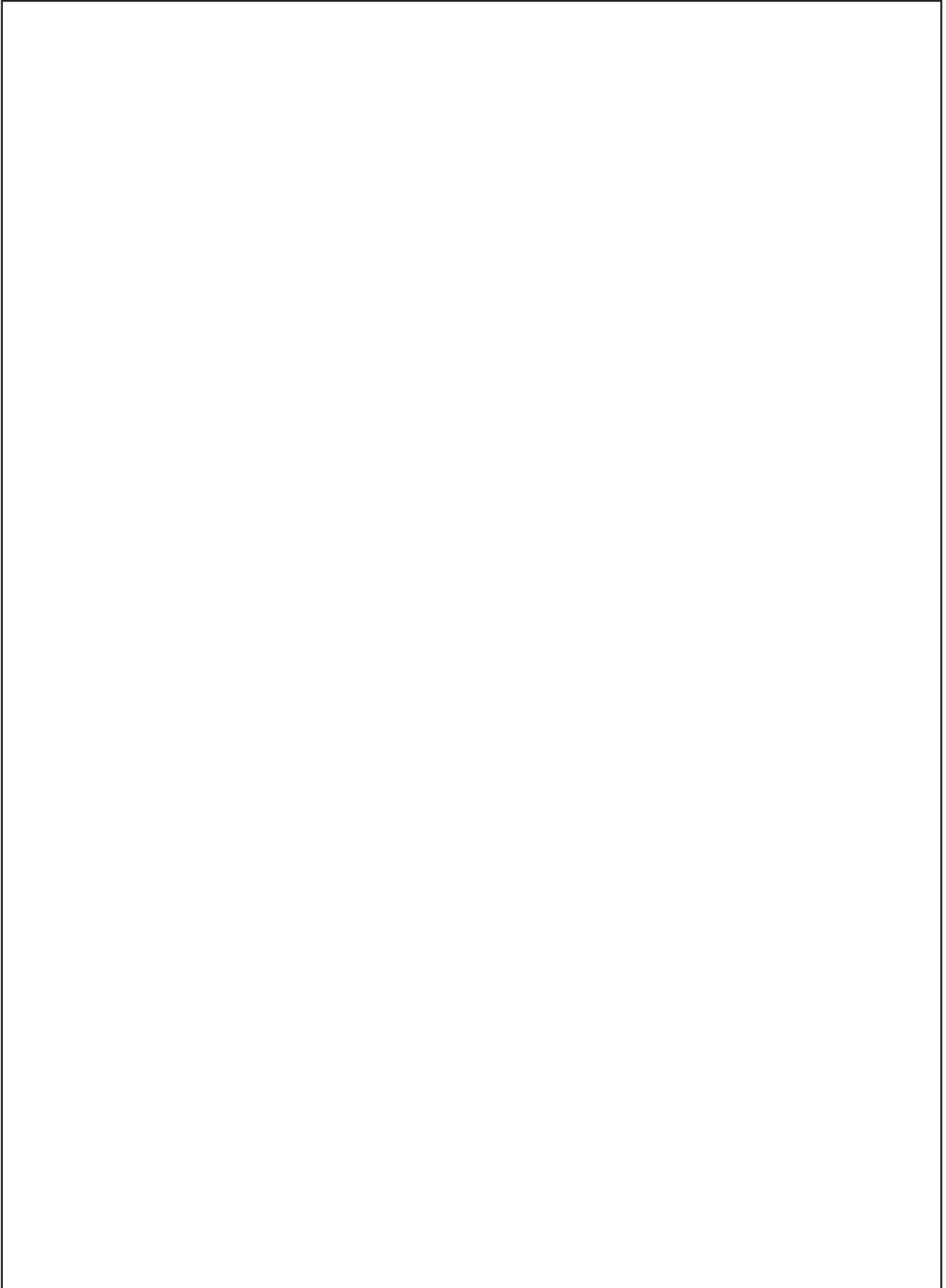


Caution - When resetting the metering wheels on the seeder shaft

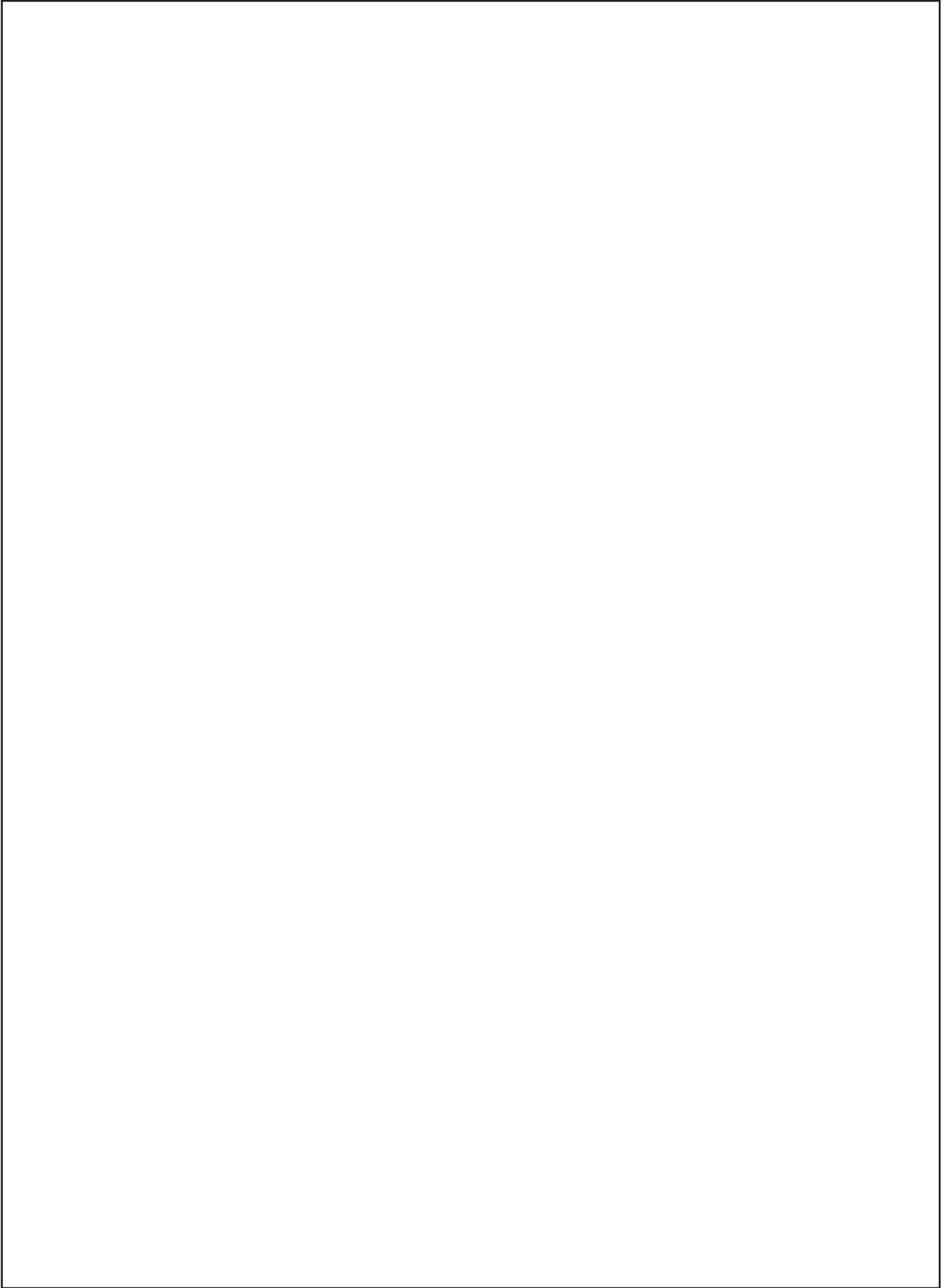
Care should be taken when tightening the grub screws on the small seed wheel. Adjust the grub screw until the movement of the metering wheel just stops, then tighten no more than 1/8 of a turn.

Do not overtighten as this can result in breakages while operating and may render the warranty on these units void.

Enviro 3000e Seed Drill Calibration Notes



Enviro 3000e Seed Drill Calibration Notes



Maintenance & Care

General Safety and Accident Prevention Advice

- 1 Make sure that if the tractor remains attached to the drill that the ignition key is removed.
- 2 During maintenance the drill should be supported in such a manner that if hydraulic failure was to occur the machine would still be adequately supported.
- 3 Wear gloves when handling components with cutting edges such as worn discs etc...
- 4 Disconnect the electrical supply from the tractor before doing any electrical maintenance.
- 5 Refer to safety sections for more safety information.



General Cautionary Maintenance Advice

- 1 **Electric Welding** - With the electronic equipment in modern tractors and on implements, it is advisable to completely disconnect the implement from the tractor, or at the very least disconnect the alternator before attempting any welding. See also the electric drive manual.



- 2 **Hydraulics** - Ensure hydraulic couplings (male & female) are clean before connecting. Dirty couplings will result in hydraulic oil contamination, hydraulic cylinder seal damage, and bore scores. This in turn will result in oil leakage past the piston seals.
Filters are only fitted to the main wheel lines. If hydraulic fittings and oil supply are not going to be kept clean, to help prevent hydraulic cylinder damage, it is recommended that a filter be fitted to the other lines.



- 3 **Water Blasting** - Water blasting, steam cleaning or other pressurised cleaning processes can force dirt etc. into undesirable places that may cause damage or rapid part wear to items such as bearings, seals, chains, bushes etc. Caution must be exercised.

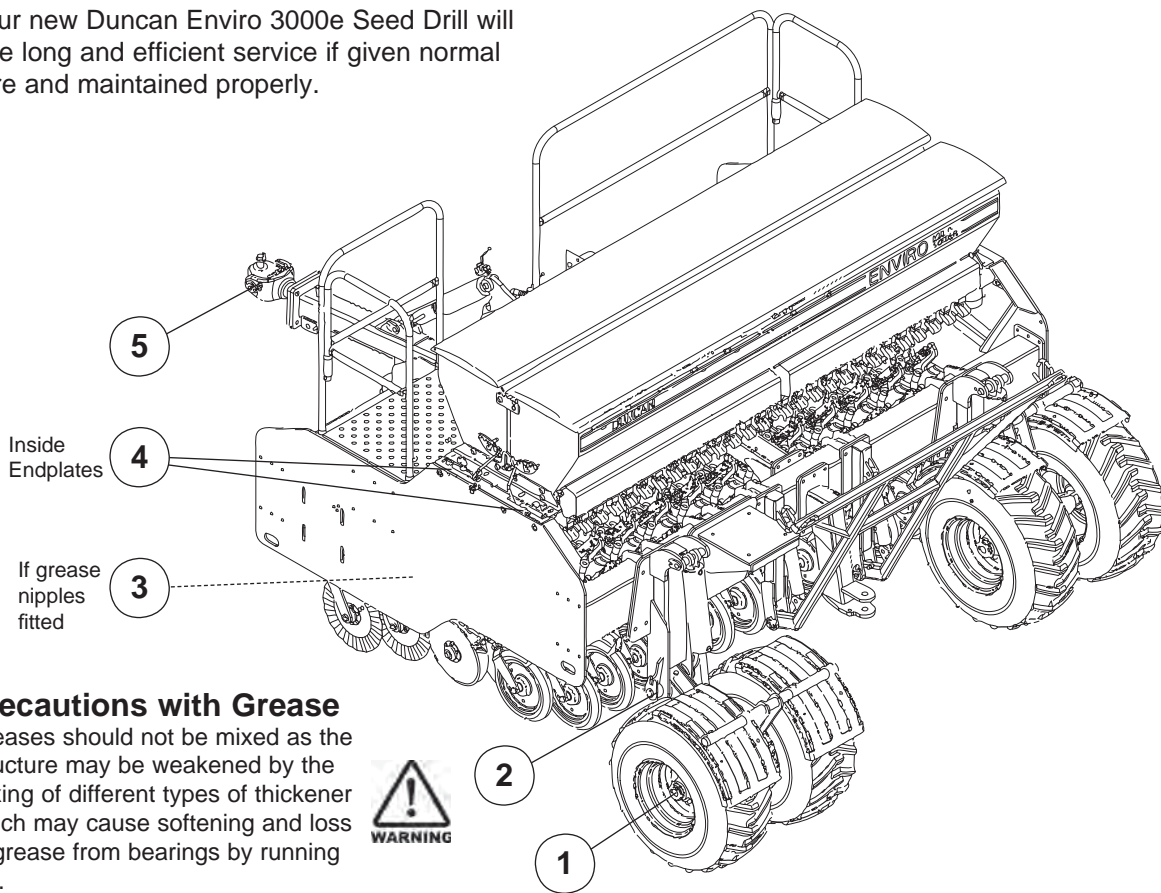


- 4 **Box set lifting eye profile** - These profiles are provided for easy removal of the dual boxes from the side frames. **Do not use when boxes are loaded nor to lift the machine.**



Maintenance

Your new Duncan Enviro 3000e Seed Drill will give long and efficient service if given normal care and maintained properly.



Precautions with Grease

Greases should not be mixed as the structure may be weakened by the mixing of different types of thickener which may cause softening and loss of grease from bearings by running out.



| Item | Components | Lubricant | Frequency |
|------|-----------------------|---------------------------------|--------------------------|
| 1 | Wheel Bearings | Castrol LMX Grease | Annually |
| 2 | Wheel Leg Pivots | SKF LGEM2 Grease or equivalent | Weekly |
| 3 | Parallel Pivot Bushes | Castrol LMX Grease | Monthly* |
| 4 | Drive Chains | Suitable Roller Chain Lubricant | See Maintenance Schedule |
| 5 | Coupling | Castrol LMX Grease | Weekly |

* where fitted with grease nipples

| Components | Daily | Weekly | Pre Season |
|--------------------------------|-----------------|------------------|--------------|
| | (or after 20Ha) | (or after 100Ha) | (or 1000 Ha) |
| Coulters & Double Discs | • | • | • |
| Press Wheels | • | • | • |
| Seeders/Agitators/Bottom Flaps | • | • | • |
| Wheels & Tyres | | • | • |
| Pivot Pin Fasteners | | • | • |
| Coupling & Safety Chains | | • | • |
| Roller Chains | | • | • |
| Hydraulics (Oil Leaks) | | • | • |
| Bolted Connections | | | • |

Refer to the 'Maintenance Schedule' for the full list

Enviro 3000e Seed Drill Maintenance Schedule

Refer Maintenance Schedule Summary Chart
(Refer Previous Page)

FRONT COULTERS

- D Check springs for damage/breakage
- D Clean any dirt build up
- D Check discs for wear, damage, buckles etc
- D Check discs turn freely
- D Check discs for excessive sideplay (>5mm)
- W Check arms for damage & sideplay
- W Check tightness of pivot pin end & tab bolts
- W Check tightness of disc pivot bolts
- A Check all other bolts for tightness

PRESS WHEELS

- D Check for & clean any dirt build up
- D Check tyres for wear, damage, cuts etc
- D Check wheels turn freely
- D Check for excessive sideplay
- D Clean dirt build up (if any) on scrapers
- D Check all height adjustments are the same
- W Check scrapers for wear
- W Check scraper position
- W Check tightness of pivot bolts
- A Check all other bolts for tightness

WHEELS

- D Check tyres for damage, wear etc
- W Check tyre pressures
- W Check wheel nuts for tightness
- W Lubricate wheel arm pivots
- W Check wheel mount bolts for tightness
- A Check all other bolts for tightness
- A Check for wear in pivots, bushes etc

HYDRAULICS

- D Clean quick release couplings
- W Check quick release couplings for damage leaks etc
- W Check connections for leaks, tighten if required
- W Check hoses for damage leaks etc replace if required
- A Clean out or replace in line filters

DOUBLE DISCS

- D Check springs for damage/breakage
- D Clean any dirt build up
- D Check discs for wear, damage, buckles etc
- D Check discs turn freely
- D Check discs for excessive sideplay (>5mm)
- W Check arms for damage & sideplay
- W Check tightness of pivot pin end & tab bolts
- W Check tightness of disc pivot bolts
- W Clean dirt build up (if any) on scrapers
- W Check scrapers for wear
- A Check all other bolts for tightness

SEEDERS / AGITATORS / BOTTOM FLAPS

- D Check seeder housings for damage
- D Check all seeder wheels are operating the same, ie all main wheels or all small wheels
- D Check agitators running correctly
- W Check bottom flaps are all the same for both boxes
- W Check units drive chains for damage wear etc
- W Clean any dirt/dust build up on drive units
- A Lubricate chains

DRAWBAR, COUPLING SAFETY CHAIN, LIGHTS

- D Check for damage, wear etc on coupling & chains
- W Check mounting bolts for tightness
- W Check anchor bolt
- A Check all other bolts for tightness
- A Check drawbar pivot roll pins, replace if damaged or loose

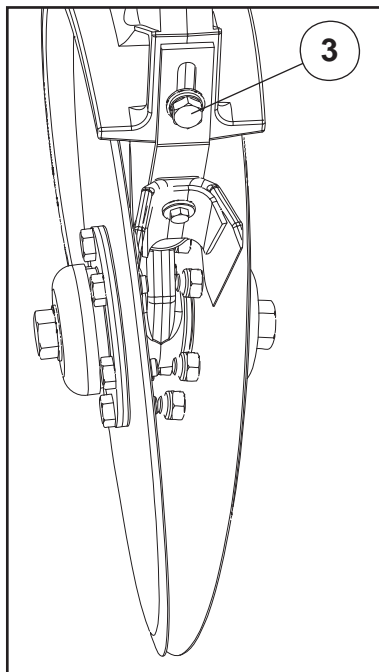
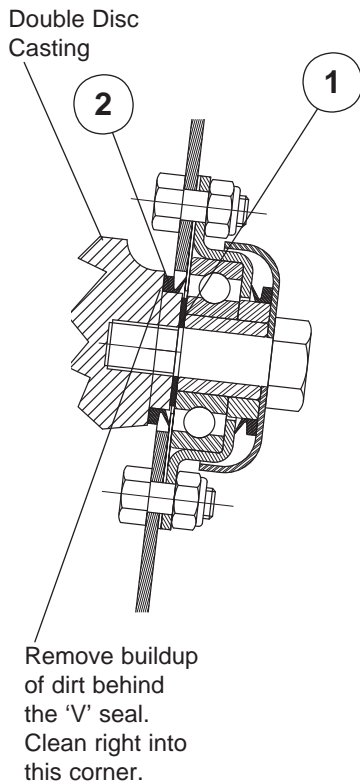
GENERAL

- A Check all bolts for tightness
- A Check safety decals for damage & readability
- A Check for any wear/damage/broken components
- A Check for any rust, paint wear or damage
- A Check seeder hoses for damage, blockages, splits etc
- A Check seeder hose clips

Key

- D Daily or every 20 ha check
- W Weekly or every 100 ha check (includes daily checks)
- A Annual or pre-season or every 1000 ha check (includes weekly checks)

Maintenance Instructions & Hints



1 Front Coulters

Front coulters bearings are sealed and do not require lubrication. Check discs for any lateral movement (wobble) on a regular basis. Replace bearings if there is any movement greater than 5mm. To ensure seal damage does not occur, check for dirt build-up around the rod seals at the piston heads on the beam adjusting rams.

2 Double Discs

Check that the discs are free from excessive wobble and the bearings run smoothly. Replace any worn bearings. Check for dirt build-up behind the rubber "V" seals on the double disc castings. Clean right into the corner, and check that the "V" seal bearing surface is not damaged and is free from rust. It is recommended to replace the inner "V" seals when the bearings are replaced. When discs wear in diameter (to 13"), remove the flat washer (Item 1 Part Number 29247) so the discs meet. Also remove the nylon washer (Item 2, Part Number 22136). The double disc coulters is equipped with two scrapers to remove sticking soil. These scrapers have been set by the factory in such a way that they lightly touch the discs without having a noticeable braking effect. After extensive use of the drill a certain amount of wear may be evident on the scrapers. The scrapers should be reset using the adjusting bolt so they just touch the discs as described above. Refer Item 3. In some cases if a notch has formed on either of the blades by the abrasive action of the coulters disc, you may need to regrind the leading edge to give optimum cleaning action or replace.

3 Both Front Coulters & Double Discs

When replacing front or double disc units on the frame, tighten the M16x70 bolts first until the thread protrudes through the nyloc nut by 6 - 6.5mm. Use anti-seize on M16x200 bolts. The tightening sequence of the two M16x200 bolts alters the position of the double discs. Measure the spacings of the discs at the discs, NOT at the clamps. If replacing any grey bushes in the clamps or double disc castings, spray the bores with CRC, align the bushes correctly and PRESS the bushes in. Do NOT knock them in.

4 Press Wheels

Scrapers will wear, the rate being dependent on the ground conditions. The minimum clearance is 2mm. In some conditions a greater clearance may give better performance.

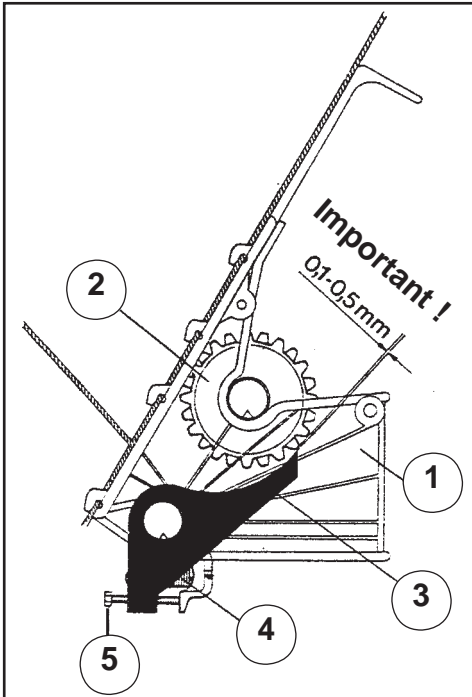
5 Main Wheels (Tyre Pressure)

The recommended tyre pressure is shown in 'Dimensions & Capacities'. Check tyre pressure regularly to ensure the correct pressure is maintained. Weekly checks are recommended.

Maintenance & Care (Continued)

10 Bottom Flaps

The required seed rate is controlled by both the metering wheels and the bottom flaps. The seed flows from the seed box into the metering wheel housings. Inside the metering wheel housing (1) the seed is caught between the metering wheel (2) and the bottom flap (3). The metered amount of seed is transported by the metering wheel to the edge of the bottom flap where it drops off into the seed guide tube which leads to the coulter. Varying grain sizes require the matching of the flap clearance to the different grain sizes. This matching is done by raising or lowering the bottom flaps by using the flap adjusting lever on the LH end of the seed box. If larger foreign particles, e.g. stones get between the metering wheel and the bottom flap, the bottom flap can give way downwards. A strong return spring (4) brings the bottom flap immediately back into the working position.



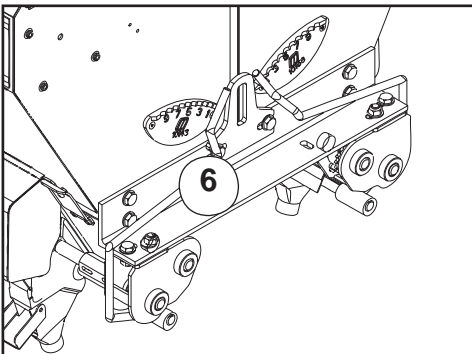
The metering system should be checked daily or before any sowing period with an empty seed box and empty metering housings.

Use the following procedure:

Put the bottom flap setting levers (6) (located on the LH end of the seed boxes) in position "1" for the front box and position "1" for the rear box.

By turning the metering wheel shaft by hand check the flaps are all set to a gap of 0.1 to 0.5mm.

To adjust individual flaps use the spring tensioning screw (5).



Note: Maintenance Schedule (page 24)

Where the frequency is given in terms of use (eg. weekly) or area covered (eg. 100 Ha) perform the maintenance task based on whichever occurs first.

Preparing the Machine for Storage.

Locate on a dry level surface. The machine should be stored wherever possible so the rams are not supporting any weight. The drive chains should be lubricated with suitable roller chain lubricant before prolonged periods of storage.

For longer term storage remove seed/fertiliser tubes from the boot assembly and allow to hang without deformation. Check tube lengths when replacing.

It is recommended that maintenance be carried out at the end of the season, giving sufficient time to obtain spare parts and/or carry out repairs if required.

Enviro 3000e Maintenance Service Record

DATE

HECTARES

REFER TO MAINTENANCE
SCHEDULE FOR DETAILS

ANNUAL/PRESEASON CHECK
(or every 1000 ha)

FRONT COULTERS

DOUBLE DISCS

PRESS WHEELS

SEEDERS/AGITATORS/BOTTOM FLAPS

WHEELS

DRAWBAR/COUPLING SAFETY CHAIN/
LIGHTS

HYDRAULICS

GENERAL

SERVICED BY

NOTES

Commisioning PTE Phasing Cylinders

1. General

(a) PTE cylinders will re-phase in both directions. Each piston is fitted with 2 poppet valves which open at the end of the stroke to allow oil to bypass the piston. The bypass of oil at the end of the stroke allows for initial bleeding of the system and re-phasing in operation.

(b) The valve in the piston is a precision device, **CLEANLINESS IS OF THE UTMOST IMPORTANCE.** Contamination in the oil will accelerate deterioration of the valve seat. Cylinders will creep once the integrity of the seating is lost.

2. Bleeding the System

(a) Initial bleeding after connection to the tractor

Purge all air from the system by fully stroking rams in both directions. Allow the oil to flow through the cylinders with the tractor at an idle for a minimum of 2 minutes at each end of the stroke.

(b) Re-phasing after initial bleeding

After initial bleeding the cylinders will only require occasional re-phasing during operation. This is done by extending the rams for about 30 seconds or until all cylinders have reached the end of their stroke.

3. Fault Finding

1. Cylinders creeping during operation

There are two primary causes of this:

- (i) Air in the hydraulic system
- (ii) By passing of the poppet valve.

(a) Check that there is no air in the system. Raise and lower the machine. All cylinders should move instantaneously, any lag indicates that there is air in the system. Other signs of air in the system are hoses vibrating/squealing or the control handle shuddering. Re-bleed the system if necessary.

(b) If there is no sign of air in the system and the cylinders still creep, raise the machine off the depth stop and measure the movement of each cylinder rod.

(c) If both cylinders move at the same rate it is likely to be the control valve/lock out valve that is leaking.

(d) If the slave continues moving after the master cylinder has hit the depth stop it is likely to be the piston in the master cylinder that is bypassing.

(e) If the slave cylinder extends while the master cylinder retracts it is likely to be the piston in the master cylinder that is bypassing.

(f) If the master cylinder does not move but the slave does it is likely to be the piston in the slave cylinder that is bypassing.

(g) If the piston is bypassing it is likely to be contamination in the phasing valve. The cylinder will have to be dismantled, cleaned and fitted with a new poppet valve.

Commissioning PTE Phasing Cylinders (continued)

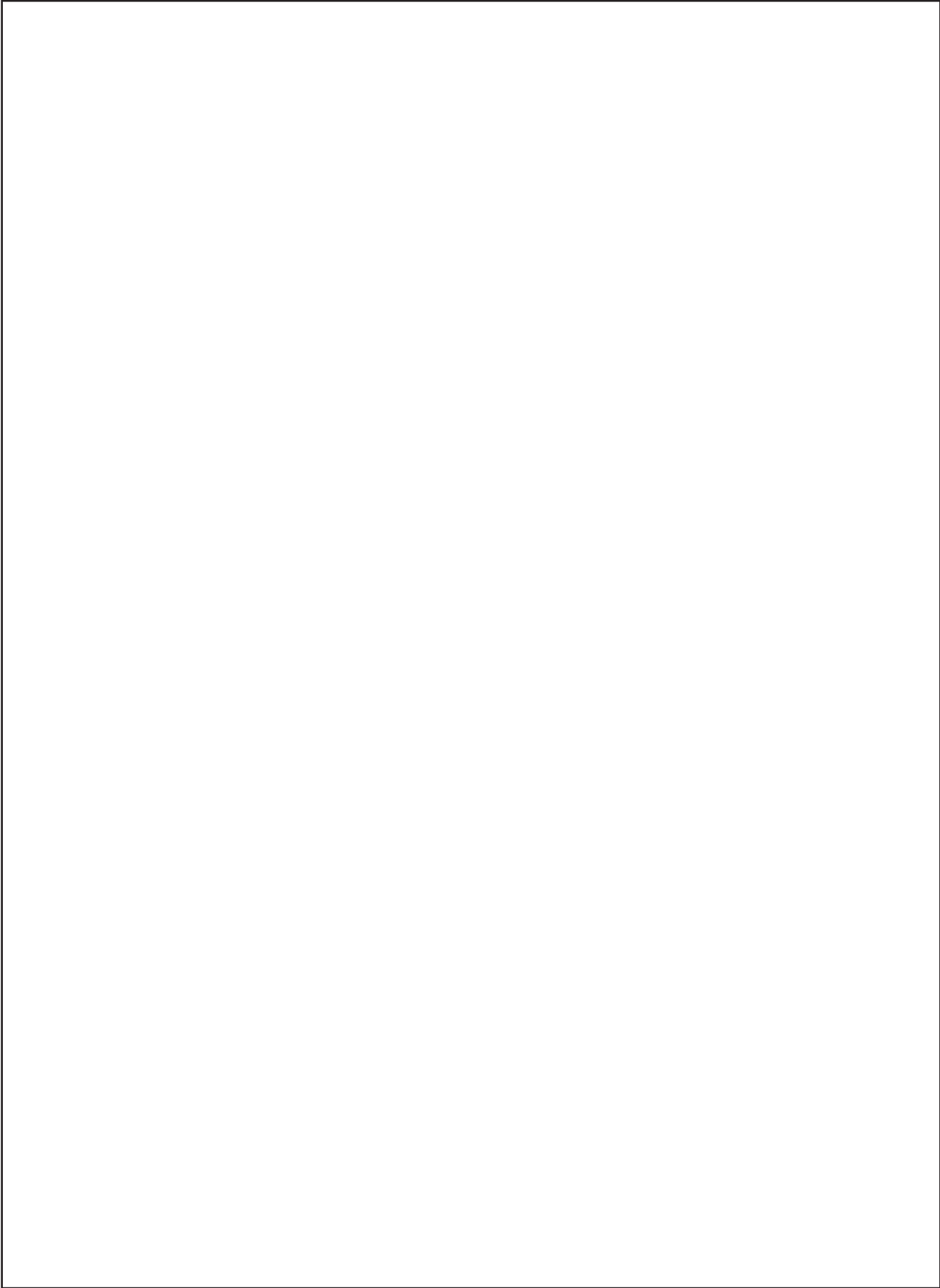
3. Fault Finding (continued)

2. Cylinders moving at different rates

(a) Check that there is no air in the system. Raise and lower the machine; all cylinders should move at the same time, any lag indicates that there is air in the system. Re-bleed the system if necessary.

(b) Ensure that the cylinders have been connected correctly. The cylinders should be connected in series so that the bore sizes go down in 1/4" increments. The Rod end port of the master cylinder (3.5" bore) is connected to the piston end port of the slave cylinder (3.25" bore).

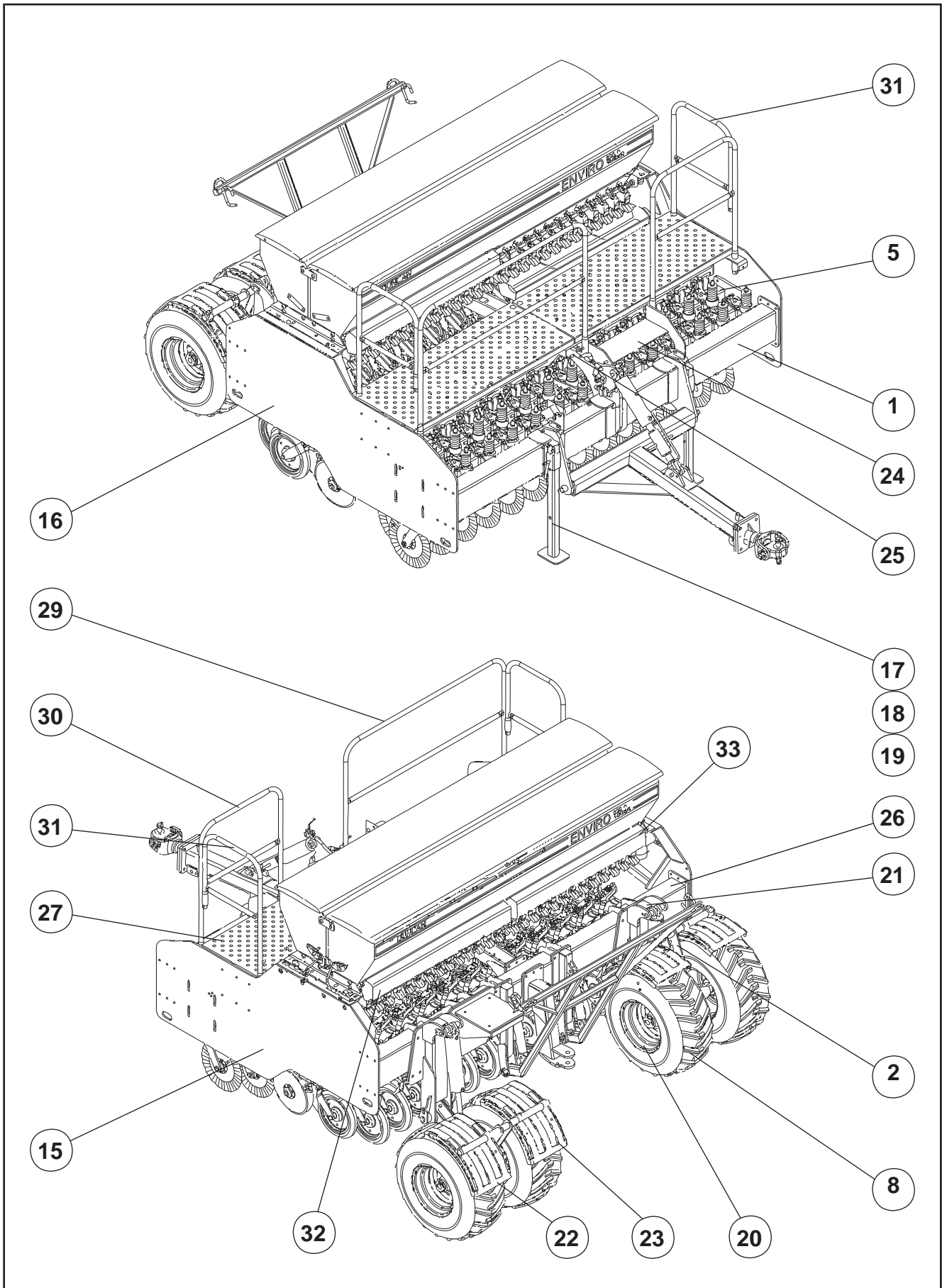
Enviro 3000e Seed Drill Maintenance Notes



Enviro 3000e Seed Drill Parts List Contents

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| Mainframe & Drawbar | 40 |
| Wheel Legs | 42 |
| Hydraulics | 44 |
| Wiring & Lighting Kit | 48 |
| Front Disc & Coulter System | 50 |
| Double Disc Assembly | 52 |
| Press Wheel Assembly | 56 |
| Radar System | 58 |
| Seedbox Assembly | 60 |
| Agitator Drives | 64 |
| Seeder Assembly | 67 |
| Electric Drive | 68 |

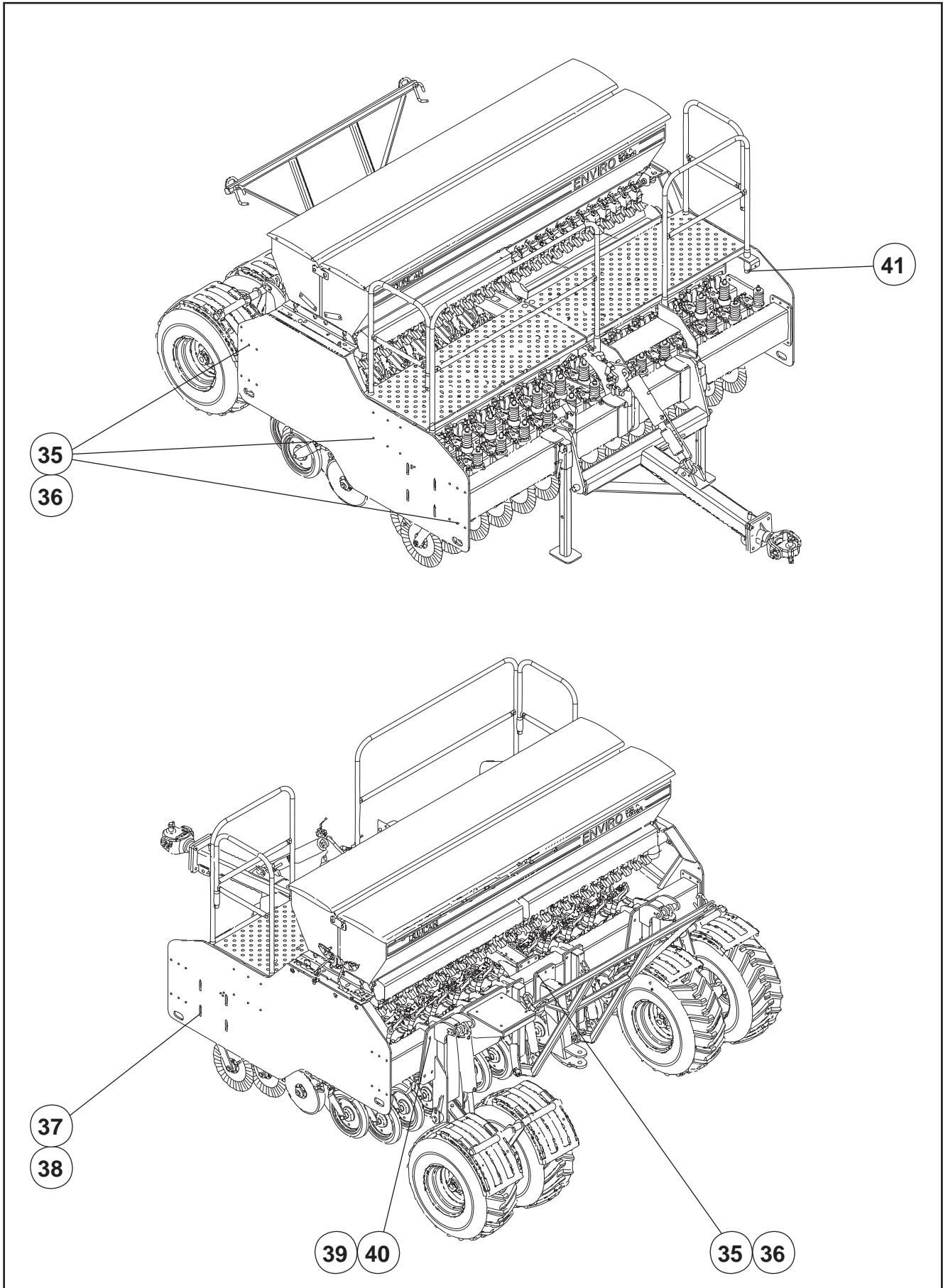
'Enviro 3000e' Complete Assembly



‘Enviro 3000e’ Complete Assembly

| ITEM | PART No. | DESCRIPTION | QTY |
|------|---------------|---------------------------------------|---------|
| 1 | 60900 | Frame Front Beam Assembly | 1 |
| 2 | Refer Page 42 | Wheel Legs | 2 |
| 3 | Refer Page 44 | Hydraulics | 1 |
| 4 | Refer Page 48 | Lighting Kit | 1 |
| 5 | Refer Page 41 | Front Coulter Beam Assembly | 1 |
| 6 | Refer Page 41 | D/Disc Coulter Beam Assembly | 1 |
| 7 | Refer Page 68 | Electric Drives | 2 |
| 8 | 43955 | 400/60 - 15.5 BKT Wheel Assembly | 4 |
| 9 | Refer Page 60 | Box Drive Shaft | 2 |
| 10 | Refer Page 60 | Seedbox Assembly | 2 |
| 11 | Refer Page 64 | Agitator Drives | 2 |
| 12 | Refer Page 65 | Agitator Shaft Assembly | 2 |
| 13 | Refer Page 67 | Seeder Assembly | per run |
| 14 | Refer Page 58 | Radar System | 1 |
| 15 | 60910 | LH Sideplate Assembly | 1 |
| 16 | 60920 | RH Sideplate Assembly | 1 |
| 17 | 60955 | Stand Leg Assembly | 2 |
| 18 | 28099 | Pin | 2 |
| 19 | 45272 | ‘R’ Clip | 2 |
| 20 | 60985 | Hub Set | 4 |
| 21 | 29080 | Wheel Mount Assembly | 2 |
| 22 | 60939 | Mudguard Assembly | 4 |
| 23 | 60960 | Mudguard Bracket Assembly | 2 |
| 24 | 60950 | Footstep Assembly | 1 |
| 25 | 60953 | Footboard Support Assembly | 1 |
| 26 | 60997 | Frame Rear Beam Assembly | 1 |
| 27 | 29280 | Footboard Assembly | 2 |
| 28 | - | - | - |
| 29 | 60940 | Guard Rail Assembly (1620 Centres) | 1 |
| 30 | 60943 | Guard Rail Assembly (810 Centres) | 1 |
| 31 | 60946 | End Rail Assembly | 2 |
| 32 | 29593 | Calibration Tray Assembly (1415 long) | 2 |
| 33 | 29594 | Calibration Tray Assembly (1313 long) | 2 |
| 34 | 60242 | Ripstop Weather Skirt | 2 |

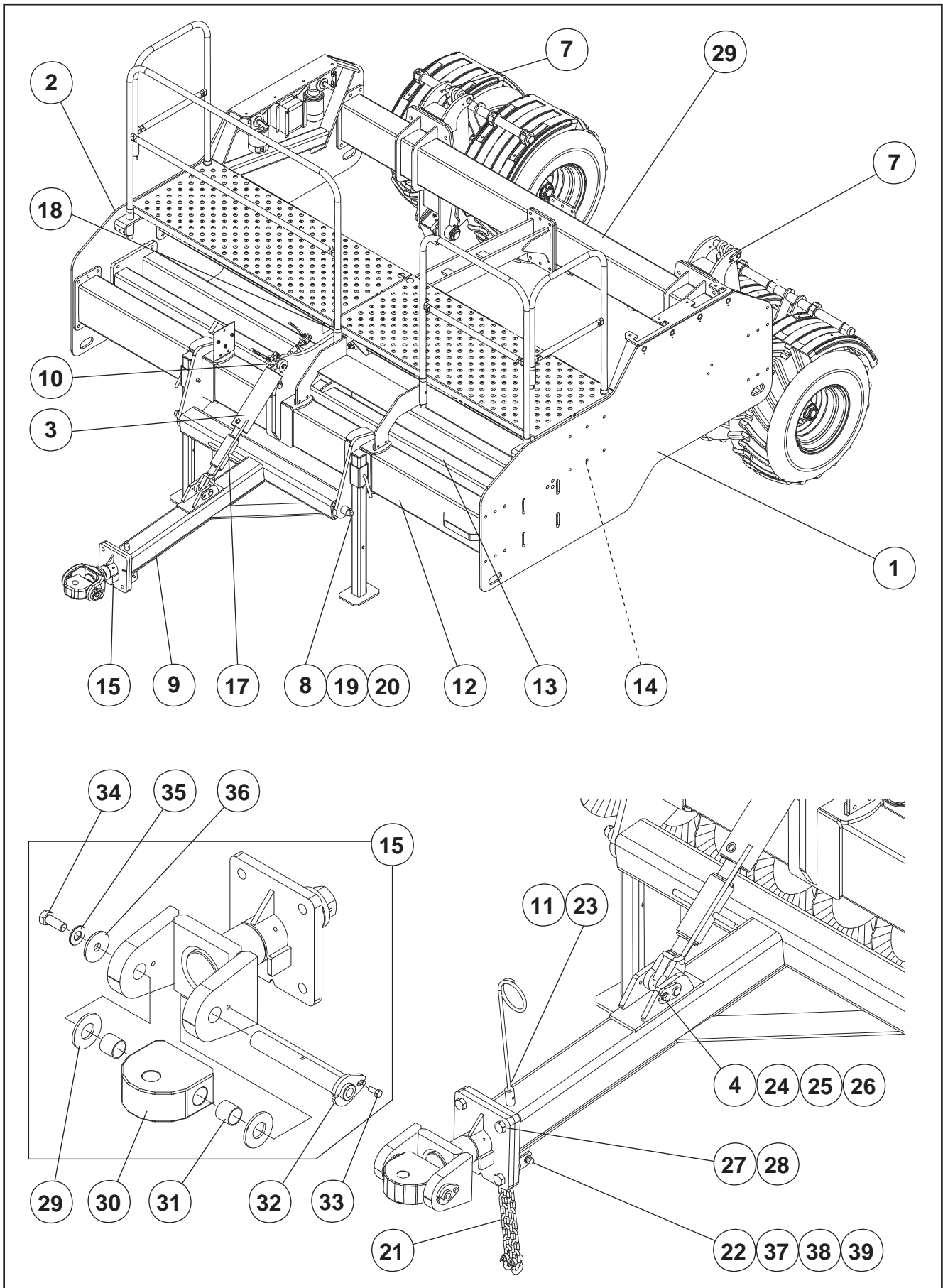
'Enviro 3000e' Complete Assembly (continued)



'Enviro 3000e' Complete Assembly (continued)

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----|
| 35 | 45039 | M16 x 45 Class 8.8 Zinc Plated Bolt | 42 |
| 36 | 45140 | M16 Nyloc Nut | 42 |
| 37 | 45060S | M20 x 40 Class 8.8 Zinc Plated Set Screw | 8 |
| 38 | 45161 | M20 Heavy Duty Flat Washer | 8 |
| 39 | 45141 | M20 Nyloc Nut | 12 |
| 40 | 45062 | M20 x 50 Class 8.8 Zinc Plated Bolt | 12 |
| 41 | 45292 | 7/16" x 1 1/2" Lynch Pin | 6 |

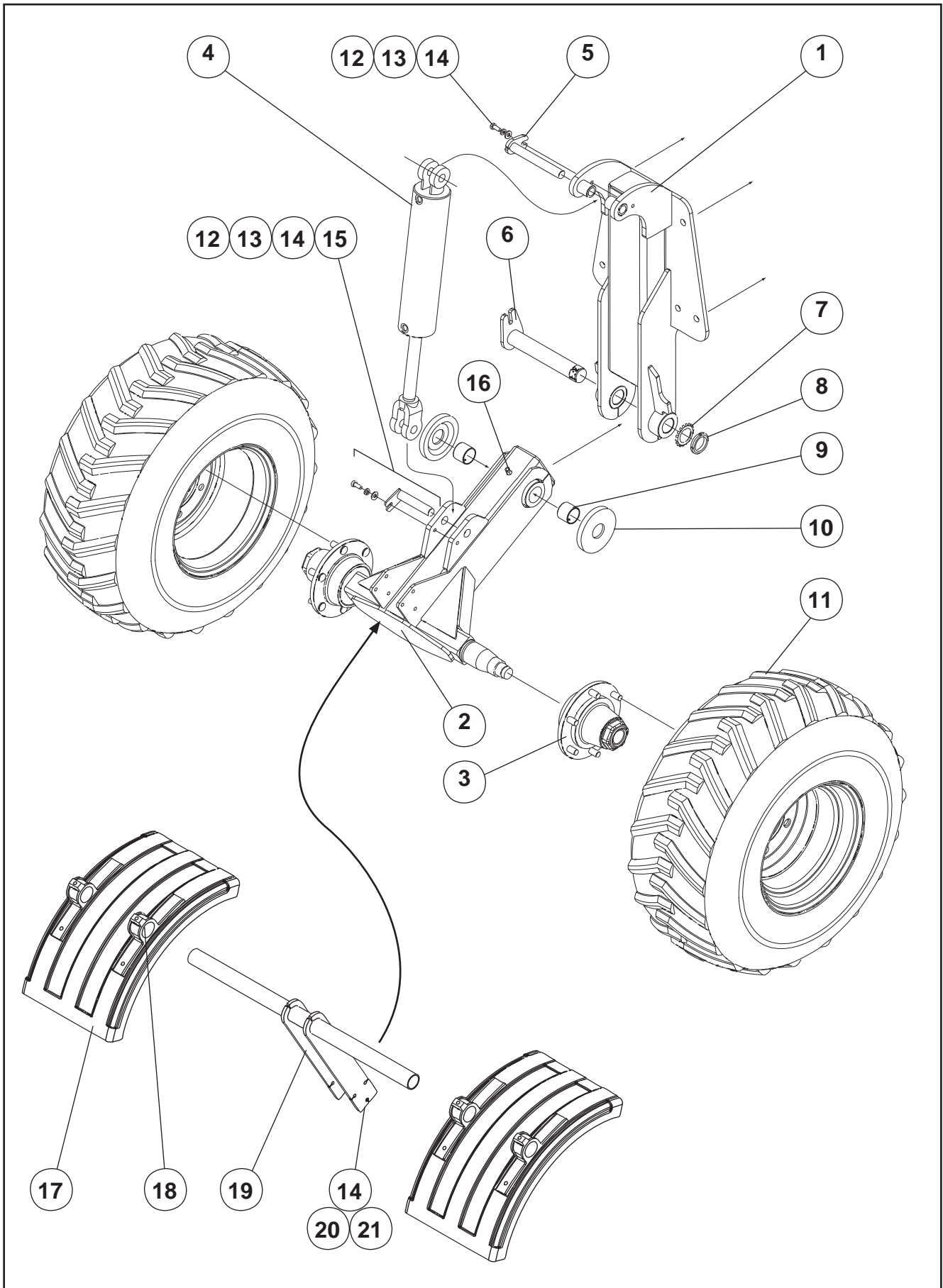
'Enviro 3000e' Mainframe & Drawbar



‘Enviro 3000e’ Mainframe & Drawbar

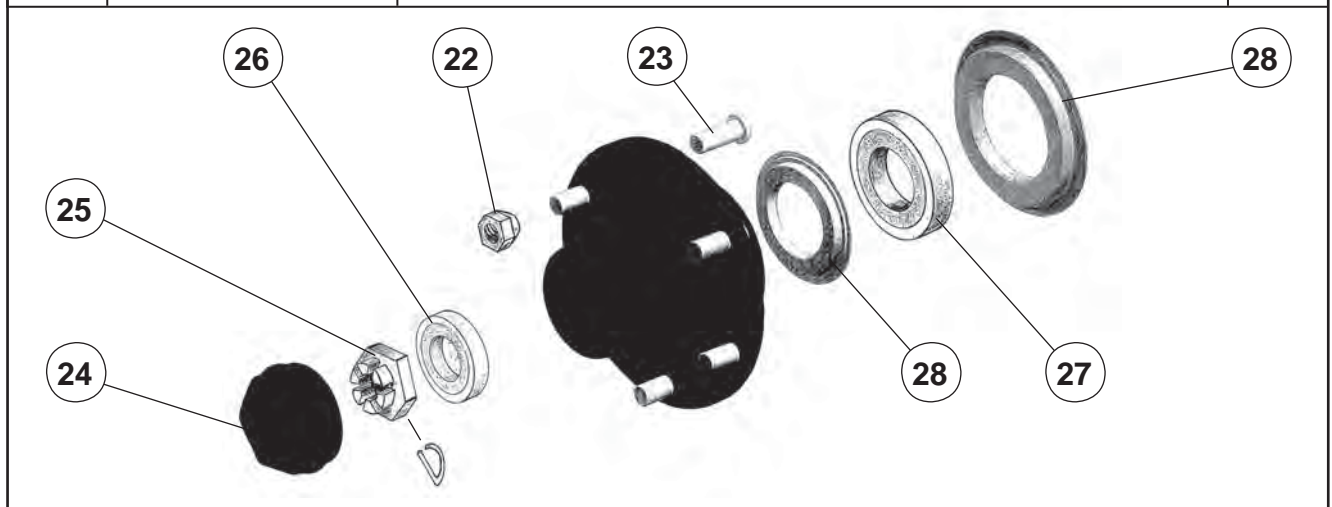
| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--------------------------------------|-----|
| 1 | 60910 | LH Sideplate Assembly | 1 |
| 2 | 60920 | RH Sideplate Assembly | 1 |
| 3 | 43628 | Drawbar Ram | 1 |
| 4 | 60982 | Clevis Pin (Tabbed) | 1 |
| 5 | 60935 | Wheel Leg Assembly (refer page 42) | 2 |
| 6 | 43499 | Stop Collar Set (not shown) | 1 |
| 7 | 29080 | Wheel Mount Assembly (refer page 42) | 2 |
| 8 | 29319 | Draw Bar Axle | 1 |
| 9 | 60984 | Draw Bar Final Assembly | 1 |
| 10 | 26558 | Ram Pin | 1 |
| 11 | 4800315 | Hose Support | 1 |
| 12 | 60900 | Frame Front Beam Assembly | 1 |
| 13 | 60963 | Front Coulter Beam Assembly | 1 |
| 14 | 29045 | Double Disc Beam Assembly | 1 |
| 15 | 29524K | Swivel Tow Hitch | 1 |
| 16 | 29356 | Decal Indicator Scale | 1 |
| 17 | 29125 | Ram Extension Indicator | 1 |
| 18 | 60953 | Footboard Support Assembly | 1 |
| 19 | 47462 | 1 1/4" Light Flat Washer | 2 |
| 20 | 45285 | Dia 10 x 60 Roll Pin | 2 |
| 21 | 43832 | Coupling Safety Chain No. 3 Grade 80 | 2 |
| 22 | 22262 | Clevis Pin (Tabbed) | 1 |
| 23 | 45181 | M8 x 12 S/HD Grub Screw | 1 |
| 24 | 45018s | M12 x 25 Class 8.8 Set Screw | 1 |
| 25 | 45159 | M12 Heavy Duty Flat Washer | 1 |
| 26 | 45167 | M12 Spring Washer | 1 |
| 27 | 45065 | M20 x 65 Class 8.8 Bolt | 4 |
| 28 | 45141 | M20 Nyloc Nut | 4 |
| 29 | 29537 | Plastic Spacer | 2 |
| 30 | 60969 | Swivel Hitch Block | 1 |
| 31 | 45190 | Glacier Bush | 2 |
| 32 | 60975 | Pivot Pin (Hitch) | 1 |
| 33 | 44992s | M8 x 20 8.8 Set Screw Z/P | 1 |
| 34 | 45038s | M16 x 40 Grade 8.8 Set Screw Z/P | 1 |
| 35 | 45160 | M16 HD Flat Washer | 1 |
| 36 | 29534 | Hitch Pivot End Cap | 1 |
| 37 | 45152 | M10 Light Flat Washer | 1 |
| 38 | 45166 | M10 Spring Washer | 1 |
| 39 | 45002s | M10 x 25 Grade 8.8 Set Screw Z/P | 1 |

'Enviro 3000e' Wheel Legs

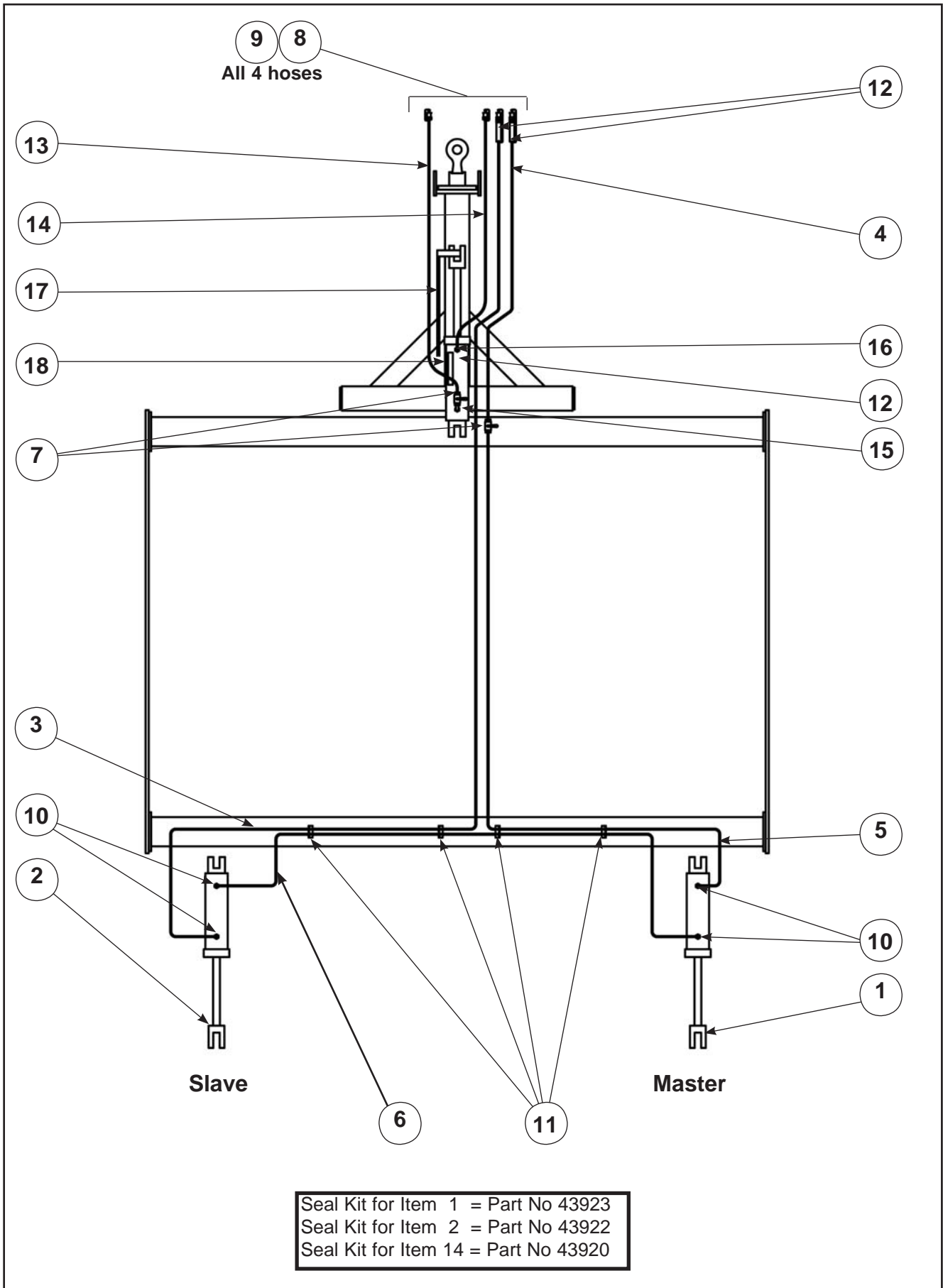


'Enviro 3000e' Wheel Legs

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----|
| 1 | 29080 | Wheel Mount Assembly | 2 |
| 2 | 60935 | Dual Wheel Leg Assembly | 2 |
| 3 | 60985 | Hub Set | 4 |
| 4 | 43935 | 4" x 12" Master Rephasing Ram | 1 |
| 4 | 43936 | 3.75" x 12" Slave Rephasing Ram | 1 |
| 5 | 60981 | Ram Pin | 2 |
| 6 | 60971 | Pivot Pin Assembly Wheel Arm | 2 |
| 7 | 45619 | Locking Washer MB9 | 2 |
| 8 | 45618 | Locknut KM9 | 2 |
| 9 | 43426 | Glacier Bush | 4 |
| 10 | 29118 | Wheel Arm Spacer | 4 |
| 11 | 43955 | Wheel Assembly 400/60-15.5 | 4 |
| 12 | 45002s | M10 x 25 Grade 8.8 Set Screw | 4 |
| 13 | 45166 | M10 Spring Washer | 4 |
| 14 | 45158 | M10 Heavy Duty Flat Washer | 16 |
| 15 | 22262 | Clevis Pin (Tabbed) | 2 |
| 16 | 43010 | Grease Nipple 90° | 2 |
| 17 | 60939 | Moulded Guard | 4 |
| 18 | 45672 | Guard Clamp | 8 |
| 19 | 60960 | Guard Bracket | 2 |
| 20 | 45003s | M10 x 30 Grade 8.8 Set Screw | 12 |
| 21 | 45138 | M10 Nyloc Nut | 12 |
| 22 | 43959 | M18 x 1.5 mm Nut | 6 |
| 23 | 43960 | M18 x 1.5 mm x 61 mm Stud | 6 |
| 24 | 43962 | Dust Cap | 1 |
| 25 | 43963 | Castle Nut and Pin | 1 |
| 26 | 43964 | Taper Roller Bearing 32210 (Small Outer) | 1 |
| 27 | 43966 | Taper Roller Bearing 30213 (Large Inner) | 1 |
| 28 | 43965 | Mk II Seal Kit | 1 |



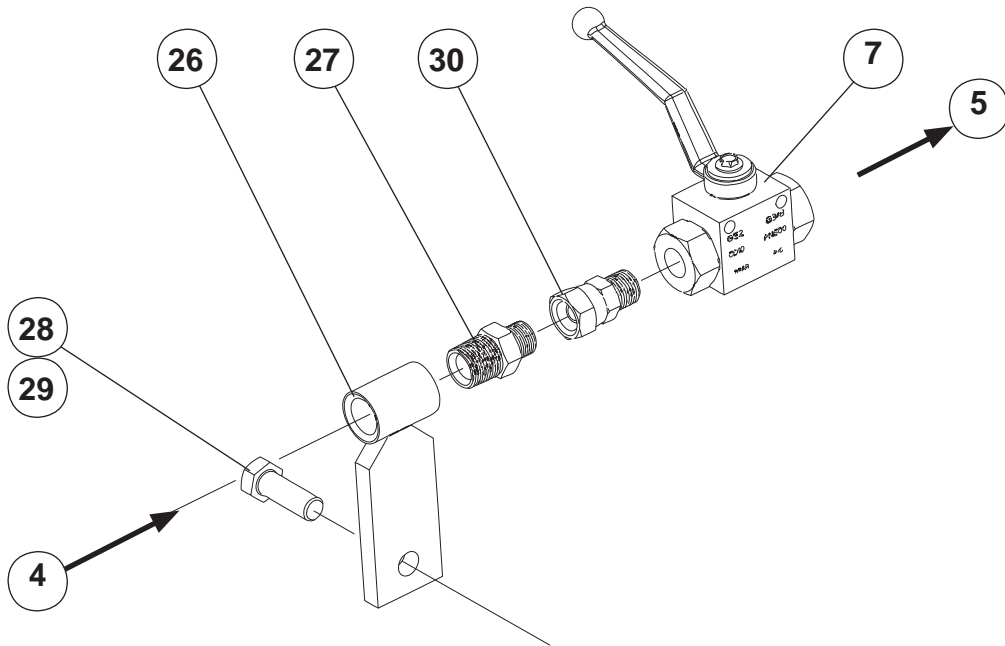
'Enviro 3000e' Hydraulics



‘Enviro 3000e’ Hydraulics

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---------------------------------|-----|
| 1 | 43935 | 4" x 12" Master Rephasing Ram | 1 |
| 2 | 43936 | 3.75" x 12" Slave Rephasing Ram | 1 |
| 3 | 29360 | Hydraulic Hose 6.35m Return | 1 |
| 4 | 29361 | Hydraulic Hose 2.90m Supply | 1 |
| 5 | 29362 | Hydraulic Hose 3.15m | 1 |
| 6 | 29363 | Hydraulic Hose 2.90m | 1 |
| 7 | 43393 | 3/8" BSP S/S Ball Valve | 2 |
| 8 | 43147 | 1/2" BSP Quick Release Coupling | 6 |
| 9 | 43617 | 1/2" Male Probe Dust Cover | 6 |
| 10 | 43151 | 3/4" UNO to 1/2" BSPT Nipple | 4 |
| 11 | 29369 | Dia 22 Tube Clamp Parts | 4 |
| 12 | 43628 | 3 1/2" x 12" Hydraulic Ram | 1 |
| 13 | 26723 | Hydraulic Hose 2.80m | 1 |
| 14 | 26724 | Hydraulic Hose 2.50m | 1 |
| 15 | 43496 | 3/4" UNO to BSPT Elbow | 1 |
| 16 | 43280 | 3/4" UNO to 3/8" BSPP Nipple | 1 |
| 17 | 29125 | Ram Extension Indicator | 1 |
| 18 | 29356 | Indicator Scale Decal | 1 |

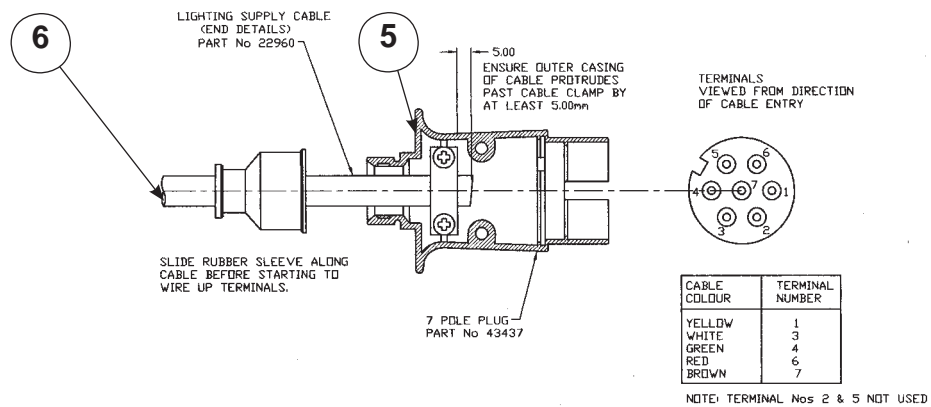
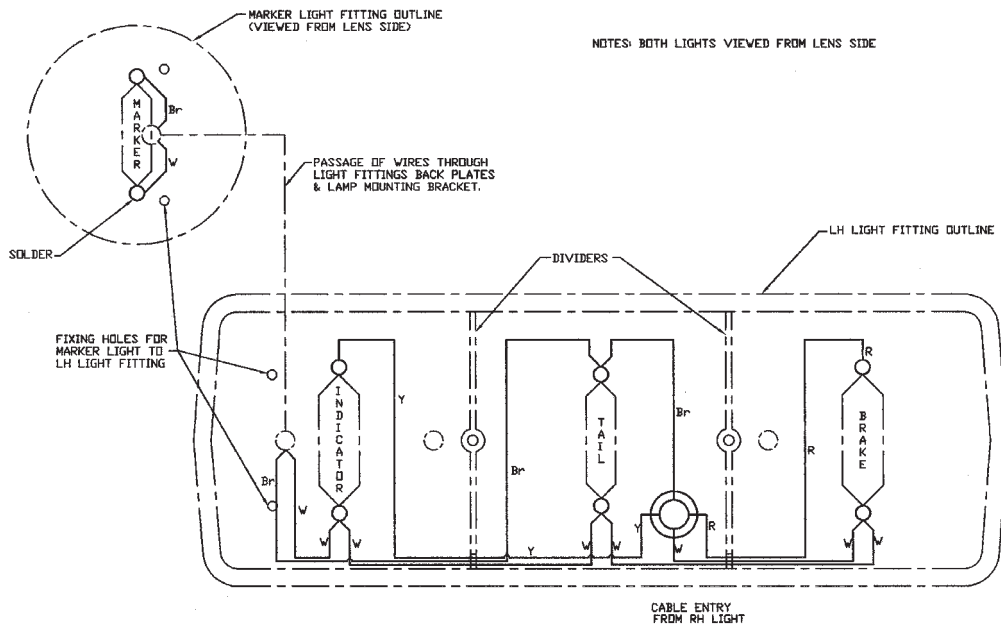
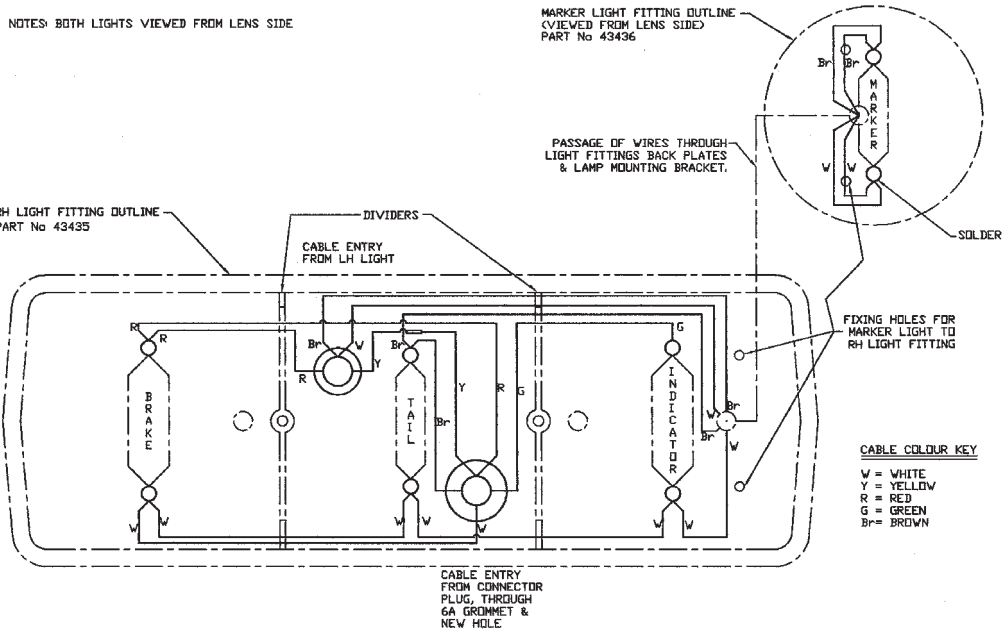
'Enviro 3000e' Hydraulics (continued)



‘Enviro 3000e’ Hydraulics (continued)

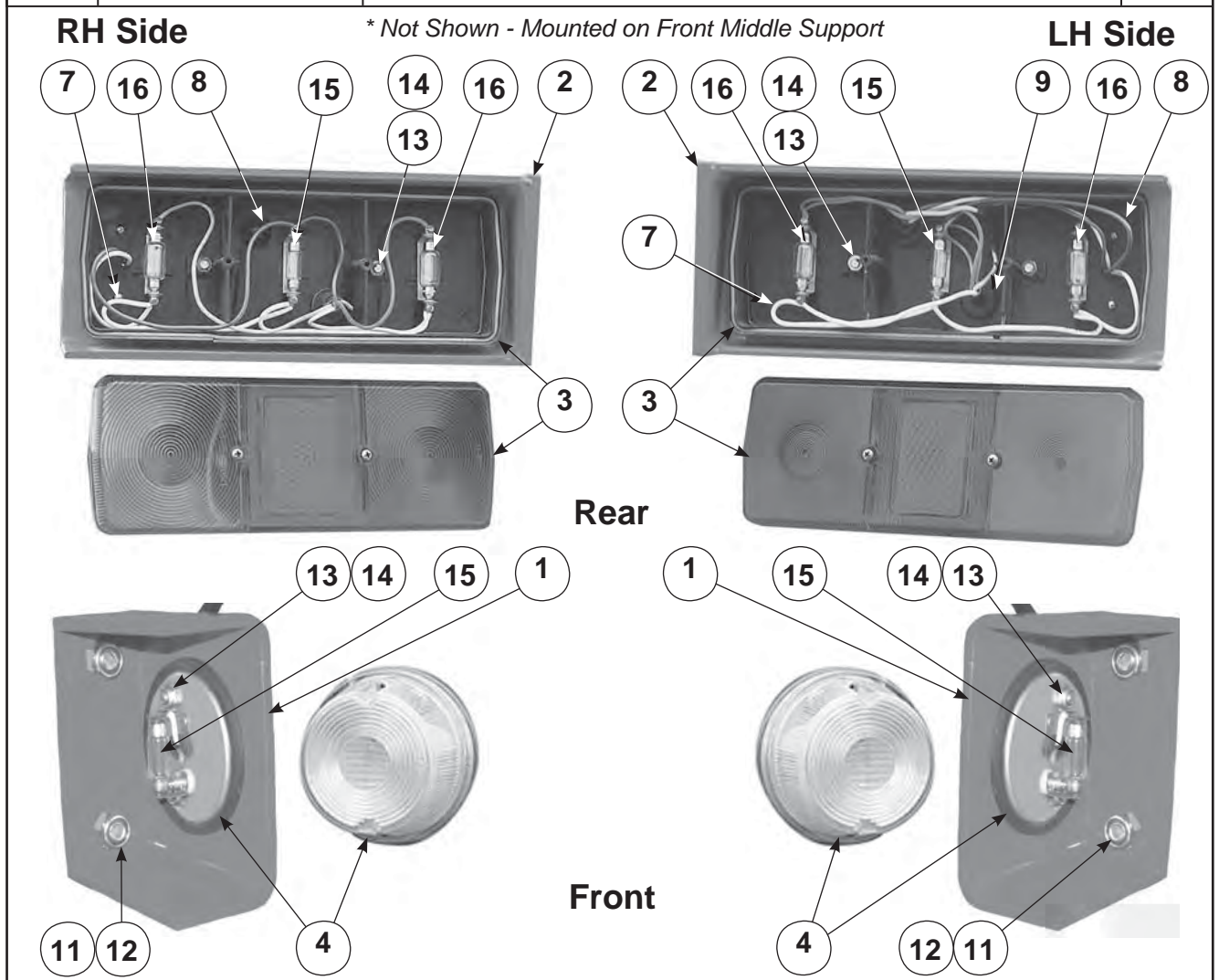
| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---------------------------------------|-----|
| 4 | 29361 | Hydraulic Hose 2.90m Supply | 1 |
| 5 | 29362 | Hydraulic Hose 3.15m | 1 |
| 7 | 43393 | 3/8" BSP S/S Ball Valve | 2 |
| 26 | 22449 | Hydraulic Valve Support Assembly | 1 |
| 27 | 43445 | 1/2" BSPT to 3/8" BSPP Nipple | 3 |
| 28 | 45438 | M12 x 60 Bolt | 1 |
| 29 | 45139 | M12 Nyloc Nut | 2 |
| 30 | 43399 | 3/8" BSPTM to 3/8" BSPF Swivel Nipple | 1 |

'Enviro 3000e' Wiring & Lighting Kit

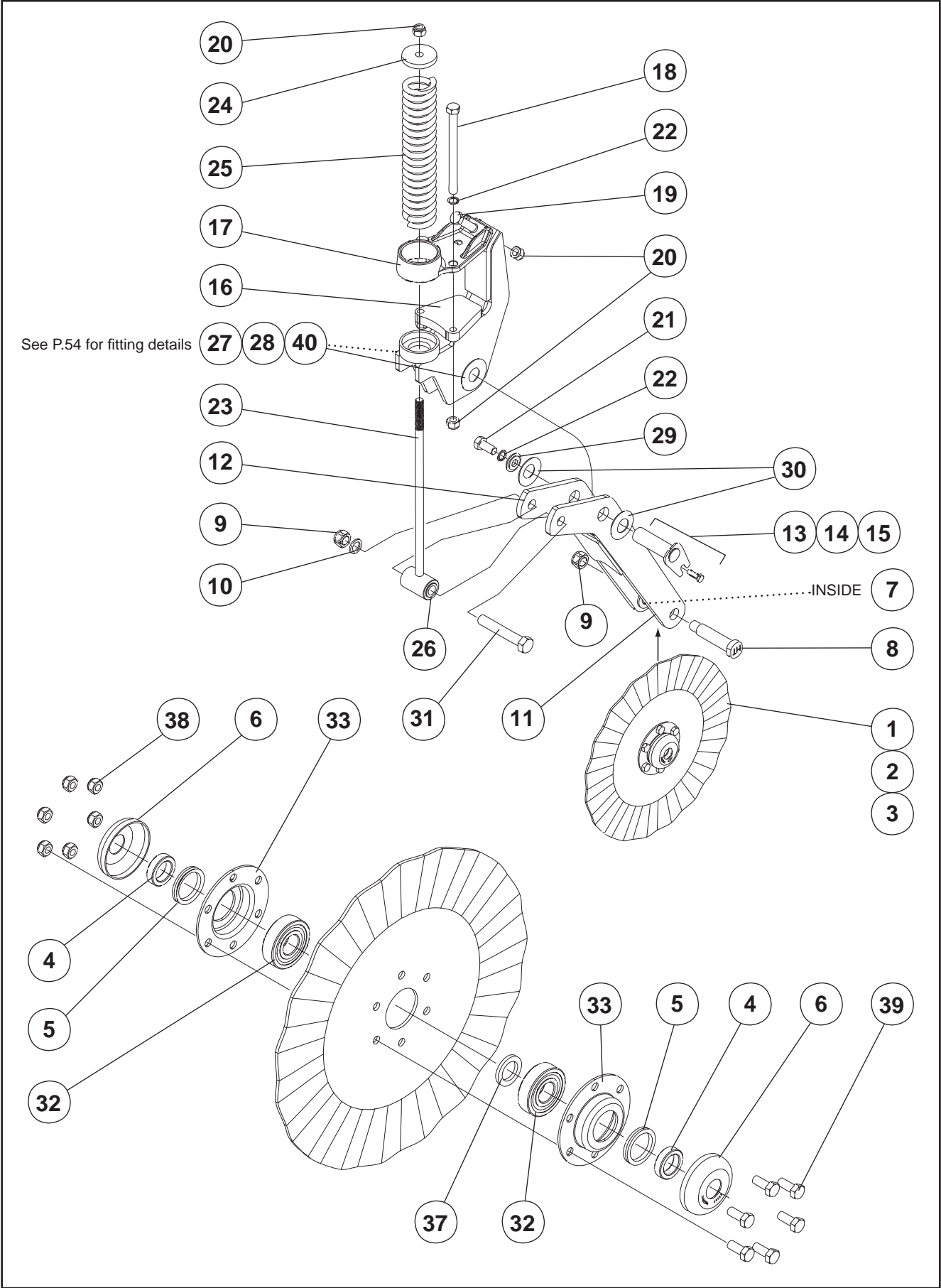


'Enviro 3000e' Wiring & Lighting Kit

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---|-------|
| 1 | 29311 | Front Lamp Bracket Assembly | 2 |
| 2 | 29312 | Rear Lamp Bracket Assembly | 2 |
| 3 | 43435 | Combination Rear Lamp | 2 |
| 4 | 43436 | Marker Lamp | 2 |
| 5 | 43437 | Trailer Round Connector Plug | 1 |
| 6 | 43438 | 5 Core Trailer Flex | 12.5m |
| 7 | 43443 | White 1mm Appliance Wire x 1m | 1 |
| 8 | 43444 | Brown 1mm Appliance Wire x 1m | 1 |
| 9 | 43928 | Trailer Connector 7 Pin (Male)* | 1 |
| 10 | 43929 | Trailer Connector 7 Pin (Female)* | 1 |
| 11 | 45138 | M10 Nyloc Nut | 4 |
| 12 | 454185S | M10 x 25 Class 4.6 Zinc Plated Bolt | 4 |
| 13 | 45401S | M6 x 16 Class 4.6 Zinc Plated Set Screw | 8 |
| 14 | 45122 | M6 Nyloc Nut | 8 |
| 15 | | 5W Festoon Bulb 15 x 44mm | 4 |
| 16 | | 21W Festoon Bulb 15 x 44mm | 4 |



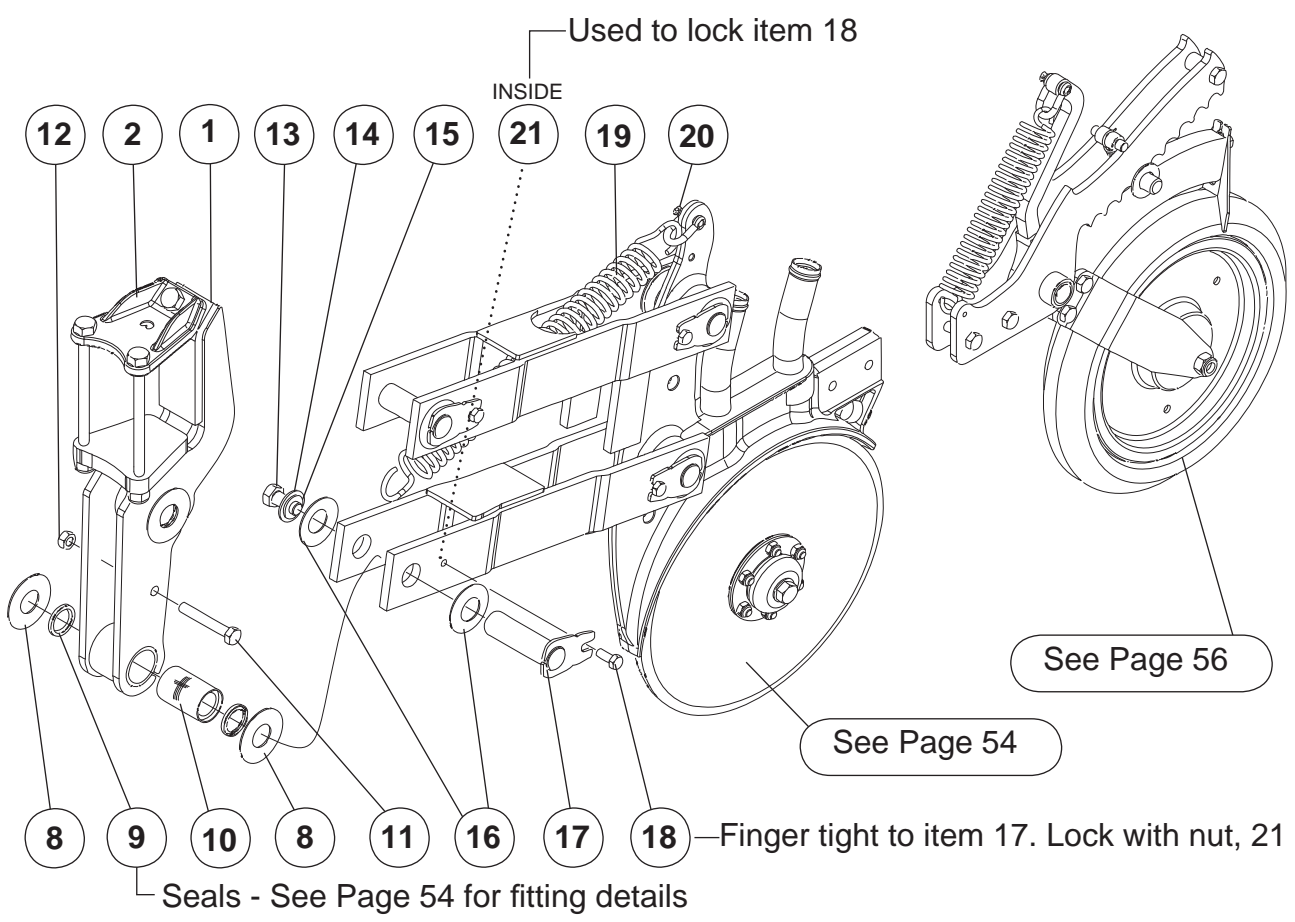
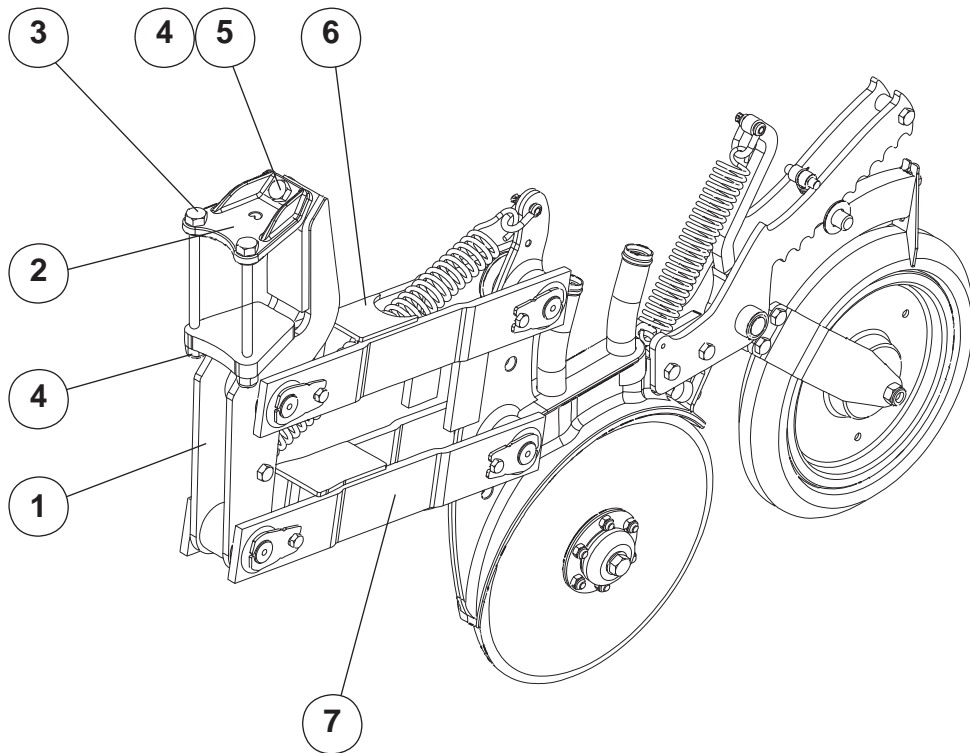
'Enviro 3000e' Front Disc Coulter Assembly



‘Enviro 3000e’ Front Disc Coulter Assembly

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---|-----|
| 1 | 22083 | Front Disc Assembly (Fluted) | 1 |
| 2 | 22084 | Front Disc Assembly (Plain) | 1 |
| 3 | 22095 | Front Disc Assembly (Turbo) | 1 |
| 4 | 43352 | V40 Vee Seal | 2 |
| 5 | 22078 | Seal Collar | 2 |
| 6 | 22080 | Dust Cap | 2 |
| 7 | 45163 | M24 Heavy Duty Flat Washer | 2 |
| 8 | 29216 | Front Coulter Axle Bolt | 1 |
| 9 | 45141 | M20 Nyloc Nut | 1 |
| 10 | 45155 | M20 Light Flat Washer | 1 |
| 11 | 29288 | LH Front Coulter Arm | 1 |
| 12 | 29289 | RH Front Coulter Arm | 1 |
| 13 | 61018 | Pivot Pin Assembly | 1 |
| 14 | 45419 | M10 x 30 Zinc Plated Bolt | 1 |
| 15 | 45130 | M10 Hex Nut | 1 |
| 16 | 29205 | Front Coulter Beam Clamp | 1 |
| 17 | 29211C | Front Coulter Top Clamp | 1 |
| 18 | 45055 | M16 x 200 Class 8.8 Zinc Plated Bolt | 2 |
| 19 | 45043 | M16 x 65 Class 8.8 Zinc Plated Bolt | 1 |
| 20 | 45140 | M16 Nyloc Nut | 3 |
| 21 | 45037 | M16 x 35 Class 8.8 Zinc Plated Bolt | 1 |
| 22 | 45168 | M16 Spring Washer | 3 |
| 23 | 29626 | Coulter Clamp Bolt W/Assembly | 1 |
| 24 | 29214 | Spring Cap | 1 |
| 25 | 29215 | Front Coulter Spring | 1 |
| 26 | 29213 | Clamp Side Plate Spacer | 1 |
| 27 | 43953 | Nylon Washer | 2 |
| 28 | 61016 | Plastic Pivot Bush | 1 |
| 29 | 29219 | Pivot Pin Cap | 1 |
| 30 | 43899 | Disc Spring | 2 |
| 31 | 45072 | M20 x 120 Class 8.8 Zinc Plated Bolt | 1 |
| 32 | 11351 | Bearing | 2 |
| 33 | 17537 | Bearing Housing (6 Hole) | 2 |
| 34 | 22000 | 406 x 4 mm Plain Disc | 1 |
| 35 | 22001 | 406 x 4 mm Fluted Disc | 1 |
| 36 | 22003 | 406 x 4 mm Action Disc | 1 |
| 37 | 22102 | Bearing Spacer | 1 |
| 38 | 45138 | M10 Nyloc Nut | 6 |
| 39 | 45002s | M10 x 25 Zinc Plated Set Screw | 6 |
| 40 | 44000 | Digger Pin Wiper Seal (See Page 54 for fitting details) | 2 |

'Enviro 3000e' Double Disc Assembly

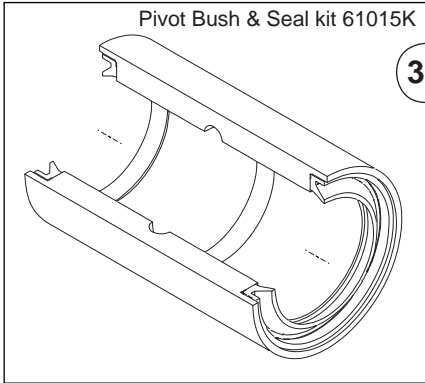


‘Enviro 3000e’ Double Disc Assembly

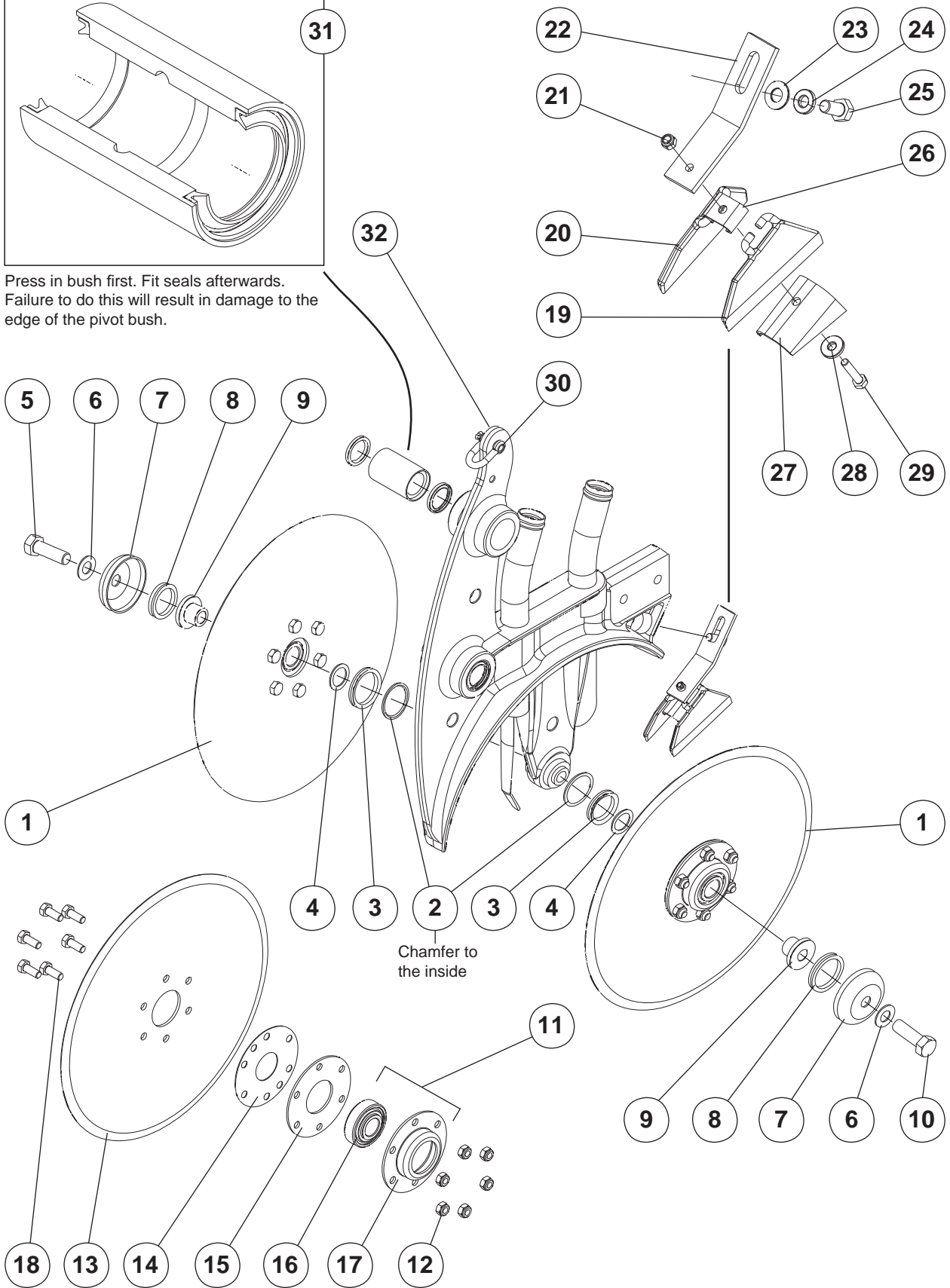
| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---|-----|
| 1 | 29225 | Double Disc Beam Clamp | 1 |
| 2 | 29228C | Double Disc Top Clamp Casting | 1 |
| 3 | 45055 | M16 x 200 Grade 8.8 Bolt | 2 |
| 4 | 45140 | M16 Nyloc Nut | 2 |
| 5 | 45043 | M16 x 65 Grade 8.8 Bolt | 1 |
| 6 | 29231 | Upper Parallel Arm Welded Assembly | 1 |
| 7 | 29230 | Lower Parallel Arm Welded Assembly | 1 |
| 8 | 43953 | Nylon Washer 30 x 70 x 2 | 8 |
| 9 | 44000 | Digger Pin Wiper Seal (See Page 54 for fitting details) | 8 |
| 10 | 61016 | Parallel Arm Pivot Bush (Grey) | 4 |
| 11 | 45029 | M12 x 80 Grade 8.8 Bolt | 1 |
| 12 | 45139 | M12 Nyloc Nut | 1 |
| 13 | 45037 | M16 x 35 Grade 8.8 Bolt | 4 |
| 14 | 45168 | M16 Spring Washer | 4 |
| 15 | 29219 | Pivot Pin Cap | 4 |
| 16 | 43899 | Disc Spring | 8 |
| 17 | 61018 | Parallel Arm Pivot Pin (Ø29.95/30.00) | 4 |
| 18 | 45002s | M10 x 25 Grade 8.8 Set Screw | 4 |
| 19 | 29227 | Double Disc Spring | 1 |
| 20 | 45321 | 5/16" 'D' Shackle | 3 |
| 21 | 45130 | M10 Plain Nut | 4 |

Note: Pivot bush and seals (Items 9 & 10) are available together in kit 61015K (1 bush, 2 seals)

'Enviro 3000e' Double Disc Assembly (continued)



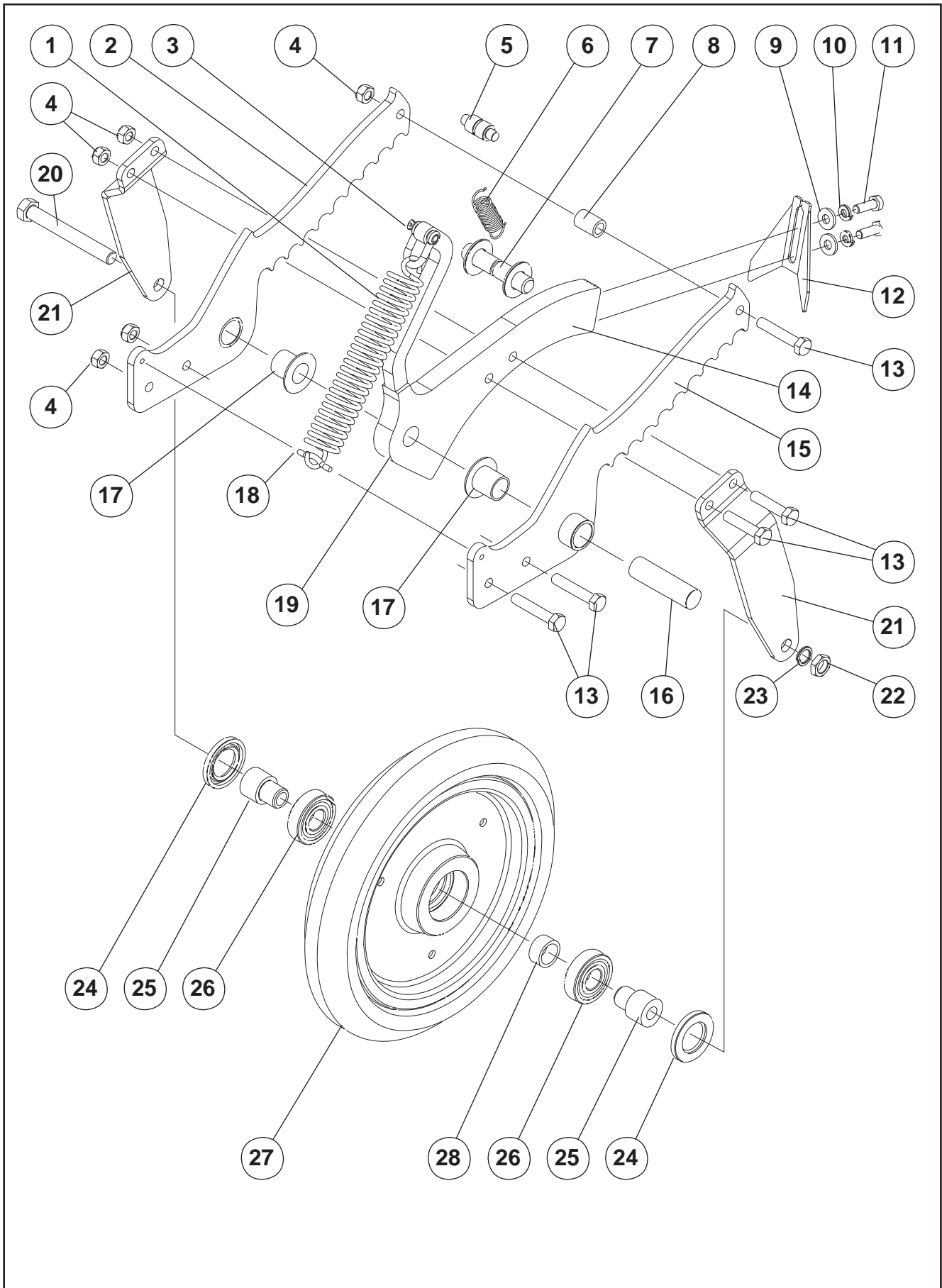
Press in bush first. Fit seals afterwards.
Failure to do this will result in damage to the edge of the pivot bush.



'Enviro 3000e' Double Disc Assembly (continued)

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---|-----|
| 1 | 29240 | Plain Disc and Bearing Assembly | 2 |
| 2 | 22136 | Plastic Spacer | 2 |
| 3 | 43352 | Vee Ring Seal V-40A | 2 |
| 4 | 29247 | 25 i/d x 35 o/d x 1.6 Flat Washer | 2 |
| 5 | 45040 | M16 x 50 Class 8.8 Bolt Z/P | 1 |
| 6 | 45154 | M16 Light Flat Washer | 2 |
| 7 | 22077 | 16 mm Bore Dust Cap | 2 |
| 8 | 43891 | Vee Ring Seal V-45A | 2 |
| 9 | 29241 | Bearing & Seal Sleeve | 2 |
| 10 | 22082 | M16 (LH Thread) x 50 Disc Retaining Bolt | 1 |
| 11 | 29242 | Triple Seal Bearing and Housing Assembly | 2 |
| 12 | 45138 | M10 Nyloc Nut | 12 |
| 13 | 22002 | Plain Disc 6 Hole | 2 |
| 14 | 22081 | Stainless Steel Face Seal Ring | 2 |
| 15 | 29244 | Bearing Housing Spacer 3 mm | 2 |
| 16 | 43890 | Triple Seal Bearing | 2 |
| 17 | 29243 | Bearing Housing 6 Hole Triple Seal | 2 |
| 18 | 45002s | M10 x 25 Grade 8.8 Set Screw | 12 |
| 19 | 22087C | LH Scraper Casting | 1 |
| 20 | 22086C | RH Scraper Casting | 1 |
| 21 | 45136 | M6 Nyloc Nut | 1 |
| 22 | 22069 | Double Disc Scraper Mounting Strap | 1 |
| 23 | 45152 | M10 Zinc Plated Light Flat Washer | 1 |
| 24 | 45166 | M10 Zinc Plated Spring Washer | 1 |
| 25 | 45001s | M10 x 20 Class 8.8 Set Screw Z/P | 1 |
| 26 | 22088 | Scraper Hinge Stainless | 1 |
| 27 | 22070 | Double Disc Scraper Tensioner | 1 |
| 28 | 45156 | M6 Heavy Duty Flat Washer | 1 |
| 29 | 44955 | M6 x 30 Class 8.8 Bolt Z/P | 1 |
| 30 | 45321 | 5/16" 'D' Shackle | 1 |
| 31 | 61015K | Pivot Bush & 2 Seals Kit | 4 |
| 32 | 29239 | Double Disc Welded Assembly (with Seed Tubes) | 1 |

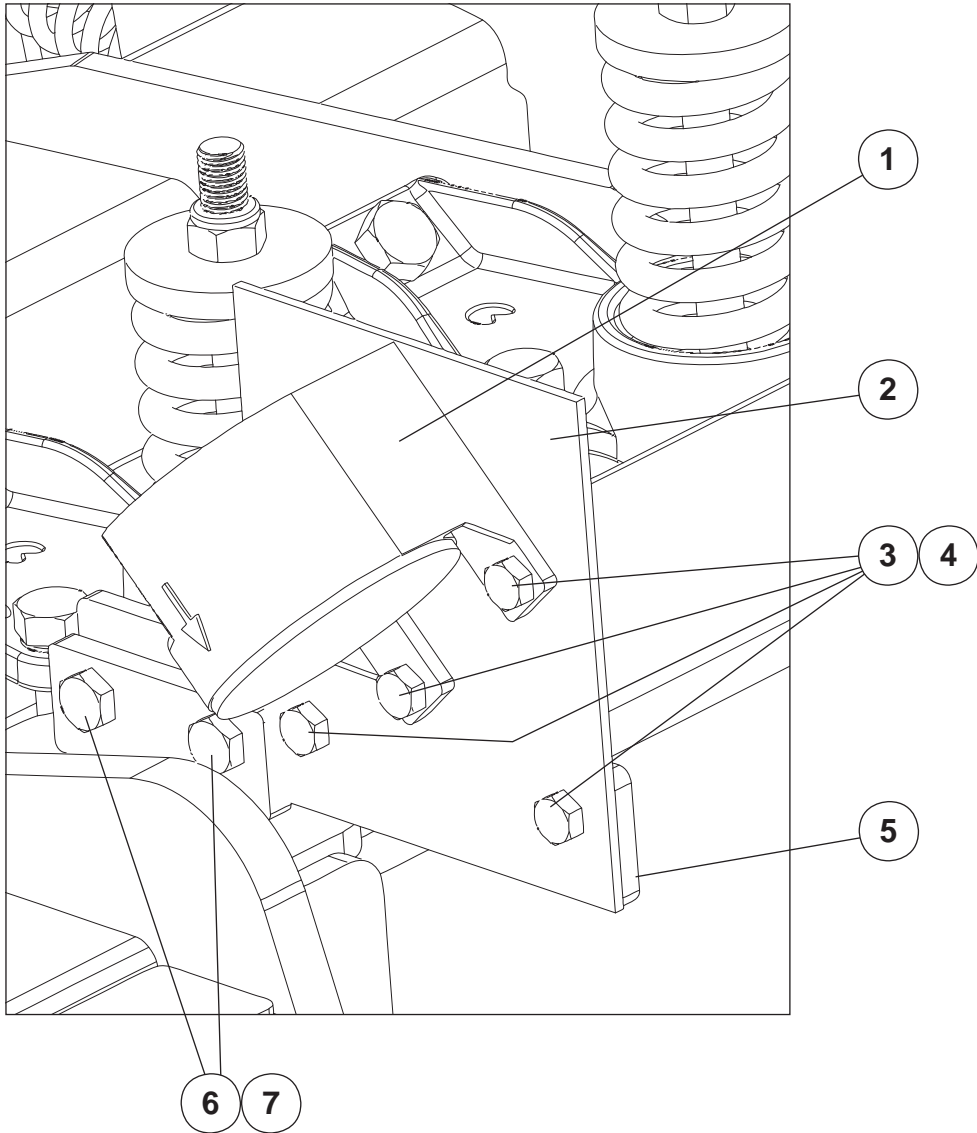
'Enviro 3000e' Press Wheel Assembly



‘Enviro 3000e’ Press Wheel Assembly

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----|
| 1 | 23536 | Tension Spring 7.5kN/m | 1 |
| 2 | 29279 | Upper Jaw Assy RH | 1 |
| 3 | 45321 | D Shackle 5/16" | 1 |
| 4 | 45139 | M12 Nyloc Nut | 5 |
| 5 | 23506 | Spring Slide | 1 |
| 6 | 23525 | Tension Spring | 1 |
| 7 | 29257 | Jaw Lock Pin Assembly | 1 |
| 8 | 23504 | Upper Jaw Spacer | 1 |
| 9 | 45158 | M10 Heavy Duty Flat Washer Z/P | 2 |
| 10 | 45166 | M10 Spring Washer Z/P | 2 |
| 11 | 45003s | M10 x 30 Grade 8.8 Set Screw | 2 |
| 12 | 29267 | Scraper for 15" x 80mm Wedge Press Wheel | 1 |
| 13 | 45026 | M12 x 65 Grade 8.8 Bolt | 5 |
| 14 | 29274 | Lower Jaw Assembly | 1 |
| 15 | 29277 | Upper Jaw Assy LH | 1 |
| 16 | 24452 | Jaw Pivot Pin | 1 |
| 17 | 24456 | Bush Top Hat | 2 |
| 18 | 23503 | Spring Retainer | 1 |
| 19 | 45187 | M10 x 16 Socket Head Grubscrew | 1 |
| 20 | 45051 | M16 x 130 Grade 8.8 Bolt | 1 |
| 21 | 29260 | Press Wheel Arm | 2 |
| 22 | 45119 | M16 Half Nut | 1 |
| 23 | 45168 | M16 Spring Washer | 1 |
| 24 | 10283 | Oil Seal | 2 |
| 25 | 61022 | Bearing Mount | 2 |
| 26 | 11351 | Bearing | 2 |
| 27 | 43573 | Press Wheel | 1 |
| 28 | 61021 | Spacer | 1 |

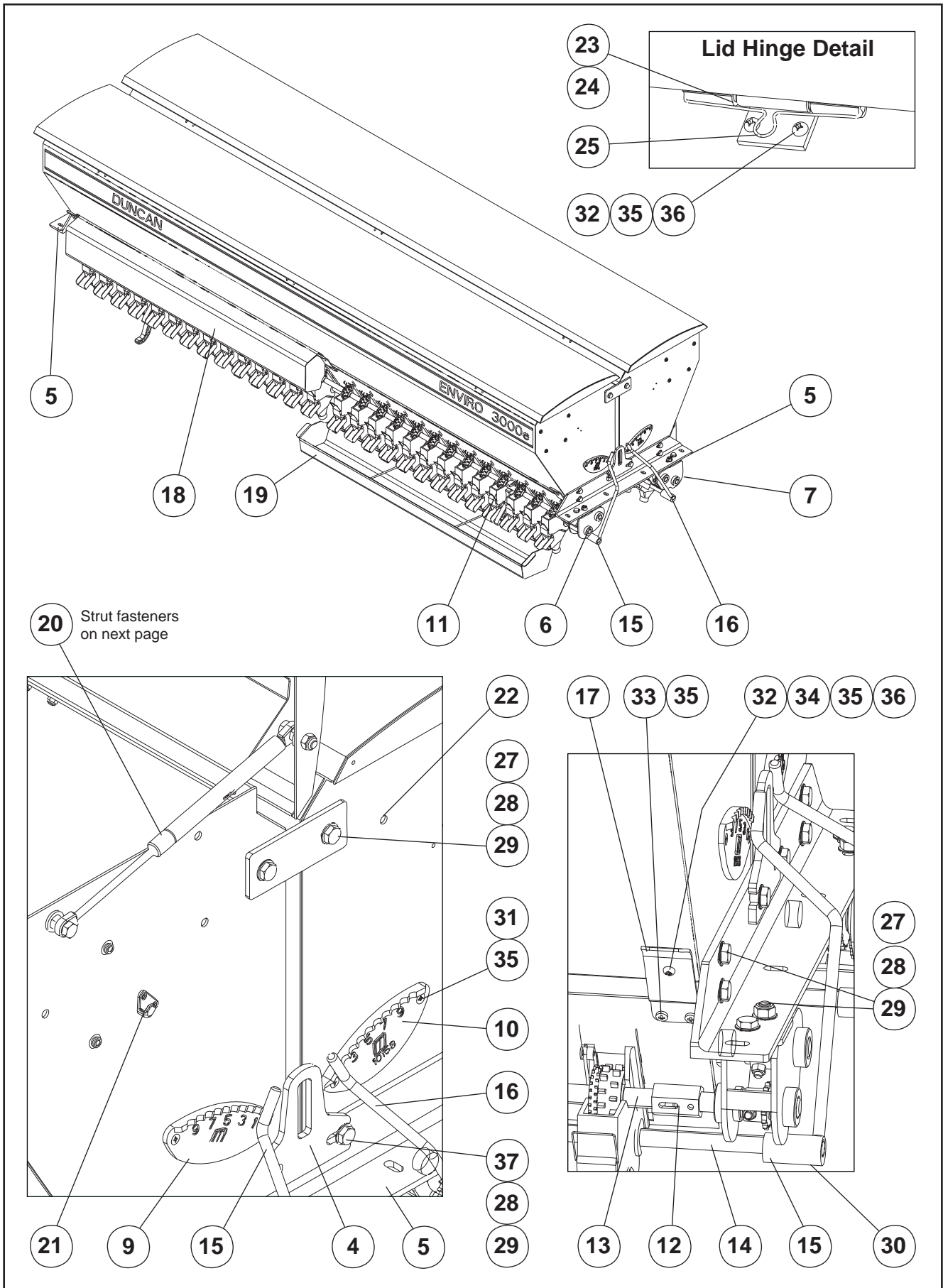
'Enviro 3000e' Radar



'Enviro 3000e' Radar

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|------------------------------|-----|
| 1 | 43951 | Radar Unit | 1 |
| 2 | 43690 | Radar Mounting Bracket | 1 |
| 3 | 45002s | M10 x 25 Grade 8.8 Set Screw | 4 |
| 4 | 45138 | M10 Nyloc Nut | 4 |
| 5 | 63110 | Extension Plate | 1 |
| 6 | 45019s | M12 X 30 Grade 8.8 Set Screw | 2 |
| 7 | 45139 | M12 Nyloc Nut | 2 |

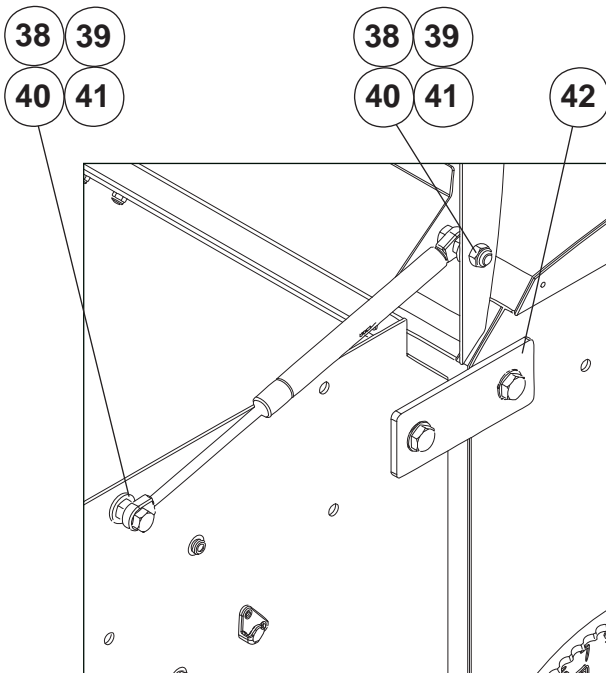
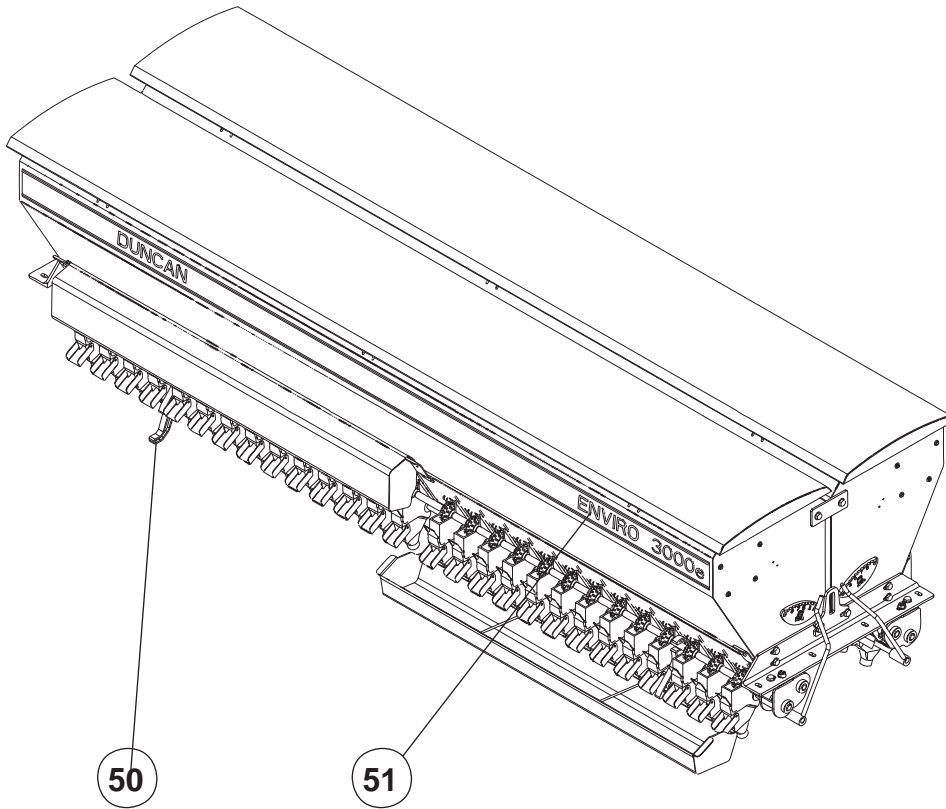
'Enviro 3000e' Seedbox Assembly



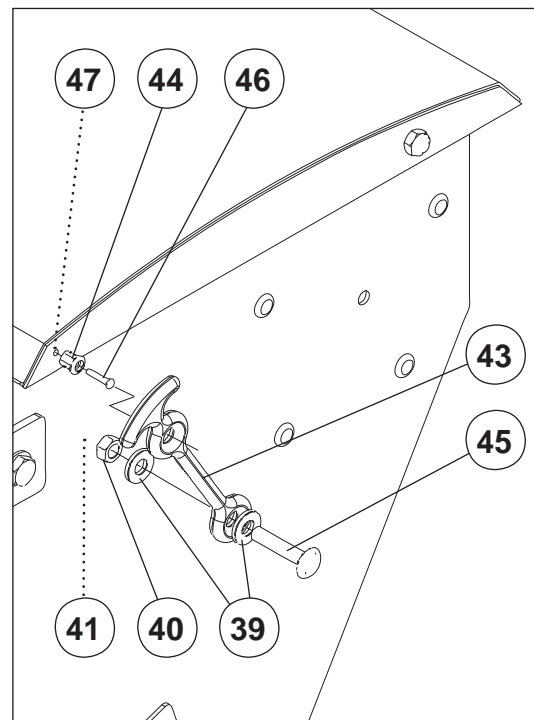
‘Enviro 3000e’ Seedbox Assembly

| ITEM | PART No. | DESCRIPTION | QTY |
|--|---------------|---|-----|
| 1 | 29579 | Box Only | 2 |
| 2 | 29576 | Box with Lid | 2 |
| 3 | 60320 | Lid Only | 2 |
| 4 | 22485P | Box Set Lifting Eye Profile | 2 |
| 5 | 29595 | Box Set Mounting Bracket | 2 |
| 6 | 60118PH | Front Agitator Drive assy | 1 |
| 7 | 60110PH | Rear Agitator Drive assy | 1 |
| 8 | 22855 | Agitator Access Blanking Plate (not shown) | 2 |
| 9 | 10143 | Front Box Quadrant Plate | 1 |
| 10 | 10158 | Rear Box Reverse Quadrant Plate | 1 |
| 11 | Refer Page 67 | Seeder Assembly | 27 |
| 12 | 23633 | Box Shaft Connecting Sleeve | 4 |
| 13 | 60146 | Box Shaft (20mm) | 2 |
| 14 | 60145 | Flap Shaft (18mm) | 2 |
| 15 | 29620 | Front Flapshaft Handle w/assy | 1 |
| 16 | 29621 | Rear Flapshaft Handle w/assy | 1 |
| 17 | 22568 | Location Tab (Calibration Tray) | 6 |
| 18 | 29593 | Calibration Tray Assembly (1415 long) | 2 |
| 19 | 29594 | Calibration Tray Assembly (1313 long) | 2 |
| 20 | 45644 | Gas Strut | 4 |
| 21 | 43430 | Lashing Hook | 4 |
| 22 | 14442 | Rubber Body Plug | 28 |
| 23 | 29163 | Hinge Assembly | 6 |
| 24 | 22491 | Hinge Pin | 6 |
| 25 | 27599 | Hinge Pin Spring Clip | 6 |
| 26 | 43373 | Black Edge Trim | 2 |
| 27 | 45019s | M12 x 30 Set Screw Class 8.8 Zinc Plate | 20 |
| 28 | 45153 | M12 Light Flat Washer | 40 |
| 29 | 45139 | M12 Nyloc Nut | 20 |
| 30 | 45186 | M10 x 12 Socket Head Grubscrew | 4 |
| 31 | 45758 | M6 x 16 Zinc Plated Countersunk Posidrive Screw | 4 |
| 32 | 45908 | M6 x 16 Zinc Plated Pan Head Machine Screw | 21 |
| 33 | 45907 | M6 x 12 Zinc Plated Pan Head Machine Screw | 6 |
| 34 | 45122 | M6 Class 8.8 Zinc Plated Hex Nut | 6 |
| 35 | 45136 | M6 Nylock Nut | 38 |
| 36 | 45150 | M6 Zinc Plated Light Flat Washer | 12 |
| 37 | 45021s | M10 x 40 Class 8.8 Set Screw Zinc Plate | 4 |
| <i>Continued on following pages...</i> | | | |

'Enviro 3000e' Seedbox Assembly (continued)



**Gas Strut Fastener
Detail**



Rubber Latch Detail

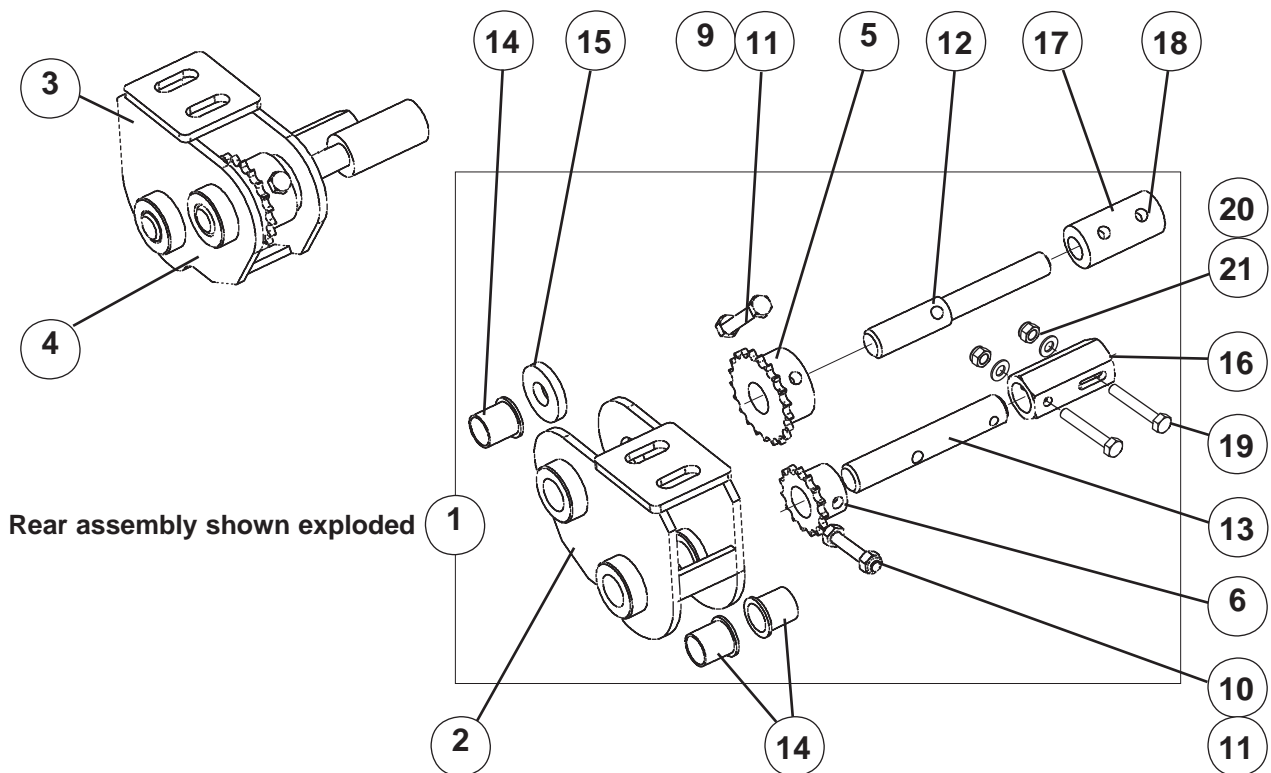
‘Enviro 3000e’ Seedbox Assembly (continued)

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|---|-----|
| 38 | 45005 | M10x 40 Bolt Class 8.8 Zinc Plate (Gas Strut) | 8 |
| 39 | 45158 | M10 Heavy Duty Washer (Gas Strut) | 16 |
| 40 | 45130 | M10 Nut (Gas Strut) | 8 |
| 41 | 45654 | M10 Dome Nut Stainless | 8 |
| 42 | 60190P | Box Strap | 2 |
| 43 | 45645 | T Pull Rubber Rope | 4 |
| 44 | 45646 | Hook for Rubber Tensioner | 4 |
| 45 | 45661ss | M10 x 50 SS Button Head Screw | 4 |
| 46 | 45633 | M4 x 25 Pan Head Screw | 4 |
| 47 | 45632 | M4 Nyloc Nut | 4 |
| 48 | 29193 | Weather Skirts (Not Shown) | 2 |
| 49 | 29194 | Weather Skirt Holder (Not Shown) | 4 |
| 50 | 26599 | Calibration Tray Bracket | 8 |
| 51 | 29346 | Decal ‘Duncan Enviro 3000e’ | 2 |

'Enviro 3000e' Agitator Drives

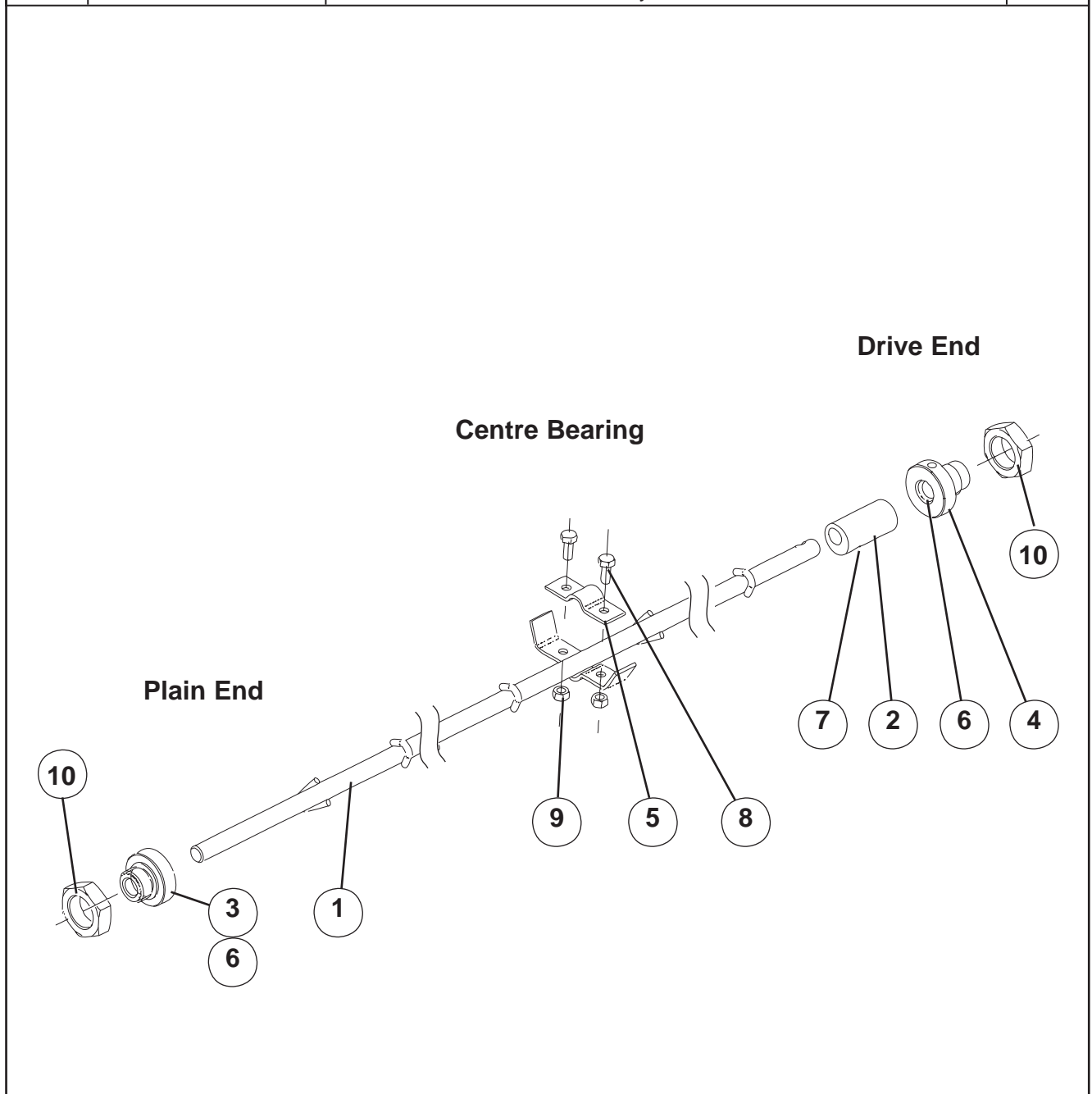
| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----|
| 1 | 60110PH | Agitator Drive Rear Housing complete with internals | 1 |
| 2 | 60110 | Rear Housing only | 1 |
| 3 | 60118PH | Agitator Drive Front Housing complete with internals | 1 |
| 4 | 60118 | Front Housing only | 1 |
| 5 | 22418 | 3/8" Pitch x 20mm Bore 21T Sprocket | 2 |
| 6 | 22422 | 3/8" Pitch x 20mm Bore 15T Sprocket | 2 |
| 7 | 22417 | 3/8" Pitch x 33 Link BS Chain | 2 |
| 8 | 43396 | 3/8" Pitch Joiner Link | 2 |
| 9 | 44968 | M8 x 60 Class 8.8 Zinc Plated Bolt | 2 |
| 10 | 44965 | M8 x 45 Class 8.8 Zinc Plated Bolt | 2 |
| 11 | 45137 | M8 Nylock Nut | 4 |
| 12 | 22425 | Agitator Shaft Extension | 2 |
| 13 | 22426 | Seed Shaft Extension | 2 |
| 14 | 43428 | Nylon Bush | 6 |
| 15 | 22416 | Agitator Drive Spacer | 2 |
| 16 | 22419 | Box Shaft Connecting Sleeve (long) | 2 |
| 17 | 22420 | Agitator Shaft Joining Collar | 2 |
| 18 | 45180SS | M8 x 10 Stainless Steel Socket Head Grub Screw | 4 |
| 19 | 44956SS | M6 x 40 Bolt S/Steel | 4 |
| 20 | 45136SS | M6 Nyloc Nut S/Steel | 4 |
| 21 | 45150SS | M6 Light Flat Washer | 4 |

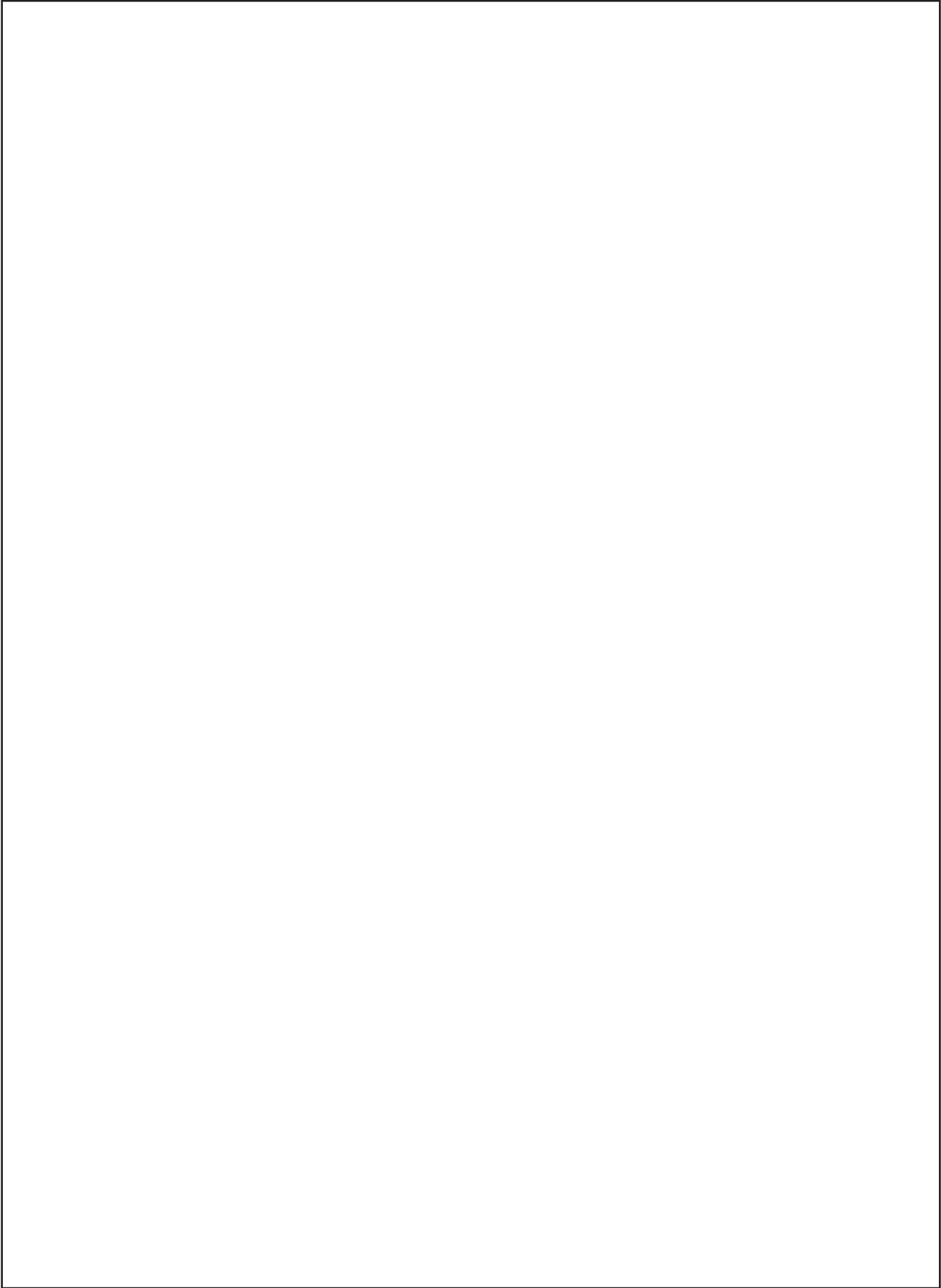
Note: Quantities are per machine single/double box



'Enviro 3000e' Agitator Shaft Assembly

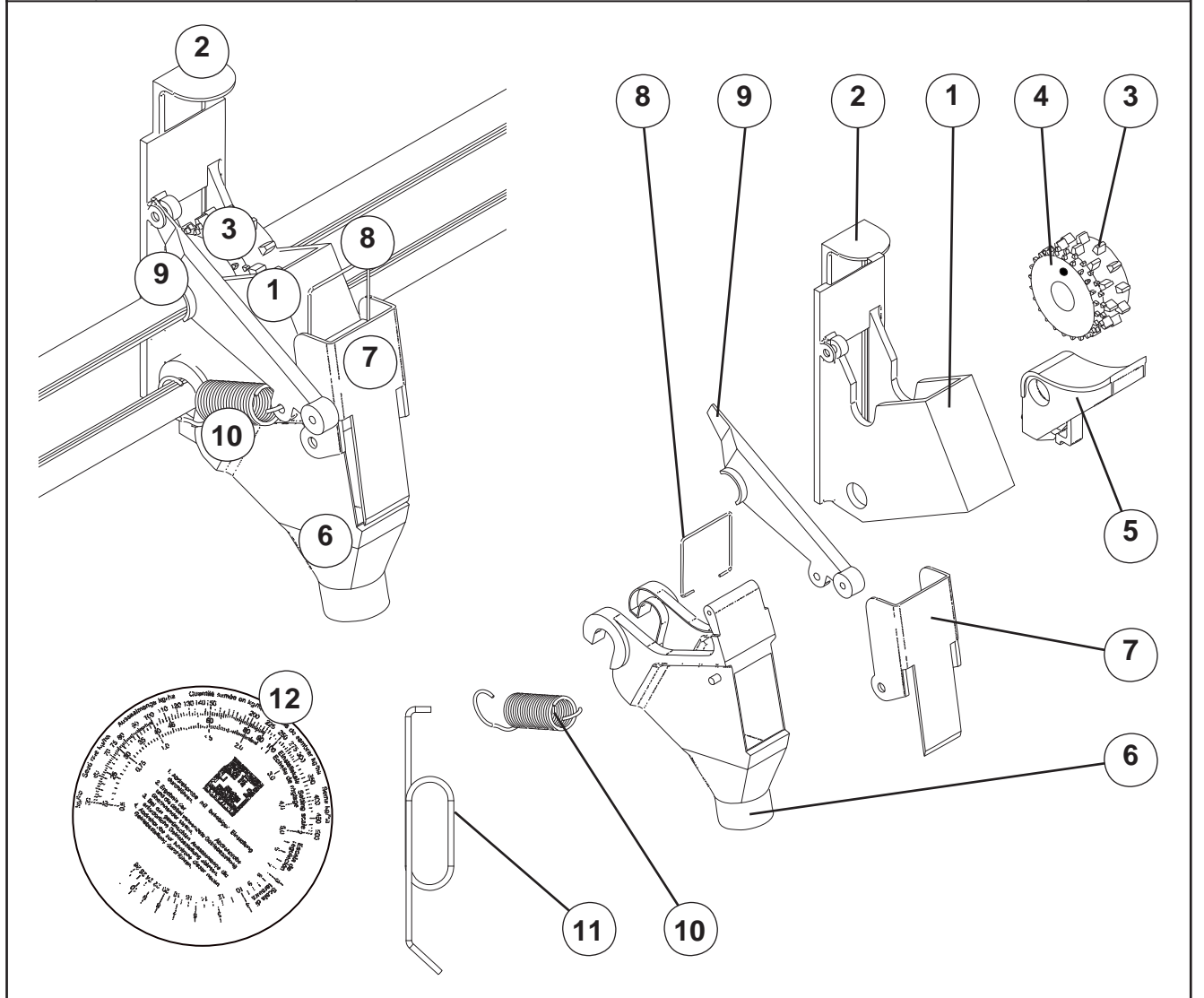
| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----|
| 1 | 29590 | Agitator Shaft Assembly (Front Box) | 1 |
| 1 | 29591 | Agitator Shaft Assembly (Rear Box) | 1 |
| 2 | 22420 | 16mm Agitator Joining Collar | 2 |
| 3 | 22423 | Agitator Shaft Support RH (Short) | 2 |
| 4 | 22424 | Agitator Shaft Support LH (Long) | 2 |
| 5 | 22428 | Agitator Shaft Support Cap | 2 |
| 6 | 43442 | 5/8" Lurethane Wiper Seal | 4 |
| 7 | 45185SS | M10 x 10 Stainless Steel Socket Head Grubscrew | 4 |
| 8 | 45410SSS | M8 x 16 Grade 316 Stainless Steel Set Screw | 4 |
| 9 | 45137SS | M8 Grade 316 Stainless Steel Nylock Nut | 4 |



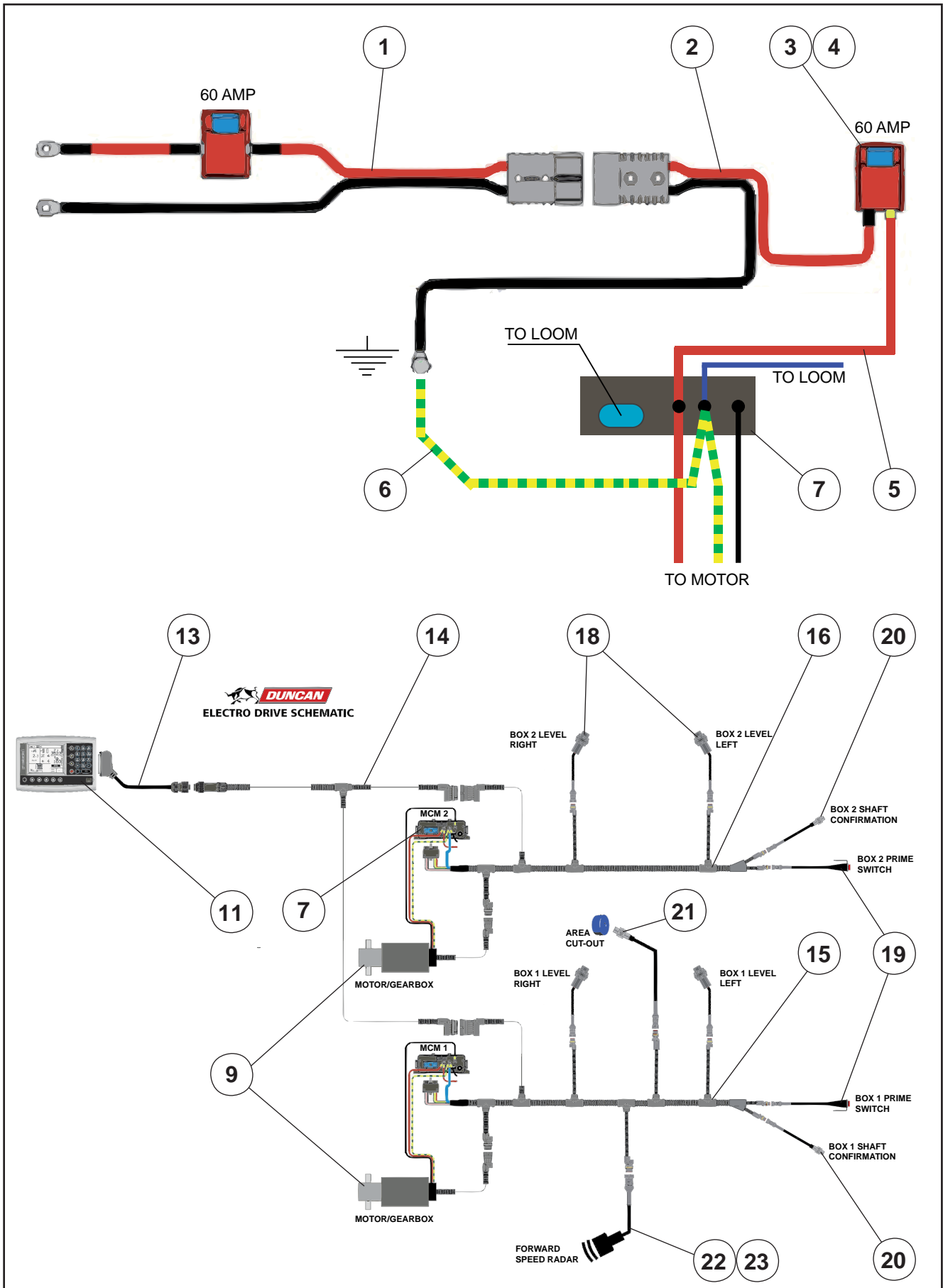


'Enviro 3000e' Seeder Mechanism

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----------|
| 1 | 43375 | Metering Housing | 2 per run |
| 2 | 43376 | Shutter Slide | 2 per run |
| 3 | 43377 | Seed Metering Wheel Assembly (Includes item 4) | 2 per run |
| 4 | 43374 | Fine Seed Wheel (For Spares Ordering Only) | - |
| 5 | 43378 | Bottom Flap & Bolt Assembly | 2 per run |
| 6 | 22550 | Seeder Extension Funnel | 2 per run |
| 7 | 22551 | Seed Diverter | 2 per run |
| 8 | 22548 | Spring Clip, S/S | 2 per run |
| 9 | 43379 | Seed Shaft Guide Bearing | 6 |
| 10 | 43380 | Guide Bearing Tension Spring | 6 |
| 11 | 43382 | Metering Wheel Clutch Hook | 1 |
| 12 | 43383 | Seed Rate Disc Calculator | 1 |
| 13 | 43362 | Fine Seed Wheel Brush (Optional Extra) | - |
| 14 | 29270 | Seed/Fertilizer Conductor Tube 600mm (Not Shown) | 2 per run |
| 15 | 11102 | Cray Clip | 4 per run |

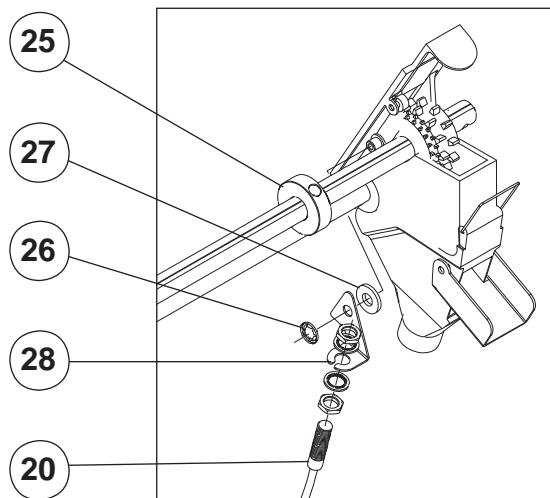


'Enviro 3000e' Electric Drive

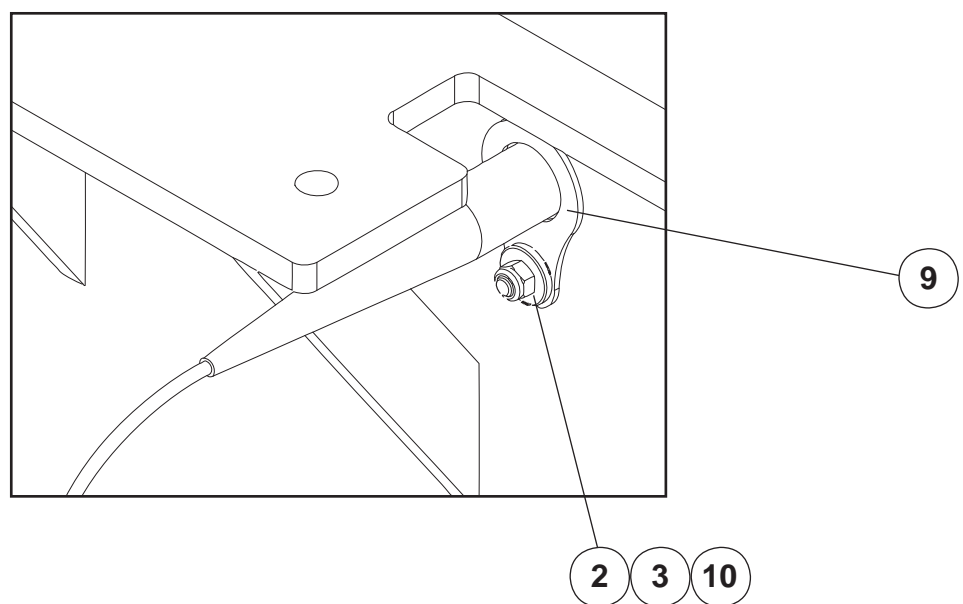
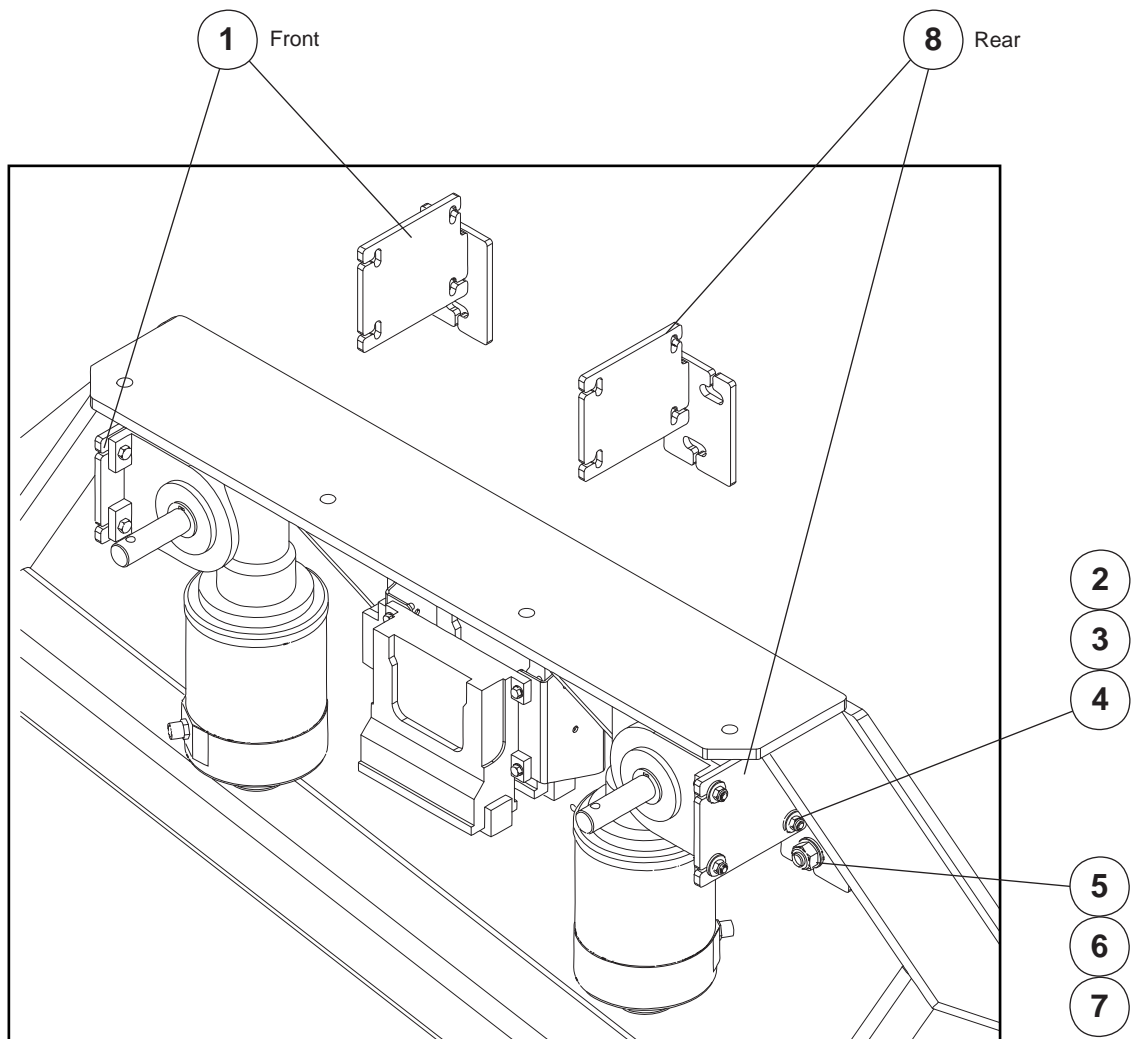


'Enviro 3000e' Electric Drive

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|--|-----------|
| 1 | 43952 | Tractor Power Lead c/w Fuse Assembly | 1 |
| 2 | 44040 | Drill Power Lead | 1 |
| 3 | 44041 | Fuseholder with fuse -60 Amp | 1 |
| 4 | 43984 | 60Amp Maxi Fuse (Blue) | 2 |
| 5 | 44042 | Red power cable 250mm long. M5 Ring 12-10 AWG | 1 per box |
| 6 | 44043 | Yellow/Green earth cable 250mm long. M5 Ring 12-10 AWG | 1 per box |
| 7 | 44025 | Motor Control Module (Cinch Connector) | 1 per box |
| 8 | 63160 | MCM Bracket | 2 per MCM |
| 9 | 43943 | 450watt, 100:1 g/box & 100ppr Encoder | 2 |
| 10 | 44044 | 150watt, 100:1 g/box & 100ppr Encoder (small seeds box only) | option |
| 11 | 44047 | Duncan PS Console with ver. 27 software | 1 |
| 12 | 43983 | PS Console Mounting Bracket | 1 |
| 13 | 43982 | Duncan PS Instrument Lead | 1 |
| 14 | 44048 | Duncan 3000e Mk2 Drill Harness to Tractor | 1 |
| 15 | 44049 | Duncan 3000e Mk2 Box 1 Harness | 1 |
| 16 | 44050 | Duncan 3000e Mk2 Box 2 Harness | 1 |
| 17 | 44051 | Duncan 3000e Mk2 Box 3 Harness | option |
| 18 | 43948 | 0.5m Level Sensor c/w Connector | 4 |
| 19 | 43950 | 0.5m Priming Switch c/w Connector | 1 per box |
| 20 | 43949 | 0.5m Shaft Speed Sensor c/w Connector | 1 per box |
| 21 | 44053 | Radar extension lead 3m | 1 |
| 22 | 44054 | Area cutout sensor 3m | 1 |
| 23 | 43951 | Radar | 1 |
| 24 | 43956 | Bar Magnet (Wheel Ram Sensor) | 2 |
| 25 | 43958 | Magnet Ring | 1 per Box |
| 26 | 45368SS | M10 Starlock Fixing Washer | 1 per Box |
| 27 | 45158 | M10 Heavy Duty Flat Washer | 1 per Box |
| 28 | 29339 | Shaft Confirmation Sensor Bracket | 1 per Box |



'Enviro 3000e' Electric Drive (continued)



'Enviro 3000e' Electric Drive (continued)

| ITEM | PART No. | DESCRIPTION | QTY |
|------|----------|------------------------------------|-----|
| 1 | 29141 | Gearbox Mount Assembly (Front) | 1 |
| 2 | 45403S | M6 x 25 Set Screw | 10 |
| 3 | 45136 | M6 Nyloc Nut | 10 |
| 4 | 45156 | M6 Heavy Duty Flat Washer | 8 |
| 5 | 45020 | M12 x 35 Bolt | 4 |
| 6 | 45139 | M12 Nyloc Nut | 4 |
| 7 | 45159 | M12 Heavy Duty Flat Washer | 4 |
| 8 | 29142 | Gearbox Mount Assembly (Rear) | 1 |
| 9 | 29338P | Priming Switch Bracket (1 per box) | 2 |
| 10 | 45150 | M6 Light Flat Washer | 2 |
| 11 | 43949 | Sensor | 1 |
| 12 | 29129 | Wheel Sensor Mount | 1 |
| 13 | 43954 | Hose Clamp | 1 |
| 14 | 43956 | Magnet | 1 |
| 15 | 29134 | Activator Arm | 1 |
| 16 | 45152 | M10 Light Flat Washer | 1 |
| 17 | 45166 | M10 Spring Washer Z/P | 1 |
| 18 | 45001s | M10 x 20 Grade 8.8 Set Screw Z/P | 1 |

