1500 Autowrap

1500 Series (1510 / 1520 / 1530 / 1540)

Tanco AUTOWRAP

Innovation in Agricultural Machinery

OPERATOR'S handbook

Model Shown: 1540 EH

1500/V.01-11-ENG

Table of Contents

Tanco Autowrap Ltd congratulates you on your choice of the TANCO AUTOWRAP 1500 Series bale wrapping machine. We are certain you will be satisfied with the machine, and that you will have the pleasure of your investment for many years.

The TANCO AUTOWRAP bale wrapping machine has more features than any other bale wrapping machine available. The 1500 Series machines can pick up the bale, wrap and stack them without the operator leaving the tractor cab; this is a patented system.

This machine is hydraulically driven by the tractor's hydraulic system and is controlled from the tractor cab by an automatic control unit. The machine can either be mounted to three point linkage, front mounted with quick-couplers to the tractors front loader or on a wheel loader. Then it's possible to stack the bales upon each other. The wrapped bale can be either dropped conventionally to the ground or with the fitting of an optional 'End Tip' (1510 & 1520 Models only) the bale can be dropped on its end.

This manual is meant to explain how TANCO AUTOWRAP 1500 Series models are setup, attached to tractor, used and how it works, and shall together with the spare part's list be a reference for maintenance and troubleshooting. So take good care of this book; it is a part of the machine.

Read carefully through this manual, and especially the safety instructions, before starting the machine. Follow the instructions thoroughly, if problems should occur, check the troubleshooting guide to try to establish the problem. Ask your dealer for advice before you attempt anything that may make the problem worse.

1500 Models
The Tanco Autowrap 1500 Range of bale wrappers consists of four models; 1510,1520 for round bales and 1530,1540 for square bales.

1510 / 1520 (See Fig. 1)
The 1510 &1520 are designed to wrap round bales of grass, hay or straw, with nominal diameter of 120 -180 cm (4-6 ft.), and weights up to 1500kg. (3300lbs). These round only models are fitted with two bale rollers.

1530 / 1540 (See Fig. 2)
The 1530 & 1540 can wrap both square and rectangular bales, from 60 x 60 to 120 x 120 x 150 cm. they can take bales of up to 1,200 kg. weight and can also wrap round bales of up to ø1200 mm. The 1530 and 1540 use a patented Rocking Roller system to manipulate square bales through their horizontal axis'.

The twin wrapping arms, used on the 1520 & 1540 models, greatly increase the output by applying two strips of film simultaneously. The patented folding arm design brings the two rolls of film together into the one cutter at the end of wrapping. This keeps the machine compact and allows good access for loading and unloading the bales. The 1500 Series has been developed and improved since it was first released in 1986, and is now a very reliable and safe machine with high security built in.

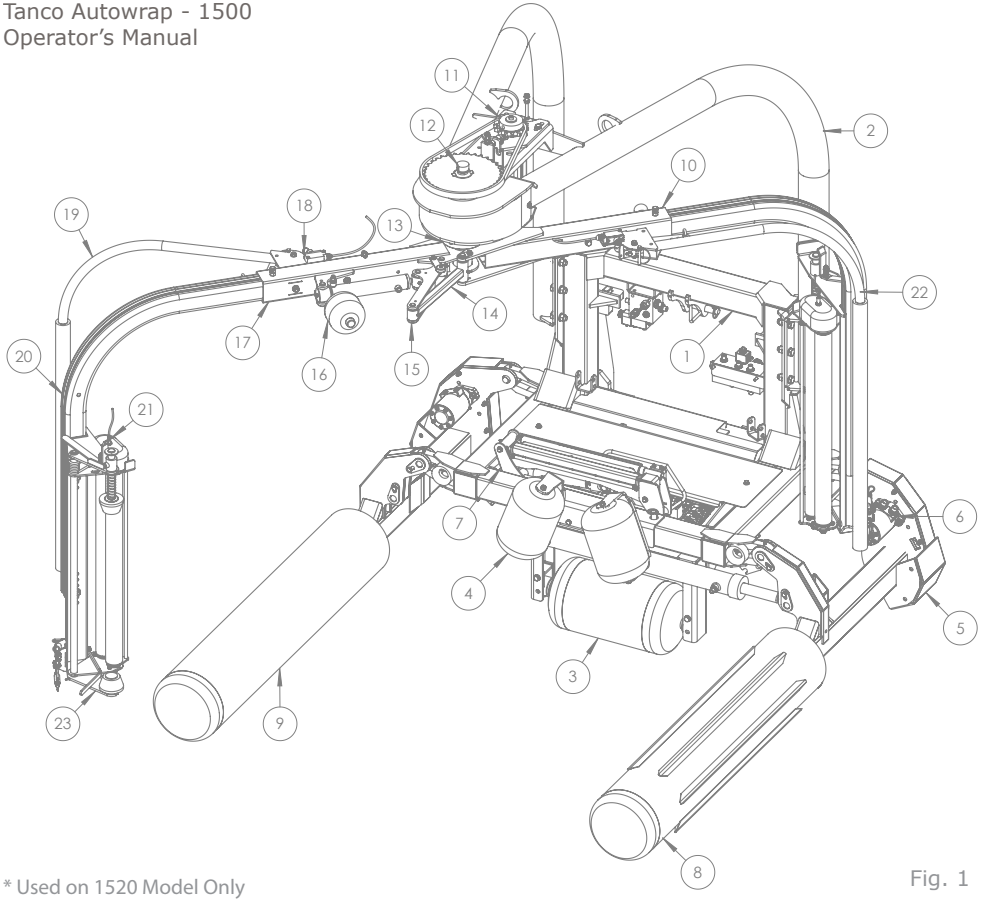
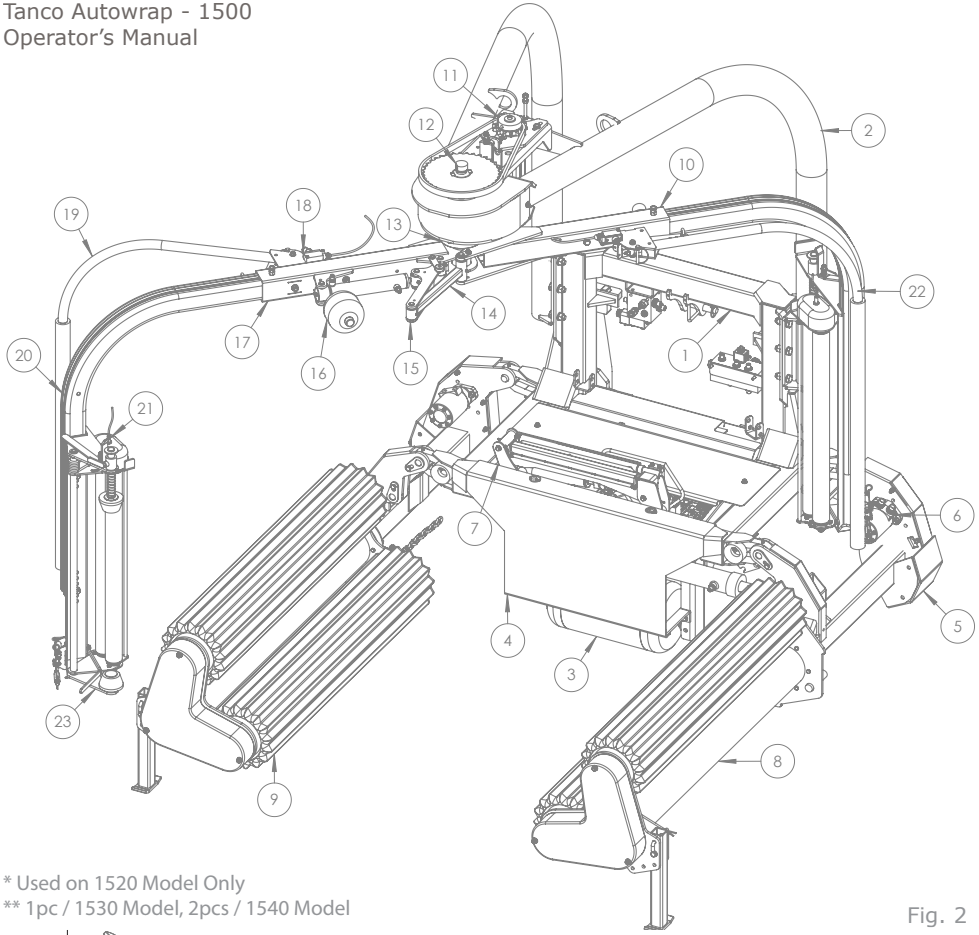


Fig. 1

* Used on 1520 Model Only
** 1pc / 1510 Model, 2pcs / 1520 Model

2. 1500 Series Models

Item No.	Description
1	Main Frame
2	Tower Frame
3	Ground Roller
4	Bale Roller
5	Roller Arm Assembly
6	Roller Motor
7	Cut & Tie Assembly
8	Gripped Roller
9	Smooth Roller
10	Main Wrapping Arm
11	Tower Motor Assembly
12	Rotary Coupling
13	Slew Ring
14*	Fixed Linkage
15*	Arm Linkage
16*	Arm Folding Ram
17*	Twin Wrapping Arm
18**	Safety Switch
19**	Emergency Stop Arm
20**	Dispenser Mounting Arm
21**	Film Breack Sensor
22	Main Dispenser Assembly
23*	Twin Dispenser Assembly



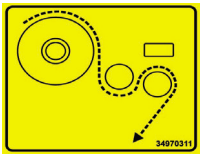
Item No.	Description
1	Main Frame
2	Tower Frame
3	Ground Roller
4	Bale Stop
5	Roller Arm Assembly
6	Roller Motor
7	Cut & Tie Assembly
8	Rocking Roller Assembly (L)
9	Rocking Roller Assembly (R)
10	Main Wrapping Arm
11	Tower Motor Assembly
12	Rotary Coupling
13	Slew Ring
14*	Fixed Linkage
15*	Arm Linkage
16*	Arm Folding Ram
17*	Twin Wrapping Arm
18**	Safety Switch
19**	Emergency Stop Arm
20**	Dispenser Mounting Arm
21**	Film Breack Sensor
22	Main Dispenser Assembly
23*	Twin Dispenser Assembly

* Used on 1520 Model Only
** 1pc / 1530 Model, 2pcs / 1540 Model

Fig. 2

Read Operators Manual
Prior to using machine

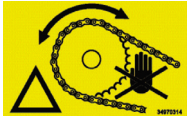
Danger from rotating
Pre-stretcher



Application of Film
to Pre-stretcher

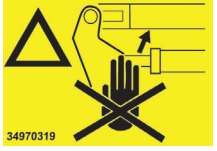
70% Pre-stretch
on gears

55% Pre-stretch
on gears



Don not open or remove
Safety Guards while the machine
is connected to the tractor

Do not place your leg between
Roller Arm and Chassis



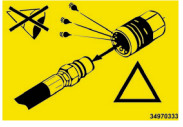
Danger - Keep hands
clear of Width Ram

Do not place your
in between Rollers

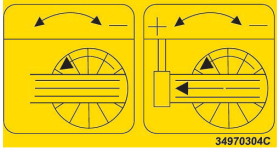
Danger stay at a safe distance
whilst machine is in operation

Danger keep hands
clear of sharp blades

Do not stand between
Rollers



Danger from oil splashes



Wrap Arm Speed Adjustment

Ensure all nuts & bolts have
been tightened prior to
operating the machine

Technical Specifications	1510	1520
Height	2820mm	2820mm
Width (min. / max.)	1520mm / 3000mm	1520mm / 3000mm
Length (min. / max.)	2450 / 3000mm	2450 / 3000mm
Weight	780kg	950kg
Wrapping Arm Speed (Recommended)	25 R.P.M	28 R.P.M
Wrapping Arm Speed (max)	27 R.P.M.	32 R.P.M
Maximum Bale Diameter	1800mm (6ft)	1800mm (6ft)
Maximum Bale Weight	1500 kg	1500 kg
Capacity	30 Bales per hour (Apx.)	45 Bales per hour (Apx.)
Pre-Stretchers	2 x 750mm Width;	2 x 750mm Width;
Pre-Stretcher Gearing	70% Stretch	70% Stretch
Hydraulic Connection	Single Working + Free Return	Single Working + Free Return
Oil Pressure	180 bar	180 bar
Oil Amount (Max / Min)	60 lts/min / 25 lts/min)	60 lts/min / 25 lts/min)
Maximum Counter Pressure	10 bar	10 bar
Eltectrical Connection	12 V DC	12 V DC

NB: Tanco Autowrap Ltd. reserves the right to modify the construction and/or technical specifications without warning and without rights to changes on already delivered products.

Technical Specifications	1530	1540
Height	2960mm	2960mm
Width (min. / max.)	1520mm / 3000mm	1520mm / 3000mm
Length (min. / max.)	2450 / 3000mm	2450 / 3000mm
Weight	780kg	950kg
Wrapping Arm Speed (Recommended)	25 R.P.M	28 R.P.M
Wrapping Arm Speed (max)	27 R.P.M.	32 R.P.M
Maximum Bale (Round)	1300mm (4ft 4in)	1300mm (4ft 4in)
Maximum Bale (Rectangle)	1200mm x 1400mm	1200mm x 1400mm
Maximum Bale Weight	1200 kg	1200 kg
Capacity	30 Bales per hour (Apx.)	45 Bales per hour (Apx.)
Pre-Stretchers	2 x 750mm Width;	2 x 750mm Width;
Pre-Stretcher Gearing	70% Stretch	70% Stretch
Hydraulic Connection	Single Working + Free Return	Single Working + Free Return
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NB: Tanco Autowrap Ltd. reserves the right to modify the construction and/or technical specifications without warning and without rights to changes on already delivered products

Tanco Autowrap Ltd does not take responsibility for damages that may occur to machine, persons or other equipment, because of the machine NOT being used as described in this manual, or because of the safety precautions NOT being followed.

Emergency Stop
The Tanco Autowrap 1500 Series is equipped with a so-called emergency stop on the wrapping arm. This device stops all functions momentarily, but is per definition not an emergency stop, because it does not shut down the inputs. But it has the same function, so we have decided to call it an emergency stop in this manual.

Safety Equipment
Before using the machine, make sure that all guards and covers are securely fitted. The machine must not be operated if a function does not work as described later in this manual.

Become Familiar with the Operations of the Machine
If you are unsure how to operate the machine properly, either use of or maintenance to your Tanco Autowrap, please contact your Tanco Autowrap dealer.

Adjustments / Maintenance
Turn off the tractor and discharge the oil pressure before performing any adjustment or maintenance on the machine. Remember that a well maintained machine is a safe machine.

IMPORTANT!
Always make sure that nobody is inside the machine's working area when it's in use. Safety distance is 5 metres

The machine must not be operated by persons who do not know enough about how to safely operate the machine, or by persons under the age of 16 years.

Dangerous Areas
Tanco Autowrap Ltd. has given the safety to the operator the highest priority, but it is still impossible to secure oneself of every danger area on the machine. Therefore we have hilighted below some of the dangers that can occur when using the 1500 Tanco Autowrap Bale Wrapper.

- Impact of the Wrapping Arm
During the wrapping process the arm rotates with a speed of 25-32 revolutions per minute around the bale. On the arm is mounted a Film dispenser unit with a plastic roll. The speed on this can give a person serious injuries if one enters the working area of the wrapping arm. To reduce this danger we have mounted an emergency stop device on the wrapping arm; this stops all movement when something comes in the way of it. It is very important that this protection always works and that it should not under any circumstances be disconnected.

- Squeeze Danger Between the Main Frame & Wrapping Arm
As earlier explained, we have a wrapping arm with a Dispenser and a plastic roll. During every revolution the wrapping arm passes the main frame. Here there may occur a squeeze danger if a person stands to close to the main frame when the wrapping arm passes. The distance between the main frame and the wrapping arm is not large enough to give place for a person. Between the pre-stretcher and the bottom frame there can also be a squeeze danger.

- Squeeze Danger Between the Stationary Arm & Wrapping Arm
During the main wrapping process the wrapping arm moves around a stationary arm. Every time the wrapping arm passes the stationary arm there is a squeeze danger that can be dangerous for the fingers. The distance between the stationary and the wrapping arm is between 25-40 mm (See Fig. 1).

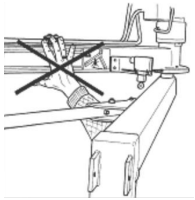


Fig. 3

- Squeeze Danger Caused by Plastic Automation
At the end of the wrapping process the plastic is cut and held tight until the start of the next wrapping process. When the cutter arm moves down to lock the plastic, there can occur a squeeze danger between the cutter arm and the cutter holder. The cutter blade that cuts the plastic is very sharp; ensure to keep hands away from the cutter (See Fig. 2).

- Squeeze Danger between the Rollers and the Main Frame
During the wrapping process the bale rotates on two rollers. When the rollers are in motion there is a danger of being squeezed.

- Squeeze Danger between Roller Arms and Main Frame (Inwards)
When loading a new bale, the roller arms move towards the main frame, Beware of the danger. Keep clear of this area.

- Squeeze Danger between Roller Arms and Main Frame (Outwards)
When loading or unloading a new bale, the roller arms move outwards. Beware of the danger. Keep clear of this area.

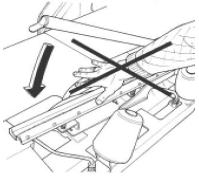


Fig. 4

- Squeeze Danger between the rollers on the 1530 & 1540
When the rollers on the 1530 &1540 machine are moved all together, there is not enough space for a person between the rollers. Here it can occur a squeeze danger, so make sure that nobody is between the rollers when they are moved together.

Three Point Mounting
When the machine is mounted on the three point linkage, make sure that the lifting arms are tightened up so there is no sideways movement.

Front Mounting
If the machine is mounted on a front loader there must be a counterweight fitted to the three point linkage. It must be large enough to give the tractor good stability.
Connecting heavy working implements often has an overall negative effect on the tractor's driving and braking capacity.

Transporting
When transported on a public road there are certain safety measures that must be taken:

Move the wrapping arm into the transport position by pressing "WRAP SLOW" in manual mode and keeping it pressed in.

Lock wrapping arm(s) in the transport position (see overleaf).

Move the main rollers completely together.

Always transport the machine in the lowest possible position.

Make sure that the machine do not cover the tractors lights. If necessary, mount extra lights.

Make sure that at least 20% of the tractor's total weight is on the steering wheels.

If the machine is front-mounted, it's necessary to balance.

For locking and disengaging the wrapping arm during transportation, ensure that the locking bracket for the wrapping arm is fitted. Fig 5 & Fig 6 show the transport and working positions of the locking bracket respectively.

Please note that locking brackets must be fitted for both arms on the 1520 & 1540 models.

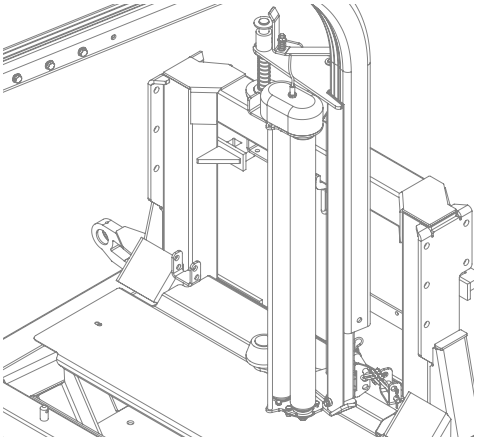


Fig. 5

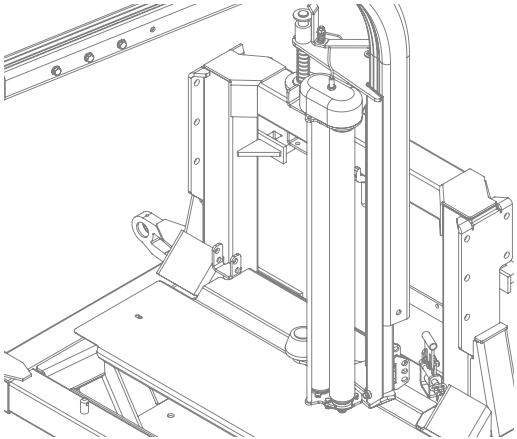


Fig. 6

Bale Wrapping Principles

The advantages of round bale silage are many, and include fewer feed units, a flexible harvesting system, large capacity and the possibility of selling feed units.

In principle, the same fermentation processes occur whether the fodder is placed in a silo or pressed into bales and packed in plastic, i.e. lactic acid fermentation in anaerobic conditions. The oxygen in the bale must be exhausted before fermentation begins.

The grass should be dried to approximately 30-40% solid content. The solid content can be determined by twisting the grass by hand. If drops of liquid are forced out of the grass, the solid content is less than 25%. Low solid content (wet grass) can lead to increased butyric acid fermentation if preservatives are not added to the grass. If the solid content is too high, (over 50%), normal fermentation will not take place and there will be enough oxygen in the bale to produce mould fungus.

The Baler

It is vital that the baler produces compact, well-formed bales, as misshapen bales can be difficult to wrap. Wrapping will also often take longer, thereby increasing the amount of plastic used.

Difficult Bales

When a misshapen bale is wrapped, it will have a tendency to move outwards or inwards on the roller. If the bale begins to move outwards, the machine must be lifted slightly at the rear edge to get the bale to rest against the support roller on the main frame. It can therefore be useful to use a hydraulic top link to make this adjustment easier.

If the bale to be wrapped is conical you must ensure that the sharp end is pointed at the tractor. It will then be easier to get the bale to lie correctly during packing. It is easy for such a bale to "turn" forward in the direction in which it is pointing, and therefore lie against the support rollers. If the bale is lying on a slope it must be picked up from the lower side. A hydraulic top link will again be advantageous.

Types of Plastic
A good type of plastic with good adhesive properties, and which is recommended for bale wrapping, must be used. The thickness of the plastic foil should be at least 25 µ. (25/1,000 mm). In order that the plastic tightens sufficiently around the bale, it is stretched before being wrapped, so it is somewhat thinner when it is put on the bale. With short-term storage (up to eight weeks) it is recommended that bales have a minimum of four layers of plastic at the thinnest points, with at least 52-53% overlap.

For long-term storage, or when the grass is wet when it is wrapped, the bale should have 90-100 µ plastic (six layers) and the same amount of overlap. If thinner plastic is used, more layers should be applied. If it is very hot the plastic will be stretched further, and more layers should be applied. It is better to have slightly too much than too little plastic on the bale.

From experience, light colored plastic produces slightly lower temperatures within the bale, and tends to improve feed quality.

Storage Location
Care should be taken in finding a suitable location for the storage of bales. The storage location should preferably be prepared before the bales are laid out. An elevation close to well-drained roads is recommended. If the wrapped bales are simply placed on stubble there is a danger of the plastic being pierced. A tarpaulin or a thin layer of sand should therefore be laid where the bales are to be stored over the winter.

Bales should be stored in the shade as far as possible. This reduces the danger of air leakage in the bales. A bale which is stored in sunlight and which therefore undergoes greater swings in temperature "pumps in" a great deal of air in comparison to a bale stored in the shade. According to "Teknik for Lantbruket" [Technology for Agriculture] in Sweden, a bale stored in the shade has only 40% of the air leakage of a bale which is stored in sunlight.

Stacking / Protection
If bales are hard and well formed, they can be stacked vertically, but loose and misshapen bales with low solid content should not be stacked higher than one layer, as this could easily cause deformity and the danger of runoff will be increased.

Bales can also be stored on their sides. The layer of plastic is thicker here, providing greater protection against piercing.

Bales should be covered with a tarpaulin or a fine-mesh net to protect against birds and small rodents. If the plastic is pierced, it must be sealed with weatherproof, hard-wearing tape, preferably under the outermost layer of plastic. Ensure that the hole is adequately sealed.

For Best Wrapping Results...

1. Harvest the grass early.

2. Ensure the grass is dried out to 30-40% solid content. If there is a danger of rain, bale and wrap the grass anyway.

3. Take care not to mix any earth in with the grass.

4. Use a baler that produces even, firm bales. Bales 1.2mtrs in width and with a diameter of 1.2-1.5mtrs are preferred sizes.

5. Wrap the bales as soon after baling as possible; never more than two hours afterwards.

6. Use a good plastic type, applying six layers of plastic. This removes the need to use preservatives.

7. Store bales in the shade to reduce the danger of air leakage.

Mounting of Support Roller

Lastly, the support roller under the machine has to be mounted. When the machine has been mounted on the tractor, lift it clear of the ground, and secure it from falling down before working underneath the machine. The Support roller can be fitted at three different heights. On the 1510 / 1520 it is fitted at the top position. If rectangular bales (for example, 90cm x 120cm) are to be wrapped on the 1530 & 1540 models the Support roller it is fitted at the center position; i. for larger bales the roller, it is fitted at the lower position.

Mounting of the Machine

Be careful! There is a danger of being crushed when working implements are fitted and connected. Carry out the fitting procedures slowly and carefully, and use separate and approved lifting equipment to make the work easier. Note the section on safety precautions and pay attention to the various safety decals displayed on different parts of the bale wrapper.

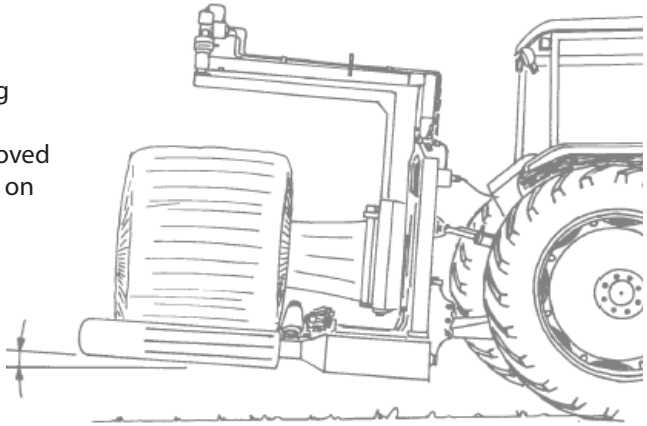


Fig. 7

Three Point Linkage

TANCO AUTOWRAP1500 Seriesis intended for rear mounting to the three point linkage, Category 2. When attached to three point linkage, make sure the machine is level across the tractor. Tighten up and lock the lifting arms so there is no sideways movement.

Top Link
Adjust the top link of the tractor so that the machine is level with the ground. It is recommended to use a hydraulic top link, as this makes it easy to adjust the angle of the machine.
During the wrapping process it is recommended to tilt the machine towards the tractor, as this will prevent the bale from falling off the rollers. (See Fig. 7).

You also need longer hydraulic hoses.
When front-mounted there must be a large enough counterweight fitted to the three point linkage, this is to secure the tractors stability.

Front Mounting
This machine can be equipped with attachment brackets for front loader or wheel loader.
(Refer to the Spare Parts Manual to see the different mounting brackets available).

When front-mounted there must be a large enough counterweight fitted to the three point linkage, this is to secure the tractors stability.

1500 Control Box

The control unit consists of the emergency stop button, a control cable, a fuse and a battery cable. The control unit should be attached to a suitable place in the tractor cab using the suction pad provided.

The Remote Control Unit is not Shock Proof, make sure that is fastened to a soft pad that secures a non-vibratting foundation.

Electrical Connection
The electric supply for the machine's remote control and electro-hydraulic components must come directly from the tractors' 12 volt battery.

The electric wires from the battery must have an area measurement of min. 2,5 mm2. Connection to other contacts on the tractor can cause risk of malfunction and is not recommended.

Important: When connecting the control unit to the machine, always ensure that the communication cable cannot get damaged by the 3-point linkage or dragging along the ground, by tying slack cable inside the cab.

Note:
Brown leader goes to the Battery's Positive Pole
Blue leader goes to the Battery's Negative Pole

Hydraulic Connection
The hydraulic hoses between machine and tractor are equipped with 1/2" ISO Male Quick-Couplers. Discharge the oil pressure before you connect the oil hoses. The tractors' hydraulic lever must be lock open when running. To make sure that the bale wrapper works properly, the tractors' oil pressure has to be at least 180bar. The oil flow should be 15 - 25 liters per minute.

To make sure that the bale wrapper works properly, the tractors' oil pressure has to be at least 180 bar. The oil flow should be 15 - 25 liters per minute. The return pressure on the return must be as low as possible, and not exceed 10 bar. This should be measured with a gauge. It is recommended to use one single-working hydraulic outlet and arrange a free return circuit to the oil tank.

If you are unsure of what oil pressure the tractor gives, or what oil pressure the bale wrapper receives, please contact your machinery dealer. Generally all tractors have got some counter-pressure in their hydraulic return systems. Some tractors have more than others.

Note:
The Hose with the Red Cap shall be connected to pressure 'P' and Hose with Blue Cap to the return 'T'.

Open & Closed Center Hydraulics
The 1500 Series' hydraulic system can be set up for tractors with Open or Closed Center Hydraulics.

Open Centre Hydraulics
Most tractors have a hydraulic system that gives a continuous output which flows through the valve on the machine and back to tank when no function is operating (Open center).

Note:
The TANCO AUTOWRAP 1500 Series is set-up for open centre on leaving the factory.

Close Centre Hydraulics
Some tractors (John Deere) have a hydraulic system that require the valve on the machine to allow no flow when no function is operating (Closed Center). The hydraulic valve can easily be configured to operate in this way.

Simply push and twist the Manual Override on the Master Valve. (See Fig. 8)

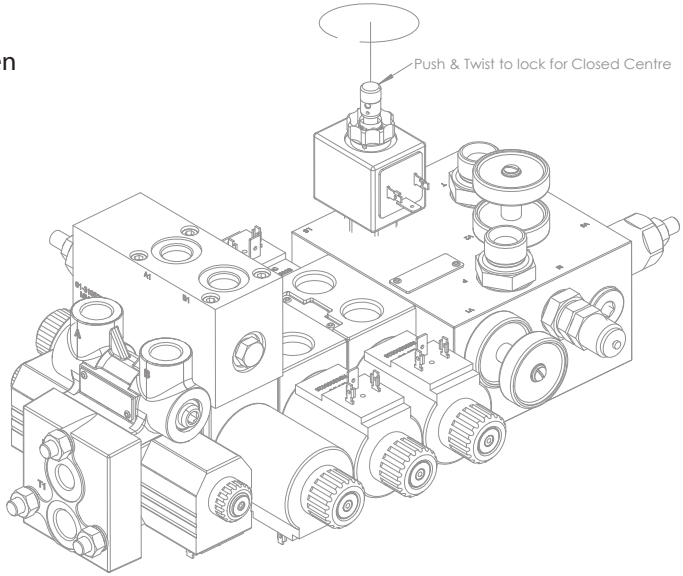


Fig. 8

LS Hydraulics
Many modern tractors have a "Load Sensing" (LS) Hydraulic System. This is most efficient as the pump remains on standby, pumping no oil until it gets a signal from the machine. It is possible to run this machine on a load sensing tractor with the standard valve.

Configure the valve for open centers and if possible adjust the flow from the tractor to give ~30 lts/min. This however means that tractor is constantly pumping and you do not get the benefit of the efficiency of your load-sensing pump.

Tanco Autowrap strongly recommend that if you are running the machine on tractor with LS Hydraulics you fit the optional Load-Sensing Block (see Hydraulic Circuit). With this block fitted a Load sensing signal is transmitted in the form of hydraulic pressure via a hose for the LS Port on the LS Entry Block to the LS Connection on the tractor.

Note:
The LS Entry Block can be configured also to run on any other hydraulic system, open or closed center.

Check List:
Before using the machine it is recommended to follow this check list:

1. Make it a habit to discharge the oil-pressure before connection or disconnection of the hydraulic hoses. (By operating the hydraulic control lever inside the tractor). (Use the tractors hydraulic control lever).

2. Return-oil should be led directly to tank. Beware that if the counter pressure is too high, the security valve on the main block will release some oil. (See Chapter 10).

3. Hose with BLUE CAP = RETURN OIL.

4. Hose with RED CAP = PRESSURE.

5. Tie up loose hoses and Connection Cables so that no squeeze damages occur.

6. Start the tractor and try out the functions. A bale is not required for this test.

7. Check all connections, hoses and couplings. If there is any oil-leakage, it should be rectified immediately.

8. Start the tractor and try out the functions. A bale is not required for this test.

9. Check all connections, hoses and couplings. If there is any oil-leakage, it should be rectified immediately.

If any problems should occur, it is most likely that the failure is in the quick-couplers on the tractors pressure and return-connections.

Make sure that both the male and female-couplers opens properly for the oil flow, check these carefully. The best thing to do is to exchange the quick-coupling on the return side and arrange a "free return".

Your TANCO AUTOWRAP bale wrapper has been tested in practical operation in approx. 3 1/2 hours at the factory.

Emergency Stop (See Fig. 9)
This machine is equipped with a safety guards on the Wrapping Arms, and its operation must be tested before work itself is started.

The Emergency Stop is to prevent the Wrapping Arm from damaging people and objects, when the machine is started and during the wrapping process. It consists of two safety arms that run in front of the film dispensers. When tripped they activate an electric switch, which gives a signal to the control box to activate the emergency stop.

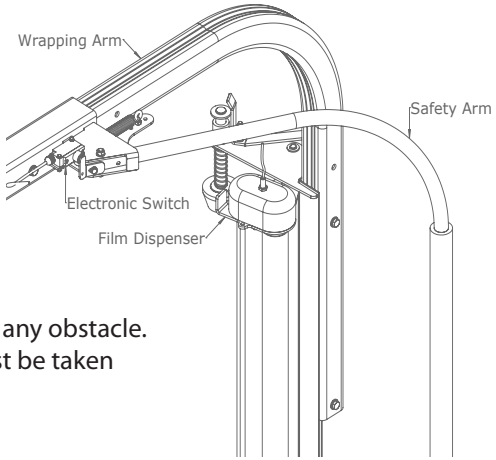


Fig. 9

When testing this function, start the Wrapping Arm, hold out an arm or any obstacle. The wrapping arm shall now stop before it hits the arm. Great care must be taken when testing this function.

To restart the machine the obstacle must be removed and the arm must be returned to its original position. The Red Auto Switch on the control box must be activated again. The wrap cycle can then be resumed by pressing the resume cycle switch.

IMPORTANT!
GIVEN THE VELOCITY AND MOMENTUM OF THE ARM IT IS IMPOSSIBLE TO STOP THE WRAP ARM IMMEDIATELY. THE EMERGENCY STOP ARM IS PROVIDED TO HELP REDUCE THE RISK OF SERIOUS INJURY AND GREAT CARE MUST BE TAKEN WHEN OPERATING THIS MACHINE.

Mounting of Plastic Film (See Fig. 10 & 11)
When loading a plastic roll, first ensure the Top Cone is pushed up to the latched position, then push back the Dispenser Insert until held in position by the Bottom Latch.

Place the Roll on the Bottom Cone and release the Top Latch.
BEWARE OF FINGERS!

Pull the film between the rollers on the Dispenser Insert in the direction of the arrow, as shown below. (See also the sticker on the dispenser).

Release the Bottom Latch and allow the rollers to lie against the roll of film.
Pull the film from the roll and tie it to the bale.

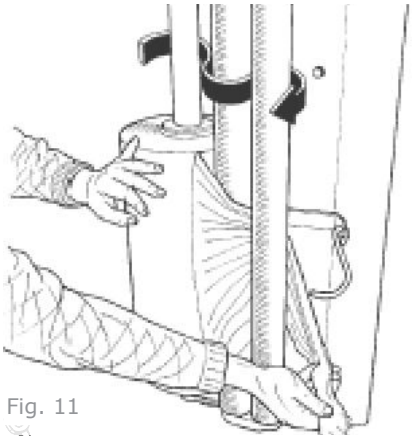


Fig. 11

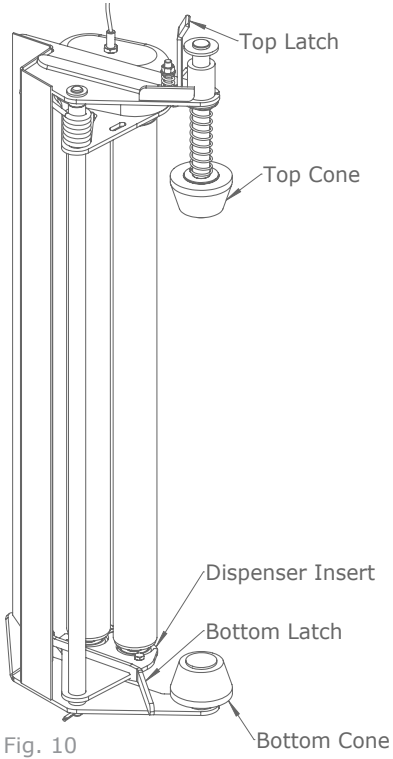


Fig. 10

Adjusting the Height of the Dispenser

The standard film dispenser is designed for 750mm film. If using 500 mm film an adaptor is required which must be ordered separately. See parts book and contact your dealer.

The plastic film should hit at the middle of the bale wrapped (Fig. 12), and therefore it can be necessary to adjust the height of the pre-stretcher (See Fig. 13).

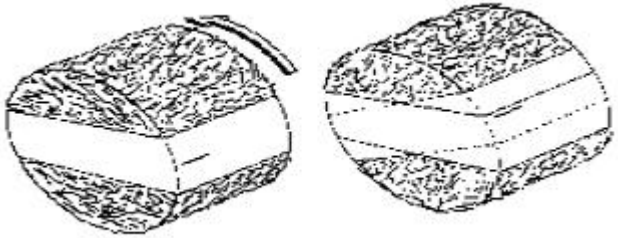


Fig. 12

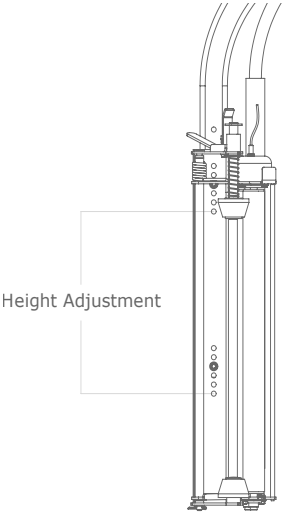


Fig. 13

Tanco Dual Stretch Dispenser

All Tanco Autowrap machines are supplied with a patented dual stretch gear system. This system enables a quick change of stretch levels on the Film Dispenser.

If the Gear Bolt is fitted in Position 1 (See Fig. 14), the top set of gears provide the stretch @ 70%. By removing the Gear Bolt from Position 1 and fitting it in Position 2, the bottom set of gears become the stretch gears giving 32% (for pre-stretched film) or optionally 55% (for use in hotter climates or with square bales).

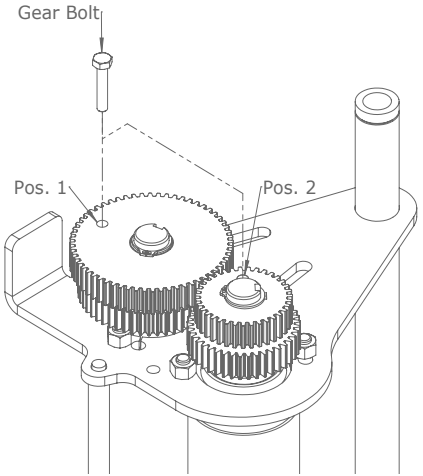


Fig. 14

Tanco Dispenser Gear Combinations

Inner Gear	Outer Gear	% Stretch
60 Tooth	35 Tooth	70%
58 Tooth	37 Tooth	55%
54 Tooth	41 Tooth	32%

Introduction

The Tanco Autowrap Bale Wrap Controller enables the operator to monitor and control the operation of the bale wrapper at any stage of the wrapping cycle. The controller is designed for models: 1300EH, 1320, 1400, 1510, 1520, 1530, and 1540 rotating-arm type wrappers.

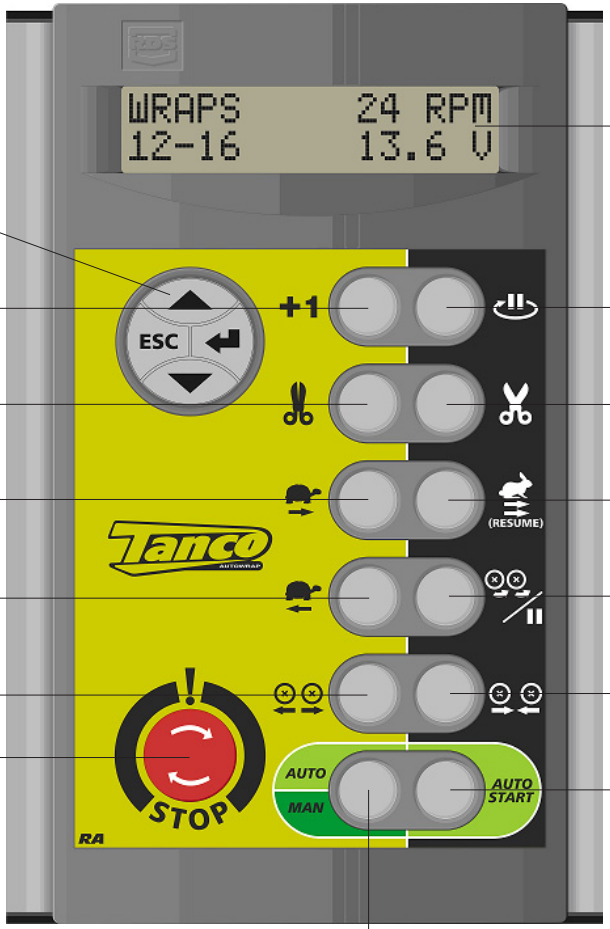
There are 2 operating modes – Automatic and Manual. The Automatic Mode permits 'one-touch wrapping' to ease the workload on the operator. The controller is fully programmable to optimise wrapping performance. Bale counts are automatically logged in any one of 10 selectable memory stores, in addition to a grand total memory store.

IMPORTANT SAFETY INFORMATION!
Please read and understand the instructions for using this controller before operating the machine.

This controller is fitted with a push-button type On/Off Emergency Stop switch. Always ensure the controller is switched OFF via this switch before attempting any adjustment or maintenance to the machine. Please follow ALL other safety instructions given in the manufacturers' Operator's Manual for this machine.

Controller Main Operating Functions & Display

The principal instrument features and operating functions of the Controller are shown in Fig. 15 overleaf.



Display; Shows in normal working mode:
- Current No. of Wraps
- Target No. of Wraps
- Wrapping Speed (R.P.M)
- Bale Total (10 Separate Stores)
- Grand Total No. of Bales
- Mode: M (Manual) / A (Automatic)

4-Way Menu Switch:
- Set No. of Wraps
- Change / Reset Bale Sub-Total
- Access Operator Setup Menu
- Access Technician Setup Menu
- Access Manual Wrap Arm Fold
(Second Function on L5 / R5)

L1 - Add 1 Wrap to current (or next) bale

R1 - Pause Wrapping

L2 - Cut & Grip Film

R2 - Release Film Grip

L3 - Slow Wrap

R3 - Fast Wrap / Resume Wrap (After Manually Pausing)

L4 - Reverse Wrap Arm

R4 - Pause Bale Rotation (During Auto-Wrap Cycle)

L5 - Bale Unload or Arm Unfold

R5 - Bale Load or Arm Fold

Power On/Off / Emergency Stop

R6 - Start Automatic Wrapping Cycle; press STOP switch to stop cycle

L6 - Select Operating Mode: 'M' or 'A'

Fig. 15

Operation

Operation in Automatic mode

The controller is generally used in automatic mode for 'one touch wrapping'.
Note the controller counts in steps of 2, because for each revolution of the wrapping arm two wraps of film are applied.

1. 'A' on the centre of the display indicates that the controller is set in Automatic mode. If not, press (L6) to select.

2. With the rollers in the open position (step 5), bring the machine up to the bale.

3. Press (R5) to move the rollers to the closed position.

4. Press (R6)switch to commence the automatic wrapping cycle. The wrap arm will first unfold to the straight position. It will then complete the target number of wraps, on the last half revolution the wrap arm will return to the folded position, come to a stop after passing the cutter and reverse to the centre.

5. Press (L5) switch to move the rollers to the open position to unload the bale.

Manually Interrupting an Automatic Wrapping Cycle

Press (R1) to bring the wrapper to a controlled stop. Pressing (R3) will continue the Auto-Wrap cycle from where it stopped.

For safety reasons; if it is necessary to work on the machine (e.g. in the event of a film break or the film running out), then it is strongly recommended that you then switch the controller off via the red stop button and disengage the machine power source. Pressing (R3) after switching the controller back on will resume the auto-wrap cycle from where it stopped.
Unless it is an emergency situation, do not bring the machine to a stop by pressing the red stop button as this will impose unnecessary strain on the machine.

Manual options in Automatic mode
With the controller in automatic mode, the following manual functions are possible.

- Slow Wrap (L3): This button will rotate the wrap arm at slow speed (not during an automatic wrapping sequence).

- Fast Wrap (R3): This button will rotate the wrap arm at normal fast speed. This button will also resume an automatic wrapping cycle if interrupted.

- Reverse Wrap Arm (L4): This button will rotate the wrap arm in reverse at slow speed (not during an automatic wrapping sequence).

- Pause Bale Rotation (R5): Holding down this button during an automatic wrapping sequence will stop the bale rotating and so will add more film to a particular part of the bale. Release the button when sufficient additional film has been applied.

- ADD 1 WRAP (L1): Each time you press this button an additional wrap will be put on the current bale if the wrapping sequence is in progress or onto the next bale if the automatic cycle has not yet been started. You can add as many wraps as required.

- Rollers Out or Wrap Arm Unfold (L5)
This button has two functions; its primary function is to operate rollers out to unload the bale. If the programming factor Roller Out is set to 0.0 in the Operator Setup on the controller then this button must be held down for the duration of the unloading operation. If a time is set for Roller Out then one touch of this button will trigger the function to operate for that time. In M manual mode the button must be held down for the duration of the unloading.

This button also manually performs the wrap arm unfold (to the straight position) function. To get it to change to this function hold down the Esc button (left side on 4 position button) for 5 seconds. ARM will flash on the display. To revert back to the primary function of Roller Out just press the Esc button again, ARM disappears from the display.
In the automatic wrap sequence this unfolding function is performed automatically.

- Rollers In or Wrap Arm Fold (R5)
This function operates in a similar fashion to the above Roller Out/Wrap Arm Unfold, just both function operate in the opposite direction.

- Pressing the Auto/Start (R6) button during an automatic wrapping sequence (after 4 or more wraps) will finish the sequence on the next rotation of the arm. The arm folding and cutter functions will operate as normal.

Operation in Manual mode
'M' on the display indicates that the controller is set in manual mode. If not, press (L6) to select.
In manual mode you have total control of every stage of the wrapping cycle.

Controller Outputs
The following are the electric solenoid valves powered for each machine function. The vale numbering corresponds to the numbers on the electric cables to the valves.
Note: Valve 7 (Master Valve) is powered for all functions.

Operation	Powered Solenoids		
Loading	7	3	10
Wrapping:	7	5	6*
Unloading:	7	4	
Reverse:	7	5	8
Arm Unfold:	7	11	
Arm Fold:	7	9	
Cutter Open:	7	1	
Cutter Close:	7	2	

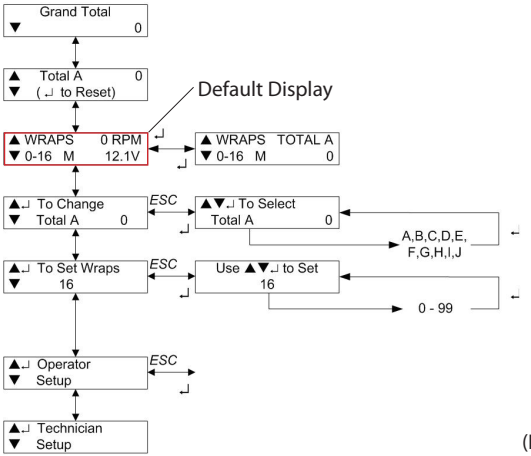
* In fast speed

The Display Menu

The Display menu is divided into 3 sections. At the top level are the settings used during the daily work with the machine – i.e. Store totals and No. of Wraps.
The Operator Setup section enables the operator to perform adjustments to the machine operation – e.g. time duration and time delay settings during the automatic cycle.

The 'Technician Setup' menu is not normally accessible to the operator without a PIN access code. 'Technician Setup' is not covered by this manual.

Use the 4-way switch to navigate the menu. Each menu screen indicates which keys to press to make the settings. The instrument will default back to the main operating display after 30 seconds if no other key is pressed.

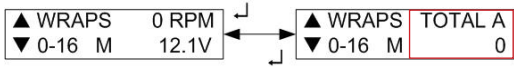


(Note: See Programming Factors)

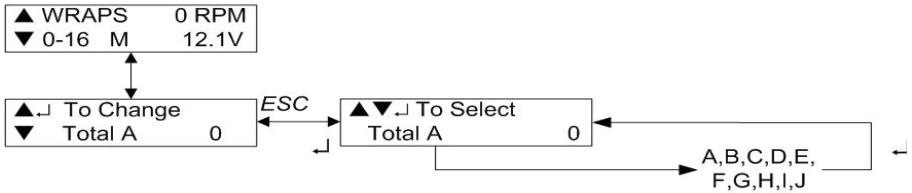
NOTE: There are additional sequences selectable in the Operator Setup menu but not shown in the table. These sequences are for wrapper models to which this manual does not apply.
Please refer to the Operator Setup Menu for further explanation of the Operator Setup functions given in the table above.

Selecting a Store Total
There are 10 individual memory registers labeled 'Store A' to 'Store J' for bale totals. Each time a bale cycle is completed, the currently selected store total and the grand total increments by 1.

The currently selected store is displayed on one of the two screens selectable in the normal operating mode.



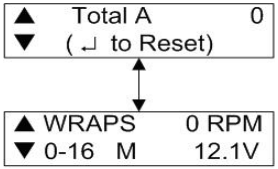
The default setting is Store A. To select a particular store, navigate the display menu using the 4-way switch.



Press the Up/Down arrow keys to select the store, then press the ENTER key to confirm the selection.

Resetting a Store Total to Zero

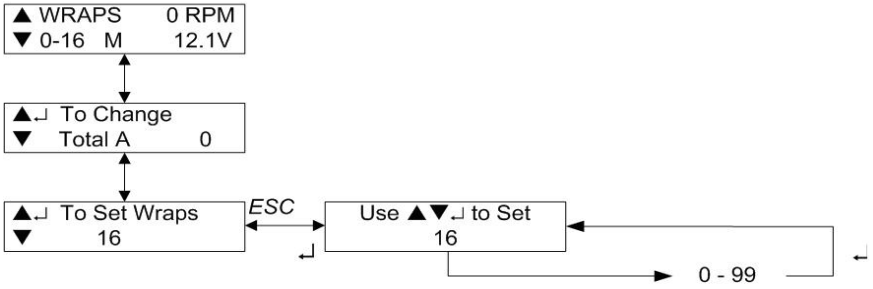
Stores A to J can be individually reset to zero at any time. The Grand Total store cannot be reset. First select the store to be zeroed, and then navigate the display menu as shown below.



Press the ENTER key to reset.

Setting the Number of Wraps

The default number of wraps is 16. You can set the target number from 0 to 99 by navigating the display menu as shown below.



1500 Programmable Factors - Operator Level

Menu No.	Operator Level	Default	Units	Notes
N/A	Target No. of Wraps	16		
4.01	Contrast	2		
4.02	Film Break	OFF		Switches On or Off Film Break Sensor
4.41	Remote Type	RF		Sets Controller For Remote Control Type (Optional Extra)
4.15	Rotate Stop / Rev	0.0	Seconds	Pulses On & Off Roller Rotation During Wrapping
4.22	Stop Bale Wraps	0.0	Pulses	Stops Roller Rotation at the Beginning Of Wrapping
4.23	Wraps to Release	*1	Pulses	Number Of Wraps To Cutter Releasing Film
3.39	Second Release	9.0	Pulses	Number Of Wraps To Cutter Releasing Film For 2nd Time
4.25	Release delay	0.5	Seconds	Delay From Wrap Arm Passing Sensor To Cutter Opening
4.26	Delay To Slow	1.0	Seconds	Time From Wrap Arm Passing Sensor On Last Turn To
				Speed Changing From Fast To Slow
4.27	Delay To Stop	1.2	Seconds	Time (Passed Sensor) To Stop The Wrap Arm
4.28	Reverse Time	0.6	Seconds	Time Wrap Arm Reverses At The End Of Wrapping Cycle
4.29	Rotation After	0.0	Seconds	Not used on 1320
4.37	Roller In	0.0	Seconds	Sets Roller In Time For Automatic Loading; If Set To 0.0
				Manual Must Be Held Down For Duration Of Loading
4.38	Roller Out	0.0	Seconds	Sets Roller Out Time For Automatic Unloading. (As Above)
4.35	Language	English		Sets Controller Language

1500 Programmable Factors - Technician Level (Pin 1,2,3,4)

Menu No.	Technician Level	Default	Units	Notes
5.01	Sequence	Model		Sets Controller Program For Machine Model
5.15	Slow Start Time	2.5	Seconds	Time Wrap Arm Runs In Slow Speed at Start Of Wrapping
5.16	C&S Open Time	0.4	Seconds	Cutter Opening Time
5.17	C&S Close time 1	3.0	Seconds	Cutter Closing Time During Wrapping
5.18	C&S Close time 2	2.0	Seconds	Cutter Closing Time At End Of Wrapping
5.48	Arm Unfold	2.5	Seconds	Time For Wrap Arm To Unfold to Straight Position At The
				Beginning Of Wrapping
5.49	Delay to Fold	0.5	Seconds	Time After Wrap Arm Speed Changes to Slow Speed
				to Wrap Arm Folding (at End of Wrap Cycle)
5.5	1-D Rolls Stop	1.0	Seconds	Rollers Intermittent Stop Time For 1 Film Wrapping
5.51	1-D Rolls Rot.	1.3	Seconds	Rollers Intermittent Rotation Time For 1 Film Wrapping
5.25	RPM Alarm	35	Seconds	Maximum Wrapping Arm Speed
5.28	Set Default			Sets Controller Back To Its Default Settings

Operator Setup Menu

The default settings for the machine are developed by Tanco for optimal operation of the machine. However, the operator can change certain parameters in the 'Operator Setup' menu to take account of operational conditions.

Operating Instructions
We shall now go through a complete wrapping process, from loading to storage place, and explain the practical use of Tanco Autowrap 1500 Series.

Fitting Rolls of Film
Remember that the plastic film ends have to be locked in the Cutter/Film holder before starting the wrapping. Take care when doing this.

Bale Height Adjustment
The dispensers should apply the film to the centre of the bale.
The 1500's are set up as standard to do this on 1200mm diameter bales with the roller arms fully closed. If larger diameter bales are being wrapped then the arm stop pins should be used to limit the closed height of the rollers, this lowers the height of the bale on the machine. This gives clearance between the top of the bale and the rotating arm and also gets the film applied to the centre of the bale.

Setting Wrapping Arm Speed
Once the bale has been loaded onto the machine in order to adjust the correct overlap, you have to leave the tractor cab while wrapping. Check that the wrapping arm has a speed of approx. 22 revolutions per minute. (Note: Max RPM = 35RPM) If not, adjust this by turning the control valve for wrapping arm speed (See Fig 16).
When the wrapping arm speed is OK, you can set the overlap.

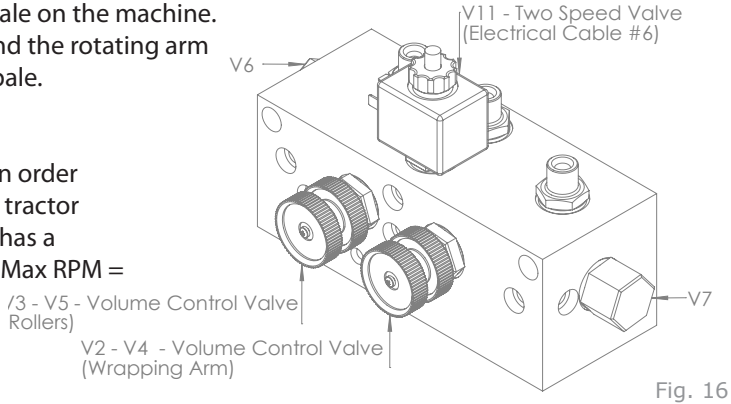


Fig. 16

Clockwise rotation of the valve knob reduces arm / roller speed, anti clockwise to increase speed. It is recommended that the wrap arm speed is not increased above 30 RPM because above this the warp arm will "catch" more air, and this air may not be able to evacuate from the bale, the result is bad fodder.

NOTE: If the wrapping arm speed is adjusted the roller speed too should be adjusted relatively to ensure the desired overlap is maintained, failure to do so will result in poor quality bales.

REMEMBER!
Increased speed of tractor engine does not increase the wrapping speed, it only increases the oil flow into the system, this may increase the temperature in the hydraulic system.

Overlapping
Use a black marker to mark a line on the middle of the film wrapped on the bale. Adjust the control valve for roller speed, (See Fig 16), so that the marker line is just covered. Approx. 52-53% is the ideal overlap.

IMPORTANT: If you have less than 50% overlap, what happens is that while most of the bale with have 4 or 6 layers, some narrow strips will have half that. Therefore DAMAGE TO SILAGE!

This adjustment can be kept as long as you wrap bales with approx. same diameter. When changing bale size, control the overlap.

How Many Layers of Plastic Film?
When the bale is completely covered with film, read the counter that displays the number of revolutions done by the wrapping arm. Add 1 to this number and multiply by 2 or 3, depending on how many layers of film you want to have;

* 4 layers - multiply by 2.
* 6 layers - multiply by 3.

As long as you wrap bales with the same diameter, you can stop at the same number every time. It would be recommended as a minimum to apply 18 warps to 1.2m diameter bale.

Machine Operation
We shall now go through a complete wrapping process, from loading to storage place, and explain the practical use of Auto Wrap 1510, 1520, 1530 & 1540 models.

Loading
Find a bale you wish to wrap. Increase the opening between the rollers as much as possible. A limiting chain has been fitted to the each set of rollers on the 1530 & 1540 machines to make them stand vertically above each other and lift up a small square bale more easily.
This may need to be adjusted to Rollers are vertical (See Fig. 17)

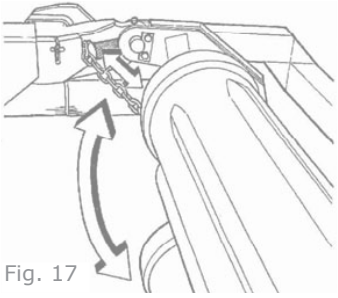


Fig. 17

Height Adjustment of Dispensers
The Film Dispenser are fitted in a fixed position on the wrap arm.
It is fastened with two bolts. To ensure the plastic film is always hitting the middle of the bale, you must adjust the roller arm stops.

The film dispenser is designed for use with 750 mm film. If you use 500 mm film, special film adaptors are required.

Roller Arms Stops

To ensure the plastic film is always hitting the middle of the bale, you must adjust the roller arm stops. This is done by moving the stop pins under the main tilt ram.

They can be placed in four different positions, as well as removed, as shown in figs. 18 & 19. Place the stop pins in the required position, fit the bolts and secure with the split pin. (The bearer-arms must be fitted against the main tilt ram/stop pins before wrapping is started so that the bale does not rock from side to side.)

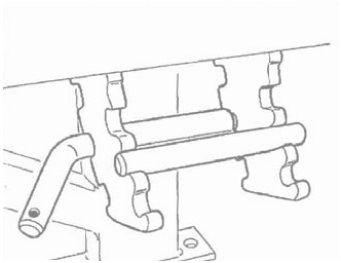


Fig. 18

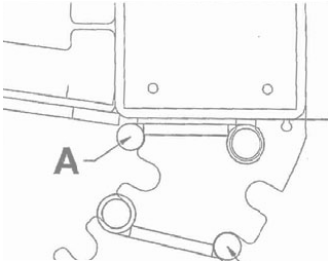


Fig. 19

Wrapping Square Bales (1530 & 1540)

A) When loading small square bales it is important to lower the rollers as close to the ground as possible. This to make all four rollers to get a grip on the side of the bale. If two of the rollers come over the bale, the machine will not be able to load it. (See Fig. 20). If necessary, adjust the position of the rollers by means of the limiting chains.

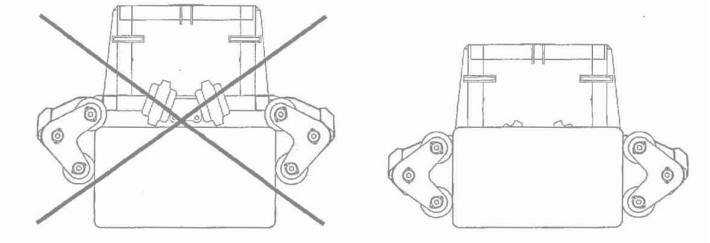


Fig. 20

B) Minimum recommended bale size is 60 x 90 cm, (2' x 3'). If you wish, you can place two bales upon each other, and wrap them together as a bale of 120 x 90 cm, (3' x 4'). (Max. bale size is 120 x 120 cm. (4' x 4')).

C) When wrapping rectangular bales, (e.g. 70 x 120 cm), the bale will rotate with uneven speed. To get a smoother wrapping, or if you want more film on the long sides of the bale, it is recommended to mount a hydraulic valve that stops the rotation of the bale while the wrapping arm continues to go.

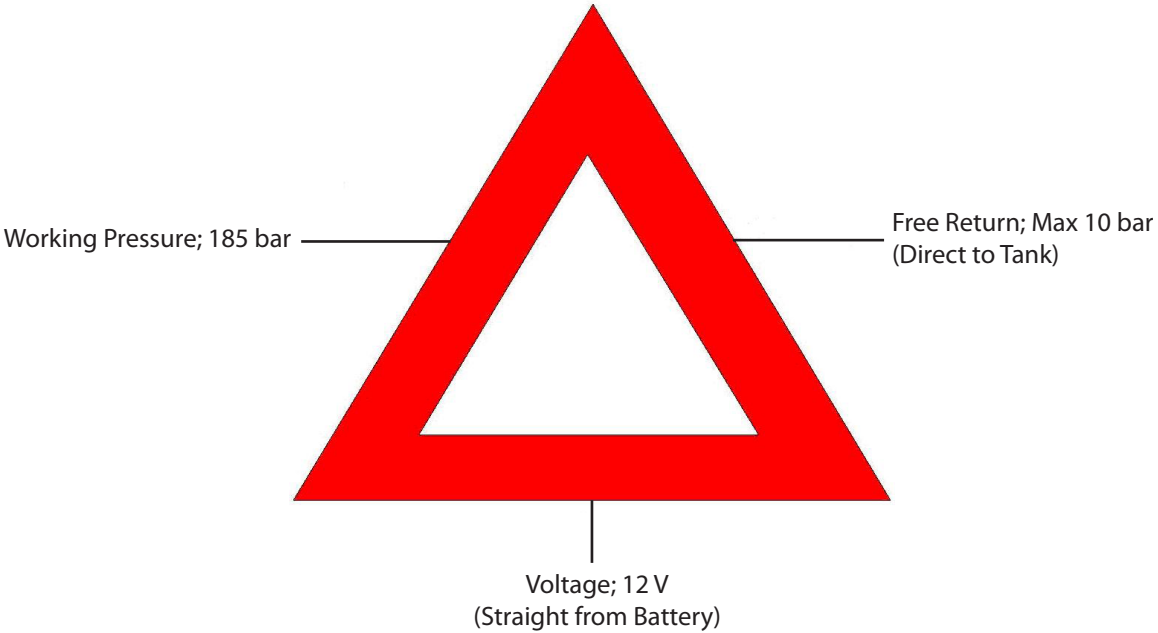
D) Sometimes it can be necessary to move the width between the rollers while wrapping. This is most in common when wrapping bad shaped and loosely packed bales. If the machine has problems rotating the bale, you can move the rollers in or out with the ROLLER OUT (7) or ROLLER IN (6) with the control box while wrapping.

Start Wrapping
Remember that the plastic film end has to be held in the cut and start unit before starting the Wrapping cycle. When the plastic film end is held, push START (8), and the wrapping arm now moves at ½ speed for approx. one half revolution before it automatically switches to full speed. This is to avoid damage of the film when starting. When the wrapping arm has done a couple of revolutions, the cutter-arm automatically releases the film end.

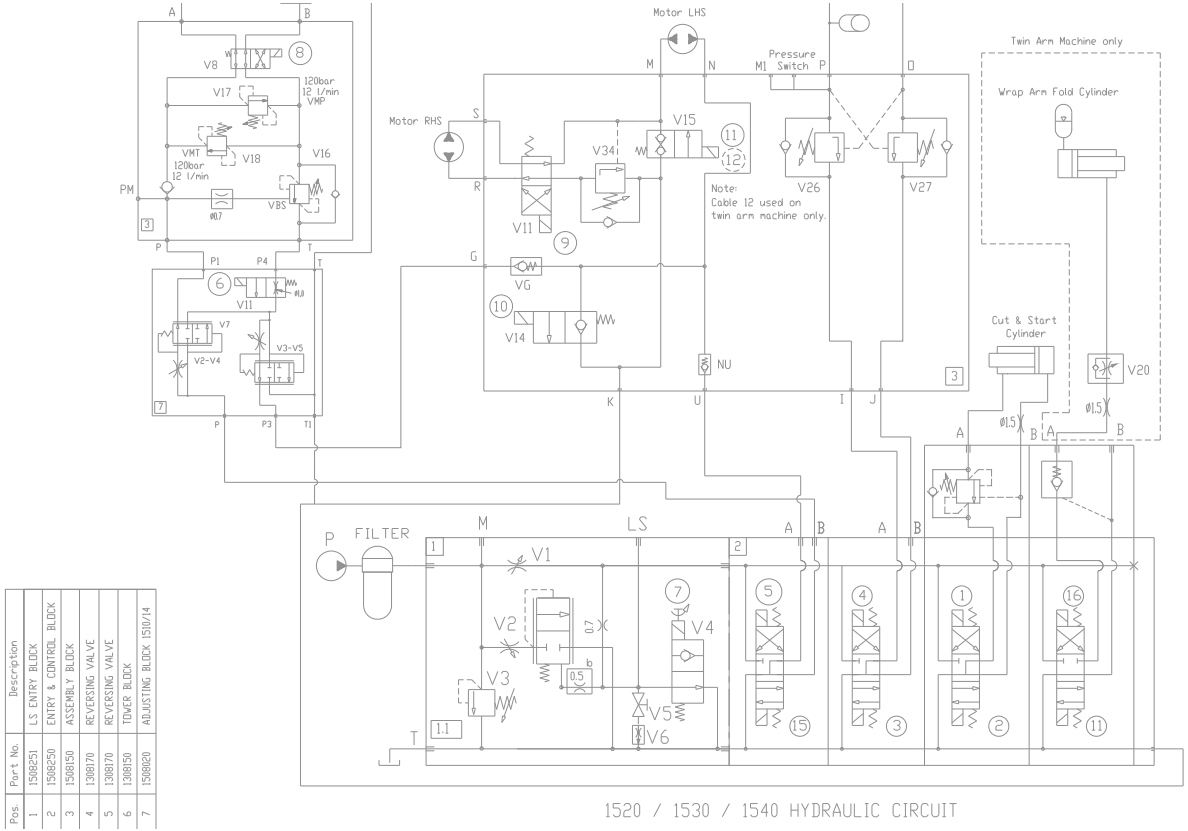
Stop
On the last revolution, the controller automatically slows, the cutter opens, and it stops at the right place for next wrapping cycle. Then the cutter closes automatically, and the film is held tight in the U-formed slot and perforated. The bale is now completely wrapped and ready for stacking.
Rotation after wrapping, the bale will be rotated till it is in the right position for off loading, by pushing and holding the Rotate rollers button (R4) or entering a time in Rotate After in the controller Operator Setup. When the wrapping sequence is ended, Off Load the bale by pressing the Rollers out button. After a certain delay the controller is reset and the bale counter is incremented.

Storage Place
At the storage place the bales should be placed systematically. Start at the right-hand side, and stack to the left. Lower the machine until the support roller rests on the ground. Push control 7, ROLLERS OUT, and the bale will rest on the ground. Drive the tractor carefully away from the bale. Try to avoid touching the bale with the rollers. The plastic film will now tear off by the perforation at the cutter. Place the next bale to the left of the first one so that the loose film end on the last ball will be locked. Then you do not have to leave the tractor cab to fasten the loose film end. To be sure we recommend that you check that the film ends are securely fastened, and eventually fasten them a little bit better when you have stacked the bales. If the machine is front mounted, the bales can be staked upon each other.

Electro-Hydraulics
Note: There are 3 basics, which must ALWAYS be followed if the machine is to function correctly.

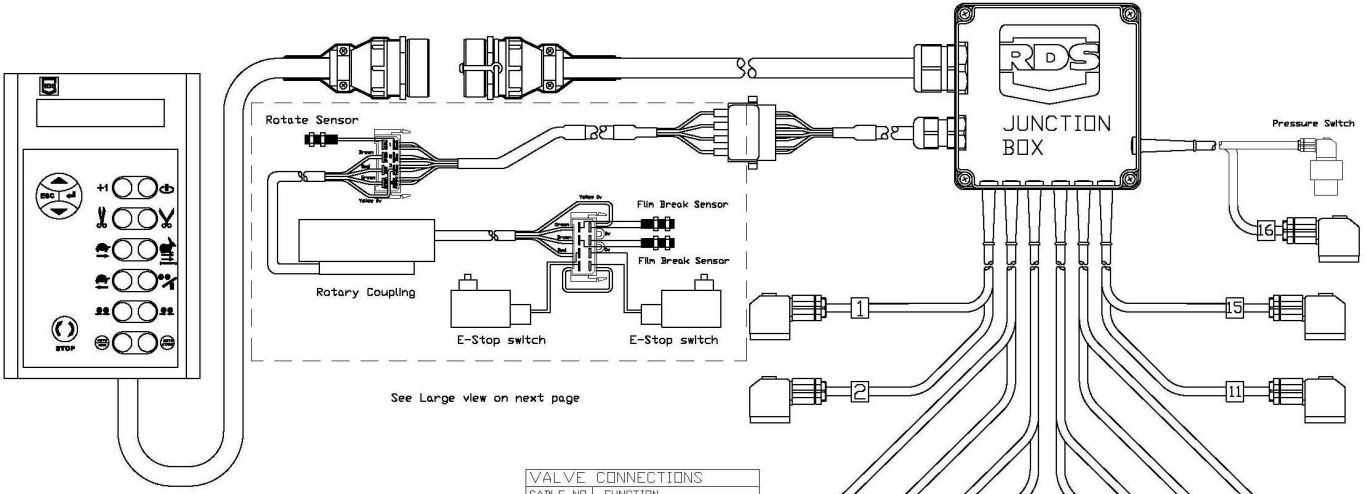


1500 Hydraulic Circuit



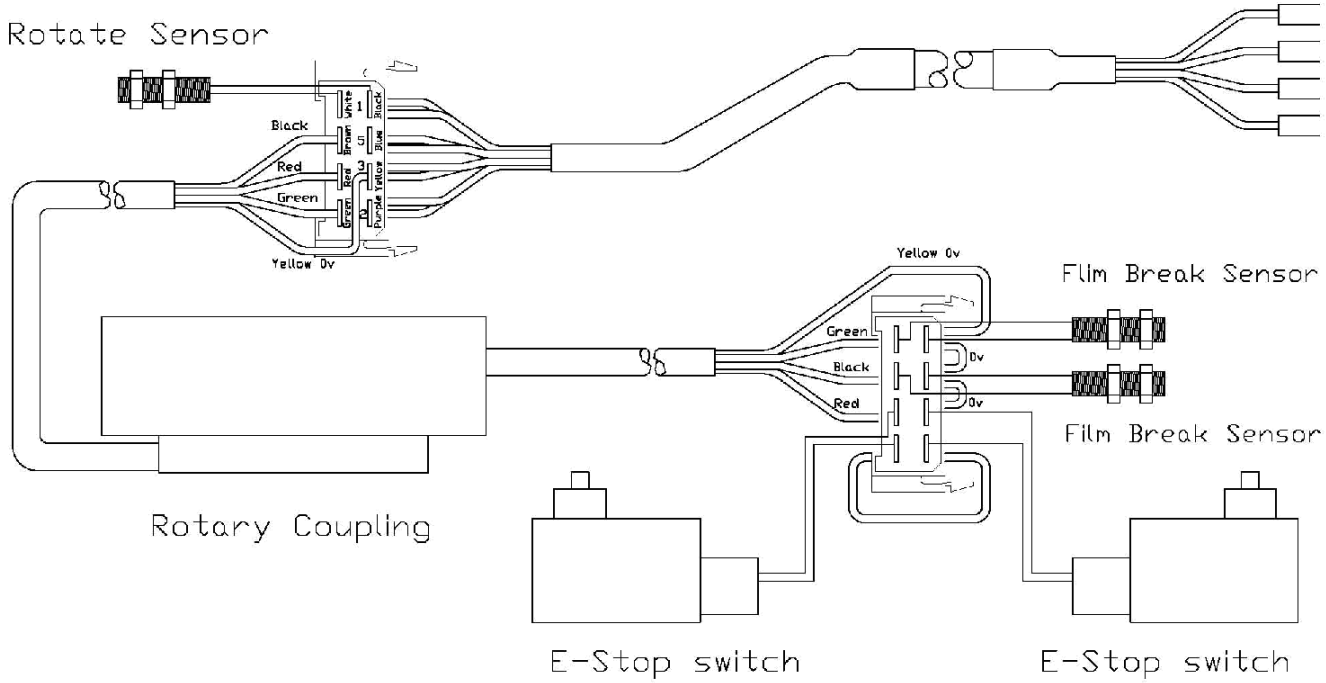
Pos.	Part No.	Description
1	1508251	LS ENTRY BLOCK
2	1508250	ENTRY & CONTROL BLOCK
3	1508150	ASSEMBLY BLOCK
4	1308170	REVERSING VALVE
5	1308170	REVERSING VALVE
6	1308150	TOWER BLOCK
7	1508020	ADJUSTING BLOCK 1510/14

1520 / 1530 / 1540 HYDRAULIC CIRCUIT



INPUT CHECK	
INPUT NO.	FUNCTION
1	ROTATE SENSOR
2	FILM BREAK
3	E-STOP
5	SQUEEZE PRESSURE
6	FILM BREAK

VALVE CONNECTIONS	
CABLE NO.	FUNCTION
1	C&S OPEN
2	C&S CLOSED
3	ROLLERS IN
4	ROLLERS OUT
5	FWD ROTATE
6	FAST ARM ROTATE
7	MASTER VALVE
8	REVERSE ROTATE
9	DOUBLE DRIVE
10	ROLLERS STOP + FREEWHEEL
11	WRAP ARM UNFOLD
15	ROTATE AFTER
16	WRAP ARM FOLD


Rotate Sensor
Black
Red
Green
Yellow 0v
White
Black
Brown
Blue
Red
Yellow
Green
Purple
Yellow 0v
Green
Black
Red
0v
0v
Film Break Sensor
Film Break Sensor
Rotary Coupling
E-Stop switch
E-Stop switch

Electric System

The electric system consists of a control unit with power supply line, control cable, (24-Lead), with a plug at control unit side, and distributing lines to the different magnet valves and switches on the machine.

The electric cables to the valves and switches are numbered from 1 to 16, and extend to the listed appliances below.

Tanco Junction Box							
Pin Number	Cable Colour 25 core	Function **1540**	Cable Identifier	Circuit Board Identifier	Sensor Lead Wire Colours	Sensor Con. No.s	Controller Input Check No.
12	White/Blue	Rolls stop+Free.Wheel	10 **	D			
11	Brown	REVERSING	8	C			
8	Yellow	ARM UNFOLD	11	M			
6	Black	C & S CLOSE	2	K			
3	White	ROLLERS IN	3	O			
2	Green	ROLLERS OUT	4	J			
20	Green/Red	FILM SENSOR			Green	1	2
24	Red/Blue	FILM SENSOR 2			Brown	3	6
22	Green/Blue (*)	SQ. PR. SW.		H			5
21	Grey/Blue (**)	ROTATE SENSR.			White	4	1
13	Red/Black	DOUBLE DRIVE	9	E			
9	Pink	MASTER VALVE	7	N			
7	Red	C & S OPEN	1	L			
5	Grey	ARM FOLD	16	A			
10	Violet	ROT AFT WRAP	15	B			
23	Yellow/Blue	E-STOP			Red	2	3
1	Blue	FAST SPEED	6	I			
4	Orange	FWD ROTATE	5	P			
14	Turquoise	0 VOLTS			Violet	5	
15	Yellow/Red	0 VOLTS			Blue	7	
16	Yellow/Green	0 VOLTS			Yellow	6	
17	Blue/Black	0 VOLTS			Black	8	
18	White/Red	0 VOLTS					
19	Orange/Blue	0 VOLTS					

Note: Solenoid leads must be connected BROWN to+, BLUE to -, Diodes fitted in connectors!

** 2 Cables on 1540

* Non-RoHS cable = Orange/Green! ** Non-RoHS cable = White/Green!

Supply Of El-Power.
The electric circuit must only be connected to 12 volt DC. Connect directly to the tractor battery, to avoid any loss of power. The fuse on the plus-leader must not be more than 15 A.

Description Of The System
All functions on the machine are operated from the control unit. It is a microprocessor operated, programmable unit that controls the whole wrapping process. When e.g. START (8) is pushed, the wrapping arm motor starts at ½ speed. After a preprogrammed time it switches over to full speed. After approx. two revolutions it releases the film end, and switches over to ½ speed again before it stops when number of programmed revolutions is obtained. The signals from the control unit are all the time sent to the magnet valves that shall be activated. The exit clips in the control unit are numbered from 1-16.

Power Distribution
When the machine is operating the following valves should all receive electrical current at the same time:

1	Open Cutter	Current to nos. 1 and 7
2	Close Cutter	Current to nos. 2 and 7
3	Rollers In	Current to nos. 3, 9 and 7 (+15)
4	Rollers Out	Current to nos. 4, 7, 9 and 11
5	Wrapping Arm Half Speed	Current to nos. 5 and 7
6	Wrapping Arm Full Speed	Current to nos. 5, 6 and 7
7	Cutter Releases Film	Current to nos. 1 and 7
8	Rotation Stop	Current to nos. 10, 5, 6 & 7
9	Reversing	Current to nos. 8, 5, and 7
10	Rotation After Wrapping Complete	Current to nos. 15 and 7
11	Wrap Arms Unfold	Current to nos. 11 and 7
12	Wrap Arms Fold	Current to nos. 16 and 7

Description Of Hydraulics

The 1500 Series machines are driven by the tractor's hydraulic system. The machine's hydraulic installation is easy to change from an open center to a closed center hydraulic system. The machine's hydraulics consist of a number of different blocks, and all the valves have a "V" number. They are numbered in a logical sequence from the inlet and then onwards through the whole machine. The valve blocks are marked with every individual valve number, as is the hydraulic circuit.

During the wrapping sequence all three hydraulic motors on the machine are connected in series, i.e. the oil goes first to the wrapping arm motor, and then to each of the roller motors and then back to the tank. Disconnecting the roller motors is done by means of a hydraulic connection on each of the roller motors. The accumulator (See Fig. 21) absorbs any pressure surge during load and also ensures that the distance between the load arms can increase a little when the rollers go "round the corner" on square bales during loading. The functions of each particular valve will now be discussed and explained.

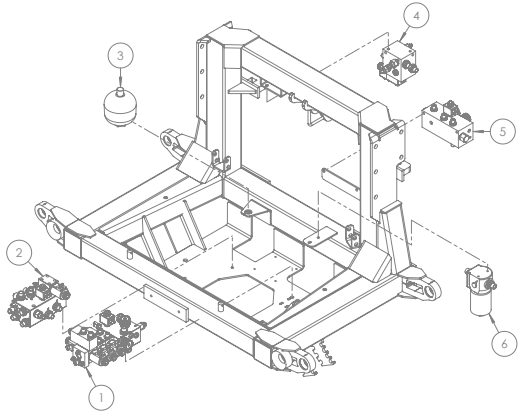


Fig. 21

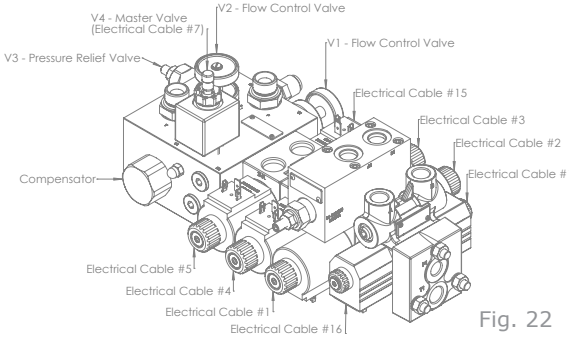


Fig. 22

Entry Block & Control Block

V1 - Flow Control Valve

The entry block is designed to take an inlet flow of up to 90 l/min. This valve works with the compensator valve to regulate the flow to the machine to 30 l/min. Please note that all valves have been set in the factory and should not be adjusted except by trained technicians.

V2 - Flow Control Valve

This valve should normally be set fully open to allow the compensator to work. When set for Load sensing this should be screwed fully closed.

V3 - Pressure Relief Valve

In the event of the oil coming against a dead head this valve opens allowing oil back to tank. This is set in the factory to be 185 bar and should not be tampered with.

V4 - Master valve (Electric Cable #7)

This is an electrical vave, when the machine is running idly, this valve remains open and the oil circulates constantly from and to the tractor. As soon as one of the control box functions is selected, this valve will close and simultaneously open the LC valve for the particular function.

Manual Overide for Open/Closed Center

- Open Center Hydraulics

Most tractors have an oil pump which produces a fixed volume per revolution. For these tractors the selector valve must be in the open position. (See section 4.10.) If no other function is activated, the oil flows from the tractor, through the oil filter, the selector valve the circulation valve and back to the tractor.

As soon as a function button is pressed on the control box, the circulation valve, V3, will close the oil circuit and at the same time open the valve for the selected function.

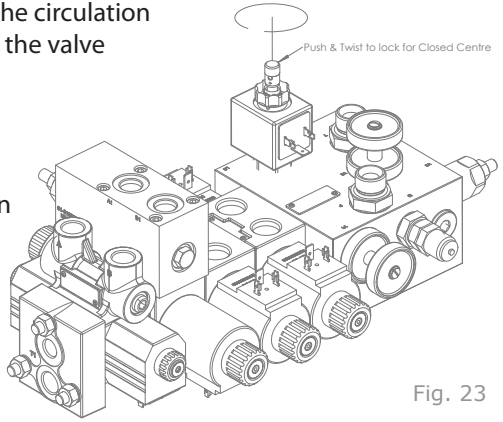


Fig. 23

- Closed Center Hydraulics
For tractors with variable oil pumps, for example older John Deere's, the master valve must be in the closed position To do this push and twist the manual override on top of the master valve. (See Fig. 23) With this setting the oil can only enter the control block when one of the functions has been selected.

The control block contains the double acting sectional valves which are bolted together to the entry block. These six electro-hydraulic valves control the main functions of the machine. They do not have V numbers, but have the same number as the electric cables to which they are connected. (See Fig. 22)

The Cut and Start Unit
To prevent the pressure on the cut and start reducing so that it does not hold the plastic film for sufficient time, there is an over-center block bolted onto the valve for this section.

Adjusting Block (See Fig. 24)
This contains the adjusting valves for roller speed and wrapping arm speed, together with the two-speed valve.

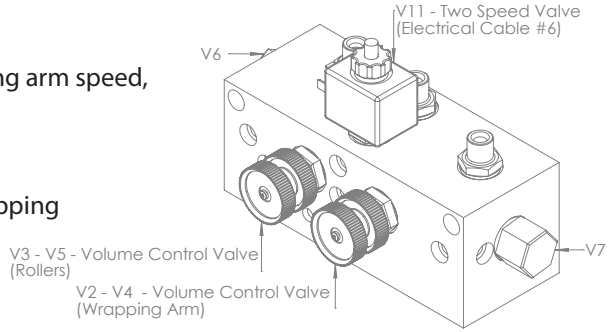


Fig. 24

V11 - Two Speed Valve (Electric Cable #6)
The speed is divided into two stages in order to make the wrapping arm start and stop smoothly. (This happens automatically.) When the wrapping sequence starts, the valve is closed. This makes the oil from the wrapping arm motor go through an orifice that limits the speed. After about half a revolution the two-stage valve opens and the oil flows outside this nozzle. This makes the wrapping arm turn at full speed. The same thing happens when the arm is stopped, but in reverse order.

V2-V4 - Volume Controlling Valve for the Wrapping Arm
This regulates the oil volume and thereby the speed of the wrapping arm motor. This is controlled by V7. Excess oil is directed onwards to V3-V5.

V3-V5 - Volume Controlling Valve for the Rollers
This regulates the oil volume and thereby the speed of the roller motor. This is controlled by V6. Excess oil is directed back to the tractor.

NOTE: If the wrapping arm speed is adjusted the roller speed too should be adjusted relatively to ensure the desired overlap is maintained, failure to do so will result in poor quality bales.

Wrapping Arm Block (See Fig. 25)
The Wrapping Arm Block is mounted on the tower, and contains 4 valves. When the wrapping arm starts the oil pressure releases the brake. When the brake is operated there is however a need for a slight delay here so as to prevent the wrapping arm stopping too abruptly. This is achieved by a nozzle which is fitted in the hexagon nipple of the brake.

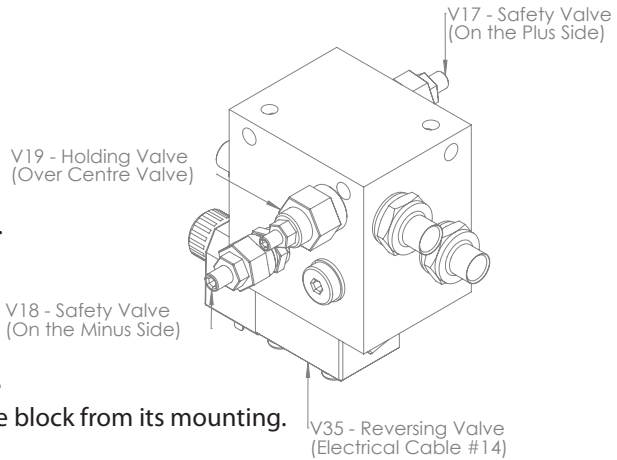


Fig. 25

V16 - Check Valve
This prevents the oil flowing back to V10. It is fitted inside the block and can only be reached by removing the entire block from its mounting.

V17 - Safety Valve on the Plus Side
This makes the wrapping arm stop smoothly and prevents the build-up of high pressure on the motor's outflow side when the arm stops. The valve releases oil from the outflow side of the motor into the inflow side.

V18 - Safety Valve on the Minus Side
This limits the maximum torque on the wrapping arm. The valve releases excess oil into the motor's outflow side. It is adjusted so that the traction out on the wrapping arm is approximately 35 kilo.

V19 - Holding valve (Over Center Valve)
This valve regulates the oil flow out the outflow side to maintain a constant pressure on the wrapping arm motor. This makes the motor run evenly so the brake does not have to be operated even if the wrapping arm runs a bit "downhill" (when the machine is wrapping while on a slope).

V35 - Reversing Valve ((Electric Cable #14)
When a TWIN machine has completed a wrapping sequence, the wrapping arm reverses before the next bale. At this point the computer sends a signal to V35 which reverses the oil flow to the wrapping arm motor and so makes the wrapping arm reverse.

Assembly Block (See Fig. 26)
The assembly block contains all the valves which control and regulates the various functions concerned with loading and off-loading the bales.

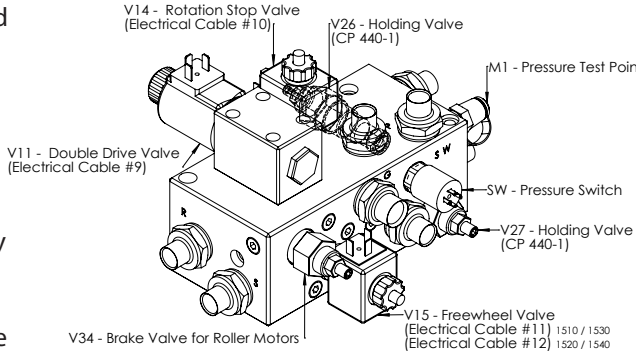


Fig. 26

SW - Pressure Switch
When the oil pressure reaches the preset level this valve operates, this tells the controller to switch the outputs between squeeze and rotate rollers. It is preset at the factory to 120 bar. The pressure is measured at test point M1 when 'roller width in' is activated. When the pressure drops the outputs switches again and the machine squeezes. The cycle repeats until the bale is fully loaded.

V11 - Double-Drive Valve
This rotates all the rollers during loading (with the left and right-hand rollers turning in opposite directions.) This makes the bale lift right up without the bale itself rotating. This can be an advantage when wrapping two square bales on top of each other.

V30 - Double-Drive valve (Electric Cable #13)
Electric valve which connects or disconnects the double-drive function. This is only active when "Roller Width In" (6) and "Roller Width Out" is selected.

VG - Check Valve
This valve prevents oil going back to the wrap arm circuit during loading.

NU - Check Valve
This valve prevents oil going back through V5 during wrapping.

V26 - Holding Valve (CP 440-1.)
This maintains the current pressure on the minus side of the width cylinder when it is not activated.

V27 - Holding valve (CP 440-1.)
This maintains the current pressure on the plus side of the width cylinder when it is not activated.

V34 - Brake valve for the roller motors (CP 440-1.)
This regulates the oil flow through the roller motors. It senses the pressure on the right-hand roller motor (#2). If a rectangular or square bale started to keel over, the weight of the bale would turn the rollers. This would lower the pressure in the motor and the V3 throttle and the motor will brake.

V14 - Rotation Stop Valve (Standard) (Electric Cable #12)
This valve will allow the rollers to stop rotating while the wrapping arm continues to turn. (This can be useful on the 1530 & 1540 machine when wrapping rectangular bales.)
The function is controlled by selecting 'R4' on the Controller during the wrapping sequence to pause rotation. Useful when the wrap is going around corners on large square bales.

V15 - Freewheel Valve.
During unloading this valve is energized along with V14 and V11 to allow the motors to freewheel preventing damage to the plastic during unloading.

Rotation of Bale After Wrapping is Completed
It is possible to rotate the bale after it has been wrapped. When wrapping square bales this can be useful for moving the bale into a particular position before unloading. The function is controlled by selecting 'R4' on the controller and keeping the button pressed in until the bale has reached the required position.

Check Points Prior to Troubleshooting
There are some general check points that have to be examined first if something is wrong with the machine. There are three basic assumptions that have to be fulfilled for the machine to function properly;

1. The oil pressure from tractor should be 180 bar.
2. The return flow of oil has to be as free as possible, max. 10 bar counter pressure.
3. Enough electric power to all functions.

Oil Pressure
In order to check that the oil pressure into the machine is high enough, a gauge may be applied to the oil pressure hose, for example on the quick coupler.
If the pressure is less than 180 bar, there will be less power for the functions. The first place you trace this is at the ROLLERS OUT / IN.

Oil Flow
The amount of oil that the tractor delivers should be minimum 15 liters/minute for satisfactory operation of the machine, but it is recommended that it is 25 liters/minute. (Max. allowed oil flow is 90 liters/minute). A large oil amount will mean that the Valves get hot. (Small Oil Tank will mean insufficient cooling).

Note: Ensure that oil level in tractor's hydraulic system is correct and tractor's oil filter is changed regularly.

Return Pressure
The return pressure can be too high. With high return pressure the machine's functions will get less power. High return pressure means also that you need more power to operate the valves. MAX. ALLOWED RETURN PRESSURE IS 10 BAR. We recommend "free return" directly to the tank.

Electric Power
It is important to check that all functions receive enough electric power. If not, some, or all functions may fail.

- Is the battery voltage high enough?
If the voltage falls below 9 volts the valves will not be able to open.

- Are the cables correctly connected to the battery?
Follow directions in chapter 6.

- Is the connection between battery cable and control unit OK?
Clean off the poles and check the plug.

- Is the connection between remote control unit and machine OK?
Change contacts if any doubt about the condition.

- Is the fuse on the battery cable OK?
There are two 10A fuses. DO NOT INCREASE THIS FUSE SIZE.

PLEASE CONTACT YOUR DEALER IF YOU ARE IN DOUBT ABOUT ANYTHING.
(Remember always to give your dealer the serial number and production year of your machine when contacting dealer and when ordering spare parts).

Procedure of Troubleshooting
If the machine fails to operate correctly it must be determined if the problem is Hydraulic, Mechanical or Electrical.

Solenoid Valves
When checking if the Solenoid valves are receiving electric power, you do this in the following way:

1. Unscrew the nut that holds the solenoid.
2. The solenoid is easy to move without electric power.
3. Push the current function on the remote control. If the solenoid gets power, it will be difficult to move, it "sticks". This is the best and easiest way to check if the solenoid valve is receiving electric power. Another way is to hold a screwdriver up to the magnet. If it "sticks", the solenoid is receiving electric power.

The power supply to the valve can also be measured with a voltmeter, but then the contact must be connected to the solenoid, so it is using power. To have reliable functions, the voltage should not be lower than 11,5 volts, even if the solenoid valve usually works with a little lower voltage.

Only For Solenoid Valves to the Main Functions
If the electric supply is in order and one of the functions fails, the reason can be dirt that tightens or prevents the sliding shaft (spool) from moving.
Try to manoeuver the function manually, by pressing the point of a screwdriver into the end of the valve housing. At the same time the corresponding switch on the control unit has to be operated to get electric power to the master valve. If the function is working again after this, the dirt may have been pushed out in the oil system and the machine can be operated normally again.


Take care so that the machines moving parts, do not cause damage to persons or objects.

Master Valve.
To get anything to work, the Master Valve, (See Section 10), must have electric power. If there is no power supply to this valve, the oil goes straight back to the tank, and nothing happens. (V2 must always have power when attached to a tractor with closed center hydraulics.)

Emergency Stop
The Emergency Stop is constructed so that the electric circuit must be closed to be able to start the machine. As soon as it's broken, the machine will stop. "E-STOP ACTIVE" will flash on the control-units' display by. When the Emergency Stop is activated, there should be measured 4 volts over the Emergency Stop switch.

Trouble Discription	Symptom Cause / Solution
"The machine is not functioning"	- Check the power supply. Even though the pressure gauge shows an adequate pressure there is no response from the machine. The reason could be that one (or both) of the quick couplers are not opening to let the oil through. - Change the quick couplers. - Check that the selector valve (V1) is in the right position. (See Section 10) The circulation valve is not receiving any power, or there is dirt in the valve so that the slide valve is not closing. - If the power is OK, unscrew the valve and clean it, or replace it. If necessary ask your dealer to test the valve. The safety valve, V3, is wrongly adjusted or defective. - Adjust, clean or replace. (See Section 10)
The display shows "ENERGENCY STOP"	The safety guard on the wrapping arm is not in position. - Defective return spring or dirt in the bracket. Defective emergency stop switch. - Replace switch. The counting switch is active, or the rounds counter is defected, when the power is connected.

Trouble Discription	Symptom Cause / Solution
"Everything is going slowly."	The volume-controlling valves (V4/V5) are wrongly adjusted or defective. - Adjust if necessary or replace defective valve. (See Section 10) Leak in the circulation valve (V3). - Clean the valve, check the O-rings or replace defective valve.
"Roller width IN does not work when the machine has no load."	The solenoid valve (no. 3) is not receiving power or there is dirt in the valve. - See 'Solenoid Valves' Section 11.
"Roller width IN does not work when the machine has no load."	Pressure switch (SW) is defective or there is a fault with the wire. The maximum clamp pressure switch is defective or wrongly adjusted (two low) - Check, adjust or replace defective switch.
"The wrapping arm rotates the wrong way when loading."	Leak in check valve (VG). - Clean the valve or replace if defective.
The bale cannot be loaded."	Maximum clamp pressure switch must be adjusted. (See Section 10) - The clamp pressure must be increased or reduced using SW. Maximum 120Bar
"The wrapping arm will not turn."	The transport safety catch has not been released. - (See Section 5) The solenoid valve (no. 5) is not receiving power or there is dirt in the valve. - See 'Solenoid Valves' Section 11. The volume-controlling valves for the wrapping arm (V4/V5) are closed or defective. - Clean valves or replace if defective. (See Section 10) The brake is not releasing properly. - Mechanical cause, repair or replace brake. Wrongly adjusted or defective safety valves (V17/V18) - Adjust, clean or replace valve. (See Section 10) Defective wrapping arm motor. - Replace motor.

Trouble Discription	Symptom Cause / Solution
"The wrapping arm only turns slowly."	The two-stage valve (V11) is not receiving power or is defective. - Replace defective valve (See Section 10) The holding valve V19 is not opening or V17 in is open too much. Clean the valve or replace if defective. The volume-controlling valves (V7) are wrongly adjusted. - Clean valves or replace if defective. (See Section 10) The brake is not releasing properly. - Mechanical cause, repair or replace brake.
"The speed of the wrapping arm cannot be adjusted."	The volume-controlling valves (V3/V5/V6) are defective or full of dirt. - Clean valves or replace if defective.
"The rollers move apart from each other during loading."	The fault is probably in the holding valve (V26). - Clean the valve or have it tested by your dealer. If necessary replace defective valve.
"The wrapping arm turns but the rollers do not rotate."	The volume controlling valves for the rollers (V3/V5/V6) are closed or defective. - (See Section 10) Dirt in one of the following valves: V14 & NU This would cause the oil to leak back to the tank. - Clean the valves or replace if defective.
"The cutter does not function."	The solenoid valves (V1 and V2, V4), are not receiving power or there is dirt in the valves. - See 'Solenoid Valves' Section 11. The cutter cylinder seals are defective. - Replace. The cutter lifts quickly but drops slowly. - The pilot-controlled check valve is defective. Replace.
"The cutter will not grip the film."	The pressure in the cutter cylinder is dropping. The fault is probably in the pilot-controlled check valve. Replace defective valve or have it tested by your dealer. (See Section 10)

Trouble Discription	Symptom Cause / Solution
"The cutter will not grip the film." Contd.	The fault could also be that the check valve that is fitted below the pilot-controlled check valve is leaking. - Clean this valve or replace it with a new one.
"The cutter will not release the film when the machine is tested without a bale loaded."	When the machine is running idly, i.e. the wrapping arm and rollers are turning without a loaded bale, it can happen that there may not always be sufficient extra pressure to open the pilot-controlled check valve if the cutter is closed with full pressure. - This can be avoided by not leaving the cutter closed with full pressure. Therefore press the "CUTTER OPEN" (5) button briefly. (This problem cannot occur when a bale is being wrapped on the machine.)
"Roller width OUT does not work."	The solenoid valve (no. 4) is not receiving power or there is dirt in the valve. - (See Section 10) The holding valve (V26) is not opening. - Replace defective valve or have it tested by your dealer.

Periodic Maintenance
Bearings
All ball-bearings are packed with grease, and do not need any more maintenance.

Pre-Stretchers
If the machine is in daily use, the Gears under the plastic cover on the dispenser should be greased when needed.

Cutters / Film Holders
The cutter / film holder is pre-adjusted from the factory and does not need further adjustments. When replacing spare parts, it is necessary to adjust it. The springs for the U-shaped slot shall be adjusted so that they are almost completely squeezed together when the cutter-arm is all down.

Cleaning
The machine should be cleaned and oiled regularly and at the end of the wrapping season.
When using high pressure washing apparatus, care must be taken with the electrical installation.
Also make sure that water is not sprayed directly into the bearings, etc. Keep the control box protected from rain and water. If necessary use compressed air to dry electrical components.

Square-Bale Unit (1530 / 1540)
After a period of wrapping, grass will collect around the flanged bearings on the square-bale unit. When this becomes wet, acids can form in the grass which can damage the bearings. This grass must therefore be removed at regular intervals

Hydraulic Cylinders
Make sure that all hydraulic cylinders are closed when storing the machine.

Quick Couplers
Ensure that the quick couplers are kept clean and apply the dust caps after use.

Storage
The machine should be parked on a dry place during the closed season.

Oil Filter
The oil filter must be changed once a year.

Lubrication (See Fig. 26)
The table below outlines the recommended lubrication requirements for components on the 1500;

No.	Component	Type	Intervals
1	Width Ram	Grease	10hrs
2	Cut & Tie Ram	Grease	10hrs
3	Arm Folding Ram	Grease	10hrs
4	Wrap Arm Drive*	Oil	50hrs
5	Roller Drive**	Oil	50hrs
6	Dispenser Gears	Oil	50hrs

* Chain & Sprockets
** Sprockets (1530 / 1540 Models - Rocking Roller Bearings to be kept clear of grass)

Note: We recommend that you change the oil in the Tower & Roller motors every 500hrs.

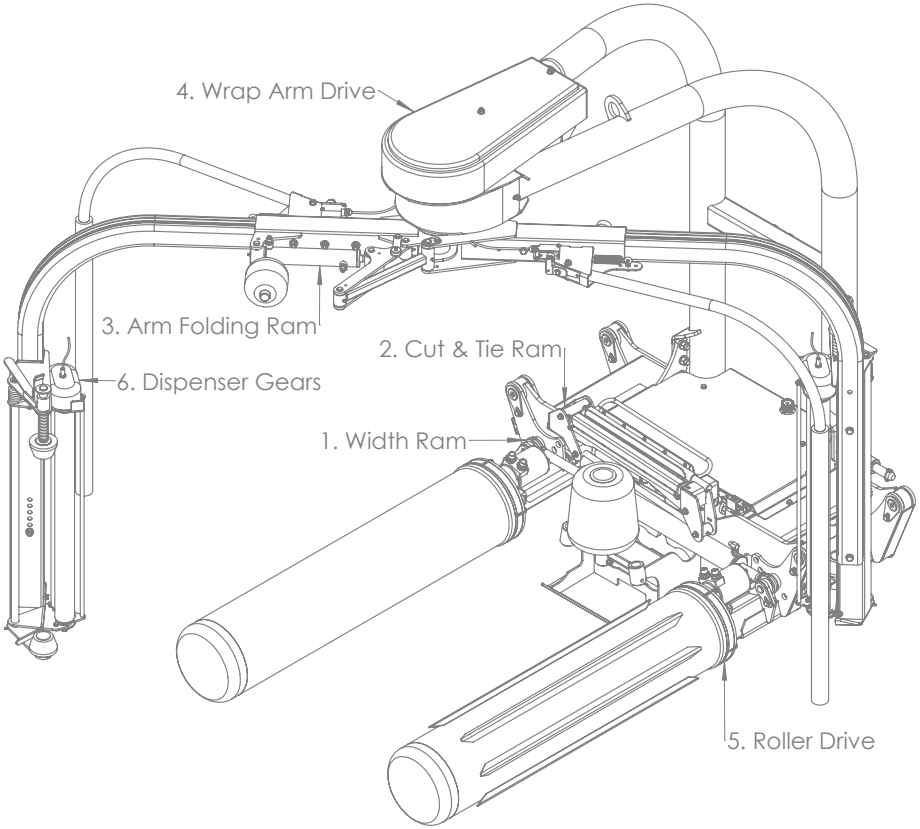

4. Wrap Arm Drive
3. Arm Folding Ram
2. Cut & Tie Ram
6. Dispenser Gears
1. Width Ram
5. Roller Drive

Fig.26

GUARANTEE

Subject to hereunder provided, the sellers undertake to correct either by repair or at their election by replacement any defect of material or workmanship which occurs in any of its goods within twelve months after delivery of such goods to first user, with the exception of contractors or commercial users when warranty period is six months.
In respect of Autowraps the warranty period is for 12 months or 8000 bales, whichever occurs first.

The term goods when used in this document means the article or articles described in invoices as sold by the sellers but dose not include equipment or proprietary parts or accessories not manufactured by the sellers. The sellers, however, undertake to pass on so far as they legally can to the first user the benefit of any warranty given to the sellers by the suppliers of such equipment, parts or accessories.
This understanding shall not apply to:-

(a) Any goods that have been sold by the first user.
(b) Any goods which have been injured by unfair wear and tear, neglect or improper use.
(c) Any goods the identification marks of which have been altered or removed.
(d) Any goods that have not received the basic normal maintenance such as tightening of bolts, nuts, tines, hose connections and fittings and normal lubrication with the recommended lubricant.
(e) The use of any product on tractors exceeding the recommended horsepower.
(f) Any goods that have been altered or repaired other that on instruction or with the written approval of the seller or to which any part not manufactured or having written approval by the sellers have been fixed.
(g) Any second-hand goods or parts thereof.

Any allegedly defective part or parts returned to the seller must be sent carriage paid. No claim for repair or replacement will be entertained unless upon discovery of the alleged defect written notification is sent to the Sellers giving, at the same time, the name of the Buyer from whom the goods were purchased and the date of purchase, together with the full details of the alleged defect and the circumstances involved, also the serial number of the machine etc.

The sellers shall be under no liability to their Buyers and first or subsequent users of their goods or to any other person or persons for loss or damage howsoever arising in respect of either personal injuries or for arising out of, or in any other way connected with or arising from the manufactures sale, handling, repair, maintenance, replacement or use of its goods or the failure or malfunction of any of its goods. Representation and/or warranties made by any persons (including Buyers and employees and other representatives of the Seller) which are inconsistent or conflicting with these conditions are not binding upon the sellers unless given in writing and signed by a director of sales.

CLAIMS

If you wish to make a claim under the guarantee:

1: Immediately, stop using the machine.

2: Consult with your Tanco dealer (supplier). He/She can download a warranty claim form on-line. This should be filled out and e-mailed to distributor and forwarded to relevant contact person in Tanco. Please ensure all relevant information is included on this form

3: Consult with your Tanco dealer (supplier) and have him forward your claim and the damaged item to Tanco.

EC DECLARATION OF CONFORMITY

ACCORDING TO DIRECTIVES 8 9/392/336 /EEC AS AMENDED

CE

Manufacturer:
TANCO ENGINEERING Co Ltd
BAGENALSTOWN
CO CARLOW
IRELAND

CERTIFIES THAT THE FOLLOWING PRODUCT:
TANCO AUTOWRAP
MODEL: 1510 EH / 1520 EH / 1530 EH / 1540 EH
SERIAL NO:

To which this declaration relates, corresponds to the essential requirements of the Directive 89/392/336/EEC as amended.

To conform to these essential health and safety requirements, the provisions of the following harmonized standards were particularly considered:

EN 292-1,2, EN 294, EN 1152, prEN 703, prEN 811, prENl553, prEN 982.

DATE 10.02.11

Singned: _____

Con Hourihane, Technical Manager

Tanco Autowrap - 1500
Spare Parts Manual

1500 Spare Parts List

We recommend that when you require spare parts you use only original parts.

When ordering spare parts please follow the following steps;

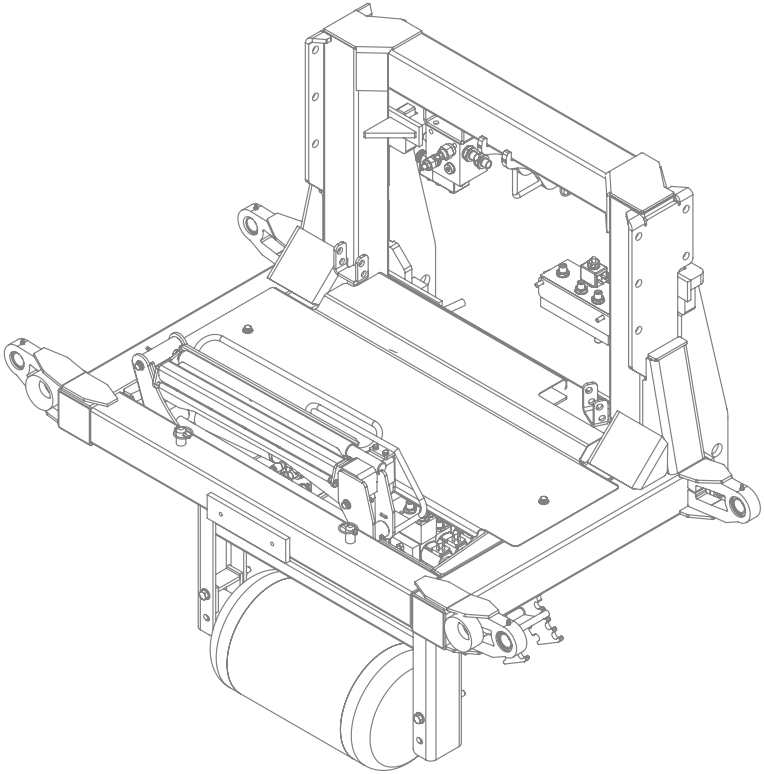
1. Identify the part you require using the detailed drawings.

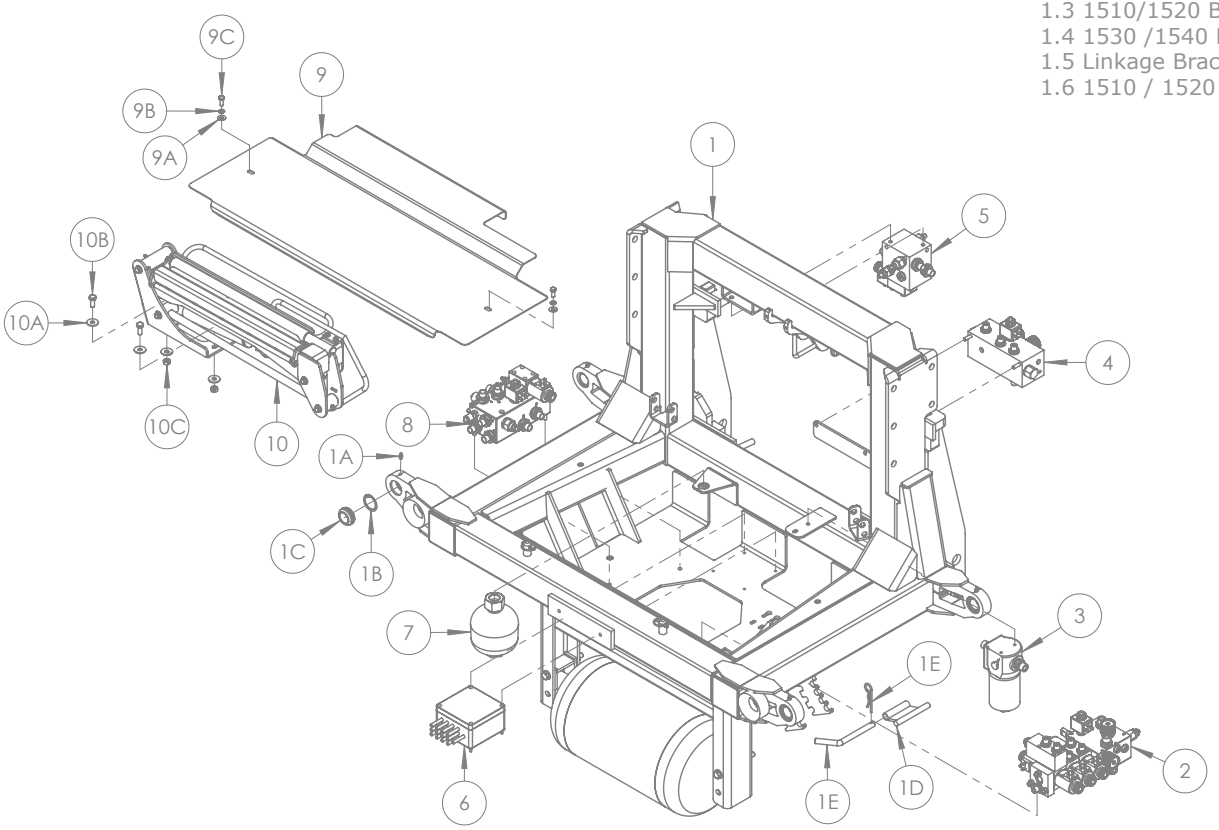
2. Once you have identified the part you require reference the item number relating to the part on the item list where you will find the part number and description of the part you require. You will be require to give the complete part no and decription when ordering your part(s).

3. When ordering you must give the Serial Number and Model Number of the machine.

4. All orders must go through your local Tanco Dealer, and must be either faxed or e-mailed to Tanco Autowrap.

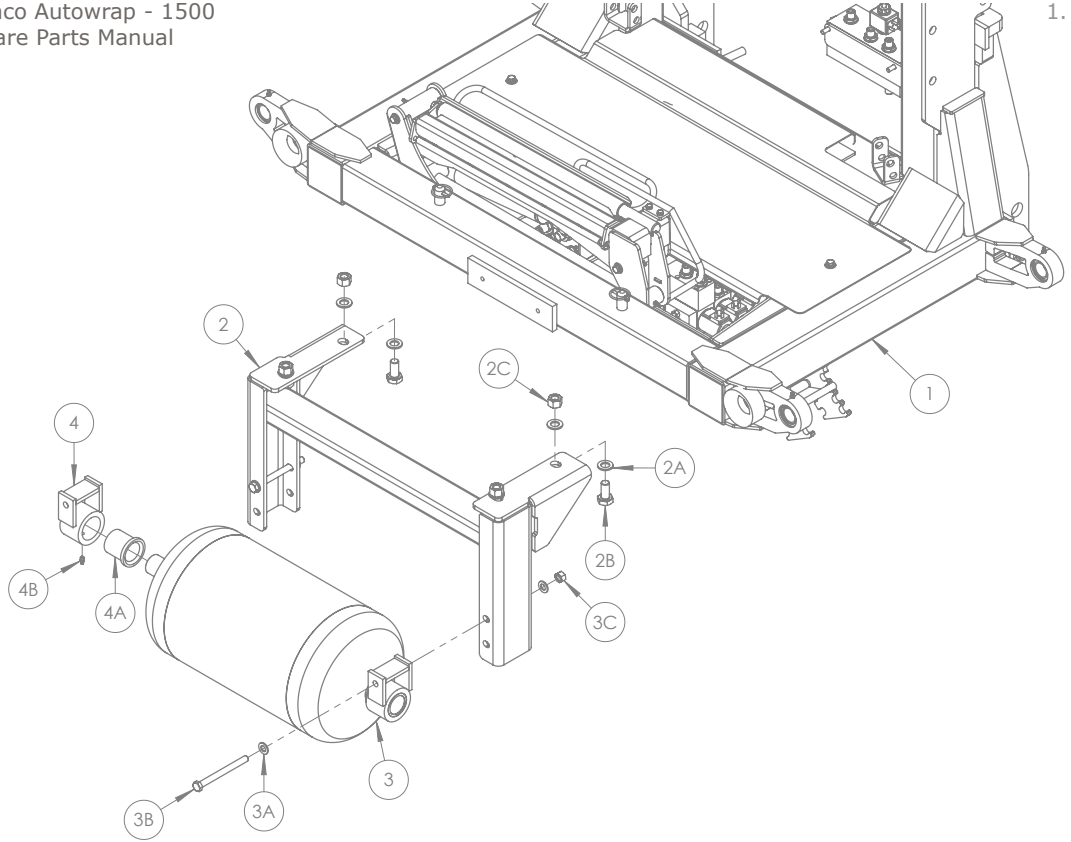
Spare Parts Manual



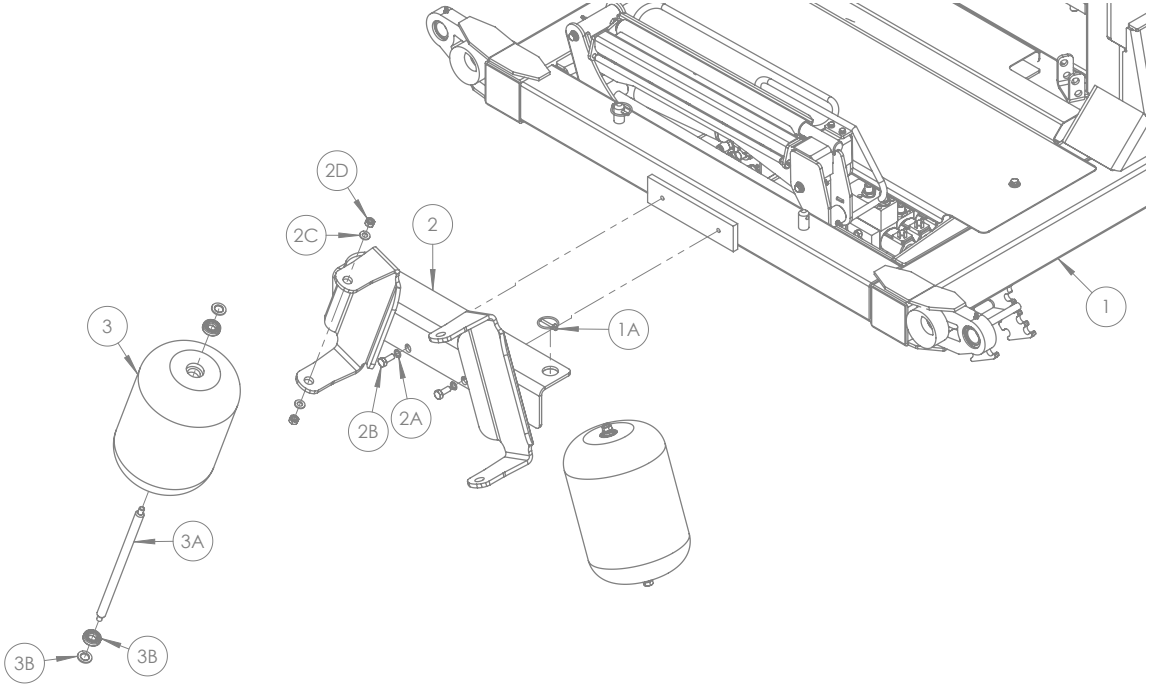


Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
1A	34060800	M8 x 1 Grease Nipple	4
1B	34240400	47mm Internal Cir Clip	4
1C	34320521	Swivel Bearing (GE30 ES-2RS)	4
1D	34380510	Roller Arm Stop	2
1E	34105675	Roller Arm Stay Pin	2
1F	Z36-02	4mm 'R' Clip	2
2	1508250	1500 Control Block	1
3	1308070	Pressure Filter	1
4	1508020	Adjustment Block	1
5	1308180	Tower Block	1
6	1509000	1500 RDS Control Kit (Junctin Box)	1
7	1508160	0.70L Accumulator (Charged 50Bar)	1
8	1508150	Assembly Block	1

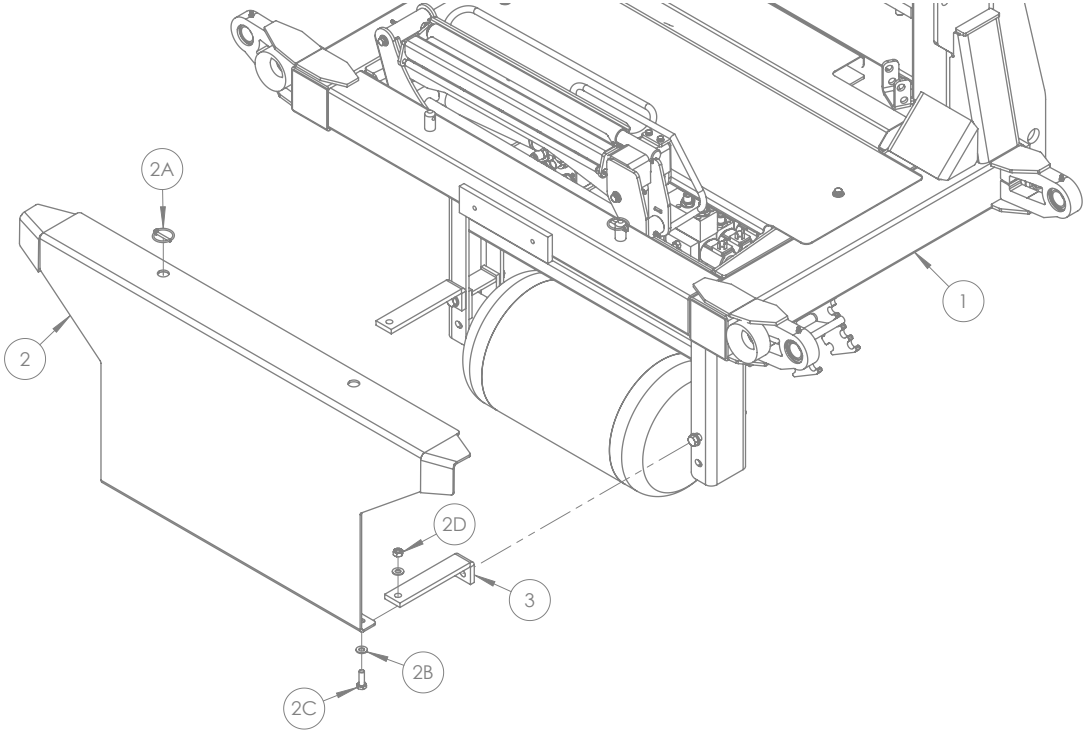
Item No.	Part No.	Description	Qty
9	34620545	1500 Valve Cover	1
9A	Z11-02-081	8mm Mud Washer	2
9B	Z12-02-08	8mm Spring Washer	2
9C	Z26-039S	M8 x 20mm Hex Set	2
10	1406100	Professional Cut & Tie	1
10A	Z11-02-101	10mm Mud Washer	4
10B	Z26-063S	M10 x 30 Hex Set	2
10C	Z23-10	10mm Locknut	2



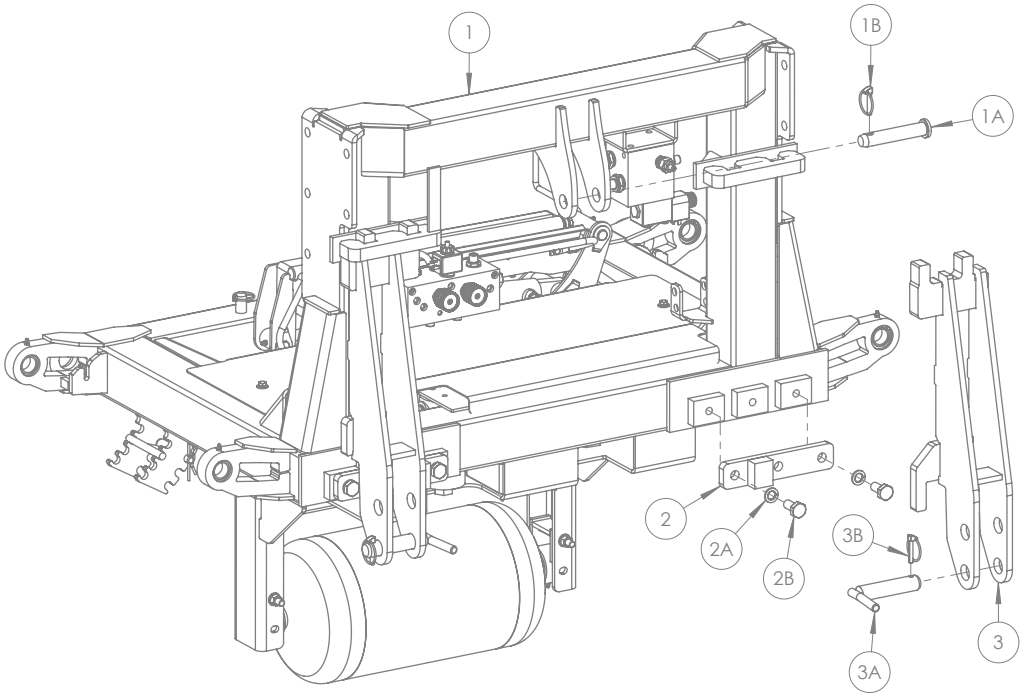
Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
2	1501550	Ground Roller Frame	1
2A	Z10-02-16	16mm Flat Washer	8
2B	Z26-121S	M16 x 35mm Hex Set	4
2C	Z23-16	16mm Locknut	4
3	1501585	Ground Support Roller	1
3A	Z10-02-12	12mm Flat Washer	4
3B	Z26-094B	M12 x 130mm Hex Bolt	2
3C	Z23-12	12mm Locknut	2
4	34321233	Roller Shaft Mounting	2
4A	34360503	Roller Mounting Nylon Bush	2
4B	34060800	M8 x 1 Grease Nipple	2



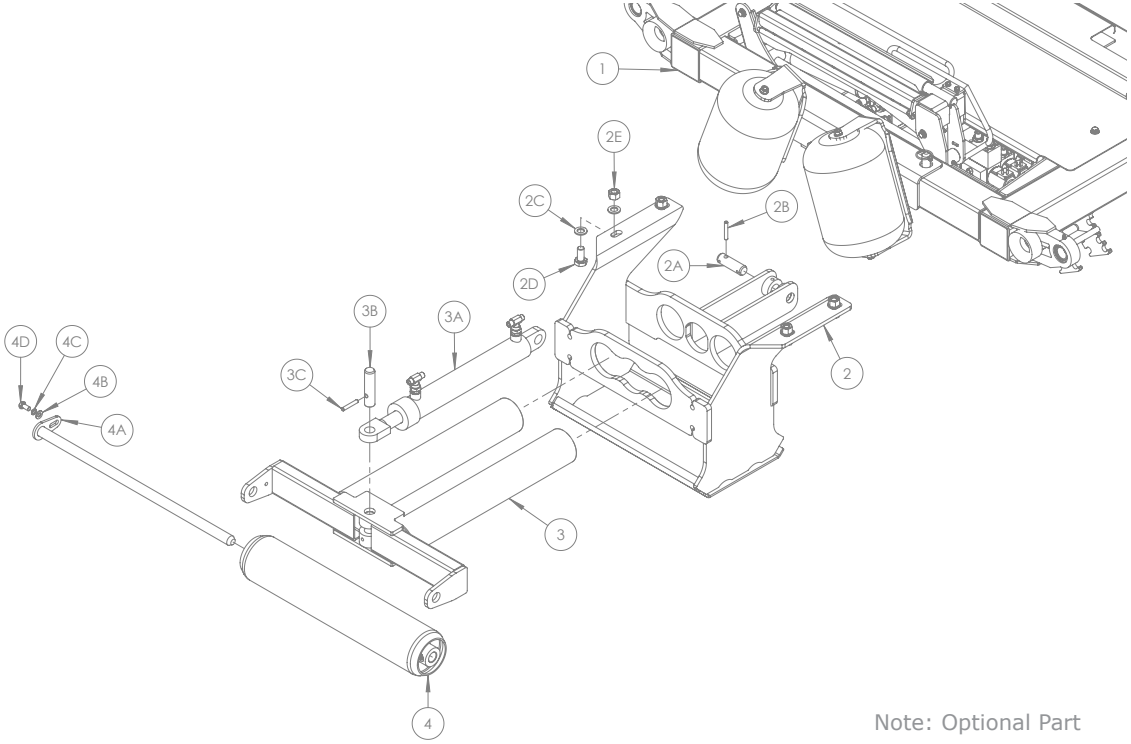
Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
1A	Z03-22-03	1/4" Linch Pin	2
2	34680034	Support Roller Mounting Frame	1
2A	Z12-02-10	10mm Spring Washer	2
2B	Z26-061B	M10 x 25mm Hex Set	2
2C	Z10-02-10	10mm Flat Washer	4
2D	Z23-10	10mm Locknut	4
3	34340107	Bale Stop Roller	2
3A	34130213	Bale Stop Roller Shaft	2
3B	Z10-02-16	16mm Flat Washer	4
3C	34320515	Ball Bearing (6003 2RS)	4



Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
2	34380508	Bale Stop	1
2A	Z03-22-03	1/4" Linch Pin	2
2B	Z10-02-10	10mm Flat Washer	4
2C	Z26-062SB	M10 x 30mm Hex Set	2
2D	Z23-10	10mm Locknut	2
2E	34670139	Bale Stop Mounting Bracket	2



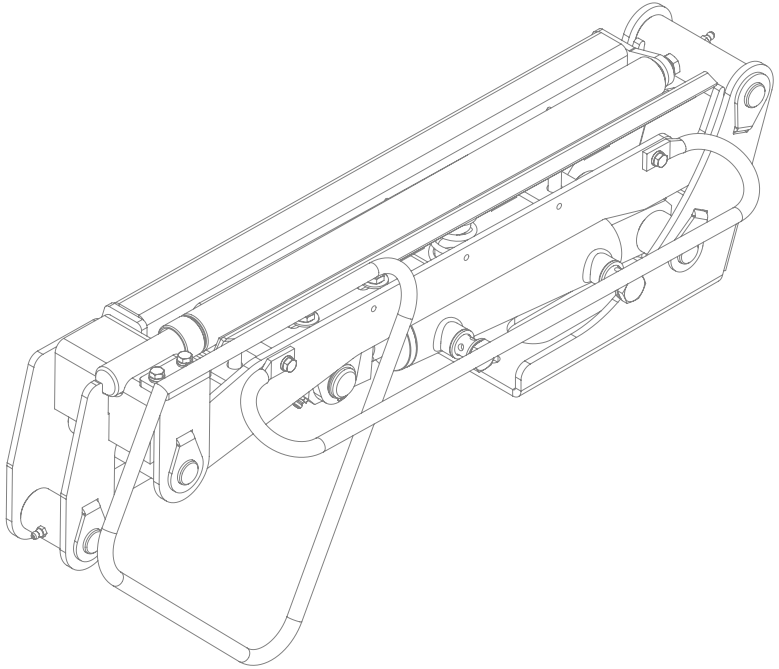
Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
1A	34105635	Top Link Pin	1
1B	Z03-22-04	5/16" Linch Pin	1
2	34251401	3pt Linkage Mounting Baracket	2
2A	Z12-02-16	16mm Spring Washer	4
2C	Z26-121S	M16 x 35mm Hex Set	4
3*	34680037	Lower Link Bkt (Right)	1
3A	34105636	Lower Link Pin	2
3B	Z03-22-04	5/16" Linch Pin	2

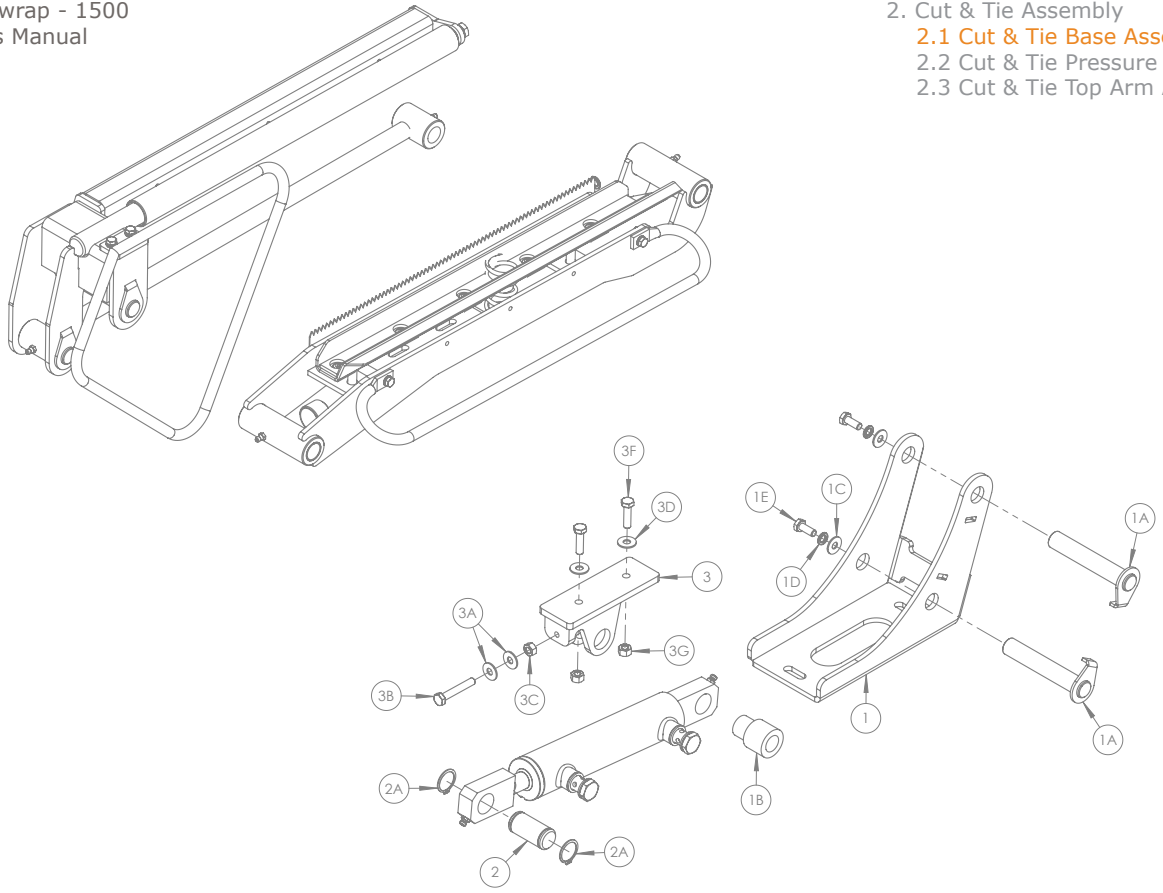


Note: Optional Part

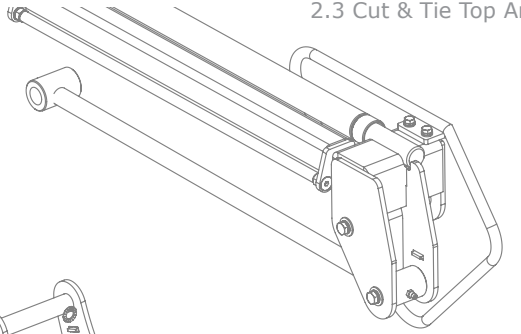
Item No.	Part No.	Description	Qty
1	1501000	Chassis Frame	1
2	1509100	End Tip Main Frame	1
2A	1301386	End Tip Ram Pin A	1
2B	Z03-20-09	M8 x 50 Roll Pin	1
2C	Z10-02-16	16mm Flat Washer	8
2D	Z26-121S	M16 x 35mm Hex Set	4
2E	Z23-16	16mm Locknut	4
3	1301390	Pusher Frame	1
3A	34001482	End Tip Ram	1
3B	1301387	End Tip Ram Pin B	1
3C	Z03-20-09	M8 x 50 Roll Pin	1
4	1301380	End Tip Roller	1
4A	1301393	End Tip Pivot Pin	1
4B	Z10-02-10	10mm Flat Washer	1
4C	Z12-02-10	10mm Spring Washer	1
4D	Z26-060S	M10 x 20 Hex Set	1

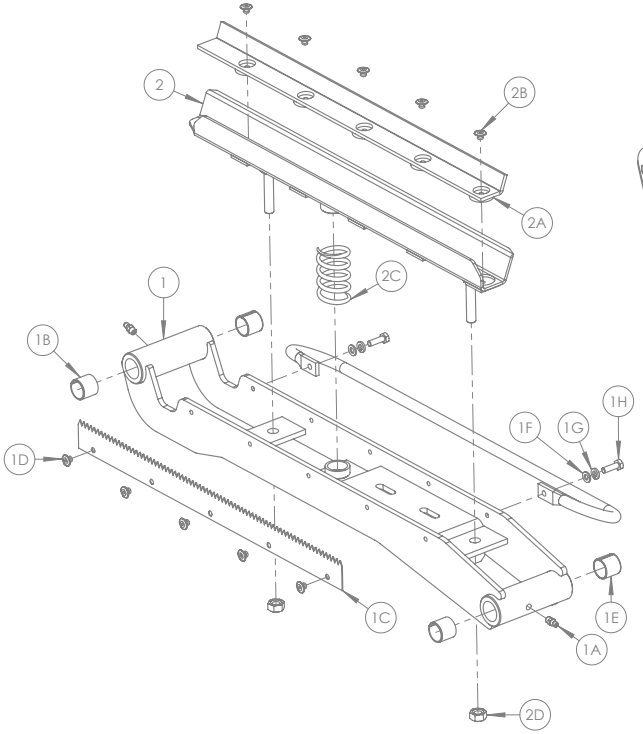
Note: Optional Part No: 1509150



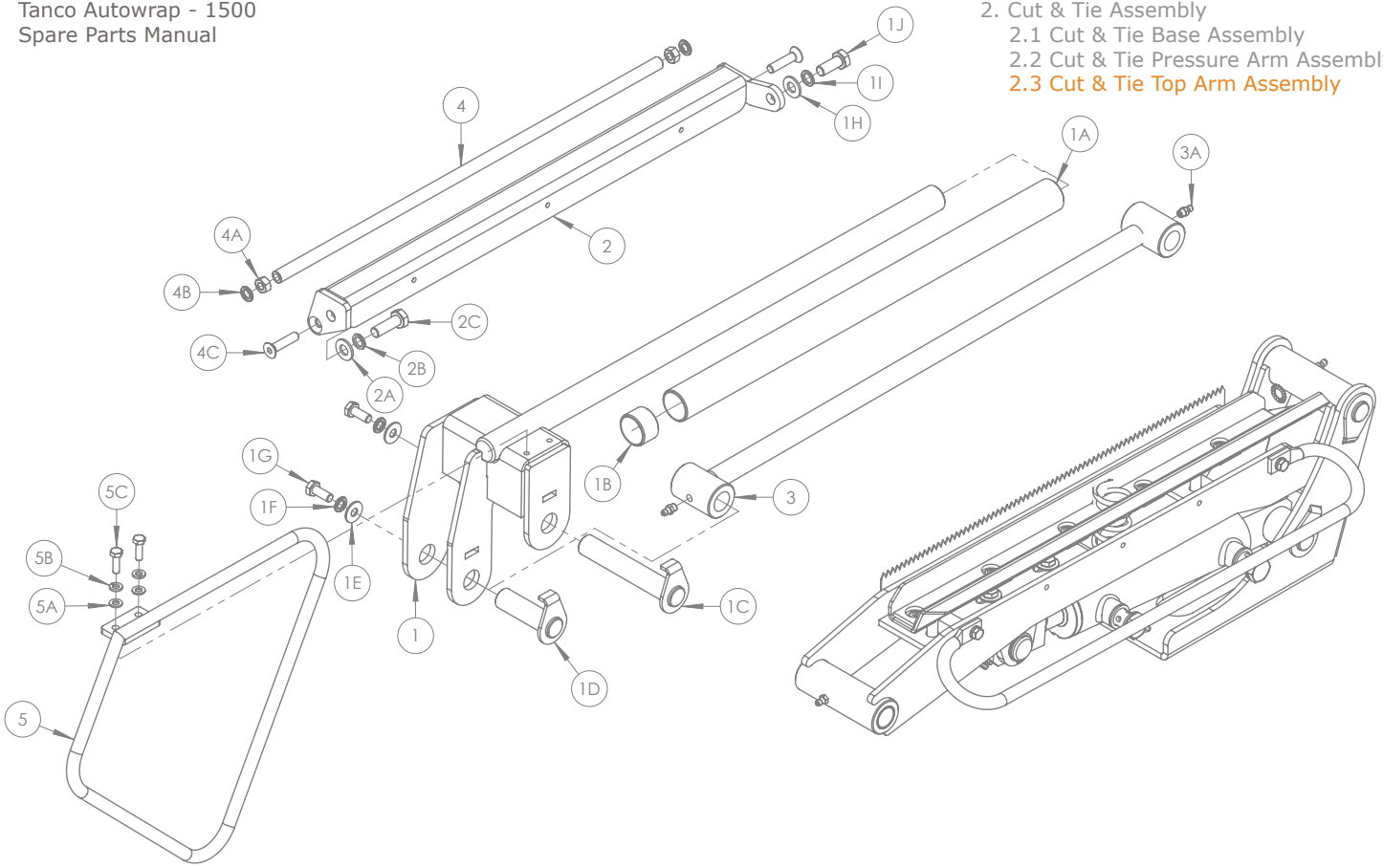


Item No	Part No	Description	Qty
1	1406060	Cut & Tie Base	1
1A	1406080	Cut & Tie Pin (Long)	2
1B	1406035	Ram Spacer	1
1C	Z11-02-081	8mm Mud Washer	2
1D	Z12-02-08	8mm Spring Washer	2
1E	Z26-039S	M8 x 20mm Hex Set	2
2	1308151	Cut & Tie Ram	1
2A	34060800	M8 x 1.25 Grease Nipple	2
2B	34105631	Ram Mounting Pin	1
2C	Z28-525	M25 External Circlip	2
3	34920525	Cut & Tie Casting	1
3A	Z11-02-081	8mm Mud Washer	2
3B	Z26-045S	M8 x 50mm Hex Set	1
3C	Z18-08	8mm Plain Hex Nut	1
3D	Z11-02-081	8mm Mud Washer	2
3E	Z26-041S	M8 x 30mm Hex Set	2
3F	Z23-08	8mm Hex Nut	2



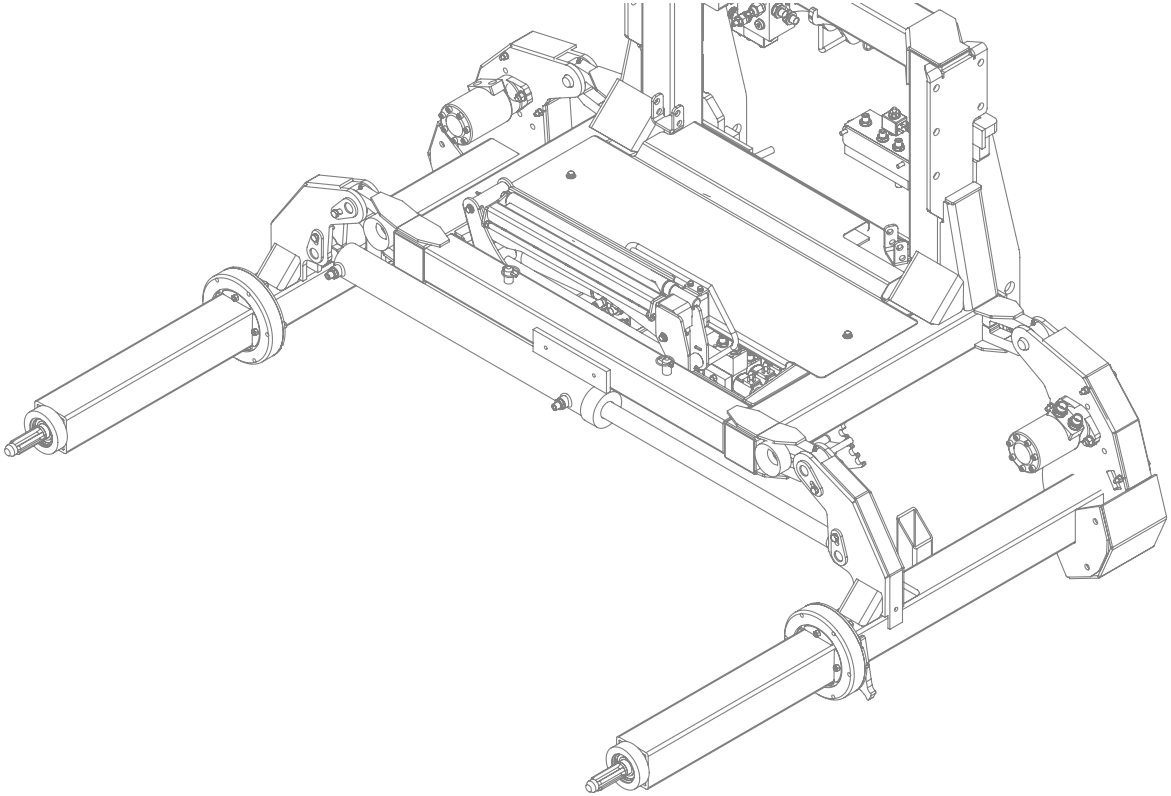


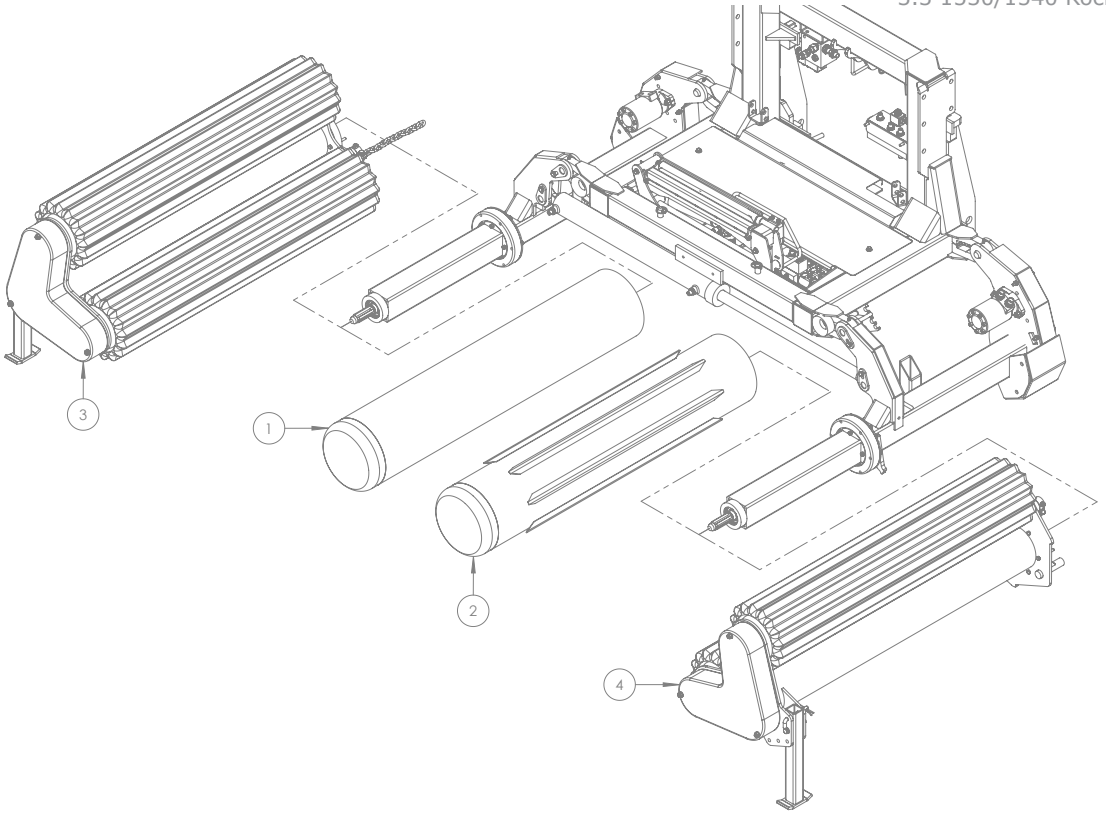
Item No	Part No	Description	Qty
1	1406112	Cut & Tie Lift Arm	1
1A	34060800	M8 x 1.25 Grease Nipple	2
1B	1406074	Cut & Tie Balde	1
1C	Z03-25-05	Pop Rivet	5
1D	1406075	Film Gathering Bar	1
1E	Z10-02-06	6mm Flat Washer	2
1F	Z12-02-06	6mm Spring Washer	2
1G	Z26-020S	M6 x 20mm Hex Set	2
2	1406101	Pressure Plate	1
2A	1406706	Rubber Strip	1
2B	Z03-25-05	Pop Rivet	5
2C	1406078	Pressure Spring	1
2D	Z23-10	10mm Locknut	2



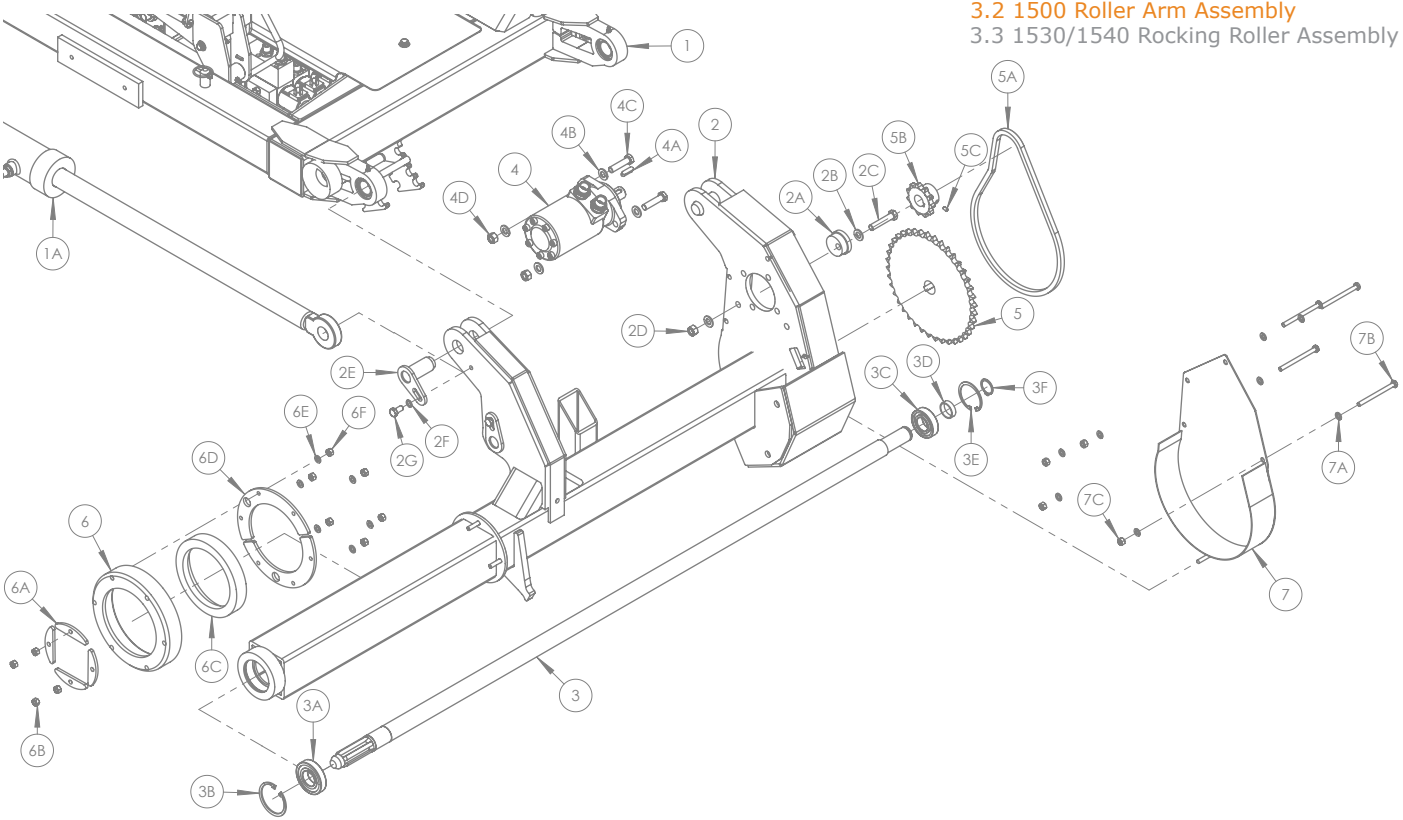
Item No	Part No	Description	Qty
1	1406113	Pull Down Arm	1
1A	1406077	Knurled Roller	1
1B	1406085	Cut & Tie Pin (Short)	1
1C	1406080	Cut & Tie Pin (Long)	1
1D	Z11-02-081	8mm Mud Washer	2
1E	Z12-02-08	8mm Spring Washer	2
1F	Z26-039S	M8 x 20mm Hex Set	2
1G	Z10-02-10	10mm Flat Washer	1
1H	Z12-02-10	10mm Spring Washer	1
1I	Z26-0611S	M10 x 25mm Hex Set	1
2	1406065	Top Arm	1
2A	Z10-02-08	8mm Flat Washer	2
2B	Z12-02-08	8mm Spring Washer	2
2C	Z18-08	8mm Plain Hex Nut	1
2D	Z26-041S	M8 x 30mm Hex Set	1
3	1406102	Connecting Arm	1
3A	34060800	M8 x 1.25 Grease Nipple	2

Item No	Part No	Description	Qty
4	1406068	Film Roller	1
4A	Z18-08	8mm Plain Hex Nut	2
4B	Z12-02-08	8mm Spring Washer	2
4C	Z13-5-08X35	M8 x 35mm CSK AH Set	2
5	1406122	Cut & Start Loop Bracket	1
5A	Z10-02-06	6mm Flat Washer	2
5B	Z12-02-06	6mm Spring Washer	2
5C	Z26-020S	M6 x 20mm Hex Set	2



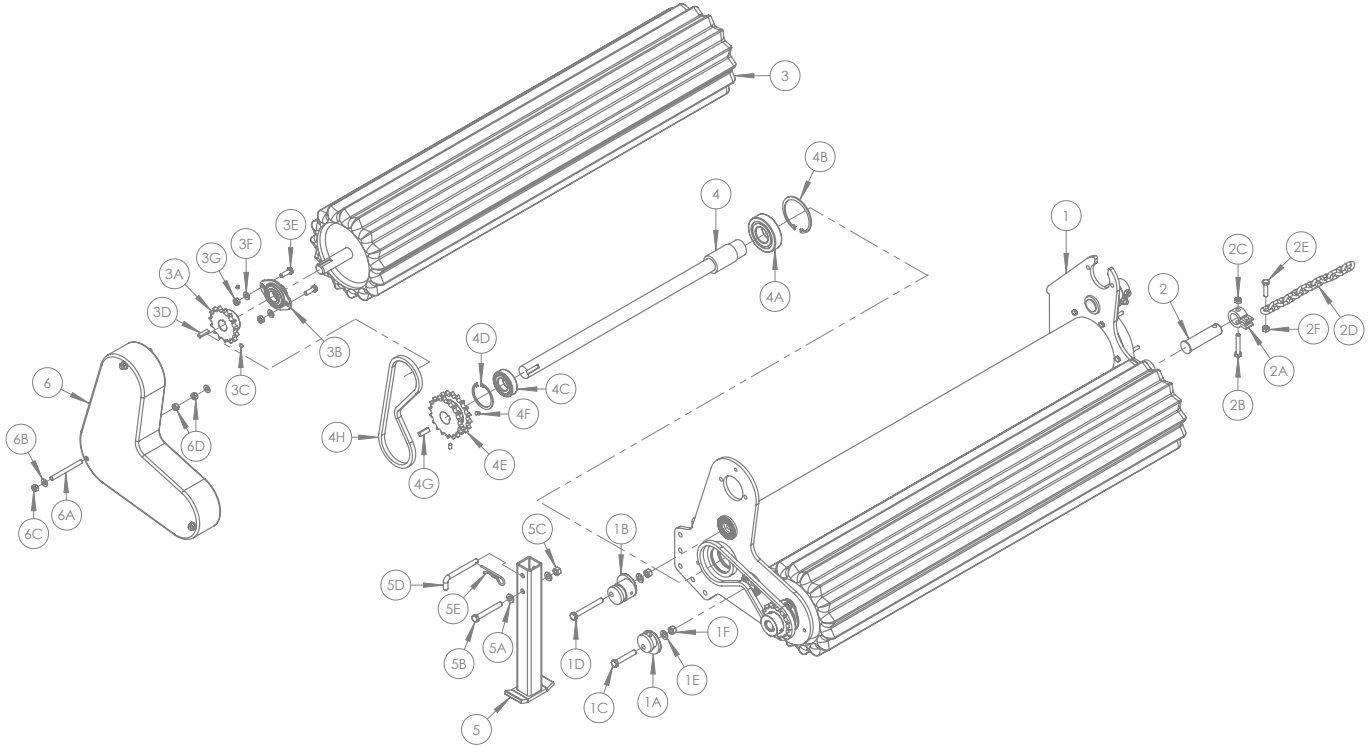


Item No	Part No	Description	Qty
1	34340122	1510 / 20 Smooth Roller	1
2	34340123	1510 / 20 Gripped Roller	1
3	1504000-R	1530 / 40 Rocking Roller Assembly (Right)	1
4	1504000-L	1530 / 40 Rocking Roller Assembly (Left)	1



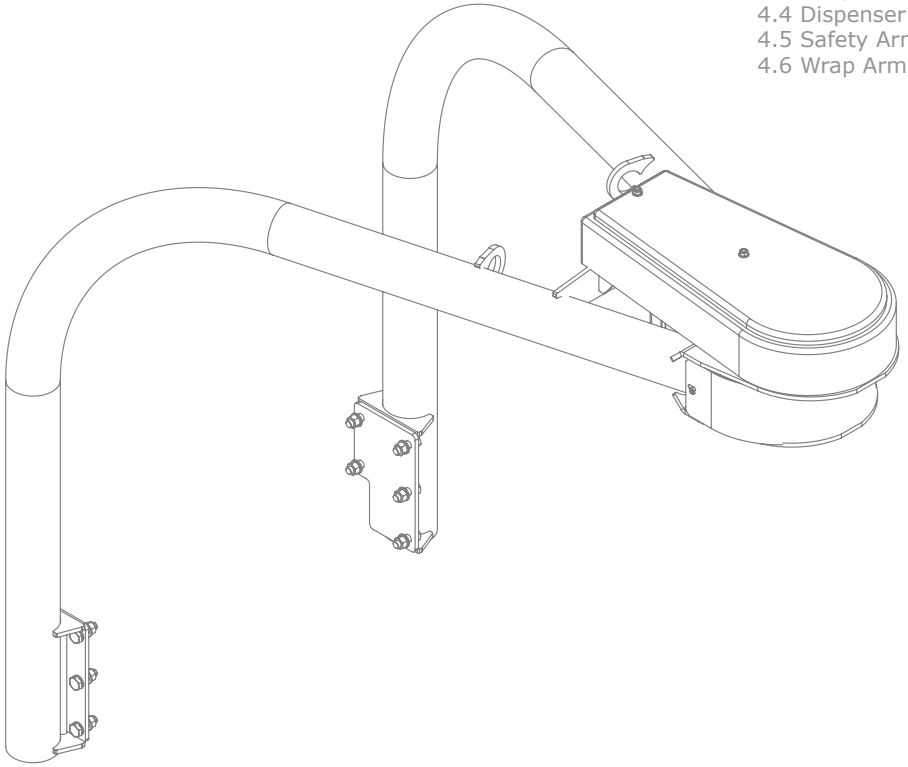
Item No	Part No	Description	Qty
1	1501000	Chassis Frame	1
1A	34001490-TAN	Roller Width Cylinder	1
2	1502100	Roller Arm Frame (Left)	1
2A	34090132	Motor Chain Tensioner	1
2B	Z10-02-12	12mm Flat Washer	1
2C	Z26-088S	M12 x 60mm Hex Set	1
2D	Z23-12	12mm Locknut	1
2E	1502060	Roller Arm Pivot Pin	3
2F	Z12-02-10	10mm Spring Washer	3
2G	Z26-060S	M10 x 20mm Hex Set	3
3	34130231	Roller Drive Shaft	1
3A	34321521	Ball Bearing (1726207 2RS1)	1
3B	34240100	Internal Cir Clip 1-72	1
3C	34215203	Ball Bearing (17026206 2RS)	1
3D	34371421	Sprocket Spacer	1
3E	34240719	Internal Cir Clip 1-62	1
3F	34240708	External Cir Clip A-30	1
4	1508800	Roller Drive Motor	1
4A	34270111	8 x 7 x 30mm Key Steel	1

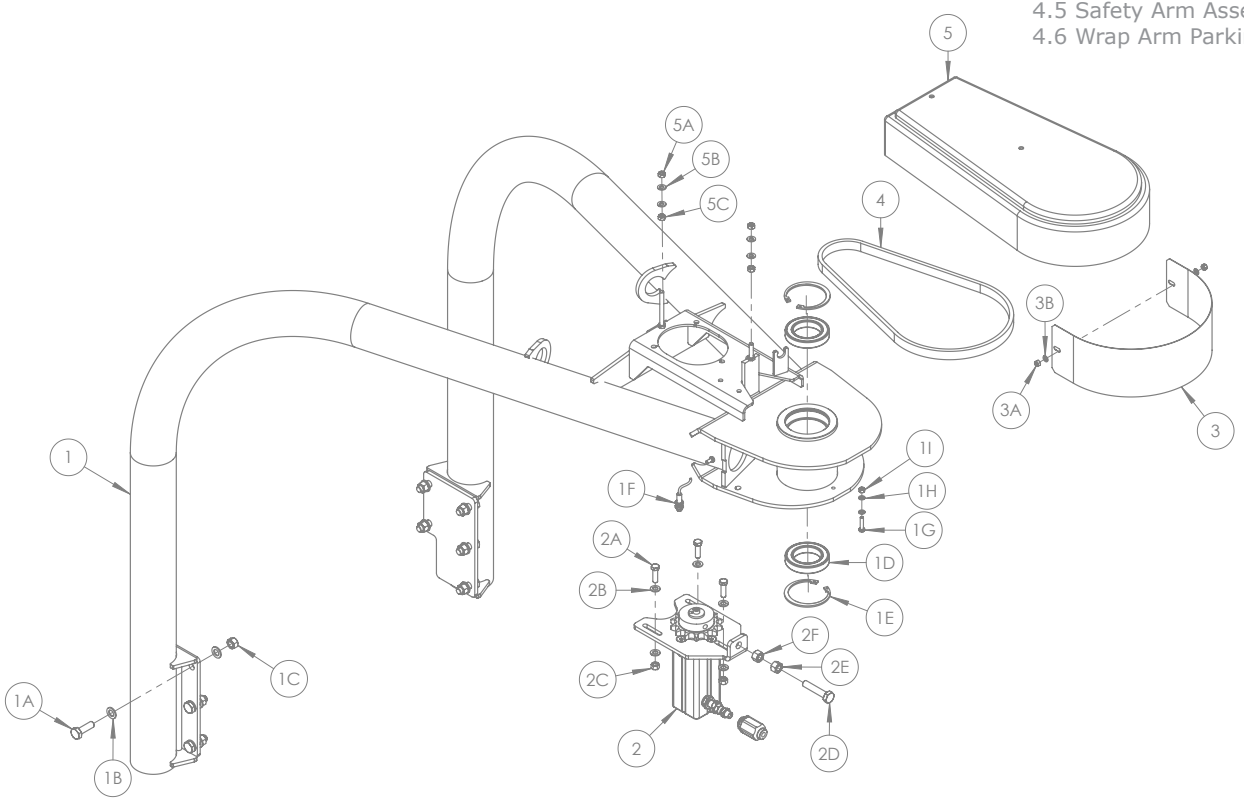
Item No	Part No	Description	Qty
4B	Z10-02-12	12mm Flat Washer	4
4C	Z26-086S	M12 x 50mm Hex Set	2
4D	Z23-12	12mm Locknut	2
5	34090131	3/4" 40T Sprocket	1
5A	34810835	3/4" Chain (50 Rollers)	1
5B	1502098	11 T 3/4" Sprocket	1
5C	Z28-008	M8 x 10mm Grub Screw	1
6	34480012	Nylon Bearing	1
6A	34920538	Clamp Plate	4
6B	Z23-08	8mm Locknut	4
6C	34480014	Roller Inner Nylon Ring	1
6D	34920579	Clamp Plate	2
6E	Z10-02-08	8mm Flat Washer	6
6F	Z23-08	8mm Locknut	6
7	34851236	Roller Arm Rear Guard - Left	1
7A	Z10-02-08	8mm Flat Washer	8
7B	Z26-057B	M8 x 100mm Hex Bolt	4
7C	Z23-08	8mm Locknut	4



Item No	Part No	Description	Qty
1	1504100	Rocking Roller Frame	1
1A	34810831	Chain Tensioner (Low)	1
1B	1504014	Chain Tensioner (High)	1
1C	Z26-089B	M12 x 70mm Hex Bolt	1
1D	Z26-092B	M12 x 100mm Hex Bolt	1
1E	Z10-02-12	12mm Flat Washer	2
1F	Z23-12	12mm Locknut	2
2	34105708	Retainer Chain Pin	1
2A	34251457	Retainer Chain Bracket	1
2B	Z26-067B	M10 x 60mm Hex Bolt	1
2C	Z23-10	10mm Locknut	1
2D	34801338	8 x 24mm x 25 Link Alloy Chain	1
2E	Z26-064B	M10 x 40mm Hex Bolt	1
2F	Z23-10	10mm Locknut	1
3	34911095	Roller Assembly	2
3A	34810833	3/4" x 15T Simplex Sprocket	2
3B	34321519	Bearing YET206/2XPF (w/ Housing)	4
3C	Z28-008	M8 x 10mm Grub Screw	4
3D	34270105	8 x 7 x 32mm Key Steel	2
3E	Z26-062B	M10 x 30mm Hex Bolt	8
3F	Z10-02-10	10mm Flat Washer	8
3G	Z23-10	10mm Locknut	8

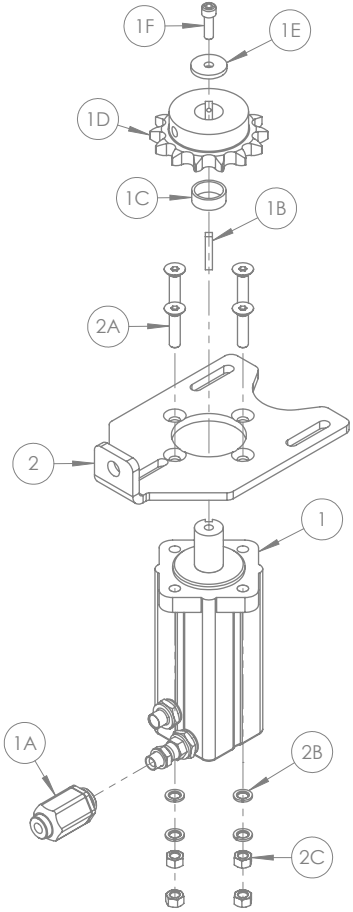
Item No	Part No	Description	Qty
4	34130260	Centre Shaft Assembly	1
4A	34320519	Centre Shaft Bearing (1309)	1
4B	34240715	Internal Cir Clip 1-100	1
4C	34321530	Bearing (w/ Cam Lock Collar)	1
4D	34240100	Internal Cir Clip 1-72	1
4E	1504013	3/4" x 18T Duplex Sprocket	1
4F	34119010	M8 x 16mm Grub Screw	2
4G	34270113	8 x 10 x 32mm Key Steel	1
4H	34810834H	ASA60H Chain (46 Rollers)	2
5	1504150	Rocking Roller Parking Stand	1
5A	Z10-02-12	12mm Flat Washer	2
5B	Z26-091B	M12 x 90mm Hex Bolt	1
5C	Z23-12	12mm Locknut	1
5D	WD60-874	Bissel Pin - Long	1
5E	Z36-02	4mm 'R' Clip	1
6	1504050	Chain Guard	1
6A	1504017	M10 x 110mm Threaded Bar	3
6B	Z10-02-10	10mm Flat Washer	6
6C	Z23-10	10mm Locknut	3
6D	Z18-10	10mm Plain Hex Nut	6



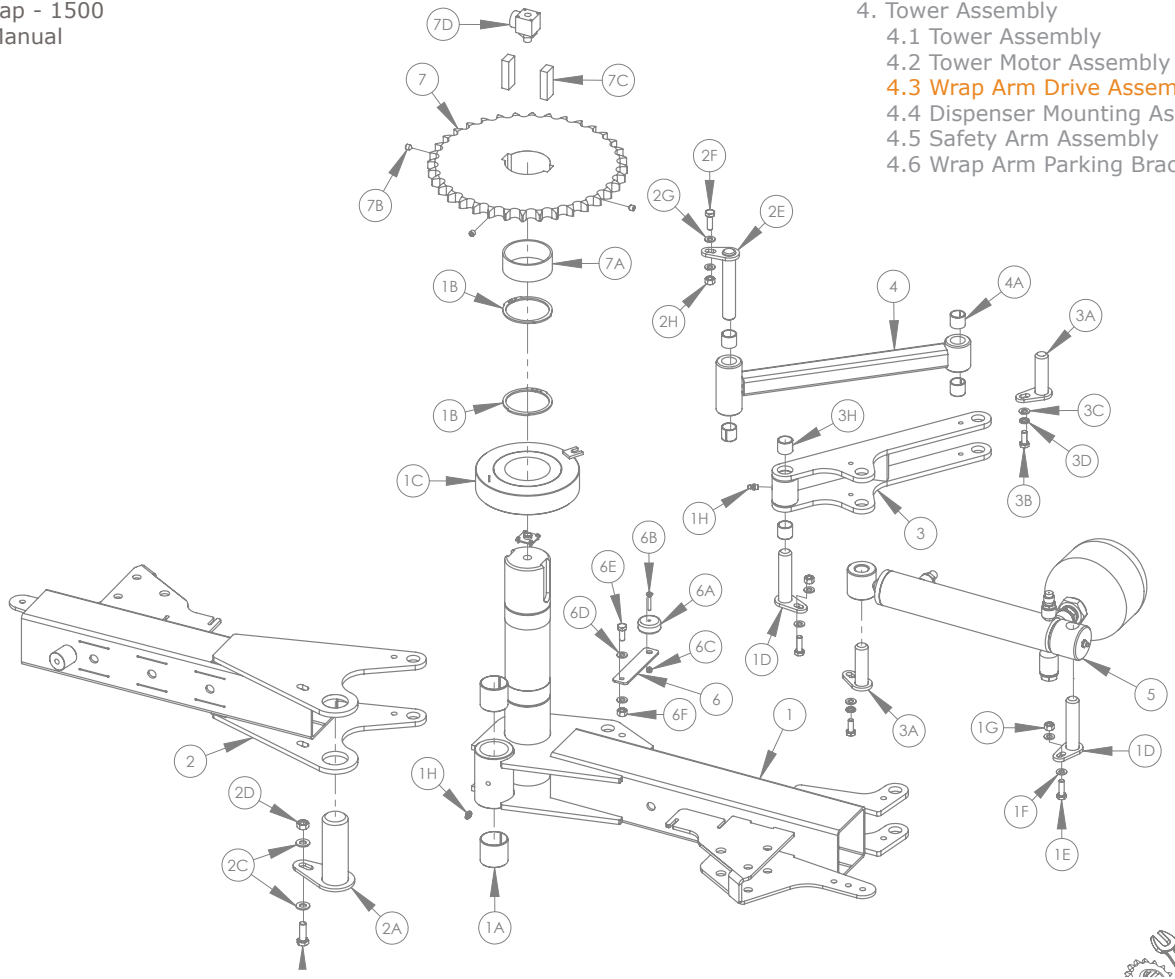


Item No.	Part No.	Description	Qty
1	1513000	Tower Frame	1
1A	Z31B-064	M16 x 45mm Hex Set	8
1B	Z10-02-16	16mm Flat Washer	16
1C	Z20-10	16mm Locknut	8
1D	1404052	Bearing (6014 2RS)	2
1E	1404051	Int Circlip 110mm	2
1F	1309203	RDS Sensor	1
1G	Z26-042S	M8 x 35mm Hex Set	1
1H	Z10-02-08	6mm Flat Washer	2
1I	Z23-08	6mm Locknut	1
2	Z01-02-RF200	Tower Motor	1
2A	Z26-084S	M12 x 35mm Hex Set	3
2B	Z10-02-12	12mm Flat Washer	6
2C	Z23-12	12mm Locknut	3
2D	Z26-12915	M16 x 80 Hex Set	1
2E	Z18-16	16mm Plain Hex Nut	1
2F	Z23-16	16mm Locknut	1

Item No.	Part No.	Description	Qty
3	1404076	Tower Front Cover	1
3A	Z12-02-10	8mm Spring Washer	2
3B	Z11-02-101	8mm Flat Washer	2
4	Z09-AW9	1" BS Chain (56 Links)	1
5	1404450	Chain Cover	1
5A	Z23-10	10mm Locknut	2
5B	Z10-02-10	10mm Flat Washer	4
5C	Z18-10	10mm Plain Hex Nut	2

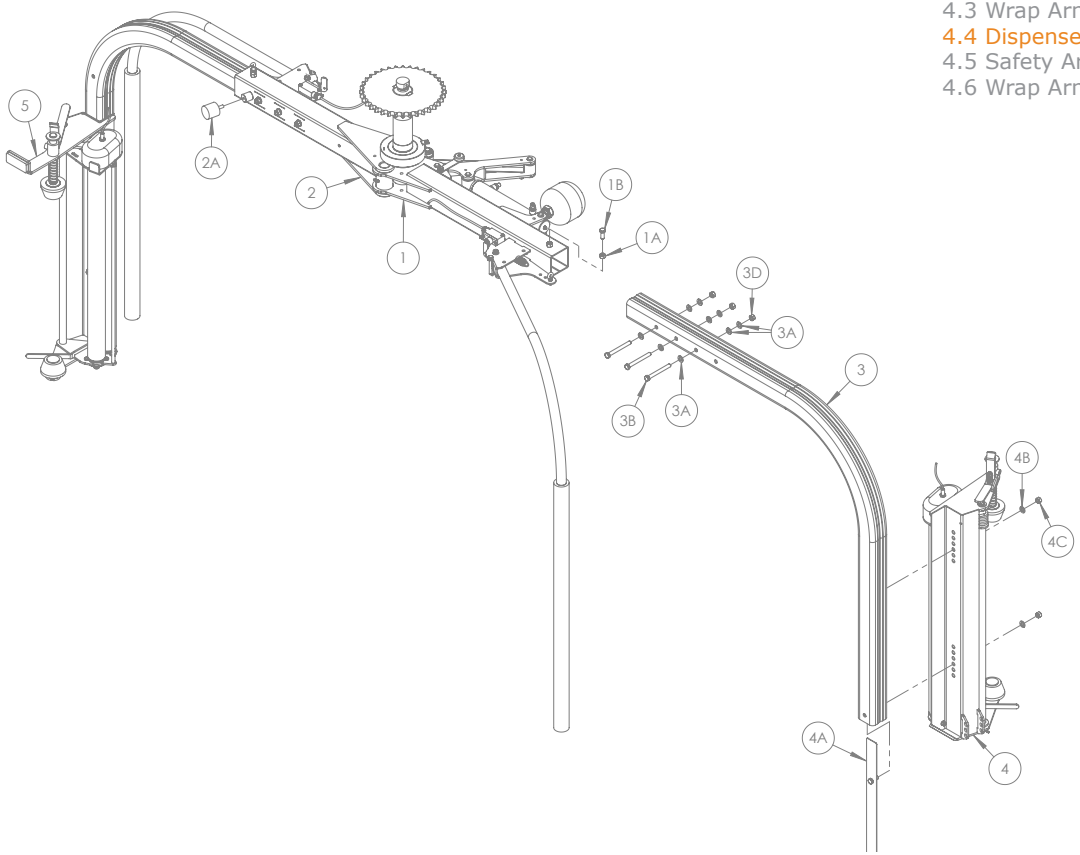


Item No	Part No	Description	Qty
1	Z01-02-RF200	Tower Motor	1
1A	Z01-03-1046	3/8" Speed Control Valve	1
1B	WD64-053	Key Steel 5/16" x 5/16" x 45mm	
IC	1503172	Motor Spacer	1
1D	1315301	14 Tooth 1" Sprocket	1
1E	WD623-071	1 1/2" Collar	1
1F	Z13-4-32	1 1/4" x 3/8"UNC Socket Cap Screw	1
2	1503247	Motor Mounting Plate	1
2A	Z13-5-12X50	M12 x 50 C.S.K. Allen Set	4
2B	Z12-02-12	12mm Spring Washer	4
2C	Z23-12	12mm Locknut	4

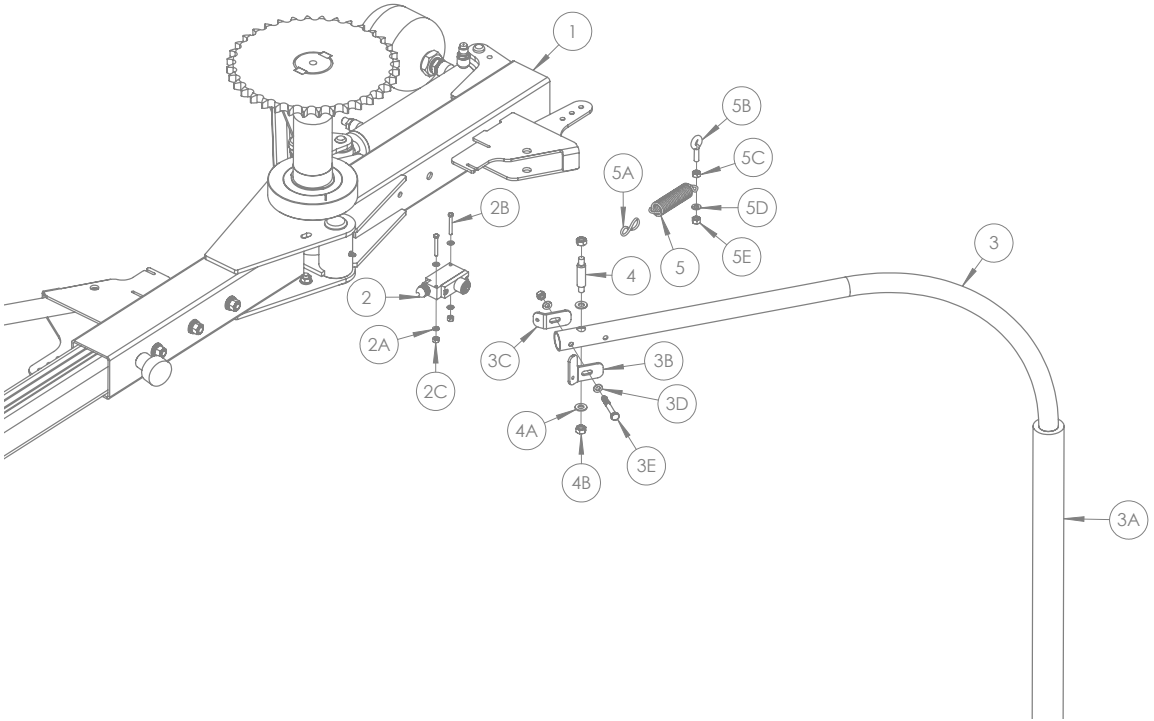


Item No.	Part No.	Description	Qty
1	1514100	Main Wrap Arm Mounting	1
1A	Z03-20-27	DX Bush 40mm ID x 40mm Long	2
1B	1404053	External Circlip (Dia 67mm)	2
1C	1319100	Slew Ring	1
1D	1315405	Ram Mounting Pin	2
1E	Z26-040B	M8 x 25mm Hex Bolt	2
1F	Z10-02-08	8mm Flat Washer	4
1G	Z23-08	8mm Locknut	2
1H	34060800	M8 x 1 Grease Nipple	2
2	1514200	Slave Wrap Arm Mounting	1
2A	1315409	Main Pivot Pin	1
2B	Z26-062B	M10 x 30mm Hex Bolt	1
2C	1303004	10mm Flat Washer	2
2D	Z23-10	10mm Locknut	1
2E	1315403	Lnkage Pin	1
2F	Z26-040B	M8 x 25mm Hex Bolt	1
2G	Z10-02-08	8mm Flat Washer	2
2H	Z23-08	8mm Locknut	1
3	1314400	Fixed Linkage Assembly	1
3A	1315407	Linkage / Ram Pin	2
3B	Z26-039S	M8 x 20mm Hex Bolt	2
3C	Z10-02-08	8mm Flat Washer	2
3D	Z12-02-08	8mm Spring Washer	2
3E	Z26-040B	M8 x 25mm Hex Bolt	1
3F	Z10-02-08	8mm Flat Washer	2
3G	Z23-08	8mm Locknut	1
3H	z03-20-32	DX Bush 20mm ID x 20mm Long	2
4	1314300	Linkage Assembly	1
4A	Z03-20-32	DX Bush 20mm ID x 20mm Long	4
4B	34060800	M8 x 1 Grease Nipple	2
5	1318171	Tower Ram	1
6	1315109	Magnet Mounting Bracket	1
6A	1309201	RDS Magnet	1
6B	Z13-5-04X30	M4 x 30mm CSK Allen Head Set	1
6C	Z23-04	4mm Locknut	1
6D	Z10-02-08	8mm Flat Washer	2
6E	Z26-039S	M8 x 20mm Hex Set	1
6F	Z23-08	8mm Locknut	1
7	1404010	1" x 36T Drive Sprocket	1
7A	1403075	Drive Shaft / Sprocket Spacer	1
7B	Z18-008	M8 x 10mm Grub Screw	3
7C	1404024	Key Steel 20 x 12 x 50	2
7D	1318176	Rotary Coupling	1

NB: Items 2, 3, 4, 5 & 6 including associated parts are required for 1520 & 1540 (Twin) models only

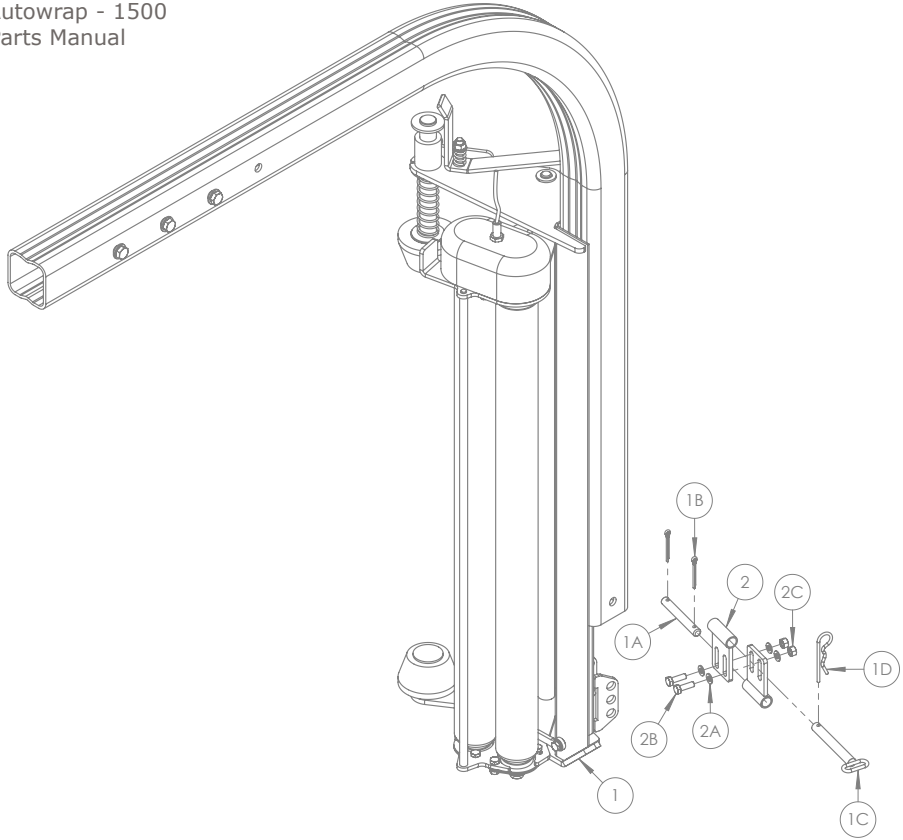


Item No.	Part No.	Description	Qty
1	1514100	Main Wrapping Arm	1
1A	Z23-12	12mm Locknut	1
1B	Z26-082S	M12 x 30mm Hex Set	1
2	1514200	Slave Wrapping Arm	1
2A	Z40-20	50mm Dia x 42 Rubber Buffer	1
3	1404009	Wrap Arm	2
3A	Z10-02-12	12mm Flat Washer	26
3B	Z26-0925	M12 x 100mm Hex Set	6
3C	Z23-12	12mm Locknut	6
4	1405150	Dispenser Assembly	1
4A	1405015	Dispenser Mounting Bracket	2
4B	Z10-02-12	12mm Flat Washer	2
4C	Z23-12	12mm Locknut	2
5	1505160	Twin Dispenser Assembly	1

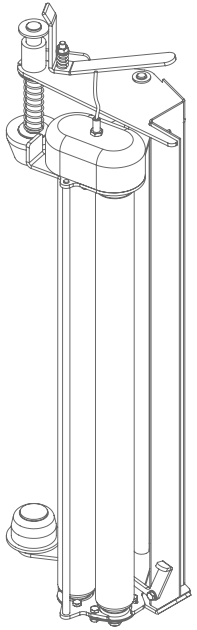


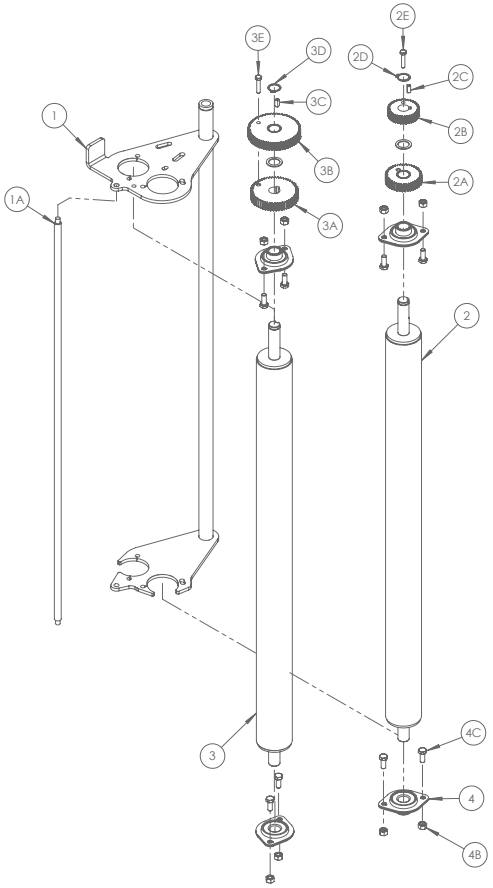
Item No	Part No	Description	Qty
1	1514100	Main Wrapping Arm	1
2	34950179	Safey Switch	1
2A	Z10-02-05	5mm Flat Washer	4
2B	Z26-0137S	M5 X 40 Set	2
2C	Z23-05	5mm Locknut	2
3	34611357	Emergency Stop Arm	1
3A	34480020	Emergency Stop Arm Cover	1
3B	1404013	Switch Activator	1
3C	34670152	Emergency Stop Arm Bracket	1
3D	Z10-02-08	8mm Flat Washer	2
3E	Z26-047B	M8 x 60mm Hex Bolt	1
3F	Z23-08	8mm Locknut	1
4	34105651	Emergency Stop Arm Pivot Bolt	1
4A	Z10-02-10	10mm Flat Washer	2
4B	Z23-10	10mm Locknut	2

Item No	Part No	Description	Qty
5	34430300	Emergency Stop Arm Spring	1
5A	34660111	Emergency Stop Arm S Hook	1
5B	34119043	Eye Bolt (M8 x 25mm)	1
5C	Z18-08	8mm Plain Hex Nut	1
5D	Z10-02-08	8mm Flat Washer	1
5E	Z23-08	8mm Locknut	1

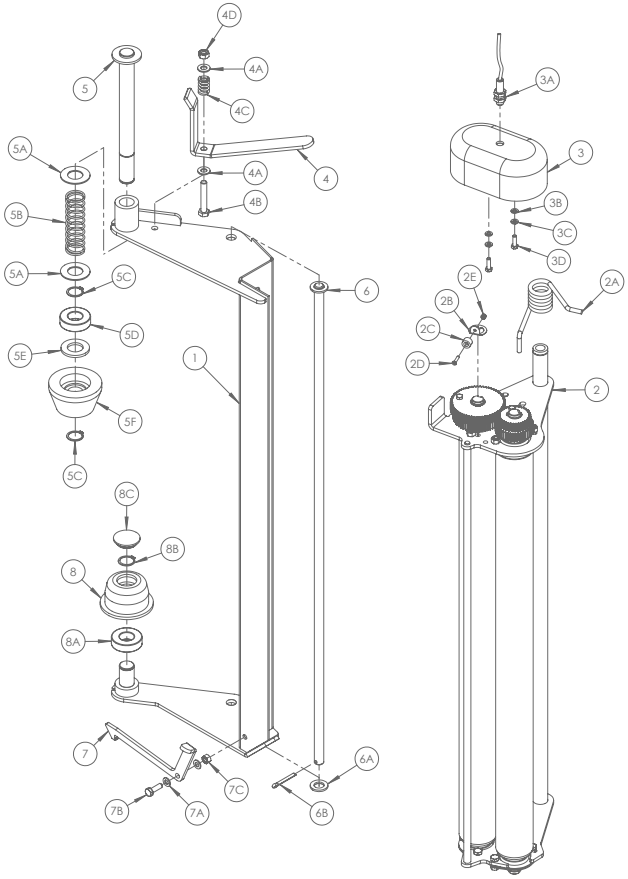


Item No.	Part No.	Description	Qty
1	1405150	Dispenser Assembly	1
1A	34105677	Retainer Hinge Pin	1
1B	34220200	Split Pin - 4mm x 36mm	2
1C	34105676	Wrap Arm Locking Pin	1
1D	Z36-02	4mm 'R' Clip	1
2	1313015	Wrap Arm Lock	2
2A	Z10-02-08	8mm Flat Washer	4
2B	Z26-040S	M8 x 25 Hex Set	2
2C	Z23-08	8mm Locknut	2





Item No	Part No	Description	Qty
1	1505001	Roller Mounting Frame	1
1A	1305035	Film Seperating Roller	1
2	1305120	Inner Roller	1
2A	1305104	37 Tooth Gear	1
2B	1305102	35 Tooth Gear	1
2C	1305123	6mm Square Key Steel (15mm Long)	1
2D	Z28-520	20mm External Cir-Clip	1
2E	Z26-022S	M6 x 30mm Hex Set	1
3	1305121	Outer Roller	1
3A	1305101	60 Tooth Gear	1
3B	1305103	58 Tooth Gear	1
3C	1305123	6mm Square Key Steel (15mm Long)	1
3D	Z28-520	20mm External Cir-Clip	1
3E	Z26-022S	M6 x 30mm Hex Set	1
4	1305122	Roller Bearing (SLFL20A)	4
4A	Z26-039S	M8 x 20mm Hex Set	8
4B	Z23-08	8mm Locknut	8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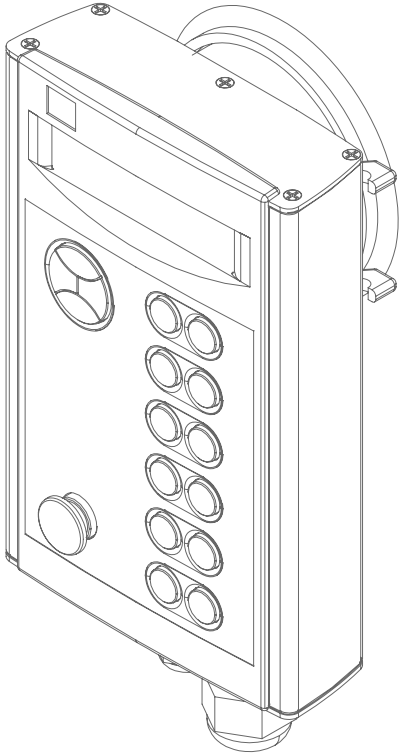
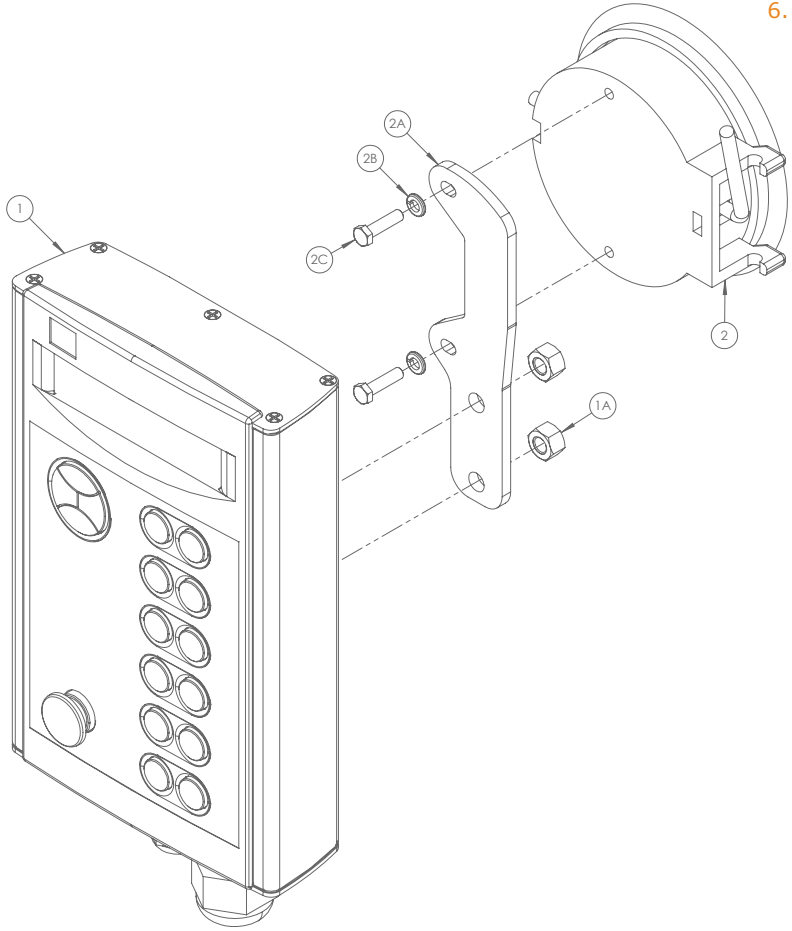
Item No	Part No	Description	Qty
1*	1405100	Dispenser Frame	1
2	1305100B	Dispenser Insert (70/55%)	1
2A	1305034	Torsion Spring	1
2B	WD404-052	Magnet Mounting Bracket	1
2C	D606C-M	Sensot Magnet	1
2D	Z13-5-04X20	M4 x 20mm CSK Set	1
2E	Z23-04	4mm Locknut	1
3	1305125	Dispenser Gearbox Cover	1
3A	1309203	RDS Sensor (4m Cable)	1
3B	Z10-02-06	6mm Flat Washer	2
3C	Z12-02-06	6mm Spring Washer	2
3D	Z26-020S	M6 x 20mm Hex Set	2
4	1305026	Dispenser Top Latch	1
4A	Z10-02-10	10mm Flat Washer	2
4B	Z26-067B	M10 x 60mm Hex Bolt	1
4C	1305027	Top Latch Compression Spring	1
4D	Z23-10	10mm Locknut	1

* Twin Arm Dispenser Frame Part No: 1514600

Item No	Part No	Description	Qty
5	1305022	Dispenser Top Shaft	1
5A	Z11-02-25	25mm Flat Washer (Light Duty)	2
5B	1305021	Compression Spring	1
5C	Z28-525	25mm External Circlip	2
5D	Z06-AWRB	Ball Bearing (6205-ZZ LDK)	1
5E	Z10-02-25	25mm Flat Washer (Heavy Duty)	1
5F	1305019	Top Nylon Cone	1
6	1405007	Insert Mounting Pin	1
6A	Z10-02-16	16mm Flat Washer	1
6B	Z03-21-14	3/16" Split Pin (1 1/2" Long)	1
7	1405151	Dispenser Bottom Latch	1
7A	Z10-02-08	8mm Flat Washer	2
7B	Z26-040B	M8 x 25mm Hex Bolt	1
7C	Z23-08	8mm Locknut	1
8	1405006	Bottom Nylon Cone	1
8A	Z06-AWRB	Ball Bearing (6205-ZZ LDK)	1
8B	Z28-525	25mm External Circlip	1
8C	Z32-15F	1 1/4" NB Tube Insert (37mm)	1

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2A
2B
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Item No	Part No	Description	Qty
1	1309006*	RA Control Unit	1
*	1319000	1500 Control Kit Complete	-
1A	Z23-08	8mm Locknut	2
2	1309012	Controller Suction Cup	1
2A	1309011	Sucntion Cup Mounting Bracket	1
2B	Z12-02-05	5mm Spring Washer	2
2C	Z26-017S	M5 x 20mm Hex Set	2