

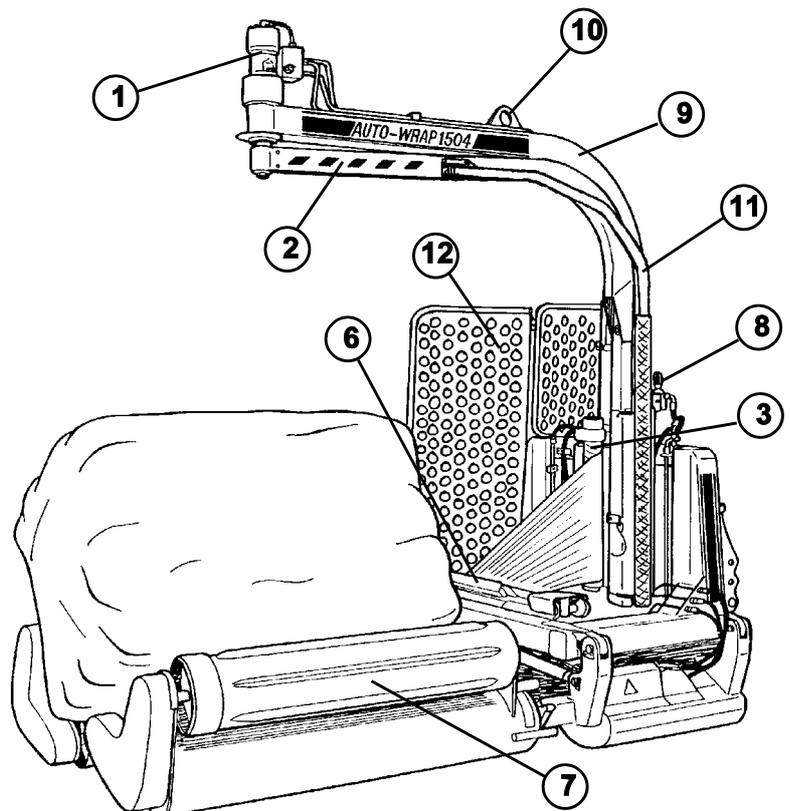
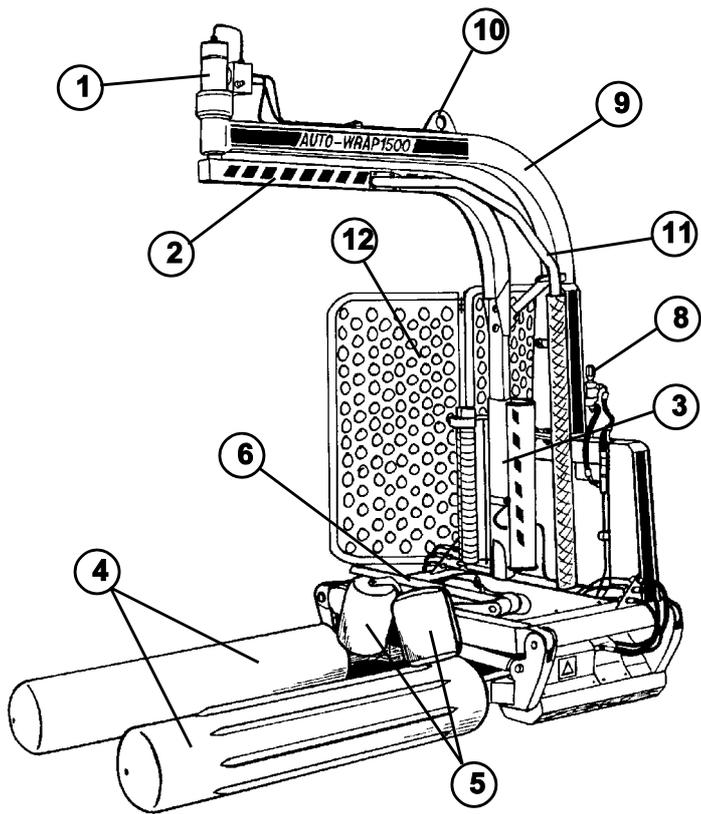
USER'S MANUAL

NORSE AUTO WRAP 1500 /1504 EH

CHAP.	CONTENTS	PAGE
1.0	INTRODUCTION	3
2.0	SAFETY PRECAUTIONS	4
3.0	GENERAL INFORMATION ON BALEWRAPPING	9
4.0	SETTING UP / MOUNTING OF THE MACHINE	11
5.0	EMERGENCY STOP* (Momentarily stop)	17
6.0	MOUNTING OF PLASTIC FILM	18
7.0	REMOTE CONTROL UNIT, CR 900	20
8.0	SPEED SETTING OF THE WRAPPING ARM	23
9.0	ADJUSTING THE OVERLAP	24
10.0	OPERATION INSTRUCTION	25
11.0	AUTO WRAP 1500 EH TWIN / 1504 EH TWIN	28
12.0	PERIODIC MAINTENANCE	29
13.0	ELECTRIC CIRCUIT	31
14.0	DESCRIPTION OF HYDRAULICS	32
15.0	DESCRIPTION OF HYDRAULICS, AUTO WRAP 1504 EH	35
16.0	PROCEDURE OF TROUBLE SHOOTING	37
17.0	TROUBLE SHOOTING	39
18.0	HYDRAULIC CHART, AUTO WRAP 1500 EH	41
	HYDRAULIC CHART, AUTO WRAP 1504 EH	42
19.0	WARRANTY TERMS	43

NORSE AUTO WRAP 1500 / 1504 EH /TWIN

Bale wrapping machines



- 1. Wrapping arm motor
- 7. Special rollers for square bales
- 2. Wrapping arm
- 3. Prestretcher
- 4. Rollers
- 5. Support rollers
- 6. Cutter

- 8. Speed control
- 9. Stationary arm

1.0 INTRODUCTION.

TELLEFSDAL A.S congratulates you with the choice of AUTO WRAP 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 AUTO WRAP bale wrapping machine has more features than any other bale wrapping machine available. AUTO WRAP can pick up the bale, wrap and stack them without the operator leaving the tractor cab. This system is protected by patent law's almost world wide.

AUTO WRAP is hydraulically driven by the tractors hydraulic system, and is controlled from the tractor cab by a remote control unit. The machine can either be mounted to three point linkage, front mounted with quick-couplers to the tractors frontloader or on a wheel loader. Then it's possible to stack the bales upon each other.

AUTO WRAP 1500 EH is designed to wrap bales of grass, hey or straw, with nominal diameter of 4 - 6 ft. (120 -180 cm), and weights up to 2650 lbs. (1200kg).

The machine is developed and has been improved since the beginning in 1986, and is now a very reliable and safe machine with high security built in.

This manual is meant to explain how AUTO WRAP is prepared, mounted, 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 the books, they are a part of the machine.

Read carefully through this manual, and specially chapter 2.0, safety instructions, before starting the machine, and follow the instructions thoroughly. If problems should occur, check with chapter 17.0, and try to find out what is wrong. Ask your dealer for advice before you make the problem worse than it is.

See also chapter 19.0, conditions of warranty.

- * **EMERGENCY STOP. Auto wrap 1500/1504 EH 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.**

Technical Specifications	AUTO WRAP 1500 EH	AUTO WRAP 1504 EH
Height in working position	2820 mm (9'3")	2960 mm (9'9")
Width, min. / max.	1520 / 3000 mm (5' / 10')	1520 / 3000 mm (5' / 10')
Length, min. / max.	2450 / 3000 mm (8' / 10')	2540 / 3300 mm (8'4"/10'10")
Weight	780 kg (1720 lbs)	870 kg (1920 lbs)
Wrapping arm speed, recom.	22 rev. per minute	22 rev. per minute
Wrapping arm speed, max.	27 rev. per minute	27 rev. per minute
Bale size, max.	ø1800 mm (6')	1200x1200x1500 mm (4'x4'x5')
Bale weight, max.	1200 kg (2650 lbs)	1200 kg (2650 lbs)
Capacity	Approx. 25 bales per hour	Approx. 25 bales per hour
Prestretcher	500 / 750 mm (20" / 30")	500 / 750 mm (20" / 30")
Hydraulic connection	1 single work. +free return	1 single work. +free return
Oil pressure / amount, min.	180 bar / 15 litres/minute	180 bar / 15 litres per minute
Oil amount, max.	40 litres per minute	40 litres per minute
Counter pressure, max.	10 bar	10 bar
Electric connection	12 V DC	12 V DC

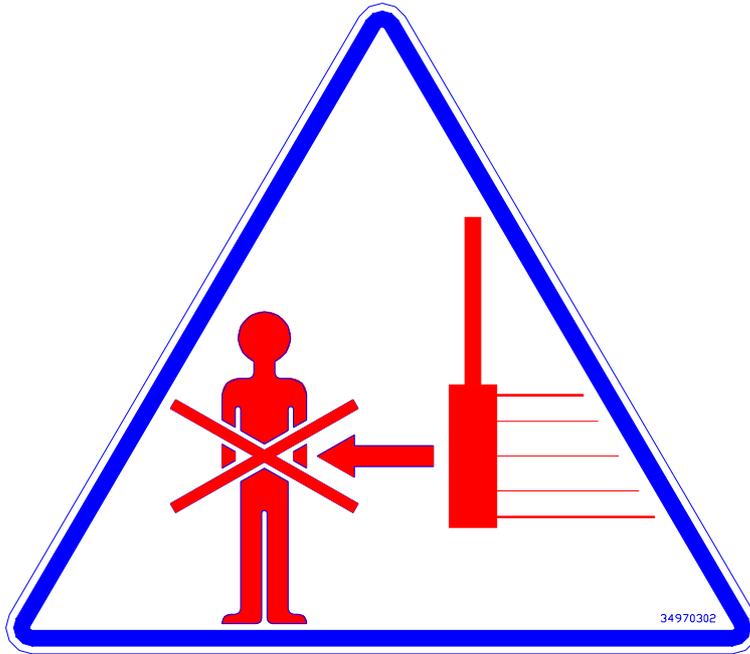
TELLEFSDAL A.S can change the construction and/or technical specifications without warning and without rights to changes on already delivered products.

© Copyright. All rights reserved. Any copying and reproduction of this manual are not permitted without permission from TELLEFSDAL A.S.

With precaution of printing failure.

2.0 SAFETY PRECAUTIONS.

TELLEFSDAL A.S does not take the responsibility for damages that may occur on 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.

2.1 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. (See chapter 2.5).

2.2 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 Auto Wrap, please contact your Auto Wrap dealer.

2.3 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.

2.4 IMPORTANT!

MAKE ALWAYS SURE THAT NOBODY IS IN THE HAZARD AREA OF THE WRAPPING ARM WHEN THE MACHINE IS IN USE.

THE MACHINE MUST NEVER BE OPERATED BY PERSONS WHOM DOES NOT KNOW ENOUGH ABOUT HOW TO SAFELY OPERATE THE MACHINE, OR BY PERSONS UNDER 16 YEARS OF AGE.

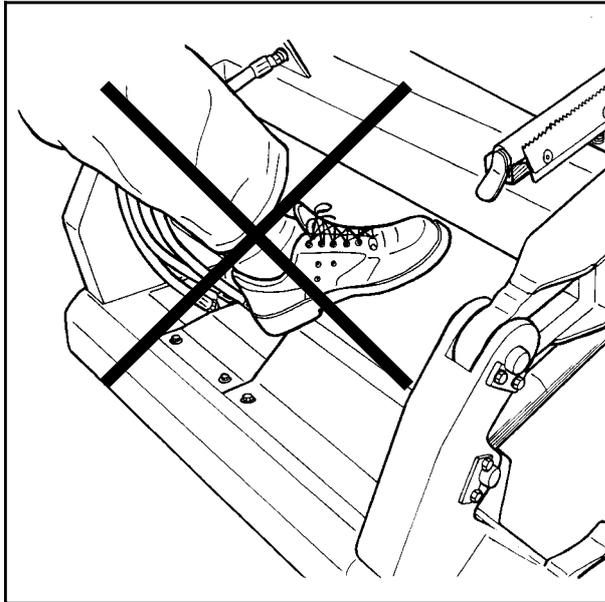


Fig. 2-3

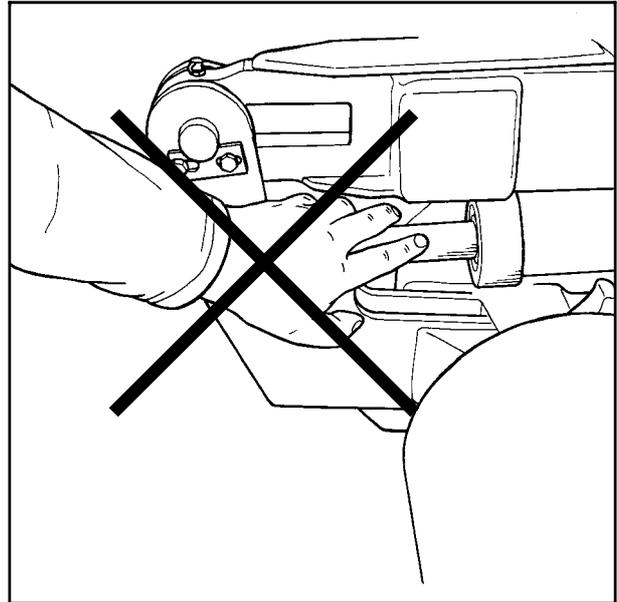


Fig. 2-2

2.5 DANGEROUS AREAS.

TELLEFSDAL A.S 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 will now go through some of the dangers that can occur when using the Auto Wrap balewrapper.

1. PUNCH OF THE WRAPPING ARM.

During the wrapping process the arm rotates with a speed of 20-27 revolutions per minute around the bale. On the arm there is mounted a prestretcher unit with a plastic roll. The speed on this can give a person serious injuries if one comes too close to 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 instantly when someone 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.

(See more about the emergency stop* in chapter 5.0).

2. SQUEEZE-DANGER BETWEEN THE MAIN FRAME AND THE WRAPPING ARM.

As earlier explained, we have a wrapping arm with a prestretcher and a plastic roll. Once every time around this wrapping arm passes the main frame. Here there may occur a squeeze danger if a person stands too 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 prestretcher and the bottom frame there can also be a squeeze danger.

To protect the user from this there is mounted a protection guard on the right hand side of the machine. You lift this up and turn it out on the side of the machine when operating the baler. You put it in transport position by lifting it up and turning it into the frame. (Fig. 2-1). The guard must not under any circumstances be removed, and if damaged it must be repaired before the machine is used again.

3. SQUEEZE-DANGER BETWEEN THE STATIONARY AND THE 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. 2-2).

4. **SQUEEZE DANGER BETWEEN THE ROLLER ARMS AND THE MAIN FRAME.**
When loading a bale, the roller arm moves in underneath the main frame. Here it can occur a squeeze danger for feet and fingers. Keep therefore fingers and feet away from this area. (See fig. 2-3).

5. **SQUEEZE DANGER BETWEEN HINGE ON THE ROLLER ARMS AND MAIN FRAME.**
When loading a bale there is also a squeeze danger between the hinge-ears on the roller arms and the main frame, and between the width cylinders and the main frame. (Fig. 2-4). Keep hands away from these areas. The squeeze danger between cylinders and frame is reduced by the mounting of a rubber shield up front.
The machine must not be used if this cover is removed.

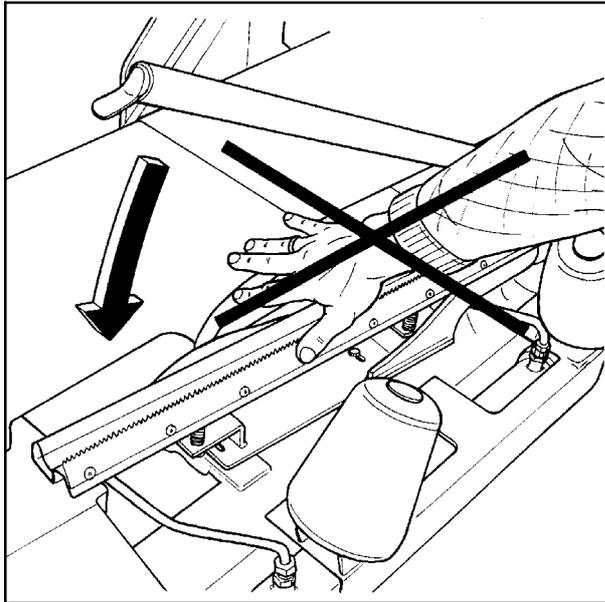


Fig. 2-5



Fig. 2-6

6. SQUEEZE DANGER CAUSED BY PLASTIC AUTOMATION.

At the end of the wrapping process the plastic shall be perforated 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 perforates the plastic is very sharp, so keep hands away from the cutter. (See fig. 2-5).

Always put the security cover over the cutter blade when the machine is not in use.

7. SQUEEZE DANGER BETWEEN THE ROLLERS ON AUTO WRAP 1504 EH.

When the rollers on the 1504 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. (See fig. 2-7 on next page).

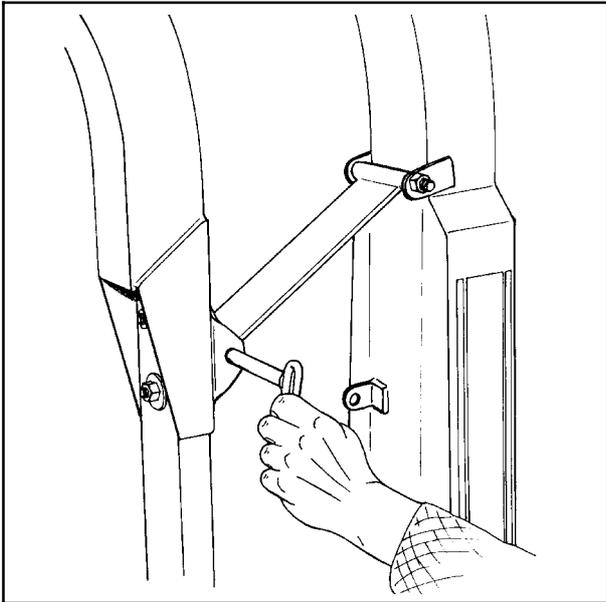


Fig. 2-7

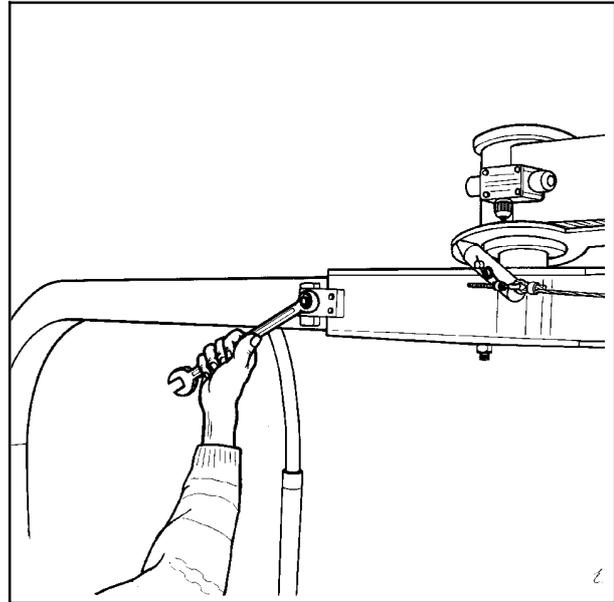


Fig. 2-8

2.6 LOCKING THE WRAPPING ARM.

When the machine is not in use, make sure the locking bolt for the wrapping arm is mounted, and that the secure pin is fitted. If the bolt is not mounted, the wrapping arm and/or the machine could be damaged during transport. (See fig. 2-8).

2.7 THREE POINT MOUNTING.

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

2.8 FRONT MOUNTING.

If the machine is mounted on the front loader there must be a counterweight in the three point linkage. It must be large enough to give the tractor good stability.

2.9 TRANSPORTING.

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

1. Make sure that the locking bolt on the wrapping arm is mounted. (Chapter 2.6).
2. Lift the protection guard, turn it into the machine and secure it with the locking pin. (See chapter 2.5.2).
3. Move the main rollers completely together.
4. Always transport the machine in the lowest possible position.
5. Make sure that the machine do not cover the tractors lights. If necessary, mount extra lights.
6. Make sure that at least 20% of the tractor's total weight is on the steering wheels.
7. If the machine is front-mounted, it's necessary to balance the weight with a counterweight mounted to the three-point linkage.

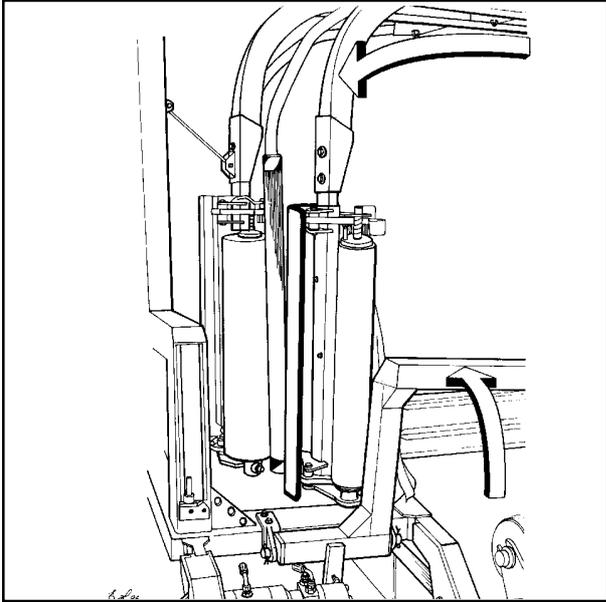


Fig .2-9

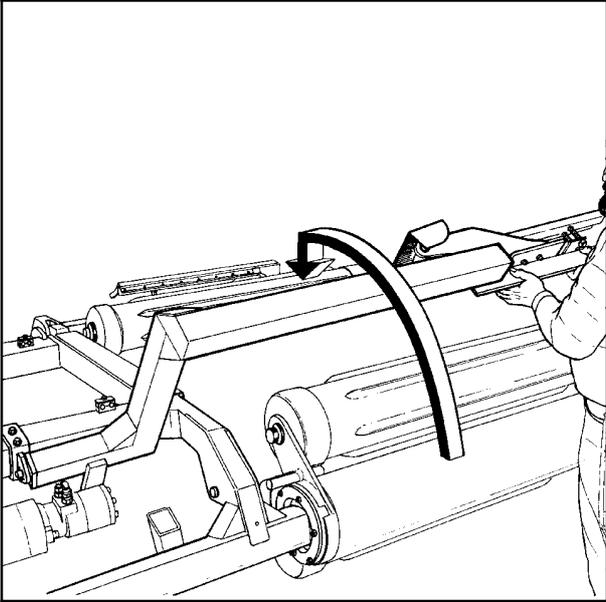


Fig. 2.10

3.0 GENERAL INFORMATION ON BALE WRAPPING.

3.1 THE PRINCIPLE.

The advantages of round bale ensilage 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.

3.2 THE BALE PRESS.

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

3.3 DIFFICULT BALES.

When a misshapen bale is packed, it will have a tendency to move outwards or inwards on the rollers. 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 rollers on the main frame. It can therefore be useful to use a hydraulic top stay to make this adjustment easier. (See chapter 4.2).

If the support rollers almost disappear into the bale the machine should be pressed down slightly at the rear edge in order to remove the bale from the machine. The plastic can be damaged when friction against the rollers increases. Best results are achieved when the bale rolls easily against the support rollers all the time.

If the bale to be packed 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 stay will again be advantageous.

3.4 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 packed, the bale should have 90-100 μ plastic, (6 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 plastic produces slightly lower temperatures within the bale, and tends to improve feed quality.

3.5 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 which is stored in the shade. According to "Teknik for Lantbruken" [Technology for Agriculture] in Sweden, a bale which is stored in the shade has only 40% of the air leakage of a bale which is stored in sunlight.

3.6 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.

3.7 The best wrapping results are obtained by...

1. ...harvesting the grass early.
2. ...drying it out to 30-40% solid content. If there is a danger of rain, press and pack the grass anyway.
3. ...taking care not to mix any earth in with the grass.
4. ...using a press that produces even, firm bales.
Bales 1.2 m in width and with a diameter of 1.2-1.5 m are the preferred sizes.
5. ...packing the bales soon after pressing, never later than two hours afterwards.
6. ...using a good type of plastic and six layers of plastic. This removes the need to use preservatives.
7. ...storing bales in the shade to reduce the danger of air leakage.

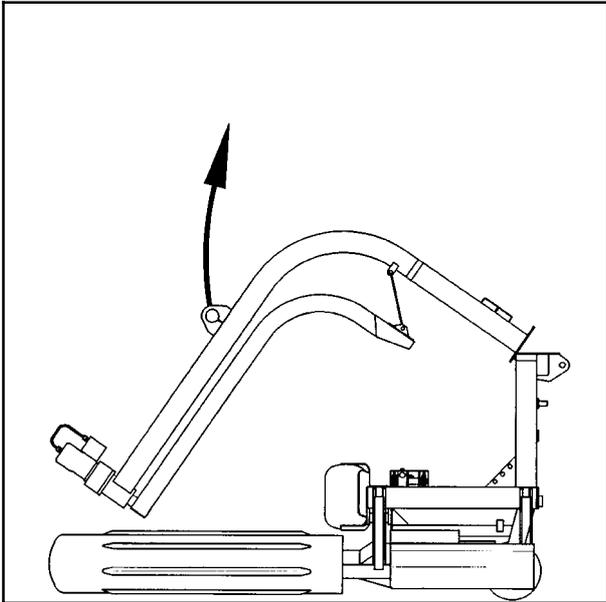


Fig. 4-1

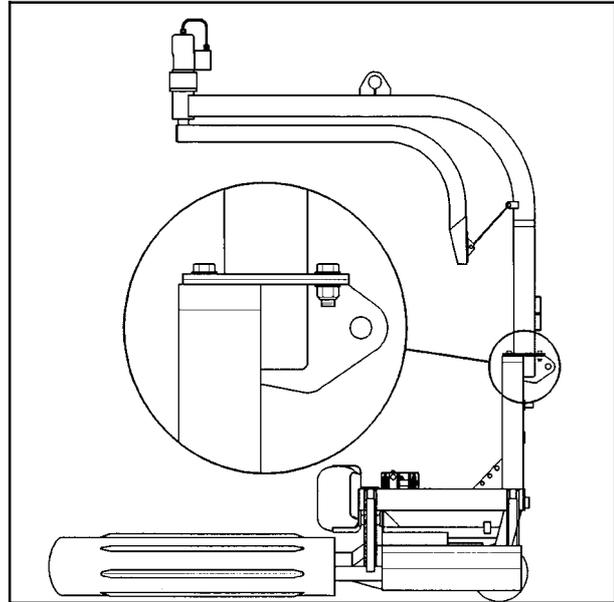


Fig. 4-2

4.0 SETTING UP / MOUNTING OF THE MACHINE.

4.1 HINGED TOWER.

Because of the freighting of the machine, AUTO WRAP 1500 / 1504 is sometimes delivered with the tower hinged down. Before use, the tower must be lifted up and fastened with 5 pcs. 16mm bolts. Figure 4-1 shows the machine at delivery.

Remove all packing strips and lift up the tower. Use a crane or the front-loader on the tractor and lift in the liftingpoint at the top of the machine. (See arrow).

Then mount the 5 pcs. M16 x 55 bolts with washers and lock nuts. **TIGHTEN THE BOLTS WELL !**

After a few hours use, these bolts have to be tightened again.

4.2 MOUNTING OF PRESTRETCHER.

It is to be fastened with the same 2 bolts that the locking bracket is fastened with. (You don't have to remove the locking bracket). Remove the nuts and mount the prestretcher and the wrapping arm.

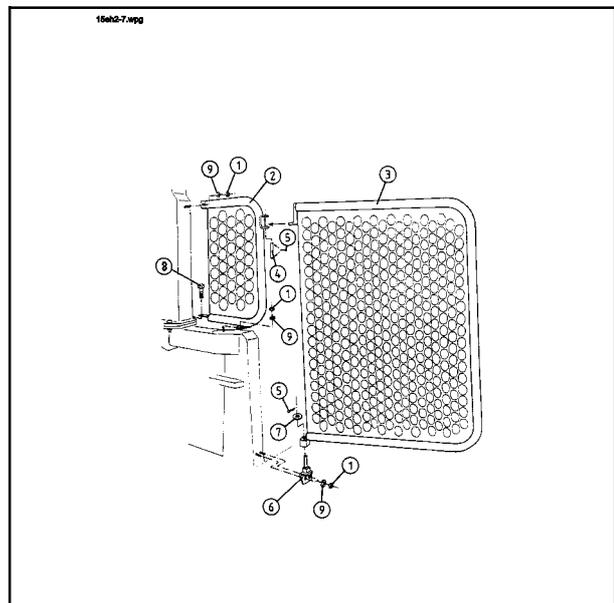


Fig. 4-3

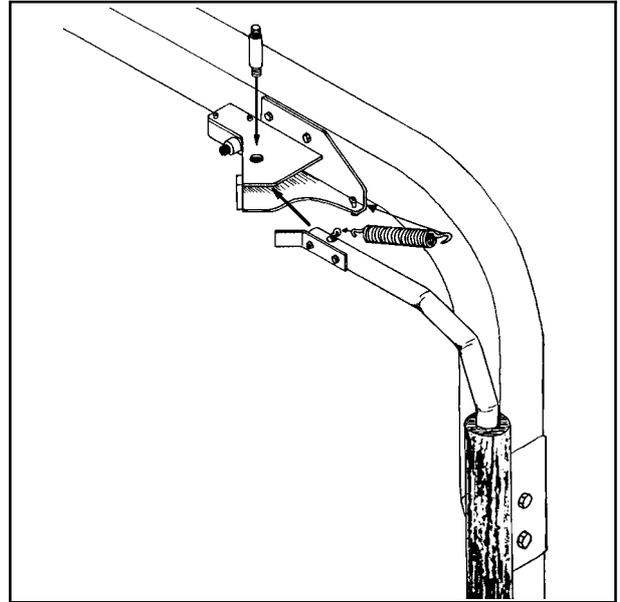
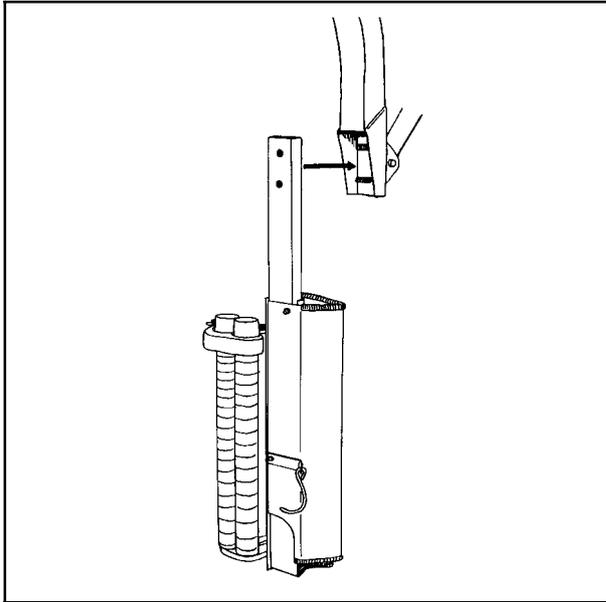


Fig. 4-5

4.3 MOUNTING OF EMERGENCY STOP* ARM.

The machine is equipped with an emergency stop*, and the releasing arm has to be mounted. Put the arm into the bracket and mount the hinge bolt. Replace the washers and tighten the locking nuts. (See fig. 4-4).

The return spring is to be fastened between the eye bolt on the arm and the eye bolt on the bracket. (See chap. 9-1 in the spare parts list for details).

4.4 MOUNTING OF RELIEF ROLLER.

At last the relief 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. Mount the relief roller with 4 pcs. M10 x 40 bolts, washers and lock nuts. (See fig. 4-5).

If it is a 1504-machine, it also has to be mounted distances between the machine and the relief roller.

(See chapter 6-6 in the spare parts list).

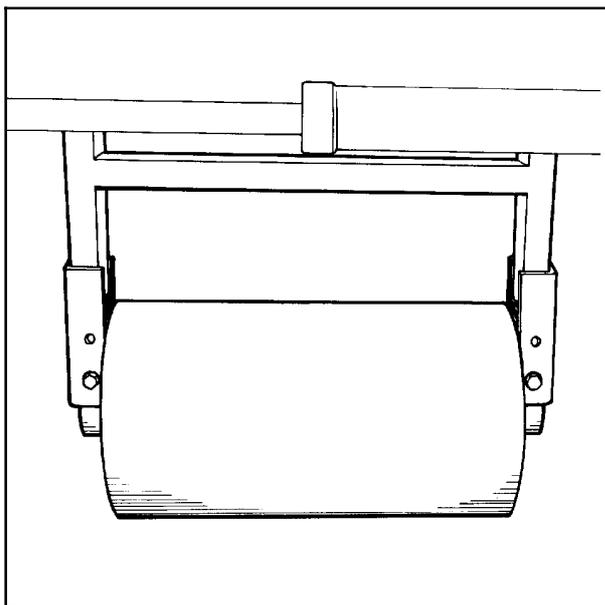


Fig. 4-6

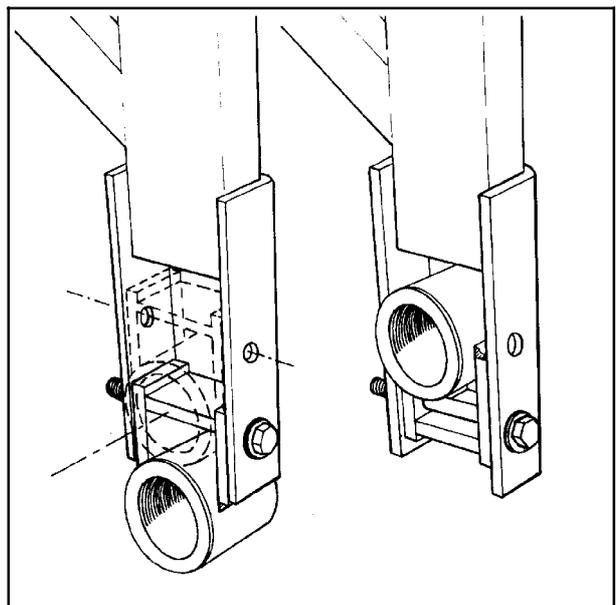


Fig. 4-7

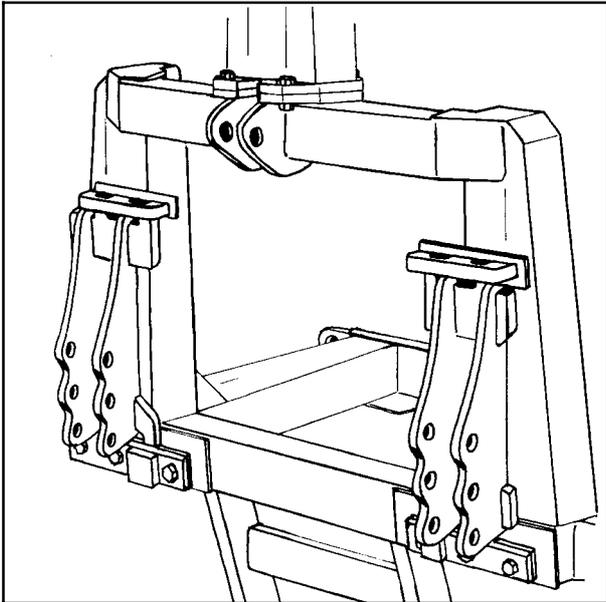


Fig. 4-6

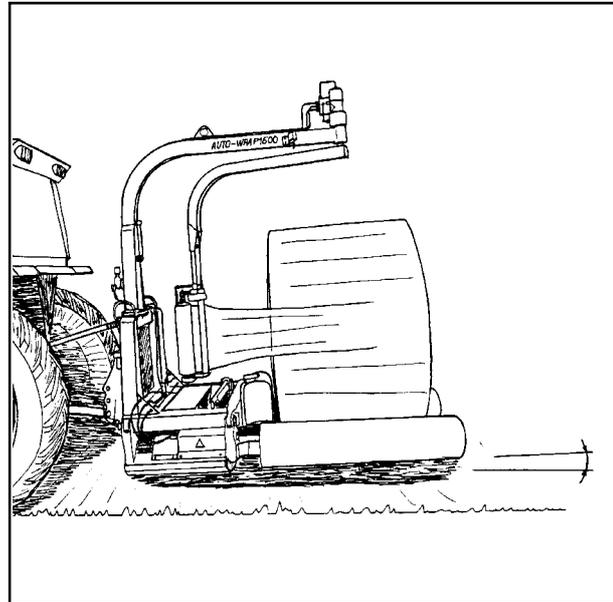


Fig. 4-7

4.5 THREE POINT LINKAGE.

AUTO WRAP 1500 / 1504 EH is intended for rear mounting to the three point linkage, category 2. (Fig. 4-6). With considering of transportation are not the three point brackets mounted on the machine when it leaves the factory. (See spare parts list chapter 2-1 for more details). When attached to three point linkage, make sure the machine is level across the tractor. Tight up and lock the lifting arms so there is no sideways movement.

4.6 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. 4-7).

4.7 FRONT MOUNTING.

As extra equipment the machine can be equipped with quick-couplers for front loader or wheel loader. (See spare parts list chapter 2-2 for what types of quick couplers there are). You also need longer hydraulic hoses. (See spare parts list chapter 4-2 for more details). When front-mounted there must be mounted a large enough counterweight in the three point linkage, this is to secure the tractors stability.

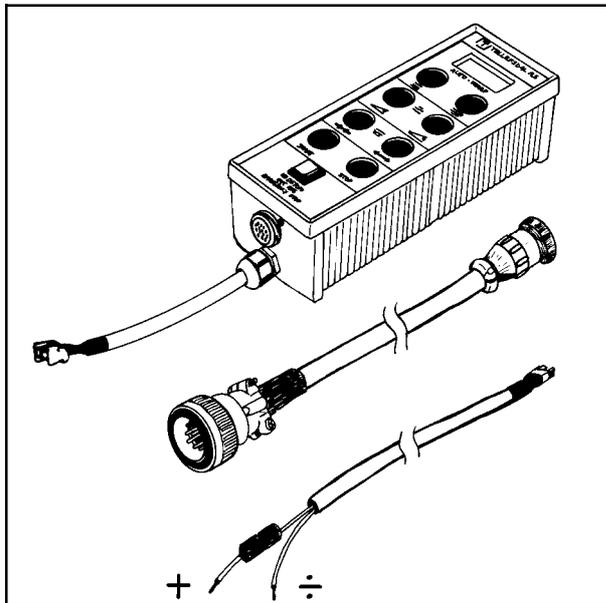


Fig. 4-8

4.8 ELECTRIC 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 misfunctions, and is not to recommend.

To secure the electric system against short-circuits there is an 8A fuse on the plus-leader, near to the battery pole.

**BROWN LEADER GOES TO BATTERY PLUS POLE
BLUE LEADER GOES TO BATTERY MINUS POLE**

REMOTE CONTROL.

The control unit should be attached to a suitable place in the tractor cab, next to the front loader's operating lever if the machine is front mounted.

THE REMOTE CONTROL UNIT IS NOT SHOCK-PROOF. MAKE SURE THAT IT IS FASTENED TO A SOFT PAD THAT SECURES A NON-VIBRATING FOUNDATION.

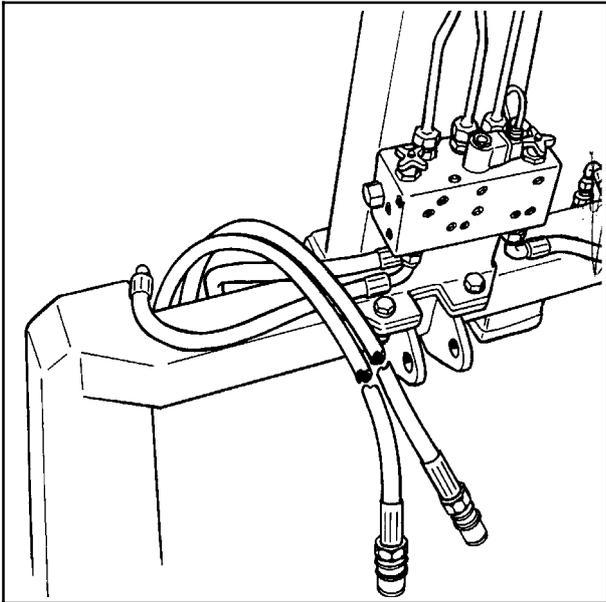


Fig. 4-9

4.9 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. Use the tractors' hydraulic lever. To make sure that the balewrapper works properly, the tractors' oil pressure has to be at least 180 bar. The oil flow should be 15 - 25 litres per minute.

The counter 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 balewrapper 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. **Hose with red cap shall be connected to pressure, (P), and hose with blue cap to the return. (T).** (See fig. 4-9).

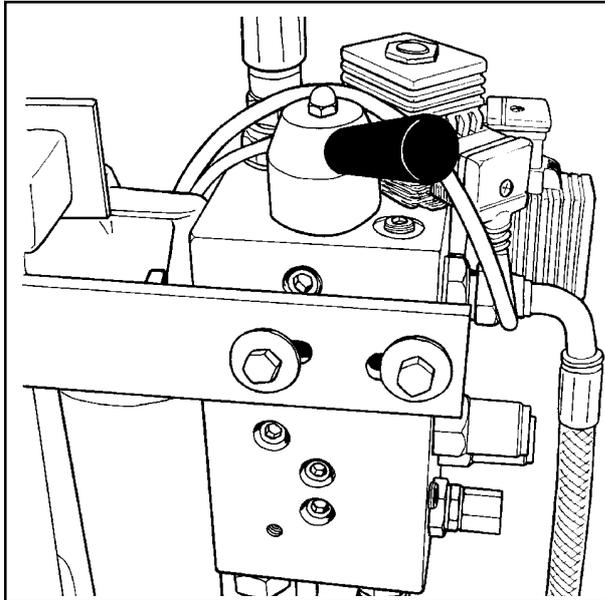


Fig. 4-11

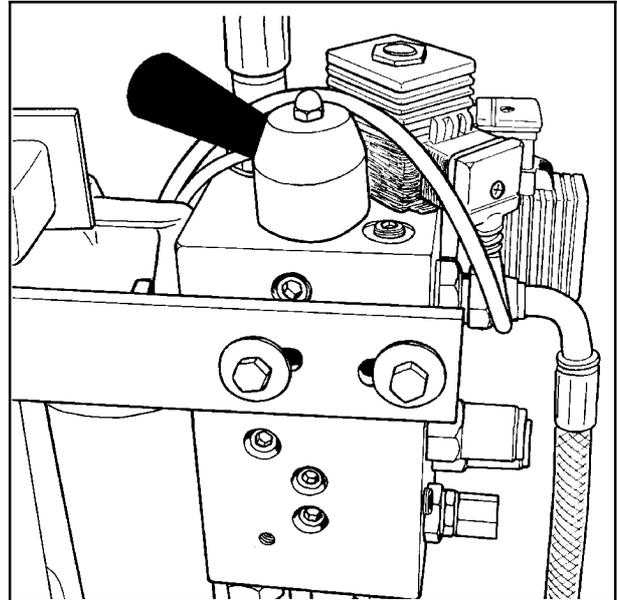


Fig. 4-12

4.10 OPEN AND CLOSED CENTRE HYDRAULIC SYSTEM. (See also chap. 14.1).

With the ball valve you can choose between a hydraulic system with open or closed centre. Almost all tractors have a hydraulic pump that gives a fixed oil flow per revolution. (Open centre). The valve, (with the red handle), shall then be in open position. Some tractors, (like f.i. John Deere), have an oil pump with variable volume per revolution. (Closed centre). The ball valve shall then be in closed position. (See fig. 4-10).

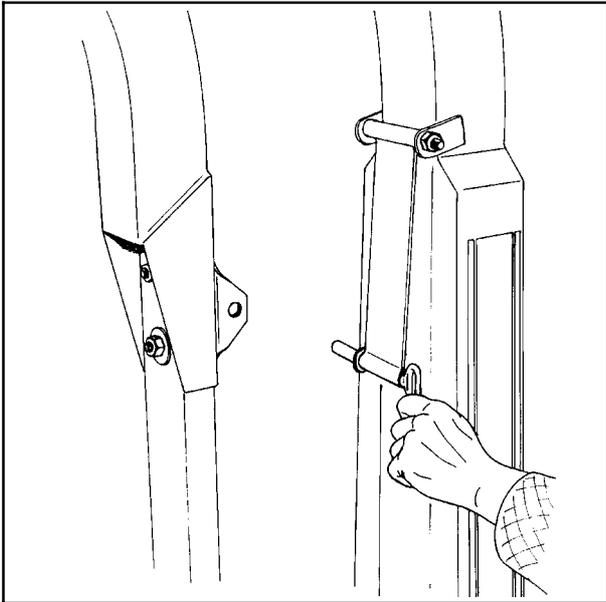


Fig. 4-13

4.11 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 as directly to tank as possible. Beware that if the counter pressure is too high, the security valve on the main block will release some oil. (See chapter 14.3).
3. Hose with **BLUE CAP = RETURN OIL.**
4. Hose with **RED CAP = PRESSURE.**
5. Tie up loose hoses so that no squeeze damages occur.
6. Remove the locking bolt that holds the wrapping arm to the frame during transport.(Fig. 4-13)
7. Make sure that the plug-in contact from the remote control is connected to the socket on the machine.
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.

They can be very narrow and work badly after some years.

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

Your AUTO WRAP bale wrapper has been tested in practical operation in approx. 2 hours at the factory.

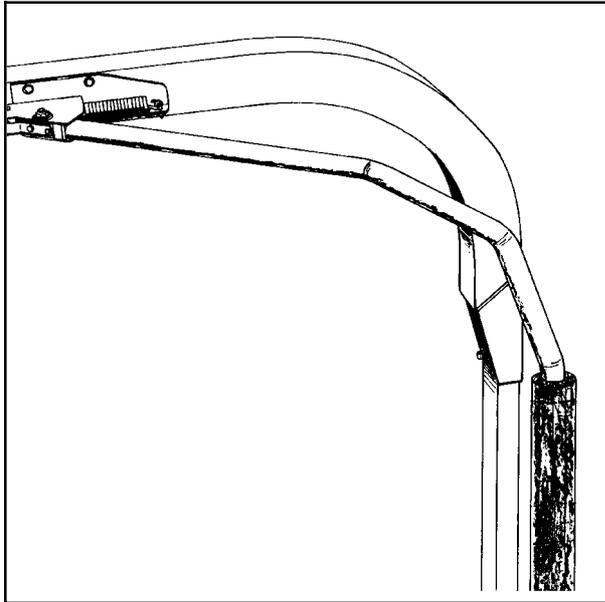


Fig. 5-1

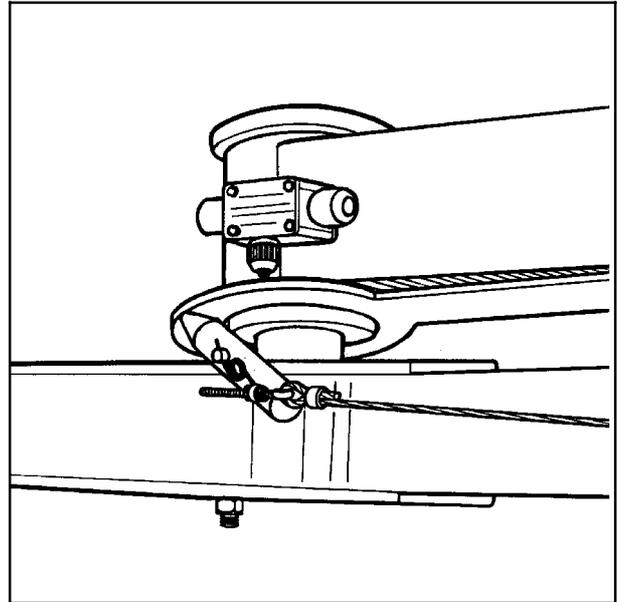


Fig. 5-2

5.0 EMERGENCY STOP*.

5.1

5.2

5.3 The emergency stop* is constructed with a "positive" connection, i.e. it has to be in full order before the machine can be started.

5.4

5.5 When this function shall be tested, you start the wrapping arm. Hold out an arm or any obstacle. The wrapping arm shall now stop before it hits the arm.

5.6

5.7 When the machine has been parked for some time, there might be copper acetate on the skidding rings, so there is no contact. If so, the machine cannot be started. Rub carefully off the rings with a fine rubbing paper. Clean it up with some alcohol or electric contact spray.

NB! TO GET A RELIABLE MACHINE, IT IS VERY IMPORTANT TO ALWAYS KEEP THE SKIDDING RINGS AND BRUSHES CLEAN AND IN ORDER AT ALL TIME.

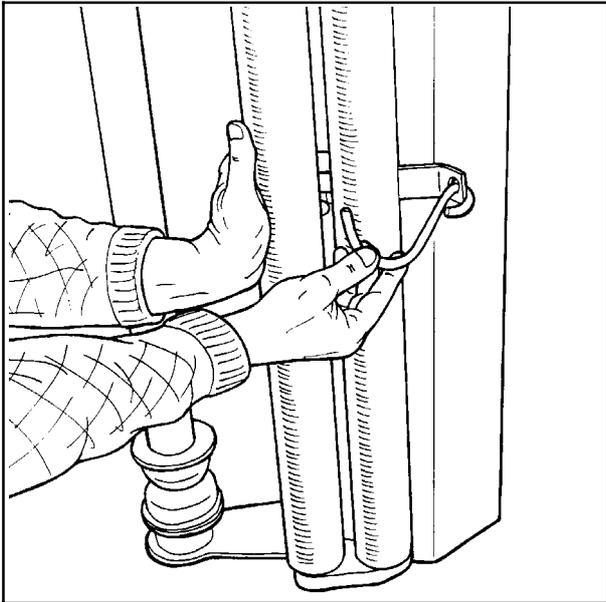


Fig. 6-1

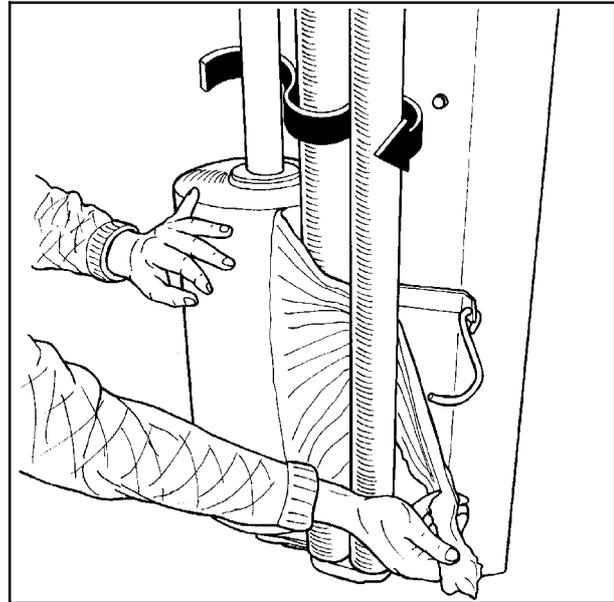


Fig. 6-2

6.0 MOUNTING OF PLASTIC FILM.

- 6.1 When the plastic roll shall be mounted, you have to hold the prestretcher-rollers aside, Hold the rollers aside and put on the holding hook. (See fig. 6-1).
- 6.2 Place a reel of film on to the prestretcher's holding axle and put on the springloaded lock.
- 6.3 Pull the film between the rollers on the prestretcher in the direction of the arrow. (See fig. 6-2). (See also the sign on the wrapping arm).
- 6.4 The filmholder / cutter opens by pushing **CUTTER UP**, (5), on the remote control block. Pull out the film and place it over the U-shaped slot.
- 6.5 Push the **CUTTER DOWN**-button, (4), and the film will be held in the U-shaped slot.

6.6 HEIGHT ADJUSTMENT OF PRESTRETCHER / PLASTIC FILM.

The plastic film shall hit at the middle of the bale wrapped, and therefore it can be necessary to adjust the height of the prestretcher. (See more about this in chapter 10.2).

If you use 500 mm plastic on a 750 mm prestrecher, then you can use the two distance sleeves to adjust the height on the plastic roll. There can be mounted one sleeve on each side of the plastic roll, or both sleeves can be mounted above or below.

7.0 REMOTE CONTROL UNIT.
Type CR 900-6.

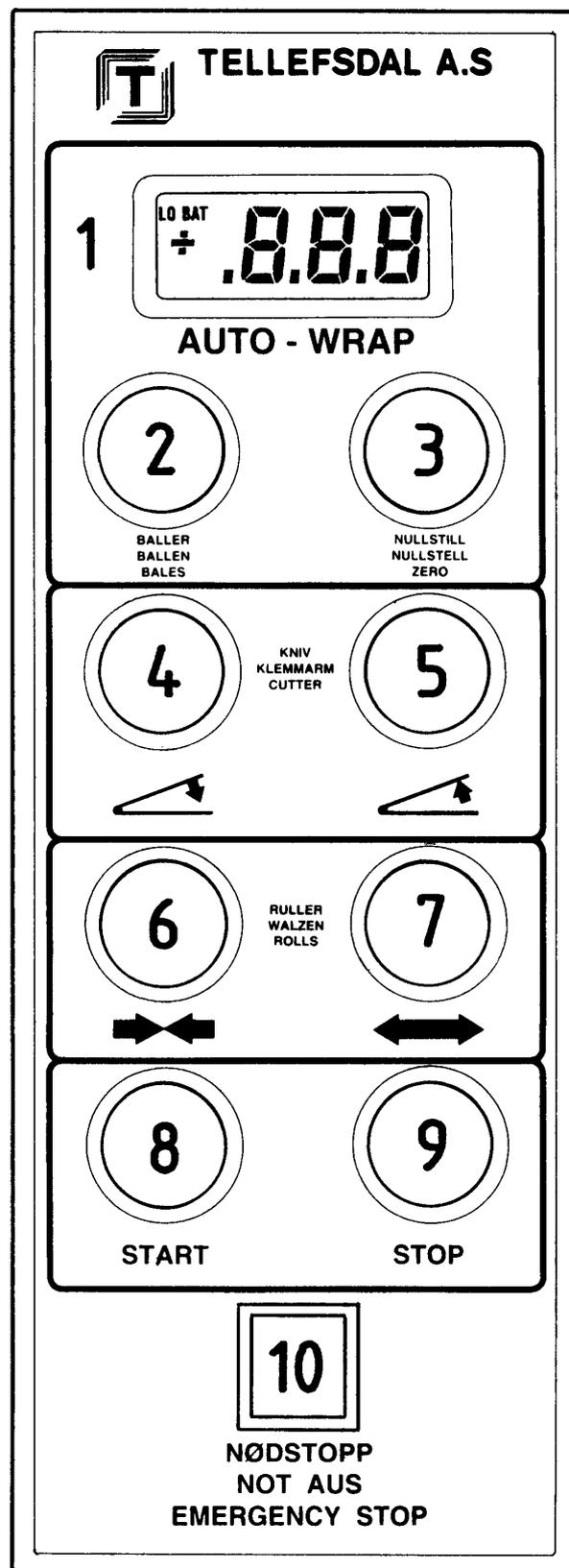


Fig. 7-1

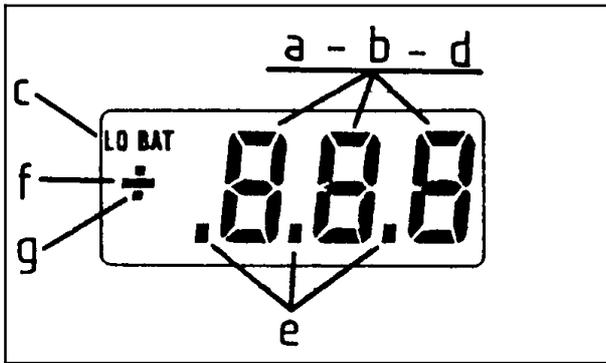


Fig. 7-2

7.2 **DISPLAY.**
The digital display, (fig. 7-2), has the following functions:

7.1 **DISPLAY.**

The digital display, (fig. 7-2), has the following functions:

- a) While wrapping the display shows the number of revolutions done by the wrapping arm at any time
- b) When pushing control 2, **BALES**, the display shows the number of bales that is wrapped. This is in the display as long as the button is pushed, and then in three seconds. Then the display automatically switches back to the number of revolutions done in this wrapping sequence.
- c) Shows if the supply voltage falls below the minimum limit of 10 volts. **LO BAT** lights up if the voltage is too low. If the voltage drops below 9 volts, all functions will fall out.
- d) If the wrapping arm rotates too fast, all the numbers on the display will start blinking. If the speed is passing a preset safety limit the wrapping arm will stop automatically, and the three points,(e), will light up. In order to continue the wrapping process the speed has to be reduced and the **START**-button, (8), pushed.
- e) When **EMERGENCY STOP***, (10), (or the emergency stop* device on the wrapping arm), has been activated the three points will light up. When resetting the emergency stop* the lighting points extinguish.
- f) If the operator is choosing the number of revolutions last shown on the display as the stop value for the next wrapping cycles, he should give the **ZERO**-button, (3), a short push. To the left on the display a little stroke will light up.
- g) Two points to the left are lighting when stop value for the wrapping cycle is set to zero by means of button 3, **ZERO**.
(Fig. 7-2).

7.2 **BALES.**

When this control button 2 is pushed the display shows the number of bales wrapped after the last zero out.

The number of bales is shown as long as the button is kept down, and in max. 3 seconds after leaving the button. Then number of revolutions appears again.

To zero out the number of bales, push button 2, **BALES**, simultaneously with button 3, **ZERO**, which has to be pushed for some seconds before it reacts.

7.8 START.
Starts the wrapping cycle.

NOTE! As long as the control-button is pushed down the wrapping cycle can be extended. (This may be the case with misshaped bales or by damage on the film). When the button is left, the wrapping process will continue according to the program.

7.9 STOP.
When the machine is started, a push on the **STOP**-button will activate the stop-sequence. This means that the machine, by the next revolution, at first opens the cutter and by the second rotation reduces the speed, and finally stops the arm. oses automatically.

When the arm has stopped, and the **STOP**-button,(9), is pushed the arm will start to rotate slowly as long as the button is being held down.

7.10 EMERGENCY STOP*.
A short push on this button stops all functions immediately and all exits are cut out. **EMERGENCY STOP*** is shown on the display by the 3 lighting points.
They are extinguished when the machine is set in operation again.

- a) If the machine is operating from the stop point, the **START**-button, (8), is pushed. The wrapping arm continues the programmed cycle.
If the operator wants to stop the machine before the preset stop-value is being reached, the **STOP**-button; (9), is pushed.
The machine will then stop the normal way.

- b) If, however, the **STOP**-button is pushed after an emergency stop*, this shows that the whole wrapping cycle is stopped and that the operator wishes to start all over again with a new cycle.

If the rotation speed on the wrapping arm is **over 27 revolutions per minute**, the wrapping arm will stop automatically. To get the arm started again, the same procedure as when **EMERGENCY STOP*** is activated, has to be done.

The control unit is programmed at the factory to cut out when the wrapping arm speed reach 27 rpm. If this programming has been changed to speed up the wrapping arm, **ALL TELLEFSDAL's warrantees are out.**

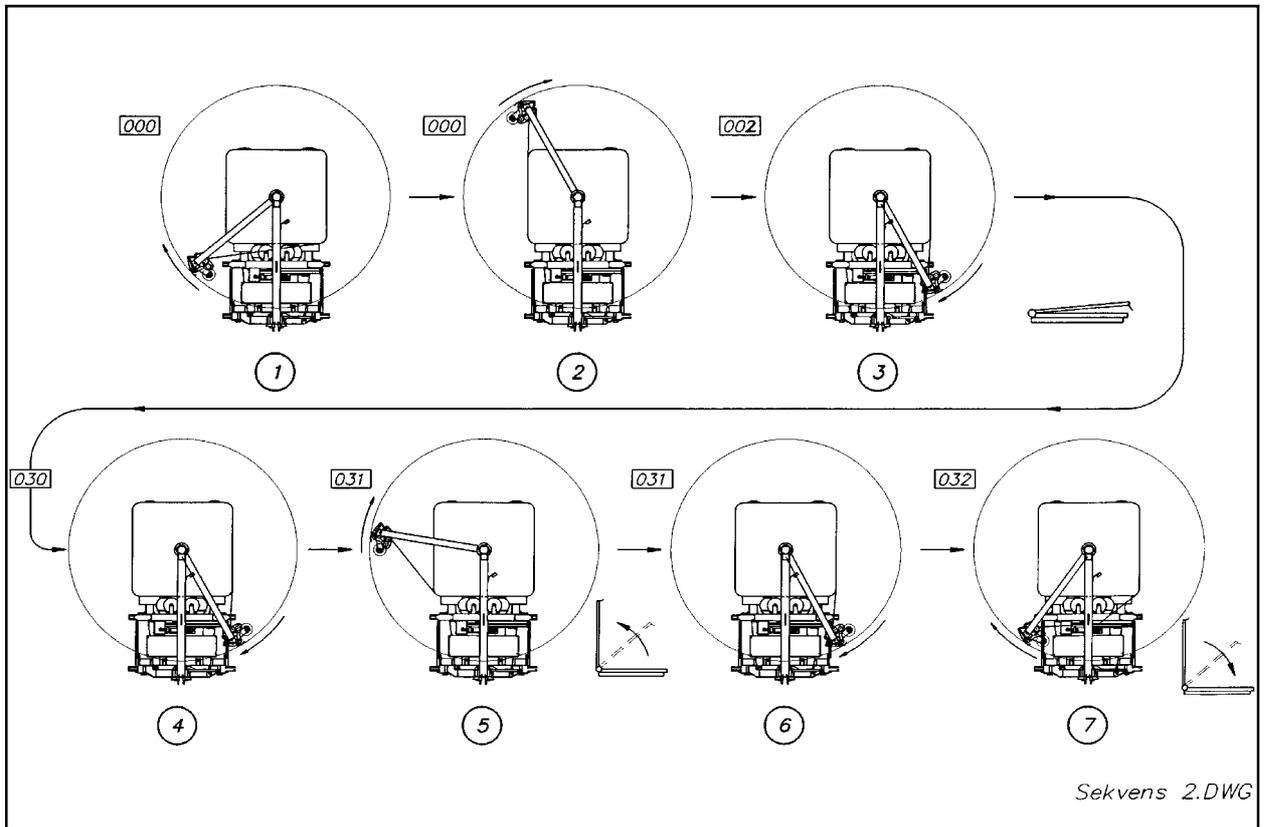


Fig. 7-3

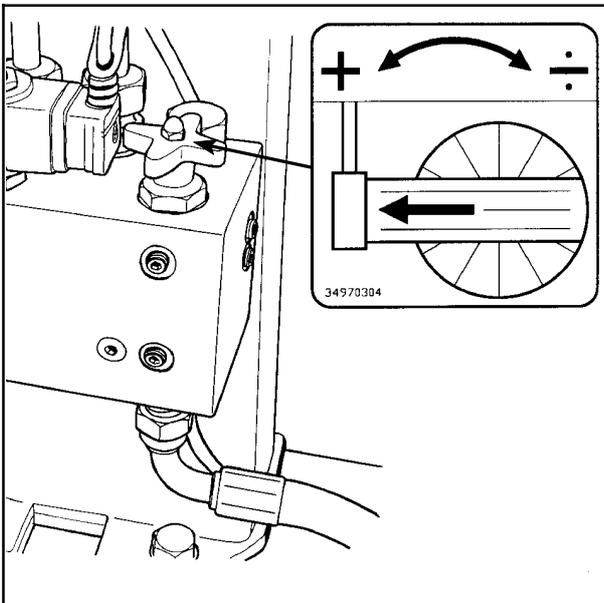


Fig. 8-1

8.0 SPEED-SETTING OF THE WRAPPING ARM.

8.1

8.2 The control valve on the right-hand side, is for adjustment of the wrapping arm speed. (See fig. 8-1).

8.3 Adjust the wrapping arm speed to approx. 22 revolutions per minute. (Just below three seconds per revolution.) The adjustment is carried out by turning the wheel on the control valve. Turning **clockwise REDUCES** the speed and turning **counterclockwise INCREASES** the speed. It is recommended not to wrap with higher speed than 22 revolutions per minute, because then the plastic film will "catch" more air, and this air do not reach to evacuate from the bale. The result is bad fodder.

OBS! Max. allowed wrapping arm speed is 27 revolutions per minute.

REMEMBER!

Increased speed of tractor engine do not increase the wrapping speed, it only increases the oil flow into the system and by that also the temperature in the hydraulic system.

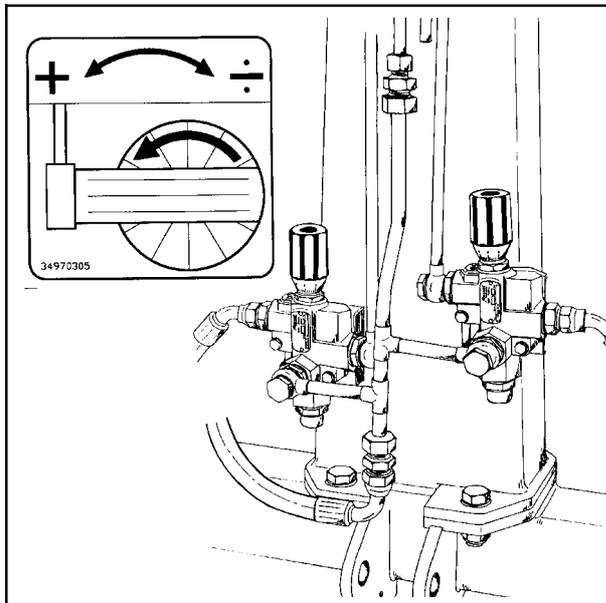


Fig. 9-1

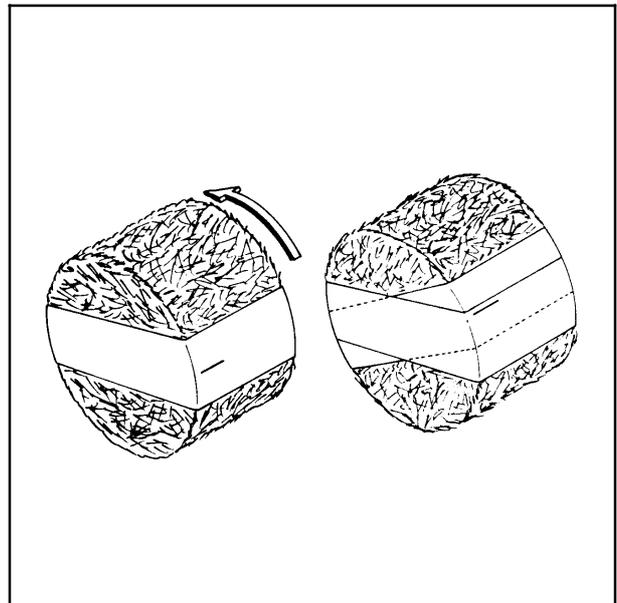


Fig. 9-2

9.0 ADJUSTING THE OVERLAP.

9.1 WRAPPING ARM SPEED.

Load a bale on to the machine. To be able to adjust 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. If not, adjust this by turning the control valve for wrapping arm speed. (See chapter 8.3). When the wrapping arm speed is OK, you can set the overlap.

9.2 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. 9-1), so that the marker line is just covered. Approx. 52-53% is the ideal overlap. (See fig. 9-2).

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

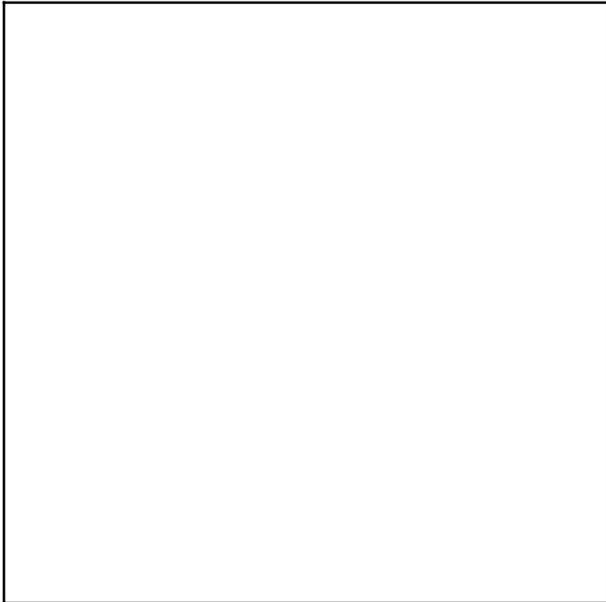


Fig. 10-1

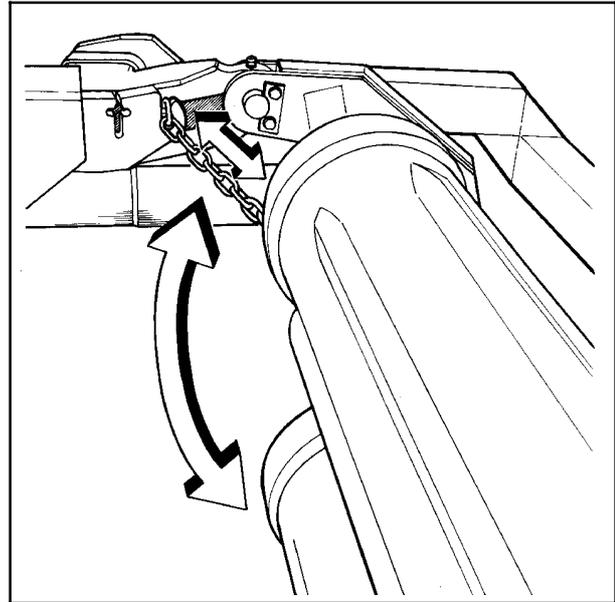


Fig. 10-2

10.0 OPERATION INSTRUCTION.

10.1 LOADING.

Pick a bale to wrap. Increase the opening between the rollers as much as possible. Lower the machine until the relief roller underneath the machine rests on the ground. Drive in under the bale. Close the rollers until they begin to lift the bale. Lift the machine and the bale approx. 4"-6", (10-15 cm), above the ground. Close the rollers completely. **The rollers must not under any circumstances hit the ground while closing.** The reason why the rollers shall not hit the ground is that this will increase the wearing on the gears and the bearings of the rollers.

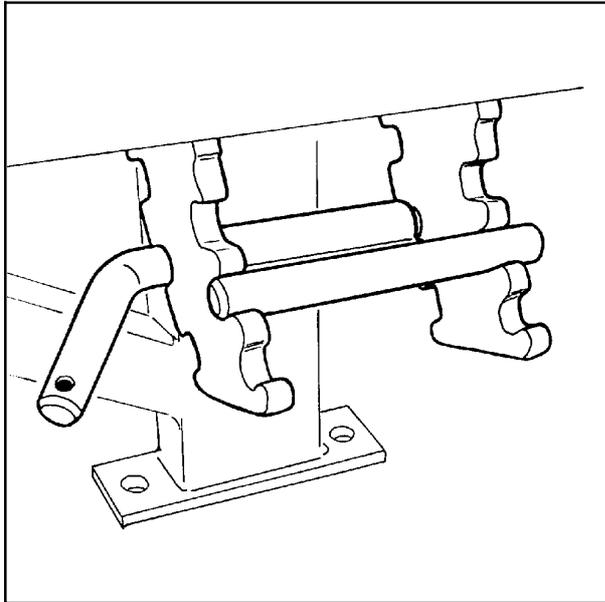


Fig. 10-3

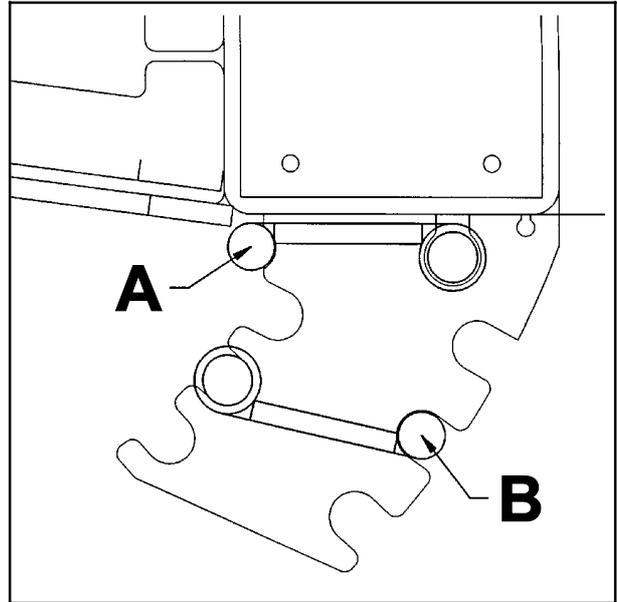


Fig. 10-4

10.2 HEIGHT ADJUSTMENT OF PRESTRETCHER.

The prestretcher can be placed in two different positions. It is fastened with two bolts. The prestretcher has to be adjusted so that the plastic film is always hitting the middle of the bale. If you use a 500 mm film on a 750 mm prestretcher, the height of the film roll can also be adjusted with the two distance sleeves. (See chapter 6.6).

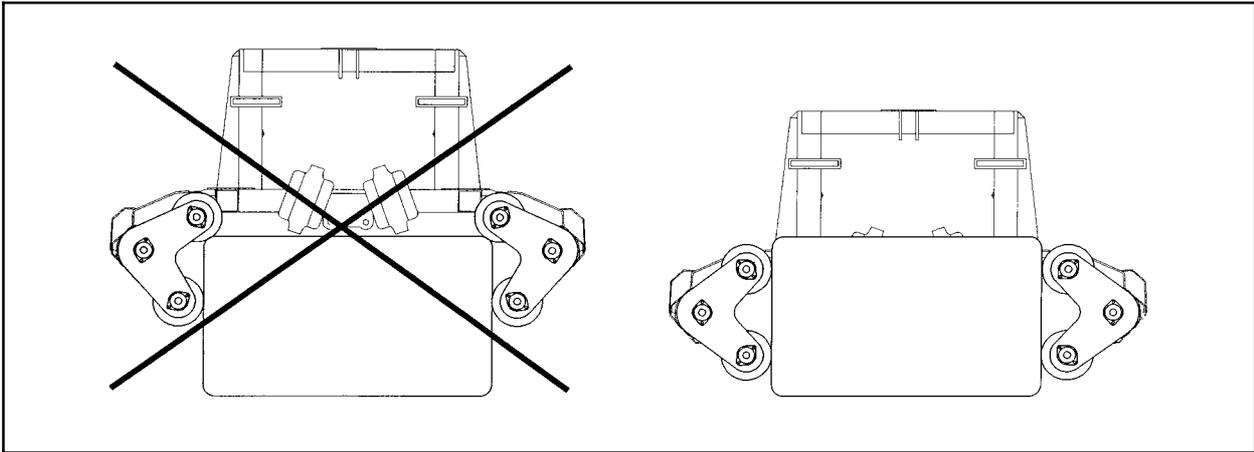


Fig.10-5

10.3 WRAPPING SQUARE BALES. (Auto Wrap 1514 / TWIN).

- 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. 10-5).
- 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 110 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. (See chap. 15.6).
- 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 loose pressed bales. If the machine has problems rotating the bale, you can move the rollers in or out with the control box while wrapping. (See chap. 7.7)
- e) **SQUEEZE VALVE.**
This is adjusted at the factory, but it can be necessary to adjust it if the machine has problems with loading the bale, or if the rollers are spinning on the bale while loading. The squeeze valve, (pos. 4, fig. 15-1), is to be adjusted so that the width-cylinders move easily together when loading. Unscrew the counter nut and adjust the valve. (Turning clockwise increases the squeeze pressure).

10.4 START.

Remember that the plastic film end has to be locked in the U-shaped slot before starting the wrapping. When the plastic film end is in the slot, push **START**, 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. (See also chapter 10.8).

10.5 OVERLAP.

Control that the overlap is correct. If not, see chapter 9.0.

10.6 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. This number has to be multiplied 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.

10.7 STOP.

When the required number of revolutions is obtained, push the **STOP**-button. The wrapping arm will now rotate 1-2 revolutions, the cutter moves up, the arm speed is reduced and it stops at the right place for next wrapping cycles. Then the cutter is closing automatically, and the film is held tight in the U-formed slot and perforated. The bale is now completely wrapped and ready for stacking.

10.9 When the wrapping sequence is ended, give the **ZERO**-button a **short** push, and a stroke lights up in the display. The stop-value is now stored in the memory, and the wrapping arm will automatically stop after the same number of revolutions by the next wrapping sequence. (The stroke will extinguish after the first revolution in next wrapping sequence).

10.10 If it later is required to change the number of revolutions stored in the memory, push the **ZERO**-button for some seconds and the previously registered numbers are erased. This is confirmed by two lighting points in the display.

10.11 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 relief 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. (See more in chapter 3.0).

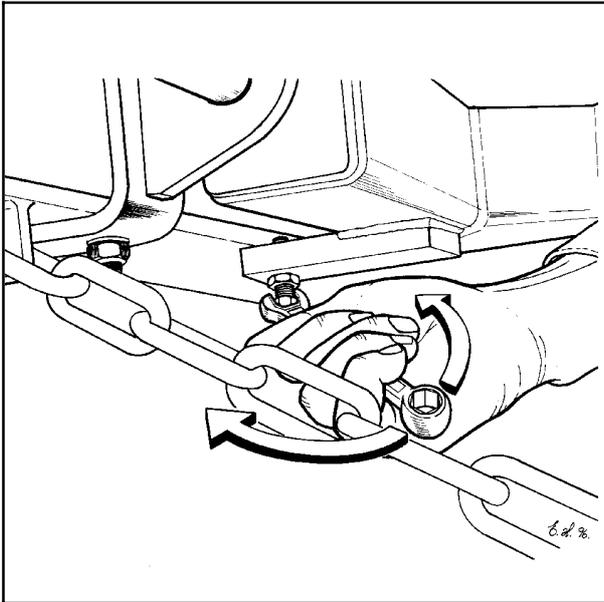


Fig. 11-1

11.0 AUTO WRAP 1500 EH TWIN / 1504 EH TWIN.

Auto Wrap 1500 EH / 1504 EH can also be equipped with a double wrapping arm, two prestretchers and two cutters. The machine will then increase its efficiency considerably. This machine is generally quite like a standard machine, except for a stronger stationary arm and another motor/valveblock. There is also a connection-box that controls the reversing of the rotating arm when the wrapping process is completed. This function is activated when the bale is unloaded. (ROLLERS OUT).

11.1 SETTING UP / MOUNTING.

Before the machine is operative the cutter-frames must be brought in their working position. Remove the linch pin locking the frame and pull the frame approx. 5 cm backwards. Turn it 90° and push it back in locked position. Secure with the linch pin. (See fig.11-1).

The wrapping arm must be "unfolded". Remove the locking device holding the arms together. Unfold the arm and fasten it to the other one with the locking plate. Fasten tightly. (See fig.11-2).

11.2 WRAPPING.

Before the TWIN machine can load a bale the rotating arm must be positioned correctly. The rotating arm is positioned by pushing and holding **ROLLERS OUT**. The wrapping arm will then reverse and stop automatically. Fasten the film ends to both cutters. (See chapter 6.4).

When adjusting the overlap, (chapter 9.0), the roller speed is set to approx. 52-53% overlap between the two prestretchers. This means that the rollers must rotate twice as fast as on a standard machine.

When the wrapping sequence is over the wrapping arm will be positioning a bit diagonal to the rollers. When the bale is unloaded by pushing **ROLLERS OUT**, the wrapping arm will automatically return to an 90° angle to the tower.

NB ! AUTO WRAP 1500 / 1504 EH TWIN is only constructed for use with 500 mm prestretchers. If there are used 750 mm prestretchers, this is the user's responsibility, considering damages on the machine and the wrapping- and feed-quality.

OBS! Before the machine is transported on public roads the wrapping arms and cutters must be fixed in the transport-position.

12.0 PERIODIC MAINTENANCE.

12.1 BEARINGS.

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

12.2 PRESTRETCHER.

If the machine is in daily use, the guiding sleeves at the prestretcher should be oiled once a week or when needed. Sprockets and bearings on the prestretcher should also be oiled when needed.

12.3 CUTTER / FILM HOLDER.

The cutter / film holder is preadjusted from the factory and does not need further adjustments. By replacement of some spares 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.

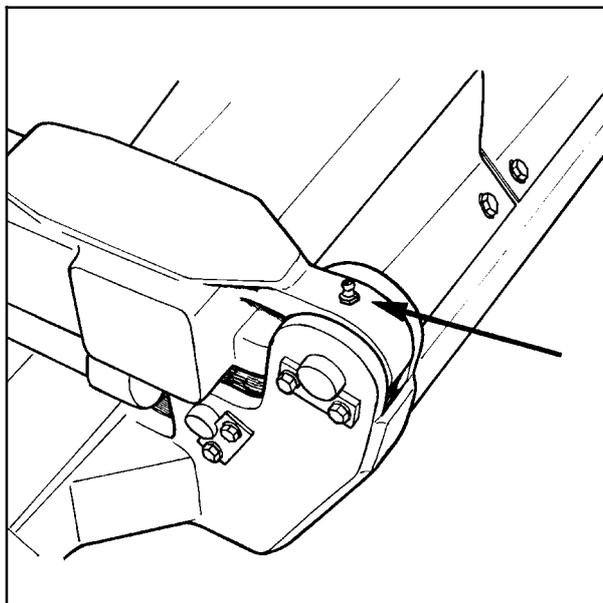


Fig. 12-1.

12.4 GEAR OIL.

TYPE OF OIL	+5° C / +40° C IV 95 min. (VG 150, ISO 3448)
AGIP	Blasia 150
ARAL	Degol BG 150
BP MACH	GR XP 150
CASTROL	Alpha SP 150
CHEVRON	Non leaded gear compound 150
ELF	Reductelf SP 150
ESSO	Spartan EP 150
I.P.	Mellana 150
MOBIL	Mobilgear 629
SHELL	Omala oil 150
TOTAL	Carter EP 150

12.5 OIL FILTER.

The oil filter must be changed once a year.

12.11 CLEANING.

The machine should be cleaned and oiled regularly and by the end of the wrapping season.

NB! When using a steamer, you need to be careful with the electric equipment and bearings. Keep the remote control unit protected from rain and water.

12.6 HYDRAULIC CYLINDERS.

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

12.7 QUICK COUPLERS.

Be painstaking by keeping the quick couplers clean and apply the dust caps after use.

12.8

12.9

12.12 STORAGE.

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

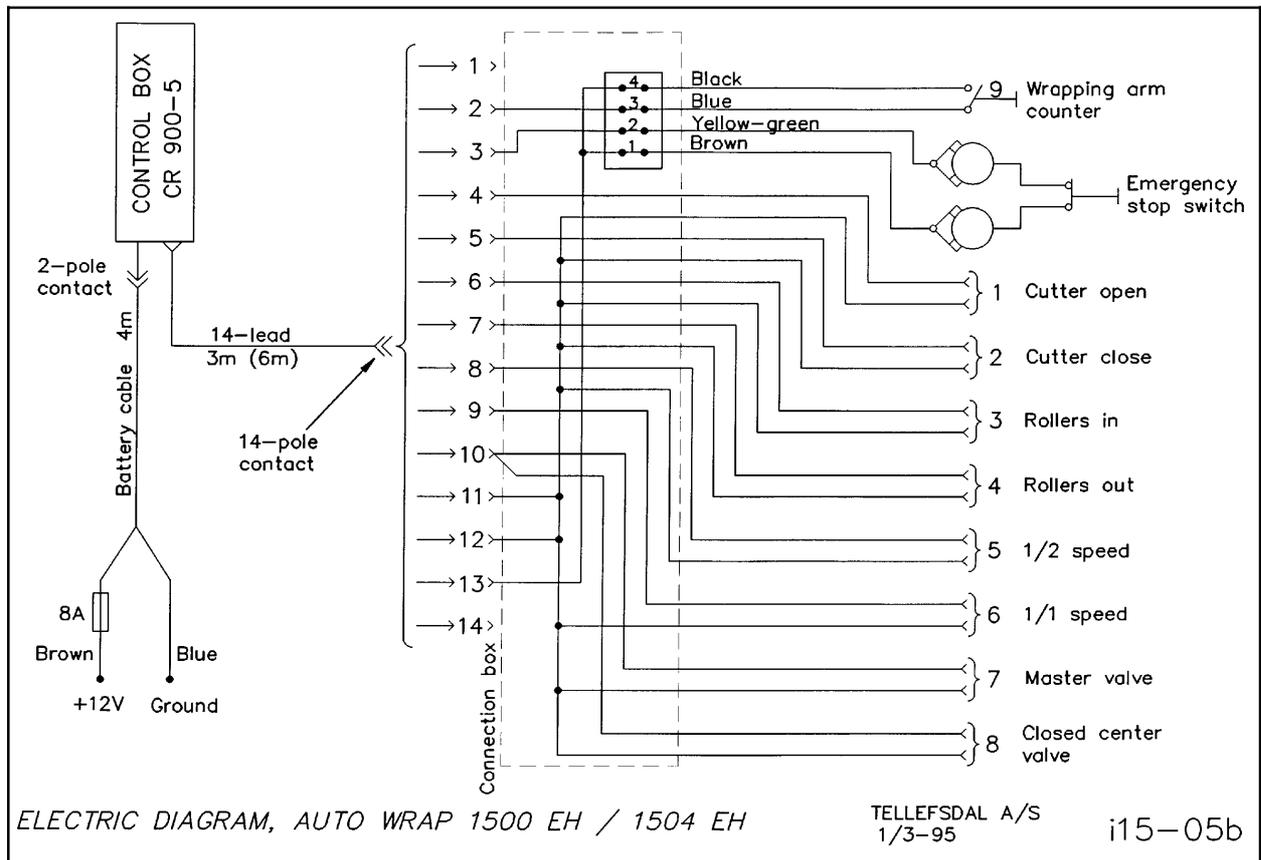


Fig. 13-1

13.0 ELECTRIC CIRCUIT.

13.1 COUPLEFORM.

The electric system consists of a remote control unit with supply line, control cable, (14-lead), with plug in both ends, and distributing lines to the different magnet valves and switches on the machine. (See fig. 13-1).

13.2 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 8A. See chap. 4.8 and 4.11.7 about connection and setting up of the machine.

13.3 DESCRIPTION OF THE SYSTEM.

All functions on the machine are operated from the remote control unit. It is a microprocessor operated, programmable unit that controls the whole wrapping process. When e.g. START is pushed, the wrapping arm motor starts at 1/2 speed. After a preprogrammed time it switches over to full speed. After approx. two revolutions it releases the film end, and switches over to 1/2 speed again before it stops when number of programmed revolutions is obtained. (See also chapter 10.8). 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 1-14.

13.4 DISTRIBUTION OF POWER. (See fig. 13-1).

When operating the machine the following valves shall be supplied with power simultaneously:

- | | | |
|----|-------------------------------|------------------------------|
| 1. | CUTTER opening | Power to No 1, 7 and 8 |
| 2. | CUTTER closing | Power to No 2, 7 and 8 |
| 3. | ROLLERS together | Power to No 3, 7 and 8 |
| 4. | ROLLERS out | Power to No 4, 7 and 8 |
| 5. | WRAPPING ARM 1/2 speed | Power to No 5, 7 and 8 |
| 6. | WRAPPING ARM 1/1 speed | Power to No 5, 6, 7 and 8 |
| 7. | CUTTER opening a little | Power to No 1, 5, 6, 7 and 8 |

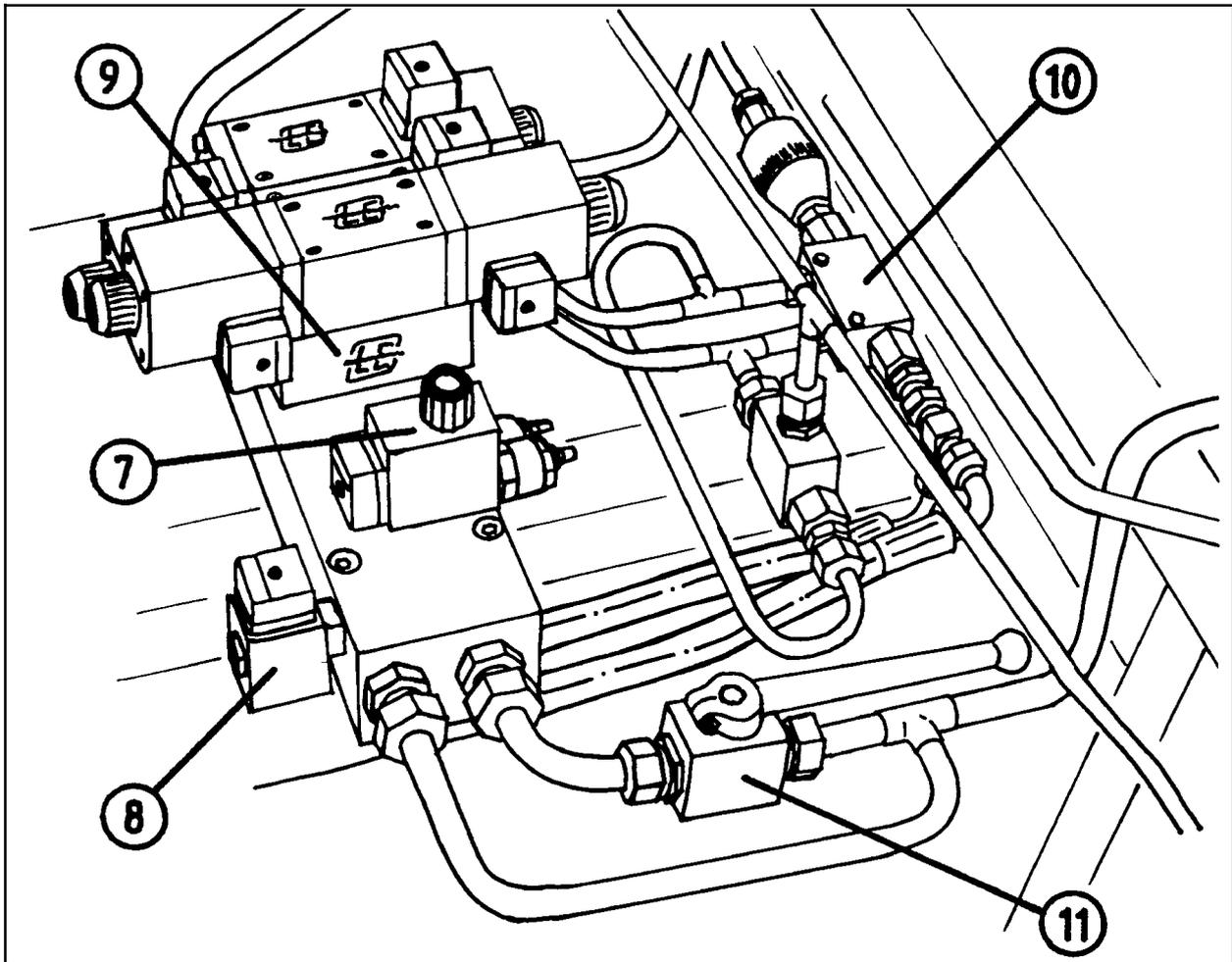


Fig. 14-1

14.0 DESCRIPTION OF HYDRAULICS.

AUTO WRAP 1500 EH / 1504 EH is driven from the hydraulic system of the tractor. The hydraulics of the machine can easily be changed from **"Open Centre"** to **"Closed Centre"** hydraulic system.

14.1 "OPEN CENTRE" HYDRAULIC.

Most tractors have an oil pump which gives a certain quantity per revolution. Then the crane handle, (pos. 10, fig.14-1), has to be set in open position. (See chapter 4.10). If no other function is activated, the oil flows from the tractor, through the main valve block and back to the tank. When one of the functions on the control unit is operated, **THE MASTER VALVE**, (pos. 7, fig. 14-1) closes the oil flow circuit, and simultaneously the valve for the current function is opening.

"CLOSED CENTRE" HYDRAULIC.

For tractors with variable oil pump, like John Deere, the crane handle must be closed. (Pos. 10, fig.4-1) Then the oil can only come into the main valve block by operating one of the functions.

The "closed centre" valve, (pos. 8, fig. 14-1), opens the oil flow into the block, and simultaneously the valve for the current function is opening.

THE MASTER VALVE, (pos. 7), will always close, and the "closed centre" valve, (pos. 8), is automatically opening regardless of which function that is operated.

14.2 THE CUTTER.

To prevent that the oil pressure to the cutter is falling, so that it not holds the film long enough, there is a piloted non-return valve, (pos. 9, fig.14-1), underneath the magnet valve on the main block. (Pos. 1-2, fig. 14-2).

Underneath the above piloted non-return valve, inside the block, there is also a non-return valve that prevents that sudden pressure impulses in the return system can open the piloted non-return valve.

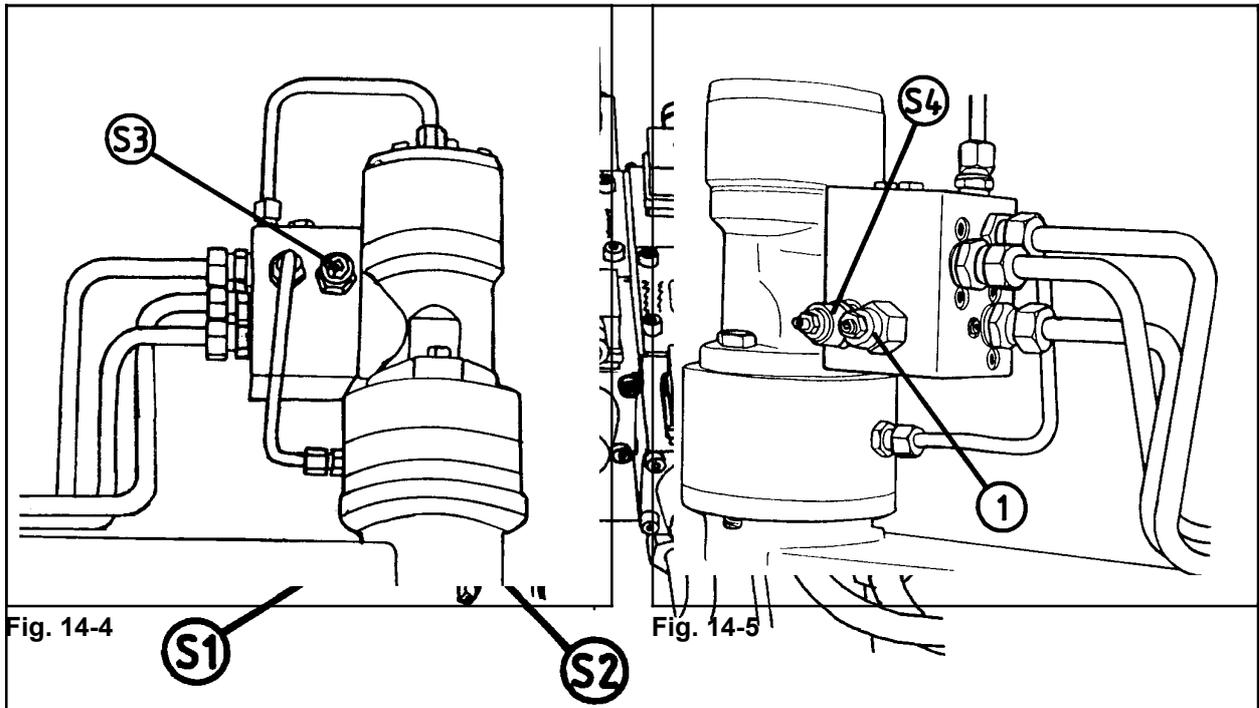


Fig. 14-2

- 14.3** The hydraulic system is equipped with a safety valve, (S1), which is preset to 185 bar. It opens for the oil circuit to tank if max. pressure is exceeded. This valve is attached to the main valve block. See fig. 14-2.
- 14.4** There is also a safety valve, (S2), on the return side in the main block. It works like an "emergency outlet valve", and lets the oil out on the ground if the return line should be blocked up. This valve is preset to 105 bar, and the valve's mission is to prevent that it by an accident can come high pressure into the return side of the wrapping arm motor.

**AUTO WRAP 1500 / 1504 EH
NUMERICAL ORDER OF THE MAGNET VALVES**

The numbers of the magnet valves are identical with the corresponding numbers on the electric leaders.

Valve for CUTTER	= Valve no. 1 - 2
Valve for ROLLERS IN / OUT	= Valve no. 3 - 4
Valve for wrapping arm, 1/2 speed	= Valve no. 5
Valve for wrapping arm, full speed	= Valve no. 6
Master valve	= Valve no. 7
"Closed centre" valve	= Valve no. 8
Piloted non-return valve for CUTTER	= Valve no. 9
Double piloted non-return valve for ROLLERS	= Valve no. 10
Main pressure limit valve	= Valve S1
Safety limit valve	= Valve S2
Power limit valve for wrapping arm	= Valve S3
Stop limit valve for wrapping arm	= Valve S4

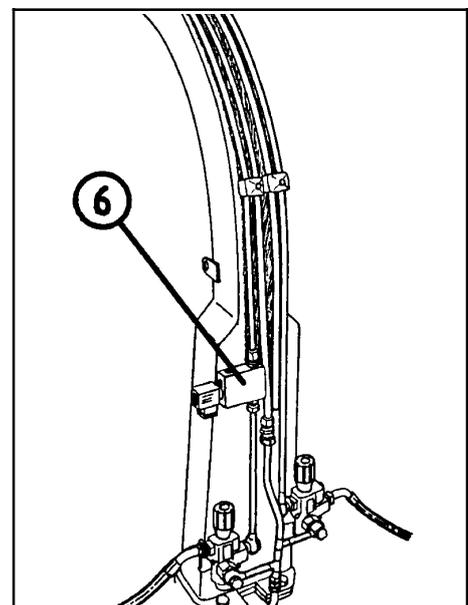


Fig. 14-3

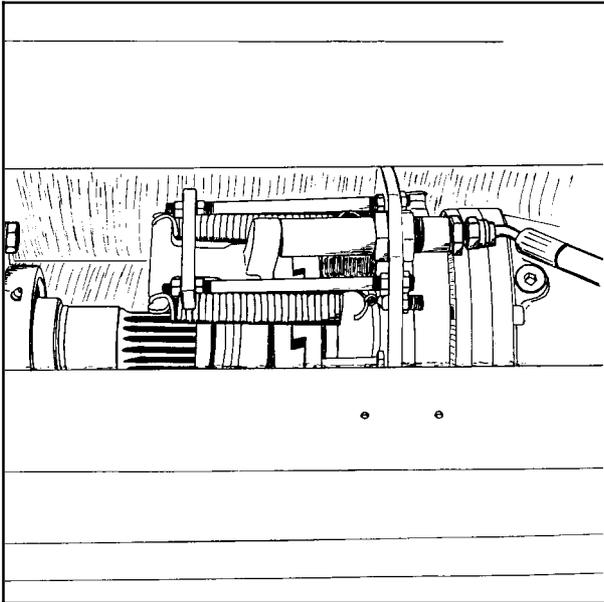


Fig. 14-6

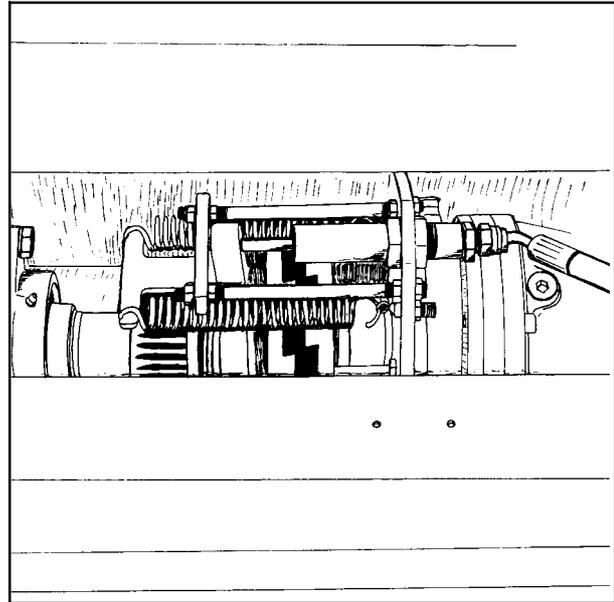


Fig. 14-7

14.5 In order to get a soft conversion between **START** and **STOP** of the wrapping arm, the speed is divided in two steps. (This happens automatically).

At $\frac{1}{2}$ speed the magnet valve, (pos. 5, fig. 14-2), opens for oil to the wrapping arm, but it goes through a nozzle that limits the oil amount.

At full speed also the magnet valve on the tower of the machine, (pos. 6, fig. 14-3), is opening, so that the oil goes outside the nozzle.

14.6 All three oil motors on the machine are serial-connected. At first the oil runs through the wrapping arm motor, then to the control valve for roller-speed, through each of the roller motors and returns to tank.

14.7 WRAPPING ARM VALVE BLOCK.

The wrapping arm valve block is attached to the wrapping arm motor, and includes 4 valves.

When the wrapping arm starts, the oil pressure also goes to the brake so it is released. But we want a little delay here to prevent a too hard stop when the brake goes on. This is obtained by the mounting of a nozzle inside the fitting to the brake.

a) Non return valve.

It shall prevent the oil of going back to the control valve for wrapping arm speed. It is placed inside the block, and can only be reached by removing the whole block from the motor.

b) Safety valve on the minus side. (S3, fig. 14-4).

This valve limits the max. torque of the wrapping arm. The valve lets the additional oil over to the motors' outlet side. It is adjusted so that the pull force on the far end of the arm is approx. 35 KP.

c) Safety valve on the plus side. (S4, fig. 14-5).

This valve shall provide a gradual stop of the wrapping arm and prevent accumulation of pressure on the motor's outlet side when the arm stops. The valve lets the oil flow from the outlet side of the motor to the input side.

d) Holding valve. (Pos. 1, fig. 14-5).

This valve regulates the oil flow on the outlet side to be able to hold a constant input pressure to the wrapping arm motor. This makes the motor go smooth, and the brake is not activated even if the wrapping arm rotates easy "downwards". (If the machine is in an oblique position while wrapping).

14.8 FREE COUPLING.

Both roller motor casings contain a hydraulic free drive coupling. (Fig.14-6). At the standard **AUTO WRAP 1500** are both roller motors disengaged when the rollers are moved **IN** or **OUT**, to let the rollers rotate freely.

On the **AUTO WRAP 1504** are the left rollers rotating while loading the bale, (see chap. 15.4), and thereby is only one of the roller motors disengaged when the rollers are moved **IN**. When the rollers are moved **OUT**, both rollers disengaged on both types of machines.

The free run of the rollers continues as long as the control button is held down. When leaving the button the roller motors are re-engaged.

15.0 AUTO WRAP 1504 EH. DESCRIPTION OF HYDRAULIC. (See fig. 15-1. Pos. no. = chapter no.)

15.1 CHOKE / NON-RETURN VALVE.

This valve shall control the speed of the **ROLLERS OUT**-function, and make sure that there is enough pressure in the system to activate the free coupling cylinders.

15.2 DOUBLE PILOTED NON-RETURN VALVE.

This valve shall make sure that the right roller motor does not rotate while loading the bale, (ROLLERS IN), and that the left motor rotates.

15.3 SHUTTLE VALVE, VS-06.

This one shall make sure that the roller motors get enough oil while wrapping and while loading the bale. The oil to the motors can come from two places, and the shuttle valve always closing one of the two, so that the oil does not go the easiest way back to the oiltank.

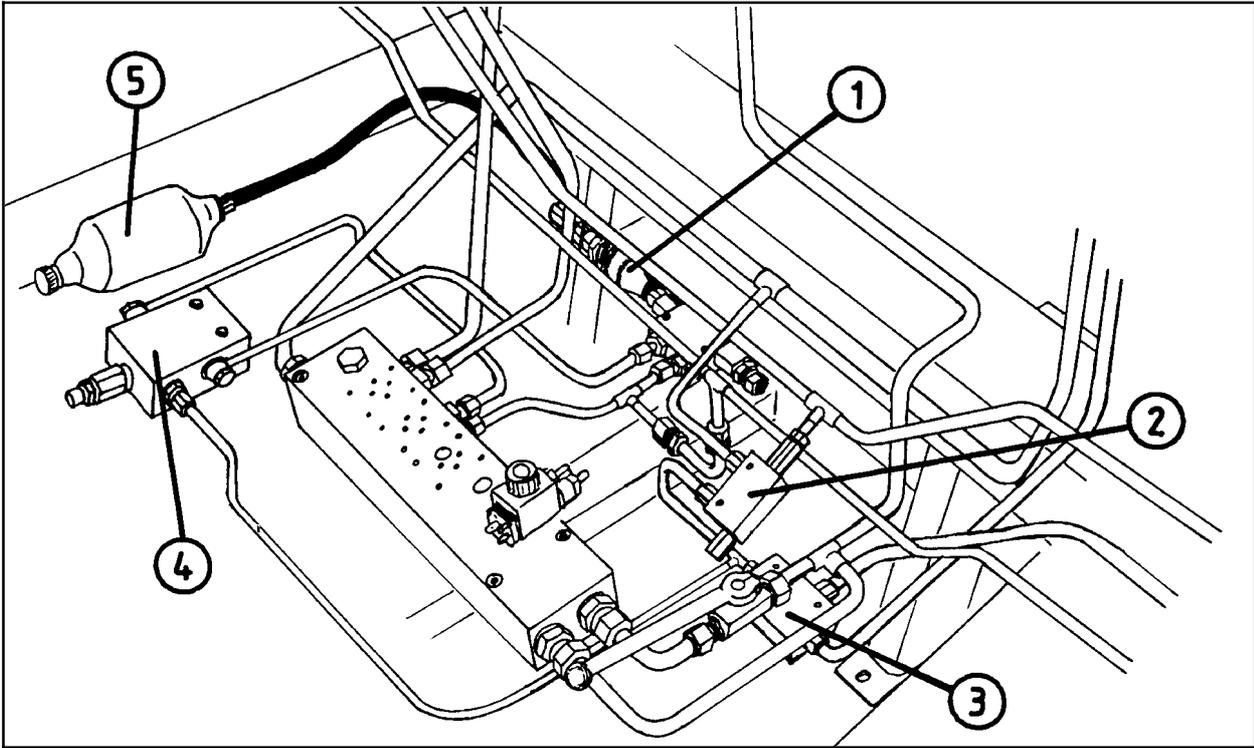


Fig. 15-1

15.4 SQUEEZE VALVE.

This is a sequence valve that changes between the width cylinders and the roller motor while loading the bale. When the oil pressure to the width cylinders is approx. 100 bar, the valve changes the oil pressure over to the left roller motor.

When the pressure to the width cylinders falls again, the valve changes back and the cylinders start to squeeze again. This repeats until the bale is loaded up.
(Adjustment of the squeeze valve, see chap. 10.3).

15.5 ACCUMULATOR, H 350 R.

It accumulates possible oil-pressure shocks while loading. It makes it so that the distance between the rollers can increase when the rollers are going around the corners of the bale while loading.

**15.6 BALE-ROTATION STOP.
(Extra equipment).**

Cartridge valve, 12C 1-S. (See fig. 15-2).

If the bales to be wrapped are very rectangular, it can be mounted an extra valve that stops the rotation of the rollers while wrapping.

It is electric served. You push a button/switch inside the tractor cabin while wrapping, and the oil flow opens to the tank after it has passed the wrapping arm motor, and the rollers stop.

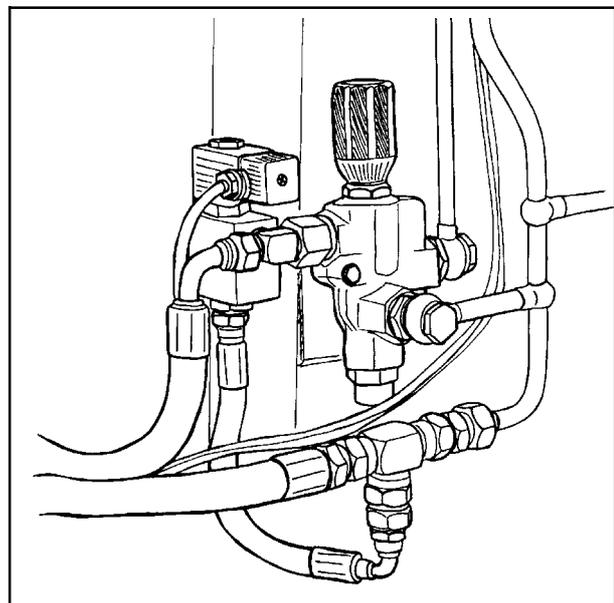


Fig. 15-2

16.0 CHECK POINTS BEFORE TROUBLE SHOOTING.

In this chapter we have some general check points that have to be examined first if something is wrong with the machine. In chapter 17.0 we have a more detailed trouble shooting.

There are three basic assumptions that have to be fulfilled if the machine shall 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.

16.1 OIL PRESSURE.

In order to control that the oil pressure into the machine is high enough, there has to be applied a gauge 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 AMOUNT.

The oil amount that the tractor delivers must be **minimum 15 liters/minute**, but it is recommended that it is 25 liters/minute. (Max. allowed oil amount is 40 liters/minute).

REMEMBER! Large oil amount = Valves get hot. (Small oiltank = insufficient cooling).

16.2 COUNTER PRESSURE.

The counter pressure can be too high. With high counter pressure the machine's functions will get less power. High counter pressure means also that you need more power to operate the valves.

MAX. ALLOWED COUNTER PRESSURE IS 10 BAR.

If you are in doubt about the counter pressure, arrange a "free return" directly to the tank.

If the counter pressure goes over 105 bar, the emergency outlet valve, (S2), will open and let the oil out on the ground through the outlet tube. (See chapter 14.4).

16.3 ELECTRIC POWER.

It is important to check that all function gets enough electric power. If not, some, or all functions may fall out.

Is the battery voltage high enough?

The control unit's display will show **LO BAT** if the voltage is too low.

If the voltage falls below 9 volts, the control unit will comprehend it as broken power supply, and all functions will stop.

Are the cables correctly connected to the battery?

Follow directions in chapter 4.8 and 13.0.

Is the connection between battery cable and control unit OK?

Clean off the poles and check that the plug comes correct in place.

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?

In addition to the fuse on the battery cable, there is a fuse inside the remote control. This is 10A, and secures the current to the magnet valves.

PLEASE CONTACT YOUR DEALER IF YOU ARE IN DOUBT OF ANYTHING.

(Remember always to give your dealer the serial number and productionyear of your machine when contacting dealer and when ordering spare parts).

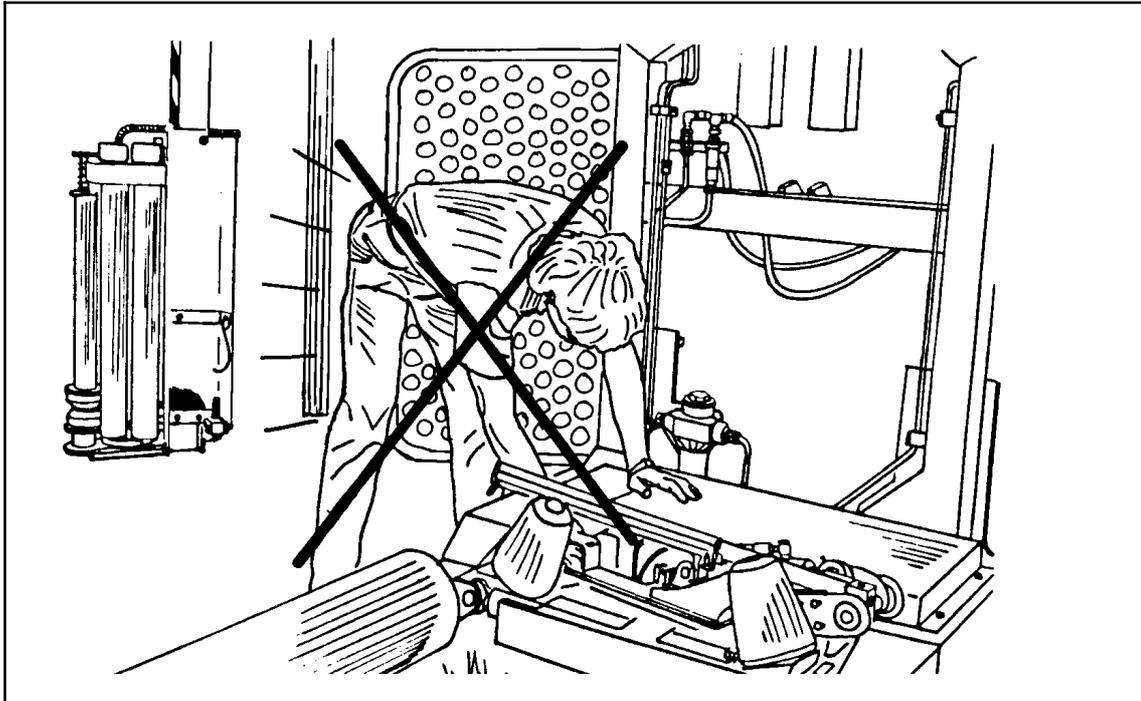


Fig. 16-1 **BEWARE OF MOVING PARTS WHEN TESTING THE MACHINE.**

16.4

PROCEDURE OF TROUBLE SHOOTING.

16.4.1 MAGNET VALVES.

When you shall check if the magnet valves get 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 magnet valve gets electric power. Another way is to hold a screwdriver o.e. up to the magnet. If it "sticks", the solenoid gets 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 magnet valve usually works with a little lower voltage.

NB! Normally, repairs of magnet valves shall not be done by the dealers, but turned over to the manufacturer of the machine. This has to be agreed upon between the manufacturer and the importer.

16.4.2 Only for magnet valves to the main functions. (Pos. 1-5, fig. 14-2).

If the electric supply is in order and one of the functions falls out, the reason can be a mote that tights or prevents the sliding shaft to open and/or close.

Try to manoeuvre 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 mote has been pushed out in the oil system and the machine can be operated normally again.

16.4.3 MASTER VALVE.

To get anything to work, the master valve, (pos. 7, fig. 14-1), must have electric power. If there is no power supply to this valve, the oil goes straight back to the tank, and nothing happens.

(For tractors with closed centre hydraulic, the "closed centre" valve, (pos. 8, fig. 14-1), always have electric power). (See also chapter 14.1 and 16.4.1).

16.4.4 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. This is shown on the control-units' display by three points lighting up. (See chapter 7.10). When the emergency stop* is activated, there shall be measured 4 volts over the emergency stop*-switch.

17.0 TROUBLE SHOOTING.

In this chapter we assume that the descriptions in chapter 16.0 are controlled and in order.

17.1 THE MACHINE DOES NOT FUNCTION.

- a) Even if the gauge shows enough pressure there is no reaction in the machine. The reason could be that one, (or both), of the quick-couplers does not open for the oil.
Change quick couplers.
- b) The counter pressure could be too high.
Max. allowed counter pressure is 10 bar. (See chapter 16.2).
- c) Make sure that the crane handle is turned into correct position. (See chapter 4.10).

(Disturbances of this type, a, b or c, are most likely in the first days that the machine is in use).

17.2 CUTTER, WRAPPING ARM OR ROLLERS WIDTH DOES NOT FUNCTION.

Each of the main functions, wrapping arm, cutter and rollers width has a separate magnet valve. If one of these functions falls out, and the electric supply is in order, the reason can be a mote that tights or prevents the sliding shaft to open and/or close. (See chapter 16.4.2).

17.3 THE CUTTER WILL NOT HOLD THE FILM.

The pressure is falling and the springs start to lift the cutter. (See chapter 14.2).

17.4 THE WRAPPING ARM WILL NOT ROTATE.

- a) The bolt that secures the wrapping arm during transport has to be removed so that the wrapping arm can move free.
- b) The safety valve, (S3, fig. 14-4), can be leak, so that the oil is passing by the wrapping arm motor. Dismantle and try out if the sliding shaft can move freely.
- c) The wrapping arm valve, (pos. 5, fig. 14-2), is not working because of lack of electric power or a mote inside the block. **See chapter 16.4.1. Clean it up or change the valve.**
- d) The control valve, (fig. 8-1), can be blocked. Dismantle and try out if the valve works normally. **Do not use sharp tools.**
- e) Check if the oil motor is working.
Ask your dealer for advice BEFORE you make the problems bigger and repairing more difficult.
- f) If the emergency stop* has been activated, the machine can be started again in two ways:
 - 1) If **START** is pushed, the wrapping will continue from that point in the program where the emergency stop* was activated.
 - 2) If **STOP** is pushed before **START**, the wrapping sequence will be reset, and the sequence starts from the beginning again. (See also chapter 5.6 and 7.10).

Some possible trouble with the emergency stop*:

- 1. **Bad contact of the skidding rings.**
Rub it carefully with fine rubbing paper.
- 2. **The release hoop is out of position.**
Defect return spring or fragments in the fastening bracket.
- 3. **The switch is defect.**
Replace.

17.5 THE ROLLERS WIDTH DOES NOT WORK.

a) **Does the magnet valve enough electric power?**

With many power consumers at the same time, the voltage can fall so much that all functions, or only the width-function does not work.

b) **Check the master valve. (Pos. 7, fig. 14-1).**

If it gets enough electric power and closes the oil flow, the failure has to be found in the magnet valve for rollers width. (See chapter 16.4.1).

17.6 THE ROLLERS ARE MOVING APART WHEN NORMALLY LOADED.

The fault is probably to be found in the double piloted non-return valve, (pos. 10, fig.14-1). Replace the valve or let the dealer test it.

17.7 THE WRAPPING ARM IS ROTATING, BUT THE ROLLERS ARE NOT.

Check first that the flow control valve for rollers is not closed. (Fig. 9-1).

17.8 THE CUTTER DOES NOT LEAVE THE FILM WHEN THE MACHINE IS TESTED WITHOUT LOAD.

The reason for this is that when the cutter is closed with maximum pressure it might be difficult to obtain sufficient pressure to open the piloted non-return valve, (pos. 9, fig.14-2), if the machine is empty, i.e. wrapping arm and rollers unloaded.

This will not happen while wrapping with a bale on the machine. If this should occur when testing without a bale, it can be avoided by not having the cutter closed with full pressure. Give a short push on control no. 5, **CUTTER up**, enough to release some of the pressure.

17.9 ONLY FOR AUTO WRAP 1504 EH.

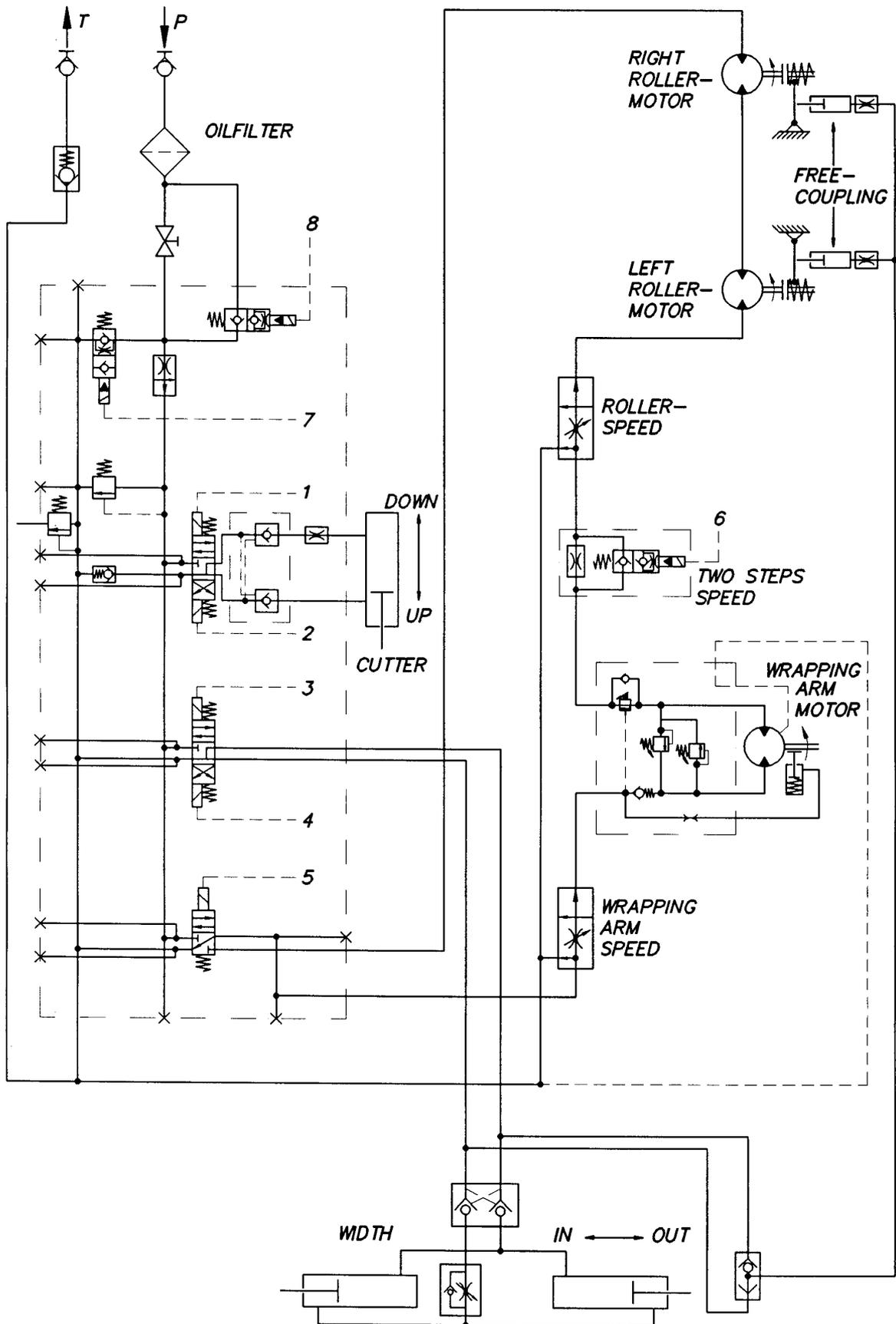
a) **Power at only one of the rollers while wrapping.**

The reason to this might be that the piloted non-return valve, (pos. 2, fig. 15-1), does not close. Replace it with a new one.

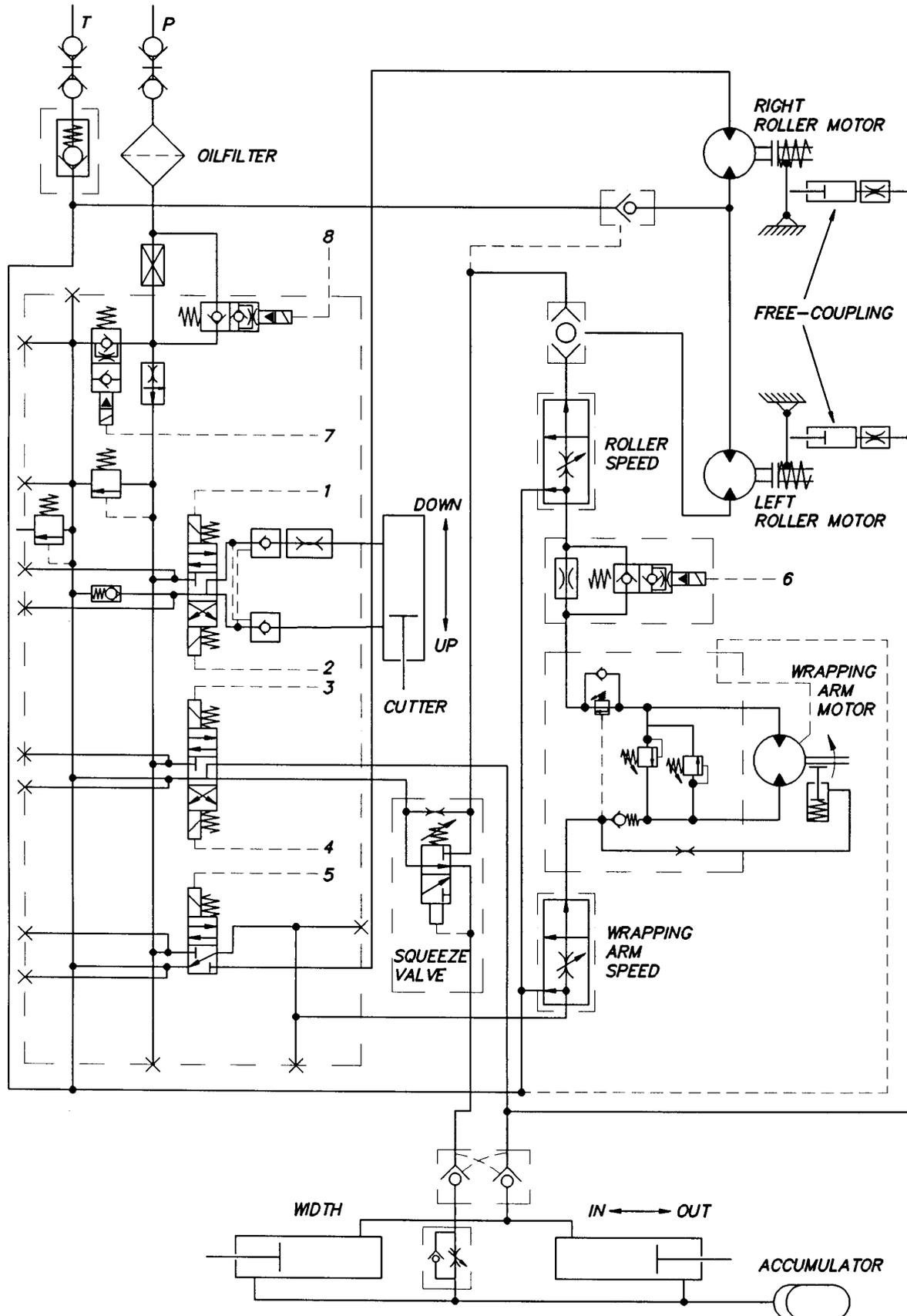
b) **Power at both rollers while loading the bale.**

The piloted non-return valve, (pos. 2, fig. 15-1), does not open. Replace.

HYDRAULIC CHART, NORSE AUTO WRAP 1500 EH



HYDRAULIC CHART, NORSE AUTO WRAP 1504 EH



19.0 WARRANTY TERMS.

19.1 TELLEFSDAL A.S. warrants the NORSE AUTO WRAP 1500 / 1504 EH bale wrapping machines for 12 full months from the date of purchase.

19.2 During the warranty period TELLEFSDAL A.S will repair, replace or test any parts proved to be defective in material or construction.

19.3 Before comprehensive warranty services are done, the warranty claim has to be agreed upon with TELLEFSDAL A.S.

By approval of warranty claims TELLEFSDAL A.S covers all repair costs.

Freight costs and all personal travel costs are normally the responsibility of the dealer.

Before repairing the machine locally the terms of compensation have to be agreed upon between the buyer and the manufacturer.

Compensation for defective parts corresponds to the current spare parts price-list, minus normal discount.

If the warranty claim should be rejected, TELLEFSDAL A.S is not responsible for expenses incurred.

19.4 All claims **must be presented in written form**, on a fixed NOTICE OF CLAIM, and enclosed a copy of the warranty card, properly filled in. Guarantee claimed parts also have to be enclosed. All return shall be agreed upon before sending, and marked with serial number on the machine and the name and address of the dealer. Freight costs for returned parts have to be paid by the buyer.

19.5 The NORSE warrantee is **NOT** valid if:

- A) The warrantee card has not been filled out and a copy is not enclosed with the claim.
- B) The user's manual and safety instructions have not been followed.
- C) The machine has been misused, abused or carelessly operated.
- D) The machine is modified by welding or by attachments of not original parts and pieces. It has been serviced by persons, who are unauthorized by Tellefsdal A.S.
- E) The machine is re-programmed to contribute more than what is programmed at the factory. (Max. 27 rpm).

19.6 TELLEFSDAL A.S IS NOT responsible for lost working time or lost revenue that has resulted because of a defect in the machine.

19.7 The buyer can not claim a cancellation the purchase, a price-reduction or any other claims, if TELLEFSDAL A.S, within reasonable time, repairs the machine.

19.8 The buyer is granted credit on warranty claims AFTER approval from TELLEFSDAL A.S. Deductions of credits on current invoices is not accepted without prior agreement.

WARRANTY CARD NORSE AUTO WRAP

Serial number of machine: _____ Type: _____

Serial number of control unit: _____

Production year: _____

Purchase date: _____

WE HAVE READ AND ACCEPT THE CURRENT WARRANTY TERMS.

Importer: _____
Date Firm Signature

Dealer: _____
Date Firm Signature

Customer: _____
Name Address

Signature

HAVE YOU GOT ENOUGH TRAINING ABOUT
THE MACHINE FROM YOUR DEALER?

YES

NO