

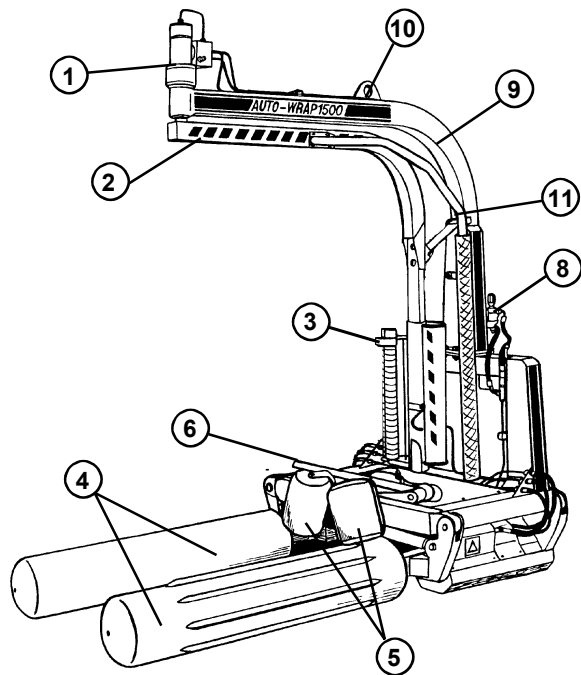
USER'S MANUAL

AUTO WRAP 1510 / 1514 / TWIN

| CHAP. | CONTENTS | PAGE |
|-------|--------------------------------------|------|
| 1.0 | INTRODUCTION | 3 |
| 2.0 | SAFETY PRECAUTIONS | 4 |
| 3.0 | GENERAL INFORMATION ON BALE WRAPPING | 10 |
| 4.0 | SETTING UP / MOUNTING OF THE MACHINE | 12 |
| 5.0 | EMERGENCY STOP* | 19 |
| 6.0 | MOUNTING OF PLASTIC FILM | 20 |
| 7.0 | CONTROL BOX | 21 |
| 8.0 | SPEED SETTING OF THE WRAPPING ARM | 25 |
| 9.0 | ADJUSTING THE OVERLAP | 26 |
| 10.0 | OPERATION INSTRUCTION | 27 |
| 11.0 | OPERATION INSTRUCTION TWIN | 31 |
| 12.0 | PERIODIC MAINTENANCE | 32 |
| 13.0 | ELECTRIC CIRCUIT | 34 |
| 14.0 | DESCRIPTION OF HYDRAULICS | 36 |
| 15.0 | CHECK POINTS BEFORE TROUBLE SHOOTING | 44 |
| 16.0 | PROCEDURE OF TROUBLE SHOOTING | 45 |
| 17.0 | TROUBLE SHOOTING SHEET | 46 |
| 18.0 | HYDRAULIC CHART | 50 |
| 19.0 | WARRANTY TERMS | 51 |

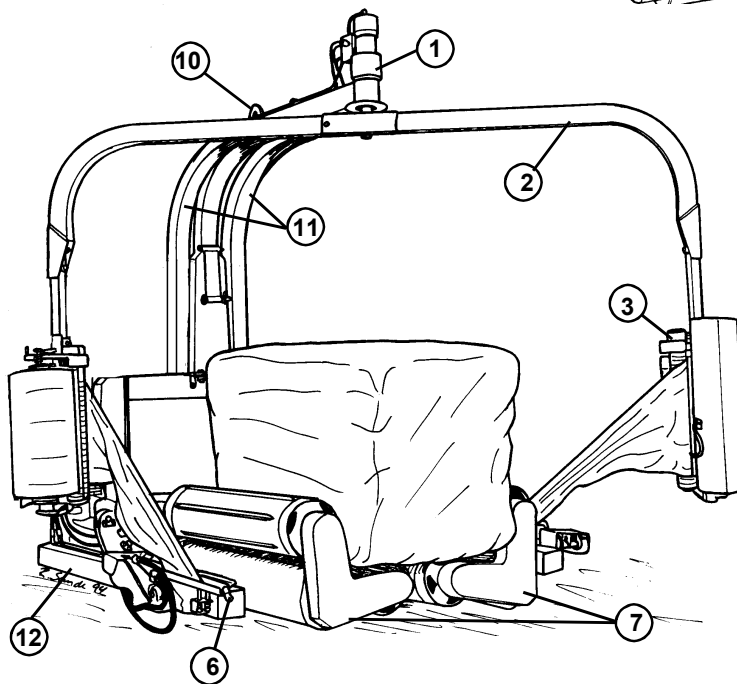
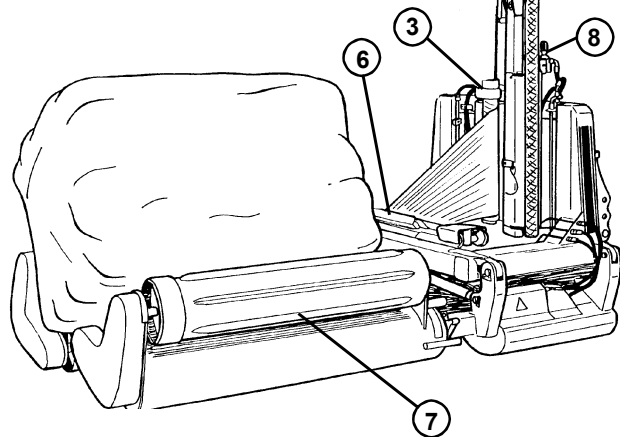
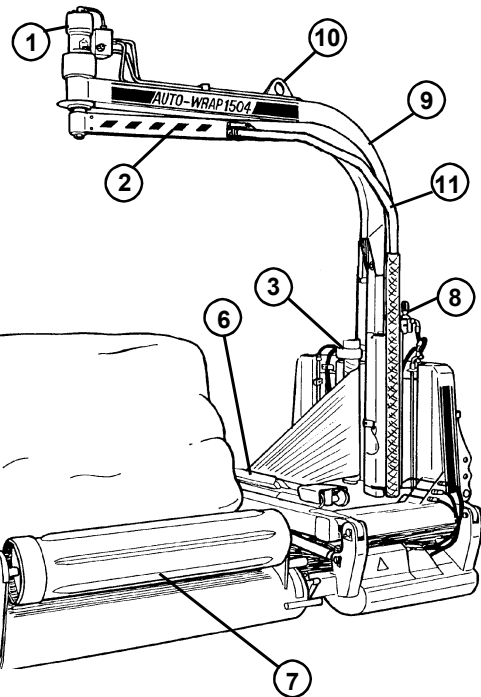
AUTO WRAP 1510 / 1514 / TWIN

Bale wrapping machines



1. Motor for sveivarm
2. Sveivarm
3. Forstrekker
4. Bæreruller
5. Støtteruller
6. Kniv
7. Spes.ruller for firkantballe (1514)
8. Hastighetskontroll
9. Tårn
10. Løftebøyle
11. Sikkerhetsbøyle
12. Knivramme (TWIN)

1. Wrapping arm motor
2. Wrapping arm
3. Prestretcher
4. Rollers
5. Support rollers
6. Cutter
7. Special rollers for square bales
8. Speed control
9. Stationary arm
10. Lifting clamp
11. Safety arm
12. Cutter housing (TWIN)



1. Wickelarm-Motor
2. Wickelarm
3. Vorspanner
4. Tragwalzen
5. Stützrollen
6. Messer
7. Tragwalzen für Vierkantballen
8. Geschwindigkeitskontrolle
9. Turm
10. Hebeöse
11. Notstopbügel
12. Messerrahmen (TWIN)

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 1510 is designed to wrap bales of grass, hey or straw, with nominal diameter of 4-6 ft. (120 -180 cm), and weights up to lbs. (1500kg).

The AUTO WRAP 1514 is essentially the same machine as the AUTO WRAP 1510, but with a patented special mounting for the rollers so that square bales can be wrapped. The AW 1514 can wrap both square and rectangular bales, from 60 x 60 to 120 x 120 x 150 cm. It can take bales of up to 1,200 kg. It can also wrap round bales of up to \varnothing 1200 mm.

Both the AW 1510 and 1514 can also be supplied as TWIN models, i.e. the machines are equipped with two film stretching units and two cutters. This gives the machines a significantly increased capacity.

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.

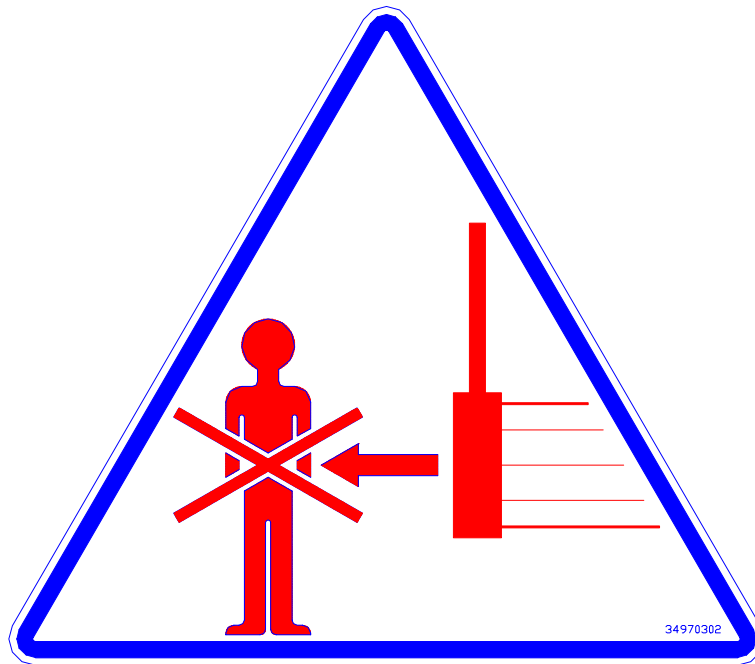
Read carefully through this manual, and specially chapter 2.0, safety instructions, before starting the machine, and follow the instructions thoroughly. If problems should occur, check with chapter 17.0, and try to find out what is wrong. Ask your dealer for advice before you make the problem worse than it is. See also chapter 19.0, conditions of warranty.

| AUTO WRAP | 1510 | 1514 | 1510 / 1514 TWIN |
|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Height in working position | 2820 mm (9'3") | 2960 mm (116") | 2960 mm(116") |
| Width, min. / max. | 1520 / 3000 mm (5' / 10') | 1520 / 3000 mm (5' / 10') | 2440 / 3215 mm |
| Length, min. / max. | 2450 / 3000 mm (8' / 10') | 2450 / 3000 mm (8' / 10') | 2540 / 3425 mm |
| Weight | 780 kg (1720 lbs) | 780 kg (1720 lbs) | 950 / 1100 kg |
| Wrapping arm speed, recom. | 22 rev. per minute | 22 rev. per minute | 22 rev. per minute |
| Wrapping arm speed, max. | 27 rev. per minute | 27 rev. per minute | 27 rev. per minute |
| Bale size, max. | \varnothing 1800 mm (6') | \varnothing 1800 mm (6') | Same as std. maskin |
| Bale weight, max. | 1500 kg (3300 lbs) | 1200 kg (2650 lbs) | Same as std. maskin |
| Capacity | Approx. 25 bales per hour | Approx. 25 bales per hour | Approx. 40 bales per hour |
| Prestretcher | 500 / 750 mm (20" / 30") | 500 / 750 mm (20" / 30") | 500 mm (20") |
| Hydraulic connection | 1 single work. +free return | 1 single work. +free return | 1 single work. +free return |
| Oil pressure / amount, min. | 180 bar / 25 litres/minute | 180 bar / 25 litres/minute | 180 bar / 25 litres/minute |
| Oil amount, max. | 60 litres per minute | 60 litres per minute | 60 litres per minute |
| Counter pressure, max. | 10 bar | 10 bar | 10 bar |
| Electric connection | 12 V DC | 12 V DC | 12 V DC |

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Reservation is made for possible printing errors.



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).



The Auto Wrap 1510 / 1514 / TWIN models are equipped with an "EMERGENCY STOP" on the wrapping arm. This device stops all functions instantly, but is by definition not an emergency stop, because it does not interrupt the feed. Nevertheless it has an equivalent function, so we have decided to call it an EMERGENCY STOP in this book.

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.**

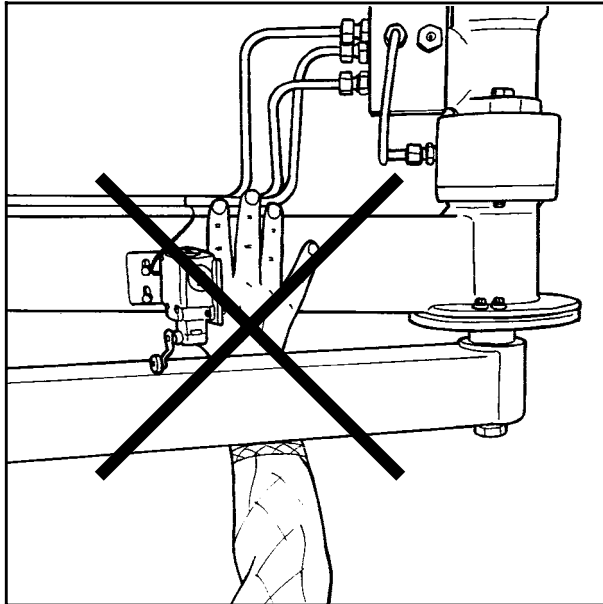


Fig. 2-2

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.



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).

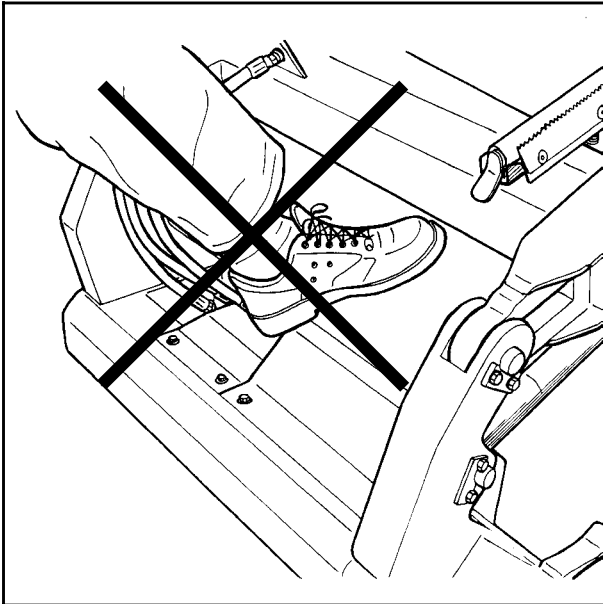


Fig. 2-3

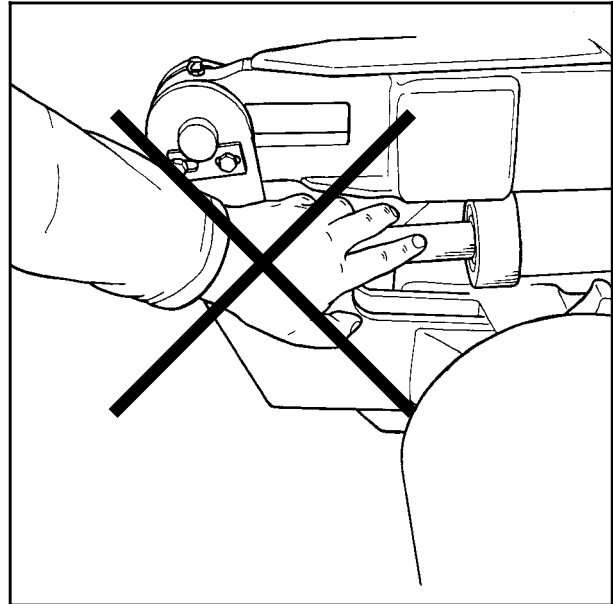


Fig. 2-4



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.

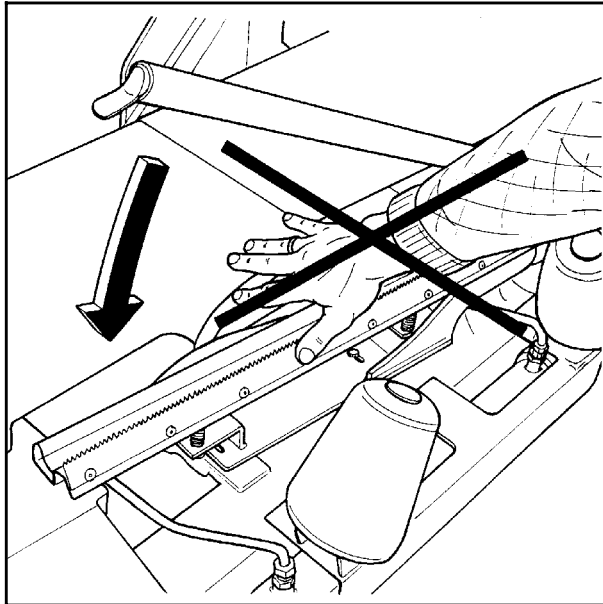


Fig. 2-5

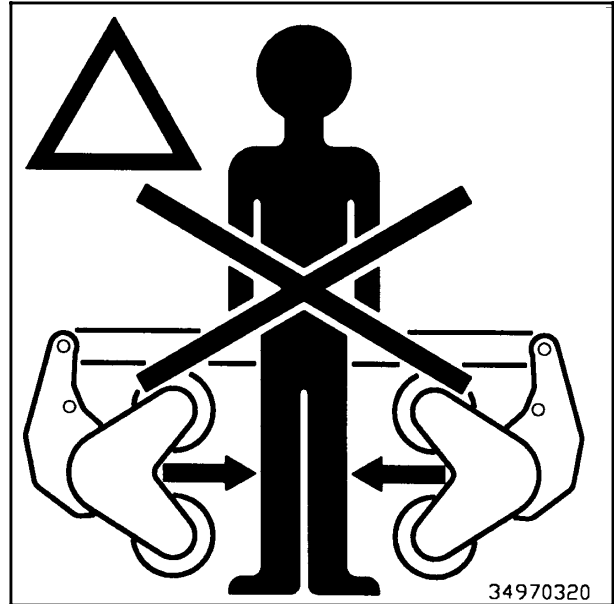


Fig. 2-6



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 1514 / TWIN.

When the rollers on the 1514 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. 2-6).

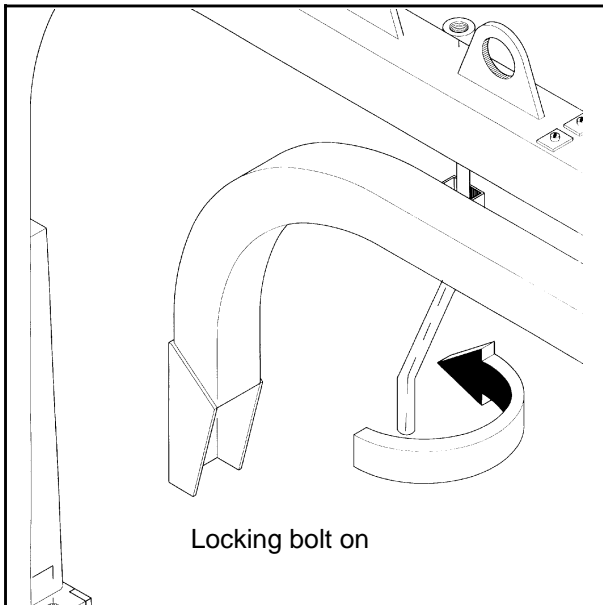


Fig. 2-7a

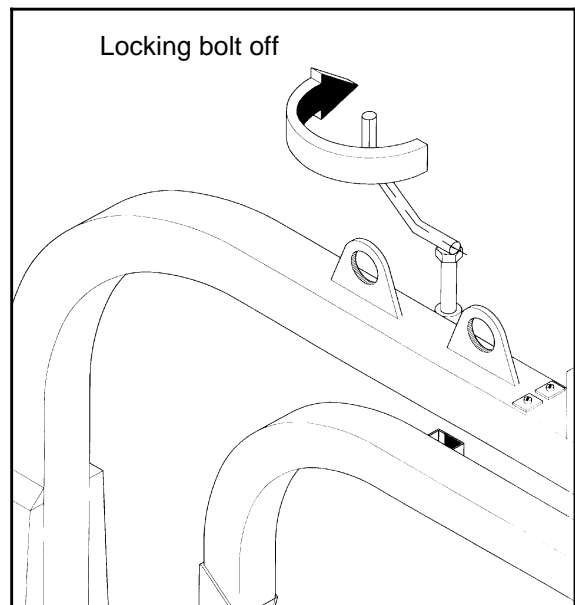


Fig. 2-7b

2.6 LOCKING THE WRAPPING ARM.

When the machine is not in use, make sure the locking bolt for the wrapping arm is mounted. If the bolt is not mounted, the wrapping arm and/or the machine could be damaged during transport. (See fig. 2-7). For TWIN machines, see also section 2.10.

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.



Connecting heavy working implements often has an overall negative effect on the tractor's driving and braking capacity.



2.9 TRANSPORTING.

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

1. Move the wrapping arm in under the davit in the transport position by pressing "STOP"(9) and keeping it pressed in.
2. For locking and disengaging the wrapping arm during transportation, ensure that the locking bolt for the wrapping arm is fitted. (See section 2.6 and fig. 2-7.)
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.

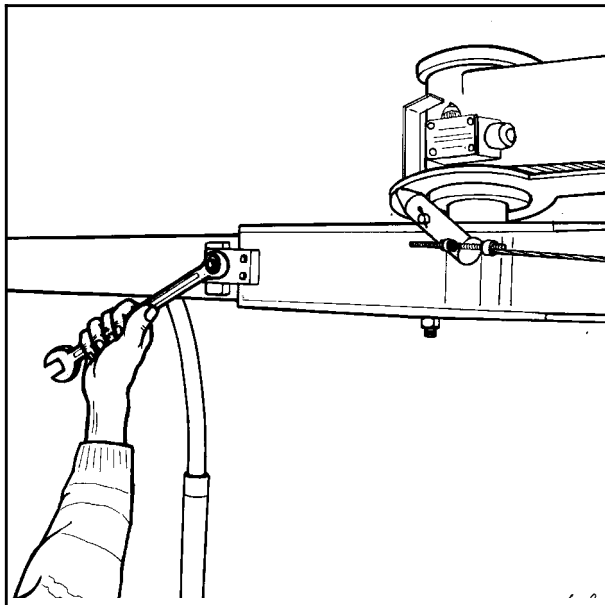


Fig. 2-8

2.10 SPECIAL INSTRUCTIONS FOR AUTO WRAP 1510 / 1514 TWIN

These machines must be prepared for transport in a slightly different way:

1. Move the main wrapping arm in under the davit in the transport position by pressing **"STOP" (9)** and keeping it pressed in.
2. For locking and disengaging the wrapping arm during transportation, ensure that the locking bolt for the wrapping arm is fitted. (See section 2.6 and fig. 2-7.)
3. Loosen the fixing screws for the locking plate which secures the second wrapping arm in the working position. Then swing the arm in towards the davit. (See fig. 2.8.)
4. To reduce the transport width of the TWIN machines, at the same time preventing the secondary arm from accidentally swinging out to the side during transportation (see fig. 2.9), each cutting beam is put in the transport position by holding the beam by the edge and lifting it upwards and inwards by hand. Using a special grooved slot at the back end of the mounting point, the cutting beam locks automatically in the raised transport position when the beam is dropped to its lower position once more at the back. (See fig. 2.10.) (See also sections 3 to 8 for the standard machines)

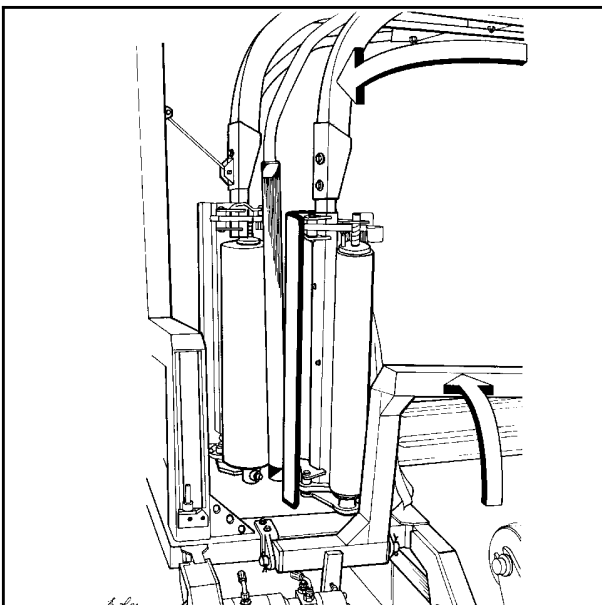


Fig. 2-9

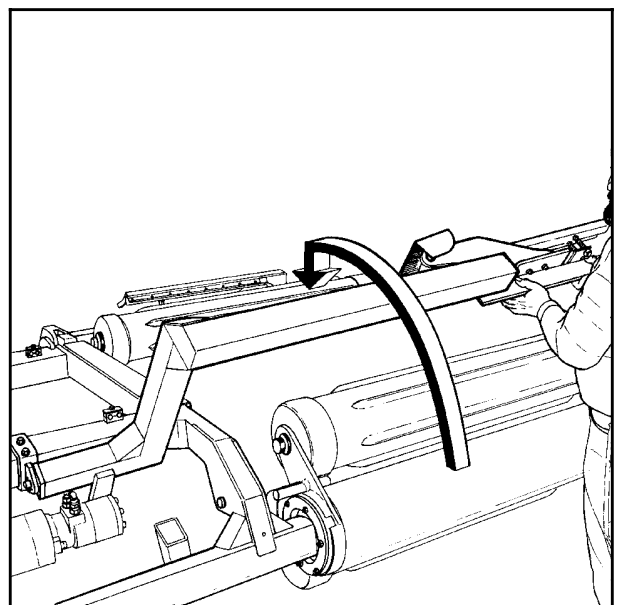


Fig. 2-10

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 Lantbruket" [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.

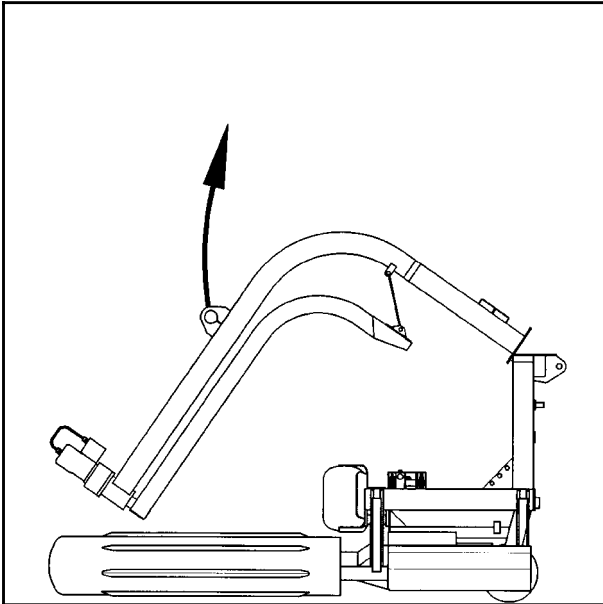


Fig. 4-1

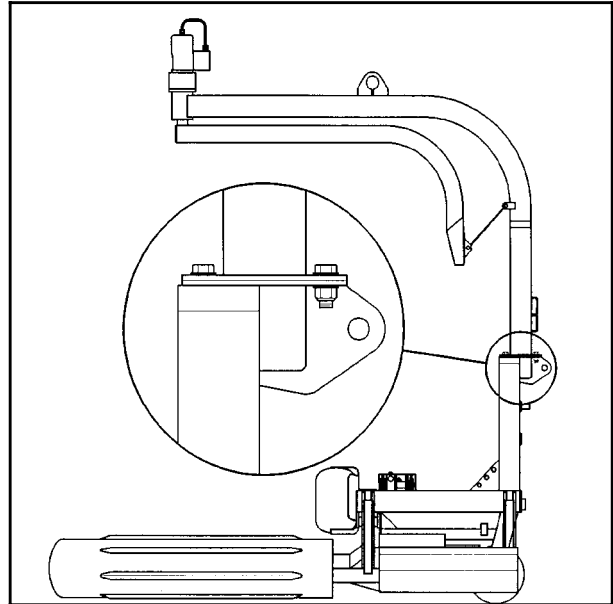


Fig. 4-2

4.0 SETTING UP / MOUNTING OF THE MACHINE.



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. See section 2 on safety regulations and pay attention to the various safety decals displayed on different parts of the bale wrapper.

4.1 HINGED TOWER.

Because of the freighting of the machine, AUTO WRAP 1500 / 1514 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.

Securing the davit on TWIN machines is slightly more complicated because of the bracing clamps which have to be fitted on each side of the davit. Fit the lower fixing screws for the clamps (8 screws size 12 x 140).

SCREW IN SECURELY and after several hours' use tighten all the screws once again.

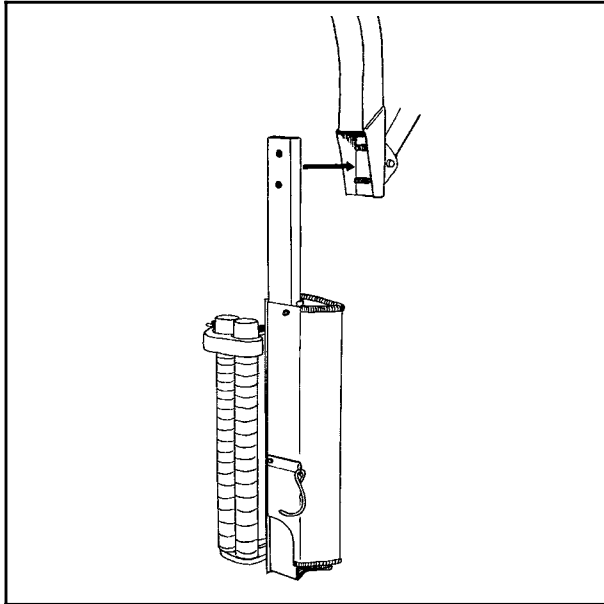


Fig. 4-4

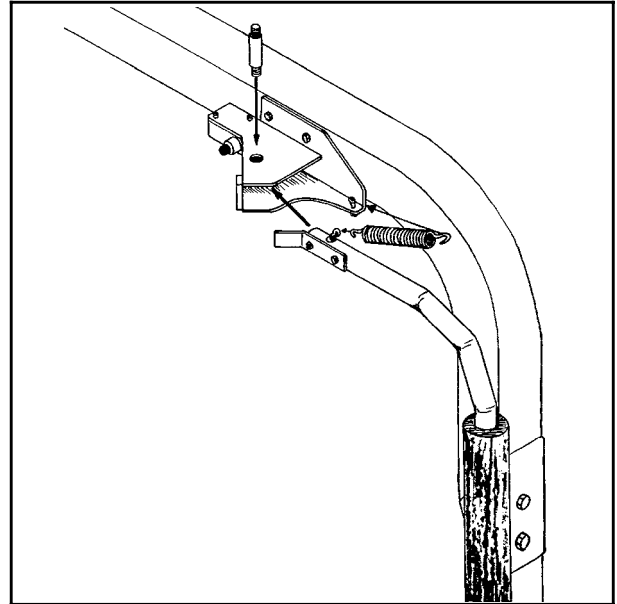


Fig. 4-5

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. The same procedure is followed for fitting the brace on TWIN machines.

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).

TWIN machines have emergency stop arms on each brace and are fitted in the same way as they are on standard machines.

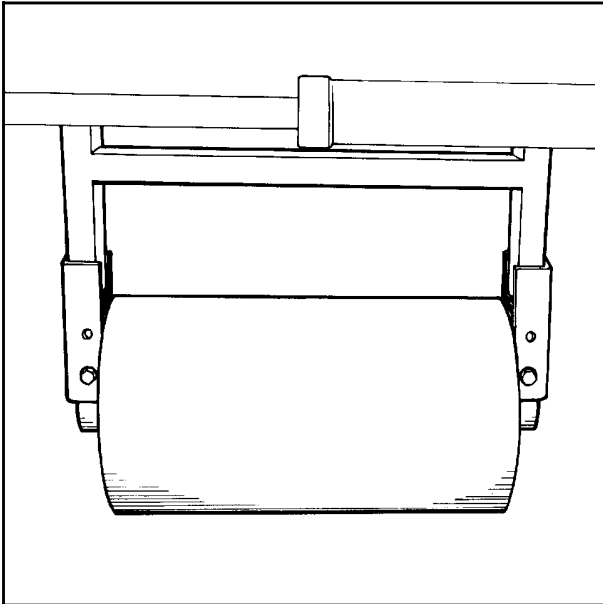


Fig. 4-6

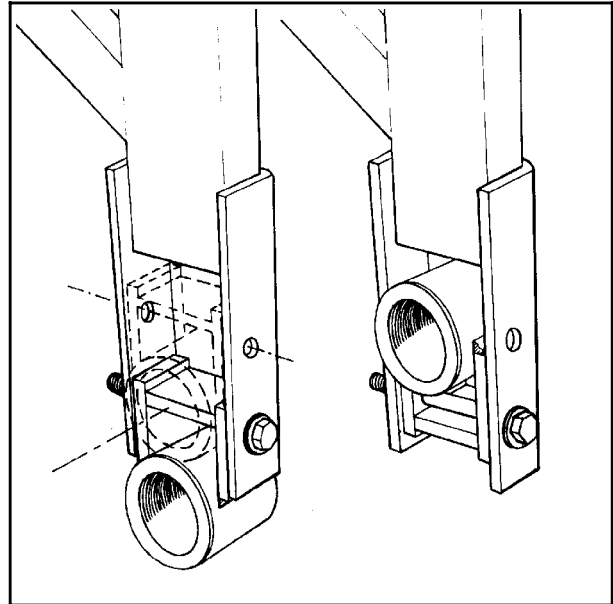


Fig. 4-7

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 2 pcs. M12 x 120 bolts, washers and lock nuts. (See fig. 4-6).

The off-loading roller can be fitted at three different heights. On the Auto Wrap 1510 it is fitted at the top position as illustrated on the right in fig. 4-7. (The locating bracket must be turned 180E)
 On the Auto Wrap 1514 it is fitted at the centre position if rectangular bales (for example, 90 x 120 cm) are to be wrapped. For bales which are squarer than this, it is fitted at the lower position.

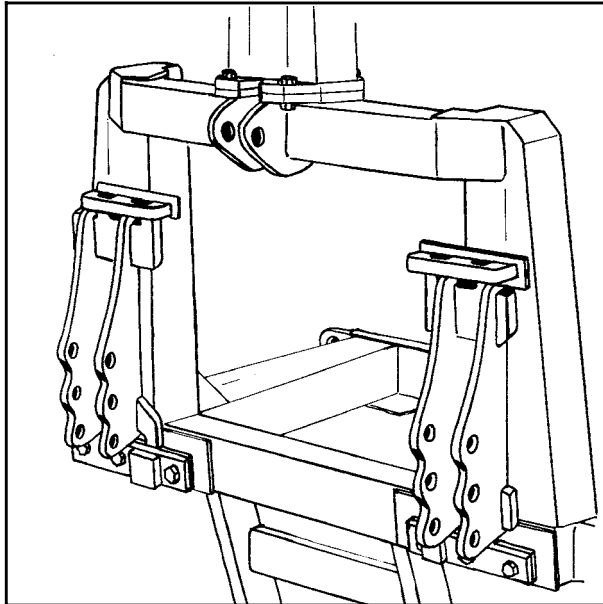


Fig. 4-8

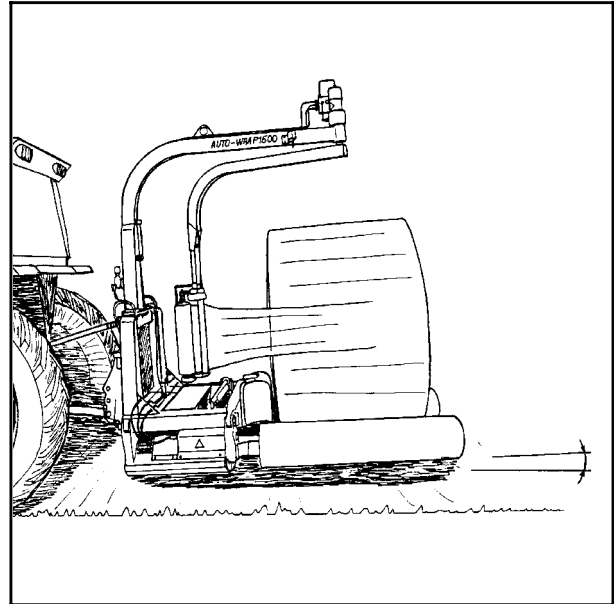


Fig. 4-9

4.5 THREE POINT LINKAGE.

AUTO WRAP 1500 / 1504 /TWIN is intended for rear mounting to the three point linkage, category 2. (Fig. 4-8). 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. 4-9).

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.

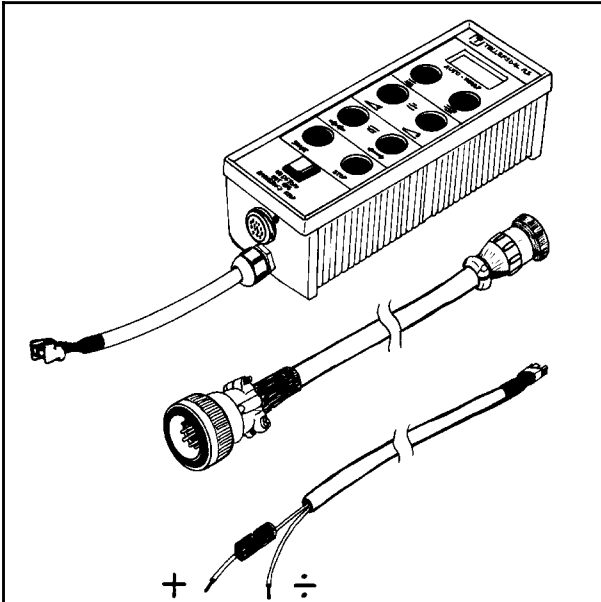


Fig. 4-10

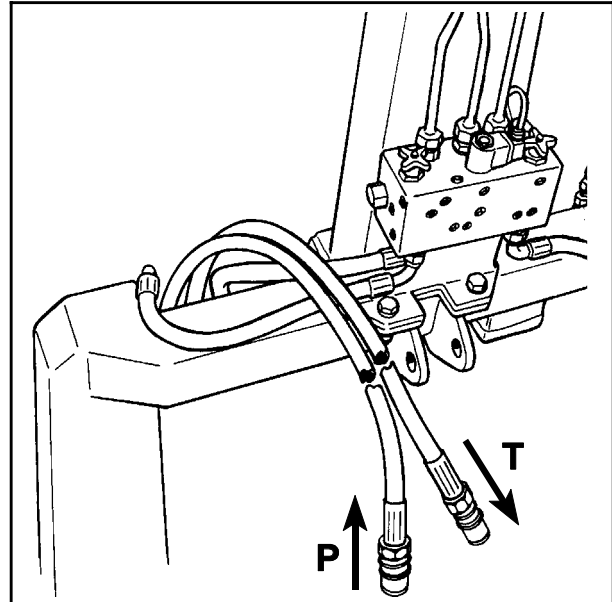


Fig. 4-11

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.

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. 4-11).

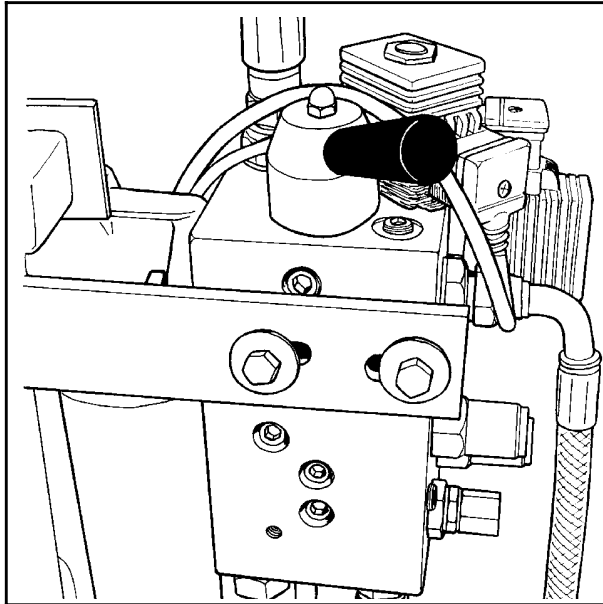


Fig. 4-12

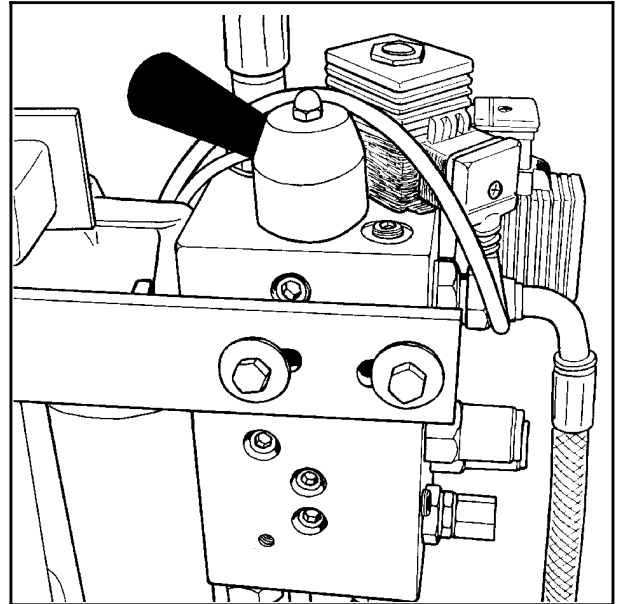


Fig. 4-13

4.10 HYDRAULIC SYSTEM WITH OPEN OR CLOSED CENTRE (See also section 14.1.)

The selective control valve (V1) allows you to choose between an open and closed centre for the hydraulic system. Most tractors have a hydraulic pump which produces a fixed volume of oil per revolution (open centre). The valve must then be in the open position. (See fig. 4-12.)

Some other tractors (such as John Deere) have oil pumps with **variable** volume per revolution (closed centre). The valve must then be in the closed position. (See fig. 4-13.)

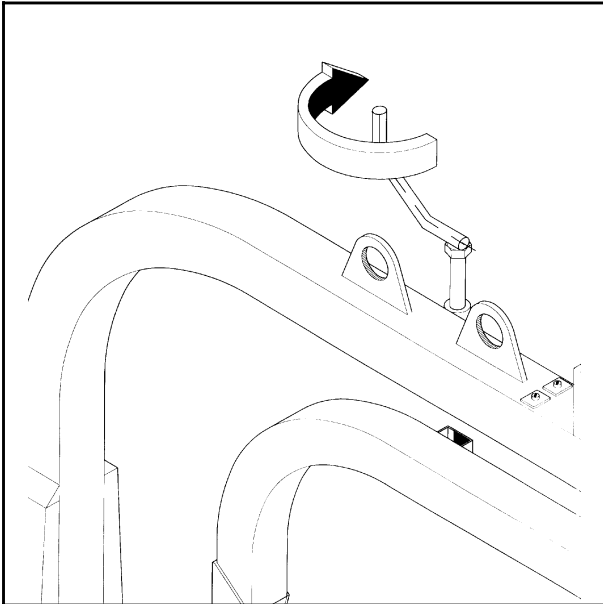


Fig. 4-14

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. (Use the tractors hydraulic control lever).
2. Return-oil should be led as directly to the 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 may occur.
6. Remove the locking bolt that holds the wrapping arm to the frame during transport.(Fig. 4-14 and Fig. 2-7)If necessary unfold and lock the extra wrapping arm on a TWIN machine. Do the same with the cutter beams. (See section 2.10 and figs. 2.7, 2.8, 2.9 and 2.10.)
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.

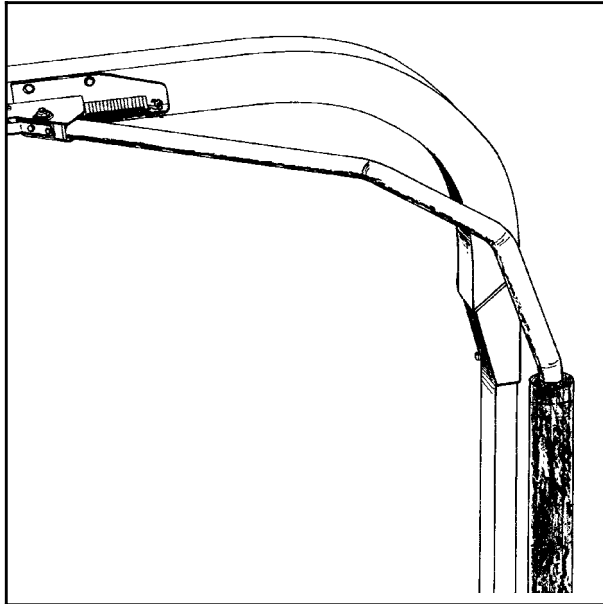


Fig. 5-1

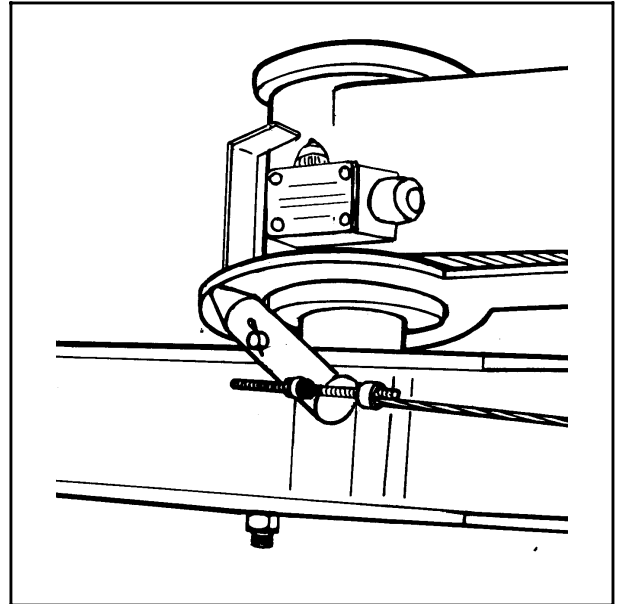


Fig. 5-2

5.0 EMERGENCY STOP.

- 5.1 The machine is equipped with a safety guard on the wrapping arm, and its operation must be tested before work itself is started.
- 5.2 The safety guard is designed to stop the wrapping arm injuring operators or objects either when starting up or when wrapping bales.
- 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 This consists of a release guard which is connected by a wire to the lever arm, and this activates a small electrical switch via a sliding contact (14, fig. 5-2).
If the electrical circuit is broken, the hydraulic oil flow is cut off and all functions stop immediately. This is indicated on the control box display by three illuminated dots. (See section 7.1.)
- 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 To restart the machine the obstacle must be removed and the safety guard must return to its original position. If "**STOP**" (9) is pressed before "**START**" (8), the wrapping continues from the point in the program at which the emergency stop was activated. If, on the other hand, "**STOP**" (9) is pressed before "**ZERO**" (3), then the wrapping sequence starts from the beginning again. (See further in section 7.9.)

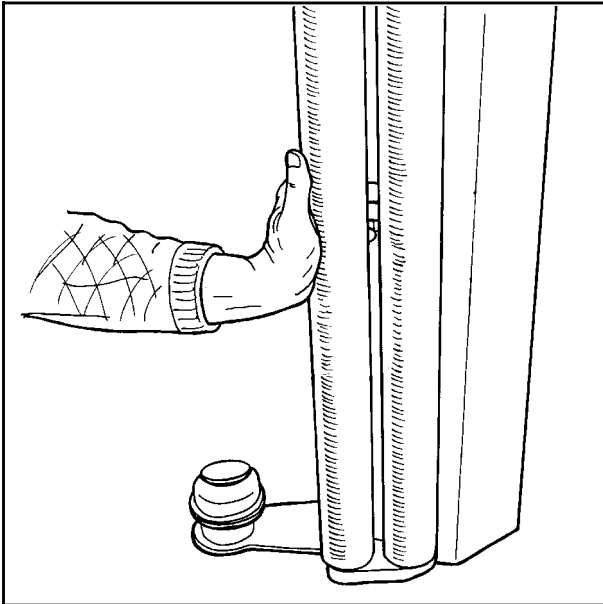


Fig. 6-1

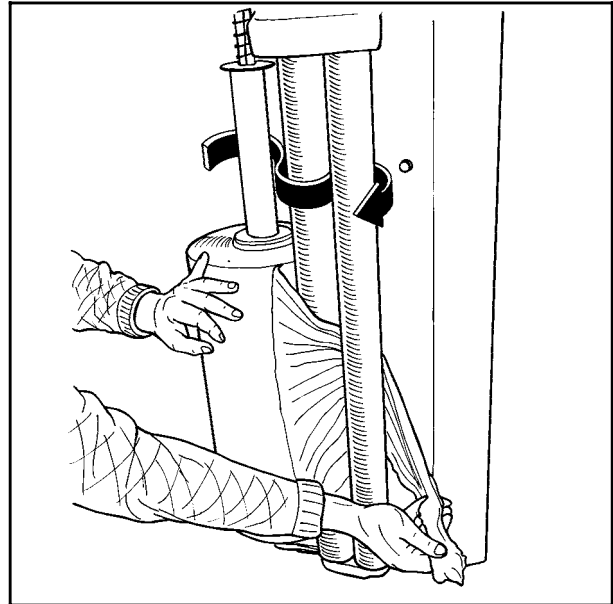


Fig. 6-2

6.0 MOUNTING OF PLASTIC FILM.

- 6.1 When the plastic roll shall be mounted, you have to hold the prestretcher-rollers aside. Push the rollers to the side and hold inn place with each of the locking springs. (See fig. 6-1).
- 6.2 Place a reel of film on to the prestretcher's lower 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 OPEN** , (5), on the remote control block. Pull out the film and place it over the U-shaped slot.
- 6.5 Push the **CUTTER CLOSED**-button, (4), and the film will be held in the U-shaped slot.

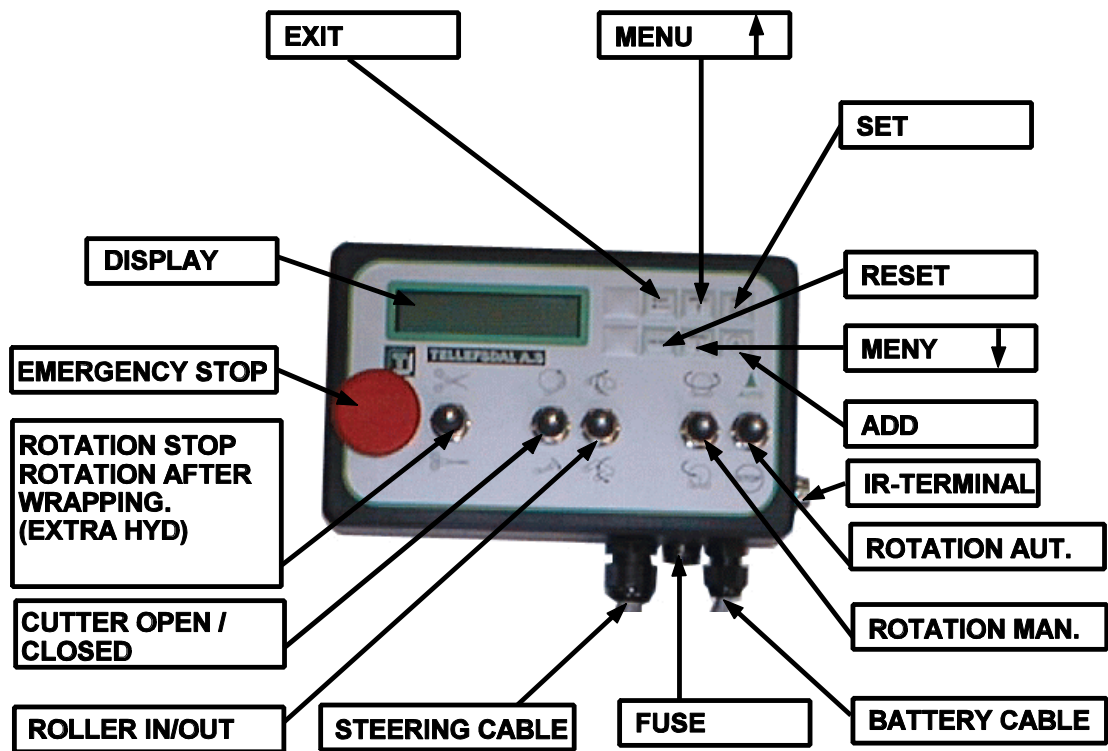
6.6 HEIGHT ADJUSTMENT OF PRESTRETCHER / PLASTIC FILM.

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 CONTROL BOX FUNCTIONS.

7.1-1 FUNCTIONS
Arm model.



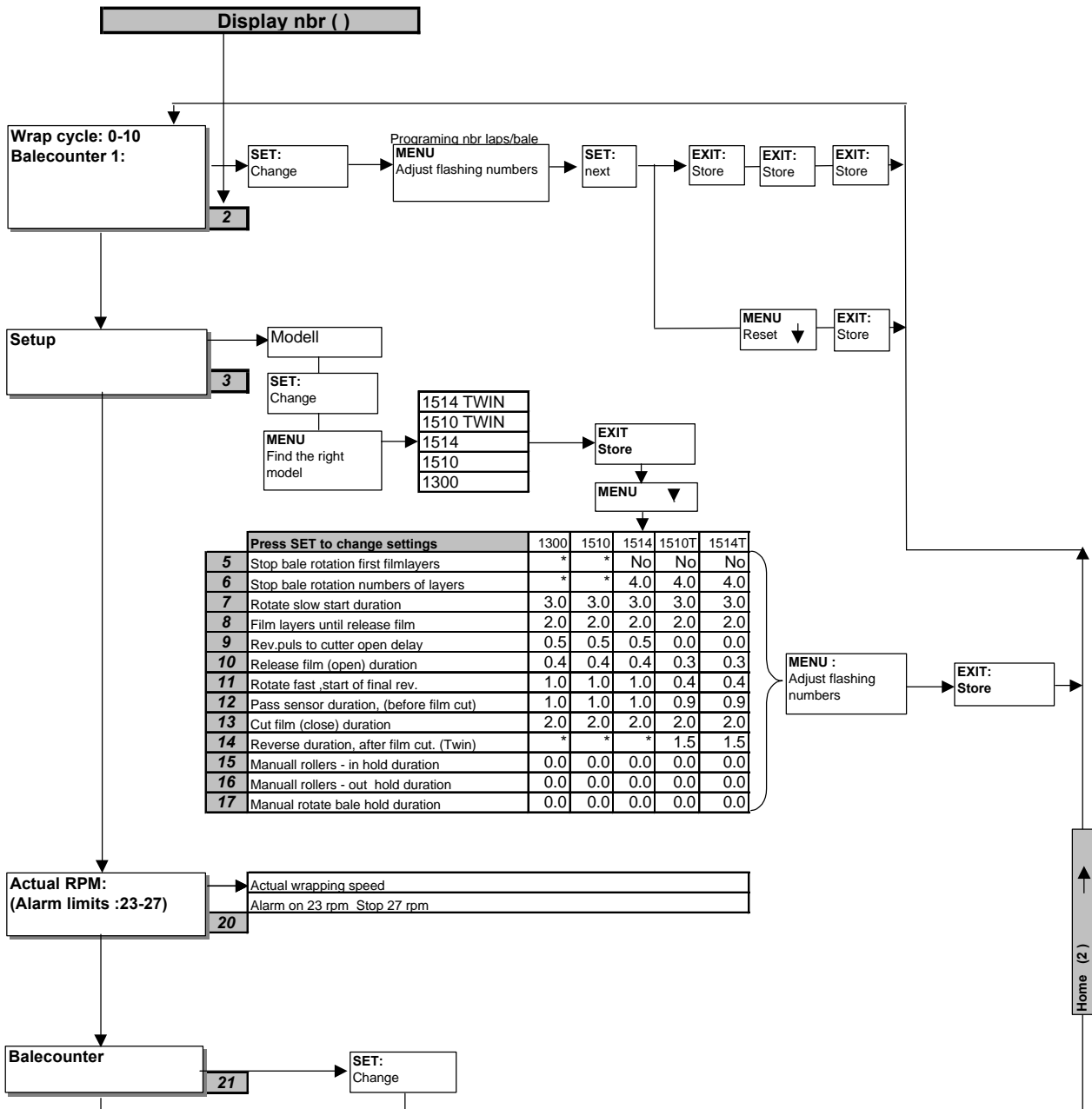
7.1-2 PROGRAMMING
Arm model.

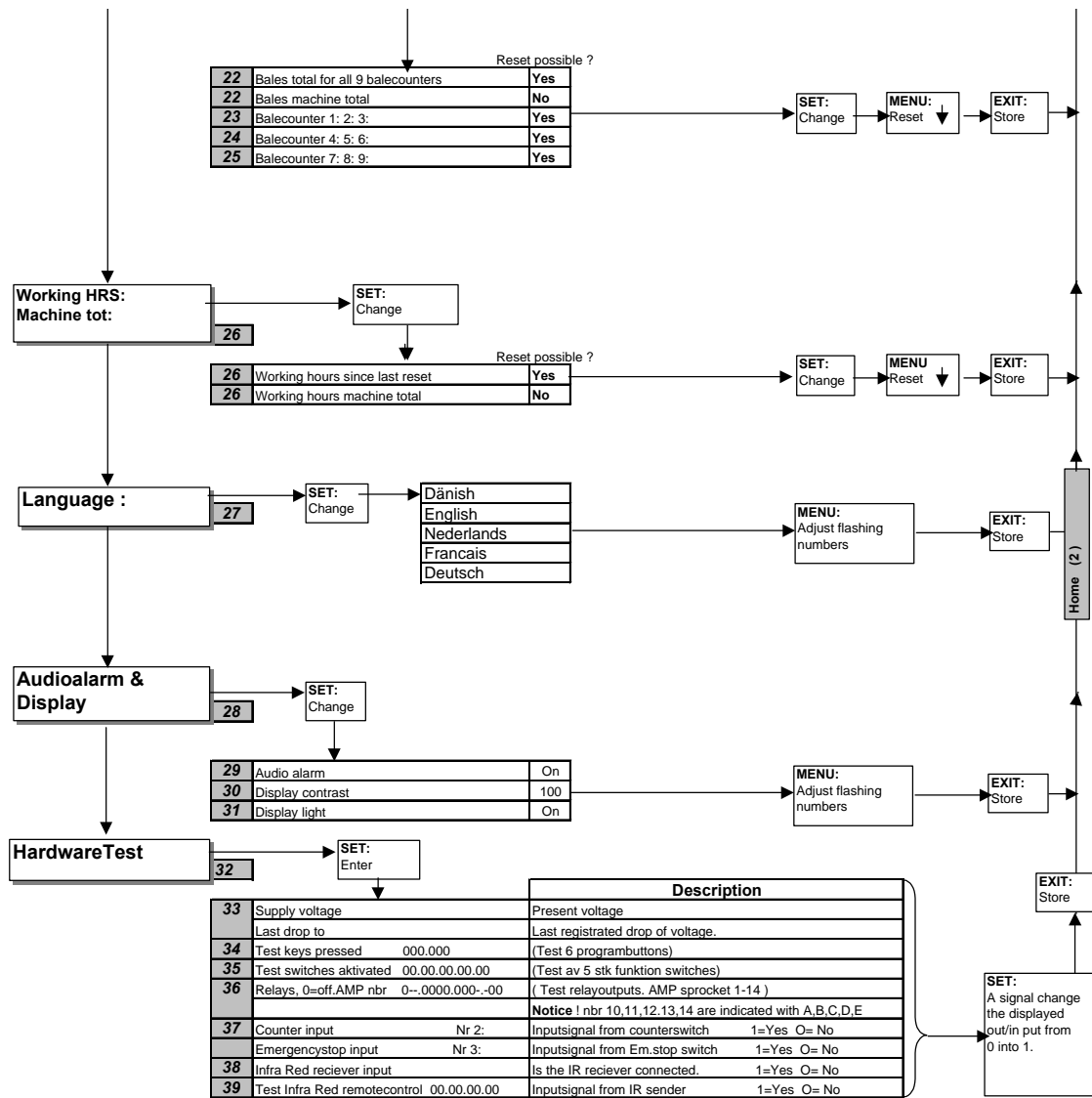
Notice:

By pressing "EXIT" more than 3 sek.you allways will be braught back to "Wrap-cycle" (Wrapp modus)
By pressing "MENU" more than 3 sek, the display contrast will be adjusted. "MENY" up = Stronger MENY down = weaker

Manual operation

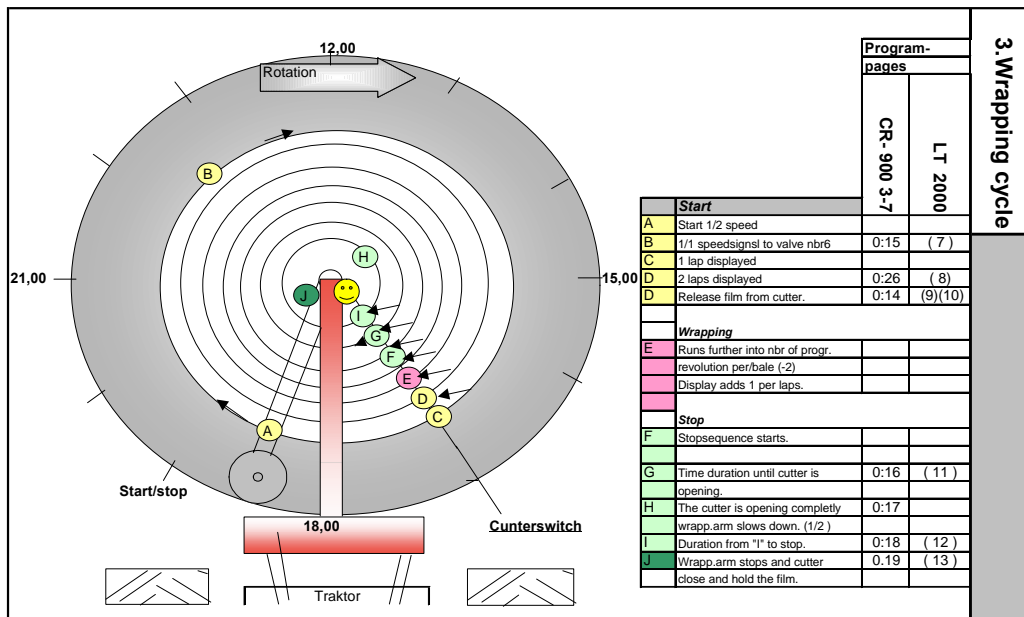
Behind the rubberplug on the the rear side of the control box it is placed a switch for manual/automatic operation.
Please notice that the display does'nt work in manuel modus.





7.1-3 WRAPPING CYCLE

Arm model.



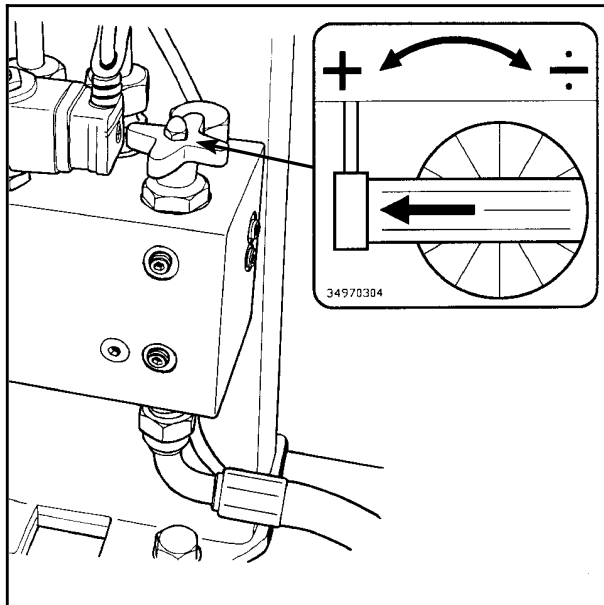


Fig. 8-1

8.0 SPEED-SETTING OF THE WRAPPING ARM.

8.1 Start the tractor, let it run at approx. 1000 revolutions per min. lift the machine clear off the ground. The oil flow to the packing machine is adjusted with the use of two control valves which are placed on the valve block situated behind the machine's "neck". [see fig. 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 does 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 does not increase the wrapping speed, it only increases the oil flow into the system and by that also the temperature in the hydraulic system.

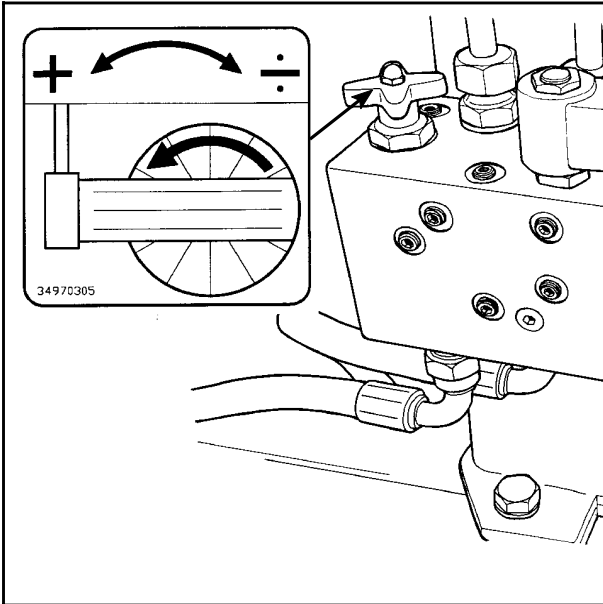


Fig. 9-1

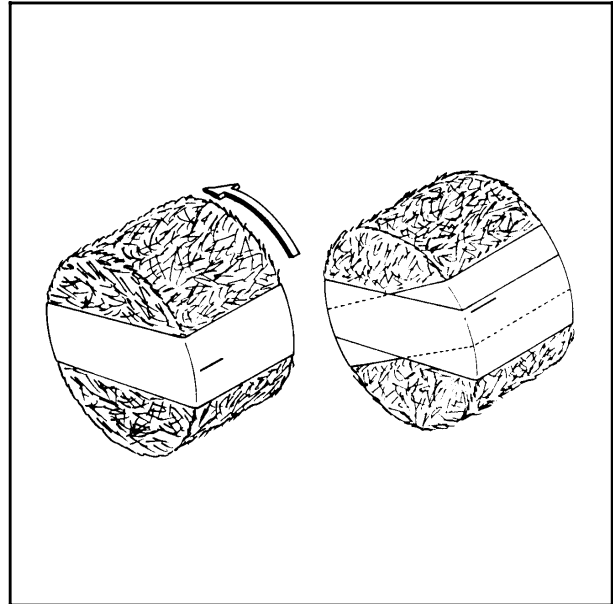


Fig. 9-2

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.

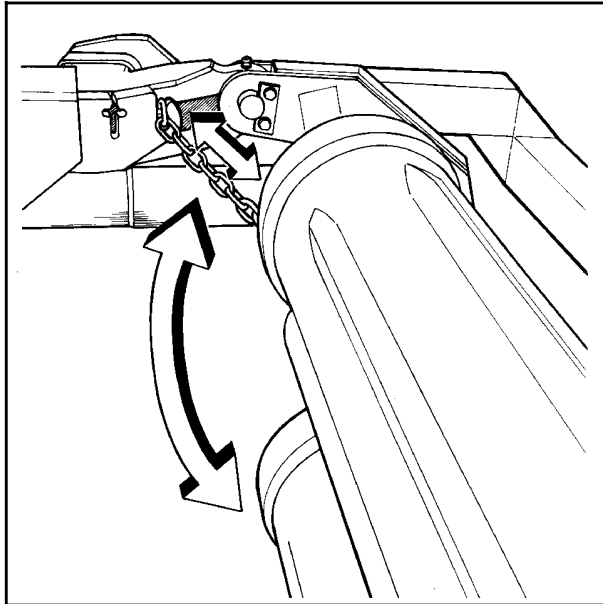


Fig. 10-1

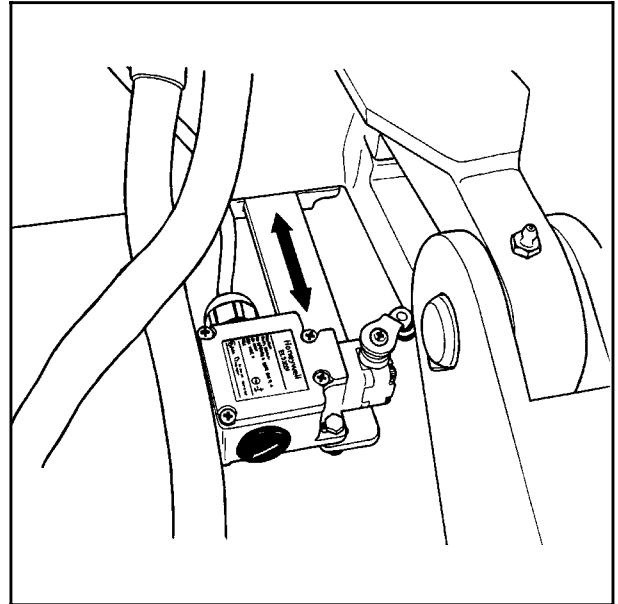


Fig. 10-2

10.0 OPERATION INSTRUCTION.

We shall now go through a complete wrapping process, from loading to storage place, and explain the practical use of Auto Wrap 1510 / 1514 / TWIN.

10.1 LOADING

Find a bale you wish to wrap. Increase the opening between the bearer-rollers as much as possible. So that the rollers on the 1514 machines can stand vertically above each other and lift up a small square bale more easily, a limiting chain has been fitted on each side. Continue testing until the correct adjustment has been made. (See fig 10-1.)

CLAMP VALVE. (V23)

If the machine has difficulty loading the bale, or if the rollers spin against the bale during loading, an adjustment of the clamp valve may be necessary. (V23, fig. 14-7.)

The valve is adjusted so that the width cylinders retract more easily during loading. Loosen the lock nuts and adjust the valve. Turning clockwise increases the clamping pressure.

MAX. CLAMPING PRESSURE SWITCH

On the left-hand bearer-arm a switch is fitted which engages V20 when the rollers have gone far enough in under the bale. This will vary according to the size of the bale which is being wrapped, so this switch must be adjusted to the desired position.

When this switch is tripped, the rollers stop rotating and only the width cylinder is connected. (See also section 10-2.)

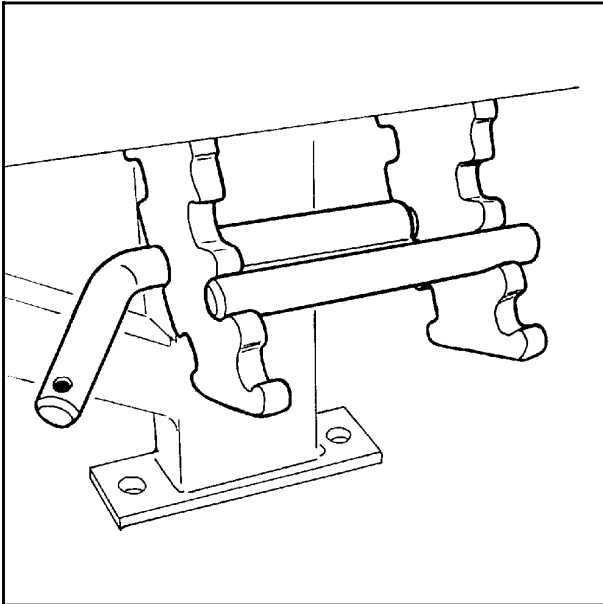


Fig. 10-3

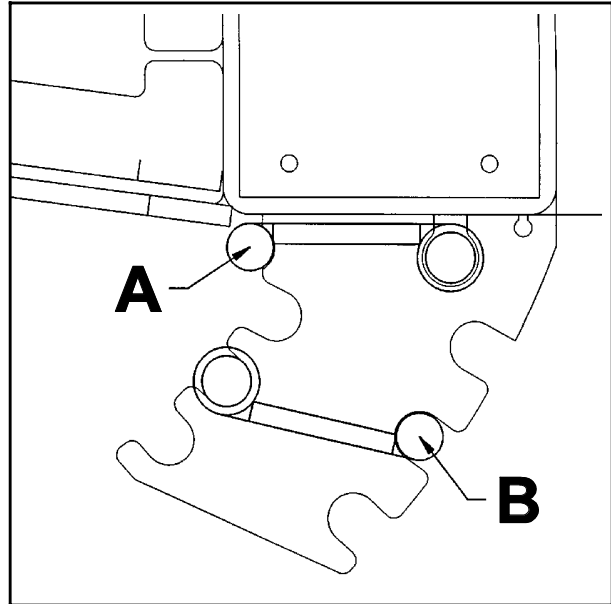


Fig. 10-4

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).

10.3 STOP PINS FOR THE BEARER-ARMS

If the bales being wrapped are so large that the film stretcher cannot be adjusted high enough, the bearer-rollers can be lowered instead. This is done by moving the stop pins under the main tilt ram. They can be placed in four different positions, **(B)**, as well as removed, **(A)**, as shown in figs. 10-3 and 10-4. 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.)

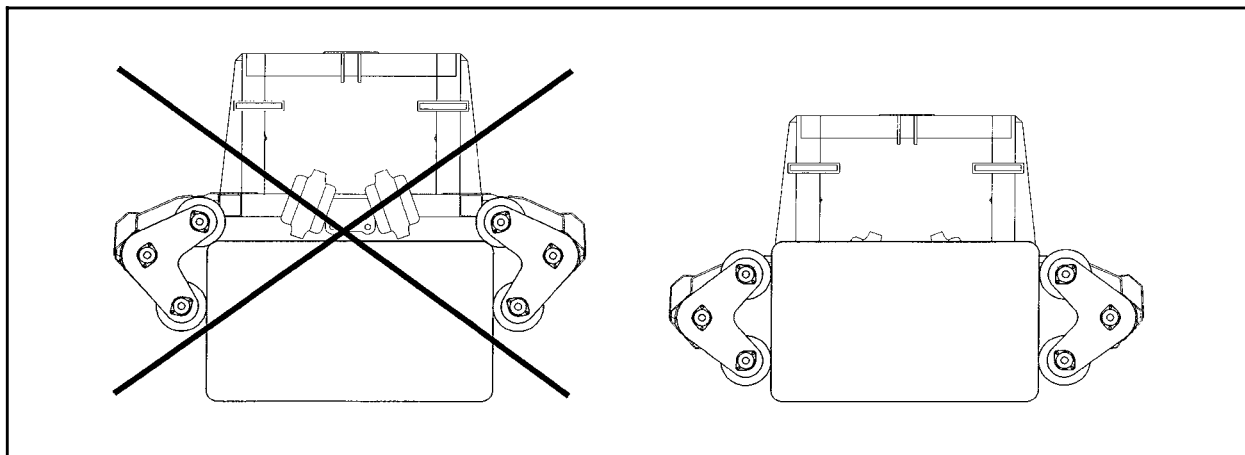


Fig.10-5

10.4 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). If necessary, adjust the position of the rollers by means of the limiting chains. (See section 10.1.)
- 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. (See V14, chap. 14.3).
- 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 **ROLLER OUT (7)** or **ROLLER INN (6)** with the control box while wrapping.

10.5 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 (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. (See also chapter 7-11).

10.6 OVERLAP.

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

10.7 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.

10.8 **STOP.**

When the required number of revolutions is obtained, push the **(9) 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 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.

EXTRA EQUIPMENT

If the machine is equipped with **Rotation of bale after finished packaging**, the bale will be rotated till it is in the right position for storage, by pushing and holding the **(2) BALLE**-button.

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 bale 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 stacked upon each other. (See more in chapter 3.0).

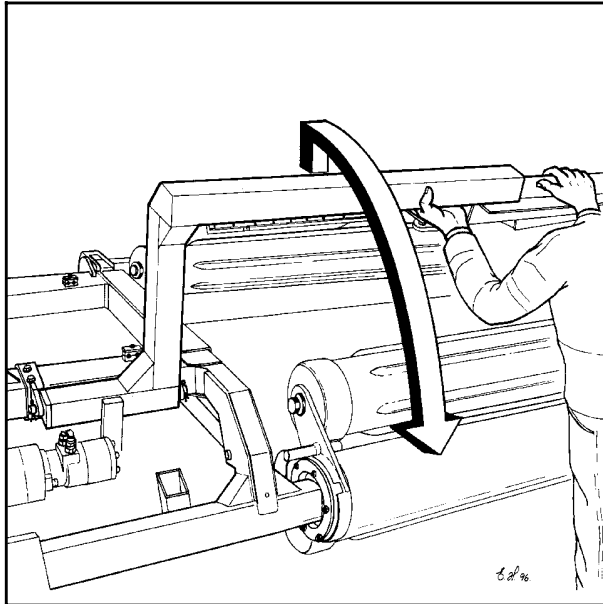


Fig. 11-1

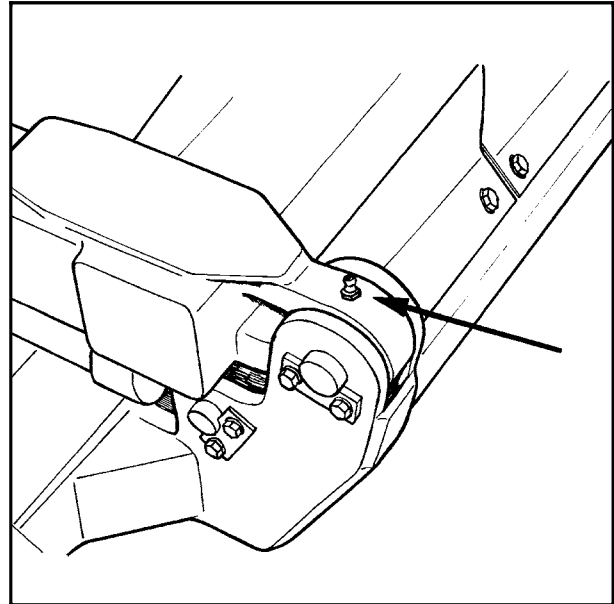


Fig. 12-2.

11.0 SPECIAL OPERATING INSTRUCTIONS FOR THE TWIN MACHINES

The Auto Wrap 1510/1514 can, as described earlier, also be supplied with a double set of wrapping arms, film stretchers and cutters. This significantly increases the machine's capacity. This machine is essentially the same as a standard machine, apart from a stronger davit and an extra valve block for the wrapping arm motor which reverses the wrapping arm after the wrapping sequence is completed.

It also has two cutters which are fitted on a hinged cutter beam on each side of the machine.

11.1 PREPARATION

Before the machine can be used, the wrapping arm must be "folded out" and the cutter beams placed in their operating positions. See fig 2-8 and fig 11-1 for more detailed descriptions.

ADJUSTING THE CUTTER ARM.

The height of the cutters can be adjusted if, for example, the pinching arm does not hold the film properly. Loosen the lock nuts and adjust the cutter arm to the required height. Tighten the lock nut again. (See fig. 11-12.)

11.2 WRAPPING

Before the TWIN machines load up the bale, the wrapping arm must be positioned across the davit. The wrapping arm is moved to the start position by pressing "**STOP**" (9) and holding it in. The wrapping arm will now rotate at half speed, and when it reaches the correct position the button must be released. Then fix both the film ends securely in the cutters. (See sections 6.4 and 6.5.)

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 completed and the wrapping arm has stopped, the wrapping arm will not be parallel with the bearer rollers. As soon as the cutters have closed, the wrapping arm will automatically reverse back to the start position which is at right angles to the davit.

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 1510 / 1514 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.

12.4 LINK BEARINGS.

The link bearings between the main frame and roller arms must be greased once a week or, by, as, required. (Fig. 12-1).

12.5 GEAR OIL. (Applies only to TWIN machines.)

The oil in the gears of the wrapping motor must be changed after the first 100 hours of operation, and then every 2,000 hours or at least once a year. Fill up with new oil, the quantity being about 0.25 litres. Use EP gear oil in the viscosity group VG 150 (ISO 3448) or similar. See the table of approved oils.

| 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 |

12.6 OIL FILTER.

The oil filter must be changed once a year.

12.7 HYDRAULIC CYLINDERS.

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

12.8 QUICK COUPLERS.

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

12.9 CHAINS/CHAIN TIGHTENERS

After some hours' use the chains on the bearer arms which drive the rollers (all 1510/1514/TWIN machines) and similarly the chains at the outer end of the rollers on the square-bale units must be tightened. (1514/1514 TWIN).

12.10 SQUARE-BALE UNIT (AUTO WRAP 1514/1514 TWIN.)

After a period of wrapping, grass will collect around the flanged bearings on the square-bale unit. (Position 16, section 6-5 in the spare parts list.) When this becomes wet, acids can form in the grass which can damage the bearings. This grass must therefore be removed at regular intervals.

12.11 SCREWED FITTINGS

Make a general check of all screwed fittings and tighten where necessary.



Pay attention if removing the wrapping arm as this is fitted on a conical journal and can therefore fall off as soon as the fixing screw is removed from the end of the journal. Always secure the wrapping arm with a strap or something similar to prevent it falling off, BEFORE THE FIXING SCREW IS LOOSENED.

12.12 CLEANING.

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

NOTE !

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.

12.13 STORAGE.

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

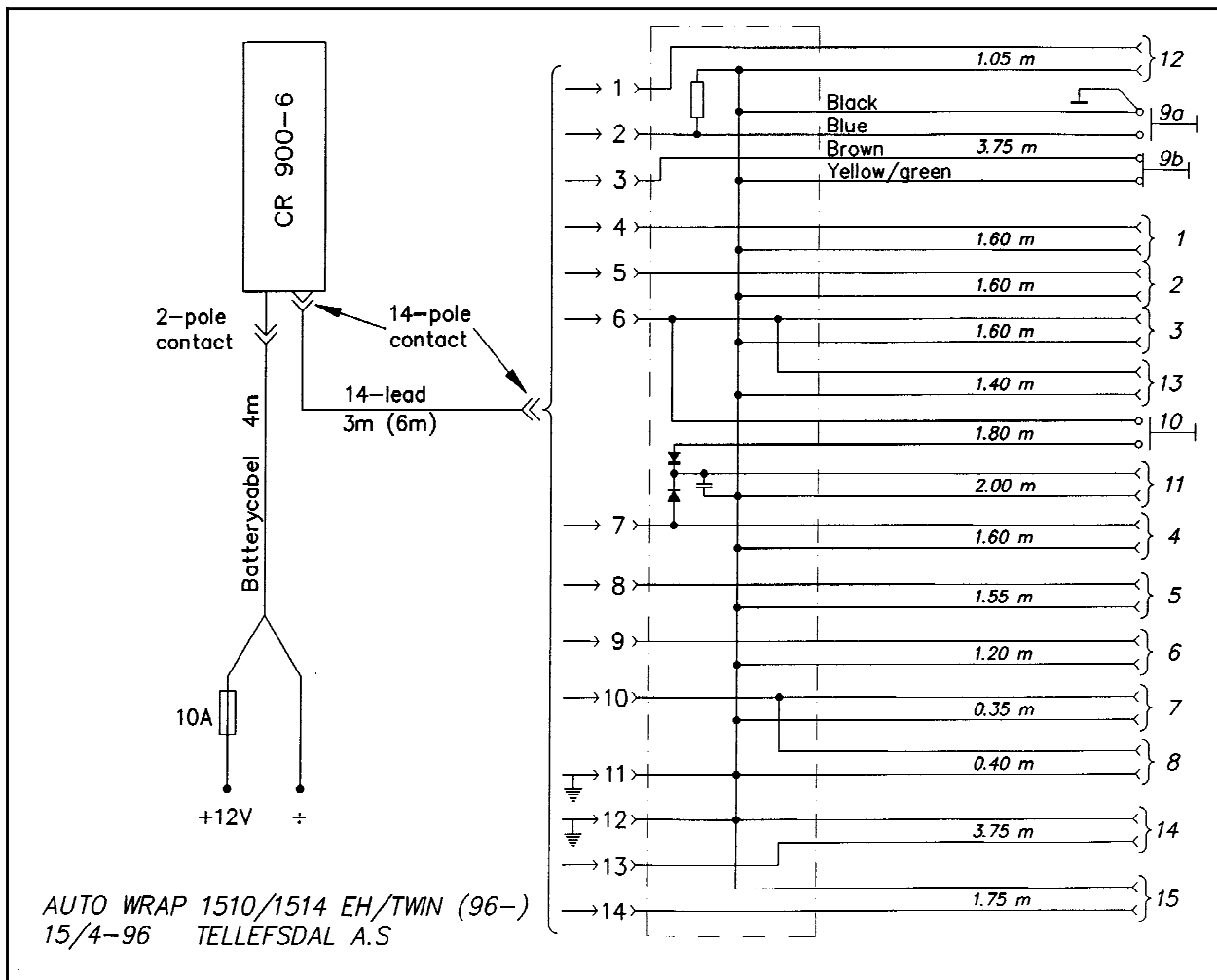


Fig. 13-1

13.0 ELECTRIC CIRCUIT.

13.1 COUPLE FORM.

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).

The electric lines to the valves and switches are no. from 1 to 15, and extend to the listed appliances bellow.

1. Cutter open.
2. Cutter closed.
3. Rollers in
4. Rollers out
5. Wrapping arm half speed.
6. Wrapping arm full speed.
7. Master valve.
8. The closed center valve
- 9a. Revolution counter
- 9b. Emergency stopp switch.
10. Max. Squeeze pressure switch.
11. Max. Squeeze valve.
12. Rotation stop (extra equipment)
13. Double drive (extra equipment)
14. Reversing (TWIN)
15. Rotation after wrapping completed (extra equipment)

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 10A. 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 (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. (See also chapter 7.11). 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 POWER DISTRIBUTION. (See fig. 13-1)

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

- | | | |
|-----|---|----------------------------------|
| 1. | "OPEN CUTTER":..... | Current to nos. 1, 7 and 8 |
| 2. | "CLOSE CUTTER":..... | Current to nos. 2, 7 and 8 |
| 3. | "ROLL INN":..... | Current to nos. 3, 7 and 8 (+11) |
| 4. | "ROLL OUT":..... | Current to nos. 4, 7, 8 and 11 |
| 5. | Wrapping arm half speed:..... | Current to nos. 5, 7 and 8 |
| 6. | Wrapping arm full speed:..... | Current to nos. 5, 6, 7 and 8 |
| 7. | Cutter releases film:..... | Current to nos. 1, 5, 6, 7 and 8 |
| 8. | Rotation stop (extra equipment):..... | Current to nos. 12, 7 and 8 |
| 9. | Double operation (extra equipment):..... | Current to nos. 13, 7 and 8 |
| 10. | Reversing (TWIN):..... | Current to nos. 14, 5, 7 and 8 |
| 11. | Rotation after wrapping completed (extra equipment) | Current to nos. 15, 7 and 8 |

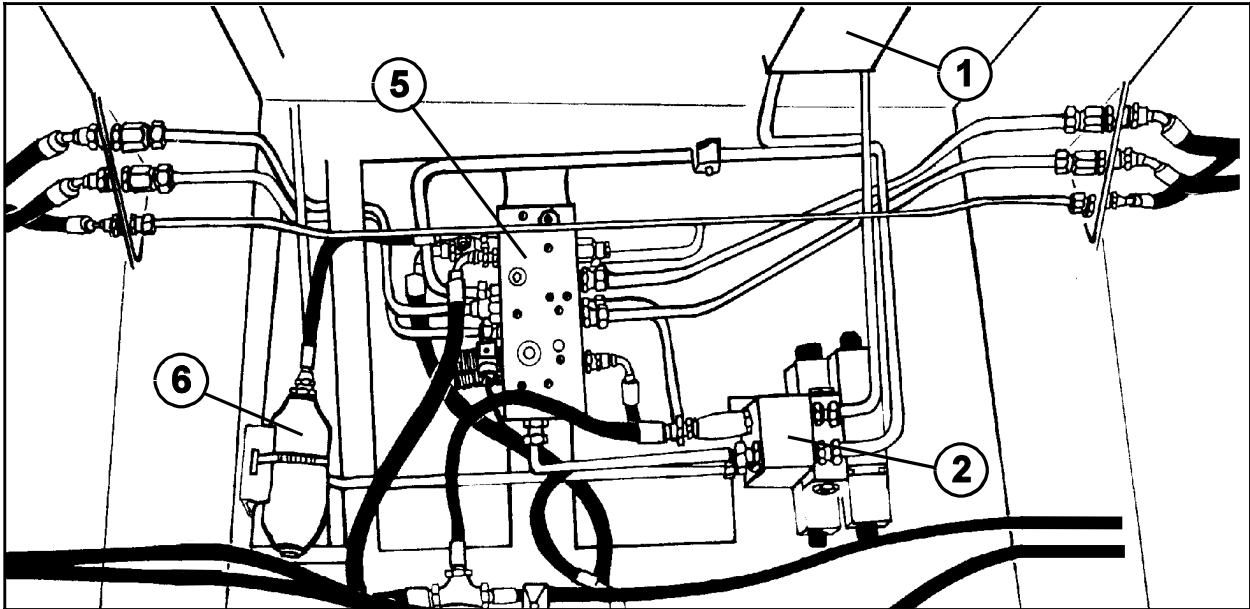


Fig. 14-0

1. Filter block.
2. Control block.
3. Adjusting block. (On the back of the "neck").
4. Wrapping arm block. (On the top of the machine.)
5. Collecting block.
6. Accumulator.

14.0 HYDRAULICS.

The **AUTO WRAP 1510 / 1514 / TWIN machines** are driven by the tractor's hydraulic system. The machine's hydraulic installation is easy to change from an open centre to a closed centre hydraulic system. (See section 4.10).

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 hydraulics diagram.

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. When **ROLL WIDTH "OUT"(7)** is pressed, the oil travels simultaneously to the releasing cylinders.

The accumulator is also shown in fig. 14-0. This absorbs any pressure surge during load and also ensures that the distance between the bearer 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. Refer to the hydraulics diagram in section 18.0 for further clarification.

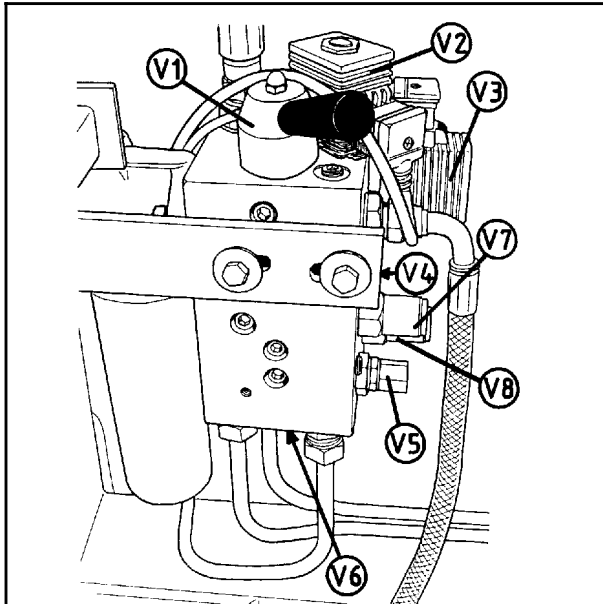


Fig. 14-1

14.1 FILTER BLOCK

This block contains the oil filter, the selector valve for open or closed centre, the circulation valve, safety valves and volume-regulating valve.

V1 Selector valve for open/closed centre (CP 620-1.)

Open centre 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.

Closed centre hydraulics

For tractors with variable oil pumps, for example John Deere, the **selector valve** must be in the closed position. (See section 4.10.)

With this setting the oil can only enter the control block when one of the functions has been selected.

V2 Closed centre valve (CP 500-3.) (Electric cable number 8.)

Electric valve. This is closed when no function is selected, and opens whatever function has been selected. It releases oil into the control block, and simultaneously opens the LC valve for the particular function. (When the selector valve (V1) is in the open position, it has no function.)

V3 Circulation valve (CP 500-4.) (Electric cable number 7.)

Electric valve. 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. (When the selector valve (V1) is in the closed position, it has no function.)

- V4 Check valve (VRC 6.)**
This prevents oil from flowing to the circulation valve in closed centre hydraulics.
- V5 Regulator for V6 (CP 610-2.)**
Used to adjust the volume of oil that flows into the volume-control valve, which in turn regulates the amount of oil that flows into the control block.
At the factory this is set to 35 litres/minute.
This must not be adjusted to a higher figure.
- V6 Volume-control valve (CP 311-4.)**
Limits the volume of oil that flows into the control block. Excess oil volume is sent back to the tractor. This is designed to handle an oil volume of up to 60 litres/minute.
- V7 Emergency overflow valve (CP 200-3.)**
Safety valve on the return side. If the return hose should become blocked, this will open and release oil into the outside. The purpose of this valve is to stop the pressure becoming too high in the drainage connection on the wrapping arm motor. This is set to 120 bars.
- V8 Safety valve (CP 200-3.)**
This prevents the oil pressure from becoming too high in the control block. If the preset pressure level is exceeded, this valve opens and the oil is sent to the return hose. It is set at 180 bars.

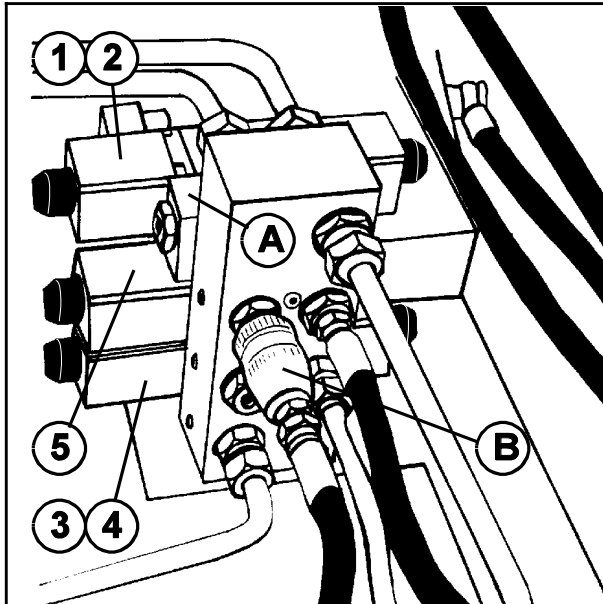


Fig. 14-2

14.2 CONTROL BLOCK

The control block contains the five LC valves that 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 the diagram of connections, fig. 13.1.)

1. Cutter "open".
2. Cutter "close".
3. Roller width "in".
4. Roller width "out".
5. Start roller and wrapping arm.

The cutter

To prevent the pressure on the cutter reducing so that it does not hold the plastic film for sufficient time, there is a double pilot-controlled check valve (**A, fig. 14-2**) below the solenoid valves for the cutter.

Below the check valve on the block itself there is another check valve which stops any pressure surge in the return hose opening the pilot-controlled check valve.

An adjustable throttle valve (**B, fig. 14-2**) is fitted on the plus side of the cutter cylinder on TWIN machines. This is used to adjust the speed of the cutter when it opens.

(On standard machines there is also a throttle, but this is fixed and is fitted inside the valve block.)

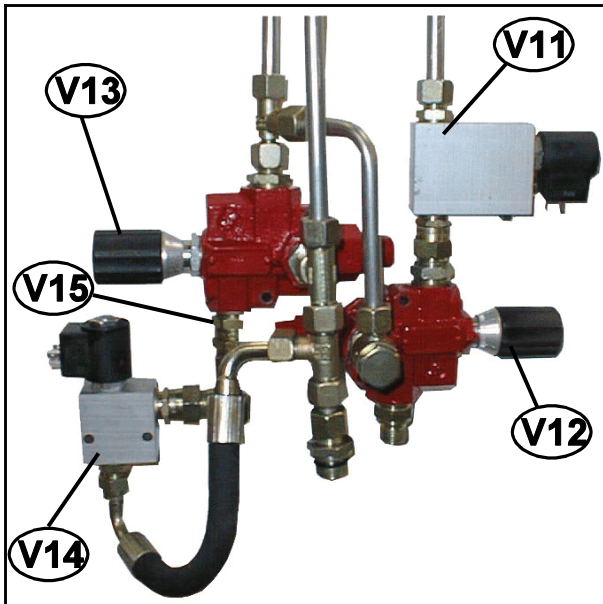


Fig. 14-3

14.3 ADJUSTING BLOCK

This contains the adjusting valves for roller speed and wrapping arm speed, together with the two-stage start valve.

- V11 Two-stage valve** (Electric cable no. 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 a nozzle 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.
- V12 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 V12. Excess oil is directed onwards to V9.
- V13 Volume-controlling valve for the rollers**
 This regulates the oil volume and thereby the speed of the roller motor. This is controlled by V13. Excess oil is directed back to the tractor.
- V14 Rotation stop valve (Additional equipment)** (CP 508-1.) (Electric cable no. 12.)
 If there is a requirement to be able to stop the rotation of the rollers while the wrapping arm continues to turn, a valve can be fitted here. (This can be useful on the 1504 machine when wrapping rectangular bales.)
 Standard machines have just a blind plug in this position.
- V15 Check valve**
 This prevents oil flowing in from the collecting block.

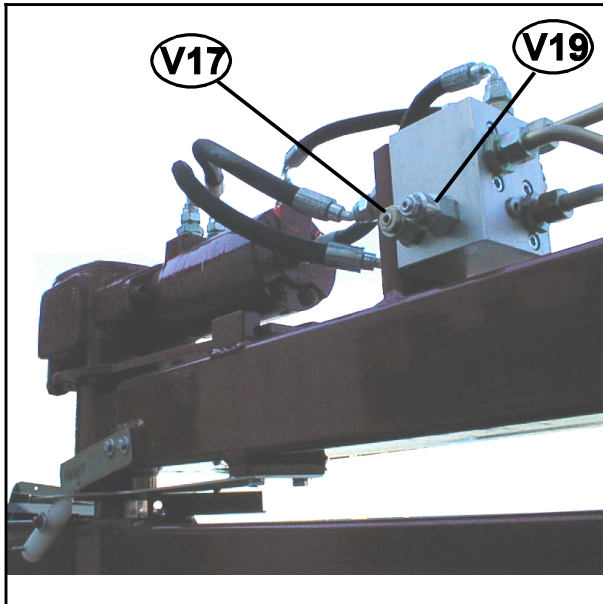


Fig. 14-4

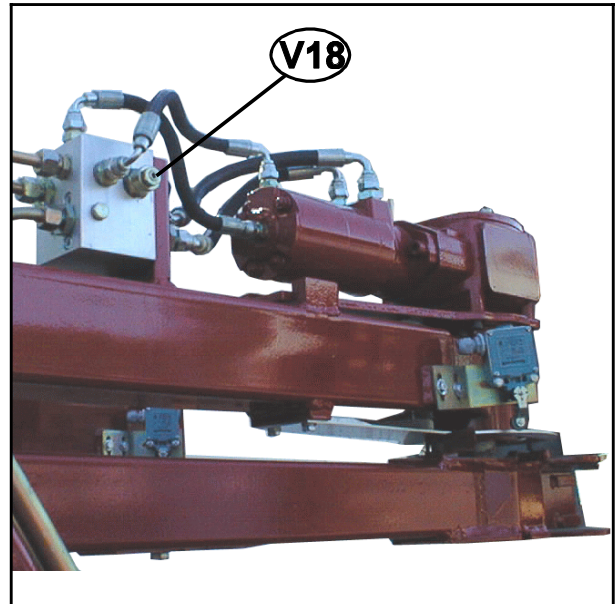


Fig. 14-5

14.4 WRAPPING ARM BLOCK

The wrapping arm block is fitted on the wrapping arm motor, and contains 4 valves. (On TWIN machines there is an additional electro-magnetic reversing valve, V35, fig. 14-6).

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.

TWIN machines

TWIN machines have a second hydraulic oil motor with a reduction gear which provides sufficient braking capacity without a separate brake unit.

- V16 Check valve (VRC 6.)**
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 the motor.
- V17 Safety valve on the plus side (LPC 6.)**
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 (LPC 6.)**
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 kiloponds.
- V19 Holding valve (Over centre valve) (CP 440-1.)**
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 (TWIN models) (LC1-A11A) (Electric cable no. 14) (Fig14-6, next page)**
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. When the switch on the revolution counter (9) gives the signal, the wrapping arm stops again. It is therefore very important that the switch and the transmitter are correctly adjusted.

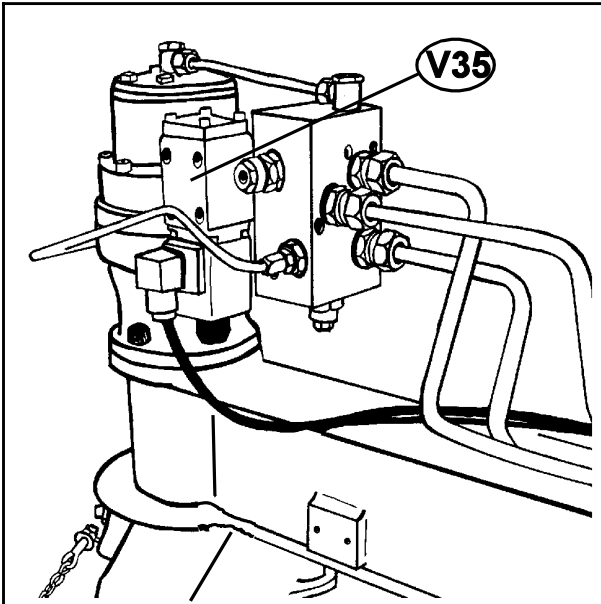


Fig. 14-6

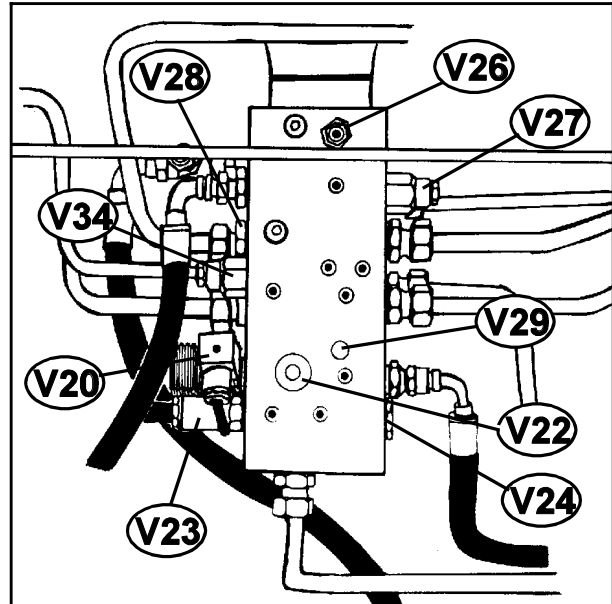


Fig. 14-7

14.5 COLLECTING BLOCK (See fig. 14-7.)

The collecting block contains all the valves which control and regulate the various functions concerned with loading and off-loading the bales.

- V20 Selector valve** (CP 520-1.) (Electric cable no. 11.)
When the width between the rollers is reduced (while loading) and they reach the position at which the switch on the left bearer arm has been adjusted to trip (see section 10.1), this valve will then be activated. It directs all the oil to the width cylinder, and the bale is lifted right up into the machine. It is also activated by ROLLER WIDTH OUT.
- V22 Roller operation valve (Sequence valve.)** (CP 240-8L.)
When the oil pressure reaches the preset level, this valve opens to direct oil to the left-hand roller motor while loading. It is preset at the factory to 120 bars. The pressure is measured in the hose between the tractor and the bale wrapper when 'roller width in' is activated and the maximum clamp pressure switch is not operating.
- V23 Clamp valve** (CP 230-2.)
This keeps the clamp pressure in the width cylinder constantly at the preset level. It is preset at the factory to 70 bars. When the pressure rises higher than this, the valve closes and the oil is directed to the left-hand roller motor via V22. The roller motor will then rotate in under the bale and help to load it up.
- V24 Check valve** (CP 100-1.)
This valve closes when full clamp pressure is reached. This is to prevent the oil pressure "leaking out" through V23.
- V26 Holding valve** (CP 440-1.)
This maintains the current pressure on the minus side of the width cylinder when it is not activated.
It also controls the pressure for the disconnecting function.
- V27 Holding valve** (CP 440-1.)
This maintains the current pressure on the plus side of the width cylinder when it is not activated.
- V28 Check valve** (CP 100-1.)
This valve closes when wrapping is in progress. This is to prevent the oil "leaking out" through V22.

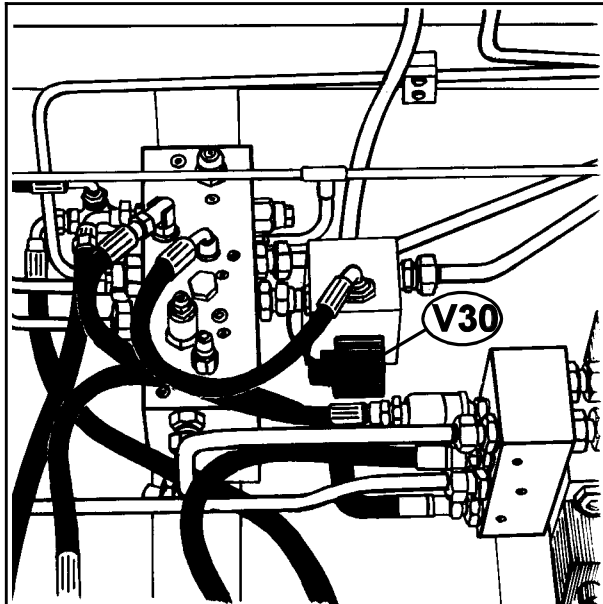


Fig. 14-8

V29 Pilot controlled check valve (CP 450-2.)

This lets the oil flow past during loading. It is opened by the force of the oil pressure flowing to the minus side of the width cylinder.

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 (Number 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 V34 throttle and the motor will brake.

14.6 DOUBLE-OPERATION BLOCK (Additional equipment)

A double-operation system can be supplied as additional equipment for the Auto Wrap 1510/1514/TWIN machines. 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. The wrapping will however run somewhat slower with double-operation.

V30 Double-operation valve (CP 520-1.) (Electric cable no. 13.)

Electric valve which connects or disconnects the double-operation function. This is only active when **"ROLLER WIDTH IN" (6)** is selected.

14.7 ROTATION OF BALE AFTER WRAPPING IS COMPLETED (Additional equipment.)

V36 Directional valve (LC1 E2.) (Electric cable no. 15.) (Not illustrated)

The machine can be supplied with a valve, as additional equipment, which makes it 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 stacking. The function is controlled by selecting **"BALES" (2)** and keeping the button pressed in until the bale has reached the required position.

15.0 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.

15.1 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).

15.2 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).

15.3 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 box display indicates the voltage being supplied if this is too low.

If the voltage falls below 10 volts this is treated as an interruption of the power supply and all functions stop.

Are the cables correctly connected to the battery?

Follow directions in chapter 4.9 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 production year of your machine when contacting dealer and when ordering spare parts).

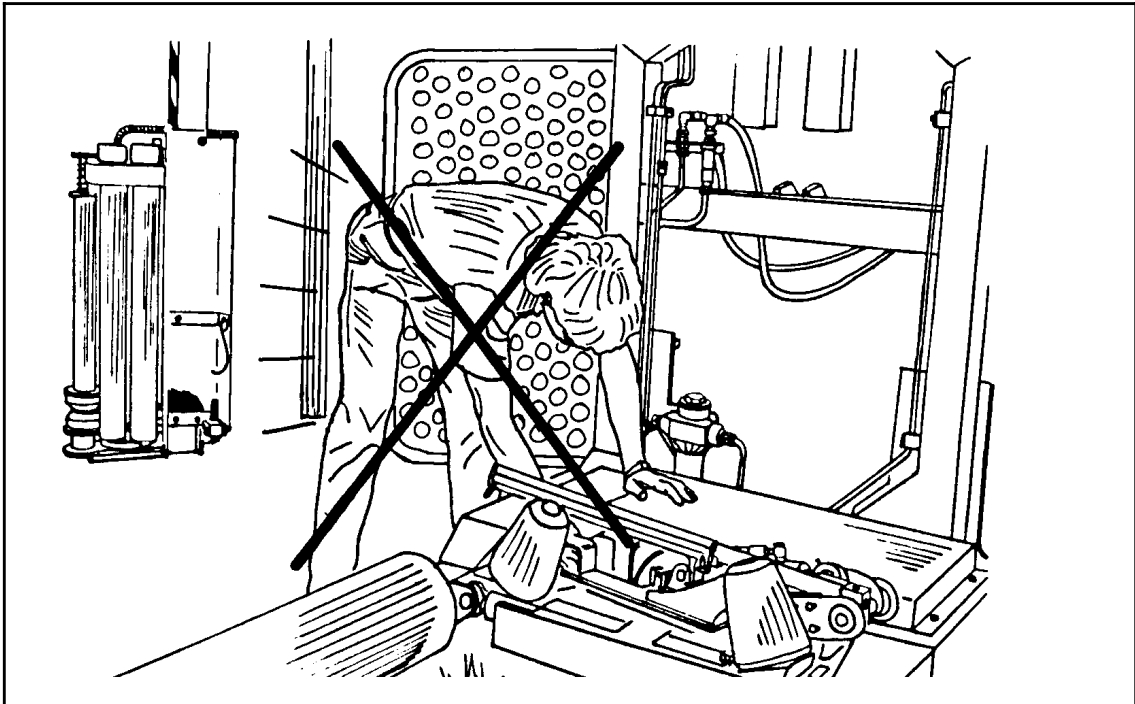


Fig. 16-1 **BEWARE OF MOVING PARTS WHEN TESTING THE MACHINE.**

16.0 PROCEDURE OF TROUBLE SHOOTING.

16.1.1 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.

An **INDICATOR PLATE** is fitted to the solenoid on the circulation valve. This lights up when power is supplied to the solenoid. This plate can, if required, be moved to whichever solenoid you wish to check.

Voltage at any one valve can also be measured with a voltmeter, but the solenoid must be in contact so that it draws current.

For reliable functioning the voltage should not be lower than 11.5 volts, even if the solenoid valve will often work with a 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.**

16.2 Applies only to the solenoid valves on the control block. (See section 14-2.)

If the electric supply is in order and one of the functions falls out, the reason can be a mote that tightens 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.

16.3 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.

(V2 must always have power when attached to a tractor with closed centre hydraulics.) (See also section 14.1 and 16.1.)

16.4 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 7.1). When the emergency stop* is activated, there shall be

measured 4 volts over the emergency stop*-switch.

17.0 TROUBLE SHOOTING SHEET.

Throughout this section it is assumed that everything described in section 15.0 has been checked and is in order.

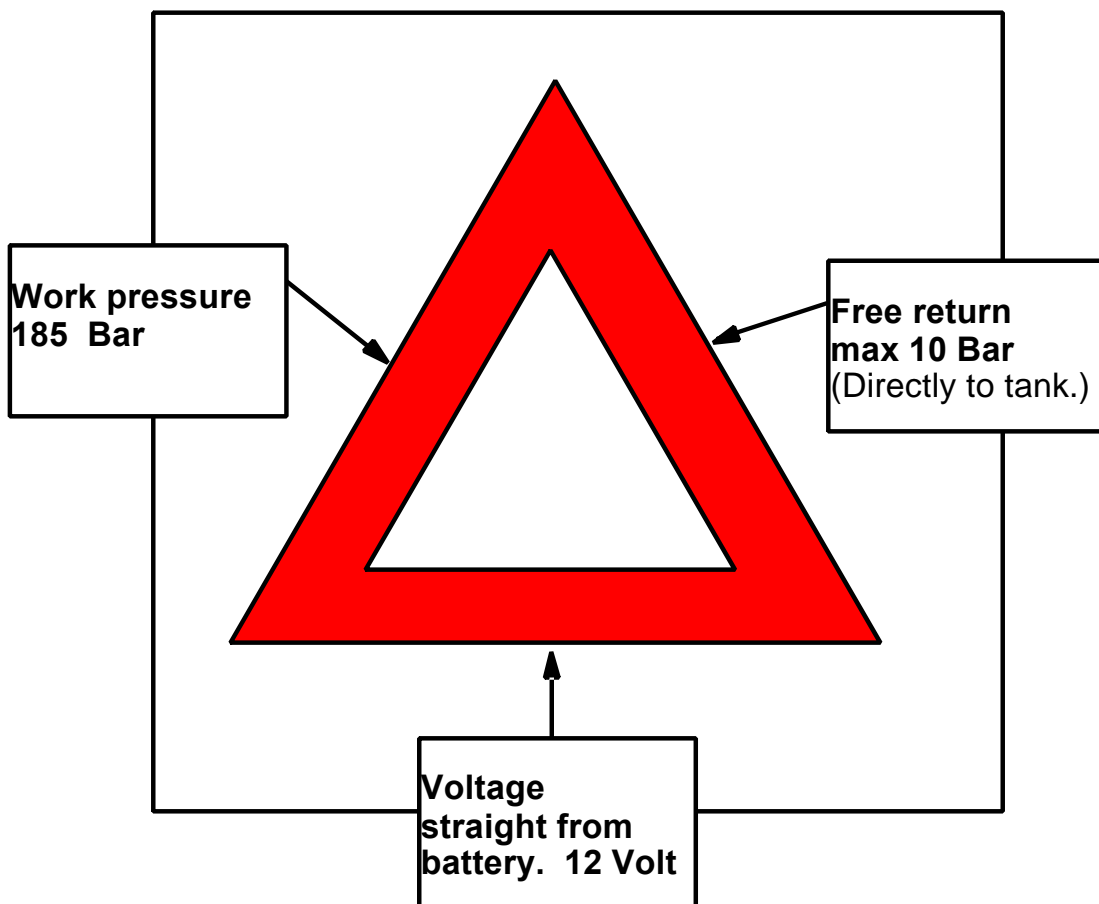
| TROUBLE DISCIPTION | | SYMPTOM CAUSE / SOLUTION |
|--|---|---|
| G E N E R A L T R O U B L E S H O O T I N G | <p>"The machine is not functioning and nothing works. "</p> | <p>Check the power supply. See section 15.3</p> <p>Even though the pressure gauge shows an adequate pressure there is no response from the machine. The reason could be that one (or both) of the quick couplers is/are not opening to let the oil through. Change the quick couplers.</p> <p>Check that the selector valve (V1) is in the right position. See sections 4.11 and 14.1.</p> <p>The circulation valve is not receiving any power, or there is dirt in the valve so that the slide valve is not closing. (See section 16.1 and 16.3.) If the power is OK, unscrew the valve and clean it, or replace it. If necessary ask your dealer to test the valve.</p> <p>The safety valve, V8, is wrongly adjusted or defective. See section 14.1. Adjust, clean or replace.</p> <p>The safety guard on the wrapping arm is not in position. Defective return spring or dirt in the bracket.</p> <p>Defective emergency stop switch. Replace switch.</p> |
| | <p>The display shows "u06"</p> | <p>The counting switch is active, or the rounds counter is defected, when the power is connected.</p> |
| | <p>"Everything is going so slowly."</p> | <p>The volume-controlling valves (V5/V6) are wrongly adjusted or defective. See section 14.1. Adjust if necessary or replace defective valve.</p> <p>Leak in the circulation valve (V3). Clean the valve, check the O-rings or replace defective valve.</p> |

| TROUBLE DISCRPTION | | SYMPTOM CAUSE / SOLUTION |
|--------------------|---|---|
| LOADING | "Roller width IN does not work when the machine has no load." | <p>The solenoid valve (no. 3) is not receiving power or there is dirt in the valve. See section 16.1 and 16.2.</p> <p>V24 is defective. Clean the valve or replace if defective.</p> <p>Either the clamp valve (V23) or the holding valve (V27) is not opening for the oil flow. Replace defective valve or have it tested by your dealer.</p> |
| | "The left-hand roller motor does not rotate when a bale is loaded." | <p>The roller-operating valve (V22) is not opening. Check, adjust or replace if defective.</p> <p>The maximum clamp pressure switch is defective or wrongly adjusted. Check, adjust or replace defective switch.</p> <p>Leak in the rotation-stop valve (V14). (There can still be a leak even if there is only a blind plug fitted here.) Clean or replace defective valve.</p> |
| | "The wrapping arm rotates the wrong way when loading." | <p>Leak in check valve (V15). Clean the valve or replace if defective.</p> |
| | The bale cannot be loaded." | <p>Maximum clamp pressure switch must be adjusted. (Section 10.1.) The clamp pressure must be increased or reduced using V23.</p> |
| WRAPPING | "The wrapping arm will not turn." | <p>The transport safety catch has not been released.See section 4.12.</p> <p>The solenoid valve (no. 5) is not receiving power or there is dirt in the valve. See section 16.1 and 16.2. Clean the valve or replace if defective.</p> <p>The volume-controlling valves for the wrapping arm (V10/V12) are closed or defective. See section 8.0 and 14.3. Clean valves or replace if defective.</p> <p>The brake is not releasing properly. Mechanical cause. Repair or replace brake.</p> <p>Wrongly adjusted or defective safety valves (V17/V18). Adjust, clean or replace valve.</p> <p>Defective wrapping arm motor. Replace motor.</p> |
| | "The wrapping arm only turns slowly." | <p>The two-stage valve (V11) is not receiving power or is defective. See section 14.3 and 16.1. replace defective valve.</p> <p>The holding valve V19 is not opening. Clean the valve or replace if defective.</p> <p>The volume-controlling valves (V12) are wrongly adjusted. See section 9.0.</p> <p>The brake is not releasing properly. Mechanical cause. Repair or replace brake.</p> |
| | "The speed of the wrapping arm cannot be adjusted." | <p>The volume-controlling valves (V10/V12) are defective or full of dirt. Clean valves or replace if defective.</p> |

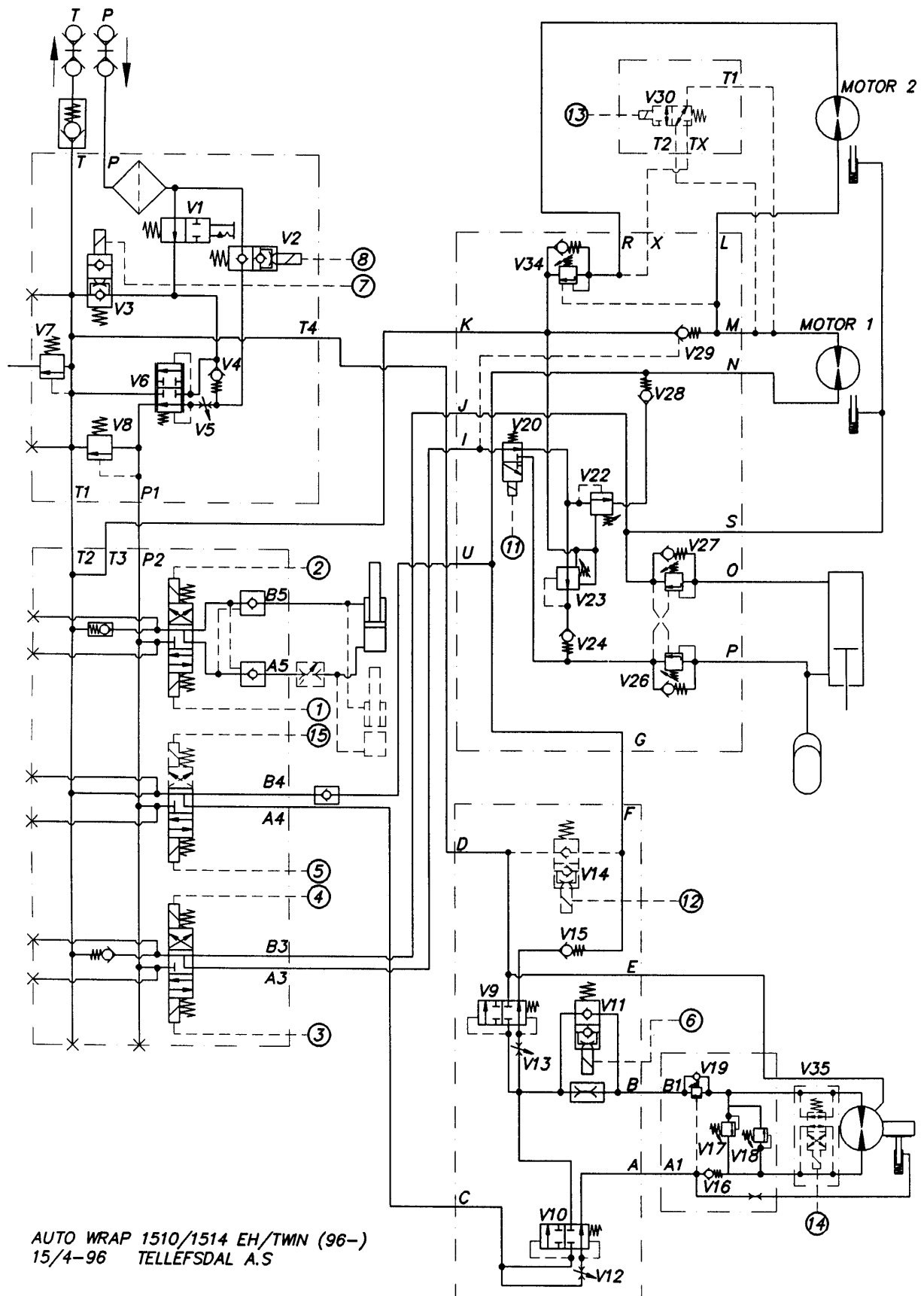
| TROUBLE DISCIPTION | | SYMPTOM CAUSE / SOLUTION |
|--|--|--|
| W R A P P I N G | "The rollers slide apart from each other during loading." | The fault is probably in the holding valve (V26). Clean the valve or have it tested by your dealer. If necessary replace defective valve. |
| | "The wrapping arm turns but the rollers do not rotate." | The volume controlling valves for the rollers (V9/V13) are closed or defective. See section 9.0 and 14.3. Dirt in one of the following valves: V14, V28 or V29. 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 (nos. 1 and 2), are not receiving power or there is dirt in the valves. See section 16.1 and 16.2. The cutter cylinder is defective. Replace. The cutter lifts quickly but drops slowly. The double 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 double pilot-controlled check valve. (See section 14.2.) Replace defective valve or have it tested by your dealer. 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 (section 14-2) 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.) |
| O F F L O A D I N G | "Roller width OUT does not work." | The solenoid valve (no. 4) is not receiving power or there is dirt in the valve. See section 16.1 and 16.2. The holding valve (V26) is not opening. Replace defective valve or have it tested by your dealer. |

There are 3 basics which must **ALWAYS** be followed if the machine is to function correctly

NOTE !



HYDRAULIC CHART,AUTO WRAP 1510/1514/TWIN



AUTO WRAP 1510/1514 EH/TWIN (96-)
15/4-96 TELLEFSDAL A.S

19.0 WARRANTY TERMS.

- 19.1** TELLEFSDAL A.S. warrants the NORSE AUTO WRAP 1510 / 1514 / TWIN 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 payed 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