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Section 1:

Introduction
1: Introduction

The McHale 991B round bale wrapper which you have purchased has been developed through years of constant research and development. Given proper care and attention the 991B will give years of reliable and dependable performance. However it is important that this technical manual is read and fully understood to achieve this, before the machine is operated. As part of this philosophy it is vital to use only genuine McHale replacement parts, as these are manufactured to the same standard as the original machine. These may be obtained through your McHale dealer.

If any part of this manual is not fully understood please contact your McHale dealer who will be able to answer any questions you may have. It is important to quote the machine serial number when requiring spare parts or technical assistance.

This manual covers the following machine variants (Not all variants are available in all markets):

991B   Trailed machine with manual controls.
991BC  Trailed machine with manual controls using cables.
991BJ  Trailed machine with cable control joystick control.
991BJS Trailed machine with hydraulic servo joystick controls.
991BE  Trailed machine using full electronic control.
991BER Trailed machine using full electronic control with remote control

If you require further copies of this technical manual please quote part number: CLT00209

Due to a policy of continuous product development and improvement, McHale Engineering Ltd reserve the right to alter machine specification without prior notice.
Section 2

991 wrapper
Component reference

Contents:

2.1: Getting familiar with the McHale 991 bale wrapper

2.2: Designated use of machine

2.3: Component location
2.1: Getting familiar with the McHale 991 wrapper

The McHale 991 wrapper is protected against many dangers to itself while being operated from the control box in both manual and automatic cycles. However, it is of utmost importance for the safety of the operator and for others, that the operator pay attention to all warnings and instructions given in this manual. In particular all safety devices, decals, guards and controls must be in place and in fully functioning condition.

Never try to clear any malfunction when the tractor is switched on or the machine running. Keep the “danger zone” free of all persons and animals at all times while the machine is in operation. This manual must be read and fully understood by anyone who will operate the machine.

2.2: Designated use of machine

The McHale 991B series round bale wrapper is designed to wrap, with plastic stretch film, cylindrical section bales of forage for the purpose of storage as fodder for livestock. This designation includes movement of machine, between fields by track or road, incidental to the wrappers main use.

The manufacturer will not be held responsible for any loss or damage resulting from machine applications other than those specified above. Any other use the machine may be put to, is entirely at the owners/operators risk.
2.3: Component location

- Bale Damper
- Cut and hold
- Dispenser unit
- Rotation table
- Main Chassis
- Bale lift arm

Cut and hold
Dispenser unit
Bale Damper
Section 3

Health and Safety

Contents:

3.1: General safety

3.1.1: Beware of all safety information
3.1.2: Follow all safety instructions
3.1.3: Store all items carefully
3.1.4: Protective clothing
3.1.5: In case of emergencies
3.1.6: Stay clear of rotating elements
3.1.7: Operating the McHale 991 bale wrapper safely
3.1.8: General safety warnings

3.2: Specific safety

3.2.1: Electronic safety warnings
3.2.2: Hydraulic safety warnings
3.2.3: Noise level
3.2.4: Fire precautions
3.2.5: Safety instruction decal location
3.2.6: Description of safety warnings and instructions
3.2.7: Danger Zone
3.1: General Safety

3.1.1: Be aware of all safety information

The symbol opposite is the symbol used to alert you to safety issues. It appears both in this manual and on some of the safety decals. On the decals it appears on a yellow background while in this manual it appears in black and white.

Follow all safety precautions and practice safe operation of all machinery at all times.

When reading through this manual, pay attention to where you see the above symbol paying extra care to where you will see the Warning and Caution pointers.

3.1.2: Follow all safety instructions

Using this manual, read all safety instructions, messages and be aware of the meanings of all safety decals. Ensure, if safety decals are damaged or missing due to wear and tear or due to component replacement, that they be replaced. Use the Decals section in the provided spare parts book as a handy reference for spare part codes and relevant decals, which are available from your McHale dealer.

As with all machinery, learn all operations and use of controls by reading this manual thoroughly. Do not attempt to let anyone operate this machine without being fully instructed.

3.1.3: Store all items carefully

Store all attachments such as spare net rolls, film rolls and any other stored items in a secure and safe manner so as to prevent items from falling. Keep storage areas clear of bystanders and children.

3.1.4: Protective clothing

Always wear clothing and safety equipment that is fit for the job at hand, never wear loose clothing. In the event of loud noises, wear suitable protective hearing devices. Use of radio (walkman) headphones are not recommended while operating machinery as this impairs operators attention.
3.1.5: **In case of emergencies**

In the event of any accident, emergency equipment should be kept close at hand. A first aid kit and fire extinguisher along with emergency phone numbers should always be available to machine operators.

3.1.6: **Stay clear of rotating elements**

Serious injury or death can result from entanglement of clothing or body parts with PTO shafts, drivelines and other rotating and moving components. Keep all guards in place at all times, only wear close fitting clothing and ensure that tractor engine has stopped, key removed and that PTO has stopped turning before carrying out any adjustments, connections or cleaning of PTO driven equipment.

3.1.7: **Operating the McHale 991 safely**

In order to avoid serious injury or even death by being pulled into the machine:

1. **Never** attempt to do anything to the machine **while the bale wrapper is running**.
2. Disengage oil flow, shut tractor engine off and remove the key.
3. Stand well clear of bale wrapper and tractor when machine is operating.
3.1.8: General safety warnings

- **Read and understand** this operator’s manual before using the machine. If any of the instructions appear unclear do not hesitate to contact your McHale dealer.

- **Only competent persons** who have read and fully understood this manual are qualified to operate this machine. The owner of this machine is obliged by law to ensure that every operator must understand all the functions, controls, working processes and safety warnings before operating the machine.

- **All safety devices** such as guards, protection parts and safety controls must be in place and in fully functioning condition. It is forbidden to operate this machine with defective or incomplete safety devices (never disable or defeat any electrical safety circuits).

- **All safety decals** on the machine must be kept in good legible condition. If they are not they must be replaced by genuine McHale decals from your McHale dealer (part numbers are available in this manual).

- **Before operating** this machine the operator must ensure that all covers are closed and all safety devices are in operating mode.

- **Before operating** this machine the operator must ensure that the manufacturer’s instructions for attaching and detaching the machine are followed. This includes the drawbar attachment, the electric and hydraulic lines, in particular the lighting and brake system.

- **Before operating** this machine the operator must ensure that no persons or animals are carried on the machine or are hidden under the machine (on the tractor persons are only allowed to sit on the relevant seats).

- **Before operating** this machine the operator must ensure that there is no person in the “danger zone” (in front of tractor, between tractor and round bale wrapper, and a minimum of 5 m behind the machine).

  *Note:* It is the operator's responsibility to keep all people out of this area! In this area a person is subject to a risk to his/her own health or safety!

- **While operating** this machine on hilly or sloping ground the operator must take extra precautions, in particular the “danger zone” is increased in such conditions as bales are more likely to roll away causing a potential risk.

- **While operating** this machine the operator must ensure that there is a minimum of 4 m clearance between the machine and any obstacle above, in particular electrical high voltage lines.
➢ **Before working on** this machine, such as replacing net or film rolls, clearing forage away from any part of the machine or altering any setting, the operator must ensure that the tractor has definitely stopped moving, handbrake is applied, engine has stopped and ignition key is removed, PTO shaft is removed from pto stub and electric power supply is disconnected. It is forbidden to open any safety guards or to carry out any work on the machine unless the above-specified precautions have been carried out.

➢ **Warning!** If carrying out inspection during machine operation within the danger zone (**highly dangerous and not recommended!**), then there should be a trained and fully competent second person operating both the tractor and baler controls. If at any time the second operator loses sight of the inspector, turn off all tractor power immediately! Such inspection should only be carried out if all guards are fully in place, machine on level ground and a safe distance from the machine maintained from any hazards on the machine e.g. pick-up region.

➢ **Maintenance and repair work** on this machine should always be carried out in accordance with this manual.

➢ **Maintenance and repair work** exceeding the content of this manual should only be carried out by qualified persons or your *McHale* dealer.

➢ **Before travelling on public roads** the owner of this machine is obliged by law to ensure that every operator has got a valid driving licence and is familiar with the road traffic regulations relating to the country of use.
3.2: Specific safety warnings

3.2.1: Electronic safety warnings

- This machine is equipped with electronic parts and components which comply to the EMC directive 89/336/EEC but still may be influenced by electromagnetic transmissions of other apparatus, such as welding machines, etc.
- Check electric cables regularly for signs of breakage or wear. If in doubt always replace.

3.2.2: Hydraulic safety warnings

- The maximum pressure in the hydraulic system of this machine should not exceed 210 bar.
- Always ensure system is not under pressure before working on the machine. Oil under pressure can penetrate the skin and cause injury. Beware of pipes under accumulator pressure, depressurise lines by unthreading connections extremely slowly.
- Hydraulically actuated devices, such as table tip, lift arm and cutting device must be blocked mechanically against movement, before working on the machine.
- If any hoses are removed or replaced ensure they are marked and re-installed to the correct position during re-assembly.
- Check hoses regularly for signs of leakage or wear. If in doubt always replace – the recommended maximum working time of hoses should not exceed 5 years. Only use exact specification, McHale genuine replacement parts.
- Do not work on hydraulic systems unless you are qualified to do so, this work should only be carried out by qualified persons or your McHale dealer.
3.2.3 Noise level

The European regulation 86/188/EEC directs employers and employees to control the noise level at work. The noise level at field work may differ according to the tractor, to the ground, to the crops and other environmental conditions.

In normal conditions the noise level next to the drivers ear of the McHale 991 round bale wrapper does not exceed 70 dB (A) with the rear screen of the tractor cabin open. The common noise level of the machine and the tractor is primarily influenced by the tractor noise (radio is an additional noise source). It is recommended to operate this machine with closed cabin windows.

3.2.4: Fire precautions

- Be aware that crops are easily flammable.
- Do not smoke or make use of any open fire next to the machine.
- A functioning fire extinguisher should always be available on the tractor.
- The machine is to be kept cleaned of oil, grease, crops or any other flammable material at all times.
- Do not continue work with overheated parts, cables or pipes unless you have identified and eliminated the reason for overheating.
3.2.5: Safety Instruction Decal Locations:

[Diagram showing various safety instruction decals on a tractor and other equipment, with arrows pointing to the different decal locations.]
3.2.6: Description of safety warnings

It is important that all safety warnings and instructions are understood and followed. If any of the decals become damaged or are missing they are available from your McHale dealer. The part numbers are shown in brackets.

Read instruction manual.
(CST00057)

Keep hands out of trap area.
(CST00026)

Lock tap before carrying out maintenance on table. (BJS machines only)
(CST00086)

Danger of rotating parts, foreign objects. Keep clear of machine while working.

Max table speed 30 R.P.M.
(CST00031)
Support table before working under it. Refer to instruction manual.
(CST00059)

Keep hands out of crush area.
(CST00019)

Keep hands clear of rotating rollers.
(CST00017)

Keep clear of bale damper crush area.
(CST00048)

Keep clear of rotating table.
(CST00028)

Do not dismantle. Risk of pressure release.
(CST00056)
**IMPORTANT**

This pin MUST be greased immediately after the lift arm is fitted to the machine

Grease pin immediately after fitting the lift arm
(CST00105)

Diagram of plastic film path through Dispenser.
(CST00049)

Check wheel nuts daily.
(CST00020)

Manual control valve controls.
(CST00064) 991B

Cable control valve controls.
(CST00025) 991BC
Check tyre pressure.
(CST00058)

Bale damper drop speed adjustment
(CST00061)

Grease daily
(CST00060)

Dispenser height setting.
(CST00062)

Lift machine at these points.

Lock joystick before carrying out work on the machine.
(CST00099)
Bale damper skid adjustment.  
(CST0050)

991 BJS joystick operating instructions.  
(CST00065)

Freeflow return to tank.  
(CST0006)

Raise bale damper when lights are being used on the road. Refer to section 6.4 road transport  
(CST00063)

Remove key from tractor when adjusting or repairing machine.  
(CST00015)
3.2.7: Danger zone

The operator must be aware of the “DANGER ZONE” which varies in size depending on operating conditions. The “danger zone” is the hazardous area around a machine i.e. the area in which a bale could land in the event of it being dropped suddenly from the wrapping table or from the mat frame. The “danger zone” for working on level ground is the area around the rotating table (approx. 5 metres radius from the rotating centre axis), 1 metre in front of the table and a minimum of 10 metres at the back of the machine to allow safe bale discharge. It is the operators responsibility to keep persons out of this region.
Section 4

Tractor & Bale wrapper Preparation

Contents:

4.1: Tractor requirements and preparation
   4.1.1: Tractor requirements
   4.1.2: Control box installation
   4.1.3: Lighting system
   4.1.4: Attaching 991 to drawbar
   4.1.5: Attaching the hydraulic hosing to the tractor

4.2: Baler requirements and preparation
   4.2.1: Care of the film dispenser
   4.2.2: Loading plastic film
   4.2.3: Pre-operation checks
4.1: Tractor requirements and preparations

4.1.1: Tractor requirements

The minimum recommended size of a tractor for operating the McHale 991 comfortably, depends mainly on the ground conditions and slope. McHale recommends a tractor size of approximately 75 kW on hilly ground or difficult conditions, an additional 5 to 10 kW is advisable.

Note: Ensure that the tractor has clean, good quality, hydraulic/ universal oil to avoid problems later on. Also, the hydraulic filters on the tractor should be changed regularly, according to the manufacturers service instructions. Do not let dirt get into the hydraulic couplings.

The following items on the tractor are required for attachment of the bale wrapper behind the tractor:

1. Low/High drawbar hitch.*
2. One hydraulic feed supply.
3. One free-flow tank return.
4. One 12 V / 7 pin socket for lighting.
5. One 12 V / 20 Amp euro socket or battery power cable*.
   * Depending on country of use.

4.1.2: Control box installation

The electronic control box must be located inside the tractor cab in the operator’s field of vision, and within easy reach. It is secured to the glass using the suction pad on the rear. Ensure that the cable to the machine is not under tension and not near sharp edges etc.

The control box is to be connected to a 12V / 20 Amp power supply using the supplied euro lead. A good power supply is critical for proper machine operation as the electronic control box is the main interface between the operator and the machine.

Caution: Do not attempt to connect control box to a power supply greater than 12V as machine component damage will result.
4.1.3: Lighting system

The 7 pin plug of the lighting system on the machine must be connected to the 7 pin socket on the tractor. **Note:** Before travelling on a public road the operator must ensure that the (complete tractor and machine) lighting system is in a fully functioning condition.

4.1.4: Attaching to drawbar

The drawbar is to be attached so that the *McHale* 991 is horizontal to the ground as in Fig. 1 “Drawbar attachment”. Machines are set up for hitching to the tractor drawbar as shown in fig. 1 below. Adjustment of the drawbar is shown in fig. 2 below. Once the tractor is attached to the drawbar attach the hydraulic couplings. Depending on the country of use a safety chain may also be required. Detach in reverse order of attachment.

![Fig. 1 Drawbar attachment](image1)

![Fig. 2 Drawbar adjustment](image2)
4.1.5: Attaching the hydraulic hosing to the tractor

*Warning!* When connecting hydraulic hosing to the tractor ensure that the tractor engine is turned off and that the ignition key is removed. Ensure that all hydraulic connections are correctly tightened.

There are a total of two hydraulic hoses that must be connected to the tractor. They are as follows:

A. One ½” female quick release oil supply (max. flow 40 litres per minute).
B. One ½” female quick release for the Tank Return with non return valve (X)
C. One 37 pin ECU socket. 991BE model.

Fig. 3 Hydraulic hose attachment
4.2: Wrapper requirements and preparation

4.2.1: Care of the film dispenser

Before operating the baler ensure that the following procedure is followed to ensure improved plastic application:

- Clean off aluminium feed rollers and check for any tacky material.
- Ensure that both rollers are moving freely.
- Ensure stretch gears (Fig. 5) are greased properly
- Ensure dispenser is at the correct height for the size of bale being wrapped.

**Note:** Never use cleaning agents such as benzene, petrol, turpentine oil or similar cleaning solvents to clean feed roll, otherwise damage may occur!

*McHale* recommend to use any of the following:

- A high pressure washer
- Soapy water.
4.2.2: Loading plastic film

1) Push back handle until dispenser latches open.

2) When removing old roll, push upwards to latch top roll holder in the “up” position. Then remove the old roll and discard carefully.

3) Sit new roll onto bottom roll holder and align with top roll holder.

4) While still holding roll, pull cable to release top roll holder. The roll of plastic film is now held.

5) Thread the film through the dispenser rollers as per the threading diagram.

6) Tie end of plastic film to the bale on the table.

⚠️ Do not attempt to clamp plastic film in cut & hold mechanism.

7) Close dispenser by releasing the latch. The roll should now rest against one of the aluminium rollers.
4.2.3: Pre-operation checks.
Grease the:
- Lift arm cylinder pin
  - X 1
- Lift arm pivot points
  - X 2
- Table roller pillar block bearings
  - X 4
- Cut and hold plunger
  - X 1
- Bale damper pivot points
  - X 4
- Sub chassis pivot points
  - X 2
- Table tip hydraulic cylinder ends
  - X 2
- Dispenser stretch gears
  - X 1
Section 5

Bale wrapper field operation

Contents:

5.1: Wrapping

5.2: Controls for operating 991 series
   5.2.1: Manual 4 lever control. 991B
   5.2.2: Manual 4 lever cable control. 991BC
   5.2.3: Manual joystick cable. 991BJ
   5.2.4: Servo joystick control. 991BJS
   5.2.5: Electronic control. 991BE

5.3 Dispenser height adjustment

5.4 Bale damper speed adjustment

5.5 Rotation speed

5.6 Layers of film
5.1: Wrapping
Wrapping behind tractor (991B series)

The following is the recommended method for working the 991B series after a tractor. It assumes the bales are well shaped for wrapping. However since it is impossible to allow for all differing conditions and terrain it may be necessary for the operator to vary this.

The operator must be aware of the “DANGER ZONE” which varies in size depending on operating conditions. The “danger zone” is the hazardous area around a machine i.e. the area in which a bale could land in the event of it being dropped suddenly from the wrapping table or from the mat frame. The “danger zone” for working on level ground is the area around the rotating table (approx. 5 metres radius from the rotating centre axis), 1 metre in front of the table and a minimum of 10 metres at the back of the machine to allow safe bale discharge. It is the operators responsibility to keep persons out of this region.

1) Ensure the bale lift arm is lowered to the ground.

2) Drive tractor up beside the bale to be wrapped. It will take practice to line up the bale correctly with the wrapper. Ensure the lift arm goes under the bale.

3) Actuate hydraulic control valve (manual control) or button (electronic control) to load bale.

4) The wrapper should now go through a sequence either worked manually, or automatically on electronic machines.
   a) The bale lift arm lifts the bale onto the wrapping table (manual). On electronic machines the auto load cycle can be activated see control box features.
   b) The bale lift arm is lowered to the ground again manually (manual machines). It is lowered automatically in electronic machines
   c) The table starts rotating and plastic film is applied to the bale.
   d) After a few revolutions the plastic is released out of the cut & hold.
   e) The table slows down two revolutions before the required number of revolutions is reached (electronic control)
   f) The table stops rotating when the required number of rotations are reached. It is now lined up for tipping off.
   g) To tip the bale off, the table tip button must be activated (electronic machines).
h) The bale damper raises up and the table tips.
i) The cut and hold closes, holding and cutting the plastic film.
j) The table and bale damper lower down and the bale is lowered to the ground.
k) The table resets to loading position as it is being lowered (electronic).

5) The wrapper is now ready to receive another bale.

6) When changing the plastic film rolls always turn off the tractor and electronics. Always remove ignition key from tractor.

Fig. 1
There are four main functions on a 991 B series wrapper. These are shown in Fig. 1.

1. Lift arm
2. Table rotate
3. Table tip
4. Cut and hold
5.2: Controls on 991B series

5.2.1: 991B Series

The 991B series wrapper controls are four levers. The levers are directly on the valve which is mounted at the rear of the tractor. Hydraulic hoses to the wrapper operate each of the four functions. The valve is never to be mounted inside of the cab of the tractor due to the high hydraulic pressure in the hoses.

1. Lift arm up / down
2. Table rotate reverse/ forward
3. Table tip up/ down
4. Cut and hold open/ close

Fig. 2

Fig. 2A
5.2.2: 991BC Series

The 991BC series wrapper controls are four levers. These levers joined back to the main valve via cables to operate each spool. The valve is mounted on the front of the machine chassis. On the latest model there is a solenoid on the rotation spool to hold the lever into wrapping position for the duration of wrapping.

1. Lift arm up/ down
2. Table rotate reverse/ forward
3. Table tip down/ up
4. Cut and hold close/ open

Fig. 3

Fig. 3A
5.2.3:  991BJ Series

The 991BJ series wrapper control is a cable operated joystick. All the functions are as outlined below with all 4 functions on the one joystick. There is only one switch which operates the lift arm if pressed in one direction and the cut and hold in the other, when the joystick is moved.

The functions are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Joystick function</th>
<th>Control function</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Joystick forward direction</td>
<td>Table tip</td>
</tr>
<tr>
<td>1</td>
<td>Joystick left</td>
<td>Table rotation wrapping</td>
</tr>
<tr>
<td>5</td>
<td>Joystick right</td>
<td>Table rotation reverse</td>
</tr>
<tr>
<td>2A</td>
<td>Joystick left with switch pressed</td>
<td>Lift arm down</td>
</tr>
<tr>
<td>6A</td>
<td>Joystick right with switch pressed</td>
<td>Lift arm up</td>
</tr>
<tr>
<td>4B</td>
<td>Joystick forward with switch pressed</td>
<td>Cut and hold closed</td>
</tr>
<tr>
<td>7B</td>
<td>Switch pressed</td>
<td>Cut and hold open</td>
</tr>
</tbody>
</table>

Fig. 4

Fig. 4A

Fig. 4B
5.2.4: 991BJS Series

The 991BJS series wrapper is controlled by one joystick. This servo operated unit controls all four functions from the tractor with only very low pressure hydraulics through the hoses in the cab. The functions are as follows:

<table>
<thead>
<tr>
<th></th>
<th>Joystick forward direction</th>
<th>table tip</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Joystick left</td>
<td>Table rotation wrapping</td>
</tr>
<tr>
<td>1</td>
<td>Joystick right</td>
<td>Table rotation reverse</td>
</tr>
<tr>
<td>5</td>
<td>Joystick left with button pressed</td>
<td>Lift arm down</td>
</tr>
<tr>
<td>6C</td>
<td>Joystick right with button pressed</td>
<td>Lift arm up</td>
</tr>
<tr>
<td>A</td>
<td>Switch left</td>
<td>Cut and hold open</td>
</tr>
<tr>
<td>B</td>
<td>Switch right</td>
<td>Cut and hold closed</td>
</tr>
</tbody>
</table>

Fig. 5
5.2.5: 991BE Series

The 991BE series wrapper is controlled by this electronic unit (Fig. 6). There are buttons on the unit to control all functions on the wrapper. These functions only work when the unit is in manual mode. In Auto mode the unit will go through the full cycle of picking up, wrapping and tipping off just by pressing the Auto start button.

<table>
<thead>
<tr>
<th>No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display up</td>
</tr>
<tr>
<td>2</td>
<td>Escape back to main display</td>
</tr>
<tr>
<td>3</td>
<td>Enter</td>
</tr>
<tr>
<td>4</td>
<td>Display down</td>
</tr>
<tr>
<td>5</td>
<td>Stop button</td>
</tr>
<tr>
<td>6</td>
<td>Display</td>
</tr>
<tr>
<td>7</td>
<td>Table tip (In Auto starts the tipping part of the cycle)</td>
</tr>
<tr>
<td>8</td>
<td>Table lower</td>
</tr>
<tr>
<td>9</td>
<td>Cut &amp; hold close</td>
</tr>
<tr>
<td>10</td>
<td>Cut &amp; hold open</td>
</tr>
<tr>
<td>11</td>
<td>Table reverse (slow)</td>
</tr>
<tr>
<td>12</td>
<td>Table forward (slow/ fast) Press button for slow speed, release and quickly press again for fast. Resume: Starts the wrapping cycle after film break.</td>
</tr>
<tr>
<td>13</td>
<td>Automatic cycle/Manual cycle</td>
</tr>
<tr>
<td>14</td>
<td>Automatic cycle start</td>
</tr>
<tr>
<td>15</td>
<td>Bale lift arm down</td>
</tr>
<tr>
<td>16</td>
<td>Bale lift arm up</td>
</tr>
<tr>
<td>17</td>
<td>Spare button</td>
</tr>
<tr>
<td>18</td>
<td>Spare button</td>
</tr>
</tbody>
</table>

Fig. 6

Fig. 6A
5.3: Dispenser height adjustment

The dispenser on the 991 series bale wrapper is mounted with three u bolts. (Fig. 7) The plastic to be applied to the bale should always be applied to the middle of the bale (Fig. 7A). This ensures the correct application of plastic.

The location decal in fig. 7 shows the position for the dispenser when wrapping a standard 1.25m bale.
5.4: Bale damper speed adjustment

The speed with which the bale damper (A) leaves the bale to the ground is dependant on the weight of the bale. This speed can be adjusted by a flow restrictor tap (Fig. 8A) which is fitted to all machines.

Tap location is showed by the arrow. For heavy bales the tap is screwed in and out for lighter bales.
5.5: Rotation speed

Rotation speed on all of the 991 series wrappers is determined by the volume of oil going to the motor driving the table (Fig. 9). The only way to slow the rotation speed down is to restrict oil flow from the tractor. Most tractors now have some means of controlling oil flow. The required flow to rotate the 991B at 30 rpm is 25l/m.

5.6: Layers of film

The film application on the 991B series wrapper has a 50/50 overlap. Each layer of film covers the previous layer by 50%.

The correct method of counting the layers required is as follows:

- Rotate the bale until all the crop is covered,
- Add one more rotation to seal the bale,
- This is two layers of film on the bale,
- Typically it will take 7 rotations (750 mm film) to cover a 1.25m bale + one to seal it is 8,
- For four layers multiply this by two, (8 x 2 = 16 Rotations)
- For 6 layers multiply this by 3, (8 x 3 = 24 Rotations)
## Section 6

### Electronic System

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- 6.1.2: Wizard electronic control unit connector
- 6.1.3: Wizard electronic control unit program
- 6.1.4: Main valve solenoid
- 6.1.5: Rotation sensor

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- 6.2.2: Wiring connections
- 6.2.3: Programming BWC
- 6.2.4: Rotation sensor
- 6.2.5: Valve solenoids

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Section 6

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6.4.3: Rotation sensor
6.4.4: Tip sensor
6.4.5: Film sensor
6.4.6: Lift arm potentiometer
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6.6: Sensor testing

6.6.1: Reed sensor testing
6.6.2: Potentiometer testing
6.1: 991B/ BC

6.1.1: Main loom

This main loom is used on the 991B and 991BC machines. There are two connectors on the end of the loom. On the 991B there is only one used for the rotation sensor. The other is idle. On the 991BC the second is also used, for the rotation valve solenoid. One of these connectors is male and the other female. Part no. CEL00187 is for the 991B (Single connector). Part no. CEL00188 is for the 991BC/ 991B (Two connector)
6.1.2: Wizard connector

![Diagram of Wizard connector with pin assignments](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Green</td>
<td>Sensor</td>
</tr>
<tr>
<td>2</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Violet</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brown</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Black</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Ground loop</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Turquoise</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Orange</td>
<td>Solenoid</td>
</tr>
<tr>
<td>9</td>
<td>Green/Red</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Yellow/Red</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ground loop</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Red &amp; Pink</td>
<td>12 Volt</td>
</tr>
</tbody>
</table>

Fig. 2
6.1.3: Wizard Electronic control unit program

The bale wrap computer is fitted to all machines not fitted with Expert electronic control.

The Bale Wrap Computer is used to monitor and control a number of different McHale bale wrapping machines both manual and semi-automatic. It is very important that the correct programme be selected to control the wrapping machine.

<table>
<thead>
<tr>
<th>Programme</th>
<th>Manual</th>
<th>Programme 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>991B</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991BC</td>
<td>cable control</td>
<td>Programme 2</td>
</tr>
</tbody>
</table>

Selecting Programme
Switch off or unplug Bale Wrap Computer.
Press and hold 'cal button'.
Switch on computer.
Release cal button.
The display shows the over speed alarm setting.
Press and release the cal button again.
The last digit will flash '1', '2' or '3'.
Change by pressing 'SET/RESET'
When the correct programme number is displayed switch off the computer.
The settings will be retained in the memory.

For information on the other settings of the bale wrap computer please refer to the separate RDS wizard manual (CLT00031, English, French, German)
6.1.4: Main valve solenoid

Shown in Fig. 3 is the main hydraulic valve for the 991BC. This valve has one solenoid which is on the rotation spool. It will be energised after 2 rotations of the table to keep the table rotating without having to hold the lever in the cab. The solenoid will hold the spool in place until the end of the last rotation. The table will not stop in the correct position to tip off the bale. The solenoid is connected directly to the loom with a two way connector.

There should be 12 volts going to this solenoid when in operation.

If the solenoid will not hold in place:

1. There may not be power getting to it:
   - Faulty power supply
   - Damaged loom
   - Wizard control in the wrong program

2. Solenoid may be damaged:
   - Solenoid not energising
   - Plunger surface damaged

---

**Fig. 3**

**Fig. 3A**

CVA00238
6.1.5: Rotation sensor

The rotation sensor is located at the back of the machine on the sub chassis. It has the magnets passing over it as the table rotates. On the 991B/991BC series machines it takes one pulse of the sensor to count one rotation of the table. There is only one set of magnets (A) on these machines.

If the rotation sensor is faulty or magnet is missing:
- It will not count rotations
- It will not count bales
- It will not show table rotation speed.

It is a standard reed sensor. See Reed sensor testing Sec. 6.6
### 6.2: 991BJ

#### 6.2.1: Main loom scheme

The main loom shown is to fit a 991BJ machine.

- A. Power supply
- B. BWC connection
- C. Rotation sensor
- D. Diverter solenoid (Lift arm)
- E. Diverter solenoid (Cut and hold)
- F. Joystick connection

Fig. 5

---

Fig. 6

Part no. CEL 00009

---

NOTE: diodes if fitted connected as shown
6.2.2: Wiring connections

The joystick wiring.

<table>
<thead>
<tr>
<th>Loom ends (F in Fig. 5)</th>
<th>Joystick end (A Fig. 7)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue</td>
<td>Blue</td>
</tr>
<tr>
<td>Red</td>
<td>Red</td>
</tr>
<tr>
<td>Brown</td>
<td>Black</td>
</tr>
</tbody>
</table>

The control unit wiring: Shown in Fig. 9 below.
6.2.3: Programming BWC

9.1) Bale wrap computer

The Bale Wrap Computer is used to monitor and control a number of different McHale bale wrapping machines both manual and semi-automatic. It is very important that the correct programme be selected to control the wrapping machine.

<table>
<thead>
<tr>
<th>Model</th>
<th>Mode</th>
<th>Programme</th>
</tr>
</thead>
<tbody>
<tr>
<td>991 Farmer</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991B</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991BJ</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991L</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991LB</td>
<td>Manual</td>
<td>Programme 1</td>
</tr>
<tr>
<td>991BJS</td>
<td>Semi-automatic</td>
<td>Programme 2</td>
</tr>
<tr>
<td>995LM</td>
<td>Semi-automatic</td>
<td>Programme 3</td>
</tr>
</tbody>
</table>

(995LM is not covered by this manual)

Selecting Programme
Switch off or unplug Bale Wrap Computer.
Press and hold 'programme button'.
Switch on computer.
Release programme button.
The display shows the over speed alarm setting.
Press and release the programme button again.
The last digit will flash '1', '2' or '3'.
Change by pressing 'SET/RESET'.
When the correct programme number is displayed switch off the computer. The settings will be retained in the memory.

For information on the other settings of the bale wrap computer please refer to the separate RDS bale wrap computer manual (CLT00009, English) (CLT00011, German)
6.2.4: Rotation sensor

The rotation sensor is located at the back of the machine on the sub chassis. It has the magnets passing over it as the table rotates. On the 99BC series machines it takes one pulse of the sensor to count one rotation of the table. There is only one set of magnets (A) on these machines. If the rotation sensor is faulty or magnet is missing:

- No rotation speed will be shown
- It will not count rotations

See REED sensor testing Sec. 6.6
6.2.5: Solenoids

The solenoids on the 991BJ main valve are shown in Fig. 12.

These direct acting solenoids operate two function:

Solenoid A: Lift arm
Solenoid B: Cut and hold

When energised solenoid A will divert the oil from the rotation of the table to the lift arm.

When energised solenoid B will divert the oil from the table tip to the cut and hold.

Fig. 11
6.3: 991 BJS

Fig. 12

6.3.1: BJS Main loom

Colours in brackets

Yellow (Brown) (Range 2006+)

White Green Brown Red Black Yellow

Relay

Computer 12 way BICC 12 way BICC

11 8 12 1

Brown

Blue Red Yellow

Joystick

12V

CEL00175 rev1

BJS Loom 2002

Issue 1: 0109

McHale 991 round bale wrapper Technical service manual

06-13
6.3.2: 991 BJS Main loom (2001 machines)

CEL00118 Loom for 2001 991 BJS machine with red stop switch.

Fig. 13
6.3.3: **Wizard control unit connector**

![Diagram of wizard control unit connector](image)

<table>
<thead>
<tr>
<th>Pin</th>
<th>Color</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Green</td>
<td>Sensor</td>
</tr>
<tr>
<td>2</td>
<td>Yellow</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Violet</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Brown</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Black</td>
<td>Ground</td>
</tr>
<tr>
<td>6</td>
<td>Ground loop</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Turquoise</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Orange</td>
<td>Solenoid</td>
</tr>
<tr>
<td>9</td>
<td>Green/Red</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>Yellow/Red</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>Ground loop</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Red &amp; Pink</td>
<td>12 Volt</td>
</tr>
</tbody>
</table>

*Fig. 14*
6.3.4:  **Wizard electronic control unit**

The bale wrap computer is fitted to all machines not fitted with Expert electronic control.

The Bale Wrap Computer is used to monitor and control a number of different McHale bale wrapping machines both manual and semi-automatic. It is very important that the correct programme be selected to control the wrapping machine.

**991BJS**  Semi-automatic  Programme 2

**Selecting Programme**

Switch off or unplug Bale Wrap Computer.
Press and hold ‘cal button’.
Switch on computer.
Release cal button.
The display shows the over speed alarm setting.
Press and release the cal button again.
The last digit will flash ‘1’, ‘2’ or ‘3’.
Change by pressing ‘SET/RESET’
When the correct programme number is displayed switch off the computer.
The settings will be retained in the memory.

For information on the other settings of the bale wrap computer please refer to the separate RDS wizard manual (CLT00031, English, French, German)
6.3.5: Main valve solenoid

Shown in Fig. 15 is the main hydraulic valve for the 991 BJS. The two solenoids (A) are to operate the cut and hold. Directly operated from the switch on the joystick, there will be power to one of these only when the switch is pressed and held and to the other one when the switch is pressed in the opposite direction.
6.3.6: Rotation sensor

The rotation sensor is located at the back of the machine on the sub chassis.
It has the magnets passing over it as the table rotates. On the 991B/991BC series
machines it takes one pulse of the sensor to count one rotation of the table. There is
only one set of magnets (A) on these machines.

If the rotation sensor is faulty or magnet is missing:
- It will not count rotations
- It will not count bales
- It will not show table rotation speed.

It is a standard reed sensor.
See Reed sensor testing Sec. 6.6
6.3.7: Joystick connections

The wiring of the joystick to the loom is as shown in the diagram below. The colour of the wires on the joystick end changed during production. The colour of the wires on the loom end are always as shown.

On the 4 pin connector on the joystick (Fig. 17) the wire colours are as follows:

- Pin 1: Red or violet
- Pin 1 to switch: Orange or Black
- Pin 2: Blue
- Pin 3: Black or grey
- Pin 4: Yellow or Brown (Orange 2006+)

Fig. 17

Fig. 17A

Colours in brackets used in later production.
6.4: 991BE

6.4.1: Electronic schematic

<table>
<thead>
<tr>
<th>AMP no.</th>
<th>colour</th>
<th>function</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td>green</td>
<td>arm down</td>
</tr>
<tr>
<td>7</td>
<td>white</td>
<td>arm up</td>
</tr>
<tr>
<td>16</td>
<td>orange</td>
<td>rotate fwd.</td>
</tr>
<tr>
<td>13</td>
<td>grey</td>
<td>rotate rev.</td>
</tr>
<tr>
<td>6</td>
<td>black</td>
<td>c&amp;t close</td>
</tr>
<tr>
<td>24</td>
<td>red</td>
<td>c&amp;t open</td>
</tr>
<tr>
<td>22</td>
<td>yellow</td>
<td>tip up</td>
</tr>
<tr>
<td>2</td>
<td>pink</td>
<td>tip down</td>
</tr>
<tr>
<td>18</td>
<td>blue</td>
<td>slow</td>
</tr>
<tr>
<td>11</td>
<td>brown</td>
<td>beacon</td>
</tr>
<tr>
<td>10</td>
<td>grey/blue</td>
<td>spare output</td>
</tr>
<tr>
<td>20</td>
<td>grn/red</td>
<td>tip sensor</td>
</tr>
<tr>
<td>9</td>
<td>wht/grn</td>
<td>rotate sensor</td>
</tr>
<tr>
<td>31</td>
<td>yell/blu</td>
<td>film break sensor (combi)</td>
</tr>
<tr>
<td>33</td>
<td>red/blu</td>
<td>pressure switch</td>
</tr>
<tr>
<td>8</td>
<td>org/grn</td>
<td>safety loop</td>
</tr>
<tr>
<td>30</td>
<td>violet</td>
<td>table position sensor (combi)</td>
</tr>
<tr>
<td>4</td>
<td>white/blue</td>
<td>spare output</td>
</tr>
<tr>
<td>3</td>
<td>red/black</td>
<td>spare output</td>
</tr>
<tr>
<td>1</td>
<td>grey/green</td>
<td>spare input</td>
</tr>
<tr>
<td>17</td>
<td>grey/brown</td>
<td>spare input</td>
</tr>
<tr>
<td>28</td>
<td>white/vio</td>
<td>5 volt</td>
</tr>
<tr>
<td>25</td>
<td>green/black</td>
<td>analogue in</td>
</tr>
<tr>
<td>21</td>
<td>green/blue</td>
<td>gnd (analogue)</td>
</tr>
</tbody>
</table>

35 turquoise gnd.
23 blu/blk gnd
34 yell/red gnd
27 yell/grn gnd
32 org/blu gnd

grn/yel ground loops

Connectors viewed from wiring side

CEL00087
6.4.2: Main component location

Shown below are the locations of the 6 main electronic components on the 991 series bale wrapper.

1. Rotation sensor
2. Tip sensor
3. Film sensor
4. Main valve
5. Slow speed valve (BE only)
6. Lift arm potentiometer (BE only)
6.4.3: Rotation sensor

The rotation sensor is located at the back of the machine on the sub chassis. It has the magnets passing over it as the table rotates. On the 99BC and 991BJS series machines it takes one pulse of the sensor to count one rotation of the table. There is only one set of magnets (A) on these machines.

On the 991BE series machine or any of the electronic control machines it needs two pulses to count one rotation of the table. There is two sets of magnets (same as A), on all machines at 90 degrees to each other on the table.

If the rotation sensor is faulty:
- No rotation speed will be shown
- It will not count rotations
- Table will not stop in correct place
- It will not count rotations

See REED sensor testing Sec. 6.6
6.4.4: Tip sensor

The function of the tip sensor varies depending on model of machine. There is only a tip sensor on electronically controlled machines.
On the 991BE machine the function of the tip sensor is to signal when the table is down far enough (after tipping the bale off) to rotate it to the loading position for the next bale.
On the 991LBER the function is to signal when the table is tipped enough to cut and hold the plastic.
On 991BE:
• Move magnet up to let table down more before rotation.
• Move magnet down to start table rotation earlier.
On 991LBER:
• Move magnet up to reduce the amount table tips before cutting plastic.
• Move magnet to allow table to tip further before cutting plastic.

See REED sensor testing Sec. 6.6
6.4.5: Film sensor

The film sensor is mounted on top of the dispenser gears on all electronically controlled machines. There is a magnet bolted to the bigger gear and this gives the signal that the dispenser roller is rotating which can only happen when there is actually film going on the bale. There is a function to turn on or off this sensor on the electronic control unit. When turned off the signal is ignored and the machine will not stop when film runs out. When turned on, the sensor should send a signal to the electronic control unit to indicate there is film going on the bale. When the film breaks or runs out the signal ends and the table should stop and reverse two revolutions.

If there is film going on the bale and the table stops:
- Sensor not working.
- Magnet missing
- Turned off in operator set-up.

If the film breaks and the table does not stop:
- Faulty sensor
- Magnet missing
- Turned off in operator set-up.

See REED sensor testing Sec. 6.6
6.4.6: Lift arm potentiometer

The lift arm potentiometer shown in Fig. 22 is positioned on the front pivot point of the lift arm (Fig. 22A). This pot is to return a signal to the electronic control unit on the position of the lift arm. The “three pin connector” is plugged into the loom. The pin is located into the lift arm pivot pin. This pin has a flat edge and is locked into position with an allen key threaded through the lift arm pivot pin. The “lift arm location arm” is located into a slotted bracket on the lift arm.

See Sec. 6.6.2: for potentiometer testing.
6.4.7: Pressure switch

The pressure switch (Fig. 23) is threaded into the bottom of the main valve. This port is directly linked to the oil feed supply from the tractor. Once a hydraulic cylinder reaches full stroke and oil pressure reaches 180 bar. The pressure switch closes at this and sends an electrical signal back to the electronic control unit to move to the next stage of the cycle.

1. If the oil pressure is not high enough the unit will not get a signal and it will time out after 8 seconds. If the pressure switch is not working or disconnected this will also happen.

2. If the oil pressure reaches 180 bar before the end of that function it will not finish it. If the pressure switch is set to low this will also happen.

Fig. 23
6.4.8: Main Valve solenoid

Shown in Fig. 24 is the 991BE hydraulic main valve. This is operated from the electronic control unit through the solenoids (A) on the valve. The solenoid receives a 12 volt supply to operate each function. There are two solenoids on each function.

When testing a solenoid there will only be power to it when
- the electronic unit is in manual and the relative button is pressed.
- The electronic control unit (in auto) is running through a cycle and that particular function is in operation.
6.4.9: Slow speed valve

The slow speed valve is only fitted to electronically controlled machines. The slow speed valve is attached to the table drive motor with two bolts. Between both flat surfaces there are two O-rings to seal the units together. This aluminium valve shown in fig. 11 has two oil ports on each end of the valve beside which there are two relief valves (A). The purpose of the relief valves is to allow the return of the excess restricted oil into the return line when slow speed is used or when the table is being reversed. On the face of the valve there is a solenoid. This solenoid when powered restricts the oil flow and gives the table its slow speed. This only happen in forward rotation of the table.

To test slow speed press the rotation button once and keep pressed. The table should rotate in slow speed at about 11RPM. If the button is pressed a second time quickly fast speed is then chosen. With tractor off, oil off and safety arm in place the solenoid should receive power when the button is pressed.

If there is no slow speed only fast:

- Solenoid not getting power.
- Damaged solenoid.
- Damaged cartridge.
- Internal fault in valve.

If there is only slow speed:

- Solenoid continuously getting power.
- Cartridge damaged.
- Slow speed valve attached to motor upside down.

Location on hydraulic drive motor

Fig. 25
6.4.10: **Expert electronic control unit**

The Electronic Control unit is the main interface between the operator and the machine. While the machine is fully automatic, setting up is required before wrapping commences. It is also possible to work the machine manually through the buttons on the box. The electronic control unit is fitted to the following machines:

- 991BE
- 991BER
- 991LBER
- 991TBER

This control unit should have a direct power supply from the tractor battery. It should never read under 12 Volts on the display even when working.

To reset unit back to factory settings:
- Turn unit off,
- Press and hold up arrow,
- With up arrow pressed turn on unit,
- Let up arrow go,
- Press enter button twice,
- When SET DEFAULT DEFAULT SET appears on the screen it is done.
- Turn off and on unit as normal,
- Ensure all settings are set to operators specification and machine use as per operators manual.
### 6.4.11: Electronic control unit Functions

<table>
<thead>
<tr>
<th>No.</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display up</td>
</tr>
<tr>
<td>2</td>
<td>Escape</td>
</tr>
<tr>
<td>3</td>
<td>Enter</td>
</tr>
<tr>
<td>4</td>
<td>Display down</td>
</tr>
<tr>
<td>5</td>
<td>Stop button</td>
</tr>
<tr>
<td>6</td>
<td>Display</td>
</tr>
<tr>
<td>7</td>
<td>Table tip (In Auto starts the tipping part of the cycle)</td>
</tr>
<tr>
<td>8</td>
<td>Table lower</td>
</tr>
<tr>
<td>9</td>
<td>Cut &amp; hold close</td>
</tr>
<tr>
<td>10</td>
<td>Cut &amp; hold open</td>
</tr>
<tr>
<td>11</td>
<td>Table reverse (slow)</td>
</tr>
<tr>
<td>12</td>
<td>Table forward (slow/fast) Press button for slow speed, release and quickly press again for fast. Resume: Starts the wrapping cycle after film break.</td>
</tr>
<tr>
<td>13</td>
<td>Automatic cycle/Manual cycle</td>
</tr>
<tr>
<td>14</td>
<td>Automatic cycle start</td>
</tr>
<tr>
<td>15</td>
<td>Bale lift arm down</td>
</tr>
<tr>
<td>16</td>
<td>Bale lift arm up</td>
</tr>
<tr>
<td>17</td>
<td>Spare button</td>
</tr>
<tr>
<td>18</td>
<td>Spare button</td>
</tr>
</tbody>
</table>
### 6.4.12: Available wrapping programmes

<table>
<thead>
<tr>
<th>Programme</th>
<th>Description</th>
<th>Table start position</th>
</tr>
</thead>
<tbody>
<tr>
<td>STANDARD</td>
<td>O 991BE, 991BER standard field operation</td>
<td>Cut &amp; hold at left side of machine</td>
</tr>
<tr>
<td>COMBI TRAILED</td>
<td>OO Not used on 991B series/991L series</td>
<td></td>
</tr>
<tr>
<td>COMBI STANDARD</td>
<td>IL Not used on 991B series/991L series</td>
<td></td>
</tr>
<tr>
<td>REMOTE r97L</td>
<td>991LBER with bale lift arm</td>
<td>Cut &amp; hold at left side of machine</td>
</tr>
<tr>
<td>REMOTE r94</td>
<td>991LBER standard</td>
<td>Cut &amp; hold at front of machine</td>
</tr>
<tr>
<td>REMOTE r t</td>
<td>991BER remote control operation</td>
<td>Cut &amp; hold at front of machine</td>
</tr>
<tr>
<td>REMOTE</td>
<td>Programme not in use.</td>
<td></td>
</tr>
<tr>
<td>SIDE LOAD REMOTE SR94</td>
<td>991LBER side load</td>
<td>Cut &amp; hold at left side of machine</td>
</tr>
</tbody>
</table>
6.4.13: Menu structure

- **Grand Total**: 267
- **Total A**: 0
- **Total Auto Load Mode**: To Accept
- **MAN**: 0 - 16
- **Total A**: 0
- **14.1 V**: 0 RPM
- **To Change**: Total A
- **To Select**: Total A
- **Menu Structure**:
  - **Operator Setup**: Slow Down Time
    - **To Select**: Slow Down Time
  - **To Select Sequence**
    - **Sequence Standard**: On
    - **Combi Tailed**: On
    - **Combi Std.**: On
    - **Remote**: On
    - **Remote r/f**: On
    - **Remote r/rt**: On
    - **Side Load Remote 994**: On
- **To Select Film Sensor**
  - **Film Sensor**: On
- **To Select Contrast**
- **To Select Remote Type**
  - **Remote Type**
    - **IR - RF - RF Learn**: IR
- **To Select Continuous Cycle**
  - **Continuous Off**: On
- **To Select Auto Load Setup**
  - **Auto Load On**: On
  - **To Select Lower Position**
  - **To Select Float Position**

Use ▲, ▼ to move up and down through the menu options, use ▶ (enter) to select the option and use ESC to return to the previous level.

Using manual switches move Load Arm to desired position and press Enter to store.
6.4.14: Menu features

Working display
When the control box is first switched on it displays "Expert Series" followed by the programme version number. The enter button must be pressed to confirm continuous cycle or auto load sequence. After a short delay the working display appears. The working display is in two halves: the upper half displays machine status manual or automatic, the current wrap count and the preset number of wraps; the lower half displays the voltage and the table speed in RPM; or the total for the selected bale counter. Pressing enter toggles between the two working display options.

Bale Counters
The Expert Series control box contains ten different bale counters (A - J) which can be reset and a grand total counter which cannot be reset.

To Select Bale Counter
From the working display press the down arrow to select "To Change Total" display, press enter to move to the "To Select Total" display, select desired counter (A - J) using up and down arrow buttons and when correct press enter to select, press up arrow or ESC to return to the working display.

Voltage Monitor
The Expert Series control box monitors its operating voltage and displays it during wrapping. If the voltage falls below a safe level LOW BATT is flashed on the display. The usual causes of low voltage are a bad battery or a defective charging circuit, loose or corroded connections or fuses or a faulty power lead to the control box.
To Set Wraps
To change the desired number of film wraps press the down arrow button twice to display the "To Set Wraps" screen, press enter to move to the "Use To Set" screen, use up and down arrow buttons to make changes to the flashing figure and when correct figure shows press enter, the second digit is programmed in a similar manner. When the desired figure is displayed return to the working display by pressing ESC or the up arrow.

Operator Set-up
The Expert Series control box is designed to control a number of different McHale wrapping machines therefore it is very important that the correct wrapping sequence be selected to suit the machine in use before work begins. To enter the operator set up menu press the down arrow three times, press enter once to move to the operator adjustable factors; Slow Down Time, Sequence, Film Sensor, Display Contrast, Continuous Cycle, Auto Load Set up. Select using up and down arrows, press enter to adjust.

Slow Down Time
The table slow down time may be adjusted from within this sub menu, (that is the number of pulses before the end at which the table slows from high speed to low speed -two pulses per rotation- adjustment range 1-4). Normally this will automatically be set when the wrapping sequence is selected.

Wrapping Sequence
It is very important that the correct wrapping sequence is selected and the table rotated to the correct starting position before wrapping starts. Once selected the wrapping sequence will be retained in memory. Refer to available wrapping programmes section 9.2

Film Sensor
The film sensor monitors the passage of film through the dispenser rollers. If the roll empties or the film breaks FILM BREAK will be flashed on the display, the wrapping table will rotate forward in slow speed and pause briefly. The table then rotates slowly in reverse to a position before the film breakage and waits for film to be replaced. The operator must apply the parking brake, switch off the tractor and remove the key, replace the film roll, attach the film to the bale, start the tractor and press `resume` to complete wrapping.
Display Contrast
Extremes of temperature may affect the contrast of the display which is adjustable from the contrast menu.

Continuous Cycle
The Continuous Cycle when enabled allows the wrapping machine to complete the wrapping cycle without waiting for the operator to press the tip switch to start the tipping part of the cycle. Each time the control box is switched on it asks the operator to press enter to confirm that the Continuous Cycle is required.

The continuous cycle should not be used in hilly terrain as the operator needs better control of bale unloading i.e. the bale should be unloaded on level ground.

Auto Load
The Auto Load feature when selected enables automatic loading of the bale. The loading arm normally sits at the preset float position, on approaching the bale Auto Start is pressed, the loading arm drops to the preset lower position and the machine is moved forward to receive the bale. Auto Start is again pressed; the loading arm lifts the bale on to the wrapping table, the arm lowers to the float position and wrapping starts.

Both the float position and the lower position may be adjusted from the control box. To set; move to the 'To select lower position' screen, using manual switches move arm to desired position, when correct press enter to store the setting. The same applies to setting the float position. When settings are correct move to the Auto Load screen and set to ON. More accurate settings can be achieved if the adjustments are done as the arm is moved from a higher to a lower position. Each time the control box is switched on the operator must press enter to confirm that the Auto Load Cycle is required.
6.4.15: Loom adaptor

This loom adaptor will allow you to use an expert series electronic control unit on a machine which has a 24 pin loom. (old type Control unit).

Fig. 26

24 pin receptacle housing

37 pin tab housing

---

CEL00058 991BE OLD AUTO BOX - EXPERT ADAPTOR (37-24 pin adaptor)

---

To use this adaptor with a 991B (Old) control box, the loom will need to be modified. The table above shows how the loom wires are connected to the new 37 pin loom. The purple wire is hidden near the fuse box. This wire is marked on the rear of the 991B control box. To check the correct position of the purple wire, simply connect the purple wire to the 37 pin control box and check for the correct control power. If the 991B control box is used, the purple wire will be connected to the rear of the 37 pin control box. If the 991B control box is used, the purple wire will be connected to the rear of the 37 pin control box.
6.4.16: Input/ output test on expert control unit

Scroll down to Technician setup screen and hold down arrow for three seconds until the Input Check screen appears. Pressing the 'Enter' key moves through the displays.

The Input Check screen shows the status of the control box inputs.

'-' indicates the input is off while ' ' shows the input is energised.

Pressing 'Enter' again moves to the Output check screen. Pushing the appropriate button on the control box will energise the output.
6.5: Remote Type
This option is used to select the remote control type. There are 2 different types, the older type Infra-red (IR) (Fig. 27) and Radio (RF) (Fig. 28).

6.5.1: Infra-red Remote
Whenever an Infra-red remote is being used, select “IR”. Connect the receiver to the serial port on the control box and select Auto mode.
The cycle can be started by pointing the remote at the receiver and pressing Auto Start. The Stop button will stop the cycle at any time.
The other two buttons will rotate the table in forward and reverse.

6.5.2: Radio Remote
Whenever a Radio remote is being used, the remote frequency must be “learned” by the control box. Select “RF LEARN” and connect the receiver to the serial port on the control box. Press the stop button on the remote. A code will appear on the screen to show that the radio frequency has been stored.
Then select “RF” and the remote is ready to use.
There is a safety button located on the back of the remote which needs to be pressed simultaneously with any function button to activate it. This safety button doesn’t need to be used for the Stop button.
There is a very long range with these radio remotes, so care must be taken not to accidentally press any buttons even when far away from the machine.
6.5.3: Infra red receiver wiring

Fig. 29
6.5.4: Radio receiver wiring

Fig. 30
6.6: Sensor testing

6.6.1: Reed sensor testing

Function

The chopping knives on and net cut sensors are 12 mm stainless steel reed sensors. These sensors contain a glass reed switch in series with a 100 Ohm resistor. The switch closes when a magnet is placed near it’s front face, 25 mm approx. For best range the magnets are usually mounted with stainless steel bolts – non magnetic.

Testing

Connect a multi-meter set on the Ohms ‘Ω’ range to the sensor. The meter should show a very high reading or open circuit, placing a magnet close to the sensor should reduce the resistance to approximately 100 Ohms.

These sensors can be monitored from within the Input/Output test menu.

Note: All sensors must be handled with care, the glass reed switch inside is easily damaged, do not subject to mechanical shocks or over tighten.
6.6.2: Potentiometer testing

Total potentiometer resistance is 1000 ohms.

Set the multi-meter to measure resistance Ohms.
With the multi-meter pins connected to the green/ yellow wire and one other wire (Blue or Brown), rotating the potentiometer should increase or decrease the resistance. It should vary from 0 –1000 ohms. The reading between green/ yellow and brown wire added to the reading between green/ yellow and blue wire should accumulate to about 1000 Ohms. As pin is rotated reading should change.
Section 7

Hydraulic System

Contents:

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7.2: Main valve 991B/ BC
  7.2.1: Hydraulic scheme
  7.2.2: Hosing diagram
  7.2.3: Hydraulic valve assembly
7.3: Main valve 991BJ
  7.3.1: Hydraulic scheme
7.4: Main valve 991BJS
  7.4.1: Hydraulic assembly
  7.4.2: Hydraulic valve to joystick assembly
  7.4.3: Hydraulic diverter valve
7.5: Main valve 991BE
  7.5.1: Hydraulic scheme
  7.5.2: Hydraulic assembly
  7.5.3: Hydraulic valve assembly
7.6: Hydraulic spool valve set-up (Open/ Closed centre)
7.7: Table rotation motor
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  7.8.1: Cut and hold assembly
  7.8.2: Accumulator pressure
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7.9: Gearbox seal kit
  7.9.1: Gearbox assembly
7.1: Component location

Fig. 1

- Lift arm cylinder
- Main Control Valve
- Table drive motor
- Main table gearbox
- Cut and hold
7.2: Main valve 991 B/ BC

The 991 BC/ B valve is a simple four lever control spool valve as shown in Fig. 2. Each of the four levers operates the four functions on the 991 series wrapper. A in Fig. 2 shows the main relief valve which is set at 230 bar (4.5 turns out) on an open centre hydraulic system and screwed fully in on a closed centre hydraulic system. To change the valve from one hydraulic system to the other plug B must also be changed. See Section 7.5.

Each of the lever pivot covers (Marked C) are removed to fit the cables which allows this valve to be mounted on the machine on a 991BC as opposed to on the tractor for the 991B series.

The spool inside of the valve may be removed from the bottom of the valve shown in D Fig. 2A.

Once the top lever pivot cover is removed and then the bottom cover the spool will drop down. There are no seals between the spool and valve housing. It is machined to a very fine tolerance.

On the 991BC valve there is a solenoid on the table rotation spool to hold it in working position while wrapping. (Fig. 2A).

Fig. 2B shows the 991B valve.
7.2.1: Hydraulic scheme 991B/ BC

[Diagram of hydraulic scheme 991B/ BC]
7.2.2: Hosing diagram 991B/ BC
7.2.3: Hydraulic valve assembly 991B/ BC
7.3: 991BJ main valve.

With only two spools on the valve operating the table rotation and the table tip, the other two functions on the 991BJ are found on an additional valve mounted to the main valve shown in Fig. 3A.

The solenoids on the valve are shown in Fig. 3. These operate two diverters on the valve.

These direct acting solenoids operate two functions:
- Solenoid A: Lift arm
- Solenoid B: Cut and hold

When energised solenoid A will divert the oil from the rotation of the table to the lift arm.

When energised solenoid B (Fig. 3) will divert the oil from the table tip to the cut and hold.

A marked in Fig. 3A is a lever which is used to convert the main valve from open to closed centre hydraulics. Lever up is for open centre and down for closed centre.

B marked in Fig. 3A is the main relief valve which should be set at 230 bar. This is 4.5 threads out from fully screwed in.
7.4: Main valve 991BJS

The main valve on the 991 BJS is a servo control hydraulic unit. With the oil flowing through the main valve, only a supply of oil under low pressure (14 Bar) is fed to the control joystick.

There are two solenoids on the valve to operate the table rotation and the table tip. The Lift arm is operated through diverter valve D. See sec 7.4.3. The cut and hold is operated through a diverter valve (V) mounted is series with the main valve. When the solenoid is operated from the switch on the joystick the oil is diverted to the cut and hold.

There is a blow off valve (A in Fig. 4) which is there to protect the valve. If the pressure in the system is above 70 bar it will dump oil through this port.

The Main relief valve marked R is set to 230 bar for an open centre hydraulic system (4.5 threads out) and screwed all the way in for closed centre. In Fig 4A the plug fitting marked P is to be changed when changing from open to closed centre system.

---

**Fig. 4**

**Fig. 4A**
7.4.1: Hydraulic assembly

Diagram showing hydraulic assembly components such as Table Tip Ram, Cut & Hold Ram, Accumulator, Gearbox, Motor, and other hardware parts connected by hydraulic lines.
<table>
<thead>
<tr>
<th>Item</th>
<th>Part Code</th>
<th>Description</th>
<th>Qty</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CVA00066</td>
<td>VALVE CTL 4 BANK BJS SERVO</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>CVA00098</td>
<td>VALVE NON RET 3/8&quot; 0.5 BAR</td>
<td>1</td>
</tr>
<tr>
<td>3</td>
<td>CHY02100</td>
<td>HOSE KIT TABLE TIP LOCK 991BJS</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>CHY02002</td>
<td>ADAPTOR 3/8&quot; BSP M-M</td>
<td>16</td>
</tr>
<tr>
<td>5</td>
<td>CHY00084</td>
<td>HOSE 3/8&quot;X930 F/ST F/ST</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>CHY00086</td>
<td>HOSE 3/8&quot;X510 F/ST 90</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>CHY02097</td>
<td>T PIECE 3/8&quot; M-M-F</td>
<td>3</td>
</tr>
<tr>
<td>8</td>
<td>CVA03007</td>
<td>VALVE RESTRICTOR 3/8&quot;</td>
<td>1</td>
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<tr>
<td>9</td>
<td>CHY02008</td>
<td>ADAPTOR 1/2&quot; M 3/8&quot; M</td>
<td>7</td>
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<td>10</td>
<td>CHY00082</td>
<td>HOSE 3/8&quot; X3210 F/ST 90</td>
<td>4</td>
</tr>
<tr>
<td>11</td>
<td>CHY00085</td>
<td>HOSE 3/8&quot;X2540 F/ST 90</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>CHY02098</td>
<td>ADAPTOR 3/8&quot; BSP M-F</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>CHY00087</td>
<td>HOSE 3/8&quot;X1220 BANJO 90</td>
<td>1</td>
</tr>
<tr>
<td>14</td>
<td>CHY00083</td>
<td>HOSE 3/8&quot;X4000 F/ST 90</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>CHY00089</td>
<td>HOSE 1/2&quot;X2400 M 90</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>CHY00088</td>
<td>HOSE 3/8&quot;X2500 F/ST BANJO</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>CHY02015</td>
<td>QR 1/2&quot; MALE PARKER 7814G4X4</td>
<td>2</td>
</tr>
<tr>
<td>18</td>
<td>CMT00002</td>
<td>MOTOR 250CC 4BOLT 1 1/4&quot; TAPER</td>
<td>1</td>
</tr>
<tr>
<td>19</td>
<td>CVA00011</td>
<td>VALVE RELIEF CL OMS100&amp;130BAR</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>CHY00098</td>
<td>ADAPTOR 3/8&quot; BANJO BOLT</td>
<td>2</td>
</tr>
<tr>
<td>21</td>
<td>CVA02999</td>
<td>VALVE NON RET 1/2&quot; 0.5BAR</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>CHY02013</td>
<td>ADAPTOR 1/2&quot; BSP M/M</td>
<td>1</td>
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<tr>
<td>23</td>
<td>CVA03100</td>
<td>VALVE ON/OFF 3/8&quot; BALL TYPE</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>CHY02098</td>
<td>ADAPTOR 3/8&quot; BSP M-F</td>
<td>2</td>
</tr>
</tbody>
</table>
7.4.2: Hydraulic valve to joystick assembly
7.4.3: Hydraulic diverter valve

The hydraulic diverter valve shown in Fig. 5 is used to operate the lift arm of the machine. Oil will flow through this valve in normal function to operate the table rotation. When the solenoid is energised the oil is diverted to the lift arm. A good 12V power supply is needed to ensure correct operation of the solenoid. Fig 5A shows the position the valve is mounted in relation to the main valve.

Fig. 5

Fig. 5A
### 7.5: Main valve 991BE

The main valve on the 991BE series is a fully electronic controlled four bank valve. Eight solenoids operate the four functions on the wrapper. The valve can also be operated from the spool levers which still exist as standard.

To change the valve from open to closed centre hydraulics, the relief valve R (Fig. 6A) should be screwed all the way in and the change plug P (Fig. 6B). See Section 7.6.

Main relief should be set to 230 bar pressure.

The pressure switch marked S in Fig. 6A converts the hydraulic pressure to an electrical signal. It is set to 180 bar.
7.5.1: Hydraulic scheme
7.5.2: Hydraulic assembly
7.5.3: Hydraulic valve assembly
7.6: **Hydraulic spool valve setup**

The wrapper hydraulic valve must be set up in accordance with the type of hydraulic system on the tractor that is being used. Check the tractor manual or dealer if unsure of which system is used on the tractor. If in any doubt after checking, use open centre settings as this will not damage the tractors hydraulics. The valve may be set up in two different ways:

**Plug A (manual, part no CVA06003) (electronic, part no CVA06004)**
This plug is used for both open centre and load sensing hydraulic systems. The hydraulic valve is set up to this specification when leaving the factory. When using load sensing hydraulics always set tractor oil flow to achieve 30rpm on the table using the flow control on the tractors auxiliary valve.

**Plug B (part no CVA06001)**
This setting is used for closed centre hydraulic systems.

Changing from plug A to plug B (Manual & Electronic valves & BJS valves)
1) Remove plug A and replace with closed centre plug B.
2) Tighten in relief valve fully.

Changing from plug B to plug A (Manual & Electronic valves & BJS valves)
3) Remove closed centre plug B and replace with plug B.
4) Using a pressure gauge set relief valve to 230 bar.

<table>
<thead>
<tr>
<th>991B &amp; 991BC valve</th>
<th>991BE valve</th>
<th>991BJS (Joystick)</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Diagram PLUG A" /></td>
<td><img src="image2.png" alt="Diagram PLUG A" /></td>
<td><img src="image3.png" alt="Diagram PLUG A" /></td>
</tr>
<tr>
<td><img src="image4.png" alt="Diagram PLUG B" /></td>
<td><img src="image5.png" alt="Diagram PLUG B" /></td>
<td><img src="image6.png" alt="Diagram PLUG B" /></td>
</tr>
<tr>
<td><img src="image7.png" alt="Diagram PLUG B" /></td>
<td><img src="image8.png" alt="Diagram PLUG B" /></td>
<td><img src="image9.png" alt="Diagram PLUG B" /></td>
</tr>
</tbody>
</table>
7.7: Table motor

This 250cc hydraulic drive motor rotates the table. A 12 tooth sprocket on the motor drives a 38 tooth sprocket on the table via a 16B chain. The end of the shaft is keyed and tapered. There is a valve fitted to the motor on all machines. There are two different types of valve shown in 7.7.1 and 7.7.2. The motor should not be used without a valve. Both have relief valves to protect the motor. Motor shaft area should be kept clean and free from crop and plastic to avoid damage to the machine.

7.7.1: Table motor slow speed valve

The slow speed valve is mounted directly to the motor. It has a relief valve to protect the motor in each direction. Set to 130 bar for forward rotation and 100 bar for reverse rotation. The solenoid is activated to slow the table rotation down to slow speed. About 12RPM. This valve is only used on electronically controlled machines. If this valve is not working correctly then the table will either stop dead when slow speed is to kick in or it will keep the table rotating at full speed. In this case the table will over shoot its stopping position.

If the slow speed is not working and there is no electrical fault there could be a cartridge or internal fault in the valve. If this valve is fitted incorrectly (up side down) then there will only be slow speed.
7.7.2: Table motor relief valve

The valve is mounted directly to the motor. It has a relief valve to protect the motor in each direction. Set to 130 bar for forward rotation (A) and 100 bar for reverse rotation (B).

Fig. 9
7.8: Cut and hold

The cut and hold unit shown has a double acting cylinder operated by the main valve in one direction and an accumulator on the other. When the cylinder extends the plastic is cut and held. After the bale is rotated 3 revolutions at the start of wrapping the cylinder is retracted to release the plastic film. It is the accumulator pressure that opens the cut and hold cylinder to do this.

On the cylinder there is a non return valve welded (N). This is to allow the recharge of the accumulator. See section 7.8.2.

When the cut and hold extends it holds the plastic between the cylinder end and the plunger shown in Fig. 10B. There should enough travel in the cylinder to compress the spring enough that the plastic passes the knife (K). If it will not do this then there is possibly too much oil in the accumulator. If the cylinder does not open fully when releasing the film then there is possibly not enough oil in the accumulator or too much back pressure in the system for it to be effective. Ensure a free flow return to tank is always used on the tractor.
7.8.1: Cut and hold assembly
7.8.2: Accumulator pressure

The cut & hold is held open by a hydraulic accumulator which is primed before leaving the factory. If for whatever reason the pressure drops or increases it is possible to prime the circuit again as follows.

It is very important that care is taken in carrying out the following procedure to protect both the operator and any personnel that may be nearby. If unsure of how to carry out this procedure entrust the job to your McHale dealer.

To increase accumulator pressure.

1) Remove blanking cap on the hydraulic cylinder.

2) Remove the cut & hold feed pipe (and adaptor) and fit to the open port.

3) Operate the cut and hold to prime system. It only needs a small amount of oil to prime back up.

4) Remove hydraulic pipe (and adaptor) and refit to original position.

5) Replace blanking cap on priming port. Operate cut and hold to ensure it is opening and closing. Repeat if not fully primed.

To decrease accumulator pressure.

6) Remove blanking cap on hydraulic cylinder.

7) Insert a small punch into the hydraulic cylinder port. There is a one way ball valve in the cylinder which the punch needs to unseat to release oil. Always cover the punch with a cloth to prevent oil contacting skin.

8) Replace blanking cap and test cut and hold to ensure it is opening and closing correctly.
7.8.3: Accumulator test.

There are two accumulators on the machine.

1. **The chamber density valve:** This holds the chamber shut as the crop forces against in to form a bale. The pressure on the density clock should increase gradually as the bale is nearly full. If there is a sudden rise the accumulator may not be working.

2. **The knife valve:** this accumulator is to protect the knives while chopping. If there is a problem with the knives the accumulator may be faulty.

To test either accumulator:

⚠️ **Warning! Ensure the pressure in the relative clock on the front of the machine is at 0 bar.**

1. Remove the accumulator
2. Look into the end of it. If there is a green plastic seal showing (A) and cannot be pushed in, it can be assumed that it is ok.
3. If this cannot be seen or can be moved the accumulator should be replaced.
7.9: Gearbox seal kit

The gearbox has a sealed unit to bring oil to the cut and hold. Hydraulic pressure from the valve is carried through the gearbox. The main housing holds the seals to the rotating centre shaft.

A: Outlet port to cut and hold.
B: Inlet port from the main hydraulic valve.
C: Shows both places where oil will leak if internal seals are damaged.

For gearbox assembly see drive section

![Gearbox seal kit diagram](image-url)
7.9.1: Gearbox assembly
Section 8

Drive System

Contents:

8.1: Table drive assembly
  8.1.1: Drive assembly parts

8.2: Gearbox
  8.2.1: Gearbox assembly
  8.2.2: Gearbox parts
  8.2.3: Gearbox drive mechanism
  8.2.4: Gearbox repair

8.3: Table roller drive

8.4: Dispenser drive gears
8.1: Table drive assembly

The table rotation drive comes from a 250 cc hydraulic motor. This motor mounted to the sub-chassis has a 12 tooth sprocket. This is on a keyed tapered shaft. The 38 tooth sprocket on the table gearbox is driven by this motor via a 16B chain (Part 11). The chain is adjusted by the motor adjusting bolt (Part 15) which pulls the motor adjusting plate (Part 21) away from the gearbox.
## 8.1.1: Drive assembly parts

<table>
<thead>
<tr>
<th>No.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>CMT00015</td>
<td>MOTOR SPINDLE NUT</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>CMH00061</td>
<td>MOTOR SPROCKET 12 TOOTH 1”</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>CFA00151</td>
<td>BOLT M16X40 Z/P</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>CFA00124</td>
<td>NUT M12 NYLOC</td>
<td>4</td>
</tr>
<tr>
<td>8</td>
<td>CFA00079</td>
<td>BOLT M12X45</td>
<td>4</td>
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<tr>
<td>9</td>
<td>ACH00010</td>
<td>SUB CHASSIS FRAME 991B</td>
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</tr>
<tr>
<td>10</td>
<td>CFA00157</td>
<td>KEY 8X7X35</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>CCH00003</td>
<td>CHAIN 16B 1” 47 LINKS</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>CBE00002</td>
<td>RUBBER BUFFER M10 THREAD</td>
<td>2</td>
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<tr>
<td>13</td>
<td>CFA00141</td>
<td>SPRING WASHER 16mm</td>
<td>4</td>
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<tr>
<td>14</td>
<td>CZD00192</td>
<td>WASHER 17X45X4</td>
<td>4</td>
</tr>
<tr>
<td>15</td>
<td>CFA00041</td>
<td>MOTOR ADJUSTING BOLT M16X240</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>CFA00179</td>
<td>BOLT 10X40 SOCKET CAP SCREW</td>
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<tr>
<td>17</td>
<td>CVA00011</td>
<td>RELIEF VALVE DANFOSS/OMS</td>
<td>1</td>
</tr>
<tr>
<td>17A</td>
<td>CVA03000</td>
<td>SLOW SPEED VALVE DANFOSS OMS</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>CMT00002</td>
<td>MOTOR 250cc CHAR LYNN</td>
<td>1</td>
</tr>
<tr>
<td>20*</td>
<td>CSE00082</td>
<td>HALF SEAL KIT CHAR LYNN</td>
<td>1</td>
</tr>
<tr>
<td>20*</td>
<td>CSE00081</td>
<td>SEAL KIT CHAR LYNN COMPLETE</td>
<td>1</td>
</tr>
<tr>
<td>20*</td>
<td>CSE00083</td>
<td>SEAL KIT MOTOR DANFOSS</td>
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<tr>
<td>21</td>
<td>ACH00020</td>
<td>MOTOR ADJUSTING PLATE</td>
<td>1</td>
</tr>
<tr>
<td>22</td>
<td>CFA00128</td>
<td>NUT M16 NYLOC</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>CFA00021</td>
<td>SPLIT PIN 4X50</td>
<td>1</td>
</tr>
</tbody>
</table>
8.2: Table drive gearbox

8.2.1: Gearbox assembly

Fig. 2
### 8.2.2: Gearbox parts

<table>
<thead>
<tr>
<th>No.</th>
<th>PART NUMBER</th>
<th>DESCRIPTION</th>
<th>QUANTITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>ACH00015</td>
<td>COMPLETE GEARBOX NEW</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>ACH00029</td>
<td>GEARBOX REBUILD KIT</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>CFA00002</td>
<td>CIRCLIP 62mm INTERNAL</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>CFA00213</td>
<td>SPACER SHIM</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>CFA00009</td>
<td>ROLL PIN 8X40</td>
<td>1</td>
</tr>
<tr>
<td>4A</td>
<td>CFA00006</td>
<td>ROLL PIN 5X40 INSERT</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>CFA00007</td>
<td>ROLL PIN 6X60</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>CFA00011</td>
<td>ROLL PIN 8X60</td>
<td>1</td>
</tr>
<tr>
<td>7</td>
<td>CMH00213</td>
<td>GEARBOX CROSS SHAFT</td>
<td>1</td>
</tr>
<tr>
<td>8</td>
<td>CBR00001</td>
<td>GEARBOX BEARING 6007 2RS</td>
<td>2</td>
</tr>
<tr>
<td>9</td>
<td>CZF00169</td>
<td>GEARBOX TOP PLATE</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>CBR00002</td>
<td>GEARBOX BEARING 6215 2RS</td>
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</tr>
<tr>
<td>13</td>
<td>CFA00213</td>
<td>SPACER SHIM</td>
<td>3</td>
</tr>
<tr>
<td>14</td>
<td>CFA00045</td>
<td>BOLT M6X16</td>
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<tr>
<td>15</td>
<td>CMH00064</td>
<td>GEAR BOX SHIM 36X50X6</td>
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<tr>
<td>16</td>
<td>CMH00054</td>
<td>BEVEL GEAR 16 TOOTH MOD/4</td>
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</tr>
<tr>
<td>17</td>
<td>ACH00034</td>
<td>GEAR BOX HOUSING</td>
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</tr>
<tr>
<td>19</td>
<td>CMH00032</td>
<td>SEAL BLOCK HOUSING</td>
<td>1</td>
</tr>
<tr>
<td>20</td>
<td>CSE00001</td>
<td>MAIN ROTARY SEAL GEAR BOX</td>
<td>2</td>
</tr>
<tr>
<td>22</td>
<td>CBR00003</td>
<td>BEARING 6216 2RS</td>
<td>1</td>
</tr>
<tr>
<td>24</td>
<td>CMH00031</td>
<td>SPLIT RING</td>
<td>1</td>
</tr>
<tr>
<td>25</td>
<td>CMH00019</td>
<td>GEAR BOX MAIN SHAFT</td>
<td>1</td>
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<tr>
<td>26</td>
<td>CFA00003</td>
<td>CIRCLIP 85mm EXTERNAL</td>
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<td>27</td>
<td>CFA00011</td>
<td>ROLL PIN 8X60</td>
<td>1</td>
</tr>
<tr>
<td>28</td>
<td>CFA00007</td>
<td>ROLL PIN 6X60</td>
<td>1</td>
</tr>
<tr>
<td>29</td>
<td>CFA00042</td>
<td>BOLT M16X50</td>
<td>6</td>
</tr>
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<td>30</td>
<td>CFA00032</td>
<td>BOLT M12X30 Z/P</td>
<td>2</td>
</tr>
<tr>
<td>31</td>
<td>CHY02001</td>
<td>3/8&quot;M-3/8&quot;F EXTENSION</td>
<td>1</td>
</tr>
</tbody>
</table>
8.2.3: Gearbox drive mechanism

The assembly of the gearbox is shown in the three pictures below.

In Fig. 3
- the base plate and centre shaft as one machined piece
- the main bearing in place.
- The 16 tooth bevel gear which is held in place with a roll pin or in later machines with both a roll pin and a key way.

In Fig. 4
- The main housing of the gearbox with the holes for the cross shaft assembly
- The 38 tooth main sprocket which is welded to the main housing on one side.

In Fig. 5
- The assembled gearbox with both bevel gears and cross shaft housing in place.
8.2.4: Gearbox repair

There is a gearbox repair kit available with all of the main components. The steps to dismantle the gearbox:

- Un-tension the table chain and drop motor from sub chassis.
- Remove nuts on sub chassis (Fig. 6)
- Lift off table from chassis and stand on edge (Fig. 6B).
- Remove top cover from gearbox (Fig. 6A).
- Remove the roll pin holding the cross shaft in cross shaft housing.
- Slide out cross shaft free from the gearbox.
- Un-do bolts bolting gearbox to table (Fig. 6D).
- Use M12 threaded holes on sprocket to remove complete gearbox from table.
- Remove cross shaft housing from gearbox (Fig. 6A).
- Remove circlip from centre shaft (Fig. 6C).
- Some older machines (Pre ‘08’) will have two half circle rings which need to be removed too. On new machines circlip is directly on the centre shaft.
- Once this is removed the centre shaft can be forced down out of the gearbox, using a press if necessary.
8.3: Table roller drive

The table roller drive comes from the gearbox cross shaft to a sprocket (A in Fig. 7). The drive is taken to a sprocket on the shaft of the driven roller on the table with the 12B chain (Fig. 7A). This sprocket is a shear bolt unit (B in Fig. 7B) designed to protect the drive to the rollers. This M8 bolt will shear if the drive is shock loaded in any way.
8.4: Dispenser drive gears

The dispenser drive gears (Fig. 9) are situated on top of each of the two aluminium stretch rollers. Depending on the stretch required the no. of teeth on each gear will vary.
55% stretch : 58 teeth 37 teeth
64% stretch : 59 teeth 36 teeth
70% stretch : 60 teeth 35 teeth

It is important that these gears are kept greased to ensure free running of the aluminium rollers. Any restriction will cause the plastic to over stretch or tear. If the gears mesh too tightly it can cause one tight spot when rotating the rollers, this will also cause the plastic to tear.

Fig. 9
Section 9

Machine Maintenance

Contents:

9.1: Maintenance safety
9.2: Maintenance intervals
9.3: Chain adjustment
9.4: Recommended lubricants
9.5: Tightening torque values
9.1: Maintenance safety

The following section provides a list of areas which can be checked during an end of year service or after a pre-determined number of bales.

It is important to note that this section provides guidelines which trained service personnel can follow. Other service issues may need to be taken into consideration due to crop and ground conditions in the country in question.

Warning!

➢ Ensure to wear proper safety equipment at all times when working with the machine, such as gloves, eye protection etc. and follow all safety decals and instructions as stated in this manual.

➢ McHale recommend that nobody ever be in the danger zone (for additional information on the danger zone please refer to section 3) at any time during machine operation, but in the event of carrying out inspections (contrary to our safety recommendations) when the machine is in operation, there must always be a second operator at the tractor controls (who is fully competent in the operation of both the tractor and the machine) in case emergency stop action is required.
9.2: Maintenance Intervals

The following intervals should be adhered to, to ensure long and efficient life of the machine. They assume constant working during the wrapping season.

1) First 5 working hours

1) Check all nuts and bolt for tightness. Tighten if necessary.

1) Every day

1) Grease bale lift arm hinges. (2)
2) Grease bale lift arm hydraulic cylinder ends. (2)
3) Grease sub chassis pivots. (2)
4) Grease table tip hydraulic cylinder ends. (2)
5) Grease bale damper hinge pivots. (4)
6) Grease bale damper hydraulic cylinder ends. (2)
7) Grease side tip bale damper hinges (option). (2)
8) Check wheelnuts. (12)
9) Check all guards and safety related components.
10) Check for any oil leaks and damaged pipes.

2) Every week

1) Grease table roller bearings. (4)
2) Grease cross shaft bearing. (1)
3) Grease dispenser top coil roller shaft. (1)
4) Grease cut and hold plunger. (1)
5) Grease sidetip latch. (1)

3) Every month

1) Grease parking jack. (1)
4) Every year

1) Clean and lubricate dispenser gears.
2) Check table gearbox for grease.
3) Grease shearbolt to sprocket flange on table drive roller.

It may become necessary from time to time to clean the dispenser rollers as they pick up the “tack” from the plastic film.

At the end of the wrapping season the machine should be washed and cleaned. Any damaged paintwork should be touched up. Any exposed rods of hydraulic cylinders should be greased. Any maintenance or repairs should be carried out at this stage. The electronic control box is not waterproof so must always be stored in a dry environment.
9.3: Chain adjustments

It is important for the efficient operation of the machine that all drive chains are kept correctly tensioned. The following is a general guide to chain adjustment.

The sag is measured at the midpoint of the chain between the sprockets. Always ensure one side of the chain is tight so that the correct reading is obtained. Even though some drives differ in detail the basic adjustments stay the same.

![Figure 6 Measuring chain sag.]

9.4: Recommended lubricants

The following lubricants are recommended for use on the 991B, 991L & T series wrappers.

<table>
<thead>
<tr>
<th>Grease</th>
<th>Multi purpose grease</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dispenser gears</td>
<td>Open gear grease</td>
</tr>
</tbody>
</table>
9.5: Tightening torque values

It is important that the correct torques for fasteners and fittings are adhered to. Below are tables of recommended torques for these. These are to be used unless torques are otherwise specified. These values are for general use only. Check tightness of all fasteners periodically. All torques are in Nm (Newton metres).

McHale Torque Specifications

Torque specifications of hex. bolts, socket head cap screws, hex. nuts. Torque values are in Nm (Newton metres).

<table>
<thead>
<tr>
<th>Nuts and bolts</th>
<th>Black, Phosphatised or Galvanized</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grade marking</td>
<td>8.8</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Metric standard thread</td>
</tr>
<tr>
<td>Hex. bolts</td>
<td>Din 931</td>
</tr>
<tr>
<td>M4</td>
<td>2.7</td>
</tr>
<tr>
<td>M5</td>
<td>5.5</td>
</tr>
<tr>
<td>M6</td>
<td>10</td>
</tr>
<tr>
<td>M8</td>
<td>23</td>
</tr>
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<td>M10</td>
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<td>M12</td>
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<td>M27</td>
<td>980</td>
</tr>
<tr>
<td>M30</td>
<td>1260</td>
</tr>
<tr>
<td>Dimensions</td>
<td>Metric fine thread</td>
</tr>
<tr>
<td>Hex. bolts</td>
<td>Din 960, Din 961</td>
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<tr>
<td>M8 X 1</td>
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<tr>
<td>M10 X 1.25</td>
<td>48</td>
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<tr>
<td>M12 X 1.25</td>
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<tr>
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<td>M16 X 1.5</td>
<td>210</td>
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<td>M18 X 1.5</td>
<td>300</td>
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<td>M20 X 1.5</td>
<td>415</td>
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<tr>
<td>M22 X 1.5</td>
<td>560</td>
</tr>
<tr>
<td>M24 X 2</td>
<td>720</td>
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<tr>
<td>M27 X 2</td>
<td>1050</td>
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<tr>
<td>M30 X 2</td>
<td>1450</td>
</tr>
</tbody>
</table>

NOTE: For cadmiated or copper plated bolts and nuts a torque value must be used that is 25% lower than the value stated above.
Section 10

Trouble Shooting

Contents:

10.1:  Trouble shooting Lift arm
10.2:  Rotation table
10.3:  Plastic dispenser
10.4:  Controls
10.5:  Bale damper
10.6:  Cut and hold
10.7:  Hydraulic components
## 10.1: Lift arm

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lift arm not operating (991BJ &amp; BJS)</td>
<td>1) Faulty power supply/electrical connections.</td>
<td>1) Check and correct</td>
</tr>
<tr>
<td></td>
<td>2) Diverter spool sticking (grit).</td>
<td>2) Remove spool and clean.</td>
</tr>
<tr>
<td></td>
<td>3) Joystick switch not operating.</td>
<td>3) Check and correct.</td>
</tr>
<tr>
<td>Lift arm or table slow in one direction (991BJ / BC)</td>
<td>1) Cable adjustment</td>
<td>1) Adjust cable</td>
</tr>
<tr>
<td>Table hits lift arm (991BJ)</td>
<td>1) Switch being released too soon on joystick</td>
<td>1) Release switch later (operator familiarity)</td>
</tr>
<tr>
<td>Lift arm not in correct position after auto load. (991 BE)</td>
<td>Lift arm potentiometer not set correctly. Faulty potentiometer</td>
<td>Calibrate potentiometer. Replace potentiometer.</td>
</tr>
</tbody>
</table>
### 10.2: Rotation table

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table tips when oil is switched on (991BJ)</td>
<td>1) Tap on hydraulic return line is closed</td>
<td>1) Open tap</td>
</tr>
</tbody>
</table>
| Machine tips bale but does not reset to load | 1) Tip sensor faulty.  
2) Magnet broken. | 1) Locate and replace.  
2) Locate and replace. |
| Table rotates but bale not indexing. | 1) Table drive roller shearbolt broken.  
2) Gearbox cross shaft roll pins broken. | 1) Replace shearbolt.  
2) Replace roll pins. |
| Table stopping in wrong position (Electronic machines) | 1) Magnet settings.  
2) Not starting in correct position  
3) Slow down setting in control box.  
4) Slow speed valve not working.  
5) Dirt in slow speed cartridge.  
6) Speed set too fast | 1) Reset magnets.  
2) Start with cut & hold at rear of machine.  
3) Adjust.  
4) Check electrical connections.  
5) Clean cartridge.  
6) Set table rotation to 30 RPM |
| Table moving in tip | 1) Drive chain loose | 1) Tighten chain. |
| Table slow to tip down | 1) Back pressure too high.  
2) Faulty quick release couplings | 1) Ensure free flow return is fitted.  
2) Replace couplings. |
| No table rotation | 1) No oil flow.  
2) Broken drive chain.  
3) Damaged motor | 1) Ensure oil flow.  
2) Check and repair chain.  
3) Replace motor. |
### Problem
**Table rotation**

<table>
<thead>
<tr>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) Bale sticking to roller as it is leaving the table.</td>
<td>1) Shake chalk under belt to reduce friction.</td>
</tr>
<tr>
<td>2) Bale damper ram adjusted too high</td>
<td>2) Adjust damper cylinder.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1) No power to solenoid</td>
<td>1) Check power supply</td>
</tr>
<tr>
<td>2) Faulty solenoid</td>
<td>2) Ensure solenoid is working.</td>
</tr>
<tr>
<td>3) Faulty valve</td>
<td>3) Replace valve.</td>
</tr>
</tbody>
</table>
### 10.3: Plastic dispenser

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
</table>
| Plastic film splitting as bale leaves table | 1) Bale sticking to roller as it is leaving the table.  
2) Bale damper ram adjusted too high | 1) Shake chalk under belt to reduce friction.  
2) Adjust damper cylinder. |
| Plastic tearing | 1) Rollers not running free.  
2) Rollers too tight | 1) Check stretch gears  
2) Check bearings |
| Plastic not covering bale correctly | Dispenser at incorrect height | Set height that plastic is applied to the middle of the bale. |
| Plastic not stretching | 1) Build up of tack/glue on dispenser rollers  
2) Torsion springs weak on dispenser  
3) Stretch rollers not unlatched to run up against roll of plastic. | 1) Clean off with kerosene.  
2) Replace springs.  
3) Un latch rollers to run up against roll of plastic. |
| Plastic getting caught around cut & hold (Electronic machines) | 1) Table down magnet set too high. | 1) Reset table down magnet |
| Not reading “out of film” when plastic is finished. | 1) Turned off in Control unit.  
2) Faulty sensor or magnet.  
3) Incorrectly wired | 1) Check film sensor is turned on.  
2) Check sensor and magnet.  
3) Check wiring diagram. |
## 10.4: Controls

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control box not counting</td>
<td>1) Sensor damaged.</td>
<td>1) Locate and replace.</td>
</tr>
<tr>
<td></td>
<td>2) Magnet broken.</td>
<td>2) Locate and replace.</td>
</tr>
<tr>
<td></td>
<td>3) Sensor - magnet clearance.</td>
<td>3) Adjust sensor approx. 10-15mm from magnet.</td>
</tr>
<tr>
<td></td>
<td>4) Faulty control box</td>
<td>4) Replace control box.</td>
</tr>
<tr>
<td>&quot;LOW BATT&quot; appears on control box.</td>
<td>1) Supply voltage too low</td>
<td>1) Check battery and charging system.</td>
</tr>
<tr>
<td>Half the number of actual rotations displayed</td>
<td>1) One set of magnets missing</td>
<td>1) Replace missing set of magnets</td>
</tr>
<tr>
<td>on control box</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Control box will not switch to &quot;auto&quot; setting</td>
<td>1) Loom not connected to box.</td>
<td>1) Connect loom.</td>
</tr>
<tr>
<td>Remote control receiver not accepting signal</td>
<td>1) Not connected properly.</td>
<td>1) Check on rear of control box.</td>
</tr>
<tr>
<td></td>
<td>2) Sunlight shining direct into receiver.</td>
<td>2) Turn away or shade.</td>
</tr>
<tr>
<td></td>
<td>3) Operating through tinted glass.</td>
<td>4) Operate where glass cannot come in the way.</td>
</tr>
<tr>
<td></td>
<td>4) Batteries exhausted on handpiece.</td>
<td>5) Replace batteries.</td>
</tr>
<tr>
<td></td>
<td>5) Not pressing Start button for long enough.</td>
<td>5) Press button for 2-3 seconds.</td>
</tr>
<tr>
<td>991BJ joystick stiff to operate</td>
<td>1) Cables not routed correctly.</td>
<td>1) Route cables ensuring there are no sharp bends or kinks.</td>
</tr>
<tr>
<td></td>
<td>2) Cables damaged.</td>
<td>2) Replace cables.</td>
</tr>
<tr>
<td>Tip up and cut &amp; hold cycles very slow</td>
<td>1) Tractor pressure too low.</td>
<td>1) Ensure tractor has 150 bar pressure.</td>
</tr>
<tr>
<td></td>
<td>2) Faulty pressure switch (electronic machines)</td>
<td>2) Replace</td>
</tr>
<tr>
<td></td>
<td>3) Relief valve set too low.</td>
<td>3) Set to 150 bar</td>
</tr>
<tr>
<td>Problem Table rotation</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>------------------------</td>
<td>-------</td>
<td>--------</td>
</tr>
</tbody>
</table>
| Control unit will not turn on or light up | Poor power supply
Wired incorrectly | Wire direct from battery.
Ensure wired correctly. |
| 991BC will not hold rotation lever on to keep wrapping. | 1) Control unit in incorrect program.
2) No power to solenoid.
3) Faulty solenoid. | 1) Check program.
2) Check power supply and wiring
3) replace solenoid. |
| Not reading “out of film” when plastic is finished. | 1) Turned off in Control unit.
2) Faulty sensor or magnet.
3) Incorrectly wired | 1) Check film sensor is turned on.
2) Check sensor and magnet.
3) Check wiring diagram. |
| Expert control unit in wrong language | Operator error | 1) Find language setting and change when unit is turned on.
2) Reset to factory settings. |
# 10.5: Bale damper

<table>
<thead>
<tr>
<th>Problem Table rotation</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Damper not raising fully.</td>
<td>1) Bales too light.</td>
<td>1) Make heavier/denser bales if possible.</td>
</tr>
<tr>
<td>Damper slow or fails to come down.</td>
<td>1) Restrictor tap set too tight.</td>
<td>1) Adjust restrictor.</td>
</tr>
<tr>
<td>Damper rising during wrapping cycle</td>
<td>1) High hydraulic back pressure. 2) Faulty quick release coupling.</td>
<td>1) Fit free flow return. 2) Replace quick release coupling.</td>
</tr>
</tbody>
</table>
## 10.6: Cut and hold

<table>
<thead>
<tr>
<th>Problem</th>
<th>Cause</th>
<th>Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cut &amp; hold not operating (991BJ)</td>
<td>1) Faulty power supply/connections</td>
<td>1) Check &amp; correct</td>
</tr>
<tr>
<td></td>
<td>2) Joystick switch not working.</td>
<td>2) Check and correct</td>
</tr>
<tr>
<td>Plastic getting caught around cut &amp; hold (Electronic machines)</td>
<td>1) Table down magnet set too high.</td>
<td>1) Reset table down magnet</td>
</tr>
<tr>
<td>Cut &amp; hold not catching plastic film</td>
<td>1) Positioned incorrectly.</td>
<td>1) Check position</td>
</tr>
<tr>
<td></td>
<td>2) Table not stopping in correct tip off position.</td>
<td>2) Check and adjust magnets if necessary</td>
</tr>
<tr>
<td>Cut &amp; hold not opening</td>
<td>1) Pressure low on accumulator.</td>
<td>1) Prime accumulator</td>
</tr>
<tr>
<td>Cut &amp; hold not closing</td>
<td>1) Pressure high on accumulator.</td>
<td>1) Release pressure from accumulator</td>
</tr>
<tr>
<td>Cut &amp; hold opens.</td>
<td>1) Seals weak in gearbox.</td>
<td>1) Replace seals</td>
</tr>
<tr>
<td></td>
<td>2) Loose hydraulic fitting on gearbox.</td>
<td>2) Tighten</td>
</tr>
<tr>
<td>Cut and hold opens slowly with no external leaks or internal gearbox leaks.</td>
<td>Main valve leaking back around spool due to ware. (Older machines)</td>
<td>Fit repair kit REP00001 to valve.</td>
</tr>
<tr>
<td>Holding but not cutting plastic</td>
<td>Blunt or missing knife</td>
<td>Replace knife</td>
</tr>
<tr>
<td>Prime accumulator and still will not work</td>
<td>Faulty Accumulator</td>
<td>Replace accumulator</td>
</tr>
<tr>
<td>Problem</td>
<td>Cause</td>
<td>Remedy</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>--------------------------------------------------------</td>
<td>----------------------------------------------------------</td>
</tr>
<tr>
<td>Hydraulics under pressure when wrapper is idle</td>
<td>1) Valve set to closed centre on open centre system.</td>
<td>1) Change setting.</td>
</tr>
<tr>
<td>Dump valve on main valve leaking (electronic machines)</td>
<td>1) Back pressure too high.</td>
<td>2) Ensure free flow return is fitted.</td>
</tr>
<tr>
<td></td>
<td>2) Return hose not connected.</td>
<td>2) Connect hose.</td>
</tr>
<tr>
<td>Hydraulic system vibrating</td>
<td>1) Incorrect valve setting for tractor being used</td>
<td>1) Set valve to suit tractor hydraulic system being used.</td>
</tr>
</tbody>
</table>

10.7: Hydraulic components
Section 11

Technical specifications

Contents:

11.1: Technical specifications
# 11.1 Technical specifications

**991B Series**

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transport length</td>
<td>5.55m (18')</td>
</tr>
<tr>
<td>Transport width</td>
<td>2.35m (7' 9&quot;)</td>
</tr>
<tr>
<td>Total height</td>
<td>2.46m (8' 1&quot;)</td>
</tr>
<tr>
<td>Height to top of rollers</td>
<td>1.06m (3' 6&quot;)</td>
</tr>
<tr>
<td>Weight (unladen)</td>
<td>1870 kg (4123 lbs.)</td>
</tr>
<tr>
<td>Tyre dimensions</td>
<td>31x13.5 x15</td>
</tr>
<tr>
<td>Attachment</td>
<td>Pin hitch</td>
</tr>
<tr>
<td>Towing tractor requirements</td>
<td>35KW</td>
</tr>
<tr>
<td>Hydraulics</td>
<td>Open centre, closed centre or load sensing</td>
</tr>
<tr>
<td>Minimum hydraulic pressure</td>
<td>160 bar (2200 lbs./sq. in)</td>
</tr>
<tr>
<td>Minimum hydraulic flow</td>
<td>18 litres/min (4 gallons/min)</td>
</tr>
<tr>
<td>Maximum rotary table speed</td>
<td>30 R.P.M.</td>
</tr>
<tr>
<td>Maximum bale weight</td>
<td>1100 kg (2425 lbs.)</td>
</tr>
<tr>
<td>Maximum road speed</td>
<td>40 km/hr</td>
</tr>
<tr>
<td>Film stretch</td>
<td>70% (55% optional)(32% enduro)</td>
</tr>
<tr>
<td>Film layers</td>
<td>2+2 system</td>
</tr>
<tr>
<td>Film width</td>
<td>750mm (500mm optional)</td>
</tr>
<tr>
<td>Electrics</td>
<td>12Volt DC, 7amp approx.</td>
</tr>
</tbody>
</table>