

Basic textile operations

Level -I

Learning Guide -30

Unit of Competence: Operate Cotton Ginning
Machines and Controlling Bale
Press Operations

Module Title: Operating Cotton Ginning
Machines and Controlling Bale
Press Operations

LG Code: IND BTO1 M09 LO3-LG30

TTLM Code: IND BTO1 TTLM, 0919v1

LO 3: Operate bale or mote press



This learning guide is developed to provide you the necessary information regarding the following **content coverage** and topics –

- ❖ Starting press machinery
- ❖ Monitoring lint feed
- ❖ Feeding bale tie system

This guide will also assist you to attain the learning outcome stated in the cover page.

Specifically, upon completion of this Learning Guide, **you will be able to –**

- ❖ Start press machinery in accordance with workplace standard operating procedures
- ❖ Monitor the feed of lint in the lint slide to the press
- ❖ Feed bale tie system in accordance with manufacturer procedures
- ❖ Clean and maintain work area around machinery to meet workplace and OHS practices

Learning Instructions:

1. Read the specific objectives of this Learning Guide.
2. Follow the instructions described in number 3 to 20.
3. Read the information written in the “Information Sheets 1”. Try to understand what are being discussed. Ask you teacher for assistance if you have hard time understanding them.
4. Accomplish the “Self-check 1” **in page -**.
5. Ask from your teacher the key to correction (key answers) or you can request your teacher to correct your work. (You are to get the key answer only after you finished answering the Self-check 1).
6. If you earned a satisfactory evaluation proceed to “Information Sheet 2”. However, if your rating is unsatisfactory, see your teacher for further instructions or go back to Learning Activity #1.
7. Submit your accomplished Self-check. This will form part of your training portfolio.

Information Sheet-1	Starting press machinery
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2. starting press machinery



Procedures/safety precautions

- Trouble shooting or testing should be performed only by individuals who are familiar with the systems that control the operation of this machine.
- Lock air supply in “off” position before working on the pneumatic system, hopper door or hopper diverter gate. Optional feature, may not apply if not furnished by gallant Henning nopak controls mode options: the baler is designed for two modes of operation, manual and automatic. The manual mode is primarily for servicing and “readying” the baler for automatic use. The auto mode is the normal mode for baling. Automatic loading via the bulk hopper* permits continuous cycling. Use of the side hopper* will interrupt bulk hopper operation. Baler must be cycled to return to continuous operation. Mode controls: all of the operator’s controls are located on the operator’s console (see console guide). Some controls are operative only in “manual” while others are operative only in “auto”. The baler must be powered up before either set of mode controls is operative. Side hopper control is operative in either mode. Baler power up for operation in either mode is accomplished by satisfying the following conditions:

1. “Emergency stop” push buttons must be pulled “out” to engage control power. control power and machine processing can be terminated at any time by depressing any of these buttons. Emergency stop buttons are located on main control cabinet, operator’s console, and near the baler gate.
2. “Hand” “off” “auto” keyed selector must be in the “hand” position.
3. Operate “master reset” push button to engage and/or restore control circuit power.
4. Operate “motor start” push button to start electric motor.

Note: auto mode controls will be operative only if the mode selector switch is in the “auto” position and the initial starting conditions are satisfied. If auto operation is desired and the dataliner does not display the message “engage auto mode”, proceed to section ii-6 “baler not ready”. Monitor the position of each ram by observing the dataliner-caution: the hydraulic pump is directly coupled to the electric motor. Whenever the motor is running the pumping units are active. Even at low pressure the hydraulic cylinders have the potential to do great bodily harm. Observe all safety precautions whenever the pump/electric motor is in operation.

* Optional feature, may not apply if not furnished by galland henning nopak.

general operating conditions.

Operating temperature: this equipment will operate correctly in its intended ambient, at a minimum between 41°f (5°c) and 104°f (40°c).



Relative humidity: this equipment will operate correctly within an environment at 50% RH, 104°F (40°C). Higher RH may be allowed at lower temperatures. Measures should be taken by the purchaser to avoid the harmful effects of occasional condensation.

Altitude: this equipment will operate correctly up to 3280 feet (1000m) above mean sea level.

Transportation and storage: this equipment will withstand, or has been protected against, transportation and storage temperatures of -13°F (-25°C) and 131°F (55°C) and for short periods up to 158°F (70°C). It has been packaged to prevent damage from the effects of normal humidity, vibration and shock.

Foreseeable misuse

This equipment is not designed for compacting containers that contain flammable, toxic, radioactive or bio-hazardous material. Examples of items that should not be baled in this machine include but not limited to) aerosol cans, solvent cans, medical waste, munitions and electrical devices.

Manual mode

The mode selector switch on the operator's console must be in the "hand" position in order to operate the cylinders using the selector switches.

The only exceptions are:

- The bulk feed hopper door* (auto only)
- The side hopper*

(See bulk feed hopper or side hopper operations for details)

Starting the motor; the motor is started by the "motor start" push button. Motor will Stop/not start whenever the mode selector switch position is in "off" or when the "motor stop" or "emergency stop" buttons are activated.

Note: motor will stop / not start if guard door is opened / not closed.

Note: your console may contain additional features for the operation of auxiliary systems. Consult your engineering department for details.

Motor "on" light (when "on") indicates the motor is running.

Manually operating the cylinders- operate the desired cylinder(s) by turning the appropriate selector switch on the operator's console. For safety purposes, the action of each cylinder is restricted as follows:

- 1) #1 ram...cannot advance unless the #2 ram is fully retracted.
- 2) #2 ram...cannot advance unless the gate is fully closed or fully open.
- 3) Gate...cannot close unless the #2 ram is fully retracted.



4) Bulk feed hopper door*... (No manual control) cannot open unless baler is in the auto mode and baler is “ready” and “cycled in auto”.

5) Side hopper...cannot operate unless #1 and #2 rams are retracted, gate is closed, and bulk feed hopper* is not dumping to baler.

warning: pressing of material in the charging box by the #1 ram positively must not be done unless gate is closed and the #2 ram is fully retracted serious damage to the baler could result if this precaution is not adhered to optional feature, may not apply if not furnished by galland henning nopak.

Automatic mode

The automatic mode: when the baler is in the “auto” mode, all ram operating levers are In operative with the exception of the bulk feed hopper door* and the side hopper*, which Can be operated in the “auto” mode under special circumstances.

Automatic sequence outline (of bale making stages) once the auto cycle is initiated, the Baler will perform each of the bale making stages automatically in the following order:

- 1) 1st compression (#1 ram advances to end of forward stroke). (If the #1 almost forward limit switch, ls1af, is reached before ps3 is actuated #1 ram may retract to allow more material to be dropped into the baler.)
- 2) 2nd compression (#2 ram advances until ps1 is actuated).
- 3) Bale made (ps1 actuates when pressure reaches max.).
- 4) Decompression (#1 & #2 rams retract briefly).
- 5) Gate opens.
- 6) Bale eject (#2 ram advances to end of forward stroke, ps2 is actuated).
- 7) Cylinders return home in the following order:
 - a). #2 rams retracts completely.
 - b). gate closes.
 - c.) #1 rams retracts completely.
- 8) Cycle ends when #1 rams is fully retracted. At this time the baler is said to be “ready” and “cycled in auto”.

Note: see complete automatic sequence for detailed description of each “stage” listed above. If the baler is not equipped with a bulk hopper* than each subsequent cycle must be initiated by the operator. during the automatic operation, the normal function of the bulk feed hopper* is to automatically measure and dump (when full) one load of scrap (per baling cycle) into the baling chamber when the baler is “ready” and “cycled in auto” and to initiate a new automatic baling cycle. Thus, the baler and bulk hopper (together) will operate in tandem automatically and continuously. The 1st compression ram is set to make several gathering cycles before



the 2nd compression ram is actuated. Consult galland hennaing nopak for further information. To prevent the baling chamber from being over loaded and possibly jammed, the electrical controls are designed so that the bulk feed hopper* will not perform its normal function (see hopper operation for additional details) if the continuous automatic cycling of the machine is interrupted. For that reason, it is always necessary to begin the initial automatic cycle by pressing the “cycle start” button. After the baler has completed this initial “auto” cycle, the bulk feed hopper* will resume its normal function. The message “bulk feed hopper waiting for material” will be displayed while the hopper is collecting material and the baler is “ready” and “cycled in auto”.

Automatic mode

Operation in auto mode- to operate in auto turn the mode selector switch to the “hand” position, and start the pumps by pushing the “motor start” button. then turn the mode selector to the “auto” mode. Note: motor will not start if the guard door is not closed. Start the auto cycle by depressing the “cycle start” button.

Warning: do not operate baler unattended in auto mode before bulk hopper* and 1st comp. recycle counter is adjusted to produce desired bale size. See normal bales.

Note: cycle will not start if baler is not “ready” & hopper* door is closed.

Baler ready- the baler must be “ready” for the “cycle start” push button to be operative. If the message “press cycle start” is not displayed, then the baler is not “ready”.

Initial starting conditions

Baler not ready- if the baler is not ready, check the display on the operator’s console to see which of the following initial conditions have not been met. The Automatic cycle cannot be started unless all of these conditions are met:

- 1) #1 ram “retracted”
- 2) #2 ram “retracted”
- 3) Gate “closed”
- 4) Side hopper* down and guard door closed

Note: if abbreviations used are unfamiliar, see abbreviations.



Self-Check -1	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. What is the difference between Starting press machinery and Operate bale or mote press?
2. Explain the difference between Stopping the machinery and shutting down machinery

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____

2. _____



Information Sheet-2	Monitoring lint feed
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2 Monitoring lint feed

In order to have uniform output or product, the bale press has to receive equal amount of input coming from lint cleaner. This throughput is controlled automatically rather than manually.

Increased production of Upland cottons with the advent of the Whitney and Holmes tooth gin Stands in 1792 created a major problem in packaging the ginned lint. Until 1810, ginneries Usually had only one gin stand and packaged the ginned lint in bags that varied from 125 to 350 lb in weight. The bags were hooked on frames constructed around holes in the floor and tied out in the basement. Workers tramped lint down into the bags with their feet or wooden pestles

Wooden and iron screw cotton presses were tried by 1799. After 1810, wooden screw presses gained favor and were used extensively. Some still operated in 1903. Animal sweeps provided power for the pressing. These presses were usually placed outdoors and were often provided with small sheltering roofs. A few of the old gins employed a pit beneath the press, where the bale was tied out. Other early gins with outdoor presses did not use a pit and tied out at ground level

After 1854, when the use of steam power at cotton gins became prevalent, animal power was seldom used. After about 1860, many gins used steam engines and moved the presses into ginning buildings. Some early presses retained the iron and steel screws. Others began to employ steam plungers.

By 1878 these plungers were being used above the cotton boxes for mechanical tramping and packing. These presses required an operator to rake the ginned lint from the lint slide into the box and then to manually operate the steam piston tramper by means of a rod-controlled valve.

Cotton bales of various densities and weights were used. Square bales came to 500 lb average and round bales came to a standard of 250 lb weight. From 1940-1960, standard and high-density presses at gins began to be widely used. These bales weighed about 500 lb and were packaged at densities of about 24 and 32 lb/ft³, respectively.

The advantages of module feeding are as follows:



1. It increases ginning capacity by 10-25 percent by providing a consistent, uninterrupted flow of cotton to the gin plant.
2. It eliminates suction telescope labor.
3. It frees the module truck for long hauls by enabling continuous ginning of two to six modules.
4. It blends wet cotton in the module with dry cotton.
5. It extracts trash, thereby not only reducing the amount of trash entering the gin but also increasing fan and piping life.

The feed rate for telescope suction systems is automatically controlled by a surge bin (feed control hopper or steady flow hopper). Sensors in the surge bin turn the suction off and on by opening and closing a valve in the suction line of the telescope. Output feed rate is controlled by regulating the speed of feed rollers in the bottom of the surge bin. A variable-speed drive on module dispersers may be interconnected with the surge between sensors or can be used independently. Either system provides a remote variable- speed control that allows overall control of the unloading rate.

Unloading system capacity depends on the condition of the cotton and unloading system. Damp, trashy, and tightly packed cotton unloads slower and requires more horsepower than does clean, loose cotton. The suction fan has to provide sufficient vacuum pressure to overcome system resistance, to break the cotton loose and entrain it in the conveying air stream, and to compensate for leakage through piping and equipment. Velocity in the conveying pipes from the telescope to the unloading separator must be maintained at 5,000 ft/min for successful conveying. Velocity in the vertical suction telescope should be higher: 5,500-6,000 ft/min is typical. About 20 ft³ of air/lb of cotton is required, with the higher volume required to handle damp, tightly packed cotton.

Typical sizes, unloading capacities, fans sizes, and power requirements for telescope suction unloading systems are shown in table 5-1. These data are applicable for clean, dry cotton. Capacity and power requirement depend on length of pipe, number and radius of elbows, type and condition of cotton.

Self-Check -2	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. Why feed control is needed? (4 pts.)
2. Write the advantages of feed control in production of ginning.(4 pts.)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____

Rating: _____

Name: _____

Date: _____

1. _____

2. _____

Information Sheet-3	Feeding bale tie system
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3. Feeding bale tie system

Bale Packaging System

Bale packaging is the final step in processing cotton at the gin. The packaging system consists of a battery condenser, lint slide, lint feeder, tramper, bale press, and bale tying mechanism. This system may be supplemented with systems for bale conveying, weighing, and wrapping. The bale press consists of a frame, one or more hydraulic rams, and a hydraulic power system. Tying subsystems may be entirely manual, semi-automated, or fully automated.

Bale presses are described primarily by the density of the bale that they produce, such as low density (flat or modified flat) or universal density (gin or compress). Other descriptions include up-packing, down-packing, fixed box, and doorless. Regardless of description, they all package lint cotton so that it can be handled in trade channels and at textile mills. Battery condensers have a slow-turning, screened or perforated metal-covered drum on which the ginned lint forms a batt. The batt is discharged between doffing rollers to the lint slide. Conveying air supplied by a vane-axial or high-volume centrifugal fan passes through the screen on the drum and is usually discharged out one end of the drum through an air duct. The discharged air then goes to dust abatement equipment and then into the atmosphere. The lint slide is a sheet-metal trough (approximately 54-in. wide) that connects the battery Condenser to the lint feeder on the tramper. It is installed at an angle of 33°-45° to ensure Movement of the lint without rolling the batt. The length of the lint slide is based on the capacity of the ginning system and the time required to turn the press between bales.

The lint feeder is a device for moving lint from the lint slide into the charging box of the press.

There are three basic types of feeders:

- (1) Revolving paddle kicker,
- (2) Belt feed used in conjunction with the kicker
- (3) Lint pusher.

All of these devices should deposit lint into the charging box with a fast but gentle action, without breaking up the batt as it is received from the condenser. A smoother lint sample will result if this can be accomplished.

The purpose of the tramper is to initially pack the lint into the press box to reduce the press box volume required. Mechanical and hydraulic trampers are available. Regardless of type, care should be taken to prevent contamination of lint beneath the tramper by hydraulic fluid



or grease from the tramper mechanism. Motors that have 10-15 hp and that are equipped with a fail-safe brake are usually used on mechanical trampers. Motors used on hydraulic trampers vary from 25-75 hp.

Four types of gin presses have been used; each type is named according to the bale it produces –

Flat, modified flat (bales to be sent for recompression to become compress universal density Bales), gin standard, and gin universal. Today all of the bales produced at gins in the United States are gin universal density.

After the bale is compressed to a given density or press platen separation, ties are applied around the circumference of the bale to restrain the lint within prescribed dimensions. Bale ties are normally either wire or flat, cold-rolled steel bands, or plastic, and are placed at intervals along the length of the bale. Usually, six or eight ties per bale are used. The ties can be applied manually or with a semi-automated tying system. In order to reduce labor requirements, bale tying systems are rapidly being automated.

Self-Check -3	Written Test
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Directions: Answer all the questions listed below. Use the Answer sheet provided in the next page:

1. ____ is the final step in processing cotton at the gin. (1 pt.)
 - A) Lint cleaning
 - B) Starting bale press machine
 - C) Feeding
 - D) Bale packaging
2. Write the 3 types feeders in of bale pressing. (3 pts.)

Note: Satisfactory rating - 3 points

Unsatisfactory - below 3 points

Answer Sheet

Score = _____
Rating: _____

Name: _____

Date: _____

Short Answer Questions

1. _____
2. _____

