

AGRICULTURAL GUIDE

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Machinery

Large round balers

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The continuing search for a labor-saving method of hay harvest led to the development of the large round baler. At this time there are 15 manufacturers selling over 40 balers that produce large round bales of 400 to 2,300 pounds in size.

Types of large round balers

Three baler types are produced: 1) ground roll, 2) carried bales formed in an expandable chamber, and 3) carried bales formed in a fixed chamber.

Ground roll baler. At the present time there is one ground roll baler being manufactured. Following are some of its characteristics. The bale rolls on the ground on top of the incoming windrow. The upper portion of the bale is confined by a series of cables and rollers. Ground roll bales have an average density of 11 to 12 pounds per cubic foot. Tractor power takeoff (PTO) horsepower requirements are in the

30+ horsepower range for ground roll balers.

Expandable chamber balers. Bales formed in these balers have tension applied by either belts or chains and slats commonly called raddles. Tension is applied to the bale as the core is formed until the bale is completed. Some of the balers of this type produce a bale with a uniform density, while others produce a bale with a density at the outer diameter that is about double that at the center. Whole bale density averages from 10 to 17 pounds per cubic foot, and production averages from 6 to over 20 tons per hour. Tractor PTO horsepower requirements vary from 30 to 120 hp.

Carried fixed chamber balers. These balers tumble hay within the bale chamber until the last stages of formation, when tension is maintained by hydraulic pressure. The baling chamber is a series of belts or rollers. The operator reads a hydraulic pressure gauge to determine when a bale is done. These bales have a

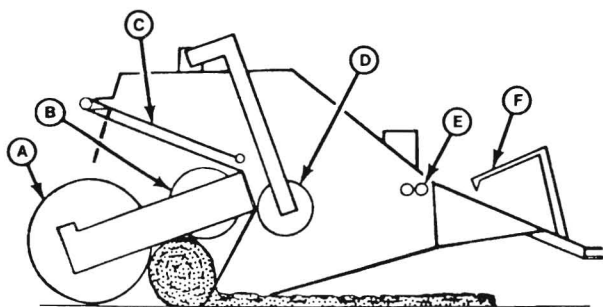


Figure 1. Ground Roll Baler. Lundell 760D: (A) Pickup, (B) Bale Forming Roller, (C) Bale Forming Cables, (D) Bale Forming Roller, (E) Twine Rollers, (F) Second Bale Starter.

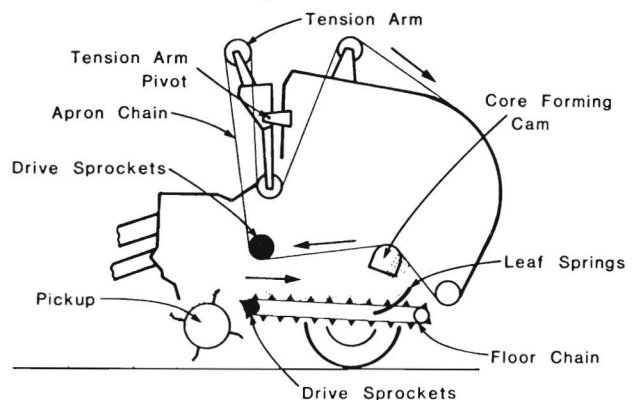


Figure 2. Expandable Chamber Baler.

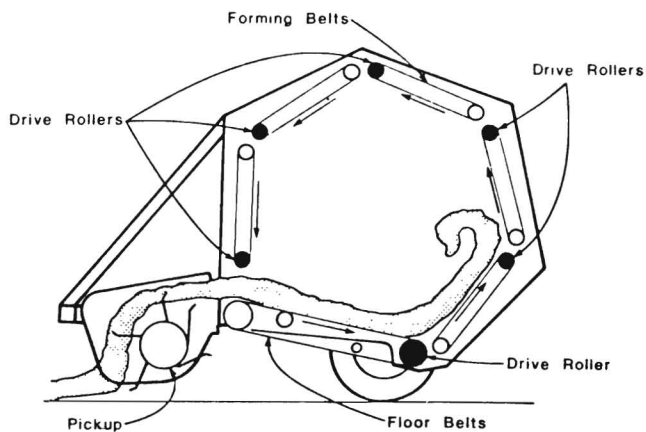


Figure 3. Carried Fixed Chamber Baler.

low density or soft-core center and an outer diameter density about double that of the center. Whole bale density averages from 10 to over 19 pounds per cubic foot, and production capacity is about 4 to 18 tons per hour. PTO power requirements are 30 to 70 hp.

Work quality

Ground roll balers. This baler produces a lower density bale with irregular surfaces. Nonuniform windrows cause poor-quality bales. Irregular and lower density bales result in severe weathering with high moisture penetration. Pickup and bale-chamber losses are impossible to measure because hay is rolled on the ground, and all losses appear on the ground behind the pickup.

Carried expandable chamber balers. Good bales are easier to make when windrows are large and uniform. Occasionally, the bale core is hard to start and might even need to be discharged and a new bale started. Bale formation is usually easier if an extended weave pattern is followed while baling. (See UMC Guide G 1955 for a diagram of this pattern.) Some balers now weave automatically allowing the tractor to drive straight and produce a uniform bale. These balers can be used to produce bales varying in weight. Bales tend to be uniform in shape and density. Under most conditions, you back up the baler before discharging the bale. You must take care in lowering the rear gate or door, as expensive damage can occur if the gate strikes the unloaded bale as it closes. Driving forward before closing the gate prevents this. Some balers have an optional attachment that will cause the bale to move away from the rear gate. Twine consumption varies with bale size and number of wraps. From 150 to 450 feet per ton are needed, as compared to small square bales that need 670 feet per ton.

Carried fixed chamber balers. Windrow size and shape is not as critical for these balers, and an

extended weave is not needed when starting the bale because the hay tumbles loosely in the chamber. When the outer part of the bale is being formed, an extended weave driving pattern will be needed on irregular or light windrows, because as the hay is under tension and will not move across the chamber. For ideal bales, use the maximum bale chamber capacity.

Baler attachments

Attachments available depend on the particular manufacturer. Horns or lights can be mounted on the tractor to signal when the bale is done. Some manufacturers offer bale sensing instruments that warn of an improperly shaped bale.

Manual, electric or hydraulic twine feeding mechanisms may be used. Automatic and dual twine feed mechanisms are also available. They speed up tying and make faster baling possible.

Tedder devices are being used to fluff wide windrows mashed down by tractor tires or to bring wide windrows to the same width as the baler pickup. Bale ejectors can move the bale away from the tailgate. Bale counters are standard equipment in most cases.

Two attachments available on some machines or from outside manufacturers are wrapping equipment for applying plastic completely around the bale and hay preservative equipment for metering chemical preservatives into the bale as it is formed.

Ground roll balers

Model or series designation	Lundell 760D
Maximum weight of bale-pounds	1,400
Bale diameter	to 66
Bale length-inches	60
Bale wrapped with twine	yes
Number of twine knotters	none
Number of twine wraps around bale	varies
Type of twine recommended	baler
Baler capacity-tons/hour	6-10
Pickup width-inches	60
Pick up type-tine bar, other	—
Bale compression method	rollers
Baler overall height-inches	78
Baler overall width-inches	96
Baler overall length-inches	196
Baler shipping weight-pounds	3,700
Tractor size required-PTO horsepower	30+
Tractor PTO used-540 or 1000	none
Tractor minimum hydraulic pressure	—
Tractor minimum hydraulic flow rate	—
Recommended travel speed-MPH	to 5

Carried fixed chamber balers

Model or series designation	Claas				M&W	
	R034	R044	R062	R085	1500	1800
Maximum weight of bale-pounds	500	772	1325	1875	varies	varies
Bale diameter	48	48	48	60	59	70.87
Bale length-inches	36	48	64	72	47.25	59
Bale wrapped with twine	yes	yes	yes	yes	yes	yes
Number of twine knotters	none	none	none	none	none	none
Number of twine wraps around bale	opt.	opt.	opt.	opt.	var.	var.
Type of twine recommended	sisal	sisal	sisal	sisal	certified	
Baler capacity-tons/hour	—	—	—	—	6-11	8-18
Pickup width-inches	58	58	58	63	53.6	61.87
Pick up type-tine bar, other	tine bar	tine bar	tine bar	tine bar	tine bar	tine bar
Bale compression method	rollers				spring & linkage	
Baler overall height-inches	77	87	87	109.5	82.6	94.5
Baler overall width-inches	83	83	83	94.5	80.75	96.5
Baler overall length-inches	150	156	174	177	132.25	143.75
Baler shipping weight-pounds	2976	3527	3968	4635	2866	3748
Tractor size required-PTO horsepower	40 +	40 +	40 +	70 +	40	45
Tractor PTO used-540 or 1000	either	either	either	either	540	540
Tractor minimum hydraulic pressure	1500	1500	1500	1500	1000	1000
Tractor minimum hydraulic flow rate	6	6	6	6	4	4
Recommended travel speed-mph	3-7	3-7	3-7	3-7	var.	var.

Carried fixed chamber balers

Model or series designation	KMN/Krone				Owatonna	
	KR100	KR125	KR151	KR181	590	595
Maximum weight of bale-pounds	400	500	1100	1800	850	1500
Bale diameter	48×36	48×36	48×60	60×72	51	72
Bale length-inches	48	48	60	72	48	60
Bale wrapped with twine	yes	yes	yes	yes	yes	yes
Number of twine knotters	DNA*	DNA*	DNA*	DNA*	none	1
Number of twine wraps around bale	var.	var.	var.	var.	opt.	var.
Type of twine recommended	baler	baler	baler	baler	baler	baler
Baler capacity-tons/hour	4-8	5-10	6-11	8-18	to 12	10-15
Pickup width-inches	54	54	54	62	53	66
Pick up type-tine bar, other	tine bar	tine bar	tine bar	tine bar	tine bar	tine bar
Bale compression method					rollers	rollers
Baler overall height-inches	67	71	83	94	89	106
Baler overall width-inches	83	83	83	94	87.5	96
Baler overall length-inches	132	127	133	145	151	174
Baler shipping weight-pounds	2230	1650	2855	3748	3450	4365
Tractor size required-PTO horsepower	35	35	40	45	55	70 +
Tractor PTO used-540 or 1000	540	540	540	540	540	either
Tractor minimum hydraulic pressure	1000	1000	1000	1000	1200	1200
Tractor minimum hydraulic flow rate	4	4	4	4	DNA*	DNA*
Recommended travel speed-MPH	var.	var.	var.	var.	6	6

*Does Not Apply

Carried expandable chamber balers

Model or series designation	Massey Ferguson				Gehl	
	645	656	1400	1550	RB 1460	RB 1860
Maximum weight of bale-pounds	—	2200	1300	1700	1000 +	2000 +
Bale diameter	48 × 72	61 × 74	48-60	60-72	60	72
Bale length-inches	—	—	48	60	45	60
Bale wrapped with twine	yes	yes	yes	yes	yes	yes
Number of twine knotters	none	none	none	none	none	none
Number of twine wraps around bale	var.	var.	var.	var.	var.	var.
Type of twine recommended	baler	baler	baler	baler	baler	baler
Baler capacity-tons/hour	—	22	8	10-12	6-10	8-12
Pickup width-inches	48	61	48	60	56	72
Pick up type-tine bar, other	tine bar	tine bar	tine bar	tine bar	tine bar	tine bar
Bale compression method	belts	belts	belts	belts	belts	belts
Baler overall height-inches	108	108	94	104	97	109
Baler overall width-inches	83-92	95	84	95	80	96
Baler overall length-inches	148	148	162	170	142	174
Baler shipping weight-pounds	—	5075	4100	4780	3790	4450
Tractor size required-PTO horsepower	70	70	45	55	50	60
Tractor PTO used-540 or 1000	either	either	either	either	either	either
Tractor minimum hydraulic pressure	1600	1600	1600	1600	1000	1000
Tractor minimum hydraulic flow rate	4.5	4.5	4.5	4.5	5	5
Recommended travel speed-MPH	6-8	6-8	to 6	to 6	var.	var.

Carried expandable chamber balers

Model or series designation	New Holland				Vermeer
	848	853	855	856	605J
Maximum weight of bale-pounds	1100	1200	1700	2300	2200
Bale diameter	54	80	66	66	74
	48	57	66	90	61
Bale wrapped with twine	yes	yes	yes	yes	yes
Number of twine knotters	none	none	none	none	none
Number of twine wraps around bale	var.	opt.	opt.	opt.	var.
Type of twine recommended	baler	baler	baler	baler	baler
Baler capacity-tons/hour	6-10	8-13	11-15	to 18	20
Pickup width-inches	58	56	72	97	61
Pick up type-tine bar, other	tine bar	tine bar	tine bar	tine bar	tine bar
Bale compression method	raddle	raddle	raddle	raddle	belts
Baler overall height-inches	93	101	101	101	108
Baler overall width-inches	85	90	108	135	95-104
Baler overall length-inches	153	162	172	217	148
Baler shipping weight-pounds	3580	4300	5500	7465	5075
Tractor size required-PTO horsepower	40-60	40-60	55-75	90-120	60
Tractor PTO used-540 or 1000	540	540	either	1000	either
Tractor minimum hydraulic pressure	1500	1500	1500	1600	1600
Tractor minimum hydraulic flow rate	6	6	6	6	6
Recommended travel speed-MPH	3-6	4-6	4-6	4-6	4-6

