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Evaluation Report 489

Claas Rollant 62 Round Baler

A Co-operative Program Between
ALBERTA FARM MACHINERY RESEARCH CENTRE
PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

CLAAS ROLLANT 62 ROUND BALER

MANUFACTURER:
Claas OHG
D-4834, Harswinkle
West Germany

DISTRIBUTORS:
Claas of America Inc.
#1-811, 56th St. E.
Saskatoon, Saskatchewan
S7K 5Y9

RETAIL PRICE:
$17,229.00 (January 1986, f.o.b. Portage la Prairie, Manitoba) with wide angle universal drive shaft, over-run clutch, hydraulic twine wrap and bale discharge ramp.

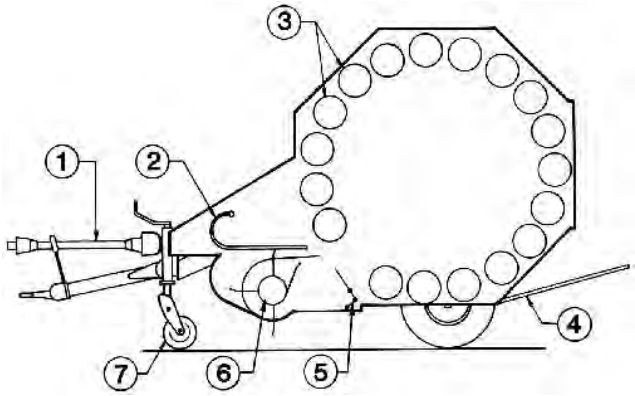

FIGURE 1. Claas Rollant 62 Round Baler, (1) Power Shaft, (2) Windguard, (3) Rollers, (4) Bale Discharge Ramp, (5) Feed Rakes, (6) Pickup, (7) Wheeljack.

SUMMARY

Performance: The performance of the Claas Rollant 62 round baler was very good in hay, and most straw crops. Baling short straw required slow power take off speeds, and dampness to help form a good durable bale.

Capacity: The average throughput of the Claas Rollant 62 varied from 2.8 ton/h (2.5 t/h) in rye straw to 10.0 ton/h (9.1 t/h) in alfalfa-bromegrass. Throughput was usually limited by pickup and feeding performance rather than by bale chamber capacity.

Bale Quality: Bale quality was very good, with well formed and durable bales in all crops except short straw. In this case, bale quality was fair to good due to poor bale durability as a result of limiting bate density pressure. Hay bales weighed from 750 to 900 lb (341 to 409 kg) and straw bales from 500 to 590 lb (227 to 268 kg).

Weatherability: Resistance to bale moisture penetration and spoilage was very good after 70 days of weathering.

Leaf Loss: Total leaf toss varied from 5.0 to 8.0% for 16% and 11% moisture contents respectively. This was considered good.

Power Requirements: Peak power requirements were about 41 hp (31 kW) in hay and straw on level fields. A 75bp (56 kW) tractor was needed to fully utilize baler capacity on soft and hilly fields.

Ease of Operation: Starting and forming the bale was very easy with the Claas Rollant 62. In short straw, the bate density pressure had to be limited to about 170 bar (2460 psi) or the bale would stop rolling in the bale chamber.

The hydraulic twine wrapping device required operator experience to tie a good bale. The flow control valve did not adequately control the twine tube speed. The operator was required to stop, once the wrapping operation began. A bale ejector made backing unnecessary to clear the bale from under the gate. A bate could be wrapped and discharged in about 50 seconds.

Feeding was positive and aggressive in all crops. Overloading the bale chamber caused the hydraulic relief valve to release, while overloading the pickup caused activation of the slip clutch. The Claas Rollant 62 was easy to manoeuvre and transport. Visibility to the rear was restricted.

Ease of Adjustment: Servicing, maintenance and routine adjustments were simple.

Operator Safety: The Claas Rollant was safe to operate if personal precautions were observed.

Operator's Manual: The operator's manual was clearly written and useful.

Mechanical History: No relevant serious mechanical problems were apparent during the 222 hours of field test.

RECOMMENDATIONS:

It is recommended that the manufacturer consider modifications to the hydraulic flow control valve on the twine wrap mechanism to improve its operation.

Station Manager: G.M. Omichinski

Project Engineer: R.R. Hochstein

THE MANUFACTURER STATES THAT

With regard to the recommendation:

It is suggested that if the tractor hydraulic circuit is equipped with a hydraulic flow control valve, that the tractor hydraulic flow be set at a minimum flow setting.

The twine wrap flow control valve should then be set to give a travel speed of 30 to 60 seconds across the chamber opening. When wrapping twine on the bale, the operator with the use of the tractor hydraulic lever, intermittently moves the twine tube to apply the twine and control the number of wraps.

GENERAL DESCRIPTION

The Claas Rollant 62 is a pull-type, power take-off driven baler with a cylindrical baling chamber and a floating drum pickup. The twine wrapping mechanism is hydraulically actuated.

Hay is fed directly into the 4.0 ft (1.22 m) wide baling chamber by the pickup. The baling chamber is a fixed chamber type with eighteen, 12 in (305 mm) diameter steel rollers about the circumference of the bale chamber.

Detailed specifications are given in Appendix I, while FIGURE 1 shows the location of major components.

The machine supplied to PAMI was equipped with the following options: wide angle power take-off drive shaft, 31 x 13.5/15 tires, bale ejector and hydraulic twine wrap.

SCOPE OF TEST

The Claas Rollant 62 baler was operated in a variety of crops (TABLE 1) for 222 hours, while producing 2817 bales. It was evaluated for rate of work, quality of work, power requirements, ease of operation, ease of adjustment, operator safety and suitability of the operator's manual.

TABLE 1. Operating Conditions

Crop	Hours	Number of Bales	Equivalent Field Area	
			ac	ha
Alfalfa	36	435	165	67
Alfalfa-Bromegrass	20	500	100	41
Alfalfa-Timothy	40	443	160	65
Bromegrass	40	400	160	65
Grass	11	91	35	14
Canary Reedgrass	8	175	40	16
Millet	22	302	70	29
Fall Rye Greenfeed	10	114	40	16
Rye Straw	5	50	23	9
Barley Straw	12	170	49	20
Wheat Straw	18	137	30	12
Total	222	2817	872	354

RESULTS AND DISCUSSION

RATE OF WORK

Average throughput depended on windrow size, uniformity of crop conditions, field surface, available tractor speeds and

operator skill. Average throughput for the Claas Rollant 62 (TABLE 2) varied from 2.8 ton/h (2.5 t/h) in rye straw to 10.0 ton/h (9.1 t/h) in alfalfa-bromegrass. The values in Table 2 are all based on average workrates for daily field operation. Peak workrates during any one day were generally 10 to 20% higher.

In most crops, the feedrate was primarily limited by windrow size and pickup/feeding performance. In lighter crops, the ground speed was normally limited to about 9 mph (14 km/h) due to rough ground and pickup performance.

TABLE 2. Typical Average Throughputs

Crop	Crop Yield		Daily Average Throughput	
	ton/ac	t/ha	ton/h	t/h
Alfalfa	1.7	3.8	6.7	6.1
Grass	1.1	2.5	4.2	3.8
Alfalfa-Bromegrass	2.0	4.5	10.0	9.1
Alfalfa-Timothy	1.5	3.4	5.9	5.4
Canary Reedgrass	1.8	4.0	8.8	8.0
Fall Rye Greenfeed	1.0	2.2	4.0	3.6
Rye Straw	0.6	1.4	2.8	2.5
Barley Straw	1.1	2.5	4.7	4.3

QUALITY OF WORK

Bale Quality: The Class Rollant 62 produced firm, durable bales with flat ends and uniform diameter in all hay crops (FIGURE 2). Short straw generally resulted in a less durable bale for handling. This was generally due to a limitation of exceeding a certain bale forming pressure, at which point the bale would stop turning in the chamber. The overall bale quality depended greatly on the operator experience. Failure of the operator to evenly feed both sides of the baler in light windrows resulted in barrel or cone-shaped bales.

FIGURE 2. Typical Hay Bale.

A typical hay or straw bale averaged 4.0 ft (1.22 m) in width and 5.3 ft (1.61 m) in diameter. Bales usually settled to about 94% of their original height after 100 days. Average hay bales weighed from 750 to 900 lb (340 to 409 kg) with average densities ranging from 8.5 to 10.2 lb/ft³ (136 to 164 kg/m³). Average straw bales weighed from 500 to 590 lb (227 to 255 kg) with average densities ranging from 5.7 to 6.7 lb/ft³ (91 to 102 kg/m³).

Bale Weathering: During a period of 70 days, over which a total rainfall was measured at 4.4 in (11 cm), moisture had penetrated to a maximum of 2 in (50 mm) on the windward side in the area where another bale had been touching. Spoilage occurred to a depth of 1.0 in (25 mm) in the ground contact area.

Leaf Loss: The Claas was tested for leaf loss in an average crop of alfalfa, which had been cut with a 10 ft (3 m) mower conditioner and in which two swaths were raked together to form a single windrow. Average crop yield was about 2.4 ton/ac (2.2 t/ha). Total leaf loss ranged from 5.0% at 16% M.C. to 8.0% at 11% M.C., which was considered good.

The importance of baling at a high moisture content on losses can be noted in FIGURE 3. This figure represents an accumulation of previous data for several round balers showing the total measured leaf loss over a range of moisture contents, in fields of mixed alfalfa-crested wheatgrass and bromegrass. Although the Claas Rollant 62 was tested in a different crop, its performance was close to that presented in the figure.

FIGURE 3 does not include relative effects of baling unconditioned or light windrows. Heavy, conditioned windrows were important to minimizing losses. Lower power take-off speed was also effective in reducing the number of times the bale turned in the chamber, and consequently reducing leaf loss.

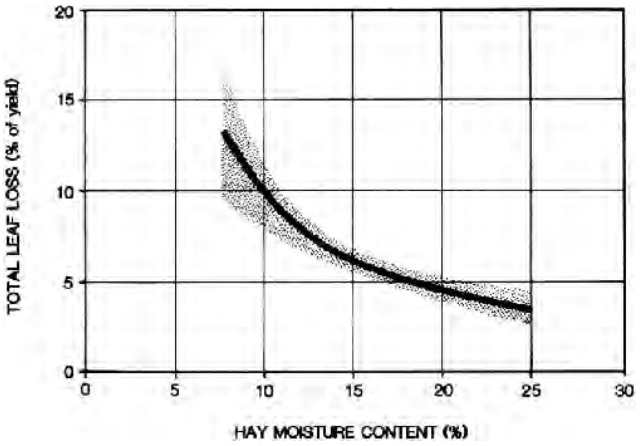

FIGURE 3. Leaf Loss in Mixed Alfalfa, Crested Wheatgrass and Bromegrass.

POWER CONSUMPTION

Power Requirements: FIGURE 4 shows the power takeoff and drawbar power requirements for the Claas Rollant 62. The power input is plotted against bale weight to show the power requirements while a bale is formed. Power take-off input varied from 1.5 hp (1.1 kW) at no load to a maximum of 37 hp (28 kW) in alfalfa and barley straw. Drawbar requirements at 6.6 mph (10.6 km/h) on flat firm fields were about 4.0 hp (3.0 kW) when the bale reached maximum size. Although maximum horsepower requirements did not exceed 41 hp (31 kW), additional power was needed to suit field conditions. In soft, hilly fields, a 75 hp (56 kW) tractor would be needed to fully utilize baler capacity.

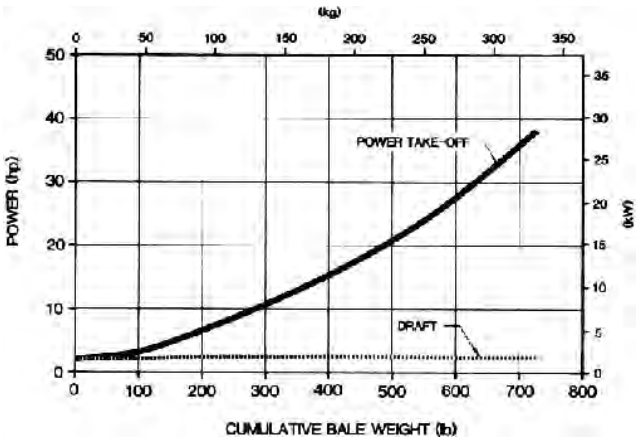

FIGURE 4. Power Consumption During Bale Formation in Alfalfa-Bromegrass.

Specific Capacity: Specific capacity is a measure of how efficiently a machine performs a task. A large specific capacity indicates efficient energy use. The specific capacity of the Claas Rollant 62 was about 0.54 ton/hp-h (0.65 t/kW-h) in alfalfa at the instantaneous workrate of 10 ton/h (9.1 t/h). This specific capacity was greatly influenced by the workrate. This compares to an average specific capacity of 0.6 to 1.2 ton/hp-h (0.7 to 1.4 t/kW-h) for small square balers in alfalfa.

EASE OF OPERATION

Forming a Bale: It was easy to form a neat, durable bale in most crops. Feeding hay across the entire width of the bale chamber by weaving during bale core formations was not critical as the hay tumbled within the bale chamber, distributing itself quite evenly across the chamber.

Alternate side-to-side feeding, to a count of at least ten at each side, was required during the later stages of bale formation to produce bales of uniform diameter. FIGURE 5 shows stages of the bale formation in the Claas Rollant 62.

In very dry and short straw, especially straw from a rotary combine, the baler could not form a high density bale. Too high a pressure in the chamber caused the bale to cease turning. The operator manual recommends a maximum pressure of 170 bar or 2460 psi. It was found that decreasing the power take-off speed and baling during late evening or morning when the straw was slightly damp, improved the performance considerably. To improve performance in short straw, the manufacturer provided PAMI with 0.15 x 0.8 in (4 x 20 mm) metal bars, which were welded to three alternate rollers at the front of the baler. Six bars were appropriately spaced on each roller (FIGURE 6). The performance of these could not be accurately assessed as it was difficult to compare with the exact crop conditions that had been encountered when the difficulty arose. In general it was found that maintaining a low density bale allowed the baler to perform satisfactorily.

FIGURE 5. Stages of Bale Formation: (Left) Starting Bale, (Centre) Partially Completed Bale, (Right) Completed Bale.

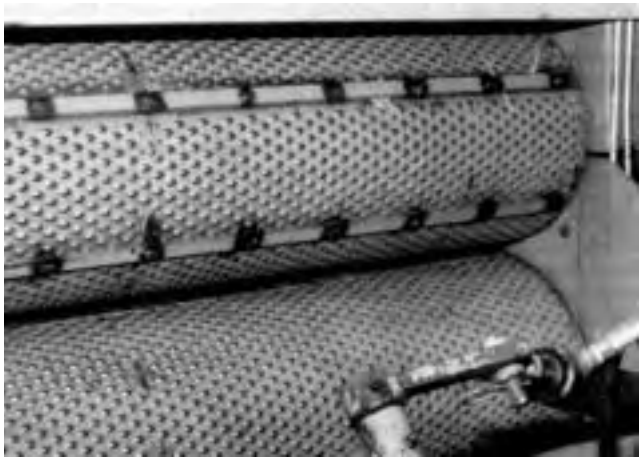

FIGURE 6. Bars Mounted to Alternate Rollers at Front.

Wrapping the Twine: The twine wrapping on the Claas Rollant 62 was hydraulically actuated. A bale density gauge on the right upper front of the baler cued the operator when to tie the bale.

To start wrapping, the twine tube is hydraulically moved to the centre of the bale chamber. Once the twine has been caught by the hay entering the chamber, the operator repositions the twine tube back to the right hand side of the chamber and the tractor forward travel is stopped. After allowing at least two wraps, the hydraulic control is then actuated to move the tube across the front of the bale chamber while running the power take-off. The speed of the twine tube across to the left hand side of the chamber is controlled by an adjustable flow control valve. When the twine tube reaches the left side, the hydraulic lever is momentarily released so that there is at least two wraps at the bale end. The hydraulic lever is then reverse actuated to return the twine tube to the rest position and to cause the twine to cut itself on the knife when the tube strikes the cutter.

It was difficult to set the hydraulic flow control valve to a slow enough travel speed without restricting the full travel of the twine tube to the left end of the bale. It was necessary to control the speed of the twine tube with the hydraulic actuator lever in the tractor. It is recommended that the manufacturer consider modifications to the twine tube mechanism to improve the speed control.

Twine requirements for the Claas Rollant 62 was about 225 ft/ton (75 m/t).

Discharging a Bale: Once the twine was cut, the bale was ready for ejecting by simply opening the gate with the remote hydraulics. A discharge ramp at the rear of the baler facilitated rolling of the bale, as it was discharged away from under the gate. A triangular flag at the front of the baler indicated to the operator when the bale cleared the ramp to permit closing of the gate. It was not required to disengage the power take-off. The bale was wrapped and discharged in about 50 seconds. There was no requirement to back up prior to discharging the bale.

Transporting: The Claas Rollant 62 was easy to manoeuvre and transport. Ground clearance was adequate and there was ample hitch clearance for turning sharp corners. Care was necessary when backing up or transporting on roadways due to obstructed visibility to the rear. The baler could be easily towed behind a tractor or a suitably sized truck. A single rope facilitated both lifting and lowering the pickup. This was convenient to operate.

Hitching: The Claas Rollant 62 was easy to hitch to a tractor. The hitch height was infinitely adjustable from ground height to about one meter off the ground by swinging the hitch frame up or down at the main frame. The hitchjack was convenient for raising and lowering the hitch tongue. The hitch jack was also provided with a wheel, which could be locked into its stored position as soon as the base was clear of the ground. Full retraction of the jack was required. The steel wheel was convenient for maneuvering the baler by hand on concrete or firm ground.

Feeding: Feeding was positive and aggressive in all crops with only infrequent plugging.

Twine Threading: Twine threading was convenient. Twine could be threaded with the use of wire or similar device.

The twine cutter performed well, leaving a good length for starting the twine feed on the next bale. It was necessary to adjust the twine tension such that the twine did not adversely begin to wrap at the wrong time during bale formation.

EASE OF ADJUSTMENT

Roller Drive Chains: Chain tension was provided by an adjustable spring on each of the three drive chains. Chain tension was held constant. No adjustment to the springs was required during the 222 hour test.

Pickup: Pickup floatation was provided by an adjustable floatation spring. The pickup height was adjusted with the lift rope from the tractor to give about 1 in (25 mm) clearance between the ground and the pickup teeth while the floatation spring was adjusted to carry as much weight as possible without excessive pickup bounce. Once proper settings were determined, no further adjustments were required during the test.

The pickup drive chain required frequent adjustment. This was convenient to adjust.

Servicing: The Claas Rollant 62 used an automatic oil dispensing system for lubricating the roller drive chains. Oil was applied to the chains upon each opening of the gate. This system used about one gallon (4.5 L) per 1000 bales. In addition, the pickup chains required oiling every 8 to 10 hours. There was a total of 35 grease fittings and one gear box. The operator manual recommended lubrication of eight grease fittings every 10 hours, 16 grease fittings every 50 hours and checking gear box oil and servicing the remaining eleven grease fittings every 500 hours. The automatic chain oiling reservoir also required periodic filling. Complete daily servicing took about 15 minutes.

OPERATOR SAFETY

The operator is cautioned that a round baler is potentially very dangerous. The operator must disengage the power take-off and stop the tractor engine to clear blockages or to make adjustments. Many serious and fatal accidents have occurred with round balers. Most of these are caused by operators dismounting from the tractor while leaving the baler running.

The Claas Rollant 62 was safe to operate and service as long as common sense was used and the manufacturer's safety recommendations were followed. Rotating parts were well shielded. The pickup and feeding area were well shielded to discourage operators from attempting to clear blockages with the baler in operation. The safety shields were hinged so they could not be completely removed.

The Claas Rollant 62 had rear gate cylinder locks to permit safe servicing with the rear gate open. A slow moving vehicle sign was provided at the rear of the baler.

OPERATOR'S MANUAL

The operator's manual was well written and contained much useful information on operation, servicing, adjustments and safety procedures.

MECHANICAL HISTORY

The Claas Rollant 62 was operated for 222 hours while baling 2817 bales. The intent of the test was an evaluation of functional performance and an extended durability evaluation was not conducted.

The spring pin on the twine tube mechanism sheared several times throughout the test. This was a safeguard against twine tube damage and extra spring pins were provided with the baler. Some of the pickup guards had also incurred some damage due to encountering stones. These were easily repaired by removing and straightening to their original shape.

APPENDIX I
SPECIFICATIONS

MAKE:	Claas
MODEL:	Rollant 62
SERIAL NUMBER:	00308908
MANUFACTURER:	Claas OHG 4834 Harswinkle 1 West Germany
DIMENSIONS:	
-- width	7.8 ft (2.4 m)
-- height	8.7 ft (2.6 m)
-- length	14.5 ft (4.4 m)
-- ground clearance	14.5 in (370 mm)
TIRES:	two, 31 x 13.50-15
WEIGHT:	
-- left wheel	1966 lb (892 kg)
-- right wheel	1576 lb (715 kg)
-- hitch point	595 lb (270 kg)
Total	4137 lb (1877 kg)
BALE CHAMBER:	
-- type	chain driven pressure rollers rotating at ends on sealed bearings and driven at left side
-- width	4.0 ft (1.22 m)
-- maximum diameter	5.25 ft (1.60 m)
-- bale density control	hydraulic oil pressure
-- bale peripheral speed (at 540 rpm)	4.34 mph (7.0 km/h)
ROLLERS:	
-- type	18 steel rollers
-- length	4.0 ft (1.22 m)
-- diameter	12.0 in (305 mm)
-- speed	124 rpm
-- peripheral speed	4.34 mph (7.0 km/h)
BALE CHAMBER FEEDER:	
-- type	16 tooth feed rake
-- speed	205 strokes/min
-- length of teeth	6.3 in (160 mm)
-- teeth spacing	2.5 in (63 mm)
BALE SIZE INDICATOR TYPE:	pressure gauge indicates hydraulic oil pressure on gate
TAIL GATE CLOSED INDICATOR:	pressure gauge
PICKUP:	
-- type	fully floating, cylindrical drum with spring teeth
-- height adjustment	mechanical winch operated by rope from tractor seat
-- width	5.1 ft (1.55 m)
-- diameter	26 in (670 mm)
-- number	01 tooth bars four, 18 teeth per bar
-- speed (at 540 rpm)	85 rpm
-- tooth tip speed (at 540 rpm PTO)	6.6 mph (10.7 km/h)
TWINE SYSTEM:	
-- capacity	4 balls
-- type	hydraulic actuated wrap
-- recommended twine	sisal or plastic
-- twine feed	single tube controlled by tractor hydraulics
-- twine cutter	stationary knife actuated by tube striking lever
DRIVES:	
-- number of chain drives	four
-- number of gear drives	one
-- number of universal joints	two
SAFETY DEVICES:	
-- main drive shearbolt and over-run clutch	
-- pickup slip clutch	
-- rear gate cylinder locks	
-- hinged safety shields	
-- bale chamber overload, pressure relief valve	
SERVICING:	
-- grease fittings	eight, every 10 hours sixteen, every 50 hours eleven, every 500 hours
-- chains	one, oil every 8 hours and refill automatic reservoir periodically
-- pivot points	five, every 8 or 50 hours
-- gear box check	every 500 hours
TRACTOR HOOK-UP:	
-- connections	two, double action hydraulic hose
-- hitch height	totally variable

APPENDIX II
MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports:

Excellent	Fair
Very Good	Poor
Good	Unsatisfactory

SUMMARY CHART

CLAAS ROLLANT 62 ROUND BALER

RETAIL PRICE:	$17,229.00 (January 1986, f.o.b. Portage la Prairie, MB)
CAPACITY:	2.8 to 10.0 ton/h (2.5 to 9.1 t/h)
QUALITY OF WORK:	
Bale Quality	**Very Good,** soft core, firm durable bales.
Weatherability	**Very Good,** about 2 in (50 mm) spoilage
Leaf Loss	5.0 to 8.0% in alfalfa hay
POWER REQUIREMENTS:	
Tractor size	75 hp (56 kW) tractor has sufficient reserve for most field conditions
Specific Capacity	0.54 ton/hp-h (0.65 t/kW-h)
EASE OF OPERATION:	
Forming a bale	**Very Good**, short straw required operator to limit bale density
Wrapping the twine	**Excellent,** operator experience required
Discharging the bale	**Excellent,** 50 sec to wrap & discharge
Transporting	**Very Good,** pickup adjustable from tractor
Hitching	**Very Good,** jack was convenient
Feeding	**Very Good,** aggressive in all crops
EASE OF ADJUSTMENT:	
Drive Chains	**Very Good,** chains were self-tensioning and auto-oiled
Pickup	**Good,** flotation adjusted once, drive chain adjusted frequently
Bale Size & Wrap Settings	**Very Good,** Not adjustable and hydraulically controlled from tractor
Servicing	**Good,** about 15 min. for daily service
OPERATOR SAFETY	Well shielded and accessible
OPERATOR MANUAL	**Very Good,** well written
MECHANICAL HISTORY	Four pickup guards were pushed back; these were easily fixed

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