Printed: June, 1988
Tested at: Portage la Prairie
ISSN 0383-3445
Group: 4(a)

Evaluation Report 557

Gehl RB 1710 Round Baler

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

GEHL RB 1710 ROUND BALER

MANUFACTURER AND DISTRIBUTOR:
Gehl Company
West Bend, Wisconsin

PARTS DISTRIBUTOR:
Homestead Farm Supply
4030 Thatcher Avenue
Saskatoon, Saskatchewan
S7K 3J7

RETAIL PRICE:
$20,505 (April 1988, f.o.b. Portage la Prairie, Manitoba) with electric twine wrapping and floatation tires.

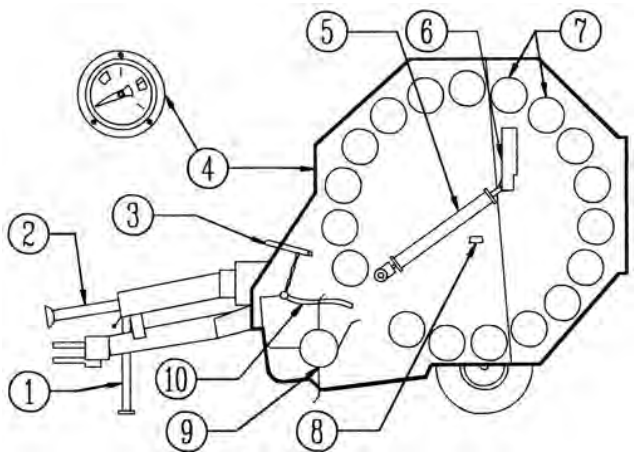

FIGURE 1. Gehl RB 1710 Round Baler: (1) Jack, (2) Drive Shaft, (3) Pickup Height Adjustment, (4) Pressure Gauge, (5) Hydraulic Cylinder, (6) Hydraulic Cylinder Lockout, (7) Forming Rollers, (8) Bale Counter, (9) Pickup, (10) Windguard.

SUMMARY

Rate of Work: Typical throughput of the Gehl RB 1710 varied from 2.5 ton/h (2.3 t/h) in wheat straw to 10.5 ton/h (9.5 t/h) in alfalfa-timothy-clover. Throughput was usually limited by pick up and feeding performance rather than by bale chamber capacity.

Quality of Work: Bale quality was very good, with well formed and durable bales in all conditions except short straw. In this case, bale quality was fair to good due to poor bale durability as a result of limiting bale density pressure. Hay bales weighed from 1100 to 1400 lb (500 to 640 kg) and straw bales weighed from 750 to 1000 lb (340 to 450 kg).

Resistance to bale moisture penetration and spoilage was very good after 100 days of weathering. Total leaf loss was 7.9% at a 13% moisture content which was considered fair.

Ease of Operation: Ease of bale forming transporting hitching, and feeding was very good; ease of bale discharging and twine threading was good; and ease of twine wrapping was fair. Starting and forming a bale was very easy with the Gehl 1710, in short straw, the bale density pressure had to be limited to about 2200 psi (15.2 MPa) or the bale would stop rolling in the chamber.

The twine cut-off mechanism was very inconsistent. Either it cut the twine off too short to start wrapping the next bale or it would not cut the twine at all. Best success was achieved when the tractor engine was idled down to its lowest speed just prior to moving the twine guide tubes to their home position. The operator was required to stop forward motion of the tractor once the wrapping operation began. The baler had to be backed up to clear the bale from under the gate before starting a new bale. A bale could be wrapped and discharged in about 40 seconds.

Feeding was positive and aggressive in all crops. Overloading the bale chamber caused the shearbolts to break, while overloading the pickup caused activation of the slip clutch.

Ease of Adjustment: Ease of adjusting the roller drive chains and the pickup was very good; and ease of lubricating was good. Daily servicing took one person about 15 minutes.

Power Requirements: Peak power requirements were about 73 hp (54 kW) in hay and straw on level fields. A 90 hp (67 kW) tractor was needed to fully utilize baler capacity on soft and hilly fields.

Operator Safety: Operator safety on the Gehl 1710 was very good if normal safety precautions were observed.

Operator's Manual: The operator's manual was very good. It was well written and clearly illustrated.

Mechanical History: One chain idler wore out, several lower rollers were dented after baling in a field with tree roots, and the twine cut-off mechanism malfunctioned during the evaluation.

RECOMMENDATIONS:

It is recommended that the manufacturer consider modifications to the twine wrapping system to improve reliability.

Station Manager: G.M. Omichinski

Project Engineer: D.J. May

THE MANUFACTURER STATES THAT:

With regard to the recommendation:

1. The twine cut-off was redesigned following field testing in 1987 and all 1987 built units, similar to the PAMI test unit, have been field updated to the latest design as incorporated into the 1988 Production Balers. Length of twine ends is controlled by position of twine arm when knife is exposed to twine.

MANUFACTURER'S ADDITIONAL COMMENTS:

In addition 1988 Models have a constant velocity 80 degree wide angle PTO driveline.

GENERAL DESCRIPTION

The Gehl RB 1710 is a pull-type, PTO driven baler with a cylindrical baling chamber and a floating drum pickup. The twine wrapping mechanism uses dual twine tubes and is actuated from inside the tractor cab.

Hay is fed directly into the 4.9 ft (1.5 m) wide baling chamber by the pickup. The baling chamber is a fixed chamber type with twenty, 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 optional electric twine wrapping and floatation tires. Other options available but not tested included: hydraulic twine wrapping, automatic chain oiler, pickup gauge wheel, bale discharge bumper, high density bale kit and various tire sizes.

SCOPE OF TEST

The Gehl RB 1710 baler was operated in a variety of crops (TABLE 1) for 144 hours, while producing 1541 bales. It was evaluated for rate of work, quality of work, ease of operation, ease of adjustment, power requirements, operator safety, and suitability of the operator's manual.

TABLE 1. Operating Conditions

Crop	Hours	Number of Bales	Equivalent Field Area	
			ac	ha
Alfalfa	57	667	340	138
Alfalfa-Bromegrass	8	60	100	41
Alfalfa-Timothy-Clover	17	255	225	91
Couch Grass	10	115	35	14
Mixed Grass	13	111	65	26
Oat Straw	12	180	50	20
Wheat Straw	20	113	60	24
Barley Straw	4	20	15	6
Flax Straw	3	20	35	14
Total	144	1541	925	374

RESULTS AND DISCUSSION

RATE OF WORK

Throughput depended on windrow size, uniformity of crop con-

ditions, field surface, available tractor speeds and operator skill.

Average throughput for the Gehl 1710 (TABLE 2) varied from 2.5 ton/h (2.3 t/h) in wheat straw to 10.5 ton/h (9.5 t/h) in alfalfa-timothy-clover. The values in Table 2 are 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 8 mph (13 km/h) due to rough ground and pickup performance.

TABLE 2. Average Throughput

Crop	Crop Yield		Daily Average Throughput	
	ton/ac	t/ha	ton/h	t/h
Alfalfa: Field A	0.6	1.3	3.0	2.7
Field B	1.5	3.4	8.8	8.0
Alfalfa-Bromegrass	0.4	0.9	4.5	4.1
Alfalfa-Timothy-Clover	1.0	2.2	10.5	9.5
Couch Grass	2.1	4.7	7.2	6.5
Mixed Grass	1.3	2.9	6.6	6.0
Oat Straw	1.6	4.0	7.5	6.8
Wheat Straw	1.0	2.2	2.5	2.3
Flax Straw	0.3	0.7	4.0	3.6

QUALITY OF WORK

Bale Quality: The Gehl 1710 produced firm, durable bales with flat ends and uniform diameter in all hay crops (FIGURE 2). Handling the bales when transporting did not present a problem. The overall bale quality depended greatly on the operator's experience. Failure of the operator to evenly feed both sides of the baler in light windrows resulted in barrel or cone-shaped bales.

A typical hay bale averaged 5.0 ft (1.5 m) in width and 6.2 ft (1.9 m) in diameter. Bales usually settled to about 94% of their original height after 100 days. Average hay bales weighed from 1100 to 1400 lb (500 to 640 kg) with average densities ranging from 7.3 to 9.3 lb/ft³ (117 to 149 kg/m³). Average straw bales weighed from 750 to 1000 lb (340 to 450 kg) with average densities from 5.0 to 6.6 lb/ft³ (80 to 106 kg/m³).

Bale Weathering: During a period of 100 days, over which a total rainfall was measured at 10.4 in (266 mm), moisture had penetrated to a maximum of 2.0 in (50 mm) in the area where the bale touched the ground. Spoilage occurred to a depth of 1.0 in (25 mm) on top of the bale which was considered very good.

FIGURE 2. Typical Hay Bale.

Leaf and Stem Loss: The Gehl 1710 was tested for leaf and stem loss in an average crop of alfalfa, which had been cut with an 18 ft (5.5 m) swather. Average crop yield was about 2.9 ton/ac (6.5 t/ha). Total leaf and stem loss was 7.9% at a 13% moisture content which was considered fair.

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 and stem loss over a range of moisture contents, in fields of mixed alfalfa, crested wheatgrass and bromegrass. Although the Gehl 1710 was tested in a different crop, it had higher leaf and stem losses than shown, indicating higher losses than might be expected with most other balers.

FIGURE 3 does not include relative effects of baling unconditioned or light windrows. Heavy, conditioned windrows are important to minimizing losses. Lowering PTO speed is also effective in reducing the number of times the bale is turned in the chamber, and consequently reducing leaf loss.

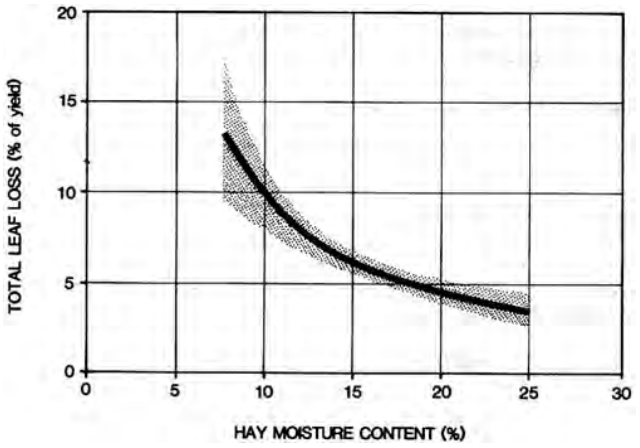

FIGURE 3. Typical Round Baler Leaf and Stem Loss in Mixed Alfalfa. Crested Wheatgrass and Bromegrass.

EASE OF OPERATION

Bale Forming: Ease of bale forming on the Gehl 1710 was very good in most crops. Feeding hay across the entire width of the bale chamber by weaving during bale core formation 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 4 shows stages of the bale formation in the Gehl 1710.

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's manual recommends a maximum pressure of 3200 psi (22.1 MPa). Usually a maximum pressure of only 2200 psi (15.2 MPa) could be reached before the bale stopped turning. It was found that decreasing the PTO speed and baling during late evening or morning when the straw was slightly damp, improved the performance considerably. Also, if the bale was wrapped with twine as soon as any backfeeding of straw into the pickup was observed, a good low density bale could be produced.

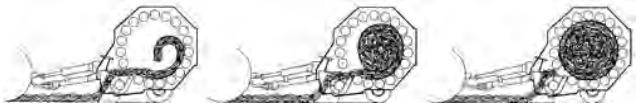

FIGURE 4. Stages of Bale Formation: (Left) Starting Bale, (Centre) Partially Completed Bale. (Right) Completed Bale.

Twine Wrapping: Twine wrapping on the Gehl 1710 was fair. It was electrically actuated and 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 tubes were moved to the centre of the bale chamber, using the toggle switch on the electric control box. Once the twine was caught by the hay entering the chamber, the operator stopped the forward motion of the tractor and swung the twine tubes to the left hand side of the chamber. After allowing at least two wraps, the control switch was moved so that the tubes were moved across the front of the bale chamber while running the PTO. The speed of the twine tubes across to the right hand side of the chamber was controlled by the operator intermittently switching the actuator on and off with the toggle switch. When the twine tube reached the right side, the tubes were stopped to leave at least two wraps on the edge of the bale. Then the tubes were moved to their home position and the twine was cut off as it was drawn across the stationary knife.

It was extremely important that the tractor engine was idled down to its minimum speed just prior to moving the twine tubes to their home position. If this was not done, either the twine was cut off too short to start wrapping the next bale, or the twine would not be cut off and would continue wrapping on the bale in the chamber until the PTO was shut off. Even with the tractor idled down, prior to moving the twine tubes to their home position, the wrapping system

often failed and the operator had to shut off and dismount the tractor to correct the problem. It is recommended that the manufacturer consider modifications to the twine wrapping system to improve reliability.

The operator could wrap the bale with as much twine as desired by changing the amount of time the toggle switch on the control box was held on. The minimum twine usage was about 340 ft/ton (110 m/t). Most operators preferred a wrap cycle, which consumed about 730 ft/ton (250 m/t). This produced a durable bale, which could be handled several times. Typical twine consumption for small square balers is about 670 ft/ton (230 m/t). In short straw more twine was required to produce bales of adequate durability. If the end wraps of twine on straw bales were less than 7.5 in (190 mm) from the end, the twine would usually slip off the ends during wrapping or when the bale was discharged. Twine requirements varied with the type of crop, type of twine and the desired durability.

Bale Discharging: Ease of bale discharging was good. Once the twine was cut, the PTO was allowed to turn and the gate was hydraulically opened, ejecting the bale. The baler had to be backed up prior to discharging the bale so that the gate could be closed before feeding more material into the bale chamber. The bale was wrapped and discharged in about 40 seconds.

Transporting: Ease of transporting and maneuvering was very good. Ground clearance was adequate and there was ample hitch clearance for turning sharp corners. The operator had to remember to place the jack into its storage position to prevent damage on turns. 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 suitably sized truck. A safety chain was available as optional equipment. The load on the baler tires with a full bale chamber did not exceed the Tire and Rim Association maximum load ratings at transport speeds of 25 mph (40 km/h). Dismounting the tractor was required to lift the pickup. Placing the pickup in transport required an upward lift of about 25 lb (110 N).

Hitching: Ease of hitching the Gehl 1710 was very good. The hitchjack could be removed and placed into its storage position as soon as the base was clear of the ground. Full retraction of the jack was not required. Some driveline chatter was observed on corners. There was no constant velocity joint on the PTO driveline or equal angle hitch extension available.

Feeding: Pickup performance of the Gehl 1710 was very good. It was positive and aggressive in all crops with only infrequent plugging. A pickup drive clutch prevented overloading of the windrow pickup. Very dry and short straw would backfeed into the pickup area when the bale was nearing completion. As soon as any backfeeding was observed it was advisable to begin the wrapping sequence so that the bale would not stop turning inside the bale chamber. Baling short straw when it was slightly tough reduced this problem.

Twine Threading: Ease of twine threading was good. Threading the twine through the twine projection tubes required the use of a piece of stiff wire.

The twine cutter performed poorly throughout the evaluation. The tractor engine speed had to be idled to its minimum just prior to moving the twine tubes to their home position. If this was not done either the twine was cut off too short, or was not cut off at all. Even with the tractor idled down the twine cutting system often failed.

EASE OF ADJUSTMENT

Roller Drive Chains: Ease of adjusting the roller drive chain tension was very good. Chain tension was provided by an adjustable spring tensioner on each of the four drive chains. The spring tensioners were each adjusted about three times during the 144 hour test. Each tensioner took one person about two minutes to adjust.

Pickup: Ease of adjusting the pickup was very good. Pickup floatation was provided by an adjustable spring on each side of the baler. The pickup height was adjusted with a lever on the left hand side of the baler. The pickup was adjusted as high off the ground as possible while still being able to pick up the crop. The floatation springs were adjusted to carry as much weight as possible without excessive pickup bounce. Once proper settings were determined, no further adjustments were required throughout the test. Typical pickup height adjustment took one person about two minutes while floatation spring adjustment took one person about ten minutes.

Lubricating: Ease of lubricating the test machine was good. The Gehl 1710 had five drive chains, 21 grease fittings and one gear box. The operator's manual recommended using a foaming aerosol lubricant every 6 to 8 hours on the drive chains, servicing 14 grease fittings every eight hours, and seven grease fittings every 100 hours. Also recommended was that the gearbox be checked every 100 hours and fluid added if necessary. Complete daily servicing took one person about 15 minutes.

POWER CONSUMPTION

Power Requirements: FIGURE 5 shows the PTO and drawbar power requirements for the Gehl 1710. The power input is plotted against bale weight to show the power requirements while a bale is formed. PTO requirements varied from 2.9 hp (2.2 kW) at no load to a maximum of 67 hp (50 kW) in alfalfa. Drawbar requirements at 3.5 mph (5.6 km/h) on flat firm fields were about 5.3 hp (4.0 kW) when the bale reached maximum size. Although maximum horsepower requirements did not exceed 73 hp (54 kW) additional power was needed to suit field conditions especially in soft hilly fields. The manufacturer suggested a tractor of at least 70 hp (52 kW). To fully utilize baler capacity, PAMI recommends a tractor of at least 90 hp (67 kW) in order to have sufficient power reserve in all field conditions.

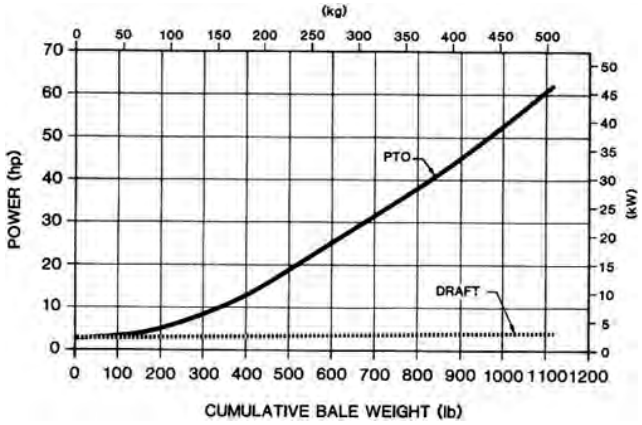

FIGURE 5. Power Consumption During Bale Formation in Alfalfa.

Specific Capacity: Specific capacity is a measure of how efficiently a machine performs a task. A high specific capacity indicates efficient energy use. The specific capacity of the Gehl 1710 was measured at 0.28 ton/hp-h (0.34 t/kW-h) in alfalfa at a workrate of 8.8 ton/h (8.0 t/h). This specific capacity was greatly influenced by the workrate. At a maximum workrate of 12.6 ton/h (11.4 t/h) a specific capacity of 0.40 ton/hp-h (0.49 t/kW-h) could be expected. The typical range of specific capacities for small square balers in alfalfa is 0.6 to 1.2 ton/hp-h (0.7 to 1.4 t/kW-h).

OPERATOR SAFETY

Overall operator safety on the Gehl 1710 was very good. The operator is cautioned that a round baler is potentially very dangerous. The operator must disengage the PTO 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 manufacturer can only go to certain limits in providing shielding and safety devices and must rely on the operator's common sense in following established safety procedures.

The Gehl 1710 conformed to ASAE safety standards. It 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 guarded to discourage operators from attempting to clear blockages with the baler in operation. The safety shields were conveniently hinged so they did not have to be completely removed.

The Gehl 1710 had rear gate cylinder locks to permit safe servicing with the rear gate open.

A slow-moving-vehicle sign was not provided with the baler, but a mounting bracket was.

OPERATOR'S MANUAL

The operator's manual was very good. It was well written and clearly illustrated and contained much useful information on operation, servicing, adjustments, assembly, optional equipment, warranty and safety procedures.

MECHANICAL HISTORY

The Gehl RB 1710 was operated for 144 hours while baling 1541 bales. The intent of the test was an evaluation of functional performance and an extended durability evaluation was not conducted. TABLE 3 outlines those problems, which occurred during functional testing.

TABLE 3. Mechanical History

Item	Operating Hours	Equivalent Field Area	
		ac	ha
-Chain idler wore out and was replaced at	15	190	77
-Several lower rollers dented at	25	325	131
-Twine cut-off unit malfunctioned and was replaced at	58	485	196

DISCUSSION OF MECHANICAL PROBLEMS

Chain Idler: The locking collar on one of the lower rollers loosened and fell off. This allowed the roller to slip out of line and the drive chain wore the teeth off of the idler. The idler was replaced with a new one, the roller was put back in line and the locking collar replaced. This repair took one person about 1 hour to complete.

Lower Rollers: Several lower rollers were dented when tree roots entered the bale chamber without the operator noticing and were expelled between the rollers. The dents were not serious enough to replace the rollers. The manufacturer recommends shutting off the PTO as soon as any stone or other debris is seen entering the bale chamber. Then opening the tailgate approximately 8 in (200 mm) and slowly run the PTO until the foreign object falls out.

Twine Cut-off: The twine cut-off unit malfunctioned from the start of the evaluation. Either it cut the twine off too short or it wouldn't cut the twine off at all. Then the operator had to shut off the PTO and cut the twine by hand or pull the right amount of twine out of the twine guide tube to start the next bale. Replacing the twine cut-off unit did not help this situation. It was eventually found that if the tractor engine was idled down to its lowest speed just prior to moving the twine guide tubes to their home position, the cut-off mechanism would usually function properly.

APPENDIX I
SPECIFICATIONS

MAKE:	Gehl
MODEL:	RB 1710
SERIAL NUMBER:	19259
MANUFACTURER:	Gehl Company, West Bend, Wisconsin
DIMENSIONS:	
-- width	8.5 ft (2.6 m)
-- height	9.2 ft (2.8 m)
-- length	14.6 ft (4.4 m)
-- ground clearance	12.5 in (320 mm)
TIRES:	two, 31 x 13.50-15, 6-ply
WEIGHT:	
-- left wheel	2319 lb (1052 kg)
-- right wheel	2099 lb (952 kg)
-- hitch point	564 lb (256 (kg)
Total	4982 lb (2260 kg)
BALE CHAMBER:	
-- type	chain driven pressure rollers rotating on sealed bearings at ends and driven at left side
-- width	4.9 ft (1.5 m)
-- maximum diameter	5.9 ft (1.8 m)
-- bale density control	hydraulic oil pressure
-- bale peripheral speed (540 rpm)	4.34 mph (7.0 km/h)
ROLLERS:	
-- type	20 steel rollers
-- length	4.9 ft (1.5 m)
-- diameter	12.0 in (305 mm)
-- speed	124 rpm
-- peripheral speed	4.34 mph (7.0 km/h)
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	height adjustment lever with spring loaded locking pin
-- width	4.9 ft (1.5 m)
-- diameter	26 in (660 mm)
-- no. of tooth bars	four, 20 teeth per bar
-- speed (at 540 PTO rpm)	85 rpm
-- tooth tip speed (540 rpm)	6.6 mph (10.7 km/h)
TWINE SYSTEM:	
-- capacity	4 balls
-- type	electrically actuated wrap
-- recommended twine	sisal or plastic
-- twine feed	dual twine guide tubes activated by electric control box on tractor
-- twine cutter	twine drawn across stationary knife
DRIVES:	
-- number of chain drives	5
-- number of gear drives	1
-- number of universal joints	3

SAFETY DEVICES:
- -- main drive shearbolts and rubber coupler on gearbox output shaft
- -- pickup slip clutch
- -- rear gate cylinder locks
- -- hinged safety shields

LUBRICATING:	8 hour	100 hrs/Annually
-- grease	14	7
-- oil	5	1

TRACTOR HOOK-UP:	
-- connections	single remote hydraulics (two hoses) one electrical cable
-- hitch height	variable

APPENDIX II
MACHINE RATINGS

The following rating scale is used in PAMI Evaluation Reports

Excellent	Fair
Very Good	Poor
Good	Unsatisfactory

SUMMARY CHART
GEHL RB 1710 ROUND BALER

RETAIL PRICE:	$20,505 (April 1988, f.o.b. Portage la Prairie, MB)
RATE OF WORK:	2.5 ton/h (2.3 t/h) in wheat straw 40.5 ton/h (9.5 t/h) in alfalfa-timothy-clover
QUALITY OF WORK:	
Bale Quality	**Very Good,** soft core, tight outside wrap
Weatherability	**Very Good,** about 1.0 in (25 mm) spoilage
Leaf and Stem Loss	**Fair,** 7.9% in alfalfa hay at 13% moisture
EASE OF OPERATION:	
Bale Forming	**Very Good,** short straw required operator to limit bale density
Twine Wrapping	**Fair,** tractor had to be idled down just prior to twine cut-off
Bale Discharging	**Good,** tractor had to be backed up
Transporting	**Very Good,** ample ground clearance
Hitching	**Very Good,** jack was convenient
Feeding	**Very Good,** aggressive in all crops
Twine Threading	**Good,** piece of stiff wire required
EASE OF ADJUSTMENT:	
Drive Chains	**Very Good,** adjustable spring tensioner
Pickup	**Very Good,** lever quick and simple
Lubricating	**Good,** about 15 min for daily servicing
POWER REQUIREMENTS:	
Tractor Size	90 hp (67 kW) has sufficient power reserve for most field conditions
Specific Capacity	0.40 ton/hp-h (0.49 t/kW-h) at a workrate of 12.6 ton/h (11.4 t/h)
OPERATOR SAFETY:	**Very Good,** well shielded and visible decals
OPERATOR'S MANUAL:	**Very Good,** well written and clearly illustrated
MECHANICAL HISTORY:	Chain idler wore out, lower forming rollers were dented and the twine cut-off mechanism malfunctioned

ALBERTA FARM MACHINERY RESEARCH CENTRE

3000 College Drive South
Lethbridge, Alberta, Canada T1K 1L6
Telephone: (403) 329-1212
FAX: (403) 329-5562
http://www.agric.gov.ab.ca/navigation/engineering/afmrc/index.html

Prairie Agricultural Machinery Institute
Head Office: P.O. Box 1900, Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-2555

Test Stations:

P.O. Box 1060
Portage la Prairie, Manitoba, Canada R1N 3C5
Telephone: (204) 239-5445
Fax: (204) 239-7124

P.O. Box 1150
Humboldt, Saskatchewan, Canada S0K 2A0
Telephone: (306) 682-5033
Fax: (306) 682-5080