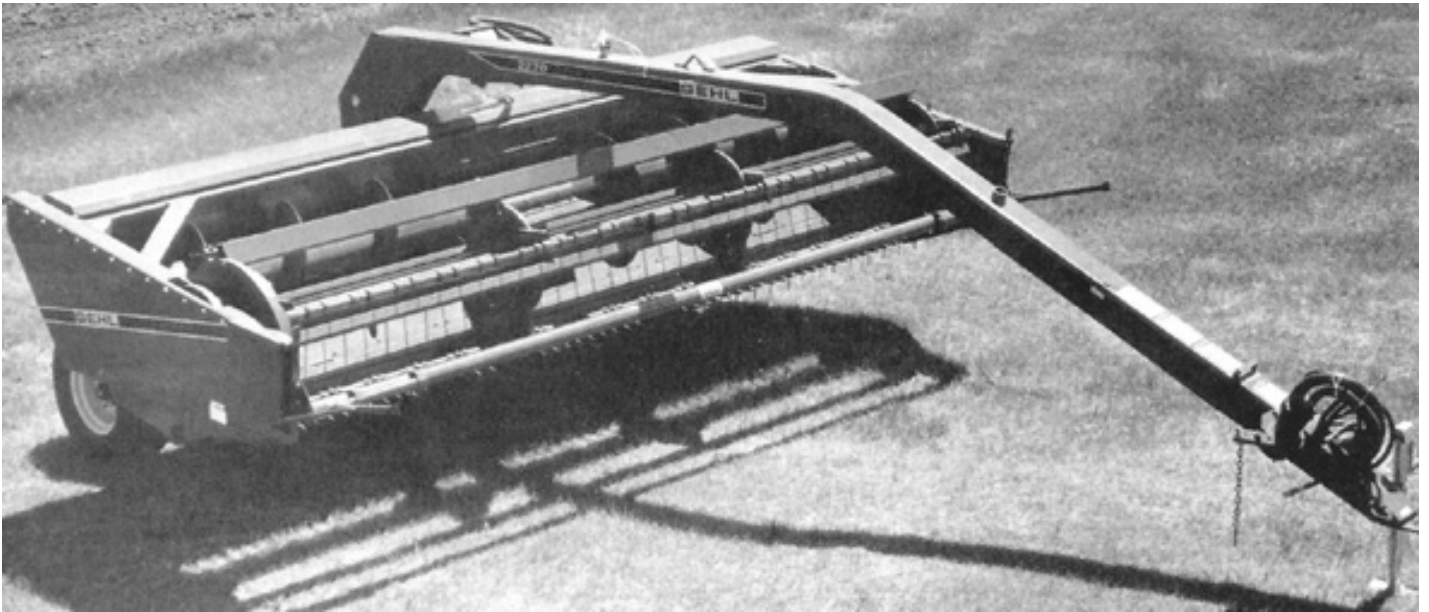


Evaluation Report

594



Gehl 2270 Swing Frame Mower Conditioner

A Co-operative Program Between



ALBERTA
FARM
MACHINERY
RESEARCH
CENTRE



PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

GEHL 2270 SWING FRAME MOWER CONDITIONER

MANUFACTURER AND DISTRIBUTOR

Gehl Company
West Bend, Wisconsin
53095 U.S.A.
Phone: (414) 334-6633

RETAIL PRICE: \$23,260.00 (March 1989, f.o.b. Portage la Prairie, Manitoba)

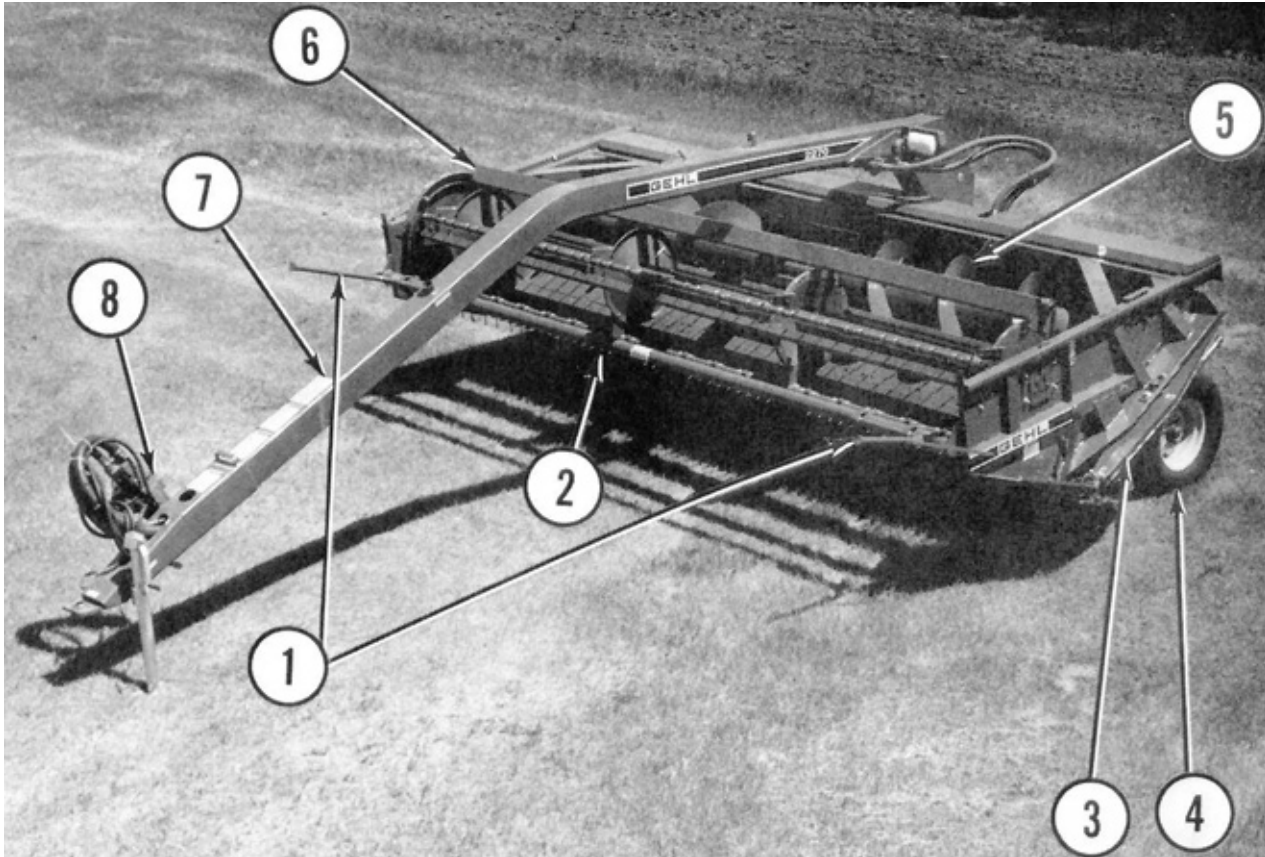


FIGURE 1. Gehl2270 Swing Frame Mower Conditioner: (1) Optional Crop Dividers, (2) Push Bar, (3) Wobble Arm, (4) Floatation Tires, (5) Feed Auger, (6) Bat Reel, (7) Swing Hitch, (8) Hydraulic Pump.

SUMMARY

Rate of Work: The average continuous ground speed for the Gehl 2270 mower conditioner was 6.0 mph (9.6 km/h). Ground speed was limited by field roughness and crop density. Average continuous work rate was 8.0 ac/h (3.2 ha/h).

Quality of Work: The performance of the Gehl 2270 mower conditioner in all crops tested was very good. The cutterbar performance was very good cutting alfalfa, native grasses, brome, timothy and clover. Performance of the conditioning rolls was very good in all crops and the windrow formation was very good. After initial adjustment, floatation was easily set to meet field conditions. Floatation was very good and leaf toss was minimal.

Ease of Operation: Ease of hitching, operating hydraulic controls, transporting, and lubricating were all very good. Ease of field operation was good. The Gehl 2270 was easy to operate and took little operator practice. Daily service took about 20 minutes.

Ease of Adjustment: Most adjustments to the Gehl 2270 were easy to carry out. Ease of adjusting the cutterbar, reel speed, skid shoes and swath gate was very good; ease of adjusting the reel position, auger, roll clearance and header floatation was good; ease of adjusting the push bar was fair; and ease of adjusting the roll pressure and gauge wheels was poor. Ease of maintaining the

knife was very good.

Operator Safety: The Gehl 2270 was safe to operate if normal safety precautions were followed. The Gehl 2270 complied with all applicable ASAE standards for safety.

Operator's Manual: The operator's manual was excellent. It contained useful and accurate information.

Mechanical History: Several mechanical problems occurred during the 178 hours of test time.

RECOMMENDATIONS:

It is recommended that the manufacturer consider:

1. An alternate method of adjusting the pressure of the conditioning rolls.
2. Simplifying the height adjustment for the optional header gauge wheels.
3. Replacing the two bolts used to attach the bearing to the wobble arm with bolts of higher strength.

Station Manager: G.M. Omichinski

Project Technologist: R.K. Harris

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. Gehl Company is now presetting conditioner roll pressure at the factory and further adjustment is not required.
2. Changes to the height adjustment of the optional gauge wheels are being considered while maintaining their present location close to the cutterbar. This allows faster reaction to changes in ground contours, which prevents damage to sickles and guards.
3. Changes of bott strength are under advisement.

GENERAL DESCRIPTION

The Gehl 2270 swing frame mower conditioner is designed to condition and windrow forage and hay crops. It is a pull-type machine and has a centre mounted pivoting hitch. The hitch is also used as an oil reservoir for the hydraulic drives. The Gehl 2270 is powered by an integral hydraulic pump, which derives its rotary power input from the power take-off of a tractor. The Gehl 2270 can be operated by either a 540 or 1000 rpm PTO, depending on the option ordered. It is capable of cutting a 14.3 ft (4.4 m) swath in a single pass. Cutting is accomplished with a single full width sickle bar, which is mechanically driven from the left hand side of the machine. Crop is forced against the knife by a cam operated four bat finger reel, then into the full width feed auger. Stripper bars allow crop to be fed to the 9.1 ft (2.8 m) conditioning rolls, along it's full length. The Gehl 2270 is supported on both sides with floatation tires.

The height of the machine is hydraulically adjustable to allow mechanical transport locks to be positioned. A steel block is utilized to lock the main frame perpendicular to the hitch for transport. Optional equipment tested was additional rubber paddles for the feed auger and additional reel bats. The push bar on the front of the machine was fitted with optional crop dividers and optional gauge wheels were supplied.

SCOPE OF TEST

The Gehl2270 was operated in the crops shown in TABLE 1 for 177 hours while cutting and conditioning about 1600 ac (647 ha). It was evaluated for rate of work, quality of work, ease of operation and adjustment, power requirements, operator safety and suitability of the operator's manual. In addition, mechanical problems were monitored throughout the test.

TABLE 1. Operating Conditions

CROP	HOURS	EQUIVALENT FIELD AREA	
		ac	(ha)
Alfalfa	97	1100	(445)
Brome	12	100	(40)
Native Grasses	35	250	(101)
Timothy/Clover	20	150	(61)
12% Transport	13		
TOTAL	177	1600	(647)

RESULTS AND DISCUSSION

RATE OF WORK

The rate of work was dependent on field roughness, soil moisture, crop density and operator experience. The average continuous ground speed was 6.0 mph (9.6 km/h), and the average workrate was 8.0 ac/h (3.2 ha/h). Due to the long hitch length, considerable distance was required to turn 180 degrees at the completion of a row. This reduced the rate of work.

QUALITY OF WORK

Windrow Formation: The Gehl 2270 produced very good quality windrows in all crops tested. When the fluffer handle was adjusted to its highest position, the forming shields produced a clean sharp edge that was used as a guide for the tractor wheel for the succeeding row. When the handle was adjusted to the lower settings, wide flatter rows

resulted. Windrows up to 7.5 ft (2.3 m) wide could be achieved with the fluffer handle set to the lowest position. The Gehl 2270 provided eight settings for the windrow fluffer control. The centre delivery or discharge allowed a continuous windrow to be formed around tight corners.

Cutterbar Performance: Cutting ability of the single sickle bar was very good in all crops. The Gehl 2270 was effective in cutting native grasses due to the high cyclic rate of the knife (1640 strokes/min). Damp and fine stemmed crops did not affect cutting ability. In damp field conditions, the knife would plug if it was passed through a small mound of soil such as a mole hill. In addition the knife would plug if the points of the guards were adjusted low enough to pick up crop residues from previous crops. The Gehl 2270 produced ideal stubble in all crops if the header floatation was adjusted to suit the field. In areas that were trampled or lodged, stubble was ragged. Stubble height was controlled by the adjustable skid shoes and gauge wheels located on each end of the header and under the cutterbar.

Floatation: After initial adjustment, header floatation was very good. Four large tension springs provide header floatation on the Gehl 2270. Two skid shoes and two gauge wheels allowed the header to follow ground contours.

Conditioner Performance: Conditioner performance was very good. The Gehl 2270 was equipped with two counter rotating rubber conditioning rolls. The 9.1 ft (2.8 m) rolls meshed together in an intermittent rib design. As the crop was pulled through the rotating conditioning rolls the stems were crushed or broken allowing more rapid moisture evaporation. The performance of the conditioning rolls was very good in most crops. Grasses did not appear to be conditioned as thoroughly as a legume crop. The difference in drying or curing time between a conditioned crop and an unconditioned crop is shown in FIGURE 2. The tests were carried out in the same crop, on the same day and in parallel windrows. Relative humidity during the test period was unusually high. Other conditions that affect curing time are stubble height, ambient temperature and wind velocity. Generally the advantage of a conditioned crop is one half to one day advance in start of baling.

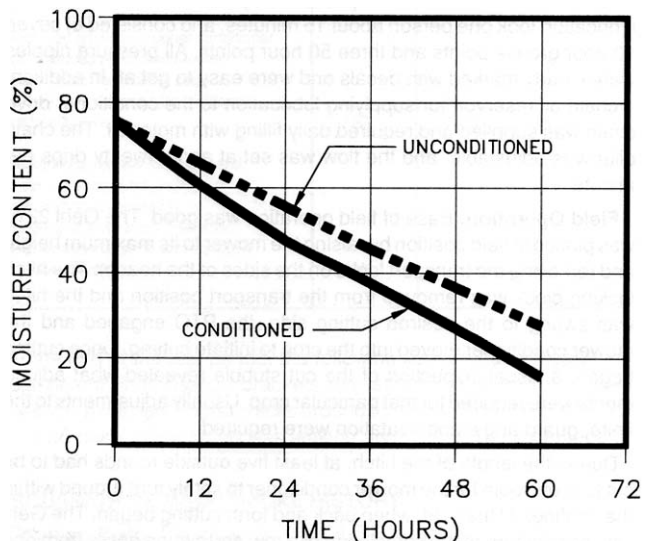


FIGURE 2. The Effect of Conditioning in Alfalfa at 2.0 ton/ac (4.5 t/ha) for the Gehl 2270.

Leaf Loss: Leaf loss was minimal and considered very good on the Gehl 2270. Some leaf loss was observed in crops that were quite heavy and would not allow sunlight to penetrate to the bottom of the plant. After the mower passed, yellowed leaves could be found on the ground.

EASE OF OPERATION

Hitching: Ease of hitching was considered very good. The Gehl 2270 was supplied with a drawbar extension which when attached to the tractor drawbar provided additional room to install the hydraulic pump onto the PTO shaft of the tractor. The drawbar extension was fastened to the tractor drawbar with two bolts. The Gehl 2270 was

equipped with a hitch jack which allowed the hitch to be raised and then lowered over the attachment pin. Once the mower conditioner was secured to the tractor, the hitch jack was removed and stowed on a bracket provided on the hitch. The hydraulic pump was attached to the PTO shaft of the tractor and a torque arm on the pump was extended to rest against the side of the drawbar to prevent pump body rotation. A chain bolted to the torque arm, was wrapped around the drawbar and fastened to the pump. The attachment of three hydraulic hoses to the tractors remote hydraulic couplers completed the hitching. Hitching was easy and took one person about ten minutes.

Hydraulic Controls: Ease of operating the hydraulic controls was very good. The Gehl 2270 was equipped with two separate control circuits. Mower height was controlled by cylinders attached to each of the ground wheels. These cylinders also lifted the mower high enough to remove or engage the transport locks. The second circuit was used to power the cylinder which swung the hitch to the desired cutting side and to steer the mower around obstacles. The cylinder allowed 45 degrees of deflection on either side of centre.

Transporting: Ease of transporting was very good. The Gehl 2270 was transported by moving the hitch to the centre position and engaging the lock block in its locked position. The mower was then raised to its maximum height and the transport lock bars were swung into place. Spring pins prevented the lock bars from dislocating once in the locked position. The 15.7 ft (4.8 m) overall width made meeting oncoming traffic difficult and extreme caution was required. The Gehl 2270 towed well at 30 mph (50 km/h) and had sufficient ground clearance over high crowned roads. The two floatation tires provided very good floatation over damp ground and met the requirements of the Tire and Rim Association Standard for the weight of the machine.

Lubrication: Ease of lubrication was very good. The hitch of the Gehl also served as the hydraulic fluid reservoir and contained about 20.8 gal (95 L) of automatic transmission fluid. The reservoir was equipped with a dipstick for checking the level of the oil. The hitch had to be level when checking oil level or an erroneous reading would result. The hitch was also used to mount the replaceable hydraulic filter. Normal daily lubrication took one person about 15 minutes, and consisted of seven 10 hour grease points and three 50 hour points. All pressure nipples were clearly marked with decals and were easy to get at. In addition, a chain oil reservoir for supplying lubrication to the conditioner drive chain was supplied and required daily filling with motor oil. The chain oiler was adjustable, and the flow was set at about twenty drips per minute.

Field Operation: Ease of field operation was good. The Gehl 2270 was placed in field position by raising the mower to its maximum height and removing the transport locks on the sides of the header. The hitch locking block was removed from the transport position and the hitch was swung to the desired cutting side, the PTO engaged and the mower conditioner moved into the crop to initiate cutting. Once cutting began, a visual inspection of the cut stubble revealed what adjustments were required for that particular crop. Usually adjustments to the knife, guard angle and floatation were required.

Due to the length of the hitch, at least five outside rounds had to be cut to allow room for the mower conditioner to safely turn around within the confines of the field, when back and forth cutting began. The Gehl was easy to turn at the completion of a row and swung easily from one side of the tractor to the other.

EASE OF ADJUSTMENTS

Push Bar: Ease of adjusting the push bar was fair. Adjustments for changing the height of the pushbar allowed 9 in (230 mm) of height movement. The adjustment consisted of removing three cap screws per side and raising or lowering the pushbar to the desired location and replacing the cap screws. Adjusting the pushbar was difficult for one person and took two persons about five minutes.

Cutterbar: Ease of adjusting the cutterbar was very good. The adjustment for changing the angle of the cutterbar and guards consisted of either lengthening or shortening the turnbuckle link located in the centre of the machine (FIGURE 3) taking minimal time and effort. The tips of the guards were adjustable 6 to 14 degrees from horizontal. A hammer was required to loosen and retighten the jam tab.

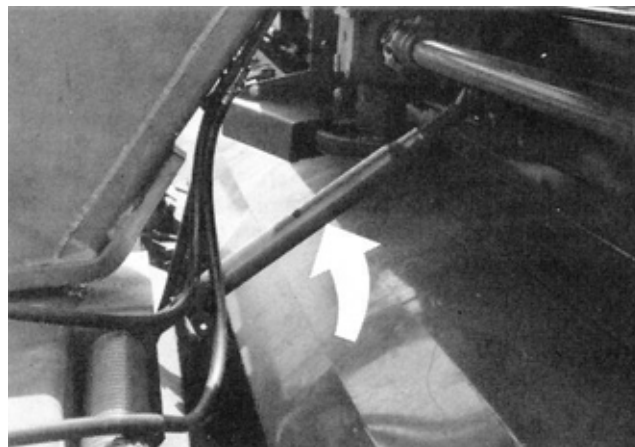


FIGURE 3. Cutterbar Angle Adjustment.

Reel: Ease of adjusting the reel speed was very good and ease of adjusting reel position was good. Reel speed was adjustable for two speeds of 71 and 98 rpm. The speed was adjusted by the addition or removal of shims between the two halves of the drive sheaves. Reel speed adjustment took one person about fifteen minutes. The position of the reel was also adjustable for height and back or forward positioning. The reel adjustment for height allowed 2 in (51 mm) of movement, while the forward adjustment allowed 3 in (76 mm) of movement. Reel position adjustments were easy to make if directions in the operator's manual were followed and took one person about 15 minutes. In addition, the crop release point of the bat bar tines was adjusted by loosening three cap screws and rotating the cam plate to the desired position and retightening the cap screws. This adjustment was easy and took one person about 15 minutes.

Auger: Ease of adjusting the auger was good. The feed auger for the Gehl 2270 was adjustable for position and speed. The position adjustment allowed the auger to be moved forward or backward a distance of 1 in (25 mm) and was accomplished by loosening four cap screws and pulling the auger to the desired position. This adjustment took one person about 20 minutes. Speed adjustments were accomplished by replacing the 16 tooth sprocket with a 14 tooth sprocket. This adjustment was not attempted by PAMI staff as a replacement sprocket was not available during the test.

Conditioner Rolls: Ease of adjusting the conditioner roll pressure was poor and ease of adjusting roll clearance was good. Adjusting the conditioning roll pressure was difficult and inconvenient, and required the operator to lay on his back under the machine. Roll pressure was adjusted by turning a turnbuckle located under the header of the machine until the desired amount of pressure was achieved by trial and error. It is recommended that the manufacturer consider an alternate method of adjusting the pressure of the conditioning rolls. The conditioner roll clearance was also adjustable and was performed by loosening the jam nuts on the bumper bolts located on each side of the machine between the conditioner roll support bearings. The bumper bolts were then rotated until the desired amount of clearance was obtained. The conditioning roll adjuster allowed adjustments of no clearance to approximately 1 in (25 mm). Adjusting the conditioner roll clearances was easy and took one person about 20 minutes.

Floatation: Ease of adjusting header floatation was good. Four large tension springs provided header floatation on the Gehl 2270. Two skid shoes and two optional gauge wheels allowed the cutterbar to follow ground contours. Header floatation adjustments were required to prevent the cutterbar from plugging in soft field conditions or to prevent undulating stubble in rough fields. Header floatation adjustments were carried out by rotating the bolts in the ends of each tension spring until a force of 50 to 70 lbs (220 to 310 N) would lift each end of the header clear of the ground.

Ease of adjusting the skid shoes was very good and ease of adjusting the gauge wheels was poor. The two skid shoes on the bottom ends of the table were easily adjusted by placing the two pins per shoe in the appropriate holes. The adjustment took minimal time and effort. The

skid shoe adjustments allowed the cutterbar to operate within a range of 1 to 6 in (25 to 150 mm) above ground level. In addition to the skid shoes the Gehl 2270 was equipped with two optional gauge wheels for flotation (FIGURE 4). Adjusting the height of the gauge wheels to correspond with the skid shoes was very difficult for one person, due to their location, weight and method of attachment. It is recommended that the manufacturer consider simplifying the height adjustment for the optional header gauge wheels.

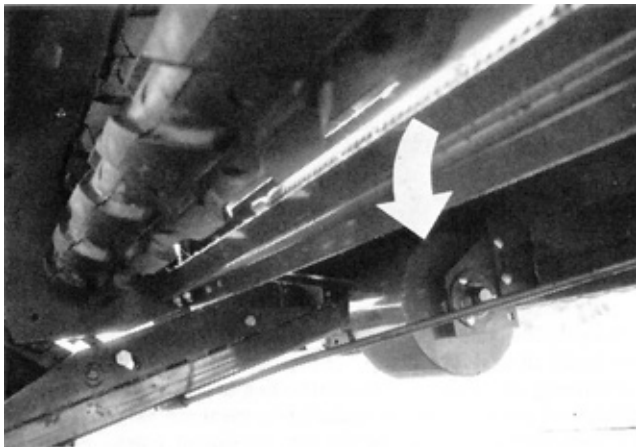


FIGURE 4. Optional Gauge Wheels.

Swath Gate: Ease of adjusting the windrow width and height was very good. The adjustable swath fluffer offered eight settings which allowed windrow widths from narrow windrow to a swath of 7.5 ft (2.3 m). Narrow windrow widths varied from crop to crop. Windrow width was adjusted by selecting one of eight available positions. Raising the fluffer lever produced a high narrow windrow while lowering the lever produced a wide low swath. Adjustments were quick and easy.

Knife: Ease of maintaining the knife was very good. Changing the single cutter bar took one person about 15 minutes, if the guards were straight and in alignment. Changing individual knife sections and guards was quick and easy. Knife drive belt tensioning was easy, and took one person about 5 minutes.

POWER REQUIREMENTS

Average and peak PTO power requirements for the Gehl 2270 were 21 hp (16 kW) and 28 hp (21 kW) respectively. Average drawbar pull at 2.8 mph (4.6 km/h) was 960 lbs (4270 N), for a crop yielding 1.5 ton/ac (3.4 t/ha). PAMI used a 72 hp (54 kW) tractor throughout the evaluation and found it to have adequate PTO power reserve. However, side draft loads were very noticeable with the unballasted tractor, especially when the mower reached the point of maximum deflection of the hitch. In addition, the tractor required two remote hydraulic couplers capable of supplying 1750 psi (12 MPa). A PTO shaft capable of 540 rpm was required to operate the test machine.

OPERATOR SAFETY

Safety on the Gehl 2270 was good. The Gehl 2270 was safe to operate if normal safety precautions were followed. Some safety concerns were noted in regards to adjusting the conditioner roll pressure and adjusting the optional gauge wheels for the cutterbar. In both adjustments, the operator was required to crawl under the machine to achieve the objective. Otherwise, the 2270 conformed with ASAE Standards for Safety. All pulleys, sprockets and other potentially dangerous devices were adequately guarded and labeled. The Gehl 2270 was not equipped with a slow moving vehicle sign, however there was a support bracket in place for a SMV sign.

OPERATOR'S MANUAL

The operator's manual was excellent, and contained useful information on warranty, specifications, safety, operation, adjustments, lubrication, servicing, transporting, storage, trouble shooting, set-up

and assembly. All information was found to be factual and accurate. The book was well written and illustrated.

MECHANICAL HISTORY

The mechanical history of the Gehl 2270 mower conditioner over the evaluation period is outlined in TABLE 2. The intent of this evaluation was the functional performance of the machine and an extended durability evaluation was not conducted.

TABLE 2. Mechanical History

ITEM	HOURS	EQUIVALENT AREA ac (ha)	
Coupler chain failed and was repaired at:	3	25	(10)
Conditioner drive chain oiler fell off and was lost at:	21	168	(68)
Conditioner drive chain wore out and was replaced at:	47	376	(152)
Pitman arm bearing failed and was replaced at:	90	720	(291)
Conditioner roll pressure adjustment turnbuckle fell off and was repaired at:	101	808	(327)
Pitman arm broke and was repaired at:	118	944	(382)
Pitman arm attachment bolt failed and was replaced with a higher grade at:	118	944	(382)
Wobble arm cracked around pivot bushing. Was welded and repaired at:	154	1232	(499)
Bearing support plate for conditioner rolls cracked and was repaired at:	156	1248	(505)
Sheet metal conditioner guard cracked and was repaired at:	156	1248	(505)
Replaced gib key on upper conditioner roll, replaced right hand header assist cable, replaced 2 cable pulleys, and replaced 2 conditioner roll bearings at:	160	1250	(506)
Replaced sprockets for upper and lower conditioner roll, replaced oiler and brush assembly for conditioner drive chain, replaced both conditioner rolls, and replaced conditioner drive chain at:	160	1250	(506)

At the end of the test period, the following items required repair or replacement; four support brackets that attached the bats and tine tubes to the reel developed cracks around the bolt holes. The hydraulic oil return hose swivel fitting was leaking and required replacement.

DISCUSSION OF MECHANICAL HISTORY

Coupler Chain: The roller chain (FIGURE 5) that joins the two halves of the flexible connector used to connect the hydraulic motor to the gear box failed as a result of misalignment. The roller chain replacement took one person about one half hour to complete.

Conditioner Drive: The conditioner roll drive chain wore due to lack of lubrication and was replaced. It took one person about forty five minutes to replace.

Pitman Bearing: The bearing that attached the pitman arm to the eccentric wheel failed and was replaced. Replacement of the bearing took one person about one hour.

Cable Link: The cable link or turn buckle that joined the two conditioning roll pressure cables together was lost as the result of missing jam nuts. The turnbuckle took one person about one hour to replace.

Pitman Arm: The pitman arm and it's attachment bearing were broken when one of two 0.5 in (13 mm) grade 5 bolts used to attach the

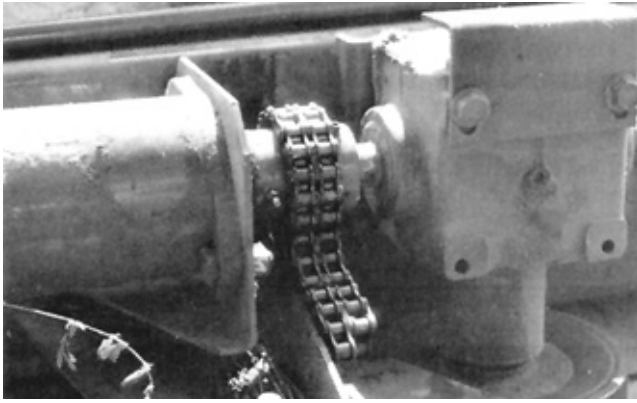


FIGURE 5. Failed Chain Coupler.

pitman arm to the wobble arm sheared (FIGURES 6 & 7). It is recommended that the manufacturer consider replacing the bolts used to attach the bearing to the wobble arm with bolts of higher strength. The pitman arm was straightened and welded. The bearing was replaced and took one person about 4 hours to affect repairs.

Wobble Arm: The wobble arm developed cracks around the bushing hole. The cracks were welded, and no further problems occurred. It took one person about one hour to affect the repair.

Bearing Support Plate: The plate that supported the conditioner roll bearings on the left side of the machine developed cracks around the



FIGURE 6. Sheared Bolt.

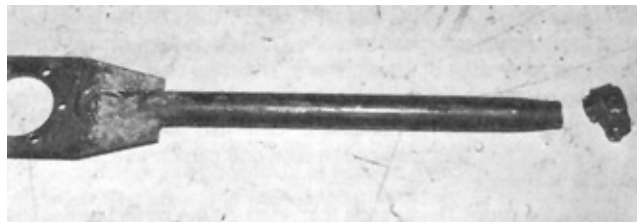


FIGURE 7. Failed Pitman.

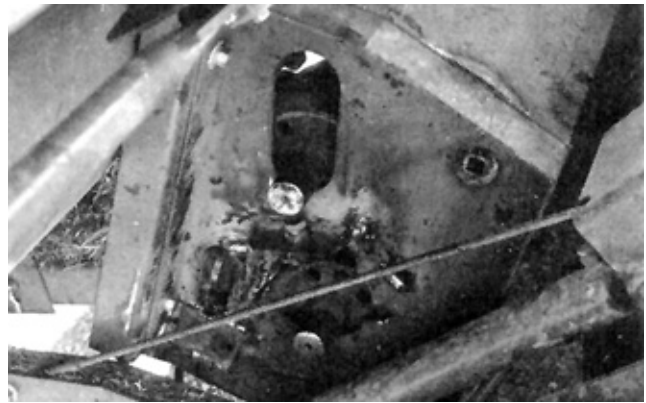


FIGURE 8. Failed Bearing Support Plate.

bolt holes. The plate was removed and welded but broke again after a few hours of use. The plate and the bearings as well as the two conditioning rolls were replaced and no further problem was noted. In addition to the bearing support plate failing, the sheet metal that covers the conditioning rolls across the top developed cracks and was replaced at the same time as the bearing support (FIGURE 8).

APPENDIX I

SPECIFICATIONS

MAKE:	GEHL
MODEL:	MC 2270
SERIAL NUMBER:	24102

OVERALL DIMENSIONS:

	Transport Position	Field Position
- length	22.5 ft (6.9 m)	15.3 ft (4.7 m)
- width	15.8 ft (4.8 m)	21.8 ft (6.6 m)
- height	6.3 ft (1.9 m)	

HEADER

effective width of cut	14.3 ft	(4.3 m)
range of cutting height	1.0 to 6.0 in	(25 to 152 mm)
guard angle	6 to 14 degrees from horizontal	
guard type	twin forged steel	
guard spacing	3.0 in	(76 mm)
knife stroke	3.0 in	(76 mm)
knife speed	1640 strokes/min	
knife section	under serrated	
length of knife bar	14 ft	(4.3 m)

REEL:

- number of bats	4 standard equipment	
	6 optional	
- diameter	3.6 ft	(1.09 m)
- number of tines per bat	37	
- bat teeth spacing	4.3 in	(108 mm)
- reel speed range	60 to 75 rpm	

AUGER:

- speed	adjustable	
- length of auger	14.1 ft	(4.3 m)
- outside diameter	22 in	(560 mm)
- inside diameter	10 in	(250 mm)
- auger flighting pitch	20 in	(510 mm)

CONDITIONING ROLLS:

- number of rolls	2	
- roll construction	molded rubber with meshing lugs	
- roll length	9.9 ft	(3.0 m)

- roll diameter	7.5 in	(190 mm)
- roll speed	740 rpm	
- roll pressure control	turnbuckle and cables	
- roll clearance adjustment	0 to 1 in	(0 to 25 mm)

WEIGHT:

- left wheel	2332 lbs	(1060 kg)
- right wheel	2358 lbs	(1072 kg)
- hitch	<u>906 lbs</u>	<u>(412 kg)</u>

Total:	5596 lbs	(2544 kg)
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TIRES: two 11L x 14, 6 ply

DRIVES:

- number of chain drives	2
- number of belt drives	2

HYDRAULIC CONTROLS:

- header lift	two single acting cylinders (one per wheel)
- pivot hitch	one double acting cylinder.

NUMBER OF LUBRICATION POINTS:

- 10 hours	7
- 50 hours	3

APPENDIX II

The following rating scale is used in PAMI Evaluation Reports:

Excellent	Fair
Very Good	Poor
Good	Unsatisfactory

SUMMARY CHART

GEHL 2270 SWING FRAME MOWER CONDITIONER

RETAIL PRICE:	\$23,260.00 (March 1989, f.o.b. Portage la Prairie, Manitoba)
RATE OF WORK:	Average continuous speed was 6 mph (9.6 km/h). Average work rate was 8.0 ac/h (3.2 ha/h).
QUALITY OF WORK:	
Windrow Formation	Very Good; width and height controlled by fluffer. Fully adjustable.
Cutterbar Performance	Very Good; tended to plug in damp conditions.
Floatation	Very Good; after initial adjustment.
Conditioner Performance	Very Good; less effective on native grasses.
Leaf Loss	Very Good; minimal.
EASE OF OPERATION:	
Hitching	Very Good; easy and took 10 min.
Hydraulic Controls	Very Good; adequate for operation.
Transporting	Very Good; wide width required caution.
Lubrication	Very Good; easy to lubricate.
Field Operation	Good; long hitch length required wide turning radius.
EASE OF ADJUSTMENTS:	
Pushbar	Fair; difficult for one person.
Cutterbar	Very Good; easy, only one adjuster.
Reel Position	Good; allowed 2 in (50 mm) of travel.
Reel Speed	Very Good; incremental, 71 to 98 rpm.
Auger	Good; adjustable with additional sprocket.
Conditioner Roll Pressure	Poor; presented a safety concern.
Conditioner Roll Clearance	Good; one adjuster per side.
Skid Shoes	Very Good; easily adjusted.
Gauge Wheels	Poor; very difficult and dangerous.
Floatation	Good; soft fields required adjustment.
Swath Gate	Very Good; easy to set, offered wide range of possible windrows.
Knife	Very Good; one person, 15 minutes.
POWER REQUIREMENTS:	
Tractor Size	72 hp (54 kW) was sufficient.
OPERATOR SAFETY:	Good; conformed with ASAE Standards. Some adjustments raised safety concerns.
OPERATOR'S MANUAL:	Excellent; was clear and concise, well organized and illustrated.
MECHANICAL HISTORY:	Several mechanical problems were noted.



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