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Group 4d

Evaluation Report 595

Hesston 8100 Self-Propelled Windrower

A Co-operative Program Between

ALBERTA FARM MACHINERY RESEARCH CENTRE

PAMI
PRAIRIE AGRICULTURAL MACHINERY INSTITUTE

HESSTON 8100 SELF-PROPELLED WINDROWER

MANUFACTURER:

Hay and Forage Industries
P.O. Box 4000
Hesston, Kansas 67062

DISTRIBUTOR:

Hesston Industries Ltd.
#2 - 2315 30th Avenue North East
Calgary, Alberta
T2E 7C7
Telephone: (403) 250-7320

RETAIL PRICE:

$44,533.00 [March, 1989, f.o.b. Humboldt with 30 ft (9.1 m) double windrow header].

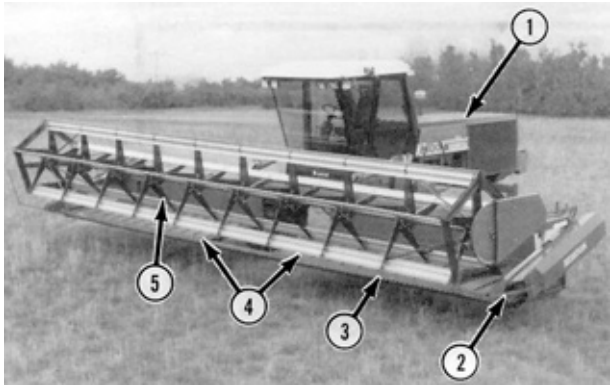

FIGURE 1. Hesston 8100: (1) Traction Unit, (2) Dividers, (3) Cutterbar, (4) Drapers, (5) Reel.

SUMMARY AND CONCLUSIONS

Rate of Work: Average speeds for the Hesston 8100 were 5 to 7 mph (8 to 11 km/h). Average workrates varied from 15 to 22 ac/h (6 to 8.8 ha/h). Lower workrates resulted from the draper slowing down from heavy toad in canola. Maximum workrate was about 28 ac/h (11.2 ha/h).

Quality of Work: Divider performance was very good. The smooth dividers did not flatten crop except in leaning canola or tangled crops. Reel performance was very good. The adjustments were suitable for all crops. Cutting ability was very good. The knife had ample power in alt crops, tn green, tough or weedy crops material collected on the guards at the center of the header where the knives overlap and required frequent cleaning. When cutting short in rolling terrain, extra care was required to prevent the cutterbar from contacting the ground, since the center of the cutterbar was slightly lower than the outer ends. Header flotation was very good, and minimized cutterbar damage in stony fields. Draper performance was good. The drapers ran at suitable speeds in most crops but slowed down from heavy loads in canota. The platform angle was 14° at a cutting height of 6 in (150 mm) and could be adjusted to 17°.

Windrow formation was very good. Mostly parallel windrows were formed. Depending on the width of the windrow opening, single center delivery windrows were normally 4 to 5 ft (1.2 to 1.5 m) wide. Side- by-side double windrows were usually 7 to 10 ft (2.1 to 3.0 m) wide. Windrow uniformity was excellent when single windrowing and very good when double windrowing. When double windrowing in short crops, slightly uneven windrows resulted when the reel hit th e crop mated al that collected along the front edge of the drapers.

Ease of Operation and Adjustment: Operator comfort was very good. The ride was smooth. Operator station sound level was 81 dBA. Ease of operating the controls was good. They were conveniently located but reel and draper speed controls were not identifiedin the cab1 The draper speed control also controlled draper position. This was inconvenient as draper speed had to be readjusted each time the drapers were shifted. The instruments were good, and were easy to observe. Audible alarms were provided onty for engine coolant temperature and park brake engagement. No warning system was provided for the hydrostatic drive. The lighting was excellent. There was ample lighting for operating at night.

Handling was very good. Steering was very responsive but not overly sensitive. The windrower tipped forward on level ground during sudden stops. The wide header made meeting traffic on roadways inconvenient. A side loading transporter was used during the test.

Ease of adjustment was good. Most adjustments were easy to make but reel-to-cutterbar clearance and draper alignment were inconvenient to adjust.

Ease of lubrication was good. Daily servicing took 20 minutes. Some grease fittings were greased more frequently than stated in the manual.

Engine and Fuel Consumption: The engine had ample power for all conditions. Average fuel consumption was 2.2 gal/h (10 L/h).

Operator Safety: No safety hazards were apparent on the Hesston 8100. However, normal safety precautions were required. Safety stops were provided for both the reel and header lift cylinders. All guards were bolt-on type. A side loading transporter was used and the transport width required extreme care on narrow roads or when allowing traffic to pass.

Operator's Manual: The operator's manuals were good. They contained much useful information, however, they did not show all locations for greasing. No procedure was given for adjusting the reel-to-cutterbar clearance.

Mechanical History: A few mechanical problems occurred during the test. A rear wheel castor failed, the sliding draper decks derailed, and the left draper deflector failed.

RECOMMENDATIONS

It is recommended that the manufacturer consider:

1. Modifying the draper drive to provide adequate speeds under heavy load.
2. Modifications to improve the sliding draper decks.
3. Labeling the draper and reet speed controls.
4. Supplying more rear weights with the windrower when equipped with a 30 ft (9.1 m) header.
5. Improving the draper spring tensioners for easier alignment.
6. Showing all grease fitting locations and providing instructions for adjusting reel clearance in the operator's manual.

Senior Engineer: J.D. Wassermann

Project Technologist: A.R. Boyden

THE MANUFACTURER STATES THAT

With regard to recommendation number:

1. The quality of the draper motors was not up to the necessary standards determined in previous field tests with our prototype machines. All units in the field will be retrofitted with suitable motors.
2. A solution for this problem is currently being evaluated which will be incorporated on to the header after field evaluation. We expect it to be adaptable to older units.
3. Identification decals will be added on new series machines.
4. It is difficult for the factory to predict what size header will be used, or the balance preference of the operator. Therefore, rear weights are to be supplied by the dealer or customer. A weight bar is supplied with each tractor as standard equipment which allows the customer to weight the machine to his preference.

5. A system to eliminate the need for any tools to adjust tension is being worked on. It was field tested last season and will be further tested this coming season.
6. The Operator's Manual will be corrected to show all grease fittings.

GENERAL DESCRIPTION

The Hesston 8100 (FIGURE 1)is a self-propelled windrower with a draper header capable of center, left or right end delivery for laying single or double windrows. It runs on two traction drive wheels and two rear castor wheels. It is powered by a FIAT 238 cu in (3.9 L) four cylinder diesel engine. The traction unit drive wheels are hydrostatically powered with chain reduction final drives.

The cutterbar has two synchronized knives that overlap in the center and are mechanically driven at each end of the header by a half swaybar, timing belt, and drive shaft from the traction drive unit. The right divider draper is also belt driven from the knife drive shaft. The sliding drapers and the reel are driven by hydraulic motors.

Draper and reel speeds are hand controlled from the operator station with push-pull controls. The reel and header lift valves are foot control led. The draper delivery position is operated by the draper speed push-pull control. Header gauge wheel height, and width of the windrow opening were adjustable.

The test machine was equipped with a 30 ft (9.1 m) double windrow draper header and five bat reel. Detailed specifications are given in APPENDIX I.

SCOPE OF TEST

The main purpose of the test was to determine the functional performance of the Hesston 8100. Measurements and observations were made to evaluate the rate of work, quality of work, ease of operation and adjustment, engine performance, operator safety, and suitability of the operator's manuals. Although extended durability testing was not conducted, the mechanical failures which occurred during the test were recorded.

The Hesston 8100 was operated in the conditions shown in TABLE 1 for 112 hours while cutting about 2087 ac (835 ha).

Table 1. Operating Conditions

OPERATION	CROP	VARIETY	YIELD bu/ac (t/h)	HOURS	AREA ac (ha)
Single and double windrows	Barley	Bonanza Harrington	30 - 50 (1.7 - 2.8)	27	495 (198)
	Wheat	Columbus Katepwa Neepawa	15 - 45 (1.0 - 3.0)	47	840 (336)
Single windrows	Flax	Norland	15 - 25 (0.9 - 1.5)	7	140 (56)
	Canola	Westar Tobin	10 - 30 (0.6 - 1.7)	31	612 (245)
			TOTAL	112	2087 (835)

RESULTS AND DISCUSSION

RATE OF WORK

Uniform windrows were formed in most crops at average speeds of 5 to 7 mph (8 to 11 km/h). Speeds up to 9 mph (14 km/h) were achieved in straight even crops on smooth ground. Reduced speeds of 4 to 5 mph (6 to 8 km/h) were required in tangled and leaning crops which is typical of mostwindrowers. However, in canola similar speed reductions were necessary as the drapers slowed down from the heavy load. It is recommended that the manufacturer consider modifying the draper drive to provide adequate speeds under heavy load.

Average workrates for the 30 ft (9.1 m) windrower varied from 15 to 22 ac/h (6 to 8.8 ha/h). In straight even stands on level fields, workrates as high as 28 ac/h (11.2 ha/h) could be achieved. Lower workrates resulted from the drapers slowing down under heavy load in canola.

QUALITY OF WORK

Dividers: Dividers performance was very good.

Crop did not hairpin on the dividers or on the divider rods. The smooth dividers did not flatten crop except in leaning canola or tangled crops.

When double windrowing, the right divider draper laid the first windrow *away* from the standing crop. This provided ample room for maneuvering on the second round, and the left divider seldom snagged the first windrow.

Reel: Reel performance was very good.

Reel speed was variable from 0 to 63 rpm. Reel tip speed ranged from 0 to 9.8 mph (0 to 15.8 km/h). The reel was usually operated at a tip speed 10 to 20 percent faster than ground speed to minimize shatter losses. Material did not wrap on the reel ends.

The range of vertical and fore-and-afl reel adjustments were suitable for all crops. The reel was normally positioned slightly ahead of the cutterbar.

Cutterbar: Cutting ability was very good in all crops.

The knife had ample power and never stalled throughout the test. Stubble ranged from smooth to ragged ends depending on ground speed and condition of the knife system (FIGURE 2).

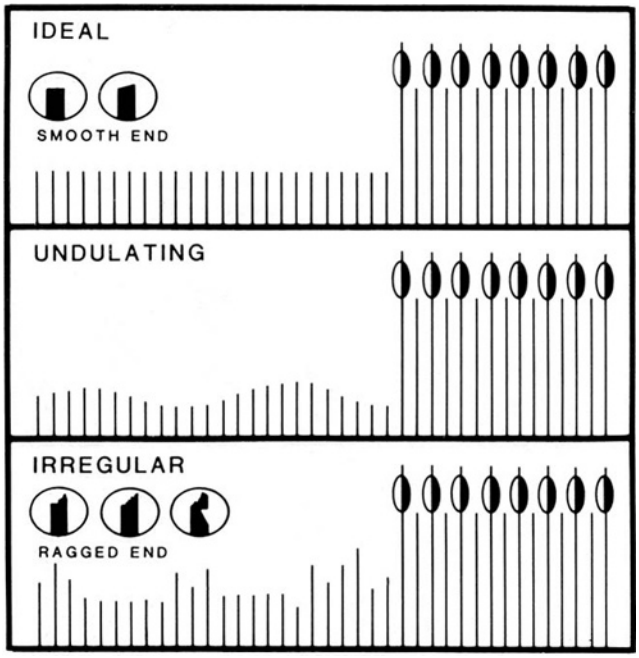

FIGURE 2. Types of Stubble.

In green, tough or weedy crops, material collected around the guards at the knife overlap (FIGURE 3) resulting in irregular cut stubble. This area required frequent cleaning about every hour in these conditions. The knife should be maintained in good condition to provide clean cutting.

The gauge wheels adequately protected the cutterbar from contacting the ground in slightly undulating fields at normal cutting heights. When cutting very low or when in rolling terrain the cutterbar would contact the ground at the outer ends or at the center. The header was raised slightly in these conditions to prevent the knife from contacting the ground. This is typical of most windrowers with 30 ft (9.1 m) wide headers. However, on the Hesston 8100, extra care was required since the center of the cutterbar was slightly lower than the outer ends. The manufacturer indicated that the header is intentionally designed to have the outer ends of the cutterbar initially higher than the center as the outer ends will level out as the machine ages.

No header height indicator was provided. Cutting height was gauged by the stubble left behind the header.

FIGURE 3. Knife Plugging.

Header Flotation: Header flotation was very good.

Flotation was provided by four tension springs (FIGURE 4). Header flotation minimized cutterbar damage in stony fields and enabled the header to follow most ground contours.

Undulating stubble occurred in rough fields as the header bounced.

Drapers: Draper performance was good.

Draper speed under no load could be varied from 0 to 730 ft/min (0 to 3.7 m/s). In most crops, the drapers were run between 500 and 620 ft/min (2.5 to 3.1 m/s). Maximum draper speeds were used while operating in canola but the drapers slowed down from the heavy loads. This resulted in lower work rates. A recommendation regarding the draper drive has been made. Draper speed control within the cab was helpful in forming uniform windrows as crop conditions varied.

Platform angles of less than 20° are suitable for grain windrowing while steeper angles are suggested when windrowing hay. Long drapers require lower platform angles, especially in short crops. The minimum platform angle was 14° and could be increased to 17° by adjusting the header lift linkage chains. The minimum platform angle worked well in all crops when single windrowing. While double windrowing in short crops, crop material collected along the front edge of the drapers as it was conveyed along the entire width of the header. The build-up of crop material on the draper was hit by the reel, giving the windrow an uneven appearance.

When double windrowing, the right divider draper laid the first windrow about 24 in (610 mm) from the standing crop edge (FIGURE 5). This kept the divider from snagging the windrow on the second pass.

Windrow Formation: Windrow formation was very good.

Windrows may be classified into four general patterns (FIGURE 6), although many combinations and variations exist. FIGURES 7 to 10 show typical windrows. Center and end delivery windrows were usually formed parallel. In short or leaning crops, single windrows were occasionally fantailed while double windrows were angle parallel.

The width of the windrow opening could be adjusted if the quantity of crop material varied. Depending on the width of the windrow opening, single center-delivery windrows were normally 4 to 5 ft (1.2 to 1.5 m) wide. Single canola windrows varied from 4 to 6 ft (1.2 to 1.8 m) wide after they had been rolled. Side-by-side double windrows formed with alternate end delivery varied from 7 to 10 ft (2.1 to 3.0 m) wide. The gap between the windrows could be reduced from 24 in (610 mm) by driving closer to the first windrow on the second pass, but reduced the width of cut slightly. The left windrow deflector usually prevented the windrows from being closer than 8 in (203 mm) apart. However, driving this close

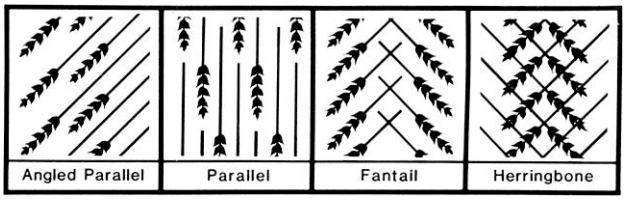

FIGURE 6. Windrow Types.

FIGURE 4. Header Flotation System.

FIGURE 7. Wheat, Double Windrow: 35 bu/ac (2.3 t/ha).

FIGURE 5. First Pass While Double Windrowing.

FIGURE 8. Canola, Single Windrow: 30 bu/ac (1.7 t/ha).

to the first windrow usually resulted in this windrow being snagged by the divider.

Windrow Uniformity: Windrow uniformity was excellent when single windrowing and very good when double windrowing.

Single and double windrows were uniform at typical speeds up to 7 mph (11 km/h). Slightly uneven windrows occurred in short crops while double windrowing. This resulted from the reel hitting the build-up of short crop material on the front edge of the drapers.

Speed controls for the reels and drapers within the cab aided in forming uniform windrows, as they were easily set when conditions changed.

EASE OF OPERATION AND ADJUSTMENT

Operator Comfort: Operator comfort was very good.

The header and stubble were easily viewed. The cab was clean and quiet. The seat was comfortable, but was positioned too far forward to suit tall operators. The incoming air was effectively filtered and the air conditioner provided comfortable cab temperatures on hot days. No cab heater was provided.

The ride was smooth for a self-propelled windrower, even while windrowing at right angles to the the previous seeding operation.

Operator station sound level at full speed under load was about 81 dBA.

Controls: Ease of operating the controls was good.

All controls were conveniently located (FIGURE 11). The travel speed control lever and header clutch lever were conveniently located and easy to engage.

Header height and reel lift controls were conveniently operated. The foot pedal to the left of the steering column controlled the header height, while the right pedal controlled reel lift. The reel and header raised and lowered smoothly and responded immediately.

Reel and draper speeds were operated by push-pull controls in the cab. The controls could be easily adjusted on-the-go and could be pushed or pulled for coarse adjustment or rotated for finer adjustment. Reel and draper speed controls were not identified in the cab. It is recommended that the manufacturer consider labeling the draper and reel speed controls.

For double windrowing, the sliding drapers had to be bolted together and the right draper motor direction reversed by exchanging the two hydraulic hose quick couplers. One push-pull control then set the draper position, the draper speed and the draper direction of operation. The lower half of the control stroke ran the drapers to the right and moved the sliding drapers to the left. The upper half of the stroke ran the drapers to the left, and slid the drapers to the right. Specific control position on each half of the stroke set the draper speed. Having the draper position and draper speed on the same control made draper speed control inconvenient as draper speed had to be readjusted each time the draper position was changed for alternate end delivery.

The sliding draper decks derailed on several occasions, while shifting for alternate end delivery. Dirt and crop material collected under the warped draper slides (Figure 12) preventing smooth operations. Also, the draper stops were not effective in keeping the decks in position. It is recommended that the manufacturer consider modifications to improve the sliding draper decks.

Instruments: The instruments were good.

The console was conveniently located and easy to observe. It included gauges for fuel level, engine coolant temperature, and engine hours. Warning lights indicated low engine oil pressure, high engine coolant temperature, and electrical system discharge. Audible alarms were provided only for high engine coolant temperature and park brake engagement. No warning system was provided for the hydrostatic drive.

Lighting: The lighting was excellent.

Two head lights and two flood lights were located on the front of the windrower, and a single flood light located at the rear. This provided ample lighting for operation at night. Warning lights were provided for road travel. Road travel at night with the wide header is not recommended.

FIGURE 9. Barley, Double Windrow: 40 bu/ac (2.2 t/ha).

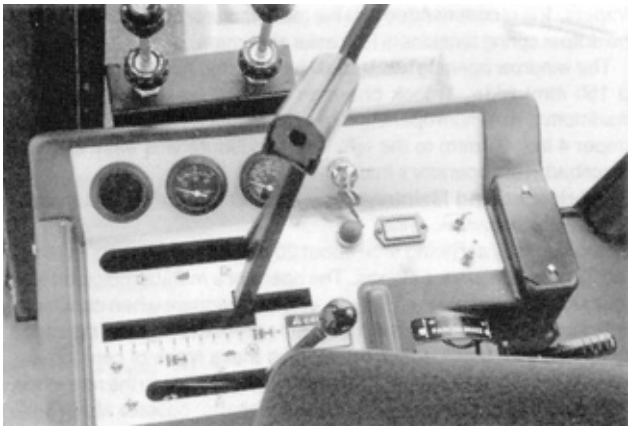

FIGURE 11. Operator Station Instruments and Controls.

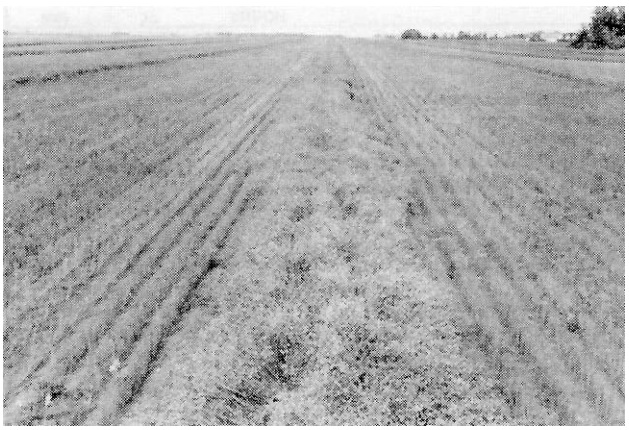

FIGURE 10. Flax, Single Windrow: 25 bu/ac (1.5 t/ha).

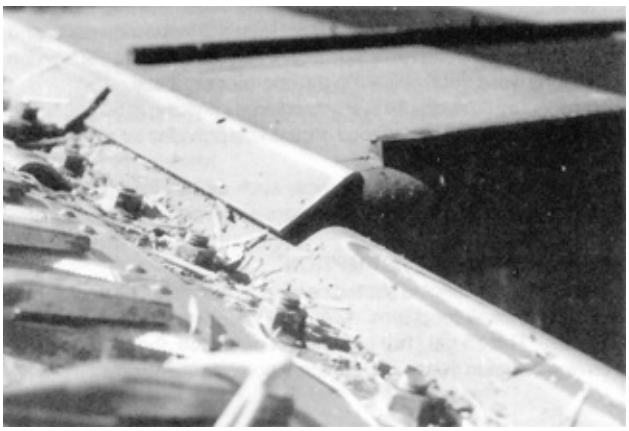

FIGURE 12. Draper Deck Slide.

Handling: Handling of the Hesston 8100 was very good in all field conditions.

Steering was very responsive but not overly sensitive. Gradual slow turns were possible for following the crop edge. Following the crop edge became easier with operator familiarity. While double windrowing, the right divider draper laid the first windrow away from the standing crop. This allowed for some error in steering on the following round without missing crop or snagging the windrow.

The hydrostatic drive made reversing direction quick and easy. The windrower tipped forward on level ground during sudden stops. Four weights were provided at the rear of the windrower. More rear weights would increase the windrower's stability. It is recommended that the manufacturer consider supplying more rear weights with the windrower when equipped with a 30 ft (9.1 m) header.

Transporting: The overall header width of 32 ft (9.8 m) made meeting traffic on roadways inconvenient. The operator had to provide passage for oncoming traffic by steering off the road at approaches or intersections where practical.

A side loading transporter was used during the test. The Hesston 8100 was 22.7 ft (6.9 m) wide when side loaded. The load width required extreme care on narrow roadways or when allowing oncoming traffic to pass. Like most self-propelled windrows the rear castor wheels shimmied excessively when they rolled over bumps or dips at normal transport speeds of 20 mph (32 km/h).

The manufacturer recommends removing the header and transporting the header and traction unit by truck for long transport distances. The header can easily be removed with the quick detach system.

Adjustments: Ease of adjustment was good.

The header side-to-side leveling and flotation were easily adjusted using the operator's manual instructions. Reel fore-and-aft position was easily adjusted. The reel to cutterbar clearance was inconvenient to adjust, and no adjustment procedure was given in the operator's manual.

The draper tension was easily adjusted with a wrench. Draper alignment was inconvenient as locking pliers, a small wrench and a small pry bar were required to adjust the spring tension for the rollers within the drapers. It is recommended that the manufacturer consider improving the draper spring tensioners for easier alignment.

The windrow opening width could be adjusted from 52 to 60 in (130 to 150 mm) wide. It took one man one-half hour to change from maximum to minimum opening size which included moving the margin draper 4 in (100 mm) to the left. The procedure was easy and well described in the operator's manual.

Lubrication and Maintenance: Ease of lubrication and maintenance was good.

Routine daily servicing took about 20 minutes. The Hesston 8100 had 33 pressure grease fittings. The operator's manual indicated a 50 hour service interval for all fittings, or more frequent when conditions were severe or unusual. Twelve pressure grease fittings were greased about every 10 hours during the test, as these types of components typically receive more frequent greasing. These include the rear wheel castors, walking beam pivot, knife drive shafts, counter shaft, knife heads and sway bars. The operator's manual did not display all components that required greasing.

The engine and hydraulic oil and engine coolant levels had to be checked daily. The fuel sediment bowl required inspection daily, and the air precleaner required inspection every four hours. All service instructions were clearly stated in the operator's manual.

The engine and hydraulic system required servicing at 50 hours and every 200 hours there after. Good access was provided for all the filters, dipsticks, and oil fill ports.

Routine maintenance and service, such as tensioning belts and changing guards and knife sections were easily performed.

ENGINE AND FUEL CONSUMPTION

The FIAT diesel engine started easily and ran well. The engine had ample power for all conditions. Average fuel consumption was 2.2 gal/h (10 L/h). The 35 gal (160 L) fuel tank permitted about 15 hours of operation between fillings. Oil consumption was insignificant.

OPERATOR SAFETY

No safety hazards were apparent on the Hesston 8100. However, normal safety precautions were required.

All moving parts were well shielded. However, all of the shields were bolt-on type and extra time was required to properly reinstall them. Safety stops were provided for the header and reel lift cylinders. The header and reel should be fully lowered or safety stops installed when working near the header orwhen the windrower is left unattended. If the operator must make adjustments or work in dangerous areas, the speed control lever should be in neutral position, the park brake engaged, and the header drive and engine should be shut off. Safety switches prevented the engine from starting if the park brake was not on, and the speed control lever and steering wheel were not in neutral position.

The overall header width of 32 ft (9.8 m) was too wide to allow safe travel on highways. Care was required while transporting on less busy gravel roadways to allow safe passage for oncoming traffic. Transporting at night is not recommended. A side loading transporter was used during the test. The Hesston 8100 was 22.7 ft (6.9 m) wide when side loaded. The load width required extreme care on narrow roads or when allowing oncoming traffic to pass. Transport speeds should never exceed 20 mph (32 km/h). The side loading transporter did not carry the rear castor wheels of the windrower. Like most self-propelled windrows, the rear castor wheels shimmied excessively when they rolled over bumps or dips making the load unstable. Care is required in selecting a side loading transporter. The bed and hitch should be sized to fit the Hesston 8100. The tires, rims, and axles should have adequate load capacity for safe transporting. The manufacturer recommends removing the header and transporting the header and traction unit by truck for safe long distance transport.

A slow moving vehicle sign, warning lights, taillights, rear view mirror, and seat belt were provided.

The operator's manual emphasized operator safety. Warning decals adequately indicated all dangerous areas.

OPERATOR'S MANUAL

The operator's manuals were good.

Separate manuals were provided for the header and traction unit. They contained much useful information on operation, adjustment, lubrication and maintenance of the windrower. Not all grease fitting locations were shown in the manuals. No instructions were given for adjusting the reel to cutterbar clearance. It is recommended that the manufacturer consider showing all grease fitting locations and providing instructions for adjusting reel clearance in the operator's manuals.

MECHANICAL HISTORY

TABLE 2 outlines the mechanical history of the Hesston 8100 during 112 hours of field operation while windrowing about 2087 ac (835 ha). The intent of the test was functional performance evaluation. Extended durability testing was not conducted.

TABLE 2. Mechanical History.

ITEM	OPERATING HOURS	EQUIVALENT FIELD AREA ac	(ha)
- The left rear wheel castor bent during transport and was replaced at	7	102	(41)
- The right reel lift cylinder leaked and was replaced at	11	192	(77)
- The drapers slowed significantly in heavy crops, and the draper drive pump was replaced at	11	192	(77)
- The drapers derailed and the draper stops were modified at	21	404	(162)
- The knife timing was off and was ratimed at	29	612	(245)
- The left windrow deflector failed at its hinge and was replaced at	44	921	(368)

MECHANICAL HISTORY CONT'D

ITEM	OPERATING HOURS	EQUIVALENT FIELD AREA ac	(ha)
- The header drive jackshaft bearings failed and were replaced at	90	1800	(720)
- Seven knife sections were replaced		During the Test	
- Two knife guards were replaced		During the Test	

Rear Wheel Castor: The left rear wheel castor failed while transporting on a side loading windrower transporter. The castor wheel shimmied excessively after the wheel rolled through a dip on a paved road. The loss of weight on the rear of the windrower allowed the castor wheel to revolve forward and bend when it recontacted the ground. The castor was replaced and extreme care was required while transporting to prevent a reoccurrence.

Drapers: The drapers slowed significantly and stalled while windrowing heavy canola. The pump was changed during the test which improved draper performance but did not eliminate the problem as the drapers still occasionally slowed in heavy canola. Recommendations regarding the draper drive have been made.

The sliding draper decks were warped up at their ends. The stops for the sliding draper decks were not effective in keeping the draper decks in position. This caused the right draper to derail after it overran the stop and collided with the divider draper. Also, dirt and crop material collected under the draper slides preventing smooth operation. Recommendations regarding the draper decks have been made.

Left Windrow Deflector: The hinge on the left draper deflector failed from the draper splice repeatedly hitting the deflector. The left draper deck was moved inward to prevent contact with the deflector.

Header DriveJackshaft: The headerjackshaft bearings faileddue to the lack of adequate greasing. Although the bearings were greased regularly, the cavity was large and contained minimal grease upon disassembly. It appeared that the bearings did not receive adequate greasing upon assembly. New bearings were installed and the cavity was filled with grease.

APPENDIX I

SPECIFICATIONS

MAKE:	Hesston
MODEL:	8100
SERIAL NUMBER:	Header - 810H-00197 Traction Unit - 810T-00266
MANUFACTURER:	Hay and Forage Industries P.O. Box 4000 Hesston, Kansas 67062
CUTTERBAR:	
- width of cut (divider points)	31.0 ft (9.45 m)
- effective cut (inside dividers)	30.0 ft (9.14 m)
- range of cutting height	3 to 36 in (75 to 914 mm)
- guard spacing	3 in (75 mm)
- knife section (over serrated)	
- width	3.0 in (75 mm)
- full depth	3.25 in (83 mm)
- cutting length	2.5 in (64 mm)
- knife stroke	3.0 in (75 mm)
- knife speed	670 cycles/min
HEADER:	
- platform angle	
- fully raised	5° below horizontal
- fully lowered	14° below horizontal
- number of drapers	3
- draper width	42 in (1070 mm)
- draper lengths	
- left	12.4 ft (3.78 m)
- right	10.7 ft (3.26 m)
- right extension draper	1.5 ft (0.46 m)
- draper material	rubberized polyester with fiberglass slats
- draper speed range	0 to 730 ft/min (0 to 3.7 m/s)
- draper roller diameter	2.5 in (64 mm)
- height of windrow opening	34 in (860 mm)
- widths of windrow openings (between rollers)	52 or 60 in (1320 or 1520 mm)
- raising time	4.0 s
- lowering time	3.0 s
REEL:	
- number of bats	5
- number of arms per bat	10
- diameter	52 in (1320 mm)
- speed range	0 to 63 rpm
- range of adjustment	
- fore-and-aft	39.5 in (1003 mm)
- height above cutterbar	38 in (965 mm)
- raising time	2.0 s
- lowering time	2.0 s
TRACTION DRIVE:	
- type	hydrostatic pump hydraulic motors and chain final drive
- speed control	hand lever
- maximum forward speed	12 mph (19.3 km/h)
STEERING:	steering wheel mechanically linked to hydrostatic pump
BRAKES:	caliper disc brakes with hand lever
HYDRAULIC SYSTEM:	
- hydrostatic traction drive	(see traction drive)
- reel and draper drives	separate variable displacement pumps with motors on reel and drapers
- reel lift	2 single acting cylinders in series
- header lift	2 double acting cylinders in parallel
NO. OF CHAIN DRIVES:	
- traction unit	2
- header	0
NO. OF V-BELTS:	
- traction unit	6
- header	4
LUBRICATION POINTS:	
- pressure grease fittings	33
- final drive chain housings	2
NO. OF PRELUBRICATED BEARINGS:	46
ENGINE:	
- make	FIAT
- model	8041105 (4 cylinder diesel)
- displacement	238 cu in (3.9 L)
- no load speed	2500 rpm
- power (nominal)	77 hp (57 kW)
- fuel tank capacity	35 gal (160 L)
TIRES:	
- drive wheels	two, 21.5 L x 16.1, 12 ply traction tread
- castor wheels	two, 7.6 x 15, 4 ply ribbed implement
- header gauge wheels	two, 16 x 6.50, 8 ply
OVERALL DIMENSIONS:	
- width	32.0 ft (9.8 m)
- length	22.7 ft (6.9 m)
- height	10.0 ft (3.0 m)
- wheel tread	10.6 ft (3.2 m)
- wheel base	10.0 ft (3.0 m)

WEIGHT: (fuel tank empty)

- left drive wheel	4610 lb	(2091 kg)
- right drive wheel	4420 lb	(2005 kg)
- castor wheels	1120 lb	(508 kg)
TOTAL	10150 lb	(4604 kg)

OPTIONS AND ATTACHMENTS:

- 21.5 L - 16.1 or 16.5 L - 16.1 drive tires
- standard bat reel or pickup reel
- header gauge wheels
- right side rear view mirror
- header available in 21,25 and 30 ft (6.4, 7.6 and 9.1 m) widths
- radio

SUMMARY CHART

HESSTON 8100 SELF-PROPELLED WINDROWER

RETAIL PRICE	$44,533.00 (March, 1989, f.o.b. Humboldt, Sask.)
RATE OF WORK	
Average Speed	5 to 7 mph (8 to 11 km/h)
Average Workrate	15 to 22 ac/h (6 to 8.8 ha/h)
QUALITY OF WORK	
Dividers	**Very Good**; only flattened leaning canola or tangled crops
Reel	**Very Good;** range of adjustment suitable for all crops
Cutterbar	**Very Good;** ample power, crop material collected around guards at knife overlap
Header Flotation	**Very Good;** minimized cutterbar damage in stony fields
Drapers	**Good;** adequate speeds in most crops but slowed down from heavy load in canola
Windrow Formation	**Very Good;** mostly parallel
Windrow Uniformity	**Excellent;** when single windrowing **Very Good;** when double windrowing, slightly uneven windrows resulted in short crops
EASE OF OPERATION AND ADJUSTMENT	
Operator Comfort	**Very Good;** cab was clean and quiet, ride was smooth
Controls	**Good;** conveniently located but draper speed was inconvenient to set while double windrowing
Instruments	**Good;** audible alarms for engine coolant temperature and park brake engaged, no warnings for hydrostatic drive
Lighting	**Excellent;** ample lighting for operating at night
Handling	**Very Good;** steering very responsive but not overly sensitive, tipped forward on level ground during sudden stops
Transporting	side-loading transporter was used
Adjustments	**Good;** most adjustments were easy but reel-to-cutterbar clearance and draper alignment were inconvenient to adjust.
Lubrication and Maintenance	**Good;** daily servicing took 20 minutes.
ENGINE AND FUEL CONSUMPTION	2.2 gal/h (10 L/h); ample engine power
OPERATOR SAFETY	No safety hazards apparent, all shields were bolt-on type
OPERATOR'S MANUAL	**Good;** much useful information but not all grease locations shown, no instructions given on adjusting the reel-to-cutterbar clearance
MECHANICAL HISTORY	A few mechanical problems occurred

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