2280
Hydrostatic Drive
Windrower

JOHN DEERE

TECHNICAL MANUAL

2280 Hydrostatic Drive
Windrower

TM1179 (01APR83) English

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LITHO IN U.S.A.
ENGLISH

2280 HYDROSTATIC-DRIVE WINDROWER

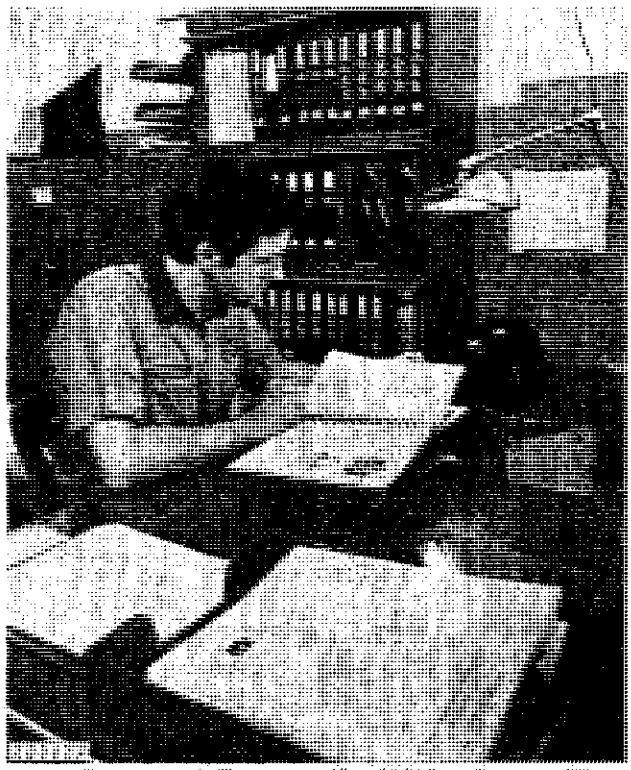
Technical Manual
TM-1179 (Apr-83)

CONTENTS

All information, illustrations and specifications contained in this technical manual are based on the latest information available at the time of publication. The right is reserved to make changes at any time without notice.

New and revised information is identified by vertical lines in the margin of the pages.

INTRODUCTION



Use FOS Manuals for Reference

Use Technical Manuals for Actual Service

This technical manual is part of a twin concept of service:

- **FOS Manuals—for reference**
- **Technical Manuals—for actual service**

The two kinds of manuals work as a team to give you both the general background and technical details of shop service.

Fundamentals of Service (FOS) Manuals cover basic theory of operation, *fundamentals* of trouble shooting, *general* maintenance, and *basic* types of failures and their causes. FOS Manuals are for training new people and for reference by experienced technicians.

Technical Manuals are concise service guides for a *specific* machine. Technical Manuals are on-the-job guides containing only the vital information needed by an experienced technician.

When a service technician should refer to a FOS Manual for more information, a FOS symbol like the one at the left is used in the TM to identify the reference.

Some features of this technical manual.

- *Table of contents at front of manual*
- *Exploded views showing parts relationship*
- *Photos showing service techniques*
- *Specifications grouped for easy reference*

This technical manual was planned and written for you—a service technician. Keep it in a permanent binder in the shop where it is handy. Refer to it whenever in doubt about correct service procedures or specifications.

Using the technical manual as a guide will reduce error and costly delay. It will also assure you the best in finished service work.

SI UNITS OF MEASURE

Because John Deere sells its products world-wide, U.S. units of measure are shown with their respective Metric equivalents throughout this technical manual. These equivalents are the SI (International System) Units of Measure.

SAFETY AND YOU

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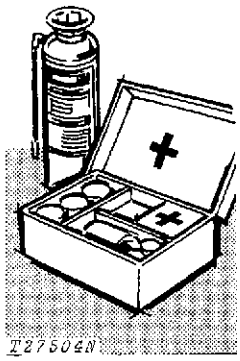
INTRODUCTION

This safety alert symbol identifies important safety messages in this manual and on the windrower. When you see this symbol, be alert to the possibility of personal injury and carefully read the message that follows.



T27502N

Be prepared if an accident or fire should occur. Know where the first aid kit and the fire extinguishers are located—know how to use them.

SERVICE AREA

Keep the service area clean and dry. Wet or oily floors are slippery. Wet spots can be dangerous when working with electrical equipment.

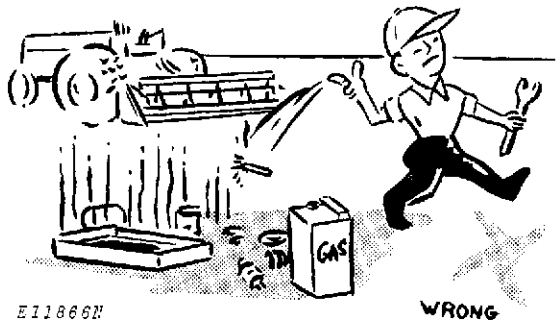
Make sure the service area is adequately vented.

Periodically check the shop exhaust system for leakage. Engine exhaust gas is dangerous.

Be sure all electrical outlets and tools are properly grounded.

Use adequate light for the job at hand.

AVOID FIRE HAZARDS



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Don't smoke while refueling or handling highly flammable material.

Engine should be shut off when refueling.

Use care in refueling if the engine is hot.

Don't use open pans of gasoline or diesel fuel for cleaning parts. Good commercial, nonflammable solvents are preferred.

Provide adequate ventilation when charging batteries.

Don't check battery charge by placing metal objects across the posts.

Don't allow sparks or open flame near batteries.

Don't smoke near battery.

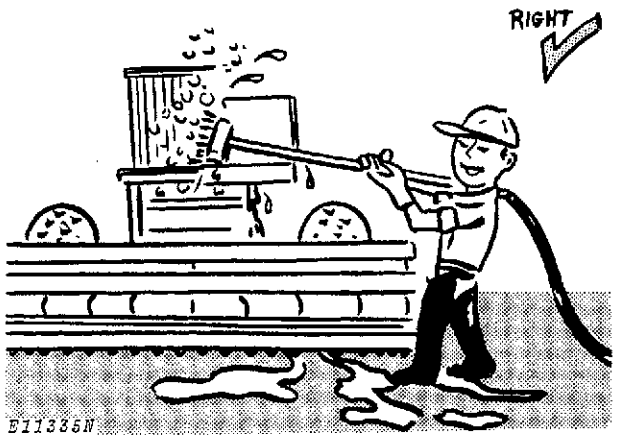
Never check fuel, battery electrolyte or coolant levels with an open flame.

Never use an open flame to look for leaks anywhere on the equipment.

Never use an open flame as a light anywhere on or around the equipment.

When preparing engine for storage, remember that inhibitor is volatile and therefore dangerous. Seal and tape openings after adding the inhibitor. Keep container tightly closed when not in use.

CLEANING THE WINDROWER



Always stop the engine before cleaning the windrower.

Keep the operator's platform clean. Do not use it as a storage area.

Keep the radiator screen free of foreign matter. Avoid a possible fire hazard.

Keep all equipment free of dirt and oil. In freezing weather, beware of snow and ice on ladder steps and operator's platform.

FLUIDS UNDER PRESSURE

Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Before disconnecting lines, be sure to relieve all pressure. Before applying pressure to the system, be sure all connections are tight and that lines, pipes and hoses are not damaged. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.

If injured by escaping fluid, see a doctor at once. Serious infection or reaction can develop if proper medical treatment is not administered immediately.

Don't forget the hydraulic system or diesel fuel injection system may be pressurized! To relieve pressure, follow the instructions in this technical manual.

When checking hydraulic pressure, be sure to use the correct test gauge for the pressure in the particular system.

PERSONAL SAFETY

Always avoid loose clothing or any accessory—flopping cuffs, dangling neckties and scarves—that can catch in moving parts and put you out of work. Always wear your safety glasses while on the job.

Keep transmission and brake control units properly adjusted at all times. Before making adjustments, stop engine.

Before removing any housing covers, stop engine. Take all objects from your pockets which could fall into the opened housings. Don't let adjusting wrenches fall into opened housings.

Don't attempt to check belt tension while the engine is running.

Don't adjust the fuel system while the machine is in motion.

Before repairing the electrical system, or performing a major overhaul, make sure the batteries are disconnected.

Avoid working on equipment with the engine running. If it is necessary to make checks with the engine running, ALWAYS USE TWO PEOPLE—one, the operator, at the controls, the other checking the machine, always in view of the operator. Also, put the transmission in neutral, set the brake, and apply any safety locks provided. KEEP HANDS AWAY FROM MOVING PARTS.

Use extreme caution in removing radiator caps, drain plugs, grease fittings, or hydraulic pressure caps.

Section 10
GENERAL

CONTENTS OF THIS SECTION

Group 5
SPECIFICATIONS

TRACTION UNIT

Engine

Make	John Deere
Model	219
Number of cylinders	4
Type	4-stroke cycle, in-line, valve-in-head
Horsepower	70
Bore	4.02 in. (102 mm)
Stroke	4.33 in. (111 mm)
Piston displacement	219 cu. in. (3595 cm^3)
Compression ratio	16.3 to 1
Firing order	1-3-4-2
Recommended maximum speed (no load)	2665 rpm
Recommended idle speed	800 rpm
Fuel	Diesel
Cooling system	Pressurized
Lubrication system	Force-feed, pressurized with full-flow oil filter
Fuel system	Direct injection, inlet metering, distributing-type. Diaphragm-type fuel pump.

TRACTION UNIT—Continued

Electrical System

Starter, alternator, lights, and accessory voltage ..... 12 volts

Propelling Drive ..... Hydrostatic

Tire Sizes:

Drive wheels ..... 18:4 x 16:1, 4-ply rated (16 psi) (110 kPa)

Caster wheels ..... 9:50 x 14, 4-ply rated (16 psi) (110 kPa)

Torque

Front ..... 140-170 ft-lbs (190-230 N·m)

Rear ..... 85 ft-lbs (115 N·m) (11.5 kgm)

Ground Speed ..... 0-12 mph (0-19 km/h)

Turning Radius ..... Variable to 0 ft. (0 m)

Weight

(Without cab) ..... (Approx.) 5,280 lbs. (2395 kg)

(With cab) ..... (Approx.) 5,790 lbs. (2624 kg)

(With air-cond. cab) ..... (Approx.) 6,150 lbs. (2790 kg)

Capacities

Fuel tank ..... 37 U.S. gals. (151 l)

Hydraulic system ..... 10 U.S. gals. (38 l)

Engine oil crankcase (including filter) ..... 6 U.S. qts. (5.7 l)

Cooling system ..... 14 U.S. qts. (13.2 l)

Main drive gear case ..... 2-1/2 U.S. qts. (1.4 l)

Final drive gear case ..... 9 U.S. qts. (8.5 l)

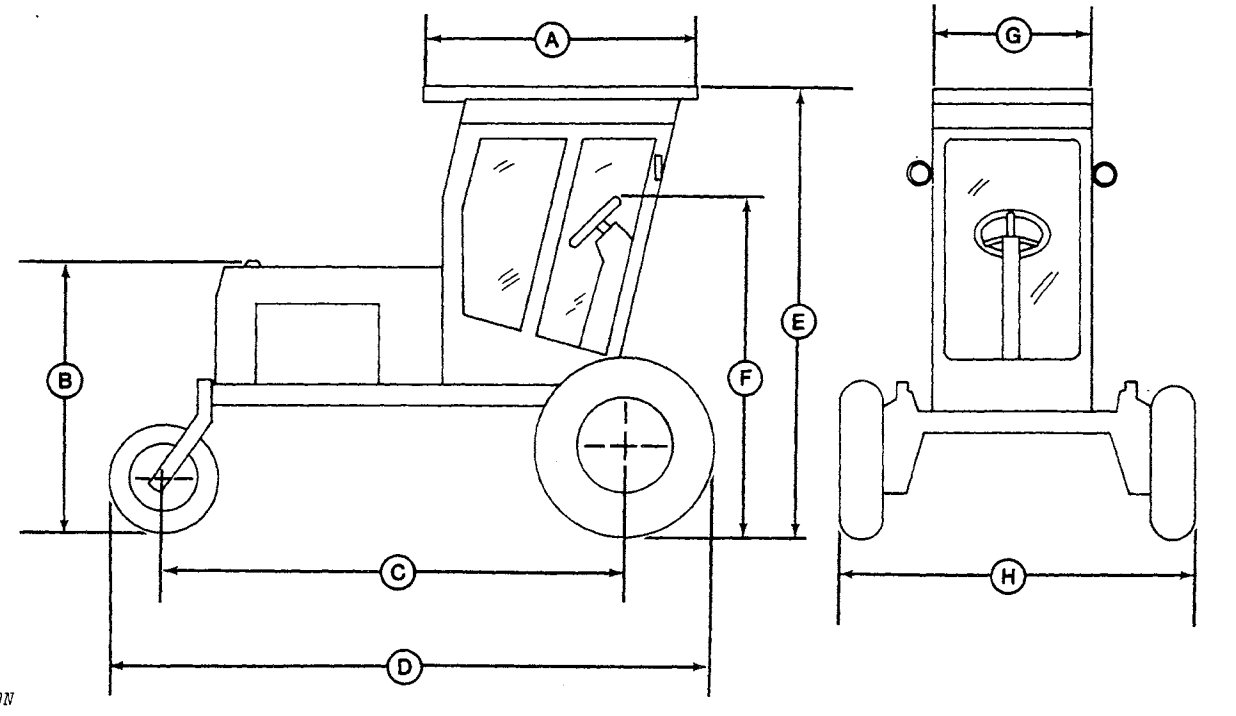


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Fig. 1-Dimensions of 2280 Hydrostatic Drive Windrower

Windrower Dimensions

A—Length of cab ..... **68 in. (1676 mm)**

B—Height to top of radiator cap ..... **82 in. (2083 mm)**

C—Wheel base ..... **123-5/8 in. (3140 mm)**

D—Overall length ..... **159-1/2 in. (4050 mm)**

E—Height to top of cab ..... **115-1/2 in. (2930 mm)**

F—Height to top of steering wheel ..... **93 in. (2360 mm)**

G—Width of cab ..... **44 in. (1118 mm)**

H—Overall width ..... **126 in. (3200 mm)**

120 DRAPER PLATFORM

Width ..... 12 ft. (3.66 m)
Cutterbar:
Type of drive ..... Enclosed, running in oil
Speed..... 725 rpm, 1450 strokes per min.
Guards ..... Double tine
Guard angle ..... Variable, 6-1/2° to −12-1/2° below horizontal
Knives ... Overserrated, underserrated, or smooth

Reel:
Type ..... Pickup
Speed..... Variable, 36 to 81 rpm
Adjustments:
Vertical ..... 27 in. (686 mm)
Horizontal ..... 12 in. (305 mm)
Conveyor Canvases:
Drive..... Bevel gear case and chain
Speed..... 758 rpm
Draper tension ..... Spring-loaded
Range of Platform Cutting Height .....−5 to 22 in. (−127 to 559 mm)
Platform Angle ..... 30°
Distance Between Canvases 36 in. (914 mm)
Weight..... (Approx.) 1885 lbs. (855 kg)

230 AUGER PLATFORM

Width ..... 12 ft. (3.66 m), 14 ft. (4.27 m) and 16 ft. (4.88 m)
Cutterbar:
Type of drive ..... Enclosed, running in oil
Speed..... 725 rpm, 1450 strokes per min.
Guards ..... Double tine
Guard angle ..... Variable, 6-1/2° to −12.5° below horizontal
Knives ... Overserrated, underserrated, or smooth
Reel:
Type .....3-Hub - 12 ft. (3.66 m); 4-Hub - 14 ft. (4.27 m) and 16 ft. (4.88 m)
Speed..... 12-tooth sprocket - 41-52 rpm
15-tooth sprocket - 52-66 rpm
18-tooth sprocket - 62-79 rpm
Auger:
Outside diameter ..... 22 in. (559 mm)
Width of flighting ..... 5 in. (127 mm)
Speed..... 12-tooth - 126 rpm
15-tooth - 158 rpm
18-tooth - 190 rpm

Range of Platform Cutting Height .....−5 to 22 in. (−127 to 559 mm)
Weight:
12-ft. (3.66 m) with conditioner
.....(Approx.) 2640 lbs. (1197 kg)
14-ft. (4.27 m) with conditioner
.....(Approx.) 2820 lbs. (1279 kg)
16-ft. (4.88 m) with conditioner
.....(Approx.) 3000 lbs. (1361 kg)

HAY CONDITIONER

Model 20 Crimper Conditioner - Draper Platform Only

Type of rolls ..... Formed steel, fluted
Drive..... Chain
Roll:
Length ..... 58 in. (1.50 m)
Diameter ..... 7-3/4 in. (197 mm)
Speed ..... 862 rpm
Weight (approx.) ..... 518 lbs. (235 kg)

Model 30 Crimper Conditioner - Auger Platform Only

Type of rolls ..... Formed steel, fluted
Drive..... Gear and shaft
Roll:
Length ..... 58 in. (1.50 m)
Diameter ..... 7-3/4 in. (197 mm)
Speed ..... 862 rpm
Weight (approx.) ..... 485 lbs. (220 kg)

Model 40 Crusher Conditioner - Auger Platform Only

Type of rolls .....Upper steel roll
Lower rubber roll
Drive..... Gear and shaft
Roll:
Length ..... 58 in. (1.50 m)
Diameter ..... 7 in. (180 mm)
Speed ..... 865 rpm
Weight (approx.) ..... 525 lbs. (238 kg)

Group 10
PREDELIVERY, DELIVERY AND AFTER-SALES SERVICES

PREDELIVERY SERVICE

Because of the shipping factors involved, plus extra finishing touches that are necessary to promote customer satisfaction, proper delivery service is of prime importance to the dealer.

After completing the factory-recommended dealer checks and services listed on the predelivery page, remove the page from the windrower operator's manual and file it with the shop order for the job. The page will certify that the windrower has received the proper predelivery service when that portion of the customer's John Deere Delivery Receipt is completed.

TEMPORARY WINDROWER STORAGE

Service	Specification	Reference
Check radiator for coolant loss and antifreeze protection.	2 inches (51 mm) above baffle.	.....
Reduce shipping pressure of tires.	.....	Page 10-5-2
Cover windrower and tires for protection and cleanliness.	.....	.....

BEFORE DELIVERING WINDROWER

COOLING SYSTEM		
Inspect radiator for coolant loss.	.....	.....
Check antifreeze protection.	.....	.....
ELECTRICAL SYSTEM		
Install electrolyte and charge batteries	.....	FOS-20 Manual
Stamp date code on battery.	.....	FOS-20 Manual
Connect alternator. Do not attempt to polarize.	.....	Section 40
Clean terminals and connect battery cables.	.....	Section 40
TIRES AND WHEELS		
Adjust pressure of tires.	.....	Operator's manual
Check front wheel cap screws and rear wheel hub bolts for tightness.	Front cap screws - 140-170 ft-lbs (190-230 N·m) Rear hub bolts - 85 ft-lbs (115 N·m) (12 kgm)	.....

BEFORE DELIVERING WINDROWER—Continued

Service	Specification	Reference
LUBRICATION		
Check crankcase oil level.	.....	Section 10-Group 20
Check final drives oil level.	SAE 85-140 API GL5 Gear Lubricant	Operator's manual
Check hydraulic system oil level.	John Deere Hy-GARD Transmission and Hydraulic Oil	Operator's manual
Check main gear case oil level.	SAE 85-140 API GL5 Gear Lubricant	Operator's manual
Lubricate grease fittings.	John Deere Multi-Purpose Lubricant	Operator's manual
Lubricate drive chains.	SAE 30 or heavier engine oil	Operator's manual
ENGINE		
Remove protective covers from all ..... engine openings.	.....	
Fill fuel tank and start engine.	.....	Operator's manual
Check operation of gauges and lights.	.....	.....
Check engine speeds.		
Slow idle	800 rpm	.....
Fast idle	2665 rpm	.....
OPERATION		
Check to be certain drive wheels Operator's manual are fully engaged or disengaged.	.....	
Check master control operation.	.....	Section 60-Group 10
Check hydrostatic drive operation.	.....	.....
Check all hydraulic system functions.	.....	Section 70
Check parking brake operation.	.....	Section 60-Group 10
Check steering operation.	.....	Section 60 Group 05
Check seat operation.	.....	Section 80-Group 15

Service	Specification	Reference
GENERAL		
Install non-slip cleats on operator's platform.	.....	Operator's manual
All moving parts are working freely.	.....	.....
Install platform and harvesting units. Make sure platform lift arm lock plates are properly installed.	.....	Operator's manual
Adjust platform float.	.....	Operator's manual
Check tension of all belts and adjust if necessary.	.....	Operator's manual
Check all chains for proper installation and adjustment.	.....	Operator's manual
Check platform draper belt for cracks, missing rivets, etc.	.....	Operator's manual
Check and, if necessary, lubricate all points of lubrication.	.....	Operator's manual
Tighten accessible nuts and cap screws.	.....	.....
Clean windrower and touch up paint.	.....	.....

DELIVERY SERVICE

A thorough discussion of the operation and service of a new windrower at the time of delivery helps to assure complete customer satisfaction. Proper delivery should be an important phase of a dealer's program. A portion of the John Deere Delivery Receipt emphasizes the importance of proper delivery service.

Many complaints have arisen simply because the owner was not shown how to operate and service the new windrower properly. Enough time should be devoted, at the customer's convenience, to introducing the owner to the new windrower and explaining how to operate and service it.

The following procedure is recommended before the service technician and owner complete the delivery acknowledgments portion of the delivery receipt.

Using the windrower operator's manual as a guide, be sure that the owner understands these points thoroughly.

1. Controls and instruments.
2. How to start and stop the engine.
3. The importance of the break-in period.
4. All functions of the hydraulic system.
5. All functions of hydrostatic system.
6. Advise the customer of the optional harvesting units that are available for special crop and operating conditions.
7. The importance of lubrication and periodic services.
8. The importance of safety.

After explaining and demonstrating the above features, have the owner sign the delivery receipt and give the owner the operator's manual.

AFTER-SALE INSPECTION

The purchaser of a new John Deere windrower is entitled to a free inspection within the warranty period after the equipment has been "run in." The terms of this after-sale inspection are outlined on the back of the John Deere Delivery Receipt.

The purpose of this inspection is to make sure that the customer is receiving satisfactory performance from the windrower. At the same time, the inspection should reveal whether or not the windrower is being operated, lubricated, and serviced properly.

If the recommended after-sale service inspection is followed, the dealer can eliminate a needless volume of service work by preventing minor irregularities from developing into serious problems later on. This will promote strong dealer-customer relations and present the dealer an opportunity to answer questions that may have arisen during the first few days of operation. During the inspection service, the dealer has the further opportunity of promoting the possible sale of other new equipment.

The following inspection program is recommended within the first 100 hours of harvester operation.

Service	Specification	Reference
Cooling System		
Check radiator coolant level.	.....	Operator's manual
Clean external surface of radiator core.	.....	.....
Check hoses and connections for leaks.	.....	.....

Service	Specification	Reference
Fuel System		
Remove water and foreign material from filter sediment bowls	. . . . .	Operator's manual
Bleed fuel system.	. . . . .	Operator's manual
Check fuel line and connections.	. . . . .	. . . . .
Electrical System		
Check specific gravity of battery (s).	Full charge - 1.260 at 80°F (26.7°C)	FOS-20 Manual
Check level of battery electrolyte.	To bottom of filler neck in cell.	Operator's manual
Check belt tension.	Alternator - 3/4-inch (19 mm) deflection with a 20 lb. (89 N) (8.9 kgm) force. Compressor - 1/4-inch (6.4 mm) deflection with a 15 lb. (67 N) (6.7 kgm) force.	Operator's manual
Start engine and check operation of starter, lights, and indicator lamps.	. . . . .	Operator's manual
Tires and Wheels		
Adjust pressure of tires. Operator's manual	. . . . .	
Check front wheel cap screws and rear wheel hub bolts for tighness.	Front cap screws - 140-170 ft-lbs (190-230 N·m) Rear hub bolts - 85 ft-lbs (115 N·m) (12 kgm)	. . . . .
Lubrication		
Check crankcase oil level.	To upper mark on dip stick.	Operator's manual
Check hydraulic system oil level.	To upper mark on dip stick.	Section 10 - Group 20
Check hydraulic lines and connections.	. . . . .	. . . . .
Check final drive gear case oil level.	To check plug.	Section 10 - Group 20
Check main drive case oil level.	To check plug.	Section 10 - Group 20
Check cutterbar drive case.	To check plug.	Section 10 - Group 20
Lubricate grease fittings.	. . . . .	Operator's Manual

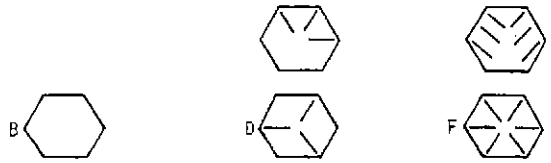
AFTER-SALE INSPECTION—Continued

Service	Specification	Reference
Engine		
Check air cleaner.	.....	Operator's manual
Check fan belt tension.	3/4 -inch (19 mm) deflection with 20 lb (89 N) (8.9 kgm) force	Operator's manual
Check valve clearance (static).	Intake: 0.014-in. (0.356 mm) Exhaust: 0.018-in. (0.457 mm)	Section 20 - Group 10
Check engine speed.		
Slow idle	800 rpm.	.....
Fast idle	2665 rpm	.....
Check operation of starter, alternator, gauges, and indicator lights.	.....	Operator's manual
Operation		
Check platform drive clutch lever adjustment.	.....	Operator's manual
Check parking brake adjustment.	.....	Operator's manual
Check hydraulic system operation.	.....	Section 70
Check hydrostatic system operation.	.....	Section 70
Check steering.	.....	Section 60
Check headlight adjustment.	.....	Section 40
Check cab controls and seat operation.	.....	Operator's manual
Check drive chain adjustments.	.....	Operator's manual
Check V-belt adjustments.	.....	Operator's manual

Service	Specification	Reference
General		
Tighten accessible nuts and cap screws	.....	.....
Visual inspection.	.....	.....
All safety shields in place.	.....	.....
Clean windrower and touch up paint.	.....	.....

TORQUE CHART

RECOMMENDED TORQUE IN FT-LBS (Nm)
COARSE AND FINE THREADS



Bolt Diameter	Plain Head	Three Dashes	Six Dashes
1/4	Not used	10 (14)	14 (19)
5/16	Not used	20 (27)	30 (41)
3/8	Not used	35 (47)	50 (68)
7/16	35 (47)	55 (75)	80 (108)
1/2	55 (75)	85 (115)	120 (163)
9/16	75 (102)	130 (176)	175 (237)
5/8	105 (142)	170 (230)	240 (325)
3/4	185 (251)	300 (407)	425 (576)
7/8	160 (217)	445 (603)	685 (929)
1	250 (339)	670 (908)	1030 (1397)
1-1/8	330 (447)	910 (1234)	1460 (1980)
1-1/4	480 (651)	1250 (1695)	2060 (2793)

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The types of bolts and cap screws are identified by head markings as follows:

Plain Head: regular machine bolts and cap screws.

3-Dash Head: tempered steel high-strength bolts and cap screws.

6-Dash Head: tempered steel extra high-strength bolts and cap screws.

Machine bolts and cap screws 7/8-inch and larger are sometimes formed hot rather than cold, which accounts for the lower torque.

Group 15
TUNE-UP

GENERAL INFORMATION

Before tuning up a windrower, determine whether a tune-up will restore operating efficiency. When there is doubt, the following preliminary tests will help determine if the engine can be tuned up. If the condition is satisfactory, proceed with the tune-up. Choose from the following procedures only those necessary to restore the unit.

PRELIMINARY ENGINE TESTING

Operation	Specification	Section-Group Reference
Check compression (minimum readings)	300 psi (19 bar) (21 kg/cm²) at full cranking speed	FOS 30 Manual * Chapter 12
Check engine coolant.	No air bubbles or oil film in radiator.	FOS 30 Manual, Chapter 12

ENGINE TUNE-UP

Service air cleaner and check system for leaks.	.....	FOS 30 Manual, Chapter 12
Check exhaust system for leaks.	.....	FOS 30 Manual, Chapter 12
Check muffler and exhaust pipe for restrictions.	.....	FOS 30 Manual, Chapter 12
Check crankcase ventilating system for restrictions.	.....	FOS 30 Manual, Chapter 12
Clean cooling system screen, radiator core, and oil cooler core.	.....	Section 20 - Group 40
Clean and flush cooling system; check thermostat opening temperature, if necessary.	.....	Section 20 - Group 40
Check pressure cap.	6.25 to 7.50 psi (0.38 bar) (0.44 kg/cm²) to (0.45 bar) to (0.53 kg/cm²) release pressure..	Section 20 - Group 40

** Fundamentals of Service Manual—ENGINES*

ENGINE TUNE-UP—Continued

Operation	Specification	Section-Group Reference
Tighten cylinder head cap screws.	95 ft-lbs (129 N·m) in sequence	Section 20 - Group 10
Set valve clearance.	Intake-0.014-inch (0.36 mm) Exhaust-0.018-inch (0.46 mm)	Section 20 - Group 10
Windrower Fuel System		
Check fuel tank for water or or other foreign material.		
Check fuel pump pressure.	3-1/2 - 4-1/2 psi (0.21 bar) (0.25 kg/cm²)-(0.27 bar) (0.32 kg/cm²)	Section 30 - Group 10
Clean sediment bowls and change filter(s).		Section 30 - Group 10
Injection Pump:		
Service and check timing	TDC	Section 30 - Group 10
	4° advance at 1200 rpm (no load)	Section 30 - Group 10
Adjust throttle linkage.		
Slow idle	800 rpm	
Fast idle	2665 rpm	
Check engine oil pressure.	45 - 65 psi (3.1 bar) (3.2 kg/cm²)-(4.5 bar) (4.6 kg/cm²) at high idle	Section 20 - Group 30

Operation	Specification	Section-Group Reference
Charging System:		
Check battery specific gravity.	1.240 - 1.260	FOS-20 Manual*
Check battery water consumption and electrolyte level.		Section 40 - Group 5
Clean battery, cables, and carrier.		
Check alternator belt tension.	20 lb (89 N) (8.9 kgm) with 3/4-in. (19 mm) belt deflection	Operator's Manual
Check alternator output.	38 amps at 13.5 to 14 volts (2665 engine rpm, 4500 alternator rpm).	Section 40 - Group 10
Check alternator regulated voltage.	13.8 - 14.3 volts (operating)	Section 40 - Group 10
Starting System:		
Check neutral start switch operation.		Section 40 - Group 15
Check battery voltage when starting.	Min. 9 volts (cranking)	Section 40 - Group 15
Check starter current draw.	Approx. 400 amps.	Section 40 - Group 15
Check operation of alternator and oil pressure indicator lights.		Section 40 - Group 5

MISCELLANEOUS TESTING

Make the following tests whenever the engine is tuned up.

Electrical System:		
Check each electrical function.		Section 40 - Group 5
Inspect wiring.		
Parking Brake:		
Adjust brake linkage.		Section 60 - Group 10
Inspect brake stators.		
Steering:		
Check smoothness of steering.		Section 60 - Group 5
Inspect linkages.		
Hydraulic System:		
Check each function.		Section 70 - Group 5
Inspect oil lines and hoses.		
Inspect filter.		
Check oil level in reservoir.	Top mark on dipstick.	
Hydrostatic System:		
Check each function.		Section 70 - Group 5
Tires:		
Check tire inflation.		Section 10 - Group 5
Tighten accessible bolts and cap screws.		Torque chart - page 10-10-7

* *Fundamentals of Service Manual—ELECTRICAL SYSTEMS*

MISCELLANEOUS TESTING—Continued

Operation	Specification	Section-Group Reference
Final Drive Gear Case:		
Check oil level.	To check plug.	Section 10 - Group 20
Main Drive Gear Case:		
Check oil level.	To check plug.	Section 10 - Group 20
Cutterbar Drive Case:		
Check oil level.	To check plug.	Section 10 - Group 20
V-Belt Drives:		
Inspect and adjust tension.	.....	Operator's manual
Chain Drives:		
Inspect and adjust tension.	.....	Operator's manual
Lubrication:		
Lubricate grease fittings.	.....	Operator's manual
Visual Inspection:	.....	.....

Group 20
LUBRICATION

GENERAL INFORMATION

Carefully written and illustrated instructions are included in the windrower operator's manual. Remind your customer to follow the recommendations in these instructions.

For your convenience when servicing the windrower, the following chart showing capacities and type of lubricant for the various components has been included. Additional lubrication information is on page 20-2.

Component	Capacity	Type of Lubricant	Inverval of Service
Engine crankcase	6 U.S. quarts (5.7 l) (including filter)	See "Engine Lubricating Oils" on page 10-20-2	10 Hours - Check 100 Hours - Drain and refill. 200 Hours - Change filter element.
Final drives (Two)	9 U.S. quarts (8.5 l)	SAE 85-140 API GL5 Gear Lubricant	50 Hours - Check 500 Hours - Drain and refill.
Hydraulic system	10 U.S. gallons (38 l)	John Deere Hy-GARD Transmission and Hydraulic Oil (or its equivalent)	10 Hours - Check 500 Hours - Drain and refill. Replace filter.
Main drive gear case	2-1/2 U.S. quarts (1.4 l)	SAE 85-140 API GL5 Gear Lubricant	50 Hours - Check 500 Hours - Drain and refill.
Cutterbar drive case	1-1/2 pts (0.71 l)	SAE 85-140 PAI GL5 Gear Lubricant	50 Hours - Check 500 Hours - Drain and refill.
Grease fittings	.....	John Deere Multi-Purpose Lubricant (or its equivalent)	See Operator's Manual
Drive chains	.....	SAE 30 or heavier engine lubricating oil	See Operator's Manual

LUBRICANTS

Engine Lubricating Oils

X3377N

Fig. 1-Torq-Gard Supreme Engine Oil

We recommend John Deere Torq-Gard Supreme engine oil for use in the engine crankcase. Torq-Gard Supreme is compounded specifically for use in John Deere engines, and provides superior lubrication under all conditions for diesel engines. NEVER PUT ADDITIVES IN THE CRANKCASE. Torq-Gard Supreme oil was formulated to provide all the protection your engine needs. Additives could reduce this protection rather than help it.

If oil other than Torq-Gard Supreme is used, it must conform to the following specifications:

SINGLE VISCOSITY OILS

DIESEL ENGINES	GASOLINE ENGINES
API Service CD/SD MIL-L-2104C* series 3*	API Service CD/SE, CD/SD, CC/SD or SD MIL-L-46152 MIL-L-2140C*

MULTI-VISCOSITY OILS

DIESEL AND GASOLINE ENGINES

API Service CC/SE, CC/SD or SD
MIL-L-46152

** As further assurance of quality, the oil should be identified as suitable for API Service Designation SD.*

Depending on the expected prevailing temperature for the fill period, use oil of viscosity as shown in the following chart.

Air Temperature	John Deere Torq-Gard Oil	Other Oils: Single Viscosity Oil	Other Oils: Multi-Viscosity Oil
Above 32°F (0°C)	SAE 30	SAE 30	Not recommended
-10°F to 32°F ** (-23°C to 0°C)	SAE 10W-20	SAE 10W	SAE 10W-30
Below -10°F (-23°C)	SAE 5W-20	SAE 5W	SAE 5W-20

**SAE 5W-20 oil may also be used to insure optimum lubrication at starting; particularly when engine is subjected to −10°F (−23°C) or lower temperatures for several hours.

Some increase in oil consumption may be expected when SAE 5W-20 or SAE 5W oils are used. Check oil level More frequently.

Break-In Oil

Use Torq-Gard Supreme SAE 10W-20 oil for the first fill after a major engine overhaul.

Hydraulic System

Use John Deere Hy-GARD Transmission and hydraulic Oil or its equivalent in the hydraulic system.

Final Drive Cases

Use only SAE 85-140 API GL5 Gear Lubricant in the final drive cases.

Main Drive Gear Case

Use only SAE 85-140 API GL5 Gear Lubricant in the main drive gear case.

Cutterbar Drive Case

Use only SAE 85-140 API GL5 Gear Lubricant in the cutterbar drive case.

Greases

John Deere Multi-Purpose Lubricant or its equivalent is recommended for all grease fittings. Application of lubricant as instructed in the lubrication chart will provide proper lubrication and will prevent contamination of bearings.

Storing Lubricants

Your windrower can operate efficiently only if clean lubricants are used. Use clean containers to handle all lubricants. Store them in an area protected from dust, moisture, and other contamination.

FOS

For more information on lubricants, refer to "Fundamentals of Service" manual on General Information, "FOS-50."

Group 25
SEPARATION

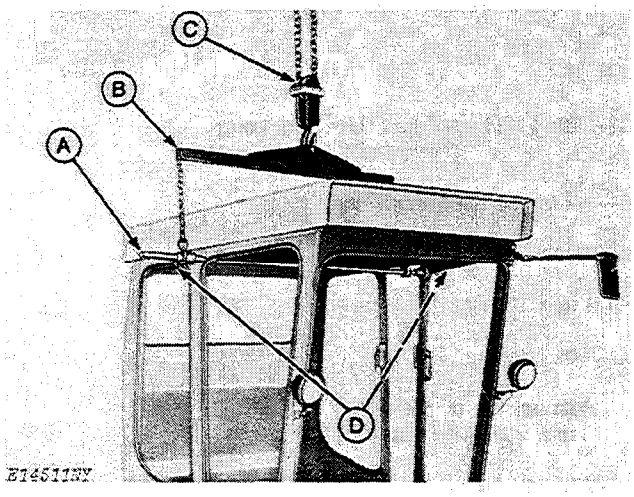
OPERATOR'S CAB

When the windrower is equipped with a cab, it may be necessary to remove the cab in order to service the windrower or the cab components.

REMOVAL

Disconnect all electrical wires and remove all bolts that mount the cab to the operator's platform. If air conditioning is installed, the hoses must be disconnected.

CAUTION: When disconnecting the refrigerant hoses, first discharge the compressor or complete system as explained on page 80-10-12. Follow all safety precautions listed to avoid personal injury.



A—Lifting Rod
B—Sling
C—Hoist
D—Retainer Pins

Fig. 1-Removing Operator's Cab

Open cab door and secure in this position.

Remove push-out plug from right hand side of cab and install lifting rod (A, Fig. 1). The hex. nut on the rod must engage the channel along the top of the door opening. This will prevent the lifting rod from sliding out of the cab, which would let the cab fall, causing serious damage. See "Making Special Tools" on page 10-25-2, for instructions to make the lifting rod (A) and sling (B).

Lift the cab off the windrower with the lifting sling and a hoist (C). Secure the lifting sling (B) on the lifting rod (A) with a retainer pin (D) at each end of rod. Make the lifting sling as instructed on the next page.

CAUTION: When lifting the cab, be certain to install a retainer pin (D) at each end of lifting rod (A) to prevent accidental dropping of the cab. Personal injury and/or damage to cab could result.

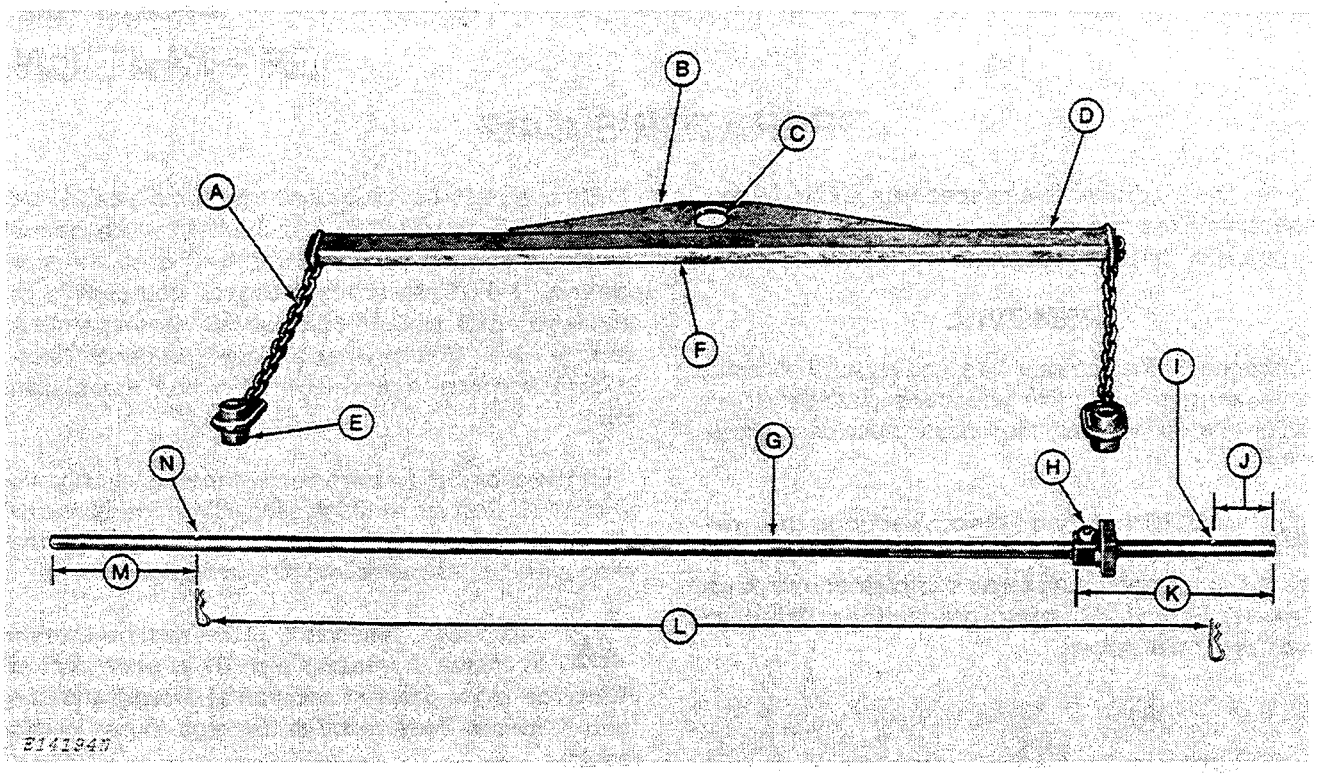
The hoist (C) must have a 1000 lb (453.6 kg) minimum lifting capacity.

INSTALLATION

Install the cab by reversing the procedure used to remove it. Connect all electrical wires and refrigerant hoses.

IMPORTANT: Refer to Section 80 - OPERATOR'S CAB for instructions to charge the air conditioning system, and for pressurizer system service instructions.

MAKING SPECIAL TOOLS



A—Two Pieces of Chain Links 16-1-1/2 in. (38 mm)

B—3/8-in. x 3 in. x 2 ft. Long (9.5 x 76 x 610 mm)

C—Hole

D—Channel - 1-1/4 in. x 2 in. x 4 ft. Long (32 x 51 x 1219 mm)

E—Two Pipe Spacers - 13/16-in. I.D. x 2 in. Long (21 mm I.D. x 51 mm)

F—Lifting Sling

G—Lifting Rod - 3/4 in. O.D. x 5 ft. Long (19 mm O.D. x 1524 mm)

H—3/4-in. (19 mm) Hex. Nut

I —9/32-in. (7.1 mm) Diameter Hole

J —3 in. (76 mm)

K—9 in. (229 mm)

L —Retainer Pin or 1/4-in. x 1-1/4 in. Cap Screw With Nut

M—7 in. (178 mm)

N—9/32 in. (7.1 mm) Diameter Hole

Fig. 2-Making Operator's Cab Lifting Rod and Sling

Weld hex. nut to the lifting rod (Fig. 2).

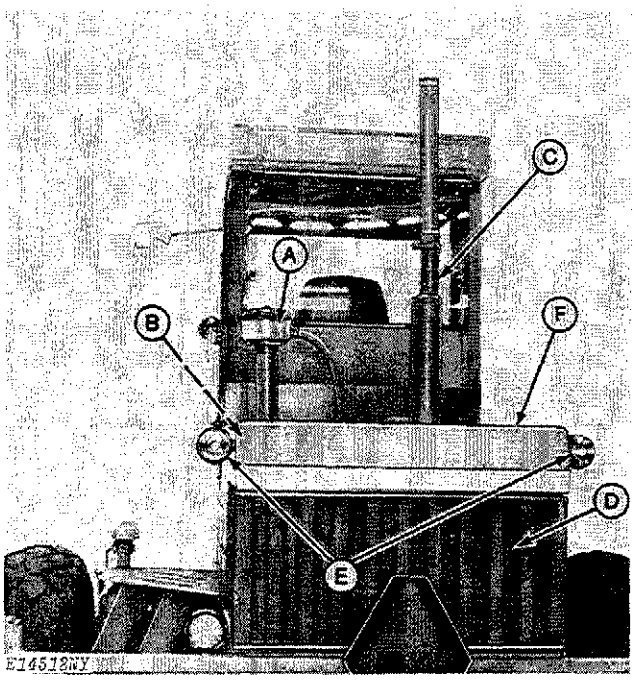
Weld the lifting sling as follows:

1. Pipe spacer to each length of chain.
2. A length of assembled chain to each end of channel.
3. Plate centered on top of channel.

ENGINE

REMOVAL

IMPORTANT: Be certain to plug all openings and cap all hoses or lines that are disconnected to prevent contamination of a particular system.



A—Precleaner
B—Air Cleaner
C—Muffler-Exhaust Pipe
D—Radiator Screen
E—Warning Lamp
F—Engine Hood

Fig. 3-Removing Air Cleaner, Aspirated Precleaner, Muffler, Radiator Screen, and Engine Hood

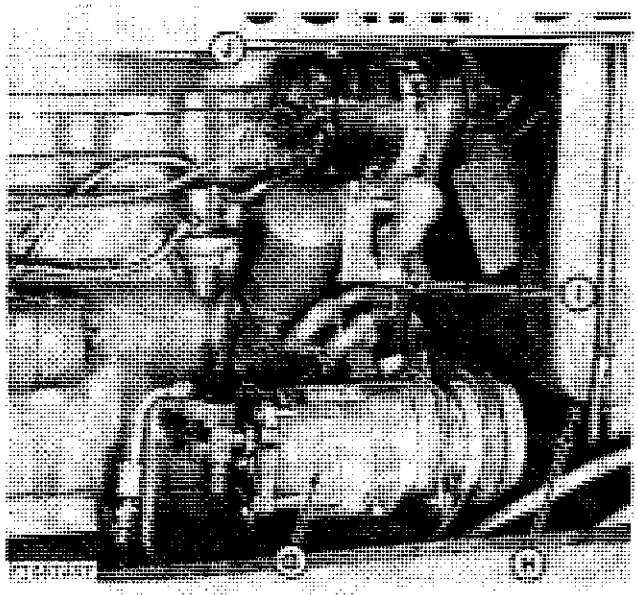
Remove aspirated precleaner (A, Fig. 3), air cleaner (B), exhaust pipe muffler (C), and radiator screen (D) (Fig. 3).

Disconnect warning lamp wires and remove warning lamps (E).

Remove engine hood (F).

Remove the compressor (G) and secure to the outside of main frame member. Do not disconnect the refrigerant hoses.

IMPORTANT: Be careful not to damage refrigerant hoses and compressor assembly.

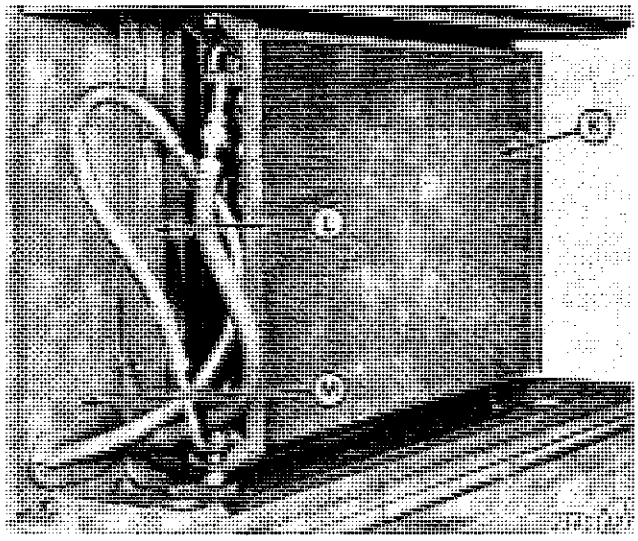


G—Compressor
H—Radiator Drain Plug
I—Lower Hose
J—Upper Hose

Fig. 4-Removing Compressor, Draining Cooling System, and Removing Radiator Hoses

Drain cooling system.

Disconnect the upper and lower radiator hoses (Fig. 4).



K—Condenser **L—Condenser Mounting** **M—Radiator Panel**

Fig. 5-Removing Condenser

Remove condenser (K).

IMPORTANT: Do not disconnect the refrigerant hoses.