VERSATILE

FORD
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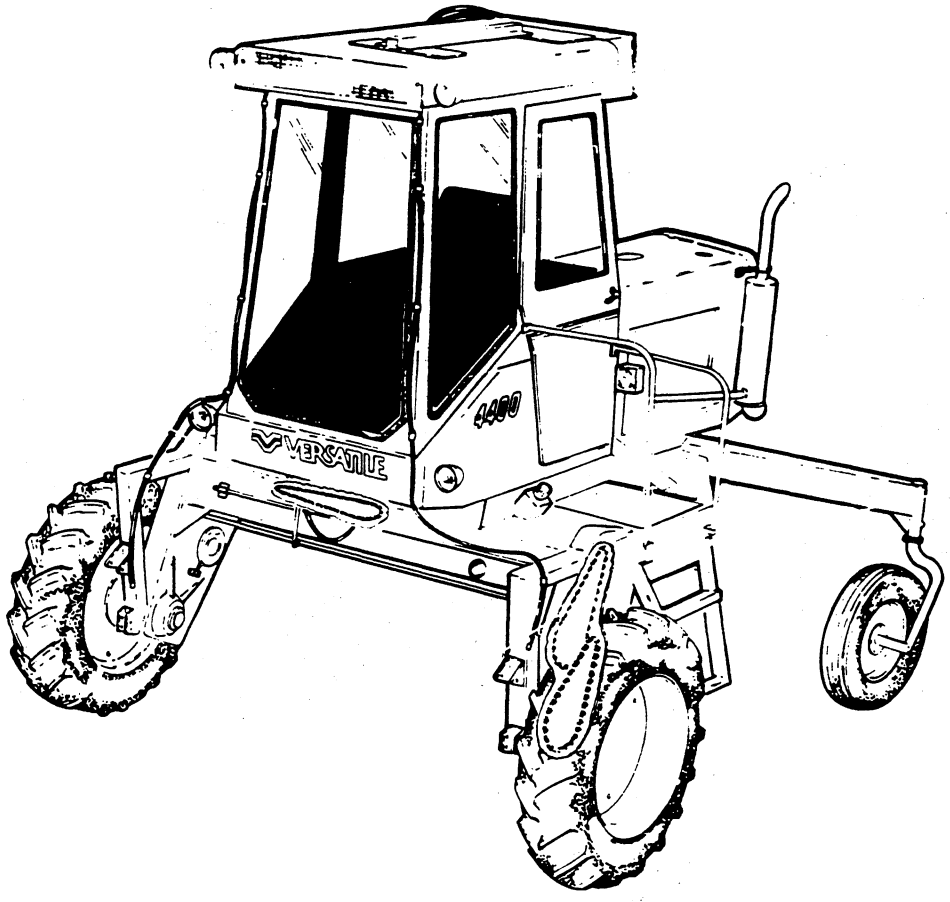
Service Manual

Swather
4400



Reprinted

4400 SWATHER SERVICE MANUAL

VERSATILE

VERSATILE FARM EQUIPMENT COMPANY

A division of Versatile Corporation

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FOREWORD

This service manual provides instructions for troubleshooting, removal, inspection, replacement and overhaul of 1977, 1978, 1979, 1980, 1981, 1982 and1983 Model 4400 VERSATILE® Swather components.

The service manual should be used in conjunction with the parts manual for the specific model year.

A table of contents precedes each section providing detailed coverage of the information contained within that section. The index at the end of the book should ease location of specific information.

REVISIONS AND ADDITIONS

The purpose of a loose-leaf service manual is to enable us to keep the book updated.

When changes are made, pages will be forwarded to you marked either as replacement or additional pages.

Replacement pages will carry the same page number as the original. Discard the original page and insert the replacement page in its place. Added pages will carry the original page number plus an alphabetical suffix. Insert these pages after the existing page.

Please complete the feedback page at the back of the book and return it to Versatile Farm Equipment Company. Such information will help us improve our service manuals in the future.

Safety

This section contains general safety precautions which should be studied and practised by all service personnel.

GENERAL SAFETY

1. Mount a fire extinguisher in the service area. Maintain it according to manufacturer's recommendations.

2. Never operate swather in a closed building. If it is absolutely necessary to do so, ensure building is well ventilated and use ducting to channel exhaust fumes outside.

3. Always keep clothing relatively tight and belted. Remove jewelry or any objects that might catch in moving parts.

4. Use steps and handholds when entering or leaving swather.

5. Park swather on clear, level area before servicing. Ensure engine is shut down, key removed, parkbrake set and all controls are in neutral. Chock wheels.

6. Lower table and reel completely before leaving swather.

7. Operate all swather controls from the operator's seat.

8. Clear personnel before moving swather.

TRANSPORT SAFETY

1. Do not tow swather or hydrostatic system may be damaged. Move swather under its own power or transport on a flatbed.

2. Use a trailer with a minimum capacity of 3 175 kg (7 000 lb) to haul swather.

3. Securely chain swather to trailer, chock wheels and engage parkbrake to prevent swather movement.

HOIST SAFETY

1. Use a chain hoist and frame to lift swather or table. Follow capacities recommended in the sections on special tools and equipment throughout this manual.

2. Protect yourself from injury when swather, table or parts are being raised by doing the following:

   a. Do not stand on swather or table when lifting.

   b. Keep hands away from pinch points where chain links or belts tighten or are against swather or table frame.

   c. Do not let swather, table or parts swing and strike personnel or hoist frame as it leaves the ground.

   d. Keep support stands nearby and place under lifted item when the necessary height is reached.

   e. Do not go under swather, table or part supported by a hoist. Place support stands of recommended capacity under item before working on it.

MAINTENANCE SAFETY

1. Shut down engine, disengage table drive and remove key before servicing swather or table.

2. Be alert when approaching swather while it is running, especially the reel and table assembly.

3. Engage cylinder locks and securely block taable and reel before servicing and adjusting swather.

4. Never service, lubricate or clean swather or table while it is running.

5. Add coolant only when engine is shut down. Do not remove radiator cap until coolant temperature is well below boiling. Turn radiator cap to its first stop to relieve pressure before removing cap.

6. Relieve all hydraulic pressure before servicing components. Use a piece of wood or cardboard and wear safety gloves and goggles when searching for hydraulic leaks.

7. Repair adhesive is very flammable. Keep adhesive and its vapors away from heat, sparks and flames.

8. During adhesive use and until vapor is dissipated, avoid using spark producing electrical equipment. Keep container closed when not in use.

9. Use adhesive only in a well ventilated area.

FUEL AND FLUID SAFETY

1. Do not smoke and avoid open flame or sparks when:

   a. Filling fuel tanks.

   b. Filling batteries.

   c. Working on air conditioning systems. Refrigerant vapor and flame combine to produce a lethal gas.

2. Never use an open pail or can to transport fuel. Use only an approved container manufactured for that purpose.

3. If clothing is splashed with fuel, change immediately. Fuel soaked clothes are an extreme fire hazard.

4. Dispose of all fuel soaked rags. Do not leave them lying around work area where they may be exposed to flames, sparks or cigarette smoking.

SECTION 1: SPECIFICATIONS AND DATA

Table of Contents

SECTION 1: SPECIFICATIONS AND DATA

1 Introduction

This section contains general information about specifications, capacities, lubricants, fluids and fuels for the swather.

1.1 TRANSPORTATION

1.1.1 Highway Driving and Towing

When driving or towing a self-propelled swather, follow recommendations listed in the Safety section.

1.2 HOISTS AND JACKS

1.2.1 General

Observe recommendations listed in the Safety section.

2 Specifications

CANVAS

Depth . . . . . 42 in. (1 070 mm)

Drive . . . . . Hydraulic motor

Control . . . . . Adjustable flow control valves give 200 to 800 r/min on each roller

CAPACITIES

Gas Engine

Cooling System . . . . . 12 qt US (11.4 L)

Engine Oil . . . . . 4.5 qt US (4.2 L)

Fuel Tank . . . . . 32 gal US (120 L)

Hydraulic Tank . . . . . 20 gal US (76 L)

Diesel Engine

Cooling System . . . . . 17 qt US (16 L)

Engine Oil . . . . . 7 qt US (7.1 L)

Fuel Tank . . . . . 32 gal US (120 L)

Hydraulic Tank . . . . . 20 gal US (76 L)

CUTTERBAR AND FRAME

Lift Range . . . . . – 1 to + 43 in. (– 25 to + 1 090 mm)

Swath Opening
(Standard Table) . . . . . Adjustable 40 to 47 in. (1 020 to 1 190 mm)

(Double Swath Table) . . . Adjustable, 2 positions, 44 or 50 in. (1 120 mm or 1 270 mm)

Draper Angle at 8 in. (203 mm)
Cutting Height . . . . . Upper position:14.5°
Lower position: 11°

Knife Speed . . . . . 1 080 strokes/min

Knife Stroke . . . . . 3-1/4 in. (85 mm)

Suspension . . . . . Full-floating, adjustable on springs with independent end articulation

Knife Drive . . . . . Timken-mounted counterweight, with pitman to swaybar

Cutting Parts . . . . . Twin-forged, mill-cut guards and heavy-duty knife sections

DIMENSIONS

Overall Length . . . . . 235 in. (5 970 mm)

Tractor Unit Length . . . . . 156 in. (3 960 mm)

Tractor Unit Frame Width . . . . . 84 in. (2 130 mm)

Wheelbase, Normal . . . . . 120 in. (3 050 mm)

Wheelbase, Tailbeam
Reversed . . . . . 90 in. (2 290 mm)

Wheel Tread Width
(11.1 x 24 tires) . . . . . 104 in. (2 640 mm)
(18.4 x 16.1 tires) . . . . . 110 in. (2 790)

Height, with Cab . . . . . 128 in. (3 250 mm)
Less Cab . . . . . 84 in. (2 130 mm)

Clearance, Table to Tractor
Unit Frame . . . . . 36 in. (910 mm)

DIVIDERS

Type . . . . . Laterally adjustable

Total Cutting Width
Adjustment . . . . . ± 10 in. (± 250 mm)

ENGINE

Gas Engine

Type . . . . . Ford gasoline, six-cylinder

Horsepower at 2 800 r/min . . . . . 75 hp (56 kW)
SAE J245

Full load governed speed . . . . . 2 600 r/min

Displacement (79-82) . . . . . 200cu in. (3.3 L)
(83) . . . . . 5.4 qt US (5.1 L)
Bore x Stroke . . . . . 3.68 x 3.13 in.
(93.5 x 79.5 mm)

Compression Ratio 8.3:1

Idle Speed . . . . . 550 r/min

Oil Capacity
1979 to 1982 . . . . . 4.5 qt (4.2 L)
1983 . . . . . 5.4 qt US (5.1 L)

Diesel Engine

Type . . . . . VERSATILE® diesel, four cylinder

Horsepower at 2 600 r/min . . . . . 69 HP (51.5 kW)
SAE J270

Displacement . . . . . 220 cu in. (3.6 L)

Bore × Stroke . . . . 3.8 × 4.6 in. (98.4 × 118 mm)

Compression Ratio 16.5:1

High Speed Idle . . . . . 2 800 r/min

Low Speed Idle . . . . . 1 000 r/min

Oil Capacity . . . . . 7 qt US (7.1 L)

ELECTRICAL SYSTEM

Gas Engine

Type . . . . . 42 A alternator; 12V, negative ground

Diesel Engine

Type . . . . . 72 A alternator; 12V, negative ground

GENERAL

Rear Suspension . . . . . Two castering rear
wheels on articulating, reversible tailbeam

Weight Pans . . . . . Sand, 240 lb/pan (110 kg/pan)

Seat . . . . . Position and suspension adjustable

Steering column . . . . . Tilting and telescoping

HYDROSTATICS

Pump . . . . . Double pump with integral
charge and auxiliary pump

Motors . . . . . Fixed displacement

Speed Control . . . . . Infinitely variable

Speed Range . . 0 to 12 mph (0 to 19 km/h) forward
0 to 7 mph (0 to 11.2 km/h) reverse

Steering . . . . . Steering wheel operates
transmission independently
of speed control

OPTIONS

Cab

Length (Outside Top) . . . . . 45 in. (1 140 mm)

Length (Outside Bottom) . . . . . 55 in. (1 400 mm)

Width (Outside Top) . . . . . 36 in. (910 mm)

Width (Outside Bottom) . . . . . 42 in. (1 070 mm)

Height . . . . . 59.5 in. (1 510 mm)

Windows . . . . . Tinted safety glass; side windows open

Double Swath Table

Swath Opening . . . 44 or50 in. (1 120 or 1 270 mm)

Deck Shifting and Motor Reversing Control . . . . . Solenoid-operated valves

Knives . . . . . Black overserrated high-rise, chrome overserrated high-rise chrome overserrated low-rise

Engine

Gas Engine . . . . . Ford, six cylinder

Diesel Engine . . . . . VERSATILE®, four cylinder

Field Light Package
Hydraulic Hand Control
Spark Arrestor
Heater Package
Hanging Divider with Double Swath Table
Crimper
Pickup Reel
Skid Shoes
Air Conditioning Package

REEL

Type . . . . . Five sheet metal, roll-formed bats

Diameter . . . . . 54 in. (1 370 mm)

Speed Range . . . . . 0 to 60 r/min, variable sheave adjustment

Lift Range
above Cutterbar . . . . . 1 to 30 in. (25 to 760 mm)

Drive . . . Hydraulic motor, roller chain and V-belt

TABLE DRIVES

Reel and Canvas Drives . . . . . Hydraulic, fixed displacement pump, proportionator, two motors

Knife Drive . . . . . Mechanical, 1 080 r/min PTO

TIRES

Front . . . . . 11.2 × 24 or 18.4 × 16 (optional)

Tailwheels . . . . . 6.70 × 15 (170 × 381)

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

3 Fuel, Fluids and Lubricants

SAFETY

DO NOT HANDLE FUEL NEAR AN OPEN FLAME, WHILE SMOKING OR UNDER ANY CONDITION THAT COULD CAUSE A SPARK.

USE ONLY A PROPERLY ENCLOSED CONTAINER APPROVED FOR FUEL HANDLING.

IF WORK CLOTHES BECOME SPLASHED WITH FUEL, CHANGE IMMEDIATELY. FUEL-SOAKED CLOTHES ARE AN EXTREME FIRE HAZARD.

DISPOSE OF ANY FUEL-SOAKED RAGS LYING AROUND A WORK AREA WHERE THEY MAY BE EXPOSED TO FLAME, SPARK OR CIGARETTE SMOKING.

BE ALERT

3.1 FUEL

The performance of the VERSATILE® Model 4400 Swather depends on the quality of the petroleum products used. The necessary fuel, fluids and lubricants are widely available from dealer outlets of major refiners.

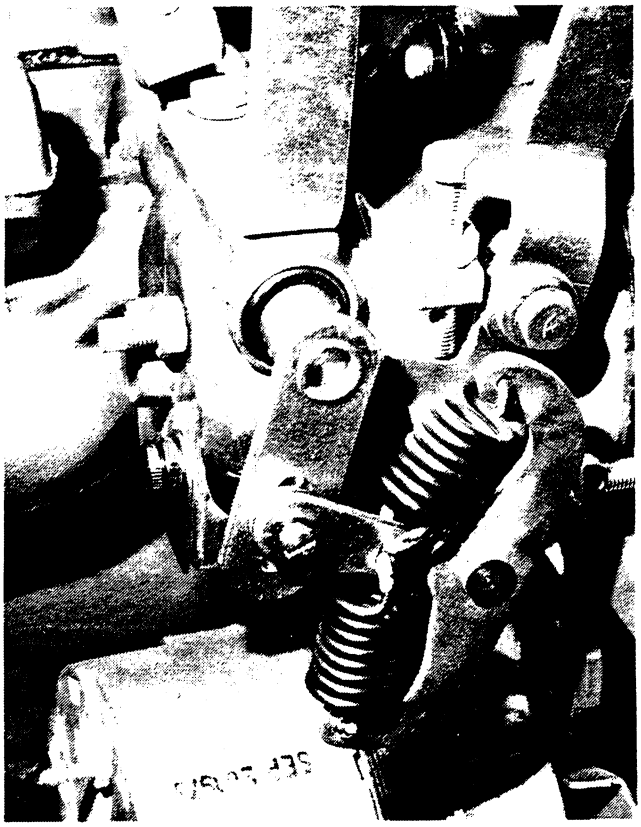

FIGURE 1-1: Gas Engine Governor Oil Plug

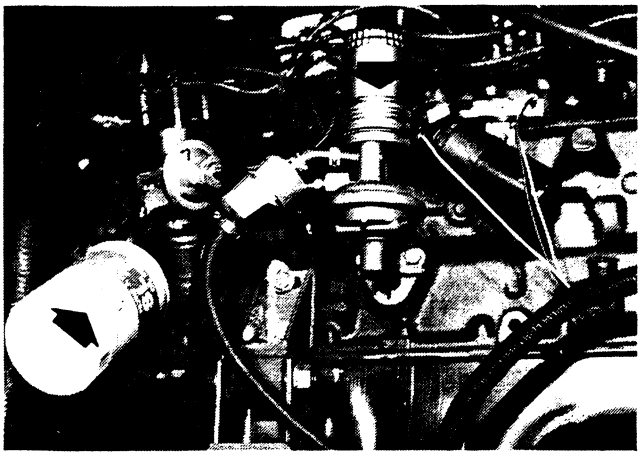

FIGURE 1-2: Gas Engine Oil and Fuel Filters

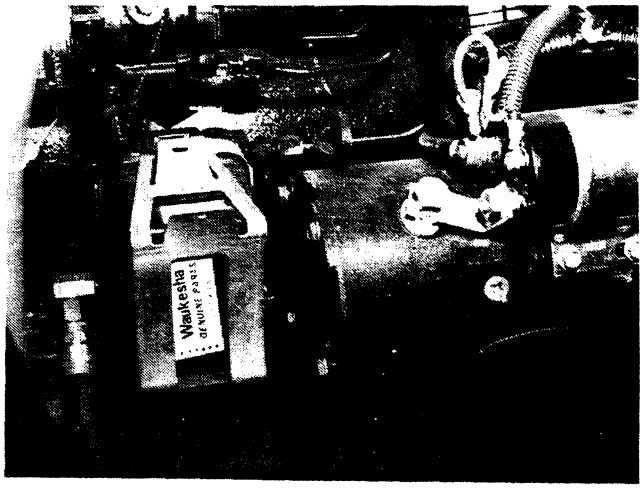

FIGURE 1-4: Diesel Engine Fuel Filter

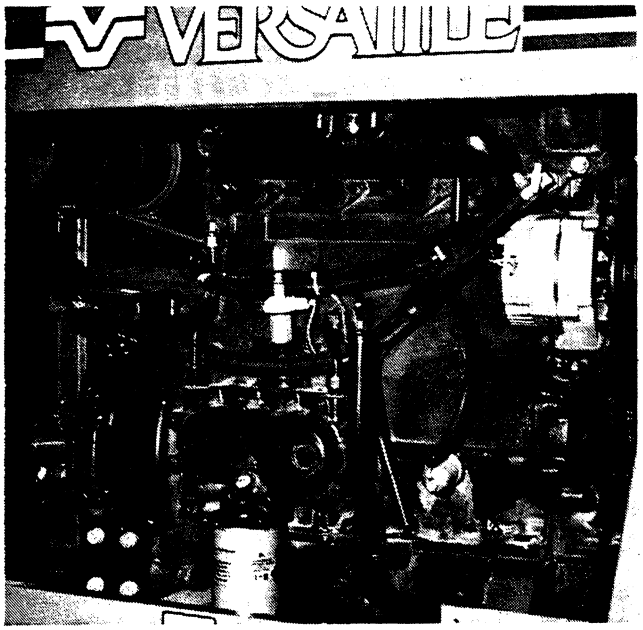

FIGURE 1-3: Diesel Engine Oil Filter

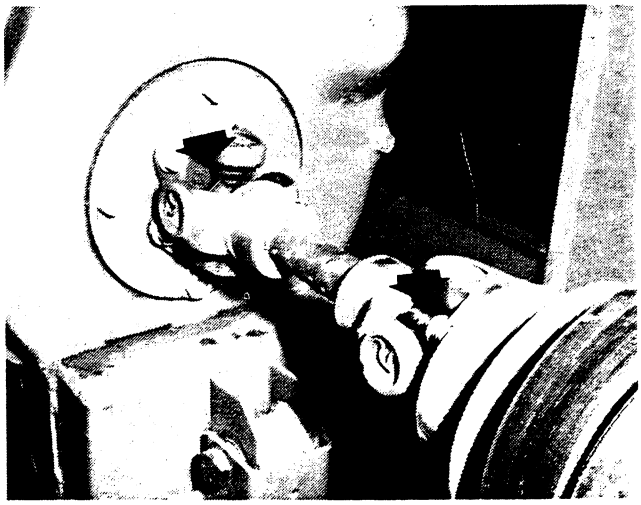

FIGURE 1-5: Main Drive U-Joints

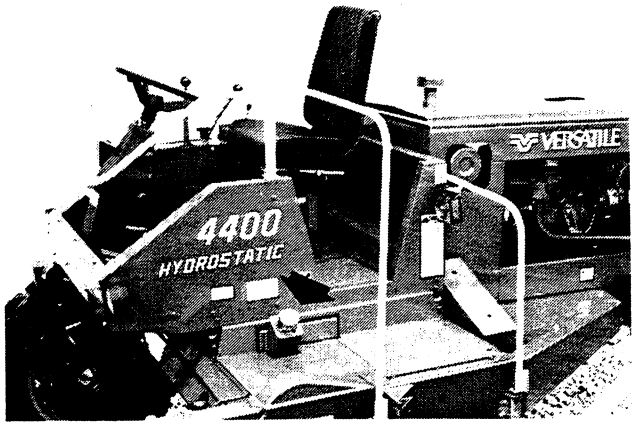

FIGURE 1-6: Hydraulic Tank

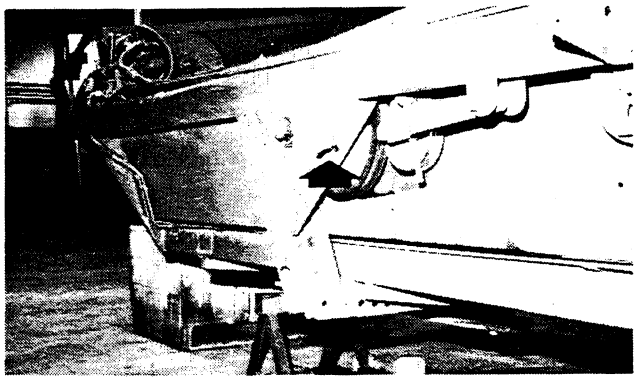

FIGURE 1-7: Pitman Assembly

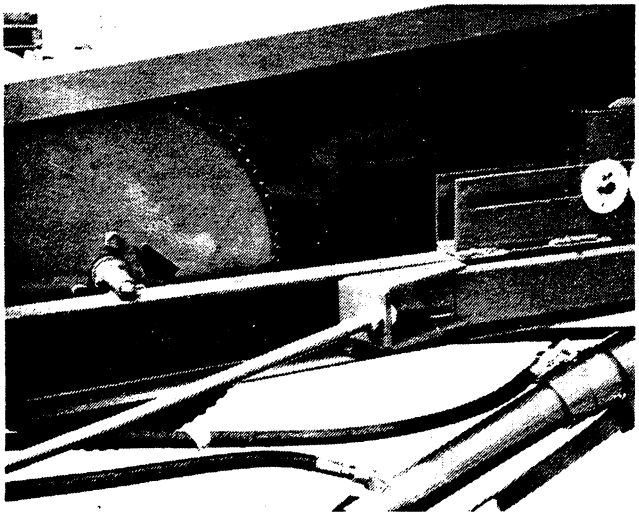

FIGURE 1-8: Intermediate Reel Pulley

FIGURE 1-9: Crimper Top and Bottom Roller Grease Fittings

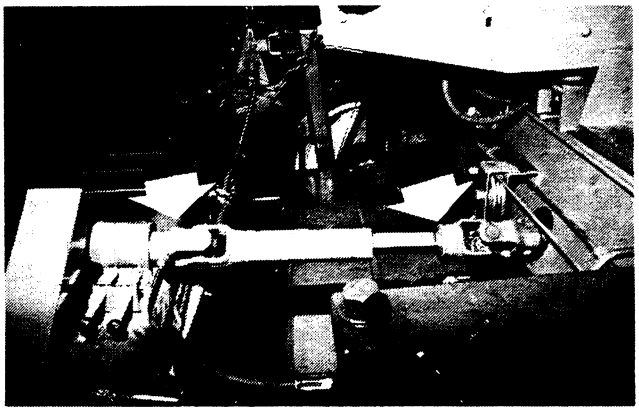

FIGURE 1-10: Table Driveshaft U-Joints

FIGURE 1-11: Air Compressor Belt and Oil Plug

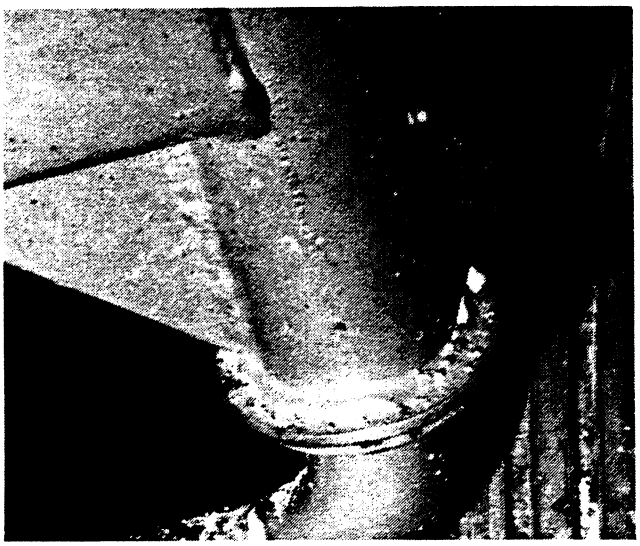

FIGURE 1-12: Rear Wheel Swivel Grease Fitting

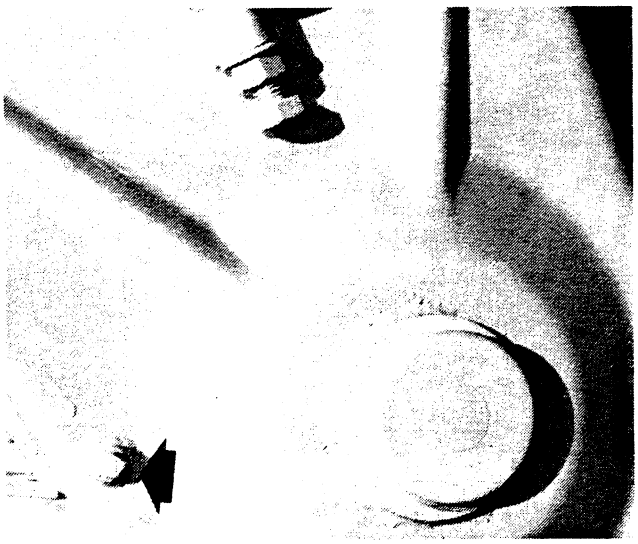

FIGURE 1-13: Wheel Leg Oil Plug

3.1.1 Fuel Type

3.1.1.1 GAS ENGINE

Tank Capacity . . . . . 32 gal US (120 L)

1. A minimum octane rating of 93 (regular gasoline).
2. An absence of dirt and moisture.

3.1.1.2 DIESEL ENGINE

Tank Capacity . . . . . 32 gal US (120 L)

The engine uses No. 2 diesel fuel, but No. 1 or other fuels within the following specifications may be used:

1. Maximum of 0.7 percent sulfur content.
2. Sediment and water content of 0.1 percent or less.
3. Cetane number of at least 40. A high cetane number fuel may be necessary at low temperatures or high altitudes.
4. Maximum ash content of 0.02 percent.

3.1.2 Fuel Storage

1. Fuel should be stored in tanks designed for fuel storage.
2. Fuel tanks should be shielded from direct sunlight.
3. Tanks should be equipped with a water trap or sediment filter.
4. A nearly empty tank invites moisture condensation. Fill tanks regularly. Check for condensation periodically by draining a small amount from tank bottom.

3.2 FLUIDS

3.2.1 Coolant

Gas Engine Capacity . . . . . 12 qt US (11.4 L)

Diesel Engine Capacity . . . . . 17 qt US (16 L)

The swather is factory-shipped with a 1:1 mixture of water and antifreeze in its cooling system. When replacing coolant, observe the following:

1. Water should be clean and soft; generally, any drinking water is satisfactory.
2. Select a recognized brand of ethylene glycol based antifreeze. Use a 1:1 mixture.

Lubrication and Maintenance Chart

TABLE 1-1: Environmental System

	AS REQUIRED	10 HOURS	50 HOURS	100 HOURS	200 HOURS	400 HOURS	LUBRICANT	NO. OF POINTS
Check air conditioner hoses and fittings			•	•	•	•		
Check compressor for leaks or loose mounting			•	•	•	•		
Check and adjust compressor belt			•	•	•	•		
Check heater hoses and fittings								
Check compressor oil level					•	•	F	
Clean cab air intake filter								
Replace compressor belt	•							

TABLE 1-2: Hydraulic/Hydrostatic System

	AS REQUIRED	10 HOURS	50 HOURS	100 HOURS	200 HOURS	400 HOURS	LUBRICANT	NO. OF POINTS
Check hydraulic/hydrostatic oil level		•	•	•	•	•		
Replace filter								
Check all lift cylinders for leaks		•	•	•	•	•		
Check all hydraulic fittings								
Check mounting bolt on pump		•	•	•	•	•		
Check and replace damaged or worn hydraulic hoses	•							
Adjust speed control lever	•							
Check and adjust hydraulic pump belt		•	•	•	•	•		
Change hydraulic/hydrostatic oil					•	•	A	1

TABLE 1-3: Table and Crimper

	AS REQUIRED	10 HOURS	50 HOURS	100 HOURS	200 HOURS	400 HOURS	LUBRICANT	NO. OF POINTS
Check belts for correct tension		•	•	•	•	•		
Check and adjust cutterbar and knives			•	•	•	•	A	
Check and adjust knife guards			•	•	•	•		
Torque pitman assembly			•	•	•	•		
Check and adjust canvas tightness and alignment		•	•	•	•			
Check canvas condition	•							
Check and lube chains		•	•	•	•	•	C	3
Check belts on crimper			•					
Grease crimper roller bearings			•	•	•	•	B	2
Check reel wooden bearings			•	•	•	•	B	2
Grease table driveline U-joints			•	•	•	•	B	2
Check and grease intermediate reel pulley bearing			•	•	•	•	B	1
Check swaybar to knife clearance								
Check and adjust table flotation	•							
Check and/or replace swaybar bushings			•	•	•	•		
Check end play of table driveshaft			•	•	•	•		
Check table drive shield	•							
Grease table drive U-joint			•	•	•	•	B	1
Grease counterweight flywheel			•	•	•	•	B	1
Grease cutterbar							A	1
Change crimper gearbox oil					•	•	D	1

TABLE 1-4: Drive Train (Tractor)

	AS REQUIRED	10 HOURS	50 HOURS	100 HOURS	200 HOURS	400 HOURS	LUBRICANT	NO. OF POINTS
Check chain tension on wheel legs	•		•	•	•	•		
Check wheel leg oil level			•	•	•	•		
Change oil in wheel legs							D	2
Grease tail wheel swivels			•	•	•	•	B	2
Repack tail wheel hub bearings							B	2
Replace tail wheel hub bearings	•							
Check tire inflation			•	•	•	•		
Check wheel bolt torque			•	•	•	•		
Check all nuts and bolts for tightness	•		•	•	•	•		
Grease main driveshaft U-joints			•	•	•	•	B	2
Grease pinion housing							B	1

TABLE 1-5: Engine and Cab

	AS REQUIRED	10 HOURS	50 HOURS	100 HOURS	200 HOURS	400 HOURS	LUBRICANT	NO. OF POINTS
Check engine oil level	•	•	•	•	•	•	A	1
Check engine coolant level		•	•	•	•	•		
Check and adjust governor and governor oil level		•	•	•	•	•	A	1
Change governor oil							A	2
Check and clean radiator and grill		•	•	•	•	•		
Check air intake filter and body								
Replace air intake element						•		
Check batteries			•	•	•	•		
Grease driveline U-joints			•	•	•	•	B	2
Drain fuel tank sediment								
Check, adjust and/or replace belts		•	•	•	•	•		
Replace fuel filters					•	•		
Replace engine oil and filter					•	•	A	1
Replace coolant						•		
Adjust carburetor						•		
Check air cleaner hose								
Check control linkages, parkbrake and steering operation	•							
Check and grease main drive pulleys							G	1

TABLE 1-6: BRAND AND TYPE OF LUBRICANTS AND FLUIDS

	IMPERIAL	SHELL	TEXACO	MOBIL	GULF	CLASSIFICATION
A	Essolube HDX Plus	Rotella S	Havoline Ursa Super Plus	Mobil CD	Gulf XHD	SAE 10 W30, Grade CD/SF Above – 1° C (30° F) SAE 5W30, Grade CD/SF below – 1° C (30° F)
B	Unitol EP2	MP Alvania	Marfak A.P.	Mobilgrease	Super Crown MP	Multi-purpose grease
C						Graphite spray/SAE 30 oil
D*	Gearoil GX-Extra	Spirax	Multigear E.P.	Mobilube HD90	GearLube	SAE 90 GL5 below 32° C (90° F) SAE 140 GL5 above 32° C (90° F)
E	Antifreeze	Antifreeze	Antifreeze	Antifreeze	Antifreeze	Glycol base antifreeze (1:1 mix)
F	Zerice 100	Clavis 100	Capella WF 100	Gargoyle	Eskimo C	A/C compressor oil
G	Unirex EP2	Extrema EP2	Hi-Therm EP2	Mobilex EP2		Clay base high temp. grease

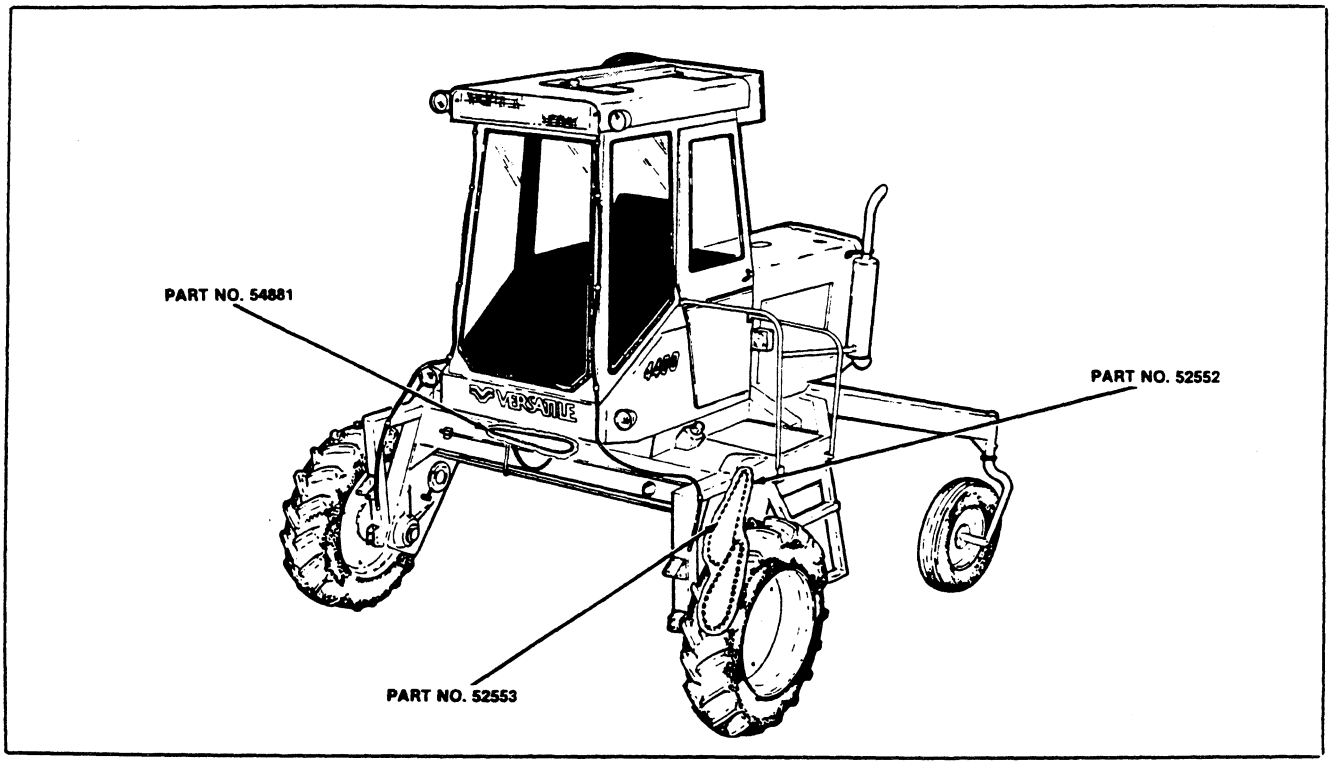

FIGURE 1-14: Chain Locations

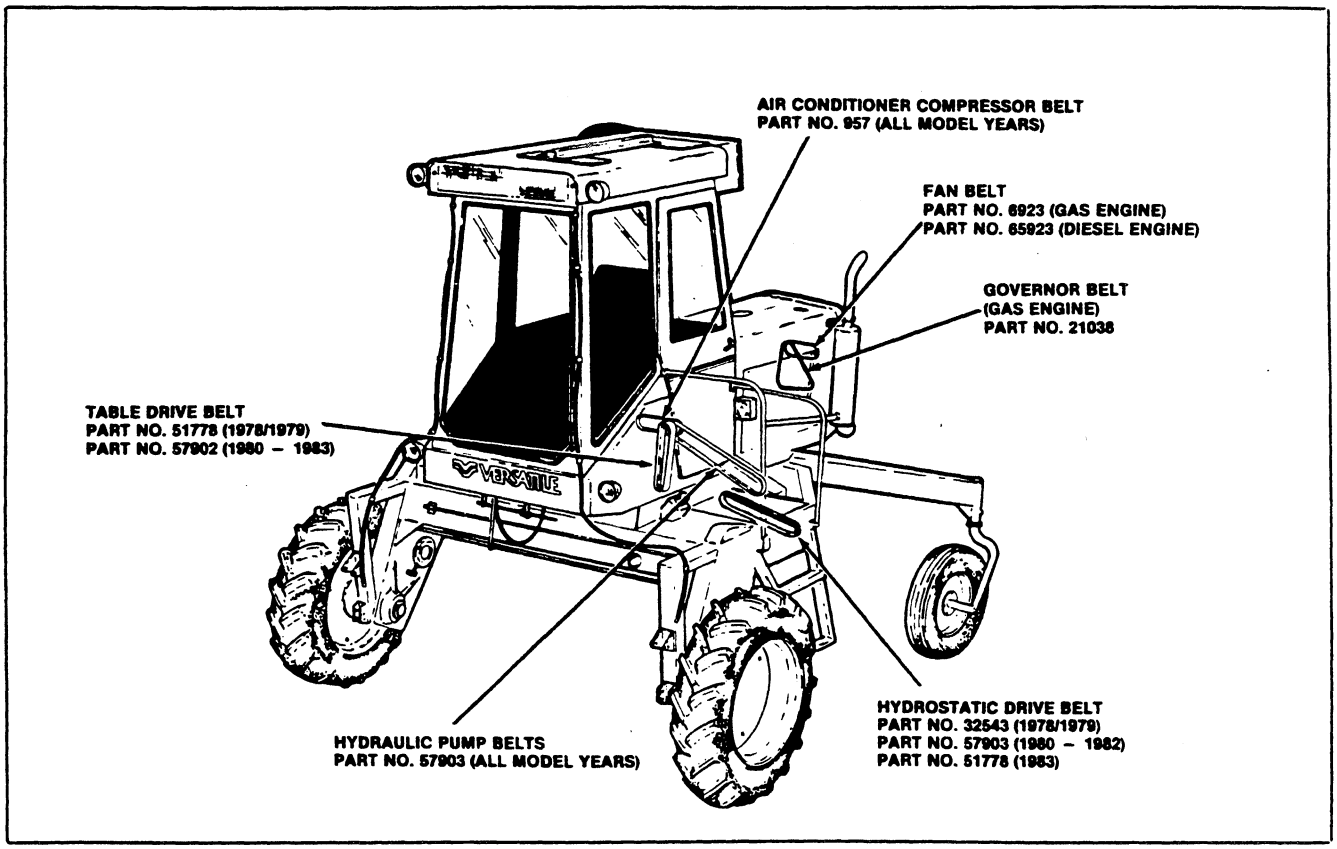

FIGURE 1-15: Belt Locations

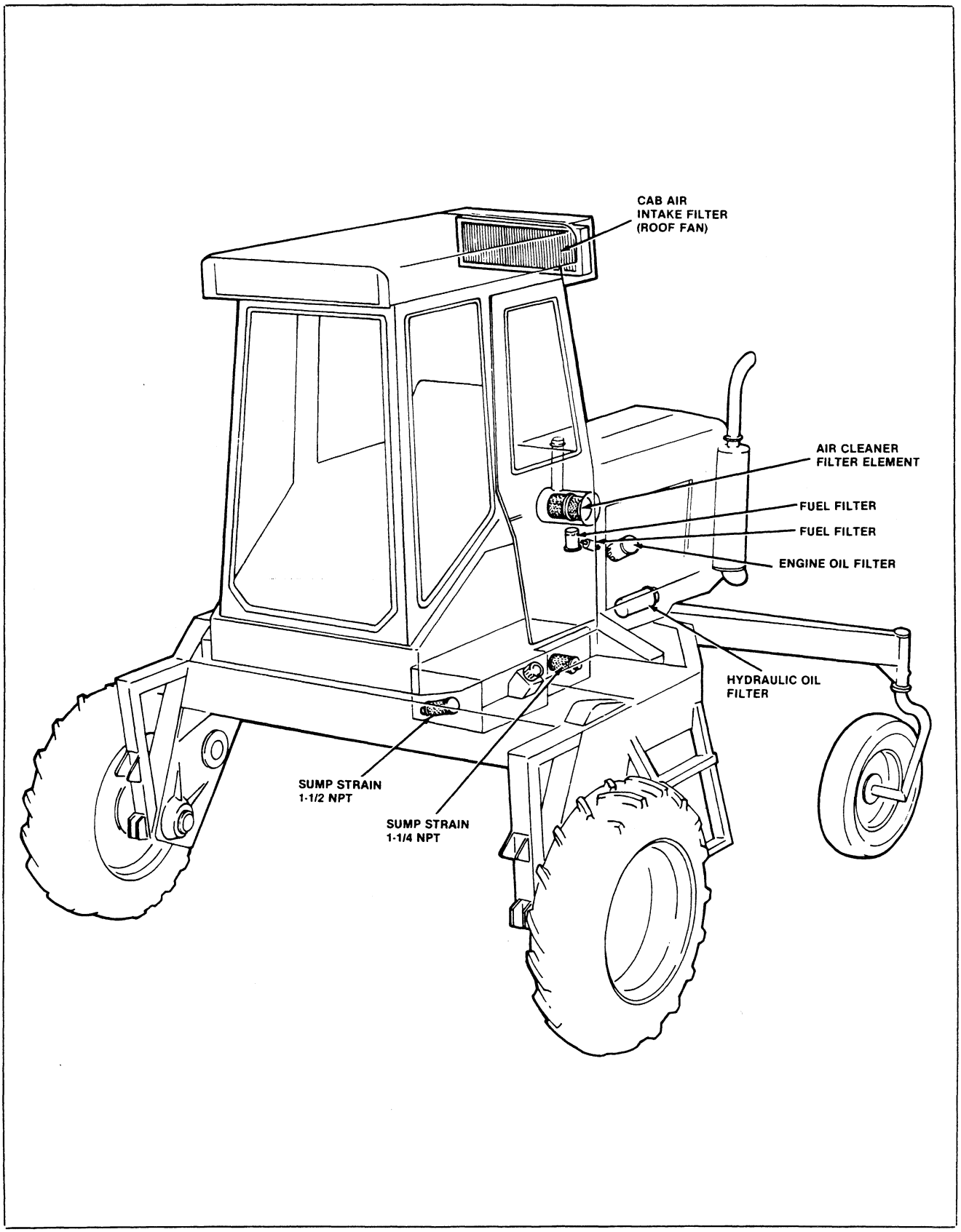

FIGURE 1-16: Filter Locations

- CAUTION

ADD COOLANT ONLY WHEN ENGINE HAS COOLED BELOW BOILING.

LOOSEN CAP TO RELIEVE PRESSURE BEFORE REMOVING IT COMPLETELY.

NEVER OVERFILL COOLING SYSTEM.

3.2.2 Adding and Replacing Coolant

Premix a quantity of makeup coolant in the 1:1 ratio and use it to top up the radiator coolant level as required.

Whenever the cooling system is drained, be sure to open all draincocks on the engine and radiator. Refill the system with coolant in the 1:1 ratio mixture.

3.2.3 Hydraulic Fluid

Tank Capacity . . . . . 20 gal US (76 L)

The swather is shipped with SAE 10W30 oil. SAE 10W40 oil can be used in ambient temperatures above 90° F (33° C). Do not mix brands or grades of oil in the hydraulic/hydrostatic system.

3.3 LUBRICANTS

3.3.1 Lubricant Grades

CD (commercial grade) oil protects against low-temperature deposits, rust and corrosion.

SC (service grade) oil controls high and low-temperature deposits, wear, rust and corrosion.

SF (service grade) oil protects against oxidation, high-temperature engine deposits and corrosion.

3.3.2 Engine Oil

Gas Engine Capacity
1979 to 1982 . . . . . 4.5 qt US (4.2 L) with oil filter
1983 . . . . . 5.4 qt US (5.1 L) with oil filter

Refer to Tables 1-7, 1-8, 1-9 for correct component replacement. Refer to Figures 1-14 and 1-15 for Belts and Chains general location.

Diesel Engine Capacity
. . . . . 7 qt US (7.1 L) with oil filter

SAE 10W30 motor oil of grades CD and SF is recommended.

3.3.3 Gas Engine Governor

Capacity . . . . . 2.5 to 3 oz (72.5 to 87 mL)

SAE 10W30 Motor oil of grade CD and SF is recommended.

3.3.4 Wheel Legs

Capacity . . . . . 1.2 gal US (4.5 L)

At temperatures 90° F (32° C) and below, use SAE 90 gear oil. Above this temperature, use SAE 140 gear oil.

3.3.5 Crimper Gearbox

Capacity . . . . . 3/4 qt US (0.75 L)

At temperatures 90° F (32° C) and below, use SAE 90 gear oil. Above this temperature, use SAE 140 gear oil.

3.3.6 Grease

SAE multipurpose grease is recommended for all pressure grease fittings.

4 Belts, Chains and Filters

4.1 GENERAL

Refer to Tables 1-7, 1-8, 1-9 for correct component replacement. Refer to Figures 1-14 and 1-15 for Belts and Chains general location.

4.2 COMPONENT REPLACEMENT PART NUMBERS

TABLE 1-7: Drive Belts

	1980 – 83	1979	1978
Fan (Gas Engine)	6923	6923	6923
Fan (Diesel Engine)	65923		
Governor (Gas Engine)	21038	21038	21038
Air Conditioning Compressor	957	957	957
Main Drive	57903	32543	32543
Table Drive, Double Band	57902	57902	57902
Table Drive Pump	51778	51778	51778
Reel Drive	28619	28619	28619
Knife Drive	52631	52631	52631
Crimper Main Drive, Grip Belt	52802	52802	52802
Crimper Main Drive	52729	52729	52729

TABLE 1-8: Drive Chains

	1980 – 83	1979	1978
Wheel Drive RC-40	52552	52552	52552
Wheel Drive RC-2	52553	52553	52553
Reel Drive	28651	28651	28651
Table			
Outer and Inner Roller	55119	55119	55119
Crimper			
Top Roller	52800	52800	52800
Bottom Roller	52801	52801	52801
General			
Canvas Tightener	28563	28563	28563
Sliding Unit (R)	51477	51477	51477
Sliding Unit (L)	51479	51479	51479
Adjustment (Crimper)	52000	52000	52000
Flow Control (PCFC)	54881	54881	54881

TABLE 1-9: Filters

	1980 – 83	1979	1978
Gas Engine (oil)	6920	6920	6920
Gas Engine (fuel)	58736	58736	58736
Diesel Engine (oil)	75037		
Diesel Engine (fuel)	75044		
Hydraulic Tank 1-1/2 Sump Strain	58227	58227	58227
Hydraulic Tank 1-1/4 Sump Strain	35381	35381	35381
Hydraulic Oil Line	6501	6501	6501
Table-Suction (Filter)	NA	16321	16321
Table-Suction (Element)	NA	6502	6502
Table Return (F)	NA	7709	7709
Table Return (E)	362103V1	362103V1	362103V1
Roof Fan Assembly	58736	58736	58736

5 Storage

5.1 STORING THE SWATHER

Warm engine and do the following:

1. Change engine oil and filter.
2. Clean engine exterior of grease and foreign matter.
3. Flush cooling system and refill with recommended coolant.
4. Change wheel leg oil.
5. Change oil in hydrostatic/hydraulic circuit and reservoir.
6. Run the swather to circulate oil to all components.
7. Clean swather thoroughly and touch up all scratched or chipped surfaces.
8. Remove, clean and repair canvases. Hang them in a dry place away from rodents.
9. Remove chains (except in wheel leg) and clean thoroughly. Brush heavy oil on them to prevent corrosion.
10. Coat all exposed metal surfaces (axles, piston rods on cylinders and shafts on pumps) with grease or rust preventive.
11. Relieve belt tension.
12. Jack up swather and block up axles and tables to remove weight from tires. Remove wheels and store in a cool, dark and dry place. Cover tires if exposed to heat and sun.
13. Seal the following openings: air cleaner inlet, muffler, fuel tank, radiator, hydrauic and hydrostatic system.
14. Store swather in a dry, protected place. If outside, cover with protective material.
15. Make a list of parts required for following season. The off season allows for time to prepare the machine, and the dealer is able to provide better service.

5.2 PREPARATION OF ENGINE FOR STORAGE

Before storing the swather, start the engine and run until coolant temperature is up to at least 160° F (70° C). (Shielding the radiator may be necessary to achieve this temperature under no load). Shutting the engine down while the temperature is well up helps prevent condensation formation during storage.

5.3 STORING BATTERY

If the swather is to be stored for more than 30 days, remove the battery with the electrolyte level at the bottom of the split ring. Charge the battery before storing it.

IMPORTANT

Battery should be brought to a full-charge state (1.265 SG) at least every 30 days of storage.

Smear petroleum jelly or light multipurpose grease over terminals and posts to prevent corrosion.

5.4 PREPARATION AFTER STORAGE

1. Inflate tires to recommended pressure. Install wheels and remove supports.
2. Check cooling system.
3. Check oil levels in crankcase, axles and hydraulic/hydrostatic system.
4. Check belts for slippage. Adjust as required.

5.5 ENGINE STARTUP AFTER STORAGE

1. Electrical cables must be clean, tight and in good condition. They should be cleaned at all connection points before starting unit.
2. If a new battery is installed, it must be of equivalent or higher capacity than original battery.
3. The battery must be fully charged (1 235 to 1 265 hydrometer reading). This reading should not be taken immediately after charging or on discharged battery. Distilled water will greatly add to battery life. Any drinking water can be used also.

IMPORTANT

Water and electrolyte do not mix immediately. Do not top up battery with water in freezing weather, unless engine is to be run at least one hour.

- CAUTION

ENSURE ALL CONTROLS ARE IN NEUTRAL BEFORE STARTING ENGINE.

OPERATE ALL CONTROLS ONLY FROM THE OPERATOR'S SEAL.

STOP ENGINE BEFORE SERVICING SWATHER.

BE ALERT

KEEP ALL SHIELDS IN PLACE.

4. Install battery and connect it.
5. Tighten all V-belts and drive belts. Alternator belt must be tight and in good condition to keep battery charged.
6. Clean all fuel lines and strainers and fill fuel tank.
7. Install all chains and canvases. Adjust tension.
8. Lubricate swather and run at half speed for an hour to circulate all fluids.
9. Check all bearings, belts, nuts, bolts and drives for looseness and overheating.
10. Never crank engine for more than 30 seconds. Cool starting motor for two minutes before another crank cycle.
11. If the engine does not start within 30 seconds (assuming starting aids are used as necessary and cranking speed is ample) engine is probably not receiving fuel.
12. Avoid engine high speed rev-up. Bearings are dry after storage and can be damaged by a high-speed start.

6 Troubleshooting

Engine System

	Faulty thermostat	Throttle open	Parkbrake disengaged	Speed control out of neutral	Low battery output	Defective safety switch	Faulty ignition wiring[1]	Faulty/dirty fuel pump	Broken coil resistor	Governor out of adjustment	Loose carburetor butterfly screws[1]	Dirty fuel filter	Clogged radiator fins	Loose fan belt	Damaged radiator cap	Loose/broken vacuum line	Low coolant level	Engine needs tune-up[1]	Carburetor mix too rich[1]	Engine rings unseated/worn	Plugged air cleaner/filter
Starter does not crank engine			•	•	•	•															
Engine cranks but does not start							•	•										•			•
Engine stops when key goes into ignition									•												
Engine surges										•	•	•				•					
Engine overheats	•												•	•	•		•				
High fuel consumption																		•	•		•
Engine diesels		•																	•		
Exhaust smoke bluish under load																					•
Exhaust smoke black under load																		•	•	•	•

1. **Gasoline engine only**

Hydraulic System

	Slipping belts	Canvases loose	Scored/seized cylinder shaft	Low oil level	Faulty pump/control valve	Relief valve setting too low	Leaky seals on cylinder	Air in system	Faulty cylinder adjustment	Seals, O-rings, poppets damaged	Misaligned hydraulic motors	Clogged suction screen	Adjust speed control valve	Faulty hydraulic hose	Line on sliding unit cylinders reversed
Leaking cylinders			•							•					
No lift on table or reel			•	•	•										
Table drops too fast					•										
Table/reel drop. Lever in neutral					•			•							
Table doesn't lift, reel does						•									
Left side of reel doesn't lift all the way							•								
Uneven table height								•	•						
Left side of table drops during operation							•			•					
Canvas or rollers stick											•				
Canvas speed too low at full throttle	•	•		•								•	•	•	
Hydraulic motor malfunctioning				•				•		•	•	•			
Sliding units creep in wrong direction															•

Hydrostatic System
(Closed Loop)

	Adjust friction washer on speed control shaft	Adjust speed control/steering	Check hydrostatic belt tension	Low oil level	Air in system	Check mounting bolts	Service relief valve/pump	Adjust chain drive tension	Damaged steering linkage	Engine malfunction	Dirty cooler	Plugged oil filter	Air leaks	Faulty transmission pump	Oil leak
Transmission creeps/noisy in neutral		•							•						
Transmission loses speed	•		•						•	•				•	•
Noisy operation				•	•	•			•					•	
Erratic or no transmission output			•	•			•		•	•				•	
Poor steering		•	•					•	•					•	
Oil overheating				•							•	•		•	
Foaming oil				•									•	•	

Table

	Table flotation set improperly	Loose bolts at pitman/swaybar joints	Main driveline misaligned	Material buildup on knife	Misaligned guards	Worn/loose knife clips	Poor knife register	Swather speed too fast	Wrong canvas speed	Reel too far forward, high	Cutterbar too high	Reel speed slow	Poor reel position	Guards, knives, clips, guards bent/broken	Incorrect reel setting	Reel speed too fast	Crimper shields adjusted too narrow	Improper roller tension	Roller gap too small
Machine/main driveshaft vibration	•	•	•																
Poor or difficult cutting				•	•	•	•	•				•		•					
Swather lays poor swath								•	•			•	•						
Grain falls over cutterbar front										•	•	•	•						
Grain loss												•	•			•			
Reel wraps in tangled crops													•		•	•			
Improper drying																	•	•	
Excessive drying/bleaching																		•	•

SECTION 2: GAS ENGINE SYSTEMS

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