

440 LIQUIFIRE® Snowmobile

(Serial No. 120,001-155000)



DEALER
SERVICE SHOP
COPY

OPERATOR'S MANUAL



FILE THIS NEW MANUAL

Horicon Works
OM-M67978 Issue E9

LITHO IN U.S.A.



To The Operator



Snowmobile Serial Number



Engine Serial Number



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

This operator's manual contains SI Metric equivalents which follow immediately after the U.S. customary units of measure.

Record the snowmobile and engine serial numbers in the space below.

This operator's manual is prepared for the following snowmobile:

John Deere 440 LIQUIFIRE (Serial No. J44LJ 120,001M-).

Snowmobile Serial No. _____

Engine Serial No. _____

Date of Purchase _____

(To be filled in by purchaser.)

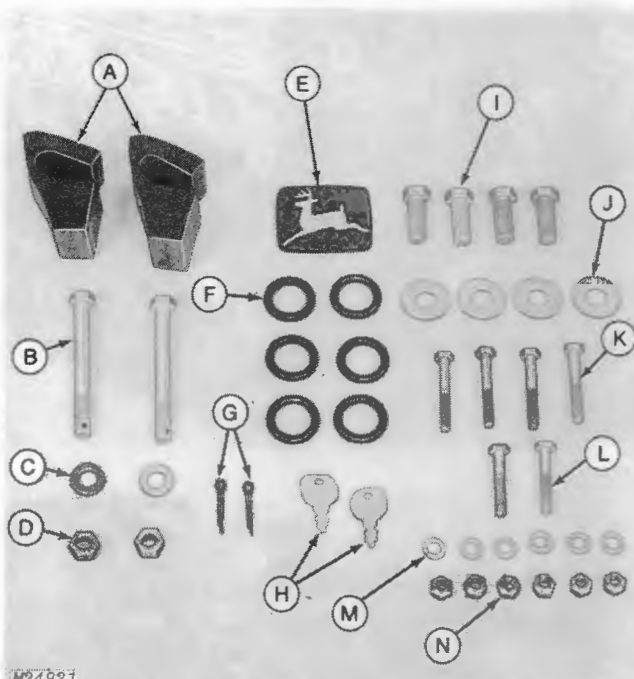
ASSEMBLY

Unpack Components

1. Skis
2. Windshield
3. Rear Bumper and Snow Flap Support
4. Operator's Manual
5. Bag of Parts

Check Contents of Bag of Parts

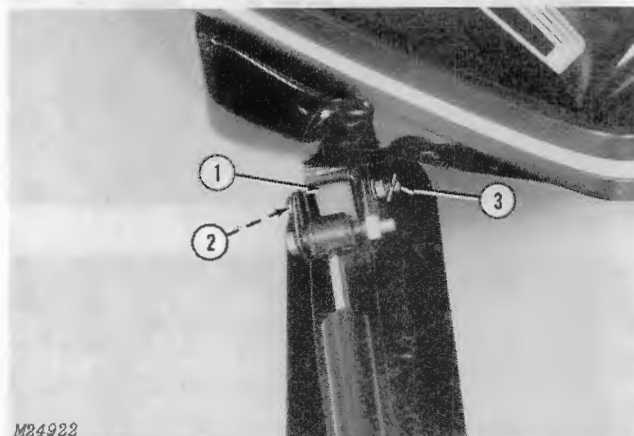
- A—Ski Spring Stop (2 used)
 B—Ski Pivot Bolt (2 used)
 C—13/32" x 3/4" Flat Washer (2 used)
 D—3/8" - 24 Lock Nut (2 used)
 E—John Deere Medallion
 F—Windshield Retaining Rings (6 used)
 G—Cotter Pins (2 used)
 H—Ignition Keys
 I—7/16" x 1-1/8" Locking Bolt (4 used)
 J—15/32" x 1-1/8" Flat Washer (4 used)
 K—1/4" x 1-3/4" Cap Screws (4 used)
 L—1/4" x 1-1/2" Cap Screws (2 used)
 M—9/32" x 1/2" Flat Washer (6 used)
 N—1/4" - 20 Lock Nut (6 used)

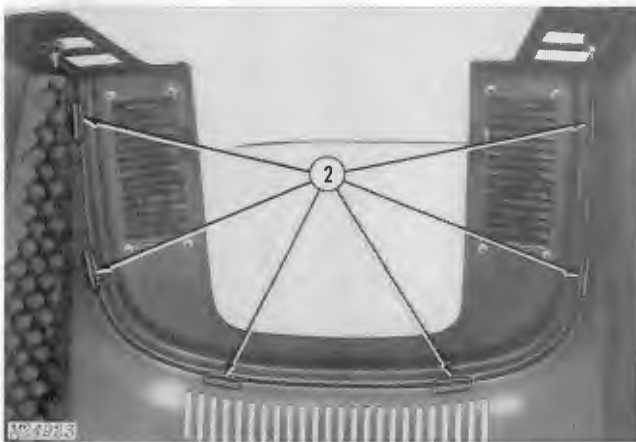


Install Skis

NOTE: Bushing is factory installed in steering spindle.

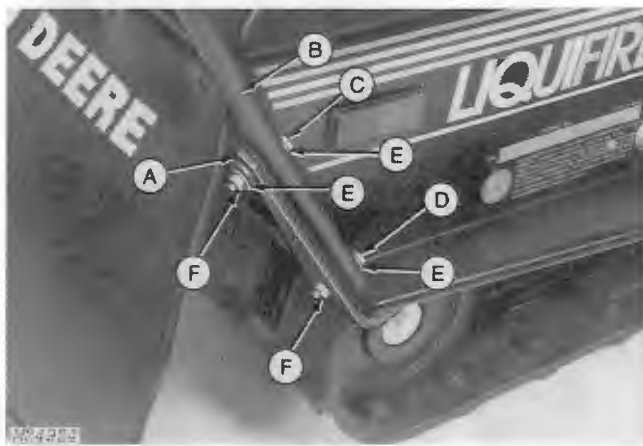
1. Install rubber ski spring stop over spindle. Stop is held in place by the ski saddle.
2. Position ski so that rear hole of ski is aligned with spindle. Install ski bolt with head of bolt facing out.
3. Install 13/32 x 3/4-inch flat washer and 3/8-inch lock nut. Torque nut to 39 ft-lbs (52 Nm). Install cotter pin through bolt.





Install Windshield

1. Install windshield tabs through holes in hood.
2. Secure windshield tabs to hood with rubber retaining rings.



Install Rear Bumper

Assemble rear bumper and snow flap support to tunnel as shown.

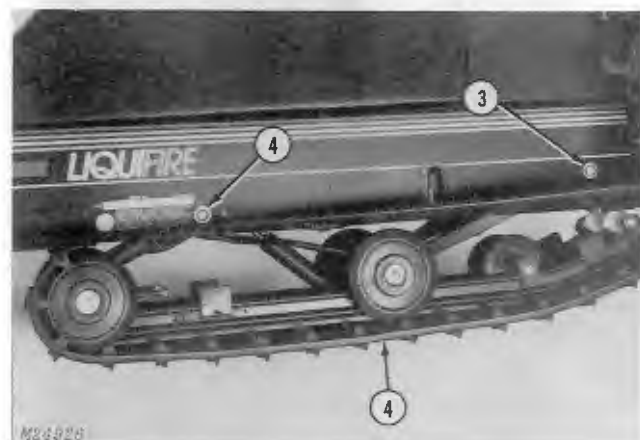
A—Snow Flap Support
B—Rear Bumper
C—1/4 x 1-3/4"
Cap Screw

D—1/4" x 1-1/2"
Cap Screw
E—9/32" x 1/2"
Flat Washer
F—1/4" - 20 Lock Nut



Position Handlebars

1. Loosen lock nut securing handlebars in down position.
2. Use plastic mallet to loosen aluminum block before moving handlebar.
3. Move handlebar to desired position. Install two 1/4 x 1-3/4-inch bolts and 1/4-inch lock nuts. Tighten all four nuts to 10-ft-lbs (13.5 Nm) torque.
4. Install medallion.



Install Suspension

1. Loosen track tension.
 2. Turn snowmobile on its side.
 3. Position front of suspension in tunnel and install front two suspension bolts. Do not tighten bolts.
 4. Position rear of suspension in tunnel. Push in on track at center of suspension with your knee to align the two rear holes. Install two rear suspension bolts.
- NOTE:** Use a flat washer under the head of all four bolts.
5. Tighten all four suspension bolts to 55 ft-lbs (74.5 Nm) torque.
 6. Adjust the track tension for 1/4-inch clearance between track wear clip and slide rail.

PREDELIVERY CHECK LIST



CAUTION: When starting snowmobile, support machine so track is clear of ground. Check throttle for proper operation.

1. Align skis and check steering linkage.
2. Check track tension and align.
3. Check brakes. Adjust if necessary.
4. Check operation of choke and throttle. Adjust if necessary.
5. Check chain case oil level.
6. Fill fuel tank with 50:1 mix.
7. Fill oil tank with 2-cycle oil.
8. Check gear case sight gauge. Oil level should be at least half way up on gauge. Add 10W-30 oil (Service SE) to gear case if necessary.
9. Check coolant level.
10. Start engine and check idle speed.
11. Check emergency stop and key switch.
12. Check operation of all lights.
13. Aim and adjust headlight.
14. Test drive or dynamometer test snowmobile.
15. Install accessories desired by customer.

DELIVERY CHECK LIST

1. Explain operator's manual to customer.
2. Instruct customer about snowmobile operation.
3. Explain fuel and oil injection system. Use regular (leaded or non-leaded) gasoline with an anti-knock index of 88 or higher.
4. For the first tank of fuel, pre-mix gasoline and oil in a 50:1 ratio and fill fuel tank. Fill the oil tank with John Deere 2-Cycle Oil or a BIA certified 2-cycle engine oil. Use gasoline only in fuel tank and 2-cycle oil in oil tank after break-in.
5. Tell customer about free 10-hour check up. See reverse side of this sheet.

Break-In Period

Do not exceed 50 mph (80 km/h) for the first 25 miles (16 km), or force the machine at full throttle in deep snow. An occasional burst of power on hard-packed snow will not be harmful.

KEEP THIS SHEET WITH YOUR OPERATOR'S MANUAL
BE SURE YOUR SELLING DEALER PERFORMS THIS FREE
10-HOUR CHECK-UP

The following services must be performed on your snowmobile following the first 10 hours of operation to assure you of top performance and to avoid premature failure of critical components. Your John Deere Dealer will perform these services FREE.

Present this sheet to your selling dealer for your free 10-hour check-up.

Retain this sheet with your records as proof that the 10-hour check-up has been performed.

1. Check and adjust track tension.
2. Remove drive belt. Check sheave alignment and inspect drive and driven sheaves for free operation.
3. Tighten cap screw on drive sheave to proper torque.
4. Check chain case oil level. Check and adjust chain tension.
5. Check carburetor adjustment and clean air intake silencer.
6. Tighten ski bolts and all steering components to proper torque.
7. Inspect condition of ski wear rod.
8. Check operation and adjustment of brake, throttle, and choke lever controls.
9. Tighten band securing carburetor to rubber mount.
10. Tighten all suspension hardware to proper torque.
11. Check engine timing.
12. Check ski alignment.
13. Check operation of headlight, stop-taillight and dimmer switch.
14. Check coolant level.
15. Check gear case oil level.
16. Check engine cylinder head bolts for (16 to 18 ft-lbs) (21 to 24 Nm) torque.
17. Check engine exhaust manifold nuts for (10 to 12 ft-lbs) (13 to 16 Nm) torque.

Dealer's Signature

Date

IMPORTANT: The selling dealer's signature above will be proof that these very important services have been performed. This information will prove helpful should your snowmobile require service from a John Deere dealer other than the selling dealer.



Contents

	Page
Safety	2
Identification	5
Preparation	6
Fill Fuel Tank	6
Fill Oil Tank	6
Fuel Mix For Break-In Period	6
Fuel For Temperatures of -40°F (-40°C) or Below	6
Operation	7
Break-In Period	7
Before Operating	7
Starting Engine	7
Emergency Starting	8
Stopping Engine	9
Lights	9
Towing	9
Clearing Track	9
Dressing For The Weather	10
Service	11
Service Interval Chart	11
Spark Plugs	12
Carburetor and Oil Injection Pump	13
Choke System	13
Adjusting Choke Plunger	13
Synchronizing the Carburetors	14
Adjusting Oil Injection Pump	15
Setting Engine Idle Speed	15
Checking Float Level	16
Main Jet Chart	16
Speed Limiter System	16
In-Line Fuel Filter	17
Air Intake Silencer	17
Liquid Cooling System	18
Draining and Filling Cooling System	18
Gear Case	19
Oil Injection Pump	19
Drive System	20
Servicing Drive and Driven Sheaves	20
Replacing Drive Belt	20
Adjusting Brake	21
Checking Chain Case Oil Level	21
Checking and Adjusting Chain Tensioner	21
Slide Suspension	22
Replacing Wear Bars	22
Adjusting Track Tension	22
Adjusting Suspension Springs	23
Skis	23
Replacing Ski Wear Rods	23
Replacing Ski Wear Plates	24
Aligning Skis	24
Eliminating Loose Steering	25
Lighting System	25
Tightening Hardware and Components	27
Storage	28
Trouble Shooting	30
Specifications	32



Safety



M23365



CAUTION: DO NOT carry a passenger. Improper use or maintenance by the operator can result in injury. Follow these safety suggestions.

Preparation

Before starting the engine, read your operator's manual from cover to cover. Knowledge can prevent accidents.

Always operate your throttle and brake controls several times before you start your engine. Stuck or frozen controls could cause serious injury or damage.

Know your controls. Learn how to stop in an emergency.

Know your state, provincial, federal and local laws pertaining to snowmobiling. Respect property of others. Don't spoil this fine winter sport by creating a bad image.

Never add fuel when smoking or while engine is running. Use a safe gasoline container. Always use fresh, clean fuel. See page 6.

Wear clothing designed for snowmobiling... avoid frostbite. Never wear scarves, loose belts, or clothes that could catch on moving parts or tree limbs.

Always wear eye and headgear protection to guard against injury.

Prolonged exposure to loud noise can cause impairment or loss of hearing. Wear earplugs or any suitable hearing protective device that is comfortable when wearing a snowmobile helmet to protect against objectionable or uncomfortable loud noises. Always wear an approved helmet to guard against head injury.

Avoid sun blindness. Wear properly tinted goggles or face shields. Never wear yellow eye protection in the bright sun.

Do not allow anyone to operate snowmobile without proper instructions. Take proper precautions before allowing young operators to drive.

Always use the "buddy system." Remember you can drive farther in 30 minutes than you can walk in a day.

Carry adequate tools and repair items for emergency field repairs.

Don't overload your snowmobile... use sleds to carry provisions.

Always carry emergency survival supplies when going on long trips. Let friends and relatives know your destination and expected arrival time.

Operation

Give complete and undivided attention to your snowmobile... don't be a show-off.

Do not operate snowmobile in crowded areas or steer the machine toward persons.

Do not operate snowmobile too close to avalanche areas, or on other unsafe terrain where spills could occur.

Observe all state, provincial, federal and local regulations, especially those with regard to operating on streets and highways.

When crossing highways (where permitted by law) always stop, look both directions, and cross at a 90-degree angle. Post guards when crossing in groups.

Do not operate snowmobiles on or near railroad tracks. Trains cannot always be heard above sound of snowmobile engine... it is difficult to escape from between tracks.

Skiers and snowmobiles don't mix on the same hill-sides. Avoid ski slopes.

Never operate snowmobile on rivers or lakes without first checking thickness of ice. If you go through the ice, don't panic. Conserve energy.

Never operate snowmobile at night without lights. Keep headlight and taillight areas free of snow.

Keep all shields in place... all guards and protective hoods.

Never open new trails at night. Follow established trails. Unseen barbed wire or guy wires can cause serious injury or death.

Always use both hands for steering.

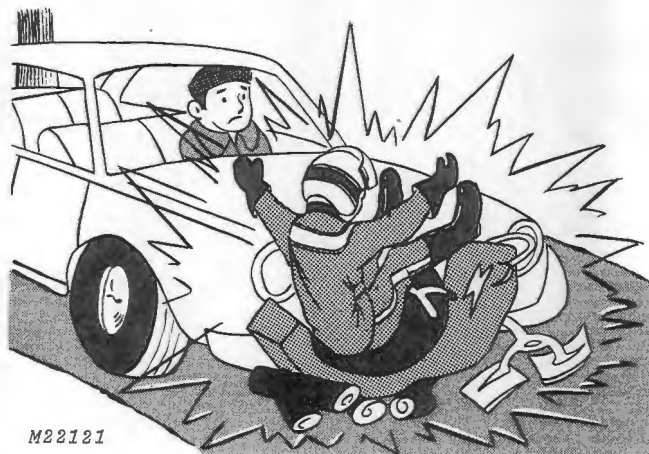
Avoid operating snowmobile at excessive speed. Always be aware of terrain.

If throttle sticks, don't panic. Turn emergency stop switch on the right-hand handlebar. See page 9.

Always allow adequate stopping distance based on ground cover conditions. Remember, ice requires a greater stopping distance. To avoid skidding, don't apply brakes rapidly on ice.

Ice or hard surfaces do not provide the same stability as snow. Drive slower on these surfaces. Do not accelerate rapidly.

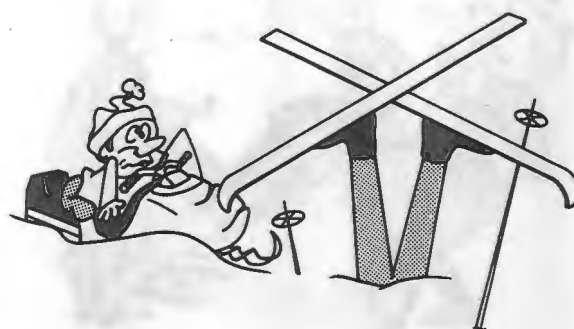
Be sure tool box lid is closed at all times. An open lid could cause interference with steering or possible contact with the throttle lever producing unexpected acceleration.



M22121



M23364



M23366

Do not speed through wooded areas. Hidden obstructions, hanging limbs, unseen ditches, and even wild animals can cause accidents.

Do not tailgate when riding trails. Rear end collisions can cause injury and machine damage.

Don't mix alcoholic beverages with snowmobiling.

Keep feet on footrests at all times. Do not permit them to hang over sides. Do not attempt to stabilize machine with feet when making turns or in near-spill situations. Broken limbs could result.

Select a riding position suited to the terrain upon which you're operating. Do not stand on seat, stunt, or show-off.

Do not jump snowmobile. Operator injury or machine damage could result.

Keep hands and feet out of the track area . . . be especially careful when freeing your snowmobile from deep snow.

When towing a sled, use a solid towbar. Do not use ropes or other flexible tow straps. See page 9.

Observe fuel and oil supply regularly. Do not travel farther than your fuel will permit you to return.

Remove key from switch whenever you leave your machine unattended.

Never drive your snowmobile onto a tilt-bed trailer. Winch it on.

Always secure snowmobile firmly to trailer. Be sure trailer lights are operative.

Maintenance and Storage

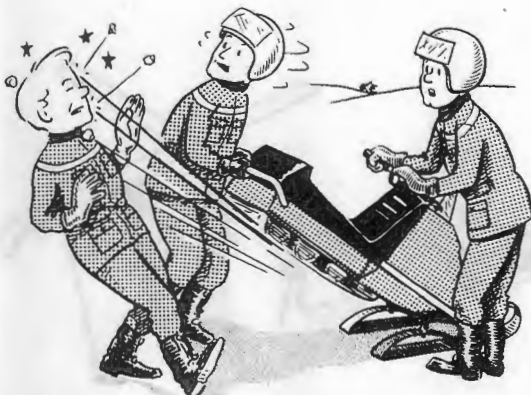
Check over your snowmobile regularly. This will prevent many problems from occurring.

Do not attempt to make repairs to your snowmobile while engine is running.

Keep matches away and do not smoke while filling the fuel tank. Avoid possible explosions.

Check skis and steering components frequently to see they are in good condition. Keep all hardware tight.

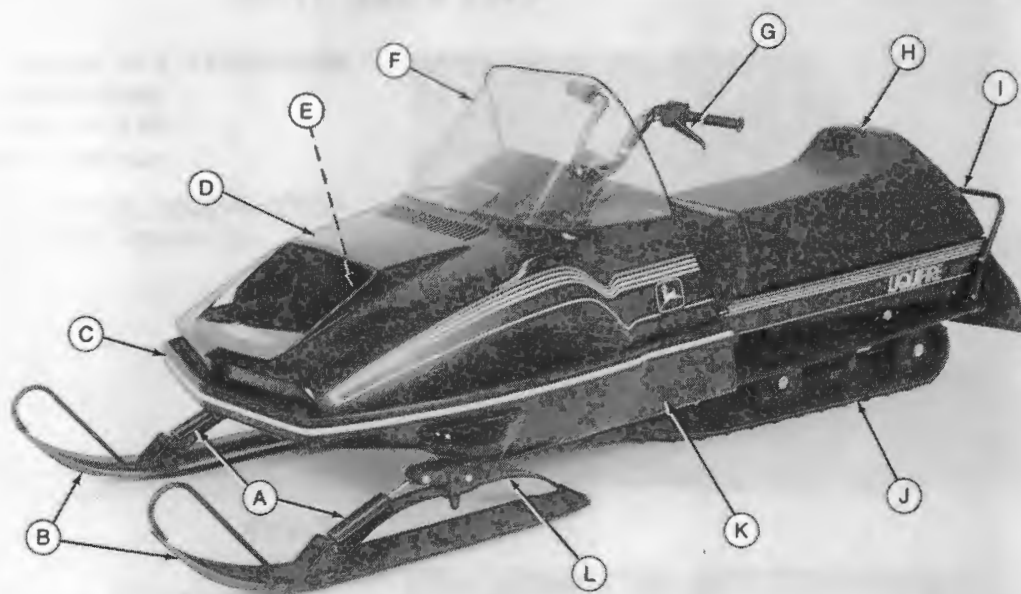
Never lift the rear of the snowmobile to clear the track. Chunks of ice or rocks may be thrown rearward. Tilt machine on one footrest when clearing track . . . and keep all persons clear of area. Keep hands and feet clear of track.





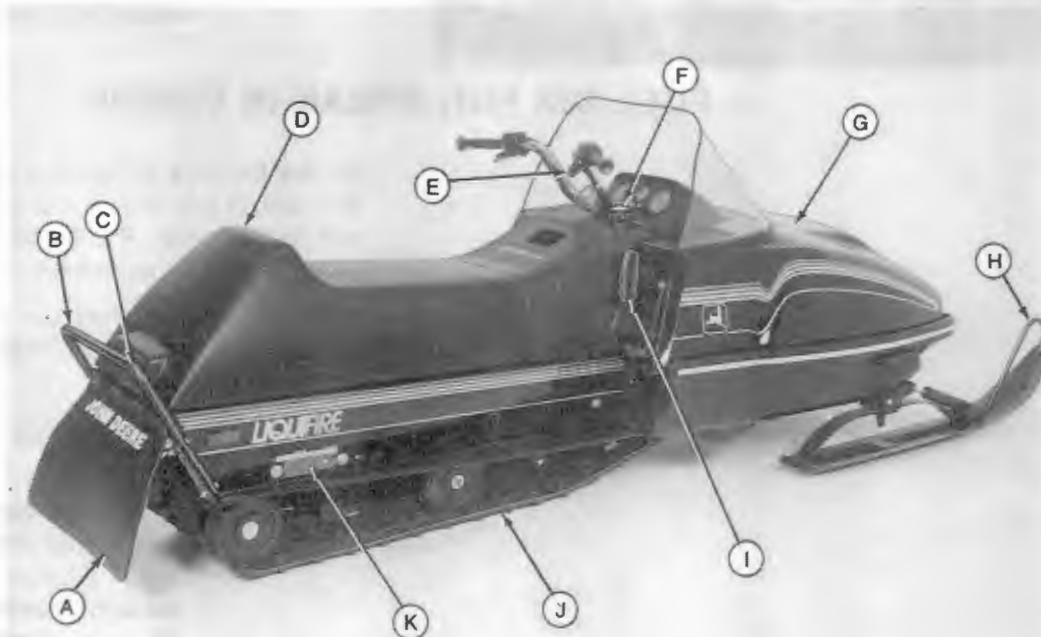
Identification

- A—Shock Absorbers
- B—Skis
- C—Front Bumper
- D—Hood
- E—Headlight
- F—Windshield
- G—Brake Control
- H—Seat
- I—Rear Bumper
- J—Track
- K—Pan
- L—Ski Spring



M24927

- A—Snow Flap
- B—Rear Bumper
- C—Stop-Taillight
- D—Seat
- E—Throttle Control
- F—Fuel Tank
- G—Hood
- H—Ski Handle
- I—Recoil Start
- J—Track
- K—Snowmobile Serial Number



M24928



Preparation

FILL FUEL TANK



IMPORTANT: Use regular leaded or non-leaded gasoline with an anti-knock index of 88 or higher. Never use gasoline that has been stored for a long time.

NOTE: Regular (leaded) gasoline is preferred but non-leaded gasoline is acceptable.

FILL OIL TANK



NEVER ALLOW OIL TANK TO BECOME EMPTY. Use John Deere 2-cycle oil or a BIA approved 2-cycle engine oil. Oil tank holds 3.5 U.S. pints (1.7 L).

IMPORTANT: If other than John Deere 2-cycle oil is used, it must meet BIA (Boating Industry Association) test qualification TCW.

Never use dirty or contaminated oil. The oil and oil tank must remain clean to avoid oil injection pump failure and engine damage.

FUEL MIX FOR BREAK-IN PERIOD

For the first tank of fuel, pre-mix gasoline and oil in a 50:1 ratio (1 pint of oil with 6 U.S. or 5 Imperial gallons) and fill fuel tank. Fill the oil tank with John Deere 2-cycle oil or its equivalent.

After the break-in period, use ONLY GASOLINE in the fuel tank and John Deere 2-cycle oil or its equivalent in the oil tank.

FUEL FOR TEMPERATURES OF -40°F (-40°C) OR BELOW

IMPORTANT: Use a 50:1 gasoline and oil pre-mix in the fuel tank and fill the oil tank with 2-cycle oil. DO NOT use straight gasoline in the fuel tank. The oil injection system may not function efficiently at -40°F (-40°C) and this could cause engine failure.



Operation

BREAK-IN PERIOD

Do not exceed 50 mph (80 km/h) for the first 25 miles (16 km) or force the machine at full throttle in deep snow. An occasional burst of power on hard-packed snow will not be harmful.

BEFORE OPERATING

1. Clean windshield with a damp cloth. Do not use gasoline, solvents, or abrasive cleaners.
2. Check skis, wear rods, and all steering components. Check steering for a full right and left-hand turn.
3. Check track for proper tension.
4. Check fuel and oil levels. Oil level must be checked each time that fuel is added.
5. Check throttle and brake controls for free operation and proper adjustment.
6. Start engine and test operation of emergency stop switch, key switch, headlight dimmer switch, headlight, and stop-tail light.

STARTING ENGINE

CAUTION: Be sure area in front of machine is clear. Be prepared to apply brake to prevent snowmobile movement.

Cold Starting

1. With no choke and no throttle, pull recoil start to turn engine over two or three times.
2. Flip choke lever up (normal position). In extremely cold weather, flip choke over center all the way (richer position).



Normal Position



Richer Position



3. Emergency stop switch must be in center position.
4. Turn key switch "ON." Do not press throttle lever.
5. Pull recoil start rope.
6. When engine starts, allow it to run briefly before pushing choke lever down.

NOTE: If choke was in rich position, push down to normal position and allow engine to warm up.

7. If engine becomes "flooded," close the choke. Hold the throttle lever in the wide open position. Pull start rope until engine starts. Release the throttle lever.

NOTE: Remove and dry plugs if engine is extremely flooded.

IMPORTANT: DO NOT permit the engine to idle for more than five minutes. Overheating and engine damage will occur due to inadequate air flow through the radiator and lack of snow against the heat exchanger in the tunnel.

Warm Starting

1. Do not use choke.
2. Place emergency stop switch in center position.
3. Turn key switch "ON."
4. Pull recoil start rope.

EMERGENCY STARTING



1. Use tools provided with the snowmobile to remove recoil starter.
2. Tie a knot in rope and wind rope around recoil starter cup.
3. Pull on rope to start engine.
4. Carry an extra rope for emergency starting.

STOPPING ENGINE

1. Release throttle lever.
2. Turn emergency stop switch up or down.
3. Apply brake.
4. Before restarting, emergency stop switch must be in center position. Always check emergency stop switch before attempting to start engine.
5. Turn key switch "OFF." Remove key before leaving machine unattended.



LIGHTS

NOTE: The lights are automatically "ON" whenever the engine is running.

1. Stoplight comes on when brake is applied.
2. Turn dimmer switch to low beam.
3. Turn dimmer switch again for high beam.

NOTE: If one filament of bulb fails, the other beam can still be used. See pages 25 and 26 for adjusting headlight and changing bulbs.



TOWING



CAUTION: Always use a solid towbar when possible. Flexible ropes or pull straps do not allow for control on turns or when stopping.

1. Remove drive belt.
2. Secure skis of disabled machine to tow machine.
3. DO NOT use rear bumper for towing.

CLEARING TRACK

1. Clear track after operating in slushy snow.
2. Tip machine on its left side until track clears the ground.
3. Spin track at moderate speed until snow and ice are thrown clear.



CAUTION: Be sure no one is behind machine when clearing track. Injury could result from ice or rocks thrown from track.

IMPORTANT: If track freezes, free it manually. Do not use the engine to break track loose. The drive belt will be burned and damaged.

DRESSING FOR THE WEATHER

1. To prevent frostbite, dress for the wind and weather.
2. Wear protective clothing and accessories.
3. The chart provides a guide and illustrates the danger zones.



CAUTION: Always wear a snowmobile helmet. The helmet provides both warmth and protection against head injury.

WIND CHILL CHART

ESTIMATED WIND SPEED IN MPH	ACTUAL THERMOMETER READING (°F.)											
	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
EQUIVALENT TEMPERATURE (°F.)												
calm	50	40	30	20	10	0	-10	-20	-30	-40	-50	-60
5	48	37	27	16	6	-5	-15	-26	-36	-47	-57	-68
10	40	28	16	4	-9	-21	-33	-46	-58	-70	-83	-95
15	36	22	9	-5	-18	-36	-45	-58	-72	-85	-99	-112
20	32	18	4	-10	-25	-39	-53	-67	-82	-96	-110	-124
25	30	16	0	-15	-29	-44	-59	-74	-88	-104	-118	-133
30	28	13	-2	-18	-33	-48	-63	-79	-94	-109	-125	-140
35	27	11	-4	-20	-35	-49	-67	-82	-98	-113	-129	-145
40	26	10	-6	-21	-37	-53	-69	-85	-100	-116	-132	-148
(Wind speeds greater than 40 mph have little addi- tional effect.)	LITTLE DANGER (for properly clothed person)				INCREASING DANGER				GREAT DANGER			
					Danger from freezing of exposed flesh							

M10123



Service

SERVICE INTERVAL CHART

Item	As Needed	Daily	Every 150 Miles	Every 300 Miles	Annually	Page
Clean windshield.	X					7
Check coolant level.		X				18
Check condition of skis and steering.		X				23,24
Check track condition and tension.		X				22
Check throttle control operation.		X				13,14,15
Check operation of brakes.		X				21
Check emergency stop and key switches.		X				8,9
Check lighting system.		X				9
Check chain case oil level.			X			21
Check chain tensioner.				X		21
Change oil in the gear case.					X	19
Check oil injection pump.					X	15
Check in-line fuel filter.					X	17
Check drive belt condition.		X				20
Check carburetor adjustments.			X	X	X	13,14,15,16
Check choke adjustments.			X	X	X	13
Check ski alignment.	X					24
Check headlight adjustment.	X					25
Check ski wear rods and wear plate.				X	X	23,24
Check slide suspension wear bars.				X	X	22
Oil throttle cable.					X	15
Check all components for condition and tightness.					X	27
Service drive and driven sheaves.					X	20
Store snowmobile properly.					X	28

SPARK PLUGS

Removing Spark Plugs



CAUTION: High-energy ignition systems can produce injurious electrical shock. Stop engine and remove key before working on ignition.

1. Stop engine.
2. Pull spark plug wire connectors from plugs.

IMPORTANT: Do not pull on wire to remove connectors. Pull on connectors only.



Checking Spark Plugs



CAUTION: Do not hold the plug or plug wire in your hand when checking for spark.

1. Reconnect spark plug wire to plug.
2. Lay plug on engine.
3. With ignition "ON," pull recoil start rope and check for spark.

New plugs are gapped at 0.025 inch (0.635 mm). The gap will widen in proportion to the hours and miles of use. When plug gap reaches 0.045 inch (1.143 mm), or if plug malfunctions, replace it.

Plug Appearance	Possible Cause
Tan or Cocoa Brown	Proper fuel mixture, good combustion.
Black or Sooty	Fuel mixture too rich, poor combustion.
White or Light Tan	Fuel mixture too lean, hot combustion.

NOTE: Replace plug if appearance is abnormal, engine starts hard or malfunctions.

Installing Spark Plugs

1. Clean plug seating surface on cylinder head.
2. Install plugs and tighten to 10 to 12 ft-lbs (14 to 16 Nm) torque.
3. Connect spark plug wire connectors to plugs.

NOTE: See page 32 for spark plug recommendations.

CARBURETOR AND OIL INJECTION PUMP

IMPORTANT: DO NOT run engine when adjusting carburetor.

The John Deere 440 LIQUIFIRE Snowmobile is equipped with two Mikuni Carburetors. Each carburetor is a float-type, fixed main jet carburetor. The floats in the fuel bowl maintain a constant fuel level in the bowl. The fixed main jet eliminates high-speed adjustments. Altitude and temperature variations may require carburetor changes.

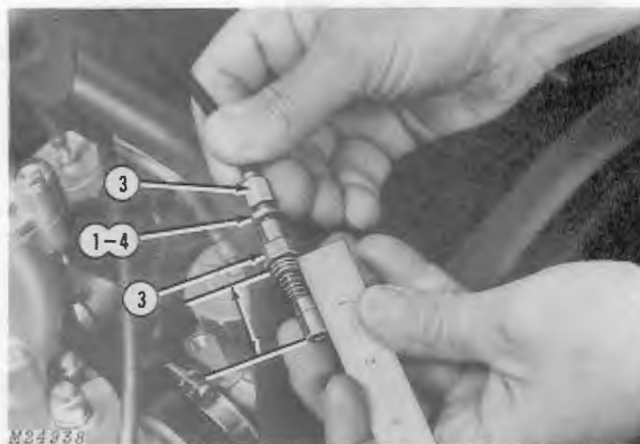
IMPORTANT: DO NOT run engine with air intake silencer removed. To do so will cause engine to run lean and could cause engine failure.

Choke System

A separate metered choke system is used. The system is opened and closed by a choke plunger. Do not open the throttle when starting the engine; otherwise, the fuel-air mixture will be too lean for starting.

Adjusting Choke Plunger

1. Loosen jam nut securing adjusting sleeve to brass choke adapter.
2. Remove choke assembly from carburetor.
3. Turn adjusting sleeve (in or out) of brass choke adapter to obtain a dimension of 1.25 to 1.30 inch (32 to 33 mm) on the right choke and 1.20 to 1.25 inch (31 to 32 mm) on the left choke, from the bottom of choke plunger to bottom of brass choke adapter.
4. Tighten jam nut down tight against brass choke adapter.
5. Install choke assembly in carburetor.
6. Start and warm up the engine until it idles smoothly. DO NOT run at idle for more than five minutes.
7. Insert a 0.030 inch (0.762 mm) feeler gauge between choke lever and dash (dash must be in down position). This should indicate free-play and should not affect idle.



Continued on next page

Adjusting Choke Plunger—Continued

8. Flip choke lever up to first position and the engine should stop. This indicates that the choke is operating properly.

Synchronizing the Carburetors

IMPORTANT: See "Adjusting Oil Injection Pump" on page 15. Pump lever must be synchronized with the carburetor throttle valves.

1. Remove the air intake silencer.
2. Use a strong rubber band or clamp and lock the throttle lever tightly against the handgrip.
3. Place your finger in the throat of each carburetor. Loosen jam nut and turn adjusting sleeve clockwise (in) until the backside of the throttle valve is flush with the inside of the bore. Tighten jam nut.

NOTE: When the throttle valve is adjusted correctly, the backside of the valve will be flush with the bore. No part of the valve will restrict air flow through the carburetor.

4. Turn the idle adjusting screws counterclockwise until the screw tip is flush with the inside of the carburetor bore.
5. Remove rubber band or clamp from the throttle lever and allow the throttle valves to fully seat in the carburetor bores.
6. Turn both idle adjusting screws clockwise until the screws contact the throttle valves. When the screws contact the valves, the valves will begin to rise. Turn idle adjusting screws three additional turns clockwise. This will give a preliminary idle speed setting for both carburetors.
7. Look into the throat of both carburetors and slowly compress the throttle lever on the handgrip. Both throttle valves should begin to rise at exactly the same time. If throttle valve movement does not occur as specified, repeat Steps 2, 3 and 4.

IMPORTANT: There must be slight free-play between the front of throttle lever and stop switch housing.

8. Carefully turn both pilot air screws clockwise (in) until a slight seating resistance is felt.
9. Turn both pilot air screws counterclockwise (out) 1-1/2 turns.



Idle Adjusting Screws



Pilot Air Screws

Adjusting Oil Injection Pump

IMPORTANT: The oil injection pump lever must be adjusted to move off the peg at exactly the same time that the carburetor throttle valves start to rise.

Adjust oil injection pump as follows:

1. Remove the left-hand carburetor from the engine.
2. Loosen the two jam nuts securing the oil injection pump control cable adjusting sleeve.
3. Back sleeve out to tighten cable or turn in to loosen cable. Cable should have slight free-play; it should not be stretched tight. Control lever should be tight against the stop pin.
4. Press the throttle lever on the handgrip and observe throttle valve and oil injection pump control lever. The throttle valves and lever should all start to move at exactly the same time.
5. When adjustment is correct, tighten the jam nuts securing the oil injection pump control cable adjusting sleeve.
6. Install left-hand carburetor.

IMPORTANT: Lubricate throttle cable once each season with LPS or WD-40. Hold the throttle lever against the handgrip and allow lubricant to run down cable. **DO NOT** use engine oil or silicon spray. These lubricants may destroy the plastic components of the throttle cable or cause control cable to become sticky in cold temperatures.

Setting Engine Idle Speed

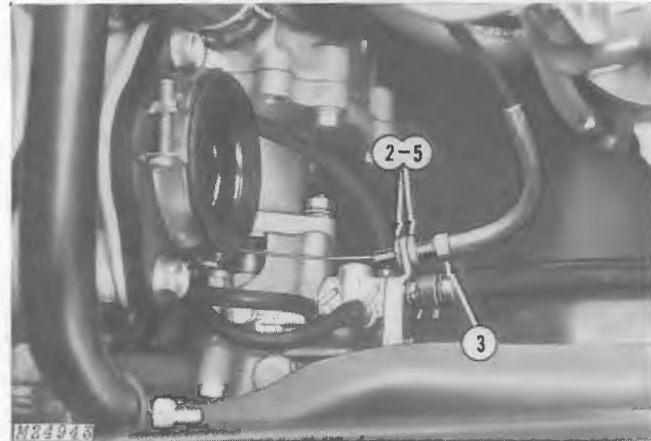
NOTE: The preliminary idle speed (Step 6, page 14) may not be correct for normal operation, even though the carburetors and oil injection pump are synchronized.

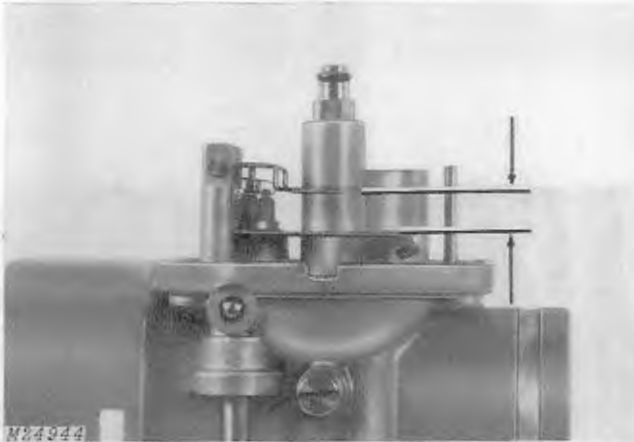
To check engine for proper idle, proceed as follows:

1. Install air intake silencer and run the engine until operating temperature is obtained. **DO NOT** run engine for more than 5 minutes at idle speed.
2. If the engine will not idle or if increased idle rpm is desired, turn the idle adjusting screws clockwise until desired idle is obtained. Correct engine idle speed is 2000 to 2500 rpm.

NOTE: Set both idle adjusting screws equally.

IMPORTANT: **DO NOT** use the air screws at any time to set engine idle speed. Be sure the air screws are adjusted as explained in Steps 8 and 9 on page 14.





Checking Float Level

NOTE: The fuel level in the float chamber is regulated by the float. If dirt or foreign particles get between the needle valve and seat, or wear or damage occurs in the needle valve area, fuel overflow may occur. If the needle valve sticks, a limited amount of fuel will flow into the float chamber.

1. Remove the air intake silencer, fuel lines, and carburetor from the engine.
2. Remove the float chamber body and gasket from carburetor.
3. Invert the carburetor and check to see if the float arm is parallel with the edge of the mixing chamber. If adjustment is necessary, bend only the float arm actuating tab.

MAIN JET CHART

Carburetor and clutch changes, adjustments, or modifications may be necessary for operation at altitudes above 4000 feet (1 219.2 m). See your John Deere dealer.

TEMPERATURE								ALTITUDE
Below -30°F (Below -34°C)		-30° to 0°F (-34° to -18°C)		0° to 30°F (-18° to -1°C)		Above 30°F (Above -1°C)		Sea Level to 4000 Feet (1 219.2 m)
Main Jet	Power Jet	Main Jet	Power Jet	Main Jet	Power Jet	Main Jet	Power Jet	
150	100	150*	90*	150	90	140	85	

*Factory installed

SPEED LIMITER SYSTEM

The speed limiter system provides two types of protection; it limits maximum engine speed to 9000 rpm in the event of a broken belt at wide open throttle, and it also limits engine speed to 3500 to 3700 rpm if the throttle lever is released and the carburetor slides should stick open.

The function of the speed limiter system can be checked by holding the throttle lever pin rearward and pressing the throttle lever slowly. If the system is functioning correctly, the engine will "miss" or "cut out" at 3500 to 3700 rpm.

IN-LINE FUEL FILTER

Change the filter annually or when contamination builds up in the cone.



AIR INTAKE SILENCER

The air intake silencer should be checked daily if the snowmobile has been run in conditions which allow trash to be drawn into the silencer.

The first indication of trash in the silencer will be loss of power and performance. The engine will run "rich" because adequate air will not be mixing with the fuel.

1. Remove silencer.
2. Shake or blow out silencer to remove any trash.
3. Install silencer.

IMPORTANT: DO NOT run engine with air intake silencer removed. Serious engine damage will result.



LIQUID COOLING SYSTEM



The liquid cooling system is a pressurized, thermostatically-controlled system. A heat exchanger is located in the tunnel and a radiator is under the front hood. The combination of snow against the exchanger and air through the radiator cools the system. The thermostat is located in the engine thermostat housing and controls engine temperature.

During the initial break-in period, operate the snowmobile for five minutes. Allow the engine to cool slightly before opening the radiator cap to check coolant level. Coolant level should be flush with bottom of the filler neck. Capacity of the system is approximately 3 quarts (2.8 L).

If coolant must be added, use a 50-50 solution of ethylene glycol anti-freeze and water. **DO NOT** use any anti-freeze containing a radiator stop-leak. **NEVER** add radiator stop-leak to the cooling system.

IMPORTANT: DO NOT exceed the recommended 50-50 solution. **Never** add anti-freeze to fill the system until after checking the solution with a hydrometer. A 50-50 solution should give approximately a -40°F (-40°C) reading. Check solution when engine is completely warmed up.

Draining and Filling Cooling System

NOTE: Water pump-to-oil injection pump coupling should be greased every year with molybdenum grease when draining and filling the system. See your John Deere dealer.

Draining System (2 Year Intervals Only)

1. Remove drain screw and pressure cap.
2. Remove lower hose from heat exchanger.
3. Raise rear of snowmobile slightly to drain system. Replace drain screw and lower hose.
4. Wash engine and compartment with clean water.



Filling System

1. Connect lower hose to heat exchanger and replace drain screw.
2. Position snowmobile on a level surface.
3. Remove air vent screw from thermostat housing.
4. Start filling the system with a 50-50 solution of ethylene glycol anti-freeze and water until liquid flows from the air vent. Install air vent screw and washer.
5. Continue filling system until radiator is full. System capacity is approximately 3 U.S. quarts (2.8 L). Check coolant recovery container. Add solution until approximately one inch of solution is in the container and covers the end of the hose.
6. Check all hose connections for leaks.
7. Install pressure cap. Block up track so engine can be run safely. Start the engine and again check system for leaks.



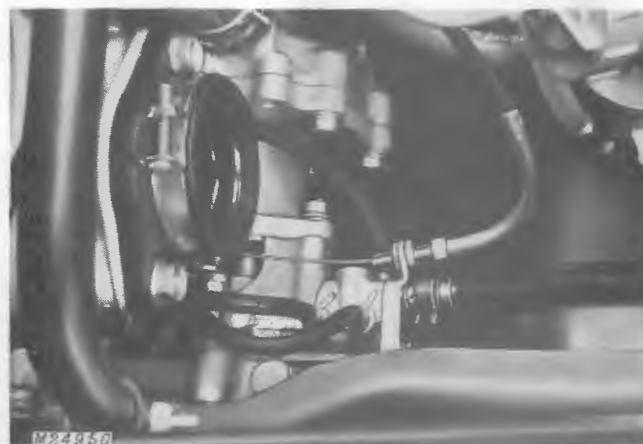
GEAR CASE

Change oil in gear case annually. Use 10W-30 oil (Series SE). Gear case holds approximately 1.35 oz. (40 cc).



OIL INJECTION PUMP

Check oil flow annually. See your John Deere dealer for this service.



DRIVE SYSTEM

Servicing Drive and Driven Sheaves

Once a year, service the drive and driven sheaves. See your John Deere dealer for this service.

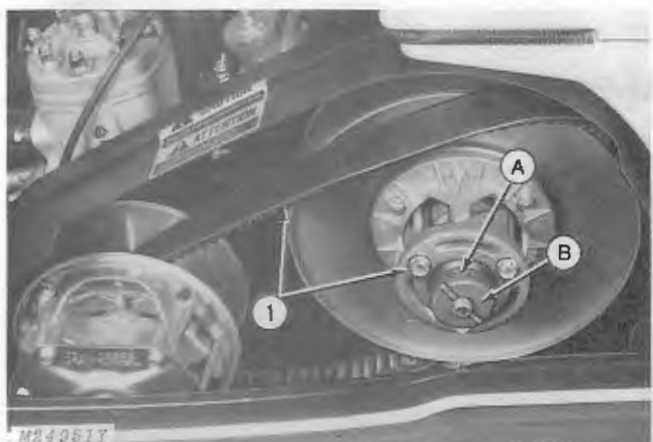
Replacing Drive Belt

The drive belt should be replaced if its width is reduced by 1/8 inch (3.18 mm). A narrow belt reduces snowmobile top speed. Correct width is 1-1/4 inches (31.75 mm).

If drive belt wears rapidly, drive and driven sheaves may be out of alignment. See your John Deere dealer. A belt worn narrow in one area is caused by trying to free a frozen track with the engine. Free a frozen track manually before starting engine.



CAUTION: Keep fingers out of area between driven sheave halves. If driven sheave sticks, use care when opening it to prevent your hand from being pinched.



A—Spacer Washers

B—Retaining Washer

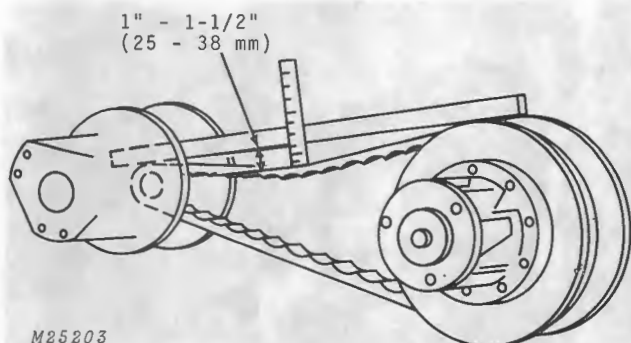
1. Push in on center of driven sheave and lift belt up and over sheave.

2. Remove belt from drive sheave.

IMPORTANT: Never pry belt over sheaves.

3. Install belt in reverse sequence. Always install belt so that number on belt can be read when viewed from left side of snowmobile.

NOTE: As belt wear increases or if belt stretches, remove spacer washer (A) from behind retaining washer (B). When new belt is installed, replace washer. Torque cap screw to 20 ft-lbs (27 Nm). If snowmobile has a tendency to creep at idle speed after installing a new belt, add a washer (A).



M25203

IMPORTANT: A drive belt that is too loose or too tight will cause slow acceleration and affect performance. Pull down on belt with your hand and measure between the straightedge and belt as shown. If belt deflection is less than 1 inch, add a washer. If belt deflection is more than 1-1/2 inches, remove a washer. See note above.

Adjusting Brake

1. Apply the brake control lever and measure the distance from the lever to the handgrip. It should be 1 to 1-1/2 inches (25 to 38 mm).



2. Adjust brake by loosening jam nut and turning cap screw in. Retighten jam nut securely.

CAUTION: DO NOT adjust jam nuts on brake cable.

3. Check brake tension.
4. Readjust if necessary.

NOTE: Be certain dowel on end of brake cable is seated properly in recess of brake control lever.

5. After brake adjustment, check operation of stoplight switch. If stoplight does not work, check for a defective switch.



Checking Chain Case Oil Level

1. Park snowmobile on a level surface.
2. Remove lower plug from chain case. If oil flows from this hole, oil level is satisfactory.
3. To add oil, remove upper plug and add SAE 90 oil until it flows from lower hole.
4. Install plugs.

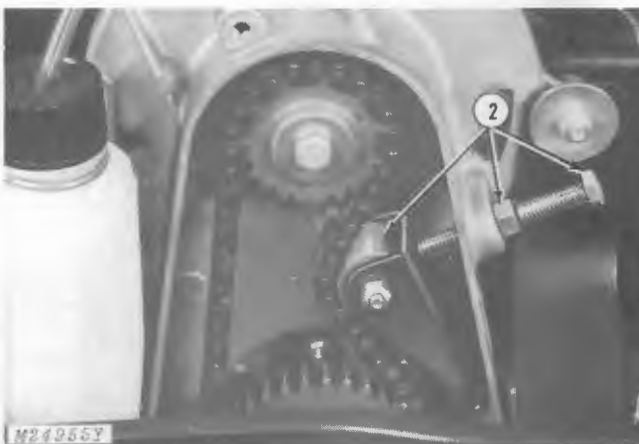


Checking and Adjusting Chain Tensioner

1. Turn snowmobile on its left side. Remove chain case cover.
2. Check chain tensioner roller. Replace tensioner if roller does not turn freely or is excessively worn. To adjust tensioner, loosen jam nut and turn adjusting screw in (finger-tight) and then back screw out 1/4 turn. Tighten jam nut.

IMPORTANT: If chain is too tight, excessive drag occurs between the sprockets and heat build-up may occur in the chain case.

3. Add oil to chain case if required. Install cover.
4. Wipe any spilled fuel from the pan and sheaves on the left side of snowmobile.



SLIDE SUSPENSION

Replacing Wear Bars

When running in marginal snow conditions, check wear bars daily.

1. Tip snowmobile on its side.

NOTE: Engine may "flood" and be difficult to start when snowmobile is tipped on its side. See page 8.

2. Check wear bars in several places for cracks, thin areas and sand and gravel imbedded in the bars.

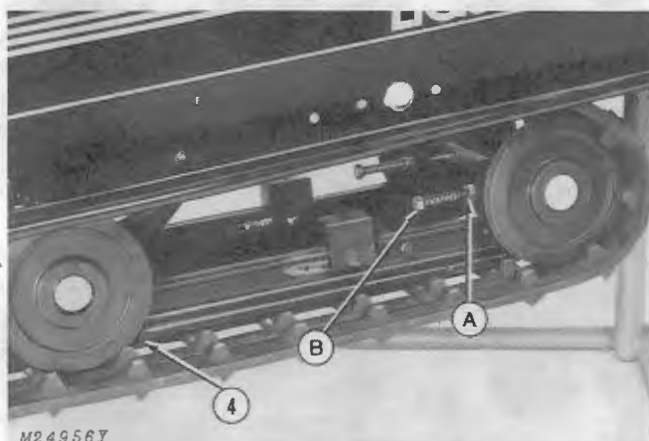
NOTE: Sand or gravel imbedded in the wear bars acts as an abrasive and will destroy the steel wear clips in the track.

3. If any of these conditions exist, see your John Deere dealer for wear bar replacement.

Adjusting Track Tension

Check track tension and alignment frequently. A loose track causes excessive slap and could damage the track, tunnel or slide assembly. A tight track requires additional power to operate.

1. Suspend or support snowmobile so track is clear of ground.
2. Loosen jam nuts (A) on track adjusting screws (B).
3. Turn adjusting screws (B) to tension track.
4. Measure below the lower shock absorber mount for clearance of 1/4 inch (6.35 mm) between track wear clip and slide wear bar. Both sides should be equal. Tighten jam nuts.



M24956Y

A—Jam Nuts

B—Adjusting Screws

After Adjusting Track Tension

1. Start engine and allow track to rotate slowly several times. Shut off engine and allow track to coast to a stop. **DO NOT APPLY BRAKE TO STOP TRACK.**
2. Check alignment. Rear idler wheels should run in center of drive lugs.
3. Slide rail wear bar should be in middle of each slide rail opening of track.
4. If either Step 2 or 3 indicates a need for adjustment, repeat the procedure.

NOTE: Track will run to the loose side. If track is too far to the left, tighten the left adjusting screw to move the track to the right.

Adjusting Suspension Springs

Ride the snowmobile to determine adjustment requirements.

Front Springs

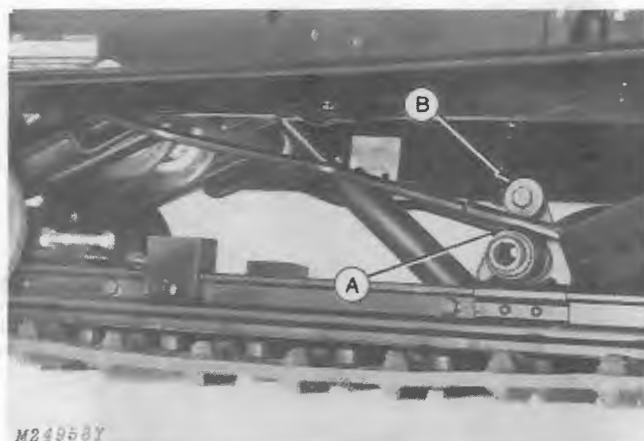
If the front springs are tightened too much, the ride will be stiff and the front of the snowmobile will seem light and lift up when power is applied. Added lift is fine for deep snow but makes the ride choppy on rough surfaces.

To reduce spring tension, turn adjusting nuts counterclockwise. Be sure that at least two threads of the adjusting screws protrude through the nuts.



Rear Springs

To increase tension, move the springs from the bottom position (A) to the top position (B). Wheel does not have to be removed to reposition springs.



A—Bottom Position
B—Top Position

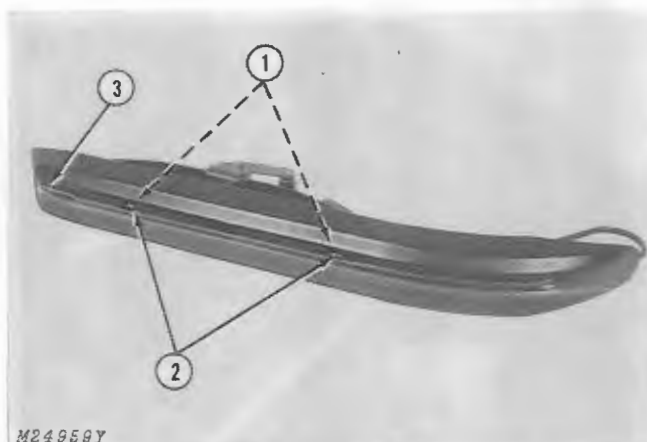
Wheel Removed to Illustrate Spring

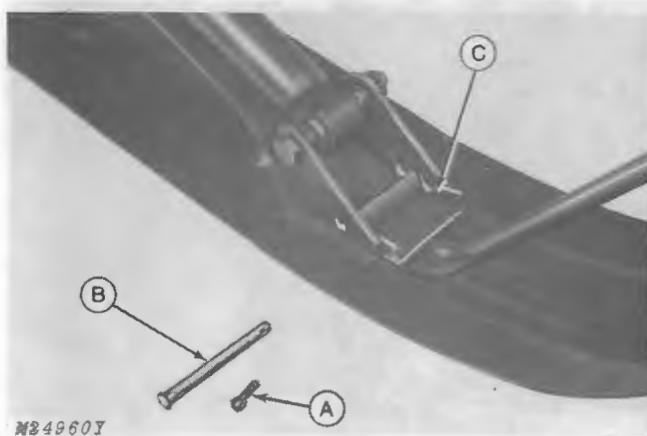
SKIS

Replacing Ski Wear Rods

Wear rods should be replaced when they are worn to half their original size.

1. Remove lock nuts securing wear rod to ski.
2. Pry rod down to free studs from holes.
3. Slide rod forward to remove rod from rear hole.
4. Install new rod in opposite sequence.





Replacing Ski Wear Plates

Replace wear plates when excessively worn.

1. Raise front of snowmobile.
2. Remove cotter pin (A) and drilled pin (B).
3. Lift spring and remove wear plate (C).
4. Install new wear plate.
5. Lower spring and install drilled pin and cotter pin.

A—Cotter Pin
B—Drilled Pin
C—Wear Plate



Aligning Skis

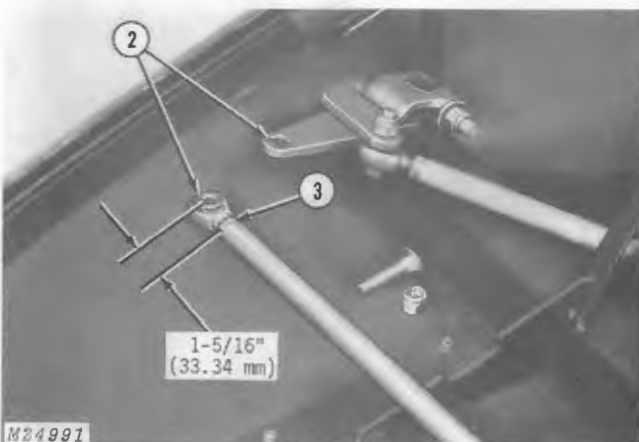
When properly aligned, skis are parallel and handlebars are positioned straight ahead.

1. Raise front of snowmobile slightly to take weight off skis.
2. Disconnect right tie rod from steering arm.
3. Loosen jam nut on right tie rod end. The left tie rod jam nut does not need to be loosened, it is staked to the rod.
4. Turn right tie rod end (in or out) to align skis. Measure from straight edge of skis; not tapered ends. Distance should be equal at locations shown.

IMPORTANT: When adjusting tie rod, **DO NOT** exceed 1-5/16 inches (33.34 mm) between tie rod and center of tie rod end.

5. Tighten jam nut on tie rod. Hold tie rod when tightening jam nut. This prevents stripping threads in ball joint.

IMPORTANT: After jam nut is tight, be sure tie rod end swivels freely.



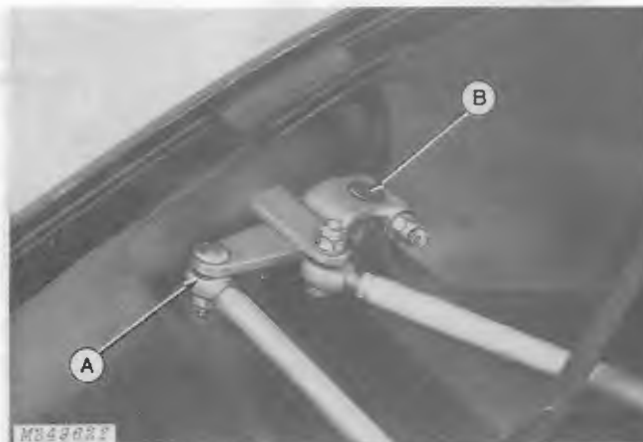
Eliminating Loose Steering

CAUTION: Check steering components and hardware frequently for condition and tightness.

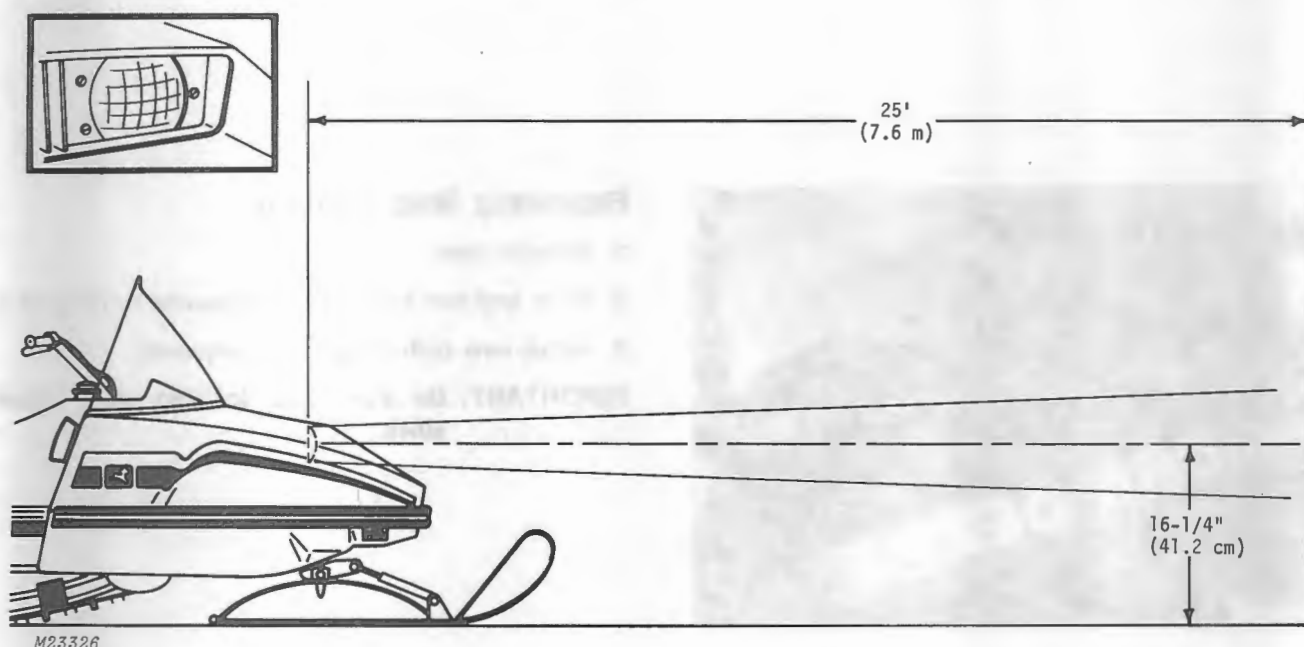
The two major causes of loose steering are:

1. Excessively worn tie rod ends (A).
2. Excessively worn spindle bushings (B).
3. Replace or tighten parts as required.

A—Tie Rod End
B—Spindle Bushing



LIGHTING SYSTEM



Adjusting Headlight

1. Position snowmobile on a flat surface with the headlight 25 feet (7.5 mm) from a vertical surface.
2. With operator on seat and headlight on "HIGH" beam, light beam center line should be straight ahead and 16-1/4 inches (41.2 cm) above ground level.
3. Loosen or tighten the two adjusting screws to raise or lower the light beam.
4. Loosen or tighten the adjusting screw to move the light beam right or left.





Replacing Headlight

1. Disconnect wiring from light.
2. Unhook wire end from slot.
3. Remove wire clamp and headlight.
4. Reverse procedure to install new headlight.



Replacing Stop-Taillight

1. Remove lens.
2. Push and turn bulb counterclockwise to remove it.
3. Install new bulb in opposite sequence.

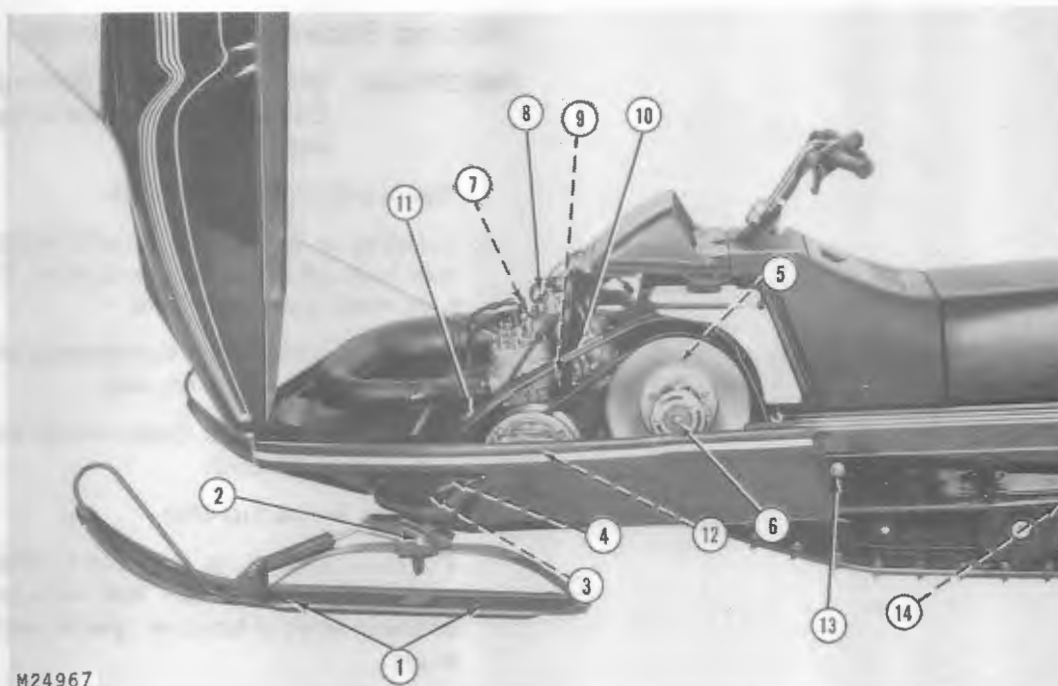
IMPORTANT: Be sure bulb locking tabs match slots.



Replacing Speedometer and Tachometer Bulbs

1. Pull the bulb socket out of the instrument.
2. Push and turn bulb counterclockwise to remove bulb from socket.
3. Install new bulb in opposite sequence.

TIGHTENING HARDWARE AND COMPONENTS



M24967

Check hardware and components for tightness, wear and damage on a yearly basis. Replace any parts that are questionable.



CAUTION: Worn, bent or damaged ski and steering components are unsafe.

1. Wear rod nuts.
2. Ski bolts.
3. Steering arm bolts.
4. Tie rod end bolts.
5. Secondary shaft bearing cap screws.
6. Driven sheave cap screw.
7. Muffler clamp.
8. Throttle and choke cables.
9. Intake manifold nuts.
10. Carburetor attachment.
11. Engine mounting bolts.
12. Drive sheave cap screw.
13. Suspension cap screws.
14. Shock absorber screws.



Storage

Placing Snowmobile in Storage

IMPORTANT: DO NOT drain cooling system. Coolant must remain in system during storage.

1. Thoroughly clean snowmobile.
2. Polish hood, pan and tunnel with automotive-type wax. Use upholstery cleaner on seat. Touch-up all bare metal parts with paint.
3. Check cap screws and components for tightness. Order any new parts required.
4. Siphon fuel from tank. Start and run engine out of fuel at IDLE SPEED.
5. Replace in-line fuel filter.
6. Remove spark plugs and add 1 teaspoon of 2-cycle oil in each cylinder. Pull recoil start rope six or seven times to lubricate cylinder walls. Replace plugs.
7. Remove drive belt and coat drive and driven sheaves with light grease.
8. Change oil in chain case.
9. Support snowmobile so track is clear of ground. Loosen track adjusting screws.
10. Place cover on snowmobile and store inside.

Removing Snowmobile From Storage

1. Wipe grease from drive and driven sheaves. Install drive belt.
2. Fill fuel tank and oil tank.
3. Check throttle and brake controls for proper adjustment and operation.
4. Adjust track tension.
5. Review operating and safety suggestions.
6. Drain a small amount of coolant into a clear glass jar and check for color and sediment. After 2 years of use, replace coolant with a new 50-50 solution of anti-freeze and water.
7. Start engine and test operation of all switches and lights.
8. Ride snowmobile at slow speed until you are sure it is operating properly.
9. Run the snowmobile until coolant temperature is up to normal. Check coolant with a hydrometer. Hydrometer should read approximately -40°F (-40°C). Adjust coolant as necessary for the coldest temperature in which the snowmobile will operate.



Trouble Shooting

Engine

Engine Starts Hard or will Not Start

- Fuel tank empty.
- Emergency stop switch in "OFF" position.
- Plugged in-line fuel filter.
- Fuel pump malfunctioning.
- Faulty ignition system.
- Ignition timing incorrect.
- Idle set too high.

Engine Lacks Power or Acceleration

- Running on one cylinder.
- Throttle cable improperly adjusted.
- Improper fuel mixture.
- Carburetor out of adjustment.
- Restricted in-line fuel filter.
- Ignition timing incorrect.
- Speed limiter system malfunctioning.

Engine Backfires and Runs Unevenly

- Ignition timing incorrect.
- Speed limiter system malfunctioning.

Engine Overheats

- Carburetor set too lean.
- Intake manifold or carburetor leaking.
- Faulty coolant pump.
- Coolant level low.

Lights

Stoplight Not Working

- Bulb burned out.
- Stoplight switch defective.

Lights Won't Light

- Bulbs burned out.
- Loose electrical connections.
- Faulty lighting coil.

Power Train and Track

Clutch Does Not Engage Properly

- Engine idles too fast.
- Faulty clutch.
- Short drive belt.

Clutch Engages Slowly

- Faulty clutch.
- Stretched or worn drive belt.

Excessive Drive Belt Wear

- Driving long distances at clutch engagement speed.
- Freeing frozen track with engine.
- Drive and driven sheaves misaligned.

Rapid Track Wear

- Operating on bare ground.
- Track improperly tensioned.

Skis and Steering

Loose Steering

- Worn tie rod ends.
- Worn spindle bushings.

Poor Maneuverability

- Worn ski wear rods.
- Loose steering linkage.



Specifications

SNOWMOBILE SPECIFICATIONS

Component	Item	440 Liquifire
Engine	Manufacturer	John Deere "Fireburst"*
	Model	TC 440 A
	No. of Cylinders	Two
	Bore	68 mm
	Stroke	60 mm
	Displacement	436 cc
Fuel System	Carburetor Manufacturer	Mikuni
	Carburetor No.	AM55068
	Tank Capacity	8 gals. (30.3 L)
	Fuel	See page 6
	Oil	See page 6
Chassis and Body	Tunnel	Aluminum
	Pan	Steel and TPR
	Hood	Sheet Molding Compound
	Windshield	Polycarbonate
	Overall Length	102 in. (2 591 mm)
	Overall Width	39 in. (991 mm)
	Overall Height	35 in. (889 mm)
	Weight (Approx.)	404 lbs. (183.2 kg)
Track and Suspension	Suspension	Slide Suspension
	Track Material	Molded Rubber
	Track Width	15 in. (381 mm)
Power Train	Transmission	2-Sheave Variable
	Manufacturer:	
	Primary	John Deere (Comet)**
	Model	102C (Comet)
	Secondary	John Deere
	Final Drive Ratio	1.59:1
	Brake	Mechanical Disk
	Drive Belt	M68416
Electrical System	Spark Plug (Champion)	N-2 (AM52640)
		QN-2 (AM55044)
	Spark Plug Gap	0.025 in. (0.635 mm)
	Timing	16° BTDC with engine running at 6500 rpm
	Lighting Coil Capacity	120 Watts
	Light Bulbs:	
	Headlight	AM53887
	Taillight	AM52619
	Speedometer	AM52847
	Tachometer	AM52847

*Manufactured for John Deere by Kawasaki Heavy Industries, Japan

**Manufactured for John Deere by Comet Industries, Richmond, Indiana

MEMORANDA

MEMORANDA

JOHN DEERE SERVICE LITERATURE AVAILABLE...

To order these publications, fill out the form below and mail it with payment to the address given. Make checks payable to Deere & Co. Service Publications. Please allow three weeks for delivery. Prices include handling, taxes and postage to anywhere in the U.S.A. and Canada.

John Deere Distribution Service Center
Department S/P
1400 3rd Ave.
Moline, Ill. 61265

Please send to...

Name

Address

Town

State Zip

Title	Order No.	Qty.	Price Each
Parts Catalog 440 Liquifire Snowmobile (Serial No. 120,001-)	PC-1742		\$ 3.00
Operator's Manual 440 Liquifire Snowmobile (Serial No. 120,001-)	OM-M67978		\$ 1.00
Service or Technical Manual 440 Liquifire Snowmobile (Serial No. 120,001-)	TM-1217		\$12.25

NOTE: If you want manuals or catalogs for equipment not shown on this list, list the model number, serial number and name of the equipment below.

Illinois State Residents add 5% for ROT. ☐

Check or money order in U.S. dollars enclosed ... Total
(Do not send cash or stamps)

Prices subject to change without notice.

PARTS CATALOG



A parts catalog containing exploded view illustrations and lists of all parts is useful when purchasing service parts. Helps identify the correct parts. Useful in assembling and disassembling.

OPERATOR'S MANUAL



An extra copy of the operator's manual may be important if the copy furnished with your machine is misplaced.

SERVICE OR TECHNICAL MANUAL



The service or technical manual is a service guide for your machine. Included in the manual are specifications, diagnosis and adjustments, illustrations of special assembly and disassembly procedures, and wiring diagrams.

JOHN DEERE SERVICE LITERATURE AVAILABLE...

PARTS CATALOG



The John Deere parts catalog is a comprehensive guide to the thousands of parts used in John Deere equipment. It includes detailed drawings, part numbers, and descriptions for every component. The catalog is organized by equipment type and then by individual parts, making it easy to find the information you need. It is an essential reference for anyone working on John Deere machinery.

OPERATOR'S MANUAL



The operator's manual provides detailed instructions on how to safely and efficiently operate John Deere equipment. It covers everything from basic operation to advanced techniques and troubleshooting. The manual is written in clear, easy-to-understand language and includes numerous diagrams and photographs to illustrate key points. It is a must-have for every John Deere operator.

SERVICE OR TECHNICAL MANUAL



The service or technical manual provides detailed information on the internal components and systems of John Deere equipment. It is used by technicians and mechanics to diagnose and repair problems. The manual includes detailed drawings, part numbers, and step-by-step instructions for disassembly and reassembly. It is a comprehensive guide to the inner workings of John Deere machinery.

Model	Year	Part Number
100	1970	100-1000
100	1971	100-1000
100	1972	100-1000
100	1973	100-1000
100	1974	100-1000
100	1975	100-1000
100	1976	100-1000
100	1977	100-1000
100	1978	100-1000
100	1979	100-1000
100	1980	100-1000

John Deere Service Literature is available in a variety of formats, including printed manuals, microfiche, and electronic versions. We offer a wide range of options to suit your needs and budget. Contact us today to learn more about our services and products.

John Deere Service Literature is available in a variety of formats, including printed manuals, microfiche, and electronic versions. We offer a wide range of options to suit your needs and budget. Contact us today to learn more about our services and products.

John Deere Service Literature is available in a variety of formats, including printed manuals, microfiche, and electronic versions. We offer a wide range of options to suit your needs and budget. Contact us today to learn more about our services and products.



John Deere Service Literature is available in a variety of formats, including printed manuals, microfiche, and electronic versions. We offer a wide range of options to suit your needs and budget. Contact us today to learn more about our services and products.