

OM

Operator's Manual

John Deere
300 and 400
Snowmobiles

DEALER
SERVICE SHOP
COPY

OM-M66064
Issue D5





Safety Precautions

CAUTION: A snowmobile is no safer than the person operating it. Improper use or maintenance on the part of the operator can result in injury. To reduce this possibility, 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. See "Code of Ethics" on page 12.

Never add fuel when smoking or while engine is running. Use a safe gasoline container. Always use fresh, clean fuel of the proper mixture. See pages 6 and 38.

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 headgear protection to guard against 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. See page 10.

Always use the "buddy system" on long trips. 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. See page 14.

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.

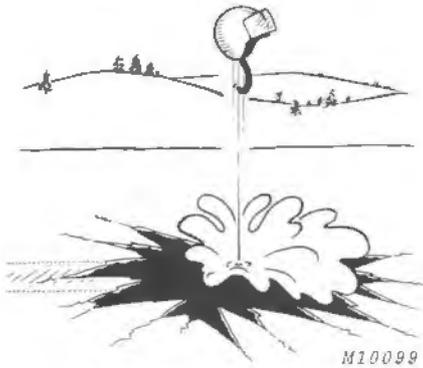
Do not operate snowmobile too close to avalanche areas, or on other unsafe terrain where spills could occur.

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 hillsides. 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, protective hoods and consoles.

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. Press emergency stop switch (once) on the right-hand handlebar. See page 8.

Drive at a slower rate of speed when carrying a passenger...especially a child.

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.

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

Remove key from ignition 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

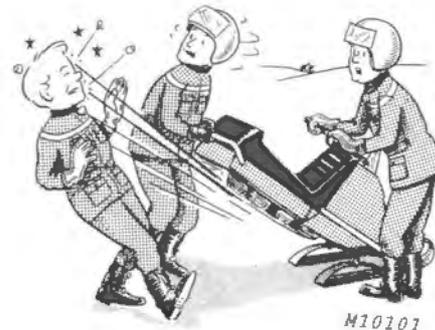
Check over your snowmobile regularly. This will prevent many problems from occurring.

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 or charging battery. 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.





To the Purchaser

Look around you. Snowmobiling has really caught on...it's the fastest growing winter sport in America. Take a few minutes to be sure that it's a safe sport for you and your family...read this operator's manual carefully. You'll have more fun...have fewer problems.

Keep your operator's manual in the re-usable, waterproof Zip-Lock envelope provided with your manual. Keep it handy in your snowmobile storage compartment.

Before operating your new snowmobile, check and observe all state and local regulations pertaining to snowmobiling. Respect the property of others. Don't spoil a fine sport for others.

! **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 read carefully the message that follows.**

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

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

John Deere 300 Snowmobile (Serial No. J300E 055001M-)
John Deere 400 Snowmobile (Serial No. J400E 055001M-)

John Deere Snowmobiles

Model No. (300 or 400) _____

Machine Serial No _____

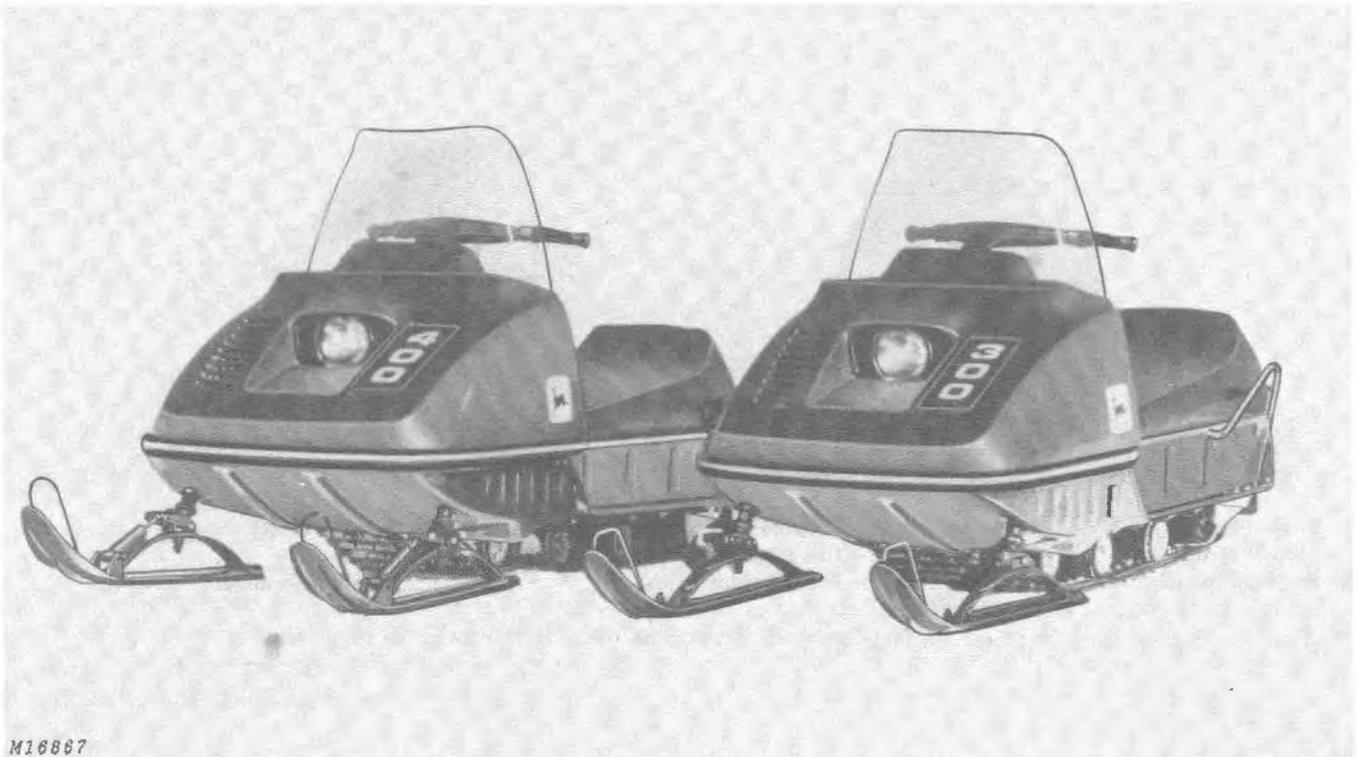
Engine Serial No _____

To the Purchaser



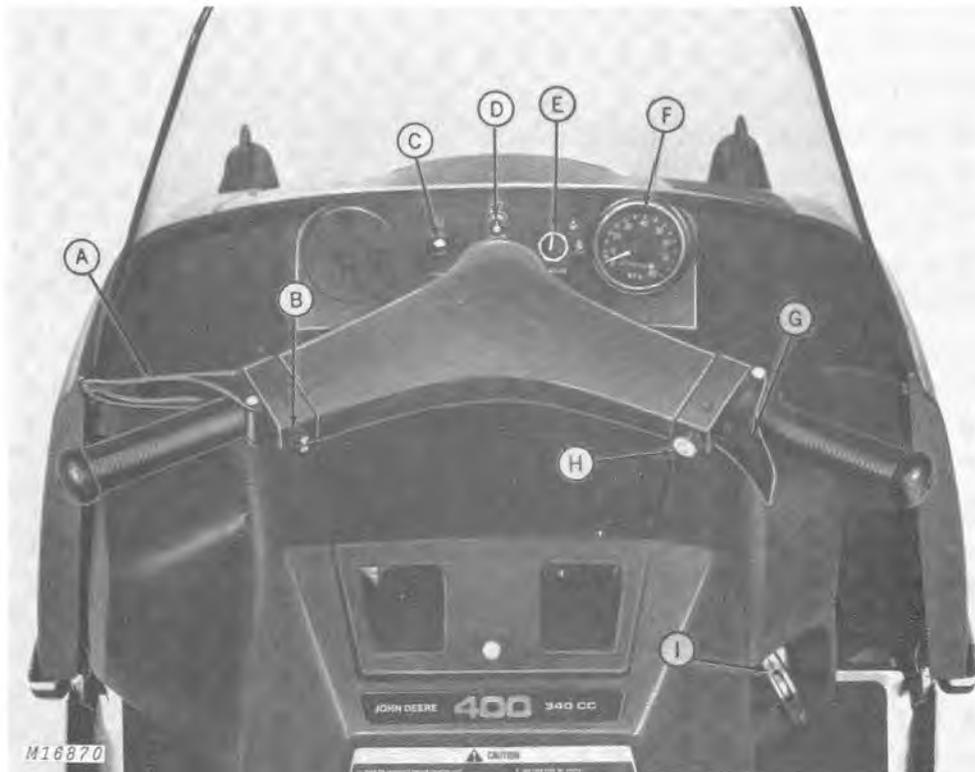
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Controls



- A - Brake Control** - Compress control handle toward handlebar for braking action.
- B - Headlight (Hi-Lo) Dimmer Switch** - Push once for low beam; push again for high beam. See page 9.
- C - Choke** - Pull out to start. Push choke in when engine begins to run smoothly.
- D - Light Switch** - Move light switch up (forward) to turn lights on; pull down (rearward) to turn lights off. Stop light comes on when brakes are applied.
- E - Ignition Switch** - To start engine manually, turn key to "RUN" position and pull recoil starter rope. If equipped with electric start, turn key to "START" to crank engine. Release and key returns to "RUN" position. Turn key to "OFF" position to shut off engine.

NOTE: (Electric Start Models) If engine "false-starts", return key to "OFF" position before attempting to restart.

- F - Speedometer - (Extra Equipment)** - Indicates vehicle speed in miles-per-hour (mph) and records total mileage.
- G - Throttle Control** - Compress control lever toward handlebar to increase engine speed.
- H - Emergency Stop Switch** - Stops engine immediately by grounding out ignition. Push once to stop engine. Push again to allow starting. See page 8.
- I - Recoil Starter** - Used to start engines not equipped with electric start... provides a backup starting system on machines with electric start.



Operation

BEFORE STARTING ENGINE

Mixing Gasoline and Oil

Two-cycle snowmobile engines require that oil be mixed with the gasoline. It is important that quality gasoline and oil are used and mixed thoroughly in the proper ratio. Too little oil results in engine damage, while too much oil will cause spark plug fouling and excessive smoking.

NOTE: Mix gasoline with John Deere Snowmobile Oil, which is an ashless, 2-cycle oil without metallic additives. John Deere Snowmobile Oil meets BIA (Boating Industry Association) test qualification TC-W, test procedure BIA-312-69, and is available in 1-pint and 1-quart "pop-top" cans.

IMPORTANT: Gasoline for the 300 and 400 Snowmobiles must be regular or premium grade with an octane rating of 90 or higher. Premium grade is recommended for continued high-speed operation. DO NOT use non-leaded gasoline.

NOTE: Some gasoline anti-freeze additives could cause carburetor diaphragm damage.

For the first tank of fuel used, mix gasoline and oil in a 40 to 1 ratio (1 pint [0.473 l]) of oil with 5 U.S. gallons [18.9 l] or 4 Imperial gallons [18.2 l] of gasoline). After this break-in period, mix gasoline and oil in a 50 to 1 ratio (1 pint [0.473 l] of oil with 6 U.S. gallons [22.7 l] or 5 Imperial gallons [22.7 l] of gasoline).

See specifications on page 38 for United States and Canadian gasoline and oil mixtures.

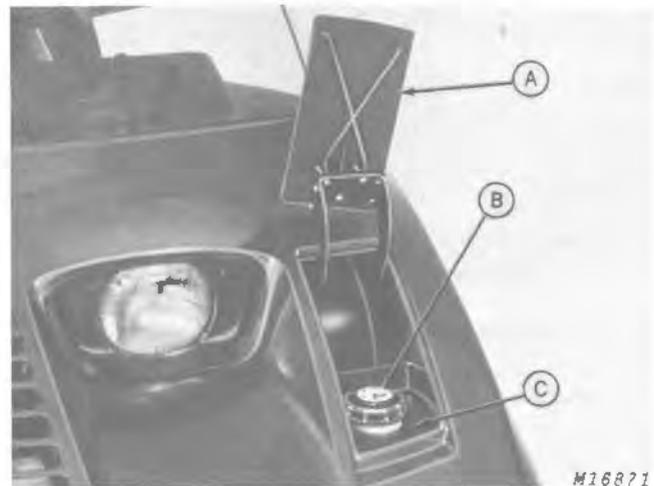
IMPORTANT: If other than John Deere Snowmobile Oil is used, it should meet BIA (Boating

Mix fuel according to the following procedure:

Pour the required amount of John Deere snowmobile oil into a clean container...add one-half the necessary gasoline and shake vigorously. Add the remainder of the gasoline and agitate the mixture thoroughly. Mix gasoline and oil in a separate container...never mix in the snowmobile fuel tank. The John Deere Gasoline Can (TY5027) is ideal for snowmobile use.

CAUTION: Dirty fuel can cause engine failure that could leave you stranded...this could be dangerous in severe weather. Always use clean, fresh fuel.

Filling Fuel Tank



A—Access Door B—Fuel Cap C—Spill Tray

Open access door (A) in hood. Remove fuel cap (B). If available, use a fine screen funnel when refueling. Should spillover occur, the spill tray (C) will drain excess fuel onto snow. Fuel tank capacity is

Operation

Pre-Starting Inspection

CAUTION: Before starting your snowmobile the first time, read this entire manual and all decals on your snowmobile. Each time thereafter do the following:

1. Wipe the windshield with a clean damp cloth. Do not scratch it. Do not clean windshield with gasoline, solvents or abrasive cleaners.
2. Check skis, wear rods and all steering components and bolts for wear. Tighten all bolts and replace worn or damaged parts.
3. Check track for proper tension.
4. Check throttle and brake controls for freeness of operation and proper adjustment.
5. Check fuel level.
6. Start engine and test operation of emergency stop switch, headlight, dimmer switch, taillight and stop light.

STARTING THE ENGINE

CAUTION: When starting your snowmobile be sure there are no bystanders behind or in front of your machine.



Starting A Cold Engine

Manual Recoil Start

NOTE: In extreme cold weather, with NO choke and NO throttle, pull the recoil start to turn the engine over 2 or 3 times. This will break loose any friction between the piston and cylinder.

1. Turn key switch to "RUN" position.
2. Push emergency stop switch to "ON" position. See page 8.

3. Pull choke knob out. Use your left hand and hold the throttle approximately 1/3 open. Pull recoil start slowly until it catches... then pull rope vigorously.

NOTE: Let the recoil start handle return slowly into the housing. Do not release and let it snap back.

CAUTION: When engine starts, be prepared to release the throttle and apply brake to prevent snowmobile movement.

4. When engine starts, push choke in and allow engine to warm up briefly.

5. If engine becomes "flooded", push choke in and hold throttle slightly open while cranking.

NOTE: It may be necessary to remove and dry or replace spark plugs if engine is extremely flooded.

IMPORTANT: Do not permit engine to idle for long intervals. Spark plug fouling could occur. Shut off the engine whenever you stop.

Starting a Warm Engine

DO NOT choke. Use partial throttle when restarting a warm engine.

Electric Start

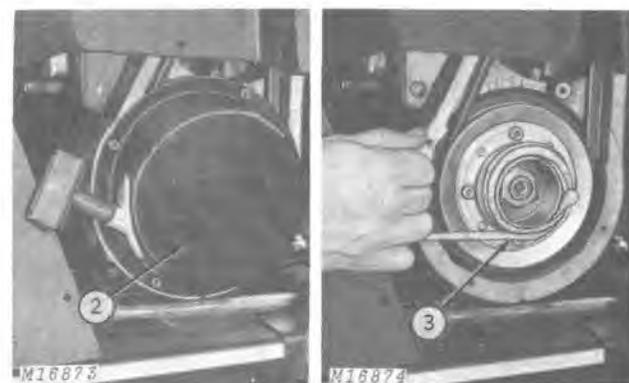
Use exactly the same procedure as described under manual start. The only difference is that starter turns the engine instead of the recoil start.

NOTE: If engine "false starts" and key switch returns to "RUN" position, switch must be returned to "OFF" position before attempting another start.

Emergency Starting

In an emergency, when both recoil and electric start systems are inoperative, use the following starting procedure:

300 Snowmobile



Emergency Starting—Continued

300 Snowmobile

1. (Not illustrated.) Remove right-hand access panel and fan guard.
2. Remove recoil starter using 3/16-inch Allen wrench.
3. Wrap the first turn of the rope around the drive hub at an angle and then wrap succeeding turns over the first turn to provide a firm grip on the hub.

400 Snowmobile



1. (Not illustrated.) Remove right-hand access panel.
2. Remove recoil starter using 10 mm wrench.
3. Wind a rope around the starter cup pulley.
4. Pull on rope to crank engine.

All Snowmobiles

Carry a screwdriver, starter rope and 3/16-inch Allen wrench (300 only) in your storage compartment (in addition to your tool kit) for emergency starting. See page 14.

The snowmobile recoil starter rope can be used as the emergency starter rope, if desired.

STOPPING THE ENGINE

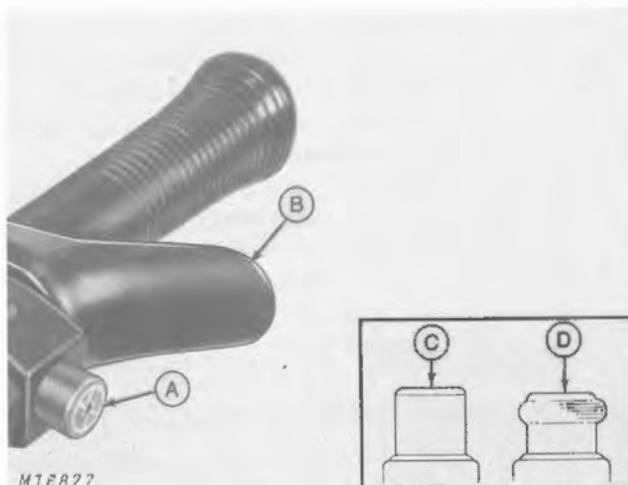
To stop the engine under normal circumstances, release throttle control lever and turn ignition key to "OFF" position.

IMPORTANT: Do not permit engine to idle for long intervals. Spark plug fouling could occur. Shut off the engine whenever you stop.

Emergency Stopping

300 Snowmobile

1. (Not illustrated.) Remove right-hand access panel and fan guard.
2. Remove recoil starter using 3/16-inch Allen wrench.
3. Wrap the first turn of the rope around the drive hub at an angle and then wrap succeeding turns over the first turn to provide a firm grip on the hub.



A—Emergency Stop Switch
B—Throttle Control

C—"ON" Position
D—"OFF" Position

The emergency stop switch (A) grounds out the ignition and brings the engine to a quick stop. Before the machine can be restarted, you must push switch to "ON" position (C). See inset for "ON" and "OFF" switch positions (C and D).

NOTE: Always check position of switch (A) before attempting to start your snowmobile.

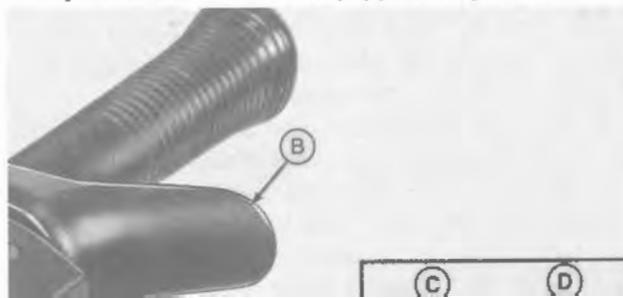
OPERATING THE LIGHTS

The John Deere snowmobile features a regulated electrical system. This regulation offers uniform lighting at all engine speeds and prevents all bulbs from burning out should one fail.



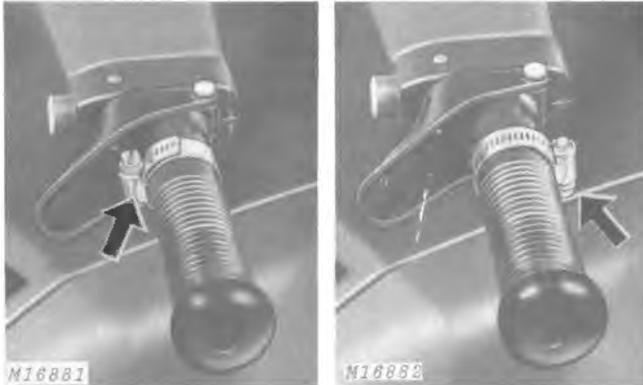
Push the light switch up (forward) to operate the lights. The stoplight will come on whenever the brake is operated whether lights are "ON" or "OFF".

If your snowmobile is equipped only with manual



Getting Acquainted with Your Snowmobile

To enjoy your new snowmobile to the fullest, you must become well-acquainted with it. Select a wide open, level area for your first ride. Try out the controls. As you gain confidence and learn more how you and the machine work together as a team, open the throttle gradually.



Throttle (Speed) Restricted

Throttle (Speed) Unrestricted

When teaching young persons to ride, you may wish to restrict throttle operation with a hose clamp, John Deere Part No. AR21839, as shown above. The clamp can be turned out of the way or removed for unrestricted throttle operation.

Choosing Your Driving Position

Whether you sit, kneel, or stand when operating your snowmobile should be dictated by your comfort, ability to operate controls, and the terrain. Maintain flex in legs when standing...especially over rough terrain.

Level Surfaces

For longer rides on level surface, the sitting position will no doubt be the most comfortable. Place feet on front footrests, slide back on seat until comfortable.

To enjoy your new snowmobile to the fullest, you must become well-acquainted with it. Select a wide open, level area for your first ride. Try out the controls. As you gain confidence and learn more how you and the machine work together as a team, open the throttle gradually.

Going Straight Up or Down Hills

The sitting position is usually recommended when going straight up or down hillsides. When ascending accelerate at bottom of hill. When descending brake occasionally, but never lock the track.

CAUTION: Never apply brakes fully on hills. Release your throttle and "play" brakes gently to keep track from locking and snowmobile from "tobogganing."

Cross Hillsides

Here the kneeling position can prove helpful. Place one foot on the footrest that is "uphill"...the other knee on the seat. Using this position, you can lean into the hillsides.

Turning

When turning, always lean or shift weight into the turn to prevent rollover regardless of riding position. High speed turns should be made by shifting weight in a seated position. This keeps the center of gravity low.

Clearing The Track

After operating in deep or slushy snow, clear the track. Snow and ice could freeze the track, making starting difficult the next time.

Tip the machine on its side until the track clears the ground. Spin the track at moderate speed until snow and ice are thrown clear.

CAUTION: Always check to see there is nobody behind your machine when clearing track. Ice or rocks could be thrown from the track.

IMPORTANT: If the track does freeze, free the track manually rather than attempting to break it loose with the engine. Breaking track loose with engine will burn and damage the drive belt.

The sitting position is usually recommended when going straight up or down hillsides. When ascending accelerate at bottom of hill. When descending brake occasionally, but never lock the track.

CAUTION: Never apply brakes fully on hills. Release your throttle and "play" brakes gently to keep track from locking and snowmobile from "tobogganing."

Dressing for the Weather

To enjoy snowmobiling fully, and to be safe from frostbite, dress for the wind and weather.

Even the mildest temperatures can prove uncomfortable when traveling at high speed...or if strong winds are blowing.

The chart below provides a handy guide, and illustrates the danger zone when you're most susceptible to frostbite. Dress according to this wind chill factor...not the temperature.

Wear protective snowmobile uniforms and accessories, available from your local dealer. See page 36.

CAUTION: Always wear a snowmobile helmet when snowmobiling. The helmet provides both warmth and protection against accidental 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 additional effect)	LITTLE DANGER (for properly clothed person)			INCREASING DANGER				GREAT DANGER Danger from freezing of exposed flesh				

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CAUTION

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| <ol style="list-style-type: none"> 1. Read the operator's manual carefully and follow "Before-Starting" check list daily. 2. Be sure throttle and brake controls operate freely. 3. Before starting, be sure area ahead is clear. 4. Know the controls and how to stop. | <ol style="list-style-type: none"> 5. Use rigid hitch for towing. 6. Keep hands and feet away from track especially when freeing a stuck machine. 7. Keep all shields in place. 8. Shut off engine before refueling. |
|---|--|



ATTENTION

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Lisez attentivement le Livret d'Entretien et suivez toujours les conseils "Avant le Démarrage." 2. Assurez-vous que l'accélérateur et le frein fonctionnent librement. 3. Avant de démarrer, assurez-vous que le terrain est dégagé. 4. Sachez utiliser les commandes et comment arrêter la machine. 5. Pour le remorquage, utilisez un attelage rigide. | <ol style="list-style-type: none"> 6. Gardez vos mains et vos pieds à l'écart de la chenille particulièrement lorsque vous dégager une machine enneigée. 7. Laissez tous les protecteurs en place. 8. Arrêtez le moteur avant de remplir le réservoir de carburant. |
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Snowmobile Code of Ethics

- | | |
|--|--|
| <ol style="list-style-type: none"> 1. I will be a good sportsman. I recognize that people judge all snowmobile owners by my actions. I will use my influence with other snowmobile owners to promote sportsmanlike conduct. 2. I will not litter trails or camping areas. I will not pollute streams or lakes. 3. I will not damage living trees, shrubs, or other natural features. 4. I will respect other people's property and rights. 5. I will lend a helping hand when I see someone in distress. 6. I will make myself and my vehicle available to assist search and rescue parties. | <ol style="list-style-type: none"> 7. I will not interfere with or harass hikers, skiers, snowshoers, ice fishermen or other winter sportsmen. I will respect their rights to enjoy our recreation facilities. 8. I will know and obey all federal, state and local rules regulating the operation of snowmobiles in areas where I use my vehicle. I will inform public officials when using public lands. 9. I will not harass wildlife. I will avoid areas posted for the protection or feeding of wildlife. 10. I will stay on marked trails or marked roads open to snowmobiles. I will avoid country travel unless specifically authorized. |
|--|--|

... *International Snowmobile Industry Association*

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|---|--|
| <ol style="list-style-type: none"> 1. Read the operator's manual carefully and follow "Before-Starting" check list daily. 2. Be sure throttle and brake controls operate freely. 3. Before starting, be sure area ahead is clear. 4. Know the controls and how to stop. | <ol style="list-style-type: none"> 5. Use rigid hitch for towing. 6. Keep hands and feet away from track especially when freeing a stuck machine. 7. Keep all shields in place. 8. Shut off engine before refueling. |
|---|--|



ATTENTION

- | | |
|---|--|
| <ol style="list-style-type: none"> 1. Lisez attentivement le Livret d'Entretien et | <ol style="list-style-type: none"> 6. Gardez vos mains et vos pieds à l'écart de la |
|---|--|



Maintenance

NOTE: Be sure to have your dealer perform the free 10-hour check-up as described on the insert sheet at the front of this manual.

This section of your operator's manual describes the adjustments and services that you can perform to keep your snowmobile running smoothly. At times your snowmobile may need service that requires special tools or "know-how" . . . then it is best to contact your John Deere dealer.

EMERGENCY REPAIR ITEMS

Carry necessary tools and repair items in your snowmobile storage compartment to:

1. Replace the drive belt.
2. Change spark plugs.
3. Adjust track tension.
4. Adjust the brake.
5. Tow a disabled snowmobile.
6. Start the engine if recoil starter fails.



Following is a recommended list of items to carry:

- Nylon Starting/Tow Rope
- Extra Drive Belt
- Two Extra Spark Plugs

NOTE: Extra drive belt can be carried in the snowmobile engine compartment area to save storage compartment space for other items.

REMOVING CONSOLE



The console contains three access panels. The top panel is secured with a thumbscrew; the right- and left-hand side panels by machine screws.

To remove the console:

1. Remove left-hand access panel and top access panel.
2. Open hood and remove windshield.
3. Remove two screws securing console to tunnel (one on right-hand side, one on left-hand side).

300 SNOWMOBILE SPARK PLUGS

Spark plugs will probably require more attention than any other item on your snowmobile. Spark plugs should frequently be removed for cleaning, gapping and **inspection of color**.

Spark Plug Maintenance

Remove top access panel and carefully pull spark plug connectors from plugs.

IMPORTANT: Do not pull on wire to remove connectors. Carefully pull spark plug connectors from plugs.

Remove spark plugs using tool supplied with snowmobile. Analyze condition before cleaning or discarding. Check plug color periodically. See page 17.



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If inspection reveals plugs are still serviceable, clean and regap plugs to 0.020 inch (0.508 mm).

Wet-fouled plugs can occasionally be salvaged by drying with a match or by cleaning with carburetor cleaner and a tooth brush.

Clean the spark plug seating surface on cylinder head and install plugs. Tighten moderately, being certain spark plug gasket makes good contact with cylinder head. If not, clean carbon from cylinder head threads with a spark plug tap.

Reinstall spark plug wires and top access panel.

Spark Plug Analysis

Carefully examine spark plugs to determine if spark plug heat range and carburetor adjustments are correct.

Use the chart on page 17 in addition to the following as a guide in making corrections.

Ideal Spark Plug



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A spark plug insulator tip with brown or dark tan color, few combustion deposits, and with electrodes not burned or eroded, indicates ideal operation. Carburetor adjustments and spark plug heat range are both correct. A spark plug having this appearance can be gapped, cleaned and reinstalled.

Overheated Spark Plug



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A spark plug insulator tip with light gray or chalky-white color indicates an "overheated" condition. An "overheated" plug will cause pre-ignition, resulting in engine damage.

This is usually caused by too "lean" a carburetor setting or by using a spark plug with too "hot" a heat range for operating conditions. Air leakage past carburetor or intake manifold gaskets could also be at fault.

300 SNOWMOBILE SPARK PLUGS—Continued

"Wet-Fouled" Spark Plug



A black color and a damp, oil film over the firing end, indicates a wet-fouled spark plug.

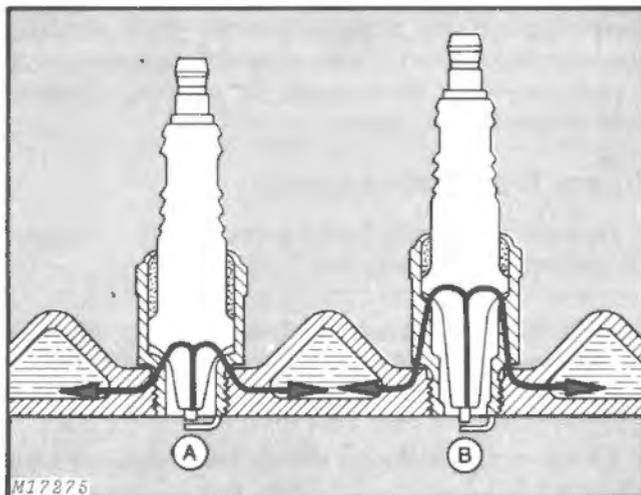
This condition is caused by excessive oil in the fuel mixture, carburetor adjustments too "rich," or too "cold" a spark plug for operating conditions. Excessive idling could also be at fault.

Spark Plug Heat Ranges

Spark plugs must operate within a specific temperature range to provide good performance. The spark plug design determines this operating temperature range. See illustration at above right.

The factory installed spark plugs in your snowmobile are of a "normal" heat range for normal operation. Normal operation includes mostly medium-duty use with occasional slow-speed (light-duty) or high-speed (heavy-duty) operation.

If prolonged slow-speed (light-duty) operation is expected, you may have to switch to the "hot" spark plugs listed in the "Spark Plug Chart" to



A—Cold

B—Hot

prevent spark plug fouling. However, improper carburetor adjustments could also be at fault. See pages 18 and 19.

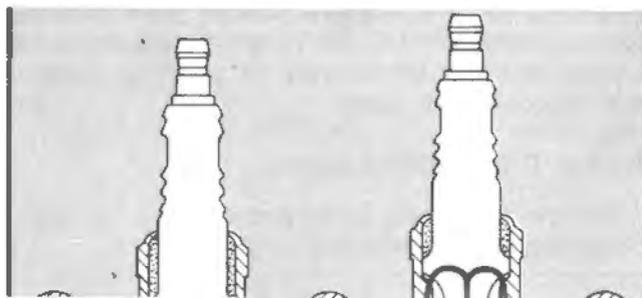
IMPORTANT: Always start with the factory installed, "normal" heat range plugs. Use "hot" spark plugs only if fouling is encountered and proper carburetor adjustments do not correct condition. Use "hot" spark plugs for prolonged light-duty operation only, or pre-ignition and piston damage will result.

If prolonged high-speed (heavy-duty) operation is expected, switch to the "cold" spark plugs listed in the "Spark Plug Chart".

IMPORTANT: The use of "normal" or "hot" spark plugs under prolonged heavy-duty operating conditions will cause pre-ignition and piston failure.

The spark plugs listed in the chart on page 39 are available from your John Deere dealer.

"Wet-Fouled" Spark Plug



300 SNOWMOBILE ENGINE PERFORMANCE CHART

Plug Description (Insulator Tip Color)	Plug Change		Adjust Carburetor (High-Speed Needle)
Black and wet	Change to hotter plug and stop long periods of idling.	and/or	Lean carburetor 1/8-turn or less clockwise
Black and dry	Consider hotter plug if present driving pattern is planned.	and/or	Lean carburetor 1/8-turn or less clockwise
Charcoal to brown	OK, but idle engine a little less or drive a little faster.	and/or	Lean carburetor 1/16-turn clockwise
Brown to dark tan	Ideal		Ideal
Tan	OK, but avoid longer, faster runs.	and/or	Adjust carburetor 1/8-turn richer (counterclockwise)
Light tan to white	Consider colder plug, slow down.	and/or	Adjust carburetor 1/8-turn richer (counterclockwise)
Grey to white	STOP - Change to colder plug. Severe engine damage will result.	and	Adjust carburetor richer (counterclockwise)

- NOTE:** 1. The carburetor low-speed needle plays a part. Be sure it is adjusted according to instructions on page 18.
2. Oil selection and mixture are important. Use John Deere Snowmobile Oil mixed at a 50 to 1 ratio. See pages 6 and 38.
3. Speeding up your pattern of operation can lighten plugs. Slowing down will darken them. A tan plug can become hazardous to the engine if prolonged higher speeds are expected. A charcoal plug can wet-foul if slower speeds are expected.
4. Excessive idling will cause a black and wet plug condition, even if heat range and carburetor adjustments are proper. Long periods of idling should be avoided.

400 SNOWMOBILE SPARK PLUGS

NOTE: The spark plugs used in the 400 Snowmobile are Champion QN 19-V (John Deere Part No. AM53787).

Removing Spark Plugs

⚠ CAUTION: High-energy ignition systems can produce injurious electrical shock. Always stop engine and remove key from switch before touching or working on any ignition parts. **DO NOT** hold spark plug, leads or connectors in hand to check for spark.

Stop the engine. Remove the top access panel and carefully pull spark plug connectors from plugs.

IMPORTANT: Do not pull on wire to remove connectors. Carefully pull spark plug connectors from plugs.

Remove plugs.

Checking Spark Plug

Heavily carboned (sooted) plugs can fire properly with capacitor discharge ignition systems (CDI). Only a spark plug with a cracked external insulator or one that is carbon-tracked cannot function properly with this system. An insulator cracked around the electrode will not harm spark plug performance.

If the spark plug center electrode is burned back 1/32 inch (0.794 mm) below the insulator, replace the plug. Do not replace the plug unless this condition exists, the external insulator is cracked or the plug is carbon-tracked.

To check for plug spark with capacitor discharge ignition (CDI), stop the engine. Remove spark plug and reconnect spark plug wire to plug. Lay the plug on the engine shroud. **Do not hold the plug or plug wire in your hand.** Pull the starter rope and check for spark. Replace plug if necessary.

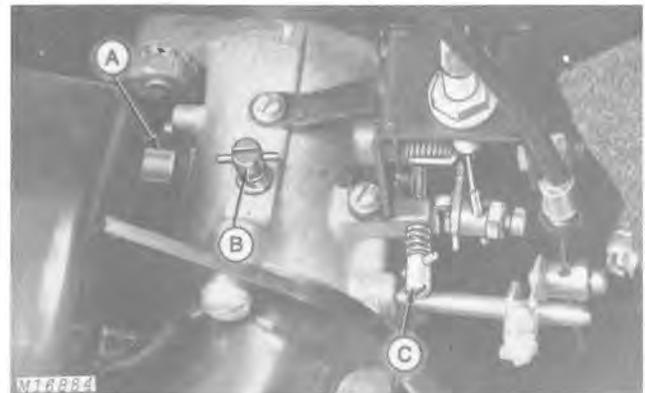
Installing Spark Plug

Clean the spark plug seating surface on the cylinder head and install plugs. Tighten moderately, being certain spark plug gasket makes good contact with cylinder head. If not, clean carbon from cylinder head threads with a spark plug tap. **NOTE:** The spark plugs used in the 400 Snowmobile are Champion QN 19-V (John Deere Part No. AM53787).

Removing Spark Plugs

⚠ CAUTION: High-energy ignition systems can produce injurious electrical shock. Always stop engine and remove key from switch before touching or working on any ignition parts.

ADJUSTING CARBURETOR



A—Low-Speed Needle
B—High-Speed Needle

C—Idle Stop Screw

There are three external carburetor adjustments; the low-speed needle (A), high-speed needle (B) and idle stop screw (C). Ride the snowmobile for a short distance to fully warm-up the engine. Remove the top access panel and adjust the carburetor in the following manner:

Adjusting Low-Speed Needle

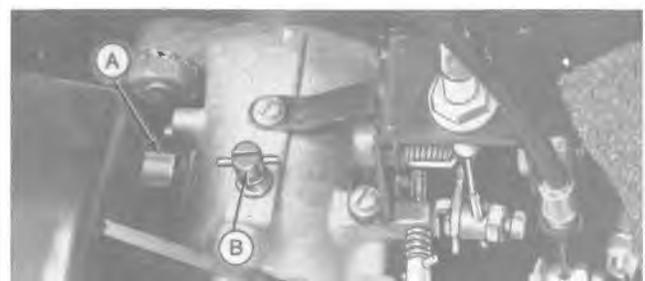
1. Shut off the engine.
2. Carefully turn the low-speed needle (A) clockwise until lightly seated. Do not force.
3. Back low-speed needle (A) out 1/2 turn.
4. Start engine.
5. Turn low-speed needle (A) clockwise or counterclockwise until smoothest running and highest rpm is obtained.

NOTE: Keep the low-speed needle (A) adjusted as lean (turned clockwise) as possible, while still providing smooth idling and unfaltering acceleration. This will reduce spark plug fouling.

Adjusting Idle Stop Screw

The idle stop screw (C) is adjusted only when a change in idle speed is required. Set the idle speed at 2200 to 2600 rpm.

Generally, if the idle stop screw (C) is adjusted, the low-speed needle (A) will have to be readjusted.



Adjusting High-Speed Needle

1. Shut off the engine.
2. Carefully turn the high-speed needle (B) clockwise until lightly seated. Do not force.
3. Back high-speed needle (B) out 1-1/4 turn.
4. Start engine and take snowmobile for a high-speed trial run in a large, level area.
5. Stop, turn high-speed needle (B) 1/8 turn or less clockwise, and make another trial run.
6. Continue this procedure, 1/8 turn or less at a time, clockwise or counterclockwise, until optimum performance is obtained.
7. Turn high-speed needle (B) 1/8 turn counterclockwise for final adjustment.

IMPORTANT: Too lean (turned clockwise) a high-speed needle setting can seriously damage your engine.

NOTE: High altitude (distance above sea level) requires a leaner carburetor setting. Use the following rule for leanest possible high-speed needle (B) setting.

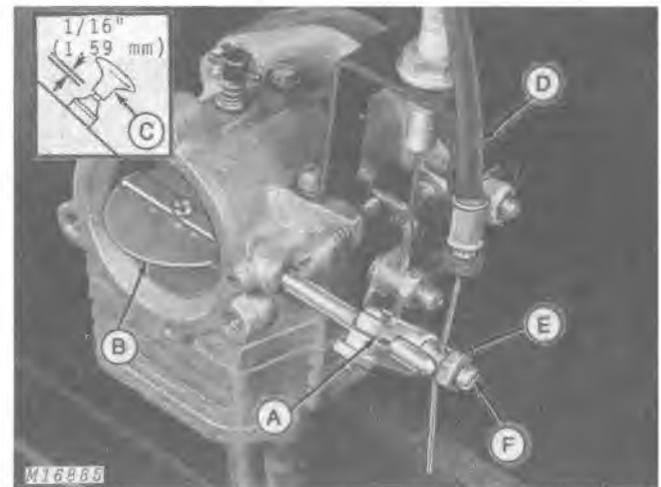
Above 5000 feet altitude (1524 meters) =
5/8 turn open

If, after setting high-speed needle (B) correctly, engine falters or hesitates on acceleration, it may be necessary to lean or enrichen low-speed needle (A) slightly to correct this condition.

On 300 Snowmobiles, spark plug heat ranges and carburetor high-speed needle settings work together in affecting spark plug insulator tip color. See "Engine Performance Chart" on page 17 for additional information.

IMPORTANT: Never set the high-speed needle (B) with the track off the ground and the engine in a "no-load" situation. Engine must be under load to prevent engine damage from overspeeding and to obtain proper carburetor adjustment. Overspeeding the engine may damage or destroy cooling fan belt.

ADJUSTING CHOKE



A—Choke Lever
B—Choke Plate
C—Choke Knob

D—Choke Cable
E—Swivel
F—Set Screw

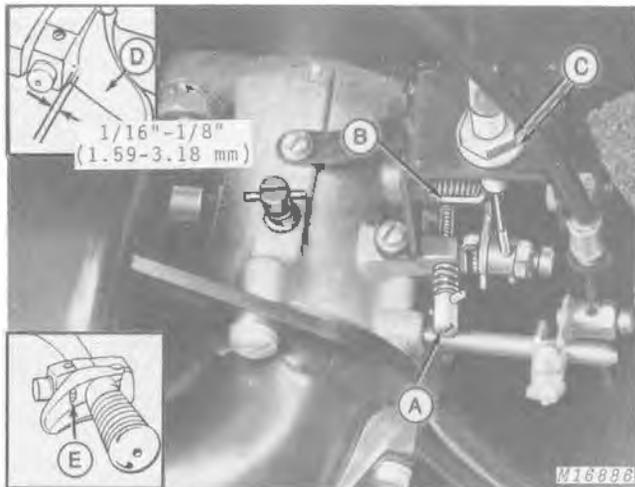
Choke Plate in Full Open Position

1. Loosen set screw (F) in choke lever swivel (E) to allow swivel to slide on wire.
2. Pull out choke knob (C) on instrument panel approximately 1/16 inch (1.59 mm).
3. Slide swivel (E) on wire until choke plate (B) is in the full open position.
4. Tighten set screw (F).

Keep the choke adjusted so the choke plate (B) completely closes when the choke knob (C) is pulled out and completely opens when the knob is pushed in.

NOTE: Do not use force on choke lever (A). Lever should move freely with finger pressure when not connected to wire.

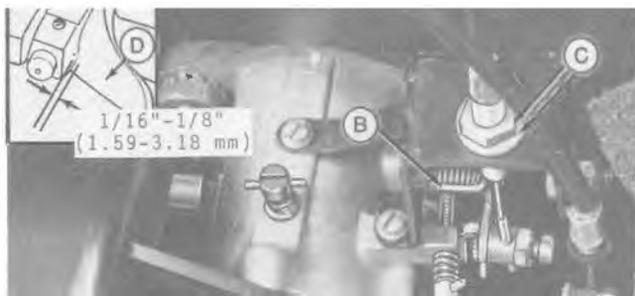
ADJUSTING THROTTLE



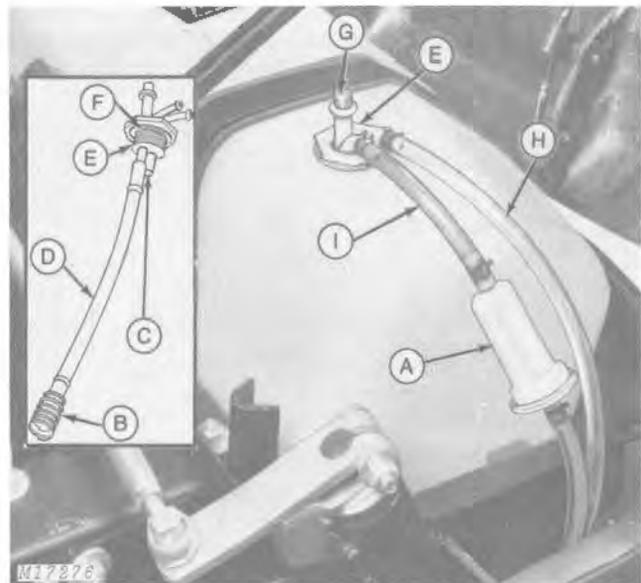
A—Idle Stop Screw
 B—Throttle Lever
 C—Jam Nuts
 D—Throttle Control
 E—Dowel

1. Loosen jam nuts (C) holding throttle cable.
2. Adjust cable up or down until throttle lever (B) rests against idle stop screw (A).
3. When in idle position, throttle control (D) on handgrip should have 1/16 to 1/8-inch (1.59 to 3.18 mm) free movement (upper inset) before activating throttle lever (B).
4. Squeeze throttle control (D) on handgrip to fast position and make sure throttle lever (B) is against stop.

CAUTION: Check position of dowel (E) (lower inset). This dowel must be seated properly in throttle control handgrip to obtain correct throttle adjustment.



CLEANING FUEL TANK SCREEN



A—In-Line Filter
 B—Screen with Check Valve
 C—Vapor Return
 D—Fuel Pickup Line
 E—Fitting
 F—Gasket
 G—Vent
 H—Clear Line
 I—Green Line

Remove fuel lines (H and I) from fitting (E). Unscrew fitting (E) and remove it from tank.

Clean screen (B) with gasoline and compressed air. Replace gasket (F) on fitting (E) if damaged.

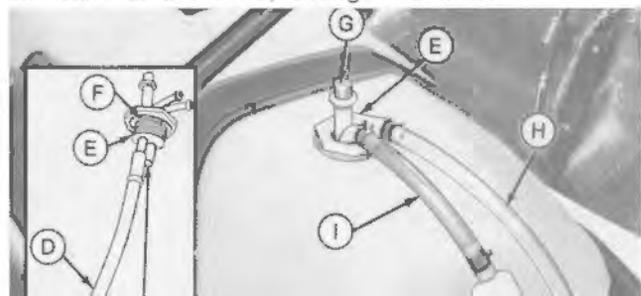
Blow into fuel pickup line (D). Check valve should prevent air passage. If not, replace screen assembly (B).

IMPORTANT: Connect green line (I) to rear fitting and clear line (H) to front fitting.

REPLACING IN-LINE FUEL FILTER

Change the filter annually when the snowmobile is taken out of summer storage, or as indicated by the contamination build-up in the cone.

The nylon screen in the in-line fuel filter has a self-cleaning action. Pulsation of the screen shakes loose contamination such as dirt, rust and small fibers. Loose contamination collects at the base of the cone. When the packed contamination starts to build up at the base of the cone, change the filter.



CHECKING FAN BELT TENSION

Shut off engine.

Remove the right-hand access panel. Remove fan guard to provide access to fan belt.



300 Snowmobile



400 Snowmobile

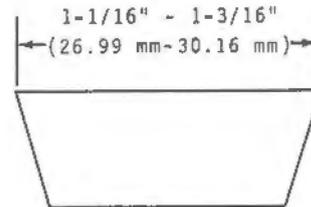
Use your finger to deflect belt as shown. If more than 3/8-inch (9 mm) deflection is possible or if belt condition is questionable, see your John Deere dealer. Belt tensioning or replacement requires the use of special tools.

SERVICING DRIVE AND DRIVEN SHEAVES

Once a year, the drive and driven sheaves on your snowmobile should be disassembled, cleaned and checked for worn parts. This service will keep your snowmobile in top operating condition. Because special tools are required to perform this maintenance, see your John Deere dealer.

REPLACING DRIVE BELT

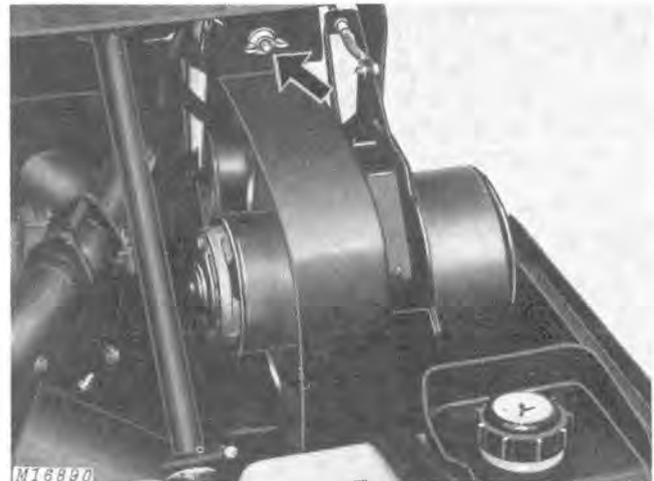
The drive belt should be replaced if obviously worn or damaged or if its width is reduced by 1/8 inch (3 mm) or more. A narrow belt will reduce snowmobile top speed.



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If drive belt wears rapidly, drive and driven sheaves are probably out of alignment. See your John Deere dealer because a special tool is required to align sheaves.

A belt worn narrow in only one area is caused by trying to free a frozen track with the engine. Always free a frozen track manually prior to starting engine.



1. Remove the left-hand access panel.

2. Loosen wing nut securing driven sheave belt guard. Deflect guard down and back to release it from wing nut to provide access to drive belt.



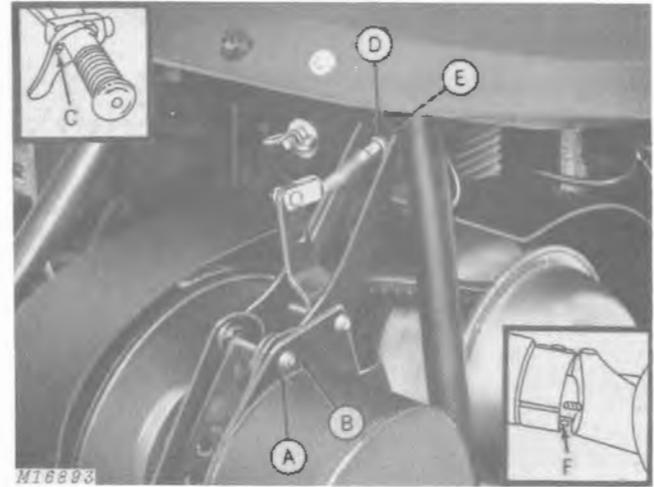
IMPORTANT: Never pry belt over sheaves. If driven sheave is opened properly, no prying is necessary.

3. Grasp movable half of driven sheave and rotate counterclockwise while pulling, to open.
4. Lift belt up and over sheave half to remove.
5. Remove belt from drive sheave last.

CAUTION: Keep fingers out of area between center of driven sheave halves when sheave is opened. If driven sheave sticks closed, use care in opening to prevent fingers from becoming pinched.

6. Install belt in the opposite sequence from which it was removed.
7. Tighten driven sheave belt guard and install left-hand access panel.

ADJUSTING BRAKE



- | | |
|--------------|--------------------|
| A—Anchor Pin | D—Nut |
| B—Rear Hole | E—Jam Nut |
| C—Dowel | F—Stoplight Switch |

2. Adjust brake by backing off nut (D) several turns and tighten jam nut (E) behind bracket.
3. Check brake tension.
4. Readjust if necessary.

In time, adjustment will be used up on the cable. When this occurs, loosen the cable adjustment and move the brake band anchor pin (A) to the rear hole (B). Adjust brake as explained above. When the adjustment is used up with the pin in the rear hole, see your dealer for brake band replacement.

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

After brake adjustment, check operation of stoplight switch (F). Check for a "frozen" switch if stoplight does not work.



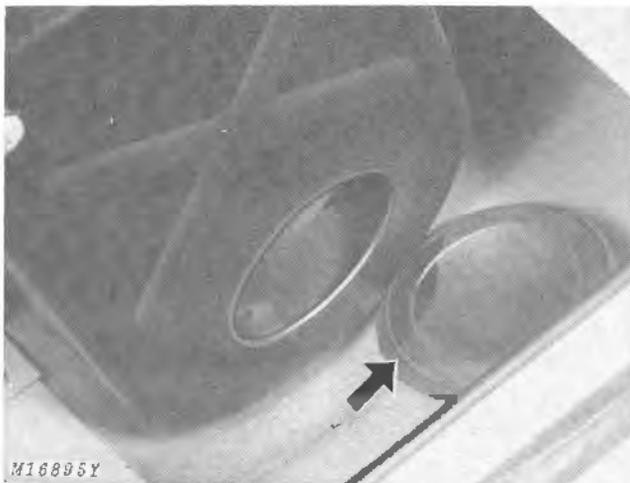
SERVICING DRIVE CHAIN



The drive chain operates in an oil bath and is tensioned with two spring-loaded tension blocks. No adjustment is necessary.

Periodically, remove upper access plug and inspect condition of drive chain, tension blocks and springs. See your dealer if service is required.

CHECKING CHAIN CASE OIL LEVEL



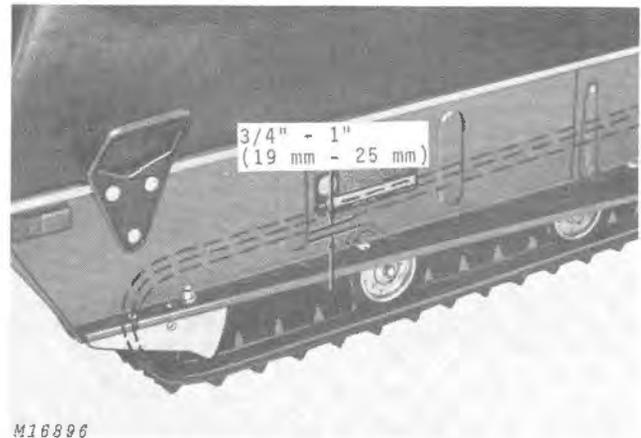
With the snowmobile parked on a level surface, open hood and remove lower access plug from chain case. The oil level should be about 1/4 to 1/2 inch (6 to 12 mm) below the access hole. Add SAE 30 oil if necessary. Install access plug.

NOTE: A light film of oil on the lip of the access plug will make installation easier.

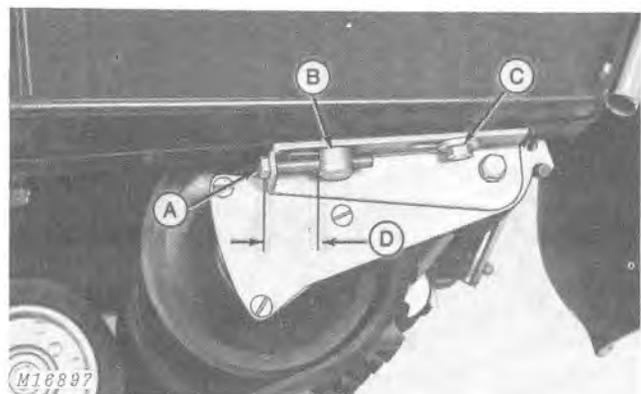
When placing machine in storage, remove oil from chain case with a syringe and replace with new SAE 30 oil.

ADJUSTING TRACK TENSION

Proper track tension is very important and is the key to obtaining maximum track life. If "ratcheting" of the track is noticed during operation, track tension is too loose. "Ratcheting" occurs when the drive lugs on the track slip over the cogs on the drive wheel. Check track tension as follows:



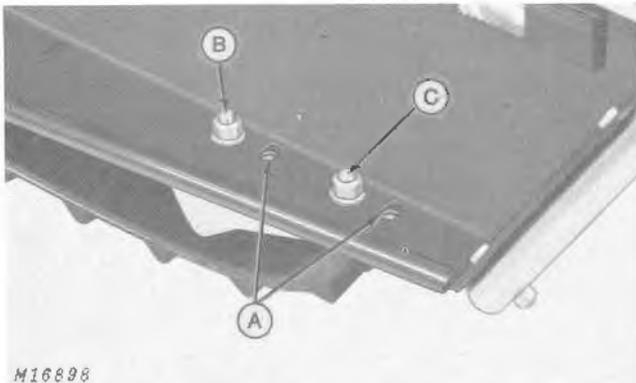
1. Place machine on a level surface with an operator on the seat.
2. Check clearance between the track stabilizers (located on the bogie tube) and the track. Clearance should be 3/4 to 1 inch (19 to 25 mm).
3. If clearance is more than 3/4 to 1 inch (19 to 25 mm), track is too tight; if less, track is too loose.



A—Adjusting Screw **C—Rear Bolt**
B—Trunnion Bolt **D—Both Sides Equal**

4. Loosen trunnion bolt (B) and rear bolt (C) on both sides of snowmobile.
5. Turn adjusting screws (A) into trunnions to increase track tension and out to decrease track tension.
6. Adjust both sides equally (D).
7. Tighten bolts.

IMPORTANT: Both sides must be adjusted equally with an equal length between screw head and trunnion bolt. Unequal adjustment will cause improper track alignment and possible track damage.

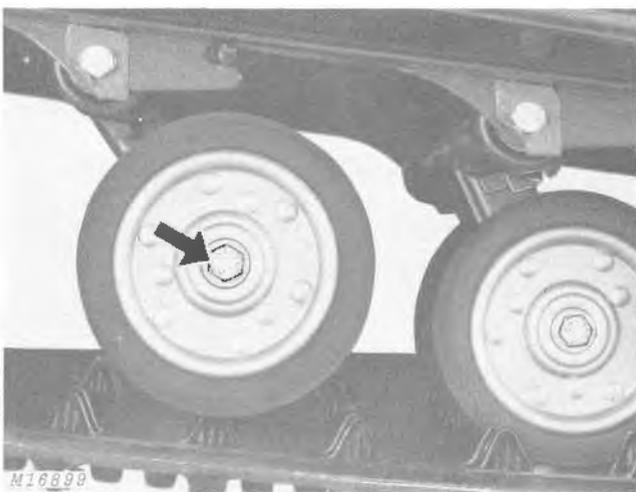


A—Rear Adjusting Holes
B—Trunnion Bolt

C—Rear Bolt

In time, adjustment will be used up on adjusting screws. When this occurs, transfer rear bolts (C) to rear holes (A); then, trunnion bolts (B) to rear holes. Adjust track as outlined previously.

REPLACING BOGIE WHEELS

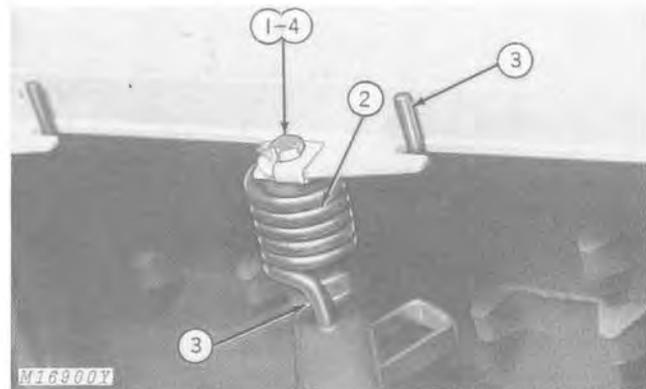


Periodically inspect bogie wheels for freeness of operation. If a bogie wheel is stuck (won't turn) it must be replaced because track damage will result.

Remove cap screw securing bogie wheel to tube arm. When installing new wheel, be certain shoulder on wheel is next to the tube arm. Install and tighten **improper track alignment and possible track damage.**



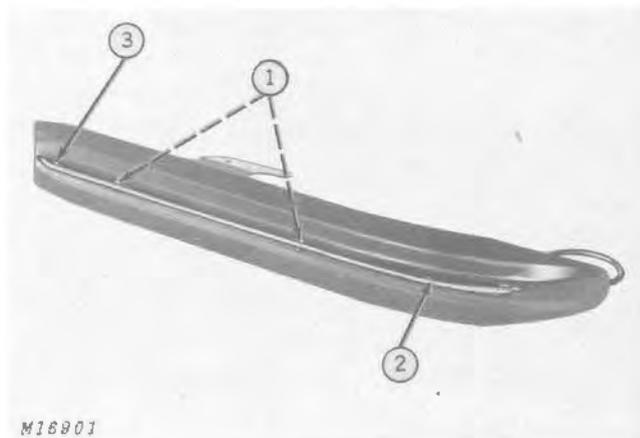
REPLACING BOGIE SPRINGS



To replace bogie springs:

1. Remove cap screw securing bogie tube to tunnel.
2. Remove spring from bogie tube.
3. Install new spring with long leg in tunnel notch and short leg in notch on tube arm.
4. Install bogie tube to tunnel and tighten cap screw.

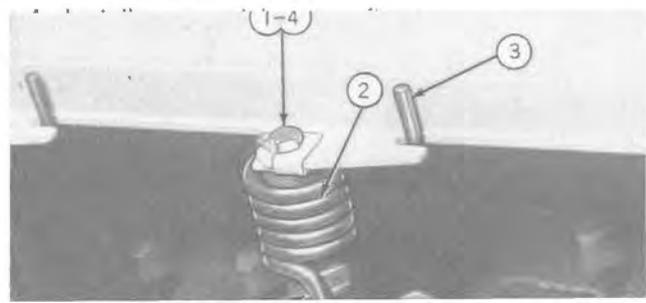
REPLACING SKI WEAR RODS



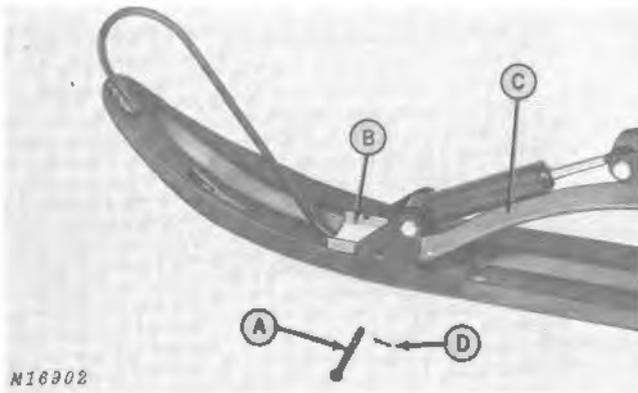
Inspect wear rods periodically and replace them if they are worn to one half their original size. Remember, worn wear rods reduce snowmobile maneuverability.

To replace ski wear rods:

1. Remove lock nuts securing wear rod to ski.
2. Pry rod down to get studs out of holes.
3. Slide rod forward to remove rod from rear hole and remove rod.



REPLACING SKI WEAR PLATES



A—Drilled Pin
B—Wear Plate

C—Ski Spring
D—Cotter Pin

To prevent ski damage, replace wear plates when excessively worn.

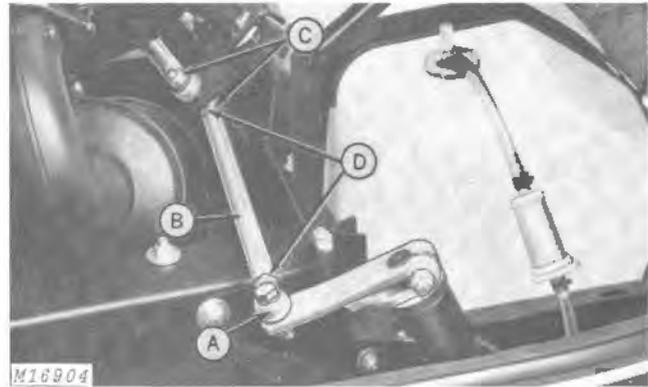
1. Raise front of snowmobile slightly.
2. Remove drilled pin (A) securing front of ski spring (C).
3. Lift front of ski spring (C) and remove wear plate (B).
4. Install new wear plate (B).
5. Lower ski spring (C) in place.
6. Secure ski spring (C) with drilled pin (A) and cotter pin (D).

ALIGNING SKIS



When properly aligned, skis are parallel (equal distance apart when measured at front and rear) with skis pointing straight forward and handlebars positioned to steer straight ahead.

IMPORTANT: Measure from straight sides of skis only; not from tapered ends.



A—Tie Rod End
B—Tie Rod

C—Gold-Colored Tie Rod Ends
D—Jam Nuts

To align skis:

1. Loosen jam nuts (D). Gold-colored tie rod ends (C) have left-hand threads which must be loosened opposite normal rotation.
2. Turn tie rods (B) to either lengthen or shorten them to keep skis parallel and handlebars in alignment with skis.

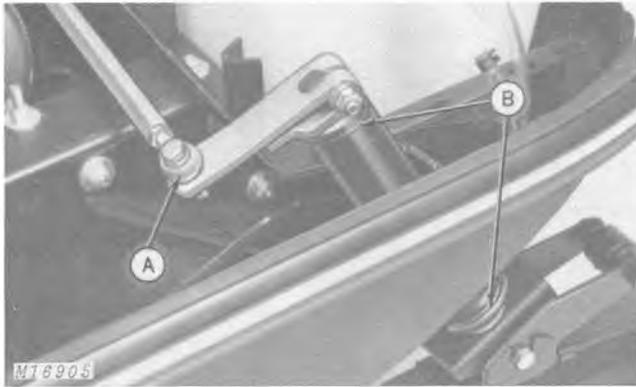
IMPORTANT: When adjusting tie rods (B), length from center hole-to-center hole must not exceed 12-1/4 inches (31.12 cm).

3. Tighten jam nuts (D) securely. Hold tie rod (B) with vice grips while the jam nut (D) is being tightened. Damage or stripping of the threads may occur within the ball joint if the tie rod is not held.

IMPORTANT: When tightening jam nuts (D) on tie rods (B), be certain tie rod ends (A) are still free to swivel after jam nuts are tight.

ELIMINATING LOOSE STEERING

⚠ CAUTION: Make it a habit to frequently check steering components and hardware for condition and tightness. Remember your snowmobile travels at near-highway speeds.

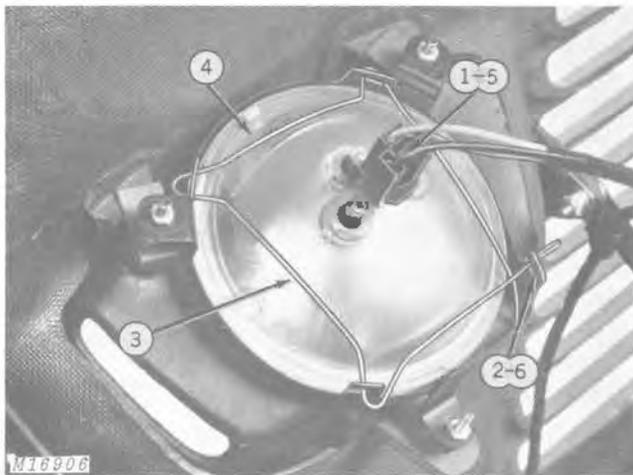


A—Tie Rod End B—Spindle Bushings

The two major causes of loose steering are as follows:

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

REPLACING SEALED-BEAM HEADLIGHT



1. Open hood and disconnect headlight coupler.
2. Unhook wire end from slot.
3. Remove wire clamp and sealed-beam headlight.

⚠ check steering components and hardware for condition and tightness. Remember your snowmobile travels at near-highway speeds.



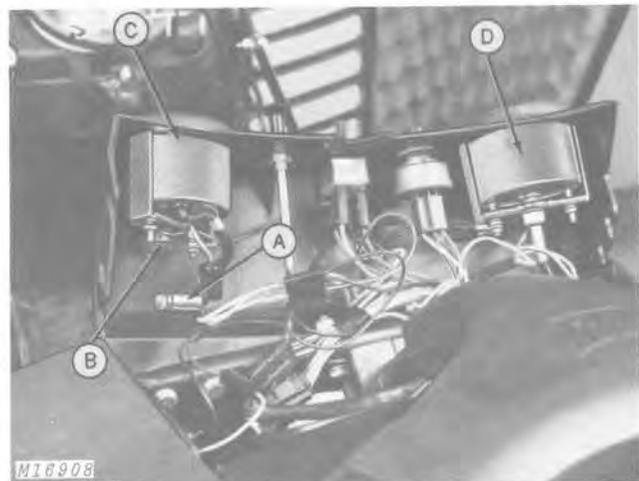
REPLACING STOP-TAILLIGHT BULB



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

IMPORTANT: Bulb can be installed in one position only. Be certain locking tabs match slots.

REPLACING SPEEDOMETER AND TACHOMETER BULBS

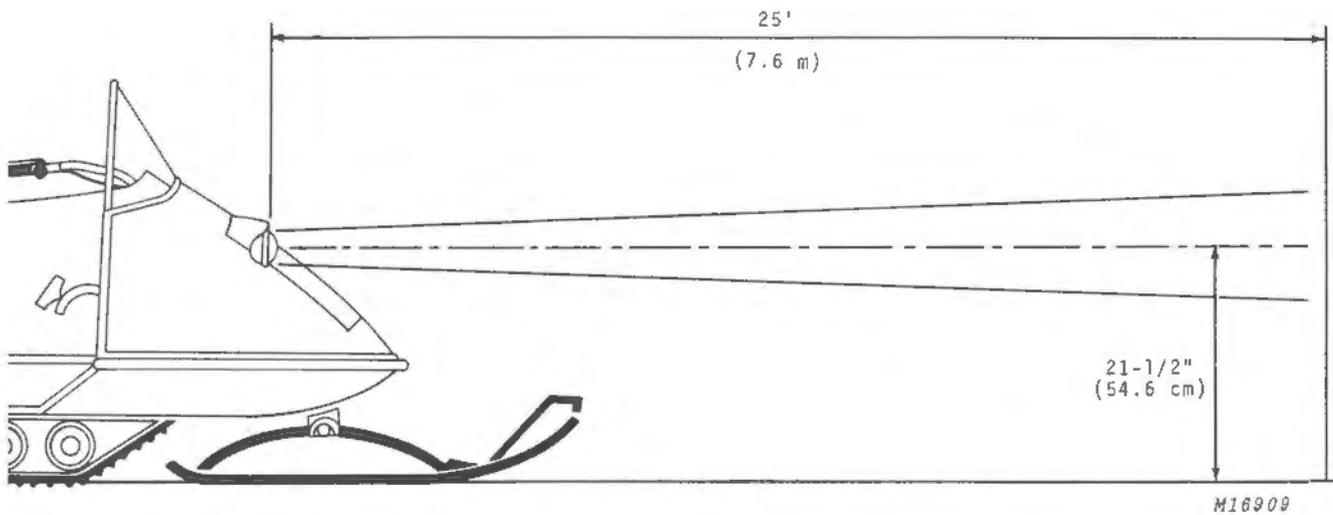


A—Bulb C—Tachometer
B—Bulb Socket D—Speedometer

1. Remove windshield.
2. Loosen two nuts on each side of the instrument panel.
3. Tip the instrument panel back to expose the backside of the tachometer (C) and speedometer (D).
4. Pull bulb socket (B) out of the instrument.



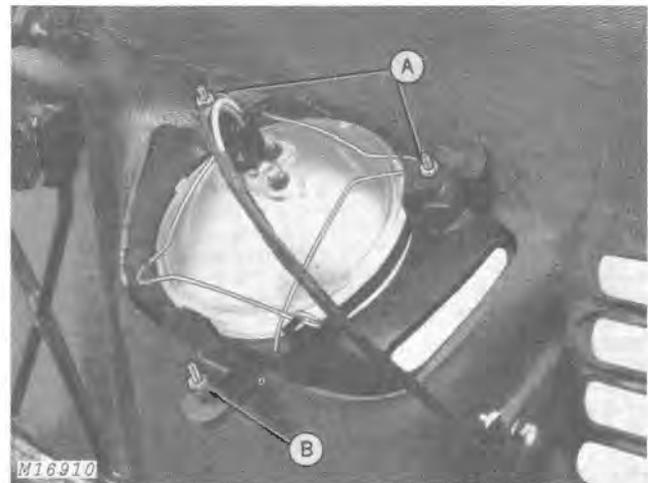
AIMING HEADLIGHT



Position snowmobile on a flat surface with the headlight 25 feet (7.6 meters) from a vertical surface. With an operator on the seat and the headlight on **high** beam, the light beam centerline should be straight ahead of the machine and 21-1/2 inches (54.6 cm) above the ground level.

Loosen or tighten top two adjusting nuts (A) as necessary to position the light beam straight ahead.

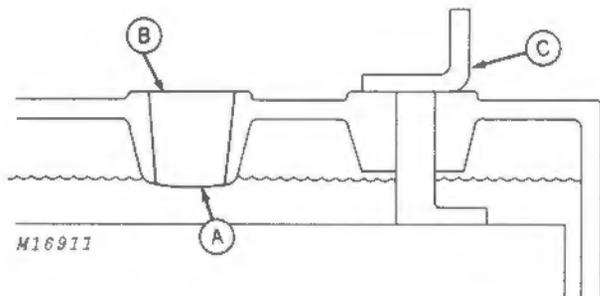
Loosen or tighten the vertical height adjusting nut (B) to raise or lower the light beam.



A—Straight Ahead Adjusting Nuts
B—Vertical Height Adjusting Nut

SERVICING BATTERY (Electric Start Models Only)

Checking Electrolyte Level



A—Electrolyte Level
B—Filler Tube

C—Battery Terminal

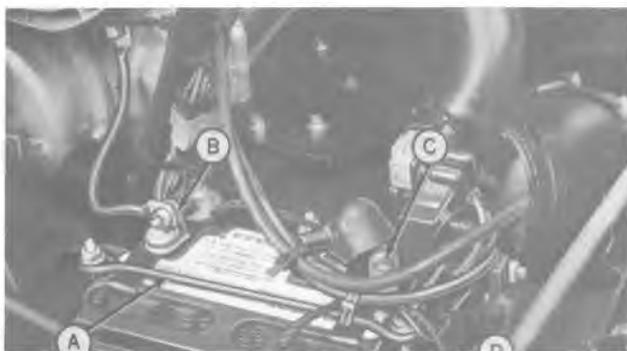
CAUTION: Battery electrolyte is poisonous and corrosive. It can be injurious to eyes, skin and clothing. Handle it carefully. If electrolyte is spilled, flush immediately with a solution of one part baking soda to four parts water.

Remove six caps and check electrolyte level (A) periodically (at least once each month). If necessary, add distilled water to bring level to bottom of split filler tubes (B).

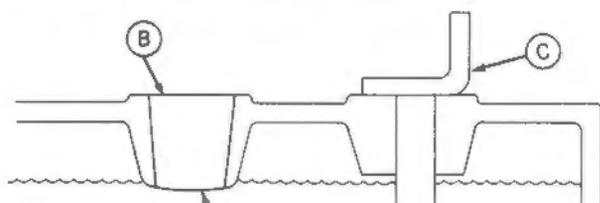
In freezing weather, never add water to the battery unless snowmobile will be operated for one hour to allow the water and electrolyte to mix.

IMPORTANT: A discharged battery will freeze and break battery case. Always keep battery fully charged.

Removing and Installing Battery



Checking Electrolyte Level



Loosen two hold-down bolts (D), unhook bolts (D) from battery box and remove hold-down (A). Remove cables from battery terminals, negative (B) first; then positive (C). Remove battery vent tube and lift battery from box.

Install in opposite sequence. Always connect solenoid cable to positive (+) terminal (C) first; then ground cable to negative (-) terminal (B). Be certain vent tube extends through bottom of snowmobile pan and that rubber boot is in place over positive (+) terminal.

Cleaning Battery and Battery Box

Corrosion around the battery terminals is normal. However, an accumulation of corrosion over a long period can shorten the life of the battery. Therefore, keep battery terminals clean and cable connections tight. Place a light coat of petroleum jelly on terminals to prevent corrosion.

To remove corrosion, first remove battery from snowmobile. Remove all corrosion from terminals using a wire brush. Wash remaining components using a solution of one part ordinary baking soda to four parts water. Do not permit cleaning solution to enter battery cells.

Rinse entire battery, battery box and hold-down components with clear water. Do not get water in electrical couplers.

Charging Battery

CAUTION: While charging battery, hydrogen and oxygen gases are emitted which are very explosive. Therefore, keep open flames and sparks away from battery and provide adequate ventilation.

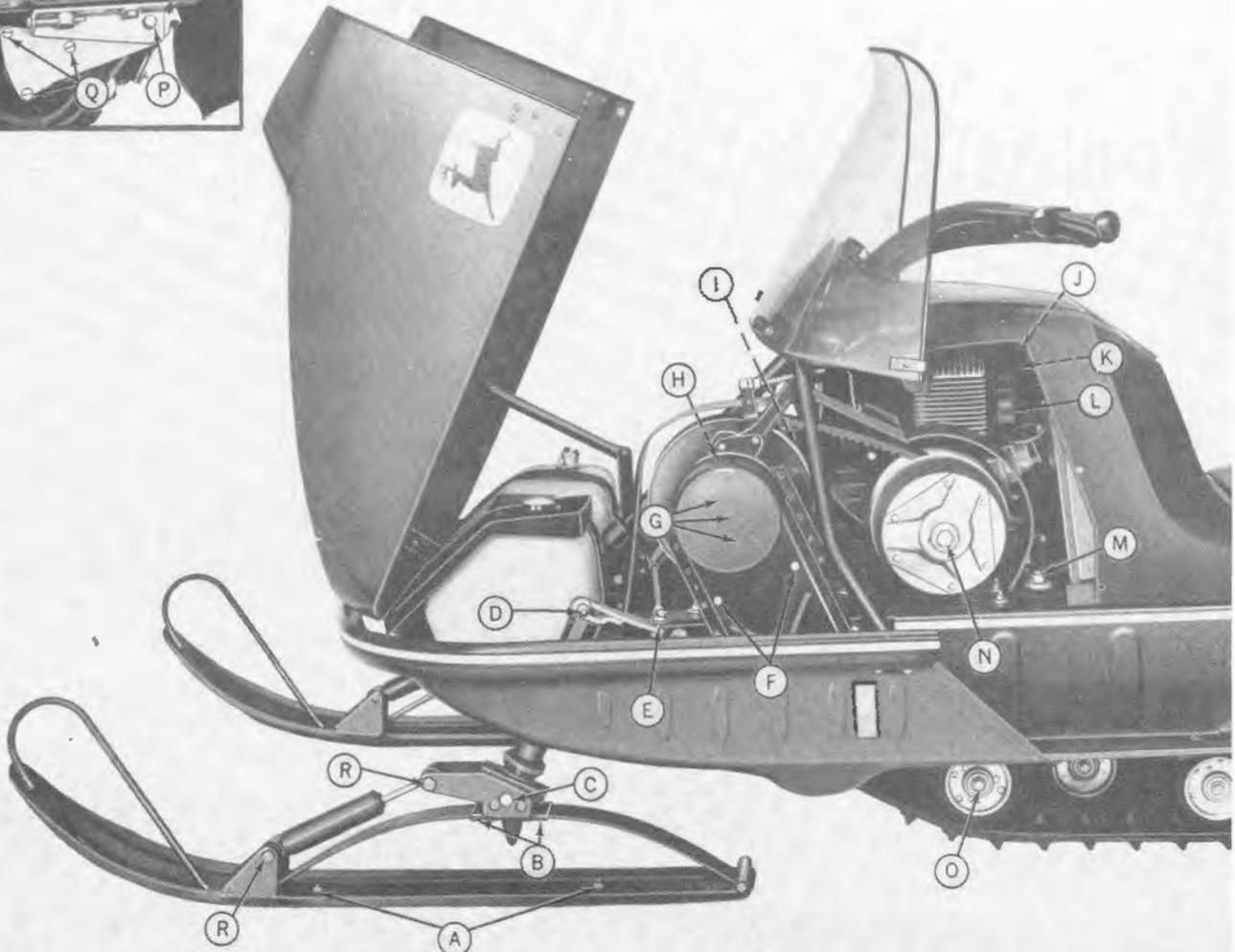
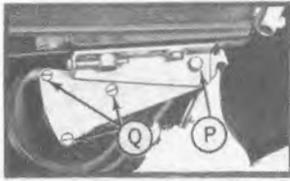
Normally, the battery will not require charging. The charging system in the snowmobile is sufficient to keep the battery fully charged.

However, if most of your operating is done with the lights on, and the starter is used frequently, it may be to your advantage to use the trickle charger shown on page 34.

Loosen two hold-down bolts (D), unhook bolts (D) from battery box and remove hold-down (A). Remove cables from battery terminals, negative (B) first; then positive (C). Remove battery vent tube and lift battery from box.

Install in opposite sequence. Always connect solenoid cable to positive (+) terminal (C) first; then

TIGHTENING HARDWARE AND COMPONENTS



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The following hardware and components should be checked for tightness on a yearly basis, before or after placing snowmobile in summer storage.

While tightening these items, also check for worn or damaged parts. Replace any parts found questionable, especially if they pertain to skis and steering.

⚠ CAUTION: Worn, bent, or damaged ski and steering components are unsafe. Remember, your snowmobile travels at near highway speeds.

Check these items:

- A—Wear rod nuts.
- B—Ski saddle cap screws (300 Snowmobile).
- C—Ski bolts.

- D—Steering arm bolts.
- E—Tie rod end bolts.
- F—Tension block cap screws.
- G—Secondary shaft bearing cap screws.
- H—Driven sheave retaining cap screw.
- I—Muffler clamp.
- J—Throttle and choke cables.
- K—Intake manifold nuts.
- L—Carburetor attachment.
- M—Engine mounting bolts.
- N—Drive sheave retaining cap screw.
- O—Bogie wheel cap screws.
- P—Rear idler cap screws.
- Q—Rear idler bearing retainer screws.
- R—Shock absorber attaching cap screws.



Trouble Shooting

ENGINE

Your snowmobile has a handy trouble shooting chart underneath the top (spark plug) access panel. Use it for quick reference.

Engine Starts Hard or Will Not Start

Fuel tank empty.

Emergency Stop Switch in "OFF" Position.
See page 8.

Plugged Fuel Tank Screen.
See page 20.

Plugged In-Line Filters in Suction Line. Change in-line filter. See page 20.

Fuel Pump Malfunctioning.
See dealer for fuel pump service.

Engine Flooded.

Crank with choke knob in and throttle wide open. Release the throttle and apply the brake when the engine starts, to prevent snowmobile movement.

Check carburetor adjustments. See page 18. If necessary, remove and dry plugs or replace plugs and repeat procedure.

Spark Plugs Fouled or Defective.
See page 15 (300) or page 18 (400).

Faulty Ignition System.
Check all electrical connections. See dealer for ignition system repair.

Ignition Timing Wrong.
See dealer for ignition timing.

Choke Not Functioning Properly.
Adjust choke. See page 19.

Engine Lacks Power or Acceleration

Running On One Cylinder.

Throttle Cable Improperly Adjusted.
Adjust throttle. See page 20.

Improper Fuel Mixture.
Drain tank and fill with fuel of proper mixture.
See page 6.

Carburetor Out of Adjustment.
See page 18.

Restricted Fuel Tank Screen or In-Line Filter.
See page 20.

Ignition Timing Wrong.
See dealer for ignition timing.

Spark Plugs Fouled or Defective.
See page 15 (300) or page 18 (400).

Engine Backfires and Runs Unevenly

Carburetor Set Too "Lean."
See page 18.

Ignition Timing Wrong.
See dealer for ignition timing.

Spark Plugs Fouled or Defective.

Spark Plug Heat Range Too "Hot" (300).
See pages 15 and 16.

Engine Overheats

Carburetor Set Too "Lean."
See page 18.

Engine Fan Belt Slipping or Broken.
See page 21.

Fan Blade(s) Broken Off.

Intake Manifold or Carburetor Gaskets Leaking.

Spark Plug Heat Range Too "Hot" (300).

ELECTRIC START (Extra Equipment)

Engine Fails to Crank

Key Switch Not Returned to "OFF" Position Prior to Second Starting Attempt.

See page 7.

Loose or Corroded Battery Terminals.

See page 28.

Faulty Starter Solenoid.

See dealer.

Faulty Starter Motor.

See dealer.

Battery Discharged.

See page 28.

Battery Will Not Stay Charged

Faulty Lighting Coil.

See dealer.

Faulty Regulator or Rectifier.

See dealer.

Loose or Corroded Electrical Connections.

Battery Defective.

Machine Not Operated Long Enough Between Starts.

Lights Left On.

LIGHTS

Stoplight Not Lighting

Bulb Burned Out.

See page 26.

Stoplight Switch Defective.

Stoplight Switch Frozen. See page 22.

Lights Won't Light

Sealed-Beam and/or Bulbs Burned Out.

See page 26.

Faulty Light Switch.

See dealer.

Loose Electrical Connections.

Faulty Lighting Coil.

See dealer.

WINDSHIELD

Windshield Becomes Clouded and Brittle

Fuel or Other Hydrocarbons Cause Windshield to Deteriorate, Become Fogged or Brittle.

Keep fuels and hydrocarbons off windshield.

Clean windshield with a damp cloth.

POWER TRAIN AND CHASSIS

Clutch Does Not Disengage Properly

Engine Idles Too Fast.

Set to correct idle speed. See page 18.

Faulty Clutch (Drive Sheave).

See dealer.

Short Drive Belt.

Clutch Engages Too Slowly

Faulty Clutch (Drive Sheave).

See dealer.

Stretched or Worn Drive Belt.

Excessive Drive Belt Wear

Driving Snowmobile Long Distances at Clutch Engagement Speed.

Drive and Driven Sheaves Misaligned.

See dealer.

Freeing Frozen Track With Engine.

Free track manually.

Rapid Track Wear

Operating on Bare Ground.

Track Improperly Tensioned.

See page 23.

Track Not Adjusted Equally (Side-to-Side).

See pages 23 and 24.

Track Wearing on One Side.

Track not adjusted equally (side-to-side) or track too loose. See pages 23 and 24.

SKIS AND STEERING

Loose Steering

Worn Tie Rod Ends.

See page 26.

Worn Spindle Bushings.

See page 26.

Poor Maneuverability

Worn Ski Wear Rods.

See page 24.

Loose Steering Linkage.

See page 26.

"Hard" Steering

Dry Steering and Spindle Bushings.

Lubricate with silicon spray.



Storage

PLACING SNOWMOBILE IN STORAGE

1. Thoroughly clean your machine with a hose to remove dirt, rocks, or grass from track area. Remove debris from inside console and hood areas.

IMPORTANT: Do not spray water around engine or carburetor. Allow all parts ample time to dry.

2. Clean and polish the hood, pan, and tunnel with an automotive-type wax. Use an upholstery cleaner on the seat. If metal parts are scratched or bare, touch up these areas with paint. Oil or paint bottom of skis to prevent rust. See your John Deere dealer for matching paint.

3. Check condition of all parts and assemblies so that needed parts may be ordered and installed during the summer months. Check cap screws and components for tightness. See page 29.

4. Siphon fuel from tank. Start engine and run it out of fuel at IDLE SPEED. Clean fuel tank screen. See page 20. Check in-line fuel filter for contamination and replace as necessary.

5. Close choke by pulling choke knob out. Wrap carburetor with plastic sheet. Place plastic bag over end of air intake hose.

6. Remove spark plugs and add 1 teaspoon of John Deere Snowmobile Oil into each spark plug hole.

With plugs removed, pull starter rope six or seven times to properly lubricate cylinder walls. Replace plugs.

7. Remove drive belt and lubricate the drive and driven sheave surfaces with a light grease to prevent corrosion.

8. Change oil in chain case. See page 23.

9. Support snowmobile so track is off ground. Loosen track adjusting screws to remove tension from track during storage.

10. Disconnect battery (if so equipped) and remove from snowmobile. Bring electrolyte to proper level, clean and charge battery. See page 28. Store in a cool, dry place.

Recharge battery in ventilated area every 30 to 40 days during the summer or keep it charged with AM32400 Battery Trickle Charger. See page 34.

11. Place a cover over your snowmobile and store it inside if at all possible.

REMOVING SNOWMOBILE FROM STORAGE

1. Check for loose cap screws and components if not done prior to storage. See page 29.

2. Wipe all grease, oil, or other lubricants from drive and driven sheave and reinstall drive belts.

3. On 300 Snowmobiles, clean and gap spark plugs. See page 15.

4. Fill fuel tank with properly mixed fuel. See page 6.

5. Check battery electrolyte level, charge it fully and install in snowmobile. See page 28.

6. Check throttle and brake controls for proper adjustment and operation. See pages 20 and 22.

7. Adjust track to proper tension. See page 23.

8. Familiarize yourself once more with all operating and safety suggestions.

9. Start engine and test operation of emergency stop switch, headlight, dimmer switch, taillight and stoplight.

NOTE: When first starting an electric-start machine use the manual starting method to get fuel to the carburetor. This will prevent battery drain during the initial start.

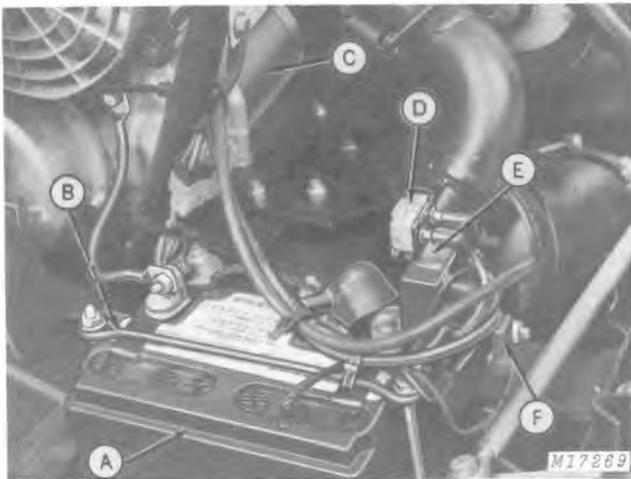
10. Take the snowmobile on a short ride at slow operating speed. Increase speed as you become assured machine is operating properly.



Accessories

The following items are all available from your John Deere Dealer.

ELECTRIC START KIT



- | | |
|-------------|-------------------|
| A—Battery | D—Circuit Breaker |
| B—Vent Tube | E—Rectifier |
| C—Starter | F—Solenoid |

You can equip your John Deere 300 or 400 Snowmobile with an electric start system for effortless starting. It's ideal for women and young adults.

The kit includes an electric starter, rectifier, solenoid, circuit breaker, battery box and all necessary wires and cables for installation.

A spill-proof, manifold-vented, 12-volt battery (not included with kit) is also available.

BATTERY CHARGER



The trickle charger keeps your battery warm, charged and ready to start your snowmobile in even the coldest temperatures. It plugs into any 110-volt outlet and is self-regulating to prevent overcharging.

The Charger Kit includes necessary wiring harness for quick hook-up

WEAR RODS WITH CARBIDE INSERTS



Ski wear rods with carbide inserts are available for the 300 and 400 Snowmobiles.

These wear rods are ideal for the performance-minded enthusiast. They provide increased maneu-

Accessories

The following items are all available from your

BATTERY CHARGER

SNOWMOBILE COVER



M16914

Protect your investment. The urethane-coated, polyester snowmobile cover provides excellent waterproof protection in addition to being tailor-fit for a sharp appearance. Use the cover when towing or storing your machine.

Covers are available for 300 and 400 Snowmobiles, with or without backrest.

NOTE: Clean the cover with a mild soap and water solution. Do not use solvents or gasoline.

BACKREST



M11393Y

You will appreciate the backrest, available for 300 and 400 Snowmobiles, especially if you're the passenger instead of the operator.

The kit includes backrest and all parts necessary for installation.

TACHOMETER

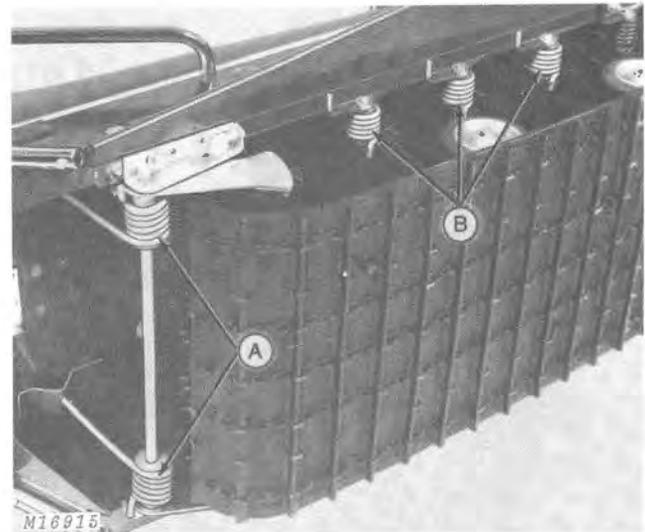


M15105

A tachometer is available for 300 and 400 Snowmobiles to accurately indicate engine rpm for the performance-minded snowmobiler.

A built-in light makes it easy to read at night.

HEAVY-DUTY REAR SUSPENSION



M16915

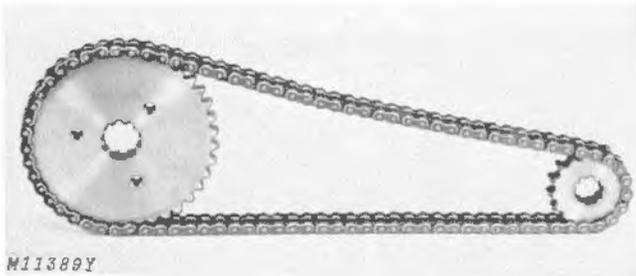
A—Rear Pivot Springs B—Bogie Axle Springs

The heavy-duty rear suspension consists of two rear pivot springs (A) and three right-hand and left-hand bogie axle springs (B).

The purpose of this suspension is to reduce the tendency of the suspension to "bottom" when trail riding with a driver and passenger.

This suspension is available for 300 and 400 Snowmobiles.

HIGH TORQUE KIT



High torque kits are available for 300 and 400 Snowmobiles.

Increased final drive reduction provides peak operating performance under adverse snowmobiling conditions. The kit also provides more torque for pulling loaded sleds and faster breakaways in deep snow conditions.

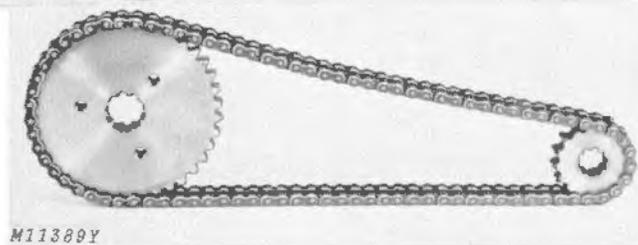
HOURLMETER



This accessory helps you determine when it is time to perform the periodic services necessary to keep your snowmobile running smoothly. It is excellent for persons operating a snowmobile rental service. The hourmeter functions only with electric start-equipped snowmobiles.

The kit comes complete with wiring harness and parts required for installation.

SNOWMOBILE CLOTHING AND ACCESSORIES



High torque kits are available for 300 and 400





Specifications

SNOWMOBILE SPECIFICATIONS

Components	Item	300	400
Engine	Make	Kohler (Canada)	John Deere (Kioritz)*
	Model	K295-2AXY	KEC-340/22A
	No. of Cylinders	2	2
	Bore	56 mm	60 mm
	Stroke	55 mm	60 mm
	Displacement	292 cc	339 cc
Fuel System	Carburetor Mfg.	Walbro	Walbro
	Carburetor Part No.	AM52876	AM52875
	Tank Capacity	6.50 U.S. Gal. (24.6 l)	6.50 U.S. Gal. (24.6 l)
	Fuel Mixing Ratio	50:1**	50:1**
Chassis and Body	Material:		
	Tunnel and Pan	Aluminum	Aluminum
	Hood and Console	Polyester	Polyester
	Windshield	Polycarbonate	Polycarbonate
	Overall Length	103.4 in. (2.63 m)	103.4 in. (2.63 m)
	Overall Width	34.5 in. (87.6 cm)	34.5 in. (87.6 cm)
Overall Height	44 in. (1.1 m)	44 in. (1.1 m)	
Weight (lbs)	375 (170 kg)	380 (172 kg)	
Track and Suspension	Suspension Type	Trailing Arm Bogie	Trailing Arm Bogie
	No. of Bogie Wheels	15	15
	Track Material	Polyurethane	Polyurethane
	Track Width	15.5 in. (39.4 cm)	15.5 in. (39.4 cm)
Power Train	Transmission:		
	Type	2 Sheave Variable	2 Sheave Variable
	Manufacturer	Salsbury	John Deere*** (Comet)
	Model	780	102C
	Final Drive Ratio:		
	Standard	2.44:1	2.19:1
	Optional	2.67:1	2.44:1 or 2.67:1
	Brake	External Band	External Band
Drive Belt	M64549	M64550	

*Manufactured for John Deere by Kioritz Corp., Japan

**With John Deere Snowmobile oil. See page 6.

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

SNOWMOBILE SPECIFICATIONS—Continued

Components	Item	300	400
Electrical System	Spark Plug Gap	0.020 in. (0.508 mm)	
	Breaker Point Gap	0.016 ± .002 in. (0.406 ± .051 mm)	
	Timing	0.090 in. BTDC (2.286 mm BTDC)	0.100±0.010 (2.54±0.254 mm) (BTDC) engine running at idle.
	Lighting Coil Capacity	120 Watt	120 Watt
	Light Bulbs:		
	Headlight	AM52959	AM52959
	Stop-tailight	AM52619	AM52619
	Speedometer	AM52847	AM52847
	Tachometer	AM52847	AM53193
	Battery (Electric-Start)	AM52050*	AM52050*

*When replacing the battery, use the John Deere battery or an equivalent manifold-vented snowmobile battery as shown in the following chart:

BATTERY SPECIFICATIONS

Voltage	John Deere Part Number	BCI Group	Cold Cranking Amps 0°F - 20°F	Reserve Capacity (Minutes at 25 amps)
12	AM52050	U1	175 105	35

FUEL AND OIL MIXTURES

United States

Ratio	Oil	Fuel
40:1	1 pint (0.473 l)	5 gal. (18.9 l)
50:1	1 pint (0.473 l)	6 gal. (22.7 l)

Canada

Ratio	Oil	Fuel
40:1	1 pint (0.473 l)	4 Imperial gal. (18.2 l)
50:1	1 pint (0.473 l)	5 Imperial gal. (22.7 l)

NOTE: United States gallon contains 3.785 liters and the Canadian Imperial gallon contains 4.543 liters. The snowmobile oil in pints or quarts is in U.S. measurement. This accounts for the different ratios in liters of fuel for the 40:1 mix

Components	Item	300	400
Electrical System	Spark Plug Gap	0.020 in. (0.508 mm)	
	Breaker Point Gap	0.016 ± .002 in. (0.406 ± .051 mm)	
	Timing	0.090 in. BTDC (2.286 mm BTDC)	0.100±0.010 (2.54±0.254 mm) (BTDC) engine

SPARK PLUG SPECIFICATIONS

Model	Brand	Cold**	Normal	Hot**
300	AC	S41XLR-AM53008		S43XLR-AM53018
	Champion	RN2-AM53001	QN3-AM53941	RN4-AM53019
	Champion*	N59G-AM52641		RN4G-AM53020
400	Champion	————	QN19-V-AM53787	————

*Gold-Palladium plugs.

**Use "hot" or "cold" plugs only under circumstances explained on page 16. The "normal" heat range plug is proper for most snowmobiling. Hot and cold plugs not recommended for use in Canada. Use normal plug only in Canada.

(Specifications and design subject to change without notice.)



A Guide to Safe Snowmobiling

Snowmobiling has opened up a whole new world of winter family fun. But like any sport involving machines capable of high speed, there is a certain degree of hazard.

You can significantly reduce, or perhaps even eliminate, the possibility of an accident by being aware of the hazards of improper snowmobiling and by operating your snowmobile in a responsible manner.

The following tips provide a guide to safe snowmobiling. Play it smart...play it safe...and have fun.

General Safety Tips

Observe all safety precautions contained on the inside front two pages of this operator's manual.

Ask your John Deere Dealer for a free copy of the 12-page "Guide to Safe Snowmobiling."

Respect the property of others. Keep snowmobiling fun for all. Observe the Code of Ethics on page 12.

Join a snowmobile club. If there's none in your area, start one. Keep alert to current and recommended snowmobile legislation. Protect the snowmobiling sport.

Observe all governmental regulations regarding use of streets, highways and railroad right-of-ways. Avoid trespassing on private property. Don't cut fences.



Don't cut across another snowmobiler's path. Don't cause other operators to panic by sudden changes in direction. Don't tailgate.

Use understandable hand signals when traveling in groups. Let others know your intentions when stopping or turning.

Always allow adequate stopping distance, based on ground cover conditions. Remember, ice requires a greater stopping distance... makes turning more difficult. Avoid skidding...don't apply brakes rapidly on ice.

Don't loan your machine to unreliable operators. You may be sued in case of injury...or held accountable in other ways for their mistakes.

*Always wear an approved helmet...*one that will not only keep you warm, but that will provide adequate protection from injury in case of an accident. A face shield could save your eyesight should you hit a small tree branch.

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

Preparing for a Trip

Check all cap screws and carriage bolts for tightness. Be sure snowmobile is properly maintained to be in top operating condition. Don't operate your snowmobile when it is in need of repairs.

Check the weather forecasts (both long range and local) before starting out on a trip. Cancel your plans if a storm is suspected.

*Know where help is located...*study maps of the area before the trip. Note locations of phones, resorts, shelters, towns, farms and ranches. Know where fuel is available. Use the buddy system when ...

Secure snowmobile to trailer when driving to your starting point and be sure trailer lights are working. Winch the machine on the trailer. . . don't drive it on.

Don't overload your snowmobile. Use a sled with a stiff towbar to haul your supplies.

Don't risk a heart attack if your snowmobile gets stuck in deep snow. Carry a small block and tackle for situations. Never let someone manually pull on the skis while you attempt to drive machine out.

Don't operate beyond one-half the round trip cruising range of your fuel. Keep in mind how far it is home.

Remember. . . improper fuel mixtures can lead to engine problems that could leave you stranded during severe weather conditions.

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

Carry adequate eating and cooking utensils (small pans, kettle, plates, cups, etc.) on longer trips. Carry matches in a waterproof container. . . candles for building a fire. . . food that is easy to pack. . . food that won't be damaged by freezing. Carry emergency rations such as dry food or space energy sticks.

Pack extra clothing, a tent, sleeping bag, hand axe and compass. A first aid kit and snow shoes may come in handy. Space age blankets (one side silver-foil) furnish warmth and also can be used as heat reflectors or signaling devices for aerial search parties.

Emergency Survival Techniques

In the event of an emergency. . . don't panic. Relax, think the situation over and decide on a course of action. You may be within a short distance of help. Attempt to repair your snowmobile so you can drive to safety. But remember, conserve your energy. . . and stay warm.

Avoid frostbite while servicing your machine. Keep hands and feet active to promote circulation.

Mentally retrace your route. Where was the last point where help could be located? Don't attempt to walk long distances in deep snow. Make yourself comfortable until help arrives.



Be properly equipped for your trip and you can turn any undesirable area into a suitable campsite.

Build a small shelter if necessary with tree branches or evergreen boughs. Look for a cave or sheltered area against a hill or cliff. Even burrowing in the snow offers protection from the cold and wind.

Prepare a signal. Set a fire using evergreen boughs and snowmobile oil. If you can't build a fire, make an S-O-S in the snow.

Beat cooking utensils or use a policeman's whistle to attract attention or frighten off wild animals.

When camp is established, climb the nearest hill to determine your whereabouts. Observe landmarks on the way, so you can find your way back to your campsite. Don't rely on your footprints that may be covered over by blowing snow.

Conserve food. Eat for strength, not out of boredom. Your food may have to last you some time.

Snowmobiling makes the wide, white, wonderful world of winter your playground. It's an astonishingly beautiful place. Do your part to help keep it that way.