



NUVIK

futura

1977 OPERATOR MANUAL

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(First copy free with unit purchased)

484 0206 00



**Recreational
Products**



moto-ski
LAWSON PRODUCTS

Observe the following precautions:

- Throttle mechanism should be checked for free movement before starting engine.
- Engine should be running only when pulley guard is secured in place.
- Never run engine without drive belt installed. Running an unloaded engine can prove to be dangerous.
- Never run the engine at high R.P.M. when the track of the vehicle is raised off the ground.
- It can be dangerous to run engine with the cab open.
- Gasoline is flammable and explosive under certain conditions. Always perform procedures in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity. If gasoline fumes are noticed while driving, the cause should be determined and corrected without delay.
- Your snowmobile is not designed to be operated on public streets, road or highways. In most States and Provinces, it is considered and illegal operation.
- Maintain your vehicle in top mechanical condition at all times.
- Your snowmobile is not designed to be driven or operated on black top, bare earth, or other abrasive surfaces. On such surfaces abnormal and excessive wear of critical parts is inevitable.
- Only perform procedures as detailed in this manual. Unless otherwise specified, engine should be turned OFF for all lubrication and maintenance procedures.

- Installation of other than "stock" equipment, including ski-spreaders, bumpers, pack racks, etc., could severely affect the stability and safety of your vehicle. Avoid adding on" accessories that alter the basic vehicle configuration.
- The snowmobile engine can be stopped by activating the emergency cut-out or tether switches, or turning off the key.

Please read and understand all other warnings contained elsewhere.

THIS MANUAL SHOULD REMAIN WITH THE VEHICLE AT THE TIME OF RESALE.

CONTROLS / INSTRUMENTS

Throttle control lever, brake control lever, ignition / light switch headlamp dimmer switch, emergency cut-out switch, decompressor, rewind starter, choke, primer, tachometer, speedometer, tether cut-out switch, cab opening, tool box, fuel gauge **4,5,6**

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Track, bogie wheels, slide suspension, ski, fuel tank, carburetor, cylinder lubrication, chaincase, controls, battery, drive pulley, chassis, general inspection. **27,28,29,30**

PRE-SEASON PREPARATION

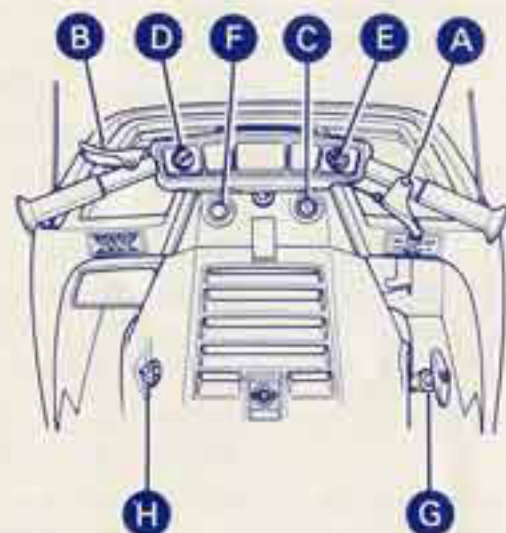
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TROUBLE SHOOTING GUIDE

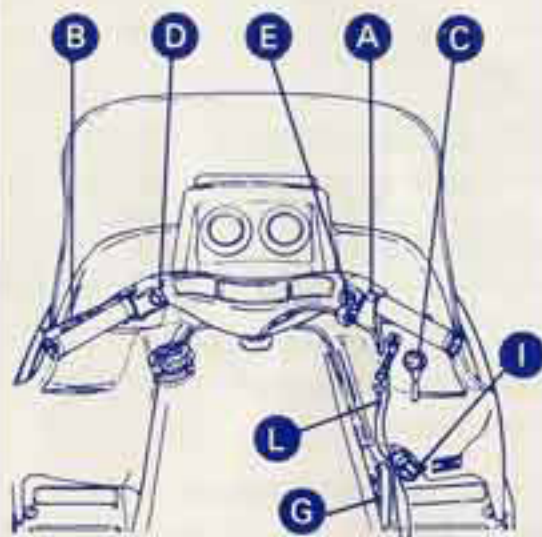
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SPIRIT

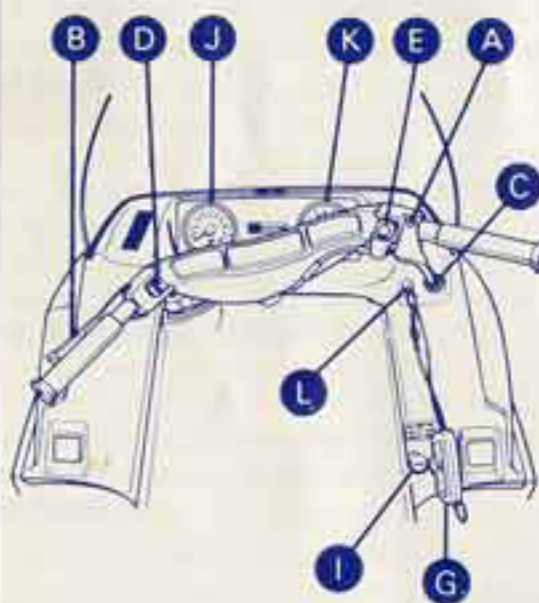


NUVIK



*On 300 single model, the manual starter handle and the primer are interchanged.

FUTURA



- A) Throttle Control Lever
- B) Brake Control Lever
- C) Ignition / Light Switch
- D) Headlamp Dimmer Switch
- E) Emergency Cut-Out Switch
- F) Decompressor (Spirit model only)
- G) Manual Starter Handle
- H) Choke
- I) Primer
- J) Tachometer
- K) Speedometer
- L) Tether Cut-Out Switch

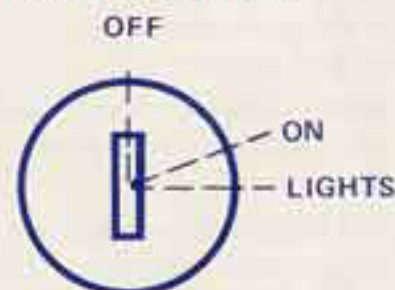
A) Throttle Control Lever

Located on right side of handlebar. When compressed, it controls the engine speed and the engagement of the transmission. When released, engine speed returns automatically to idle.

B) Brake Control Lever

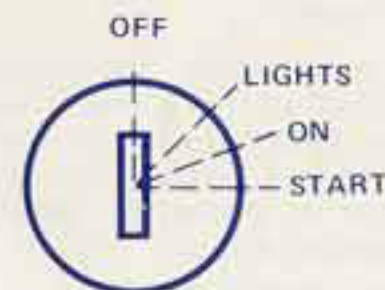
Located on the left side of handlebar. When compressed, the brake is applied. When released, it automatically returns to its original position. Braking effect is proportionate to the pressure applied on the lever.

C) Ignition / Light Switch (Manual Start Models)



Key operated, 3 position switch. To start engine, first turn key clockwise to ON position. To stop engine, turn key counter-clockwise to OFF position. Turning key fully clockwise, with engine running, illuminates both headlamp and taillight.

(Electric Start Models)



Key operated, 4 position switch. To start engine, turn key fully clockwise to START position and hold. Return key to ON position immediately engine has started. To stop engine, turn key counter clockwise to OFF position. To illuminate both headlamp and taillight, turn key to LIGHTS position.

D) Headlamp Dimmer Switch

The dimmer switch, located on left side of handlebar, allows correct selection of headlamp beam. To obtain high or low beam simply depress switch.

E) Emergency Cut-Out Switch

A push button switch located on right side of handlebar. To stop the engine in an emergency, press button down into lower position.

Before re-starting engine always depress button into released upper position. The driver of this vehicle should familiarize himself with the function of this device by using it several times on first outing. Thereby being mentally prepared for emergency situations requiring its use.

WARNING: If the button has been used in an emergency situation the source of malfunction should be determined and corrected before restarting engine.

F) Decompressor (Spirit Model Only)

Two position (OFF / ON), push-pull knob. To engage, pull decompressor knob fully out.

CAUTION: The decompressor provides easier starting by reducing engine compression. However, leaving decompressor engaged while running will damage your engine. Always disengage after engine has started.

G) Rewind Starter Handle

Auto-rewind type located on right hand side of vehicle. To engage mechanism, pull handle.

H) Choke (Spirit Model Only)

Two position (OFF / ON) dial knob. To engage choke, turn dial clockwise to ON position. To disengage, turn to OFF position. The choke should always be used for easier cold engine starts. After engine is warm however, it is not necessary to use choke when starting.

I) Primer

A push-pull button located alongside manual starter handle. Pull and push button (2-3 times) to activate primer. The primer should always be used for cold engine starts. After engine is warm however, it is not necessary to use primer when starting.

J) Tachometer

The tachometer registers the impulses of magneto. Direct-reading dial indicates, in thousands, the number of revolutions per minute (RPM) of the engine.

K) Speedometer (440 Futura Only)

The speedometer is linked directly to the drive axle. Direct-reading dial indicates the speed of the vehicle in miles per hour (MPH). Odometer records the total number of miles travelled.

L) Tether Cut-Out Switch

A pull switch located on the right side of cab. Attach tether cord to wrist or other convenient location then snap tether cut-out cap, over receptacle before starting engine.

If emergency engine "shut off" is required completely pull cap from safety

switch and engine power will be automatically "shut off".

○ **NOTE:** The cap must be installed on the safety switch at all times in order to operate the vehicle.

◆ **WARNING:** If the switch is used in an emergency situation the source of malfunction should be determined and corrected before restarting engine.

Cab Opening

For Spirit model; unlock latches on both sides where cab meets frame. For Nuvik models; push down on cab and turn cab handles toward front of vehicle. On Futura models; lift both handles to disengage latches.

○ **NOTE:** Always lift cab gently up until stopped by restraining device.

◆ **WARNING:** It is dangerous to run engine with cab open. Personal injury could result.

Tool Box

Located under the cab. To gain access, tilt cab. Ideal location for spare plugs, belt, rope, etc. Spark plugs and other breakable emergency items should be wrapped in foam or similar material. This will prevent possible breakage while travelling over rough or bumpy terrain.

Fuel Gauge

On all models except Spirit model, unscrew fuel tank cap and withdraw dipstick to check fuel level. On Spirit model, the tank is translucent and fuel level can be checked by opening cab and glancing at tank.

◆ **WARNING:** Never use a lighted match or open flame to check fuel level.

With Moto-Ski snowmobile engines, a break-in period is required before running the vehicle at full throttle. Manufacturers' recommendation for the Bombardier-Rotax engine is 10 to 15 operating hours. During this period, a richer mixture is needed (i.e. 40 parts of gas for 1 part of 50/1 Bombardier snowmobile oil). Maximum throttle should not exceed $\frac{3}{4}$, however, brief full acceleration and speed variations contribute to a good break-in. Continued wide open throttle accelerations, prolonged cruising speeds, and lugging are detrimental during the break-in period.

Inspection

After the break-in period, each Moto-Ski snowmobile should have an inspection check. This inspection is at the expense of the vehicle owner.

FUEL MIXING

Oil must be added to the gasoline in pre-measured amounts then both oil and gasoline should be thoroughly mixed together before fueling the tank.

Recommended Gasoline

The correct gasoline is regular gasoline, available from all service stations.

▼ **CAUTION:** Never experiment with different fuel or fuel ratios. Never use low lead or non leaded gasoline, naphta, methanol or similar products.

Recommended Oil

Use concentrated Bombardier snowmobile oil available from your dealer. This type of oil has specially formulated oil bases to meet the lubrication requirements of the Bombardier-Rotax engine.

If Bombardier snowmobile oil is unavailable substitute with a high-quality 2 cycle snowmobile oil. The oil / gas mix must meet the vehicle requirements. See oil manufacturer recommendations on container.

▼ **CAUTION:** Never use outboard or straight mineral oils.

Fuel Mixture Ratio

The importance of using the correct fuel mixture cannot be overstressed. An incorrect fuel ratio results in serious engine damage. Recommended fuel ratio is 50 / 1.

5 gallons of regular gasoline plus 1 can of 50 / 1 concentrated Bombardier snowmobile oil = correct fuel mixture.

○ **NOTE:** To facilitate fuel mixing, oil should be kept at room temperature.

Fuel Mixing Procedure

To mix the gasoline and oil always use a separate clean container. Never mix directly in your snowmobile tank. For best results, acquire two containers, either plastic or metal. Draw from one until empty then use the second one.

◆ **WARNING:** Gasoline is flammable and explosive under certain conditions. Always perform procedures in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity. If gasoline fumes are noticed while driving, the cause should be determined and corrected without delay. Never add fuel while engine is running. Avoid skin contact with fuel at below freezing temperatures.

1. Pour approximately one gallon of gasoline into a clean container.



2. Add the full amount of oil.



3. Replace container cap and shake the container thoroughly.



4. Add the remainder of the gasoline.

5. Once again thoroughly agitate the container. Then using a funnel with a fine mesh screen to prevent the entry of water and foreign particles, transfer mixture from container into the snowmobile tank.

○ **NOTE:** When using pre-mixed fuel, always shake the container thoroughly as the oil has a tendency to settle.

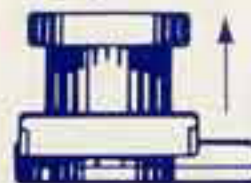
◆ **WARNING:** Never 'top up' gas tank before placing vehicle in a warm area. At certain temperatures, gasoline will expand and overflow.

Check Points

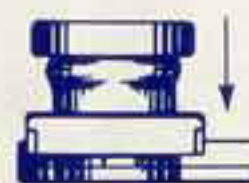
- Activate the throttle control lever several times to check that it operates easily and smoothly. The throttle control lever must return to idle position when released.
- Check that the skis and the track are not frozen to the ground or snow surface and that the steering operates freely.
- Activate the brake control lever and make sure the brake fully applies before the brake control lever touches the handlebar grip.
- Check fuel level.
- Verify that the path ahead of the vehicle is clear of bystanders and obstacles.

WARNING: Only start your snowmobile once all components are checked and functioning properly.

Upper position
before starting
engine.



Lower position
to stop engine.



Electric Starting

1. Insert key in ignition switch.
2. **Test throttle control lever.** Activate primer (2 or 3 times) or engage choke.
3. Make sure the tether cut-out cap is in position and that the cord is attached to your body. Check that the emergency cut-out button is in the released upper position.
4. Turn ignition key clockwise until starter engages. If engine does not start on first try, key must be turned fully back to OFF each time.

WARNING: Do not apply throttle while starting.

5. Release key immediately engine has started. If applicable, disengage choke.
6. Check operation of the emergency cut-out switch and when applicable, tether switch. Restart engine.

WARNING: If engine does not shut-off when applying the emergency cut-out switch and where applicable, pulling the tether cut-out cap, stop the engine by turning off the ignition key. Do not operate the vehicle further, see your dealer.

7. Allow the engine to warm before operating at full throttle.

Manual Starting

1. Insert key in ignition and turn to ON position.
2. **Test throttle control lever.** On single cylinder model, pull decompressor knob fully out.
3. Engage choke or activate primer (2 to 3 times). Primer or choke are not necessary when engine is warm.
4. Make sure the tether cut-out cap is in position and that the cord is attached to your body. Check that the emergency cut-out button is in the released upper position.
5. Grasp manual starter handle firmly and pull slowly until a resistance is felt then pull vigorously. Slowly release rewind starter handle.

WARNING: Do not apply throttle while starting.

6. If applicable, disengage choke. On Spirit model, push in decompressor.
7. Check operation of the emergency cut-out switch, and where applicable, tether switch. Restart engine.

WARNING: If engine does not shut-off when applying the emergency cut-out switch and where applicable, pulling the tether cut-out cap, stop the engine by turning off the ignition key. Do not operate the vehicle further, see your dealer.

8. Allow the engine to warm before operating at full throttle.

Emergency Starting

Should the rewind starter rope fray and break, the engine can be started with an emergency starter rope.

On Futura models, remove the tuned muffler.

◆ **WARNING:** Make sure that the muffler is cold before attempting to remove it from vehicle.

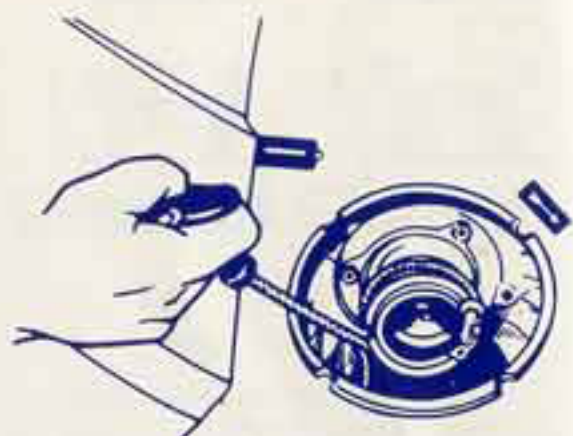
Remove the rewind starter assembly from the engine and transfer the rope handle to your emergency rope.

On Futura models, install tuned muffler before attempting to start engine.

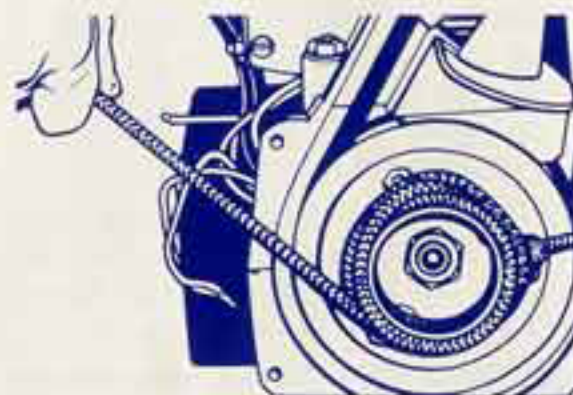
Wind rope around starting pulley.

○ **NOTE:** On twin cylinder engines, the knot of the emergency rope should be positioned behind one stud of the pulley.

Pull vigorously as per usual manual starting to start engine.



Single Cylinder



Twin Cylinder

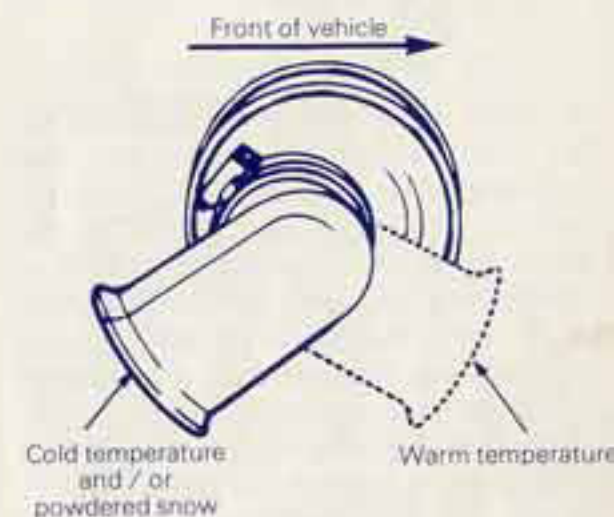
DRIVING TIPS

Slide Suspension

During normal driving, snow will act as a lubricant and coolant for the slider shoes. Extensive riding on ice or sand-ed snow, (not to mention dirt, asphalt, etc. never recommended) will create excessive heat build-up and cause pre-mature slider shoe wear.

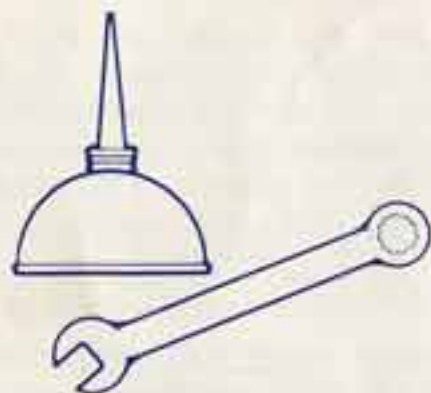
Air Intake Silencer (All Except Spirit Model)

At cold temperature and /or when the vehicle is operated in powdered snow, the air intake silencer elbow must be turned toward the rear of the vehicle. The elbow may be turned to the front of the vehicle only when the vehicle is operated at warm temperature.



▼ **CAUTION:** Never operate your snowmobile with the air intake silencer disconnected. Serious engine damage will occur if this notice is disregarded.

Frequency



Routine maintenance is necessary for all mechanized products, and the snowmobile is no exception. A weekly vehicle inspection contributes to the life span of the snowmobile as well as retain safe and trouble-free operation. It is recommended that the steering system and suspension, be lubricated monthly or every 40 hours of operation. If the vehicle is operated in wet snow or in severe conditions these items should be lubricated more frequently.

WARNING: Only perform such procedures as detailed in this manual. Unless otherwise specified, engine should be turned OFF for all lubrication and maintenance procedures.

Console Removal (Spirit Model)

For any procedure that may require removal of console, proceed as follows:

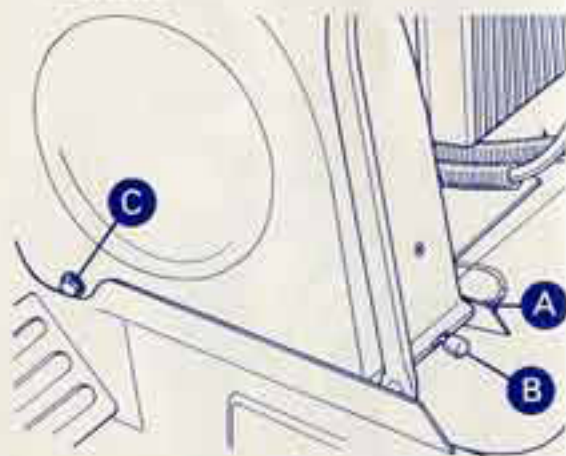
1. Unlock latch where console and dashpanel meet.
2. Push the console downward then tilt away from engine. To reinstall, reverse procedure.

Pulley Guard Removal

WARNING: Engine should be running only when pulley guard is secured in place.

Spirit Model

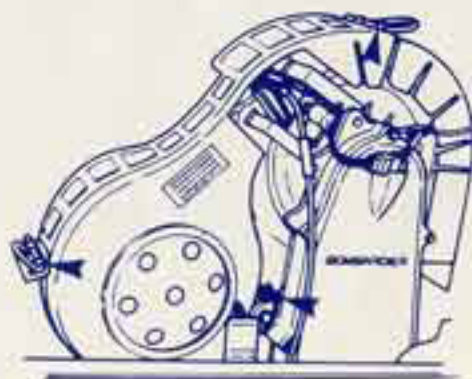
1. Tilt cab and remove console.
2. Pull out retaining clip (A) and pull on spring (B) to disengage pin from bracket.



3. Push pulley guard forward to disengage front attachment (C) from frame. Lift guard from vehicle.

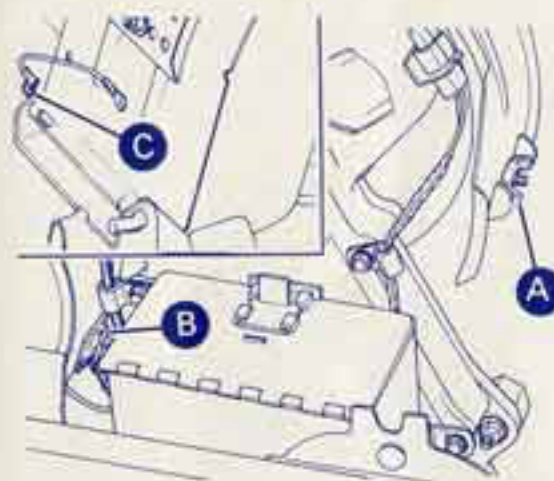
Nuvik Models

Detach air duct from engine and pull it from muffler compartment wall. Unlock pulley guard from attaching points and remove from vehicle.



Futura Models

1. Tilt cab, unscrew wing nut (A) and pull out retaining clips (B & C).

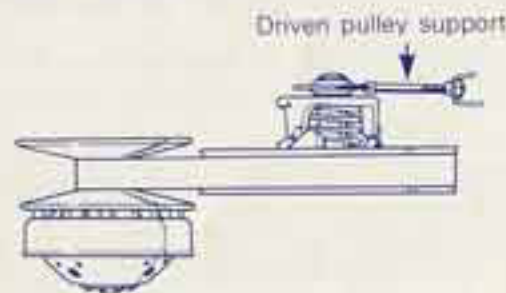


2. Disengage guard from rear and middle brackets then disengage pin from front bracket. Remove complete assembly.

Drive Belt Removal

WARNING: Never start or run engine without drive belt installed. Running an unloaded engine is dangerous.

1. Tilt cab and remove pulley guard. If applicable, unlock and raise driven pulley support.



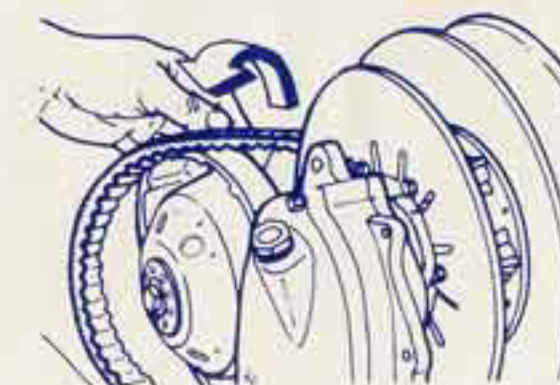
2. Open the driven pulley by twisting and pushing the sliding half. Hold in fully open position.



3. Slip slackened belt over the top edge of the sliding half.

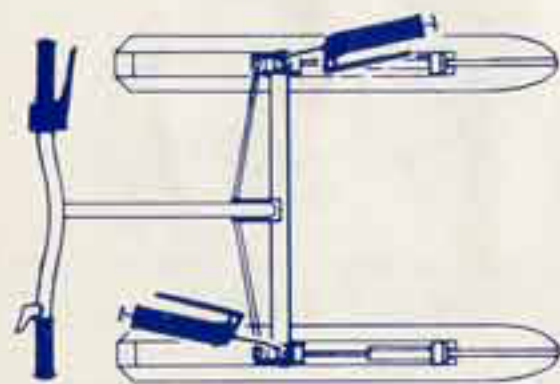


4. Slip the belt out from the drive pulley and remove completely from vehicle. To install drive belt, reverse procedure.



Steering Mechanism

Lubricate ski legs at grease fittings until new grease appears at joints. Oil spring coupler bolts.



◆ **WARNING:** Do not lubricate throttle and / or brake cable and housings.

Chaincase Oil Level

On Spirit model, remove tool box then check oil level by removing oil level inspection plug. Oil should be at bottom lip of hole. Replenish as necessary by removing the filler cap using spark plug socket.

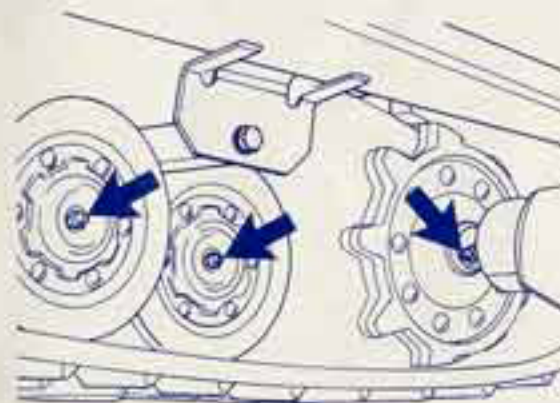


On Nuvik and Futura models, using the spark plug socket, remove the filler cap then using a rigid wire as a "dipstick" check oil level. The oil level on the "dipstick" should be 7.5 to 8.5 cm (3" to 3 1/2"). Replenish as necessary.

○ **NOTE:** On all models, the chaincase oil capacity is approximately 256 ml (9 oz.).

Bogie Wheel Suspension

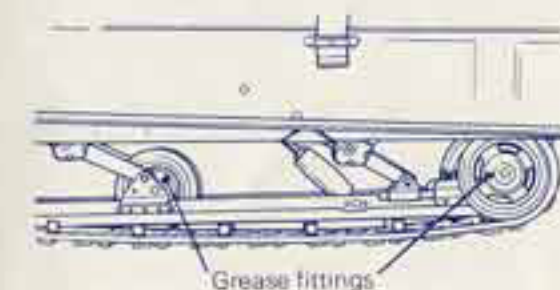
Lubricate the suspension bogie wheels using low temperature grease. Pump through the grease fitting at center of each wheel until new grease appears at the joint of inner side of shaft. Lubricate the rear axle with low-temperature grease. Pump through the rear axle fittings.



▼ **CAUTION:** Always use a low pressure grease gun when lubricating rear axle.

Slide Suspension

Using a low pressure grease gun, lubricate the four (4) idler wheels, with low temperature grease. Pump 3 to 4 times through the grease fitting located on each cap of idler wheel. Wipe off excess.



Drive Pulley

On Spirit model the drive pulley requires lubrication bi-monthly or every 20 hrs. of operation. All other models, covered in this manual do not require lubrication.

◆ **WARNING:** The lubrication of the drive pulley should be performed only by an authorized Moto-Ski dealer. A disassembly, cleaning, inspection and lubrication where applicable should also be performed by the dealer every 100 operating hours or at the end of each season, whichever occurs first.

IMPORTANT: The drive pulley assembly will be excluded from warranty, if the factory seal is broken by other than a duly authorized representative of Bombardier.

The following Maintenance Chart indicates regular servicing schedules to be performed by you or your servicing dealer. If these services are performed as suggested, your snowmobile will give you many years of low-cost use.

WARNING: Only perform such procedures as detailed in this manual. Unless otherwise specified, engine should be turned OFF for all lubrication and maintenance procedures.

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(W1) Spark Plug

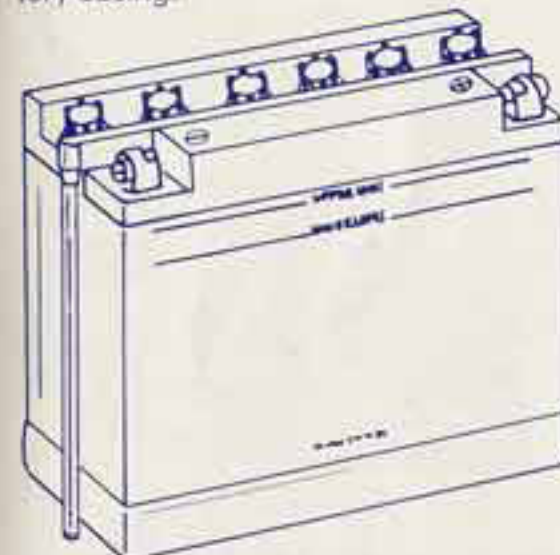
1. Disconnect spark plug wires and remove spark plugs.
2. Check condition of plugs.
 - A brownish tip reflects ideal conditions. (Correct carburetor setting, spark plug heat range, etc.).
 - A black insulator tip indicates fouling caused by: carburetor idle speed mixture and / or high speed mixture too rich, incorrect fuel mixture ratio, wrong type of spark plug (heat range), or excessive idling.
 - A light grey insulator tip indicates a lean mixture caused by: carburetor high speed mixture adjusted too lean, wrong spark plug heat range, incorrect fuel mixture ratio, or a leaking seal or gasket.



- CAUTION:** If spark plug condition is not ideal, contact your authorized Moto-Ski dealer.
3. Reinstall plugs and connect wires.

(W2) Battery

Check electrolyte level. Electrolyte level must be at upper level line on battery casing.



If necessary add distilled water. Battery connections must also be free of corrosion. If cleaning is necessary remove corrosion using a stiff brush then clean with a solution of baking soda and water. Rinse and dry well.

CAUTION: Do not allow cleaning solution to enter battery. It will destroy the chemical properties of the electrolyte.

After reconnecting battery coat battery terminals and connectors with petroleum jelly to prevent corrosion. Check that battery is well secured and that battery overflow tube is not blocked or kinked.

WARNING: Overflow tube must be free and open. A kinked or bent tube will restrict ventilation and create gas accumulation that could result in an explosion. Avoid skin contact with electrolyte.

(W3) Suspension

Visually inspect suspension springs. Replace any weak or broken spring. If vehicle is equipped with a slide suspension, inspect shoe condition and replace as necessary.

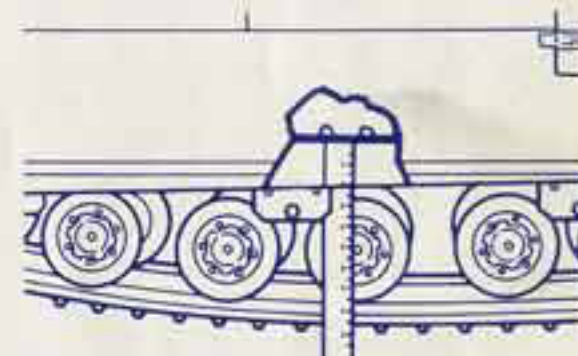
(W4) Track

With rear of vehicle off the ground, rotate track and inspect condition. Check for bad cuts, missing inserts or track guides. If bad cuts missing or defective inserts or guides are noted, contact your dealer for replacement.

(W5) Track Tension and Alignment Bogie wheel suspension

Lift the rear of vehicle and support it off the ground. Using a rule, check the track tension from the middle set of bogie wheels. The track tension distance between top inside edge of track and the bottom of the footboard should be:

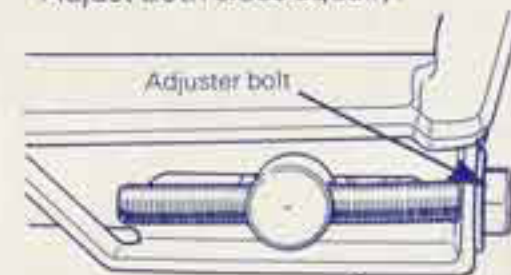
Spirit 3.5 cm \pm 3 mm (1 3/8" \pm 1/8")
Nuvik 6 cm \pm 3 mm (2 1/4" \pm 1/8")



If track tension is too loose, the track will have a tendency to thump. If too tight, performance will be affected.

If necessary to adjust:

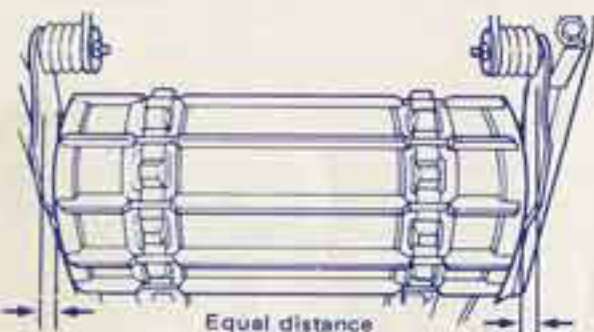
1. Using wrench, loosen both track adjusters by unscrewing the lock nuts situated on the inner side of the suspension springs.
2. Adjust to proper tension by turning adjuster bolts clockwise to tighten track, counter-clockwise to slacken. Adjust both sides equally.



3. Proceed with track alignment.

○ **NOTE:** Track tension and alignment are inter-related. Do not adjust one without checking the other.

Support rear of vehicle with a mechanical stand. Start the engine and accelerate slightly so that track turns **slowly**. Check that track is well centered and turns evenly on the rear sprockets. The distance between the edges of the track and the link plates should be the same on both sides. Misalignment can cause excessive wear of track edges and sprocket teeth.



To adjust:

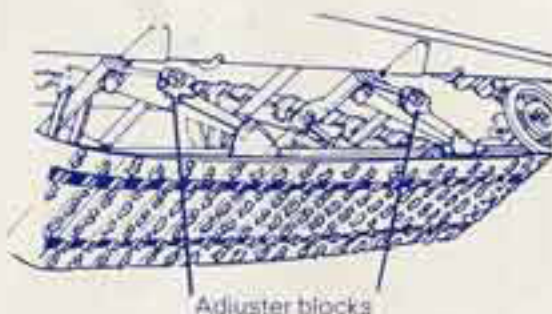
1. Stop engine. Using wrench, turn track adjuster bolt clockwise on the side where the track is closest to the link plate until track aligns.
2. Firmly retighten adjuster lock nuts.
3. Restart engine and rotate track **slowly** and recheck alignment.

◆ **WARNING:** Before checking track alignment, ensure that the track is free of all particles which could be thrown out while track is rotating. Keep hands, feet, tools and clothing clear of track.

Slide Suspension

The suspension is adjustable, the front adjustment for surface condition, the rear for driver's weight.

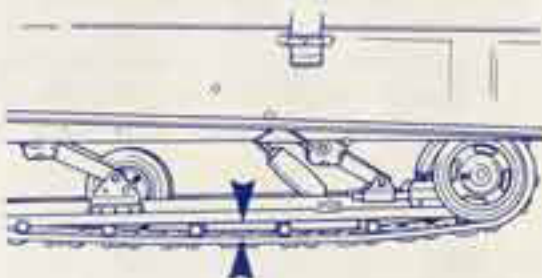
When the front adjuster blocks are at the lowest elevation more weight is distributed on skis. At the highest position the weight is transferred from the skis to the track. The rear adjuster blocks should be adjusted to suit the driver's preference. (The spark plug socket is an ideal tool to turn adjuster blocks).



▼ **CAUTION:** Always turn left side adjuster blocks in a clockwise direction, the right side blocks in a counter-clockwise direction. Left and right adjuster blocks of each adjustment must always be set at the same elevation.

Tension and Alignment

Lift rear of vehicle and support with a mechanical stand. Allow slide to extend normally. On Nuvik models a gap of 1-1.25 mm ($\frac{1}{16}$ - $\frac{1}{2}$ inch) should exist between slider shoe and bottom inside of track. On Futura models, the gap should be 1.9 mm ($\frac{3}{16}$ inch). If track tension is too loose, the track will have a tendency to thump.

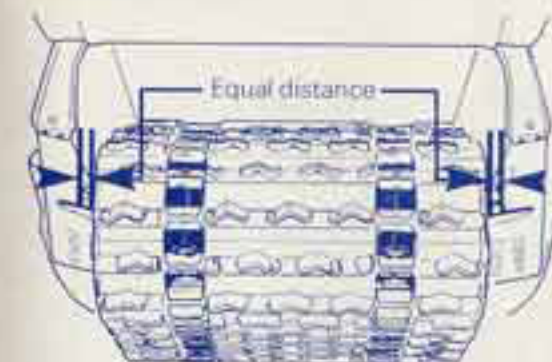


○ **NOTE:** Too much tension will result in power loss and excessive stresses on suspension components.

If necessary to adjust, loosen or tighten adjuster bolts located on inner side of rear idler wheels. If correct tension is unobtainable. Contact your dealer.

○ **NOTE:** Track tension and alignment are inter-related. Do not adjust one without the other.

Start the engine and accelerate slightly so that track turns **slowly**. Check that track is well centered and turns evenly. To correct, stop engine then loosen the lock nuts and tighten the adjuster bolt on side where track is closest to the frame. Tighten lock nuts and recheck alignment.

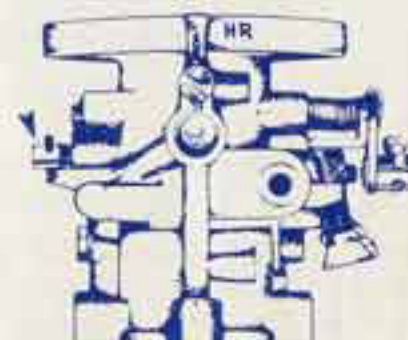


◆ **WARNING:** Before checking track alignment, ensure that the track is free of all particles which could be thrown out while track is rotating. Keep hands, tools, feet and clothing clear of track.

(W6) Carburetor Adjustment

▼ **CAUTION:** Never operate your snowmobile with the air silencer box disconnected. Serious engine damage will occur if this notice is disregarded.

On the Spirit model the carburetor is a diaphragm type carburetor. The diaphragm carburetor adjustment is the Low Speed Mixture Adjustment. Turn Low Speed Mixture Screw fully clockwise until closed then back off screw clockwise 1 turn (+ $\frac{1}{4}$ - 0).



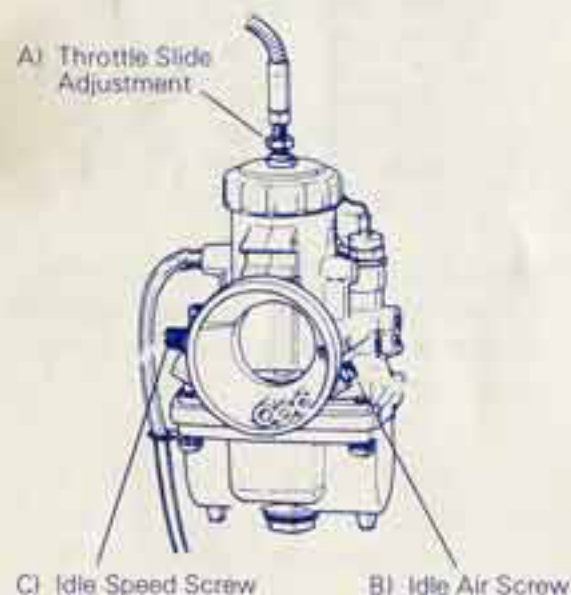
▼ **CAUTION:** Do not close screw too tightly as screw and/or screw seat can be damaged.

On all models, except Spirit model, the carburetor is a float type carburetor. On this type of carburetor the adjustments are:

Throttle Slide Adjustment, Idle Speed and Idle Speed Mixture Adjustment.

A) Throttle Slide Adjustment

Completely open (counter-clockwise) the idle speed screw (C) unlock cable adjuster lock nut then adjust the throttle cable to remove all slack when operating throttle control lever. Lock cable adjuster in position by tightening the adjuster lock nut against the carburetor top cover.



B) Idle Speed Mixture

Completely close the idle air screw (until a slight seating resistance is felt) then back off 1 1/2 turn.

C) Idle Speed

Turn idle speed screw clockwise until it contacts the throttle slide then continue turning two (2) additional turns. This will provide a preliminary idle speed setting. Start engine and allow it to warm then adjust idle speed to 1500-1800 RPM by turning idle speed screw clockwise or counter-clockwise.

CAUTION: Do not attempt to set idle speed using the idle air screw. Severe engine damage can occur.

(W7) Drive Belt

Inspect belt for cracks, fraying or abnormal wear (uneven wear, wear on one side, etc.). If abnormal wear is noted, probable cause is pulley misalignment. Contact your dealer. Check drive belt width. On Spirit model the drive belt width should not be less than 2.7 cm (1 1/8 in.), on all other models drive belt should not be less than 3 cm (1 3/8 in.) wide.

NOTE: When installing a new drive belt, a break-in period of 16-24 km (10-15 miles) is strongly recommended.

(W8) Steering Mechanism

Inspect steering mechanism for tightness of components (steering arms, tie rods, ball joints, spring coupler bolts, etc.). If necessary, replace or retighten.

Check condition of skis and ski runners. Replace if worn.

(M1) Brake

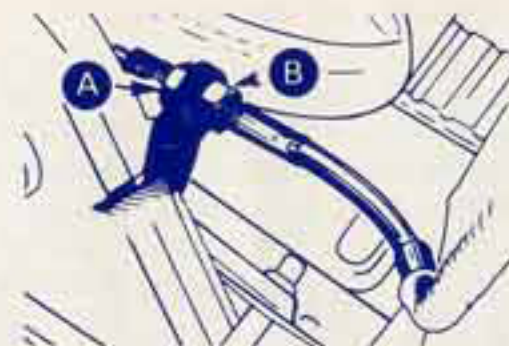
The brake mechanism on your snowmobile is an essential safety device. Keep this mechanism in proper working condition. Above all, do not operate your snowmobile without an effective brake system.

WARNING: Brake pad or pucks less than 4.5 cm (7/16 in.) thick must be replaced. Replacement must be performed by an authorized dealer.

On Spirit Model

Brake should apply fully while brake control lever is still 2.5 cm (1 inch) minimum from handlebar grip.

If a minor adjustment is indicated, slacken off cable housing nut (A) and tighten nut (B) to increase lever clearance. Turn each nut vice versa to decrease.



If correct brake control lever clearance is not obtained, proceed with major adjustment as follows:

Slacken off the nut retaining brake cable to lower brake lever. Adjust cable to required length by lengthening or shortening brake cable. Retighten nut. Ensure that minor adjustment nuts are located approximately half way on adjuster threads.

WARNING: Always check the stop light to see if it functions after performing brake adjustment.

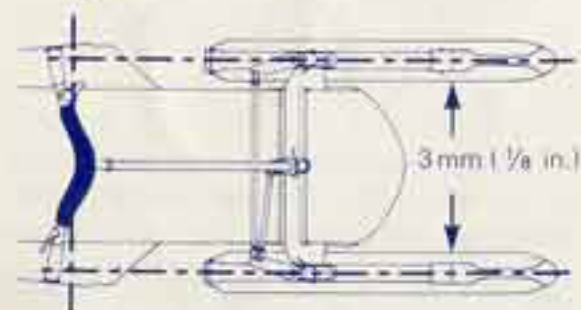
Self-Adjusting Brake

The brake mechanism is self-adjusting, therefore, periodic adjustment is not required. However, check operation of brake mechanism by depressing brake control lever. Brake should apply fully when lever is 2.5 cm (1/2 in.) approx. from handlebar grip. If not, do not tamper with the brake, contact your servicing dealer.

WARNING: Brake pad or pucks less than 4.5 mm (7/16 in.) must be replaced. Replacement must be performed by an authorized dealer.

(M2) Steering Adjustment Spirit Model

Skis should have a toe out of 3 mm (1/8 in.). To check, measure distance between skis at front and rear of leaf springs.

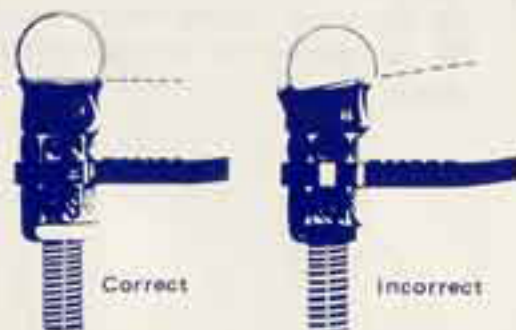


If necessary to adjust:

Loosen lock nuts of the longer tie rod. Turn tie rod manually until skis are properly aligned. Firmly retighten lock nuts.

Handlebar should also be horizontal when the skis are pointed toward front. To adjust, loosen the lock nuts of the shorter tie rod. Turn tie rod manually until handlebar is horizontal. Retighten lock nuts firmly. Check tightness of the steering arm locking bolts, ball joint wear, etc.

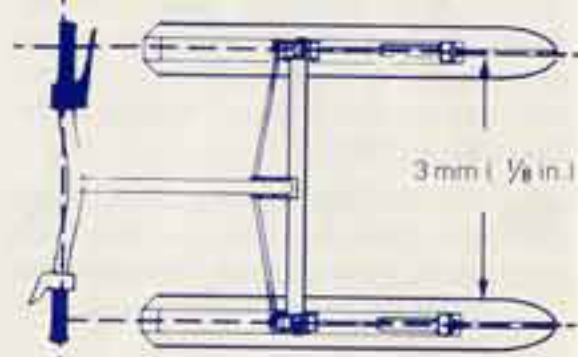
WARNING: The cut off section of the ball joint must run parallel with the steering arm. When tightening lock nuts, restrain ball joint with appropriate size wrench. Ensure at least half of the ball joint threads are inserted into the tie rod.



Nuvik and Futura Models

Skis should have a toe out of 3 mm (1/8 in.). To check, measure distance between each ski at front and rear of leaf springs. The front distance should be 3 mm (1/8 in.) more than the rear when the handlebar is horizontal.

IMPORTANT: Close front of skis manually to take all slack from steering mechanism.



If adjustment is required:

Unscrew the nuts locking the tie rods in place. Turn one or both tie rods until skis are parallel to each other. Then, measuring at front of leaf springs, add an additional 1.5 mm (1/16 in.) on each side by rotating turnbuckles. Tighten the nuts firmly against the tie rod. Check tightness of the steering arm locking bolts, ball joint wear, etc.

WARNING: The ball joint socket must run parallel with the steering arm. The socket must be restrained when tightening the tie rod end lock nuts. Ensure at least half of the ball joint threads are inserted into the tie rod.



(M3) Engine Head Nuts

After the first 5 hours of operation, check that engine head nuts are tight and equally torqued 1.9 to 2.2 kg-m (14 to 16 ft-lbs) when engine is cold.

(M4) Engine Mount Nuts

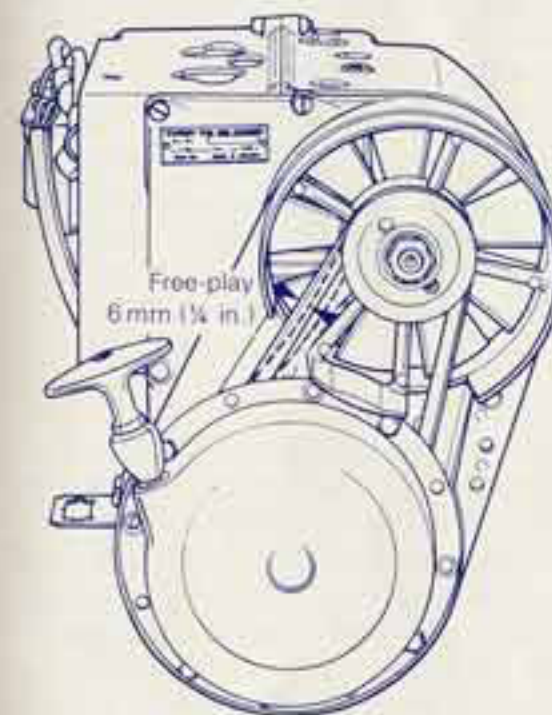
Check engine mount nuts for tightness. Retighten if necessary.

(M5) Muffler Attachment

The engine / muffler attaching parts are vital toward efficient muffler function. Check all attachments. Replace springs and / or tighten if necessary.

(M6) Fan Belt

Twin cylinder models only. Inspect belt for cracks, uneven wear, etc. Check fan belt tension 6 mm (1/4 in.) free play should exist when deflection is correct.



If belt seems damaged or if tension is incorrect, contact your dealer immediately.

WARNING: If fan protector is removed, always reinstall after servicing.

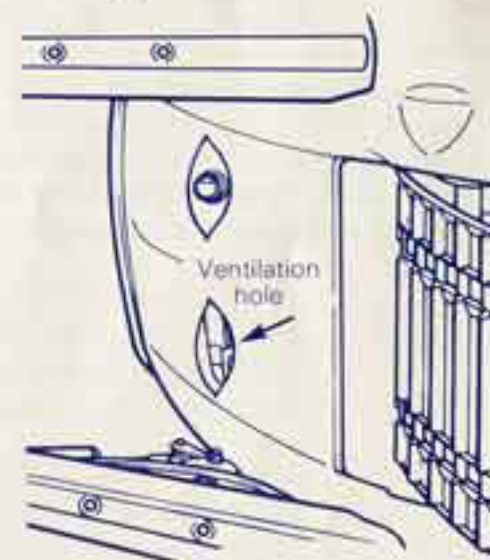
(M7) General Inspection

Check electrical wiring and components, retighten loose connections. Check for stripped wires or damaged insulation. Thoroughly inspect the vehicle and tighten loose bolts, nuts and linkage. Inspect skis and ski runners for wear.

(M8) Ventilation (Nuvik Models only)

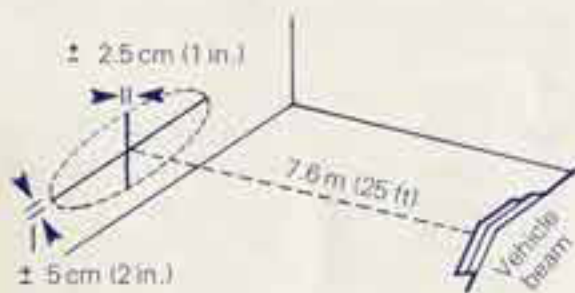
Check that the belly pan ventilation hole is not blocked or obstructed. Blockage of the system will create engine overheating.

NOTE: The condition of the ventilation must be checked more often if the vehicle is used on rough trails.



Headlamp Beam Aiming

The angle of the headlamp beam has been pre-adjusted prior to delivery. Should you wish re-adjustment, place vehicle on a flat surface, 7.6 meter (25 feet) from a wall or screen. Turn HI beam on (engine must be running on manual start models). Beam aiming is correct when beam center is equal with horizontal deviation of 5 cm (2 inches) and a maximum vertical deviation of 2.5 cm (1 inch).



If applicable remove chrome ring then turn upper or lower adjustment screws to obtain specified beam position.

Bulb Replacement

If headlamp is burnt, tilt cab. Unplug connector from headlamp. Remove rubber boot and unfasten bulb retainer clips. Detach bulb and replace. If tail-light bulb is burnt, expose bulb by removing red plastic lens. To remove, unscrew the two (2) Phillips head screws. Verify all lights after replacement.



It is during summer, or when a vehicle is not in use for any length of time that proper storage is a necessity. Storage of the snowmobile during long periods of inactivity consists of checking and replacing missing broken or worn parts. Proper lubrication and treatments to insure that parts do not become rusted; Cleaning items such as carburetor of fuel / oil mixtures, to prevent gum varnish formation within the carburetor; and in general, preparing the vehicle so that when the time comes to use the snowmobile again it will start and be in top condition.

WARNING: Only perform such procedures as detailed in this manual. Unless otherwise specified, engine should be turned OFF for all lubrication and maintenance procedures.

Track

Inspect track for cuts, missing track inserts and / or guides and broken rods. Make any necessary replacement. Lift rear of vehicle until track is clear of ground then support with brace or trestle. The snowmobile should be stored in such a way that track does not stay in contact with cement floor or bare ground.

NOTE: The track should be rotated periodically, (every 40 days). Do not release track tension.

SUSPENSION Bogie Wheels

Remove bogie wheel sets. Identify the installation position of each set. Remove cross shaft from each bogie wheel set. Clean bogie wheel assembly and shaft of dirt and rust. Check condition of cross shaft, replace if worn. Apply a coat of low temperature grease over shaft.



Grease each set then spray springs with metal protector, or wipe using an oil soaked cloth. Assemble and install each set in proper position. Lubricate rear hub through grease fittings.

Slide Suspension

Remove any dirt or rust. Grease idler wheels at grease fittings. Wipe off surplus. Replace worn slider shoes.

Ski Assembly

Wash or brush all dirt or rust accumulation from skis and springs. Grease ski legs at grease fittings. Check condition of skis, ski runners and leaf springs. Replace if worn or weak.



Apply metal protector on ski assembly. If unavailable, wipe the entire ski with cloth soaked in oil to prevent rust formation.

Fuel Tank

Remove cap then using a siphon, remove gasoline from tank.

◆ **WARNING:** Gasoline is flammable and explosive under certain conditions. Always perform procedures in a well ventilated area. Do not smoke or allow open flames or sparks in the vicinity.

Carburetor

The carburetor must be dried out completely to prevent gum formation during the storage period.

Assure that carburetor fuel line is disconnected (on vehicle equipped with float type carburetor disconnect the fuel pump inlet line) then start the engine and run it at idle until out of gas. On Spirit model, engage choke (turn to ON), remove air silencer and pack carburetor throat with a clean piece of cloth. Allow engine to turn a few more times to eliminate the remaining fuel.

▼ **CAUTION:** Do not apply throttle. Suction created can suck the cloth into the engine.

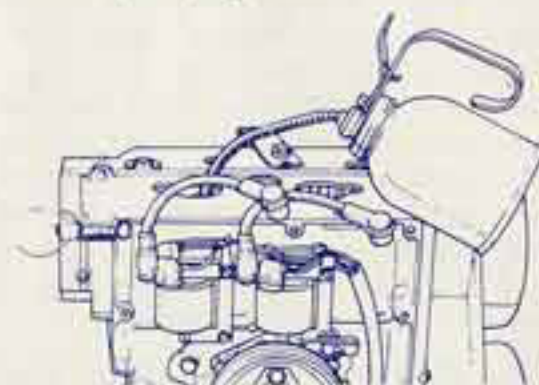
Install air silencer and connect fuel lines.

Cylinder Lubrication

Engine internal parts must be lubricated to protect cylinder walls from possible rust formation during the storage period.

○ **NOTE:** This operation should be repeated every 40 days during storage.

Remove spark plugs. Operate rewind starter to bring piston at top position. Pour the equivalent of one spoonful of oil into spark plug hole.



Slowly crank engine several times using manual starter. Repeat above steps for other cylinder. Install spark plugs.

▼ **CAUTION:** To prevent ignition system damage, make sure that the cut-out button is in the lower position.

Chaincase

Drain the chaincase and refill to proper level. To drain chaincase on Spirit model, remove access plug (lower plug) and tilt vehicle hard left. On all other models, remove chaincase cover.

Controls

Lubricate steering mechanism. Inspect components for tightness, (spring coupler bolts, steering arm locking bolts, tie rods, ball joints, etc.). Tighten if necessary. Oil moving joints of brake mechanism.

◆ **WARNING:** Do not lubricate throttle and/or brake cable housing. Avoid getting oil on brake lining(s).

Coat electrical connections and switches with a greaseless metal protector. If unavailable, use petroleum jelly.

Battery (Electric models only)

Remove battery from vehicle and clean outside surface of battery with solution of baking soda and water. Remove all deposits from posts then rinse with clear tap water.

▼ **CAUTION:** Do not allow cleaning solution to enter battery interior since it will destroy the electrolyte.

Check electrolyte level. Refill if necessary with distilled water. Fully charge battery. (A stored battery should be recharged at least every 40 days)

◆ **WARNING:** Gases given off by a battery being charged are highly explosive. Always charge in a well ventilated area. Keep battery away from cigarettes or open flames. Avoid skin contact with electrolyte.



Coat battery terminals with petroleum jelly and store unit in a cool, dry place.

IMPORTANT: Lack of preventive maintenance could void battery warranty.

Drive Pulley

The drive pulley should be cleaned and inspected. On Spirit model, the drive pulley also requires lubrication.

◆ **WARNING:** The lubrication of the drive pulley should be performed only by an authorized Moto-Ski dealer. A disassembly, cleaning, inspection and lubrication where applicable should also be performed by the dealer every 100 operating hours or at the end of each season, whichever ever occurs first.

IMPORTANT: The drive pulley assembly will be excluded from warranty, if the factory seal is broken by other than a duly authorized representative of Bombardier.

Chassis

Clean the vehicle thoroughly, removing all dirt and grease accumulation.

▼ **CAUTION:** Plastic alloy components such as throttle and brake control handles, windshield, etc., can be cleaned using mild detergents or isopropyl alcohol. Do not use strong soaps, degreasing solvents, abrasive cleaners, paint thinners, gasoline, etc.

Inspect cab and repair damage. Repair kits are available at your authorized Moto-Ski dealer. Clean frame.

Touch up all metal spots where paint has been scratched off. Spray all bare metal parts of vehicle with metal protector. Wax the cab for better protection.

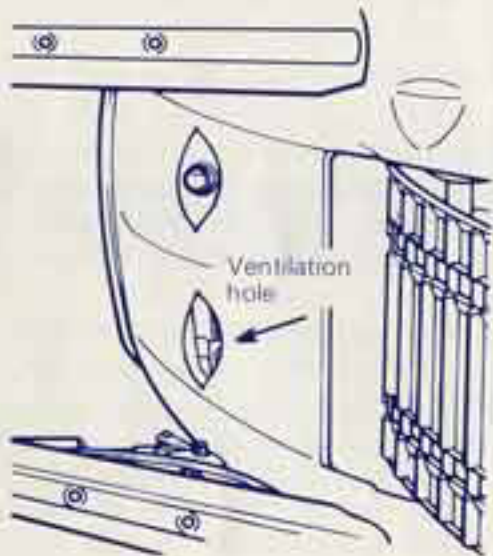
○ **NOTE:** Apply wax on glossy finish of cab only. Protect the vehicle with a Moto-Ski cover to prevent dust accumulation during storage.

General Inspection

Check electrical wiring and components, retighten loose connections. Check for stripped wires or damaged insulation.

Thoroughly inspect the vehicle and tighten loose bolts, nuts and linkage.

CAUTION: On Nuvik models, to retain the efficiency of the cooling system, check that the belly pan ventilation hole is not blocked or obstructed.



Snow is falling and you are now anticipating the next snowmobile safari. If you have observed and adhered to the storage procedures outlined in this manual, your vehicle preparation become a relatively easy task.

To simplify the pre-season preparation we have drawn up a small chart. The chart indicates servicing points to be performed by you and your servicing dealer. If these services are performed as suggested, your vehicle will give you many hours of fun and low cost use.

IMPORTANT: Observe all Warnings and Cautions mentioned throughout this manual which are pertinent to the item being checked. When component conditions seem less than satisfactory, replace with genuine Bombardier parts or approved equivalents.

PRE-SEASON PREPARATION

To be performed by dealer ●	
To be performed by owner ○	
Change spark plugs	○
Check chaincase oil level	○
Check drive pulley condition and if applicable lubricate	●
Check ski alignment / ski runners	○
Replace fuel filter	○
Connect fuel lines and check attaching points	○
Check track tension and alignment	○
Lubricate suspension	○
Inspect drive belt and install	○
Check throttle cable for damage and free operation	○
Inspect brake condition and operation	○
Inspect oil seals for possible cuts or leaks	●
If applicable test battery clean and install	●
Set engine timing, if necessary, replace breaker points	●
Check electrical wiring (broken wire, damaged insulation.)	○
Inspect condition of starting rope	○
Check tightness of all bolts, nuts and linkage	○
Refill gas tank	○
Adjust carburetor	●
Twin cylinder models, check fan belt condition and tension	○

TROUBLE SHOOTING GUIDE

SYMPTOMS	POSSIBLE CAUSES	WHAT TO DO
Engine turns over but fails to start or starts with difficulty	1. No fuel to the engine	Check the tank level and fill up with correct gas/oil mixture. Check for possible clogging of fuel line, item 5.
	2. Spark Plug	Check for fouled or defective spark plug. Disconnect spark plug wire, unscrew plug and remove from cylinder head. Reconnect wire and ground exposed plug on engine cowl, being careful to hold away from spark plug hole. Follow engine starting procedure and check for spark. If no sparks appear, replace spark plug. If trouble persists, check item 3.
	3. Faulty ignition	Disconnect spark plug wire from plug, unscrew the spark plug cap then position wire about 3 mm (1/8 in.) from the cylinder head. Follow engine starting procedure and if no sparks appear, it means a faulty ignition system. Do not attempt to repair. Contact your dealer.
	4. Flooded engine	Remove wet spark plugs, turn ignition to OFF and crank engine several times. Install clean dry spark plugs. Start engine following usual starting procedure. If engine continues to flood, see your dealer.
	5. Clogged fuel line (water or dirt)	Check condition of fuel filter, if necessary change filter cartridge. Check condition and connections of fuel lines. Check the cleanliness of fuel tank.
	6. Faulty Carburetor	First make primary adjustments on carburetors (See Maintenance Section). If carburetor is still faulty, contact your dealer for repair.
	7. Too much oil in fuel	Drain the fuel tank and refill with the correct gas/oil mixture.
	8. Engine Timing	Engine timing may be defective or out of adjustment. Contact your dealer.
	9. Poor engine compression	Running with a lean fuel mixture may produce excessive engine wear resulting in poor engine compression. If this occurs, contact your dealer at once.
Engine will not turn manually	1. Seized engine	In the case of a seized engine contact your dealer. Seizure is a direct result of poor lubrication.

SYMPTOMS	POSSIBLE CAUSES	WHAT TO DO
Engine lacks acceleration or power	1. Fouled or defective spark plug	Check item 2 of "Engine turns over but fails to start or starts with difficulty".
	2. Clogged fuel line (water or dirt)	Check fuel line condition. (See item 5 of "Engine turns over but fails to start or starts with difficulty").
	3. Carburetor	Readjust the carburetor. (See Maintenance section). If trouble persists, contact your dealer.
	4. Defective ignition	First check item 2 and 3 of "Engine turns over but fails to start or starts with difficulty". If the ignition system still seems defective, contact your dealer.
	5. Engine	If unable to locate specific symptoms, contact your dealer.
Engine continually backfires	1. Faulty spark plug	Check item 2 of "Engine turns over but fails to start or starts with difficulty".
	2. Overheated	Carburetor set too lean. Contact your dealer.
	3. Engine timing incorrectly set	Contact your dealer.
Snowmobile cannot reach full speed	1. Drive belt	Check for damaged or worn drive belt. Replace if necessary.
	2. Incorrect track adjustment	Check track tension and alignment. Readjust to specifications. (See Maintenance Section).
	3. Faulty engine	Check item 1 to 5 of "Engine lacks acceleration or power".
	4. Pulley misaligned	Contact your dealer.

SPECIFICATIONS (SPIRIT)

Engine	Number of cylinders	250
	Bore	53 mm (2.118")
	Stroke	66 mm (2.598")
	Displacement	246.8 cm ³ (15.09 in. ³)
	Compression ratio	7.5:1
Chassis	Carburetor	Tillotson HR
	Starting	Manual
	Overall length	2.25 m (88 1/2")
	Overall width	77.5 cm (30 1/2")
	Height	106.7 cm (42")
Power train	Height w / o windshield	92.7 cm (36 1/2")
	Weight	126.6 kg (278 lbs)
	Bearing area	6904 cm ² (1070 in. ²)
	Ground pressure	18.3 gr / cm ² (261 lbs / in. ²)
	Maximum load capacity	90.7 kg (200 lbs)
Electrical System	Track width	38.1 cm (15")
	Std. gear ratio	10 / 25
	Lighting system (output)	12 volts, 75 / 23 W
	Headlamp	60 / 60 W
	Tail / stop light	5 / 21
Fuel	Spark plug (Bosch)	M-175-T-1
	Spark plug gap	0.50 mm (.020")
	Advanced ignition timing	3.73 mm (.147") - .162" BTDC (direct)
	Tank capacity - ISO *	15.9 liters
	- Imp.	3.5 gals.
Brake	- U.S.	4.2 gals.
	Gasoline	Regular
	Gas / oil ratio	50 / 1
	Type	Drum

* International Standard Organization

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SPECIFICATIONS (NUVIK)

Engine	Number of cylinders	300 (TWIN)	340 / 340E	440 / 440E
	Bore	55.5 mm (2.185")	59.5 mm (2.342")	87.5 mm (3.443")
	Stroke	61 mm (2.401")	61 mm (2.401")	61 mm (2.401")
	Displacement	256.1 cm ³ (15.6 in. ³)	339.2 cm ³ (20.7 in. ³)	436.6 cm ³ (26.6 in. ³)
	Compression ratio	11:1	11.3:1	12:1
Chassis	Carburetor	Mikuni VM-30	Mikuni VM-30	Mikuni VM-34
	Starting	Manual	Manual / Electric	Manual / Electric
	Overall length	2.56 m (100 1/2")	2.56 m (100 1/2")	2.56 m (100 1/2")
	Overall width	83.8 cm (33")	83.8 cm (33")	83.8 cm (33")
	Height	109.2 cm (43")	109.2 cm (43")	109.2 cm (43")
Power train	Height w / o windshield	83.8 cm (33")	83.8 cm (33")	83.8 cm (33")
	Weight	175.1 kg (386 lbs)	175.1 kg (386 lbs)	181.9 kg (401 lbs)
	Bearing area	7045 cm ² (1092 in. ²)	6948 cm ² (1077 in. ²)	6948 cm ² (1077 in. ²)
	Ground pressure - (Manual start)	24.9 gr / cm ² (353 lbs / in. ²)	25.2 gr / cm ² (358 lbs / in. ²)	26.2 gr / cm ² (372 lbs / in. ²)
	- (Electric start)		26.9 gr / cm ² (383 lbs / in. ²)	27.8 gr / cm ² (396 lbs / in. ²)
Electrical System	Track width	38.1 cm (15")	38.1 cm (15")	38.1 cm (15")
	Std. gear ratio	16 / 35	14 / 34	20 / 34
	Lighting system (output)	12 Volts, 100 Watts	12 Volts, 100 Watts	12 Volts, 100 Watts
	Headlamp	60 / 60 W	60 / 60 W	60 / 60 W
	Tail / stop light	5 / 21 W	5 / 21 W	5 / 21 W
Fuel	Spark plug (Bosch)	W-240-T-1	W-240-T-1	M-250-MZ-1
	Spark plug gap	0.50 mm (.020")	0.50 mm (.020")	0.50 mm (.020")
	Advanced ignition timing (indirect)	3.35 mm - 3.69 mm (1.32" - 1.53")	3.35 mm - 3.69 mm (1.32" - 1.53")	3.43 mm - 4.04 mm (1.35" - 1.59")
	Tank capacity - ISO *	22.7 liters	22.7 liters	22.7 liters
	- Imp.	5 gals.	5 gals.	5 gals.
Brake	- U.S.	6.25 gals.	6.25 gals.	6.25 gals.
	Gasoline	Regular	Regular	Regular
	Gas / oil ratio	50 / 1	50 / 1	50 / 1
	Type	Disc self-adjusting	Disc self-adjusting	Disc self-adjusting

* International Standard Organization

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SPECIFICATIONS (FUTURA)

		400 / 400E	440 / 440E
Engine	Number of cylinders	2	2
	Bore	64.5 mm (2.539")	67.5 mm (2.657")
	Stroke	61 mm (2.401")	61 mm (2.401")
	Displacement	398.6 cm ³ (24.3 in ³)	438.6 cm ³ (26.8 in ³)
	Compression ratio	10:1	12:1
Chassis	Carburetor	Mikuni VM 30	Mikuni VM 34
	Starting	Manual / Electric	Manual / Electric
	Overall length	268.6 cm (105 7/8")	268.6 cm (105 7/8")
	Overall width	92.1 cm (36 1/8")	92.1 cm (36 1/8")
	Height	104.1 cm (41")	104.1 cm (41")
	Height w / o windshield	86.4 cm (34")	86.4 cm (34")
	Weight	190 kg (419 lbs) / 201.8 kg (445 lbs)	199.1 kg (439 lbs) / 210.9 kg (465 lbs)
	Bearing area	8045 cm ² (1247 in ²)	8045 cm ² (1247 in ²)
	Ground pressure - (Manual start)	23.6 gr / cm ² (336 lbs / in ²)	24.7 gr / cm ² (352 lbs / in ²)
	- (Electric start)	25.1 gr / cm ² (367 lbs / in ²)	26.2 gr / cm ² (373 lbs / in ²)
Power train	Track width	41.9 cm / 16 1/2"	41.9 cm (16 1/2")
	Std. gear ratio	18 / 34	21 / 38
	Lighting system (output)	12 Volts, 100 Watts	12 Volts, 100 Watts
Electrical System	Headlamp	60 / 60 W	60 / 60 W
	Tail / stop light	5 / 21 W	5 / 21 W
	Spark plug (Bosch)	W 260 MZ 1	M 200 MZ 1
	Spark plug gap	0.50 mm (.020")	0.60 mm (.020")
	Advanced ignition timing (indirect)	3.35 mm - 3.88 mm (1.32" - 1.53") B.T.D.C.	3.43 mm - 4.04 mm (1.35" - 1.59") B.T.D.C.
Fuel	Tank capacity - ISO*	27.2 liters	27.2 liters
	- Imp.	9 gals.	6 gals.
	- U.S.	7.5 gals.	7.5 gals.
	Gasoline	Regular	Regular
Brake	Gas / oil ratio	50 / 1	50 / 1
	Type	Disc self-adjusting	Disc self-adjusting

* International Standard Organization

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