

Alpine®

1977 OPERATOR MANUAL

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ski-doo®
snowmobiles



Recreational Products Group

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FOREWORD

Within the North American Continent, there exist a very special breed of people... people who enjoy ice and snow, and the unexcelled trails that lead to virtually every corner of the snowbelt. They enjoy too, the comfort of warm clothing, the friendliness of companions, and the recreational vehicle that made it all possible... the Ski-Doo snowmobile.

We, like millions of North American families, have never forgotten our pioneer heritage, or our love of nature and the great outdoors, consequently, we have designed and engineered all our models with safety, comfort and quietness foremost in our minds. We do respect your desires, and that of others.

Information has been prepared to acquaint the owner / operator of a new 1977 snowmobile with the various vehicle controls, owner-related maintenance, and safe operating instructions.

This is accomplished via three manuals; 'The Snowmobile Safety Handbook' the 'Warranty and Consumer Guide Booklet' and the 'Operator Manual'. Each is inseparable toward proper use of the product, and should be kept with the vehicle at all times.

This manual emphasizes particular information denoted by the wording and symbols;

◆ **WARNING:** Identifying an instruction which, if not followed, could cause personal injury.

▼ **CAUTION:** Denotes an instructions which, if not followed, could severely damage vehicle components.

○ **NOTE:** Indicates supplementary information needed to fully complete an instruction.

Although the mere reading of such information does not eliminate the hazard, your understanding of the information will promote its correct use.

Ride safe and have fun.

MICHEL CLOUTIER,



General Manager
Recreational Product Group

SAFETY IN MAINTENANCE

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 tracks of the vehicle are raised off the ground.
- It can be dangerous to run engine with the cab removed.
- 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 an 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 standard 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.

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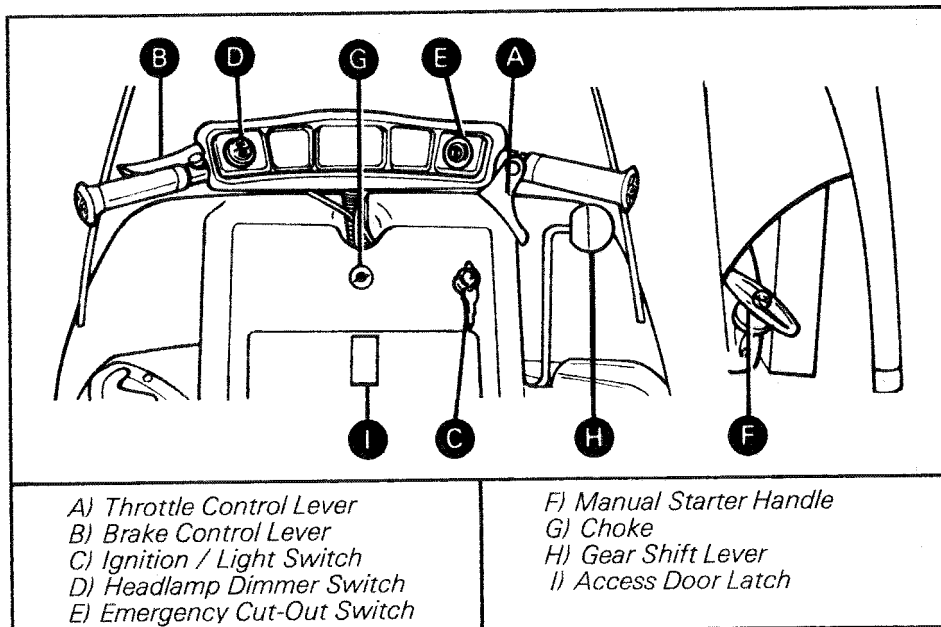
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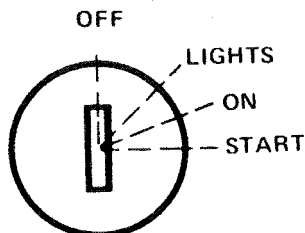
A) Throttle Control Lever

Located on right side of handlebar. When depressed, 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 depressed, 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



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) Manual Starter Handle

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

G) Choke

A push-pull button. Pull button to engage choke, push to disengage. 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.

H) Gear Shift Lever

A 2 position, (FORWARD / REVERSE) gear shift lever. Push up for forward and down for reverse.

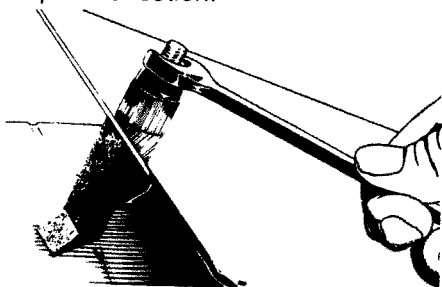
▼ **CAUTION:** Do not activate gear shift lever while snowmobile is in motion.

○ **NOTE:** When towing a disabled vehicle, its drive belt must be removed from pulleys and the gear shift lever positioned into forward gear.

I) Access Door Latch

To gain access to the carburetor or spark plugs, lift pressure lock tap and pull open access door.

To adjust locking device turn nut in required direction.



Cab Removal

Unlatch cab by turning both handles toward front of vehicle, remove fuel tank cap, gently lift cab then disconnect junction block at right side of engine. Remove cab from vehicle.

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

Seat Compartment

Remove backrest and tilt seat. Ideal location for spare plugs, belt, rope, etc.

○ **NOTE:** Emergency materials should be wrapped in foam or similar material. This will prevent possible damage to breakable items when travelling over rough or bumpy terrain.

Fuel Gauge

Unscrew fuel tank cap and withdraw dipstick to check fuel level.

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

With Ski-Doo snowmobile engines, a break-in period is required before running the vehicle at full throttle. Manufacturer's 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 Ski-Doo snowmobile should have an inspection check. This inspection is at the expense of the vehicle owner, refer to the "Warranty and Consumer Guide Booklet".

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, naphtha, 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 recommended gasoline plus 1 can of 50 / 1 concentrated Bombardier snowmobile oil = correct fuel mixture

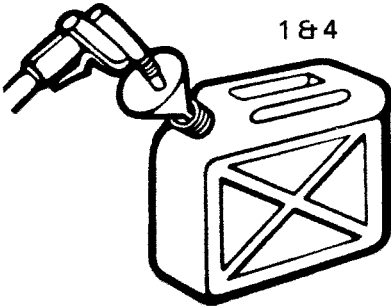
○ NOTE: To facilitate fuel mixing oil should be kept at room temperature.

Fuel Mixing Procedure

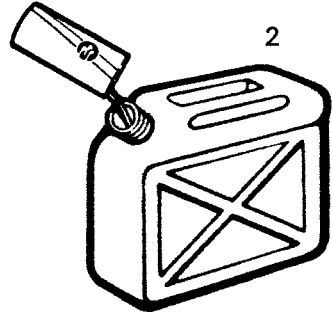
To mix the gasoline and oil always use a separate clean container. Never mix directly in your snowmobile tank. For best results, acquire two containers, either plastic or metal. Draw from one until empty then use the second one.

◆ **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.

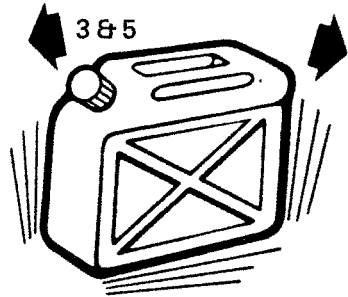
1. Pour approximately one gallon of gasoline into a clean container.



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 tendency to settle.

◆ **WARNING:** Never 'top up' gas tank before placing the 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.

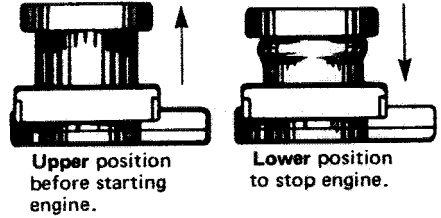
Check that the ski and the tracks are not frozen to the ground or snow surface and that the steering operates freely.

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.



1. Insert key in ignition switch.
2. Engage choke.
3. Make sure 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 then disengage choke.

▼ **CAUTION:** Never operate your snowmobile with the battery removed or disconnected.

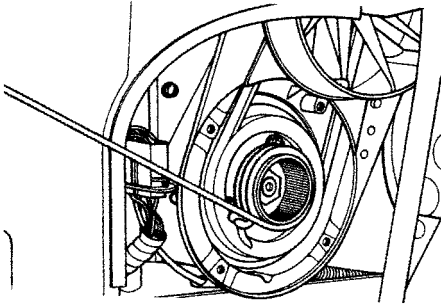
6. Check operation of the emergency cut-out switch then restart engine.

◆ **WARNING:** If engine does not cut-out, stop the engine by turning off the ignition key. Do not operate the vehicle, see your dealer.

7. Allow the engine to warm before operating at full throttle. If for some reason, the vehicle cannot be started electrically, place ignition key to ON position and start engine manually.

Emergency Starting

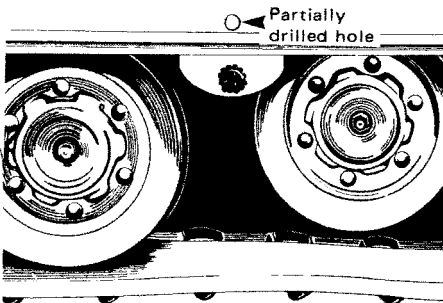
Should the rewind starter rope fray and break, remove starter unit using tool supplied with the vehicle. Transfer rope handle to your emergency rope. Make a knot at the end of emergency starter rope and wind rope around rewind starting pulley. Pull vigorously as per usual manual starting.



Driving Tips

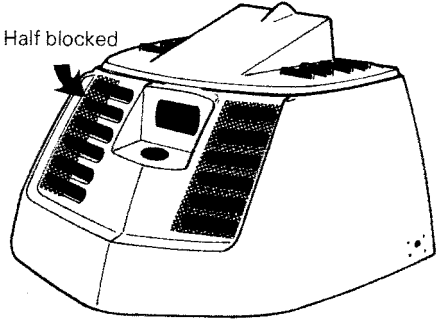
Bogie wheel

By raising the outer attachment of the bogie wheel sets, vehicle maneuverability in deep snow will increase. You will note that there are partially drilled holes located approx. 3.5 cm (1 3/8") above the original cross shaft holes of the frame. To reposition bogie wheel sets, drill holes fully through using a 5/16" dia. drill. Remove cap-screws securing bogie wheel cross shafts to frame and reinstall bogie wheels in new position.



Front cab louvers

Half blocked



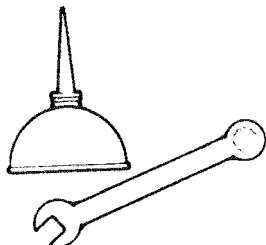
When operating the vehicle in powder snow it is advisable to block the front cab louvers as per illustration. Unblock the louvers as soon as snow condition becomes firmer or as soon as engine becomes too hot.

Pulling heavy loads

When pulling heavy loads, such as trail gromer, it is strongly recommended to enrich the Low Speed Mixture by turning its screw 1/4 of a turn counter-clockwise. (See page 14).

LUBRICATION

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 safe and trouble-free operation.

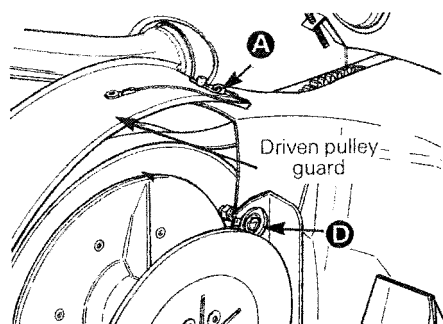
It is recommended that the steering system and suspension, be lubricated monthly or every 40 hours of operation. If the vehicle is operated in wet snow or in severe conditions these items should be lubricated more frequently.

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

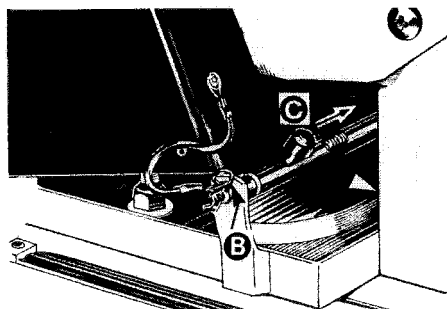
Pulley Guard Removal

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

1. Remove cab. Pull out retaining clip (A) and tilt driven pulley guard toward front of vehicle.



2. Pull out retaining clip (B) to disengage pin (C) from bracket.

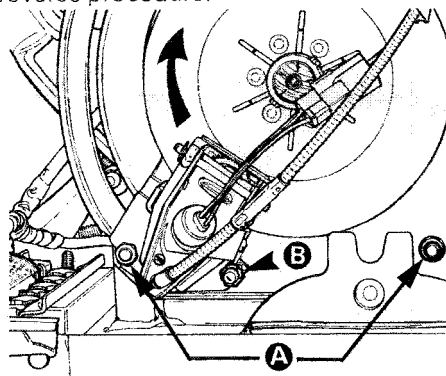


3. Move pulley guard toward front of vehicle to disengage front attaching device from front bracket.

Drive Belt Removal

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

Remove cab and pulley guard. Remove the two bolts (A) holding disc brake to the frame. Loosen nut (B) to separate brake caliper from disc brake bracket. Pivot the brake bracket assembly half a turn. Open the driven pulley. Twist and push the sliding half then hold in open position; slip slackened belt over the top edge of the sliding half. Slip the belt out from the drive pulley and remove from vehicle by passing it under the driven pulley and disc brake assembly. To install drive belt follow reverse procedure.



Driven Pulley

With cab removed, grease the driven pulley shaft as follows:

Remove pulley guard and slip off drive belt. Open the driven pulley, (push and twist sliding half).

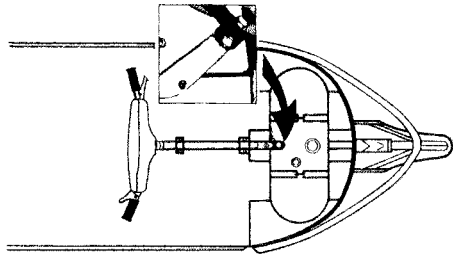
Thoroughly clean the driven pulley shaft.

Apply a light coat of low-temp grease on the shaft. Always lubricate lightly and wipe off surplus.

○ **NOTE:** Activate the sliding half several times to distribute lubricant over full length of shaft. Be careful that lubricant does not get on inner halves of pulley.

Steering Mechanism

Using light machine oil, lubricate the spring located on top of steering column housing. Allow oil to run in. Oil the mobile contact point at bottom end of steering arm. Using a small brush, dipped in low temp grease, lubricate steering arm ball joint.

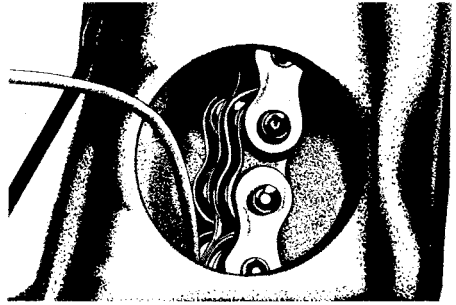


Grease the ski leg at grease fitting until new grease appears at the joint. Lubricate spring coupler bolt with oil.

Gearbox Oil Level

The gearbox oil capacity is 454 ml (16 ozs.) To check level:

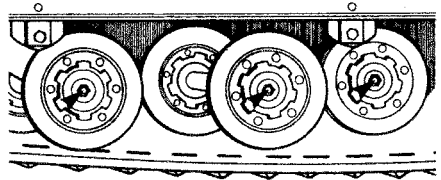
Remove rubber inspection cover located on bottom right side of gearbox. Using a rigid piece of wire as dipstick, check oil level. Oil level must reach 8.2 cm (3¼") on dipstick.



To fill, remove filler cap from top of gearbox. Refill as required using Bombardier chaincase oil.

Bogie Wheels

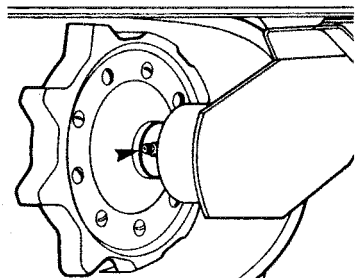
Grease the suspension bogie wheels with low-temperature grease. Pump through the grease fitting at the center of each wheel until new grease appears at the joint of inner side.



To grease the inner side bogie wheels, tilt vehicle on its side and apply pressure on track to expose grease fittings.

Rear Axles

Lubricate the rear axles with low-temperature grease. Pump grease through the rear axle fittings.



▼ **CAUTION:** Always use a low-pressure grease gun.

MAINTENANCE

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.

Code	Weekly	Page
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W2	Battery	12
W3	Suspension	13
W4	Tracks	13
W5	Track tension and alignment	13
W6	Carburetor adjustment	14
W7	Drive belt	14
W8	Steering mechanism	14
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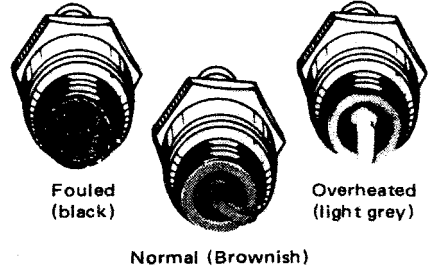
Code	Monthly	Page
M1	Brake	15
M2	Steering adjustment	15
M3	Engine head nuts	15
M4	Engine mount nuts	15
M5	Muffler attachment	15
M6	Fan belt	16
M7	Vehicle general inspection	16
	Headlamp adjustment	16

(W1) Spark Plugs

Open access door. Disconnect spark plug wires and remove plugs. check condition of plugs.

- A brownish tip reflects ideal conditions. (Correct carburetor adjustment, 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 mixing 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.

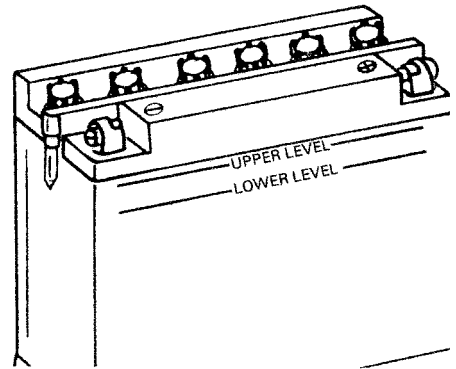


Check spark plug gap using a wire feeler gauge. Gap must be 0.5 mm (.020").

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.

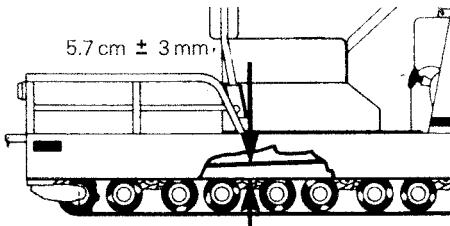
(W4) Tracks

Lift rear of vehicle and support it off the ground. Place gear shift lever in forward position. With engine off, rotate tracks by hand and inspect condition. If bad cuts or missing track inserts are noted, see your dealer for replacement.

○ **NOTE:** Without these inserts continual abrasion would wear and cut the track therefore, always replace a missing or damaged insert as soon as possible.

(W5) Track Tension and Alignment

Lift the rear of vehicle and support it off the ground. Using a rule, check track tension at the second set of bogie wheels from rear.

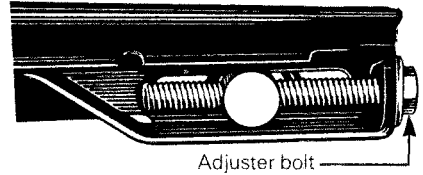


The deflection of each track should be 5.7 cm ± 3 mm (2¼" ± ⅛") between top inside edge of track and center of bogie wheel set retaining bolt.

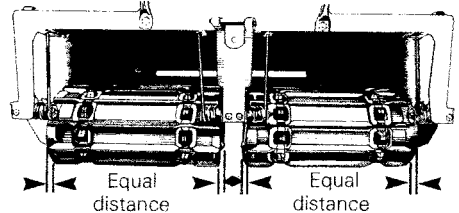
To adjust track use the following procedure:

Loosen link plate spring lock nuts (4) located on inner side of link plate springs.

Turn adjuster bolts clockwise to tighten tracks, counter-clockwise to slacken.



Start engine and allow tracks to rotate slowly. Check if tracks are well centered and turn evenly on the rear sprockets. The distance between track edges and link plates should be equal.



To correct:

Turn inner side adjuster bolt(s) counter-clockwise to bring track closer to center link plate(s), turn clockwise to withdraw track(s) from link plate(s).

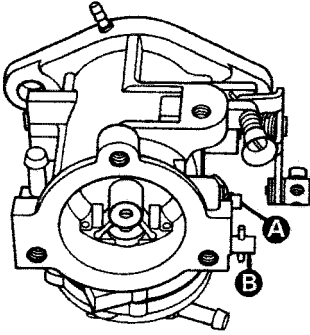
Tighten link plate spring lock nuts.

Rotate tracks 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.

(W6) Carburetor Adjustment

The carburetor mixture adjustments are: A) Low Speed Mixture, and B) High Speed Mixture.



A) Low Speed Mixture Adjustment

Turn Low Speed Mixture Screw fully clockwise (until a slight seating resistance is felt). Back off screw $1 \frac{1}{8}$ turn ($+ \frac{1}{4} - 0$) counter-clockwise.

CAUTION: When pulling heavy loads such as trail groomer, it is strongly recommended to enrich the Low Speed Mixture by turning its screw $\frac{1}{4}$ of a turn counter-clockwise.

B) High Speed Mixture Adjustment

Turn High Speed Mixture Screw fully clockwise until closed. Back off screw one (1) turn ($+ \frac{1}{4} - 0$) counter-clockwise

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

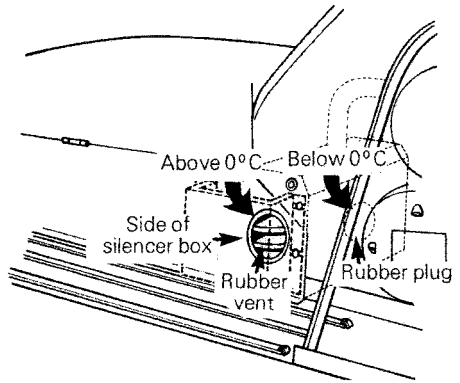
WARNING: A final High Speed Mixture Adjustment must be carried out only by an authorized Ski-Doo dealer.

Air Silencer Box

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

When operating the vehicle in temperature exceeding 0°C (32°F), the rubber plug must block the engine side

orifice and the rubber vent must be positioned on the side of the silencer box to allow cold air circulation.



In temperatures below 0°C (32°F) and/or powder snow, the rubber plug must block the entry of fresh air on the side of the silencer box and the rubber vent must allow the warm air being emitted from the engine to be directed over the carburetor.

CAUTION: Observe temperature changes and locate plugs accordingly. Incorrect location of plugs may cause carburetor ice-up or engine overheating.

(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, drive belt width should not be less than 3 cm ($1 \frac{3}{16}$ " wide).

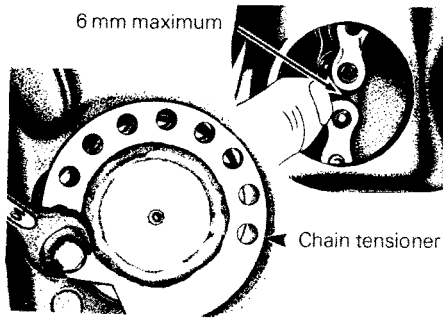
NOTE: When installing a new drive belt, a break-in period of 10-15 miles is strongly recommended.

(W8) Steering Mechanism

Inspect steering mechanism for tightness of components (steering arm, ball joint, etc.). If necessary, replace or retighten. Check condition of ski and ski runner. Replace if worn.

(W9) Drive Chain Tension

Run vehicle forward so that true free-play can be taken. Check tension then turn driven pulley $\frac{1}{2}$ turn counter-clockwise and recheck. Starting from maximum reading, adjust chain tension to 6 mm ($\frac{1}{4}$ ") free-play. Remove cap-screw locking chain tensioner in place. (Tensioner is located at bottom left of gearbox).



Rotate the tensioner as required to obtain correct chain tension.

Replace capscrew to lock chain tensioner in place.

○ **NOTE:** If the vehicle is used to carry or pull heavy loads, it is advisable to change the gear ratio. Contact your dealer for optional gears.

(M1) Brake

The brake mechanism is self-adjusting, therefore, periodic adjustment is not required. However, the brake mechanism can be checked by depressing brake control lever. Brake should apply fully when lever is 13 mm ($\frac{1}{2}$ ") approx. from handlebar grip. If it does not, do not tamper with the brake, contact your servicing dealer. Check the stop light to see if it functions. If necessary, readjust switch position.

◆ **WARNING:** Brake pucks less than 5 mm ($\frac{3}{16}$ ") must be replaced. Replacement must be performed by an authorized Ski-Doo dealer. Always check the stop light to see if it functions.

(M2) Steering Adjustment

Ski should be perpendicular to handlebar. To align:

Remove bolt securing handlebar to steering column.

Remove handlebar to expose splined end of steering column.

Reposition handlebar on splines so that it is perpendicular with ski. Install and tighten bolt to 4.1-4.8 kg-m (30-35 ft-lbs).

○ **NOTE:** If correct spline alignment is unobtainable at handlebar, move lower steering bracket to obtain proper location. (Lower steering bracket holes are slotted).

(M3) Engine Head Nuts

After the first 5 hours of operation, check that engine head nuts are tight and equally torqued to 1.8-2.3 kg-m (13 to 17 ft-lbs) when engine is cold.

(M4) Engine Mount Nuts

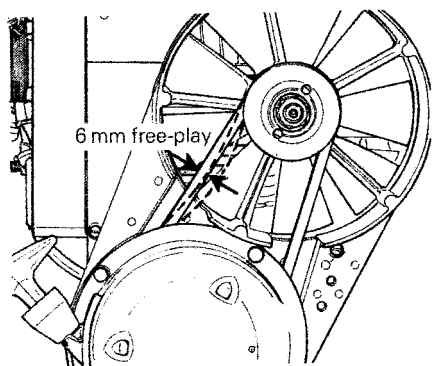
Check engine mount nuts for tightness. Retighten if necessary.

(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

Inspect belt for cracks, uneven wear, etc. Check fan belt tension, 6 mm (¼") free-play should exist when deflection is correct.



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

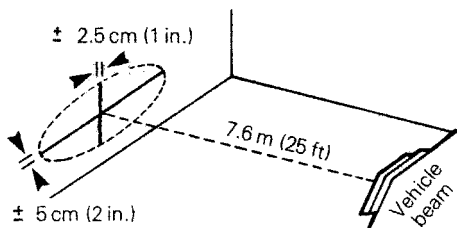
◆ **WARNING:** If fan protector is removed, always reinstall after servicing.

(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 ski and ski runner for wear.

Headlamp

The angle of the headlamp has been pre-adjusted prior to delivery. Should you wish re-adjustment place vehicle on a flat surface, 7.6 meters (25 feet) from a wall or screen. Turn Hi beam on. Beam aiming is correct when beam center is equal with horizontal beam line, within a maximum horizontal deviation of 5 cm (2") and a maximum vertical deviation of 2.5 cm (1").



To adjust, remove headlamp chrome ring. Turn upper or lower adjusting screws to obtain desired beam position.

Bulb Replacement

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

STORAGE

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 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.

Tracks

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

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

Suspension

Remove the bogie wheel sets from the vehicle. Remove cross shaft from bogie wheel set. Clean bogie wheel assembly and cross shaft of dirt or rust. Grease each bogie wheel until all old grease is flushed out. Spray bogie wheel springs with metal protector. If unavailable, wipe with cloth or rag soaked in oil. Check condition of shaft and replace if bent or worn. Apply a coat of low temp. grease on cross shaft.



Reassemble entire bogie wheel set, making sure assembly moves freely. Reinstall bogie wheel set. Repeat above steps on remaining bogie wheel sets. Lubricate rear hubs through grease fittings.

Ski Assembly

Wash or brush all dirt or rust accumulation from ski and spring. Grease ski leg at grease fitting. Check condition of ski and ski runner. Replace if worn or weak. Apply metal protector on ski assembly. If unavailable, wipe the entire ski with a cloth soaked in oil to prevent rust formation.

Fuel Tank

Remove cap then using a syphon, 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 storage period. Assure that fuel lines are disconnected then start the engine and run it out of gas. Disconnect the air silencer tube, engage choke then pack the carburetor throat with a clean piece of cloth and turn the engine a few more times. The suction should eliminate the remaining fuel. Connect air silencer tube and 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.

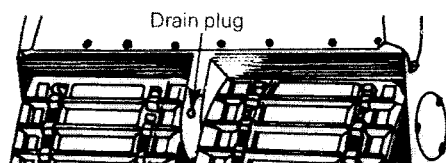
Remove spark plugs, operate rewind starter to bring piston at top position. Pour the equivalent of one spoonful of oil into spark plug hole.

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.

Gearbox

Drain gearbox and refill with 454 ml (16 ozs.) of fresh Bombardier chaincase oil. (Drain plug is located beneath frame).



Controls

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

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

Driven Pulley

Remove cab and drive belt. Thoroughly clean the driven pulley shaft. Apply a light coat of low-temperature grease on shaft. Activate the sliding half several times to distribute grease on shaft. Activate the sliding half several times to distribute lubricant. Spray internal pulley surfaces with Ski-Doo metal protector.

○ **NOTE:** Leave drive belt off during entire storage period.

Battery

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 electrical connections and switches with a greaseless metal protector, if unavailable, use petroleum jelly. Store unit in a cool, dry place.

Chassis

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

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

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

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 Ski-Doo 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.

PRE-SEASON PREPARATION

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.

PRE-SEASON PREPARATION CHART

To be performed by dealer ●	
To be performed by owner ○	
Change spark plugs	○
Check gear box oil level	○
Check pulleys, clean and check condition of drive pulley	●
Check steering adjustment / ski runner	○
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	●
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	●
Check fan belt condition and tension	●

TROUBLE SHOOTING GUIDE

SYMPTOMS	POSSIBLE CAUSES	WHAT TO DO
<p>Engine turns over but fails to start or starts with difficulty</p>	<p>1. No fuel to the engine</p>	<p>Check the tank level and fill up with correct gas-oil mixture. Check for possible clogging of fuel line, item 5.</p>
	<p>2. Spark plug</p>	<p>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.</p>
	<p>3. Faulty ignition</p>	<p>Disconnect spark plug wire from plug, unscrew the spark plug cap then hold wire about 3 mm (1/8") 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.</p>
	<p>4. Flooded engine</p>	<p>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.</p>
	<p>5. Clogged fuel line (water or dirt)</p>	<p>Remove and clean the fuel filter. Change filter cartridge if necessary. Check condition and connections of fuel lines. Check the cleanliness of fuel tank.</p>
	<p>6. Faulty carburetor</p>	<p>First make primary adjustments on carburetor (See Maintenance Section). If carburetor is still faulty, contact your dealer for repair.</p>
	<p>7. Too much oil in fuel</p>	<p>Drain the fuel tank and refill with the correct gas/ oil mixture.</p>
	<p>8. Engine timing</p>	<p>Engine timing may be defective or out of adjustment. Contact your dealer.</p>
	<p>9. Poor engine compression</p>	<p>Running with a lean fuel mixture may produce excessive engine wear resulting in poor engine compression. If this occurs, contact your dealer at once.</p>
<p>Engine will not turn manually</p>	<p>1. Seized engine</p>	<p>In the case of a seized engine contact your dealer. Seizure is a direct result of poor lubrication.</p>

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. Faulty 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 faulty, 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

ALPINE 640 ER Engine	Number of cylinders	2
	Bore	76 mm (2.992")
	Stroke	70 mm (2.755")
	Displacement	635.1 cc (38.76 cu. in.)
Chassis	Compression ratio	9:1
	Carburetor	Tillotson HRM 7A
	Starting	Electric
	Overall length	288.3 cm (113.5")
Power Train	Overall width	88.9 cm (35")
	Height with windshield	120 cm (47 1/4")
	Weight	281.2 kg (620 lbs)
	Bearing area	13935.45 cm ² (2160 in ²)
Electrical System	Ground pressure	20.2 gr / cm ² (.287 lb. / in ²)
	Track width	2 x 38 cm (15")
	Std. gear ratio	17 / 38
	Lighting system output	140 W
Fuel	Headlamp bulb	60 W
	Tail / stop light	8 / 23 W
	Spark plug	Bosch M-240-T-1
	Spark plug gap	0.5 mm (.020")
Brake	Advance ignition timing	3.71-4.22 (.146"-.166") B.T.D.C.
	Tank capacity — U.S.	6.25 gals
	— Imp.	5 gals
	— SI*	22.7 liters
International system	Gasoline	Regular
	Gas / oil ratio	50 / 1
	Type	Disc self-adjusting

*International system

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