



INTRUDER

ST440-A4



SNOWMOBILE ASSEMBLY & PREPARATION MANUAL

NOTICE TO DEALERS

This manual is provided to ensure that the snowmobile is assembled correctly and given proper presale preparation. Your customer expects and deserves a safe, reliable snowmobile, and performance of the steps listed here is essential to that end.

The selling dealer assumes sole responsibility for any unauthorized modifications prior to sale. **REFER TO YOUR SNOW PRODUCTS BINDER FOR ANY SERVICE BULLETINS SPECIFYING FACTORY DIRECTED MODIFICATIONS WHICH MUST BE PERFORMED BEFORE THE SNOWMOBILE IS READY FOR SALE.**

SAFETY AWARENESS

WARNING

This warning symbol identifies special instructions or procedures which, if not correctly followed, could result in personal injury, or loss of life

CAUTION

This caution symbol identifies special instructions or procedures which, if not strictly observed, could result in damage to, or destruction of equipment.

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Dealer's Assembly and Preparation Check List

Remove the Assembly & Preparation Check List from storage case. Complete each item of the check list following the procedures outlined in this manual. Verify compliance by placing a check (✓) in box preceeding each item as it is completed. Be sure to sign all sections of the form as they are completed. Retain completed check list for your records.

KAWASAKI SNOWMOBILE DEALER'S ASSEMBLY & PREPARATION CHECK LIST	
I hereby certify that prior to delivery to the first retail purchaser assembly and preparation servicing was performed on the snowmobile listed below in accordance with the following check list, and in compliance with the established procedures prescribed by Kawasaki: (✓) check each item when completed)	
SNOWMOBILE INFORMATION	
MODEL _____	SERIAL NO. _____ ENGINE NO. _____
ASSEMBLY CHECK LIST	
1 ☐ REMOVE CRATE - check for damaged & missing parts.	6 ☐ SAFETY DECALS - properly installed.
2 ☐ SKIS - install - torque all bolts.	7 ☐ TOOL KIT - complete/installed.
3 ☐ SKI SHOCKS - mount and torque bolts.	
4 ☐ WINDSHIELD - mount to hood.	
5 ☐ HANDLEBARS - adjust to proper position/torque bolts.	ASSEMBLY BY: _____
	Signature _____
PREPARATION CHECK LIST	
1 ☐ STEERING - align skis/components secure.	*17 ☐ OIL LINE TO PUMP - (all oil injection models) bleed/secure/properly routed.
2 ☐ CLUTCH ALIGNMENT - check/adjust.	*18 ☐ ENGINE COOLANT - check level/freeze protection.
3 ☐ CLUTCH CENTER TO CENTER - check/adjust.	19 ☐ SPARK PLUGS - check/gap.
4 ☐ CHAINCASE - add lube if required/check for leaks.	20 ☐ GAS TANK - fill with recommended fuel/oil mix (refer to Owner's Manual) check for leaks.
5 ☐ BRAKE - clean disc/adjust.	21 ☐ CARBURETOR AIR SCREW - adjust.
6 ☐ WIRING HARNESS - properly routed/electrical connectors secure.	22 ☐ CARBURETOR IDLE SPEED - adjust.
7 ☐ SUSPENSION - check/adjust.	*23 ☐ PRIMER - check operation.
8 ☐ NUTS, BOLTS, OTHER FASTENERS - check/tighten.	24 ☐ IGNITION TIMING - check when engine is warm/adjust.
*9 ☐ ENGINE GEARCASE LUBRICANT - check level/add recommended oil as required.	25 ☐ ELECTRICAL SYSTEM - check operation - adjust
10 ☐ FUEL PUMP TUBES - secure and no kinks.	☐ Headlight: ☐ Battery Charging System
11 ☐ ENRICHENER CONTROL - check/adjust.	☐ Taillight ☐ Brake Light
*12 ☐ OIL PUMP - check synchronization/adjust.	* ☐ Electric Starter ☐ Instruments & Indicator Lights
13 ☐ THROTTLE CABLE - check/adjust.	
*14 ☐ CARB SYNCHRONIZE - check/adjust (twin carb models).	26 ☐ TRACK - adjust tension/align
*15 ☐ FAN BELT - check/adjust (axial fan models).	
*16 ☐ OIL TANK - fill with Kawasaki approved oil/check for leaks.	
	PREPARATION BY: _____
	Signature _____
TEST RIDE	
1 ☐ CONTROL CABLES - throttle & brake works without binding in any steering position/returns freely.	8 ☐ SPEEDOMETER/TACHOMETER - check operation.
2 ☐ ENGINE STOP SWITCH - check operation.	9 ☐ NO UNUSUAL NOISES.
3 ☐ SUSPENSION - check slider ride adjustment.	*10 ☐ NO COOLANT LEAKS.
4 ☐ STEERING - action is free lock to lock/no looseness.	11 ☐ NO FUEL OR OIL LEAKS.
5 ☐ ENGINE - recoil starter works properly/engine starts promptly/good throttle response and return. Exhaust smoke present but not excessive (oil injection models).	*12 ☐ COOLANT LEVEL - check/add coolant mix as required.
6 ☐ CLUTCHES - smooth operation/correct maximum RPM.	13 ☐ CONTROLS - properly positioned/secure/adjusted.
7 ☐ BRAKES - adequate - smooth stopping power.	
	TEST RIDDEN BY: _____
	Signature _____
CUSTOMER DELIVERY	
1 ☐ OWNER'S MANUAL - explain contents/proper maintenance/install.	4 ☐ CONTROLS - explain location & operation/properly positioned for customer.
2 ☐ OWNER'S SAFETY HANDBOOK - explain contents/install.	
3 ☐ WARRANTY CERTIFICATE - explain warranty and customer responsibilities thoroughly/install.	DELIVERED BY: _____
	Signature _____
DEALER VERIFICATION	
Dealer Name _____	Signature of Dealership Manager _____
Address _____	Date _____
*Applicable models only - refer to assembly instruction provided by Kawasaki for specific models.	
P/N 49007-3501	white copy dealer file/canary copy owner
Printed in U.S.A.	
If it is desired to utilize the French portion of this check list, please remove the carbon sheet and insert in proper location.	

Assembly

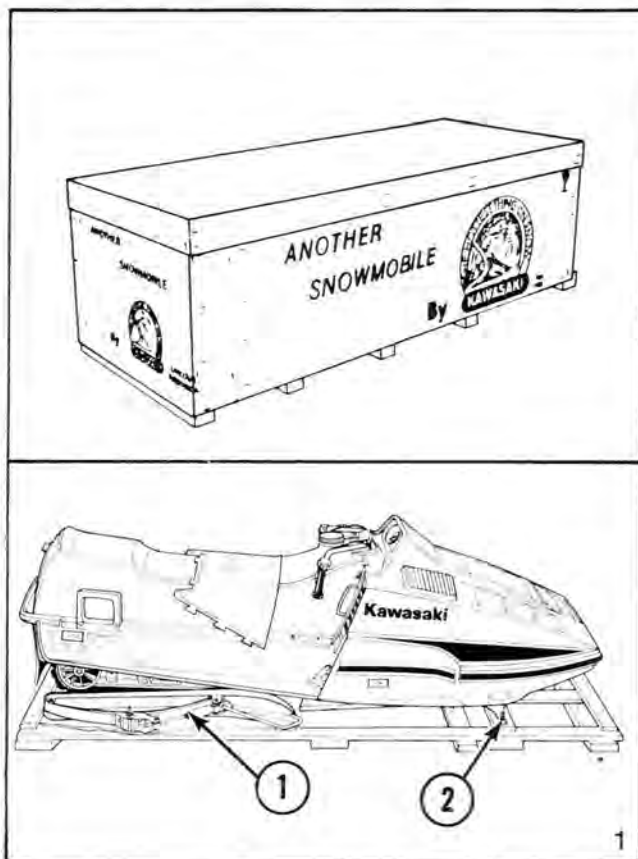
Uncrate

Observe this **CAUTION** during next step

Bend over all exposed crate fasteners to prevent personal injury or possible vehicle damage.

In a large clear work area, open the crate. Separate the top and sides of the crate and remove the windshield from the seat. Unscrew nuts securing ski assemblies and spindles to the crate bottom and discard hardware as it is not used for snowmobile assembly. (See Figure 1.)

NOTE: When uncrating vehicle, inspect for concealed damage that may occur during shipping. If damage is apparent, STOP uncrating and check your WARRANTY POLICIES & PROCEDURES section of your Snow Products Binder under RECEIVING WAREHOUSE UNITS.



- 1. Ski Assembly
- 2. Ski Spindle

Observe this **WARNING** during next step

To prevent personal injury, use lifting equipment with approved safety hooks when raising the snowmobile.

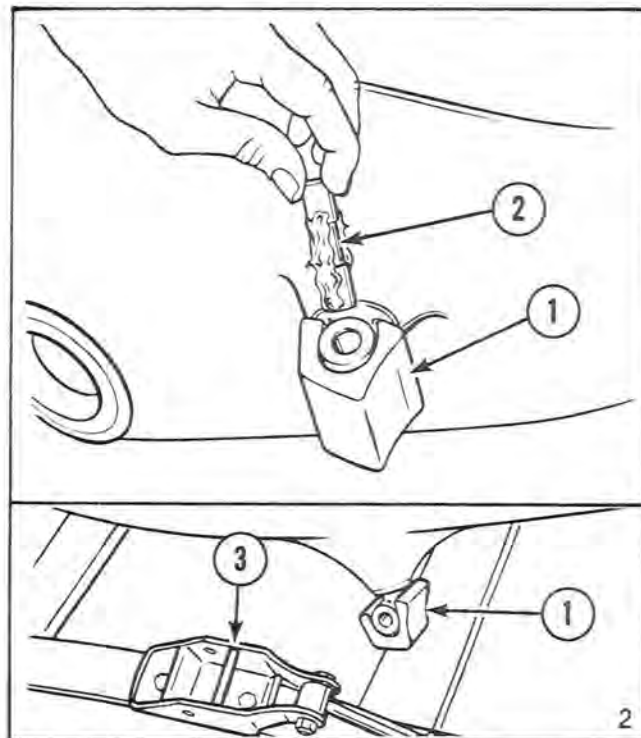
With assistance, or the use of a hoist, carefully lift snowmobile from crate. Thoroughly inspect the snowmobile for shipping damage and missing parts.

Remove plastic bag containing mounting hardware for skis and windshield from storage case.

Skis

Place the snowmobile on its side. Be sure to provide a protected surface to prevent marring the finish of the snowmobile. Then perform the following:

1. Install the ski attitude damper. Apply Silicone spray or soapy water on the damper to ease installation of the ski saddle over the damper. (See Figure 2.)



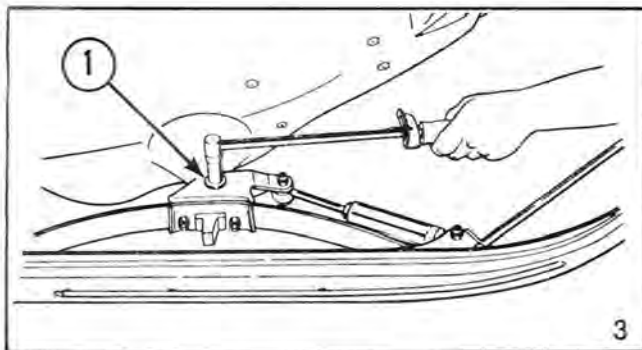
- 1. Ski Attitude Damper
- 2. Grease Groove
- 3. Ski Saddle

2. Fill the grease groove or cut away area of the spindle sleeve with a low temperature extreme pressure (ep) grease, and insert sleeve into spindle. (See Figure 2.)

Observe this **WARNING** during next step

Improper tightening of spindle to saddle bolt will result in excessive steering system play. This negatively affects vehicle handling and could result in loss of control leading to possible personal injury to the operator.

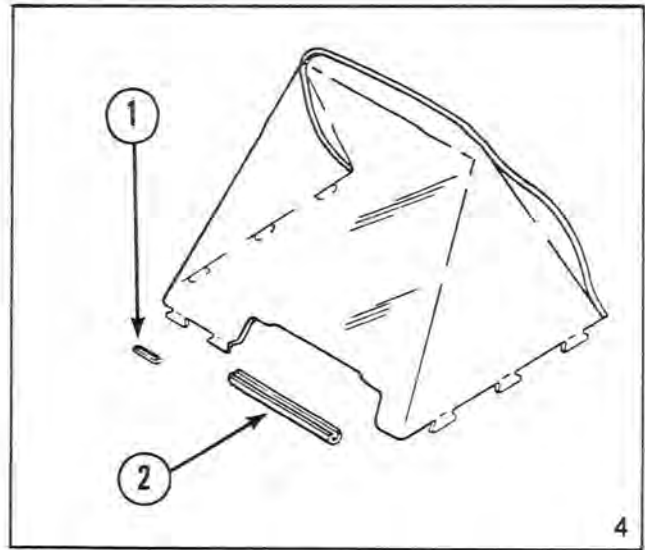
3. Secure the ski assembly to the spindle with the hardware supplied. Be sure the nut and large flat washer are installed on the inward side of the ski assembly. Torque nut 46 ft lb (6.4 kg-m). (See Figure 3.)



1. Flat Washer

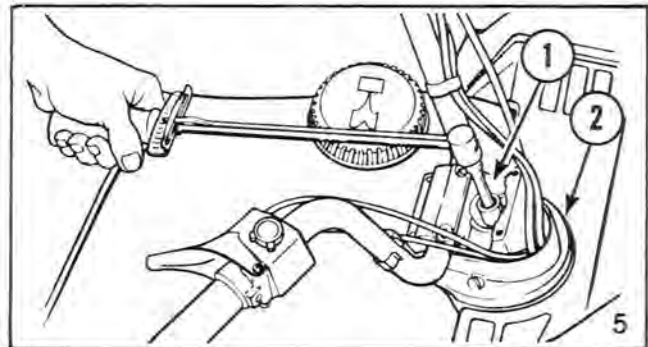
Windshield

Remove plastic covering and install trim seal on windshield. Install windshield with o-ring fasteners provided. (See Figure 4.)



1. "O" ring
2. Trim seal

Check the routing of the cables and wire harnesses for proper positioning. They should pass through the console at the handlebar holder, and have adequate free movement to prevent binding or rubbing during vehicle operation. (See Figure 5.)



1. Lower Handlebar Holder
2. Console

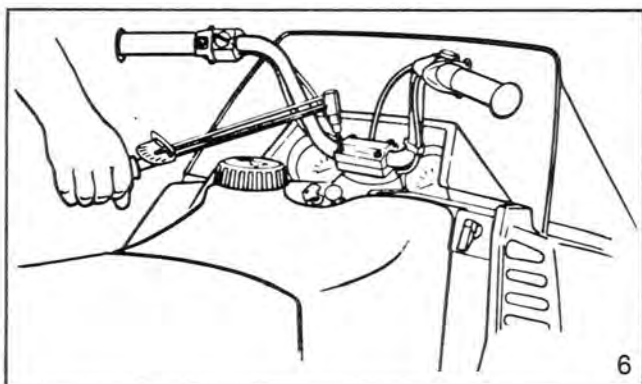
Handlebar

Prior to securing the handlebars, check the lower handlebar holder for security to the steering pole. Torque the lower handlebar holder mounting bolt 35 ft lb (4.8 kg-m). (See Figure 5.)

Observe this **CAUTION** during next step

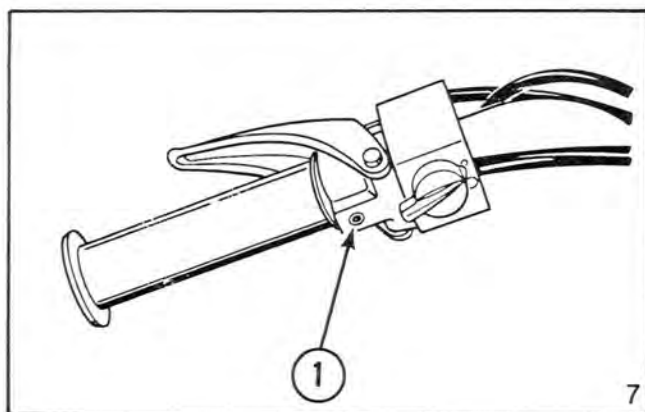
Adjust the handlebar so it does not hit the windshield when turning in either direction.

Adjust the handlebar for a comfortable driving position and evenly torque the four socket screws securing the handlebar holder 105 in.lb (1.2 kg-m). (See Figure 6.)



Throttle and Brake Control Levers

Check throttle and brake control lever position. Be sure they are comfortable for driving. Torque set screws 25 in.lb (0.3 kg-m). (See Figure 7.)



1. Set Screw

Tool Kit, Owner Manual, and Safety Handbook

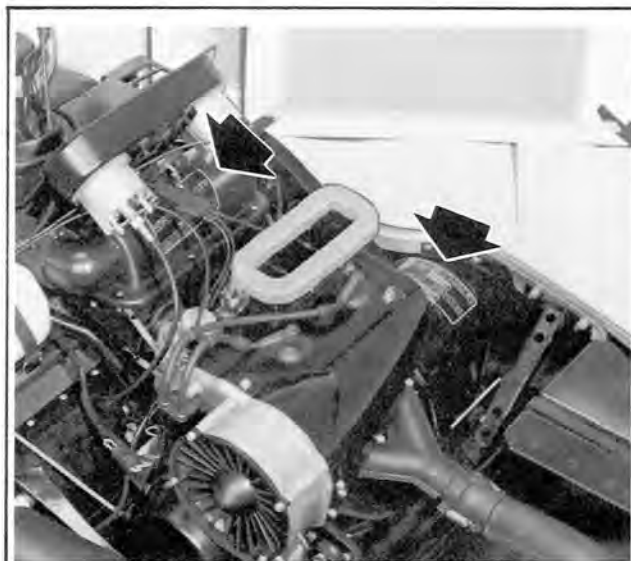
Check the storage box to be sure it contains the Tool Kit, Owner's Manual and Safety Handbook.

Safety Labels

WARNING

Safety labels specify special instructions or procedures, which if not followed correctly, could lead to personal injury.

Safety labels are located on, or next to, components that, under certain conditions, could cause personal injury. Be sure they are properly located and secure. (See Figure 8.)



Preparation

Suspension

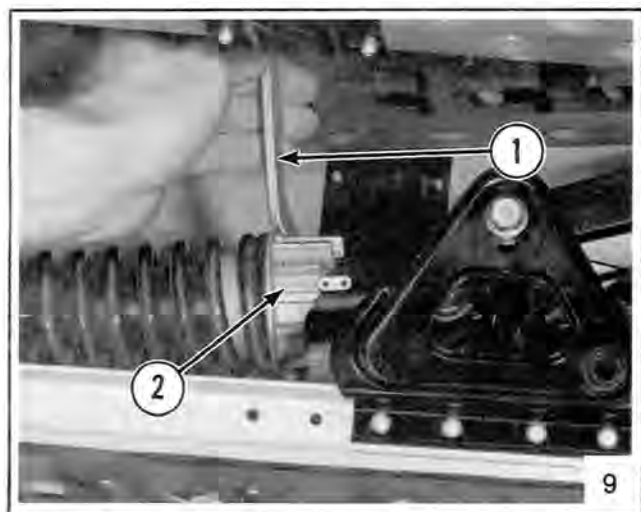
The snowmobile is shipped with the suspension springs adjusted during production assembly to provide satisfactory ride and handling characteristics for average driver weight. Normally, no adjustments are required.

WARNING

Suspension springs are under heavy spring load, improper adjusting techniques may result in personal injury.

Ride Adjustment

Ride Adjustment may be varied by changing the position of the shock absorber spring adjusting cam, using the special tool provided in the tool kit. Rotating the cam towards the heavy pre-load position will increase spring pre-load, resulting in a stiffer ride. If the cam is rotated towards the light pre-load position, this will decrease spring pre-load, resulting in a softer rider for the operator. (See Figure 9.)



1. Cam Adjusting Tool
2. Spring Cam

NOTE: An optional heavy-duty shock absorber spring kit is available to increase the load carrying capacity of the snowmobile.

Handling Adjustment

The handling adjustment is controlled by changing spring tension of the front suspension springs. Increasing spring tension causes the suspension to press harder on the ground, resulting in less ski pressure. Reducing the spring tension causes the front of the suspension to have less pressure on the ground and the ski pressure to increase. A change in ski pressure will affect the vehicles steering response.

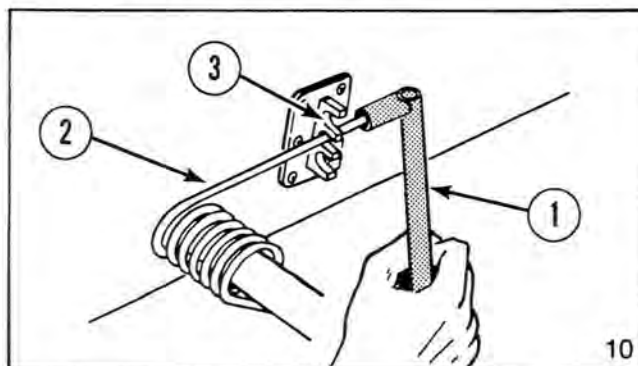
CAUTION

The tension (pre-load) of the front springs on each side of the suspension arm must be equal. Excessive tension of one spring can cause spring breakage or excessive wear to one side of the slide wear strips. (See Figure 10.)

The spring arm on each side of the suspension should be positioned as required, to achieve the desired steering response and effort for existing terrain and snow conditions in your area.

To change spring tension:

1. Install spring adjusting tool P/N 57001-3507 onto the end of the spring arm as shown. (See Figure 10.)



1. Spring Adjusting Tool
2. Spring Arm
3. Spring Retainer

Observe this **WARNING** during next step

Front suspension springs are under heavy spring load and improper adjusting techniques may result in personal injury.

2. Apply a firm grip on the spring adjusting tool with both hands and carefully lift the spring arm out of the detent in the spring retainer. Be prepared for the heavy spring load to be transferred to the spring adjusting tool as the spring arm is lifted out of the retainer detent.
3. Install the spring arm into the retainer detent necessary to obtain the handling characteristics desired.
4. Repeat procedure on other front spring to make tension equal on both sides of suspension (front to front).

Swing Arm Adjustment

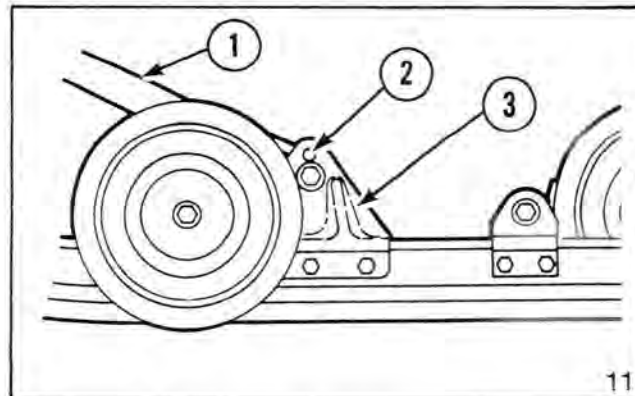
WARNING

Front suspension arm is under heavy spring load. Remove spring tension from the front suspension springs before relocating the front swing arm assembly to prevent possible personal injury.

The front swing arm is positioned in lower hole of suspension front bracket for best over-all acceleration and ride characteristics. Changing swing arm to upper hole location causes less weight transfer from skis to suspension during acceleration. Less weight transfer decreases ski lift allowing increased steering stability during acceleration. (See Figure 11.)

To change swing arm position:

1. Position spring adjusting tool P/N 57001-3507 onto end of front spring. (See Figure 10.)



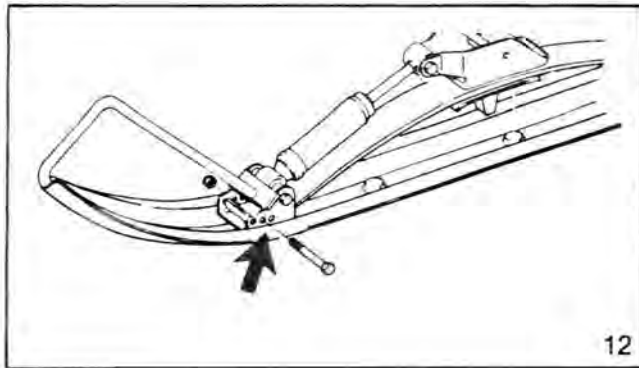
1. Suspension Front Swing Arm
2. Upper Hole Location
3. Suspension Front Bracket

2. Applying firm grip on adjusting tool, carefully force spring out of retaining bracket detent. Be prepared to accept heavy spring load as spring is released from retainer detent.
3. Repeat procedure on other front spring to relieve spring on suspension front.
4. Loosen rear axle adjusting bolt jam nuts. Back out adjusting bolts to relieve track tension.
5. Remove swing arm to bracket mounting bolts and position swing arm in upper location. Reinstall bolts and torque 30 ft lb (4.1 kg-m).
6. Use spring adjusting tool to reposition spring into desired detent.
7. Adjust track tension as instructed in track adjustment.

Ski Spring Preload

Three positions have been provided for the front ski spring mounting bolt:

CENTER HOLE POSITION - During factory assembly the bolt was installed in the center hole in the ski and normally no change is required for general snowmobiling. (See Figure 12.)



REAR HOLE POSITION - Installation of the bolt in the rear hole of the ski will reduce spring preload, increase the spring arch, and result in a softer rider with greater spring travel. This position is recommended for deep snow operation or slow speed trail riding.

FRONT HOLE POSITION - Placing the bolt in the front hole of the ski will increase spring preload, reduce the spring arch, and result in a stiffer rider with less spring travel. This position should be used for maximum stability during high speed operation.

NOTE: Always mount the front ski spring bolt into the same position on each ski.

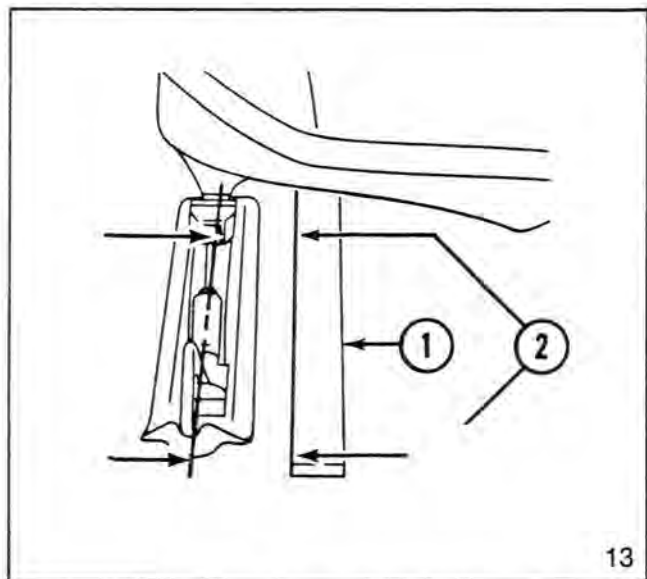
To change the preload of the ski spring, be sure the weight of snowmobile is on the skis, and proceed as follows:

1. Remove nut from front spring mounting bolt.
2. Open hood and with assistance from another, stand on front bumper to relieve spring tension from mounting bolt.
3. With weight still on front bumper, remove bolt, slide spring rub strip to align with desired hole position of ski, and insert bolt.
4. Install nut and torque 25 in. lb (0.3 kg-m).

Steering Alignment

Check the ski alignment and handlebar centering:

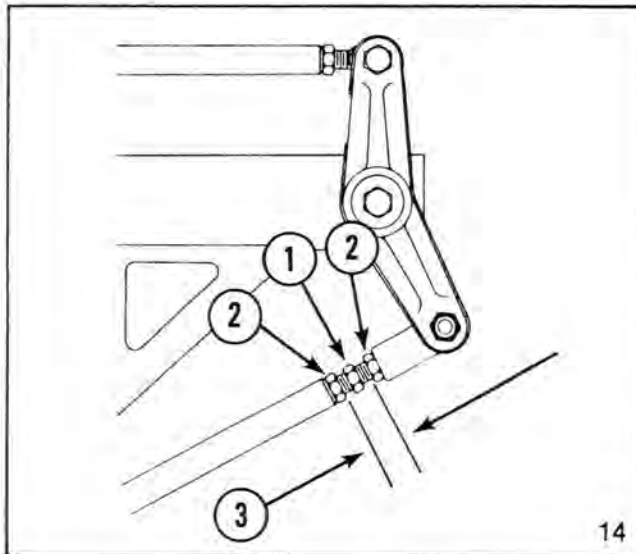
1. Place a long board (or suitable straight edge) against the right hand edge of the track, and measure the distance between the board and center line of the ski. Position the ski so that the distance measured between the ski centerline and edge of board is the same at the front and rear of the ski. (See Figure 13.)



1. Straight Edge Against Track
2. Measure Distance Here

2. When the center line of the ski is parallel to the outside edge of the track, check steering handlebar for centering. The handlebar holder should be parallel to lower edge of control panel.
3. To center handlebar, loosen lock (jam) nuts and turn tie rod adjusting stud in the direction necessary to center handlebar. (See Figure 14.)

NOTE: Be sure the center line of the ski remains parallel to the straight edge while turning the tie rod length adjusting stud.



1. Tie Rod Length Adjusting Stud
2. Locknuts
3. 1-1/4 in. (32 mm) Maximum

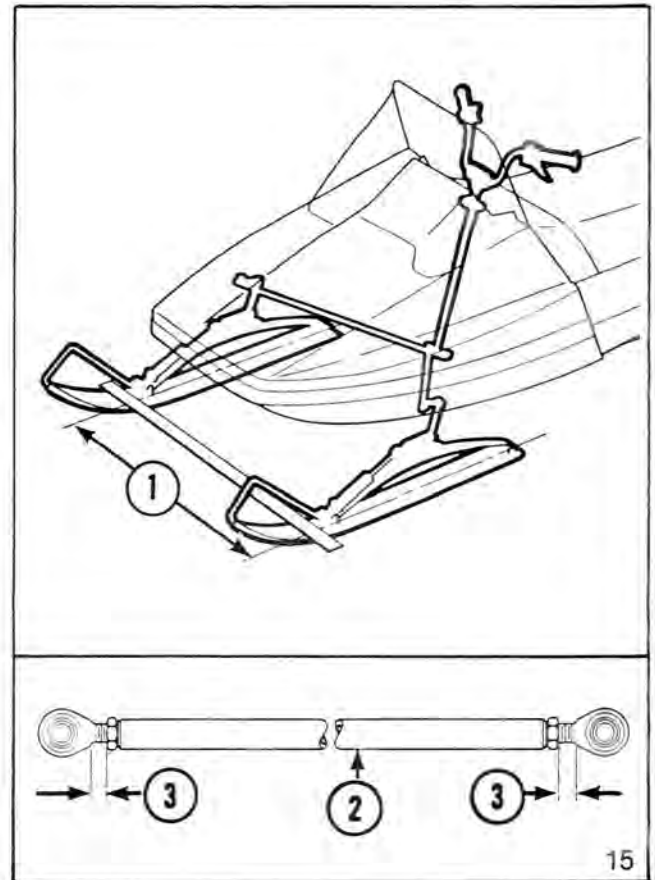
WARNING

To prevent possible steering linkage failure the adjusting stud must remain centered between the two jam nuts and the measurement between the jam nuts must not exceed 1-1/4 in. (32 mm). (See Figure 14.)

4. To align other ski move both ski tips towards center of snowmobile to remove steering linkage play. Loosen lock nuts and turn tie rod to obtain an equal distance from ski center to ski center when measured at the front and rear of the skis. (See Figure 15.)

WARNING

After proper alignment is obtained, the number of exposed threads at each rod end must be equal and not exceed 1/2 in. (12.7 mm) when measured from the jam nuts or possible steering linkage failure may occur. (See Figure 15.)



1. Equal Distance Front and Rear
2. Tie Rod
3. Exposed Threads - 1/2 in. (12.7 mm) maximum

5. Tighten all hardware (nuts, bolts, etc.) in steering system. Torque jam nuts on tie rod assemblies 120 in.lb (1.4 kg-m). Refer to Torque Chart for recommended torque values of other fasteners in the steering system

Wiring Harness

Check wiring harness for proper routing. Be sure wires are not being rubbed or pinched and all connectors are secure and fully connected.

Battery

The battery's primary function is to provide power to start the engine. It also supplies power for lights and other accessories when the engine is not running. Once the engine has started, the charging system takes over and supplies the required power and recharges the battery.

The battery is supplied in a dry-charge condition. To prepare the battery for use, perform the following procedure.

Battery Removal

1. Unfasten clamp and remove battery cover assembly. (See Figure 16.)



2. Disconnect cables from terminals of battery. Carefully lift battery out of mounting bracket. (See Figure 17.)
3. If corrosion or dirt are present, clean battery terminals and top surface with solution of water and baking soda.



Battery Charging

WARNING

Battery electrolyte contains sulfuric acid which is poisonous and causes severe burns. When installed in the battery, the electrolyte generates Hydrogen gas which under certain conditions is flammable and explosive. Keep all flames and sparks (cigarettes, etc.) away and always wear eye protection when working on or near the battery.

POISON/DANGER
KEEP OUT OF REACH OF CHILDREN

ANTIDOTE

EXTERNAL - Flush with water at least 5 minutes.

INTERNAL - Drink large quantity of water or milk. Follow with milk of magnesia, beaten egg or vegetable oil.

CALL PHYSICIAN IMMEDIATELY.

EYES - Flush with water for 15 minutes. **GET PROMPT MEDICAL ATTENTION.**

1. Cut off sealed end of battery vent tube and remove filler caps.
2. Fill each cell to upper level line on battery case with fresh electrolyte at a temperature of 86°F (30°C) or less. Let battery stand for 30 minutes before charging.

NOTE: If electrolyte level drops, add electrolyte to upper level line before charging.

3. Cover filler openings with a cloth, paper towel, etc. to prevent splashing of electrolyte during charging.

Observe this **CAUTION** during next step

Charging the battery at higher rate than specified may damage the battery. The higher charging rate causes excess heat, which can warp the plates creating internal short circuits. Also, the plates may shed active material, accumulating deposits that cause internal short circuits.

4. Connect battery to a 12 Volt charger. Set charging rate at 12 volts, 1.6 amps and charge for 10 hours. (See Figure 18.)



NOTE: If electrolyte temperature rises above 115° (45°C) during charging, reduce charge rate to lower the temperature. Increase charging time proportionately.

5. Disconnect charger and measure battery voltage. The voltage should be 12 to 13 volts. Check specific gravity of each cell with a hydrometer. A hydrometer reading of 1.26 or above is good. A lower indication means additional charging is necessary.

Battery Installation

1. Dispose of the cloth and install filler caps. Dry the top of the battery.
2. Lower battery into mounting bracket (be sure protective pads are positioned between battery and mounting brackets to prevent damage). Route vent tube downward through chaincase drain plug hole.
3. Secure the battery with cover assembly.

Observe this **CAUTION** during next step

Do not reverse battery connections or damage to the voltage regulator/rectifier will result.

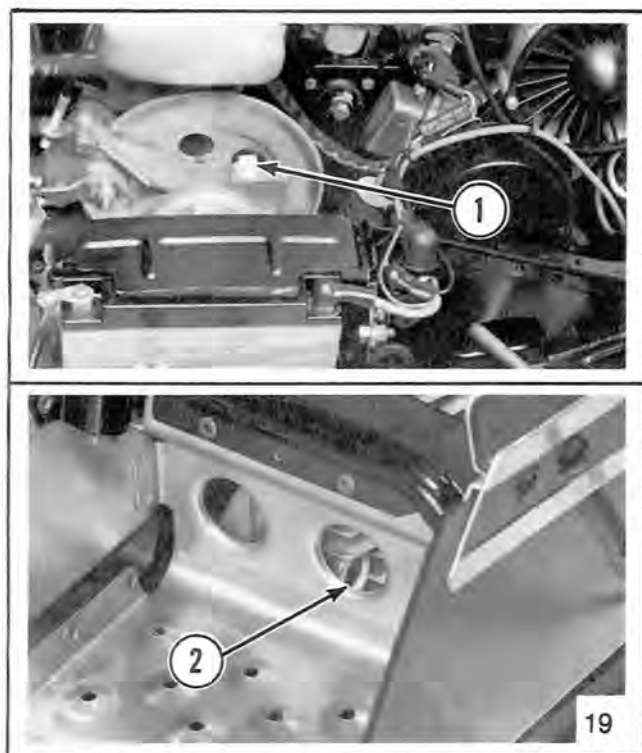
4. Connect "RED" cable and fuse wire to positive (+) terminal. Coat terminal with grease to prevent corrosion. Slide rubber boot over terminal for protection.
5. Connect "BLACK" cable to negative (-) terminal and coat terminal with grease to prevent corrosion.

Chaincase Lubrication

NOTE: Use DEXRON II Automatic Transmission Fluid when filling the chaincase.

WARNING

Prevent oil mist from coating brake components, which may reduce braking action, by installing the fill plug with vent hole pointed away from brake disc.



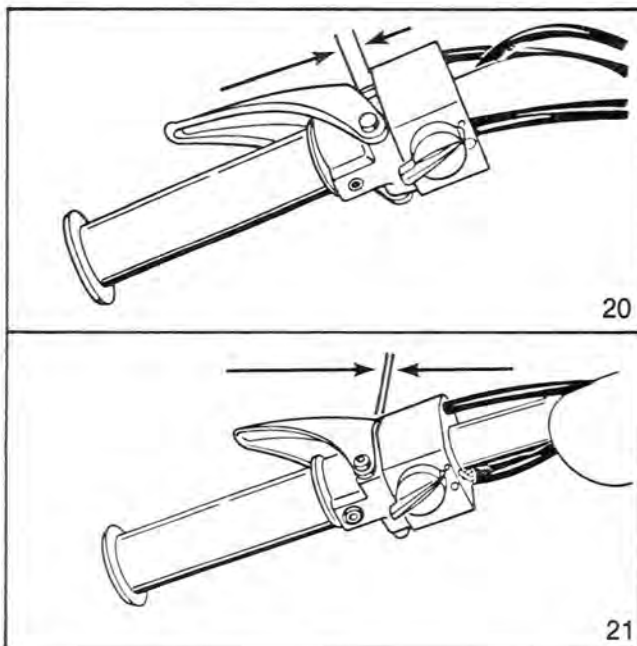
1. Chaincase Fill Plug
2. Lubricant Level Sight Gauge

Check the chaincase fluid level. For proper lubrication of chain and bearings, fluid level must be between the center and top of sight gauge.

If additional fluid is required, remove upper plug in chaincase and pour DEXRON II Automatic Transmission Fluid into chaincase until correct level is attained. (See Figure 19.)

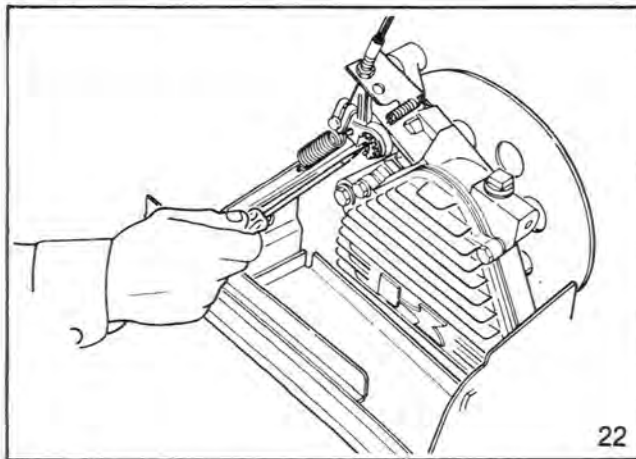
Brake Adjustment

The INTRUDER is equipped with a self-adjusting disc brake. To check proper operation, apply the brake firmly and measure the movement which should be $\frac{3}{4}$ in. (19 mm) when brake is fully applied. (See Figure 20.) Release the brake handle and measure distance. (See Figure 21.) This dimension should be no greater than $\frac{1}{8}$ in. (3.2 mm). Perform Brake Adjustment if required.



1. Back both brake cable jam nuts away from bracket about $\frac{1}{4}$ in. (6.4 mm). (See Figure 22.)
2. Remove cable slack by pulling brake cable upward without moving brake cam lever and snug upper jam nut to bracket.
3. Turn lower jam nut up to bracket and torque both jam nuts to 50 in.lb (0.6 kg-m).
4. Check handlebar brake lever for correct dimension. (See Figure 21.)

5. Apply brake firmly and turn manual adjuster until correct measurement of 3/4 in. (19 mm) is achieved. (See Figure 22.)



NOTE: Clockwise rotation of the adjuster screw increases the handlebar brake lever measurement, and counter-clockwise rotation decreases the measurement.

The brake disc and hub assembly must float (free movement from left to right on jackshaft) to maintain proper alignment between the brake pads. This movement may result in a rattle heard during vehicle operation and is a normal condition.

Fan Belt Tension

Remove fan guard to test fan belt tension. With 11 lb (5 kg) force applied to belt, the belt tension should be 5/32 in. (4.0 mm). (See Figure 23.)

If adjustment of fan belt tension is required, remove outer pulley half from fan shaft. Add or remove spacers between pulley halves as required for proper belt tension. Adding spacers will decrease belt tension and removing spacers will increase tension.

CAUTION

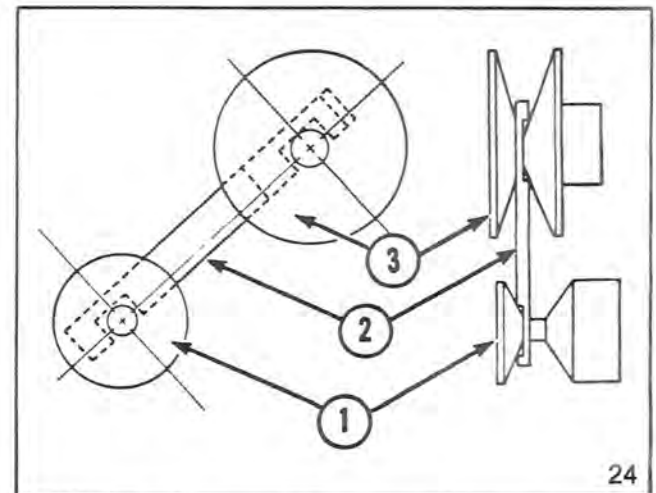
To prevent fan belt damage, remove spark plugs and rotate engine crankshaft while torquing outer pulley mounting nut.



1. 5/32 in. (4.0 mm)

Use Fan Pulley Holder Tool P/N 57001-3506 to hold pulley and torque nut 47 ft lb (6.5 kg-m).

Drive and Driven Converter Alignment



1. Drive Converter
2. Alignment Gauge P/N 57001-3508
3. Driven Converter

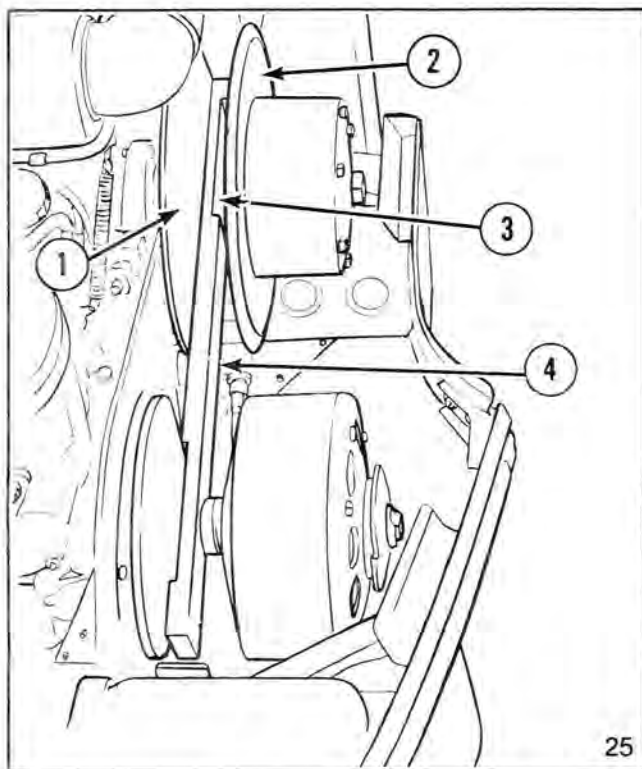
Correct converter center-to-center distance of 12.0 in. (304.8 mm) and converter offset distance of 0.525 to 0.588 in. (14.34 to 14.94 mm) is obtained when alignment gauge P/N 57001-3503 is correctly positioned between drive and driven converter sheaves. (See Figure 24.)

Center-To-Center Distance

NOTE: Improper handling or misuse of the alignment gauge will result in inaccurate converter alignment. Check the flatness of the alignment gauge with a straight edge prior to each use.

1. Remove the drive belt guard and drive belt.

NOTE: Drive belt will not be reinstalled until running tests on the engine are completed.



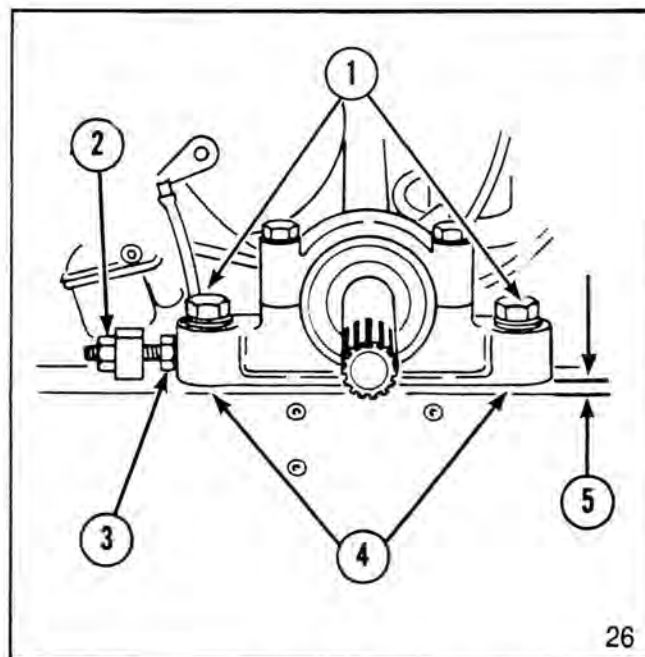
1. Driven Converter Movable Sheave
2. Driven Converter Stationary Sheave
3. Alignment Gauge Deep Notch
4. Alignment Gauge P/N 57001-3503

2. Rotate the driven converter movable sheave clockwise, and insert the alignment gauge between the sheaves with the deep notch facing the stationary sheave. Carefully release the movable sheave, allowing the spring tension to keep the gauge in position between the stationary and movable sheaves. (See Figure 25.)

3. Center distance is correct if the notch in the alignment gauge fits over the shaft on the drive converter.

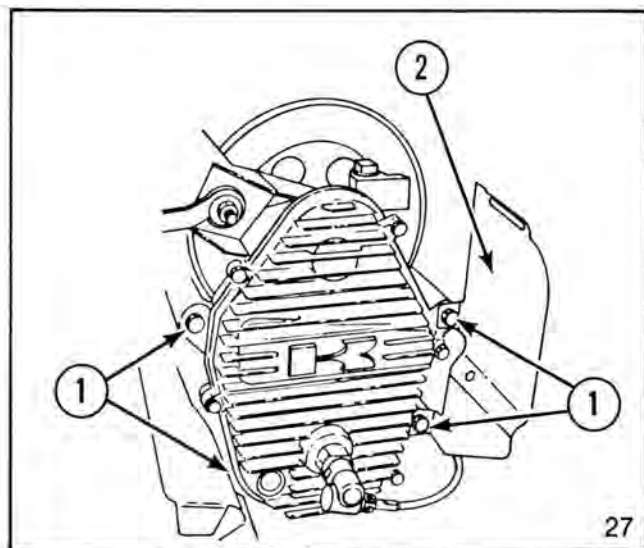
If adjustment of the converter center distance is required:

1. Loosen the jackshaft bearing retainer mounting bolts and the adjusting bolt locknut. (See Figure 26.)



1. Bearing Retainer Mounting Bolts
2. Adjusting Bolt Locknut
3. Adjusting Bolt
4. Bearing Retainer Shims
5. Parallel

2. With the battery removed (refer to Battery Removal) loosen four mounting bolts securing lower battery bracket, then remove the bracket for access to chaincase mounting bolts. (See Figure 27.)



1. Chaincase Mounting Bolts
2. Battery Bracket

3. Loosen all four chaincase mounting bolts and move the jackshaft bearing retainer and chaincase forward or rearward as required to obtain 12.0 in. (304.8 mm) center distance.
4. To insure correct center distance is maintained, turn the adjusting bolt so the head of the bolt contacts the jackshaft bearing retainer flange, and tighten the locknut. (See Figure 26.)

CAUTION

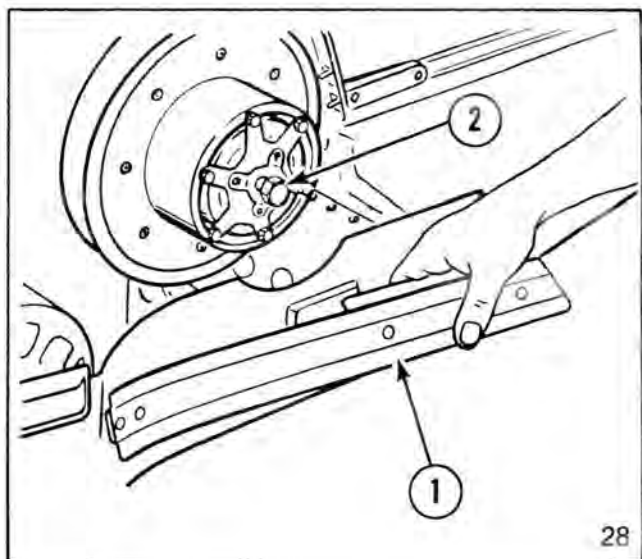
To prevent premature jackshaft bearing failure, reshim the bearing retainer after changing center distance.

5. Tighten chaincase mounting bolts and torque 18 ft lb (2.5 kg-m). Reinstall lower battery bracket. (See Figure 27.)
6. Install battery (refer to Battery Installation). Perform procedure for Jackshaft Bearing Retainer Shimming.

Jackshaft Bearing Retainer Shimming

After adjusting center-to-center distance, shim the jackshaft bearing retainer as follows:

1. Remove the left side aluminum trim from lower pan and unscrew the bolt securing driven converter to jackshaft. (See Figure 28.)



1. Aluminum Trim
2. Retaining Bolt

2. Remove the shims below the bearing retainer. (See Figure 26.)
3. Position the bottom of the retainer parallel to the top surface of the chassis. (See Figure 26.)

Observe this

CAUTION

during next step

The bearing retainer should be shimmed until the jackshaft centerline is 6.62 in. (168.2 mm) above the track drive shaft center line.

4. Install "U" shaped shims, as required, to fill the space between the bottom of the retainer and top of chassis. This procedure prevents excessive preloading of the jackshaft bearings.
5. Tighten all bolts and nuts on the jackshaft bearing retainer.
6. Position the driven converter onto the jackshaft and check Converter Offset Distance.

Filling Oil Tank

Fill oil tank with recommended oil. **DO NOT ALLOW DIRT TO ENTER TANK WHILE FILLING.** Oil tank capacity is 2-1/2 quarts (2.37 liters).

Check the oil tank vent tube for:

1. **Proper Routing** - Sharp bends or kinks in the vent tube will reduce oil flow to the oil pump.
2. **Tie Band Installation** - Tie band may pinch off tube, reducing oil flow to the oil pump, if installed too tight.
3. **Vent Tube Position** - To prevent siphoning action possible under certain conditions, position end of vent tube higher than top of oil tank and away from brake components (disc and pads).

Fuel Recommendations

Use regular or premium leaded gasoline with a minimum PUMP POSTED ANTI-KNOCK NUMBER OF 89. **DO NOT USE GASAHOL.**

WARNING

Gasoline fumes are heavier than air and can become explosive if exposed to a pilot light from a furnace, hot water heater, clothes dryer, etc. Mix fuel or fill fuel tank only in an area that is well ventilated and free from pilot lights and sparks.

Fuel/Oil Mixture (Break-in Only)

To insure adequate lubrication of internal engine components during early break-in, a 25-to-1 gasoline-to-oil ratio is recommended for the first three (3) gallons of gasoline. This ratio can be obtained by thoroughly mixing 1 pint (0.47 liter) of Kawasaki Snowmobile Oil with three (3) gallons (11.4 liters) of gasoline. Pre-mixing gasoline and oil will no longer be required after the initial three gallons of gasoline and oil mix have been consumed.

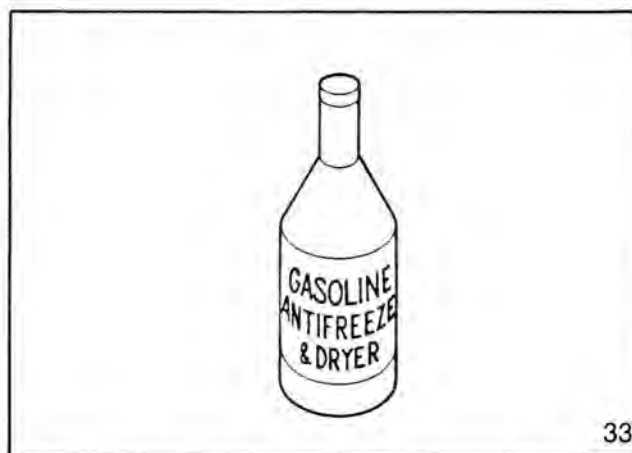
25 to 1 Gasoline to Oil Mixture. Break-in Only	
Oil	Gasoline
1 pint (U.S.)	3 gal. (U.S.) 2.6 gal. (Imp.)
1 pint (Imp.)	3 gal. (Imp.) 3.7 gal. (U.S.)

Fuel/Oil Mixture (Standard)

The fuel-to-oil ratio required is automatically controlled at the engine oil pump.

Adding Gasoline Antifreeze

A major brand of Gasoline Antifreeze (such as Heet) should be added to the fuel tank by following the manufacturer's recommendations on the container for proper mix ratio of gasoline with antifreeze. (See Figure 33.)



CAUTION

Each time fuel tank is filled, gasoline antifreeze must be added to fuel system. Moisture trapped in fuel system components (fuel tank, lines, fuel pump or carburetors) may freeze causing engine malfunction or damage.

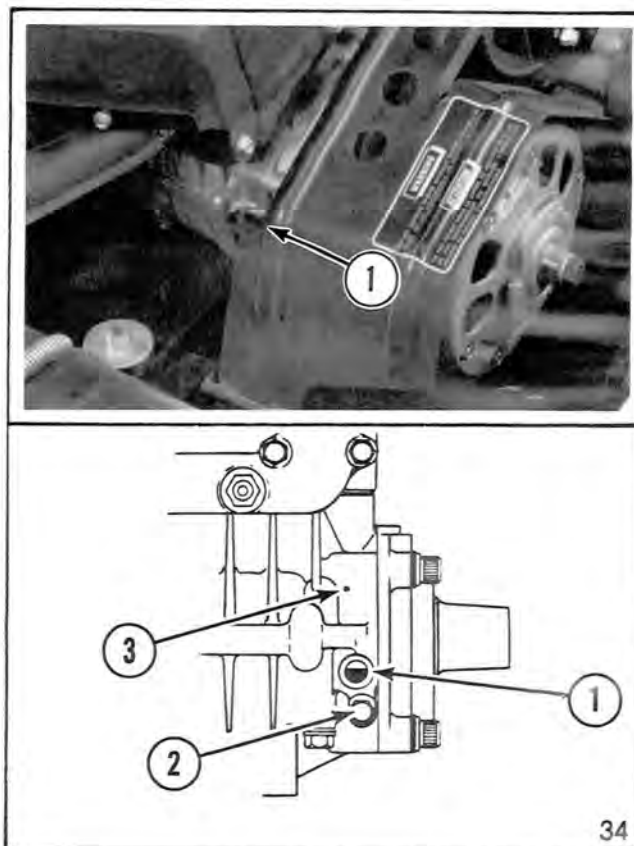
Filling Fuel Tank

Before removing filler cap from the fuel tank, remove any ice, snow, or water from around the fuel tank opening to prevent contamination of fresh fuel mixture.

WARNING

Gasoline fumes are heavier than air and can become explosive if exposed to a pilot light from a furnace, hot water heater, clothes dryer, etc. Fill the fuel tank only in an area that is well ventilated and free from pilot lights and sparks.

Fill the fuel tank slowly and pour the fuel into the tank using a funnel with a fine mesh screen.



1. Oil Level Sight Gauge
2. Engine Gearcase Drain Plug
3. Gearcase Breather Hole

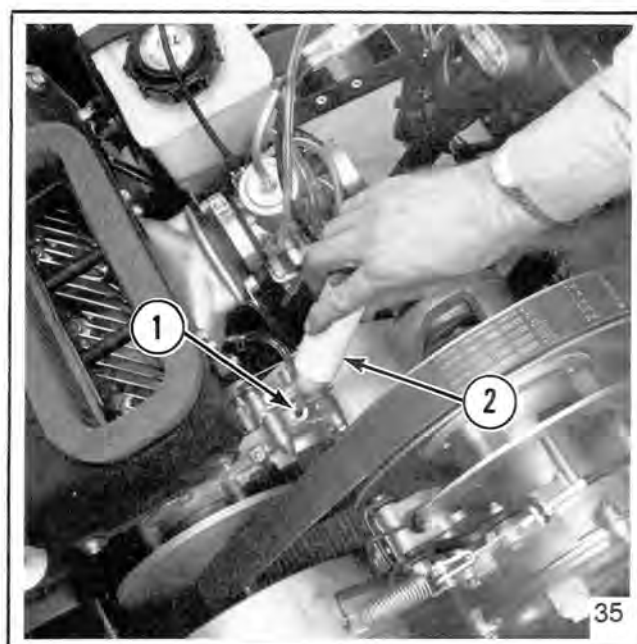
Engine Gearcase Lubrication

Components inside the gearcase drive the oil injection pump.

Lubricant level is correct when the oil appears above the center of the sight gauge, but not higher than the top. The sight gauge is located on the engine front, below left-hand cylinder assembly. (See Figure 34.)

Fill or add lubricant to the gearcase as follows:

1. Remove the instrument panel mounting screws to provide the additional clearance needed and remove the air silencer assembly.
2. Loosen clamp screw and separate the left-hand carburetor from its rubber holder.
3. Remove gearcase fill plug (located on top of gearcase) and pour Kawasaki engine gearcase oil or Shell FIRE AND ICE 10W40 or an equivalent viscosity motor oil that meets or exceeds API service SE specifications. Gearcase capacity is about 1.35 oz. (40 cc). (See Figure 35.)



1. Gearcase Fill Hole
2. Container of Oil

NOTE: The air silencer assembly should not be installed until Purging Air from Oil Pump Outlet Tubes procedure is completed.

Engine gearcase oil should be changed after the initial 100 miles of engine operation, and at the end of each season, to remove any impurities or foreign matter present in the gearcase cavity. To drain gearcase, remove drain plug and raise rear of snowmobile. (See Figure 34.)

Observe this **CAUTION** during next step

Failure to remove obstructions from gearcase breather hole may cause excessive oil consumption resulting in extensive engine damage. (See Figure 34.)

To insure proper operation of the oil seal between the engine gearcase and crankcase, check for accumulated obstructions in the gearcase breather hole, located above the gearcase sight gauge.

Before reinstalling the carburetor, perform Oil Injection System preparation.

Oil Injection System

The oil pump is a variable ratio pump; at idle, the fuel/oil ratio is approximately 110 to 1 increasing with throttle position to approximately 25 to 1 at maximum power.

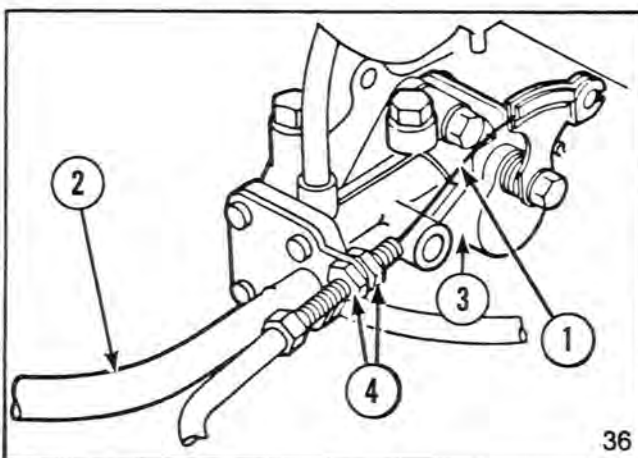
Bleeding Oil Pump Supply Tube

Observe this **CAUTION** during next step

Failure to bleed out air trapped in the oil line can cause severe engine damage.

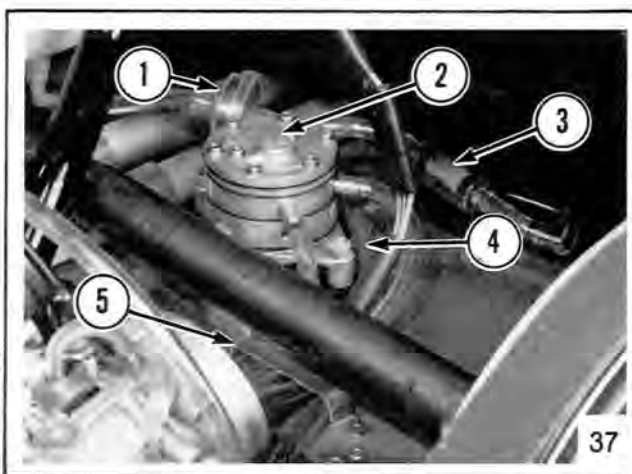
After filling the oil tank, bleed the air from oil pump inlet tube as follows:

1. Remove instrument panel mounting screws and the air silencer assembly
2. Loosen carburetor holder clamp screw and pull LH carburetor from engine.
3. Loosen the locknuts and remove oil pump cable. (See Figure 36.)



1. Oil Pump Cable
2. Oil Supply Tube
3. Oil Pump
4. Locknuts

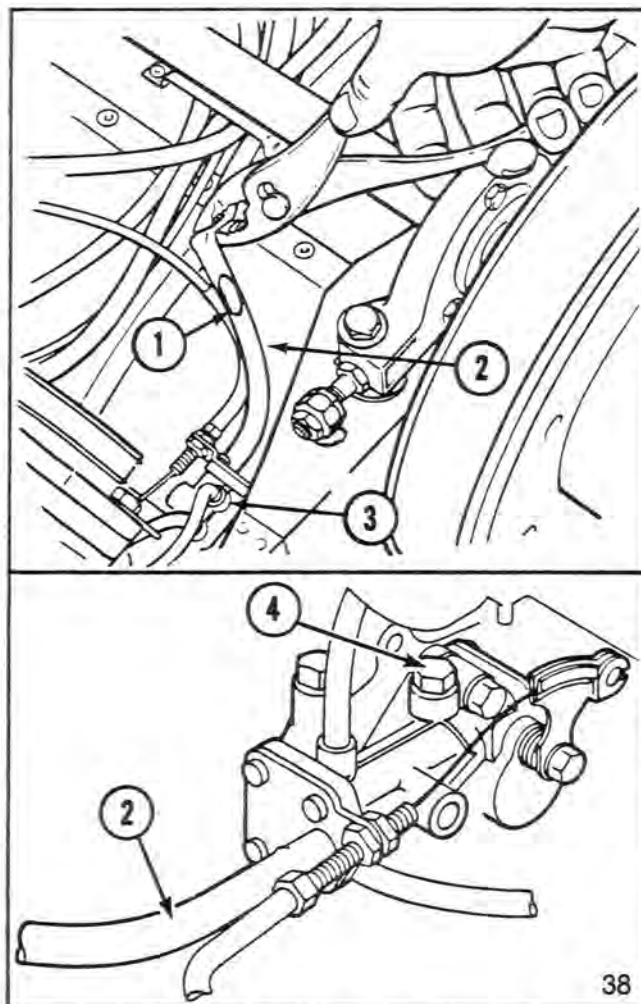
4. Remove oil supply tube from oil pump and pull supply tube out from under fuel tube cover. (See Figure 37.)



1. Oil Supply Tube Filter
2. Fuel Pump
3. Fuel Pump Filter
4. Oil Supply Tube
5. Fuel Line Cover Bracket

5. Hold oil supply tube and filter in a vertical position, as oil fills the line and filter make sure all air in filter has been forced out.
6. Reinstall oil supply tube under fuel tube bracket.
7. Pinch off oil supply tube with a pair of pliers to prevent excessive oil spillage.
8. Reinstall oil supply tube on oil pump.
9. Air trapped inside the oil pump assembly can be removed by squeezing (pulsing) oil pump supply tube with pliers. This process causes air to exit the oil pump nipple and enter the supply tube. (See Figure 38.)

Continue squeezing (pulsing) oil pump supply tube until bubbles no longer exit the pump assembly.



1. Air Bubble
2. Oil Pump Supply Tube
3. Oil Pump
4. Oil Pump Bleed Screw

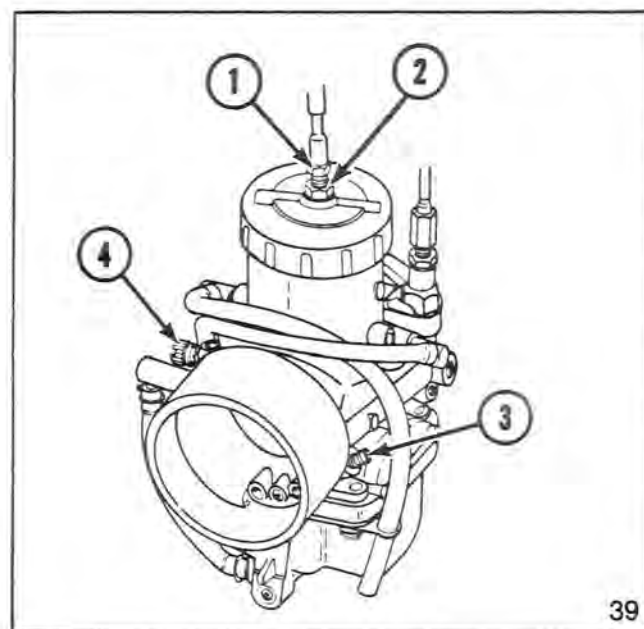
10. Remove the bleed screw from the oil pump and allow oil to drain until all the air bubbles are removed from the inlet tube. Visually check the entire length of the tube to be sure all of the air has been removed; then reinstall bleed screw. (See Figure 38.)
11. With oil pump cable jam nuts still loose perform steps under Oil Pump to Carburetor Synchronization. Do not reinstall LH carburetor.

Oil Pump to Carburetor Synchronization

Synchronization of the oil pump and carburetors is extremely important to assure adequate engine lubrication and peak performance.

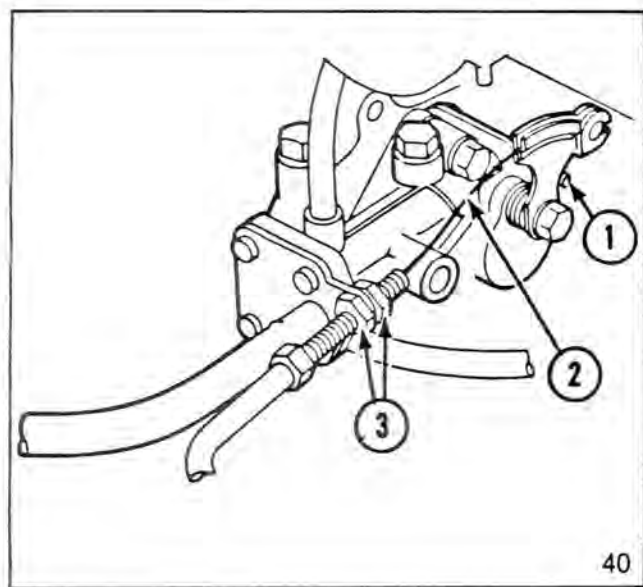
Remove instrument panel mounting screws, air silencer assembly and LH carburetor. Remove the drive belt and perform the following procedure.

1. Loosen the idle stop screws so that both throttle slides bottom-out in the carburetor bores. (See Figure 39.)



1. Throttle Cable Adjuster
2. Adjuster Jam Nut
3. Air Screw
4. Idle Stop Screw

2. Push the oil pump lever forward until it contacts the stop pin; this insures the oil pump is at the dead idle position. (See Figure 40.)
3. Adjust the throttle cable on the RH carburetor so that all of the slack is removed. The throttle slide should begin to raise as soon as the throttle lever on the handlebar is advanced. (See Figure 39.)
4. Loosen the locknuts on the oil pump cable and, while holding the oil pump lever against the stop pin, remove all the slack. Adjustment is correct when the lever on the oil pump and the throttle slide in the RH carburetor move simultaneously as the throttle control lever is activated. (See Figure 40.)



1. Lever Stop Pin
2. Slack Removed
3. Cable Locknuts

5. Position LH carburetor into holder. Be sure carburetor float bowl does not contact front frame and tighten clamp screw. Adjust throttle cable so both throttle valves move simultaneously as throttle lever is activated.
6. Turn the idle stop screws, on both carburetors, in until the spring is coil bound. Then back off each screw six complete turns (initial adjustment). Air screw is properly adjusted when opened 1 turn off its seat.
7. Perform steps under Purging Air From Oil Pump Outlet Tubes.

Purging Air From Oil Pump Outlet Tubes

Remove the instrument panel mounting screws and the air silencer assembly. Remove the drive belt and perform the following procedure.

Any air bubbles in the oil pump outlet tubes will cause serious internal engine damage. Purge the air from these tubes as follows:

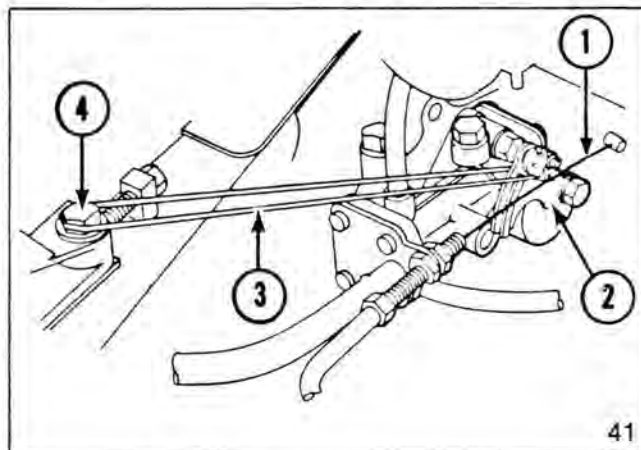
Observe this

WARNING

during next stop

Failure to disconnect the oil pump control cable when performing this procedure will damage the cable. The damaged oil pump control cable will prevent the throttle from returning to the idle position, resulting in automatic clutch engagement when the engine is started, which may lead to personal injury.

1. The oil pump inner control cable must be disconnected from the control lever on the oil pump to prevent damage to cable. Do not disturb cable locknuts when removing the inner cable. (See Figure 41.)



1. Oil Pump Inner Control Cable
2. Oil Pump Control Lever
3. Rubber Band
4. Mount Bolt

2. Attach a rubber band to hold the oil pump control lever in the wide open position. This will cause the maximum flow of oil through the outlet tubes. (See Figure 41.)

Observe this **CAUTION** during next step

Never run the engine with the air silencer removed from the carburetor. Poor engine performance and engine damage will result.

3. Temporarily install air intake silencer on carburetors.
4. Start the engine and turn both idle stop screws equally, to obtain engine idle speed of 2,500 RPM. Stop the engine after it has idled for one minute. This is ample time to purge all the air from the oil pump outlet tubes.
5. Remove the air silencer assembly; release the rubber band, and reconnect the oil pump inner control cable to the lever. Be sure to check the operation of the oil pump control lever and cable by activating the throttle control lever on the handlebar.
6. Install the air silencer assembly onto the carburetors and check that the rubber seals between air silencer body and carburetors fit securely during installation.

NOTE: Properly position the plastic adapters on the carburetors prior to air silencer installation, to prevent breakage of the plastic econo jet fitting.

CAUTION

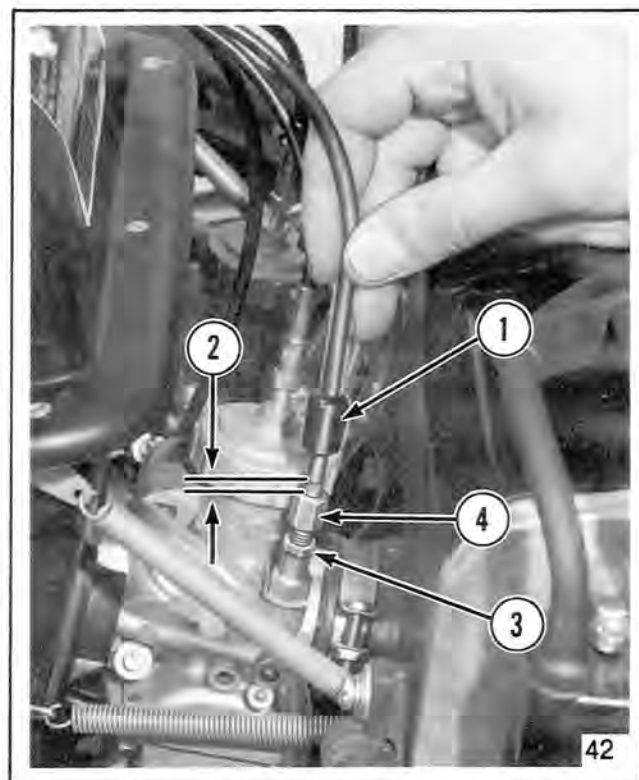
Be sure the air silencer hose is directed to the rear and is positioned underneath the cables. Incorrect hose position will result in engine damage.

7. Secure the air silencer into position with four springs. Install long springs on upper silencer tab retainers and short springs on lower silencer tab retainers.
8. Install the mounting screws to secure the instrument panel assembly.

Enrichener Cable Adjustment

With the Enrichener lever down, and plastic boot slid up the casing, the enrichener cable should have 1/16 in. (1.5 mm) free movement when raised as shown. (See Figure 42.)

NOTE: Engine flooding may occur if the Enrichener Cable free movement is less than 1/16 in. (1.5 mm).



1. Plastic Boot
2. 1/16 in. (1.5 mm)
3. Jam Nut
4. Adjusting Screw

If adjustment is required, loosen jam nut and turn adjusting screw to obtain correct movement. Torque jam nut 20 in.lb (0.2 kg-m).

After adjustment or check, position boot over fitting to prevent dirt from entering the enrichener system.

Carburetor Synchronization

It is extremely important that both carburetors function in unison. For maximum power and efficiency both cylinders must work equally. The most effective method of synchronizing the carburetors is to use a Mercury Synchro Tuner, Kawasaki P/N 57001-3510.

The Mercury Synchro Tuner measures vacuum within the engine intake system. Measurement of the vacuum will vary depending on the position of the carburetor throttle valve. Raising the throttle valve position reduces the restriction on air flow resulting in a lower vacuum measurement. A lower throttle valve position restricts air flow which causes a higher vacuum measurements.

At idle the throttle valves are positioned by the idle stop screws. The throttle cables hold the throttle valves in position when the throttle lever is actuated.

Adjust idle screws and throttle cables so that vacuum measures equally at idle and partial throttle positions for both carburetors by performing the following procedure:

NOTE: Air silencer assembly should be properly installed and drive belt removed. Secure converter guard in position with clip pins.

1. For proper adjustment and ease of starting engine without primer, start engine and allow it to warm up.

Observe this

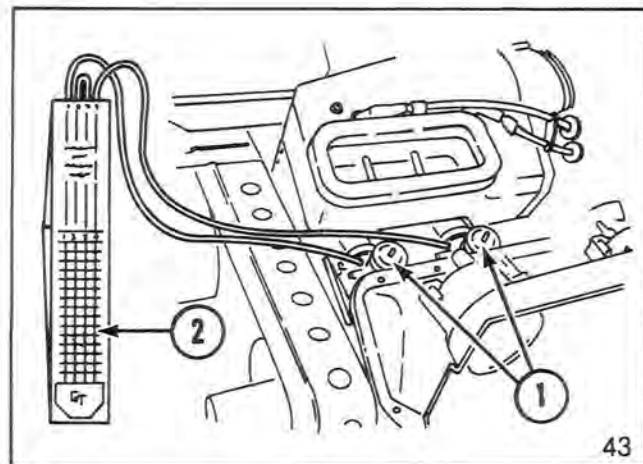
WARNING

during next step

Avoid personal injury, do not touch hot engine components.

2. Turn engine off and disconnect primer tubes from carburetor fittings.
3. Connect one tube from the Synchro Tuner to each carburetor primer fitting. (See Figure 43.)

NOTE: It may be necessary to install a short piece of primer tubing into the Synchro Tuner tubing ends to insure a good seal.



1. Carburetors
2. Mercury Synchro Tuner

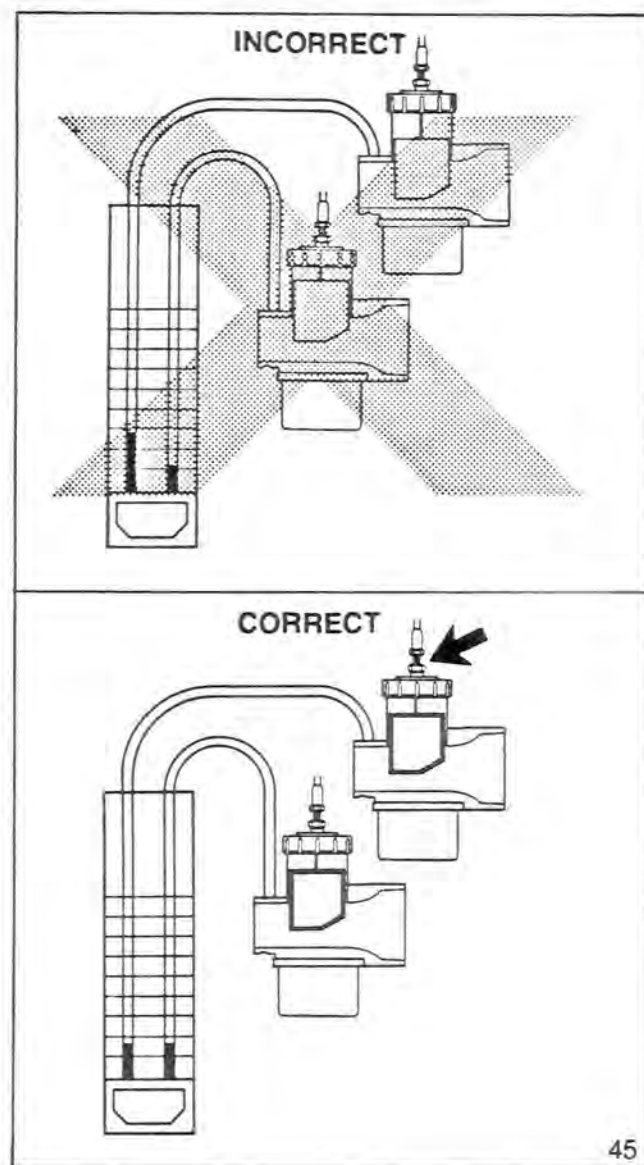
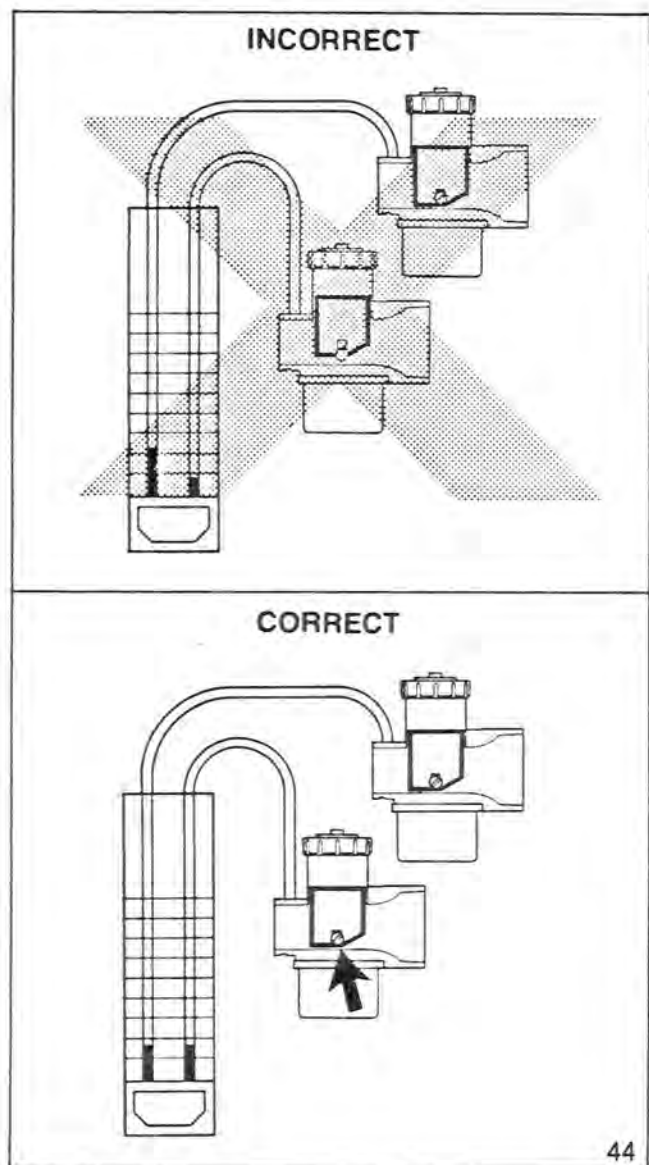
4. Start engine and observe the vacuum indications on the Synchro Tuner at idle speed.
5. Adjust idle stop screws on both carburetors to obtain an equal vacuum at 2,500 RPM. (See Figure 44.)

NOTE: Turn Idle screw inward to raise the throttle valve position. This will increase RPM and lower the vacuum. Turn idle screw out to lower RPM and increase vacuum.

6. Use a small piece of wood to wedge throttle lever slightly open (approximately 5,000 RPM). Observe vacuum indications on Synchro Tuner. (See Figure 45.)

NOTE: Because RH carburetor has been synchronized with oil pump, adjust LH carburetor only.

7. Loosen LH carburetor throttle cable jam nut. Turn LH carburetor throttle cable adjuster until vacuum indication is equal to RH carburetor. (See Figure 45.)



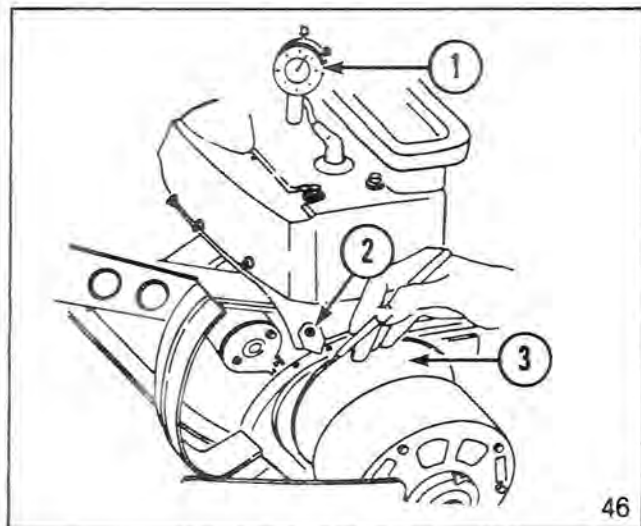
NOTE: Turn adjuster inward to increase the vacuum. Turn adjuster outward to lower the vacuum.

8. Actuate throttle lever to check for equal vacuum at different throttle positions. Readjust LH throttle cable if necessary. Torque LH carburetor throttle cable jam nut 20 in.lb (0.2 kg-m).
9. Reinstall primer tubes to carburetors. Proceed to Ignition Timing Check before installing the drive belt.

Ignition Timing Check

Remove the drive belt prior to performing the following procedure.

1. Install a fabricated timing pointer onto the engine. For accuracy, it is important to attach the pointer to the engine rather than the chassis, so the pointer can move with the engine. (See Figure 46.)



1. Dial Indicator
2. Fabricated Pointer
3. Drive Converter Fixed Sheave

WARNING

To avoid possible severe burns or a potential fire hazard, NEVER attempt to start or turn over engine with only one of the two spark plugs removed from a cylinder.

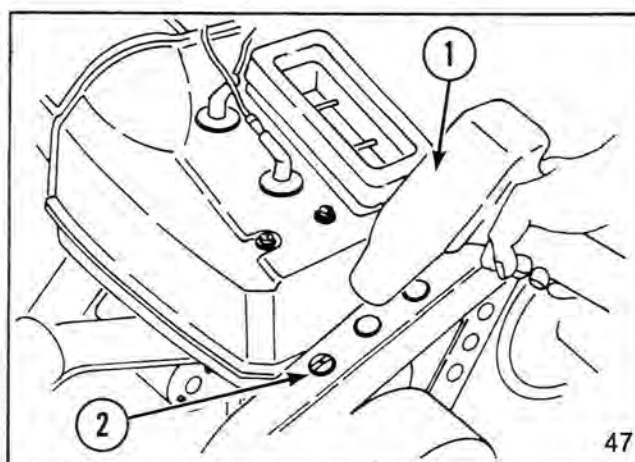
2. Remove both spark plugs and install a dial indicator into the RH cylinder spark plug hole.
3. Rotate the drive converter in the normal direction of rotation (counterclockwise) to find TDC. Next, turn the drive converter clockwise to 0.073 in. (1.86 mm) BTDC. Make a mark on the drive converter fixed sheave opposite the timing pointer. (See Figure 46.)
4. Remove dial indicator and before installing spark plugs, check that:
 - a. Plug gap is properly adjusted to 0.024 in. (0.66 mm).
 - b. Be sure washer is installed on plug and the seat on the cylinder head is clean.

Install spark plugs and torque 20 ft lb (2.8 kg-m) torque.

Observe this **WARNING** during next step

Do not touch the spark plug leads while engine is running as they will transmit a powerful electrical shock. Do not touch the hot exhaust system. A severe burn would result.

5. With the drive belt removed and the converter guard secured in place, run the engine at 6,500 RPM. Direct the timing light through the opening in the converter guard directly over the timing pointer. The timing is correct when the mark on the converter aligns with the pointer as the timing light flashes. (See Figure 47.)



1. Timing Light
2. Mark on Drive Converter

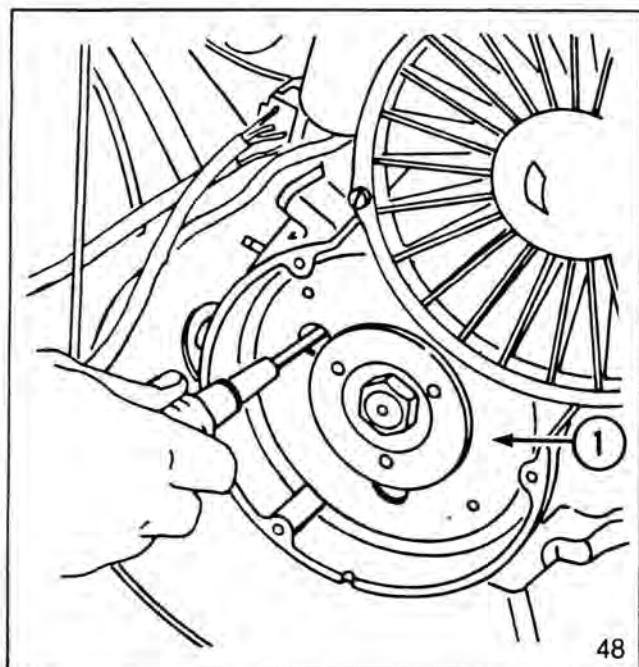
If timing is incorrect, proceed as follows:

1. Remove muffler, recoil starter and starter pulley for access to openings in flywheel; then loosen stator plate mounting screws through holes in the flywheel. (See Figure 48.)

Observe this **CAUTION** during next step

When adjusting the stator plate, take care not to damage the coil windings.

2. Turn the stator plate as required (clockwise to retard timing; counterclockwise to advance timing) to correct timing and tighten stator plate screws. Temporarily position muffler on to exhaust manifold, start engine using emergency starter rope, and recheck timing.



1. Flywheel

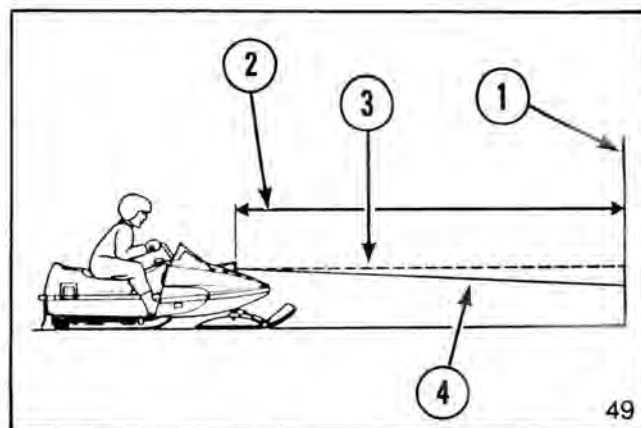
3. When ignition timing is correct, remove timing light, replace recoil starter components and install muffler assembly.

NOTE: Make sure the lip on insulation washer is properly positioned in the slotted muffler bracket before tightening muffler mounting nuts.

4. Install drive belt and secure converter guard into proper position with clip pins.

Headlight Adjustment

1. Position the snowmobile on a level floor so the headlight points at a wall 25 feet (7,620 mm) away.
2. Measure the distance from the floor to the center of the headlight and mark the wall at the dimension measured (reference mark). (See Figure 49.)



1. Wall
2. 25 Feet (7,620 mm)
3. Reference Mark (center of headlight to floor)
4. 2 in. (51 mm) Below Reference Mark

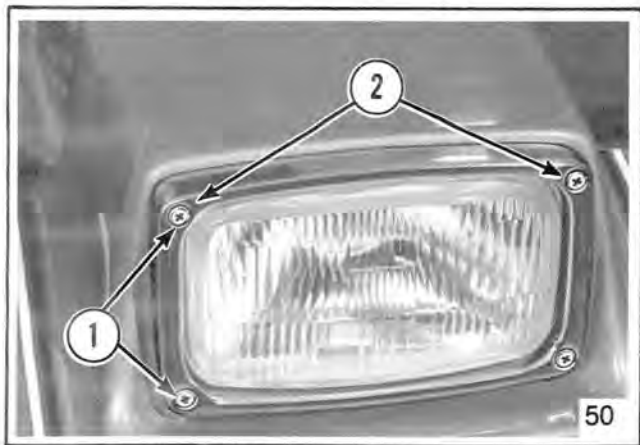
NOTE: To assure proper aiming and to prevent the vehicle from creeping ahead, be sure the hood is properly secured and an operator is seated on the vehicle.

3. Turn key switch to "RUN/LIGHTS" position and turn on headlight high beam. The headlight is properly aimed when the high beam is centered and aimed 2 in. (51 mm) below the reference mark on the wall. (See Figure 49.)

Observe this **CAUTION** during next step

Always turn headlight adjusting screws to the right (clockwise). Turning screws counterclockwise may back them out of the headlight, allowing the headlight to become loose or drop out of position.

4. If headlight adjustment is required, turn adjusting screws to the right (clockwise) as required. (See Figure 50.)



1. Horizontal Adjusting Screws
2. Vertical Adjusting Screws

Check the operation of the headlight low beam.

Tail/Brake Light Test

The tail light will operate only when the key switch is in the "Run/Lights" position.

The brake light is activated by a switch mounted in the brake lever housing on the handlebar. Brake light operation is independent of the other lights and the key switch.

Track Adjustments

WARNING

When raising the rear of the snowmobile off the ground, place the ski tips against a stationary object and be sure the vehicle is properly secured to prevent personal injury.

1. Raise the rear of the snowmobile so the track is off the ground for its entire length and secure the snowmobile so it cannot fall; then hang a 5 lb (2.3 kg) weight from the mid point of the track.

NOTE: Do not position the snowmobile on its side to adjust track tension as it would be impossible to get an accurate adjustment.

2. The clearance from the bottom of the wear strip to the top edge of the track should be $\frac{3}{4}$ in. (19 mm) when measured directly below the rear suspension pivot arm bolt. (See Figure 51.)



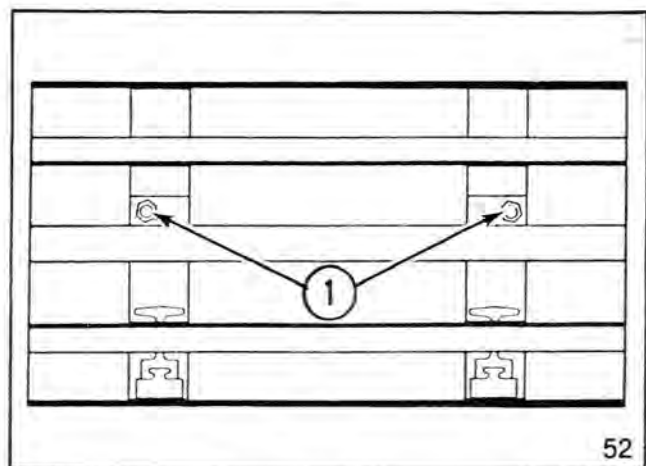
1. $\frac{3}{4}$ in. (19 mm)

Track Tension

WARNING

To prevent personal injury, never adjust track tension with the engine running.

3. Loosen the rear axle locking bolt on either side; then turn the rear axle adjusting nuts through rear track openings clockwise to decrease the clearance between the wear strip and track. (See Figures 51 and 52.)



1. Rear Axle Adjusting Nuts

4. When the proper tension is attained, be sure both adjusting nuts have the same number of exposed threads protruding through the nut. This is a good starting point for track alignment.
5. Remove weight from the track.

WARNING

NEVER raise rear of snowmobile by hand or stand behind the vehicle when engine is running or track is rotating. A rotating track can fling debris rearward at great velocity. This may cause severe personal injury. Remove all tool and foreign matter from track area before starting engine.

6. Start the engine and push on the throttle lever only enough to turn the track slowly a few revolutions. Stop the engine and perform Track Alignment Check.

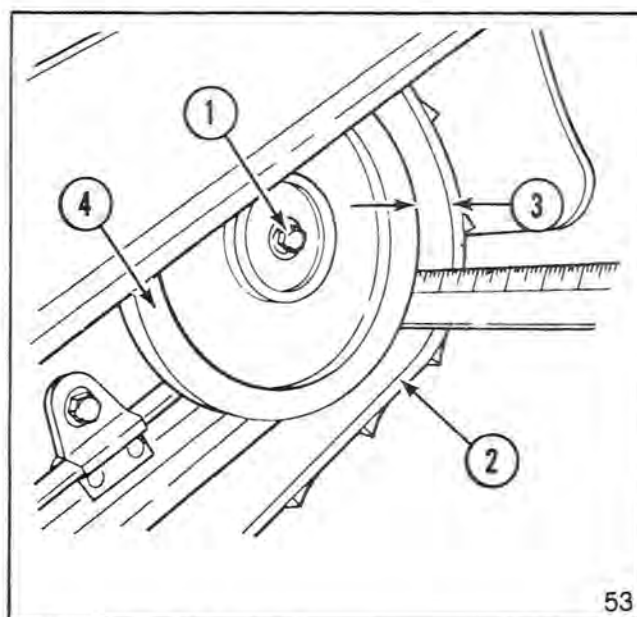
NOTE: If ratcheting (slippage or jumping between the drive lugs on the track and the drive sprockets) occurs during hard acceleration or braking, tighten the track slightly.

Track Alignment

Observe this **WARNING** during next step

To prevent injury, never adjust or measure track alignment while the engine is running.

Track alignment is correct when the measurements from the rear idler wheel to the outside edge of the track are equal on both sides of the machine. (See Figure 53.)



1. Rear Axle Locking Bolts
2. Edge of Track
3. Dimension Equal on Both Sides
4. Idler Wheel

After performing Track Tension procedures, adjust track alignment as follows:

1. Start engine and apply throttle to turn track slowly a few revolutions. Let track coast to a stop and measure alignment.

2. If measurement on one side is larger, loosen rear axle locking bolts. Tighten rear axle adjusting nut on side with the larger measurement about 1/2 turn.

3. Restart engine and recheck alignment. Repeat adjustment as necessary until alignment is correct.

CAUTION

If track alignment requires considerable adjustment, track tension should be rechecked to prevent damage to drive or suspension system.

4. Torque rear axle locking bolts 25 ft lb (3.5 kg-m).

NOTE: After the rear axle bolts have been tightened, check to be sure that the spacers (tubing) over the rear axle squeeze against the slide rail brackets, preventing the spacers from rotating. Loose spacers will permit the rear axle to float and proper track alignment cannot be maintained.

Test Ride (Operational Checks)

Test ride the snowmobile and check for the following:

✓ CONTROL CABLES

The throttle and brake controls must operate without binding and return freely in any steering position.

NOTE: With engine running at idle turn handle bars lock to lock. If any change in engine speed occurs, check cables for proper routing.

✓ STEERING

Steering should be smooth and free from lock-to-lock with no excessive looseness or tightness in the steering linkage.

✓ ENGINE

Recoil starter works properly and the engine starts promptly. Test for good throttle response and return.

✓ SUSPENSION

Adjusted for average driver weight and operates smoothly.

✓ TRACK

Track runs true with little vibration or drag. If ratcheting (slippage or jumping between drive lugs on track and drive sprockets) during hard acceleration or braking occurs, tighten track tension slightly.

✓ EMERGENCY STOP SWITCH

Check operation in all switch positions.

✓ CONVERTERS

Test for smooth operation and correct engine RPM, 6900 to 7100 at full throttle.

✓ INSTRUMENTS

Check for proper indications.

✓ BATTERY CHARGING SYSTEM

Check charging system output. Connect voltmeter to battery, voltage should read 12 to 13 volts. Start engine and allow it to idle (3,000 RPM) voltage should read 13.5 to 14.5 volts.

During the test ride, listen for any unusual noises (rattles, squeaks, etc.) that may warrant inspection and correction.

Upon completion of Test Ride, check the following:

1. Brake adjustment.
2. Engine gearcase lubricant level.
3. Drive converter mounting bolt torque - 70 ft lb (10.0 kg-m).
4. Thoroughly inspect the engine compartment for fuel or oil leaks and repair as required.
5. Fastener check - Perform a general inspection to check fasteners for security. Use torque chart as a guide for tightening hardware when required.

Specifications

ENGINE

Type TA440C-D201
Displacement 26.6 C.I. (436cc)
Bore X Stroke 2.677 x 2.362 in. (68 x 60 mm)
Number of Cylinders 2
Ignition System Capacitor Discharge (C.D.)
Ignition Timing (engine warm) 18° @ 6500 RPM, 0.073 in. (1.86 mm) BTDC
Spark Plug NGK BZ-9EV
Spark Plug Gap 0.024 in. (0.6 mm)
Carburetor Make and Model Mikuni VM32 Econo Jet
Engine RPM at Full Throttle 6900 to 7100 RPM
Engine Gearcase Capacity 1.35 oz. (40 cc)

CARBURETOR SETTINGS

Air Screw 1 turn off seat
Idle Screw 6 turns open from coil bound initial (2500 RPM final)

FUEL

Gasoline Regular or Premium Leaded, minimum pump posted octane number 89
Oil Kawasaki Snowmobile Oil or B.I.A. certified TC-W oil
Gasoline/Oil Ratio Oil Injection

LUBRICANTS

Engine Gearcase Shell FIRE AND ICE 10W40
(Oil that meets or exceeds API service SE specifications)
Chaincase DEXRON II Automatic Transmission Fluid

DRIVE SYSTEM

Drive Belt Width 1-1/4 in. (31.7 mm)
Drive Belt Outside Circumference 46-5/8 in. (1,184 mm)
Converter Offset 0.525 - 0.588 in. (13.3-14.9 mm)
Converter Center Distance 12 in. (304.8 mm)

ELECTRICAL SYSTEM

Type 12 Volts - 120 Watts
Headlight Stanley 5988
Tail/Brake Light G.E. No. 1157
Instrument Lights G.E. No. 1816

Torque Chart

DESCRIPTION	TORQUE	DESCRIPTION	TORQUE
CONTROLS & CABLES			
Brake lever locking - allen screw	25 in.lb (0.3 kg-m)	Chaincase to chassis - nut (5/16)	18 ft lb (2.6 kg-m)
Ignition switch mtg. - face nut	30 in.lb (0.3 kg-m)	Jackshaft bearing retainer adjusting bolt - jam nut (3/8)	20 ft lb (2.8 kg-m)
Throttle lever locking - allen screw	25 in.lb (0.3 kg-m)	Jackshaft bearing retainer housing - nuts (5/16)	18 ft lb (2.6 kg-m)
		Jackshaft bearing retainer to chassis, front - bolt (3/8)	18 ft lb (2.6 kg-m)
		Jackshaft bearing retainer to chassis, rear - bolt (3/8)	31 ft lb (4.0 kg-m)
		Speedometer drive adaptor	120 in.lb (1.4 kg-m)
CABLES		BRAKE	
Brake cable - jam nuts (5/16)	50 in.lb (0.6 kg-m)	Brake caliper to chaincase (3/8)	35 ft lb (4.8 kg-m)
Enrichener cable - jam nuts (6 mm)	20 in.lb (0.2 kg-m)		
Enrichener lever mtg. - nut	Hand tighten		
Oil pump cable - jam nuts (6 mm)	20 in.lb (0.2 kg-m)		
Speedometer cable	Hand tighten	DRIVEN CONVERTER	
Throttle cable - jam nut (6 mm)	20 in.lb (0.2 kg-m)	Coupling to fixed sheave - bolts (6 mm)	120 in. lb (1.4 kg-m)
		Cover to movable sheave - bolts (6 mm)	50 in.lb (0.6 kg-m)
		Driven converter to jackshaft - bolt (5/8)	50 ft lb (6.9 kg-m)
HOOD		DRIVE CONVERTER	
Hood hinge to hood - screws (1/4)	25 in.lb (0.3 kg-m)	Cover to movable sheave - bolts (6 mm)	120 in.lb (1.4 kg-m)
Hood latch band mtg. - nuts (1/4)	Compress rubber	Drive converter to crankshaft bolt (1/2)	70 ft lb (9.7 kg-m)
		Ramp & pin assy mtg. - bolts (6 mm)	96 in.lb (1.1 kg-m)
SEAT & CONSOLE		Roller & pin assy mtg. - bolts (6 mm)	120 in.lb (1.4 kg-m)
Control panel bracket to chassis - nuts (1/4)	95 in.lb (1.1 kg-m)	Weight ramp assy - nut (special)	60 in.lb (0.7 kg-m)
Control panel to bracket - screws (#10)	15 in.lb (0.2 kg-m)		
Fuel level gauge panel mtg. - screws (#10)	15 in.lb (0.2 kg-m)	ENGINE MOUNT & EXHAUST	
Oil level gauge panel mtg. - screws (#10)	15 in.lb (0.2 kg-m)	Engine mount to chassis, recoil side - nuts (3/8)	25 ft lb (3.5 kg-m)
Seat to tunnel - bolts (1/4)	35 in.lb (0.4 kg-m)	Engine PTO mount to engine mount - allen screws	16 ft lb (2.2 kg-m)
		Exhaust mount damper to bracket - nuts (5/16)	55 in.lb (0.6 kg-m)
STEERING		Mount damper to engine mount - nuts (1/4)	105 in.lb (1.2 kg-m)
Handlebar holder - allen screws (1/4)	105 in.lb (1.2 kg-m)		
Handlebar holder to steering column - bolt (3/8)	35 ft lb (4.8 kg-m)	ENGINE LUBRICATION SYSTEM	
Steering arm to spindle - bolt (3/8)	30 ft lb (3.9 kg-m)	Elbow fitting to oil tank	Judgement
Steering column mount to chassis - bolt (5/16)	18 ft lb (2.5 kg-m)	Oil pump inlet plate mtg. - screws (4 mm)	40 in.lb (0.5 kg-m)
Tie rod end - jam nuts (3/8)	120 in.lb (1.4 kg-m)	Oil pump mounting - bolts (6 mm)	60 in.lb (0.7 kg-m)
Tie rod end to steering arm - nuts (3/8)	30 ft lb (3.9 kg-m)	Oil pump outlet nozzle to crankcase - bolt (8 mm)	10 in.lb (0.1 kg-m)
Tie rod end to steering column - nut (3/8)	30 ft lb (3.9 kg-m)	Oil pump outlet nozzle to cylinder - bolt (8 mm)	10 in.lb (0.1 kg-m)
SKI & SPINDLE		ENGINE GEARCASE	
Shock absorber to ski - nut (3/8)	31 ft lb (4.0 kg-m)	Gearcase drain plug - bolt (6 mm)	50 in.lb (0.6 kg-m)
Shock absorber to ski saddle - nuts (3/8)	31 ft lb (4.0 kg-m)	Gearcase to crankcase - allen bolts	12 ft lb (1.7 kg-m)
Ski saddle to spindle - nut (3/8)	46 ft lb (6.4 kg-m)	Gearcase to crankcase boss - bolt (6 mm)	60 in.lb (0.7 kg-m)
Ski skreg to ski - nuts (5/16)	120 in.lb (1.4 kg-m)	Oil pump gear to pump - nut (8 mm)	12 ft lb (1.7 kg-m)
Ski spring to saddle - nuts (3/8)	46 ft lb (6.4 kg-m)		
Ski spring to ski, front - nut (3/8)	25 in.lb (0.3 kg-m)	CYLINDER HEAD AND CYLINDER	
Ski spring to ski, rear - nut (3/8)	31 ft lb (4.0 kg-m)	Carburetor holder to cylinder - bolts (8 mm)	45 in.lb (0.6 kg-m)
		Cylinder head to cylinder - bolts	16 ft lb (2.2 kg-m)
		Exhaust manifold mounting - nuts (8 mm)	70 in.lb (0.8 kg-m)
		Spark plug to cylinder head (13 mm)	20 ft lb (1.7 kg-m)
CHASSIS		FAN CASE AND AIR SHROUD	
Bumper & brace to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Engine air duct to main shroud - nuts (#10)	30 in.lb (0.3 kg-m)
Bumper & hood guide to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Exhaust shroud to main shroud - bolts (6 mm)	70 in.lb (0.8 kg-m)
Bumper & hood hinge to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Fan pulley to fan - nut (14 mm)	47 ft lb (6.5 kg-m)
Bumper to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Fan screen to fan housing - screws (6 mm)	70 in.lb (0.8 kg-m)
Fuel pump to tunnel - nuts (1/4)	35 in.lb (0.4 kg-m)	Intake shrouds to cylinder - bolts (6 mm)	70 in.lb (0.8 kg-m)
Outer guide & brace to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Main shroud to cylinder head - bolts (6 mm)	70 in.lb (0.8 kg-m)
Outer guide & inner guide to pan - nuts (1/4)	70 in.lb (0.8 kg-m)	Main shroud to fan housing - bolts (6 mm)	70 in.lb (0.8 kg-m)
Outer guide & inner guide to pan - nuts (#10)	20 in.lb (0.2 kg-m)		
Rear stay to tunnel - bolt (3/8)	19 ft lb (2.7 kg-m)		
Snow flap spacer mtg. - nut (1/4)	50 in.lb (0.6 kg-m)		
Voltage regulator - nut (1/4)	105 in.lb (1.2 kg-m)		
		CRANKCASE	
SUSPENSION		Gearcase fill plug - bolt (8 mm)	60 in.lb (0.7 kg-m)
Front pivot shaft to tunnel - bolt (3/8)	25 ft lb (3.5 kg-m)	Lower crankcase boss to upper - bolt (6 mm)	16 ft lb (2.2 kg-m)
Front suspension rail brace - bolt (3/8)	25 ft lb (3.5 kg-m)	Lower crankcase to upper crankcase - bolt (8 mm)	16 ft lb (2.2 kg-m)
Front swing arm to suspension bracket - bolt (3/8)	30 ft lb (3.6 kg-m)		
Idler wheel shaft mtg. - bolt (3/8)	25 ft lb (3.5 kg-m)	PISTON AND CRANKSHAFT	
Limiter strap to swing arm - nuts (1/4)	45 in.lb (0.6 kg-m)	Flywheel mounting - nut (18 mm)	60 ft lb (8.3 kg-m)
Lower idler wheel - bolt (3/8)	25 ft lb (3.5 kg-m)		
Rail wear strip retaining - nut (1/4)	25 in.lb (0.3 kg-m)	RECOIL STARTER	
Rear axle locking - bolt (3/8)	25 ft lb (3.5 kg-m)	Friction plate to rope reel - nut (8 mm)	10 ft lb (1.4 kg-m)
Rear limiter strap to pivot arm - nut (1/4)	45 in.lb (0.6 kg-m)	Recoil assembly mtg. - bolt (6 mm)	70 in.lb (0.7 kg-m)
Rear pivot shaft to tunnel - bolt (3/8)	25 ft lb (3.5 kg-m)	Starter pulley to flywheel - bolts (6 mm)	18 ft lb (2.5 kg-m)
Rear pivot arm to rear suspension arm - bolt (3/8 Gr. 8)	25 ft lb (3.5 kg-m)		
Suspension brackets to slide rail - nuts (3/8)	105 in.lb (1.2 kg-m)	MAGNETO	
Suspension rear arm to pivot arm - bolts (3/8)	25 ft lb (3.5 kg-m)	CDI igniter mounting (1/4)	60 in.lb (0.6 kg-m)
Suspension shock absorber mtg., front - nut (3/8)	25 ft lb (3.5 kg-m)	Ignition coil mounting - screw (6 mm)	70 in.lb (0.8 kg-m)
Suspension shock absorber mtg., rear - nut (thin)	15 ft lb (1.9 kg-m)	Stator plate mounting - screw (5 mm)	70 in.lb (0.8 kg-m)
Top idler shaft - bolt (3/8)	25 ft lb (3.5 kg-m)	Voltage regulator - nut (1/4)	105 in.lb (1.2 kg-m)
Track adjuster lock - nut (3/8)	10 ft lb (1.4 kg-m)	Wiring harness connector mounting - screw (4 mm)	40 in.lb (0.5 kg-m)
DRIVESHAFT		ELECTRIC START	
Bearing housing to tunnel - nuts (5/16)	18 ft lb (2.6 kg-m)	Battery cable to solenoid - nut (6 mm)	55 in.lb (0.6 kg-m)
Locking collar - set screw (1/4)	70 in.lb (0.8 kg-m)	Battery cables to battery - bolt (6 mm)	40 in.lb (0.4 kg-m)
		Battery case to chassis - nut (1/4)	70 in.lb (0.8 kg-m)
CHAINCASE & JACKSHAFT		Rear starter motor bracket to starter motor - bolt (6 mm)	50 in.lb (0.6 kg-m)
Chaincase drain plug	Judgement	Rear starter bracket to engine - nut (5 mm)	32 in.lb (0.4 kg-m)
Chaincase fill plug	Judgement	Starter motor to engine - cap screw (8 mm)	12 ft lb (1.7 kg-m)
Chain sprocket to driveshaft, bottom - bolt (special)	35 ft lb (4.8 kg-m)	Starter motor cable to solenoid - nut (6 mm)	55 in.lb (0.6 kg-m)
Chain sprocket to jackshaft, top - bolt (5/8)	50 ft lb (6.9 kg-m)	Starter solenoid to duct assy. - bolt (5/16)	10 ft lb (1.4 kg-m)
Chain tensioner mtg. - bolt (1/4)	50 in.lb (0.6 kg-m)		
Chaincase cover mtg. - bolts (1/4)	70 in.lb (0.8 kg-m)		

Wiring Diagram

