

K
Kawasaki

LTD 440

SS440-B2

SS440-B3



**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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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.)

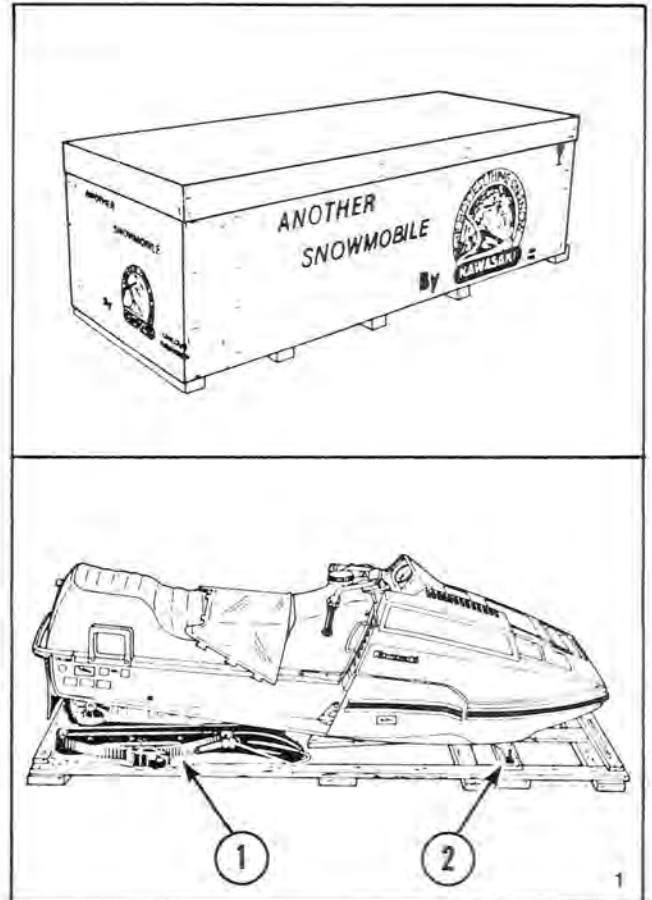
NOTE: When uncrating vehicle, inspect for concealed damage that may occur during shipping. If damage is apparent, STOP uncrating and check your WARRANTY POLICIES & PROCEDURES section of your Snow Products Binder under RECEIVING WAREHOUSE UNITS..

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 the snowmobile from the crate. Thoroughly inspect the snowmobile for shipping damage and missing parts.

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

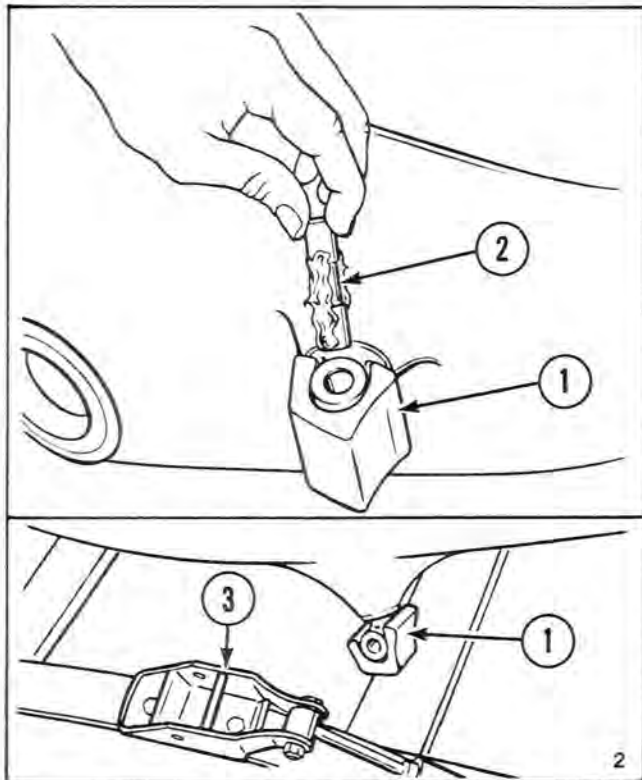


1. Ski Assembly
2. Ski Spindle

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.)
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 the spindle. (See Figure 2.)

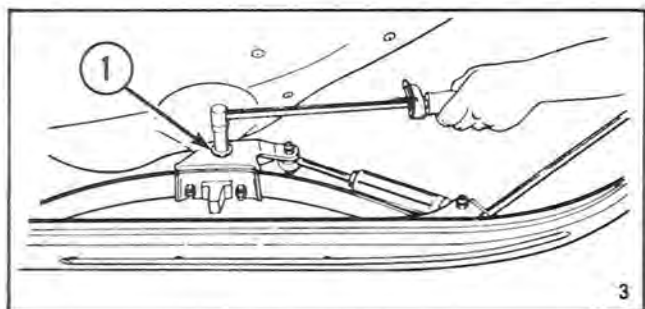


- 1. Ski Attitude Damper
- 2. Grease Groove
- 3. Ski Saddle

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 and possible personal injury to the operator.

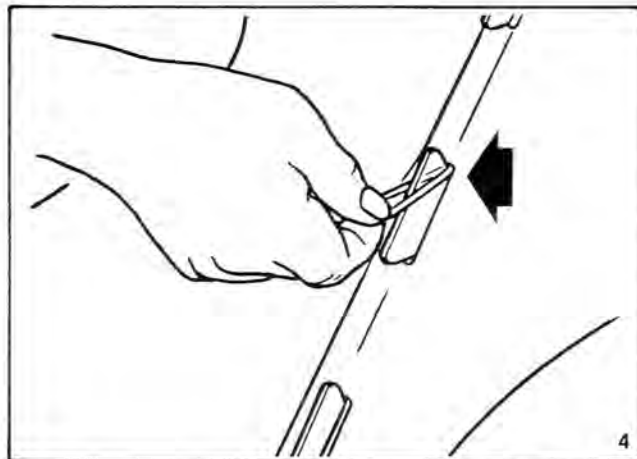
- 3. Secure the ski assembly to the spindle with the hardware supplied. Be sure the nut and large flat washer are installed on the inward side of the ski assembly, then torque the nut 46 ft lb (6.4 kg-m). (See Figure 3.)



- 1. Flat Washer

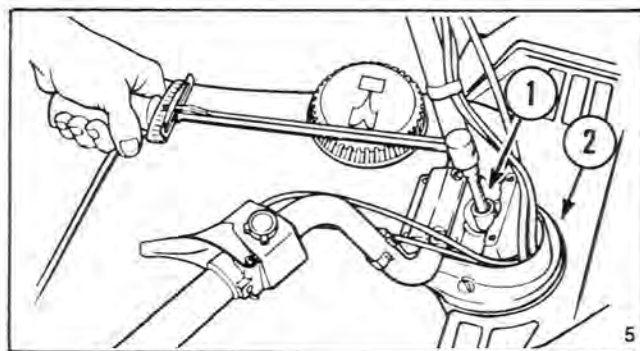
Windshield

Remove the plastic covering and install the windshield with the o-ring fasteners provided. (See Figure 4.)



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 (5.0 kg-m). (See Figure 5.)



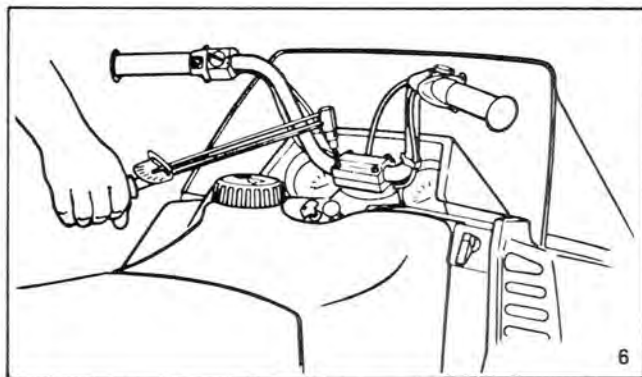
- 1. Lower Handlebar Holder
- 2. Console

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.)

Observe this **CAUTION** during next step

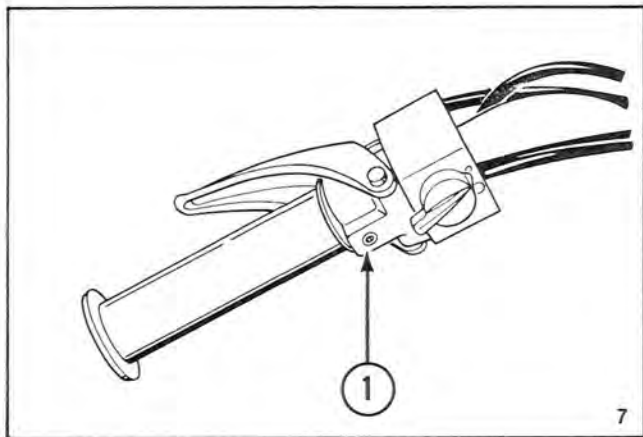
Adjust the handlebar so it does not hit the windshield, when turning in either direction.

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

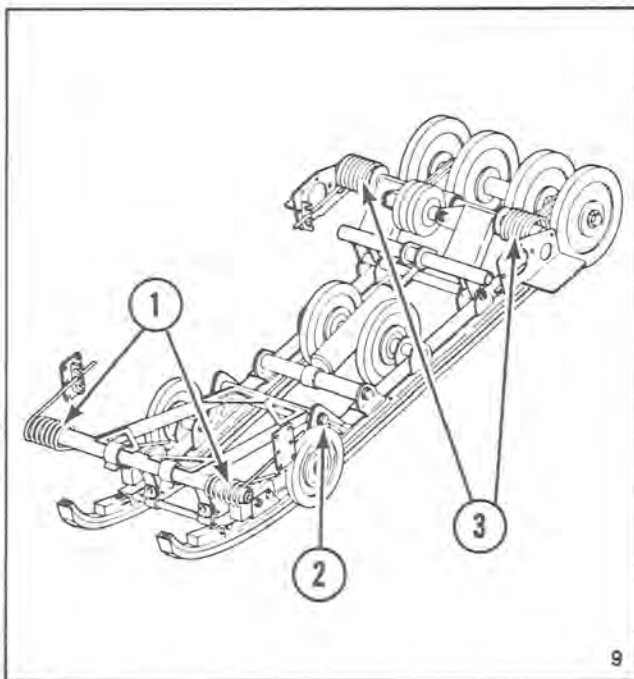
Suspension

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.

Suspension adjustments consist of changing front and rear spring tension to alter vehicle handling and ride characteristics, and adjusting the front swing arm mounting position to alter weight transfer during acceleration. (See Figure 9.)



1. Suspension Front Springs
2. Suspension Front Swing Arm
3. Suspension Rear Springs

CAUTION

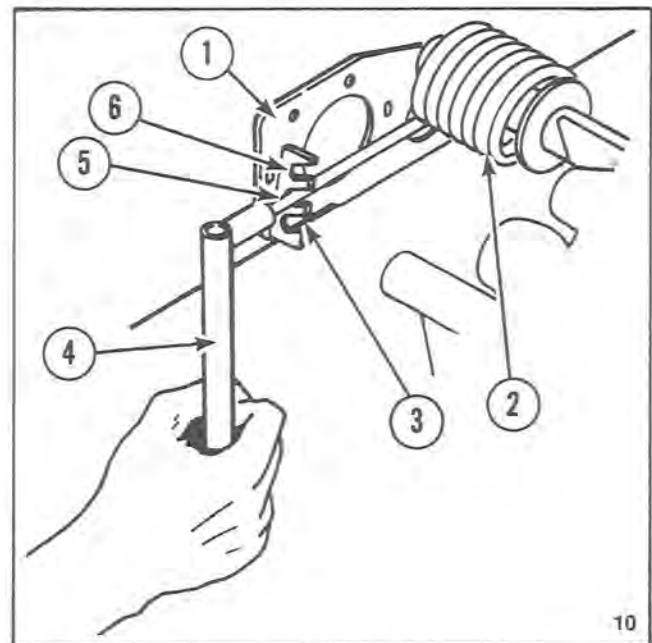
Spring tension (pre-load) of springs must be equal on each side of suspension (front to front, rear to rear). Higher tension adjustment on one spring can cause spring breakage or excessive slide wear strip wear.

Ride Adjustment

The rear springs, located on each side of the rear pivot arm, control the ride by pushing downward on the suspension to hold vehicle up. Increasing rear spring tension will stiffen the ride allowing more driver or passenger weight. Decreasing tension creates a softer ride for lighter loads.

To change rear spring tension:

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



1. Rear Spring Retaining Bracket
2. Suspension Rear Spring
3. Low Tension Position
4. Spring Adjusting Tool P/N 57001-3507
5. Mid Tension Position
6. High Tension Position

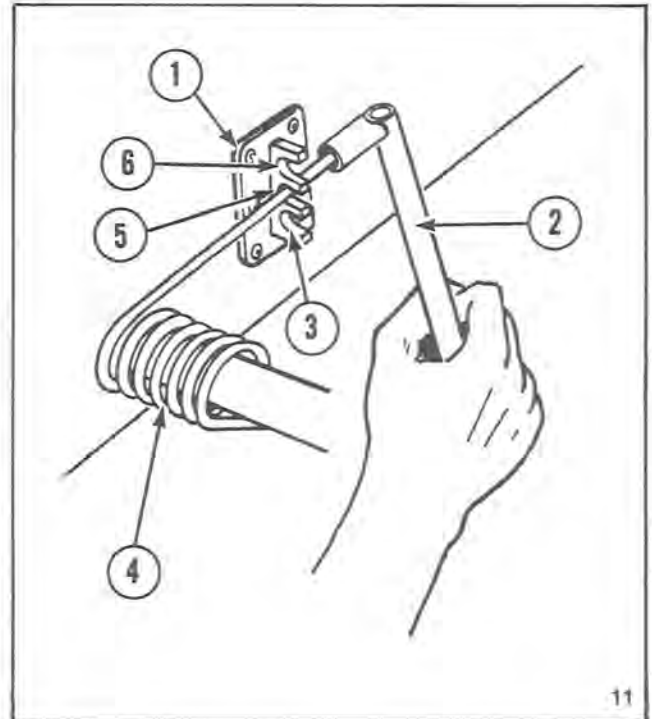
2. Apply firm grip on adjusting tool with both hands. Carefully force spring out of retainer detent. Be prepared to accept heavy spring load as spring is released from retainer detent.
3. Install spring into upper detent to increase tension or into lower detent to decrease tension.
4. Repeat procedure on other rear spring to make tension equal on both sides of suspension (rear to rear).

Handling Adjustment

The front springs, located on each side of the front swing arm, control handling or steering response. Increasing spring tension forces the front of the suspension to lift more, shifting weight or pressure from skis to the suspension. Reducing tension causes less suspension lift, increasing pressure on skis. The amount of pressure on the skis directly affects steering effort and response. More ski pressure means increased steering response and effort while less pressure means easier effort but less response.

To change front spring tension:

1. Position spring adjusting tool P/N 57001-3507 onto end of spring. (See Figure 11.)
2. Apply firm grip on adjusting tool with both hands. Carefully force spring out of retainer detent. Be prepared to accept heavy spring load as spring is released from retainer detent.
3. Install spring into lower detent to increase tension or into upper detent to decrease tension.
4. Repeat procedure on other front spring to make tension equal on both sides of suspension (front to front).



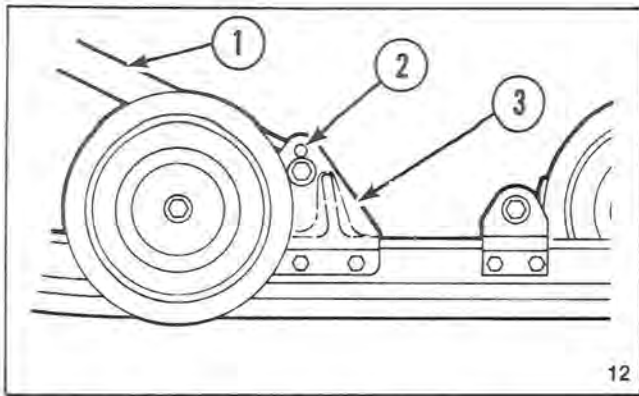
1. Front Spring Retaining Bracket
2. Spring Adjusting Tool P/N 57001-3507
3. High Tension Position
4. Suspension Front Spring
5. Mid Tension Position - as produced
6. Low Tension Position

Swing Arm Adjustment

WARNING

Suspension front swing arm is under heavy spring load. Improper service techniques may result in personal injury.

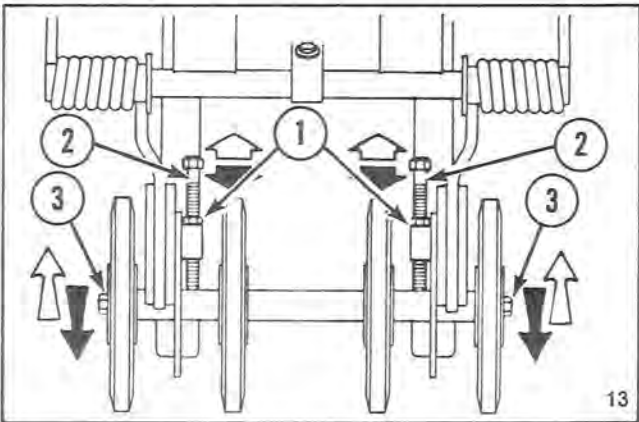
The front swing arm is positioned in lower hole of suspension front bracket for best over-all acceleration and ride characteristics. Changing swing arm to upper hole location causes less weight transfer from skis to suspension during acceleration. Less weight transfer decreases ski lift allowing increased steering stability during acceleration. (See Figure 12.)



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

To change swing arm position:

1. Relieve spring tension from front swing arm.
2. Repeat procedure on other front spring.
3. Loosen rear axle locking bolts and adjusting bolt jam nuts. Back out adjusting bolts to relieve track tension. (See Figure 13.)

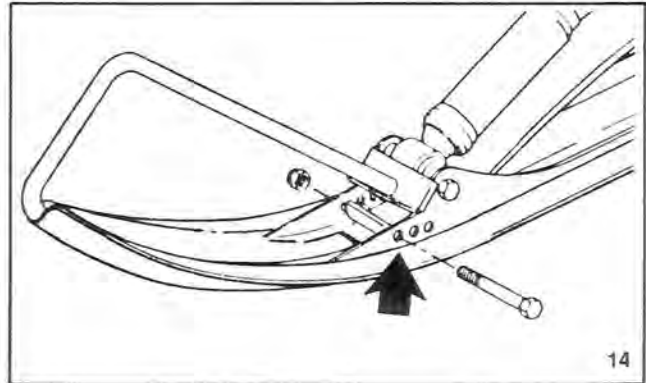


1. Adjusting bolt jam nuts
2. Adjusting bolts
3. Rear axle locking bolts

4. Remove swing arm to bracket mounting bolts and position swing arm in upper location. Reinstall bolts and torque 25 ft lb (0.2 kg-m).
5. Use spring adjusting tool to reposition spring into desired detent.
6. Adjust track as instructed in Track Adjustment procedures.

Ski Spring Preload Adjustment

Three positions are provided for front ski spring mounting bolt.



FRONT HOLE POSITION - secures spring to reduce spring arch, increasing spring tension preload, resulting in a firmer ride with less spring travel for maximum stability during high speed operation.

CENTER HOLE POSITION - allows more spring arch, reducing spring preload, resulting in a softer ride for moderate speeds and trail riding.

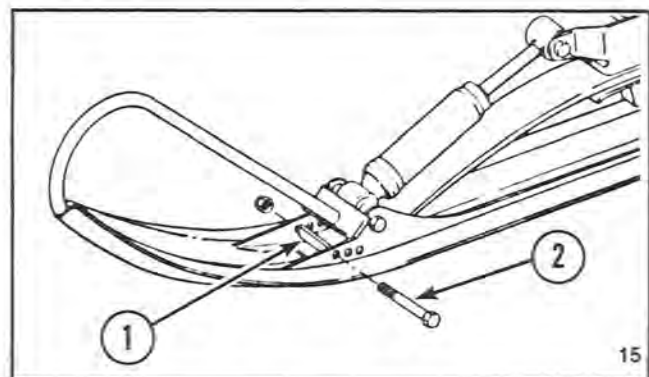
REAR HOLE POSITION - provides maximum spring arch, further reducing spring preload, resulting in a much softer ride. This position is recommended for deep snow operation or slow speed trail riding only.

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 weight of snowmobile is on skis, and proceed as follows:

1. Remove nut from front spring mounting bolt.

- Open hood and with assistance from another, stand on front bumper to relieve spring tension from mounting bolt.
- With weight still on front bumper, remove bolt, slide spring rub strip to align with desired hole position of ski, and insert bolt. (See Figure 15.)



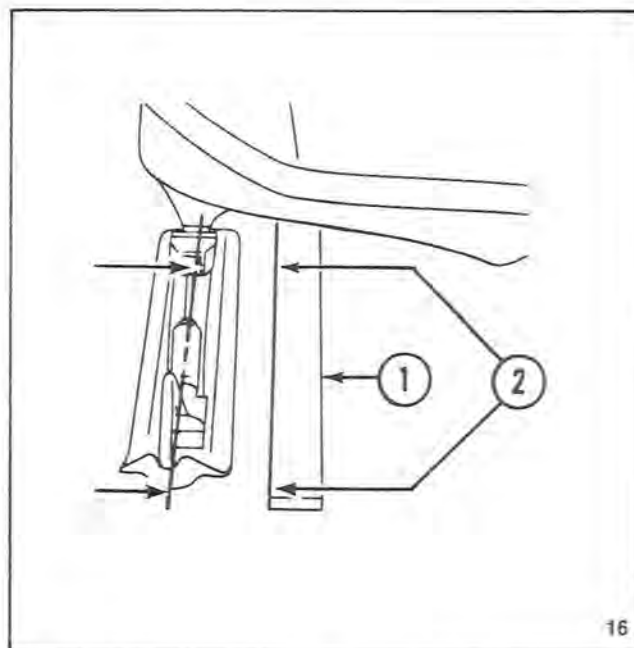
- Spring rub strip
- Spring bolt

- Install nut and torque 25 in. lb (0,3 kg-m).

Steering Alignment

Check ski alignment and handlebar centering.

- Place long board (or suitable straight edge) against right hand edge of the track, and measure the distance between the board and center line of the ski. (See Figure 16.)
- Position the ski so distance measured between ski center line and board edge is the same at front and rear of ski. (See Figure 16.)

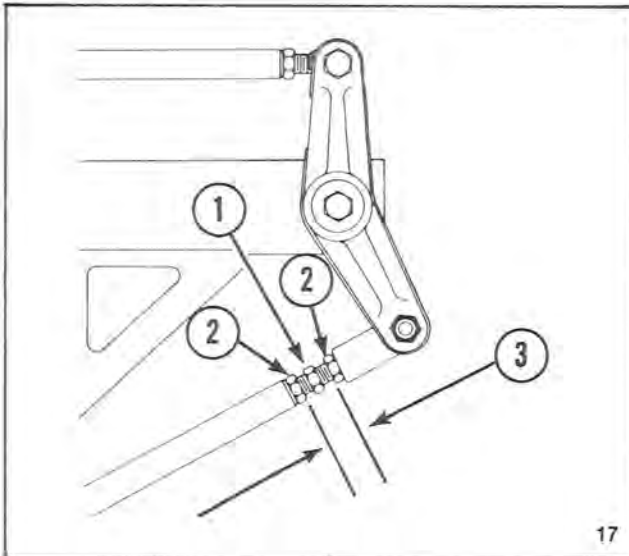


- Straight Edge Against Track
- Measure Distance Here

- When the ski center line 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.
- To center handlebar, remove two right-hand muffler mount nuts and springs. Force muffler upward for access to tie rod adjusting stud.
- Loosen lock (jam) nuts and turn tie rod adjusting stud in the direction necessary to center handlebar. (See Figure 17.)

CAUTION

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 17.)



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

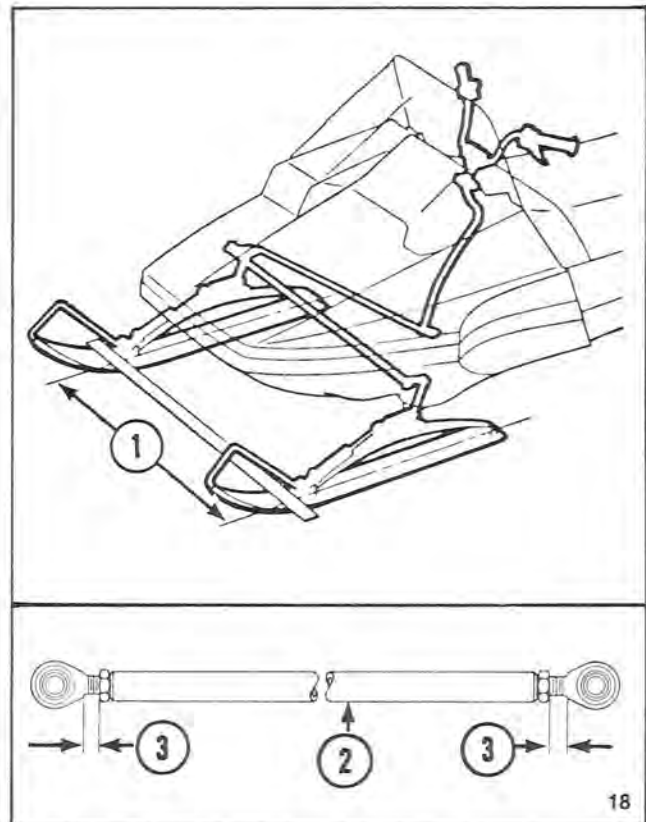
NOTE: Be sure center line of ski remains parallel to straight edge while turning tie rod length adjusting stud.

6. To align other ski, move both ski tips towards center of the 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 18.)

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 18.)

7. 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.



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

8. Reposition muffler and install mounting nuts and springs.

NOTE: Be sure insulation washer lip is properly positioned in slotted muffler bracket and special insulating shield is properly located before tightening muffler mounting nuts.

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.

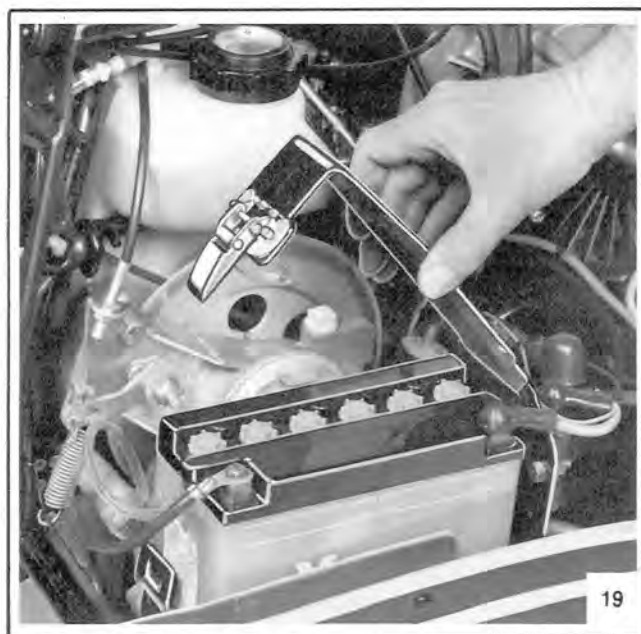
Battery (Electric Start Models Only)

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 19.)



2. Disconnect cables from terminals of battery. Carefully lift battery out of mounting bracket. (See Figure 20.)
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 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 21.)



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 Installaion

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.

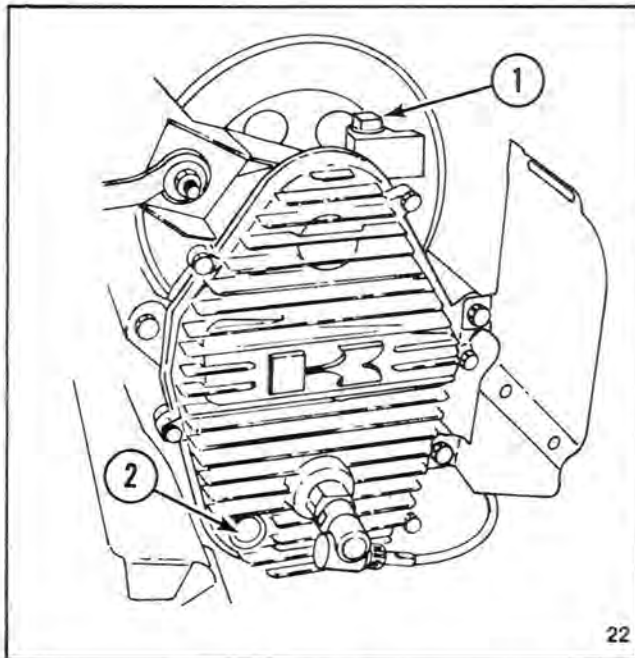
Observe this **CAUTION** during next step

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.



1. Upper Fill Plug
2. Fluid Level Sight Gauge

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

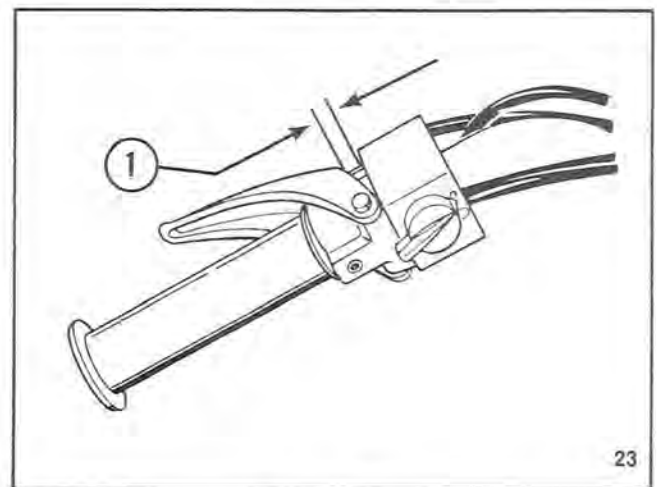
If additional fluid is required, remove upper plug in the chaincase and pour DEXRON II Automatic Transmission Fluid into chaincase until level is correct. (See Figure 22.)

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.

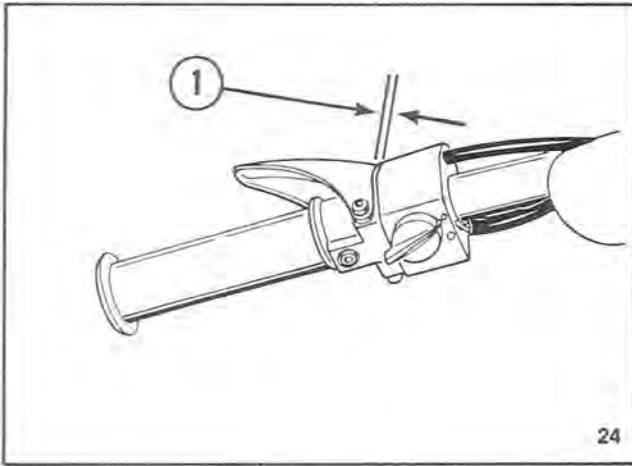
Brake Adjustment

The LTD is equipped with a self adjusting disc brake. To check proper operation, apply the brake firmly and measure lever movement which should be 3/4 in. (19 mm) when brake is fully applied. (See Figure 23.)



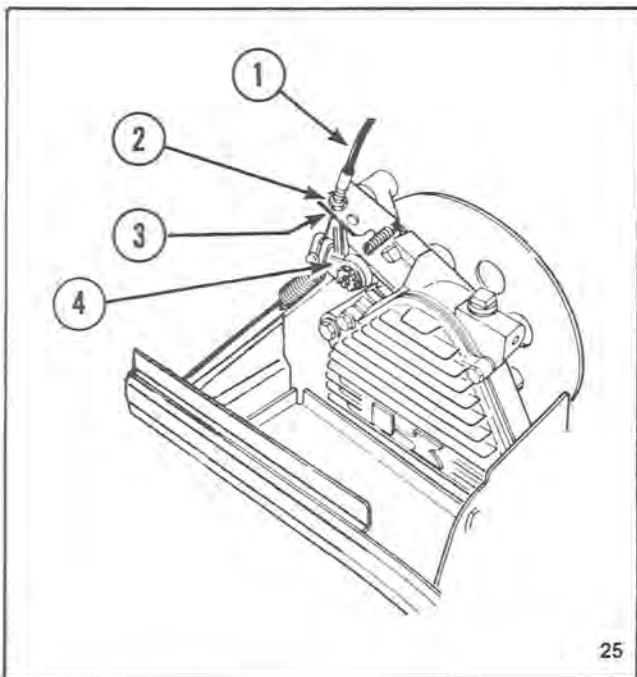
1. 3/4 in. (19 mm)

Release the brake handle, measure distance. (See Figure 24.) This dimension should be no greater than 1/8 in. (3.2 mm). Perform Brake Adjustment if required.



1. 1/8 in. (3.2 mm)

1. Back both cable jam nuts away from bracket about 1/4 in. (6.4 mm). (See Figure 25.)



1. Brake Cable
2. Upper Brake Cable Jam Nut
3. Lower Brake Cable Jam Nut
4. Brake Actuation Lever

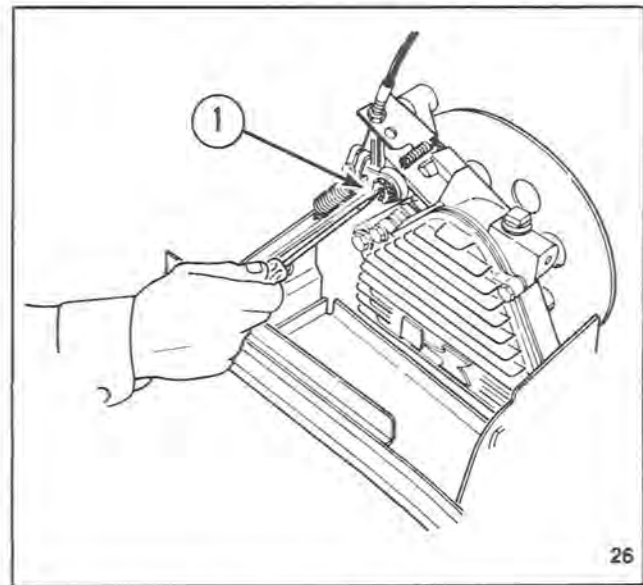
2. Remove cable slack by pulling brake cable upward without moving brake cam lever and snug upper jam nut to bracket.

3. Turn lower jam nut up to bracket and torque both jam nuts to 50 in.lb (0.6 kg-m).

4. Check handle bar brake lever. (See Figure 24.)

5. Apply brake firmly and turn the manual adjuster until the correct measurement of 3/4 in. (19 mm) is achieved. (See Figure 26.) Do not over adjust or brake drag will occur.

NOTE: Clockwise rotation of the adjuster screw increases the handlebar brake lever measurement. Counterclockwise rotation decreases the measurement.



1. Brake Adjuster

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.

Engine Coolant Recommendation

WARNING

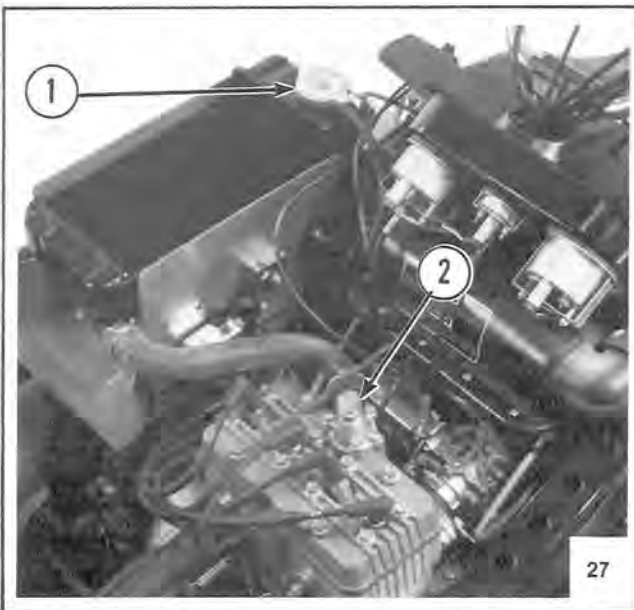
To be sure coolant level is adequate, always fill to within 1/4 to 1/2 in. (6 to 12 mm) of the tank top.

Coolant Supply - Use a 55/45 mixture of antifreeze and water (55% ETHYLENE GLYCOL base antifreeze and 45% water) when filling the cooling system. This recommended mixture will protect against freezing down to approximately -50°F (-45°C). A major brand of antifreeze (such as Prestone II or Dowgard) is recommended. The coolant level must be within 1/4 to 1/2 in. (6 to 12 mm) of the tank top when cool.

Filling Cooling System

Observe this **WARNING** during next step

Use care removing the pressure cap when engine is hot or severe burns could result. Remove pressure cap from reservoir only after cooling system has had adequate time to cool or temperature gauge needle has returned to the peg at bottom of the green zone.



1. Radiator Pressure Cap
2. Vent Plug

1. Remove the pressure cap from reservoir tank. If the cooling system is empty or the coolant level is considerably low, loosen vent plug at top of thermostat housing. (See Figure 27.)

Observe this

CAUTION

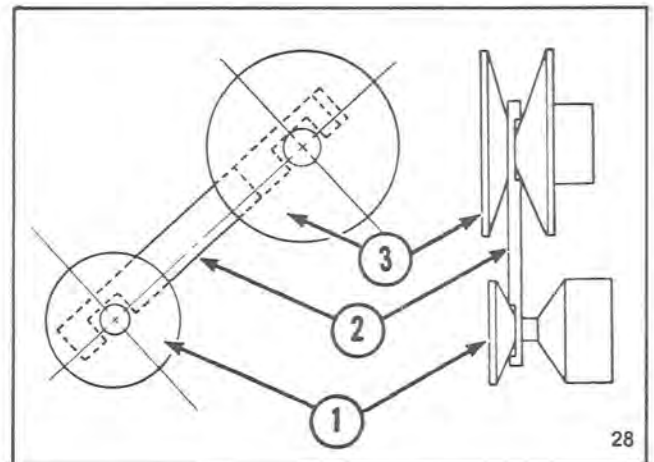
before next step

DO NOT USE 100% ANTIFREEZE OR WATER. 100% antifreeze will freeze before a 55/45 mixture of antifreeze and water.

2. Slowly fill cooling system through reservoir tank opening. Cooling system capacity is approximately 1.2 gallons.
3. When coolant appears at vent opening in thermostat housing, tighten vent plug, and continue filling until level is 1/4 to 1/2 in. (6 to 12 mm) down from neck in reservoir tank. Reinstall pressure cap.

Drive and Driven Converter Alignment

Correct converter center-to-center distance of 12.0 in. (304.8 mm) and converter offset distance of 0.525 to 0.588 in. (13.35 to 14.94 mm) is obtained when alignment gauge P/N 57001-3503 can be positioned between drive and driven converter sheaves correctly. (See Figure 28.)



1. Drive Converter
2. Alignment Gauge P/N 57001-3503
3. Driven Converter

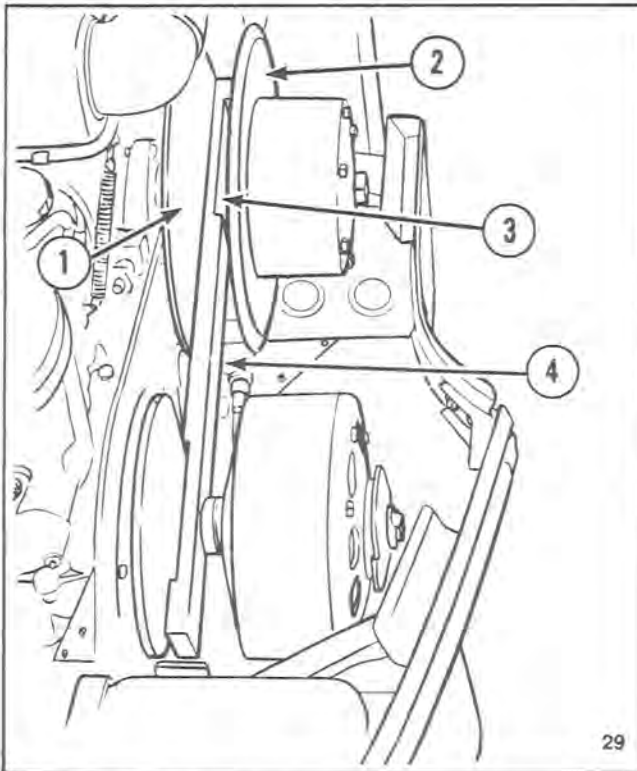
Center-to-Center Distance

NOTE: Improper handling or misuse of alignment gauge will result in inaccurate converter alignment. Check flatness of alignment gauge with 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 engine are completed.

2. Rotate driven converter movable sheave clockwise, and insert alignment gauge between sheaves with deep notch facing the stationary sheave. Carefully release movable sheave, allowing spring tension to keep gauge in position between the stationary and movable sheaves. (See Figure 29.)

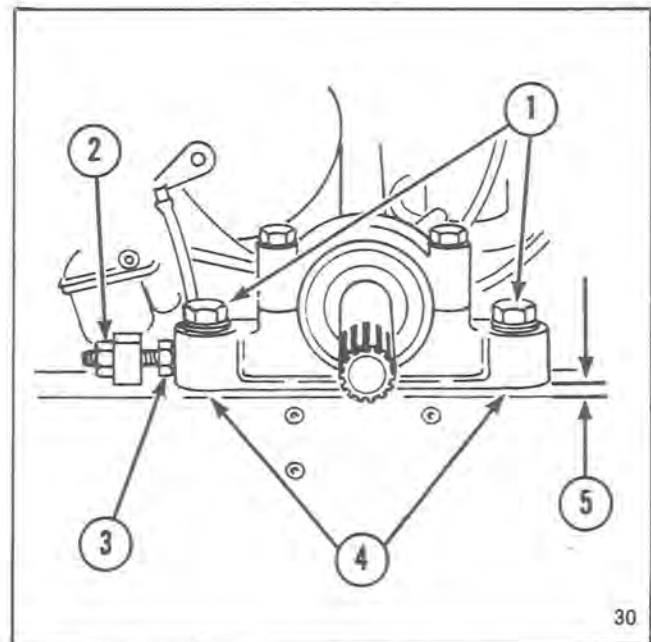


1. Driven Converter Movable Sheave
2. Driven Converter Stationary Sheave
3. Alignment Gauge Deep Notch
4. Alignment Gauge P/N 57001-3503

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

If adjustment of the converter center distance is required:

1. Loosen jackshaft bearing retainer mounting bolts and adjusting bolt locknut. (See Figure 30.)



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

2. Loosen four chaincase mounting bolts and three bolts securing the radiator brace bracket assembly to chassis and chaincase. (See Figure 31.)

Engine Coolant Recommendation

WARNING

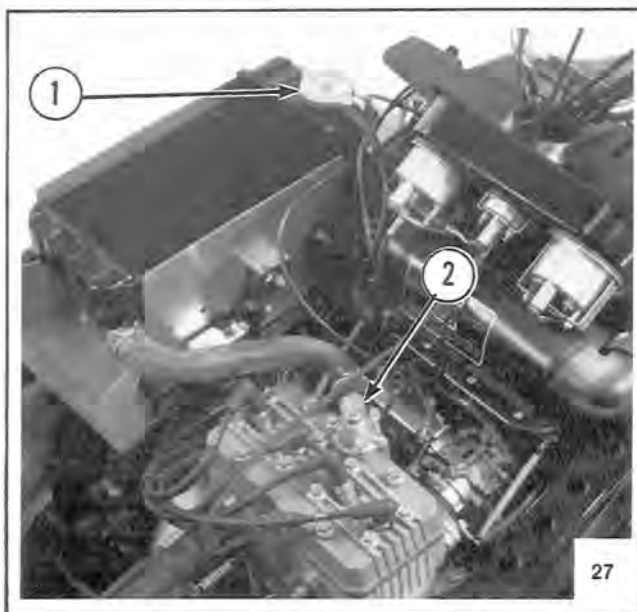
To be sure coolant level is adequate, always fill to within 1/4 to 1/2 in. (6 to 12 mm) of the tank top.

Coolant Supply - Use a 55/45 mixture of antifreeze and water (55% ETHYLENE GLYCOL base antifreeze and 45% water) when filling the cooling system. This recommended mixture will protect against freezing down to approximately -50°F (-45°C). A major brand of antifreeze (such as Prestone II or Dowgard) is recommended. The coolant level must be within 1/4 to 1/2 in. (6 to 12 mm) of the tank top when cool.

Filling Cooling System

Observe this **WARNING** during next step

Use care removing the pressure cap when engine is hot or severe burns could result. Remove pressure cap from reservoir only after cooling system has had adequate time to cool or temperature gauge needle has returned to the peg at bottom of the green zone.



1. Radiator Pressure Cap
2. Vent Plug

1. Remove the pressure cap from reservoir tank. If the cooling system is empty or the coolant level is considerably low, loosen vent plug at top of thermostat housing. (See Figure 27.)

Observe this

CAUTION

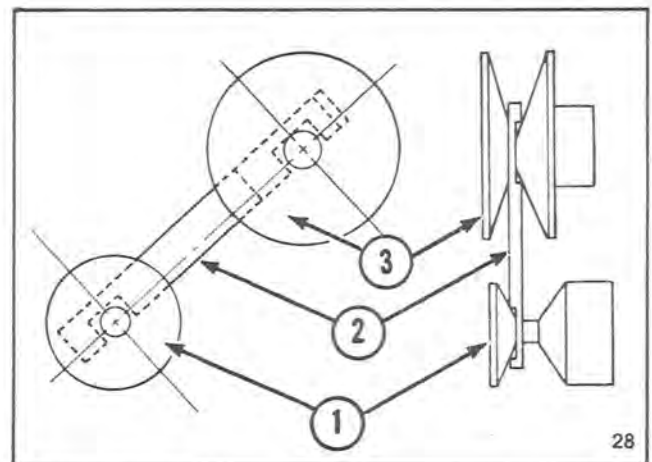
before next step

DO NOT USE 100% ANTIFREEZE OR WATER. 100% antifreeze will freeze before a 55/45 mixture of antifreeze and water.

2. Slowly fill cooling system through reservoir tank opening. Cooling system capacity is approximately 1.2 gallons.
3. When coolant appears at vent opening in thermostat housing, tighten vent plug, and continue filling until level is 1/4 to 1/2 in. (6 to 12 mm) down from neck in reservoir tank. Reinstall pressure cap.

Drive and Driven Converter Alignment

Correct converter center-to-center distance of 12.0 in. (304.8 mm) and converter offset distance of 0.525 to 0.588 in. (13.35 to 14.94 mm) is obtained when alignment gauge P/N 57001-3503 can be positioned between drive and driven converter sheaves correctly. (See Figure 28.)



1. Drive Converter
2. Alignment Gauge P/N 57001-3503
3. Driven Converter

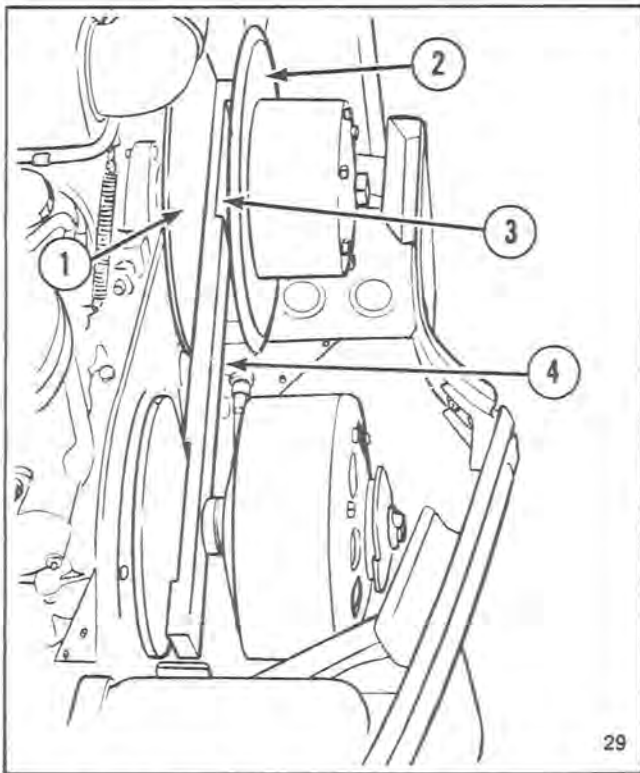
Center-to-Center Distance

NOTE: Improper handling or misuse of alignment gauge will result in inaccurate converter alignment. Check flatness of alignment gauge with 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 engine are completed.

2. Rotate driven converter movable sheave clockwise, and insert alignment gauge between sheaves with deep notch facing the stationary sheave. Carefully release movable sheave, allowing spring tension to keep gauge in position between the stationary and movable sheaves. (See Figure 29.)

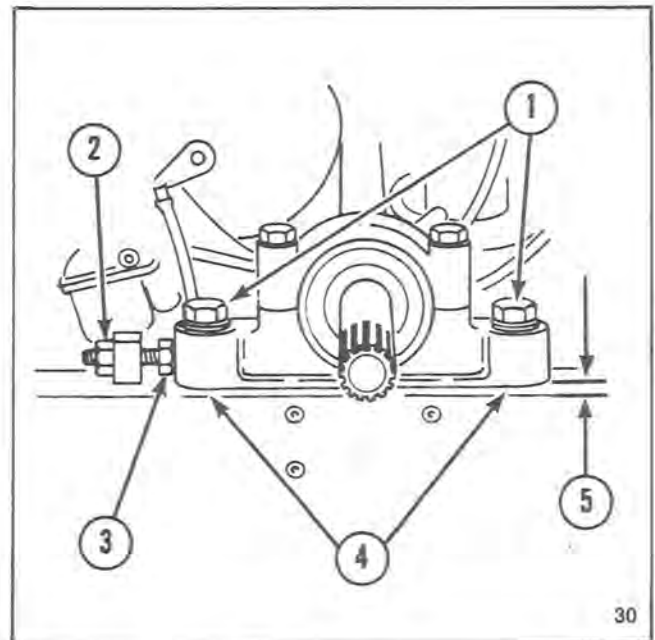


1. Driven Converter Movable Sheave
2. Driven Converter Stationary Sheave
3. Alignment Gauge Deep Notch
4. Alignment Gauge P/N 57001-3503

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

If adjustment of the converter center distance is required:

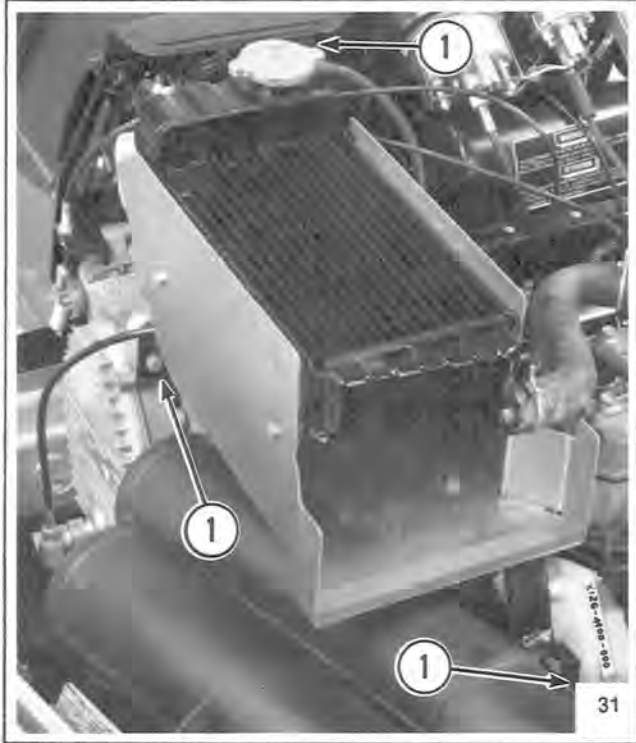
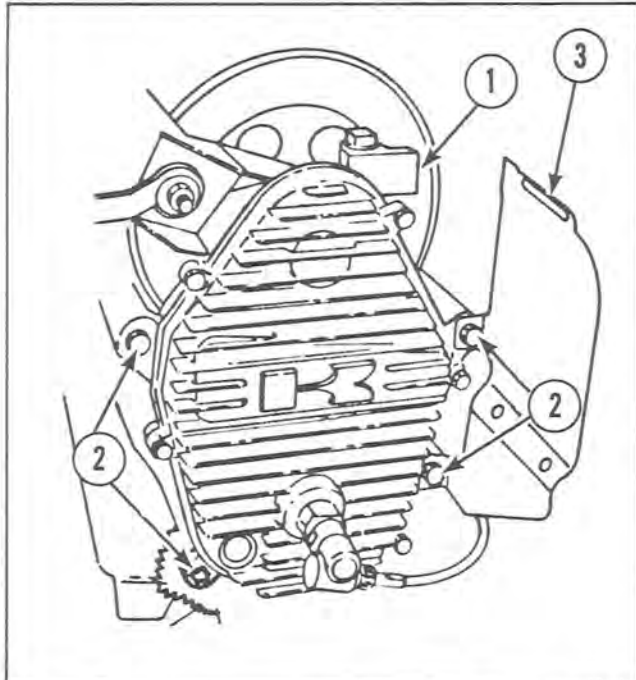
1. Loosen jackshaft bearing retainer mounting bolts and adjusting bolt locknut. (See Figure 30.)



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

2. Loosen four chaincase mounting bolts and three bolts securing the radiator brace bracket assembly to chassis and chaincase. (See Figure 31.)

NOTE: Models equipped with electric start, remove lower battery bracket for access to chaincase mounting bolts. (See Figure 31.)



- 1. Radiator Brace Mounting Bolts
- 2. Chaincase Mounting Bolts
- 3. Battery Heat Shield

3. 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 adjusting bolt so head of the bolt contacts jackshaft bearing retainer flange, and tighten locknut. (See Figure 30.)

CAUTION

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

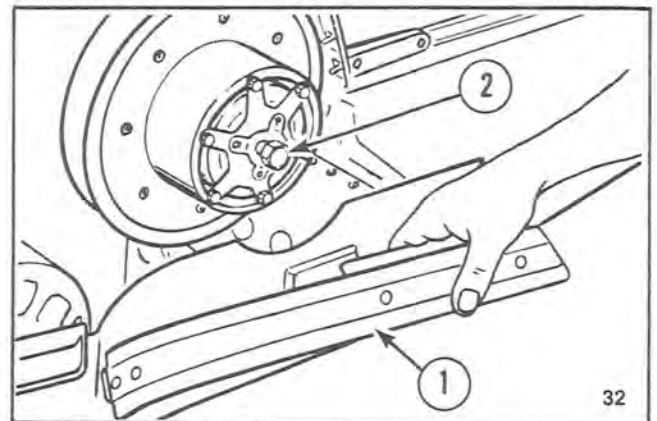
5. Tighten all bolts and nuts for chaincase and radiator brace bracket assembly, then perform procedures listed under Jackshaft Bearing Retainer Shimming.

NOTE: On Models equipped with electric start, reinstall lower battery bracket. Install special round head screws upward through footrest with washers and nuts toward battery case.

Jackshaft Bearing Retainer Shimming

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

1. Remove left side aluminum trim from lower pan and unscrew bolt securing driven converter to the jackshaft. (See Figure 32.)



- 1. Aluminum Trim
- 2. Retaining Bolt

Engine Break-In

For proper engine break-in, run machine on hard-packed snow at approximately 3/8 to 1/2 throttle, with occasional bursts to full speed. Limit full speed operation to 1-1/2 to 2 minutes, then return to cruising speed for 10 to 15 minute intervals. After 10 hours of operation, or two tanks of gasoline are used, break-in is complete.

Oil Recommendation

We recommend using Kawasaki Snowmobile Oil. This oil is specially formulated to give minimum piston ring varnish and combustion chamber deposits along with excellent lubrication qualities.

In an emergency situation, when Kawasaki Snowmobile Oil is not available, a B.I.A. certified TC-W oil may be substituted. All certified oils will indicate the TC-W rating on the container. If the B.I.A. certification does not appear on the container, **the oil must not be used.**

The use of lubricants such as "tune-up tonics and "super oils" are NOT RECOMMENDED.

Filling Oil Tank

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

Check 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 Recommendation

Use regular or premium leaded gasoline with a MINIMUM PUMP POSTED ANTI-KNOCK INDEX 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.) 3.75 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 anti-freeze. (See Figure 37.)



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

Observe this **WARNING** during next step

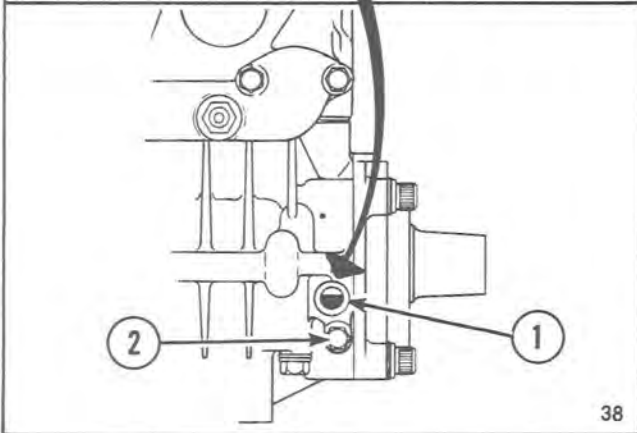
Gasoline fumes are heavier than air and can become explosive if exposed to a pilot light from a furnace, hot water heater, clothes dryer, etc. Fill the fuel tank, only in an area that is well ventilated and free from pilot lights and sparks.

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

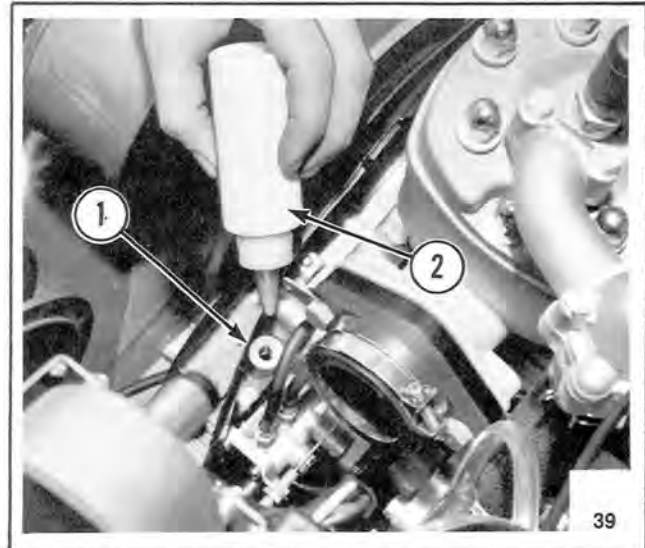
Engine Gearcase Lubrication

Components inside gearcase drive the oil injection pump and coolant pump.

Lubricant level is correct when oil appears above center but not higher than the top of the sight gauge. This sight gauge is located on the engine front, below left-hand muffler assembly. (See Figure 38.)



1. Oil Level Sight Gauge
2. Engine Gearcase Drain Plug



1. Gearcase Fill Hole
2. Container of Oil

Engine gearcase oil should be changed after the initial 100 miles of engine operation, and at the end of each season, to remove any foreign matter present in the gearcase cavity. To completely drain gearcase, remove drain plug and raise rear of snowmobile. (See Figure 38.)

Fill or add lubricant to the gearcase as follows:

1. Remove gearcase fill plug located on top of gearcase.
2. 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 39.)

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

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 38.)

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

Before reinstalling carburetor, perform Oil Injection System preparation.

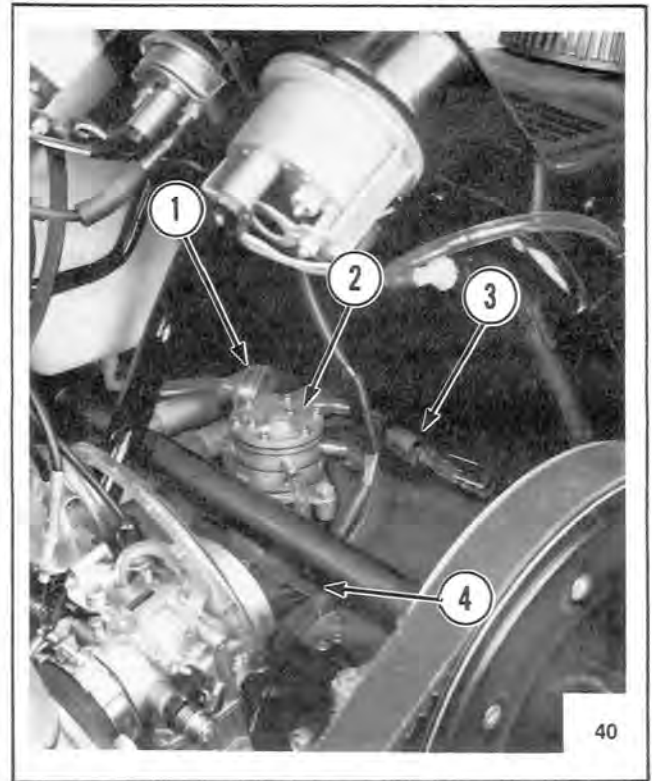
Oil Injection System

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 tube can cause severe engine damage.



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

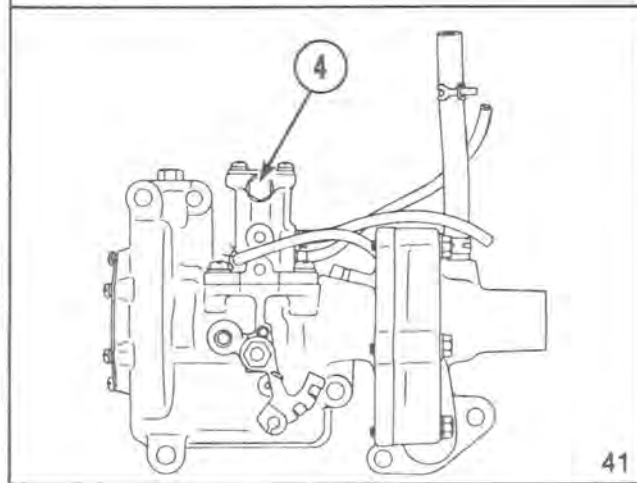
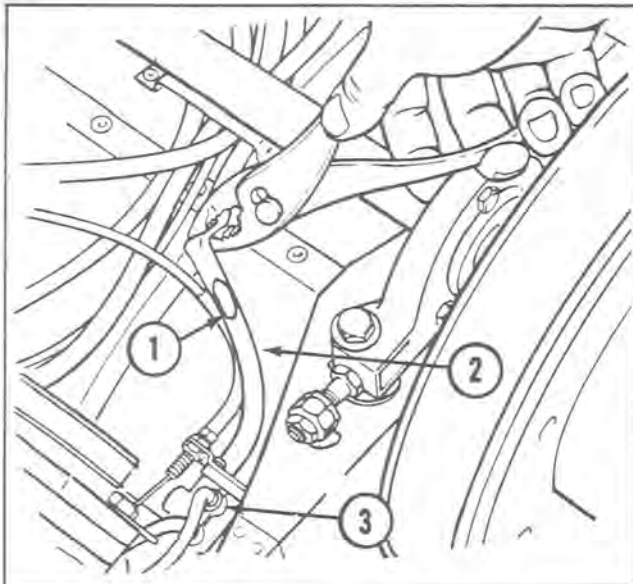
After filling the oil tank, bleed air from oil pump supply tube as follows:

1. Remove the air silencer assembly.
2. Loosen carburetor holding clamp screws and remove both carburetor assemblies.
3. Remove oil supply tube from oil pump and pull out from underneath fuel tube cover. (See Figure 40.)
4. Hold oil supply line and filter in a vertical position, as the oil fills the line and filter, make sure all air in filter has been forced out.
5. Reinstall oil supply tube under fuel tube bracket.
6. Pinch off oil supply tube with a pair of pliers to prevent excessive spillage.
7. Reinstall oil supply tube on oil pump.
8. Air trapped inside oil pump assembly can be removed by squeezing (pulsing) oil pump supply tube with pliers. This process causes air to exit oil pump nipple and enter the supply tube. (See Figure 41.)

Oil Pump to Carburetor Synchronization

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

1. Back off throttle cable jam nut 1/4 in. (6.4 mm) and loosen throttle cable until there is slack in the inner cable.
2. Turn the idle stop screw on the LH carburetor counterclockwise until the LH butterfly completely closes carburetor bore. (See Figure 42.)

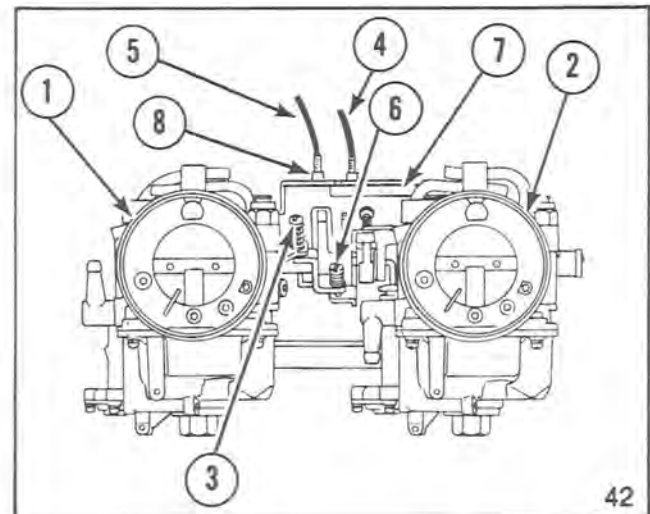


1. Air Bubble
2. Oil Pump Supply Tube
3. Oil Pump
4. Oil Pump Bleed Screw

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

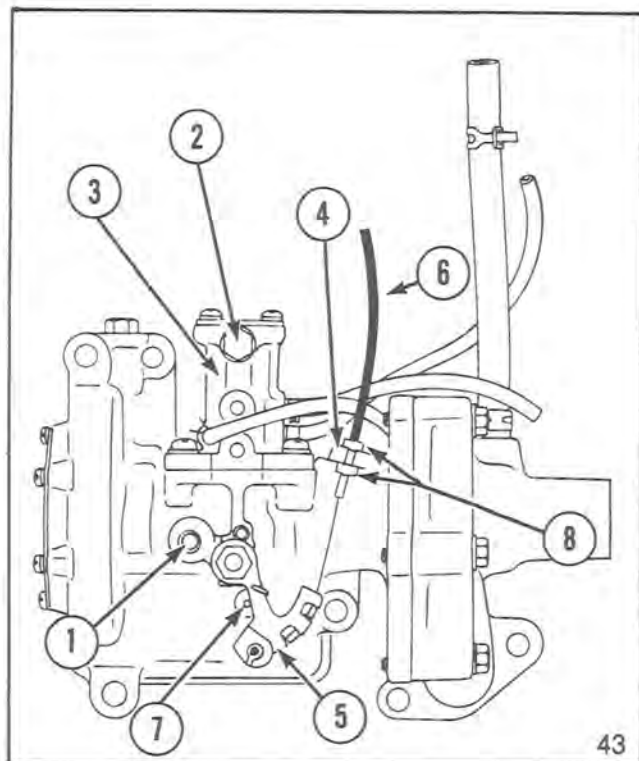
9. Loosen bleed screw from back of oil pump and allow oil to drain until all air bubbles are removed from filters and inlet tube. Visually check entire length of the tube to be sure that all air has been removed, then tighten bleed screw.

NOTE: Do not reinstall carburetors.



1. LH Carburetor
2. RH Carburetor
3. LH Carburetor Idle Stop Screw
4. Oil Pump Cable
5. Throttle Cable
6. RH Carburetor Idle Stop Screw
7. Upper Carburetor Bracket
8. Throttle Cable Jam Nut

3. Push oil pump lever until it contacts the stop pin; this insures the oil pump is at dead idle position. (See Figure 43.)



1. Oil Supply Tube Inlet
2. Oil Pump Bleed Screw
3. Oil Pump
4. Oil Pump Cable Bracket
5. Oil Pump Control Lever
6. Oil Pump Cable
7. Oil Pump Lever Stop Pin

4. Loosen jam nuts on oil pump cable and while holding oil pump lever against stop pin, remove all slack. Adjustment is correct when the lever on the oil pump and throttle butterfly in the LH carburetor move simultaneously as throttle lever is activated. (See Figure 43.)

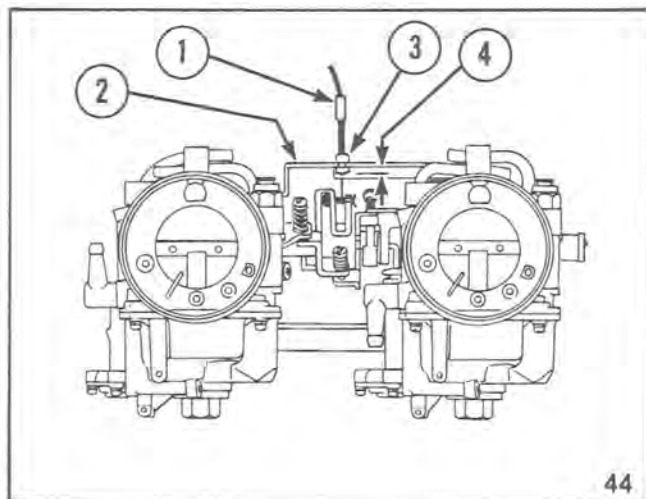
WARNING

When adjusting oil pump cable, measure amount the oil pump cable housing extends below upper carburetor bracket. If distance is greater than 1/16 in. (1.6 mm) loosen upper jam nut and adjust cable to dimension given. (See Figure 44.) Failure to adjust this cable properly could result in improper engine speed adjustment, resulting in damage to the snowmobile or personal injury to the operator.

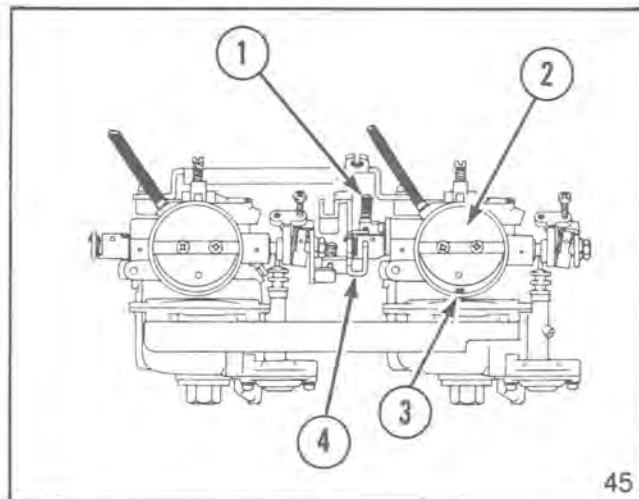
5. Tighten all jam nuts.

Carburetor Synchronization - Mechanical

1. Open LH carburetor throttle valve and insert a 1/16 in. (1.6 mm) drill in space between bottom of carburetor bore and throttle valve. Release the valve slowly and let it seat on drill. (See Figure 45.)



1. Oil Pump Cable Housing
2. Upper Carburetor Bracket
3. Jam Nut
4. 1/16 (1.6 mm) Dimension



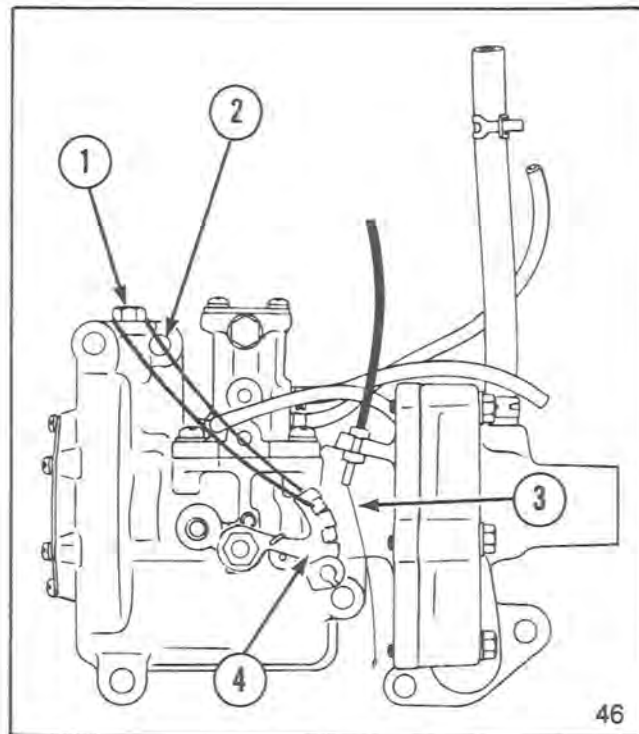
1. Idle Speed Screw
2. Throttle Valve
3. 1/16 in. (1.6 mm)
4. Throttle Lever

2. With carburetor throat facing downward, slowly turn idle speed screw in until the drill falls out. (See Figure 45)
3. Repeat procedure for RH carburetor. See Figure 42 for location of RH carburetor idle stop screw.
4. Turn LH carburetor idle stop screw out until both butterflies close carburetor bores.
5. Reinstall carburetors on engine.

Purging Air from Oil Pump Outlet Tubes

Remove air silencer assembly, drive belt and perform the following procedure.

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



1. Gearcase Fill Bolt
2. Rubber Band
3. Oil Pump Inner Control Wire
4. Oil Pump Control Lever

Observe this **WARNING** during next step

Failure to disconnect 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 idle position, resulting in automatic clutch engagement when 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 46.)
2. Attach rubber band to hold oil pump control lever in the wide open position. This will cause the maximum flow of oil through the outlet tubes. (See Figure 46.)

Observe this **CAUTION** during next step

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

3. Temporarily position air silencer onto carburetors.
4. Start engine and turn idle stop screw to obtain engine idle speed of 2,500 RPM. Stop engine after it has idled for one minute. This is ample time to purge all air from the oil pump outlet tubes.

NOTE: Recheck the coolant level after running the engine.

5. Remove air silencer assembly; release rubber band, and reconnect oil pump inner control cable to lever. Be sure to check operation of oil pump control lever and cable by activating throttle control lever on the handlebar.
6. Install air silencer assembly onto carburetors and check that rubber seals between air silencer body and carburetors fit securely during installation.
7. Secure air silencer into position with four springs. Install long springs on upper silencer tab retainers and short springs on lower silencer tab retainers.

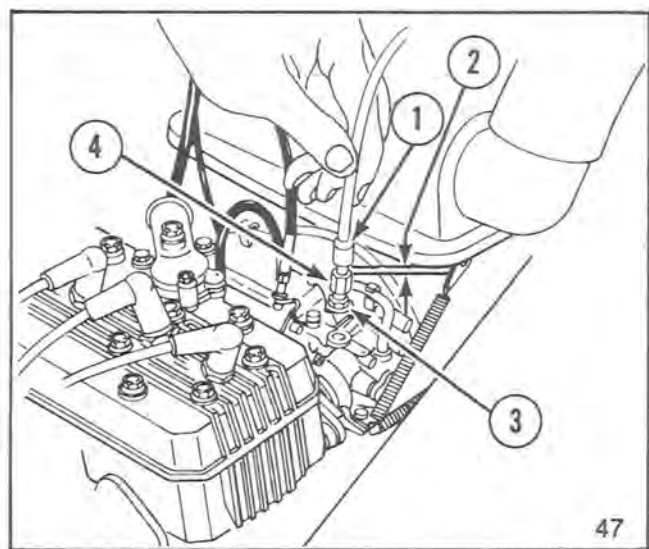
NOTE: Engine flooding may occur if the Enrichener Cable free movement is less than 1/16 in. (1.6 mm).

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 enrichener system.

Enrichener Cable Adjustment

With Enrichener lever down, and protective boot slid up casing, the enrichener cable should have 1/16 in. (1.6 mm) free movement when raised as shown. (See Figure 47.)



1. Protective Boot
2. 1/16 in. (1.6 mm)
3. Jam Nut
4. Adjusting Screw

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 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 this vacuum will vary depending on the position of the carburetor throttle valve. Opening the throttle valve reduces the restriction on air flow resulting in a lower vacuum measurement. Closing throttle valve restricts air flow which causes a higher vacuum measurement.

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

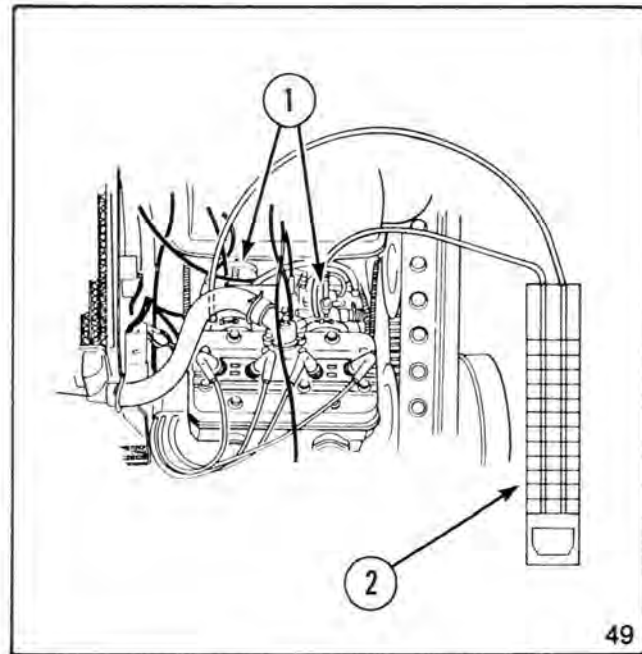
Adjust throttle valve balance so that vacuum measures equally at idle and partial throttle positions for both carburetors by performing the following procedure.

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

1. For proper adjustment and ease of starting engine, start engine and allow it to warm up.

Observe this **WARNING** during next step

Avoid personal injury. Do not touch hot engine parts.

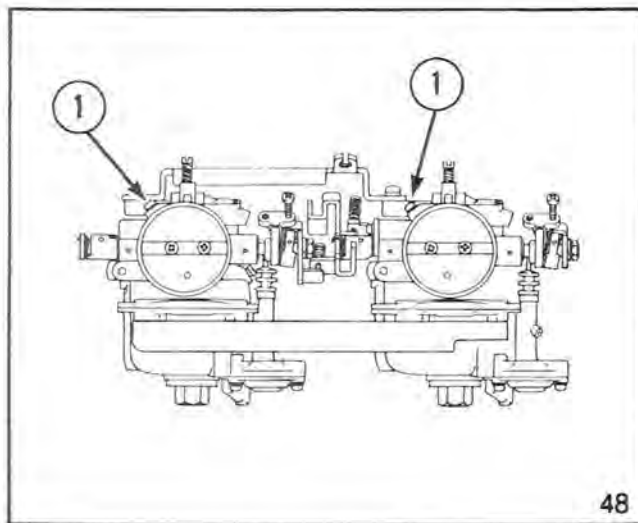


1. Carburetors
2. Mercury Synchro Tuner

2. Turn engine off and remove screw plugs from vacuum pick up hole. (See Figure 48.)

3. Screw in adapter (P/N 92005-3509) and connect one tube from the Synchro Tuner to each carburetor adapter fitting. (See Figure 49.)

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



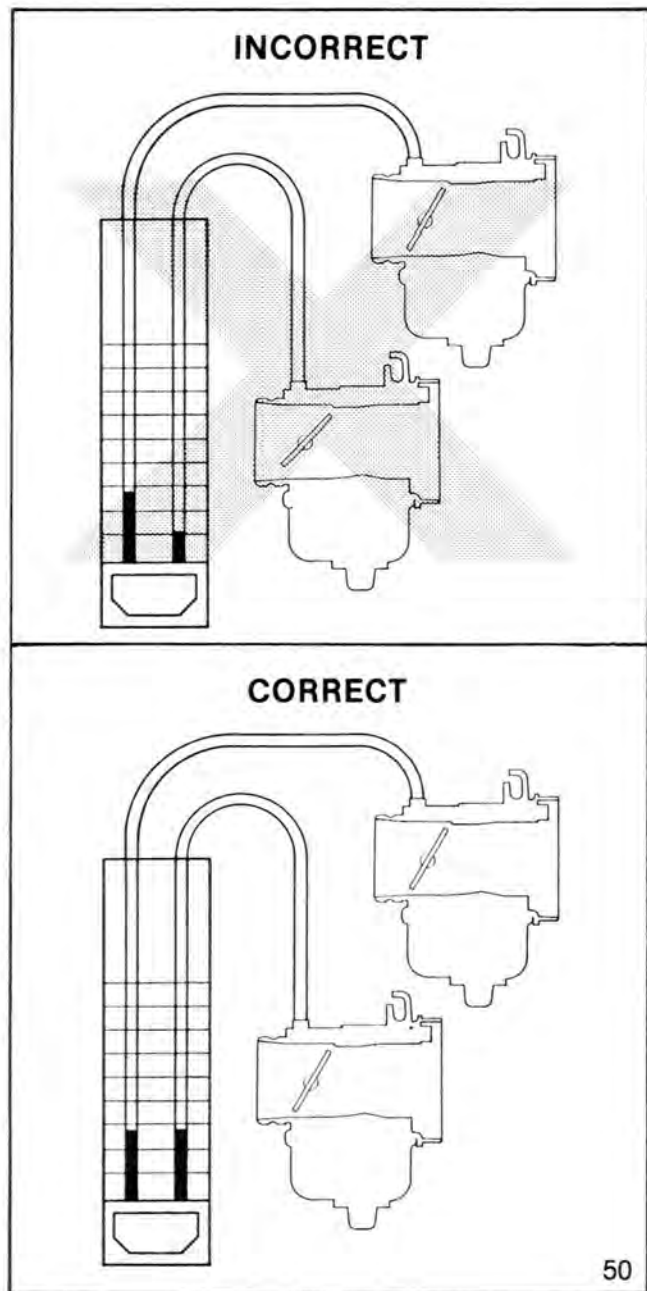
1. Screw Plugs

4. Start engine and observe vacuum indications on the Synchro Tuner at idle speed.

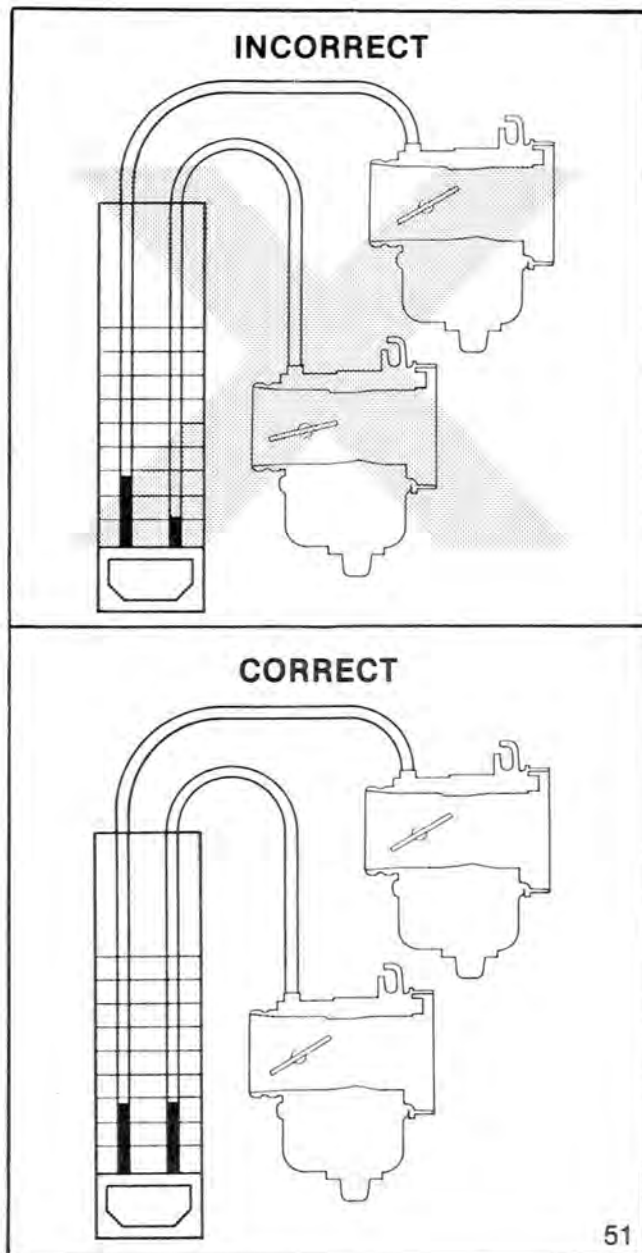
5. Adjust RH carburetor idle stop screw to obtain an equal vacuum at 2,500 RPM. (See Figure 49.) Turn LH carburetor idle stop screw to adjust idle RPM. (See Figure 42.)

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

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



- Adjust the RH carburetor idle screw until vacuum indication is equal to LH carburetor. (See Figure 50.)



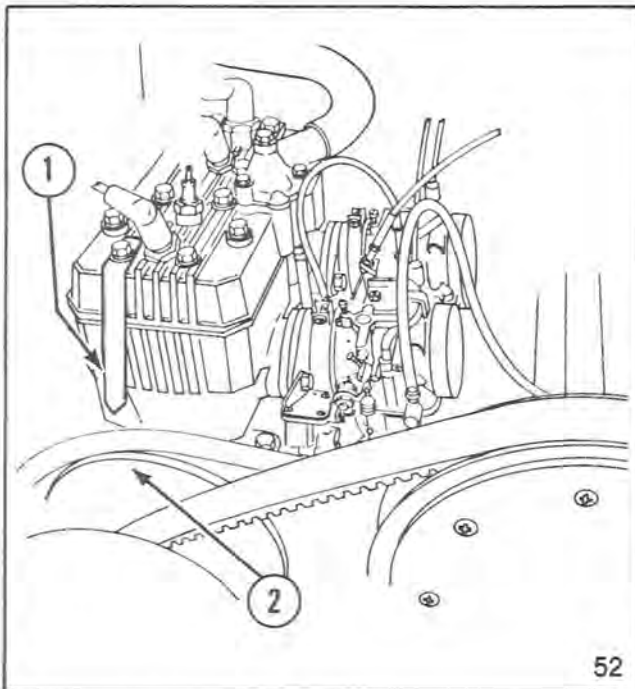
NOTE: Turn adjuster outward to increase the vacuum. Turn adjuster inward to lower the vacuum.

- Actuate throttle lever to check for equal vacuum at different throttle positions.
- Remove carburetor adapter fittings and reinstall screw plugs and gaskets.

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 52.)



1. Fabricated Pointer
2. 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.

Observe this **CAUTION** during next step

When removing spark plugs, carefully rotate plug cap back and forth while pulling cap straight upward. Do not attempt to twist or force plug cap off by pulling on lead wires as this will damage connection. (See Figure 53.)

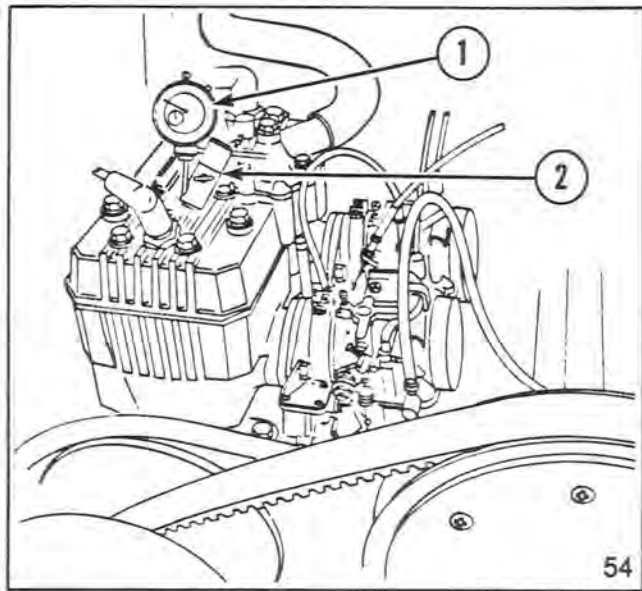


2. Remove all spark plugs and use dial indicator adaptor kit P/N 99970-3543 to install a dial indicator into the LH cylinder spark plug hole. (See Figure 54.)

NOTE: Dial indicator adaptor kit P/N 99970-3543 must be used with a dial indicator to obtain correct measurements. Installing the dial indicator on an angle will lead to incorrect timing adjustments that may cause poor engine performance.

3. Rotate drive converter in normal direction of rotation (counterclockwise) to find TDC. Index dial indicator to read "0" at TDC.

4. Rotate drive converter clockwise to 0.102 in. (2.61 mm) BTDC. Mark the drive converter fixed sheave opposite timing pointer. (See Figure 54.)



1. Dial Indicator
2. Dial Indicator Adaptor P/N 99970-3543

5. 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.

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

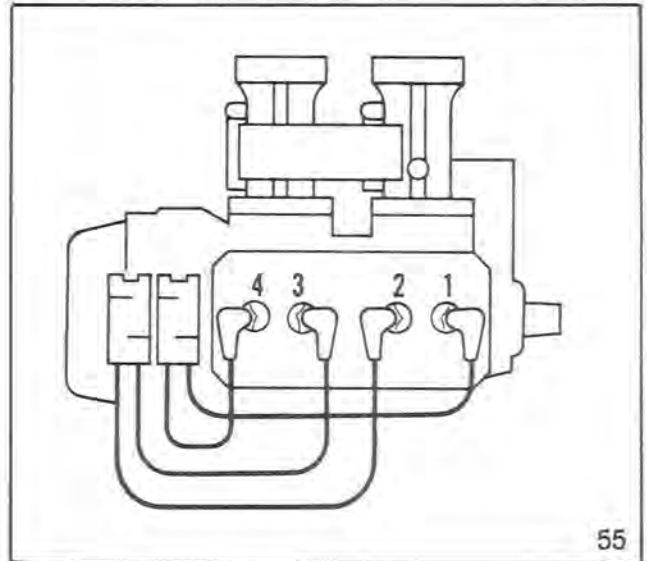
7. Connect spark plug leads firmly to plugs in the sequence shown in Figure 55.

Observe this

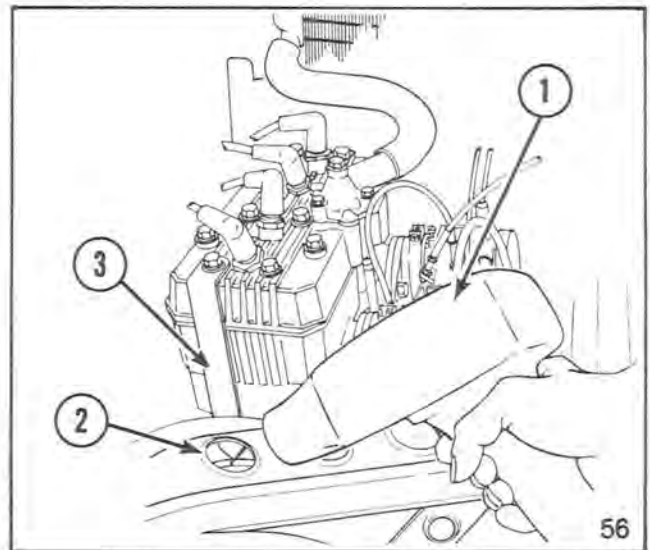
WARNING

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.



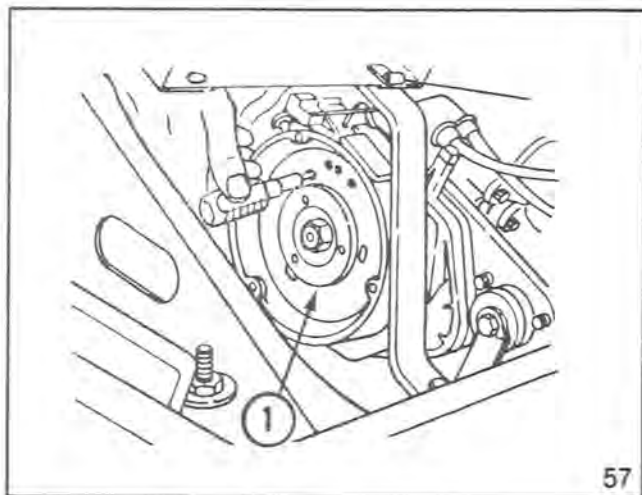
8. With drive belt removed and converter guard secured in place, run engine at 6,500 RPM. Direct timing light through opening in the converter guard directly over timing pointer. The timing is correct when the mark on the converter aligns with the pointer as timing light flashes. (See Figure 56.)



1. Timing Light
2. Mark on Drive Converter
3. Timing Pointer

If timing is incorrect, proceed as follows:

1. Unscrew radiator brace mounting bolts for clearance to remove mufflers, recoil starter, starter pulley and spacer for access to flywheel openings.
2. Loosen stator plate mounting screws through openings in the flywheel. (See Figure 57.)



1. Flywheel

Observe this **CAUTION** during next step

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

3. Turn stator plate as required (clockwise to retard timing; counterclockwise to advance timing) to correct timing and tighten stator plate screws. Temporarily position mufflers onto exhaust manifold, start engine using emergency starter rope, and recheck timing.
4. When ignition timing is correct, remove timing light, replace recoil starter components and install mufflers.

NOTE: Be sure insulation washer lip is properly positioned in slotted muffler bracket and special insulating shield is properly located before tightening muffler mounting nuts.

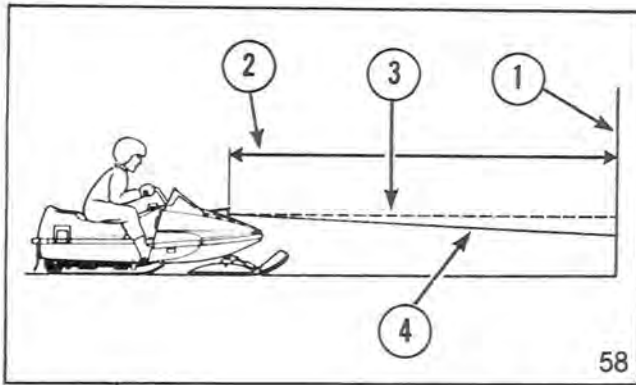
5. Reinstall radiator brace mounting bolts.
6. Install drive belt and secure converter guard into proper position with clip pins.

CAUTION

Be certain the air silencer hose is directed to the rear after the converter guard is reinstalled, as incorrect position may result in engine damage.

Headlight Adjustment

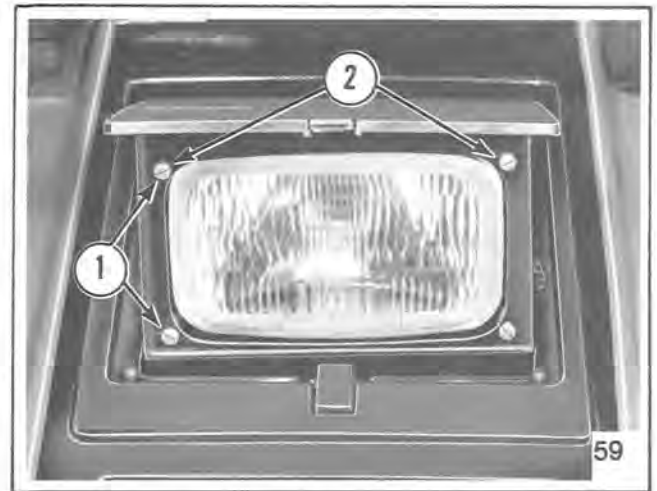
1. Position snowmobile on a level floor so headlight points at a wall 25 ft. (7,620 mm) away. The headlight must be in the up and locked position.
2. Measure distance from floor to the center of the headlight and mark wall at the dimension measured (reference mark.) (See Figure 58.)



1. Wall
2. 25 ft. (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 vehicle from creeping ahead, be sure hood is properly secured and an operator is seated on the vehicle.

4. If headlight adjustment is required, turn adjusting screws to the right (clockwise) as required. (See Figure 59.)



1. Horizontal Adjusting Screws
2. Vertical Adjusting Screws

Check the operation of the headlight low beam.

Observe this **WARNING** during next step

If adjusting the headlight indoors, provide proper ventilation to prevent possible carbon monoxide poisoning.

3. Turn on headlight high beam. Headlight is properly aimed when the high beam is centered and aimed 2 in. (51 mm) below reference mark on the wall. (See Figure 58.)

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 headlight to become loose or drop out of position.

Tail/Brake Light Test

The taillight will operate only when 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 other lights and the key switch.

Track Adjustments

Track Tension

Observe this **WARNING** during next step

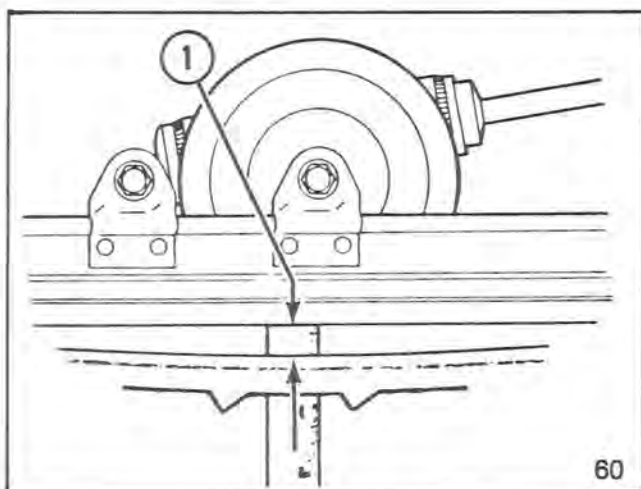
When raising rear of the snowmobile off ground, place ski tips against a stationary object and be sure the vehicle is properly secured to prevent personal injury.

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

1. Raise rear of the snowmobile so track is off the ground for its entire length and securely brace the snowmobile so it cannot fall.

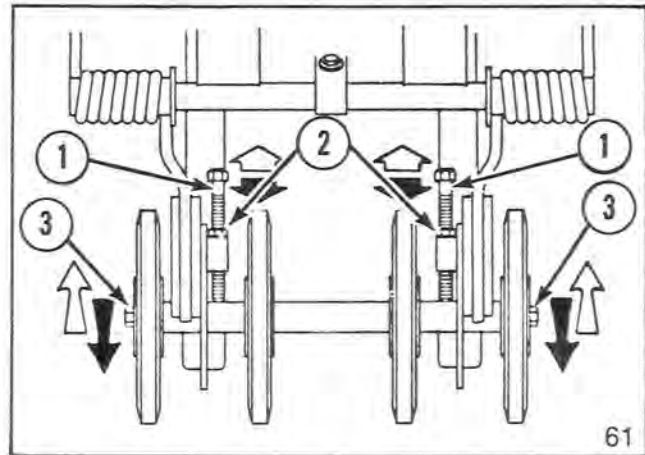
NOTE: Do not position snowmobile on its side to adjust track tension, as it would be impossible to get an accurate adjustment.

2. Hang a 5 lb (2.3 kg) weight from the track below the center set of idler wheels. At a point below the center idler wheel, measure from track upper surface to the wear strip bottom surface. The track tension should measure 3/4 in. (19 mm). (See Figure 60.)



1. 3/4 in. (19 mm)

3. To adjust track tension, loosen rear axle locking bolts. Back off rear axle adjusting bolt jam nuts from rear axle bracket. (See Figure 61.)



1. Adjusting Bolts
2. Adjusting Bolt Jam Nuts
3. Rear Axle Locking Bolts

4. Turn adjusting bolts equally to attain proper tension. As a good starting point for track alignment, be sure both adjusting bolts measure the same length from bolt head to bracket.
5. Remove weight from track.

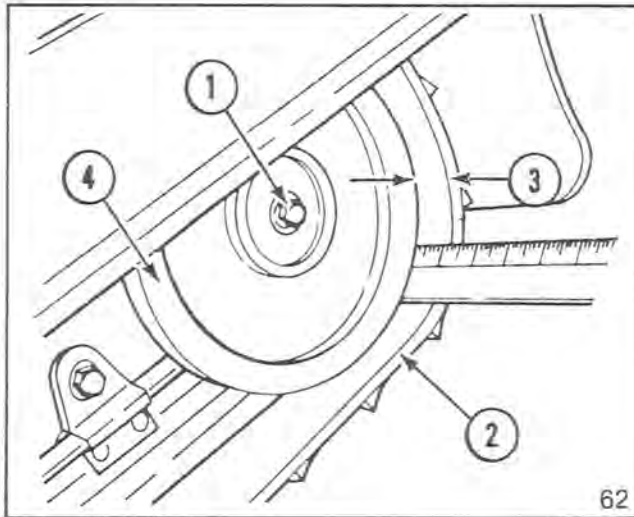
WARNING

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 tools and foreign matter from track area before starting engine.

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

Track Alignment

Track alignment is correct when measurements from the rear idler wheel to the outside edge of the track are equal on both sides of the machine. (See Figure 62.)



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:

Observe this **CAUTION** during next step

Always stop the engine and allow track to coast to a stop before measuring track alignment.

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 bolt 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). Tighten jam nuts on adjusting bolts.

NOTE: After rear axle bolts have been tightened, check to be sure that spacers (tubing) over the rear axle squeeze against 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)

CAUTION

Improper engine warm-up could result in extensive engine damage.

Engine Warm-Up - To warm up the engine, idling is not recommended. It is better to drive snowmobile about five minutes at slow speeds before any sustained full throttle operation. Liquid cooled engines need time to warm up the coolant, allowing pistons and cylinders to obtain proper clearances.

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 handlebars 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, 8,200 at full throttle.

✓ BRAKES

When activated, the brakes should result in adequate smooth stopping of the track; when released, there should be no brake drag.

✓ INSTRUMENTS

Check for proper indications.

✓ COOLANT TEMPERATURE

Operating speed, loads, snow conditions and air temperature directly affect engine temperature. The radiator needs air flowing through it to transfer heat from the coolant. The heat exchanger, mounted below the seat, transfers heat by melting snow thrown on its fins by the track.

On hard-packed snow or ice where little snow contacts the exchanger, the radiator cools the engine. In deep snow, where high speeds are not possible and there is little air flow, the heat exchanger cools the engine.

Both systems require vehicle movement. Faster operating speed means more cooling air flow through the radiator and more snow contacting the exchanger. Low speed operation on hard-packed or marginal snow and/or unseasonably warm weather may cause the engine to run above normal temperature.

Engine temperature is "NORMAL" when the temperature gauge needle is in the green zone. The snowmobile may be operated if the needle enters the yellow zone, but the temperature gauge should be monitored more frequently. If the gauge needle begins to enter the red zone, increase the speed or ride the sled into deep snow that can be thrown onto the exchanger. If it remains in the red zone, stop the engine and inspect cooling system for proper operation.

✓ 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. Cooling system coolant level.
4. Retorque drive converter mounting bolt 70 ft lb (10.0 kg-m).
5. Thoroughly inspect the engine compartment for fuel or oil leaks and repair as required.
6. 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	TC440D-A201
	TC440D-A204
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	Dual Capacitor Discharge (C.D.)
Ignition Timing (engine cold)	21° @ 6500 RPM, 0.102 in. (2.61 mm) BTDC
Spark Plug	NGK BZ-9EV
Spark Plug Gap	0.024 in. (0.6 mm)
Carburetor Make and Model	Keihin BD 40-36 x 2 (twin) with accelerator pump
Engine RPM at Full Throttle	8200 RPM
Engine Gearcase Capacity	1.35 oz. (40 cc)

CARBURETOR SETTINGS

Idle Mixture Screw	2 1/2 turns off seat
Idle Speed Screw	2500 RPM final

FUEL

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

LUBRICANTS

Engine Gearcase	Kawasaki Gearcase Lubricant (10W40 oil that meets or exceeds API service SE specifications)
Chaincase	DEXRON II Automatic Transmission Fluid

COOLANT

Engine Cooling System	55% ETHYLENE GLYCOL base antifreeze/45% water protection to -50°F (-45°C)
Cooling System Capacity	1.2 Gallons (4.5 liters)

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)

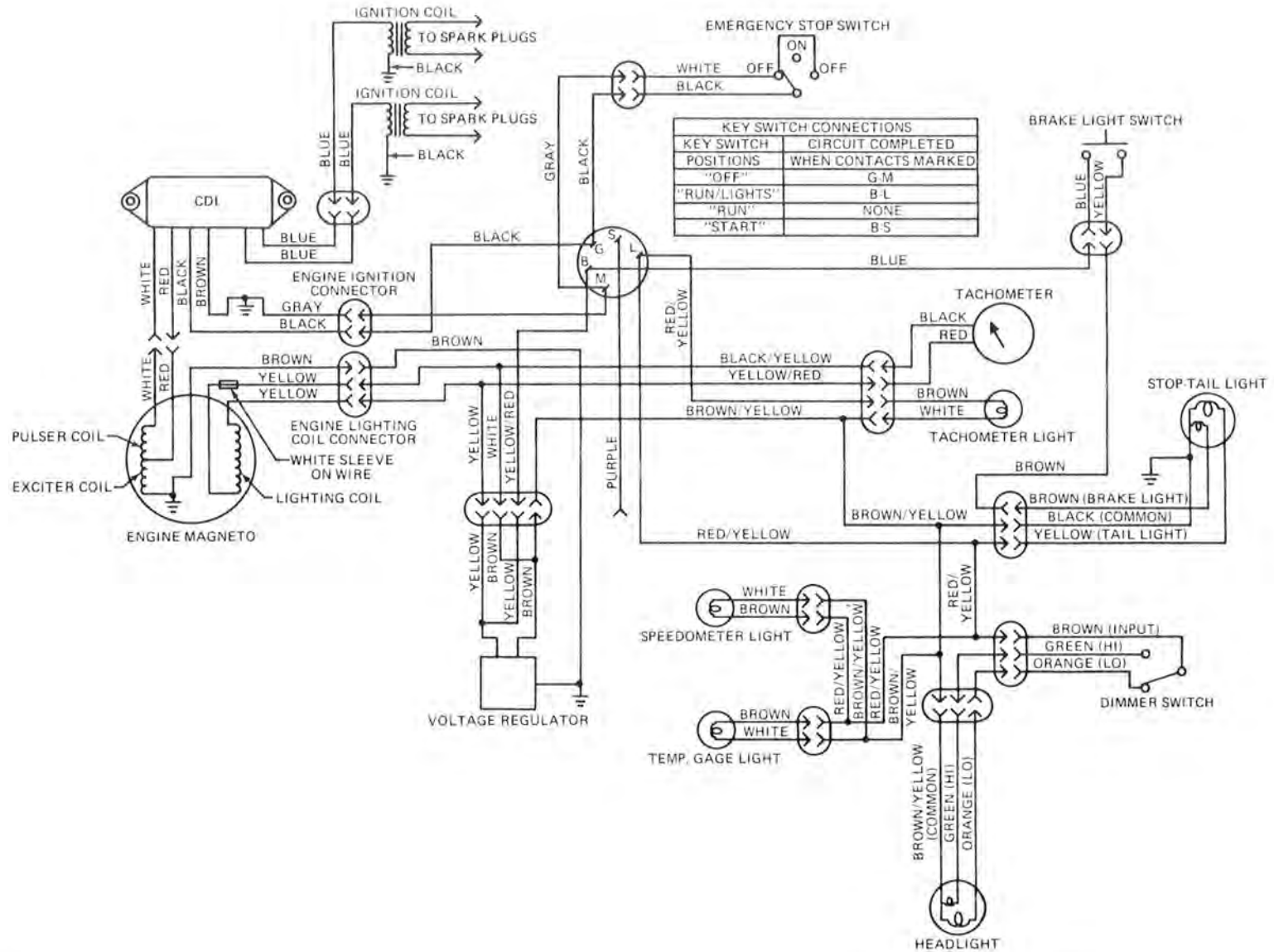
ELECTRICAL SYSTEM

Type	12 Volts - 160 Watts
Headlight	12V 60/55 W Quartz, PHILIPS No. 12342-PH4, TUNGSRAM No. 50440-PH3T-38
Tail/Brake Light	G.E. No. 1157
Instrument Lights	G.E. No. 1816
Temperature Gauge Light	G.E. No. 363

TORQUE CHART

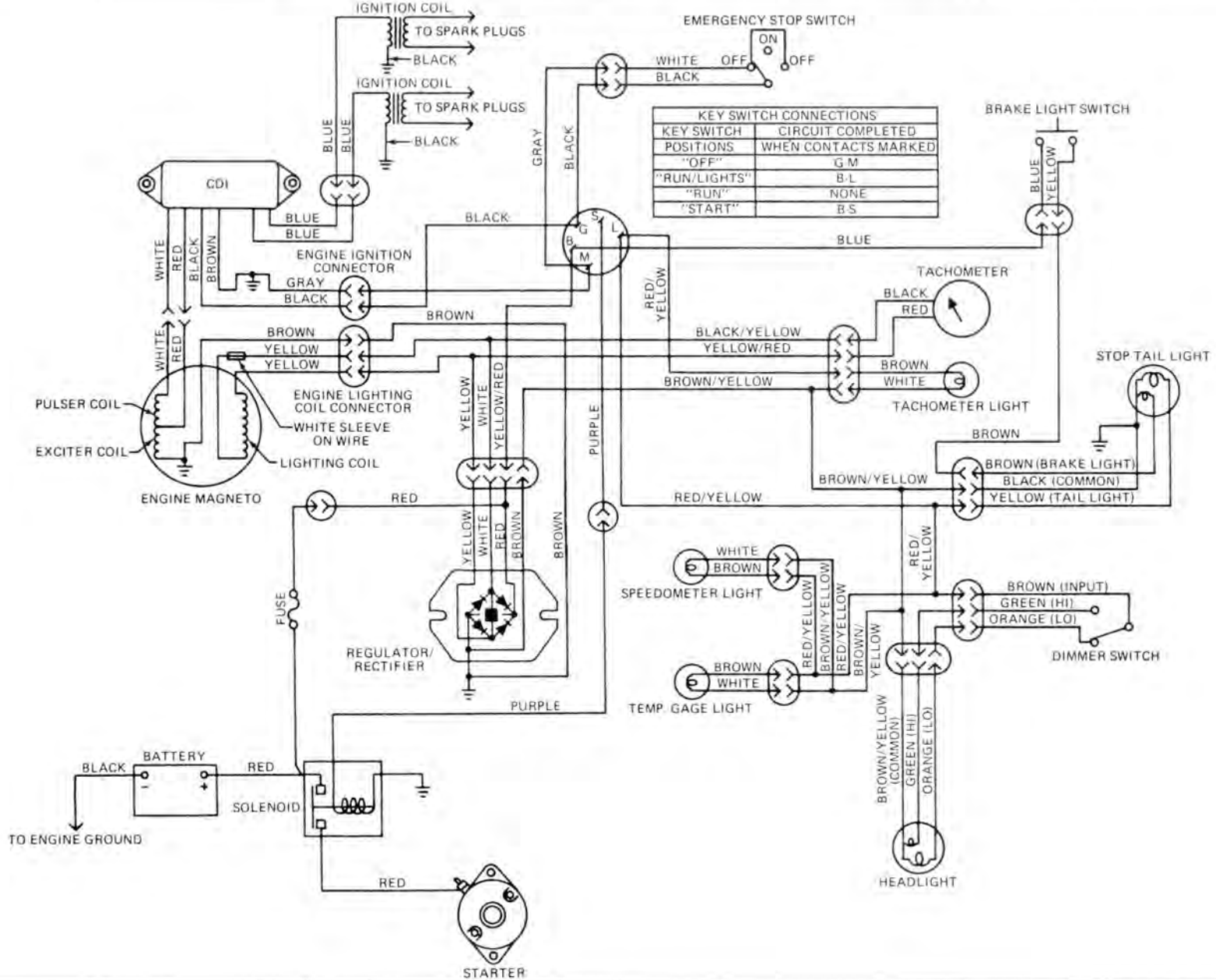
DESCRIPTION	TORQUE	DESCRIPTION	TORQUE
CONTROLS & CABLES Brake lever locking - allen screw Ignition switch mtg. - face nut Throttle lever locking - allen screw	25 in.lb (0.3 kg-m) 30 in.lb (0.3 kg-m) 25 in.lb (0.3 kg-m)	Chaincase to chassis - nut (5/16) Jackshaft bearing retainer adjusting bolt - jam nut (3/8) Jackshaft bearing retainer housing - nuts (5/16) Jackshaft bearing retainer to chassis, front - bolt (3/8) Jackshaft bearing retainer to chassis, rear - bolt (3/8) Speedometer drive adaptor	18 ft lb (2.5 kg-m) 20 ft lb (2.8 kg-m) 18 ft lb (2.6 kg-m) 19 ft lb (2.6 kg-m) 31 ft lb (4.1 kg-m) 120 in.lb (1.4 kg-m)
CABLES Brake cable - jam nuts (5/16) Enrichener cable - jam nuts (6 mm) Enrichener lever mtg. - nut Oil pump cable - jam nuts (6 mm) Speedometer cable Throttle cable - jam nut (6 mm)	50 in.lb (0.6 kg-m) 50 in.lb (0.2 kg-m) Hand tighten 20 in.lb (0.2 kg-m) Hand tighten 20 in.lb (0.2 kg-m)	BRAKE Brake caliper to chaincase (3/8)	35 ft lb (4.8 kg-m)
HOOD Headlamp housing holder to hood - screws (#10) Hinge bracket to hood housing holder - screws (#10) Hood hinge to hood - screws (1/4) Hood latch band mtg. - nuts (1/4)	25 in.lb (0.3 kg-m) 50 in.lb (0.6 kg-m) 25 in.lb (0.3 kg-m) Compress rubber	DRIVEN CONVERTER Coupling to fixed sheave - bolts (6 mm) Cover to movable sheave - bolts (6 mm) Driven converter to jackshaft - bolt (5/8)	120 in. lb (1.4 kg-m) 50 in.lb (0.6 kg-m) 50 ft lb (6.9 kg-m)
SEAT & CONSOLE Control panel bracket to chassis - nuts (1/4) Control panel to bracket - screws (#10) Fuel level gauge panel mtg. - screws (#10) Oil level gauge panel mtg. - screws (#10) Seat to tunnel - bolts (1/4)	95 in.lb (1.1 kg-m) 15 in.lb (0.2 kg-m) 15 in.lb (0.2 kg-m) 15 in.lb (0.2 kg-m) 35 in.lb (0.4 kg-m)	DRIVE CONVERTER Cover to movable sheave - bolts (6 mm) Drive converter to crankshaft bolt (1/2) Ramp & pin Assy mtg. - bolts (6 mm) Roller & pin Assy mtg. - bolts (6 mm) Weight ramp Assy - nut (special)	120 in.lb (1.4 kg-m) 70 ft lb (9.7 kg-m) 96 in.lb (1.1 kg-m) 120 in.lb (1.4 kg-m) 60 in.lb (0.7 kg-m)
STEERING Handlebar holder - allen screws (1/4) Handlebar holder to steering column - bolt (3/8) Steering arm to spindle - bolt (3/8) Steering column mount to chassis - bolt (5/16) Tie rod end - jam nuts (3/8) Tie rod end to steering arm - nuts (3/8) Tie rod end to steering column - nut (3/8)	105 in.lb (1.2 kg-m) 35 ft lb (4.2 kg-m) 30 ft lb (3.9 kg-m) 18 ft lb (2.5 kg-m) 120 in.lb (1.4 kg-m) 30 ft lb (3.9 kg-m) 30 ft lb (3.9 kg-m)	ENGINE MOUNT & EXHAUST Engine mount to chassis, recoil side - nuts (3/8) Engine PTO mount to engine mount - allen screws Exhaust mount damper to bracket - nuts (5/8) Mount damper to engine mount - nuts (1/4)	25 ft lb (3.5 kg-m) 90 in.lb (1.0 kg-m) 55 in.lb (0.6 kg-m) 105 in.lb (1.2 kg-m)
SKI & SPINDLE Shock absorber to ski - nut (3/8) Shock absorber to ski saddle - nuts (3/8) Ski saddle to spindle - nut (3/8) Ski skog to ski - nuts (5/16) Ski spring to saddle - nuts (3/8) Ski spring to ski, front - nut (3/8) Ski spring to ski, rear - nut (3/8)	31 ft lb (4.0 kg-m) 31 ft lb (4.0 kg-m) 46 ft lb (6.4 kg-m) 120 in.lb (1.4 kg-m) 46 ft lb (6.4 kg-m) 25 in.lb (0.3 kg-m) 31 ft lb (4.0 kg-m)	ENGINE LIQUID COOLING SYSTEM Coolant pipe to cylinder head - bolts (6 mm) Coolant pump to crankcase - bolts (6 mm) Crankcase to cylinder coolant pipe (6 mm) Thermostat housing mtg. - bolts (6 mm) Thermostat housing vent plug - bolt (8 mm)	60 in. lb (0.7 kg-m) 60 in.lb (0.7 kg-m) 60 in.lb (0.7 kg-m) 60 in.lb (0.7 kg-m) 12 ft lb (1.7 kg-m)
CHASSIS Bumper & brace to pan - nuts (1/4) Bumper & hood guide to pan - nuts (1/4) Bumper & hood hinge to pan - nuts (1/4) Bumper to pan - nuts (1/4) Fuel pump to tunnel - nuts (1/4) Outer guide & brace to pan - nuts (1/4) Outer guide & inner guide to pan - nuts (1/4) Outer guide & inner guide to pan - nuts (#10) Rear stay to tunnel - bolt (3/8) Snow flap spacer mtg. - nut (1/4)	70 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 35 in.lb (0.4 kg-m) 70 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 20 in.lb (0.2 kg-m) 19 ft lb (2.7 kg-m) 50 in.lb (0.6 kg-m)	HEAT EXCHANGER & DUCT End caps to heat exchanger - screw (#10) Heat exchanger radiator to duct - nuts (1/4) Radiator duct brace to chaincase (1/4) Radiator duct brace to chassis (5/16) Radiator duct to brace (1/4)	60 in.lb (0.7 kg-m) 50 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 18 ft lb (2.5 kg-m) 45 in.lb (0.5 kg-m)
SUSPENSION Front pivot shaft to tunnel - bolt (3/8) Front swing arm to suspension bracket - bolt (3/8) Idler wheel shaft mtg. - bolt (3/8) Limiter strap to swing arm - nuts (1/4) Rail wear strip retaining - nut (1/4) Rear axle adjusting bolt - jam nut (3/8) Rear axle locking - bolt (3/8) Rear limiter strap to pivot arm - nut (1/4) Rear pivot shaft to tunnel - bolt (3/8) Rear pivot arm to rear suspension arm - bolt (3/8 Gr. 8) Suspension brackets to slide rail - nuts (3/8) Suspension front spring cam mtg., front - bolt (3/8) Suspension front spring cam mtg. rear - bolt (3/8) Suspension rear arm to pivot arm - bolts (3/8) Suspension shock absorber mtg., front - nut (3/8) Suspension shock absorber mtg., rear - nut (thin) Suspension rear spring cam mtg. - nuts (5/16) Top idler shaft - bolt (3/8)	25 ft lb (3.5 kg-m) 25 ft lb (3.5 kg-m) 25 ft lb (3.5 kg-m) 45 in.lb (0.6 kg-m) 25 in.lb (0.3 kg-m) 120 in.lb (1.4 kg-m) 25 ft lb (3.5 kg-m) 45 in.lb (0.6 kg-m) 25 ft lb (3.5 kg-m) 25 ft lb (3.5 kg-m) 105 in.lb (1.2 kg-m) 35 in.lb (0.4 kg-m) 10 ft lb (1.4 kg-m) 25 ft lb (3.5 kg-m) 25 ft lb (3.5 kg-m) 15 ft lb (1.9 kg-m) 45 in.lb (0.6 kg-m) 25 ft lb (3.5 kg-m)	ENGINE LUBRICATION SYSTEM Elbow fitting to oil tank Oil pump inlet plate mtg. - screws (4 mm) Oil pump mounting - bolts (6 mm) Oil pump outlet nozzle to crankcase - bolt (8 mm) Oil pump outlet nozzle to cylinder - bolt (8 mm)	Judgement 40 in.lb (0.5 kg-m) 60 in.lb (0.7 kg-m) 45 in.lb (0.6 kg-m) 45 in.lb (0.6 kg-m)
DRIVESHAFT Bearing housing to tunnel - nuts (5/16) Locking collar - set screw (1/4)	18 ft lb (2.6 kg-m) 70 in.lb (0.8 kg-m)	CRANKCASE Gearcase fill plug - bolt (8 mm) Gearcase fill plug - bolt (8 mm) Lower crankcase to upper - bolt (8mm) Lower crankcase boss - bolts (6 mm)	60 in.lb (0.7 kg-m) 60 in.lb (0.7 kg-m) 16 ft lb (2.2 kg-m) 70 in.lb (0.8 kg-m)
CHAINCASE & JACKSHAFT Chaincase fill plug Chain sprocket to driveshaft, bottom - bolt (special) Chain sprocket to jackshaft, top - bolt (5/8) Chain tensioner mtg. - bolt (1/4) Chaincase cover mtg. - bolts (1/4) Chaincase drain plug	Judgement 35 ft lb (4.8 kg-m) 50 ft lb (6.9 kg-m) 50 in.lb (0.6 kg-m) 70 in.lb (0.8 kg-m) Judgement	PISTON AND CRANKSHAFT Flywheel mounting - nut (18 mm)	60 ft lb (8.3 kg-m)
		RECOIL STARTER Friction plate to rope reel - nut (8 mm) Recoil assembly mtg. - bolt (6 mm) Starter pulley to flywheel - bolts (6 mm)	11 ft lb (1.6 kg-m) 70 in.lb (0.7 kg-m) 18 ft lb (2.5 kg-m)
		MAGNETO CDI igniter mounting (1/4) Ignition coil mounting - screw (6 mm) Stator plate mounting - screw (5 mm) Voltage regulator - nut (1/4) Wiring harness connector mounting - screw (4 mm)	60 in.lb (0.6 kg-m) 70 in.lb (0.8 kg-m) 70 in.lb (0.8 kg-m) 105 in.lb (1.2 kg-m) 40 in.lb (0.5 kg-m)
		ELECTRIC START Battery cable to solenoid - nut (6 mm) Battery cables to battery - bolt (6 mm) Battery case to chassis - nut (1/4) Rear starter motor bracket to starter motor - bolt (6 mm) Rear starter bracket to engine - nut (5 mm) Starter motor to engine - cap screw (8 mm) Starter motor cable to solenoid - nut (6 mm) Starter solenoid to duct Assy. - bolt (5/16)	55 in.lb (0.6 kg-m) 40 in.lb (0.4 kg-m) 70 in.lb (0.8 kg-m) 50 in.lb (0.6 kg-m) 32 in.lb (0.4 kg-m) 12 ft lb (1.7kg-m) 55 in.lb (0.6 kg-m) 70 ft lb (1.4 kg-m)

Wiring Diagram - SS440-B2



Wiring Diagram-(Electric Start) SS440-B3

LTD 440



WIRING DIAGRAM

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