

SECTION 7 - MISCELLANEOUS



PART C - TUNEUP and MAINTENANCE



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TROUBLESHOOTING CHART

This chart has been arranged on a "most-likely-to-occur" basis and will serve as a guide to systematic troubleshooting. If used in conjunction with detailed troubleshooting charts in the Service Manual sections, it can save expensive diagnostic time.

REMEMBER, the chart is intended as a guide only. Refer to appropriate Service Manual sections for detailed repair information.

WON'T START

Condition	Check for	What to Do	Refer to Service Manual Section
1. Lack of fuel or excessive fuel. <i>NOTE: Also check carburetor troubleshooting charts.</i>	a. Fuel tank empty. b. Fuel shut-off valve closed. c. Carburetor maladjusted or inlet needle stuck. d. Improper use of choke and/or fuel primer. e. Plugged fuel filter(s) or fuel cap vent. f. Leaking fuel line or connections. g. Pinched or kinked fuel line. h. Leaking diaphragm - fuel pump or carburetor. i. Faulty fuel primer system. j. Water in fuel. k. Crankcase vacuum leak.	a. Replenish fuel supply. b. Open fuel shut-off valve. c. Adjust to specifications. d. Check Service Manual for proper use. e. Clean or replace. f. Repair or replace. g. Eliminate pinch or kink. h. Replace. i. Repair or replace. j. Drain fuel system & refill. k. Repair leak.	4C 4C 4A 1 4C 4C 4C 4A-B 4C 1-4C 5A-B-C-D-E-F
2. No spark - weak or intermittent spark. <i>NOTE: Also check ignition troubleshooting charts.</i>	a. Ignition switch "off". b. Emergency stop switch "off". c. Faulty or wrong type spark plugs. d. High tension leads reversed. e. Faulty ignition switch and/or wiring. f. Faulty high tension lead wire and/or sparky. g. Incorrect ignition timing. h. Faulty magneto component(s). i. Faulty stator. j. Faulty or maladjusted trigger coil. k. Faulty ignition coil. l. Faulty switch box. m. Faulty flywheel and/or flywheel magneto. n. Faulty emergency stop switch.	a. Turn ignition switch "on". b. Turn stop switch "on". c. Replace. d. Switch leads around. e. Repair or replace. f. Repair or replace. g. Re-time engine. h. Repair or replace. i. Repair or replace. j. Repair or replace. k. Replace. l. Replace. m. Replace flywheel. n. Repair or replace	3B-8 3B 3B 3B 3C 3A-B-C 3B 3B-C 3B 3B 3A-C 3B-7A
3. Rewind and/or electric starter inoperative. <i>NOTE: Also check starter motor troubleshooting charts.</i>	a. Broken rewind rope and/or spring. b. Rewind starter does not engage. c. Battery faulty or not fully charged. d. Poor battery cable connections. e. Faulty ignition switch and/or wiring. f. Faulty starter solenoid. g. Faulty starter. h. Faulty starter lockout switch and/or starter protector. i. Faulty forward/reverse switch. j. Faulty voltage regulator and/or rectifier. k. Faulty stator or generator coil. l. "Blown" fuse.	a. Repair or replace. b. Repair or replace. c. Replace or charge battery. d. Clean or repair connections. e. Repair or replace. f. Repair or replace. g. Repair or replace. h. Replace. i. Replace. j. Replace. k. Replace. l. Replace.	6A 6A 3E 3E 3B 3E-6B 6B 3E 3E 3E 3E 3F
4. Engine overheated.	a. Restricted air flow and/or circulation. b. Incorrect ignition timing. c. Wrong type spark plug. d. Faulty fan and/or fan belt.	a. Eliminate restriction. b. Re-time engine. c. Replace. d. Repair or replace.	5A-B-C-D-E-F 3C 3B-8 5A-B-C-D-E

ENGINE RUNS ERRATICALLY

Condition	Check for	What to Do	Refer to Service Manual Section
1. Won't idle or idle smoothly.	a. Carburetor maladjusted. b. Fouled or wrong type spark plugs. c. Lack of fuel. d. Air leak in carburetor and/or intake manifold. e. Engine overheated. f. Faulty fuel primer check valve. g. Loose cylinder head and/or blown head gasket. h. Crankcase vacuum leak. i. Plugged or wrong type exhaust system.	a. Adjust correctly. b. Replace. c. See "Won't Start", preceding. d. Repair or replace. e. See "Won't Start", preceding. f. Repair or replace. g. Repair or replace. h. Repair leak. i. Repair or replace.	4A 3B-8 4A-B-C 4A, 5A-B-C-D-E-F 5A-B-C-D-E-F 3B-C 4C 5A-B-C-D-E-F 5A-B-C-D-E-F 7B
2. Low speed miss. <i>NOTE: Also check carburetor and ignition troubleshooting charts.</i>	a. Carburetor maladjusted. b. Fouled or wrong type spark plugs. c. Lack of fuel. d. Air leak in carburetor and/or intake manifold. e. Faulty high tension lead and/or sparky. f. Faulty magneto component(s). g. Faulty low speed stator winding. h. Short circuit in wiring harness. i. Faulty ignition coil. j. Faulty trigger coil. k. Faulty fuel primer check valve. l. Crankcase vacuum leak. m. Faulty switch box.	a. Adjust correctly. b. Replace. c. See "Won't Start", preceding. d. Repair or replace. e. Repair or replace. f. Repair or replace. g. Replace stator. h. Repair or replace. i. Replace. j. Replace. k. Repair or replace. l. Repair leak. m. Replace.	4A 3B-8 4A-B-C 4A, 5A-B-C-D-E-F 3B 3A-B-C 3A-B 3B-F 3B 3B-C 4C 5A-B-C-D-E-F 3B
3. High speed miss.	a. See "Low speed miss" ("2." preceding), except "g". b. Faulty high speed stator winding. c. Voltage leak at white starter lockout switch terminal.	a. See "Low speed miss" ("2", preceding). b. Replace stator. c. Repair or replace.	 3A-B 3B
4. Poor acceleration - loss of power. <i>NOTE: Also check carburetor and ignition troubleshooting charts.</i>	a. Carburetor maladjusted. b. Lack of fuel. c. Air leak in carburetor and/or intake manifold. d. Incorrect ignition timing and/or ignition advance lever not positioned properly. e. Drive clutch malfunctioning. f. Faulty high speed stator winding. g. Voltage leak at white starter lockout switch terminal. h. Engine overheating. i. Loose cylinder head and/or blown head gasket. j. Crankcase vacuum leak. k. Low compression. l. Loose, wrong type or plugged exhaust system.	a. Adjust correctly. b. See "Won't Start", preceding. c. Repair or replace. d. Re-time engine or position lever correctly. e. Repair or replace. f. Replace stator. g. Repair or replace. h. See "Won't Start", preceding. i. Repair or replace. j. Repair leak. k. Repair. l. Repair or replace.	4A 4A-B-C 4A, 5A-B-C-D-E-F 3C 2C 3A-B 3B 5A-B-C-D-E-F 3B-C 5A-B-C-D-E-F 5A-B-C-D-E-F 5A-B-C-D-E-F 7A

Condition	Check for	What to Do	Refer to Service Manual Section
5. Surges, backfires and loses speed. <i>NOTE: Also check carburetor and ignition troubleshooting charts.</i>	a. Carburetor maladjusted. b. Lack of fuel. c. Faulty high tension lead and/or sparky. d. Faulty high speed stator winding. e. Improper ignition timing and/or ignition advance lever not positioned properly. f. Drive clutch malfunctioning. g. Voltage leak at white starter lockout switch terminal. h. Air leak in carburetor and/or intake manifold. i. Engine overheating. j. Crankcase vacuum leak. k. Loose, wrong type or plugged exhaust system.	a. Adjust correctly. b. See "Won't Start", preceding. c. Repair or replace. d. Replace stator. e. Re-time engine or position lever correctly. f. Repair or replace. g. Repair or replace. h. Repair or replace. i. See "Won't Start", preceding. j. Repair leak. k. Repair or replace.	4A 4A-B-C 3B 3A-B 3C 2C 3B 4A, 5A-B-C-D-E-F 5A-B-C-D-E-F 3B-C 5A-B-C-D-E-F 7A

ABNORMAL PERFORMANCE and HANDLING CHARACTERISTICS

Condition	Check for	What to Do	Refer to Service Manual Section
1. Engine runs but vehicle does not move. <i>NOTE: Also check drive belt and suspension troubleshooting charts.</i>	a. Track and/or skis frozen to ground. b. Worn or broken drive belt. c. Track binding, due to incorrect adjustment and/or plugged with foreign material. d. Loose or broken drive chain and/or sprockets. e. Inoperative drive or driven sheave assembly. f. Broken drive shaft and/or drive sprockets.	a. Free track and/or skis. b. Replace. c. Adjust or clean. d. Repair or replace. e. Repair or replace. f. Replace.	2B 2E 2D 2C 2E
2. Poor vehicle acceleration. <i>NOTE: Also check drive belt and suspension troubleshooting charts.</i>	a. Track binding, due to incorrect adjustment and/or plugged with foreign material. b. Worn and/or slipping drive belt. c. Drive and/or driven sheave not functioning properly. d. Sprocket ratio not suited to operating conditions. e. Improperly adjusted brake. f. Improperly adjusted throttle.	a. Adjust or clean. b. Replace. c. Repair or replace. d. Replace. e. Adjust. f. Adjust.	2E 2B 2C 2D 7A 7A
3. Vehicle does not develop normal speeds. <i>NOTE: Also check drive belt and suspension troubleshooting charts.</i>	a. Track binding, due to incorrect adjustment and/or plugged with foreign material. b. Worn and/or slipping drive belt. c. Drive and/or driven sheave not functioning properly. d. Sprocket ratio not suited to operating conditions. e. Improperly adjusted brake. f. Improperly adjusted throttle. g. Improperly adjusted drive chain. h. Bogie wheel set inverted and/or faulty bogie wheel bearing. i. Also refer to "Engine runs erratically", "Loss of power" ("4", preceding).	a. Adjust or clean. b. Replace. c. Repair or replace. d. Replace. e. Adjust. f. Adjust. g. Adjust. h. Repair or replace.	2E 2B 2C 2D 7A 7A 2D 2E
4. Vehicle does not maintain normal speeds. <i>NOTE: Also check drive belt and suspension troubleshooting charts.</i>	a. Track binding, due to incorrect adjustment and/or plugged with foreign material. b. Drive and/or driven sheave not functioning properly. c. Also refer to "Engine Runs Erratically", "loss of power" ("4", preceding), and "Surges, backfires and loses speed" ("5", preceding).	a. Adjust or clean. b. Repair or replace.	2E 2C
5. Unusual handling and/or rough riding.	a. Foreign material on bottom of skis. b. Wear skag worn or broken. c. Loose steering system components. d. Improper ski alignment. e. Bogie wheel sets inverted and/or missing bogie wheel. f. Broken rear axle and/or suspension springs.	a. Clean. b. Replace. c. Repair or replace. d. Align. e. Repair or replace. f. Replace.	2A 2A 2A 2E 2E

SNOWMOBILE LIGHTS DO NOT OPERATE PROPERLY

Condition	Check for	What to Do	Refer to Service Manual Section
1. Headlamp(s) and/or taillamp(s) do not light. <i>NOTE: Also check lighting system troubleshooting chart.</i>	a. Light switch off or faulty. b. Burned out lamps. c. Dead battery. d. Wrong type bulbs. e. Short circuit and/or faulty connection in wiring harness. f. Headlight and/or taillight harness disconnected. g. Faulty generator coil or stator. h. Faulty light regulator. i. "Blown" fuse.	a. Turn on or replace. b. Replace. c. Charge. d. Replace. e. Repair or replace. f. Connect. g. Replace. h. Replace. i. Replace.	3B-D 3D 3E 3D 3D-F 3A-D 3D 3F
2. Intermittent lights. <i>NOTE: Also check lighting system troubleshooting chart.</i>	Short circuit and/or faulty connection in wiring harness.	Repair or replace.	3D
3. Premature lamp failure. <i>NOTE: Also check lighting system troubleshooting chart.</i>	a. Wrong type bulb. b. Cracked or broken, caused by vibration and/or improper mounting. c. Short circuit and/or faulty connection in wiring harness. d. Faulty light regulator. e. Faulty generator coil or stator.	a. Replace. b. Replace and properly install new lamps. c. Repair or replace. d. Replace. e. Replace.	3D 3D-2F 3D-F 3D 3A-D
4. Stoplight does not light when brake lever is actuated.	a. Burned out lamps. b. Improperly adjusted or faulty stoplight switch. c. Also refer to "Headlamp(s) and/or taillamp(s) do not light" ("1", preceding).	a. Replace. b. Readjust or replace.	3D 7A
5. Improper "high/low beam" operation of headlamps.	a. Burned out headlamp(s). b. Faulty headlight dimmer switch. c. Short circuit and/or faulty connection in wiring harness	a. Replace. b. Repair or replace. c. Repair or replace.	3D 3F-7A 3D-F

TUNEUP

GENERAL

A periodic tune-up will assure peak performance, safety and trouble-free operation of the snowmobile. For lasting results, a definite and thorough procedure – checking all items affecting snowmobile performance -- must be followed. The following

“sequence” should be used when performing a snowmobile tuneup. Where major corrective measures are required, refer to appropriate section of Service Manual for detailed information.

TUNEUP SEQUENCE

1. Cowling and Dash
2. Compression
3. Fuel System
4. Ignition and Electrical System
5. Lighting System
6. Drive System
7. Suspension and Track
8. Test Run

COWLING and DASH

1. Check condition of cowling, dash and windshield. Repair or replace as necessary.
2. Check for loose or missing fasteners or latches.
3. Check dash for loose or missing switch bezels.

COMPRESSION

1. Remove spark plugs. Note “which plug came from which cylinder”, to aid in troubleshooting.
2. Install compression gauge in spark plug hole.

NOTE: Use compression gauge capable of reading up to 225 PSI (lbs. per sq. in.) to prevent damage to gauge.

3. Turn engine through at least 4 compression strokes to obtain highest possible reading.
4. Check and record compression of each cylinder. Variation of more than 15 PSI (1.05kg/cm²) between cylinders indicates that lower compression cylinders are in some way defective, such as worn or sticking piston rings and/or scored pistons and cylinders.
5. Normal compression readings on a warm engine should average as follows:

Model	Reading (PSI)
220	190-200 (13.36-14.06kg/cm ²)
250	145-165 (10.19-11.60kg/cm ²)
200	130-150 (9.14-10.55kg/cm ²)
Rocket	160-180 (11.25-12.65kg/cm ²)
Lightning	160-180 (11.25-12.65kg/cm ²)
Hurricane	160-180 (11.25-12.65kg/cm ²)
440 MAX and 440 S/R	160-180 (11.25-12.65kg/cm ²)
Mark I	160-180 (11.25-12.65kg/cm ²)
Mark II	160-180 (11.25-12.65kg/cm ²)
Sno-Twister	Above 120 (8.44kg/cm ²)

NOTE: Depending upon engine performance, a reading of more than 20 PSI (1.41kg/cm²) below lowest normal average shown above may indicate that engine is in need of service.

FUEL SYSTEM

1. Remove fuel and air filter and clean or replace as necessary.
2. Inspect fuel lines for kinks or bends which may restrict fuel flow. Check connections for leaks.
3. Remove carburetor.
4. Clean carburetor; check and adjust float level or inlet control lever.
5. Reinstall carburetor. Actuate throttle control several times to make sure that throttle shutter and cable operate freely without sticking or binding.
6. Perform idle, low speed and high speed adjustments.
7. Remove fuel pump.
8. Clean fuel pump. Perform check valve test and install new diaphragm and gaskets.

IGNITION and ELECTRICAL SYSTEM

1. Check condition of spark plugs and spark plug gap.
2. Visually inspect breaker point contact surfaces and check breaker point gap.
3. Test all ignition and electrical components with recommended test equipment.
4. Check components of electric start system for proper operation.
5. Check battery electrolyte level and make sure that battery is fully charged. Inspect and clean battery terminals. Inspect battery hold-down to be sure it is clean and free of corrosion. Make sure that hold-down is tight, but not to the point of distorting or cracking battery case.
6. Check timing and make all necessary adjustments.

LIGHTING SYSTEM

1. Check headlight and taillight operation. Adjust headlights if necessary.
2. Check wiring harnesses visually and with recommended test equipment to make sure there are no open or short circuits.

DRIVE SYSTEM

1. Check variable speed drive belt for wear.
2. Check drive and driven sheaves for smooth, free operation.
3. Inspect drive and driven sheave faces. Check condition of driven sheave wear plates.
4. Check lubricant level in chaincase.
5. Adjust brake and drive chain tension.
6. Lubricate clutch splines on 220 and 250 Models.

SUSPENSION and TRACK

1. Inspect ski wear skegs, pivot bushings and wear plates for loose, worn or broken parts.
2. Check ski alignment.
3. Inspect bogie wheels, suspension tubes and springs for loose, worn or broken parts.
4. Check sprockets for worn, chipped or missing teeth.
5. Inspect front and rear axle for bent or broken parts. Make certain that bearings are in good condition and properly locked on axle.
6. Check condition of track. Inspect for loose or missing sprocket clips.
7. Check track tension and alignment.

TEST RUN

Before test-running snowmobile, inspect thoroughly for loose or missing fasteners. Test-run snowmobile and make final adjustments.

MAINTENANCE

GENERAL

Periodic, systematic inspection and lubrication is the simplest and most positive way of preventing, discovering or correcting a failure before it can cause inconvenience or mechanical damage.

Recommended inspection and lubrication intervals are based on average operating conditions in utility service. Under severe conditions, continuous heavy-duty or high-speed operation, inspection and lubrication intervals should be shortened.

The following "Inspection" and "Lubrication" charts show recommended inspection and lubrication points and intervals.

Refer to appropriate Service Manual section for detailed information.

INSPECTION CHART

Inspect/Check	Daily	Break-In (1st 10 Hrs.)	Weekly (5-10 Hrs.)	Monthly (25-40 Hrs.)
Fuel Supply	•			
Throttle and Brake Operation	•			
Steering Operation	•			
Track and/or Tunnel for Obstructions	•			
Lights	•			
Fan Belt Condition		•		•
Drive Belt Condition		•	•	
Throttle and Brake Adjustment		•		•
Track Tension and Alignment		•		•
Drive Chain Tension		•		•
Chaincase Oil Level		•		•
Battery		•		•
Fasteners - Intake and Exhaust		•		•
Fuel Leaks - Fuel Line Connections and/or Engine		•	•	
Fasteners - Cylinder Head and Cylinder		•		•
Exterior Fasteners - Engine and Chassis		•	•	
Drive and Driven Sheave			•	
Ski Attaching Hardware			•	
Suspension Springs			•	
Drive and Idler Sprockets			•	
Rewind Starter Rope Condition			•	
Spark Plugs				•
Fuel and Air Filters				•
Bogie Wheels				•
Ski Alignment				•
All Electrical Wiring				•
Wear Skeg Condition				•
Sheave Alignment				•
Engine Mount Bolts				•
Cowl Latch Operation				•
Suspension Slides	•			

LUBRICATION CHART

Lubricate	Weekly (5-10 Hrs.)	Monthly (25-40 Hrs.)	Seasonally
Drive and Driven Sheave	LTG (◆)		LO (●)
Ski Pivot Bushings	LO (▲)		
Carburetor Linkage Pivot Points	LO		
Idler Arm Pivot Bushings	LO		
Upper and Lower Steering Post Bushings		LO	
Track Adjustment Bolts		LO	
Ski Spindles		LTG	
Driven Sheave Wear Plates		LTG	
Idler Arm Wear Plates		LTG	
Ski Wear Plates		LTG	
Battery Terminals		LTG	
Electric Starter Drive		LO (◆)	
Chaincase		ATF (★)	
Ski Bottoms			LO (●)
Suspension Rollers			LTG (§)
Rear Bogie Pivot Shaft (Mark I and Mark II)		LTG	
Front Axle Bushings (Mark II with Chassis Serial No. 3787640 and Above)		LTG	

LTG - Low Temperature Grease (C-92-59999-12)

LO - Light Oil

ATF - Automatic Transmission Fluid (ATF) Type A, AA, or Dextron

*(▲) - Hurricane (644cc), Mark I (644cc) and Mark II (644cc) Models
Use Low Temperature Grease.*

*(★) - Chaincase Must Be Drained and Refilled each Season. Fill Chaincase
to Lower Edge of Oil Level Hole in Chaincase Cover.*

(●) - To Prevent Rust During Out-of-Season Storage

(◆) - Applies to 220, 250 and Sno-Twister Models Only.

(§) - Slide Rail Models Only