

scorpion

1972 operators manual



warranty

Scorpion, Inc., as manufacturer, warrants new Scorpion Snowmobiles (to the first retail purchaser) to be free from defects in material and workmanship for the specified time limits and subject to the following conditions.

Models manufactured and/or sold for racing purposes will not be warranted.

Models equipped with engines above the 400 cc CLASS, and to include the suspension system, will be warranted for a period of ninety (90) days from the date of the original retail purchase or from November 15, 1971, whichever is later. An exception to this will apply to the polyurethane track, only, which will be warranted for a period of one year from the date of the original retail purchase.

Models equipped with engines of the 400 cc CLASS and below will be warranted for a period beginning with the date of the original retail purchase and ending with the 15th day of March, 1972, with the exceptions

of the following specified parts. The suspension system and rubber track (if applicable) will be warranted for a period of ninety (90) days from the date of the original retail purchase or from November 15, 1971, whichever is later. The polyurethane track (if applicable) will be warranted for a period of one year from the date of the original purchase.

Engines on all models are subject to the engine manufacturer's guarantee.

Under no circumstances, will the warranty on a unit (slide assembly, or other part thereof) remain valid if said unit has been operated on insufficient snow cover.

Our complete warranty, backed by the highest quality of engineering and production, gives you the protection that you desire for your machine. This is our guarantee that your Scorpion is free from defects in material and workmanship for the specified time limits. In order to fully understand our Certificate of Warranty, we ask that you go over the details of this policy with your dealer at the time of purchase.

To validate your warranty, the factory copy of the warranty and marketing card must be filled out completely by your dealer at the time of sale, and must be received at the factory within five days.

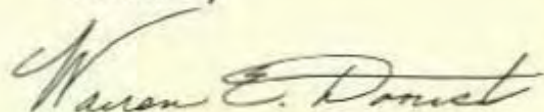
You are to retain the 10 Hour Inspection Certificate at the time

of sale. After ten hours of usage, you are entitled to take your machine to your dealer for a free inspection. We cannot stress the importance of the 10 Hour Inspection too strongly, as it may intercept a minor problem which (if not corrected) could well become a major problem . . . in terms of cost for us . . . in terms of loss of valuable time and enjoyment for you. Upon completion of the inspection, your dealer is required to forward the certificate to the Factory.

This warranty does not cover maintenance services or normal wear items. However, as the manufacturer of Scorpion Snowmobiles, we request you follow the maintenance service recommended in this manual to help forestall warranty repairs.

Welcome to the wonderful sport of snowmobiling. You have now invested in fun! Your new SCORPION will make it possible to have an enjoyable winter. An owner's manual is provided to aid you in knowing more about your machine. Please take time to study the information thoroughly, as it will help you understand some of the problems and upkeep procedures that are necessary for safe and dependable operation of your machine. Keep this booklet handy in your machine so that you may refer to it from time to time. Pay particular attention to the safety and courtesy to others section and have a great season in the snow.

Sincerely

A handwritten signature in cursive script, reading "Warren E. Doust". The signature is fluid and elegant, with a long horizontal stroke extending from the end of the name.

Warren E. Doust
President
SCORPION INC.
Crosby, Minnesota 56441
A Fuqua Industry

TABLE OF CONTENTS

	Page		Page
Identification	3	Maintenance Information	14
Pre-operating Tips	4	Ski Alignment	16
Know Your Scorpion	5	Safety Tips	17
Starting Procedures	6	Safety & Courtesy to Others	18
Fuel Procedures	7	Trouble Shooting	19
Breaking In Your Scorpion	8	Summer Storage	21
Driving Tips	9	Getting Ready for Winter	22
Adjusting the Carburetor	10	Accessory Section	25
Lubricating Your Scorpion	12		

IDENTIFICATION

The model and serial numbers of your machine are very important and should not be removed. It is suggested that you record them in the space provided.

Machine Serial Number

Engine Serial Number



PRE-OPERATING TIPS

Before you start your machine—check the following:

1. Throttle control (R. side handle bar) be sure it works freely.
2. Brake control (L. side handle bar) see that it engages properly and that it is adjusted properly.
3. Steering—turn back and forth, see that both skis work together and that nothing is binding.
4. Fuel—check level, there should be enough to get you where you are going—and back!
5. Tools and parts—be sure you have your tool kit, extra spark plugs, drive belt, headlight globe.

Now that you have done the above, let's get your machine started.

KNOW YOUR SCORPION



STARTING PROCEDURES

1. Look forward and be sure all is clear.
2. Turn ignition key to "on" position.
3. Place choke in closed position.
4. Pull starter rope slowly until it engages, then pull sharply. Do not pull rope to its limit or release rapidly from an extended position. Key start models (electric start) turn key to start position—release when engine fires. (Do not exceed 30 second starts)
5. On a cold engine—open choke slowly and let engine run at idle for a few minutes before starting out. (On a warm engine choking is not necessary)



FUEL-PROCEDURES

Use a name brand regular gasoline and Scorpion two-cycle air cooled engine oil. **DO NOT USE OUTBOARD MOTOR OIL OR LEAD FREE GAS.** The correct oil/fuel mixture is 20 to 1 (1 quart SCORPION Oil to 5 gallons of gas). The only lubrication your engine receives is the oil in the gasoline. Too little oil or improper mixing could cause an engine failure. Mix the fuel in a clean, 5 gallon container. First the oil, then about 1 gallon gas, shake well, add more gas until full, shake again. Fill your fuel tank. Remember, if you let the 5 gallon container with fuel sit very long it should be shaken again before fuel is poured into the machine.



BREAKING IN YOUR SCORPION

1. No single action on your part is as important to long engine life as the rigid adherence to proper break-in of the engine. Follow the break-in procedure closely.
2. Allow engine to warm up a minute or two before moving off.
3. Do not operate engine at prolonged full throttle for the first 10 hours of operation (about 2 tanks of gas).
4. Ask your dealer to set your carburetor slightly rich so there will always be adequate fuel to the engine.
5. Stop occasionally and check your machine. Look at the track, check the skis and steering, look at the exhaust system; in general, become familiar with your machine.

DRIVING TIPS

To learn the "feel" of your new SCORPION, take short runs before attempting long trips. Learn to shift your body to help balance your machine on hills and turns. Always approach turns at reduced speed.

When going down steep hills, use a small amount of throttle to keep the clutch engaged and use the braking power of the engine. Use a gradual braking action like "pumping" the brake on a car, when applying the brake.

When climbing hills, shift body weight forward and maintain a steady throttle to keep the track from spinning.

Your Scorpion is designed to operate best in unpacked snow. Maneuverability will be lessened on packed snow or ice. Reduce speed under packed snow or ice conditions.

Drive and track mechanisms become stiff in extremely cold weather. Run your machine slowly at first until things limber up.

When you have a passenger, go slow at first until they get the feel of riding; also be careful of low hanging branches. You will "duck" but your passenger may not even see them.

ADJUSTING THE CARBURETOR

Approximate settings were made on both high and low speed adjustments at the factory. However, due to extreme temperature and altitude changes, these settings are not necessarily correct for best performance in a given area. Before making delivery, your dealer should test run your new Scorpion and make necessary adjustments.

Here are basic points to remember regarding carburetor settings and two-cycle engine operation:



- A. The low speed needle (A) is the idle adjustment. In most cases, for proper acceleration, this adjustment must be turned out (counter-clock-wise) approximately 1 turn from best idle position. If the low speed setting is adjusted and maintained to the best idle, poor acceleration will result.
- B. The high speed adjustment needle (B) sets the amount of fuel the engine receives. If this adjustment is too lean, the engine will run hot. This will reduce engine life. By turning the needle counter-clock wise, a richer fuel mix is obtained. If this adjustment is too rich, it will operate at what is commonly called "four cycling", and excess smoke will emit from the exhaust system. Proper tests of correct high speed adjustments can only be made while engine is running at full throttle **under load**. The setting is about $1\frac{1}{4}$ to $1\frac{1}{2}$ turns or just at the point of elimination of the heavy "four cycle" symptoms at full throttle.

NOTE: If in doubt about any setting, consult your dealer.

LUBRICATING YOUR SCORPION

1. Chain case oil should be checked every month. Remove lower plug and add 10W oil until oil fills to thread level.
2. Drive clutch needle bearings every 50 hours with Scorpion Clutch Lube.
3. Driven clutch every month. Remove belt, open clutch by pushing and rotating movable face, then apply a thin coat of low temperature grease to shaft.
4. Spindles should be greased twice a season.
5. Throttle cable and housing, carburetor swivel—household oil.



MAINTENANCE INFORMATION

1. BELT REPLACEMENT

Apply pressure on brake handle, grasp movable face of driven clutch and rotate backwards. Then grasp belt with both hands and pull upward until driven clutch spreads, allowing enough slack to roll belt off the drive clutch. Roll belt off upper side of driven clutch and rotate clutch until belt is free. To install, place belt around drive clutch, spread driven clutch in same manner as above, then roll belt onto driven clutch.



2. BRAKE ADJUSTMENT

To tighten brake, back off lower nut on brake cable bracket and tighten top nut until desired engagement is achieved. Rotate driven clutch to make sure that clutch turns freely. Always allow at least $\frac{1}{2}$ inch free travel on brake lever handle.



3. TRACK ALIGNMENT AND ADJUSTMENT

Block back of unit up off surface, start engine and run slowly. The distance between the edge of the track and suspension plate should be equally spaced. If the track is not centered, loosen bolts, then tighten adjusting screw on the side where the track is closest to suspension plate. This will move track to other side. Tighten lock nuts on adjusting screws and tighten remaining nuts.

Track tension should be checked periodically as long life and efficiency of the track depends largely on the correctness of tension and alignment. With unit blocked up off surface, the track should be $\frac{1}{2}$ inch below center bogey or slider assembly.

To adjust track tension, loosen nuts both sides of unit. Then tighten or loosen adjusting screws for correct tension. Tighten all nuts and screws.



DRIVE CHAIN ADJUSTMENT

There should be $\frac{1}{4}$ inch free play in chain. If adjustment is necessary, loosen lock nut on top of eccentric housing. Then push bolt down to tighten or up to loosen. NOTE: chain should be checked once a month.



SKI ALIGNMENT

Have the handle bar in the horizontal position, both skis should be straight ahead, measure at back of skis and then at front, measurement should be the same. Loosen lock nuts on steering rods and adjust by turning rods as necessary. Be sure to lock retaining nuts when finished.



SAFETY TIPS

Your Scorpion will carry you many miles in just a few minutes. Be prepared for emergencies. Dress warmly. Take along necessary spare parts and tools.

When teaching others to operate your Scorpion, set up a nearby, pre-determined course. Make sure they are familiar with the controls. It is a good policy to ride with new drivers on their first "test" run.

Avoid sharp objects and obstructions. Reduce your speed in fresh snow which may cover dangerous obstacles. Use the "buddy" system on long trips.

Don't leave your keys in the switch. It invites theft and unauthorized use.

Use care when giving children a ride. Drive slower and set a good safety example for them.

Avoid wearing loose clothing, such as long scarves, which could become tangled in the moving mechanisms of the machine. Wear an approved safety helmet for head protection.

SAFETY & COURTESY TO OTHERS

Misuse of snowmobiles by a few can ruin a fine recreational sport. Courtesy to non-snowmobilers can lead to better relations and more fun in the future.

Stay away from skiers, ski slopes, ice skaters, and fishermen.

Respect the property rights of others. Go out of your way not to damage fences, trees, and shrubbery. When operating on golf courses, avoid running over tees and greens.

Do not operate your machine without a muffler or with a defective muffler. Excess noise tends to irritate a lot of people.

Don't chase, or otherwise molest, wild animals or domestic livestock or pets.

Do all you can to educate others to the fun of safe and sane snowmobiling.

TROUBLE SHOOTING PROCEDURES

PROBLEM	PROBABLE CAUSE	SOLUTION
Engine backfires.	1. Incorrect timing. 2. Defective spark plug. 3. Carburetor adjusted incorrectly. 4. Running out of fuel.	1. Consult your dealer. 2. Replace spark plug. 3. Adjust carburetor. 4. Check lines — Fuel level in tank.
Engine won't idle.	1. Idle speed set too low. 2. Carburetor out of adjustment.	1. Increase idle speed. 2. Adjust carburetor.
Engine starts, but runs rough.	1. Carburetor out of adjustment. 2. Ice in fuel system. 3. Spark plug fouling.	1. Adjust carburetor. 2. Add de-icer to fuel. Maximum $\frac{1}{8}$ pint per 5 gallons. 3. Clean or replace.
Engine runs after key shut-off.	1. Ign. switch unplugged from wire harness. 2. Engine too hot. 3. Wrong spark plug. 4. Improper carburetor adjustment.	1. Plug wires back in. 2. Let Engine cool down—check vents on cowl. 3. Install colder spark plug. 4. Adjust carburetor.

TROUBLE SHOOTING PROCEDURES

PROBLEM	PROBABLE CAUSE	SOLUTION
Engine fails to start.	1. No fuel in tank. 2. Ignition switch off. 3. Ice in carburetor. 4. Spark plug fouled. 5. Dirt in gasoline filter. 6. Improper, or no ignition.	1. Fill tank with properly-mixed fuel (see page 7). 2. Switch on. 3. Add de-icer to fuel. Maximum $\frac{1}{8}$ pint per 5 gallons. Thaw out carb. 4. Clean plug or replace. 5. Remove cover, clean, and replace. 6. A: Check spark plug leads. Make sure they are securely in place. B: Check spark plug condition and gap. Remove spark plug and attach high tension lead. Place metal plug seat against engine. Pull recoil starter. If spark appears across electrodes, spark plug and magneto are O.K. If no spark, place small metal object into end of high tension lead, hold end about $\frac{1}{8}$ inch from any clean metal surface. Pull recoil starter. If spark appears, replace spark plug. If no spark, magneto is faulty. See your dealer. C: If equipped with a twin-cylinder engine, repeat 6B for second cylinder. D: If all of above solutions fail, consult your dealer.

SUMMER STORAGE

During the summer months, your machine should be placed in a garage or shed. If this is not possible, it should be well covered with a tarpaulin. The machine should be placed on blocks up off the ground. The windshield should be covered to prevent sunlight from reaching it.

This is a good time to touch up any scratches incurred during the winter, or any exposed bare metal to prevent rusting. Touch-up paint in aerosol cans and pint tins is available from your dealer.

Drain the fuel from the fuel tank and run the engine until it stops. Remove the spark plug or plugs and apply a small amount of oil into the cylinder. Turn the engine over a few times and replace the spark plugs.

Coat the exposed parts of the throttle and brake cable inner wire with oil. Apply a light oil (motor oil) around the steering ski spindle shafts, around the steering shaft bearing surfaces, and on all bogie wheel bearings.

On electric start models, remove battery, clean, charge, and store in a cool, dry place. It is recommended that an inactive battery be trickle charged every 30 days.

GETTING READY FOR WINTER

Nothing is more miserable than a snowmobile engine that isn't running right or won't start. At the top of the list are spark plugs. During combustion, lead residue is deposited on the electrode of the plug. This is one reason for hard starting. Another plug problem is oil fouling due to flooding. Don't sandblast that old plug. Replace with a new one. Sandblasting always leaves some sand imbedded around the inside of the plug. Engines do not last very long with sand in them. The next largest problem area is the carburetor. The carb has three adjustments; idle adjustment, low speed adjustment, and high speed adjustment. Your idle should be set fast enough so the engine does not die and slow enough so the clutch will not engage. The idle adjustment should be 1 to 1-¼ turns out and the same for the high speed adjustments. See your operator's manual for your particular machine. The best thing you can do for your carb is make sure the gas going to it is clean. A little gas line anti-freeze (**about two ounces per five gallons of fuel**) will keep condensation in your tank from being a problem. Check your gas line and the impulse line (the one from the engine to the carburetor) to make sure they don't leak where they attach. If your engine idles quite a bit, it might run better with a hotter plug. On the other hand, if you do a lot of hard running, you might want to go to a colder plug. Hard running builds up more than adequate heat and can lead to piston scoring, so as a general rule, a cold plug should be used. Since a two-cycle has no oil sump, it must be lubricated by oil mixed in the gas passing through the crankcase.

You must, therefore, have an oil that lubricates well and also burns clean. An outboard type **does not** fill the bill because an outboard motor is water cooled and runs about 150 degrees cooler than an air-cooled snowmobile engine. Best results are obtained with an oil sold by your dealer especially for snowmobiles. Be sure to mix the oil and gas well before putting the mixture in the tank. Regular gas of 86 octane is good and contains less Tetraethyl lead than ethyl.

Check throttle cable . . be sure it works free. A little machine oil poured down the inside will make it work more freely.

Check the skis . . wear rods should be good and the bolts that hold the skis on should not show wear.

Check your track for cracks and broken areas, and be sure to inspect the drive wheels and boggie wheels. Lube all grease fittings and clutches; align the track per your owner's manual. Check your lights that they all work, and be sure your brake is adjusted properly. Check the drive chain adjustment as per your owner's manual and be sure there is oil in the chain case.

Now, take your machine out for a **short spin** and look things over again. If all is okay, you will be set for many pleasurable hours of snowmobiling fun.

ARE YOU DRESSED WARM ENOUGH?

Sweater

Goggles

CHILL FACTOR CHART

TEMPERATURE
(in degrees Fahrenheit)

35°	32	22	15	11	7	5	3	2	1	0
30°	27	16	9	4	0	-2	-4	-6	-8	-9
25°	21	10	2	-3	-7	-10	-12	-14	-15	-16
20°	16	4	-5	-10	-15	-18	-20	-21	-22	-23
15°	11	-2	-11	-17	-22	-25	-27	-29	-30	-31
10°	6	-9	-18	-25	-29	-33	-35	-37	-38	-39
5°	0	-15	-27	-32	-36	-40	-42	-45	-47	-49
0°	-5	-21	-36	-39	-44	-48	-51	-53	-55	-56
-5°	-10	-27	-40	-46	-51	-55	-58	-61	-63	-64
-10°	-15	-33	-45	-53	-59	-63	-67	-69	-71	-72
-15°	-20	-39	-52	-60	-66	-71	-74	-77	-79	-80
-20°	-26	-46	-58	-67	-74	-79	-82	-85	-87	-88

Gloves

Helmet

MILES PER HOUR

(wind velocity or snowmobile speed)

5 10 15 20 25 30 35 40 45 50

Face Shields

Jackets

Mittens

Berets

Snowmobile Suits











From Scorpion's reliable performance right on through to accessories and designer outerwear, Scorpion '72 is the ultimate in snowmobiling. In every way . . .

the Big Red One is comin' thru !

scorpion stinger '72

Designed and Manufactured by

scorpion

CROSBY, MINNESOTA 56441

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