

2004



650 Twin

ARCTIC CAT[®]

ATV Service Manual

Table of
Contents

SECTION 1 - GENERAL INFORMATION

TABLE OF CONTENTS

General Specifications	1-2
Break-In Procedure	1-3
Gasoline - Oil - Lubricant	1-3
Genuine Parts	1-4
Preparation For Storage	1-5
Preparation After Storage.....	1-5



General Specifications*

CARBURETOR	
Type	Keihin CVKR-D32 (2)
Main Jet	122 - Front 122 - Rear
Slow Jet	40
Pilot Screw Setting (turns)	2 1/2
Jet Needle	BZL-2.470
Needle Jet	3.6 #3
Idle RPM	1050-1150
Float Arm Height	4 mm (0.16 in.)
Throttle Cable Free-Play (at lever)	3-6 mm (1/8-1/4 in.)
ELECTRICAL	
Spark Plug Type	NGK CR7E
Spark Plug Gap	0.7-0.8 mm (0.028-0.032 in.)
Spark Plug Cap	4750-6250 ohms
Ignition Coil Resistance (primary) (secondary)	0.09-0.13 ohm (terminal (+) to terminal (-)) 3800-5800 ohms (high tension - plug cap removed - to ground)
Ignition Coil Peak Voltage (primary/CDI)	100+ volts (wire (+) to ground)
Magneto Coil Resistance (trigger) (charging)	110-140 ohms (blue to black/white) 0.33-0.49 ohm (black to black)
Magneto Coil Peak Voltage (trigger) (charging)	3.6+ volts (blue to black/ white) 14.0-15.0 volts (battery (+) to battery (-))

CHASSIS	
Dry Weight (approx)	293 kg (646 lb)
Length (overall)	205 cm (81 in.)
Height (overall)	125 cm (49.3 in.)
Width (overall)	120.7 cm (47.5 in.)
Suspension Travel (front)	25 cm (10 in.)
Suspension Travel (rear)	25 cm (10 in.)
Ground Clearance	20.3 cm (8 in.)
Brake Type	Hydraulic w/Brake Lever Lock and Auxiliary Brake
Wheelbase	127 cm (50 in.)
Tracking	89 cm (35 in.)
Tire Size	Front - 26 x 8-12 Rear - 26 x 11-12
Tire Inflation Pressure	0.35 kg/cm ² (5 psi)
Turning Radius	2.7 m (8.9 ft)
MISCELLANY	
Gas Tank Capacity (rated)	24.6 L (6.5 U.S. gal.)
Coolant Capacity	2.7 L (2.8 U.S. qt)
Differential Capacity	275 ml (9.3 fl oz)**
Rear Drive Capacity	250 ml (8.5 fl oz)***
Engine Oil Capacity	2.05 L (2.17 U.S. qt)
Gasoline (recommended)	87 Octane Regular Unleaded
Engine Oil (recommended)	SAE 10W-40
Differential/Rear Drive Lubricant	SAE Approved 80W-90 Hypoid
Drive Belt Width (minimum)	28.8 mm (1.13 in.)
Brake Fluid	DOT 4
Taillight/Brakelight	12V/5W/27W
Headlight	12V/27W (2)
Starting System	Electric w/Manual Recoil (Emergency)

* Specifications subject to change without notice.

** One inch below plug threads.

*** At the plug threads.

Break-In Procedure

A new ATV and an overhauled ATV engine require a “break-in” period. The first 10 hours (or 200 miles) are most critical to the life of this ATV. Proper operation during this break-in period will help assure maximum life and performance from the ATV.

During the first 10 hours (or 200 miles) of operation, always use less than 1/2 throttle. Varying the engine RPM during the break-in period allows the components to “load” (aiding the mating process) and then “unload” (allowing components to cool). Although it is essential to place some stress on the engine components during break-in, care should be taken not to overload the engine too often. Do not pull a trailer or carry heavy loads during the 10-hour break-in period.

When the engine starts, allow it to warm up properly. Idle the engine several minutes until the engine has reached normal operating temperature. Do not idle the engine for excessively long periods of time.

During the break-in period, a maximum of 1/2 throttle is recommended; however, brief full-throttle accelerations and variations in driving speeds contribute to good engine break-in.

During the break-in period (or whenever the brake pads are replaced), the hydraulic brake pads must be burnished. Slow disc-speed hydraulic brakes must be properly burnished in order to achieve maximum stopping power.

CAUTION

BRAKE PADS MUST BE BURNISHED TO ACHIEVE FULL BRAKING EFFECTIVENESS. Braking distance will be extended until brake pads are properly burnished.

TO PROPERLY BURNISH THE BRAKES, USE FOLLOWING PROCEDURE:

- Choose an area sufficiently large to safely accelerate ATV to 30 mph and to brake to a stop.
- Accelerate to 30 mph; then compress brake lever to decelerate to 0-5 mph.
- Repeat procedure five times until brakes are burnished.
- This procedure burnishes the brake pads, stabilizes the pad material, and extends the life of the brake pads.

WARNING

Do not attempt sudden stops or put the ATV into a situation where a sudden stop will be required until the brake pads are properly burnished.

■ **NOTE:** Do not be reluctant to heat up the brake pads during the burnishing procedure.

After the completion of the break-in period, the engine oil and oil filter should be changed. Other maintenance after break-in should include checking of all prescribed adjustments and tightening of all fasteners.

Gasoline - Oil - Lubricant

RECOMMENDED GASOLINE

The recommended gasoline to use is 87 minimum octane regular unleaded. In many areas, oxygenates (either ethanol or MTBE) are added to the gasoline. Oxygenated gasolines containing up to 10% ethanol, 5% methane, or 5% MTBE are acceptable gasolines.

When using ethanol blended gasoline, it is not necessary to add a gasoline antifreeze since ethanol will prevent the accumulation of moisture in the fuel system.

CAUTION

Do not use white gas. Only Arctic Cat approved gasoline additives should be used.

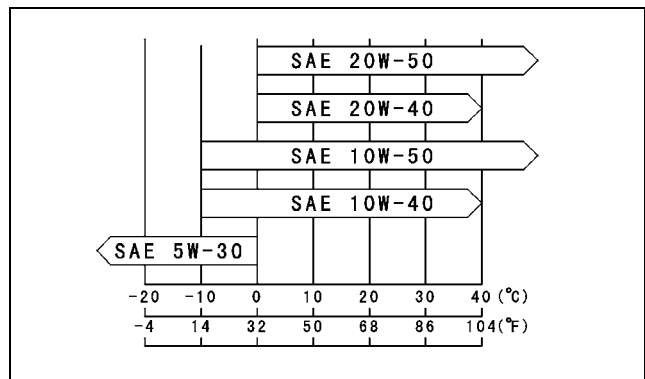
RECOMMENDED ENGINE/ TRANSMISSION OIL

CAUTION

Any oil used in place of the recommended oil could cause serious engine damage. Do not use oils which contain graphite or molybdenum additives. These oils can adversely affect clutch operation. Also, not recommended are racing, vegetable, non-detergent, and castor-based oils.

The recommended oil to use is Arctic Cat 4-Cycle Engine Oil (p/n 0436-005) or an equivalent oil which is rated SE, SF, or SG under API service classification. These oils meet all of the lubrication requirements of the Arctic Cat ATV engine. The recommended engine oil viscosity is SAE 10W-40. Ambient temperature should determine the correct weight of oil. See the following viscosity chart for details.

VISCOSITY CHART



ATV2055

RECOMMENDED FRONT DIFFERENTIAL/REAR DRIVE LUBRICANT

The recommended lubricant is Arctic Cat Gear Lube (p/n 0436-007) or an equivalent gear lube which is SAE approved 80W-90 hypoid. This lubricant meets all of the lubrication requirements of the Arctic Cat ATV front differentials and rear drives.

⚠ CAUTION

Any lubricant used in place of the recommended lubricant could cause serious front differential/rear drive damage.

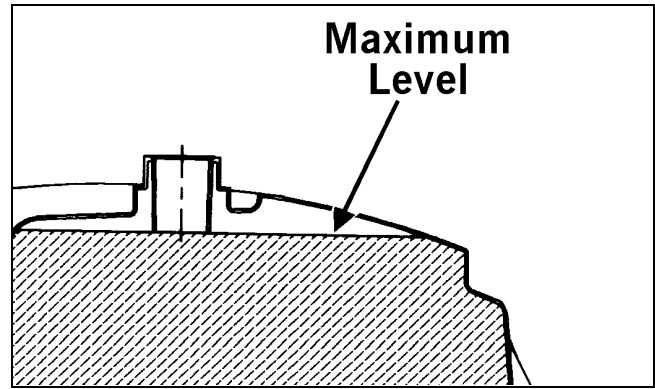
FILLING GAS TANK

⚠ WARNING

Always fill the gas tank in a well-ventilated area. Never add fuel to the ATV gas tank near any open flames or with the engine running. **DO NOT SMOKE** while filling the gas tank.



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Since gasoline expands as its temperature rises, the gas tank must be filled to its rated capacity only. Expansion room must be maintained in the tank particularly if the tank is filled with cold gasoline and then moved to a warm area.

⚠ WARNING

Do not overflow gasoline when filling the gas tank. A fire hazard could materialize. Always allow the engine to cool before filling the gas tank.

Tighten the gas tank cap securely after filling the tank.

⚠ WARNING

Do not over-fill the gas tank.

Genuine Parts

When replacement of parts is necessary, use only genuine Arctic Cat ATV parts. They are precision-made to ensure high quality and correct fit. Refer to the appropriate Illustrated Parts Manual for the correct part number, quantity, and description.

Preparation For Storage

CAUTION

Prior to storing the ATV, it must be properly serviced to prevent rusting and component deterioration.

Arctic Cat recommends the following procedure to prepare the ATV for storage.

1. Clean the seat cushion (cover and base) with a damp cloth and allow it to dry.
2. Clean the ATV thoroughly by washing dirt, oil, grass, and other foreign matter from the entire ATV. Allow the ATV to dry thoroughly. **DO NOT** get water into any part of the engine or air intake.
3. Either drain the gas tank or add Fuel Stabilizer (p/n 0638-165) to the gas in the gas tank. Remove the air filter housing cover and air filter. Start the engine and allow it to idle; then using Arctic Cat Engine Storage Preserver (p/n 0636-177), rapidly inject the preserver into the air filter opening for a period of 10 to 20 seconds; then stop the engine. Install the air filter and housing cover.

CAUTION

If the interior of the air filter housing is dirty, clean the area before starting the engine.

4. Drain the carburetor float chambers.
5. Plug the exhaust hole in the exhaust system with a clean cloth.
6. Apply light oil to the upper steering post bushing and plungers of the shock absorbers.
7. Tighten all nuts, bolts, cap screws, and screws. Make sure rivets holding components together are tight. Replace all loose rivets. Care must be taken that all calibrated nuts, cap screws, and bolts are tightened to specifications.
8. Fill the cooling system to the bottom of the stand pipe in the radiator neck with properly mixed coolant.
9. Disconnect the battery cables; then remove the battery, clean the battery posts and cables, and store in a clean, dry area.

10. Store the ATV indoors in a level position.

CAUTION

Avoid storing outside in direct sunlight and avoid using a plastic cover as moisture will collect on the ATV causing rusting.

Preparation After Storage

Taking the ATV out of storage and correctly preparing it will assure many miles and hours of trouble-free riding. Arctic Cat recommends the following procedure to prepare the ATV.

1. Clean the ATV thoroughly.
2. Clean the engine. Remove the cloth from the exhaust system.
3. Check all control wires and cables for signs of wear or fraying. Replace if necessary.
4. Change the engine/transmission oil and filter.
5. On liquid cooled models, check the coolant level and add properly mixed coolant as necessary.
6. Charge the battery; then install. Connect the battery cables.
7. Check the entire brake systems (fluid level, pads, etc.), all controls, headlights, taillight, brakelight, and headlight aim; adjust or replace as necessary.
8. Tighten all nuts, bolts, cap screws, and screws making sure all calibrated nuts, cap screws, and bolts are tightened to specifications.
9. Check tire pressure. Inflate to recommended pressure as necessary.
10. Make sure the steering moves freely and does not bind.
11. Check the spark plugs. Clean or replace as necessary.
12. Follow the recommendations found in the pre-start inspection.

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for your reading.**

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