



FOREWORD

This Arctic Cat Service Manual contains service, maintenance, and troubleshooting information for the 2012 Arctic Cat 700 Diesel SD ATV. The complete manual is designed to aid service personnel in service-oriented applications.

When using this manual as a guide, the technician should use discretion as to how much disassembly is needed to correct any given condition.

The service technician should become familiar with the operation and construction of each component or system by carefully studying the complete manual. This manual will assist the service technician in becoming more aware of and efficient with servicing procedures. Such efficiency not only helps build consumer confidence but also saves time and labor.

All Arctic Cat ATV publications and decals display specific symbols to emphasize important information. The symbol  **WARNING** identifies personal safety-related information. Be sure to follow the directive because it deals with the possibility of severe personal injury or even death. A **CAUTION** identifies unsafe practices which may result in ATV-related damage. Follow the directive because it deals with the possibility of damaging part or parts of the ATV. The symbol  **NOTE:** identifies supplementary information worthy of particular attention. The symbol  **AT THIS POINT** directs the technician to certain and specific procedures to promote efficiency and to improve clarity.

At the time of publication, all information, photographs, and illustrations were technically correct. Some photographs used in this manual are used for clarity purposes only and are not designed to depict actual conditions. Because Arctic Cat Inc. constantly refines and improves its products, no retroactive obligation is incurred.

All materials and specifications are subject to change without notice.

Keep this manual accessible in the shop area for reference.

**Product Service and
Warranty Department
Arctic Cat Inc.**

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7C Diesel SD

General Information

■NOTE: Some photographs and illustrations used in this section are used for clarity purposes only and are not designed to depict actual conditions.

General Specifications

FUEL INJECTION	
Type	Lombardini Unit Injectors
Idle RPM (engine warm)	800-900
Throttle Cable Free-Play (at lever)	1/4 in.
ELECTRICAL	
Glow Plug Type	Lombardini
Alternator	Denso 12V/40 Amp
CHASSIS	
Brake Type	Hydraulic w/Brake Lever Lock and Auxiliary Brake
Tire Size	Front - 25 x 8-12 Rear - 25 x 10-12
Tire Inflation Pressure	0.35 kg/cm ² (5 psi)
MISCELLANY	
Fuel Tank Capacity	20.81 L (5.5 U.S. gal.)
Coolant Capacity	5.6 L (5.9 U.S. qt)
Front Differential Capacity	275 ml (9.3 fl oz)*
Rear Drive Capacity	250 ml (8.5 fl oz)*
Engine Oil Capacity (with filter)	2.0 L (2.1 U.S. qt)
Engine Oil Capacity (without filter)	1.9 L (2.0 U.S. qt)
Transmission Capacity	600 ml (20.3 fl oz)
Fuel (recommended)	Biodiesel Blend up to 20% (B20)/42-50 Cetane Diesel - #1 or #2/JP 5 or JP 8 Turbine
Engine Oil (recommended)	SAE 10W-40
Differential/Rear Drive Lubricant	SAE Approved 80W-90 Hypoid
Transmission Lubricant	SAE Approved 80W-90 Hypoid
Drive Belt Width (minimum)	31.25 mm (1.23 in.)
Brake Fluid	DOT 4
Taillight/Brakelight	12V/8W/27W
Headlight	12V/27W (2)
VALVES AND GUIDES	
Valve Face Diameter (intake)	34.4 mm (1.35 in.)
(exhaust)	30.2 mm (1.19 in.)
Valve Clearance (cold engine) (intake/exhaust)	0.20 mm (0.008 in.)
Valve Guide/Stem Clearance	0.015-0.060 mm (0.0006-0.0024 in.)
Valve Guide Inside Diameter	7.005-7.020 mm (0.2758-0.2764 in.)
Valve Stem Diameter	6.960-6.990 mm (0.2740-0.2752 in.)
Valve Face/Seat Width (intake/exhaust)	1.6-2.0 mm (0.063-0.079 in.)
Valve Spring Free Length (min)	43.0 mm (1.69 in.)

Specifications subject to change without notice.

* Visible at plug threads.

CYLINDER, PISTON, AND RINGS	
Bore x Stroke	75 x 77.6 mm (2.95 x 3.05 in.)
Piston Ring End Gap - Installed (min)	0.25 mm (0.0098 in.)
Piston Ring Groove Width (1st)	0.090-0.125 mm (0.0035-0.0049 in.)
(2nd)	0.050-0.085 mm (0.0020-0.0033 in.)
(3rd)	0.040-0.075 mm (0.0016-0.0030 in.)
Piston Pin Bore (max)	18.025 mm (0.7096 in.)
Piston Pin Outside Diameter (min)	17.996 mm (0.7085 in.)
CAMSHAFT AND CYLINDER HEAD	
Camshaft Lobe Height (intake/exhaust) (min)	29.498 mm (1.161 in.)
Camshaft Injection Lobe (min)	28.848 mm (1.136 in.)
Camshaft Journal Holder Inside Diameter (max)	37.060 mm (1.459 in.)
Camshaft Journal Diameter (min)	36.975 mm (1.456 in.)
Cylinder Head Distortion (max)	0.10 mm (0.004 in.)
Rocker Arm Bore	18.015-18.030 mm (0.7092-0.7098 in.)
Rocker Arm Shaft	17.989-18.000 mm (0.7082-0.7087 in.)
CRANKSHAFT	
Connecting Rod Piston Pin Bushing (inside diameter) (max)	18.025 mm (0.7096 in.)
Crankshaft Main Bearing Journal	51.023-51.059 mm (2.009-2.010 in.)
Crankshaft Connecting Rod Journal(min)	39.9 mm (1.57 in.)
Connecting Rod Clearance	0.021-0.066 mm (0.0008-0.0026 in.)
Main Bearing Clearance	0.023-0.078 mm (0.0009-0.0031 in.)
Rod Bearing Diameter	40.021-40.050 mm (1.5756-1.5767 in.)
Oil Pump Pressure at 120° C (248° F) @ 900 RPM (min)	1.1 kg/cm ² (15.6 psi)
Cooling Fan Thermo-Switch (off→on)	93° C (199° F)
Operating Temperature (on→off)	87° C (189° F)

Torque Specifications

STEERING COMPONENTS			
Part	Part Bolted To	Torque ft-lb N-m	
Handlebar Cap	Steering Post	20	27
Steering Post Bearing Housing	Frame	20	27
Steering Post Bearing Flange	Frame	20	27
Tie Rod End	Knuckle/Steering Post	30	41
EXHAUST COMPONENTS			
Exhaust Pipe	Exhaust Manifold	14	19
Spark Arrester	Muffler	48 in.-lb	5
BRAKE COMPONENTS			
Brake Disc***	Hub	15	19
Brake Hose	Caliper	20	27
Brake Hose	Master Cylinder	20	27
Brake Hose	Auxiliary Brake Cylinder	20	27
Auxiliary Brake Pedal	Lever Axle	25	34
Caliper Holder	Knuckle	20	27
Auxiliary/Hydraulic Caliper****	Knuckle	20	27

DRIVE TRAIN COMPONENTS			
Part	Part Bolted To	Torque ft-lb N-m	
Front Mounting Bracket	Engine	20	27
Engine Mount (Upper)**	Frame	35	48
Engine Mount (Front/Rear)	Frame	20	27
Front Differential***	Frame/Differential Bracket	38	52
Rear Drive Gear Case	Frame	38	52
Input Housing	Gear Case Housing	23	31
Output Drive Yoke Nut*	Output Shaft	72	98
Differential Housing Cover**	Differential Housing	23	31
Drive Bevel Gear Retaining Nut**	Secondary Output Shaft	87	118
Secondary Drive/Bevel Gear Shaft	Transmission Case	80	108
Pinion Housing	Gear Case	25	34
Ring Gear/Thrust Button*	Gear Case	8	11
Gear Case Cover	Gear Case	23	31
Lock Collar	Differential Housing	125	170
Hub Nut	Shaft/Axle (min)	200	272
Drain Plug	Front Differential/Rear Drive	42 in.-lb	5
Fill Plug	Front Differential/Rear Drive	16	22
Oil Drain Plug	Engine	18	24
Wheel (Steel)	Hub	45	61
Wheel (Aluminum)	Hub	80	108
CHASSIS COMPONENTS			
Shift Lever***	Shift Axle	8	11
ELECTRICAL COMPONENTS			
Ground Wire	Transmission	8	11
SUSPENSION COMPONENTS (Rear)			
A-Arm	Frame	50	68
Shock Absorber (Upper)	Frame	50	68
Shock Absorber (Lower)	Lower A-Arm	20	27
Knuckle	A-Arm	50	68
SUSPENSION COMPONENTS (Front)			
A-Arm	Frame	50	68
Ball Joint Cap Screw	Knuckle	35	48
Shock Absorber	Frame	50	68
Shock Absorber	Upper A-Arm	50	68

- * w/Red Loctite #271
- ** w/Green Loctite #609
- *** w/Blue Loctite #243
- **** "Patch-Lock"

ENGINE/TRANSMISSION			
Part	Part Bolted To	Torque ft-lb N-m	
Transmission Mounting Plate	Crankcase/Transmission	35	48
Connecting Rod Cap	Connecting Rod (4 Steps)	29	40
Main Bearing Cap	Engine Block (6 Steps)	44	60
Rocker Arm Support	Cylinder Head	29	40
Cylinder Head	Cylinder (5 Steps)	35	48
Valve Cover	Cylinder Head	6.5	9
Driven Pulley Nut**	Fixed Face	125	170
Drive Clutch	Flywheel/PTO Shaft	40	54
Movable Drive Face*	Fixed Drive Hub	85	116
Oil Pump	Engine Block	22	30
Output Shaft*	Output Shaft Coupler	20	27
Output Shaft Nut*	Output Shaft	80	108
Starter	V-Belt Housing	35	48
Flywheel/PTO Shaft	Crankshaft	40	54
Crankshaft Pulley	Timing Belt Drive Pulley	9	12
Chamber Ring Nut	Chamber (Step 1) (Step 2)	72 130	98 177
Glow Plug	Cylinder Head	18	24
Crankshaft Pulley***	Crankshaft	260	354
Timing Belt Idler Nut	Engine Block	29	39
V-Belt Cover	V-Belt Housing	9	12
V-Belt Housing	Crankcase/Transmission	25	34
Fuel Rail	Unit Injectors	36 in.-lb	4
Gear Case (Left)	Gear Case (Right)	8	11
Oil Pan	Crankcase	7	10
Oil Pan Cover	Oil Pan	7	10
Crankshaft Seal/Flange	Engine Block	9	12
Camshaft Support Housing	Cylinder Head	7	10
Fuel Injector Control Rack	Unit Injector	11 in.-lb	1.2
Unit Injector Retainer Nut	Cylinder Head (5 Steps)	15	20
Camshaft Drive Pulley	Camshaft	59	80
Lift Pump Eccentric	Camshaft	59	80
Water Pump	Engine Block	22	30

- * w/Red Loctite #271
- ** w/Green Loctite #609
- *** w/Blue Loctite #243

Torque Conversions (ft-lb/N-m)

ft-lb	N-m	ft-lb	N-m	ft-lb	N-m	ft-lb	N-m
1	1.4	26	35.4	51	69.4	76	103.4
2	2.7	27	36.7	52	70.7	77	104.7
3	4.1	28	38.1	53	72.1	78	106.1
4	5.4	29	39.4	54	73.4	79	107.4
5	6.8	30	40.8	55	74.8	80	108.8
6	8.2	31	42.2	56	76.2	81	110.2
7	9.5	32	43.5	57	77.5	82	111.5
8	10.9	33	44.9	58	78.9	83	112.9
9	12.2	34	46.2	59	80.2	84	114.2
10	13.6	35	47.6	60	81.6	85	115.6
11	15	36	49	61	83	86	117
12	16.3	37	50.3	62	84.3	87	118.3
13	17.7	38	51.7	63	85.7	88	119.7
14	19	39	53	64	87	89	121
15	20.4	40	54.4	65	88.4	90	122.4
16	21.8	41	55.8	66	89.8	91	123.8
17	23.1	42	57.1	67	91.1	92	125.1
18	24.5	43	58.5	68	92.5	93	126.5
19	25.8	44	59.8	69	93.8	94	127.8
20	27.2	45	61.2	70	95.2	95	129.2
21	28.6	46	62.6	71	96.6	96	130.6
22	29.9	47	63.9	72	97.9	97	131.9
23	31.3	48	65.3	73	99.3	98	133.3
24	32.6	49	66.6	74	100.6	99	134.6
25	34	50	68	75	102	100	136

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.

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.

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.

Fuel - Oil - Lubricant

■NOTE: Arctic Cat recommends the use of genuine Arctic Cat lubricants.

RECOMMENDED FUEL

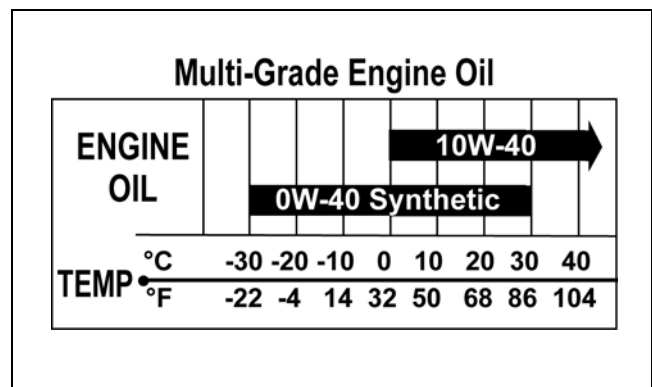
The recommended fuel to use is biodiesel blend up to 20% (B20), #1 or #2 diesel fuel (42-50 cetane), or JP 5 or JP 8 turbine fuel. At temperatures above -10° C (14° F), use #2 diesel fuel or a biodiesel blend up to 20%. At temperatures at or below -10° C (14° F), use #1 diesel fuel. Diesel fuel with a minimum cetane number below 42 should not be used.

CAUTION

Never use biodiesel blends at temperatures at or below -10° C (14° F).

RECOMMENDED ENGINE OIL

The recommended oil to use is an oil which is rated SJ/CF under API service classification. These oils meet all of the lubrication requirements of the Arctic Cat engine. The recommended engine oil viscosity is SAE 10W-40. Ambient temperature should determine the correct weight of oil. See the viscosity chart or an authorized Arctic Cat ATV dealer for details.



OILCHART

CAUTION

Any oil used in place of the recommended oil could cause serious engine damage.

RECOMMENDED TRANSMISSION LUBRICANT

The recommended transmission lubricant is SAE approved 80W-90 hypoid. This lubricant meets all of the lubrication requirements of the ATV transmission.

CAUTION

Any lubricant used in place of the recommended lubricant could cause serious transmission damage.

RECOMMENDED FRONT DIFFERENTIAL/REAR DRIVE LUBRICANT

The recommended lubricant is Arctic Cat Gear Lube 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.

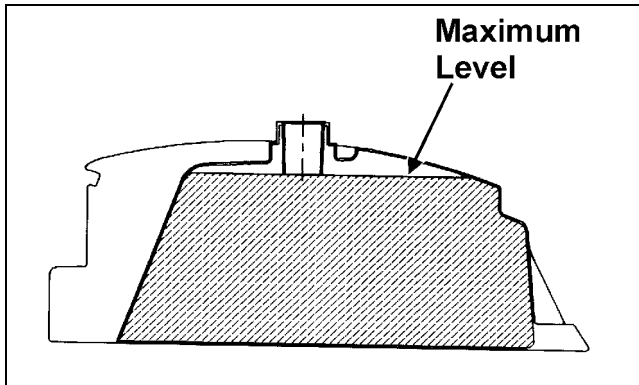
CAUTION

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

FILLING FUEL TANK

⚠ WARNING

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



ATV0049B

Since fuel expands as its temperature rises, the fuel 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 fuel and then moved to a warm area.

⚠ WARNING

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

Tighten the fuel tank cap securely after filling the tank.

⚠ WARNING

Do not over-fill the fuel 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. Fill the fuel tank with fresh #1 or #2 diesel fuel (according to ambient temperatures); then add a quality anti-microbial additive. Run the engine in a well-ventilated area for several minutes to make sure fresh, treated fuel is circulated throughout the entire injection system.

CAUTION

DO NOT store the ATV with biodiesel (B20) in the fuel system. Severe damage to the fuel system may occur.

4. Plug the exhaust hole in the muffler with a clean cloth.
5. Apply light oil to the upper steering post bushing and plungers of the shock absorbers.
6. 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.
7. Fill the cooling system to the bottom of the stand pipe in the filler neck with properly mixed coolant.
8. Disconnect the battery cables; then remove the battery, clean the battery posts and cables, and store in a clean, dry area.
9. 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 muffler.

3. Check all control wires and cables for signs of wear or fraying. Replace if necessary.
4. Change the engine oil and filter.
5. Check the coolant level and add properly mixed coolant as necessary.
6. Charge the battery; then install. Connect the battery cables.

CAUTION

The ignition switch must be in the OFF position prior to installing the battery or damage may occur to the electrical system.

CAUTION

Connect the positive battery cable first; then the negative.

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.

Periodic Maintenance/ Tune-Up

Tighten all nuts, cap screws, screws, and bolts. Make sure rivets holding components together are tight. Replace all loose rivets. Care must be taken that all calibrated nuts, cap screws, screws, and bolts are tightened to specifications.

It is advisable to lubricate certain components periodically to ensure free movement. Apply light oil to the components using the following list as reference.

- A. Throttle Lever Pivot/Cable Ends
- B. Brake Lever Pivot/Cable Ends
- C. Auxiliary Brake Cable Ends

Periodic Maintenance Chart

- A = Adjust
- C = Clean
- I = Inspect
- L = Lubricate
- R = Replace

Item	Initial Service After Break-In (First Month or 100 Miles)	Every Month or Every 100 Miles	Every 3 Months or Every 300 Miles	Every 6 Months or Every 500 Miles	Every Year or Every 1250 Miles	Every 2 Years or Every 5000 Miles	As Needed
Battery	I	I					C
Fuses/Relays/PDM	I		I				R
Air Filter	I				R		R
Valve Clearance						I	A
Muffler/Spark Arrester				C			R
Fuel/Vent Hoses	I					R	
Fuel Injectors						I	A
Throttle Cable	I			C-L			A-R
Engine Oil Level							I
Engine Oil/Filter	Replace after initial 300 miles.				R		R
Front Differential/Rear Drive Lubricant	I						R (4 Yrs)
Transmission Lubricant	I		I				R (4 Yrs)
Tires/Air Pressure	I						R
Steering Components	I		I				R
V-Belt	I			I			R
Suspension (Ball joint boots, drive axle boots front and rear, tie rods, differential and rear drive bellows)	I		I*				R
Nuts/Cap Screws/Screws/Bolts	I			I			A
Injector Timing					I		A
Headlight/Taillight-Brakelight	I						R
Switches	I						R
Shift Lever				I			A-L
Handlebar Grips							R
Handlebars	I						R
Gauges/Indicators	I						R
Frame/Welds/Racks	I	I		I			
Electrical Connections				I			C
Complete Brake System (Hydraulic & Auxiliary)	I		C				L-R
Brake Pads	I						R
Brake Fluid	I					R	
Brake Hoses	I		I				R (4 Yrs)
Coolant/Cooling System	I	Replace coolant every 2 years.					
Timing Belt						R	
Alternator Belt	I				I		

* Service/Inspect more frequently when operating in adverse conditions.

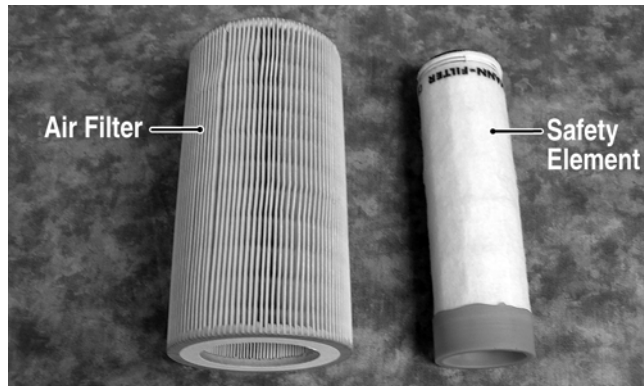
Air Filter

CLEANING AND INSPECTING FILTER

CAUTION

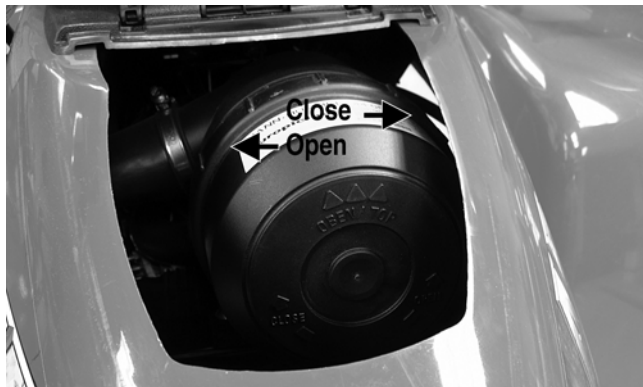
Failure to inspect the air filter frequently if the vehicle is used in dusty, wet, or muddy conditions can damage the engine.

■NOTE: This ATV is equipped with a dry-paper air filter and a cotton-fabric safety element.



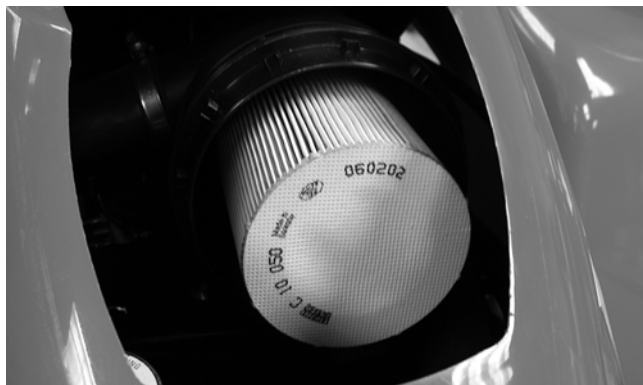
DE014A

1. Open the air filter access cover and remove the operator's seat; then rotate the air filter housing cover counterclockwise and remove from the filter housing.



DE006A

2. Remove the dry-paper air filter. Do not remove the cotton-fabric safety element at this time.



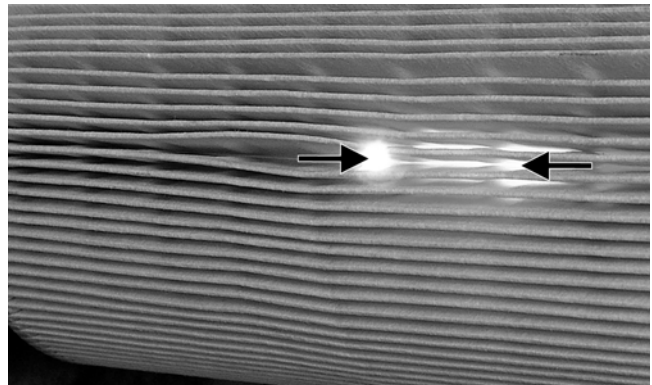
DE007

3. Clean dust and debris from the air filter housing; then remove the cotton-fabric safety element using care not to allow dirt and debris to enter the engine.



DE008

4. Lightly tap the dry-paper air filter to dislodge the dirt and dust. Do not use compressed air.
5. Insert a suitable light into the dry-paper air filter and look for any "pin-points" of light shining out of the filter medium. A bright "pin-point" of light indicates a hole and the filter element must be replaced.



DE028A

CAUTION

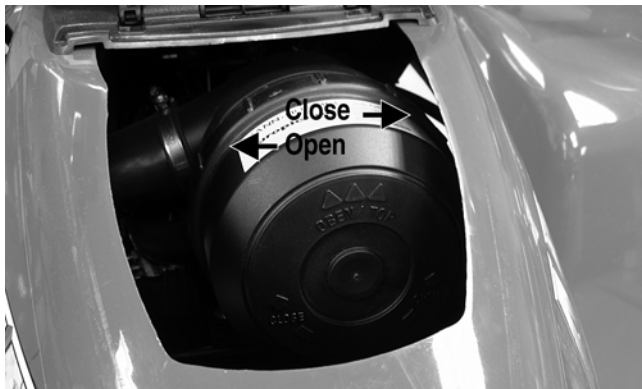
A torn air filter can cause damage to the engine. Dirt and dust may enter the engine if the element is torn. Carefully examine the element for tears before and after cleaning it. Replace the element with a new one if it is torn.

6. Check the safety element for signs of dirt build-up. If dirt is present on the element, it indicates a leak or hole in the dry-paper air filter element and both elements must be replaced.
7. Install the safety element; then install the dry-paper air filter.
8. Check the drain valve in the air filter housing cover for dirt, deterioration, or poor sealing. Clean or replace as required.



DE015

9. Install the air filter housing cover (drain facing downward) and lock it in place by turning clockwise.



DE006A

Valve Clearance

To check/adjust valve clearance, see Top-Side Components in Engine/Transmission.

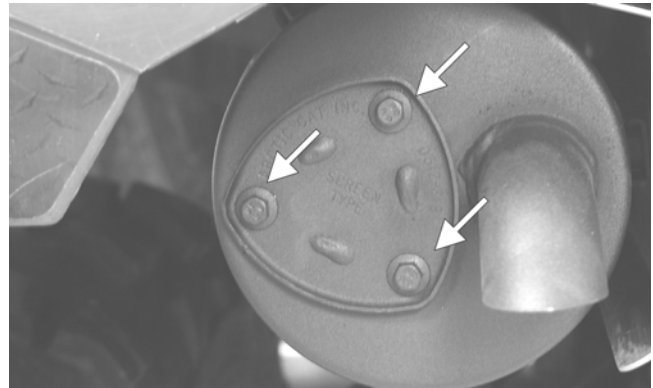
Muffler/Spark Arrester

The muffler has a spark arrester which must be periodically cleaned. At the intervals shown in the Periodic Maintenance Chart, clean the spark arrester using the following procedure.

WARNING

Wait until the muffler cools to avoid burns.

1. Remove the three cap screws securing the spark arrester assembly to the muffler; then loosen and remove the arrester.



CF105A

2. Using a suitable brush, clean the carbon deposits from the screen taking care not to damage the screen.

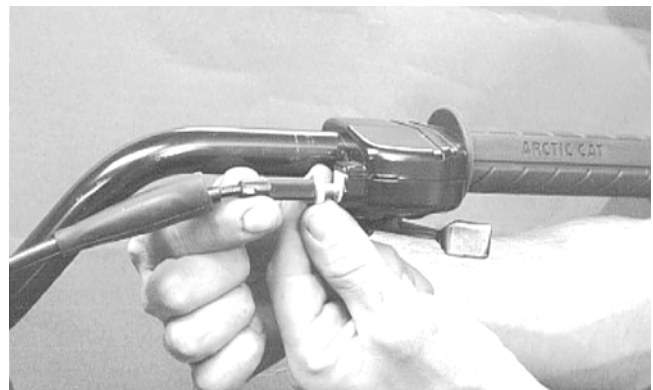
■NOTE: If the screen or gasket is damaged in any way, it must be replaced.

3. Install the spark arrester assembly with gasket; then secure with three cap screws. Tighten to 48 in.-lb.

Adjusting Throttle Cable

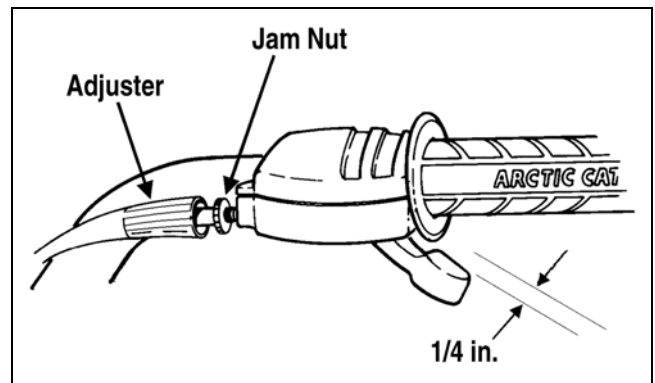
To adjust the throttle cable free-play, follow this procedure.

1. Slide the rubber boot away; then loosen the jam nut from the throttle cable adjuster.



AL611D

2. Turn the adjuster until the throttle cable has proper free-play of 1/4 in. at the lever.



ATV-0047C

3. Tighten the jam nut against the throttle cable adjuster securely; then slide the rubber boot over the adjuster.