POLARIS®
The Way Out.

SCRAMBLER 50
SCRAMBLER 90
SPORTSMAN 90
PREDATOR 90

SERVICE MANUAL

PN 9918068

POLARIS®
The Way Out.

2003 Scrambler 50, Predator 90, Scrambler 90 , Sportsman 90
SERVICE MANUAL

Foreword

This manual is designed primarily for use by certified Polaris Master Service Dealer technicians in a properly equipped shop and should be kept available for reference. All references to left and right side of the vehicle are from the operator's perspective when seated in a normal riding position.

Some procedures outlined in this manual require a sound knowledge of mechanical theory, tool use, and shop procedures in order to perform the work safely and correctly. Technicians should read the text and be familiar with service procedures before starting the work. Certain procedures require the use of special tools. Use only the proper tools as specified.

This manual includes procedures for maintenance operations, component identification and unit repair, along with service specifications for the 2003 Polaris Scrambler 50, Predator 90, Scrambler 90, and Sportsman 90. Comments or suggestions about this manual may be directed to: Service Publications Dept. @ Polaris Sales Inc. 2100 Hwy 55 Medina Minnesota 55340.

2003 Sportsman Youth ATV Service Manual (PN 9918068)

UNDERSTANDING SAFETY LABELS AND INSTRUCTIONS

Throughout these instructions, important information is brought to your attention by the following symbols:

The Safety Alert Symbol means ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED!

⚠ DANGER

Failure to follow DANGER instructions will result in severe injury or death to the operator, bystander or person inspecting or servicing the ATV.

⚠ WARNING

Failure to follow WARNING instructions could result in severe injury or death to the operator, bystander or person inspecting or servicing the ATV.

CAUTION:

A CAUTION indicates special precautions that must be taken to avoid personal injury, or ATV or property damage.

NOTE:

A NOTE provides key information to clarify instructions.

Trademarks

Polaris acknowledges the following products mentioned in this manual:

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STA-BIL, Registered Trademark of Gold Eagle
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Nyogel, Trademark of Wm. F. Nye Co.
Fluke, Registered Trademark of John Fluke Mfg. Co.
Mity Vac, Registered Trademark of Neward Enterprises, Inc.
Ammco, Registered Trademark of Ammco Tools, Inc.
Torx, Registered Trademark of Textron

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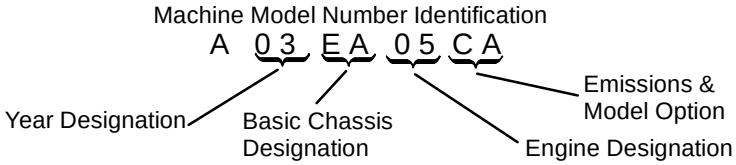
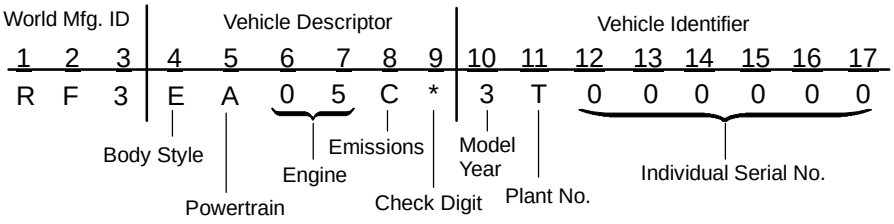
CHAPTER 1
GENERAL INFORMATION/ MAINTENANCE

MODEL IDENTIFICATION

The machine model number must be used with any correspondence regarding warranty or service.



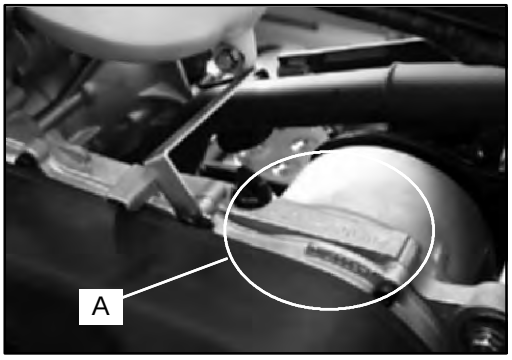
VIN IDENTIFICATION

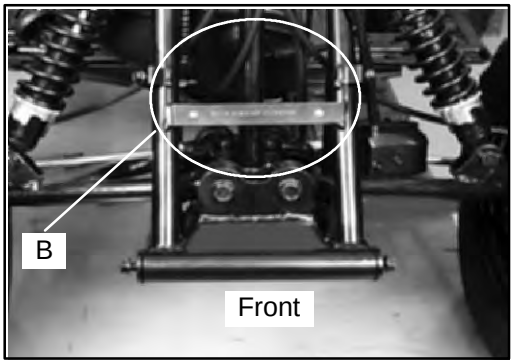


* This could be either a number or a letter

SERIAL NUMBER LOCATIONS

Whenever corresponding about an engine, be sure to refer to the engine serial number. This information can be found stamped on the transmission section located by the transmission oil fill plug(A). The machine model number and serial number are important for vehicle identification. The machine serial number is stamped on the front of the frame (B).





2003 YOUTH MODEL ATVS

SCRAMBLER 50
SCRAMBLER 90

SPORTSMAN 90

PREDATOR 90

NOTE: Colors will vary upon model.

SPECIFICATIONS

MODEL	SCRAMBLER 50	SCRAMBLER 90	PREDATOR 90	SPORTSMAN 90
ENGINE TYPE	2-Stroke Horizontal (AR03-01)	2-Stroke Horizontal (AR07-01)	2-Stroke Horizontal (AR07-01)	2-Stroke Horizontal (AR07-01)
NUMBER OF CYLINDERS	1	1	1	1
DISPLACEMENT	49.3 cc	89.2 cc	89.2 cc	89.2 cc
BORE AND STROKE	1.58x1.54″ (40x39.2 mm)	2.05x1.65″ (52x42 mm)	2.05x1.65″ (52x42 mm)	2.05x1.65″ (52x42 mm)
COMPRESSION RATIO	6.8:1	7.7:1	7.7:1	7.7:1
SPARK PLUG	BPR7HS	BPR7HS	BPR7HS	BPR7HS
ALTERNATOR OUTPUT	70 Watts @ 4000 RPM	70 Watts @ 4000 RPM	70 Watts @ 4000 RPM	70 Watts @ 4000 RPM
IGNITION TIMING **	14° @ 1500 RPM**	16° @ 1500 RPM**	16° @ 1500 RPM**	16° @ 1500 RPM**
MAX. TORQUE	4 ft.lbs (5.4 Nm) @ 6000 RPM	6.5 ft.lbs (8.82 Nm) @ 6000 RPM	6.5 ft.lbs (8.82 Nm) @ 6000 RPM	6.5 ft.lbs (8.82 Nm) @ 6000 RPM
CARBURETOR	Sunworld H68K	Mikuni VM16	Mikuni VM16	Mikuni VM16
STARTING	Electric/Kick Start	Electric/Kick Start	Electric/Kick Start	Electric/Kick Start
BATTERY	GTX5L-BS, 4.85 amp	GTX5L-BS, 4.85 amp	GTX5L-BS, 4.85 amp	GTX5L-BS, 4.85 amp
LUBRICATION	Oil Injection	Oil Injection	Oil Injection	Oil Injection
OIL CAPACITY	1.057 Quarts (1 Liter)	1.057 Quarts (1 Liter)	1.057 Quarts (1 Liter)	1.057 Quarts (1 Liter)
TRANSMISSION	Automatic (C.V.T. System)	Automatic (C.V.T. System)	Automatic (C.V.T. System)	Automatic (C.V.T. System)
FRONT SUSPENSION	A-arm with 4.25″ (10.8 cm) Travel	A-arm with 4.25″ (10.8 cm) Travel	A-arm with 4.25″ (10.8 cm) Travel	A-arm with 4.25″ (10.8 cm) Travel
REAR SUSPENSION	Single Shock/Swing Arm with 4.25″ (10.8 cm) Travel	Single Shock/Swing Arm with 4.25″ (10.8 cm) Travel	Single Shock/Swing Arm with 4.25″ (10.8 cm) Travel	Single Shock/Swing Arm with 4.25″ (10.8 cm) Travel
FRONT BRAKE	Drum	Drum	Drum	Drum
REAR BRAKE	Drum	Drum	Drum	Drum
PARKING BRAKE	Mechanical Lock	Mechanical Lock	Mechanical Lock	Mechanical Lock
FRONT TIRES	16x8-7	18x7-7	18x7-7	19x7-8
REAR TIRES	16x8-7	18x9.5-8	18x9.5-8	18x9.5-8
TIRE PRESSURE	2 psi	3 psi	3 psi	3 psi
OVERALL DIMENSIONS	54.6x34x34.7″ (138.7x86.3x88.2 cm)	57x35.75x36″ (145x91x91.8 cm)	57x35.75x36″ (145x91x91.8 cm)	57x35.75x36″ (145x91x91.8 cm)
WHEELBASE	35.4″ (90 cm)	38.5″ (98 cm)	38.5″ (98 cm)	38.5″ (98 cm)
TURNING RADIUS	74.8″ (190 cm)	98.4″ (250 cm)	98.4″ (250 cm)	98.4″ (250 cm)
SEAT HEIGHT	22.5″ (57 cm)	24.5″ (62 cm)	24.5″ (62 cm)	24.5″ (62 cm)
GROUND CLEARANCE	3″ (8 cm)	4″ (10 cm)	4″ (10 cm)	5″ (12 cm)
DRY WEIGHT	211.6 lbs. (96 kg)	233.7 lbs. (106 kg)	233.7 lbs. (106 kg)	238.1 lbs. (108 kg)
MAX. LOAD CAPACITY	100 lbs. (45.4 kg)	160 lbs. (72 kg)	160 lbs. (72 kg)	190 lbs. (86 kg)
FUEL REQUIREMENTS	87 Octane Unleaded	87 Octane Unleaded	87 Octane Unleaded	87 Octane Unleaded
FUEL CAPACITY	1.32 Gallons (5 Liters)	1.32 Gallons (5 Liters)	1.32 Gallons (5 Liters)	1.32 Gallons (5 Liters)
FRONT RACK CAPACITY	N/A	N/A	N/A	10 lbs. (4.54 kg)*
REAR RACK CAPACITY	N/A	N/A	N/A	20 lbs. (9.08 kg)*

NOTE: * Check owner's manual for loading requirements and restrictions.** **Specification is reference only - not adjustable.**

PUBLICATION NUMBERS

Model	Model No.	Owner's Manual PN	Parts Manual PN	Parts Micro Fiche PN
Scrambler 50	A03EA05	9917873	9917875	9917876
Sportsman 90	A03FA09	9917873	9917885	9917886
Scrambler 90	A03EA09	9917873	9917880	9917881
Predator 90	A03KA09	9918312	9918313	9918314

When ordering service parts be sure to use the correct parts manual.

PAINT CODES

PAINTED PART	COLOR DESCRIPTION	DITZLER NUMBER	POLARIS NUMBER
Scrambler 50 Springs	Yellow	N/A	P-216
Sportsman 90 Springs	Medium Gloss Black	9440	P-067
Scrambler 90 Springs	Yellow	N/A	P-216
Predator 90 Springs	Indy Red	N/A	P-293
Frame - All	Medium Gloss Black	9440	P-067

Order direct from Midwest Industrial Coatings (952-242-2000).

INSPECTION SCHEDULE

Service Item	Initial Service (After two weeks)	Monthly	Every 6 Months	Yearly
Air Cleaner		C		
Fuel Filter			I	
Fuel/Oil Lines		I		
Battery		I		I
Brake Shoes			I	
Spark Plug			I	
Chain Lubrication		I		
Steering Lubrication		I		
Carburetor			C	
Throttle Control		I		
Tire Pressure		I		
Fasteners		T		
Gear Oil	R			R

R = Replace C = Clean T =Tighten I = Inspect

NOTE: Inspection schedules are for reference only. If the vehicle is used often, more frequent inspections will be required.

STANDARD TORQUE SPECIFICATIONS

The following torque specifications are to be used as a general guideline. There are exceptions in the steering, suspension, and engine areas. Always consult the exploded views in each manual section for torque values of fasteners before using standard torque.

FASTENER	TORQUE (ft.lbs. / in.lbs.)	TORQUE (Nm)
5 mm bolts and nuts	39-52 in.lbs.	4.5-6 Nm
6 mm bolts and nuts	69-104 in.lbs.	8-12 Nm
8 mm bolts and nuts	13-18 ft.lbs	18-25 Nm
10 mm bolts and nuts	22-29 ft.lbs.	30-40 Nm
12 mm bolts and nuts	36-43 ft.lbs.	50-60 Nm
4 mm screws	22-30 in.lbs.	2.5-3.4 Nm
5 mm screws	30-43 in.lbs.	3.5-5 Nm
6 mm Hex bolts	87-121 in.lbs.	10-14 Nm
8 mm Hex bolts	17-22 ft.lbs.	24-30 Nm
10 mm Hex bolts	25-32 ft.lbs.	35-45 Nm

SPECIAL TOOLS

DESCRIPTION	PART NUMBER
Crankshaft Removal Tool	**0450697**
Flywheel Puller	**PA-45153**
Oil Pump Drive Gear Removal Tool	**0450699**
Crankcase Separating Tool	**0450700**
Shock Spanner Wrench	**2870872**
Shock Spring Compressor Tool	**2870623**
Battery Charger	**PV-37453**

NOTE: Special tools can be ordered by Polaris Dealers only through SPX Corporation at (800) 328-6657.

POLARIS LUBRICANT AND MAINTENANCE PRODUCTS

Part No.	Description
Engine Lubricant	
2870791	Fogging Oil
2871098	Premium 2 Cycle Engine Oil (Quart)
2871097	Premium 2 Cycle Engine Oil (Gallon)
2871240	Premium 2 Cycle Engine Oil (2.5 Gallon)
2871566	Premium 2 Cycle Engine Oil (16 Gallon)
2871385	Premium 2 Cycle Engine Oil (30 Gallon)
2871240	Premium 2 Cycle Engine Oil (55 Gallon)
2871721	Premium Gold 2 Cycle Synthetic Lubricant (Quart)
2871722	Premium Gold 2 Cycle Synthetic Lubricant (Gallon)
Gearcase / Transmission Lubricants	
2871477	Premium Synthetic Gearcase Lubricant (1 Gal.)
2871478	Premium Synthetic Gearcase Lubricant (12 oz.. bottle)
2870465	Oil Pump for Gearcase Oil
Grease / Specialized Lubricants	
2871322	Premium All Season Grease (3 oz.. cartridge)
2871423	Premium All Season Grease (14 oz.. cartridge)
2871460	Starter Drive Grease
2871312	Chain Lube (6.25 oz.)
2871312	Grease Gun Kit
2871329	Nyogel™ Grease
Additives / Sealants / Thread Locking Agents / Misc.	
2871326	Premium Carbon Clean 12 oz..
2870652	Fuel Stabilizer 16 oz..

CONVERSION TABLE

Unit of Measure	Multiplied by	Converts to
ft. lbs.	x 12	= in. lbs.
in. lbs.	x .0833	= ft. lbs.
ft. lbs.	x 1.356	= Nm
in. lbs.	x .0115	= kg-m
Nm	x .7376	= ft.lbs.
kg-m	x 7.233	= ft. lbs.
kg-m	x 86.796	= in. lbs.
kg-m	x 10	= Nm
in.	x 25.4	= mm
mm	x .03937	= in.
in.	x 2.54	= cm
mile (mi.)	x 1.6	= km
km	x .6214	= mile (mi.)
Ounces (oz)	x 28.35	= Grams (g)
Fluid Ounces (fl. oz.)	x 29.57	= Cubic Centimeters (cc)
Cubic Centimeters (cc)	x .03381	= Fluid Ounces (fl. oz.)
Grams (g)	x 0.035	= Ounces (oz)
lb.	x .454	= kg
kg	x 2.2046	= lb.
Cubic inches (cu in)	x 16.387	= Cubic centimeters (cc)
Cubic centimeters (cc)	x 0.061	= Cubic inches (cu in)
Imperial pints (Imp pt)	x 0.568	= Liters (l)
Liters (l)	x 1.76	= Imperial pints (Imp pt)
Imperial quarts (Imp qt)	x 1.137	= Liters (l)
Liters (l)	x 0.88	= Imperial quarts (Imp qt)
Imperial quarts (Imp qt)	x 1.201	= US quarts (US qt)
US quarts (US qt)	x 0.833	= Imperial quarts (Imp qt)
US quarts (US qt)	x 0.946	= Liters (l)
Liters (l)	x 1.057	= US quarts (US qt)
US gallons (US gal)	x 3.785	=Liters (l)
Liters (l)	x 0.264	= US gallons (US gal)
Pounds - force per square inch (psi)	x 6.895	= Kilopascals (kPa)
Kilopascals (kPa)	x 0.145	= Pounds - force per square inch (psi)
Kilopascals (kPa)	x 0.01	= Kilograms - force per square cm
Kilograms - force per square cm	x 98.1	= Kilopascals (kPa)
π (3.14) x R^2 x H (height)		= Cylinder Volume

TEMPERATURE CONVERSION °C to °F: 9 (°C + 40) ÷ 5 - 40 = °F

°F to °C: 5 (°F + 40) ÷ 9 - 40 = °C

SAE TAP DRILL SIZES

Thread Size/Drill Size		Thread Size/Drill Size	
#0-80	3/64	1/2-13	27/64
#1-64	53	1/2-20	29/64
#1-72	53	9/16-12	31/64
#2-56	51	9/16-18	33/64
#2-64	50	5/8-11	17/32
#3-48	5/64	5/8-18	37/64
#3-56	45	3/4-10	21/32
#4-40	43	3/4-16	11/16
#4-48	42	7/8-9	49/64
#5-40	38	7/8-14	13/16
#5-44	37	1-8	7/8
#6-32	36	1-12	59/64
#6-40	33	1 1/8-7	63/64
#8-32	29	1 1/8-12	1 3/64
#8-36	29	1 1/4-7	1 7/64
#10-24	24	1 1/4-12	1 11/64
#10-32	21	1 1/2-6	1 11/32
#12-24	17	1 1/2-12	1 27/64
#12-28	4.6mm	1 3/4-5	1 9/16
1/4-20	7	1 3/4-12	1 43/64
1/4-28	3	2-4 1/2	1 25/32
5/16-18	F	2-12	1 59/64
5/16-24	I	2 1/4-4 1/2	2 1/32
3/8-16	O	2 1/2-4	2 1/4
3/8-24	Q	2 3/4-4	2 1/2
7/16-14	U	3-4	2 3/4
7/16-20	25/64		

METRIC TAP DRILL SIZES

Tap Size	Drill Size	Decimal Equivalent	Nearest Fraction
3 x .50	#39	0.0995	3/32
3 x .60	3/32	0.0937	3/32
4 x .70	#30	0.1285	1/8
4 x .75	1/8	0.125	1/8
5 x .80	#19	0.166	11/64
5 x .90	#20	0.161	5/32
6 x 1.00	#9	0.196	13/64
7 x 1.00	16/64	0.234	15/64
8 x 1.00	J	0.277	9/32
8 x 1.25	17/64	0.265	17/64
9 x 1.00	5/16	0.3125	5/16
9 x 1.25	5/16	0.3125	5/16
10 x 1.25	11/32	0.3437	11/32
10 x 1.50	R	0.339	11/32
11 x 1.50	3/8	0.375	3/8
12 x 1.50	13/32	0.406	13/32
12 x 1.75	13/32	0.406	13/32

DECIMAL EQUIVALENTS

1/64 0156
1/32 . . . . . .0312 . . . 1 mm = .0394″
3/64 0469
1/16 0625
5/64 . . . . . .0781 . . . 2 mm = .0787″
3/32 0938
7/64 . . . . . .1094 . . . 3 mm = .1181″
1/8. 1250
9/64 1406
5/32 . . . . . .1563 . . . 4 mm = .1575″
11/64 1719
3/16 . . . . . .1875 . . . 5 mm = .1969″
13/64 2031
7/32 2188
15/64 . . . . . .2344 . . . 6 mm = .2362″
1/4 25
17/64 . . . . . .2656 . . . 7 mm = .2756″
9/32 2813
19/64 2969
5/16 . . . . . .3125 . . . 8 mm = .3150″
21/64 3281
11/32 . . . . . .3438 . . . 9 mm = .3543″
23/64 3594
3/8 375
25/64 . . . . . .3906 . . . 10 mm = .3937″
13/32 4063
27/64 . . . . . .4219 . . . 11 mm = .4331″
7/16 4375
29/64 4531
15/32 . . . . . .4688 . . . 12 mm = .4724″
31/64 4844
1/2 . . . . .5 . . . . . 13 mm = .5118
33/64 5156
17/32 5313
35/64 . . . . . .5469 . . . 14 mm = .5512″
9/16 5625
37/64 . . . . . .5781 . . . 15 mm = .5906″
19/32 5938
39/64 6094
5/8 . . . . .625 . . . . . 16 mm = .6299″
41/64 6406
21/32 . . . . . .6563 . . . 17 mm = .6693″
43/64 6719
11/16 6875
45/64 . . . . . .7031 . . . 18 mm = .7087″
23/32 7188
47/64 . . . . . .7344 . . . 19 mm = .7480″
3/4 75
49/64 7656
25/32 . . . . . .7813 . . . 20 mm = .7874″
51/64 7969
13/16 . . . . . .8125 . . . 21 mm = .8268″
53/64 8281
27/32 8438
55/64 . . . . . .8594 . . . 22 mm = .8661″
7/8 875
57/64 . . . . . .8906 . . . 23 mm = .9055″
29/32 9063
59/64 9219
15/16 . . . . . .9375 . . . 24 mm = .9449″
61/64 9531
31/32 . . . . . .9688 . . . 25 mm = .9843
63/64 9844
1 . . . . . 1.0

GLOSSARY OF TERMS

ABDC: After bottom dead center.
ACV: Alternating current voltage.
Alternator: Electrical generator producing voltage alternating current.
ATDC: After top dead center.
BBDC: Before bottom dead center.
BDC: Bottom dead center.
BTDC: Before top dead center.
CC: Cubic centimeters.
Center Distance: Distance between center of crankshaft and center of driven clutch shaft.
Chain Pitch: Distance between chain link pins (No. 35 = 3/8″ or 1 cm). Polaris measures chain length in number of pitches.
Crankshaft Run-Out: Run-out or "bend" of crankshaft measured with a dial indicator while crankshaft is supported between centers on V blocks or resting in crankcase. Measure at various points especially at PTO.
DCV: Direct current voltage.
Electrical Open: Open circuit. An electrical circuit which isn't complete.
Electrical Short: Short circuit. An electrical circuit which is completed before the current reaches the intended load. (i.e. a bare wire touching the chassis).
End Seals: Rubber seals at each end of the crankshaft.
Engagement RPM: Engine RPM at which the drive clutch engages to make contact with the drive belt.
ft.: Foot/feet.
Foot Pound: Ft. lb. A force of one pound at the end of a lever one foot in length, applied in a rotational direction.
g: Gram. Unit of weight in the metric system.
gal.: Gallon.
ID: Inside diameter.
in.: Inch/inches.
Inch Pound: In. lb. 12 in. lbs. = 1 ft. lb.
kg/cm^2 : Kilograms per square centimeter.
kg-m: Kilogram meters.
Kilogram/meter: A force of one kilogram at the end of a lever one meter in length, applied in a rotational direction.
l or ltr: Liter.
Left Side: Always referred to based on normal operating position of the driver.
m: Meter/meters.
Mag: Magneto.
Magnetic Induction: As a conductor (coil) is moved through a magnetic field, a voltage will be generated in the windings. Mechanical energy is converted to electrical energy in the stator.
mi.: Mile/miles.
mm: Millimeter. Unit of length in the metric system. 1mm = approximately .040″.
Nm: Newton meters.
OD: Outside diameter.
Ohm: The unit of electrical resistance opposing current flow.
oz.: Ounce/ounces.
Piston Clearance: Total distance between piston and cylinder wall.
psi.: Pounds per square inch.
PTO: Power take off.
qt.: Quart/quarts.
RPM: Revolutions per minute.
Regulator: Voltage regulator. Regulates battery charging system output at approx. 14.5 DCV as engine RPM increases.
Resistance: In the mechanical sense, friction or load. In the electrical sense, ohms. Both result in energy conversion to heat.
Right Side: Always referred to based on normal operating position of the driver.
RPM: Revolutions per minute.
Seized Piston: Galling of the sides of a piston. Usually there is a transfer of aluminum from the piston onto the cylinder wall. Possible causes: 1) improper lubrication; 2) excessive temperatures; 3) insufficient piston clearance; 4) stuck piston rings.
Stator Plate: The plate mounted under the flywheel supporting the battery charging coils.
TDC: Top dead center. Piston's most outward travel from crankshaft.
Volt: The unit of measure for electrical pressure of electromotive force. Measured by a voltmeter in parallel with the circuit.
Watt: Unit of electrical power. Watts = amperes x volts.
WOT: Wide open throttle.

2003 MODEL YOUTH ATV SPEED RESTRICTION

Per ANSI / SVIA–1–2001 (sec. 6.1.3)
AS DELIVERED TO THE CONSUMER:
The speed of youth models is restricted to under 10 MPH for the 50 cc models and under 15 MPH for the 90 cc models. The dealer **CANNOT**, under any circumstances, either prior to the sale or later, **even at the consumers request**, remove or adjust any speed limiting device These are to be adjusted/removed only by the consumer. Speed limiting devices can only be removed or adjusted **by the consumer** when they determine their child is capable of the additional speed. Per ANSI / SVIA–1–2001 (sec. 6.2) the unrestricted top speed is less than 15 MPH for the 50 cc models and less than 30 MPH for the 90 cc models.

SPEED CONTROL SYSTEMS

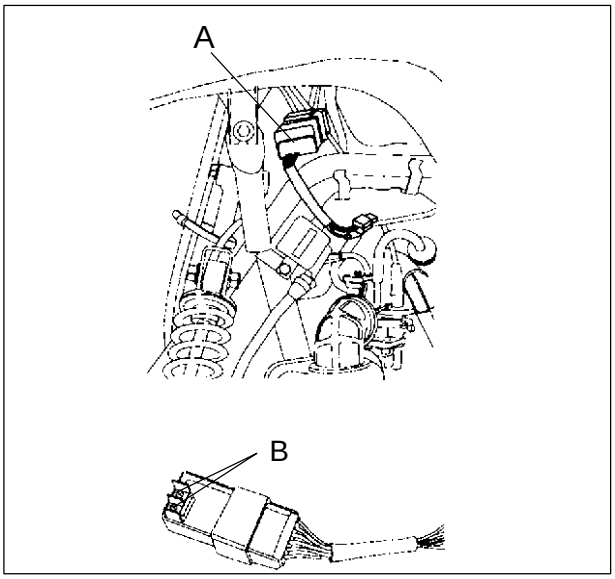
Electronic Speed Control System

Your Polaris ATV is equipped with an electronic speed control system, which controls the engine RPM and speed of the ATV.

Speed can be adjusted by removing or installing the jumper on the CDI (A). With the jumper installed, 50cc models will travel no faster than 10 mph and 90cc models will travel no faster than 15 mph. With the jumper removed, 50cc models will travel no faster than 15 mph and 90cc models will travel no faster than 30 mph.

Jumper Removal and Installation

1. Remove the CDI and its rubber mounting strap from the mounting tab, which is located on the frame bulkhead near the steering post. It can be accessed through the left front fender.
2. Remove the two screws (B) from the jumper to remove or install the jumper. Reinstall the screws.
3. Reinstall the CDI and mounting strap onto the mounting tab.

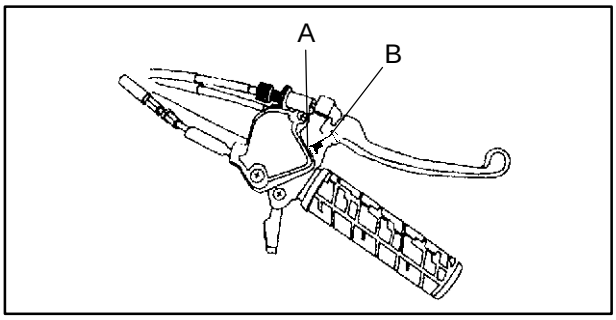


SPEED CONTROL SYSTEMS

Throttle Stop Speed Control System

Adjusting speed at the CDI is the recommended method of speed control, but the throttle stop system may also be used. Use the following procedure to control how far the throttle opens.

1. Loosen the jam nut (A)
2. Turn the screw (B) inward to reduce speed or outward to increase speed.
3. Tighten the jam nut after adjusting.



VEHICLE INSPECTION

FRONT BRAKE

1. Each front brake has a cable connected to the right hand brake lever.

2. Loosen the adjuster nuts at the right hand brake lever. Turn the cable adjuster until the proper brake setting is achieved. Tighten nuts.

Front Brake Lever Free Play:

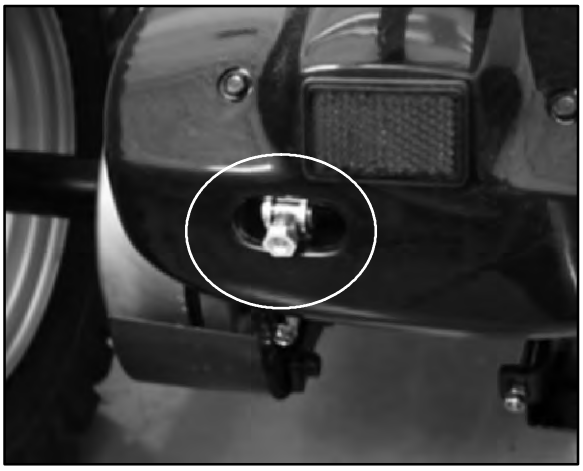
.40-.80″ (10-20 mm)

Front Brake Lever Travel:

50 cc= 1 1/8″ (28 mm)
90 cc = 1 3/4″ (45 mm)

REAR BRAKE

3. The rear brake is operated using the left hand brake lever. To adjust the rear brake setting, turn the rear brake adjuster nut until brake is set to specification.



Rear Brake Lever Free Play:

.40-.80″ (10-20 mm)

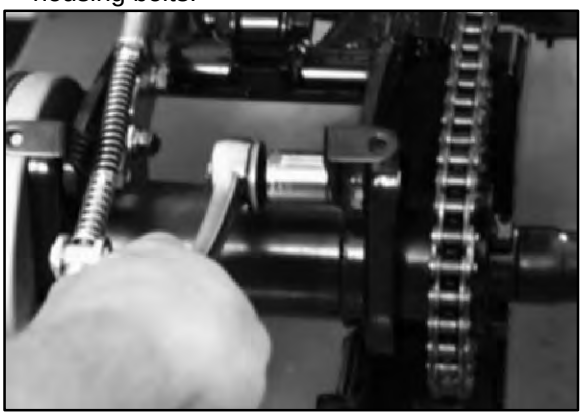
Rear Brake Lever Travel:

50 cc= 1 1/8″ (28 mm)
90 cc = 2 1/2″ (65 mm)

VEHICLE INSPECTION

CHAIN ADJUSTMENT

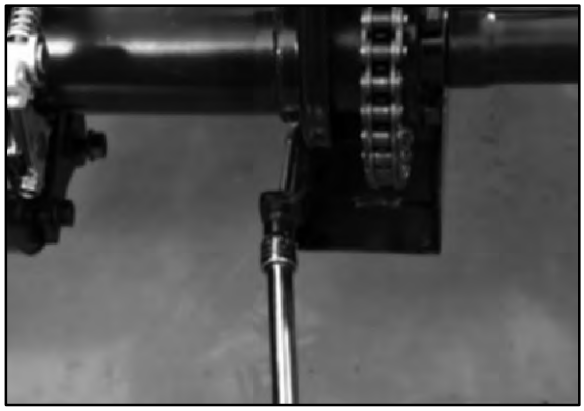
1. Remove the rear cover and loosen the four bearing housing bolts.



Chain Tension Specification:

1/4-1/2″ (10-20 mm) Deflection

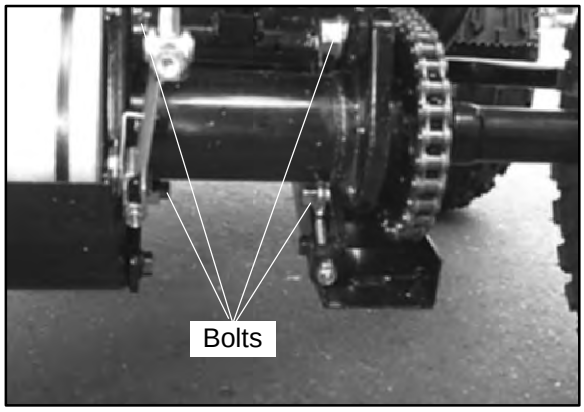
2. Loosen the four bearing housing bolts. Loosen the chain adjuster lock nut. Turn the chain adjuster clockwise until chain is set to specification **1/4"–1/2" (6–12 mm)**. Tighten the chain adjuster lock nut to specification.



Chain Adjuster Lock Nut Torque:

84 in.lbs (9.4 Nm)

3. Tighten the four bearing housing bolts to specification. Re-install rear cover.

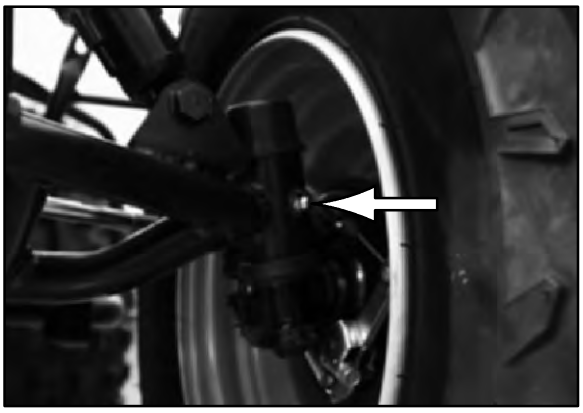


Bearing Housing Bolt Torque:

43 ft.lbs (60 Nm)

LUBRICATION

1. Lubricate grease fittings on spindles monthly with Polaris All Season Grease, or more frequently if used often.

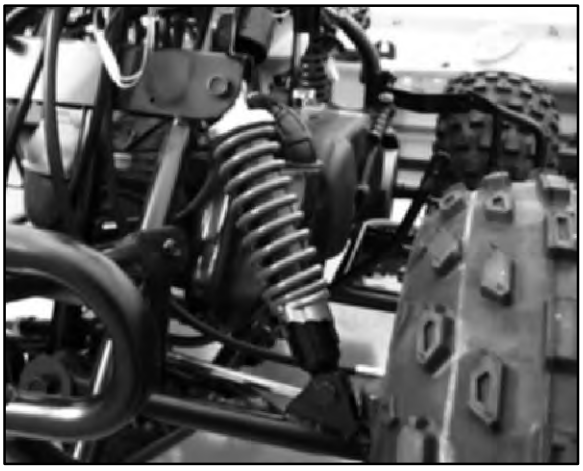


Polaris Premium All Season Grease
14 oz. (PN 2871423)

Grease Gun Kit PN 2871312

FRONT SHOCKS AND SPRINGS

1. Inspect the front shocks and springs to ensure proper function. If the shock is leaking oil, replace. The spring preload can be adjusted on the Sportsman 90 by turning the adjuster nut. Inspect the A-arm and weldments for any sign damage.



REAR SHOCK AND SPRING

1. Inspect the rear shock and spring to ensure proper function. If the shock is leaking oil, replace. Inspect the swing arm and weldments for any sign of damage.

VEHICLE INSPECTION CONT'D

WHEEL NUTS

2. Inspect the front and rear wheel nuts for tightness. Re-torque wheel nuts monthly to specification.

Wheel Nut Torque:

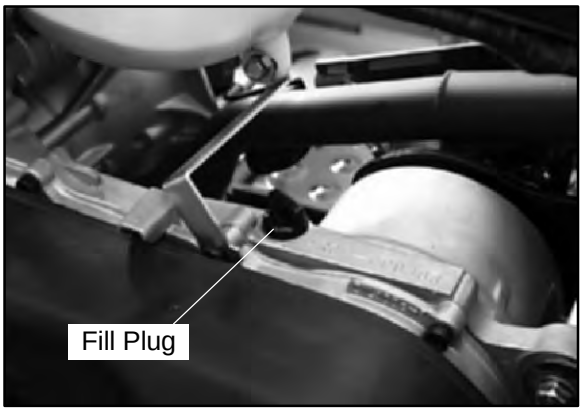
22-29 ft.lbs (30-40 Nm)

TRANSMISSION LUBRICATION

The transmission lubricant level should be checked and changed in accordance with the maintenance schedule.

Remember to:

- Be sure vehicle is level before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.
- Follow instructions to check / change transmission lubricant.



TRANSMISSION SPECIFICATIONS

Specified Lubricant:
Polaris Premium Synthetic Gearcase Lubricant (PN 2871477) (Gallon) (PN 2871478) (12 oz..)

Capacity: 10 fl.oz. / 300 ml
Capacity at Change: ..... 7 oz. / 200ml

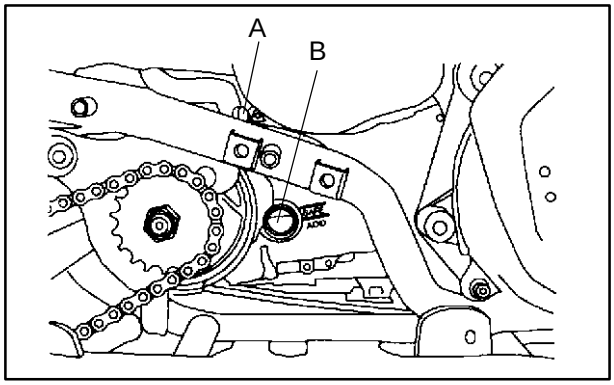
Operating Range: Oil level visible in sight glass safe zone.

Drain Plug Torque:
14 ft. lbs. (19.4 Nm)

To check the level:

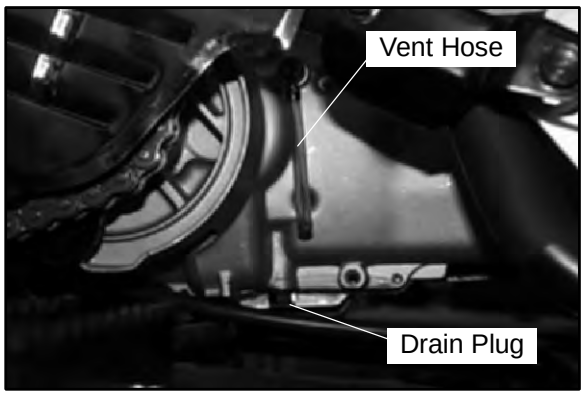
The gearcase fill plug (A) is located on the top of the gearcase. The sight glass (B) is on the right-hand side of the gearcase. The oil level must be maintained in the safe zone of the sight glass. It should be checked monthly and changed annually.

With the ATV on a level surface, check the oil level through the sight glass. If the level is low, add Polaris Premium Synthetic Gearcase Lubricant. See page 1.6 for the part numbers of Polaris-recommended products.



To change lubricant:

1. Place a drain pan beneath the transmission lubricant drain plug area.
2. Remove the drain plug and wipe the magnetic end clean to remove accumulated metallic filings.



3. After the lubricant has drained completely, install a new sealing washer and install the drain plug. Torque to 14 ft. lbs. (19.3 Nm).
4. Add the proper lubricant through the fill plug hole. Do not overfill. An indication of over filling is lubricant leaking from the vent hose after operation.
5. Check for leaks. Discard used lubricant properly.

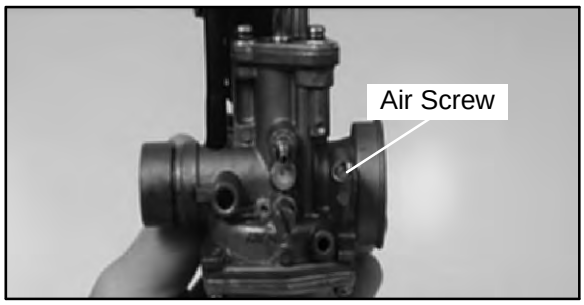
THROTTLE OPERATION

Check for smooth throttle opening and closing. Throttle lever operation should be smooth and lever must return freely without binding.

1. Start the engine and let it idle.
2. Turn handlebars from full right to full left. If idle speed increases at any point in the turning range, inspect throttle cable routing and condition.
3. Replace the throttle cable if worn, kinked, or damaged.

AIR SCREW ADJUSTMENT

1. Turn carburetor air screw in (clockwise) until lightly seated. Back screw out the specified number of turns.



Air Screw Adjustment:
50 cc: 1/2 Turn Out from Lightly Seated
90 cc: 1 Turn Out from Lightly Seated

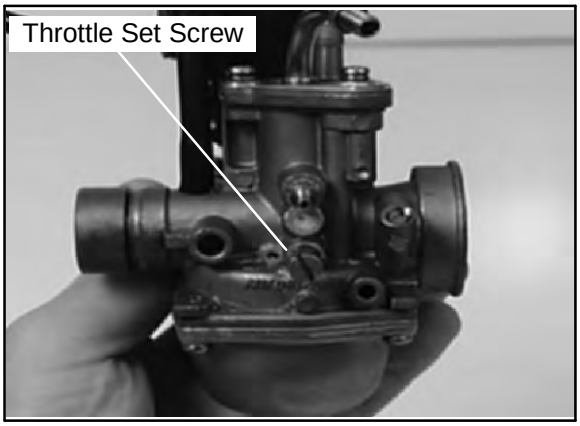
2. Warm up the engine to operating temperature (about 10 minutes).
3. Set idle speed to 800 RPM.

NOTE: Adjusting the air screw may affect idle speed. Always check throttle cable freeplay after adjusting idle speed and adjust if necessary.

4. Turn the screw in (to richen) or out (to lean) the mixture. Adjust air screw for best throttle response and smooth idle.
5. Re-adjust idle speed if necessary.

IDLE SPEED ADJUSTMENT

1. Start engine and warm it up thoroughly.



2. Adjust idle speed by turning the idle adjustment screw in (clockwise) to increase or out (counterclockwise) to decrease RPM.

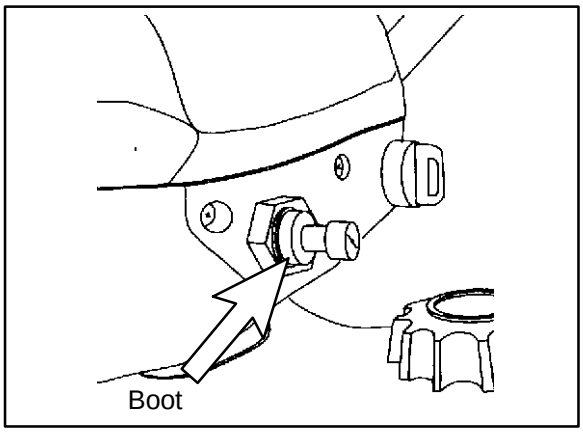
Idle Speed:

800 ± 200 RPM

NOTE: Adjusting the idle speed affects throttle cable freeplay and electronic throttle control (ETC) adjustment. Always check throttle cable freeplay after adjusting idle speed and adjust if necessary.

CHOKE (ENRICHER) ADJUSTMENT

2003 Youth ATVs are fitted with a new manual choke system. Adjust the choke tension by tightening the tensioner located under the rubber boot between the choke knob and nut. Firmly grasp the rubber boot and tighten until the choke slides freely but stays out when pulled.

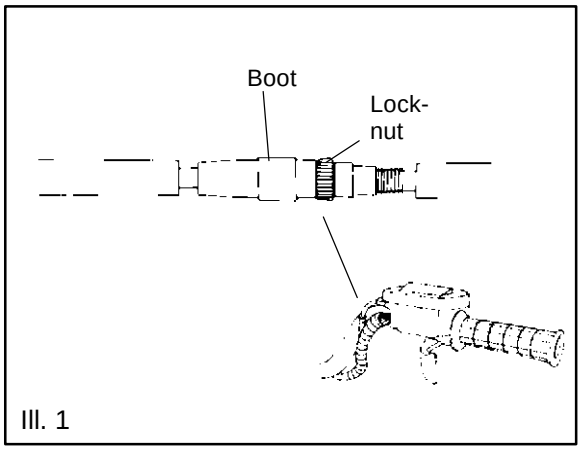


Verify free play of 1/16–3/16" (1.6–4.76 mm) and smooth operation of choke cable.

If smooth choke operation is not obtainable, inspect choke cable for kinks or sharp bends in routing.

THROTTLE CABLE / ELECTRONIC THROTTLE CONTROL (ETC SWITCH) ADJUSTMENT

1. Slide boot off throttle cable adjuster and jam nut.



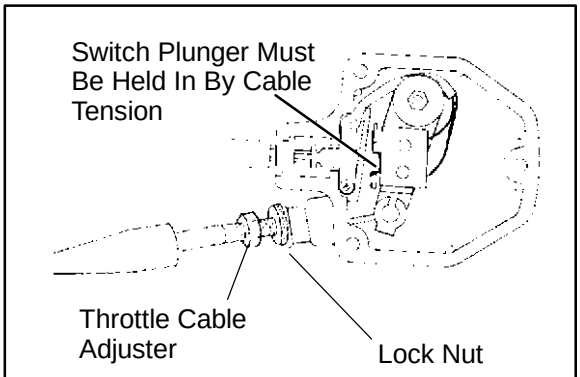
Ill. 1

2. Set parking brake.

3. Start engine and set idle to specified RPM.

NOTE: Be sure the engine is at operating temperature. See Idle Speed Adjustment.

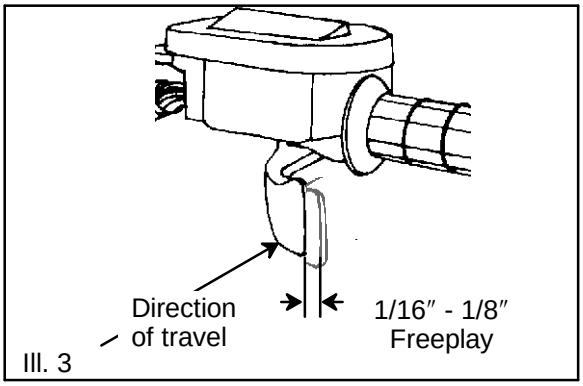
4. Loosen lock nut on in-line cable adjuster (Ill. 1).
5. Turn cable adjuster out until engine RPM begins to increase.
6. Turn cable adjuster back in until throttle lever has 1/16″ (.16 cm) of travel before engine RPM increases.
7. Tighten lock nut securely and slide boot completely in place to ensure a water-tight seal.



Ill. 2

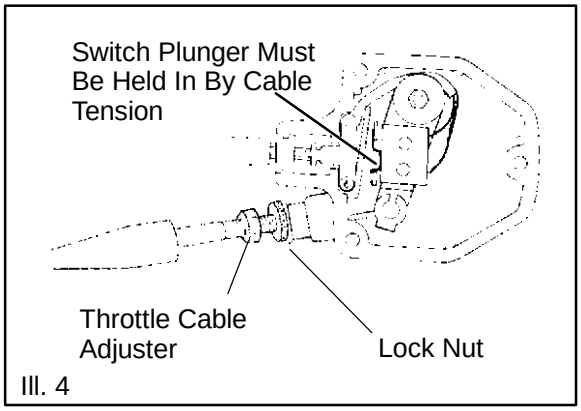
NOTE: Be sure ETC switch plunger is held inward by throttle cable tension (see Ill. 2).

NOTE: Whenever throttle cable adjustments are made, always check oil pump adjustment and re-adjust if necessary.



Ill. 3

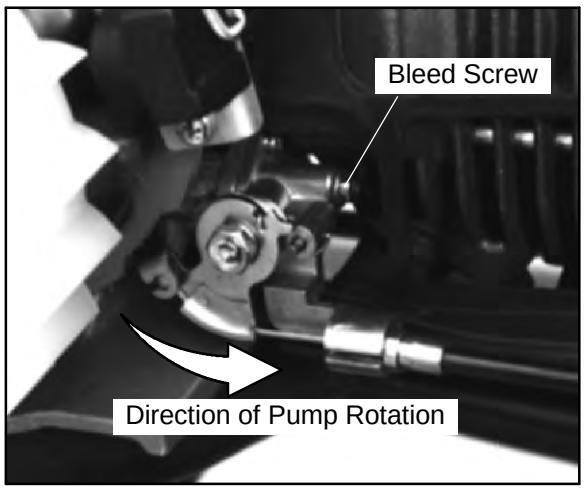
8. Turn handlebars from left to right through the entire turning range. If idle speed increases, check for proper cable routing. If cable is routed properly and in good condition, repeat adjustment procedure.



Ill. 4

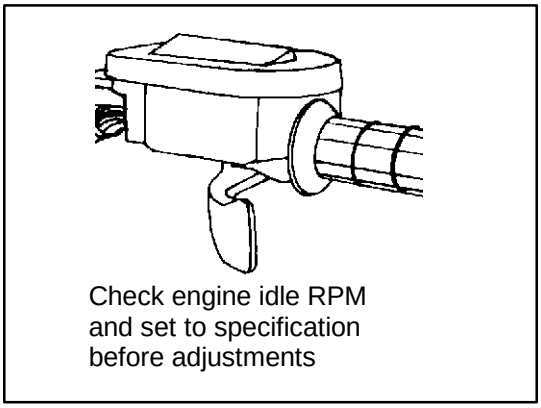
OIL PUMP BLEEDING

1. Fill the oil reservoir with Polaris injector oil.
2. Loosen the pump bleed screw one full turn. Allow oil to flow from the bleed screw for five to ten seconds. Tighten bleed screw.
   CAUTION: Never run the engine with the bleed screw loose. Loss of oil will cause serious engine damage.
3. Start the engine and turn the oil pump lever or reel to its full up (open) position. Allow engine to idle with the lever in this position for 10 to 20 seconds to make sure all air is purged out of the system.



OIL PUMP ADJUSTMENT PROCEDURE

1. Before adjusting the oil pump, check engine idle RPM and set to specification. Adjust if necessary.


Check engine idle RPM and set to specification before adjustments

2. Check and adjust throttle lever free play (ETC switch).
3. Apply parking brake.
4. Remove fan shroud.
5. Start the engine and let it idle.
6. Keep away from moving fan.
7. Place very slight pressure on the throttle lever until all freeplay is removed from throttle cable to carburetor (to the point where the carb slide is just starting to rise and engine RPM begins to increase).
8. Expose oil pump adjuster. Loosen lock nut and turn adjuster in or out until all freeplay is removed from oil pump cable (the point where the oil pump arm is just starting to move off of its stop).

NOTE: The pump stop keeps the pump arm from rotating any farther down than the idle position so no visual alignment of marks is necessary.

9. Replace oil pump adjuster covers.

OIL PUMP TROUBLESHOOTING PROCEDURE

To verify oil delivery to engine, proceed as follows:

Premix fuel in tank at a 40:1 fuel/oil ratio.

With the oil reservoir full and the pump bled, remove the oil delivery line from the intake manifold.

Test the oil delivery check valve with a low pressure pump and gauge.

Start engine and lift oil pump lever to full open position.

Oil should pulse from the delivery line every few seconds. If it does not, suspect one of the following:

A. Oil line plugged

B. Oil line leaking or blocked

C. Faulty oil pump or drive mechanism

D. Air in oil Lines

E. Insufficient/Improper oil in oil tank

FUEL SYSTEM

⚠ WARNING

Gasoline is extremely flammable and explosive under certain conditions.

⚠ Always stop the engine and refuel outdoors or in a well ventilated area.

⚠ Do not smoke or allow open flames or sparks in or near the area where refueling is performed or where gasoline is stored.

⚠ Do not overfill the tank. Fill the tank to the bottom of the filler neck. This will allow for thermal expansion.

⚠ If you get gasoline in your eyes or swallow gasoline, see your doctor immediately.

⚠ If you spill gasoline on your skin or clothing, immediately wash it off with soap and water and change clothing.

⚠ Never start the engine or let it run in an enclosed area. Gasoline powered engine exhaust fumes are poisonous, causing loss of consciousness and death in a short time.

⚠ Never drain the float bowl when the engine is hot. Severe burns may result.

FUEL LINES

1. Check fuel lines for signs of wear, deterioration, damage or leakage. Replace if necessary.
2. Be sure fuel lines are routed properly and secured with cable ties. **CAUTION:** Make sure lines are not kinked or pinched.
3. Replace all fuel lines every two years.

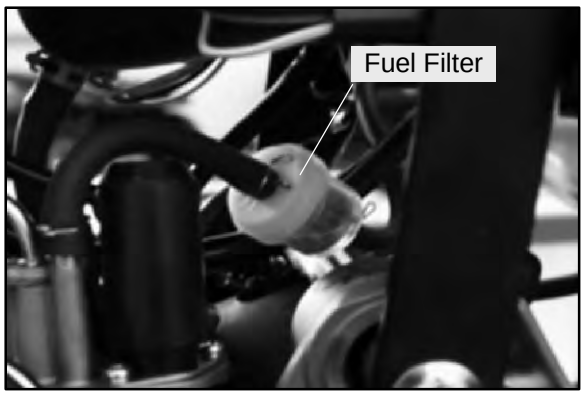
VENT LINES

1. Check fuel tank, carburetor,and transmission vent lines for signs of wear, deterioration, damage or leakage. Replace every two years.
2. Be sure vent lines are routed properly and secured with cable ties. **CAUTION:** Make sure lines are not kinked or pinched.

FUEL FILTER

The 2003 youth models have been upgraded to a molded-in screen type fuel filter.

The fuel filter should be replaced in accordance with the Periodic Maintenance Chart or whenever sediment is visible in the filter.



To service the fuel filter:

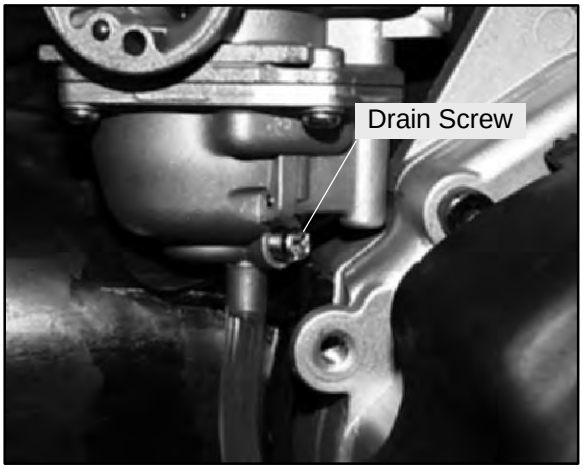
1. Shut off fuel supply at fuel valve.
2. Remove line clamps at both ends of the filter.
3. Remove fuel lines from filter.
4. Install new filter and clamps onto fuel lines.
5. Turn fuel valve **ON**.
6. Start engine and inspect for leaks.

OIL TANK

The oil tank cap is located under the seat. The tank cap is threaded for positive sealing and eases installation. Periodically check the level of the oil tank. Use Premium 2 Cycle Engine Oil when filling the tank.

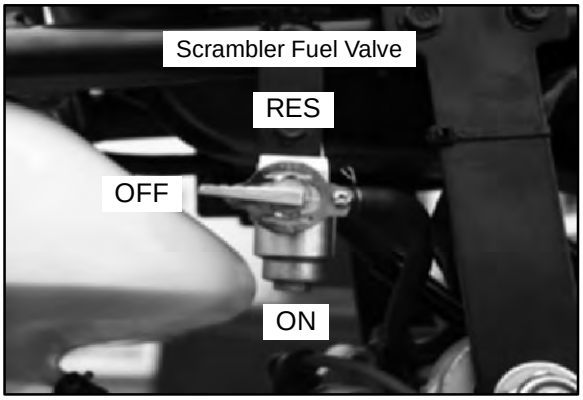
CARBURETOR DRAINING

The carburetor float bowl should be drained periodically to remove moisture or sediment from the bowl, or before extended periods of storage.



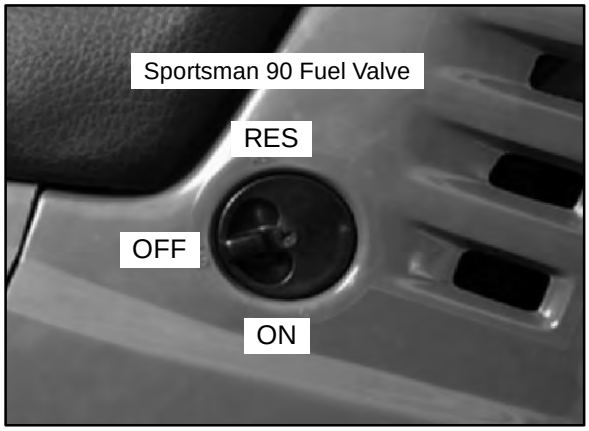
NOTE: Drain plug is located on the side of the float bowl.

1. Turn fuel valve to the off position.
2. Place a container beneath the bowl drain spigot or bowl drain hose.
3. Loosen drain screw and allow fuel in the float bowl and fuel line to drain completely.
4. Inspect the drained fuel for water or sediment.
5. Tighten drain screw.
6. Turn fuel valve to “ON”.



7. Check for fuel leaks.

8. Start engine and re-check for leaks.



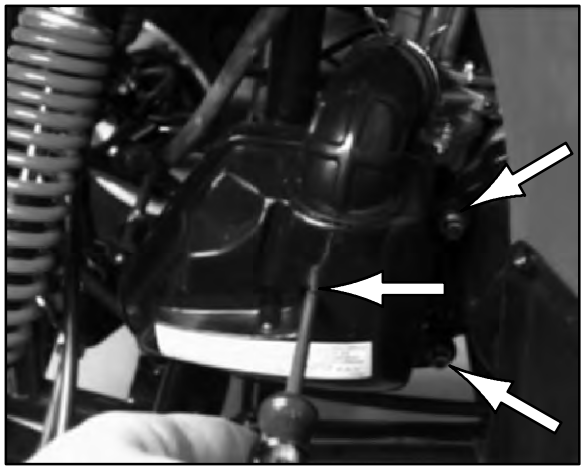
COMPRESSION TEST

1. Remove spark plug and install compression tester.
2. Connect high tension lead to a good ground on engine.
3. Open throttle and crank engine until maximum reading is obtained (approximately 3–5 seconds).

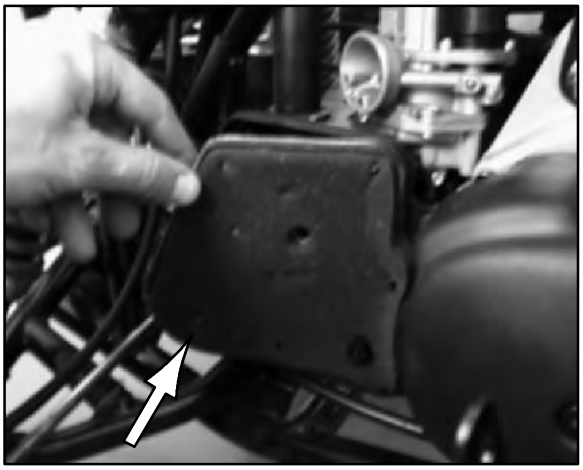
Cylinder Compression: 0–1000 ft (0–300m)	
50 cc models:	130–135 psi
90 cc models:	110–130 psi

AIR FILTER SERVICE

1. Remove three (3) screws on the airbox. Slide carburetor boot clamp off of carburetor.



2. Remove the airbox cover to expose the filter element.



3. Carefully wash the element in soapy water and dry it. Replace filter if necessary.
4. Lightly grease the sealing surfaces of the air filter cover. Install cover.
5. Install three (3) screws and boot clamp.

WHEELS

Inspect all wheels for runout or damage. Check wheel bolts and ensure they are tight. Do not over tighten the wheel bolts.

WHEEL, HUB, AND SPINDLE TORQUE TABLE

Item	Specification
Front Wheel Bolts	22-29 Ft. Lbs. (30-40 Nm)
Rear Wheel Bolts	22-29 Ft. Lbs. (30-40 Nm)
Front Spindle Nut	42-45 Ft. Lbs. (58-62 Nm)
Rear Hub Retaining Nut	78-81 Ft. Lbs. (108-112 Nm)

WHEEL REMOVAL FRONT/REAR

1. Stop the engine and lock the parking brake.
2. Loosen the wheel bolts slightly.
3. Elevate the side of the vehicle by placing a suitable stand under the footrest frame.
4. Remove the wheel nuts and remove the wheel.

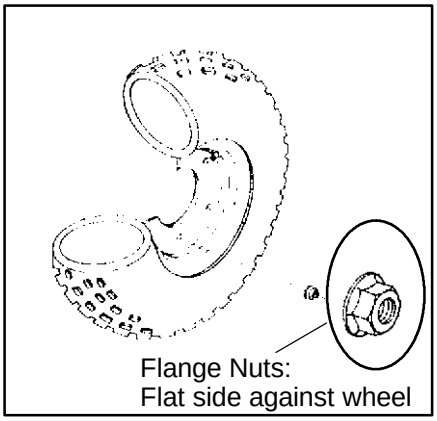
WHEEL INSTALLATION

1. With the transmission in gear and the parking brake locked, place the wheel in the correct position on the wheel hub. Be sure the valve stem is toward the outside and rotation arrows on the tire point toward forward rotation.

2. Attach the wheel nuts and finger tighten them.
3. Lower the vehicle to the ground.
4. Securely tighten the wheel nuts to the proper torque listed in the table on page 1.6.

CAUTION:

If wheels are improperly installed it could affect vehicle handling and tire wear.



TIRE PRESSURE

Tire Pressure Inspection (PSI - Cold)	
Front	**Rear**
2 (Scrambler 50)	2 (Scrambler 50)
3 (Scrambler 90)	3 (Scrambler 90)
3 (Sportsman 90)	3 (Sportsman 90)
3 (Predator 90)	3 (Predator 90)

⚠ WARNING

Operating an ATV with worn tires will increase the possibility of the vehicle skidding easily with possible loss of control.

Worn tires can cause an accident.

Always replace tires when the tread depth measures 1/8″ (.3 cm) or less.

TIRE INSPECTION

CAUTION:

Maintain proper tire pressure. Refer to the tire pressure warning decal applied to the vehicle.

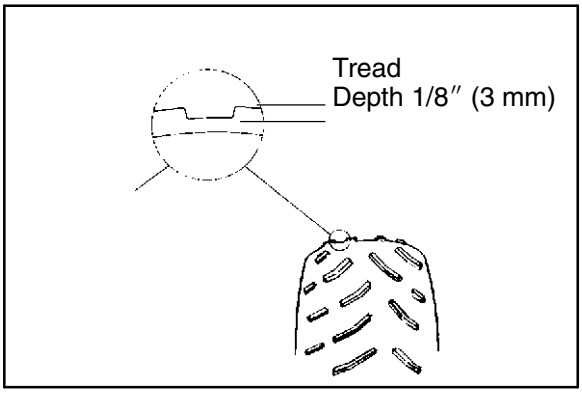
Improper tire inflation may affect ATV maneuverability.

When replacing a tire always use original equipment size and type.

The use of non-standard size or type tires may affect ATV handling.

Tire Tread Depth

Always replace tires when tread depth is worn to 1/8″ (3 mm) or less. See Illustration on next page.



FRAME, NUTS, BOLTS, FASTENERS

Periodically inspect the torque of all fasteners in accordance with the maintenance schedule. Check that all cotter pins are in place. Refer to specific fastener torques listed in each chapter.

CAMBER AND CASTER

The camber and caster are non-adjustable.

STEERING

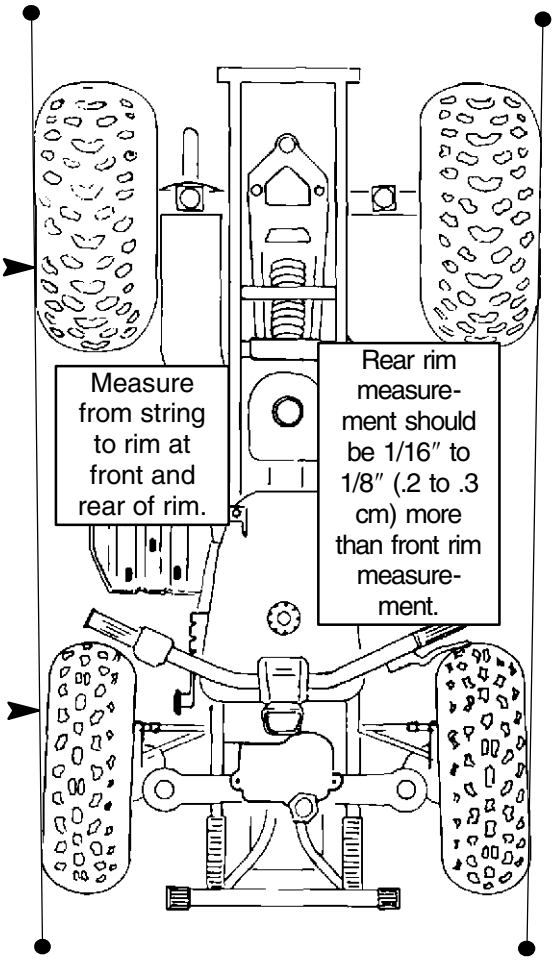
The steering components should be checked periodically for loose fasteners, worn tie rod ends, and damage. Also check to make sure all cotter pins are in place. If cotter pins are removed, they must not be re-used. Always use new cotter pins.

Replace any worn or damaged steering components. Steering should move freely through entire range of travel without binding. Check routing of all cables, hoses, and wiring to be sure the steering mechanism is not restricted or limited. **NOTE:** Whenever steering components are replaced, check front end alignment. Use only genuine Polaris parts.

WHEEL ALIGNMENT METHOD 1: STRAIGHTEDGE OR STRING

Be sure to keep handlebars centered. See notes below.

NOTE: String should just touch side surface of rear tire on each side of machine.

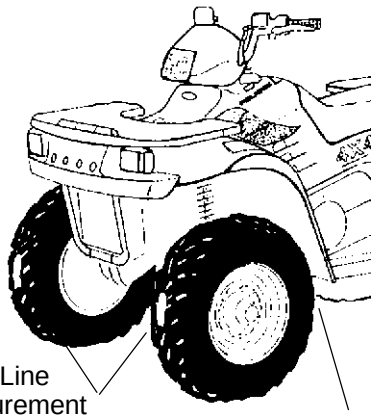


NOTE: The steering post arm “frog” can be used as an indicator of whether the handlebars are straight. The frog should always point straight back from the steering post.

WHEEL ALIGNMENT METHOD 2: CHALK

1. Place machine on a smooth level surface.
2. Set handlebars in a straight ahead position and secure handlebars in this position. **NOTE:** The steering arm "frog" can be used as an indicator of whether the handlebars are straight. The frog should always point straight back from the steering post.
3. Place a chalk mark on the center line of the front tires approximately 10″ (25.4 cm) from the floor or as close to the hub/axle center line as possible. **NOTE:** It is important that the height of both marks be equally positioned in order to get an accurate measurement.
4. Measure the distance between the marks and record the measurement. Call this measurement "A".
5. Rotate the tires 180° by moving vehicle forward or backward. Position chalk marks facing rearward, even with the hub/axle centerline.
6. Again measure the distance between the marks and record. Call this measurement "B". Subtract measurement "B" from measurement "A". The difference between measurements "A" and "B" is the vehicle toe alignment. The recommended vehicle toe tolerance is 1/8″ to 1/4″ (.3 to .6 cm) toe out. This means the measurement at the front of the tire (A) is 1/8″ to 1/4″ (.3 to .6 cm) wider than the measurement at the rear (B).

Ill.1



TOE ALIGNMENT ADJUSTMENT

1. If toe alignment is incorrect, measure the distance between vehicle center and each wheel. This will tell you which tie rod needs adjusting. **NOTE:** Be sure handlebars are straight ahead before determining which tie rod(s) need adjustment.

CAUTION: During tie rod adjustment it is very important that the following precautions be taken when tightening tie rod end jam nuts. If the rod end is positioned incorrectly it will not pivot, and may break.

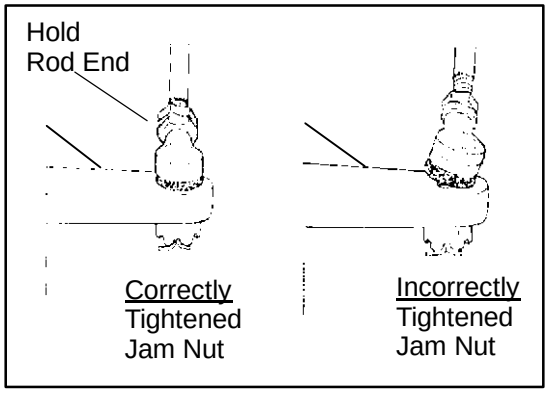
To adjust toe alignment:

old tie rod end to keep it from rotating.

Loosen jam nuts at both end of the tie rod.

Shorten or lengthen the tie rod until alignment is as required to achieve the proper toe setting as specified in Method 1 (1/16″ to 1/8″) or Method 2 (1/8″ to 1/4″).

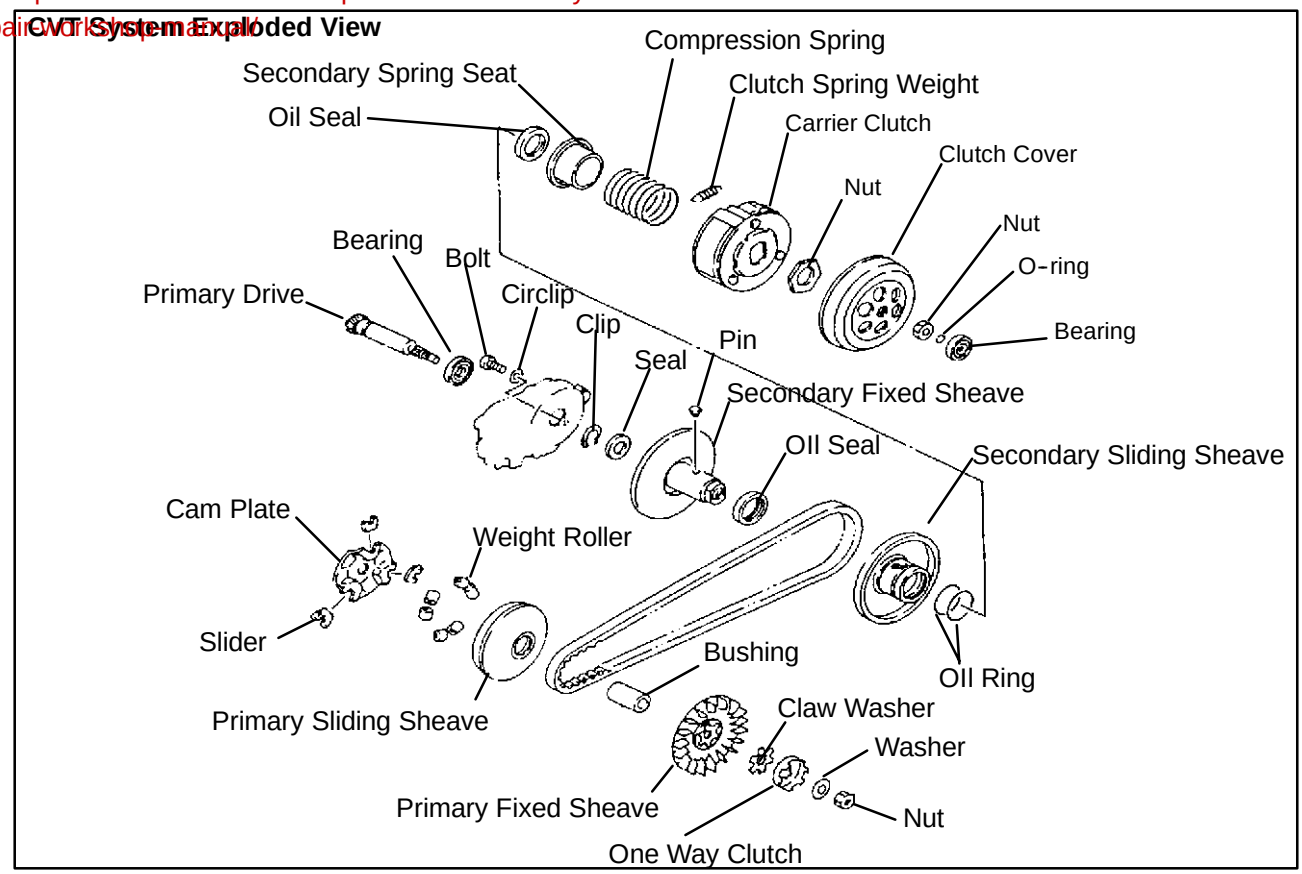
When the tie rod end jam nuts are tightened, be sure to hold tie rod ends so they are parallel with the steering arm or the steering frog, respectively, to prevent rod end damage.



2. After alignment is complete, torque jam nuts to 33-40 ft. lbs. (45-55 Nm).

CHAPTER 2
ENGINE/TRANSMISSION/CVT

CVT System Exploded View



TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS	
Fastener	**Torque**
Carburetor Adaptor	20 in.lbs (2.25 Nm)
Crankcase	86 in.lbs (10 Nm)
Intake Manifold Bolts	108 in.lbs (12 Nm)
Cylinder Head Nuts	14 ft.lbs (19 Nm)
Drive Clutch Nut	29 ft.lbs (39 Nm)
Driven Clutch Nut Torque	25 ft.lbs (34 Nm)
Transmission Cover Bolts	84 in.lbs (9.5 Nm)
Flywheel	25 ft.lbs (34 Nm)
Oil Drain Bolt (Transmission)	14 ft.lbs (19 Nm)
Oil Pump Bolts	43 in.lbs (5 Nm)
Fan Housing	84 in.lbs (9.5 Nm)
Fan Bolts	84 in.lbs (9.5 Nm)
Stator Plate	84 in.lbs (9.5 Nm)
Starter Motor Bolts	84 in.lbs (9.5 Nm)
Spark Plug	11 ft.lbs (15 Nm)

SPECIAL TOOLS

DESCRIPTION	PART NUMBER
Crankshaft Removal Tool	**0450697**
Flywheel Puller	**PA-45153**
Oil Pump Drive Gear Removal Tool	**0450699**
Crankcase Separating Tool	**0450700**

NOTE: Special tools can be ordered by Polaris Dealers only through SPX Corporation at (800) 328-6657.