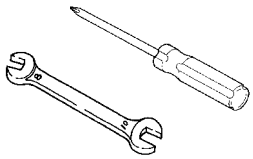
CHAPTER 2
MAINTENANCE



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PERIODIC MAINTENANCE CHART

Inspection, adjustment and lubrication intervals of important components are listed in the following chart. Maintenance intervals are based upon average riding conditions and vehicle speed.

The following symbols denote potential items to be aware of during maintenance:

■= CAUTION: Due to the nature of these adjustments, it is recommended this service be performed by an authorized Polaris dealer.

▶= SEVERE USE ITEM --If vehicle is subjected to severe use, decrease interval by 50%
(Severe Use is defined as frequent vehicle immersion in mud, water or sand, racing or race-style high rpm use, prolonged low speed - heavy load operation or extended idle. More preventative maintenance is required under these conditions. Fluid changes, cable, PVT inspections and chassis lubrication are required more frequently. For engine oil, short trip cold weather riding also constitutes severe use. Pay special attention to oil level. A rising oil level in cold weather can indicate contaminants collecting in the oil sump or crankcase. Change oil immediately and monitor level. If oil level begins to rise, discontinue use and determine cause.)

E= Emission Control System Service (California).

NOTE: Inspection may reveal the need for replacement parts. Always use genuine Polaris parts.

ENGINE / COOLING / CONTROLS							
Item				**Maintenance Interval (Whichever comes first)**			**Remarks**
				Hours	**Calendar**	**Miles (Km)**	
▶		**E**	Engine Oil - Level/Change	100 hrs	6 months	1000 (1600)	Check level pre-ride Break-In service at 1 hour
▶		**E**	Oil Filter	100 hrs	6 months	1000 (1600)	Replace with oil change
▶		**E**	Air Filter - Pre-Filter	Daily	Daily	-	Inspect, clean more often in dirty or wet conditions
▶		**E**	Air Filter - Main Element	Weekly	Weekly	-	Inspect - Replace if necessary
▶			Air Box Sediment Tube	-	Daily	-	Drain deposits whenever visible
▶			Engine Breather Filter	20 hrs	Monthly	200 (320)	Inspect and clean if necessary
▶			Oil Tank Vent Hose	100 hrs	12 months	1000 (1600)	Inspect hose routing /hose condition
		E	Idle Speed	As required	As required	-	Adjust as required
	■	**E**	Valve Clearance	100 hrs	12 months	1000 (1600)	Inspect/Adjust
	■		Throttle Cable / ETC Switch	50 hrs	6 months	500 (800)	Inspect -Adjust, Lubricate, Replace if necessary
			Choke (Enricher) Cable	50 hrs	6 months	500 (800)	Inspect -Adjust, Lubricate, Replace if necessary
			Carburetor Float Bowl	50 hrs	6 months	500 (800)	Drain bowl periodically and prior to storage
			Carburetor Air Intake Ducts/Flange	50 hrs	6 months	500 (800)	Inspect all ducts for proper sealing/air leaks
	■	**E**	Fuel System /Filter	100 hrs	12 months	1000 (1600)	Check for leaks at tank cap, lines, fuel valve, filter, pump & carburetor. Replace lines every 2 years.
			Coolant/Level Inspection (500)	Daily	Daily		Replace engine coolant every 2 years
			Coolant Strength / System Pressure Test (500)	100 hrs	6 months	1000 (1600)	Inspect strength seasonally; Pressure test system annually
▶			Radiator	100 hrs	12 months	1000 (1600)	Inspect / Clean external surfaces
▶			Cooling System Hoses	100 hrs	12 months	1000 (1600)	Pre-ride / Inspect for leaks
▶			Engine Mounts	100 hrs	12 months	1000 (1600)	Pre-ride / Inspect
			Recoil Housing	Weekly	Weekly		Inspect for water and drain More often if operating in wet evironment
			Exhaust Muffler / Pipe	100 hrs	12 months	1000 (1600)	Pre-ride / Inspect

PERIODIC MAINTENANCE CHART CONTEND

ELECTRICAL							
Item				Maintenance Interval (Whichever comes first)			Remarks
		E	Spark Plug	100 hrs	12 months	1000 (1600)	Inspect - Replace if necessary
▶			Wiring	100 hrs	12 months	1000 (1600)	Inspect for abrasion, routing, security. Apply Dielectric grease to connectors that are subjected to water, mud, etc.
	■		Ignition Timing	100 hrs	12 months	1000 (1600)	Inspect
▶			Battery	20 hrs	Monthly	200 (320)	Check terminals; Clean; Test
			Headlight Aim	As required	As required	-	Adjust as Necessary
			Headlamp Inspection	Daily	Daily	-	Check operation daily; Apply dielectric grease whenever lamp is replaced
			Tail Lamp Inspection	Daily	Daily	-	Check operation daily; Apply dielectric grease whenever lamp is replaced

CHASSIS / DRIVETRAIN / SUSPENSION / BRAKE							
Item				Maintenance Interval (Whichever comes first)			Remarks
				Hours	Calendar	Miles (Km)	
▶			General Lubrication	50 hrs	3 months	500 (800)	Lubricate All Fittings, Pivots, Cables, Etc.
▶			Front Hub Bearings	50 hrs	6 months	500 (800)	Clean and Inspect, Replace if necessary
▶			Front Hubs/Fluid Change (Early Models)	100 hrs	12 months	1000 (1600)	
▶			Front Gearcase Lubricant Level	25 hrs	Monthly	250 (400)	Inspect Monthly, Change Annually
▶			Rear Gearcase Lubricant Level	25 hrs	Monthly	250 (400)	Inspect Monthly, Change Annually
▶			Transmission Lubricant Level	25 hrs	Monthly	250 (400)	Inspect Monthly, Change Annually
			Shift Selector Box (Early Models)	200 hrs	24 months	2000 (3200)	Change Lubricant Every Two Years
			Drive Belt	50 hrs	6 months	500 (800)	Inspect - Adjust, Replace if Necessary
	■		Drive and Driven Clutches	100 hrs	12 months	1000 (1600)	Inspect, Clean, Replace Worn Parts
	■		Steering	Pre-ride	Pre-ride	Pre-ride	Inspect Daily, Lubricate
	■		Toe Adjustment	As required	As required	-	Periodic Inspection, Adjust Whenever Parts are Replaced
▶			Front Suspension	Pre-ride	Pre-ride	Pre-ride	Inspect - Lubricate if desired
▶			Rear Suspension	Pre-ride	Pre-ride	Pre-ride	Inspect - Lubricate if desired
			Tires	Pre-ride	Pre-ride	-	Inspect Daily, Pre-Ride Inspection Item
	■		Brake Fluid	200 hrs	24 months	2000 (3200)	Change Every Two Years
▶			Brake Fluid Level	Pre-ride	Pre-ride	-	Inspect Sight Glass / Pre-Ride Inspection Item
▶			Brake Lever Travel	Pre-ride	Pre-ride	-	Inspect Daily / Pre-Ride Inspection Item
▶	■		Brake Pad Wear	10 hrs	Monthly	100 (160)	Inspect Periodically
			Brake Adjustment	As required	As required	-	Inspect Deflection Daily; Adjust as required
			Brake System	Pre-ride	Pre-ride	-	Pre-Ride Inspection Item
			Wheels / Fasteners	Pre-ride	Pre-ride	-	Pre-Ride Inspection Item
			Frame Nuts, Bolts, Fasteners	Pre-ride	Pre-ride	-	Pre-Ride Inspection Item

POLARIS LUBRICANTS,MAINTENANCE AND SERVICE PRODUCTS

Part No.	Description
Engine Lubricant	
2870791	Fogging Oil (12 oz. Aerosol)
2871098	Premium 2 Cycle Engine Oil (Quart) (12 Count)
2871281	Engine Oil (Quart) Premium 4 Synthetic 0W-40 (4-Cycle) (12 Count)
2871844	Engine Oil (Gallon) Premium 4 Synthetic 0W-40 (4-Cycle) (4 Count)
2871567	Engine Oil (16 Gallon) Premium 4 Synthetic 0W-40 (4-Cycle)
Gearcase / Transmission Lubricants	
2873602	AGL Gearcase Lubricant (12 oz. bottle) (12 Count)
2873603	AGL Gearcase Lubricant (1 Gal.) (4 Count)
2871653	Premium ATV Angle Drive Fluid (8 oz.) (12 Count)
2872276	Premium ATV Angle Drive Fluid (2.5 Gal) (2 Count)
2870465	Oil Pump for 1 Gallon Jug
2871654	Premium Drive Hub Fluid (8 oz.) (12 Count)
2872277	Premium Drive Hub Fluid (2.5 gal.) (2 Count)
Grease / Specialized Lubricants	
2871322	Premium All Season Grease (3 oz. cartridge) (24 Count)
2871423	Premium All Season Grease (14 oz. cartridge) (10 Count)
2871460	Starter Drive Grease (12 Count)
2871515	Premium U-Joint Lube (3 oz.) (24 Count)
2871551	Premium U-Joint Lube (14 oz.) (10 Count)
2871312	Grease Gun Kit
2871329	Dielectric Grease (Nyogel™)
Coolant	
2871323	60/40 Coolant (Gallon) (6 Count)
2871534	60/40 Coolant (Quart) (12 Count)

NOTE: Each item can be purchased separately at your local Polaris dealer.

Part No.	Description
Additives / Sealants / Thread Locking Agents / Misc.	
2870585	Loctite™ Primer N, Aerosol, 25 g
2871956	Loctite™ Thread Sealant 565 (50 ml.) (6 Count)
2871949	Loctite™ Threadlock 242 (50 ml.) (10 Count)
2871950	Loctite™ Threadlock 242 (6 ml.) (12 Count)
2871951	Loctite™ Threadlock 262 (50 ml.) (10 Count)
2871952	Loctite™ Threadlock 262 (6 ml.) (12 Count)
2871953	Loctite™ Threadlock 271 (6 ml.) (12 Count)
2871954	Loctite™ Threadlock 271 (36 ml.) (6 Count)
2870584	Loctite™ 680-Retaining Compound (10 ml.)
2870587	Loctite™ 518 Gasket Eliminator / Flange Sealant (50 ml.) (10 Count)
2872113	Disk Brake Quiet (12 oz.) (12 Count)
2871326	Premium Carbon Clean (12 oz.) (12 Count)
2870652	Fuel Stabilizer (16 oz.) (12 Count)
2871957	Black RTV Silicone Sealer (3 oz. tube) (12 Count)
2871958	Black RTV Silicone Sealer (11 oz. cartridge) (12 Count)
2870990	DOT3 Brake Fluid (12 Count)
2872113	Disc Brake Quiet, Aerosol (9 oz.) (12 Count)
2871557	Crankcase Sealant, 3-Bond 1215 (5oz.)
2872893	Engine Degreaser (12oz.) (12 Count)

NOTE: The number count indicated by each part number in the table above indicates the number of units that are shipped with each order.

SPECIAL TOOLS

PART NUMBER	TOOL DESCRIPTION	CHAPTER TOOL USED IN
PA-44689	Valve Clutch Adjuster	2
2872105	Water Pump Mechanical Seal Puller	2
8712100 or 8712500	Tachometer	2,10
2200634	Valve Seat Reconditioning Kit	3
2870390	Piston Support Block	3
2871043	Flywheel Puller	3
2871283	Crankshaft/Water Pump Seal Install Kit	3
5131135	Water Pump Install Kit	3
2870569	Crankshaft Truing Stand	5
2872314	Carburetor Float Adjustment Tool	4
2870975	Mity Vac™ Pressure Test Tool	3, 4, 9
2870871	Ball Joint Replacement Tool	5
2870872	Shock Spanner Wrench	2, 5
2870623	Shock Absorber Spring Compression Tool	5
2871572	Strut Rod Wrench	5
2871573	LH Strut Spring Compressor	5
2871574	RH Strut Spring Compressor	5
7052069	Charging Needle	5
2200421	Gas Shock Recharging Kit	5
2871352	Shock Rod Holding Tool	5
2871351	Fox™ Shock IFP Depth Tool	5
2870506	Clutch Puller	6
9314177	Clutch Holding Wrench	6
2871358	Clutch Holding Fixture	6
2870341	Drive Clutch Spider Removal and Install Tool	6
2870654	Clutch Offset Alignment Tool	6
2870913	Driven Clutch Puller	6
2870910	Roller Pin Tool	6
2871226	Clutch Bushing Replacement Tool Kit	6
2870386	Piston Pin Puller	6
2872292	EBS Clutch Alignment Tool	6
2201379	EBS Bushing Replacement Kit	6
8700220	Clutch Compression Tool	6
2871025	Clutch Bushing Replacement Tool Kit	6
2871199	Seal Sleeve Installation Tool Kit	5, 7
2870888	Hilliard Clutch Garter Spring Installation Tool	7
2872608	Roller Pin Removal Tool	7
8700226	CV Boot Clamp Pliers	7
2871701 (Part of **2871702** Kit)	2 1/8 inch Wrench	8
2871697 (Part of **2871702** Kit)	Center Drive Bushing Tool	8
2871695 (Part of **2871702** Kit)	Backlash Setting Tool	8
2871698 (Part of **2871702** Kit)	Rear Output Seal Driver	8
2871699 (Part of **2871702** Kit)	Rear Driveshaft Seal Guide	8
2871282	Bearing Seal Driver (50 mm)	8
PV-43568	Fluke™ 77 Digital Multimeter	10
2870630	Timing Light	10
2870836	Battery Hydrometer	10

SPECIAL TOOLS, CONT'D

2460761	Hall Sensor Probe Harness	10
2871745	Static Timing Light Harness	10

NOTE: Polaris dealers can order the tools listed above through their Polaris Special Service Tools catalog.

LUBRICATION

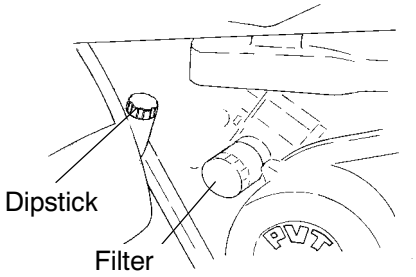
Ill. #	Item	Lube Required	Method	Frequency*
1	**Engine Oil**	Polaris 0W-40 Synthetic (**PN 2871567**)	Add oil to proper level, see procedure.	Change after 1st month, 6 months or 100 hours thereafter; Change more often (25-50 hours) in extremely dirty conditions, or short trip cold weather operation.
2	**Brake Fluid**	Polaris DOT 3 Brake Fluid (**PN 2870990**)	Fill master cylinder reservoir to indicated level inside reservoir.	As required. Change fluid every 2 years.
3	**Transmission (Early 2004 Models**	AGL Gearcase Lubricant (**PN 2873602**)	Add lube to FULL level on dipstick.	Change annually [2]
3.1	**Transmission (Late 2004 Models)**	AGL Gearcase Lubricant (**PN 2873602**)	Add lube to bottom of fill plug hole threads.	Change annually [2]

***** More often under severe use, such as operated in water or under severe loads.

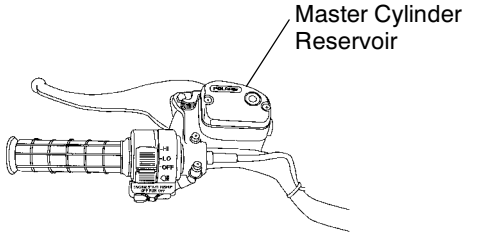
[1] Semi-annually or 50 hours of operation (refer to Maintenance Schedule for additional information)
More often under severe conditions (operating in water or hauling heavy loads)

[2] Annually or 100 hours of operation (refer to Maintenance Schedule for additional information)
More often under severe conditions (operating in water or hauling heavy loads)

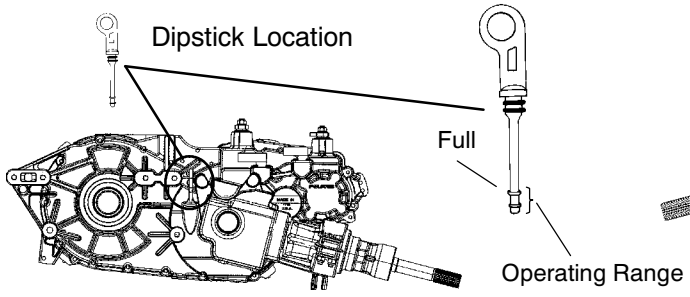
[3] Grease conforming to NLGI No. 2, such as Polaris Premium All Season Grease, Conoco Superlube M or Mobilegrease Special



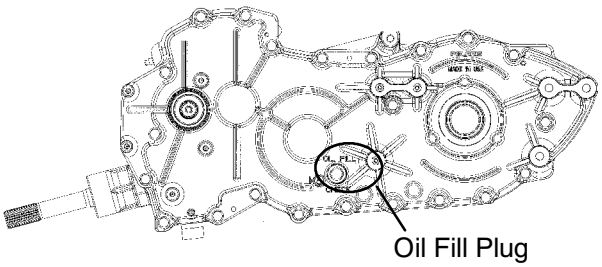
1. Engine Oil and Filter



2. Brake Fluid (Left hand Master Cylinder)



3. Transmission (Early 2004 Models)



3.1 Transmission (Late 2004 Models)

LUBRICATION

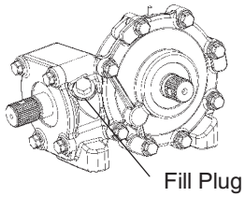
Ill. #	Item	Lube Required	Method	Frequency*
4	**Front Gearcase (Early 2004 models)**	ATV Angle Drive Fluid (**PN 2871653**)	Add oil to proper level, see procedure.	Change after 1st month, 6 months or 100 hours thereafter; Change more often (25-50 hours) in extremely dirty conditions, or short trip cold weather operation.
5	**Front Gearcase (Late 2004 models)**	Polaris Demand Drive Hub Fluid (**PN 2871654**)	Add oil to proper level, see procedure.	Change annually [2]
6	**Demand 4 Hubs - All Wheel Drive (Early 2004 models)**	Polaris Demand Drive Hub Fluid (**PN 2871654**)	Remove filler hole screw in hubs. Rotate wheels to 4 or 8 O'clock position. If lubricant is not visible add until it flows from filler hole. Reinstall screw.	Semi-annually [1]
7	**Propshaft Yoke**	Premium U-Joint Grease [3] (**PN 2871551**)	Locate fittings and grease - 3 pumps maximum	Annually [2]

***** More often under severe use, such as operated in water or under severe loads.

[1] Semi-annually or 50 hours of operation (refer to Maintenance Schedule for additional information)
More often under severe conditions (operating in water or hauling heavy loads)

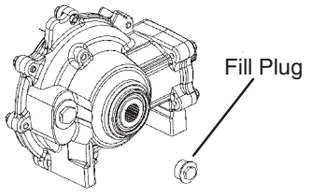
[2] Annually or 100 hours of operation (refer to Maintenance Schedule for additional information)
More often under severe conditions (operating in water or hauling heavy loads)

[3] Grease conforming to NLGI No. 2, such as Polaris Premium All Season Grease, Conoco Superlube M or Mobilegrease Special

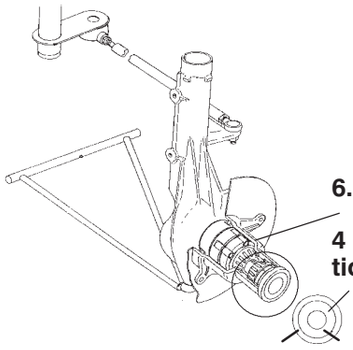


4. Front Gearcase (Early 2004 Models)

Centralized Hilliard



5. Front Gearcase (Late 2004 Models)

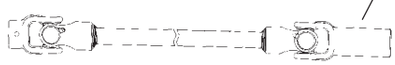


6. Demand 4 Hubs

4 or 8 O'clock position- (end view)

(Early 2004 Models)

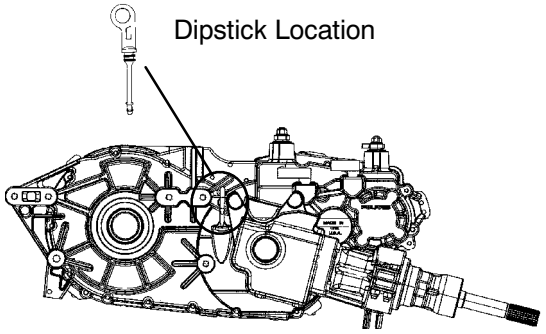
7. Propshaft Yoke (3 pumps max.)

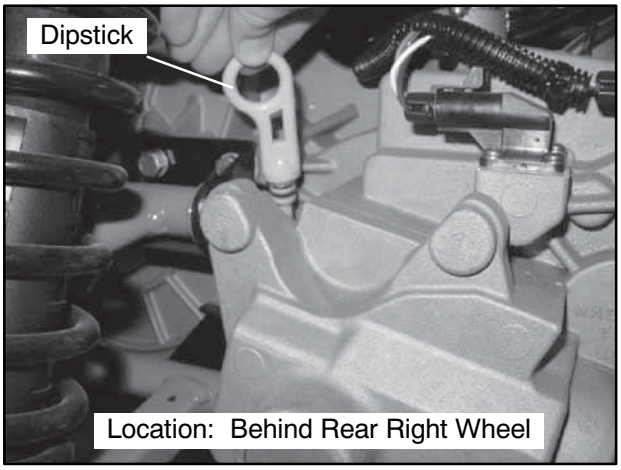


EARLY 2004 TRANSMISSION LUBRICATION

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

EARLY 2004 SPORTSMAN 400/500 TRANSMISSION





- Be sure vehicle is level before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.

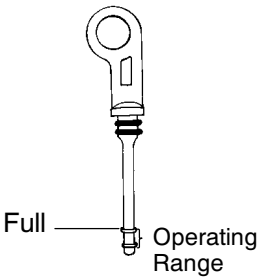
TRANSMISSION SPECIFICATIONS

Specified Lubricant:
AGL Gearcase Lubricant
(PN 2873603) (Gallon) **(PN 2873602)** (12 oz.)

Capacity: . . . . At change: Approx. 20 oz.

Drain Plug:

14 ft. lbs. (19.4 Nm)



To check the level:

1. Remove dipstick and wipe clean.
2. Reinstall dipstick completely, remove and check the level. Add the proper lubricant as required to bring level into operating range as shown.

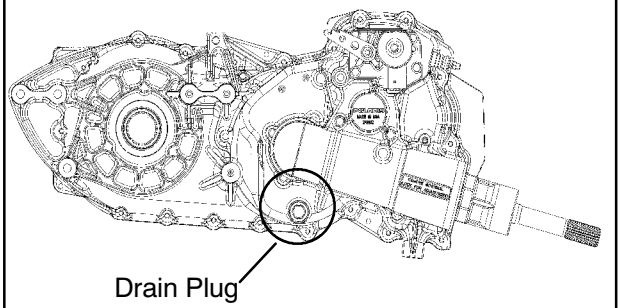
To change lubricant:

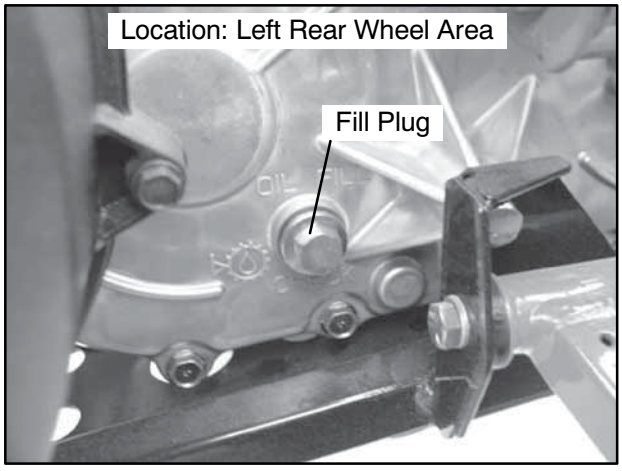
1. Remove skid plate (if necessary).
2. Place a drain pan beneath the transmission oil drain plug area.
3. Remove the drain plug and wipe the magnetic end clean to remove accumulated metallic filings.
4. After the oil has drained completely, install a new sealing washer and install the drain plug. Torque to 14 ft. lbs. (19 Nm).
5. Add the proper lubricant through the dipstick hole until the oil level is between the upper and lower limits. Do not overfill.
6. Check for leaks.
7. Reinstall skid plate if removed in Step 1.

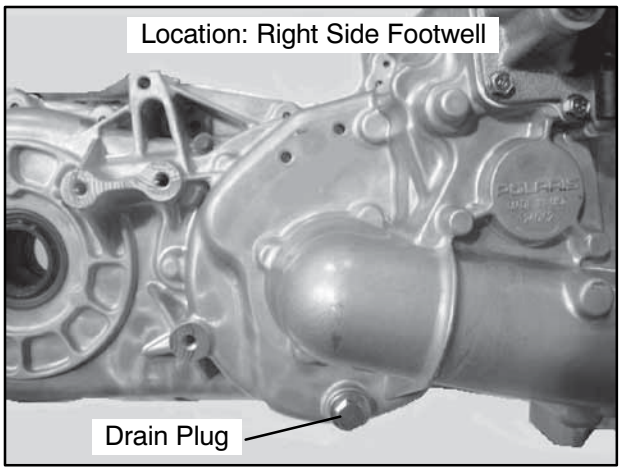
LATE 2004 TRANSMISSION LUBRICATION

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

LATE 2004 SPORTSMAN 400/500 TRANSMISSION







- Be sure vehicle is level before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.

TRANSMISSION SPECIFICATIONS

Specified Lubricant:
AGL Gearcase Lubricant:
(PN 2873603) (Gallon) **(PN 2873602)** (12 oz.)

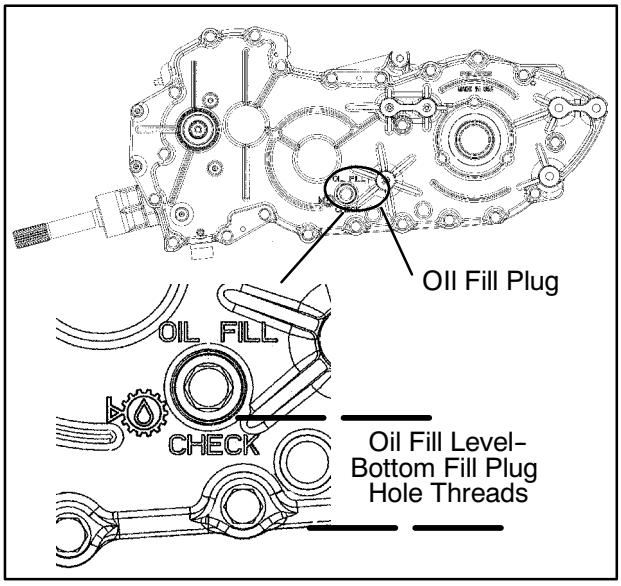
Capacity: . . . . At change: Approx. 20 oz.

Drain Plug:

14 ft. lbs. (19.4 Nm)

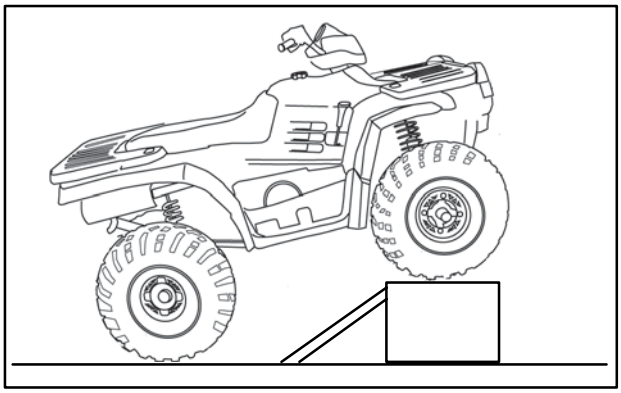
To check the level:

1. Remove fill plug.
2. Fluid should be filled to bottom of fill plug hole threads. Add the proper lubricant as required to bring level into operating range as shown.



To change lubricant:

1. Place a drain pan beneath the transmission oil drain plug area.
   - Elevate the front of the machine using a proper lifting device or automotive approved ramps.
   - This will ensure that the oil in the transmission is properly drained.



2. Remove the drain plug and wipe the magnetic end clean to remove accumulated metallic filings.
3. After the oil has drained completely, install a new sealing washer (if installed) and install the drain plug. Torque to 14 ft. lbs. (19 Nm).
4. Add the proper lubricant through the fill plug hole until the oil level is to the bottom of the fill plug hole threads (See Illustration above). Do not overfill.
5. Check for leaks.
6. Reinstall skid plate if removed in Step 1.

EARLY 2004 FRONT GEARCASE LUBRICATION

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

- Be sure vehicle is level before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.
- The correct gearcase lubricant to use is Polaris Premium GL5 80-90 Gear Lube (**PN 2871653**)

FRONT GEARCASE SPECIFICATIONS

Specified Lubricant:
ATV Angle Drive Fluid **(PN 2871653)**

Capacity: . . . . . 4.0 Oz. (120ml.)

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

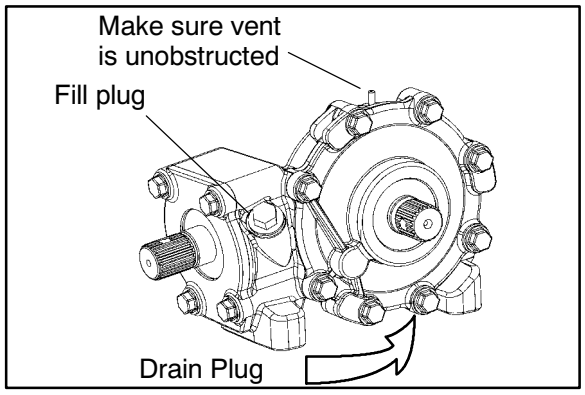
To check the level:

1. The front gearcase lubricant level *cannot be checked* with a dipstick or by visual reference. The gearcase must be drained and re-filled with the proper amount of lubricant. Refer to procedure below.

To change lubricant:

1. Remove gearcase drain plug located on the bottom and drain oil. Catch and discard used oil properly.
2. Clean and reinstall drain plug using a new sealing washer.
3. Remove fill plug.
4. Add proper amount of lubricant.

5. Install fill plug. Check for leaks.



Drain plug

LATE 2004 FRONT GEARCASE LUBRICATION

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

- Be sure vehicle is level before proceeding.
- Check vent hose to be sure it is routed properly and unobstructed.
- ***The correct lubricant to use is Premium Demand Drive Fluid for the Centralized Hilliard gearcase. Do not use other fluids as they may cause damage to gearcase components.***

FRONT GEARCASE SPECIFICATIONS

Specified Lubricant:
Demand Drive Hub Fluid **(PN 2871654)**

Capacity: .....5 oz. (150 ml)
(Centralized Hilliard)

Drain Plug / Fill Plug Torque: 14 ft. lbs.
(19 Nm)

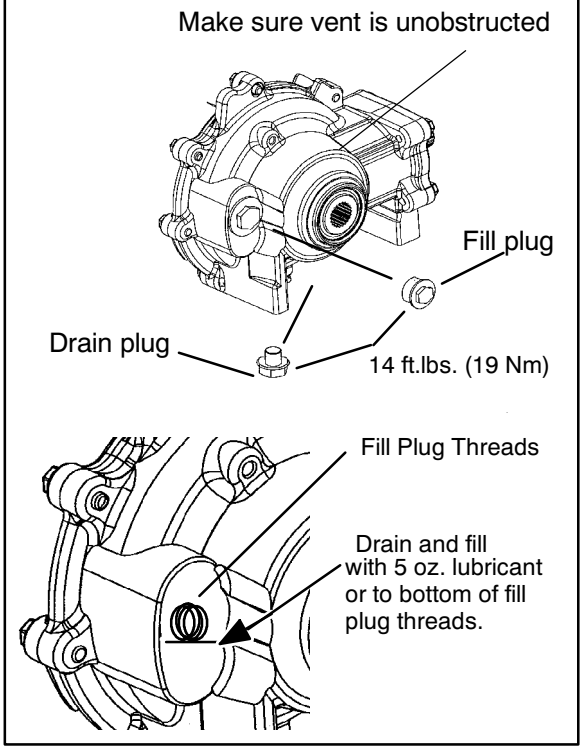
To check the lubricant level:

The gearcase must be drained and re-filled with the proper amount of lubricant. Refer to the procedure below.

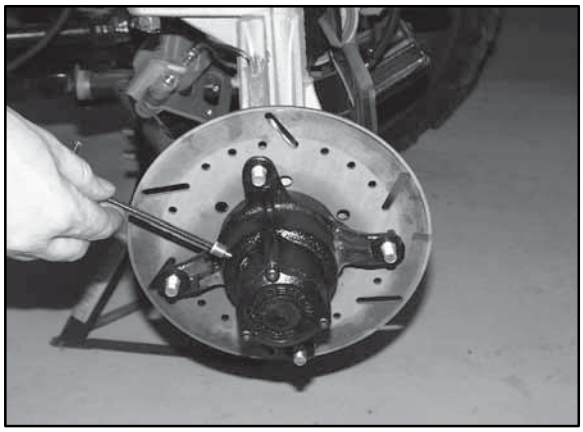
To change front gearcase lubricant:

1. With the ATV on a level surface, remove the fill plug and check the lubricant level. Lubricant should be kept at the specified level, according to the proper gearcase specifications listed.
2. Support the vehicle securely with a jackstand and remove the front tire on the driver's side.
3. Remove gearcase drain plug located (11 mm) on the bottom of the gearcase and drain oil. (The drain plug is accessible through the skid plate.) Catch and discard used oil properly.
4. Clean and reinstall drain plug using a new sealing washer. Torque to specification.
5. Remove fill plug (8 mm hex) and check O-ring.
6. Fill with the recommended fluid amount (5oz. / 150 ml) or fill to bottom of fill plug hole threads.
7. Replace fill plug and torque to 14 ft.lbs. (19 Nm).

FRONT GEARCASE PLUG LOCATIONS

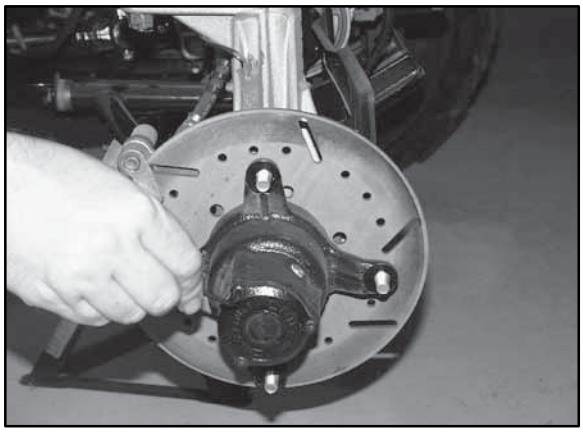


EARLY 2004 FRONT HUB FLUID LEVEL INSPECTION



1. Place vehicle on a level surface.
2. Turn wheel until front hub fill/check plug is in either the 4 o'clock or 8 o'clock position.
3. Remove fill/check plug.
4. Add Polaris Demand Drive Hub Fluid if necessary until fluid trickles out. **NOTE:** Do not force the fluid into the hub under pressure or seal damage may occur.
5. Reinstall plug.
6. Repeat procedure for other hub.

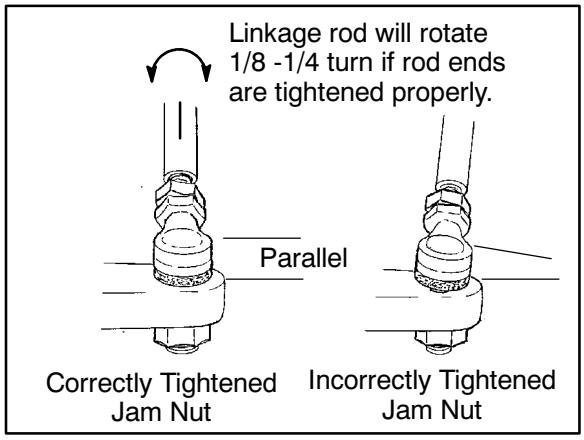
EARLY 2004 FRONT HUB FLUID CHANGE



1. Place a drain pan beneath the hub.
2. Remove check/fill plug.
3. Turn the hub to the 6 o'clock position and drain the fluid
   into the drain pan.
4. Turn wheel until front hub fill/check plug is in either the 4 or 8 o'clock position.
5. Add Polaris Demand Drive Hub Fluid (**PN 2871654**) until fluid trickles out. **NOTE:** Do not force the fluid into the hub under pressure or seal damage may occur.

Polaris Demand Drive Hub Fluid:
(PN 2871654) - 8 oz.
(PN 2872277) - 2.5 gallon

EARLY 2004 TRANSMISSION GEARSHIFT LINKAGE ADJUSTMENT, PRELIMINARY INSPECTION



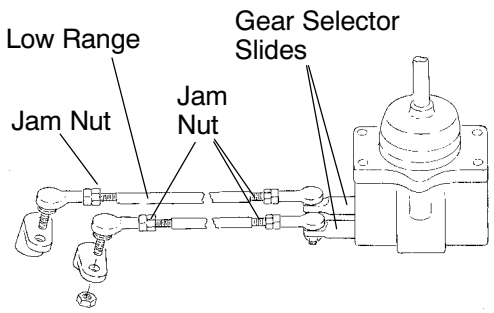
- If shifting problems are encountered, the transmission linkage can be adjusted.
- Tighten shift linkage rod end jam nuts properly after adjustment. You should be able to rotate the linkage rod between 1/8 and 1/4 turn after both jam nuts are tight.
- The transmission shift linkage should be periodically inspected for wear and parts replaced as required to remove excess play from shift linkage.
- Refer to Transmission chapter for more information.

EARLY 2004 SHIFT LINKAGE ADJUSTMENT

Linkage rod adjustment is necessary when symptoms include:

- No All Wheel Drive light
- Noise on deceleration
- Inability to engage a gear
- Excessive gear clash (noise)
- Shift selectors moving out of desired range

NOTE: When adjusting linkage, always adjust both linkage rods. The adjustment of one rod can prevent proper adjustment of the other rod. Remove necessary components to gain access to shift linkage rod ends (i.e. exhaust heat shield, exhaust pipe, etc.).



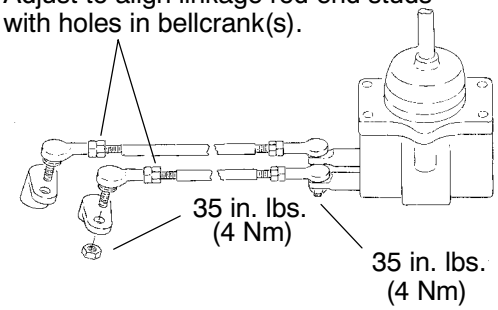
NOTE: Rod end orientation, rod ends are both down.

Ill. 1

1. Inspect shift linkage tie rod ends, clevis pins, and pivot bushings and replace if worn or damaged. Lubricate the tie rod ends with a light aerosol lubricant or grease.
2. Loosen all rod end adjuster jam nuts see Ill. 1.
3. Note orientation of tie rod end studs with stud up or down. Remove both rod end studs from transmission bell cranks.
4. Be sure idle speed is adjusted properly.

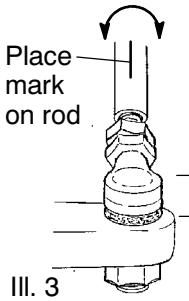
NOTE: It is important to disconnect *both* rod ends from the transmission bell cranks. If one linkage rod is incorrectly adjusted, it can affect the adjustment of the other rod.

5. Place gear selector in neutral. Make sure the transmission bell cranks are engaged in the neutral position detents.



Ill. 2

6. Be sure the shift linkage rod ends are firmly attached to the gear selector slides. Adjust the low range (inside) rod so the rod end is centered on the transmission bell crank. Install the lock nut to the rod end and torque to 35 in. lbs. (4 Nm).



- Rotate rod both directions to find points where resistance is felt.
- Center the rod between the points.
- Hold rod end parallel to mounting surface and tighten jam nut.

Ill. 3

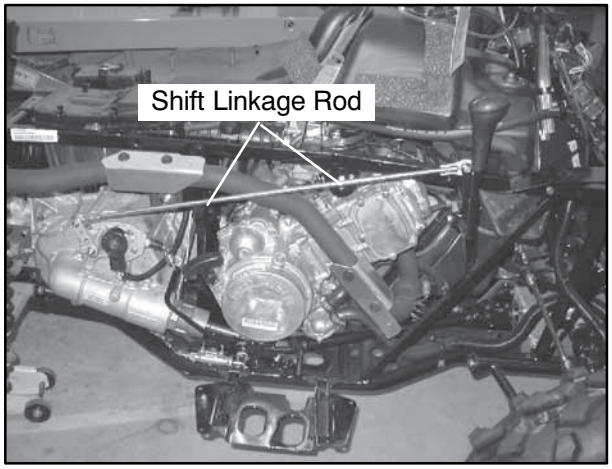
7. Rotate the linkage rod clockwise until resistance is felt. Mark the rod so revolutions can be easily counted. See Ill. 3 at right.
8. Rotate the linkage rod counterclockwise until the same resistance is felt, counting the revolutions as the rod is turned.
9. Turn the rod clockwise again one half of the revolutions counted in Step 9.
10. Tighten the rod end jam nuts securely while holding the rod end. The jam nuts must be tightened with both front and rear rod ends parallel to each other. If jam nuts are properly

tightened, the rod should rotate freely 1/4 turn without binding.

11. Repeat Steps 7-10 for the High/Reverse rod.

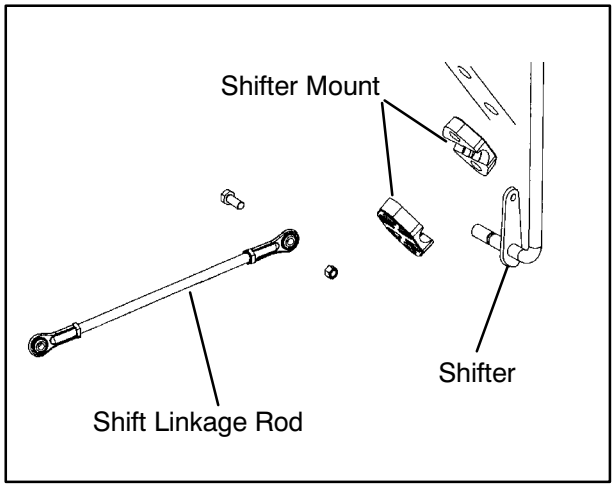
LATE 2004 SHIFT LINKAGE INSPECTION

NOTE: Shift rod is preset at time of manufacture.



1. Inspect shift linkage tie rod ends, clevis pins, and pivot bushings and replace if worn or damaged. Lubricate the tie rod ends with a light aerosol lubricant or grease.

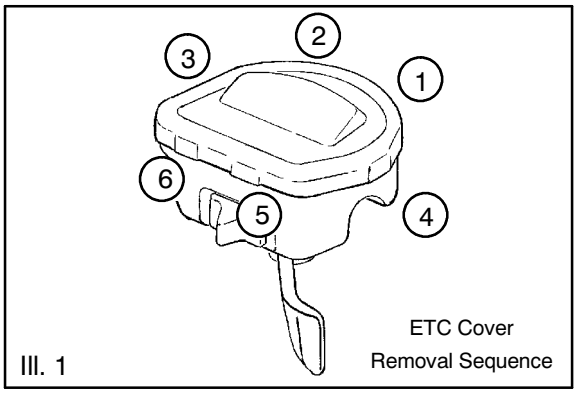
2. Note orientation of tie rod end studs with the ends that are up down (vertical). Remove both rod end bolts from transmission bell crank.



THROTTLE INSPECTION

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

1. Place the gear selector in neutral.
2. Set parking brake.
3. Start the engine and let it idle.
4. 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. Adjust cable tension as needed until lock-to-lock turning can be accomplished with no rise in engine rpm.
5. Replace the throttle cable if worn, kinked, or damaged.

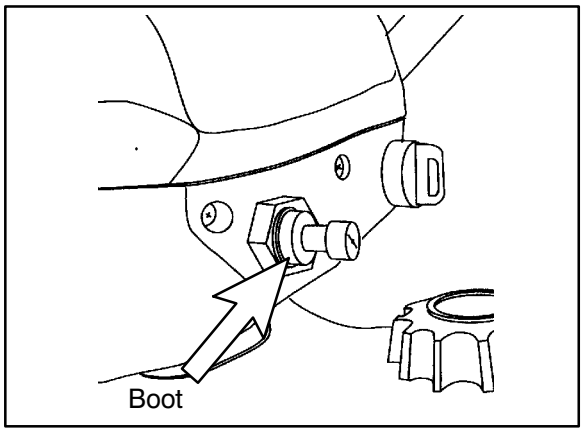


Ill. 1 ETC Cover Removal Sequence

To remove the ETC cover:

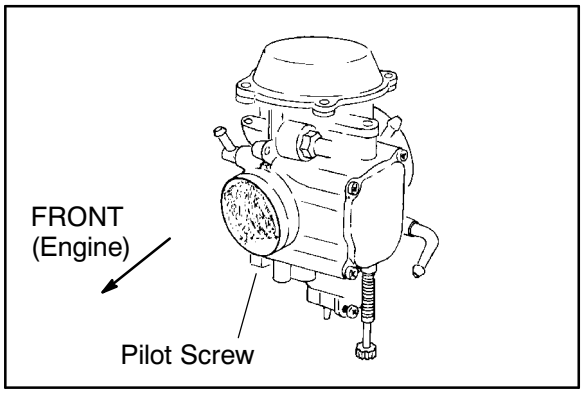
1. Use a medium flat blade screwdriver and insert blade into the pocket of the cover starting on the #1 position.
2. Twist screwdriver slightly while lifting on the cover to release snap.
3. Repeat procedure at the other five locations as shown.
   NOTE: Do not attempt to remove cover until all latch points are released.

CHOKE (ENRICHER) ADJUSTMENT



If the choke knob does not stay out when pulled, adjust the choke tension by tightening (clockwise) the jam nut 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.

PILOT SCREW ADJUSTMENT

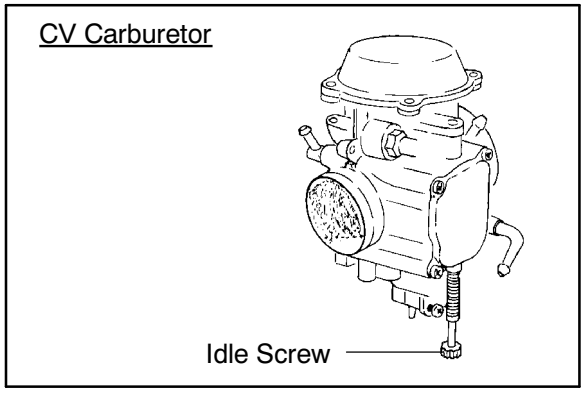


1. Start engine and warm it up to operating temperature (about 10 minutes).
2. Turn pilot screw in (clockwise) until *lightly* seated. Turn screw out the specified number of turns. **NOTE:** Do not tighten the pilot screw forcefully against the seat or the screw and/or seat will be permanently damaged.

Pilot Screw Adjustment:
Sportsman 400 – 2 3/4 Turn Out
Sportsman 500 – 2 Turns Out

3. Connect an accurate tachometer that will read in increments of + or – 50 RPM such as the PET 2100DX (**PN 8712100**DX) or the PET 2500 (**PN 8712500**).
4. Set idle speed to 1200 RPM. Always check throttle cable freeplay after adjusting idle speed and adjust if necessary.
5. Slowly turn mixture screw clockwise using the pilot screw wrench until engine begins to miss.
6. Slowly turn mixture screw counterclockwise until idle speed increases to maximum RPM. Continue turning counterclockwise until idle RPM begins to drop.
7. Center the pilot screw between the points in Step 5 and 6.
8. Re adjust idle speed if not within specification.

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. (Refer to Ill. at right).

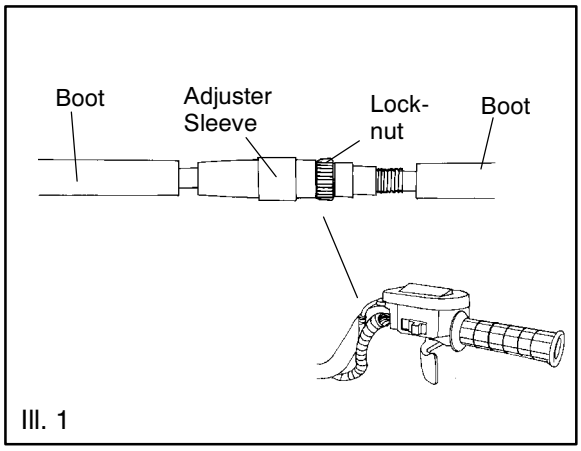
NOTE: Adjusting the idle speed affects throttle cable freeplay and electronic throttle control (ETC) adjustment. Always check throttle cable freeplay after adjusting idle speed and adjust if necessary.

Idle Speed:

1200 +/- 200 RPM

THROTTLE CABLE / ELECTRONIC THROTTLE CONTROL (ETC SWITCH) ADJUSTMENT

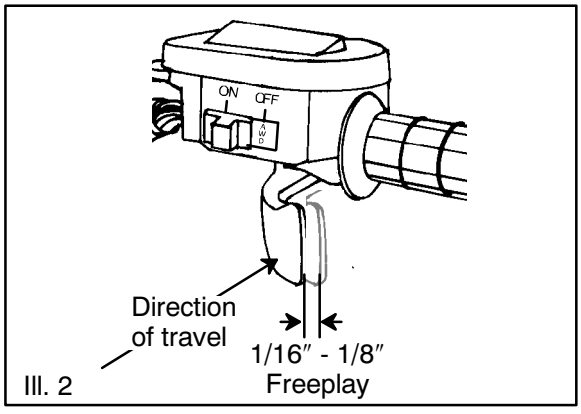
1. Slide boot off throttle cable adjuster and jam nut.
2. Place shift selector in neutral and set parking brake.
3. Start engine and set idle to specified RPM.



Ill. 1

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 adjuster until 1/16″ to 1/8″ freeplay is achieved at thumb lever. (Ill. 2). After making adjustments, quickly actuate the thumb lever several times and reverify freeplay.



Ill. 2

6. Tighten lock nut securely and slide boot completely in place to ensure a water-tight seal.
7. 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.

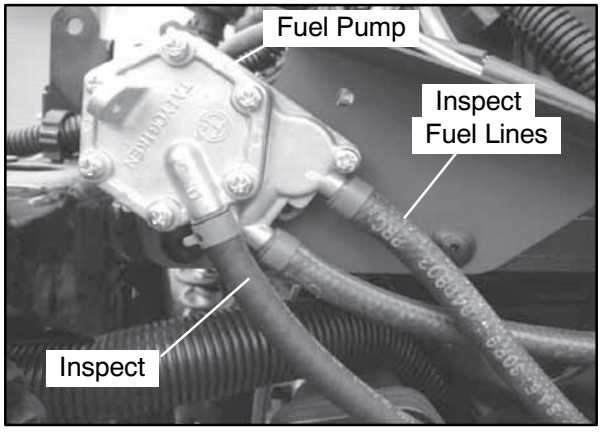
FUEL SYSTEM

⚠ 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. Do not fill the tank neck.**
- **If you get gasoline in your eyes or if you swallow gasoline, seek medical attention 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. Engine exhaust fumes are poisonous and can result loss of consciousness or 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.

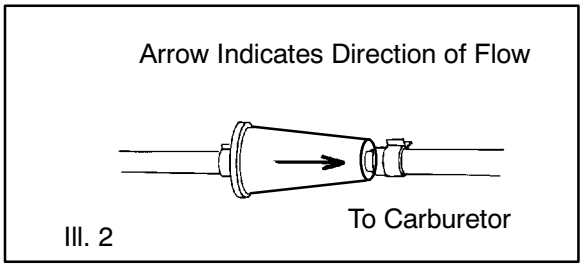
VENT LINES

Check fuel tank, oil tank, carburetor, battery and transmission vent lines for signs of wear, deterioration, damage or leakage. Replace every two years.

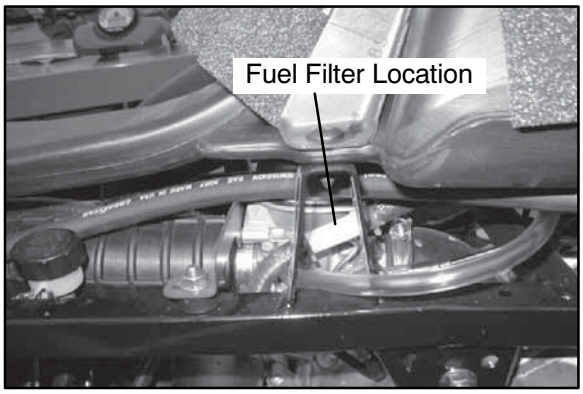
Be sure vent lines are routed properly and secured with cable ties. **CAUTION:** Make sure lines are not kinked or pinched.

FUEL FILTER

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



Ill. 2



1. Shut off fuel supply at fuel valve.
2. Remove seat and locate filter on right side of atv. NOTE: Remove side cover if necessary.
3. Remove line clamps at both ends of the filter.
4. Remove fuel lines from filter.
5. Install new filter and clamps onto fuel lines with arrow pointed in direction of fuel flow.
6. Install clamps on fuel line.
7. Turn fuel valve “ON”.
8. Start engine and inspect for leaks.

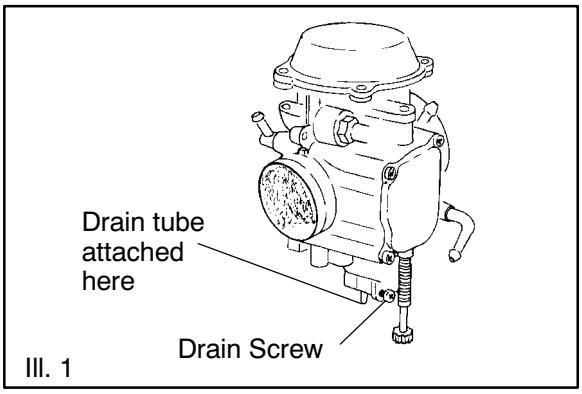
CARBURETOR DRAINING

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

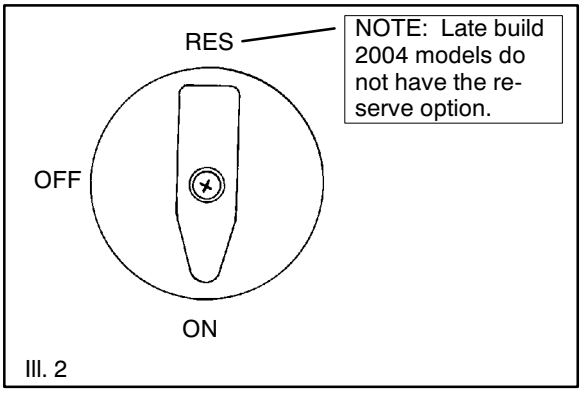
NOTE: The bowl drain screw is located on the bottom left side of the float bowl.

1. Turn fuel valve to the off position.
2. Place a clean container beneath the bowl drain spigot or bowl drain hose.
3. Turn drain screw out two turns 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. Start machine and check for leaks.

NOTE: All tubes attached to the carburetor must be check for pinching or blockage, as this will effect engine performance



Ill. 1



Ill. 2

COMPRESSION TEST

NOTE: 4-Stroke 500 and 425 engines are equipped with an automatic decompressor. Compression readings will vary in proportion to cranking speed during the test. Average compression (measured) is about **50-90 psi** during a compression test.

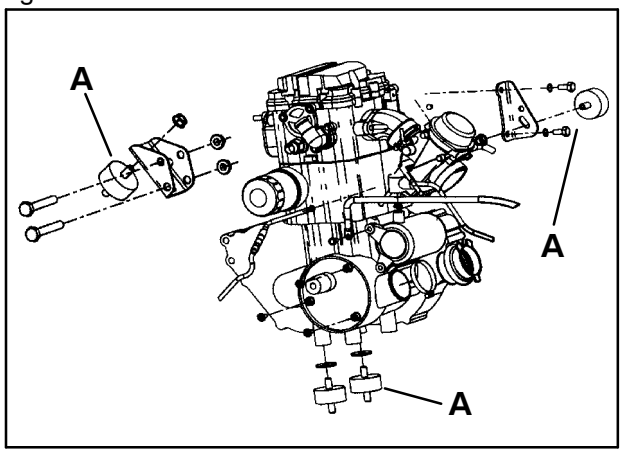
Smooth idle generally indicates good compression. Low engine compression is rarely a factor in running condition problems above idle speed. Abnormally high compression can be caused by a decompressor malfunction, or worn or damaged exhaust cam lobes. Inspect camshaft and automatic decompression mechanism if compression is abnormally high.

A cylinder leakage test is the best indication of engine condition on models with automatic decompression. Follow manufacturer’s instructions to perform a cylinder leakage test. (Never use high pressure leakage tester as crankshaft seals may dislodge and leak).

Cylinder Compression
Standard 50-90 PSI
Cylinder Leakage
Service Limit 10 %
(Inspect for cause if leakage exceeds 10%)

ENGINE MOUNTS

Inspect rubber engine mounts (A) for cracks or damage. Check engine fasteners and ensure they are
tight.



BATTERY MAINTENANCE

⚠ WARNING

Battery electrolyte is poisonous. It contains sulfuric acid. Serious burns can result from contact with skin, eyes or clothing. Antidote:

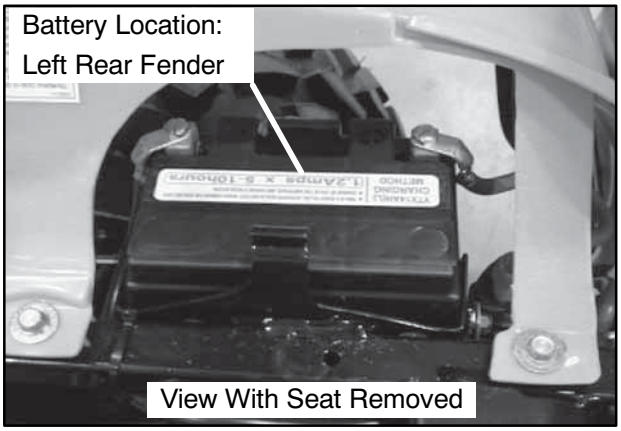
External: Flush with water.

Internal: Drink large quantities of water or milk. Follow with milk of magnesia, beaten egg, or vegetable oil. Call physician immediately.

Eyes: Flush with water for 15 minutes and get prompt medical attention.

Batteries produce explosive gases. Keep sparks, flame, cigarettes, etc. away. Ventilate when charging or using in an enclosed space. Always shield eyes when working near batteries. KEEP OUT OF REACH OF CHILDREN.

The battery is located under the left rear fender.



NOTE: All 2004 Sportsman ATV batteries are Low Maintenance in design and construction. All Low Maintenance batteries are fully charged and tested at the factory before installation. Expected shelf life is 6-8 months depending on storage conditions. As a general rule before placing the battery into service, check the battery condition and charge accordingly.

New Batteries: Batteries must be fully charged before use or battery life can be reduced by 10-30% of full potential. Charge battery for 3-5 hours at a current equivalent of 1/10 of the battery's rated amp/hour capacity (i.e. 12amp hr x .10 = 1.2 amp charging). Do not use the alternator to charge a new battery.

Low-Maintenance batteries are permanently sealed at the time of manufacture. The use of lead-calcium and AGM technology instead of lead-antimony allows the battery acid to be fully absorbed. For this reason, a Low-Maintenance battery case is dark and the cell caps are not removable, since there is no need to check electrolyte level.

NEVER attempt to add electrolyte or water to a Low-Maintenance battery. Doing so will damage the case and shorten the life of the battery. Refer to the Battery Maintenance Video (PN 9917987) for proper instruction on servicing batteries.

NOTE: New Batteries: Batteries must be fully charged before use or battery life will be reduced by 10-30% of full potential. Charge battery for 3-5 hours at a current equivalent of 1/10 of the battery's rated amp/hour capacity. Do not use the alternator to charge a new battery. (Refer to Battery Activation and Maintenance video **PN 9917987**)

LIQUID COOLING SYSTEM OVERVIEW

The engine coolant level is controlled or maintained by the recovery system. The recovery system components are the recovery bottle, radiator filler neck, radiator pressure cap and connecting hose.

As coolant operating temperature increases, the expanding (heated) excess coolant is forced out of the radiator past the pressure cap and into the recovery bottle. As engine coolant temperature decreases the contracting (cooled) coolant is drawn back up from the tank past the pressure cap and into the radiator.

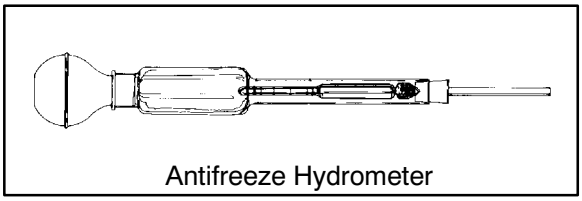
Some coolant level drop on new machines is normal as the system is purging itself of trapped air. Observe coolant levels often during the break-in period.

Overheating of engine could occur if air is not fully purged from system.

Polaris Premium 60/40 is already premixed and ready to use. Do not dilute with water.

COOLANT STRENGTH / TYPE

Test the strength of the coolant using an antifreeze hydrometer.



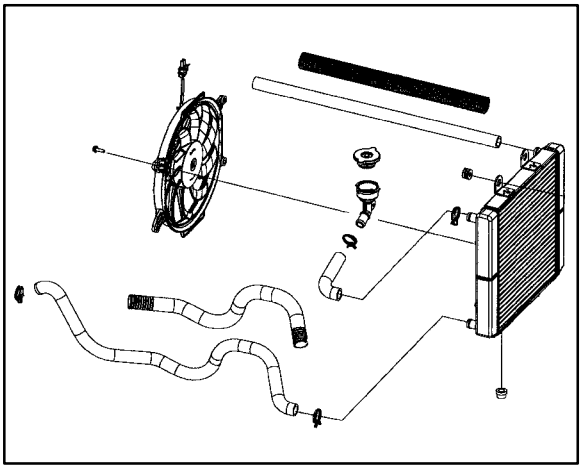
Antifreeze Hydrometer

- A 50/50 or 60/40 mixture of antifreeze and distilled water will provide the optimum cooling, corrosion protection, and antifreeze protection.
- Do not use tap water, straight antifreeze, or straight water in the system. Tap water contains minerals and impurities which build up in the system.
- Straight water or antifreeze may cause the system to freeze, corrode, or overheat.

Polaris 60/40 Anti-Freeze / Coolant

(PN 2871323)

COOLING SYSTEM HOSES

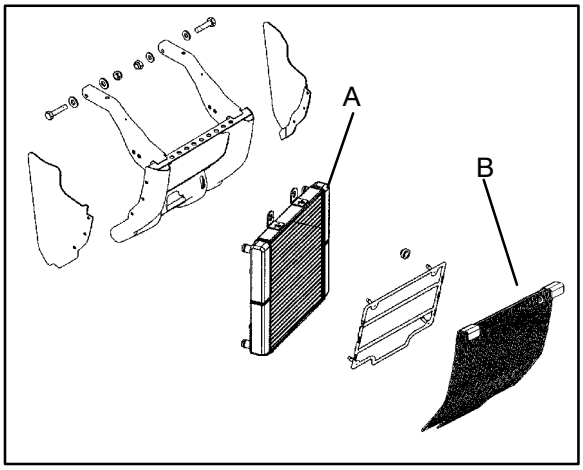


1. Inspect all hoses for cracks, deterioration, abrasion or leaks. Replace if necessary.
2. Check tightness of all hose clamps.

CAUTION:

Do not over-tighten hose clamps at radiator, or radiator fitting may distort, causing a restriction to coolant flow. Radiator hose clamp torque is 36 in. lbs. (4 Nm).

RADIATOR/GRILL SCREEN



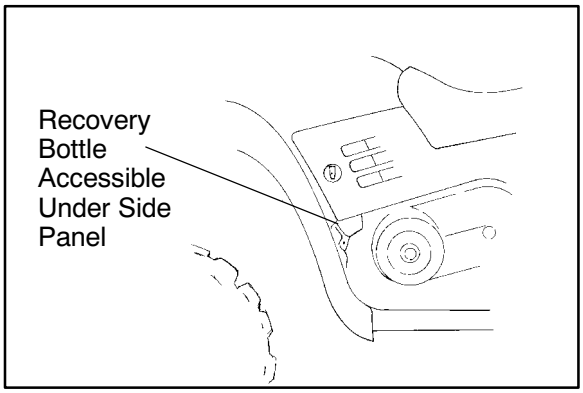
1. Check radiator (A) air passages for restrictions or damage. Check and clean the radiator screen (B).
2. Carefully straighten any bent radiator fins.
3. Remove any obstructions with compressed air or low pressure water.

COOLING SYSTEM PRESSURE TEST

Refer to Page 3.6 for pressure test procedure.

COOLANT LEVEL INSPECTION

The recovery bottle, located on the left side of the machine, must be maintained between the minimum and maximum levels indicated on the recovery bottle.



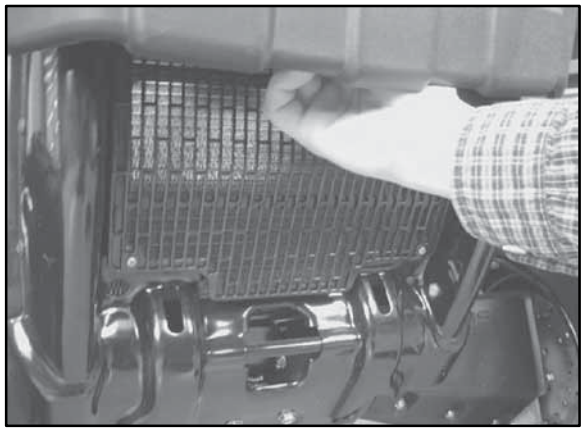
With the engine at operating temperature, the coolant level should be between the upper and lower marks on the coolant reservoir. If not:

1. Remove reservoir cap. Inner splash cap vent hole must be clear and open.
2. Fill reservoir to upper mark with Polaris Premium 60/40 Anti Freeze / Coolant or 50/50 or 60/40 mixture of antifreeze and distilled water as required for freeze protection in your area.
3. Reinstall cap.

NOTE: If overheating is evident, allow system to cool completely and check coolant level in the radiator and inspect for signs of trapped air in system.

RADIATOR SCREEN REMOVAL

1. Pull out slightly on the top of the radiator screen.
2. With the top free, pull out on the bottom of the screen to remove the screen.
3. To install the screen, simply press the tabs on the screen back into the mounting grommets. Be sure the screen is securely in place.

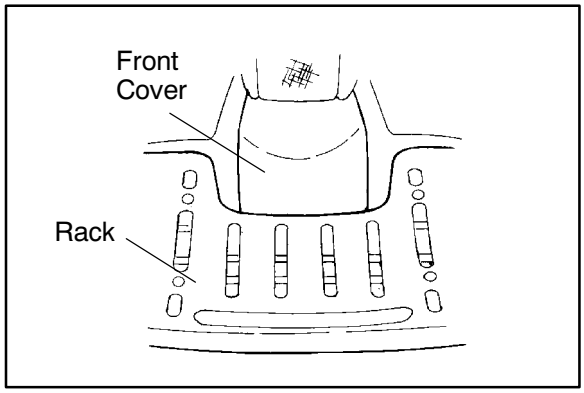


RADIATOR COOLANT LEVEL INSPECTION

NOTE: This procedure is only required if the cooling system has been drained for maintenance and/or repair. However, if the recovery bottle has run dry, or if overheating is evident, the level in the radiator should be inspected and coolant added if necessary.

⚠ **WARNING** Never remove the pressure cap when the engine is warm or hot. Escaping steam can cause severe burns. The engine must be cool before removing the pressure cap.

NOTE: Use of a non-standard pressure cap will not allow the recovery system to function properly.



To access the radiator pressure cap:

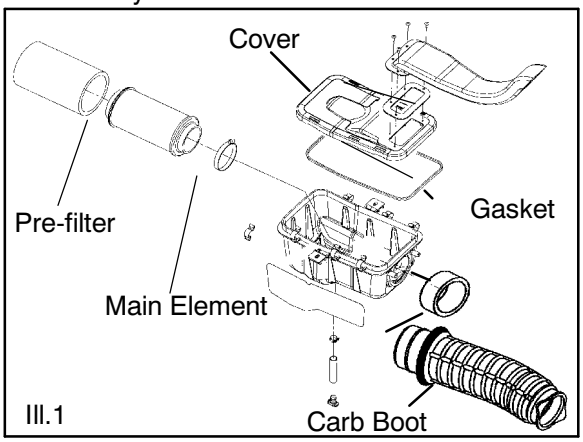
Remove the four screws securing front rack. Turn handle bars full left or right to provide more clearance. Remove front cover by placing your fingers under the front of the cover and pulling upward.

AIR FILTER/PRE-FILTER SERVICE

It is recommended that the air filter and pre filter be replaced annually. When riding in extremely dusty conditions, replacement is required more often.

The pre filter should be cleaned before each ride using the following procedure:

1. Lift up on the rear of the seat.
2. Pull the seat back and free of the tabs. **NOTE:** When reinstalling seat, make sure the slots in the seat engage the tabs in the fuel tank.
3. Remove clips (6) from air box cover and remove cover. Inspect the gasket. It should adhere tightly to the cover and seal all the way around.
4. Loosen clamp and remove air filter assembly.



Ill.1

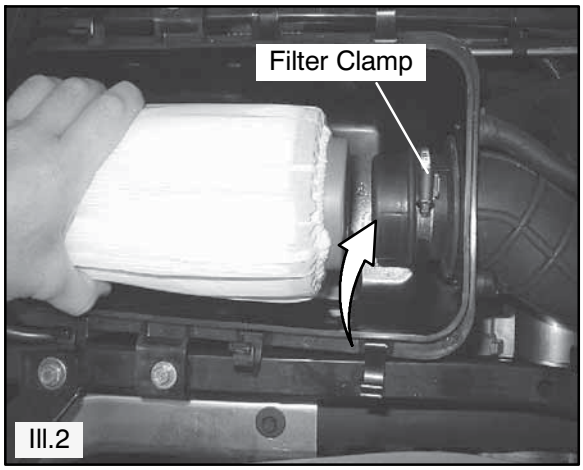
Cleaning:

5. Slip the pre-filter element off of main element. Clean the pre filter with high flash point solvent, followed by hot soapy water.
6. Rinse and dry thoroughly.
7. Inspect element for tears or damage.
8. Apply foam filter oil or clean engine oil and squeeze until excess oil is removed.
9. Inspect main filter and replace if necessary. If the filter has been soaked with fuel or oil it must be replaced.

Installation:

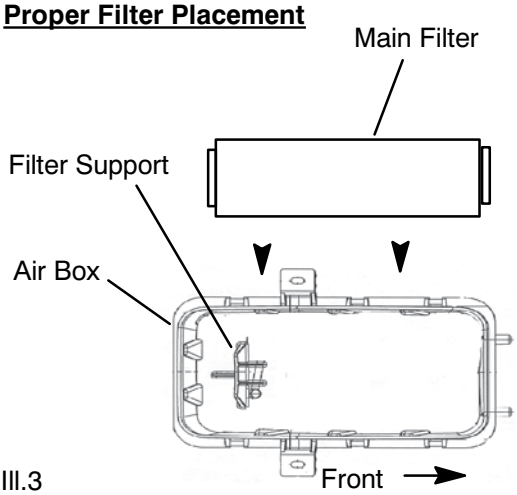
10. Reinstall pre-filter element over main filter. Be sure the element covers entire surface of main filter without folds, creases, or gaps.
11. Reinstall filter on main filter mount. Place filter clamp over the assembly and tighten.

NOTE: Apply a small amount of general purpose grease to the sealing edges of the filter before reinstalling.



Ill.2

Proper Filter Placement



Ill.3

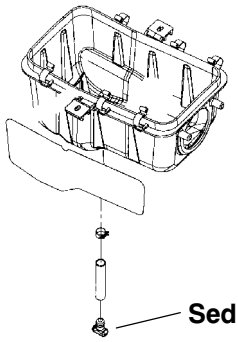
NOTE: The air filter should rest on the filter support. Proper placement of the air filter is important to prevent rattles and air leaks. See Illustration above.

12. Install air box cover and secure with clips.

AIR BOX SEDIMENT TUBE

Periodically check the air box drain tube located toward the rear of the machine. Drain whenever deposits are visible in the clear tube.

1. Remove drain plug from end of sediment tube.
2. Drain tube.
3. Reinstall drain plug.



Ill.1

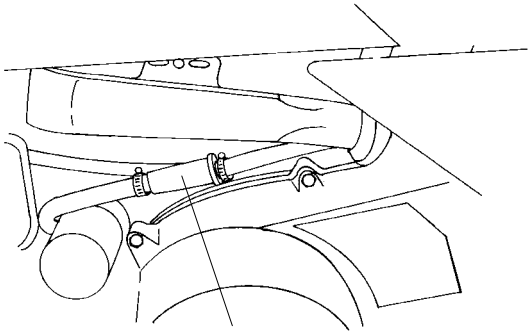
NOTE: The sediment tube will require more frequent service if the vehicle is operated in wet conditions or at high throttle openings for extended periods.

BREATHER FILTER INSPECTION

Four cycle ATV engines are equipped with a breather filter. The in-line filter is similar in appearance to a fuel filter, and is visible on the left side (Location A).

In-line breather filters should be installed with the arrow pointing toward the engine (away from the air box).

Typical Breather Filter Location



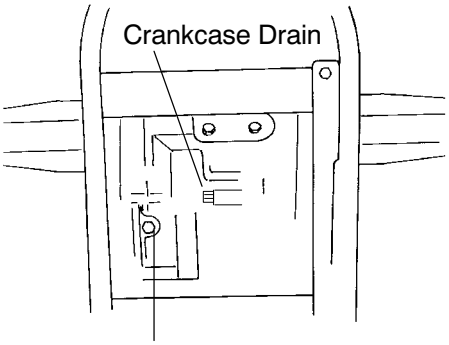
In-Line Breather Filter Location A

NOTE: In-line breather filter service life is extended when the foam air box pre-filter is in place and maintained properly. Never operate the engine without the pre-filter.

BREATHER HOSE

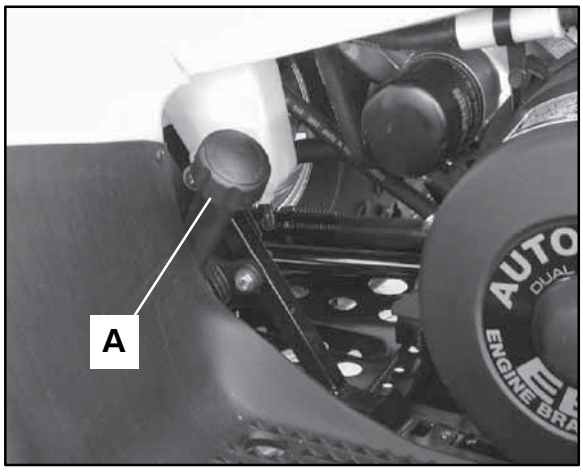
1. Be sure breather line is routed properly and secured in place. **CAUTION:** Make sure lines are not kinked or pinched.

RECOIL HOUSING



- Drain the housing periodically to remove moisture.
- Drain the recoil housing after operating the ATV in very wet conditions. This should also be done before storing the ATV. The drain screw is located at the bottom of the recoil housing. Remove the screw with a 10 mm wrench. Reinstall screw once housing has been drained.
- **CAUTION:** Make sure the manual start handle is fully seated on the recoil housing, especially when travelling in wet areas. If it is not sealed properly, water may enter the recoil housing and damage components.
- Water will enter the recoil housing if the starter handle is disengaged from the rope guide when under water.
- After travelling in wet areas the recoil housing and starter should always be drained completely by removing the recoil.
- Do not open the crankcase drain unless the engine has ingested water. Some engine oil will be lost if crankcase drain is opened.
- If recoil handle seal has been damaged, the handle should be replaced.

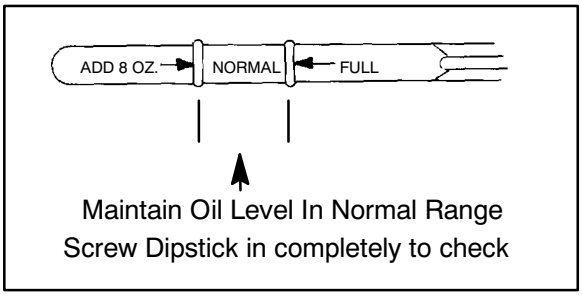
ENGINE OIL LEVEL



The oil tank is located on the left side of the vehicle. To check the oil level:

1. Set machine on a level surface.
2. Start and run engine for 20-30 seconds. This will return oil to its true level in the oil tank.
3. Stop engine, remove dipstick (A) and wipe dry with a clean cloth.
4. Reinstall dipstick, screw the dipstick into place.

NOTE: The dipstick must be screwed completely in to ensure accurate measurement.



5. Remove dipstick and check to see that the oil level is in the normal range. The oil should be between the top line and the bottom line on the dipstick. Add oil as indicated by the level on the dipstick. Do not overfill.

NOTE: Rising oil level between checks in cool weather driving, can indicate moisture collecting in the oil reservoir. If the oil level is over the full mark, change the oil.

OIL AND FILTER CHANGE

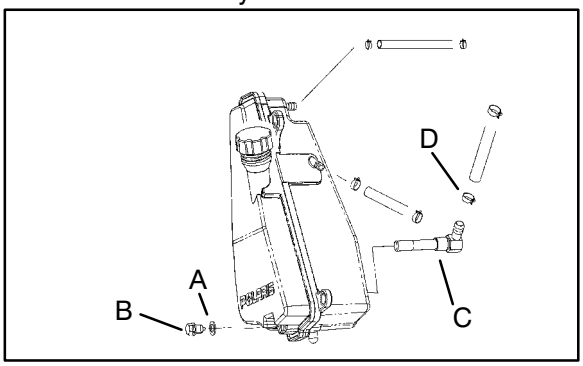
⚠ WARNING

Personal injury can occur when handling used oil. Hot oil can cause burns or skin damage.

NOTICE:

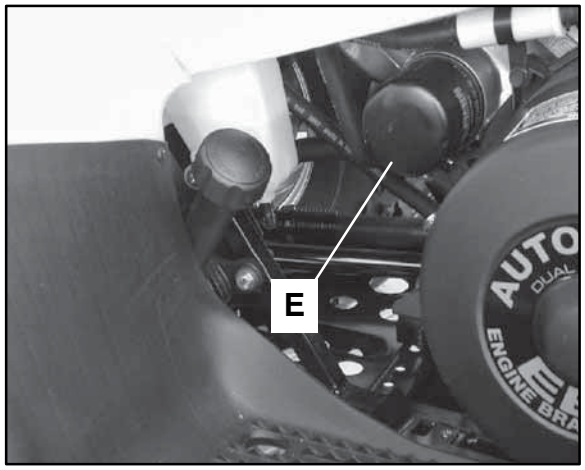
Care must be taken to ensure that fluids are contained. Be prepared to collect the fluid with suitable containers before opening any compartment or disassembly any component containing fluids.

1. Place vehicle on a level surface.
2. Run engine two to three minutes until warm. Stop engine.
3. Clean area around drain plug (B) at bottom of oil tank.
4. Place a drain pan beneath oil tank and remove drain plug. **CAUTION:** Oil may be hot. Do not allow hot oil to come into contact with skin as serious burns may result.

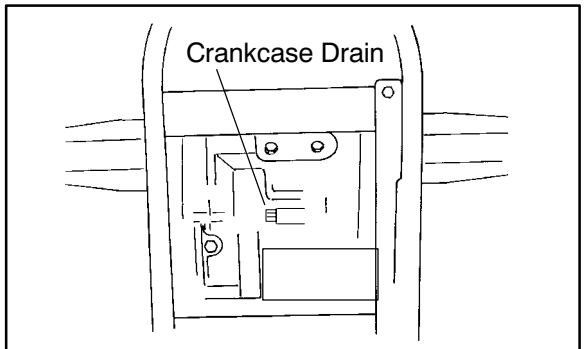


5. Allow oil to drain completely.
6. Replace sealing washer (A) on drain plug. **NOTE:** The sealing surfaces on drain plug and oil tank should be clean and free of burrs, nicks or scratches.
7. Reinstall drain plug and torque to 14 ft. lbs. (19 Nm).
8. Loosen clamp (D).
9. Remove oil hose from screen fitting (C) on bottom of oil tank.
10. Remove screen fitting (C) and clean the screen.
11. Apply Loctite™ Thread Sealant 565 (**PN 2871956**) or an equivalent pipe thread sealant or PTFE sealant tape to clean, oil free threads of fitting.

12. Install fitting and torque to 14-17 ft.lbs. (19–23 Nm).
13. Install oil hose on fitting and tighten clamp to 25 in. lbs. (3 Nm).



14. Place shop towels beneath oil filter (E) . Use Oil Filter Wrench (**PV-43527**), turn filter counterclockwise to remove.
15. Using a clean dry cloth, clean filter sealing surface on crankcase.
16. Lubricate O-ring on new filter with a film of engine oil. Check to make sure the O-ring is in good condition.
17. Install new filter and turn by hand until filter gasket contacts the sealing surface, then turn and additional 1/2 turn.



Engine Sump Drain Plug - Bottom View

18. Approximately 1 cup of engine oil will remain in the crankcase. To drain, remove drain plug found on lower right side of crankcase.

NOTE: The sealing surfaces on the drain plug and crankcase should be clean and free of burrs, nicks or scratches.

19. Reinstall drain plug.
20. Remove dipstick and fill tank with 2 quarts (1.9 L) of Polaris Premium 4 Synthetic Oil (**PN 2871844**).
21. Place gear selector in neutral and set parking brake.

NOTE: Clamp or pinch off the vent line 2" from the oil tank as shown below in the Oil Pump Priming Procedure for the 400/500 engine.

22. Re-check the oil level on the dipstick and add oil as necessary to bring the level to the upper mark on the dipstick.
23. Dispose of used filter and oil properly.

Oil Tank Drain Plug Torque:
14 ft. lbs. (19 Nm)

Crankcase Drain Plug Torque:
14 ft. lbs. (19 Nm)

Oil Filter Torque:
Turn by hand until filter gasket contacts sealing surface, then turn an additional 1/2 turn

Oil Filter Wrench:
(PV-43527)

Oil Tank Screen Fitting Torque:
14-17 ft. lbs. (19 Nm -23 Nm)

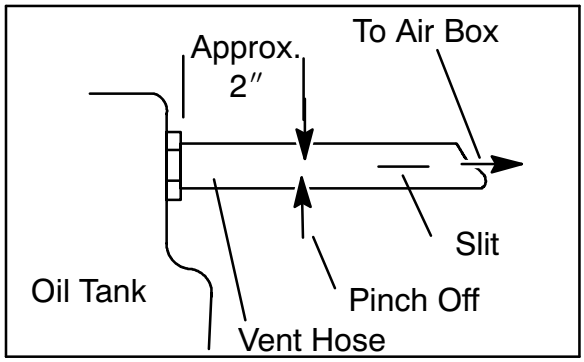
Recommended Engine Oil:

Polaris Premium 4 All Season Synthetic, 0W-40, (PN 2871281)

Ambient Temperature Range:
-40° F to 120° F

OIL PUMP PRIMING PROCEDURE (400/500)

NOTE: This priming procedure must be performed whenever the oil hose connection between the oil tank and pump inlet has been disconnected.



1. Clamp or pinch off vent line approximately 2″ from oil tank to avoid the end of oil tank vent fitting, and the vent line's pressure relief slit
2. Run engine at idle for 10–20 seconds.
3. Remove the vent line clamp. The oil pump will now be properly primed and ready for field operation. **Note:** *If the system is primed properly you should hear some air release. If you do not, the system has not primed. Repeat the process if necessary.*

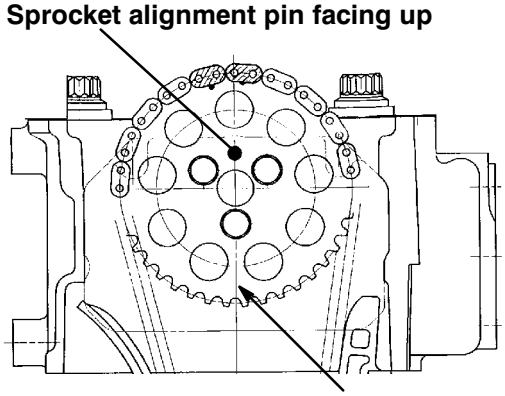
VALVE CLEARANCE

Inspect and adjust valve clearance while the engine is cold and the piston positioned at Top Dead Center (TDC) on compression stroke.

1. Remove the seat.
2. Remove body panels and fuel tank as necessary to gain access to valve cover.
3. Remove the spark plug high tension lead and remove the spark plug. **CAUTION:** Place a clean shop towel into the spark plug cavity to prevent dirt from entering.
4. Remove rocker cover bolts, cover and gasket.

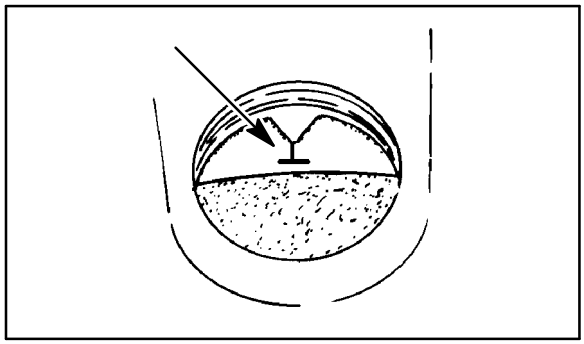
   NOTE: It may be necessary to tap cover lightly with a soft-faced hammer to loosen it from the cylinder head.
5. Remove timing inspection plug from recoil housing.

CAUTION: Failure to position the crankshaft at TDC on compression stroke will result in improper valve adjustment.



6. Rotate engine slowly with recoil rope, watching the intake valve(s) open and close.

NOTE: At this point watch the camshaft sprocket locating pin and slowly rotate engine until locating pin is facing upward, directly in line with the crankshaft to camshaft center line as shown. The camshaft lobes should be pointing downward.



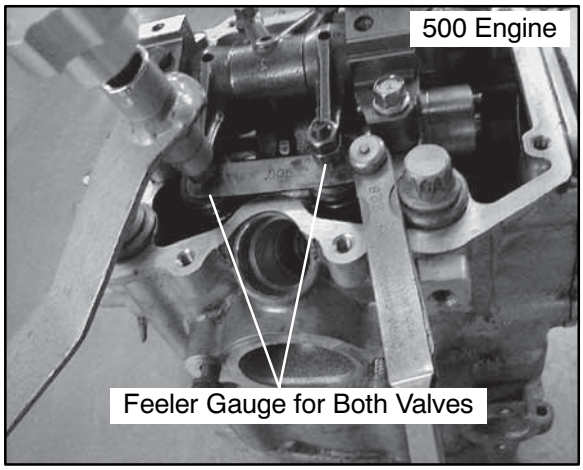
7. Verify accurate TDC positioning by observing the "T" mark aligned with the pointer in the timing inspection hole. In this position there should be clearance on all valves.

INTAKE VALVE CLEARANCE ADJUSTMENT

1. Insert a .006″ (.15mm) feeler gauge between end of intake valve stem and clearance adjuster screw.
2. Using a 10 mm wrench and a screwdriver, loosen adjuster lock nut and turn adjusting screw until there is a slight drag on the feeler gauge.
3. Hold adjuster screw and tighten adjuster lock nut securely.
4. Re-check the valve clearance.
5. Repeat adjustment procedure if necessary until clearance is correct with locknut secured.
6. Repeat this step for the other intake valve.

INTAKE VALVE CLEARANCE
.006″ (.15 mm)

EXHAUST VALVE CLEARANCE ADJUSTMENT



NOTE: The exhaust valves share a common rocker arm, and must be adjusted using two feeler gauges.

1. Insert .006 feeler gauge(s) between end of exhaust valve stem and adjuster screw(s).
2. Loosen locknut(s) and turn adjuster screw(s) until there is a slight drag on feeler gauge(s). The Valve/Clutch Adjuster Tool **(PA-44689)** can be used to adjust the engines valves. **NOTE:** Both feeler gauges should remain inserted during adjustment of each valve.

EXHAUST VALVE CLEARANCE
.006″ (.15 mm)

3. When clearance is correct, hold adjuster screw and tighten locknut securely
4. Re-check the valve clearance.
5. Repeat adjustment procedure if necessary until clearance is correct with locknut secured.

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.

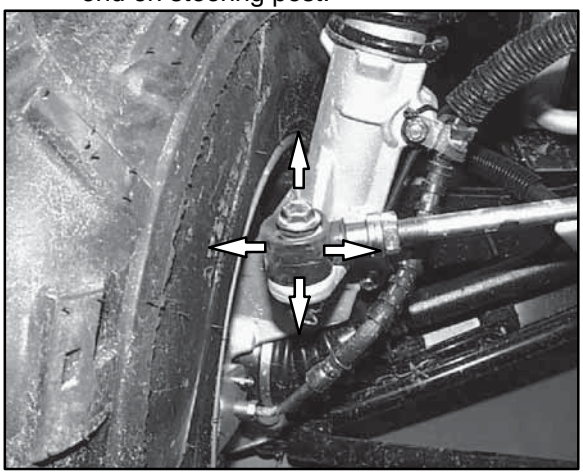
⚠ WARNING

Due to the critical nature of the procedures outlined in this chapter, Polaris recommends steering component repair and adjustment be performed by an authorized Polaris MSD-certified technician when replacing worn or damaged steering parts. Use only genuine Polaris replacement parts.

One of two methods can be used to measure toe alignment. The string method and the chalk method. If adjustment is required, refer to following pages for procedure.

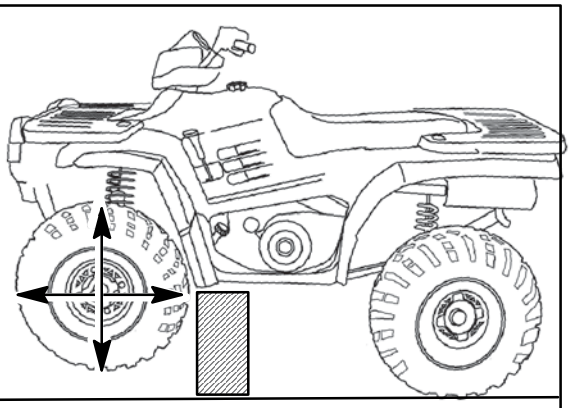
TIE ROD END / STEERING INSPECTION

- To check for play in the tie rod end, grasp the steering tie rod, pull in all directions feeling for movement.
- Repeat inspection for inner tie rod end on steering post.



- Replace any worn steering components. Steering should move freely through entire range of travel without binding.
- Elevate front end of machine so front wheels are off the ground. Check for any looseness in front hub / wheel assembly by grasping the tire firmly at top and bottom first, and then at front and rear. Try to move the wheel and hub by pushing inward and pulling outward.
- If abnormal movement is detected, inspect the hub and wheel assembly

to determine the cause (possible loose wheel nuts or loose front hub components).



Check for Loose Wheel or Hub

- Refer to the Body/Steering Chapter 5 or Final Drive Chapter 7 for service procedures.

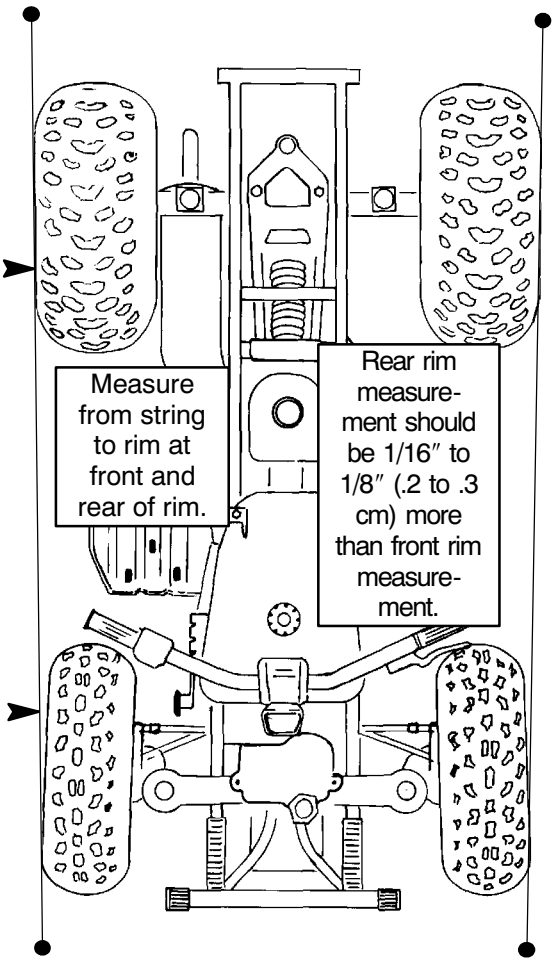
CAMBER AND CASTER

The camber and caster are non-adjustable.

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.

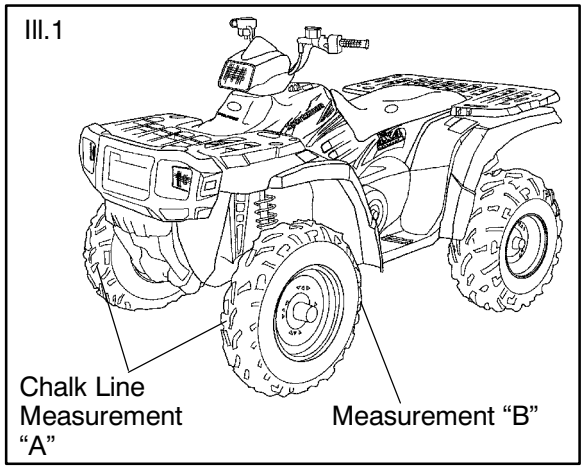
WHEEL ALIGNMENT METHOD 2: CHALK

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)

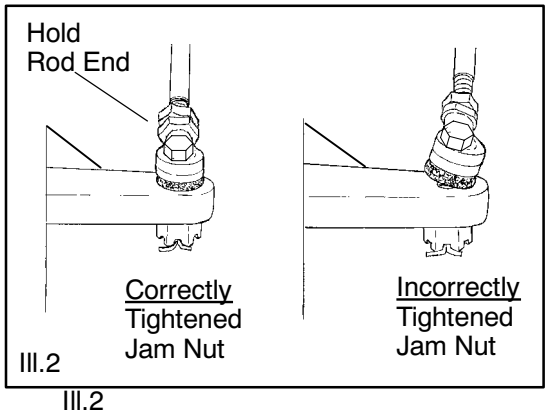
Ill.1



TOE ALIGNMENT ADJUSTMENT

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.



Ill.2

Ill.2

To adjust toe alignment:

- Hold 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 or Method 2.
- **IMPORTANT:** When tightening the tie rod end jam nuts, the rod ends must be held parallel to prevent rod end damage and premature wear. Damage may not be immediately apparent if done incorrectly. See illustration 2.

- After alignment is complete, torque jam nuts to 12-14 ft. lbs. (16-19 Nm).

EXHAUST PIPE

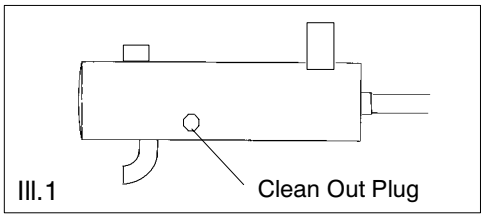
⚠ WARNING

- Do not perform clean out immediately after the engine has been run, as the exhaust system becomes very hot. Serious burns could result from contact with exhaust components.
- To reduce fire hazard, make sure that there are no combustible materials in the area when purging the spark arrestor.
- Wear eye protection.
- Do not stand behind or in front of the vehicle while purging the carbon from the spark arrestor.
- Never run the engine in an enclosed area. Exhaust contains poisonous carbon monoxide gas.
- Do not go under the machine while it is inclined. Set the hand brake and block the wheels to prevent roll back.

Failure to heed these warnings could result in serious personal injury or death.

The exhaust pipe must be periodically purged of accumulated carbon as follows:

1. Remove the clean out plugs located on the bottom of the muffler as shown in illustration 1.

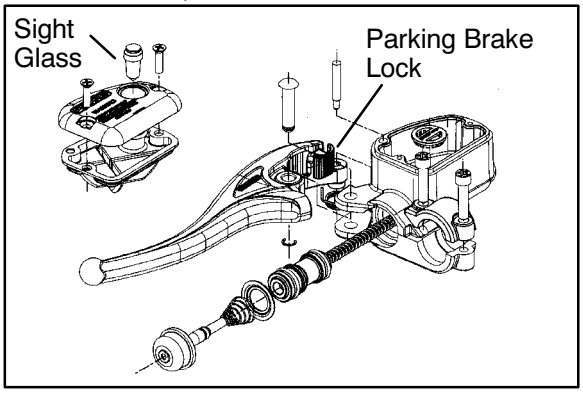


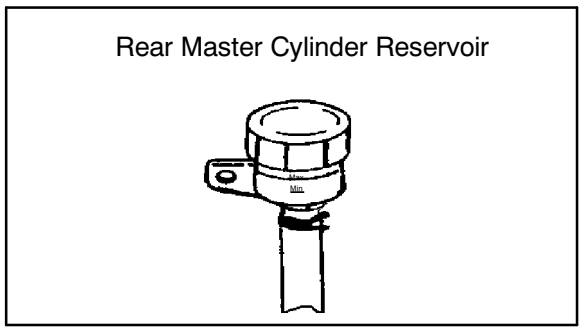
2. Place the transmission in neutral and start the engine. Purge accumulated carbon from the system by momentarily revving the engine several times.
3. If some carbon is expelled, cover the exhaust outlet and rap on the pipe around the clean out plugs while revving the engine several more times.
4. If particles are still suspected to be in the muffler, back the machine onto an incline so the rear of the machine is one foot higher than the front. Set the hand brake and block the wheels. Make sure the machine is in neutral and repeat Steps 2 and 3. **SEE WARNING**
5. If particles are still suspected to be in the muffler, drive the machine onto the incline so the front of the machine is one foot higher than the rear. Set the hand brake and block the wheels. Make sure the machine is in neutral and repeat Steps 2 and 3. **SEE WARNING**
6. Repeat steps 2 through 5 until no more particles are expelled when the engine is revved.
7. Stop the engine and allow the arrestor to cool.
8. Reinstall the clean out plugs.

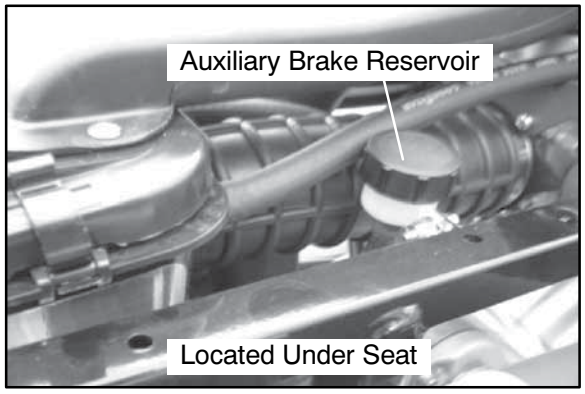
BRAKE SYSTEM INSPECTION

The following checks are recommended to keep the brake system in good operating condition. Service life of brake system components depends on operating conditions. Inspect brakes in accordance with the maintenance schedule and before each ride.

- Keep fluid level in the master cylinder reservoir to the indicated level inside reservoir.
- Use Polaris DOT 3 Brake Fluid (**PN 2870990**).



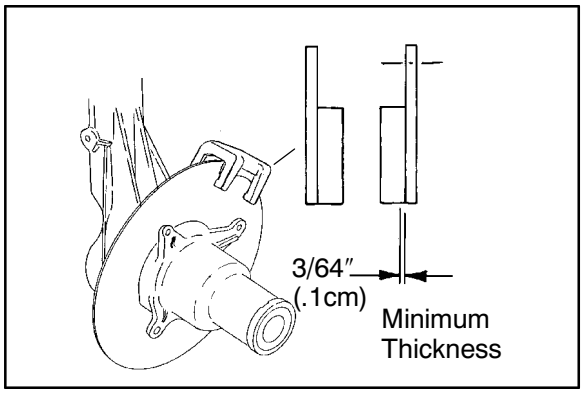




- Check brake system for fluid leaks.
- Check brake for excessive travel or spongy feel.
- Check friction pads for wear, damage or looseness.
- Check surface condition of the disc.

BRAKE PAD INSPECTION

Pads should be changed when the friction material is worn to 3/64″ (.1 cm), or about the thickness of a dime.

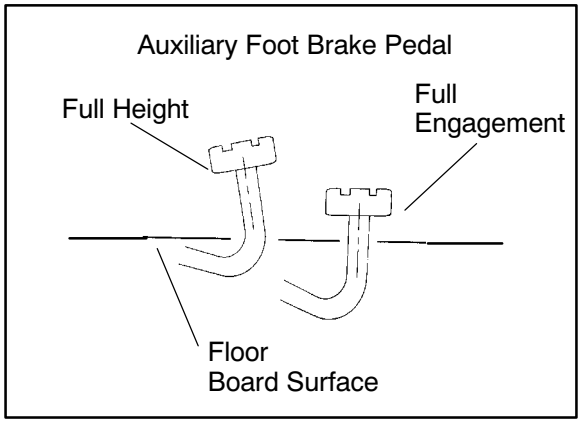


HOSE/FITTING INSPECTION

Check brake system hoses and fittings for cracks, deterioration, abrasion, and leaks. Tighten any loose fittings and replace any worn or damaged parts.

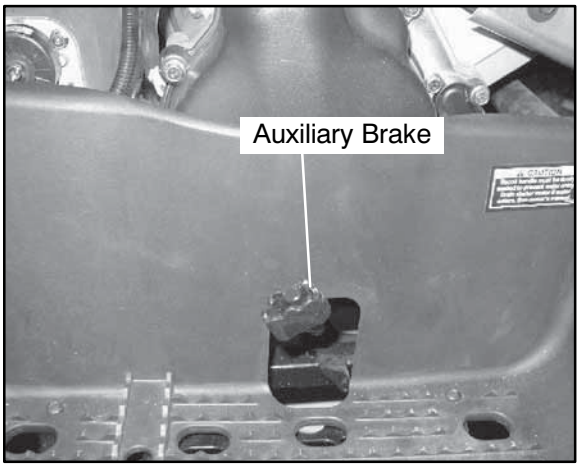
AUXILIARY BRAKE TESTING

The auxiliary brake should be checked for proper function.



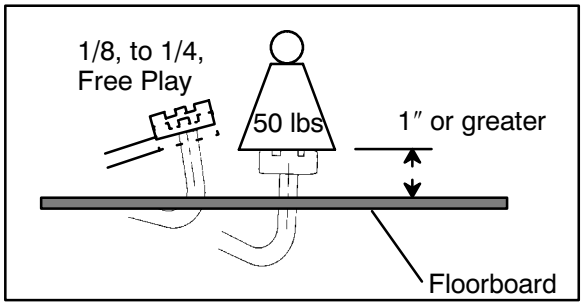
1. Support the rear wheels off the ground.
2. While turning the rear wheels by hand, apply the auxiliary foot brake. This brake should not stop the wheels from turning until the lever is half way between its rest position and bottoming on the footrest.

AUXILIARY BRAKE ADJUSTMENT (HYDRAULIC)



Use the following procedure to inspect the hydraulic auxiliary (foot) brake system and adjust or bleed if necessary:

First, check foot brake effectiveness by applying 50 lb. (approx.) downward force on the pedal. The top of the pedal should be at least 1 inch, (25.4mm) above the surface of the footrest.



If less than one inch, two things must be examined:

Free Play:

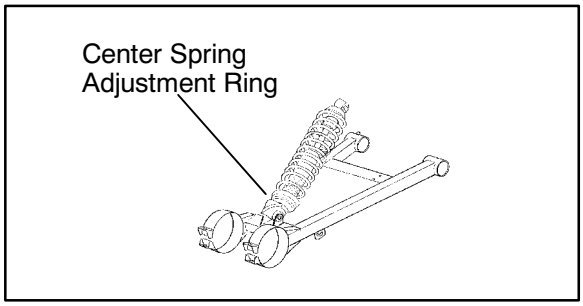
Free play of the brake pedal should be 1/8 - 1/4 inch (3.2 - 6.35 mm).

If free play is excessive, inspect pedal, linkage, and master cylinder for wear or damage and replace any parts as needed.

Bleeding:

If free play is correct and brake pedal travel is still excessive, air may be trapped somewhere in the system. Bleed the hydraulic auxiliary brake system in a conventional manner, following the procedure outlined in Brake Chapter 9.

SUSPENSION SPRING PRELOAD ADJUSTMENT



Operator weight and vehicle loading affect suspensionspringpreloadrequirements.Adjustas necessary.

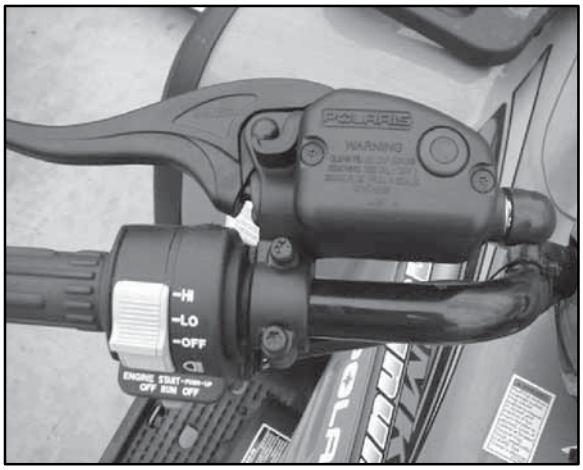
FRONT SUSPENSION

Compress and release front suspension. Damping should be smooth throughout the range of travel.

Check all front suspension components for wear or damage.

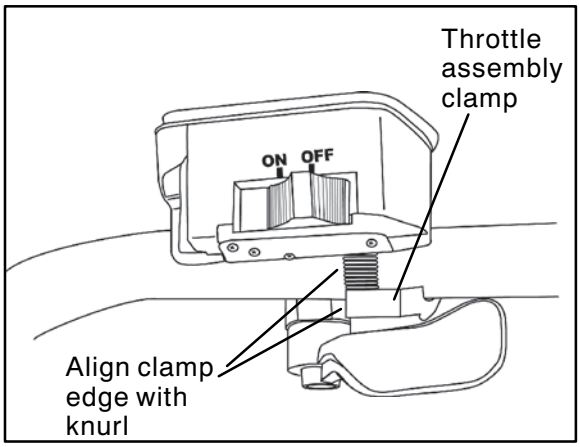
Inspect front strut cartridges for leakage.

CONTROLS



Check controls for proper operation, positioning and adjustment.

Brake control and switch must be positioned to allow brake lever to travel throughout entire range without contacting switch body.



Align throttle control assembly clamp with knurl on handlebar

WHEELS

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

⚠ WARNING

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

Worn tires can cause an accident.

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

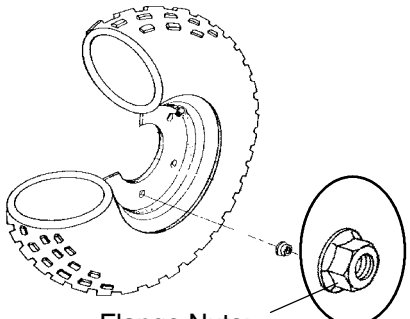
WHEELS

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

WHEEL, HUB, AND SPINDLE TORQUE TABLE

Item	Specification
Front Wheel Nuts	20 Ft. Lbs. (27 Nm)
Rear Wheel Nuts	20 Ft. Lbs. (27 Nm)
Front Spindle Nut	Refer to procedure listed in Chapter 7
Rear Hub Retaining Nut	100 Ft. Lbs. (136 Nm)

WHEEL REMOVAL FRONT OR REAR



1. Stop the engine, place the transmission in gear and lock the parking brake.
2. Loosen the wheel nuts 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 above.

CAUTION:

If wheels are improperly installed it could affect vehicle handling and tire wear. On vehicles with tapered rear wheel nuts, make sure tapered end of nut goes into taper on wheel.

TIRE PRESSURE

CAUTION:

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

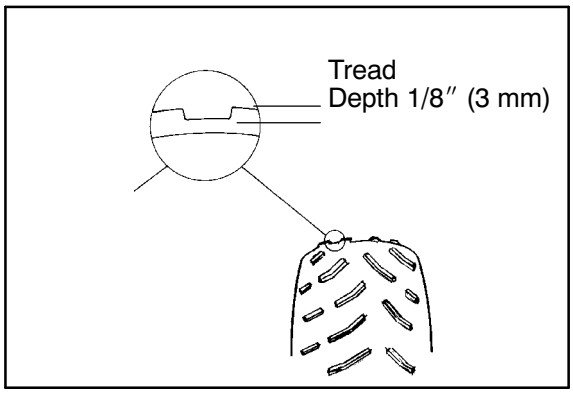
Tire Pressure Inspection (PSI - Cold)	
Front	**Rear**
5	5

TIRE INSPECTION

- 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.



⚠ 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.

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.

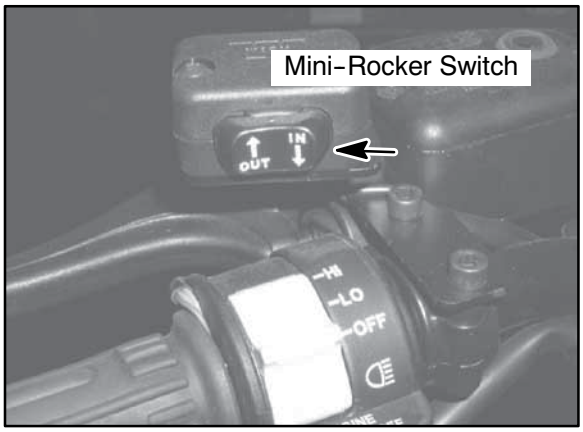
WARN® WINCH OPERATION (SPORTSMAN HUNTER EDITION)

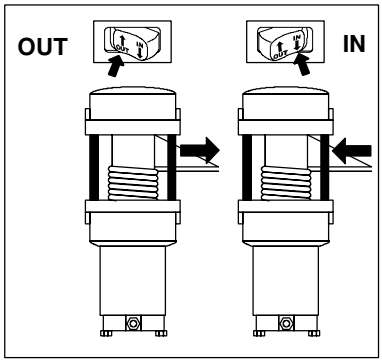
The Sportsman Hunter package is equipped with a 2500 lb. (2.5chi) Warn® Winch in the front.

Winch Handlebar Controls

The winch is located in the front bumper area.

The mini-rocker (IN/OUT) control controls the direction of the cable for the winch. **IN** pulls the cable into the winch and **OUT** feeds the cable out of the winch.





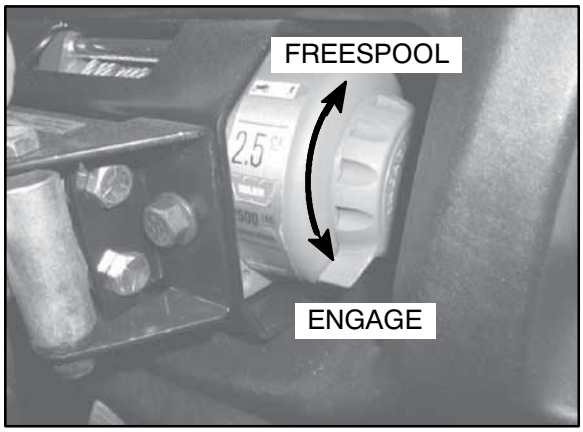
Winch Control

The winch control located on the side of the winch gives the operator easy access to switch between **ENGAGED** and **FREESPOOL**.

When the winch is ENGAGED, the winch only allows

the cable to be pulled IN or released OUT via the mini-rocker switch on the handlebar.

When the winch is FREESPOOL, the winch allows the cable to be pulled out freely. **NOTE:** The switch on the handlebar does not have to be in the OUT position.

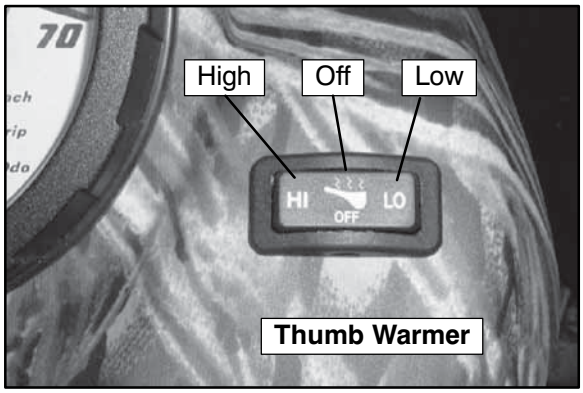


HAND / THUMB WARMER (SPORTSMAN HUNTER EDITION)

The Sportsman Hunter package is equipped with accessory hand and thumb warmers. The hand and thumb warmer's are activated by the switches located on the headlight pod.

NOTE: The hand and thumb warmers may not heat up if the machine is running at low idle speed with the headlights on. Warmer performance will be better at higher engine speeds. If operating at low engine speeds, warmer performance will be better with the headlights off.

The thumb warmer switch is located on the right side of the headlight pod. Simply flip the switch to HI, OFF, or LO for operation.



The hand warmer switch is located on the left side of the headlight pod. Simply flip the switch to HI, OFF, or LO for operation.