CHAPTER 3
Maintenance

PERIODIC MAINTENANCE

Periodic Maintenance Schedule

Periodic Maintenance Table

Item	Frequency				
	150 mi. (240 km)	500 mi. (800 km)	1000 mi. (1600 km)	2000 mi. (3200 km)	Pre-Season
Drive / Driven Clutch					
Clutch Alignment / Offset		I	I	I	I
Drive Belt Condition		I	I	I	I
Drive / Driven Clutch Condition		I / C	I / C	I / C	I / C
Drive Belt Tension		I	I	I	I
Clutch Sheaves		I	I	I	I
Engine					
Engine Mounts		I	I	I	I
Recoil Handle / Rope / Function		I	I	I	I
Engine Torque Stop / Engine Isolator		I	I	I	I
Cylinder Head Bolts	I	I	I	I	
Cylinder Base Nuts		I	I	I	
Ignition Timing				I	I
Spark Plug Condition	I	I	I	R	I
Exhaust System / Retaining Springs		I	I	I	I
VES Valves / Solenoid		I / C	I / C	I / C	I / C
Cooling System / Hoses / Coolant Level / Heat Exchangers				I	I
Oil Filter				I	I
Brake System					
Hose Condition / Routing		I	I	I	I
Fluid Level / Leaks / Fluid Condition		I	I	I	I
Brake Pads / Brake Disc		I	I	I	I
Parking Brake		I	I	I	I
Brake Fluid				R	
Fuel System					
Idle RPM		I	I	I	
CFI Fuel Filter	Replace every 2,000 miles.				
Carburetor Adjustments		I	I	I	
Throttle Lever / Choke Lever	I	L	L	L	L
Oil Pump Arm				I	I

Periodic Maintenance Table

Item	Frequency				
	150 mi. (240 km)	500 mi. (800 km)	1000 mi. (1600 km)	2000 mi. (3200 km)	Pre-Season
Throttle / Choke Cables	I	L	L	L	L
Fuel / Vent Hoses	I	I	I	I	I
Oil Hoses	I	I	I	I	I
Air Box	I		I		I
Carburetor Drains / Water Traps		I	I	I	I
Electrical System					
Auxiliary Shut-Off	I	I	I	I	I
Throttle Safety Switch	I	I	I	I	I
Ignition Switch	I	I	I	I	I
Headlights / Brake light / Taillights	I	I	I	I	I
Hand / Thumbwarmers	I	I	I	I	I
Perc Reverse System	I	I	I	I	I
Chassis					
Ski Toe Alignment		I	I	I	
Suspension Mounting Bolts	I	I	I	I	I
Steering Fasteners / Linkage / Handlebars	I	I	I	I	I
Driveshaft / Jackshaft Bearings		L	L	L	L
Ski Fasteners		I	I	I	I
Rebuildable IFP Shocks	I	High performance shocks should have oil changed and recharged at the end of every riding season.			
Drive Chain Tension	I	I	I	I	I
Chaincase / Gearcase Oil	I	I	I	R	I
Track Alignment / Track Tension	I	I	I	I	I
Rail Slide Condition	I	I	I	I	I
Bogie / Wheel Condition / Fastener Bolts	I	I	I	I	I
Hood / Seat / Chassis / Engine Compartment		C			C

L = Lubricate / I = Inspect or Adjust / R = Rebuild or Replace / C = Clean

MAINTENANCE PRODUCTS

Engine Oils / Lubricants / Misc.

DESCRIPTION	PART NUMBER
Premium 2-Cycle Semi-Synthetic Oil (Non-Variable Exhaust Engines) Quart Gallon 2.5 Gallon 16 Gallon 55 Gallon 330 Gallon	 2875035 2875036 2875038 2875037 2875039 2875040
VES Gold Plus 2-Cycle Oil (All Variable Exhaust Engines) Quart Gallon 2.5 Gallon 16 Gallon 55 Gallon 330 Gallon Liter 4 Liter 25 Liter 208 Liter	 2877882 2877883 2877884 2877885 2877886 2877892 2877887 2877888 2877889 2877890
PS-4 4-Cycle 2W-50 Oil Quart Gallon 16 Gallon 55 Gallon	 2876244 2876245 2876247 2876246
Synthetic Chaincase Lubricant Quart Gallon 2.5 Gallon	 2873105 2873106 2872952
Antifreeze 60/40 Premix Quart Gallon 55 Gallon	 2871534 2871323 2872278
Shock Oil - 5W - Walker Evans	2874522
Shock Oil - 5W - Fox Quart Gallon	 2870995 2872279
Shock Oil - 5W - Ryde FX / Arvin	2873716
Brake Fluid - DOT 4	2872189
Fogging Oil Aerosol Quart	 2870791 2871517

DESCRIPTION	PART NUMBER
Premium All Season Grease 3oz. Grease Gun Kit 14oz. Tube	 2871312 2871423
Starter Grease	2871460
Carbon Clean Plus	2871326
Isopropyl	2870505
Fuel Stabilizer Quart 2.5 Gallon	 2870652 2872280
Three Bond Sealant 5oz.	2871557
Loctite 242	2871950

BREAK-IN PROCEDURES

Engine Break-In Procedure

The first tank of fuel is considered the break-in period for the engine. During this time it is critical to not operate the engine at full throttle for more than a few seconds. Vary the throttle speed as much as possible. Monitor engine temperatures and fluid levels often during the break-in period.

NOTE: During the engine break-in period, verify the oil injection system is functioning by monitoring the oil level in the oil tank. If the oil level does not drop, inspect the oil injection system.

Polaris recommends filling the oil tank and pre-mixing the first full tank of fuel with Premium 2-Cycle Semi-Synthetic Oil when the engine is either new or refurbished (new pistons, crankshaft, cylinder(s), etc.). Polaris semi-synthetic engine oil will seat the rings faster than when using Polaris VES Gold Plus oil.

After the break-in period use Polaris VES Gold Plus engine oil for normal operation.

Fuel/Oil Premix Ratio

During the break-in period, premix the first tank a fuel (10 US gallons) using a 40:1 (fuel:oil) ratio.

Formula = 1 US Gallon = 128oz. / 40 (Desired Ratio) = 3.2oz. for every 1 US gallon of fuel.

10 US gallons of fuel requires 32oz. of oil to achieve a 40:1 premix ratio.

Always mix fuel and oil 5 gallons at a time. Never fill the tank with fuel and then add oil.

Drive Belt Break-In Procedure

The break-in period for a new drive belt is 30 miles. During this time, vary the throttle position under 50% and limit full throttle use.

New drive belts that feature a sanded finish should be first washed with warm, soapy water and allowed to air dry prior to use.

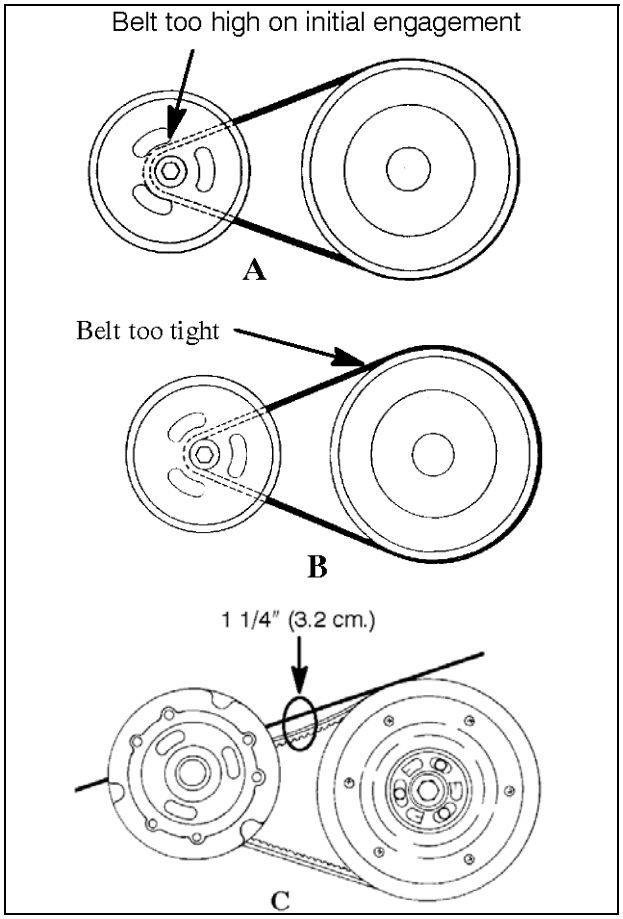
Always take time to warm up the belt and driveline prior to operating the snowmobile. Free track and skis from the ground before engaging throttle.

DRIVE / DRIVEN CLUTCHES

Belt Deflection Inspection

Too much belt deflection is when the belt is too long or the center distance is too short. The initial starting ratio will be too high, resulting in performance loss. This is due to the belt rising too high in the drive clutch sheaves upon engagement (A).

Not enough belt deflection (B) is when the belt is too short or the center distance is too long. The initial starting ratio will be too low. In addition, the machine may creep when the engine idles, causing damage to the internal face of the drive belt.



1. Measure the belt deflection with both clutches at rest and in their full neutral position.
2. Place a straight edge across the tow clutches, on top the belt.
3. Apply downward pressure to the belt and measure the distance at point (D).

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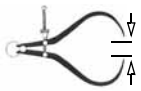
4. The measurement should be 1 1/4" (3.2cm).



= In. / mm.

Belt Deflection: 1.25" (3.2cm)

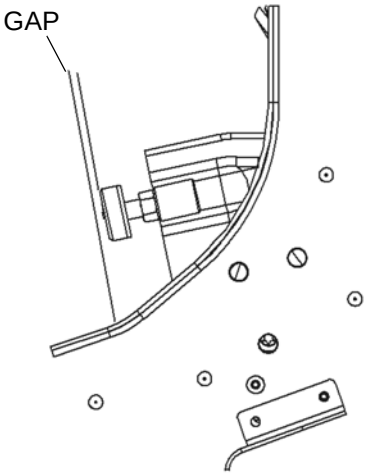
5. If the measurement is not correct adjust driven clutch.

Deflection Adjustment - SPA-P2 / Team Driven

1. Verify the drive system is FWD drive by rotating the driven clutch forward.
2. While holding the set screw with an Allen wrench, loosen the jam nut.
3. Turn the set screw clockwise while holding the jam nut stationary to increase the distance between the clutch sheaves (increase belt deflection).
4. Turn the set screw counter-clockwise while holding the jam nut stationary to decrease the distance between the clutch sheaves (decrease belt deflection).
5. Secure the jam nut while holding the set screw stationary.
6. Raise the rear of the snowmobile using a track stand to allow the track to spin.
7. Start the engine and apply enough throttle to spin the track.
8. Turn off then engine, then re-check the belt deflection.

NOTE: Do not adjust the belt deflection to the point where the drive belt cord line is visible when the belt is seated in the driven clutch.

Torque Stop Adjustment



Set torque stop bumper gap to specification after aligning drive and driven clutches.

= In. / mm.

Torque Stop Bumper-to-Engine Gap
.010 - .030 (.25 - .75mm)

After setting gap, torque jam nut to specification.

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Torque Stop Jam Nut: 15-17 ft-lb. (21-24 Nm)

NOTE: Where applicable, when installing a new torque stop, position bumper so the tip is just touching crankcase.

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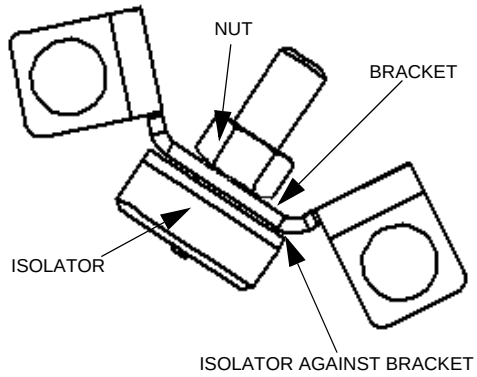
Engine Isolator Limiter Setting

Some models use an engine mount strap isolator. The isolator is located on left-front corner of the bulkhead. The isolator should not make contact with the engine strap.

If the isolator requires adjustment or replacement, hold the isolator so it is against the bracket, then torque the nut to specification.

NOTE: Do not adjust this engine isolator limiter as a torque stop or damage may occur. The approximate distance from the face of the isolator to the face of the engine strap is 0.107" (2.72mm).



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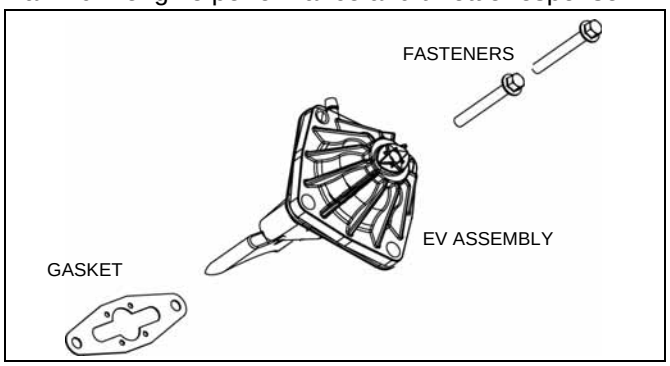
Jam Nut: 15-17 ft-lb. (21-24 Nm)

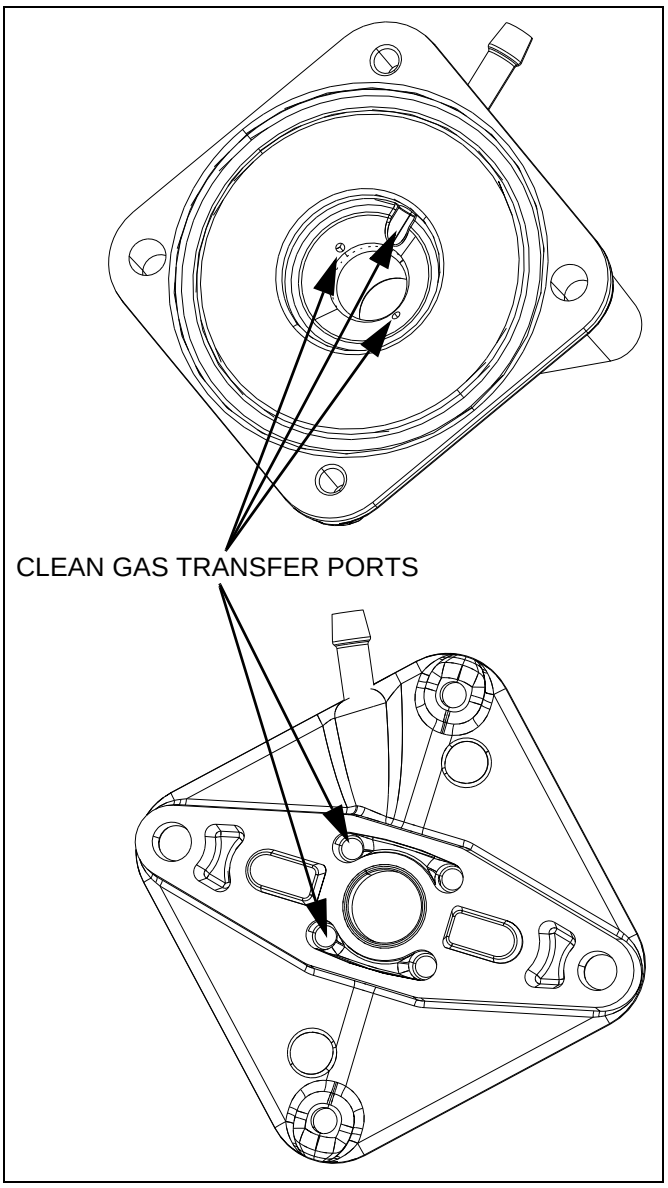
ENGINE MAINTENANCE

Exhaust Valve Cleaning

The exhaust valve guillotines must be cleaned to ensure maximum engine performance and throttle response.



1. Remove the vent hose from the EV base fittings.
2. Remove the two fasteners that secure the valve assembly to the cylinder. Remove the cover after the assembly is removed from the engine.
3. Using a clean rag or shop towel, remove the oil residue from the cylinder, guillotine, and EV base.
4. Inspection:
   - Inspect the guillotine for signs of damage. Replace guillotine if damage is found. Inspect the cylinder and piston for damage if guillotine is damaged.
   - Inspect the spring. Replace if rusted, damaged, or bent.
   - Inspect bellows. Replace if damaged or excessively worn.
   - Submerse the assembly in parts cleaner. Thoroughly flush the EV housing base, bellows, and mating surfaces. Verify no carbon is in the gas transfer ports.



   - Clean the guillotine with brake cleaner and a piece of fine steel wool. Clean only to remove hardened carbon deposits.
5. Once clean, rinse blade with mild detergent and water. Dry completely.
6. Install a new gasket, then reinstall the EV assembly. Apply Loctite 242 to the fastener threads, then torque to specification.

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NOTE: Always install a new EV base gasket. Never re-use the gasket, or modify a new gasket.

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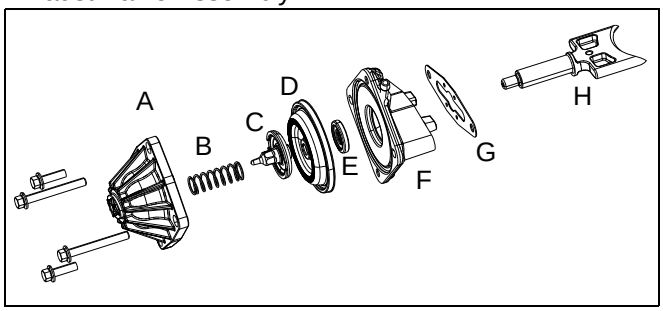
Exhaust Valve Housing Fasteners 12 Ft.Lbs. (16 Nm) - Apply Loctite 242

7. Reconnect the vent hoses.

NOTE: To obtain maximum exhaust valve performance, Polaris recommends using Polaris VES Gold Plus Synthetic Two-Stroke engine oil. Never mix different brands of engine oil.

Exhaust Valve Assembly



- A = EV Cap
- B = Spring
- C = Cap Nut
- D = Bellows
- E = Spacer
- F = EV Base
- G = Gasket
- H = Guillotine

Exhaust Valve Springs

CAUTION
Do not substitute different color springs on solenoid controlled EV engines.

SPRING	COLOR	FREE LENGTH (INCHES)
7041704-01	Blue	1.752
7041704-02	Orange	1.729
7041704-03	Pink	1.734
7041704-04	Purple	1.726
7041704-05	Yellow	1.734
7041704-06	White	1.537

Spark Plugs

Inspect/replace the spark plugs as outlined in the periodic maintenance table.

The spark plugs can be serviced by opening the left and right door panels.

Replace a spark plug when the following occurs:

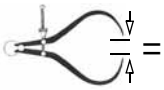
- Spark plug is damaged/insulator is cracked or missing
- Plug electrode/insulator is fouled
- Replace at interval in maintenance table

When inspecting a spark plug, take note of the electrode and insulator color. A light brown/dark tan color indicates the engine is running properly.

If the spark plug electrode/insulator is white, the engine may be running lean. Inspect the engine, throttle body boots, etc. for air leaks.

If the spark plug electrode/insulator is black, oily, or shows heavy soot, the engine may be running rich. Inspect the engine, fuel system, and lubrication system for problems.

Set the electrode gap to specification before installing a new spark plug.

 = In. / mm.
Spark Plug Gap = .027 (.70mm)

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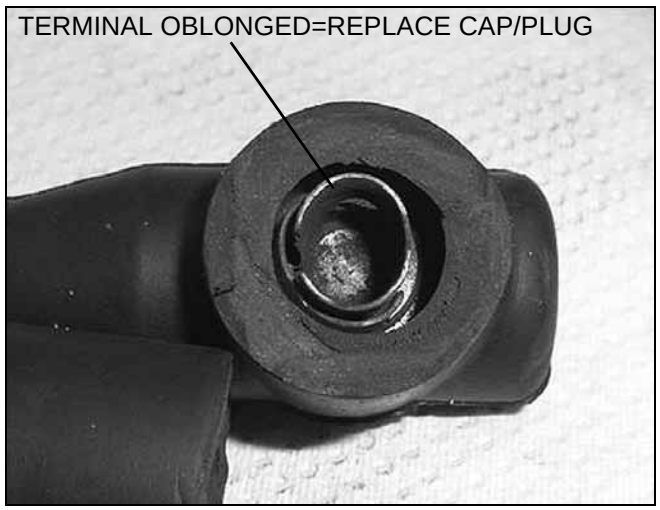
Spark Plug Torque 18-21.6 Ft.Lbs. (24-30 Nm) Apply anti-seize to threads.

Spark Plug Caps/Spark Plug Terminals

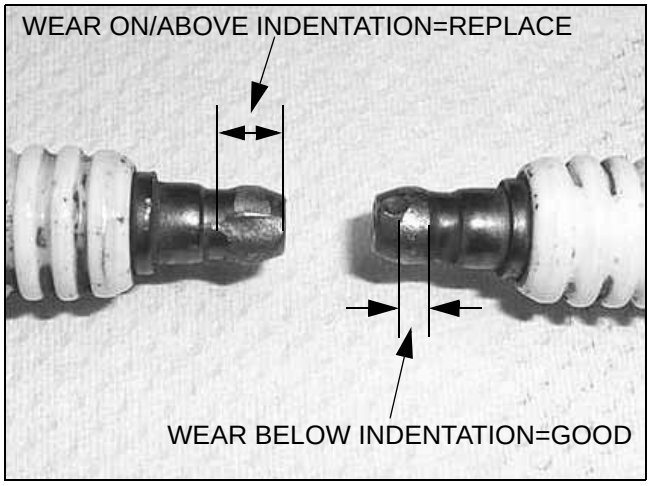
Inspect the spark plug caps when performing spark plug maintenance.

Visually inspect the terminal ring inside the cap and the spark plug tip for oblonging/uneven wear. Replace the spark plug and corresponding cap if the wear patterns on the cap terminal ring and spark plug terminal resemble the photos below.

Spark Plug Cap Terminal Ring Wear:



Spark Plug Cap Terminal Wear:



Use gentle force and a slight twisting motion when installing plug caps. An audible “click” should be heard when the terminal ring is properly seated below terminal tip indentation.

Surge Tank (Recovery Bottle)

Keep the level of the coolant inside the surge tank at the FULL COLD level mark when the coolant is at room temperature.

Always add coolant when the cooling system is COLD.

⚠ CAUTION

Never remove the surge tank pressure cap when the cooling system is warm. Severe burns to skin may occur from escaping coolant or steam.

Recommended Coolant

Use Polaris Premium 60 / 40 pre-mix antifreeze. This premium antifreeze is rated for temperatures down to -62°F (-52°C).

Cooling System Bleeding

1. Allow the cooling system to cool completely.
2. Verify the coolant level in the surge tank is at the COLD mark. Fill the surge tank if required. Loosely install the pressure cap.
3. Open the thermostat housing bleed screw. Wrap a clean shop towel around the housing to absorb any coolant that may flow out of the bleed screw.
4. Elevate the front of the machine slightly.
5. Apply the parking brake and start the engine.
6. Allow the engine idle time to stabilize.
7. Immediately add coolant to the surge tank if the coolant level dropped significantly after the engine started. Watch the level and add more coolant until the level stops dropping.

NOTE: Squeeze the coolant hoses to purge air from the cooling system.

8. Secure the pressure cap and bleed screw after the thermostat begins to open and coolant begins to flow out of the bleed screw.
9. Verify the tunnel coolers begin to warm up as the engine continues to run.
10. To remove air from the tunnel cooling system, the vehicle should be pivoted upwards in four directions (nose up, left side up, rear bumper up, and right side up) to move any air pockets in the system to the surge tank.
11. Verify that all of the coolers are warm, including the tunnel-length cooling system. Turn off the engine once the tunnel coolers are sufficiently warmed-up. Release the parking brake.

⚠ CAUTION

Always verify all tunnel coolers / radiator are warm to the touch. A tunnel cooler or return hose that is significantly "colder" than another cooler or hose is an indication of trapped air within the cooling system.

12. Allow time for the coolant temperature to cool. Re-check the coolant level in the surge tank. Add more coolant if required.

600 Widetrak IQ Cooling System Fill/Air Bleed

⚠ CAUTION

Steam and hot liquids will cause burns to your skin. Never bleed the cooling system or remove the pressure cap when the engine is warm or hot.

This procedure is intended for use after service or repair where the cooling system has been completely drained.

NOTE: Read and understand all steps of the procedure before starting.

⚠ CAUTION

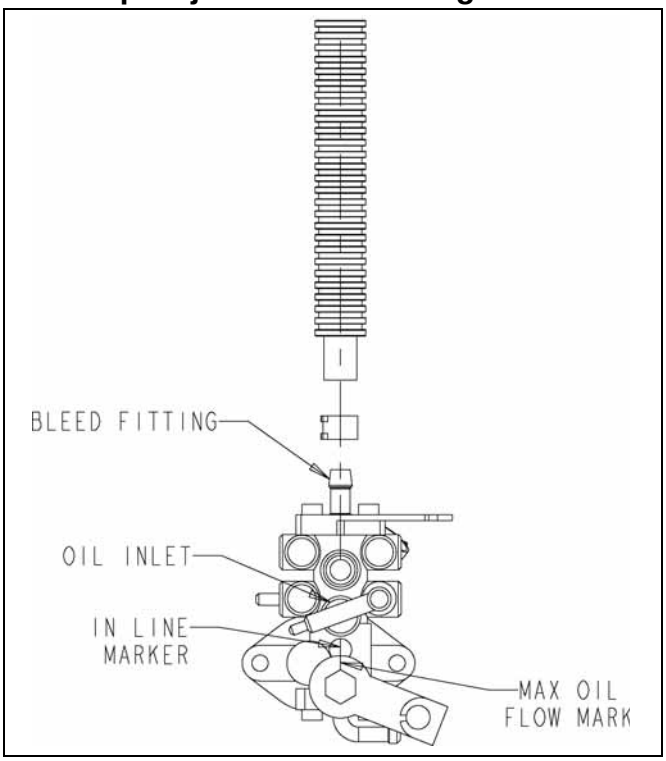
Do not start the engine until instructed to do so.

1. Shift the transmission into neutral (N).
2. Move the snowmobile into a well-ventilated area. Elevate the front of the vehicle 30 inches (76cm) using a jack or lift.
3. Open the bleed screws on the engine thermostat housing elbow and radiator. Do not misplace the bleed screws/washers if removed.
4. Remove the pressure cap from the coolant reservoir.
5. Fill the coolant reservoir with new coolant (60/40 mixture - Propylne Glycol / distilled water), until coolant drains from the radiator bleed opening.
6. Close the radiator bleed screw.
7. Continue filling the coolant reservoir until coolant drains from the thermostat housing bleed screw.

NOTE: Monitor the coolant level throughout the following steps. Add coolant as required.

8. Reinstall the pressure cap to one-click only.
9. Disconnect the radiator fan power connector.
10. Verify the transmission is in neutral (N), and start the engine in a well ventilated area.
11. Monitor the engine coolant temperature on the MFD. Push the MODE/SET switch up once to access the engine temperature display.
12. Refill the coolant reservoir as required to the 3/4 level while allowing the engine to warm-up to 120_F (50_C).
13. Increase engine RPM to 4000 intermittently (1 to 2 seconds) for step 14.
14. Pinch off the coolant hose connecting the bypass fitting to the brake caliper. Use a soft-jawed pliers to prevent hose damage. This step will assist in removing air from the rear coolers.
15. Close the thermostat housing bleed screw when a steady stream of coolant is evident.
16. Remove the pliers from the hose when the tunnel coolers become warm to the touch.
17. Reconnect the radiator fan motor harness.
18. Shut off the engine and allow it to cool for several hours while keeping the front of the vehicle elevated.
19. Lower the vehicle to the ground.
20. Fill the coolant recovery bottle to the COLD FILL line.
21. Monitor the coolant levels during operation and add coolant if necessary.

Oil Pump Adjustment - 550 Engines



NOTE: Before adjusting oil pump, always verify the throttle lever free play and idle speed RPM are set to specification.

1. Verify the oil pump MAX OIL FLOW in line marker is aligned with the oil pump body mark at WOT (Wide Open Throttle).
2. Lever adjustment is accomplished by loosening the two oil pump cable jam nuts, then moving the threaded barrel up or down until the two marker lines are aligned at WOT.
3. Apply Loctite 262 to barrel threads and secure jam nuts when adjustment is set.

Oil Pump Bleeding - 550 Engines

1. The oil pumps on IQ 550s feature an air bleed hose conencting the oil pump with the oil tank. Verify the presence of oil in the bleed hose and air bubbles migrating up to the oil tank while the engine is running.

NOTE: Any time that the engine is disassembled or repaired, it is important to purge air within the hoses and oil pump.

Oil Pump Adjustment - Carbureted Models

NOTE: Before adjusting oil pump, always verify the throttle lever free play and idle speed RPM are set to specification.

1. Always verify the throttle cable free play is set to specification (.010″ - .030″).

NOTE: The oil pump lever arm line mark MUST be aligned with the oil pump boss index mark at the exact moment when the throttle slides begin to lift from the idle position.

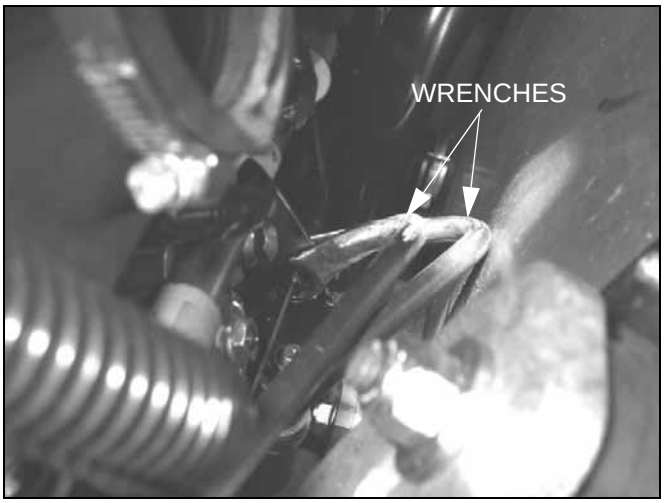
2. Remove the air box, drive belt, drive clutch and driven clutch from the engine compartment.
3. Remove the rear engine torque stop plate from the bulkhead the bulkhead.
4. Remove the 2 left-hand console mounting screws and electrical center cover piece.
5. Remove the rear 2 lower clutch guard mounting screws and 3 forward mounting nuts and plate.
6. Remove the 3 screws securing the lower clutch guard to the upper plate leaving the electrical center components in place.
7. Loosen and remove the throttle body assembly and set aside.
8. Using a mirror or a bore scope and a light, visually inspect the current oil pump setting.

> **⚠ CAUTION**
>
> The oil pump lever and pump boss marks must be observed straight-on to yield accurate results.

NOTE: The oil pump jam nuts can be manipulated using the special tool set part number: PS-49001 (Oil Pump Cable Wrenches).

9. If the oil pump lever requires adjustment or the cable is going to be replaced, insert the two oil pump cable wrenches between the bulkhead and the rear of the engine.
10. If the oil pump lever requires adjustment or the cable is going to be replaced, insert the two oil pump cable wrenches between the bulkhead and the rear of the engine.

NOTE: The wrench with the large opening is designed to fit around the cable sheath, while the wrench with the small opening is designed to fit around the inner cable wire.



11. When adjusting the lever, make adjustments in small increments, then re-check the timing mark alignment.

12. After setting the oil pump lever correctly, apply a small drop of Loctite 242 to the cable barrel threads, then secure the jam nuts.

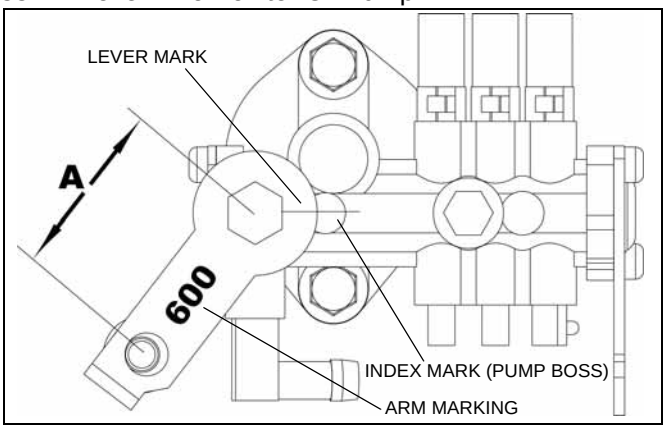
13. Re-check the oil pump alignment marks after securing the jam nuts to verify the marks are set correctly.

14. Re-assemble the removed components in the reverse they were removed. Reference the appropriate service manual chapter for component assembly fastener torques.

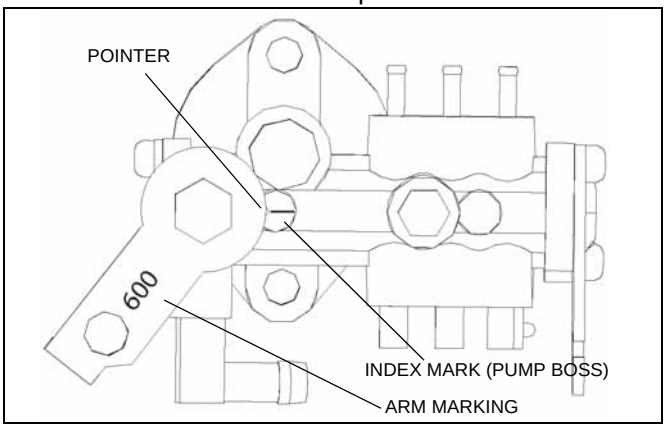
Oil Pump Adjustment - CFI Models

NOTE: Before adjusting oil pump, always verify the throttle lever free play and idle speed RPM are set to specification.

33mm Lever - No Pointer Oil Pump



28mm Lever - Pointer Oil Pump



1. Always verify the throttle cable free play is set to specification (.010″ - .030″) and the throttle lever is synchronized to the throttle plates.

NOTE: The oil pump lever arm MUST begin to move at the exact moment the throttle plates move from the throttle stop position.

2. The oil pump part number and/or lever marking determines where to set the oil pump lever.

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Oil Pump Adjustment Settings (CFI Models Only)

PART NUMBER	ARM MARKING/LENGTH (A) (MM)	LEVER SETTING
2520552	600 / 33mm - No Pointer (Lever will not clear engine strap.) Pump used on all 2007 600 CFIs and some early-build 2008 600 CFIs. (Subs to 2520831)	Set lever line mark to 1 full line width (.050″) above original oil pump boss index mark.
2520831	600 / 28mm - w/Pointer (Lever will clear engine strap.) Pump phased in for 2008 600 CFIs.	Lever mark is a pointer. Oil pump lever pointer is set POINTER-TO-LINE.
2520622	700 / 33mm - No Pointer (Lever will not clear engine strap.) Pump used on all 2007 700 CFIs and some early-build 2008 700 CFIs. (Subs to 2520832)	Set lever line mark set to 1 full line width (.050″) above original oil pump boss index mark. Some 2007 700 CFI models had a second line scribed above original pump boss mark and were marked with red paint.
2520832	700 / 28mm - w/Pointer (Lever will clear engine strap.) Pump phased in for 2008 700 CFIs. Service replacement pump for ALL 700 CFIs. 600 IQ Widetrak Oil Pump	Lever mark is a pointer. Oil pump lever pointer is set POINTER-TO-LINE.
2520833	800 / 28mm - w/Pointer (Subs to 2520901)	2008 Early Build Engines: Oil pump index mark boss is scribed with 2 lines from the factory. Oil pump lever pointer is set BETWEEN the 2 scribe lines. Late Build Engines: Oil pump index mark boss features 1 scribe line. Oil pump lever pointer is set POINTER-TO-LINE.
2520901	800/28mm - w/Pointer (Subs to 2521165)	Oil pump index mark boss features 1 scribe line. Oil pump lever pointer is set POINTER-TO-LINE.
2521165	800A/28mm - w/Pointer	

NOTE: Some 2008 600 and 700 CFI engines were manufactured with model year 2007 oil pumps (PNs 2520552 and 2520622). Always reference the oil pump adjustment chart to determine the oil pump lever setting based on the oil pump and not the engine model year.
All service parts will be the 28mm w/Pointer oil pumps.

⚠ CAUTION

Failure to properly set the oil pump lever arm may cause severe engine damage.

3. Remove the air box, throttle body adapter plate, drive belt, drive clutch and driven clutch from the engine compartment.

4. Remove the rear engine torque stop plate from the bulkhead the bulkhead.

5. Remove the 2 left-hand console mounting screws and electrical center cover piece.

6. Remove the rear 2 lower clutch guard mounting screws and 3 forward mounting nuts and plate.

7. Remove the 3 screws securing the lower clutch guard to the upper plate leaving the electrical center components in place.

8. Loosen and remove the throttle body assembly and set aside.

9. Using a mirror or a bore scope and a light, visually inspect the current oil pump setting.

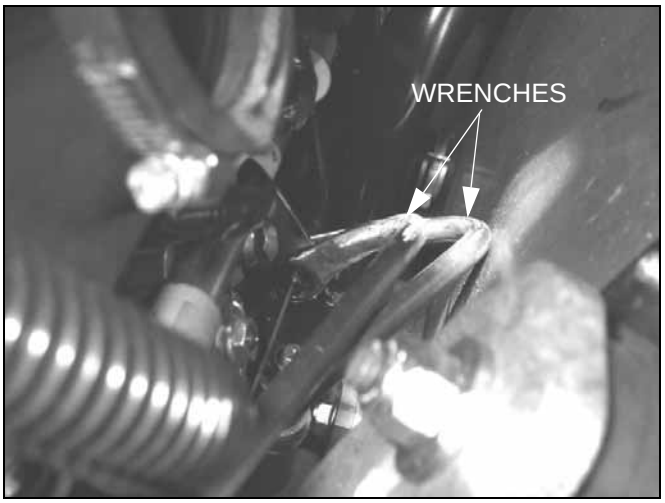
⚠ CAUTION

The oil pump lever and pump boss marks must be observed straight-on to yield accurate results.

NOTE: The oil pump jam nuts can be manipulated using the special tool set part number: PS-49001 (Oil Pump Cable Wrenches).

10. If the oil pump lever requires adjustment or the cable is going to be replaced, insert the two oil pump cable wrenches between the bulkhead and the rear of the engine.

NOTE: The wrench with the large opening is designed to fit around the cable sheath, while the wrench with the small opening is designed to fit around the inner cable wire.



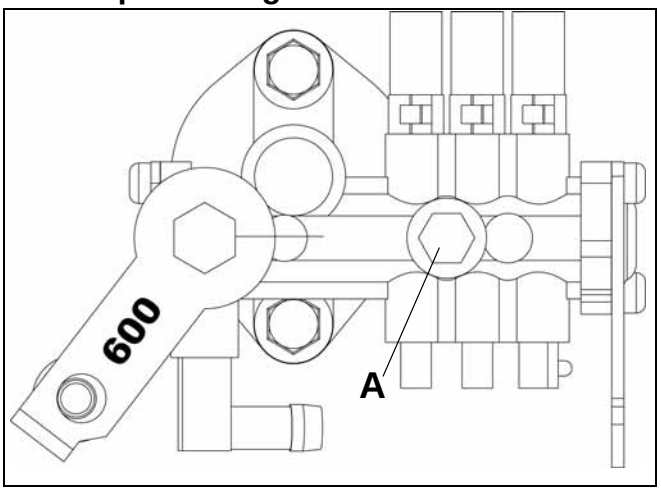
11. When adjusting the lever, make adjustments in small increments, then re-check the timing mark alignment. Reference the OIL PUMP ADJUSTMENT SETTING TABLE to verify where the oil pump lever is set in relation to the oil pump boss index mark.

12. After setting the oil pump lever correctly, apply a small drop of Loctite 242 to the cable barrel threads, then secure the jam nuts.

13. Re-check the oil pump alignment marks after securing the jam nuts to verify the marks are set correctly.

14. Re-assemble the removed components in the reverse they were removed. Reference the appropriate service manual chapter for component assembly fastener torques.

Oil Pump Bleeding



1. Verify oil tank is filled with oil.

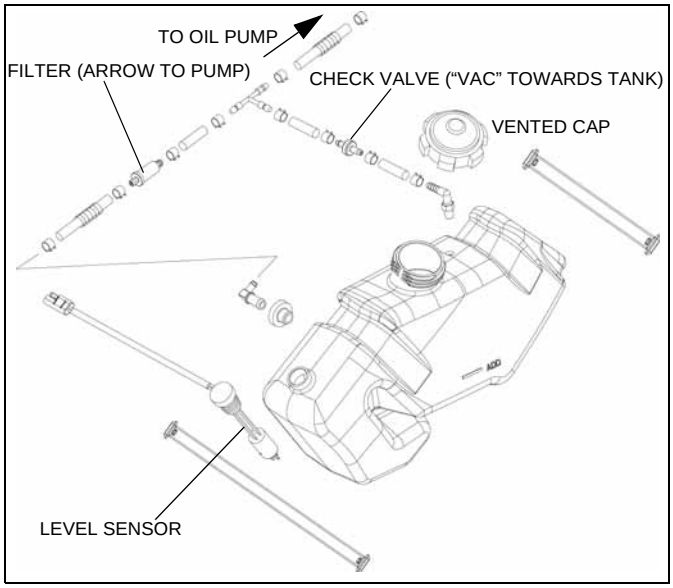
2. Loosen the bleed screw (A). Verify a stream of oil flows from the bleed screw.

3. After bleeding oil pump, secure bleed screw and wipe up oil residue.

NOTE: Any time that the engine is disassembled or repaired, it is important to purge air within the hoses and oil pump.

600 IQ Widetrak Self-Bleeding Oil Tank

In addition to an oil pump air bleed, the 600 IQ Widetrak features a self-bleeding oil supply hose.



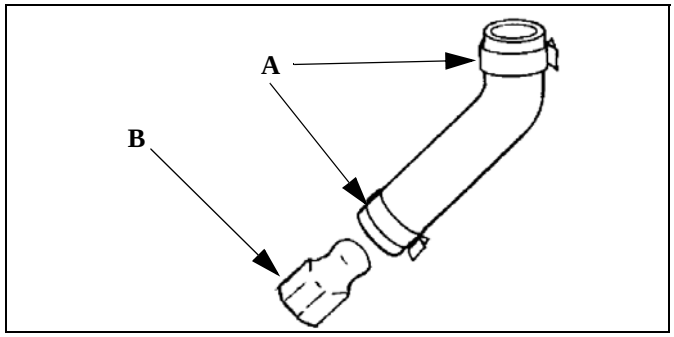
FUEL / INTAKE SYSTEM

Water Sediment Trap

WARNING

When draining the traps, fuel spillage will occur. Be sure to work in a well ventilated area away from anything which may cause the fuel to ignite such as an open flame, heaters, trouble lights or cigarettes.

Vehicles with carburetors incorporate a patented float bowl water / sediment traps located at the bottom of each carburetor.



1. Turn the fuel tank supply valve to the “OFF” position.
2. Position a container or shop towels under the work area to help catch some of the contaminated gasoline.
3. Slide the clamp (A) away from the drain plug (B) and remove it from the sediment tube and drain the contaminated material from the bowl. Repeat for each carburetor.
4. Wipe off the residue from the plug and reinstall the clamps.

Fuel Filter - Carbureted Models

CAUTION

The in-tank fuel filter and fuel lines should be inspected regularly. Special attention should be given to the fuel line condition after periods of storage.
Normal deterioration from weather and fuel can occur during this storage period. Do not damage fuel lines when removing them. If a fuel line has been damaged or kinked it must be replaced.

All models feature a fuel pick with filter located inside the fuel tank. To inspect and replace:

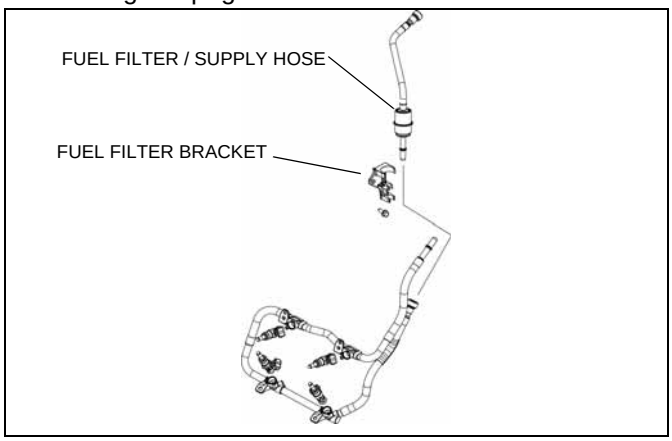
1. Remove the gas cap.
2. Use a coat hanger to carefully pickup the fuel hose inside the tank.
3. Inspect and replace the pickup/filter at the end of the hose.

Fuel Filter - CFI Models

WARNING

When removing the fuel filter fuel spillage will occur. Be sure to work in a well ventilated area away from anything which may cause the fuel to ignite such as an open flame, heaters, trouble lights or cigarettes.

1. The fuel filter should be replaced as outlined in the periodic maintenance table. For information involving de-pressurizing the fuel system and disconnecting fuel hoses, See “Fuel Rail Bleeding / Pressure Testing” on page 4.37.



2. After de-pressurizing the fuel system and disconnecting the fuel hoses, remove the fuel filter cartridge from the bracket. Dispose of any fuel in an appropriate container, then discard assembly.

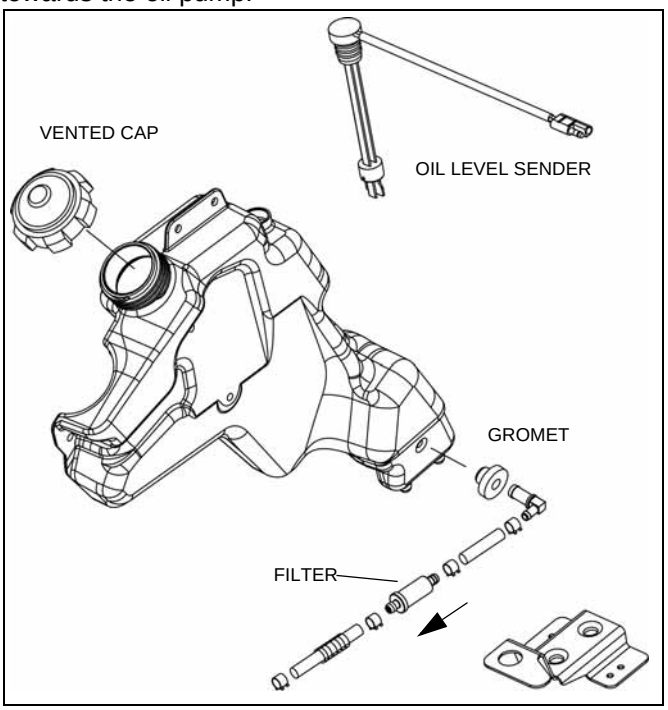
3. When re-connecting the fuel hoses, verify the connections are secure by firmly pulling on the two hose connections. Push the filter cartridge back into the bracket.

4. To prime the fuel system after installing a new filter, connect a 12 volt Vdc battery to the fuel pump prime plug. See “Diagnostic Plugs” on page 11.18.

Oil Filter

All models feature an inline oil filter located between the oil reservoir and oil pump. Always bleed the oil supply hose and oil pump of air after replacing the filter.

Install the oil filter so that the directional arrow points towards the oil pump.

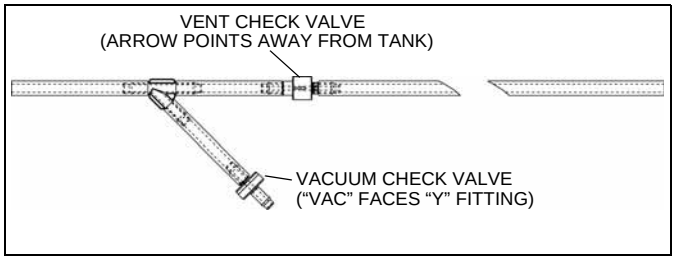


Fuel Tank Vent System

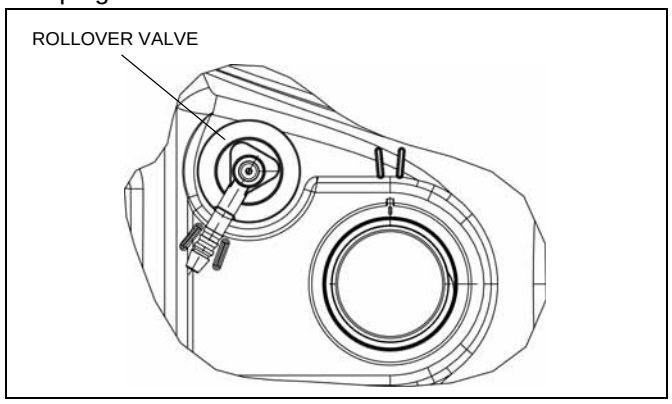
All models feature a fuel tank vent / vacuum check valve system. There are two systems used depending on the model year of the snowmobile.

On some models, the vent / vacuum check valve system resembles the illustration below.

When inspecting the system, verify the hoses are not cut or kinked.



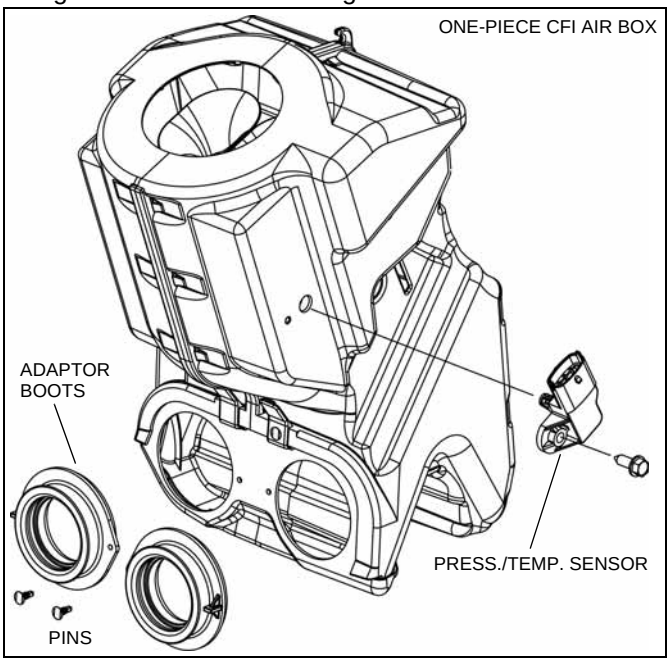
Some models feature a rollover check valve / vent / vacuum check valve assembly bonded to the inside of the fuel tank. The rollover check valve prevents fuel from escaping the tank in the event of a vehicle rollover.



The rollover check valve is not serviceable. When inspecting the system, verify the hose is not kinked.

Air Intake Box / Pre-Filters

Inspect the inside of the air intake box and pre-filters for foreign material and/or damage.



NOTE: All 2007 and some 2008 CFI models were manufactured with a two-piece airbox where an adapter plate was secured to the throttle body. The airbox then snapped into the adapter plate to make the airbox assembly.
The two-piece air box is no longer available. A one-piece air box is the direct replacement. The new air box features adaptor boots that are pinned to the air box. A set of gear clamps secure the boots to the throttle body assembly.

Inspect the console-mounted pre-filters for damage, and foreign material. Replace filter(s) or clean if required.

CHASSIS LUBRICATION

Chassis, suspension and mechanical grease points should be lubricated Polaris Premium All Season Grease.

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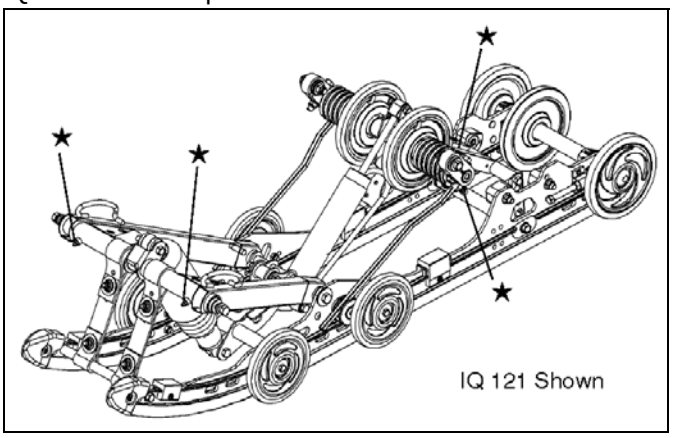
Polaris Premium All Season Grease Part Numbers: 3oz. Grease Gun Kit = 2871312 14oz. Tube = 2871423

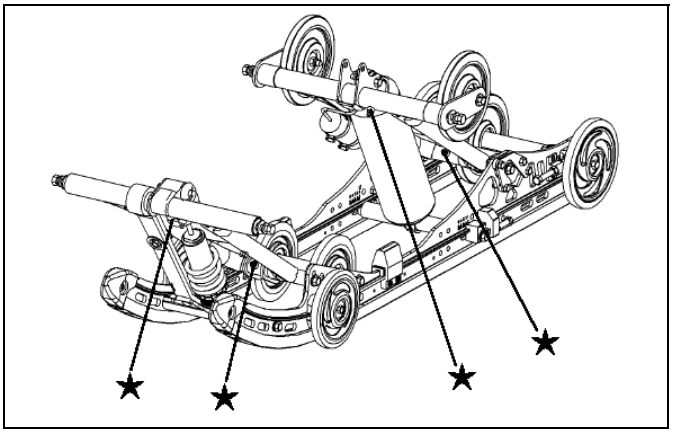
Rear Suspension

Lubricate grease zerks with Premium All Season Grease.

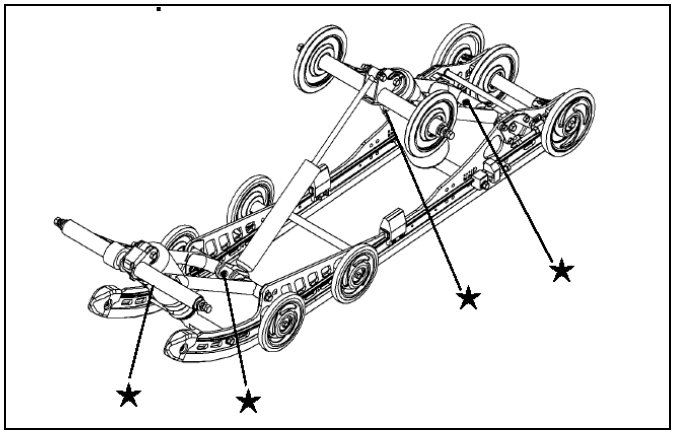
IQ 121 / 136 Coupled / 136 Comfort



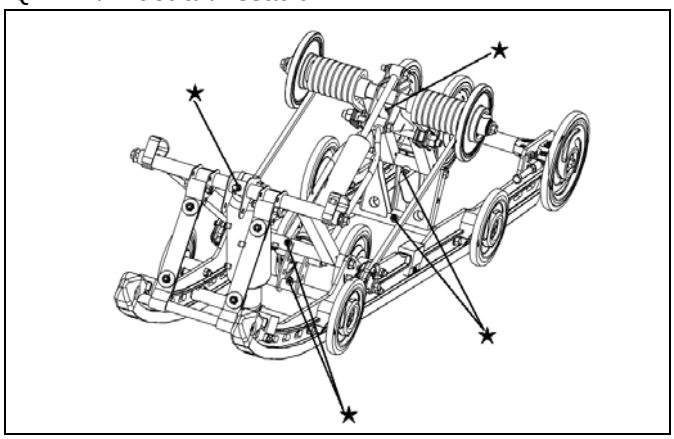
M-10 128



M-10 136

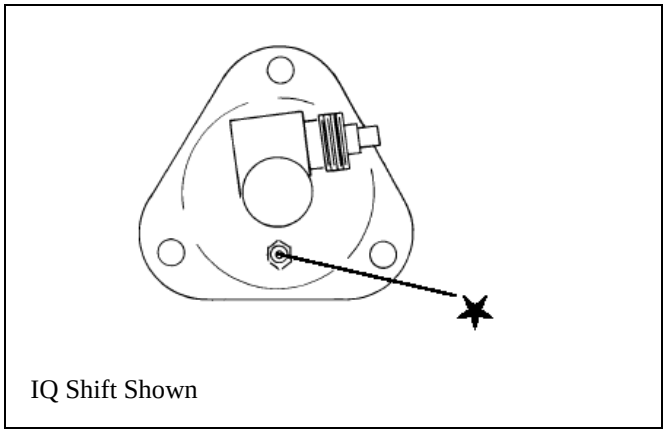


IQ RMK/Widetrak/Assault



Driveshaft Bearing

Lubricate with Premium All Season Grease.



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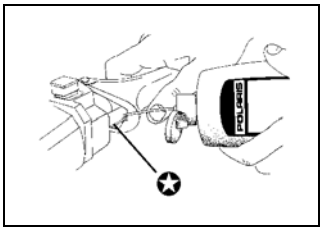
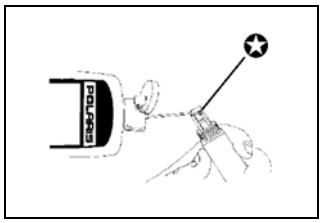
Throttle Cable

Lubricate the throttle cable lightly with fresh oil. With the engine off, turn the handlebars to the left and lubricate well as shown.



Choke And Choke Cable

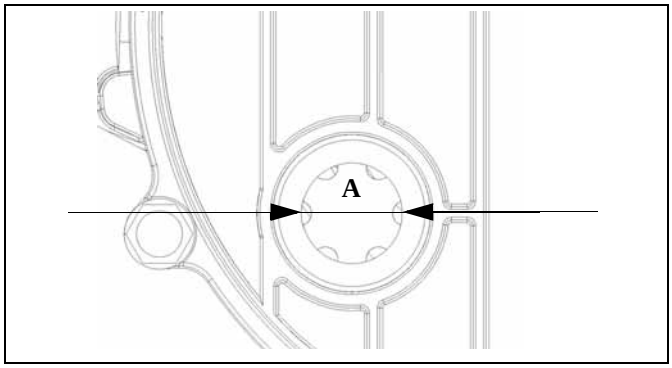
Lubricate the choke slide and cables lightly with oil or grease. Before turning the engine off, operate the choke intermittently to draw moisture out of the choke plunger area and reduce the possibility of the choke becoming frozen.



Chaincase Oil Level Check

Maintain the oil level at the mid-point of the sight glass.

1. Position the vehicle on a level surface.
2. Verify the oil level is in the middle of the sight glass.
3. Add the recommended oil as needed at the fill plug. Do not overfill.



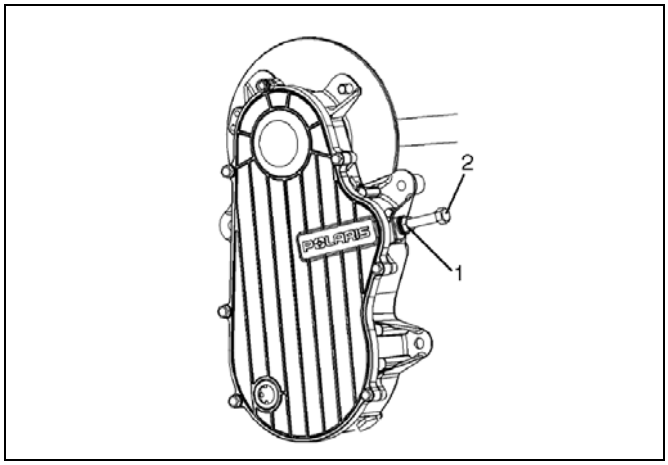
Chaincase Oil Replacement

1. Locate the chaincase drain plug on the bottom of the nosepan.
2. Place an oil catch pan under the drain plug.
3. Remove the drain plug and drain the oil into the catch pan.
4. Clean the magnetic plug to remove metal shavings.
5. Install drain plug and hand-tighten. Do not over-tighten the drain plug.
6. Fill chaincase with oil at the fill plug location.

Chaincase Oil Capacity = 11oz. (325.3 ml)
Recommended Lubricants:
Chaincase = Polaris Synthetic Chaincase Lubricant

Drive Chain Tension Adjustment

1. Rotate the driven clutch counterclockwise to move all of the slack in the chain to the tensioner side. Lock the parking brake, or have an assistant hold the brake lever.
2. Loosen the adjuster bolt jam nut (1).
3. Finger tighten the adjuster bolt (2) until it con no longer be adjusted by hand, then back 1/4 turn.
4. Tighten the jam nut while holding the adjuster bolt. torque to 21 ft.lbs. (28 Nm).
5. Release the brake lever lock.



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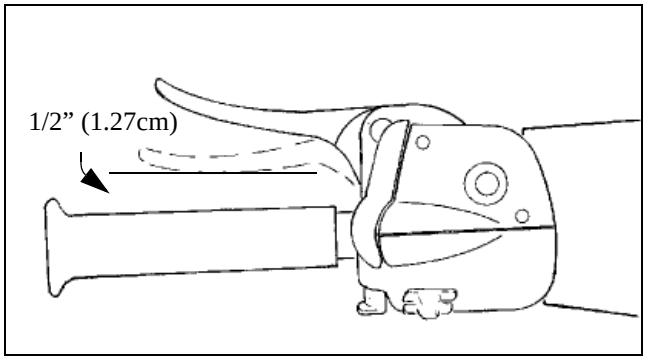
BRAKE SYSTEM MAINTENANCE

Brake Lever Travel



The gap between the brake lever and handlebar grip should be equal to or more than 1/2″ (1.27cm) when depressing the brake lever.

If the gap is less than 1/2″ (1.27cm), the brake system should be inspected and bled of any air within the fluid.

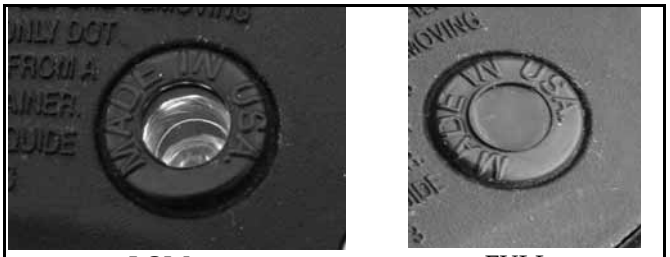
Brake Fluid

⚠ WARNING

Do not over fill the master cylinder. Fluid expansion could cause brakes to lock, resulting in serious injury or death. Once a bottle of brake fluid is opened, use what is necessary and discard the rest. Do not store or use a partial bottle of brake fluid. Brake fluid is hygroscopic, meaning it rapidly absorbs moisture from the air. This causes the boiling temperature of the brake fluid to drop, leading to early brake fade and the possibility of serious injury

Inspect the reservoir to be sure it contains the correct amount of fluid. Use only Polaris DOT 4 high temperature brake fluid. Change fluid every 2 years or whenever the fluid is dark or contamination is suspected.

NOTE: A low brake fluid level can be indicated through the sight glass on the cover. If the fluid is low this sight glass will glow a brighter. color.



LOW FULL

THROTTLE AND CHOKE CABLE ADJUSTMENTS

Idle Speed Gap / Throttle Free Play Adjustment - VM Carburetors

⚠ CAUTION

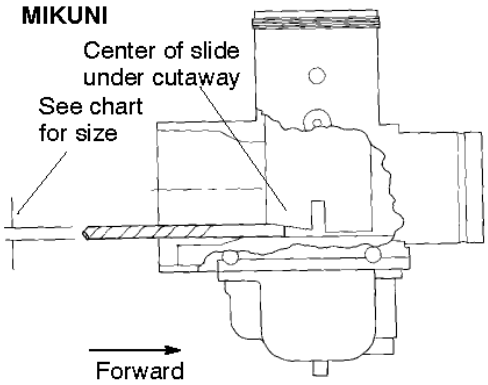
When adjusting throttle lever free play, always verify the engine idle RPM does not increase when turning the handle bar to the full-left or full-right positions.

After idle speed adjustments are made, the throttle lever clearance and oil pump adjustment must be checked and adjusted.

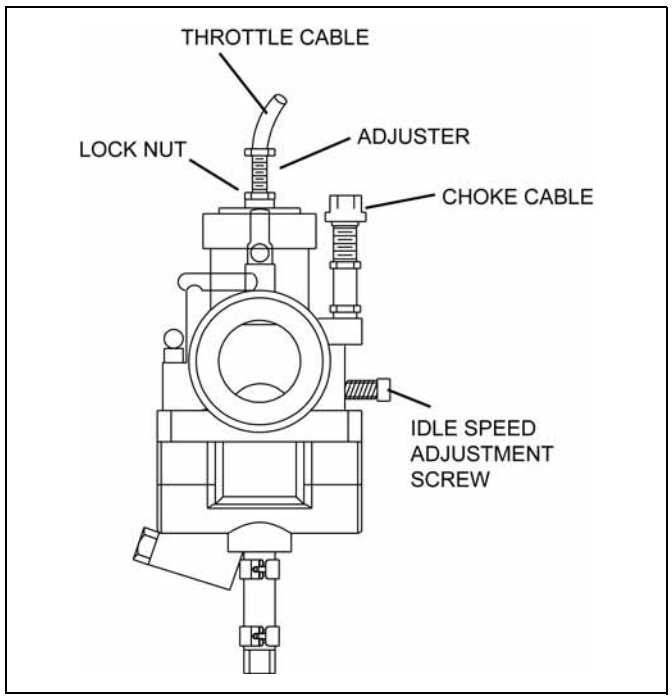
1. Always set the idle speed when the engine is at operating temperature.

2. Turn the idle speed adjustment screws on each carburetor out at least 2 turns.

3. Reference the throttle gap drill bit size specification for each engine. Insert the drill bit(s) under each of the throttle slide cutaway(s).



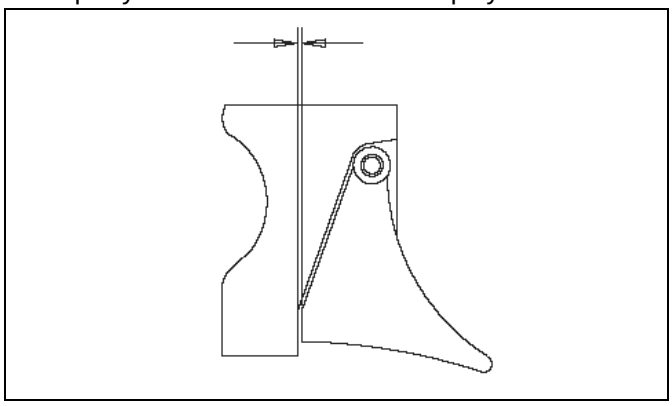
4. Loosen lock nut(s) (on top of carburetor) and turn the throttle cable adjuster in (clockwise) or out (counterclockwise) until a slight drag can be felt on the drill bit.



5. Secure the adjuster lock nut(s).

6. Slowly turn each idle speed screw inward until the tip begins to touch the throttle slide. Remove the drill bit(s).

7. Set the throttle lever free play by loosening both carburetor adjuster lock nuts. Turn each adjuster out equally until the throttle lever free play is set.



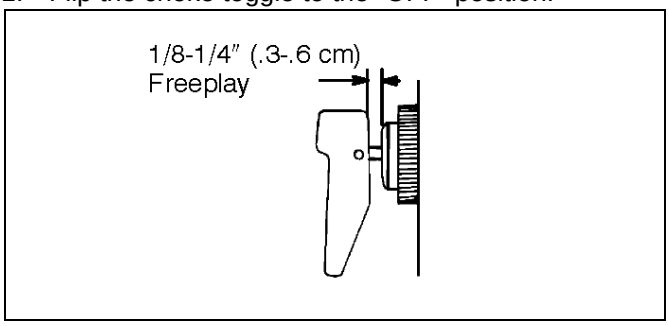
Throttle Lever Free Play
.010″ - .030″ (.25 - .80mm)

8. Secure the adjuster lock nuts.

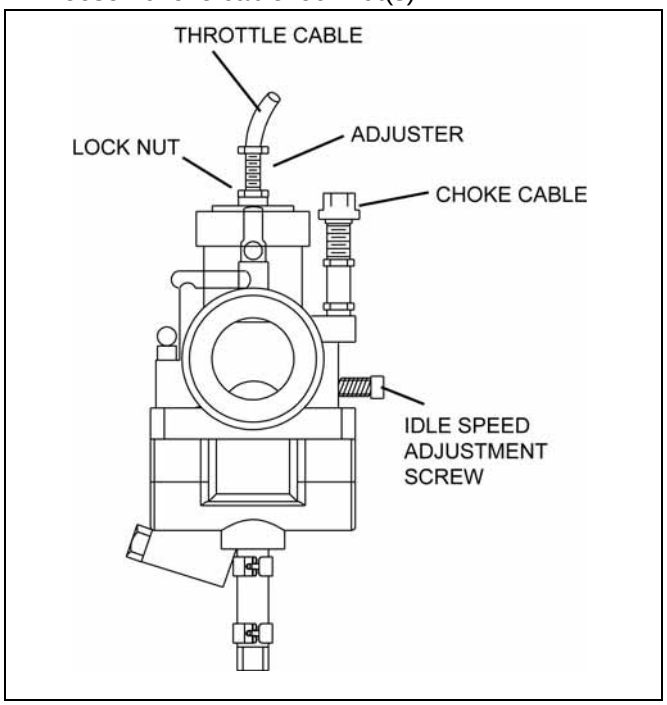
NOTE: If the idle speed screw is adjusted inward and the cable sleeve is not adjusted to take up the throttle lever clearance, the engine may misfire or kill upon initial throttle opening.

Choke Lever Adjustment - Mikuni VM

1. Flip the choke toggle to the “OFF” position.



2. Loosen choke cable lock nut(s).



3. Turn cable sleeve adjuster counterclockwise on the carburetor until choke toggle has zero free play, then rotate it clockwise until 1/8" to 1/4" (.3 - .6) toggle free play is evident.

NOTE: Verify the plunger does not lift when checking the free play.

4. Tighten adjustment lock nut.

5. Repeat steps on the other carburetor.

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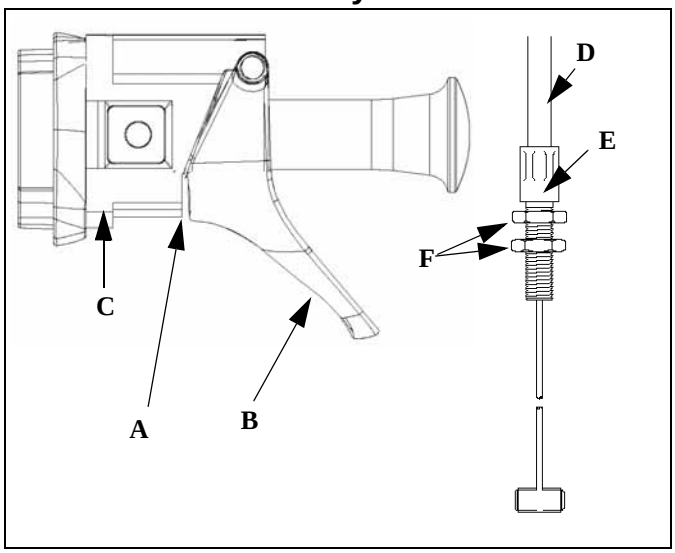
Throttle Lever Free Play - Non CFI



= In. / mm.

Throttle Lever Free Play: 0.010"-0.030" (.25-.8mm)

CAUTION

When adjusting throttle lever free-play, always verify the engine RPM does not rise with bars in the full low and full up-right Rider Select positions (if applicable) and while turning the handlebars to the full left and full right positions.

Throttle lever free play must always be at a specified clearance (A) 0.010″-0.030″ (0.25-0.80 mm) between the throttle lever (B) and the throttle block (C). This clearance is controlled by the throttle cable (D).

If adjustment is needed follow these steps:

CAUTION

After any idle speed adjustments are made, the throttle lever clearance and the oil pump adjustment must be checked and adjusted.

1. Check the idle RPM and verify it is within the specified range.
2. Shut off engine.
3. Locate the throttle cable that is attached to the carburetors and adjust the throttle free play by adjusting the barrel nut (E) and lock nuts (F).
4. Once you achieve the proper free play of 0.010″-0.030″ (.25-.80mm), tighten the lock nuts.
5. Verify the oil pump index marks are within specification.
6. Check the idle RPM and verify it is within the specified range.

NOTE: If the idle speed screw is adjusted inward and the cable sleeve is not adjusted to take up the throttle lever clearance, the engine may misfire or kill upon initial throttle opening.

Throttle Lever Free-Play - CFI Models

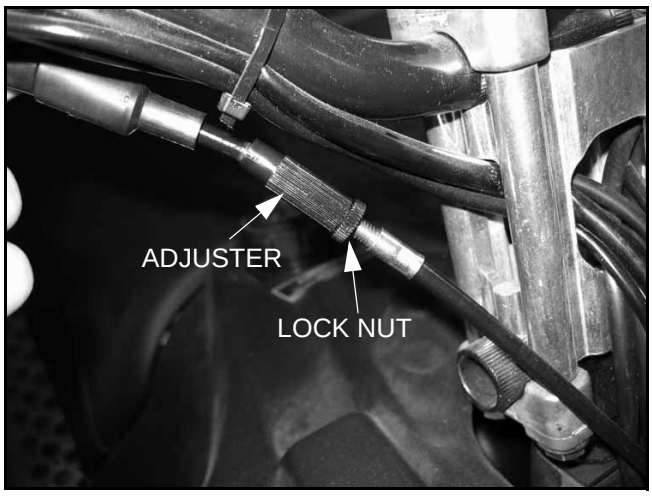
CAUTION

When adjusting throttle lever free-play, always verify the engine RPM does not rise with bars in the full low and full up-right Rider Select positions (if applicable) and while turning the handlebars to the full left and full right positions.

= In. / mm.

Throttle Lever Free Play: 0.010″-0.030″ (.25-.8mm)

The inline adjuster should only be used to set free play and to remove cable slack that occurs if the cable has stretched over time.



NOTE: Never use the in-line adjuster to adjust engine idle speed and never adjust the cable so that

the throttle plate cam on the throttle body no longer rests against the idle air gap screw.

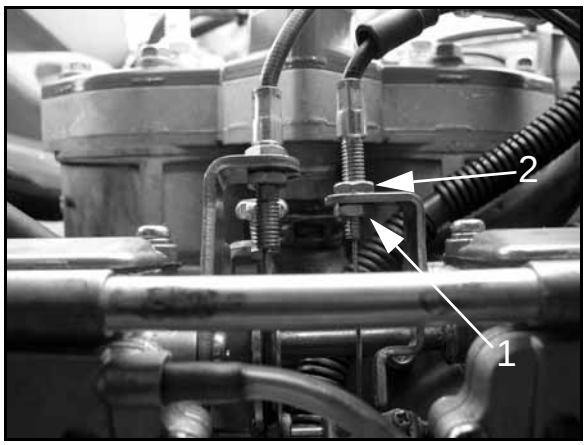
Turning the in-line adjuster inwards (clockwise) will increase throttle lever free-play.

Turning the in-line adjuster outwards (counter-clockwise) will decrease throttle lever free-play.

After setting the throttle lever free play, always verify the oil pump adjustment is set correctly.

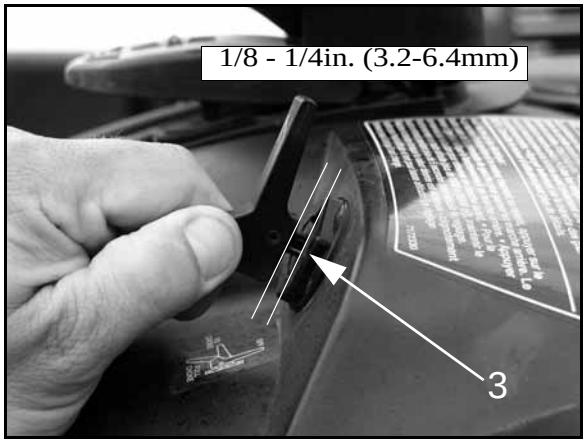
Choke Adjustment

1. Flip the choke toggle to the “OFF” position.
2. Loosen locknuts (1) on the carburetor.



3. Turn sleeve adjusting nut (2) counter-clockwise until the choke toggle shows no free play when pulled, then rotate it clockwise until there is between 1/8 - 1/4in (3.2-.6.4mm) free play (3).

NOTE: Verify the cable does not lift the plungers when checking the free play.

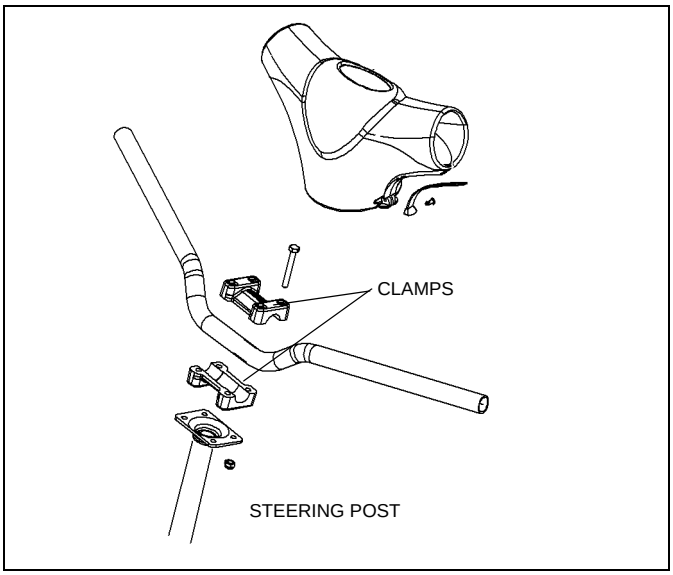


4. Tighten adjustment locknut (2).

STEERING / SUSPENSION MAINTENANCE

Handlebars

Periodically inspect the torque of the handlebar clamp fasteners.

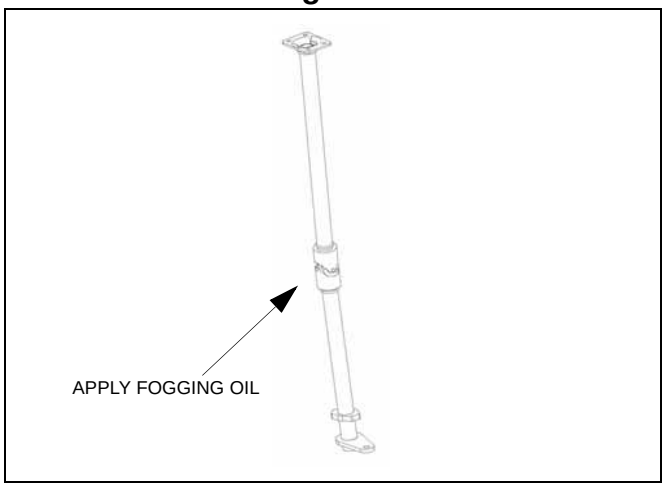


1. To adjust the handlebar angle, remove the handlebar cover to expose the clamp.
2. Loosen the four clamp fasteners. Slightly pry the upper clamp up with a flat blade screwdriver.
3. Adjust handlebars to desired position. Verify the wiring harness, brake hose, and throttle cable do not kink.
4. Secure the front clamp fasteners first to specification. Finish by securing the two rear clamp fasteners to the same torque setting.

= T
Handlebar Clamp Fastener Torque 16 Ft.Lbs. (21 Nm)

5. If equipped, reinstall the handlebar cover.

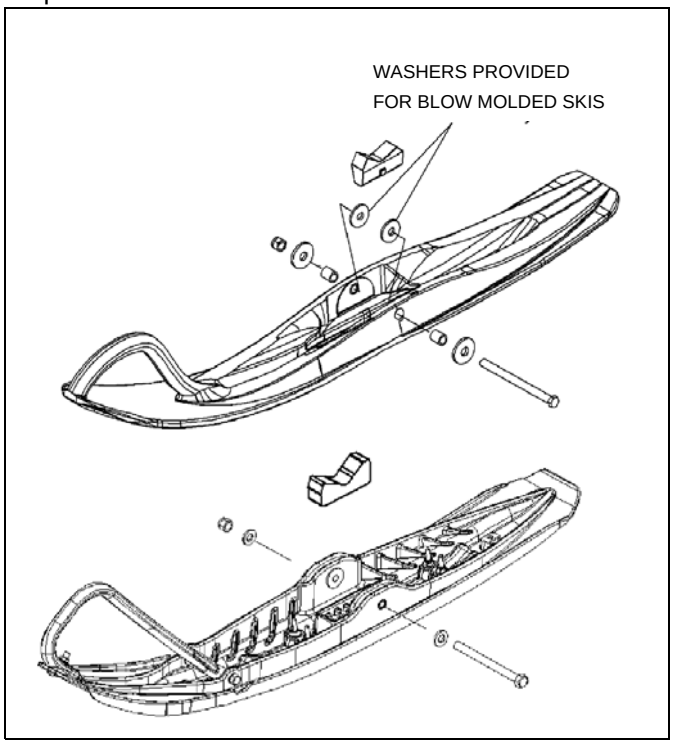
Rider Select Steering U-Joint



The rider select steering U-joint should be lubricated with Polaris fogging oil (PN 2870791).

Ski/Ski Skag Fasteners

Periodically inspect the ski-to-spindle fasteners for proper torque.



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Ski-to-Spindle Fastener Torque
36 Ft.Lbs. (49 Nm)

Inspect ski skags and skag fasteners for abnormal wear and tear. Replace skags when carbide edge is worn away.

Always use new Nylok nuts and secure hand tight.

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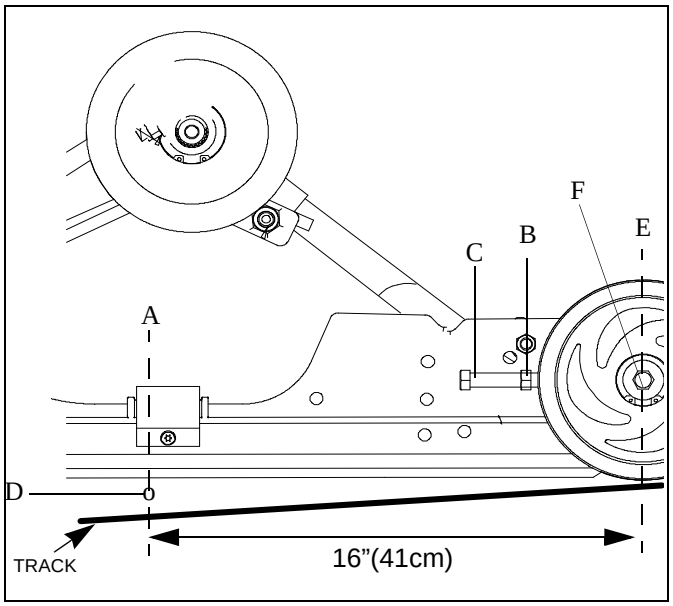
Track Tension

Track tension is critical for maintaining correct suspension operation. If the track tension is too loose it may cause the track to slip or “ratchet”. If the track is too tight it will wear down the rail slides, reduce top speeds, cause rear suspension vibration and cause track and rear suspension durability problems.



1. Lift the rear of the machine and place a jack stand or secure the rear of the machine so that the track is off of the ground.

2. Start the engine and slowly let the engine turn the track over. This will warm up the track for a correct measurement.

3. Shut off the engine.

4. Place a 10 lb. (4.54kg) weight at point (A). Point (A) is 16″ (41cm) ahead of the rear idler shaft (E).

5. Measure the distance (D) between the rail slider and the track. This measurement should fall with in the measurement range for the appropriate vehicle, see chart o this page.

6. If adjustment is needed, loosen up the lock nuts (B) on each side.

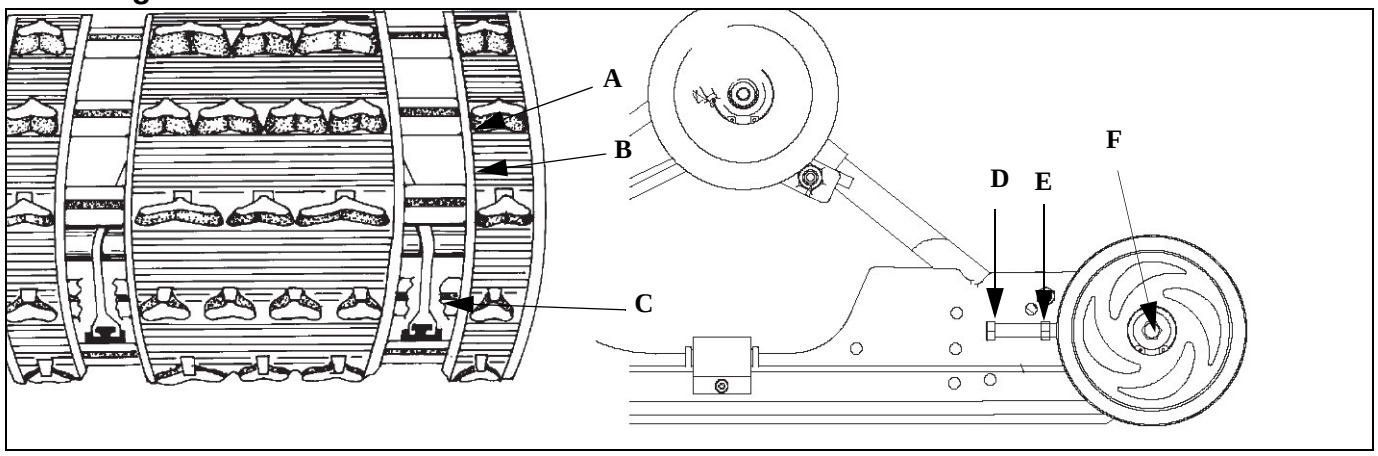
7. Loosen up the idler shaft bolts (F).

8. Turn each adjuster bolt (C) clockwise to tighten track. Turn the adjuster bolt counterclockwise to loosen track tension.

9. Torque the lock nuts (B) and idler shaft bolts on each side to 35 ft-lb (48 N-m).

SUSPENSION	MEASUREMENT
IQ 121 136 Coupled 136 Comfort	7/8″ - 1-1/8″ (2.2 - 2.9cm)
M-10 128	7/8″ - 1-1/8″ (2.2 - 2.9cm)
M-10 136	3/4″ - 1.0″ (1.9 - 2.5cm)
IQ RMK/Switchback/ Widetrak/Assault	3/8″ - 1/2″ (1 - 1.3cm)

Track Alignment



NOTE: ***Track alignment affects track tension. Misalignment of the track will cause excessive wear to the track, rail slides, and rail.***

NOTE: ***Excessive rail slide wear occurs due to running in inadequate snow conditions.***

Periodically check that the track is centered and running evenly on the slide rails. Misalignment will cause excessive wear to the track and slide rails.

1. Safely lift and support the rear of the snowmobile off the ground.
2. Rotate the track by hand to check for any possible damage.
3. Inspect the track rods (A) carefully and examine the track along the entire length of each rod, bending the track edge and inspecting it for breakage. If any rod damage is found, the track should be replaced.
4. Warm up the track by starting the engine and apply a small amount of throttle so the track runs slowly at least five complete revolutions.
5. Stop the engine and turn the ignition off.
6. Inspect track alignment by carefully looking through the track window (B) to make sure the rails (C) are evenly spaced on each side.
7. If the track runs to the left, loosen the left locknut and tighten the left adjusting bolt (D). If the track runs to the right, loosen the right locknut and tighten the right adjusting bolt. It may be necessary to check this with the engine rotating the track. Be sure to SHUT THE MACHINE OFF before making any further adjustments.
8. Loosen the rear idler shaft (F).
9. After any adjustments are complete, be sure to torque the locknuts (E) to 35 ft-lb (48 N-m).

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Adjuster Lock Nuts: 35 ft-lb (48 N-m)

10. Torque both idler shaft bolts (F) to 35 ft-lb (48 N-m).

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Idler Shaft Bolt: 35 Ft.Lbs. (48 Nm)

WARNING
Broken track rods can cause a rotating track to come off the machine. Never operate or rotate a damaged track under power with a broken rod. Serious injury or death may occur. Stay clear of all moving parts to avoid personal injury. Never make any adjustments with the engine running, as serious personal injury can result.

ELECTRICAL SYSTEMS

Headlight Bulb Replacement

NOTE: Do not touch the bulb with your fingers. The grease from body oil will cause a hot spot on the bulb and cause bulb failure. If you do touch the bulb clean the bulb with isopropyl alcohol.

1. Push in on the “PUSH” section of the plenum.
2. Slide the access panel down to gain access to the bulb.
3. Squeeze and move the bulb clip up.
4. Replace the bulb, clip and access panel.

MFD SERVICE INTERVAL

Function

The gauge logs the number of engine hours accumulated between service reminders. When the logged hours reaches the designated service interval (set by the user), the gauge provides a reminder that service is due. "SErVCE" will flash in the odometer area and "ENG" will flash in the icon area for five seconds each time the engine is started (until the service reminder is reset.) Use the following procedures to reset the reminder.

To reset the reminder at the existing interval:

1. Press and release the MODE button until the history program is displayed.
2. Press and release the SET button until the service interval screen is active.
3. Press and hold the SET button for ten seconds, continuing to hold even after the display begins to flash.
4. When the display stops flashing, release the button. The service interval has been reset.

To reset the reminder at a new interval:

1. Press and release the SET button until the service interval screen is active.
2. Press and hold the SET button for five seconds, until the hours begin to flash. Immediately release the button.
3. Press the button again, up to five times, to advance the reminder in 50-hour increments. The maximum interval is 250 hours.
4. Press and release the MODE button to save the new settings.

Press and release the MODE button until the history program is displayed.

To disable the service interval reminder:

1. Press the SET button once after reaching 250 hours on the display. The gauge will display "OFF".

OFF-SEASON STORAGE

Chassis And Hood

Proper storage starts by cleaning, washing and waxing the hood, chassis, upholstery and plastic parts. Clean and touch up with paint any rusted or bare metal surfaces. Ensure that all corrosive salt and acids are removed from surfaces before beginning preservation with waxes and rust inhibitors (grease, oil, or paint).

If the machine is equipped with a battery, disconnect the battery cables and clean the cables and battery posts. Fill battery to proper level with distilled water and charge to full capacity. Remove and store the battery in a cool dry place.

The machine should be stored in a dry garage or shed out of the sunlight and covered with a fabric snowmobile cover. Do not use plastic to cover the machine; moisture will be trapped inside causing rust and corrosion problems.

Clutch And Drive System

Remove drive belt and store in a cool dry location. Lubricate sheave faces and ramps of drive and driven clutches with light oil or rust inhibitor. All lubrication applied as a rust preventative measure must be cleaned off before installing belt for service and operating machine.

Controls And Linkage

All bushings, spindle shafts and tie rod ends should be coated with a light coat of oil or grease. Throttle controls and cables should be lubricated. Force a small amount of lubricant down cables.

Electrical Connections

Separate electrical connector blocks and clean corrosive build-up from connectors. Lubricate or pack connector blocks with Nyogel™ grease and reconnect. Replace worn or frayed electrical wire and connectors.

Carburetor/Throttle Body

Fog engine with Polaris Fogging Oil (aerosol type) according to directions on can.

Fuel System

Treat the fuel system with Polaris Carbon Clean. If Polaris Carbon Clean is not used, fuel tank, fuel lines, and carburetor should be completely drained of gasoline.

Corrosion

To prevent corrosion, always grease jackshaft and drive shaft (clutch side) bearings with Polaris Premium all season grease. Loosen driven clutch retaining bolt and pull clutch outward to expose bearing. Use a point type grease gun fitting to inject grease through hole in flangette into bearing until grease purges out inside or outside bearing seal. Push clutch back on shaft and replace clutch retaining bolt. Inject grease into fitting on speedometer drive adaptor until grease purges out inside or outside the bearing seal. Lubricate both front ski pivots at bushings and spindles.

Shocks

Use T-9 Metal Protectant (or equivalent) on shock absorber shafts to help prevent corrosion.

Battery

Disconnect and remove the battery. Clean the terminals and cables. Apply dielectric grease to the terminals. Store in a cool dry place for storage.