

PERIODIC MAINTENANCE PROCEDURES

SERVICE TOOLS

Description	Part Number	Page
SUCTION PUMP	529 035 880	9

SERVICE PRODUCTS

Description	Part Number	Page
LOCTITE 243 (BLUE)	293 800 060	10
LONG LIFE ANTIFREEZE	219 702 685	10–11
PULLEY FLANGE CLEANER	413 711 809	13
XPS 4-STROKE SYNTH. BLEND OIL (SUMMER)	293 600 121	7
XPS 4-STROKE SYNTHETIC OIL (ALL CLIMATE)	293 600 112	7
XPS FUEL STABILIZER.....	413 408 601	12

GENERAL

This subsection provides general maintenance instructions. Where detailed instructions for disassembly or reassembly is required, refer to the applicable subsection.

PROCEDURES

ENGINE

Lubrication System

Recommended Engine Oil

Use XPS 4-STROKE SYNTH. BLEND OIL (SUMMER) (P/N 293 600 121) or XPS 4-STROKE SYNTHETIC OIL (ALL CLIMATE) (P/N 293 600 112). (If the recommended XPS™ engine oil is not available, use 5W40 or 10W40 API SERVICE SN synthetic oil).

Engine Oil Level Verification

NOTICE Check level frequently and refill if necessary. Do not overfill. Operating the engine with an improper level may severely damage engine.

CAUTION Certain components in the engine compartment may be very hot. Direct contact may result in skin burn.

Oil level can be checked with watercraft either in or out of water.

Out of Water

NOTICE Watercraft must be level.

CAUTION When operating the engine out of water, the heat exchanger may become very hot. Avoid any contact with the heat exchanger as burns may occur.

1. Raise trailer tow pole, then block in position when bumper rail is level.
2. Install a garden hose on the exhaust system flushing connector. Refer to *EXHAUST SYSTEM* in this section and follow the procedure.

NOTICE

- Never run engine without supplying water to the exhaust system. Failure to cool exhaust system may severely damage it.
- Never run engine longer than 2 minutes. Drive line seal has no cooling when watercraft is out of water. Also, extreme heat will damage engine.

3. With the engine already at normal operating condition, let engine idle for 30 seconds then stop engine.

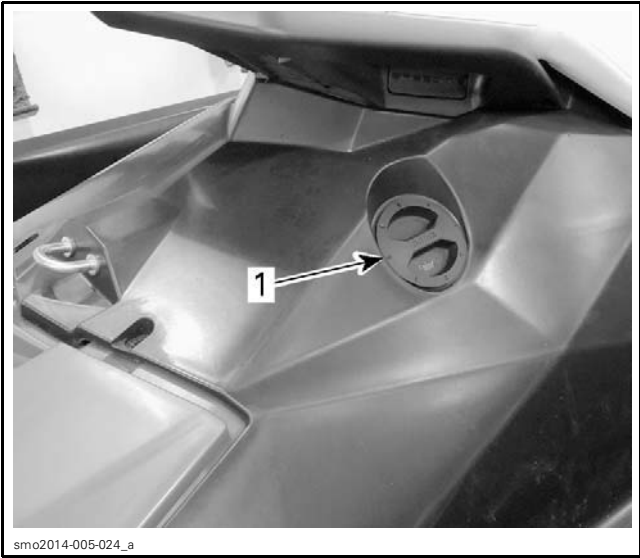
4. Wait at least 30 seconds for the oil to settle in the engine.

In or Out of Water

5. To check level, remove access cover located on rear of RH side of watercraft by turning counter-clockwise.

Section 01 MAINTENANCE

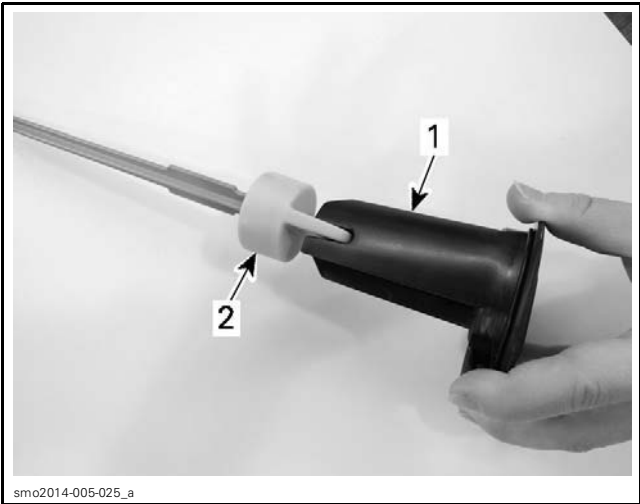
Subsection 02 (PERIODIC MAINTENANCE PROCEDURES)



TYPICAL
1. RH access cover

6. Unscrew dipstick, pull it out and wipe clean.

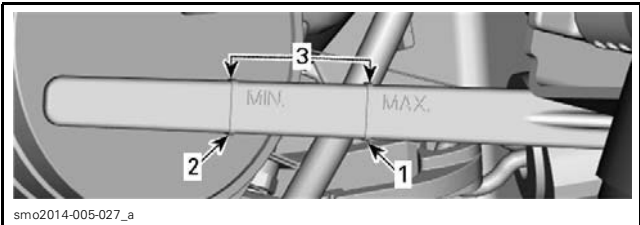
NOTE: Inner side of RH access cover is equipped with an extension to facilitate dipstick unscrewing.



1. RH access cover - extension side
2. Dipstick

7. Reinstall dipstick, push in completely.

8. Remove dipstick again and read oil level. It should be between the MAX and MIN marks.



1. Maximum
2. Minimum
3. Operating range

9. Add oil to ensure the level is between marks as required.

NOTE: Do not overfill.

To add oil:

- Place a funnel in the oil neck opening.
- Add the recommended oil to the proper level.

NOTE: Every time oil is added in the engine, the complete procedure explained in this section must be carried out again. Otherwise, you will obtain a false oil level reading.

10. Properly reinstall dipstick and RH access cover.

Engine Oil Replacement

Scheduled Maintenance	Storage	Preseason
✓	✓	

NOTICE Engine oil and oil filter must be replaced at the same time.

1. Bring engine to its normal operating temperature (90°C (194°F) at oil tank surface).

NOTICE When watercraft is out of water:

- Never run engine without supplying water to the exhaust system.
- Never run engine longer than 2 minutes. Drive line seal has no cooling when watercraft is out of water.

2. Place watercraft on a level surface.

3. Remove access cover located on rear of RH side of watercraft by turning counterclockwise.



TYPICAL
1. RH access cover

4. Remove dipstick.

⚠ CAUTION Engine oil may be hot. Certain components in the engine compartment may be very hot. Direct contact may result in skin burn.

5. Siphon oil through the dipstick tube.

REQUIRED TOOL	
SUCTION PUMP (P/N 529 035 880)	

NOTICE Never crank or start engine when suction pump hose is in the dipstick tube. Never start engine when there is no oil in engine.

NOTE: To properly position the suction pump hose is located at the proper height to siphon oil, it is suggested to put some electrical tape on hose at 400 mm (15 in) from its end. Then, insert the hose until you reach the tape.

6. Pull suction pump hose out of dipstick tube.

7. Replace *OIL FILTER*, see procedure in this subsection.

8. Fully depress the throttle lever and HOLD it while cranking engine for 10 seconds. Siphon oil again. Repeat the crank-siphon cycle 2 - 3 times.

9. Refill oil tank at the proper level with the recommended oil.

ENGINE OIL CAPACITY	
Capacity with oil filter replacement	1.8 L (1.9 qt (U.S. liq.))

10. Reinstall dipstick in oil tank and properly tighten it.

11. Start engine and let it idle for a few minutes.

12. Ensure there are no leaks.

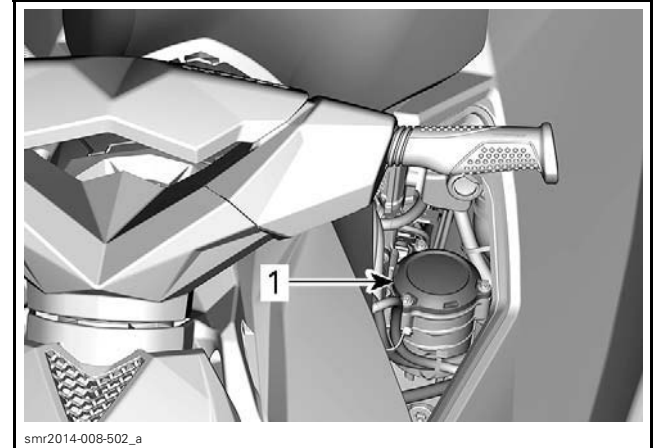
13. Stop engine and check oil level as explained in this subsection. Refill if necessary.

14. Dispose oil and filter as per your local environmental regulations.

Engine Oil Filter Replacement

Scheduled Maintenance	Storage	Preseason
✓	✓	

1. Remove the port access cover.



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PORT SIDE - ACCESS COVER REMOVED

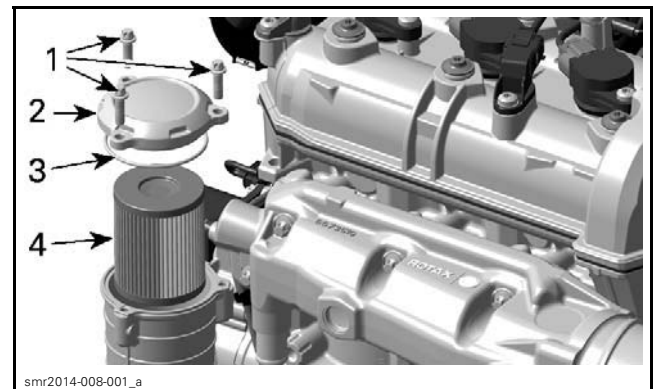
1. Oil filter cover

2. Clean oil filter area.

NOTE: Oil will spill when oil filter cover is removed place a rag around oil filter housing to catch it.

3. Remove:

- Oil filter cover screws
- Oil filter cover with O-ring
- Oil filter.



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1. Oil filter cover screws

2. Oil filter cover

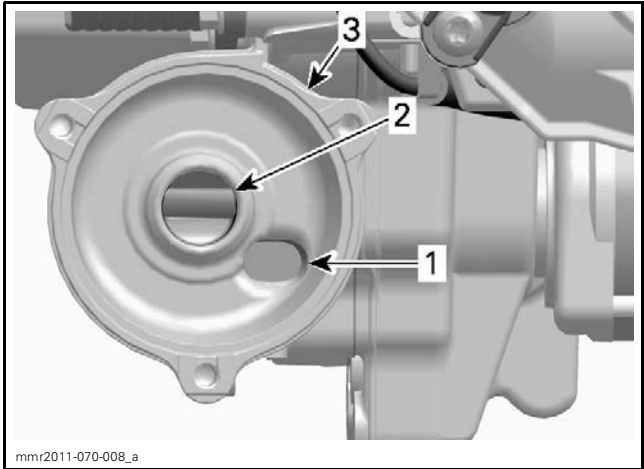
3. O-ring

4. Oil filter

4. Dispose filter as per your local environmental regulations.

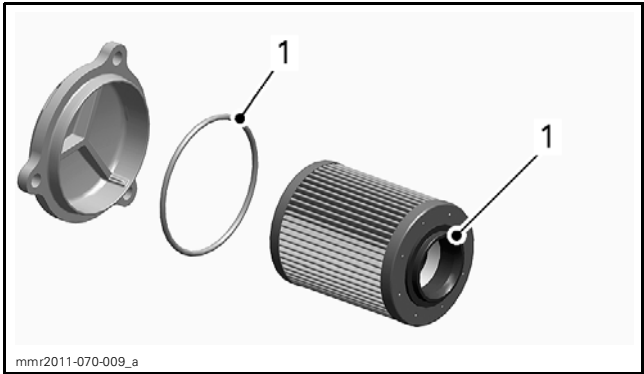
5. Check the oil filter inlet and outlet orifices inside oil filter housing (integrated in magneto cover) for dirt and contaminations.

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- 1. Oil inlet orifice from the oil pressure pump
- 2. Oil outlet orifice to the engine lubrication system
- 3. Oil filter housing

- 6. Install a **NEW** O-ring on oil filter cover.
- 7. Lubricate filter seal and cover O-ring with engine oil.



- 1. Lubricate with engine oil

- 8. Install the oil filter cover.
- 9. Apply LOCTITE 243 (BLUE) (P/N 293 800 060) to the oil filter cover screws.
- 10. Tighten oil filter cover screws to the specified torque.

OIL FILTER COVER	
Tightening torque	9 N•m ± 1 N•m (80 lbf•in ± 9 lbf•in)

Cooling System

Cooling System Inspection

Scheduled Maintenance	Storage	Preseason
		✓

Inspect cooling system pressure cap, hoses and clamps for leaks.

Test pressure cap for proper operation.

Recommended Engine Coolant

Always use LONG LIFE ANTIFREEZE (P/N 219 702 685). If the recommended coolant is not available, use a low silicate, extended life ethylene-glycol premixed coolant (50%-50%) specifically formulated for internal combustion aluminum engines.

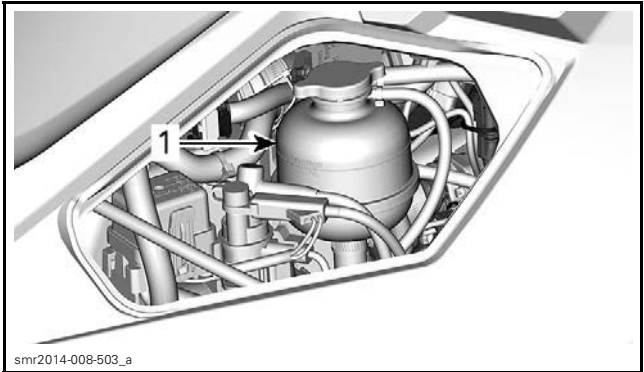
To prevent antifreeze deterioration, always use the same brand and grade. Never mix different brands or grades unless cooling system is completely flushed and refilled.

Engine Coolant Level Verification

Scheduled Maintenance	Storage	Preseason
✓		✓

Check coolant level at room temperature with the cap removed. Liquid should be at cold level line (engine cold) of coolant tank.

NOTE: When checking level at low temperature it may be slightly lower than the mark.



PORT ACCESS COVER REMOVED
1. Coolant tank

Engine Coolant Replacement

Scheduled Maintenance	Storage	Preseason
✓		

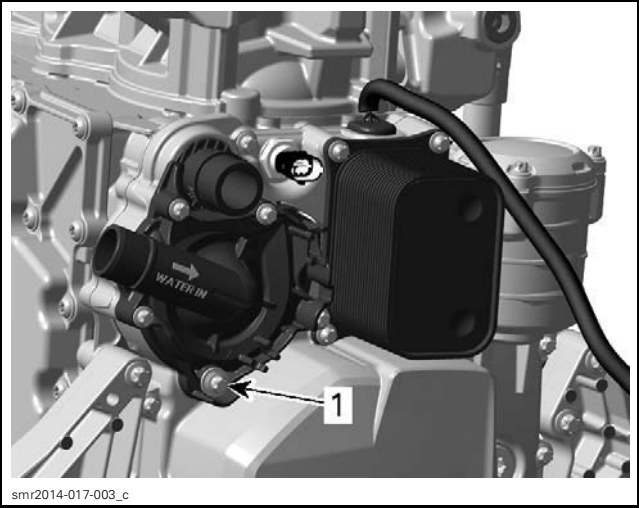
Replace coolant every 300 hours or 5 years.

Cooling System Draining

WARNING

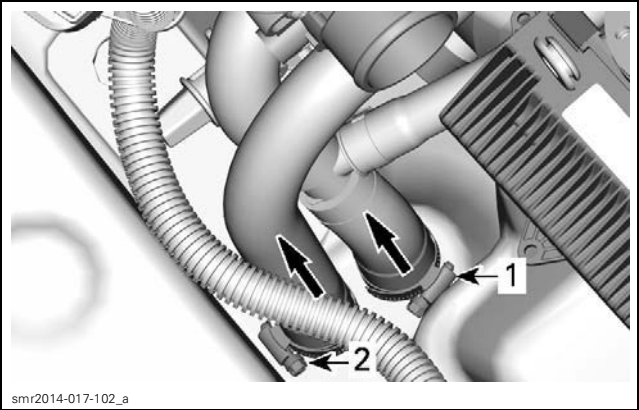
Never drain or refill the cooling system when engine is hot.

- 1. Remove central body. Refer to *BODY*.
- 2. Place a drain pan under the drain screw.
 - 2.1 Remove components as required.
- 3. Remove drain screw at water pump to drain coolant.



1. Drain screw

4. Remove coolant reservoir cap.
5. When coolant level is low enough, disconnect heat exchanger outlet hose.



HEAT EXCHANGER HOSES- VIEW INSIDE HULL

1. Heat exchanger outlet hose
2. Heat exchanger inlet hose

6. Siphon remaining coolant from heat exchanger.
7. Install outlet hose on heat exchanger.

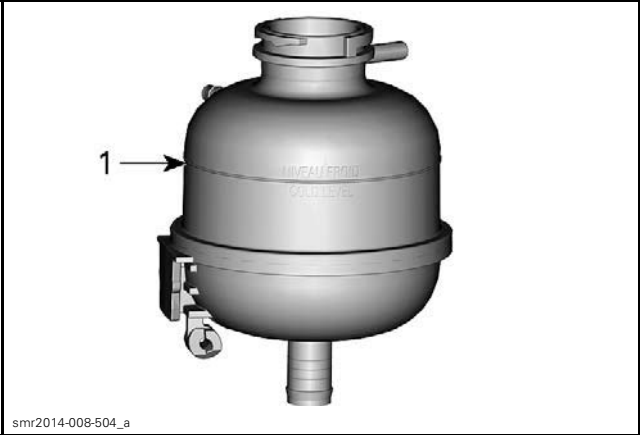
SCREW CLAMP	
Tightening torque	4 N•m ± 1 N•m (35 lbf•in ± 9 lbf•in)

8. Install **new** sealing washer on drain screw.
9. Tighten drain screw to specification.

DRAIN SCREW	
Tightening torque	9 N•m ± 1 N•m (80 lbf•in ± 9 lbf•in)

Cooling System Refilling and Bleeding

1. Fill coolant reservoir with LONG LIFE AN-TIFREEZE (P/N 219 702 685).



COOLANT RESERVOIR

1. Full mark

- Do not install pressure cap at this time.
2. Connect water hose to exhaust system. Refer to *EXHAUST SYSTEM FLUSHING*.

NOTICE Always start the engine before opening the water tap. Open water tap immediately after engine is started to prevent overheating. Never run engine without supplying water to the exhaust system when watercraft is out of water.

3. Start engine.
4. Supply water to hose.

NOTICE Never run engine longer than 2 minutes when out of water.

5. Turn off water.
6. Stop engine.
7. Refill coolant reservoir as necessary.
8. Repeat this run-stop cycle 2-3 times until thermostat opens and stop engine.

Last, refill coolant tank and install pressure cap. When engine has completely cooled down, recheck coolant level coolant tank and top up if necessary.

EXHAUST SYSTEM

Exhaust System Inspection

Scheduled Maintenance	Storage	Preseason
	✓	

Check the following components for leaks, cracks, or other damage:

- Exhaust system mounts
- Muffler
- Manifold

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- Resonator
- Hoses
- Clamps

Exhaust System Flushing

Flushing the exhaust system with fresh water is essential to neutralize corroding effects of salt or other chemical products present in water. It will help to clean up sand, salt, shells or other particles in water jackets and hoses.

Exhaust system flushing should be performed when the watercraft is not expected to be used further the same day or when the watercraft is stored for any extended time.

NOTICE Failure to flush the system, when necessary, will severely damage exhaust system. Make sure engine operates during entire procedure.

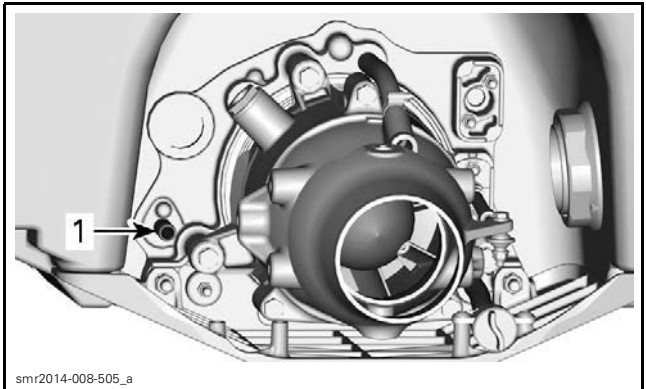
**WARNING**

Perform these operations in a well ventilated area. Certain components in the engine compartment may be very hot. Direct contact may result in skin burn. Do not touch any electrical part or jet pump area when engine is running.

**WARNING**

When operating the engine while the watercraft is out of the water, the heat exchanger may become very hot. Avoid any contact with heat exchanger as burns may occur.

Connect a hose to the jet pump support connector or a garden hose to the flushing device kit (P/N 295 100 555) located at the rear of watercraft. Do not open water tap yet.



1. Water inlet connector

To flush the exhaust system, start the engine then immediately open the water tap.

NOTICE Always start the engine before opening the water tap. Open water tap immediately after engine is started to prevent overheating. Never run engine without supplying water to the exhaust system when watercraft is out of water.

Run the engine 90 seconds at idle speed.

NOTICE Never run engine longer than 2 minutes. Drive line seal has no cooling when watercraft is out of water.

Ensure water flows out of jet pump while flushing.

Close the water tap, run the engine at 5000 RPM for 5 seconds and stop the engine.

NOTICE Always close the water tap before stopping the engine.

Disconnect the garden hose.

NOTICE Remove flushing connector adapter after operation (if used).

FUEL SYSTEM

Fuel System Protection

Scheduled Maintenance	Storage	Preseason
	✓	

With the new fuel additives used today, it is critical to add a fuel stabilizer to the fuel during storage to prevent fuel deterioration, gum formation and fuel system gumming. Follow manufacturers instructions for proper use.

RECOMMENDED PRODUCT
XPS FUEL STABILIZER (P/N 413 408 601)

NOTICE The fuel stabilizer should be added prior to engine lubrication, to ensure fuel system component protection against varnish deposits.

1. Pour fuel stabilizer in fuel tank.
2. Fill up fuel tank completely.
3. Run engine sufficiently for fuel with stabilizer to be distributed to entire fuel system.
4. Ensure there is no water inside fuel tank.

NOTICE Do not drain fuel system.

Fuel Line and Connection Inspection

Scheduled Maintenance	Storage	Preseason
✓	✓	✓

Visually inspect all fuel lines and connections for cracks or leaks.

Throttle Body Inspection and Cleaning

Scheduled Maintenance	Storage	Preseason
✓		✓

Clean throttle plates and throttle body bores using PULLEY FLANGE CLEANER (P/N 413 711 809).

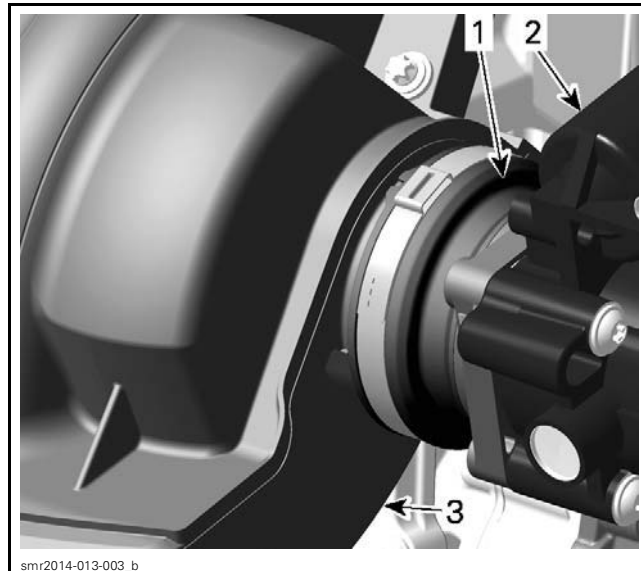
AIR INTAKE SYSTEM

Throttle Body Connecting Socket

Scheduled Maintenance	Storage	Preseason
✓		

Visually inspect throttle body connecting socket for cracks or other damages.

Replace if necessary. Refer to *FLAME ARRESTOR* in the *AIR INTAKE SYSTEM* subsection.



1. Connecting socket
2. Throttle body
3. Intake manifold

Flame Arrestor

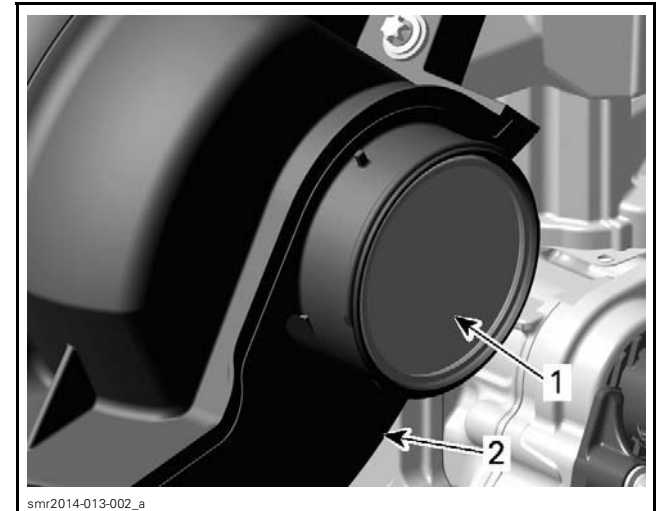
Scheduled Maintenance	Storage	Preseason
✓		

Get access to the flame arrestor. Refer to *FLAME ARRESTOR* in the *AIR INTAKE SYSTEM* subsection.

Check for any debris clogging the flame arrestor.

Clean flame arrestor. Refer to *FLAME ARRESTOR CLEANING* in the *AIR INTAKE SYSTEM* subsection.

Replace flame arrestor if necessary.



1. Flame arrestor
2. Intake manifold

ELECTRICAL SYSTEM

Battery Charging

Scheduled Maintenance	Storage	Preseason
	✓	✓

To charge battery, refer to *CHARGING SYSTEM* subsection.

Spark Plug Replacement

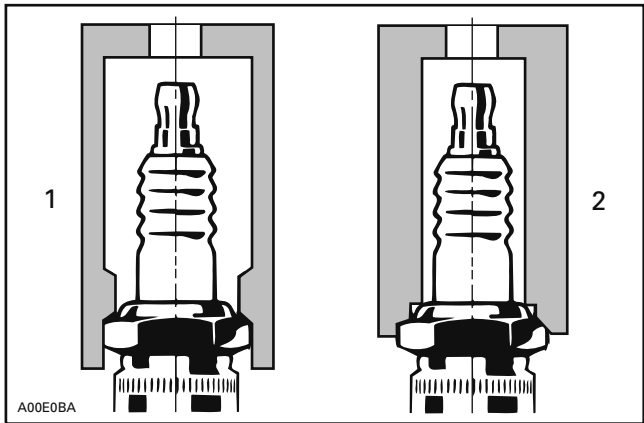
Scheduled Maintenance	Storage	Preseason
✓		

Spark Plug Removal

1. Remove ignition coil from spark plug. Refer to *IGNITION SYSTEM* subsection.
2. Using an approved spark plug socket, release the torque applied to the spark plug and unscrew a few turns.

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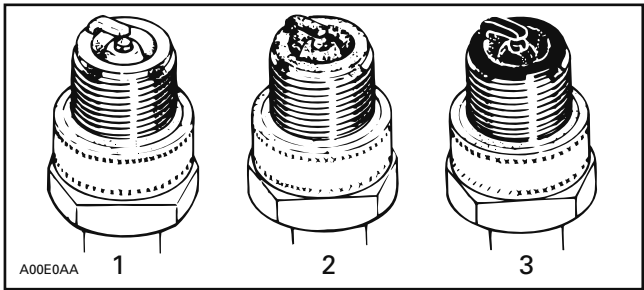
Subsection 02 (PERIODIC MAINTENANCE PROCEDURES)



1. Approved socket
2. Improper socket

3. Clean the spark plug and cylinder head with pressurize air.
4. Remove spark plug.

Spark Plug Analysis



TYPICAL

1. Overheated (light gray, white)
2. Normal (light brown, brown)
3. Fouled (black, wet or dry, dark deposits, gray, melted coating)

The plug face reveals the condition of the engine, operating condition, method of driving and fuel mixture. For this reason it is advisable to inspect the spark plug at prescribed intervals, examining the plug face (i.e. the part of the plug projecting into the combustion chamber).

Troubleshooting a Fouled Spark Plug

Fouling of the spark plug is indicated by irregular running or misfiring of the engine, decreased engine speed due to misfiring, reduced performance, and increased fuel consumption.

Other possible causes are: a incorrect or bad fuel, defective ignition system, incorrect spark plug gap, loss of compression, or lubricating oil entering the combustion chamber.

The plug face of a fouled spark plug has either a wet or dry black carbon deposit. Such coatings form a conductive connection between the center electrode and the ground electrode.

Spark Plug Installation

Prior to installation, ensure the contact surfaces of the cylinder head and spark plug are free of grime.

1. Using a wire feeler gauge, check electrode gap as specified in the following chart.

NOTICE Do not adjust gap on this type of spark plug. The adjustment could weaken negative electrodes which may lead to electrode breakage and severe engine damage.

SPARK PLUG	GAP mm (in)
NGK CRBEB	0.7 mm to 0.8 mm (.028 in to .031 in) NOT adjustable

2. Hand screw spark plug into cylinder head. Then, tighten the spark plug clockwise to specified torque with an approved spark plug socket.

SPARK PLUG	
Tightening torque	13 N•m ± 1 N•m (115 lbf•in ± 9 lbf•in)

3. Install ignition coil. Refer to *IGNITION SYSTEM* subsection.
4. Complete the installation in the reverse order of the removal.