

HONDA MCHP1.2D/ MCHP1.2DP

6K, 12K & 18K

Hour Service

Instructions for

freewatt[®] PLUS

POWERED by **HONDA**[™]

Kits # 550002024 & 550002045



4. INSPECTION/ ADJUSTMENT

MCHP1.2D•MCHP1.2DP

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1. PERIODIC MAINTENANCE

MAINTENANCE SCHEDULE

Maintenance intervals (1)		Monthly	Every 6,000 operating hours (2) or every 3 years	Every 12,000 operating hours (2)	Every 24,000 operating hours (2)	Ref. page
Item						
Perform visual checks	Check	○(3)				See owner's manual
Engine starting condition, abnormal noise, abnormal vibration	Check		○(4)			—
Engine lubricant leaks	Check		○(4)			—
Engine coolant leaks	Check		○(4)			—
Cracks in the crankcase breather tube	Check		○(4)			—
Fuel gas and exhaust gas leaks	Check		○(4)			3-50
Condition of discharged condensate	Check		○(4)			—
Air cleaner element (Clean the urethane part, if not clean)	Check		○(4)			4-6
(Replace the urethane foam)	Replace			○(4)(5)		4-6
(Replace the air cleaner unit)	Replace				○(4)	4-6
Engine lubricant and drain washer	Replace		○(4)			4-3
Engine lubricant oil filter	Replace		○(4)			4-3
Spark plug	Replace		○(4)			4-7
Valve clearance	Adjust		○(4)			4-8
Crankcase breather separator	Replace			○(4)		4-10
Lower crankcase breather tube	Replace			○(4)(5)		4-10
Engine coolant	Replace				○(4)	See Furnace manual
Fuel hose	Replace				○(4)	5-22, 26
	Check leaks after replacement					
Fuel inlet hose	Replace				○(4)(6)	5-59
	Check leaks after replacement					
Heat exchanger	Replace				○(4)	5-56 thru. 58
Condensate drain tube A	Replace				○(4)	5-33
Condensate drain tube B	Replace				○(4)	5-33
Exhaust gas leak sensor	Test	○	○(4)			4-11
	Replace					Every 5 years (4) 4-12
Battery	Replace					Every 5 years (4) 4-13

- (1) Complete the routine maintenance at either the designated operating hours or years, whichever comes first.
- (2) The operating hours in the boost and back-up modes are converted to the operating hours in the normal mode by multiplying by a factor 1.4.
The total of these operating hours plus the normal operating hours corresponds to the operating hours indicated in the maintenance schedule.
- (3) This check should be performed at the beginning of each heating season in addition to the monthly check during the season.
- (4) These items must be serviced by a qualified service professional as they require special knowledge and tools.
- (5) Perform the maintenance at every 12,000 operating hours or 6 years, whichever comes first.
- (6) Perform the maintenance at every 24,000 operating hours or 12 years, whichever comes first.

ENGINE OIL/OIL FILTER REPLACEMENT

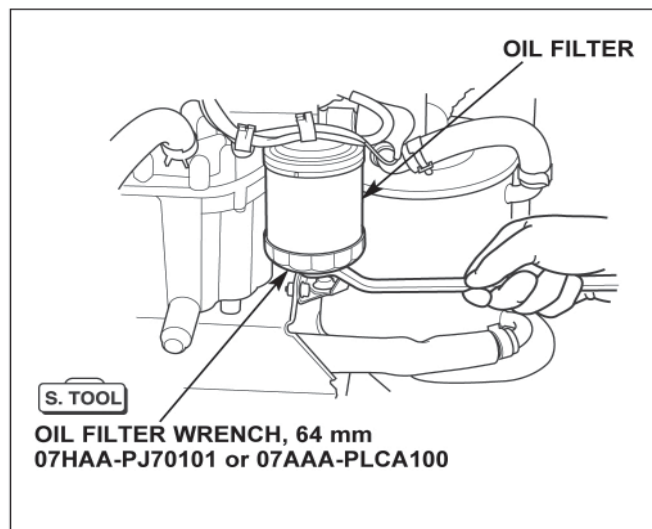
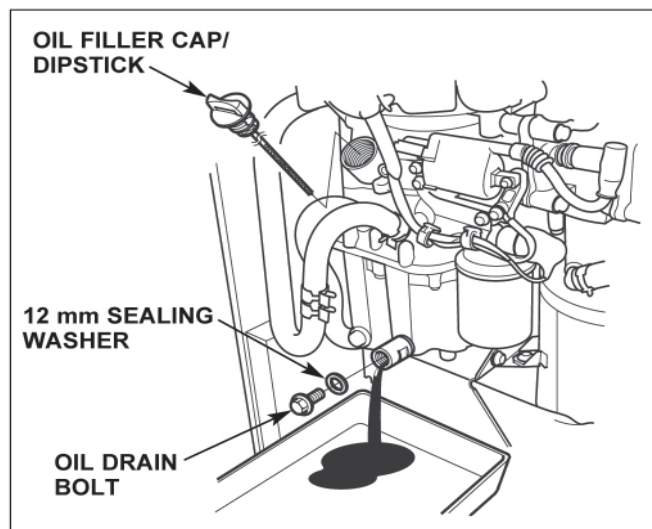
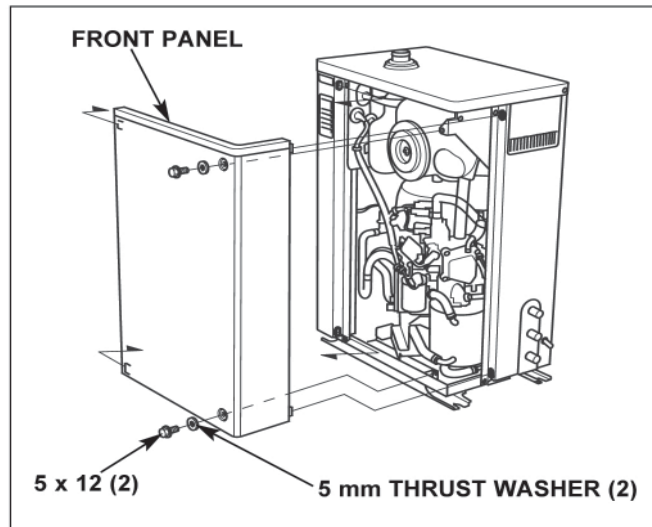
⚠ CAUTION

The engine and engine oil are very hot right after stopping the engine and they remain hot for a while. You could be burned.

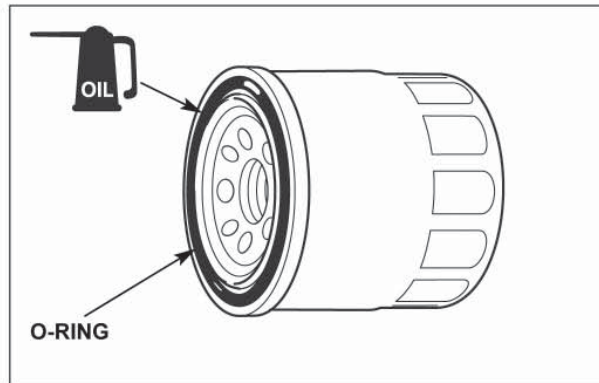
NOTICE

Take care not to spill the engine oil on the hoses and harnesses when replacing the engine oil/oil filter. Wipe up any spilled oil thoroughly.

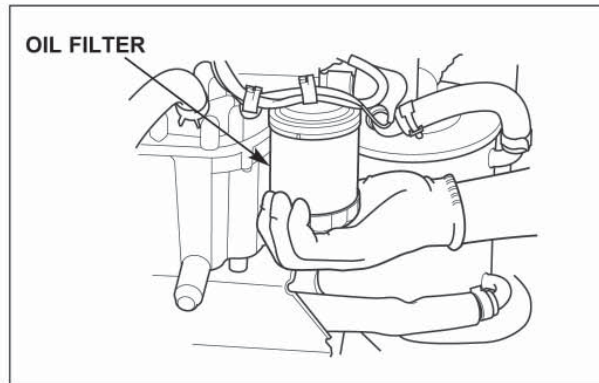
- 1) Turn OFF the gas. Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing. Do not use the MCHP rotary switch to turn the power OFF.
- 2) Remove the 5 x 12 mm flange bolts and 5 mm thrust washers, and remove the front panel.
- 3) Remove the oil filler cap/dipstick.
- 4) Place a shop towel under the drain bolt and set the tray or equivalent container on the shop towel.
- 5) Drain the engine oil by removing the oil drain bolt and 12 mm sealing washer.
- 6) Place a shop towel under the oil filter, then remove the oil filter using the oil filter wrench, 64 mm (special tool).
 - Catch any leaking oil during removal of the oil filter.



- 7) Clean the oil filter mounting surface on the engine side and apply the engine oil to the surface.
- 8) Apply MCHP lubricant to the O-ring on the new oil filter.

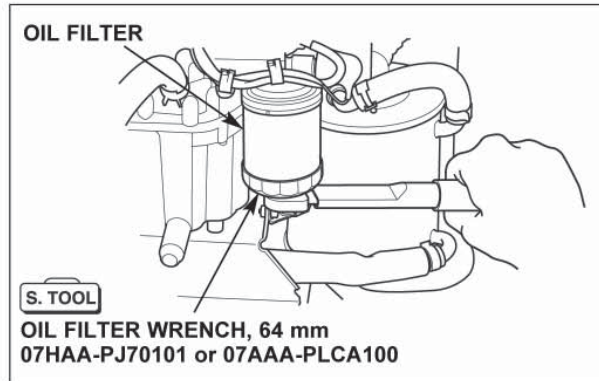


- 9) Tighten the oil filter by hand until the O-ring contacts the mounting surface on the engine.



- 10) Tighten the oil filter to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

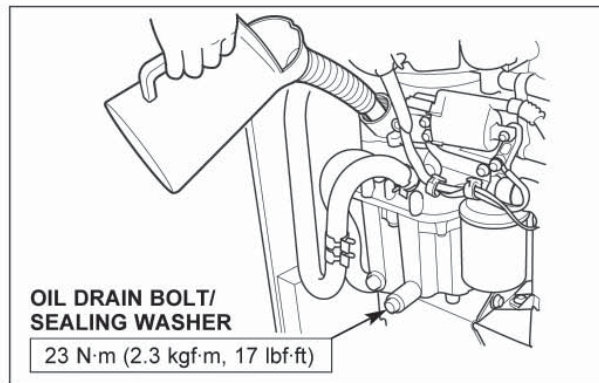


- 11) Place a new sealing washer on the oil drain bolt and tighten the oil drain bolt to the specified torque.

TORQUE: 23 N·m (2.3 kgf·m, 17 lbf·ft)

- 12) Add MCHP oil up to the specified level on the oil filler cap/dipstick and tighten the oil filler cap/dipstick securely.

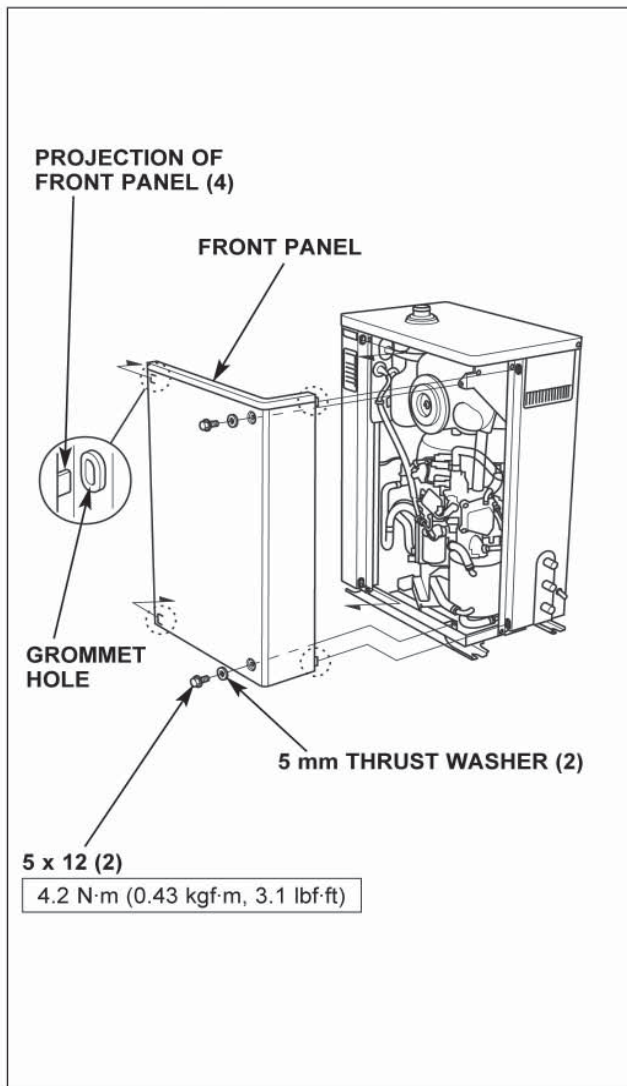
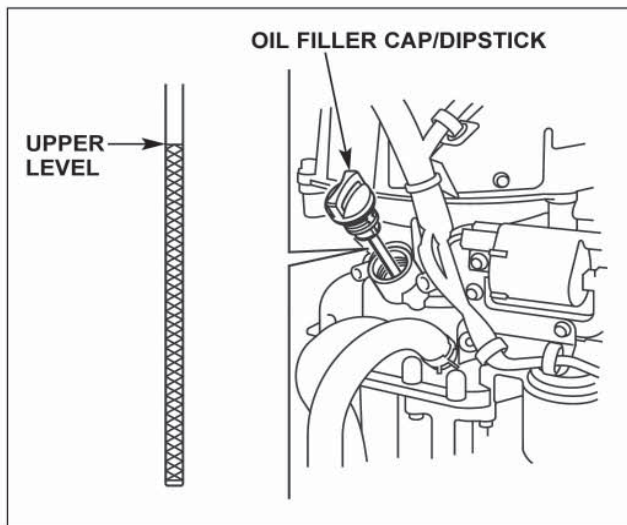
ENGINE OIL CAPACITY	3.5 L (3.70 US qt, 3.08 Imp qt) With oil filter change: 3.7 L (3.91 US qt, 3.26 Imp qt)
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- 13) Trial start the engine (see page 3-4 for trial operation).
Check the oil drain bolt and oil filter for leakage.
- 14) Turn OFF the power supply to the MCHP (Do not use the MCHP rotary switch to turn the power OFF) to prevent the accidental start of the engine.
- 15) Remove the oil filler cap/dipstick.
Wipe the oil off the dipstick with a shop towel.
- 16) Insert the oil filler cap/dipstick into the oil filler port.
Do not screw it in.
- 17) Remove the oil filler cap/dipstick again.
Check that the oil is at or close to the upper level mark on the dipstick.
- 18) If the oil level is low, add the recommended engine oil up to the upper level mark on the dipstick.
Reinstall the oil filler cap/dipstick securely.
- 19) Install the front panel aligning the four projections of the front panel with the grommet holes.
- 20) Install the two 5 x 12 mm flange bolts and two 5 mm thrust washers and tighten the flange bolts to the specified torque.

TORQUE: 4.2 N·m (0.43 kgf·m, 3.1 lbf·ft)



AIR CLEANER INSPECTION

⚠ CAUTION

The engine is very hot right after stopping and it remains hot for a while.
You could be burned.

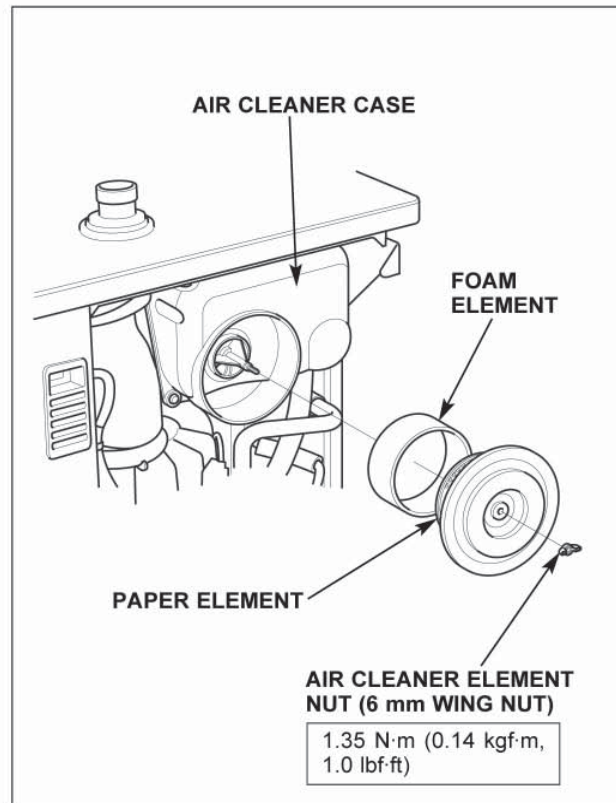
- 1) Turn OFF the gas.
Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing.
Do not use the MCHP rotary switch to turn the power OFF.
- 2) Remove the front panel (P. 4-3).
- 3) Loosen the air cleaner element nut that secures the air cleaner elements.
Remove the air cleaner elements.
- 4) Remove the foam element from the paper element.
- 5) Check the foam and paper elements for holes and tears.
Replace the foam element if it has holes, tears or other damage.
If the foam element has stuck to the paper element or if the paper element is damaged, replace the foam and paper elements as a set.
- 6) Check the paper element for contamination by lightly tapping on it.
If contamination is severe, replace the paper element.
- 7) Check inside the air cleaner case for contamination.
If necessary, clean inside the air cleaner case with care not to let the dust and dirt enter the air duct.
- 8) Set the foam element on the paper element and install it in the air cleaner case.
Tighten the air cleaner element nut to the specified torque.

TORQUE: 1.35 N·m (0.14 kgf·m, 1.0 lbf·ft)

NOTICE

*Install the air cleaner element securely.
Failure to install the air cleaner element properly may allow dirt to enter the engine, causing rapid engine wear.
This type of damage is not covered by the Distributor's Limited Warranty.*

- 9) Install the front panel (P. 4-5).



SPARK PLUG REPLACEMENT

⚠ CAUTION

The engine and spark plug are very hot right after stopping the engine and they remain hot for a while. You could be burned.

- 1) Turn OFF the gas.
Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing.
- 2) Remove the front panel (P. 4-3).
- 3) Remove the spark plug cap and clean the area around the spark plug.

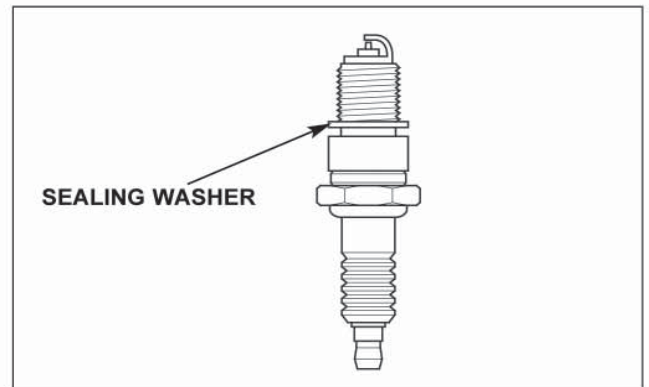
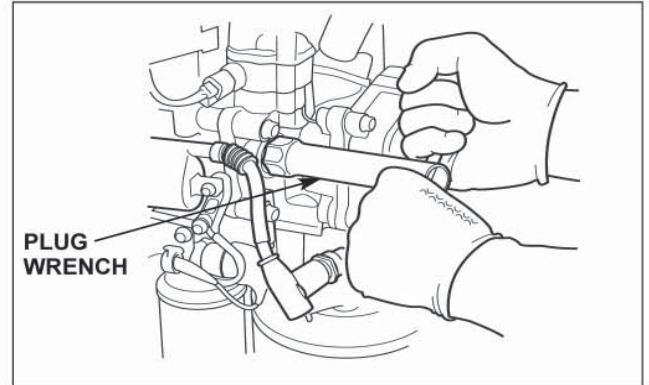
- 4) Use the spark plug wrench to remove the spark plug.

STANDARD SPARK PLUG	6G (NGK)
NEW SPARK PLUG GAP	0.3 – 0.4 mm (0.012 - 0.016 in)

- 5) Tighten a new spark plug by hand until the sealing washer sets on the sealing surface.
Take care not to cross-thread the spark plug.
Then, tighten the spark plug to the specified torque with a wrench.

TORQUE: 20 N·m (2.0 kgf·m, 15 lbf·ft)

- 6) Install the spark plug cap.
- 7) Install the front panel (P. 4-5).



VALVE CLEARANCE INSPECTION/ ADJUSTMENT

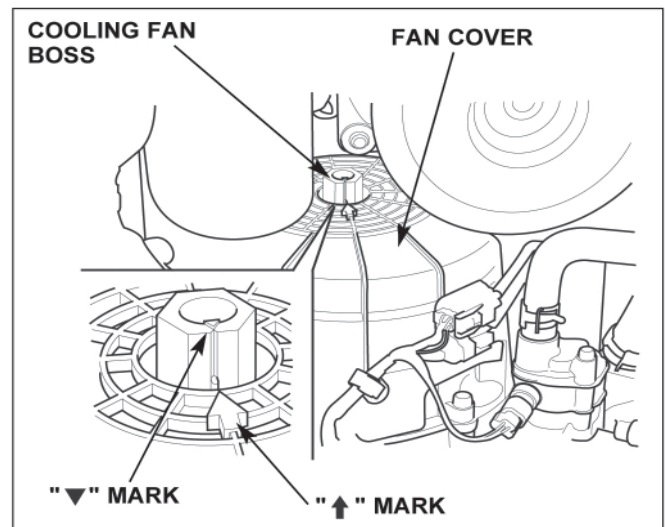
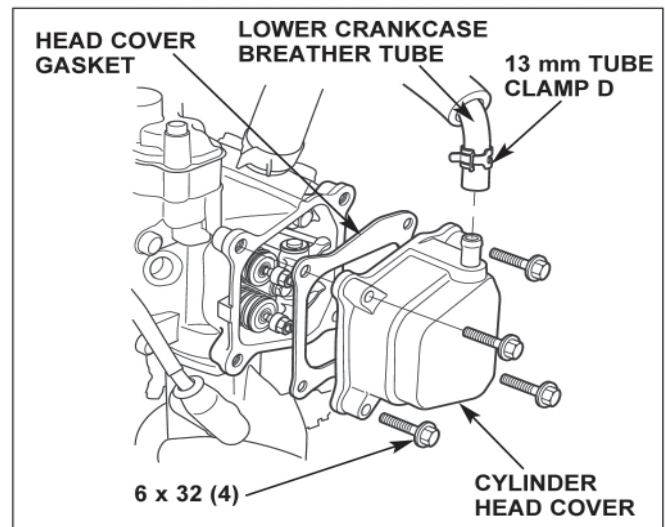
⚠ CAUTION

The engine is very hot right after stopping and it remains hot for a while.
You could be burned.

NOTICE

Perform the valve clearance inspection/adjustment while the engine is cold.

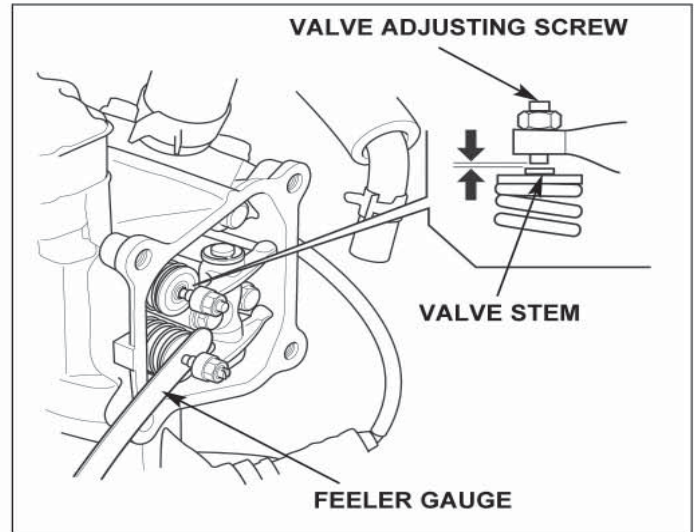
- 1) Turn OFF the gas.
Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing.
- 2) Remove the front panel (P. 4-3).
- 3) Remove the spark plug (P. 4-7).
- 4) Slide the 13 mm tube clamp D up the tube and disconnect the lower crankcase breather tube from the cylinder head cover.
- 5) Remove the four 6 x 32 mm flange bolts and remove the cylinder head cover and head cover gasket.
 - Before removing the cylinder head cover, place a shop towel under the cylinder head cover to protect the hoses and sensors from leaking engine oil.
 - Wipe up any spilled oil thoroughly.
- 6) Check that the triangular mark "▼" on the boss of the cooling fan aligns with the "↑" mark on the fan cover.
- 7) If the marks are out of alignment, set a wrench on the boss of the cooling fan.
Turn the cooling fan counterclockwise and set it to the position where the "▼" mark aligns with the "↑" mark and the cylinder is at TDC of the compression stroke.
 - If the exhaust side valve opens, turn the cooling fan one full turn again and align the "▼" mark at the cooling fan boss with the "↑" mark on the fan cover.



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- 8) Insert a feeler gauge between the valve adjusting screw and valve stem and measure the valve clearance.

VALVE CLEARANCE		
With engine cold	IN	0.13 – 0.17 mm
	EX	0.18 – 0.22 mm
With engine warm (Reference)	IN	0.18 – 0.22 mm
	EX	0.23 – 0.27 mm



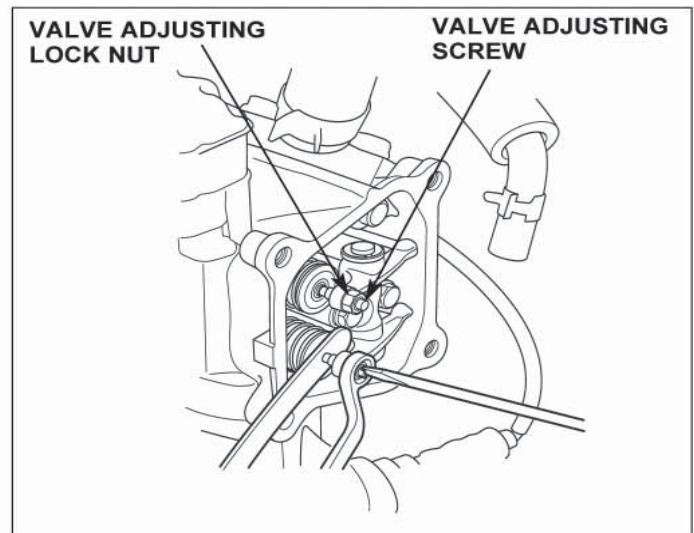
- 9) If adjustment is necessary, loosen the valve adjusting lock nut while holding the valve adjusting screw with a screwdriver.

- 10) Loosen the valve adjusting screw and adjust the intake and exhaust valve clearances.

- 11) After adjustment, loosely tighten the valve adjusting lock nut while holding the valve adjusting screw with a screwdriver.

- 12) Check the valve clearance again and tighten the valve adjusting lock nut to the specified torque.

TORQUE: 7.4 N·m (0.75 kgf·m, 5.5 lbf·ft)



- 13) Install the cylinder head cover and head cover gasket. Tighten the four bolts to the specified torque.

TORQUE: 11 N·m (1.1 kgf·m, 8 lbf·ft)

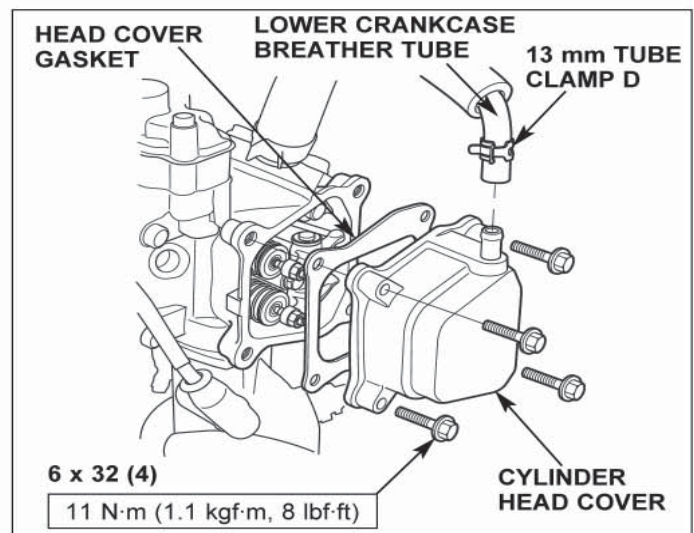
- Check the head cover gasket for damage and deformation before reinstallation. Replace the head cover gasket with a new one if necessary.
- Tighten the bolts diagonally in two or three steps.

- 14) Connect the lower crankcase breather tube to the cylinder head cover.

- Set the 13 mm tube clamp D in the proper position (P. 2-44).

- 15) Install the spark plug (P. 4-7).

- 16) Install the front panel (P. 4-5).

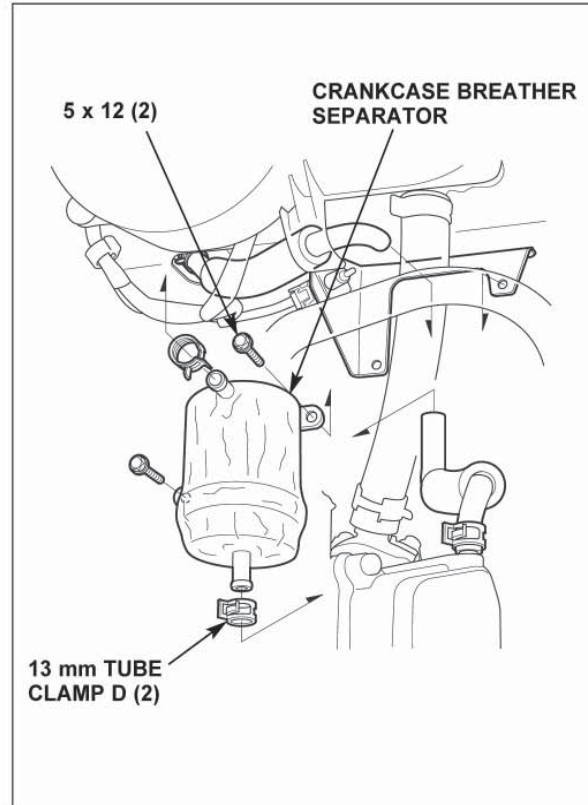


CRANKCASE BREATHER SEPARATOR REPLACEMENT

⚠ CAUTION

The engine is very hot right after stopping and it remains hot for a while. You could be burned.

- 1) Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing.
- 2) Remove the front panel (P. 4-3).
- 3) Slide the two 13 mm tube clamps D up the tube and disconnect the upper and lower crankcase breather tubes from the crankcase breather separator.
- 4) Remove the two 5 x 12 mm flange bolts and remove the crankcase breather separator.
- 5) Install a new crankcase breather separator in the direction shown.
Tighten the two 5 x 12 mm flange bolts securely.
- 6) Connect the upper and lower crankcase breather tubes to the crankcase breather separator and secure it with the two 13 mm tube clamps D (P. 2-44).
- 7) Install the front panel (P. 4-5).

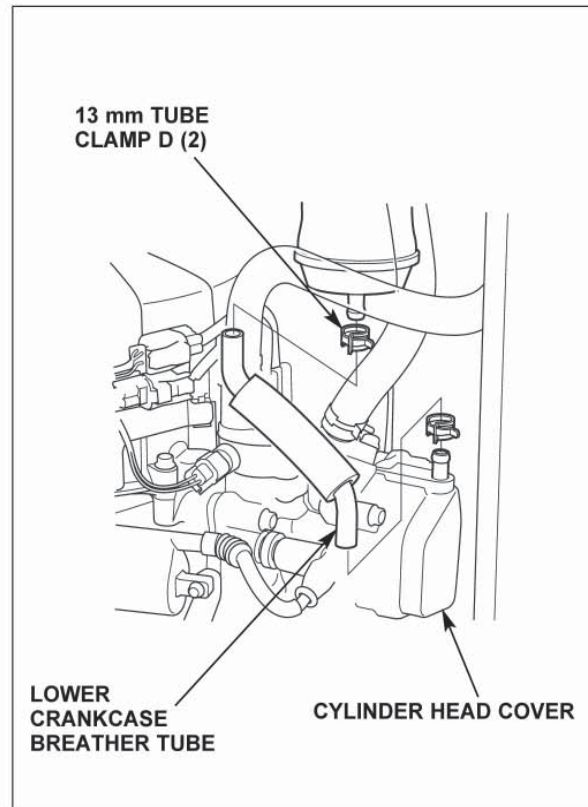


LOWER CRANKCASE BREATHER TUBE REPLACEMENT

⚠ CAUTION

The engine is very hot right after stopping and it remains hot for a while. You could be burned.

- 1) Turn the MCHP system switch to the OFF position and then turn the circuit breaker for the MCHP to the OFF position before servicing.
- 2) Remove the front panel (P. 4-3).
- 3) Slide the two 13 mm tube clamps D up the tube and remove the lower crankcase breather tube from the space between the crankcase breather separator and cylinder head cover.
- 4) Install a new lower crankcase breather tube in the reverse order of removal.
- 5) Secure the lower crankcase breather tube with the 13 mm tube clamps D. (P. 2-44).
- 6) Install the front panel (P. 4-5).



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Check our website frequently for updates: www.ecrinternational.com

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