

HONDA EU 2000i GENERATOR MAINTENANCE

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Good maintenance of the generator is important and simple. These instructions are based on my use and care of three different Honda generators in the past approximately 25 years. It started with a small 400 W to 1 KW (EX 1000) to the current EU2000i. The information presented here is not a substitute for reading the Owner's manual. Read the manual and become familiar with the information and details in it. Some of the particulars in this document are from the original Honda Owner's manual.



Figure 1 My generator, approximately 10 years young

You too can keep your generator in great condition and expect a long life. The key is proper care and maintenance. Keep the following in mind.

Brief summary.

- a. High quality oil is inexpensive insurance for long life. Change the oil as recommended or more frequently. If the generator was stored for long periods (1 year or more), play it safe and change the oil before using.
- b. When changing the oil, first run the generator for a few minutes to warm it up and 'mix' and sediments so that they are removed.
- c. Use clean fresh fuel.
- d. Do **NOT** allow any fuel to dry up in the gas tank or carburetor.
- e. Clean and maintain the air filter.
- f. Clean the spark arrester.
- g. Save the box. Store the generator in the box.
- h. Join the Yahoo group listed below. A good source of good information.
- i. As the saying goes, "if everything else fails, read the book".

Operating Precautions

Be sure your fuel (fresh or stabilized) is clean. Use of an outboard fuel filter with fine mesh and large surface area will reduce the chance of clogging the generator's small internal fuel strainer. Don't run the generator on a dirty or dusty surface; place it on a piece of plywood or other clean, level surface. Check the oil level before starting; the EU2000i's low-oil cutoff switch will prevent starting if the oil level is low. It is good practice to always have some oil handy while the generator is in use. From my experience, this generator does not burn/use up any of the oil in the crankcase between oil changes, but have some handy.

Short-Term Storage

WARNING: Gasoline vapors are highly flammable and explosive. Make sure to work in an open area and keep away from heat, sparks and flames.

All gasoline degrades over time, and gasoline may contain ethanol, causing it to degrade even more quickly. If the generator will not be used for several months, drain the gasoline (see the Owner's manual) and run the engine under light load (50 to 100 Watts is adequate) until the fuel system is completely and the generator stops. This ensures that all the gasoline was consumed. Failure to do so will eventually clog the carburetor jets (varnish build up) which is expensive to fix. Consider adding a stabilizer, such as Sta-Bil, to any fuel that sits either in the generator or in a storage container for more than a few months. It is best to use fresh fuel after any storage. If the drained gasoline is clean, transfer it to your car. The quantity is small and not likely to have any adverse effects. If you are not sure about the cleanliness of the gasoline, play it safe, pour it slowly through a few coffee filters.

Periodic Maintenance

The basic care involves maintaining the proper oil level, changing the oil after ten to twenty hours of break-in and every 100 hours of operating time after that, cleaning the air filter, cleaning the spark arrestor, and cleaning and gapping the spark plug. Figure 2 below is the Honda recommended maintenance schedule (copied from the Owner's manual). Refer to the Owner's Manual for details and notes. Changing engine oil is inexpensive 'health insurance', therefore change it frequently. Also, use high quality oil. On the other hand, if the generator was used much less than 200 a year, no point changing the spark plug every year.

MAINTENANCE SCHEDULE

REGULAR SERVICE PERIOD (3)		ITEM	Each use	First month or 20 Hrs.	Every 3 months or 50 Hrs.	Every 6 months or 100 Hrs.	Every year or After each 200 Hrs.	
Perform at every indicated month or operating hour interval, whichever comes first.								
•	Engine oil	Check level	○					
		Change		○		○		
•	Air cleaner	Check	○					
		Clean			○(1)			
•	Spark plug	Check-adjust				○		
		Replace					○	
	Spark arrester	Clean				○		
•	Valve clearance	Check-readjust					○(2)	
•	Combustion chamber	Clean	Every 300 Hrs (2)					
•	Fuel tank and filter	Clean				○(2)		
•	Fuel line	Check	Every 2 years (Replace if necessary) (2)					

Figure 2 Maintenance Schedule

Engine Oil

High-quality oil is 'inexpensive insurance' for long engine life. The Honda manual recommends 10W-30 weight (for our temperature) conventional mineral engine oil. Synthetic oil is very high quality and an improvement over conventional oil. While it's nearly four times as expensive as conventional oil, you will be buying and using only small quantities at a time. According to the car-care guru Leon Kaplan (KABC radio, Sunday mornings at 9 AM), synthetic oil should not be used on a brand new engine unless specifically recommended by the engine manufacturer. If you elect to use synthetic oil, run the engine with the Honda-recommended conventional oil to allow the engine components to 'set' before switching to the synthetic. I switched to synthetic (Mobil 1, 10W – 30) after approximately 100 hours of use. The issue of mixing mineral oil with synthetic is debated by experts (I am not one of them). Be safe and smart, do not mix; use one or the other.

Hints: Run the engine for several minutes to warm up the oil prior to draining it. Avoid tilting the engine forward while the crankcase is full in order to drain the old oil as shown in Figure 3 and the Owner's Manual. This can be messy (been there, done that)! A better way is to first pump out most of the oil. Only after most of the oil has been drained, tilt the engine to finish the draining process. In view of the small amount of oil to be drained, a turkey baster (around a dollar at the 99 Cents store) with a short hose is just fine for the job. Are the baster materials compatible with engine oil? Your guess is as good as mine. Therefore, wash it in warm soapy water after each use and be prepared to discard after a few uses. If you are willing to spend more money (\$12 and up), there are specific oil removal hand pumps which may speed up the oil draining process. These pumps are widely used in marine engines where the drain plug is not accessible and the oil is pumped out through the dip stick tube.

- a. Jabsco Oil Hand Pump kit JAB 34060-0010
 - b. SeaSense Oil Transfer Hand Pump BRA 50091447
 - c. Pep Boys has one for approximately \$12.00
 - d. Harbor Freight has some low cost pumps under \$10.
- Disclaimer. Product quality here is on the low end

When refilling the crankcase with fresh oil, tilt the engine slightly toward the rear. Insert a funnel snugly into the oil cavity and fill approximately 0.35 – 0.4 quarts of oil. Set the generator level and add only enough additional oil until the oil level is just a little under the front bottom edge of the oil drain/fill cavity (see figure 3 on the right). It may easier if you use a short flexible hose between the funnel and oil cavity. See figure 11 on the right for a versatile funnel (red) with some adapters (approximately \$3.50, purchased in July 2010 at a WalMart Supercenter).

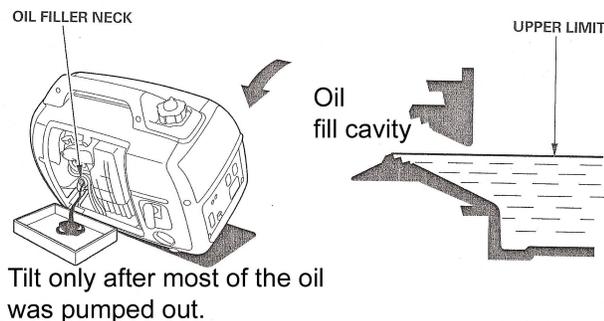


Figure 3 Avoid tilting the engine forward when crankcase is full.

Air Filter

The Honda air filter uses a foam element that can be cleaned with warm water and mild dishwashing detergent. After cleaning rinse it thoroughly with warm water and allow it to fully dry and re-oil it with filter oil. Honda suggests using engine oil, but does not give details about the oil weight. My preference is to use special air filter oil. A good source: K & N <http://www.knfilters.com/> item number 99-0504 air filter oil.



Figure 4. Oil fill / drain & air filter cover



Figure 5. Location of oil cap and air filter

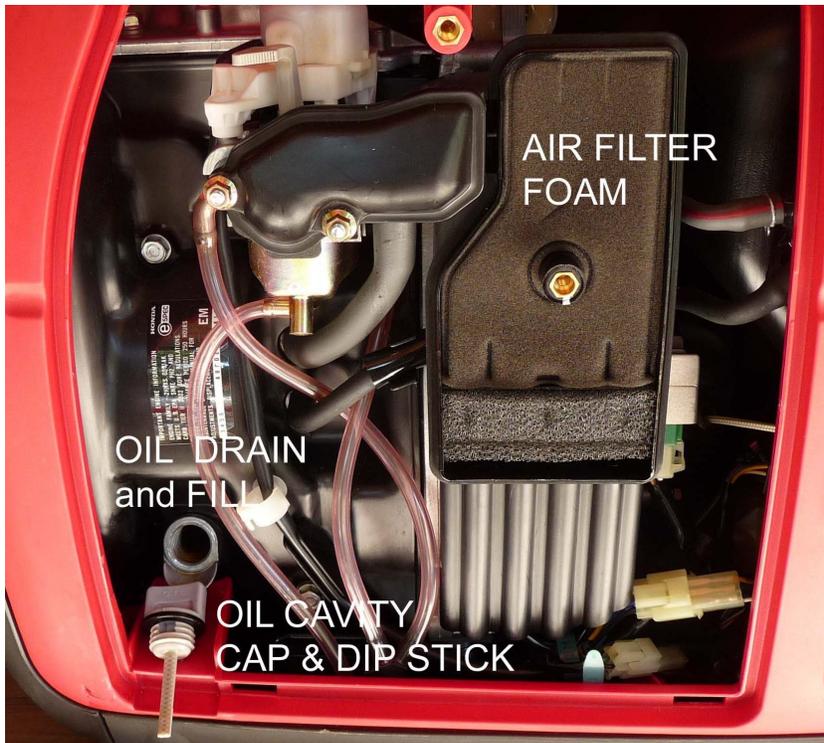


Figure 6. Oil cavity cap, dip stick and foam air filter

Spark Plug

The spark plug is located under a small cover at the top of the generator. It may be necessary to use a flat screw driver (gently) to pry open this cover. It opens from the bottom.



Figure 7. Spark plug cover

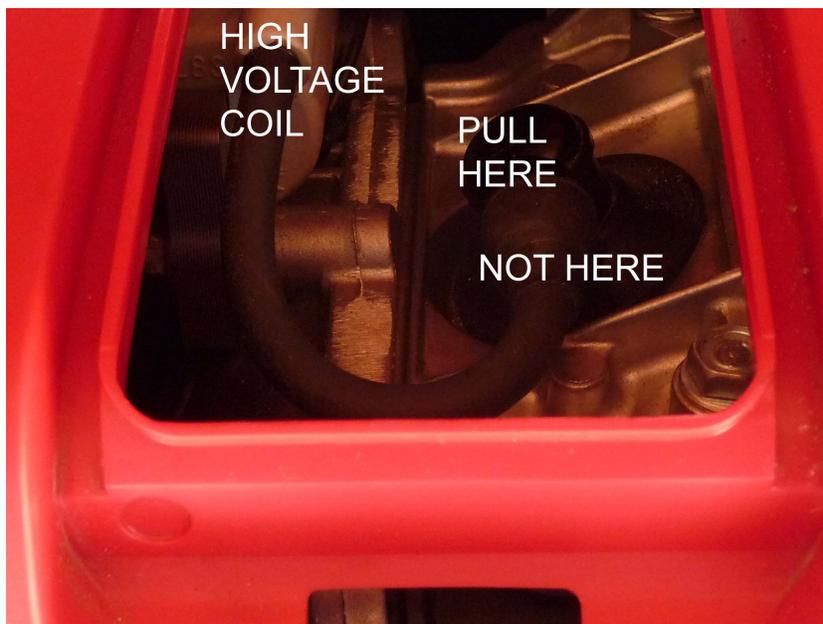


Figure 8. Spark plug cable

Carefully lift the spark plug cable from the spark plug. **Do not pull on the cable.** Hold the center of the circle and lift straight up.



Figure 9. Spark plug

Caution: Be careful when removing the spark plug. Use a dedicated 5/8", 6 point spark plug socket with foam padding inside. Make sure that the socket fits properly seated straight over the spark plug all the way to the bottom to avoid breaking it. Breaking a plug in its seat may cause serious and expensive future problems.

See the owner's manual for instructions and illustrations on servicing the spark plug. Use some compressed air (air duster can or the turkey baster) to blow away any dirt and particles from around the bottom of the spark plug **before** removing the plug. Any particle that may enter the cylinder can cause serious damage. Installing and tightening the spark plug is critical. An improperly tightened plug or wrong plug may damage the engine. Make sure to follow the instructions in the Owner's manual.

The Honda recommended spark plus is NGK CR5HSB. Gap should be 0.024 – 0.026 inch. My search for an equivalent Champion spark plug did not find any.

Spark Arrester.

WARNING: Allow the muffler to cool before doing any work.

The spark arrester must be cleaned every 100 hours. Please refer the Owner's Manual for details.

Long-Term Storage

Prior to a long period of non-use, it is essential to drain the fuel system as described in Short-Term Storage, above. In addition, you should fog the cylinders with fogging oil (if necessary regular oil can used as well) which provides a protective coating to the combustion cylinder and related parts to prevent corrosion. Fogging oil usually comes in aerosol cans and should be sprayed into the spark-plug hole (CRC can in figure 12) while pulling on the starting rope several times to spread the oil and coat the cylinder walls.. Follow the instructions on the fogging oil can for additional details. Warning: WD40 is versatile, widely used good product, however it is a solvent not lubricant. Do not use it in lieu of fogging oil.

Gas tank cap

Do not tighten the gas tank cap prior to long term storage. Screw on the cap all the way and back it up approximately 1/4 to 1/2 turn. This will prevent the rubber gasket from forming a permanent set and groove. Make sure that the vent valve works properly. After a long storage it may stick. The clue for this condition is when the generator runs for a few minutes and stops. Open the gas cap and start the generator. If it runs properly, the vent valve is stuck. Clean it.



Figure 10. Gas tank cap

Preparing to Use After Long-Term Storage

Pour a small amount of gasoline into the tank, start the engine with a small load. While the engine is running, pour the manufacturer's recommended dose of carburetor cleaner and run the engine until it is 'nice and warm'. Drain the old oil and refill with fresh oil. Remember, oil is relatively inexpensive while generator repairs are very expensive. A little extra care can reduce repair cost and above all will maintain the generator in good operating condition.

Tools and Equipment

These required tools and maintenance items are common and inexpensive.

1. Spark plug wrench (socket) 5/8" 6 points (foam padded).
2. Spark plug feeler gauge (not shown in figure 11)
3. Flat blade screw driver 1/4 inch.
4. Philips screwdriver, No. 2.
5. General purpose pliers may come handy.
6. Turkey baster to drain the oil.
7. Approximately 8 – 10 inches of suitable plastic or rubber tubing, to fit the baster tip (snugly) and 3/8 – 1/2 inch O.D to fit the generator oil drain opening.
8. Funnel with 3/8 – 1/2 inch nozzle.
9. Empty bottle for the old oil. Bleach, milk and juice bottles work great.
10. 10W - 30 weight high quality oil, approximately 1/2 quart.
11. Engine fogging oil. Highly recommended if the generator will be stored for extended time without use.
12. Carburetor cleaner liquid (not spray) optional, not shown. Add small amount to fresh gasoline after long storage. Follow the instructions on the cleaner can.
Caution: If you insist on using a spray carburetor cleaner, make sure to remove the foam air filter first and spray directly into the carburetor, **NOT** into the foam.



Figure 11. Tools for the job

The empty milk bottle is for the old oil.



Figure 12. Fluids (air filter cleaner optional)

References:

1. Sites related to fogging oil.

Note: Fogging oil is widely used on marine engines in preparation for long storage. Some of sites below are oriented to marine engines.

- a. http://www.syntheticoilnlubes.com/engine_fogging_oil.html
- b. http://www.ehow.com/about_4675032_fogging-oil.html
- c. <http://www.syntheticoilhq.com/car-care-protectant.html>
- d. <http://www.pennzoil.com/documents/Pennzoil%20Marine%20Fogging%20Oil.pdf>

This site has a brief description and details about fogging oil

- e. <http://www.sportsmansguide.com/net/cb/CRC-Engine-Stor-Fogging-Oil.aspx?a=571348&kwid=310347>

2. Sites related to engine oil

Note: These sites are related to car engines and certainly apply to other internal combustion engines.

- a. http://www.askmen.com/cars/car_tips_150/166_car_tip.html
Basic simple information about engine oil (car engines)
- b. http://www.carbibles.com/engineoil_bible.html
More information about oils comparing mineral, semi-synthetic and synthetic oils.
- c. http://www.automedia.com/Synthetic_or_Conventional_Oil/ccr20050201so/1
Interesting short reading about synthetic oil.
- d. <http://www.jdpower.com/autos/articles/Synthetic-Motor-Oils>
Information on synthetic oil.

3. Engine oils

The following is only a sample of high quality oils:

- A. Conventional mineral oils: Kendal, Castrol, Valvoline, Quaker State
- B. Synthetic oils: Mobil 1, Castrol Syntec, AMSOIL

4. Yahoo Group related to the EU2000i

http://autos.groups.yahoo.com/group/Honda_EU2000_Generators/

It is free to join with good information.

Disposal of the used oil

Check the internet for a convenient toxic dump location near you. In Marina Del Rey, Los Angeles County has a self service oil dump container and provision for other related item such as anti freeze, batteries, etc. It is located on Fiji way approximately a hundred yards from Admiralty Way towards the main channel next to the dry boat storage facility. There is no charge. Also, check with some auto parts supply stores, some do collect used oil.

Thank you

I wish to thank Marty Woll N6VI for his encouragement, support, reviews, comments, corrections and the many valuable suggestions.

73, Mort