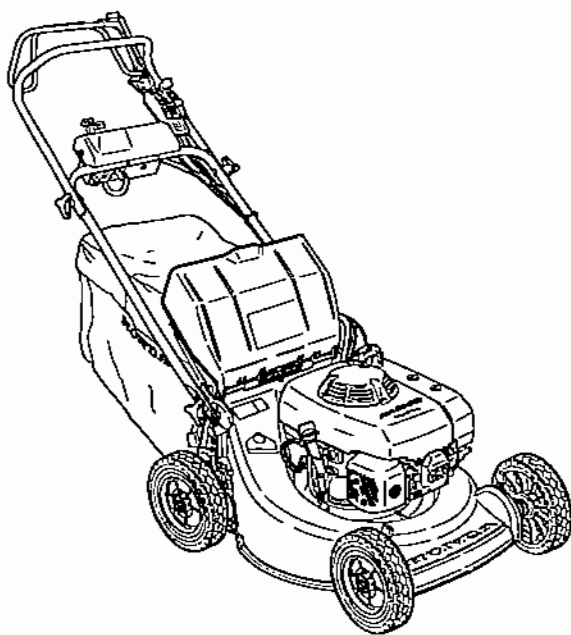


HONDA

LAWN MOWERS

HR 1950 K1 - HR 2150 K1
HR 2160 - HRA 2160



OWNER'S MANUAL

INTRODUCTION

Dear Honda User,

You have just purchased a HONDA lawn mower and we thank you for your confidence in us.

This manual has been written to familiarise you with your mower, to enable you to use it in the best possible conditions and to carry out its maintenance.

Our aim is to make you benefit to the full from technological advances, from new equipment and materials and from our experience. This is why we regularly make improvements to our models. Thus, the specifications and information contained in this manual may be modified without prior notice and without obligation to update it.

The illustrations of this manual are based on the most significant model, according to the described subject.

If you have a problem, or if you have any questions concerning the mower, contact your supplying dealer or approved HONDA dealer.

Keep this manual handy so you can consult it at any time. If you sell the mower be sure that the manual accompanies it.

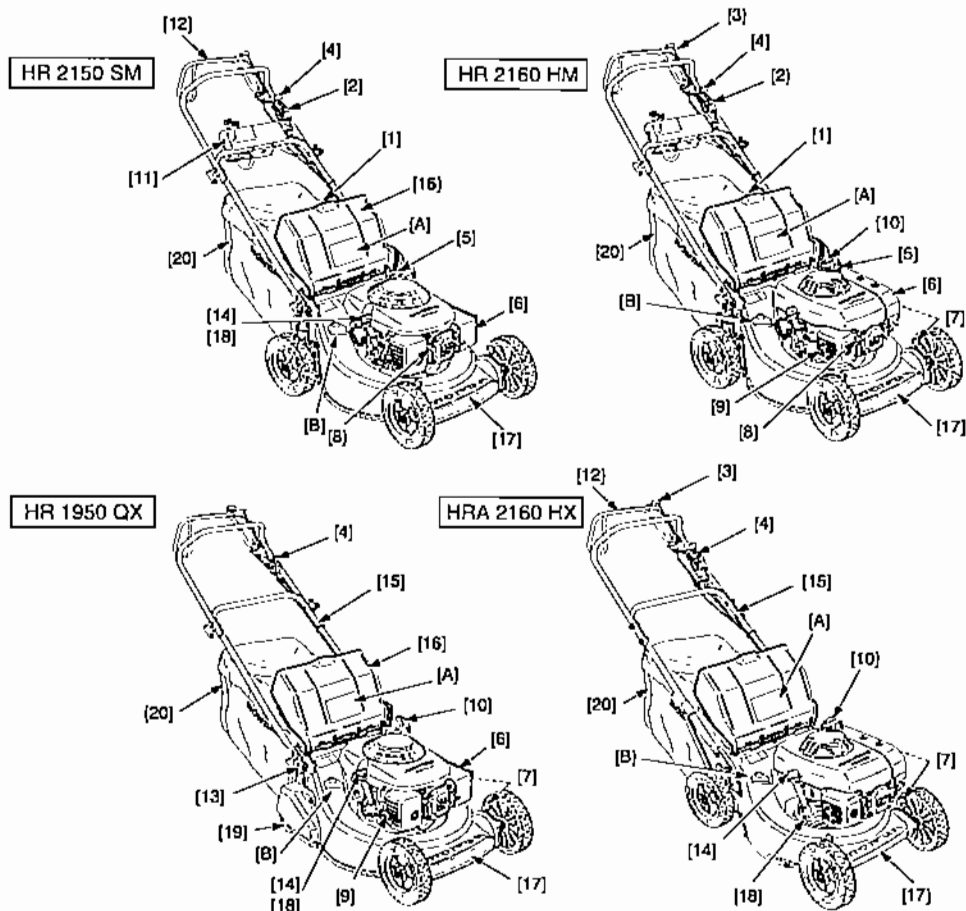
We recommend that you read the guarantee policy to fully understand your rights and responsibilities. The guarantee policy is a separate document provided by your dealer.

No reproduction, even partial, may be made of this publication without prior written authorisation.

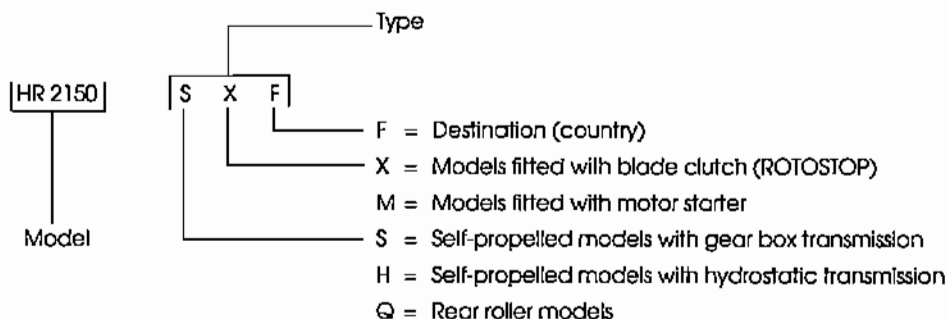
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GENERAL DESCRIPTION

Equipment identification



Description of the codes used in this manual :



GENERAL DESCRIPTION

CONTROLS

- 1 Grass bag grip
 - 2 Shift lever *
 - 3 ROTOSTOP safety lever*
 - 4 Throttle lever
 - 5 Fuel tank filler cap
 - 6 Air cleaner
 - 7 Cutting height adjustment lever
 - 8 Spark plug cap
 - 9 Muffler
 - 10 Starter
 - 11 Control box
 - 12 Drive clutch lever
 - 13 Handle height adjustment system*
 - 14 Oil filler cap
 - 15 Handle
 - 16 Discharge guard
 - 17 Blade housing
 - 18 Oil drainer cap
 - 19 Rear roller*
 - 20 Grass bag
- * Where fitted

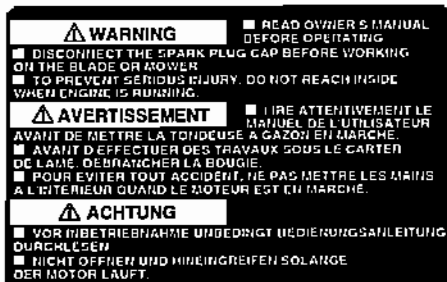
FUNCTIONS

- Disassembling and emptying of the grass bag
- Selects the forward speed
- Starts and stops blade rotation
- Controls engine speed
- Opens/closes fuel shut-off valve (HR 1950 -HR 2150)
- Selects desired cutting height
- Pull to start engine
- Battery location, engine ignition key
- Adapts handle height to user (except HRA 2160)
- Used to fill and to check oil level
- Used to drain engine oil
- Prevents objects being thrown by blade
- Used to drain engine oil
- Collects grass cuttings

* Where fitted

SAFETY LABEL LOCATIONS

The labels shown here give important safety information. Please read them carefully. These labels are considered to be integral parts of the mower. If a label becomes detached or difficult to read, contact your dealer to replace it.



SAFETY INSTRUCTIONS

Any part from the machine is a potential source of danger if the machine is used in abnormal conditions or if the maintenance is not done correctly.

Headings preceded by the following words must be read very carefully :

WARNING :

Indicates that there is danger of serious bodily injury or even death if instructions are not followed.

CAUTION :

- Indicates that there is a possible risk of bodily injury or equipment damage if instructions are not followed.

NOTE : Source of useful information.



This sign means that you must take care during certain operations. Refer to the safety instructions on page 7, to the point indicated in the square.

WARNING :

The HONDA mower is designed to give safe and dependable service if operated according to instructions and intended use : mowing (cutting) grass and collecting cut grass, when equipped with a grass bag. Any other use could be dangerous. Read and understand the Owner's Manual before operating the mower. Failure to do so could result in personal injury or equipment damage.

DESCRIPTION OF THE SYMBOLS USED IN THIS MANUAL :



Four-wheels models



3-speed transmission models



Rear roller models



Hydrostatic transmission models (H.S.T.)



Recoil starter models



Models equipped with blade clutch (ROTOSTOP)

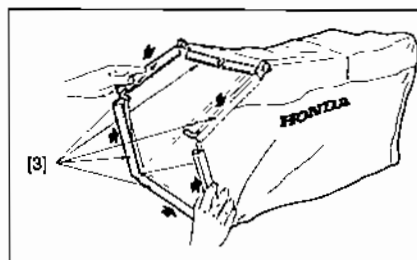
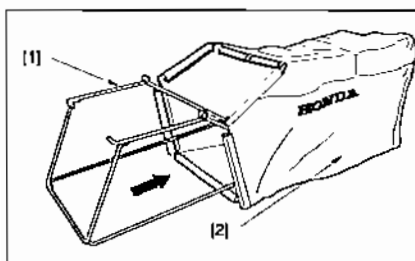


Electric starter models
(also equipped with recoil starter)

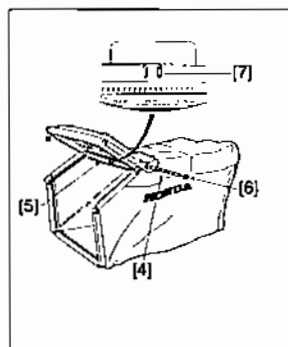
1. Read and understand the owner's manual operations of all the controls before using the machine. Know how to stop the engine quickly.
2. Never permit anyone, especially children to operate the mower without proper instruction. The legislation may limit the operator's age.
3. Check the mower condition before using. This may prevent accident or damage to the unit.
4. Avoid mowing when people, mainly children, or pets are in the operating area.
5. Never stand in front of self-propelled mowers when the engine is running. Someone may accidentally engage the drive clutch.
6. Protect yourself by wearing long trousers and appropriate shoes. Never mow with bare feet or wearing sandals.
7. Clear the lawn of stones, sticks, or debris before mowing.
8. **DANGER** : Gasoline is highly flammable. Store fuel in a suitable container. Do not store gasoline or mower with gasoline in a risky area. Refuel the mower before starting the engine. Do not smoke when handling fuel. Never open the fuel tank when the engine runs or is still hot. If fuel is spilled, move the mower out of the area of spillage, ensure the area is dry and free of vapours before starting the engine. After using the mower, set the throttle lever to the stop position and close the fuel cock.
9. Never use the mower with damaged or worn parts. Damaged parts must be replaced, not repaired. Use genuine HONDA parts or equivalent. Non equivalent quality parts may damage the mower and be prejudicial to your safety.
10. Check the blade and blade bolts before use. Replace any of these parts when damaged, in order to keep a correct balance. Ensure the cutting blade is balanced when sharpening.
11. Never run the engine in an enclosed or confined area. Exhaust gas contains poisonous carbon monoxide. Ensure good ventilation.
12. Mow only by daylight or sufficient artificial light.
13. Avoid using the equipment on wet grass. Watch your steps on slopes. Walk, never run.
14. Mow across slopes, never up an down.
15. Use extra care when changing the direction on slopes. Do not mow slopes of more than 20°.
16. Pay special attention when handling or moving the machine.
17. Stop the engine immediately if the blade hits an object or the mower starts to vibrate. Remove the spark plug cap and check the machine for damage. Replace any damaged part before continuing to mow.
18. Stop the blade when moving the mower off the lawn and when the mower has to be tilted for transportation.
19. Never use the mower without its shields, safety guards, grassbag or ejector. Replace these parts if damaged.
20. Before reaching under the cutter deck or into the discharge opening, stop the engine and remove the spark plug cap.
21. Stop the engine for grass bag removal or installation or when adjusting the cutting height.
22. Wear thick leather gloves for disassembly or assembly the blade .
23. Never alter the engine speed governor adjustment or overspeed the engine.
24. Keep feet away from the blade when starting the engine.
25. Never tilt the mower when starting the engine. Start the mower on a clean area, free of obstacles.
26. To prevent any risks of fire, allow the engine to cool down before storing the mower.
27. Before storage, clean the mower, especially the engine of leaves or grass cuttings, and empty the grass bag. Never leave containers of vegetable matter in or near a building.
28. Store the mower in a dry place.
29. Regular maintenance is an essential factor for user safety and keeping a high level of performance.

FITTING AND CHECKING OF THE GRASS BAG

1. Insert the bag frame (1) into the grass bag (2), as shown.
2. Hook the plastic edges (3) of the grass bag onto the frame.



3. Assemble the upper lid by threading the shaft (4) through the hinge and the plastic edge (5) of the grass collection bag. Fix the two caps (6) to each end of the shaft using a mallet.

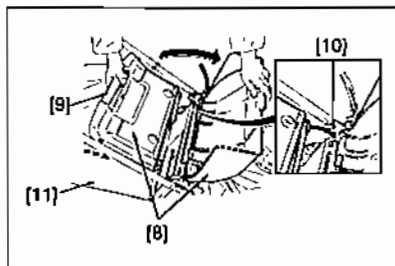


NOTE :

- Be sure to replace the cap nuts with a new one when disassembling or replacing the grass bag, as an assembly.
- When assembling the grass bag, insert the shaft (7) in the sequence shown.

Bag removal :

1. Stop the engine.
2. Raise discharge guard (8), grasp handle (9) and remove bag while keeping it in an upright position.



Bag fitting :

1. Raise the discharge guard and hook the front of the bag (11) on the mower's attachment lugs (10).
2. Once the bag is fitted, the mower operates like a vacuum cleaner. It forces air into the bag which traps the grass cuttings.

⚠ WARNING :

Before use, ensure that the bag closing device is correctly locked (discharge guard).

Even in normal use, the grass bag tends to wear. Regularly check that it is not frayed or torn. A worn out bag must be replaced. Replace a damaged bag by a HONDA bag only.



SAFETY

19 20

PREPARATION AND CHECKS BEFORE USE

⚠ WARNING :

To carry out this series of checks, place the mower on stable and level ground with engine stopped and spark plug cap removed.

CHECKING FUEL LEVEL

⚠ WARNING :



Do not fill the fuel tank up to the brim (there must be no fuel in the filler neck). When filling is completed, ensure that the tank filler cap is screwed fully on.

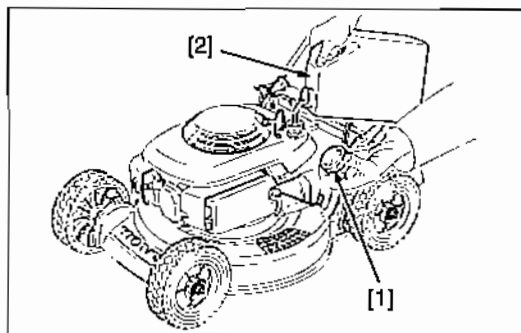
Avoid getting fuel on the skin repeatedly or for long periods and avoid breathing fuel vapours. Keep fuel away from children.

CAUTION :

- *Never use a gas oil mixture.*
- *Do not let dirt, clippings, etc. get into the tank.*
- *Do not use dirty or contaminated fuel (water, dust, ...), or fuel which is too old.*

To check the fuel level :

1. Remove filler cap (1) and check fuel level.
2. Fill (2) tank if level is low.
3. Screw filler cap (1) fully on after filling.



Fuel tank capacity :

HR 1950 - HR 2150 : 1 liter
HR 2160 - HRA 2160 : 2 liters

Recommended fuel : regular or premium gasoline, unleaded preferred.

NOTE : Fuel substitutes are not recommended and can harm the components of the fuel system.

PREPARATION AND CHECKS BEFORE USE

GAS CONTAINING ALCOHOL

If you intend to use gas with alcohol, ensure that its octane number is at least as high as that recommended by HONDA.

There are two types of gas/alcohol mixtures : one contains ethanol and the other methanol. Do not use mixtures containing more than 10% ethanol, or gas containing methanol (methyl or wood alcohol), which do not contain cosolvents, or corrosion inhibitors for methanol.

In the case of a mixture containing methanol with addition of cosolvents and corrosion inhibitors, limit the proportion to 5% of methanol.

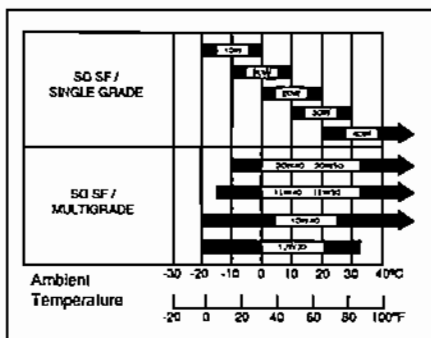
NOTE : The guarantee does not cover damage caused to the fuel system or engine performance problems resulting from the use of gas containing alcohol.

HONDA does not give its approval to the use of fuels containing methyl alcohol since their suitability is not yet proven.

CHECKING ENGINE OIL LEVEL

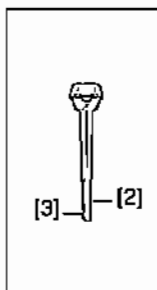
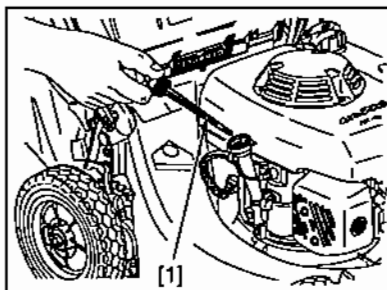
CAUTION :

- The engine oil is an essential element which affects the performance and lifetime of the engine.
- The engine may be seriously damaged if run with insufficient oil. We recommend the use of HONDA 4-stroke oil or an equivalent quality engine oil which is highly detergent. Oil viscosity must be appropriate for the average temperature in the zone where the mower is to be used.



To check engine oil level :

1. Place the mower on level ground.
2. Remove the oil filler cap and wipe the dipstick (1).
3. Replace the dipstick in the filler neck but do not screw it down.
4. Check the level of the oil left on the dipstick. If the level is near the low level mark (3), add the recommended oil up to the high level mark (2).
5. Screw filler cap.



PREPARATION AND CHECKS BEFORE USE

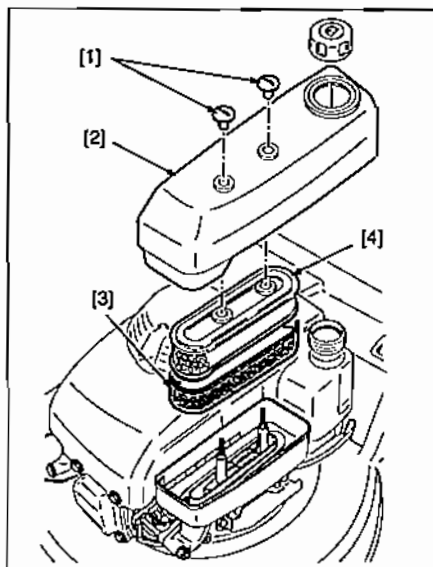
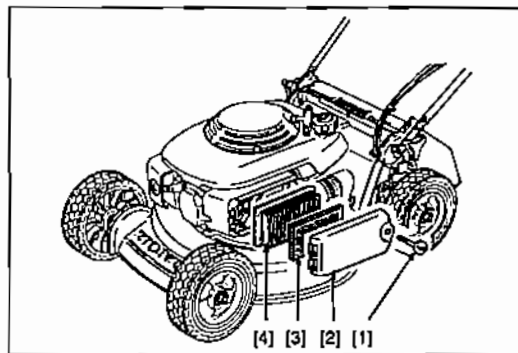
CHECKING THE AIR CLEANER

CAUTION :

- Never run the engine without the air cleaner fitted since this could cause premature engine wear.

To check the condition of the air cleaner :

1. Remove screws (1) and cover (2).
2. Check the cleanliness of filter elements (3) and (4).
If the elements are dirty, follow the cleaning procedure (see Maintenance chapter).
3. Refit cover (2) and screws (1).



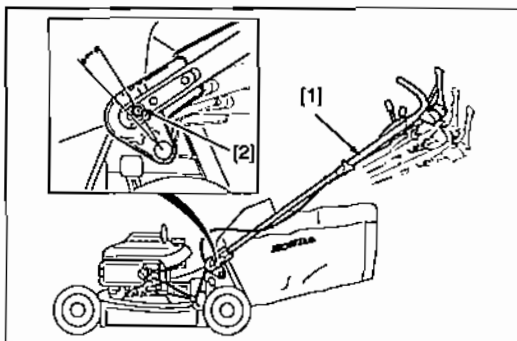
NOTE : After cleaning the air cleaner element, replace cover and push fully home. If the cover screws are not correctly tightened, the cover will not remain in place and the engine will not operate correctly.

HANDLE HEIGHT ADJUSTMENT SYSTEM (except HRA 2160)

Handle height (1) is adjustable continuously thanks to the nuts (2).

Choose the height which is most comfortable for you.

1. Untighten nuts (2) each side.
2. Set the handle height at the suitable position.
3. Retighten the two nuts securely.



PREPARATION AND CHECKS BEFORE USE

ADJUSTING CUTTING HEIGHT

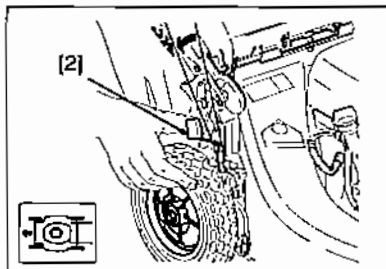
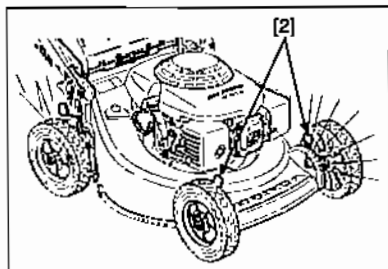
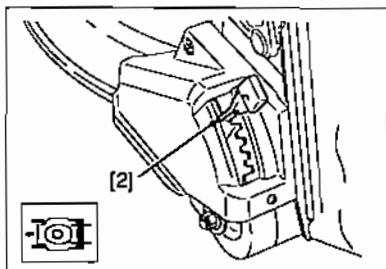
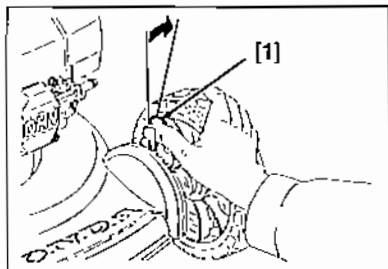
To change the cutting height :

1. Stop the engine.
2. Push (1) the front and rear adjusting levers (2) towards the wheels and move them up or down to raise or lower the cutting height. Adjust front and rear wheels to the same height.

A WARNING :

Before adjusting the height, make sure the engine is switched off.

Be careful not to touch the muffler when adjusting the right front wheel height.



The cutting height settings are approximate values, the actual height of the cut grass varies with the lawn and ground condition. To choose the cutting height, check how the lawn looks after mowing a small area and adjust the cutting height where necessary.

Models	Types		Positions							
			1	2	3	4	5	6	7	8
HR 1950	S, SX, SM	Cutting height (mm)		21	29	40	51	63	75	
	QME		13	21	29	40	51			
HR 2150	S, H, SX, HX			20	27	38	50	62	75	87
HR 2160	S, H, SX, HML, HX			20	27	38	50	62	75	87
	HX(E)		16	24	34	45	56	68	80	
	QX(E)		16	24	34	45	56			
HRA 2160	HX				35	45	55	66	77	
	HX(E)			28	35	45	55	66	77	

CHECKING BLADE CONDITION

CAUTION :

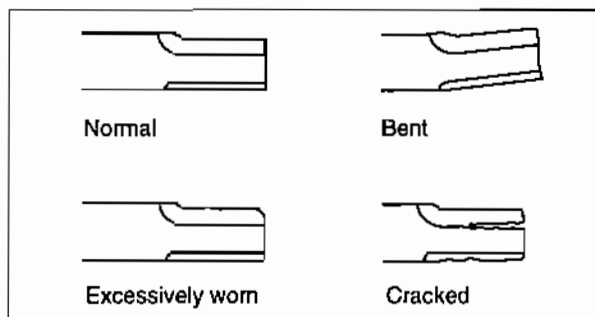
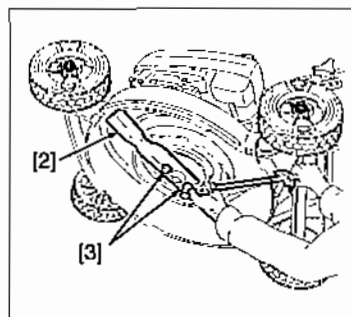
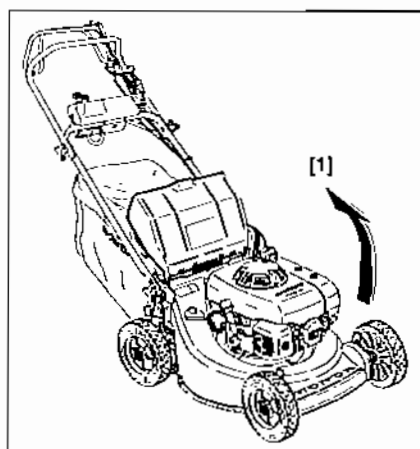
- Do not tilt the mower with the carburetor facing down ; this will make the mower difficult to start later, due to engine oil blocking the air cleaner.



3 10 20 22

To check blade condition :

- Stop the engine.
- Pull off the spark plug cap.
- Place the mower on its side (1), so that the carburetor is facing upwards (left side) :
 - Check if the blade (2) shows signs of wear or damages and replace it if necessary.
 - Check that blade screws (3) are tightened (see Maintenance chapter).
 - For blade replacement or removal/ installation, refer to the procedure described in the Maintenance chapter.



A WARNING :

Never operate the mower with a worn, damaged, split or dented blade.

A piece of blade which breaks off and is thrown outwards can cause serious bodily injuries.

NOTE : Blade wear is increased when the mower is used on sandy soils. Inspect the blade more often when the mower is used in these conditions.

STARTING AND STOPPING THE ENGINE

STARTING THE ENGINE

CAUTION :

- Do not start the engine with the blade clutch lever or the drive clutch lever engaged.



3 11 19

- Place the throttle lever (5) in "CHOKE" position (1).

NOTE : This control opens fuel valve for HR 1950 - HR 2150 models.

NOTE : Place the throttle lever in "FAST" position (2) when the engine is hot or the ambient temperature is high.



(1) **CHOKE**
For starting a cold engine.



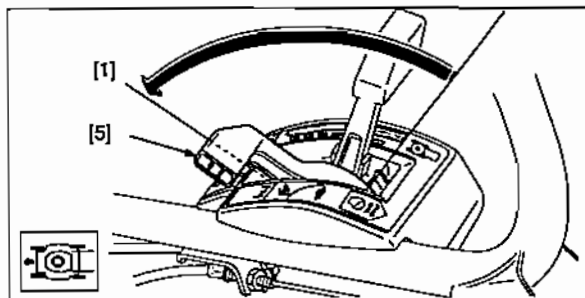
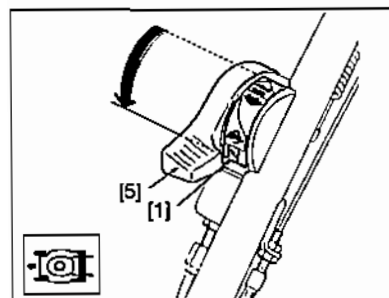
(2) **FAST**
For restarting a hot engine and for mowing.



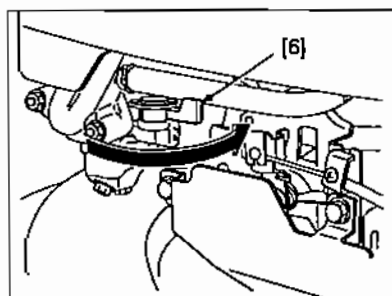
(3) **SLOW**
Selects engine idling speed.



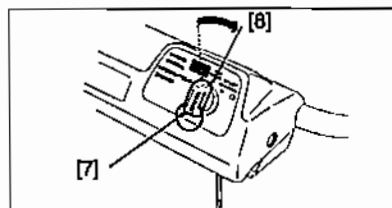
(4) **STOP**
Stops engine and closes fuel inlet (HR 1950 - HR 2150).



- Turn the fuel valve "ON" (6) (HR 2160 - HRA 2160).



- Turn the engine switch (7) to the "ON" position (8).

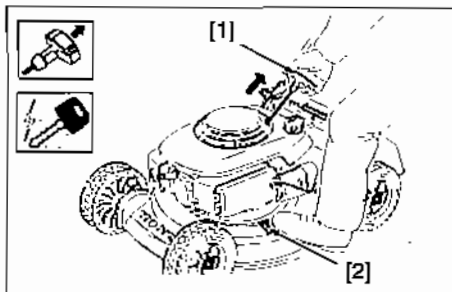


STARTING AND STOPPING THE ENGINE

With recoil starter:

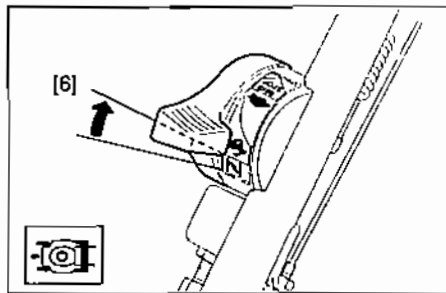
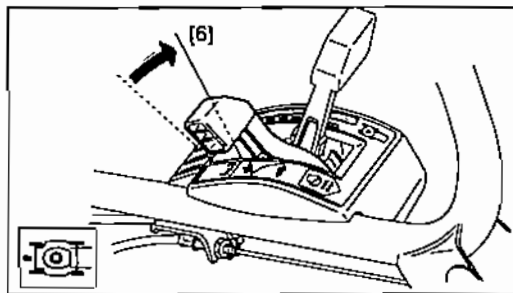
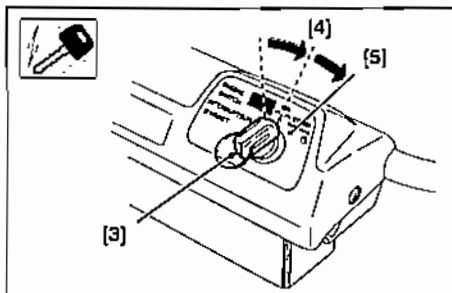
4. Place your foot on the non-slip step on the mower housing (2).
5. Pull the starter rope (1) lightly until you feel resistance, then pull briskly.

NOTE : Do not let the rope snap back ; return it by hand.



With electric starter:

4. Turn the engine switch (3) to the "START" position (5) and hold it there until the engine starts.
5. After the engine starts, let the engine switch return to "ON" (4). Do not use the electric starter for more than 5 seconds at a time. If the engine fails to start, release the switch and wait 10 seconds before operating the starter again.
6. After the engine warms up move the throttle to "FAST" position (6).



NOTE :

- To adjust the engine speed when the mower is running, the throttle lever can be set anywhere between the "FAST" (2) and "SLOW" (3) positions. However, the best results are obtained in the "FAST" position.
- The engine may stall if the lever is in the "SLOW" position (3) when the blade clutch is engaged.
- To facilitate starting, place the mower on a flat surface where the grass is not long.

STARTING AND STOPPING THE ENGINE

USING THE MOWER AT HIGH ALTITUDES

At high altitudes, the standard gas/air mixture in the carburetor is much too rich : this will reduce performance and increase fuel consumption.

It is possible to improve the high altitude performance by fitting the carburetor with a smaller diameter jet and by adjusting the pilot screw. If you use your mower at an altitude of more than 1800 meters above sea level, we recommend that you have these modifications made by your approved HONDA dealer.

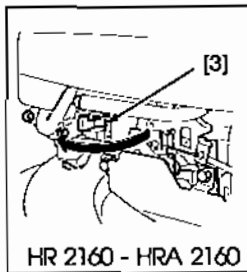
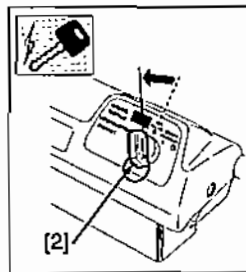
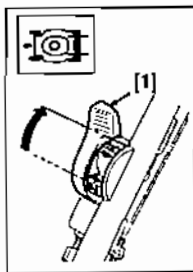
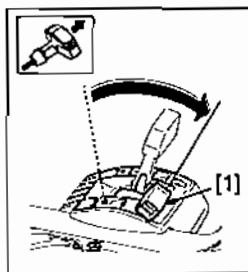
Even with the appropriate modifications made to the carburetor, engine power will be reduced by about 3.5% for every 300 meters of altitude. However, the altitude will have a much greater effect on power if these modifications are not carried out.

CAUTION :

- *Running the mower at an altitude less than that for which the carburetor is adjusted may cause overheating and seriously damage the engine, due to the gas/air mixture being far too weak.*

STOPPING THE ENGINE

1. Set the throttle lever (1) on "STOP" (recoil starter models) or turn off the switch key (2) (motor start models).
2. For the models HR 2160 and HRA 2160, turn off the fuel cock (3).



FLOODED ENGINE

If the engine still refuses to start after several pulls on the starter, the engine may be flooded.

To clear a flooded engine :

1. Place the throttle lever in "STOP" position (1).
2. Remove and dry the spark plug. When refitting the spark plug, screw it up until it is finger tight and correctly seated. Then using the plug spanner, tighten it an additional 1/8 to 1/4 turn so that the washer is correctly compressed.
3. Next, place the throttle lever in "FAST" position (2) and repeat the operations previously mentioned under the heading "Starting the engine", page 14, § 2 and 3.

(1)



(2)



⚠ WARNING :

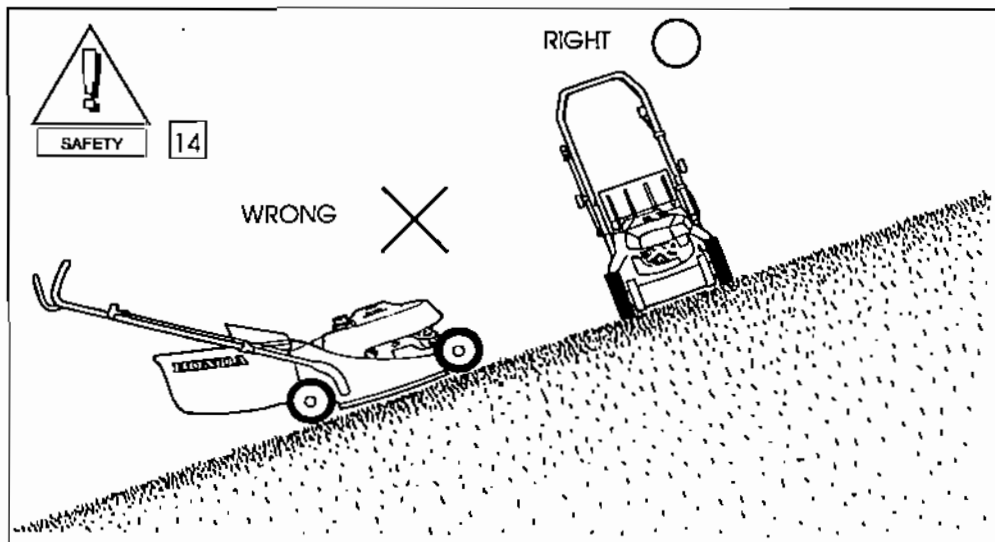
Take special care when mowing on uneven or irregular ground. The mower may tip over, thus uncovering the blade ; also, the blade may throw out objects which were previously hidden.

Keep the four wheels firmly on the ground.

Control the direction of the mower using the handle and not by exerting pressure on the blade housing with your foot.

CAUTION :

- When mowing around an obstacle, be careful that the blade does not hit it. Never push the mower directly over an object.
- When mowing an uneven area, do not let yourself be pulled along by the mower. Hold the handle firmly and control its advance.



If the mower's speed becomes too slow when mowing on a slope, move the shift lever slightly towards the "FAST" position.

OPERATING HINTS AND TIPS

CONTROLS AND MOWING PROCEDURES

Read the safety instructions before starting to mow.



To mow :

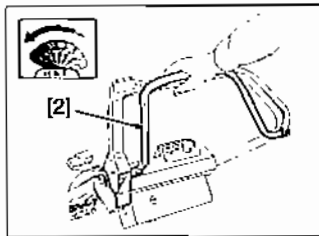
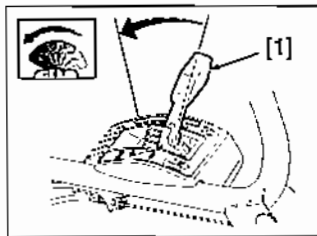
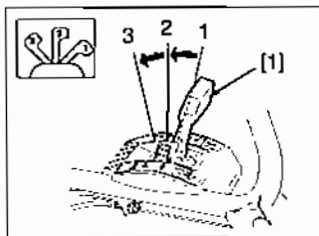
1. Place the mower in an obstacle-free area
2. Start the engine, allow it to reach its maximum temperature and rotation speed. (The engine runs evenly when the accelerator lever is moved away from the "CHOKE" position).
3. Select the suitable forward speed thanks to the shift lever (1).

The following forward speeds are available :

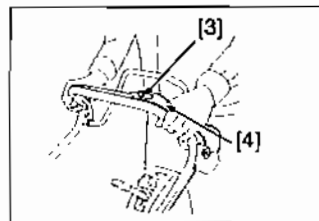
Models	Types	1 st	2 nd	3 rd	Minl	Maxl
HR 1950	Q	1.1 m/s	-	-	-	-
HR 2160	Q					
HR 1950	S	0.8 m/s	1.2 m/s	1.4 m/s	-	-
HR 2150	S					
HR 2160	S					
HR 2150	H	-	-	-	0.6 m/s	1.45 m/s
HR 2160	H					
HRA 2160	H	-	-	-	0.85 m/s	1.65 m/s

NOTE : For the models with hydrostatic transmission, the maximum speed is preset with the shift lever (1). The drive clutch lever (2) acts as a variator, according to its squeezing position. It makes the speed vary between zero and the maximal speed preset with the shift lever.

The maximum speed can be reached when both levers (1) and (2) are pushed forward completely.



4. Engage the blade, press the yellow button (3) located on the top of the blade control lever, and at the same time push the lever (4) to the front and hold it against the handle.



CAUTION :

- Move the blade control lever quickly from one end of its travel to the other, so that the blade is always either fully engaged or fully disengaged. This is to avoid stalling the engine and increases the service life of the blade control mechanism. Always release the blade control lever and the drive clutch lever before starting the engine. Starting is more difficult when the blade is engaged. If the clutch is engaged, the mower will move when the engine is started.

- Engage the mower forward drive when the engine has built-up speed (models fitted with blade clutch).
- To start the mower moving, squeeze the drive clutch lever (2) towards the handle and hold it.

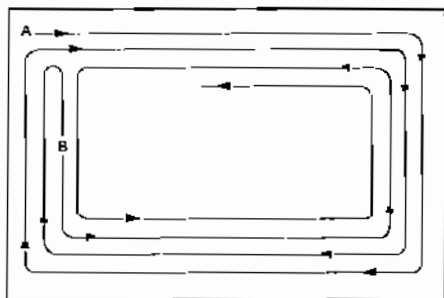
CAUTION

- For the models fitted with 3-speed transmission, move the bar quickly from one end of its travel to the other, so that the clutch is always either fully engaged or fully disengaged. This avoids stalling the engine and increases the service life of the clutch mechanism.*
- To start to mow with self-propelling, engage the blade clutch lever as explained above, then squeeze the drive clutch lever towards the handle and hold it.
 - To stop the mower moving, release the clutch lever.

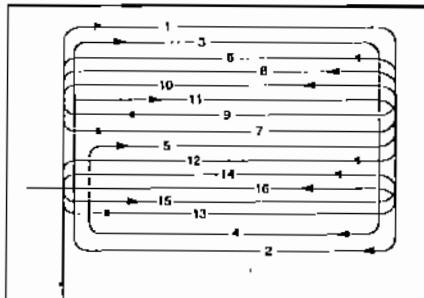


- To stop the blade rotating, release the blade clutch control lever (4).

NOTE : When the grass is too long, it is preferable to mow in stages reducing the cutting height after each pass or/and the cutting width. This will avoid the discharge tunnel becoming blocked.



How to mow a small area



How to mow a large area



For models equipped with blade clutch, it is possible to disengage the drive clutch when mowing in confined areas.

Also, the transmission may be used to move the mower without the blade being engaged (paths, around flower beds, etc.).

OPERATING HINTS AND TIPS

EMPTYING THE GRASS BAG

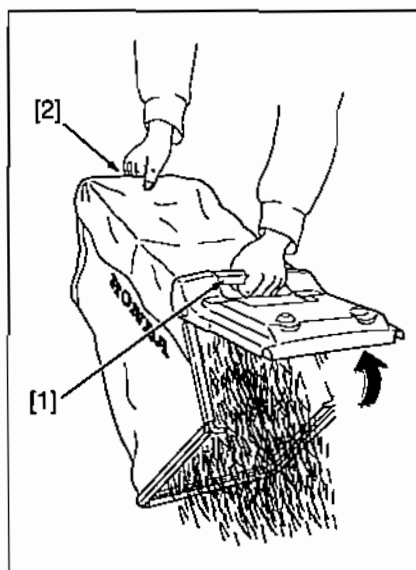
When the grass bag becomes too full, grass collection is no longer efficient (the sound of the mower changes and the bag is no longer puffed up by the air from the blade).

1. Stop the engine.
2. Remove the grass bag (see p. 8).
3. Empty the bag :
 - Hold the bag by the handle (1).
 - Grasp the bag rear side (2) and shake it to remove the grass.

CAUTION :

To reduce the fire risk, never leave grass cuttings or leaves in the grass bag, or in or near buildings. Decomposing vegetable matter causes a high temperature rise.

4. Reinstall the grass bag on the mower (see p. 8).



WARNING :



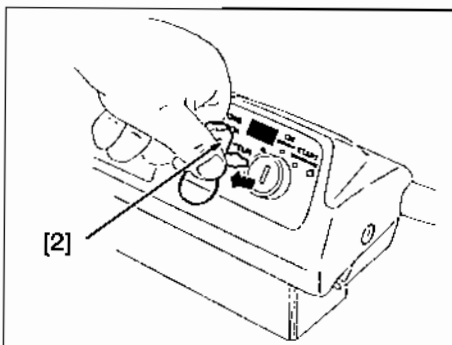
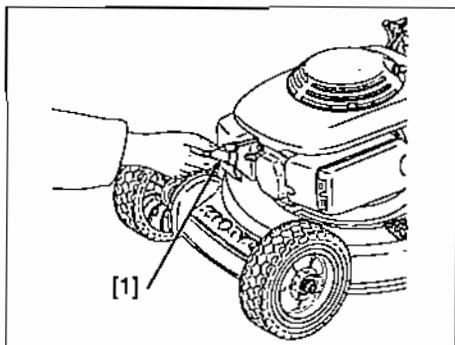
19

Make sure that the grass bag fastener is securely closed before use (discharge guard).

Regular maintenance will ensure a long life for your mower.

⚠ WARNING :

To prevent accidental start-up, shut off the engine and disconnect the spark plug (1) cap and remove the engine key (2) before carrying out any maintenance work.



8 9 11 20 29

CAUTION :

- Use only genuine HONDA parts or their equivalent for maintenance or repair. Replacement parts which are not of equivalent quality may damage the mower.
- The engine and the muffler reach temperatures high enough to cause burns and start fires if flammable materials are to be found nearby. Allow the engine to cool down for 15 minutes before carrying out maintenance operations.
- For longer service life and greater efficiency, keep the underside of the mower clean and free from grass clippings by washing it down with a hose after use and/or cleaning it with a wire brush and scraper. Remove any rust and apply a rention are especially important before seasonal storage.
- Periodic inspection and adjustment of the mower is essential if a high level of performance is to be maintained. Regular maintenance will ensure a long service life. The required service intervals and the kind of maintenance to be performed are described on page 22.

MAINTENANCE

MAINTENANCE SCHEDULE

FREQUENCY Maintenance to be carried out at the intervals indicated in months or in operating hours which ever occurs first (5)		Each use	First month or 20 hours	Every 3 months or 50 hours	Every 6 months or 100 hours	Every year or 300 hours	Every year or 1000 hours
Item	Intervention						
Engine oil	Check level						
	Change						
Transmission oil	Check level				(2)*		
	Change						(2)**
Air cleaner element	Check						
	Clean			(1)			
Grass bag	Clean						
Blade bolt tightness and blade condition	Check						
Spark plug	Check						
	Clean						
Spark arrester (optional part)	Clean						
ROTOSTOP cable	Check (3)						
	Adjust (3)						
ROTOSTOP	Check (3)				(2)		
Shift cable	Adjust (3)						
Throttle cable	Check (3)						
	Adjust (3)						
Valve clearance	Check					(2)	
	Adjust					(2)	
Fuel tank and filter	Clean					(2)	
Fuel lines	Check (replace if necessary)	Every 2 years (2)					
Battery	Recharge (3)			(4)			

NOTE :

- (1) Increase cleaning frequency when mower is used in dusty areas.
 - (2) Maintenance of these points must be carried out by a HONDA dealer unless the user has the necessary tools and mechanical experience. See HONDA Shop Manual.
 - (3) If applicable
 - (4) During storage
 - (5) For professional commercial use, log hours of operation to determine proper maintenance intervals.
- * For HRA 2160 H
 - ** For HRA 2160

CHANGING THE ENGINE OIL

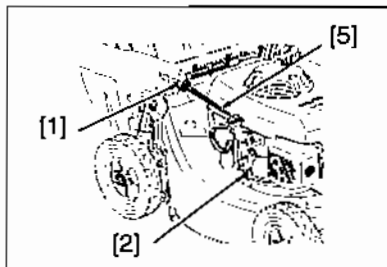
Drain the oil while the engine is still hot, so that the oil drains quickly and completely.

CAUTION :

- *Used engine oil can cause skin cancer if it remains in contact with the skin for long periods. Although this is highly unlikely unless you handle used oil every day, we recommend that you wash your hands thoroughly with soap and water each time you handle used engine oil.*

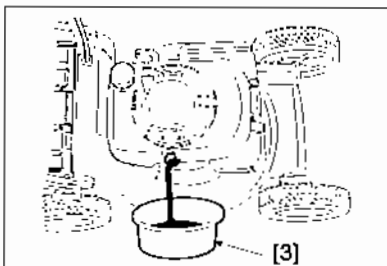
HR 2160 and HRA 2160 :

1. Place a flat container under the cutter deck, at the place of the cutter deck draining hole.
2. Remove the filler cap (1).
3. Remove the drain bolt (2), drain the oil and retighten the bolt securely.



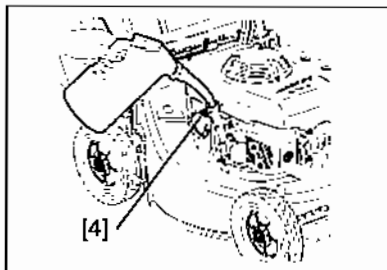
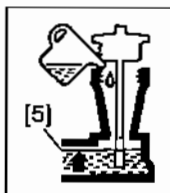
HR 1950 and HR 2150 :

1. Tip the mower on its side.
2. Place a receptacle (3) under the casing filler tube hole.
3. Remove the oil filler cap (1).
4. Return the mower to the upright position on its wheels when the casing is completely empty.



Every models :

5. Fill up (4) to "high level" (5) using the recommended oil.
6. Screw the filler cap (1) fully on to avoid the risk of leaks.



NOTE : The used engine oil must be disposed of in a manner which respects the environment. We recommend that you take it to a service station who will ensure that it is recycled. Never dispose of used engine oil in dustbins or pour it away on the ground, in the gutter or down the drains.

MAINTENANCE

AIR CLEANER MAINTENANCE

A dirty air cleaner will reduce the flow of air to the carburetor. To prevent the carburetor operating inefficiently, the air cleaner must be regularly maintained.

⚠ WARNING :

Never clean the air cleaner elements using gas or flammable solvents ; this could cause a fire or an explosion.

1. Remove the fuel tank cap (HR 2160 - HRA 2160).
2. Remove screw(s) (1) and cover (2) from the air cleaner (5).
3. Remove the elements (3) and (4) and separate them.
Carefully check them for holes or tears ; replace if necessary.
4. Foam element (3) : clean in hot soapy water, rinse and allow to dry thoroughly or clean in high flash-point solvent and allow to dry.

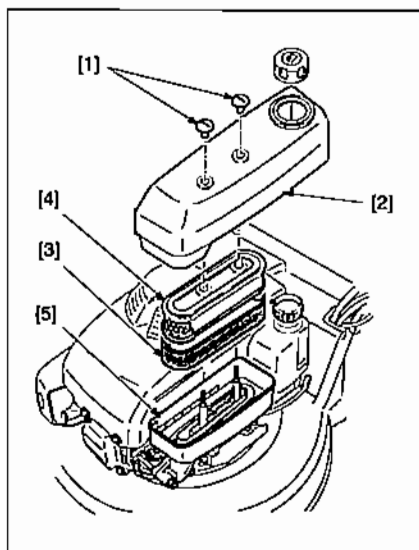
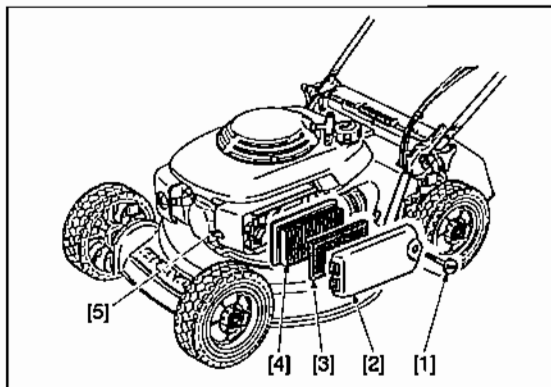
HR 2160 - HRA 2160 :

Dip the element in clean engine oil and squeeze out all excess oil. The engine will smoke during start-up if too much oil is left in the foam.

HR 1950 - HR 2150 :

The air cleaner foam element must operate dry. Do not impregnate it with oil.

5. Paper element (4) : tap the element lightly against a hard surface to remove excess dirt, or blow compressed air through it from the inside out. Never try to remove the dirt by brushing the filter since this will only force the impurities into the fibres.



SPARK PLUG

Standard plugs :

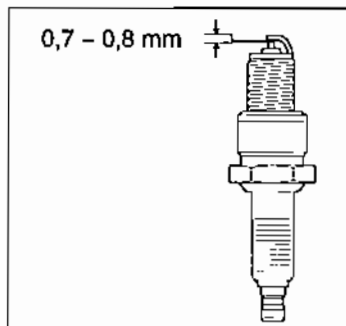
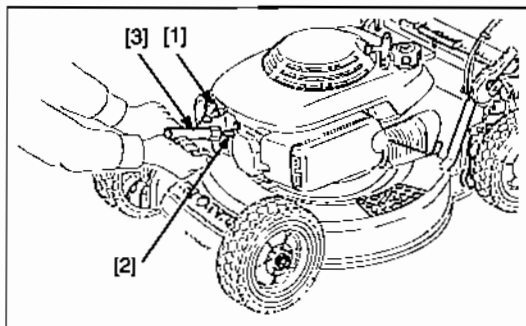
	NGK	NIPPONDENSO Co., Ltd
HR 1950 - HR 2150	BPR5ES	-
HR 2160 - HRA 2160	BPR5ES	W16 EPR-U

CAUTION :

- Use only recommended spark plugs. Using spark plugs with inappropriate temperature ranges may damage the engine.

WARNING :

If the engine has just been run, do not touch the muffler and the spark plug which will still be very hot.



- Pull off spark plug cap (1) and remove spark plug (2) using a plug spanner (3).
- Carefully inspect the spark plug. Replace the plug if there are a lot of deposits or if the insulator is cracked or broken.
- Measure the plug gap using a set of feeler gauges : the gap must be between 0.028 and 0.032 in (0.7 and 0.8 mm). If adjustment is necessary, carefully bend the side electrode.
- Check that the sealing washer is in good condition ; then screw the plug down by hand until finger tight and correctly seated.
- Using a plug spanner, give an additional 1/2 turn for a new spark plug, to compress the washer. If you refit the same plug, just 1/8 to 1/4 turn will do from the finger tight position.
- Refit the spark plug cap.

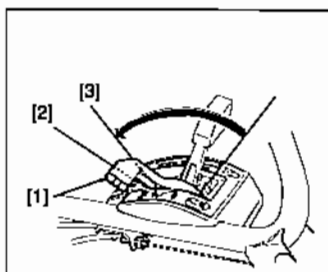
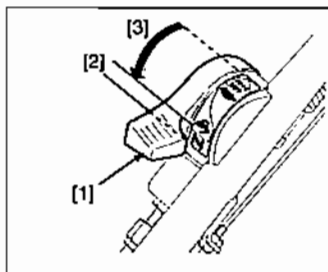
CAUTION :

- The spark plug must be correctly tightened. A plug incorrectly screwed down can become very hot and damage the engine.

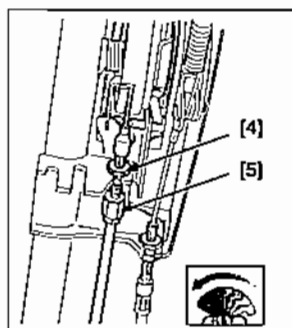
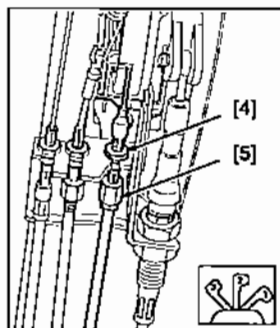
MAINTENANCE

THROTTLE CONTROL CABLE ADJUSTMENT

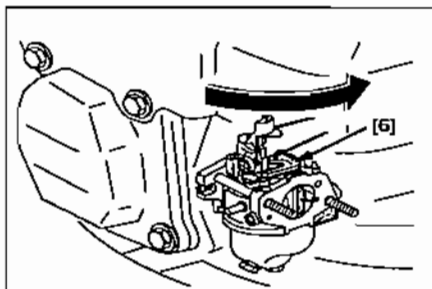
1. Place the throttle lever (1) on "FAST" position (3). The arm (7) should touch the starter control (8) (clearance 0 to 1 mm).



2. If an adjustment is necessary, loosen the block nut (4) of the throttle cable and turn the adjuster (5) as required to obtain the free play (0 to 1 mm). Tighten the lock nut (4) securely. Place the throttle lever in the "STARTER" position and check whether the choke arm (8) is completely raised.

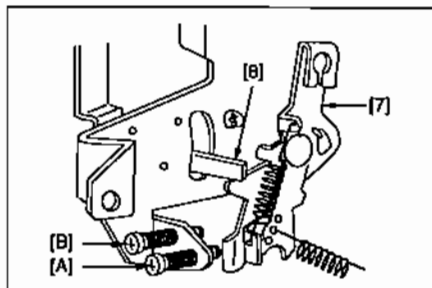


3. Push the choke arm (6) with your finger to check whether it is all the way to the right. Adjust the screw (B) so that it just touches the throttle control (7), with the choke arm (8) completely raised.
4. Start the engine and place the throttle lever on the "FAST" position. Adjust the screw (A) to get the specified engine speed. Start the engine and make sure it stops when the throttle lever is moved to the "STOP" position. Readjust the cable if necessary.



CAUTION

- If you do not have the required skills or equipment, it is recommended to ask your HONDA dealer for adjustment.

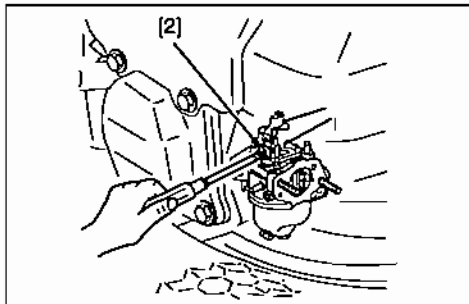
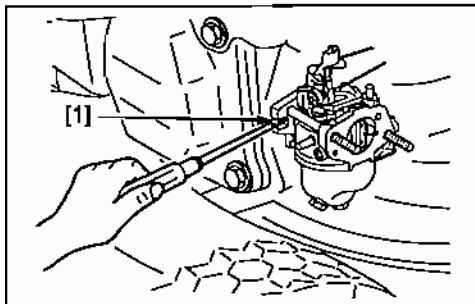


CARBURETOR ADJUSTMENT

1. Start the engine in the open air and allow it to reach its normal operating temperature.
2. Place the throttle lever in "SLOW" position.



11



3. Screw the pilot screw (1) in or out until you reach the highest idle speed. Generally, the correct setting is found 2 turns out from the fully in position.
4. When the pilot screw is correctly adjusted, turn the throttle stop screw (2) to obtain the specified idle speed.

IDLE SPEED

HR 1950	2000 ± 150 rpm
HR 2150	
HR 2160	1700 ± 150 rpm
HRA 2160	

MAINTENANCE

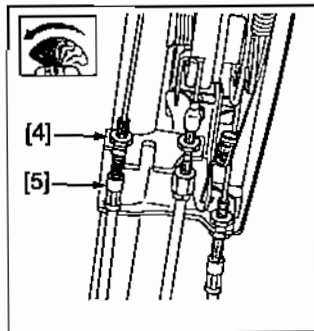
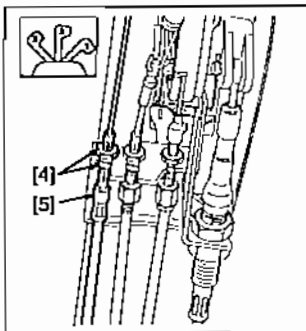
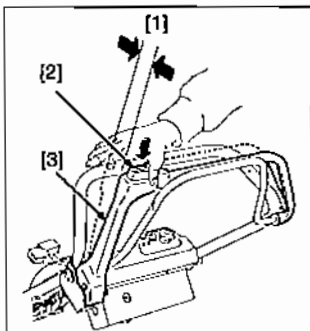
ROTOSTOP SAFETY LEVER FREE PLAY



Measure the free play (1) at the top of the lever (3) by holding the yellow button (2) pressed in. It must be between 20 and 25 mm.

If necessary :

1. Loosen locknuts (4) using a 10 mm spanner and move the adjuster (5) up or down as required.
2. Retighten the locknuts and recheck the free play.
3. Start the engine in the open air and operate the blade control lever. Check that the blade starts to rotate when you pull the lever to the rear, and that it stops rapidly when the lever is released. If the blade does not start to rotate or stop as it should, even when the cable is correctly adjusted, the system may need to be repaired. Take the mower to an approved HONDA dealer.

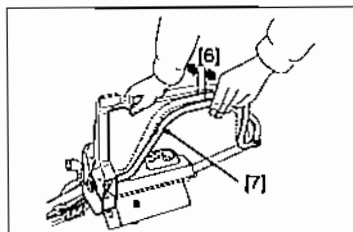


DRIVE CLUTCH LEVER FREE PLAY



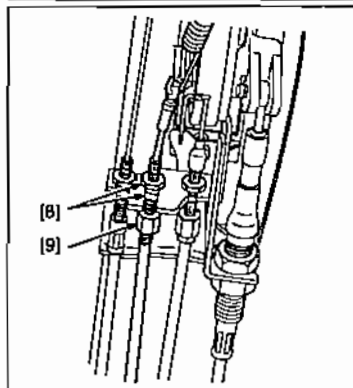
Measure the free play (6) at the tip of the lever (7) when completely released.

The freeplay must be set between 5 and 7 mm except for HR 1950, HR 2150, HR 2160 SX and SM types, for which it must be adjusted between 10 and 15 mm.



If necessary :

1. Untighten the lock nuts (8) with a 10 mm spanner and turn the adjuster (9) right or left as required.
2. Tighten the lock nuts securely and check the free play again.



NOTE : For models with hydrostatic transmission, directly refer to the next section "Shift lever free play", page 29.

SHIFT LEVER ADJUSTMENT



HR 2150 - HR 2160 :

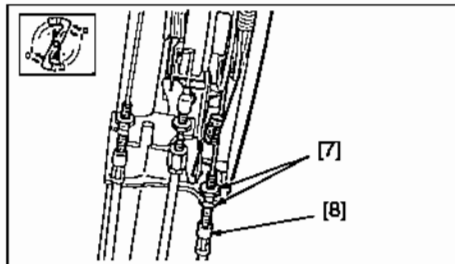
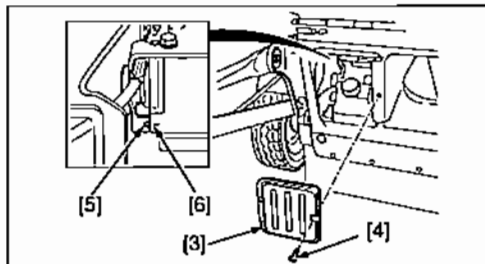
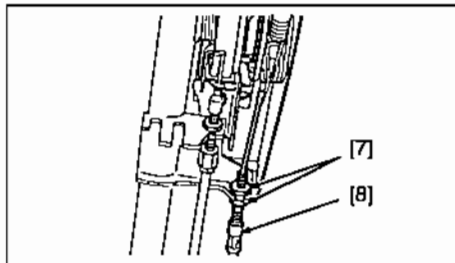
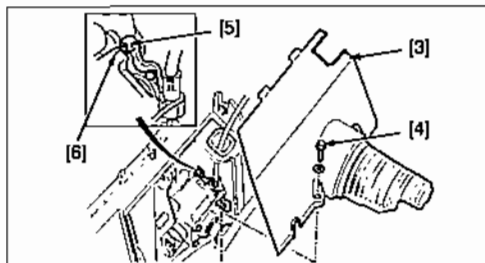
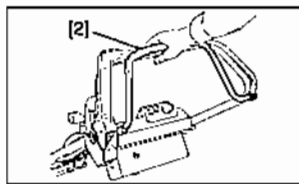
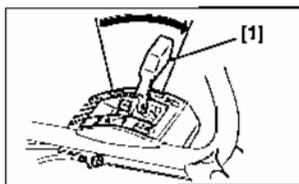
1. Lower the cutter deck by using the cutting height adjusting lever.
2. Remove the screws (4) and drive shaft cover.

HRA 2160 :

1. Raise the cutter deck by using the cutting height adjusting lever.
2. Remove the screws (4) and rear cover (3).

All models :

3. Position the shift lever (1) to minimum speed, and engage the drive clutch lever (2) as it is.
4. Make sure that slot (5) of the control arm aligning with index mark (6) of the case as shown.
5. If adjustment is necessary, keep this position, loosen the lock nut (7) and turn the adjusting nut (8) to align the slot with the index mark.
6. Start the engine and operate the shift lever. Check to ensure the transmission is shifting smoothly.
7. When installing the drive shaft cover, be sure that the claws of the cover are located securely.



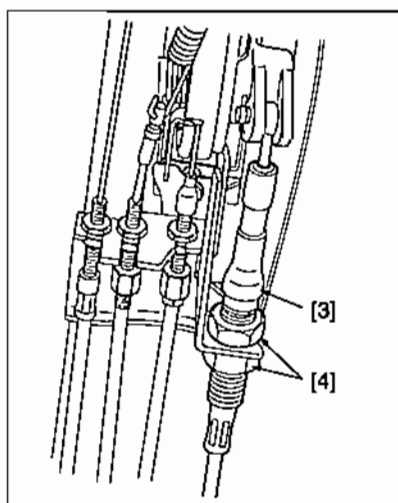
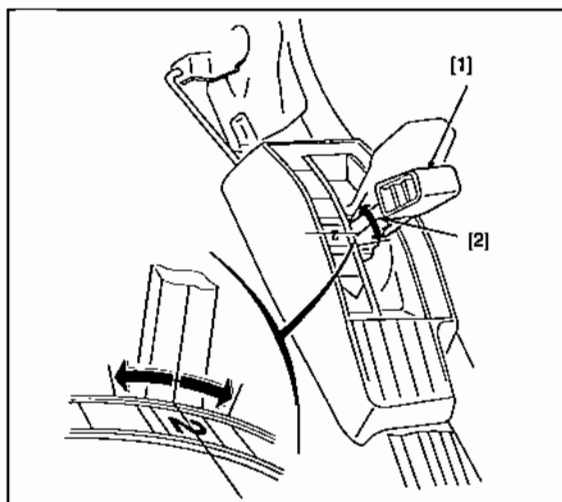
MAINTENANCE

SHIFT LEVER ADJUSTMENT



1. With the shift lever (1) in "SECOND" speed, check that the lever, including its free play (2), is centered on number "2" on the lever cover.
2. If adjusting is necessary, loosen the lock nuts (4) with a 19 mm wrench, and move the adjuster (3) up or down as required. Tighten the lock nuts and recheck lever alignment.
3. Start the engine and operate the shift lever. Check to be sure the transmission shifts properly. If the transmission does not shift properly, and the lever correctly positioned, take the mower to an authorized HONDA dealer for repair.

NOTE : Release the drive clutch lever before mowing the shift lever.



BATTERY CHARGING



The battery will automatically recharge while the mower is operated. A plug-in charger (optional part) is available for additional charging if the mower is not operated frequently enough to keep the battery charged. Use the plug-in charger to recharge the battery after prolonged storage, or whenever you notice a decrease in starter motor speed.

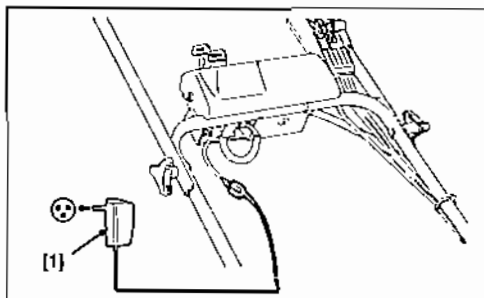
1. Disconnect the black battery lead, located under the control box.
2. Connect the black battery lead to the charger.
3. Plug the charger into a standard AC power outlet and allow the battery to charge for 18-36 hours (HR 1920 - HR 2150), 36-72 hours (HR 2160).

NOTE : It is normal for the charger to become a little warm during charging.

4. When the battery has been fully charged, disconnect the charger and reconnect the black couplers under the control box.

NOTE :

- Only use the genuine HONDA charger or equivalent.
- The use of a charger whose electrical characteristics are different from the recommended one could cause damage to the battery.
- Avoid quick charging or overcharging. It could result in a shortened service life of the battery.

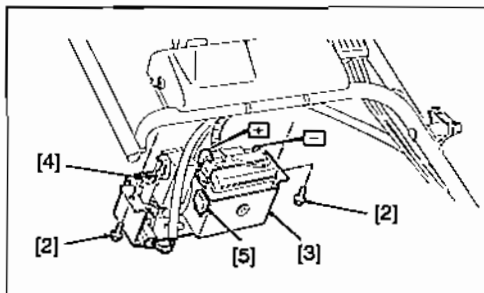


FUSE

If the fuse has blown, check the cause and replace it with a spare fuse of the rated capacity (1A). Unless the cause is corrected, the fuse may blow again.

Replacement method :

1. Remove the two bolts (2) and separate the control box from panel (3), as shown.
2. Pull out the spare fuse (4) and install it in place of the blown fuse in figure (5).



MAINTENANCE

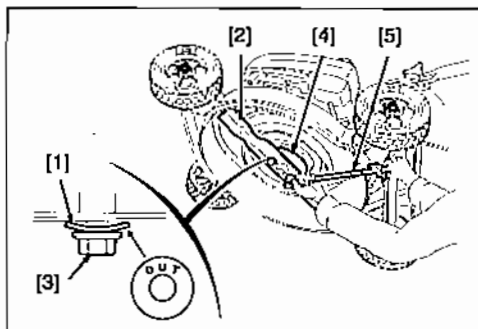
CUTTING BLADE

Blade removal

1. Place the throttle lever in "STOP" position.
2. Close the fuel valve (HR 2160 - HRA 2160) and drain the carburetor.
3. Tip the mower so that the carburetor faces upwards. Remove the blade bolts and remove blade.

NOTE : Never tip the mower so that the carburetor faces down ; this will make starting difficult.

4. Remove bolts (3) and blade (2) using a 14 mm socket wrench. Use a wood block to stop the blade rotating when slackening the bolts.
5. Remove the blade from the blade holder (4), as well as the bearing shim (models equipped with ROTOSTOP).



Blade sharpening

1. Sharpen the blade cutting edges with a file. File the top side only. Maintain the original bevel for a fine cutting edge. File both ends evenly to maintain blade balance.
2. After sharpening, test the blade's balance using a screwdriver as shown. If either side dips slightly below the horizontal, file that side. Replace the blade if it dips excessively.



CAUTION :

- Blade balance is critical to proper mower performance. Replace any blade that is damaged or out of balance.
- Use only a genuine HONDA replacement blade or equivalent.

Blade fitting

1. Clean the dirt and grass from around the blade assembly area.
2. Install the flange of the bearing shim against the bearing (models with ROTOSTOP).
3. Fit blade (2) using the two bolts (3) and special washers (1) as shown. Fit the special washers with their convex side, marked "OUT", facing the bolts.

CAUTION :

- Viewed from below, the blade turns counterclockwise. When reinstalling, place the blade so its cutting edges face this direction of rotation (punched reference oriented against blade holder).
- The blade bolts are specially designed for this purpose. Do not use other bolts.

3. Retighten the blade bolts using a torque wrench. Use a wood block to stop the blade rotating when tightening the bolts.

Blade bolt tightening torque : 5 to 6 kg.m (from 49 to 59 N.m)

CAUTION :

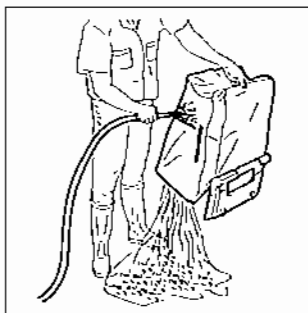
- If you do not have the required sharpening equipment or a torque wrench (5), ask your approved HONDA dealer to tighten the blade bolts for you before you use the mower.
- If the blade bolts are too tight or too slack, they may break or unscrew.

GRASS BAG CLEANING AND REPLACEMENT

Bag cleaning

CAUTION :

- Washing with a high pressure water or steam jet will damage the bag.
- Blocked mesh will prevent the grass from entering the bag.
- To clean the bag, we recommend washing it using a water jet directed from the outside to the inside of the bag. The bag must be completely dry before being used again. If the bag is damp, it will become clogged very quickly.



A WARNING :

Objects struck by the blade may be thrown through a torn or damaged grass bag. Objects thrown out by the blade can cause serious injuries. Always replace a torn or damaged grass bag.

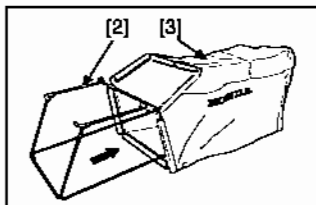
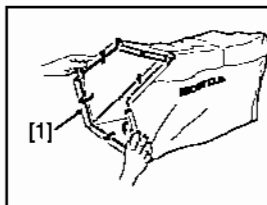
Bag replacement

The grass bag tends to wear even in normal conditions of use. Regularly check that it is not frayed or torn. Replace a damaged bag only by a genuine HONDA replacement bag.

1. Detach the plastic edges (1) of the worn bag (3) and remove the bag's fram (2).
2. Insert the frame into the new bag and fit the plastic edges to the frame.



9 19



A WARNING :

Before use, check that the bag closing device is correctly locked (discharge guard).

MAINTENANCE

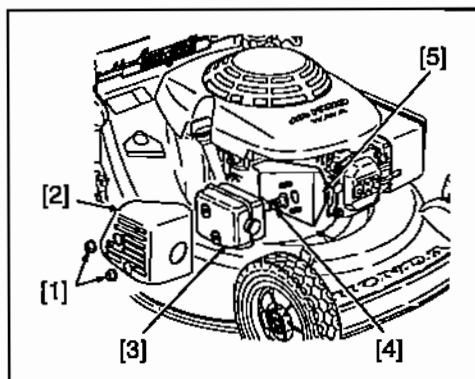
SPARK ARRESTER (optional part)

⚠ WARNING :

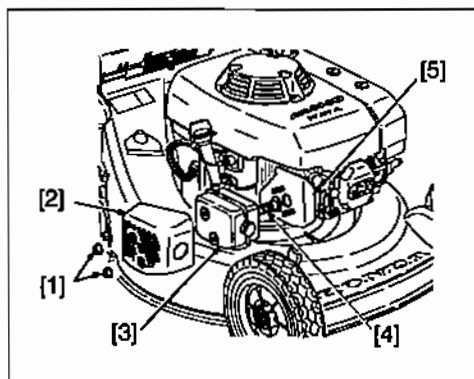
If the mower has just been run, the silencer will still be very hot. Allow it to cool down before carrying out this operation.

In some regions, it is prohibited to operate an engine without a spark arrester. Check local regulations before using your mower. A spark arrester is available on option from HONDA dealers.

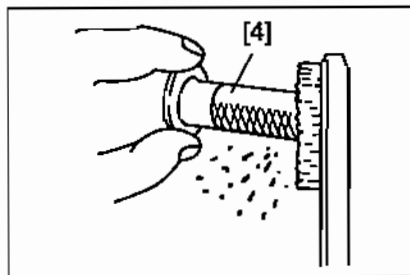
1. Unscrew and remove the two nuts (1) using a 10 mm socket wrench.
2. Remove the muffler guard (2) and the muffler (3), then the Insulation (5).
3. Remove the spark arrester (4), taking care not to damage the grille.
4. If necessary, clean the carbon deposits from around the exhaust port and spark arrester.
5. Refit the spark arrester in the muffler.
6. Refit the Insulation, the muffler and the muffler guard.
7. Fully retighten the two 10 mm nuts.



HR 1950 - HR 2150



HR 2160 - HRA 2160



Incident	Probable cause	Page
Engine does not start :	1. No gas	9
	2. Throttle lever is in "STOP" position (except electric starter models)	14
	3. Fuel valve is closed (HR 2160 - HRA 2160)	14
	4. Spark plug cord incorrectly attached or disconnected.	-
	5. Spark plug defective or incorrect electrode gap	25
	6. Engine flooded	16
The starter won't turn : (Electric starter types only)	1. The battery is disconnected	31
	2. The battery is discharged	31
	3. The fuse is blown	31
Hard starting or loss of power :	1. Dirt in petrol tank	-
	2. The air cleaner is dirty	24
	3. Water in petrol tank and carburetor	
	4. Vent in fuel cap and/or carburetor clogged	-
Erratic operation :	1. Spark plug faulty or improperly gapped	25
	2. The air cleaner is dirty	24
Engine overheats :	1. Spark plug improperly gapped	25
	2. The air cleaner is dirty	24
	3. Dirty cooling fins	-
	4. Low oil level	10
	5. Starter pulley clogged by grass, etc.	-
Excessive vibration :	1. Loose blade or engine mounting bolts	32
	2. Blade unbalanced	32

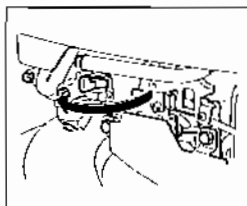
TRANSPORT

Do not tilt the mower since this may cause fuel or oil spillage ; spilt fuel or even fuel vapours are a fire hazard.

To transport the mower :

1. Place the throttle lever in "STOP" position.
2. Pull off the spark plug cap.
3. Close the fuel valve (HR 2160 - HRA 2160).

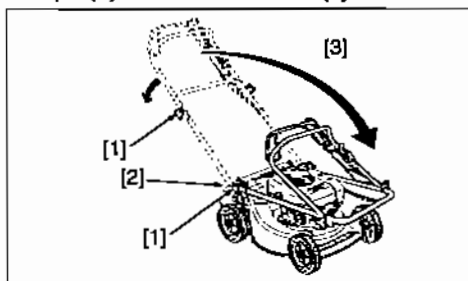
To facilitate the operation, remove the grass bag (see p. 8).



NOTE : After folding the handle, check that the cables are not kinked, twisted or stretched.

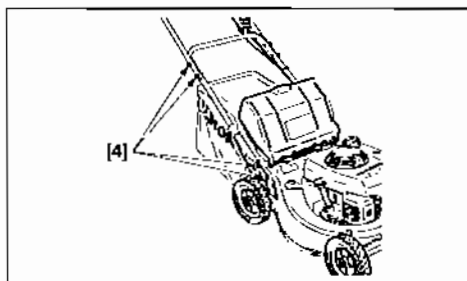
HR 1950 - HR 2150 - HR 2160 :

Loosen the handle attachment knobs (1), pull out the adjustment stops (2) and fold handle (3).



HRA 2160 :

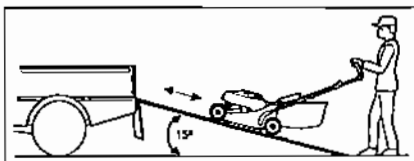
Loosen the four fixing bolt (4) to fold the handle.



Loading the mower

CAUTION :

- To prevent losing control of or damaging the mower, do not use the drive system when going up or down a loading ramp.
- To prevent damaging the drive system, do not engage the clutch when the mower is rolling backwards.
- Transport the mower in normal horizontal position with its four wheels flat on the vehicle platform.
- We recommend that you use a loading ramp or that you get someone to help you load and unload the mower.
- Adjust the loading ramp so that it is inclined at an angle of less than 15°.
- When transporting the mower, immobilise it using straps and place chocks under the wheels.
- The straps must not touch the following parts of the mower: throttle lever, blade clutch lever, gas tank and all the control cables.



Preparations for storing the mower

Carry out the following operations to protect the mower each time it is to be stored for a period of more than 30 days.

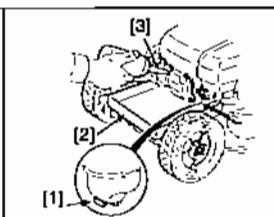
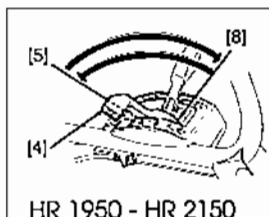


26 27 28

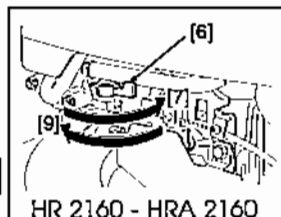
⚠ WARNING :

Do not drain the fuel tank while the muffler is hot.

1. Drain the fuel tank and the carburetor into a suitable receptacle (2).
 - a. Place the throttle lever (4) in "FAST" position (5) to open the fuel system (HR 1950 - HR 2150) or to open (7) the fuel cap (6) (HR 2160 - HRA 2160).
 - b. Remove drain plug (1) to drain carburetor and fuel tank.
 - c. Then refit the drain plug and place the throttle lever in "STOP" position (8) (HR 1950 - HR 2150) or close the fuel cap (9) (HR 2160 - HRA 2160).
2. Change the engine oil (see p. 23).



8



3. Pull the starter slowly until a resistance is felt. This closes the valves and protects them from dust and corrosion.
4. Coat all surfaces liable to rust with a thin film of oil. Cover the mower and store it on a flat surface in a dry, dust free place. Do not use a plastic cover since this retains dampness.
5. Disconnect the black battery lead, located under the control box.
6. Charge the battery every 3 months if the voltage is lower than 12 Volts (see p. 31).

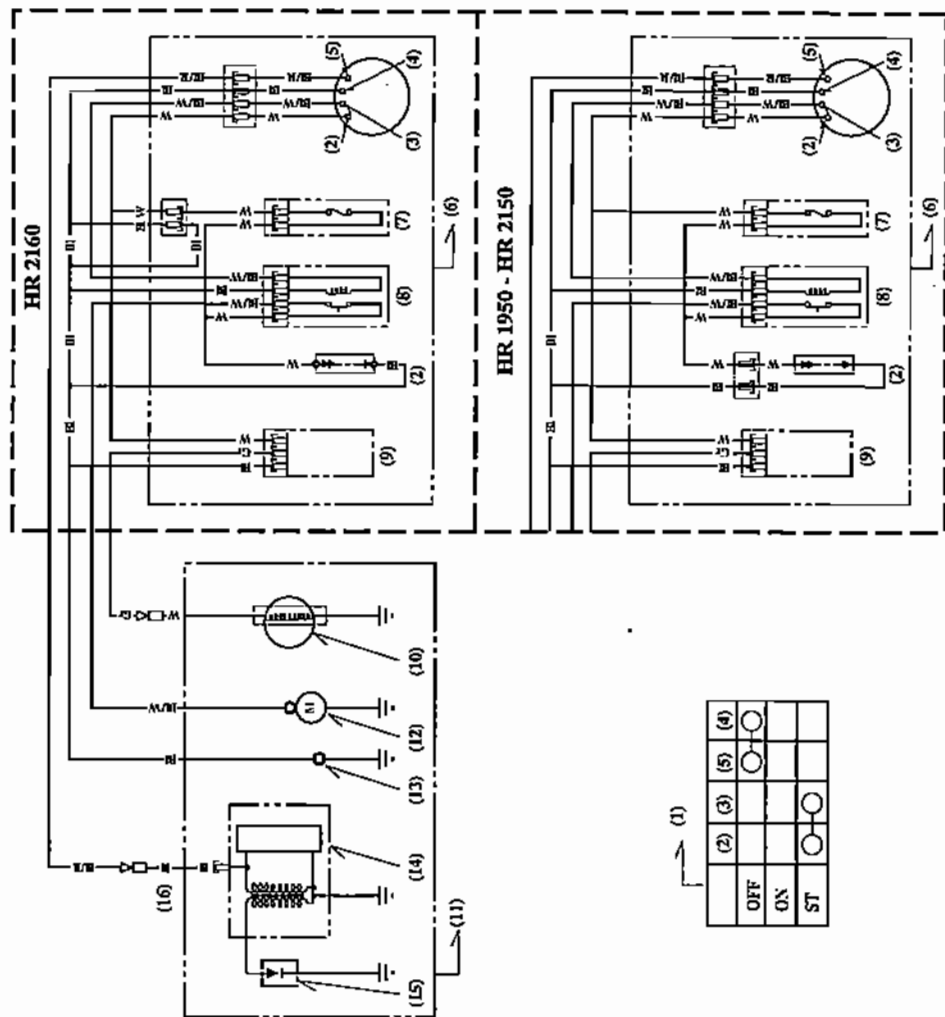
NOTE : If the mower is to be stored for a period of more than 3 months, remove the spark plug and pour 5 to 10 cc of clean engine oil into the cylinder (3); then pull the starter slowly two or three times to spread the oil. Do not leave the mower lying on its side over long periods. This may cause difficult starting and gear oil leaks.

Using the mower after a storage period

1. Remove the spark plug, check that it is clean and that the electrode gap is correct. Pull the starter several times (see p. 25).
2. We recommend that the spark plug be screwed down as far as possible by hand until finger tight; then use a plug spanner to tighten it by an extra 1/8 or 1/4 turn.
3. Check the level and condition of the engine oil (see p. 10).
4. Fill the fuel tank and start the engine.

NOTE : If the cylinder has been coated with oil, the engine will smoke on startup. This is normal.

WIRING DIAGRAM



(1)	Combination switch
(2)	Battery
(3)	Starter
(4)	Ground
(5)	Ignition
(6)	Control box block
(7)	Main fuse
(8)	Starter relay switch
(9)	Regulator/rectifier
(10)	Charge coil
(11)	Engine block
(12)	Starter motor
(13)	Ground terminal
(14)	Ignition coil
(15)	Spark plug
(16)	Red mark

Bl	Black
Y	Yellow
Bu	Blue
G	Green
R	Red
W	White
Br	Brown
O	Orange
Lb	Light blue
Lg	Light green
P	Pink
Gr	Grey

HR 1950 KI					HR 2150 KI						
SF	I	SXF	I	SMF	OME	SF	SXF	HG	HXE	HXF	HXG
GENERAL CHARACTERISTICS											
Power product code					MZAK						
Dimensions L x I x H (mm)					1620x510x1065	1670x510x1065	1475x510x1065	1475x510x1065	1475x510x1065	1475x510x1065	1475x510x1065
Dry weight (kg)					40.0	43.5	47.5	50.5	42.0	45.5	46.0
Track F/R/R (mm)					415/450	415/450	415/430	415/430	470/500	470/500	46.0
Cutting width (mm)					470	470	470	470	530	530	53.0
Cutting heights settings					- 6 - (21-75mm)						
Wheel diameter (mm)					200	200	200/100	200/100	200	200	200
Grass bag capacity (l)					73	73			78	78	86 dB(A)
Sound pressure level at operator's ears (according to NPS 31-041)					85 dB(A)						
Sound power level (according to Directive CEE/84/538)					95 dB(A)						
ENGINE											
Model					GSX 140 KI						
Type					Overhead valve, single cylinder, 4-Stroke						
Ignition					Tondrolight magnet						
Recommended plug					NGK: BR8ES						
Electrode gap					0.7 - 0.8mm						
Displacement (cc/cv x stroke)					135 cm ³ (84 x 42mm)						
Cooling					Forced air						
Lubrication					By splash and spray						
Compression ratio					8.0 : 1						
Maximum power					3.3 kW						
Maximum torque					9.0 N.m / 2100 rpm						
Operating speed setting					2000 - 3000 rpm						
Idle speed					1550 - 1850 rpm						
Air cleaner					See double element						
Fuel tank capacity (l)					1						
Recommended fuel					Regular or premium, unleaded preferred						
Running time on tank of fuel (h)					1.9						
Oil capacity (l)					0.5						
Recommended oil					SAE 10W/30 is recommended for general use of all temperatures						
TRANSMISSION											
Type					Bevel gear						
Engine to drive					Drive shaft						
Final transmission					Gear						
Main clutch					Dog clutch						
Number of speeds					3						
Forward speed					0.8 - 1.2 - 1.4 m/s						
Lubrication					Oil bath and splash						
Oil capacity (l)					0.2						
Recommended oil					SAE 90						
					HONDA hydraulic fluid						

TECHNICAL SPECIFICATIONS

GENERAL CHARACTERISTICS									
SE	SXF	HF	HXE	HXF	HMG	QXE	HXE	HXF	HXG
<div>HR 2160</div> <div>HBA 2160</div>									
<div>Power product code</div> <div>1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030 1630-370x1030</div>									
<div>Dimensions L x l x h (mm)</div> <div>44.5 50.0 47.0 50.5 53.0 47.0/49.0 48.0/50.0</div>									
<div>Track FR/RR (mm)</div> <div>470/520</div>									
<div>Cutting width (mm)</div> <div>SSQ</div>									
<div>Cutting height settings</div> <div>7 - (20-87mm) 7 - (16-80mm) 7 - (20-87mm) 7 - (16-80mm) 7 - (20-87mm) 7 - (16-80mm) 7 - (20-87mm) 7 - (16-80mm) 7 - (20-87mm) 7 - (16-80mm)</div>									
<div>Wheels diameter (mm)</div> <div>200</div>									
<div>Grass bag capacity (l)</div> <div>78</div>									
<div>Sound pressure level of operator's ears (according to NF S 31-041)</div> <div>88 dB(A)</div>									
<div>Sound power level (according to Directive CEE/84/553)</div> <div>100 dB(A)</div>									
<div>ENGINE</div> <div>Model</div> <div>GVX 160</div>									
<div>Type</div> <div>Overhead valves, single cylinder, 4-Stroke</div>									
<div>Ignition</div> <div>Transistorised magneto</div>									
<div>Recommended plug</div> <div>NGK - BPRES - NIPPONDENSO Co. Ltd. : W16 EPR-U</div>									
<div>Electrode gap</div> <div>0.7 - 0.8mm</div>									
<div>Displacement (cubic x stroke)</div> <div>153 cm³ (9.3 x 45mm)</div>									
<div>Cooling</div> <div>Forced air</div>									
<div>Lubrication</div> <div>By splash and lever</div>									
<div>Compression ratio</div> <div>8.0:1</div>									
<div>Maximum power</div> <div>4.0 kW</div>									
<div>Maximum torque</div> <div>10.8 Nm / 2500 U/min</div>									
<div>Operating speed setting</div> <div>2550 - 3100 U/min</div>									
<div>Idle speed</div> <div>1550 - 1850 U/min</div>									
<div>Air cleaner</div> <div>Semi-dry, dust element type</div>									
<div>Fuel tank capacity (l)</div> <div>2</div>									
<div>Recommended fuel</div> <div>Regular or premium, unleaded, protected</div>									
<div>Running time on tank of fuel (h)</div> <div>3</div>									
<div>Oil capacity (l)</div> <div>0.65</div>									
<div>Recommended oil</div> <div>SAE 10W30 is recommended for general use at all temperatures</div>									
<div>TRANSMISSION</div> <div>Type</div> <div>Bevel gear</div>									
<div>Engine to drive</div> <div>Bevel gear</div>									
<div>Final transmission</div> <div>Drive shaft</div>									
<div>Main clutch</div> <div>Geor</div>									
<div>Number of speeds</div> <div>Opening/closing of the hydraulic circuit</div>									
<div>Forward speed</div> <div>Continuous</div>									
<div>Lubrication</div> <div>Oil bath and splash</div>									
<div>Oil capacity (l)</div> <div>0.2</div>									
<div>Recommended oil</div> <div>SAE 90</div>									
<div>Oil capacity (l)</div> <div>0.35</div>									
<div>Recommended oil</div> <div>HONDA hydraulic fluid</div>									
<div>Oil capacity (l)</div> <div>0.16</div>									
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