

shindaiwa®

FH235

Shaft Hedge Trimmer

Operator's Manual

ENGLISH

WARNING

Burn Hazard



The muffler or catalytic muffler and surrounding cover may become extremely hot. Always keep clear of exhaust and muffler area, otherwise serious personal injury may occur.

WARNING

The engine exhaust from this product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

WARNING



Users of this equipment risk injury to themselves and others if the unit is used improperly and/or safety precautions are not followed. ECHO provides an operator's manual. It must be read and understood for proper and safe operation. Failure to do so could result in serious injury.

Specifications, descriptions and illustrative material in this literature are as accurate as known at the time of publication, but are subject to change without notice. Illustrations may include optional equipment and accessories, and may not include all standard equipment.

X7507820800

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INTRODUCTION

Welcome to the SHINDAIWA family. This SHINDAIWA product was designed and manufactured to provide long life and on-the-job dependability. Read and understand this manual. You will find it easy to use and full of helpful operating tips and SAFETY messages.

The Operator's Manual

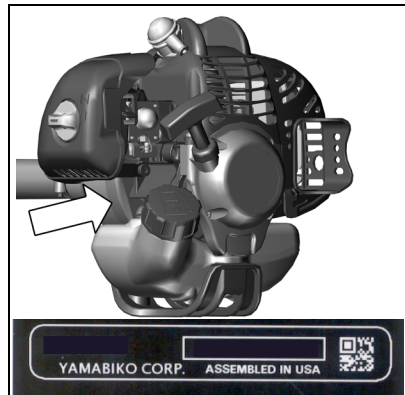
Keep it in a safe place for future reference. Contains specifications and information for safety, operation, maintenance, storage and assembly specific to this product.

SERVICING INFORMATION

Parts/Serial Number

Genuine SHINDAIWA Parts and Assemblies for your SHINDAIWA products are available only from an Authorized SHINDAIWA Dealer. When you do need to buy parts **always** have the Model Number and Serial Number of the unit with you. You can find these numbers on the engine housing. For future reference, write them in the space provided below.

Model No. _____
 Serial No. _____



Service

Service of this product during the warranty period must be performed by an Authorized SHINDAIWA Service Dealer. For the name and address of the Authorized SHINDAIWA Service Dealer nearest you, ask your retailer or call: 1-877-986-7783. Dealer information is also available on WWW.SHINDAIWA-USA.COM. When presenting your unit for Warranty service/repairs, proof of purchase is required.

Consumer Product Support

If you require assistance or have questions concerning the application, operation or maintenance of this product you may call the SHINDAIWA Consumer Product Support Department at 1-877-986-7783 from 8:00 am to 5:00 pm (Central Standard Time) Monday through Friday. Before calling, please know the model and serial number of your unit.

Product Registration

To ensure trouble free warranty coverage it is important that you register your SHINDAIWA equipment on-line at WWW.SHINDAIWA-USA.COM or by filling out the product registration sheet included in this manual. Registering your product confirms your warranty coverage and provides a direct link between you and ECHO if we find it necessary to contact you.

Additional or Replacement Manuals

Replacement Operator and Parts Catalogs are available from your SHINDAIWA dealer or at WWW.SHINDAIWA-USA.COM or by contacting the Consumer Product Support Department (1-877-986-7783). Always check WWW.SHINDAIWA-USA.COM for updated information.

SAFETY

Manual Safety Symbols and Important Information

Throughout this manual and on the product itself, you will find safety alerts and helpful, informational messages preceded by symbols or key words. The following is an explanation of those symbols and key words and what they mean to you.

DANGER

The safety alert symbol accompanied by the word “DANGER” calls attention to an act or condition which WILL lead to serious personal injury or death if not avoided.

WARNING

The safety alert symbol accompanied by the word “WARNING” calls attention to an act or condition which CAN lead to serious personal injury or death if not avoided.

! CAUTION

The safety alert symbol accompanied by the word “CAUTION” calls attention to an act or condition which may lead to minor or moderate personal injury if not avoided.

NOTICE

The enclosed message provides information necessary for the protection of the unit.

Note: This enclosed message provides tips for use, care and maintenance of the unit.


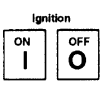


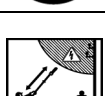


CIRCLE AND SLASH SYMBOL

This symbol means the specific action shown is prohibited. Ignoring these prohibitions can result in serious or fatal injury.

International Symbols

Symbol	Description	Symbol	Description
	Warning, See Operator's Manual	H	Carburetor Adjustment - High Speed Mixture
	Wear Eye, Ear and Head Protection	T	Carburetor Adjustment - Idle Speed
	Wear Hand Protection	L	Carburetor Adjustment - Low Speed Mixture
	Safety/Alert		Emergency Stop
	Hot Surface		Fuel and Oil Mixture

Symbol	Description	Symbol	Description
	Finger Severing		Do not operate closer than 10 m (33 ft.) from electrical hazard.
	Avoid all power lines. This unit is not insulated against electrical current.		Plan retreat path from falling objects.
	DO NOT Allow Flames or Sparks Near Fuel		Ignition ON / OFF
	DO NOT Smoke Near Fuel		Primer Bulb
	Choke Control "RUN" Position (Choke Open)		Choke Control "COLD START" Position (Choke Closed)
	Wear Foot Protection		Keep bystanders at least 15 m (50 ft.) away.
	Do not operate closer than 15 m (50 ft.) from electrical hazard. Keep bystanders at least 15 m (50 ft.) away.		



LOOK BEFORE YOU PUMP!

Ethanol Percentage

0% - 10%	15% - 30% - 50% - 85%
----------	-----------------------

USE E10 OR LESS FUEL

Do not use any fuel containing greater than 10 percent ethanol (E10) in this equipment. It may cause damage or failure and is prohibited by Federal Law.

For Details, see the "Fuel" Section of your Operators Manual

Personal Condition and Safety Equipment

WARNING

Users of this product risk injury to themselves and others if the unit is used improperly and/or safety precautions are not followed. Proper clothing and safety gear must be worn when operating unit.

Physical Condition

Your judgment and physical dexterity may not be good:

- If you are tired or sick
- If you are taking medication
- If you have taken alcohol or drugs

Operate unit only if you are physically and mentally well.

Eye Protection

WARNING

- ◆ Eye protection that meets ANSI Z87.1 or CE requirements must be worn whenever you operate the unit.

- ◆ **For additional safety, a full-face shield may be worn over safety glasses or goggles to provide protection from sharp branches or flying debris.**

Hand Protection

Wear sturdy, no-slip, rubber work gloves to improve your grip on the handles. Gloves also provide protection against cuts and scratches, cold environments, and reduce the transmission of machine vibration to your hands.

Hearing/Ear Protection

ECHO recommends wearing hearing protection whenever unit is used.

Breathing Protection

Operators who are sensitive to dust or other common airborne allergens may need to wear a dust mask to prevent inhaling these materials while operating unit. Dust masks can provide protection against dust, plant debris, and other plant matter such as pollen. Make sure the mask does not impair your vision, and replace the mask as needed to prevent air restrictions.

Proper Clothing

Wear snug-fitting, durable clothing:

- Pants should have long legs, shirts should have long sleeves.
- DO NOT WEAR SHORTS.
- DO NOT WEAR TIES, SCARVES, JEWELRY, or clothing with loose or hanging items that could become entangled in moving parts or surrounding growth.
- Keep clothing buttoned or zipped, and keep shirt tails tucked in.

Wear sturdy work shoes with nonskid rubber soles:

- DO NOT WEAR OPEN TOED SHOES.
- DO NOT OPERATE UNIT BAREFOOTED.

Keep long hair away from engine and air intake. Retain hair with cap or net.

Heavy protective clothing can increase operator fatigue, which may lead to heat stroke. Schedule heavy work for early morning or late afternoon hours when temperatures are cooler.

! WARNING

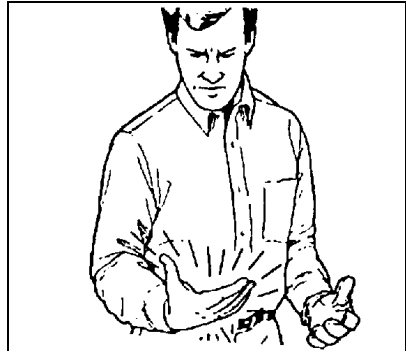
The components of this machine generate an electromagnetic field during operation, which may interfere with some pacemakers. To reduce the risk of serious or fatal injury, persons with pacemakers should consult with their physician and the pacemaker manufacturer before operating this machine. In the absence of such information, ECHO does not recommend the use of this machine by anyone who has a pacemaker.

Extended Operation / Extreme Conditions**! CAUTION**

Prolonged exposure to cold and/or vibration may result in injury. Read and follow all safety and operation instructions to minimize risk of injury. Failure to follow instructions may result in painful wrist/hand/arm injuries.

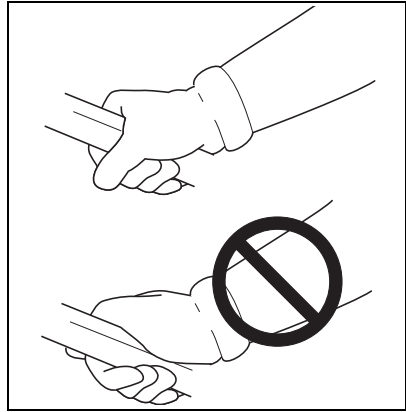
It is believed that a condition called Raynaud's Phenomenon, which affects the fingers of certain individuals, may be brought about by exposure to vibration and cold. Exposure to vibration and cold may cause tingling and burning sensations, followed by loss of color and numbness in the fingers. The following precautions are strongly recommended, because the minimum exposure, which might trigger the ailment, is unknown.

- Keep your body warm, especially the head, neck, feet, ankles, hands, and wrists.
- Maintain good blood circulation by performing vigorous arm exercises during frequent work breaks, and also by not smoking.
- Limit the hours of operation. Try to fill each day with jobs where operating the unit or other hand-held power equipment is not required.
- If you experience discomfort, redness, and swelling of the fingers followed by whitening and loss of feeling, consult your physician before further exposing yourself to cold and vibration.



Repetitive Stress Injuries (RSI)

It is believed that overusing the muscles and tendons of the fingers, hands, arms, and shoulders may cause soreness, swelling, numbness, weakness, and extreme pain in those areas. Certain repetitive hand activities may put you at a high risk for developing a Repetitive Stress Injury (RSI). An extreme RSI condition is Carpal Tunnel Syndrome (CTS), which could occur when your wrist swells and squeezes a vital nerve that runs through the area. Some believe that prolonged exposure to vibration may contribute to CTS. CTS can cause severe pain for months or even years.



To reduce the risk of RSI/CTS, do the following:

- Avoid using your wrist in a bent, extended, or twisted position. Instead try to maintain a straight wrist position. Also, when grasping, use your whole hand, not just the thumb and index finger.
- Take periodic breaks to minimize repetition and rest your hands.
- Reduce the speed and force with which you do the repetitive movement.
- Do exercises to strengthen the hand and arm muscles.
- Immediately stop using all power equipment and consult a doctor if you feel tingling, numbness, or pain in the fingers, hands, wrists, or arms. The sooner RSI/CTS is diagnosed, the more likely permanent nerve and muscle damage can be prevented.

DANGER

All over head electrical conductors and communications wires can have electricity flow with high voltages. This unit is not insulated against electrical current. Never touch wires directly or indirectly, otherwise serious injury or death may result.

DANGER

Do not operate this product indoors or in inadequately ventilated areas. Engine exhaust contains poisonous emissions and can cause serious injury or death.

Read the Manuals

- Provide all users of this equipment with the Operator's Manual for instructions on Safe Operation.

Clear the Work Area

- Spectators and fellow workers must be warned, and children and animals prevented from coming nearer than 15 m (50 ft.) while the unit is in use.

Keep a Firm Grip

- Hold the support handle and throttle handle with thumbs and fingers encircling the grips.

Keep a Solid Stance

- Maintain footing and balance at all times. Do not stand on slippery, uneven or unstable surfaces. Do not work in odd positions or on ladders. Do not over reach.

Avoid Hot Surfaces

- During operation, the drive shaft housing and attachment bearing housing may become very hot, too hot to touch. Avoid contact during and immediately after operation.



WARNING

Never perform blade maintenance procedures while engine is running.

Equipment

WARNING

Use only Shindaiwa attachments. Serious injury may result from the use of a non-approved attachment combination. ECHO, INC. will not be responsible for the failure of cutting devices, attachments or accessories which have not been tested and approved by ECHO, INC. Read and comply with all safety instructions listed in this manual and safety manual.

- ◆ Check unit for loose or missing nuts, bolts, and screws. Tighten and/or replace as needed.

- ◆ Check that the cutting attachment is firmly attached and in safe operating condition. Dull, loose or damaged blades should not be used.

WARNING

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings.

- ◆ ***ALWAYS stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.***
- ◆ ***DO NOT start or operate unit unless all guards and protective covers are properly assembled to unit.***
- ◆ ***NEVER reach into any opening while the engine is running. Moving parts may not be visible through openings.***

WARNING

Periodically check fuel system (fuel lines, vent, grommet, fuel tank, and fuel cap) for leaks especially if the unit is dropped. If damage or leaks are found, do not use unit, otherwise serious personal injury or property damage may occur. Have unit repaired by an authorized servicing dealer before using.

EMISSION CONTROL . (EXHAUST & EVAPO-RATIVE)

CARB And EPA Emissions Control Information

The emission control system for the engine is EM (engine modification) and, if the second to last character of the Engine Family on the Emission Control Information label (sample below) is "B", "C", "K", or "T", the emission control system is EM and TWC (3-way catalyst). The fuel tank/fuel line emission control system is EVAP (evaporative emissions). Evaporative emissions for California models are only applicable to fuel tanks.

EMISSION CONTROL INFORMATION
 ENGINE FAMILY: E3EHXS Q214EQ DISPLACEMENT: 21.2cc
 EMISSION COMPLIANCE PERIOD: 50Hours
 THIS ENGINE MEETS 2013 U.S.EPA EXH/EVP & CALIFORNIA
 EXH/EVP EMISSION REGULATIONS FOR S.O.R.E. REFER TO OWNER'S
 MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.
YAMABIKO CORP. MMM/YYYY 

An Emission Control Label is located on the engine. (This is an EXAMPLE ONLY, information on label varies by engine FAMILY).

Product Emission Durability (Emission Compliance Period)

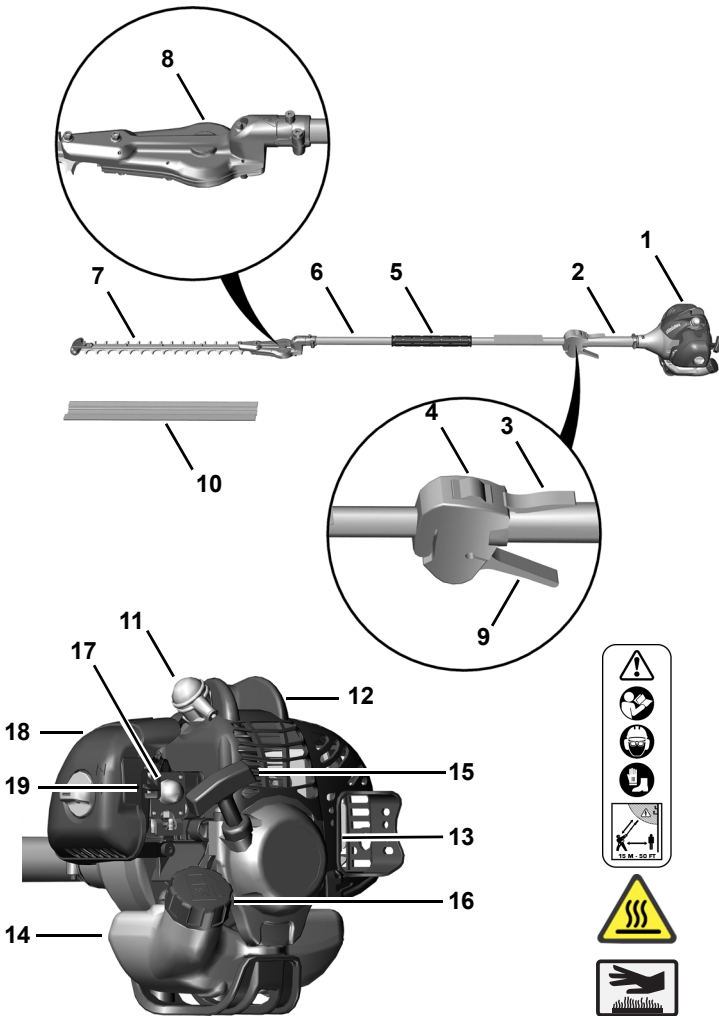
The 50 or 300 hour emission compliance period is the time span selected by the manufacturer certifying the engine emissions output meets applicable emissions regulations, provided that approved maintenance procedures are followed as listed in the Maintenance Section of this manual.

EMISSION CONTROL INFORMATION
ENGINE FAMILY: CEHXS.D214KL DISPLACEMENT: 21.2cc
EMISSION COMPLIANCE PERIOD: 300Hours
THIS ENGINE MEETS 2012 U.S. EPA EXH/EVP & CALIFORNIA
EXH/EVP EMISSION REGULATIONS FOR S.O.R.E. REFER TO OWNER'S
MANUAL FOR MAINTENANCE SPECIFICATIONS AND ADJUSTMENTS.
YAMABIKO CORP. MMM/YYYY 

ENGLISH

DESCRIPTION

Locate the safety decal(s) on your unit. Make sure the decal(s) is legible and that you understand and follow the instructions on it. If a decal cannot be read, a new one can be ordered from your SHINDAIWA dealer. Shaft decal is for example only. Your label may appear slightly different.



1. Power Head
2. Throttle Handle - For Right Hand
3. Throttle Trigger Lockout
4. Stop Switch
5. Support Handle - For Left Hand
6. Drive Shaft Assembly
7. Blades
8. Gear Housing Assembly
9. Throttle Trigger
10. Blade Cover
11. Spark Plug
12. Top Guard
13. Spark Arrestor Muffler or Spark Arrestor Muffler With Catalyst
14. Fuel Tank
15. Recoil Starter Handle
16. Fuel Tank Cap
17. Purge Bulb
18. Air Cleaner
19. Choke Control

CONTENTS

The SHINDAIWA product you purchased has been factory pre-assembled for your convenience. Due to packaging restrictions, some assembly may be necessary.

After opening the carton, check for damage. Immediately notify your retailer or SHINDAIWA Dealer of damaged or missing parts. Use the contents list to check for missing parts.

- ___ 1 Power Head and Drive Shaft Assembly
- ___ 1 Gear Case Assembly
- ___ 1 Operator's Manual
- ___ 1 Warranty Statement

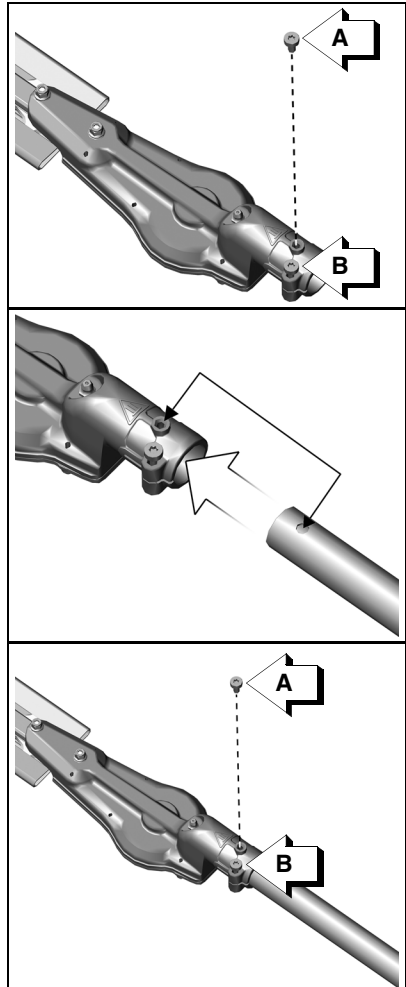
- ___1 Blade Cover
- ___1 Assembly Tool

ASSEMBLY

Gear Housing Assembly and Drive Shaft

Note: Hedge Trimmer Blades are sharp, wear gloves to protect hands.

1. Remove locating bolt (A) and loosen clamping bolt (B).
2. Remove vinyl cap from drive shaft if necessary.
3. Align locating hole in gear housing with locating hole in drive shaft.
4. Slide gear housing assembly onto drive shaft. Be certain the flex drive shaft engages the hole in the driver gear.
5. Install locating bolt (A). Tighten clamping bolt (B).



OPERATION

 **WARNING**

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings. Always stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit.

 **WARNING**

Engine exhaust IS HOT, and contains Carbon Monoxide (CO), a poison gas. Breathing CO can cause unconsciousness, serious injury, or death. Exhaust can cause serious burns. ALWAYS position unit so that exhaust is directed away from your face and body.

 **WARNING**

Operation of this equipment may create sparks that can start fires around dry vegetation. This unit is equipped with a spark arrestor to prevent discharge of hot particles from the engine. Metal cutters can also create sparks if the cutter strikes rocks, metal, or other hard objects. Contact local fire authorities for laws or regulations regarding fire prevention requirements.

Fuel **WARNING**

Diesel fuels and alternative fuels, such as E15 (15% ethanol), E-85 (85% ethanol) or any fuels not meeting Shindaiwa requirements are NOT approved for use in Shindaiwa 2-stroke or Hybrid 4-stroke gasoline engines. Use of diesel or alternative fuels may cause performance problems, loss of power, overheating, fuel vapor lock, and unintended machine operation, including, but not limited to, improper clutch engagement. Diesel or alternative fuels may also cause premature deterioration of fuel lines, gaskets, carburetors and other engine components.

Fuel Requirements

Gasoline - Use 89 Octane [R+M/2] (mid grade or higher) gasoline known to be good quality. Gasoline may contain up to 10% Ethanol (grain alcohol) or 15% MTBE (methyl tertiary-butyl ether). Gasoline containing methanol (wood alcohol) is **NOT** approved. ECHO Red Armor Fuel™ (Power Fuel™) is 93 octane, ethanol-free fuel premixed with ECHO Red Armor® engine oil at 50:1 ratio. Use of ECHO Red Armor Fuel™ (Power Fuel™) is recommended to extend engine life in all air-cooled 2-stroke and 2/4-stroke hybrid engines.

Two Stroke Oil - A two-stroke engine oil meeting ISO-L-EGD (ISO/CD 13738) and J.A.S.O. FD Standards must be used. Shindaiwa brand 2-stroke oils meet these standards. Engine problems due to inadequate lubrication caused by failure to use an ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345-FD certified oil, such as Shindaiwa brand 2-stroke oils, will void the two-stroke engine warranty.

NOTICE

Shindaiwa brand 2-stroke oils may be mixed at 50:1 ratio for application in all Shindaiwa engines sold in the past, regardless of ratio specified in those manuals.

Handling Fuel

DANGER

Fuel is VERY flammable. Use extreme care when mixing, storing or handling, or serious personal injury may result.

- ◆ **Use an approved fuel container.**
- ◆ **DO NOT smoke near fuel.**
- ◆ **DO NOT allow flames or sparks near fuel.**
- ◆ **Fuel tanks/cans may be under pressure. Always loosen fuel caps slowly allowing pressure to equalize.**
- ◆ **NEVER refuel a unit when the engine is HOT or RUNNING!**
- ◆ **DO NOT fill fuel tanks indoors. ALWAYS fill fuel tanks outdoors over bare ground.**
- ◆ **DO NOT overfill fuel tank. Wipe up spills immediately.**
- ◆ **Securely tighten fuel tank cap and close fuel container after refueling.**
- ◆ **Inspect for fuel leakage. If fuel leakage is found, do not start or operate unit until leakage is repaired.**
- ◆ **Move at least 3 m (10 ft.) from refueling location before starting the engine.**

Mixing Instructions

1. Fill an approved fuel container with half of the required amount of gasoline.
2. Add the proper amount of engine oil to gasoline.
3. Close container and shake to mix oil with gasoline.
4. Add remaining gasoline, close fuel container, and remix.

Fuel to Oil Mix – 50:1 Ratio			
US		Metric	
Gas	Oil	Gas	Oil
Gallons	Oz.	Liter	CC.
1	2.6	5	100
2	5.2	10	200
5	13	25	500

NOTICE

Spilled fuel is a leading cause of hydrocarbon emissions. Some states may require the use of automatic fuel shut-off containers to reduce fuel spillage.

After use

- DO NOT store a unit with fuel in its tank. Leaks can occur. Return unused fuel to an approved fuel storage container.

Storage - Fuel storage laws vary by locality. Contact your local government for the laws affecting your area. As a precaution, store fuel in an approved, airtight container. Store in a well-ventilated, unoccupied building, away from sparks and flames.

NOTICE

Stored fuel ages. Do not mix more fuel than you expect to use in thirty (30) days, ninety (90) days when a fuel stabilizer is added.

NOTICE

Stored two-stroke fuel may separate. ALWAYS shake fuel container thoroughly before each use.

NOTICE

Used oil and gasoline, and soiled towels are hazardous waste materials. Disposal laws vary by locality.

Starting Cold Engine

WARNING

Hedge Trimmer blades are very sharp. Touching them may lead to severe personal injury. Avoid touching blades whenever possible, and always wear gloves to protect hands.

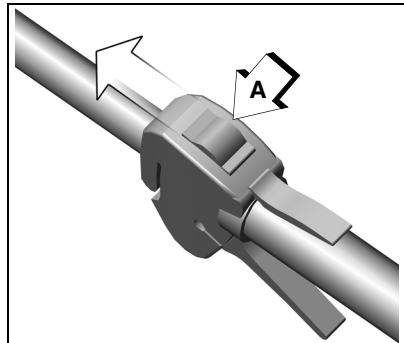
Note: The blade cover is used for transportation and storage.
Remove blade cover before using the unit.

WARNING

The attachment will operate immediately when the engine starts, and could result in possible serious injury. Keep movable parts of the attachment away from objects that could become entangled or thrown, and surfaces that could cause loss of control.

1. Stop Switch

Move stop switch (A) away from the STOP position.

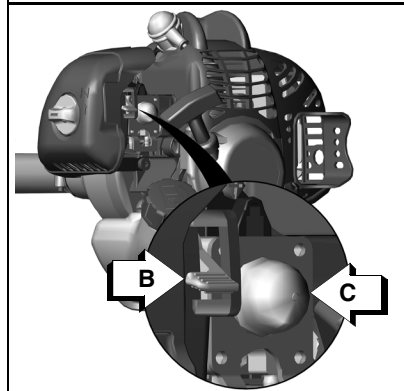


2. Choke

Move choke (B) to COLD START (CLOSED) position.

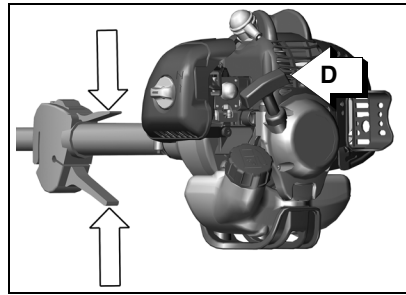
3. Purge Bulb

Pump purge bulb (C) until fuel is visible and flows freely in the clear fuel tank return line. Pump bulb an additional 4 or 5 times.



4. Recoil Starter

Lay the unit on a flat area and keep movable attachment parts clear of all obstacles. Firmly grasp throttle handle and throttle trigger lockout with left hand and fully depress throttle trigger to wide open position. Rapidly pull recoil starter handle/rope (D) until engine fires (or maximum five [5] pulls).



5. Choke

After engine fires (or 5 pulls), move choke (B) to the RUN (OPEN) position. Firmly grasp throttle handle and throttle trigger lockout with left hand and fully depress throttle trigger to wide open position. Pull starter handle/rope until engine starts and runs. Release throttle trigger and allow unit to warm up at idle for several minutes.

Note: If engine does not start with choke in “Run” position after 5 pulls, repeat instructions 2 - 5.

WARNING

The blades must not move at idle, otherwise serious personal injury may result. Periodic carburetor adjustment may be necessary to assure blades do not move at idle. If blades move, readjust carburetor according to “Carburetor Adjustment” instructions in this manual or see your SHINDAIWA Dealer.

6. Throttle Trigger

After engine warm-up, grip throttle handle and support handle. Depress the throttle trigger lockout, and gradually depress throttle trigger to increase engine RPM to operating speed.

Starting Warm Engine

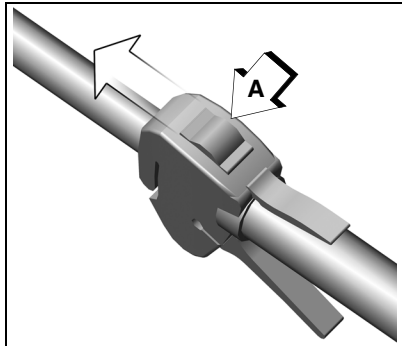
The starting procedure is the same as Cold Start except DO NOT close the choke, and do not depress throttle trigger to wide open position.

WARNING

The blades must not move at idle, otherwise serious personal injury may result. Periodic carburetor adjustment may be necessary to assure blades do not move at idle. If blades move, readjust carburetor according to “Carburetor Adjustment” instructions in this manual or see your SHINDAIWA Dealer.

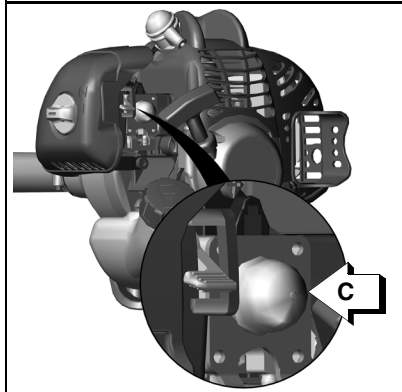
1. *Stop Switch*

Move stop switch (A) away from the STOP position.



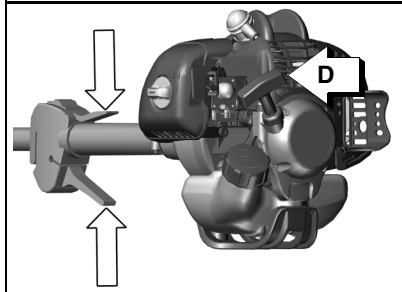
2. *Purge Bulb*

Pump purge bulb (C) until fuel is visible and flows freely in the clear fuel tank return line. Pump bulb an additional 4 or 5 times.



3. *Recoil Starter*

Lay the unit on a flat area and keep movable attachment parts clear of all obstacles. Firmly grip throttle handle and throttle trigger lockout with left hand. Rapidly pull recoil starter handle/rope (D) until engine fires.



Note: If engine does not start after 5 pulls, use Cold Start Procedure.

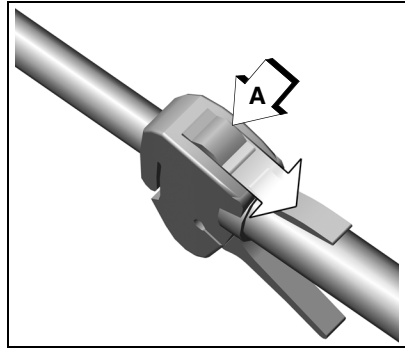
Stopping Engine

1. *Throttle*

Release throttle trigger and allow engine to return to idle before shutting off engine.

2. *Stop Switch*

Move stop switch (A) to STOP position.



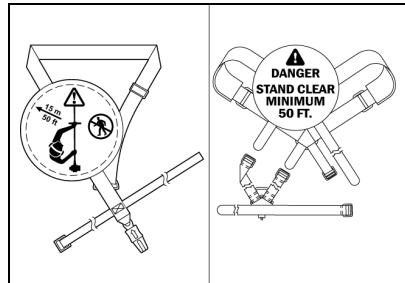
WARNING

If engine does not stop when stop switch is moved to STOP position, close choke - COLD START position - to stall engine. Have your SHINDAIWA dealer repair stop switch before using unit again.

Hedge Trimming

Shoulder Harness (if included)

1. Loosen the harness clamp screw.
2. Put the harness on and attach it to the unit.
3. Adjust the harness for comfortable operation.
4. Tighten the harness clamp screw.



WARNING

Hedge Trimmer blades are very sharp. Touching them may lead to severe personal injury. Avoid touching blades whenever possible, and always wear gloves to protect hands.

WARNING

Never remove hands from unit when blades are moving. The engine continues running even when the blades have stopped due to an obstruction. If this occurs, stop the engine, disconnect ignition cable and remove the obstruction.

1. Always grip throttle handle with right hand and support handle with left hand.
2. Hold trimmer firmly and squeeze throttle trigger to accelerate engine.
3. Tilt trimmer so cutting teeth are angled slightly toward the hedge or shrub and proceed to cut.

MAINTENANCE

 WARNING

Moving parts can amputate fingers or cause severe injuries. Keep hands, clothing and loose objects away from all openings. Always stop engine, disconnect spark plug, and make sure all moving parts have come to a complete stop before removing obstructions, clearing debris, or servicing unit. Allow unit to cool before performing service. Wear gloves to protect hands from sharp edges and hot surfaces.

Your SHINDAIWA unit is designed to provide many hours of trouble free service. Regular scheduled maintenance will help your unit achieve that goal. If you are unsure or are not equipped with the necessary tools, we recommend that you take your unit to an SHINDAIWA Servicing Dealer for maintenance. To help you decide whether you want to DO-IT-YOURSELF or have the SHINDAIWA Dealer do it, each maintenance task has been graded. If the task is not listed, see your SHINDAIWA Dealer for repairs.

Skill Levels

Level 1 = Easy to do. Common tools may be required.

Level 2 = Moderate difficulty. Some specialized tools may be required.

Maintenance Intervals

COMPONENT/SYSTEM	MAINTENANCE PROCEDURE	REQ'D SKILL LEVEL
Daily or Before Use		
Air Filter	Inspect/Clean*	1
Choke Shutter	Inspect/Clean	1
Fuel System	Inspect ³	1
Cooling System	Inspect/Clean	2

COMPONENT/SYSTEM	MAINTENANCE PROCEDURE	REQ'D SKILL LEVEL
Recoil Starter Rope	Inspect/Clean*	1
Screws/Nuts/Bolts	Inspect/Tighten/Replace*	1
Blades	Inspect/Clean ²	1
Every Refuel		
Fuel System	Inspect ³	1
3 Months		
Air Filter	Replace*	1
Fuel Filter	Inspect*	1
Fuel Cap Gasket	Inspect*	1
Spark Plug	Inspect/Clean/Replace*	1
Muffler Spark Arrestor	Inspect/Clean/Replace*	2
Cylinder Exhaust Port	Inspect/Clean/De-carbon	2
Gear Housing	Grease ¹	2
Yearly		
Fuel Filter	Inspect/Replace*	1
Fuel Cap Gasket	Replace*	1

IMPORTANT NOTE - Time intervals shown are maximum. Actual use and your experience will determine the frequency of required maintenance.

MAINTENANCE PROCEDURE NOTES:

¹Apply lithium based grease every 25 hours of use.

²Inspect blade, and clean and sharpen as needed. Lubricate blades periodically during use.


³Low evaporative fuel tanks DO NOT require regular maintenance to maintain emission integrity.

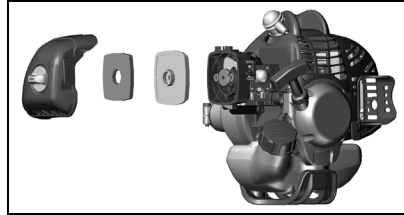
*Replacement is recommended based on the finding of damage or wear during inspection.

Air Filter

Level 1

Parts Required: Tune-Up Kit

1. Close choke (COLD START [] position). This prevents dirt from entering the carburetor throat when the air filter is removed. Brush accumulated dirt from air cleaner area.
2. Remove air filter cover and brush dirt from inside cover.
3. Remove foam pre-filter and air filter and clean as indicated below:



Foam Pre-filter

- Clean foam filter in water/detergent solution and rinse with clean water.
- Wrap the filter in a clean, dry cloth and squeeze (do not wring) dry. Allow to dry completely before reuse. Do not oil.

Dual Layer Air Filter

- Lightly brush debris from filter. Replace filter if it is damaged, very dirty, or the rubber sealing edges are deformed.
 - Soak heavily soiled filters in water/detergent solution to loosen dirt, then brush lightly.
 - Rinse with clean water and allow to dry completely before reuse.
4. Install components in reverse order.

Fuel Filter

NOTICE

Do not damage fuel line while removing fuel filter from tank.

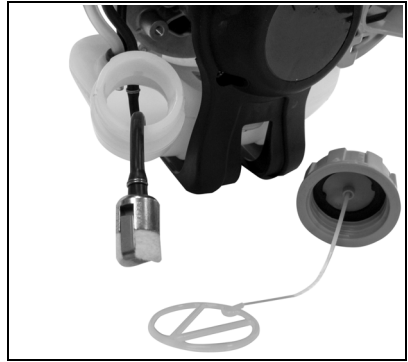
Level 1.

Parts Required: Tune-Up Kit

 DANGER

Fuel is VERY flammable. Use extreme care when mixing, storing or handling, or serious personal injury may result.

1. Use a clean rag to remove loose dirt from around fuel cap and empty fuel tank.
2. Pull the fuel filter from the fuel tank.



3. Remove the filter from the line and install the new filter.

Note: Federal EPA regulations require all model year 2012 and later gasoline powered engines produced for sale in the United States to be equipped with a special low permeation fuel supply hose between the carburetor and fuel tank. When servicing model year 2012 and later equipment, only fuel supply hoses certified by EPA can be used to replace the original equipment supply hose. Fines up to \$37,500 may be enforced for using an un-certified replacement part.

Spark Plug

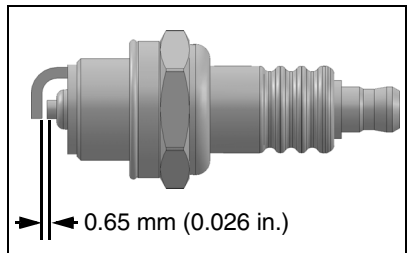
Level 2.

Parts Required: Tune-Up Kit

NOTICE

Use only NGK BPM-8Y spark plug (BPMR8Y in Canada) otherwise severe engine damage may occur.

1. Remove spark plug and check for fouling, worn and rounded center electrode.
2. Clean the plug or replace with a new one. DO NOT sand blast to clean. Remaining sand will damage engine.
3. Adjust spark plug gap by bending outer electrode.
4. Tighten spark plug to 150-170 kgf•cm (130-150 in•lbf).



Cooling System

Level 2.

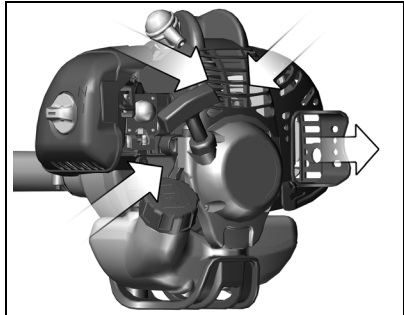
Parts Required: None if you are careful.

NOTICE

To maintain proper engine operating temperatures, cooling air must pass freely through the cylinder fin area. This flow of air carries combustion heat away from the engine.

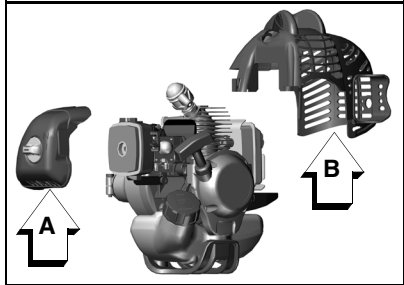
Overheating and engine seizure can occur when:

- Air intakes are blocked, preventing cooling air from reaching the cylinder.
- Dust and grass build up on the outside of the cylinder. This build up insulates the engine and prevents the heat from leaving.



Removal of cooling passage blockages or cleaning of cooling fins is considered "Normal Maintenance." Any failure attributed to lack of maintenance is not warranted.

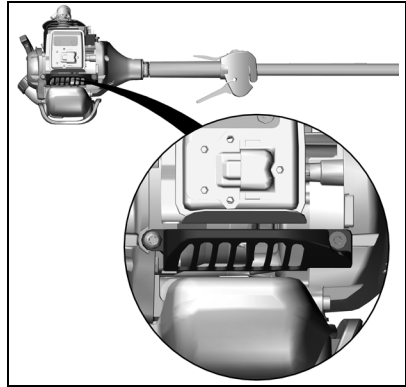
1. Remove spark plug lead.
2. Remove air cleaner cover (A).
3. Remove engine cover (B).
4. Use brush to remove dirt from the cylinder fins.



NOTICE

DO NOT use a metal scraper to remove dirt from the cylinder fins.

5. Remove grass and leaves from the grid between the recoil starter and fuel tank.
6. Assemble components in reverse order.



Exhaust System

Spark Arrestor Screen

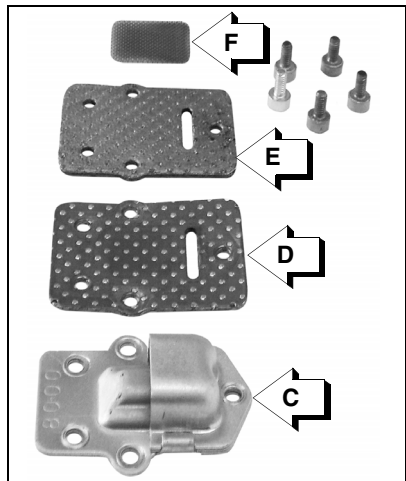
Level 2.

Parts Required: Spark Arrestor Screen, Gaskets

1. Remove spark plug lead.
2. Remove engine cover (B).
3. Place piston at Top Dead Center (TDC) to prevent carbon/dirt from entering cylinder.
4. Remove spark arrestor screen cover (C), gaskets (D), (E), and screen (F), from muffler body.
5. Clean carbon deposits from muffler components.

Note: When cleaning carbon deposit, be careful not to damage the catalytic element inside muffler.

6. Replace screen if it is cracked, plugged, or has holes burned through.
7. Assemble components in reverse order.



Exhaust Port Cleaning

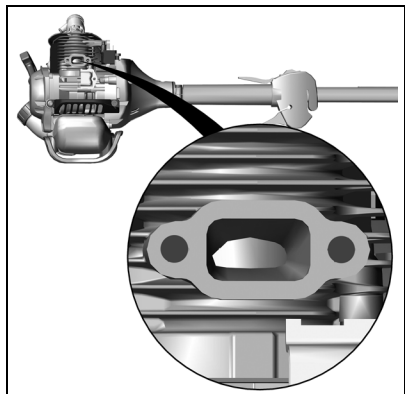
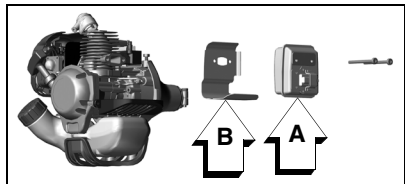
Level 2.

NOTICE

Never use a metal tool to scrape carbon from the exhaust port. Do not scratch the cylinder or piston when cleaning the exhaust port. Do not allow carbon particles to enter the cylinder.

Parts Required: As needed: Heat Shield

1. Remove spark plug lead from spark plug, and remove engine cover.
2. Place piston at top dead center. Remove muffler (A) and heat shield (B).
3. Use a wood or plastic scraping tool to clean deposits from cylinder exhaust port.
4. Inspect heat shield, and replace if damaged.
5. Install heat shield and muffler.
6. Tighten muffler mounting bolts (or nuts) to 90-110 kgf•cm (80-95 in•lbf).
7. Install engine cover and attach spark plug lead.
8. Start engine, and warm to operating temperature.
9. Stop engine, and re-tighten mounting bolts (or nuts) to specifications.



Carburetor Adjustment

Level 2.

⚠ WARNING

When carburetor adjustment is completed, the cutting attachment should not move at idle, otherwise serious personal injury may result.

Engine Break-In

New engines must be operated a minimum duration of two tanks of fuel break-in before carburetor adjustments can be made. During the break-in period your engine performance will increase and exhaust emissions will stabilize. Idle speed can be adjusted as required.

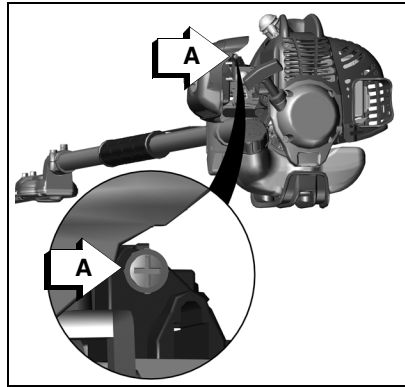
High Altitude Operation

This engine has been factory adjusted to maintain satisfactory starting, emission, and durability performance up to 1100 ft. (330 m) above sea level (ASL) (96.0 kPa). To maintain proper engine operation and emission compliance above 1100 ft. (330 m) ASL the carburetor may need to be adjusted by an authorized service dealer.

NOTICE

If the engine is adjusted for operation above 1100 ft. (330 m) ASL, the carburetor must be re-adjusted when operating the engine below 1100 feet (330 m) ASL, otherwise severe engine damage may result.

- Note: Every unit is run at the factory and the carburetor is set in compliance with emission regulations. Carburetor adjustments, other than idle speed, must be performed by an authorized dealer.
- Check idle speed and reset if necessary. If a tachometer is available, idle speed screw (A) should be set to the specifications found on "Specifications" page of this manual. Turn idle screw (A) clockwise to increase idle speed;



counterclockwise to decrease idle speed.

Lubrication

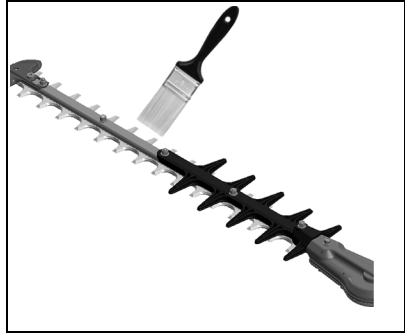
Blades

Level 1.

Parts Required: 20W Engine Oil (blade lubrication), 50-50 mixture of kerosene and 20W oil (blade cleaning)

Hedge Trimmer blades are very sharp. Touching them may lead to severe personal injury. Avoid touching blades whenever possible, and always wear gloves to protect hands.

1. Brush loose debris from blade and coat both sides of blade with the 50-50 cleaning mixture.
2. Allow cleaning mixture to soften the remaining gummy residue then wipe it from the blade.
3. Apply clean oil to the entire length of the blade. Be certain the blade bolts are lubricated.
4. Wipe excess oil from the blade before putting the unit back in service.

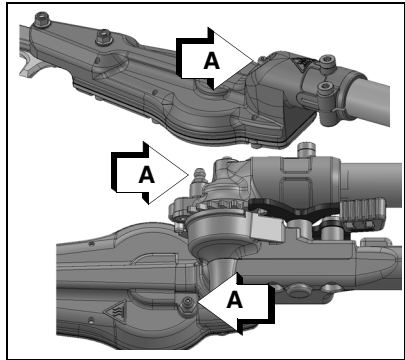


Gear Case

Level 1.

Parts Required: A grease gun with lithium based grease.

1. Clean dirt from the grease fitting (A).
2. Carefully pump grease into fitting (A). DO NOT force grease. Too much pressure will force grease past seals and cause damage. Apply 1 - 2 pumps of grease every 15 - 25 hours of operation.
3. Wipe excess grease from around grease fitting.



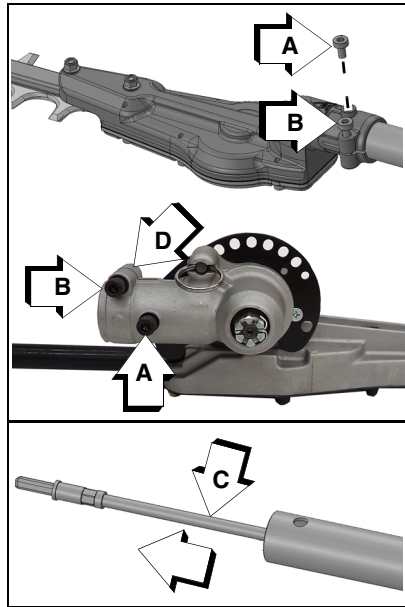
Drive Shaft Assembly

Level 1.

Parts Required: Lithium based grease.

Hedge Trimmer blades are very sharp. Touching them may lead to severe personal injury. Avoid touching blades whenever possible, and always wear gloves to protect hands.

1. Remove gear housing locating screw (A) and loosen clamping screw (B). Remove the gear housing assembly from the drive shaft housing.



2. Pull the drive shaft (C) from the housing, wipe clean, then apply 15 ml (0.5 oz.) of grease.
3. Slide the drive shaft back in the drive housing being careful not to get dirt on the flex shaft.
4. Install the gear housing assembly.

NOTICE

Flat edge of washers (D) must be against drive shaft.

Blades

Hedge trimmer blades are very sharp, touching them may lead to severe personal injury. Use long hex wrenches and sockets with extensions when tightening blade screws and blade lock nuts to keep hands at a safe distance from sharp blades.

NOTICE

Blades should only be removed and reinstalled by an authorized servicing dealer, otherwise premature wear or internal damage may occur.

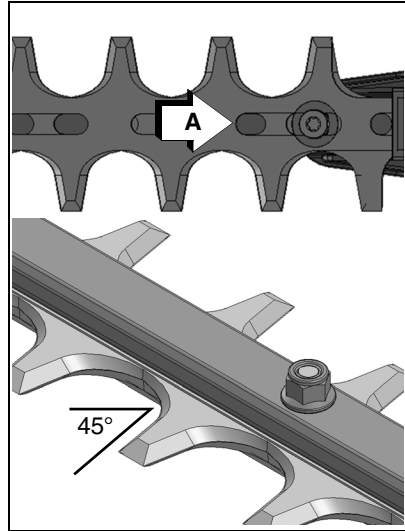
Sharpening

Level 2.

NOTICE

If a power grinder is used DO NOT allow blade to over heat.

1. Move stop switch to STOP position.
2. Disconnect spark plug wire.
3. Remove blade guard.
4. Slide blades to allow file clearance using slots (A) on bottom of blade. Do not pry against cutting edges.
5. File each edge carefully. Follow the original shape of the blade.
6. Install blade guard.



NOTICE

Use new Echo approved lock nuts each time blade guard is installed. See dealer for correct nuts.

7. Lubricate blades (see “Lubrication”).
8. Connect spark plug wire.

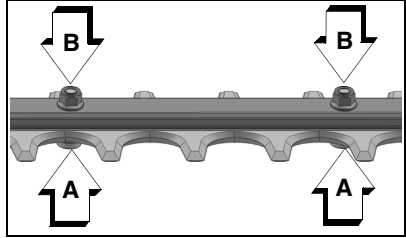
Adjustment

Level 2.

NOTICE

Locking ability of hedge trimmer blade lock nuts will diminish each time they are removed. Replace if turning resistance is not felt when installing lock nuts.

1. Tighten blade screws securely.
2. Hold blade screws (A) to prevent turning, and tighten lock nuts (B).



TROUBLESHOOTING

ENGINE PROBLEM TROUBLESHOOTING CHART					
Problem	Check	Status	Cause	Remedy	
Engine cranks Engine starts hard Engine does not start	Fuel at carburetor	No fuel at carburetor	Fuel strainer clogged	Clean or replace	
			Fuel line clogged	Clean or replace	
			Carburetor	See your Shindaiwa dealer	
	Fuel at cylinder	Muffler wet with fuel	No fuel at cylinder	Carburetor	See your Shindaiwa dealer
				OPEN choke	
				Fuel mixture too rich	Clean or replace air filter Adjust carburetor
					See your Shindaiwa dealer
	Spark at end of plug wire	No spark	No spark	Stop switch OFF	Turn switch to ON
				Electrical problem	See your Shindaiwa dealer
	Spark at plug	No spark	No spark	Interlock switch	See your Shindaiwa dealer
Spark gap incorrect				Adjust to 0.65 mm (0.026 in.)	
Spark plug covered with carbon				Clean or replace	
Spark plug fouled with fuel				Clean or replace	
			Spark plug defective	Replace plug	

ENGINE PROBLEM TROUBLESHOOTING CHART				
Problem	Check	Status	Cause	Remedy
Engine runs, but dies or does not accelerate properly	Air filter	Air filter dirty	Normal wear	Clean or replace
	Fuel filter	Fuel filter dirty	Contaminants/residues in fuel	Replace
	Fuel vent	Fuel vent plugged	Contaminants/residues in fuel	Clean or replace
	Spark Plug	Plug dirty/worn	Normal wear	Clean and adjust or replace
	Carburetor	Improper adjustment	Vibration	Adjust
	Cooling System	Cooling system dirty/plugged	Extended operation in dirty/dusty locations	Clean
	Spark Arrestor Screen	Spark arrestor screen plugged	Normal wear	Replace
Engine does not crank	N/A	N/A	Internal engine problem	See your Shindaiwa dealer

DANGER

Fuel vapors are extremely flammable and may cause fire and/or explosion. Never test for ignition spark by grounding spark plug near cylinder plug hole, otherwise serious personal injury may result.

STORAGE

 **WARNING**

The muffler and surrounding cover become hot during operation. Always keep exhaust area clear of flammable debris during transportation or when storing, otherwise serious property damage or personal injury may result.

 **WARNING**

Hedge Trimmer blades are very sharp. Touching them may lead to severe personal injury. Avoid touching blades whenever possible, and always wear gloves to protect hands.

 **DANGER**

Do not store in enclosure where fuel fumes may accumulate or reach an open flame or spark, otherwise serious personal injury may result.

NOTICE

Always store and transport hedge trimmers in a stable, horizontal position. Support gear case and cutting blades to prevent excessive flexing, which may cause damage to these components. Always install blade cover when transporting or storing unit.

Long Term Storage (Over 30 Days)

Do not store your unit for a prolonged period of time (30 days or longer) without performing protective storage maintenance which includes the following:

1. Store unit in a dry, dust free place, out of the reach of children.
2. Place the stop switch in the "STOP" position.
3. Remove accumulation of grease, oil, dirt and debris from exterior of unit.
4. Perform all periodic lubrication and services that are required.
5. Apply clean oil to the entire length of the blade. Be certain the blade bolts are lubricated.
6. Install blade cover on blades.
7. Tighten all the screws and nuts.

8. Drain fuel tank completely. Press purge bulb 6-7 times to remove remaining fuel from carburetor then drain the tank again. Close choke, start and run the engine until it stops due to lack of fuel.
9. Allow engine to cool. Remove the spark plug lead from the spark plug. Remove the spark plug. Pour 7 cc (0.25 oz.) of fresh, clean, two-stroke engine oil into the cylinder through the spark plug hole.
 - a. Place a clean cloth over the spark plug hole.
 - b. Pull the recoil starter handle 2-3 times to distribute the oil inside the engine.
 - c. Observe the piston location through the spark plug hole. Pull the recoil handle slowly until the piston reaches the top of its travel and leave it there.
10. Install the spark plug. Connect the spark plug lead to the spark plug.

SPECIFICATIONS

MODEL	FH235
Length	2017 mm (79.40 in.)
Width	251 mm (9.88 in.)
Height	237 mm (9.33 in.)
Weight (dry)	5.67 kg (12.50 lb.)
Engine Type	Air cooled, two-stroke, single cylinder gasoline engine
Bore	32.2 mm (1.27 in.)
Stroke	26.0 mm (1.02 in.)
Displacement	21.2 cc (1.29 in. ³)
Exhaust	Spark arrestor muffler or spark arrestor muffler with catalyst
Carburetor	Diaphragm with purge pump
Ignition System	Flywheel magneto, capacitor discharge ignition type
Spark Plug	NGK BPM8Y - Gap 0.65 mm (0.026 in.)
Fuel	Mixed (Gasoline and Two-stroke Oil)
Fuel to Oil Ratio	50:1 SHINDAIWA Red Armor [®] ISO-L-EGD (ISO/CD 13738) and J.A.S.O. M345- ED, two-stroke, air-cooled engine oil.
Gasoline	Use 89 Octane unleaded. Do not use fuel containing methyl alcohol, more than 10% ethyl alcohol or 15% MTBE. Do not use alternative fuels such as E20 or E85.
Oil	SHINDAIWA Red Armor [®] Premium Universal 2-Stroke Oil

MODEL	FH235
Fuel Tank Capacity	0.42 l (14.2 US fl. oz.)
Starter System	Automatic Recoil Starter
Clutch	Centrifugal Type
Gear Case Ratio	4.60:1
Cutter	Double Reciprocating Blade, Double Edge
Length	557 mm (21.9 in.)
Pitch	35 mm (1.38 in.)
Maximum Diameter Cut	
Soft Material	25.4 mm (1.0 in.)
Woody Material	13 mm (0.5 in.)
Idle Speed	3000 RPM
Clutch Engagement Speed	4400 RPM
Wide Open Throttle Speed (W.O.T.)	11,300 RPM

PRODUCT REGISTRATION

Thank you for choosing Shindaiwa Power Equipment

Please go to <http://www.shindaiwa-usa.com> to register your new product online. It's **FAST** and **EASY!** NOTE: your information will never be sold or misused by ECHO, Inc. Registering your purchase enables us to contact you in the unlikely event of a service update or product recall, and verifies your ownership for warranty consideration.

If you do not have access to the Internet, you can complete the form below and mail to:

ECHO Inc., Product Registration, PO Box 1139, Lake Zurich IL 60047.

shindaiwa® PRODUCT REGISTRATION CARD : TARJETA DE REGISTRO : CARTE D'ENREGISTREMENT DU PRODUIT

<p>ONLINE OPTION: Register online and save a stamp! You will be alerted when your Shindaiwa product information and special offers. Simply go to: www.shindaiwa-usa.com</p>	<p>OPCIÓN POR INTERNET: Regístrese en la página web y ahorre una estampilla! Le alertarán sobre actualizaciones del producto y/o se le enviará información sobre los nuevos productos Shindaiwa y las ofertas especiales. Simplemente visite: www.shindaiwa-usa.com</p>	<p>OPTION EN LIGNE: Enregistrez en ligne et économiser un timbre! Vous serez alertés par e-mail des actualisations de produits Shindaiwa et les mises à jour de produit ainsi que les offres spéciales. Simplement visitez le: www.shindaiwa-usa.com</p>
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Please Print : Por Favor Enscriba Con Letra De Molde : En Lettre Carré S.V.P. Confidential: Information provided will not be shared or sold

Purchaser's Name : Nombre del Comprador : Nom de l'acheteur	
Address : Dirección : Adresse	State : Estado : Zip Code : Código Postal : Code Postal
City : Ciudad : Ville	E-Mail Address : Dirección De Correo Electrónico : Courrier Electronique
Phone Number : Número De Teléfono : Téléphone	Date of Purchase : Fecha de la Compra : Date de l'achat
Where Purchased : Nombre del Almacén donde fue Comprado : Lieu d'achat	
Model Number : Numero del Modelo : No. de modèle	
Serial Number : Numero de Serie : No. de série	

Registering your purchase enables us to contact you in the unlikely event of a service update or product recall and verifies your ownership in the event of loss. : El registrar su compra nos permite estar en contacto con usted en caso de cualquier evento como el envío de correo electrónico o la revisión del producto y también para verificar su propiedad en caso de robo o pérdida. Comme le fait de saisir votre numéro de modèle et de vérifier que vous êtes le propriétaire en cas de vol ou de perte.

Primary use of tool: Professional Homeowner Rental Equip.
 Uso primario de la herramienta Profesional Dueño de casa Alquiler

Usage principal: Professionnel Residential Location

Do you wish to receive periodic Shindaiwa product information and special offers by e-mail? Yes No
 ¿Desea usted recibir información periódica y ofertas especiales por correo electrónico sobre el producto Shindaiwa? Yes No

Did you visit the Shindaiwa website before purchasing your product?
 Visité usted la página web Shindaiwa antes de comprar su producto? SI NO
 Avez-vous visité le site d'Shindaiwa avant de procurer votre produit? Oui Non

What factor(s) most influenced your purchase?
 Performance Price Dealer
 Reliability Prior Experience Quality Warranty
 Friend/Family Brand Friend
 Funcionamiento Precio Distribuidor
 Confiabilidad Experiencia Anterior Calidad Garantía
 Amigo/Familia Marca Garantía

Que factor (facteurs) vous a influencé le plus?
 Performance Prix Marchand
 Fiabilité Expérience Qualité Garantie

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