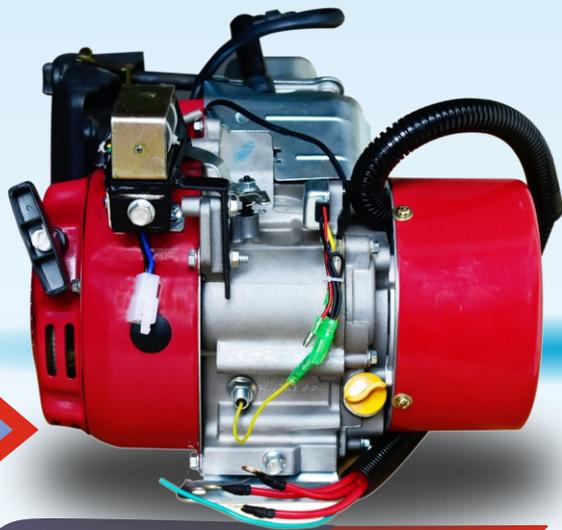




HIMALAYAN POWER

E-RICKSHAW GENSET CHARGER

OWNER'S MANUAL



ICAT CERTIFICATE NO.

CT0NN0085 Dt. 27.12 2018



Booklet No.

Welcome to the house of Himalayan Power Machines Mfg Products Family



Himalayan Power Machines Mfg. Co. is located in a beautiful Kuanwala Valley, which is a part of Doon Valley, 10 Km from DEHRADUN CITY. Promoters of this new Company are successful and leading player, in the filed of Portable Power Generation & after Sales Network since last 25 years. We have a team of India's Best Engineers, engaged consistently for development of best POWER PRODUCTS to fulfill growing Electrical needs at household, commercially as well for small Industries and Institutions. The Trademark BIO POWER™, the most environment friendly Portable Genset belongs to. Our group's mother company: Gastech Electronics Products (P) Ltd. who is the pioneer and first company of the world in developing green fuel based gas run, single cylinder small portable Genset for the household, commercial and rural electrification purpose. We gave India's first Gas Run-Gas Start Genset, way back in 1998.

The Brand name, **HPM** means the most advanced and modern Gensets in it's class with State of Arts Technology. Ours are the India's first and only company, offering widest range of portable Genset capacity 1.0 KVA to 17.0 KVA with option of multifuel like Biogas, LPG, Natural Gas, Petrol, Kerosene, Diesel. We also successfully developed Professional Generator cum Welding Machine and also Solar Hybrid Generators, Hybrid UPS Generator (International Patent).

HIMALAYAN POWER MACHINE, Once again taking a step ahead, to launch First time in India Portable Diesel Genset serving with unique features:

- Fully Automatic, Start / Stop & Load changing by itself.
- Light weight & Portable Diesel Genset.
- Low noise & Silent Technology.
- Runs comfortably 0.75 Ton, 1 Ton, 1.5 Ton & 2.0 Ton Air Conditioners.
- Low Diesel Consumption.

We also introduced first time in India new Brushless Rare Earth Magnet Generators, which are 30 to 35% more fuel efficient than conventional alternators. These generators produced Pure Sine Wave (THD < 5%) and having great overloading capacity which is very useful for running motors & industrial Loads.

We are the first Indian company who passed New Emission & Sound Norms of CPCB-II for Portable Diesel Gensets starting from 2.5 KVA capacity.

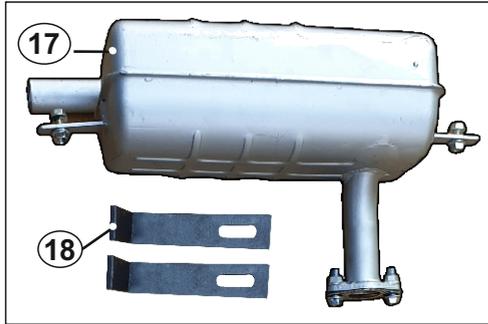
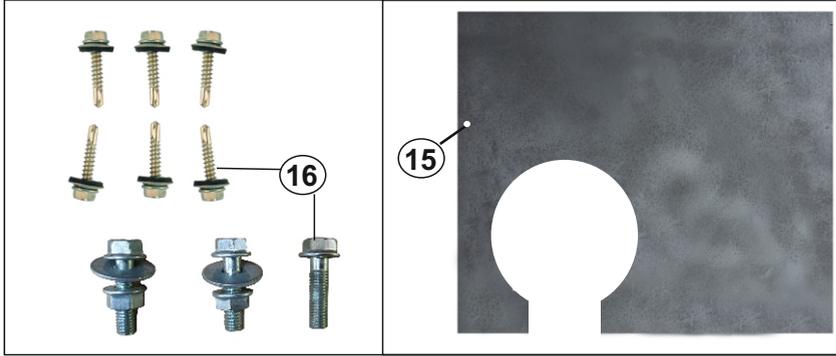
Himalayan Power Machines Mfg. Co. Offers a vast range of New Generation Portable Power Products, after 25 Years of Extensive R&D work. All new series products are a result of extensive hard work of professionals. The new range being offered are highly stable, Robust and reliable machines.

We take Pleasure to announce that from Year April 2019, HPM introducing Special DC generator for **Battery Charging** of E-Rickshaws and other electric vehicle. We hope that our **Generator- Chargers** will solve all Battery Related Problems and will help to increase Battery Life.

CONTENTS

1. अपने ई- रिक्शा चार्जर फिट को जाने।
2. ई-रिक्शा पर चार्जर फिट करने की विधि ।
 - (a) कनेक्शन करने की विधि।
 - (b) चार्जिंग करंट (एम्पीयर) सेटिंग।
 - (c) ड्राइवर सीट फिटिंग
3. सामान्य प्रश्न (FAQ) व समाधान
4. डी.सी. जनरेटर 1.2 Kw
5. Safety Precautions
6. Pre- Operation Check
7. Control
8. Check Before Operation
9. Starting Engine
10. Stop Engine
11. Maintenance
12. Storing Your Engine
13. Trouble Shootings
14. Wiring Diagram

अपने ई- रिक्शा चार्जर किट को जानें



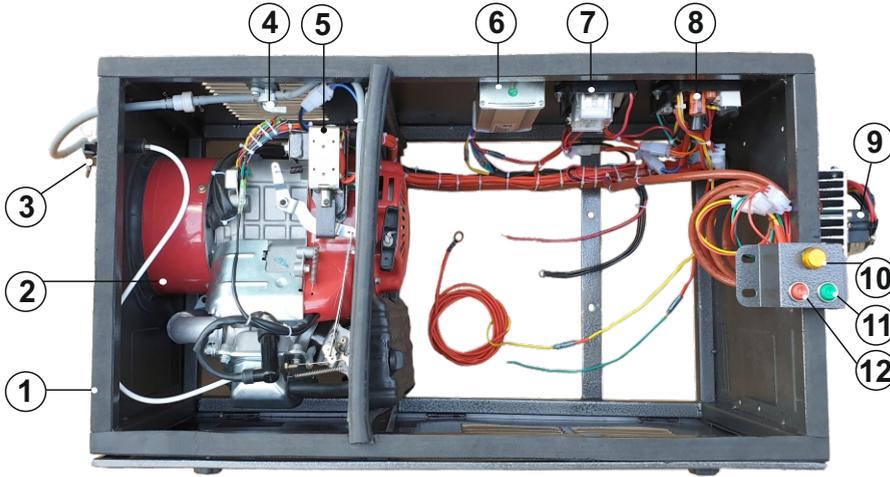


- बिना बैटरियां लगायें, हाथ से खींच कर, चार्जर कभी भी स्टार्ट ना करें।
- पीले तार को बैटरी के 12 वोल्ट टर्मिनल पर लगाने के बाद ही चार्जर स्टार्ट करें।

उपरोक्त नियमों का उल्लंघन करने पर चार्जर का इलेक्ट्रॉनिक स्टार्टर तुरंत खराब हो जायेगा

WARNING !

अपने ई- रिक्शा चार्जर किट को जानें



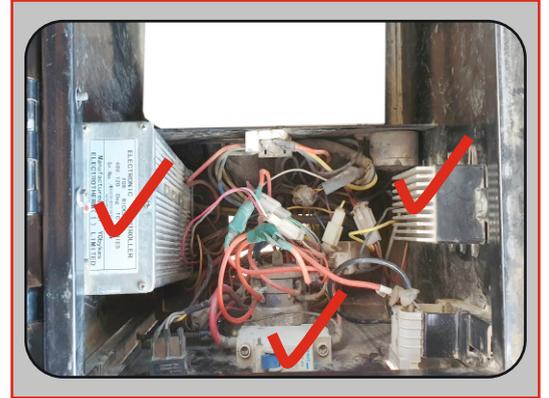
1. चार्जर बॉक्स
2. डी.सी. जनरेटर
3. चौक लीवर
4. पेट्रोल टी
5. स्पीड सोलेनाइड

6. इंजन स्ट्रार्टर
7. स्ट्रार्टर रिले
8. स्पीड कन्ट्रोलर सर्किट
9. रेक्टिफायर
10. ऑयल अलर्ट इंडिकेटर

11. स्ट्रॉट बटन
 12. स्टॉप बटन
 13. एल ब्रेकैट
 14. यू चैनल ब्रेकैट
 15. फ्लोर प्लेट
 16. M8 बोल्टस-नटस
एण्ड स्क्रू
 17. साइलेंसर असम्बली
 18. साइलेंसर ब्रेकैट (2)
 19. फ्यूल टैंक
 20. फ्यूल टैंक ब्रेकैट I
 21. फ्यूल टैंक ब्रेकैट II
 22. टूल किट
 23. ऑयल कीप
 24. ओनर मनुअल
 25. रेक्टिफायर कवर
- (Optional)**

ई-रिक्शा पर चार्जर फिट करने की विधि

1. ड्राइवर सीट को बॉक्स से अलग कर लें तथा बॉक्स को ई-रिक्शा से निकाल दें ।

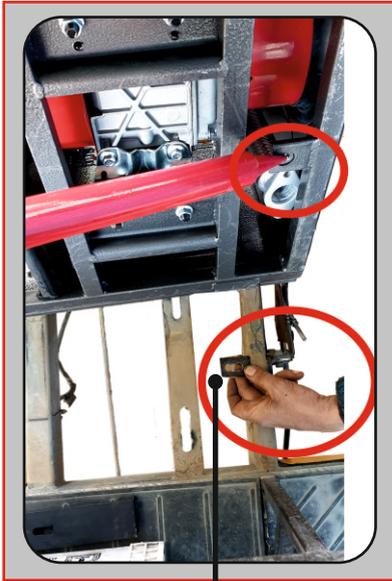


नोट :

बॉक्स को अलग करते समय वायरिंग तथा कंट्रोलर आदि पार्ट्स के कनेक्शन पर ध्यान दें तथा नोट कर ले क्योंकि यह सब को वापस पहले की तरह दूसरे बॉक्स में फिट करना होगा ।

ई-रिक्शा पर चार्जर फिट करने की विधि

2. इस एल पति को ई-रिक्शा की चेसिस पर वेल्ड करें तथा यू – चैनल पत्ती को ड्राइवर बॉक्स पर वेल्ड करें परंतु ध्यान रहे कि यह पत्ती चेसिस के ऊपर आनी चाहिए ।



L-Bracket

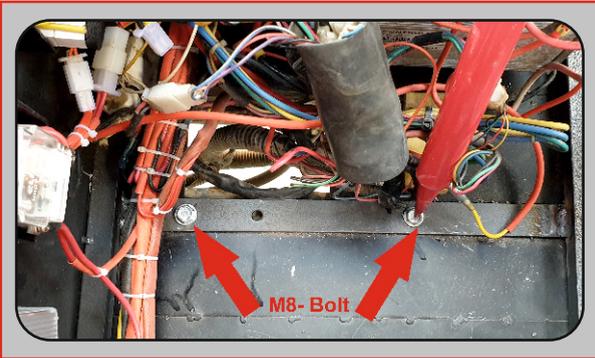


**E-Rickshaw
Chassis**

U-Channel Patti

ई-रिक्शा पर चार्जर फिट करने की विधि

- नए चार्जर बॉक्स को, ई-रिक्शा के फ्लोर पर पहले वाली जगह पर 3-M8 के नट-बोल्टों के साथ फिट करें तथा फ्लोर प्लेट को भी बॉक्स तथा चैसेस के बीच कस दें।



Floor Plate

ई-रिक्शा पर चार्जर फिट करने की विधि

4. साइलेंसर को ई-रिक्शा के नीचे दिखाए अनुसार फिट करें। साइलेंसर को चार्जर की एग्जॉस्ट फ्लैज पर नट बोल्ट से कस दें फिर साइलेंसर ब्रैकेट्स को चैसिस पर उपयुक्त स्थान पर वेल्ड कर दें।



Exhaust Flange



Exhaust Flange

ई-रिक्शा पर चार्जर फिट करने की विधि

5. फ्यूल टैंक को ई-रिक्शा के दाहिने हाथ पर ड्राइवर सीट से 5 से 6 इंच की ऊंचाई पर फिट करें ।
6. स्टार्टर स्टॉप पैनल को स्पीड मीटर के पास हैंडिल के चार बोल्ट के साथ फिट करें ।



Control Panel



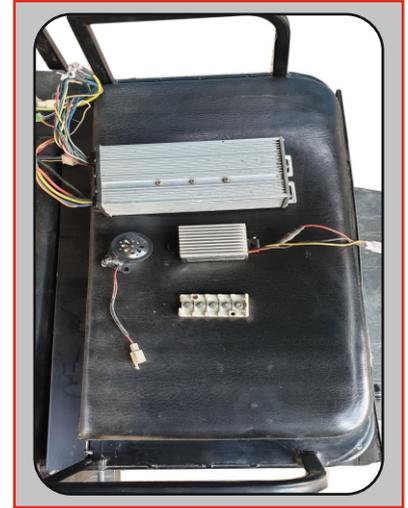
Control Panel

ई-रिक्शा पर चार्जर फिट करने की विधि

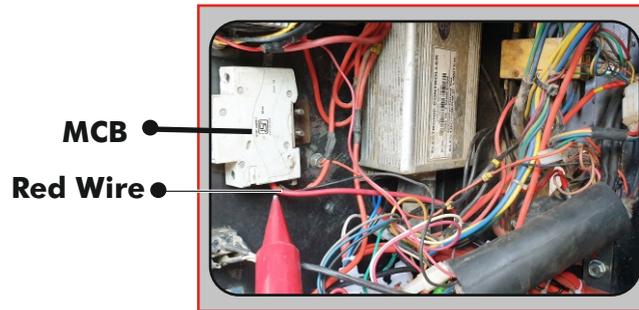
7. पहले से खोले पाटर्स जैसे कंट्रोलर, जंक्शन बॉक्स आदि नए चार्जर बॉक्स में फिर फिट करें तथा वायरिंग कनेक्शन पहले की तरह कनेक्ट करें ।

(a) कनेक्शन करने की विधि

- चार्जर बॉक्स की लाल तार को 48 वोल्ट वाली एमसीबी टर्मिनल पर कंट्रोलर वायर के साथ कनेक्ट करें ।



Red Wire

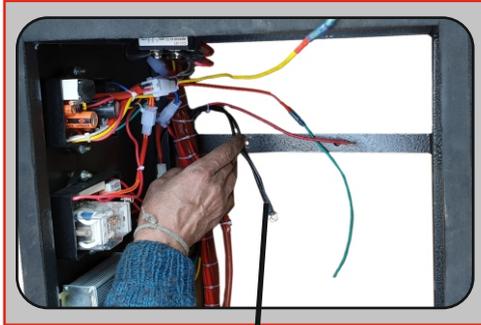


MCB

Red Wire

ई-रिक्शा पर चार्जर फिट करने की विधि

- चार्जर बॉक्स की काली तार जंक्शन बॉक्स के बैटरी माइनस टर्मिनल के साथ कनेक्ट करें ।



Black Wire



- चार्जर बॉक्स की पीली तार को बैटरी के 12 वोल्ट पॉइंट पर कनेक्ट करें ।

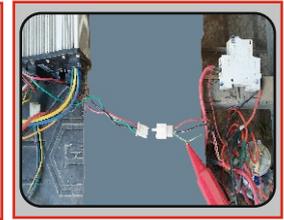
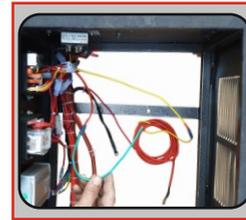


ई-रिक्शा पर चार्जर फिट करने की विधि

नोट :

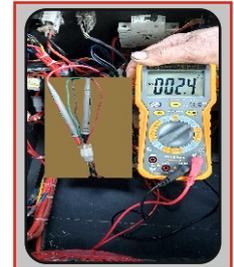
जंक्शन बॉक्स पर काली तार जिस बैट्री पर लगी है उसी बैट्री के प्लस टर्मिनल पर पीली तार लगाएं तथा मल्टीमीटर से चेक करें, काली तथा पीली तार पर 12 वोल्ट आने चाहिए।

- चार्जर बॉक्स की हरी तार को कंट्रोलर से निकलने वाली तीन वायर सॉकेट (यह एक्सीलेटर हैंडल से आने वाली स्पीड कंट्रोल की तारे हैं) में हरी वाली तार से कनेक्ट करें।



ज्यादातर रिक्शा मॉडल्स में यह तीन तार काला, लाल तथा हरा वाला स्पीड कंट्रोल का होता है।

मल्टीमीटर को काली तथा हरी तार पर लगा कर चेक करें, एक्सीलेटर रोटेट करने पर वोल्टेज 1 से 3 वोल्ट आनी चाहिए।

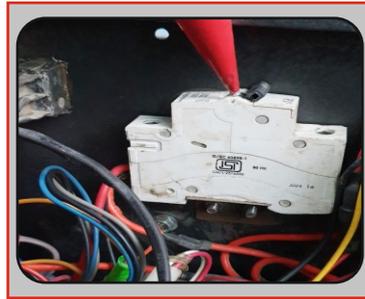


ई-रिक्शा पर चार्जर फिट करने की विधि

चार्जर इंजन स्टार्ट करने से पहले इंजन ऑयल 20W-40 ग्रेड का 400ml. इंजन में डालें।



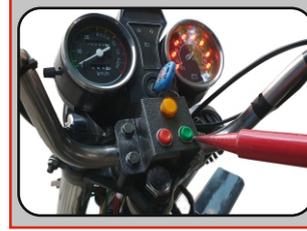
- फ्यूल टैंक में पेट्रोल डालें, पेट्रोल टी को ऑन करें, फिर ई-रिक्शा की एमसीबी ऑन करें।



Petrol T

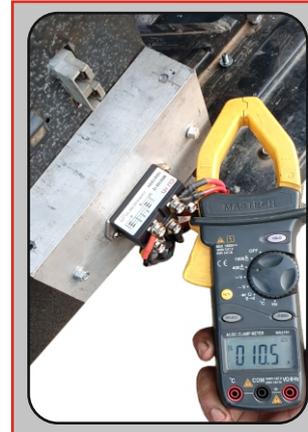
ई-रिक्शा पर चार्जर फिट करने की विधि

- चार्जर स्टार्ट करने के लिए कंट्रोल पैनल पर ग्रीन बटन प्रेस करें। चार्जर बंद करने के लिये, लाल बटन दबायें।



(b) चार्जिंग करंट (एम्पीयर) सेटिंग

- खड़ी रिक्शा पर टॉंग टेस्टर से चेक करने पर 10 से 11 एंपियर आने चाहिए, नहीं तो कार्बेटर पर इस स्क्रू को टाइट करें। एंपियर बढ़ाने के लिए स्क्रू को टाइट करें तथा एम्पीयर कम करने के लिए स्क्रू को एंटी क्लॉक वाइज घुमाकर लूज करें।



ई-रिक्शा पर चार्जर फिट करने की विधि

- एक्सीलेटर लेने पर टोंग टेस्टर पर 22 एंपियर से 25 एंपियर तक शो होना चाहिए, रनिंग गाड़ी में करंट एडजेस्ट करने के लिए इस गवर्नर स्पीड स्कू को टाइट करें । एंपियर बढ़ाने के लिए स्कू को टाइट करें तथा एम्पीयर कम करने के लिए स्कू को एंटी क्लॉक वाइज घुमाकर लूज करें ।



(c) ड्राइवर सीट फिटिंग

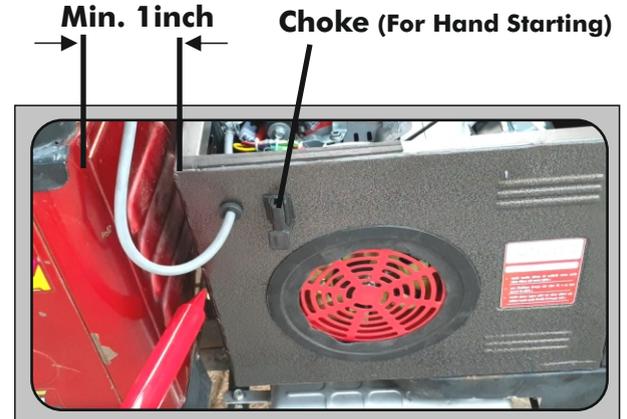
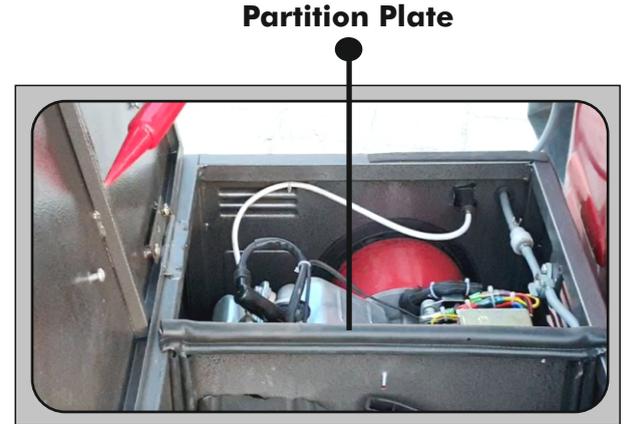
- ड्राइवर सीट के कब्जों को सीट से अलग कर दें। ड्राइवर सीट को चार्जर बॉक्स के टॉप कवर के साथ 6 मेटल स्कू के साथ कस दें।



ई-रिक्शा पर चार्जर फिट करने की विधि

नोट :

- चार्जर बॉक्स फिट होने पर यह सुनिश्चित कर लें की चार्जर की बीच के पार्टिशन प्लेट ड्राइवर सीट के साथ अच्छे से सील होनी चाहिए। इस पार्टिशन से बॉक्स गरम तथा ठंडा, दो हिस्सों में बंट जाता है। इंजन को ठंडी हवा मिलती है तथा गर्म हवा निकलती है।
- चार्जर की गर्म हवा बाहर निकले हेतु चार्जर बॉक्स को पीछे के सीट बॉक्स से कम से कम 1 इंच की दूरी पर लगायें।



सामान्य प्रश्न (FAQ) व समाधान तथा सावधानियां

1. हरा बटन प्रेस करने पर चार्जर में कोई हलचल व आवाज नहीं : ?
बैटरी खराब है या एमसीबी ऑफ है ।
2. हरा बटन प्रेस करने पर, इंजन घूमता है, परंतु स्टार्ट नहीं होता : ? टैंक में पेट्रोल चेक करें ।
3. हरा बटन प्रेस करने पर इंजन स्टार्ट होकर बंद होता है, पन्नेल पर पीली लाइट जलती है, : ?
इंजन में ऑयल कम है, इंजन ऑयल पूरा करें ।
- 4 (a) चार्जर स्टार्ट होकर, कुछ ही समय में बंद होता है : ?
यदि मीटर में सभी बैटरी एल इ डी (LED) इंडिकेटर जल रहे हैं, तो समझे बैटरी पूरी तरह चार्ज है, इसलिए चार्जर अपने आप बंद हो रहा है ।
- 4 (b) यदि चार्जर अपने आप से स्टार्ट – स्टॉप (या अप–डाउन) हो रहा है : ?
ऐसे में बैटरी को चेक करवाएं कोई एक बैटरी खराब हो सकती है ।
5. बैटरी की लाइफ हेतु, इसमें पानी का विशेष ध्यान रखें ।
6. चार्जर की लाइफ हेतु, 100 घंटे चल जाने पर इंजन ऑयल बदलें तथा एयर फिल्टर साफ करें ।



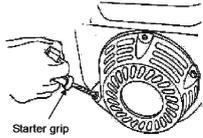
- बिना बैटरियां लगायें, हाथ से खींच कर, चार्जर कभी भी स्ट्रट ना करें ।
- पीले तार को बैटरी के 12 वोल्ट टर्मिनल पर लगाने के बाद ही चार्जर स्ट्रट करें ।

उपरोक्त नियमों का उल्लंघन करने पर चार्जर का इलेक्ट्रॉनिक स्टार्टर तुरंत खराब हो जायेगा

चार्जर बंद करने की विधि

- पहले लाल बटन दबा कर चार्जर को बंद करें ।
- फिर तत्पश्चात ई-रिक्शा का MCB "OFF" करें ।

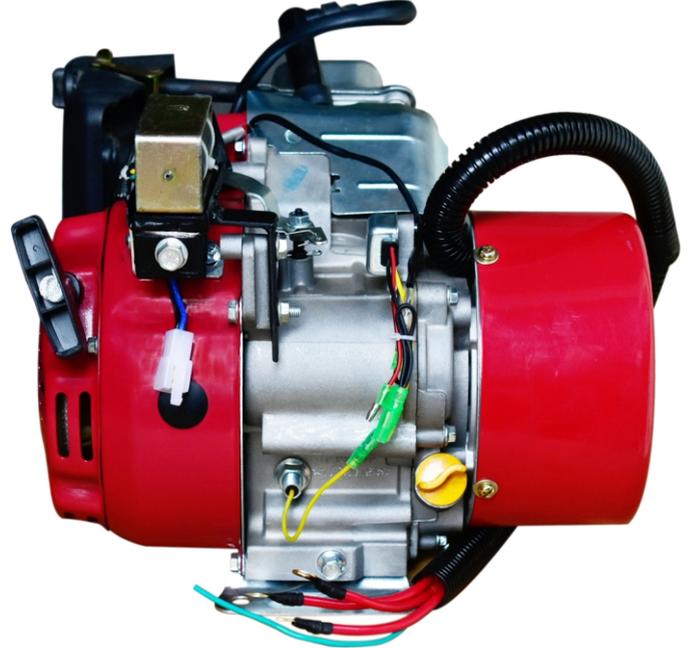
GE 1400- GENERATOR-1.2 KW



हाथ से स्टार्ट
करने की विधि

यदि कभी सेल्फ स्ट्रार्ट खराब हो, तो रिकॉइल हेन्डल
खींच कर स्टार्ट करें।

- पहले ई-रिक्शा की MCB "ON" करें। फिर चार्जर बॉक्स के दाहिनी तरफ लगी चोक लीवर को ऊपर खींचे।
- अब रिकॉइल हेन्डल को जोर से 1-2 बार झटके से खींचे।
- चार्जर इंजन स्ट्रार्ट होने पर चोक लीवर को वापिस पहले वाली स्थिति में Push करें।



S. No.	Model : Genset / Engine / Alternator	Test Requirement	Certificate No.	Authorized Govt. Lab.
1	Petrol Engine HM 156 P (Used in Genset GE 1400 R)	CPCB II Emission Norms - 2013	ICAT/MoEFCC/ PGCOP/HPM-F-HM 170P/N-1370 Dt. 05.07.2018	ICAT Manesar
2	Petrol Genset GE 1400 R	CPCB II Sound Norms 2013,< 72 Db from 1Meter	CT0NN0085 Dt. 27.12 2018	ICAT Manesar
3	Petrol Engine HM 156 P (Used in Genset GE 1400 R)	Life Test & fuel Consumption as Per IS: 7347-1974	TT-033 Dt. 09.02.2018	NSIC Rajkot
4	Alternator (Used in Genset GE 1400 R)	Winding Temp. rise & Electrical Performance Test as per IS 12824 : 1989 /IS 4722 : 2001 & Standard	C0569 Dt. 29.03.2017	ERTL Okhla New Delhi

SAFETY PRECAUTIONS

1. ENGINE SAFETY

IMPORTANT SAFETY INFORMATION

Most accidents with engines can be prevented if you follow all instructions in this manual and on the engine. Some of the most common hazards are discussed below, along with the best way to protect yourself and others.

Owner Responsibilities

The engines are designed to give safe and dependable service if operated according to instructions. Read and understand this owner's manual before operating the engine. Failure to do so could result in personal injury or equipment damage. Know how to stop the engine quickly, and understand the operation of all controls.

Never permit anyone to operate the engine without proper instructions. Do not allow children to operate the engine. Keep children and pets far away from the area of operation.

Refuel With Care

Gasoline is extremely flammable, and gasoline vapor can explode. Refuel outdoors, in a well-ventilated area, with the engine stopped. Never smoke near gasoline, and keep other flames and sparks away. Always store gasoline in an approved container. If any fuel is spilled, make sure the area is dry before starting the engine.

Hot Exhaust

The muffler becomes very hot during operation and remains hot for a while after stopping the engine. Be careful not to touch the muffler while it is hot. Let the engine cool before storing it indoors.

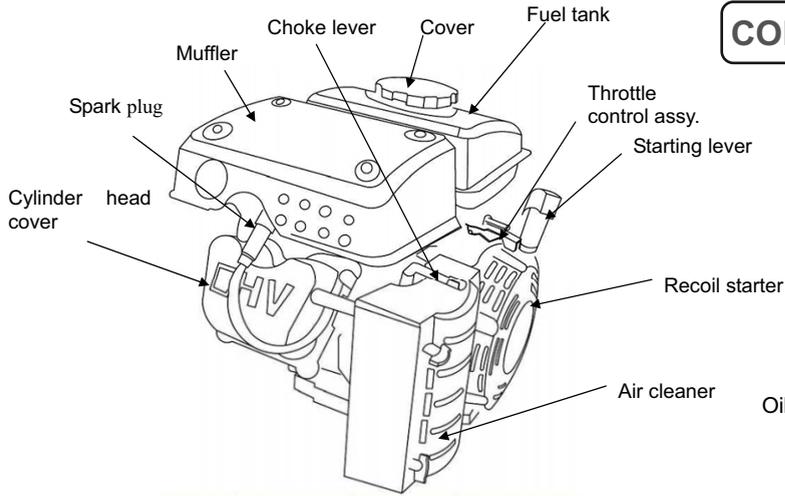
To prevent fire hazards and to provide adequate ventilation for stationary equipment applications, keep the engine at least 3 feet (1 meter) away from building walls and other equipment during operation. Do not place flammable objects close to the engine.

Carbon Monoxide Hazard

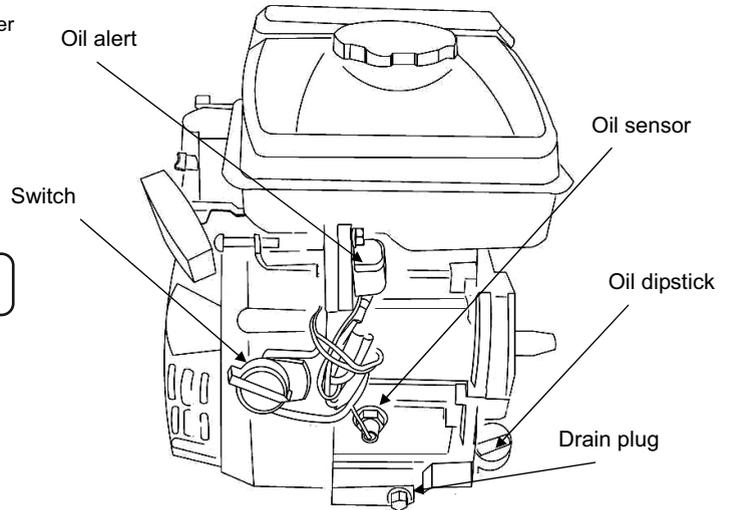
Exhaust gas contains poisonous carbon monoxide. Avoid inhalation of exhaust gas. Never run the engine in a closed garage or confined area.

PRE-OPERATION CHECK

COMPONENTS & CONTROL LOCATIONS



COMPONENTS & CONTROL LOCATIONS

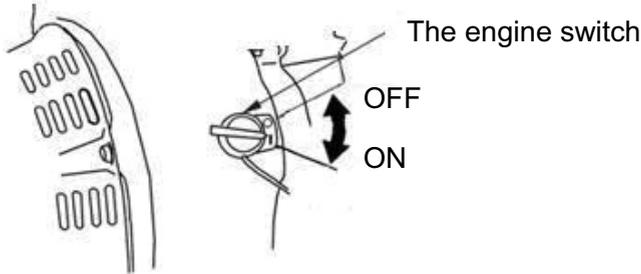


CONTROLS

3. CONTROLS

1) Engine Switch

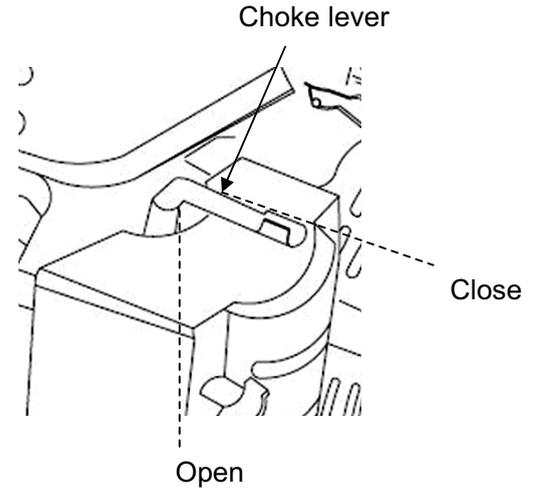
The engine switch enables and disables the ignition system. The engine switch must be in the ON position for the engine to run. Turning the engine switch to the OFF position stops the engine.



2) Choke Lever

The choke lever opens and closes the choke valve in the carburetor.

Set lever "CLOSE" for starting a cold engine. After starting, set the choke lever to "OPEN" position



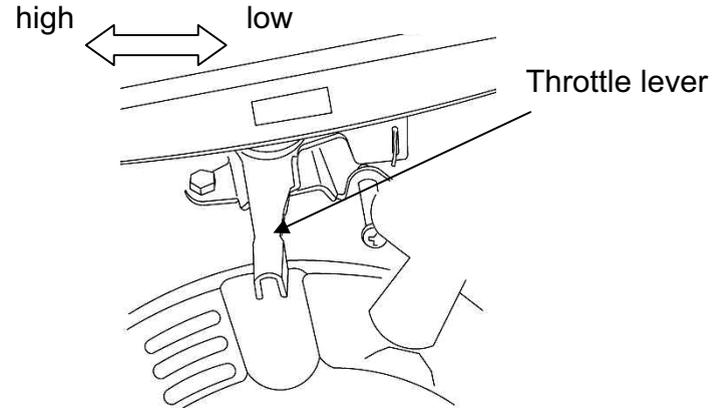
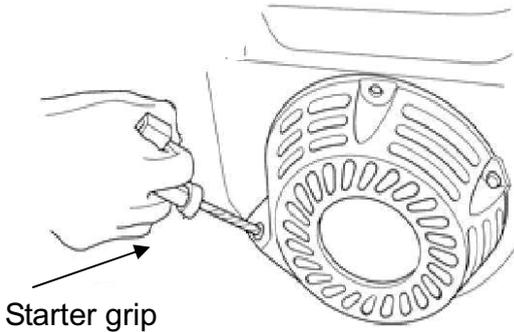
3) Recoil Starter Grip

Pulling the starter grip operates the recoil starter to crank the engine.

CAUTION

Don't let the lever suddenly rebound, lightly put the lever back.

CONTROLS



4) Governor lever

Adjust the throttle lever position to get required speed. For proper engine speed, refer to indication provided by equipment.

when oil lowering lower limit, the oil protecting system will automatically make the engine stopping.(engine still keep the "OPEN" position.)

5) Oil protecting system

The oil protecting system is used for preventing from oil insufficiency in the crankcase,

CAUTION

If automatically stopping and not starting, first, check the oil lever, then, check other trouble.

CHECK BEFORE OPERATION

4. CHECK BEFORE OPERATION

1) Check

Look around and underneath the engine for signs of oil or gasoline leaks.

Look for signs of damage.

Check that all shields and covers are in place, and all nuts, bolts, and screws are tightened.

2) Check oil

CAUTION When stopping the engine at horizontal place, check the oil

- 1) Take the oil dipstick and clean
- 2) Insert the oil dipstick in and check the oil level without screwing down.
- 3) If the oil is too low, add the recommended oil in.
- 4) After finishing, reassemble and screw the oil dipstick down.

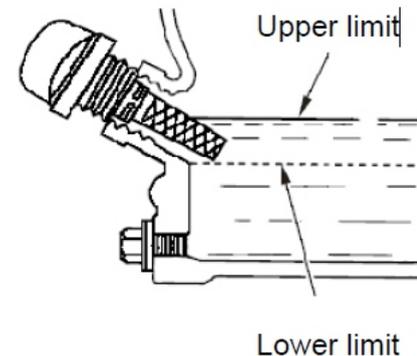
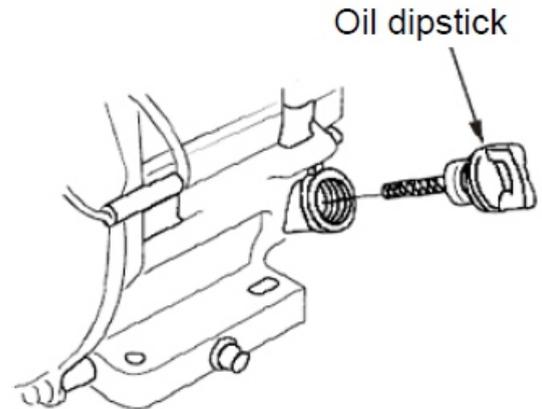
The Oil Alert system (applicable engine types) will automatically stop the engine before the oil level falls below safe limits. However, to avoid the inconvenience of an unexpected shutdown, always check the engine oil level before startup.

3) Check fuel

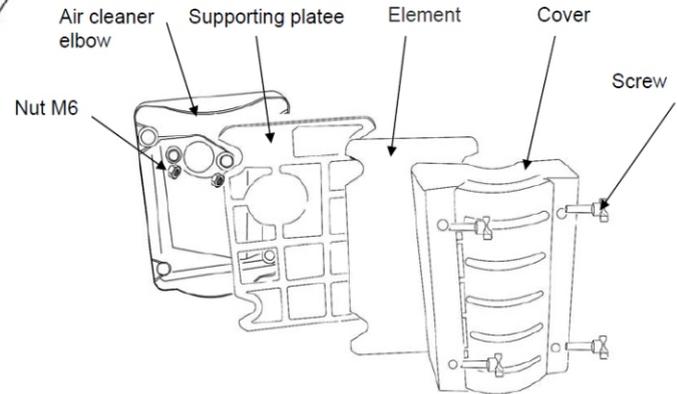
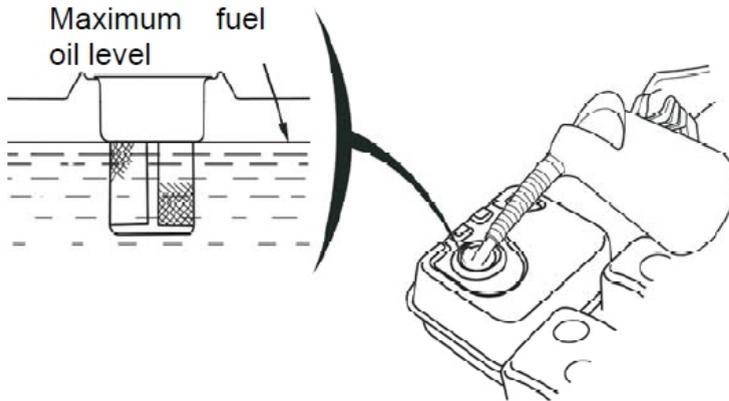
First stop the engine, open the fuel cover, and check oil level. If the oil level is too low, add the fuel to full, after finishing, screw the fuel cover down.

Don't add the fuel over the shoulder of the carburetor when fueling (maximum oil level).

Fuel tank volume: 154F: 1.6 L



CHECK BEFORE OPERATION



Recommended octane rating over 90 unleaded gasoline

For unleaded gasoline, can make carbon deposit muck less and enhance exhaust system service life

Don't use used and contaminated or gasoline with oil , Avoid the dirt and water entering into fuel tank.

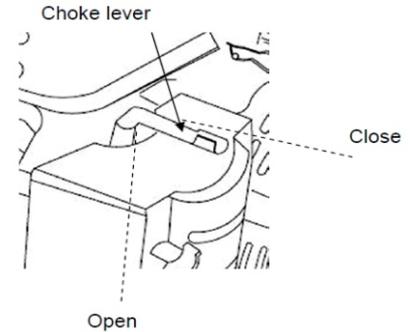
4) Check air cleaner

Remove the air cleaner housing and check the element, if the element dirt, clean it, if damaged, renew.

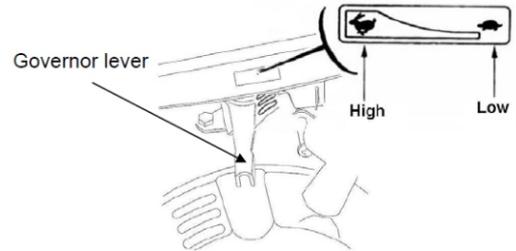
STARTING ENGINE

5. Starting engine

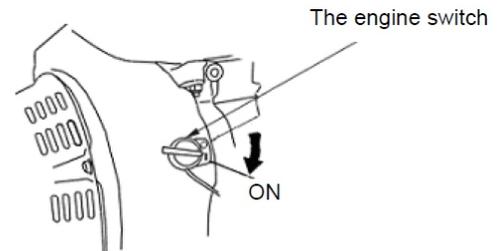
1) To start a cold engine, move the choke lever to the "CLOSE" position. To start a warm engine, turn the choke lever to the "OPEN" position.



2) Move the throttle lever away from the "LOW" position, about 1/3 of the way toward the "HIGH" position.



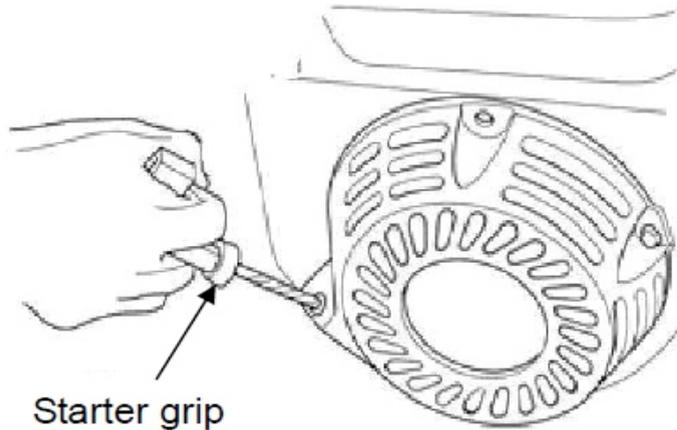
3) Turn the engine switch to the "ON" position.



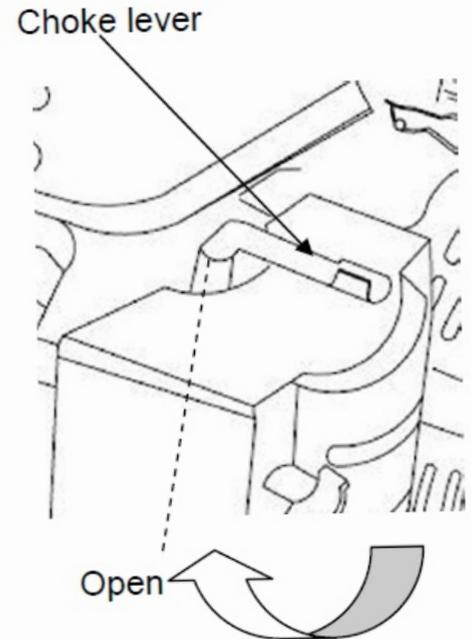
STARTING ENGINE

4) Pull the starter grip lightly until you feel resistance, then pull briskly.

CAUTION Don't let starting lever suddenly rebound, and lightly put the lever back.



5) If the choke lever has been moved to the "CLOSE" position to start the engine, gradually move it to the "OPEN" position as the engine warms up.



STOPPING THE ENGINE

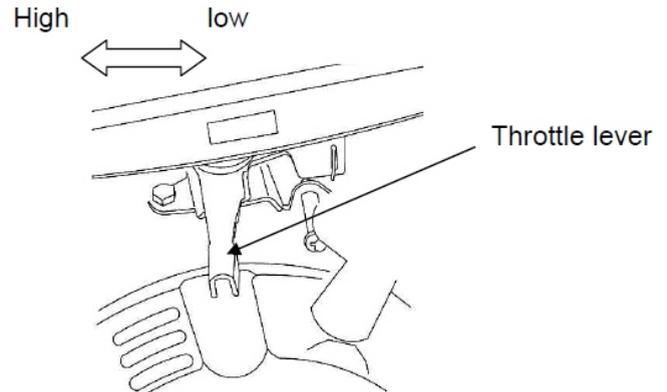
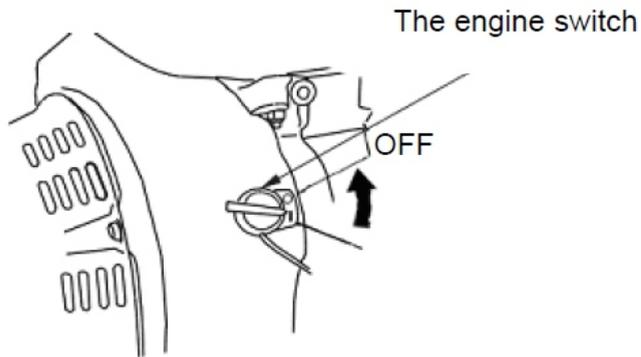
6. STOPPING THE ENGINE

To stop the engine in an emergency, simply turn the engine switch to the "OFF" position.

Under normal conditions, use the following procedure.

1). Move the throttle lever to the "LOW" position.

2) Turn the engine switch to the "OFF" position.



MAINTENANCE

7. MAINTENANCE

SCHEDULE

REGULAR SERVICE PERIOD		Each use	First month or 20 Hrs.	Every 3 months or 50Hrs.	Every 6 months or 100Hrs.	Every year or 300Hrs.
Engine oil	Check level	○				
	Change		○		○	
Air cleaner	Check	○				
	Clean			○(1)		
	Replace					
Sediment	Cup Clean				○	
Spark plug	Clean				○	Replace
Valve clearance	Check-Adjust					○(2)
Cover comp head	Clean			After every 300 Hrs. (2)		
Fuel tank and fuel filter	Clean			Every 2 years (Replace if necessary) (2)		
Fuel line	Check			Every 2 years (Replace if necessary) (2)		

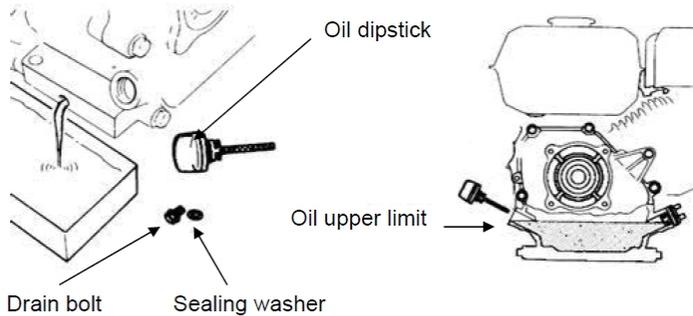
1. Service more frequently when used in dusty areas.
2. These items should be serviced by your servicing dealer unless you have the proper tools and are mechanically proficient.

RENEWING ENGINE OIL

Drain the used oil while the engine is warm. Warm oil drains quickly and completely.

1. Place a suitable container below the engine to catch the used oil, and then remove the pad and dipstick and the drain plug.
2. Allow the used oil to drain completely, and then reinstall the drain plug and pad, and tighten it securely. Please dispose of used motor oil in a manner that is compatible with the environment. We suggest you take used oil in a sealed container to your local recycling center or service station for reclamation. Do not throw it in the trash; pour it on the ground; or down a drain.
3. With the engine in a level position, fill to upper limit with the recommended oil.

MAINTENANCE



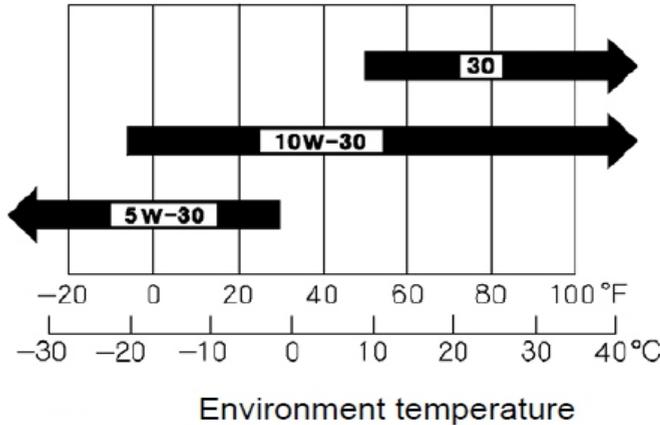
4) Assembling oil dipstick and screwing down
Recommended oil:

Use 4-stroke automotive detergent oil.
We recommend that you use API SERVICE
Category SE or SF oil or equivalent to SG
grade SAE 10W-30.

You can use this brand oil if your area
temperature list within some brand oil
temperature range

MAINTAINING AIR CLEANER

A dirty air filter will restrict air flow to the
carburetor, reducing engine performance.
If you operate the engine in very dusty areas,
clean the air filter more often than specified
in the MAINTENANCE SCHEDULE.



NOTICE

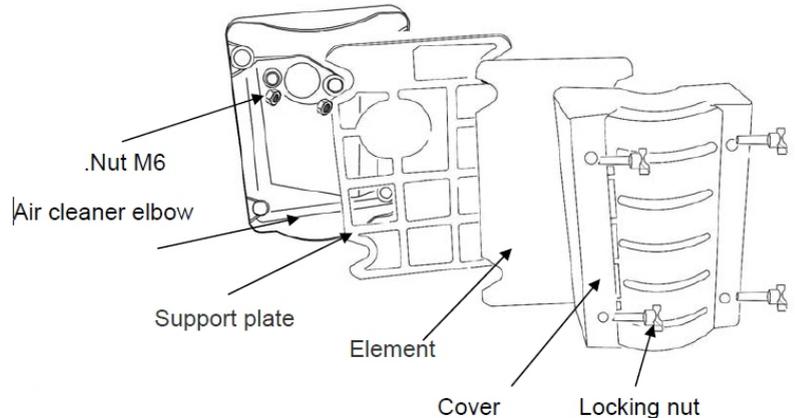
Operating the engine without element or with
a damaged element will allow dirt to enter
the engine, causing rapid engine wear.

Engine oil capacities :
LC154F: 0.35 L

MAINTENANCE

Air cleaner

1) Screw off air cleaner bolt and remove the cover.



2) Remove foam element

Check element and renew if damaged.

Wash foam element?

Wash the cover and filter in warm, soapy water, rinse, and allow drying thoroughly. Or clean in nonflammable solvent and allow drying. Dip in clean engine oil, and then squeeze out all excess oil.

1. Empty the used oil from the air cleaner case, wash out any accumulated dirt with nonflammable solvent, and dry the case.

3) Clean the air cleaner I, cover and rubber gasket, preventing dust entering into carburetor.

4) Reassemble the foam element, paying attention to rubber gasket underneath the element.

5) Reassemble the air cleaner, and tighten the wing nut securely.

WASHING SEDIMENT CUP

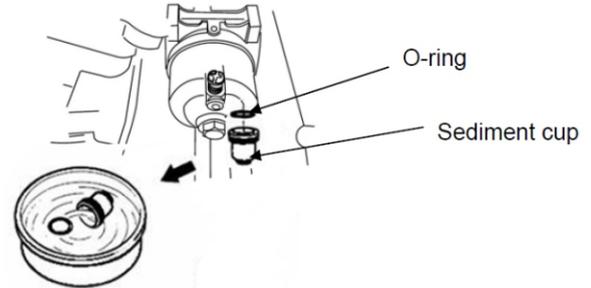
(First check fuel tank for fuel, if having, drain the fuel in the fuel tank completely.)

1. Remove the fuel sediment cup and O-ring.

2. Wash the sediment cup and O-ring in nonflammable solvent, and dry them thoroughly.

MAINTENANCE

3. Place the O-ring in the fuel valve, and install the sediment cup. Tighten the sediment cup securely.
4. Move the fuel valve to the ON position, and check for leaks. Replace the O-ring if there is any leakage.



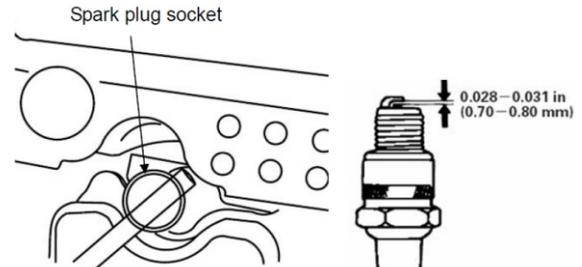
SPARK PLUG

Recommended spark plugs: E7RTC or other equivalents.

NOTICE

An incorrect spark plug can cause engine damage.

1. Disconnect the spark plug cap, and remove any dirt from around the spark plug area.
2. Remove the spark plug with a spark plug wrench.
3. Inspect the spark plug. Replace it if the electrodes are worn, or if the insulator is cracked or chipped. The gap should be 0.028 -0.031 in (0.70 - 0.80 mm). Correct the gap, if necessary.



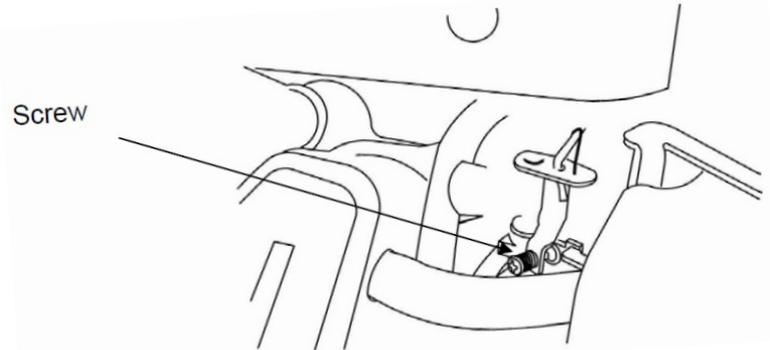
MAINTENANCE

4. Install the spark plug carefully, by hand, to avoid cross-threading.
5. After the spark plug seats, tighten with a spark plug wrench to compress the water.
If reinstalling the used spark plug ?tighten 1/8 - 1/4 turn after the spark plug seats.
If installing a new spark plug, tighten 1/2 turn after the spark plug seats.
6. Assemble spark plug.

ADJUSTING IDLE SPEED

1. Start the engine outdoors, and allow it to warm up to operating temperature.
2. Move the throttle lever to its slowest position.
3. Turn the idle speed screw to obtain the standard idle speed.

Standard idle speed: 1,800±150 rpm



STORING YOUR ENGINE

8. STORING YOUR ENGINE

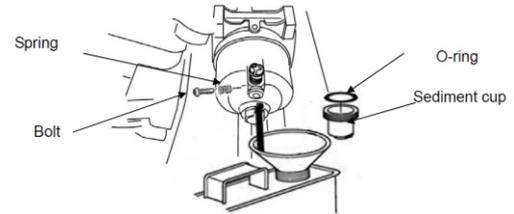
If the engine has been running, allow it to cool for at least half an hour before cleaning.

Clean all exterior surfaces, repair any damaged paint, and coat other areas that may rust with a light film of oil.

CAUTION

Water with big pressure can enter into air cleaner and muffler and even into cylinder along with air path, resulting in causing rust and water spatter on the hot engine to damage engine, so don't wash engine until the engine is cooled.

- 1) Place a container underneath the carburetor, and use funnel for oil not spattering, close fuel cock.
- 2) Remove the drain plug and sediment cup, then, open the fuel cock.



- 3) Immediately reassemble sediment cup and drain bolt after fuel completely draining. And screw down.
- 4) Change the engine oil.
- 5) Remove the spark plugs.
- 6) Pour a tablespoon (5-10 cc) of clean engine oil into the cylinder.
- 7) Pull the starter rope several times to distribute the oil in the cylinder.
- 8) Reinstall the spark plugs.
- 9) Pull the starter rope slowly until resistance is felt. This will close the valves so moisture cannot enter the engine cylinder. Return the starter rope gently.
- 10) Put the out case on the engine and place in the ventilated and dry area.

TROUBLESHOOTING

1) Starting difficult

Phenomenon	Possible Cause			Correction	
Cylinder pressure normal	Spark plug normal	Fuel system abnormal	Oil path unpassing	No fuel, oil cock closed	Add fuel, open the oil cock
				Air hole clogged	Clean clogged
				Oil cock clogged	wash
				Main jet adjusted not well, or clogged	Readjust, wash and blow
				Needle valve or float blocked.	Repair or renew
			Oil path passing	Fuel too dirt or deteriorated	Renew fuel or clear carburetor
	Water in the fuel	Renew fuel and clean carburetor			
	Too much fuel in the cylinder	Drain fuel and clean spark plug			
	Fuel system normal	Spark normal	Spark plug poor	Wrong fuel	Change fuel
				Carbon deposit and dirt electrode	Clean carbon deposit and dirt
				Damaged insulator	Renew spark plug
				Electrode burn through.	Renew spark plug
		Spark normal	No spark	Wrong gap	Adjust gap
				High tension coil damaged	Renew high tension coil
Igniter coil damaged				Renew high tension coil	
Magnetic field strength not enough				Charge magnetic or renew	
Cylinder pressure abnormal	Fuel system normal	Igniter normal	Spark plug normal	Piston ring worn or broken.	Renew
				Ring cementation	Clean carbon deposit
				No washer or not tightening	Add washer or tighten
				Leaking from joint	Renew gasket
				valve sealing poor	Lap or renew

TROUBLESHOOTING

Phenomenon	Possible Cause		Correction	
When increasing throttle speed up or slowly speed down or stop the engine	Ignition system	Ignition time not right	Replace ignition coil	
		Fuel system	Fuel path with air	Exhaust air
	Wrong adjustment of main jet		Readjustment	
	Needle valve and main jet clogged		Clean and blow	
	Oil cock clogged		Clean or replace	
	Carbon deposit in the combustion chamber		Clean carbon deposit	
	Intake system		Air cleaner clogged	Clean or replace
		Intake system clogged	Repair or replace	
	Compression poor	Piston, cylinder piston ring worn	replace	replace
			Leakage between cylinder and cylinder head	Replace cylinder head gasket
Valve gap not right			Readjustment	
Valve sealing leakage			Grinding or replacement	

3) SUDDENLY STOP THE ENGINE

Phenomenon	Possible Cause		Correction
Suddenly stop in running	Fuel system	No fuel	Refuel and pass through
		Carburetor clogged	Check fuel path
		Carburetor float leaking fuel	Repair float
		Needle valve blocked	Repair
	Ignition system	Spark plugs breakdown, carbon deposit short circuit	Replace spark plug
		Spark plug electrode fallen off	Replace spark plug
		High tension line fallen off	Repair and replace
		Ignition coil breakdown	Replace
Others	Serious scuffing and valve fallen off	Repair or replace damaged parts	

TROUBLESHOOTING

Phenomenon	Possible Cause	Correction
Gasoline engine overheating	Ignition time not right	Replace ignition coil
	Gasoline not enough	Refill gasoline
	Exhaust pipe clogged	Clean exhaust pipe
	Guided air shield clogged	Repair
	Air path clogged	Clean air cooling fin
	Cooling fan damaged	Reinstall
	Gas leaking from ring to down	Replace damaged parts
	Gasoline engine speed too high	Check and governor speed system or replace speed gear
	Crankshaft bearings burned	Replace or repair

5) Abnormal sound

Phenomenon	Possible Cause	Correction
Knocking sound	Piston and piston ring worn	Replace damaged parts
	Connecting rod, piston pin and pin hole worn	Replace damaged parts
	Crankshaft bearings worn	Replaces or repair
	Piston rings broken	Replace piston rings
Deflagration and metal sound	Combustion chamber carbon deposit too much	Clean carbon deposit
	Spark plug electrode gap too narrow	Adjust electrode gap
	Engine flooded with fuel	Check carburetor
	Wrong fuel	Replace fuel
	Gasoline engine overheating	Refer to overheated trouble column
Other abnormal sounds	Valve gap adjustment wrong	Readjust valve gap
	Flywheel connection with crankshaft loosen	Replace connecting key and reinstall

WIRING DIAGRAMS

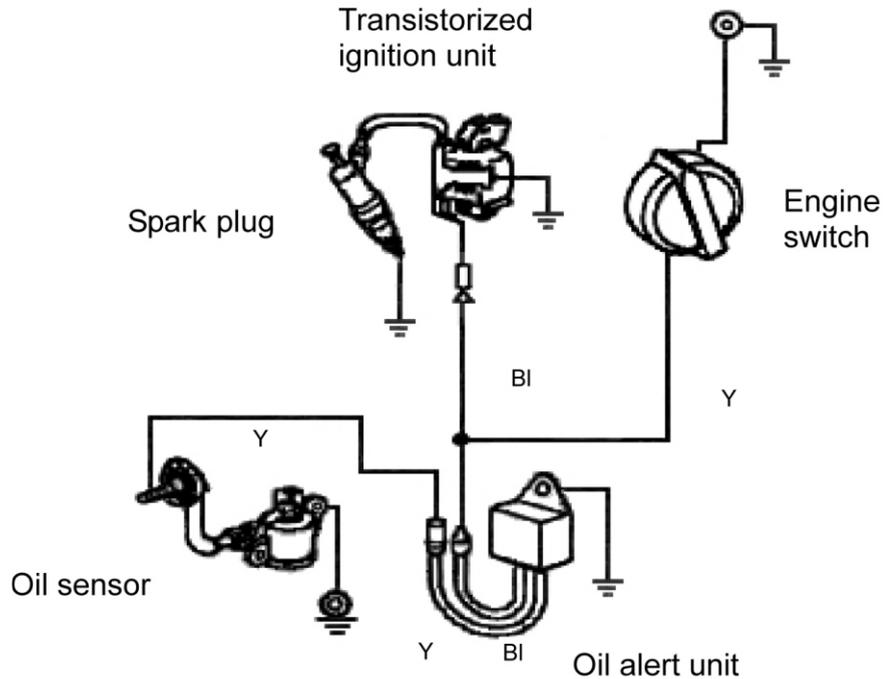
11. WIRING DIAGRAMS

Non-electric starting engine with oil protection system.

Engine switch WIRING

	IG	E	ST	BAT
OFF	○—○			
ON				
START			○—○	

BI	black
Y	yellow
G	green



NOTES

THE ULTIMATE POWER MACHINES



ADDRESS
Authorized Dealer & Service Centre