

ORIGINAL INSTRUCTIONS
THE NH SERIES
GASOLINE ENGINE
OPERATOR'S MANUAL



Read this manual carefully before operation.
This manual includes important guidance for safety operation.

This Manual contains important safety information and operating instruction related to the engine. **Please read this Manual carefully.** Don't follow the instructions will result in property loss, personal injury or even death.

This manual should be perceived as a permanent part of the engine, and should remain with the engine if resold.

Photos and illustrations contained in the Manual are for reference only and may be different from actual conditions.

All information in the Manual is based on the latest product information at the time of printing. The manufacturer reserves the right to change or improve the product and manual at any time without notice and shall assume no responsibility.

It is forbidden to reproduce or copy any information contained in this Manual without written permission.

Please write down the engine serial number and purchase information. Keep the Manual and receipt properly for future use.

Model No.:

Serial number:

Date of Purchase:

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I. Safety Instructions

1. Safety Regulations



Please pay attention to the safety warning signs.

Be in compliance with all safety regulations indicated by the signs could avoid possible personal injury or death.

Safety information is composed of warning signs and corresponding warning words, such as “Danger”, “Warning” or “Caution”.

DANGER

This indicates a hazardous situation, which, if not avoided, could result in property loss, serious injury or even death.

WARNING

This indicates a dangerous situation, which, if not avoided, could result in property loss, serious injury or death.

CAUTION

This indicates a dangerous situation, which, if not avoided, could result in property loss, serious injury.



WARNING

Please read this Manual carefully before operating the engine.

It is forbidden to operate the engine, before you can't fully understand the safety regulations, operating and maintenance instructions contained in the Manual.

Noncompliance with instructions may result in property loss, personal injury or death.

Warning and precautions contained in the Manual can not cover all possible situations. The user shall both acquire the product knowledge unmentioned in the Manual and have cautious operation attitude.

WARNING

It is forbidden to refit the engine or use it for inappropriate purposes.

WARNING

Before each operation, check parts and components for looseness or damage carefully, and observe whether there is engine oil or fuel leakage, or other situations that may influence normal operation. Repair or replace all damaged or defective parts and components in time.

Know all operating control positions and safety sign descriptions.

Ensure that all safety indicators are located at appropriate positions under correct operating state all the time.

No articles shall be obstructed in cooling channels.

Children or untrained persons shall not operate the engine.

The engine is forbidden to be operated under unmanned situation, and it is required to shut down the engine before leaving.

DANGER

Do not tamper with the engine governor.

High operating speed is very dangerous, which will increase the risk of personal injury and equipment damage.

Operating the engine at low speed and high load will reduce the service life of engine.



DANGER

Toxic Smoke

Engine exhaust contains toxic carbon monoxide that is a kind of odorless, colorless and poisonous gas. Indoor operation could cause death.

It is forbidden to use the engine in buildings or other closed environment in any form, and even if doors and windows are open, it is forbidden to use it indoors.

The engine shall be placed at a well-ventilated area. Please consider the wind direction and air flow carefully.



⚠ DANGER

Fire or Explosion

Gasoline is a flammable and explosive material.

Fire or explosion will cause serious burn or death.

When using the engine, keep it away from flammables.

It is required to fill the fuel tank with fuel at a well-ventilated outdoor area and ensure the engine is under stoppage state.

Please wipe off overflowing fuel, and operate the engine after fuel volatilization.

It is forbidden to operate the engine in case of fuel system leakage.

Use appropriate fuel storage devices and treatment measures. Do not store fuel or flammables next to the engine

Please empty the fuel tank before engine storage or transportation.

Please equip fire extinguishers nearby for future fire control.



⚠ WARNING

High-temperature Surface

As operating engine can produce lots of heat, touching high-temperature surface could result in serious burn.

Avoid the contact with high-temperature exhaust.

Do not touch the operating or just stopping engine.

Maintain at least 0.9m space around the engine, to ensure good cooling effect.

Flammable materials may catch fire if it is in contact with high-temperature surface.

Within a range of 1.5 meters, do not store any flammables.

⚠ WARNING

Read the user's manual of the engine-driven equipment to know more about safety rules, engine startup, stoppage and operation, or safety information possibly required by engine operation.



WARNING

Fire

In the process of operation, the engine may produce sparkles and lead surrounding dry articles to catch fire.

The engine muffler may be equipped with no spark extinguisher. It is required to install an approved spark extinguisher when used at the place where flammables exist (for example, crop, forest, grassland or other similar articles).

At some regions, laws and regulations require that the engine shall be provided with spark extinguisher. Please contact with local fire department to acquire relevant laws or regulations on fire protection requirements.



DANGER

Moving Parts

Moving parts may result in serious injury. Keep hands and feet away from moving parts.

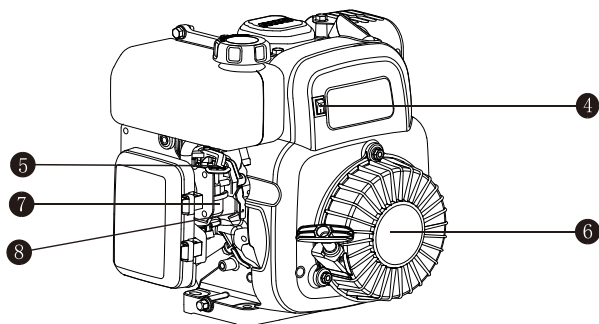
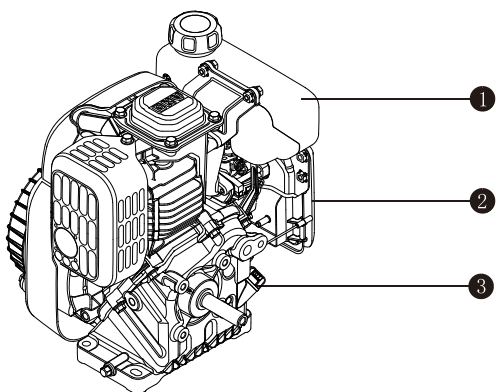
Fingers, hand or body shall not get close to the engine in operation.

It is forbidden to cover or envelop the engine in operation, or remove the protection device which operating.

Moving parts can seize hands, feet, hair and clothes etc and result in traumatic amputation or serious fracture.

Please bind long hair. Do not wear loose and shaking decorations or articles that may be caught by the engine.

II. Feature and Control



- | | |
|------------------------|---|
| ① Fuel tank (optional) | ⑤ Choke lever |
| ② Air filter | ⑥ Recoil starter |
| ③ Oil dipstick | ⑦ Carburetor |
| ④ Engine switch | ⑧ Governor Gear Bracket Assembly (optional) |

III. Operation

1. Inspection Items before Operation

1 Operation Location

It is only applicable to outdoor environment. Clean up the ambient environment of engine.

Please place the engine at a well-ventilated place, and keep track of the wind direction and air flow.

Please place the engine on flat ground before engine operation.



DANGER

Toxic Smoke

Engine exhaust contains carbon monoxide. Indoor operation could cause death.

It is forbidden to use the engine in buildings or other closed environment in any form, even if doors and windows are open.

CAUTION

Even if the carburetor is modified, the engine power will decrease with the increasing altitude. For every increase of 300m, the power will be decreased at about 3.5%. If the carburetor is not modified, the altitude above sea level will have more influences on the power.

CAUTION

Operating the high-altitude carburetor kits at the altitude of lower than 1,500m may cause engine overheating, which result in serious damage to the engine. In case the engine operates at a low altitude, please restore the carburetor to the factory specifications at the distributor.

High altitude

To ensure normal operation of engine at a high altitude, carburetor may be equipped with

high-altitude kits. If the engine is always used at the altitude of more than 1,500m, for high altitude kits information, please consult local distributor.

2 Operating Condition

Check parts and components for looseness or damage, and

check engine oil or fuel for leakage or other situations that may influence normal operation of engine. Repair or replace all damaged or defective parts and components in time.

WARNING

Before engine operation, it is required to correct discovered problems. Otherwise, such problems could result in property loss, serious personal injury or death.

Remove the dirt or foreign materials on engine surface, especially muffler and recoil starter.

Refer to the user's manual of equipment driven by the engine. In the process of operation, do not exceed the maximum limit range of engine. For details, see the table of specifications.

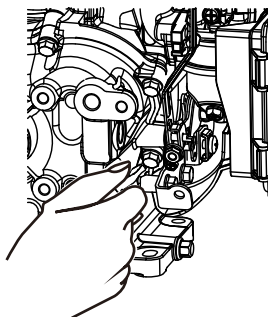
3 Engine Oil

Place the engine on flat ground, and shut down the engine.

Screw off oil dipstick, and clean it.

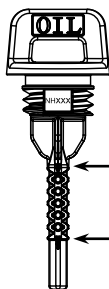
Insert the oil dipstick into the oil filler, and stay at the filler neck. Do not screw the oil dipstick

into the oil filler.



Remove the oil dipstick

Remove the oil dipstick again, and check the engine oil quantity. The engine oil quantity shall reach the position above the lower limit of oil dipstick.



Oil dipstick scale

If the engine oil is too little, fill the recommended engine oil until the oil reaches the upper limit.

Tighten the oil dipstick again.

Know more information about **Filling the Engine Oil** in the chapter of **Maintenance**.

Engine oil quantity (rated):
see parameter.

⚠ WARNING

Before delivery, the engine is not filled with oil. Before it is filled with engine oil of recommended grade and quantity properly, any attempt to rotate crankshaft or start engine could result in permanent damage to the engine and product warranty invalidation.

⚠ WARNING

Engine oil is an important factor with influences on performance and service life. Please use four-stroke engine oil recommended in the chapter of Maintenance.

4 Engine Fuel

After the engine stops, check the fuel quantity. If necessary, please fill the fuel.

⚠ CAUTION

A certain pressure will come into being due to gasoline volatilization in fuel tank. Before fuel tank cap is removed, please cool down the engine for at least

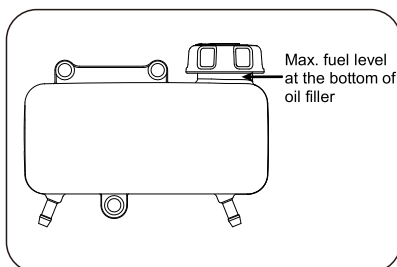
2 minutes. Unscrew the fuel tank cap slowly to decrease the pressure in tank.

Use fresh and clean unleaded gasoline.

Do not mix engine oil with fuel.

Ensure the fuel level does not exceed the upper limit mark, so as to reserve volatilizing space for gasoline.

Fuel quantity (rated):
see parameter.



⚠ DANGER

For the fuel filled into fuel tank, the fuel level shall not exceed the upper limit. Overfilling could result in unstable engine operation or even flameout, damage to carbon canister (if equipped), and invalidation of product warranty.



WARNING

Fire or Explosion

Gasoline is a flammable and explosive material.

When using the engine, keep it away from any flammable.

Do not fill the fuel tank indoors, or in the case of engine operating or under high temperature condition.

It is required to fill the fuel tank at a well-ventilated outdoor area and ensure the engine under stoppage state.

After filling, wipe off all overflowing fuel. Periodically check the fuel system for damage or leakage. It is forbidden to operate the engine, in case of fuel system leakage.

Use appropriate fuel storage devices and treatment measures. Do not store fuel or flammables nearby.

Please equip fire extinguishers nearby for future fire control.

Don't use engine or carburetor detergent in fuel tank.

Otherwise, it could cause permanent damage. It is very important that preventing the colloid in fuel system parts and components (for example, carburetor, fuel filter, fuel pipe or tank) from depositing in the process of storage and transportation in addition, experience shows, in the process of storage and transportation, alcohol blend fuel (so-called alcohol blended fuel, including ethanol or methanol) could absorb water, which lead to the decompose of fuel and generate methanol.

Acidic fuel can damage the fuel system of the generating set while in storage. Be sure to review the instructions given in "Storage" section.

Gasoline/alcohol blended fuel: It is permitted to use the fuel of which volume ratio is 10% alcohol and 90% unleaded gasoline. It is forbidden to use the gasoline/alcohol fuel of other mixing ratios.

The warranty does not cover the damage caused by deteriorated fuel, ineffective fuel or polluted fuel.

CAUTION

In order to reduce the colloid deposit in fuel system as far as possible and to ensure the startability, please do not use the remaining fuel after last usage.

5 Equipment Inspection

Inspect the equipment driven by the engine. Before engine startup, please read the operator's manual provided by the equipment manufacturer, to know relevant safety measures and usage information to be observed.

WARNING

The design and manufacture of the engine have specific application range. Do not tamper with the engine or use it beyond the design scope. If you have any doubt about specific application range, please consult local distributor.

2. Starting the Engine

1

Implement the Inspection Items

before Operation (see Page 6).

2

Please close the manual choke valve before cold startup (open the manual choke valve after operating time $\geq 3\text{min}$).

3

Recoil starter

WARNING

Before usage, please check the starter cable. If the cable is worn seriously, please replace it at a local authorized distributor.

To start up the engine, hold the recoil starter handle and pull it slowly, until you feel resistance force. And then pull it rapidly to start the engine up.



WARNING

Backlash

In the process of rapid backing, recoil starter could pull hand and arm toward the engine at a higher speed than operating.

If no precautions were taken, this could result in trauma, bruise, sprain or fracture.

After startup, restore the choke valve to ON position.

3. Switching off the Engine

1

If possible, unload the engine.

2

Operating the engine for several minutes under no-load state, so as to stabilize the internal temperature of engine.

3

Close the kill switch (place the switch at OFF position).

4

Turn the fuel switch to OFF position, if provided.

IV. Maintenance

The user is responsible for timely completing all engine maintenance tasks. Before engine operation, please correct all existing problems. Observe the inspection, maintenance advices and period information contained in the Manual.

CAUTION

The filter element may contains PAHs, PAHs are harmful for your health. Please wear gloves for protection during air filter maintenance.



DANGER

Unexpected startup could result in serious personal injury or death. Before any maintenance, remove the spark plug cap and conduct grounding.

⚠ WARNING

Improper maintenance or failure to remedy problems could result in fault and property loss, serious personal injury or death.

Improper maintenance action could result in warranty invalidation.

1. Maintenance Period

Before maintenance, switch off the engine, disconnect all loads and batteries (if equipped), and cool down the engine completely.

Observe the maintenance intervals specified in the following table. When the engine is operating under extreme conditions, please increase the maintenance frequency. If users need the help in engine maintenance, please contact local distributor.

		Before each use	After 5 h or the first month ²	After 25h or every three months ²	After 50 h or every six months ²	After 100h or every year ²
Engine oil	Check	√				
	Replace		√		√	
Air filter	Check	√				
	Clean			√ ³		
Spark plug	Check / adjust				√	
	Replace					√

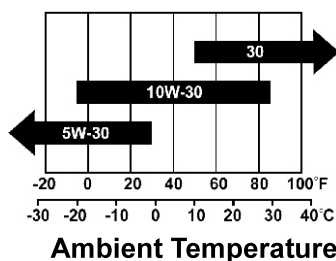
		Before each use	After 10h or the first month ²	After 50h or every three months ²	After 100h or every six months ²	After 300h or every year ²
Spark extinguisher ¹	Clean				√	
Idling	Check / adjust					√ ⁴
Valve clearance	Check / adjust					√ ⁴
Carbon canister ¹	Check	Every two years ⁴				
Low permeability oil pipe ¹	Check	Every two years ⁴				
Oil pipe	Check	Every two years ⁴				

1. For applicable model.
2. Before use in every season or after corresponding hours (whichever comes first).
3. Under dusty and extreme conditions, increase the maintenance frequency appropriately.
4. Only experienced users or authorized distributors are permitted to complete the work.

2. Routine Maintenance

Engine Oil

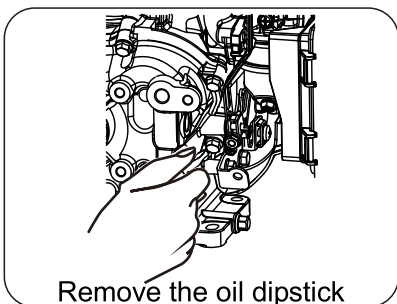
Under normal conditions, it is always recommended to use SAE 10W-30 within a full-temperature range. In accordance with actually-applied average ambient temperature and the information shown in the diagram, choose the engine oil having different viscosity.



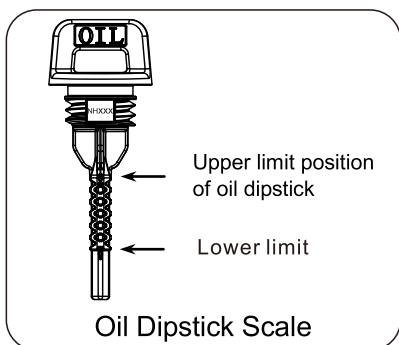
Engine oil quantity (rated):
see parameter.

Fill the Engine Oil

1. Place the engine on flat ground.
2. Remove and clean the oil dipstick.



3. Fill the recommended engine oil, until the oil reaches the upper limit.



⚠ CAUTION

Inspection of Filling Scale

Insert the oil dipstick into the oil filler again, and stay at the filler neck. Do not screw the oil dipstick into the oil filler.

4. Tighten the oil dipstick completely.
5. Please use approved waste engine oil recovery equipment for used oil disposal.

Replace the Engine Oil

⚠ CAUTION

Replace the engine oil when the engine is under heating state.

1. Place the engine on flat ground.
2. Clean the area around oil dipstick and oil drain plug.
3. Remove the oil dipstick.
4. Remove the oil drain plug, and drain off engine oil.
5. Replace and tighten the oil drain plug securely.
6. Fill the recommended engine oil, until the oil reaches the upper limit (see the above-mentioned "Filling the Engine Oil").
7. Tighten the dipstick completely.
8. Please use approved waste engine oil recovery equipment for used oil disposal.

⚠ WARNING

The engine is not filled with oil before delivery, Before filled with engine oil of recommended grade and quantity, any engine operation could result in damage to the engine and the warranty invalidation at same time.

Air Filter

1. Screw off air filter cover.



2. Remove the foam/paper element.
3. Paper filter element: Remove the internal impurities of paper filter element (do not wash, soak or destroy its structure);

Foam filter element: Clean the foam filter element in liquid detergent and hot water, and then wrap it with a piece of clean cloth and extrude water, for the purpose of complete dryness. Dip it in clean engine oil. Finally, wrap it with a piece of clean absorbent cloth, and extrude excessive engine oil.

4. Reinstall the filter element into assembly.
5. Replace the air filter cover,

and then install the air filter.

WARNING

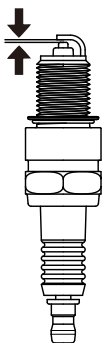
Do not operate the engine without air filter. Otherwise, it could result in damage to the engine.

Spark Plug

1. Clean the spark plug cap, and remove the dirt at the bottom of spark plug.
2. Remove the spark plug cap.
3. Use spark plug socket to loose and remove the spark plug.
4. Observe the spark plug and spark plug gasket. If they are damaged or worn, please replace them with new ones. If it is required to reuse them, clean them with a steel wire brush.
5. Inspecting the spark plug gap. If necessary, please bend one of the electric shock ends carefully to adjust the gap.

Spark plug gap: 0.6mm - 0.8mm.

0.6mm - 0.8mm



Check spark plug gap

6. Screw the spark plug into the engine carefully with hands.
7. After the spark plug is fixed, tighten it with special socket for spark plug.

Spark plug tightening torque: 20-25 N.m

8. Install the spark plug cap on the spark plug, so that spark plug cap is connected with spark plug.

⚠ WARNING

Use the recommended or equivalent spark plug. Do not use the spark plug having an improper heat value range.

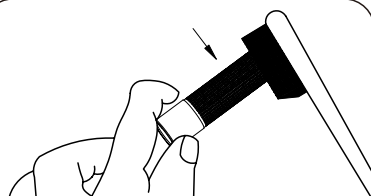
Spark Extinguisher

(If equipped)

1. Before spark extinguisher

check, cool down the engine completely.

2. Remove the two screws on the fixing cover plate, which is connected with the end of spark extinguisher, so that it is kept in the muffler.
3. Remove the spark extinguisher strainer.
4. Remove the carbon deposit on the spark extinguisher strainer with a steel wire brush carefully.



Remove carbon deposit

5. Replace the spark extinguisher if damaged.
6. Reinstall the spark extinguisher on the muffler, and fix it with two screws.

3. Idling Speed

Idling speed has been preset in the factory. Adjustment is only required in very rare situations. If adjustment is necessary, please contact a local authorized distributor.

WARNING

Unauthorized adjustment could damage the engine and the equipment driven by it, and result in product warranty invalidation.

4. Adjustment

Engine does not need any other maintenance and (or) adjustment.

Unauthorized adjustment or modification could damage the engine and the equipment driven by it, and result in product warranty invalidation. Before such adjustment, please contact a local authorized distributor.

WARNING

Unauthorized modification could result in damage to the engine and invalidation of product warranty.

V. Troubleshooting

Symptom	Problems	Solution
Engine cannot be started.	Engine switch is at OFF position.	Place the engine switch at ON position.
	No fuel	Fill fuel into the fuel tank in accordance the manual.
	Inadequate engine oil	Check the engine oil. The engine is equipped with low oil level transducer. It is impossible to start the engine when the engine oil level is lower than the given minimum oil level limit.
	No ignition	<p>Remove the spark plug cap. Clean the dirt around spark plug base. Then remove the spark plug. Insert the spark plug into the spark plug cap. Place the engine switch at ON position. Connect the electrode with any ground terminal of engine, pull the recoil starter, and observe whether electric sparks generate between spark plug gaps. If no sparks, replace the spark plug.</p> <p>Install the spark plug and restart engine in accordance with the manual.</p> <p>Please consult the authorized distributor, if necessary.</p>

VI. Storage and transportation

Storage

DO NOT mix oil with gasoline. The engine should be started at least once every 2 weeks and allowed to run for at least 20 minutes. Follow the instructions below for longer term storage if the engine will be out of service for 2 months or more.



⚠ DANGER

Fire or explosion

Gasoline is highly flammable and extremely explosive. Empty the fuel tank and take back the brake before storing or transporting this engine.

1. Change oil while engine is still warm from operation.
2. Allow the engine to cool completely.
3. Drain all fuel completely from the fuel tank, fuel hose and carburetor.
4. Remove spark plug and pour about 1 oz. of engine oil into cylinder. Reinstall spark plug. Crank engine slowly to distribute oil and lubricate cylinder.
5. Clean the engine according to the instructions in the Maintenance section.

6. Store the unit in a clean, dry area out of direct sunlight.

Transportation

To prevent fuel spillage when transporting or during temporary storage, the washer should be secured upright in its normal operating position, with the engine switch OFF. The fuel valve lever should be turned OFF.



WARNING

When transporting:

Do not over fill the tank.

Avoid a place exposed to direct sunlight when putting the engine on a vehicle. If the engine is left in an enclosed vehicle for many hours, high temperature inside the vehicle could cause fuel to vaporize resulting in a possible explosion.

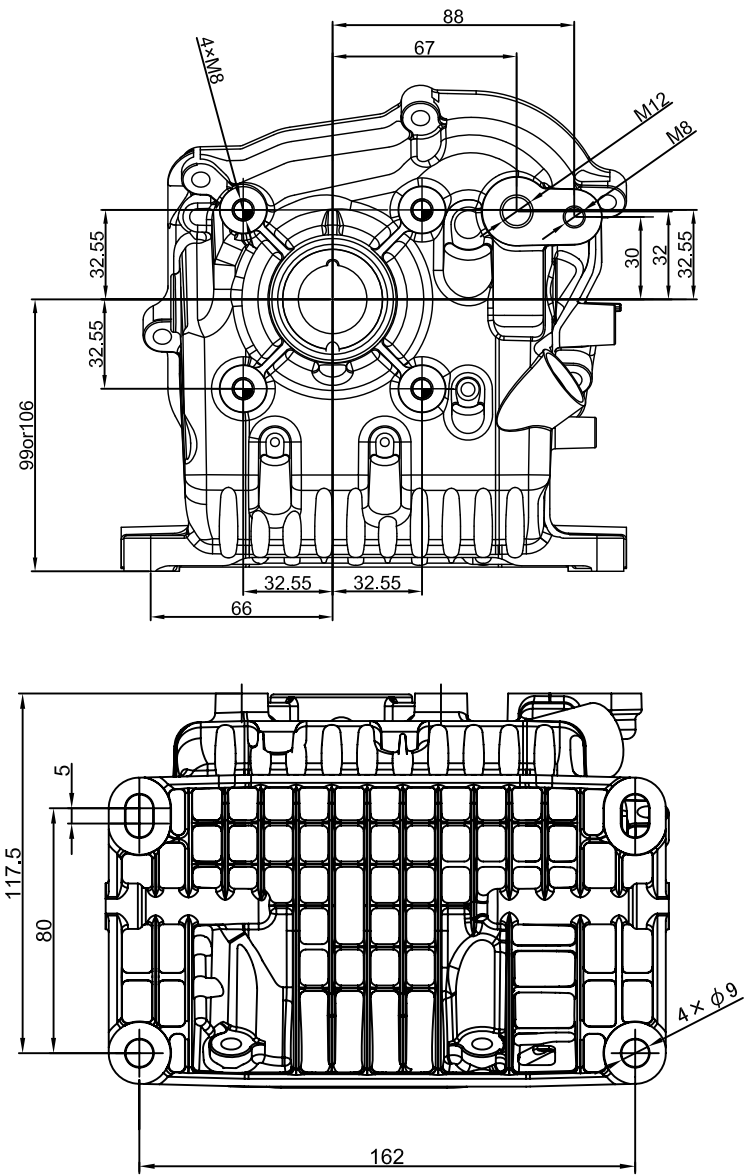
Do not drive on a rough road for an extended period with the engine on board. If you must transport the engine on a rough road, drain the fuel from the engine beforehand.

VII. Specifications

1. Table of Specifications and Parameters

Category	Item	NH80	NH100	NH130	NH150	
Main structure parameters	Air valve arrangement	Overhead valve				
	Number of air cylinders	1				
	Air cylinder diameter(mm)	51	57	61	65	
	Piston stroke(mm)	38.8	38.8	45	45	
	Total displacement (cm ³)	79	99	132	149	
	Compression ratio	7.6:1	8.2:1	8.1:1	8.3:1	
	Rated power(kW/min ⁻¹)	1.4/3600	1.65/3600	2.2/3600	2.5/3600	
	Direction of rotation	Anticlockwise (From the PTO end direction)				
	Ignition advance angle(°)	25°±2°	25°±2°	18°±2°	18°±2°	
	Valve clearance	Admission valve clearance (mm)	0.10-0.15			
		Emission valve clearance (mm)	0.15-0.20			
		Spark gap(mm)	0.6-0.8			
Fuel and oil	Lubricating oil brand	SAE 10W-30				
	Fuel supplier	Carburetor oil supply				
	Fuel capacity(L)	1.1	1.2	1.1	1.1	
	Oil capacity(L)	0.5				
Demission and mass	Demission(mm) (Length× Width× Height)	333×241× 330	333×241× 323	333×241× 330	333×241× 330	
	Net mass(kg)	9.3	9.8	9.9	10	

2. Installation Dimension of Tank Cap





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