



M805020A.5

ITEM NUMBER: 114593 (804313),
114594 (804314),
114656 (804315)

SERIAL NUMBER: _____

Engine Owner's Manual: Instructions for Set-up, Operation, Maintenance, Handling & Storage

⚠ WARNING

SPECIAL HAZARDS

- **CO Poisoning:** Exhaust from engine contains carbon monoxide, a poisonous gas that can cause carbon monoxide poisoning and possible death if inhaled.
- **Flying Debris:** Engine can cause flying debris.
- **Electric Shock:** Operating engine in wet conditions or near water can cause electric shock.
- **Fire/Explosion:** Engine sparking can ignite fuel or other flammable liquids or vapors in the vicinity. Hot exhaust from engine can ignite combustible materials.
- **Burns:** Engine have hot surfaces that can cause burn injuries.

Detailed safety information about these hazards appears throughout this manual.

Engine Protection Quick Facts

Inspect Upon Delivery: FIRST! Inspect for missing or damaged components. See *"Initial Set-Up"* section for where to report missing or damaged parts.

*****Add Engine Oil:** Engine is shipped **without oil**. See Operations instructions for information on capacity and viscosity recommendations.

Storage: See *"Storage"* section for more information.

Maintenance Schedule: Engine requires periodic inspection and servicing to keep functioning efficiently. See *"Maintenance Schedule Summary"* in *"Maintenance"* section for frequency of servicing.

Any Questions, Comments, Problems, or Parts Orders
Call NorthStar Product Support 1-800-270-0810

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About Engine

Thank you for purchasing your NorthStar Engine! It is designed for long life, dependability, and top performance.

Intended Use. The engines in this manual can be used in pressure washers, air compressor, water pump, and other similar outdoor power equipment.

Note: Do not use for other unapproved purposes, as unforeseen hazards or engine damage may result.

Supplies Required. Normal operation will require you to supply:

- Gasoline
- Engine oil
- Personal Protection Equipment

See “*Specifications*” section of this manual for more detail.

Site Location. Intended for outdoor use only.

Personal Protection. Wear safety apparel during operation, including safety glasses with side and top protection. Ear protection is also recommended if working near any operating engine. Other safety apparel includes waterproof, insulated gloves and non-slip protective footwear.

Adult Control only. Only trained adults should operate this engine. Do not let children operate this engine.

Under The Influence. Never operate, or let anyone else operate, this engine while fatigued or under the influence of alcohol, drugs, or medication.

Keep this manual for reference and review.

ATTENTION: Rental Companies and Private Owners who loan this engine/equipment to others!

All persons to whom you rent/loan engine/equipment powered by this engine, must have access to and read this manual. Keep this owner's manual with the engine/product at all times and advise all persons who will operate the engine to read it. You must also provide personal instruction on how to safely set-up and operate the engine and remain available to answer any questions a renter/borrower might have. Owner's Manuals are available from NorthStar at 1-800-270-0810.

Features

Electronic Fuel Injection (EFI) System

EFI replaces the need for carburetor that mixes air and fuel. It electronically injects fuel directly into an engine's intake manifold or cylinder.

The EFI system monitors parameters such as engine speed, intake pressure and temperatures when the engine is started and warmed up. There are no adjustments to be made to EFI system. If there is a problem with startup or operation, please immediately contact a NorthStar Authorized Service Center to solve the problem.

Advantages of EFI Engine:

1. **More consistent power:** An EFI engine is constantly self-adjusting and will run at its most advantageous fuel and air mixture setting.
2. **Better fuel efficiency:** Electronic fuel injection improves engine's fuel efficiency (up to a 28% improvement).
3. **Fewer emissions:** With increased fuel efficiency, exhaust emissions improvements will also occur.
4. **Less Maintenance:** Common maintenance issues with carbureted engines are eliminated, such as fuel deposits and gumming of sensitive carburetor passageways.
5. **Automatic altitude adjustments:** EFI engine automatically adjusts fuel/air mixture to keep the engine running when altitude changes.

Specifications

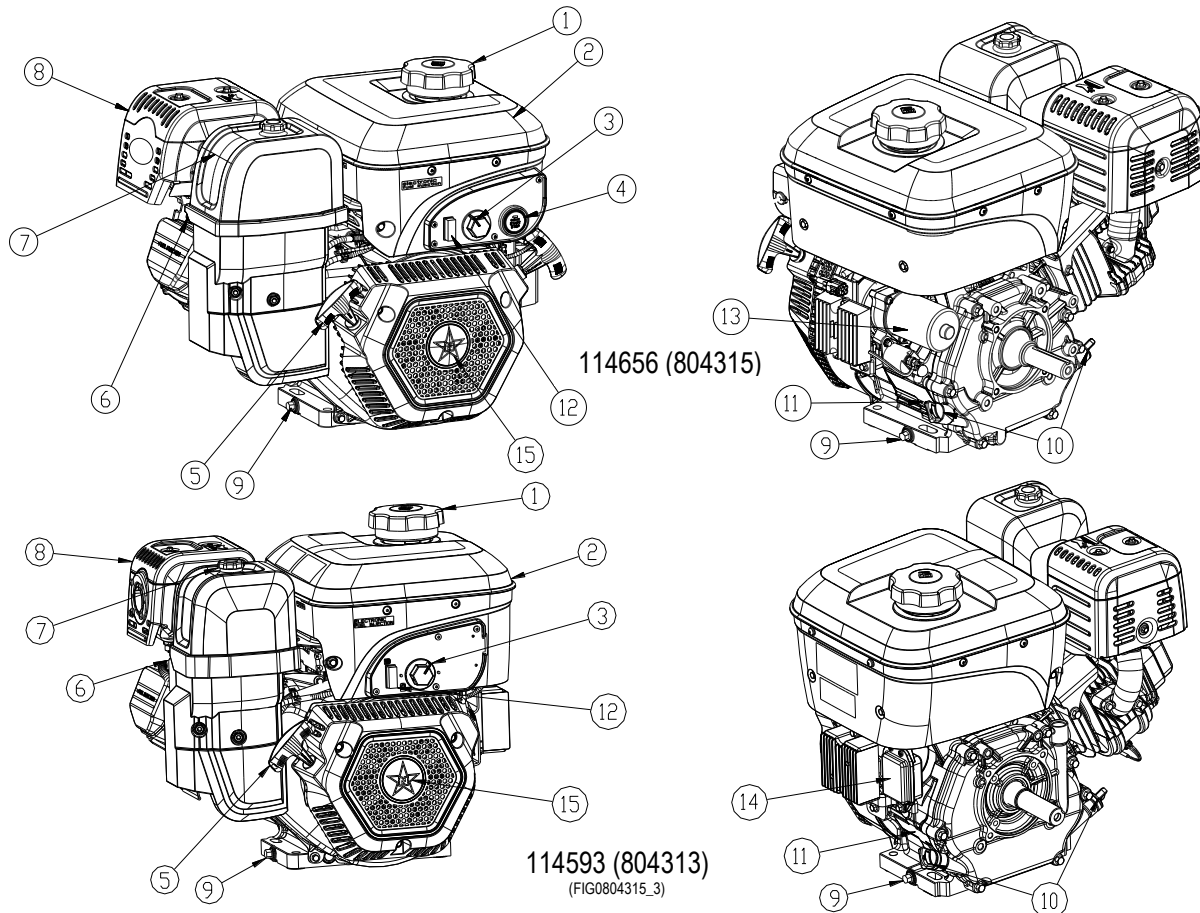
114593 (804313) – e300	
DIMENSIONS/COMPONENTS	
Engine Type	Four- stroke, Overhead, Single-Cylinder
Length	18.90in
Width	13.00in
Height	17.91in
Net Weight	62.8lbs
Displacement	301cc
Fuel Tank Capacity	1.45 Gal (5.5L)
Compression Ratio	8.2:1
Cylinder Diameter X Stroke	3.15X2.36in
Maximum Output Power	6.2 kW / 3600 rpm
Net Torque	13.28ft-lbs. / 2500 rpm
Cooling System	Forced Air Cooling
Ignition System	Transistorized Coil Ignition (TCI)
Spark Plug	F6RTC / F7RTC
Lubrication System	Splash Type
Oil Capacity	1.06 qt. (33.81 oz.)
Power Output Shaft Direction	Counterclockwise
Output Shaft	1in x 3.48in Length with 1/4in keyway
Mounting Face	SAE J609 Flange B 5/16-24 UNF 2B Tap on a 5.00in(126.5mm) bolt circle and 3/8-16 UNC 2B Tap on a 6.50in (165.1mm) bolt circle
Clearance of spark plug	0.028 – 0.031in
Valve clearance	0.002 – 0.0039in
Operating Temperature (°F)	14°F to 104°F

114594 (804314) – e420	
DIMENSIONS/COMPONENTS	
Engine Type	Four- stroke, Overhead, Single-Cylinder
Length	20.28in
Width	14.57in
Height	18.31in
Net Weight	76lbs
Displacement	420 cc
Fuel Tank Capacity	1.64 Gal (6.2L)
Compression Ratio	8.2:1
Cylinder diameter X Stroke	3.54X2.60in
Maximum Output Power	8.8 kW / 3600 rpm
Net Torque	18.44 ft-lbs. / 2500 rpm
Cooling System	Forced Air Cooling
Ignition System	Transistorized Coil Ignition (TCI)
Spark Plug	F6RTC / F7RTC
Lubrication System	Splash Type
Oil Capacity	1.17 qt. (37.19 oz.)
Power Output Shaft Direction	Counterclockwise
Output Shaft	1in x 3.48in Length with 1/4in keyway
Mounting Face	SAE J609 Flange B 5/16-24 UNF 2B Tap on a 5.00in(126.5mm) bolt circle and 3/8-16 UNC 2B Tap on a 6.50in (165.1mm) bolt circle
Clearance of spark plug	0.028 – 0.031in
Valve clearance	0.002 – 0.0039in
Operating Temperature (°F)	14°F to 104°F

Specifications

114656 (804315) – e420 (Electric Start)	
DIMENSIONS/COMPONENTS	
Engine Type	Four- stroke, Overhead, Single-Cylinder
Length	19.5in
Width	14.57in
Height	18.31in
Net Weight	80.5lbs
Displacement	420 cc
Fuel Tank Capacity	1.64 Gal (6.2L)
Compression Ratio	8.2:1
Cylinder diameter X Stroke	3.54X2.60in
Maximum Output Power	8.8 kW / 3600 rpm
Net Torque	18.44 ft-lbs. / 2500 rpm
Battery Requirement	12 VDC – 14 Ahr *Battery required for operation
Cooling System	Forced Air Cooling
Ignition System	Transistorized Coil Ignition (TCI)
Spark Plug	F6RTC / F7RTC
Lubrication System	Splash Type
Oil Capacity	1.17 qt. (37.19 oz.)
Power Output Shaft Direction	Counterclockwise
Output Shaft	1in x 3.48in Length with 1/4in keyway
Mounting Face	SAE J609 Flange B 5/16-24 UNF 2B Tap on a 5.00in(126.5mm) bolt circle and 3/8-16 UNC 2B Tap on a 6.50in (165.1mm) bolt circle
Clearance of spark plug	0.028 – 0.031in
Valve clearance	0.002 – 0.0039in
Operating Temperature (°F)	14°F to 104°F

Component Identification



1. **Fuel Tank Cap:** Remove the fuel tank cap to add fuel once engine has cooled.
2. **Fuel Tank:** Storage for gasoline to power the engine.
3. **Throttle Knob:** Adjust the engine speed with the throttle knob.
4. **Engine Start/Stop Button (Only Electric Start Model):** Push button start/stop switch (Electric Start Model Only)
5. **Starter Recoil Handle:** Pull the Starter Recoil handle to start the engine.
6. **Spark Plug:** Ignites compressed fuel and air within the combustion chamber of the engine.
7. **Air Cleaner:** Prevents dust and debris from entering the engine.
8. **Muffler:** The muffler reduces noise from engine. It will become hot during operation, do not touch.
9. **Oil Drain Bolt:** Remove oil drain bolt to drain oil from the engine. See “*Maintenance*” section of this manual.
10. **Oil Dipstick:** Remove oil dipstick and inspect to ensure proper oil level in engine.
11. **Serial Number:** Unique engine serial number etched into the engine block.
12. **Engine Switch:** Switch that turns the engine on and off.
13. **Electric Starter Motor (Electric Start Model Only):** Device which starts without pulling the recoil.
14. **Battery Box (Recoil Start Models Only):** Holds 2- 9V batteries to power ECU and fuel pump upon initial starting.
15. **NorthStar Illuminated Logo:** Illuminates when Engine Switch is turned On

See “*Parts Explosion*” for more details

Safety

Hazard Signal Word Definitions



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

DANGER (red) indicates a hazardous situation, which if not avoided, will result in death or serious injury.

WARNING (orange) indicates a hazardous situation, which if not avoided, could result in death or serious injury.

CAUTION (yellow) used with the safety alert symbol, indicates a hazardous situation, which if not avoided, could result in minor or moderate injury.

CAUTION (yellow) without the safety alert symbol, is used to address practices not related to personal injury.

NOTICE is used to address practices not related to personal injury.

Safety Labeling

Safety Decal Locations

WARNING

ALWAYS make sure safety labels are in place and in good condition. If a safety label is missing or not legible, order new labels from NorthStar Product Support at 1-800-270-0810.

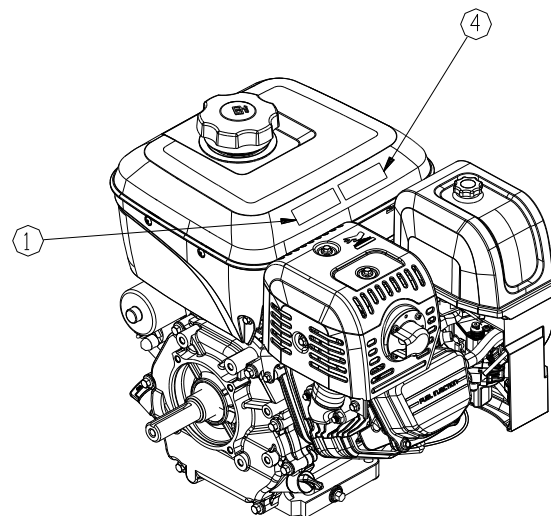
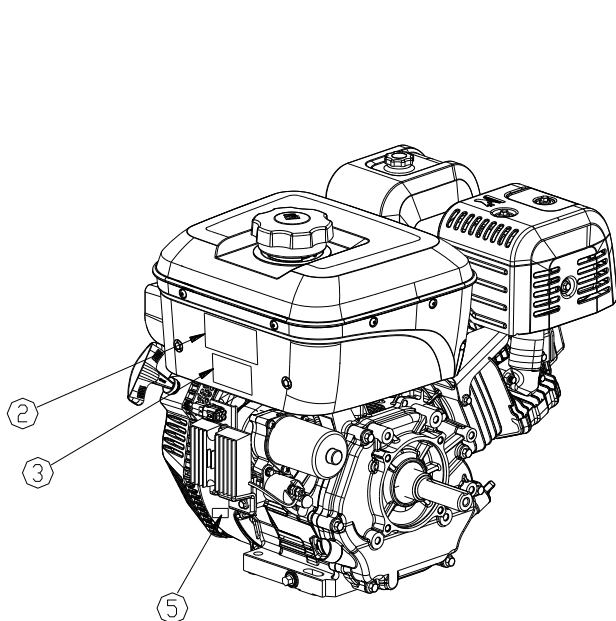


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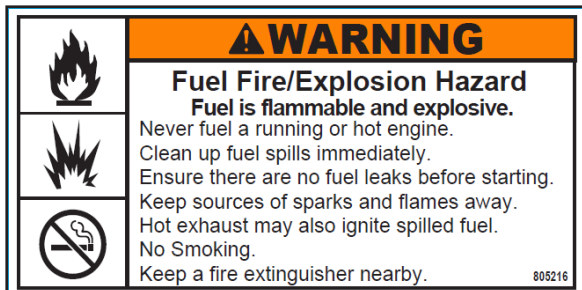
On-Product Warning Labels		
Location	Part Numbers	Description
1	790852	Burn Hazard Decal
2	788935	Fuel Fire / Explosion Hazard
3	795124	Allowable Ethanol % In Fuel
4	805132	Poisonous Gas Decal
5	N/A	Emission Label

Safety Labeling

1



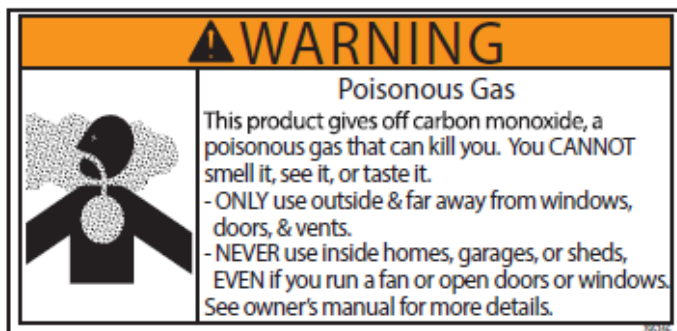
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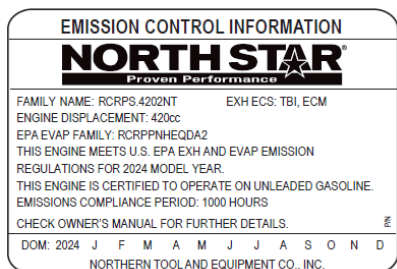
3



4



5



To order replacement safety labels, call NorthStar Product Support at 1-800-270-0810.

Initial Set-Up

Outdoor Use Only

WARNING

Location Hazards

Choose a suitable site for operating your engine to prevent possible death from carbon monoxide poisoning or injury from fire/explosion, hot surfaces, or equipment tip-over.

Select a suitable outdoor location:

1. Never run the engine in an enclosed or partially enclosed location such as a building, garage, barn, shed, or house. These spaces can trap poisonous gases. Running a fan or opening windows will not provide adequate ventilation to prevent dangerous CO build-up.
2. Only use the engine outdoors at least 20 feet from the home, away from windows, vents, and air intakes, to allow proper ventilation. If you start to feel sick, dizzy, or weak while using the engine, shut off the engine and get to fresh air RIGHT AWAY.
3. Position the engine so that the exhaust fumes will not be directed towards people or building air intakes.
4. Do not locate and use the engine in the presence of flammable vapors, dust, gases, or other potentially combustible materials.
5. Ensure that working, battery-operated or battery back-up carbon monoxide alarms are used in any dwelling/structure that is in close proximity to the running engine.

Positioning:

1. Ensure the engine is positioned on a firm, level (less than 3-degree slope), heat-resistant surface.
2. Situate so there is adequate pulling room for starting the engine using the recoil starter. Attempting to pull at an odd angle could rip off grip cord and/or cause muscular injuries to the operator.

Airflow:

1. Situate so there is adequate clearance around the engine to allow for airflow – at least 7 feet from any non-combustible wall or obstruction.
2. Do not place any objects against or on top of the engine.

3. The engine needs adequate, unobstructed flow of air to allow for proper combustion and adequate cooling. Proper combustion can only be obtained when there is a sufficient supply of oxygen available for the amount of fuel being burned. Cooling ventilation is required to prevent overheating of the engine and possible fire.

Exhaust:

WARNING

Exhaust Modification Hazard

Never attempt to attach ductwork to the muffler system to allow for installation inside an enclosure. This could cause heat build-up and increased exhaust back-pressure, resulting in possible exhaust leakage or damage to the engine.

1. The exhaust gas from your engine is extremely hot and can cause combustible materials to catch on fire.
2. Make sure the engine is at least 7 feet from all combustible materials and structures during operation.
3. Keep a fire extinguisher rated "ABC" nearby. Keep it properly charged and be familiar with its use.
4. Place the engine so that the exhaust fumes will not be directed towards people or building air intakes.

DANGER

Carbon Monoxide Hazard

Exhaust fumes from the engine contain carbon monoxide (CO), a poisonous gas you cannot see, smell, or taste. The CO generated by the engine can rapidly accumulate, even in areas that appear to be well ventilated, resulting in dangerous and fatal concentrations within minutes. NEVER run engine inside any enclosed or semi-enclosed spaces, including homes, garages, basements, sheds, boxes, pick-up truck beds, RVs, or boats. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. If you start to feel sick, dizzy, or weak while using the engine, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

Operation

Follow Safety Rules for Operation

After you have checked, oiled, and fueled the engine and positioned it in a suitable worksite, it is time to start your engine. The following are the procedures necessary for safe, successful operation of your engine.



WARNING

Failure to follow safety rules may result in serious injury or death to the operator or bystanders.

Instruct Operators. Owner must instruct all operators in safe set-up and operation. Do not allow anyone to operate the engine who has not read the Owner's Manual and been instructed on safe use practices.

Safety Equipment/Controls. Always operate with all safety covers, guards, and barriers in place and in good working order, and all controls properly adjusted for safe operation.

Moving Parts. Keep hands, feet, hair, and apparel away from moving parts. Air vents may cover moving parts and should be avoided as well.

Ear Protection. Hearing can be damaged from prolonged, close-range exposure to the type of noise produced by this engine. The use of ear plugs, or other hearing protection devices is recommended for persons working within 15-20 feet of the running engine for an extended period of time.

Eye Protection. Wear ANSI "Z87.1" required safety glasses when operating or servicing the engine.

NOTE!

Before starting the engine, review the following general safety rules for operation:

Conditions for Use

Know How to Stop. Be thoroughly familiar with proper use of the engine and all controls and connections. Know how to stop the engine and depressurize the system quickly if needed.

Instruct All Operators. The engine owner must instruct all operators and potential renters in safe set-up and operation. Do not allow anyone to operate the engine who has not read the Owner's Manual and been instructed on its safe use.

Adult Control only. Only trained adults should set up and operate the engine. Do not let children operate. Engine can generate forces greater than children can control and require judgment beyond what can be expected of children.

Under the Influence. Never operate, or let anyone else operate, the engine while fatigued or under the influence of alcohol, drugs, or medication.

Safety Equipment / Controls in place. Do not operate the engine unless all safety covers, guards, and barriers are in place and in good working order, and all controls are properly adjusted for safe operation.

Damaged. Do not operate the engine with damaged, missing, or broken parts. Never attempt to repair a component. Always replace it with a part that is rated.

Modifications. Do not modify the engine in any way or deactivate any safety device. Do not change or add to fuel tank, fuel lines, or exhaust system. Modifications can result in hazards related to carbon monoxide poisoning, fuel leaks, fire, explosion, or other serious safety hazards, and will also void the warranty.

During Use

Stay alert. Watch what you are doing at all times.

Clear work area. Clear the work area of all bystanders.

Keep children and pets away.

Keep engine away from electrical wiring. Engine contact with electrical wiring will likely result in severe electrical shock or electrocution.

Hot exhaust/parts. Stay clear of engine exhaust. Never touch a hot engine muffler, or other hot surfaces. All are very hot and will burn you. Cleaning should be done with a damp sponge with the engine OFF.

Let engine cool at least two minutes before refueling.

Operation

Preparing for Operation

Make sure that any regular maintenance has been performed as prescribed in “Maintenance” section.

Check/Add Engine Oil

Use the recommended oil type for your engine and expected ambient conditions.



WARNING

Burn Hazard

Never open oil port while engine is running. Hot oil can spray over face and body.

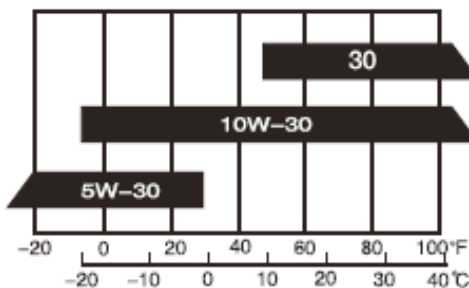
Notes:

- Low oil shutdown feature prevents the engine from starting without sufficient oil.
- Engine is shipped without oil. You must add oil before first use.

Engine Oil. Use 4-stroke engine oil, API service classification SN class or equivalent and above. Check the API label on the oil container to be sure it includes the letters SN class or equivalent and above.

SAE 10W-30 is recommended for general use. Other viscosity shown in the chart may be used when the average temperature in your area is within the indicate range.

SAE Viscosity Grades

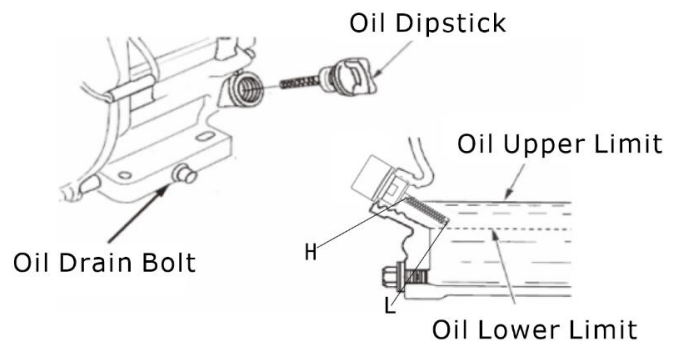


CAUTION

Oil is an important factor affecting the output and life of the engine. Do not use unclean oil or two-stroke oil, which may cause damage to the engine.

Oil level check:

1. Remove the oil dipstick and clean it with a rag.
2. Reinsert the dipstick into the oil filling hole without screwing it in. Pull the dipstick out and check the oil level. The dipstick has an “H” to indicate proper oil level, and an “L” to indicate oil level is too low.
3. If the oil level is too low, the engine will not start. Add the recommended engine oil, to the “H” mark on the oil dipstick.
4. Reinstall the dipstick.
5. Oil Capacity:
 - 1) 114593 (804313) = 1.06 qt. (33.8oz.)
 - 2) 114594 (804314) = 1.17 qt. (37.2oz)
 - 3) 114656 (804315) = 1.17 qt. (37.2oz)



CAUTION

Running the engine with insufficient engine oil may damage the engine severely and would not be covered under warranty.

Air Cleaner

Remove the air cleaner cover and check the filter to make sure it is clean and not damaged. Clean or replace as necessary. See “Maintenance” section of this manual for details.

CAUTION

Never run the engine without the air filter and cover installed or damage to the engine could result. Damage to the engine by not having the air filter and cover installed is not covered under warranty.

Operation

Add Fuel

! WARNING

Fuel Fire/Explosion Hazard

Gasoline is highly flammable and explosive. Heat, sparks, and flames can ignite fuel vapors, which can become widespread during fueling. A flash fire and/or explosion could result and cause serious injury or death. Always use extreme care when handling fuels. Carefully follow all instructions to avoid the following conditions which could result in fuel ignition:

- gas vapor collection inside enclosures
- static electric sparks
- sparks from electric wiring, batteries, or running engines
- sources of heat (such as a hot engine exhaust)
- open flames, including pilot lights

Always follow these general safety rules when fueling:

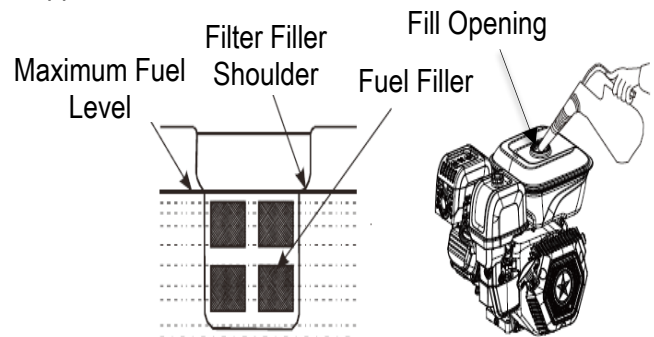
- 1) Turn engine off and allow to cool for at least two minutes before removing any fuel tank cap.
Note: A running, or still-hot engine is hot enough to ignite fuel.
- 2) Fill fuel tank OUTDOORS – never indoors. Fuel vapors can ignite if they collect inside, and enclosure and explosion can result.
- 3) Stay away from all sources of heat, sparks, and flames. Do not smoke.
- 4) Never pump fuel directly into the gas tank at a gas station – it could cause a static electric spark. Follow these steps to avoid static electric sparking during fueling:
 - Always place container on the ground to be filled. Never fill the portable gas container while it is sitting inside a vehicle, trailer, trunk, or pick-up truck bed.
 - Dissipate static charge from your body before beginning the fueling process by touching a grounded metal object at a safe distance from fuel sources.
 - Keep nozzle in contact with container while filling. Do not use a nozzle lock-open device.

- 5) Clean up fuel spills/splashes immediately.
 - Wipe up spilled fuel and wait 5 minutes for excess fuel to evaporate before starting engine.
 - Fuel-soaked rags are flammable and should be disposed of properly.
 - If fuel is spilled on your skin or clothes, change clothes and wash skin immediately.

Fill Engine Fuel Tank

Check the gasoline tank level. If needed, fill tank with fresh unleaded gasoline from a portable container:

- 1) Remove engine fuel tank cap.
- 2) Add gasoline through the fill opening:
 - Use only a UL-approved portable gasoline container to transfer the gasoline to engine's tank.
 - Do NOT overfill the gasoline tank. Never fill fuel above the maximum fuel level and into the filter filler shoulder area.
- 3) Replace fuel tank cap securely before starting engine.
- 4) Store extra gasoline in a cool, dry place in a UL-approved container.



Operation

Inspect Fuel System/Check for Leaks

Inspect the engine fuel system and check for leaks before each use.

Do not start engine until all needed repairs have been completed.

⚠ WARNING

Fuel Leak Hazard

Gasoline fuel is highly explosive and fuel leaks can result in fire or explosions. You can be burned and seriously injured if the fuel system is not properly hooked up or there is a fuel leak when you start the engine.

Inspect the entire fuel system. Look for:

- signs of leaks or deterioration
- chafed or spongy fuel hose

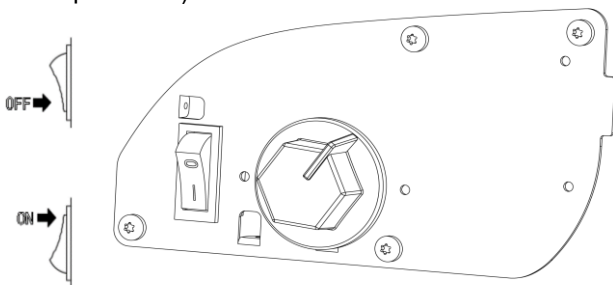
Perform Scheduled Maintenance, As needed

- Make sure that any other regular maintenance has been performed as prescribed in this manual in the "Maintenance Schedule Summary" section.
- Refer to the engine Owner's manual for engine maintenance instructions.

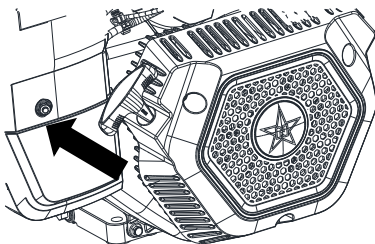
Starting the Engine (Recoil Models Only):

114593 (804313) and 114594 (804314):

1. Adjust the throttle speed to maximum speed.
2. Toggle the engine switch to the "ON" position. (NorthStar illuminated logo will illuminate fuel pump will power on).



3. Pull the recoil to start the engine.



CAUTION

Do not release the starter handle suddenly after starting to avoid it from recoiling back and hitting the engine. It should be released slowly with the rebound of the starter rope.

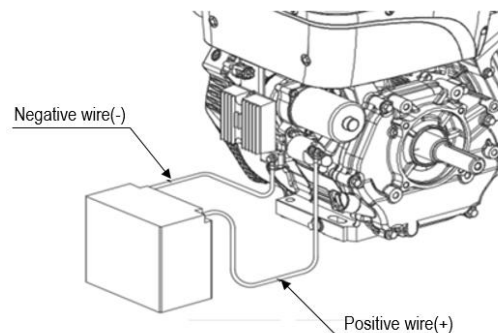
- For electronic fuel injection (EFI) engines, no altitude adjustment is required.

Starting the Engine (Electric Start)

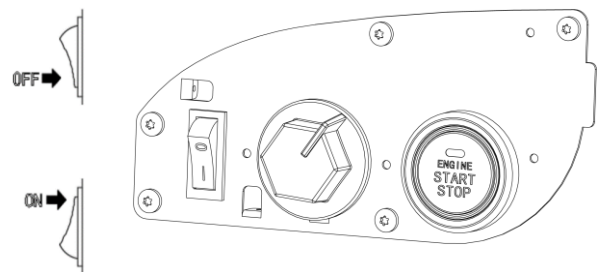
114656 (804315):

Note: A 12V 14Ah (minimum) battery is required for operation of this engine.

Connect the positive wire (+) to the positive pole (+) of the battery. Connect the negative wire (-) to the negative pole (-) of the battery.



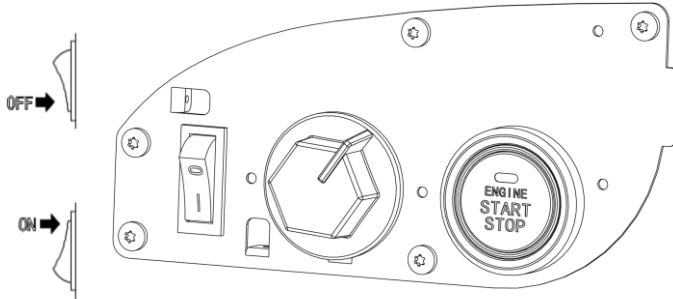
- 1) Toggle the engine switch to the "ON" position. (Engine Start/Stop button will have solid red illumination).



illumination). This will allow the engine to start. Alternatively, pull the recoil to start the engine.

Operation

- 2) Press the Engine Start/Stop button to start the engine (Engine Start/Stop button will blink green illumination while engine start and turn solid green once engine has successfully started).



NOTICE:

- The engine will repeat the start sequence three times if the engine fails to start. To terminate startup, toggle the engine switch to the "OFF" position.
- When not in use, keep the engine switch at the "OFF" position to avoid the loss of battery power.

Shutdown of the Engine (Recoil Models Only):

114593 (804313) and 114594 (804314):

1. Toggle the engine switch to the "OFF" position.

Shutdown of the Engine (Electric Start Model Only):

114656 (804315):

1. Press and release the Engine Start/Stop button (Engine Start/Stop will blink red while engine is stopping and turn solid red once engine has successfully shutdown).
2. Toggle the engine switch to "OFF" position.

NOTE:

- In case of emergency, the engine switch can be directly toggled to the "OFF" position.
- When not in use, keep the engine switch at the "OFF" position to avoid the loss of battery power.

Maintenance

⚠ WARNING

Maintenance Hazards

ALWAYS turn off engine, and disconnect the spark plug wire before cleaning, adjusting, or servicing the engine. After servicing, make sure all guards and cover shields are replaced before using.

Maintenance Schedule Summary

Maintenance period		Each use	First month or 20 hours	Every 3 months or 50 hours	Every 6 months or 200 hours	Every year or 300 hours
Engine oil	Check level	√				
	Change		√		√	
Air filter element	Inspection	√				
	Clean			√		
	Replace				√*	
Spark plug	Replace					√**
Spark arrester	Clean				√*	
Replace batteries (Recoil engines only)						√**
Idle	Check-adjust					√
Valve clearance	Check-adjust					√***
Fuel tank and fuel filter	Clean					√
Fuel hose	Inspection	Every 2 years (replace it if necessary)				
	* Service more frequently when used in dusty environments. ** If necessary. *** These items shall be maintained by a NorthStar Authorized Service Center unless the user has proper tools and maintenance capability.					

Maintenance

No modifications. Never modify or alter the engine in any way. Modifications can create serious safety hazards and will also void the warranty.

Improper maintenance or failure to perform pre-operation checks before operation will result in malfunctions that could cause serious injury to you or others.

Follow Safety Rules

Read and follow these safety rules whenever you will be servicing the engine:

- **Turn off.** Always turn off before inspection or maintenance. Remove spark plug or spark plug wire to prevent accidental starting.
- **Replace guards.** Make sure all guards and cover shields are replaced after servicing.
- **Major repair.** Major service, including the installation or replacement of parts, should be performed only by a qualified service technician. Obtain factory approved parts from NorthStar Product Support at 1-800-270-0810.
- **Replacement parts.** If a part needs replacement, only use factory approved repair parts. Replacement parts that do not meet specifications may result in a safety hazard or poor operation of the engine and will void the warranty.

Keep Engine Clean

If dust or debris accumulates on the engine, clean with a damp cloth or soft bristle brush. Do not allow air intakes to become blocked.

DANGER

Carbon Monoxide Hazard

Exhaust fumes from the engine contain carbon monoxide (CO), a poisonous gas you cannot see, smell, or taste. The CO generated by the engine can rapidly accumulate, even in areas that appear to be well ventilated, resulting in dangerous and fatal concentrations within minutes. NEVER run engine inside any enclosed or semi-enclosed spaces, including homes, garages, basements, sheds, boxes, pick-up truck beds, RVs, or boats. These spaces can trap poisonous gases, EVEN if you run a fan or open windows. If you start to feel sick, dizzy, or weak while using the engine, shut off the engine and get to fresh air RIGHT AWAY. See a doctor. You may have carbon monoxide poisoning.

Improper maintenance or failure to perform pre-operation checks before operation will result in malfunctions that could cause serious injury to you or others.

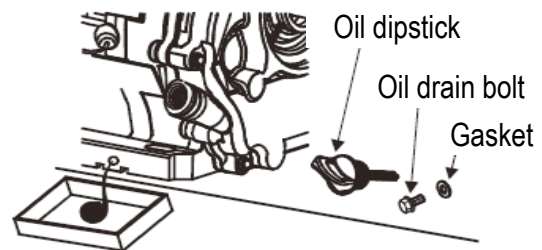
Changing Engine Oil

WARNING

Burn Hazard

Never open oil port while engine is running. Hot oil can spray over face and body.

- 1) Drain the oil when the engine is warm to ensure quick and thorough draining
- 2) Unscrew the oil dipstick and oil drain bolt to drain the oil. Replace the oil drain bolt and tighten it.
- 3) Refill the recommended oil and check the oil level.
- 4) Reinstall the oil dipstick.



NOTICE:

Dispose of used motor and pump oil in a manner that is compatible with the environment and in accordance with local, state, and federal laws and regulations.

- 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 pour it down the drain.

Maintenance

Air Filter Maintenance

A dirty air filter may restrict air from entering the engine. To prevent engine failure, the air filter should be maintained regularly. If the engine is operated in a dusty place, it needs to be maintained more frequently.

WARNING

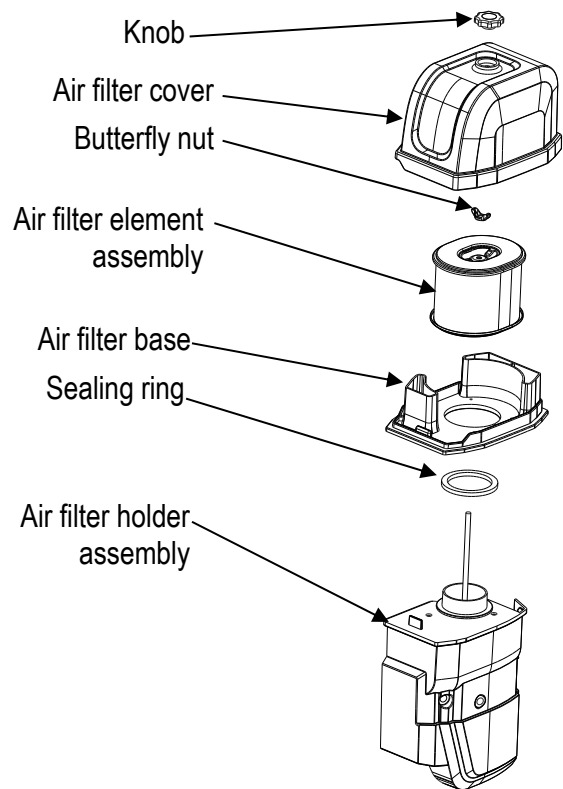
Never use fuel or a solvent with a low ignition point to clean the air filter element, doing so may cause explosion. Please clean the element with warm soapy water or non-flammable solvents.

CAUTION

Never run the engine without the air filter and cover installed or damage to the engine could result. Damage to the engine by not having the air filter and cover installed is not covered under warranty.

- 1) Remove the air filter cover and air filter element assembly.
- 2) Carefully separate the foam filter element from the Paper filter element assembly.
 - a. Paper filter element: Remove the dust by tapping the filter element several times on a hard surface or use compressed air from inside out.
 - b. Foam filter element: Wash it with warm, soapy water, then dry it. Soak it in the clean engine oil and squeeze out the excess oil. If too much oil remains in the foam filter element, there will be smoke coming out from the engine in the initial startup stage.

- 3) Clean off dust on the air filter cover and inner surface with a wet rag. Be careful not to allow dust to enter the engine.
- 4) Install the filter element assembly and the air filter cover.

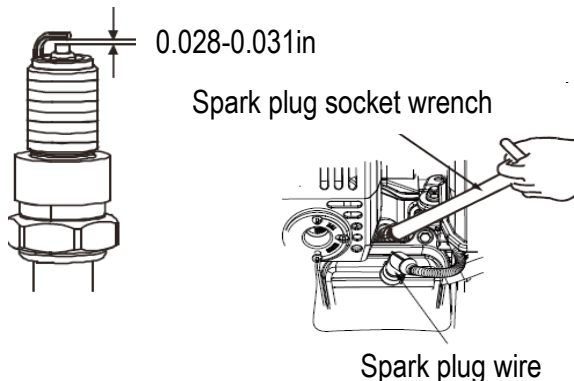


Maintenance

Spark Plug Maintenance

To ensure proper operation of the engine, the spark plug must be provided with proper clearance and are free of deposits.

- 1) Remove the spark plug wire.
- 2) Clean the dirt around the spark plug holder.
- 3) Remove the spark plug with a spark plug socket wrench.
- 4) Visually inspect the spark plug. If it is damaged, replace it with a new one. If the spark plug can still be used, clean it with a wire brush.
- 5) Measure the spark plug gap.



- 6) To prevent misalignment of the threads, screw the spark plug into the screw hole by hand.
- 7) After the spark plug is screwed to the end, tighten it with spark plug socket wrench.
 - a) To install a new spark plug, the user should replace it according to the original spark plug type. Thread the spark plug into the engine until hand tight, then an additionally 1/2 turn (after hand tight).
 - b) If a used spark plug is reinstalled, thread the spark plug into the engine until hand tight, then an additionally 1/8-1/4 turn (after hand tight).

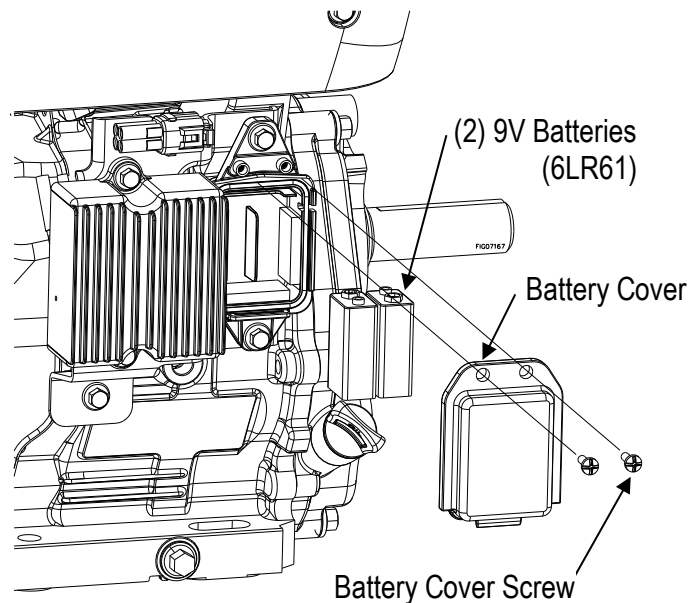
CAUTION

The spark plug must be tightened properly, or it may be extremely hot and damage the engine.

Battery Replacement (Recoil Only Engines - 114593 (804313) and 114594 (804314))

To ensure efficient starting of the engine, the batteries will need to be replaced periodically.

- 1) Remove Battery Cover Screws and Battery Cover.
- 2) Remove and replace batteries. Use two fresh 9V (6LR61) batteries. Do not mix old/new ...
- 3) Replace Battery Cover and Battery Cover Screws



High Altitude Operation

One of the benefits of an EFI engines, is that it can adjust fuel and air based on various ambient conditions.

For high altitude operation, no engine modification is required.

For additional question go to www.northerntool.com or contact us at 1-800-270-0810.

Storage

Prepare Engine for Long Term Storage

First prepare the engine for long term storage if you will not be using it for more than 30 days.

Fuel can become stale when stored over 30 days. Stale fuel causes acid and gum deposits to form in the fuel system which can cause malfunction of the engine.

1. Prepare fuel system for storage:

- **Add fuel stabilizer** to the gasoline (following manufacturer's instructions)

Fuel stabilizer steps:

- a. Ensure gas tank is full. If the fuel tank is partially filled, the air in the fuel tank will deteriorate the fuel more quickly.
 - b. Add stabilized fuel to fuel tank.
 - c. *Run engine* at least 5 minutes after adding stabilizer to allow it to enter the fuel system.
 - d. Shut off engine.
2. Lubricate cylinder and piston:
- a. Disconnect spark plug wire and remove spark plug.
 - b. Add one teaspoon oil through spark plug hole.
 - c. Place rag over spark plug hole and slowly pull the recoil a few times to lubricate the combustion chamber.

Replace spark plug, but do not reconnect the spark plug wire.

Move engine to Storage Location

Let engine cool for 5 minutes before moving the engine to its storage location.

Removal from Long Term Storage

Upon removal of the engine from storage, remove gas from fuel tank into a suitable container. Refill with fresh gas.

WARNING

Fuel Fire/Explosion Hazard

Gasoline is highly flammable and explosive. Heat, sparks, and flames can ignite fuel vapors, which can become widespread during fueling. A flash fire and/or explosion could result and cause serious injury or death. Always use extreme care when handling fuels. Carefully follow all instructions to avoid the following conditions which could result in fuel ignition:

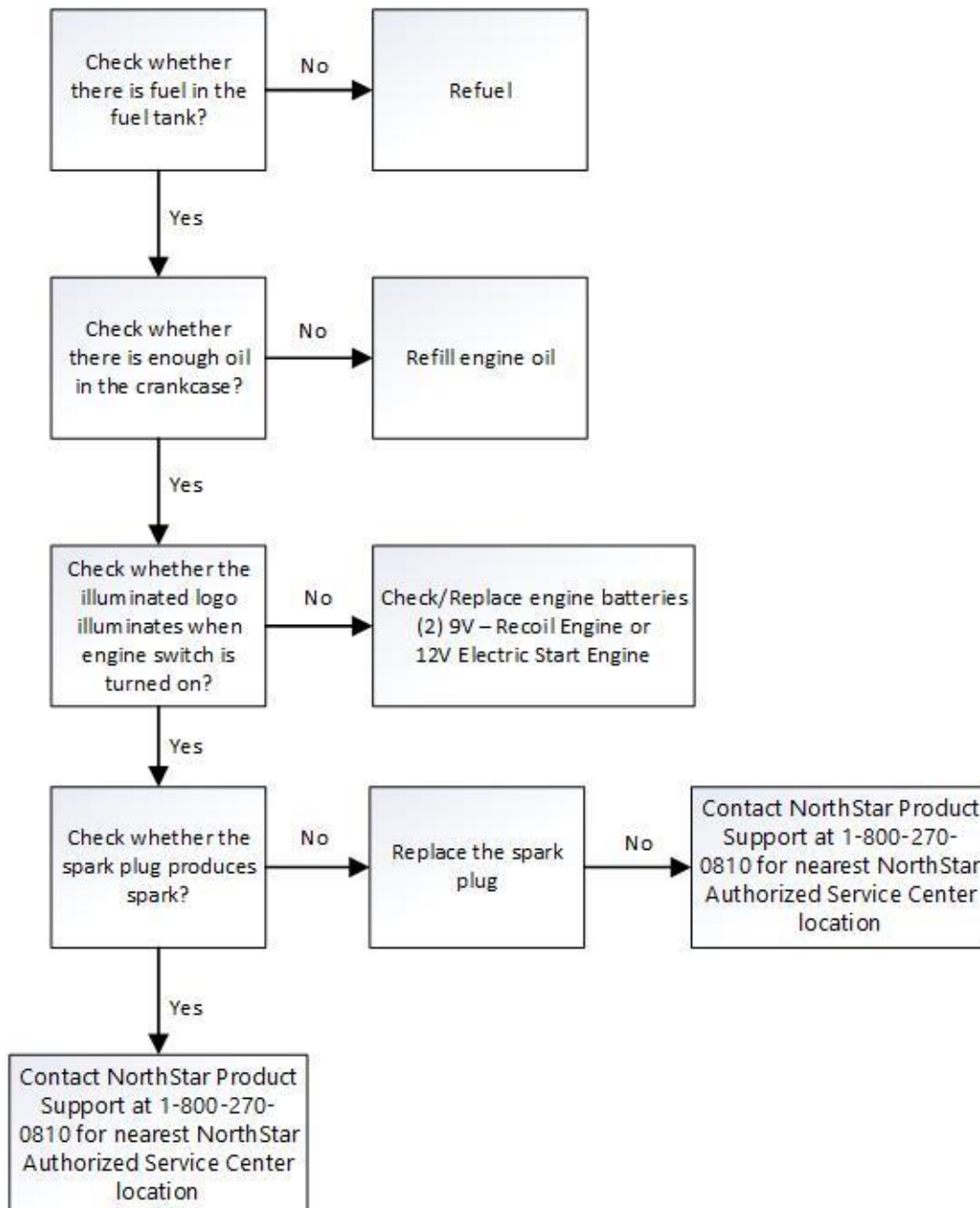
- gas vapor collection inside enclosures
- static electric sparks
- sparks from electric wiring, batteries, or running engines
- sources of heat (such as a hot engine exhaust)
- open flames, including pilot lights

Troubleshooting

COMMON REASONS ENGINE WILL NOT START

Causes	Solutions
Low oil shutdown	Fill engine with the adequate amount of oil
No fuel	Add gas to fuel tank.
Engine not turned ON	Place Engine Switch in the ON position
Dead batteries (Recoil Engines Only)	Replace (2) 9V batteries
Dead battery (Electric Start Only)	Replace/charge 12V battery
Spark plug wire not attached	Attach spark plug wire to spark plug

Troubleshooting flow chart for failure to start the gasoline engine:

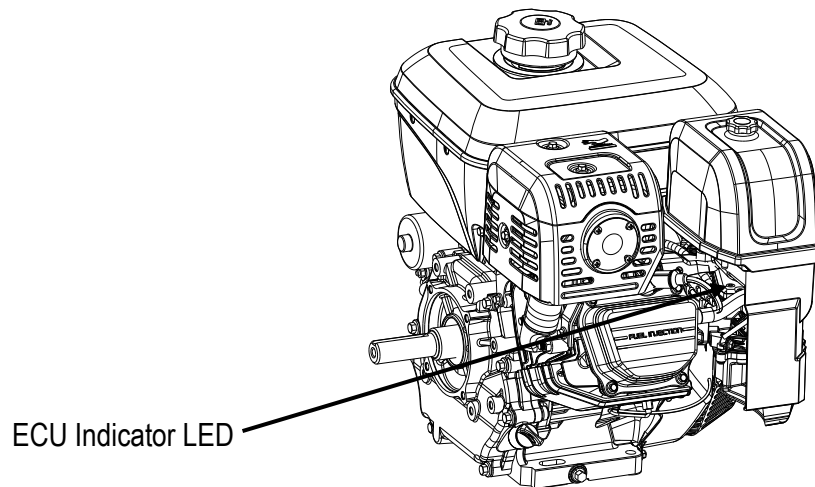


Troubleshooting

Engine ECU Indicator Inspection:

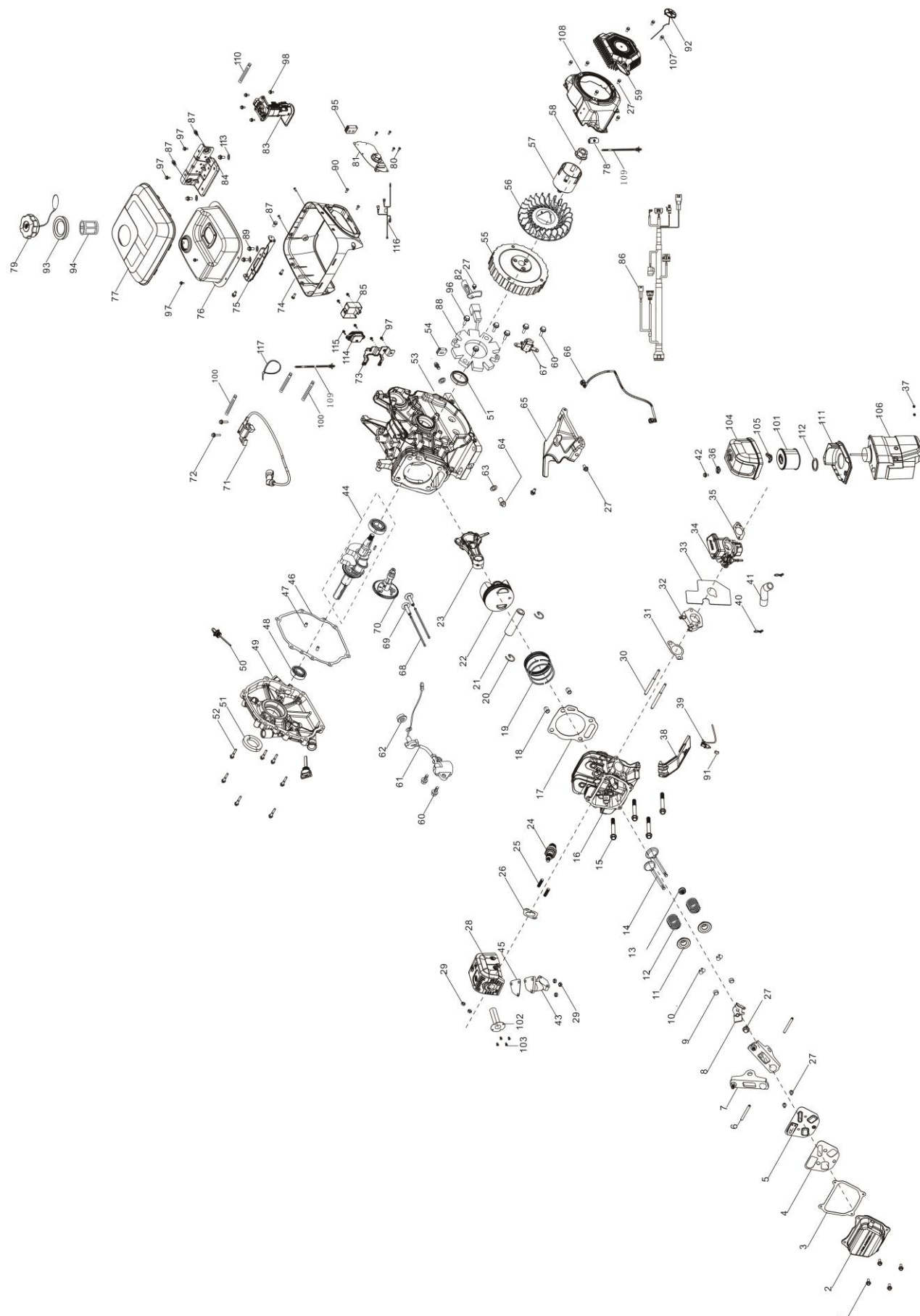
The engine ECU has a red LED indicator that illuminates and/or flashes to indicate that there is a problem with the engine. If the red engine ECU indicator LED lights up or flashes during engine operation, please Contact NorthStar Product Support at 1-800-270-0810 for nearest NorthStar Authorized Service Center location as soon as possible to solve the problem. If the engine has stopped automatically, follow these steps:

- 1) Make sure the engine is level.
- 2) Check the engine fuel level. Refer to the “Add Fuel” section of the Operation section of this manual.
- 3) Check the engine oil. Refer to the “Check/Add Engine Oil” section of the Operation section of this manual.
- 4) Start the engine. Refer to the “Starting the Engine” section of the Operation section of this manual.
- 5) Do not use the engine if the red engine indicator LED is always on or flashing regularly and the engine stops automatically. Please Contact NorthStar Product Support at 1-800-270-0810 for nearest NorthStar Authorized Service Center location immediately to solve this problem. Please see the below table for the possible causes (DTC Name) and number of flashes.



DTC Name	Flashes
Injector Fault	1
Fuel Pump Fault	4
Ignition Coil Fault	8
Throttle Position Sensor Fault	7
Engine Head Temperature	5
Manifold Air Pressure Sensor Fault	2
Manifold Air Temperature Sensor Fault	On
Charging System Fault	
Battery Voltage Fault	
Engine Temperature too High	
Low Oil Switch	

Item 114593 (804313) - e300 Engine Parts Explosion- Rev A.4



Item 114593 (804313) - e300 Engine Parts Explosion– Rev A.4

REF#	PART #	DESCRIPTION	QTY
1	Kit #8	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
2	Kit #8	COVER SUBASSEMBLY, CYLINDER HEAD	1
3	Kit #4, Kit #8	CYLINDER HEAD COVER GASKET	1
4	Kit #4, Kit #8	GASKET, BREATH GROOVE	1
5	Kit #8	STOP ENGINE PIECE SUBASSEMBLY	1
6	Kit #7	SHAFT SUBASSEMBLY, ROCKER	2
7	Kit #7	ROCKER SUBASSEMBLY, VALVE	2
8	Kit #7	CYLINDER HEAD COVER PIN LIMIT PLATE	1
9	Kit #7	ROTATOR, VALVE	2
10	Kit #7	CLAMP, VALVE LOCK	4
11	Kit #7	SEAT, VALVE SPRING	2
12	Kit #7	SPRING, VALVE	2
13	Kit #7	GUIDE, SEAL	1
14	Kit #7	VALVES SET	1
15	Kit #9	CYLINDER HEAD BOLT	4
16	Kit #9	HEAD SUBASSEMBLY, CYLINDER	1
17	Kit #4, Kit #9	GASKET, CYLINDER HEAD	1
18	Kit #9	POSITION PIN - TYPE A	2
19	N/A	RING ASSY, PISTON	1
20	N/A	CLIP, PISTON PIN	2
21	N/A	PIN, PISTON	1
22	N/A	PISTON	1
23	N/A	ROD, CONNECTING	1
24	Kit #9, Kit #10	PLUG, SPARK	1
25	Kit #9	STUD BOLT (BM=2D)	2
26	Kit #2, Kit #4,	GASKET, EXHAUST OUTLET	1
27	Kit #6, Kit #7, Kit #8, Kit #20, Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	11
28	Kit #2	MUFFLER	1
29	Kit #2	LOCK NUT	5
30	Kit #9	STUD BOLT (BM=2D)	2
31	Kit #4, Kit #5	GASKET, INLET	1
32	Kit #5	PLATE, CARBURETOR INSULATOR	1
33	Kit #4, Kit #5	CARBURETOR SEAL GASKET	1
34	805464	ECU ASSEMBLY	1
35	Kit #4, Kit #5	AIR CLEANER SEAL GASKET	1
36	Kit # 1	KNOB	1
37	Kit #1	HEXAGON NUT WITH FLANGE	2
38	Kit #9	SHROUD, CYLINDER BODY	1
39	805750 or Kit #9	SENSOR, TEMPERATURE	1
40	Kit #1	PIPE CLAMP	2
41	Kit #1	TUBE, BREATHER	1
42	Kit #1	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	1
43	Kit #2	PIPE, EXHAUST	1
44	N/A	CRANKSHAFT ASSY.	1
45	Kit #2, Kit #4	GASKET, MUFFLER	1
46	Kit #4, Kit #21	GASKET, CRANKCASE	1
47	Kit #21	POSITION PIN - TYPE A	2

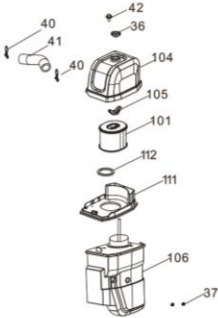
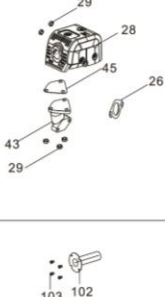
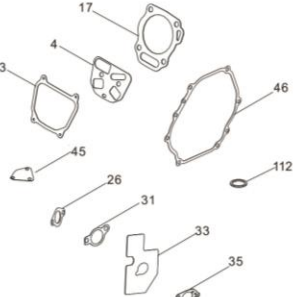
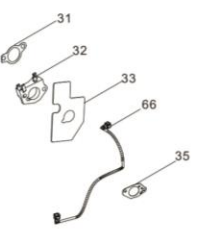
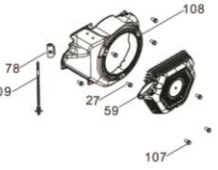
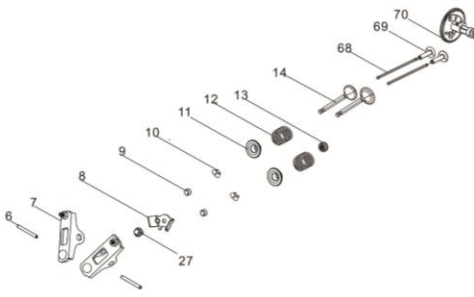
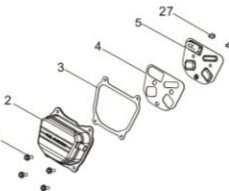
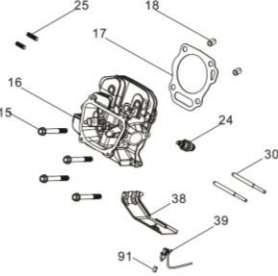
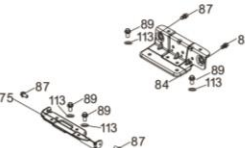
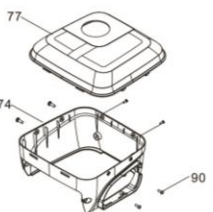
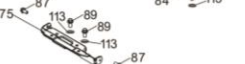
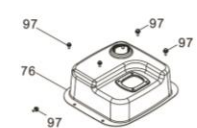
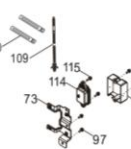
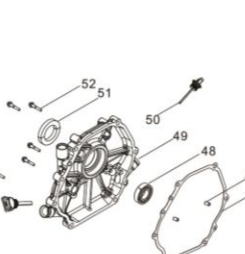
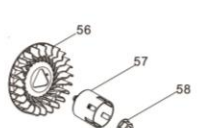
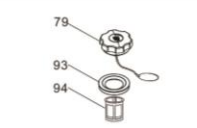
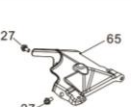
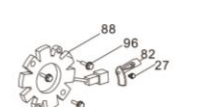
Item 114593 (804313) - e300 Engine Parts Explosion– Rev A.4

48	Kit #21	DEEP GROOVE BALL BEARING - P53	1
49	Kit #21	COVER, CRANKCASE	1
50	805467 or Kit #21	DIPSTICK SUBASSEMBLY, OIL	2
51	Kit #21	SEAL, OIL	2
52	Kit #21	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	7
53	N/A	CRANKCASE SUBASSEMBLY.	1
54	805570	PLUG, RUBBER	1
55	805465	FLYWHEEL SUBASSEMBLY	1
56	Kit #22	IMPELLER	1
57	Kit #22	PULLEY, STARTER	1
58	Kit #22	NUT, FLYWHEEL	1
59	Kit #6	MANUAL STARTING ASSEMBLY	1
60	Kit #11, Kit #25	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
61	Kit #11	SENSOR, ENGINE OIL	1
62	Kit #11	HEXAGON NUT WITH FLANGE	1
63	Kit #24	FLAT WASHER	2
64	Kit #24	BOLT, DRAIN PLUG	2
65	Kit #20	CONTROL ASSY, THROTTLE	1
66	Kit #5	HIGH PRESSURE FUEL TUBE SUBASSEMBLY	1
67	Kit #25	TRIGGER ASSY.	1
68	Kit #7	LIFTER SUBASSEMBLY, VALVE	2
69	Kit #7	TAPPET, VALVE	2
70	Kit #7	CAMSHAFT ASSY.	1
71	Kit #12	COIL, IGNITION	1
72	Kit #12	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2
73	Kit #19	MOUNTING BRACKET	1
74	Kit #14	HOUSING, ENGINE	1
75	Kit #13	FRAME, FUEL TANK INSTALLTION	1
76	Kit #17	FUEL TANK	1
77	Kit #14	COPING, ENGINE COUTER COVER	1
78	Kit #6	WIRE CLIP	2
79	Kit #18	COVER, FUEL TANK	1
80	Kit #16	HEXALOBULAR SOCKET PAN HEAD SCREW	4
81	Kit #16	PANEL SUBASSEMBLY, CONTROL	1
82	Kit #23	CLAMP, CHARGE COIL	1
83	Kit #15	BUILT-IN ELECTRONIC FUEL PUMP	1
84	Kit #13	FUEL TANK INSTALLATION REAR BRACKET	1
85	Kit #19	REGULATOR, VOLTAGE	1
86	805466	ECU WIRING HARNESS	1
87	Kit #13	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
88	Kit #23	COIL SUBASSEMBLY, CHARGE	1
89	Kit #13	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
90	Kit #14	HEXALOBULAR SOCKET PAN HEAD SCREW	6
91	Kit #9	BUSH	1
92	805571	LED LOGO	1
93	Kit #18	SLEEVE, FILLING OIL HOLE RUBBER	1
94	Kit #18	STRAINER, FUEL	1
95	Kit #16	JACKET, CABLE RUBBER	1
96	Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4

Item 114593 (804313) - e300 Engine Parts Explosion– Rev A.4

97	Kit #17, Kit #19	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
98	Kit #15	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
99	N/A	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
100	Kit #12, Kit #19	CABLE TIE	3
101	Kit #1, Kit #10	AIR CLEANER ELEMENT ASSEMBLY	1
102	Kit #3	COLLECTOR, SPARK	1
103	Kit #3	CROSS-RECESSED SELF-TAPPING SCREW	4
104	Kit #1	COVER, AIR CLEANER CASE	1
105	Kit #1	BUTTERFLY NUT - STAMPED	1
106	Kit #1	ELBOW SUBASSEMBLY, AIR CLEANER	1
107	Kit #6	HEXAGON SOCKET FLANGE FACE BOLT	3
108	Kit #6	SHROUD	1
109	Kit #6, Kit #19	CABLE TIE	2
110	Kit #15	WIRE CLIP	1
111	Kit #1	FILTER ELEMENT SUPPORT PLATE	1
112	Kit #1, Kit #4	AIR FILTER HOUSING GASKET	1
113	Kit #13	FLAT WASHER	4
114	Kit #19	CASE, BATTERY	1
115	Kit #19	BOLT	2
116	805943	ECU WIRING HARNESS - BATTERY	1
117	N/A	CABLE TIE	1

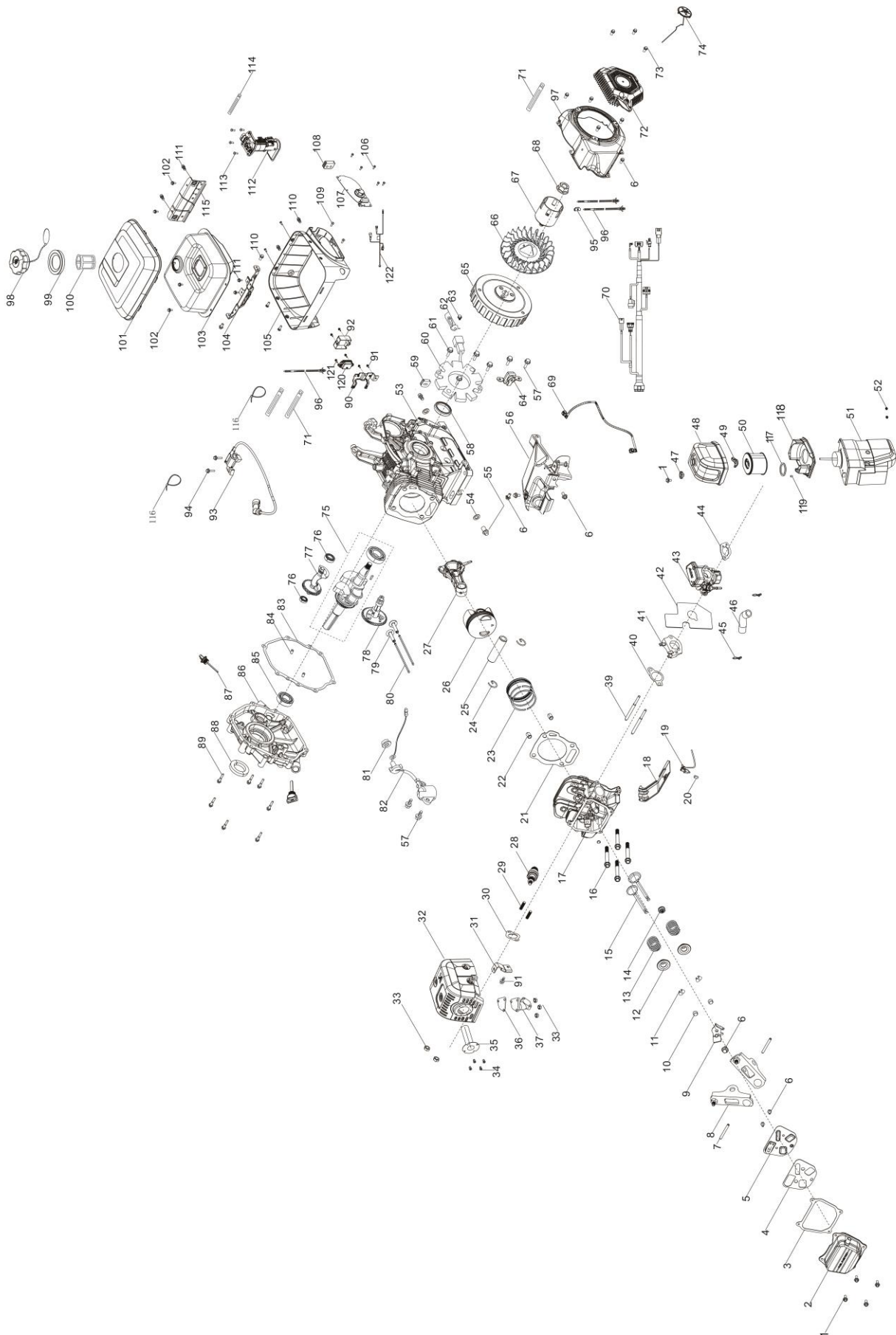
Item 114593 (804313) - e300 Engine Parts Kits – Rev A.4

 Kit #1	 Kit #2	 Kit #3	 Kit #4
 Kit #5	 Kit #6	 Kit #7	 Kit #8
 Kit #9	 Kit #10	 Kit #11	 Kit #12
 Kit #13	 Kit #14	 Kit #15	 Kit #16
 Kit #17	 Kit #18	 Kit #19	 Kit #20
 Kit #21	 Kit #22	 Kit #23	 Kit #24

Item 114593 (804313) - e300 Engine Parts Kits – Rev A.4

KIT REF #	KIT PART #	DESCRIPTION	QTY
1	805438	AIR CLEANER KIT	1
2	805439	MUFFLER KIT	1
3	805440	SPARK COLLECTOR KIT	1
4	805441	GASKET KIT	1
5	805442	ECU/CARBURETOR MOUNT KIT	1
6	805443	ENGINE SHROUD & RECOIL STARTER KIT	1
7	805445	ROCKER ARM AND VALVE KIT	1
8	805446	VALVE COVER KIT	1
9	805447	CYLINDER HEAD KIT	1
10	805448	MAINTENANCE KIT	1
11	805449	LOW OIL SENSOR KIT	1
12	805450	IGNITION COIL KIT	1
13	805451	FUEL TANK MOUNT KIT	1
14	805452	FUEL TANK COVER KIT	1
15	805453	FUEL PUMP KIT	1
16	805941	CONTROL PANEL KIT	1
17	805455	FUEL TANK KIT	1
18	805456	FUEL CAP KIT	1
19	805942	VOLTAGE REGULATOR KIT	1
20	805458	CONTROL THROTTLE ASSEMBLY KIT	1
21	805459	CRANKCASE COVER KIT	1
22	805460	IMPELLER / STARTER PULLEY KIT	1
23	805461	CHARGE COIL KIT	1
24	805462	DRAIN PLUG BOLT KIT	2
25	805463	TRIGGER ASSEMBLY KIT	1

Item 114594 (804314) – e420 Engine Parts Explosion – Rev A.4



Item 114594 (804314) – e420 Engine Parts Explosion – Rev A.4

REF#	PART #	DESCRIPTION	QTY
1	Kit #1, Kit #8	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	5
2	Kit #8	COVER SUBASSEMBLY, CYLINDER HEAD	1
3	Kit #4, Kit #8	CYLINDER HEAD COVER GASKET	1
4	Kit #4, Kit #8	GASKET, BREATH GROOVE	1
5	Kit #8	STOP ENGINE PIECE SUBASSEMBLY	1
6	Kit #6, Kit #7, Kit #8, Kit #20	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	11
7	Kit #7	SHAFT SUBASSEMBLY, ROCKER	2
8	Kit #7	ROCKER SUBASSEMBLY, VALVE	2
9	Kit #7	CYLINDER HEAD COVER PIN LIMIT PLATE	1
10	Kit #7	ROTATOR, VALVE	2
11	Kit #7	CLAMP, VALVE LOCK	4
12	Kit #7	SEAT, VALVE SPRING	2
13	Kit #7	SPRING, VALVE	2
14	Kit #7	GUIDE, SEAL	1
15	Kit #7	VALVES SET	1
16	Kit #9	CYLINDER HEAD BOLT	4
17	Kit #9	HEAD SUBASSEMBLY, CYLINDER	1
18	Kit #9	SHROUD, CYLINDER BODY	1
19	805750 or Kit #9	SENSOR, TEMPERATURE	1
20	Kit #9	BUSH	1
21	Kit #4	GASKET, CYLINDER HEAD	1
22	Kit #9	POSITION PIN - TYPE A	2
23	805572	RING ASSY, PISTON	1
24	805573	CLIP, PISTON PIN	2
25	805574	PIN, PISTON	1
26	805575	PISTON	1
27	805576	ROD, CONNECTING	1
28	Kit #9, Kit #10	PLUG, SPARK	1
29	Kit #9	STUD BOLT (BM=2D)	2
30	Kit #2, Kit #4	GASKET, EXHAUST OUTLET	1
31	Kit #2	MOUNTING BRACKET	1
32	Kit #2	MUFFLER BODY	1
33	Kit #2	LOCK NUT	2
34	Kit #3	CROSS-RECESSED SELF-TAPPING SCREW	4
35	Kit #3	COLLECTOR, SPARK	1
36	Kit #2, Kit #4	GASKET, MUFFLER	1
37	Kit #2	PIPE, EXHAUST	1
38	N/A	LOCK NUT	3
39	Kit #9	STUD BOLT (BM=2D)	2
40	Kit #4, Kit #5	GASKET, INLET	1
41	Kit #5	PLATE, CARBURETOR INSULATOR	1
42	Kit #4, Kit #5	CARBURETOR SEAL GASKET	1
43	805489	ECU/CARBURETOR ASSEMBLY	1
44	Kit #4, Kit #5	AIR CLEANER SEAL GASKET	1
45	Kit #1	PIPE CLAMP	2
46	Kit #1	TUBE, BREATHER	1
47	Kit #1	KNOB	1

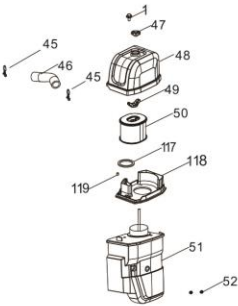
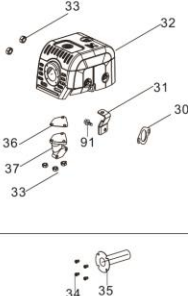
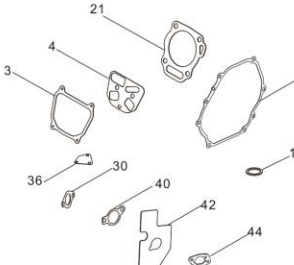
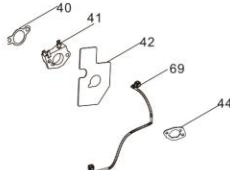
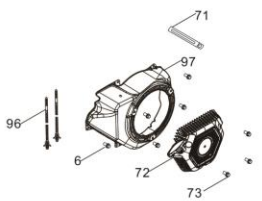
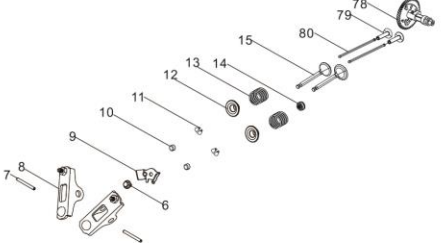
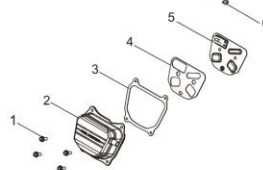
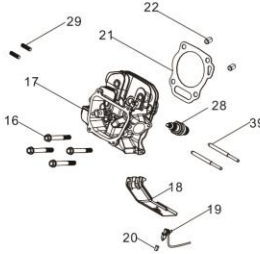
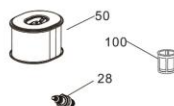
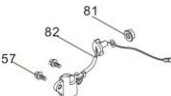
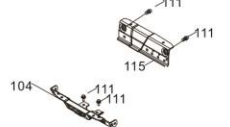
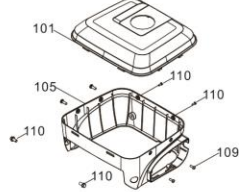
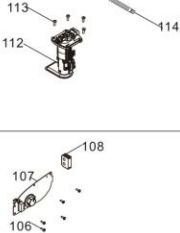
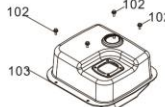
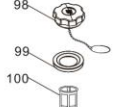
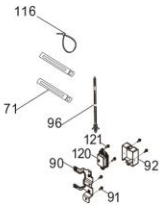
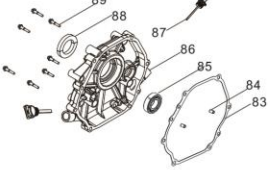
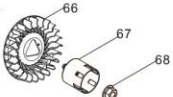
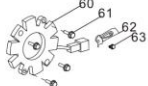
Item 114594 (804314) – e420 Engine Parts Explosion – Rev A.4

48	Kit #1	COVER, AIR CLEANER CASE	1
49	Kit #1	BUTTERFLY NUT - STAMPED	1
50	Kit #1, Kit #10	AIR CLEANER ELEMENT ASSEMBLY	1
51	Kit #1	AIR CLEANER BASE BODY	1
52	Kit #1	HEXAGON NUT WITH FLANGE	2
53	805577	CRANKCASE SUBASSEMBLY.	1
54	Kit #24	FLAT WASHER	2
55	Kit #24	BOLT, DRAIN PLUG	2
56	Kit #20	CONTROL ASSY BASE PLATE, THROTTLE	1
57	Kit #11, Kit #25	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
58	805578	SEAL, OIL	1
59	N/A	PLUG, RUBBER	1
60	Kit #23	COIL SUBASSEMBLY, CHARGE	1
61	Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2
62	Kit #23	CLAMP, CHARGE COIL	1
63	Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	1
64	Kit #25	TRIGGER ASSY.	1
65	805490	FLYWHEEL SUBASSEMBLY	1
66	Kit #22	IMPELLER	1
67	Kit #22	PULLEY, STARTER	1
68	Kit #22	NUT, FLYWHEEL	1
69	Kit #5	HIGH PRESSURE FUEL TUBE SUBASSEMBLY	1
70	805491	ECU WIRING HARNESS	1
71	Kit #6, Kit #19	WIRE CLIP	3
72	Kit #6	STARTER ASSY, RECOIL	1
73	Kit #6	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	3
74	805571	LED LOGO	1
75	805579	CRANKSHAFT ASSY.	1
76	805580	DEEP GROOVE BALL BEARING - P53	2
77	805581	SHAFT ASSY, BALANCING	1
78	Kit #7	CAMSHAFT ASSY.	1
79	Kit #7	TAPPET, VALVE	2
80	Kit #7	LIFTER SUBASSEMBLY, VALVE	2
81	Kit #11	HEXAGON NUT WITH FLANGE	1
82	Kit #11	SENSOR, ENGINE OIL	1
83	Kit #4, Kit #21	GASKET, CRANKCASE	1
84	Kit #21	POSITION PIN - TYPE A	2
85	Kit #21	DEEP GROOVE BALL BEARING - P53	1
86	Kit #21	COVER, CRANKCASE	1
87	805467 or Kit #21	DIPSTICK SUBASSEMBLY, OIL	2
88	Kit #21	SEAL, OIL	1
89	Kit #21	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	7
90	Kit #19	MOUNTING BRACKET	1
91	Kit #2, Kit #19	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	5
92	Kit #19	REGULATOR, VOLTAGE	1
93	805582 or Kit #12	COIL, IGNITION	1
94	Kit #12	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2
95	805762	WIRE CLIP	1
96	Kit #6, Kit #19	BAND	3

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97	Kit #6	SHROUD	1
98	Kit #18	COVER, FUEL TANK	1
99	Kit #18	SLEEVE, FILLING OIL HOLE RUBBER	1
100	Kit #10, Kit #18	STRAINER, FUEL	1
101	Kit #14	COPING, ENGINE COUNTER COVER	1
102	Kit #17	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
103	Kit #17	FUEL TANK	1
104	Kit #13	FRAME, FUEL TANK INSTALLTION	1
105	Kit #14	HOUSING, ENGINE	1
106	Kit #16	CROSS-RECESSED PAN HEAD SCREW	5
107	Kit #16	PANEL SUBASSEMBLY, CONTROL	1
108	Kit #16	JACKET, CABLE RUBBER	1
109	Kit #14	HEXALOBULAR SOCKET PAN HEAD SCREW	6
110	Kit #14	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
111	Kit #13	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
112	Kit #15	BUILT-IN ELECTRONIC FUEL PUMP	1
113	Kit #15	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
114	Kit #15	WIRE CLIP	1
115	Kit #13	FUEL TANK INSTALLATION REAR BRACKET	1
116	Kit #12, Kit #19	CABLE TIES	2
117	Kit #1, Kit #4	AIR FILTER HOUSING GASKET	1
118	Kit #1	FILTER ELEMENT SUPPORT PLATE	1
119	Kit #1	PLUG	1
120	Kit #19	CASE, BATTERY	1
121	Kit #19	HEXAGON SOCKET FLANGE BOLT – GRADE B	2
122	805943	ECU WIRING HARNESS - BATTERY	1

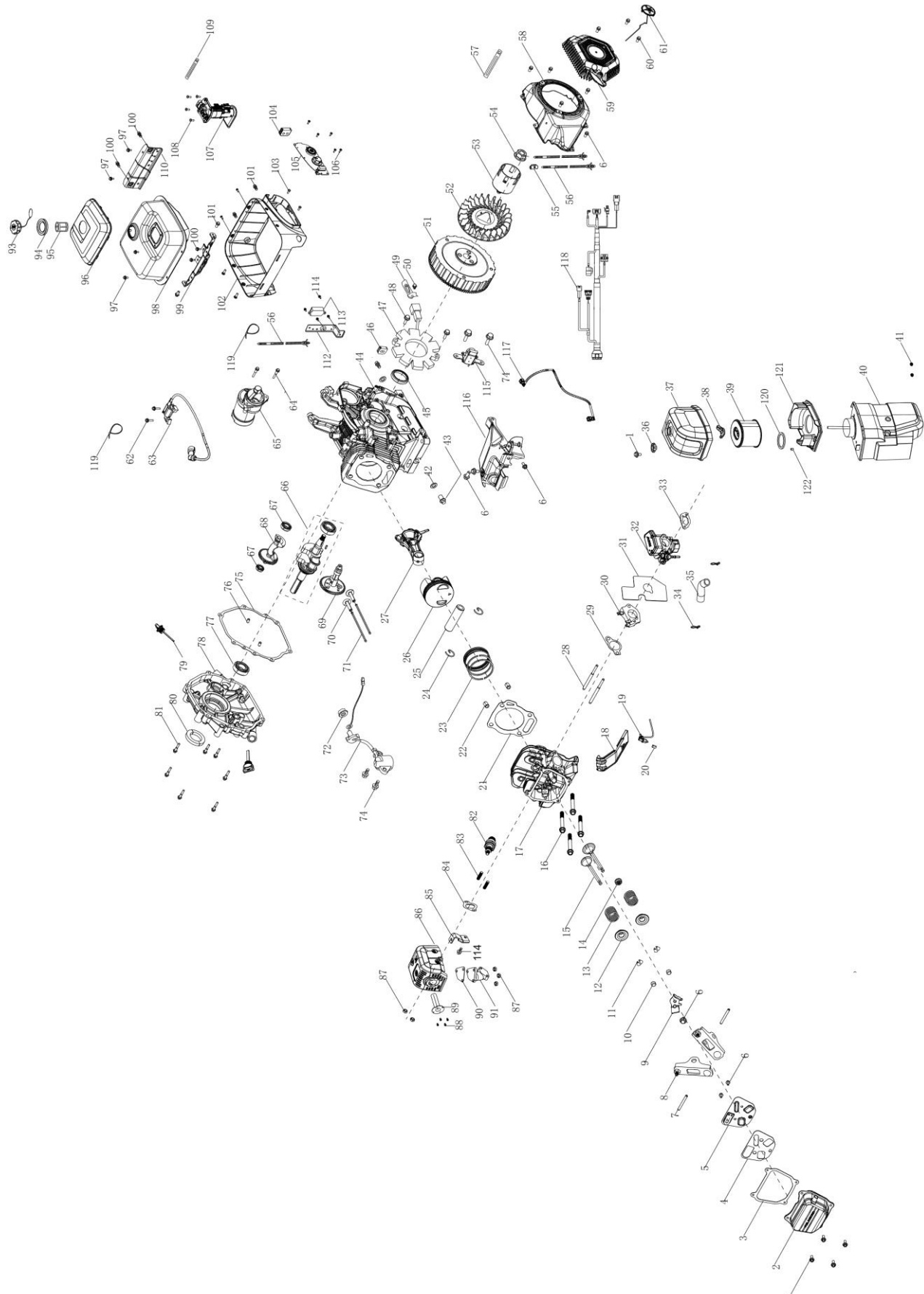
Item 114594 (804314) – e420 Engine Parts Kits – Rev A.4

 Kit #1	 Kit #2	 Kit #4	 Kit #5	
 Kit #6	 Kit #7	 Kit #8	 Kit #9	
 Kit #10	 Kit #11	 Kit #12	 Kit #13	 Kit #14
 Kit #15	 Kit #17	 Kit #18	 Kit #19	 Kit #20
 Kit #21	 Kit #22	 Kit #23	 Kit #24	 Kit #25

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KIT REF #	KIT PART #	DESCRIPTION	QTY
1	805468	AIR CLEANER KIT	1
2	805469	MUFFLER KIT	1
3	805440	SPARK COLLECTOR KIT	1
4	805470	GASKET KIT	1
5	805471	CARBURETOR KIT	1
6	805472	ENGINE SHROUD & RECOIL STARTER KIT	1
7	805474	ROCKER ARM AND VALVE KIT	1
8	805475	VALVE COVER KIT	1
9	805476	CYLINDER HEAD KIT	1
10	805477	MAINTENANCE KIT	1
11	805449	LOW OIL SENSOR KIT	1
12	805583	IGNITION COIL KIT	1
13	805478	FUEL TANK MOUNT KIT	1
14	805479	FUEL TANK COVER	1
15	805453	FUEL PUMP KIT	1
16	805944	CONTROL PANEL KIT	1
17	805481	FUEL TANK KIT	1
18	805456	FUEL CAP KIT	1
19	805945	VOLTAGE REGULATOR KIT	1
20	805483	CONTROL THROTTLE ASSEMBLY	1
21	805484	CRANKCASE COVER KIT	1
22	805485	IMPELLER / STARTER PULLEY KIT	1
23	805486	CHARGE COIL KIT	1
24	805487	DRAIN PLUG KIT	2
25	805488	TRIGGER ASSEMBLY KIT	1

Item 114656 (804315) – e420 Engine Parts Explosion – Rev A.4



Item 114656 (804315) – e420 Engine Parts Explosion – Rev A.4

REF#	PART #	DESCRIPTION	QTY
1	Kit #1, Kit #8	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	5
2	Kit #8	COVER SUBASSEMBLY, CYLINDER HEAD	1
3	Kit #4, Kit #8	CYLINDER HEAD COVER GASKET	1
4	Kit #4, Kit #8	GASKET, BREATH GROOVE	1
5	Kit #8	STOP ENGINE PIECE SUBASSEMBLY	1
6	Kit #6, Kit #7, Kit #8, Kit #20	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	11
7	Kit #7	SHAFT SUBASSEMBLY, ROCKER	2
8	Kit #7	ROCKER SUBASSEMBLY, VALVE	2
9	Kit #7	CYLINDER HEAD COVER PIN LIMIT PLATE	1
10	Kit #7	ROTATOR, VALVE	2
11	Kit #7	CLAMP, VALVE LOCK	4
12	Kit #7	SEAT, VALVE SPRING	2
13	Kit #7	SPRING, VALVE	2
14	Kit #7	GUIDE, SEAL	1
15	Kit #7	VALVES SET	1
16	Kit #9	CYLINDER HEAD BOLT	4
17	Kit #9	HEAD SUBASSEMBLY, CYLINDER	1
18	Kit #9	SHROUD, CYLINDER BODY	1
19	805750 or Kit #9	SENSOR, TEMPERATURE	1
20	Kit #9	BUSH	1
21	Kit #4, Kit #9	GASKET, CYLINDER HEAD	1
22	Kit #9	POSITION PIN - TYPE A	2
23	805572	RING ASSY, PISTON	1
24	805573	CLIP, PISTON PIN	2
25	805574	PIN, PISTON	1
26	805575	PISTON	1
27	805576	ROD, CONNECTING	1
28	Kit #9	STUD BOLT (BM=2D)	2
29	Kit #4, Kit #5	GASKET, INLET	1
30	Kit #5	PLATE, CARBURETOR INSULATOR	1
31	Kit #4, Kit #5	CARBURETOR SEAL GASKET	1
32	805619	ECU ASSEMBLY	1
33	Kit #4, Kit #5	AIR CLEANER SEAL GASKET	1
34	Kit #1	PIPE CLAMP	2
35	Kit #1	TUBE, BREATHER	1
36	Kit #1	KNOB	1
37	Kit #1	COVER, AIR CLEANER CASE	1
38	Kit #1	BUTTERFLY NUT - STAMPED	1
39	Kit #1, Kit #10	AIR CLEANER ELEMENT ASSEMBLY	1
40	Kit #1	AIR CLEANER BASE BODY	1
41	Kit #1	HEXAGON NUT WITH FLANGE	2
42	Kit #24	FLAT WASHER	2
43	Kit #24	BOLT, DRAIN PLUG	2
44	805620	CRANKCASE SUBASSEMBLY.	1
45	805578	SEAL, OIL	1
46	805570	PLUG, RUBBER	1
47	805621 or Kit #23	COIL SUBASSEMBLY, CHARGE	1
48	Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2

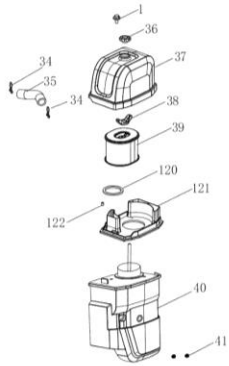
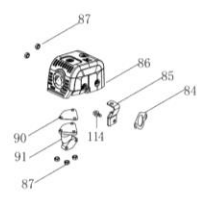
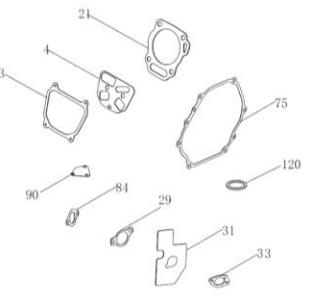
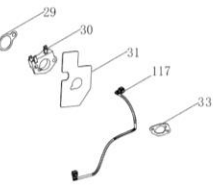
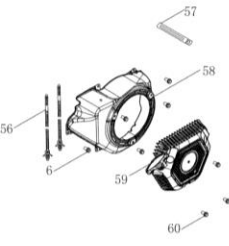
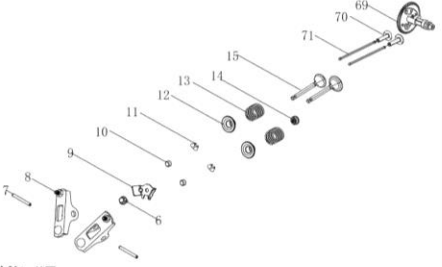
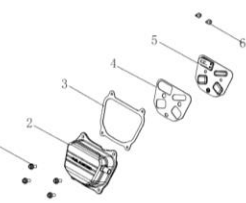
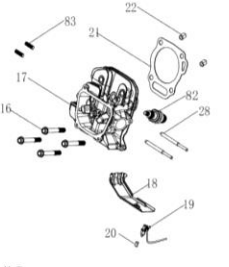
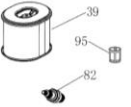
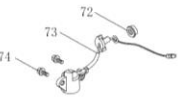
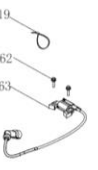
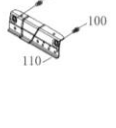
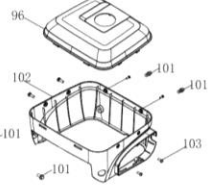
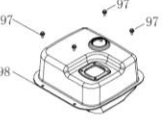
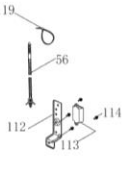
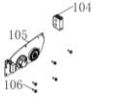
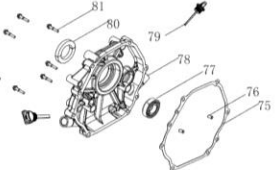
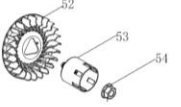
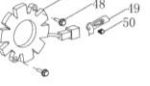
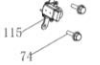
Item 114656 (804315) – e420 Engine Parts Explosion – Rev A.4

49	Kit #23	CLAMP, CHARGE COIL	1
50	Kit #23	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	1
51	805622	FLYWHEEL SUBASSEMBLY	1
52	Kit #22	IMPELLER	1
53	Kit #22	PULLEY, STARTER	1
54	Kit #22	NUT, FLYWHEEL	1
55	805762	WIRE CLIP	1
56	Kit #6, Kit #19	BAND	3
57	Kit #6	WIRE CLIP	1
58	Kit #6	SHROUD	1
59	Kit #6	STARTER ASSY, RECOIL	1
60	Kit #6	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	3
61	805571	LED LOGO	1
62	Kit #12	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2
63	805582 or Kit #12	COIL, IGNITION	1
64	N/A	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	2
65	805623	STARTING MOTOR ASSEMBLY	1
66	805579	CRANKSHAFT ASSY.	1
67	805580	DEEP GROOVE BALL BEARING - P53	2
68	805581	SHAFT ASSY, BALANCING	1
69	Kit #7	CAMSHAFT ASSY.	1
70	Kit #7	TAPPET, VALVE	2
71	Kit #7	LIFTER SUBASSEMBLY, VALVE	2
72	Kit #11	HEXAGON NUT WITH FLANGE	1
73	Kit #11	SENSOR, ENGINE OIL	1
74	Kit #11, Kit #25	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
75	Kit #4, Kit #21	GASKET, CRANKCASE	1
76	Kit #21	POSITION PIN - TYPE A	2
77	Kit #21	DEEP GROOVE BALL BEARING - P53	1
78	Kit #21	COVER, CRANKCASE	1
79	805467 or Kit #21	DIPSTICK SUBASSEMBLY, OIL	2
80	Kit #21	SEAL, OIL	1
81	Kit #21	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	7
82	Kit #9, Kit #10	PLUG, SPARK	1
83	Kit #9	STUD BOLT (BM=2D)	2
84	Kit #2, Kit #4	GASKET, EXHAUST OUTLET	1
85	Kit #2	MOUNTING BRACKET	1
86	Kit #2	MUFFLER	1
87	Kit #2	LOCK NUT	5
88	Kit #3	CROSS-RECESSED SELF-TAPPING SCREW	4
89	Kit #3	COLLECTOR, SPARK	1
90	Kit #2, Kit# 4	GASKET, MUFFLER	1
91	Kit #2	PIPE, EXHAUST	1
93	Kit #18	COVER, FUEL TANK	1
94	Kit #18	SLEEVE, FILLING OIL HOLE RUBBER	1
95	Kit #10, Kit #18	STRAINER, FUEL	1
96	Kit #14	COPING, ENGINE COUNTER COVER	1
97	Kit #17	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
98	Kit #17	FUEL TANK	1
99	Kit #13	FRAME, FUEL TANK INSTALLTION	1

Item 114656 (804315) – e420 Engine Parts Explosion – Rev A.4

100	Kit #13	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
101	Kit #14	HEXAGON SOCKET FLANGE FACE BOLT - SMALL SERIES	4
102	Kit #14	HOUSING, ENGINE	1
103	Kit #14	HEXALOBULAR SOCKET PAN HEAD SCREW	6
104	Kit #16	JACKET, CABLE RUBBER	1
105	Kit #16	PANEL SUBASSEMBLY, CONTROL	1
106	Kit #16	CROSS-RECESSED PAN HEAD SCREW	5
107	Kit #15	BUILT-IN ELECTRONIC FUEL PUMP	1
108	Kit #15	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	4
109	Kit #15	WIRE CLIP	1
110	Kit #13	FUEL TANK INSTALLATION REAR BRACKET	1
112	Kit #19	MOUNTING BRACKET	1
113	Kit #19	REGULATOR, VOLTAGE	1
114	Kit #2, Kit #19	HEXAGON SOCKET FLANGE FACE BOLT - BIG SERIES - GRADE B	5
115	Kit #25	TRIGGER ASSY.	1
116	Kit #20	CONTROL ASSY BASE PLATE, THROTTLE	1
117	Kit #5	HIGH PRESSURE FUEL TUBE SUBASSEMBLY	1
118	805624	ECU WIRING HARNESS	1
119	Kit #12, Kit #19	CABLE TIES	2
120	Kit #1, Kit #4	AIR FILTER HOUSING GASKET	1
121	Kit #1	FILTER ELEMENT SUPPORT PLATE	1
122	Kit #1	PLUG	1

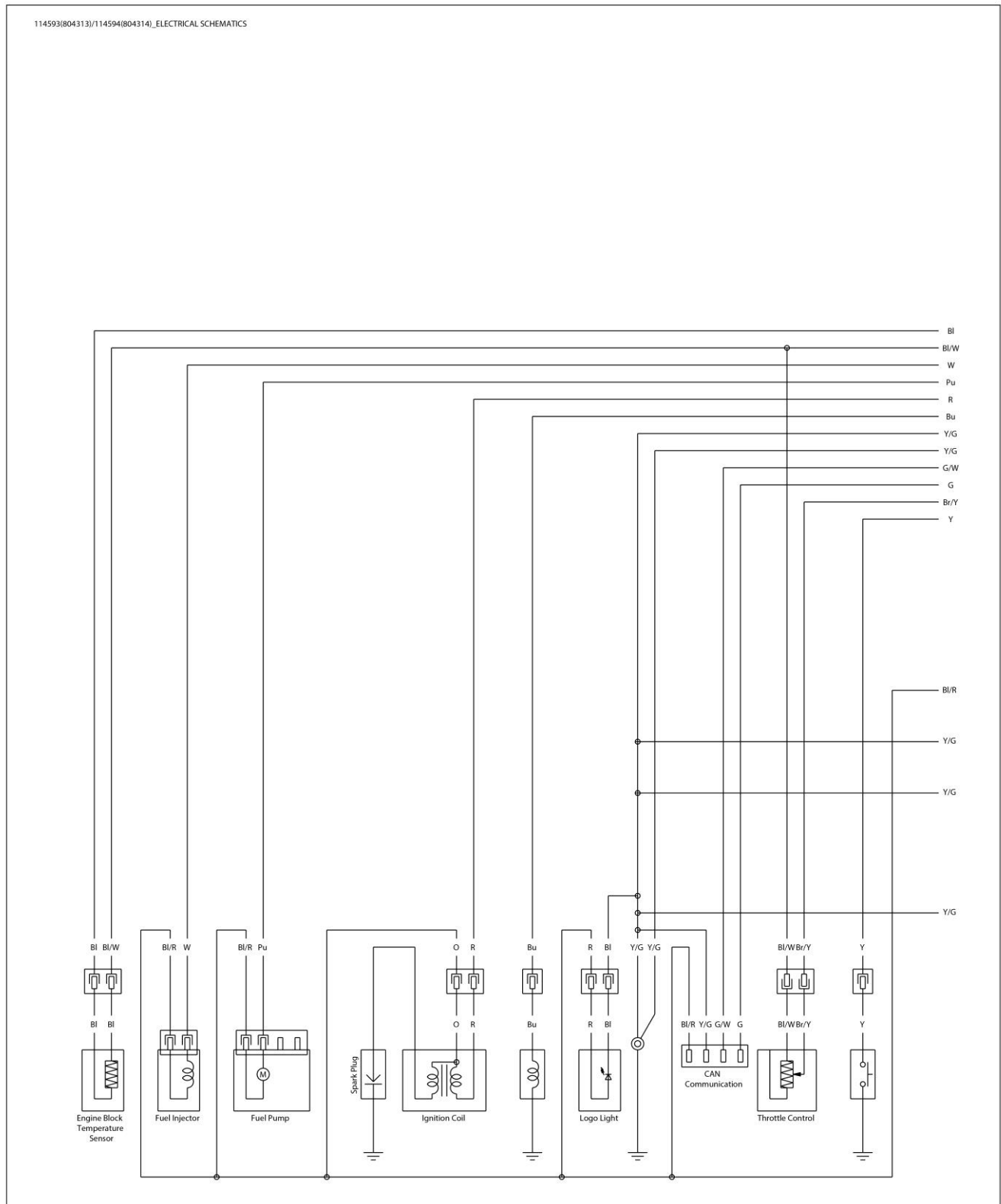
Item 114656 (804315) – e420 Engine Parts Kits – Rev A.4

 Kit #1	 Kit #2  Kit #3	 Kit #4	 Kit #5	
 Kit #6	 Kit #7	 Kit #8	 Kit #9	
 Kit #10	 Kit #11	 Kit #12	 Kit #13	 Kit #14
 Kit #15	 Kit #17	 Kit #18	 Kit #19	 Kit #20
 Kit #16				
 Kit #21	 Kit #22	 Kit #23	 Kit #24	 Kit #25

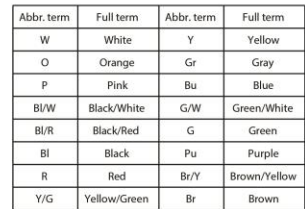
Item 114656 (804315) – e420 Engine Parts Kits – Rev A.4

KIT REF #	KIT PART #	DESCRIPTION	QTY
1	805468	AIR CLEANER KIT	1
2	805469	MUFFLER KIT	1
3	805440	SPARK COLLECTOR KIT	1
4	805470	GASKET KIT	1
5	805471	ECU/CARBURETOR MOUNT KIT	1
6	805472	ENGINE SHROUD & RECOIL STARTER KIT	1
7	805474	ROCKER ARM AND VALVE KIT	1
8	805475	VALVE COVER KIT	1
9	805625	CYLINDER HEAD KIT	1
10	805477	MAINTENANCE KIT	1
11	805449	LOW OIL SENSOR KIT	1
12	805583	IGNITION COIL KIT	1
13	805478	FUEL TANK MOUNT KIT	1
14	805479	FUEL TANK COVER	1
15	805453	FUEL PUMP KIT	1
16	805626	CONTROL PANEL KIT	1
17	805481	FUEL TANK KIT	1
18	805456	FUEL CAP KIT	1
19	805627	VOLTAGE REGULATOR KIT	1
20	805483	CONTROL THROTTLE ASSEMBLY	1
21	805484	CRANKCASE COVER KIT	1
22	805485	IMPELLER / STARTER PULLEY KIT	1
23	805628	CHARGE COIL KIT	1
24	805487	DRAIN PLUG KIT	2
25	805488	TRIGGER ASSEMBLY KIT	1

114593(804313) and 114594(804314) Electrical Schematic Diagram

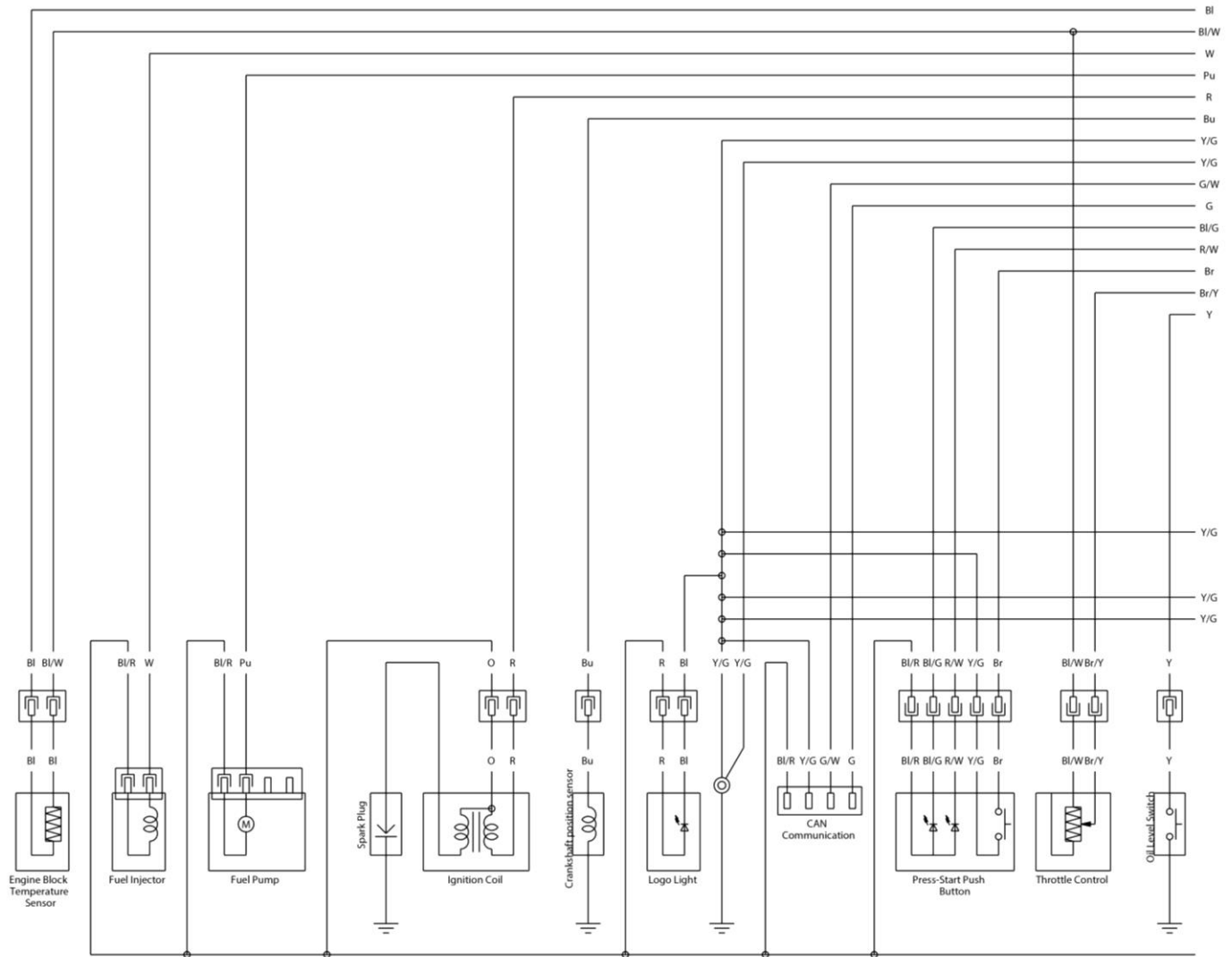


114593(804313)/114594(804314)_ELECTRICAL SCHEMATICS

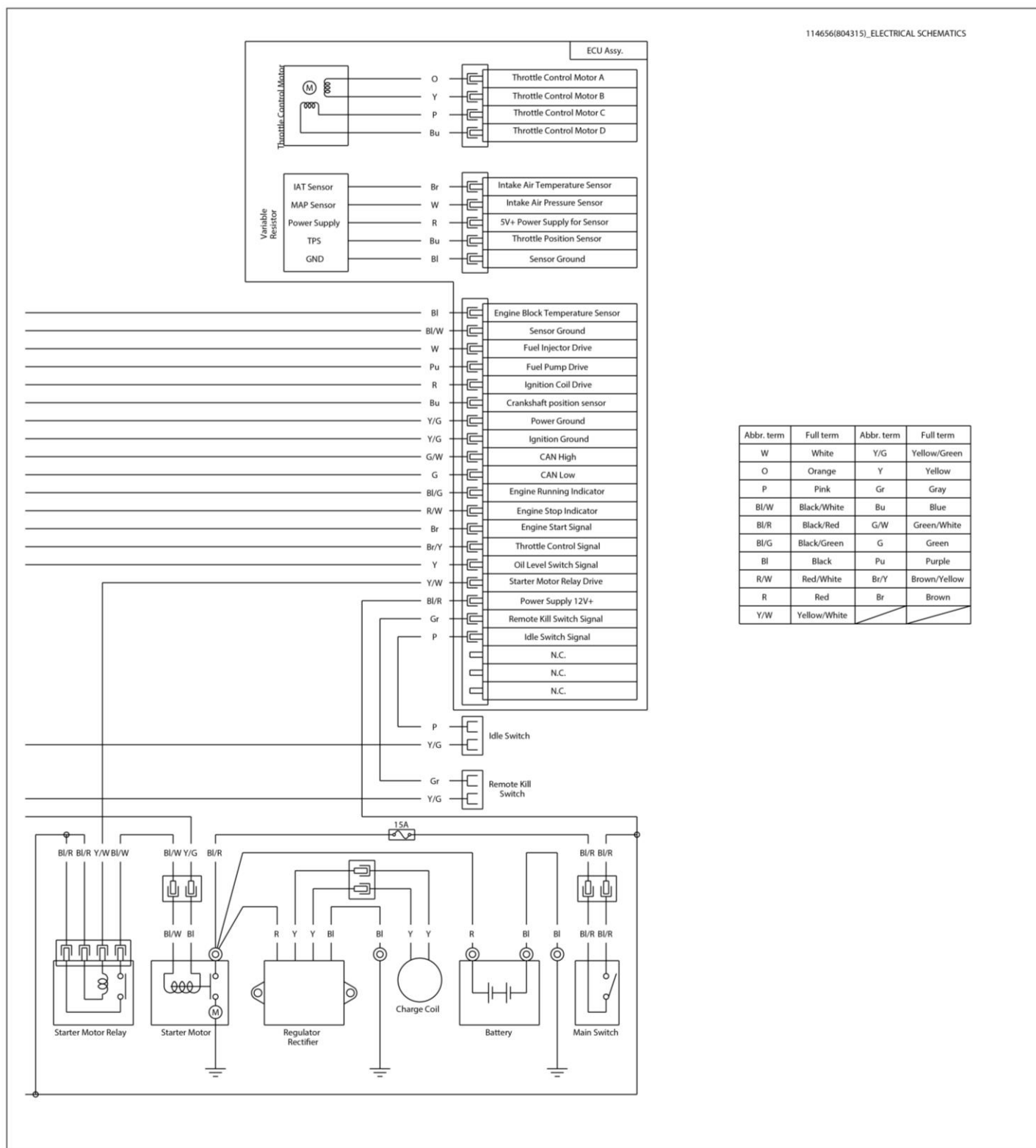


114656 (804315) Electrical Schematic Diagram

114656(804315)_ELECTRICAL SCHEMATICS



114656 (804315) Electrical Schematic Diagram



Limited Warranty

Dear Valued Customer:

The NorthStar Product you just purchased is built with the finest material and craftsmanship. Use this product properly and enjoy the benefits from its high performance. By purchasing a NorthStar product, you show a desire for quality and durability. Treat this engine like the high-quality piece of machinery it is. Neglect and improper handling may impair its performance. Please thoroughly read the instructions and understand the operation before using your product. Always contact NorthStar Product Support at 1-800-270-0810 prior to having any service or warranty work performed, as some services performed by parties other than NorthStar approved service centers may void this warranty. This warranty is in lieu of any other warranty expressed or implied and NorthStar assumes no other responsibility or liability outside that expressed within this warranty.

Limited Warranty

NorthStar shall warranty this engine, or parts of the engine, to be free from defects in material or workmanship for a period of:

Item Number	Item Name	Commercial/Consumer Warranty	Details
114593 (804313) 114594 (804314) 114656 (804315)	e300 e420 e420	5 years from date of purchase	The engine warranty is covered under the terms and conditions as outlined by the NorthStar engine warranty and is the sole responsibility of NorthStar. Normal engine maintenance such as spark plugs, air filters, adjustments, fuel system cleaning and obstruction due to build up is not covered by this NorthStar warranty.

"Consumer use" means personal residential household use by a consumer. "Commercial use" means all other uses, including use for commercial, income producing or rental purposes or when purchased by a business.

This warranty applies to the original purchaser of the engine (verification of purchase, in the form of a receipt, is the responsibility of the buyer), is non-transferable, and covers parts and labor. Parts will be replaced or repaired at no charge, except when the engine has failed due to lack of proper maintenance. If a part is no longer available, the part may be replaced with a similar part of equal function. Any misuse, abuse, alteration or improper installation or operations will void warranty. Determining whether a part is to be replaced or repaired is the sole decision of NorthStar. NorthStar will not provide for replacement of complete products due to defective parts. Any costs incurred due to replacement or repair of items outside of a NorthStar approved facility is the responsibility of the buyer and not covered under warranty. Transportation costs to and from service center is the responsibility of the customer.

This warranty specifically excludes the following: failure of parts due to damage caused by accident, fire, flood, windstorm, acts of God, applications not approved by NorthStar in writing, corrosion caused by chemicals, use of replacement parts which do not conform to manufacturer's specifications, damage related to rodent and/or insect infestation and damage caused by vandalism. Additional exclusions: loss of running time, inconvenience, loss of income, or loss of use, including any implied warranty of merchantability of fitness for a specific use. Also, Outdoor Power Equipment needs periodic parts and service to perform well, and this warranty does not cover instances when normal use has exhausted the life of a component or the engine.

This warranty does not cover any personal injury or damage to surrounding property caused by failure of any part. Repair or replacement of parts does not extend the warranty period.

The engine warranty is covered under the terms and conditions as outlined by the engine manufactures warranty contained herein and is the sole responsibility of the engine manufacture. Normal engine maintenance such as spark plugs, air filters, adjustments, fuel system cleaning and obstruction due to build up is not covered by this NorthStar warranty.

Please fill in the following information and have it on hand when you call in on a warranty claim.

Customer Number: _____

Date of Purchase: _____

NorthStar Serial Number: _____

Item Number: _____

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