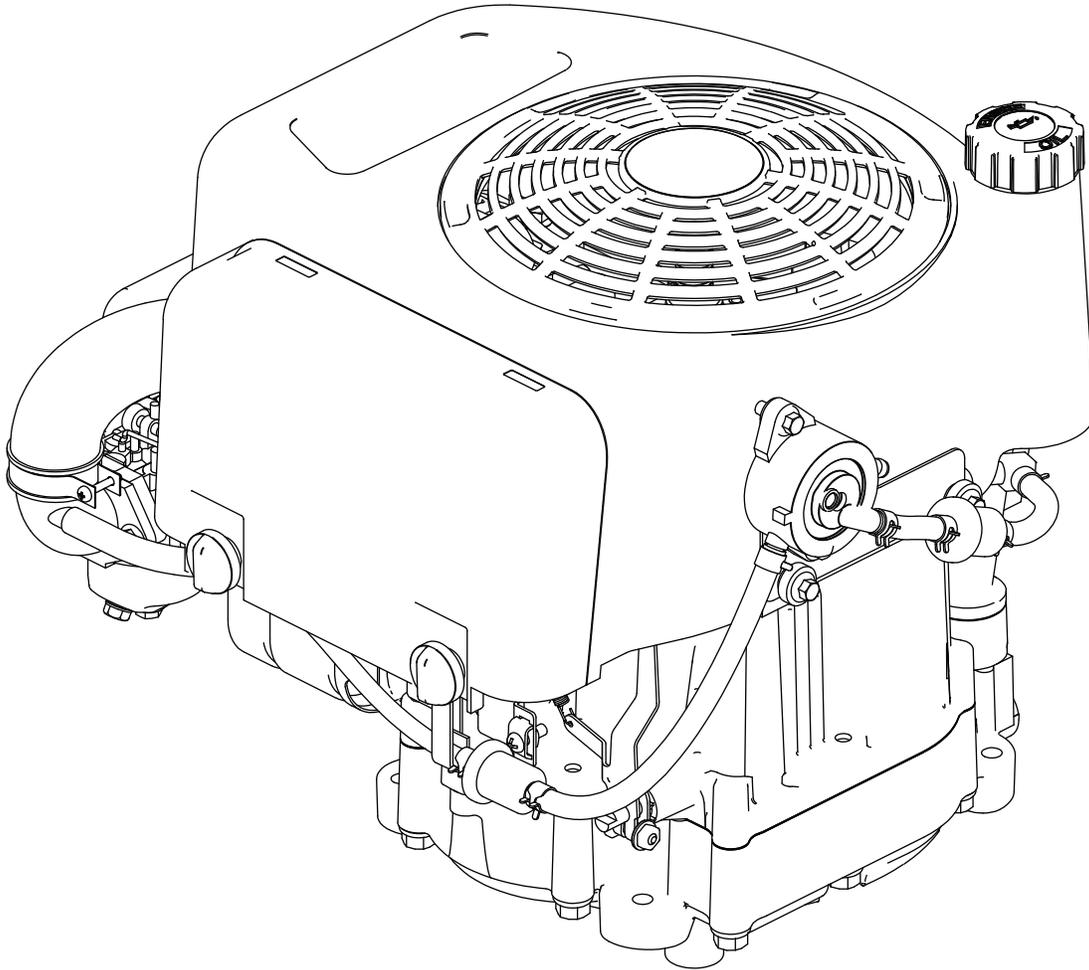




Operator's Manual
Original Operating Instructions
Viper® 340cc
4-Cycle Engine



Get parts online at
www.ardisam.com



P/N: 21203
ECN: 10638
REV1: 12/15/14
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INTRODUCTION

Congratulations on your investment in quality. Thank you for purchasing a Viper® Engine. We have worked to ensure that your engine meets the highest standards for usability and durability. With proper care, your engine will provide many years of service.

Please read this entire manual before installation and use. Viper® reserves the right to change, alter or improve the product and this document at any time without prior notice.

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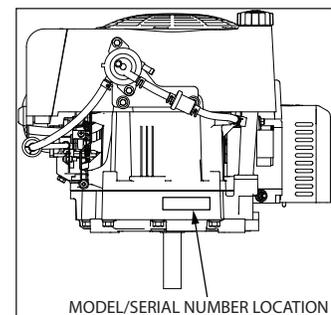
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Federal Emission Information

Viper® warrants to the retail purchaser, that this small, off-road engine was designed, built and equipped to conform at the time of initial sale to all applicable regulations of the U.S. Environmental Protection Agency (EPA).

REGISTRATION AND SERVICE

Record the engine model number and serial number in the space provided for easy reference when ordering parts or requesting technical support. Excluding emissions-related warranty items, the warranty is valid only if the completed registration is received by Ardisam within 30 days of purchase. **(SEE WARRANTY SECTION FOR MORE INFORMATION.)** Warranty for your Viper® Engine is carried out by registering the product which your Viper® Engine powers. You can register your warranty online by visiting www.getearthquake.com, or by mailing it to: Ardisam, 1160 Eighth Avenue, Cumberland, WI 54829. If you do not have a computer, call our customer service department at (800) 345-6007 Mondays through Fridays from 8 a.m. to 5 p.m. CST.



OWNERSHIP RECORDS		
Owner's Name:		
Owner's Address:		
City:	State/Province:	Zip Code/Postal Code:
Model Number:	Serial Number:	
Date of Purchase:		
Notes:		

This manual may contain information for several models. Read and keep this manual for future reference. This manual contains important information on SAFETY, ASSEMBLY, OPERATION, AND MAINTENANCE. The owner must be certain that all the product information is included with the unit. This information includes the MANUAL, the REPLACEMENT PARTS and the WARRANTIES. This information must be included to make sure state laws and other laws are followed. This manual should remain with the engine even if it is resold.

WARNINGS AND SAFETY PRECAUTIONS

Owner's Responsibility

Accurate assembly and safe and effective use of the rototiller is the owner's responsibility.

- Read and follow all safety instructions.
- Carefully follow all assembly instructions.
- Maintain the tiller according to directions and schedule included in this Earthquake® operator's manual.
- Ensure that anyone who uses the tiller is familiar with all controls and safety precautions.

Special Messages

Your manual contains special messages to bring attention to potential safety concerns, machine damage as well as helpful operating and servicing information. Please read all the information carefully to avoid injury and machine damage.

NOTE: *General information is given throughout the manual that may help the operator in the operation or service of the machine.*

Important Safety Precautions

Please read this section carefully. Operate the tiller according to the safety instructions and recommendations outlined here and inserted throughout the text. Anyone who uses this tiller must read the instructions and be familiar with the controls. Your tiller is equipped with a safety device that enables you to stop the wheels and tines quickly in an emergency. Learn how the drive safety control lever operates and how to control the tiller at all times.



THIS SYMBOL POINTS OUT IMPORTANT SAFETY INSTRUCTIONS WHICH IF NOT FOLLOWED COULD ENDANGER YOUR PERSONAL SAFETY. READ AND FOLLOW ALL INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO OPERATE THIS EQUIPMENT.

- Do not allow children to operate this rototiller. Keep small children away from the area being tilled. Do not allow adults to operate the tiller without proper instruction.

Intended Use / Foreseeable Misuse

IMPORTANT:

This is a motorized rotary tiller that works the soil by means of rotating tines. It is pedestrian-controlled, but not self-propelled, with a gasoline-fueled internal combustion engine to power the tines. It shall not be used for any other purpose.

WARNING

WARNING INDICATES A HAZARD WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY AND/OR PROPERTY DAMAGE.

CAUTION

CAUTION INDICATES YOUR EQUIPMENT CAN BE DAMAGED IF THE SAFETY INSTRUCTIONS THAT FOLLOW THIS SIGNAL WORD ARE NOT OBEYED.

IMPORTANT

INDICATES HELPFUL INFORMATION FOR PROPER ASSEMBLY, OPERATION, OR MAINTENANCE OF YOUR EQUIPMENT.

WARNING

CALIFORNIA PROPOSITION 65 WARNING

ENGINE EXHAUST FROM THIS PRODUCT CONTAINS CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM.

WARNING

YOU MUST READ, UNDERSTAND AND COMPLY WITH ALL SAFETY AND OPERATING INSTRUCTIONS IN THIS MANUAL BEFORE ATTEMPTING TO SETUP AND OPERATE YOUR MACHINE.

FAILURE TO COMPLY WITH ALL SAFETY AND OPERATING INSTRUCTIONS CAN RESULT IN LOSS OF MACHINE CONTROL, SERIOUS PERSONAL INJURY TO YOU AND/OR BYSTANDERS, AND RISK OF EQUIPMENT AND PROPERTY DAMAGE. THE TRIANGLE IN THE TEXT SIGNIFIES IMPORTANT CAUTIONS OR WARNINGS WHICH MUST BE FOLLOWED.

 **WARNING**

ENGINES GIVE OFF CARBON MONOXIDE, AN ODORLESS, COLORLESS, POISONOUS GAS. CARBON MONOXIDE MAY BE PRESENT EVEN IF YOU DO NOT SMELL OR SEE ANY ENGINE EXHAUST. BREATHING CARBON MONOXIDE CAN CAUSE NAUSEA, FAINTING OR DEATH, IN ADDITION TO DROWSINESS, DIZZINESS AND CONFUSION.

IF YOU EXPERIENCE ANY OF THESE SYMPTOMS, SEEK FRESH AIR AND MEDICAL ATTENTION IMMEDIATELY.

START AND RUN ENGINE OUTDOORS. DO NOT START OR RUN ENGINE IN ENCLOSED AREA, EVEN IF DOORS OR WINDOWS ARE OPEN.

HOT GASES ARE A NORMAL BY-PRODUCT OF A FUNCTIONING MUFFLER. FOLLOW ALL SAFETY INSTRUCTIONS TO PREVENT BURNS AND FIRES.

DO NOT ALTER/MODIFY ENGINE:

NEVER ALTER OR MODIFY THE ENGINE FROM THE FACTORY. SERIOUS INJURY OR DEATH MAY OCCUR IF ENGINE IS MODIFIED OR ALTERED.

WHEN WORKING ON OR REPLACING PARTS FOR THE ENGINE OR PRODUCT, YOU MUST ALWAYS DISCONNECT SPARK PLUG WIRE FROM THE SPARK PLUG AND KEEP IT AWAY FROM THE SPARK PLUG.

ENGINE SAFETY PRECAUTIONS

- Preventing Carbon Monoxide Poisoning
- Never try to ventilate engine exhaust indoors. Carbon monoxide can reach dangerous levels very quickly.
- Never run engine outdoors where exhaust fumes may be pulled into a building.
- Never run engine outdoors in a poorly ventilated area where the exhaust fumes may be trapped and not easily taken away. (Examples include: in a large hole or areas where hills surround your working area.)
- Never run engine in an enclosed or partially enclosed area. (Examples include: buildings that are enclosed on one or more sides, under tents, car ports or basements.)
- Always run the engine with the exhaust and muffler pointed in the direction away from the operator.
- Never point the exhaust muffler towards anyone. People should always be many feet away from the operation of the engine and its attachments.
- Do not change the engine governor settings or over-speed the engine.
- Stay away from rotating parts. Place protective covers over rotating parts.

- Do not use engine around dry brush, cloth rags, or other flammable materials.
- Always keep materials and debris clear of muffler guard and other hot engine parts.
- Never operate the engine without the muffler guard in place.
- Always make sure exhaust pipe is free of foreign objects.
- The engine exhaust becomes very hot during operation. Keep engine at least three feet away from buildings and other equipment during operation.
- Wear appropriate clothing such as a long-sleeved shirt or jacket. Also wear long trousers or slacks. Do not wear shorts. Never wear sandals, sneakers, or open shoes, and never operate the machine with bare feet.
- Do not wear loose clothing or jewelry. They can get caught in moving parts. Always keep hands, feet, hair and loose clothing away from any moving parts on engine and machine.

Gasoline Fires and Handling Fuel Safely

Use extra care in handling gasoline and other fuels. They are flammable and vapors are explosive.

- When storing extra fuel be sure that it is in an appropriate container and away from any fire hazards.
- Prevent fire and explosion caused by static electric discharge. Use only nonmetal, portable fuel containers approved by the Underwriter's Laboratory (U.L.) or the American Society for Testing & Materials (ASTM).
- Always fill fuel tank outside in a well ventilated area. Never fill your fuel tank with fuel indoors. (Examples include: basement, garage, barn, shed, house, porch, etc.) Never fill tank near appliances with pilot lights, heaters, or other ignition sources. If the fuel has to be drained, this should be done outdoors. The drained fuel should be stored in a container specifically designed for fuel storage or it should be disposed of carefully.
- Never remove the fuel cap or add fuel with the engine running. Stop engine and allow to cool before removing the fuel cap/and or refilling the engine.
- Never drain fuel from engine in an enclosed area.
- Always wipe up excess (spilled) fuel from engine before starting. Clean up spilled fuel immediately. If fuel is spilled, do not start the engine but move product and fuel container from area. Clean up spilled fuel and allow to evaporate and dry after wiping and before starting.

- Allow fuel fumes/vapors to escape from the area before starting engine.
- Test the fuel cap for proper installation before starting and using engine.
- Always run the engine with fuel cap properly installed on the engine.
- Never smoke while refilling fuel tank or while operating the engine.
- Do not store engine with fuel in fuel tank indoors. Fuel and fuel vapors are highly explosive.
- Never pour fuel from engine fuel tank.
- Never siphon fuel by mouth to drain fuel tank.
- Always have an adult fill the fuel tank and never allow children to fill the engine.
- Never allow an adult or anyone under the influence of drugs or alcohol to fill engine.
- When storing gasoline or equipment with fuel in the tank, store away from furnaces, stoves, water heaters or other appliances that have a pilot light or other ignition source because they can ignite gasoline vapors.

Burns and Fires

The muffler, muffler guard and other parts of the engine become extremely hot during the operation of the engine. These parts remain extremely hot after the engine has stopped.

Prevention of Burns and Fires

- Never remove the muffler guard from the engine.
- Never touch the muffler guard because it is extremely hot and will cause severe burns.
- Never touch parts of the engine that become hot after operation.
- Always keep materials and debris away from muffler guard and other hot parts of the engine to avoid fires.

SERVICE

- Always stop the engine whenever you leave the equipment, before cleaning, repairing or inspecting the unit. Engine should be turned off and cool, spark plug wire must be removed from spark plug before any repairs or adjustments are attempted. Never make adjustments or repairs with the engine (motor) running. Disconnect the spark plug wire, and keep the wire away from the plug to prevent accidental starting. Remove the ignition key if equipped with an electric start.
- Always wear eye protection when you make adjustments or repairs.
- Keep all nuts and bolts tight and keep equipment in good condition.
- Never tamper with safety devices. Check their proper operation regularly.
- When servicing or repairing the engine, do not tip the engine over or up unless specifically instructed to do so in this manual. Service and repair procedures can be done with the engine in an upright position. Some procedures will be easier if the engine is lifted on a raised platform or working surface.
- To reduce fire hazard, keep engine free of grass, leaves, or other debris build-up. Clean up oil or fuel spillage. Allow engine to cool before storing.
- Stop and inspect the equipment if you strike an object. Repair, if necessary, before restarting.
- Clean and replace safety and instruction decals as necessary.
- To guard against engine over-heating, always keep recoil housing clean.
- Inspect engine before storage. When not in use, disconnect spark plug lead and store indoors in a dry place locked or otherwise inaccessible to children.
- Use only original equipment parts from Viper®, including all nuts and bolts.

SAFETY SYMBOLS

The following symbols may be used on your engine to alert you to potential hazards or to give you guidance in operating your engine. Look over them and understand their meanings before operating your engine.



- A: Warning!
- B: Avoid Injury From Rotating Tines.
- C: Read Owner's Manual Before Operating Machine.
- D: Remove Objects that Could Be Thrown By This Machine.
- E: Dangerous Moving Parts.
- F: Be Aware of Moving and Rotating Parts.
- G: Wear Ear and Eye Protection At All Times.
- H: Do Not Service or Adjust Moving Parts Unless Engine is Stopped and Spark Plug Wire is Disconnected.
- I: Dress Appropriately And Wear Sturdy Footwear.
- J: Toxic Fumes—Do Not Operate in Unventilated Areas.
- K: Hot Surfaces.
- L: Fire Hazards.
- M. Do Not Use In Thunderstorms--For severe weather, stop operation of this machine and seek shelter.
- N. Team Lift--For your safety, always have at least two people when lifting this machine.
- O. Do Not Till Above Underground Utility Lines And Pipes.
- P. Do Not Operate When Children Or Others Are Around.

SPECIFICATIONS

Displacement / Cycle	340 cc 4-Cycle
Ignition Type	Electronic ignition
Cooling System	Forced air cooling
Idling Carburetor Adjust	1900 +/- 100 RPM
Valve Clearance	Cold engine-Intake: 0.15 +/- 0.02 mm; Exhaust: 0.20 +/- 0.02 mm
Maximum Torque	21.0 Nm@2500 RPM (15.50 LBS/FT)
Bore and Stroke	88 mm x 56 mm
Spark Plug Type / Gap	Torch F6TC or F6RTC / GAP 0.032" (0.8 mm) (NGK - BP6ES/BPR6ES)
Fuel Type	Minimum 87 octane gasoline NOTE: if using an ethanol blended fuel, a fuel stabilizer, mixed to manufacturer specifications, is recommended.
Fuel Tank	Remote
Drive Shaft Type	22.2 mm, 55 mm from end of shaft to mounting surface, 4 mm x 26 mm full key, drilled and tapped 3/8-24 UNF-23 mm min., full thread
Start Type	Electric
Speed	3600 RPM 1.1
Oil Capacity and Type	1.16 quart (1.1 liters); (Refer to "Table 1 Choose Oil Type", Page 8)(SAE 15W/40)
Weight	60.5 lb, dry (27.5 kg, dry)
Overall Dimensions	415 mm x 442 mm x 395 mm

FEATURES

Engine Components SEE FIGURE 1

Model 21198, 340CC Vertical shaft

This is a 4-cycle air cooled engine. The 340cc engine utilizes a vertical shaft and an oil slinger lubricated system.

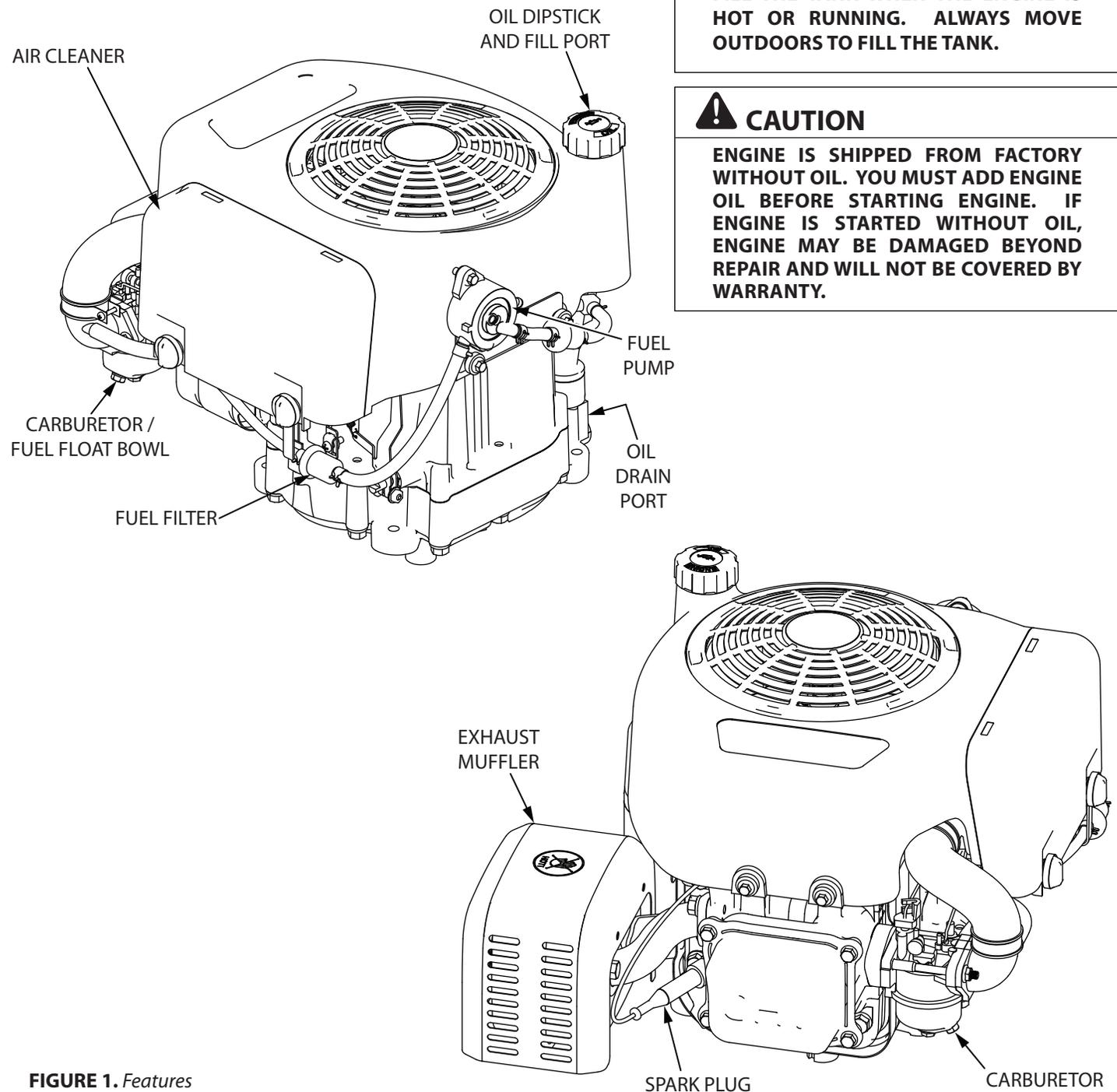


FIGURE 1. Features

OPERATION

Pre-Operation Inspection

! WARNING

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IF YOU EXPERIENCE ANY OF THESE SYMPTOMS, SEEK FRESH AIR AND MEDICAL ATTENTION IMMEDIATELY.

IMPROPER MAINTENANCE OF THIS ENGINE, OR FAILURE TO CORRECT A PROBLEM BEFORE OPERATION, CAN CAUSE EQUIPMENT MALFUNCTIONS. ALWAYS PERFORM A PRE-OPERATION INSPECTION BEFORE EACH OPERATION. CORRECT ANY PROBLEMS BEFORE OPERATION.

FUEL IS HIGHLY FLAMMABLE AND MUST BE HANDLED WITH CARE.

- NEVER FILL THE TANK WHEN THE ENGINE IS HOT OR RUNNING.
- ALWAYS MOVE OUTDOORS TO FILL TANK.
- DO NOT REFUEL WHILE SMOKING, NEAR OPEN FLAME, OR OTHER POTENTIAL HAZARDS.

FAILURE TO FOLLOW WARNING CAN CAUSE SERIOUS INJURY OR DEATH.

DO NOT ATTEMPT TO START ENGINE IN THE FOLLOWING WAYS:

- DO NOT USE STARTING FLUID.
- DO NOT SPRAY FLAMMABLE LIQUIDS OR VAPORS INTO AIR CLEANER, CARBURETOR OR SPARK PLUG CHAMBER.
- DO NOT REMOVE SPARK PLUG AND PULL ON STARTER ROPE. FLAMMABLE FUEL CAN SPRAY OUT AND IGNITE FROM A SPARK FROM SPARK PLUG.

! CAUTION

HOT GASES ARE A NORMAL BY-PRODUCT OF A FUNCTIONING INTERNAL COMBUSTION ENGINE. FOLLOW ALL SAFETY INSTRUCTIONS TO PREVENT BURNS AND FIRES.

DO NOT ALTER/MODIFY ENGINE:

NEVER ALTER OR MODIFY THE ENGINE FROM THE FACTORY. SERIOUS INJURY OR DEATH MAY OCCUR IF ENGINE IS MODIFIED OR ALTERED.

WHEN WORKING ON OR REPLACING PARTS FOR THE ENGINE OR PRODUCT, YOU MUST ALWAYS FLIP THE ON/OFF SWITCH TO THE OFF POSITION.

1. Check that the engine is equipped with the proper amount and type of oil. To determine the most appropriate type of oil to use, **SEE TABLE 1.**
2. Check that the engine has appropriate amount of fuel.
3. Examine underneath and around engine for signs of oil or fuel leaks.
4. Inspect fuel hoses and connections for tightness and fuel seepage.
5. Look for signs of engine damage.
6. Check that all guards and shields are in place, and all screws, nuts and bolts are tightened.
7. Eliminate excessive debris around muffler and recoil starter.
8. Be sure air filter and cylinder fins are clean and free of debris.
9. Check the equipment powered by this engine. Review the operator's manual provided with the equipment powered by this engine for any safety and warning precautions and/or procedures that should be followed before starting this

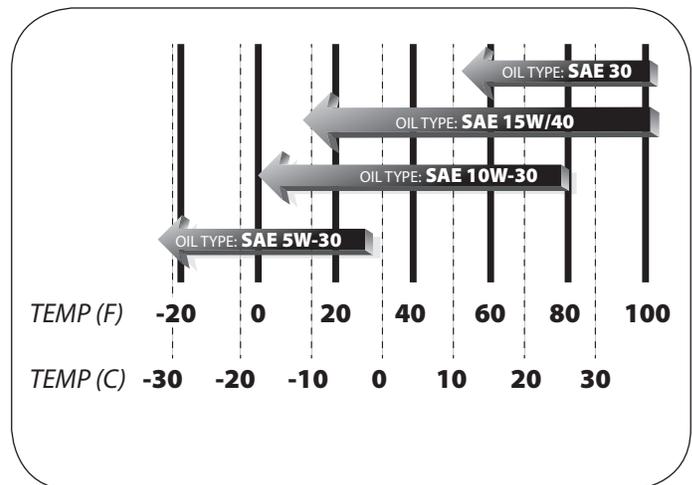


Table 1. Choose Oil Type

! WARNING

USE THE CORRECT PERSONAL PROTECTION. ENGINE OIL IS HAZARDOUS TO YOUR HEALTH. DISPOSE OF OIL APPROPRIATELY. USE A SAFE DISPOSAL/RECYCLING CENTER.

! CAUTION

ENGINE IS SHIPPED FROM FACTORY WITHOUT OIL. YOU MUST ADD ENGINE OIL BEFORE STARTING ENGINE.

! WARNING

USE THE CORRECT PERSONAL PROTECTION. FUEL IS HIGHLY FLAMMABLE AND MUST BE HANDLED WITH CARE. NEVER FILL THE TANK WHEN THE ENGINE IS HOT OR RUNNING. ALWAYS MOVE OUTDOORS TO FILL THE TANK. FAILURE TO FOLLOW WARNING CAN CAUSE SERIOUS INJURY OR DEATH.

Checking And Adding Oil

Be sure the engine is located on a level surface before checking or refilling oil. **SEE FIGURE 2**

1. Clean around oil fill area.
2. Slide out dipstick and wipe clean with cloth.
3. Reinsert and tighten dipstick.
4. Slide out dipstick and check oil.
5. If oil level is below the marking on the oil dipstick, refill to upper level.
6. Change oil if contaminated.

Checking And Filling Fuel Tank

Be sure the machine is located on a level surface before checking or refilling fuel. Use unleaded regular, unleaded premium automotive fuels only. Commercial fuel may contain up to 10% ethanol. Ethanol additives to fuel are known to cause deterioration of fuel lines and other fuel components. Viper® recommends the addition of fuel stabilizer to protect your engine's fuel system and prolong the life of your engine.

DO NOT mix oil with fuel.

1. Make sure engine is cool and not running while filling fuel.
2. Locate the remote fuel tank and remove fuel cap.
3. Replace fuel cap and clean up any spilled fuel before operating.

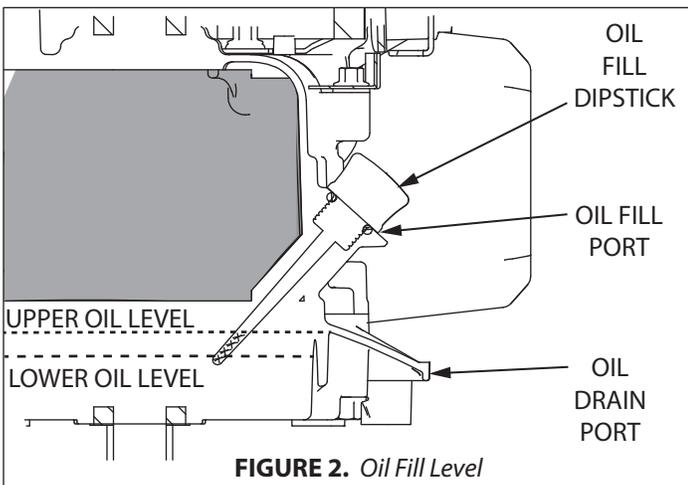


FIGURE 2. Oil Fill Level

⚠ WARNING

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IF YOU EXPERIENCE ANY OF THESE SYMPTOMS, SEEK FRESH AIR AND MEDICAL ATTENTION IMMEDIATELY.

Starting And Stopping Engine

NOTE: *Operating engine on angles greater than 25 degrees will cause the engine to lose lubrication and seize.*

Review "Warnings and Safety Precautions" and "Pre-Operation Inspection" sections before starting engine.

Electric Start Engine Procedures

1. Move engine to a well-ventilated area, always outdoors, to prevent carbon monoxide poisoning.
2. Move to an area away from flames or sparks, to avoid ignition of vapors if present.
3. Remove all debris from air cleaner holes and the remote tank fuel cap to ensure proper air flow.
4. Move throttle to choke position.
SEE FIGURE 3
5. Turn the ignition key to the start position for no more than 5 seconds. If the engine does not start after 3 attempts, **Refer to Trouble Shooting** section of this manual.
6. After engine begins operating, move throttle lever to "IDLE" position. Run engine for 30 to 45 seconds at "IDLE" position until engine warms up.
7. After starting the engine, slowly move the throttle control lever from the "IDLE" position to desired speed as the engine warms up.

To Stop the Engine:

1. Set the throttle lever to the "IDLE" position and allow the engine to run at low speeds for 1-2 minutes before stopping.
2. Turn the key to the "OFF" position

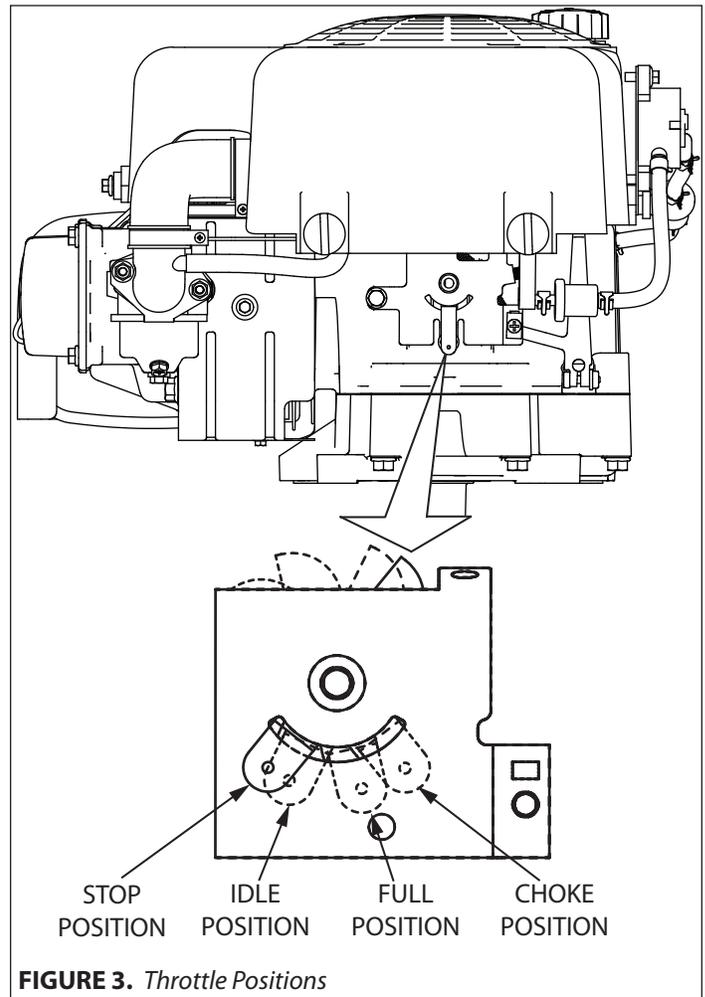


FIGURE 3. *Throttle Positions*

MAINTENANCE AND STORAGE

Refer to **Table 2. Maintenance Schedule**, and observe these recommended care operating intervals to extend the life of your engine.

Good maintenance is essential for safe, economical, and trouble-free operation. It will also help reduce air pollution. To help you properly care for your engine, the following pages include a maintenance schedule, routine inspection procedures, and simple maintenance procedures using basic hand tools. Other service tasks that are more difficult, or require special tools, are best handled by professionals and are normally performed by a technician or other qualified mechanic.

Maintenance, replacement or repair of the emissions control devices and systems may be performed by any non-road engine repair establishment or individuals. However, items must be serviced by an authorized dealer to obtain "no charge" emissions control warranty service.

The maintenance schedule applies to normal operating conditions. If you operate your engine under unusual conditions, such as sustained high-load or high-temperature operation, or use in unusually wet or dusty conditions, consult your servicing dealer for recommendations applicable to your individual needs and use.

WARNING

TO PREVENT ACCIDENTAL STARTING:

ENGINE MUST BE TURNED OFF AND COOL AND SPARK PLUG WIRE MUST BE REMOVED FROM SPARK PLUG BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR..

TEMPERATURE OF MUFFLER AND NEARBY AREAS MAY EXCEED 150° F (65° C). AVOID THESE AREAS.

IMPROPER MAINTENANCE OF THIS ENGINE, OR FAILURE TO CORRECT A PROBLEM BEFORE OPERATION, CAN CAUSE EQUIPMENT MALFUNCTIONS. ALWAYS PERFORM A PRE-OPERATION INSPECTION BEFORE EACH OPERATION. CORRECT ANY PROBLEMS BEFORE OPERATION.

FAILURE TO FOLLOW WARNINGS, CAN CAUSE SERIOUS INJURY OR DEATH.

Table 2. Maintenance Schedule

MAINTENANCE ITEM		Every 8 hours (daily)	Every 50 hours or monthly	Every 100 hours or seasonally	Every 300 hours or yearly
Clean Engine and Check Bolts and Nuts		X			
Engine Oil	Check	X			
(See Lubrication section)	Change *	(initial 5 hours)	X		
Oil in Gear Reduction (if equipped)	Change		X		
Air Filter	Check	X		X	
(See Air Filter section)	Clean **		X		
	Replace		X		X
Spark Plug (Gap 0.032")	Check-Adjust			X	
(See Spark Plug section)	Replace				X
Fuel Filter	Clean ***		X		
(See Fuel Filter section)	Replace				

* Perform initial oil change after first 5 hours of operation, then every 50 hours or every season

** Service more frequently under dusty conditions

*** These items should only be performed by a mechanically proficient person or by the servicing dealer

Engine Maintenance

For daily maintenance checks, review "Pre-Operation inspection" section.

Lubrication

Choose engine oil that meets or surpasses the latest API service classification. Synthetic oils may be substituted for petroleum-based oils in extreme temperatures. For temperatures higher than 32° F, use SAE 30, SAE 10W-30, or SAE 15W-40 motor oil. Use SAE 5W-30 if temperatures are below 32° F.

Note: See "Choosing Oil Type" in "Operation" section for more information.

Oil Maintenance

After the first five hours of operating a new Viper® Engine the oil should be replaced, and every 50 hours of operating time thereafter. The oil should be changed every 25 hours if used under severe conditions, such as in high temperatures or under heavy loads, otherwise changed weekly. Check oil periodically; do not overfill.

Changing Oil

Be sure the engine is not operating and is located on a level surface before checking or refilling oil. Engine should be warm for easy removal of oil.

1. Detach spark plug wire. Secure the wire away from the spark plug. If the engine uses a battery, disconnect at negative terminal. **SEE FIGURE 4**
2. Remove dipstick and carefully tip the engine toward the dipstick side to empty oil from oil fill area. Empty oil into a suitable oil container and dispose of oil properly. **SEE FIGURE 5**
3. Tip engine back onto a level surface and fill with appropriate oil to the top of the marking on the dipstick.
4. Reinsert dipstick and tighten.

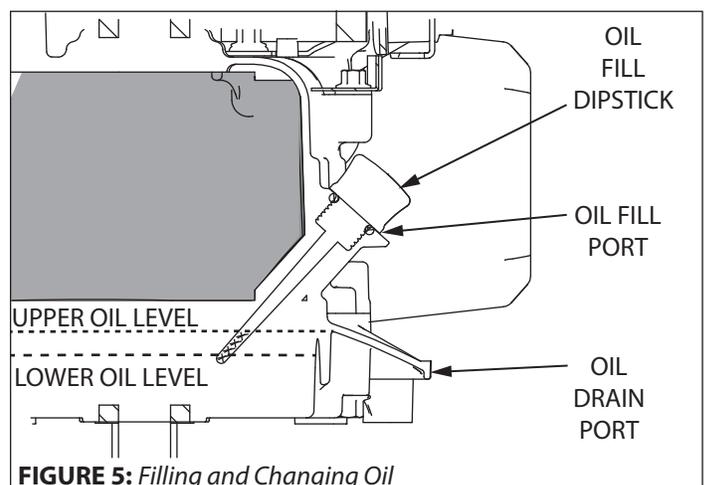
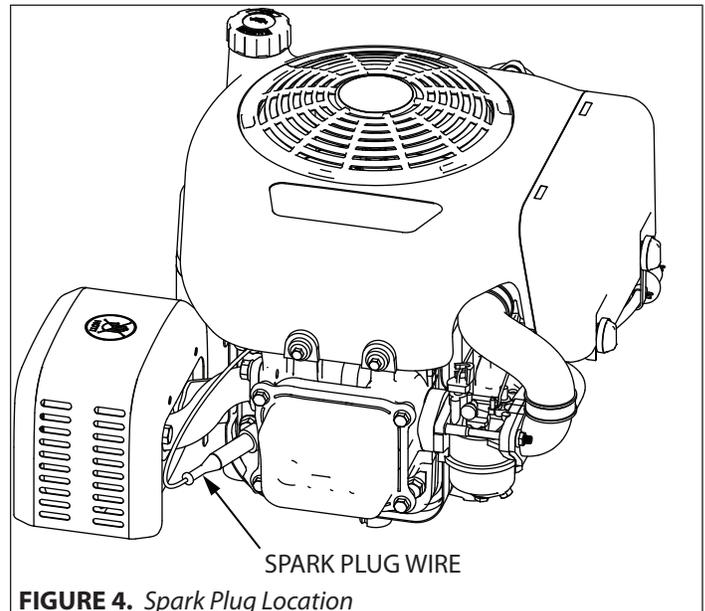
CAUTION

OIL IS HAZARDOUS WASTE

AVOID INJURY! ENGINE OIL IS HAZARDOUS TO YOUR HEALTH. DISPOSE OF OIL APPROPRIATELY. USE A SAFE DISPOSAL/RECYCLING CENTER.

CAUTION

RUNNING ENGINE WITH AN LOW OIL LEVEL WILL CAUSE DAMAGE TO YOUR ENGINE. THIS TYPE OF DAMAGE IS NOT COVERED UNDER WARRANTY.



Air Filter

Refer to maintenance schedule for suggestions on when to service your air filter. **Washing filter is not recommended. When dirty, replace filter (Viper P/N 10905).**

Removing/Installing Air Filter **SEE FIGURE 6**

1. Remove air cleaner cover.
2. Remove the pre-filter and air filter element.
3. Replace with new air filters.
4. Replace air filter cover.

Spark Plug

The recommended spark plug is a Torch DK7RTC (NGK DCPR7E). The spark plug is located to the left of the valve cover. **SEE FIGURE 5**

Checking And Changing Spark Plug

1. Check spark plug every 50 operating hours.
2. Disconnect the spark plug cap, and clean any debris from around the spark plug area.
3. Remove spark plug and replace if any of the following occur; pitted electrodes, burned electrodes, cracked porcelain, or deposits around electrodes.
4. After analysis, seat spark plug and tighten with spark plug wrench to compress the sealing washer.
 - Reinstall original spark plug, tighten additional 1/2 turn.
 - Installing new spark plug, adjust spark plug gap to 0.032" (0.8 mm) and tighten additional 1/8 – 1/4 turn.

NOTE: Loose spark plug may overheat and damage engine. Over tightened spark plug may damage threads in the cylinder head.

Spark Plug Maintenance

Spark plug should be removed, cleaned and gap adjusted after approximately fifty hours of operating time.

NOTE: A sand blaster should not be used to clean spark plugs. Microscopic particles remaining in the plug may score the engine cylinder during operation. Use solvent and a wire brush to clean the plug and compressed air to blow it out thoroughly.

Carburetor

- Never tamper with factory setting of the carburetor.
- Contact your service provider or Viper® if adjustment is needed.

⚠ CAUTION

NEVER RUN ENGINE WITHOUT AIR FILTER PROPERLY INSTALLED. ADDED WEAR AND ENGINE FAILURE MAY OCCUR IF AIR FILTER IS NOT INSTALLED ON ENGINE.

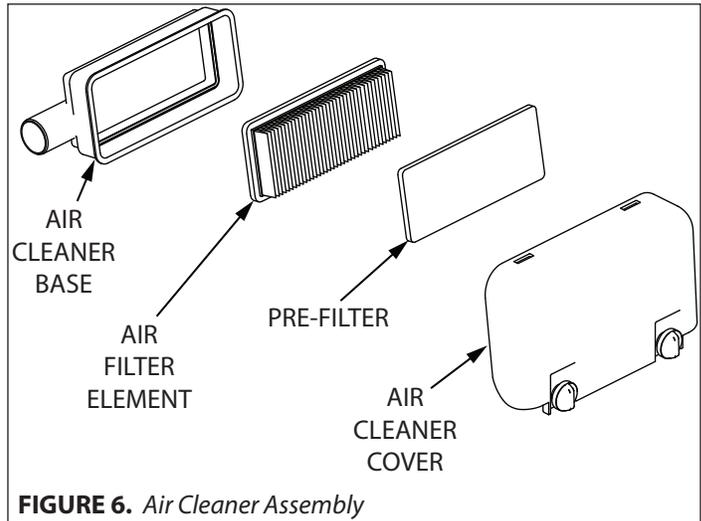


FIGURE 6. Air Cleaner Assembly

 **WARNING**

ENGINES GIVE OFF CARBON MONOXIDE, AN ODORLESS, COLORLESS, POISONOUS GAS. CARBON MONOXIDE MAY BE PRESENT EVEN IF YOU DO NOT SMELL OR SEE ANY ENGINE EXHAUST. BREATHING CARBON MONOXIDE CAN CAUSE NAUSEA, FAINTING OR DEATH, IN ADDITION TO DROWSINESS, DIZZINESS AND CONFUSION.

IF YOU EXPERIENCE ANY OF THESE SYMPTOMS, SEEK FRESH AIR AND MEDICAL ATTENTION IMMEDIATELY.

IMPROPER MAINTENANCE OF THIS ENGINE, OR FAILURE TO CORRECT A PROBLEM BEFORE OPERATION, CAN CAUSE EQUIPMENT MALFUNCTIONS. ALWAYS PERFORM A PRE-OPERATION INSPECTION BEFORE EACH OPERATION. CORRECT ANY PROBLEMS BEFORE OPERATION.

FUEL IS HIGHLY FLAMMABLE AND MUST BE HANDLED WITH CARE.

- **NEVER FILL THE TANK WHEN THE ENGINE IS HOT OR RUNNING.**
- **ALWAYS MOVE OUTDOORS TO FILL TANK.**
- **DO NOT REFUEL WHILE SMOKING, NEAR OPEN FLAME, OR OTHER POTENTIAL HAZARDS.**

FAILURE TO FOLLOW WARNING CAN CAUSE SERIOUS INJURY OR DEATH.

DO NOT ATTEMPT TO START ENGINE IN THE FOLLOWING WAYS:

- **DO NOT USE STARTING FLUID.**
- **DO NOT SPRAY FLAMMABLE LIQUIDS OR VAPORS INTO AIR CLEANER, CARBURETOR OR SPARK PLUG CHAMBER.**
- **DO NOT REMOVE SPARK PLUG AND PULL ON STARTER ROPE. FLAMMABLE FUEL CAN SPRAY OUT AND IGNITE FROM A SPARK FROM SPARK PLUG.**

FUEL FILTER**Clean or Replace Fuel Filter as follows:**

1. Disconnect spark plug wire from spark plug. Remove spark plug.
2. Drain fuel from tank before attempting to clean/replace filter.
3. Remove hose clamp closest to gas tank.
4. Pull filter out from end of hose.
5. Filter may be washed with kerosene or similar solvent.
6. If filter is extremely dirty or torn, replace with new filter.
7. Reassemble with clean or new filter, and fill with clean, fresh gasoline. Check for leaks prior to starting engine.

Transporting Engine

1. Never transport engine inside an enclosed space or vehicle. Fuel or fuel vapors may ignite causing serious injury or death.
2. If fuel is present in the fuel tank remove fuel or transport with an open vehicle in an upright position.
3. If an enclosed vehicle must be used, remove fuel into an approved red fuel container. DO NOT siphon by mouth.
4. Run engine or drain to use up the fuel in the carburetor and fuel tank. Always run engine in a well ventilated area.
5. Wipe away any spilled fuel from engine. Allow to dry.

**Steps For Long-Term Storage
(30 days or more without use)**

1. Add fuel stabilizer according to manufacturer's instructions.
2. Run engine for 10-15 minutes to ensure that the stabilizer reaches the carburetor.
 - a) Start engine and run until engine runs itself out of any residual fuel left in carburetor bowl and fuel lines. (It is normal for the engine to run two to three minutes before the fuel is completely out of system.)
3. Remove the remainder of the fuel from the fuel tank into an approved fuel container.
4. Store engine in its upright position.
5. Remove all debris from engine.
6. Pull the starter handle slowly and return the handle to its original position when resistance is felt. This operation will prevent outside moisture from entering the combustion chamber.

TROUBLESHOOTING AND REPAIR

At Viper® we build quality and durability into the design of our products; but no amount of careful design by us, and careful maintenance by you, can guarantee a repair-free life for your Viper® Engine. Most repairs will be minor, and easily fixed by following the suggestions in **Table 3 Troubleshooting Guide**.

This section will help you pinpoint the causes of common problems and identify remedies. For more complicated repairs, you may want to rely on your retailer, an authorized service center, or contact Viper® customer service. Viper® will make the necessary repairs if a service center is not available. A parts breakdown is located toward the end of this manual. We will always be glad to answer any questions you have, or help you find suitable assistance.

Ordering Replacement Parts

Parts can be obtained from the store where the machine was purchased or direct from the factory. To order parts visit www.Info@Ardisam.com or call 1-800-345-6007.

For other general questions, you can e-mail us at info@Ardisam.com.

Please include the following information with your order:

- 1) Part numbers
- 2) Part description
- 3) Quantity
- 4) Model number and serial number

TROUBLESHOOTING GUIDE

Spare Parts

Only use approved Viper® spares.

Table 3. *Troubleshooting Guide*

PROBLEM	POSSIBLE CAUSE	REMEDY/ACTION
Engine will not start	1. Spark plug wire disconnected	2. Connect spark plug wire to spark plug
	2. Out of fuel	3. Refuel
	3. Spark plug wet, faulty or improperly gapped	4. Clean, replace or gap spark plug
	4. Stale fuel	5. Drain old fuel and replace with fresh. Use fuel stabilizer as a future preventative measure.
Engine runs rough, floods during operation	1. Dirty air filter	1. Replace air filter
	2. Carburetor out of adjustment	2. Call factory
Engine is hard to start	1. Stale fuel	1. Drain old fuel and replace with fresh. Use fuel stabilizer as a future preventative measure.
	2. Spark plug wire loose	2. Make sure spark wire is securely attached to spark plug
	3. Dirty carburetor	3. Clean carburetor, use fuel stabilizer, new fuel can
Engine misses or lacks power	1. Clogged fuel tank or fuel filter	1. Remove and clean
	2. Clogged air filter	2. Replace air filter
	3. Improper carburetor adjustment	3. Call factory
	4. Spark plug dirty, improper gap, or wrong type	4. Replace spark plug and adjust gap to 0.032" (0.8mm)
Engine runs, then quits	1. Fuel tank venting	1. Replace fuel tank vent

Contact a service provider if above remedies fail.

HIGH ALTITUDE OPERATION

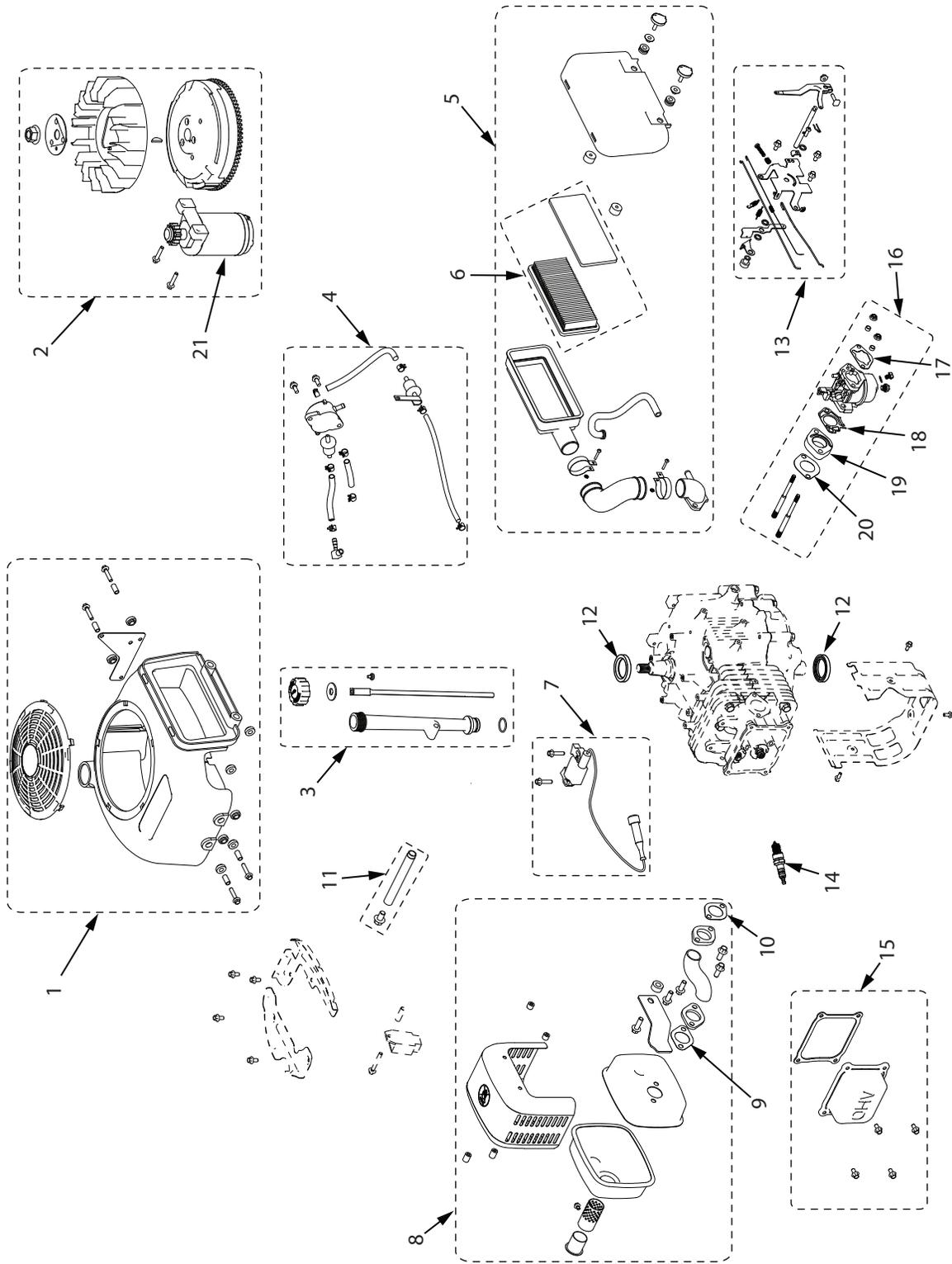
Operating an engine with standard air-fuel mixture at altitudes greater than 3,000 feet will result in a fuel-rich operating condition. This can lead to increased fuel consumption, increased emissions, and the formation of carbon deposits on spark plugs that can result in difficulty starting engine. To ensure compliance with federal emission standards and avoid performance degradation, engines must be fitted with the appropriate altitude kit when operated at altitudes 3,000 feet or greater.

Altitude Kit Summary		
Altitude Kit Identification Number	Altitude Kit Part Number	Altitude Range (ft above sea level)
Altitude Kit 1#	21675	3000-6000 ft
Altitude Kit 2#	21776	6000-8000 ft

NOTICE:

1. Engines should not be operated at less than 3,000 feet when fitted with an altitude kit. Doing so may result in serious damage to engine.
2. Engines that have been modified with an altitude kit should only be operated at altitudes for which the kit is designed. Failure to use the appropriate altitude kit at altitudes in excess of 3,000 feet may result in decreased engine performance, increased fuel consumption and increased engine emissions.
3. Engine operation is not recommended in altitudes greater than 8,000 feet. Doing so will negatively affect engine performance.
4. For more information on obtaining an altitude kit, see an authorized Viper dealer or contact customer service at 800-345-6007 Mondays through Fridays from 8 a.m. to 5 p.m. CST, or send an email to info@ardisam.com. Installation of altitude kits should be performed by an authorized Viper service center only.

ILLUSTRATED PARTS BREAKDOWN 340cc Engine Main PARTS Explosion



ILLUSTRATED PARTS BREAKDOWN 340cc Engine Main PARTS Explosion

ITEM #	PART #	DESCRIPTION	QTY.
1	21423	KIT BLOWER HOUSING	1
2	21415	KIT FLYWHEEL IMPELLER STARTER	1
3	21425	KIT ASSEMBLY DIPSTICK	1
4	21421	KIT FUEL LINE AND CONNECTOR FILTER	1
5	21424	KIT AIR CLEANER	1
6	21581	KIT AIR CLEANER REPLACEMENT	1
7	21413	KIT IGNITION COIL AND HARDWARE	1
8	21428	KIT MUFFLER	1
9	21470	GASKET MUFFLER EXHAUST FLANGE	1
10	21472	GASKET HEAD EXHAUST FLANGE	1
11	21482	KIT ASSEMBLY PLUG ENGINE OIL	1
12	21231	SEAL CRANK ENGINE RV340	2
13	21444	KIT THROTTLE ASSEMBLY	1
14	21277	SPARK PLUG RV340	1
15	21422	KIT CYLINDER HEAD COVER	1
16	21226	KIT CARBURETOR	1
17	21245	GASKET INTAKE TO CARB ENGINE RV340	1
18	21469	GASKET INSULATOR CARBURETOR	1
19	21297	FLANGE CARBURETOR RV340	1
20	21244	GASKET CARB TO ENGINE RV340	1
21	21370	STARTER 340CC RV340	1

NOTE: Service kits contain multiple parts shown within outlined boxes.



WARRANTY TERMS AND CONDITIONS

ENGINE WARRANTY: 2-YEAR LIMITED EMISSIONS CONTROL WARRANTY (SEE EXPLANATION OF EMISSIONS CONTROL WARRANTY STATEMENT FOR DETAILS)

Ardisam warrants the Viper® engine(s) under a two-year limited emissions control warranty to be free from defects in the materials or workmanship or both for the service life of the product not to exceed twenty-four consecutive months from the date of purchase for consumer applications. As a Viper® small engine owner, you are responsible to perform periodic maintenance as specified in the product's operator's manual and/or engine manual. The warranty period begins on the date of purchase by the first retail consumer or commercial end user, and continues for the period of time stated above.*

For replacement parts, phone 800-345-6007.

*This warranty policy applies only to products which have not been subjected to negligent use, misuse, uses other than those indicated in the product's operator's manual, alteration, accident, use of unauthorized parts, failure to perform periodic maintenance as specified in product's operator's manual, normal wear and tear, use of unauthorized parts or repairs performed at unauthorized service centers. There is no other expressed warranty. Implied warranties, including those of merchantability and fitness for a particular purpose, are limited to one year from purchase, or to the extent permitted by law. All other implied warranties are excluded. Liability for incidental or consequential damages are excluded to the extent exclusion is permitted by law. Ardisam does not assume, and does not authorize any other person to assume for Ardisam, any liability in connection with the sale of Ardisam products. **To be at "No Charge," warranty work must be sent directly to and performed by Ardisam or an Ardisam Authorized Warranty Service Facility.** To obtain warranty service and/or replacement instructions, contact the Ardisam Customer Service Department at 800-345-6007. If you choose to ship your product to Ardisam for warranty repair, you must first have prior approval from Ardisam by calling the Ardisam Customer Service Department for a return material authorization number (RMA#). Under these circumstances, all items must be shipped prepaid. For Viper® engine warranty repairs, Ardisam will cover the cost of shipping only for purchasers located more than 100 miles from an Ardisam Authorized Warranty Service Facility if it is determined that warranted repair is indeed necessary. Ardisam will at no charge, repair or replace, at the discretion of Ardisam, any defective part which satisfies all conditions stated above. Ardisam retains the right to change models, specifications and price without notice. Ardisam shall not be obligated to ship any repair or replacement product to any location outside of the United States of America or Canada.

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YOUR WARRANTY RIGHTS AND OBLIGATIONS

The United States Environmental Protection Agency and ARDISAM INC. (ARDISAM) are pleased to explain the emission control system warranty on your 2014-2015 model year small off-road engine/equipment. In the United States, new small off-road engine/equipments must be designed, built and equipped to meet stringent anti smog standards. ARDISAM must warrant the emission control system on your small off-road engine/equipment for the periods of time listed below provided there has been no abuse, neglect or improper maintenance of your small off-road engine/equipment.

Where a warrantable condition exists, ARDISAM will repair your small off-road engine/equipment at no cost to you including diagnosis, parts and labor.

MANUFACTURER'S WARRANTY COVERAGE:

This emissions control system is warranted for two years. If any emission-related part on your small off-road engine/equipment is defective, the part will be repaired or replaced by ARDISAM.

OWNER'S WARRANTY RESPONSIBILITIES:

As the small off-road engine/equipment owner, you are responsible for the performance of the required maintenance listed in your owner's manual. ARDISAM recommends that you retain all receipts covering maintenance on your small off-road engine/equipment, but ARDISAM cannot deny warranty solely for the lack of receipts or for your failure to ensure the performance of all scheduled maintenance.

As the small off-road engine/equipment owner, you should however be aware that ARDISAM may deny you warranty coverage if your small off-road engine/equipment or a part has failed due to abuse, neglect, improper maintenance or unapproved modifications.

If you have any questions regarding your warranty rights and responsibilities, you should contact ARDISAM at 1-(800)345-6007 or E-mail: info@ardisam.com

DEFECTS WARRANTY REQUIREMENTS:

- (a) The warranty period begins on the date the engine/equipment is delivered to an ultimate purchaser.
- (b) General Emissions Warranty Coverage. ARDISAM warrants to the ultimate purchaser and each subsequent owner that the engine/equipment is:
 - (1) Designed, built, and equipped so as to conform with all applicable regulations adopted by the Environmental Protection Agency
 - (2) Free from defects in materials and workmanship that causes the failure of a warranted part for a period of two years.
- (c) Warranty Parts for Exhaust Emission.
 - (1) Fuel System
 - (2) Air Induction System
 - (3) Ignition System

The following parts are also considered emission related components for exhaust emissions, if applicable

- (1) Exhaust Gas Recirculation (EGR) System
- (2) After-treatment devices.
- (3) Crankcase ventilation valves.
- (4) Sensors.
- (5) Electronic control units.

ARDISAM will furnish with each new engine/equipment written instructions for the maintenance and use of the engine/equipment by the owner.



Viper® Engines, Division of Ardisam, Inc.
1160 8th Avenue, PO Box 666
Cumberland, WI 54829
800-345-6007 | Fax 715-822-2223
E-mail: info@ardisam.com

All weights, specifications and features are approximate and are subject to change without notice. Due to continuous product improvements, product images may not be exact. Items used for props not included. Some assembly may be required.

Check for parts online at www.ardisam.com or call 800-345-6007 M-F 8-5