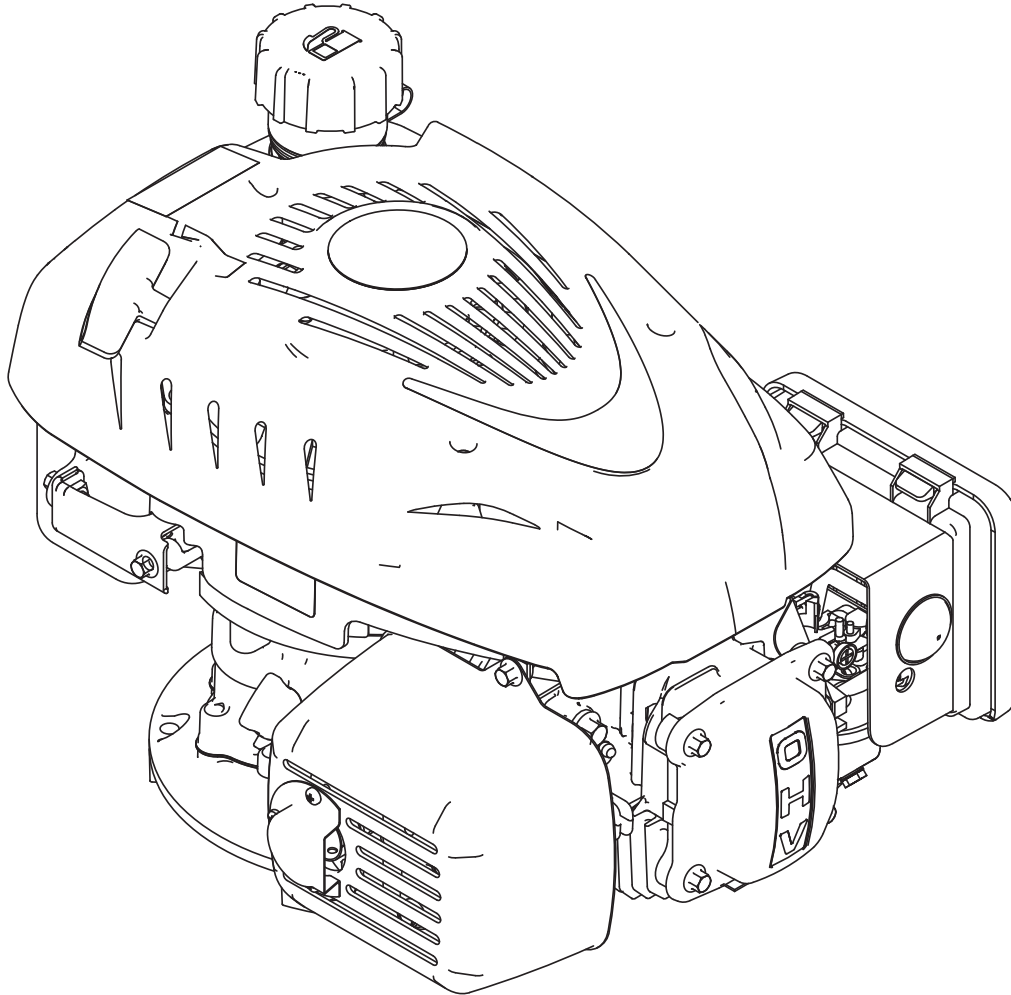


VIPER[®]

ENGINES

Operator's Manual
Original Operating Instructions
Viper[®] 173cc
4-Cycle Engine



Product #: 186000

For more information, email
info@ardisam.com



P/N: 14506
ECN: 10842
REV4: 06/22/15
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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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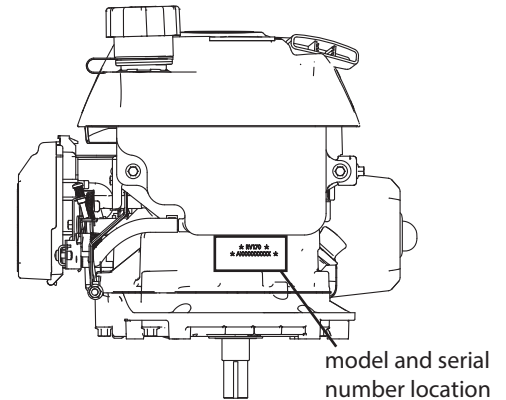
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FEDERAL EMISSION INFORMATION

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:
Engine Model Number:	Engine 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

OPERATOR'S RESPONSIBILITY

Accurate, safe and effective use of this engine is the operator's responsibility.

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

SAFETY MESSAGES

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

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



This symbol points out important safety instructions which if not followed could endanger your personal safety.

BEFORE OPERATING ENGINE:

WARNING

READ ENTIRE OPERATING AND MAINTENANCE INSTRUCTIONS FOR THIS PRODUCT AND THE INSTRUCTIONS FOR THE EQUIPMENT THIS ENGINE POWERS. FAILURE TO FOLLOW INSTRUCTIONS COULD RESULT IN SERIOUS INJURY OR DEATH. OPERATE THE ENGINE ACCORDING TO THE SAFETY INSTRUCTIONS OUTLINED HERE AND INSERTED THROUGHOUT THE TEXT. ANYONE WHO USES THIS ENGINE MUST READ THE INSTRUCTIONS AND BE FAMILIAR WITH THE CONTROLS.

WARNING

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

CAUTION

CAUTION INDICATES YOU CAN BE HURT OR YOUR EQUIPMENT 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

CERTAIN COMPONENTS IN THIS PRODUCT AND ITS RELATED ACCESSORIES CONTAIN CHEMICALS KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS, OR OTHER REPRODUCTIVE HARM. WASH HANDS AFTER HANDLING.

WARNING

FAILURE TO COMPLY WITH ALL SAFETY AND OPERATING INSTRUCTIONS CAN RESULT IN LOSS OF ENGINE CONTROL, SERIOUS PERSONAL INJURY TO YOU AND/OR BYSTANDERS, AND RISK OF EQUIPMENT AND PROPERTY DAMAGE.

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.

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.

WARNING

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.

- 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.

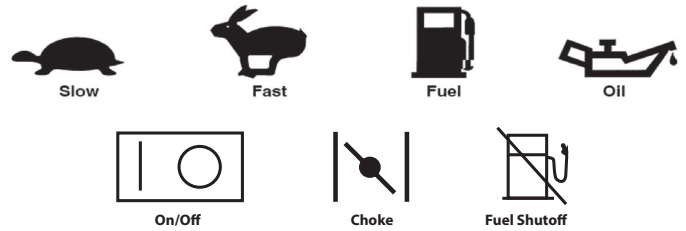
HAZARD SYMBOLS AND MEANINGS



- 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.

CONTROL AND OPERATING SYMBOLS

Pictured below are control and operating symbols on the unit or in this manual. Before you operate your unit, learn and understand the purpose for each symbol.



SPECIFICATIONS

Displacement / Cycle	173cc / 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	9.0Nm@2500 RPM (6.64 ft. lbs.)
Bore and Stroke	70 mm x 45 mm
Spark Plug Type / Gap	DK7RTC / ~.030" (0.7-0.8 mm gap)
Fuel Type	Minimum 87 octane gasoline with NO ethanol content NOTE: If using an ethanol blended fuel, a fuel stabilizer, mixed to manufacturer specifications, is recommended
Fuel Tank Capacity	Approximately .3 gallons (1.1 L)
Drive Shaft Type	22.2mm, 55mm from end of shaft to mounting surface, 4mm x 26mm full key, drilled and tapped 3/8-24 UNF-23 mm min., full thread
Start Type	Recoil
Speed	3600 RPM
Oil Capacity and Type	0.63 quart (0.6 liters); SAE 30 (in freezing weather use 5W30)
Weight	31 lb, dry (14.1 kg, dry)
Overall Dimensions	396 mm x 355 mm x 339 mm

FEATURES

ENGINE COMPONENTS

MODEL 186000 173CC VERTICAL SHAFT

This is a 4-cycle air cooled engine. The 173cc engine utilizes a vertical shaft and an oil slinger lubricated system.

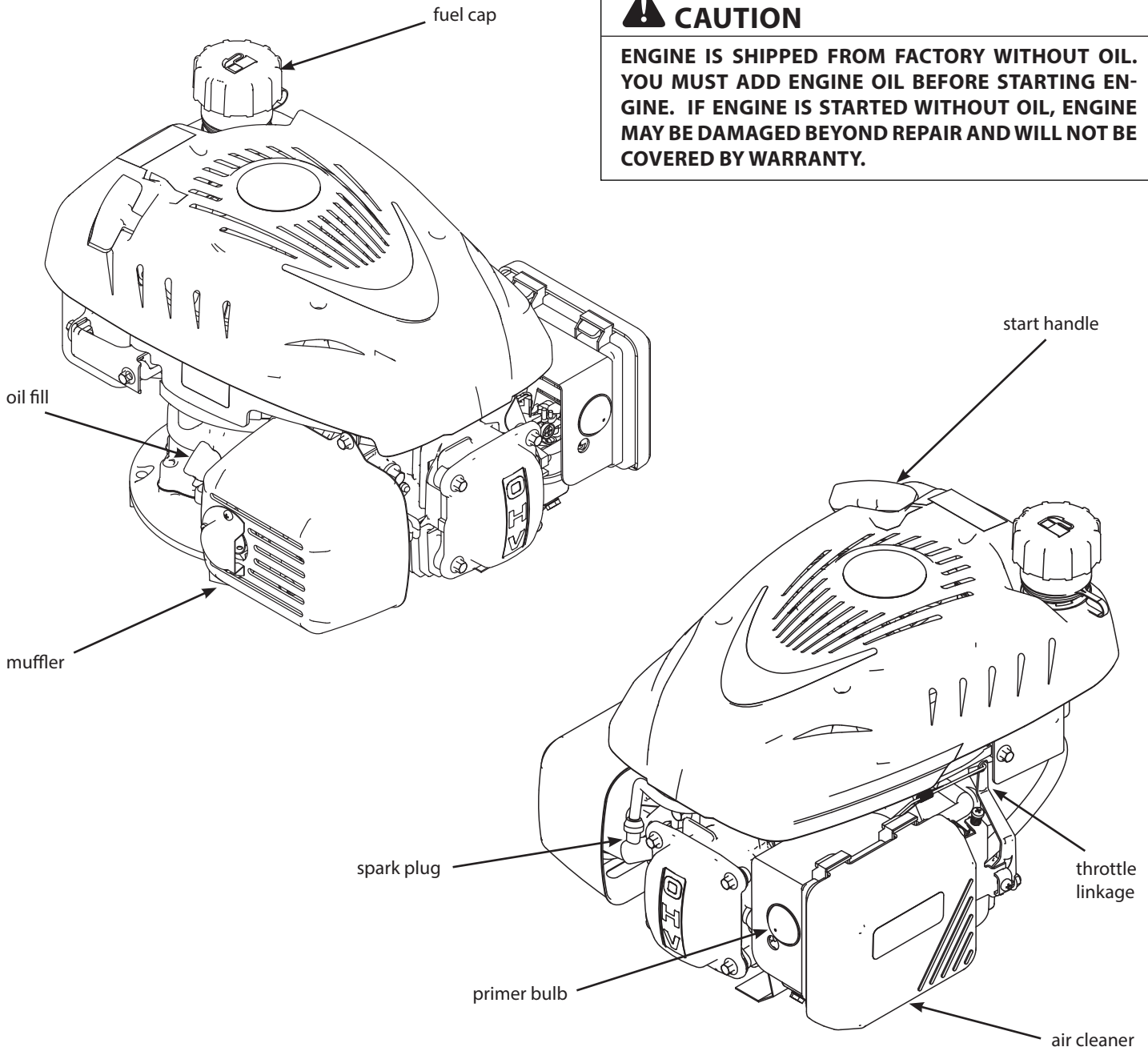
WARNING

DO NOT REFUEL WHILE SMOKING, NEAR OPEN FLAME, OR OTHER POTENTIAL HAZARDS.

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.

CAUTION

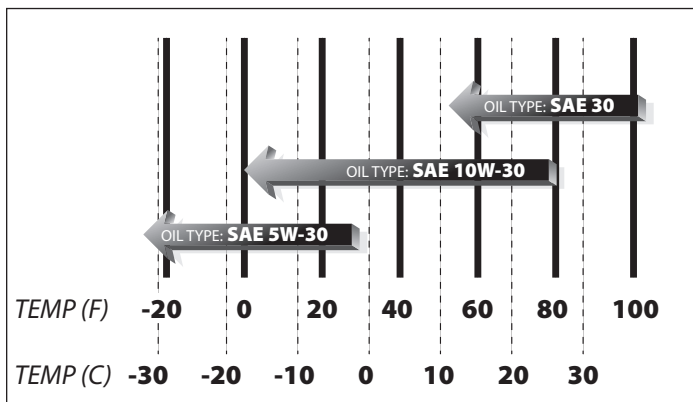
ENGINE IS SHIPPED FROM FACTORY WITHOUT OIL. YOU MUST ADD ENGINE OIL BEFORE STARTING ENGINE. IF ENGINE IS STARTED WITHOUT OIL, ENGINE MAY BE DAMAGED BEYOND REPAIR AND WILL NOT BE COVERED BY WARRANTY.



OPERATION
PRE-OPERATION INSPECTION

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 the chart below.
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 engine.

Choosing Oil Type



! WARNING

IMPROPERLY MAINTAINING THIS ENGINE, OR FAILURE TO CORRECT A PROBLEM BEFORE OPERATION, CAN CAUSE A MALFUNCTION WHICH MAY RESULT IN SERIOUS INJURY OR DEATH. ALWAYS PERFORM A PRE-OPERATION INSPECTION BEFORE EACH OPERATION AND CORRECT ANY PROBLEM.

! WARNING

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.**

DO NOT REFUEL WHILE SMOKING, NEAR OPEN FLAME, OR OTHER POTENTIAL HAZARDS.

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.

! CAUTION

FOR THE SAFETY OF THE USER, AND TO MAXIMIZE THE LIFE OF THE ENGINE, IT IS CRUCIAL TO TAKE TIME TO CHECK THE CONDITION OF THE ENGINE. PROBLEMS MUST BE CORRECTED BEFORE OPERATING.

AVOID INJURY! 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.

CHECKING AND ADDING OIL

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

1. Clean around oil fill area. **SEE FIGURE 1**
2. Slide out dipstick and wipe clean with cloth. **SEE FIGURE 1**
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. **SEE FIGURE 1**
6. Change oil if contaminated.

CHECKING AND FILLING FUEL TANK

Be sure the engine 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.
2. Remove fuel cap.
3. Fill tank to fuel level limit. **SEE FIGURE 2**
Note: Do not overfill. Leave room for fuel expansion.
4. Replace cap and remove any spilled fuel before operating.
NOTE: If using ethanol blends, it is recommended you also use an ethanol fuel treatment to protect against corrosion. DO NOT use E85 fuel.

WARNING

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.

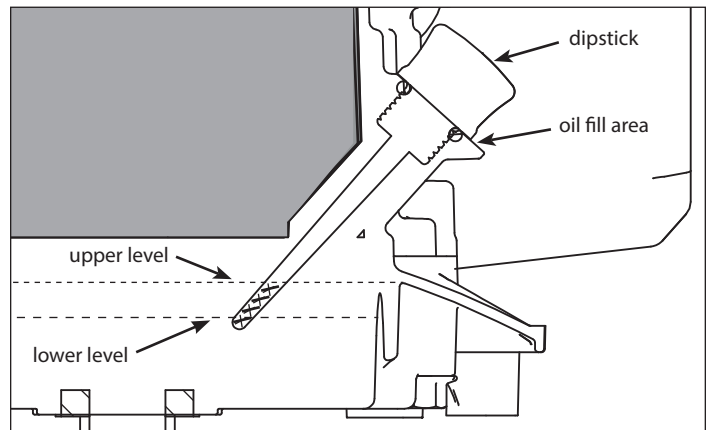


FIGURE 1

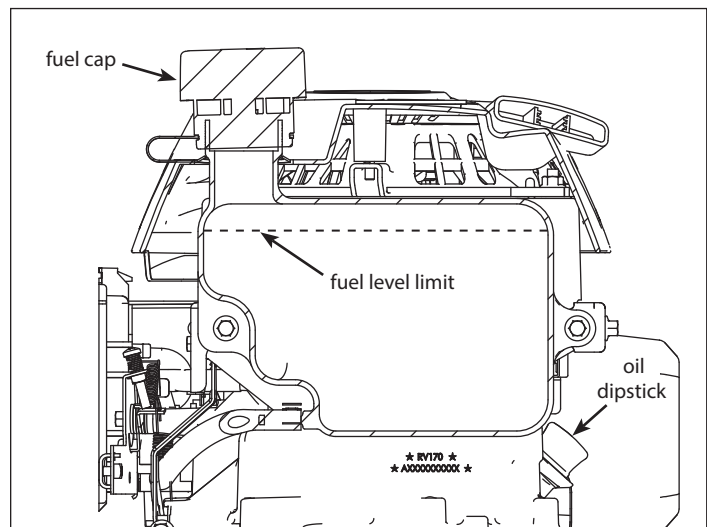


FIGURE 2

⚠ CAUTION

OPERATING ENGINE ON ANGLES GREATER THAN 25 DEGREES WILL CAUSE THE ENGINE TO LOSE LUBRICATION AND SEIZE.

⚠ WARNING

**CARBON MONOXIDE GAS IS TOXIC. INHALATION CAN CAUSE UNCONSCIOUSNESS AND DEATH.
NEVER LEAVE ENGINE RUNNING WHILE UNATTENDED.**

STARTING AND STOPPING ENGINE

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

Manual-Start Engine

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 fuel cap to ensure proper air flow.
4. Press primer bulb three times. Let bulb fully recover between each depression. **SEE FIGURE 3**
5. Move throttle between the "HALF" and "FULL" position. *(This is not necessary on models with throttle fixed at full throttle position.)* **SEE FIGURE 4**
6. Grasp starter handle and pull out slowly, until resistance is felt. Without letting it retract, pull rope with a rapid stroke. **DO NOT** pull out the rope all of the way. Let it return to its original position slowly. Repeat this step until engine starts.
7. After engine begins operating, move throttle lever to "IDLE" position (**SEE FIGURE 4**). Run engine for 30 to 45 seconds at "IDLE" position until engine warms up. Then return throttle to operating speed. *(This is not necessary on models with throttle fixed at full throttle position.)*

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. *(This is not necessary on models with throttle fixed at full throttle position.)*
2. Move throttle to "STOP" position. On models with fixed throttle, move ON/OFF switch to "OFF" position. **SEE FIGURE 4**
3. 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.

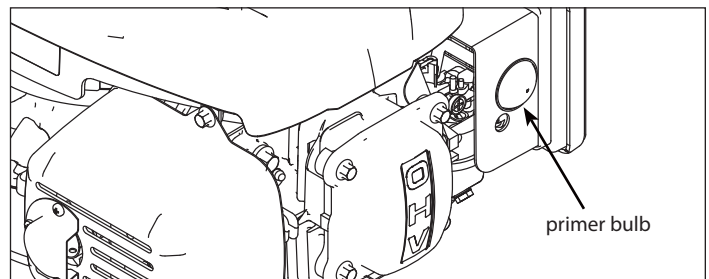


FIGURE 3: Primer Bulb

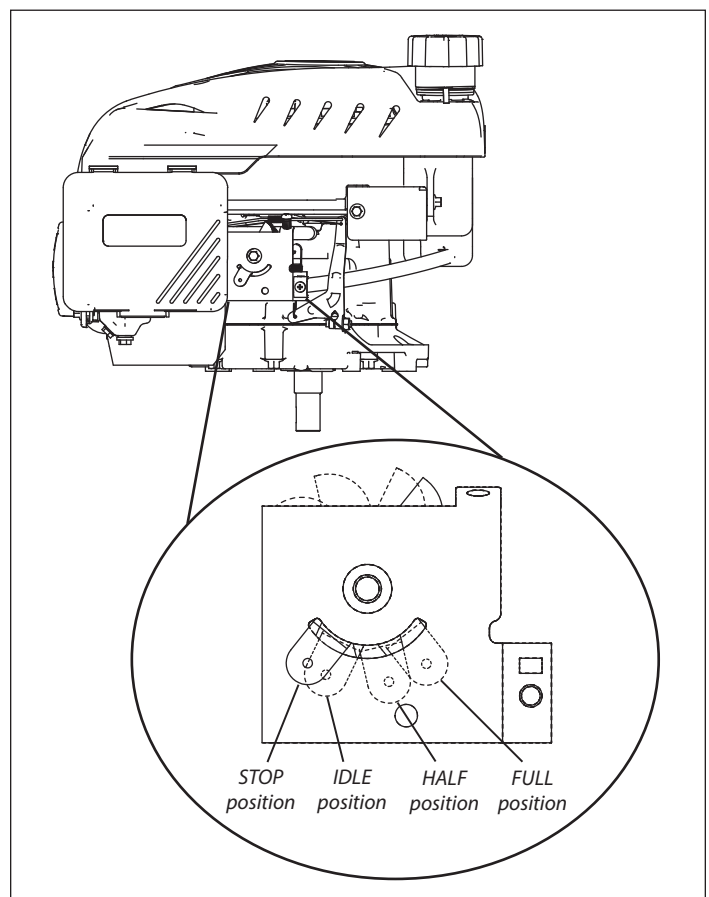


FIGURE 4: Throttle positions

MAINTENANCE AND STORAGE

Please read the maintenance schedule, found in the accompanying combined exhaust and evaporative emissions control warranty statement, 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 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.

MAINTENANCE SCHEDULE

For maintenance schedule see EPA Emissions Control Warranty Statement included with your product.

WARNING

IMPROPER MAINTENANCE, OR FAILURE TO CORRECT A PROBLEM BEFORE OPERATION CAN CAUSE A MALFUNCTION WHICH MAY RESULT IN SERIOUS INJURY OR DEATH. ALWAYS FOLLOW THE INSPECTION AND MAINTENANCE RECOMMENDATIONS AND SCHEDULES IN THIS OPERATOR'S MANUAL.

CAUTION

TO PREVENT ACCIDENTAL STARTING:

AVOID INJURY! ENGINE MUST BE TURNED OFF AND COOL AND SPARK PLUG WIRE MUST BE REMOVED FROM SPARK PLUG BEFORE CHECKING AND ADJUSTING ENGINE OR EQUIPMENT.

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

AVOID INJURY! CHECK ENGINE OFTEN FOR LOOSE NUTS AND BOLTS. KEEP THESE ITEMS TIGHTENED.

WARNING

NEVER RUN YOUR ENGINE IN A POORLY VENTILATED AREA. THE EXHAUST FROM ENGINE MAY CONTAIN POISONOUS CARBON MONOXIDE. BREATHING IT WOULD CAUSE SHOCK, UNCONSCIOUSNESS, AND EVEN DEATH.

ENGINE MAINTENANCE

For daily maintenance checks, review "pre-operation inspection" section.

Lubrication

Choose 4-cycle 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 or SAE 10W-30 motor oil. Use SAE 5W-30 if temperatures are below 32° F. **DO NOT USE SAE 10W-40 MOTOR OIL.**

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

Oil Maintenance

After the first ten hours of operating a new Viper[®] Engine the oil should be replaced, and every 30 hours of operating time thereafter. The oil should be changed every 10 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 and move away from spark plug. If the engine uses a battery, disconnect at negative terminal. **SEE FIGURE 5**
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 6**
3. Tip engine back onto a level surface and fill with appropriate oil to the top of the marking on the dipstick. **SEE FIGURE 6**
4. Reinsert dipstick and tighten. **SEE FIGURE 6**

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

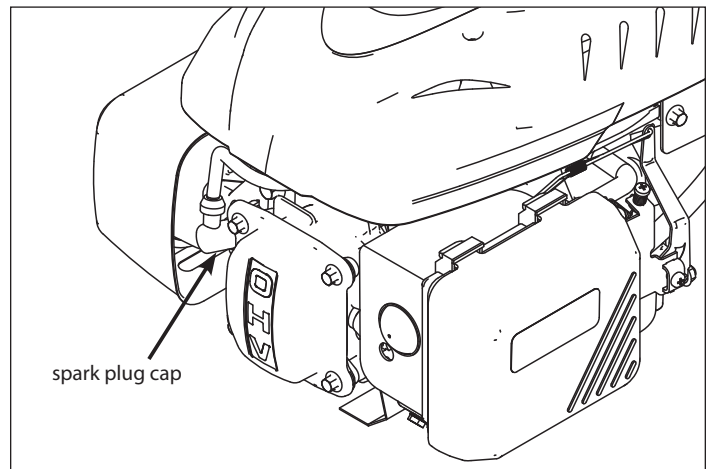


FIGURE 5: Spark plug location

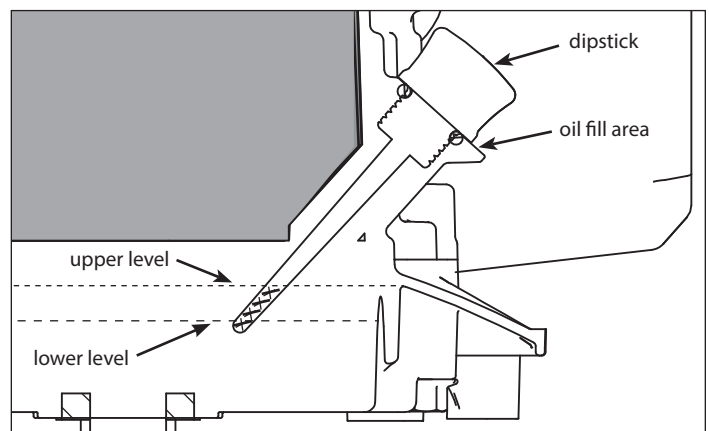


FIGURE 6: Filling and changing oil

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 7).

1. Remove air cleaner cover.
2. Remove the air filter.
3. Replace with new air filter.
4. Replace air filter cover.

SPARK PLUG

The recommended spark plug is a DK7RTC. 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 .030" (0.7-0.8 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.

CAUTION

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

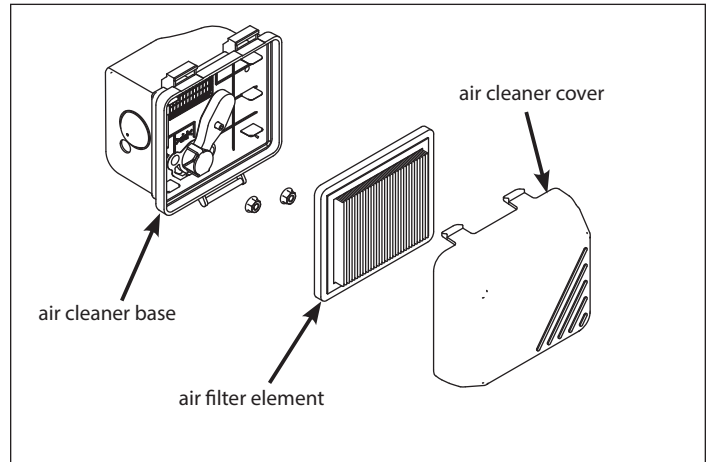


FIGURE 7

CARBURETOR

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

FUEL FILTER

Cleaning Or Replacing Fuel Filter

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 carb 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.

WARNING

FAILURE TO FOLLOW MAINTENANCE INFORMATION CAN CAUSE DEATH OR SERIOUS INJURY.

DO NOT REMOVE FUEL WHILE SMOKING, NEAR OPEN FLAME, OR WHEN IN PROXIMITY TO OTHER POTENTIAL HAZARDS.

AVOID INJURY! NEVER STORE ENGINE WITH FUEL IN THE TANK INSIDE A BUILDING. POTENTIAL SPARKS MAY BE PRESENT CAUSING IGNITION OF FUEL AND FUEL VAPORS.

WARNING

AVOID INJURY! TO AVOID INJURY OR DEATH, NEVER SIPHON FUEL BY MOUTH.

AVOID INJURY! CHECK ENGINE OFTEN FOR LOOSE NUTS AND BOLTS. KEEP THESE ITEMS TIGHTENED.

WARNING

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 FUEL TANK.

TROUBLESHOOTING AND REPAIR

At Ardisam 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 the troubleshooting guide in this section.

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 Ardisam customer service. Ardisam 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. To order parts or inquire about warranty, call or e-mail us using the contact information found in this section.

ORDERING REPLACEMENT PARTS

Parts can be obtained directly from the factory. To order parts visit www.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: part numbers; part description; quantity; and model number and serial number.

SPARE PARTS

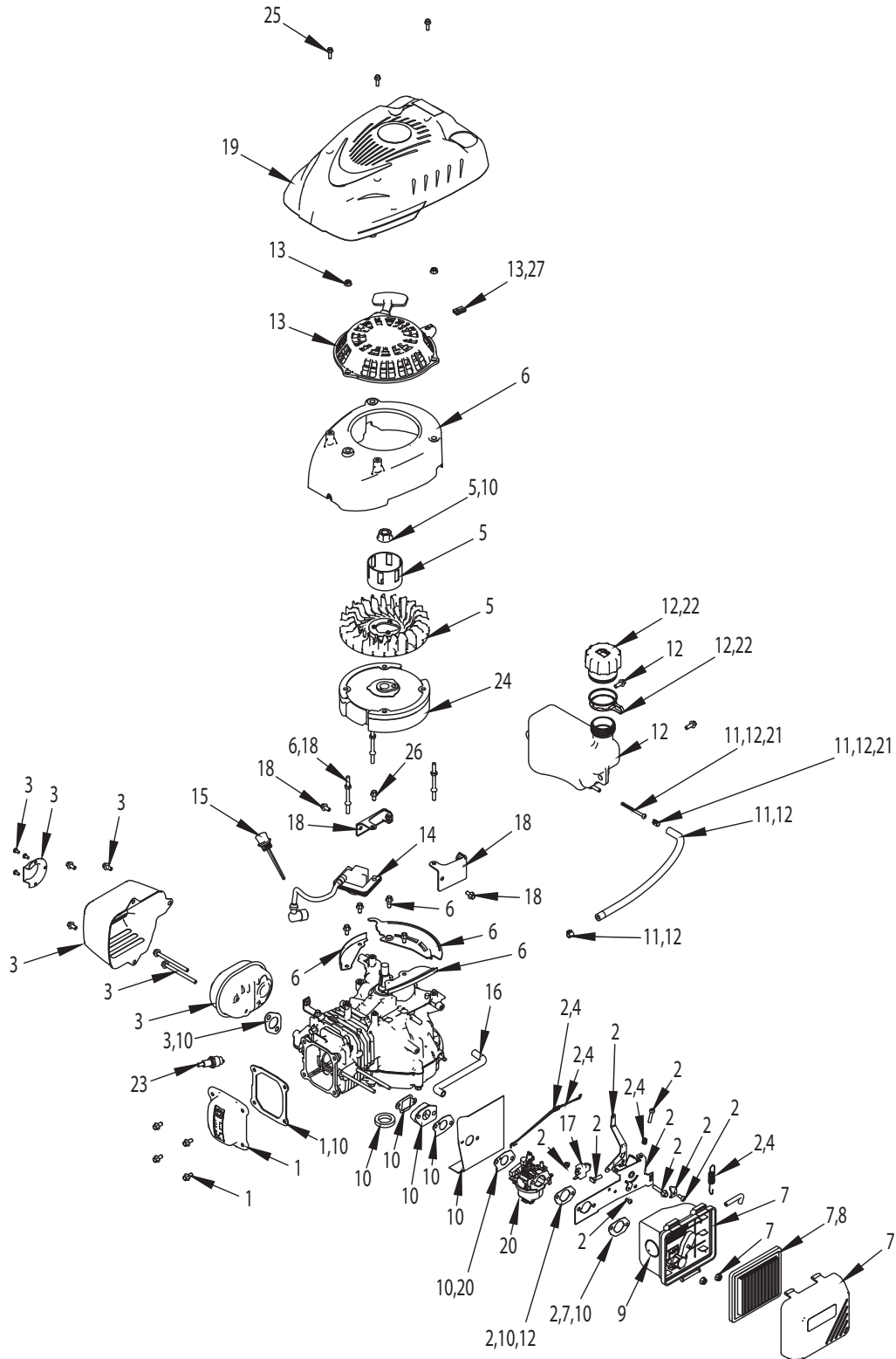
Only use approved Viper[®] spares.

TROUBLESHOOTING GUIDE

PROBLEM	POSSIBLE CAUSE	REMEDY/ACTION
Engine will not start	1. Power switch off	1. Flip switch to ON position
	2. Spark plug wire disconnected	2. Connect spark plug wire to spark plug
	3. Out of fuel	3. Refuel
	4. Spark plug wet, faulty or improperly gapped	4. Clean, replace or gap spark plug
	5. 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, and fresh fuel
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 .030"
Engine runs, then quits	1. Fuel cap not venting	1. Replace fuel cap

Contact a service provider if above remedies fail.

PARTS BREAKDOWN
173cc ENGINE MAIN PARTS EXPLOSION



173CC ENGINE MAIN PARTS LIST

REF NO.	PART NO.	DESCRIPTION	QTY.
1	11211	KIT VALVE COVER	1
2	11228	KIT THROTTLE REPLACEMENT	1
3	11989	KIT MUFFLER	1
4	11216	KIT THROTTLE CONTROL SPRINGS	1
5	11217	KIT STARTER CUP AND FAN	1
6	11218	KIT BLOWER HOUSING	1
7	11993	KIT AIR CLEANER COMPLETE	1
8	10905	FILTER ELEMENT AIR CLEANER	1
9	10899	PRIMER BULB	1
10	11225	KIT ENGINE GASKETS	1
11	11226	KIT FUEL LINE AND FILTER	1
12	11935	KIT FUEL TANK REPLACEMENT	1
13	11366	KIT RECOIL AND HARDWARE	1
14	10915	IGNITION COIL	1
15	11051	DIPSTICK WITH SEAL	1
16	11009	BREATHER TUBE	1
17	11149	SWITCH ENGINE SHUT OFF	1
18	11232	KIT MOUNTING BRACKETS AND RODS	1
19	10871	ENGINE SHROUD	1
20	11987	KIT CARBURETOR REPLACEMENT	1
21	11008	FUEL FILTER	1
22	11910	FUEL CAP EPA III COMPLIANT	1
23	11994	SPARK PLUG DK7RTC	1
OTHER PARTS (Contact customer service for ordering information)			
24	--	FLYWHEEL	
25	--	BOLT M5 X 0.8 X 16 MM HHF GR8.8 ZN	
26	--	BOLT M6 X 1.0 X 12 HHF GR8.8 ZN	
27	--	CLIP NUT	
PARTS NOT SHOWN			
--	14615	ALTITUDE KIT 3,000-6,000 FT	
--	14616	ALTITUDE KIT 6,000-8,000 FT	

NOTE: Service kits contain multiple parts.



Warranty Terms and Conditions

ARDISAM LIMITED 5 YEAR VIPER ENGINE WARRANTY FOR ENGINES GREATER THAN 79CC'S MANUFACTURED AFTER 10/1/2014

Ardisam, Inc. (Ardisam) warrants this engine under a five-year limited warranty to be free from defects in the material or workmanship or both for a period not exceeding sixty consecutive months from the date of original purchase by the first retail consumer or first commercial end user. "Consumer use," means personal recreational use by a retail consumer. "Commercial use," or "commercial application," means all other uses, including use for commercial, income producing or rental purposes. Once a product has experienced commercial use, it shall thereafter be considered as a commercial use product for the purpose of this warranty. This warranty applies to the original owner that provides a proof of purchase. This warranty is not transferable. The warranty period begins on the date of purchase by the first retail consumer or commercial end user, and continues for the sixty month consecutive period thereafter. Any unit used in a commercial application is covered for a period of 90 days after purchase by the first commercial end user. For the warranty to be valid, the product must be registered online within 30 days of purchase, or the warranty card must be filled out and received by Ardisam within 30 days of purchase. Ardisam shall not be obligated for transportation charges that result from repair or replacement under the terms of this warranty. Transportation charges are the sole responsibility of the purchaser.

This warranty excludes parts that are worn or damaged due to normal wear such as spark plugs, recoil ropes, fuel filters, and bearings. Routine maintenance items such as filter elements, O-rings, seals, lubricants, and tune-ups are also excluded. Natural fading or peeling from normal deterioration due to weather elements, sea water, and chemicals is also excluded. Non catalytic mufflers will be warrantied for one year. For all catalytic mufflers refer to the emissions control warranty contained in the retail package.

This limited warranty applies to defects in the material or workmanship of the engine only. This warranty does not apply to the product to which the engine is mounted. This warranty policy applies only to engines which have not been subjected to misuse including but not limited to operating engine with insufficient, contaminated, or incorrect grade of oil, using gasoline with ethanol greater than 10%, contaminated gasoline, dirt ingestion due to improper air filter maintenance or improper installation, improper tension of belts creating excessive force on crankshaft, excessive vibration causing loose hardware, unbalanced items attached to the crankshaft, uses other than those indicated in the product manual, alteration, accident, use of unauthorized parts, failure to perform periodic maintenance as specified in engine manual, normal wear and tear, use of unauthorized parts or repairs performed at unauthorized service centers. Parts applied to the external engine like clutches, pulleys, belt engagement items are subject to the warranty of the product to which the engine is mounted. Failure resulting from obstructing airflow to the engine such as dirt, grass, rodent nests that cause overheating is excluded. All parts specified in the "Emissions Control Warranty" contained in the retail package will follow the terms of that agreement and are not included as part of this warranty. There is no other express 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. Ardisam will, in its discretion, at no charge, repair or replace any defective part to which this warranty applies. 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. Some states and countries do not allow the limitations on how long an implied warranty lasts, or the exclusion or limitation of incidental or consequential damages, so the above limitation may not apply to you. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state and country to country.

NOTES



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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