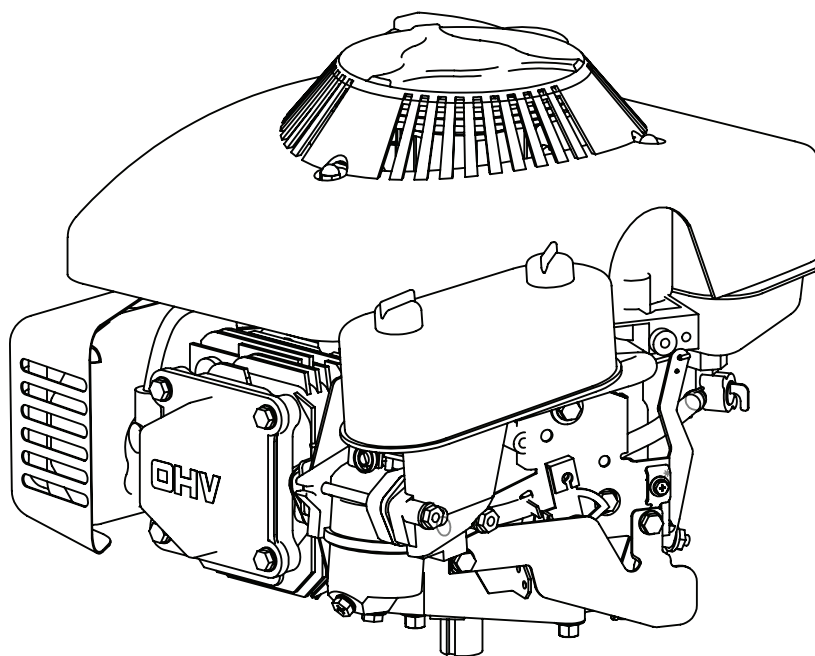




OPERATING & MAINTENANCE INSTRUCTIONS 173CC 4-CYCLE ENGINE



OM31321
Rev. 11/27/09
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INTRODUCTION

Thank You . . .

for purchasing a Viper engine from Ardisam, Inc. We have worked to ensure that our product meets high standards for usability and durability. With proper care, your engine will provide many years of excellent service. Please take the time to read this manual carefully to learn how to correctly operate and maintain your Viper engine. Due to continuous efforts to perfect our products, certain procedures and specifications are subjected to change without notice. Congratulations on your investment in quality.

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FEDERAL EMISSION INFORMATION

Ardisam, Inc. 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).

SPECIFICATIONS	
Engine Type	4-Stroke Gasoline Engine with Vertical Shaft & Recoil Start Air Cooled/Engine Model: 31321
Displacement	173 cc
Torque	6.5 ft. lbs. at 3,000 RPM
Fuel Tank Capacity	0.52 Gal.
Engine Oil Capacity	27 oz.
Air Cleaner Type	Cartridge Type
Weight	38 lbs.
IMPORTANT! <i>This product requires oil and fuel to be added before starting. Attempting to start the Engine without oil WILL ruin the Engine and void the warranty.</i> <i>*The emission control system for this Engine is warranted for standards set by the U.S. Environmental Protection Agency. For warranty information, refer to pages 3-4 of the manual.</i>	





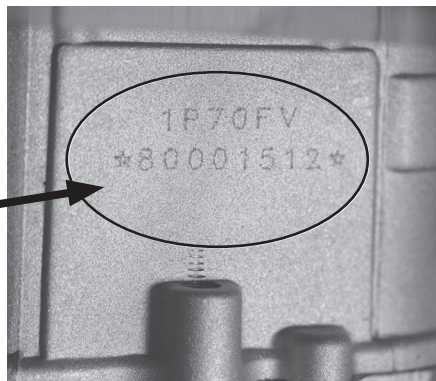
WARRANTY

Ardisam, Inc., Manufacturing Company warrants its Viper Engines under a two year limited warranty to be free from defects in materials and workmanship for the service life of the product not to exceed twenty four consecutive months from the date of purchase for consumer applications. As an Ardisam Viper small engine owner, you are responsible for executing proper maintenance listed in your Operating and Maintenance Instructions. 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.

This warranty applies only to products which have not been subjected to negligent use, misuse, alteration, accident, unauthorized parts, failure to use proper fuel and oil, or if repairs have been performed at non-authorized service centers. This warranty supersedes all other warranties either expressed or implied and all other obligations or liabilities on our part. Ardisam, does not assume, and does not authorize any other person to assume for us, any liability in connection with the sale of our products. To be at "No Charge," however, warranty work must be sent directly to Ardisam, Inc. or one of our authorized service centers and performed by them. To obtain warranty service and replacement instructions, contact our customer service department at 800-345-6007 Monday through Friday from 8 a.m. to 5 p.m. or visit www.ardisam.com. Ardisam will at no charge, repair or replace, at their discretion, any defective part which falls under the conditions stated above. Ardisam retains the right to change models, specifications and price without notice.



Viper Engines, A Division of Ardisam, Inc.
1160 Eighth Avenue; P.O. Box 666
Cumberland, Wisconsin 54829
800-345-6007 · Fax (715) 822-2223
E-mail: info@ardisam.com



The Engine Serial Number is located under the fuel tank.

REGISTRATION, SERVICE AND MAINTENANCE LOG

Record the model number and serial number in the space provided for easy reference. Fill out and mail the registration card located in the parts packet or register online at www.ardisam.com. The Engine Serial Number is located under the fuel tank.

OWNERSHIP RECORDS		
Owner's Name:		
Owner's Address:		
City:	State/Province:	Zip Code/Postal Code:
Model Number: 31321	Serial Number:	
Date of Purchase:		
Notes:		





Explanation of Emissions Control Warranty Provisions

Viper Engines are designed, built and equipped to meet all EPA requirements. It warrants that it is free from defects in material and workmanship that could cause failure to the warranted part; and that it is identical in all material respects to the engine described in the manufacturer's application for certification. When a warrantable condition exists, Viper will repair your engine at no cost to you, including parts and labor. The engine emissions label will indicate certification information. If the purchaser is in need of a warrantable repair and is not within 100 miles distance from an Ardisam authorized repair center, Ardisam will pay for shipping costs to and from an authorized Ardisam repair center.

Listed below are the parts covered by the emissions control systems warranty. Some parts listed below may require scheduled maintenance and are warranted up to the first scheduled replacement point for that part. Coverage under this warranty includes only the parts listed below (the emission and evaporation control systems) if so equipped:

- Air Filter Assembly (only to the first scheduled replacement point)
- Fuel Filter (only to the first scheduled replacement point)
- Carburetor
- Fuel Lines, Fuel Line Fittings and Clamps
- Fuel Metering Valve (if equipped)
- Evaporative System (if equipped)
 - Canister (if equipped)
 - Canister filter (if equipped)
 - Vapor hose (if equipped)
 - Orifice connector (if equipped)
 - Fuel tank
 - Fuel cap
 - Primer bulb canister (if equipped)
- Spark Plugs
- Magneto Ignition System
- Muffler Assembly

LIMITATIONS

The Emission Control Systems Warranty shall not cover any of the following:

- a) Repair or replacement required because of misuse or neglect, improper maintenance, repairs improperly performed or replacements not conforming to Ardisam, Inc. specifications that adversely affect performance and/or durability and alterations or modifications not recommended or approved in writing by Ardisam, Inc.
- b) Replacement of parts and other services and adjustments necessary for required maintenance at or after the first scheduled replacement point;
- c) Consequential damages such as loss of time, inconvenience, loss of use of the engine or equipment, etc.
- d) Diagnosis and inspection fees that do not result in eligible warranty service being performed; and
- e) Any add-on or modified part, or malfunction of authorized parts due to the use of add-on or modified parts.

These items will be covered for a period of **two years** from the date of the original purchase. Viper warrants that: the components are designed, built and equipped so as to conform with all applicable regulations adopted by the EPA; that they are free from defects in material and workmanship that could cause failure to the engine or other; and that the components used are identical in all material respects to the engine described in the manufacturer's application for certification. The warranty period begins on the date the engine is originally purchased.

MAINTENANCE AND REPAIR REQUIREMENTS

The owner is responsible for the proper use and maintenance of the engine. Ardisam, Inc. recommends that all receipts and records covering the performance of regular maintenance be retained in case questions arise. If the engine is resold during the warranty period, the maintenance records should be transferred to each subsequent owner. Ardisam, Inc. reserves the right to deny warranty coverage if the engine has not been properly maintained; however, Ardisam, Inc. may not deny warranty repairs solely because of the lack of repair maintenance or failure to keep maintenance records.

Normal maintenance replacement or repair of emission control devices and systems may be performed by any repair establishment or individuals; however, warranty repairs must be performed by an Ardisam authorized service center. Any replacement parts or service that is equivalent in performance and durability may be used in non-warranty maintenance or repairs, and shall not reduce the warranty obligations of the engine manufacturer.

The warranty on emissions-related parts is as follows:

- Any warranted part that is not scheduled for replacement as required maintenance in the owner's manual supplied, is warranted for the warranty period stated above. If any such part fails during the period of warranty coverage, that part will be repaired or replaced at no charge to the owner. Any such part repaired or replaced under the warranty will be warranted for the remaining warranty period.
- Any warranted part that is scheduled only for regular inspection in the owner's manual supplied, is warranted for the warranty period. Any such part repaired or replaced under warranty will be warranted for the remaining warranty period.
- Any warranted part that is scheduled for replacement as required maintenance in the owner's manual supplied, is warranted for the period of time prior to the first scheduled replacement point for that part. If the part fails prior to the first scheduled replacement, the part will be repaired or replaced at no charge to the owner. Any such part repaired or replaced under warranty will be warranted for the remainder of the period prior to the first scheduled replacement point for the part.
- Add on or modified parts that are not exempted by the Air Resources Board may not be used. The use of any nonexempted add on or modified parts by the owner will be grounds for disallowing a warranty claim. The manufacturer will not be liable to warrant failures of warranted parts caused by the use of a nonexempted add on or modified part.



GENERAL SAFETY PRECAUTIONS

Please read this section carefully. Operate the engine according to the safety instructions and recommendations outlined here and inserted throughout the text. Anyone who uses this engine must read the instructions and be familiar with the controls.

Owner's Responsibility:

It is the owner's responsibility to accurately assemble the engine for safe and effective use.

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

SIGNAL WORDS



A signal word alerts you to potential hazards that could harm you or others. Each signal word is preceded by the safety alert symbol followed by the word **DANGER**, **WARNING**, **CAUTION** or **IMPORTANT**.

Each signal word will make you aware of what the hazard is, what can happen, and what you can do to prevent or decrease injury occurrence.

DANGER

DANGER INDICATES YOU WILL BE KILLED OR SERIOUSLY INJURED IF THE SAFETY INSTRUCTIONS THAT FOLLOW THIS SIGNAL WORD ARE NOT OBEYED.

WARNING

WARNING INDICATES YOU CAN BE KILLED OR SERIOUSLY INJURED IF THE SAFETY INSTRUCTIONS THAT FOLLOW THIS SIGNAL WORD ARE NOT OBEYED.

CAUTION

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

IMPORTANT

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

PRECAUTIONS**WARNING:
FUEL FILLING PRECAUTIONS**

- FUEL AND FUEL VAPORS ARE HIGHLY FLAMMABLE.
- NEVER FILL GAS TANK INDOORS OR IN A POORLY VENTILATED AREA.
- TURN ENGINE OFF AND LET COOL BEFORE REMOVING GAS CAP.
- DO NOT OVERFILL GAS TANK. IF FUEL SPILLAGE OCCURS, WIPE AWAY CAREFULLY AND ALLOW FUEL TO DRY BEFORE STARTING ENGINE.
- PREVENT FIRE AND EXPLOSION CAUSED BY STATIC ELECTRIC DISCHARGE. USE ONLY NON-METAL, PORTABLE FUEL CONTAINERS APPROVED BY THE UNDERWRITER'S LABORATORY(U.L.) OR THE AMERICAN SOCIETY FOR TESTING & MATERIALS (ASTM).
- NEVER POUR FUEL OUT OF ENGINE GAS TANK.
- NEVER ALLOW CHILDREN TO FILL THE GAS TANK. ADULTS ONLY.
- NEVER ALLOW YOURSELF, OR ANYONE UNDER THE INFLUENCE OF DRUGS OR ALCOHOL, TO FILL GAS TANK.
- GAS CAP MUST BE PROPERLY SECURED BEFORE AND DURING OPERATION.
- REFRAIN FROM SMOKING AND STAY AWAY FROM OPEN FLAMES AND SPARKS WHEN REFUELING.

**WARNING:
FIRE & BURN PROTECTION**

- KEEP ALL SPARKS, SMOKING MATERIALS, AND OPEN FLAMES AWAY FROM ENGINE.
- DO NOT USE ENGINE AROUND DRY BRUSH, CLOTH RAGS, OR OTHER FLAMMABLE MATERIALS.
- BE CAREFUL OF HOT PARTS. THE MUFFLER GUARD AND OTHER PARTS BECOME EXTREMELY HOT DURING AND IMMEDIATELY AFTER USE. HOT PARTS CAN CAUSE SEVERE BURNS.
- ALWAYS KEEP MATERIALS AND DEBRIS CLEAR OF MUFFLER GUARD AND OTHER HOT ENGINE PARTS.
- NEVER OPERATE THE ENGINE WITHOUT THE MUFFLER GUARD IN PLACE.

**WARNING:
OTHER SAFETY PRECAUTIONS**

- STAY AWAY FROM ROTATING PARTS. PLACE PROTECTIVE COVERS OVER ROTATING PARTS.
- DO NOT CARRY OR REMOVE ENGINE WHILE IN OPERATION.
- OPERATE THE ENGINE ONLY ON LEVEL AND STABLE SURFACES.

**WARNING:
EXHAUST PRECAUTIONS**

- DO NOT INHALE EXHAUST FUMES. THEY GIVE OFF CARBON MONOXIDE, AN ODORLESS, COLORLESS, DEADLY GAS.
- USE EXTREME CARE WHEN RUNNING ENGINE NEAR PEOPLE OR ANIMALS. ALWAYS POINT EXHAUST AND MUFFLER IN A SAFE DIRECTION.
- NEVER RUN ENGINE IN AN ENCLOSED OR PARTIALLY ENCLOSED AREA. EXAMPLES INCLUDE: BUILDINGS THAT ARE ENCLOSED ON ONE OR MORE SIDES, CAR PORTS OR BASEMENTS.
- ALWAYS MAKE SURE EXHAUST PIPE IS FREE OF FOREIGN OBJECTS.

**WARNING:
ENGINE REPAIR PRECAUTIONS**

- BEFORE WORKING ON ENGINE, ENGINE SHOULD BE OFF AND COOL.
- ALWAYS DISCONNECT THE SPARK PLUG WIRE FROM THE SPARK PLUG.
- SECURE DISCONNECTED SPARK PLUG WIRE AWAY FROM SPARK PLUG AND ANY METAL OBJECTS TO AVOID ARCING (HAZARDOUS UNINTENTIONAL CONNECTION).
- CHECK ALL PARTS THAT WERE REPAIRED OR REMOVED TO ENSURE SECURE AND PROPER FIT.
- USE ONLY ORIGINAL VIPER EQUIPMENT AND PARTS.

ENGINE COMPONENTS

MODEL 31321 173CC HORIZONTAL SHAFT

This is a 4-cycle air cooled engine. This 173cc engine utilizes a vertical shaft output.

Note: Figure 1 pictures may vary slightly from the actual model.

⚠ 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.

IMPORTANT

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.

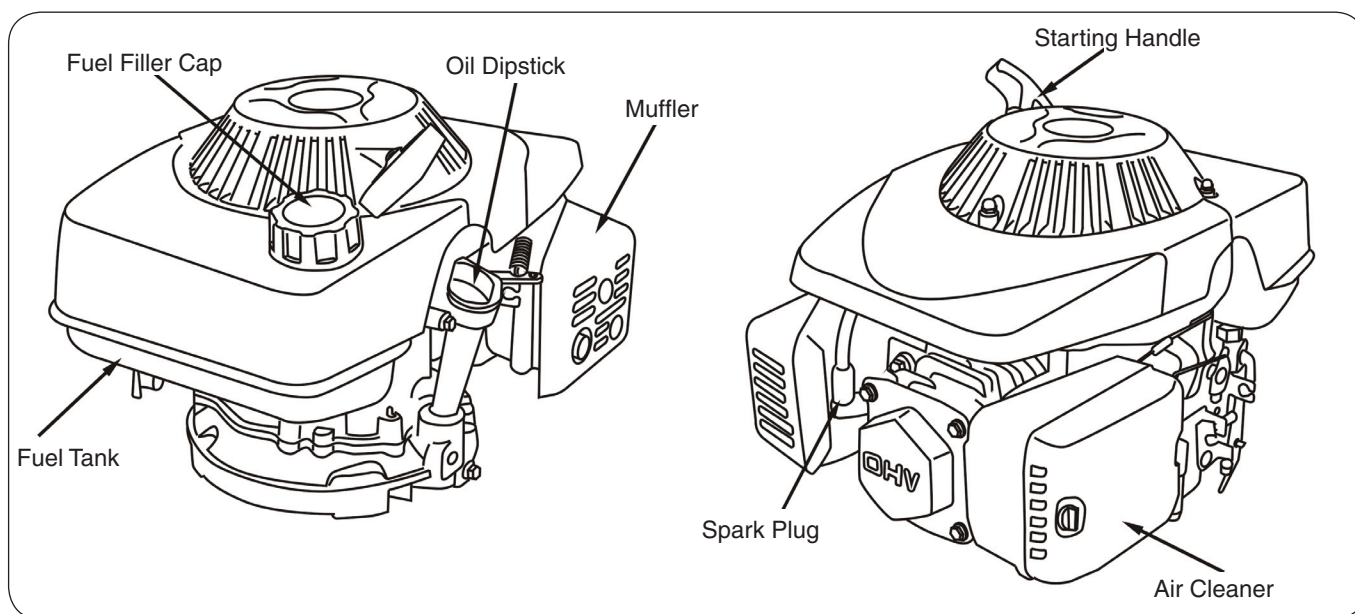


FIGURE 1

PRE-OPERATION PROCEDURES

PRE-OPERATION INSPECTION

1. Examine underneath and around engine for signs of oil or fuel leaks.
2. Inspect fuel hoses and joints for tightness and fuel seepage.
3. Look for signs of engine damage.
4. Check that all guards and shields are in place, and all screws, nuts and bolts are tightened.
5. Eliminate excessive debris around muffler and recoil starter.
6. Inspect the air filter component for air restrictions that may reduce engine performance.

CHECKING & ADDING OIL

NOTE: Engine oil is a key factor in deciding the engine's performance. Do not apply engine oil with additives or 2-stroke gasoline engine oil, as they haven't enough lubrication, which may shorten the engine's service life.

Check the engine with it stopped on a level ground. Engine oil recommended: SAE-30. **SEE FIGURE 2.** As viscosity varies with regions and temperatures, so the lubricant has to be selected in accordance with our recommendation.

OIL CAPACITY

27 oz.

CHECK

Procedure in checking oil level should be taken as follows: **SEE FIGURE 3**

1. Ensure that the engine is stopped on a level ground.
2. Remove dipstick and clean it.
3. Reinsert the dipstick into the oil filler without screwing in, and then withdraw it to check oil level.
4. If the oil level is too low, add recommended engine oil to the upper level on the dipstick. **SEE FIGURE 3**
5. Reinstall the dipstick.

NOTE: Running with insufficient engine oil may damage the engine severely.

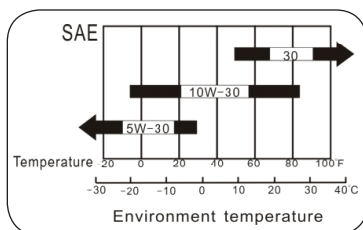


FIGURE 2

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.

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.

IMPORTANT

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

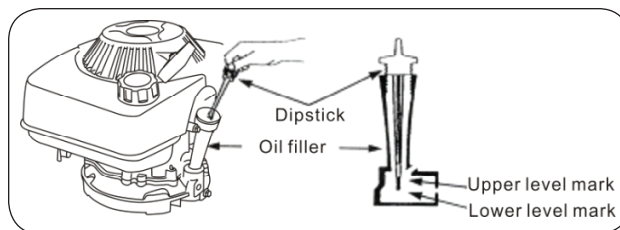


FIGURE 3

CHECKING & FILLING GAS TANK

FUEL AND FUEL TANK

The engine must run on unleaded gasoline with an octane number over 86. Using unleaded gasoline will decrease the possibility of producing carbon deposits and prolong the engine's service life.

NOTE: Do not use E85, serious engine damage may result.

1. Never apply used or contaminated gasoline or a mixture of gasoline and engine oil. Make sure the fuel is free of dirt and water.

NOTE: Handle fuel with care because it can damage plastic and painted surfaces.

2. Fuel tank capacity: 0.52 gal.

NOTE: Gasoline is extremely flammable and is explosive under certain conditions. Refuel in a well ventilated area with the engine stopped. Do not smoke or allow flames or sparks in the area where gasoline is stored or where the fuel tank is refueled.

Do not overfill the tank (there should be no fuel in the filler neck). After refueling, make sure the fuel tank cap is screwed on.

Be careful not to spill fuel when refueling. Spilled fuel vapor may ignite. If any fuel is spilled, make sure the area is completely dried before starting the engine.

Avoid repeated or prolonged contact with skin or breathing of fuel vapor.

Keep out of reach of children.

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.

ENGINE OPERATION

REVIEW SECTION “PRE-OPERATION INSPECTION” BEFORE STARTING ENGINE.

STARTING & STOPPING ENGINE

ENGINE STARTING

1. Set the fuel shutoff to “ON” **SEE FIGURE 5**
2. Push the throttle lever to choke position.

NOTE: If the engine is hot, closing the choke may not be necessary.

3. Start the engine as follows: Pull the starting rope handle up slightly until feeling resistance, and then make a rapid pull.

OPERATION

1. After engine starts, push the choke lever back to “HIGH” or “FAST”.
2. Set the throttle lever in proper position to ensure the engine runs at preset RPM (high speed)

STOP

1. Move throttle to stop position.

! WARNING

CARBON MONOXIDE GAS IS TOXIC. INHALATION CAN CAUSE UNCONSCIOUSNESS AND DEATH.

NEVER LEAVE ENGINE RUNNING WHILE UNATTENDED.

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

DO NOT STOP ENGINE BY MOVING CHOKE CONTROL TO CHOKE. BACKFIRE, ENGINE DAMAGE, OR FIRE MAY OCCUR.

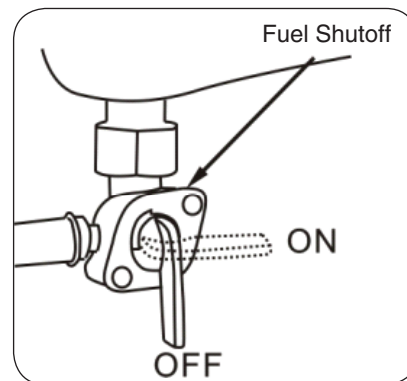


FIGURE 5



MAINTENANCE

Please read the 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 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.

⚠ 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.

MAINTENANCE ITEM		Every 8 hours (daily)	Every 50 hours or seasonally	Every 100 hours or seasonally	Yearly
Clean Engine and Check Bolts & Nuts		X			
Engine Oil (See Lubrication section)	Check	X			
	Change *	(initial 5 hours)	X		
Air Filter (See Air Filter section)	Check	X		X	
	Clean **		(20 hours)		
	Replace				X
Spark Plug (Gap .030") (See Spark Plug section)	Check-Adjust		X		
	Replace				X
Fuel Filter (See Fuel Filter section)	Clean ***		X		
	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

Failure to follow this maintenance schedule could result in nonwarrantable failures.

ENGINE MAINTENANCE

LUBRICATION

Choose engine oil that meets or surpasses the latest API service classification. For temperatures higher than 32° F, use SAE 30 or SAE 10W-30 motor oil. Use SAE 5W-30 or SAE 10W if temperatures are below 32° F.

NOTE: Do not use SAE 10W-40 motor oil.

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 and move away from spark plug. **SEE FIGURE 11.**
2. Remove oil drain plug and empty oil into suitable oil container. Dispose of oil properly. **SEE FIGURE 12.**
3. Reinstall drain plug. Remove dipstick (if applicable) or oil fill cap. **SEE FIGURE 2.**
4. Fill with appropriate oil to “FULL” or top line of dipstick.
5. Reinsert dipstick or oil fill cap and tighten.

AIR FILTER

- Never run engine without air filter properly installed. Added wear and engine failure may occur if air filter is not installed on engine.
- Service air filter every 3 months or after 20 hours of operation. Clean filter daily in extremely dusty conditions.
- Replace air filter yearly.

! 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.

OIL IS HAZARDOUS WASTE

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

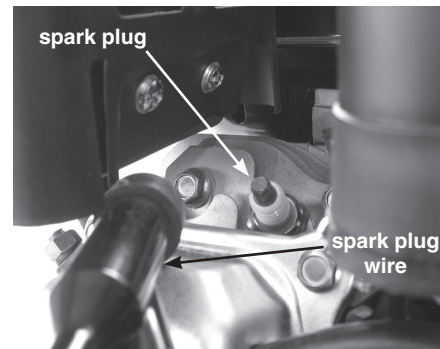


FIGURE 11

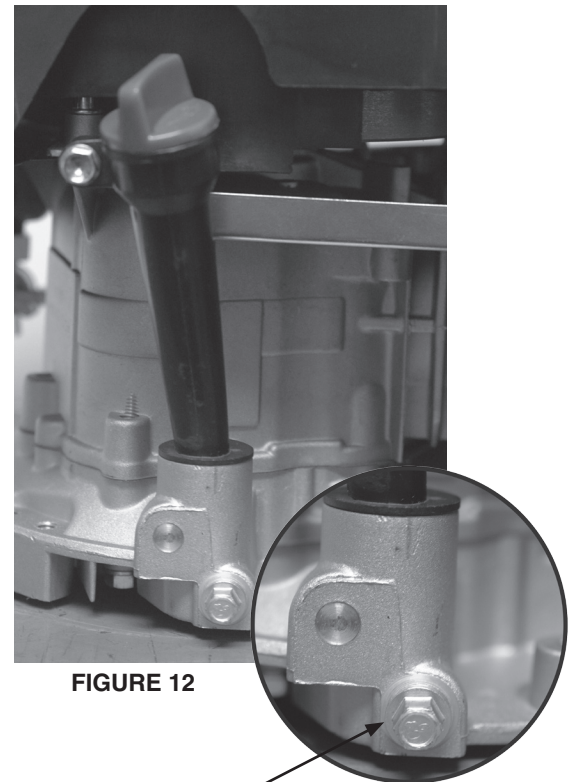


FIGURE 12

Drain Plug

OPERATING AND MAINTENANCE INSTRUCTIONS

173cc Vertical Shaft Engine



SPARK PLUG

The recommended spark plug is a Torch F6TC which cross references to an NGK BPR6ES or Champion N9YC.

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. **SEE FIGURE 11.**
- Reinstall original spark plug, tighten additional 1/2 turn.
 - Installing new spark plug, adjust spark plug gap to .030" 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 out completely.

CARBURETOR

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

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 GAS TANK.

SERVICE AND TROUBLESHOOTING

SERVICE INFORMATION

At Ardisam, we build quality and durability into the design of our products. Nevertheless, no amount of careful design by us, or thorough maintenance by you, can guarantee a repair-free life for your engine. Most repairs will be minor and easily fixed by following the suggestions in the troubleshooting guide of 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 mechanic or Ardisam, Inc. (contact your retailer for a list of authorized mechanics in your area). A parts catalog is included in this section. We will always be glad to answer any questions you encounter or find suitable assistance to meet your needs. To order parts or inquire about our warranty call, write or browse our website at the address found below under the section "ordering repair parts."

ORDERING REPAIR PARTS

Parts can be obtained from the store where your engine was purchased or direct from the factory. To order from the factory, call or write to:

Ardisam, Inc.
1160 Eighth Avenue, Cumberland, WI 54829
Phone (715) 822-2415 Fax (715) 822-4180
1-800-345-6007
Email: info@ardisam.com
www.ardisam.com

Please include the following information with your order:

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

CAUTION

PRACTICE SAFETY AT ALL TIMES. ENGINE MUST BE TURNED OFF AND ALLOWED TO COOL AND SPARK PLUG WIRE MUST BE DISCONNECTED BEFORE ATTEMPTING ANY MAINTENANCE OR REPAIR.

OPERATING AND MAINTENANCE INSTRUCTIONS

173cc Vertical Shaft Engine



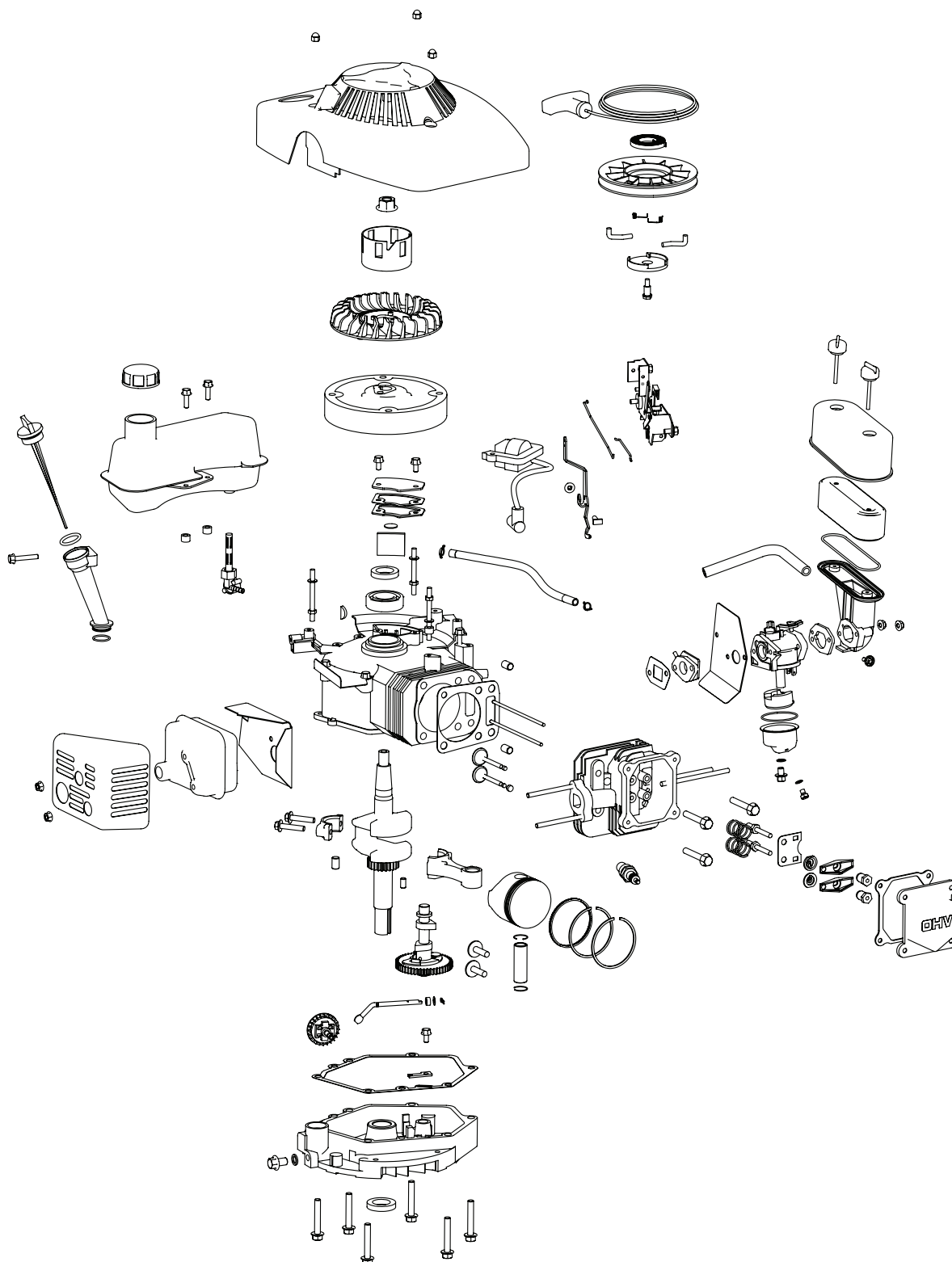
TROUBLESHOOTING

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 sparkplug
Engine runs rough, floods during operation	1. Dirty air filter	1. Clean or replace air filter
	2. Choke partially engaged	2. Turn off choke
	3. Carburetor out of adjustment	3. Call factory
Engine is hard to start	1. Stale fuel	1. Drain old fuel and replace with fresh. Use gas stabilizer at end of season
	2. Spark plug wire loose	2. Make sure spark wire is securely attached to spark plug
	3. Dirty carburetor	3. Clean carburetor, use gas stabilizer, new gas can
Engine misses or lacks power	1. Clogged gas tank	1. Remove and clean
	2. Clogged air filter	2. Clean or replace
	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. Gas cap not venting	1. Check cap for venting

Contact service provider if above remedies fail.

173cc VERTICAL SHAFT ENGINE PARTS

Note: Some parts are listed and shown for illustration purposes only, and are not available individually as replacement parts.

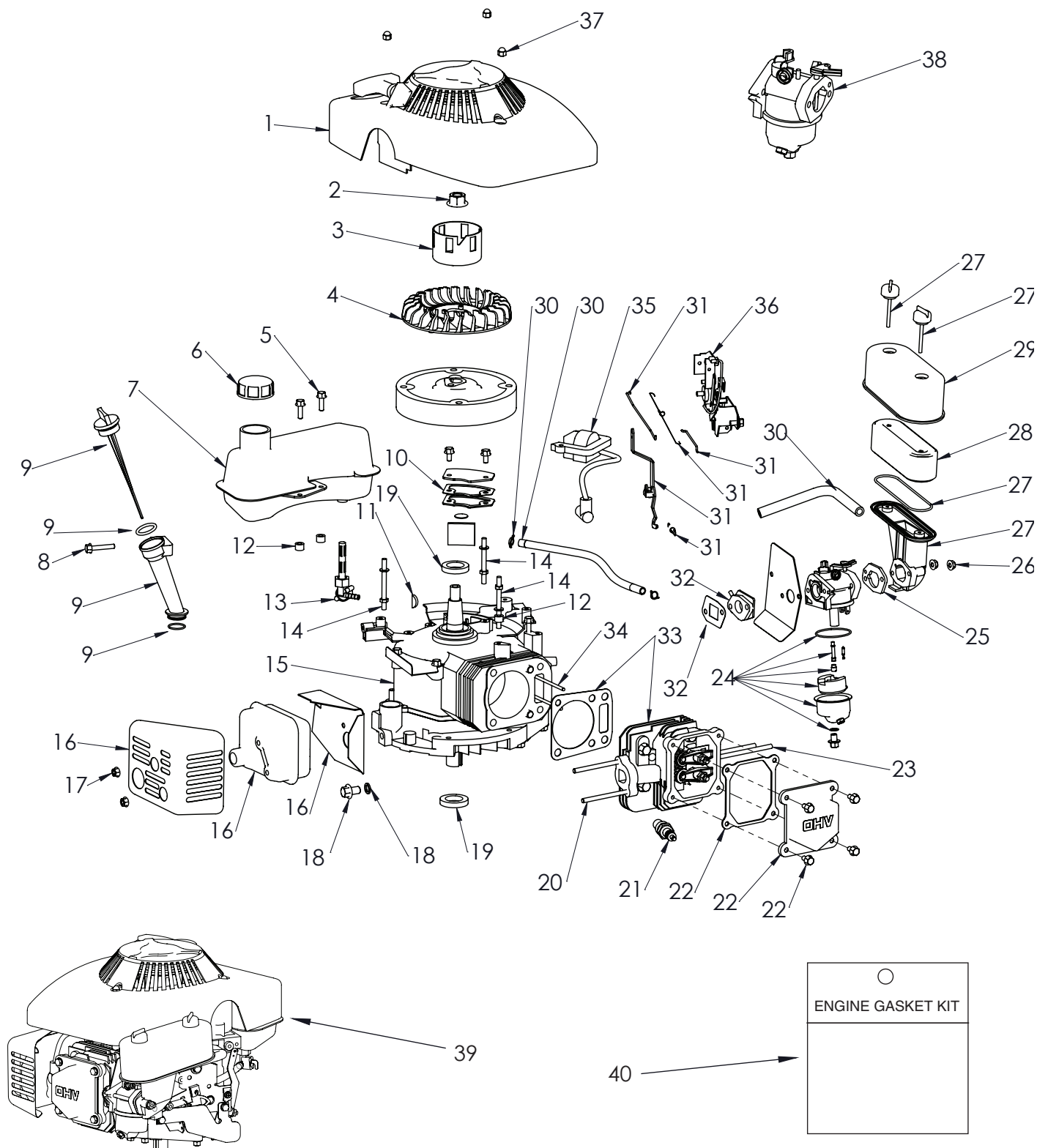


OPERATING AND MAINTENANCE INSTRUCTIONS

173cc Vertical Shaft Engine

173cc VERTICAL SHAFT ENGINE PARTS EXPLOSION

Note: Duplicate key numbers indicates part is only available as a service kit.





6.0 HP VERTICAL SHAFT ENGINE PARTS LIST

KEY NO.	PART NO.	DESCRIPTION	QTY.	KEY NO.	PART NO.	DESCRIPTION	QTY.
1	913142	RECOIL STARTER ASSEMBLY	1	25	913187	AIR CLEANER GASKET	1
2	913249	FLYWHEEL NUT	1	26	913219	NUT AIR FILTER HOUSING M6	2
3	913250	STARTER FLANGE	1	27	913218*	AIR FILTER BASE SERVICE KIT	1
4	913251	FLYWHEEL FAN	1	28	913216	AIR FILTER	1
5	913207	BOLT M6 X 20	1	29	913215	AIR CLEANER COVER	1
6	913205	GAS CAP ASSEMBLY	1	30	913114	BREATHER AND FUEL LINE SERVICE KIT	1
7	913206	FUEL TANK	1	31	913150	GOV LINKAGE/SPRING REPAIR SERVICE KIT	1
8	913130	BOLT M6 X 28	1	32	913189	HEAT INSULATOR AND GASKET	1
9	913133	DIPSTICK AND TUBE ASSEMBLY	1	33	913146	CYLINDER HEAD ASSEMBLY	1
10	913101	BREATHER SERVICE KIT	1	34	913170	PUSHROD SERVICE KIT	1
11	913159	FLYWHEEL KEY	1	35	913253	IGNITION COIL	1
12	913208	SPACER SERVICE KIT	4	36	913236	SPEED CONTROL ASSEMBLY	1
13	913212	FUEL SHUTOFF AND FILTER	1	37	913231	ACORN NUT M6	3
14	913149*	RECOIL STUD SERVICE KIT	1	38	913186	CARB COMPLETE	1
15	913155**	ENGINE SHORTBLOCK W/GASKET SET	1	39	31321	REPLACEMENT ENGINE	1
16	913145*	MUFFLER SERVICE KIT	1	40	913178	ENGINE GASKET SET	1
17	913124	MUFFLER NUT	2				
18	913128	DRAIN PLUG ASSEMBLY	1				
19	913129*	OIL SEAL SERVICE KIT	1				
20	913136	MUFFLER STUD AND NUT SERVICE KIT	1				
21	913137	SPARK PLUG	1				
22	913144*	VALVE COVER AND GASKET SERVICE KIT	1				
23	913147	CARB STUD	2				
24	913158	CARB REPAIR SERVICE KIT	1				

*Duplicate key numbers indicates part is only available as a service kit.

**Limited availability

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