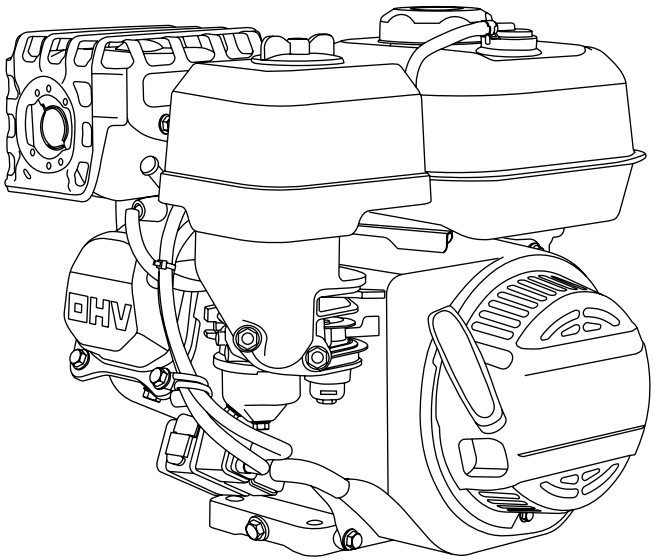
CRX® ENGINES

SINGLE-CYLINDER

TROUBLESHOOTING & REPAIR MANUAL



This manual is intended as a reference for trained service personal only, who have mechanical knowledge for the safe troubleshooting and repair of internal combustion engines and their associated components.

Part Number: 7125781

REV A - 1/2025

INTRODUCTION

This manual covers the troubleshooting and repair of single-cylinder CRX engines. All information contained in this manual is based on information available at the time of printing. The FNA Group reserves the right to make changes at anytime without notice or obligation. Always verify if you have the latest version of this manual.

Safety should be of the utmost concern during the troubleshooting, repairing and commissioning processes. Alway heed the notices given; never proceed without the proper safeguards in place.

A special note about electric start engines: When ANY preventative maintenance or repairs needs to be performed to an electric start engine, **DISCONNECT** the **NEGATIVE** (BLACK) battery lead from the battery **FIRST**. NEVER disconnect the positive (RED) battery lead first.

HAZARD ALERT SYMBOLS

Be sure to understand the safety symbols and definitions listed below. Each symbol contains one of four words: **DANGER**, **WARNING**, **CAUTION**, ***NOTICE***, indicating different levels of hazard severity. These symbols are used throughout this manual and are followed information about a specific hazard, the consequences of the hazard, and instructions on how to avoid the hazard. Failure to heed these symbols and follow the instructions provided with them will result in property damage, injury, and/or death.

⚠ DANGER: Indicates an imminently dangerous situation, which if not avoided, will result in property damage, serious injury, and/or death.

⚠ WARNING: Indicates a potentially hazardous situation, which if not avoided, could result in property damage, serious injury, and/or death.

⚠ CAUTION: Indicates a hazardous situation, which if not avoided, could result in property damage and/or minor to moderate injury.

NOTICE Indicates information considered important, but not directly hazard related.

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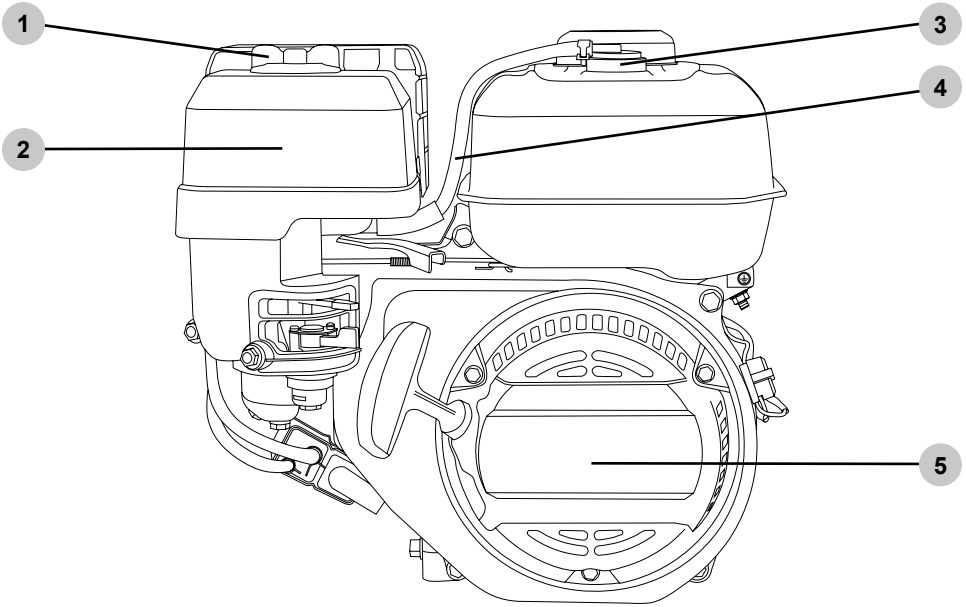

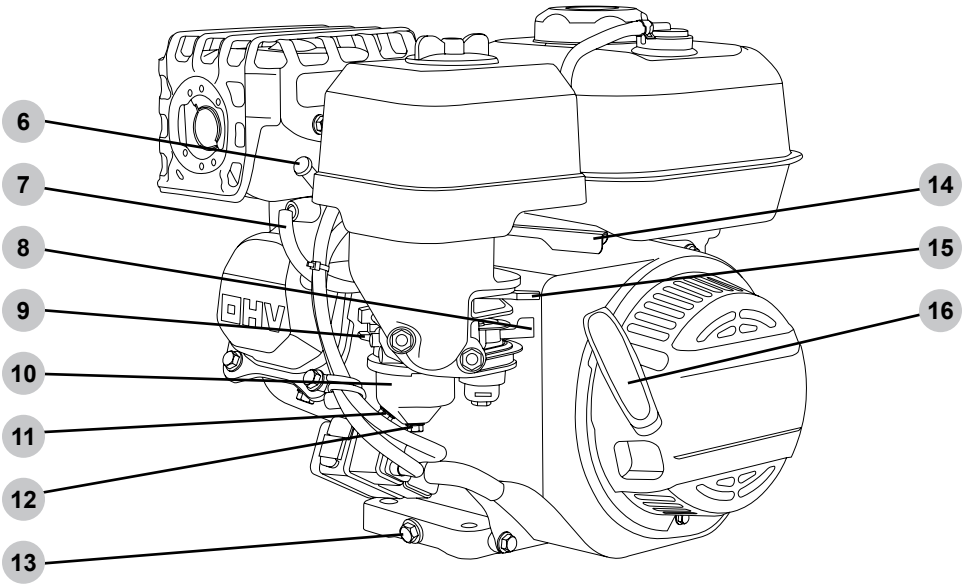

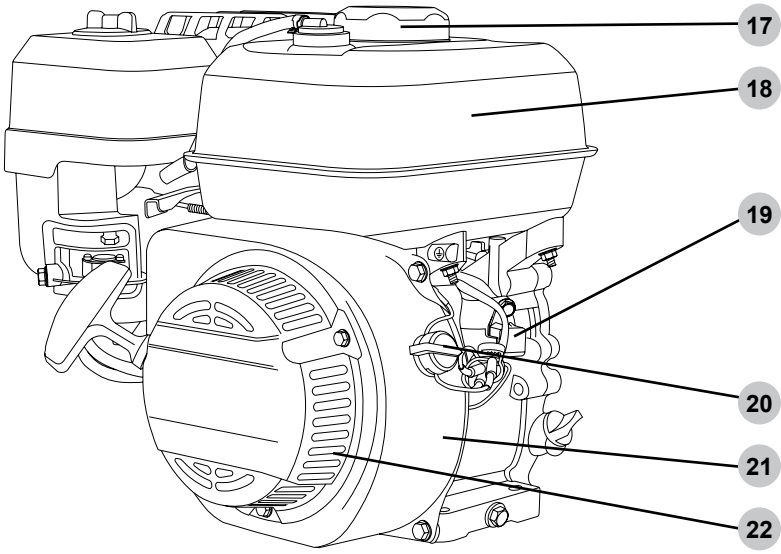
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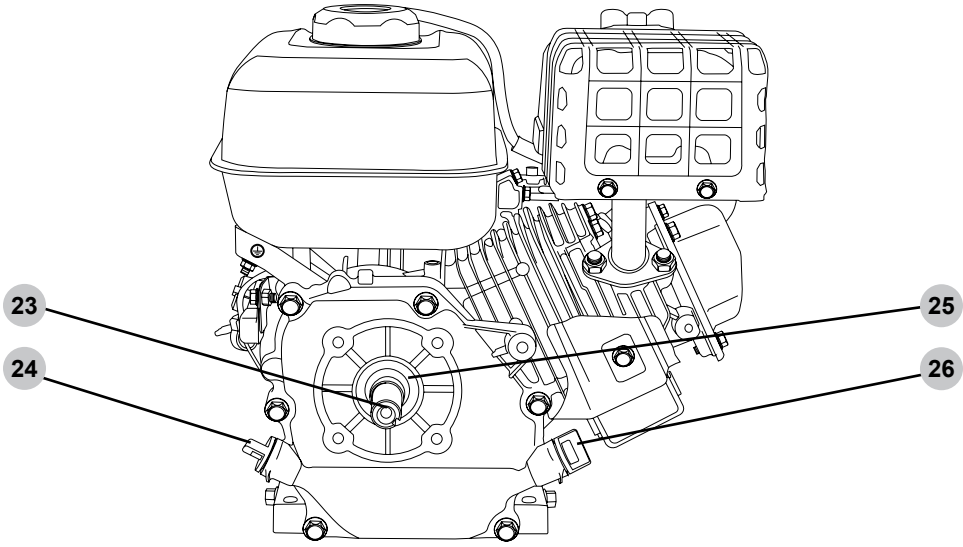
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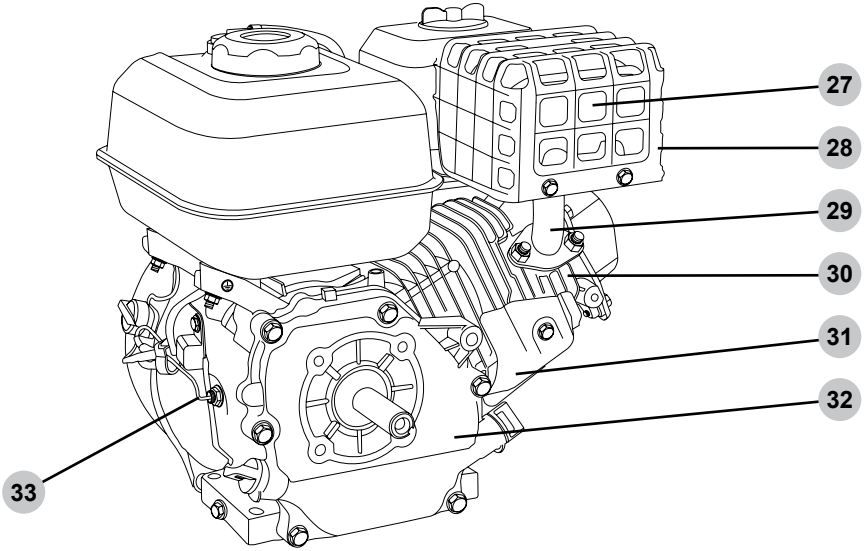
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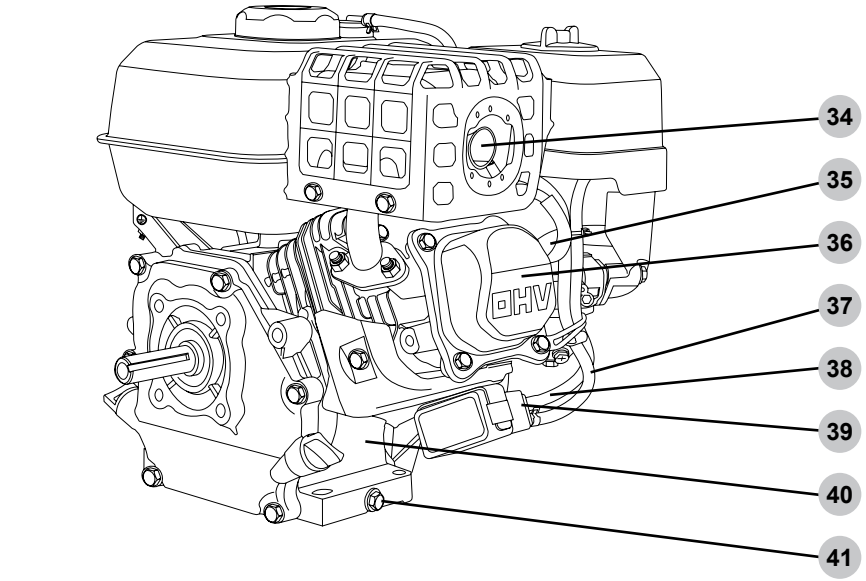
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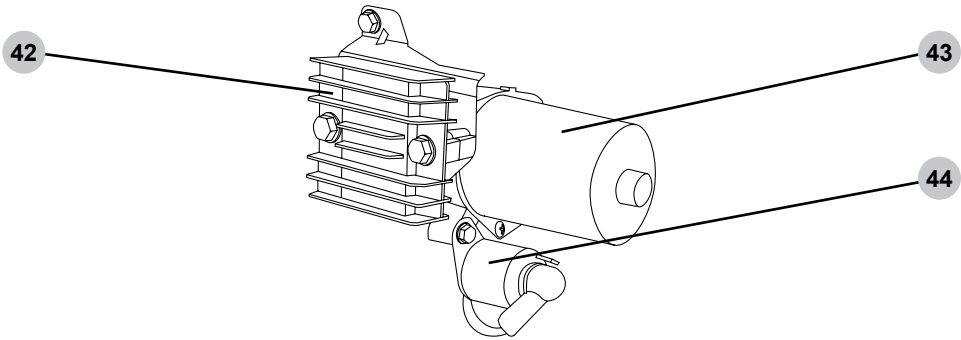
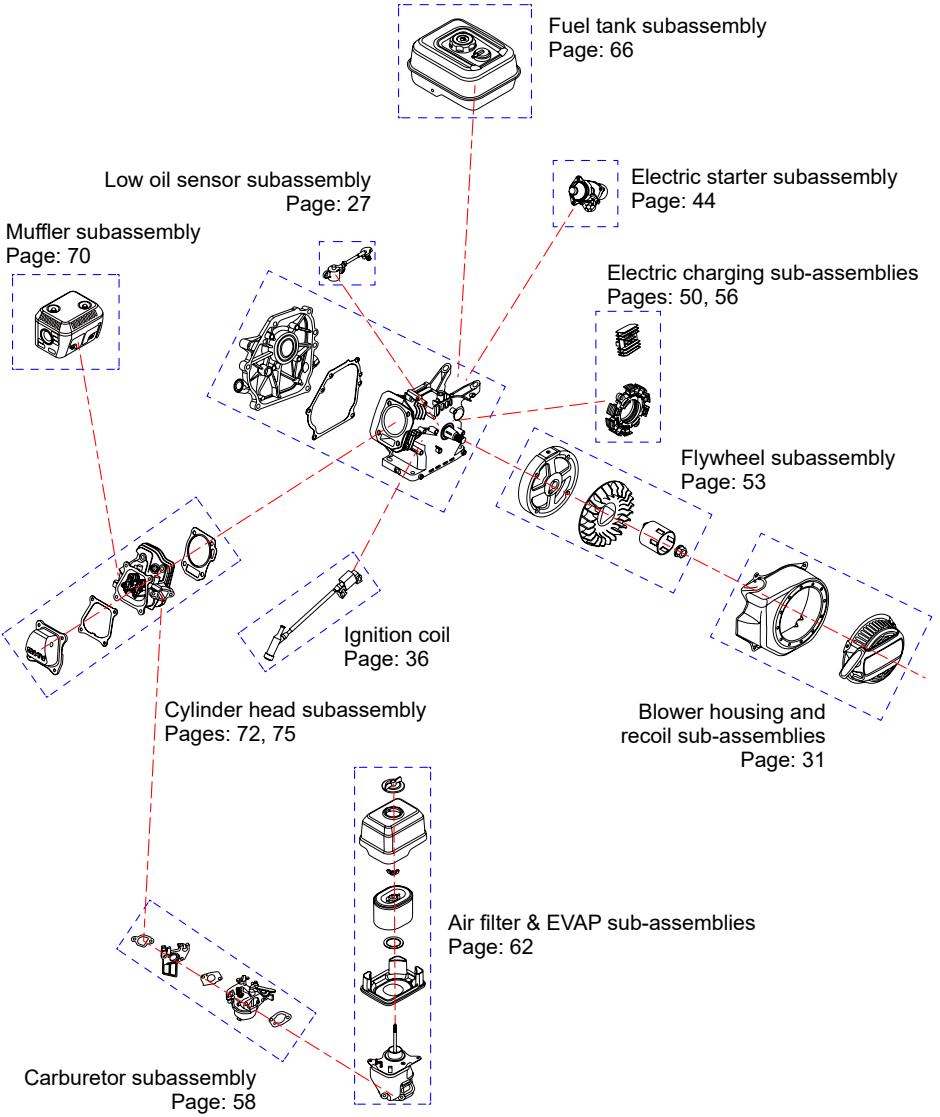


1. Air cleaner cover wingnut
2. Air cleaner cover
3. Fuel Tank Vent Valve
4. Vapor tube
5. Starter recoil cover
6. Spark plug terminal boot
7. Spark plug lead with heat shield
8. Fuel valve lever
9. Carburetor
10. Carburetor bowl
11. Carburetor bowl drain bolt
12. Carburetor bowl retaining bolt
13. Oil drain plug (1 of 2)
14. Throttle lever (if equipped)
15. Choke lever
16. Starter recoil handle
17. Fuel filler cap
18. Fuel tank
19. Low Oil Alert Sensor
20. Engine ON/OFF switch
21. Emission Control Information label
22. Cooling air intake
23. Crankshaft (Power Take Off)
24. Oil filler cap/dipstick
25. Crankshaft bearing / oil seal
26. Oil filler cap (secondary)
27. Muffler
28. Muffler protector
29. Muffler pipe
30. Cylinder head
31. Air cooling shroud
32. Rear housing cover
33. Low oil sensor float switch lead
34. Spark arrestor (if applicable)
35. Breather tube
36. Valve cover
37. Vapor hose
38. Vacuum hose
39. EVAP carbon canister
40. Serial number sticker
41. Oil drain plug (2 of 2)
42. Rectifier / battery charging regulator (if applicable)
43. Starter motor (if applicable)
44. Starter solenoid (if applicable)

ENGINE EXPLODED DIAGRAM



TROUBLESHOOTING DECISION TREES

Engine will not start

DANGER:
These tests involve running the engine. Use proper ventilation during testing.

Is the fuel tank filled with fresh fuel?
NO → Drain fuel tank and carburetor bowl of old fuel, refill w/ fresh fuel.

YES

Is the fuel valve moved to ON?
NO → Move the valve to ON.

YES

Is the engine switch turn to ON?
NO → Rotate the engine switch to ON.

YES

Is the engine choke set properly?
NO → Set to CHOKE for a cold engine, RUN for a warm engine.

YES

Is the spark plug lead attached to the spark plug?
NO → Connect the lead to the spark plug.

YES

With the engine placed on a level surface, is the engine oil at the proper level?
NO → Adjust oil level to bring it within the proper range as indicated on the dipstick.

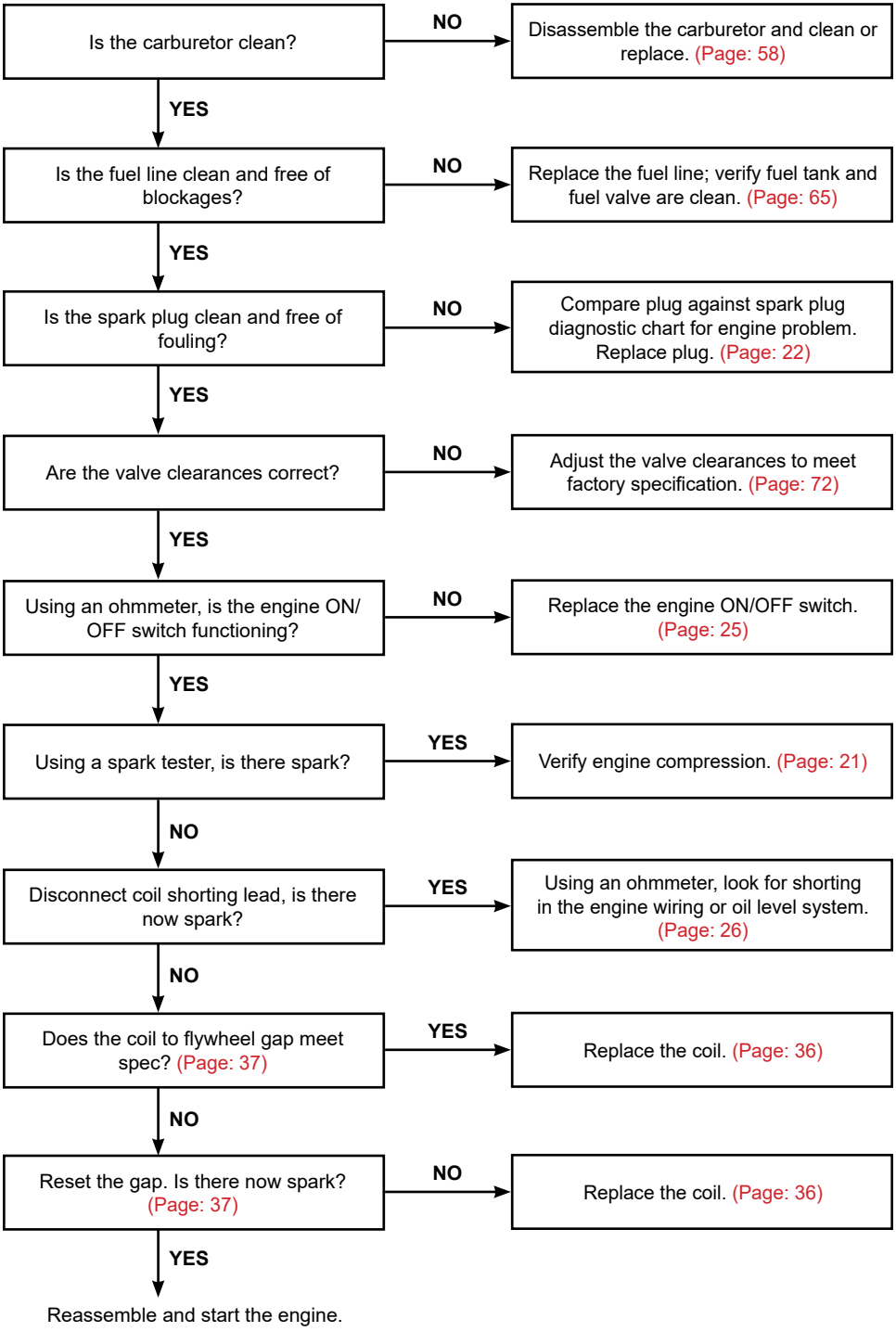
YES

Is the air filter clean?
NO → Clean or replace the air filter element.

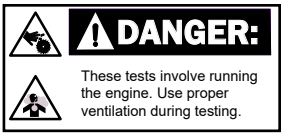
YES

Continued on the next page.

Engine will not start cont.



Engine will not stay running



Is the fuel fresh?

NO → Drain fuel tank and carburetor bowl of old fuel, refill w/ fresh fuel.

YES

Is the engine choke set properly?

NO → Set to CHOKE for a cold engine, RUN for a warm engine.

YES

With the engine placed on a level surface, is the engine oil at the proper level?

NO → Adjust oil level to bring it within the proper range as indicated on the dipstick.

YES

Is the air filter clean?

NO → Clean or replace the air filter element.

YES

Is the spark plug clean and free of fouling?

NO → Compare plug against spark plug diagnostic chart for engine problem. Replace plug. (Page: 22)

YES

Is the carburetor clean?

NO → Disassemble the carburetor and clean or replace. (Page: 58)

YES

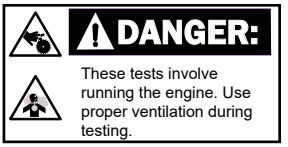
Is the fuel line clean and free of blockages?

NO → Replace the fuel line; verify fuel tank and fuel valve are clean. (Page: 65)

YES

Carburetor out of adjustment. Adjust or replace if damaged.

Engine runs rough



Is the fuel fresh?

NO → Drain fuel tank and carburetor bowl of old fuel, refill w/ fresh fuel.

YES

Is the engine choke set properly?

NO → Set to CHOKE for a cold engine, RUN for a warm engine.

YES

Is the air filter clean?

NO → Clean or replace the air filter element.

YES

Is the spark plug clean and free of fouling?

NO → Compare plug against spark plug diagnostic chart for engine problem. Replace plug. (Page: 22)

YES

Is the carburetor clean?

NO → Disassemble the carburetor and clean or replace. (Page: 58)

YES

Is the fuel line clean and free of blockages?

NO → Replace the fuel line; verify fuel tank and fuel valve are clean. (Page: 65)

YES

Carburetor out of adjustment. Adjust or replace if damaged. (Page: 58)

Engine lacks power

DANGER:

These tests involve running the engine. Use proper ventilation during testing.

With the load removed from the engine, does the engine appear to run properly?

YES → Verify the engine is properly matched to the load.

NO

Is the fuel fresh?

NO → Drain fuel tank and carburetor bowl of old fuel, refill w/ fresh fuel.

YES

Is the engine choke set properly?

NO → Set to CHOKE for a cold engine, RUN for a warm engine.

YES

Is the air filter clean?

NO → Clean or replace the air filter element.

YES

Is the spark plug clean and free of fouling?

NO → Compare plug against spark plug diagnostic chart for engine problem. Replace plug. (Page: 22)

YES

Is the carburetor clean?

NO → Disassemble the carburetor and clean or replace. (Page: 58)

YES

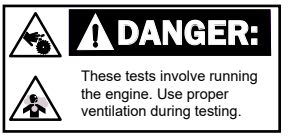
Carburetor out of adjustment. Adjust or replace if damaged. Is the engine now running correctly while loaded?

YES → No further troubleshooting required.

NO

Verify engine compression. (Page: 21)

Engine speed does not increase



Is the air filter clean?
NO → Clean or replace the air filter element.
YES

Is the spark plug clean and free of fouling?
NO → Compare plug against spark plug diagnostic chart for engine problem. Replace plug. (Page: 22)
YES

Is the governor linkage moving freely and properly adjusted?
NO → Inspect the linkage for binding and gummed lubricant. Clean and adjust for proper movement.
YES

Is the carburetor clean and free of blockages?
NO → Disassemble and clean or replace the carburetor. (Page: 58)
YES

Is the carburetor mounting loose?
YES → Tighten the hardware if required. (Page: 61)
NO

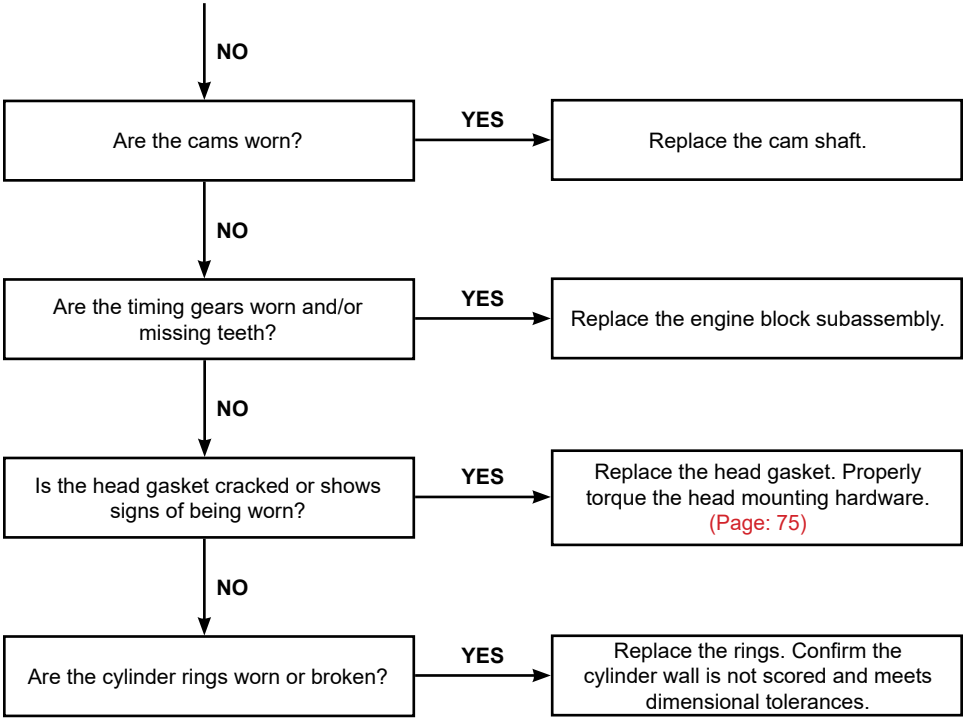
Is the carburetor gasket worn/cracked?
YES → Replace the gasket. (Page: 56)
NO

Are the valve clearances correct?
NO → Adjust the valve clearances to meet factory specification. (Page: 72)
YES

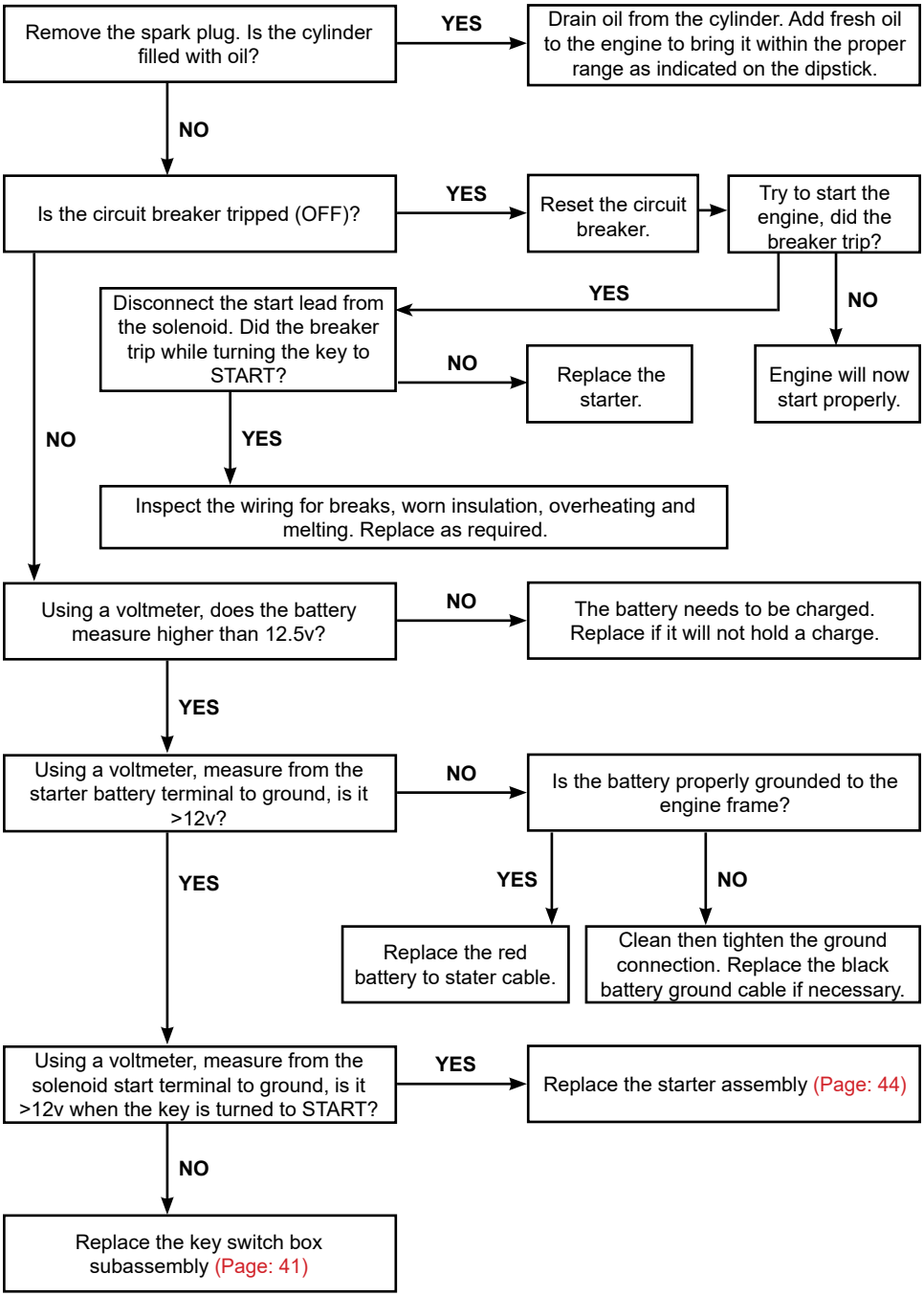
Are the push rods worn or bent?
YES → Replace the push rods.

Continued on the next page.

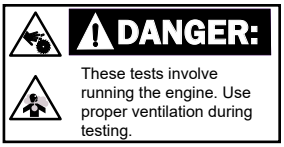
Engine speed does not increase cont.



Electric start engine will not crank



Battery will not charge



Disconnect the black, negative battery lead from the battery. With an ohmmeter, measure from the battery connector to the engine block, should be <5 ohms.

NO → Replace the black, negative battery lead.

YES ↓

Start the engine. Using a voltmeter, measure from the battery positive terminal to engine chassis. Should be >14v.

YES → The battery is exhausted. Replace the battery.

NO ↓

With the engine still running, measure from the battery terminal on the solenoid to ground, is it >14v?

YES → Replace the red, positive battery lead.

NO ↓

Disconnect the stator leads from the rectifier / regulator. Start the engine and using a voltmeter, measure across the stator leads, should be >18vAC.

YES → Replace the rectifier / regulator module. (Page: 50)

NO ↓

Replace the stator. (Page: 56)

Adjusting the Engine Idle Speed

DANGER:

This procedure involves running the engine. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated. DO NOT place your fingers near moving parts. Make sure all loose clothing, jewelry or hair are properly tied back and never allowed to contact moving parts. Be careful of HOT surfaces such as the muffler.

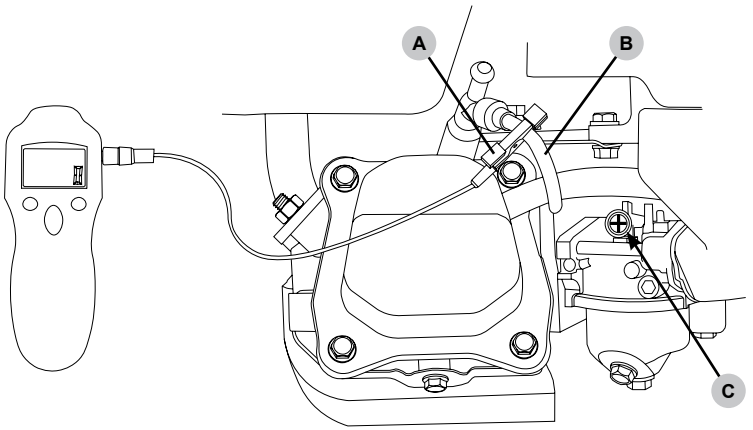


Fig. IDLE - 1

Idle adjustment procedure:

1. If possible, remove the load from the engine.
2. Start the engine; allow it to run until the normal operating temperature is met.
3. Turn the engine off.
4. Clamp the probe of a tachometer (Fig. IDLE - 1A) to the spark plug lead (Fig. IDLE - 1B). Be careful to avoid the HOT muffler.
5. Once again, start the engine.
6. The approved engine idle speed is as follows:

165 - 225cc	1650rpm to 1950rpm
275 - 340cc	1500rpm to 1800rpm
420 - 530cc	1450rpm to 1750rpm

7. Should the idle speed be outside the above ranges, use a Phillips head screwdriver to adjust the throttle stop screw (Fig. IDLE - 1C) unit the idle speed is brought into the approved range.
8. Turn the engine off. Allow it to fully cool before reconnecting the load to the engine (if applicable).

Testing Cylinder Compression

DANGER:

This procedure involves working on a warm engine. Care must be taken not to burn yourself on the engine, muffler or spark plug. DO NOT run the engine indoors unless inside a properly ventilated chamber designed for running engines.

1. Start the engine. Allow it to warm to its normal operating temperature.
2. With the engine still running, flip the fuel valve (Fig. COMP - 1A) to OFF. Allow the engine to stop on its own from lack of fuel.
3. While wearing heat resistant gloves, disconnect the spark plug lead from the spark plug (Fig. COMP - 1B).
4. Using a spark plug wrench, remove the spark plug.
5. Grasp the recoil handle, then pull it two times to remove any unburned fuel from the chamber.
6. Thread the compression gauge hose into the engine block.
7. With the choke and throttle open fully, pull the recoil handle briskly until a peak reading is achieved on the gauge. Note this figure.
8. Press the pressure release (Fig. COMP - 2A) on the gauge. Once again, pull the recoil handle briskly to achieve a peak reading on the gauge.

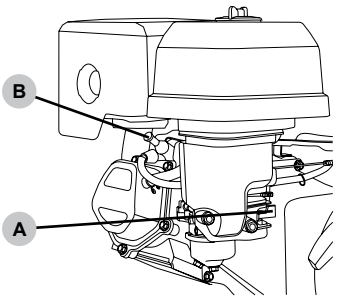


Fig. COMP - 1

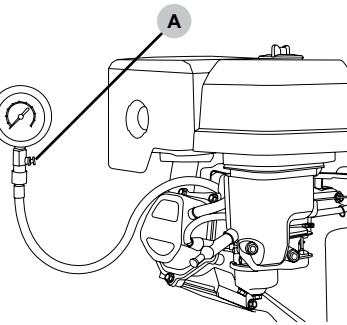


Fig. COMP - 2

9. The pressure measurements you noted in the tests should be greater than 90psi in a new engine to approximately 70psi for an older engine. **If these measurements cannot be achieved, further diagnosis is required including inspection of the decompression yoke, the head gasket, and valve clearances.**
10. Relieve pressure, then unthread the compression gauge hose.
11. Inspect the spark plug for damage or buildup. Clean or replace as needed. Hand thread the spark plug into the engine block. Tighten the plug with a torque wrench to a reading of 15-18 Ft. lb.
12. Reconnect the spark plug lead to the spark plug.

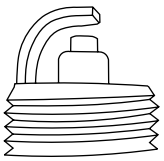
Spark Plug Maintenance

CAUTION:

This procedure should be done with the engine fully cooled down. Rubber gloves should be worn while dealing with soiled parts.

Spark plug inspection:

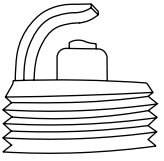
With the engine fully cool, use a spark plug socket or spark plug wrench to remove the spark plug. Inspect the spark plug electrodes for damage or buildup that could be an indication of the overall condition of the engine. Use the graphics and descriptions below to see what the spark plug indicates.



Normal

Visible condition: A light brown to tan coloring. No to very little wear to the electrodes. The insulator glaze is still glossy

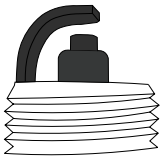
What it may indicate: The engine is running correctly. The spark plug has the correct temperature range for the engine.



Worn

Visible condition: Same coloring as a normal spark plug, but the electrodes are rounded and worn with light deposits.

What it may indicate: The plug is ready to be changed. Hard starting is a good indication of a worn spark plug. The plug needs to be replaced with the correct style and heat range.



Carbon Fouled

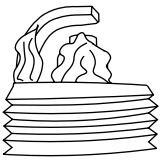
Visible condition: The electrodes and insulator are covered with soot. The plug may have a strong odor of gasoline.

What it may indicate: The air filter is plugged. The carburetor is adjusted to a rich mixture. The engine is ran with the choke on for an excessively long period of time. The ignition coil is putting out a weak spark.

Oil Fouled

Visible condition: The electrodes and insulator are coated in oil. The plug may have a strong odor of oil also.

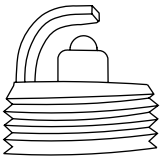
What it may indicate: The valve guides or piston rings are worn allowing excessive amounts of oil into the combustion chamber. The head gasket may be cracked. Typically very hard starting is noted with white to light blue exhaust. The engine needs oil at more frequent intervals than noted in the past.



Ash Fouled

Visible condition: The electrodes and insulator are encrusted with deposits, typically tan in color.

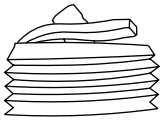
What it may indicate: The engine was ran without the air filter in place. Improper octane fuel is used. Fuel additives are used. The valve guides are worn allowing light amount of oil into the combustion chamber. Thick deposits will cause hard starting.



Overheated

Visible condition: The electrodes and insulator have no deposits. The insulator looks blistered. The electrode has wear.

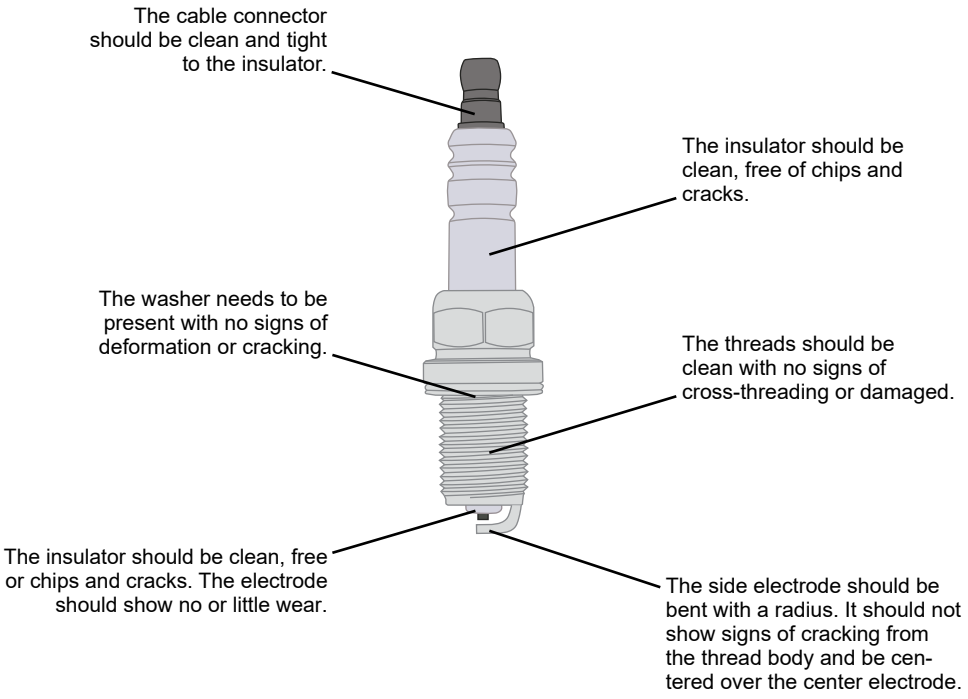
What it may indicate: The fuel/air mixture is too lean. Valves may be sticking. The plug has an improper heat range. The engine does not receive proper air flow for cooling.



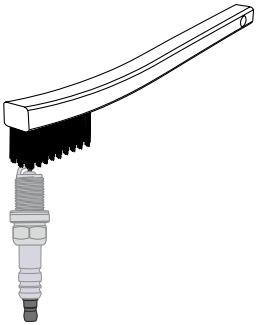
Mechanical Damage

Visible condition: The electrodes and insulator are crushed.

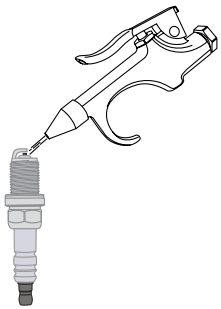
What it may indicate: An incorrect spark plug was used causing it to come into contact with the piston. A foreign object is in the combustion chamber. The head should be removed to inspect the piston for damage and any foreign objects inside the chamber.



Spark plug cleaning:



If wear to the spark plug is minimal, you can continue to use the plug. It is recommended to clean the electrodes with a soft wire brush to remove any surface contaminants.



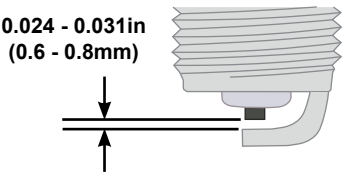
Once cleaning is completed, blow out the well of the plug with light air pressure (<20 psi) to remove the freed debris.

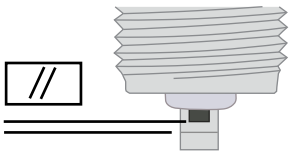
Setting the spark plug gap:

A proper set spark plug gap is essential for the health of the engine. An improperly gapped plug can cause rough idling, knocking, spark plug damage, poor gas economy and increased emissions.

Use of a common spark plug gauge or feeler gauges of the proper thickness will quickly give a measurement of the gap. All CRX single-cylinder engines have a spark plug gap of 0.024 - 0.031 inches.

Should the gap distance need to be adjusted, make sure to bend the side electrode without causing stress or damage to the center electrode and insulator. Also make sure the electrode faces are parallel to one another. A side electrode that is not parallel to the center electrode can cause wear by focusing the spark to one area of the electrodes.





Spark plug installation:

1. Hand thread the spark plug into the engine head making sure not to cross-thread it.

2. Using a spark plug socket and a torque wrench, torque the plug to 15-18 Ft. lb.

3. Connect the ignition lead by pushing it fully down onto the spark plug. A loose cable can cause hard to no starting and a very rough running engine.

Ignition System Troubleshooting

⚠ CAUTION:

Only perform the following steps when the engine is completely cooled down. The ignition system can produce a painful, but non-lethal shock. Do not hold onto the spark plug lead while pulling the starter recoil handle.

Verify oil level:

For engines that will not start, first verify if the oil level is within the required range. If the engine is equipped with a “low oil shutdown” system, the engine will not start if the oil level is not sufficient. Verify the oil level while the engine is on a level surface.

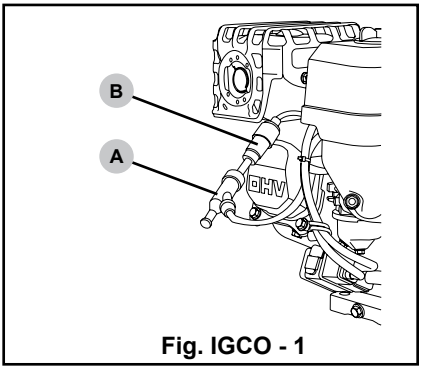


Fig. IGCO - 1

Verify the engine ignition has spark:

1. Disconnect the spark plug lead (Fig. IGCO - 1A) from the spark plug. Connect an in-line spark tester (Fig. IGCO - 1B) to the spark plug. Connect the engine spark plug lead to the other end of the spark plug tester.
2. With the kill switch in the “ON” position, gently pulled the recoil handle until resistance is felt, then tug the handle rapidly. You should see multiple bright flashes from the spark plug tester. If you did not see any indication of spark, proceed to test the kill switch.

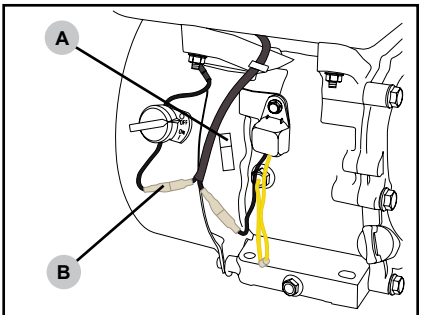


Fig. IGCO - 2

Testing the kill switch:

1. Release the wiring on the side of the engine from the wiring retainer (Fig. IGCO - 2A). Disconnect the kill switch lead (Fig. IGCO - 2B) from the harness connector.
2. Using a multimeter set to OHM, connect one lead to the kill switch wire (Fig. IGCO - 3A) while touching the other lead to the engine block (Fig. IGCO - 3B).
3. With the switch in the OFF position, you should see a very low resistance (< 2 ohms).
4. Rotate the switch to ON, you should now see an infinite amount of resistance.
5. If the switch passed the proceeding tests, you should now test the oil level switch. If the kill switch test failed, it will need to be replaced as outline in ‘Replacing the kill switch’.

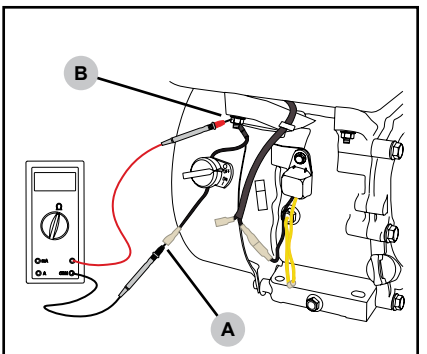


Fig. IGCO - 3

Testing the oil level switch:

1. Disconnect the oil level switch lead connector (Fig. IGCO - 4A) from the yellow lead going to the oil level sensor.
2. Using a multimeter set to OHM, connect one lead to the yellow oil level switch wire (Fig. IGCO - 4B) while touching the other lead to the engine block (Fig. IGCO - 4C).
3. With the engine oil at the required level you should see an infinite amount of resistance.
4. Drain the engine oil into an approved container; dispose of properly.
5. With the engine oil removed, you should see a very low resistance (< 2 ohms).
6. If the switch passed the proceeding tests, you should now test the oil level sensor. If the oil level switch test failed, it will need to be replaced as outline in 'Replacing the oil level switch'.

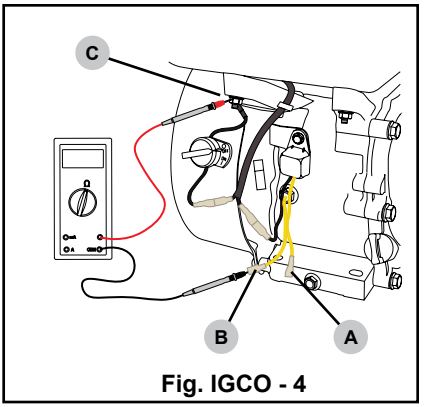


Fig. IGCO - 4

Testing the oil level sensor:

Note: On electric start engines that contain the integrated key switch box, the oil level sensor is located within the switch box. Testing is performed in the same way as indicated below.

Should the oil level sensor be found at fault, the key switch box subassembly must be replaced.

1. Disconnect the oil level sensor lead connector (Fig. IGCO - 5A) from the black lead going to the ignition coil harness.
2. Using a multimeter set to DIODE, connect the BLACK lead to the black oil level sensor wire (Fig. IGCO - 5B) while touching the RED lead to yellow oil level sensor wire (Fig. IGCO - 5C). You should see an indication of no current passing; typically displayed as 'OL'.
3. Again using the multimeter set to DIODE, connect the RED lead to the black oil level sensor wire (Fig. IGCO - 6A) while touching the BLACK lead to yellow oil level sensor wire (Fig. IGCO - 6B). You should see a voltage drop of approximately 0.948 volts.
4. If the sensor failed the proceeding tests, replace the unit. If the unit passed, the key switch (if equipped) or ignition coil could be faulty. See 'Key ignition switch box troubleshooting' and 'Ignition coil testing, adjustment and replacement'.

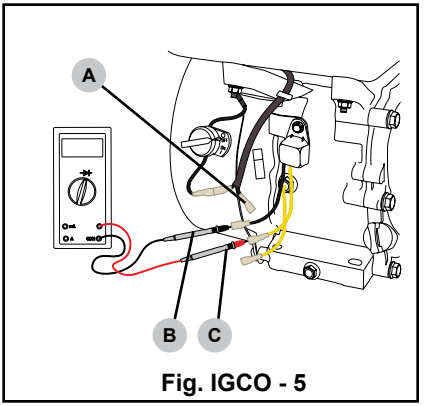


Fig. IGCO - 5

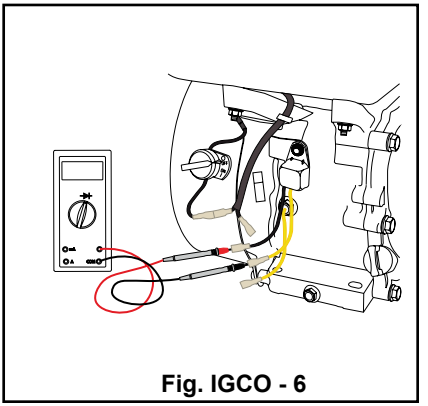


Fig. IGCO - 6

Replacing the Oil Level Switch

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

CAUTION:

This procedure should be done with the engine fully cooled down. Rubber gloves should be worn while dealing with oil soaked parts. Special caution should be taken when rotating or removing geared parts so as not to cause crushing injuries.

Oil level switch removal steps:

1. Disconnect the spark plug lead from the spark plug (Fig. OLSW - 1A).
2. Place an appropriate container under the oil drain bolt. Remove the bolt using an socket and ratchet. Allow the oil within the crankcase to drain into the container. Dispose of the oil properly.
3. Using a socket and ratchet, remove the six (Fig. OLSW - 2A) or seven (Fig. OLSW - 2B) bolts retaining the rear cover. Carefully free the cover then pull it backward off of the PTO shaft.
4. In the **CRX275 or lower**, you will need to first remove the cam gear (Fig. OLSW - 3A) so as to have full access to the oil level switch (Fig. OLSW - 3B). In order to do this, you must rotate the PTO (Fig. OLSW - 4) so the timing marks align (Fig. OLSW - 5).

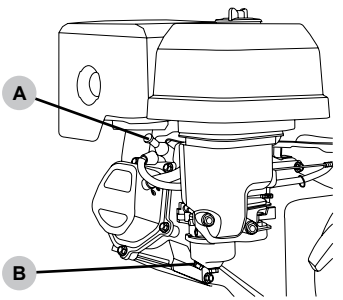


Fig. OLSW - 1

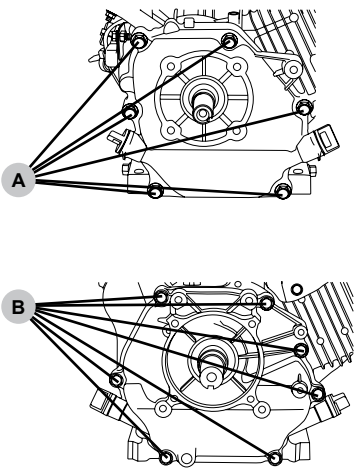


Fig. OLSW - 2

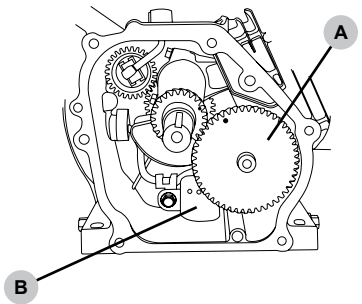


Fig. OLSW - 3

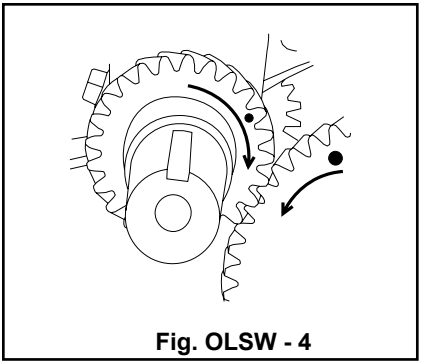


Fig. OLSW - 4

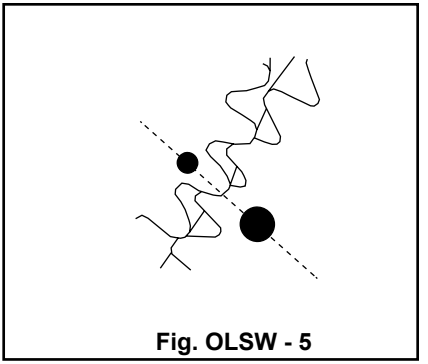


Fig. OLSW - 5

5. **CRX340 to CRX530 models**, you will need to first remove the balance weight shaft (Fig. OLSW - 6A) so as to have full access to the oil level switch cable grommet. In order to do this, use a grease marker (Fig. OLSW - 6B) to show its alignment to the PTO gear. During assembly, the balance gear must be installed in proper timing or the oil dipper may strike the balance weight shaft during startup causing damage.

6. Disconnect the oil level switch lead connector (Fig. OLSW - 7A) from the oil level sensor.

7. While holding the oil level switch cable grommet with your right hand, use an open ended wrench to loosen the grommet locknut (Fig. OLSW - 7B). Fully remove the nut.

8. Using a socket and ratchet, loosen then remove the two bolts (Fig. OLSW - 8A) securing the oil level switch (Fig. OLSW - 8B). Discard of the old oil level switch properly.

9. Place the new oil level switch (Fig. OLSW - 9A) into the oil sump. Secure it with the two flange head cap screws (Fig. OLSW - 9B); torque to 10-12 Ft. lb.

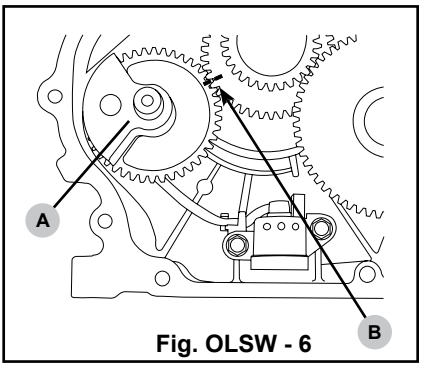


Fig. OLSW - 6

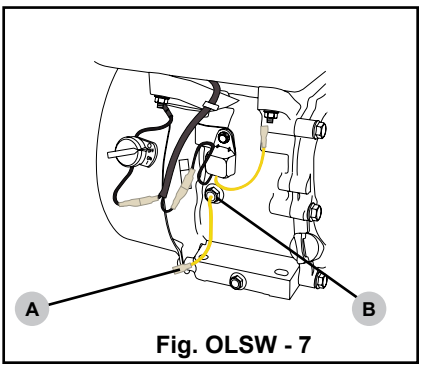


Fig. OLSW - 7

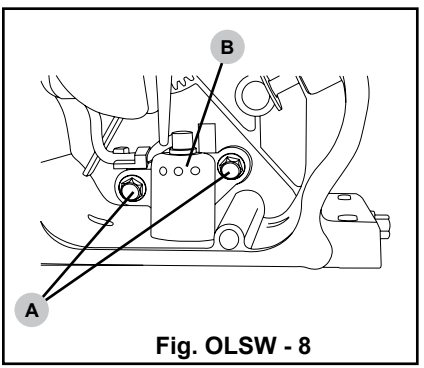


Fig. OLSW - 8

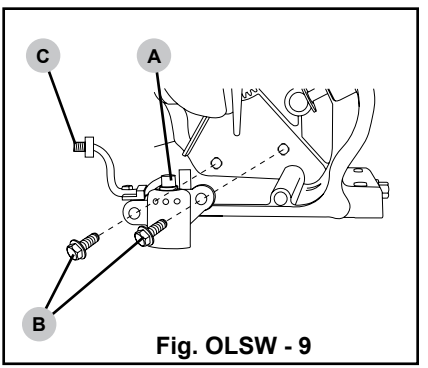


Fig. OLSW - 9

10. Insert the threaded stud of the rubber grommet (Fig. OLSW - 9C) through the wall of the casting. From the outside, thread on the locking nut (Fig. OLSW - 10A), tighten.

11. Using a multimeter set to OHM, connect one lead to the yellow oil level switch wire (Fig. OLSW-10B) while touching the other lead to the engine block (Fig. OLSW-10C) you should see a very low resistance (< 2 ohms).

12. In the **CRX275 or lower**, insert the cam gear (Fig. OLSW-11A) into the crankcase making sure to align the timing mark to the mark on the crank gear (Fig. OLSW-11B). Note, you may need to insert the push rods for the cams to go in easily.

13. **CRX340 to CRX530 models**, insert the balance weight shaft (Fig. OLSW-12A) into the crankcase making sure to align the grease mark to the crank gear (Fig. OLSW-12B).

14. Remove the old crankcase housing gasket; discard. Place a new gasket onto the housing surface (Fig. OLSW-11C), (Fig. OLSW-12C).

15. Carefully slide the crankcase cover over the PTO shaft. Align the cover with the dowel pins and evenly press it to the crankcase housing.

16. Hand thread the six or seven flange head cap screws. With a socket and torque wrench, following the tightening patterns in (Fig. OLSW-13) or (Fig. OLSW-14). Torque to 13-16 Ft. lb. (**CRX275 or smaller**), 16-18 Ft. lb.(**CRX340 to CRX530 models**).

17. Fill the crankcase with oil until the top line is met on the dipstick. Inspect the seals for leaks.

18. As in step #11, using a multimeter set to OHM, connect one lead to the yellow oil level switch wire while touching the other lead to the engine block. You should see infinite resistance (OL). Connect the oil level switch lead to the oil level sensor lead.

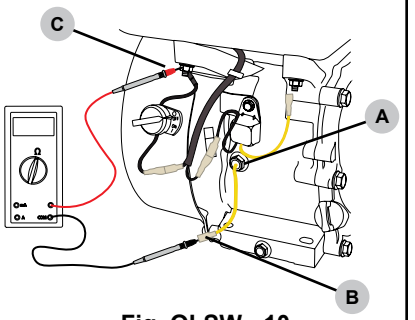


Fig. OLSW - 10

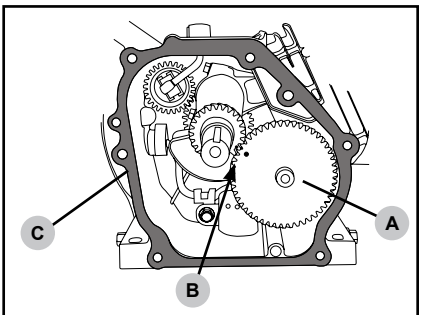


Fig. OLSW - 11

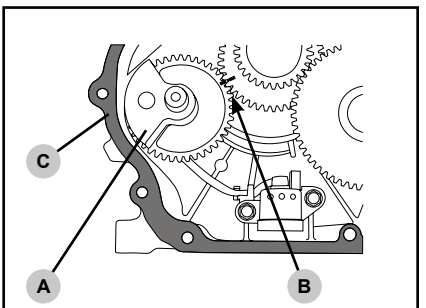


Fig. OLSW - 12

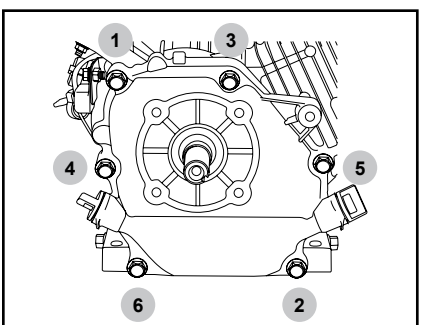


Fig. OLSW - 13

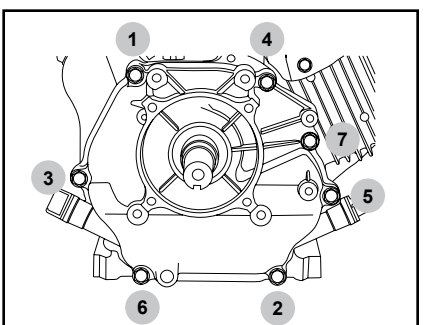


Fig. OLSW - 14

Replacing the Kill Switch

1. Disconnect the kill switch lead (Fig. KLSW - 1C) from the harness connector.
2. Using a socket and ratchet, loosen the two bolts (Fig. KLSW - 1A & 1D) holding the blower housing. Fully remove the upper bolt (Fig. KLSW - 1A)
3. Gently pull the blower housing forward enough to allow the wire eyelet (Fig. KLSW - 1B) to be removed.
4. Using a thin, flat bladed screwdriver, gently pry the kill switch (Fig. KLSW - 2A) out of the blower housing.
5. Press the new kill switch into the blower housing until you hear a solid “click”.
6. Gently pull the blower housing forward enough to allow the wire eyelet (Fig. KLSW - 3A) to be slid between it and the engine casting.
7. Thread in the bolt (Fig. KLSW - 3B) making sure it passes through the wire eyelet.
8. Using a socket and ratchet, tighten the two bolts (Fig. KLSW - 3B & 3D).
9. Connect the kill switch lead (Fig. KLSW - 3C) to the harness connector.

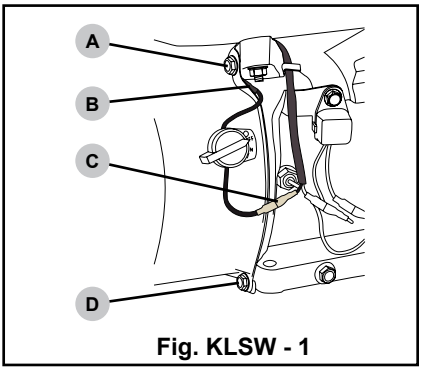


Fig. KLSW - 1

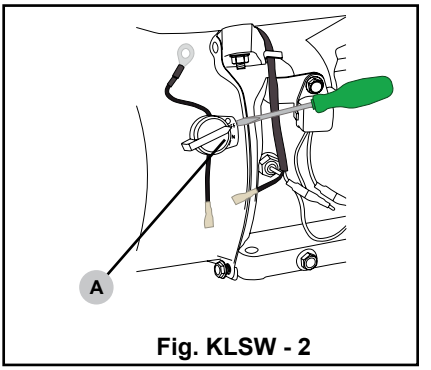


Fig. KLSW - 2

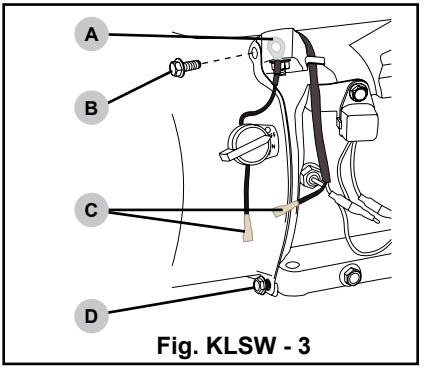


Fig. KLSW - 3

Blower Housing Removal and Installation

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

Blower housing removal steps:

1. (Electric start engines, only) Disconnect the negative (BLACK) cable from the battery.
2. Disconnect the spark plug lead from the spark plug (Fig. HOUS - 1A).
3. Place an appropriate container under the carburetor drain bolt (Fig. HOUS - 1B). Remove the bolt using a open end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly.
4. Loosen the air cleaner cover wingnut (Fig. HOUS - 1C). Remove the air cleaner cover.
5. Loosen the wingnut securing the filter elements (Fig. HOUS - 2A). Remove the air filter elements (Fig. HOUS - 2B).
6. Remove the air cleaner base (Fig. HOUS - 2C).
7. Remove the vacuum hose (Fig. HOUS - 3A) from the air cleaner elbow (Fig. HOUS - 3C). Remove the air cleaner elbow cover (Fig. HOUS - 3B).

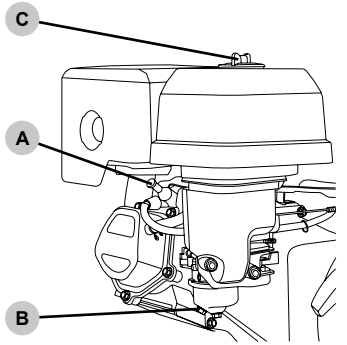


Fig. HOUS - 1

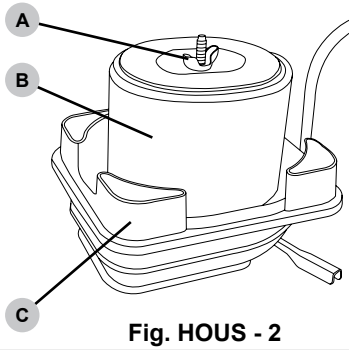


Fig. HOUS - 2

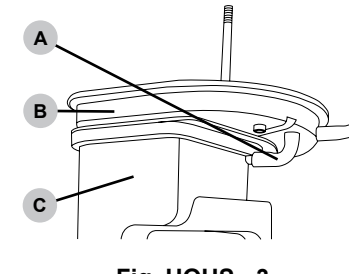


Fig. HOUS - 3

8. Using pliers, depress the hose clamp (Fig. HOUS - 4B) on the breather tube (Fig. HOUS - 4C). Remove the breather tube from the valve cover (Fig. HOUS - 4A). Note, on some units, the breather hose is inserted into the valve cover and does not have a hose clamp.

9. Using a nut driver, loosen then remove the two nuts (Fig. HOUS - 4D).

10. Using a nut driver, loosen then remove the bolt (Fig. HOUS - 4E).

11. Remove the air cleaner elbow (Fig. HOUS - 4F).

12. On some units, you will need to remove the throttle mount in order to disconnect the throttle linkage. Using a socket and ratchet, loosen then remove the two bolts securing the plate (Fig. HOUS - 5A).

13. To remove the throttle linkage (Fig. HOUS - 6A) from the throttle mount, rotate the freed mount as indicated so the throttle mount can slide out of the linkage loop.

14. **CRX340 to CRX530 models only** - Using pliers, depress the hose clamp (Fig. HOUS - 7A) on the fuel line (Fig. HOUS - 7B). Remove the fuel line from the fuel valve (Fig. HOUS - 7C).

15. Using needle-nosed pliers, remove the throttle return spring (Fig. HOUS - 7D) from the throttle cam (Fig. HOUS - 7E).

16. Rotate the throttle cam until the governor rod (Fig. HOUS - 7F) can be lifted free. Swing the rod out from under the throttle lever. This will allow the blower housing to be pulled forward once unbolted.

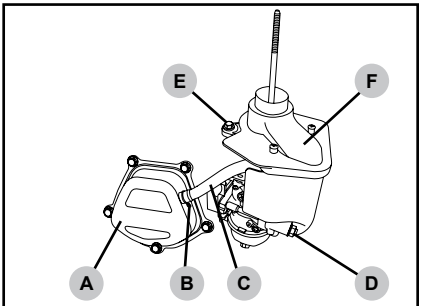


Fig. HOUS - 4

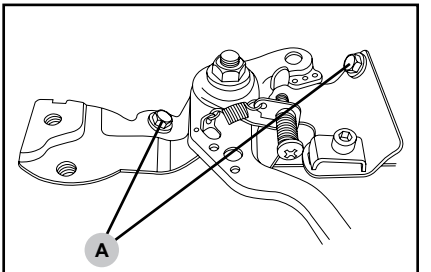


Fig. HOUS - 5

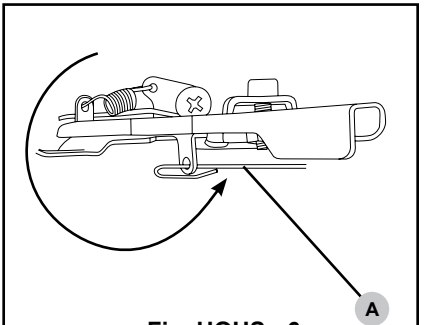


Fig. HOUS - 6

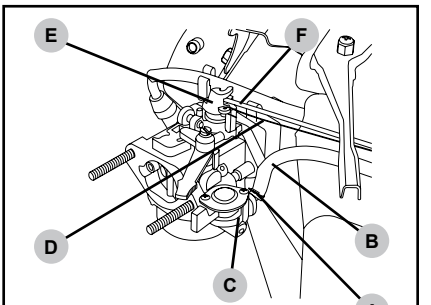


Fig. HOUS - 7

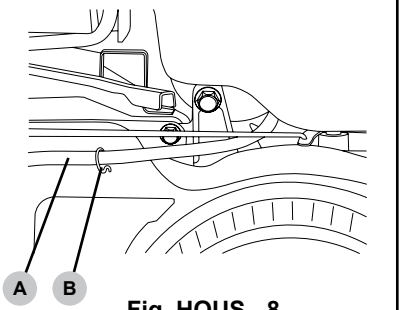


Fig. HOUS - 8

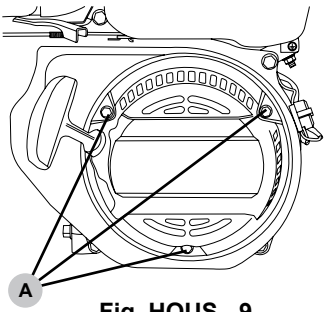


Fig. HOUS - 9

17. **CRX340 to CRX530 models only** - Slide the free end of the fuel hose (Fig. HOUS - 8A) out of the hose retaining ring (Fig. HOUS - 8B).

18. Using a socket and ratchet, remove the three bolts (Fig. HOUS - 9A) holding the recoil starter mechanism. Pull the mechanism forward to remove it from the starter cup.

19. Free the wiring from the retaining clip (Fig. HOUS - 10A). Disconnect the kill switch wire (black) from the harness (Fig. HOUS - 10B).

20. Using a ratchet and socket, loosen then remove the four (Fig. HOUS - 11A) or five (Fig. HOUS - 11B) bolts securing the blower housing. Pull the housing forward to remove it.

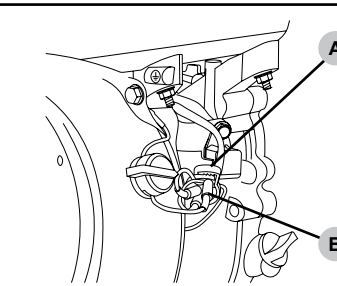


Fig. HOUS - 10

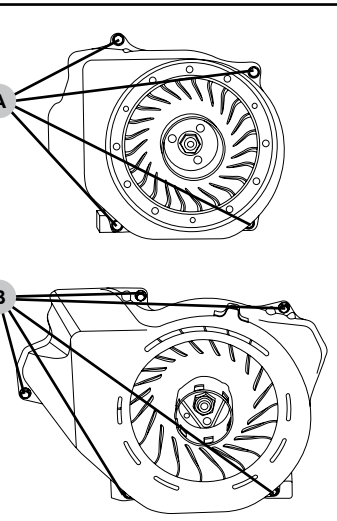


Fig. HOUS - 11

Blower installation steps:

1. Slide the blower housing onto the engine block making sure to avoid striking the fan.

2. Slide the kill switch wire eyelet (Fig. HOUS - 12A) between the blower housing and the engine block casting (were applicable).

3. Thread in the mounting bolts (Fig. HOUS - 11A or B). Torque the mounting bolts to 7-9 Ft. lb.

4. Connect the kill switch lead (Fig. HOUS - 12B) to the harness connector.

5. **CRX340 to CRX530 models only** - Slide the free end of the fuel hose (Fig. HOUS - 13A) through the hose retaining ring (Fig. HOUS - 13B).

6. **CRX165 to CRX275 models only.** Place the throttle mount (Fig. HOUS - 14A) onto the throttle linkage loop (Fig. HOUS - 14B). Rotate the throttle mount as indicated.

7. **CRX165 to CRX275 models only.** Place the throttle mount (Fig. HOUS - 15A) onto the engine block. Thread in the two mounting bolts (Fig. HOUS - 15B); torque to 7-9 Ft. lb.

8. Rotate (if needed) the throttle cam (Fig. HOUS - 16A) so the governor rod (Fig. HOUS - 16B) can be dropped down into the throttle cam

9. Using needle-nosed pliers, place the throttle return spring (Fig. HOUS - 16C) into the throttle cam (Fig. HOUS - 16A).

10. **CRX340 to CRX530 models only.** Using pliers to depress the fuel line hose clamp (Fig. HOUS - 17A), slip the fuel line onto the carburetor fuel line barb (Fig. HOUS - 17B).

11. Slide the air filter elbow (Fig. HOUS - 18A) onto the mounting bolts. Thread on the (2) nuts (Fig. HOUS - 18B) then thread in the bolt (Fig. HOUS - 18C). Torque to 7-9 Ft. lb.

12. Using pliers, depress the hose clamp (if equipped) (Fig. HOUS - 18D) on the breather tube (Fig. HOUS - 18E). Slip the breather tube onto the valve cover breather (Fig. HOUS - 18F).

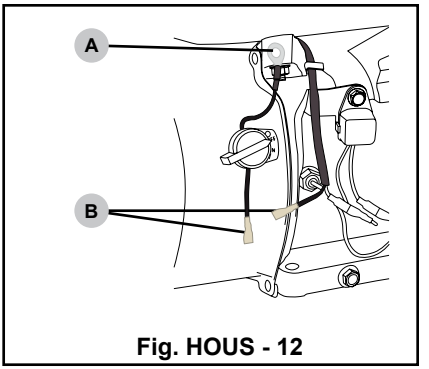


Fig. HOUS - 12

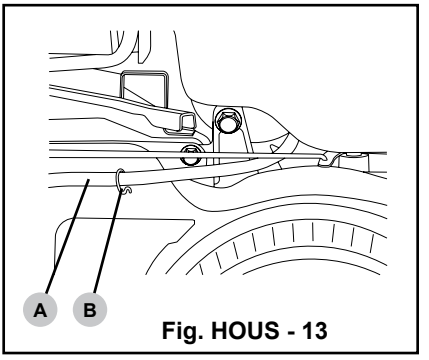


Fig. HOUS - 13

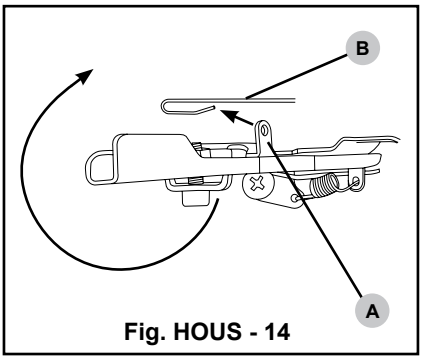


Fig. HOUS - 14

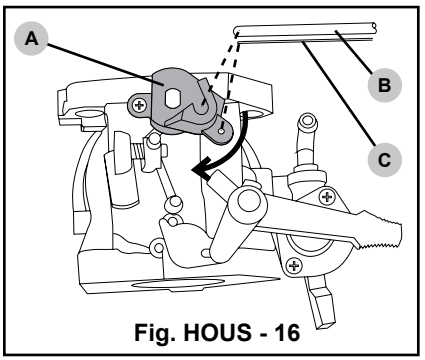


Fig. HOUS - 16

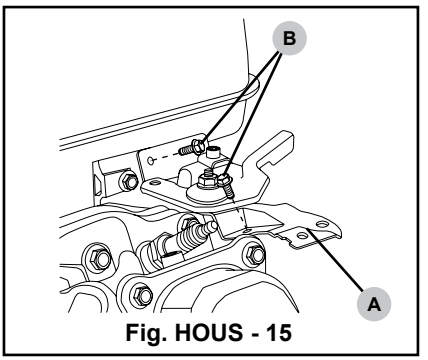


Fig. HOUS - 15

13. Place the air cleaner elbow cover (Fig. HOUS - 19A) onto the air cleaner elbow (Fig. HOUS - 19B). Connect the vacuum hose (Fig. HOUS - 19C) to the air cleaner elbow.

14. Place the air filter cover base (Fig. HOUS - 20A) onto the air filter elbow cover. Seat a new, clean air filter element (Fig. HOUS - 20B). Thread on the air filter element wingnut (Fig. HOUS - 20C).

15. Seat the air filter cover (Fig. HOUS - 21A), then tighten the air filter cover wingnut (Fig. HOUS - 21B).

16. Push the recoil mechanism (Fig. HOUS - 22A) forward onto the starter cup. Thread in the three retaining bolts (Fig. HOUS - 22B). Torque to 7-9 Ft. lb.

17. Reconnect the spark plug lead to the spark plug (Fig. HOUS - 21C).

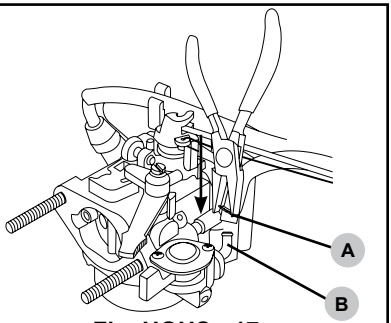


Fig. HOUS - 17

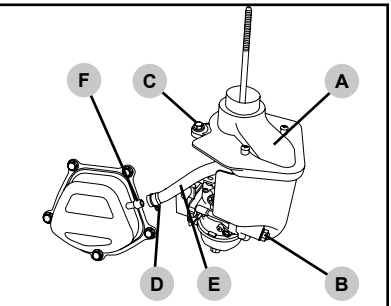


Fig. HOUS - 18

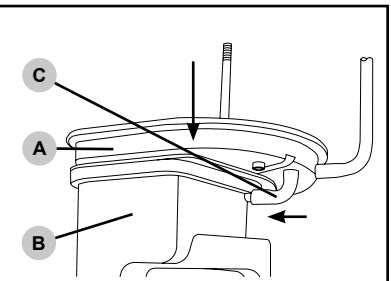


Fig. HOUS - 19

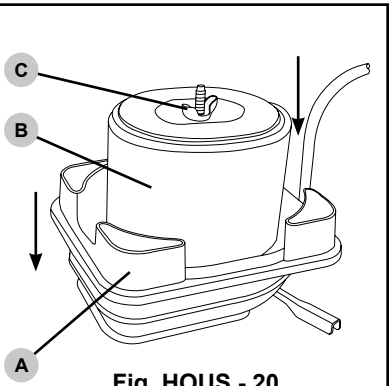


Fig. HOUS - 20

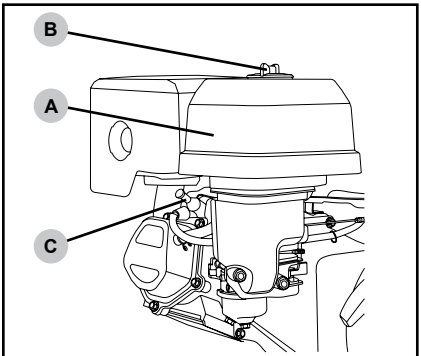


Fig. HOUS - 21

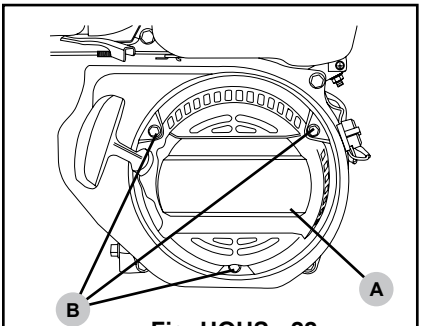


Fig. HOUS - 22

Ignition Coil testing, Adjustment and Replacement

⚠ CAUTION:

Only perform the following steps when the engine is completely cooled down. The ignition system can produce a painful, but non-lethal shock. Do not hold onto the spark plug lead while pulling the starter recoil handle.

Before troubleshooting the ignition coil, make sure to following all steps in the section 'Troubleshooting the Ignition System'.

Testing the ignition coil resistances:

1. Disconnect the spark plug lead (Fig. COIL - 1A) from the spark plug.
2. Release the wiring on the side of the engine from the wiring retainer (Fig. COIL - 2A). Disconnect the kill switch lead (Fig. COIL - 2B) and the oil level sensor lead (Fig. COIL - 2C) from their respective harness connector.
3. Using a multimeter set to OHM, touch one lead (Fig. COIL - 3A) to the engine casting while touching the other lead to the ignition coil harness (Fig. COIL - 3B). You should read a measurement of approximately 1 ohm.
4.

If either measurement in steps 3 or 4 are widely different than noted, the ignition coil needs to be replaced.

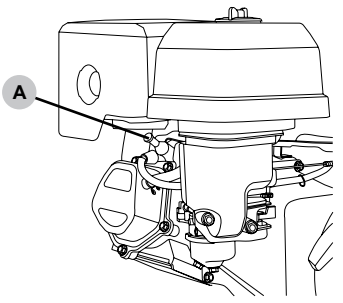


Fig. COIL - 1

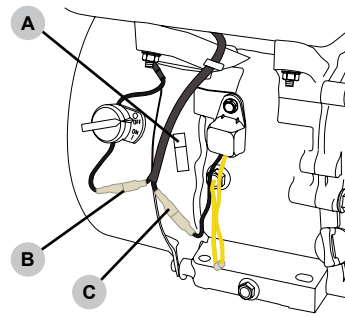


Fig. COIL - 2

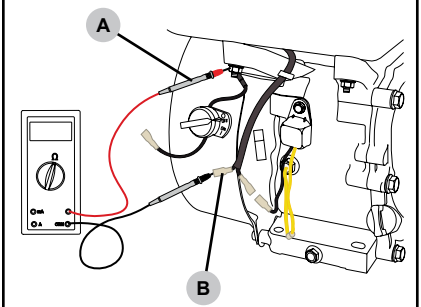


Fig. COIL - 3

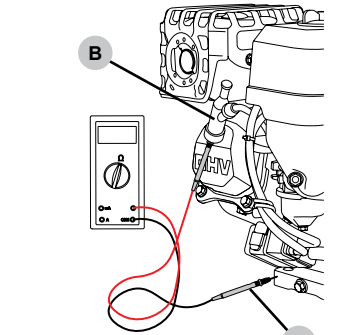


Fig. COIL - 4

Verify ignition coil to flywheel gap:

1. Follow the instructions in 'Removing the blower housing' to gain access to the ignition coil.
2. If needed, hand spin the flywheel (Fig. COIL - 5A) so the magnet is away from the coil. Using flexible feeler gauges, make sure the ignition coil (Fig. COIL - 5B) is spaced 0.2-0.6mm (0.01-0.02in) from the flywheel. Both core pieces must be spaced equally. Should the gap be outside of the tolerance, adjust the gap as indicated below.

Note: If the gap was too small, <0.2mm (0.01in), inspect BOTH the coil and flywheel for damage. If the ignition coil core and/or the magnet on the flywheel show damage, they must be replaced.

3. Using a socket and ratchet, loosen the two mounting bolts (Fig. COIL - 6A). Slide a 0.4mm flexible feeler gauge (Fig. COIL - 6B) between the ignition coil and flywheel (Fig. COIL - 6C).
4. Press down on the ignition coil so both core pieces are at an equal distance from the flywheel. Tighten the mounting bolts to 6-9 Ft lb. Remove the feeler gauge.

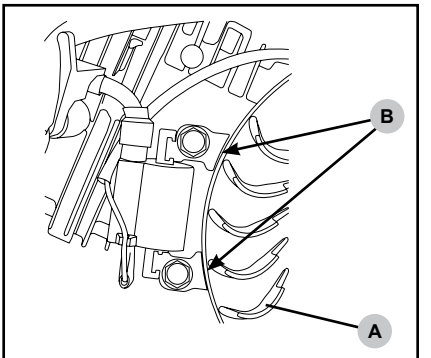


Fig. COIL - 5

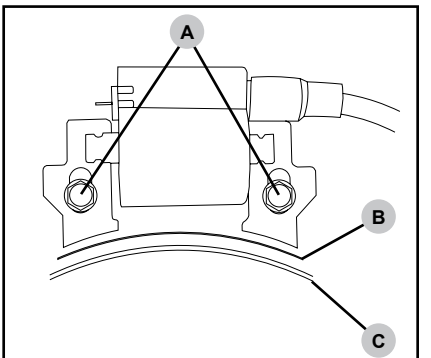


Fig. COIL - 6

Replacing the ignition coil:

1. Follow the instructions in 'Removing the blower housing' to gain access to the ignition coil.
2. If needed, hand spin the flywheel (Fig. COIL - 7A) so the magnet is away from the coil.
3. Disconnect the shorting lead (Fig. COIL - 7B) from the ignition coil. Gently pull the wire out of the retaining ears on the ignition coil body.
4. Remove the spark plug lead (Fig. COIL - 7C) from the carburetor insulator (Fig. COIL - 7D).
5. Using a socket and ratchet, loosen then remove the two mounting bolts (Fig. COIL - 7E) from the ignition coil. Carefully pull the ignition coil away from the engine while threading the spark plug lead out from under the fuel line (Fig. COIL - 7F).
6. Place the new ignition coil against the standoffs then hand thread in the mounting bolts. Do not tighten.
7. Route the spark plug lead under the fuel line then through the mounting ears on the carburetor insulator.
8. Connect the shorting lead to the terminal on the ignition coil. Snap the wire into the retaining ears on the ignition coil body.
9. Follow instructions 3 & 4 under 'Verify ignition coil to flywheel gap' to properly adjust the coil mounting.

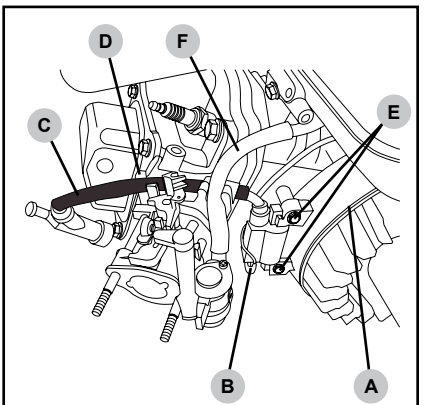
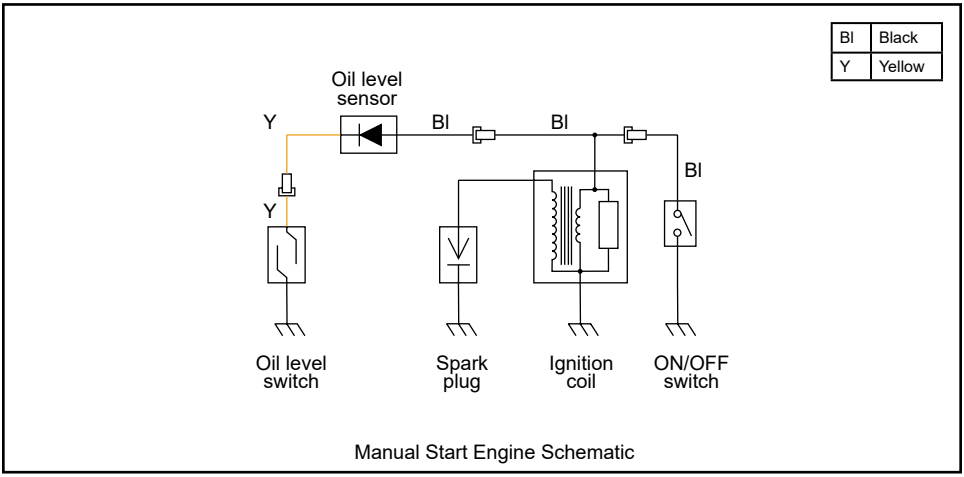


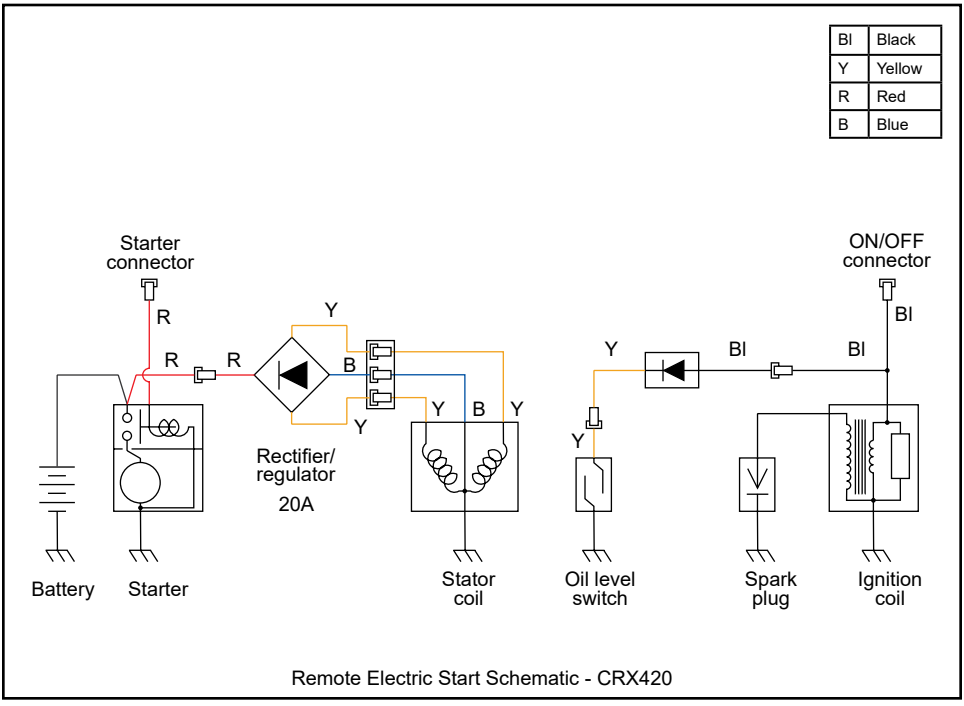
Fig. COIL - 7

10. Reassemble the blower housing then reconnect the kill switch lead and oil level sensor lead (if disconnected).
11. Connect the spark plug lead to the spark plug.

Electrical schematics



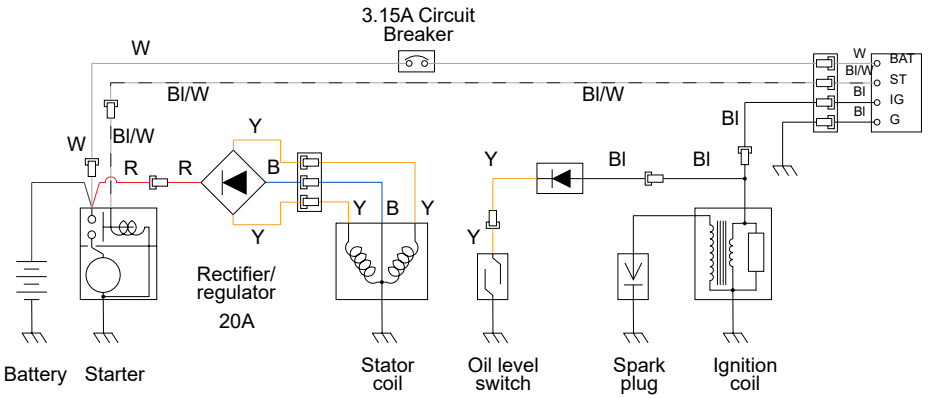
Manual Start Engine Schematic



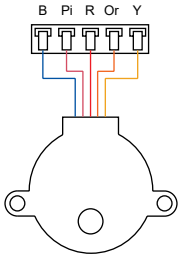
Remote Electric Start Schematic - CRX420

	BAT	ST	IG	G
OFF			o—o	
ON				
START	o—o			

Bl	Black
Y	Yellow
R	Red
B	Blue
W	White
Bl/W	Blk/Wht

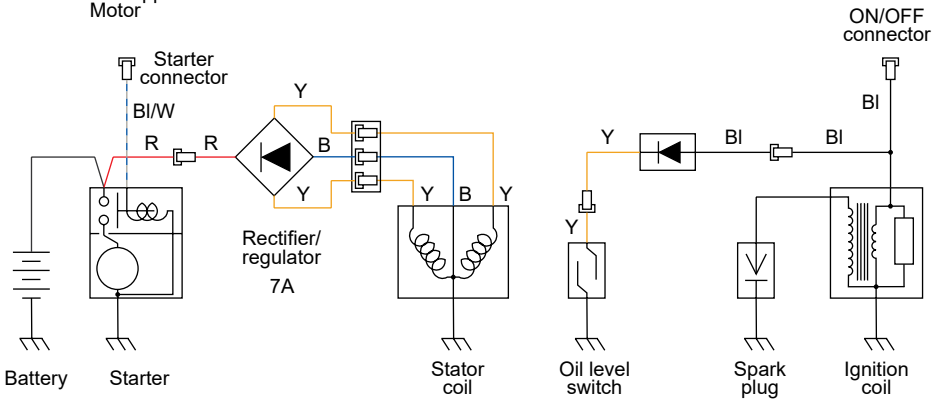


Electric Start Schematic - CRX420, CRX460, CRX530

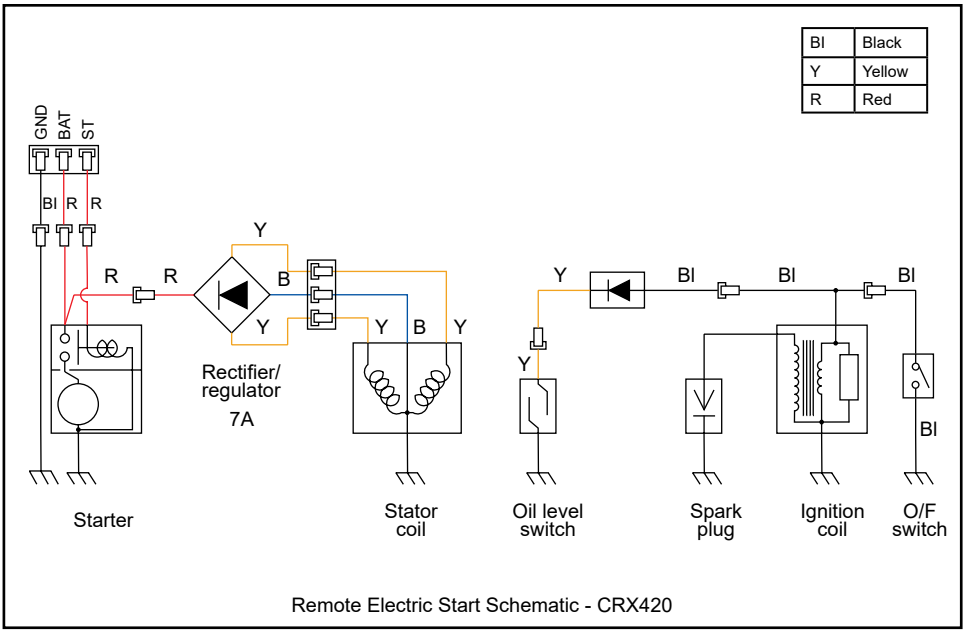


Bl	Black
Y	Yellow
R	Red
B	Blue

Pi	Pink
Or	Orange
Bl/W	Blk/Wht



Remote Electric Start with Electric Choke Schematic - CRX420



Remote Electric Start Schematic - CRX420

Key ignition switch box troubleshooting

The key ignition switch box is shown in figure SHBX - 1. The box contains the ignition key switch (Fig. SHBX - 1A) and the ignition circuit breaker (Fig. SHBX - 1B). Also contained within the box is the oil level sensor (not shown).

SHBX - 2 illustrates the leads that connect to the key ignition switch box. They are as follows:

A). Engine off wire (black); connects to the engine kill wire.

B). Oil level sensor wire (yellow); connects to the low oil level switch.

C). Start lead wire (black with white stripe); connects starter solenoid terminal.

D). Positive lead wire (white); connects to the starter positive battery terminal.

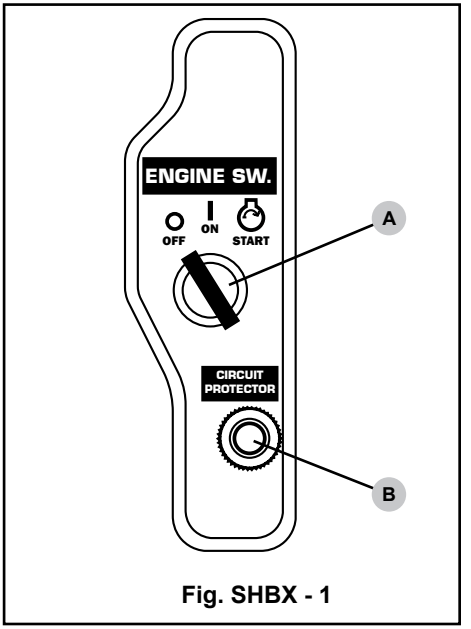


Fig. SHBX - 1

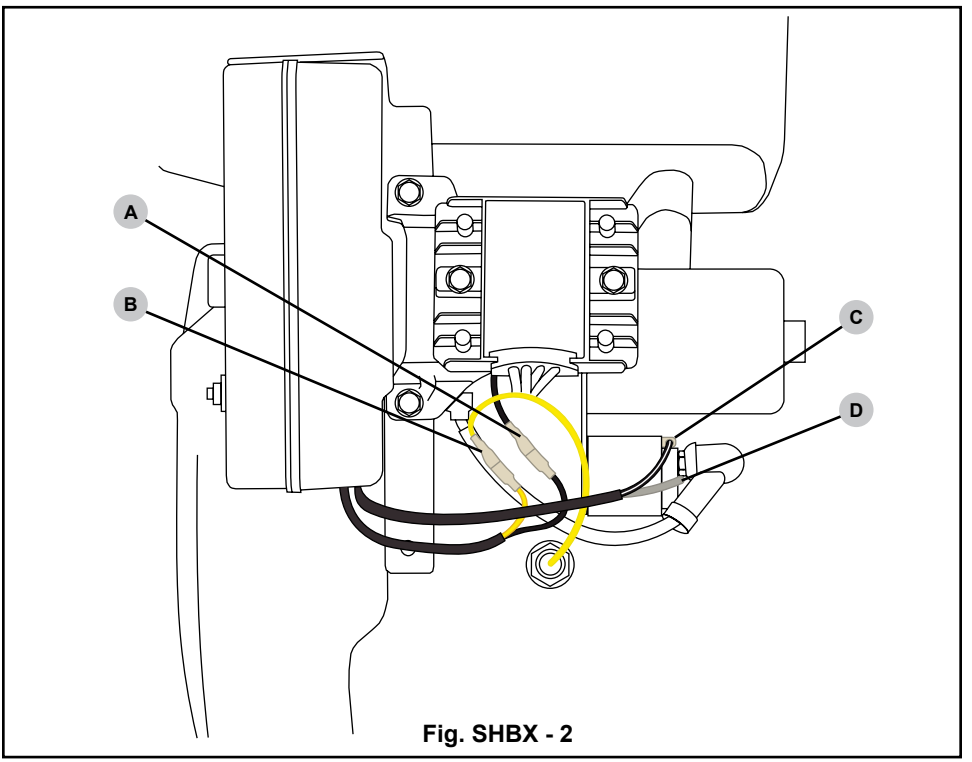


Fig. SHBX - 2

Testing the ignition switch box:

1. Disconnect the negative (BLACK) battery cable from the battery.
2. Disconnect the starter lead wire (Fig. SHBX - 3A), from the stater solenoid terminal (Fig. SHBX - 3B).
3. Using a multimeter set to OHM, connect one probe to the starter lead wire (Fig. SHBX - 3C) and the other probe to the positive battery terminal on the starter (Fig. SHBX - 3D). You should see an infinite amount of resistance
4. Using the same connections in Step #3, turn the key to START. While holding the key in the START position, you should see a very low resistance (< 2 ohms).
5. Allow the key to return to the ON position. You should once again see an infinite amount of resistance. Turn the key to OFF and you should continue to measure an infinite amount of resistance.

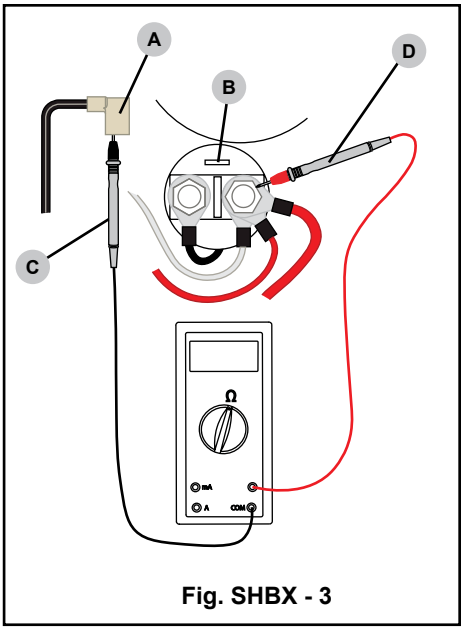


Fig. SHBX - 3

6. Disconnect the engine kill wire (Fig. SHBX - 4A), from the off switch wire (Fig. SHBX - 4B).
7. Using a multimeter set to OHM, connect one probe to the engine kill wire, and other to the off switch wire. With the key switch in the OFF position, you should see a very low resistance (< 2 ohms).
8. Using the same connections in Step #7, turn the key to the ON position. You should see an infinite amount of resistance. Turn the key to START and you should continue to measure an infinite amount of resistance.

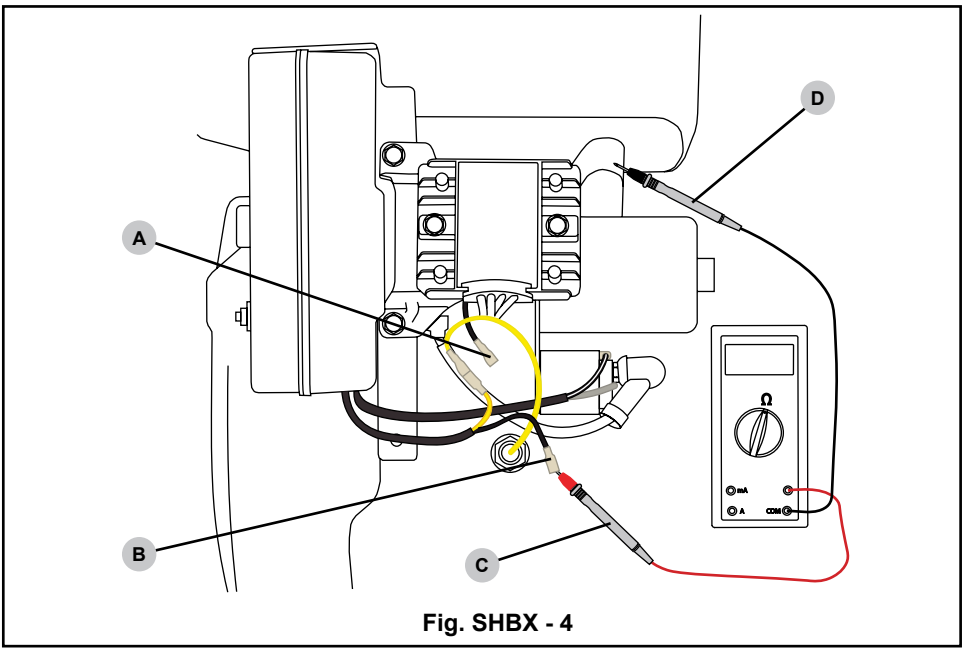


Fig. SHBX - 4

Replacing the key ignition switch box:

1. Disconnect the negative (BLACK) battery cable from the battery.
2. Disconnect the starter lead wire (Fig. SHBX - 5A) from the stater solenoid terminal.
3. Using a nut driver, remove the positive lead wire (Fig. SHBX - 5B) from the positive battery terminal.
4. Disconnect the oil level sensor and the engine off wire connectors (Fig. SHBX - 5C).
5. Using a socket and ratchet, loosen then remove the two bolts (Fig. SHBX - 5D) securing the rectifier and switch box.
6. Allow the rectifier (Fig. SHBX - 5E) to fold forward.
7. Remove the switch box (Fig. SHBX - 5F).
8. Reverse the above order for the new switch box. Torque the mounting bolts (Fig. SHBX - 5D) to 7-9 Ft lb.

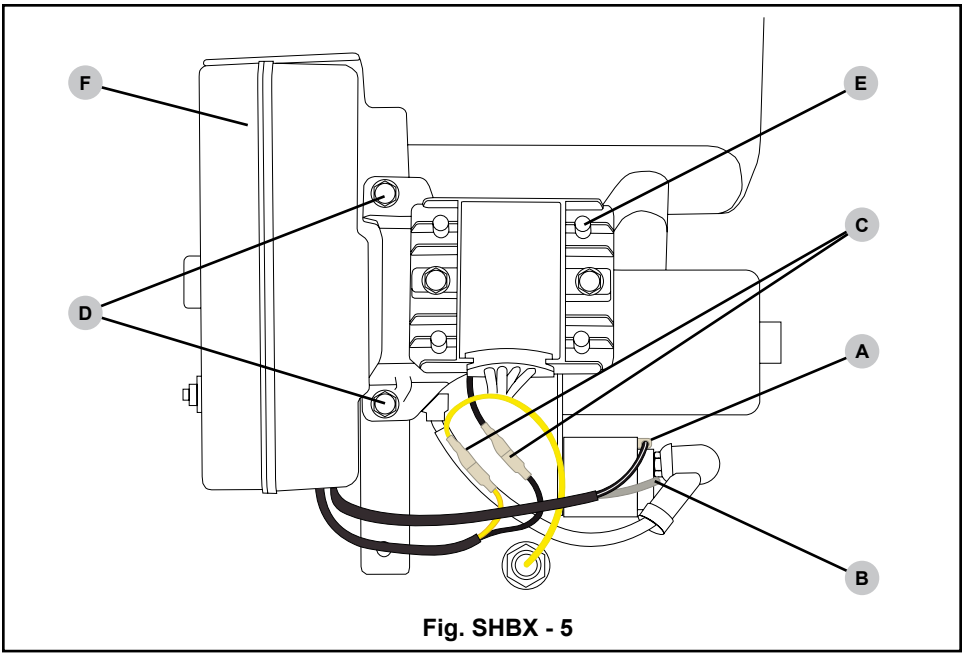


Fig. SHBX - 5

Replacing the Electric Starter Assembly

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

Starter assembly removal steps:

1. Using an appropriate tool, disconnect the BLACK, NEGATIVE lead from the battery.
2. Disconnect the spark plug lead from the spark plug (Fig. STRT - 1A).
3. Place an appropriate container under the carburetor drain bolt (Fig. STRT - 1B). Remove the bolt using a open-end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly. Return the bolt, tighten.
4. Loosen the air cleaner cover wingnut (Fig. STRT - 1C). Remove the air cleaner cover.
5. Loosen the wingnut securing the filter elements (Fig. STRT - 2A). Remove the air filter elements (Fig. STRT - 2B).
6. Remove the air cleaner base (Fig. STRT - 2C).
7. Remove the vacuum hose (Fig. STRT - 3A) from the air cleaner elbow (Fig. STRT - 3C). Remove the air cleaner elbow cover (Fig. STRT - 3B).

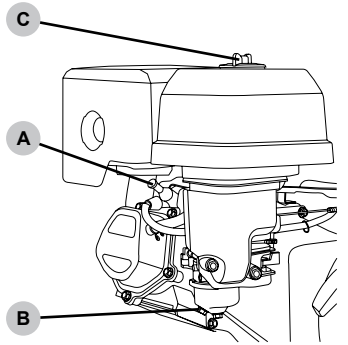


Fig. STRT - 1

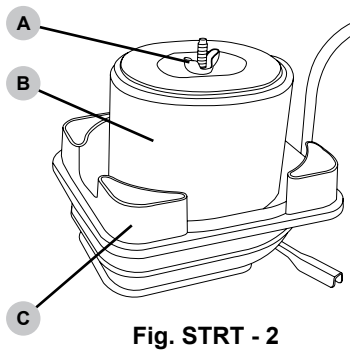


Fig. STRT - 2

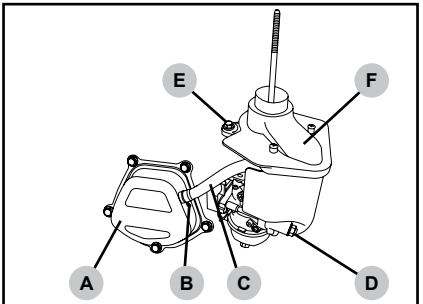


Fig. STRT - 4

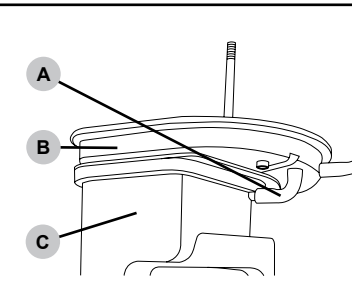


Fig. STRT - 3

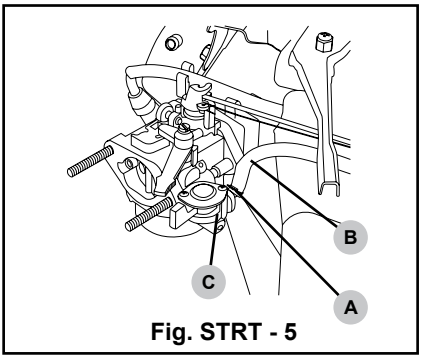


Fig. STRT - 5

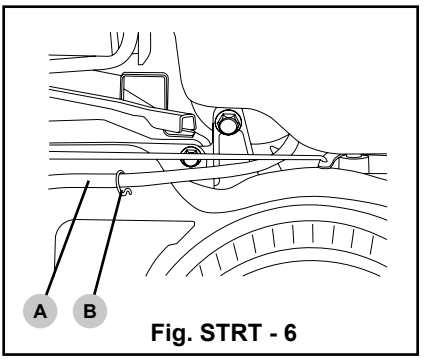


Fig. STRT - 6

8. Using pliers, depress the hose clamp (Fig. STRT - 4B) on the breather tube (Fig. STRT - 4C). Remove the breather tube from the valve cover (Fig. STRT - 4A).

9. Using a nut driver, loosen then remove the two nuts (Fig. STRT - 4D) on the air cleaner elbow.

10. Using a nut driver, loosen then remove the bolt (Fig. STRT - 4E).

11. Remove the air cleaner elbow (Fig. STRT - 4F).

12. Using pliers, depress the hose clamp (Fig. STRT - 5A) on the fuel line (Fig. STRT - 5B). Remove the fuel line from the fuel valve (Fig. STRT - 5C).

13. Slide the free end of the fuel hose (Fig. STRT - 6A) out of the hose retaining ring (Fig. STRT - 6B).

14. Using an open-end wrench, loosen then remove the nut on the solenoid terminal (Fig. STRT - 7A). Remove the red battery, red rectifier and white switch leads.

15. Using needle-nosed pliers, carefully remove the black with white stripe lead from the solenoid (Fig. STRT - 7B).

16. Disconnect the stator harness from the rectifier lead connector (Fig. STRT - 8A).

17. Using a socket and ratchet, loosen then remove the two bolts (Fig. STRT - 8B) securing the rectifier bracket (Fig. STRT - 8C).

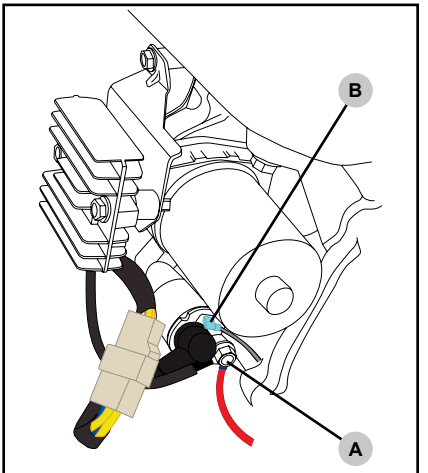


Fig. STRT - 7

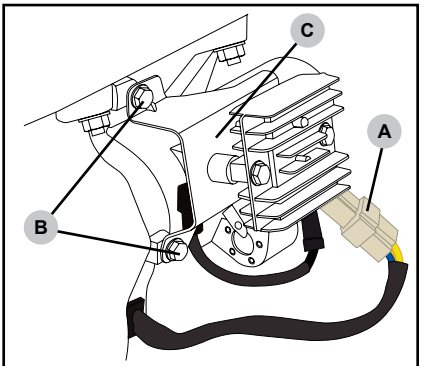


Fig. STRT - 8

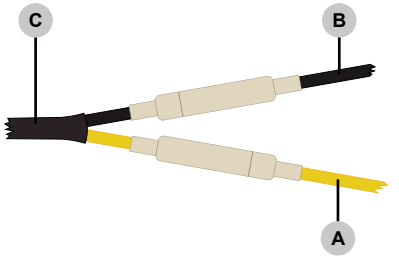


Fig. STRT - 9

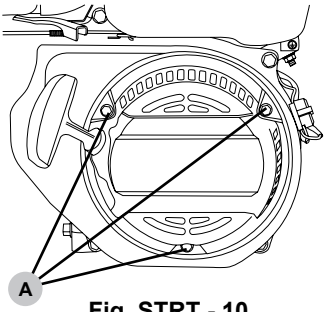


Fig. STRT - 10

18. In units that have the attached key switch box, you will need to disconnect the yellow oil level lead (Fig. STRT - 9A) and the black ignition coil lead (Fig. STRT - 9B) from the switch box harness (Fig. STRT - 9C).

19. Using a socket and ratchet, remove the three bolts (Fig. STRT - 10A) holding the recoil starter mechanism. Pull the mechanism forward to remove it from the starter cup.

20. Using a ratchet and socket, loosen then remove the five bolts (Fig. STRT - 11A) securing the blower housing. Pull the housing forward to remove it.

21. Using a ratchet and socket, loosen then remove the two bolts (Fig. STRT - 12A) securing the starter assembly. Pull the starter toward the rear to remove it.

22. Now is time to inspect the flywheel gear teeth for damage (Fig. STRT - 13). Missing or damaged teeth could damage the new starter and cause hard starting. If any damage is noted, the flywheel must be replaced.

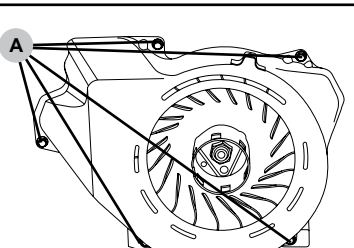


Fig. STRT - 11

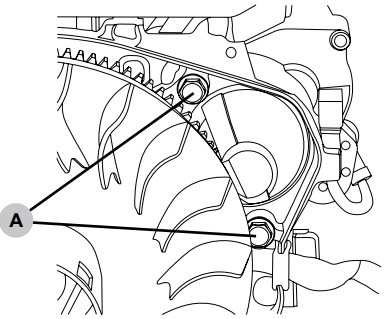


Fig. STRT - 12

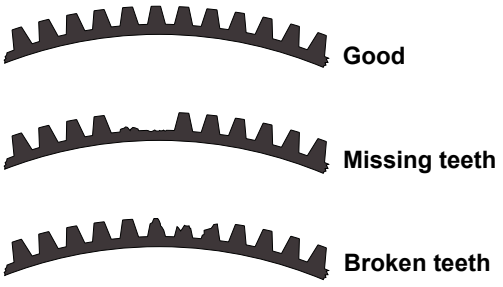


Fig. STRT - 13

Starter assembly installation steps:

1. Inspect the routing of the ignition coil lead (Fig. STRT - 14A) insuring it is in the keepers (Fig. STRT - 14B) and placed against the block (Fig. STRT - 14C) so as not to interfere with the starter installation.

2. Place the new starter assembly (Fig. STRT - 15A) into the engine frame (Fig. STRT - 15B).

3. Hand thread the mounting bolts (Fig. STRT - 15C) into the starter assembly. With a socket and torque wrench, tighten to 16-19 Ft. lb.

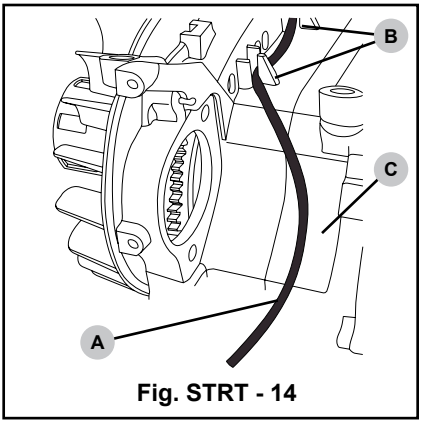


Fig. STRT - 14

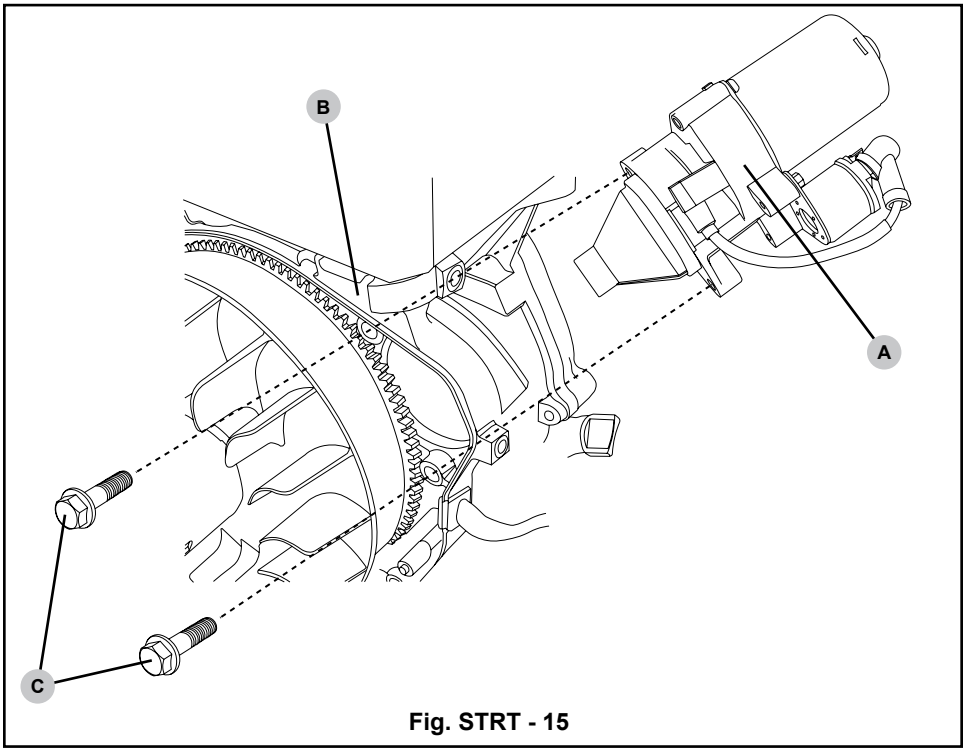


Fig. STRT - 15

4. Place the blower housing back onto the engine body. Insert the five mounting bolts (Fig. STRT - 11A) into the housing, torque to 7-9 Ft. lb.

5. Place the recoil starter mechanism onto the blower housing. Insert the three mounting bolts (Fig. STRT - 10A) into the housing, torque to 7-9 Ft. lb.

6. In units that have the attached key switch box, reconnect the yellow oil level lead and the black ignition coil lead to the switch box harness.

7. Place the rectifier bracket (Fig. STRT - 8C) again the engine block. Thread in the two bolts (Fig. STRT - 8B). Using a socket and torque wrench, tighten the bolts to 7-9 Ft. lb.

8. Connect the stator harness connector to the rectifier lead connector (Fig. STRT - 8A).

9. Slide the free end of the fuel hose (Fig. STRT - 16A) into the hose retaining ring (Fig. STRT - 16B).

10. Using pliers to depress the fuel line hose clamp (Fig. STRT - 17A), slip the fuel line onto the carburetor fuel line barb (Fig. STRT - 17B).

11. Slide the air filter elbow (Fig. STRT - 18A) onto the mounting bolts. Thread on the (2) nuts (Fig. STRT - 18B) then thread in the bolt (Fig. STRT - 18C). Tighten all three fasteners with a nut driver.

12. Using pliers, depress the hose clamp (Fig. STRT - 18D) on the breather tube (Fig. STRT - 18E). Slip the breather tube onto the valve cover breather (Fig. STRT - 18F).

13. Place the air cleaner elbow cover (Fig. STRT - 19A) onto the air cleaner elbow (Fig. STRT - 19B). Connect the vacuum hose (Fig. STRT - 19C) to the air cleaner elbow.

14. Place the air filter cover base (Fig. STRT - 20A) onto the air filter elbow cover. Seat a new, clean air filter element (Fig. STRT - 20B). Thread on the air filter element wingnut (Fig. STRT - 20C).

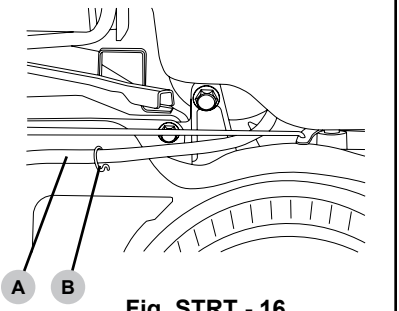


Fig. STRT - 16

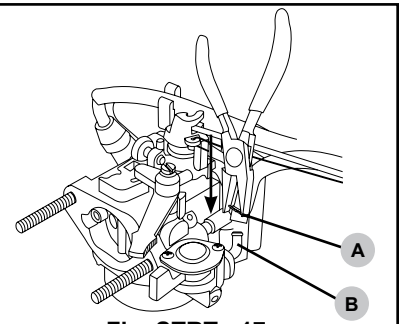


Fig. STRT - 17

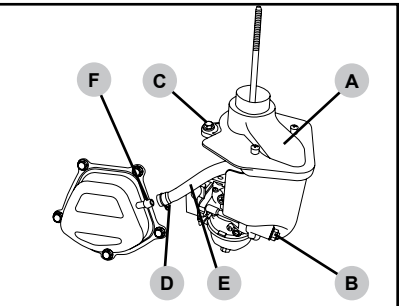


Fig. STRT - 18

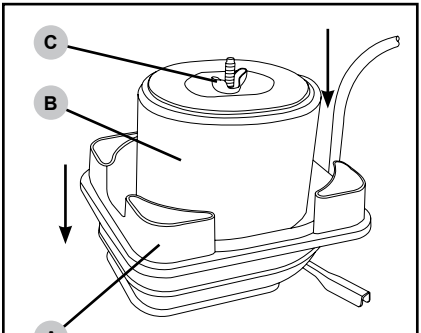


Fig. STRT - 20

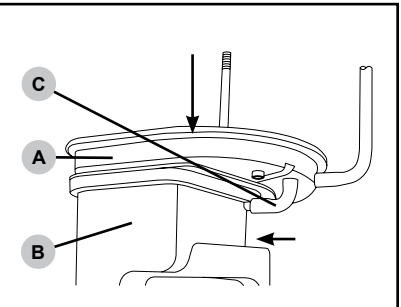


Fig. STRT - 19

15. Seat the air filter cover (Fig. STRT - 21A), then tighten the air filter cover wingnut (Fig. STRT - 21B).

16. Using Fig. STRT - 22, place the positive wiring connectors onto the solenoid post. Place the washer onto the post, then thread on the hex nut. Using a nut driver, tighten securely.

17. As shown in Fig. STRT - 22, slip the start lead onto the spade connector.

18. Verify the oil level in the crankcase is at the proper level.

19. Place enough fuel into the tank to allow the engine to start.

20. Connect the black, negative lead to the battery.

21. Connect the spark plug lead to the spark plug.

22. With the engine placed under a powered fume hood or outside the structure, set the throttle (if equipped) to FAST, the choke to CHOKE and the fuel valve to ON.

23. Turn the key past ON to RUN. The starter should rotate the engine. Once the engine starts, release the key. If the engine does not start after five seconds, release the key and allow the starter to cool for one minute before attempting to start the engine once more.

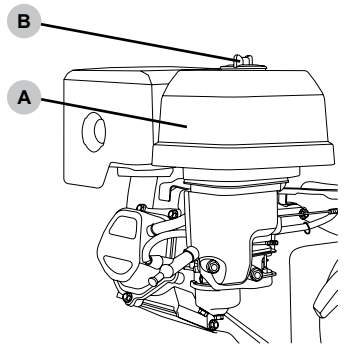


Fig. STRT - 21

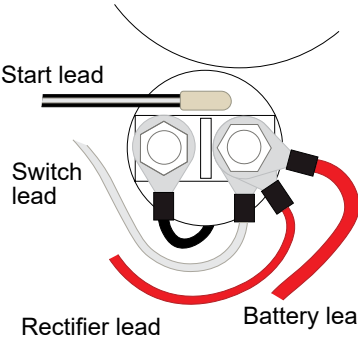


Fig. STRT - 22

Charging system testing and troubleshooting

DANGER:

This procedure involves working on a warm engine. Care must be taken not to burn yourself on the engine, muffler or spark plug. DO NOT run the engine indoors unless inside a properly ventilated chamber designed for running engines.

Testing the charging system:

Please note: This manual focuses on the engine and its components. When it comes to the battery and cables, your system may vary from those represented in this section. It is beyond the scope of this manual to cover every possible situation. The theory of operation will remain the same regardless of your installation.

1. Inspect the battery for very common issues that can lead to bad charging such as loose terminals (Fig. CHRG - 1A), corroded terminals (Fig. CHRG - 1B) and overheated battery cables (Fig. CHRG - 1C).

   While wearing rubber gloves, corrosion needs to be removed with a liquid battery cleaner. The terminals and battery connectors should then be mechanically cleaned as talked about in Step 2.

   Battery cables that show signs of overheating such as darkened, blistered or split insulation need to be replaced.

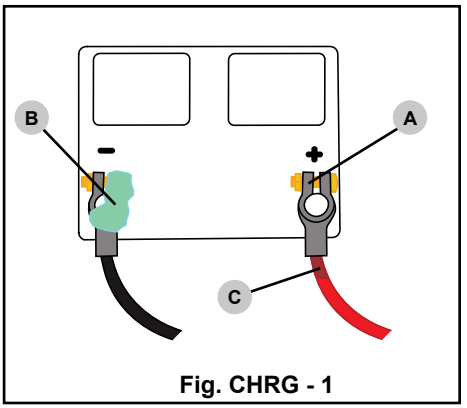


Fig. CHRG - 1

2. Regardless of the battery state mentioned in Step 1, in order to properly test the charging system, the battery terminals and battery connectors must be cleaned and tight. A low resistance connection between the two is required.

   Starting with the NEGATIVE connector, loosen then remove the battery connectors from the battery. Using a terminal brush, clean the posts of the battery (Fig. CHRG - 2) using a circular and up-down motion until the terminals are clean and bright.

   Clean the cable connectors (Fig. CHRG - 3) just like the battery terminals using a circular and up-down motion until they are clean and bright.

   Reconnect the POSITIVE battery cable to the battery; tighten securely.

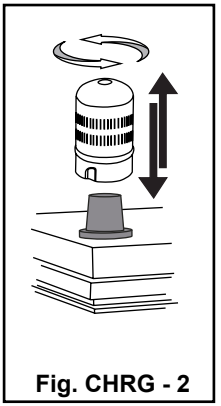


Fig. CHRG - 2

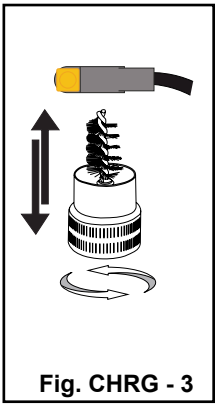


Fig. CHRG - 3

3. Using an ohmmeter, measure the resistance between the engine block (Fig. CHRG - 4A) and the negative battery connector (Fig. CHRG - 4B). You should measure about 5 ohms or lower. An infinite amount of resistance indicates the battery cable is bad and needs to be replaced. A resistance greater than 20 ohms indicates the cable connection to the engine block or steel frame needs to be cleaned and tightened. Reconnect the NEGATIVE battery cable to the battery when completed; tighten securely.

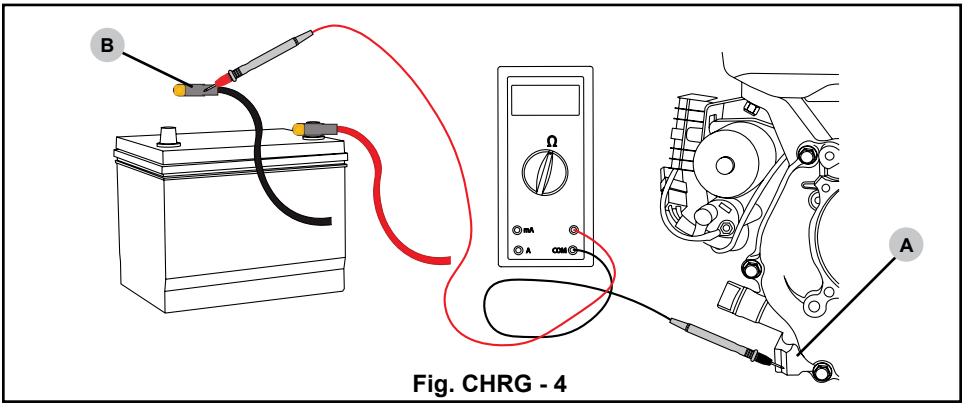


Fig. CHRG - 4

4. Place the engine in a vented fume hood or outside; start the engine. Using a voltmeter, carefully measure between the positive battery post (Fig. CHRG - 5A) and the engine block (Fig. CHRG - 5B). You should find approx. 14vDC or higher. If this voltage is present, the battery is mostly likely exhausted, but further troubleshooting should be performed. If you do not measure this voltage, proceed to Step #5.

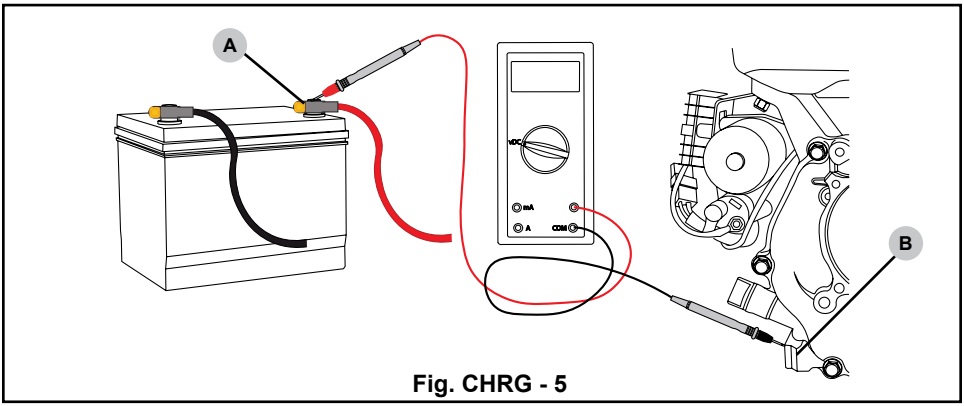


Fig. CHRG - 5

5. With the engine still running, carefully measure between the positive solenoid post (Fig. CHRG - 6A) and ground. You should find approximately 14vDC or higher. If this voltage is present, the POSITIVE battery cable needs to be replaced. If this voltage is lower (~12v), proceed to Step #6.

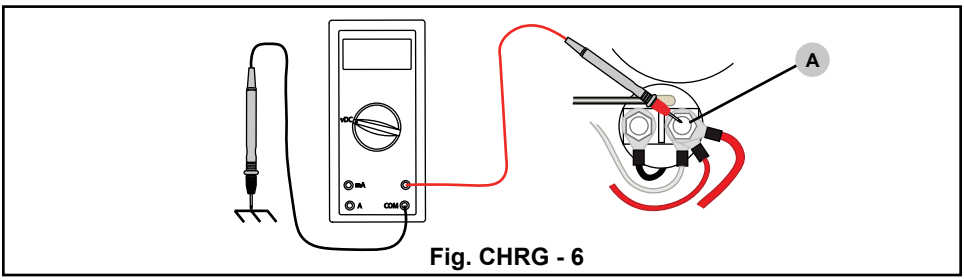


Fig. CHRG - 6

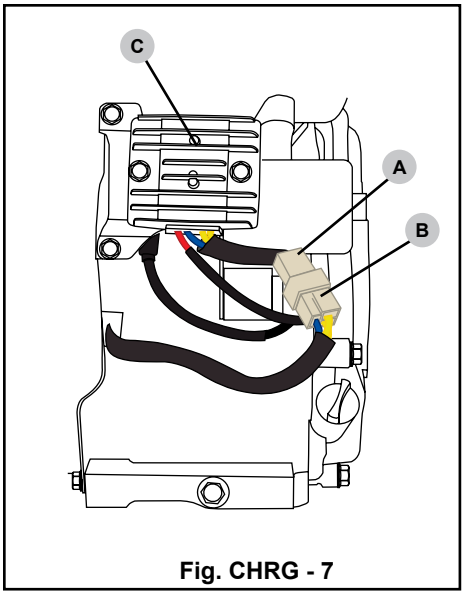


Fig. CHRG - 7

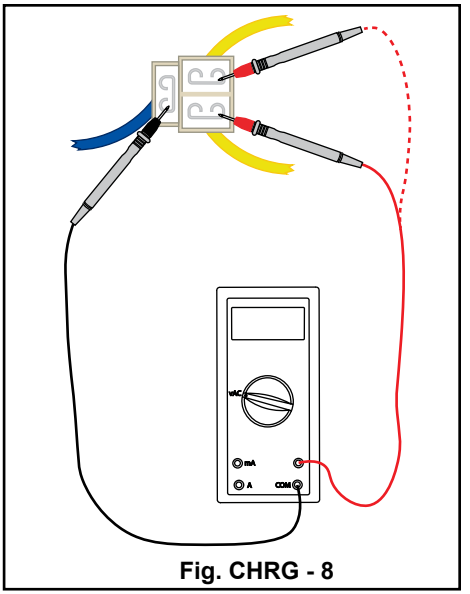


Fig. CHRG - 8

6. With the engine turned OFF, disconnect the rectifier/regulator harness (Fig. CHRG - 7A) from the stator lead harness (Fig. CHRG - 7B).

7. Start the engine. Using a voltmeter set to AC, measure from the blue wire to one of the yellow wires of the stator lead harness (Fig. CHRG - 8). You should measure 18vAC or greater. Next, measure from the blue wire to the other yellow wire. Again, you should measure 18vAC or greater.

   If both of these voltages are correct, the rectifier/regulator (Fig. CHRG - 7C) needs to be replaced.

   If one or both of these voltages are low or completely missing, the stator will need to be replaced.

Removing & replacing the Flywheel

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

DANGER:

The flywheel is heavy and can cause crushing injuries to fingers and hands. Hold the flywheel by its sides when removing or mounting it to the crankshaft. Disconnect the negative battery cable from the battery on electric start models. Never try to electrically rotate the engine while having finger or hands near the teeth of the flywheel.

Flywheel removal steps:

1. (Electric start engines, only) Disconnect the negative (BLACK) cable from the battery.
2. Follow the instructions in 'Blower Housing Removal and Installation' to gain access to the flywheel.
3. If needed, hand spin the flywheel (Fig. FYWL - 1A) so the magnet (Fig. FYWL - 1B) is away from the ignition coil (Fig. FYWL - 1C).
4. Using a socket and ratchet, loosen then remove the two bolts (Fig. FYWL - 1D) securing the ignition coil. Move the coil to the side so it will be clear of the flywheel.
5. Snuggly wrap a strap wrench (Fig. FYWL - 2A) around the flywheel (Fig. FYWL - 2B). Take care not to put undo stress on the cooling fan (Fig. FYWL - 2C).
6. Using an impact driver and deep well socket, loosen then remove the hex nut (Fig. FYWL - 2D). Remove the cooling fan and the starter cup (Fig. FYWL - 2E).
7. Inspect the cooling fan for broken blades or any cracking. If any abnormalities are noted, the cooling fan will need to be replaced.

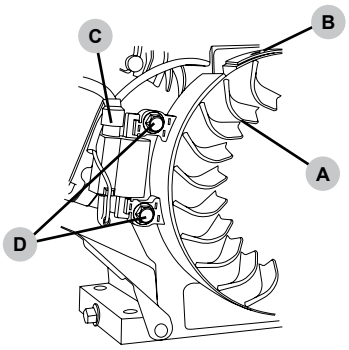


Fig. FYWL - 1

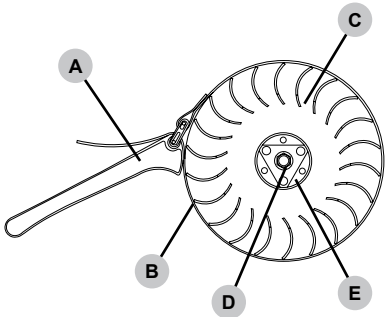


Fig. FYWL - 2

8. Using a commercially available flywheel puller, thread the mounting bolts into the three threaded taps (Fig. FYWL - 3A) in the flywheel.

Note: The flywheel illustrated in FYWL - 3, is for an electric start engine. The starter was removed for clarity. The need to remove the starter in your particular application may not be required. If you find the need to remove the starter is warranted, following the removal and assembly procedures in 'Replacing the Electric Starter Assembly' section of this manual.

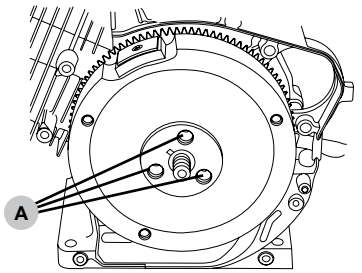


Fig. FYWL - 3

9. With the use of an open-end wrench, turn the main bolt (Fig. FYWL - 4A) of the flywheel puller to free the flywheel from the crank shaft. Be careful removing the flywheel to avoid personal injury or damage to the crank shaft. Make note to not lose the woodruff key.

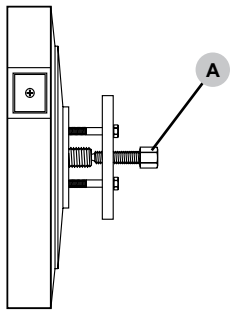


Fig. FYWL - 4

10. Inspect the crankshaft (Fig. FYWL - 5A) for signs of damage including the key seat (Fig. FYWL - 5B). Also inspect the woodruff key (Fig. FYWL - 5C) for damage.

Flywheel installation steps:

1. Clean the mating surfaces of the shaft and flywheel with isopropyl alcohol.
2. Place the woodruff key (Fig. FYWL - 6A) into the key seat of the crankshaft (Fig. FYWL - 6B). NOTE: Do NOT use grease to secure the key to the shaft.
3. Slide the flywheel (Fig. FYWL - 5C) onto the crankshaft making sure not to disrupt the seating of the woodruff key. NOTE: Do NOT use grease for reassembly.

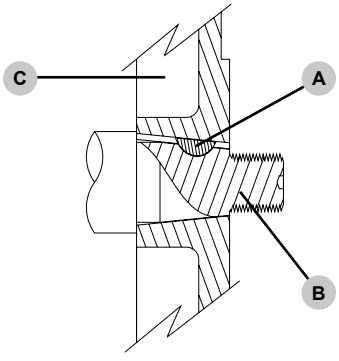


Fig. FYWL - 6

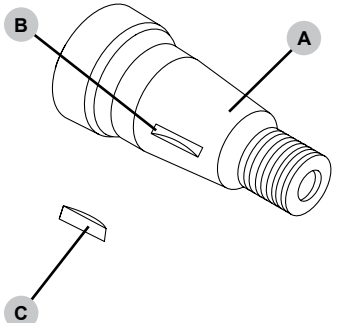


Fig. FYWL - 5

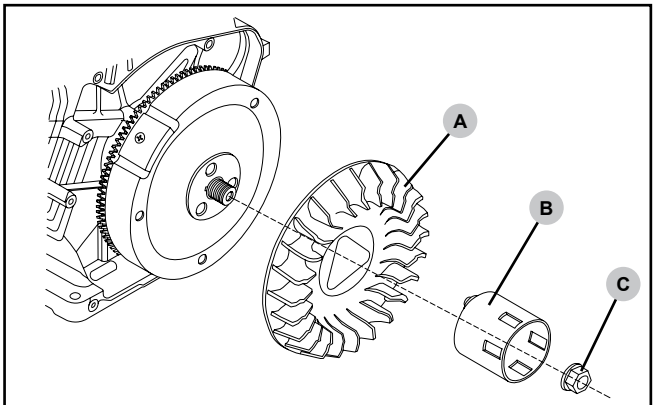


Fig. FYWL - 7

3. Place the cooling fan (Fig. FYWL - 7A) against the flywheel. Place the starter cup (Fig. FYWL - 7B) to the flywheel making sure to align the its reliefs into the removal holes on the flywheel. Thread on the hex nut (Fig. FYWL - 7C).

4. Using a strap wrench to secure the flywheel from rotating, torque the crankshaft hex nut to meet the range listed in the chart below.

	Foot pounds (Ft. lb.)	Newton-meters (N.m)
CRX165	62.7 - 67.1	85 - 91
CRX210	62.7 - 67.1	85 - 91
CRX225	62.7 - 67.1	85 - 91
CRX275	62.7 - 67.1	85 - 91
CRX340	70.1 - 77.4	95 - 105
CRX420	70.1 - 77.4	95 - 105
CRX460	70.1 - 77.4	95 - 105
CRX530	70.1 - 77.4	95 - 105

5. Following the instructions in the ‘Ignition Coil Testing, Adjustment and Replacement’ section of this manual, to secure and adjust the ignition coil.

6. See ‘Blower Housing Removal and Installation’ to reassemble the blower housing and recoil.

Replacing the Stator

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

DANGER:

The flywheel is heavy and can cause crushing injuries to fingers and hands. Hold the flywheel by its sides when removing or mounting it to the crankshaft. Disconnect the negative battery cable from the battery on electric start models. Never try to electrically rotate the engine while having finger or hands near the teeth of the flywheel.

Stator removal steps:

1. Disconnect the negative (BLACK) battery cable from the battery.
2. Disconnect the rectifier/regulator harness (Fig. STAT - 1A) from the stator lead harness (Fig. STAT - 1B).
3. Follow the instructions in 'Removing the Blower Housing' to gain access to the flywheel.
4. Follow the instructions in 'Replacing the Flywheel' to gain access to the stator.

   Note: The stator illustrated in STAT - 2, may differ depending on engine size or stator current capacity. The replacement procedure will be the same regardless of stator style.
5. Using a socket and ratchet, remove the bolt (Fig. STAT - 2A) securing the harness protector (Fig. STAT - 2B).
6. Using a socket and ratchet, remove the bolts (Fig. STAT - 2C) securing the stator (Fig. STAT - 2D). Remove the stator.

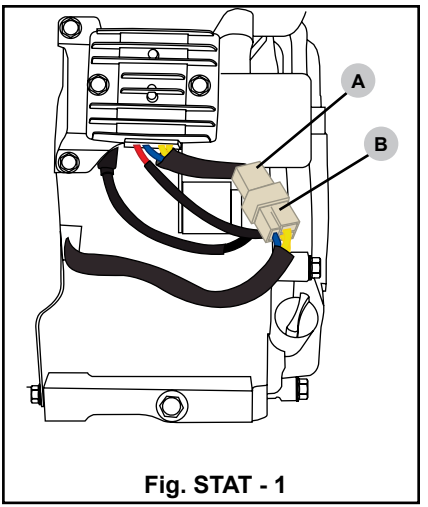


Fig. STAT - 1

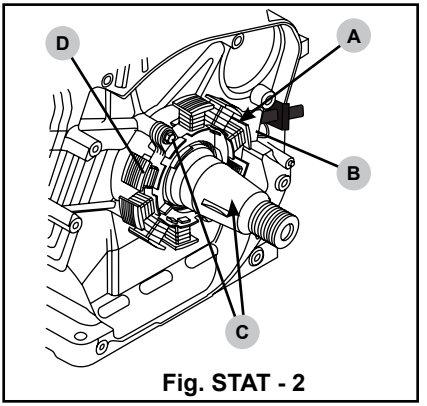


Fig. STAT - 2

Stator installation steps:

1. Hold the new stator (Fig. STAT - 3A) to the engine block. Thread in the retaining bolts (Fig. STAT - 3B). Using a torque wrench and socket, tighten the mounting bolts to 7-9 Ft lb.

2. Push the harness grommet (Fig. STAT - 3C) into the harness slot (Fig. STAT - 3D) of the engine block.

3. Place the harness retainer (Fig. STAT - 4A) against the stator harness (Fig. STAT - 4B). Thread in the bolt (Fig. STAT - 4C), torque to 7-9 Ft lb.

4. Reassemble the flywheel as per the 'Replacing the Flywheel' instructions.

5. Reassemble the blower housing and recoil mechanism.

6. Connect the rectifier/regulator harness to the stator lead harness.

7. Connect the negative (BLACK) battery cable to the battery.

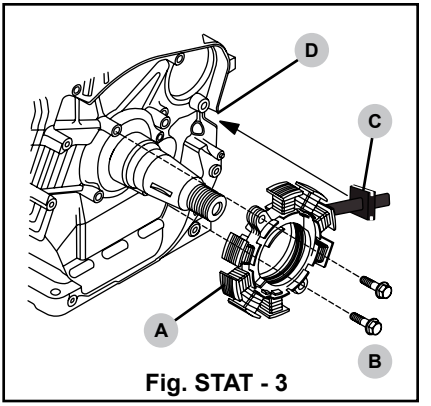


Fig. STAT - 3

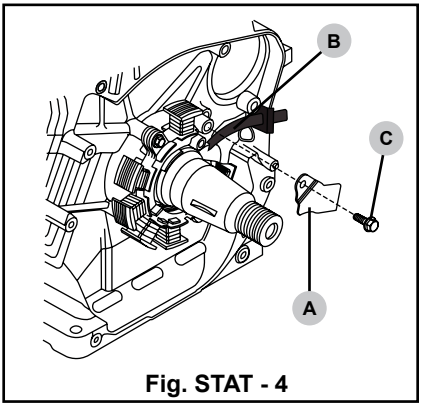


Fig. STAT - 4

Replacing the Carburetor

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

Carburetor removal steps:

1. Disconnect the spark plug lead from the spark plug (Fig. CARB - 1A).
2. Place an appropriate container under the carburetor drain bolt (Fig. CARB - 1B). Remove the bolt using an open end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly.
3. Loosen the air cleaner cover wingnut (Fig. CARB - 1C). Remove the air cleaner cover.
4. Loosen the wingnut securing the filter elements (Fig. CARB - 2A). Remove the air filter elements (Fig. CARB - 2B).
5. Remove the air cleaner base (Fig. CARB - 2C).
6. Using pliers, depress the hose clamp (Fig. CARB - 3A) then slide it down the vapor hose (Fig. CARB - 3B).
7. Carefully remove the vapor hose from the roll over valve (Fig. CARB - 3C).
8. Remove the vacuum hose (Fig. CARB - 4A) from the air cleaner elbow (Fig. CARB - 4C). Remove the air cleaner elbow cover (Fig. CARB - 4B).

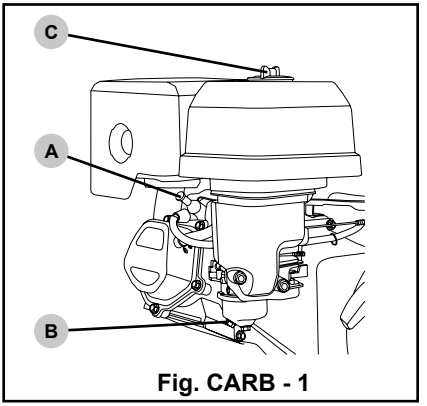


Fig. CARB - 1

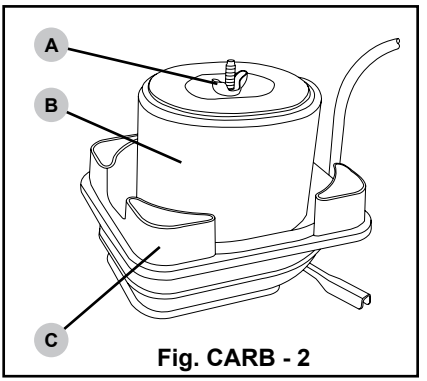


Fig. CARB - 2

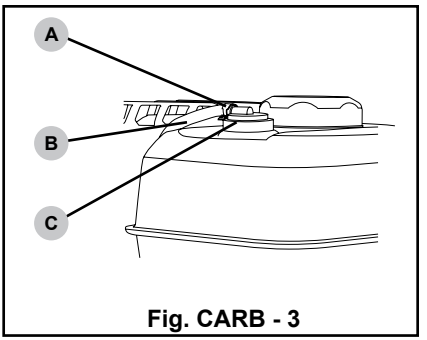


Fig. CARB - 3

9. Using pliers, depress the hose clamp (Fig. CARB - 5B) on the breather tube (Fig. CARB - 5C). Remove the breather tube from the valve cover (Fig. CARB - 5A).

10. Using a nut driver, loosen then remove the two nuts (Fig. CARB - 5D).

11. Using a nut driver, loosen then remove the bolt (Fig. CARB - 5E).

12. Remove the air cleaner elbow (Fig. CARB - 5F).

13. Using pliers, depress the hose clamp (Fig. CARB - 6A) on the fuel line (Fig. CARB - 6B). Remove the fuel line from the fuel valve (Fig. CARB - 6C).

14. Using needle-nosed pliers, remove the throttle return spring (Fig. CARB - 6D) from the throttle cam (Fig. CARB - 6E).

15. Rotate the throttle cam until the governor rod (Fig. CARB - 6F) can be lifted free.

16. Remove the spark plug lead (Fig. CARB - 7A) from the carburetor insulator (Fig. CARB - 7B). Slide the old carburetor (Fig. CARB - 7C) off of the mounting bolts.

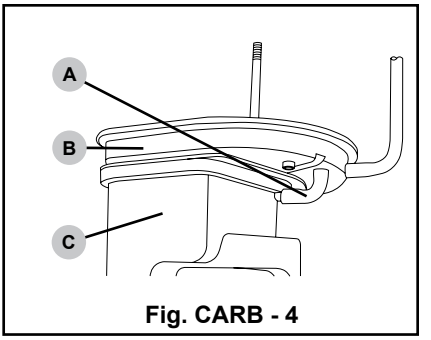


Fig. CARB - 4

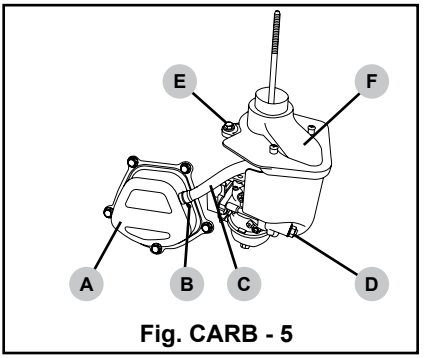


Fig. CARB - 5

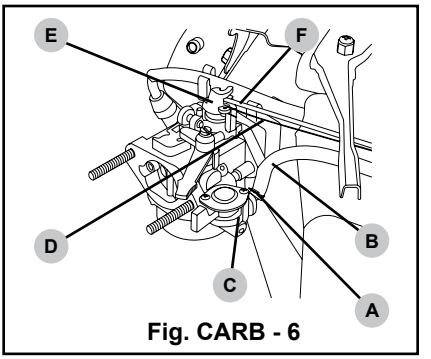


Fig. CARB - 6

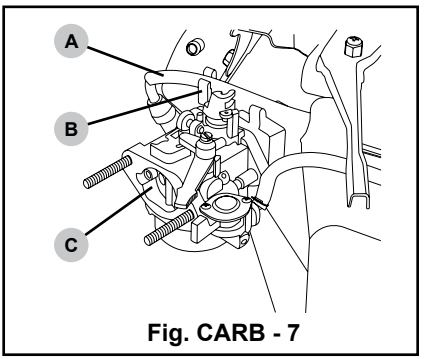


Fig. CARB - 7

Carburetor installation steps:

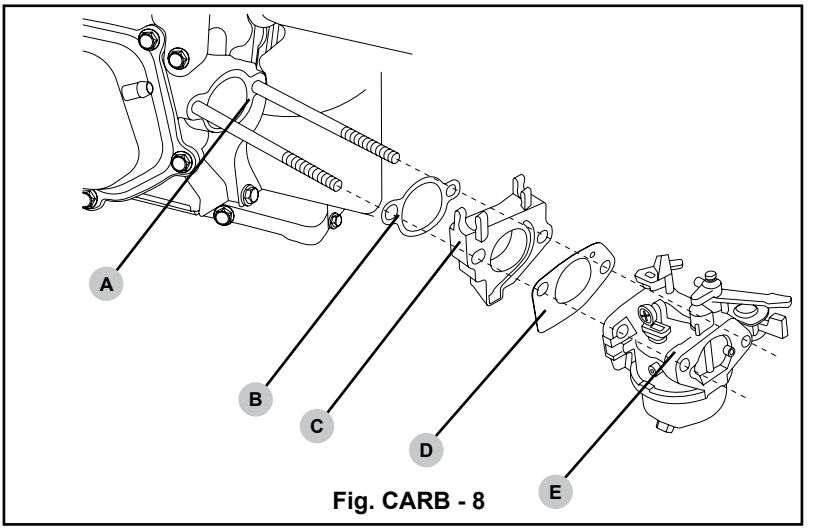


Fig. CARB - 8

1. Verify the mating surface on the head is clean of debris (Fig. CARB - 8A).

2. Place onto the mounting bolts, in this order, the Insulator Packing (Fig. CARB - 8B), the carburetor insulator (Fig. CARB - 8C), the carburetor packing (Fig. CARB - 8D) and finally the carburetor (Fig. CARB - 8E).

3. Rotate (if needed) the throttle cam (Fig. CARB - 9A) so the governor rod (Fig. CARB - 9B) can be dropped down into the throttle cam.

4. Using needle-nosed pliers, place the throttle return spring (Fig. CARB - 9C) into the throttle cam (Fig. CARB - 9A).

5. Place the spark plug lead (Fig. CARB - 10A) into the carburetor insulator (Fig. CARB - 10B).

6. Using pliers to depress the fuel line hose clamp (Fig. CARB - 11A), slip the fuel line onto the carburetor fuel line barb (Fig. CARB - 11B).

7. Slide the air filter elbow (Fig. CARB - 12A) onto the mounting bolts. Thread on the (2) nuts (Fig. CARB - 12B) then thread in the bolt (Fig. CARB - 12C). Torque to 7-9 Ft lb.

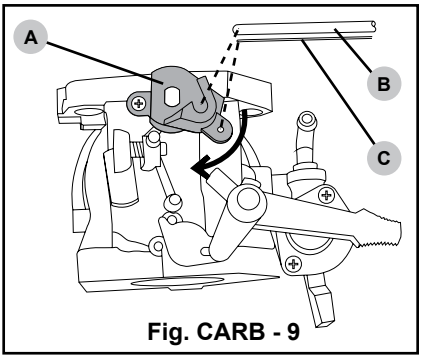


Fig. CARB - 9

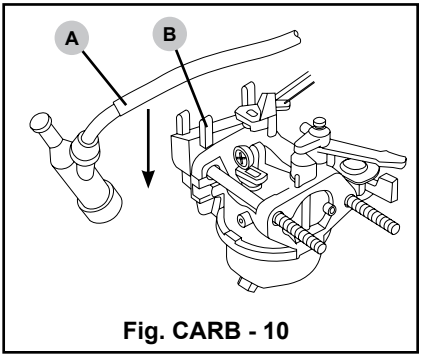


Fig. CARB - 10

8. Using pliers, depress the hose clamp (Fig. CARB - 12D) on the breather tube (Fig. CARB - 12E). Slip the breather tube onto the valve cover breather (Fig. CARB - 12F).

9. Place the air cleaner elbow cover (Fig. CARB - 13A) onto the air cleaner elbow (Fig. CARB - 13B). Connect the vacuum hose (Fig. CARB - 13C) to the air cleaner elbow.

10. Using pliers, depress the hose clamp (Fig. CARB - 14A) then slide the vapor hose (Fig. CARB - 14B) onto the roll over valve hose barb (Fig. CARB - 14C).

11. Place the air filter cover base (Fig. CARB - 15A) onto the air filter elbow cover. Seat a new, clean air filter element (Fig. CARB - 15B). Thread on the air filter element wingnut (Fig. CARB - 15C).

12. Seat the air filter cover (Fig. CARB - 16A), then tighten the air filter cover wingnut (Fig. CARB - 16B). Reconnect the spark plug lead to the spark plug (Fig. CARB - 16C).

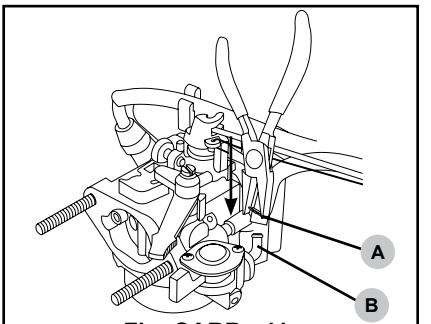


Fig. CARB - 11

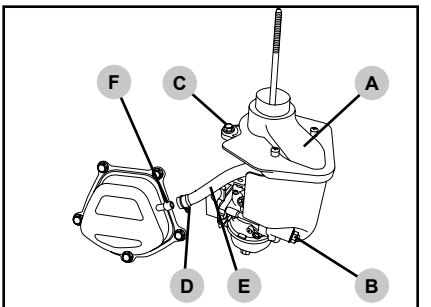


Fig. CARB - 12

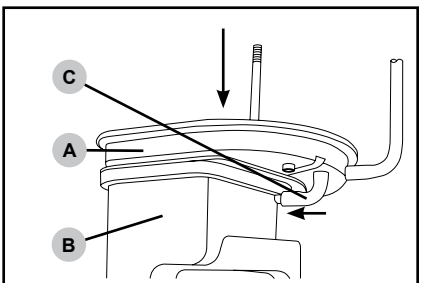


Fig. CARB - 13

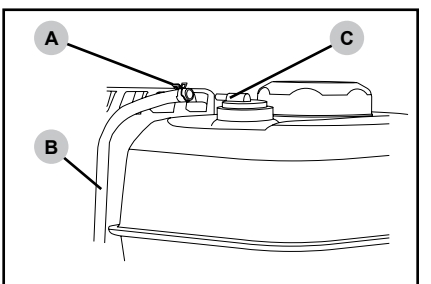


Fig. CARB - 14

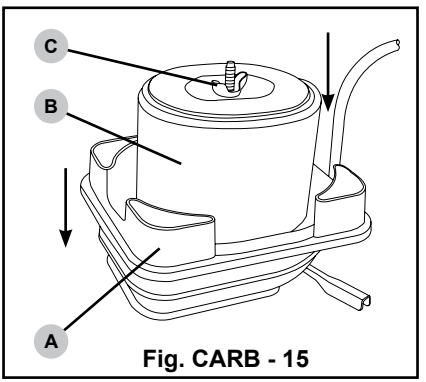


Fig. CARB - 15

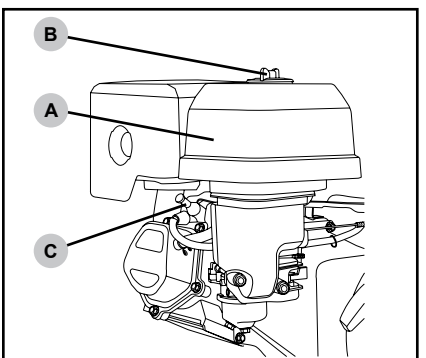


Fig. CARB - 16

Replacing the EVAP canister

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

EVAP canister removal steps:

1. Disconnect the spark plug lead from the spark plug (Fig. EVAP - 1A).
2. Loosen the air cleaner cover wingnut (Fig. EVAP - 1B). Remove the air cleaner cover.
3. Loosen the wingnut securing the filter elements (Fig. EVAP - 2A). Remove the air filter elements (Fig. EVAP - 2B).
4. Remove the air cleaner base (Fig. EVAP - 3A) being careful to remove the fuel tank vapor hose (Fig. EVAP - 2B) from the routing pieces.
5. Using side cutting dykes, snip the “zip” tie(s) (Fig. EVAP - 4A) being careful not to knick the hoses; discard. Unfold the retaining strip allowing the hoses to be free (Fig. EVAP - 4B).

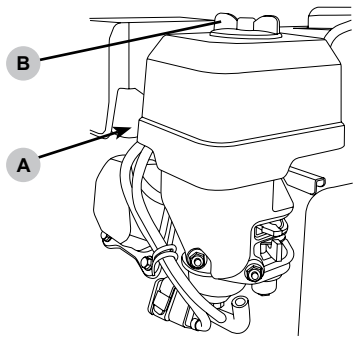


Fig. EVAP - 1

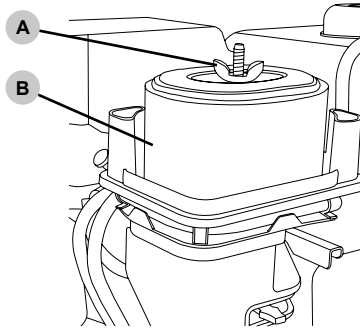


Fig. EVAP - 2

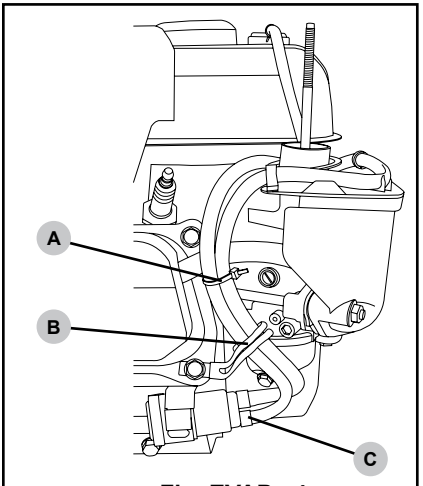


Fig. EVAP - 4

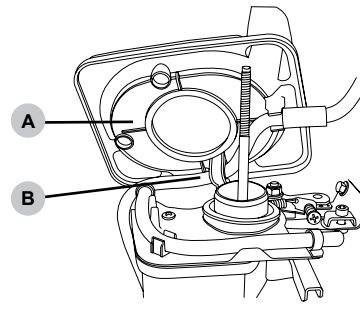


Fig. EVAP - 3

6. Using pliers, depress the clamp on the vapor hose (Fig. EVAP - 4C) then remove the hose being careful not to damage the it.

7. Using needle-nosed pliers, remove the vacuum hose (Fig. EVAP - 5B) from the air cleaner elbow cover vacuum port (Fig. EVAP - 5A).

8. Remove the vacuum hose (Fig. EVAP - 5B) from the hose eyelets (Fig. EVAP - 5C).

9. Remove the EVAP canister (Fig. EVAP - 6A) from the canister bracket (Fig. EVAP - 6C). If needed, use a small, flat bladed screwdriver to allow the rubber straps (Fig. EVAP - 6B) to be freed from the bracket.

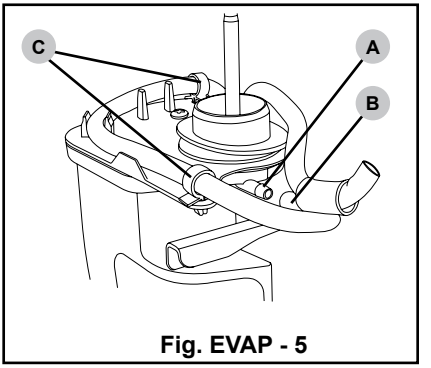


Fig. EVAP - 5

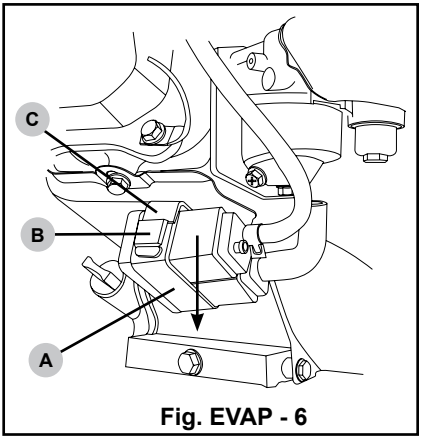


Fig. EVAP - 6

EVAP canister installation steps:

1. Slide the EVAP canister (Fig. EVAP - 7A) into the canister bracket (Fig. EVAP - 7B) allowing the bracket arms to be captured by the rubber straps (Fig. EVAP - 7C). Be careful not to put undo stress on the straps.

2. Route the vacuum hose (Fig. EVAP - 8A) through the eyelets (Fig. EVAP - 8B). Connect the hose to the vacuum port (Fig. EVAP - 8C). Finally push the hose down into the keepers (Fig. EVAP - 8D).

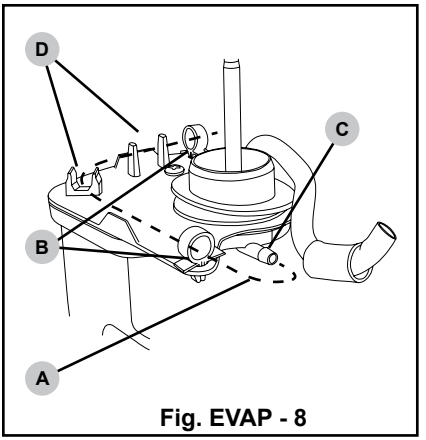


Fig. EVAP - 8

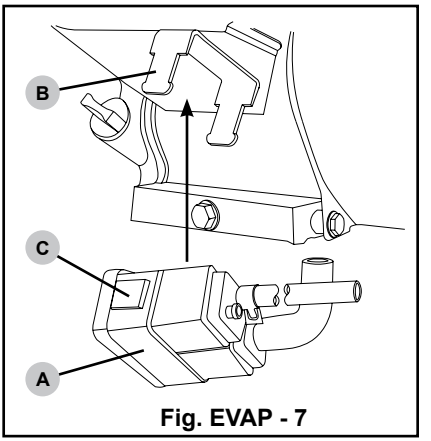


Fig. EVAP - 7

3. Route the vapor hose (Fig. EVAP - 9A) through the retaining clips on the air cleaner base (Fig. EVAP - 9B).

4. Move the base over the air filter screw (Fig. EVAP - 9C) onto the air filter elbow cover (Fig. EVAP - 9D).

5. Using pliers, depress the clamp on the vapor hose (Fig. EVAP - 10A) then push the hose onto the vapor port of the EVAP canister.

6. Route the hoses as shown using the retaining strap (Fig. EVAP - 10B).

7. Secure the hoses with a “zip” tie (Fig. EVAP - 10C) just below the breather hose.

8. Place the air filter (Fig. EVAP - 11A) onto the filter base. Thread on the wingnut (Fig. EVAP - 11B) to secure the filter elements.

9. Place the air filter cover onto the air filter base (Fig. EVAP - 12A). Tighten the air cleaner cover wingnut.

10. Reconnect the spark plug lead to the spark plug (Fig. EVAP - 12B).

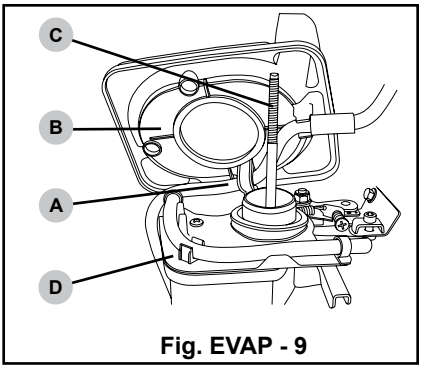


Fig. EVAP - 9

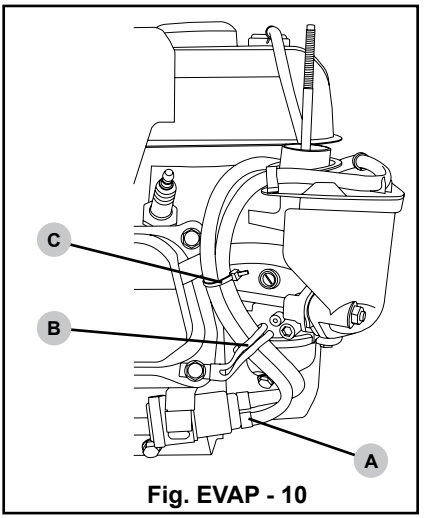


Fig. EVAP - 10

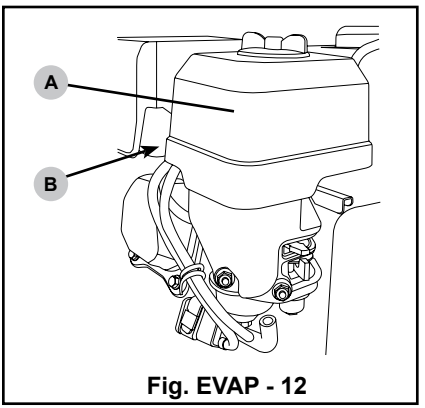


Fig. EVAP - 12

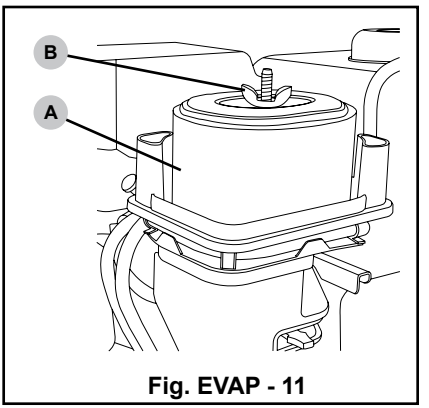


Fig. EVAP - 11

Replacing the Fuel Tank

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

Fuel tank removal steps:

1. Disconnect the spark plug lead from the spark plug (Fig. FLTK - 1A).
2. Place an appropriate container under the carburetor drain bolt (Fig. FLTK - 1B). Remove the bolt using an open end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly. Thread in the drain bolt; tighten.
3. Loosen the air cleaner cover wingnut (Fig. FLTK - 1C). Remove the air cleaner cover.
4. Loosen the wingnut securing the filter elements (Fig. FLTK - 2A). Remove the air filter elements (Fig. FLTK - 2B).
5. Remove the air cleaner base (Fig. FLTK - 2C).
6. Using pliers, depress the hose clamp (Fig. FLTK - 3A) then slide it down the vapor hose (Fig. CARB - 3B).
7. Carefully remove the vapor hose from the roll over valve (Fig. FLTK - 3C).
8. Remove the vacuum hose (Fig. FLTK - 4A) from the air cleaner elbow (Fig. FLTK - 4C). Remove the air cleaner elbow cover (Fig. FLTK - 4B).

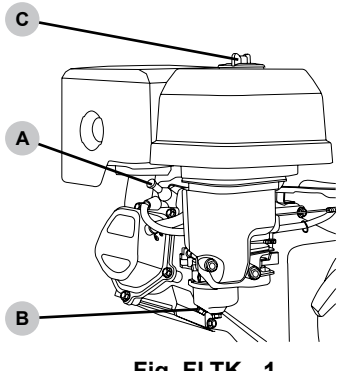


Fig. FLTK - 1

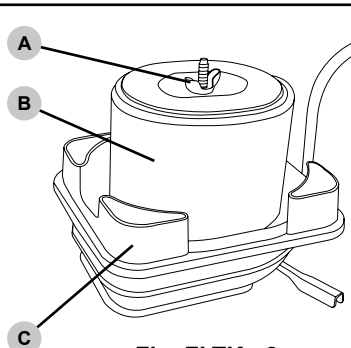


Fig. FLTK - 2

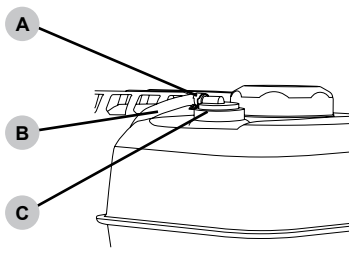


Fig. FLTK - 3

9. Using pliers, depress the hose clamp (Fig. FLTK - 5B) on the breather tube (Fig. FLTK - 5C). Remove the breather tube from the valve cover (Fig. FLTK - 5A).

10. Using a nut driver, loosen then remove the two nuts (Fig. FLTK - 5D).

11. Using a nut driver, loosen then remove the bolt (Fig. FLTK - 5E).

12. Remove the air cleaner elbow (Fig. FLTK - 5F).

13. Using pliers, depress the hose clamp (Fig. FLTK - 6A) on the fuel line (Fig. FLTK - 6B). Remove the fuel line from the fuel valve (Fig. FLTK - 6C).

14. Using a socket and ratchet, loosen then remove the bolt (Fig. FLTK - 7A) on the front of the fuel tank.

15. Using an open end wrench, loosen then remove the two lock nuts (Fig. FLTK - 8A) below the fuel tank support brackets.

16. Using a socket and ratchet, loosen then remove the bolt (Fig. FLTK - 8B) on the rear of the fuel tank.

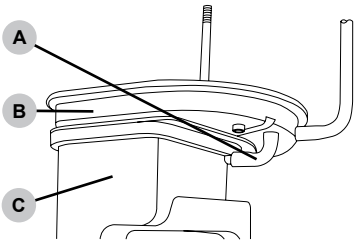


Fig. FLTK - 4

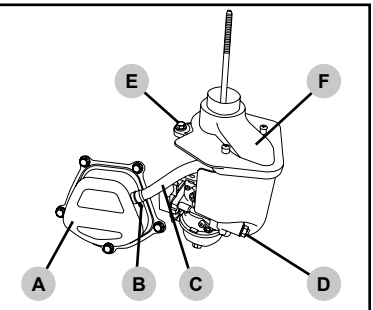


Fig. FLTK - 5

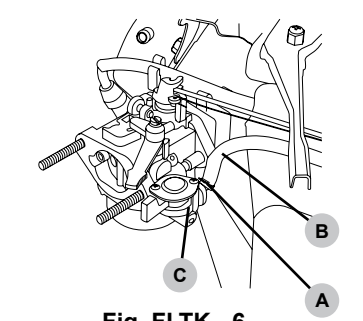


Fig. FLTK - 6

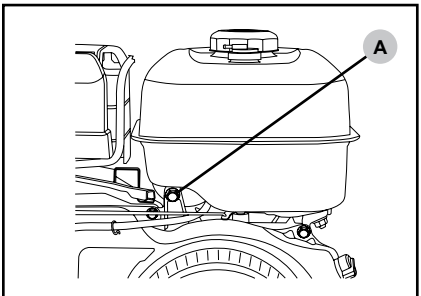


Fig. FLTK - 7

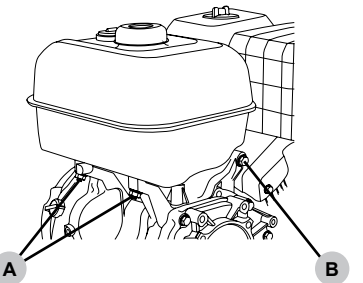


Fig. FLTK - 8

17. Lift the old fuel tank (Fig. FLTK - 9A) allowing the fuel line (Fig. FLTK - 9B) to slip through the hose retaining ring (if equipped) (Fig. FLTK - 9C) and out from under the governor rod (Fig. FLTK - 9D).

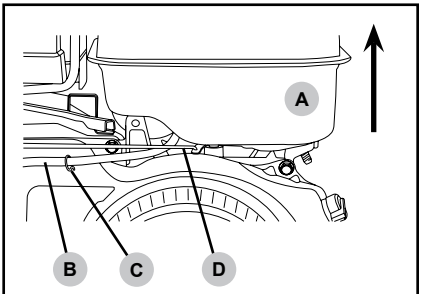


Fig. FLTK - 9

Fuel tank installation steps:

1. Press the new rollover valve (Fig. FLTK - 10A) into the new fuel tank (Fig. FLTK - 10B).

2. Using pliers, slide the spring clamp (Fig. FLTK - 11A) onto the new fuel hose (Fig. FLTK - 11B). Keeping the clamp depressed, slide the fuel hose onto the fuel tank barbed fitting (Fig. FLTK - 11C).

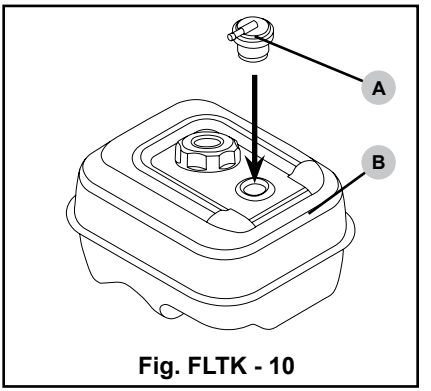


Fig. FLTK - 10

3. Place the new fuel tank (Fig. FLTK - 12A) down onto the tank mounting brackets allowing the fuel line (Fig. FLTK - 12B) to slip under the governor rod (Fig. FLTK - 12D). Lastly thread the fuel hose through the hose retaining ring (if equipped) (Fig. FLTK - 12C).

4. Thread the two lock nuts (Fig. FLTK - 13A) onto the tank studs. Torque to 7-9 Ft. lb. (**CRX275 or smaller**), 17-20 Ft. lb.(**CRX340 to CRX530 models**).

5. Thread the front (Fig. FLTK - 13B) and the rear (Fig. FLTK - 13C) bolts into the tank. Torque to 7-9 Ft. lb. (**CRX275 or smaller**), 17-20 Ft. lb.(**CRX340 to CRX530 models**).

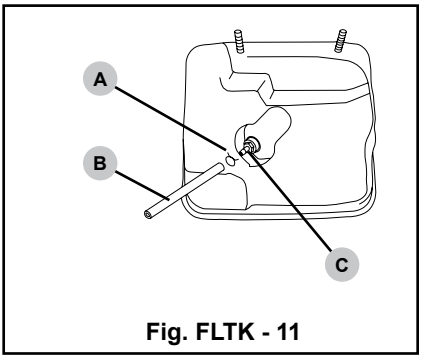


Fig. FLTK - 11

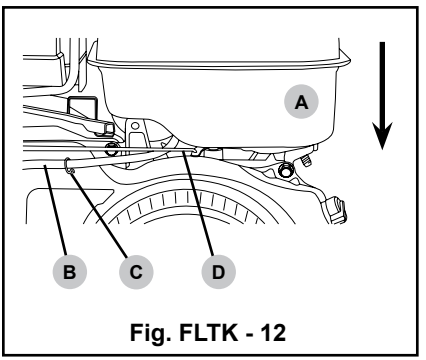


Fig. FLTK - 12

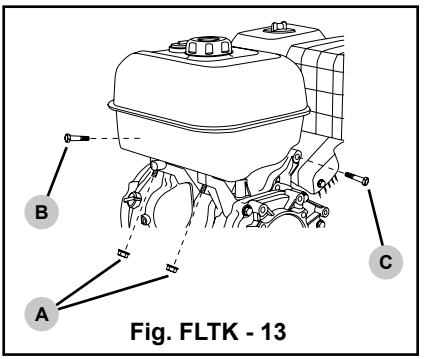


Fig. FLTK - 13

5. Using pliers to depress the fuel line hose clamp (Fig. FLTK - 14A), slip the fuel line onto the valve fuel line barb (Fig. FLTK - 14B).

6. Slide the air filter elbow (Fig. FLTK - 15A) onto the mounting bolts. Thread on the (2) nuts (Fig. FLTK - 15B) then thread in the bolt (Fig. FLTK - 15C). Torque to 7-9 Ft. lb.

7. Using pliers, depress the hose clamp (Fig. FLTK - 15D) on the breather tube (Fig. FLTK - 15E). Slip the breather tube onto the valve cover breather (Fig. FLTK - 15F).

8. Place the air cleaner elbow cover (Fig. FLTK - 16A) onto the air cleaner elbow (Fig. FLTK - 16B). Connect the vacuum hose (Fig. FLTK - 16C) to the air cleaner elbow.

9. Remove the existing vapor hose (Fig. FLTK - 16D) from the air cleaner elbow cover (Fig. FLTK - 16A). Slip on the new vapor hose.

10. Using pliers, depress the hose clamp (Fig. FLTK - 17A) then slide it onto the vapor hose (Fig. FLTK - 17B). With the clamp still depressed, slip the vapor hose onto the roll over valve hose barb (Fig. FLTK - 17C).

11. Place the air filter cover base (Fig. FLTK - 18A) onto the air filter elbow cover. Seat a new, clean air filter element (Fig. FLTK - 18B). Thread on the air filter element wingnut (Fig. FLTK - 18C); tighten.

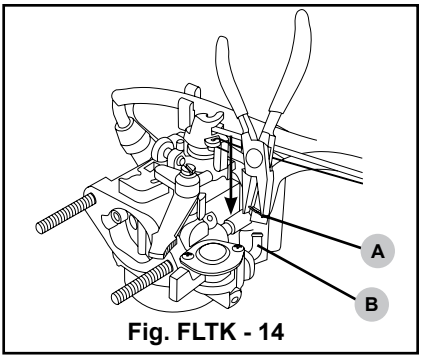


Fig. FLTK - 14

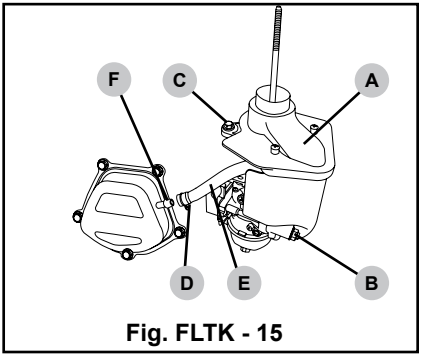


Fig. FLTK - 15

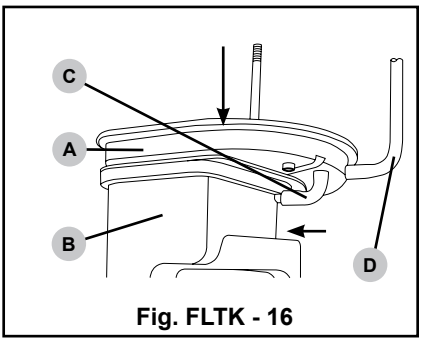


Fig. FLTK - 16

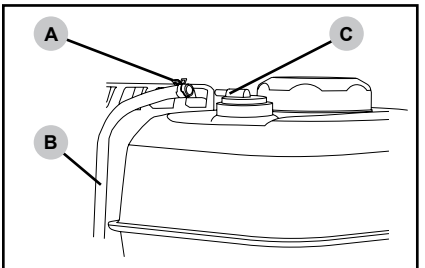


Fig. FLTK - 17

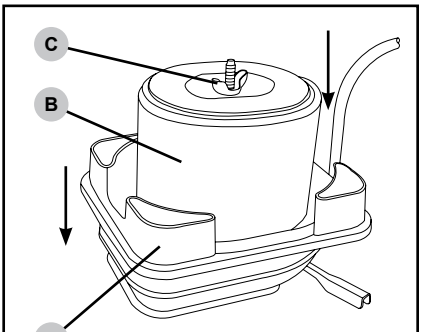


Fig. FLTK - 18

12. Seat the air filter cover (Fig. FLTK - 19A), then tighten the air filter cover wingnut (Fig. FLTK - 19B). Reconnect the spark plug lead to the spark plug (Fig. FLTK - 19C).

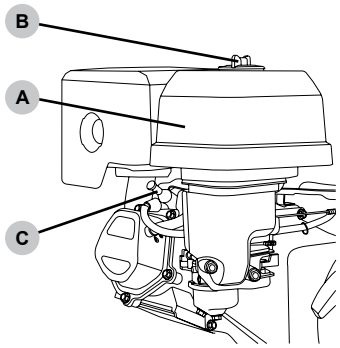


Fig. FLTK - 19

Replacing the Muffler

CAUTION:

Only work on the exhaust system when the engine is completely cooled down. Repairing the exhaust system on a warm or hot engine may cause severe burns.

Muffler removal steps:

1. Disconnect the spark plug lead from the spark plug (Fig. MUFF - 1A).
2. Remove any dirt or debris from the cooling fins around the area of the muffler connection (Fig. MUFF - 2A).
3. Using the appropriate sized socket and ratchet, loosen then remove the nuts securing the muffler to the head (Fig. MUFF - 2B). Remove the muffler assembly.
4. Remove the old gasket (Fig. MUFF - 3A) if it did not come off with the muffler. Next, clean the gasket flange of any debris taking care not to allow it to fall inside the head (Fig. MUFF - 3B).

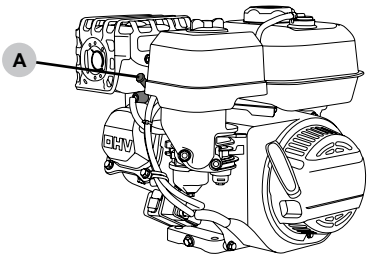


Fig. MUFF - 1

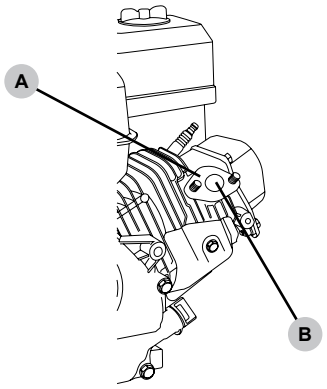


Fig. MUFF - 3

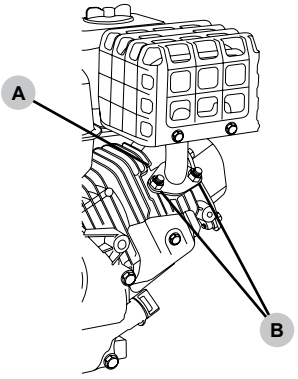


Fig. MUFF - 2

Muffler installation steps:

1. Place the gasket (Fig. MUFF - 4A) onto the mounting studs (Fig. MUFF - 4B).

2. Place the muffler (Fig. MUFF - 4C) onto the mounting studs. Thread on the retaining nuts (Fig. MUFF - 4D).

3. Using a torque wrench and the appropriate size socket, torque the retaining nuts to 17-20 Ft.lb.

4. Reconnect the spark plug lead to the spark plug.

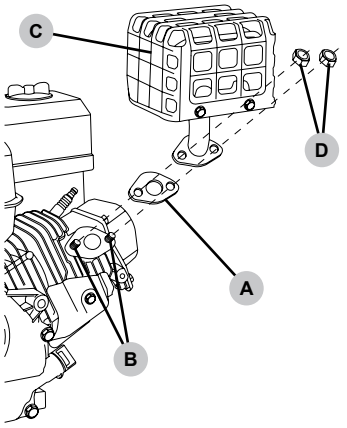


Fig. MUFF - 4

Adjusting the valve clearance

CAUTION:

This procedure should be done with the engine fully cooled down. Rubber gloves should be worn while dealing with oil soaked parts.

Measuring the valve clearance:

1. Disconnect the spark plug lead from the spark plug (Fig. AVC - 1A).
2. Disconnect the breather hose from the valve cover (Fig. AVC - 2A). Note, on some units the hose is inserted into the cover while on some of the larger units, the hose is connected to a barb fitting and secured with a hose clamp.
3. Using a socket and ratchet, remove the four (Fig. AVC - 2B) or five bolts retaining the valve cover. Carefully free the cover.
4. The clearance or gap between the rocker arm (Fig. AVC - 3A) and the end of the valve stem cover (Fig. AVC - 3B) is important so the valve sits fully closed and opens properly. Valves that do not fully close or open properly can cause hard starting, rough idle and may cause damage to the valves and cam shaft.

CRX165 - CRX420 Valve clearances:
Intake: 0.004 - 0.006” (0.10 - 0.15mm)
Exhaust: 0.006 - 0.008” (0.15 - 0.20mm)

CRX460 - CRX530 Valve clearances:
Intake: 0.004 - 0.006” (0.10 - 0.15mm)
Exhaust: 0.004 - 0.006” (0.10 - 0.15mm)

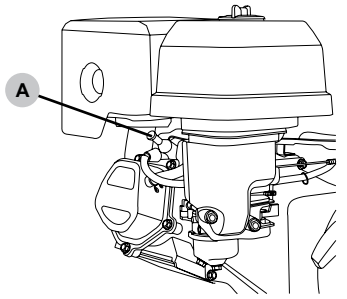


Fig. AVC - 1

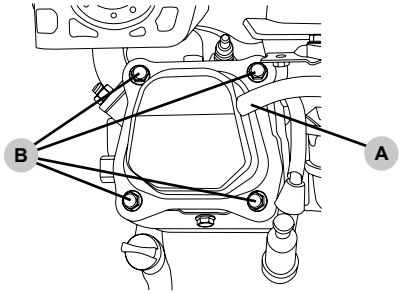


Fig. AVC - 2

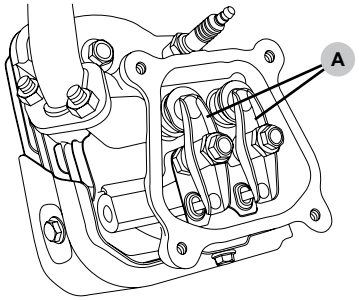


Fig. AVC - 4

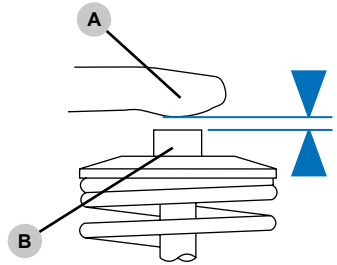


Fig. AVC - 3

5. In order to measure the valve clearance properly, the valves need to be in the closed position. You can easily determine this by noting if the rocker arms (Fig. AVC - 4A) are level with one another. If one of the valves are open, slowly pull the recoil starter handle until the valve closes.

6. To measure the clearance, use a feeler gauge (Fig. AVC - 5A) of the proper thickness for that specific valve; intake (Fig. AVC - 5B) or exhaust (Fig. AVC - 5C). Slip the gauge between the rocker arm and the valve stem cover. An improper gap needs to adjusted.

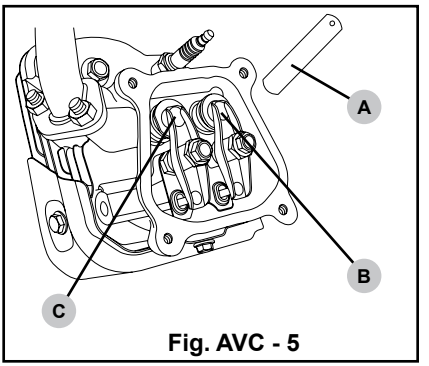


Fig. AVC - 5

Adjusting the valve clearance:

1. Loosen the locking nut (Fig. AVC - 6A) using an open-end wrench (Fig. AVC - 6B).

2. Place a feeler gauge (Fig. AVC - 7A) of the proper thickness between the rocker arm and the valve stem cover.

3. Hand adjust the rocker arm pivot (Fig. AVC - 7B) until the proper gap is met. If required, gently use a wrench.

4. Holding the rocker arm pivot (Fig. AVC - 8A) with an open-end wrench, torque the locking nut (Fig. AVC - 8B) to 7-9 Ft. lb.

5. Once the nut is torqued, recheck the clearance. If required, repeat the process.

6. Inspect the valve cover gasket (Fig. AVC - 9A) for damage or wear. Replace if required.

7. Place the valve cover (Fig. AVC - 10A) onto the cylinder head.

8. Hand thread the valve cover bolts (Fig. AVC - 10B) into the cylinder head. Using a socket and torque wrench, torque to 7-9 Ft. lb. in a criss cross pattern.

9. Reconnect the breather hose (Fig. AVC - 10C) to the valve cover.

10. Reconnect the spark plug lead to the spark plug.

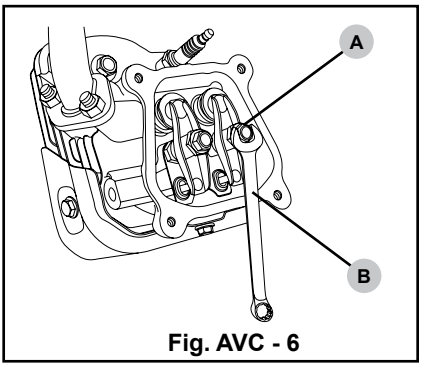


Fig. AVC - 6

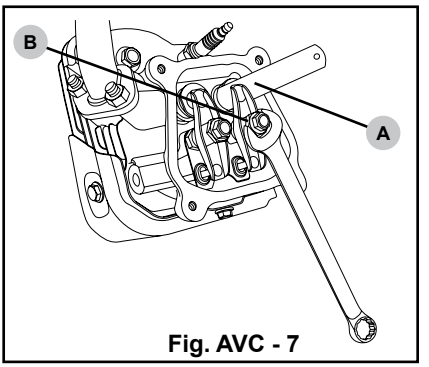


Fig. AVC - 7

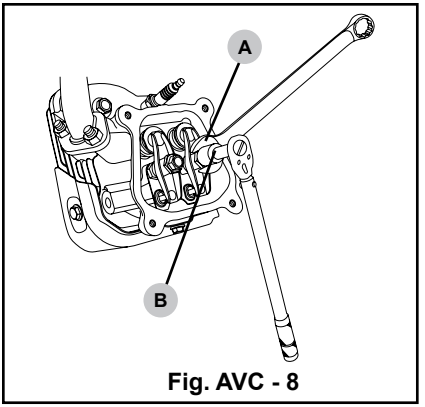


Fig. AVC - 8

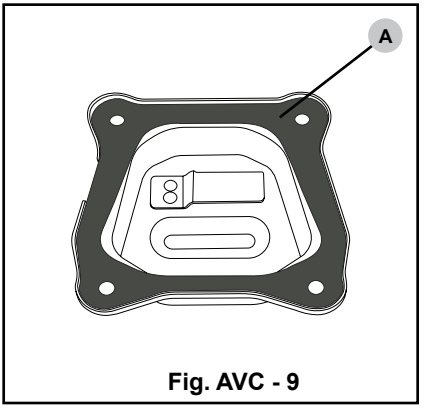


Fig. AVC - 9

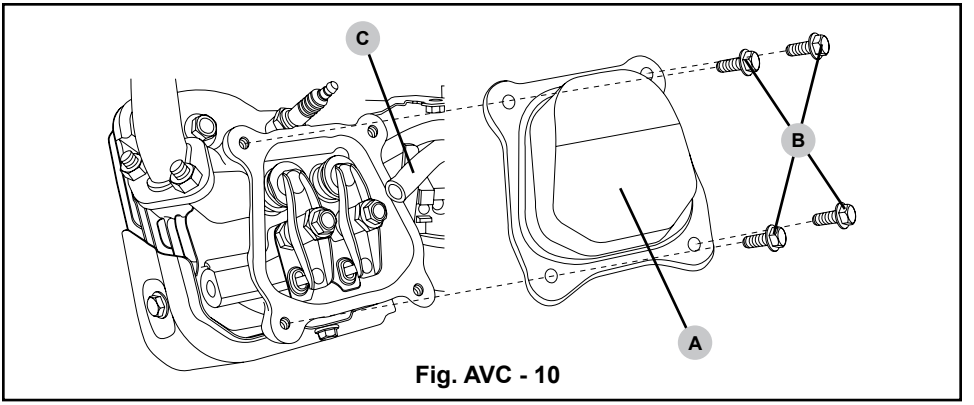


Fig. AVC - 10

Replacing the Head Gasket

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

CAUTION:

This procedure should be done with the engine fully cooled down. Rubber gloves should be worn while dealing with oil soaked parts.

Cylinder head removal procedure:

1. Disconnect the spark plug lead from the spark plug (Fig. HEAD - 1A).
2. Place an appropriate container under the carburetor drain bolt (Fig. HEAD - 1B). Remove the bolt using an open end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly.
3. Loosen the air cleaner cover wingnut (Fig. HEAD - 1C). Remove the air cleaner cover.
4. Loosen the wingnut securing the filter elements (Fig. HEAD - 2A). Remove the air filter elements (Fig. HEAD - 2B).
5. Remove the air cleaner base (Fig. HEAD - 2C).
6. Remove the vacuum hose (Fig. HEAD - 3A) from the air cleaner elbow (Fig. HEAD - 3C). Remove the air cleaner elbow cover (Fig. HEAD - 3B).
7. Using pliers, depress the hose clamp (if equipped) (Fig. HEAD - 4B) on the breather tube (Fig. HEAD - 4C). Remove the breather tube from the valve cover (Fig. HEAD - 4A).

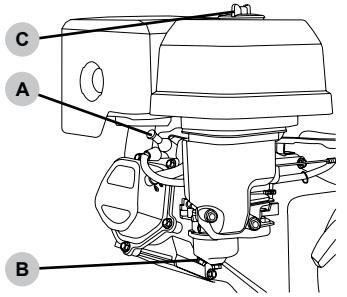


Fig. HEAD - 1

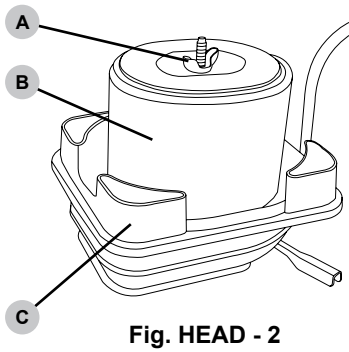


Fig. HEAD - 2

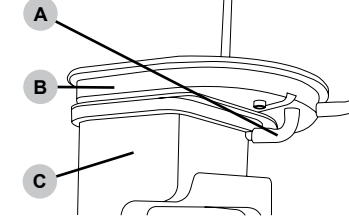


Fig. HEAD - 3

8. Using a nut driver, loosen then remove the two air cleaner elbow retention nuts (Fig. HEAD - 4D).

9. Using a nut driver, loosen then remove the bolt (Fig. HEAD - 4E).

10. Remove the air cleaner elbow (Fig. HEAD - 4F).

11. Using pliers, depress the hose clamp (Fig. HEAD - 5A) on the fuel line (Fig. HEAD - 5B). Remove the fuel line from the fuel valve (Fig. HEAD - 5C).

12. Using needle-nosed pliers, remove the throttle return spring (Fig. HEAD - 5D) from the throttle cam (Fig. HEAD - 5E).

13. Rotate the throttle cam until the governor rod (Fig. HEAD - 5F) can be lifted free.

14. Remove the spark plug lead (Fig. HEAD - 6A) from the carburetor insulator (Fig. HEAD - 6B). Side the carburetor (Fig. HEAD - 6C), gaskets and carburetor insulator off of the mounting bolts.

15. Using an open-end wrench, loosen then remove the two hex nuts (Fig. HEAD - 7A) from the muffler mounting studs. Remove the muffler (Fig. HEAD - 7B) and muffler gasket.

16. **CRX165 to CRX275 models only.** Using a socket and ratchet, loosen then remove the two bolts (Fig. HEAD - 8A) securing the throttle mounting plate (Fig. HEAD - 8B).

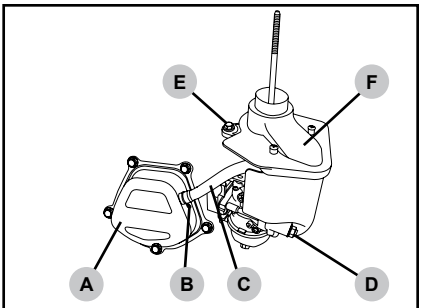


Fig. HEAD - 4

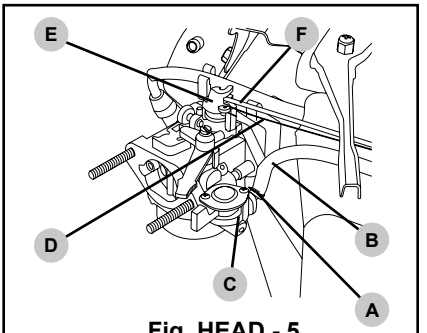


Fig. HEAD - 5

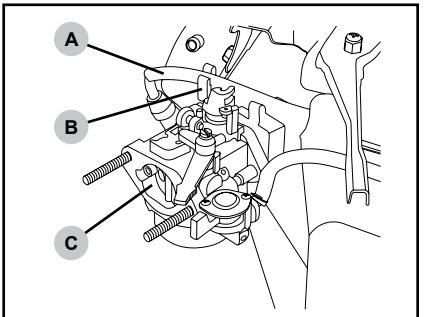


Fig. HEAD - 6

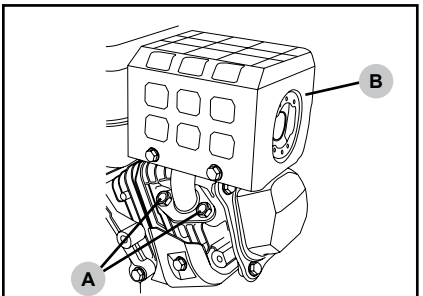


Fig. HEAD - 7

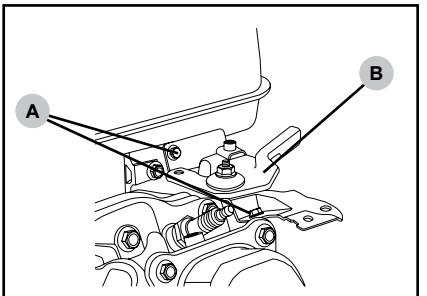


Fig. HEAD - 8

17. **CRX165 to CRX275 models only.** Remove the throttle linkage (Fig. HEAD - 9A) from the throttle mount; rotate the freed mount as indicated so the throttle mount can slide out of the linkage loop.

18. **CRX340 to CRX530 models only.** Using a socket and ratchet, loosen then remove the three bolts (Fig. HEAD - 10A) securing the throttle mounting plate (Fig. HEAD - 10B).

19. **CRX340 to CRX530 models only.** Using needle-nosed pliers, remove the throttle linkage (Fig. HEAD - 11A) from the throttle mount (Fig. HEAD - 11B).

20. **CRX165 to CRX275 models only.** Using a ratchet and socket, remove the three bolts (Fig. HEAD - 12A) securing the air deflector (Fig. HEAD - 12B).

21. Using a ratchet and socket, remove the four (Fig. HEAD - 12C) or five bolts securing the valve cover (Fig. HEAD - 12D). Carefully free the cover.

22. Using a ratchet and socket, remove the four bolts (Fig. HEAD - 13A) securing the cylinder head assembly (Fig. HEAD - 13B). Carefully remove the head in order to not damage the push rods.

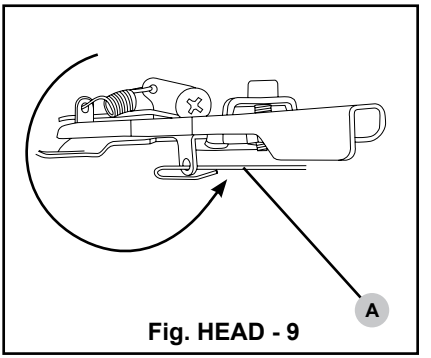


Fig. HEAD - 9

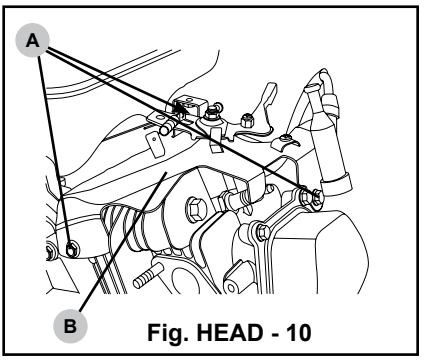


Fig. HEAD - 10

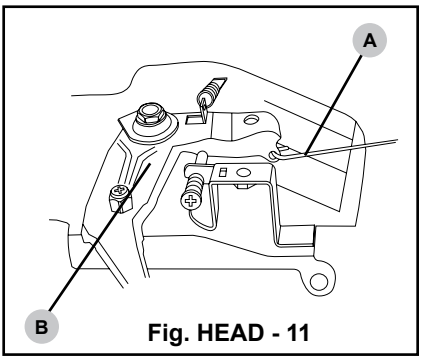


Fig. HEAD - 11

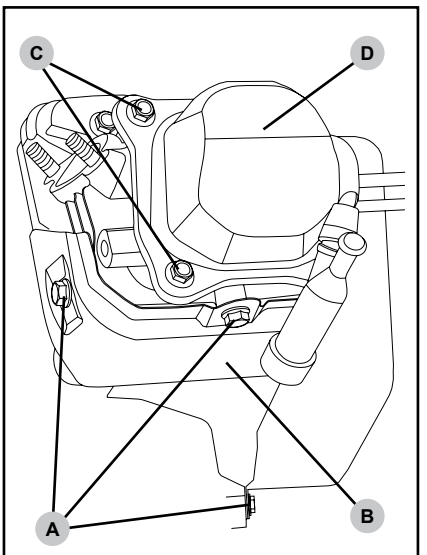


Fig. HEAD - 12

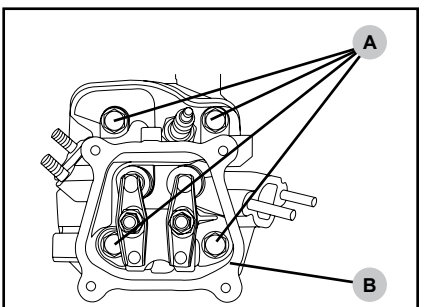


Fig. HEAD - 13

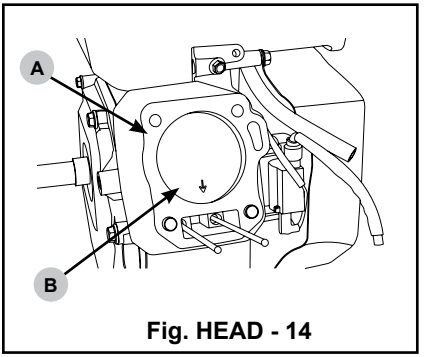


Fig. HEAD - 14

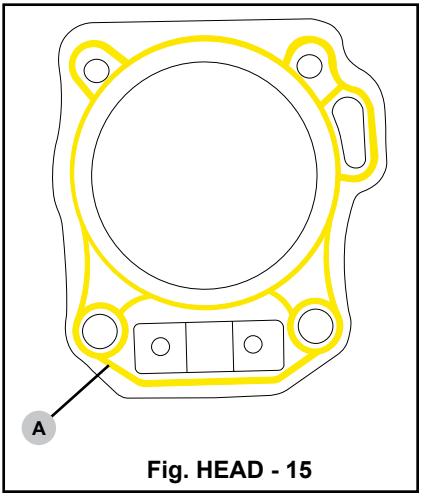


Fig. HEAD - 15

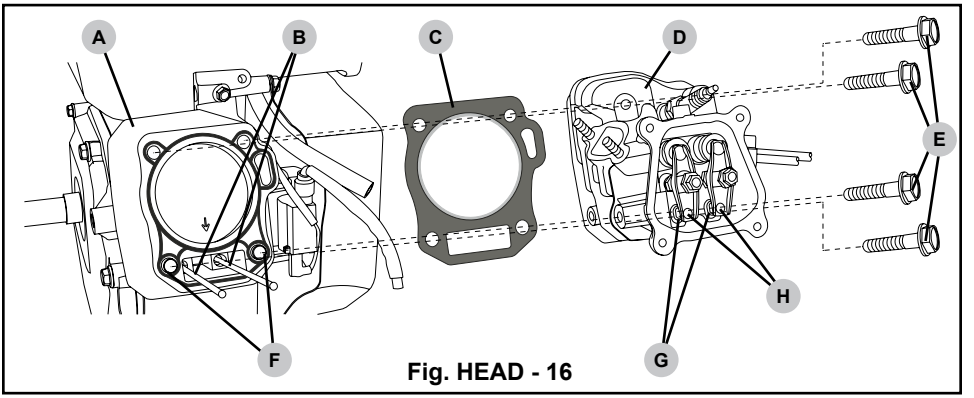


Fig. HEAD - 16

23. Clean the mating surface (Fig. HEAD - 14A) of remnants of the old gasket, sealant and oil.

24. Vacuum the cylinder bore (Fig. HEAD - 14B) of any debris from the previous step.

25. Apply a high-quality gasket sealant to both mating surfaces (head and block) as illustrated in Fig. HEAD - 15A. Do not allow the sealant to get inside the cylinder bore, onto the piston or into the mounting threads.

Cylinder head reassembly procedure:

1. Make sure the dowel pins (Fig. HEAD - 16F) are fully pushed into the engine block (Fig. HEAD - 16A).

2. Place the head gasket (Fig. HEAD - 16C) onto the engine block using the dowel pins for alignment.

3. Lightly oil the tips of the push rods (Fig. HEAD - 16B).

4. Place the head (Fig. HEAD - 16D) onto the engine block making sure the push rods slide through the guides (Fig. HEAD - 16G) and align with the reliefs (Fig. HEAD - 16H) on the rocker arms.

5. Insert the four bolts (Fig. HEAD - 16E) through the head into the engine block. Hand thread the bolts to start their engagement.

6. Following the pattern in Fig. HEAD - 17, use a socket and torque wrench to tighten the head bolts to the requirements below.

	Foot pounds (Ft. lb.)	Newton-meters (N.m)
CRX165	16.2 - 18.4	22 - 25
CRX210	16.2 - 18.4	22 - 25
CRX225	20.7 - 22.1	28 - 30
CRX275	19.2 - 22.1	26 - 30
CRX340	40.6 - 44.3	55 - 60
CRX420	40.6 - 44.3	55 - 60
CRX460	40.6 - 44.3	55 - 60
CRX530	40.6 - 44.3	55 - 60

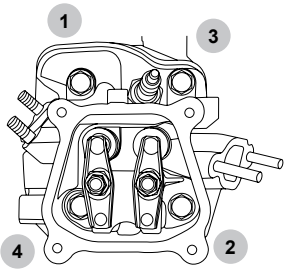


Fig. HEAD - 17

7. Using the instructions in **'Adjusting the Valve Clearance'** section of this manual, verify if the valve clearance will need to be adjusted.

8. **CRX165 to CRX275 models only.** Place the air deflector onto the engine block making sure to slip the lower tab between the block and the blower housing.

9. Inspect the valve cover gasket (Fig. HEAD - 18A) for damage or wear. Replace if required.

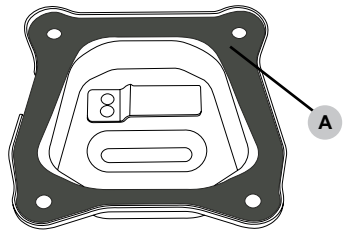


Fig. HEAD - 18

10. Place the valve cover (Fig. HEAD - 19A) onto the cylinder head.

11. Hand thread the valve cover bolts (Fig. HEAD - 19B) into the cylinder head. Using a socket and torque wrench, torque to 7-9 Ft. lb. in a criss cross pattern.

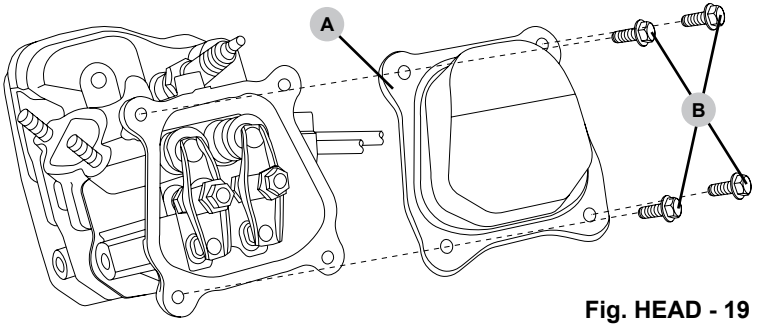


Fig. HEAD - 19

12. **CRX340 to CRX530 models only.** Using needle-nosed pliers, connect the throttle linkage (Fig. HEAD - 20A) to the hole in the throttle mount (Fig. HEAD - 20B).

13. **CRX340 to CRX530 models only.** Place the throttle mount (Fig. HEAD - 21A) onto the engine block. Thread in the three mounting bolts (Fig. HEAD - 21B); torque to 7-9 Ft. lb.

14. **CRX165 to CRX275 models only.** Place the throttle mount (Fig. HEAD - 22A) onto the throttle linkage loop (Fig. HEAD - 22B). Rotate the throttle mount as indicated.

15. **CRX165 to CRX275 models only.** Place the throttle mount (Fig. HEAD - 23A) onto the engine block. Thread in the two mounting bolts (Fig. HEAD - 23B); torque to 7-9 Ft. lb.

16. Inspect the muffler gasket (Fig. HEAD - 24A) for damage; replace if required. Place it onto the mounting studs (Fig. HEAD - 24B).

17. Place the muffler (Fig. HEAD - 24C) onto the mounting studs. Thread on the retaining nuts (Fig. HEAD - 24D).

18. Using a torque wrench and socket, torque the retaining nuts to 17-20 Ft. Lb.

19. Verify the mating surface on the head is clean of debris (Fig. HEAD - 25A).

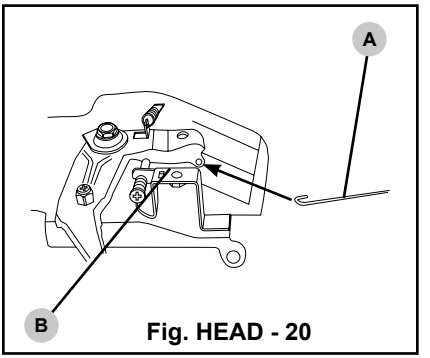


Fig. HEAD - 20

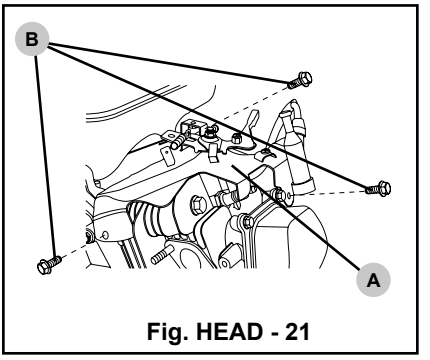


Fig. HEAD - 21

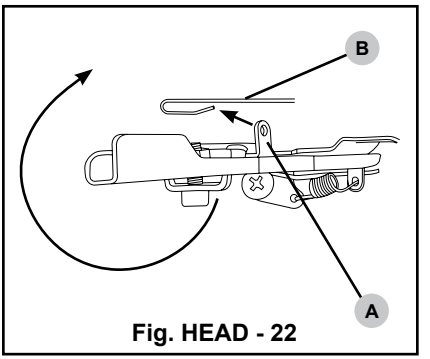


Fig. HEAD - 22

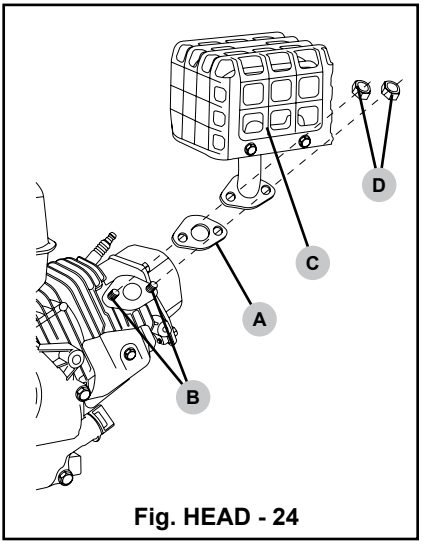


Fig. HEAD - 24

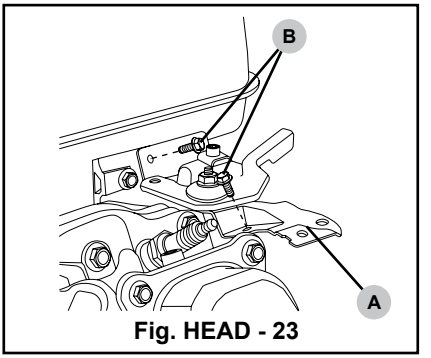


Fig. HEAD - 23

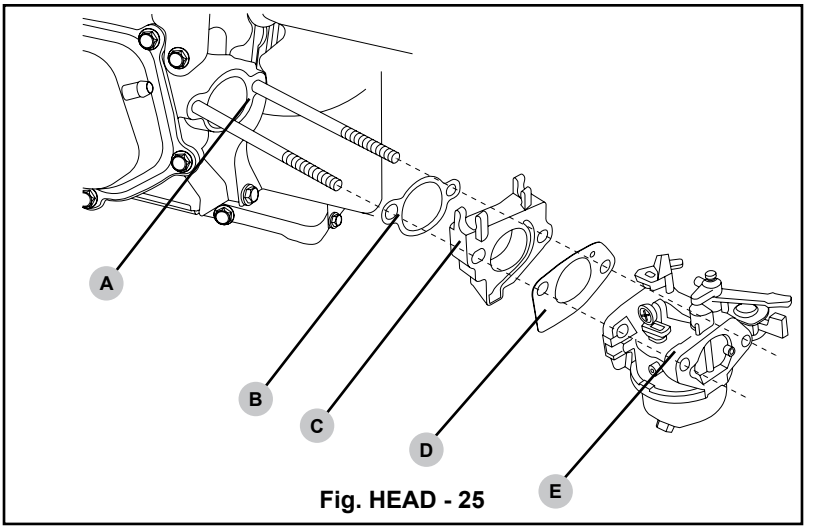


Fig. HEAD - 25

20. Inspect all carburetor gaskets for rips, tears or any other forms of damage, replace if necessary.

21. Place onto the mounting bolts, in this order, the insulator packing (Fig. HEAD - 25B), the carburetor insulator (Fig. HEAD - 25C), the carburetor packing (Fig. HEAD - 25D) and finally the carburetor (Fig. HEAD - 25E).

22. Rotate (if needed) the throttle cam (Fig. HEAD - 26A) so the governor rod (Fig. HEAD - 26B) can be dropped down into the throttle cam.

23. Using needle-nosed pliers, place the throttle return spring (Fig. HEAD - 26C) into the throttle cam (Fig. HEAD - 26A).

24. Place the spark plug lead (Fig. HEAD - 27A) into the carburetor insulator (Fig. HEAD - 27B).

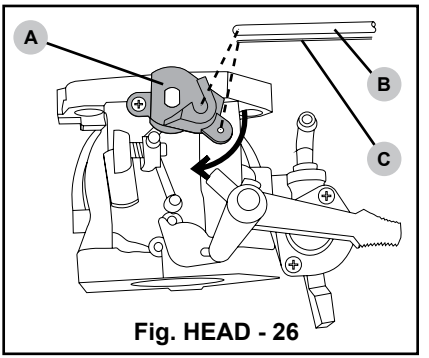


Fig. HEAD - 26

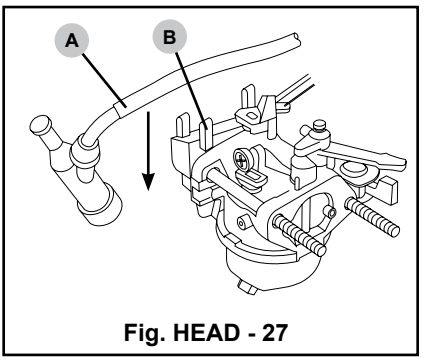


Fig. HEAD - 27

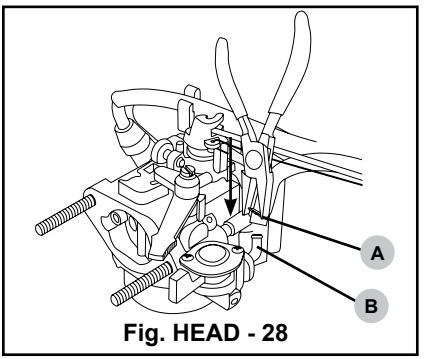


Fig. HEAD - 28

25. Using pliers to depress the fuel line hose clamp (Fig. HEAD - 28A), slip the fuel line onto the carburetor fuel line barb (Fig. HEAD - 28B).

26. Slide the air filter elbow (Fig. HEAD - 29A) onto the mounting bolts. Thread on the (2) nuts (Fig. HEAD - 29B) then thread in the bolt (Fig. HEAD - 29C). Torque to 7-9 Ft. lb.

27. Using pliers, depress the hose clamp (if equipped) (Fig. HEAD - 29D) on the breather tube (Fig. HEAD - 29E). Slip the breather tube onto the valve cover breather (Fig. HEAD - 29F).

28. Place the air cleaner elbow cover (Fig. HEAD - 30A) onto the air cleaner elbow (Fig. HEAD - 30B). Connect the vacuum hose (Fig. HEAD - 30C) to the air cleaner elbow.

39. Place the air filter cover base (Fig. HEAD - 31A) onto the air filter elbow cover. Seat a new, clean air filter element (Fig. HEAD - 31B). Thread on the air filter element wingnut (Fig. HEAD - 31C).

30. Seat the air filter cover (Fig. HEAD - 32A), then tighten the air filter cover wingnut (Fig. HEAD - 32B). Reconnect the spark plug lead to the spark plug (Fig. HEAD - 32C).

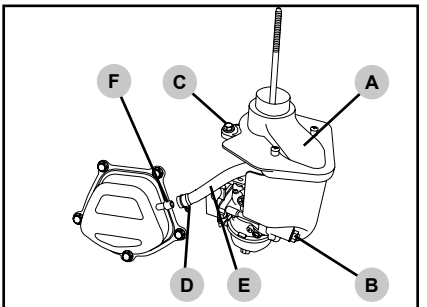


Fig. HEAD - 29

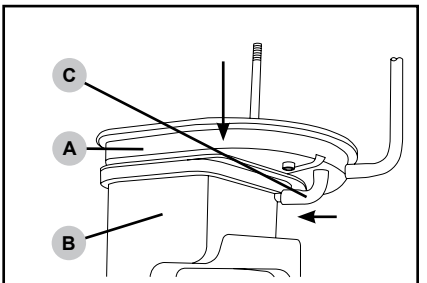


Fig. HEAD - 30

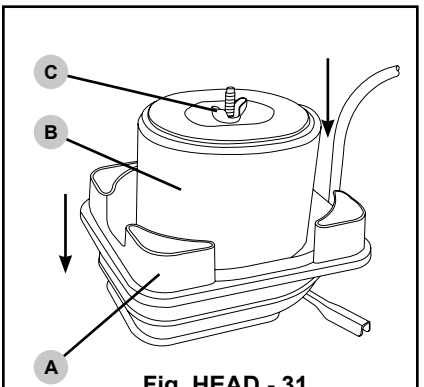


Fig. HEAD - 31

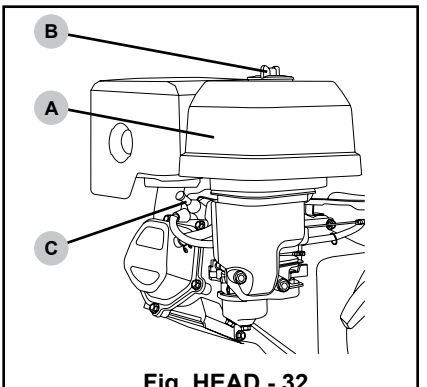


Fig. HEAD - 32

Decompression Yoke Inspection

⚠ CAUTION:

This procedure should be done with the engine fully cooled down. Rubber gloves should be worn while dealing with oil soaked parts. Special caution should be taken when rotating or removing geared parts so as not to cause crushing injuries.

Camshaft removal steps:

1. (Electric start engines) Disconnect the BLACK negative battery lead from the battery.
2. Disconnect the spark plug lead from the spark plug (Fig. DYIR - 1A).
3. Place an appropriate container under the oil drain bolt. Remove the bolt using an socket and ratchet. Allow the oil within the crankcase to drain into the container. Dispose of the oil properly.
4. Using a socket and ratchet, remove the six (Fig. DYIR - 2A) or seven (Fig. DYIR - 2B) bolts retaining the rear cover. Carefully free the cover then pull it backward off of the PTO shaft.
5. In order to remove the cam gear (Fig. DYIR - 3A) you must rotate the PTO (Fig. DYIR - 4) so the timing marks align (Fig. DYIR - 5).

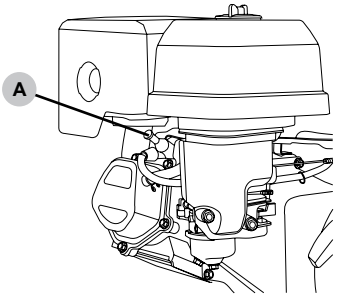


Fig. DYIR - 1

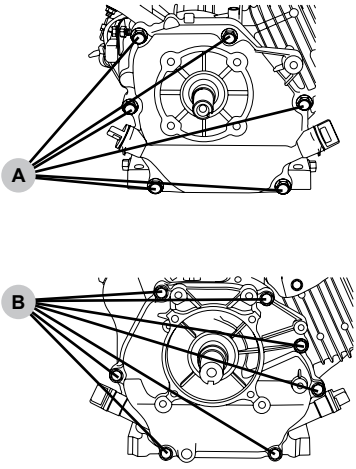


Fig. DYIR - 2

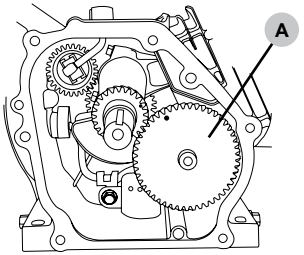


Fig. DYIR - 3

6. Carefully remove the camshaft by gripping the timing gear and gently pulling the camshaft straight out of the crankcase.

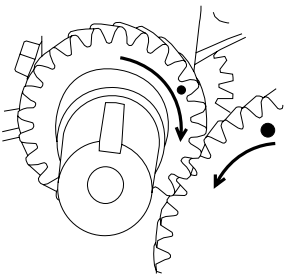


Fig. DYIR - 4

Decompression yoke inspection:

1. The counterweight (Fig. DYIR - 6A) should move freely when pushed without binding and return to its rested position without assistance.
2. As the counterweight moves, it should cause the auxiliary cam (Fig. DYIR - 6B) to move as indicated.
3. When the counterweight (Fig. DYIR - 7A) is pushed, the return spring (Fig. DYIR - 7B) should stretch freely without binding.
4. Should any of the following conditions be noted, the camshaft assembly will need to be replaced:

   Broken or missing pieces.
   Binding in the moving parts.
   Worn auxiliary cam.
   Weakened return spring.

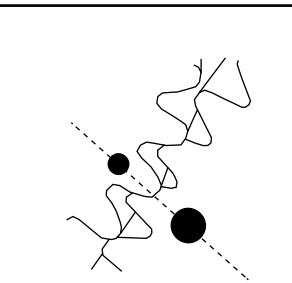


Fig. DYIR - 5

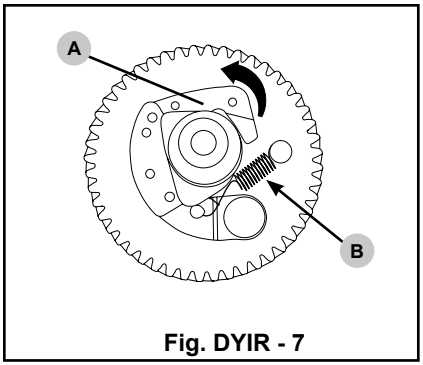


Fig. DYIR - 7

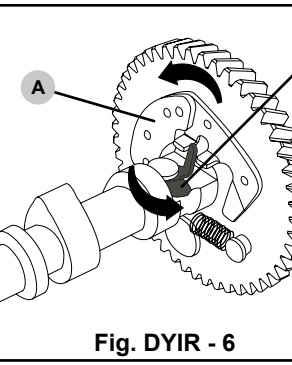


Fig. DYIR - 6

Camshaft assembly:

1. Insert the camshaft (Fig. DYIR - 7A) into the crankcase making sure to align the timing mark to the mark on the crank gear (Fig. DYIR - 7B). Note, you may need to insert the push rods for the cams to go in easily.
2. Remove the old crankcase housing gasket (Fig. DYIR - 7C); discard. Place a new gasket onto the housing surface.

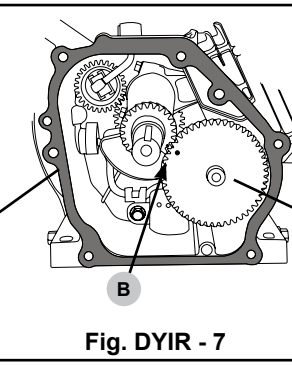


Fig. DYIR - 7

3. Carefully slide the crankcase cover over the PTO shaft. Align the cover with the dowel pins and evenly press it to the crankcase housing.
4. Hand thread the six or seven flange head cap screws. With a socket and torque wrench, follow the tightening patterns in (Fig. DYIR - 8) or (Fig. DYIR - 9). Torque to 13-16 Ft. lb. (**CRX275 or smaller**), 16-18 Ft. lb. (**CRX340 or larger**).
5. Fill the crankcase with fresh oil until the top line is met on the dipstick. Inspect the seals for leaks.

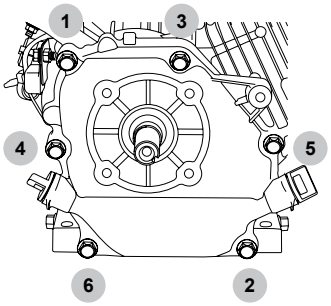


Fig. DYIR - 8

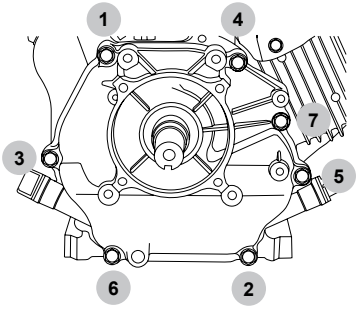


Fig. DYIR - 9

Setting the Maximum Engine Speed

DANGER:

This procedure involves working on the fuel system. DO NOT work in an area with open flames or sparks. DO NOT smoke while working on the fuel system. Promptly wipe up fuel spills. Gasoline fumes can collect and cause nausea. Work in a well ventilated area and remove yourself to fresh air if you feel lightheaded or nauseated.

Maximum engine speed adjustment steps:

1. Disconnect the spark plug lead from the spark plug (Fig. GOV - 1A).
2. Place an appropriate container under the carburetor drain bolt (Fig. GOV - 1B). Remove the bolt using an open end wrench. Allow the remaining fuel within the carburetor bowl and the fuel tank to drain into the container. Dispose of the fuel properly. Thread in the drain bolt; tighten securely.
3. Loosen then remove the fasteners from the fuel tank (Fig. GOV - 2). Remove the fuel tank being careful not to damage the fuel line. Move the tank forward enough to allow access to the governor arm.
4. Loosen the nut (Fig. GOV - 3A) on the governor arm.
5. Rotate the governor arm (Fig. GOV - 3B) clockwise so as to open the throttle fully.
6. Rotate the governor shaft (Fig. GOV - 3C) clockwise as far as it will rotate.
7. Tighten the nut (Fig. GOV - 3A) on the governor arm to 7-9 Ft. lb.

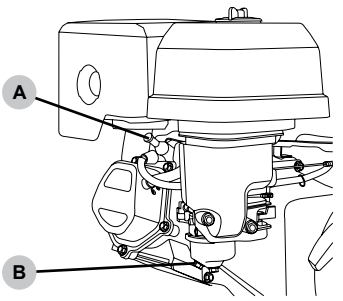


Fig. GOV - 1

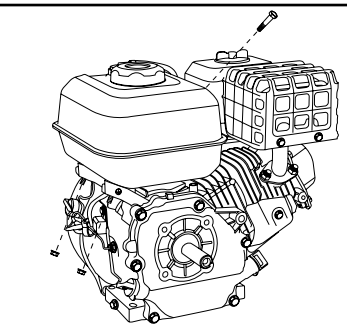
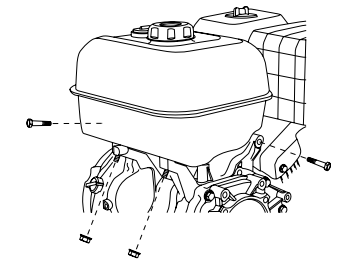



Fig. GOV - 2

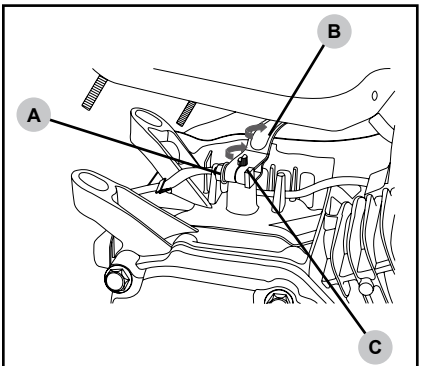


Fig. GOV - 3

8. Place the fuel tank back onto its mounting cradle. Thread the two lock nuts onto the tank studs. Torque to 7-9 Ft. lb. (CRX275 or smaller), 17-20 Ft. lb.(CRX340 to CRX530 models).

9. Thread the bolt(s) into the tank. Torque to 7-9 Ft. lb. (CRX275 or smaller), 17-20 Ft. lb.(CRX340 to CRX530 models).

10. Connect the spark plug lead to the spark plug (Fig. GOV - 4A). Clamp the probe of a tachometer (Fig. GOV - 4B) to the spark plug lead.

11. Fill the fuel tank with fresh fuel for testing.

12. With the engine in a fume hood or outside in open air, start the engine and allow it to warm to normal operating temperature.

13. The maximum allowed speed is 3600 rpm +/-150 rpm.

14. With the engine still running, move the throttle lever (Fig. GOV - 5A) to reach the maximum speed allowed for the engine.

15. While holding the throttle lever at the point found above, tighten the adjustment screw (Fig. GOV - 5B) to lock the lever movement at this maximum position. Once the screw has been adjusted properly, place a drip of thread retainer (Fig. GOV - 6) onto the thread to lock the screw into place.

16. Stop the engine and allow it to cool down.

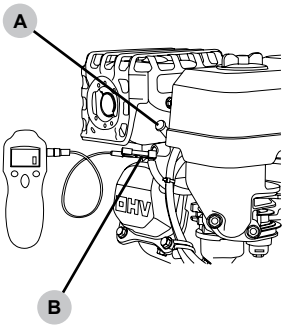


Fig. GOV - 4

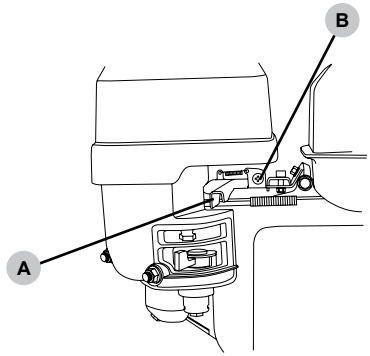


Fig. GOV - 5

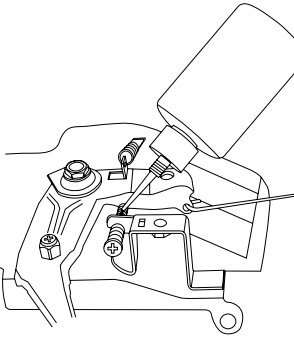
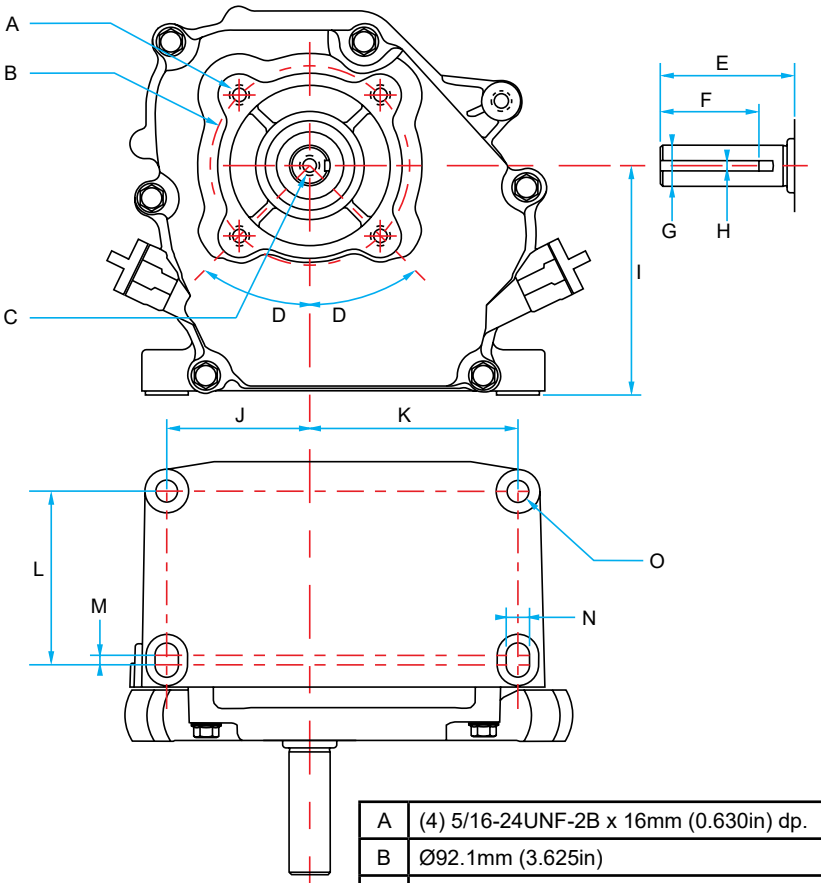


Fig. GOV - 6

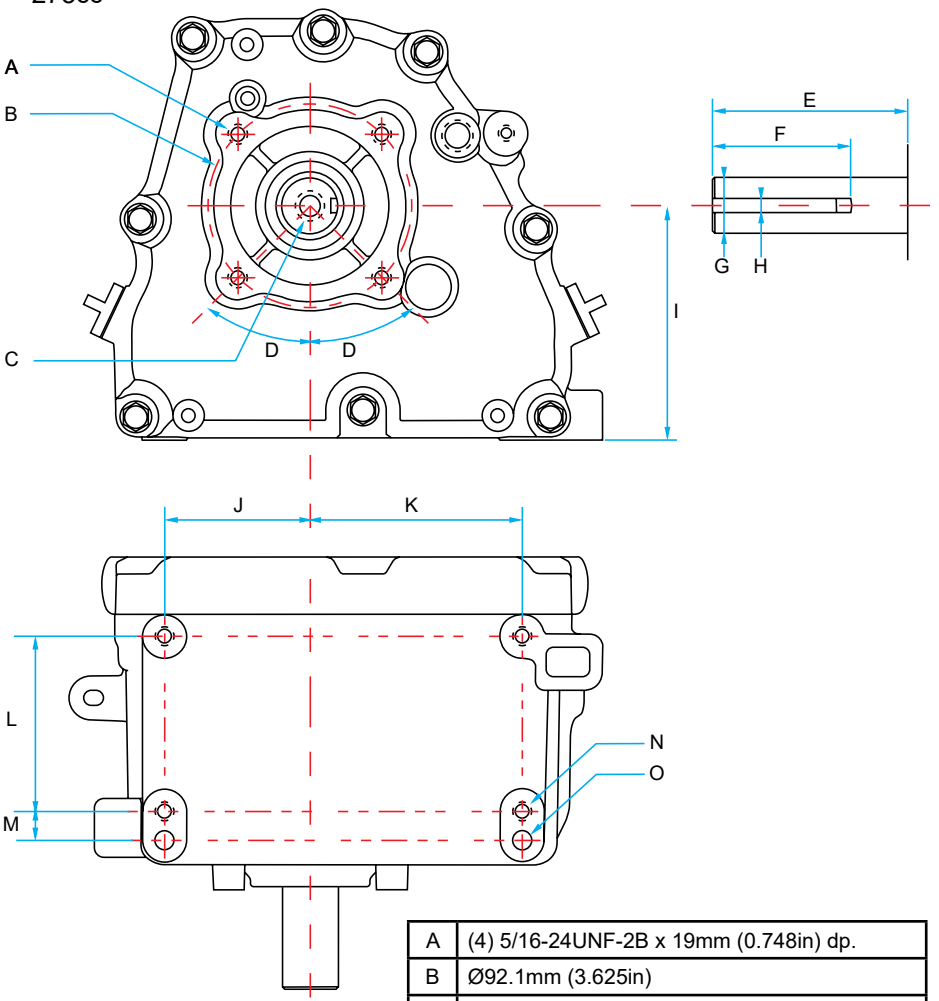
MOUNTING & PTO DIMENSIONS

165cc, 210cc, 225cc



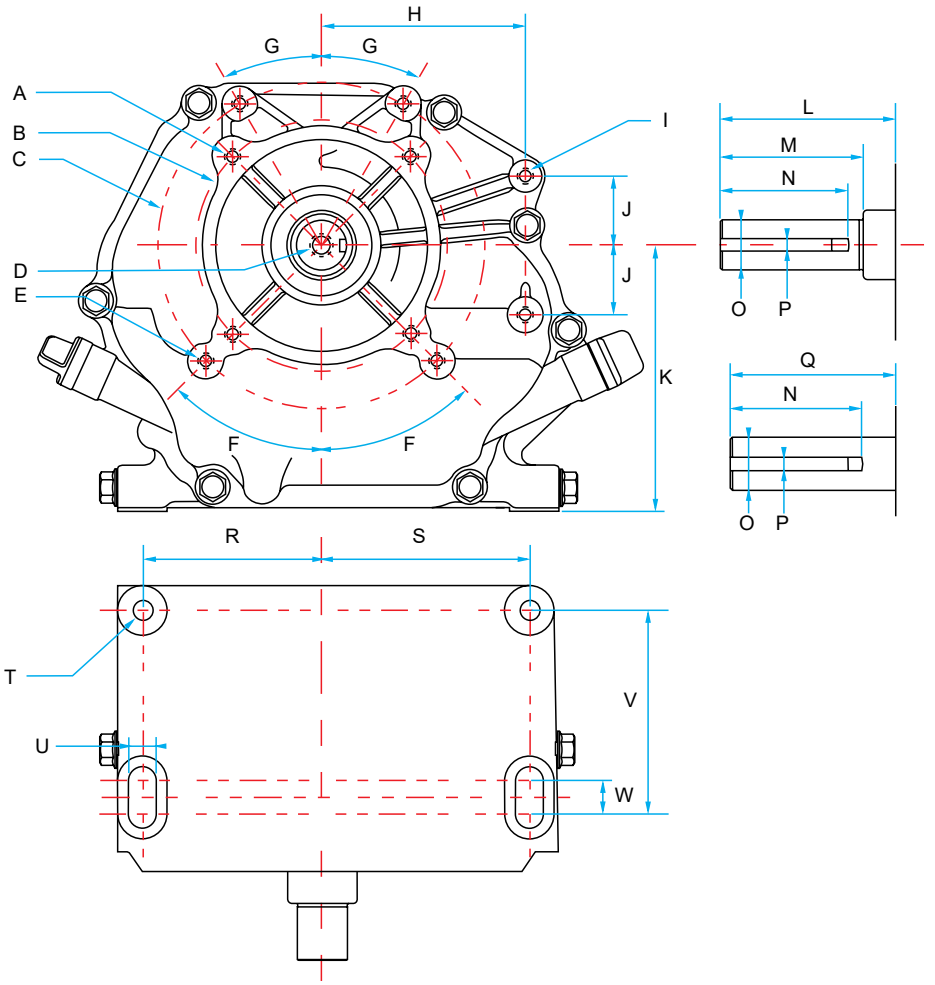
A	(4) 5/16-24UNF-2B x 16mm (0.630in) dp.
B	Ø92.1mm (3.625in)
C	5/16-24UNF-2B x 30mm (1.181in) dp.
D	45°
E	61.7mm (2.430in)
F	45.5mm (1.791in)
G	19.05mm (0.750in) +0 / -0.03mm (0.001in)
H	4.75mm (0.187in)
I	106mm (4.173in)
J	66mm (2.598in)
K	96mm (3.780in)
L	80.3mm (3.161in)
M	4.5mm (0.177in)
N	10mm (0.394in)
O	Ø10mm (0.394in)

275cc



A	(4) 5/16-24UNF-2B x 19mm (0.748in) dp.
B	Ø92.1mm (3.625in)
C	7/16-20UNF x 28mm (1.102in) dp.
D	45°
E	73.5mm (2.894in)
F	56mm (2.205in)
G	25.4mm (1.00in) +0 / -0.021mm (0.0008in)
H	6.3mm (0.248in)
I	106mm (4.173in)
J	66mm (2.598in)
K	96mm (3.780in)
L	79.4mm (3.126in)
M	13mm (0.512in)
N	(4) M8 x 18mm (0.709in) dp.
O	Ø10.2mm (0.402in) x 28mm (1.102in) dp.

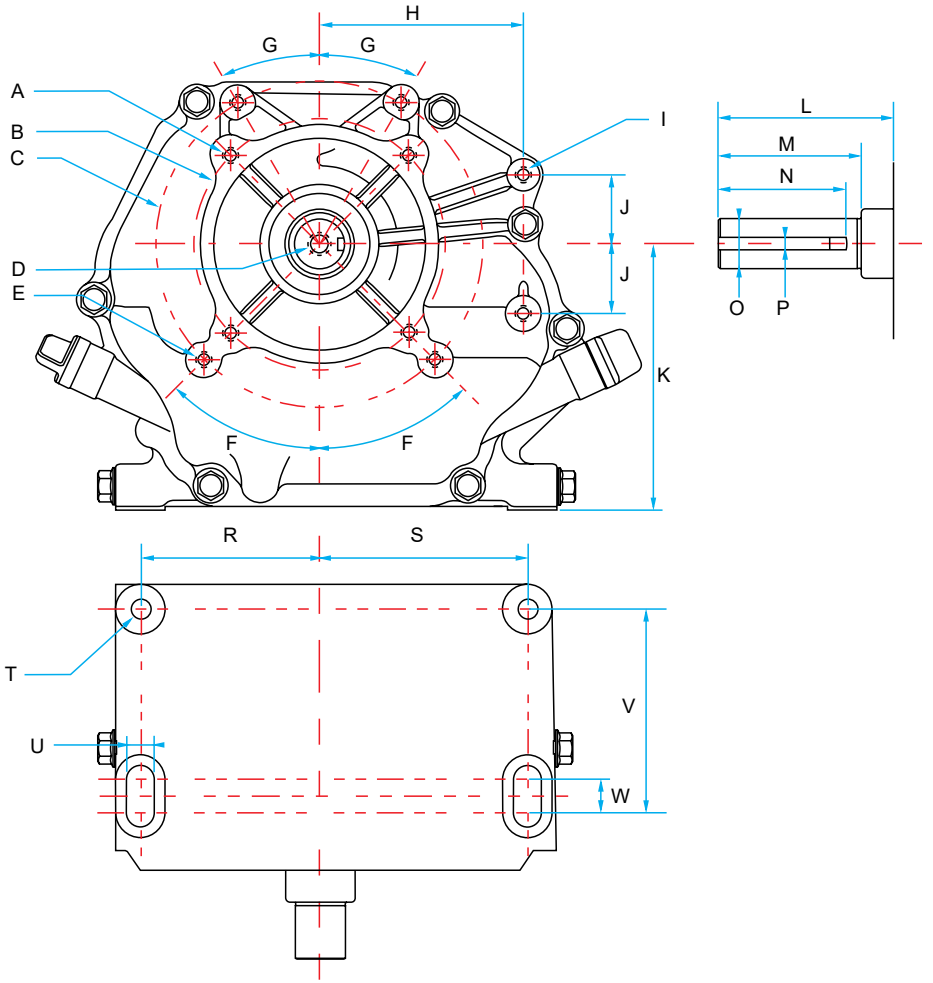
340cc, 420cc, 460cc



A	(4) 5/16-24UNF x 17mm (0.670in) dp.
B	Ø127mm (5.00in)
C	Ø165.1mm (6.50in)
D	7/16-20UNF x 28mm (1.102in) dp.
E	(4) 3/8-16UNC x 18mm (0.709in) dp.
F	45°
G	30°
H	103mm (4.055in)
I	(2) 5/16-24UNF x 18mm (0.709in) dp.
J	35mm (1.378in)
K	133.5mm (5.256in)
L	88.5mm (3.484in)

M	72.2mm (2.843in)
N	56mm (2.205in)
O	25.4mm (1.00in) -.02mm (0.0008in) / -0.053mm (0.002in)
P	6.3mm (0.248in)
Q	73.5mm (2.894in)
R	90.5mm (3.563in)
S	105mm (4.134in)
T	Ø12mm (0.47in)
U	14mm (0.551in)
V	103mm (4.055in)
W	17mm (0.669in)

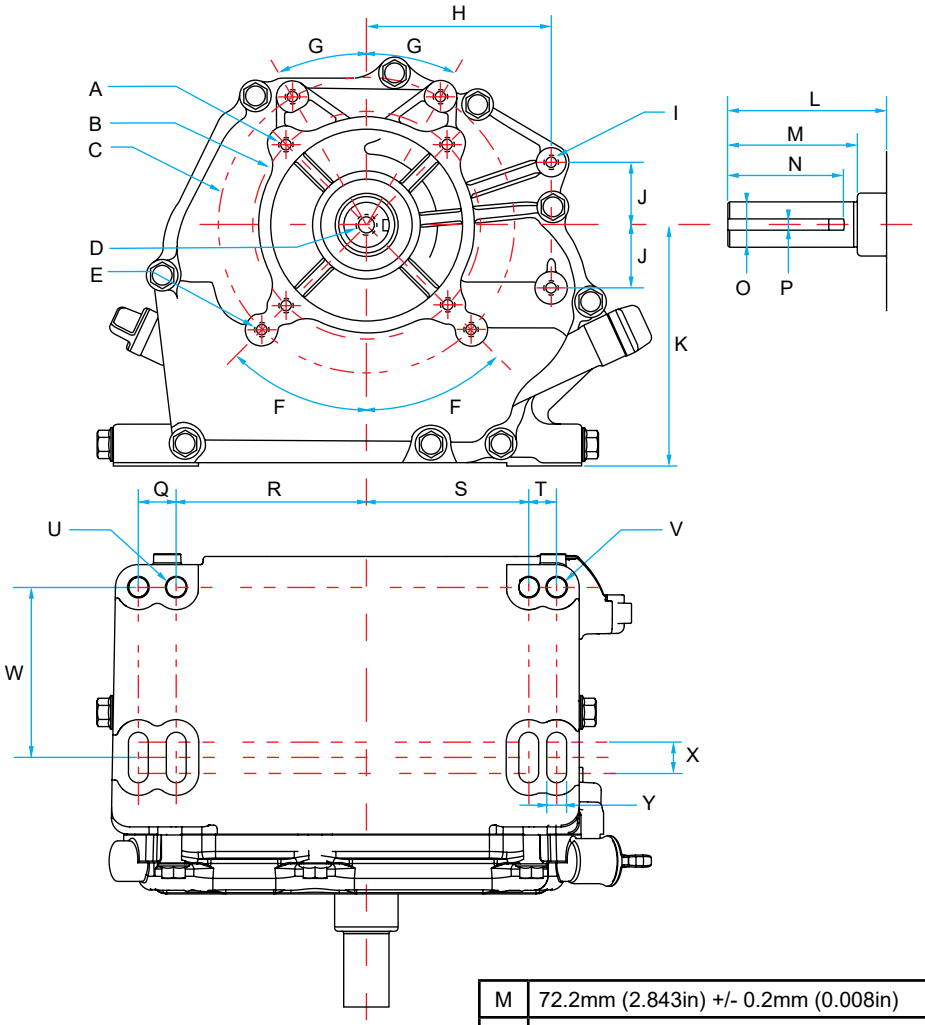
420cc commercial, 460cc commercial



A	(4) 5/16-24UNF x 17mm (0.670in) dp.
B	Ø127mm (5.00in)
C	Ø165.1mm (6.50in)
D	7/16-20UNF x 28mm (1.102in) dp.
E	(4) 3/8-16UNC x 18mm (0.709in) dp.
F	45°
G	30°
H	103mm (4.055in)
I	(2) 5/16-24UNF x 18mm (0.709in) dp.
J	35mm (1.378in)
K	133.5mm (5.256in)
L	88.5mm (3.484in)

M	72.2mm (2.843in)
N	56mm (2.205in)
O	25.4mm (1.00in) -.02mm (0.0008in) / -0.053mm (0.002in)
P	6.3mm (0.248in)
Q	73.5mm (2.894in)
R	105mm (4.134in)
S	90.5mm (3.563in)
T	Ø12mm (0.47in)
U	14.1mm (0.555in)
V	103mm (4.055in)
W	17mm (0.669in)

530cc



A	(4) 5/16-24UNF x 24mm (0.945in) dp.
B	Ø127mm (5.00in)
C	Ø165.1mm (6.50in)
D	7/16-20UNF x 28mm (1.102in) dp.
E	(4) 3/8-16UNC x 18mm (0.709in) dp.
F	45°
G	30°
H	103mm (4.055in) +/-0.15mm (0.006in)
I	(2) 5/16-24UNC x 18mm (0.709in) dp.
J	35mm (1.378in)
K	133.5mm (5.256in)
L	88.5mm (3.484in) +/-0.68mm (0.027in)

M	72.2mm (2.843in) +/- 0.2mm (0.008in)
N	56mm (2.205in) +/- 0.3mm (0.012in)
O	25.4mm (1.00in) -.02mm (0.0008in) / -0.053mm (0.002in)
P	6.3mm (0.248in)
Q	21mm (0.827in)
R	105.5mm (4.154in)
S	90.5mm (3.563in)
T	16mm (0.630in)
U	Ø11mm (0.433in) +0.1mm (0.004in)/-0
V	Ø10.9mm (0.429in) +0.1mm (0.004in)/-0
W	94.5mm (3.720in) +/- 0.5mm (0.020in)
X	17mm (0.669in) +/- 0.1mm (0.004in)
Y	11mm (0.433in) +/- 0.2mm (0.008in)

REVISION DOCUMENTATION

REV	DATE	NOTES
A	1-2025	Original document release.

Part Number: 7125781 REV A - 1/2025