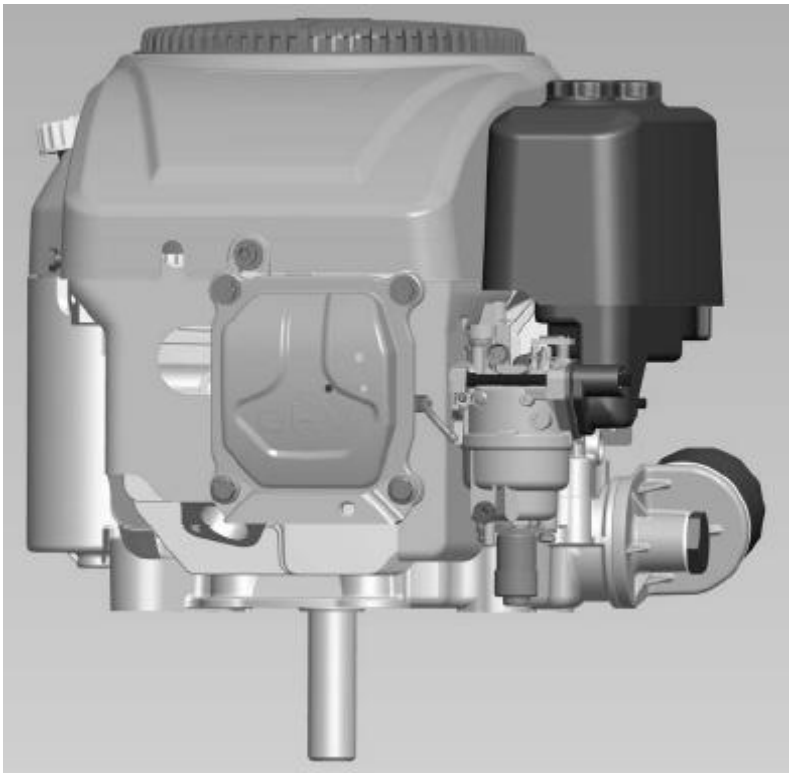
RESIDENTIAL PRODUCTS

RIDING PRODUCT
ENGINE SERVICE MANUAL

LC1P92F (452cc)



About this Manual

This service manual was written expressly for Toro service technicians. The Toro Company has made every effort to make the information in this manual complete and correct. Basic shop safety knowledge and mechanical/electrical skills are assumed. The Table of Contents lists the systems and the related topics covered in this manual. An electronic version of this service manual is available on the Toro Dealer Portal. We are hopeful that you will find this manual a valuable addition to your service shop. If you have any questions or comments regarding this manual, please contact us at the following address:

The Toro Company
Residential and Landscape Contractor Service Training Department
8111 Lyndale Avenue South
Bloomington, MN 55420

NOTES:

Chapter 1 – General Service Information

1

Safety

Safety Information

This symbol means **WARNING or PERSONAL SAFETY INSTRUCTION** – read the instruction because it has to do with your safety. Failure to comply with the instruction may result in personal injury or even death.
This manual is intended as a service and repair manual only. The safety instructions provided herein are for troubleshooting, service, and repair of the Toro engine. The Toro operator's manual contains safety information and operating tips for safe operating practices.

Avoid Unexpected Engine Start - Turn off engine and disconnect the spark plug before servicing engine.

Avoid Lacerations and Amputations - Stay clear of all moving parts while the engine is running.

Avoid Burns - Do not touch the engine, muffler, or other components which may increase in temperature during operation, while the unit is running or shortly after it has been running.

Avoid Fires and Explosions - Avoid spilling fuel and never smoke while working with any type of fuel or lubricant. Wipe up any spilled fuel or oil immediately. Never remove the fuel cap or add fuel when the engine is running. Always use approved, labeled containers for storing or transporting fuel and lubricants.

Avoid Asphyxiation - Never operate an engine in a confined area without proper ventilation.

Avoid Injury From Batteries - Battery acid is poisonous and can cause burns. Avoid contact with skin, eyes, and clothing. Battery gases can explode. Keep cigarettes, sparks, and flames away from the battery.

Avoid Injury Due To Inferior Parts - Use only original equipment parts to ensure that important safety criteria are met.

Avoid Injury To Bystanders - Always clear the area of bystanders before starting or testing power equipment.

Avoid Injury Due To Projectiles - Always clear the area of sticks, rocks, or any other debris that could be picked up and thrown by the power equipment.

Avoid Modifications - Never alter or modify any part unless it is a factory approved procedure.

Service Rules

1

1. **Only use genuine Toro parts and lubrication products.**

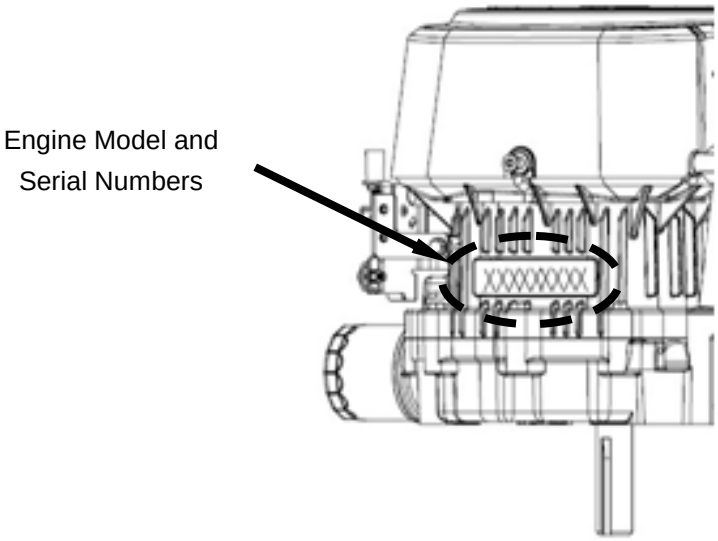
2. **Always install new gaskets, O-rings and seals when assembling engine.**

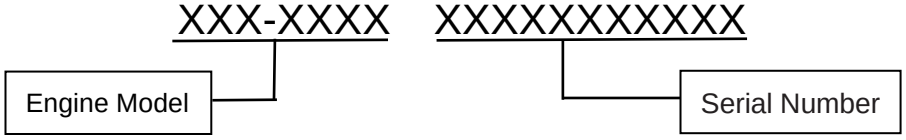
3. **Always torque fasteners to specification and in sequence.**

4. **Always lubricate friction components with clean engine oil or engine assembly lube when assembling engine.**

Engine Model / Serial Number Location

The engine model and serial number are stamped into the crankcase.





Engine Fastener Torque Specifications

Oil Drain Valve	7 ft-lbs (10 Nm)
Oil Filter Adaptor Bolt	31 ft-lbs (42 Nm)
Spark Plug	20 ft-lbs (28 Nm)
Connecting Rod Bolts	12 ft-lbs (16 Nm)
Crankcase Cover Bolt	20 ft-lbs (28 Nm)
Fuel Pump Asm. Mounting Bolts	7 ft-lbs (10 Nm)
Breather Plate Bolts	7 ft-lbs (10 Nm)
Cylinder Head Bolts	40 ft-lbs (54 Nm)
Rocker Arm Studs	23 ft-lbs (31 Nm)
Rocker Arm Pivot Lock Nut	11 ft-lbs (15 Nm)
Alternator Bolts	7 ft-lbs (10 Nm)
Valve Cover Bolts	7 ft-lbs (10 Nm)
Flywheel Nut	81 ft-lbs (110 Nm)
Ignition Coil Bolts	7 ft-lbs (10 Nm)
Starter Motor Bolts	20 ft-lbs (28 Nm)
Carburetor Mounting Nuts	7 ft-lbs (10 Nm)
Throttle / Choke Bracket Asm. Bolts	7 ft-lbs (10 Nm)
Fan Cover Nuts	7 ft-lbs (10 Nm)
Fan Shroud Bolts	7 ft-lbs (10 Nm)
Standard Torque Values	M5 Bolt / Nut – 4.5 ft-lbs (6 Nm)
	M6 Bolt / Nut – 7.5 ft-lbs (10 Nm)
	M8 Bolt / Nut – 19 ft-lbs (26 Nm)
	M10 Bolt / Nut – 28 ft-lbs (38 Nm)
	M12 Bolt / Nut – 41 ft-lbs (55 Nm)

General Specifications

1

Model	1P92F-1
Type	Single Cylinder, 4-Stroke, Forced Air Cooling, OHV
Bore X Stroke (mm)	92×68
Displacement (cc)	452
Compression Ratio	8.8 :1
Lubrication	Oil Pump with Oil Filter
Starting	Electric
Rotation	Counter Clockwise (From P.T.O. Side)
Ignition System	Transistorized Magneto Ignition
Air Cleaner	Foam and Paper
Fuel Type	Unleaded Gasoline, 87 Octane
Oil Capacity	34 oz. (1.0 L) Without Filter Change 36 oz. (1.05 L) With Filter Change
Dimension (L×W×H) (mm)	432×388×300
Weight	68.3 lbs. (31 kg)

Engine Specifications

Part	Item	Standard	Service Limit
Engine	Operating RPM	3350 – 3450 RPM	—
	Idle RPM	1700 – 2000 RPM	—
Cylinder Head	Warpage	—	0.00393” (0.10 mm)
Cylinder	Sleeve Taper / Out of Round (Inside Diameter)	3.6220” - 3.6224” (92-92.01 mm)	3.6259” (92.10 mm)
Piston	Skirt Outside Diameter	3.620 - 3.621” (91.96-91.975 mm)	3.6196” (91.940 mm)
	Cylinder Clearance	0.00098 - 0.0017” (0.025-0.045 mm)	0.0032” (0.081 mm)
	Piston Pin Bore Inside Diameter	0.7870 - 0.7877” (20.002-20.008 mm)	0.7879” (20.01 mm)
	Piston Pin Clearance	0.00016 - 0.00063” (0.004-0.016 mm)	0.0011” (0.029 mm)
Piston Pin	Outside Diameter	0.7871 - 0.7873” (19.992-19.998 mm)	0.7834” (19.9 mm)
Piston Rings	Ring To Groove (Top and Middle)	0.00079 - 0.00236” (0.02-0.06 mm)	0.00433” (0.11 mm)
	End Gap (Top and Middle)	0.0059 - 0.0118” (0.15-0.30 mm)	0.0137” (0.35 mm)
	Width (Top and Middle)	0.046 - 0.0468” (1.17-1.19 mm)	0.0433” (1.10 mm)
	Width (Oil Ring)	0.11 - 0.126” (2.8-3.2 mm)	0.1063” (2.7 mm)
Connecting Rod	Small End Inside Diameter	0.79 - 0.788” (20.07-20.018 mm)	0.7881” (20.02 mm)
	Big End Inside Diameter	1.4179 - 1.4183” (36.015-36.025 mm)	1.4185” (36.03 mm)
	Big End Oil Clearance	0.00157 - 0.00248” (0.04-0.063 mm)	0.0047” (0.12 mm)
	Big End Side Clearance	0.00079 - 0.0138” (0.02-0.35 mm)	0.00157” (0.4 mm)
Crankshaft	Crankpin Outside Diameter	1.417 - 1.4165” (35.966-35.981 mm)	1.415” (35.946 mm)
Valve	Clearance (cold) (Intake)	0.0039” (0.10 mm)	—
	Clearance (cold) (Exhaust)	0.0059” (0.15 mm)	—
	Stem Diameter (Intake)	0.2584 - 0.2590”(6.565-6.58 mm)	0.2579” (6.550 mm)
	Stem Diameter (Exhaust)	0.2577 - 0.2583” (6.545-6.56 mm)	0.2571” (6.530 mm)
Valve Guides	Inside Diameter (Intake, Exhaust)	0.2362 - 0.2604” (6.0-6.615 mm)	0.2606” (6.620 mm)
	Stem to Guide Clearance (Intake)	0.00079 - 0.00197” (0.02-0.05 mm)	0.0047” (0.12 mm)
	Stem to Guide Clearance (Exhaust)	0.00157 - 0.00275” (0.04-0.070 mm)	0.00669” (0.17 mm)
Valve Seat	Seat Width	0.03149 - 0.0393” (0.8-1.0 mm)	0.0591” (1.5 mm)
Valve Spring	Free Length	1.555 - 1.594” (39.5-40.5 mm)	1.535” (39.0 mm)
Camshaft	Height (Intake)	1.282 - 1.284” (32.563-32.603 mm)	1.276” (32.40 mm)
	Height (Exhaust)	1.262 - 1.264” (32.049-32.099 mm)	1.256” (31.9 mm)
	Journal (Bearing)	0.6298 - 0.6293” (15.996-15.984 mm)	0.6266” (15.916 mm)
Crankcase Cover	Camshaft Hole Diameter	0.6299 - 0.6306” (16.0-16.018 mm)	0.6338” (16.1 mm)
	Crankshaft Hole Diameter	2.8330 - 2.8338” (71.949-71.979 mm)	2.8366” (72.05 mm)
Spark Plug	Gap	0.0275 - 0.0314” (0.7-0.8 mm)	—
Ignition Coil	Resistance (Primary)	1.0-1.6 Ω	—
	Resistance (Secondary)	10.5 KΩ +/- 15%	—
	Gap to Flywheel	0.011 - 0.019” (0.3-0.5 mm)	—

Troubleshooting

1

Hard Starting / Poor Running

- Incorrect Fuel (Level, Age, Octane, Ethanol Content)
- Fuel System Contamination and / or Debris in Carburetor
- Incorrect Oil Level
- Weak Battery / Charging System
- Spark Plug (Incorrect Gap, Fouled, Loose or Faulty)
- Air Filter Restriction
- Air Intake System Leaks
- Ignition Coil to Flywheel Gap Incorrect
- Weak / No Spark
- Incorrect Fuel Solenoid / Fuel Pump Operation
- Choke / Governor Linkage
- Operating RPM Incorrect
- Governor Adjustment Incorrect
- Engine Valve Clearance out of Specification
- Low Compression or Excessive Leakdown

Overheating

- Incorrect Oil Level
- Cylinder Head Gasket Leak
- Debris Build-Up Restricting Air Flow

NOTES:

Chapter 2 – Engine Service / Maintenance

2

Engine Oil Change Procedure

1. Warm engine, then remove the ignition key before changing the engine oil.

2. Drain oil through the drain valve / hose into an approved container.

3. When oil has drained completely, close the oil drain valve. Remove the oil drain hose and wipe up any excess oil on the frame.

Note: Properly dispose of used engine oil.

4. Remove the oil filter from the engine and clean the filter adapter gasket surface.

5. Apply a thin coat of new oil to the rubber gasket on the new oil filter.

6. Install the new oil filter onto the filter adapter and turn the oil filter clockwise until the rubber gasket contacts the filter adapter. Tighten the oil filter an additional 1/2 to 3/4 turn.

7. Remove the dipstick from the oil fill / check tube. Add the appropriate amount of approved engine oil.

8. Install the oil fill cap/dipstick.

9. Start engine and let run for 1-3 minutes. Shut off the engine.

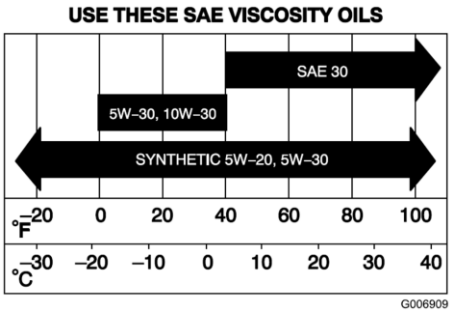
10. Remove the dipstick from the oil fill / check tube. Wipe it clean and reinstall it.

11. Unscrew the dipstick and inspect the oil level. If the oil level is low, pour oil into the fill hole to raise the level to the Full mark on the dipstick.

Important: Do not overfill the crankcase

Engine Oil Capacity:
Max. Fill: 34 oz (1.0 l) without oil filter change
Max. Fill: 36 oz (1.05 l) with oil filter change

Engine Oil Type: Detergent oil - API classification of SF,SG, SH, SJ, SL, or higher



Air Cleaner Service

2

1. Remove the ignition key before servicing the air cleaner.
2. Thoroughly clean the air filter area.
3. Loosen the (2) Cover Knobs and remove the air cleaner cover.
4. Remove the (2) air cleaner retainer nuts and the air cleaner retainer plate.
5. Carefully remove and separate the foam and paper filter elements from the air cleaner housing.

Foam Element:

6. Clean the foam element with liquid soap and warm water – rinse and dry it thoroughly.

Important: Replace the foam element if it is torn or worn.

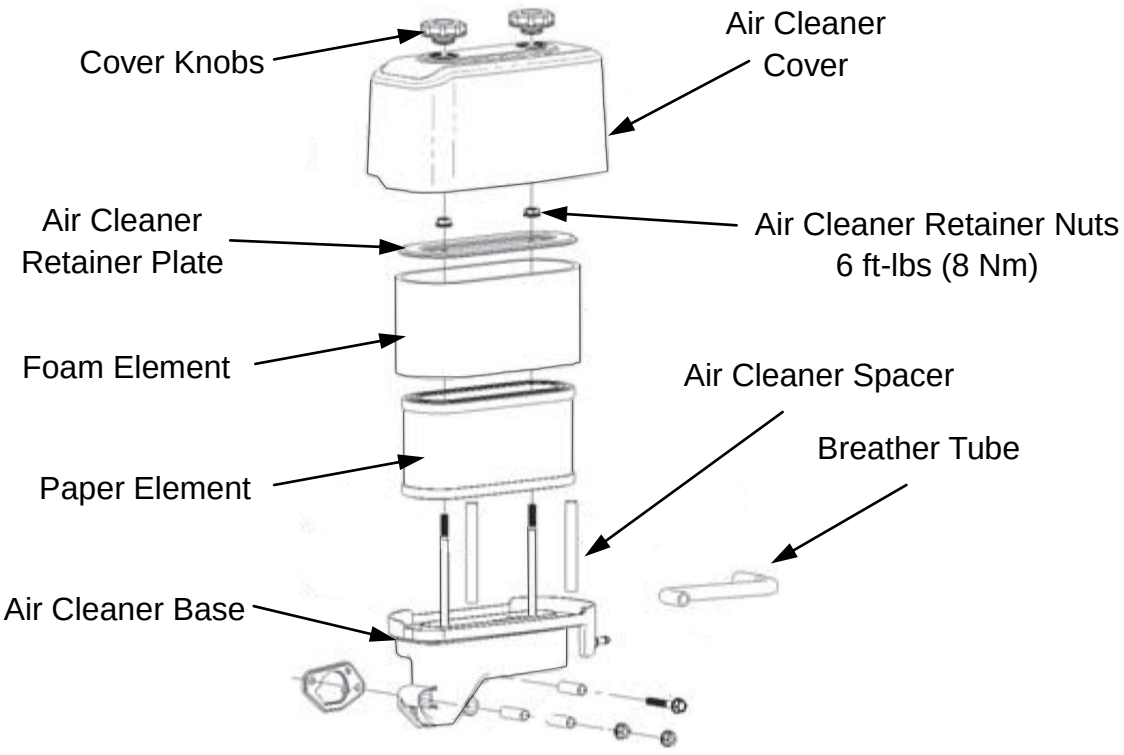
Paper Element:

7. Replace paper element if excessively dirty or damaged. If cleaning the filter, tap the dirty paper element on a solid, flat surface to remove dust and dirt.
8. Inspect the paper element for tears, oily film or damage to the rubber seal. Replace if necessary
9. Thoroughly clean the air filter housing and cover.

Installing the Foam and Paper Elements

Important: Never operate the engine without the air cleaner installed.

10. Install the foam element onto the paper element.
11. Install the air cleaner asm. on to the air cleaner base.
12. Install the air cleaner retainer plate and torque the fasteners to specification.
13. Install the air cleaner cover and sufficiently tighten the cover knobs

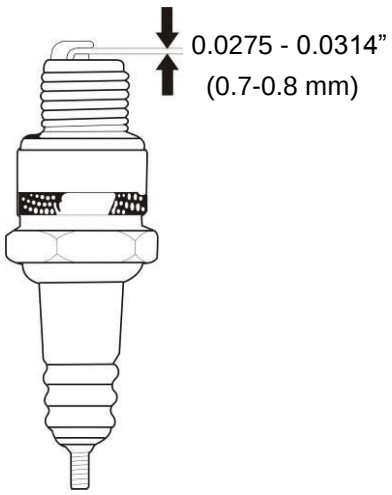


Spark Plug Service

NOTE: Spark plugs of the wrong size or incorrect heat range can cause severe engine damage.

High Voltage Ignition Systems can be Dangerous - Use Caution when Servicing Ignition Systems

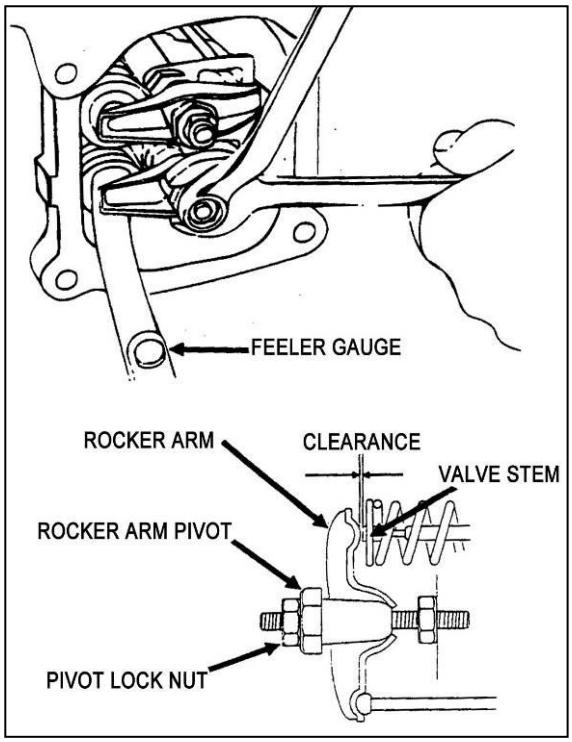
1. Disconnect the spark plug boot and thoroughly clean the spark plug area.
2. Remove the spark plug from the engine.
3. Inspect the spark plug for excessively worn electrodes, chips or cracks in the insulator, or excessive deposits.
4. Measure the electrode gap and adjust if necessary. **Spark Plug Gap: 0.0275 - 0.0314" (0.7-0.8 mm)**
5. Install spark plug and torque to specification - **22 ft-lbs (30 Nm).**
6. Fully install the spark plug boot on the plug.



Valve Clearance Inspection and Adjustment

2

NOTE: Valve clearance inspection and adjustment must be done with the engine cold.



1. Rotate Engine to TDC (top-dead-center) of the compression stroke.

2. Remove the valve cover. Be sure both valves are completely closed and the decompression arm is not holding the valve open.

3. Measure the clearance between the rocker arm and the valve stem with a feeler gauge.

   Intake: 0.0039" (0.10 mm)
   Exhaust: 0.0059" (0.15 mm)

4. To adjust valve clearance:
   - Hold the rocker arm pivot and loosen the pivot lock nut.
   - Turn the rocker arm pivot to obtain the specified clearance.
   - Hold the rocker arm pivot and tighten the pivot lock nut to specification - **11 ft-lbs (15 Nm).**

5. Recheck the clearance and readjust if necessary.

6. Inspect the valve cover gasket and replace if necessary. Install the valve cover and torque fasteners to specification - **7.5 ft-lbs (10 Nm).**

Engine Governor – Zero Point Setting

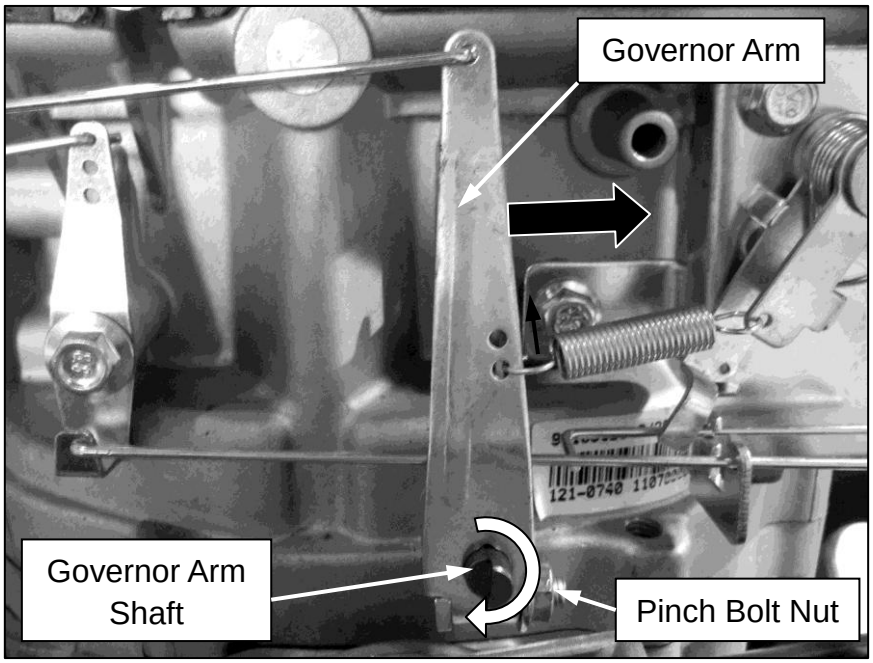
1. Loosen but do not remove the governor arm pinch bolt and nut.

2. Move the governor arm to fully open the throttle valve. Firmly hold the governor arm in this position.

3. Rotate the governor shaft fully clockwise and secure it in this position with a pair of pliers.

4. Tighten the governor arm pinch bolt and nut to specification - **7.5 ft-lbs (10 Nm).**

5. Verify that the governor arm and throttle valve move freely.

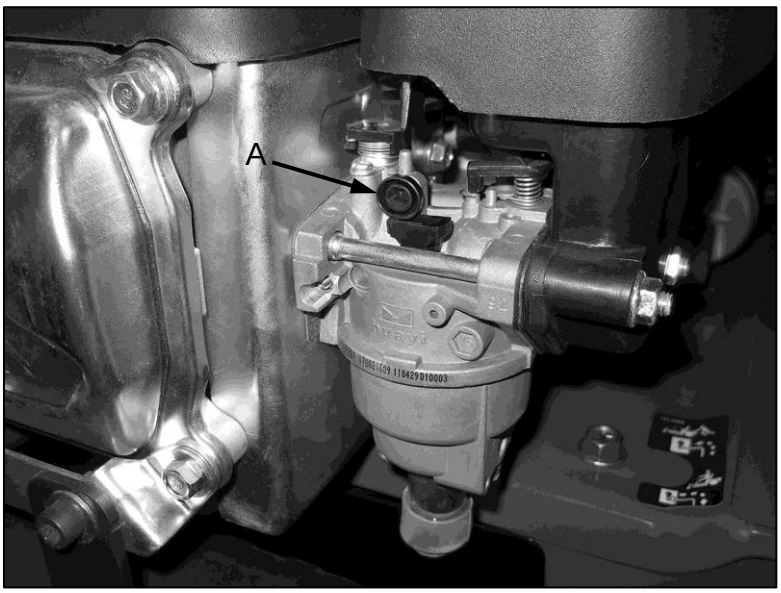


Engine Idle Speed

2

1. Start the engine and allow it to warm to normal operating temperature.
2. With the throttle control in the idle position and the engine idling, adjust the throttle stop screw (A) to achieve the recommended engine idle speed.

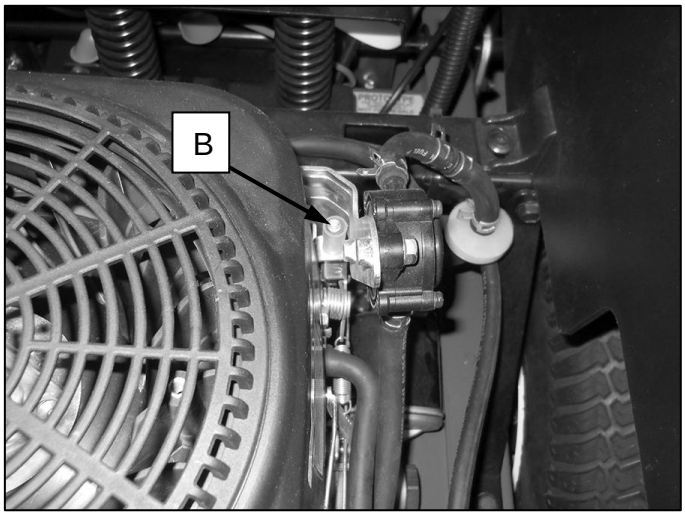
Engine Idle Speed: 1700 - 2000 RPM



Engine Operating RPM Adjustment

1. Properly set the governor zero point as shown in this manual.
2. Attached an appropriate tachometer to the engine.
3. Start and warm engine. Run engine at MAX RPM.
4. Adjust engine MAX RPM by turning the High Speed Setting Screw (B) located near the fuel pump asm.

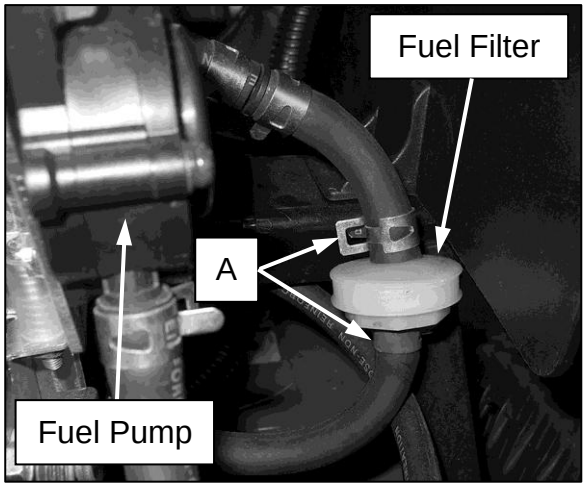
Engine Operating RPM - 3350 - 3450 RPM (USA Specification)

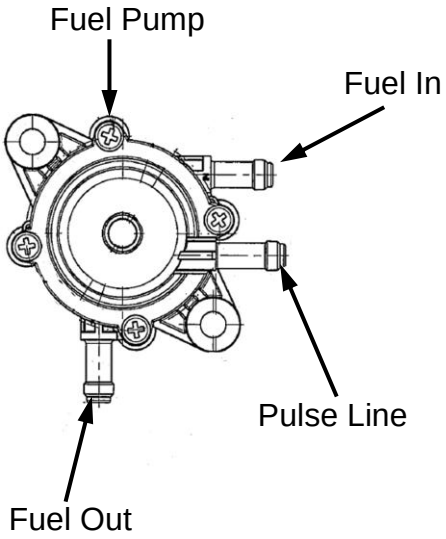


Fuel Filter and Replacement

- **Fuel is Extremely Flammable** - Use Extreme Caution When Servicing the Fuel System

1. Place a proper fuel drain pan under the fuel filter area.
2. Release the fuel filter / fuel hose clamps (A) and slide them away from the filter.
3. Remove the fuel filter from the (2) fuel hoses.
4. Install new fuel filter and reinstall the fuel hose clamps (A). Make note of installation direction for proper fuel flow.
5. Verify hose routing and check for leaks.
6. Properly dispose of any fuel.

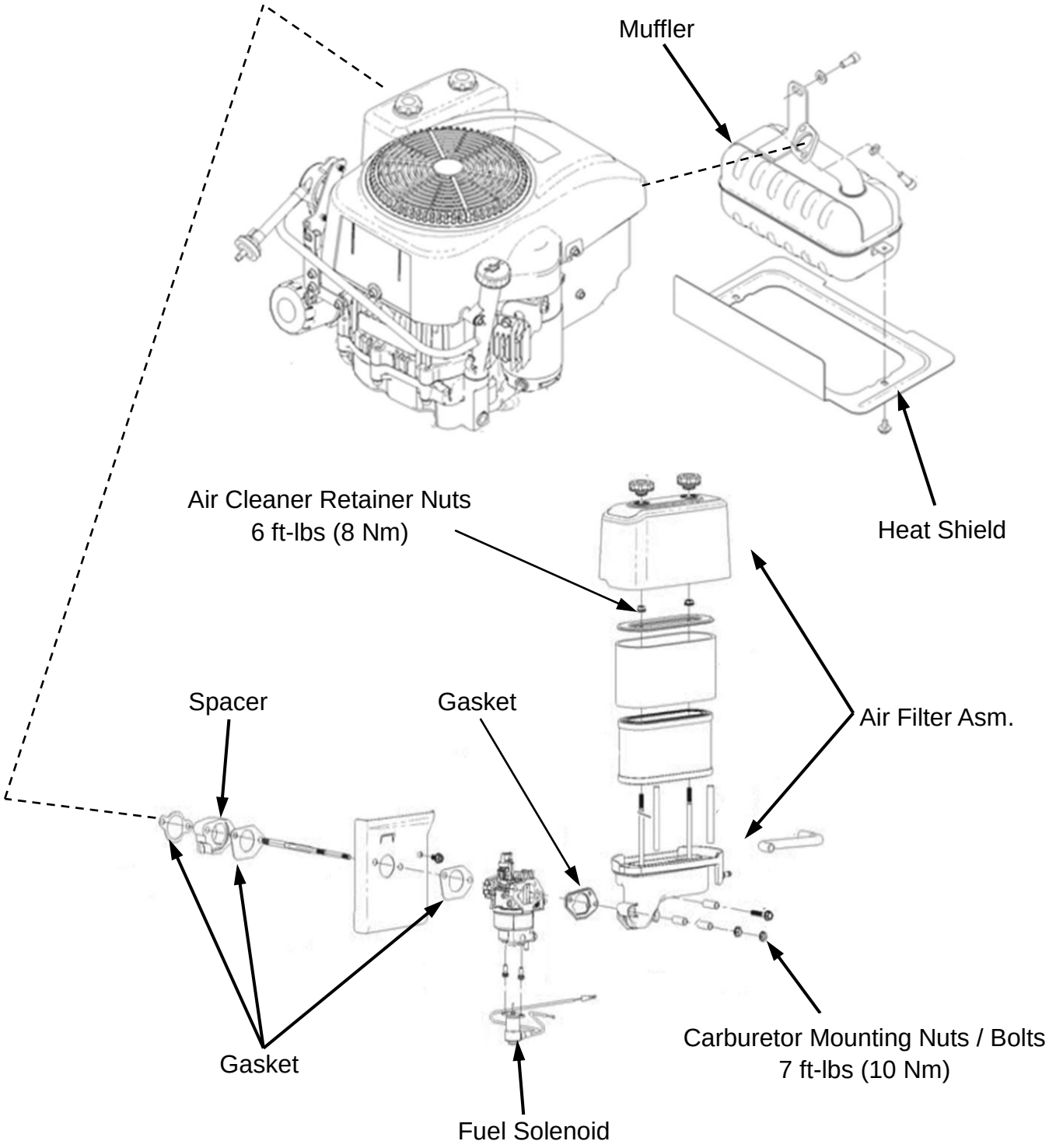




Chapter 3 - Engine Disassembly and Service 3

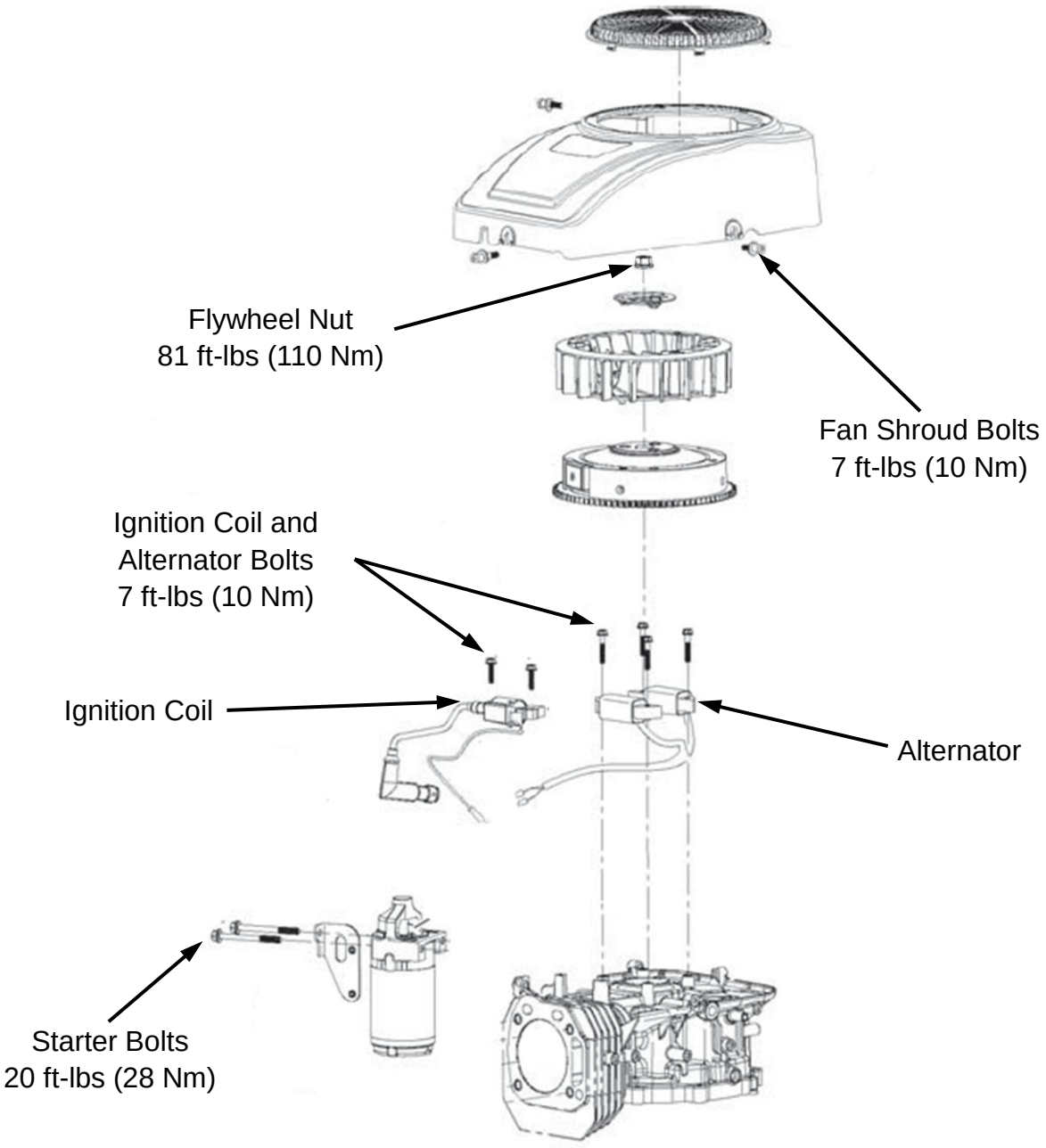
Engine Service – Upper End

Air Cleaner and Muffler Exploded View

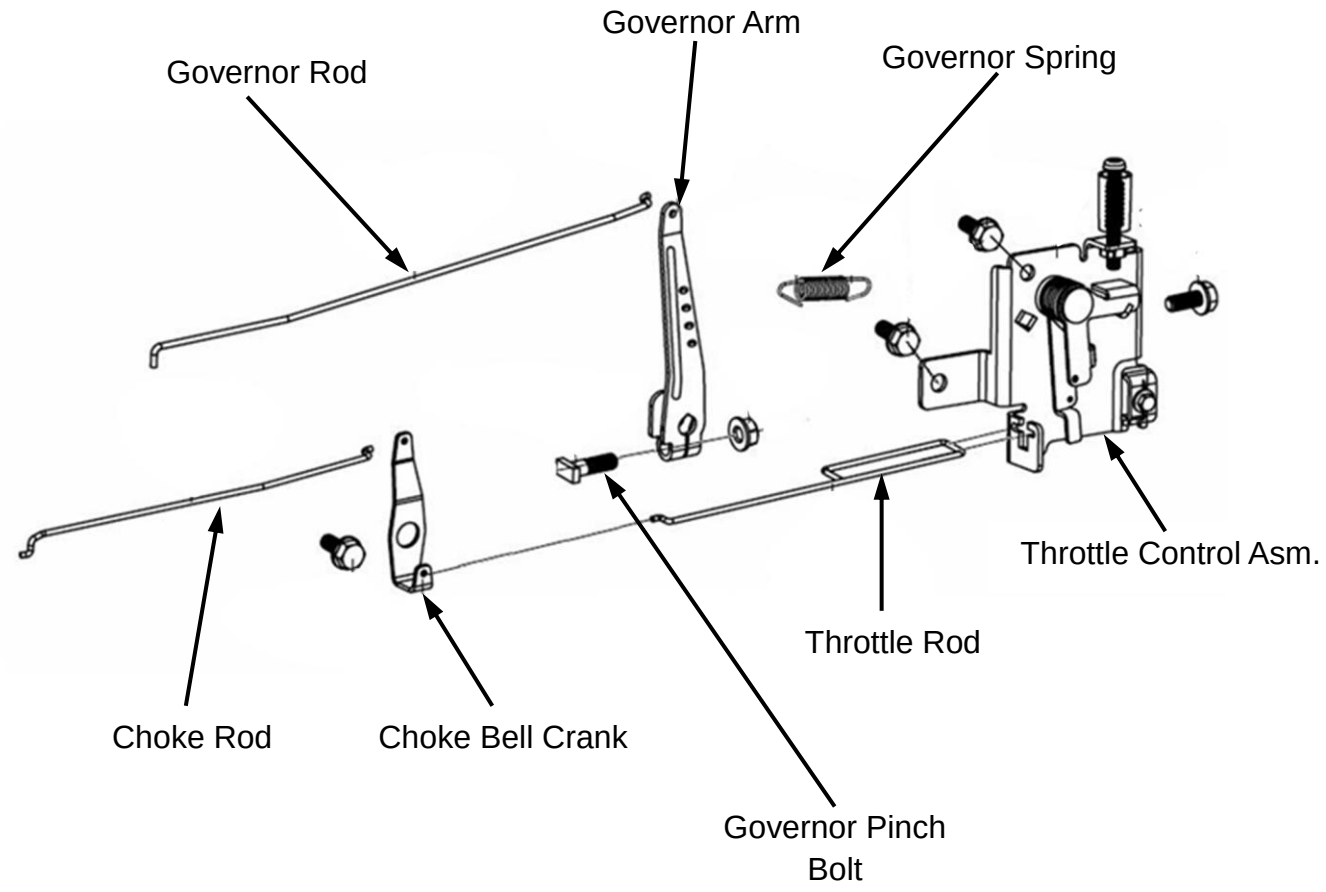


Starter, Flywheel and Engine Cover Exploded View

3



Carburetor and Linkage Exploded View



Carburetor Exploded View

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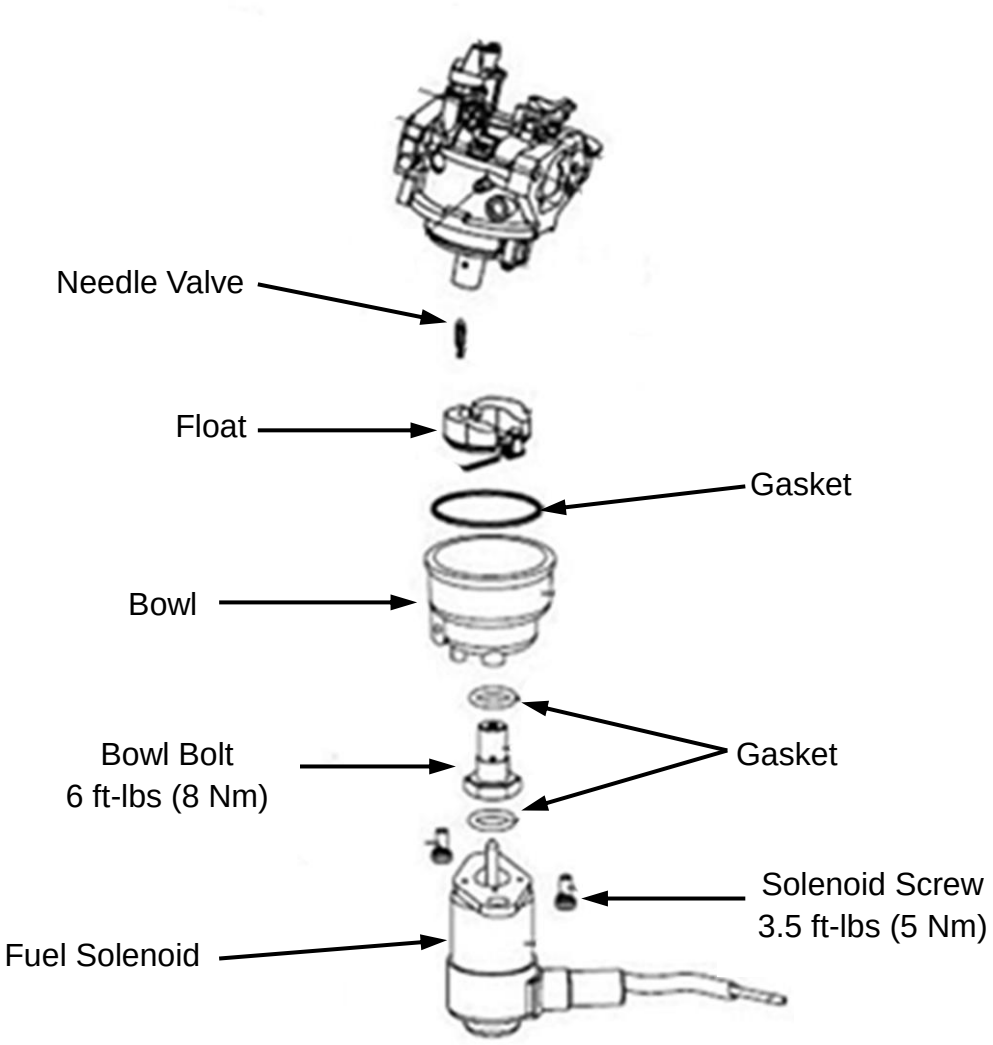
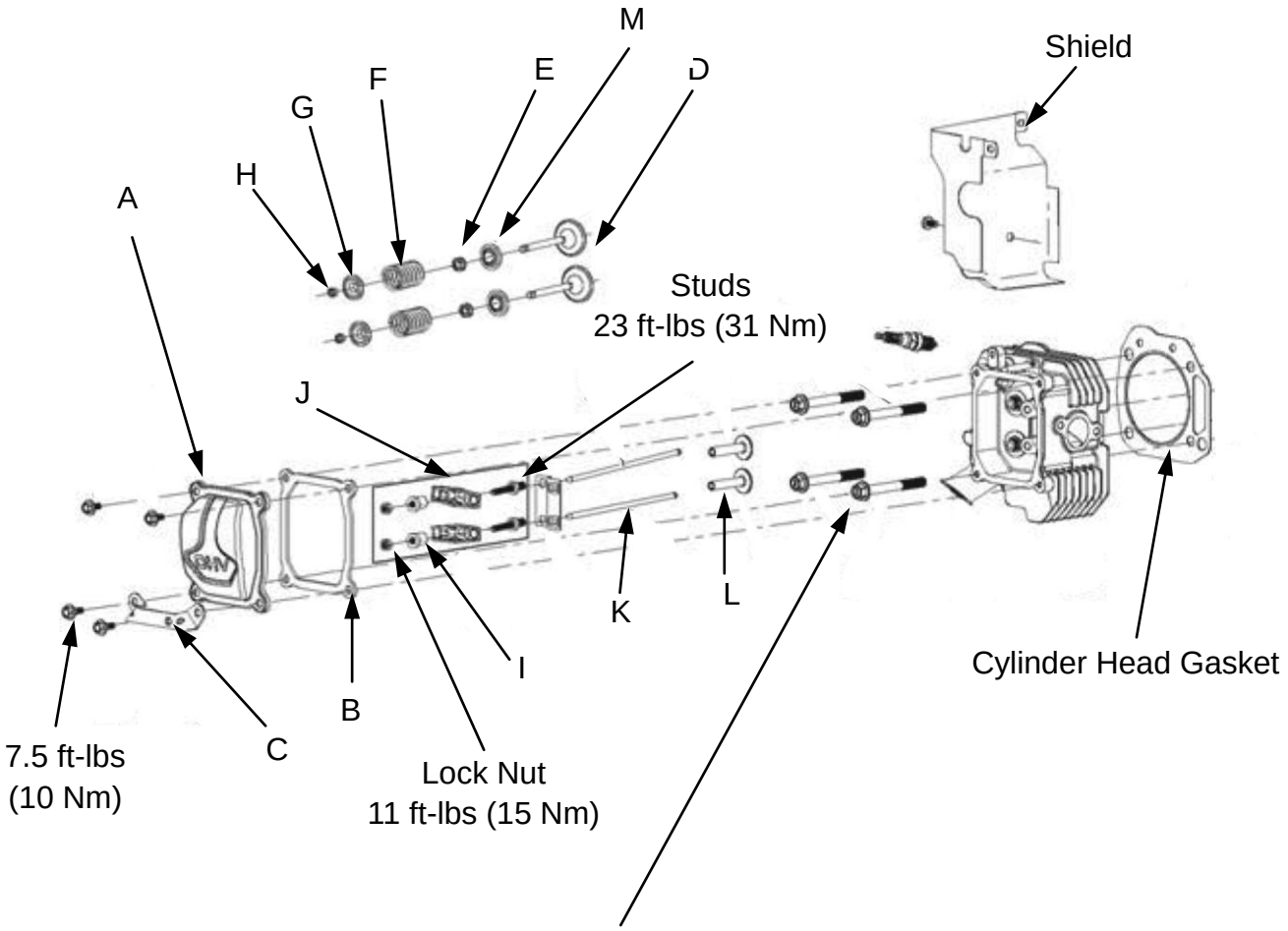


Cylinder Head Exploded View and Service Information



Cylinder Head Bolt Torque Sequence:

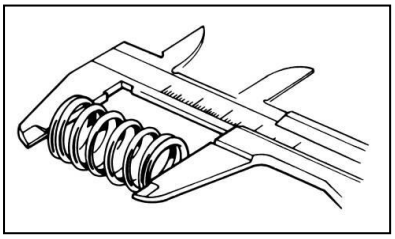
1. Initially Torque the (4) Cylinder Head Bolts in a Crisscross Pattern to **10 ft-lbs (14 Nm).**

2. Evenly Torque the (4) Cylinder Head Bolts in a Crisscross Pattern to **40 ft-lbs (54 Nm).**

A Valve Cover
B Valve Cover Gasket
C Muffler Bracket
D Intake / Exhaust Valves
E Valve Seal
F Valve Spring
G Valve Spring Retainer
H Valve Keeper
I Rocker Arm Pivot
J Rocker Arm
K Push Rods
L Tappet
M Valve Spring Seat

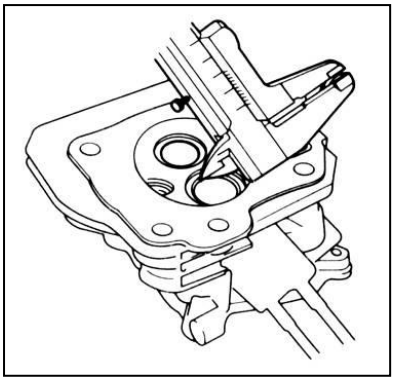
Valve Spring Free Length Specification

Standard	Service Limit
1.555 - 1.594” (39.5-40.5 mm)	1.535” (39.0 mm)



Valve Seat Width Inspection

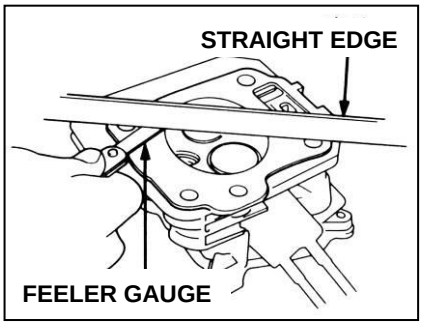
Remove carbon deposits from the combustion chamber. Inspect the valve seats for pitting or other damage.



Valve Seat Width Specification:

Standard	Service Limit
0.03149 - 0.0393” (0.8-1.0 mm)	0.0591” (1.5 mm)

Cylinder Head Warp Inspection



- Remove carbon deposits from the combustion chamber.

- Clean off any gasket material from the cylinder head surface.

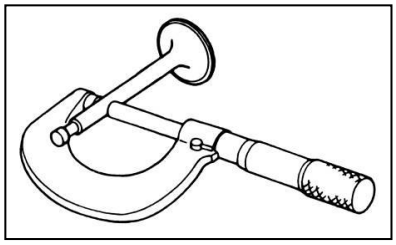
- Check the spark plug hole and valve areas for cracks.

- Check the cylinder head for warpage with a straight edge and a feeler gauge as shown.

Service Limit	0.00393” (0.10 mm)

Valve Stem Inspection

Inspect each valve for face irregularities, bending or abnormal wear.

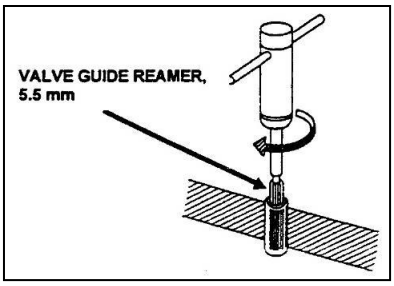


Valve Stem Diameter Specification

	Standard	Service Limit
Intake	0.2584 - 0.2590” (6.565-6.58 mm)	0.2579” (6.550 mm)
Exhaust	0.2577 - 0.2583” (6.545-6.56 mm)	0.2571” (6.530 mm)

Valve Guide Inspection

Ream the exhaust valve guide to remove any carbon deposits before measuring.



Valve Guide ID Specification:

Standard	Service Limit
0.2362 - 0.2604” (6.0-6.615 mm)	0.2606” (6.620 mm)

Valve Stem to Guide Clearance

Subtract each valve stem OD from the corresponding guide ID to obtain the guide-to-stem clearance.

	Standard	Service Limit
Intake	0.00079 - 0.00197” (0.02-0.05 mm)	0.0047” (0.12 mm)
Exhaust	0.00157 - 0.00275” (0.04-0.070 mm)	0.00669” (0.17 mm)

Valve Seat Reconditioning

1. Thoroughly clean the combustion chamber and valve seats to remove carbon deposits.

2. Apply a light coat of Prussian Blue or erasable felt-tipped marker ink to the valve faces.

3. Properly install valves, springs and keepers. Manually open the valves, then and snap them closed against their seats several times. Be sure the valves do not rotate on the seat. Remove the valve assemblies. The transferred marking compound will show any area of the seat that is not concentric.

4. Use a 45°cutter to remove enough material to produce a smooth and concentric seat. Follow the valve seat cutter manufacture's instructions. Turn the cutter clockwise, never counterclockwise. Continue to turn the cutter as you lift it from the valve seat.

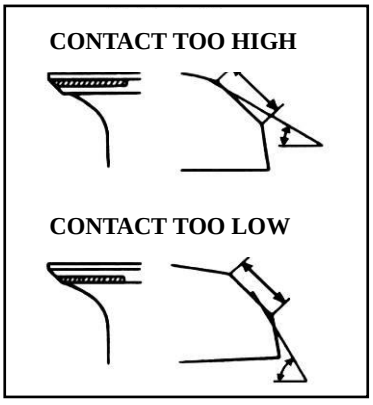
5. Use a 30°~32° and 60° cutter to narrow and adjust the valve seat so that it contacts the middle of the valve face. The 30°~32° cutter removes material from the top edge. The 60° cutter removes material from the bottom edge. Be sure that the width of the finished valve seat is within specification.

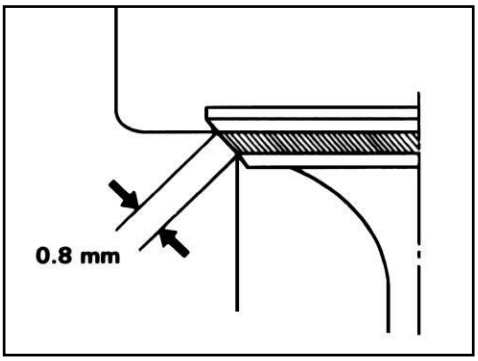
6. Lap valves in accordance with valve lapping kit instructions.

7. Clean valve and seat of all lapping compound.

Valve Seat Width

Standard	Service Limit
0.03149 - 0.0393"	0.0591"
(0.8-1.0 mm)	(1.5 mm)

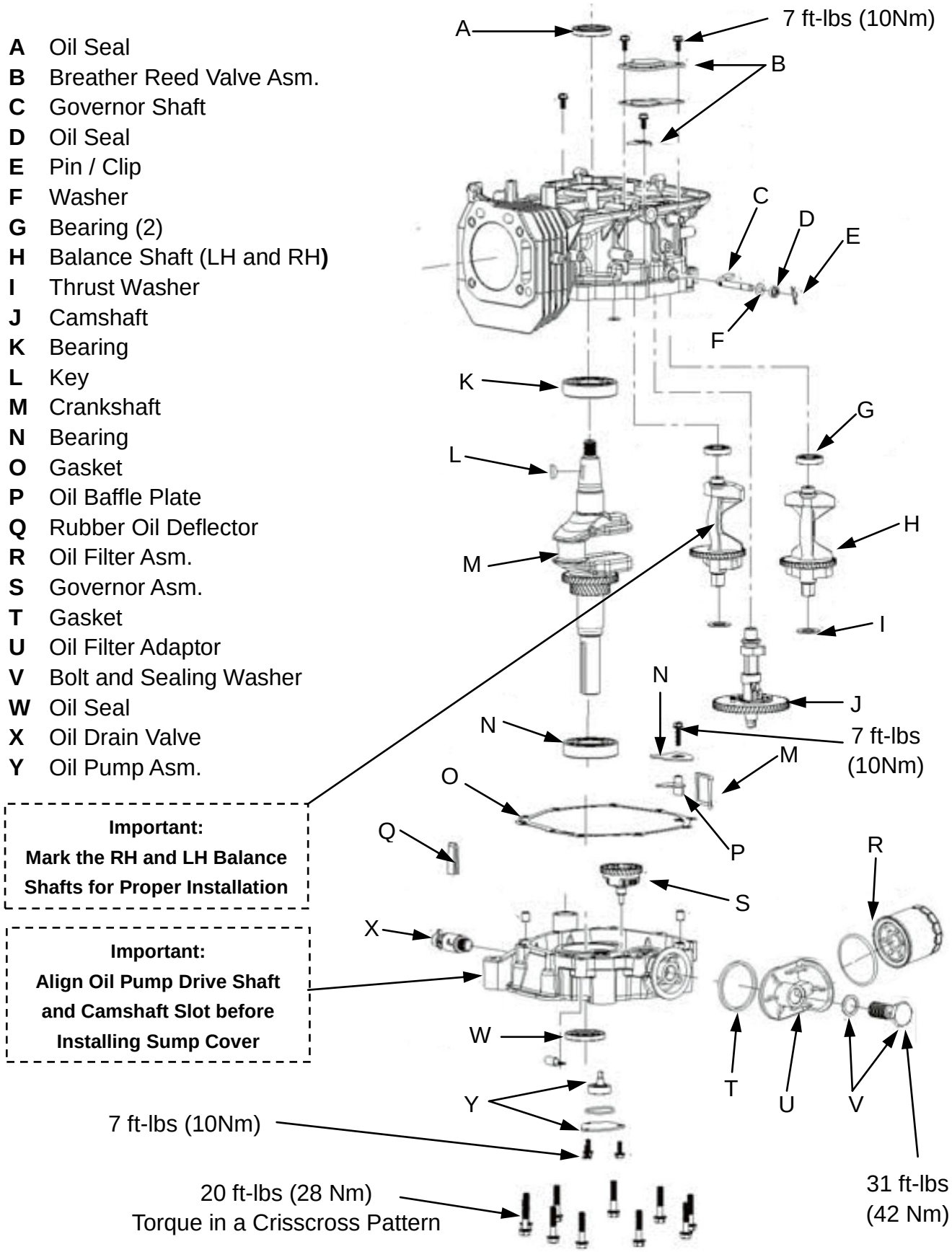




Engine Service – Lower End

Crankcase Exploded View and Service Information

A Oil Seal
B Breather Reed Valve Asm.
C Governor Shaft
D Oil Seal
E Pin / Clip
F Washer
G Bearing (2)
H Balance Shaft (LH and RH**)**
I Thrust Washer
J Camshaft
K Bearing
L Key
M Crankshaft
N Bearing
O Gasket
P Oil Baffle Plate
Q Rubber Oil Deflector
R Oil Filter Asm.
S Governor Asm.
T Gasket
U Oil Filter Adaptor
V Bolt and Sealing Washer
W Oil Seal
X Oil Drain Valve
Y Oil Pump Asm.

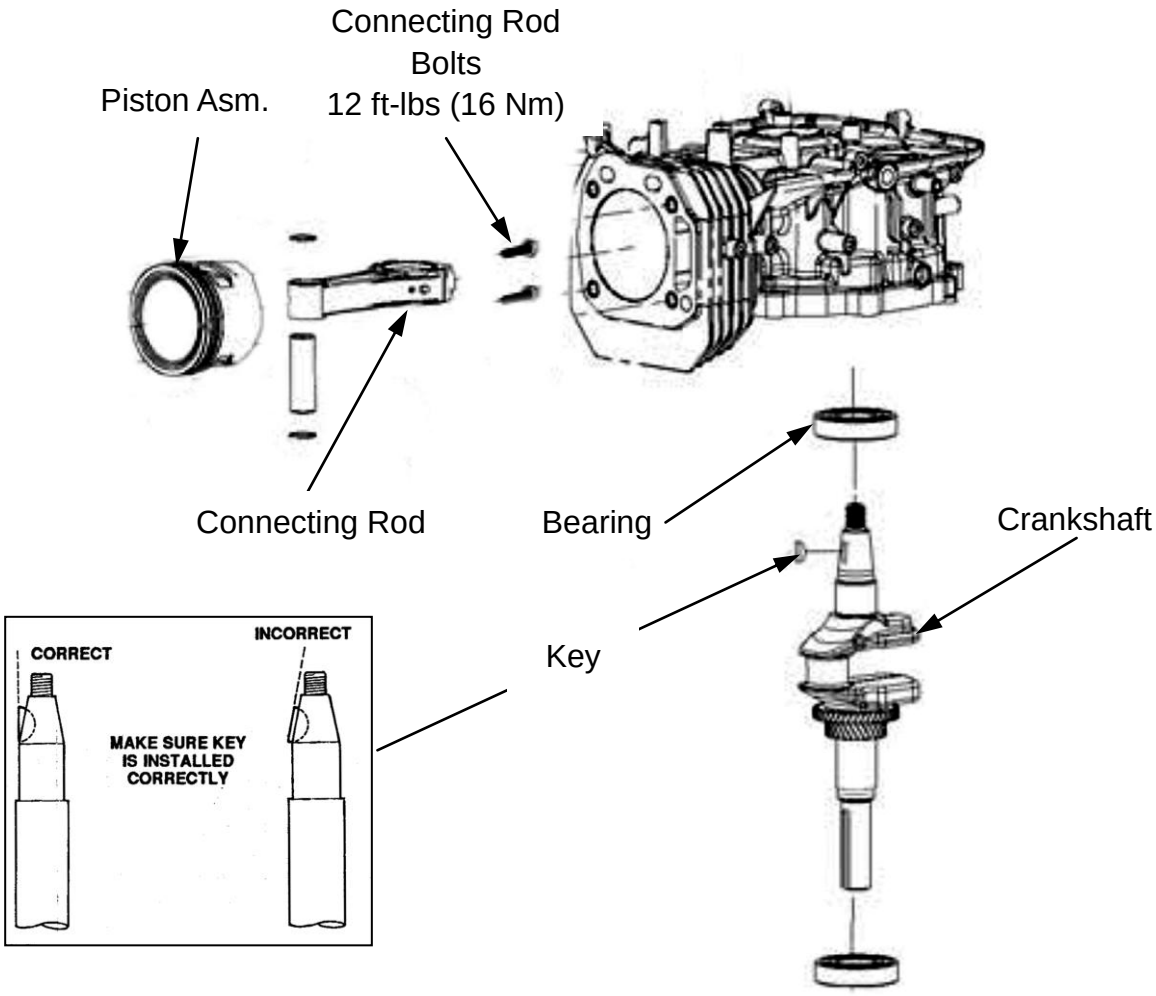


Important:
Mark the RH and LH Balance Shafts for Proper Installation

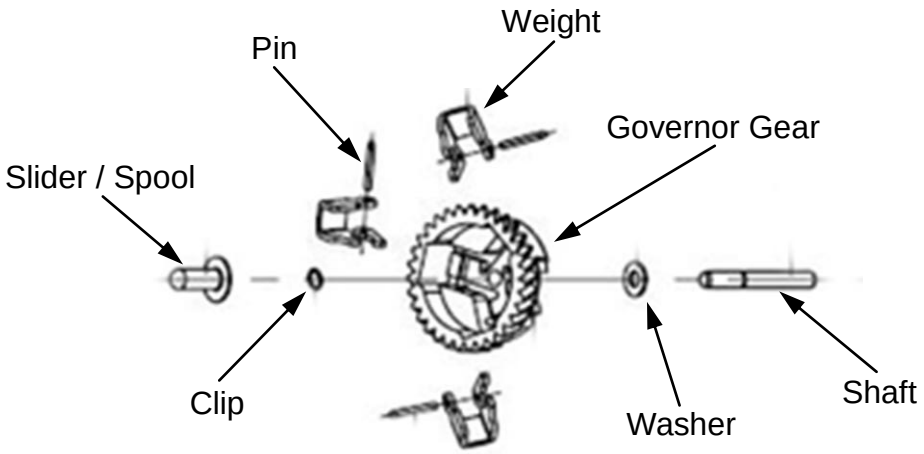
Important:
Align Oil Pump Drive Shaft and Camshaft Slot before Installing Sump Cover

Crankshaft / Piston / Exploded View and Service Info

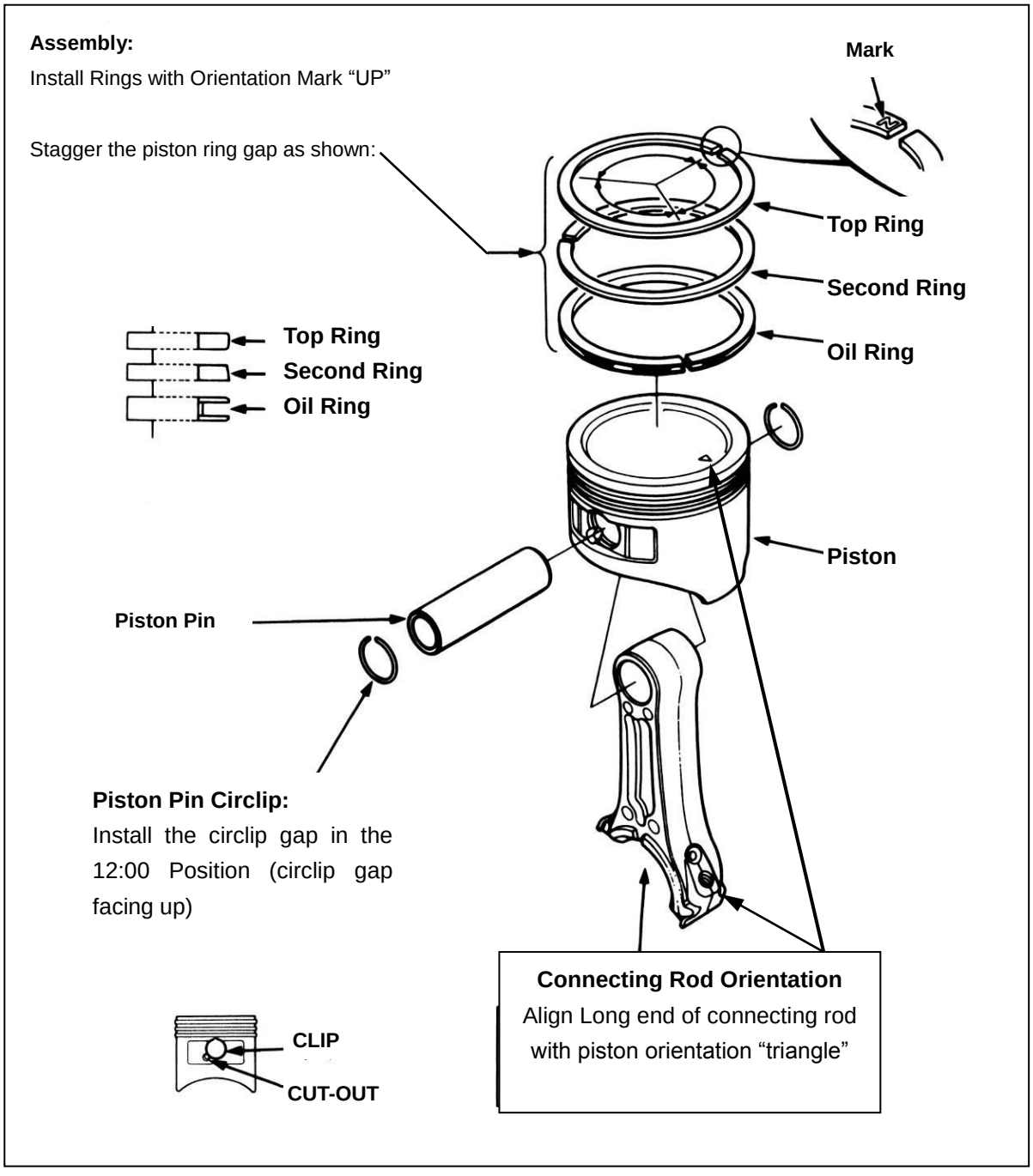
3



Governor Exploded View



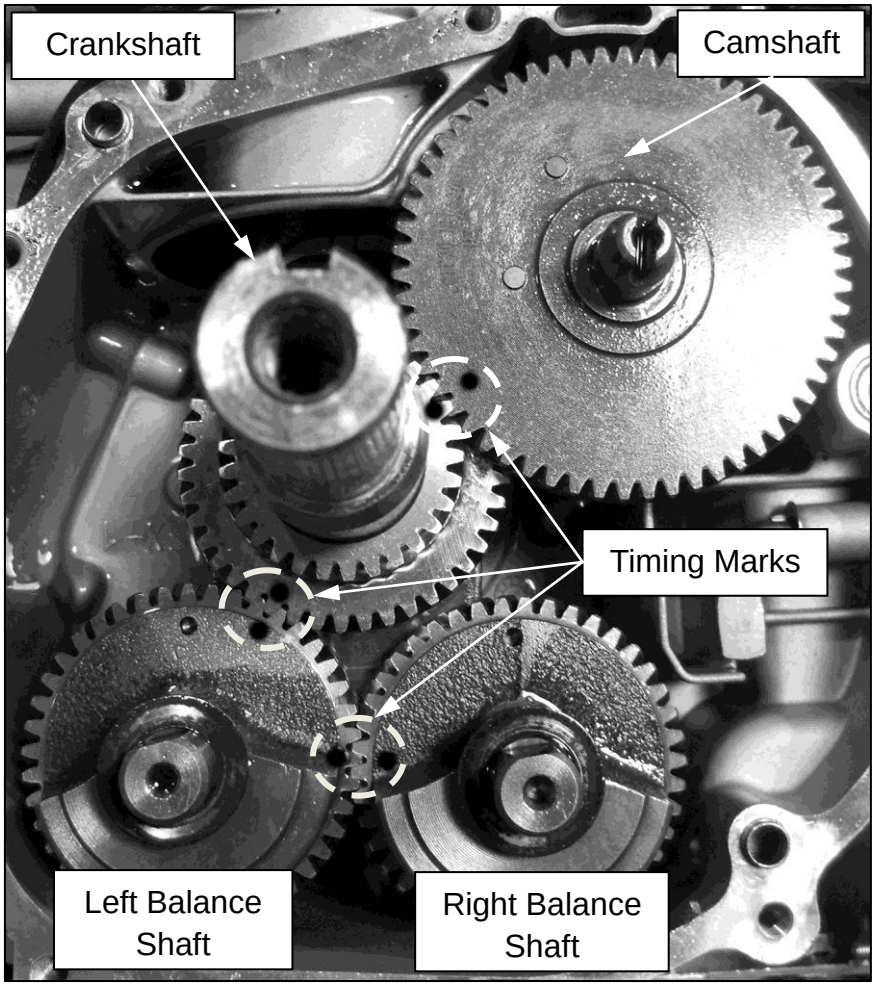
Piston Connecting Rod Exploded View and Service Information



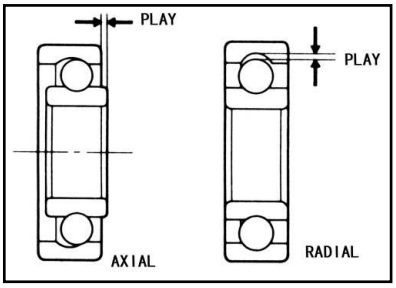
Camshaft and Balance Shaft Timing

3

1. Install crankshaft.
2. Align crankshaft and camshaft timing marks and install camshaft.
3. Align the left balance shaft timing marks and install the left balance shaft.
4. Align the right balance shaft timing marks and install the right balance shaft.

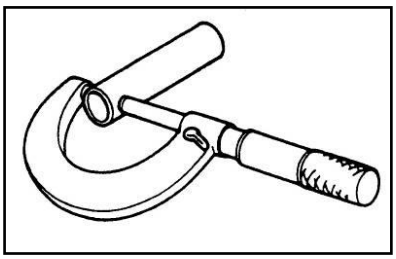


Crankshaft Bearing Free Play



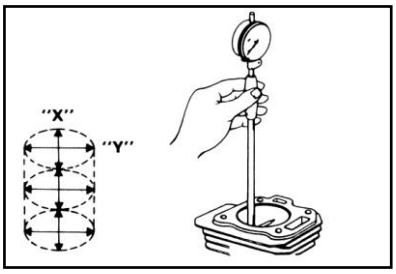
Clean the bearing in solvent and dry it.
Spin the bearing by hand and check for play.
Replace the bearing if it is noisy or has excessive free play.

Piston Pin OD



Standard	Service Limit
0.7871 - 0.7873” (19.992-19.998 mm)	0.7834” (19.9 mm)

Cylinder Taper and Out of Round

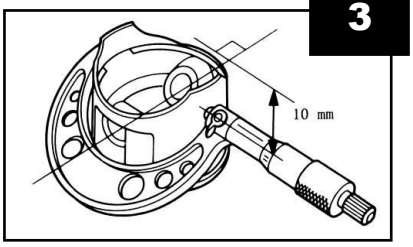


Inspect cylinder for taper and out of round with a bore gauge.
Measure in two different directions, front to back and side to side, on three different levels (½”down from the top, middle and ½” up from the bottom).

Cylinder Taper and Out of Round Specifications

Standard	Service Limit
3.6220” - 3.6224” (92-92.01 mm)	3.6259” (92.10 mm)

Piston Skirt Outside Diameter



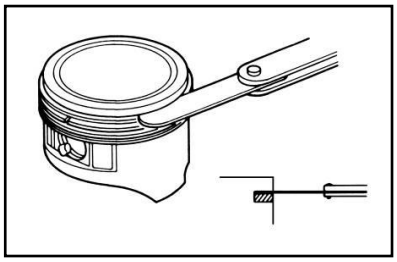
Measure and the piston skirt outside diameter 10mm from the skirt base and 90°to piston pin hole.

Standard	Service Limit
3.620 - 3.621” (91.96-91.975 mm)	3.6196” (91.940 mm)

Piston to Cylinder Clearance Specification

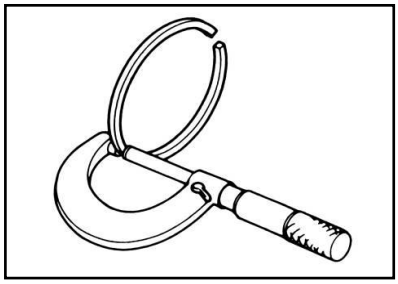
Standard	Service Limit
0.00098 - 0.0017” (0.025-0.045 mm)	0.0032” (0.081 mm)

Piston Ring to Groove Clearance



	Standard	Service Limit
Top/ Middle	0.00079 - 0.00236” (0.02-0.06 mm)	0.00433” (0.11 mm)

Piston Ring Width

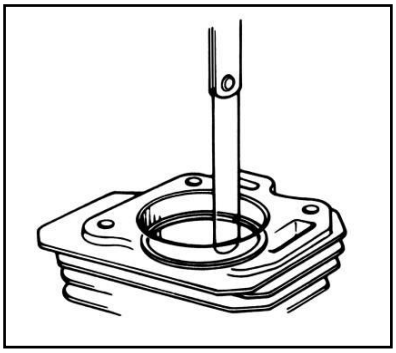


	Standard	Service Limit
Top/ Middle	0.046 - 0.0468” (1.17-1.19 mm)	0.0433” (1.10 mm)

Piston Ring End Gap

Standard	Service Limit
0.0059 - 0.0118” (0.15-0.30 mm)	0.0137” (0.35 mm)

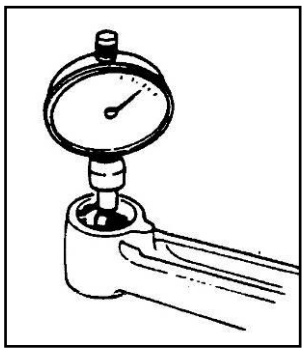
Use the piston to position the rings squarely 1” down from the top of the cylinder.



Connecting Rod Small End ID

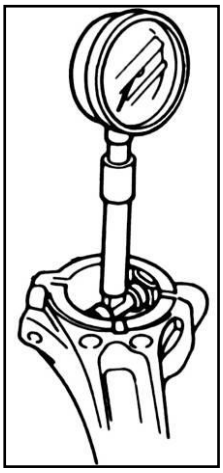
Standard	Service Limit
0.79 - 0.788” (20.07-20.018 mm)	0.7881” (20.02 mm)

.



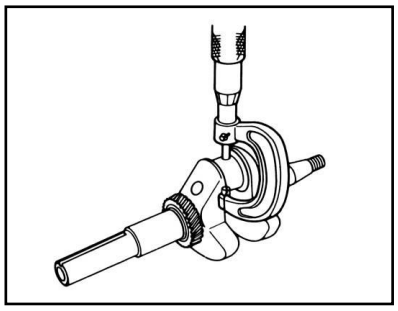
Connecting Rod Big End ID

Standard	Service Limit
1.4179 - 1.4183” (36.015-36.025 mm)	1.4185” (36.03 mm)



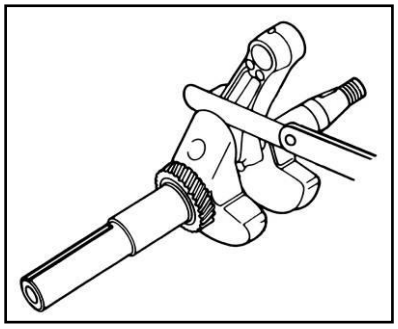
Crankshaft Pin OD

Standard	Service Limit
1.417 - 1.4165” (35.966-35.981 mm)	1.415” (35.946 mm)



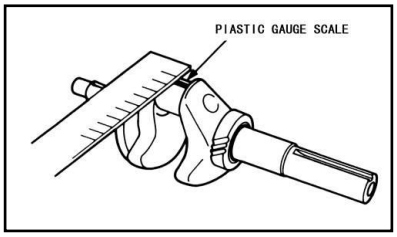
Connecting Rod Big End Side Clearance

Standard	Service Limit
0.00079 - 0.0138” (0.02-0.35 mm)	0.00157” (0.4 mm)



Connecting Rod Big End Oil Clearance

1. Clean oil from the crankshaft and connecting rod.
2. Use plastic gauge style measuring tool in accordance to the manufactures instructions to measure the oil clearance.

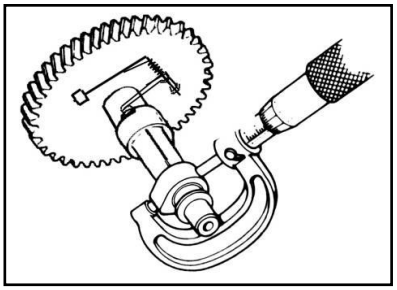


Connecting Rod Bolt Torque: **9.5 ft-lbs (13 Nm**)

Standard	Service Limit
0.00157 - 0.00248” (0.04-0.063 mm)	0.0047” (0.12 mm)

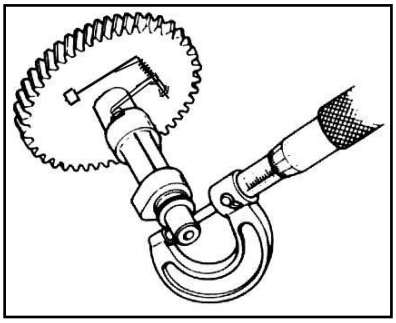
Camshaft Lobe Specifications

	Standard	Service Limit
Intake	1.282 - 1.284” (32.563-32.603 mm)	1.276” (32.40 mm)
Exhaust	1.262 - 1.264” (32.049-32.099 mm)	1.256” (31.9 mm)



Camshaft Journal OD

Standard	Service Limit
0.6298 - 0.6293” (15.996-15.984 mm)	0.6266” (15.916 mm)



Check the camshaft bearing journal for scoring, wear or damage.

NOTE: Verify that the decompression mechanism moves freely.

Chapter 4 – Electrical System Information

4

Ignition Coil Gap Adjustment

High Voltage Ignition Systems can be Dangerous - Use Caution when Servicing Ignition Systems

1. Install the ignition coil and lightly tighten the ignition coil mounting bolts.
2. Rotate engine so ignition coil is aligned with the magnet portion of the flywheel.
3. Insert the feeler gauge between the flywheel and coil.
4. Adjust the ignition coil gap at both side of the coil.
5. Sufficiently tighten the mounting bolts.

Ignition Coil Gap	0.011- 0.019” (.3-.5 mm)

Igniting Coil Resistance Inspection

Primary Coil

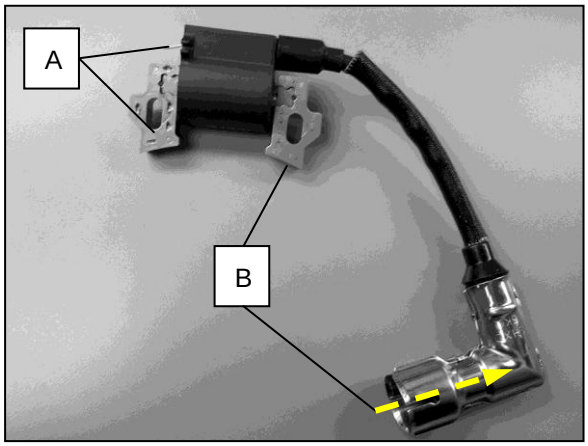
Place Ohm meter leads between the harness connection lead and the exposed metal coil leg.

A - Primary Coil Resistance	1.0-1.6 Ω

Secondary Coil

Place Ohm meter leads between exposed metal coil leg and the spark plug terminal connection.

B - Secondary Coil Resistance	10.5 KΩ +/- 15%



Spark Testing

- **Fuel is Extremely Flammable** - Use Extreme Caution When Servicing the Fuel System
- **High Voltage Ignition Systems can be Dangerous** - Use Caution when Servicing Ignition Systems

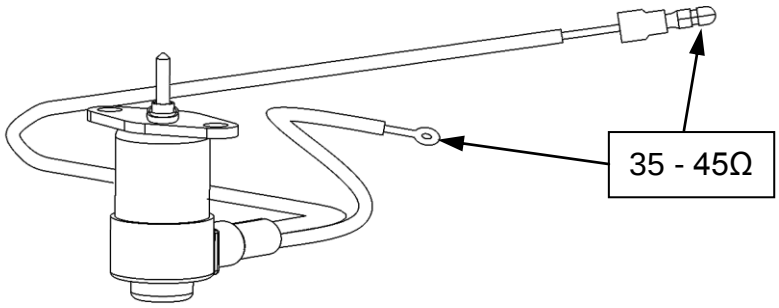
1. Remove spark plug cap from the spark plug.
2. Remove the spark plug from the engine.
3. Connect the negative (-) electrode of the spark plug (threaded area) to ground (cylinder head cover).
4. Crank the engine and view the electrode gap. Spark should be present when engine is turning over.
5. Reinstall the spark plug and torque to specification - **22 ft-lbs (30 Nm)**.
6. Properly install the spark plug boot.

Fuel Solenoid

Fuel Solenoid Resistance

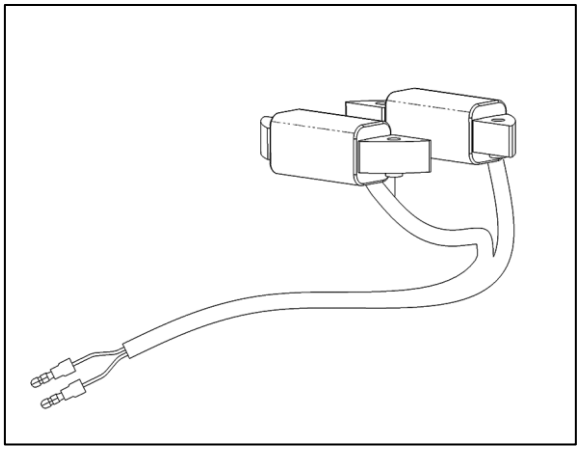
Place Ohm meter leads between the harness connections,

Fuel Solenoid Resistance	35 - 45Ω



Charging System Specifications

Charge Coil(s) Air Gap Measure Between the Magnet Area of the Flywheel and the Charge Coil Legs	0.011- 0.019” (.3-.5 mm)
No Load DC Voltage Output @ 3000 RPM Measure Across Battery Terminals	14.5 +/- .5 Volts DC
No Load AC Voltage Output @ 3000 RPM Measure Across Stator Leads – Stator Leads Disconnected	30 VAC
Charge Coil / Stator Resistance Measure Resistance Across the Two Stator Leads	0.16 Ohms +/- 15%



NOTES:

RESIDENTIAL PRODUCTS

Form Number: 492-9234