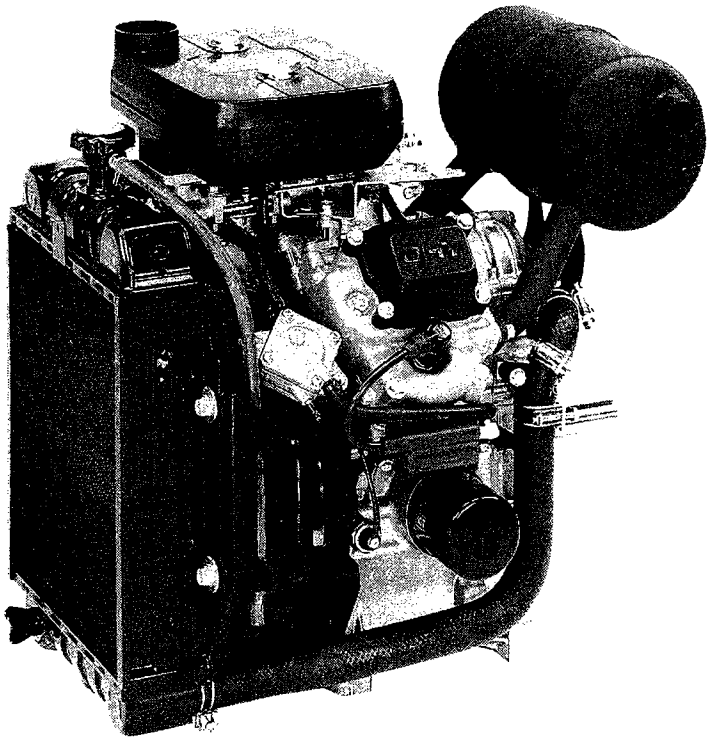
Kawasaki

FD501D



4-stroke liquid cooled V-twin gasoline engine

Service Manual Supplement

This supplement is designed to be used in conjunction with the FD440V/FD501V/FD590V base Service manual (99924-2041-01). Service operations, procedures, specifications, figures, and limits put in this supplement are only these that are unique to the FD501D engine. These remain almost identical to these put in the base service manual. Complete and proper service of the FD501D engine therefore requires both this supplement and the base service manual. Use the base service manual to see the FD501V engine corresponding to the FD501D engine.

First Edition (1) : Jan. 20, 1995 (T)

Supplement - FD501D

Table of Contents

GENERAL INFORMATION
- Engine Profiles 9-2
- General Specifications 9-3

FUEL SYSTEM
- Exploded View 9-4
- Exploded View 9-5
- Specifications 9-6
- Carburetor 9-7
- Fuel Pump 9-8
- Air Cleaner 9-11

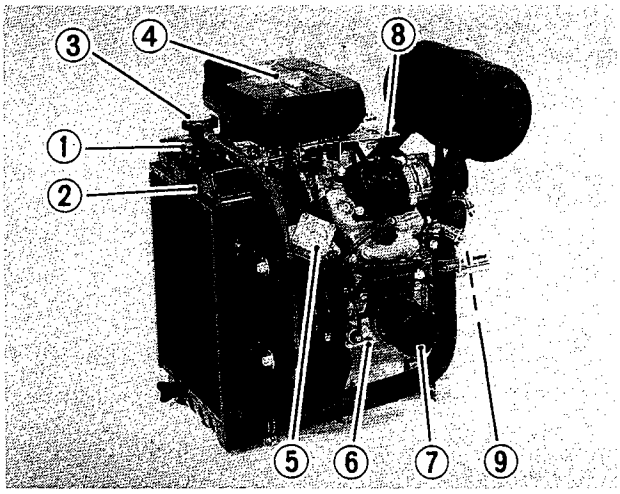
COOLING SYSTEM
- Exploded View 9-12
- Specifications 9-13
- Coolant 9-14

LUBRICATION SYSTEM
- Exploded View 9-15
- Specifications 9-16
- Engine Oil 9-17

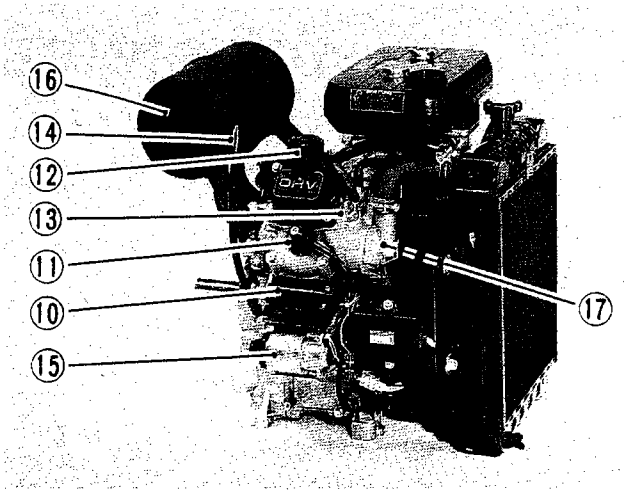
ELECTRICAL SYSTEM
- Wiring Diagram Revised 9-18

GENERAL INFORMATION

Engine Profiles



Left-Hand Side Shown



Right-Hand Side Shown

1. Radiator
2. Radiator Screen
3. Pressure Cap
4. Air Cleaner
5. Fuel Pump
6. Oil Pressure Switch
7. Oil Filter
8. Speed Control Plate
9. Coolant Check Valve
10. Ignition Coil
11. Spark Plug
12. Oil Filler Cap
13. Coolant Temperature Switch
14. Oil Level Gauge
15. Electric Starter
16. Muffler
17. Thermostat

GENERAL INFORMATION

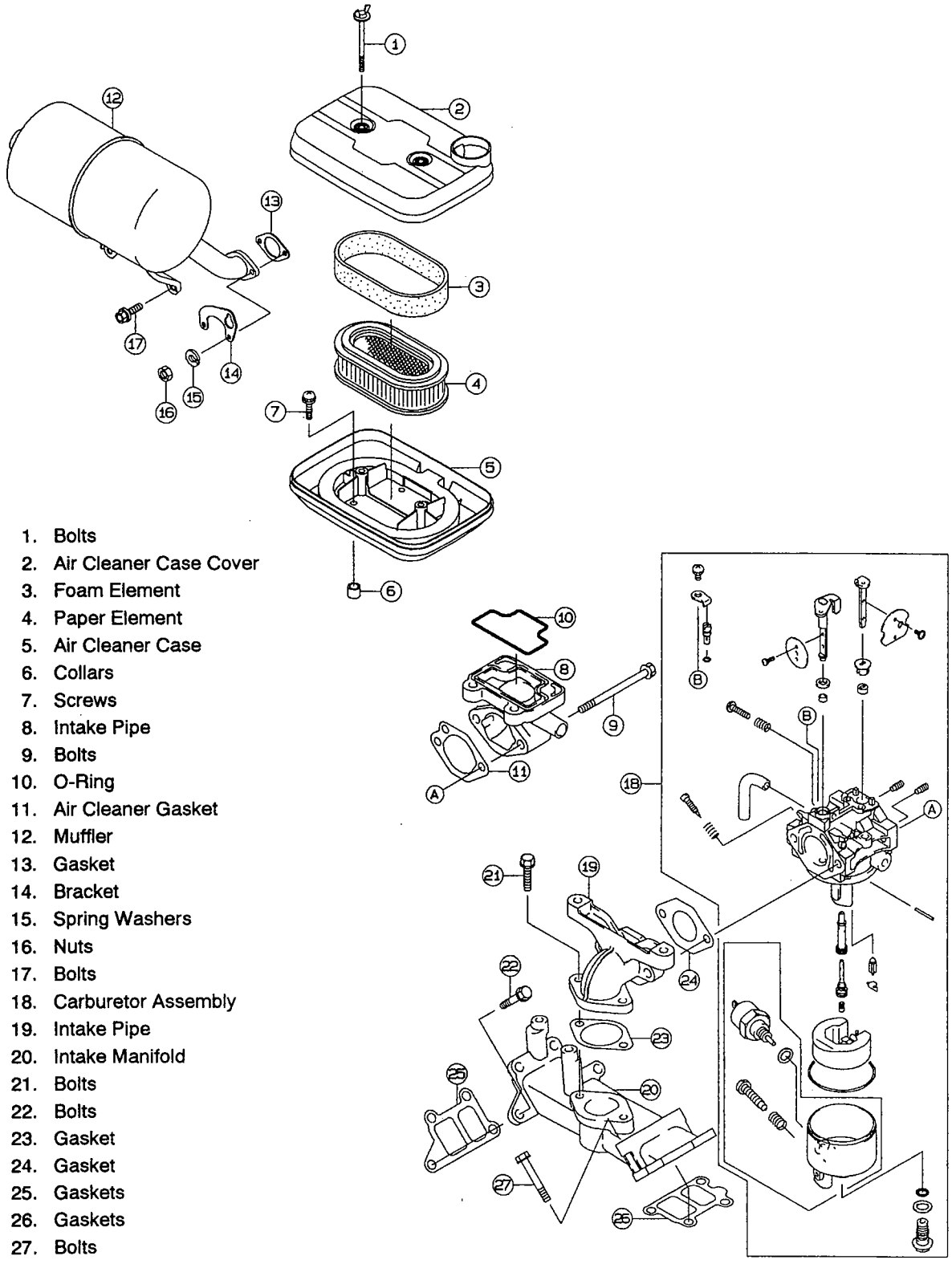
General Specifications

Type of Engine	Liquid-cooled, Horizontal shaft, OHV, 4-stroke, 90°V-twin, gasoline engine
Bore x Stroke	67m x 62 mm (2.64 x 2.44 in)
Piston Displacement	437 mL (26.7 cu-in)
Compression Ratio	9.3 : 1
Max. Output	11.8 kW (16.0 hp/3600 rpm)
Low Idle Speed	1 550 rpm
Fast Idle Speed	3 600 rpm
Fuel Pump	Pressure/vacuum operated diaphragm pump
Dimensions (L x W x H)	523 x 385 x 481 mm (20.6 x 15.2 x 18.9 in)
Dry Weight (with muffler)	35.2 kg (77.6 lb)

Specifications subject to change without notice

FUEL SYSTEM

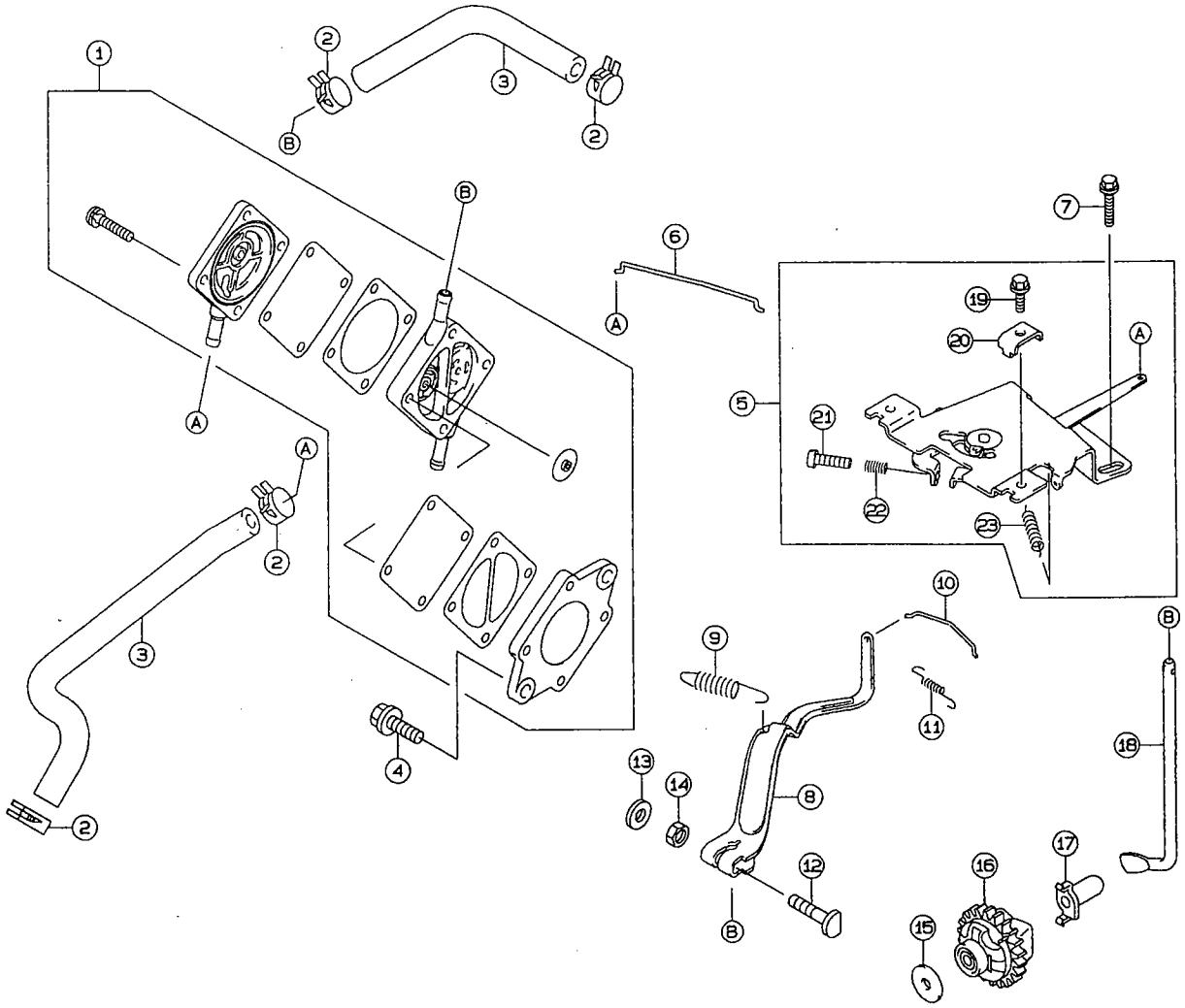
Exploded View



1. Bolts
2. Air Cleaner Case Cover
3. Foam Element
4. Paper Element
5. Air Cleaner Case
6. Collars
7. Screws
8. Intake Pipe
9. Bolts
10. O-Ring
11. Air Cleaner Gasket
12. Muffler
13. Gasket
14. Bracket
15. Spring Washers
16. Nuts
17. Bolts
18. Carburetor Assembly
19. Intake Pipe
20. Intake Manifold
21. Bolts
22. Bolts
23. Gasket
24. Gasket
25. Gaskets
26. Gaskets
27. Bolts

FUEL SYSTEM

Exploded View



1. Fuel Pump Assembly
2. Clamps
3. Tube
4. Bolts
5. Control Panel Assembly
6. Choke Link
7. Bolts
8. Governor Arm
9. Governor Spring
10. Link
11. Spring
12. Bolt
13. Washer
14. Nut
15. Thrust Washer
16. Governor Assembly
17. Sleeve
18. Governor Pivot Arm
19. Bolt
20. Clamp
21. Screw
22. Spring
23. Spring

FUEL SYSTEM

Specifications

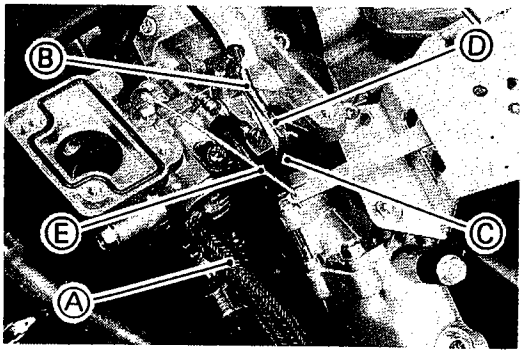
Items	Standard
Carburetor Specifications :	
Make/Type	MIKUNI/BV24-18
Main Bore Diameter	24 mm (0.94 in)
Venturi Diameter	18 mm (0.71 in)
Main Jet	#112.5
Pilot Jet	#47.5
Main Air Jet	Φ 1.2
Pilot Air Jet	Φ 1.0
Pilot Air Screw (Idle Mixture Screw) Turning Back	1 - 3/8
Low Idle	1 550 rpm
Fast Idle	3 600 rpm
Fuel Pump Specifications :	
Type	Pressure/vacuum operated diaphragm pump
Fuel Minimum Pressure	6.12 kPa (0.9 psi)
Fuel Minimum Flow	80 mL (2.7 oz/15 seconds)

Specifications subject to change without notice

FUEL SYSTEM

Carburetor

Carburetor Removal



- Remove the air cleaner and related parts (see Air Cleaner).
- Turn the fuel shut-off valve on the equipment to the OFF position.
- Drain fuel from the carburetor.
- Disconnect the fuel tube at the fuel inlet joint (A) of the carburetor.
- Disconnect the fuel shut-off valve lead terminal.
- Unscrew the carburetor mounting nuts.
- Unhook the throttle link spring (B) at the governor arm (C) top end.
- Unhook the throttle and choke link rod (D, E) at the top ends of their arms while lifting off the carburetor.

High Altitude Operation

High Altitude Main Jet FD501D

Altitudes		STD
0 ~ 1 000 m	(0 ~ 3 000 ft) (STD)	#112.5
1 000 ~ 2 000 m	(3 000 ~ 6 000 ft)	#110
2 000 m	(6 000 ft) and higher	#107.5

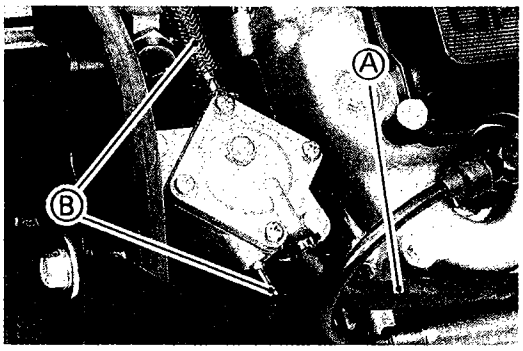
FUEL SYSTEM

Fuel Pump

The FD440V/FD501V/FD590V engines have a mechanical drive type diaphragm pump. A cam on the camshaft of the engine moves an actuating plunger. This plunger moves a pivot arm which is connected to a diaphragm. In the other hand, the FD501D engine is equipped with a pressure/vacuum operated diaphragm pump. The pump operates using changes in vacuum that occur in the crankcase during engine operation.

⚠WARNING

Gasoline is dangerous. Avoid fires due to smoking or careless maintenance practices.



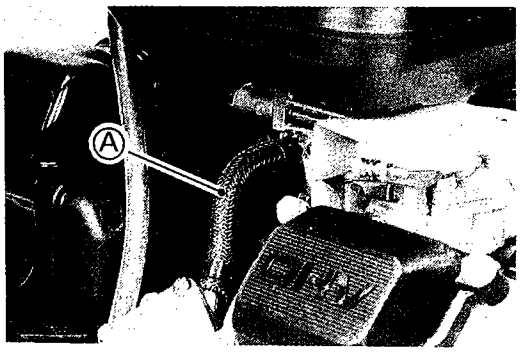
- Test the fuel pump before removal (see Fuel Pump Test).
- Close the fuel shut-off valve.
- Disconnect the vacuum line (A) and the fuel lines (B). Close all openings using caps and plugs.
- Remove the fuel pump to inspect for wear or damage. Repair or replace as necessary.

Fuel Pump Test

- Start and run the engine at slow idle for 1 minute to fill the carburetor with fuel.
- Stop the engine.
- Disconnect and plug the fuel pump outlet hose.
- Connect a pressure gauge to the fuel pump outlet.
- Start and run the engine at fast idle for 15 seconds, then record pressure reading.
- Stop the engine.

Minimum Specification

Fuel Pressure **6.12 kPa (0.9 psi)**



- Remove the fuel pump outlet pressure gauge and connect the hose.
- Disconnect the fuel pump outlet hose (A) from the carburetor and put it in a graduated container.
- Start and run the engine at fast idle for 15 seconds, then stop the engine to record container measurement.

★The measurement should be more than 80 mL (2.7 oz)/15 seconds.
If the measurement is less than the specification, inspect for:
Plugged fuel tank vent, fuel line, or fuel filter
Low crankcase vacuum
Damaged or worn fuel pump

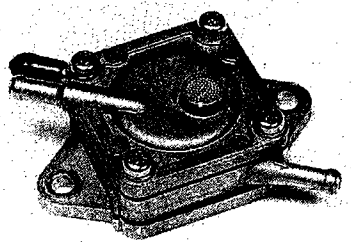
Minimum Specification

Fuel Flow **80 mL (2.7 oz)/15 seconds**

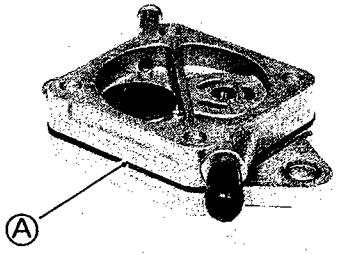
FUEL SYSTEM

Fuel Pump Disassembly

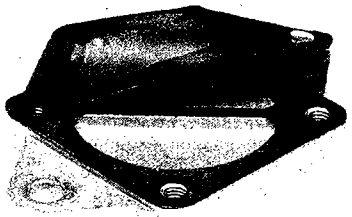
- Remove the fuel pump.
- Remove the screws and washers.
- Remove the cover, gaskets, and the diaphragm. Make sure the vent in the cover is not plugged. Inspect the diaphragm for hairline cracks or wear.



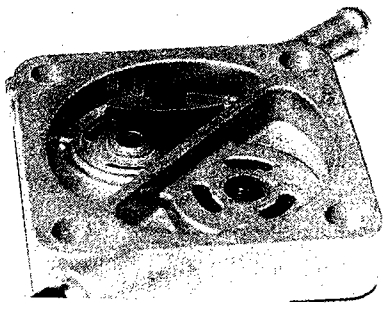
- Remove the pump body and the gasket (A).



- Remove the bottom diaphragm and the gasket. Inspect the diaphragm for holes, wrinkles or wear.
- Inspect all pump mounting surfaces. They must be free of any nicks or burrs. Replace any worn or damaged gaskets or diaphragms.

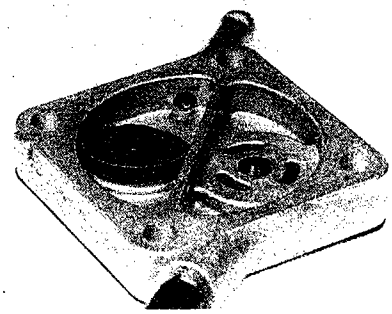


- When installing inlet and outlet valve assemblies, use a punch or small dull shaft to stretch rubber grommet. Push stretched assembly into the pump body.
- When assembling the pump body, make sure flat area on the bottom plate and the pump body match.



FUEL SYSTEM

- Remove the valves by pulling the rubber grommet. Inspect the valves for hairline cracks or wear.



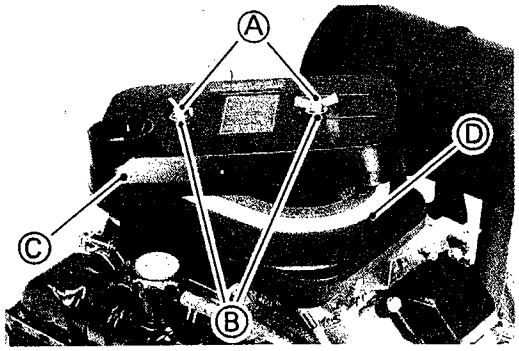
Fuel Pump Assembly

- Assembly is the reverse of disassembly.

FUEL SYSTEM

Air Cleaner

Elements Removal

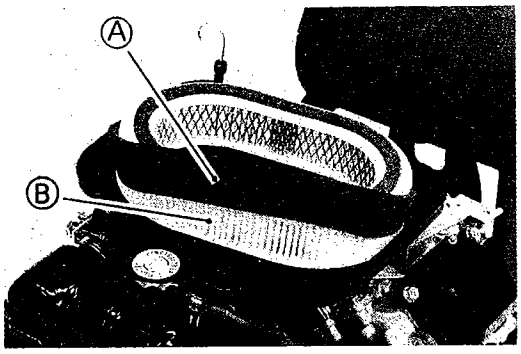


● Remove the wing bolts (A), the washers (B), and the cleaner case cover (C) to remove the elements (D).

A. Wing Bolts
B. Washers
C. Cleaner Case Cover
D. Elements

Element Cleaning and Inspection

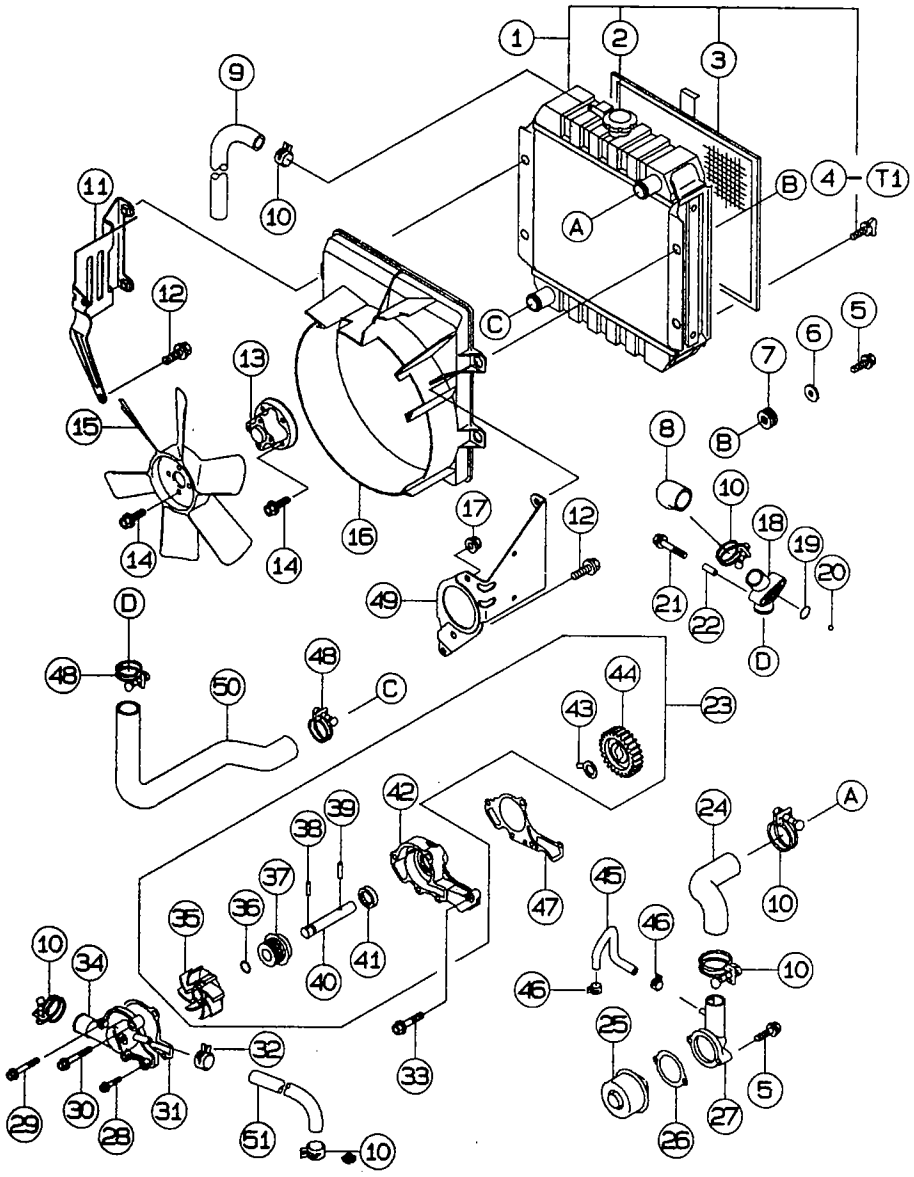
CAUTION
Do not clean the paper element. Replace if oily, dirty, or damaged in any way or direct light can be seen through paper.



● Remove the air cleaner elements to separate the foam element (A) from the paper element (B).

COOLING SYSTEM

Exploded View



1. Radiator
2. Pressure Cap
3. Screen
4. Drain Screw
5. Bolts
6. Collars
7. Dampers
8. Coolant Hose (Suction)
9. Overflow Tube
10. Clamps
11. Bracket
12. Bolts
13. Fan Extension
14. Bolts
15. Fan
16. Duct
17. Nut
18. Hose Joint
19. O-Ring
20. Steel Ball (Coolant Check Valve)
21. Bolts
22. Collars
23. Coolant Pump
24. Coolant Hose (Discharge)
25. Thermostat
26. Gasket
27. Thermostat Cover
28. Bolts
29. Bolt
30. Bolt
31. Gasket
32. Clamps
33. Bolts
34. Pump Cover
35. Impeller
36. O-Ring
37. Mechanical Seal
38. Dowel Pin
39. Dowel Pin
40. Impeller Shaft
41. Oil Seal
42. Pump Case
43. Washer
44. Gear
45. Tube (Air Vent)
46. Clamp
47. Gasket
48. Clamps
49. Bracket
50. Coolant Hose (Suction)
51. Coolant Tube (Bypass)

T1: 2.0 N-m (0.2kg-m, 17in-lb) (Finger Tight)

COOLING SYSTEM

Specifications

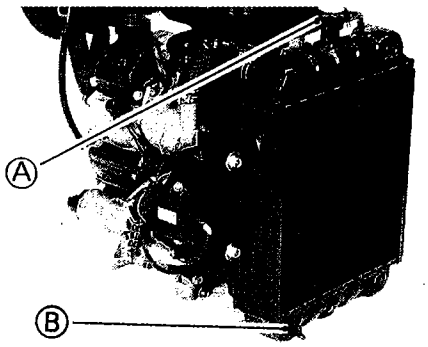
Item	Standard
Coolant:	
Total amount	2.0 L (2.1 qt)

Specification subject to change without notice

COOLING SYSTEM

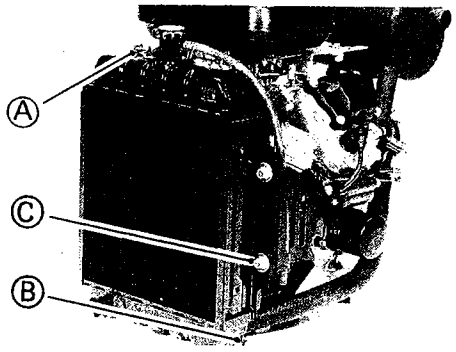
Coolant

Coolant Draining



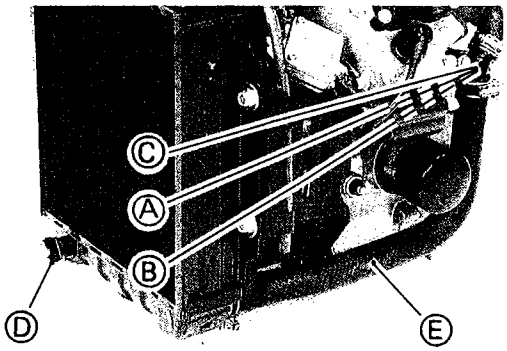
- Remove the radiator cap (A) as follows.
  - First turn the cap counterclockwise to the first stop and wait there for a few seconds.
  - Push down the cap, then turn the cap counterclockwise to the next stop.
  - Lift off the cap.
- Place a suitable container under the radiator. Turn the drain screw (B) few turns counterclockwise to drain the radiator of coolant.

Radiator Removal



- Remove the radiator cap and drain the coolant out of the radiator (see Coolant Draining).
- Loosen the hose clamps (A and B) and disconnect the radiator hoses at the top and the bottom of the radiator.
- Unscrew the radiator mounting bolts (C) and carefully remove the radiator.

CAUTION
The steel ball will be loose when the hose joint is removed. Do not let it fall out of the engine block.



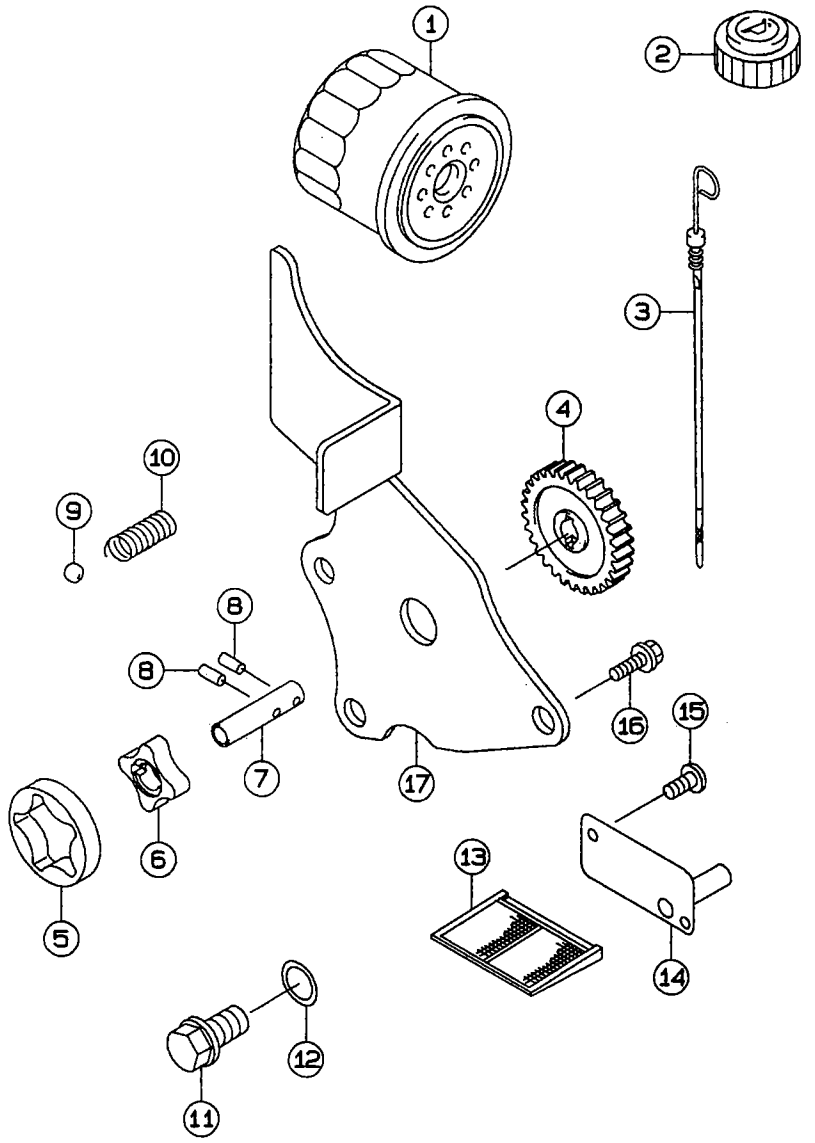
- Inspect the hose joint O-ring (B) and the steel ball (A). Replace if worn or damaged.

Steel Ball (Coolant Check Valve) Operation

As coolant flow pushes the steel ball (A) against its seat in the hose joint (C) when the engine is running, the steel ball (A) operates as a check valve not to allow suction to short-circuit. As the coolant pump stops, the coolant flow disappears when the engine stops. Static coolant in the cylinder heads, water jackets, and the intake manifold pushes the ball (A) out of the way, draining from the drain (D) through the hose joint (C) and the coolant hose (E).

LUBRICATION SYSTEM

Exploded View



1. Oil Filter
2. Oil Filler Cap
3. Oil Gauge
4. Pump Gear
5. Pump Outer Rotor
6. Pump Inner Rotor
7. Pump Shaft
8. Pins
9. Relief Valve (Steel Ball)
10. Relief Valve Spring
11. Drain Plug
12. Gasket
13. Oil Screen
14. Plate
15. Screws
16. Bolts
17. Cover

LUBRICATION SYSTEM

Specifications

Item	Standard
Engine Oil:	
Oil Pan Capacity (H)	1.3 L (2.74 US pt)
Oil Pan Capacity (L)	0.8 L (1.68 US pt)
Oil Filter Capacity	0.15 L (0.31 US pt)

Specifications subject to change without notice

LUBRICATION SYSTEM

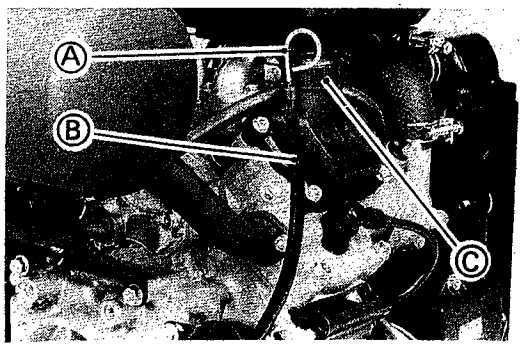
Specifications

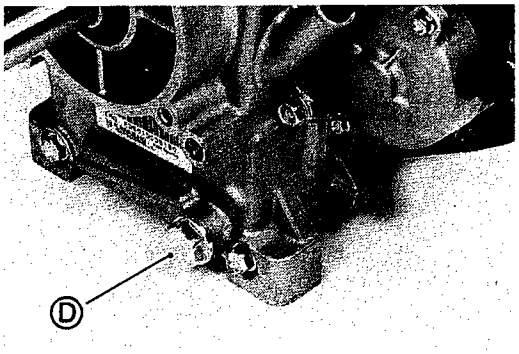
Oil Level Inspection

- Place the engine on a level surface and check the oil level.
- Clean area around the dipstick (A) before removing it.
- Remove the dipstick and wipe it with a clean cloth.
- Insert the dipstick into the tube (B) following the tube bend and let its plug firmly fit into the tube. Then check the oil level.
- The oil level should be between "H" and "L" marks on the dipstick.

★If the oil level is near or below "L" mark, remove the oil filler cap (C) and add enough engine oil to bring oil level to "H" mark.

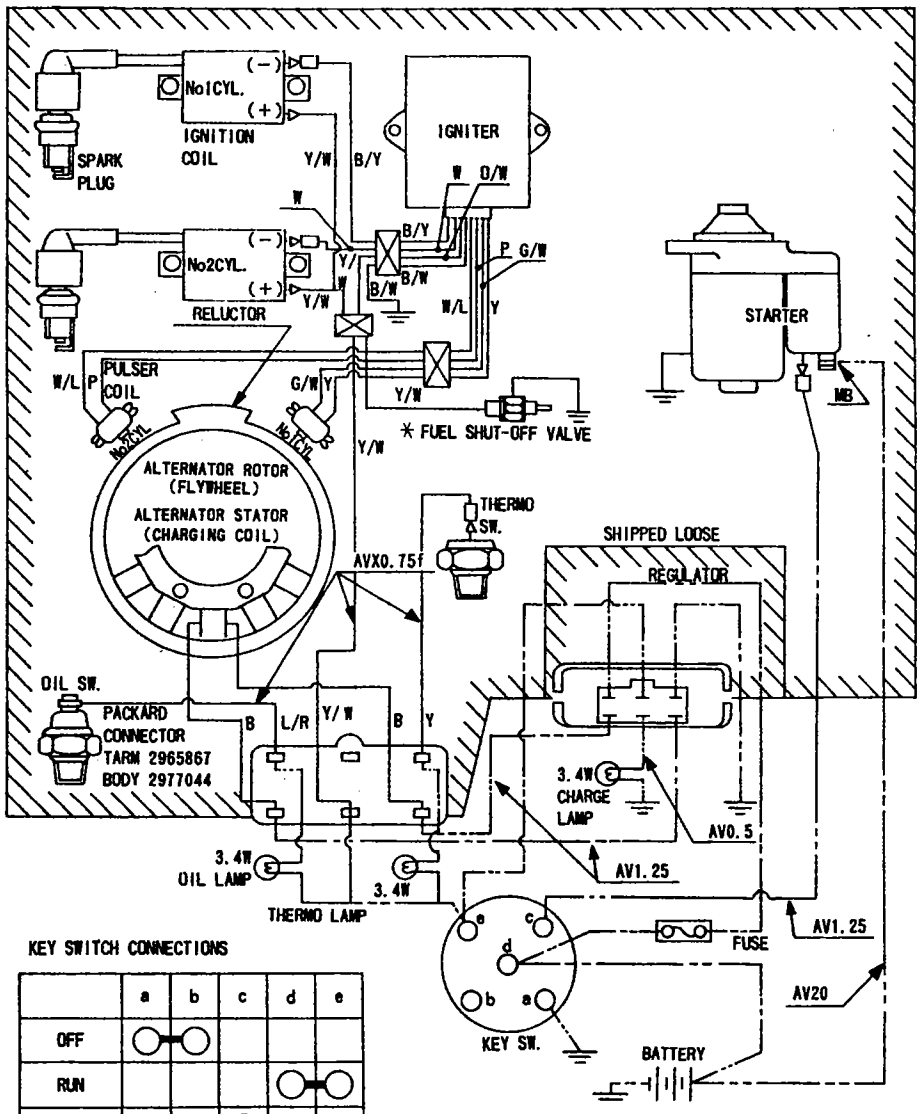
★If the oil level is too high, remove excess oil by loosening the drain plug (D).





ELECTRICAL SYSTEM

Wiring Diagram Revised



KEY SWITCH CONNECTIONS

	a	b	c	d	e
OFF	○	○			
RUN				○	○
START			○	○	○

Wire Color

P: Pink	G/W: Green/White
Y: Yellow	O/W: Orange/White
W: White	B/Y: Black/Yellow
R: Red	B/W: Black/White
B: Black	Y/W: Yellow/White
W/L: White/Blue	L/R: Blue/Red

NOTE: PORTION SURROUNDED BY /// SHOWS KAWASAKI PROCUREMENT PARTS.
* FUEL SHUT-OFF VALVE WITH WHICH FD501V IS EQUIPPED

Kawasaki Motors Corp., U.S.A.
ENGINE DIVISION
P.O. BOX 888285
GRAND RAPIDS, MI 49588-8285

Part No. 99924-2043-51

Printed in U.S.A.