TO THE READER

This Workshop Manual has been prepared to provide servicing personnel with information on the mechanism, service and maintenance of T1460 · T1560. It is divided into two parts, "Mechanism" and "Servicing" for each section.

■ **Mechanism**

Information on the construction and function are included. This part should be understood before proceeding with troubleshooting, disassembling and servicing.

■ **Servicing**

Under the heading "General" section comes general precautions, check and maintenance and special tools. Other section, there are troubleshooting, servicing specification lists, checking and adjusting, disassembling and assembling, and servicing which cover procedures, precautions, factory specifications and allowable limits.

All information, illustrations and specifications contained in this manual are based on the latest production information available at the time of publication.

The right is reserved to make changes in all information at any time without notice.

December '94

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G GENERAL

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⚠ SAFETY FIRST

This symbol, the industry's "Safety Alert Symbol", is used throughout this manual and decals on the machine itself to warn of the possibility of personal injury. Read these instructions carefully.
It is essential that you read the instructions and safety regulations before you attempt to repair or use this unit.

⚠ **DANGER** : Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

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

⚠ **CAUTION** : Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

■ **IMPORTANT** : Indicates that equipment or property damage could result if instructions are not followed.

■ **NOTE** : Gives helpful information.

SAFETY SERVICING AND REPAIRING

(1) Before working on the vehicle :
- Park the vehicle on a firm and level ground, and set the parking brake.
- Lower the mower to the ground.
- Stop the engine, and remove the key.
- Disconnect the battery's ground cable.
- Clean the work area and vehicle.

(2) Do not work on the vehicle while under the influence of alcohol, medication, or other substances or while fatigued.
(3) Do not wear a necktie, scarf, necklace, loose or bulky clothing when you work near machine tools or moving parts.
(4) Use tools appropriate to the work. Makeshift tools, parts, and procedures will not make good repairs.
(5) When servicing is performed together by two or more persons, take care to perform all work safely.
(6) Do not work under the vehicle that is supported solely by a jack. Always support the vehicle by safety stands.

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MECHANISM

[1] WIRING DIAGRAM AND ELECTRICAL CIRCUIT

The electrical system includes these circuits written below.

- Engine starting circuit
  (Starter motor, etc.)
- Engine key switch shut-off circuit
  (Engine stop relay, fuel cut off solenoid, etc.)
- Power generating and charging circuit
  (Charging coil, regulator, etc.)
- Lighting circuit
  (Head light, head light switch, etc.)

The voltage applied to the each circuit is 12 volts.

(1) Wiring Diagram

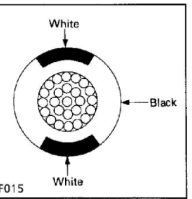
- **Color of Wiring**

B	Black	Y	Yellow
Br	Brown	BOr	Black / Orange
G	Green	BW	Black / White
R	Red	BY	Black / Yellow
Or	Orange	RW	Red / White
W	White		

- **Wire Size**

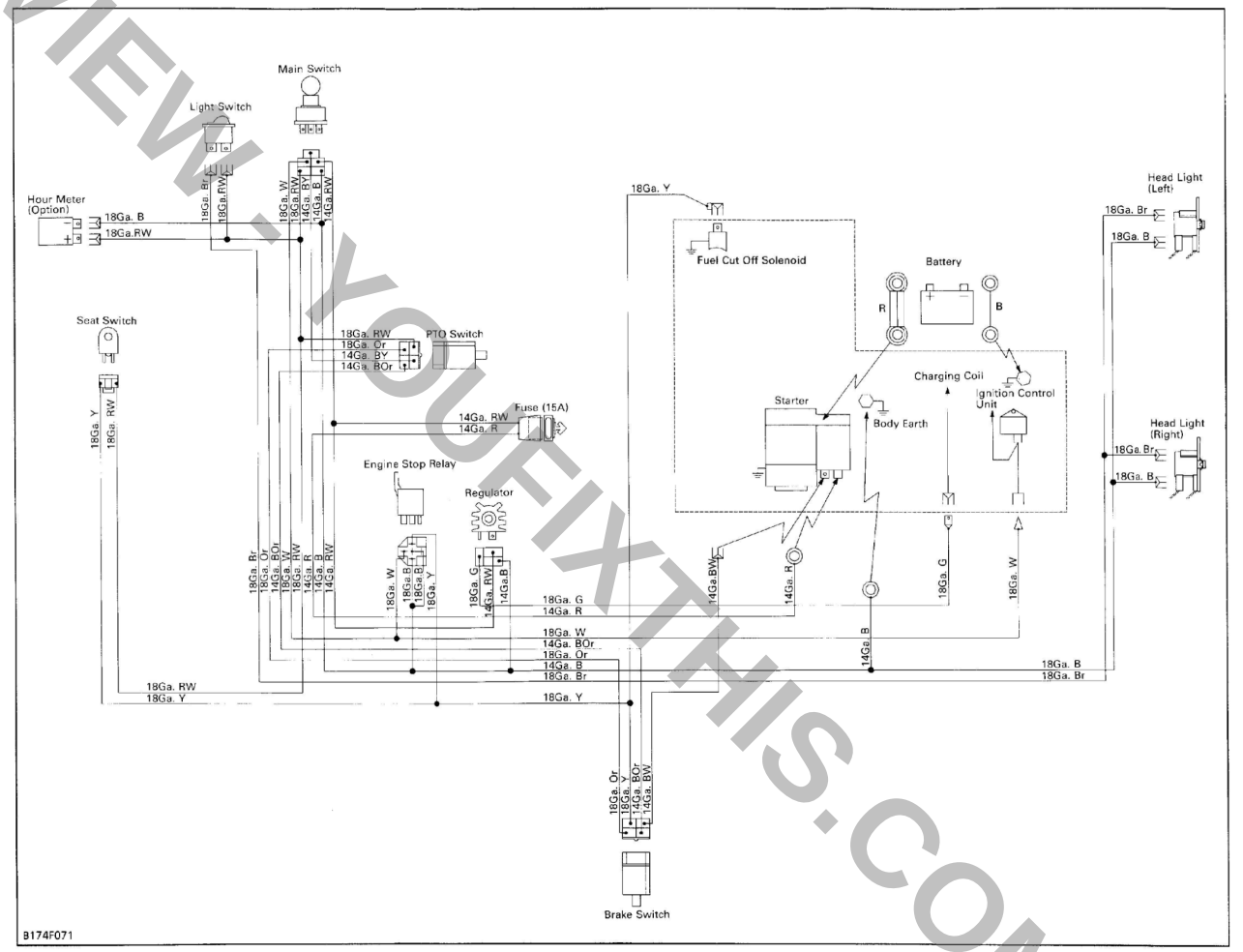
SAE wire size	Metric wire size
18 Ga.	0.8 mm²
14 Ga.	2.0 mm²

- **Two-color Lead**

Lead (Cross-section)	
Name of lead color	Black / White (BW)

- **Main Switch Table**

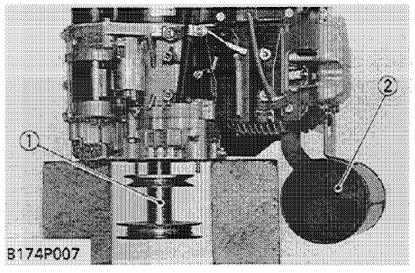
Key Position \ Terminal	EARTH (G)	IG (M)	BAT (B)	ON (L)	START (S)
OFF	●	●			
ON			●	●	
START			●	●	●



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(2) External Components



(1) Engine Pulley (2) Muffler

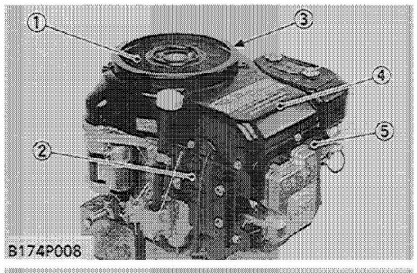
Engine Pulley and Muffler

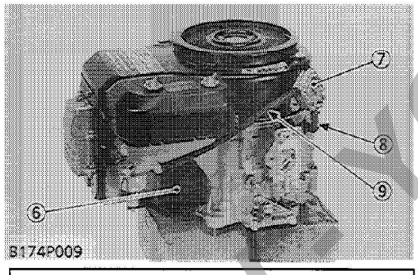
1. Unscrew the engine pulley mounting screw, and remove the engine pulley (1).
2. Unscrew the muffler mounting nuts, and remove the muffler (2).

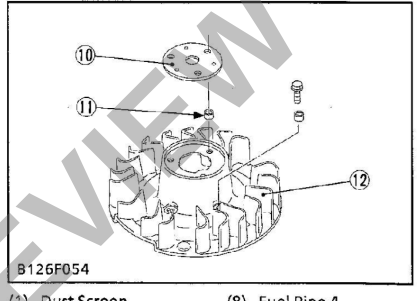
(When reassembling)

- Replace the muffler gasket with a new one.

Tightening torque	Engine pulley mounting screw	48.1 to 55.9 N·m 4.9 to 5.7 kgf·m 35.5 to 41.2 ft-lbs
	Muffler mounting nut	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft-lbs







(1) Dust Screen
(2) Cylinder Cowling 2
(3) Fan Guard
(4) Fan Cover
(5) Cylinder Cowling 1
(6) Cylinder Cowling 3
(7) Fuel Pump
(8) Fuel Pipe 4
(9) Fuel Pipe 3
(10) Shim
(11) Collar
(12) Fan
(13) Counter Blade

Cylinder Cowling and Fan Cover

CAUTION

- **Gasoline is extremely flammable. Do not smoke or allow flames or sparks in your working area. Clean up any spilled gasoline immediately.**

1. Remove the fan guard (3), and remove the dust screen (1) and shim (10).
2. Remove the fuel pump (7), fuel pipe 3 (9) and fuel pipe 4 (8).
3. Remove the cylinder cowling 1 (5), fan cover (4), cylinder cowling 2 (2) and cylinder cowling 3 (6).
4. Remove the fan (12).

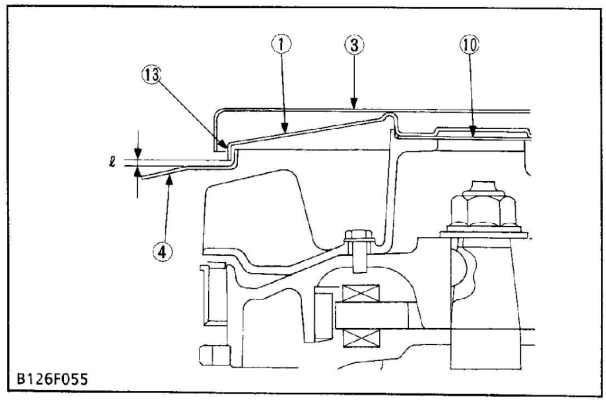
(When reassembling)

- Be sure to install the three collars (11) in the fan.
- Be sure to install the shim (10) on the fan (12).

■ IMPORTANT

- **Check the clearance (ℓ) between the counter blade (13) and fan cover (4). If the measurement is out of the factory specification, adjust it by changing number of shim (10).**

Clearance (ℓ) between the counter blade and fan cover	Factory spec.	Approx. 1.5 mm 0.059 in.



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[4] TIGHTENING TORQUES (GENERAL USE SCREWS, BOLTS AND NUTS)

Screws, bolts and nuts whose tightening torques are not specified in this Workshop Manual should be tightened according to the table below.

(1) Metric Screws, Bolts and Nuts

Grade / Unit / Nominal Diameter	GR. 8.8 * (8.8)			GR. 10.9 * (10.9)		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
M 8	23.6 to 27.4	2.4 to 2.8	17.4 to 20.2	29.4 to 34.3	3.0 to 3.5	21.7 to 25.3
M10	48.1 to 55.8	4.9 to 5.7	35.5 to 41.2	60.8 to 70.5	6.2 to 7.2	44.9 to 52.1
M12	77.5 to 90.1	7.9 to 9.2	57.2 to 66.5	103 to 117	10.5 to 12.0	76.0 to 86.8
M14	124 to 147	12.6 to 15.0	91.2 to 108	167 to 196	17.0 to 20.0	123 to 144
M16	196 to 225	20.0 to 23.0	145 to 166	260 to 303	26.5 to 31.0	192 to 224

* The figures on the table above are indicated the top of screw or bolt.

(2) American Standard Screws, Bolts and Nuts with UNC or UNF Threads

Grade / Unit / Nominal Diameter	GR. 5 * ( )			GR. 8 * ( )		
	N·m	kgf·m	ft-lbs	N·m	kgf·m	ft-lbs
5/16	23.1 to 27.8	2.35 to 2.84	17.0 to 20.5	32.5 to 39.3	3.31 to 4.01	24 to 29
3/8	47.5 to 57.0	4.84 to 5.82	35 to 42	61.0 to 73.2	6.22 to 7.47	45 to 54
1/2	108.5 to 130.2	11.07 to 13.29	80 to 96	149.2 to 179.0	15.22 to 18.27	110 to 132
9/16	149.2 to 179.0	15.22 to 18.27	110 to 132	217.0 to 260.4	22.14 to 26.57	160 to 192
5/8	203.4 to 244.1	20.75 to 24.91	150 to 180	298.3 to 358.0	30.44 to 36.53	220 to 264

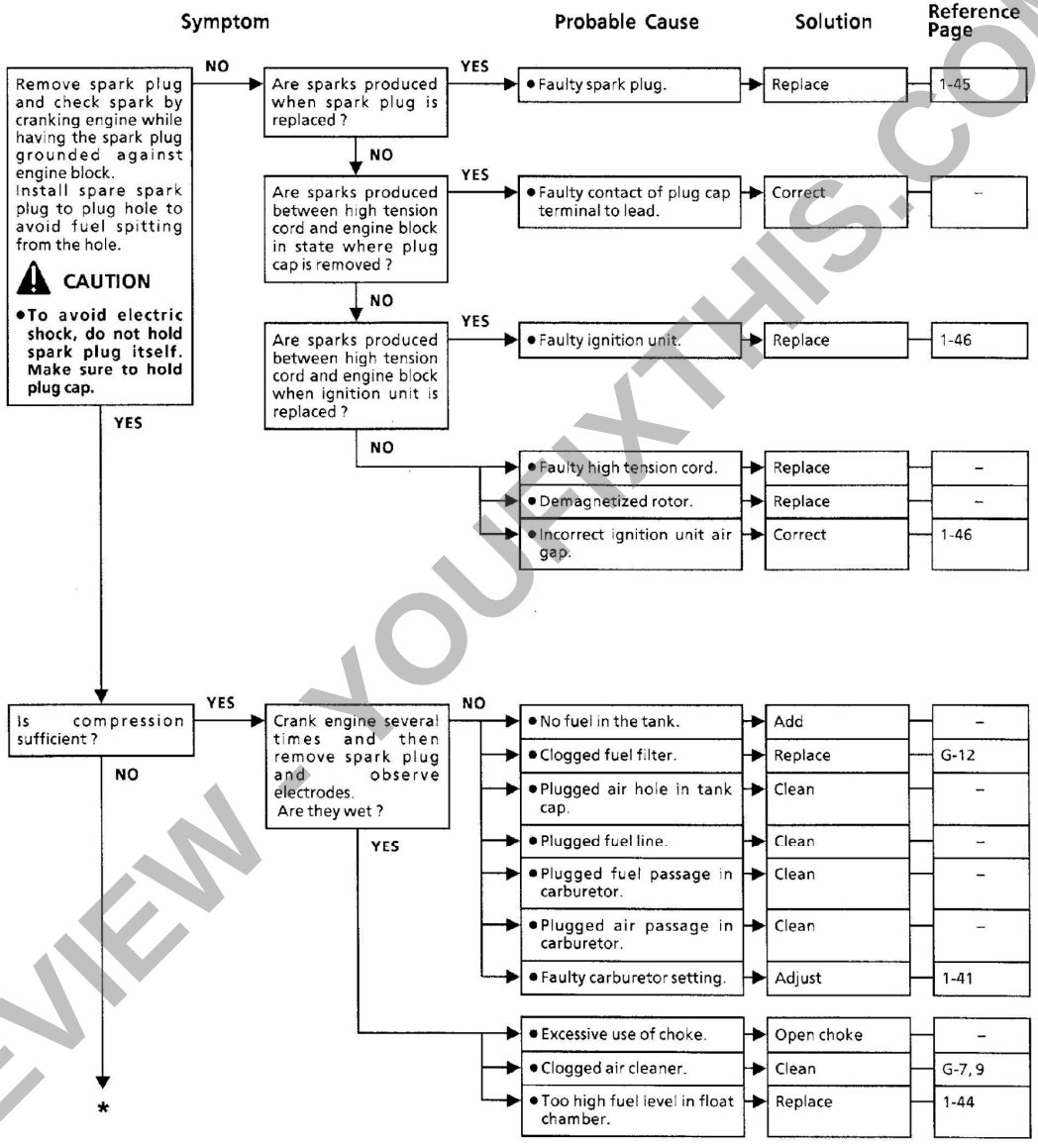
* The figures on the table above are indicated the top of screw or bolt.

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TROUBLESHOOTING

[Hard Starting]



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SPECIFICATIONS

Model			T1460	T1560
Engine	Model		GH410V	GH420V
	Type		Forced air-cooled, Vertical shaft OHV, 4-stroke gasoline engine	
	Number of cylinders		1	
	Bore and stroke		89 mm × 68 mm (3.50 in. × 2.68 in.)	
	Total displacement		423 cm³ (25.8 cu.in.)	
	Maximum horsepower		9.3 kW / 3600 min⁻¹ (12.5 HP / 3600 rpm)	10.4 kW / 3600 min⁻¹ (14.0 HP / 3600 rpm)
	Maximum torque		29.2 N·m / 2300 min⁻¹ (2.98 kgf·m / 2300 rpm, 21.6 ft-lbs / 2300 rpm)	30.6 N·m / 2300 min⁻¹ (3.12 kgf·m / 2300 rpm, 22.6 ft-lbs / 2300 rpm)
	Maximum bare speed		3350 ± 50 min⁻¹ (3350 ± 50 rpm)	
	Minimum bare idling speed		1550 ± 75 min⁻¹ (1550 ± 75 rpm)	
	Direction of rotation		Counterclockwise facing the PTO shaft	
	Compression ratio		8.4 : 1	
	Ignition system		Flywheel magneto transistor type	
	Spark plug		Champion RN11YC	
	Carburetor		Float type with fixed main jet	
	Air cleaner		Semi-cyclone type with dual element	
	Governor		Mechanical flyweight type	
	Lubricating system		Forced lubrication by oil pump	
	Cooling system		Forced air cooling	
	Starting system		Electric starter (12 V, 0.6 kW)	
	Charging system		Charging coil (12 V, 3 A)	
	Battery		U1L-9 (12 V, 300 CCA)	
	Throttle system		Manual	ATA (Auto Throttle Advance)
	Engine stop system		Key stop	
Capacities	Fuel tank		11.0 ℓ (2.9 U.S.gals., 2.4 Imp. gals.)	
	Engine crankcase		1.3 ℓ (1.4 U.S.qts., 1.1 Imp.qts.)	
	Hydrostatic transmission		2.3 ℓ (2.4 U.S.qts., 2.0 Imp.qts.)	
Dimensions	Overall length		1720 mm (67.7 in.)	
	Overall width		1320 mm (52.0 in.)	
	Overall height		1095 mm (43.1 in.)	
	Wheel base		1195 mm (47.0 in.)	
	Tread	Front	710 mm (28.0 in.)	
		Rear	660 mm (26.0 in.)	
Weight (with mower)			240 kg (529.1 lbs)	
Tire size	Front		15 × 6.00 - 6	
	Rear		18 × 8.50 - 8	
Steering system			Sector gear type	
Transmission			Hydrostatic transmission	
Brake			Internal disk type	
Traveling speed	Forward		0 to 9.0 km / h (0 to 5.6 mph)	
	Reverse		0 to 4.0 km / h (0 to 2.5 mph)	
PTO clutch			Belt tension	
Mower	Model		RCK40LT	
	Overall length		835 mm (32.9 in.)	
	Overall width		1320 mm (52.0 in.)	
	Overall height		260 mm (10.2 in.)	
	Mounting method		Parallel linkage	
	Adjustment of cutting height		Dial gauge	
	Cutting width		1016 mm (40 in.)	
	Cutting height		25 to 102 mm (1.0 to 4.0 in.)	
	Number of blades		2	
	Weight (Approx.)		43 kg (94.8 lbs)	
	Discharge		Right side	

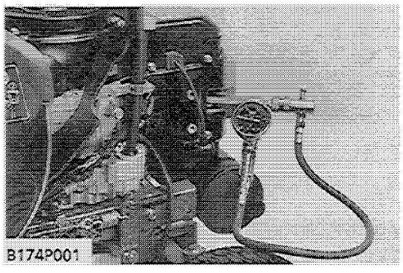
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CHECKING, DISASSEMBLING AND SERVICING

[1] ENGINE BODY

CHECKING AND ADJUSTING

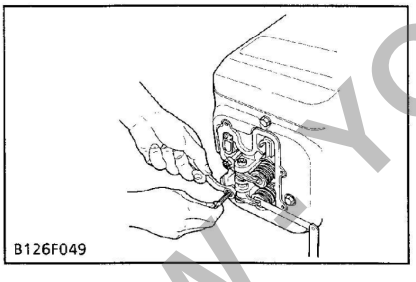

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Compression Pressure

1. Remove the upper and lower bonnet.
2. Remove the muffler cover and front bumper.
3. Run the engine until it is warmed up, and stop the engine.
4. Remove the spark plug and set the air cooled compression tester (Code No. 07909-30251) to the plug hole.
5. Disconnect the 1P connector from the fuel cut off solenoid.
6. Turn a crank by electric starter and read the gauge.
7. Measure the compression pressure several times.
8. If the measurement is below the factory specification, check the valve seat contact and measure the compression pressure again.
9. If the reading does not improve, check the cylinder liner wall, valves and piston rings.

■ **NOTE**
- **Check the compression pressure with the specified valve clearance.**
- **Always use a fully charged battery for performing this test.**

Compression pressure	Factory spec.	483 kPa or more 4.93 kgf/cm² or more 70.1 psi or more


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Valve Clearance

■ **IMPORTANT**
- **Valve clearance must be checked and adjusted when engine is cold.**

1. Open the bonnet and remove the cylinder head cover.
2. Put the piston in the compression top dead center.
3. Check the intake and exhaust valve clearance with a feeler gauge.
4. If the clearance is out of the factory specification, adjust with the adjusting screw.

■ **NOTE**
- **After adjusting the valve clearance, secure the adjusting screw with the lock nut.**

Intake and exhaust valve clearance (Cold)	Factory spec.	0.15 mm 0.0059 in.
Tightening torque	Lock nut	17.0 to 23.0 N·m 1.7 to 2.4 kgf·m 12.5 to 17.0 ft-lbs

DISASSEMBLING AND ASSEMBLING

(1) Separating Engine

Dismounting Mower

1. See page 9-5.

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SERVICING SPECIFICATIONS

ENGINE BODY

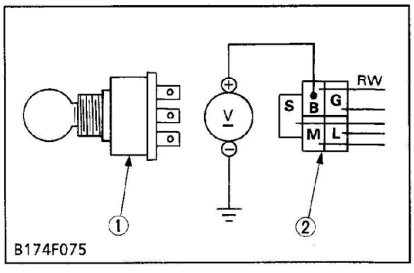
Item		Factory Specification	Allowable Limit
Compression Pressure (When Cranking with Electric Starter)		483 kPa or more 4.93 kgf/cm² or more 70.1 psi or more	–
Valve Clearance (Intake and Exhaust)		0.15 mm 0.006 in.	–
Cylinder Head Surface	Flatness	–	0.05 mm 0.0020 in.
Rocker Arm	I.D.	–	13.068 mm 0.51449 in.
Rocker Arm Shaft	O.D.	–	12.936 mm 0.50929 in.
Valve Stem	O.D. (Intake)	–	6.930 mm 0.27283 in.
	O.D. (Exhaust)	–	6.915 mm 0.27224 in.
Valve Stem	Runout	–	0.03 mm 0.0012 in.
Valve Guide	I.D. (Intake and Exhaust)	–	7.065 mm 0.27815 in.
Push Rod	Runout	–	0.30 mm 0.0118 in.
Valve Spring	Free Length	–	37.50 mm 1.4764 in.
Valve Seat	Width (Intake and Exhaust)	1.10 to 1.46 mm 0.0433 to 0.0575 in.	2.50 mm 0.0984 in.
Valve Seat	Angle (Intake)	1.047 rad. 60°	–
	Angle (Exhaust)	0.785 rad. 45°	–
Valve Face	Angle (Intake and Exhaust)	0.79 rad. 45°	–
Cylinder Liner	I.D. (STD)	88.980 to 89.000 mm 3.50315 to 3.50394 in.	89.076 mm 3050693 in.
Oversize Cylinder Liner (Boring Size)	I.D. (0.25 OS)	89.210 to 89.230 mm 3.51221 to 3.51299 in.	–
	I.D. (0.50 OS)	89.460 to 89.480 mm 3.52205 to 3.52284 in.	–
Oversize Cylinder Liner (Honing Size)	I.D. (0.25 OS)	89.230 to 89.250 mm 3.51299 to 3.51378 in.	89.326 mm 3.51677 in.
	I.D. (0.50 OS)	89.480 to 89.500 mm 3.52284 to 3.52362 in.	89.576 mm 3.52662 in.

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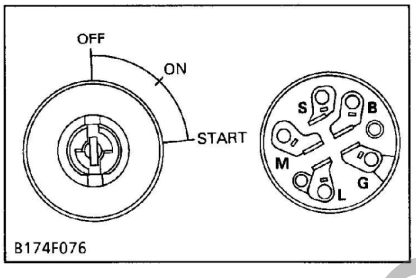
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[2] STARTING SYSTEM

CHECKING



B174F075



B174F076

Main Switch

1) Connector Voltage

1. Turn the main switch off.
2. Open the bonnet and disconnect the 5P connector (2) from the main switch (1).
3. Measure the voltage with a voltmeter across the connector **B** terminal and chassis.
4. If the voltage differs from battery voltage, the wiring harness is faulty.

Voltage (B terminal – Chassis)	Factory spec.	Battery voltage

(1) Main Switch (2) 5P Connector

2) Terminal Continuity

1. Remove the main switch from the main panel.
2. Measure the resistance with an ohmmeter across terminals when the main switch is set at **"OFF"** position.
3. Measure the resistance with an ohmmeter across terminals when the main switch is set at **"ON"** position.
4. Measure the resistance with an ohmmeter across terminals when the main switch is set at **"START"** position.
5. If the resistance values specified below are not indicated, the main switch is faulty.

■ Main switch is set at **"OFF"** position.

	G terminal	M terminal	B terminal	L terminal	S terminal
G terminal		Continuity	Infinity	Infinity	Infinity
M terminal	Continuity		Infinity	Infinity	Infinity
B terminal	Infinity	Infinity		Infinity	Infinity
L terminal	Infinity	Infinity	Infinity		Infinity
S terminal	Infinity	Infinity	Infinity	Infinity	

■ Main switch is set at **"ON"** position.

	G terminal	M terminal	B terminal	L terminal	S terminal
G terminal		Infinity	Infinity	Infinity	Infinity
M terminal	Infinity		Infinity	Infinity	Infinity
B terminal	Infinity	Infinity		Continuity	Infinity
L terminal	Infinity	Infinity	Continuity		Infinity
S terminal	Infinity	Infinity	Infinity	Infinity	

■ Main switch is set at **"START"** position.

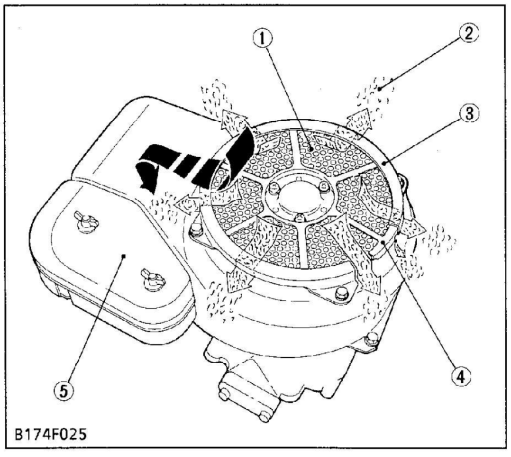
	G terminal	M terminal	B terminal	L terminal	S terminal
G terminal		Infinity	Infinity	Infinity	Infinity
M terminal	Infinity		Infinity	Infinity	Infinity
B terminal	Infinity	Infinity		Continuity	Continuity
L terminal	Infinity	Infinity	Continuity		Continuity
S terminal	Infinity	Infinity	Continuity	Continuity	

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MECHANISM

[1] INTAKE AIR SYSTEM AND COOLING AIR SYSTEM



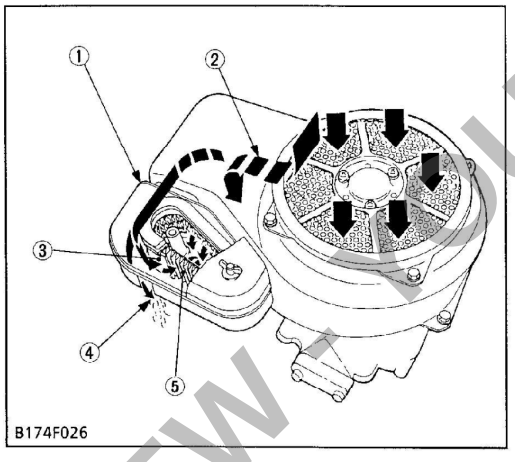
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The system utilitizes a special screen and peripheral blades (4) that remove grass and debris. A careful study was made to determine the most efficient size and shape for the rotating screen (1) as it must be capable of removing grass clippings and yet allow adequate cooling air to enter the fan.

A peripheral blade (4) is incorporated to cut and remove long, thin grass drawing through the screen perimeter and the fan housing.

A safety guard (3) is on the outside of blade for user protection.

(1) Rotating Screen
(2) Flapping Grass
(3) Safety Guard
(4) Peripheral Blade
(5) Air Cleaner

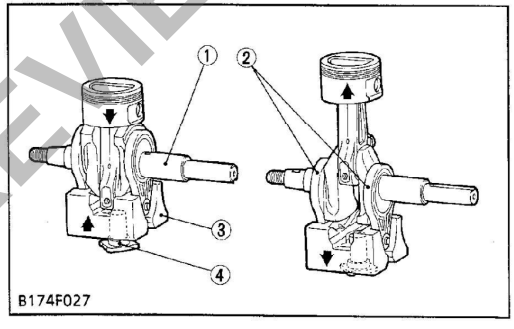


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As shown left, dirty air is drawn into the cooling air inlet. Centrifugal force caused by the sharp curve in the element housing (1) forces the large particles of dirt to be thrown to the outer wall of the housing and out the air cleaner outlet (4). The smaller particles are removed by the primary pre-cleaner (3) and secondary paper element (5) allowing only thoroughly cleaned air to enter the engine.

(1) Element Housing
(2) Cooling Air
(3) Primary Pre-cleaner
(4) Air Cleaner Outlet
(5) Secondary Paper Element

[2] RECIPROCATING BALANCE SYSTEM



B174F027

The vibrations generated by engines is attributed mainly to the inertia force resulting from the reciprocating motion mass of the piston, piston ring and piston pin.

The GH410V and GH420V have the balancer weight (3) mounted to the crankshaft (1) and reciprocating balance is accomplished in the exact line of the piston motion axis. This method is the most effective means of canceling the inertial force and reducing vibration.

(1) Crankshaft
(2) Balancer Link Rod
(3) Balancer Weight
(4) Balancer Support Shaft

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