TO THE READER

This supplement shows the altered points of T1760 from T1560. As for the items which are not explained in this supplement, refer to the T1460·T1560 Workshop Manual (Code No.: 97897-11740). Complete and proper service of T1760 requires both this supplement and T1460·T1560 Workshop Manual.

Please note the page number with the mark "*" shows the page number of T1460·T1560 Workshop Manual.

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.

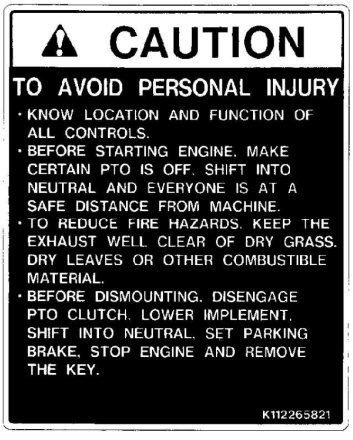
December '95

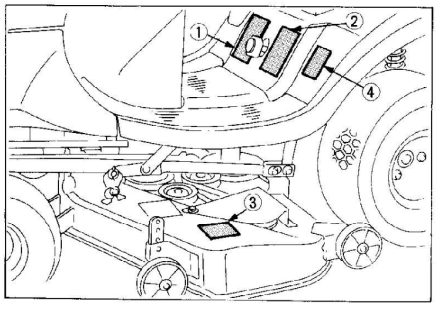
SAFETY DECALS

- The following safety decals are installed on the vehicle and mower.
  If a decal becomes damaged, illegible or is not on the vehicle and mower, replace it. The decal part number is listed in the parts list.

① Part No. K1122-6581-1

② Part No. K1122-6582-1





③ Part No. K5112-7312-1

④ Part No. K1122-6584-1

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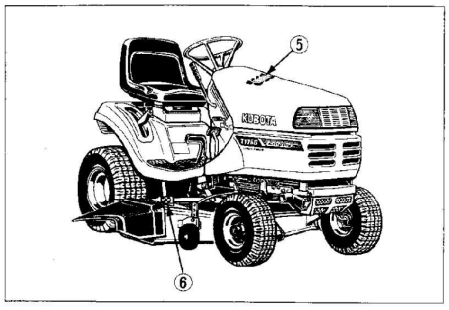
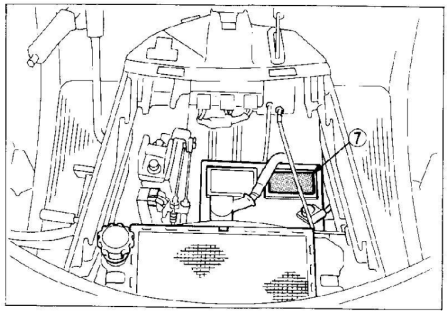
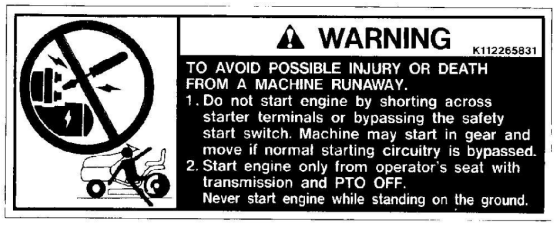


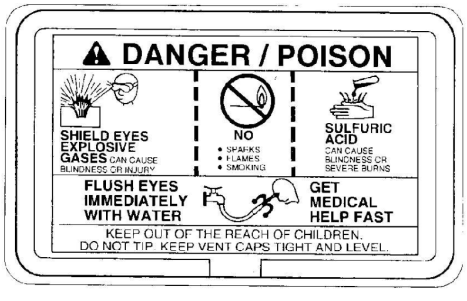


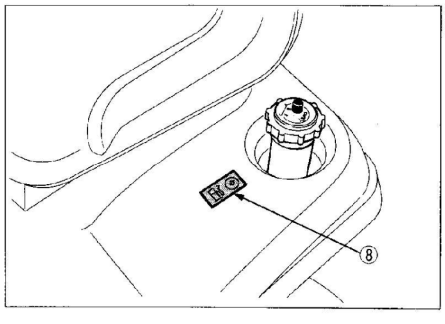
⑤ Part No. K1122-6583-1 (Under Hood)



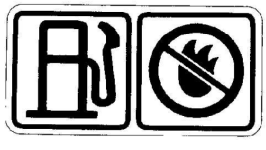
⑥ Part No. K5112-7311-1

⑦ Part No. K1122-6115-1





⑧ Part No. K1122-6585-0
Gasoline fuel only — No fire

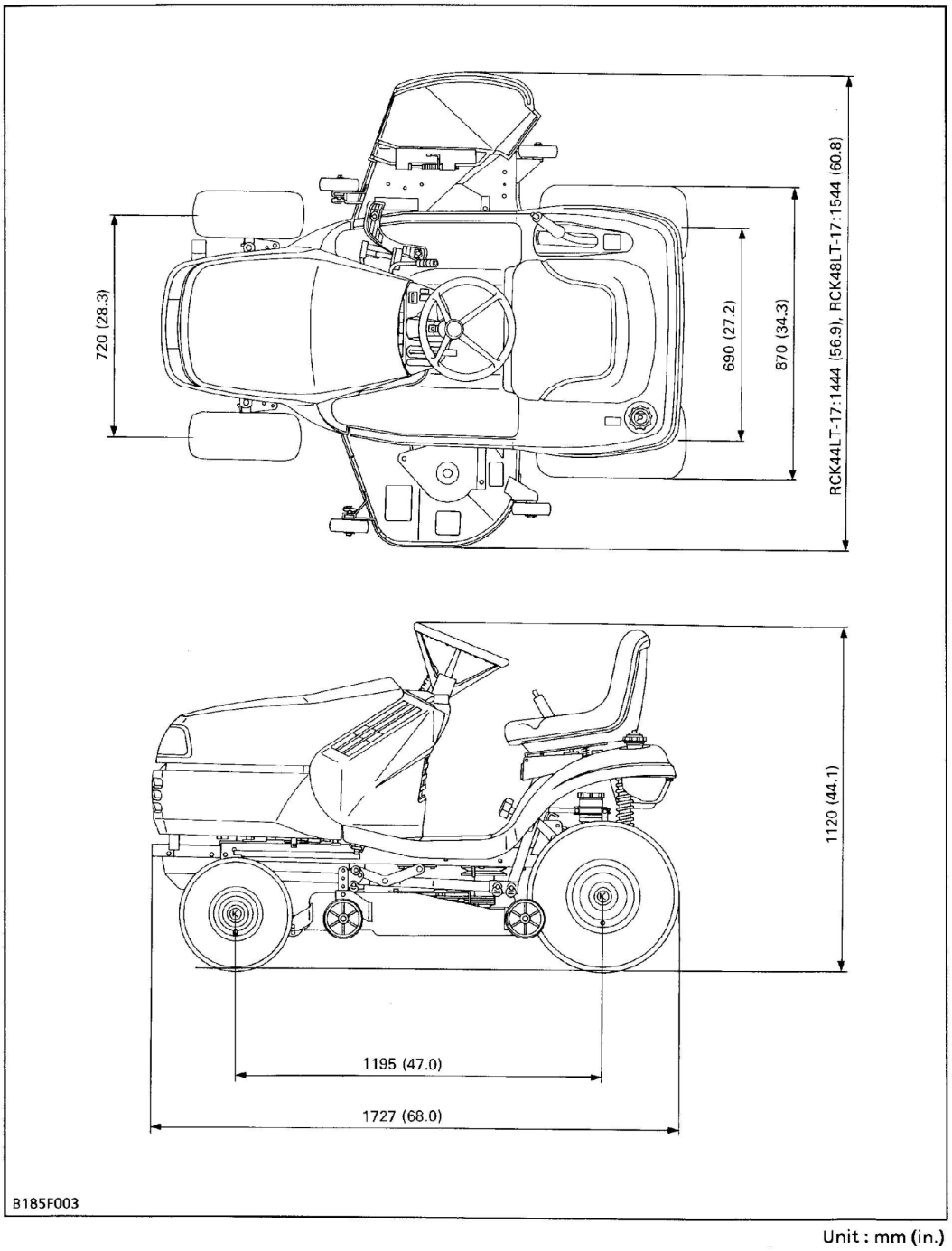


B185F002

SPECIFICATIONS

Model			T1760	
Engine	Model		WG510V	
	Type		Liquid-cooled, Vertical shaft, OHV, 4-stroke engine	
	Number of cylinders		2	
	Bore and stroke		67 mm × 62 mm (2.64 in. × 2.44 in.)	
	Total displacement		437 cm^3 (26.7 cu.in.)	
	Maximum horsepower		12.6 kW / 3600 min^{-1} (17 HP / 3600 rpm)	
	Maximum bare speed		3500 to 3625 min^{-1} (rpm)	
	Minimum bare idling speed		1550 ± 75 min^{-1} (1550 ± 75 rpm)	
	Direction of rotation		Counterclockwise facing the PTO shaft	
	Ignition system		Transistor-controlled battery-ignition system	
	Spark plug		NGK BMR6A	
	Carburetor		Float type with fixed main jet	
	Air cleaner		Dual stage element	
	Governor		Mechanical fly weight type	
	Lubricating system		Forced lubrication by oil pump	
	Cooling system		Pressurized radiator, Forced circulation with water pump	
	Starting system		Shift type electric startor	
	Charging system		Charging coil (12 V, 20 A) with regulator	
	Battery		U1L-9 (12 V, 300 CCA)	
	Throttle system		ATA (Auto Throttle Advance)	
	Engine stop system		Key stop	
Capacities	Fuel tank		11.0 ℓ (2.9 U.S.gals., 2.4 Imp. gals.)	
	Radiator coolant		2.1 ℓ (2.2 U.S.gals., 1.8 Imp. gals.)	
	Engine crankcase		1.5 ℓ (1.6 U.S.qts., 1.3 Imp.qts.)	
	Hydrostatic transmission		2.4 ℓ (2.5 U.S.qts., 2.1 Imp.qts.)	
Dimensions	Overall length		1727 mm (68.0 in.)	
	Overall width		1444 mm (56.9 in.)	1544 mm (60.8 in.)
	Overall height		1120 mm (44.1 in.)	
	Wheel base		1195 mm (47.0 in.)	
	Tread	Front	720 mm (28.3 in.)	
		Rear	690 mm (27.2 in.)	
Weight (with mower)			270 kg (595 lbs)	275 kg (606 lbs)
Tire size	Front		15 × 6.00 - 6	
	Rear		20 × 10.00 - 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 5.0 km / h (0 to 3.1 mph)	
PTO clutch			Belt tension	
Mower	Model		RCK44LT-17	RCK48LT-17
	Overall length		793 mm (31.2 in.)	863 mm (34.0 in.)
	Overall width		1444 mm (56.9 in.)	1544 mm (60.8 in.)
	Overall height		289 mm (11.4 in.)	
	Mounting method		Parallel linkage	
	Adjustment of cutting height		Dial gauge	
	Cutting width		1118 mm (44 in.)	1219 mm (48 in.)
	Cutting height		25 to 102 mm (1.0 to 4.0 in.)	
	Number of blades		3	
	Weight (Approx.)		50 kg (110 lbs)	55 kg (121 lbs)
	Discharge		Right side	

DIMENSIONS



Unit : mm (in.)

G GENERAL

CONTENTS

[1] LUBRICANTS, FUEL AND COOLANT

Place	Capacity	Lubricants and fuel
Fuel tank	11.0 ℓ 2.9 U.S.gals. 2.4 Imp. gals.	Automobile unleaded gasoline **[Use of alcohol mixed gasoline (Gasohol)]** Use **"Gasohol"** only when the ethanol additive is less than 10 % of the fuel. The use of methanol additive is not recommended. Warranty does not apply to mechanical or performance problems arising from the use of **"Gasohol"**. For best results use unleaded fuel with a minimum of 87 octane.
Engine crankcase	1.5 ℓ 1.6 U.S.qts. 1.3 Imp.qts.	Engine oil : API service classification SE or SF Below 0 °C (32 °F) ····· SAE5W-20 Above 0 °C (32 °F) ····· SAE30
Hydrostatic transaxle	2.4 ℓ 2.5 U.S.qts. 2.1 Imp.qts.	Engine oil : API service classification CD or SG SAE 20W–30
Coolant	2.1 ℓ 2.2 U.S.qts. 1.8 Imp.qts.	Clean and fresh soft water with anti-freeze
Greasing		
Kingpin	Moderate amount	SAE multi-purpose type grease
Lubricating points		
PTO clutch wire	Moderate amount	Oil
Mower brake wire		
Speed change pedal shaft		
Mower link collar		
Center pin		
Throttle cable		
ATA PTO cable		
ATA speed cable		

[2] MAINTENANCE CHECK LIST

To keep the machine working in good condition as well as to avoid any accident and trouble, carry out periodic inspection and maintenance. Check the following points before use.

Service Interval	Check Points	Reference Page
Daily (Each use)		
[Walking around the machine]	• Check the tire pressure, wear and damage	*G-5
	• Check the oil and water leaks	—
	• Check the engine oil level	*G-5
	• Check the fuel level	—
	• Check the transmission oil level	G-4
	• Check the damage of machine body, tightness of all screws, bolts and nuts	—
	• Check the brake play	3-2
	• Check the battery electrolyte level	*G-6
	• Check the air intake screen and radiator screen	G-3
	• Check the coolant level	G-4
[While sitting in the operator's seat]	• Check the speed change pedal restriction	2-7
	• Check the parking brake	3-2
	• Check the steering wheel	*5-2
[Turning the key switch on]	• Check the head lights	—
[Starting the engine]	• Check the color of the exhaust fumes	—
	• Check the safety start switch and seat safety control	*G-6
	• Check for abnormal noise and vibration	—
[Mower]	• Make sure blade screws are tight	9-8
	• Check the blades for wear or damage	9-3
	• Check the all hardware	—
	• Make sure all pins are in place	—
[Others]	• Check the areas where previous trouble was experienced	—
Initial 3 Months or 25 Hours	• Grease the all grease nipples	*G-7
	• Check the all belts	*G-7
	• Check the PTO belt tension	*7-2
	• Check and adjust the brake play	3-2
Every 3 Months or 25 Hours	• Clean the air cleaner foam element	*G-7
	• Oiling	*G-8
Initial 6 Months or 50 Hours	• Change the engine oil	*G-9
Every 6 Months or 50 Hours	• Clean the air cleaner paper element	*G-9
	• Check the battery electrolyte gravity	*8-6
	• Check the all belts	*G-7
	• Check the PTO belt tension	*7-2
	• Check and adjust the brake play	3-2
	• Grease the all grease nipples	*G-7
	• Check the radiator hose and clamp	G-4
Annually or Every 100 Hours	• Change the engine oil	*G-9
	• Check the spark plug	*G-10
	• Check the fuel filter	*G-11
	• Clean the fuel tank	*G-11
	• Check and adjust the throttle cable	1-39
	• Check and adjust the ATA PTO cable	1-45
	• Check and adjust the ATA speed cable	1-46
	• Change the coolant	G-5
	• Check and clean the radiator core	G-5

[2] MAINTENANCE CHECK LIST (Continued)

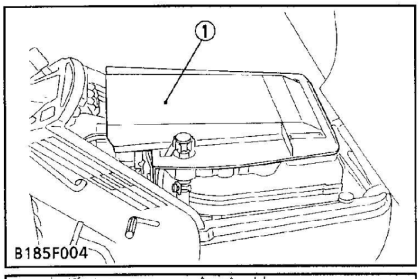
Service Interval	Check Points	Reference Page
Every 2 Years or 200 Hours	• Change the engine oil filter cartridge • Change the radiator hose and clamp	G-5 G-5
Every 3 Years or 300 Hours	• Change the air cleaner element (paper element and foam element) • Change the fuel filter • Change the all fuel lines • Check and adjust the valve clearance	*G-12 *G-12 *G-12 1-14

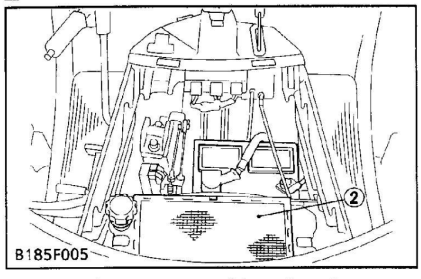
[3] CHECK AND MAINTENANCE

■ **NOTE**

- **As for the items which are not described here, refer to the other section or T1460·T1560 WSM according to the indication of "MAINTENANCE CHECK LIST".**

(1) Check Points of Daily or Each Use





(1) Air Intake Screen (2) Radiator Screen

Checking Air Intake Screen and Radiator Screen

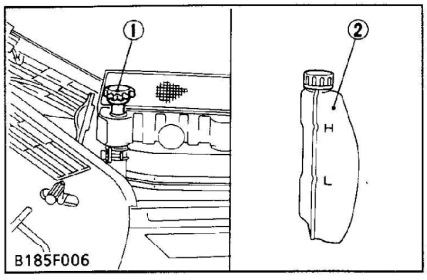
⚠ **CAUTION**

- **Be sure to stop the engine before checking or cleaning dust screen.**

■ **IMPORTANT**

- **Dust screen must be clear of debris to prevent engine from overheating.**

1. Lift the bonnet and remove the air intake screen.
2. Check that the air intake screen and radiator screen are clear of grass clippings and debris.
3. If screen is dirty, clean the screen with a brush or cloth.
4. If the dust or chaff is accumulated inside of the panel, clean the inside of the panel completely.



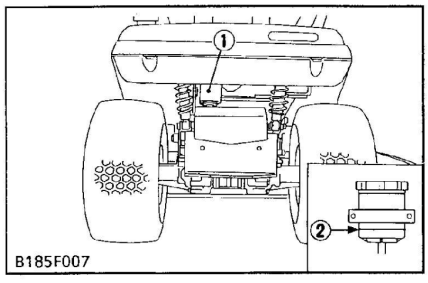
(1) Radiator Cap (2) Reservoir

Checking Coolant Level

⚠ WARNING

- **Do not remove the radiator cap until coolant temperature is well below the boiling point.**
- **For refilling, add the specified mixture of coolant. Adding water alone dilutes the coolant and degrades its anti-corrosion properties.**

1. Check the coolant level in the reservoir.
2. The coolant level should be within the mark **"H"** and **"L"**. If not, add the coolant up to **"H"** mark.
3. Remove the radiator cap to check the coolant level in the radiator.
4. The coolant level should be the filler neck bottom. If shortage, add the coolant.

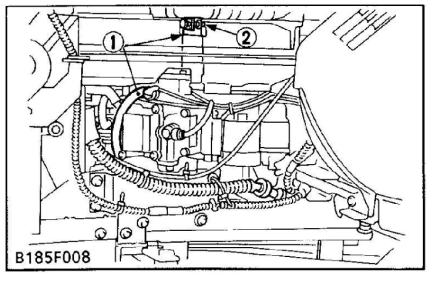


Checking Transmission Oil Level

1. Park the machine on a level surface.
2. Check oil level while HST is cold.
3. Oil level should be at the level mark of the tank. If oil is below the level mark, add enough oil to bring oil level to the level mark.

(1) Oil Tank (2) Level Mark

(2) Check Points of Every 6 Months or 50 Hours

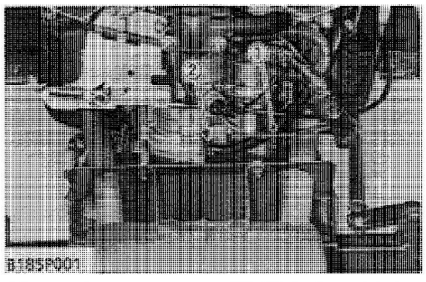


Checking Radiator Hose and Clamp

1. Check the radiator hoses and clamps for tightness.
2. If the clamps are loose, tighten them securely.
3. Replace hoses and tighten clamps securely, if radiator hoses are swollen, hardened, or cracked.
4. Replace hoses and clamps every 2 years or earlier if checked and found that hoses are swollen, hardened or cracked.

(1) Radiator Hose (4 Hoses) (2) Clamps (7 Clamps)

(3) Check Points of Every Year or 100 Hours



(1) Bypath Hose (2) Water Pump Inlet

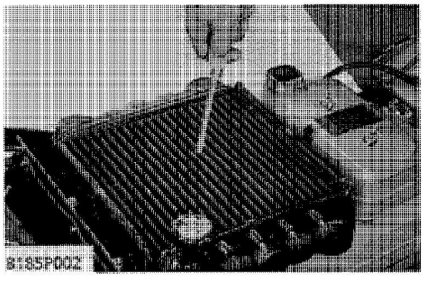
Changing Coolant

⚠ WARNING

- **Do not remove the radiator cap when the engine is still hot.**
- **Loosen the cap slightly to the stop to relieve any excess pressure before removing cap completely.**

1. Remove the lower and upper bonnets.
2. Remove the front bumper. (See page 1-16)
3. Drain the coolant from the water pump inlet (2). (See page 1-16)
4. Connect the bypath hose (1) to the water pump inlet. Fill the specified mixture of coolant.
5. Also change the coolant in reservoir.
6. Run the engine for a few minutes, then open the radiator cap to check the coolant level.
7. Coolant level should be at the filler neck bottom. If shortage, refill the coolant.

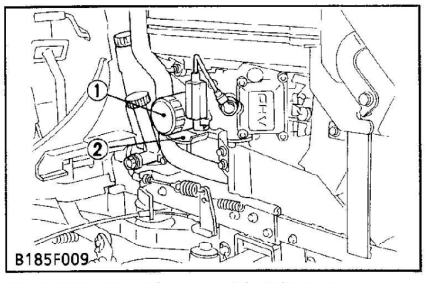
Coolant	Capacity	2.1 ℓ 2.2 U.S. qts. 1.8 Imp. qts.



Checking and Cleaning Radiator Core

1. Remove the air intake screen and radiator screen.
2. Check for the dirt and insects lodged in the radiator core. Clean them out using compressed air or low pressure water.
3. Check the radiator fins. If they are deformed, carefully straighten them with the blade of thin screw driver.

(4) Check Points of Every 2 Years or 200 Hours



(1) Oil Filter Cartridge (2) Oil Drip Tray

Changing Engine Oil Filter Cartridge

1. Remove the lower bonnet and place a suitable container beneath the oil drip tray.
2. Using a filter wrench, turn the filter counterclockwise to remove it.
3. Apply thin coat of oil onto the filter rubber gasket and install new filter cartridge.
4. Run the engine for a few minutes, and check the oil level.

Changing Radiator Hose and Clamp

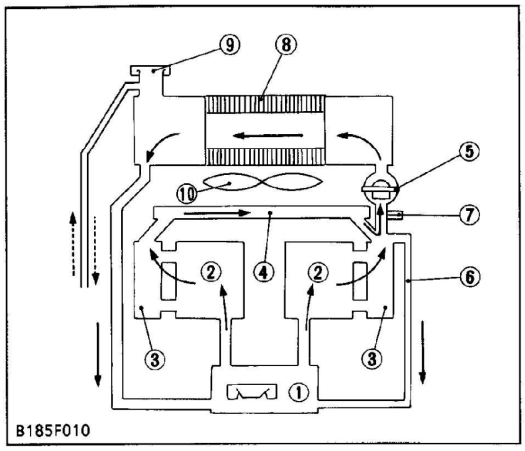
1. Replace the hoses and clamps every 2 years (See page G-4 "Checking Radiator Hose and Clamp".).

1 ENGINE

CONTENTS

MECHANISM

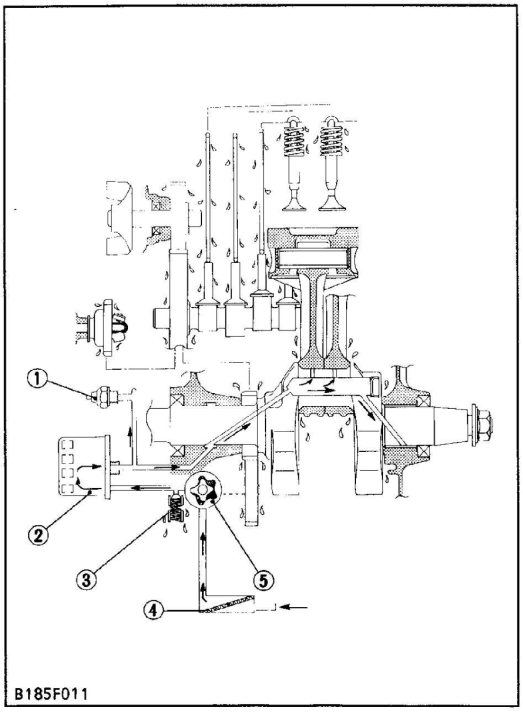
[1] COOLING SYSTEM



This engine is equipped with a highly efficient pressurized cooling system using a thermostat (5) to maintain an optimum operating temperature. Coolant bypasses the closed thermostat when cold until operating temperature is attained, causing the engine to warm up more quickly. If the coolant temperature becomes too high, a thermo switch (7) on the engine activates the coolant warning lamp to alert the operator of cooling problem.

(1) Coolant Pump
(2) Cylinder Jackets
(3) Cylinder Heads
(4) Intake Manifold
(5) Thermostat
(6) Bypass Tube
(7) Thermo Switch
(8) Radiator
(9) Radiator Cap
(10) Cooling Fan

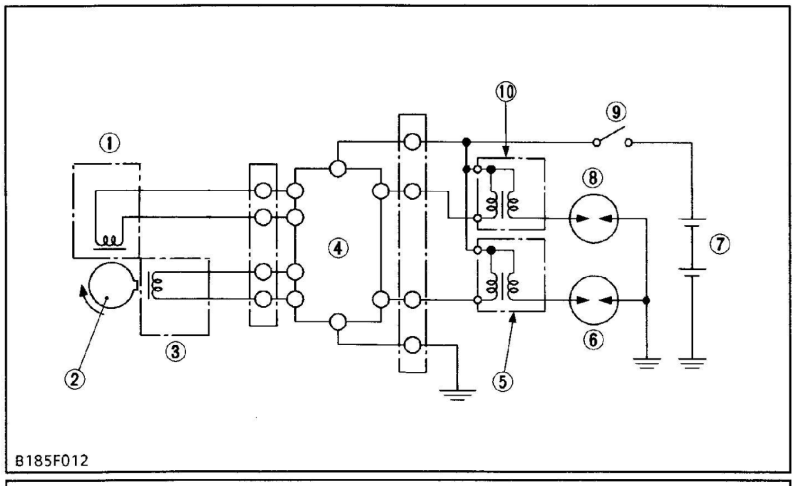
[2] PRESSURIZED LUBRICATION SYSTEM



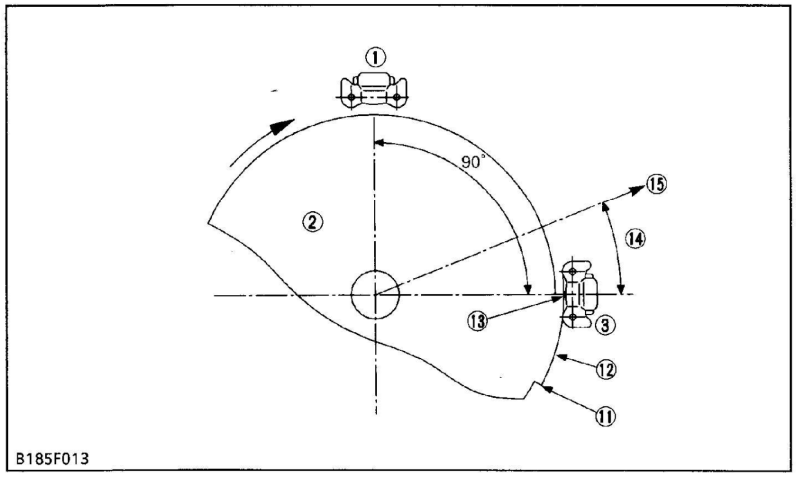
The engine lubrication circuit is a pressurized system consisting of an oil pump (5) which picks up oil through an oil screen filter (4) from the crankcase. The oil is pumped to a replaceable oil filter (2), through the engine's oil passages to lubricate internal components, and return to the crankcase. A bypass valve is incorporated in the oil filter to allow oil to circulate if the filter becomes clogged. A pressure relief valve (3) is used between the oil pump and oil filter to relieve excessive oil pressure by returning excess oil to the crankcase.

(1) Oil Pressure Switch
(2) Oil Filter
(3) Pressure Relief Valve
(4) Oil Screen Filter
(5) Oil Pump

[3] IGNITION SYSTEM



(1) Pulser Coil (No.2 Cylinder)
(2) Flywheel
(3) Pulser Coil (No.1 Cylinder)
(4) Igniter
(5) Ignition Coil (No.1 Cylinder)
(6) Spark Plug (No.1 Cylinder)
(7) Battery (12 V)
(8) Spark Plug (No.2 Cylinder)
(9) Key Switch
(10) Ignition Coil (No.2 Cylinder)
(11) Leading Edge
(12) Reluctor
(13) Trailing Edge
(14) Ignition Time (22.5° ± 2° Before Top Dead Center)
(15) Crankpin Center Direction



The ignition system is a transistor-controled battery-ignition and controls the current for the primary circuit by use of a electronic switching unit integrated into the igniter (4).

The switching unit is triggered by the pulser coils (pick up coil) (1) (3) on each cylinder and contains no mechanical parts. This system consists of the following components.

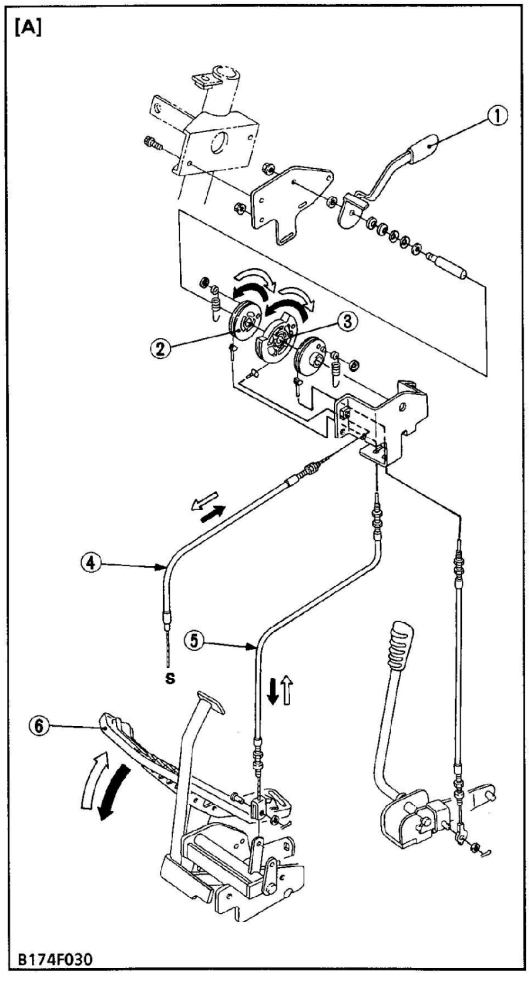
- Ignition coil units (5) (10)
- Igniter (Ignition Control Unit) (4)
- Pulser coils (pick up coils) (1) (3)
- 12 V Battery (7)
- Spark Plugs (6) (8)

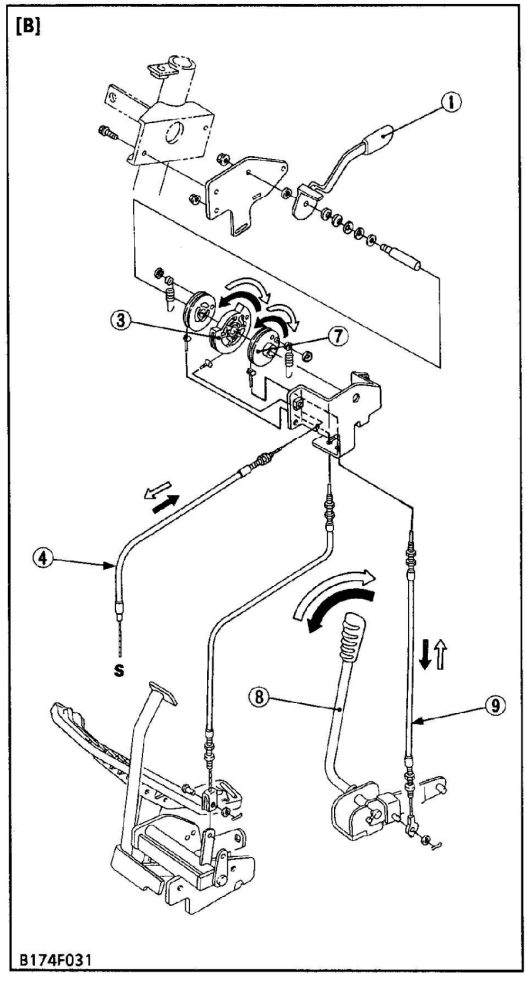
As the starter turns the flywheel (2), the reluctor (12) in the flywheel runs past the pulser coils (1) (3), this creates a magnetic field in the pulser coils and close the switching unit in the igniter and allow the current flow through the primary circuit in the ignition coils (5) (10).

As the flywheel turns, the trailing edge (5) passes under pulser coils, opening switching unit in the igniter and causing the primary coil current to stop suddenly. This creates an induced high voltage in a secondary coil windings, which fire the spark plugs (6) (8).

Each spark plug fires every time the piston rises. When a spark does jump across the electrodes during the exhaust stroke, it will not affect engine operation, since there is no compression and no combustible fuel / air mixture. the transistor controlled ignition system contains no mechanical parts, no wear occurs and no periodic maintenance is required except for the spark plug.

[4] AUTO THROTTLE ADVANCE SYSTEM





(1) Throttle Lever
(2) Side Pulley 1
(3) Center Pulley
(4) Throttle Cable
(5) ATA Speed Cable
(6) Speed Change Pedal
(7) Side Pulley 2
(8) PTO Clutch Lever
(9) ATA PTO Cable
S : To speed control panel
⬅ : Engine speed increase
⇦ : Engine speed decrease

The Auto Throttle Advance System delivers synchronized acceleration.

All you need to do is to move the PTO clutch lever (8) and the speed change pedal (6) ; there is absolutely no need for you to operate always an throttle lever (1).

[A] PTO clutch lever is in "DISENGAGE" position.

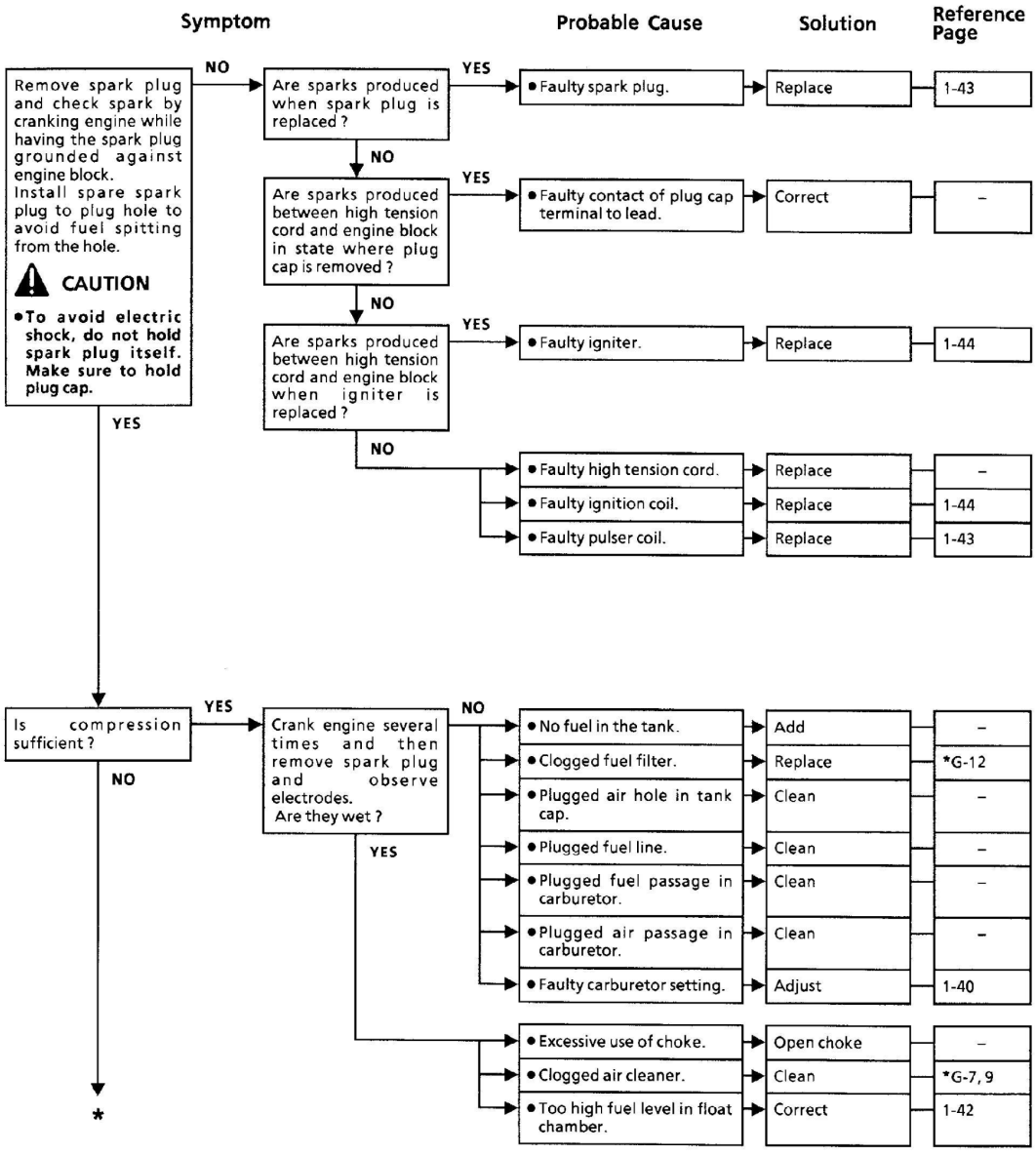
While operating with the PTO clutch lever (8) in **"DISENGAGE"** position, the engine speed increase or decrease in response to your movement of the speed change pedal (6) as shown in the figure.

[B] PTO clutch lever is in "ENGAGE" position.

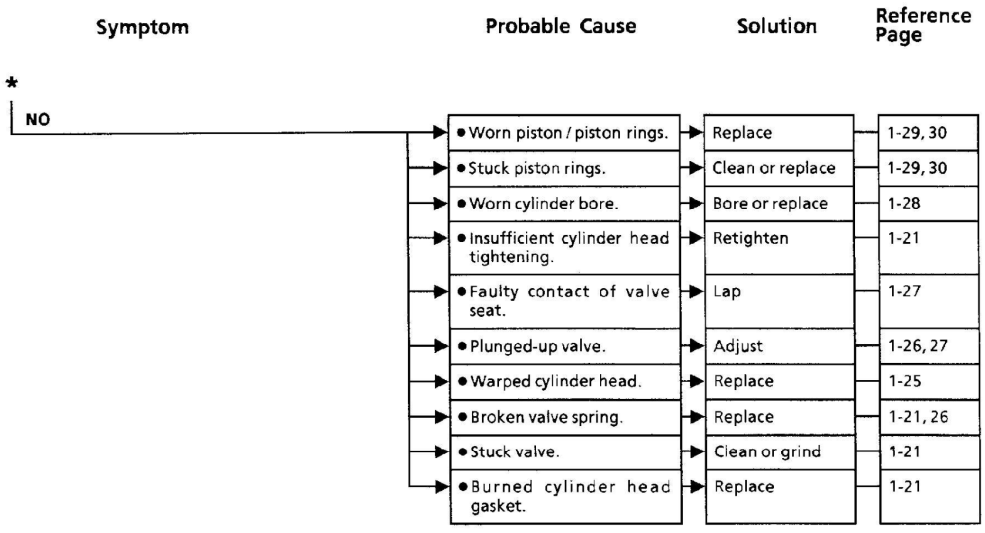
When the PTO clutch lever (8) is set to **"ENGAGE"** position, the engine speed automatically increase to ensure the optimum working speed as shown in the figure.

TROUBLESHOOTING

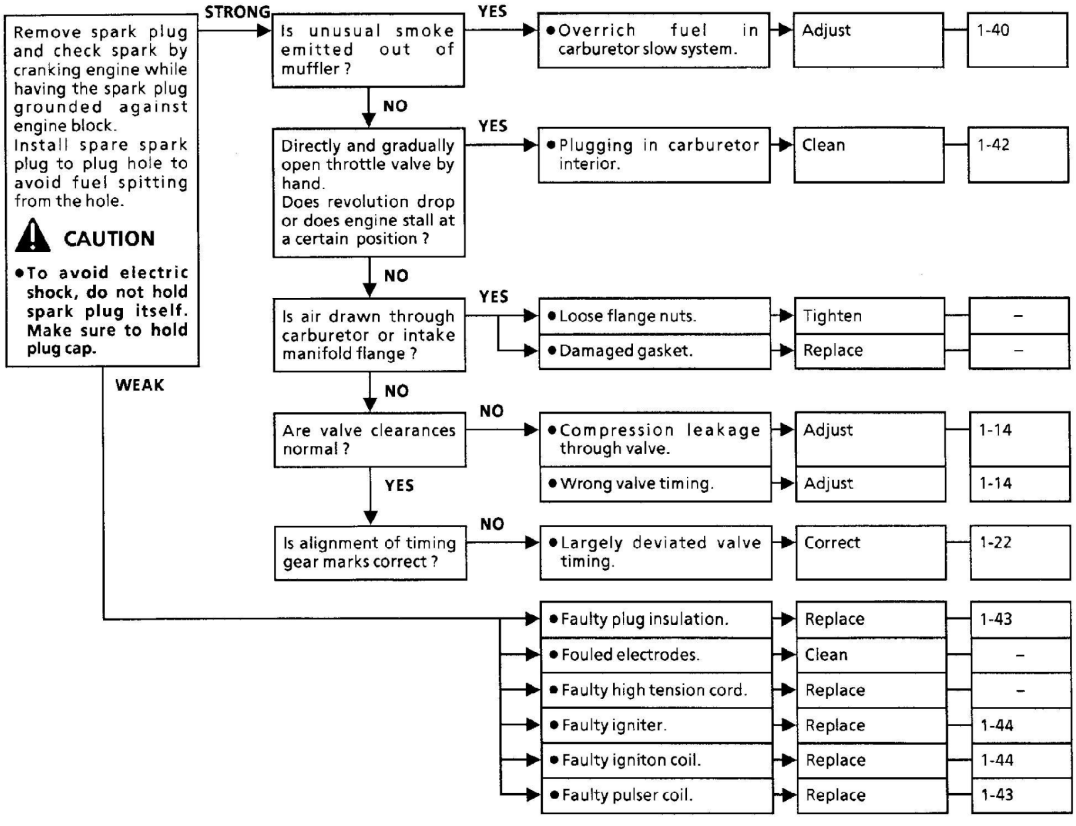
[Hard Starting]



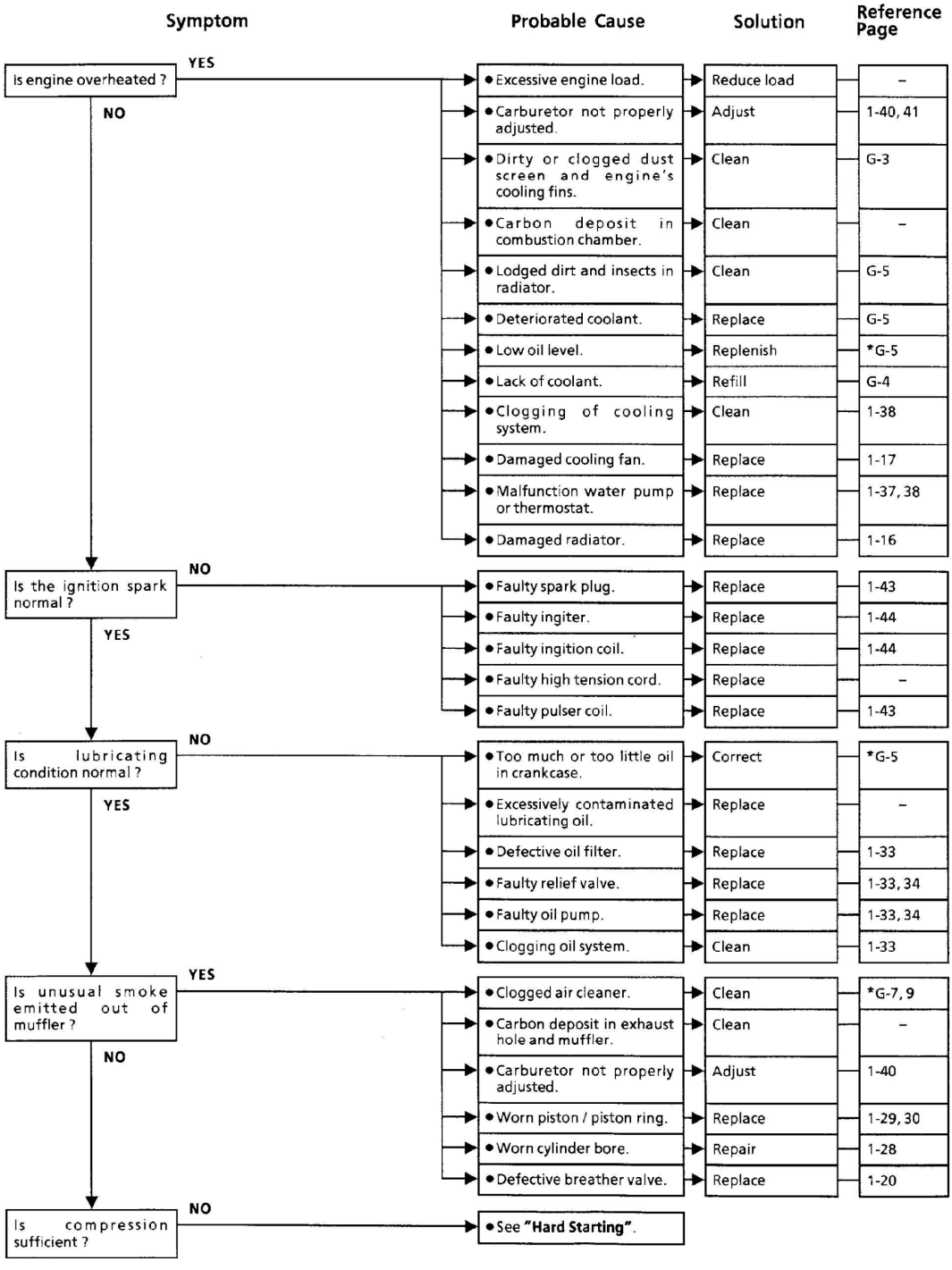
[Hard Starting (Continued)]



[Malfunctions at Low Speed]



[Low Power]


Symptom
Probable Cause
Solution
Reference Page
Is engine overheated ?
YES
NO
• Excessive engine load. → Reduce load → –
• Carburetor not properly adjusted. → Adjust → 1-40, 41
• Dirty or clogged dust screen and engine's cooling fins. → Clean → G-3
• Carbon deposit in combustion chamber. → Clean → –
• Lodged dirt and insects in radiator. → Clean → G-5
• Deteriorated coolant. → Replace → G-5
• Low oil level. → Replenish → *G-5
• Lack of coolant. → Refill → G-4
• Clogging of cooling system. → Clean → 1-38
• Damaged cooling fan. → Replace → 1-17
• Malfunction water pump or thermostat. → Replace → 1-37, 38
• Damaged radiator. → Replace → 1-16
Is the ignition spark normal ?
NO
YES
• Faulty spark plug. → Replace → 1-43
• Faulty ingiter. → Replace → 1-44
• Faulty ingition coil. → Replace → 1-44
• Faulty high tension cord. → Replace → –
• Faulty pulser coil. → Replace → 1-43
Is lubricating condition normal ?
NO
YES
• Too much or too little oil in crankcase. → Correct → *G-5
• Excessively contaminated lubricating oil. → Replace → –
• Defective oil filter. → Replace → 1-33
• Faulty relief valve. → Replace → 1-33, 34
• Faulty oil pump. → Replace → 1-33, 34
• Clogging oil system. → Clean → 1-33
Is unusual smoke emitted out of muffler ?
YES
NO
• Clogged air cleaner. → Clean → *G-7, 9
• Carbon deposit in exhaust hole and muffler. → Clean → –
• Carburetor not properly adjusted. → Adjust → 1-40
• Worn piston / piston ring. → Replace → 1-29, 30
• Worn cylinder bore. → Repair → 1-28
• Defective breather valve. → Replace → 1-20
Is compression sufficient ?
NO
• See "Hard Starting".

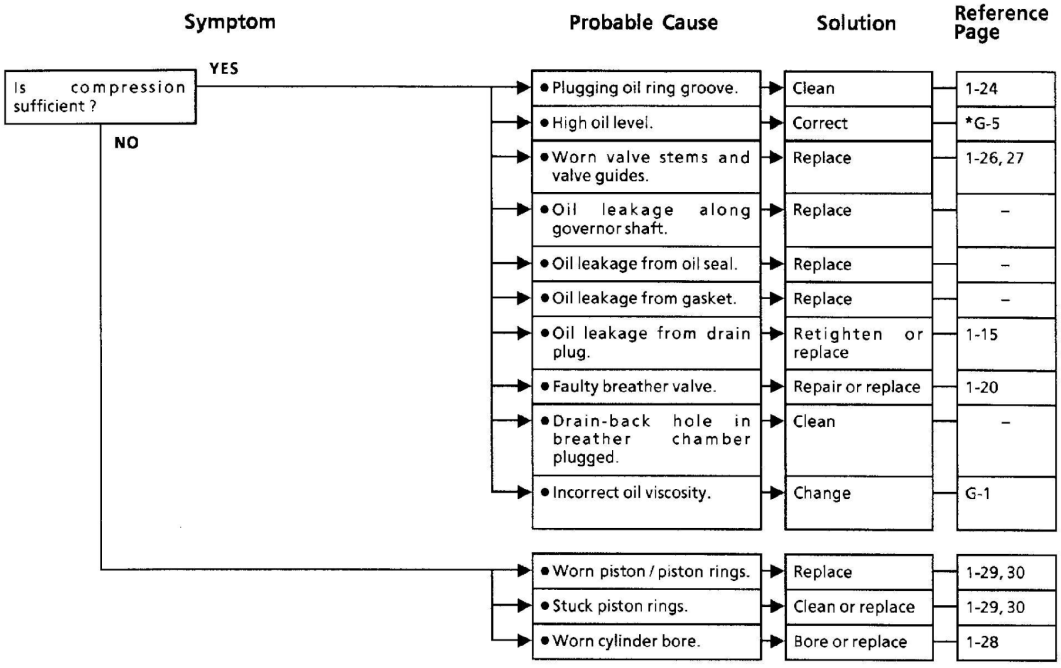
[Erratical Run]

Symptom	Probable Cause	Solution	Reference Page
Problem in fuel system. (lack of fuel)	• Entry of dust or water into fuel pipe or fuel filter.	Clean or replace	*G-11, 12
	• Air or vapor lock in fuel line.	Remove	–
	• Plugged air vent of fuel tank cap.	Clean	–
	• Plugged air / fuel passages in carburetor.	Clean	1-42
	• Too little opening of carburetor pilot screw.	Correct	–
Problem in governor system.	• Incorrect governor linkage adjustment.	Correct	1-39
	• Faulty governor spring.	Replace	–
	• Governor gear assembly malfunction.	Replace	–
Engine knocks.	• Stale fuel.	Change	*G-2
	• Excessive carbon deposit in engine.	Clean	–
	• Excessive engine load.	Reduce	–
	• Engine overheating.	See "Low Power"	1-6
	• Faulty igniter.	Replace	1-44

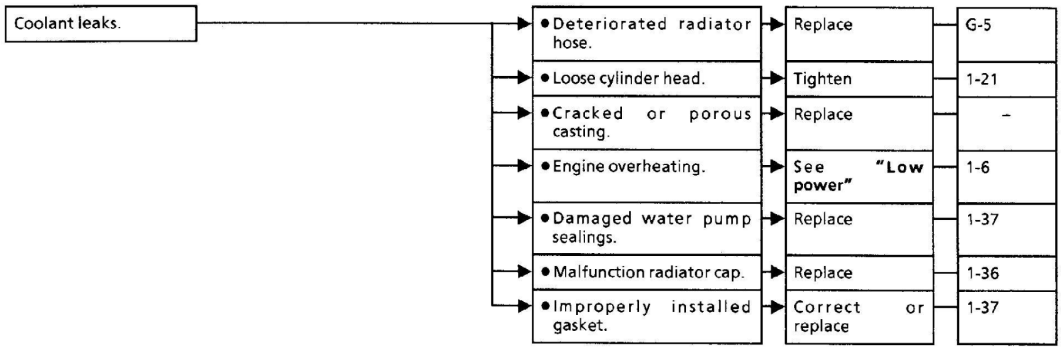
[Excessive Fuel Consumption]

Is compression sufficient ? YES	• Carburetor not properly adjusted.	Adjust	1-40
	• Clogged air cleaner.	Clean	*G-7, 9
	• High idling speed.	Adjust	1-40
	• Incomplete opening of choke valve.	Open	–
NO	• Worn piston / piston rings.	Replace	1-29, 30
	• Stuck piston rings.	Clean or replace	1-29, 30
	• Worn cylinder bore.	Bore or replace	1-28
	• Insufficient cylinder head tightening.	Retighten	1-21
	• Faulty contact of valve seat.	Lap	1-27
	• Plunged-up valve.	Adjust	1-26, 27
	• Warped cylinder head.	Replace	1-25
	• Broken valve spring.	Replace	1-21, 26
	• Stuck valve.	Clean or grind	1-21
	• Wrong valve timing.	Adjust	1-14

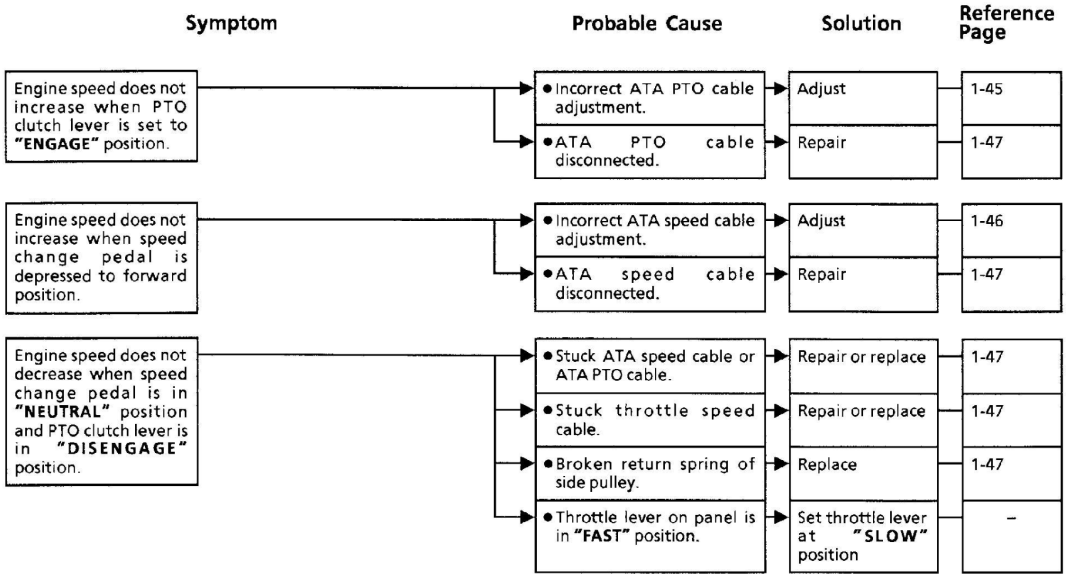
[Excessive Oil Consumption]



[Coolant Leakage]



[Auto Throttle Advance System]



SERVICING SPECIFICATIONS

ENGINE BODY

Item		Factory Specification	Allowable Limit
Compression Pressure (When Cranking with Electric Starter)		1171 kPa or more 11.9 kgf/cm² or more 170 psi or more	–
Valve Clearance (Intake and Exhaust)		0.15 mm 0.006 in.	–
Cylinder Head Surface	Flatness	–	0.06 mm 0.0024 in.
Rocker Arm	I.D.	–	12.074 mm 0.4754 in.
Rocker Arm Shaft	O.D.	–	11.949 mm 0.4704 in.
Valve Stem	O.D. (Intake)	–	4.930 mm 0.1941 in.
	O.D. (Exhaust)	–	4.920 mm 0.1937 in.
Valve Stem	Runout	–	0.03 mm 0.0012 in.
Valve Guide	I.D. (Intake and Exhaust)	–	5.06 mm 0.1992 in.
Push Rod	Runout	–	0.80 mm 0.0315 in.
Valve Spring	Free Length	–	27.30 mm 1.0748 in.
Valve Seat	Width (Intake and Exhaust)	–	0.5 to 1.1 mm 0.02 to 0.043 in.
Valve Seat	Angle (Intake and Exhaust)	0.785 rad. 45°	–
Valve Face	Angle (Intake and Exhaust)	0.785 rad. 45°	–
Cylinder Bore	I.D. (STD)	66.980 to 67.000 mm 2.6370 to 2.6378 in.	67.060 mm 2.6402 in.
Oversize Cylinder Bore (Boring Size)	I.D. (0.25 OS)	67.230 to 67.250 mm 2.6469 to 2.6476 in.	–
	I.D. (0.50 OS)	67.480 to 67.500 mm 2.6567 to 2.6575 in.	–
Oversize Cylinder Bore (Honing Size)	I.D. (0.25 OS)	67.258 to 67.280 mm 2.6480 to 2.6488 in.	67.310 mm 2.6500 in.
	I.D. (0.50 OS)	67.508 to 67.530 mm 2.6578 to 2.6587 in.	67.560 mm 2.6598 in.
Piston Skirt	O.D. (STD)	–	66.950 mm 2.6358 in.

ENGINE BODY (Continued)

Item		Factory Specification	Allowable Limit
Oversize Piston Skirt	O.D. (0.25 OS)	–	67.200 mm 2.6457 in.
	O.D. (0.50 OS)	–	67.450 mm 2.6555 in.
Piston Pin Hole	I.D.	–	16.040 mm 0.6315 in.
Piston Pin	O.D.	–	15.980 mm 0.6291 in.
Top Compression Ring	Thickness	–	1.200 mm 0.0472 in.
Top Compression Ring to Ring Groove	Clearance	–	0.10 mm 0.0039 in.
Top Compression Ring	Ring Gap	–	1.00 mm 0.039 in.
Connecting Rod Small End	I.D.	–	16.05 mm 0.6319 in.
Connecting Rod Big End	I.D.	–	31.06 mm 1.2228 in.
Crankpin	O.D.	–	30.93 mm 1.2177 in.
Crankshaft Journal	O.D. (Rotor Side)	–	29.92 mm 1.1780 in.
	O.D. (PTO Side)	–	29.92 mm 1.1780 in.
Crankshaft	Runout	–	0.05 mm 0.0020 in.
Camshaft Journal	O.D. (Rotor Side)	–	13.957 mm 0.5495 in.
	O.D. (PTO Side)	–	13.957 mm 0.5495 in.
Cam Lobe	Height (Intake and Exhaust)	–	24.43 mm 0.9618 in.
	Height (Fuel Pump)	–	19.50 mm 0.7677 in.
Crankshaft Bearing	I.D. (Crankcase Cover Side)	–	30.09 mm 1.1846 in.
	I.D. (Crankcase Side)	–	30.09 mm 1.1846 in.
Camshaft Bearing	I.D. (Crankcase Cover Side)	–	14.018 mm 0.5519 in.
	I.D. (Crankcase Side)	–	14.018 mm 0.5519 in.
Water Pump Shaft Bearing	I.D. (Crankcase Side)	–	10.088 mm 0.3972 in.

LUBRICATING SYSTEM

Item		Factory Specification	Allowable Limit
Engine Oil Pressure Condition • Engine Speed : 3550 min $^{-1}$ (3550 rpm) • No Load		–	276 kPa 2.82 kgf/cm^2 40.0 psi
Relief Valve Spring	Free Length	–	19.50 mm 0.7677 in.
Pump Shaft	O.D.	–	10.923 mm 0.4300 in.
Pump Shaft Bearing	I.D.	–	11.072 mm 0.4359 in.
Inner Rotor to Outer Rotor	Clearance	–	0.30 mm 0.0118 in.
Outer Rotor	O.D.	–	40.430 mm 1.5917 in.
Outer Rotor	Width	–	7.830 mm 0.3870 in.
Pump Housing	I.D.	–	40.801 mm 1.6063 in.
Pump Housing	Depth	–	10.230 mm 0.4028 in.

COOLING SYSTEM

Radiator	Water Tightness	–	No leak at 90 kPa 0.92 kgf/cm^2 13.1 psi
Radiator Cap	Air Tightness	–	Cap must retain the pressure at least 6 seconds
	Opening Pressure	83 to 96 kPa 0.85 to 0.98 kgf/cm^2 12.0 to 13.9 psi	–
Pump Shaft End	O.D.	–	9.935 mm 0.3911 in.
Thermostat Valve	Opening Temperature	63 to 66°C (145 to 150°F) at beginning, 80°C (176°F) at 7 mm (0.28 in.) of opening	–
Thermo Switch	Operating Temperature	108 to 114°C (226 to 237°F) from OFF to ON during temperature rising. 101 to 107°C (214 to 225°F) from ON to OFF during temperature falling	–

FUEL SYSTEM

Slow Idle Speed	1475 to 1625 min^{-1} (rpm)	–
Maximum No-Load Speed	3500 to 3625 min^{-1} (rpm)	–

IGNITION SYSTEM

Item		Factory Specification	Allowable Limit
Spark Plug	Gap	0.6 to 0.7 mm 0.024 to 0.028 in.	–
Pulser Coil	Resistance	88 to 132 Ω	–
Igniter	Resistance	See the table in page 1-44	–
Ignition Coil Primary Coil	Resistance	3.4 to 4.6 Ω	–
Secondary Coil	Resistance	10.4 to 15.6 Ω	–

AUTO THROTTLE ADVANCE SYSTEM

Throttle Lever	Operating Force	20 to 44 N 2.0 to 4.5 kgf 4.5 to 9.9 lbs	–

TIGHTENING TORQUES

Tightening torques of screws, bolts and nuts on the table below are especially specified.
(For general use screws, bolts and nuts : See page *G-3)

Item	N·m	kgf·m	ft-lbs
Lock nut (Valve clearance adjusting screw)	8.8	0.9	6.5
Drain plug (Engine oil)	24.5	2.5	18.1
Muffler cover mounting screw	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Muffler tail pipe mounting screw	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Duct mounting screw (Bumper side)	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Plate mounting screw (Bumper side)	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Front bumper mounting screw	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
Rubber sheet stay mounting nut (Radiator side)	7.9 to 9.3	0.80 to 0.95	5.8 to 6.9
Cooling fan mounting screw	5.9	0.6	4.3
Air duct screw	5.9	0.6	4.3
Starter **B** terminal nut	9.8 to 13.7	1.0 to 1.4	7.2 to 10.1
Battery negative cable screw (Engine body side)	15	1.5	10.9
Engine mounting nut	23.5 to 27.5	2.4 to 2.8	17.4 to 20.3
Engine pulley mounting screw	48.1 to 55.9	4.9 to 5.7	35.5 to 41.2
Muffler mounting nut	9.8 to 11.3	1.00 to 1.15	7.2 to 8.3
Coolant reservoir mounting screw	3.9	0.4	2.9
Rotor mounting nut	88.3	9.0	65.1
Fuel pump mounting screw	16.7	1.7	12.3
Governor lever nut	7.8	0.8	5.8
Carburetor mounting nut	7.8	0.8	5.8
Intake manifold mounting screw	8.8	0.9	6.5
Head cover mounting screw	5.9	0.6	4.3
Spark plug	16.7	1.7	12.3
Cylinder head screw	20.6	2.1	15.2
Crankcase cover mounting screw	20.6	2.1	15.2
Water pump mounting screw (M6)	8.8	0.9	6.5
Water pump mounting screw (M8)	20.6	2.1	15.2
*Connecting rod screw	11.8	1.2	8.7
Oil pump mounting screw	7.8	0.8	5.8
Thermostat cover screw	5.9	0.6	4.3
Fuel cut off solenoid	9.8	1.0	7.2

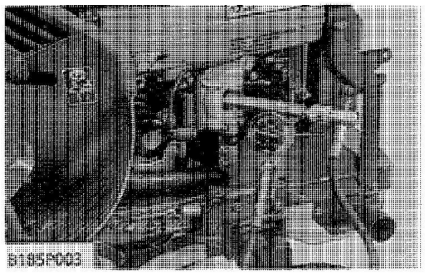
■ NOTE

- **For * marked screws, bolts and nuts on the table, apply engine oil to their threads and seats before tightening.**

CHECKING, DISASSEMBLING AND SERVICING

[1] ENGINE BODY

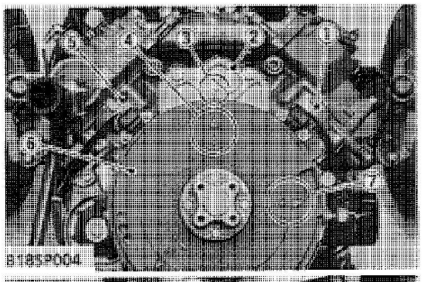
CHECKING AND ADJUSTING

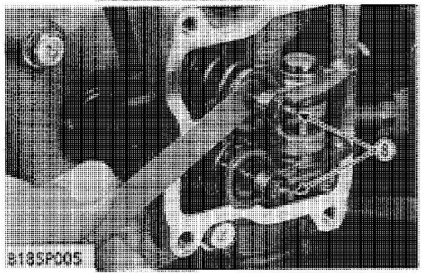


Compression Pressure

1. Remove the lower bonnet.
2. Warm up the engine.
3. Remove the spark plugs of each cylinder and set the air cooled compression tester (Code No. 07909-30251) to the one plug hole.
4. Disconnect the 1P connector from the fuel cut off solenoid.
5. Crank the engine by electric starter and read the gauge.
6. Measure the compression pressure several times.
7. Repeat the measurement to the other cylinder.
8. If the measurement is below the factory specification, check the following :
   - Gas leakage around the cylinder head – damaged gasket or cylinder head warp.
   - Condition of the valve seating.
   - Piston or cylinder wear.
   - Piston ring and piston ring groove.
   - Valve clearance.

Compression pressure	Factory spec.	1171 kPa or more 11.9 kgf/cm² or more 170 psi or more





(1) No.1 Cylinder
(2) Breather Chamber Cover
(3) Mark
(4) "1" Mark
(5) No.2 Cylinder
(6) Flywheel
(7) "2" Mark
(8) Adjusting Screw

Valve Clearance

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

■ **NOTE**
- **Let No.1 cylinder be right-hand viewed from operator's seat.**
- **Let No.2 cylinder be left-hand viewed from operator's seat.**

[Preparations] Refer to **"(1) Separating Engine"**
1. Remove the upper and lower bonnets.
2. Remove the muffler cover and front bumper to drain coolant.
3. Remove the radiator, cooling fan and cooling air ducts.
4. Remove the cylinder head covers.

[No.1 Cylinder Checking]
1. Align "1" mark (4) on the flywheel with the mark (3) on the breather chamber cover (2).
2. Check intake and exhaust valves are closed completely, if not turn the flywheel one turn clockwise and align both marks again.
3. Check the valve clearances with a feeler gauge.
4. If the measurements are out of factory specification, adjust with the adjusting screw (8).

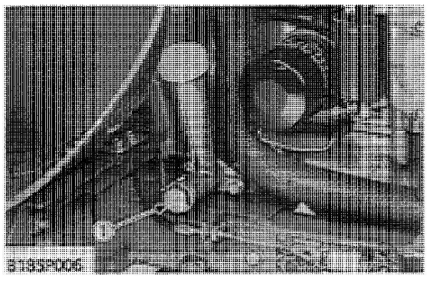
[No.2 Cylinder Checking]
1. Align "2" mark (7) on the flywheel with the mark (2) on the breather chamber cover (2).
2. Follow the same procedure as No.1 cylinder.

■ **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	8.8 N·m 0.9 kgf·m 6.5 ft-lbs

DISASSEMBLING AND ASSEMBLING

(1) Separating Engine



Dismounting Mower

1. See page 9-6.

Draining Engine Oil

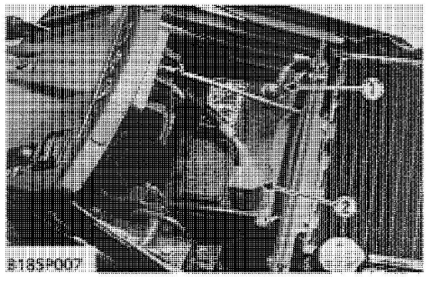
1. Place an oil pan underneath the drain plug.
2. Unscrew the drain plug (1), and drain engine oil.

(When reassembling)

■ **IMPORTANT**
- **Use the specified engine oil.**
  Refer to "LUBRICANTS AND FUEL". (See page G-2.)

Tightening torque	Drain plug	24.5 N·m 2.5 kgf·m 18.1 ft-lbs

(1) Drain Plug



Battery Cable and High Tension Cord

⚠ **CAUTION**
- **When disconnecting the battery cables, disconnect the negative cable from the battery first.**
  When connecting, connect the positive cable to the battery first.

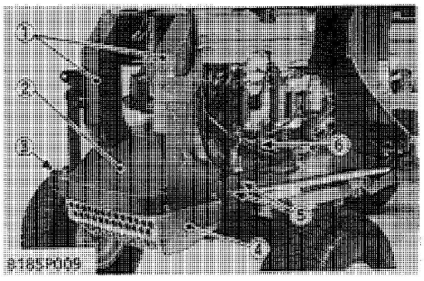
1. Turn the main switch off, and remove the intake cover.
2. Disconnect the negative cable (1) from the battery.
3. Disconnect the positive cable (2) from the battery.
4. Disconnect the high tension cord from the spark plug.

(1) Negative Cable (2) Positive Cable

Bonnet

1. Unscrew four knob screws (3), and remove the lower bonnet (4).
2. Disconnect four 1P connectors (2) from the head lights.
3. Remove the upper bonnet (1) with the bracket.

(1) Upper Bonnet (3) Knob Screw
(2) 1P Connector (4) Lower Bonnet



(1) Duct
(2) Front Bumper
(3) Tail Plate
(4) Muffler Cover
(5) Bumper Mounting Screw
(6) Plate

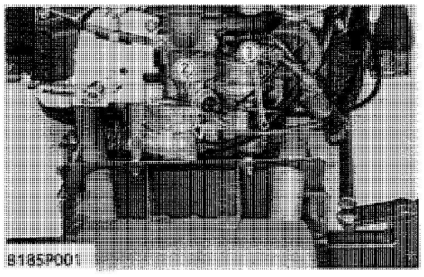
Front Bumper

1. Remove the tail plate (3) and muffler cover (4).
2. Remove the ducts (1).
3. Loosen the clamps on the bumper holding the fuel pipe and wiring.
4. Remove the plates (6) from the both sides of the front bumper (2).
5. Unscrew the mounting screws (5) and remove the front bumper (2).

(When reassembling)

- Be careful so that the drain tube and over flow tube of the carburetor locate left side of the front bumper.

Tightening torque	Tail pipe mounting screw	9.8 to 11.3 N·m 1.00 to 1.15 kgf·m 7.2 to 8.3 ft-lbs
	Muffler cover mounting screw	9.8 to 11.3 N·m 1.00 to 1.15 kgf·m 7.2 to 8.3 ft-lbs
	Duct mounting screw	9.8 to 11.3 N·m 1.00 to 1.15 kgf·m 7.2 to 8.3 ft-lbs
	Plate mounting screw	9.8 to 11.3 N·m 1.00 to 1.15 kgf·m 7.2 to 8.3 ft-lbs
	Front bumper mounting screw	23.5 to 27.5 N·m 2.4 to 2.8 kgf·m 17.4 to 20.3 ft-lbs



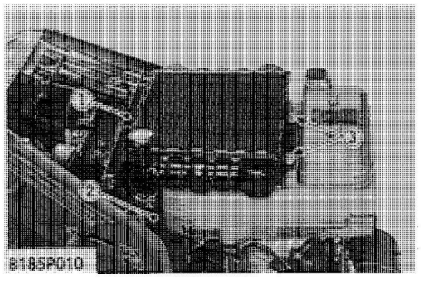
Draining Coolant

1. Remove the radiator cap.
2. Put a suitable container under the front axle.
3. Disconnect the bypath hose (1) from the water pump inlet to drain coolant.

■ NOTE

- **Coolant flashes out from water pump inlet, take care not to spill the coolant.**

(1) Bypath Hose
(2) Water Pump Inlet



Radiator

1. Unscrew the nuts and separate the rubber sheet stay (1) from the radiator.

⚠ CAUTION

- **Be careful so that the rubber sheet stay (1) does not touch the battery terminals.**

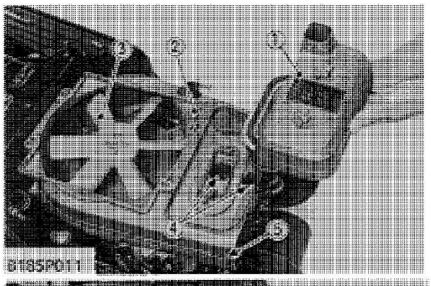
2. Unscrew the radiator mounting nuts (3).
3. Loosen the clamps of radiator hoses (2).
4. Draw out the hose from the reservoir.
5. Carefully remove the radiator not to deform the fin.

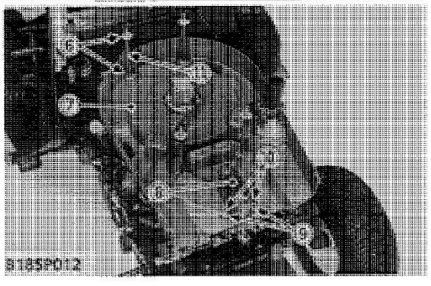
(When reassembling)

- Be sure to install the damper, collar and washer before tightening the mounting nut.

Tightening torque	Rubber sheet stay mounting nut	7.9 to 9.3 N·m 0.80 to 0.95 kgf·m 5.8 to 6.9 ft-lbs

(1) Rubber Sheet Stay
(2) Radiator Hose
(3) Radiator Mounting Nut





Air Cleaner, Cooling Fan and Cooling Air Duct

1. Unscrew the wing screws and air cleaner case (1) and element.
2. Remove the cooling fan (3).
3. Remove the clamps (5) and screws (4) to separate the upper air duct (2) from the lower air duct (7).
4. Remove the bolts (11) and washers (6).
5. Unscrew the screws (10) and remove the washers and collars (9).
6. Remove the lower air duct (7).

⚠ CAUTION

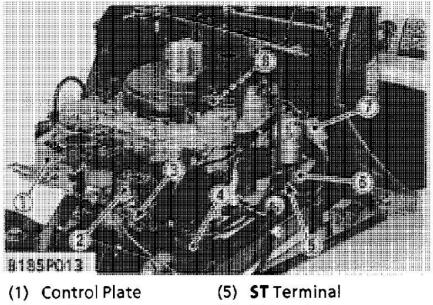
- **Do not let small fasteners and collars fall into the duct (8).**

(When reassembling)

- Install the cooling fan so that the mark "AISIN" faces upward.

Tightening torque	Cooling fan mounting screw	5.9 N·m 0.6 kgf·m 4.3 ft-lbs
	Air duct screw	5.9 N·m 0.6 kgf·m 4.3 ft-lbs

(1) Air Cleaner Case
(2) Upper Air Duct
(3) Cooling Fan
(4) Air Duct Screw
(5) Clamp
(6) Washer
(7) Lower Air Duct
(8) Duct
(9) Collar
(10) Air Duct Screw
(11) Bolt



(1) Control Plate
(2) Fuel Pump
(3) Throttle Cable
(4) Fuel Pipe
(5) **ST** Terminal
(6) **B** Terminal
(7) 6P Connector
(8) Screw

Fuel Pipe, Throttle Cable and Wiring

⚠ CAUTION

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

1. Close the fuel cock under the fender and disconnect the fuel pipe (4) from the fuel pump (2).
2. Disconnect the throttle cable (3) from the control plate (1).
3. Disconnect the 6P connector (7).
4. Disconnect the positive (+) cable from the starter **B** terminal (6).
5. Disconnect the 1P connector from the starter **ST** terminal (5).
6. Unscrew the screw (8) and disconnect the negative (–) cables of battery and main wiring harness.

(When reassembling)

- After assembling, be sure to adjust the throttle cable. (See page 1-39)

Tightening torque	Starter **B** terminal nut	9.8 to 13.7 N·m 1.0 to 1.4 kgf·m 7.2 to 10.1 ft-lbs
	Battery negative (–) cable screw	15 N·m 1.5 kgf·m 10.9 ft-lbs