CHAPTER 15

INSPECTION AND SERVICING

1. Periodic Inspection and Servicing

Periodic inspection and servicing is necessary to keep the engine in top condition at all times.
The routine inspection period depends on engine application and usage conditions, fuel and lubricating oil quality, engine handling, etc., and cannot be definitely stated. However, a general guideline will be given here. The relationship between inspection and maintenance activities and operating time is given below.
Refer to pertinent inspection sections of this manual for details.

1. Perform inspection at the operating times given below, and quickly correct any defects found.
2. Before reusing disassembled parts, check that they are in good condition.

1-1 Routine inspection

○ Inspection ◎ Parts replacement

Item	Description	Operating time	Daily	Every 50 hours	Every 100 hours	Every 300 hours	Every 500 hours	Every 1,000 hours
Fuel system	Fuel tank level check and filling		○					
	Fuel filter cleaning			○				
	Fuel filter element replacement				◎			
	Injection valve	Injection timing check					○	
	Injection pump	Injection spray inspection					○	
		Main part disassembly and inspection						○
	Fuel feed pump	Disassembly and inspection					○	
Lubrication system	Engine side	Oil pan oil level check and replenishment	○					
		Oil change			○			
		Turn filter handle	○					
	Clutch side	Oil level check and replenishment	○					
		Oil change		○ (1st time)		○ (from 2nd time)		
	Lubrication (starting chain, etc.)		○					
Cooling system	Thermostat inspection					○		
	Cooling water discharge condition		○					
	Anticorrosion zinc inspection						○	
	Water pump	Water pump drive belt tension adjustment		○ (1st time)		○		
		Water pump disassembly and inspection					○	
Engine proper	Bolt retightening		After operation or 50 hours after restarting					
	Intake and exhaust valve head clearance adjustment					○		
	Combustion chamber cleaning						○	
	Intake and exhaust valve lapping							○
	Piston disassembly and piston ring inspection							○
	Bearing and rod bolt inspection							○
Remote control	Cable inspection and adjustment					○		
Intake and exhaust system	Intake silencer element cleaning					○ (dirty condition)	○ (normal condition)	
	Mixing elbow interior inspection					○		
Electrical system	Alarm lamps and alarm buzzer		○					
	Battery electrolyte level check and replenishment		○					
	Alternator drive belt tension adjustment			○ (1st time)		○		
	Main switch and starting button inspection					○		
Piping	Rubber pipe inspection and replacement		Should be replaced every 4 years					
Others	Flexible mount and flexible coupling		Should be replaced every 4 years					

Printed in Japan
F023A9078

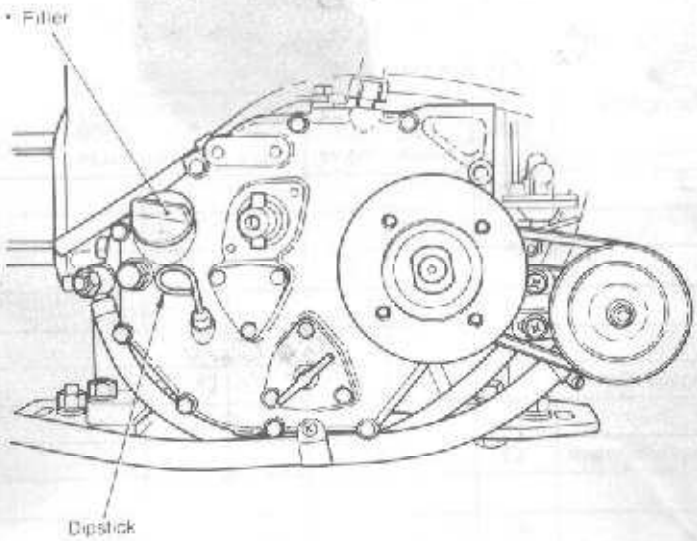
1-2 Routine maintenance and inspection procedures

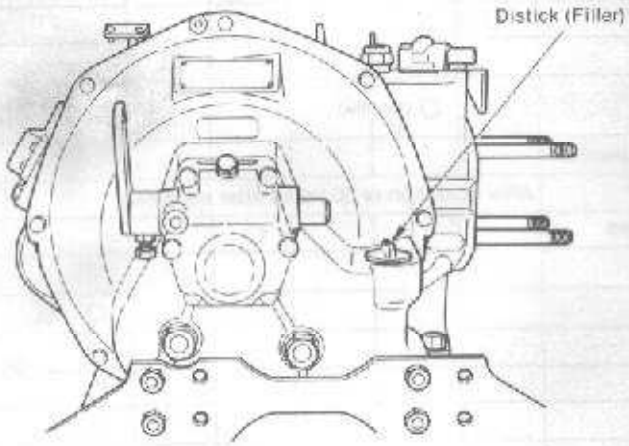
Only the most common maintenance items will be described here. Refer to the pertinent chapters of this manual for details on various parts and workshop service.

1-2.1 Daily maintenance

(1) Oil level check

Check the engine and clutch oil levels with the dipsticks, and add oil up to the top mark. Oil level must not be allowed to fall below the bottom mark.



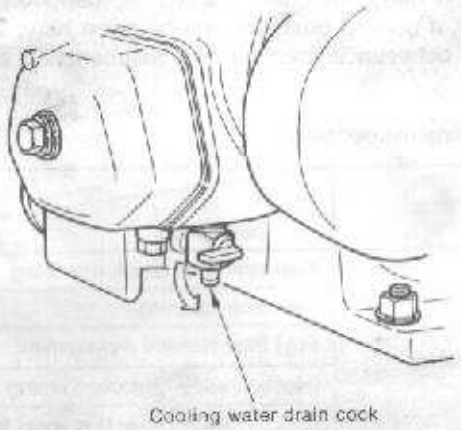


	Crankcase	Clutch case
Dipstick	Cylinder side cover	Top of clutch case (filling plug with dipstick)
Filler		

CAUTION: Use same lubricating oils for the engine and clutch.

(2) Draining the cooling water

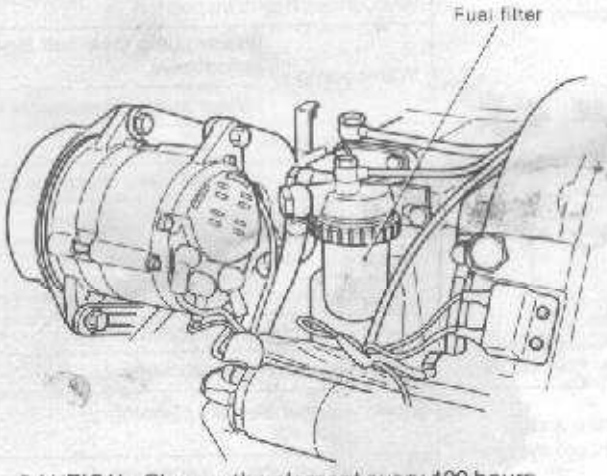
The cooling water will freeze in cold weather, causing faulty operation and cracking of the cylinders, cylinder head, and exhaust manifold. Therefore, always drain the water from the engine after use if the engine must sit in freezing weather.



1-2.2 Maintenance every 50 engine hours

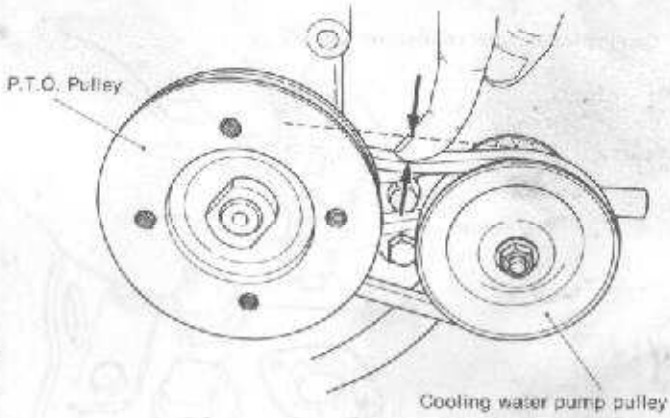
(1) C filter

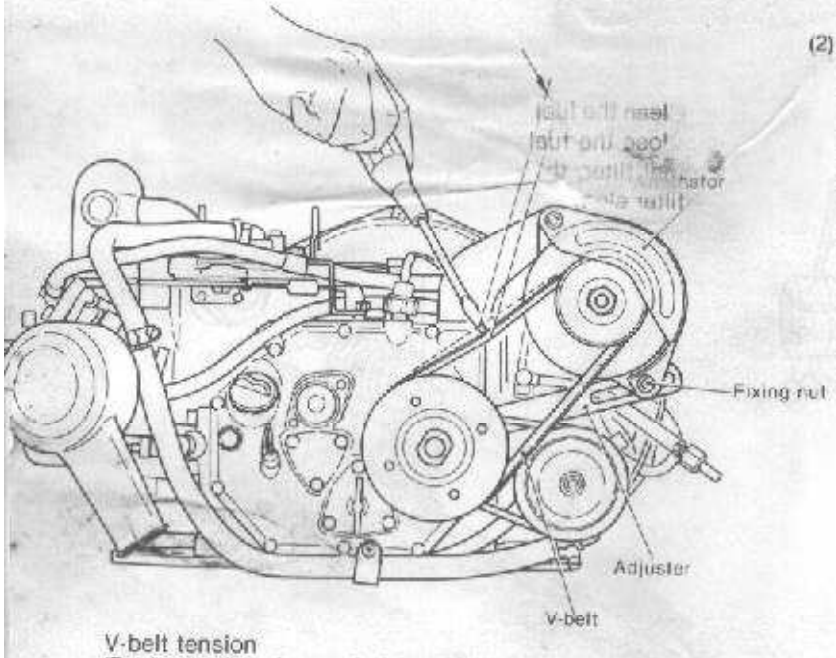
C tank cock and remove the bowl of the f en clean the inside of the bowl and the element. After reinstalling the bowl and element, open the fuel tank cock and bleed the air from the fuel system.



CAUTION: Change the element every 100 hours.

(2) V-belt tension adjustment (every 300 hours after 2nd adjustment)
Check the tension of the water pump drive V-belt and alternator drive V-belt, and adjust as required.





V-belt tension
(Pushed with a force of 10 kg (22 lb))

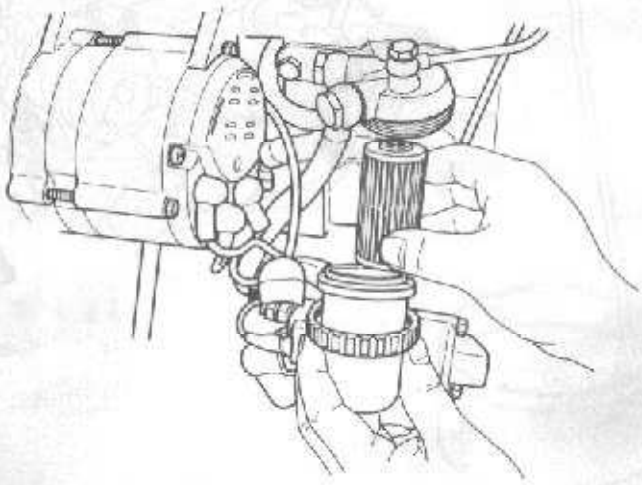
mm (in.)

Water pump	5 ~ 7 (0.197 ~ 0.275)
Alternator	5 ~ 10 (0.197 ~ 0.394)

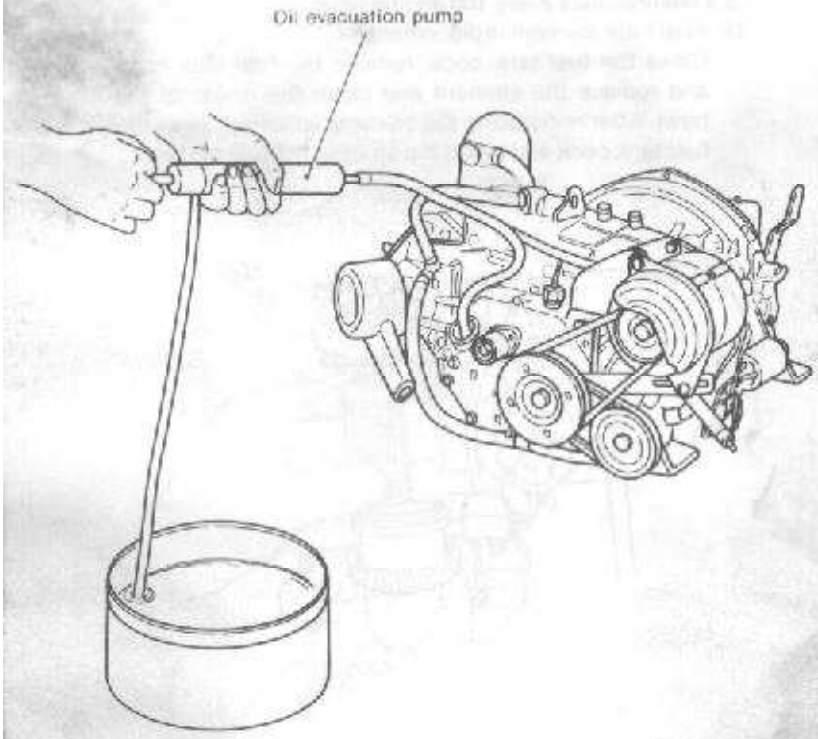
(3) Tightening bolts
Check the engine mounting bolts, cylinder head bolts, gear case bolts, and the bolts of other main parts and tighten as required.
(Refer to the bolt tightening torque table.)

1-2.3 Maintenance every 100 engine hours

(1) Fuel filter element replacement
Close the fuel tank cock, remove the fuel filter bowl and replace the element and clean the inside of the bowl. After reinstalling the element and bowl, open the fuel tank cock and bleed the air from the fuel system.



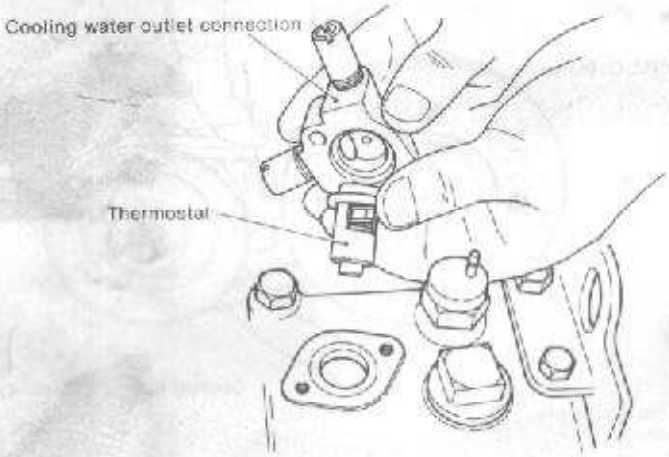
(2) Oil change
While the engine is still warm, pump the lubricating oil from the crank case and clutch case with a waste oil pump and refill both cases with new oil up to the top mark on the dipstick.
If the drain plug can be used, drain the oil by removing the drain plug.

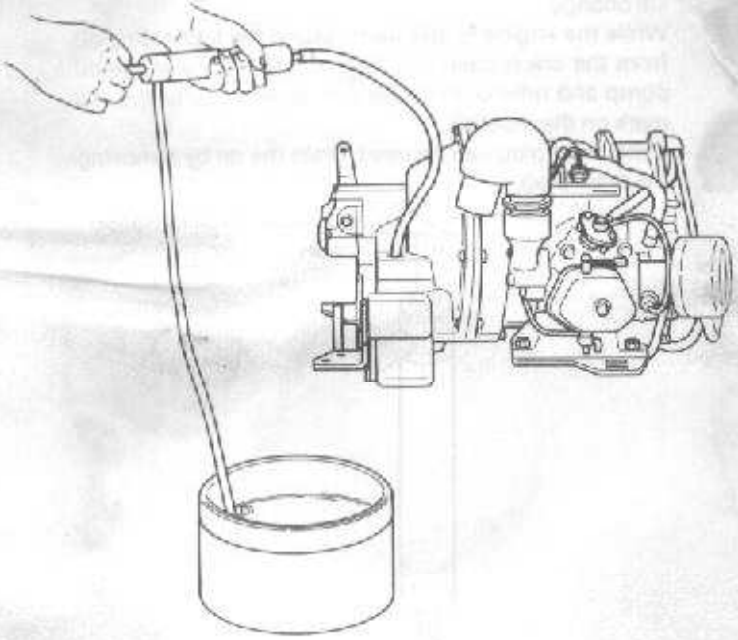


1-2.4 Maintenance every 300 engine hours

(1) Thermostat inspection

Remove the cooling water outlet flange on the top of the cylinder body and remove and inspect the thermostat.

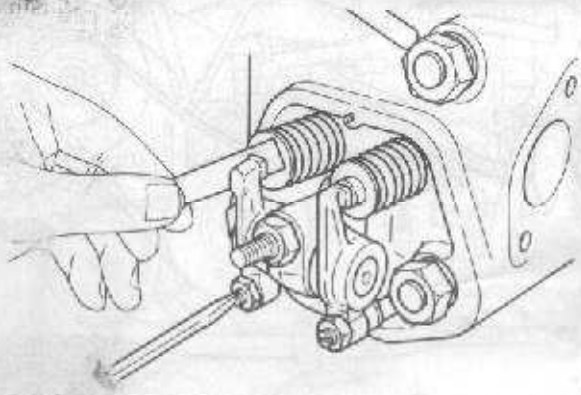




(2) Intake and exhaust valve adjustment

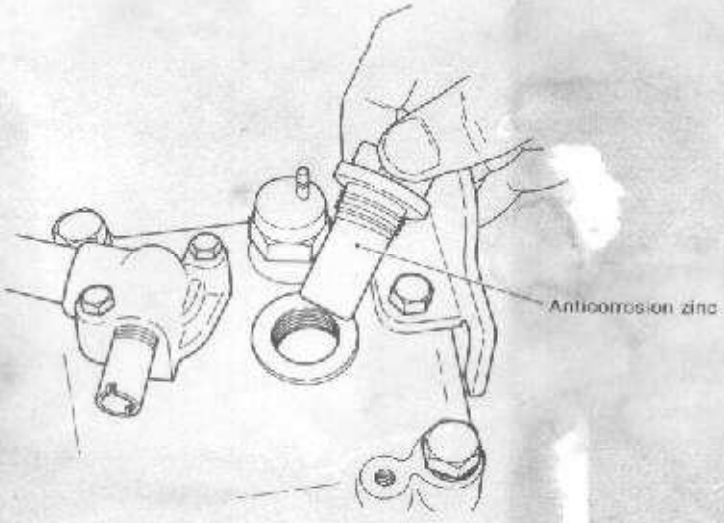
Remove the rocker arm chamber and check the intake valve and exhaust valve head clearance with a feeler gauge.

(Refer to the adjustment method.)



1-2.5 Maintenance every 500 engine hours

(1) Anticorrosion zinc replacement
Replace the anticorrosion zinc at the top of cylinder head.



(2) Inspect the fuel injection system
- Injection timing check and adjustment
- Delivery valve inspection
- ay inspection
- Noz... e Ass'y
Refer to the FUEL SYSTEM
a detailed description of
methods.

(3) Inspect the rocker arm and va