

# CH 5 ENGINE TROUBLESHOOTING

# Excessive fuel consumption

	CAUSES	REMEDIES
1	Excessive fuel pump pressure or pump leakage.	Reduce pressure; repair pump.
2	Choke partly closed after warm-up.	Open; repair automatic choke.
3	Clogged air filter.	Replace or clean the filter element.
4	High carburetor float level.	Adjust the carburetor float level as prescribed.
5	Dirty or stuck float needle valve.	Clean or free the float needle valve.
6	Worn carburetor jet.	Replace carburetor jet.
7	Idle too rich or too fast.	Adjust as prescribed.
8	Carburetor leaks.	Replace gaskets and tighten screws.
9	Stuck accelerator pump check valve.	Free valve.
10	Short-run operation.	Drive longer distance.

# Engine overheating

## CAUSES

## REMEDIES

1. Incorrect ignition timing.

Adjust as prescribed.

2. Loose or broken fan belt.

Tighten or replace.

3. Defective thermostat.

Replace.

4. Clogged water jackets.

Clean water jackets.

5. Defective radiator hose.

Replace.

6. Defective water pump.

Repair or replace.

7. Insufficient engine oil.

Add adequate amount of engine oil as prescribed

8. Incorrect valve timing.

Adjust as prescribed.

# Engine's one cylinder missing

CAUSES	REMEDIES
1. Defective spark plug.	Replace.
2. Defective distributor lead or cap.	Replace.
3. Valve stuck open.	Free valve; service valve guide.
4. Defective piston or rings.	Replace.
5. Defective head gasket.	Replace.

# Engine cranks normally but does not starting

CAUSES	REMEDIES
1. Defective ignition system.	Try sparking test; checking timing, ignition system.
2. Defective fuel system.	Prime engine; check accelerator-pump discharge, fuel pump, fuel line, choke, carburator
3. Air leaks in intake manifold or carburator	Tighten mounting; replace gaskets as needed.
4. Defective engine.	Check compression or leakage, valve action timing
5. Ignition coil or resistor burned out.	Replace.
6. Clogged fuel filter.	Clean or replace.

# Engine is loosing power

CAUSES	REMEDIES
1. Defective fuel system.	Check carburetor, choke, filter, air cleaner and fuel pump
2. Throttle valve not opening fully.	Adjust linkage.
3. Excessive carbon in engine.	Service engine.
4. Defective valve action.	Check with compression, leakage, vacuum.
5. Wrong or bad fuel.	Use correct octane fuel.
6. Heavy oil.	Use correct oil.
7. Defective ignition.	Check timing, distributor, wiring, condenser, coil and plug

# Noisy engine

CAUSES	REMEDIES
1. Worn or broken piston rings.	Replace.
2. Loosely mounted accessories; alternator, horn, oil pan, front, bumper, water pump, etc	Tighten mounting.
3. Worn main bearing and thrust bearing	Replace.
4. Loose piston pin.	Tighten.
5. Worn connecting rod bearing.	Replace.
6. Worn crankpin.	Replace.

# Piston “SLAP”

CAUSES	REMEDIES
1. Worn pistons.	Replace.
2. Misaligned connecting rods.	Replace connecting rod.
3. Collapsed piston skirts.	Replace.
4. Lack of engine oil.	Add oil.



# Valve and Tappet Noise

<b>CAUSE</b>	<b>REMEDIES</b>
1. Weak or broken valve springs	Replace
2. Worn lifter faces.	Replace
3. Lifters loose in block.	Tighten.
4. Rough cams.	Replace
5. Excessive tappet clearance.	Adjust the clearance as prescribed.
6. Defective hydraulic valve lifter.	Repair or replace.
7. Excessive wear of one or more cams of camshaft.	Replace.
8. Excessive push rod-to-guide clearance	Adjust the clearance as prescribed
9. Excessive valve stem-to-guide bore clearance	Adjust the clearance as prescribed

# Engine vibration

## CAUSES

- Defective ignition.
- Defective carburetor.
- Crankshaft out of balance.
- Clutch out of balance.
- Connecting rods and pistons of unequal weight.
- Mal-adjusted valves.
- Misaligned engine-transmission-propeller shaft.
- Too stiff engine supports.

# Engine backfires

## CAUSES

- Ignition timing off.
- Spark plug of wrong heat range.
- Excessive rich or lean mixture
- Overheating of engine
- Carbon in engine
- Cracked distributor cap
- Valves hot or sticking

# Causes Black Smoke

## CAUSES

- Choke in operation
- Spark plugs not functioning satisfactorily.
- Clogged air filter
- Punctured or incorrectly set carburettor float
- Worn out or wrong size jets
- Needle valve stuck open.
- Ignition system erratic
- Incorrect ignition timing.
- Worn out, stuck or broken piston rings

# Causes of Blue Smoke

## CAUSES

- Excessive petrol mixture ratio.
- Excessive oil in clutch chamber.
- Crank case oil seals worn out or damaged.
- Worn out, stuck or broken piston rings.
- Worn out cylinder bore.

# Engine Tune Up

- To Restore the Engine Performance after certain usage.
- Engine Repowering

# Minor Tune Up

1

- Visual Inspection

2

- Mechanical Service

3

- Instrument Test

# • Visual Inspection

Condition Checking of  
Engine Mountings & other attachments

Check Wiring, Hose pipes, Belts,  
Carburetor linkages

Check coolant, oil, fuel, Exhaust leakage,  
etc



# • Mechanical Service

Tighten the Bolts with Torque Wrench  
(if necessary)

Check Wiring, Hose pipes, Belts, Carburetor linkages

Check coolant, oil, fuel, Exhaust leakage, etc

Condition Checking of  
Engine Mountings & other attachments

# • Instruments Tests

Engine Timing, Timing Advance, Mechanism, Engine Idle setting check

Cylinder Balance check

Exhaust Gas Analysis

Compression Test, F.I. Pump Setting

# Major Tune Up

- 1 Observe the Engine Running by sound
- 2 Observe the Engine performance by Exhaust gas analyzer.
- 3 Remove Spark Plug, Injector and open the Throttle valve
- 4 Check the compression test
- 5 Replace spark plug if needed
- 6 Check battery level & other electricals.
- 7 Inspect the starting system
- 8 Inspect the Drive belt. Replace if needed
- 9 Check Distributor, Rotor, cap , contact point gap, breaker cam

# Major Tune Up

- 10 Set the ignition timing
- 11 Inspect fuel pump, filter and fuel line. Change oil + filter
- 12 Air Cleaner Cleaning
- 13 Inspect the cables.
- 14 Inspect the cooling system. Replace the component if needed
- 15 Tighten the bolts of Engine with appropriate torque.
- 16 Set engine rpm.
- 17 Check Exhaust gas before and after tune up

	<b>Major Overhaul</b>	<b>Minor Overhaul</b>
1	<b>Generally after 80,000 – 1,00,000 Km</b>	<b>Generally after 30,000 – 40,000 Km</b>
2	<b>Oil change + Oil chamber service</b>	<b>Only oil change</b>
3	<b>Engine head is opened</b>	<b>not opened</b>
4	<b>Piston rings changed</b>	<b>not changed</b>
5	<b>Drive belt changed</b>	<b>Not changed</b>
6	<b>Battery replaced</b>	<b>Battery top up/charging</b>

	<b>Major Overhaul</b>	<b>Minor Overhaul</b>
7	<b>Compression test done</b>	<b>Not done</b>
8	<b>Reboring done sometimes</b>	<b>Not needed</b>
9	<b>Sometimes Piston + Liner Replacement needed</b>	<b>Not done</b>
10	<b>Reverse flush the radiator</b>	<b>Not don</b>
11	<b>Change hose pipe &amp; Fan belt</b>	<b>Change only if needed</b>

# Excessive clearance between Piston and Cylinder

1 Compression leak ( Power Loss)

2 Blowby gas

3 Oil consumption more

4 Exhaust gas leak in crank case (oil deterioration)

5 Piston slap

# Low (Less) clearance between Piston and Cylinder

1 Scratches on Piston & Cylinder

2 Chances of Piston seizure

3 Friction loss increase

4 More wear on Piston & Cylinder



*The End*