

Fault finding

Here are some suggestions for things to check:

- If your engine does not work.
- About the general condition of your engine.

You might want to go back to your workbook sections to see how to do the checks.

The engine will not start

Simple checks

Check:

the on/off switch is ON
you have fuel in the tank
fuel tap is switched on

is the fuel in the tank very old?

the throttle lever (engine speed control) in the start position

Outboard motors – is the lanyard safety switch attached?
is the motor in gear?

On a cold engine

Check:

the choke is on
the fuel system is primed

Check there is a spark

Is the HT lead connected?

On 2 or more cylinder engines – are HT leads on the right plugs?

Check the condition of spark plug and lead

Possible causes for other engine problems

If your engine has one of these faults, check each of the suggested causes:

The engine starts and then stops

Out of fuel

The fuel tap is switched off

Fuel tank air vent is closed – or blocked

Dirt or water in the fuel line or filter

Carburettor

- idle speed adjustment is wrong
- choke not working
- fuel mixture too weak – not enough fuel
- control cable or spring broken or has come off.

Outboards

Fuel lines bent, squashed or not connected to fuel tank

Engine misfires or lacks power

Loose or broken HT lead(s) or plug cap

Dirty, oily spark plug or gap wrong

Dirt or blocked air filter

Fuel filter or fuel line blocked

Wrong fuel

Old fuel in the tank

Carburettor idle or main mixture wrong adjustment

Muffler or (2-stroke) exhaust part blocked with oil or carbon

Outboards

Weeds or dirt blocking water intake or propeller

Wrong propeller for engine

Engine runs rough and smokes

Carburettor idle and main jet wrongly adjusted

Too much oil in the fuel (2 strokes)

Air filter or piping blocked or damaged

Fuel line or filter blocked

Dirty or wrongly gapped spark plugs

4-stroke. Engine has been put on its side and oil has got into the cylinder(s)

Pistons, valves and cylinders in need of a major overhaul

Engine overheats

Blocked cooling fins, casing or fan
Wrong – or no – oil in the fuel (2 stroke)
Wrong oil or low oil level in crankcase (4 stroke)
Wrong spark plug(s)
Carburettor settings too lean (not enough fuel in mix)

Outboards

Water inlet or water pipes blocked
Water pump blocked or damaged
Thermostat not working

Engine vibrates/shakes

Fan or propeller damaged or out of balance
Mounting bracket loose or broken
Mowers – blades damaged

Engine stops suddenly

Out of fuel
HT lead come off spark plug
Propeller or cutting blades hit something solid!
Engine or gear box seized through no oil
Internal parts broken

Others

Starter cord does not return

Recoil spring broken or stuck
Loose parts

General condition checks

This worksheet reminds you of the general checks you can make on an engine:

- The type of checks to make for general condition of an engine
- Checks to test for engine compression.

Look, smell, listen and feel!

These tests can tell you a lot about an engine – and they can help you describe what is wrong to a mechanic. If an engine that you know well stops, loses power or won't go, then:

Look

For any oil, fuel or water coolant leaks. Where are they coming from?

For lack of water coming from the coolant tell-tale or exhaust (outboards only)

For anything broken.

If the engine is still going, is there more smoke than usual from the exhaust? Is it blue(oil), black(fuel mixture too rich) or white (water coolant getting into a cylinder).

Smell

Does something smell hot?

Is oil burning?

Listen

For unusual noises – are they inside the engine or in the drive to the propeller/cutters/blades it is driving?

Feel

Is anything hotter than it should be?

Is the engine shaking or vibrating more than normal?

Compression tests

An engine needs to compress the fuel/air mixture in the cylinder before the spark ignites it.

A lack of compression – or no compression - in the cylinder means an engine will produce very little power and be almost impossible to start and run.

No compression also means that there is a serious fault inside the engine.

Faults such as:

- Loose cylinder head
- Blown head gasket
- Cracked head or engine block
- Broken piston or rings
- Damaged valves (4-stroke)

Any of these faults will mean stripping down the engine to fix the problem. That is beyond what you cover in this course. You will need expert mechanical help.

You can check for compression like this:

If you have a rope or rope/rewind starter.

Set the Kill or ON/OFF switch to 'OFF'.

Slowly pull the engine over through its cycle with the starter.

You should be able to feel the engine being harder to pull-over as it gets to its compression stroke and then gets easy again.

If the engine spins very easily with no clear hard points, then it has poor compression.

If you have a wind-up or electric start

Set the Kill or ON/OFF switch to 'OFF'

Turn the engine over with the starter,

If its spins much faster than it normally does – or for longer – suspect it has poor compression.

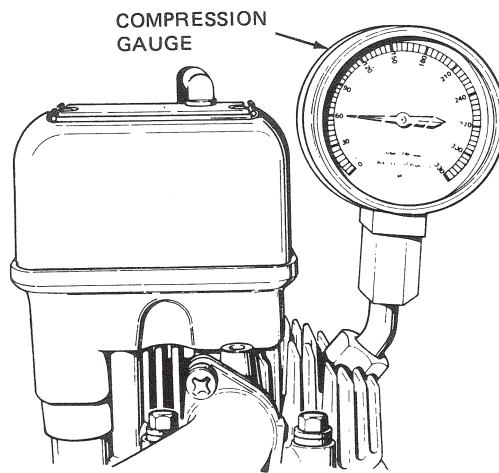
As you check for compression, listen for any unusual sounds like squeals, squeaks or scraping noises. Noises like those could mean worn or broken parts inside. Don't try to start an engine like that!

2-stroke - hard to start

If all checks on fuel and ignition are OK and the engine is hard to start – check the seals on the crankcase to crankshaft. If these seals are worn there can be not enough compression of fuel/air in the crankcase to force fuel into the cylinder.

For your interest.

In a workshop, a mechanic would check the compression with a pressure gauge in the spark plug hole(s). Like this:



The pressure should be between 60 and 100psi (pounds per square inch) for a 2-stroke and up to 150psi for a 4-stroke. On engines with more than one cylinder, they should have compression within about 10–15% of each other.

