

# Starts Then Dies — Diagnostic Chart

It fires, runs for a few seconds and stops. Or it only idles with the throttle cracked open. Four causes account for most of it.

## BEFORE YOU START

Petrol vapour ignites, batteries produce hydrogen, ignition coils carry thousands of volts and a machine on a stand can fall. Work outdoors or with the door open, disconnect the battery before probing wiring you are not deliberately measuring live, and never run an engine in a closed space. This sheet helps you observe and record. It is not a repair manual and it does not know your machine.

An engine that starts and dies can make combustion but cannot sustain it. Work down in order — the order is what makes this sheet worth printing.

## FIRST, SPLIT THE FAULT

DIES WHEN COLD, HOT, OR BOTH?

HOLDS IDLE WITH THROTTLE  
CRACKED?

HOW LONG DOES IT RUN BEFORE  
DYING?

### 1 With the engine COLD and at the top of the compression stroke, is there any detectable free play at the rocker arms?

**YES** Valve clearance is present. Note whether it felt generous or barely there, and go on.

**NO** No detectable free play means a valve is being held open. This is the single most commonly named cause of this symptom on these engines — the alloy head lets the valve and seat recede, closing the clearance up. Note it and stop guessing at the carburettor.

↓ still not solved — go on

### 2 Spraying one joint at a time — intake manifold, its gasket, the carburettor spigot, each vacuum hose — does the engine note or idle speed change?

**YES** You have found an air leak at whichever joint you had just sprayed. Note which one. Extra unmetered air is proportionally huge at idle, which is why the fault shows up there and nowhere else.

**NO** No change at any joint. Note that you tested each one separately, because testing them together proves nothing.

↓ still not solved — go on

### 3 Take the plug out after it has died. Is it dark and sooty, or light and clean?

**YES** Dark, black or wet points rich. Cross-check against the other signals in the table overleaf before acting on it.

**NO** Light, white or unusually clean points lean — which is consistent with the air leak above, so check that first if you have not.

↓ still not solved — go on

### 4 Drain the float bowl into a clear jar. Is it clean, single-phase fuel?

**YES** Fuel supply looks sound at the bowl. If everything above was normal too, record the whole pattern and take it to somebody who can see the machine.

**NO** A layer of water, debris, or fuel that smells stale or varnishy. On a machine that has stood, evaporated fuel leaves deposits in the jets that no amount of cranking will clear.

## RICH OR LEAN — FOUR SIGNALS, NOT ONE

The same engine gives four independent signals about its mixture. One of them can mislead; three pointing the same way is a finding.

| WHAT YOU OBSERVE                       | POINTS RICH                                    | POINTS LEAN                                                                 |
|----------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------|
| <b>Sound when it bogs</b>              | Sputtering, blubbing, a flatter and lower note | A “buwahhh” as it picks up, and revs that hang after you close the throttle |
| <b>Spark plug after a run</b>          | Dark, black, sooty or wet                      | Light, white or unusually clean                                             |
| <b>In cold or damp weather</b>         | Runs worse                                     | Runs better                                                                 |
| <b>At altitude</b>                     | Runs worse the higher you go                   | Runs better lower down                                                      |
| <b>Engine temperature</b>              | Runs cooler                                    | Runs hotter                                                                 |
| <b>Restrict the air intake briefly</b> | Gets worse                                     | Gets better                                                                 |

### WHERE THIS COMES FROM, AND HOW FAR TO TRUST IT

This is the mixture diagnosis used by the long-running 49ccScoot FAQ, which is the most internally consistent single source we found for these engines. It is one author's experience rather than a manufacturer document, and it is a direction of travel rather than a measurement — it tells you which way the mixture is off, never by how much. Do not change jetting on the strength of one signal.

## FINDINGS

| STEP | WHAT YOU OBSERVED | NORMAL? | DATE |
|------|-------------------|---------|------|
|      |                   |         |      |
|      |                   |         |      |
|      |                   |         |      |
|      |                   |         |      |
|      |                   |         |      |
|      |                   |         |      |
|      |                   |         |      |

### WRITE DOWN WHAT YOU SAW, NOT WHAT YOU CONCLUDED

Every box on this sheet asks for an observation. That is deliberate: the observation is recoverable later and the conclusion is not. “Plug dry after six attempts” is still useful in a month. “Fuel problem” is not, because you will not remember what made you think so.

### WHY NO CLEARANCE FIGURE APPEARS ON THIS SHEET

Published valve clearances for nominally identical engines disagree between sources, and some are quoted in thousandths of an inch and others in hundredths of a millimetre in ways that do not convert to each other. We are not willing to print one. What this sheet asks for — free play present, or none detectable at all — is the observation that actually distinguishes this fault, and it needs no figure.

## WHAT YOU CHANGED, AND WHAT HAPPENED

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**Need to work out what you actually own?**

The Scooter Parts Registry is a free public record of the Chinese factories behind US-market scooters, ATVs and go-karts — brand, engine family, VIN prefix, factory and related machines. No account, no email.

[thescooterparts.com/identify](https://thescooterparts.com/identify)