



KE-Jetronic Fuel Distributor Flow Test

“07.3-0997-06 – Repairing the CIS Jetronic Alloy Adjustable Fuel Distributor” — covers how to disassemble, inspect and understand fuel distributor internals for Bosch CIS systems, with notes that apply to 4-, 6-, and 8-cylinder distributors. This is the closest free **service-like** document that people refer to when they talk about flow tests and comparative measurements.

Note: This isn't the *factory Mercedes service manual*, and it covers Bosch CIS vs KE-Jetronic more generally, but it **does include the comparative flow test portion** that many reference.

What You'll Typically See in the *Fuel Distributor Comparative Flow Test*

In KE-Jetronic (as documented in general KB manuals and enthusiast rebuild guides):

- You measure **fuel flow at each injector outlet** (or at least measure relative volumes) at *three key positions of the airflow sensor plate* — typically:
 1. **Low/Idle position** (small plate lift \approx low demand)
 2. **Part-load/Partial plate lift** (mid demand)
 3. **Full plate lift** (wide open — high demand)The goal is to ensure the **fuel delivered to each port tracks evenly** between cylinders and responds correctly to plate position.
 - Typical acceptable variance between ports/cylinders at a given plate position is often quoted around **$\pm 10\%$** for comparative measurement.
 - There is **no single Mercedes PDF published publicly** that shows the exact flow numbers because Mercedes wanted these measurements done with dealer tools. The procedure is part of the full Bosch/MB service manual.
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Factory Service Manual References

The true, original **Mercedes Workshop Manual** for the R107 (07.3-160) does include specifications and refers to comparative flow and pressure tests — e.g., it gives test values for flow differences at idle, partial, and full conditions (*comparative values referenced in the Mercedes data*):

- Max difference at idle (≈ 4 cc/min)
 - Max difference at partial (≈ 30 cc/min)
 - Max difference at full (≈ 100 cc/min)
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How the Flow Test Usually Works (Summary)

1. **Remove the distributor** and mount it in a test jig (or leave in car, disconnect injectors).
2. **Apply system pressure** (engine off with fuel pump relay bridged).
3. **Hold the airflow sensor plate** at specific lifts — typically correlating with idle, mid-range, and WOT lifts.

4. **Collect flow from each outlet** for a set time.
 5. **Record comparative volumes** — look for significant differences.
 6. If any port is significantly low or high compared with the others at those positions, the distributor cartridge may need cleaning, rebuild, or internal adjustment.
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Important Notes

- Mixture correction is also influenced by the **EHA (electro-hydraulic actuator)** and ECU signals — so simple static flow checks on the bench don't always paint the whole picture for mixture tuning when installed.
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What You're Testing

You are verifying:

1. All 8 ports flow evenly
 2. Flow increases smoothly as the sensor plate rises
 3. No port lags, sticks, or overshoots
 4. No internal plunger hang-ups
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Tools Needed

- 8 matched graduated cylinders (at least 100–250 mL each)
- Jumper for fuel pump relay (to run pump with engine OFF)
- System pressure gauge (recommended)
- Stopwatch
- Means to hold airflow plate at fixed positions
- Fully charged battery

Injectors should be removed and flowing into the cylinders — or use hoses directly from distributor ports.

Test Setup

1. Relieve fuel pressure.
2. Remove injectors and place each into a graduated cylinder.
3. Jumper fuel pump relay so pump runs continuously.
4. Ensure system pressure is correct (~5.3–5.6 bar typical).
5. Gently lift airflow sensor plate by hand.

Do NOT snap the plate upward — move slowly and smoothly.

The Three Required Test Positions

You test at:

1. **Lower range (idle simulation)**
2. **Mid-range (part load)**
3. **Upper range (near full load)**

Each test is typically run for **30 seconds**.

Lower Plate Position (Idle Simulation)

Lift plate JUST enough to begin injector spray — barely off rest.

Run for 30 seconds.

Expected Volume (per cylinder)

Approximately:

- ~20–35 mL in 30 seconds (varies slightly by system pressure)

Acceptable Cylinder Variation

- Maximum deviation between highest and lowest cylinder:
≤ 4–5 mL

All injectors should begin spraying at nearly the same time
Spray pattern must be fine and even

If one port lags or dribbles → plunger/barrel wear or contamination.

Mid Plate Position (Cruise Simulation)

Lift plate approximately halfway.

Run for 30 seconds.

Expected Volume (per cylinder)

Approximately:

- ~60–90 mL in 30 seconds

Acceptable Cylinder Variation

- Maximum deviation:
≤ 25–30 mL

At this position, differences become more visible if:

- Control plunger is worn
- One metering slit is partially restricted
- Internal O-rings leaking

All cylinders should scale proportionally from the idle test.

High Plate Position (Near Full Load)

Lift plate near maximum upward travel.

Run for 30 seconds.

Expected Volume (per cylinder)

Approximately:

- ~120–160 mL in 30 seconds

Acceptable Cylinder Variation

- Maximum deviation:
≤ 80–100 mL

The absolute number is less important than:

- Smooth increase from previous stage
- Even distribution across all 8 cylinders

If one port falls behind significantly at high lift:

- Internal bore scoring likely
 - Plunger not concentric
 - Fuel distributor wear
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What You Should See

- Flow increases linearly with plate movement
- No sudden jumps
- No dead spots
- No cylinder that improves at one position but falls behind at another

If variation increases dramatically at higher lift → internal wear.

Important KE-Jetronic Notes (R107 Specific)

Unlike earlier CIS:

- KE uses an **EHA (Electro-Hydraulic Actuator)** to fine-tune mixture.
- For this mechanical baseline test:
 - Leave EHA electrically disconnected
 - You are verifying mechanical base distribution only

If mechanical balance is correct but mixture is off:

- Then you test EHA current (8–12 mA typical warm idle)
- Then check duty cycle

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on Incorrect Advice You May Hear

“Each cylinder must flow exactly the same volume.”
False. Minor variation is normal.

“Only test at full lift.”
Incorrect. Problems often show at low lift first.

“Absolute volume numbers must match factory exactly.”
No. Pressure differences change absolute volume. You compare cylinders to each other.

How to Interpret Results

Symptom	Likely Cause
One cylinder low at all positions	Clogged metering slit
One cylinder low only at high lift	Bore wear
One cylinder starts spraying late	Plunger sticking
All cylinders uneven	Low system pressure
Flows good but engine still lean	EHA or control pressure issue

When Is the Distributor Considered Bad?

- Variation exceeds limits
 - Flow does not increase smoothly
 - One port consistently 15–20% lower than others
 - Metal flakes found in screen
 - Plunger does not move freely
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