Diagnosis – Starting Test

Ignition: ON

- Starting test should only be performed if engine does not run.
- Test and adjustment data section A.

a) Engine 102, 103, 116, 117 CFI, 104 CFI/LH-SFI

Test sequence:

- Connect engine analyzer.
- Ignition: **ON**.
- Observe measured values and store or print out.
- Specifications appearing on the following page must appear on the engine analyzer screen.

Note:
The starting test on engines 104, 111 HFM-SFI is only possible with the oscilloscope.

b) Engine 119, 120 CFI/LH-SFI

- Set engine analyzer to:
  4 cylinder position for engine 119;
  6 cylinder position for engine 120.
- Set dual ignition adaptor to **T1/1** [1].
- Ignition: **ON**.
- Observe and store measured values.
- Set dual ignition adaptor to **T1/2** [1].
- Observe and store measured values, then
- Print out measured values and compared with specifications.
- Specifications appearing on the following pages must appear on the engine analyzer screen.

⚠

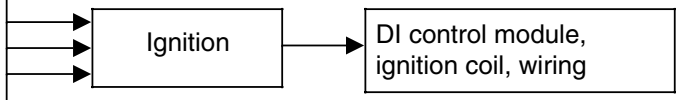
On engine 120, the diagnostic socket adapter must in addition be set for the appropriate ignition circuit.
Example: Dual ignition adaptor **T1/1**
When checking ignition timing on circuit **T1/2** the trigger clamp must be attached to the ignition cable for the no. 12 cylinder.

[1] The measurements between T1/1 and T1/2 must be carried out separately.

Diagnosis – Starting Test

Ignition: ON

Engine rpm		– rpm
Engine oil temperature		20 °C
Battery voltage		13.8 V
Ignition coil voltage, circuit 15		13.8 V
Ignition coil voltage, circuit 1		13.5 V
Current draw measured with inductive clamp		5 A
Dwell		– °
Ignition timing		– °
Ignition voltage		– KV
On-off ratio control	Control range	– %



Note:
The specifications shown are examples for a 4 cylinder engine and can not be compared directly.

Diagnosis – Starting Test

At Cranking RPM

- Starting test – Ignition: **ON**.
- Starting test should only be performed if engine does not run.
- Test and adjustment data section A.

a) Engine 102, 103, 116, 117 CFI, 104 CFI/LH-SFI

Test sequence:

- Connect engine analyzer.
- Actuate starter.
- Observe measured values and store or print out during the starting process.
- Specifications appearing on the following page must appear on the engine analyzer screen.

Note:

The starting test on engines 104, 111 HFM-SFI is only possible with the oscilloscope.

b) Engine 119, 120 CFI/LH-SFI

- Set Engine analyzer to:
  4 cylinder position for engine 119;
  6 cylinder position for engine 120.
- Set dual ignition adaptor to **T1/1** [1].
- Actuate starter.
- Observe and store measured values .
- Set dual ignition adaptor to **T1/2** [1].
- Actuate starter.
- Observe and store measured values, then
- Print out measured values and compare with specifications.
- Specifications appearing on the following page must appear on the engine analyzer screen.

⚠

On engine 120, the diagnostic socket adapter must in addition be set for the appropriate ignition circuit.

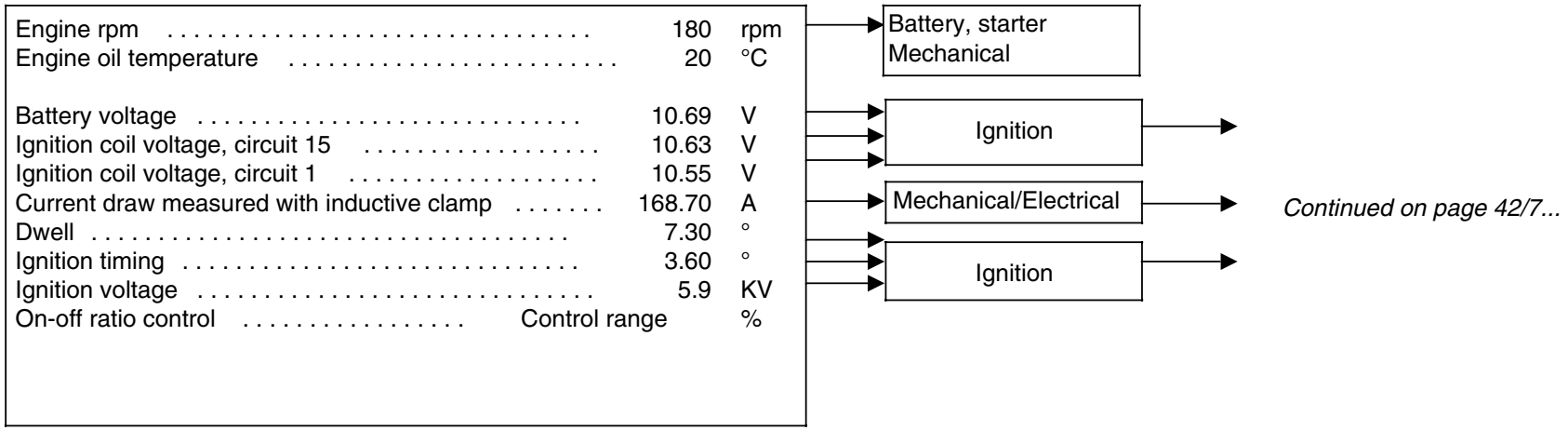
Example: Dual ignition adaptor **T1/1**

When checking ignition timing on circuit **T1/2** the trigger clamp must be attached to the ignition cable for the no. 12 cylinder.

[1] The measurements between **T1/1** and **T1/2** must be carried out separately.

Diagnosis – Starting Test

At Cranking Rpm



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Note:
The specifications shown are examples for a 4 cylinder engine and can not be compared directly.

Diagnosis – Starting Test

At Idle Rpm

a) Engine 102, 103, 104, 116, 117 CFI/LH-SFI

Test sequence:
- Connect engine analyzer.
- Start engine.
- Observe measured values and store or print out.
- Specifications appearing on the following pages must appear on the engine analyzer screen.

Note:
The starting test on engines 104, 111 HFM-SFI is only possible with the oscilloscope.

b) Engine 119, 120
- Set engine analyzer to:
  4 cylinder position for engine 119;
  6 cylinder position for engine 120.
- Set dual ignition adaptor to **T1/1** [1].
- Start engine.
- Observe and store measured values.
- Set dual ignition adaptor to **T1/2** [1].
- Observe and store measured values, then print out measured values and compare with specifications.
- Specifications appearing on the following pages must appear on the engine analyzer screen.
- Test and adjustment data section A.

⚠

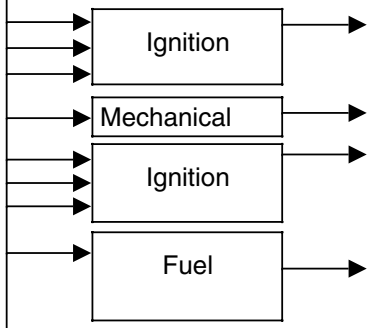
On engine 120, the diagnostic socket adapter must in addition be set for the appropriate ignition circuit.
Examples: Dual ignition adaptor **T1/1**
When checking ignition timing on circuit **T1/2** the trigger clamp must be attached to the ignition cable for the no. 12 cylinder.

[1] The measurements between **T1/1** and **T1/2** must be carried out separately.

Diagnosis – Starting Test

At Idle Rpm

Engine rpm	650	rpm
Engine oil temperature	20	°C
Battery voltage	13.5	V
Ignition coil voltage, circuit 15	13.5	V
Ignition coil voltage, circuit 1	13.5	V
Current draw measured with inductive clamp	7.5	A
Dwell	8.9	°
Ignition timing	16.1	°
Ignition voltage	8.3	KV
On-off ratio control Control range	50	%



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Note:
The specifications shown are examples for an 8 cylinder engine and can not be compared directly.

Diagnosis – Starting Test

At Cranking and at Idle Rpm