

BMW Diagnose

Testing Instructions for K Models



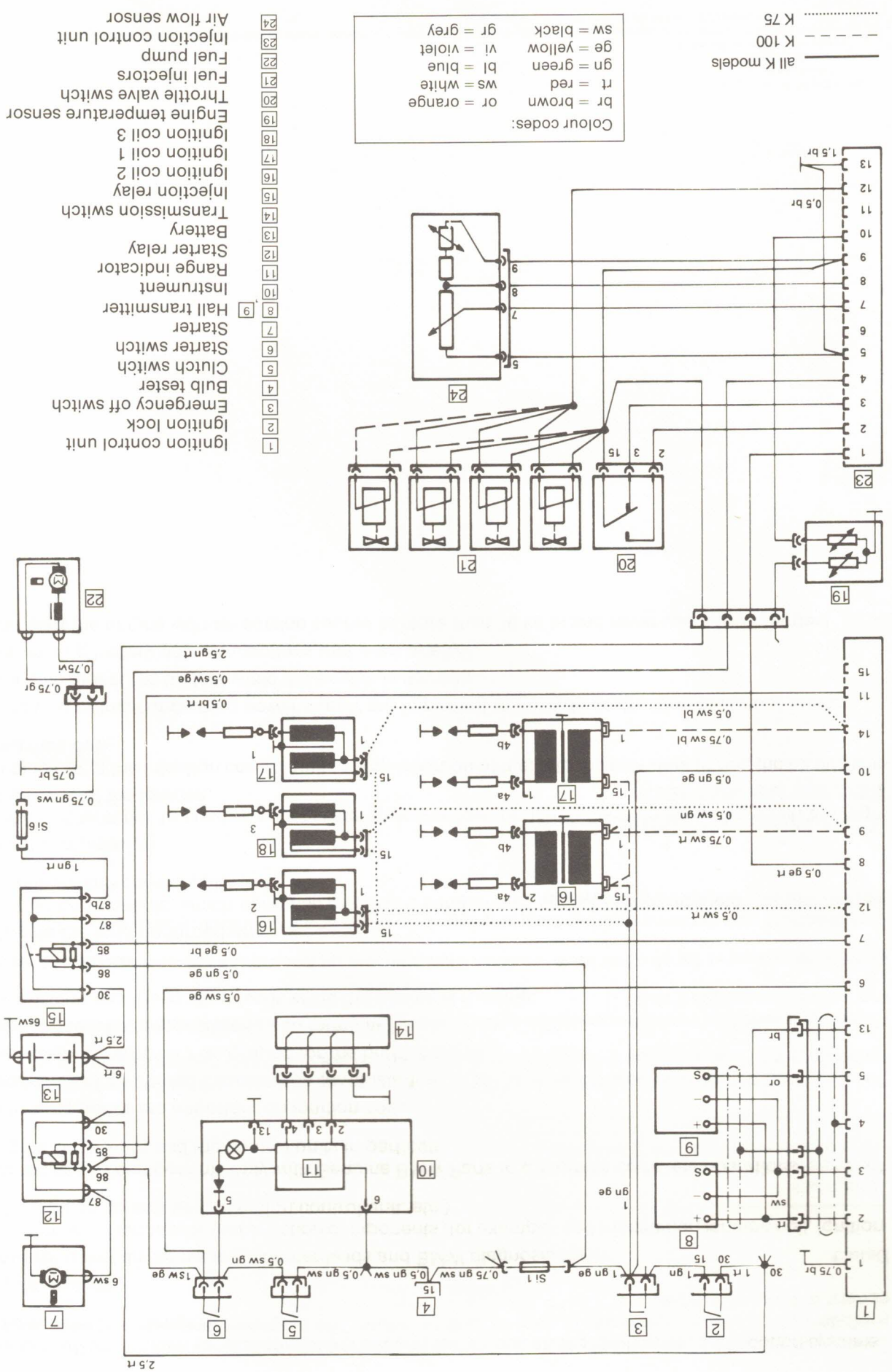
List of Contents

	Page
Introduction	2
Instructions for Handling Engine Electronics	3
Wiring Diagram – Engine Electronics	4
Plug Arrangement and Terminal Designations	5
Instructions for Application of BMW Diagnosis	6
Troubleshooting	7
Checklist – LE-Jetronic	8
Corrective Measures – LE-Jetronic	9
Checklist – Ignition	10
Corrective Measures – Ignition	11

Instructions for Handling Engine Electronics

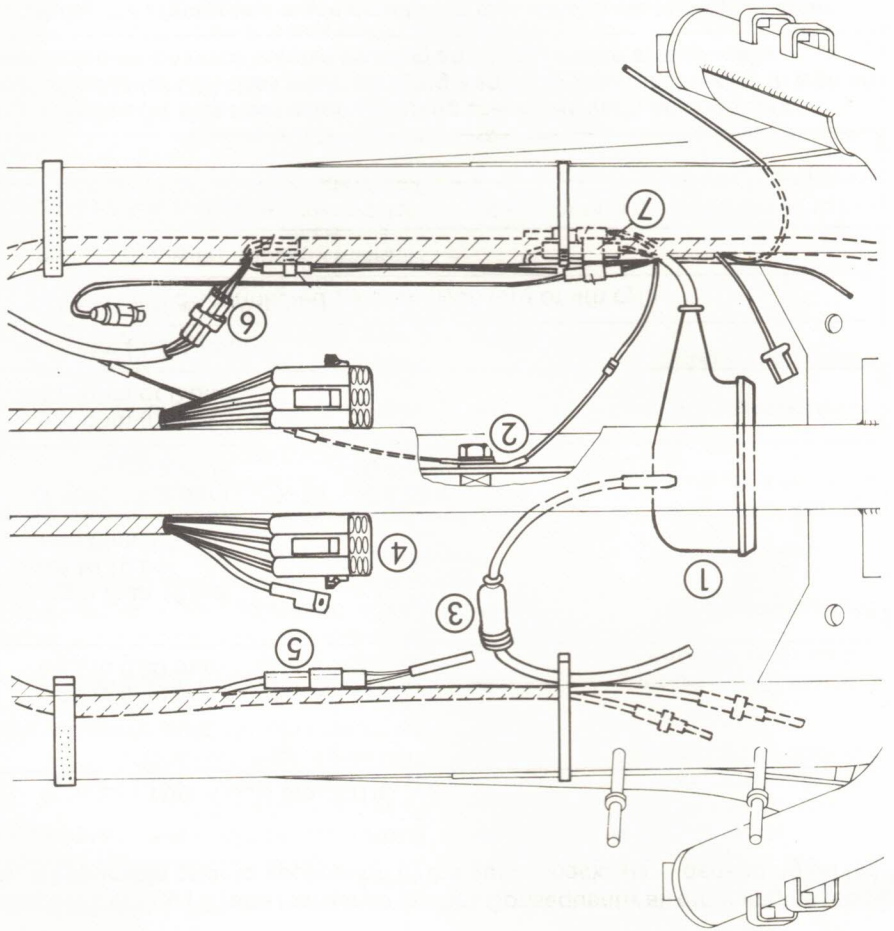
1. Always turn off the ignition (or disconnect the battery) for all jobs on the ignition or fuel injection systems, to avoid accidents – **danger!**
Such jobs include:
 - Connecting and disconnecting adapter leads and BMW diagnosis tester
 - Replacement of ignition or fuel injection components (for example: hall transmitter, ignition coil, ignition leads, ignition control unit, injection control unit, etc.)
2. Always replace all components only with Genuine BMW Parts to guarantee complete operational safety of the engine electronics and the control units in particular.
3. The following points are important on ignition coils.
 - Never connect a shielded capacitor on terminals 1 and 15.
 - Never connect terminal 1 on ground for the burglar alarm.
 - Never connect battery positive (+) on terminal 1.
 - Never disconnect the ignition leads while the engine is running.
4. Checking resistance:
 - Only with the ignition turned off.
 - Never on components, which comprise electronic components such as transistors etc., as well as hall transmitters and control units.
5. Checking compression:
 - Disconnect terminal 15 positive supply wire (green/yellow) on the ignition coils to shut down the high voltage side of the ignition.
 - Pull plug out of the injection control unit to stop injection of fuel into the cylinders (if not, the oil film will be washed out).
6. The following points concerning power supply are important to exclude destruction of control units.
 - Never disconnect the battery while the engine is running.
 - Never mix up battery pole connections (not even briefly!).
 - Never start the engine with an outside source of more than 16 volts and never use a fast charger!

General Wiring Diagram – Engine Electronics

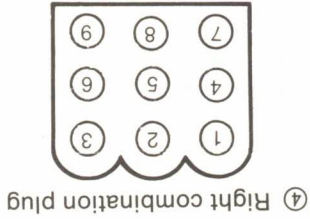


Arrangement of Most Important Plug Connections

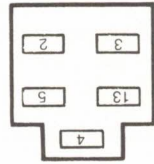
- ① Ignition control unit plug
- ② Frame ground screw connection
- ③ Hall transmitter plug
- ④ Right combination plug
- ⑤ Ignition lock plug
- ⑥ Wire harness plug
- ⑦ Clutch plug



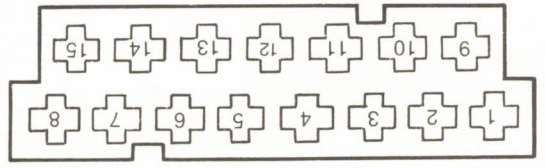
Terminal Designations (Top View of Wire Harness End)



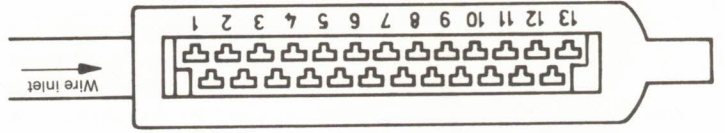
④ Right combination plug



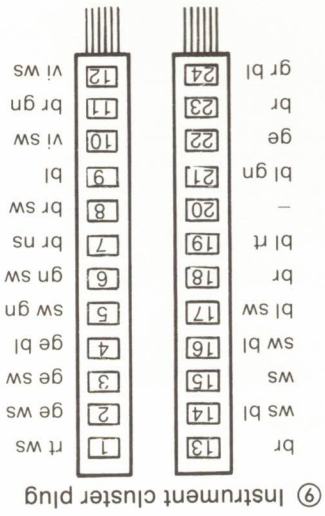
③ Hall transmitter plug



① Ignition control unit plug



⑧ Injection control unit plug



⑨ Instrument cluster plug

Colour codes:

sw = black	gr = grey
ge = yellow	vl = violet
gn = green	bl = blue
rt = red	ws = white
br = brown	or = orange

Instructions for Application of BMW Diagnosis

The tester can only be used to check voltage (V), timing (%) and resistance (ohms). Consequently all other engine technical data has to be checked separately, if applicable prior to application of the quick checklists – depending on the condition.

Ignition timing, static 6° before TDC \pm 0.24 mm BTDC

Valve clearance of cold engine (max. 35 °C)
 Intake valve 0.15 to 0.20 mm
 Exhaust valve 0.25 to 0.30 mm

Compression
 Good more than 10 bar
 Normal 8.5 to 10 bar
 Poor less than 8.5 bar

Ignition coil
 Primary K 100 ~2.2 ohm K 75 ~0.8 ohm
 Secondary ~10 k-ohm ~10 k-ohm

Spark plug connectors
 Spark plug connectors 5 k-ohm (only K 100)
 Ignition coil shielded connectors 1 k-ohm or 0 ohm

Spark plug electrode gap 0.6 mm (+ 0.1 mm)
 Fuel pressure 2.5 bar with disconnected vacuum hose (3rd or 4th cyl.)
 Idle speed 950 \pm 50 rpm
 CO value 2.0 to 2.5 % by volume

Synchronization
 Intake leak test
 – Speed (or CO) rises when clamping crankcase vent: engine leaks.
 – Speed (or CO) rises when spraying a small (!) amount of fuel (e.g. with an oil can) on throttle valve housing and shaft: intake system leaks.

Ti signal on fuel injector (pulse duty factor)
 Pulse duty factor test made direct on a fuel injector via two-pin adapter connection, choke in stage 1, ignition turned on, starter operated.
 Specified values at approx. 15 °C engine temperature:

Engine does not start	Idle speed (= 950 rpm)
K 100 ~4 % ... (10 sec) ... ~2 %	~6.5 %
K 75 ~7 % ... (10 sec) ... ~3 %	~7.5 %

Troubleshooting

Condition	Check
Transmission in neutral, ignition turned on; indicator lamps on? (including idle control)	<ul style="list-style-type: none"> no → Battery, connections and charged condition no → Fuse no. 1 (cause ??) no → Transmission switch, plugs, leads no → Test steps: ignition 1 and 6 no → Instrument cluster: plug connections and range indicator printed circuit board
Operate starter button: starter relay working?	<ul style="list-style-type: none"> no → Test steps: ignition 1, 6, 7 and 8
Starter working?	<ul style="list-style-type: none"> no → Leads: battery positive – starter relay terminal 87 – starter relay terminal 30 no → starter, starter bolting on transmission no → Replace starter relay
but only erratically (one hall signal missing)	<ul style="list-style-type: none"> no → Leads: hall transmitter – ignition control unit terminals 5 and 13 no → Replace hall transmitter no → Replace ignition control unit
Injection relay working?	<ul style="list-style-type: none"> no → Test steps: ignition 2 and 14
Fuel pump working?	<ul style="list-style-type: none"> no → Fuse no. 6 (cause ??), tank plug no → Leads: battery positive (red) – fuel injection relay terminal 30, injection relay terminal 87b (green/red) – fuse no. 6 – fuse no. 6 (green/white) – tank plug, pump connections (approx. ~3 ohms) no → Replace injection relay
but does not continue running (approx. ~1 second)	<ul style="list-style-type: none"> no → Hall transmitter plug no → Test steps: ignition 10, 11, 15 and 16
Cold engine starts?	<ul style="list-style-type: none"> no → Sufficient fuel in tank no → ti signal approx. ~6 to 3 %, if not: <ul style="list-style-type: none"> ● Test steps: LE-Jetronic (all), ignition 17 ● Replace injection control unit (if test steps are okay) ● Ignition spark, if not: <ul style="list-style-type: none"> ● Test steps: ignition 3, 4, 5, 18 through 27 ● Fuel pressure, if not: <ul style="list-style-type: none"> ● Leakage on hoses and filter (in tank) ● Pressure regulator ● Return flow plugged (→ excessive fuel pressure) no → Data in "Instructions for Application of BMW Diagnosis" no → Fuel injectors dirty
Warm engine starts?	<ul style="list-style-type: none"> no → Sufficient fuel in tank no → Fuel pressure no → Test steps: LE-Jetronic 4 through 7
Engine running in all cylinders?	<ul style="list-style-type: none"> no → Temperature comparison on exhaust manifold: non-working cylinders no → Spark plugs: broken insulators, electrode gaps no → Ignition spark: stroboscope lamp and trigger clips no → Fuel injectors: no leakage and equivalent flow rates no → Test steps: LE-Jetronic 10 and ignition 15 through 27
Engine running without misfiring?	<ul style="list-style-type: none"> no → Spark plugs and spark plug connectors no → Ignition (primary and secondary) no → Loose contact on plugs, relays and leads no → Test steps: LE-Jetronic 4 through 9 no → Data in "Instructions for Application of BMW Diagnosis"
Engine power okay?	<ul style="list-style-type: none"> no → Fuel pressure no → Test steps: LE-Jetronic 4 through 9 no → Data in "Instructions for Application of BMW Diagnosis"

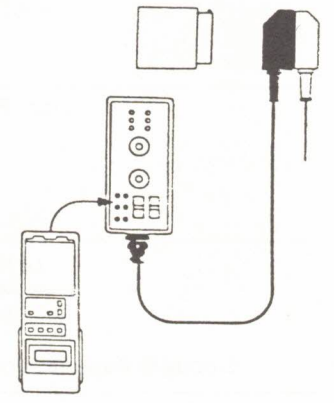
but . . . when there is a different condition, check the tank volume and data in "Instructions for Application of BMW Diagnosis" depending on the type of trouble. When in doubt, check the complete motorcycle. Also check the complete motorcycle in case of conditions, which occur only occasionally or in conjunction with certain driving conditions, whereby plugs and leads must be simultaneously loaded mechanically and moved.

Checklist for Fuel Injection

Test Step	Tested Terminals	Tested Item	TD signal	Injection relay, power supply for injection control unit	Start signal Terminal 86	Air flow sensor	Air flow sensor / potentiometer	Temperature sensor	Ground connection	Throttle valve sw. Idle contact	Throttle valve sw. Full throttle contact	Fuel injectors	12/9	11	12	Central ground
1	9/1	TD signal	X	X	X	X	X	X	X	X	X	X	X	X	X	X
2	5/9	Injection relay, power supply for injection control unit	X	X	X	X	X	X	X	X	X	X	X	X	X	X
3	5/4	Start signal Terminal 86	X	X	X	X	X	X	X	X	X	X	X	X	X	X
4	5/8	Air flow sensor	X	X	X	X	X	X	X	X	X	X	X	X	X	X
5	5/7	Air flow sensor / potentiometer	X	X	X	X	X	X	X	X	X	X	X	X	X	X
6	5/10	Temperature sensor	X	X	X	X	X	X	X	X	X	X	X	X	X	X
7	5/13	Ground connection	X	X	X	X	X	X	X	X	X	X	X	X	X	X
8	2/9	Throttle valve sw. Idle contact	X	X	X	X	X	X	X	X	X	X	X	X	X	X
9	3/9	Throttle valve sw. Full throttle contact	X	X	X	X	X	X	X	X	X	X	X	X	X	X
10	12/9	Fuel injectors	X	X	X	X	X	X	X	X	X	X	X	X	X	X
11		Air flow sensor	X	X	X	X	X	X	X	X	X	X	X	X	X	X
12		Central ground	X	X	X	X	X	X	X	X	X	X	X	X	X	X

* Connections

- Pulse duty factor ($\geq 3\%$):
- Voltage test (V):
- Resistance test (Ω):



Test leads on blue ohm jacks.
 Yellow plug on red jack, green plug on black jack
 Yellow plug on jack 1, green plug on red jack

Zero balance required before testing.
 This requires the following points on the universal test adapter:
 - Volt switch in position \uparrow
 - Ohm switch in position 9,
 - Button 5 pressed,
 - Ohm button on motorcycle tester pressed simultaneously until 0 ohm is displayed digitally.
 Release this button first.
Repeat the zero balance as soon as a different LCD display (button) is selected
 or
 as soon as the display is cancelled.

Zero balance for resistance test without Adapter:
 - Both test points pressed next to each other on blank metal (e.g. engine block)
 - Ohm button on motorcycle tester pressed simultaneously until 0 ohm is displayed digitally.

Remarks

X = yes
 - = no

Actual Value

Nominal Value K 75

Nominal Value K 100

Nominal Value K 200

Nominal Value K 500

Nominal Value K 1000

Nominal Value K 2000

Nominal Value K 5000

Nominal Value K 10000

Nominal Value K 20000

Nominal Value K 50000

Nominal Value K 100000

Nominal Value K 200000

Nominal Value K 500000

Nominal Value K 1000000

Nominal Value K 2000000

Nominal Value K 5000000

Nominal Value K 10000000

Nominal Value K 20000000

Nominal Value K 50000000

Nominal Value K 100000000

Nominal Value K 200000000

Nominal Value K 500000000

Nominal Value K 1000000000

Test Step	Tested Terminals
Repair the following wires or replace the mentioned components when there is considerable deviation from the nominal value (more than 15%).	

1	9/1	Terminal 9 (green/red) wire harness plug ⑥ - Wire harness plug (green/red) socket for injection relay - Terminal 87 injection relay terminal 30 - Socket for injection relay (red) battery positive Terminal 1 (yellow/red) - wire harness plug ⑤ - Wire harness plug (yellow/red) plug for ignition control unit ①, terminal 8, this requiring that actual values of test steps 17 for ignition and 2 for LE-Jetronic are okay.								
2	5/9	Terminal 5 (brown) frame ground ② - Ground connection frame/driver/battery ground Terminal 9 (green/red) - wire harness plug ④ - Wire harness plug (green/red) socket for injection relay - Socket for injection relay (red) battery positive, if wires are okay: if injection relay does not produce an operating noise, see test steps 2 and 14 of ignition; otherwise replace the injection relay								
3	5/4	Terminal 4 (black/yellow) wire harness plug ③ - Wire harness plug (black/yellow) starter relay plug, requiring actual value of ignition test step 6 to be correct								
4	5/8	Two possible causes: - Engine wire harness, wires terminal 8 (white/red) or terminal 5 (brown) with breaks - Air flow sensor defective								
5	5/7	First apply the following test method (with the same adapter settings): Use an instrument tester (even better: stroboscope lamp) for the voltage test, connecting positive pole of test lead on left ohm jack and negative pole on right ohm jack. Pull off plug on starter relay and remove fuse no. 6 (for fuel pump) to protect the battery during the test. Operate the start button and simultaneously open the sensor plate or the air flow sensor slowly by hand (air filter removed): voltage rises continuously (without interruptions) from approx. 1 to approx. 8 volts; sensor plate must move without hesitation. Three possible causes for defect: - Engine wire harness, breaks in wires terminal 7 (white/gray), terminal 9 (green/red) or terminal 5 (brown) - Ground out on wire terminal 7 (white/gray) - Air flow sensor defective (mechanically or electrically), break in slip contact occasionally								
6	5/10	Three possible causes: - Engine wire harness, breaks in wires terminal 10 (violet/green) or terminal 5 (brown) - Ground out in wire terminal 10 (violet/green) - Temperature sensor defective; nominal values:								
		<table border="1"> <thead> <tr> <th>Temperature (°C):</th> <th>Resistance (Ω):</th> </tr> </thead> <tbody> <tr> <td>90</td> <td>~250</td> </tr> <tr> <td>20</td> <td>~500</td> </tr> <tr> <td>0</td> <td>~2500</td> </tr> </tbody> </table>	Temperature (°C):	Resistance (Ω):	90	~250	20	~500	0	~2500
Temperature (°C):	Resistance (Ω):									
90	~250									
20	~500									
0	~2500									
7	5/13	Wire harness, breaks in wires terminal 13 or terminal 5 (brown)								
8	2/9	Three possible causes: - Throttle valve switch maladjusted - Engine wire harness, breaks in wire terminal 2 (white/black) or terminal 9 on plug for injection control unit ⑦ to terminal 18 on throttle valve switch (green/red) - Throttle valve switch defective								
9	3/9	Two possible causes: - Engine wire harness, break in wire terminal 3 (white/brown), requiring that actual value of test step 8 is okay. - Throttle valve switch defective								
10	12/9	Two possible causes: - Engine wire harness, breaks in wires terminal 12 (yellow/green) or terminal 9 (green/red) to one or more fuel injectors - One or more fuel injectors defective (electrically)								
11	8/9	Two possible causes: - Engine wire harness, breaks in wires terminal 8 (white/red) or terminal 9 (green/red) - Air flow sensor defective								

Checklist for Ignition

Test Step	Tested Terminals	Tested Item	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	
1/10		Power supply for ignition control unit	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
2	7	Control voltage for injection relay (positive)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
3	14	Power supply for ignition coil 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
4	9	Power supply for ignition coil 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
5	12	Power supply for ignition coil 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
6	6	Starter switch	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
7	7	Control voltage for starter relay (pos.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
8	8	Ignition control unit (control for starter relay, negative)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
9	4	Hall transmitter shield	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
10	3	Power supply for hall transmitter (neg.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
11	2	Power supply for hall transmitter (pos.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
12	15	Vacuum switch (open)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
13	15	Vacuum switch (closed)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
14	7	Ignition control unit (control for injection relay, neg.)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
15	5	Hall transmitter 1 outlet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
16	13	Hall transmitter 2 outlet	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
17	8	TD signal	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
18	18	Primary signal for ignition coil 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
19	19	Primary signal for ignition coil 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
20	20	Primary signal for ignition coil 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
21	21	Closed loop shutoff final stage 1	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
22	22	Closed loop shutoff final stage 2	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
23	23	Closed loop shutoff final stage 3	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
24	24	Primary side of ignition coils	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
25	25	Secondary side of ignition coils	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
26	26	Ignition coil 1 and ignition lead (cyl. 1 and 4)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
27	27	Ignition coil 2 and ignition lead (cyl. 2 and 3)	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

The ohm switch is not required in this test plan.
 * Connections:
 - Voltage test (V): Yellow plug on red jack, green plug on black jack
 - Pulse duty factor (B > %): Yellow plug on red jack 1, green plug on red jack

Actual Value
 Nominal Value K 75
 Nominal Value K 100
 Engine Running
 Starter Operated
 Starter On
 Ignition Connections *
 LCD Display (Button)
 V-Switch Position
 Ignition Control Unit Connected
 X = yes
 - = no
 Only U_B will be displayed due to 2 resistor in test adapter.
 K 75: ignition coil 3
 K 75: ignition coil 2
 Starter not working
 Starter not working
 Pull plug out of injection control unit.
 Pull off vacuum hose (cyl. 1) build up vacuum (app. 500 mbar)
 Starter speed sufficient (for test steps 14...20)
 Test at engine idle speed
 Test at engine idle speed
 Test at engine idle speed
 Ignition off/ignition on
 Ignition off/ignition on
 Ignition off/ignition on
 Resistance checked between terminals 1 + 15 of each coil.
 Check between terminal 4a and 4b (K 100) or 4 and 1 (K 75)
 Check resistance from cyl. 4 plug connector.
 Check resistance from cyl. 1 plug connector to cyl. 2 plug connector.
 Check resistance from cyl. 3 plug connector.

Remarks

Corrective Measures for Ignition

Test Step	Tested Terminals
1	1/10 Terminal 1 (brown) frame ground ② Ground connection frame/drive unit/battery negative Terminal 10 (green/yellow) right combination plug ④ terminal 2 (green/yellow) emergency off switch (green) Right combination plug terminal 9 (green) ignition lock plug ⑤ (green) ignition lock (red) Ignition lock plug (red) battery positive
2	1/7 Terminal 7 (yellow/brown) socket for injection relay Terminal 85 injection relay (coil ~75 ohms) terminal 86 Socket for injection relay (green/yellow) right combination plug ④ terminal 2, requiring that actual value of test step 1 is okay
3	1/14 Terminal 14 (black/blue) ignition coil 1 Terminal 1 primary coil (~2.2 Ω) terminal 15 Ignition coil 1 (green/yellow) – right combination plug ④ terminal 2, requiring that actual value of test step 1 is okay
4	1/9 K 100: terminal 9 (black/red) ignition coil 2 Terminal 1 primary coil (~2.2 Ω) terminal 15 Ignition coil 2 (green/yellow) right combination plug ④ terminal 2, requiring that actual value of test step 1 is okay K 75: terminal 9 (black/green) ignition coil 3 Terminal 1 primary coil (~0.8 Ω) terminal 15 Ignition coil 3 (green/yellow) right combination plug ④ terminal 2, requiring that actual value of test step 1 is okay
5	1/12 Terminal 12 (black/red) ignition coil 2 Terminal 1 primary coil (~0.8 Ω) terminal 15 Ignition coil 2 (green/yellow) right combination plug ④ terminal 2, requiring that actual value of test step 1 is okay
6	1/6 If idle control lamp does not come on, pull the clutch. If actual value still deviates, check the following wires. Terminal 6 (black/yellow) right combination plug ④ terminal 1 (black/yellow) starter switch (black/green) Right combination plug terminal 6 (black/green) clutch plug ⑦ Clutch switch Clutch plug (green/black) fuse plate, fuse no. 1 Fuse plate (green/yellow) right combination plug terminal 2 If actual value is okay when clutch is pulled, check the following wires. Right combination plug terminal 6 (black/green) instrument cluster plug ④ terminal 5 Plug contacts on and in instrument cluster Instrument cluster plug terminal 6 (green/black) fuse plate, requiring that transmission switch and wire leading to instrument cluster as well as range indicator printed circuit board are okay
7	1/11 Terminal 11 (brown/red) plug for starter relay Terminal 85 starter relay (coil ~20 Ω) terminal 86 Plug for starter relay (black/yellow) right combination plug ④ terminal 1, requiring that actual value of test step 6 is okay
8	1/11 Ignition control unit defective, requiring that actual values of test step 1 through 7 are okay
9	1/4 Ignition control unit defective, requiring that actual value of test step 1 is okay
10	1/3 Ignition control unit defective, requiring that actual value of test step 1 is okay

Check and, if applicable, repair the following wires or replace the mentioned components in case of considerable deviation from the nominal value (more than 15%).

Corrective Measures for Ignition

Test Step	Tested Terminals	
11	1/2	<p>Three possible causes:</p> <ul style="list-style-type: none"> – Disconnect plug for hall transmitter ③ – Actual value still deviating: wire of terminal 2 (red) grounded out or ignition control unit defective – Actual value now okay: hall transmitter defective
12	1/15	<p>Three possible causes:</p> <ul style="list-style-type: none"> – Vacuum switch does not open (closed permanently, defective) – Wire terminal 15 (violet/gray) to vacuum switch grounded out – Ignition control unit defective
13	1/15	<p>Three possible causes:</p> <ul style="list-style-type: none"> – Vacuum hose leaks – Vacuum switch does not close (defective) – Break in wire: terminal 15 (violet/gray) – wire harness plug ⑥ (violet/gray) vacuum switch
14	1/7	<p>Ignition control unit defective, requiring that actual values of test steps 1 through 8 are okay</p>
15	1/5	<p>Three possible causes:</p> <ul style="list-style-type: none"> – Breaks in wires of terminals 2, 3 or 5 (red, black, orange) from plug for ignition control unit ① to hall transmitter plug ③ – Hall transmitter defective – Ignition control unit defective
16	1/13	<p>Three possible causes:</p> <ul style="list-style-type: none"> – Breaks in wires of terminals 2, 3 or 13 (red, black, brown) from plug for ignition control unit ① to hall transmitter plug ③ – Hall transmitter defective – Ignition control unit defective
17	1/8	<p>Three possible causes, requiring that actual values of test steps 1, 15 and 16 and LE-Jetronic test step 2 are okay:</p> <ul style="list-style-type: none"> – Break in wire: terminal 8 (yellow/red) wire harness plug ⑥ (yellow/red) plug for injection control unit terminal 1 – Ignition control unit defective – Injection control unit defective
18	18	<p>Ignition control unit defective, requiring that actual values for test steps 1, 3, 4, 5, 15 and 16 are okay</p>
20	20	
21	21	<p>Ignition control unit defective, requiring that actual values for test steps 3 through 5 are okay</p>
23	23	

Check and, if applicable, repair the following wires or replace the mentioned components in case of considerable deviation from the nominal value (more than 15 %).