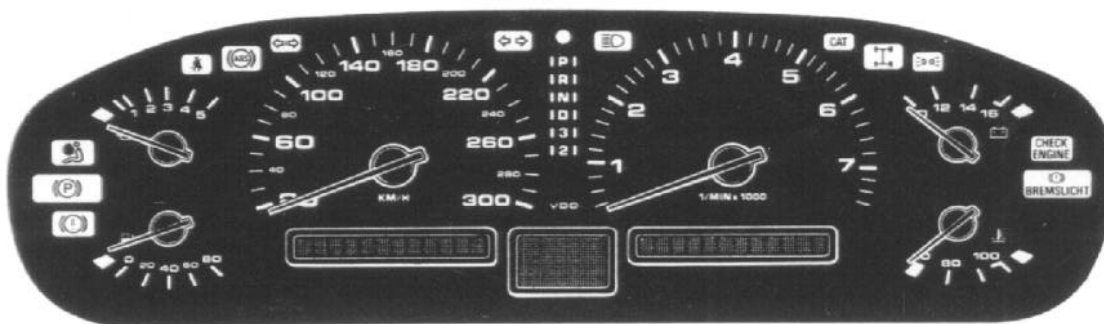




SERVICE

928 S4

DIAGNOSIS OF THE INSTRUMENT CLUSTER



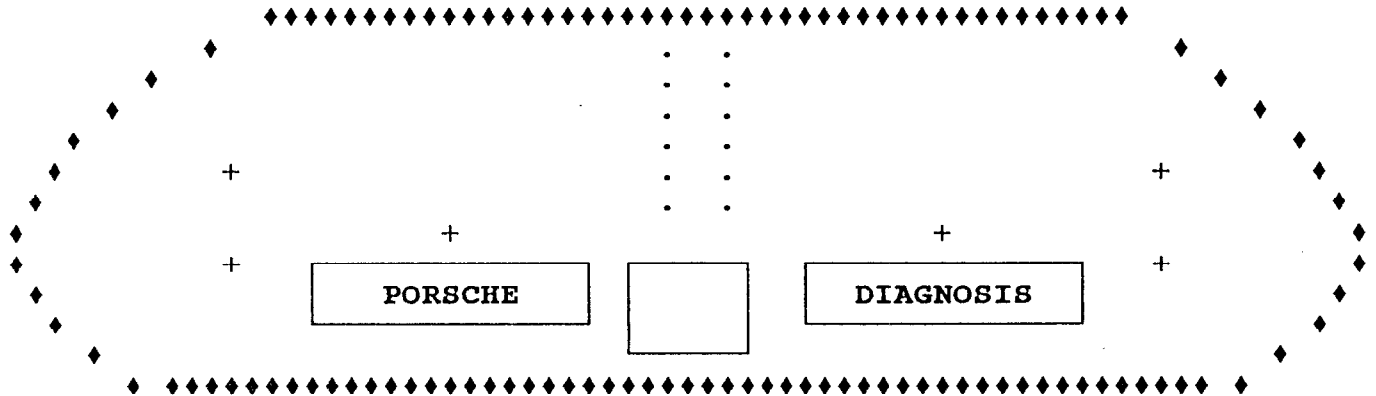
'89

INFORMATION

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Aktiengesellschaft
WKD 495 821

TECHNIK

O N B O A R D D I A G N O S I S



D I A G N O S I S
O F T H E I N S T R U M E N T C L U S T E R

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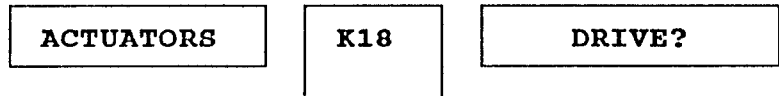
O N B O A R D D I A G N O S I S

The correct functioning of the INSTRUMENT CLUSTER itself, as well as diverse switches and sensors in the vehicle can be checked by means of the ON BOARD DIAGNOSIS. During diagnosis of the instrument cluster, the instrument's three display boxes are used to indicate:

- a.) the individual steps in the diagnosis,
- b.) the software status,
- c.) the duration and/or journey during which warnings were issued,
- d.) the ACTUAL values of sensors and switches.

The current diagnosis step is indicated in the left and right display boxes and the central display box indicates the control unit code.

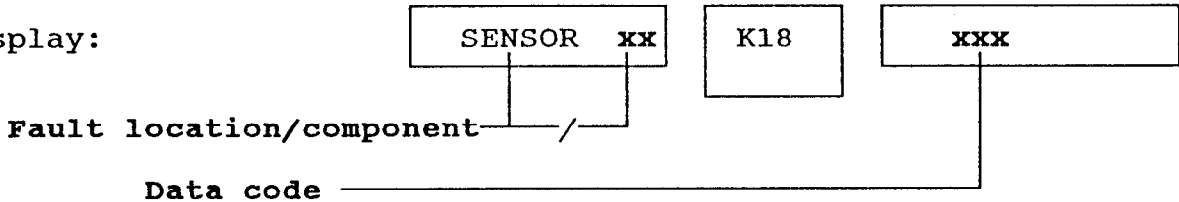
e.g. display:



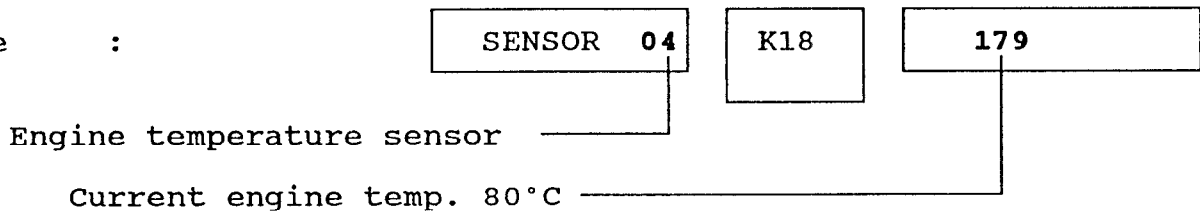
The control unit code contains a letter (K = instrument cluster) which is assigned an identification figure when diagnosis is activated, indicating the respective software status (e.g. K18) of the control unit.

The corresponding data values for each diagnosis step are indicated in the right-hand display box as either a code number or in plain text. Switches, sensors or actuators are also assigned a code number in the left-hand display box which identifies the respective component.

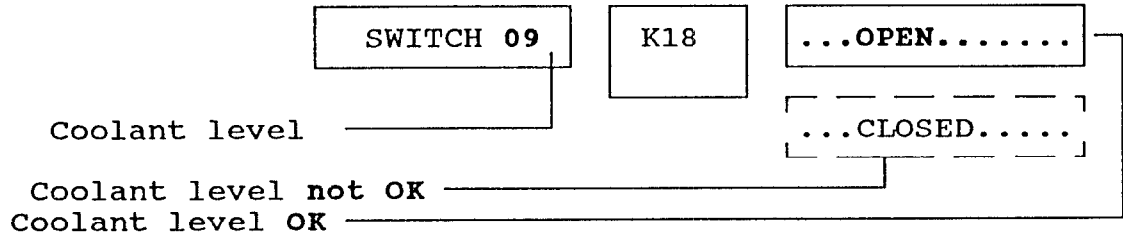
e.g. display:



Example :



or :



OPERATING LEVER functions

The operating lever - to the left of the steering column - can be used to start the diagnosis as well as to select and activate the individual steps.

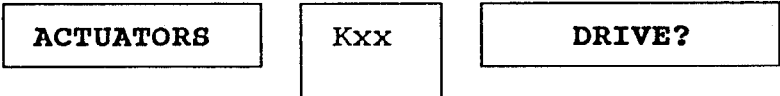
The operating lever can operate in 4 planes.

- to the **FRONT** = **start DIAGNOSIS**
- to the **REAR** = **execution desired - YES**
- **UPWARDS** = **execution desired - NO**
- **DOWNWARDS** = **execution desired - YES (clear memory only)**

RULE

If a question appears on the display during diagnosis, such as

e.g.

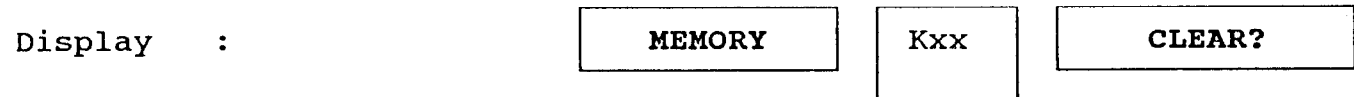


this question must be answered with YES or NO by moving the operating lever in order to continue in the diagnosis program.

NOTE: Operating lever UPWARDS = NO - Do not execute display.
 Jump to next diagnosis step

Operating lever to the REAR = YES - Execute the display.

Exception: There is one exception to this rule:



If you wish to clear the error memory (YES), the operating lever must be pressed DOWNWARDS - for approx. 1 s.

If the answer is NO move the operating lever UPWARDS.

The contact bridge 9293 is required to start diagnosis. The contact bridge 9293 must be plugged into the diagnosis-plug connector in the vehicle for this.

NOTE:

All other code letters shown in the central display box cannot be called at this time, or checked with the PORSCHE System Tester 9268 (Off Board Diagnosis).

1.) ACTIVATING DIAGNOSIS

DISPLAY (example)

1a.) Turn on ignition	:	3510 KM	+22.0 * °C	185.5 KM I
1b.) Connect contact bridge 9293	:	3510 KM	+22.0 * °C	185.5 KM I
1c.) Move operating lever to the FRONT for approx. 3 s	:	OUTSIDE	+22.0 * °C	TEMPERATURE
followed by	:	PORSCHE		DIAGNOSIS

2.) CALLING THE CLUSTER CONTROL UNIT

Press the operating lever repeatedly UPWARDS or DOWNWARDS until the identification code K appears.

PORSCHE	K	DIAGNOSIS
---------	---	-----------

If a non-assigned code letter is called, e.g. 'A' - operating lever to the REAR, the following display appears:

-----	A	-----
-------	---	-------

After a short waiting period the display changes :

PORSCHE		DIAGNOSIS
---------	--	-----------

K.) INSTRUMENT CLUSTER DIAGNOSIS

At the beginning of model year '89, the software status code K18 was fitted for the instrument cluster. The software was modified during this model year. The subsequent new software status has been assigned the code K21.

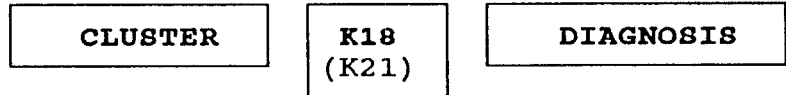
NOTE: In order to read out all diagnosis steps without maloperation and with the correct values, we recommend that the instrument cluster diagnosis be carried out with the engine running (at idle).



START THE ENGINE

Operating lever to the REAR

Display :



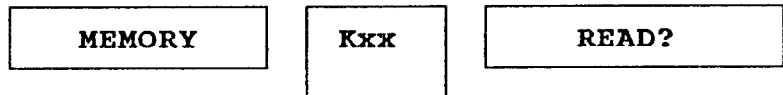
K1.) READING THE FAULT MEMORY

NOTE:

The instrument cluster software status K18 contains a fault data memory, the content of which is of no significance to the Service. Once the last, existing fault has been read out, the display indicates any existing FAULT WARNING (diagnosis step K1.1), or jumps to the next diagnosis step K2.

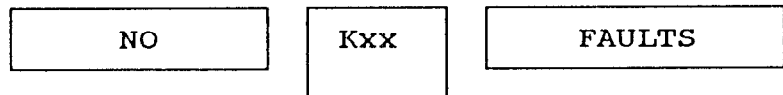
The instrument cluster software status K21 has no fault data memory. Any existing FAULT WARNINGS (diagnosis step K1.1) are indicated, otherwise the system jumps to the next diagnosis step K2.

Operating lever to the REAR:



If NO, operating lever UPWARDS - Jump to the next diagnosis step K1.2.

If 'YES' operating lever to the REAR:



.....
To continue: operating lever to the REAR.

K1.1) Fault warning display

If a warning is given in the display while driving, the duration and/or the journey is stored with this fault and issued on the display during diagnosis.

The following warnings are stored:

- OIL PRESSURE : in h/min
- OIL LEVEL : in km
- BRAKE FLUID LEVEL : in h/min
- ENGINE TEMPERATURE : in h/min
- COOLANT LEVEL : in km
- TOOTHED BELT TENSION : in h/min

Example:

Display : OIL PRESSURE Kxx ___01:12_H___

Operating lever to the REAR

Display : COOLANT LEV. Kxx ___127.3_KM___

etc.

.....
 Fault warning display TERMINATED - To continue: operating lever to the REAR.

Note: The fault warning display is cleared if the battery cable is disconnected or if the plug connections of the instrument cluster have been separated.

K1.2.) CLEARING THE FAULT MEMORY

Display	:	<input type="text" value="MEMORY"/>	<input type="text" value="Kxx"/>	<input type="text" value="CLEAR?"/>
---------	---	-------------------------------------	----------------------------------	-------------------------------------

If NO, operating lever UPWARDS - Jump to the next diagnosis step K2.

If 'YES' operating lever DOWNWARDS for approx. 1 s	:	<input type="text" value="MEMORY"/>	<input type="text" value="Kxx"/>	<input type="text" value="CLEARED"/>
--	---	-------------------------------------	----------------------------------	--------------------------------------

.....
To continue: operating lever to the REAR.

K2.) DRIVING INSTRUMENT-CLUSTER ACTUATORS

Display	:	<input type="text" value="ACTUATORS"/>	<input type="text" value="Kxx"/>	<input type="text" value="DRIVE?"/>
---------	---	--	----------------------------------	-------------------------------------

If NO, operating lever UPWARDS, jump to the next diagnosis step K3.

Operating lever to the REAR: TANK DISPLAY. The tank display must indicate 40 l.		<input type="text" value="ACTUATOR 01"/>	<input type="text" value="Kxx"/>	<input type="text" value="DRIVEN"/>
--	--	--	----------------------------------	-------------------------------------

Operating lever to the REAR: TANK DISPLAY: The tank display must indicate 80 l.		<input type="text" value="ACTUATOR 02"/>	<input type="text" value="Kxx"/>	<input type="text" value="DRIVEN"/>
--	--	--	----------------------------------	-------------------------------------

Operating lever to the REAR: The checkered DISPLAY changes inversely.		<input type="text" value="ACTUATOR 03"/>	<input type="text"/>	<input type="text" value="DRIVEN"/>
---	--	--	----------------------	-------------------------------------

Operating lever to the REAR: Only for vehicles with M 215 (Saudi Arabia): speed warning buzzer sounds.		<input type="text" value="ACTUATOR 04"/>	<input type="text"/>	<input type="text" value="DRIVEN"/>
---	--	--	----------------------	-------------------------------------

.....
Drive actuators TERMINATED - To continue: operating lever to the REAR

K3.) SENSORS

SENSOR **XX**

K18
(K21)

XXX

SENSOR CODE	COMPONENTS	NOMINAL VALUES
04	ENGINE TEMPERATURE (°C)	(Sensor value(Ω))
(97)	(120°)	(22.5)
(100)	(118°)	(23.8)
106	115°	25.5
108	113.5°	26.5
114	110.5°	29
134	100°	38.5
156	90°	51.5
179	80°	70
201	70°	97
222	60°	137
242	50°	198.5
255	40°	293

05	TANK LEVEL	(Sensor value(Ω))
96(81)	63 L	19.1 (15.5)
174(161)	42 L	42.3 (37.8)
227(218)	21 L	65.7 (61.2)
240(232)	15 L(calibration value)	72.7 (68.4)
245(238)	12.5L	75.6 (71.7)

06	VOLTAGE, Terminal 15	
96		6 V
112		7 V
128		.
144		.
166		<u>Code No.</u> = Voltage
176		16 .
129		.
208		.
224		.
240		15 V
255		16 V

07	OIL PRESSURE INDICATION (bar)	(Sensor value(Ω))
	on the instrument * on the display	
141	0.0 *	0.0 10
153	1.0 *	0.6 29.6
161	1.5 *	1.0 48
167	2.0 *	1.6 65.3
171	2.5 *	2.0 82
175	3.0 *	2.4 (2.6) 99
178	3.5 *	2.8 (3.0) 116
180	4.0 *	3.2 (3.7) 133.6
182	4.5 *	3.7 (4.2) 151
186	5.0 *	4.5 (5.0) 184

The reasons for different indications on instrument and display are due to the tolerances of the analog instrument.

K4.) SWITCHES

SWITCH

K18
(K21)

CHECK?

If NO - operating lever UPWARDS, jump to the next diagnosis step K5.

Operating lever to the REAR:

SWITCH 01

K18
(K21)

Each movement of the operating lever to the REAR - Jump to the next switch.

=====

SWITCH	COMPONENTS	SWITCH	DISPLAY
01	PARK BRAKE	Not operated Operated (-)	OPEN CLOSED
02	No function		OPEN
03	ABS	System OK Not OK (-)	OPEN CLOSED
04	No function		OPEN
05	RDK	Not installed Installed (-)	OPEN CLOSED
06	CAT. MONITOR	System OK Not OK (-)	OPEN CLOSED
07	No function		OPEN
08	WASHER WATER LEV.	Level OK Not OK (-)	OPEN CLOSED
09	COOLANT LEVEL	Level OK Not OK (-)	OPEN CLOSED
10	COOLANT PRESSURE	OK ≤ 0.1 bar ≥ 0.1 bar (-)	OPEN CLOSED

=====

01

PARK BRAKE

Not operated
Operated (-)

OPEN
CLOSED

02

No function

OPEN

03

ABS

System OK
Not OK (-)

OPEN
CLOSED

04

No function

OPEN

05

RDK

Not installed
Installed (-)

OPEN
CLOSED

06

CAT. MONITOR

System OK
Not OK (-)

OPEN
CLOSED

07

No function

OPEN

08

WASHER WATER LEV.

Level OK
Not OK (-)

OPEN
CLOSED

09

COOLANT LEVEL

Level OK
Not OK (-)

OPEN
CLOSED

10

COOLANT PRESSURE

OK ≤ 0.1 bar
≥ 0.1 bar (-)

OPEN
CLOSED

K4.) SWITCHES

SWITCH xx	K18 (K21)	
------------------	--------------	--

SWITCH	COMPONENTS	SWITCH	DISPLAY
11	OIL LEVEL	OK > 6 l Not OK <6 l	OPEN CLOSED
12	TOOTHED BELT TENS.	Tension OK Not OK (+)	OPEN CLOSED
13	BRAKE PADS	Pad OK Not OK (-)	OPEN CLOSED
14	BRAKE FLUID	Level OK Not OK (-)	OPEN CLOSED
15	BRAKE-LIGHT SWITCH	Not operated Operated (+)	OPEN CLOSED
16	BRAKE LIGHT	OK Not OK (-)	OPEN CLOSED
17	CENTRAL LOCKING	Not operated Operated (-)	OPEN CLOSED
18	No function		OPEN
19	No function		OPEN
20	TACHOMETER SIGNAL Output	Rear wheels turn	OPEN CLOSED
21	No function		OPEN
22	OIL-PRESSURE SWITCH	OK > 2.5 bar Not OK (-) < 0.25 bar	OPEN CLOSED
23	SAFETY BELT	Not closed Closed	OPEN CLOSED
24	TAIL LAMP	OK Not OK (-)	OPEN CLOSED
25	TACHO RESET	Not operated Operated (-)	OPEN CLOSED

.....
Switch diagnosis TERMINATED - To continue: operating lever to the REAR

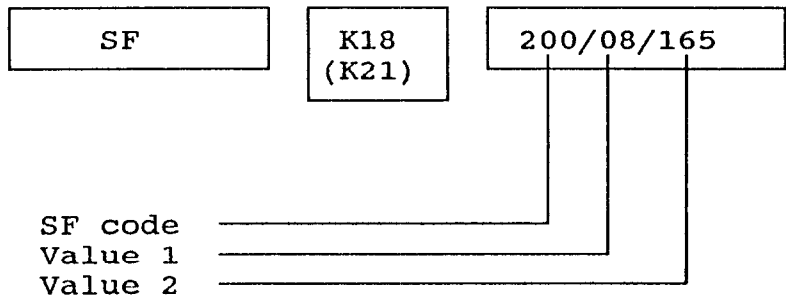
K5.) SPECIFIC FUNCTIONS

The operating time of the vehicle can be interrogated with this program without a tachometer signal (driving without tachometer connected).

If 'NO', operating lever UPWARDS. SF K18 (K21) EXECUTE?

If 'YES', operating lever to the REAR for approx. 6 s. SF K18 (K21) xxx/xx/xxx

Example:



Calculation from the display:

Failure time in minutes = (value 1 x 256) + value 2

Failure period in hours = $\frac{(value\ 1\ x\ 256) + value\ 2}{60}$

.....
 Specific functions TERMINATED
 Instrument cluster diagnosis TERMINATED - Operating lever to the REAR

Display : PORSCHE K DIAGNOSIS

To continue diagnosis - operating lever to the REAR - repeat instrument cluster diagnosis.

Interrupt diagnosis - switch off ignition, remove contact bridge.

If you forget to move the contact bridge, the following display appears when the ignition is switched on again:

DIAGNOSIS [] PLUG

 TERMINATED

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Technical Service Dept.
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