

State of California
AIR RESOURCES BOARD

EXECUTIVE ORDER D-74
Relating to Exemptions under Section 27156
of the Vehicle Code

ROBERT BOSCH CORPORATION
"ROBERT BOSCH BREAKERLESS TRANSISTORIZED
IGNITION SYSTEM (TCI-h)"

Pursuant to the authority vested in the Air Resources Board by Section 27156 of the Vehicle Code; and

Pursuant to the authority vested in the undersigned by Section 39515 of the Health and Safety Code and Executive Order G-30A;

IT IS ORDERED AND RESOLVED: That the installation of the Robert Bosch Breakerless Transistorized Ignition System (TCI-h) manufactured by Robert Bosch GmbH, Germany, and marketed by Robert Bosch Corporation, 345 E. Grand Ave., South San Francisco, California 94080, has been found to not reduce the effectiveness of required motor vehicle pollution control devices and, therefore, is exempt from the prohibitions of Section 27156 of the Vehicle Code for installation on 1972 through 1976 model year 4 cylinder vehicles equipped with a Bosch distributor using a standard Kettering ignition system except those vehicles equipped with capacitive discharge or transistorized ignition systems.

This Executive Order is valid provided that installation instructions for this device will not recommend tuning the vehicle to specifications different from those listed by the vehicle manufacturer.

Changes made to the design or operating conditions of the device, as exempted by the Air Resources Board, that adversely affect the performance of a vehicle's pollution control system shall invalidate this Executive Order.

Marketing of this device using an identification other than that shown in this Executive Order or marketing of this device for an application other than those listed in this Executive Order shall be prohibited unless prior approval is obtained from the Air Resources Board.

This Executive Order does not constitute any opinion as to the effect that the use of this device may have on any warranty either expressed or implied by the vehicle manufacturer.

THIS EXECUTIVE ORDER DOES NOT CONSTITUTE A CERTIFICATION, ACCREDITATION, APPROVAL, OR ANY OTHER TYPE OF ENDORSEMENT BY THE AIR RESOURCES BOARD OF ANY CLAIMS OF THE APPLICANT CONCERNING ANTI-POLLUTION BENEFITS OR ANY ALLEGED BENEFITS OF THE ROBERT BOSCH BREAKERLESS TRANSISTORIZED IGNITION SYSTEM (TCI-h).

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No claim of any kind, such as "Approved by Air Resources Board" may be made with respect to the action taken herein in any advertising or other oral or written communication.

Section 17500 of the Business and Professions Code makes untrue or misleading advertising unlawful, and Section 17534 makes violation punishable as a misdemeanor.

Section 43644 of the Health and Safety Code provides as follows:

"43644. (a) No person shall install, sell, offer for sale, or advertise, or, except in an application to the state board for certification of a device, represent, any device as a motor vehicle pollution control device for use on any used motor vehicle unless that device has been certified by the state board. No person shall sell, offer for sale, advertise, or represent any motor vehicle pollution control device as a certified device which, in fact, is not a certified device. Any violation of this subdivision is a misdemeanor."

Any apparent violation of the conditions of this Executive Order will be submitted to the Attorney General of California for such action as he deems advisable.

Executed at Sacramento, California, this 31st day of ^{May}~~April~~, 1977.

Original Signed By

Thomas C. Austin
Deputy Executive Officer-Technical

State of California

AIR RESOURCES BOARD

March 20, 1977

Staff Report

Evaluation of Robert Bosch Corporation
"Robert Bosch Breakerless Transistorized Ignition
System (TCI-h)" for Compliance with
Requirements of Section 27156 of the Motor Vehicle Code

I. Introduction

Robert Bosch Corporation, 345 E. Grand Ave., South San Francisco, California 94080 has submitted an application (Appendix A) requesting an exemption from the prohibitions of Section 27156 of the Motor Vehicle Code for the "Robert Bosch Transistorized Ignition System (TCI-h)", manufactured by Robert Bosch GmbH, Germany. The device is to be installed on 1972 through 1976 model year 4 cylinder vehicles equipped with a Bosch distributor using a standard Kettering ignition system. These vehicles include Audi, Ford, Mercedes, Opel, Porsche, Volkswagen, and Saab. The complete list of make and model of vehicles and the applicable "TCI-h" systems are summarized in Appendix B.

II. System Description

The "TCI-h" system is an inductive breakerless ignition system which uses the "Hall effect" principle to provide the ignition system signal. This device eliminates the need for breaker points within the distributor. The kit consists essentially of a electronic control box, ballast resistor, sensor switch, trigger wheel and a special high energy ignition coil equipped with a protective cap. Appendix D shows the exploded view of the device, and the electrical schematic.

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The sensor switch is mounted on the distributor breaker plate and is connected electrically to the electronic control box which controls the flow of the primary current to the high energy ignition coil. The trigger wheel which is attached to the distributor rotor is mounted onto the distributor drive shaft. It has four vanes that interrupt the magnetic field as each vane enters the air gap within the sensor switch.

The sensor switch consists basically of a Hall Cell and an Alnico permanent magnet. The magnetic field passes through an air gap within the sensor switch to the Hall Cell. When the trigger wheel vane is in the air gap the magnetic field is diverted through the vane and bypasses the Hall Cell. When the trigger wheel vane leaves the air gap the Hall Cell becomes saturated with magnetic field and generates voltage. This output signal voltage is transferred to the electronic control box which controls the current flow to the primary side of the ignition coil, and causes the spark plug to fire.

III. System Evaluation

The ARB staff's evaluation of the Robert Bosch "TCI-h" Breakerless Ignition System for compliance with the Vehicle Code Section 27156 consisted of an engineering analysis, evaluation of laboratory bench test results submitted by the applicant and confirmatory bench tests by the ARB Laboratory to determine if the installation

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of the device on a vehicle would adversely affect vehicle ignition system characteristics. Any significant degradation of the OEM ignition system performance characteristics is considered to have an adverse effect on the vehicle's exhaust emission control system.

A. Engineering Analysis

Breakerless ignition systems using the "Hall effect" principle have been previously evaluated by the Air Resources Board.¹

Any possible adverse effects of this type of ignition system modification is usually indicated by effects on the ignition timing advance and spark energy. Other problems associated with the use of the device are compatibility with capacitive discharge ignition systems, and electronic fuel injection systems.

The manufacturer stated that the device meets the 80 volts and 70 micro seconds duration minimum impulse requirements of the Robert Bosch L-Jetronic injection system.² The staff considers this explanation of compatibility acceptable. In addition the "TCI-h" system for the "VW Beetle" is designed to retain the

¹Gulf & Western Breakerless Ignition System and Per Lux Breakerless Ignition System.

²Bosch Corporation letter to ARB dated March 9, 1977.

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unequal timing interval requirement.³ The manufacturer will also not recommend the installation of the device on vehicles equipped with a capacitive discharge or transistorized ignition system with breaker points.⁴

The "TCI-h" system includes a high energy ignition coil. Therefore it is unlikely that the spark energy will be reduced as a result of the device installation on the OEM ignition system.

A review of the device's applications showed that all the applicable Bosch distributors have concentric breaker plates. This configuration will not affect the vacuum advance of the OEM ignition system when the device is installed. Therefore the only change in the ignition timing that could occur would be in the centrifugal advance due to the inherent delay in the electronic system of the device. This can be determined by laboratory tests.

³Bosch Corporation letter to ARB dated March 25, 1977.

⁴Ibid 2.

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B. Laboratory Tests

The applicant submitted back-to-back tests on the following distributors:

1. 1974 Audi 4 cylinder distributor
2. 1974 Ford Capri 4 cylinder distributor
3. 1974 California VW Beetle 4 cylinder distributor
4. 1974 Federal VW Beetle 4 cylinder distributor

ARB performed confirmatory tests on a 1974 Audi 4 cylinder distributor. All the above tests were performed on an ignition system simulator in accordance with the "ARB Guidelines for Testing and Criteria for Emission Compliance of Ignition System Modifications". The device was installed according to the manufacturers installation instructions shown in Appendix C. Table I through V inclusive are the summary of the test data.

A review of all the ignition test data showed that the installation of the device on the applicable distributors did not significantly change the ignition timing advance. The use of a high energy ignition coil, however, resulted in an increase of up to 80% in spark energy and a 40% increase in secondary voltage. However, the maximum voltage was less than 30kv. These increases are not considered adverse. ARB pass/fail

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criteria allows no more than 20% degradation in spark energy. Secondary voltage increase not exceeding 30kv is not considered excessive and will not put undue strain to the ignition system. In addition no significant deterioration was detected on other ignition system parameters such as spark duration and rise time.

IV. Manufacturer's Claims

The applicant claims the installation of the device will provide the following benefits to the user:

1. Up to 40% more ignition voltage over the entire rotational speed range.
2. Better starting in conditions of extreme heat or cold, thus less demand on battery.
3. Less environmentally harmful exhaust gases.
4. Sure ignition even with sooted spark plugs.

The laboratory test results on several distributor applications showed consistent improvement of the spark energy when the device was installed on the OEM ignition system. It is the staff's judgement that the above claims, except for item No. 3, can be achieved due to the use of high energy coil. The manufacturer agreed to delete the anti-pollution claims⁵ as required under Section 43644 of the Health and Safety Code.

⁵Bosch Corporation letter to ARB dated March 9, 1977.

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V. Conclusion and Recommendation

The ARB staff's engineering evaluation of the "Robert Bosch Breakerless Transistorized Ignition System (TCI-h) indicates that the use of this system as a retrofit device in place of breaker points ignition system for the Robert Bosch distributors will not have any adverse effect on the OEM ignition system performance characteristics.

Therefore the staff recommends that Robert Bosch Corporation be issued an exemption from the prohibitions of Vehicle Code Section 27156 for its "Robert Bosch Breakerless Transistorized Ignition System for installation on 1972 through 1976 model year 4 cylinder vehicles equipped with a Bosch distributor using a standard Kettering ignition system. The device is not recommended for installation in conjunction with capacitive discharge and transistorized ignition systems equipped with breaker points.

Table 1 - Robert Bosch Corporation "TCI-h" Ignition System Data Summary
for 1974 Audi 4 Cylinder Distributor (Applicant's Test Data)

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
1200	0	0
2000	14	14.4
2800	21.4	21.0
3400	23.8	22.8
4000	25.0	25.0

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>
3	0	0
6	0	0
9	0	0
15	6.4	6.4
20	6.4	6.4

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	2200	1800
3000	1900	1500

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	60	80
3000	35	40

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	50	72
3000	32.7	45.6

F. Available Secondary Voltage in Killovolts (simulating fouled spark plug)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	18	17
3000	22.5	20

G. Available Secondary Voltage in Killovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	25	23
3000	27.5	24

Table II - Robert Bosch Corporation "TCI-h" Ignition System Data
 Summary for 1974 Ford Capri 4 Cylinder Distributor
 (Applicant's Test Data)

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
1200	3.6	4
2000	13.8	13.8
2800	16.8	16.4
3400	19.8	19.0
4000	22.8	21.2

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>
3	0	0
6	0	0
9	2.8	2.8
15	6.0	6.0
20	6.0	6.0

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	2000	1800
3000	1800	1500

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	40	35
3000	80	40

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	44	72
3000	30	45.6

F. Available Secondary Voltage in Killovolts (simulating fouled spark plug)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	20	22.5
3000	15	20

G. Available Secondary Voltage in Killovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	25	27.5
3000	23	24

Table III - Robert Bosch Corporation "TCI-h" Ignition System Data
 Summary for California 1974 Volkswagen Beetle 4 Cylinder
 Distributor (Applicant's Test Data)

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
1200	3.0	3.8
2000	12.8	11.4
2800	17.2	16.0
3400	20.8	20.0
4000	23.2	22.0

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>
3	0	0
6	0	0
9	3.6	3.6
15	6.4	6.4
20	6.4	6.4

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	1400	1800
3000	1150	1500

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	50	35
3000	45	40

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	37	72
3000	25.3	45.6

F. Available Secondary Voltage in Killovolts (simulating fouled spark plug)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	20	22.5
3000	17	24

G. Available Secondary Voltage in Killovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	25	27.5
3000	23	24

Table IV - Robert Bosch Corporation "TCI-h" Ignition System Data
 Summary for Federal 1974 Volkswagen Beetle 4 Cylinder
 Distributor (Applicant's Test Data)

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
1200	1.2	1.2
2000	12.6	12
2800	17.8	17.8
3400	21.4	21.4
4000	21.4	21.4

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>
3	0	0
6	0	0
9	2.2	2.6
15	6.4	6.4
20	6.4	6.4

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	2200	1800
3000	1600	1500

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	45	35
3000	100	40

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	39.6	72
3000	32.2	45.6

F. Available Secondary Voltage in Killovolts (simulating fouled spark plug)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	21	22.5
3000	16.5	24

G. Available Secondary Voltage in Killovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	26.5	27.5
3000	25	24

Table V - Robert Bosch Corporation "TCI-h" Ignition System Data
 Summary for 1974 Audi 4 Cylinder Distributor (ARB Confirmatory
 Test)

A. Centrifugal Spark Advance in Crankshaft Degrees

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
1200	0	0
2000	14	14
2800	20	20
3400	23	22
4000	25	25

B. Vacuum Spark Advance in Crankshaft Degrees

<u>Vacuum in. Hg.</u>	<u>Baseline</u>	<u>Device</u>
6	0	0
9	0	0
12	6	6
15	6	6
20	6	6

C. Spark Duration in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	2200	2200
4000	1900	1640

D. Secondary Voltage Rise Time in Microseconds

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	120	50
4000	100	50

E. Spark Energy in Millijoules

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	39.6	63.5
4000	25.5	42.0

F. Available Secondary Voltage in Killovolts (simulating fouled spark plug)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	17	22
4000	14	19

G. Available Secondary Voltage in Killovolts (with load)

<u>Engine RPM</u>	<u>Baseline</u>	<u>Device</u>
600	24	26
4000	22	22

Kenny

ROBERT BOSCH CORPORATION



BOSCH
GERMANY

Subsidiary of Robert Bosch GmbH

Mr. K. D. Drachand, Chief
Engineering Branch
Air Resources Board Laboratory
9528 Telstar Avenue
El Monte, Ca. 91731

SOUTH SAN FRANCISCO, CALIFORNIA

January 5, 1977

Dear Mr. Drachand:

We refer to your letter of 9-21-1976 regarding the Robert Bosch breakerless ignition device and our discussion of the matter with Dick Kenny.

We would like to apply for an exemption from the prohibitions of Motor Vehicle Code Section 27156 and are enclosing data in compliance with paragraph IIB of the "Air Resources Board Criteria for Determining Compliance with Section 27156 of the Vehicle Code."

The enclosed materials consist of:

1. A description of the Robert Bosch Breakerless Transistorized Coil Ignition System (TCI-h) with a list of vehicles for which conversion kits are available.
2. A set of installation instructions.
3. Comparison Measurements on four different vehicles with the vehicles' original ignition system as baseline.

If - after evaluation of this data you should require a sample system - we can supply this in short order.

Robert Bosch would like to be able to offer this system on the American market in March 1977.

Because of the short lead-time we would appreciate it very much if you could handle this matter as soon as possible.

Best regards,

ROBERT BOSCH CORPORATION
South San Francisco

Harry Linssen
Harry Linssen

HL/em

Encls.

cc:ASV-B.Greenwood
AET-D.Richter

BOSCH

Install. Instr. with application

Appendix B

Kontaktlose
Zündanlage
(TSZ-h)

Breakerless
ignition system
(TCI-h)

Système d'allumage
sans rupteur
(TSZ-h)

Kontaktlös
tändanläggning
(TSZ-h)

Sistema d'accensione
senza rottore
(TSZ-h)

Verwendungs-
übersicht

Summary of
applications

Tableau
d'utilisation

Användnings-
översikt

Sommario
d'utilizzazione

Fahrzeug-Typ
Vehicle type
Type de véhicule
Fordonstyp
Tipo di veicolo

Baujahr
Year of
manufacture
Année de
fabrication
Tillverkningsår
Anno di
costruzione

Eingebauter Zündverteiler
Ignition distributor installed
Allumeur monté
Monterad fördelare
Spinterogeno montato

Bosch-Nr.
Bosch Part No.
Référence Bosch
Bosch-beställningsnr.
Nr. d'ordinazione
Bosch

Fahrzeug-
hersteller-Nr.
Vehicle manufacturer
Part No.
Référence fabricant
du véhicule *
Fordonstillverkarens
reservdelsnummer
Nr. d'ordinazione
costruttore del
veicolo

TSZ-h-
Bestell-Nr.
TCI-h Part No.
Référence
TSZ-h
TSZ-h
beställningsnr.
Nr. d'ordinazione
TSZ-h

ALFA-ROMEO

Alfasud, Alfasud Ti

10.74-

0 231 168 014

530 163

0 227 100 906

AUDI

60, 75

1,3 ltr. 55 PS

11.71-09.72

0 231 170 016

059 905 205 G

0 227 100 901

80

1,5 ltr. 75/85 PS

07.72-

0 231 170 021

056 905 205

0 227 100 901

80

1,6 ltr. 75/85 PS

07.72-07.75

0 231 170 022

056 905 205 A

0 227 100 901

80

08.75-

0 231 176 070

049 905 205 D

0 227 100 901

80 GT

10.73-07.75

0 231 170 139

049 905 205

0 227 100 901

80 GTE

09.75-

0 231 181 018

049 905 205 E

0 227 100 906

100

1,6 ltr. 85 PS

01.75-07.75

0 231 170 139

049 905 205

0 227 100 901

100

1,8 ltr. 85 PS

08.75-

0 231 176 070

049 905 205 D

0 227 100 901

100

1,8 ltr. 100 PS

12.71-07.74

0 231 170 016

059 905 205 G

0 227 100 901

100

12.71-08.74

0 231 170 017

059 905 205 F

0 227 100 901

100

09.74-07.76

0 231 170 016

059 905 205 G

0 227 100 901

100

1,9 ltr. 112 PS

11.71-07.76

0 231 176 013

059 905 205 H

0 227 100 901

100 Coupé S

11.71-07.76

0 231 176 013

059 905 205 H

0 227 100 901

USA-Ausführungen¹⁾

Fox Kalfornien²⁾

1,5 ltr.

12.73-08.74

0 231 176 046

056 905 205 C

0 227 100 901

Fox

1,6 ltr. K-Jetronic *SPC*

09.74-

0 231 176 037 ✓

049 905 205 A

0 227 100 901

90 Super

09.71-12.71

0 231 176 014

058 905 205 A

0 227 100 901

100

01.74-07.74

0 231 176 032

058 905 205 A

0 227 100 901

100

K-Jetronic

10.75-

0 231 176 032

058 905 205 C

0 227 100 901

100 Automatik

K-Jetronic *100C*

08.74-

0 231 176 032 ✓

058 905 205 A

0 227 100 901

AUSTIN-MINI

Clubman

01.70-09.76

0 231 176 084

-

0 227 100 904

Estate

01.71-02.76

0 231 176 084

-

0 227 100 904

Mini 850

01.70-02.76

0 231 176 084

-

0 227 100 904

Mini 1000

01.71-02.76

0 231 176 084

-

0 227 100 904

BMW

316

08.70-

0 231 180 004

12 11 1 360 692

0 227 100 906

318

08.75-09.76

0 231 180 004

12 11 1 360 692

0 227 100 906

10.75-

0 231 180 004

12 11 1 360 693

0 227 100 906

08.75-

0 231 180 004

12 11 1 360 693

0 227 100 906

320

07.74-07.75

0 231 180 004

12 11 1 355 270

0 227 100 907

519 (Superbenzin)

07.74-09.75

0 231 180 004

12 11 1 357 899

0 227 100 902

520

Kugelfischer-Einspritz⁴⁾

07.73-09.75

0 231 180 004

12 11 1 357 169

0 227 100 908

520

09.71-07.76

0 231 180 004

12 11 1 355 270

0 227 100 907

1600, 1602, Touring

09.71-07.76

0 231 180 004

12 11 1 355 270

0 227 100 907

1800, 1802, Touring

09.71-07.76

0 231 180 004

12 11 1 355 270

0 227 100 907

Fahrzeug-Typ
Vehicle type
Type de véhicule
Fordonstyp
Tipo di veicolo

Baujahr Year of manufacture Année de fabrication Tillverkningsår Anno di costruzione	Eingebauter Zündverteiler Ignition distributor installed Allumeur monté Monterad fördelare Spinterogeno montato	TSZ-h- Bestell-Nr. TCI-h Part No. Référence TSZ-h TSZ-h beställningsnr. Nr. d'ordinazione TSZ-h			
		Bosch-Nr. Bosch Part No. Référence Bosch Bosch-beställningsnr. Nr. d'ordinazione Bosch	Fahrzeug- hersteller-Nr. Vehicle manufacturer Part No. Référence fabricant du véhicule Fordonstillverkarens reservdelsnummer Nr. d'ordinazione costruttore del veicolo		
FORD (USA)					
Pinto	OHC 2,0 ltr. HC	10.72-04.73 05.73-08.74	0 231 170 018/118 0 231 170 099/100	73 HF 12 100 AA 74 HF 12 100 EA	0 227 100 901 0 227 100 901
Pinto Automatik	OHC 2,0 ltr. HC	10.72-04.73 05.73-08.74	0 231 170 019/119 0 231 170 107/108	73 HF 12 100 GA 74 HF 12 100 LA	0 227 100 901 0 227 100 901
HANOMAG-HENSCHEL					
F 20, F 25	Mot. Austin A 70	03.73-02.74	0 231 170 080	603 150 00 13	0 227 100 904
F 30, F 35	Mot. Austin A 70	03.73-02.74	0 231 170 080	603 150 00 13	0 227 100 904
MERCEDES-BENZ					
200	Mot. M 115	12.72-03.74 04.74-	0 231 170 081 0 231 170 138	- 002 158 02 01	0 227 100 901 0 227 100 901
220	Mot. M 115 Mot. M 115 Abgasentgiftg.	12.72-07.73 12.72-07.73	0 231 170 081 0 231 176 016	- 001 158 82 01	0 227 100 901 0 227 100 901
230	Mot. M 115 KV 23	02.76-	0 231 170 138	002 158 02 01	0 227 100 901
230.4	Mot. M 115	08.73-	0 231 170 137	001 158 98 01	0 227 100 901
	Mot. M 115 KV 23	08.73-	0 231 170 138	002 158 02 01	0 227 100 901
230.4 Schweden ⁵⁾	Mot. M 115 KV 23	08.75-	0 231 170 190	002 158 22 01	0 227 100 901
L 207, L 307	Motor Austin A 70	03.73-	0 231 170 080	603 150 00 13	0 227 100 904
L 408 G, LF 408 G	75/80 PS	11.72-03.74 04.74-12.74	0 231 170 081 0 231 170 138	- 002 158 02 01	0 227 100 901 0 227 100 901
L 409, LK 409	90 PS	01.75-	0 231 170 116	002 158 06 01	0 227 100 901
O 309 B	75/85 PS	11.72-03.74 04.74-12.74	0 231 170 081 0 231 170 138	- 002 158 02 01	0 227 100 901 0 227 100 901
O 309 B	90 PS	01.75-	0 231 170 116	002 158 06 01	0 227 100 901
NSU					
1000, 1000 C		01.72-01.73	0 231 170 001		0 227 100 901
1200, 1200 C		01.72-01.73	0 231 170 001		0 227 100 901
OPEL					
Ascona-A 1,2	1,2 ltr. 60 PS	01.73-12.74 04.72-12.74	0 231 170 012 0 231 170 204	12 11 027 12 11 062	0 227 100 903 0 227 100 903
Ascona-A 1,6	1,6 ltr. 68 PS	09.72-12.74 09.70-12.74	0 231 170 011 0 231 170 205	12 11 019 12 11 063	0 227 100 901 0 227 100 901
	1,6 ltr. 80 PS	01.75-08.75 01.72-12.74	0 231 170 153 0 231 170 008	12 11 040 12 11 020	0 227 100 901 0 227 100 901
		09.70-12.74	0 231 170 205	12 11 063	0 227 100 901
		01.75-08.75	0 231 170 147	12 11 042	0 227 100 901
Ascona-A 1,9	1,9 ltr. 90 PS	01.72-12.74 09.70-12.74	0 231 170 008 0 231 170 005	12 11 020 12 11 063	0 227 100 901 0 227 100 901
		01.75-08.75	0 231 170 147	12 11 042	0 227 100 901
		06.72-08.75	0 231 176 012	12 11 028	0 227 100 901
Ascona-A 1,9 USA	1,9 ltr.-S	09.75-	0 231 170 159	12 11 046	0 227 100 903
Ascona-B 1,2	1,2 ltr. 60 PS	09.75-	0 231 170 159	12 11 040	0 227 100 901
Ascona-B 1,6	1,6 ltr. 60 PS	09.75-	0 231 170 147	12 11 042	0 227 100 901
	1,6 ltr. 75 PS	09.75-	0 231 170 138	12 11 053	0 227 100 901
Ascona-B 1,9	1,9 ltr.-S	09.75-	0 231 170 014	12 11 021	0 227 100 901
Blitz 1,9	1,9 ltr.-T	05.72-01.75	0 231 170 008	12 11 020	0 227 100 901
GT	1,9 ltr. 90 PS	11.71-08.73 06.70-08.73	0 231 170 008 0 231 170 201	12 11 063 12 11 063	0 227 100 901 0 227 100 901
Kadett-B 100	1,1 ltr. 50 PS	01.73-08.73 08.71-08.73	0 231 170 012 0 231 170 204	12 11 027 12 11 062	0 227 100 903 0 227 100 903

Fahrzeug-Typ Vehicle type Type de véhicule Fordonstyp Tipo di veicolo	Baujahr Year of manufacture Année de fabrication Tijlverkningsår Anno di costruzione	Eingebauter Zündverteiler Ignition distributor installed Allumeur monté Monterad fördelare Spinterogeno montato		TSZ-h Bestell-Nr. TCI-h Part No. Référence TSZ-h TSZ-h beställningsnr. Nr. d'ordinazione TSZ-h	
		Bosch-Nr. Bosch Part No. Référence Bosch Bosch-beställningsnr. Nr. d'ordinazione Bosch	Fahrzeug-hersteller-Nr. Vehicle manufacturer Part No. Référence fabricant du véhicule Fordonstillverkarens reservdelsnummer Nr. d'ordinazione costruttore del veicolo		
OPEL					
Kadett-B 1200	1,2 ltr. 60 PS	01.73-08.73	0 231 170 012	12 11 027	0 227 100 903
		08.71-08.73	0 231 170 204	12 11 062	0 227 100 903
Kadett-B 1700	1,7 ltr. 75 PS	06.70-07.71	0 231 170 205	12 11 063	0 227 100 901
Kadett-B Rallye	1,9 ltr. 90 PS	06.70-07.71	0 231 170 205	12 11 063	0 227 100 901
Kadett-B Rallye USA	1,9 ltr.-S	06.72-08.73	0 231 176 012	12 11 028	0 227 100 901
Kadett-C 1000	1,0 ltr. 40 PS	01.75-	0 231 170 159	12 11 046	0 227 100 903
	1,0 ltr. 48 PS	01.75-08.75	0 231 170 160	12 11 049	0 227 100 903
Kadett-C 1200	1,2 ltr. 52 PS	08.73-12.74	0 231 170 012	12 11 027	0 227 100 903
		08.73-12.74	0 231 170 204	12 11 062	0 227 100 903
		01.75-	0 231 170 160	12 11 049	0 227 100 903
	1,2 ltr. 60 PS	08.73-12.74	0 231 170 012	12 11 027	0 227 100 903
		08.73-12.74	0 231 170 204	12 11 062	0 227 100 903
		01.75-	0 231 170 159	12 11 046	0 227 100 903
Kadett-C GT/E	1,9 ltr.	09.75-	0 231 170 154	12 11 047	0 227 100 901
Manta-A 1,2	1,2 ltr. 60 PS	01.73-12.74	0 231 170 012	12 11 027	0 227 100 903
		04.72-12.74	0 231 170 204	12 11 062	0 227 100 903
Manta-A 1,6	1,6 ltr. 68 PS	09.72-12.74	0 231 170 011	12 11 019	0 227 100 901
		09.70-12.74	0 231 170 205	12 11 063	0 227 100 901
		01.75-08.75	0 231 170 153	12 11 040	0 227 100 901
	1,6 ltr. 80 PS	01.72-12.74	0 231 170 008	12 11 020	0 227 100 901
		09.70-12.74	0 231 170 205	12 11 063	0 227 100 901
		01.75-08.75	0 231 170 147	12 11 042	0 227 100 901
Manta-A 1,9	1,9 ltr. 90 PS	01.72-12.74	0 231 170 008	12 11 020	0 227 100 901
		09.70-12.74	0 231 170 205	12 11 063	0 227 100 901
		01.75-08.75	0 231 170 147	12 11 042	0 227 100 901
		01.75-	0 231 170 154	12 11 047	0 227 100 901
Manta-A GT/E	1,9 ltr.	06.72-08.75	0 231 176 012	12 11 028	0 227 100 901
Manta-A USA	1,9 ltr.-S	09.75-	0 231 170 159	12 11 046	0 227 100 903
Manta-B 1,2	1,2 ltr. 60 PS	09.75-	0 231 170 153	12 11 040	0 227 100 901
Manta-B 1,6	1,6 ltr. 60 PS	09.75-	0 231 170 147	12 11 042	0 227 100 901
	1,6 ltr. 75 PS	09.75-	0 231 170 188	12 11 053	0 227 100 901
Manta-B 1,9	1,9 ltr.-S	01.75-	0 231 170 154	12 11 047	0 227 100 901
Manta-B GT/E	1,9 ltr.	06.70-10.70	0 231 170 205	12 11 063	0 227 100 901
Olympia-A	1,7 ltr. 75 PS	06.70-10.70	0 231 170 205	12 11 063	0 227 100 901
	1,9 ltr. 90 PS	05.70-12.71	0 231 170 205	12 11 063	0 227 100 901
Rekord-C 1500	1,5 ltr. 58 PS	05.70-12.71	0 231 170 205	12 11 063	0 227 100 901
Rekord-C 1700	1,7 ltr. 75 PS	05.70-12.71	0 231 170 205	12 11 063	0 227 100 901
Rekord-C 1900	1,9 ltr. 90 PS	03.75-	0 231 170 153	12 11 040	0 227 100 901
Rekord-D 1700	1,7 ltr. 60 PS	09.72-12.74	0 231 170 011	12 11 019	0 227 100 901
	1,7 ltr. 66 PS	01.75-02.75	0 231 170 153	12 11 040	0 227 100 901
		01.72-04.72	0 231 170 205	12 11 063	0 227 100 901
	1,7 ltr. 83 PS	05.72-02.75	0 231 170 033	12 11 029	0 227 100 901
		03.75-	0 231 170 153	12 11 040	0 227 100 901
Rekord-D 1900	1,9 ltr. 75 PS	03.75-	0 231 170 146	12 11 043	0 227 100 901
	1,9 ltr.-SH 90 PS	01.75-02.75	0 231 170 146	12 11 043	0 227 100 901
	1,9 ltr.-SH 97 PS	09.75-	0 231 170 188	12 11 053	0 227 100 901
Rekord-D 2000	2,0 ltr.-S				
PORSCHE					
912 E USA		09.75-	0 231 170 000	-	0 227 100 901
924		01.76-	0 231 170 000	-	0 227 100 901

Fahrzeug-Typ Vehicle type Type de véhicule Fordonstyp Tipo di veicolo	Baujahr Year of manufacture Année de fabrication Tillverkningsår Anno di costruzione	Eingebauter Zündverteiler Ignition distributor installed Allumeur monté Monterad fördelare Spinterogeno montato		TSZ-h- Bestell-Nr. TCI-h Part No. Référence TSZ-h TSZ-h beställningsnr. Nr. d'ordinazione TSZ-h	
		Bosch-Nr. Bosch Part No. Référence Bosch Bosch-beställningsnr. Nr. d'ordinazione Bosch	Fahrzeug- hersteller-Nr. Vehicle manufacturer Part No. Référence fabricant du véhicule Fordonstillverkarens reservdelsnummer Nr. d'ordinazione costruttore del veicolo		
BMW					
2000	05.71-04.73	0 231 180 005	12 11 1 355 271	0 227 100 907	
2002	05.71-07.75	0 231 180 005	12 11 1 355 271	0 227 100 907	
2002 Automatik	08.73-07.75	0 231 180 008	12 11 1 354 611	0 227 100 902	
2002 Tii	07.73-07.75	0 231 151 009	12 11 1 357 169	0 227 100 908	
2002 Touring	05.73-07.75	0 231 180 005	12 11 1 355 271	0 227 100 907	
2002 Turbo	01.74-07.75	0 231 180 014	12 11 1 356 336	0 227 100 902	
USA-Ausführungen ¹⁾					
2000 Touring	09.71-04.73	0 231 180 003	12 11 1 355 272	0 227 100 907	
2000 Tii Touring	08.73-07.75	0 231 180 013	12 11 1 357 771	0 227 100 902	
2002	09.71-05.72	0 231 180 003	12 11 1 355 272	0 227 100 907	
	06.72-10.74	0 231 180 008	12 11 1 354 611	0 227 100 902	
FORD					
Capri	OHC 1,6 ltr. HC	09.73-01.74	0 231 170 113/114	73 HF 12 100 LA	0 227 100 901
Capri GT	OHC 1,6 ltr. HC/GT	09.72-02.73	0 231 170 105	72 HF 12 100 NA	0 227 100 901
		03.73-01.74	0 231 170 091/092	73 HF 12 100 JA	0 227 100 901
Capri II 1,6	OHC 1,6 ltr. HC	02.74-08.75	0 231 170 113/114	73 HF 12 100 LA	0 227 100 901
		09.75-	0 231 170 174/175	76 HF 12 100 HA	0 227 100 901
Capri II 1,6	OHC 1,6 ltr. LC	06.74-08.75	0 231 170 149/150	74 HF 12 100 NA	0 227 100 901
		09.75-	0 231 170 176/177	76 HF 12 100 FA	0 227 100 901
Capri II 1,6 Schweden ⁵⁾	OHC 1,6 ltr. LC	09.75-	0 231 170 199/200	76 HF 12 100 JA	0 227 100 901
Capri II 1,6 GT	OHC 1,6 ltr. HC/GT	02.74-	0 231 170 091/092	73 HF 12 100 JA	0 227 100 901
Consul 1700	1,7 ltr. HC-V4	03.72-02.75	0 231 170 029/129	72 TF 12 100 ALA	0 227 100 903
	1,7 ltr. LC-V4	10.74-02.75	0 231 170 028/128	72 TF 12 100 AKA	0 227 100 903
Consul 2000	OHC 2,0 ltr. HC	03.72-02.73	0 231 170 105	72 HF 12 100 NA	0 227 100 901
		03.73-02.75	0 231 170 091/092	73 HF 12 100 JA	0 227 100 901
Consul 2000 Schweiz ⁶⁾	OHC 2,0 ltr. HC	03.72-01.73	0 231 170 030/130	72 HF 12 100 ACA	0 227 100 901
		02.73-02.75	0 231 170 089/090	73 HF 12 100 KA	0 227 100 901
Escort RS 2000	OHC 2,0 ltr. HC	07.73-12.74	0 231 170 091/092	73 HF 12 100 JA	0 227 100 901
Escort RS 2000 Schweiz ⁶⁾	OHC 2,0 ltr. HC	07.73-12.74	0 231 170 089/090	73 HF 12 100 KA	0 227 100 901
Granada 1700	1,7 ltr. HC-V4	03.75-06.75	0 231 170 029/129	72 TF 12 100 ALA	0 227 100 903
		07.75-	0 231 170 178/179	76 ET 12 100 GA	0 227 100 903
	1,7 ltr. LC-V4	03.75-08.75	0 231 170 028/128	72 TF 12 100 AKA	0 227 100 903
		09.75-	0 231 170 180/181	76 ET 12 100 HA	0 227 100 903
Granada 2000	OHC 2,0 ltr. HC	03.73-08.75	0 231 170 091/092	73 HF 12 100 JA	0 227 100 901
Granada 2000 Schweiz ⁶⁾	OHC 2,0 ltr. HC	03.73-08.75	0 231 170 089/090	73 HF 12 100 KA	0 227 100 901
Taurus 1300	OHC 1,3 ltr. HC	06.71-05.75	0 231 170 003/103	72 HF 12 100 TA	0 227 100 901
		06.75-08.75	0 231 170 169/170	76 HF 12 100 AA	0 227 100 901
		06.71-	0 231 170 002/102	72 HF 12 100 LB	0 227 100 901
Taurus 1600	OHC 1,3 ltr. LC OHC 1,6 ltr. HC	09.73-08.75	0 231 170 113/114	73 HF 12 100 LA	0 227 100 901
		09.75-	0 231 170 174/175	76 HF 12 100 HA	0 227 100 901
		06.71-02.73	0 231 170 105	72 HF 12 100 NA	0 227 100 901
	OHC 1,6 ltr. HC/GT OHC 1,6 ltr. LC	10.74-08.75	0 231 170 149/150	74 HF 12 100 NA	0 227 100 901
		09.75-	0 231 170 176/177	76 HF 12 100 FA	0 227 100 901
Taurus 1600 Schweden ⁵⁾	OHC 1,6 ltr. LC	09.75-	0 231 170 199/200	76 HF 12 100 JA	0 227 100 901
Taurus 2000	OHC 2,0 ltr. HC 4 Zyl.	01.76-	0 231 170 111/172	76 HF 12 100 CA	0 227 100 901
USA-Ausführungen ¹⁾					
Capri 2000	OHC 2,0 ltr. HC	10.72-04.73	0 231 176 004/104	73 HF 12 100 CA	0 227 100 901
		05.73-04.74	0 231 176 037/038	74 HF 12 100 JA	0 227 100 901
Capri 2000 Automatic	OHC 2,0 ltr. HC	10.72-04.73	0 231 176 005/105	73 HF 12 100 DA	0 227 100 901
		05.73-04.74	0 231 176 035/036	74 HF 12 100 CA	0 227 100 901

Fahrzeug-Typ Vehicle type Type de véhicule Fordonstyp Tipo di veicolo	Baujahr Year of manufacture Année de fabrication Tillverkningsår Anno di costruzione	Eingebauter Zündverteiler Ignition distributor installed Allumeur monté Monterad fördelare Spinterogeno montato		TSZ-h- Bestell-Nr. TCI-h Part No. Référence TSZ-h TSZ-h beställningsnr. Nr. d'ordinazione TSZ-h	
		Bosch-Nr. Bosch Part No. Référence Bosch Bosch-beställningsnr. Nr. d'ordinazione Bosch	Fahrzeug-hersteller-Nr. Vehicle manufacturer Part No. Référence fabricant du véhicule Fordonstillverkarens reservdelsnummer Nr. d'ordinazione costruttore del veicolo		
SAAB					
Sonett III	Ford-Mot. 1,5 ltr. HC-V 4	05.72-12.74	0 231 170 031/131	72 TF 12 100 AVA	0 227 100 903
95, 96	Ford-Mot. 1,5 ltr. HC-V 4	03.72-08.75	0 231 170 031/131	72 TF 12 100 AVA	0 227 100 903
		09.75-	0 231 170 182/183	76 TF 12 100 CA	0 227 100 903
95, 96 USA	Ford-Mot. 1,7 ltr. LC-V 4	07.72-12.73	0 231 178 010/110	886 120	0 227 100 903
99 L		06.72-05.74	0 231 170 115	835 60 32	0 227 100 909
99 Combi Coupé		08.73-05.74	0 231 170 115	835 60 32	0 227 100 909
		06.74-10.74	0 231 170 144	-	0 227 100 909
		11.74-04.76	0 231 170 145	835 85 33	0 227 100 909
		05.76-	0 231 170 197	836 231	0 227 100 909
99 EMS		05.73-07.74	0 231 179 001	835 487	0 227 100 909
		08.74-12.74	0 231 170 122	-	0 227 100 909
		01.75-04.76	0 231 170 158	835 8731	0 227 100 909
		05.76-	0 231 170 197	836 231	0 227 100 909
99 GL		01.76-04.76	0 231 170 145	835 8533	0 227 100 909
		05.76-	0 231 170 197	836 231	0 227 100 909
99 GL, EMS USA		01.76-04.76	0 231 170 145	835 8533	0 227 100 909
		05.76-	0 231 170 197	836 231	0 227 100 909
VOLVO					
142, 144, 145	Mot. B 20 A	05.74-07.74	0 231 170 085	462 657	0 227 100 904
	Mot. B 20 E	08.73-07.74	0 231 170 087	462 551	0 227 100 904
242, 244, 245	Mot. B 20 A	08.74-	0 231 170 085	462 657	0 227 100 904
	Mot. B 21 A	08.74-02.75	0 231 170 134	463 692	0 227 100 903
		03.75-07.75	0 231 170 173	12 19 625	0 227 100 903
		08.75-	0 231 170 185	12 19 661	0 227 100 903
VW-PORSCHE					
914 - 1.8	1,8 ltr.	09.73-08.74	0 231 168 009	022 905 205 T	0 227 100 905
914 - 1.8 USA	1,8 ltr.	11.73-07.74	0 231 181 009	022 905 205 AA	0 227 100 905
VOLKSWAGEN					
Golf	1,5 ltr. 70 PS	06.74-07.75	0 231 170 120	055 905 205 A	0 227 100 901
		11.74-07.75	0 231 170 155	055 905 205 D	0 227 100 901
	1,6 ltr. 75 PS	08.75-	0 231 176 070	049 905 205 D	0 227 100 901
Golf GTI		06.76-	0 231 181 018	049 905 205 E	0 227 100 906
K 70	75, 90, 100 PS	01.74-12.74	0 231 170 132	028 905 205 J	0 227 100 901
Käfer 1200	12 V 34 PS	08.74-07.75	0 231 170 034	043 905 205	0 227 100 910
		08.75-	0 231 170 187	043 905 205 K	0 227 100 910
Käfer 1200 - 1,6 ltr.	1,6 ltr. 50 PS	08.75-	0 231 170 186	043 905 205 K	0 227 100 910
Käfer 1200 Automatik		08.75-	0 231 170 036	043 905 205 A	0 227 100 910
Käfer 1200, 1300, 1302, 1303	1,3 ltr. 44 PS	06.73-07.75	0 231 170 034	043 905 205	0 227 100 910
Käfer 1200, 1300, 1302, 1303 Automatik	1,3 ltr. 44 PS	06.73-07.75	0 231 170 036	043 905 205 A	0 227 100 910
Käfer 1303 A	1,2 ltr. 34 PS	08.73-07.75	0 231 170 034	043 905 205	0 227 100 910
Käfer 1302 S, LS,					
Karmann Ghia 1600	1,6 ltr. 50 PS	06.73-01.74	0 231 170 034	043 905 205	0 227 100 910
Käfer 1302 S, LS,					
Karmann Ghia 1600 Autom.	1,6 ltr. 50 PS	06.73-01.74	0 231 170 036	043 905 205 A	0 227 100 910
Käfer 1303 S, LS	1,6 ltr. 50 PS	06.73-07.75	0 231 170 034	043 905 205	0 227 100 910
		08.75-	0 231 170 187	043 905 205 K	0 227 100 910
Käfer 1303 S, LS Automatik	1,6 ltr. 50 PS	10.73-07.74	0 231 170 036	043 905 205 A	0 227 100 910

BOSCH

Einbauhinweise

Installation Instructions
Instructions de montage
Monteringsanvisning
Istruzioni di montaggio

Appendix C

Kontaktlose Transistorzündanlage (TSZ-h)

Breakerless transistorized ignition system (TCI-h)

Equipement d'allumage par bobine,
transistorisé sans rupteur mécanique et sans
entretien (TSZ-h)

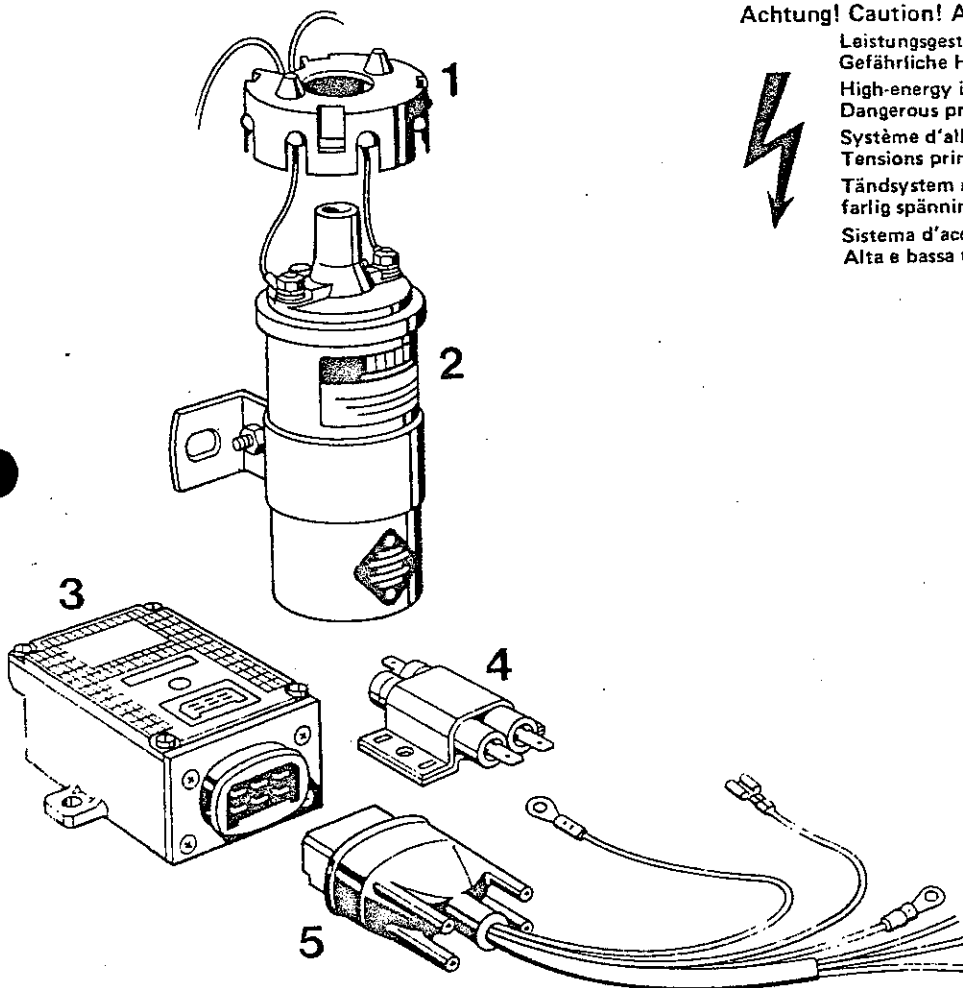
Beröringsfritt transistorändsystem (TSZ-h)

Accensione a batteria con transistori
senza rottore meccanico TSZ-h

Achtung! Caution! Attention! Varning! Attenzione!



Leistungsgesteigertes Zündsystem.
Gefährliche Hoch- und Niederspannung.
High-energy ignition system.
Dangerous primary and secondary voltages.
Système d'allumage haute puissance.
Tensions primaire et secondaire dangereuses.
Tändsystem med hög tändeffect –
farlig spänning i låg – och högspänningskrets!
Sistema d'accensione a potenza maggiorata.
Alta e bassa tensione. Pericolosa!



Bild

- 1 = Berührungsschutz
- 2 = Zündspule
- 3 = Schaltgerät
- 4 = Widerstand
- 5 = Mehrfachstecker

Fig. 1

- 1 = Electric-shock guard
- 2 = Ignition coil
- 3 = Trigger box
- 4 = Ballast resistor
- 5 = Multiple plug

Fig. 1

- 1 = Protection contre les contacts accidentels
- 2 = Bobine d'allumage
- 3 = Bloc électronique
- 4 = Résistance ballast
- 5 = Connecteur multiple

Bild 1

- 1 = Beröringsskydd
- 2 = Tändspole
- 3 = Brytare
- 4 = Forkopplingsmotstånd
- 5 = Flerpolig stickpropp

Fig. 1

- 1 = Protezione anticon tatto
- 2 = Bobina di accensione
- 3 = Centralina elettronica
- 4 = Resistore esterno
- 5 = Connettore multiplo

Diese Einbauhinweise sind unverbindlich. Wir empfehlen die Einbaumöglichkeiten nachzutesten.
These installation instructions are not binding. We recommend checking the fitting possibilities.
Ces instructions de montage ne sont données qu'à titre indicatif. Il est recommandé de tester les possibilités de montage.
Denna monteringsanvisning gäller utan förbindelse. Vi rekommenderar att möjliggöringarna först provas.
Queste istruzioni di montaggio sono solo a titolo indicativo, si raccomanda la verifica delle possibilità di montaggio.

Allgemein

Neue kontaktlose wartungsfreie Transistorzündanlage von Bosch.

bausatz für Fahrzeuge mit Zylinder-Motor und Bosch-Zündverteiler zum Teil schon ab Modelljahr 72.

Problemloser Einbau – modernste Technik.

Berührungsloser Geber mit Hall-IC

- kein Kontaktverschleiß,
- präziser Zündzeitpunkt über Jahre,
- geringerer Benzinverbrauch.

Bosch-Leistungstransistoren Silizium-Technik

Bosch-Eigenentwicklung speziell fürs Kraftfahrzeug. Hohe Zündleistung, niedriger Innenwiderstand

- bis 40% mehr Zündspannung über den gesamten Drehzahlbereich,
- besseres Startverhalten bei Hitze und Kälte, dadurch Schonung der Batterie,
- weniger umweltschädliche Abgase,
- sicheres Zünden auch bei verrußten Zündkerzen.

hervorragend geeignet für alle Fahrbedingungen ob Kurzstrecke, Stadtfahrt oder große Strecke.

Einbau

Batterie abklemmen.

Zündspule

Leitungen Kl. 1 (–) und 15 (+) lösen. Hochspannungsleitung Kl. 4 abziehen. Eingebaute Zündspule durch mitgelieferte Zündspule ersetzen.

Vorwiderstand

Einen eventuell vorhandenen Vorwiderstand ausbauen. Mitgelieferten Vorwiderstand urweit der Zündspule mit zwei Blechschrauben befestigen

Beachten: der Vorwiderstand kann auch als Widerstandskabel ausgelegt sein und muß stiftgelegt werden.

General

New, breakerless, maintenance-free, transistorized ignition system from Bosch.

For retrofitting in vehicles with 4-cylinder engines and a Bosch ignition system, in some cases for vehicles as far back as the 1972 model.

Problem-free installation – Most up-to-date technology

Hall-IC pulse generator without contacts

- No contact-point wear
- Ignition point remains exact for years
- Lower fuel consumption

Bosch power transistors – silicon technology

Bosch-developed especially for motor vehicles.

High ignition performance, low internal resistance

- up to 40% more ignition voltage over the entire rotational-speed range
- better starting in conditions of extreme heat or cold, thus less demand on battery
- less environmentally-harmful exhaust gases
- sure ignition even with sooted spark plugs.

Outstanding under all driving conditions, regardless whether short or long trips or city driving.

Installation

Disconnect battery

Ignition coil

Disconnect leads at terminals 1 (–) and 15 (+). Remove high-tension lead from terminal 4. Substitute the ignition coil provided for the ignition coil installed.

Ballast resistor

If a ballast resistor is already fitted remove it and replace it with the resistor supplied with the ignition system. Fit close to the ignition coil, and secure with two self-tapping screws.

Note: the ballast resistor can be present in resistance-cable form. It must be disconnected.

Généralités

Nouvel équipement d'allumage Bosch par bobine, transistorisé sans rupteur mécanique et sans entretien.

Jeu de pièces d'adaptation pour véhicules à moteur à 4 cylindres équipés d'un allumeur Bosch, en partie déjà sur les modèles sortis depuis 1972.

Montage sans problèmes – Technique des plus modernes.

Générateur sans contact avec circuit intégré à effet Hall

- pas d'usure des contacts
- point d'allumage précis pendant des années
- consommation d'essence réduite

Transistors de puissance Bosch, technologie silicium

Produit mis au point par Bosch spécialement pour l'automobile.

Puissance d'allumage élevée, résistance interne basse

- jusqu'à 40% de tension d'allumage en plus sur toute la gamme des vitesses de rotation
- meilleur comportement au démarrage par temps chaud et froid et donc ménagement de la batterie
- moins de gaz d'échappement nocifs à l'environnement
- allumage sûr, même quand les bougies sont recouvertes de suie.

convient parfaitement à toutes les conditions de circulation: courts trajets, circulation en ville ou longs trajets.

Montage

Débrancher la batterie

Bobine d'allumage

Débrancher les câbles des bornes 1 (–) et 15 (+). Retirer le câble haute tension de la borne 4. Remplacer la bobine d'allumage existante par celle qui est livrée avec l'équipement d'allumage.

Résistance ballast

Le cas échéant, déposer la résistance ballast existante. A l'aide de deux vis à tête, monter la résistance ballast, comprise dans la livraison, à proximité de la bobine d'allumage.

Attention!

Une résistance ballast peut déjà exister aussi sous la

Allmänt

Nytt beröringsfritt underhållsfritt transistorändsystem från Bosch.

Som kompletteringsutrustning för fordon med 4-cylinder-motorer och Bosch strömfördelare delvis redan fr. o. m. årsmodell 1972.

Problemlös montering – modernaste teknik.

Beröringsfri impulsgivare med Hall-IC

- inget kontaktslitage
- precis tändtidpunkt
- lågre bensinförbrukning

Bosch effektransistorer silicium-teknik

Bosch egen utveckling, speciellt för motorfordon.

Hög tändeffekt, låg inre resistans

- upp till 40% högre tändspänning över hela varvtalesområdet
- förbättrade startförhållanden vid värme och kyla, därmed skonas batteriet
- renare avgaser
- säker tändning, även om tändstiften sotar igen

utmärkt lämpat för alla trafiksituationer såväl korta sträckor, stadstrafik som långkörningar.

Montering

Koppla ifrån batteriet.

Tändspole

Lossa ledningarna vid uttagen 1 (–) och 15 (+). Avlägsna högspänningsledningen från uttaget 4. Ersätt den gamla tändspolen med den medlevererade tändspolen.

Förkopplingsmotstånd

Demontera eventuellt förekommande förkopplingsmotstånd. Fäst medlevererade förkopplingsmotståndet med två plåtskruvar i närheten av tändspolen.

Observera: förkopplingsmotståndet kan även förekomma i form av motståndskabel och måste i så fall kopplas bort.

Generalità

Nuovo impianto d'accensione a transistori senza rottore meccanico e senza manutenzione della Bosch.

Per il montaggio successivo su veicoli con motori a 4 cilindri ed accensione Bosch già a partire da alcuni modelli dell'anno 1972.

Montaggio senza problemi – Tecnica più moderna.

Captatore senza contatto con circuito integrato ad effetto Hall

- manca l'usura dei contatti del rottore
- punto d'accensione esatto per molti anni
- consumo di carburante più basso

Tecnica dei transistori di potenza al silicio Bosch

Una realizzazione propria della Bosch, speciale per autoveicoli.

Elevata potenza d'accensione, bassa resistenza interna

- tensione d'accensione fino al 40% più alta in tutto il campo di numero di giri
- migliore capacità di avviamento in caso di caldo e di freddo intenso. Di conseguenza risparmio della batteria
- meno gas di scarico dannosi per l'ambiente naturale
- accensione sicura anche con candele imbrattate

Perfettamente idoneo per tutte le condizioni di marcia sia su brevi percorsi che in città o su lunghi percorsi.

Montaggio

Scollegare la batteria.

Bobina di accensione

Scollegare i cavi ai morsetti 1 (–) e 15 (+). Togliere il cavo d'alta tensione al morsetto 4. Sostituire la bobina di accensione già montata con quella in dotazione

Resistore esterno

Smontare un eventuale resistore esterno, se c'è. Fissare il resistore esterno in dotazione con due viti da lamiera vicino alla bobina d'accensione

Attenzione: il resistore esterno può anche essere realizzato come resistenza sotto forma di cavo e deve venire escluso

Schaltgerät

In Nähe der Zündspule
Schaltgerät an ebener, kühler
Karosseriefäche, Anschlüsse
nach unten, mit 2 Blech-
schrauben befestigen.
Schaltgerät so befestigen,
daß zum Aufstecken des
Mehrfachsteckers genügend
Platz vorhanden ist.

Zündverteiler

Verteilerkappe (1) abheben,
Verteilerläufer (2) und Staub-
schutzdeckel (3) entfernen.
Unterbrecherkontakte (4) aus-
bauen.

Masseverbindung (Kupfer-
litze) von Unterbrecherplatte
zum Verteilergehäuse an
beiden Verbindungsstellen
abschneiden und entfernen
(siehe Bild 2).

Zündkondensator (5) ab-
schrauben und mit Anschluß-
leitungen entfernen.

Geberleitungen der Magnet-
schranke durch die Öffnung
im Zündverteiler nach außen
führen und Formstück (6) so
in die Öffnung drücken, daß
die drei dünnen Leitungen
im unteren Teil des Form-
stücks liegen.

Anschlußleitungen zur Mag-
netschranke nicht verdrehen.
Halteblech (7) in die Nut des
Formstücks einführen und
mit der kürzeren mitgeliefer-
ten Schraube festschrauben.
Magnetschranke (8) mit Fixie-
rung (14) auf Unterbrecher-
platte einrasten und mit der
längeren mitgelieferten
Schraube festschrauben.
Neuen Verteilerläufer (9) mit
Rotorblende (10) auf Vertei-
lerwelle stecken (einrasten).
Neuen Staubschutzdeckel (11)
auf Verteilergehäuse (12)
setzen (einrasten).
Verteilerkappe aufsetzen und
Haltefedern (13) einhaken.
Isolierschlauch mit 6 mm
Durchmesser über Geberlei-
tungen der Magnetschranke
schieben.

Trigger box

Fasten the trigger box in the
vicinity of the ignition coil on
a cool, flat, vehicle body
surface and with the termi-
nals facing downwards. Use
2 self-tapping screws.
When fitting the trigger box
make sure that there is
sufficient room to plug in the
multiple plug.

Ignition distributor

Lift off the distributor cap (1).
Remove the distributor rotor
(2) and dust-protection cover
(3).
Remove distributor contact
points (4).

Cut the ground connection
(copper stranded wire)
from the breaker-plate
assembly at both points of
connection and remove it
(see Fig. 2).

Unscrew ignition condenser
(5) and remove together with
connecting leads.

Feed the leads of the ignition
vane switch through the
opening in the distributor
from the inside and press the
shaped piece (6) into the
opening. The shaped piece
should be so positioned that
the three thin leads are in its
lower half.

Do not twist the leads to the
vane switch. Slip the metal
holder (7) into the groove in
the shaped piece and screw
in place with the short screw
supplied. Snap the ignition
vane switch (8) with locating
piece (14) into the breaker-
plate assembly and screw in
place with the long screw
provided.

Slip (snap in place) the new
distributor rotor (9) with
trigger wheel (10) onto the
ignition-distributor shaft.
Place the new dust-protec-
tion cover (11) over the distri-
butor housing (12) and snap
into place.
Fit the distributor cap and
secure with the spring clips
(13).
Slip the insulating tubing
(6 mm dia.) over the ignition
vane switch leads.

Bloc électronique

Fixer le bloc électronique sur
une surface plane de la car-
rosserie, à l'abri de la
chaleur, à l'aide de deux vis
à tête, à proximité de la
bobine d'allumage, les con-
nexions dirigées vers le bas.
Fixer le bloc électronique
de sorte à disposer de
suffisamment de place pour
enfiler le connecteur
multiple.

Allumeur

Oter la tête du distributeur
(1).
Retirer le rotor distributeur
(2) et le couvercle antipous-
sière (3).
Démonter les contacts du
rupteur (4).

Couper aux deux points de
jonction le câble de masse
(tresse de cuivre) raccordant
le plateau du rupteur au
boîtier de l'allumeur et le
retirer (voir fig. 2).

Dévisser le condensateur
d'allumage (5) et le retirer
ainsi que les câbles de rac-
cordement.

Conduire vers l'extérieur les
câbles de générateur de la
barrière magnétique en les
faisant passer à travers
l'ouverture de l'allumeur et
presser la pièce moulée (6)
dans l'ouverture de telle sorte
que les 3 câbles minces
reposent dans la partie in-
férieure de la pièce moulée.
Ne pas tordre les câbles de
connexion qui conduisent à
la barrière magnétique.

Introduire la tôle de fixation
(7) dans l'encoche de la
pièce moulée et la visser à
fond à l'aide de la vis courte
comprise dans la fourniture.
Enclencher la barrière mag-
nétique (8) avec sa fixation
(14) sur le plateau du rupteur
et la visser à fond en utili-
sant la vis longue comprise
dans la fourniture.

Placer le nouveau rotor distri-
buteur (9) et son tambour à
fentes (10) sur l'arbre de
l'allumeur (il y a une position
d'arrêt).

Placer un nouveau couvercle
antipoussière (11) sur le
boîtier de l'allumeur (il y
a une position d'arrêt).
Monter la tête du distributeur
et accrocher les ressorts de
fixation (13).

Glisser la gaine isolante de
6 mm de diamètre sur les
câbles de générateur de la
barrière magnétique

Brytare

Skruva fast brytaren med två
plåtskruvar på en plan och
sval karosseriyta inte långt
från tändspolen och med
anslutningarna riktade nedåt.
Fäst brytaren på sådant sätt
att tillräcklig plats finns för
anslutning av den flerpoliga
stickproppen.

Strömfördelare

Lyt bort fördelarlocket (1),
avlågsna fördelararmen (2)
och det dammtäta skydds-
locket (3).
Demontera avbrytarkontak-
terna (4).

Skär av godsförbindelsen
(kopparflätan) mellan för-
delarplattan och fördelar-
lådan vid båda anslutnings-
ställena och ta bort den
(se bild 2).

Skruva bort tändkonden-
satorn (5) tillsammans med
dess anslutningsledningar.

För ut ledningarna från mag-
netbommen genom öppningen
i fördelaren och pressa in
gummipackningen (6) i öpp-
ningen på så sätt, att de tre
tunna ledningarna vilar i
packningens undre del.
Tvinna inte anslutnings-
ledningarna till magnet-
bommen. Skjut in fästplåten
(7) i gummipackningens skåra
och skruva fast med den
kortare medlevererade
skruven.

Fixera magnetbommen (8)
med hållaren (14) på fördelar-
plattan och fäst den med
den längre medlevererade
skruven.

Trä den nya fördelararmen
(9) med rotorkåpan (10) över
fördelaraxeln till fixerings-
läget. Sätt på det nya damm-
skyddslocket (11) i fixerat
läge på fördelarlådan (12).
Sätt på fördelarlocket och
haka in spärrtjädrarna (13).
Trä på isoleringsslangen, dia-
meter 6 mm, över magnet-
bommens utgående ledningar.

Centralina elettronica

Fissare la centralina elettro-
nica su di una superficie
piana e relativamente fredda
della carrozzeria, vicino alla
bobina d'accensione con due
viti da lamiera con gli
attacchi verso il basso.
Fissare la centralina elettro-
nica in modo che ci sia
spazio sufficiente per inserire
il connettore multiplo.

Spinterogeno

Sollevare la calotta del distri-
butore (1),
togliere la spazzola rotante
(2) ed il coperchio parapol-
vere (3).

Smontare i contatti del
rutttore (4)
Tagliare e levare il collega-
mento a massa (cordoncino
di rame) che va dalla piastra
rutttore al carter dello
spinterogeno, nei due punti
di collegamento. (Vedere
figura 2).

Svitare il condensatore di
accensione (5) e levarlo
insieme ai cavi di collega-
mento.

Fare passare i cavi del
captatore magnetico attra-
verso l'apertura dello spin-
terogeno, farli uscire fuori e
premere il pezzo sagomato
(6) nell'apertura in modo che
i tre sottili conduttori si
trovino nella parte inferiore
del pezzo sagomato. Non
storcere i cavi di collega-
mento del captatore magne-
tico. Introdurre la
lamiera di fissaggio (7) nella
scanalatura del pezzo sago-
mato e bloccare con la vite
in dotazione più corta. Fare
ingranare il captatore magne-
tico (8) con il fissaggio (14)
sulla piastra rutttore e bloc-
care avvitando con la vite
in dotazione più lunga.
Innestare la nuova spazzola
rotante (9) con schermo del
rotore (10) sull'albero di
comando dello spinterogeno.
Innestare il nuovo coperchio
parapolvere (11) sul carter
dello spinterogeno (12).
Mettere la calotta del distri-
butore ed agganciare le molle
di fermo (13).
Spingere il tubo isolatore con
diametro di 6 mm sui con-
duttori del captatore magne-
tico.

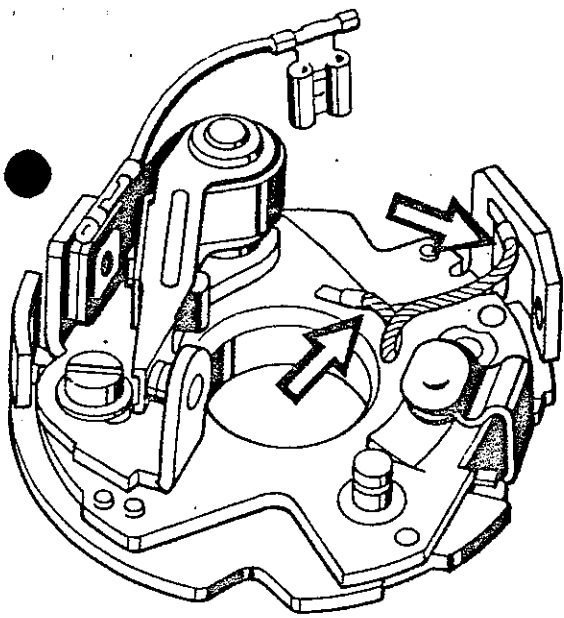


Fig. 2

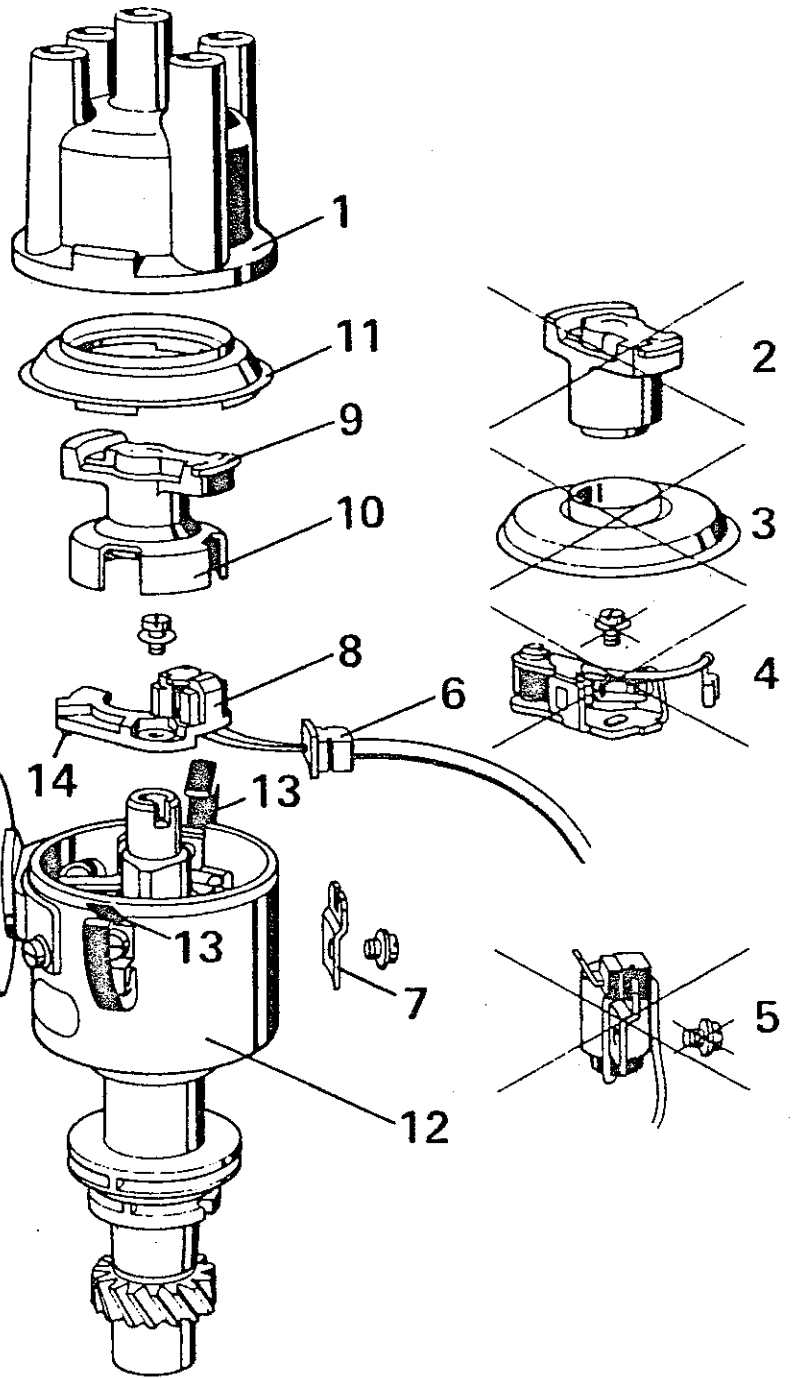


Bild 3

Fig. 3

Fig. 3

Bild 3

Fig 3

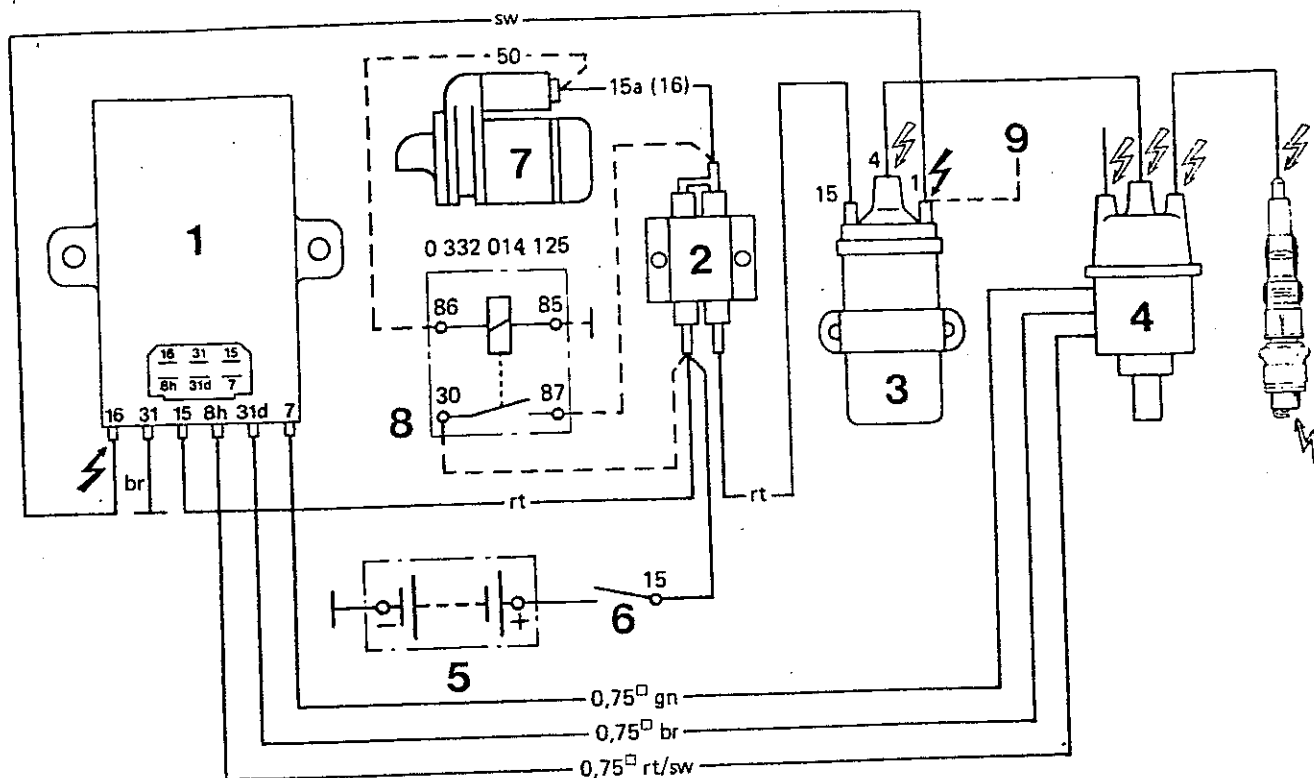
- 1 Verteilerrkappe
- 2 Verteilerläufer
- 3 Staubschutzdeckel
- 4 Unterbrecherkontakt
- 5 Zündkondensator
- 6 Formstück mit Geberleitungen
- 7 Halblech
- 8 Magnetschranke
- 9 Verteilerläufer
- 10 Rotorblende
- 11 Staubschutzdeckel
- 12 Verteilergehäuse
- 13 Haltefeder
- 14 Fixierung
- Teile entfallen

- 1 = Distributor cap
- 2 = Distributor rotor
- 3 = Dust-protection cover
- 4 = Contact point
- 5 = Ignition condensor
- 6 = Shaped piece with leads
- 7 = Sheet metal holder
- 8 = Ignition vane switch
- 9 = Distributor rotor
- 10 = Trigger wheel
- 11 = Dust-protection cover
- 12 = Distributor housing
- 13 = Spring clip
- 14 = Locating piece
- = Parts no longer required

- 1 = Tête de distributeur
- 2 = Rotor distributeur
- 3 = Couvercle antipoussière
- 4 = Contact du rupteur
- 5 = Condensateur d'allumage
- 6 = Pièce moulée avec câbles de générateur
- 7 = Tôle de fixation
- 8 = Barrière magnétique
- 9 = Rotor distributeur
- 10 = Tambour à fentes
- 11 = Couvercle antipoussière
- 12 = Boîtier de l'allumeur
- 13 = Ressort de fixation
- 14 = Fixation
- = Pièces supprimées

- 1 Fördelarlock
- 2 Fördelararm
- 3 Dammtätt skyddslock
- 4 Avbrytarkontakt
- 5 Tändkondensator
- 6 Gummipackning med utgående ledningar
- 7 Fastplåt
- 8 Magnetbom
- 9 Fördelararm
- 10 Rotorkåpa
- 11 Dammskyddstock
- 12 Fördelarlåda
- 13 Spärrfjädrer
- 14 Hållare
- Delarna bortfaller

- 1 Calotta del distributore
- 2 Spazzola rotante
- 3 Coperchio parapolvere
- 4 Contatti del rottore
- 5 Condensatore di accensione
- 6 Pezzo sagomato con conduttori del captatore
- 7 Lamiera di fissaggio
- 8 Captatore magnetico
- 9 Spazzola rotante
- 10 Schermo del rotore
- 11 Coperchio parapolvere
- 12 Carter dello spinterogeno
- 13 Molla di fermo
- 14 Fissaggio
- Mancano parti



Schaltbild

- 1 = Schaltgerät
- 2 = Vorwiderstand
- 3 = Zündspule
- 4 = Zündverteiler
- 5 = Batterie
- 6 = Zündschalter
- 7 = Starter
- 8 = Relais – wird nur angeschlossen wenn Starter keine Kl. 15 a (16) hat.
- 9 = zum Drehzahlmesser

Wiring Diagram

- 1 = Trigger box
- 2 = Series resistor
- 3 = Ignition coil
- 4 = Ignition distributor
- 5 = Batterie
- 6 = Ignition switch
- 7 = Starting motor
- 8 = Relay – to be connected only if starting motor has no terminal 15a (16).
- 9 = to Tachometer

Schéma de connexion

- 1 = Bloc électronique
- 2 = Résistance ballast
- 3 = Bobine d'allumage
- 4 = Allumeur
- 5 = Batterie
- 6 = Interrupteur d'allumage
- 7 = Démarreur
- 8 = Relais – n'est branché que si le démarreur ne possède pas de borne 15a (16).
- 9 = vers le compte-tours

Kopplingschema

- 1 = brytare
- 2 = förkopplingsmotstånd
- 3 = tändspole
- 4 = strömfördelare
- 5 = batteri
- 6 = tändningsströmbrytare
- 7 = startmotor
- 8 = relä – avsluts endast om startmotorn saknar uttag 15a (16).
- 9 = till takometer

Schema di collegamento

- 1 = Centralina elettronica
- 2 = Resistore esterno
- 3 = Bobina d'accensione
- 4 = Spinterogeno
- 5 = Batteria
- 6 = Interruttore d'accensione
- 7 = Motorino d'avviamento
- 8 = Relé – viene inserito solo quando il motorino di avviamento non ha il morsetto 15a (16).
- 9 = Al contagiri

⚡ ca. 400 V

⚡ approx 400 V

⚡ env. 400 V

⚡ cirka 400 V

⚡ circa 400 V

⚡ ca. 25 kV

⚡ approx 25 kV

⚡ env. 25 kV

⚡ cirka 25 kV

⚡ circa 25 kV

br = braun
gn = grün
rt = rot
sw = schwarz

br = brown
gn = green
rt = red
sw = black

br = brun
gn = vert
rt = rouge
sw = noir

br = brun
gn = grön
rt = röd
sw = svart

br = marrone
gn = verde
rt = rosso
sw = nero

Elektrischer Anschluß

Bei Fahrzeugen ohne Vorwiderstand oder bei denen ein Vorwiderstand ausgebaut wurde, kann die vorhandene Leitung als Stromzuführung (15) nach Schaltbild weiter verwendet werden. Wurde eine Widerstandsleitung (zur Zündspule Klemme 15) stillgelegt (siehe Abschnitt Einbau, Vorwiderstand) muß eine neue, nicht abgesicherte, durch den Zündschalter ge-

Electrical connection

In the case of vehicles fitted with an ignition coil without ballast resistor, or from which the ballast resistor was removed, the existing cable to terminal 15 of the ignition coil can still be used. If a resistance-cable (to ignition coil 15) was disconnected (see section dealing with Installation, Ballast resistor), a new non-fused cable must be fitted which is switched

Raccordement électrique

Sur les véhicules avec bobine sans résistance ballast, ou sur lesquels une résistance ballast a été démontée, on peut encore utiliser le câble existant en tant que câble d'alimentation (15, - (voir le schéma de branchement). Au cas où un câble à résistance (vers la borne 15 de la bobine) aurait été supprimé (voir au § «Montage» - Résistance ballast),

Elanslutning

vid fordon utan förkopplingsmotstånd eller vid vilka ett förkopplingsmotstånd har blivit demonterat kan den befintliga ledningen på nytt användas som strömtillförsel (15) enligt kopplings-schemat. Har en motståndskabel (till tändspolens uttag 15) blivit urkopplad (se avsnitt: Montering. Förkopplingsmotstånd) måste en ny, ej avsäkrad ledning installeras över tändningsströmbrytaren.

Collegamento elettrico

Nei veicoli senza resistore esterno o nei quali un resistore esterno è stato smontato, si può utilizzare il cavo conduttore (15) secondo lo schema. Se è stato escluso un resistore sotto forma di conduttore (alla bobina d'accensione, morsetto 15), (vedere il paragrafo riguardante montaggio e resistore esterno), si deve installare un nuovo conduttore non

Leitungen zu Kl. 1 (-) und 15 (+) der Zündspule mit Kabelschuh versehen und vor dem Anschließen durch den Berührungsschutz ziehen. Leitungen zum Mehrfachstecker durch Schutzfülle ziehen und Flachstecker anquetschen. Schaltgerät, Vorwiderstand und Zündspule nach Schaltbild anschließen.

Achtung! Bei Falschanschluß wird Magnetschranke bzw. Schaltgerät zerstört. Gute Masseverbindung von Klemme 31 Schaltgerät zur Fahrzeugmasse herstellen. Hochspannungsleitungen von Zündspule zum Zündverteiler und vom Zündverteiler zu den Zündkerzen nicht mit anderen Leitungen zusammenfassen. Berührungsschutz auf Zündspule aufsetzen.

Start-Spannungsanhebung

Während des Startens wird durch Klemme 15 a (16) des Starters ein Vorwiderstand (0,6 Ω) überbrückt. Hat der Starter keine Klemme 15 a (16), muß zusätzlich ein Relais (0 332 014 125) nach Schaltbild angeschlossen werden.

Batterie anschließen.

Zündzeitpunkt

Zündzeitpunkt nach Fahrzeug-Herstellervorschrift einstellen. Bei statischer Einstellung Prüflampe an Kl. 1 der Zündspule anschließen.

Entstörung

Besondere Entstörmaßnahmen sind nicht notwendig. Falls erforderlich kann an Klemme 15 der Zündspule ein Entstörkondensator von 2,2 µF (z. B. 0 290 800 074) angeschlossen werden.

Warn-Klebeschild

Klebeschild im Motorraum an gut sichtbarer, fett- und schmutzfreier Stelle anbringen.

leads to terminals 1 (-) and 15 (+) of the ignition coil and pull through the electric-shock guard before connecting. Pull the leads to the multiple plug through its protective cap and crimp on the blade terminals. Connect the trigger box, ballast resistor and ignition coil in accordance with the wiring diagram.

Caution! The ignition vane switch and/or the trigger box will be destroyed if the polarity is wrong. Ensure good connection from terminal 31 of the trigger box to vehicle ground. Do not bunch the high-tension leads from the ignition coil to the ignition distributor, and those from the ignition distributor to the spark plugs, together with other leads.

Fit the electric-shock guard on the ignition coil.

Voltage Increase for Starting

During starting the ballast resistor (0,6 Ω) is short-circuited via terminal 15 a (16) of the starting motor. If the starting motor is not provided with terminal 15 a (16), a relay (0 332 014 125) must be fitted in addition according to the wiring diagram.

Reconnect battery

Ignition point

Set the ignition point in accordance with the vehicle manufacturer's specifications. For static adjustment, test lamp to terminal 1 of the ignition coil.

Interference Suppression

Special interference-suppression measures are not required. If necessary a 2,2 µF suppression capacitor (e.g. 0 290 800 074) can be connected to terminal 15 of the ignition coil.

Sticker

Attach the sticker in the engine compartment at an easily visible, grease- and dirt-free location.

commutateur d'allumage. A cet effet, utiliser le câble rouge compris dans la fourniture. Munir de cosse les câbles arrivant aux bornes 1 (-) et 15 (+) de la bobine d'allumage et les faire passer à travers la protection contre les contacts accidentels, avant de les raccorder. Faire passer les fils conduisant au connecteur multiple à travers le passe-câble protecteur et serrer la fiche plate. Brancher le bloc électronique, la résistance ballast et la bobine d'allumage d'après le schéma de connexion.

Attention!

Toute erreur de branchement entraîne la destruction de la barrière magnétique et du bloc électronique. Réaliser une bonne liaison à la masse de la borne 31 du bloc électronique à la masse du véhicule.

Ne pas réunir les autres câbles avec les câbles haute tension reliant la bobine d'allumage à l'allumeur et l'allumeur aux bougies.

Placer la protection contre les contacts accidentels sur la bobine d'allumage.

Élévation de tension au démarrage

Pendant le démarrage, la résistance ballast de 0,6 Ω est court-circuitée par l'intermédiaire de la borne 15a (16) du démarreur.

Si le démarreur ne possède pas de borne 15a (16), il faut alors prévoir un relais supplémentaire (0 332 014 125), suivant le schéma de connexion.

Rebrancher la batterie.

Point d'allumage

Régler le point d'allumage en suivant les instructions du constructeur du véhicule. Lors du réglage statique, brancher la lampe de contrôle sur la borne 1 de la bobine d'allumage.

Antiparasitage

Il n'est pas nécessaire de prévoir des mesures d'antiparasitage particulières. On peut brancher éventuellement un condensateur d'antiparasitage de 2,2 µF (p. ex. 0 290 800 074) à la borne 15 de la bobine d'allumage.

Étiquette adhésive «Danger»

Coller l'étiquette adhésive à un endroit bien visible du compartiment moteur, à l'abri de la graisse et de la poussière.

Förse ledningarna till tändspolens uttag 1 (-) och 15 (+) med kabelskor och dra dem före anslutningen genom beröringsskyddet. Dra ledningarna till flerpoliga stickproppen genom skyddsbussningen och förse dem med flatstift. Anslut brytare, förkopplingsmotstånd och tändspole enligt kopplings-schemat.

Observera: Vid fel anslutning förstörs magnetbommen resp brytaren. Ordna en tillfredsställande godsförbindelse mellan brytarens uttag 31 och chassiet.

Sära på högspänningsledningarna från tändspolen till strömfördelaren och från strömfördelaren till tändstiften och andra ledningar.

Sätt på beröringsskyddet på tändspolen.

Tändspänningsökning vid start

Under starten blir ett förkopplingsmotstånd (0,6 Ω) överkopplat genom startmotorns uttag 15a (16). Saknar startmotor uttag 15a (16) måste dessutom ett manöverrelä (0 332 014 125) anslutas enligt kopplings-schemat.

Anslut batteriet.

Tändningsmoment

Ställ in tändningsmomentet enligt bilfyllverkarens föreskrifter. Vid statisk inställning ansluts provlampan till tändspolens uttag 1

Avstörning

Särskilda avstörningsåtgärder är inte nödvändiga. Om så fordras kan en avstörningskondensator på 2,2 µF (t. ex. 0 290 800 074) anslutas

Självhåttande varnings skylt

Sätt fast den självhåttande skylten inom motorrummet på väl synlig, fett- och smutsfri plats.

ritore d'accensione, usando il conduttore rosso fornito. Munire i cavi per i morsetti 1 (-) e 15 (+) della bobina di accensione di capo corda e tirarli attraverso la protezione anticontatto prima di collegarli. Introdurre i cavi per il connettore multiplo nel passacavo di protezione e schiacciare le spine platte. Collegare la centralina elettronica, il resistore esterno e la bobina d'accensione secondo lo schema.

Attenzione! In caso di connessione sbagliata dei poli, il capilatore magnetico o la centralina elettronica vengono distrutti. Creare un buon collegamento a massa dal morsetto 31 della centralina elettronica alla massa del veicolo.

Non unire con altri cavi i cavi ad alta tensione, che vanno dalla bobina d'accensione allo spinterogeno e dallo spinterogeno alle candele.

Mettere la protezione anticontatto sulla bobina d'accensione.

Tensione maggiorata all'avviamento.

Durante l'avviamento viene cortocircuitato un resistore esterno (0,6 Ohm) attraverso il morsetto 15a (16) del motorino d'avviamento. Se il motorino d'avviamento non ha il morsetto 15a, si deve inserire un relé supplementare (0 332 014 125) secondo lo schema.

Connettere la batteria.

Punto d'accensione

Mettere in fase l'accensione secondo le norme della ditta automobilistica costruttrice.

Durante la regolazione statica collegare la lampada di controllo al morsetto 1 della bobina d'accensione.

Eliminazione dei disturbi

Per l'eliminazione dei disturbi non sono necessarie misure particolari. Se necessario si può collegare al morsetto 15 della bobina d'accensione un condensatore antidisturbi da 2,2 µF (ad esempio 0 290 800 074).

Etichetta adesiva d'avvertimento

Fissare l'etichetta adesiva nel vano motore in un punto ben visibile, senza grasso e pulito

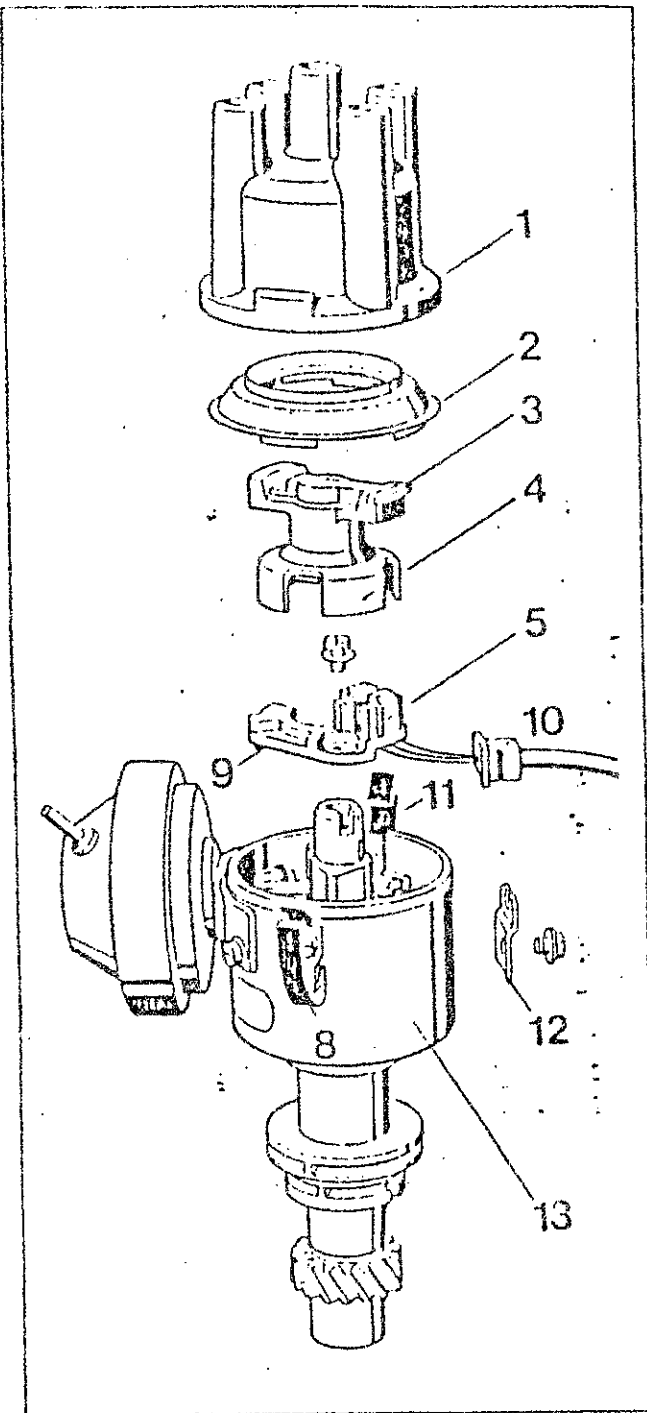


Figure 4 : Ignition distributor with
Hall generator

- 1 = Distributor cap
- 2 = Dust protection cover
- 3 = Distributor rotor with
- 4 = Trigger wheel) Hall
- 5 = Ignition vane switch) generator
- 9 = Holder locating piece
- 10 = Shaped piece
- 11 = Spring clip
- 12 = Holding plate
- 13 = Distributor housing

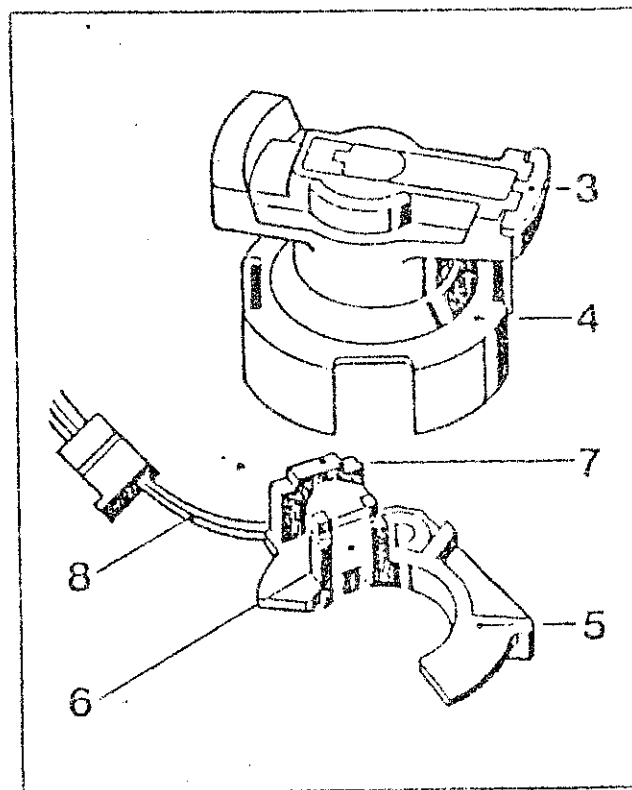
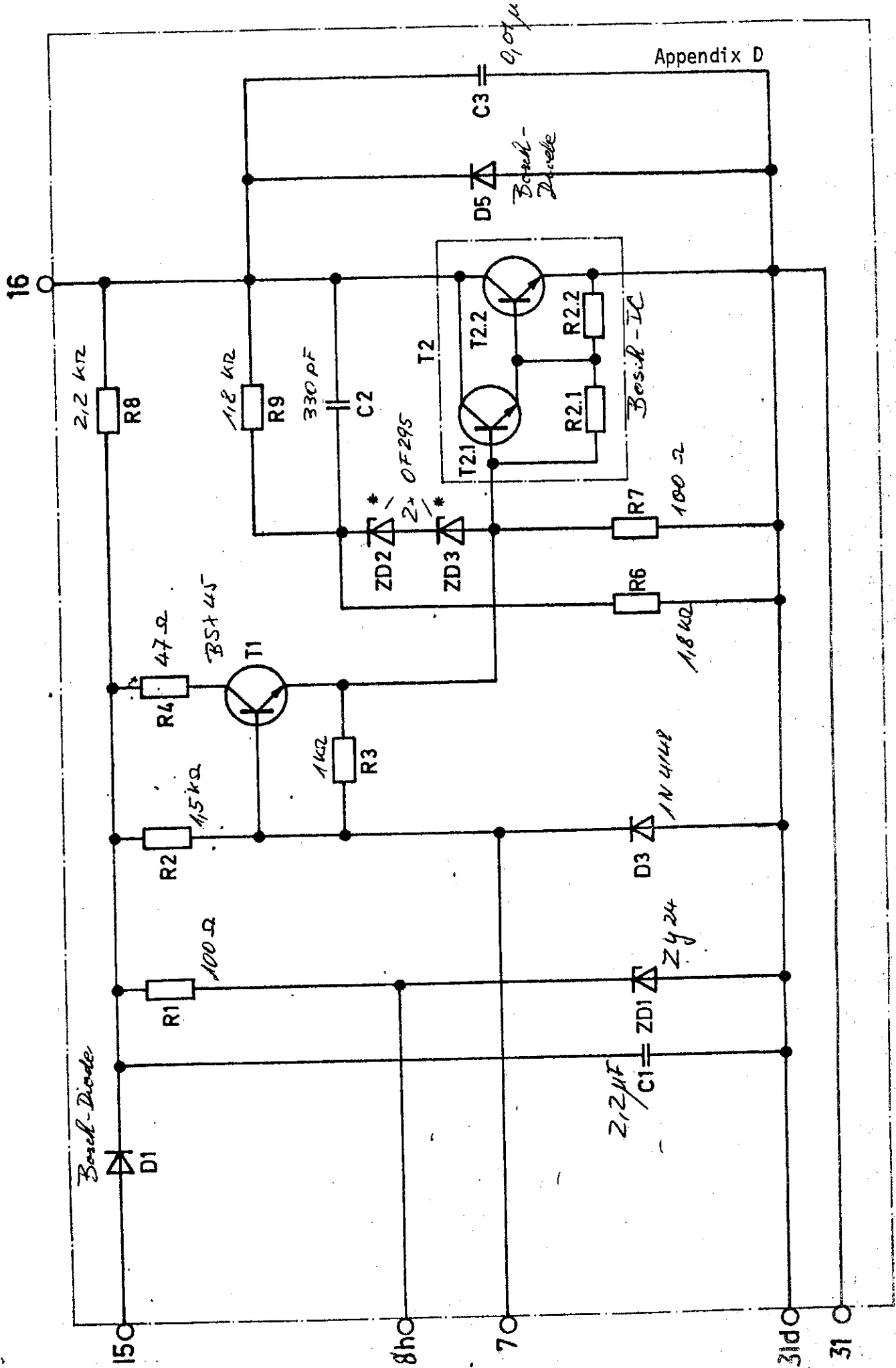


Figure 5 : Hall generator syst

- 3 = Distributor rotor with
- 4 = Trigger wheel
- 5 = Ignition vane switch
- 6 = Magnet
- 7 = Hall IC
- 8 = Pick-up leads



Appendix D