PORSCHE

924

924 turbo

Service Information

MODEL 81

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This brochure has 3 sections.

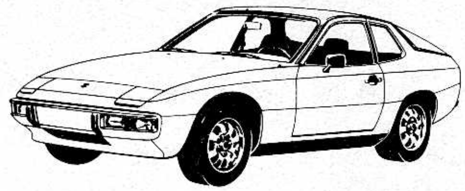
– 924, modifications for 1981 models

– 924 Turbo, modifications for 1981 models

– Specifications / Diagrams / Survey of Equipment /

Testing and Adjusting Values – 924 – All Types

PORSCHE
924



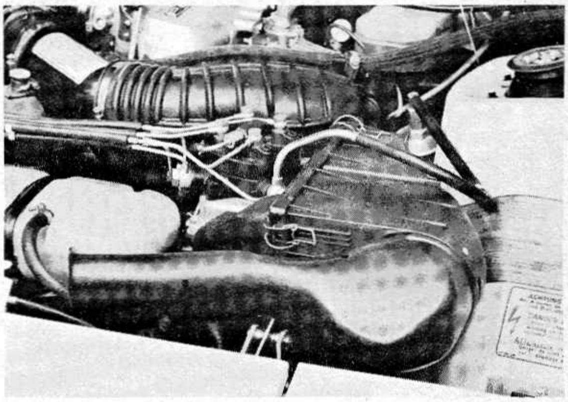
The following modifications have been made on the Porsche 924 for 1981.

- Ignition system with Hall sensor and electronic idle stabilizer
- New steering column switch
- Two-tone horn from 924 Turbo
- New symbols for controls
- Standard front stabilizer bar
- Brake fluid level indicator
- Carpet trim on center console

The various modifications will be described in the following text.

Air Cleaner

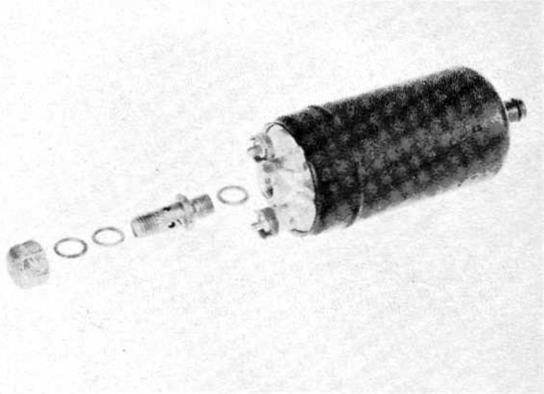
The air cleaner cover has a new intake neck to reduce the amount of air intake noise.



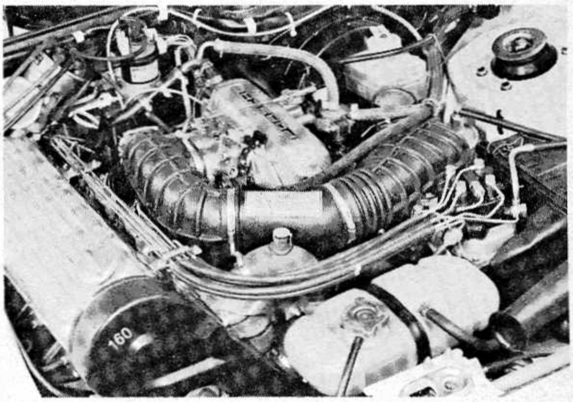
Fuel Pump (short neck version)
924, 924 Turbo

The EKP IV fuel pump is fitted with a removable check valve.
As of the 1981 model year the fuel pump is identical to the 911.

Fuel pump part no. 911.608.102.02
Bosch code 0580 254 967



Fuel injection lines are made of steel and have a straight connection on the fuel injectors.

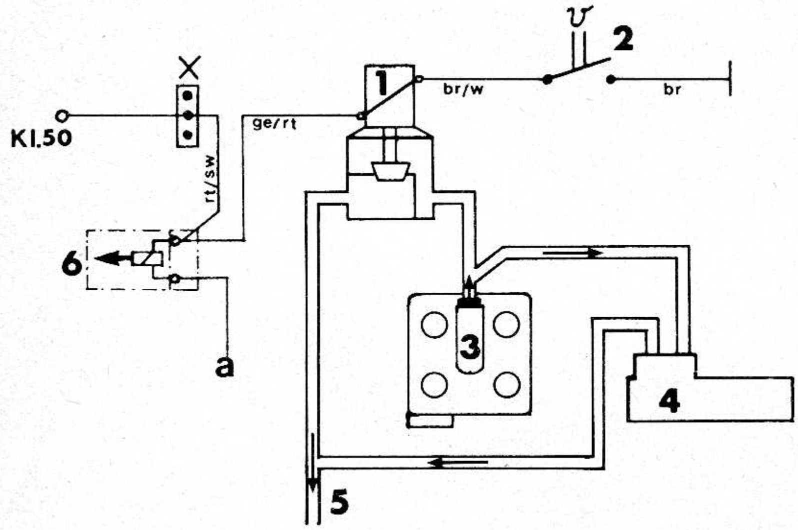


Temperature Switch for Control Pressure Reduction

The temperature switch was changed to improve warm start behavior. The switching point is 35 °C (previously 45 °C).

Operation

When starting the engine the cold start valve (6) and from there the solenoid (1) are supplied with power from the starter via term. 50 (red/black wire, term. 3 on 7-pin round plug behind the ignition coil). When coolant temperature is above **+35 °C** the temperature switch (2) will make ground contact with the solenoid. The solenoid valve opens and the fuel return flow is direct from the control pressure line to the tank return.
The control pressure will drop (to about 0.6 bar) and the sensor plate will move higher during starting.



Wiring Diagram

x – 7-pin round plug
1 – Solenoid
2 – Temperature switch
3 – Fuel distributor
4 – Control pressure regulator
5 – Return line to tank
6 – Cold start valve
a – To thermo time switch

Alternator

To have sufficient charging voltage at low engine speed, the pulley ratio has been changed from 1.909 to 2.065 by installing a smaller alternator pulley.
The drive belt is new (toothed version), but has the same length as the old belt.

Pulley dia.: 61 mm (formerly 66 mm)
Toothed drive belt size: 888 x 9.5 mm

The fuel and ignition systems of cars for North America have different modifications as listed below.

Survey

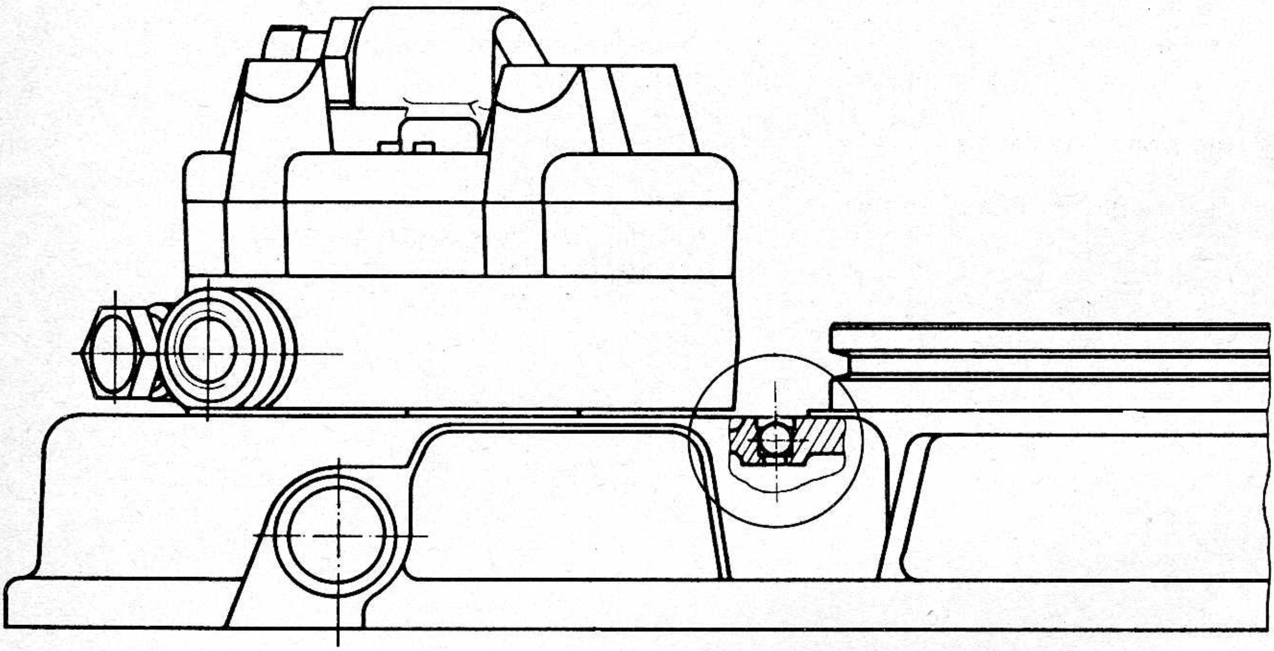
o Mixture control unit	– only in USA with CO antitamper lock
o Warm-up control	– with temperature switch (USA/Canada)
o Oxygen control	– with acceleration enrichment (USA/Canada)
o Distributor	– with Hall sensor transisterized ignition (USA/Canada)
o Electronic idle stabilizer	– (USA/Canada)
o Tank vent with carbon canister	– (USA, Canada) – with temperature switch (USA, Canada)

Mixture Control Unit (only USA)

The mixture control units have an anti-tamper plug for the CO level adjustment. US legislation requires that a certain minimum amount of time be necessary to unplug the hole in the air sensor housing for access to the CO adjustment. This legislation aims at preventing unauthorized tampering with the CO level setting.

Consequently the bore providing access to the CO level adjustment in **USA** air sensor housings is plugged with a 6 mm dia. steel ball. The ball is pressed in the housing against a stop.

Should it become necessary to adjust the engine idle speed/CO level, which is only very seldom the case for engines with oxygen sensor, the mixture control unit must be removed so that the steel ball can be pushed out from underneath.



After completion of adjustments the bore must again be plugged with a steel ball.

Control Pressure Regulator with Temperature Switch (USA, Canada)

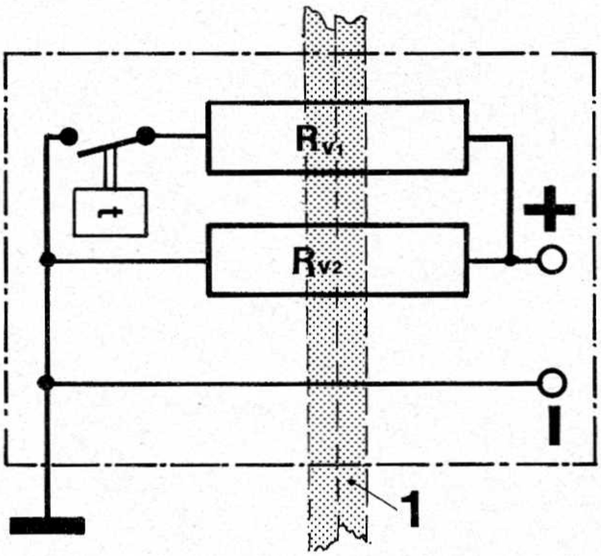
The new control pressure regulator has a flatter control curve at ambient temperatures below + 15 °C to provide better running and transition behavior during warm-up.

Operation

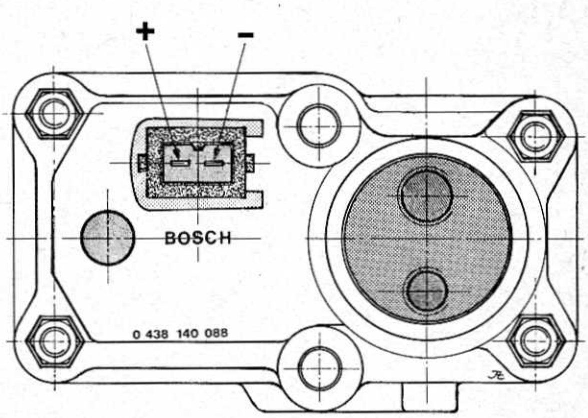
The control pressure regulator with temperature switch has two heating elements R_{v1} and R_{v2} as well as the temperature switch, which switches the heating element R_{v1} on or off depending on the operating temperature.

With the engine running, the heating element R_{v2} receives power. At temperatures below + 15 °C temperature switch (t) will be open so that heating element R_{v1} can't be heated. Due to the limited amount of heat developed by only one heating element the control pressure will increase slowly.

If the temperature rises above + 15 °C, either because of higher ambient temperature or heat from heating element R_{v2}, the temperature switch will close and connect both heating elements R_{v1} and R_{v2}. In this manner more heat can be developed and the control pressure increases rapidly.

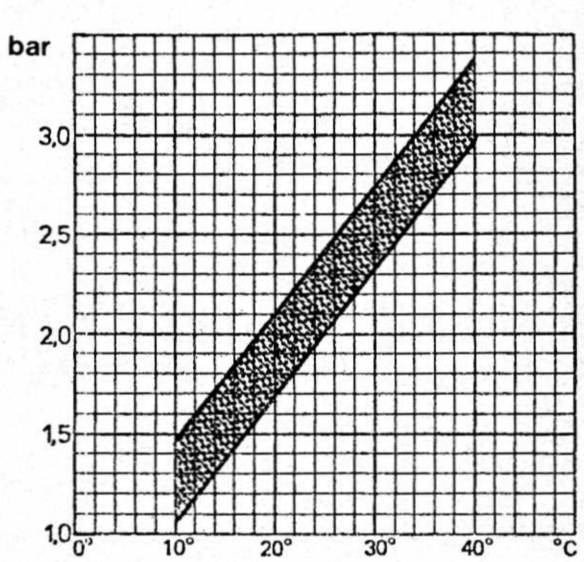


1 – Bimetal spring



Note:
Watch polarity on electric plug connection (see sketch for positive and negative connections).
Wrong connections would destroy the temperature switch and also the control pressure regulator.

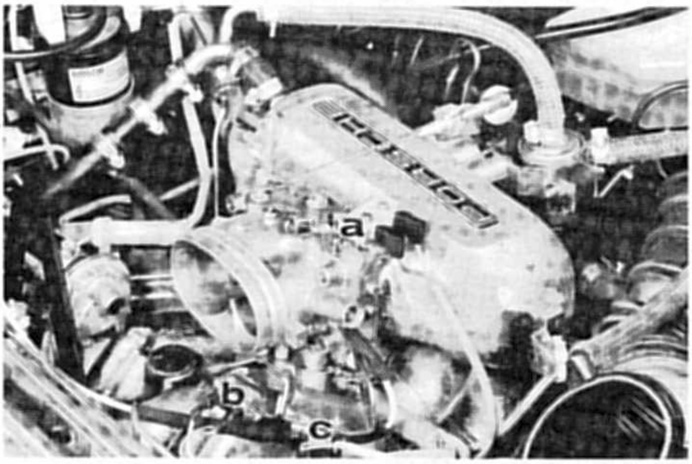
Diagram for Control Pressure Regulator
Control pressure "cold" (matching outside temperature)
Part No.: 477.133.403
Bosch Code: 0438 140 088



Auxiliary Air Regulator
The auxiliary air regulator is new.
Part No.: 477.133.455
Bosch Code: 0280 140 104

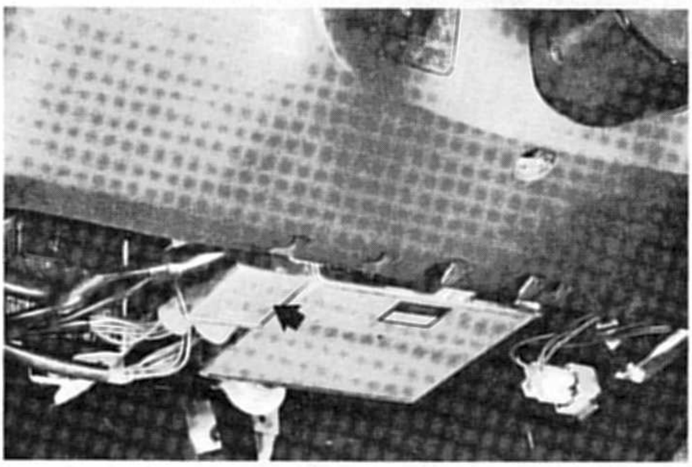
Oxygen Sensor with Acceleration Enrichment

When the throttle is opened with a cold engine and cold oxygen sensor an accelerating enrichment occures by changing the dutycycle of the frequency valve. This requires an additional microswitch (b) on the throttle housing and a new control unit.



3 microswitches are now mounted on the throttle housing, which have the following switching points and functions.

	Switching Point	Function
Switch a	1°	Acceleration enrichment
Switch b	8° ± 1°	Acceleration enrichment and idle stabilization
Switch c	55° ± 1°	Full throttle enrichment



The control unit for acceleration enrichment is located next to the oxygen sensor control unit. It also performs the function of the former speed relay (speed-controlled enrichment above 3500 rpm).

Oxygen Sensor with Acceleration Enrichment – Operation

With cold engine (temperature below 60 °C *) and cold oxygen sensor (temperature below 250 °C) the duty cycle will be switched from 50 % to 75 % when the throttle is opened, if angle positions 1° or 8° are passed. This produces an acceleration enrichment of 2.5 seconds each time. If the opening time of the throttle (from 0° to 8°) is less than 2.5 seconds, there will be enrichment only once. There will be no acceleration enrichment above 35 °C/60 °C.

* Temperature switch (installed in coolant return hose near cylinder no. 4) has a switching point of 35 °C or 60 °C.
– when heating up from cold to warm   60 °C and
– when cooling off from warm to cold   35 °C.

< less than / > more than

Engine Temp.	Sensor	Throttle Angle	Speed	Throttle = Constant	Duty Cycle When Throttle opened past 1° or 8° position
below 60/35 °C	cold	0 . . . full throttle	< 3500	50 %	75 %
		0 . . . 55°	> 3500	50 %	75 %
		55° . . . full throttle	> 3500	65 %	65 %
	warm	0 . . . full throttle	< 3500	control	control
		0 . . . 55°	> 3500	control	control
		55° . . . full throttle	> 3500	65 %	65 %
above 60/35 °C	cold	0 . . . full throttle	< 3500	50 %	50 %
		0 . . . 55°	> 3500	50 %	50 %
		55° . . . full throttle	> 3500	65 %	65 %
	warm	0 . . . full throttle	< 3500	control	control
		0 . . . 55°	> 3500	control	control
		55° . . . full throttle	> 3500	65 %	65 %

Note:

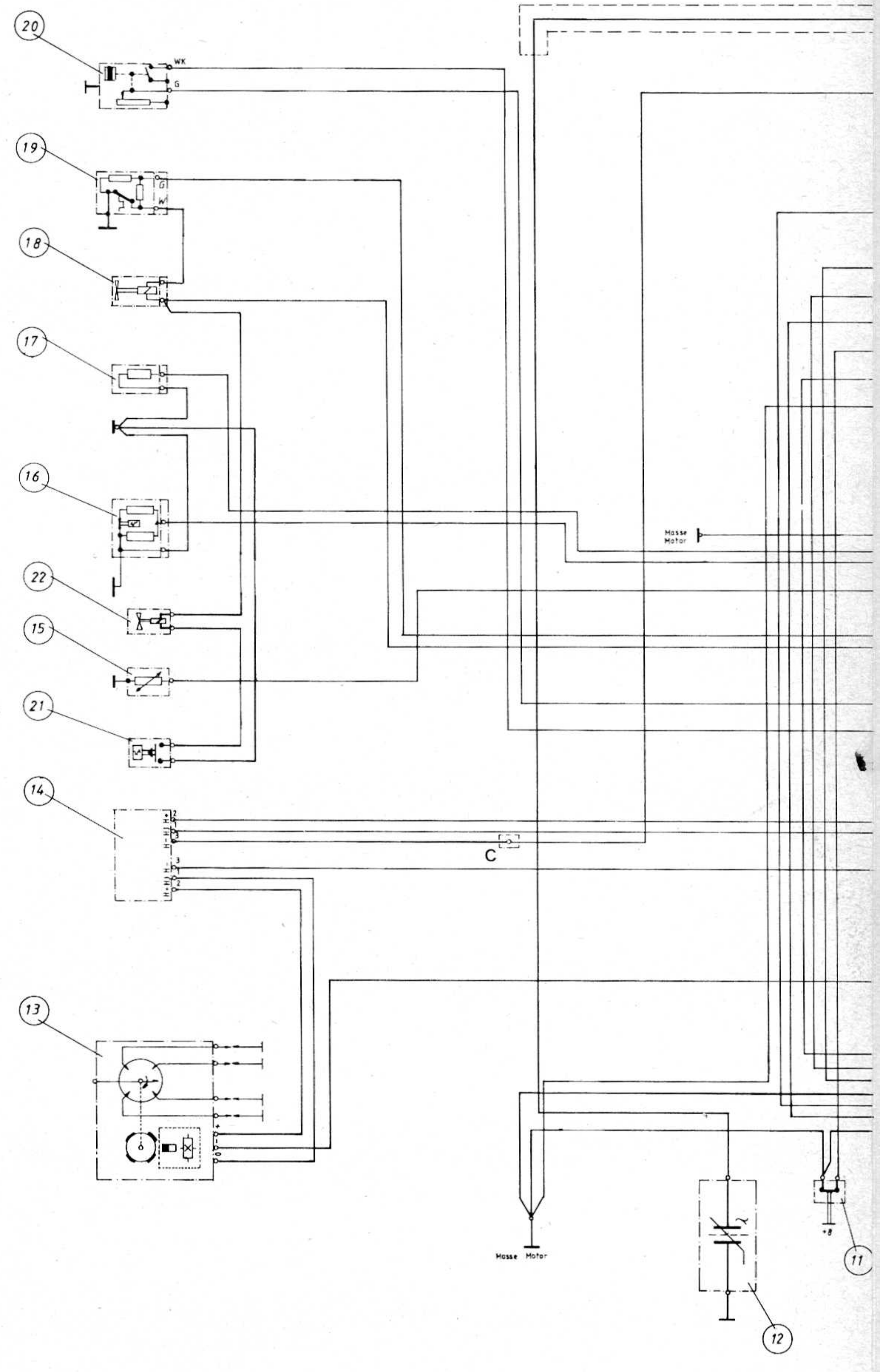
In addition to acceleration enrichment microswitch "b" also has a function for electronic idle stabilization (see page 18).

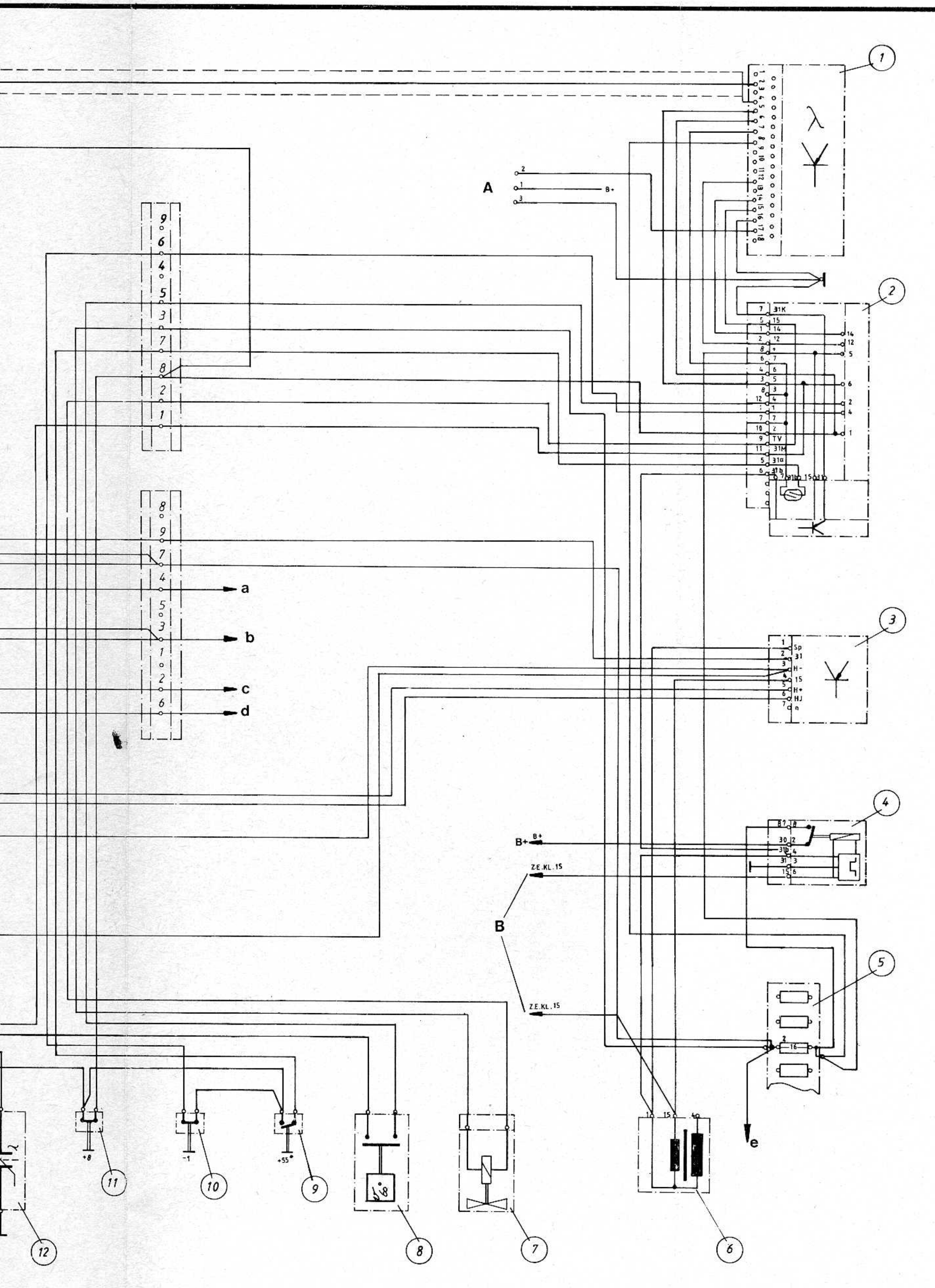
Because of the above mentioned modifications cars for USA and Canada with have a new oxygen sensor control unit.

Wiring Diagram for Oxygen Sensor with Acceleration Enrichment

1 – Oxygen sensor control unit
2 – Acceleration enrichment control unit
3 – Ignition control unit
4 – Fuel pump relay
5 – Fuel carrier, 9-pin
6 – Ignition coil
7 – Frequency valve
8 – Coolant temperature switch
9 – Microswitch
10 – Microswitch
11 – Microswitch
12 – Oxygen sensor
13 – Distributor
14 – Idle stabilizer
15 – Coolant temperature sending unit
16 – Control pressure regulator
17 – Auxiliary air regulator
18 – Cold start valve
19 – Thermo-time switch
20 – Oil pressure sending unit
21 – Control pressure reduction temp. switch
22 – Solenoid

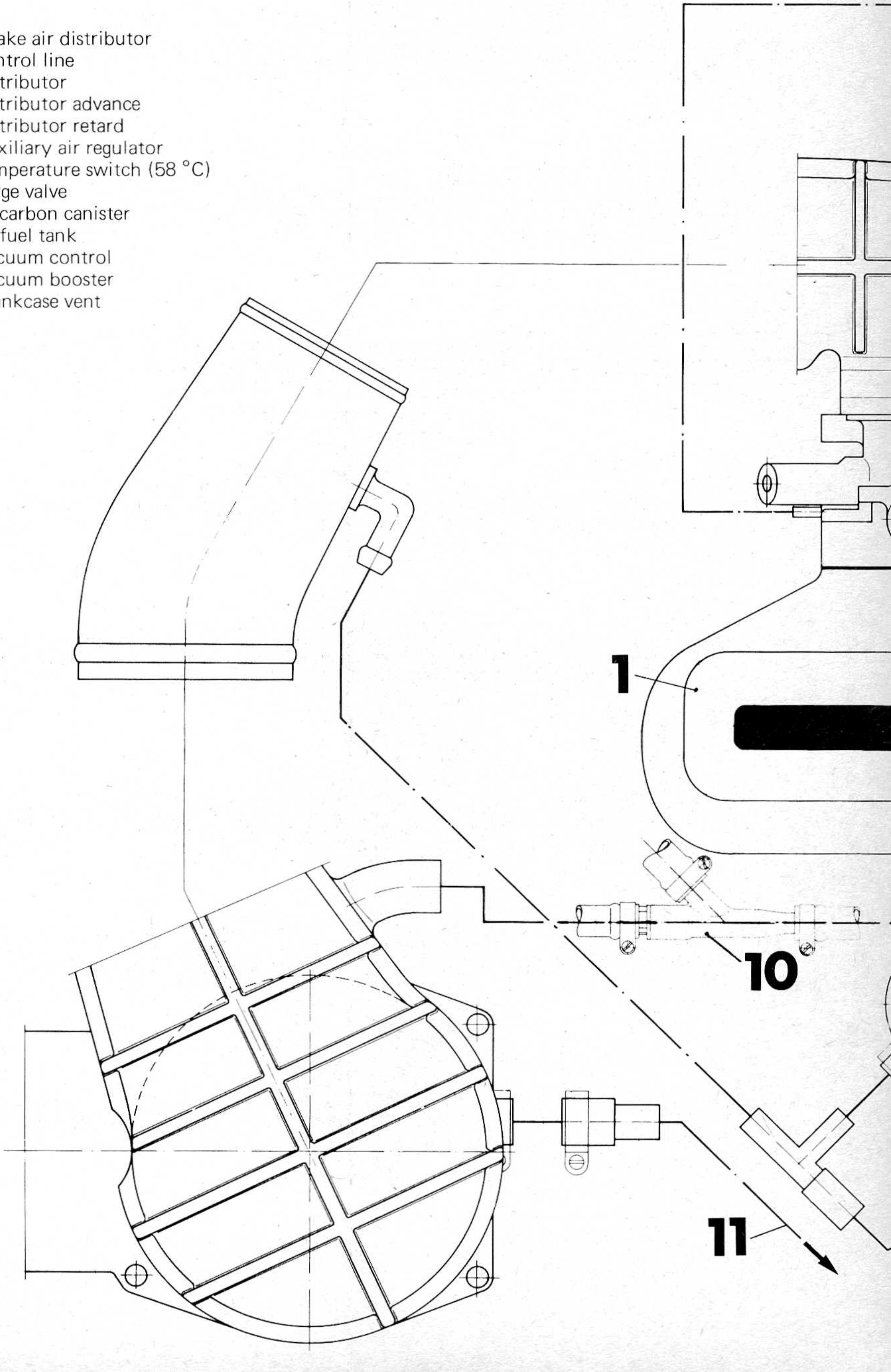
A – Test plug connection
B – To central electric term. 15
C – Idle adjustment connection point
a – Coolant temperature gauge
b – Ignition switch term. 50
c – Oil pressure gauge
d – Oil pressure indicator lamp
e – Fuel pump

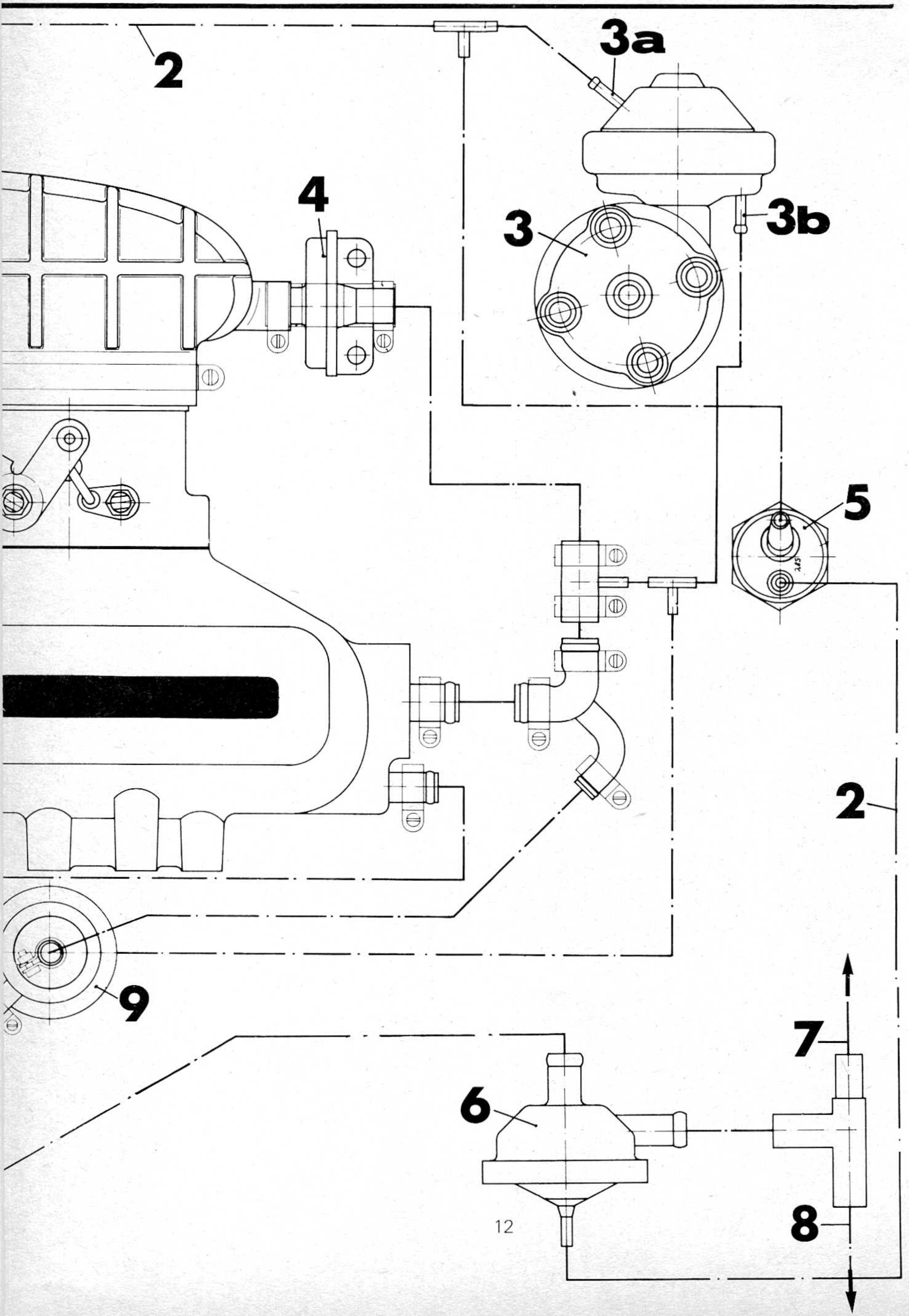

20
WK
G
19
G
W
18
17
16
22
15
21
14
C
13
Masse Motor
Masse Motor
12
11
+B



A
B+
B
Z.E.KL.15
Z.E.KL.15
a
b
c
d
e
1
2
3
4
5
6
7
8
9
10
11
12

1 – Intake air distributor
2 – Control line
3 – Distributor
3a – Distributor advance
3b – Distributor retard
4 – Auxiliary air regulator
5 – Temperature switch (58 °C)
6 – Purge valve
7 – To carbon canister
8 – To fuel tank
9 – Vacuum control
10 – Vacuum booster
11 – Crankcase vent




2
3a
4
3
3b
5
2
9
7
6
8

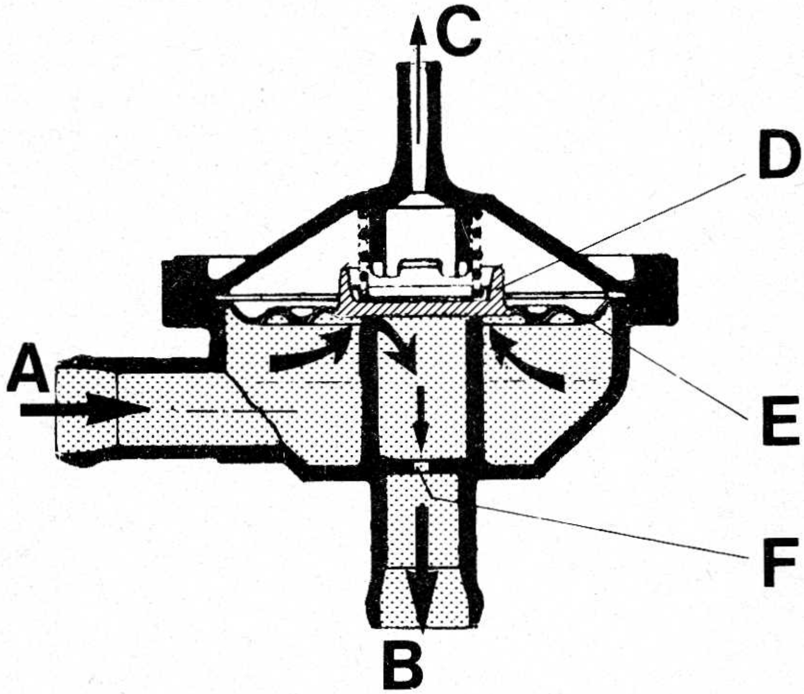
Tank Vent Control

Vacuum opens purge valve (13). A temperature switch (10) surrounded by engine coolant is installed in a control line leading to the purge valve. The temperature switch opens at a coolant temperature of 58 ± 3 °C and opens the line to the purge valve. The temperature switch closes again at 48 ± 3 °C.

Operation:

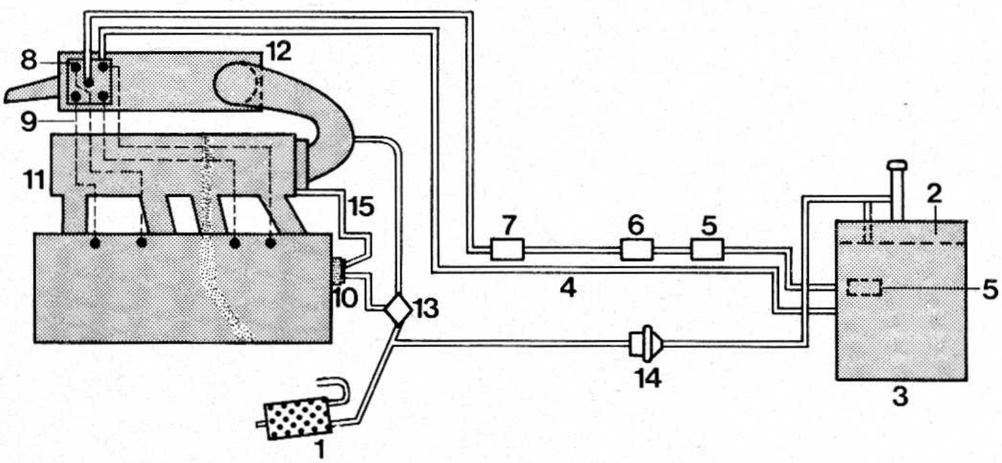
Purge Valve

A – Fuel vapor inlet
B – Fuel vapor outlet
C – Vacuum line connection
D – Spring-loaded valve plate
E – Diaphragm
F – Orifice bore



Engine Cold (coolant temperature below 58 °C)
The temperature switch is closed. No vacuum goes to the purge valve regardless of operating conditions, because the valve is closed. Tank vent vapors are trapped in the carbon canister.

Engine Warm (coolant temperature above 58 °C)
The temperature switch is open. The purge valve remains closed when engine is stopped, running at idle speed or full throttle. The purge valve is opened by vacuum in partial throttle range. Tank vent vapors are drawn off by the engine.



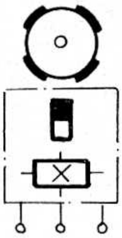
1 – Carbon canister
2 – Expansion tank
3 – Fuel tank
4 – Fuel return line
5 – Fuel pump
6 – Pressure reservoir
7 – Fuel filter
8 – Fuel distributor
9 – Fuel injection lines
10 – Temperature switch
11 – Intake air distributor
12 – Air cleaner
13 – Purge valve (with built-in orifice)
14 – Safety valve
15 – Vacuum control line

Transistor Ignition System with Hall Sender

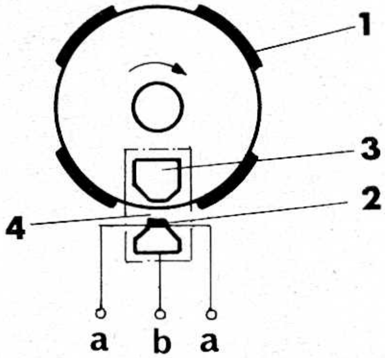
The engines for USA and Canada cars have an ignition system with a Hall sender and hybride solid state control unit.

The hall ignition system is breakerless and when combined with idle stabilizer reduces the need for timing and idle speed adjustments.

The operation of the Hall sender is based on the Hall principle: that is, if a constant amount of current flows through a semi-conductor layer and the layer is exposed to a magnetic field, a small voltage will be generated. This Hall voltage is used as control pulses to trigger the ignition control unit.



SIGN in Wiring Diagram

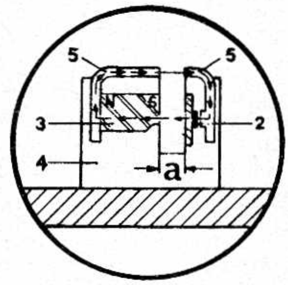


1 – Shutter
2 – Hall sender
3 – Permanent magnet
4 – Clearance

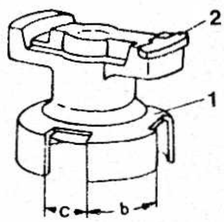
a – From or to control unit for idle stabilization
b – To ignition control unit

Design of Distributor with HALL Transmitter

The HALL sender (2) and a permanent magnet are mounted on the distributor baseplate with a space between them. This provides clearance (a) between the magnet and HALL sender. Guide plates (5) on the magnet and HALL sender permit the building up of a closed magnetic field (magnet-guide plates-HALL sender-magnet) – thus producing a magnetic field (4).

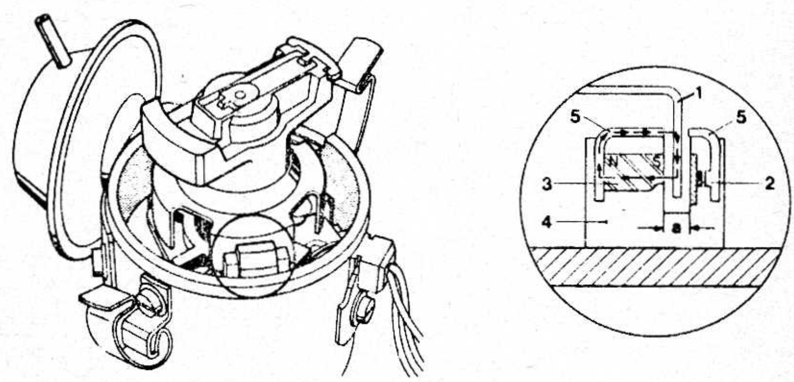


A shutter (1) connected with the distributor rotor moves through clearance (a) of the magnetic field when the engine is running. The shutter has as many equally spaced openings as there are cylinders in the engine.



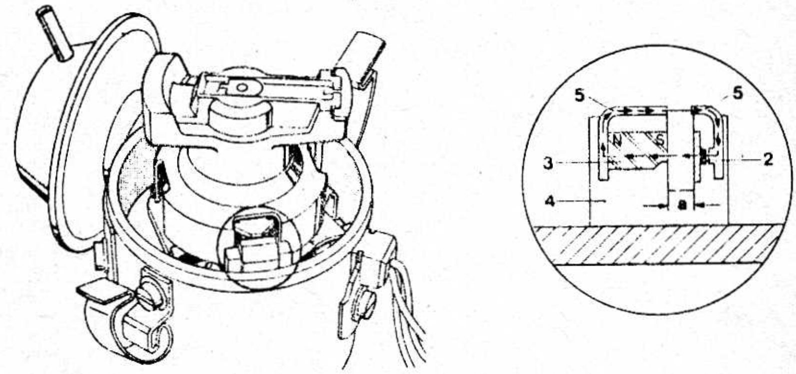
Operation

If the shutter (1) is in the area of the magnetic field (4), the magnetic lines of force will be diverted by the shutter and not have an effect on the Hall layer of the Hall sender. The Hall sender stops generating the Hall voltage. The final stage of the ignition control unit becomes conductive and primary current flows through the ignition coil.



1 – Shutter
2 – Hall sender
3 – Permanent magnet
4 – Magnetic field
5 – Guide plates
a – Clearance

As soon as the shutter (1) leaves the magnetic field (4), i. e. the shutter opening moves into the magnetic field, the magnetic lines of force flow through the Hall layer of the Hall sender. The Hall sender transmits a Hall voltage which triggers the ignition control unit. The final stage of the ignition control unit switches off the primary current to the ignition coil, and ignition occurs.



Repair Instructions

The ballast resistor, ignition coil and control unit of the transistor ignition systems are matched to each other. Always make sure that only specified parts are installed. Wire connections on the control unit and Hall sender must not be mixed up, since this would destroy the control unit and Hall sender.
The battery positive terminal must never be connected on ignition coil terminal 1, since this would destroy the control unit by short circuit.

Checking Operation

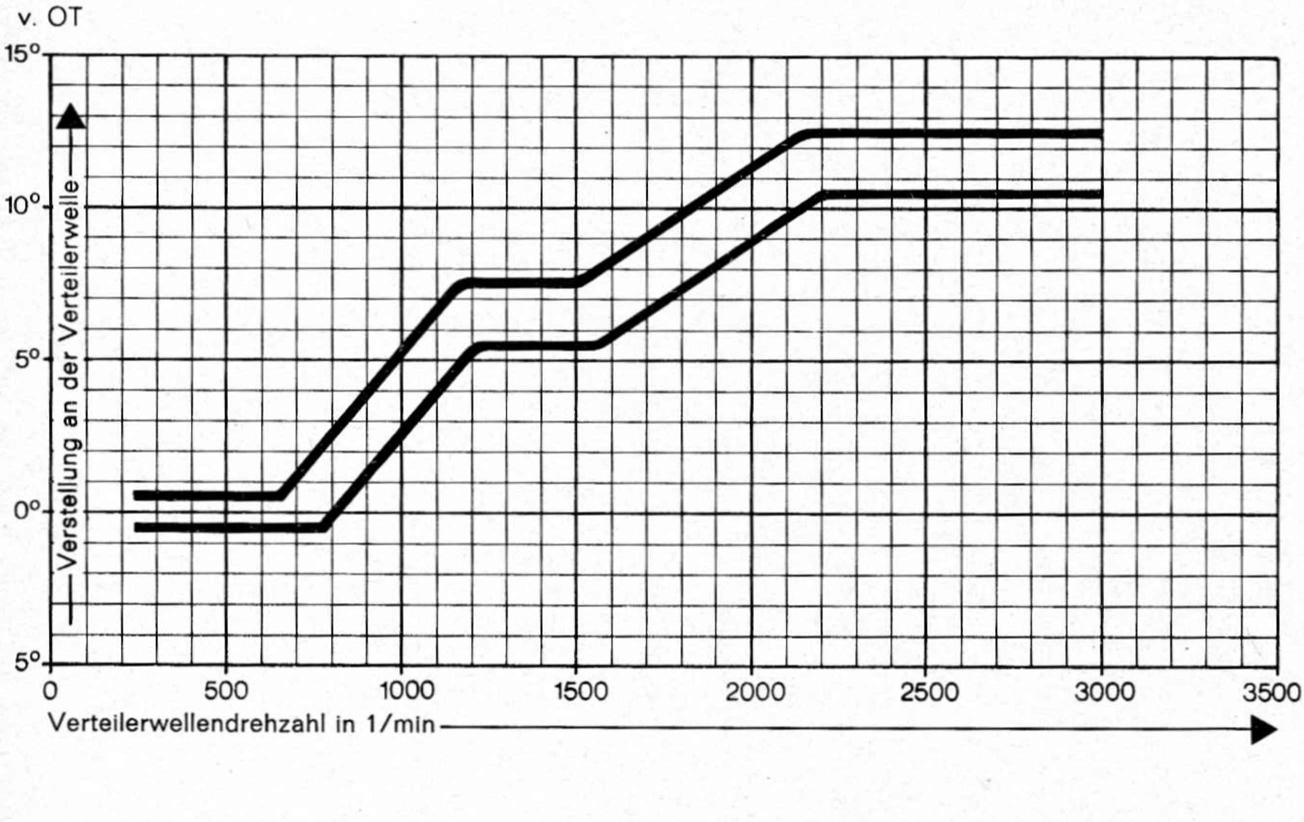
The operation of the Hall sender and control unit can be checked quickly as follows.
Connect a voltmeter (0 to 16 V range) or a test lamp between ignition coil term. 15 and ground.
Start engine and observe voltmeter or test lamp.
If voltmeter needle pulsates or test lamp flickers, the Hall sender and control unit are probably okay.

Distributor

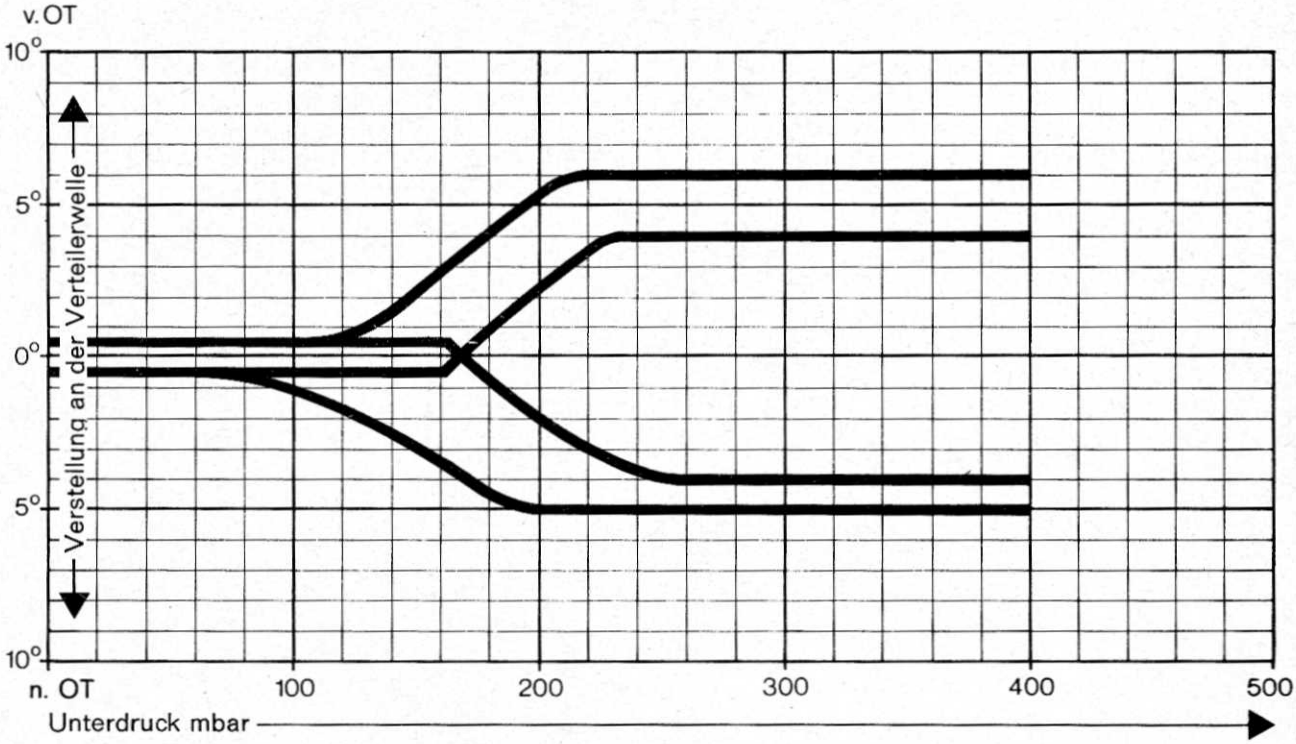
A new distributor is used in cars with Hall ignition.

Part No.: 477.905.203
Bosch Code: 0237 022 020

Centrifugal Ignition Control Curve, Type 924 (USA, Canada)



Vacuum Ignition Control Curve, Type 924 (USA, Canada)



Ignition Control Unit/Idle Stabilizer

All cars of Type 924 for USA and Canada will be fitted with Hall ignition and an electronic idle stabilizer.

The idle stabilizer is on the ignition control unit.

The ignition control unit is mounted on a heat sink at the left front of the engine compartment.

1 – Heat sink
2 – Control unit
3 – Mounting screw

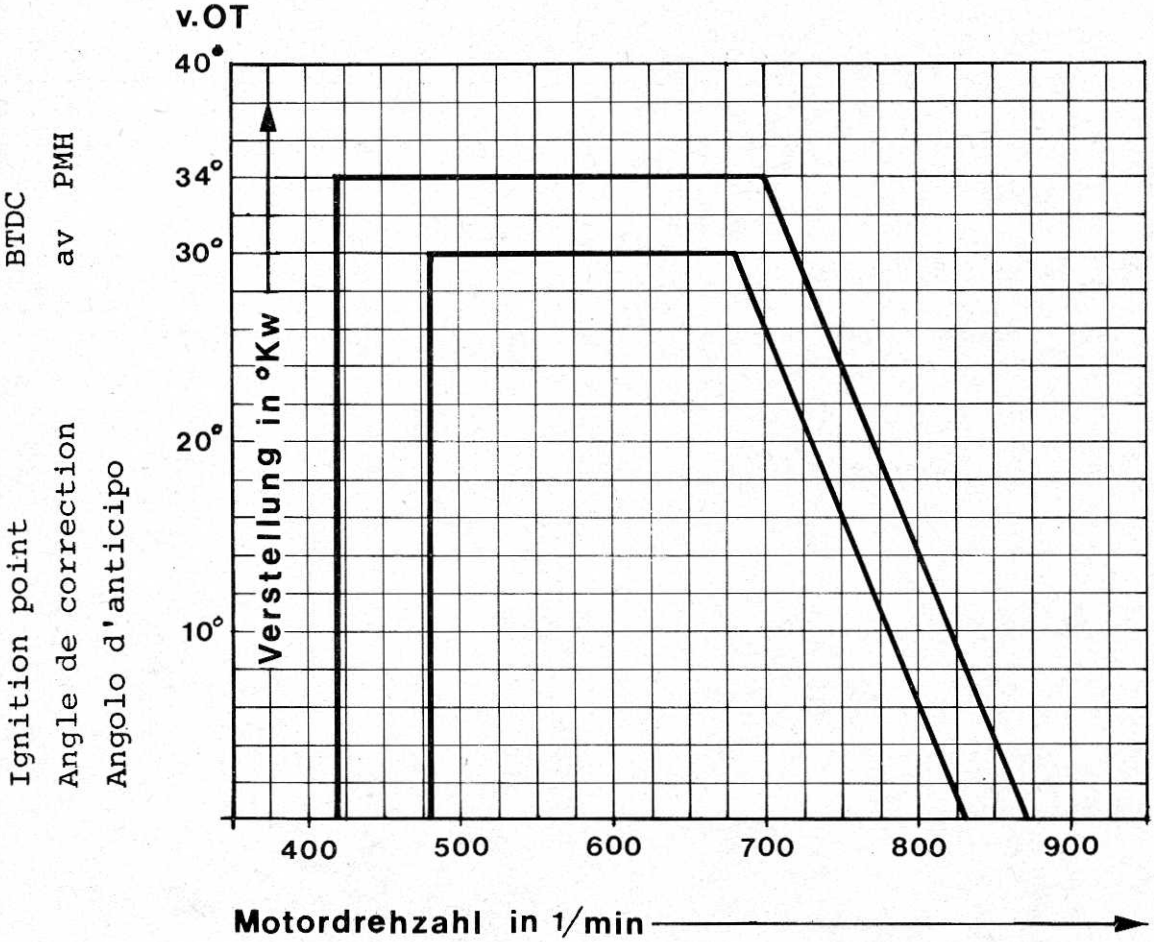
Operation of Idle Stabilizer

At idle the 8° microswitch (4) will be closed. This connects the idle stabilizer control unit with ground and makes it ready for operation. When the 8° switch is opened, the ground connection will be broken and the idle stabilizer switched off.

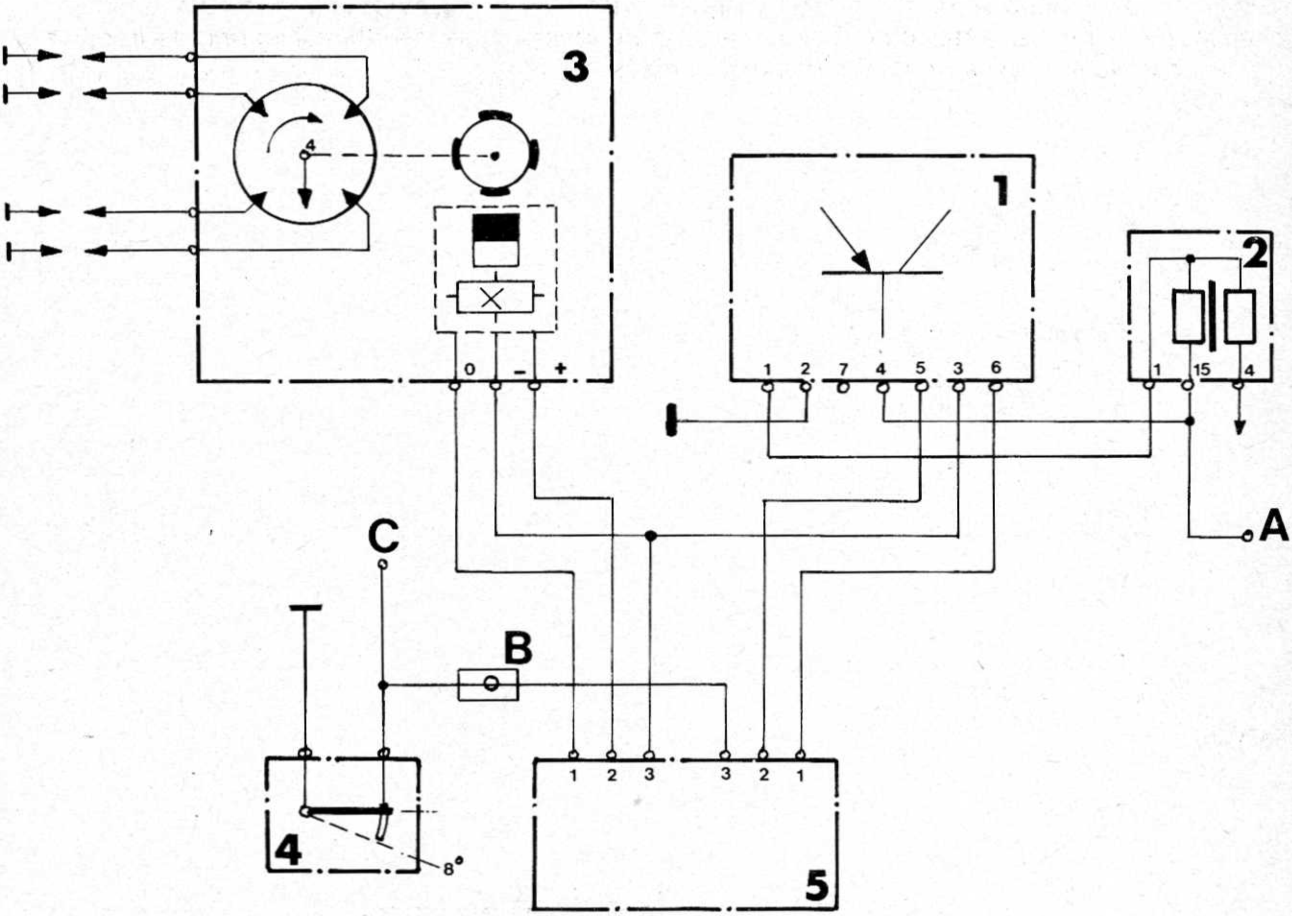
The idle stabilizer receives speed signals from the distributor, which are forwarded as ignition timing trigger signals to the ignition control unit.

The idle speed is stabilized to a constant 800 rpm. If the speed drops when switching on other equipment, e. g. air conditioner compressor, the ignition timing will be advanced and the speed stabilized.

The idle stabilizer works in a speed range between 450 and 900 rpm. It regulates the idle speed to about 800 rpm always, even if the basic idle setting is adjusted slightly too low.



Wiring Diagram for Hall Ignition with Idle Stabilizer

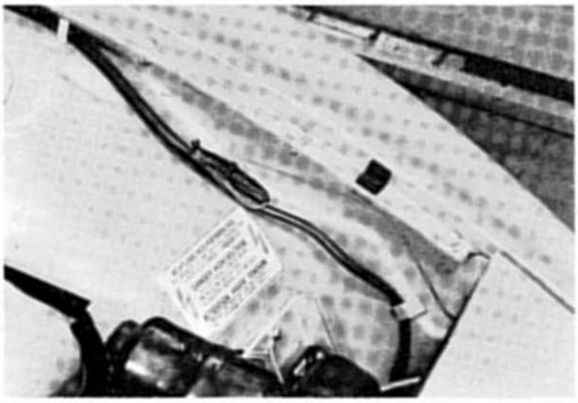


1 – Ignition control unit
2 – Ignition Coil
3 – Distributor with HALL sender
4 – Throttle switch
(opens at 8° throttle angle)
5 – Idle stabilizer

A – To term. 15 on ignition switch
B – Connector point (idle stabilizer)
C – To acceleration enrichment control unit

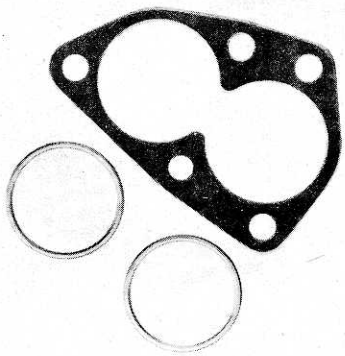
Note:

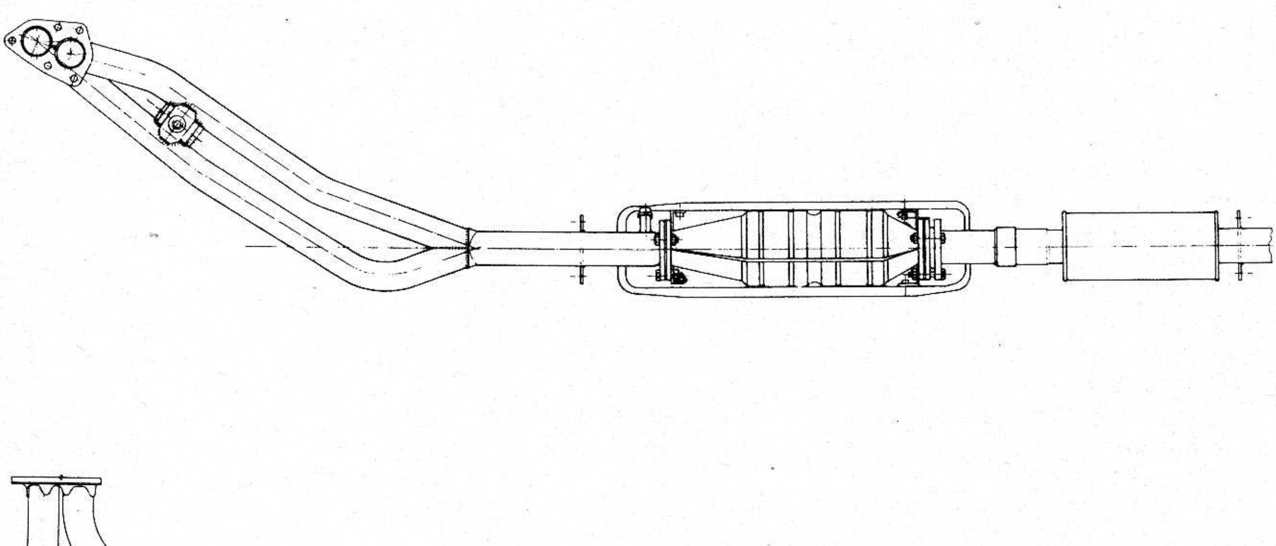
The idle stabilizer must be switched off for CO level and idle speed adjustments. Disconnect the connector in the line between the throttle switch and ignition control unit. The plug connection is accessible in the engine compartment on the left wheel housing.

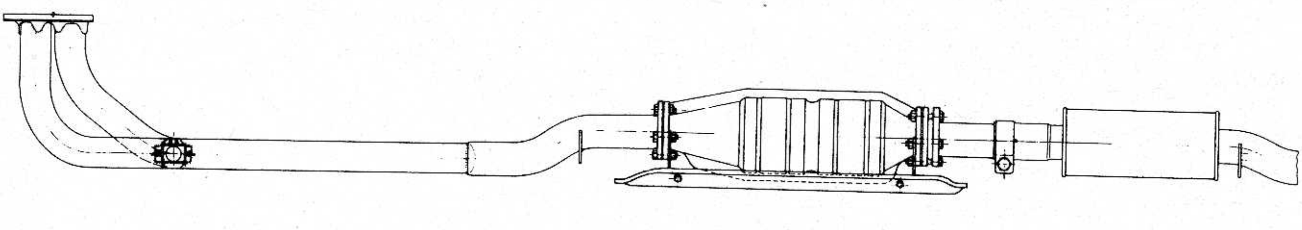


The front pipe (twin pipe) is a single-piece up to the catalytic converter. The pipe has a flange for the oxygen sensor. The former intermediate flange has been discontinued.

The twin pipe is mounted on the exhaust manifold with 10 mm dia. studs and allen nuts (8 mm wrench size) for easier installation. There is also an intermediate plate with sealing rings to improve the seal between the exhaust manifold and twin pipe.





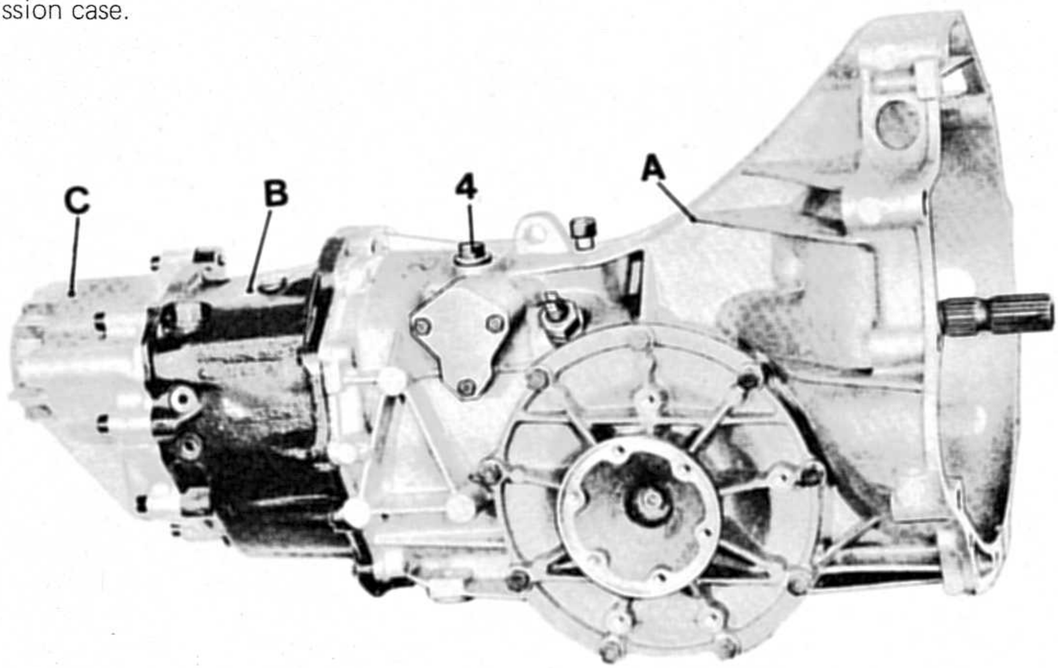


Manual Transmission

The transmission case (A), gear carrier (B) and rear transmission cover (C) are new.
The **transmission cover** has been strengthened and the ribs are different.
The hole pattern of the gear carrier is different (transmission cover – gear carrier bolts).

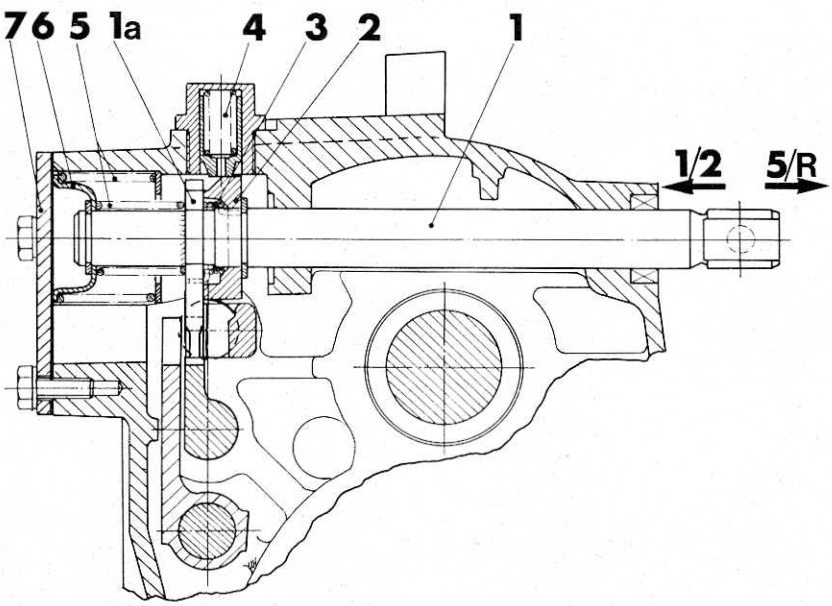
Transmission Case

The reverse gear lock-out formerly in a separate external housing has been moved inside in the transmission case.



– Transmission case – Gear carrier – Transmission cover

All locking parts (2 to 6) have been changed, including the selector shaft (1). The selector arm (1a) has been redesigned to make up the reverse gear lock-out together with the locking disc (2) and lockpin (4).



1 – Selector shaft
1a – Selector arm
2 – Locking disc
3 – Spring
4 – Lockpin with housing
5 – Springs
6 – Spring retainer
7 – Housing cover

Operation of Reverse Gear Lock-out

A

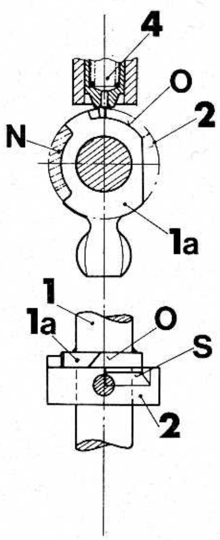


Figure A
3rd/4th Gear Shift Plane – NEUTRAL

Lockpin (4) is resting with full diameter on locking disc (2). Selector arm (1a) is turned when making 3rd/4th gear shift. Locking disc (2) must also turn via the stops of opening "N" so that lockpin (4) remains in the illustrated position.

B

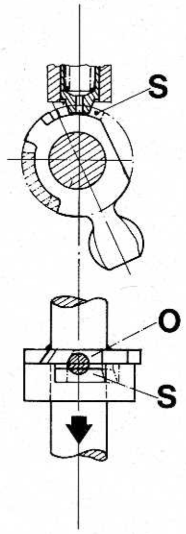


Figure B
5th/Reverse Gear Shift Plane – 5th Gear Engaged

Selector shaft (1) must be pushed in direction of arrow to get into the 5th gear shift plane. This will mean having the face of lockpin (4) partially above opening "O" of the selector arm. If 5th gear is engaged, selector shaft (1) will be turned and lockpin (4) can now engage in the free opening "S" and "O" of locking disc (2) and selector arm (1a). It is not possible to shift into reverse gear, since the selector shaft (1) would have to be turned in the opposite direction. Locking disc (2) would then rest against lockpin (4) and spring (3) of locking disc (2) would have so much tension that locking disc (2) would be positioned in opening "N" of the selector arm. Consequently further turning of the selector shaft (1) and shifting into reverse gear would not be possible.

C

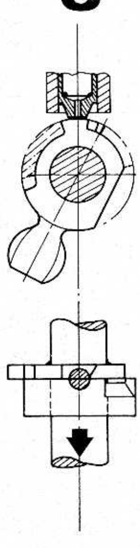
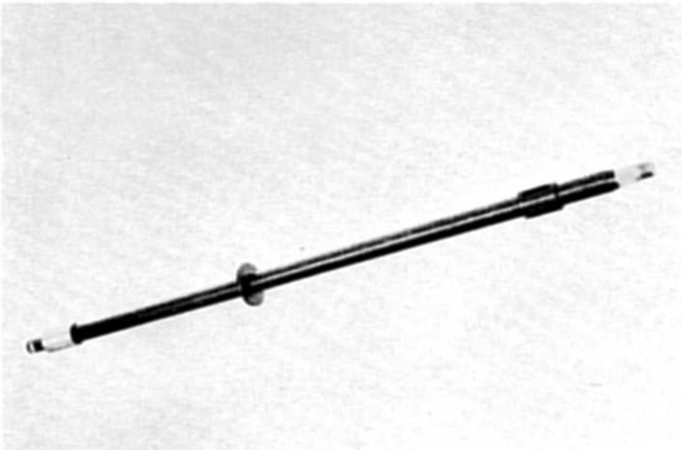


Figure C
5th/Reverse Gear Shift Plane – Reverse Engaged

Reverse gear can only be engaged from neutral. The selector shaft (1) would be pushed in direction of arrow. Lockpin (4) is resting with full diameter on locking disc (2) and selector arm (1a), the selector shaft can be turned and reverse gear can be engaged.

New Steering Shaft

The deformation element (lattice) in the steering shaft has been omitted.
A telescoping shaft with a support disc is installed for 1981 models.



Stabilizer

The 924 models are standard with a 21 mm dia. stabilizer on the front axle.

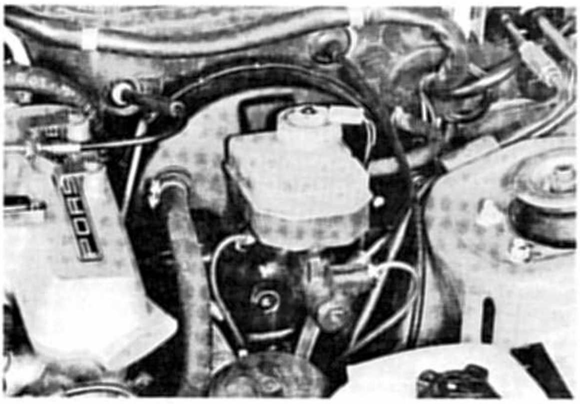
Torsion Bar – Rear Axle

All 924 models have torsion bars with a 23.5 mm diameter (was previously only installed in cars with stabilizers on front and rear axles).

Brake Fluid Level Indicator Light

The brake fluid resevoir has a float. If the fluid level is too low (below min. mark), the indicator light is grounded via an electric contact switch and the light comes on.

The brake fluid level indicator light is also used to report failure of a brake circuit. Consequently both brake and indicator light switches on the master cylinder have been omitted.

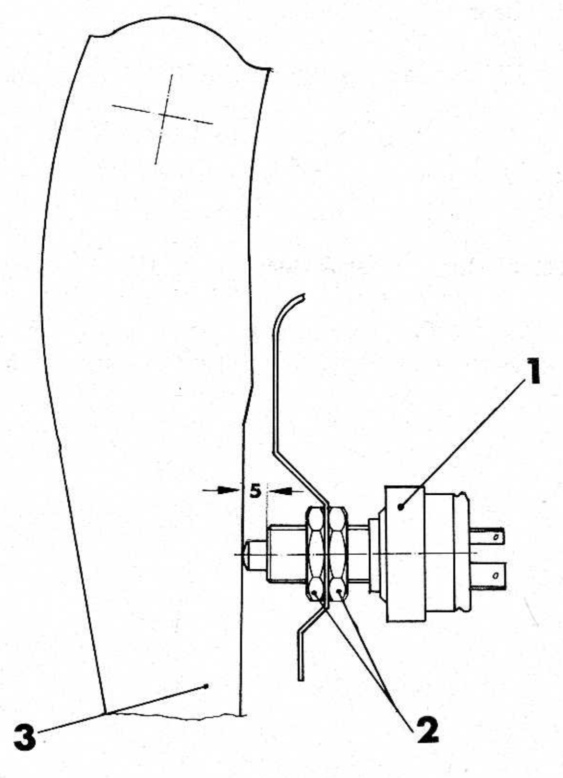


A mechanically operated switch mounted on a bracket above the brake pedal serves as a stop light switch. The switch can be adjusted.

Adjusting:

– Brake pedal released

– Adjust distance between stop light switch and brake pedal to 5 mm.



1 – Stop light switch
2 – Castle nut
3 – Brake pedal

New Switch Symbols

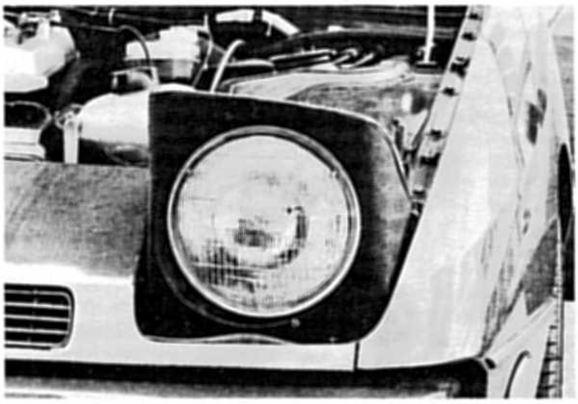

Light switch (USA)


Cigar lighter


Rear window defogger

Headlights

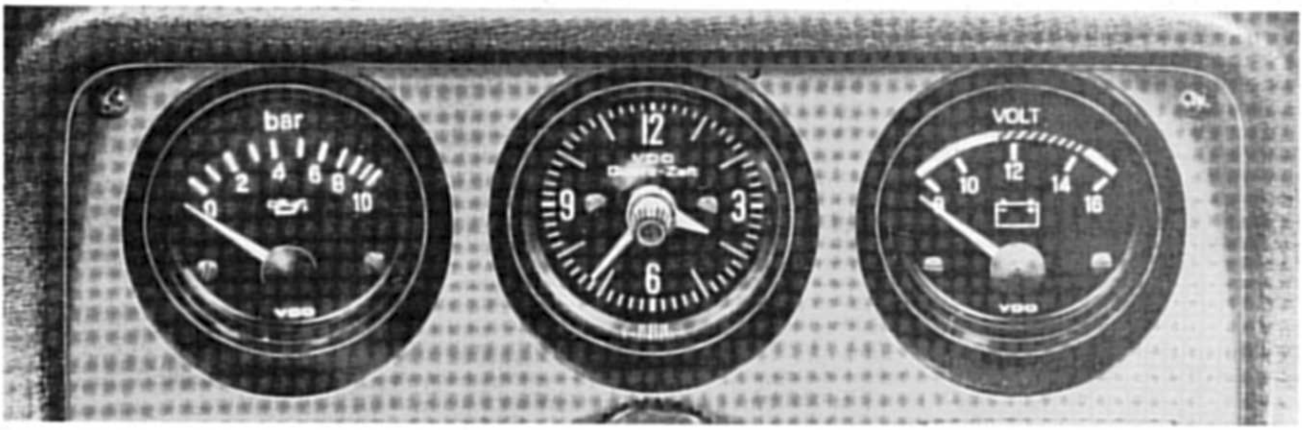
Cars for USA and Canada have halogen sealed beam headlights as standard equipment.



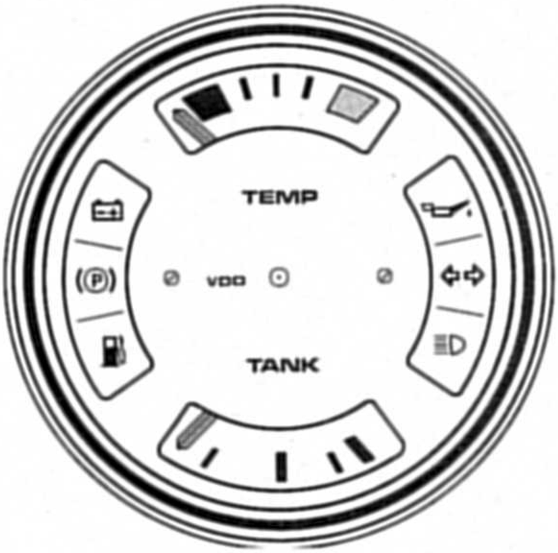
Instruments

Oil pressure gauge with symbol (dripping oil can).

Voltmeter with symbol (battery).

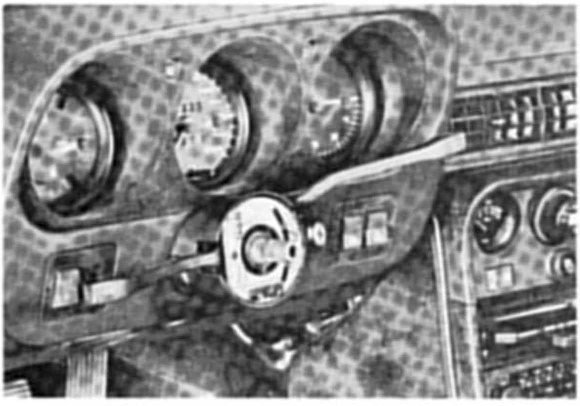


The parking brake indicator light in **instrument cluster** has a symbol (P).



Steering Column Switch

All cars are fitted with a new steering column switch (modified operating lever and housing).

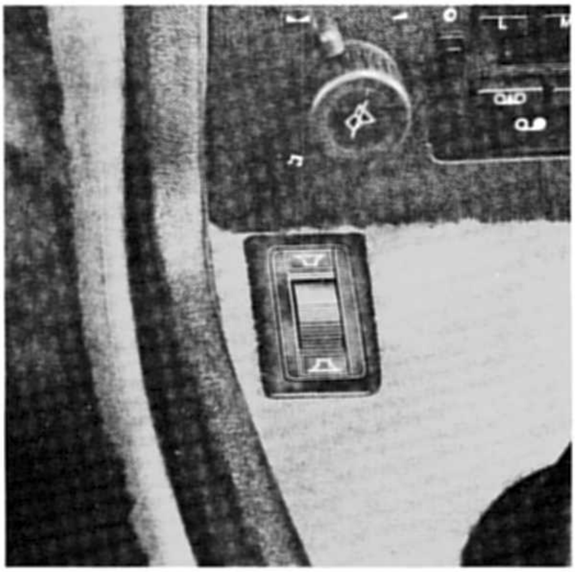


The word PORSCHE is inscribed in the door trim panel of all cars.

Two-tone Horn

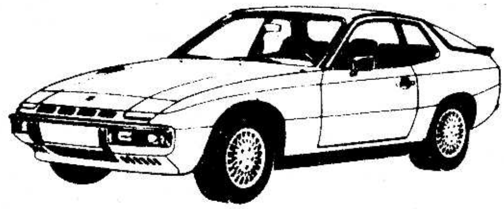
The cars have two two-tone horns (as Turbo 924).

From model year 1981 all cars fitted with a radio as optional equipment will have a speaker balance control mounted on the center console.



PORSCHE

924 turbo



The following modifications have been made on the Porsche 924 Turbo for the new model year.

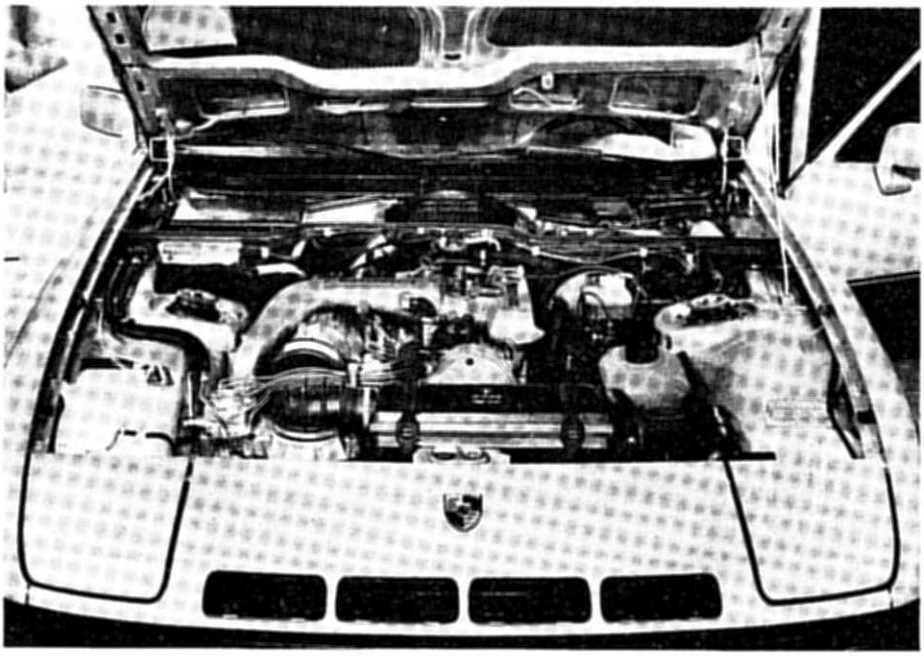
- Increase in engine power output by 5 kW (6 HP)
- New fully electronic ignition – digital ignition timing
- Modifications to turbocharger
- New steering column switch (as 924)
- New symbols for controls (as 924)
- Brake fluid level indicator light, instead of brake circuit failure indicator light (as 924)
- Instruments with white letters/numbers (formerly green)

These modifications are described in detail on the following pages.

The major modifications on the 924 Turbo concern the engine and ignition system. A new ignition system and changes to the fuel system and an increased compression ratio have increased engine power.

In the model year 1981 the 924 Turbo will be built with the following engine version.

	USA, Canada
Engine type	M 31/04
Power output	115 kW / 154 S.A.E. net
formerly	(110 kW / 143 S.A.E. net)



The crankshaft drive (except the pistons), engine block and cylinder head have not been changed.
Modifications:

Pistons

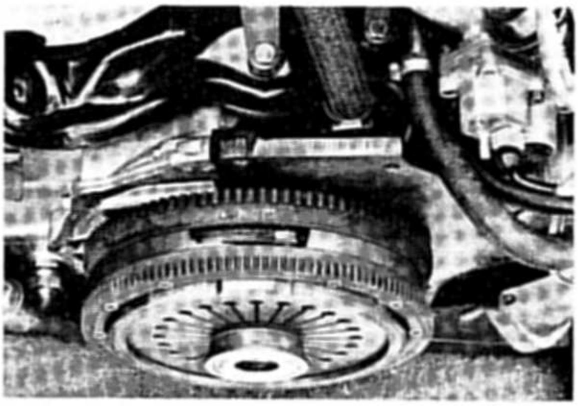
The pistons – nominal diameter 86.5 mm – have a centric, somewhat flatter combustion chamber recess than before.

Compression ratio: USA, Canada = 8.0 : 1 (formerly 7.5 : 1)

The installed position is indicated by an arrow stamped in the piston crown (faces forward to pulley).
The piston pin bore is offcenter by 1.5 mm.

From 1981 Model

Up to 1981 Model



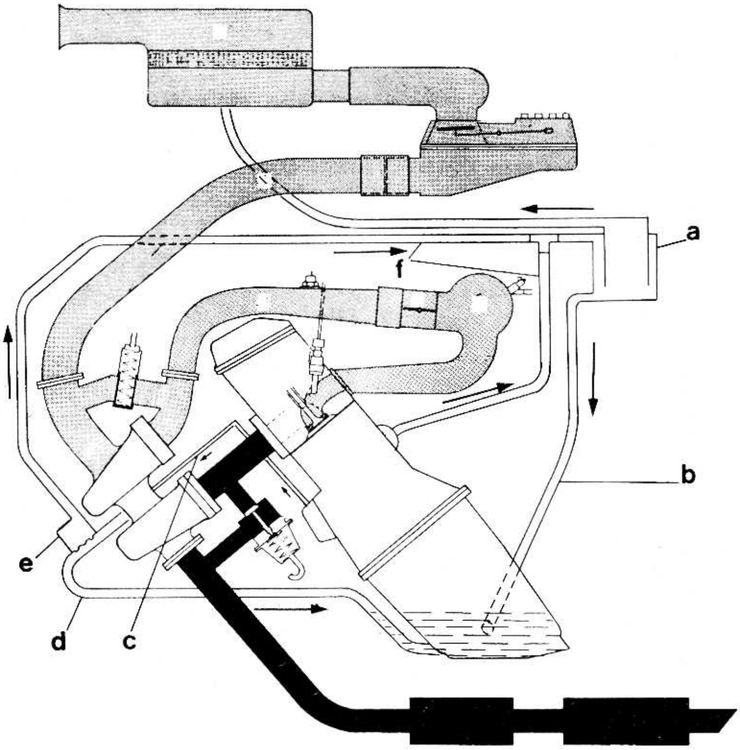
Flywheel, Clutch Plate

The flywheel is new. It has milled teeth the digital electronic ignition system.
The TDC mark (Z 1) and 9° before TDC ignition timing mark (dot) are on the flywheel.
Flywheels with 9° before TDC ignition timing marks are identified with "USA".

Important!

The flywheel is a press-fit on the crankshaft.
The flywheel must be heated to install.
Flywheel mounting bolts are 2 mm shorter than before.
For identification the bolts have a 4 mm dia. hole 2 mm deep in their heads.

Crankcase Vent (USA, Canada)

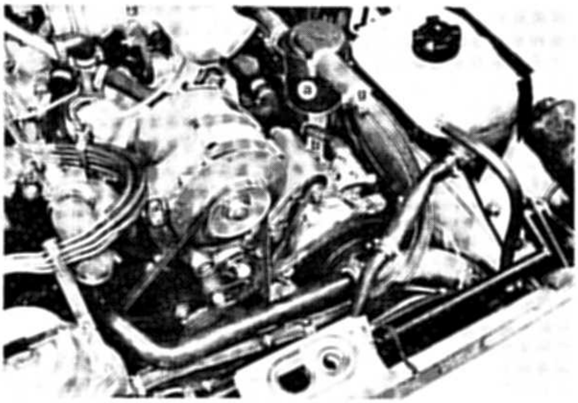


a – Oil trap
b – Return line to oil pan
c – Oil feed to turbocharger
d – Oil return from turbocharger
e – Air trap
f – Vent lines

Crankcase Vent

The blowby gas travels from the crankcase via a hose into the air-cleaner. The vent line has an oil trap (a) with a return line (b) to the oil pan.

Return line from oil trap to oil pan



a – Oil trap
b – Return line

Turbocharge Oil Return

There is a vent line with an air trap (e) in the oil return from the turbocharger to the oil pan. The vent line connects to the crankcase vent ahead of the oil trap.

Perfect oil return flow is guaranteed even with unfavorable conditions (pressure in crankcase).

Turbocharger

The turbocharger is a new refined version of the previous turbocharger.
The vanes on the compressor have been changed and provide a better degree of efficiency.
A smaller turbine housing has been selected to improve engine pickup when accelerating in the low speed range.

Collar bolts (external teeth) and dowel sleeves are used to bolt the turbocharger on the exhaust manifold.
A sealing ring is installed between the exhaust manifold wastegate pipe and turbocharger front pipe to improve sealing.
This modification required the following new parts:
Exhaust manifold, turbocharger (these parts have a groove for the sealing ring and a wastegate pipe from the exhaust manifold to the wastegate.

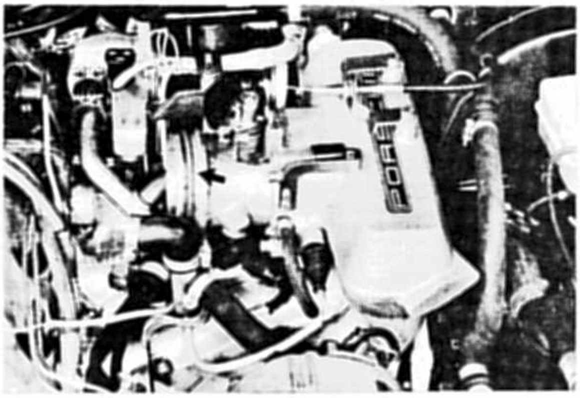
New Wastegate

The wastegate is new for 1981, however the boost pressure remaining the same as previously.

Boost pressure 0.43 to 0.47 bar

Throttle Housing

It now houses only one throttle plate (formerly two).
An O-ring is used for the pressure tube seal (arrow).
The pressure tube and intake air distributor have been changed due to the new throttle housing adapters.

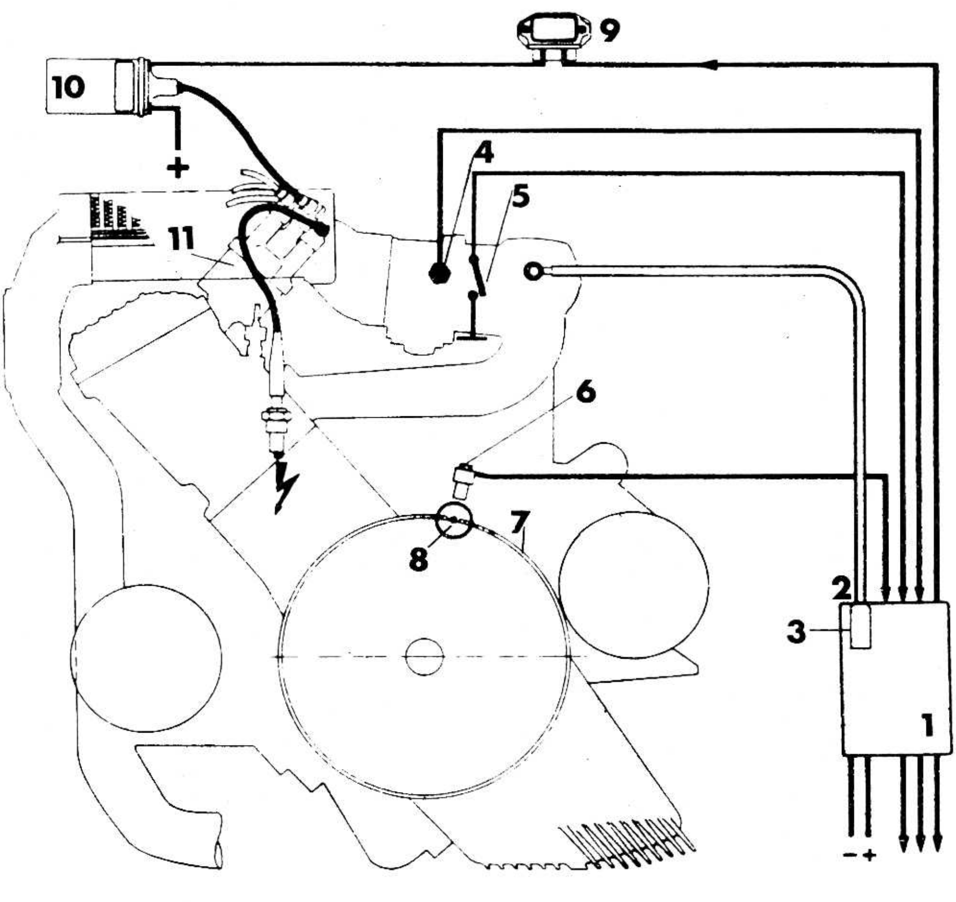


Fuel Injector Installation

The injector holder has a metal insert for better sealing and holding. A seal is installed between the fuel injector and holder (previously the holder was only made of plastic without a metal insert).

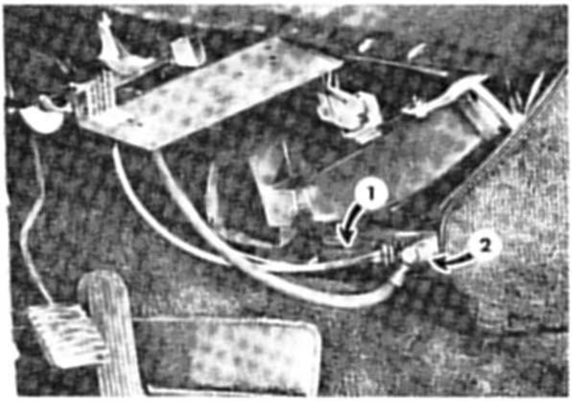
The new fuel injector holder can also be installed in cars before the 1981 models.

A digital ignition timing control (DITC) has been developed for the Porsche 924 Turbo.
Unlike previous mechanical ignition systems, control of the ignition timing is fully electronic with the DITC. With this system, it is possible to have optimum ignition timing for the special requirements of the engine in regards to power output, emission control and fuel consumption under all operating conditions.
Engine speed and intake vacuum still serve as input factors.
However, intake air temperature and throttle position (coasting or idling) also influence timing with this system.
The chief components of the digital ignition timing control are
the timing control unit (1),
the pressure sensor (3) installed in the control unit,
the temperature sensor (4),
the throttle switch (5) and
the flywheel sensor (6).

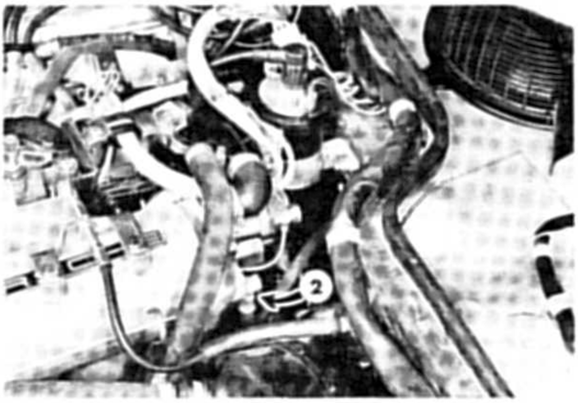


1 – Timing control unit
2 – Vacuum line
3 – Pressure sensor
4 – Temperature sensor
5 – Throttle switch
6 – Flywheel sensor
7 – Flywheel teeth
8 – Reference mark
9 – Ignition control unit
10 – Ignition coil
11 – High voltage distributor

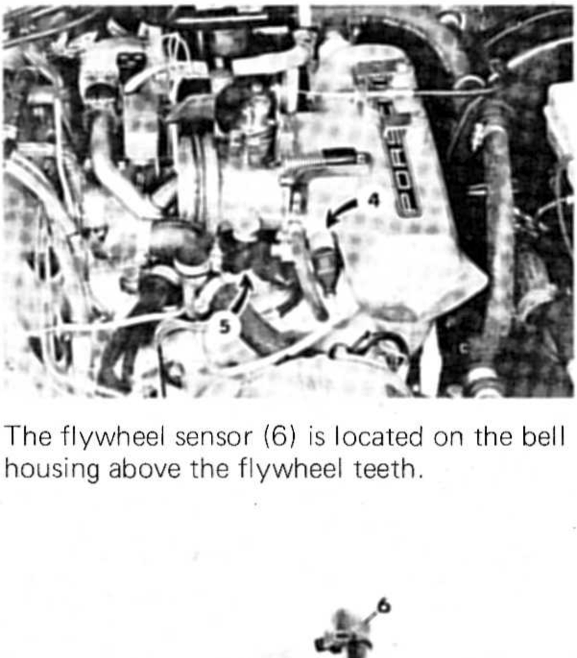
The timing control unit (1) is located underneath the center console. It has a multiple-pin plug and hose connection (2) for the pressure sensor.



Intake vacuum is taken via a threaded connection on the intake air distributor.



Throttle switch (5) and temperature sensor (4) are shown in the picture to the side.



The flywheel has an additional ring of teeth (7), and a reference mark (8).

The flywheel sensor (6) is located on the bell housing above the flywheel teeth.

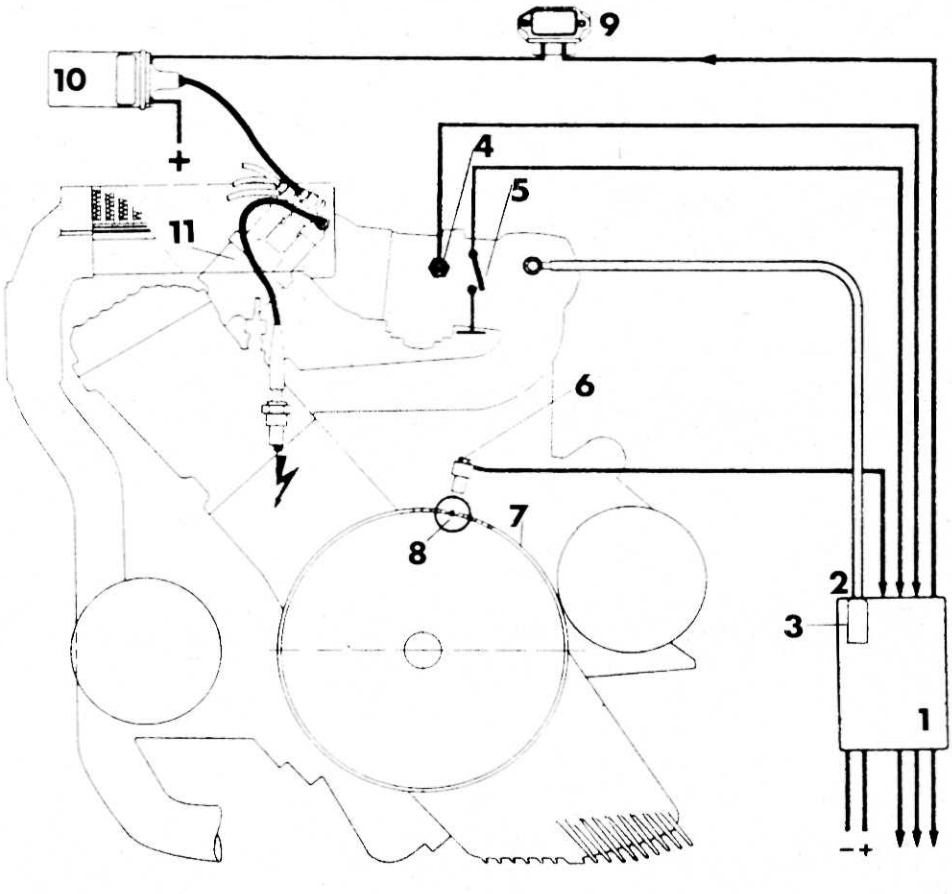
Operation

A flywheel sensor (6) is mounted on the clutch bell housing to determine engine speed and flywheel (crankshaft) position. The flywheel has a extra ring of 100 teeth (7).
Because the flywheel sensor (6) receives two voltage pulses for each of the additional flywheel teeth, it can sense every 360°/200 = 1.8° of crankshaft rotation.
One of the flywheel teeth called the "reference mark tooth" (8) has a special soft iron insert. When the "reference mark tooth" passes the flywheel sensor, it creates two voltage pulses which are stronger than those producted by the other teeth.
By counting the flywheel teeth which pass the flywheel sensor after the "reference mark tooth", the timing control unit can instantaniously calculate the crankshaft position in relation to T.D.C.

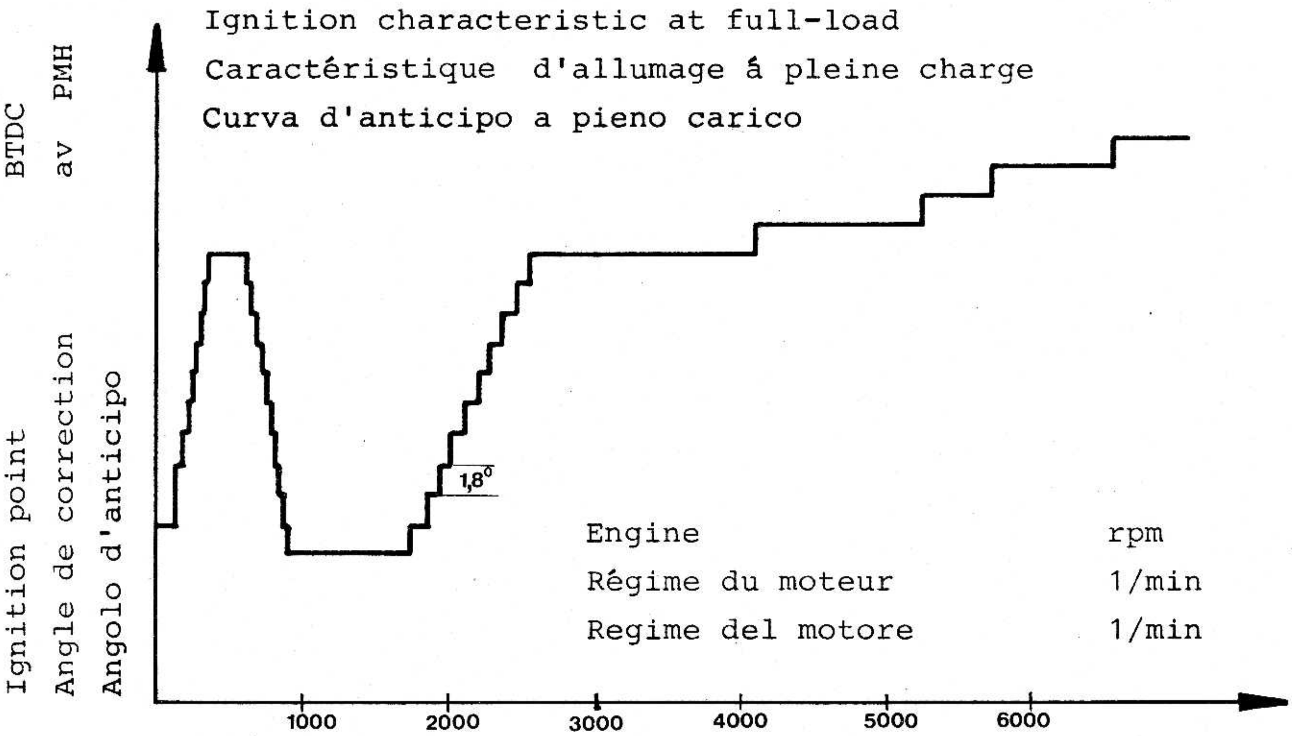
The timing control unit also calculates engine speed by counting the number of teeth which pass the flywheel sensor per time unit.

Information about engine speed, throttle position, intake vacuum, and intake air temperature is processed by the timing control unit and the correct ignition timing for these conditions is selected from the control unit's memory. When the crankshaft is at the correct position, the timing control unit sends a signal to the ignition control unit (9) which is turn switches off the primary voltage to the ignition coil (10) causing the coil to "fire".

The distributor (11) distributes the high voltage from the ignition coil to the correct spark plug.



1 – Timing control unit
2 – Vacuum line
3 – Pressure sensor
4 – Temperature sensor
5 – Throttle switch
6 – Flywheel sensor
7 – Additional ring of teeth
8 – Reference mark
9 – Ignition control unit
10 – Ignition coil
11 – Distributor



The diagram shows the basic ignition timing curve verses engine speed, without the ignition timing changes which result from input from the pressure sensor and intake air temperature sensor.

To make starting easier, the ignition timing is relatively retarded during engine cranking. As the engine starts, the timing is advanced quickly and then retards as the engine approaches idle speed. If the idle speed drops (e. g. when switching on electrical equipment or the air conditioner), the timing is advanced in order to stabilize the idle speed.

As engine speed increases above idle the timing is at first advanced quickly and then more gradually so that engine response, power output and fuel economy are optimized.

Other input data, such as intake vacuum and intake air temperature, will change the timing curve up or down depending on operating conditions.

The "reference mark tooth" eliminates the necessity for adjustment of the ignition timing.

Since the engine speed and ignition timing will change when adjusting the idle air volume, it is now necessary to make idle adjustments dependent on the ignition timing (see idle adjustments).

Idle Adjustments

The DITC (digital ignition timing control) includes idle speed regulation.

The timing control unit stabilizes the idle speed by varing the ignition timing at idle. As a result, basic idle speed adjustment must be made using an ignition timing light.

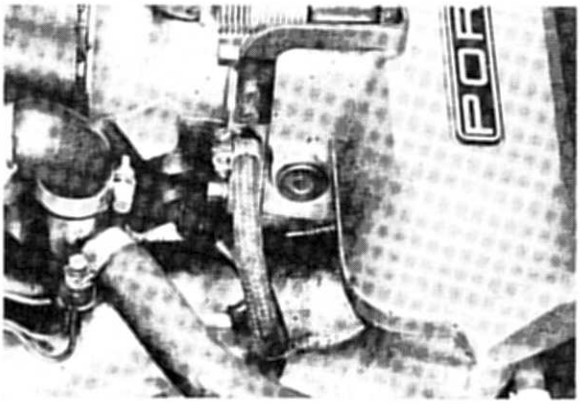
To eliminate the influence of the intake air temperature sensor, it must be removed during the idle adjustment procedure.

Adjusting

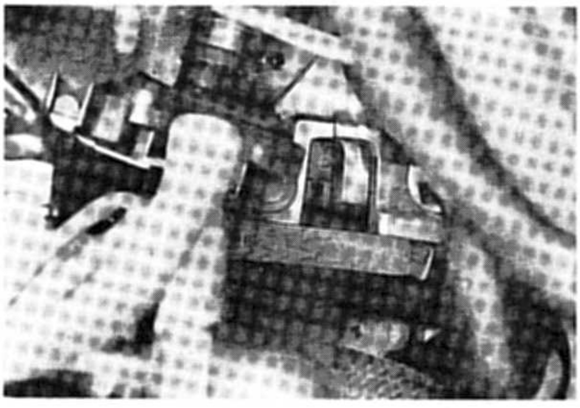
– Unscrew temperature sensor from intake manifold and place it in the fresh air tray behind the engine fire wall, leaving the wire connected (sensor temperature must be below 50 °C – 120 °F).

  A suitable plug (M 14 x 1.5) must be screwed in the opening of the intake manifold during adjustment procedures.

  Tip: Use stop screw from manual transmission 924, Part No. 088.311.721.



– Run engine to operating temperature (about 90 °C oil temperature).
– Connect CO tester according to instructions supplied with tester.
– Connect stroboscope timing light on ignition wire for cylinder no. 1.
– Turn idle control screw (bypass air screw) until ignition timing mark (dot) is fully visible at reference adge and jumps below reference mark partially.
– The speed **should then be below 900 rpm** (timing will vary slightly because the ignition timing is being regulated).

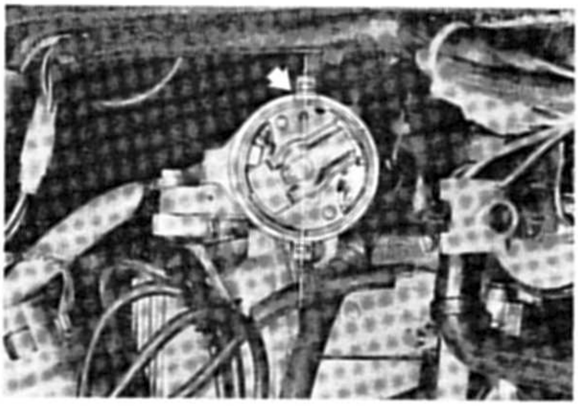


If necessary, the CO level must be corrected parallel to the idle speed adjustment (as previously). No electric equipment should be switched on during adjustments.

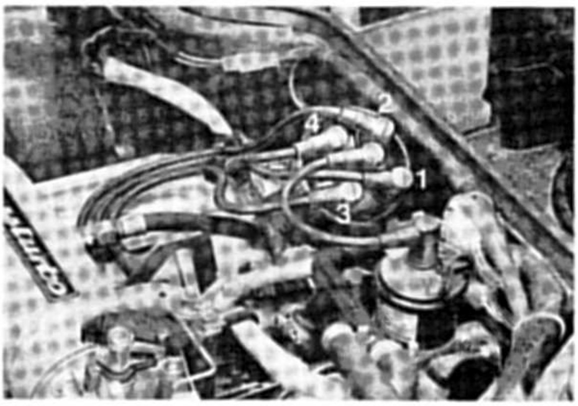
Notes on Removal and Installation of Distributor

– Set cylinder no. 1 to TDC (Z 1 mark on flywheel must align with reference edge on clutch bell housing and mark on camshaft sprocket must be opposite valve cover.

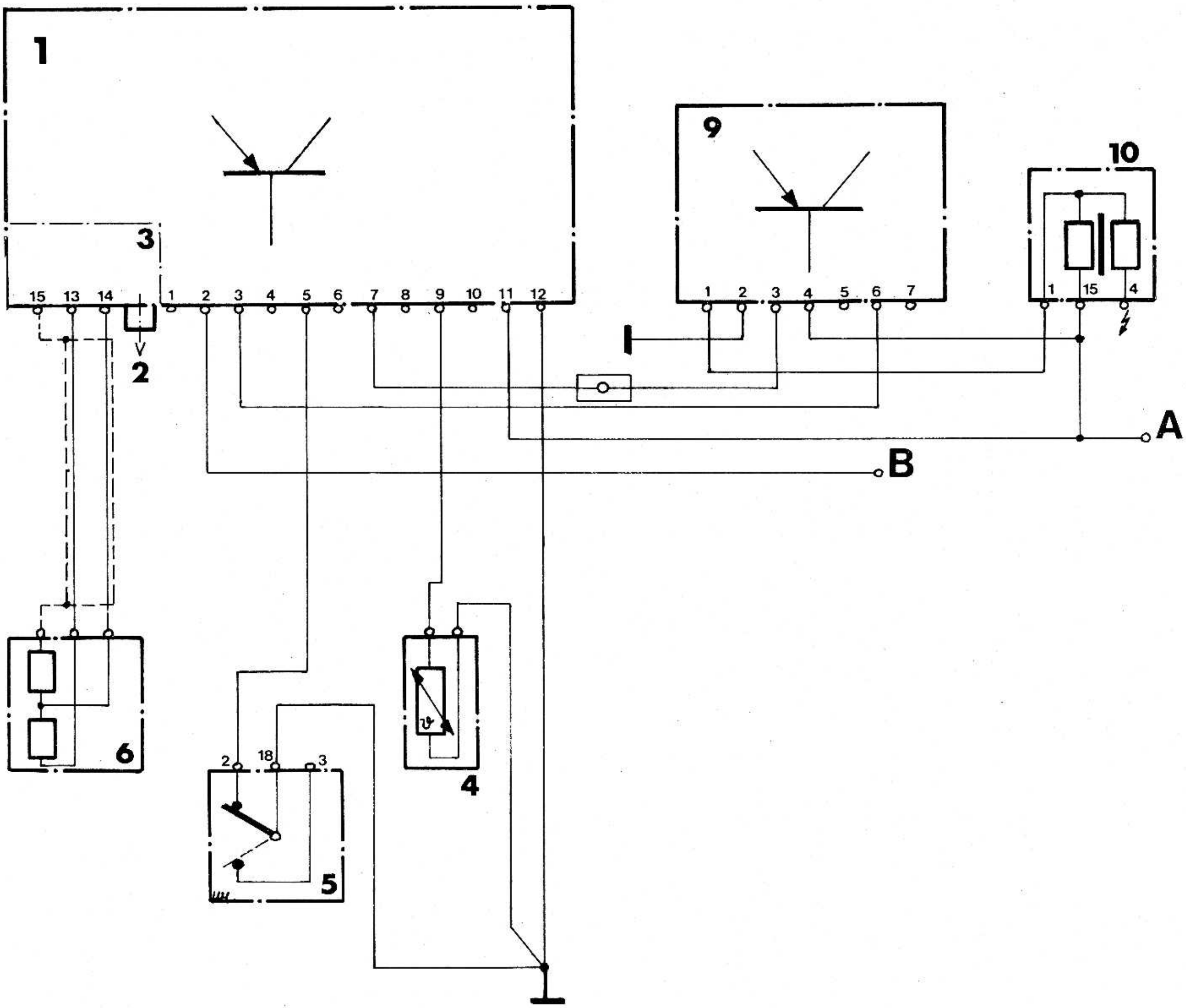
– The distributor must be installed so that tab for distributor cap faces flywheel and mounting clips face in direction of car's longitudinal axis.
The distributor rotor must be mounted so that it faces mark for cylinder no. 1 on the distributor housing.



– Make sure ignition wires are connected correctly.



DITC Wiring Diagram



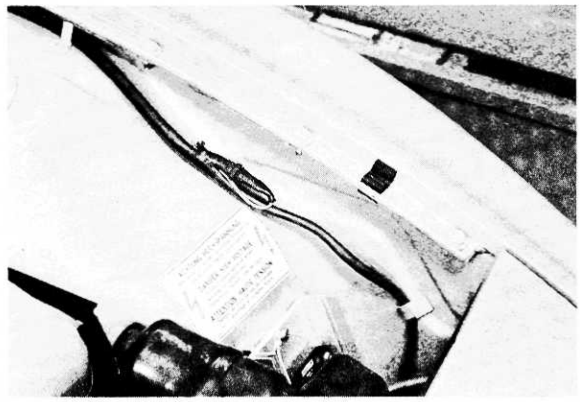
1 – Timing control unit
2 – (DITC) line conn.
3 – Integral pressure sensor
4 – Temperature sensor
5 – Throttle switch
6 – Flywheel sensor
7 –
8 –
9 – Ignition control unit
10 – Ignition coil

A – Ignition switch term. 15
B – Tachometer term. 1

Miscellaneous Information

- The ignition timing will only change depending on the speed with a closed throttle and intake air temperatures below 50 – 60 °C (120 – 140 °F).

- A wire plug connection can be seen in the engine compartment on the left wheel housing. If it is disconnected, the entire ignition timing will be retarded by about 7°.
  This plug can be disconnected, if necessary, in countries with poor quality gasoline in order to eliminate detonation.



- If the temperature sensor fails or the wire is pulled off, the ignition timing will be retarded. Also when making idle adjustments, make sure sensor temperature is below 50 °C (120 °F) (see idle adjustments).

- If the pressure sensor of the control unit fails or the pressure hose is disconnected or leaks, the ignition timing will be advanced. Consequently always be sure of tight connections and correct routing of pressure hose!

- If the throttle switch fails or a wire is pulled off, there will be no ignition retard during starting or coasting, and the idle speed will be too high.

- If the flywheel sensor fails, the entire ignition system will not operate.

The engines for USA and Canada have the ignition system "DITC" in conjunction with the oxygen sensor system. The circuitry of the oxygen sensor control unit has been changed because of this modification and the revised oxygen sensor system operation.

The former speed relay has been omitted. This relay is replaced by an acceleration enrichment control unit (18). This control unit performs the function of the former speed relay and also has a circuit for cold engine acceleration enrichment.

The water temperature switch (12) installed in the coolant return hose near cylinder no. 4 is new. It activates control unit (18) below 60 °C / 35 °C (140 °F / 95 °F).

The former throttle micro-switches replaced by a new switch housing with three built-in contacts. The switching points are

1° throttle angle = activation of DITC and control unit for acceleration enrichment,

7° throttle angle = idle switch for oxygen sensor system and activation of control unit for acceleration enrichment

66° throttle angle
or > 3500 rpm = full throttle enrichment

Throttle switch with 3 integral contacts

Operation of Acceleration Enrichment

There will only be a fuel/air mixture enrichment during acceleration when the coolant temperature is below 60 °C / 35 °C (140 °F / 95 °F) and the sensor temperature is below about 250 °C (480 °F) (during warm-up). If the temperature value is exceeded in the one or the other case there will be no acceleration enrichment.

If the throttle is opened, control unit (18) will be activated at throttle angle of 1° or 7°. Control unit (18) puts out a voltage signal to oxygen sensor control unit (19), which increases the duty cycle to 75 % for about 2.5 seconds. The fuel/air mixture will be enriched during this time.

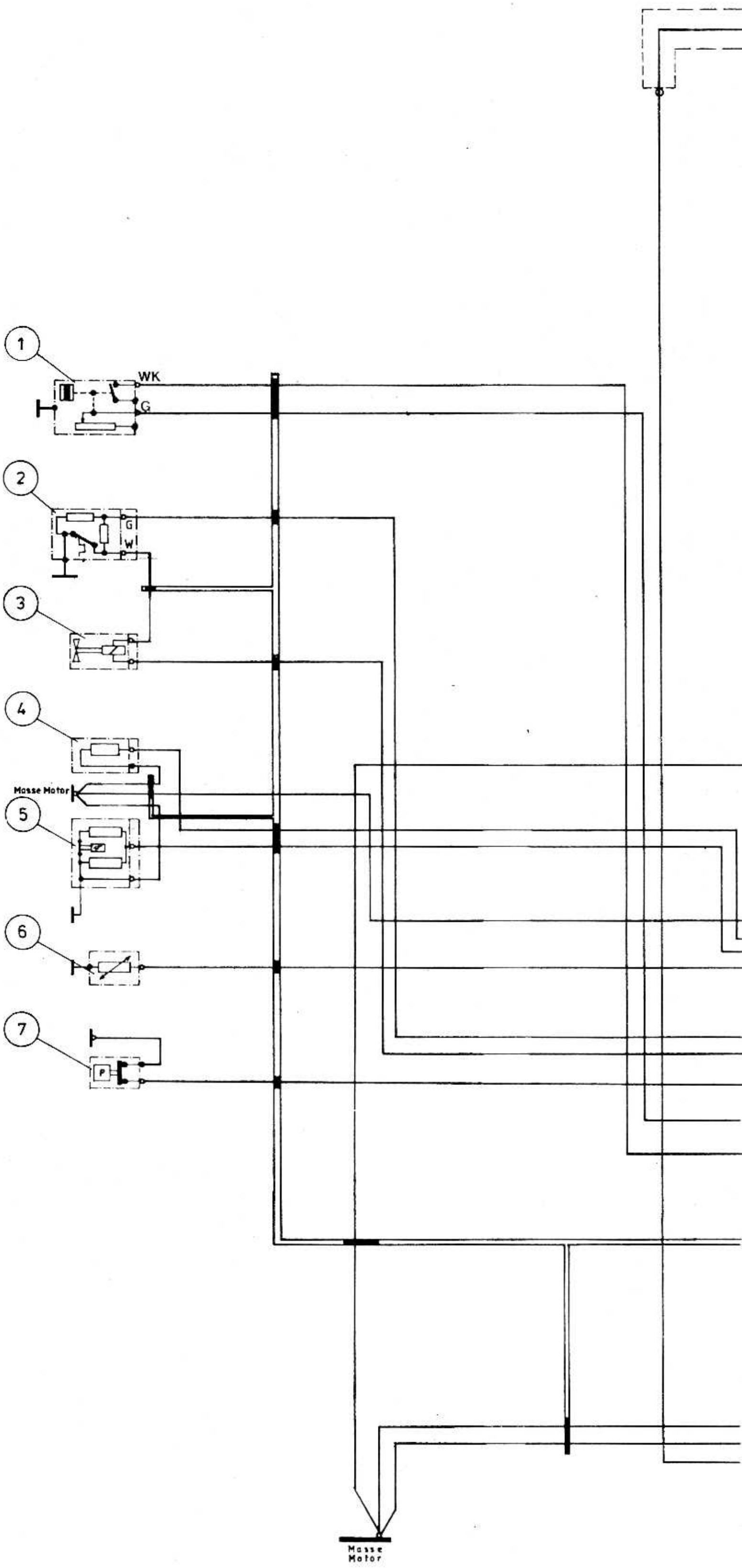
Operation Chart   < = less than; > = more than

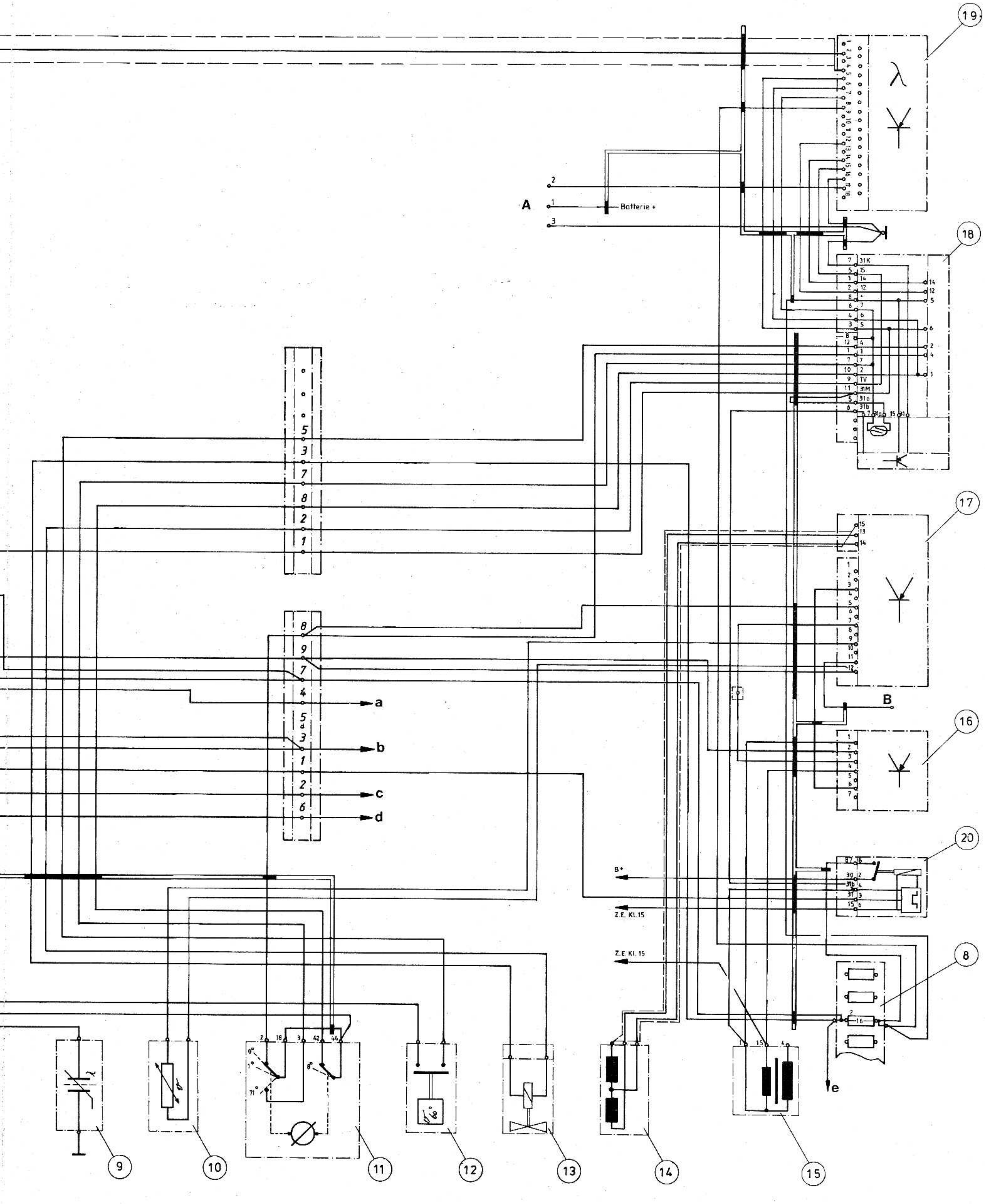
Engine Temperature	Sensor	Throttle Angle	Speed	Duty Cycle: Constant Throttle Angle	Duty Cycle: (as throttle is opened passed 1° or 7°)
< 60° / 35 °C	cold	0° ... 66°	< 3500	50 %	75 %
		66° ... full throttle	< 3500	65 %	75 %
		0° ... full throttle	> 3500	65 %	75 %
	warm	0° ... 66°	< 3500	control	control
		66° ... full throttle	< 3500	65 %	65 %
		0° ... full throttle	> 3500	65 %	65 %
> 60° / 35 °C	cold	0° ... 66°	< 3500	50 %	50 %
		66° ... full throttle	< 3500	65 %	65 %
		0° ... full throttle	> 3500	65 %	65 %
	warm	0° ... 66°	< 3500	control	control
		66° ... full throttle	< 3500	65 %	65 %
		0° ... full throttle	> 3500	65 %	65 %

Wiring Diagram 924 Turbo (USA, Canada) – Ignition System and Oxygen Sensor System

1 – Oil pressure sensor
2 – Thermo-time switch
3 – Cold start valve
4 – Auxiliary air regulator
5 – Control pressure regulator
6 – Coolant temperature sensor
7 – Boost pressure limit switch
8 – Fuse panel, 9-pin
9 – Oxygen sensor
10 – Intake air temperature sensor
11 – Throttle switch
12 – Coolant temperature switch (new)
13 – Frequency valve
14 – Flywheel sensor
15 – Ignition coil
16 – Ignition control unit
17 – Timing control unit
18 – Acceleration enrichment control unit (new)
19 – Oxygen sensor control unit
20 – Fuel pump relay with rpm limiter

A – Test plug connection
B – To central electric board plug C 15
a – Coolant temperature gauge
b – Ignition switch term. 50
c – Oil pressure gauge
d – Oil pressure indicator light
e – Fuel pump





19
18
17
16
20
8
A
Batterie +
B
a
b
c
d
e
B+
Z.E. Kl.15
Z.E. Kl. 15
31K
31M
31a
31b
TV
9
10
11
12
13
14
15

Engine

The engine's power output is 115 kW / 154 SAE net H. P.; formerly 110 kW (143 SAE net H. P.).

The pistons have a centric recess. Because of the new pistons the compression ratio is now 8.0 : 1 (formerly 7.5 : 1).

The mixture control unit (fuel distributor and air flow sensor) is not different in tuning than that of 1980 model year.

The air flow sensor for USA cars is new.

The 924 Turbo engines for USA have an antitamper plug for the CO adjustment. The bore providing access to the CO adjusting screw in the air-flow sensor is plugged with a 6 mm dia. steel ball (as for the normal 924 engine).

Air flow sensor code: 0438 120 152.

Note:

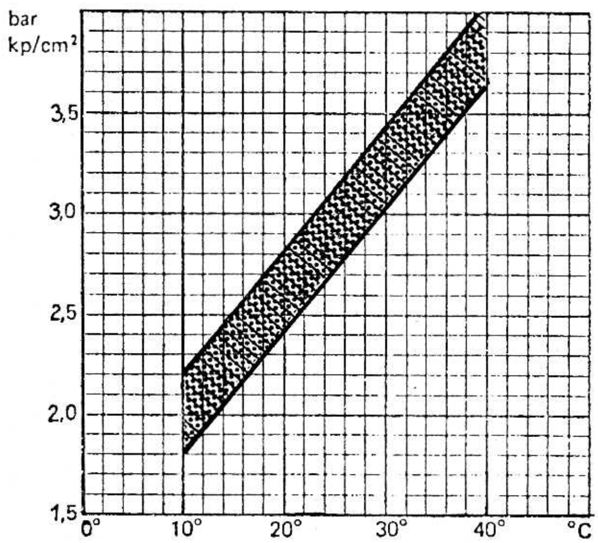
The Canada version cars don't have an antitamper plug (adjustments as before).

New control pressure regulator with temperature switch (see 924 USA for description of Operation).

Diagram for Control Pressure

Control pressure "cold"
(equalling outside temperature)

Part No.: 931.606.105.01
Bosch Code: 0438 140 091



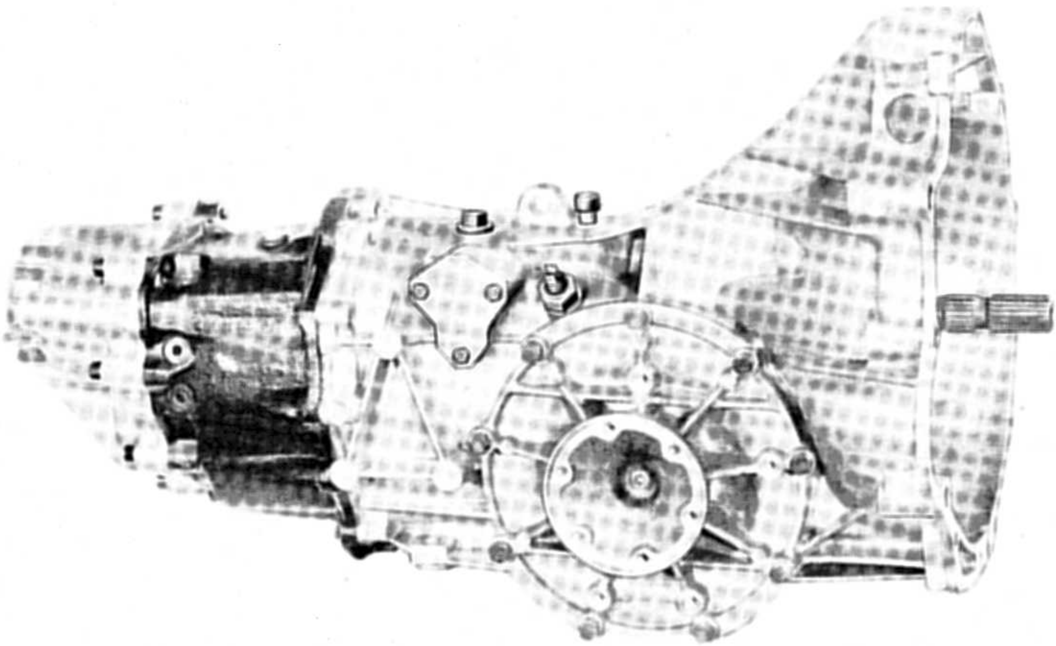
Drive Shaft/Central Tube Assembly

The Drive shaft is stronger and has a diameter of 25 mm (runs on 4 bearings as previously). The guide bearings in the central tube have been adapted to the 25 mm drive shaft diameter.

Transmission

The 924 Turbo for 1981 is equipped with the five speed manual transmission from the 1980 924 with several modifications.

Transmission Type 016 G MB = for USA, Canada



Differences with 924 Manual Transmission 016/9 MF

- Input shaft stronger with 25 mm dia. for connection to 25 mm dia. drive shaft
- Input shaft runs in 4 bearings
- New seal for input shaft to match changed shaft diameter. Sealing tube for input shaft/ transmission case omitted
- New transmission case revised for 4 bearing input shaft
- Pinion/gear ring ratio 9/35
- 3rd gear ratio 24/35
  4th gear ratio 28/31

PORSCHE

- Survey of Engine, Transmission and Chassis Numbers

- Full Throttle, Transmission and Acceleration Diagrams

- Specifications

- Adjusting Values, Survey of Equipment

924

924 turbo

As of the 1981 model year (B program) all cars will have an internationally uniform 17-digit chassis number.

Explanation of Digits

e. g. Chassis No.	W P O	Z Z Z	9 2	Z	B	N	4	5	0 0 0 1
	1 2 3	4 5 6	7 8	9	10	11	12	13	14 15 16 17

Digits	Explanation
1 2 3	World Make Code
4 5 6	VDS Code USA
7 8	1st and 2nd digits of code
9	Test number
10	Model year (B = 1981)
11	Manufacturing location
12	3rd digit of type
13	Code for body and engine
14 15 16 17	Serial number

II) Engine Numbers (8 Digits) **924 – Normal Engine**

XK 000001 – and on
XJ 000001 – and on
VC 000001 – and on

- 000001: Continuous serial number for same code letter
- XK / XJ / VC: Code letters for engine version (same for manual or automatic transmission)
  - XK = Europe, R. o. W. (LHD)
  - XJ = Europe, R. o. W. (RHD)
  - VC = USA, Canada, Japan

III) Transmission Numbers (7 Digits)

MD XX XX O
MF XX XX O
ME XX XX O
RK XX XX O
RL XX XX O

- O: Calender year ⎤
- XX (second): Month ⎬ Manufacturing date
- XX (first): Day ⎦
- MD / MF / ME / RK / RL: Code letters
  - MD = 016/8 5 speed manual transm. (9/35) Europe, R. o. W.
  - MF = 016/9 5 speed manual transm. (9/37) USA, Canada
  - ME = 016/9 5 speed manual transm. (9/37) Japan
  - RK = 087.3 Autom. transm. (11/38) Europe, R. o. W.
  - RL = 087.6 Autom. transm. (11/41) USA, Calif., Canada, Japan

924 Turbo and 924 Carrera GT – Engine and Transmission Number Ranges

II) Engine Numbers (8 Digits)

31 03 0001 – 9999 Europe, R. o. W. (LHD and RHD)
31 04 0001 – 9999 USA, California, Canada, Japan

- 0001 – 9999: Serial number
- 31 03 / 31 04: Type code
  - 31/03 = 130 kW (177 HP)
  - 31/04 = 115 kW (156 HP)

III) Transmission Numbers (9 – 11 Digits)

31 01 00001 (12) – 99999
016 G 00001 – 99999

- 00001 – 99999: Serial number
- (12): Limited slip differential M 220
- 31 01 / 016 G: Type code
  - 31/01 = 5 speed manual transm. (8/33) Europe, R. o. W.
  - MB = 016 G = 5 speed manual transm. (9/35) USA, Canada, Cal.
  - MX = 016 G = 5 speed manual transm. (9/35) Japan

Transmission Diagram

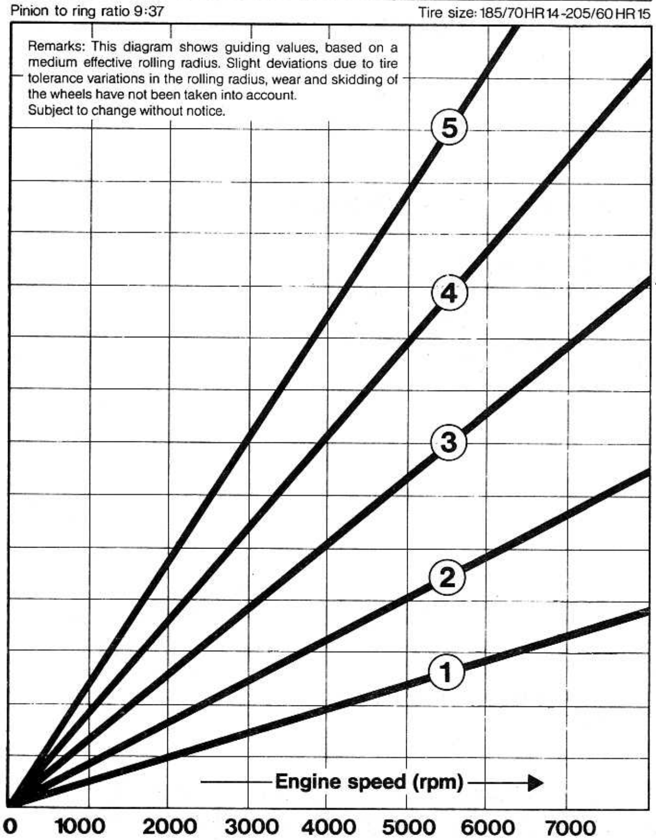
924

5-speed-transmission

USA

Pinion to ring ratio 9:37

Tire size: 185/70 HR 14 - 205/60 HR 15

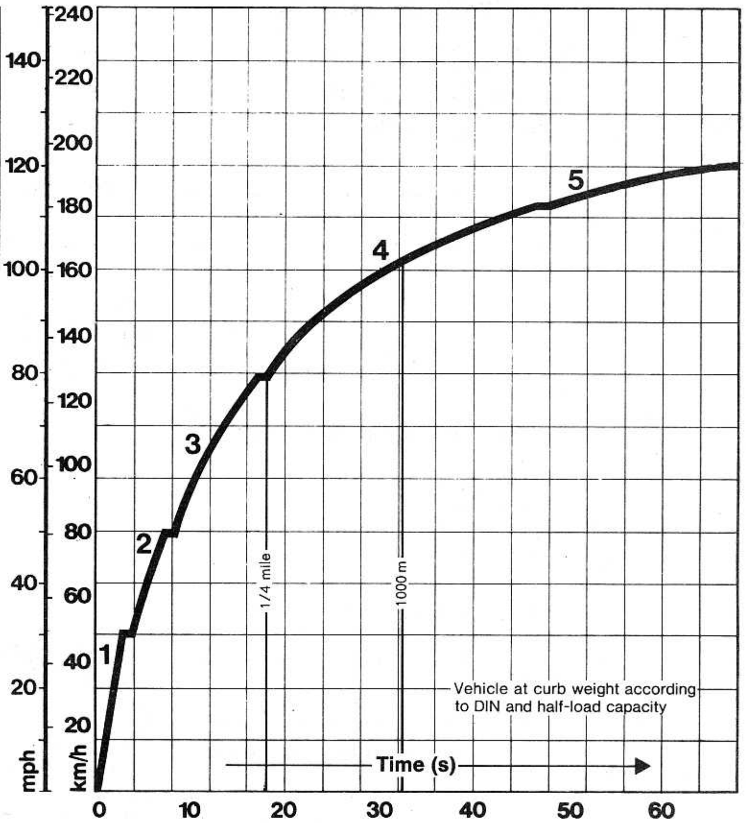


Acceleration Curve

924

5-speed-transmission

USA



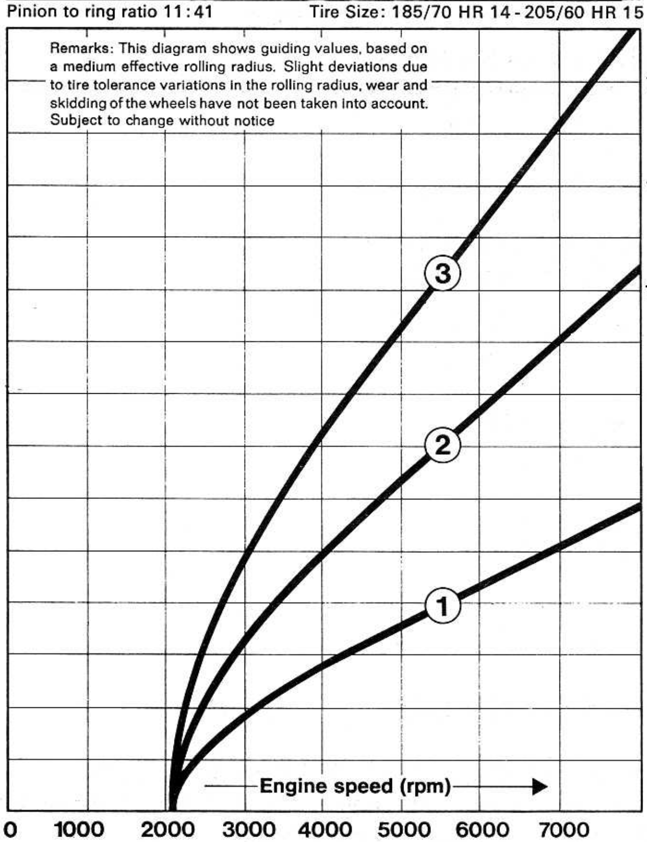
Transmission Diagram

924

Automatic

Pinion to ring ratio 11:41

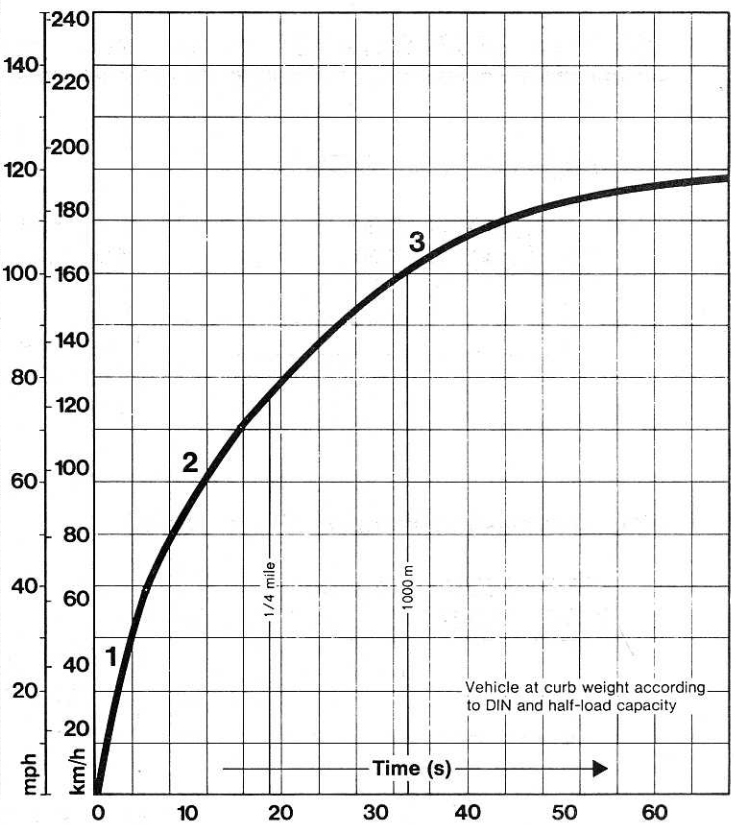
Tire Size: 185/70 HR 14 - 205/60 HR 15



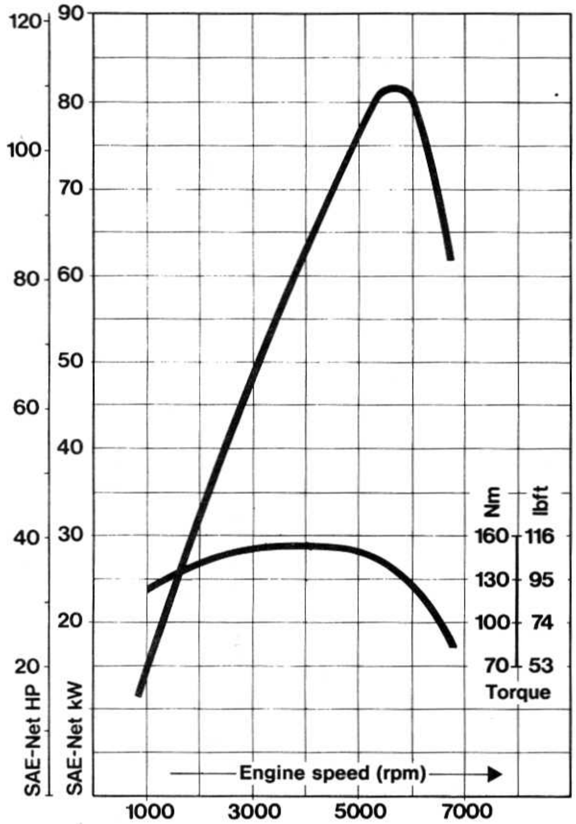
Acceleration Curve

924

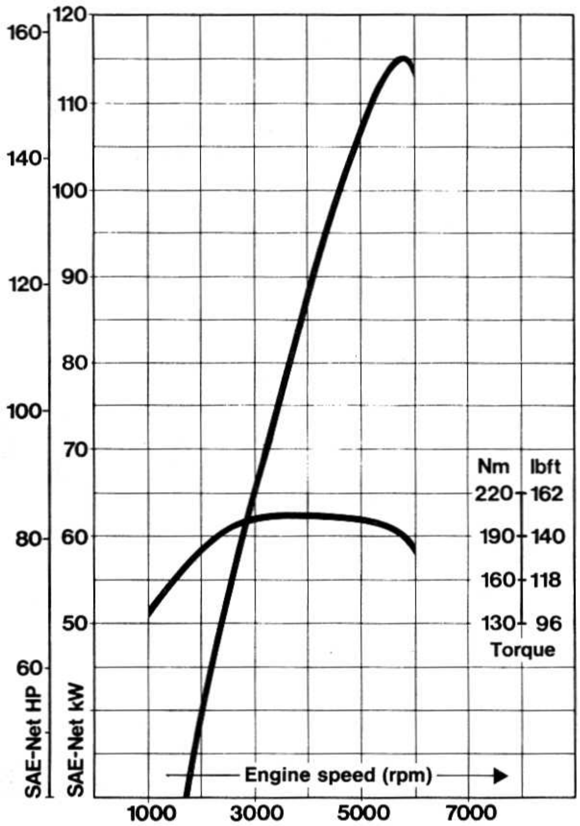
Automatic



Full-power Curve 924



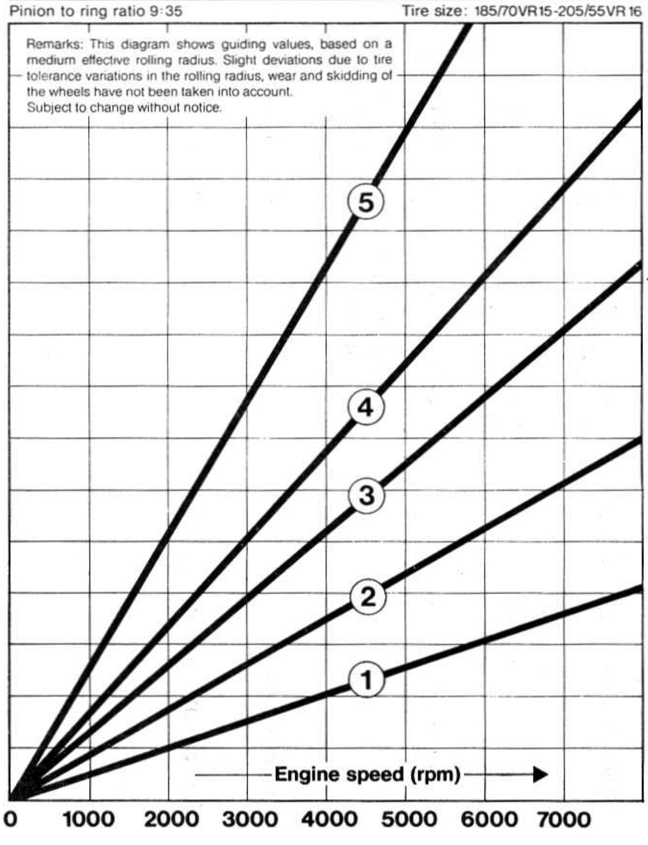
Full-power Curve 924 turbo USA



Transmission Diagram 924 turbo USA

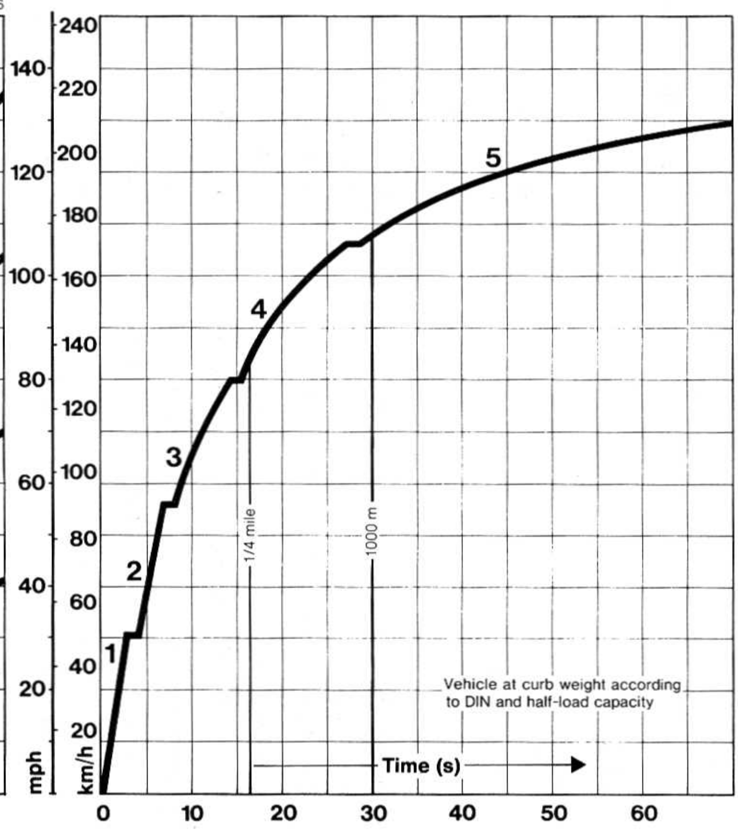
5-speed-transmission

Pinion to ring ratio 9:35 Tire size: 185/70VR15-205/55VR16



Acceleration Curve 924 turbo USA

5-speed-transmission



MOTOR

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Type	924	924 XK, 924 XJ as RHD	924 VC	M 31/03	M 31/04
Number of cylinders		4	=	=	=
Bore	mm/in.	86.5/3.41	=	=	=
Stroke	mm/in.	84.4/3.32	=	=	=
Total displacement	cm^3/cu. in.	1984/121.06	=	=	=
Compression ratio		9.3 : 1	9.0 : 1	8.5 : 1	8.0 : 1
Max. engine power, DIN 70020	kW/HP	92/125	85/115	130/177	115/156
at engine speed	rpm	5800	5750	5500	5750
Max. torque, DIN 70020	Nm/kpm	165/16.8	156/15.9	250/25.5	210/21.4
at engine speed	rpm	3500	3500	3500	3500
Max. liter output, DIN 70020	kW l/HP l	46/63	43/58	65.5/89.2	58/78.6
Max. permissible engine speed	rpm	6500	6500	6500	6500
Engine weight (dry)	kg	136	142	165	165
Valve play, cold, approx. 20 °C	Intake	0.10 mm	=	=	=
	Exhaust	0.40 mm	=	=	=
operating temperature	Intake	0.20 mm	=	=	=
	Exhaust	0.45 mm	=	=	=
Timing with 1 mm valve play	Intake opens	6° before TDC	=	=	=
	Intake closes	42° after BDC	=	=	=
	Exhaust opens	47° before BDC	=	=	=
	Exhaust closes	2° after TDC	=	=	=
Engine cooling		Closed coolant system, electric fan with temperature switch			
Coolant thermostat, opens at		87 °C	=	=	=

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
ELECTRIC EQUIPMENT					
Battery		12 V 45 Ah 12 V 63 Ah (opt. extra)	=	=	=
Alternator		1050 W/75 A	=	=	=
Ignition		TCI (breakerless transistor ignition)	= with EIS	DITC (fully electronic transistor ignition)	=
Spark plug caps		without series spark	=	with series spark	=
Firing order		1–3–4–2	=	=	=
Basic ignition timing setting		10° before TDC	TDC, with vacuum, EIS pulled off and bridged	8 – 14° before TDC	6 – 10° before TDC
at engine speed	rpm	950 ± 50 (idle speed)	759 – 800 (Japan 3° after TDC/ 950 rpm)	900 (idle speed)	900 (idle speed)
Spark plugs	Bosch	W 5 D/ W 5 DC	WR 6 DS	W 3 DP/ W 4 CS	WR 6 DS
	Beru	14 – 5 D 14 – 5 DU	RS 37	14 – 4 CS	–
	Champion	–	–	N 3 G	N 7 GY
Electrode gap	mm	0.7 + 0.1	=	0.6 – 0.7	0.7
Drive belt	mm	9.5 x 888	=	9.5 x 1050	=
Engine lubrication		Forced circulation with pump, oil filter in full flow	=	Forced circulation with pump, oil filter and oil cooler in full flow	=
Oil pressure		n = 5000 rpm up to approx. 6 bar, at 80 – 100 °C	=	=	=
Exhaust system		Twin pipes up to primary muffler, center and final mufflers	Twin pipes up to catalytic converter, then center and final mufflers	Turbocharger, single pipe up to primary muffler, primary and final mufflers, bypass valve for charge pressure control	=

EIS = Electronic Idle Stabilizer
DITC = Digital Ignition Timing Control

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Emission control		not applicable	oxygen sensor with 3-way catalytic converter	not applicable	oxygen sensor with 3-way catalytic converter
FUEL SYSTEM		CIS (cont. fuel injection)	=	=	=
Fuel delivery		2 electric pumps, of which 1 is in tank	=	=	=
Fuel grade	RON	98, premium acc. to DIN 51600	91, leadfree	98, premium acc. to DIN 51600	91, leadfree
Fuel consumption DIN 70030		5-speed / Autom.	5-speed / Autom.	5-speed manual transm.	5-speed manual transm.
a) at 90 km/h (constant)	l/100 km	6.6 / 7.4		6.7	
b) at 120 km/h (constant)	l/100 km	8.1 / 8.2		8.6	
c) EC driving test	l/100 km	12.4 / 12.8		11.3	
d) average (a + b + c divided by 3)	l/100 km	9.0 / 9.8		8.9	
POWER TRANSMISSION					
Via input shaft		20 mm dia. 4 bearings	=	25 mm dia. 3 bearings	25 mm dia. 4 bearings
5-speed manual transmission		016/8 MD	016.9 MF (USA, Canada) 016.9 ME (Japan, without crash guard)	G 31/01	016 G MB (USA, Canada) 016 G MX (Japan, without crash guard)
Transmission ratios	1st gear	(10/36) = 3.6000 : 1	=	(12/38) = 3.166 : 1	(10/36) = 3.6000 : 1
	2nd gear	(16/34) = 2.1250 : 1	=	(18/32) = 1.777 : 1	(16/34) = 2.1250 : 1
	3rd gear	(24/35) = 1.4583 : 1	(25/34) = 1.3600	(23/28) = 1.217 : 1	(24/35) = 1.4583 : 1
	4th gear	(28/31) = 1.1071 : 1	(30/29) = 0.9667	(29/27) = 0.931 : 1	(28/31) = 1.1071 : 1
	5th gear	(35/30) = 0.8571 : 1	(37/27) = 0.7297	(34/24) = 0.706 : 1	(37/27) = 0.7297 : 1
	Reverse gear	(12/42) = 3.5000 : 1	=	(22/38–12/16) = 2.909 : 1	(12/42) = 3.5000 : 1
Final drive ratio		(9/35) = 3.889 : 1	(9/37) = 4.1111	(8/33) = 4.125 : 1	(9/35) = 3.8889 : 1
Clutch		Single plate dry clutch with diaphragm spring in pressed version and mech. operation via cable	=	Single plate dry clutch with hydraulic operation in pulled version	=

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Pressure plate/clutch plate		MF 215 K/215 PSD	=	MFZ 225/GUD 225	MFZ 225/TD 225

A limited slip differential (locking factor 40 %) is available as optional extra equipment for the 924 Turbo and 924 Carrera GT

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Automatic Transmission/Type		RK	RL	not applicable	not applicable
Number of gears		3 forward, 1 reverse parking lock	=		
Transmission ratios	Range 1	2.551 : 1	=		
	Range 2	1.448 : 1	=		
	Range 3	1.000 : 1	=		
	Reverse	2.461 : 1	=		
Final drive ratio		3.454 : 1 (11/38)	3.7272 (11/41)		
Clutch		hydrodynamic torque converter, 244 mm dia.	=		
Stall speed	rpm	2500 ± 200	2450 ± 200		

PERFORMANCE

at DIN curbweight plus 1/2 payload
Automatic transmission in ( )

	924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Top speed	204 (195) km/h	120 (116) mph/ 192 (185) km/h	230 km/h/ 143 mph	134 mph/ 215 km/h
Acceleration 0 – 100 km/h / 0 – 62 mph	9.6 (11.4) seconds	11.2 (13.0) seconds	7.7 seconds	9.3 seconds
Kilometer from standing start	30.5 (32.2) seconds	32.3 (33.6) seconds	27.9 seconds	29.8 seconds
1/4 mile from standing start		17.8 (18.4) seconds		16.2 seconds

HILL CLIMBING ABILITY

(calculated values for DIN curbweight and 1/2 payload)
Automatic transmission ( )

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
1st gear	%	approx. 59 (34)	approx. 57 (60)	approx. 60	approx. 60
2nd gear	%	approx. 32 (17)	approx. 30 (30)	approx. 38.5	approx. 38.5
3rd gear	%	approx. 21 (9)	approx. 18 (11)	approx. 23.5	approx. 23.5
4th gear	%	approx. 14	approx. 11.5	approx. 16	approx. 16
5th gear	%	approx. 9.5	approx. 7	approx. 9.5	approx. 9.5

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
RUNNING GEAR					
Front axle		Independent wheel suspension from control arms and spring struts (Mc Phearson) – negative scrub radius –	=	=	=
Suspension		Each wheel one coll spring coaxial with shock absorber	=	=	=
Stabilizer	Standard	21 mm dia.	=	23 mm dia.	21 mm dia.
	Optional extra	23 mm dia.	=	–	23 mm dia.
Steering wheel	Standard	380 mm dia., 2 spokes	=	380 mm dia., 3 spokes	=
	Optional extra	380 mm dia., 3 spokes 360 mm dia., 4 spokes	= =	360 mm dia., 4 spokes –	= –
Steering wheel ratio in center		19.15 : 1	=	22.39 : 1	19.15 : 1
No. of steering wheel turns from lock to lock		4.02	=	=	=
Rear axle		Independent wheel suspension from trailing arms	=	=	=
Torsion bar		23.5 mm dia.	=	=	=
Stabilizer	Standard	none	=	14 mm dia.	none
	Optional extra	14 mm dia.	=	–	14 mm dia.
Spacers per wheel	Standard	none	=	21 mm	none

BRAKES

		924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Service brakes (foot-operated)		hydraulic dual circuit brake system with diagonal division, brake booster, front axle with sliding caliper disc brakes, rear axle with simplex drum brakes	=	hydraulic dual circuit brake system with diagonal division, brake booster, inboard vented sliding caliper brake discs on front and rear axles	Standard: as 924 Europe, Rest of World Optional extra: as 924 Turbo Europe, Rest of World
Brake booster dia.		9″	=	=	=
Master cylinder dia.		23.81 mm	=	=	=
Brake disc dia.	front/rear	257 mm/ rear drum brakes	=	282.5/289 mm	257 mm/ rear drum brakes
Brake disc thickness	front/rear	13 mm/ rear drum brakes	=	20.5/20.0 mm	13 mm/ rear drum brakes
Brake pad surface per wheel	front/rear	65/170 cm^2	=	92/63 cm^2	65/170 cm^2
Piston dia. in brake caliper	front/rear	48/19.05 mm (wheel brake cylinder)	=	54/36 mm	48/19.05 mm (wheel brake cylinder)
Parking brake (hand-operated)		mechanical action on both rear wheels (drum brakes)	=	=	=
Parking brake drum dia.		230 mm	=	180 mm	230 mm
Brake shoe width		38.6 mm	=	25 mm	38.6 mm
Brake shoe surface per wheel		170 cm^2	=	85 cm^2	170 cm^2

	924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
WHEEL RIMS, TIRES				
Standard tires	185/70 HR 14 on 6 J x 14 rims front and rear	=	185/70 VR 15 on 6 J x 15 rims front and rear	185/70 VR 15 on 6 J x 15 (4-hole) front and rear
Special tires	205/60 HR 15 on 6 J x 15 rims front and rear	=	205/55 VR 16 on 6 J x 16 rims front and rear	205/55 VR 16 on 6 J x 16 (5-hole) front and rear
Tire pressure (for all road speeds, cold tires)	2.0 bar front and rear	=	front 2.0 bar rear 2.5 bar collapsible tire front and rear 2.2 bar	= = =
WEIGHTS (acc. to DIN 70020)				
Curbweight	1130 kg	1185 kg/2612 lbs.	1180 kg	1260 kg/2779 lbs. (incl. all M equipment)
Permissible total weight	1450 kg	1500 kg/3307 lbs.	1500 kg	1550 kg/3418 lbs.
Permissible front axle load *	650 kg	660 kg/1455 lbs.	660 kg	700 kg/1544 lbs.
Permissible rear axle load *	850 kg	880 kg/1940 lbs.	880 kg	900 kg/1985 lbs.
Payload	320 kg	315 kg/ 694 lbs.	320 kg	290 kg/ 639 lbs.
Permissible trailer load without brakes **/***	500 kg	500 kg/1102 lbs.	500 kg	not applicable
Permissible trailer load with brakes **/***	800 kg	800 kg/1764 lbs.	1200 kg	not applicable
Permissible tractive weight	2250 kg	2200 kg/4850 lbs.	2700 kg	not applicable
Permissible roof load */***	35 kg	35 kg/ 77 lbs.	35 kg	35 kg/ 77 lbs.
Permissible drawbar load ***	40 ± 10 kg	40 ± 10 kg/ 88 ± 22 lbs.	40 ± 10 kg	not applicable

* Max. permissible total weight may not be exceeded. Important: payload will be reduced accordingly when installing extra equipment (air conditioner, etc.).

** Up to 12 % gradients.

*** Only applicable when using original Porsche spare parts.

FILLING CAPACITIES

	924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Engine	Total oil volume approx. 4.5 + 0.5 liters (as measured with oil dipstick)		approx. 5.5 liters	=
	Difference volume between min. and max. marks on dipstick = approx. 1.2 liters		approx. 1.6 liters	=
	Brand name HD oil for internal combustion engines conforming with API Classification SE or SF. For all year operation (oil change every 10,000 km) MULTIGRADE OIL of viscosity SAE 15 W-40 (after approval) or in summer SAE 30, in winter SAE 20 for constant temp. – 15 °C to 0 °C SAE 20 W 20, SAE 10 W for temp. below – 15 °C		=	=
Cooling system, including heater	approx. 7 liters of coolant plant antifreeze for protection to –25 °C (Northern Countries to –35 °C)	=	=	=
Manual transmission and differential	approx. 2.5 ltr. of hypoid gear lube SAE 80 W-90 of API Classification GL 4 (MIL-L 2105)	=	approx. 2.5 ltr. of hypoid gear lube SAE 90 of API Classification GL 5 (MIL-L 2105 B)	approx. 2.5 ltr. of hypoid gear lube SAE 80 W-90 of API Classification GL 4 (MIL-L 2105)
Automatic transmission	Total volume 6 liters of ATF DEXRON B, converter volume approx. 3.5 liters, watch mark on oil filling tank, final drive approx. 1 liter SAE 90 GL 5 (MIL-L 2105 B) (service life filling)		not applicable	not applicable
Fuel tank	approx. 62 liters of which 9 in reserve	=	approx. 84 liters of which 7 in reserve	approx. 62 liters of which 9 in reserve
Brake fluid tank	approx. 0.2 liter. Only use brake fluid specified in SAE J 1703 or DOT 3	=	=	=
Windshield washer and headlight cleaners	approx. 6.0 liter	=	=	=

DIMENSIONS (at DIN curbweight)	924 Europe, Rest of World	924 USA, Canada, Japan	924 Turbo Europe, Rest of World	924 Turbo USA, Canada, Japan
Wheelbase	2400 mm	2400 mm/94.488 in.	=	=
Front track width	1418 mm	1418 mm/55.886 in.	=	=
Rear track width	1372 mm	1372 mm/54.015 in.	1392 mm/54.803 in.	1375 mm Standard/ 1394 mm M-equip-ment
Length	4212 mm	4320 mm/170.078 in.	4212 mm/165.826 in.	4320 mm/170.078 in.
Length with light alloy bumper and impact absorbers (optional extra)	4290 mm	–	4290 mm/168.898 in.	–
Width	1685 mm	1685 mm/66.338 in.	=	=
Height	1270 mm	1270 mm/49.999 in.	=	1273 mm/50.118 in.
Ground clearance (at max. total weight)	125 mm	125 mm/ 4.921 in.	120 mm/4.724 in.	125 mm/4.921 in.
Curved road surface clearance	48 mm	48 mm/ 1.889 in.	=	–
Front overhang angle, limited by front spoiler (at max. total weight)	19.7°	20°	20°	20°
Rear overhang angle, limited by exhaust (at max. total weight)	15°	15°	16.4°	16.4°

Adjusting Values / Survey of Equipment

Engine		Europe, Rest of World		USA, California		Canada		Japan		Sweden		Australia	
		924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo
Engine Type (RHD)		XK (XJ)	M 31/03	VC	M 31/04	VC	M 31/04	VC	M 31/04	XK	M 31/03	XJ	M 31/03
Valve play (warm)													
Intake	mm	0.20	=	=	=	=	=	=	=	=	=	=	=
Exhaust	mm	0.45	=	=	=	=	=	=	=	=	=	=	=
Camshaft part no.		046.109.021	=	046.109.021	=	=	=	=	=	=	=	=	=
Bucket tappets		046.109.309A	=	046.109.309A	=	=	=	=	=	=	=	=	=
Ignition		TCI-i	DITC	TCI-h, EIS	DITC	TCI-h, EIS	DITC	TCI-i	DITC	TCI-i	DITC	TCI-i	DITC
Distributor		breakerless	=	=	=	=	=	=	=	=	=	=	=
Bosch code		0237 003 055	0237 501 001	0237 022 020	0237 501 001	0237 022 020	0237 501 001	0237 003 018	0237 501 001	0237 003 055	0237 501 001	0237 003 055	0237 501 001
Vacuum control		advance	none	advance/retard	none	advance/retard	none	advance/retard	none	advance	none	advance	none
Basic ignition setting		10° BTDC w/o vacuum	–	0° with vacuum, EIS disc. + bgd.	–	0° with vacuum, EIS disc. + bgd.	–	3° ATDC with vacuum	–	10° BTDC w/o vacuum	–	10° BTDC w/o vacuum	–
at speed (idle)	rpm	950 ± 50	–	750 – 800	–	750 – 800	–	950 ± 50	–	950 ± 50	–	950 ± 50	–
Control value at speed	rpm	36 ± 2° BTDC 3500 w/o vac.	8 – 14° BTDC < 900	–	6 – 10° BTDC < 900	–	6 – 10° BTDC < 900	max. 41° BTDC 4500 – 5000 without vacuum	6 – 10° BTDC < 900	36 ± 2° BTDC 3500 w/o vac.	8 – 14° BTDC < 900	36 ± 2° BTDC 3500 w/o vac.	8 – 14° BTDC < 900
Spark plugs	Bosch	W5D/W5DC	W3DP/W4CS	WR 6 DS	WR 6 DS	WR 6 DS	WR 6 DS	WR 6 DS	WR 6 DS	W5D/W5DC	W3DP/W4CS	W5D/W5DC	W3DP/W4DB
	Beru	14-5 D/DU	14-4 CS 1	RS 37		RS 37		RS 37		14-5 D/DU	14-4 CS 1	14-5 D/DU	14-4 CS 1
	Champion	–	–	–	N 7 GY	–	N 7 GY	–	N 7 GY	–	–	–	–
Electrode gap	mm	0.7 + 0.1	0.6 . . . 0.7	0.7 + 0.1	0.7	0.7 + 0.1	0.7	0.7 + 0.1	0.7	0.7 + 0.1	0.6 . . . 0.7	0.7 + 0.1	0.6 . . . 0.7
Ignition coil, Bosch code		0221 122 008	0221 122 023	=	=	=	=	=	=	=	=	=	=
Ign. contr. unit, Bosch code		0227 100 010	0227 100 101	=	=	=	=	=	=	=	=	=	=
DITC contr. unit, Siemens		–	5 WK 1664	–	5 WK 1665	–	5 Wk 1665	–	5 WK 1665	–	5 WK 1686	–	5 WK 1686
Oxygen contr. unit, Bosch		–	–	0280 800 037	0280 800 037	0280 800 037	0280 800 087	0280 800 006	0280 800 006	–	–	–	–
Engine lubrication/cooling													
Oil pressure at 5000 rpm and 80 – 90 °C oil temp.	bar	up to approx. 6	=	=	=	=	=	=	=	=	=	=	=
Oil consumption in l/1000 km		approx. 0.8	=	=	=	=	=	=	=	=	=	=	=
Max. oil temperature		150 °C	=	=	=	=	=	=	=	=	=	=	=
Coolant thermostat opens at		87 °C	=	=	=	=	=	=	=	=	=	=	=

Engine		Europe, Rest of World 924	924 Turbo	USA, California 924	924 Turbo	Canada 924	924 Turbo	Japan 924	924 Turbo	Sweden 924	924 Turbo	Australia 924	924 Turbo
Exhaust system													
Emission control		not applicable	not applicable	oxygen sensor with 3-way catalytic converter	=	=	=	=	=	not applicable	not applicable	not applicable	not applicable
CO level at idle speed	%	1.0 . . . 2.0	0.5 . . . 1.5	0.5 . . . 1.0 meas. ahead of cat. conv. oxyg. sensor wire off	= =	= =	= =	= =	= =	1.0 . . . 2.0 –	1.0 . . . 2.0 –	1.0 . . . 2.0 –	1.0 . . . 2.0 –
Turbocharger part no.		–	931.123.004.02	–	931.123.004.02	–	931.123.004.02	–	931.123.004.02	–	931.123.004.02	–	931.123.004.02
Code on data plate		–	6020	–	6020	–	6020	–	6020	–	6020	–	6020
Charge pressure control valve Code on housing		–	12	–	14	–	14	–	14	–	12	–	12
Charge pressure	bar	–	0.64	–	0.44	–	0.44	–	0.44	–	0.64	–	0.64
Fuel System													
Fuel distributor code		0438 100 005	0438 100 096	0438 100 065	0438 100 048	0438 100 065	0438 100 048	0438 100 065	0438 100 005	0438 100 005	0438 100 096	0438 100 005	0438 100 096
Air flow sensor code		0438 120 060	0438 120 141	0438 100 151	0438 100 152	0438 100 151	0438 100 092	0438 100 151	0438 100 092	0438 120 060	0438 120 141	0438 120 060	0438 120 141
Vacuum control code		–	0280 160 322	0280 160 124	0280 160 302	0280 160 124	0280 160 302	0280 160 124	0280 160 302	0280 160 124	0280 160 302	0280 160 124	0280 160 302
Throttle bypass valve code		0280 140 110	0280 140 220	0280 140 104	0280 140 220	0280 140 104	0280 140 220	0280 140 100	0280 140 220	0280 140 110	0280 140 220	0280 140 110	0280 140 220
Control Pressure Reg. code		0438 140 011	0438 140 062	0438 140 088	0438 140 091	0438 140 088	0438 140 091	0438 140 011	0438 140 091	0438 140 011	0438 140 098	0438 140 011	0438 140 098
Control pressure "cold" (at approx. 20 °C)	bar	1.3 . . . 1.7	2.0 . . . 2.4	1.7 . . . 2.1	2.4 . . . 2.8	1.7 . . . 2.1	2.4 . . . 2.8	1.7 . . . 2.1	2.4 . . . 2.8	1.3 . . . 1.7	2.0 . . 2.4	1.3 . . . 1.7	2.0 . . . 2.4
Control pressure "warm"	bar	3.4 . . . 3.8	3.45 . . . 3.85	3.4 . . . 3.8	3.45 . . . 3.85	3.4 . . . 3.8	3.45 . . . 3.85	3.4 . . . 3.8	3.45 . . . 3.85	3.4 . . . 3.8	3.45 . . . 3.85	3.4 . . . 3.8	3.45 . . . 3.85
at charge press. (from 0.3 bar)	bar	–	2.7 . . . 3.1	–	2.7 . . . 2.9	–	2.7 . . . 2.9	–	2.7 . . . 2.9	–	2.7 . . . 3.1	–	2.7 . . . 3.1
Max. control time		3.5 min.	2.5 min.	2.0 min.	5.5 min.	2.0 min.	5.5 min.	2.0 min.	5.5 min.	3.5 min.	2.5 min.	3.5 min.	2.5 min.
Fuel pump EXP 4 code		0580 254 967	=	=	=	=	=	=	=	=	=	=	=
Min. delivery rate in cc/30 sec.		750	=	=	=	=	=	=	=	=	=	=	=
Leak test: Min. press. after 10 min. Min. press. after 20 min.	 bar bar	 1.7 1.5	 = =	 = =	 = =	 = =	 = =	 = =	 = =	 = =	 = =	 = =	 = =
Power Transmission													
Clutch pressure plate		MF 215 K	MFZ 225	MF 215 K	MFZ 225	MF 215 K	MFZ 225	MF 215 K	MFZ 225	MF 215 K	MFZ 225	MF 215 K	MFZ 225
Part no.		035.141.117E	931.116.001.03	035.141.117E	931.116.001.02	035.141.117E	931.116.001.02	035.141.117E	931.116.001.02	035.141.117E	931.116.001.03	035.141.117E	931.116.001.03
Contact pressure	N	4810 . . . 5490	7200 . . . 7900	4810 . . . 5490	7200 7900	4810 . . . 5490	7200 . . . 7900	4810 . . . 5490	7200 . . . 7900	4810 . . . 5490	7200 . . . 7900	4810 . . . 5490	7200 . . . 7900
Clutch plate		215 PSD	GUD 225	215 PSD	GUD 225	215 PSD	GUD 225	215 PSD	GUD 225	215 PSD	GUD 225	215 PSD	GUD 225
Transmission type		016/8 MD	G 31/01	016.9 MF	016 GMB	016/9 MF	016 GMB	016/9 ME	016 GMX	016/8 MD	G 31/01	016/8 MD	G 31/01

		Europe, Rest of World		USA, California		Canada		Japan		Sweden		Australia	
		924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo	924	924 Turbo
Running gear													
Front Axle													
Coil spring part no.													
Stabilizer dia.	mm	21	23	21	23	21	23	21	23	21	23	21	23
Rear Axle													
Torsion bar dia.	mm	23.5	=	=	=	=	=	=	=	=	=	=	=
Stabilizer dia.	mm	–	14	–	14	–	14	–	14	–	14	–	14
Wheel Alignment (at DIN curbweight)													
Front Axle													
Toe (pressed with 150 N)		$0^{\circ}\,{}^{+5'}_{-15'}$	=	=	=	=	=	=	=	=	=	=	=
Camber		−20′ ± 10′	−20′ ± 15′	−20′ ± 10′	=	=	=	=	=	=	−20′ ± 15′	−20′ ± 10′	−20′ ± 15′
Max. left/right difference		10′	=	=	=	=	=	=	=	=	=	=	=
Caster		2° 45′ ± 30′	=	=	=	=	=	=	=	=	=	=	=
Max. left/right difference		30′	=	=	=	=	=	=	=	=	=	=	=
Toe difference angle at 20° lock		−1° ± 20′	=	=	=	=	=	=	=	=	=	=	=
Rear Axle													
Toe (total)		0° ± 10′	=	=	=	=	=	=	=	=	=	=	=
Max. left/right difference		10′	20′	10′	=	=	=	=	=	=	20′	10′	20′
Camber		−25′ ± 30′	−25′ ± 30′	−1° ± 30′	=	=	=	=	=	−25′ ± 30′	=	=	=
Max. left/right difference		30′	=	=	=	=	=	=	=	=	=	=	=
Spring strut angle		19° 30′	18° 05′	19° 30′	18° 05′	19° 30′	18° 05′	19° 30′	18° 05′	19° 30′	18° 05′	19° 30′	18° 05′
Max. left/right difference		0.5°	=	=	=	=	=	=	=	=	=	=	=
Height Adjustment													
Torsion bar center **below** wheel center	mm	5 ± 10	=	8.0 ± 10	12 ± 10	8.0 ± 10	12 ± 10	8.0 ± 10	12 ± 10	5 ± 10	=	=	=
Max. left/right difference with front end lifted	mm	10	=	=	=	=	=	=	=	=	=	=	=
1° spring strut angle change = change in car height by approx.	mm	5	=	=	=	=	=	=	=	=	=	=	=
Brakes													
Front brake pad make		Textar 276 GG	Jurid 209/380 FE	Textar 276 GG	=	=	=	=	=	=	Jurid 209/380 FE	Textar 276 GG	Jurid 209/380 FE
Rear brake pad make		Jurid 334 PGG	Jurid 231/223 GH	Jurid 334 PGG	=	=	=	=	=	=	Jurid 231/223 GH	Jurid 334 PGG	Jurid 231/223 GH