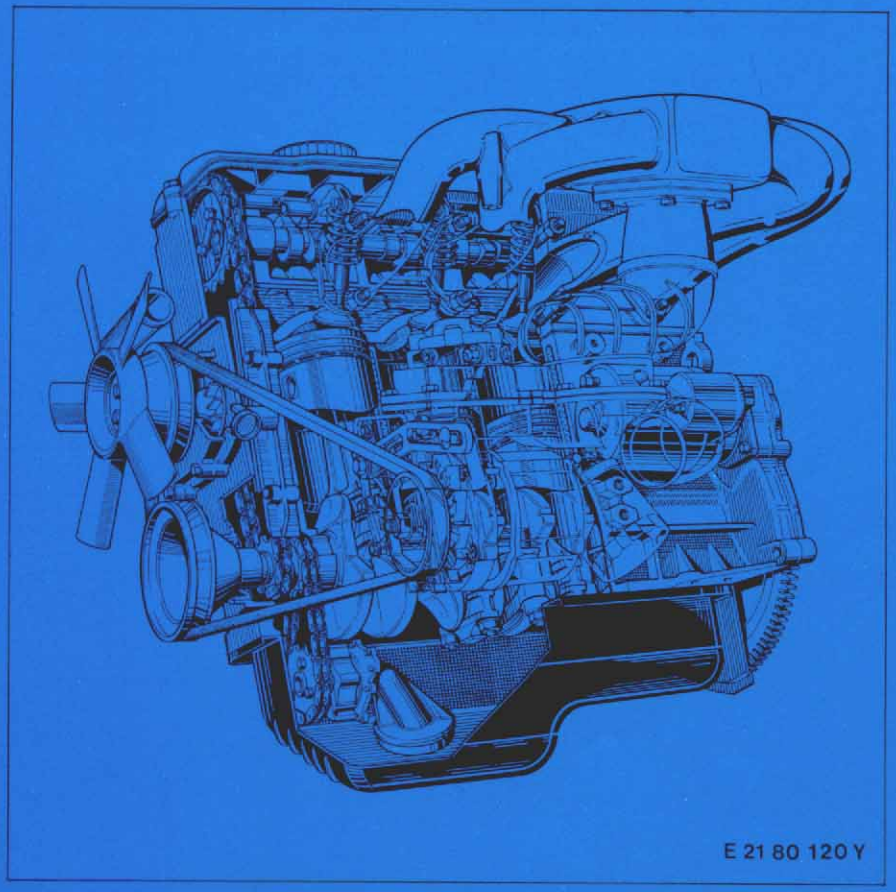

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TECHNICAL SPECIFICATIONS AND INFORMATION

Engine
Fuel Injection System
Catalytic converter
Oxygen sensor
Evaporative Emission Control System
Clutch and gearbox
Electrical system
Dimensions and weights
Performance data
Tightening torques
Service instruction plan
Air-Conditioner
Oil grades for automatic transmission
Item reference list
At a glance

Specifications

ENGINE

Type

4 cylinder, 4-stroke inline, water-cooled, with single overhead camshaft, inclined overhead valves and combustion chambers with volume concentration around the spark plug.

Position

Over front axle, inclined at 30° from vertical, 3-point mounting: at front close to center of gravity on two side-mounted rubber cushions attached directly to the front axle cross-member; at rear bolted rigidly to gearbox, with single rubber mounting on gearbox cross-member.

Cylinder block

Special grey cast iron.

Crankshaft

Forged steel, heat treated.
4 balance weights
5 three-layer main bearings.

Connecting rods and pistons

Forged steel connecting rods with replaceable three-component bearings. Pistons with raised flat crown and chromium plated nodular iron upper rings.

Valves

Overhead; inclined in inverted V arrangement. Exhaust valve hardened, with stem hard chromium plated. Valve clearance adjustment by means of eccentrics in rockers.

Valve gear

Light alloy rockers with chill-cast pads, overhead camshaft. Camshaft drive by single roller chain with automatic oildamped tensioner and recoil protection.

Valve operating clearances

Inlet and exhaust:
0.006 – 0.008" (0.15 – 0.20 mm) with engine stopped and cold (max. coolant temperature 35° C / 95° F).

Lubrication

Pressure circulating system with fullflow oil filter, gear-type pump (Eaton system) chaindriven from crankshaft; pressed steel oil pan.

Oil filter

Full-flow, with throw-away cartridge type filter and pressure relief valve opening at 35.5 ± 4.3 psi (2.5 ± 0.3 bar).

Engine breathing

Crankcase and rocker arm housing connected by cast-in passage, and ducted to intake air filter and manifold.

Air cleaner

One filter element in the intake air silencer.

Fuel supply

Two electric fuel pumps (pre-fuel pump in fuel tank and system fuel pump). Delivery rate 31.7 US gal/h, 120 Liters/h, 26.4 Imp. gal/h.

Fuel filter

Main fuel filter with throwaway element in feed line, mesh strainer in immersed fuel level sensor in tank.

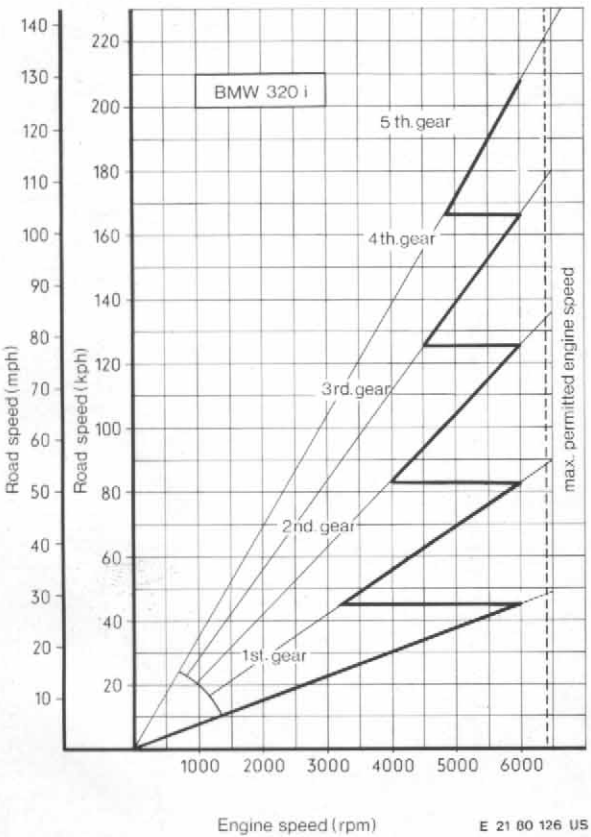
Displacement – effective	1.766 cm^3	107.8 in^3
Max. output at engine speed	75 kW 5.800 rpm	101 hp
Max. torque at engine speed	135 Nm 4.500 rpm	100 ft. lb
Output per liter displacement	42.5 kW	
Max. permissible engine speed	6400 rpm	
Max. continuous engine speed	6000 rpm	
Compression ratio	8.8 : 1	
Stroke/bore	2.79/3.50 in	71/89 mm
Ratio (stroke/bore)	0.79	
Mean piston speed at engine speed	 5.800 rpm	13.7 m/s
Power/weight ratio Car ready for road, tank full	14.8 kg/kW 32.7 lb/kW 15.0 kg/kW* 33.0 lb/kW*	11.1 kg/hp 24.5 lb/hp 11.2 kg/hp* 24.7 lb/hp*
Car fully occupied, with luggage	20.5 kg/kW 45.2 lb/kW	15.4 kg/hp 33.9 lb/hp

* Automatic model

Dimensions and weights	
Length	177.6 in or 4509 mm
Width	63.4 in or 1610 mm
Height (unloaded)	54.4 in or 1380 mm
Wheelbase	100.9 in or 2563 mm
Ground clearance (loaded)	5.7 in or 145 mm
Front overhang	35.43 in or 900 mm
Rear overhang	41.21 in or 1046 mm
Front track	54.65 in or 1387 mm
Rear track	55.0 in or 1396 mm
Min. turning circle (wheels)	30.84 ft or 9.4 m
Min. turning circle (overall)	33.46 ft or 10.2 m
Unloaded weight (ready for road, tank full) (according to FMVSS 110)	 2452 lb or 1112 kg 2474 lb* or 1122 kg*
Permissible gross weight	3438 lb or 1558 kg
Permissible front axle load	1640 lb or 743 kg
Permissible rear axle load	1860 lb or 842 kg
Maximum vehicle load	940 lb or 426 kg 940 lb* or 426 kg*
Permissible roof load	165 lb or 75 kg

* Automatic transmission model

Road speed / engine speed - BMW 320i



Performance data

Top speed		105 mph 169 km/h	102 mph* 164 km/h*
Max. gradients in	1st gear	%	
	2nd gear	%	
	3rd gear	%	
	4th gear	%	
Acceleration From	0–50 mph 0–80 km/h	8.1 sec	11.2 sec*
Standing start	1/4 mile in	18.45 sec	20.3 sec*

Fuel injection system

Your BMW 320 i is equipped with the well known Bosch K-Jetronic fuel injection system. The K-Jetronic is a mechanical, continuous operating fuel injection system. The "K" (German: **k**ontinuierlich = continuous) stands for uninterrupted fuel injection, all the time the engine is running. The K-Jetronic adjusts the injected fuel quantity in dependence of the exhaust gas composition. The fuel is injected into the intake air channel in front of the inlet valves. The injected fuel amount is adjusted by a piston in the fuel distributor.

Airflow meter and fuel distributor

The intake air passes the filter in the intake air silencer and enters the airflow meter. The airflow meter consists of:

- air funnel
- air flow sensor plate
- lever with counterweight.

The airflow meter acts on the principle of a suspended body. A round disc rises in a conical air funnel until its weight and the force of the intake air stream against the lower side of the disc are in equilibrium. If the volume of the intake air increases the rate of airflow also increases through the original annular cross-sectional area in the airflow sensor. As a result the airflow force increases, and the airflow sensor plate is forced further upwards until the original flow force exists at the new and larger cross-sectional area in the funnel. At this point the sensor plate comes again to a rest. The position of the airflow sensor plate represents a measure of the airflow rate through the funnel and is therefore a measure of the required fuel quantity. The airflow sensor plate raises a distance approx. proportional to the volumetric rate of airflow.

The weight of the lever and the airflow sensor plate are balanced by the counterweight. The control plunger in the fuel distributor operating under hydraulic pressure (fuel system pressure) builds up the counter force against the air force at the sensor plate. The intake air lifts up the sensor plate until force of intake air and force at the plunger are in equilibrium. The position of equilibrium is a measure of the intake air quantity. At the same time the control plunger is positioned at a certain point in the fuel distributor. A horizontal control edge at the control plunger opens the metering slit to a certain amount.

Control equipment in the fuel distributor

Two fuel pressures in the fuel distributor must be discerned.

1. Fuel primary system pressure (4.7 – 5.2 bar)
2. Control pressure (0.5 – 3.7 bar)

Fuel primary system pressure

The fuel primary pressure is built up by the fuel pump (see also section: fuel pumps and fuel delivery). In the fuel distributor the fuel enters the lower chambers of the differential pressure valves. The pressure is kept constant between 4.7 – 5.2 bar by means of a system pressure regulator. The pressure regulator is spring loaded and opened by fuel pressure. The excess fuel flows pressureless back to the fuel tank.

When the engine is running, the fuel passes through the metering slits to the upper side of the diaphragm in the differential pressure valves and then flows through the fuel injection lines to the injection valves.

A fuel supply line leads from the primary fuel circuit to the cold start valve (see section: air collector and cold start valve). When the engine is turned off the primary circuit pressure regulator drops the pressure in the system rapidly to the opening pressure of the injection valves and holds it at this level for a long time. The rapid reduction of the primary pressure prevents after-running.

As a result of the linear action of airflow sensor and control plunger, and because these components are joined by the lever to a single operating unit, a stable basic ratio of air and fuel is formed.

The cone of the airflow meter is formed so that the fuel/air mixture is very close to $\lambda = 1$.

The airflow meter has no full load enrichment function. The full load enrichment is made by a special function of the Emission Control System.

Control pressure

The control pressure circuit is supplied with primary fuel system pressure through a restrictor bore in the fuel distributor. A connection line leads from the upper side of the fuel distributor to the warm-up regulator.

At normal operating temperatures the warmup regulator holds the control pressure at about 3.7 bar.

It lowers the control pressure to about 0.5 bar overpressure when the engine is cold and during the warm-up period. The control pressure acts through a damping restrictor on the control plunger and develops an opposing force to the force of the air stream. Excess fuel from the warm-up regulator flows pressureless back to the transfer valve in the fuel distributor housing and from there to the fuel tank. The transfer valve is connected in part to the pressure regulating valve. It is spring loaded and opened by the pressure regulating piston. The topping point valve keeps the fuel line fully filled with fuel when the fuel pumps are not running.

The damping restrictor above the control plunger has a special function. Under conditions of pulsating air flow it damps the vibrations of the measuring plate and prevents too fast movements of the measuring plate and control plunger.

Fuel control plunger and differential pressure valves

The fuel must be distributed uniformly to the different cylinders of the engine. The unit which distributes and controls the fuel flow is a barrel with metering slits. The barrel has 4 rectangular shaped openings – metering slits. The fuel flow through the metering slits is controlled by an edge of the control plunger.

The differential pressure valve is a diaphragm valve consisting of a lower and an upper chamber with a steel diaphragm between them. In the lower chamber there is fuel, under system pressure of 4.7 – 5.2 bar, while in the upper chamber the pressure is of 0.1 bar less. The pressure differential is produced by the helical spring in the upper chamber.

If more fuel flows through the metering slit into the upper chamber, the pressure there rises temporarily. The steel diaphragm is bent downwards and enlarges the cross-section of the outlet leading to the injection valves until the 0.1 bar pressure difference is reached again.

At high fuel flow rates the diaphragm opens a larger annular cross-section so the pressure difference remains constant. If the rate of fuel flow becomes less, the diaphragm reduces the opening. The total travel of the diaphragm is only a few hundreths of a millimeter.

Throttle valve

The purpose of the throttle valve is to control the intake air volume. The air quantity is controlled by the opening angle of the throttle butterfly activated by the accelerator pedal. The WOT position of the throttle butterfly (full load) becomes a voltage signal (by means of a micro switch) and is directed to the ECU of the emission control system. The throttle valve position is also an input to the control unit of the automatic transmission (if the car is equipped with automatic transmission).

Idle speed can be adjusted by varying the quantity of air through a bypass channel in the throttle valve.

The throttle housing has tube connections for vacuum ignition advance and retard controls and the evaporative controls and the evaporative control system.

Air collector – Cold start valve

The air collector is designed for equal air distribution to the individual cylinders.

Connected to the air collector is the cold start valve. The cold start valve injects additional fuel while starting at engine coolant temperatures below 35° C or 95° F or for a maximum of 8 seconds. The cold start valve can inject only while operating the starter.

The injection time of the cold start valve is controlled by the thermo-time switch in the coolant jacket.

Auxiliary air valve

The purpose of the auxiliary air valve is delivery of additional air after cold starting and during warming-up. The aux. valve is located on the left side of the cylinder head. The aux. air is taken from in front of the throttle butterfly and directed to the air collector.

The aux. valve is electrically heated and heated from the engine warmth. The electrical heating is controlled by the fuel pump relay and activated when the fuel pumps are running. The aux. valve closes within approx. 3 min. during warming-up and interrupts the flow of additional air.

The aux. valve is fully open at very low temperatures (approx. below –30° C or – 20° F). The aux. air valve has a variable cross section dependent on temperature.

Fuel pumps and Fuel pressure accumulator

The BMW 320 i is equipped with two fuel pumps, i.e. a prefuel pump and a system fuel pump.

The pre-fuel pump is located in the fuel tank. It sucks in fuel and delivers it with a mild pre-pressure to the system fuel pump. The system fuel pump, located at the lower side of the vehicle close to the rear axle, builds up the injection pressure and delivers fuel to the fuel distributor unit and to the injection valves.

The pre-fuel pump is a vane-type pump, the system fuel pump is a roller-cell pump.

Both pumps are activated from the fuel pump relay in the engine compartment.

From the system fuel pump the fuel enters the fuel accumulator. It is located close to the fuel pump in the area of the rear axle.

In the fuel accumulator, the fuel flows into the damping chamber and compresses the spring loaded diaphragm which divides the fuel accumulator into two chambers – damping chamber and spring chamber –. The spring chamber has a connection for a leakage line which leads leaking fuel back to the suction line. The fuel accumulator acts as a damping reservoir. It compensates for small differences in the fuel system pressure. When the engine is stopped the spring in the fuel accumulator keeps up the fuel system overpressure and prevents vapor locks.

Fuel filter(s) and system pressure regulator

The purpose of the fuel filters is to prevent the intake of dirt or other micro parts into the fuel injection system. To do this, there is a fine mesh filter in the induction unit of the pre-fuel pump and the main fuel filter close to the system fuel pump.

The fuel pressure regulator is located in the fuel distributor housing. It keeps the primary system pressure constant at a value of 4.7 – 5.2 bar. The excess fuel flows pressureless back to the fuel tank.

Fuel injection valves

The purpose of the injection valves is to inject the necessary fuel quantity into the intake air in front of the inlet valves. The injection valves are located in the cylinder head in front of the inlet valves.

Warm-up regulator

During the warm-up period the engine needs a richer fuel/air mixture for reliable engine running. The unit which varies the composition of the fuel/air mixture is the warm-up regulator (or control pressure regulator). The warm-up regulator varies the control pressure in a range of approx. 0.5 – 3.6 bar. At low starting temperatures the warm-up regulator drops the control pressure to a minimum. The reduced control pressure applied to the control plunger allows a higher lifting of the airflow sensor plate and therefore a higher lifting of the control plunger. As a result the fuel flow through the injection valves increases and the fuel/air ratio becomes richer. The warm-up regulator is heated electrically and from engine warmth heated. As long as the engine is cold a bimetallic spring presses against the delivery valve spring. That enlarges the discharge cross section and reduces the pressure in the control circuit. When the engine is running the warm-up heated is electrically heated. The bimetallic spring warms up and releases the valve spring. The spring reduces the discharge cross section the control pressure increases. During the warm-up period the control pressure increases continuously and reaches a maximum of approx. 3.6 bar on a warm engine.

Frequency valve

The frequency valve, dependent on exhaust gas composition, varies the fuel pressure in the lower chambers of the fuel distributor. The frequency valve is controlled from the oxygen sensor via an electronic control unit. It allows fuel to escape from the lower chambers into the fuel return line. The fuel flows pressureless back to the fuel tank. By means of the variation of the fuel pressure in the lower chambers there is a variation of the injected fuel quantity and also a variation of the exhaust gas composition.

The frequency valve is located at the left side of the engine between the fuel distributor and engine block.

Special functions of the Emission System.

Full load enrichment

In full load driving conditions the engine needs, for a maximum of engine power an additional fuel quantity. This full load enrichment is caused by a function of the Emission Control System.

The ECU of the Emission control system switches off the normal function of the oxygen sensor above an engine speed of 3.500 ± 100 rpm. At the same time, the frequency valve is switched to a constant opening time of more than 50%.

This enlarges the discharge cross section of the differential pressure valves and enriches the fuel/air mixture.

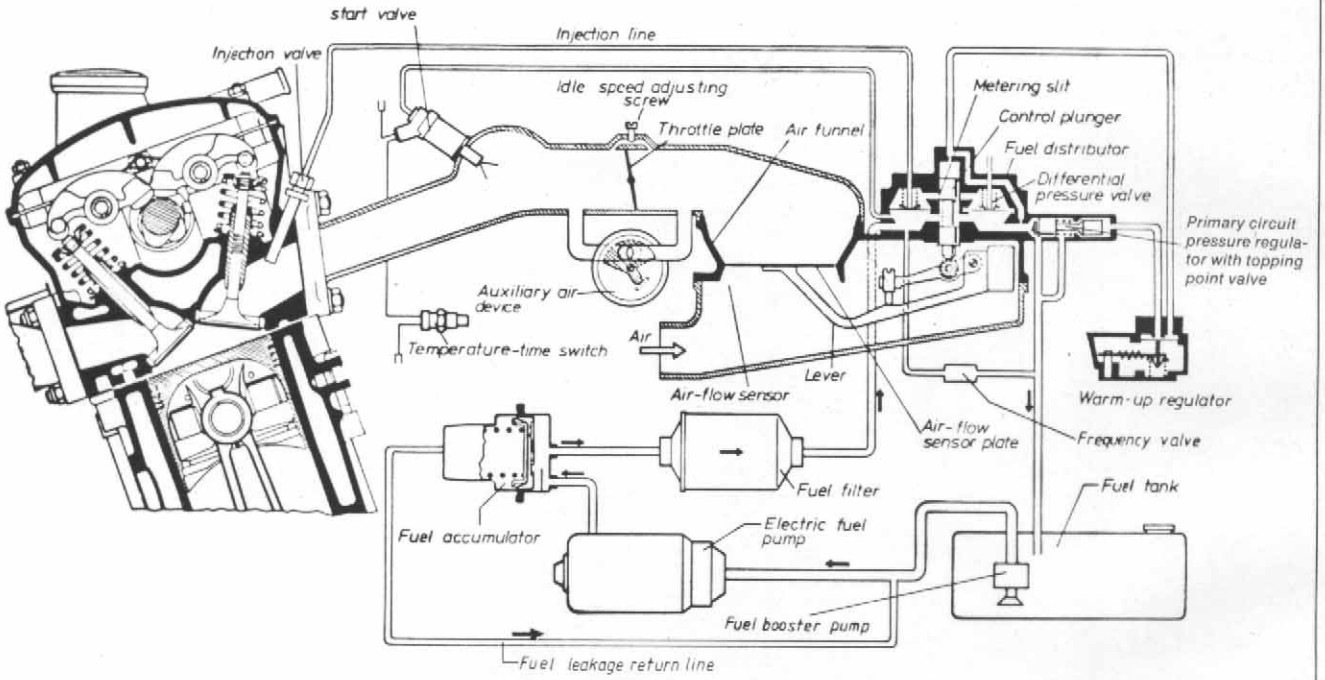
Enrichment during the warm-up phase

After cold starting and during the warming-up phase – below an engine temperature of 17 ± 3° C – the air fuel ratio is enriched by a function of the Emission Control System.

The frequency valve is switched to a constant opening time of more than 50% – as during full load driving conditions.

This function offers the necessary warm-up enrichment.

K-Jetronic fuel injection system



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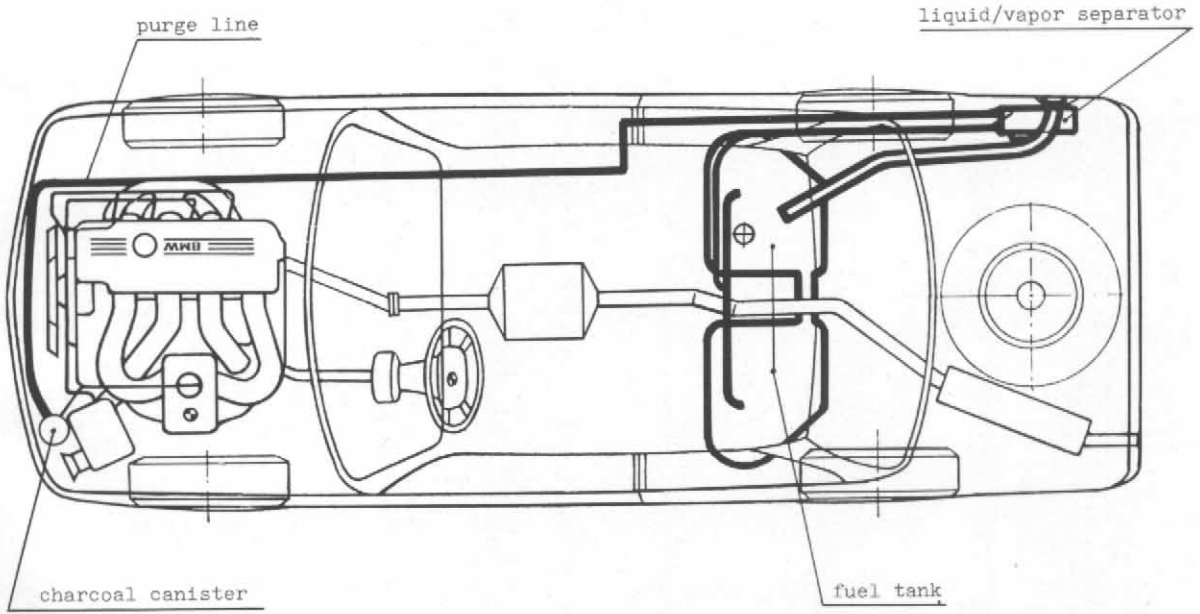
Evaporative Emission Control System



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Emission Control System

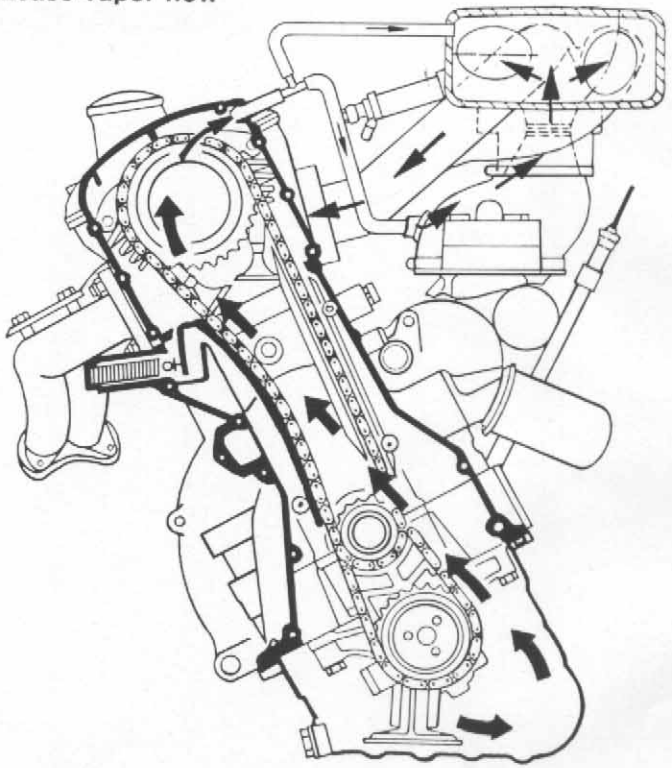
Your car has been equipped with a highly developed Emission Control System consisting of:

1. Crankcase Emission Control-System
2. Oxygen sensor
3. Catalytic converter
4. Evaporative Emission Control System
5. Ignition system with centrifugal and vacuum controls.

1. Crankcase Emission Control System

This is a "sealed system" which does not permit the entry of fresh air into the crankcase and prevents the emission of blowby to the atmosphere. The Crankcase Emission Control System is maintenance-free.

Crankcase vapor flow



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2. Lambda Control Oxygen sensor

For low pollutions it is necessary to operate the engine on a constant fuel/air mixture of 1:14. This ratio is named "stöchimetric ratio" or = 1 (Lambda).

An oxygen sensor in the exhaust pipe compares the oxygen content in exhaust gas with that in the ambient air. The measured difference is transformed into a voltage signal to the electronic control unit of the fuel injection system. If the signal changes from a given value, the ECU modulates the opening time of the frequency value and in this way readjusts the fuel/air ratio.

This oxygen sensor or lambda sensor is necessary for the most efficent use of catalytic converter.

Service warning system

After 30.000 miles or 48.000 km a warning light "OXYGEN SENSOR" comes on at the dashboard indicating that the **oxygen sensor must be replaced.**

After replacing the oxygen sensor a contact in the service interval switch will be reopened.

This extinguishes the warning light at the dashboard.

3. Catalytic converter

The catalytic converter is integrated into the exhaust system and installed below the vehicle's floor in the area of the front seats.

The catalytic converter installed in your car is a 3-way type. That means it removes carbon monoxid (CO) unburned hydrocarbons (HC) and nitrosoxides (NOx).

In this way, the catalytic converter finishes the burning process of fuel which has not been burned fully in the combustion chamber.

The catalytic converter is maintenance free. However, the catalytic converter is designed to remove the pollutions of unleaded fuel. If fuel containing lead is used even if only for a short period the catalytic converter and oxygen sensor will be destroyed or rendered inoperable.

To fulfill the EPA Emission standards the oxygen sensor and catalytic converter must allways be replaced after using leaded fuel.

Fuel filler

The fuel filler neck is equipped with a leaded fuel restrictor and a check valve.

The restrictor prevents the inserting of fuel filler nozzles not designed for lead free fuel.

The check valve prevents escaping of fuel when refilling.

4. Evaporative Emission Control System

This is a purge system consisting of a liquid-vapor separator, activated charcoal canister and purge lines to prevent gasoline vapors from escaping to the atmosphere.

Increased purging was accomplished by connection of the system to the throttle valve.

When the vehicle is stopped and the engine is off, or while standing at a non level position, the gasoline vapors are collected in the liquid-vapor separator where part of them condense and flow back to the fuel tank. The vapor continues to the charcoal canister where it is absorbed and retained until the engine is started agian. Then, suction effect causes a flow into the throttle valve and the gasoline vapor is burnt by the engine. The liquid-vapor separator is also capable of compensating the fuel expansion of a completely filled gasoline tank when ambient temperatures fluctuate about 80° F or 27° C. The system is maintenance-free.

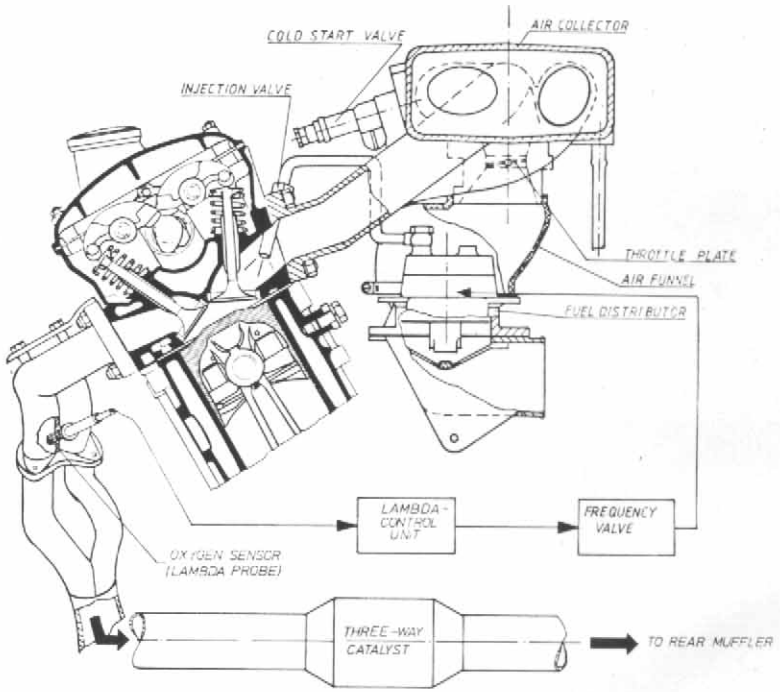
5. The **ignition system** is a transistorized breakerless coil ignition system. It consists of
   - Ignition distributor with induction coil
   - Electronic control unit
   - Ignition coil designed for operating in connection with the transistorized ignition system
   - Centrifugal advance mechanism
   - Vacuum advance device

The **centrifugal advance** system causes a variation of the ignition timing dependent on engine speed.

The **vacuum advance** system varies the ignition timing dependent on engine load.

Note: The ignition distributor has a changed rotating direction. Due to the basic construction of the engine this causes an earlier ignition point on a cold engine. As a result the engine starts easier.

Exhaust emission control system (location of main components as labelled below)



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COOLING SYSTEM

Radiator

Gilled aluminium tube; Automatic models with additional transmission oil cooler in lower coolant box of radiator. Pressure and vacuum relief valves in filler cap.

Opening pressures

of valves in filler cap:

Overpressure 1 $^{+0.15}_{-0.10}$ bar or

14.22 $^{+2.13}_{-1.42}$ lb/in²

vacuum max. 0.1 bar or 1.42 lb/in²

Coolant thermostat

Thermostatic control of engine coolant in output flow to engine with automatic equalization of engine load and outside temperature variations (BMW system).

Opens: 80 ± 1.5° C (176 ± app. 3° F)

CLUTCH

Single dry plate with diaphragm spring and hydraulic withdrawal mechanism: torsional vibration damper fitted. Automatic adjustment of clearance. Automatic transmission: fluid coupling with torque converter.

GEARBOX

a) Manual gearbox:

Five – speed with BORG-WARNER synchromesh on all forward gears, 1 reverse gear.

b) Automatic transmission: ZF 3 HP-22

Gear ratios	Manual 5-speed	Automatic
1st gear	3.682	2.73
2nd gear	2.002	1.56
3rd gear	1.330	1.0
4th gear	1.0	–
5th gear	0.805	–
Reverse gear	3.682	2.09

Torque converter ratio **1 – 2.36 : 1**

DRIVE SHAFT

Divided shaft with flexible mounting for center bearing and joint disc at front, universal joints in the center and at rear.

FINAL DRIVE

Hypoid bevel, running on taper roller bearings.

Ratio:

Pinion/ crown wheel	No. of teeth	
3.64 : 1	40 : 11	Automatic
3.91 : 1	43 : 11	Manual

Drive to rear wheels

Left and right double universal joint half-shafts with no-maintenance homokinetic joints.

Steering

ZF rack and pinion, with flexible rubber mountings.

Overall ratio: 21.1 : 1

Track rods: left and right side track rods.

Steering column

Safety steering column with divided shaft, 2 universal joints and 1 rubber disc joint.

Four-spoke steering wheel

380 mm (15 in) dia.

ELECTRICAL SYSTEM

Battery 12 V/55 Ah (Ampere-hours)

Ignition coil: Bosch KW 12 V
Bosch 0 221 122 029

Firing order: 1–3–4–2

Ignition timing:
25 ± 1° bTDC at 2.200 rpm

Adjust dynamically with engine at normal operating temperature, vacuum controls disconnected (engine speed 2.200 rpm) illuminate timing mark on flywheel with a stroboscope light.

Alternator
Bosch K1 – 14 V 65 A 20 – 910 W
Bosch 0 120 489 718

Voltage regulator
Bosch EE/14 V 3

Starter
Bosch GF (R) 12 V 1.5 HP/1.1 kW
Bosch 0 001 311 100

Spark plugs
Bosch WR 9 DS
Beru RS 33
Eletrode gap
0.024 + 0.004 in (0.6 + 0.1 mm)

Distributor
Bosch 0 237 002 049

Headlights: Sealed beam

Fusebox
in the engine compartment, on the left-hand wheel arch.

Horns
2 high-intensity single-tone horns

Wipers
Twin blades, with selector lever on right of steering column for 2 speeds and intermittent action or automatic wash/wipe.

Automatic windshield washer
Electric gear type pump with delaying relay for wipers, operated by wiper/washer lever.

Heated rear window
with 14 electrodeposited heating elements; power rating 140 Watts.

cigarette lighter and plug socket on dash-board
Can also be used for plugging in an inspection lamp or razor with standard plug; max. 200 Watt, 12 Volt rating.

CHASSIS

Wheels and tires

Steel disc wheels

5½ J x 13 H 2 well-base rims.

Light alloy wheels for tubeless tires.

5½ J x 13 H 2 well-base rims.

Tires (standard equipment)

Radial ply 185/70 SR 13 tubeless on steel and light alloy wheels.

Valves (for tubeless tires)
in conjunction with light alloy and steel disc rims: Rubber valve 43GS/11.5 DIN 7780. For safety reasons always renew tire valves when removing or renewing tires.

Winter tires

185/70 SR 13 or 165 SR 13

on light alloy wheels
or steel disc wheels

Snow chains may be used on drive wheels (rear) only.

Tread Wear Indicators

Your BMW is fitted with steel-belt tires, which incorporate built-in tread wear indicators. These are molded into the bottom of the tread grooves and will appear as approx. ½" (13 mm) wide bands when the depth of tire tread becomes 1/16" (1.6 mm). The indicators help you determine when your tires have worn down so far that they need replacing. If they appear in two or more adjacent grooves, tire replacement is recommended.

Front suspension

Independent, with wishbones, trailing links and spring/damper struts; doubleacting telescopic hydraulic dampers. Camber angle offset, lateral force equalization.

Coil springs mounted at top of struts and offset from centerline; rubber auxiliary springs and bump stops. Wheel travel 192 mm (7.6 in). Torsion bar stabilizer (anti-roll) mounted in no-maintenance rubber bushings.

Rear suspension

Independently sprung wheels with square section tube semi-trailing arms pivoting on no-maintenance rubber bushings. Delta-shaped box-section rear beam for semi-trailing arms and final drive, bolted to body shell at 3 points by means of rubber mountings. Rear rubber mounting acting as asymmetric selfaligning support.

Spring/shock absorber struts with doubleacting hydraulic shock absorber units, coil springs with rubber auxiliary springs; total wheel travel 220 mm (8.7 in).

Disc-type limited-slip differential (optional)

Bad road conditions can mean that one wheel on a car fitted with a normal differential is not able to transmit its share of the driving force without spinning. In certain circumstances a spinning wheel can be inconvenient and can largely be avoided by a limited-slip differential.

The locking action of the limited-slip differential is derived from internal friction dependent on load, and produced by the action of the equalizing shafts, thrust rings and symmetrically positioned friction discs.

Thanks to the internal friction of the disc and the outward thrust generated by the differential bevel pinions, wheelspin is retarded or totally avoided. The outward thrust is therefore proportional to the total torque being transmitted to the wheels.

The limited-slip differential is of particular value in that it operates as and when required, without any action on the part of the driver.

BRAKES

Foot brake
(dual-circuit system)
Hydraulic, acting on all 4 wheels, with booster servo and tandem master cylinder. Transparent fluid reservoir in engine compartment, brake system and brake pad wear warning light in instrument cluster.

Front

Two-piston fixed caliper disc brakes with automatic pad wear compensation.

Disc diameter	10.04 in (255 mm)
Piston diameter	1.89 in (48 mm)

Rear

Drum brakes with self-centering shoes.

Brake drum diameter	9.84 in (250 mm)
Cylinder diameter	0.75 in (19.05 mm)
Lining width	1.57 in (40 mm)

Handbrake

Operates mechanically on rear wheels. Adjust at handbrake lever after lifting rubber sleeve. Cable to each rear wheel is adjustable separately.

Brake force limiter (for rear axle) Cut-in pressure 25 ± 2 bar (356 ± 28 lb/in^2) gauge.

BODYWORK

Load-bearing all-steel bodyshell welded to floor section to form a torsionresistant complete unit.

Safety zone passenger compartment with built-in roll bar. Impact absorbing front and rear body sections.

Two doors and engine compartment lid hinged at front.

Windows

Tempered glass (windshield: laminated). Special equipment: tinted heat-insulating glass.

Luggage compartment:

Capacity 460 liters (16.2 ft^3) – absolute.
404 liters (14.3 ft^3) – German VDA method.

Fuel tank:

Capacity 15.3 US gal/58 liters/12.7 Imp. gal.

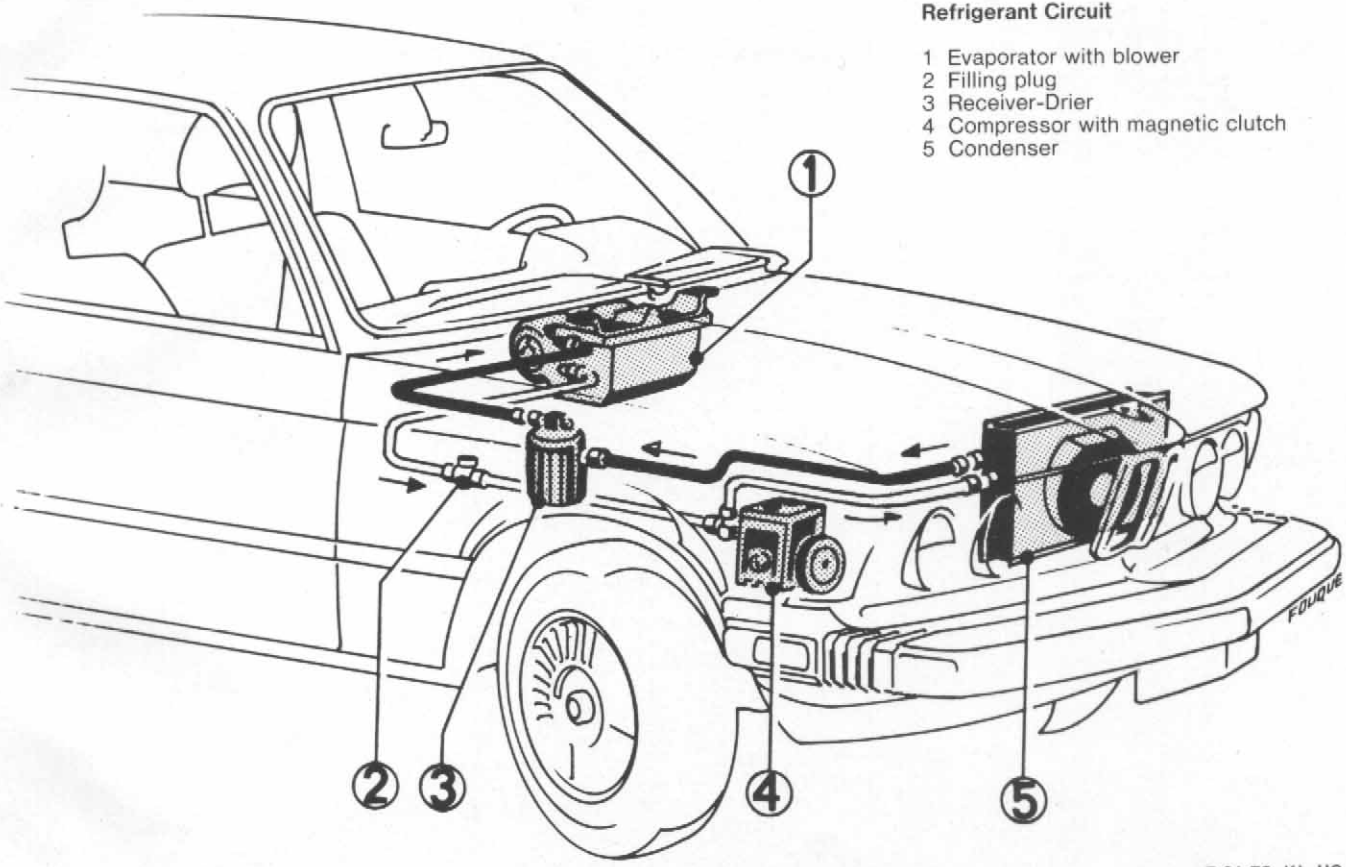
Heating and ventilation

Fresh-air heating system with heater controlled by coolant temperature and four-vane, three-speed centrifugal blower (160 W). 270° cam form or 150° tap water valve, and cross flow heater matrix or circular tube matrix with baffle plates. Simple and accurate temperature selection by a valve operated by Bowden cable with check lever (for fresh air supply), by three rotary controls (air distribution, temperature, and blower switch).
Max. heater output: 9.07 kW/h
(30950 btu) 3.3 x 10^7

Independently of the warm air supply, cold air can be supplied as desired to the car's interior through variable-direction grilles in the sides and center of the instrument panel. These stratified interior temperatures help to reduce driving fatique.

The air supply emerges through 2 footwell outlets, 2 defroster nozzles, 1 central nozzle, 2 side window nozzles, 2 central and 2 side grilles.

Stale air extraction through slots below the rear window leading to ducts in the rear roof pillars.


Refrigerant Circuit
1 Evaporator with blower
2 Filling plug
3 Receiver-Drier
4 Compressor with magnetic clutch
5 Condenser
1
2
3
4
5
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SPECIFICATIONS OF AIR CONDITIONER
(optional extra)

Evaporator housing

Air distribution: the evaporator is integrated into the fresh air ventilating system. The air distribution is the same as with standard series production vehicles without air conditioning:

Through a center and two side outlets (plus two outlets in the middle console).

Air circulation:
Four-vane centrifugal blower.

Airflow: Approx.
7 m^3/min

Protection:
Fuse element 25 amps. (blue) in fuse box.

Minimum air discharge temperature on evaporator: 2–3° C or 35–37° C.

Compressor

Bosch swash plate compressor or
York piston compressor

Electromagnetic clutch

Diameter: 6 inches

Condensor

Suface: 0.115 m^2

V-belt

Narrow-belt
Size dependent on type of A/C installed

Drying bottle

Steel housing with sight glass
Capacity: 0.0054 m^3

Refrigerant

Type: Freon, R 12 (CF_2Cl_2, difluordichloromethane)
Capacity: 34 oz./960 grams

Auxiliary electric fan:

Located in front of the condenser, being cut in and out of operation by means of the magnetic clutch as well as thermostatically as a function of the coolant temperature.

Make: Bosch IPK 12 V
Type: 11-vane axial fan with 282 mm fan ring diameter

Protection: Supplementary fuse, fuse element 25 amps (blue).

Function

The combination of the standard heater with the Air Conditioner offers you an ideal allweather comfort control in your BMW.

The Air Conditioner functions on the principle of a domestic refrigeratior. The refrigerant (Freon 12) is drawn into the compressor which compresses and discharges it in a gaseous state to the condenser located in front of the radiator. The refrigerant is cooled down by the air drawn in through the blower and the air resistance encountered when driving and returns to liquid. On the way to the evaporator the refrigerant passes through the dehydrator which removes any traces of moisture that may have accumulated in the system. The refrigerant expands in the evaporator due to the expansion valve and evaporates. The heat required for evaporation is withdrawn from the passing air stream supplied by the blower assembly. The evaporated refrigerant is drawn in by the compressor and compressed again. The cycle thus is completed.

The compressor is equipped with an electromagnetic clutch by which the compressor is cut in and out of operation. The magnetic clutch is controlled by a thermostatic switch which has its temperature sensing tube inserted in the fins of the evaporator core.

The electric auxiliary fan is automatically switched on when the compressor starts running or when coolant temperature is too high.

The evaporator is integrated into the fresh air ventilating system. The passenger compartment air to be cooled is drawn in by the auxiliary fan and blown through the evaporator fins and cooled. The supply of cooled air into the passenger compartment and the air distribution flows through the louvers on the dashboard. The air conditioner is of a recirculating design. Fresh air may be mixed with cooled air by operating the vent controls.

When your vehicle is exposed to direct sunlight for a fairly long time, first shift the blower control to the high speed position for maximum cooling. Then switch down to a convenient lower blower speed when the desired temperature is reached.

Important hints

1. The A/C operates only with the engine running.
2. Operate the A/C for a short time at least once a month (particularly important during the cold season) as otherwise there is the risk that the seal of the compressor shaft dries out and leaks.
3. When part of the air conditioner system begins to lenk or is damaged e.g. by an accident, and results in a lack of cooling the system must be switched off. Otherwise the compressor may be damaged.