

## **Wartung und allgemeine Hinweise**

Maintenance and general hints

Entretien et généralités

Manutenzione e informazioni generali

Entretienimiento e informes generales

Underhåll och allmänna anvisningar

Onderhoud en algemene aanwijzingen

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## 00 Maintenance

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**Conversion table for  
official units of measurement**

**see pages 00-0/4 and  
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Conversion table for official units of measurement

| Value             | Unit symbol                    |                     | Conversion                                                                                  |
|-------------------|--------------------------------|---------------------|---------------------------------------------------------------------------------------------|
|                   | old                            | new                 |                                                                                             |
| Length            | m                              | m                   | 1 m = 1000 mm    1 km = 1000 m    1 $\mu$ m = 0.001 mm                                      |
| Area              | m <sup>2</sup>                 | m <sup>2</sup>      | 1 m <sup>2</sup> = 10 <sup>6</sup> mm <sup>2</sup> 1 mm <sup>2</sup> = 0.01 cm <sup>2</sup> |
| Volume            | m <sup>3</sup>                 | m <sup>3</sup>      | 1 m <sup>3</sup> = 10 <sup>6</sup> cm <sup>3</sup> 1 dm <sup>3</sup> = 0.001 m <sup>3</sup> |
|                   | l                              | l                   | 1 l = 1 dm <sup>3</sup>                                                                     |
| Angle             | Surface                        | ° , rad             | 1 rad = 1 m/m $\approx$ 57°    1° = $\pi$ /180 rad                                          |
|                   | Solid                          | (°) <sup>2</sup> sr | 1 sr = 1 m <sup>2</sup> /m <sup>2</sup> (1°) <sup>2</sup> = ( $\pi$ /180) <sup>2</sup> sr   |
| Mass              | kg                             | kg                  | 1 kg = 1000 g    1 g = 1000 mg    1 t = 1 Mg = 1000 kg                                      |
| Density           | kg/m <sup>3</sup>              | kg/m <sup>3</sup>   | 1 kg/m <sup>3</sup> = 0.001 kg/dm <sup>3</sup> 1 kg/dm <sup>3</sup> = 1 kg/l                |
| Imbalance         | kgm                            | kgm                 | 1 kgm = 1000 000 gmm                                                                        |
| Time              | sec                            | s                   | 1 min = 60 s    1 h = 60 min                                                                |
|                   | s                              | s                   |                                                                                             |
| Speed of rotation | rev/sec<br>rev/min<br>(r.p.m.) | 1/s<br>1/min        | 1 U/min = 1/min    1/min = 1/(60 s)                                                         |
| Speed             | m/s                            | m/s                 | 1 m/s = 3.6 km/h                                                                            |
| Acceleration      | m/s <sup>2</sup>               | m/s <sup>2</sup>    |                                                                                             |

Conversion table for official units of measurement (continued)

| Value                        | Unit symbol          |                                             | Conversion                                                                                                                                                      |
|------------------------------|----------------------|---------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                              | old                  | new                                         |                                                                                                                                                                 |
| Force                        | kp                   | N                                           | 1 N = 1 kgm/s <sup>2</sup> 1 kp = 9.81 N                                                                                                                        |
| Pressure<br>(gas, fluids)    | at                   | N/m <sup>2</sup>                            | 1 at = 1 kp/cm <sup>2</sup> = 0.981 bar = 98 066.5 Pa                                                                                                           |
|                              | kp/cm <sup>2</sup>   | N/m <sup>2</sup>                            | 1 m WS = 9 806.65 Pa = 9 806.65 N/m <sup>2</sup>                                                                                                                |
|                              | mWS                  | Pa                                          | 1 Torr = 1.333 224 mbar                                                                                                                                         |
|                              | Torr<br>mmHg         | bar                                         | 1 mm Hg = 133.322 Pa = 133.322 N/m <sup>2</sup>                                                                                                                 |
| Mechanical<br>load, stress   | kp/mm <sup>2</sup>   | N/m <sup>2</sup><br>Pa<br>N/mm <sup>2</sup> | 1 N/m <sup>2</sup> = 1 Pa<br>1 kp/mm <sup>2</sup> = 9.81 N/mm <sup>2</sup>                                                                                      |
| Energy, work,<br>heat volume | kpm<br>Psh<br>cal    | J<br>kWh                                    | 1 J = 1 Nm    1 kWh = 3.6 MJ    1 kpm = 9.81 J<br>1 cal = 4.1868 J                                                                                              |
| Torque                       | kpm                  | Nm                                          | 1 kpm = 9.81 Nm                                                                                                                                                 |
| Power                        | PS                   | kW                                          | 1 kW = 1000 W    1 W = 1 Nm/s = 1 J/s                                                                                                                           |
|                              | kpm/s<br>kcal/h      | Nm/s                                        | 1 PS = 736 W = 75 kpm/s = 632 kcal/h<br>1 kW = 1.36 PS = 102 kpm/s = 860 kcal/h = 0.239 kcal/s                                                                  |
| Viscosity                    | dynamic<br>kinematic | Pas<br>m <sup>2</sup> /s                    | 1 Pas = 1 Ns/m <sup>2</sup> 1 P = 0.1 Pas = 1 g/cms<br>1 m <sup>2</sup> /s = 1 Pas m <sup>3</sup> /kg    1 St = 1 cm <sup>2</sup> /s = 0.0001 m <sup>2</sup> /s |
| Temperature                  | °C<br>°K             | °C<br>K                                     | 0 °C ≙ 273.15 K<br>°K = 1 K = 1 °C (temperature differential)                                                                                                   |

Conversion table for official units of measurement (continued)

| Value                          | old      | Unit symbol<br>new | Conversion                                                |
|--------------------------------|----------|--------------------|-----------------------------------------------------------|
| Elec. current                  | A        | A                  | 1 mA = 0.001 A    1 kA = 1000 A                           |
| Elec. potential/voltage        | V        | V                  | 1 V = 1 W/A    1 mV = 0.001 V    1 MV = 10 <sup>6</sup> V |
| Elec. resistance               | $\Omega$ | $\Omega$           | 1 $\Omega$ = 1 V/A = 1/S                                  |
| Magnetic flux                  | M        | Wb, Vs             | 1 Wb = 1 Vs    1 M = 10 <sup>-8</sup> Wb                  |
| Magn. flux density             | G        | T                  | 1 T = Wb/m <sup>2</sup> 1 G = 10 <sup>-4</sup> T          |
| Magn. field strength           | Oe       | A/m                | 1 A/m = 1 N/Wb    1 Oe = 10 <sup>3/4</sup> T A/m          |
| Light intensity,<br>luminosity | HK       | cd                 | 1 cd = 1.107 HK    1 HK = 0.903 342 cd                    |
| Brightness, luminance          | sb       | cd/m <sup>2</sup>  | 1 sb = 10 <sup>4</sup> cd/m <sup>2</sup>                  |
| Light density                  | ph       | lx                 | 1 ph = 10 <sup>-4</sup> lx                                |

## Specifications

### Maintenance and general instructions

| Model                                                 | a) 320/6<br>b) 320/6 A      |                              | a) 323 i<br>b) 323 i A *) |
|-------------------------------------------------------|-----------------------------|------------------------------|---------------------------|
| Dimensions and weights                                |                             |                              |                           |
| Overall length                                        | mm (in)                     | 4355 (171.4)                 |                           |
| Overall width                                         | mm (in)                     | 1610 (63.4)                  |                           |
| Overall height, unladen                               | mm (in)                     | 1380 (54.3)                  |                           |
| Ground clearance, laden (at perm. gross weight limit) | mm (in)                     | 145 (5.7)                    |                           |
| Front overhang (at perm. axle load)                   | mm (in)                     | 781 (30.7)                   |                           |
| Rear overhang (at perm. axle load)                    | mm (in)                     | 1011 (39.8)                  |                           |
| Overhang angle (at perm. axle load)                   | front °<br>rear °           | 23°20'<br>12°                |                           |
| Wheelbase (at perm. axle load)                        | mm (in)                     | 2563 (100.9)                 |                           |
| Min. turning circle (wheels)                          | left m (ft)<br>right m (ft) | 9.40 (30.8)<br>9.60 (31.5)   |                           |
| Min. turning circle (overall)                         | left m (ft)<br>right m (ft) | 10.20 (33.5)<br>10.40 (34.1) |                           |

\*) Version for Sweden

## Specifications

## Maintenance and general instructions

| Model                                                                                 |                  | a) 320/6<br>b) 320/6 A           | a) 323 i<br>b) 323 i A *)        |
|---------------------------------------------------------------------------------------|------------------|----------------------------------|----------------------------------|
| Unladen weight, empty<br>(ready for road, tank full)                                  | kg (lb)          | a) 1115 (2458)<br>b) 1130 (2491) | a) 1135 (2502)<br>b) ( )         |
| Permissible gross weight                                                              | kg (lb)          | 1550 (3417)                      | 1570 (3461)                      |
| Permissible axle load                                                                 | front<br>kg (lb) | 780 (1720)                       | 790 (1742)                       |
|                                                                                       | rear<br>kg (lb)  | 840 (1852)                       | 850 (1873)                       |
| Dimensions and weights (continued)                                                    |                  |                                  |                                  |
| Permissible trailer load.<br>unbraked                                                 | kg (lb)          | 500 (1102)                       |                                  |
| braked, max. gradient 16 %<br>(1 in 6.25)                                             | kg (lb)          | a) 1000 (2205)<br>b) 650 (1433)  | a) 1000 (2205)<br>b) 650 (1433)  |
| braked, max. gradient 12 %<br>(1 in 8.33)                                             | kg (lb)          | a) 1200 (2646)<br>b) 1000 (2205) | a) 1200 (2646)<br>b) 1000 (2205) |
| Towbar downthrust, max.                                                               | kg (lb)          | 50 (110)                         |                                  |
| Permissible load on roof (when fully laden,<br>max. angle loads must not be exceeded) | kg (lb)          | 75 (165)                         |                                  |

\*) Version for Sweden

## Specifications

## Maintenance and general instructions

| Model                        | a) 320/6<br>b) 320/6 A |          | a) 323 i<br>b) 323 i A *) |
|------------------------------|------------------------|----------|---------------------------|
| Performance<br>Max. gradient | in 1st gear            | % (1 in) | a) 58 (1.72)<br>b)        |
|                              | in 2nd gear            | % (1 in) | a) 27 (3.70)<br>b)        |
|                              | in 3rd gear            | % (1 in) | a) 14 (7.14)<br>b)        |
|                              | in 4th gear            | % (1 in) | a) 9 (11.11)<br>b)        |
| Acceleration                 | km/h (mile/h)          |          | 0 ... 50 (0 ... 31)       |
|                              | 1st – 2nd gears        | s        | a) 3.4<br>b) 5.2          |
|                              | km/h (mile/h)          |          | 0 ... 80 (0 ... 50)       |
|                              | 1st – 2nd gears        | s        | a) 7.2<br>b) 9.5          |
| 1st – 3rd gears              | km/h (mile/h)          |          | 0 ... 100 (0 ... 62)      |
|                              | s                      |          | a) 10.7<br>b) 13.6        |

\*) Version for Sweden

## Maintenance and general instructions      Specifications

| Model                                    | a) 320/6<br>b) 320/6 A |                              | a) 323 i<br>b) 323 i A *) |
|------------------------------------------|------------------------|------------------------------|---------------------------|
| 1st – 3rd gears                          | km/h (mile/h)          | 0 ... 120 (0 ... 75)         |                           |
|                                          | s                      | a) 15.8<br>b) 19.3           | a) 13.6<br>b)             |
| 1st – 4th gears                          | km/h (mile/h)          | 0 ... 140 (0 ... 87)         |                           |
|                                          | s                      | a) 22.7<br>b) 29.3           | a) 18.5<br>b)             |
| 1st – 4th gears                          | km/h (mile/h)          | 0 ... 160 (0 ... 99)         |                           |
|                                          | s                      | a) 36.0<br>b) 45.4           | a) 27.3<br>b)             |
| Standing-start<br>kilometer (3281 ft) in | s                      | a) 32.4<br>b) 35.1           | a) 30.9<br>b)             |
| Maximum speed                            | km/h (mile/h)          | a) 181 (112)<br>b) 176 (109) | a) 190 (118)<br>b)        |

\*) Version for Sweden

## **0000009 Free Delivery Check**

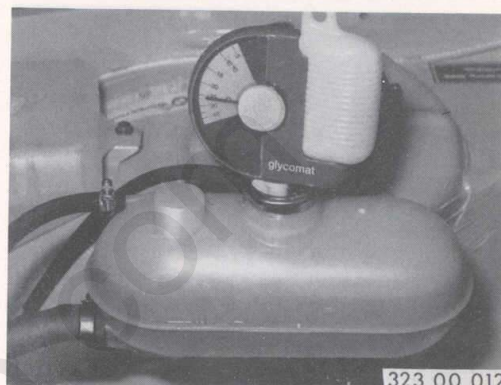
1. Checking coolant level and concentration/adding coolant
2. Tightening hose clips
3. Checking engine oil level/adding oil
4. Checking steering gear oil level
5. Checking tightness of wire connections
6. Checking and correcting V-belt tension
7. Checking and correcting battery acid level
8. Checking and correcting brake fluid level
9. Checking and correcting windshield washer fluid level
10. Checking and correcting transmission oil level
11. Checking and correcting final drive oil level
12. Checking steering wheel straight-ahead position, adjusting steering wheel
13. Checking tightness of wheel bolts
14. Checking pressure of all tires (including spare wheel)
15. Checking and adjusting headlight beams
16. Checking lights
17. Checking interior equipment, chrome-plated parts and paint, doors, engine hood and trunk lid, door windows, sliding roof, seat belts
18. Tools
19. Test drive with function check
20. Leak inspection after test drive
21. Engine idle speed adjustment, exhaust emissions test

## 1. Checking coolant level

Add coolant until level is up to a maximum of 2 cm ( $\frac{3}{4}$  in) below cap.

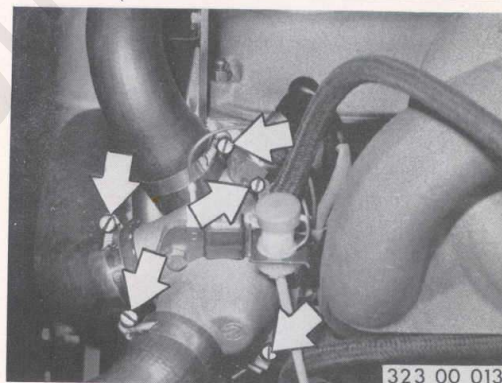


Check antifreeze concentration.  
All-year antifreeze protection to  $-25^{\circ}\text{C}$  ( $-13^{\circ}\text{F}$ ).  
Add approved long-term antifreeze and corrosion inhibitor: see Service Information Gr. 17.



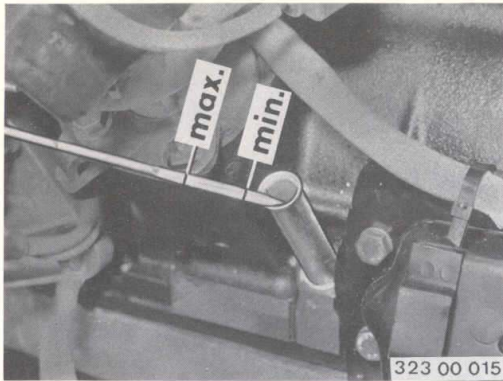
## 2. Tightening hose clips

Tighten all hose clips on engine.



Tighten all hose clips on radiator and expansion tank.



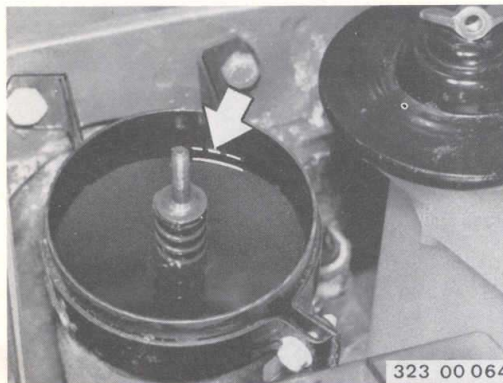


### 3. Checking/correcting engine oil level

Add oil until level is up to max. mark at the most.

Quantity of oil between min. and max. marks = 1.5 liters (1.5 US quarts, 2.6 Imp. pints).

For approved oil grades, see Service Information Group 11.

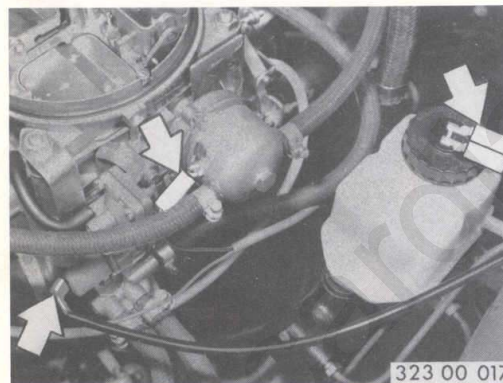


### 4. Checking/correcting power steering oil level

With engine stopped, remove wing nut and take off tank cover.

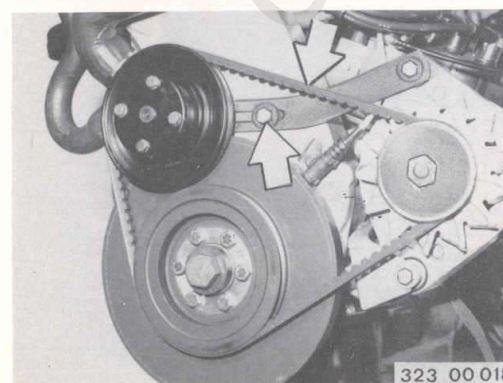
Oil level must be approx. 5 mm (0.2 in) above mark on tank wall.

Start engine and if necessary add oil until level reaches mark.



### 5. Checking tightness of wire connections

Check tightness of all wire plugs, bending them with pliers if necessary.



### 6. Checking and tightening belts

A tight belt must give under thumb pressure by 5 to 10 mm (0.2 to 0.4 in) at a point midway between two pulleys. Tighten belt for alternator and, if applicable, vane pump. Loosen alternator and, if applicable, vane pump, swing outward and tighten bolts again.

#### 7. Checking/correcting battery acid level

Lift off battery cover and unscrew plugs. Acid level approx. 5 mm (0.2 in) above plate upper edges in each cell or up to level mark visible in opening. Add distilled water when level is too low. Keep upper section of battery dry and clean.

*Important!* Be careful not to spill any acid or wipe any lead oxide from the pole connections on clothes. Never work with an open flame near a battery – danger of explosion.



#### 8. Checking/correcting brake fluid level

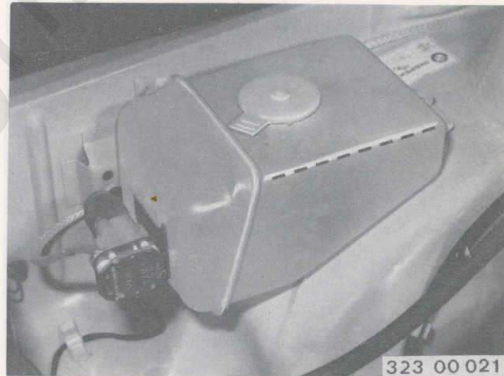
Brake fluid level in transparent tank for brake system between min. and max. marks.

Correct level only up to max. mark. Refer to Service Information Gr.34 for approved brake fluids.



#### 9. Checking/correcting windshield washer fluid level

The windshield washer and headlight cleaner systems will always be ready for use by adding 40% household spirit for temperatures down to  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ).



#### 10. Checking/correcting transmission oil level

##### a) Manual gearbox

Unscrew oil filler plug with a 17 mm socket wrench.

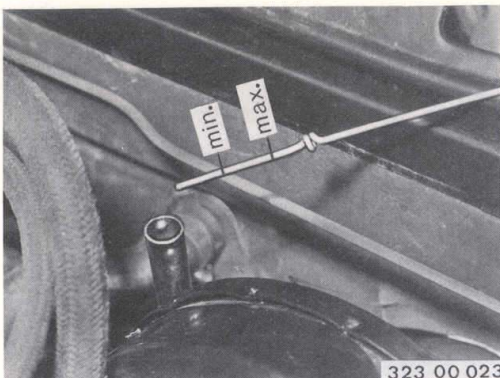
Oil level up to lower edge of filler opening.

Use only brand name SAE 80 gear oils.

Specification MIL-L-2105 or

API-GL-4





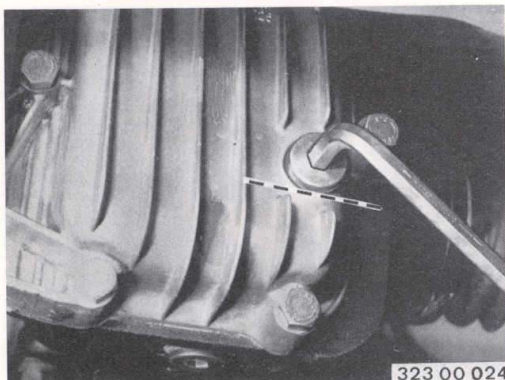
#### b) Automatic transmission

**Requirement:** Car on level ground, transmission at operating temperature, selector lever at "P" and engine running at idle speed.

Oil level must be between min. and max. marks.

Quantity of oil between min. and max. marks = 0.4 liter (0.7 Imp. pin, 0.42 US quart).

**Important:** Do not wipe oil dipstick with a fluffy cloth. Refer to Service Information Gr.24 for approved automatic transmission fluids.



#### 11. Checking/correcting final drive oil level

Unscrew oil filler plug with a 10 mm socket wrench.

Oil level up to lower edge of filler opening.

Use only brand name hypoid SAE 90 gear oils. Refer to Service Information Gr.33 for approved final drive oil grades.



#### 12. Checking steering wheel straight ahead position and steering wheel fastening

Check straight ahead position of steering wheel during a test drive. Lift off BMW emblem to adjust the steering wheel. Unscrew nut, take off steering wheel and put it on in straight ahead position. Use a new self-locking nut. Torque<sup>1)</sup>



#### 13. Checking tightness of wheel bolts

Check tightness of wheel bolts with a torque wrench.

Torque<sup>1)</sup>

<sup>1)</sup> See Specifications

#### 14. Checking pressure of tires (including spare wheel)

(Filling pressure<sup>1</sup>)



#### 15. Checking and aiming headlight beams

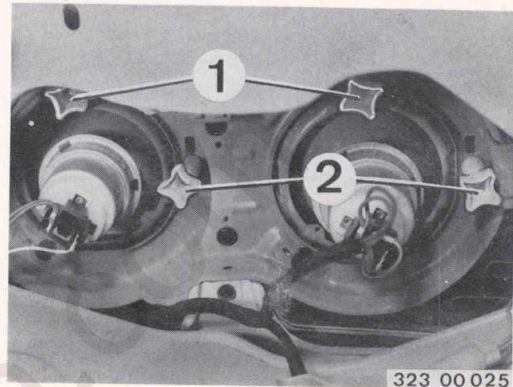
**Requirement:** Correct tire pressures, car on level ground and rear seat loaded at center by one person or 70 kg (154 lb).

Check low and high beams with optical testing equipment.

Take off covers. Correct beams with adjusting screws.

(1) Vertical adjustment

(2) Lateral adjustment



#### 16. Checking lights

Check function of parking lights, high and low beam headlights, tail lights, stop lights, backup lights, tail fog light, license plate light, turn signals, hazard lights, horns, windshield wipers and windshield washer.

Adjust windshield washer jets. Check function of heater blower, interior lamp, glove box lamp, trunk and engine compartment lamps, instrument lights and all indicator and warning lamps, and the cigar lighter.

#### 17. Check interior equipment, chrome-plated parts, paint, doors, engine hood, trunk lid, door windows, steel-panel sliding roof and seat belts

Check headliner, trim and carpets for correct installation, damage or dirt.

Check chrome-plated parts for damage or defects. Check painted parts for scratches, dust inclusions or silicone pits. Check function and alignment of doors, engine hood, trunk lid, door windows and steel sliding roof, correcting if necessary. Check function of seat belts.

<sup>1</sup>) See Specifications



#### 18. Tools

Check whether all tools are present.



Spare key, owner's handbook, service booklet,  
list of dealers and warranty card.  
Car jack and wheel wrench.  
Check whether these items are in car.

#### 19. Test drive with function check

Check function of engine, cooling system, transmission, final drive, steering and brakes during a test drive. Check items affecting road safety. Bed down the handbrake by applying to 4 notches at lever and driving app. 400 m (1300 ft.).  
Check instrument readings.

#### 20. Leak test after test drive

Check (visual inspection) engine, cooling system, transmission, final drive, fuel, clutch and brake systems for leaks after a test drive.

## 21. Adjusting engine idle speed – exhaust emissions test

### 1) Idle speed

Requirement: correct ignition timing.

Engine at operating temperature.

Oil temperature at least 60°C (140°F).

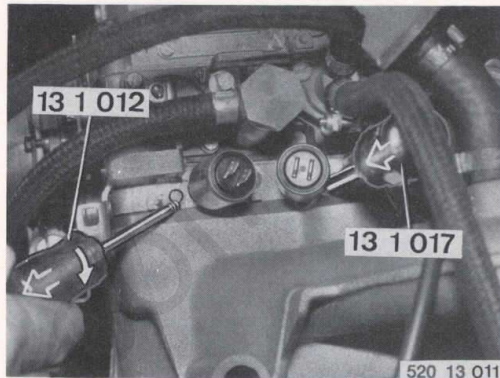
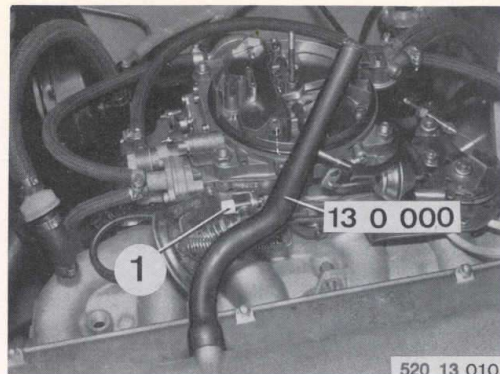
Remove air cleaner – 13 71 000.

Connect air cleaner simulator 13 0 000, using the hose between the air cleaner and the rocker cover.

Connect BMW digital tester.

Adjust engine idle speed with screw (1).<sup>1)</sup>

*Important:* remove existing locks on adjusting screws with 13 1 012 puller. After adjusting idle speed, install new locks (color blue) with tool 13 1 017.



### 2) CO level in % by volume

Remove plugs from exhaust manifold and insert test probes 13 0 020.

Connect CO level tester.

Measure CO level separately at front and rear exhaust manifolds.

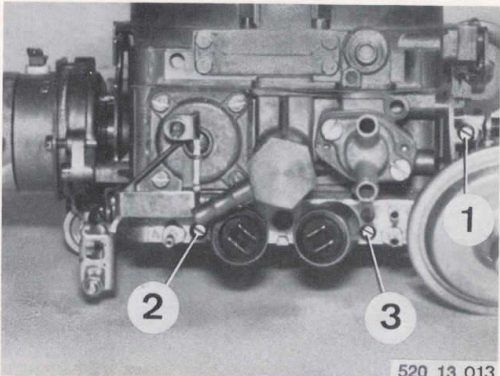


Adjust CO level with the mixture control screws (2 and 3).<sup>1)</sup>

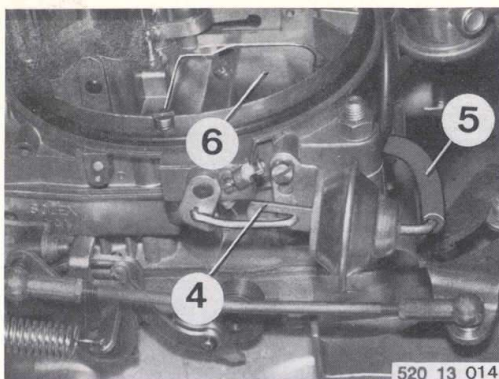
Screw (2) – rear exhaust manifold

Screw (3) – front exhaust manifold

Correct any change in idle speed with screw (1).



<sup>1)</sup> See Specifications



3) Checking function of stage II damper  
Check easy movement of air flap and closing of throttle butterfly.

Run engine at idle speed.

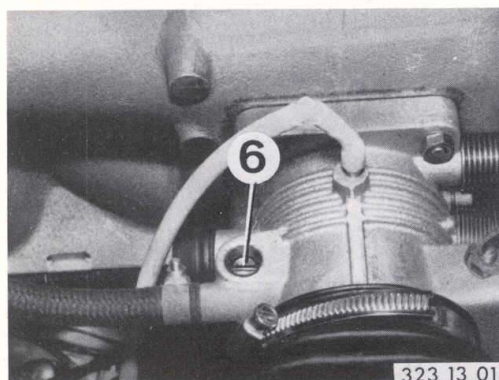
Lever (4) must be pulled against the stop by the diaphragm.

Pinch hose (5) with a Matra clamp or other means.

Operate air flap (6) several times.

The diaphragm is in working order when the lever always returns to the final stop.

*Important:* attach actuating rod with kink facing down, or accelerator linkage may jam.

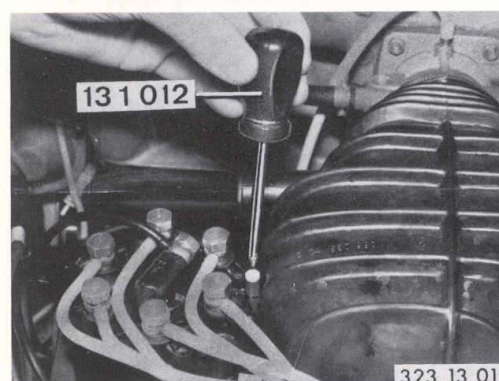


## B) Fuel injection engine

– Engine at normal operating temperature –

1) Idle speed

Turn screw (6) to adjust idle speed.<sup>1)</sup>



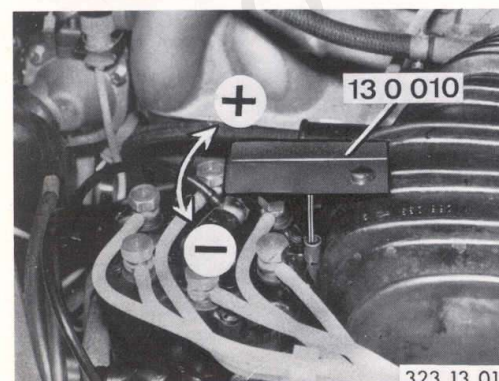
2) Adjusting CO level in % by volume

Remove screw plugs from exhaust manifolds and insert test probes 13 0 020.

Connect exhaust emissions tester.

Measure CO value at front and rear exhaust manifolds separately.

*Important:* remove screw lock with puller 13 1 012. After adjusting idle speed, attach new lock.



Use adjusting wrench 13 0 010 to set CO value.<sup>1)</sup>

<sup>1)</sup> See Specifications

**0000079 Extra work during BMW Inspection**  
**– every 30000 km (20000 miles)**

1. Transmission oil change
2. Final drive oil change
3. Checking installed clutch for wear
4. Checking and aiming headlight beams
5. Cleaning fuel strainers or renewing fuel filter

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00 00 079 Extra work during BMW Inspection – every 30 000 km (20 000 miles)

### 1. Transmission oil change

#### a) Manual gearbox

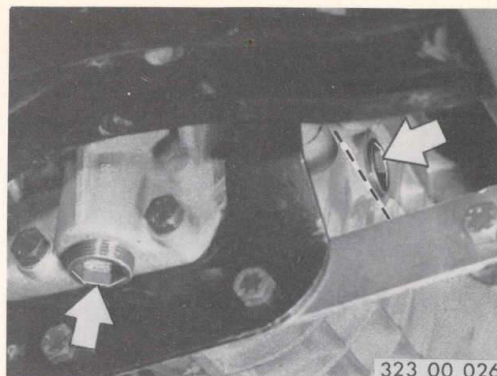
Transmission at operating temperature.

Unscrew oil drain plug and filler plug with a 17 mm Allen socket wrench. Remove, clean and insert oil drain plug.<sup>1)</sup>

Add brand name SAE 80 gear oil.

Oil level up to lower edge of filler opening.<sup>1)</sup>

Specifications MIL-L-2105 or API-GL-4.



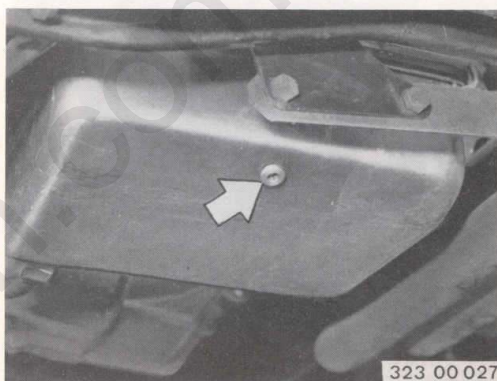
#### b) Automatic transmission

Transmission at operating temperature.

Unscrew oil drain plug with a 5 mm Allen socket wrench.

When installing: Check gasket and renew if necessary.

Pull out oil dipstick and add 2.0 liters (3.5 Imp. pints, 2.1 US quarts) of ATF. Refer to Service Information Gr.24 for approved ATF grades.



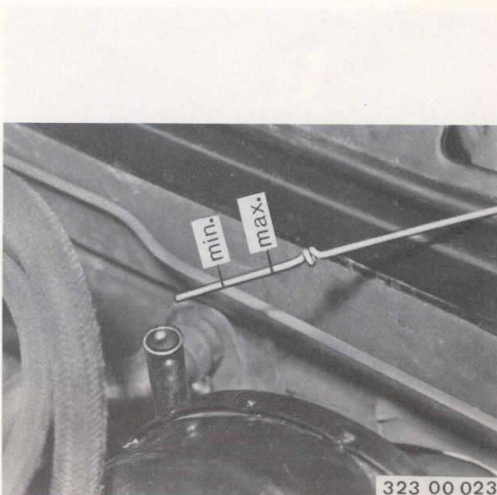
Check oil level.

Requirement: Car on level ground, transmission at operating temperature, selector lever at "P" and engine running at idle speed.

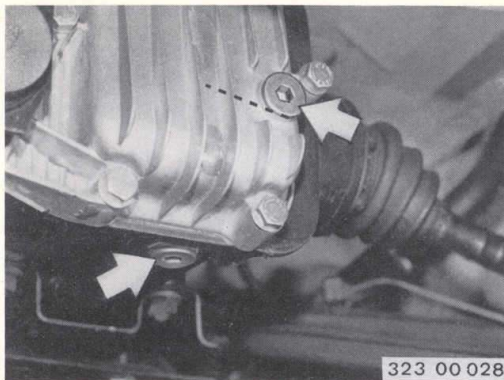
Oil level must be between min. and max. marks.

Quantity of oil between min. and max. marks = 0.4 liter (0.7 Imp. pint, 0.42 US quart).

**Important!** Never wipe off oil dipstick with a fluffy cloth.



<sup>1)</sup> See Specifications



## 2. Final drive oil change

Final drive at operating temperature.

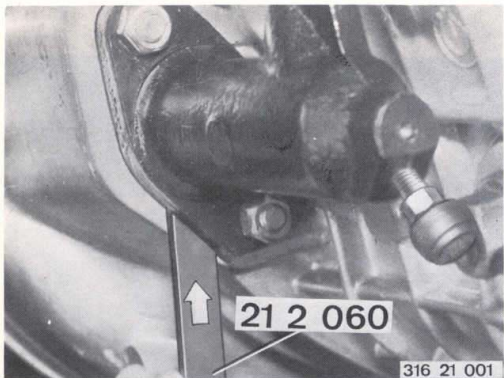
Unscrew oil drain plug and filler plug with a 10 mm Allen socket wrench.

Clean oil drain plug. Check seal and insert drain plug.

Add brand name hypoid SAE 90 gear oil.<sup>1)</sup>

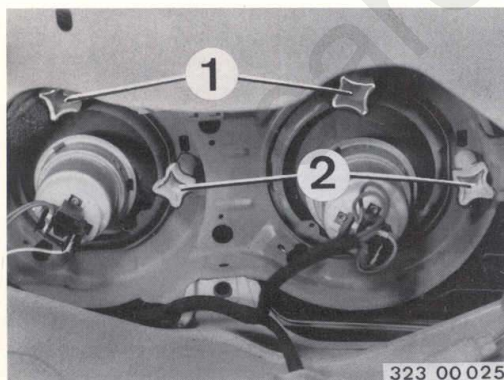
Oil level up to lower edge of filler opening.

Refer to Service Information Gr.33 for approved oils.



## 3. Checking installed clutch for wear

Clutch linings are good as long as gauge 21 2 060 can be inserted into the opening of the slave cylinder up to the stop. When there is a gap of 5 mm (0.2 in) between the gauge 21 2 060 and slave cylinder, the drive plate is worn and must be replaced.



## 4. Checking and aiming headlight beams

Requirement: Correct tire pressures, car on level ground and rear seat loaded at center by one person or 70 kg (154 lb) of weight.

Check low and high beams with an optical tester. Lift off covers. Adjust beams with the adjusting screws.

(1) Vertical adjustment.

(2) Lateral adjustment.

<sup>1)</sup> See Specifications

## 5. Cleaning fuel strainers or renewing fuel filter

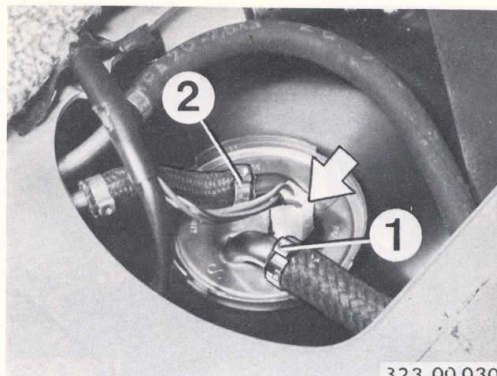
Remove rear seat.

Take off cover plate.

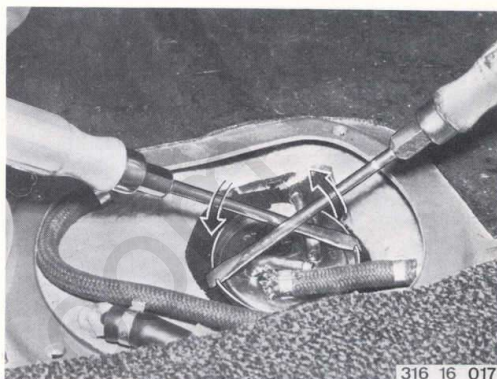
Detach hoses and cables from suction head.

When installing: 1. Suction line

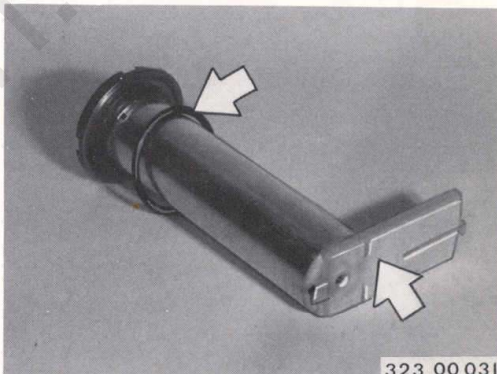
2. Return line



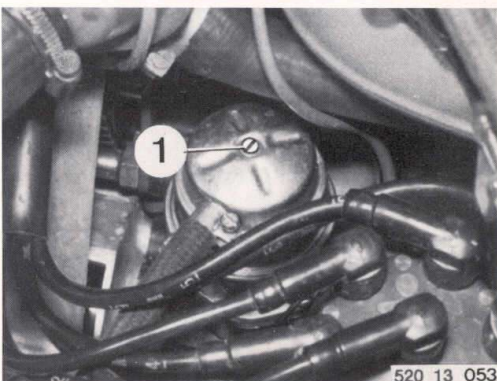
Unscrew fuel suction device by applying two crossed screwdrivers and turning counter-clockwise.

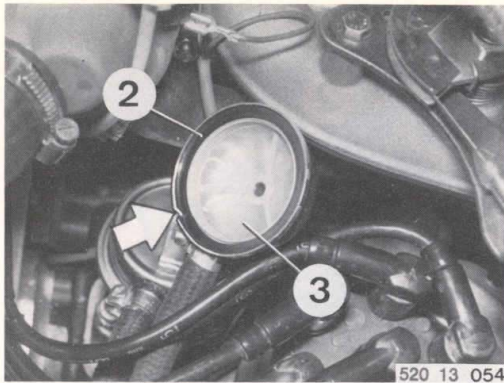


When installing: clean fuel strainer. The round cord seal swells when in contact with gasoline and in this manner provides a perfect seal. Check round cord seal and renew if necessary.



Carburetor engine:  
Clean strainer in fuel pump. Loosen screw (1).

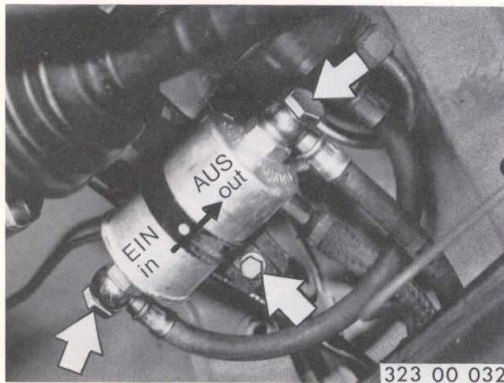




**Remove cover with sealing ring (2) and strainer (3).**

**Clean strainer.**

**When installing: lug must engage in pump housing.**



**Fuel injection engine:**

**Detach hose unions and clip.**

**When installing: note correct direction of flow.**

**0000090 Extra work during BMW Inspection**  
**– every 60000 km (40000 miles)**

- 1. Checking high pressure pump and function of power steering (special equipment)**
- 2. Renewing power steering filter**
- 3. Checking/adjusting front wheel bearing play**
- 4. Checking handbrake linings (in rear disc brakes)**

00 00 090 Extra work during BMW Inspection – very 60 000 km (40 000 miles) –

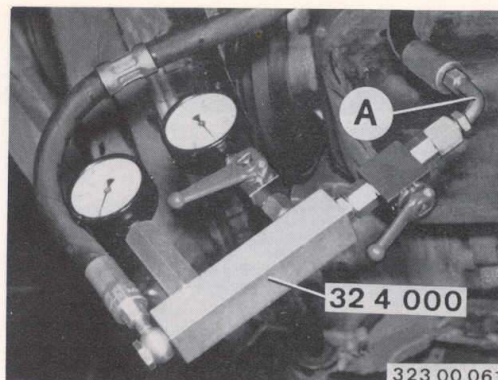
### 1. Checking vane pump and function of power steering (special equipment)

#### A) Vane pump

Always check delivery pressure of vane pump first.

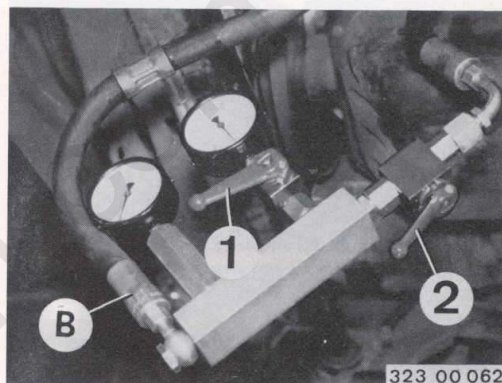
Detach pressure line (A) at vane pump and connect it to pressure tester 32 4 000.

*Important!* Never re-use oil which has run out.



Connect pressure line (B) from pressure tester to vane pump. Close cut-off valve (1). Open cut-off valve (2) and bleed hydraulic system while engine is running at idle speed – 32 13 006. Engine must be at operating temperature for this. After bleeding has been completed, close cut-off valve (2) for max. 10 seconds and read the pressure. The pressure<sup>1)</sup> given on the vane pump's data plate must not drop by more than 10%.

*Important:* shutoff valve (1) must remain closed for all high pressure measurements.



#### B) Power steering

Let engine run.

Pull steering wheel against lock stop with a force of 100 N (22 lb) for approx. 5 seconds.

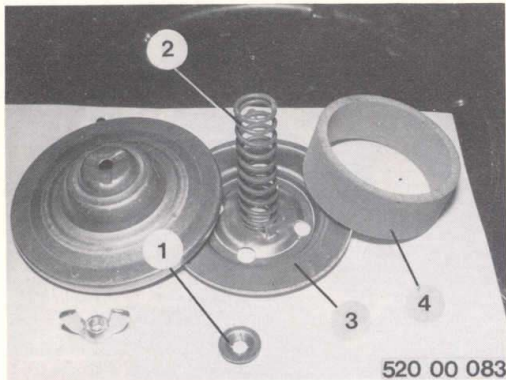
Read pressure from pressure tester 32 4 000.

Repeat same test at right lock.

The pressure<sup>1)</sup> quoted on the vane type pump data plate must not drop by more than 10%.



<sup>1)</sup> See Specifications



520 00 083

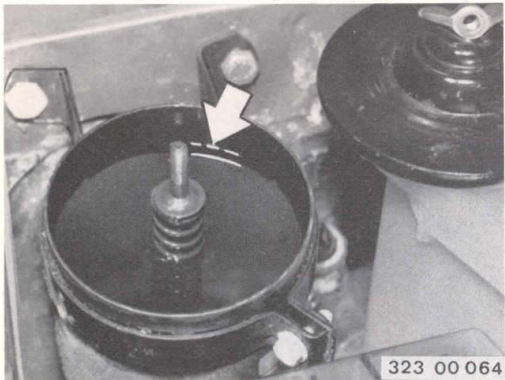
## 2. Renewing power steering filter

Unscrew cover.

Take out keeper (1).

Remove spring (2), washer (3) and filter (4).

When installing: renew keeper (1). Locate filter in its detent.



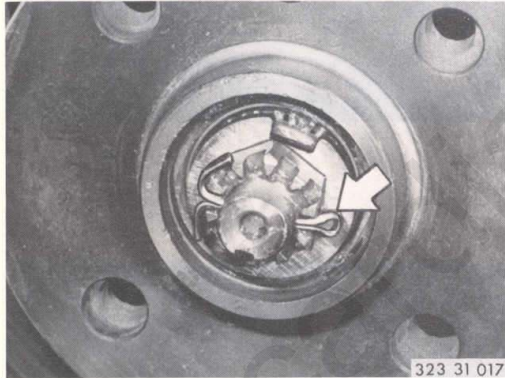
323 00 064

## Checking power steering oil level:

Stop engine. Remove wing nut and tank lid.

Oil level must be app. 5 mm (0.2 in) above mark on inside of tank.

Start engine. Add oil if necessary until level is correct.

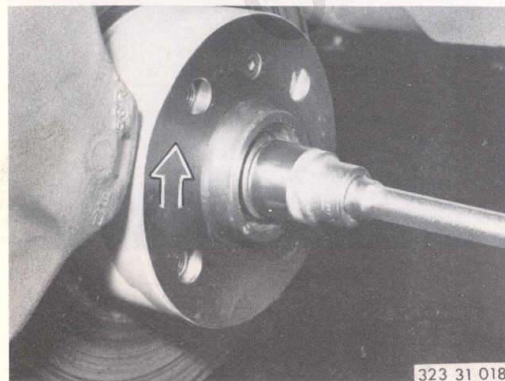


323 31 017

## 3. Checking/adjusting front wheel bearing play

Remove and install cap – 31 21 050.

Remove cotter pin and unscrew castle nut.



323 31 018

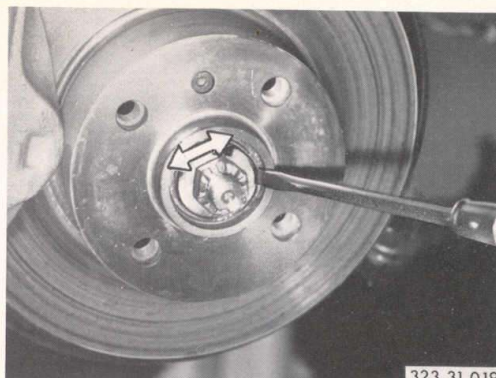
Tighten castle nut to 30... 33 Nm (22... 24 ft. lb) while constantly turning the wheel.

This will line up the taper rollers and bearing inner races. It will also force out the grease causing play. Turn tightened bearing assembly by at least 2 more turns.

When doing this, the castle nut must not be loosened nor tightened.

Loosen castle nut until there is axial play, whereby the hub must turn again. Tighten castle nut to max. 3 Nm (2 ft. lb) and lock with a cotter pin.

Checking axial bearing play: It must be possible to move tabbed disc (1) quickly and without any noticeable resistance.



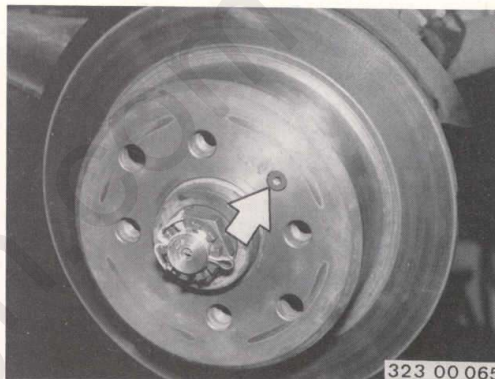
#### 4. Check handbrake linings

Detach and attach rear wheel – 36 10 320.  
Remove fixed caliper. Brake pipe remains attached.

Remove 4 mm Allen screw.

Detach brake disc from axle shaft.

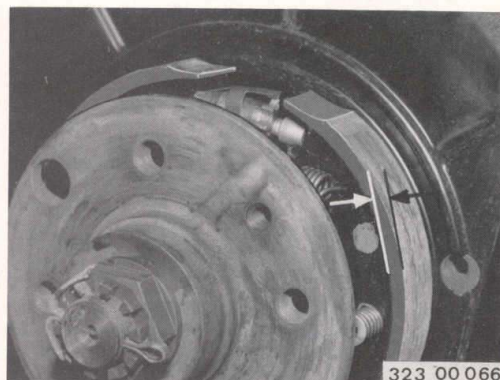
When installing: note relative positions of holes in brake disc and axle shaft flange.



Check minimum thickness and condition of linings.

Brake linings must be at least 1.5 mm (0.06 in) thick at the thinnest point.

When the minimum thickness of 1.5 mm is reached, renew the handbrake shoes.



**0000219 1st BMW Inspection**  
**– at 1000 km/600 miles –**

1. Engine oil change and oil filter renewal
2. Manual gearbox oil change
3. Final drive oil change
4. Half-shafts
5. Power steering oil level check
6. Cooling system
7. Brakes
8. Fuel pump mounting
9. Carburetor nounting
10. Fuel injection system
11. Checking/tensioning V-belts
12. Tightening nuts and bolts on engine
13. Valve clearances – adjusting
14. Tightening nuts and bolts
15. Checking foot brake/handbrake
16. Checking tire pressures, including spare wheel
17. Checking/correcting toe of front wheels
18. Checking/correcting headlight beams
19. Checking lights
20. BMW program test/digital tester – diagnosis
21. Final inspection

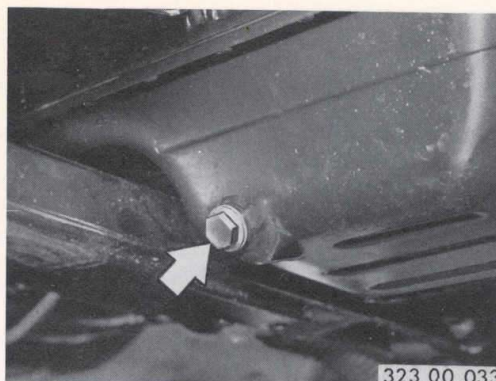
**00 00 219 1st BMW Inspection**  
**– at 1 000 km / 600 miles –**

**1. Engine oil change and oil filter renewed**

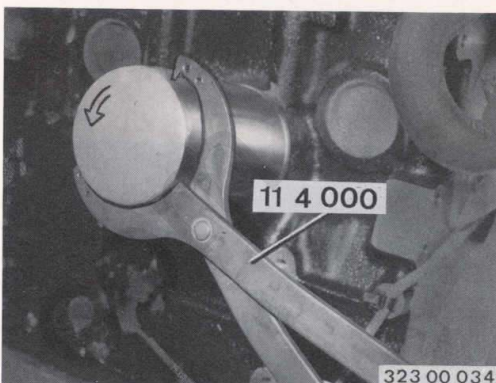
Engine at operating temperature.

Unscrew oil drain plug (19 mm/ $\frac{3}{4}$ " wrench) at bottom right of oil pan. After oil has drained, install and tighten plug. Torque<sup>1)</sup>.

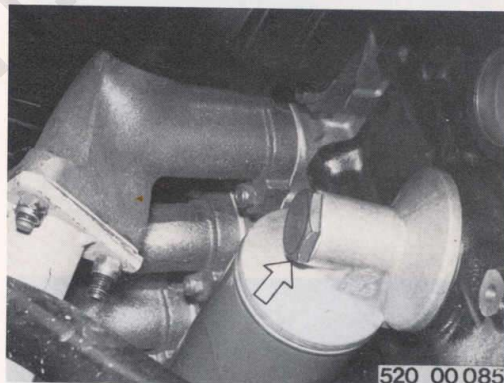
*When installing:* Check oil drain plug and seal; renew if necessary.



Unscrew oil filter with special tool 11 4 000.



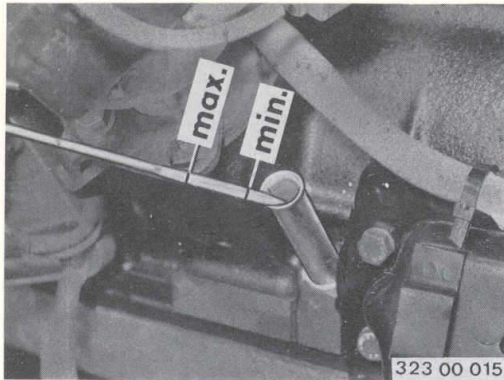
For cars with air conditioning:  
Unscrew adaptor with a 32 mm ( $1\frac{1}{4}$  in) wrench and separate filter from adaptor.



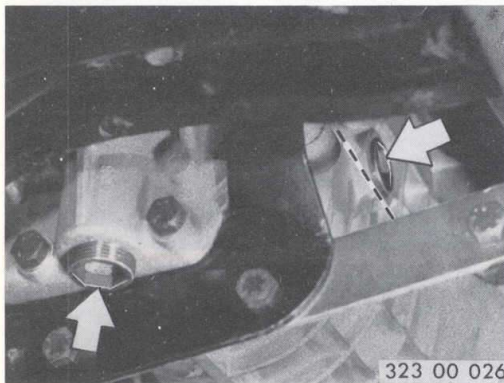
*When installing:* insert adaptor in lock. Renew the aluminum seal. Tightening torque<sup>1)</sup>.



<sup>1)</sup> See Specifications



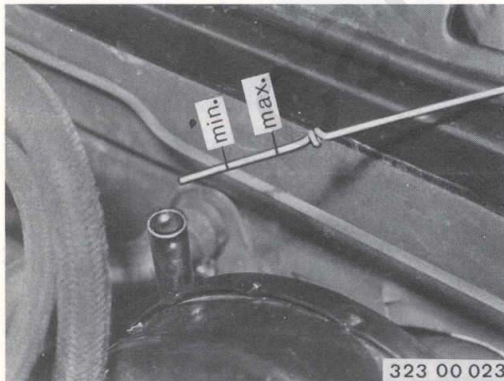
Add brand name engine oil. Quantity<sup>1)</sup>.  
Oil level not higher than max. mark.  
Quantity of oil between min. and max. marks  
= 1.5 liters (1.6 US quarts, 2.6 Imp. pints).  
For approved oil grades, see Service Information Group 11.



## 2. Oil change only for manual gearbox

Transmission at operating temperature.  
Unscrew oil drain plug and filler plug with a 17 mm wrench. Clean and install oil drain plug, tightening torque<sup>1)</sup>. brand name SAE 80 gear tightening torque<sup>1)</sup>. Add brand name SAE 80 gear oil.

Oil level<sup>1)</sup> up to lower edge of filler opening.  
Specifications MIL-L-2105 or  
API-GL-4



## Automatic transmission – checking oil level

Requirement: car on flat, level surface. Transmission at normal operating temperature, selector lever at P, engine idling.

Oil level must be between max. and min. marks.

Quantity of oil between marks: 0.4 liter (0.42 US quart, 0.7 Imp. pint).

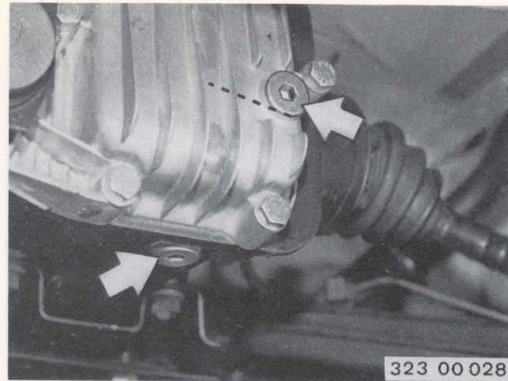
*Important:* do not clean oil dipstick with a fluffy cloth.

For approved grades of ATF, see Service Information Group 24.

<sup>1)</sup> See Specifications

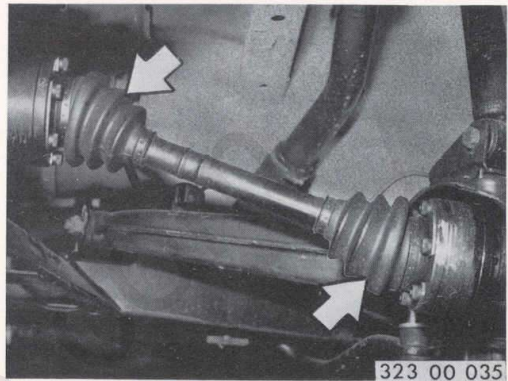
### 3. Final drive oil change

Final drive at operating temperature. Unscrew oil drain plug and filler plug with a 10 mm Allen socket wrench. Clean oil drain plug, check seal and install drain plug. Torque<sup>1)</sup>. Add. brand name SAE 90 hypoid gear oil. Oil level up to mark. Quantity<sup>1)</sup>. Refer to Service Information Gr.33 for approved oils.



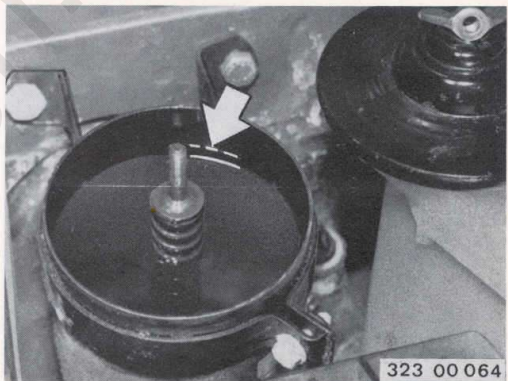
### 4. Output shafts

Check dust covers for leaks. Tighten mounting bolts. Torque<sup>1)</sup>.



### 5. Checking power steering oil level

Stop engine. Unscrew wing nut on oil tank cover and remove cover. Oil level must be app. 5 mm (0.2 in) above mark on tank wall. Start engine. Add oil if necessary up to correct level.



### 6. Cooling system

Check coolant level. Add coolant until level is not more than 2 cm (0.8 in) below radiator cap.



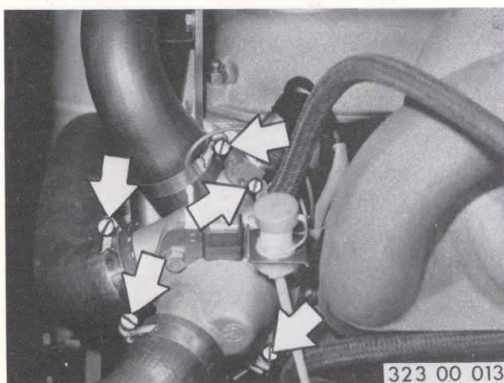
<sup>1)</sup> See Specifications



323 00 012

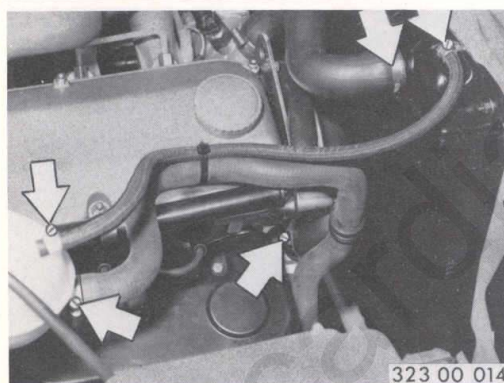
**Check antifreeze concentration.**

**All-year antifreeze protection:  $-25^{\circ}\text{C}$  ( $-13^{\circ}\text{F}$ ). Refer to Service Information Gr. 17 for approved long-term antifreeze and corrosion inhibitors.**



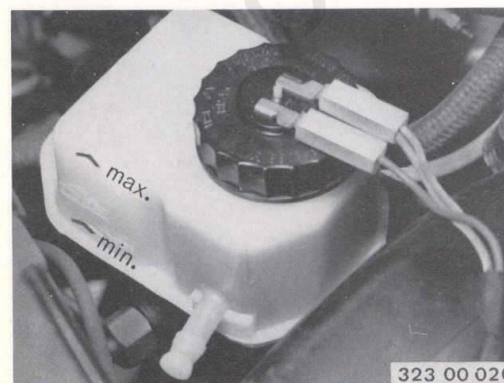
323 00 013

**Tighten all hose clips on engine.**



323 00 014

**Tighten all hose clips on radiator and expansion tank.**



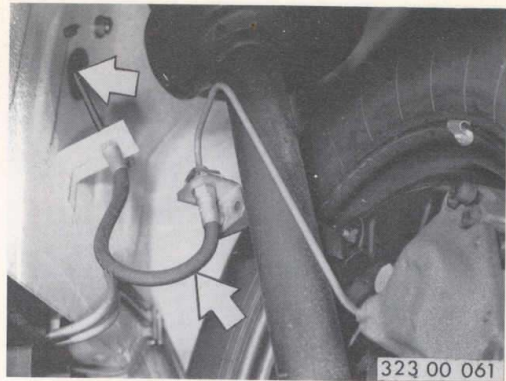
323 00 020

## 7. Brakes

**Brake fluid level in transparent reservoir for braking system must be between min. and max. marks.**

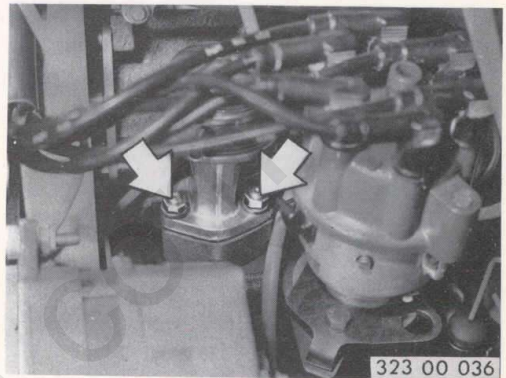
**Add fluid only up to max. mark. Refer to Service Information Gr. 34 for approved brake fluids. Important! Change brake fluid annually.**

Check brake lines, brake hoses, connections and parking brake cables for correct routing, tightness and leaks.



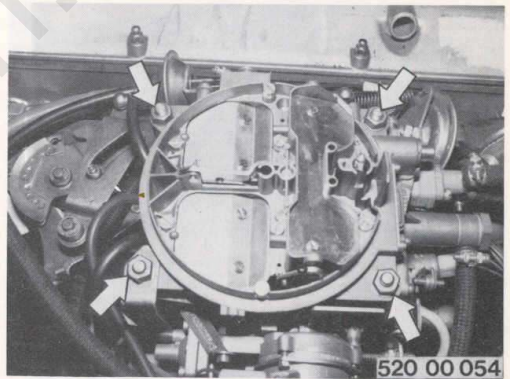
#### 8. Fuel pump mounting

Tighten nuts of fuel pump. Torque<sup>1)</sup>.  
Check (visual inspection) fuel pump and connections for leaks.



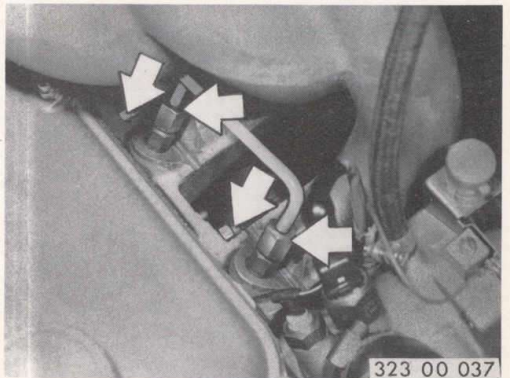
#### 9. Carburetor mounting

Take off air cleaner.  
Check tightness of carburetor nuts. Torque<sup>1)</sup>.

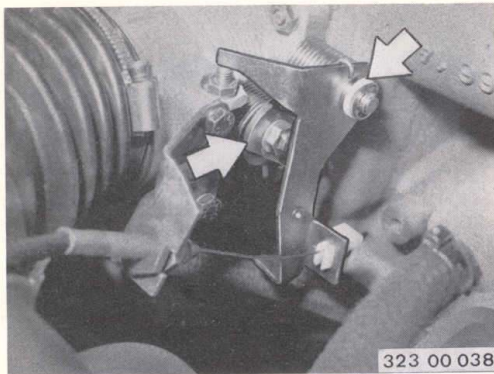


#### 10. Fuel injection system

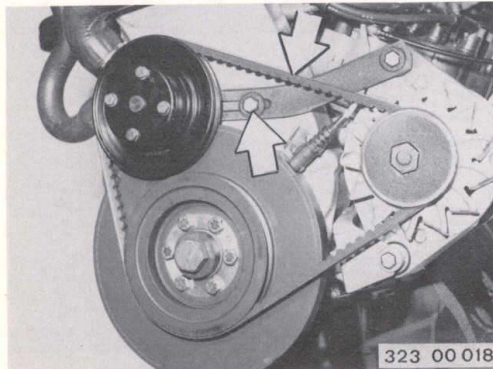
Take up any slack at injector pipe collar nuts and intake pipe retaining nuts. Check pipes for correct seating and leakage.



<sup>1)</sup> See Specifications



Oil pivots of throttle butterfly arm.



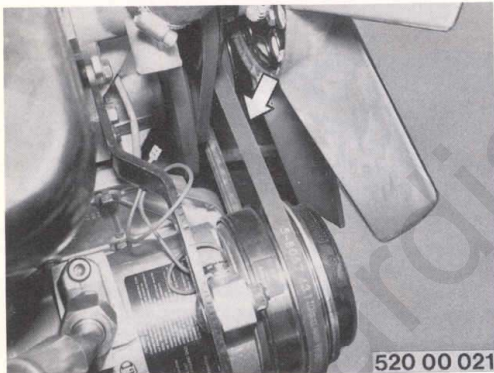
#### 11. Checking/tensioning V-belts<sup>1)</sup>.

The V-belts when tightened correctly must yield under thumb pressure by 5 to 10 mm (0.2 to 0.4 in) at a point midway between two pulleys. Tighten V-belt for alternator and, if applicable, vane pump. Loosen alternator and, if applicable, vane pump, swing outward and re-tighten the bolts.

Tighten V-belt for compressor (air conditioning).

Loosen compressor at holder and press downward.

Tighten the mounting bolts.



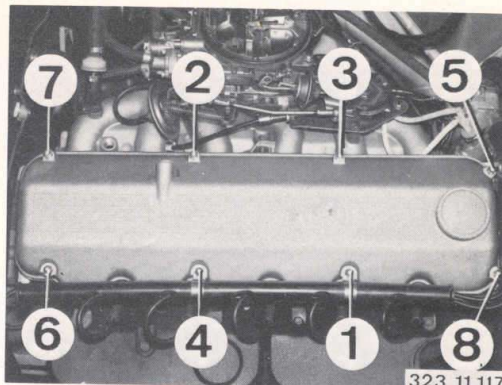
#### 12. Tightening nuts and bolts on engine

Tighten left and right engine rubber mounts, engine mounting stirrup, toothed belt cover mounting bolts, intake/exhaust manifolds and oil pan mounting bolts.

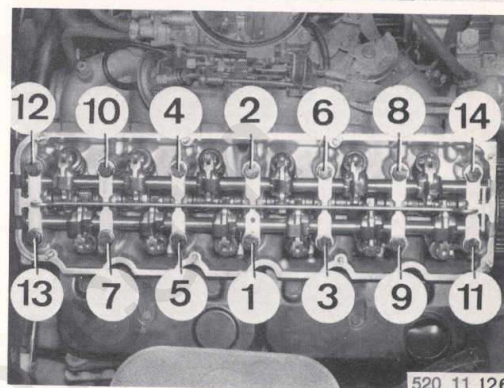
<sup>1)</sup> See Specifications

**Tighten cylinder head bolts. For this purpose remove the air cleaner (carburetor engine). Take off cylinder head cover.**

**Installation Note! Tighten nuts in sequence of 1...8.**



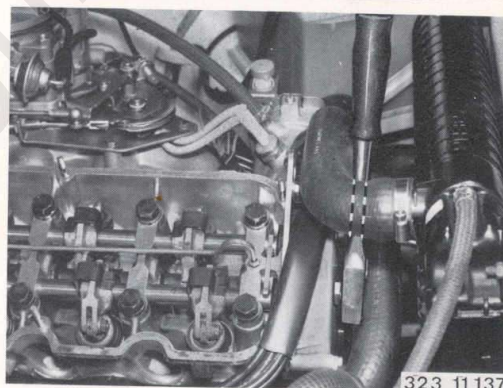
**Max. engine temperature: +35°C (95°F). Tighten cylinder head bolts one after the other in the sequence 1...14, in two stages:**



### 13. Valve clearances – adjusting

**Important: take out spark plugs before turning over engine.**

**Turn engine over with a 1/2-inch ratchet head.**

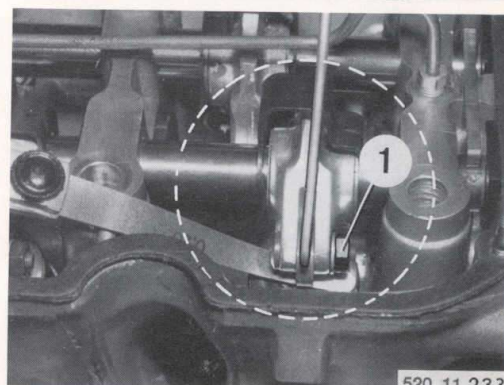


**Adjust valves in same sequence as firing order (1-5-3-6-2-4), at compression to dead center (TDC).**

**Adjust valve clearance between valve and eccentric after loosening nut (1).**

**Tighten nut (1) with special ring spanner 11 1 150 and torque wrench 00 2 050.**

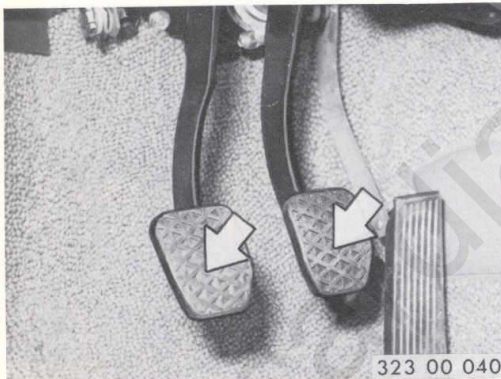
**Note correct tightening torques<sup>1)</sup>.**



<sup>1)</sup> See specifications

#### 14. Tightening nuts and bolts<sup>1)</sup>

Front axle beam to body  
Wishbone to front axle beam  
Steering gear to front axle beam  
Track rod clamping bolts  
Transmission to engine  
Bearing mount to transmission  
Rubber mount to cross member  
Cross member to body  
Exhaust pipes to exhaust manifold  
Exhaust (all exhaust holders) to front exhaust pipes  
Propeller shaft (manual gearbox), front  
Propeller shaft (automatic transmission), front  
Center bearing to body  
Propeller shaft to final drive  
Front brake calipers  
Wheel bolts



#### 15. Checking foot brake and handbrake

Check pedal action during test drive.  
Check that brakes do not pull to one side or judder.



Check handbrake adjustment.  
Apply handbrake lever by 5 notches.  
Wheels should just turn by hand without local stiffness. If necessary, adjust brakes and handbrake cables.

<sup>1)</sup> See Specifications

**16. Checking tire pressures, including spare wheel**

Check filling pressure<sup>1)</sup> with cold tires.  
Check valves for tightness.



**17. Checking/adjusting toe of front wheels**

Vehicle in normal-load position:<sup>1)</sup>  
Position steering at 0 and check toe with optical testing equipment.<sup>1)</sup>  
If necessary, adjust toe at track rods.

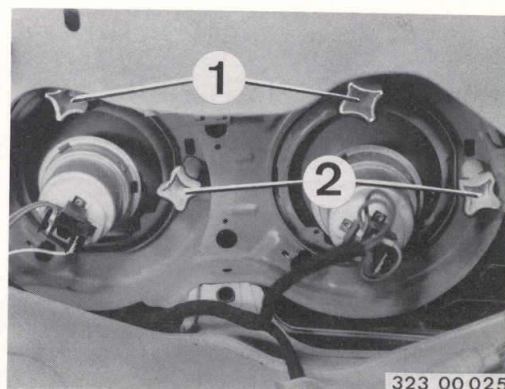


**18. Checking/aiming headlight beams**

Requirement: Correct tire pressures, car on level ground and rear seat loaded at center by one person or 70 kg (154 lb) weight.  
Check low and high beams with optical testing equipment.

Remove covers. Make corrections with adjusting screws.

- (1) Vertical adjustment
- (2) Lateral adjustment



<sup>1)</sup> See Specifications

### **19. Checking lights**

Check function of parking lights, high and low beam headlights, tail lights, stop lights, backup lights, tail fog light, license plate light, turn signals, hazard warning lights, horns, windshield wipers and windshield washer. The windshield washing and headlight cleaning system can be kept ready for use all year around down to temperatures of  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ) by adding 40% household spirit. Adjust windshield washer jets. Check function of heater blower, interior lights, glove box lamp, trunk and engine compartment lamps, instrument lights and all indicator lamps and cigar lighter.

### **20. Diagnosis with BMW program tester / digital tester**

See 11 00 005.

### **21. Final inspection**

Test drive to check road safety and function of engine, cooling system, transmission, rear axle, steering and brakes. After test drive check engine, cooling system, transmission, rear axle, steering and brakes for leaks.

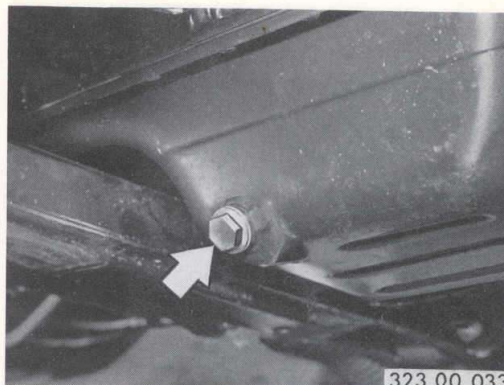
**00 00 229 1st BMW Oil Service**  
**– at 7500 km (5000 miles) –**

**1. Engine oil change and oil filter renewal**

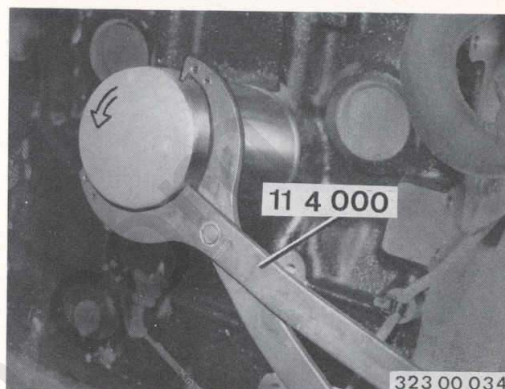
**Engine at operating temperature.**

**Unscrew oil drain plug (19 mm /  $\frac{3}{4}$  in wrench) on bottom of oil pan, right-hand side. After oil has drained install and tighten plug.<sup>1)</sup>**

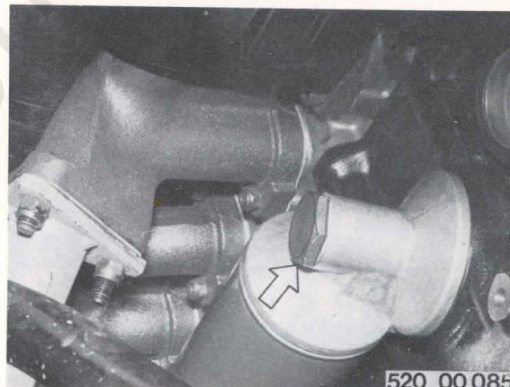
**When installing: Check oil drain plug and seal and renew if necessary.**



**Unscrew oil filter with special tool 11 4 000.**



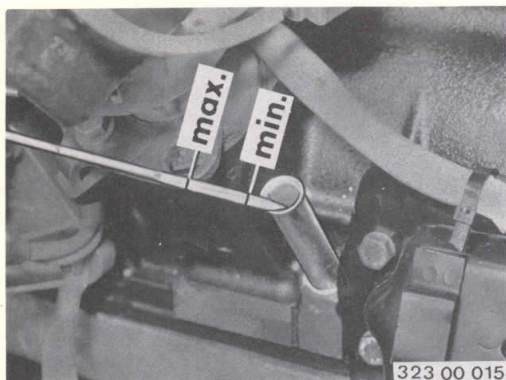
**For version with air conditioning:**  
**Unscrew adaptor with 32 mm ( $1\frac{1}{4}$  in) wrench and separate filter from adaptor.**



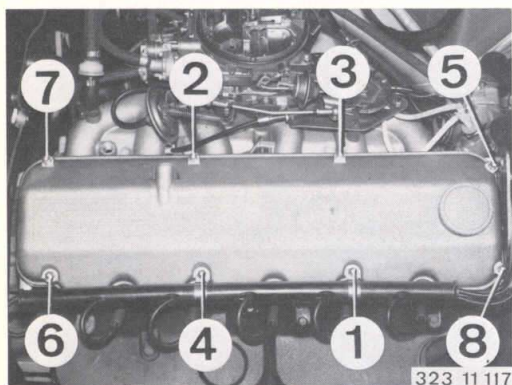
**When installing: Insert adaptor in lock.**  
**Renew aluminum seal.**  
**Tightening torque:<sup>1)</sup>**



<sup>1)</sup> See Specifications

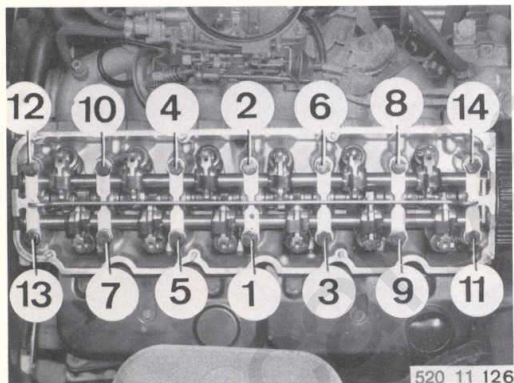


Add brand name engine oil.  
 Oil level at most up to max. mark only.  
 Quantity of oil between min. and max. marks  
 = 1.5 liters (1.6 US quarts, 2.6 Imp. pints).



2. Tightening cylinder head bolts at  
 7500 km (5000 miles); this job is not part of  
 any later Oil Service

Remove air cleaner housing.  
 Take off cylinder head cover.  
 When installing: Tighten nuts in sequence of  
 1... 8.<sup>1)</sup>



Max. engine temperature: +35°C (+95°F).  
 Tighten cylinder head bolts one after the other  
 in sequence 1... 14, in 2 stages:<sup>1)</sup>

<sup>1)</sup> See Specifications

**0000239 BMW Inspection (starting at 15000 km/10000 miles  
and then every 15000 km/10000 miles)**

1. Engine oil change and oil filter renewal
2. Checking/correcting transmission oil level
3. Checking/correcting final drive oil level
4. Half-shafts
5. Power steering oil level check
6. Cooling system
7. Checking/correcting battery acid level
8. Checking/correcting brake fluid level
9. Checking/correcting belt tightness
10. Lubricating carburetor linkage or throttle butterfly controls with oil or grease
11. Tightening nuts and bolts on engine
12. Checking/adjusting valve clearances
13. Replacing spark plugs
14. Replacing contact breaker points
15. Replacing air cleaner element
16. Checking steering
17. Checking propeller shaft
18. Tightening nuts and bolts
19. Checking exhaust system
20. Checking brake linings
21. Checking condition of braking systems/adjusting parking brake
22. Checking hinges and locks
23. Checking lights
24. Checking seat belts
25. Diagnosis with BMW program tester/digital tester
26. Final inspection

### 00 00 239 BMW Inspection

– starting at 15 000 km (10 000 miles) and then every 15 000 km (10 000 miles) –

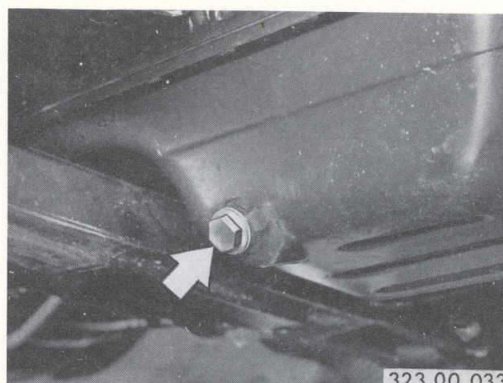
#### 1. Engine oil change and oil filter renewal

Engine at operating temperature.

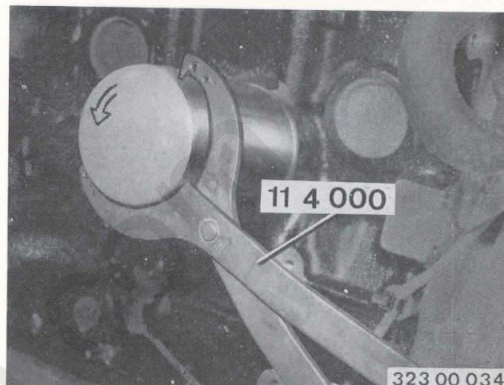
Unscrew oil drain plug (19 mm ( $\frac{3}{4}$ " wrench) from bottom of oil pan on right-hand side. After oil has drained, install and tighten plug. Torque<sup>1)</sup>.

When installing: Check oil drain plug and seal, and renew if necessary.

Unscrew oil filter with special tool 11 4 000.



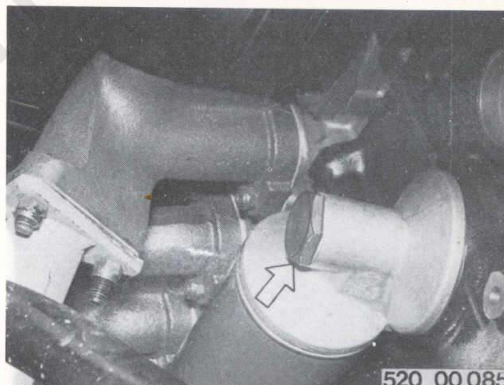
323 00 033



323 00 034

For version with air conditioning:

Unscrew adaptor with a 32 mm ( $1\frac{1}{4}$  in) wrench and separate filter from adaptor.



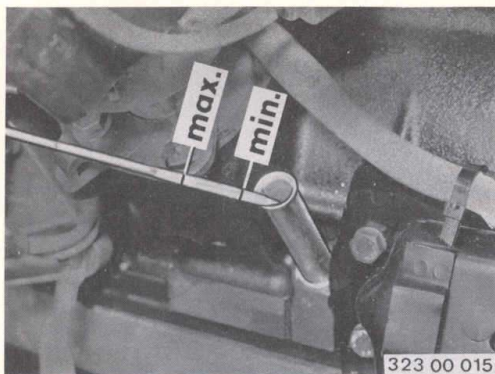
520 00 085

When installing: Place adaptor in lock. Renew aluminum seal. Tightening torque:<sup>1)</sup>



520 00 086

<sup>1)</sup> See Specifications



Add brand name engine oil.  
Oil level up to max. mark, not higher.  
Quantity of oil between min. and max. marks  
= 1.5 liters (1.6 US quarts, 2.6 Imp. pints).  
For approved grades of oil, see Service Information Group 11.

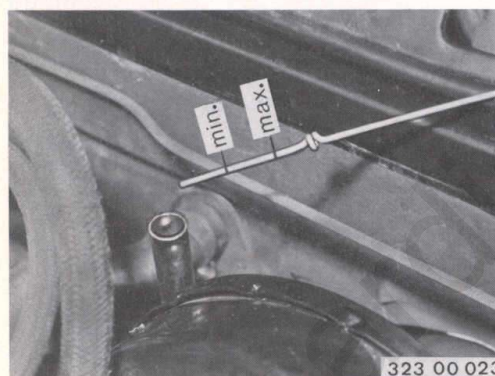


## 2. Checking/correcting transmission oil level

### a) Manual gearbox.

Unscrew oil filler plug with a 17 mm socket wrench.

Oil level up to lower edge of filler opening.  
Use only brand name SAE 80 gear oil.  
Specifications MIL-L-2105 or API-GL-4.

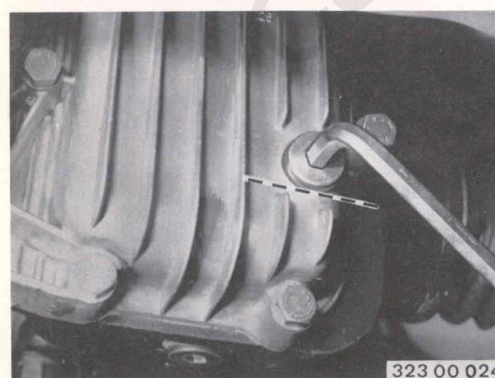


### b) Automatic transmission:

Requirement: Car on level ground, transmission at operating temperature, selector lever at "P" and engine running at idle speed.  
Oil level must be between min. and max. marks.

Quantity of oil between min. and max. marks  
= 0.4 liter (0.42 US quart, 0.7 Imp. pint).

*Important!* Never wipe oil dipstick with a fluffy cloth. Refer to Service Information Gr.24 for approved automatic transmission fluids.



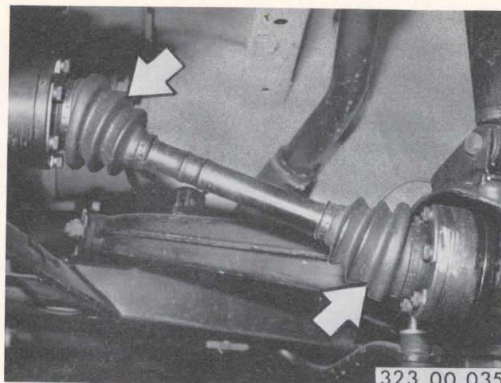
## 3. Checking/correcting final drive oil level

Unscrew oil filler plug with 10 mm socket wrench.

Oil level up to lower edge of filler opening.  
Use only brand name hypoid SAE 90 gear oils.  
Refer to Service Information Gr.33 for approved oils.

#### 4. Half-shafts

Check flexible gaiters for leakage.  
Take up any slack at the attachment bolts; tightening torque<sup>1)</sup>.



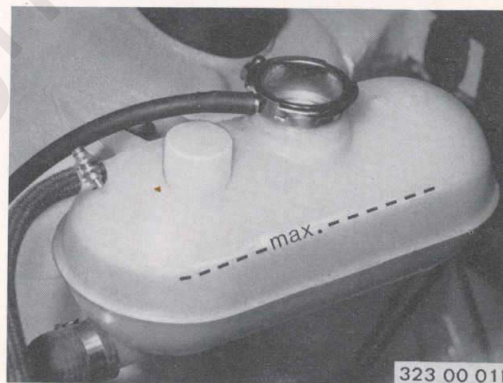
#### 5. Checking oil level in power steering

With engine stopped, unscrew wingnut from fluid reservoir and take off lid.  
The oil level must be approx. 5 mm (0.2 in) above the mark on the tank wall.  
Start the engine and add fluid if necessary until the oil level agrees with the mark.



#### 6. Cooling system

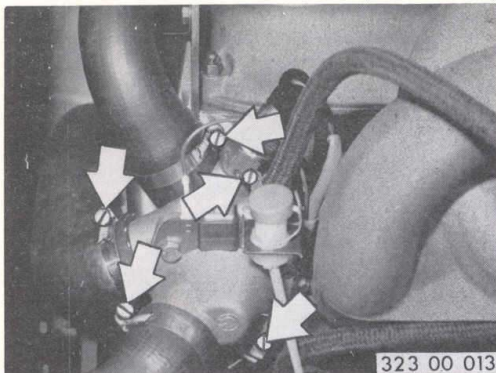
Check coolant level.  
Add water if necessary to not higher than 2 cm (0.8 in) below the filler cap.



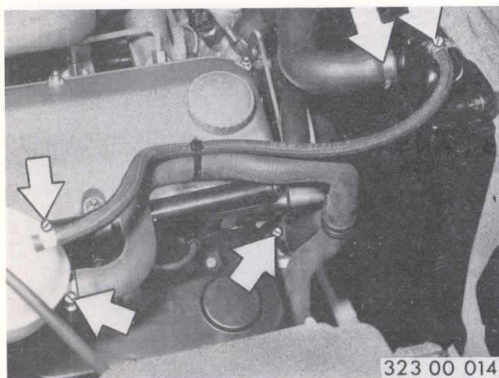
Check antifreeze concentration.  
Antifreeze protection level: down to  $-25^{\circ}\text{C}$  ( $-13^{\circ}\text{F}$ ) all the year round. For approved long-term antifreeze and corrosion inhibiting additives, see Service Information, Group 17.



<sup>1)</sup> See Specifications



Take up slack at all hose clips on the engine.



Take up slack at all hose clips on radiator and coolant expansion tank.



#### 7. Checking battery acid level/adding distilled water if necessary

Take off the battery cover and unscrew the cell plugs.

Battery acid level should be approx. 5 mm (0.2 in) above the plates in each cell, or up to the mark visible in each cell opening.

Add distilled water if the level has dropped. Keep the upper part of the battery dry and clean.

*Important:* do not allow acid or lead oxide from the terminal posts to reach the clothing. Do not bring a naked light near the battery or an explosion may occur.



#### 8. Brake fluid level – checking/restoring

The brake fluid level in the translucent reservoir for the brake system should be between the 'MIN' and 'MAX' marks.

Add fluid up to the 'MAX' mark if necessary.

For approved grades of brake fluid, see Service Information, Group 34.

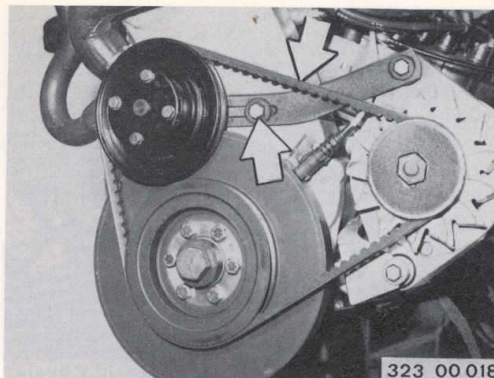
*Important:* brake fluid must be renewed at least once a year.

### 9. V-belt – checking condition, correcting tension

It should be possible to depress V-belts by 5 to 10 mm (0.2 to 0.4 in) at the centre of their runs if correctly tensioned.

Adjust the tension of the V-belts for the alternator and the power steering pump (if installed) if necessary.

Loosen the alternator (and the power steering pump if installed) at top and bottom, swing out and retighten bolts.



Correct tension of the compressor V-belt for the air conditioning (if installed).

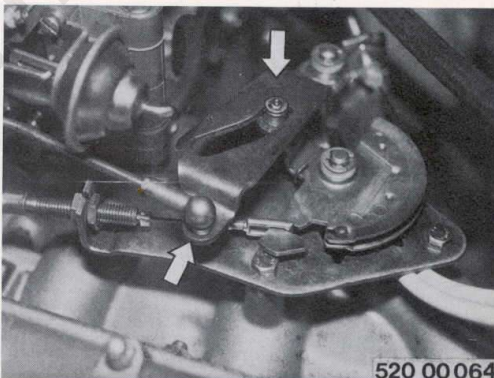
Slacken off the compressor at its mounting and press down.

Tighten the retaining bolts again.



### 10. Oil/grease the carburetor linkage or throttle butterfly actuating mechanism

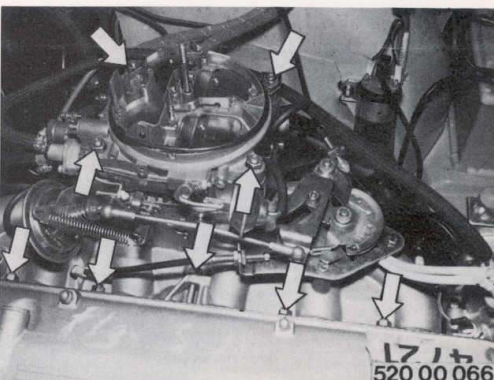
Oil or grease the pivots, bearing points and gate of the carburetor linkage or throttle butterfly actuating mechanism as appropriate.



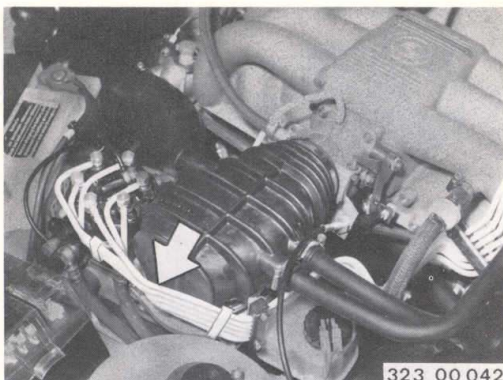
### 11. Take up slack at nuts and bolts on engine

Detach the air cleaner.

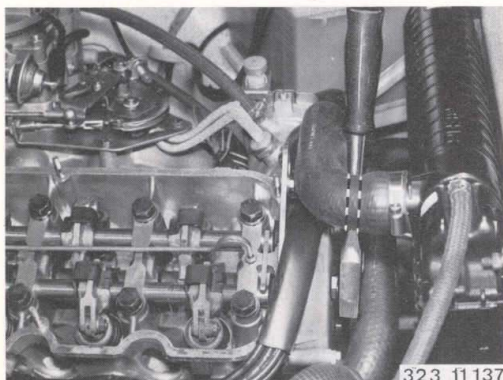
Tighten nuts on exhaust manifold, carburetor retaining nuts and fuel pump retaining nuts.<sup>1)</sup>



<sup>1)</sup> See Specifications



Check fuel lines at carburetors or fuel injection system for correct location, general condition and freedom from leaks.

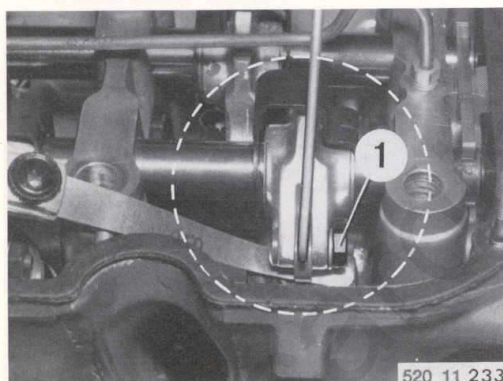


## 12. Valve operating clearances – checking/adjusting

Take off the rocker cover – 11 12 000.

*Important:* remove spark plugs before turning over engine.

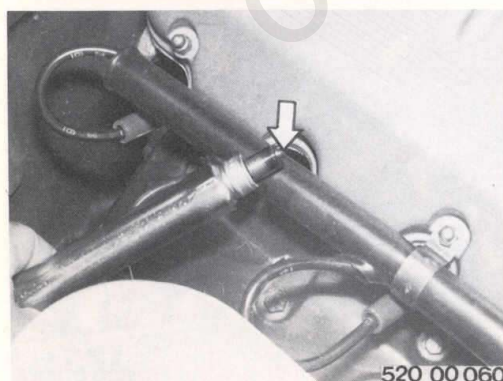
Turn the engine at the adapter with a  $\frac{1}{2}$ " ratchet.



The order of adjustment is the same as the firing order: 1-5-3-6-2-4, and is carried out at top dead center (TDC) on the compression stroke. Adjust valve clearance between the valve and the eccentric after slackening off nut (1).

Tighten nut (1) with special ring spanner 11 1 150 used in conjunction with torque wrench 00 2 050.

Note correct tightening torque<sup>1)</sup>.



## 13. Spark plugs – renewing

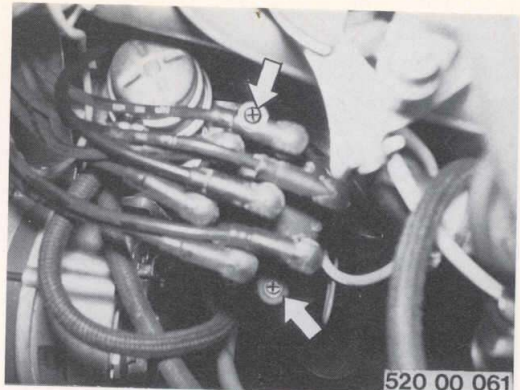
Before screwing in the new spark plugs, check their electrode gaps<sup>1)</sup>

Correct if necessary by bending the earth (ground) electrode.

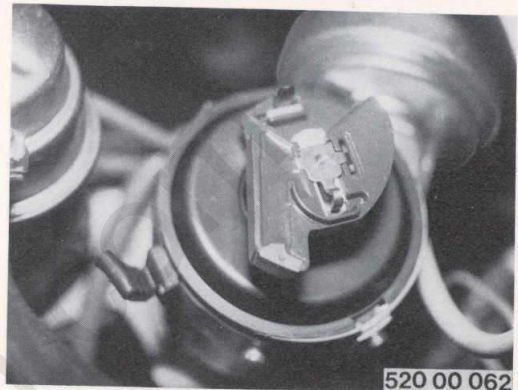
<sup>1)</sup> See specifications

#### 14. Breaker points – renewing

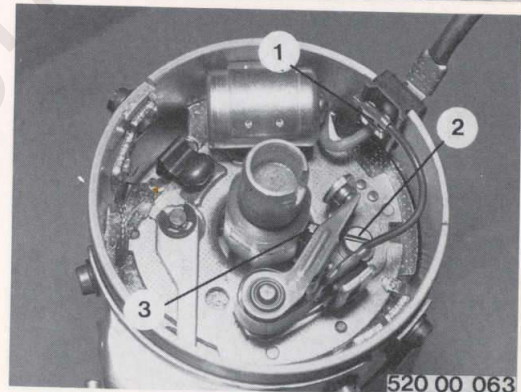
After overcoming the spring loading, turn the catch to the left and remove the distributor cap.  
*When installing:* Make sure that the distributor cap locks into position and the catches are correctly seated.



Remove the distributor rotor and dust cover.



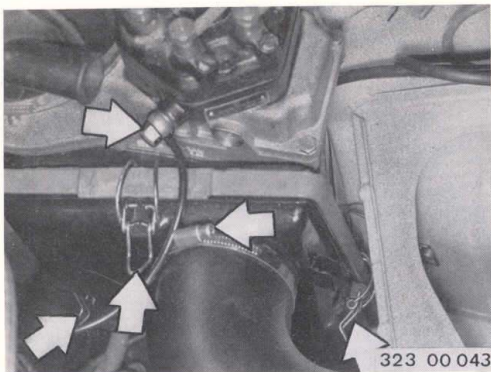
Pull off the flat pin plug (1).  
Remove screw (2).  
Pull out the breaker points assembly.  
*When installing:* clean new breaker points to remove grease.  
Apply Bosch Ft 1 v 4 grease to the cam and ramp (3) of the breaker arm.  
Adjust dwell angle and ignition timing – 12 11 004.



#### 15. Air cleaner element – renewing

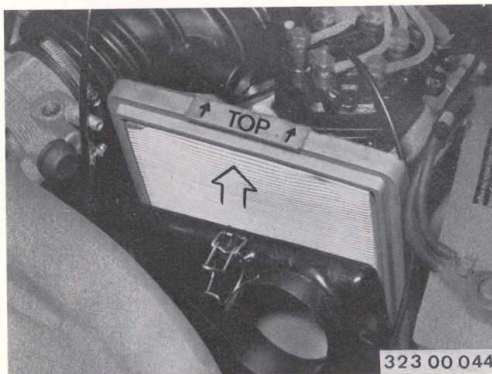
Carburetor engine:  
Loosen nut and snap catch.  
Take out and renew element.  
*When installing:* rubberized inner ring faces up.  
Arrows on intake pipe and air cleaner cover must be aligned.





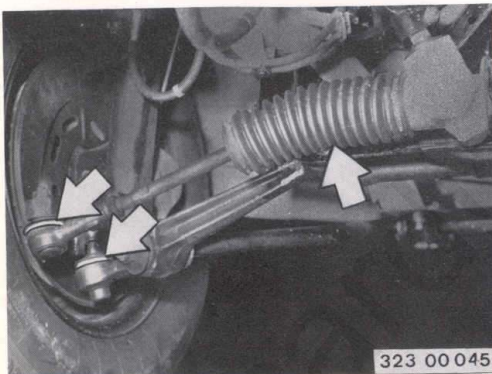
**Fuel injection engine:**  
 Unscrew the pipe.  
 Detach air inlet trumpet.  
 Release snap fasteners.

323 00 043



Take the air cleaner out upwards.  
 When installing: note "Top" inscription on element.  
 Arrows must point towards flow distributor.

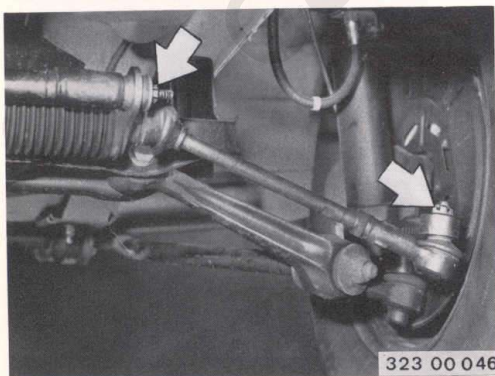
323 00 044



#### 16. Checking steering

Check front suspension and steering joints for freedom from wear and damage, and absence of play.  
 Check condition of flexible gaiters and sealing sleeves.

323 00 045



Detach left and right track rods.  
 Detach the steering damper.  
 When installing: note correct tightening torque<sup>1)</sup>.

323 00 046

<sup>1)</sup> See specifications

Lift out the BMW badge and install BMW friction gauge 00 2 000.

Using the friction gauge, turn the steering spindle from full left to right lock, and check for local stiffness or partial seizure.

To determine the friction coefficient, move the steering rack to a central position and read off the friction value.<sup>1)</sup>

If necessary, remove the rack and pinion steering gear and repeat the measurement. See 32 10 004.



#### 17. Propeller shaft – checking

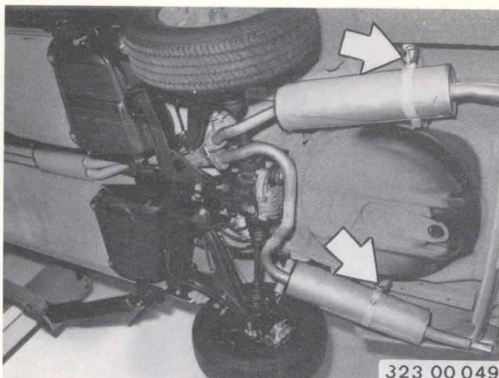
Inspect the propeller shaft, rubber coupling, universal joints and center bearing for signs of damage and absence of play.



#### 18. Take up slack at nuts and bolts<sup>1)</sup>

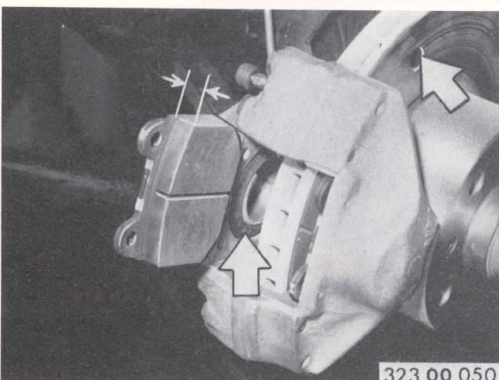
Front axle beam to body  
Wishbone to front axle beam  
Steering gear to front axle beam  
Track rod clamp bolts  
Gearbox to engine  
Pivot mount to gearbox  
Rubber mounting to cross-member  
Cross-member to body  
Exhaust pipes to exhaust manifold  
Exhaust system to front exhaust pipes  
(all exhaust system mountings)  
Propeller shaft (manual gearbox), front  
Propeller shaft (automatic transmission), front  
Center bearing to body  
Propeller shaft to final drive  
Front brake calipers

<sup>1)</sup> See Specifications



### 19. Exhaust system – checking

Check condition, path, mountings and freedom from leaks of exhaust system.



### 20. Brake linings – checking

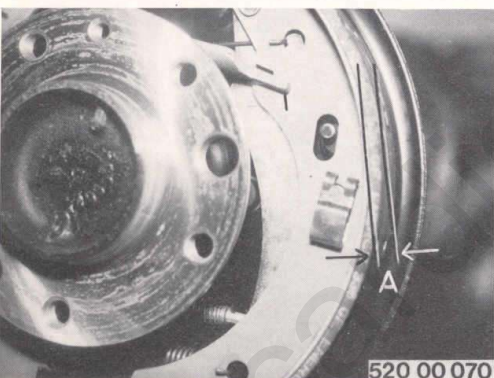
Detach the wheels.

Remove brake pads at front (and at rear if appropriate).

Renew brake pads if lining thickness (without backing plate) is only 2.0 mm (0.08 in).

Inspect the surfaces of the brake discs.

Clean out the brake calipers and check condition of sealing sleeves.



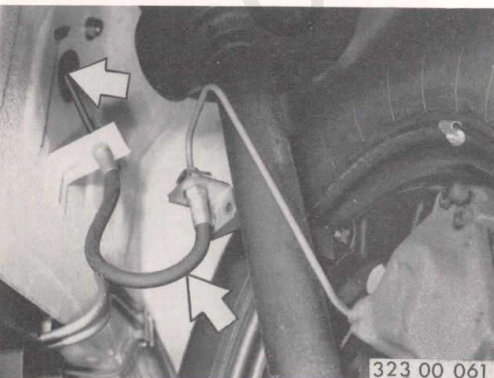
Rear drum brakes:

Remove screw and take off brake drum.

Check lining thickness. Renew brake linings if thickness (A) is only 2.0 mm (0.08 in).

Inspect the rubbed surfaces in the brake drums.

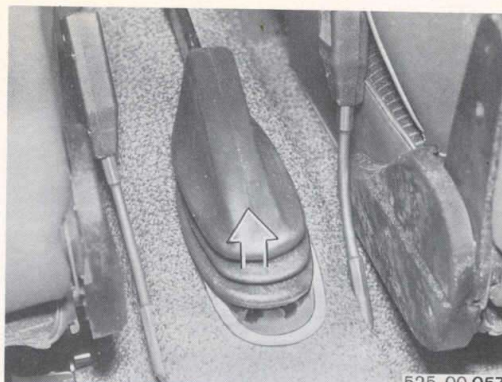
Clean out the brake drums.



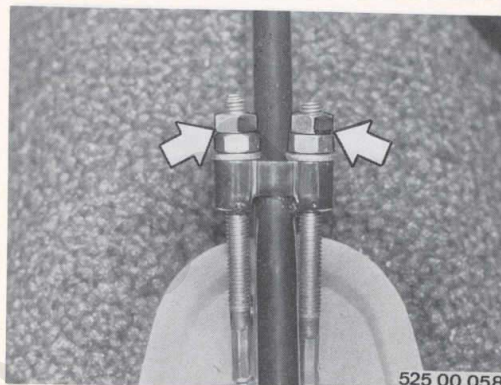
### 21. Checking condition of brake system/adjusting handbrake

Check that unions and pipes on the brake system are tight and correctly located. Check that the handbrake cables move freely.

**Adjusting handbrake:**  
pull off the rubber cover.



**Unscrew the handbrake cable nuts until the cables are no longer taut.**



**Rear disc brakes:**  
Take off the rear wheels.  
Turn the left rear brake disc until the large inspection hole is approx. 10° behind vertical at the top.  
On the right brake disc the large inspection hole should be app. 10° ahead of vertical at the top. In these positions, the adjusting nut can be seen through the inspection hole.



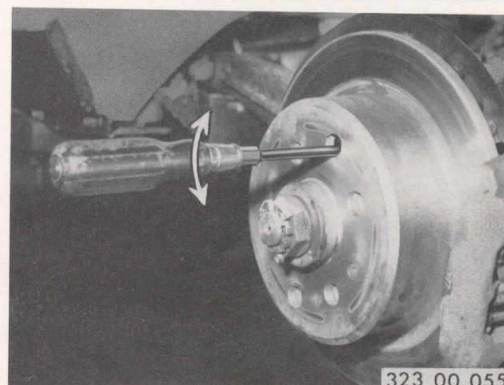
Insert a screwdriver and engage with the teeth on the adjusting nut.

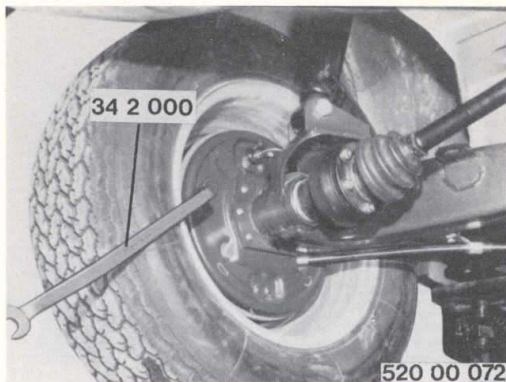
Turn the adjusting nut with the screwdriver blade to move the handbrake shoes up to the drum so that the brake disc can no longer be turned. Then slacken the adjusting nut off by 4-6 teeth.

To lock the handbrake, turn the screwdriver downwards.

To release the handbrake, turn the screwdriver upwards.

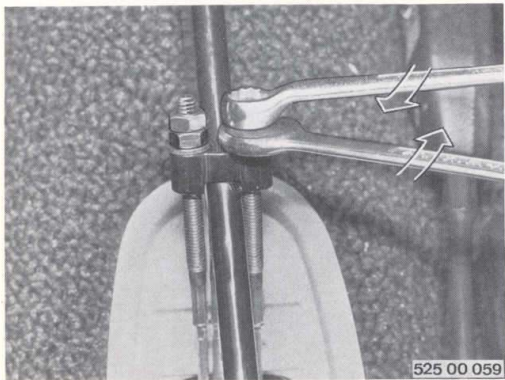
Attach the wheels again.





#### Rear drum brakes:

Using adjusting wrench 34 2 000, turn adjusting eccentric anti-clockwise on left and clockwise on right of car until the road wheel, which should be turned continuously, is locked. After this, slacken the eccentric screw by  $\frac{1}{8}$  turn so that the road wheel just turns freely.

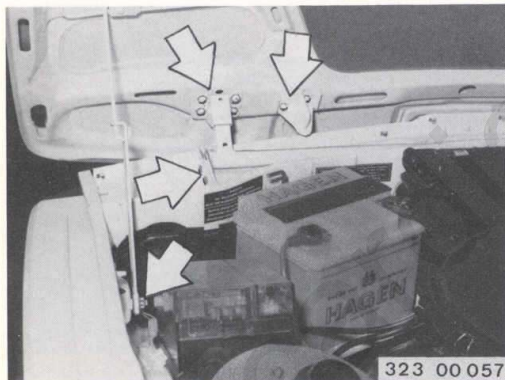


#### Adjust the handbrake cables.

Apply the handbrake lever by 4 notches and take up slack at the handbrake cables until the left and right rear wheels can just be turned without local stiffness.

Release the handbrake lever and check that the road wheels can now rotate freely.

Tighten the locknuts.



## 22. Check hinges, catches and locks

Take up slack at all retaining bolts for door and lid hinges which can easily be reached.

Grease or oil the hinges.

Check settings and correct operation of doors and lids.

### **23. Check lighting equipment**

Check operation of sidelights, low and high beam headlights, reversing (backup) lights, brake lights, rear lights, rear fog light, license plate lights, flashing turn indicators, hazard warning flashers, horns, wipers and windshield washer. Position windshield washer jets correctly. To keep the windshield and headlight washer unit operational at temperatures down to  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ), add 40% domestic spirit to the reservoir. Check operation of the heater blower, interior light, glove box light, luggage compartment and engine compartment lights, instrument lighting and all warning and telltale lamps and the cigar lighter.

### **24. Check seat belts**

Check condition and correct operation of seat belts.

### **25. Diagnosis with BMW Program tester/digital tester**

See 11 00 005.

### **26. Final inspection**

Test drive: check road safety and operation of engine, cooling system, transmission, rear axle, steering and brakes. Check handbrake. After test drive, inspect engine, transmission, cooling system, rear axle, steering and brakes for signs of leakage.

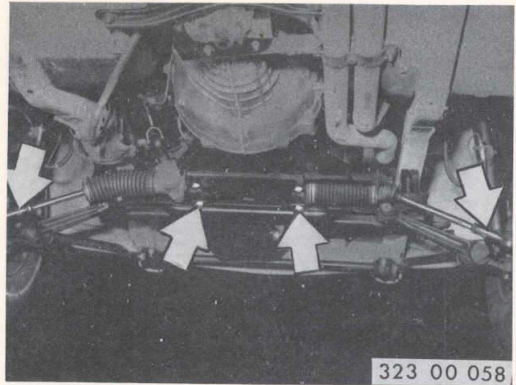
## **0000259 BMW Safety Test**

- 1. Check steering**
- 2. Check brakes**
- 3. Check tires and tire pressures**
- 4. Check lighting**
- 5. Check warning equipment**
- 6. Check wipers and washer system**
- 7. Check seat belts**
- 8. Exhaust emissions test**

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## 1. Checking steering

Check steering gear mountings, track rods and track rod pivots and steering column joints for correct attachment or play.

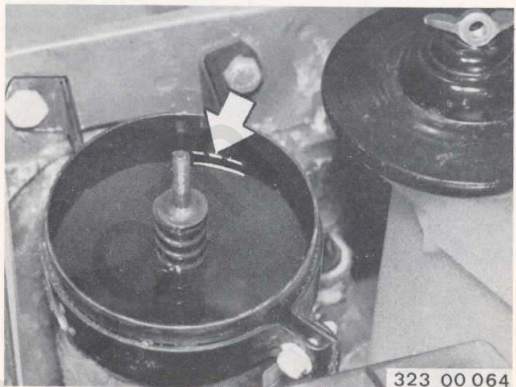


### Power steering:

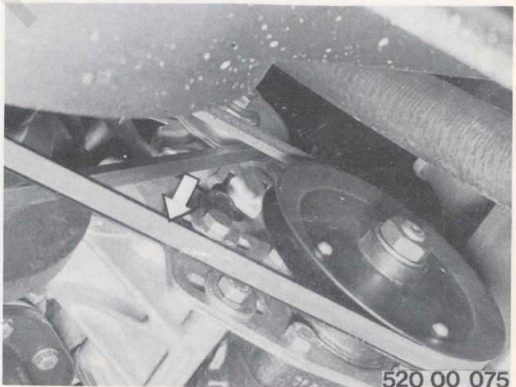
Inspect steering gear and hose connections for leaks.

To check oil level stop the engine, unscrew the wing nut from the fluid tank and take off the lid. The oil level must be approx. 5 mm (0.2 in) above the mark on the wall of the tank.

Start the engine and add oil if necessary until the level is at the mark.



Checking power steering pump V-belt: when correctly tensioned, it should be possible to depress the center of the belt run by 5 to 10 mm (0.2 to 0.4 in).



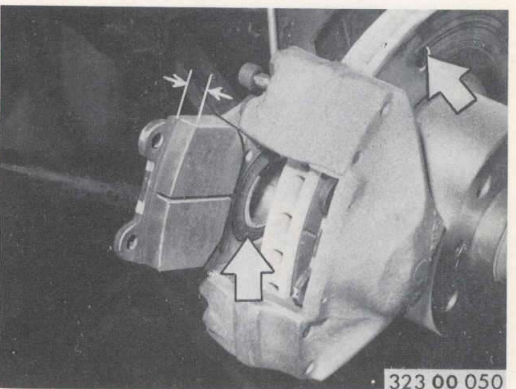
## 2. Checking brakes

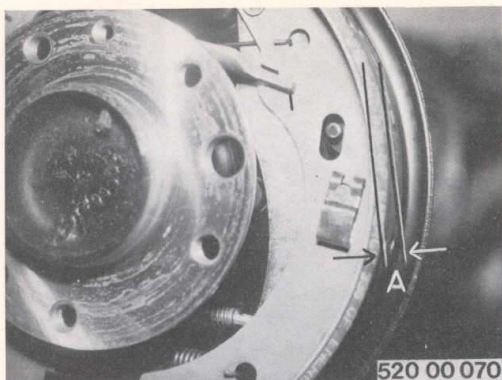
Take off the wheels.

Remove the front brake pads (and the rear pads if installed).

Renew the brake pads if the minimum thickness of 2.0 mm (0.08 in) is reached (lining material without backing plate).

Inspect the rubbed surfaces of the brake discs. Clean out the brake calipers and inspect the sealing sleeves.





#### Rear drum brakes:

Remove the screw and take off the brake drum. Check brake lining thickness. Renew linings if the minimum thickness (A) has reached 2 mm (0.08 in).

Inspect the rubbed surfaces in the brake drums.

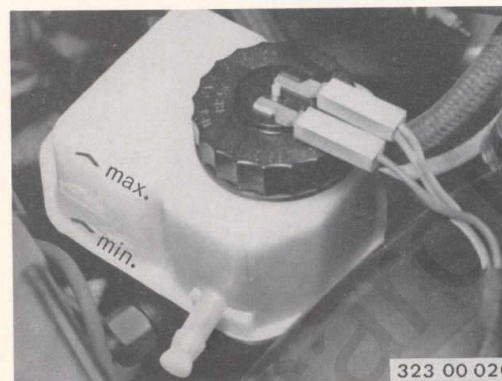
Clean the drum brakes.



#### Check handbrake setting.

Apply the handbrake by 5 notches.

It should just be possible to turn the wheels smoothly by hand.

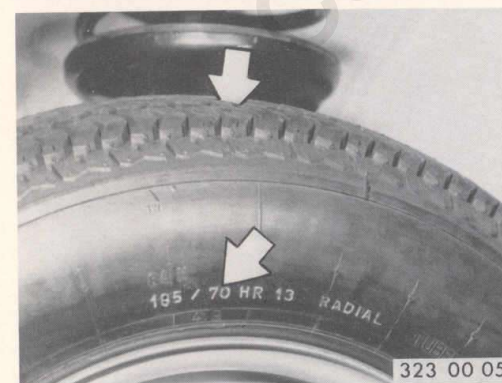


Check brake pipes, hoses, unions and the handbrake cables for correct location, strength and freedom from leaks.

The brake fluid level in the translucent reservoir for the brake system should be between the 'MIN' and 'MAX' markings.

Restore the level to the 'MAX' mark if necessary. For approved grades of brake fluid, see Service Information, Group 34.

**Important:** brake fluid must be renewed once a year.



### 3. Tires and tire pressures – checking

Although the law may permit tires to be used with only 1 mm (0.04 in) of tread depth, the car's tires should not be allowed to drop below 3 mm (0.12 in) depth of tread for safety reasons. Failing this, there is a severe risk of 'aquaplaning' at high speeds even when the road is covered only with a thin film of water. Inspect tires and rims for damage and make sure that they are of the correct size.

Checking tire pressures including spare wheel<sup>1)</sup>.



#### 4. Checking lights

Check function of headlights and auxiliary driving lights, and adjust beam settings with an optical alignment device. Check operation of side (parking) lights, rear lights, reversing (backup) lights, license plate lighting, instrument and inscription lighting, telltale and warning lights.

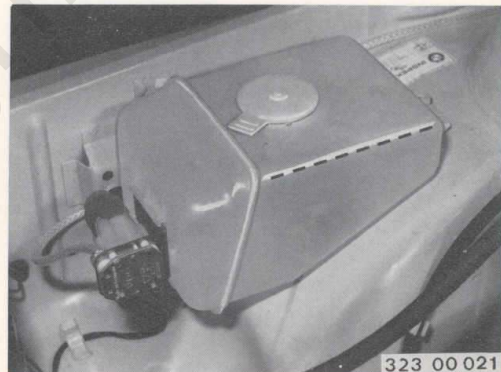
#### 5. Checking warning equipment

Check operation of horn, turn indicators, hazard warning system, brake lights, headlight flasher and rear fog light.

#### 6. Checking wipers/washer

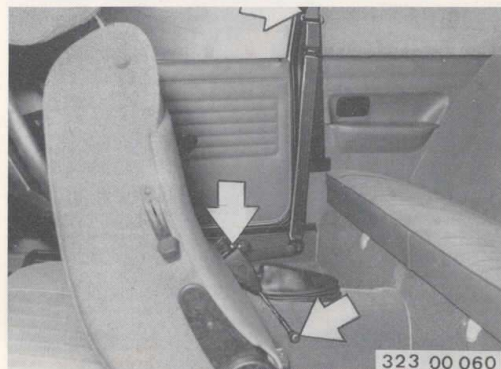
Check wiper blades, washer system (windshield and headlights if installed) and spray jets.

To keep the windshield washer and headlight cleaning systems operational at temperatures down to  $-20^{\circ}\text{C}$  ( $-4^{\circ}\text{F}$ ), add 40% domestic spirit to the reservoir.



#### 7. Checking seat belts

Check seat belts for correct function, general condition and correct attachment.



<sup>1)</sup> See Specifications



## 8. Exhaust emissions test

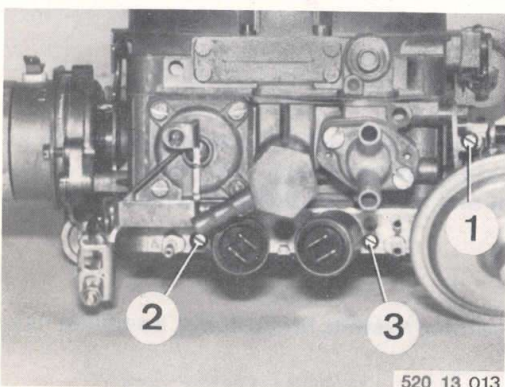
Run the engine at idle speed and at normal operating temperature.

### A) Carburetor engine

Remove the screw plugs from the exhaust manifolds and insert 13 0 020 measuring probes.

Connect the exhaust emissions tester.

Take a separate CO value reading from the front and rear exhaust manifolds.



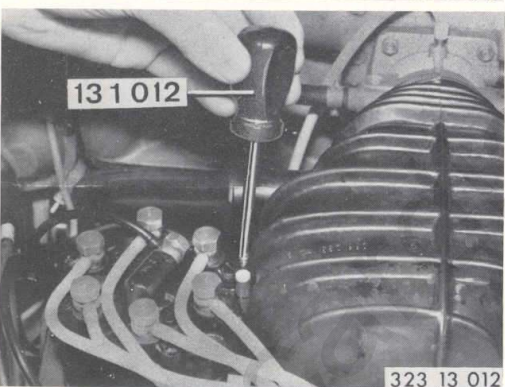
With mixture regulating screws (2 and 3), adjust the CO level in the exhaust<sup>1)</sup>.

Screw (2) = rear exhaust manifold

Screw (3) = front exhaust manifold

If the idle speed varies, correct at screw (1).

After adjusting engine idle speed and exhaust emissions, install new anti-tampering devices.



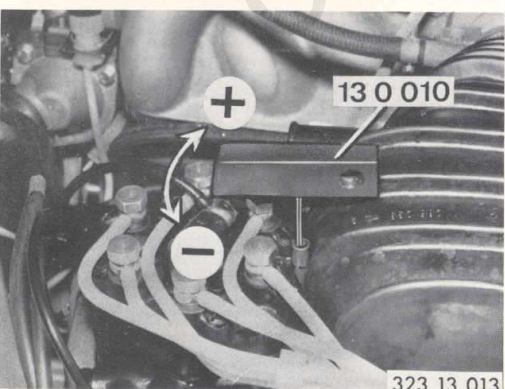
### B) Fuel injection engine

Remove the screw plugs from the exhaust manifolds and insert measuring probes 13 0 020.

Connect the exhaust emissions tester.

Take separate readings for the CO level at the front and rear exhaust manifolds.

*Important:* remove the anti-tampering device with extractor 13 1 012. After adjusting engine idle speed and exhaust emissions, install a new anti-tampering device.



Adjust the CO value<sup>1)</sup> with adjusting wrench 13 0 010.

<sup>1)</sup> See Specifications

