

Maintenance**Maintenance Procedures - Cabriolet****01 - MAINTENANCE****ENGINE OVERVIEW**

NOTE: • **Some engines listed below are for European models.**

Gasoline engines

1*) 91 RON standard unleaded gasoline is permissible, however with decreased power output.

2*) 95 RON Super unleaded gasoline is permissible, however with decreased power output.

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2*) 95 RON Super unleaded gasoline is permissible, however with decreased power output.

Diesel engines

1*) Engine code AVF 3.0 Nm

*

DELIVERY INSPECTION**Delivery inspection**

For information regarding Inspection Service refer to ServiceNet; Delivery Satisfaction; Perfect Delivery Inspection (PDI) forms for appropriate model and year.

OIL CHANGE SERVICE**Oil change service**

For engine oil specifications and capacities please refer to ServiceNet; Additional Information; Fluid Capacity Chart for appropriate model and year

Also, for appropriate service intervals refer to ServiceNet; Maintenance Schedule for appropriate model year

INSPECTION SERVICE**Inspection Service**

For appropriate service intervals refer to ServiceNet; Maintenance Schedule for appropriate model year

DESCRIPTION OF WORK

All switches, all electrical components, all displays and other operating elements: Checking function

- Check following:
 - Lighting, headlamps, fog lights, turn signals, hazard warning flashers, taillights, rear fog lights, backup lights, brake lights, parking lights
 - Interior and reading lights (automatic shutoff on interior lights), illuminated storage compartment, illuminated ashtray, luggage compartment lighting, illuminated ignition
 - Warning buzzer for lights and/or radio left on
 - All switches in console
 - Driver Information System (DIS)
 - Instrument unit with all displays, meters and lights
 - Two-tone horn
 - Windshield/headlamp wipers, headlamp cleaning system
 - Cigarette lighter
 - Electric exterior mirrors (heated, adjustable)
 - Electric windows
 - Electric tilt/slide sunroof
 - Central locking, remote control operation, comfort closing
 - Electric seat
 - Heated seat
 - Radio

Final drive (automatic transmission): Check oil level, add oil if necessary

Automatic transmission

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- **39 - FINAL DRIVE, DIFFERENTIAL** for 5 SPD. AUTOMATIC TRANSMISSION 01V
- **39 FINAL DRIVE - FRONT DIFFERENTIAL** for 6 SPD. AUTOMATIC TRANSMISSION 09L ALL WHEEL DRIVE

Continuously Variable Transmission (CVT)

--> - **39 - FINAL DRIVE, DIFFERENTIAL**

Battery: Check**Battery with "magic eye"**

Battery is located in plenum chamber between engine compartment and windshield or in spare wheel well on RS4.

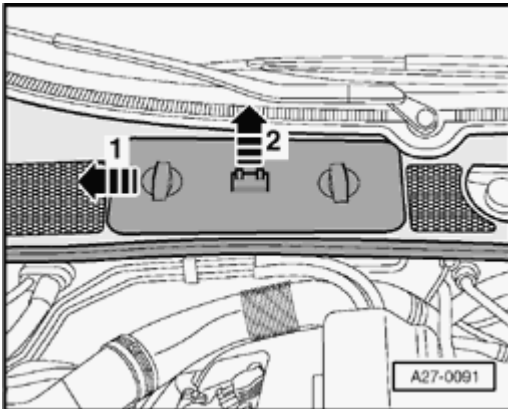


Fig. 1: Pushing Cover Over Battery Toward Right And Removing It Upward
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Slide cover over battery to right - **arrow 1** - and remove upward - **arrow 2** -.

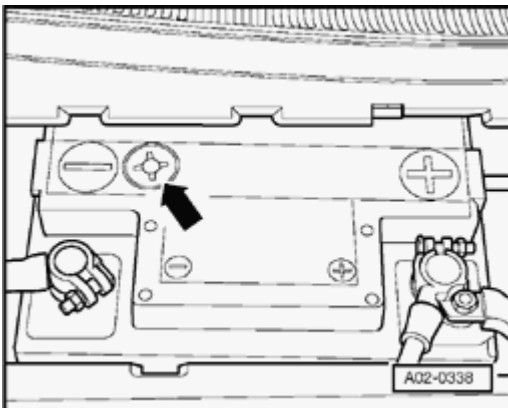


Fig. 2: Identifying The Visual Indicator
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The visual indicator - **arrow** - gives information about electrolyte level and battery charge.
- Switch ignition off.

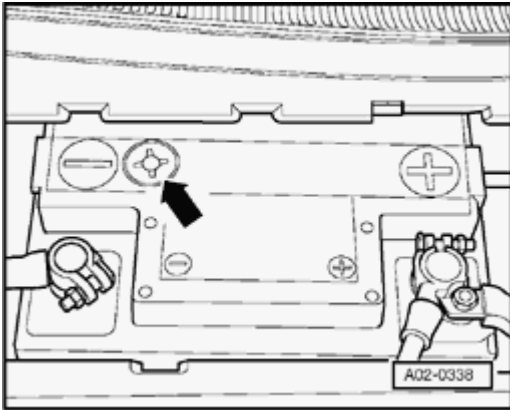


Fig. 3: Identifying The Visual Indicator

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check electrolyte level at visual indicator - **arrow** -
- Tap lightly on battery housing with a blunt object, air bubbles under the visual indicator can cause a false reading.
- Green battery charge is OK.
- Black no charge or charge too low
- No color or yellow critical electrolyte level has been reached, battery must be replaced --> - **27**
BATTERY, STARTER, GENERATOR, CRUISE CONTROL

NOTE:

- **Observe before disconnecting battery --> Note before disconnecting battery.**

Battery sealing plugs

- On batteries with visible min and max markings, electrolyte level only needs to be checked visually.
- Electrolyte level must be between min. and max. markings.
- On batteries where the outer min. and max. markings are difficult to see or the visibility of the electrolyte level cannot be guaranteed due to the opaque battery housing, the sealing plugs must be removed. Then it is possible to check electrolyte level by a visual inspection of the battery interior.
- The electrolyte level must meet the inner electrolyte level marking (plastic bar). This corresponds to the outer max. mark.

NOTE:

- **If electrolyte level is too low, battery loses capacity (loses performance) because the cell plates dry out. If the cell plates are not covered by electrolyte, the plates and plate bridges start to corrode causing the function of the battery to diminish. After a while the battery does no longer function. The battery becomes useless.**

WARNING: If the electrolyte level is below them in. marking, the battery must be

replaced! --> - 27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL

Valve-regulated lead acid battery or absorbed glass mat (AGM) battery

NOTE:

- Valve-regulated lead acid or AGM batteries are sealed, they cannot and must not be opened. --> - 27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL

Battery: No load voltage, checking before starting engine for the first time

Necessary test equipment

- Digital multimeter V.A.G 17.5

or

- Portable multimeter V.A.G 1526 B



Fig. 4: Special Tool - Multimeter V.A.G 1526 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Portable multimeter

NOTE:

- Battery must not be loaded by connected components for at least 12 hours before testing.
- Battery must not be charged for at least 12 hours before testing.
- Measure voltage between terminals with engine switched off.

WARNING: Always follow procedure exactly, otherwise measured values could be incorrect.

Battery: Ensure battery cable fits securely

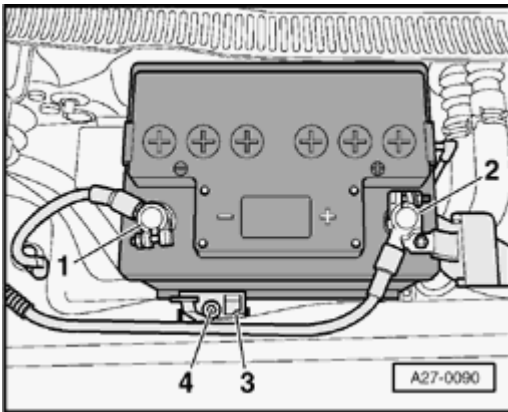


Fig. 5: Locating Battery Terminals On Battery

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check battery terminals on vehicle battery for secure fit, tighten nuts on -terminal -1- and + terminal - 2 - if necessary.

WARNING: If the battery clamp is not seated securely on the positive terminal, disconnect battery Ground (GND) strap on battery negative terminal first, to prevent possible accidents.

NOTE:

- Observe before disconnecting battery --> Note before disconnecting battery.

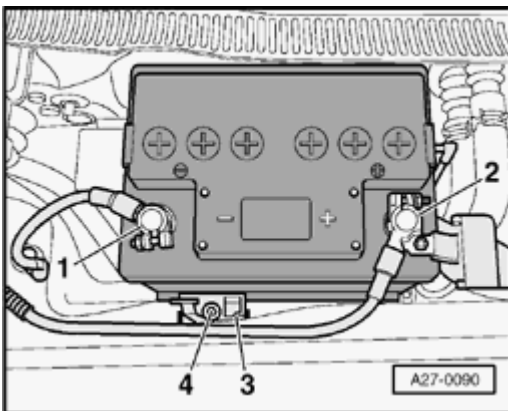


Fig. 6: Locating Battery Terminals On Battery

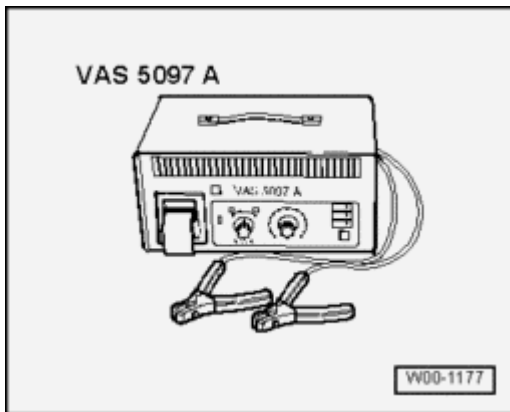
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check battery for secure fit, tighten screws - 4 - on securing bracket - 3 - if necessary.

Battery: Perform battery load test

Battery load test indicates battery condition.

Special tools, testers, and measuring equipment

**Fig. 7: Battery VAS Tester**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Battery tester VAS 5097 A

NOTE:

- If battery tester VAS 5097A is used, it is not necessary to remove battery. The battery does not need to be disconnected either.

Perform battery load test

- Switch ignition off.
- Read battery tester operating instructions.
- Connect test lead clamps to battery terminals as shown in battery tester operating instructions.

The clamps must make good contact with battery poles.

- Load current depends on battery capacity and must be adjusted on the tester battery tester operating instructions.
- Perform battery load test according to operating instructions.

Tester display during battery load test

Note following tester evaluations:

Table:

- Replace battery. --> - **27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL**

Regarding battery load test:

Because of the high load on the battery during this test (a high current flows) the battery voltage lowers.

If the battery is OK, the voltage only goes down to the minimum voltage specification.

If the battery is malfunctioning or only faintly charged, the battery voltage will drop rapidly to below the displayed minimum voltage.

After the test, this low voltage remains steady over a longer time before the voltage slowly increases.

Brake fluid level, dependent on lining wear: Check

NOTE:

- Use only new Original VW / Audi brake fluid, see ETKA

WARNING:

- Brake fluid is poisonous. Due to its caustic nature, it must also never be brought into contact with paint.
- Brake fluid is hygroscopic, meaning that it absorbs moisture from the surrounding air, and must therefore always be stored in air-tight containers.

- Please observe the following:

Delivery inspection

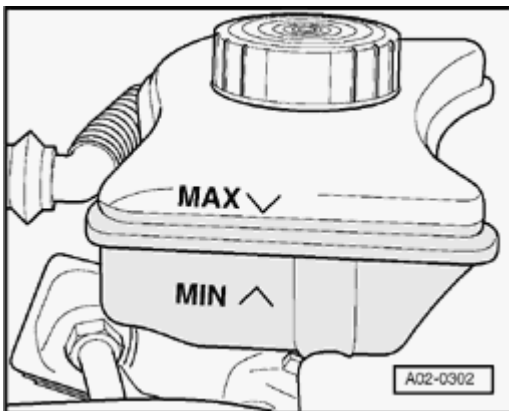


Fig. 8: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fluid level must be at MAX mark

NOTE:

- To prevent the brake fluid from overflowing from the reservoir, the level must not be over the MAX mark.

Inspection service

When driving, fluid level drops slightly from use and automatic brake pad adjustment.

- Always check fluid level in conjunction with brake pad wear:

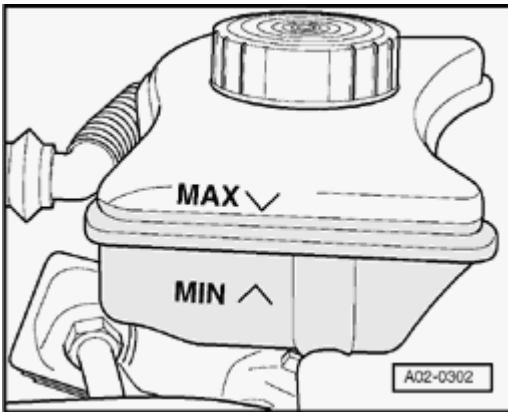


Fig. 9: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- When brake pads are new or if there is still enough brake lining left, the brake fluid level must be between MIN and MAX marks.
- With brake fluid at MIN mark or slightly above, topping off brake fluid is not necessary when wear limit of brake pads has been almost reached.

WARNING: If brake fluid level is below MIN mark, check brake system (repair procedure), before adding brake fluid.

Brake fluid: Changing

Special tools, testers, and measuring equipment



Fig. 10: Identifying Brake Filler And Bleeder Unit VAS 5234

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VAS 52.4 Brake filling and bleeding tool



Fig. 11: Identifying Brake Filler And Bleeder Unit V.A.G 1869
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1869 Brake filling and bleeding tool with Adapter set V.A.G 1869/4

NOTE:

- Use only new Original VW / Audi brake fluid, see ETKA

WARNING:

- Brake fluid must never come into contact with fluids containing mineral oils (oil, gas, cleaning solutions). Oils containing minerals damage seals and sleeves on brake systems.
- Brake fluid is poisonous. Due to its caustic nature, it must also never be brought into contact with paint.
- Brake fluid is hygroscopic, which means that it absorbs moisture from the air. Always store brake fluid in air-tight containers.
- Wash off brake fluid spillage using plenty of water.
- Observe waste disposal regulations!

Observe operating instructions for VAS 52.4 or for V.A.G 1869 !

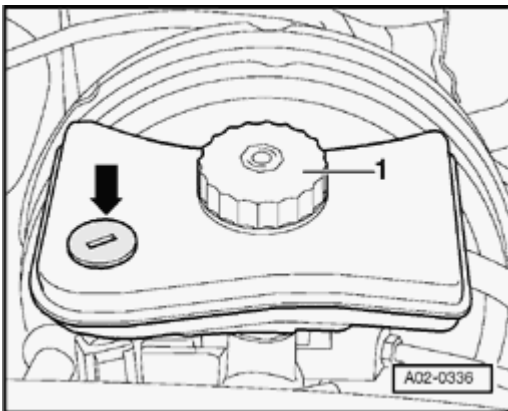


Fig. 12: Identifying Brake Fluid Reservoir Cap
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove brake fluid reservoir cap - 1 -.

WARNING: • The strainer in the brake fluid reservoir must not be removed.

- Remove brake fluid reservoir plug - **arrow** -.

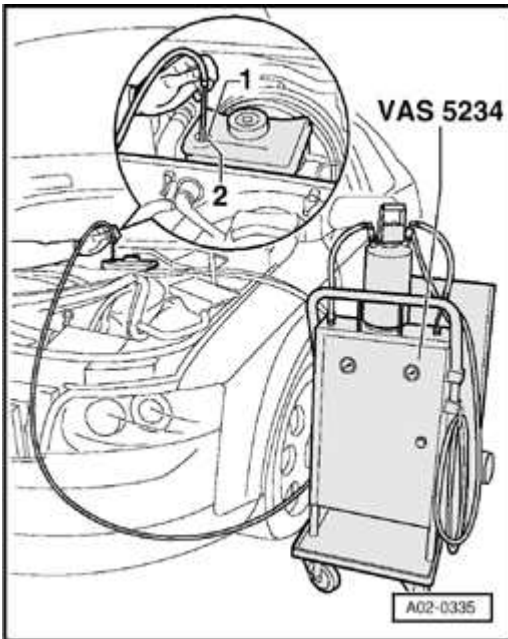


Fig. 13: Connecting Suction Hose From VAS 52.4 Or V.A.G 1869 To Tube Of Brake Fluid Reservoir
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect suction hose from VAS 52.4 or V.A.G 1869 to tube - 1 - of brake fluid reservoir.
- Extract as much brake fluid as possible using suction hose from VAS 52.4 or from V.A.G 1869 or with extractor bottle.
- Disconnect suction hose.

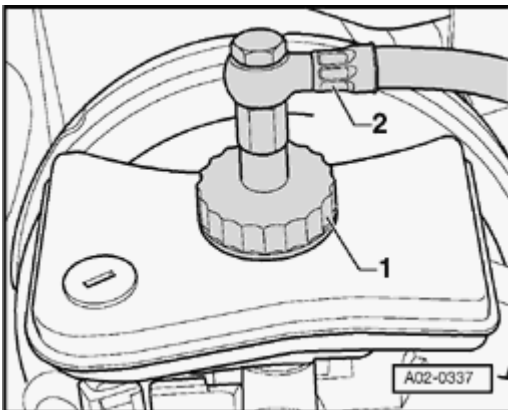


Fig. 14: Connecting Suction Hose From VAS 52.4 Or V.A.G 1869 To Tube Of Brake Fluid Reservoir

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect suction hose from VAS 52.4 or V.A.G 1869 to tube - 2 - of brake fluid reservoir.
- Extract as much brake fluid as possible using suction hose from VAS 52.4 or from V.A.G 1869 or with extractor bottle.
- Disconnect suction hose.
- Install brake fluid reservoir plug.

WARNING: Do not reuse, (used) extracted brake fluid.

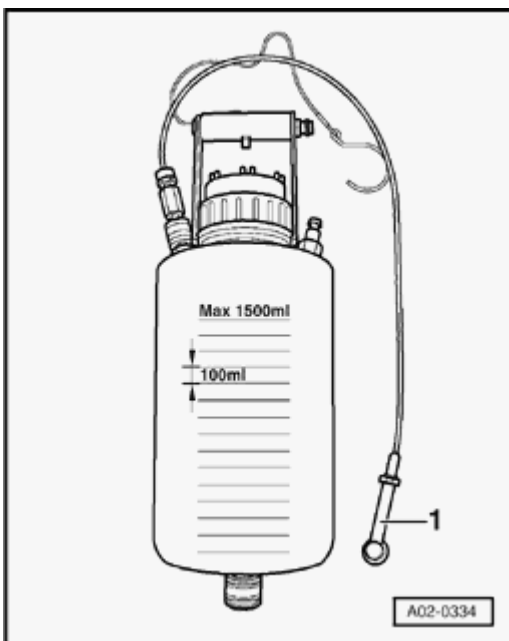


Fig. 15: Connecting Filler Hose From VAS 52.4 Or V.A.G 1869 To Adapter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install adapter - 1 - to brake fluid reservoir.
- Connect filler hose - 2 - from VAS 52.4 or V.A.G 1869 to adapter.

Vehicles with manual transmission:

- Pull cover cap off clutch slave cylinder bleed screw.

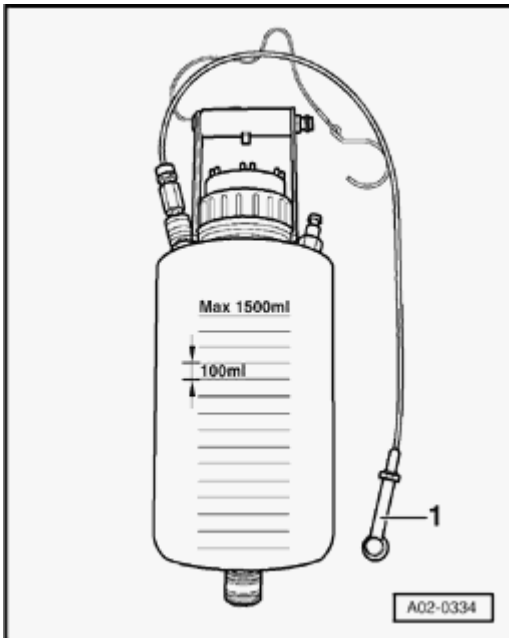


Fig. 16: Connecting Filler Hose From VAS 52.4 Or V.A.G 1869 To Adapter
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place extractor bleeder hose - **1** - on clutch slave cylinder bleeder screw, open bleeder screw, and let about 100 ml drain out. Close bleeder screw and install cover cap.
- Operate clutch pedal several times.

Continued for all vehicles:

- Remove caps from the bleeder screws.
- Connect extractor bleeder hose - **1** - to front left bleeder screw, open bleeder screw and allow about 2.0 ml to flow out. Close bleeder screw.

Repeat work sequence on other side of vehicle at front.

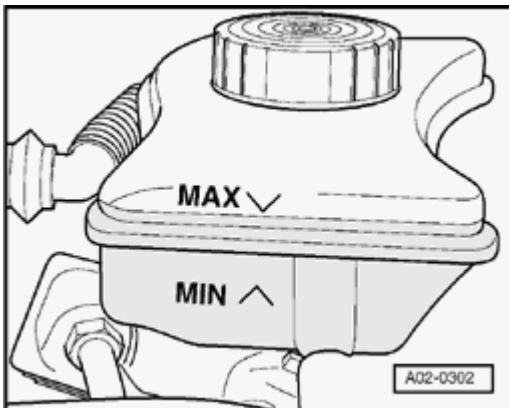


Fig. 17: Identifying Fluid Level
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect extractor bleeder hose - **1** - to rear left bleeder screw, open bleeder screw and allow about 2.0 ml to flow out. Close bleeder screw.

Repeat work sequence on other side of vehicle at rear.

Table - Sequence / quantity of brake fluid

* Including brake fluid extracted from brake fluid reservoir and quantity from clutch slave cylinder.

- Fit cover caps to brake caliper bleed screws.
- Move filler lever on VAS 52.4 or V.A.G 1869 to position - **B** - (see operating instructions).
- Take filler hose off adapter.
- Unscrew adapter from brake fluid reservoir.

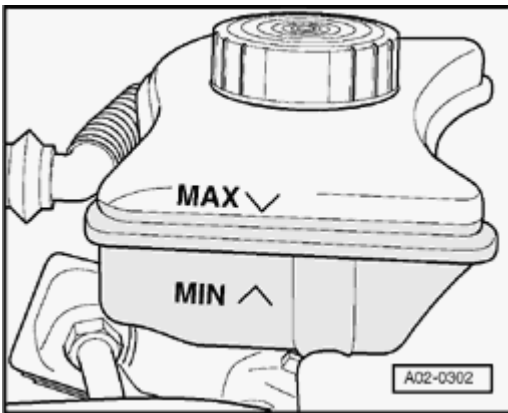


Fig. 18: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check brake fluid level and correct if necessary.
- Install cap to brake fluid reservoir.
- Check pedal pressure and brake pedal free play. Free play: Max. $1/3$ of pedal travel

Brake system: Visual inspection for leaks and damage

- Check the following components for leaks and damage:
 - Brake master cylinder
 - Brake booster
 - ABS Hydraulic unit
 - Brake calipers
- Check that brake hoses are not twisted.
- Ensure brake hoses do not come in contact with any vehicle components when steering is at full lock.

- Check brake hoses for porosity, bubbles and cracks.
- Check brake hoses and pipes for chafing.
- Check all brake line connections for secure mounting, leaks, or corrosion.

WARNING: Malfunctions found must be rectified (repair measure).

Brake pads: Thickness, checking

WARNING: At a pad thickness of 7 mm (including backing plate) the brake pads have reached their wear limit and must be replaced (repair measure). Inform the customer.

Front disc brake pads:

- Determine thickness of outer pads by checking visually (using a flashlight through a hole in wheel).

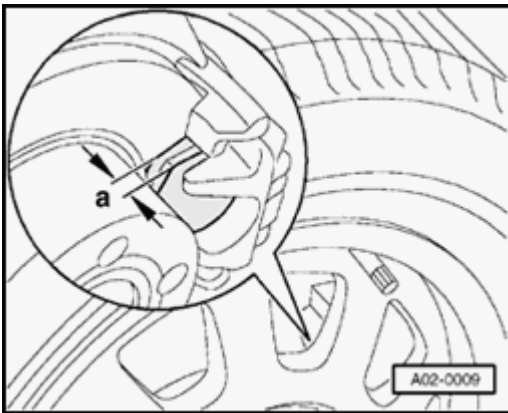


Fig. 19: Identifying Thickness Of The Inner Pad
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine thickness of the inner pad by visual check (using a flashlight through a hole in the wheel).

Rear disc brake pads:

- Determine thickness of outer pads by checking visually (using a flashlight through a hole in wheel).

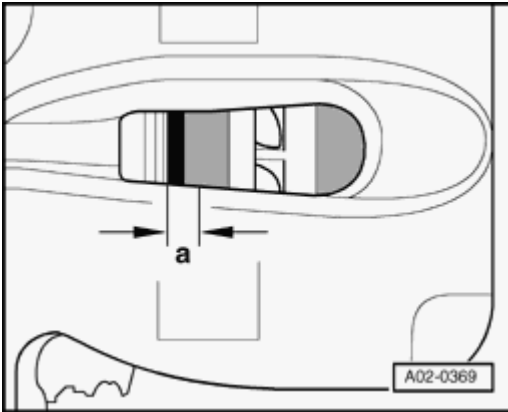


Fig. 20: Identifying Thickness Of The Inner Pad

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine thickness of the inner pad by visual check (using a flashlight through a hole in the wheel).

Tires: Checking condition, wear pattern and tread depth and adjusting tire pressure.

Tires, checking

NOTE:

- For reasons of safety only tires of same type and tread pattern should be fitted on a vehicle!
- On All Wheel Drive vehicle tires of the same type and tread pattern must be used. Otherwise the center differential may be damaged.

Delivery inspection

- Check running surfaces and side walls for damage, remove foreign bodies, if necessary.

Inspection service

- Check running surfaces and side walls for damage, remove foreign bodies, if necessary.
- Check tires for scuffing, one sided wear, porous side walls, cuts and fractures.

WARNING: Report any damage to customer and mark repair order accordingly.

Checking tire wear pattern

- The wear pattern of the front wheels can be used to assess whether a check of the track and camber is necessary:
 - Feathered edges of the treads may indicate faulty toe adjustment.
 - One-sided tread wear is mainly attributed to incorrect camber.

NOTE:

- When wear of this nature is noticed determine cause by performing alignment checks (repair measure).

Check tread depth.

- Minimum depth: 1.6 mm

NOTE:

- This value may vary for individual countries due to different legislative regulations.

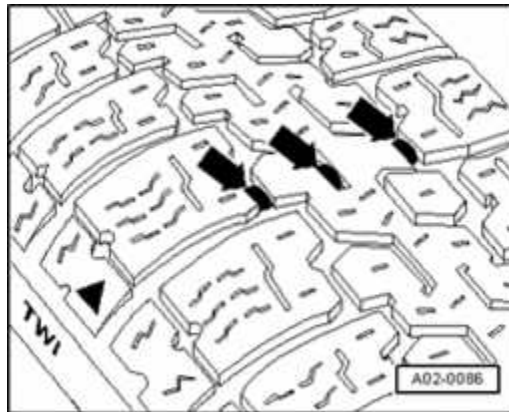


Fig. 21: Checking Tire Tread Depth

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The minimum tread depth is reached when the tires have worn down level with the 1.6 mm high tread wear indicators - arrows - positioned at intervals around the tire.
- If the tread depth is approaching the legal minimum permissible depth, the customer must be informed.

Tire pressure, adjusting

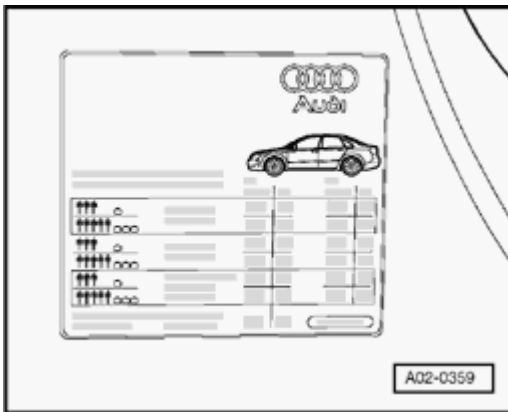


Fig. 22: Identifying Tire Pressure Values For Summer Tires On Sticker

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Tire pressure values for summer tires are on the sticker on the inside of the fuel tank flap.

NOTE:

- **Observe that the inflation pressure specifications on the sticker refer to the air pressure of cold tires. Do not reduce increased pressures on warm tires.**
- **When using winter tires, the tire pressure must be increased about 0.2 bar.**

Spare wheel

- Spare wheel with standard tire

Keep the highest pressure intended for the vehicle

- Mini spare tire

Pressure is on side of tire

- Tire repair kit

Check --> **Tire repair kit: Checking**

NOTE:

- **Tire valves must be sealed with valve caps. Otherwise, dirt can enter valve needle which becomes jammed and can no seal shut.**

Set digital clock

Vehicle is equipped with a radio or quartz clock.

Radio clock

If an acceptable radio clock signal is received, clock automatically switches to "radio-controlled quartz clock" operating mode. The radio clock reception symbol (radio tower radiating waves) appears in display. If the clock does not receive a valid signal, it automatically switches to "quartz clock" mode after 3 days and radio clock reception symbol goes out.

Quartz clock**Set hour**

- Press "MODE" button; hour display blinks.
- Press "+" button to advance hour display.
- Press "-" button to reverse hour display.

Set minute

	12:53:56 AM	Page 18	

- Press "MODE" button until minute display blinks.
- Press "+" button to advance minute display.
- Press "-" button to reverse minute display.

Set date

- Press "MODE" button until date display blinks.
- Press "+" or "-" button to set day.
- Press "MODE" button again, month display blinks.
- Press "+" or "-" button to set month.
- Press "MODE" button again, year display blinks.
- Press "+" or "-" button to set year.

DTC memory: Retrieving with VAS 5051/ 5052

- Follow these steps in sequential order.

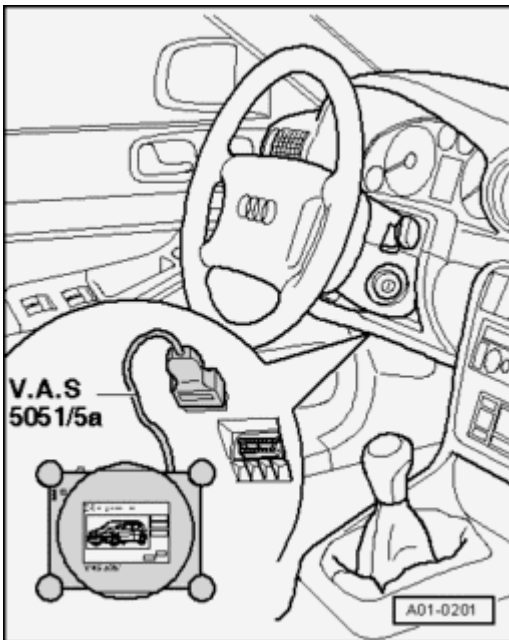


Fig. 23: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Vehicle - Self-diagnosis
- Gateway - Installation list

- Read control module with stored DTC memory.
- Correct relevant malfunctions with customers approval.

Electric windows: Check positioning

Electric windows forget current position and automatic lowering and raising function when battery is disconnected.

Activate automatic lowering/raising function as follows:

- Switch ignition on.
- Raise windows with electric window regulators up to stop.
- Then operate all window switches again for at least 1 second in "close" position to activate automatic lowering/raising.
- Press switch down. Window must lower to stop by itself.

Check vehicle key function

- Separate keys so that each can be checked individually for function.
- Mechanically lock and unlock drivers door with each key.
- Insert each key in ignition and switch ignition on. Immobilizer key symbol in instrument cluster must go out after two seconds. If key symbol blinks, key is not programmed to immobilizer. Guided Fault Finding; Program vehicle key

NOTE:

- Enter number of keys checked and delivered to customer in delivery protocol.

Noise insulation: Removing

Vehicles with auxiliary heater:

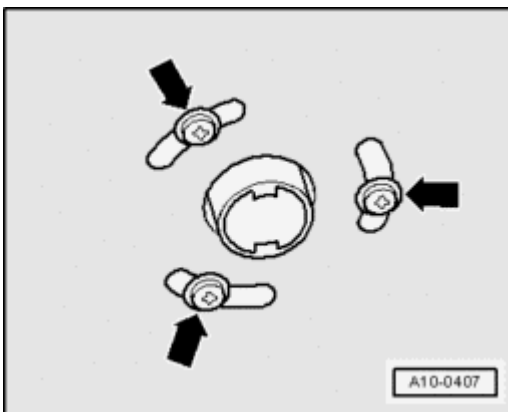


Fig. 24: Identifying Exhaust Pipe Fasteners

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove parking/auxiliary heater exhaust pipe screws - **arrows** - on noise insulation.

All:

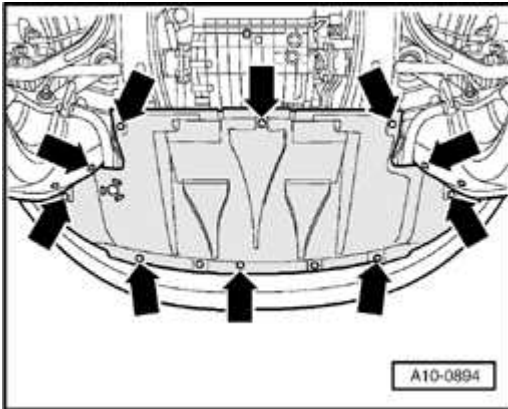


Fig. 25: Removing Sound Insulation

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove quick-release screws - **arrows** -.

Rear lid hinges: Lubricate

- Open rear lid
- Remove left/right lid hinge cover if present.

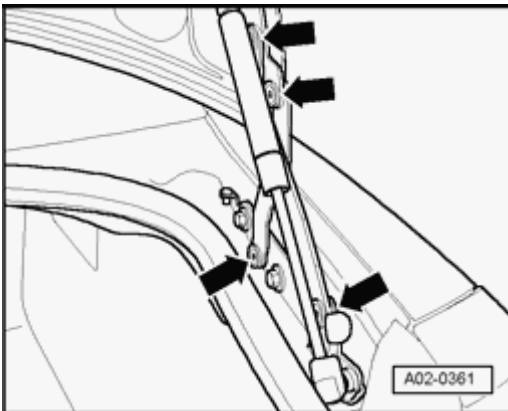


Fig. 26: Lubricating Hinge Joints

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lubricate the four hinge joints on both rear lid hinges at the left and right of the hinge guides - **arrows** -.
- Lubricant: "G 000 115 A2"

NOTE:

- Included spray tube must be inserted in sprayer head to aim spray.

- **Shake spray can about five times.**
- **Spray must not be shaken too long or hard because otherwise spray oil will foam up and its lubricating ability is reduced.**
- **Clean excess oil from body and joints.**

Power steering fluid: Check for leaks and fluid level, top off fluid, if necessary

- With engine not running, move front wheels in straight-ahead position.

Cold fluid (exterior temperature approx +20 C)

- Remove cover.
- Clean dipstick with clean cloth.
- Screw cap on hand-tight and remove again.

Screw cap fully in to get an accurate fluid level reading.

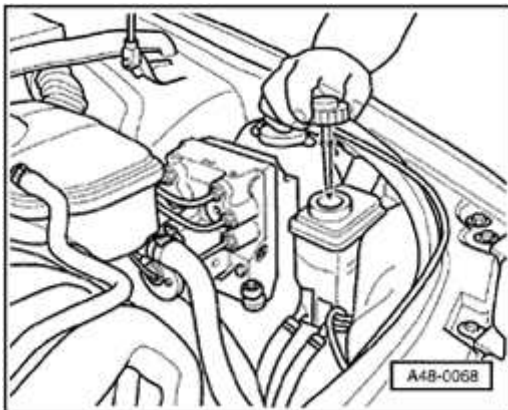


Fig. 27: Checking Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check fluid level: Fluid level must be in area of "MAX" marking.

Warm fluid (engine oil temperature +80 C)

- Check fluid level: Fluid level must be 10 mm above "MAX" marking.

NOTE:

- **If fluid level is above specified range, fluid must be extracted off.**
- **If the fluid level is below the specified level, check the power steering system for leaks. It is not enough to simply top off with fluid.**
- **Do not use power steering fluid that has drained out.**

Calibrate rearview mirror with compass

--> - 68 - INTERIOR EQUIPMENT

A/C system: Check function, set temperature to 72 F (22 C)

- Check all climate control functions: Owners manual

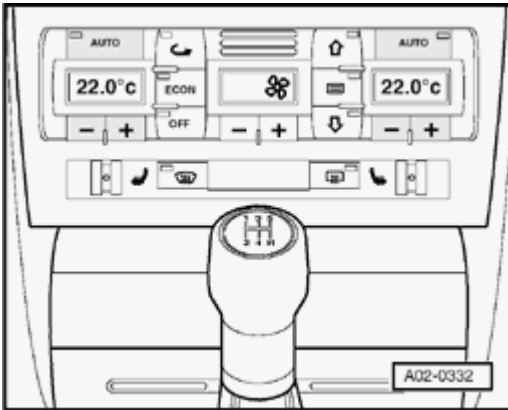


Fig. 28: Checking Whether 72F (22C) Is Set In Both Display Fields
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether 72F (22C) is set in both display fields.
- Set temperature as follows, if necessary:
- Press the "AUTO" button.
- Set temperature on drivers and passengers side to 72F (22C) with "+" and "-" buttons.

Instrument cluster: Adapt language version

- Follow these steps in sequential order.

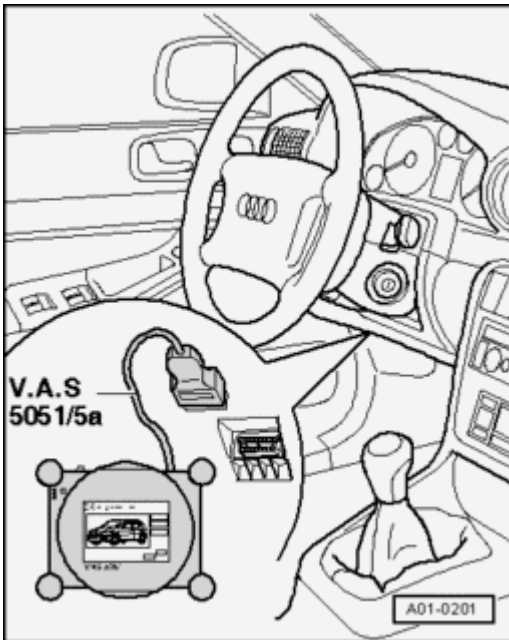


Fig. 29: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Language adaptation
- Now follow guided program

NOTE:

- Please follow guided program function description
- K-lead adapter VAS 6017B must be used.

Cooling system: Check freeze protection, add coolant, if necessary

NOTE:

- All new engines are filled with coolant additive G 12 Plus according to TL VW 774 F (purple color). G 12 Plus can be mixed with the previous coolant additives G 11 and G 12 (red). Ensure that the system is replenished only with G12 Plus (due to its positive properties).
- G 12 Plus is suitable as a filled-for-life filling for cast iron and all-aluminum engines and gives optimum protection against freezing, corrosion damage, scaling and over-heating.
- G 12 Plus increases the boiling point to 2.5F (135C) and ensures for a

better heat dissipation.

- The coolant portion of the mixture must amount to at least 40% (freeze protection to -13F [-25C]) and should not exceed 60% (freeze protection to -40F [-40C]). Otherwise the freeze protection will be reduced and the cooling efficiency will be worsened.
- The freeze protection must be ensured to approximately -13F (-25 C).

Checking freeze protection and adding coolant additive if necessary

Special tools, testers and auxiliary items required

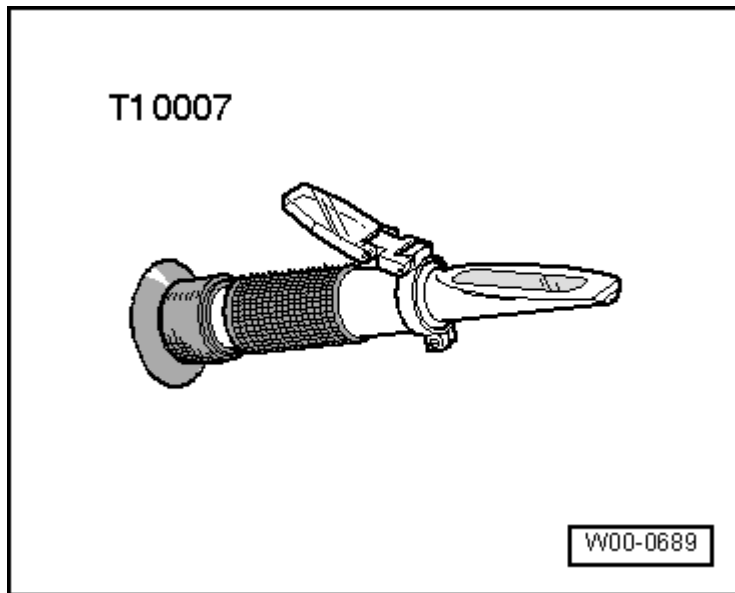


Fig. 30: Identifying Refractometer T10007

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Refractometer T10007

NOTE:

- Read the bright/dark boundary to obtain an accurate reading for the following tests. Place a drop of water on the glass to improve the readability of the bright/dark boundary. The bright/dark boundary can be clearly recognized on the "WATERLINE".
- Check the concentration of the coolant additive using refractometer T10007 (operating instructions).

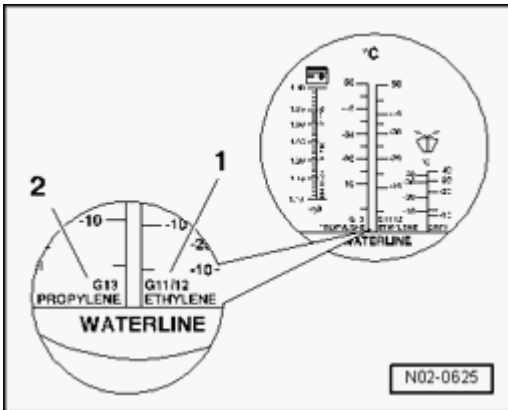


Fig. 31: Identifying Refractometer Scales

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The scale - 1 - of the refractometer is designed for coolant additives G 12; G12 Plus and G11.

Scale - 2 - refers only to coolant additive G 13. (previously L80)

NOTE:

- The freeze protection must be ensured to approximately -13F [-25C].
- If for climatic reasons greater freeze protection is required, the amount of G 12 Plus can be increased, but only up to 60% (freeze protection to about -40F [-40C]), otherwise freeze protection and cooling effectiveness will be reduced.
- If freeze protection is insufficient, drain off required quantity shown in freeze protection table and add coolant additive G 12 Plus.

NOTE:

- Observe waste disposal regulations!
- Check coolant additive concentration after test drive again.

Checking coolant level and adding coolant if necessary

- Check coolant level in expansion tank with engine cold.

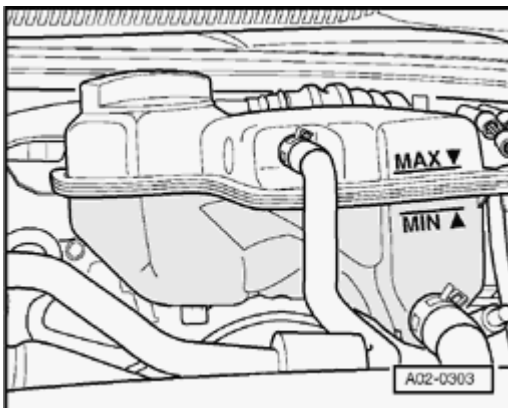


Fig. 32: Checking Coolant Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Delivery inspection: Coolant level above the "MIN marking" - **arrow** -.
- Inspection service: Coolant level above the "MIN marking" - **arrow** -.
- If coolant is too low, add required amount according to mixture ratio.

NOTE:

- Determine cause of fluid loss which cannot be attributed to normal use and rectify (repair measure).

Mixture ratio:

NOTE:

- Coolant additive G 12 Plus conforming to TL VW 774 F prevents freeze and corrosion damage, scaling, and raises the boiling point. For these reasons, the cooling system must be filled with radiator freeze and corrosion protection fluid all year round.
- Especially in countries with tropical climates or when vehicle is driven under heavy load, the coolant improves the engine reliability by its increased boiling point.
- The coolant concentration must not be reduced by adding water, even during the warmer season. The coolant additive ratio must be at least 40%.

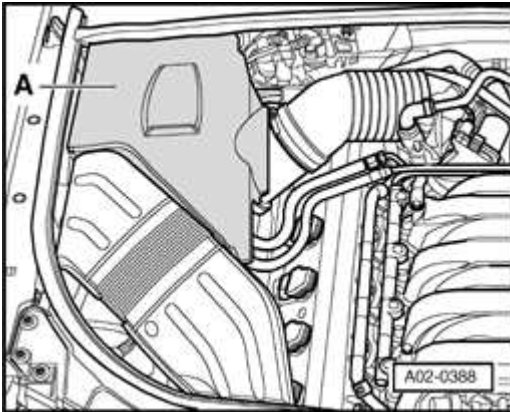
Ribbed belt: Replacing

8-cyl. 5V engines 4.2L

- Ribbed belt, removing and installing: --> -
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 4.2 LITER V8 5V ENGINE MECHANICAL, ENGINE CODE(S): BHF

Air cleaner: Clean air filter housing and replace filter

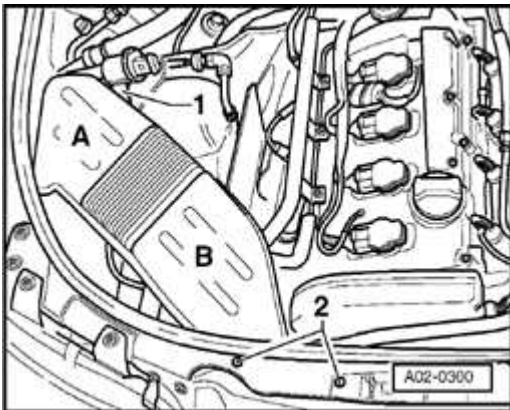
All:

**Fig. 33: Identifying Cover**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- If present, remove cover - **1** - upward.

All:

**Fig. 34: Identifying Intake Hose And EVAP Valve Retainer**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove intake hose - **A** - upward, pull tab - **1** - (if present) out of EVAP valve retainer.
- Remove both screws - **2** - and remove air intake hose - **B** -.

NOTE:

- In various engine versions, a snow screen is located in intake hose - **A** -. Screen must be removed and cleaned.

4-cyl. 2.0L FSI engines --> **4-cyl. 2.0L FSI engines**

4-cyl. 1.8L Turbo engines --> **4-cyl. 1.8L Turbo engines**

6-cyl. 3.0L MPI engines --> **6-cyl. 3.0L MPI engines**

6-cyl. 3.2L FSI engines --> **6-cyl. 3.2L FSI engines**

8-cyl. 4.2L MPI engines --> **8-cyl. 4.2L MPI engines**

8-cyl. 4.2L FSI engines (RS4) --> **8-cyl. 4.2L engines (RS4)**

4-cyl. 2.0L FSI engines

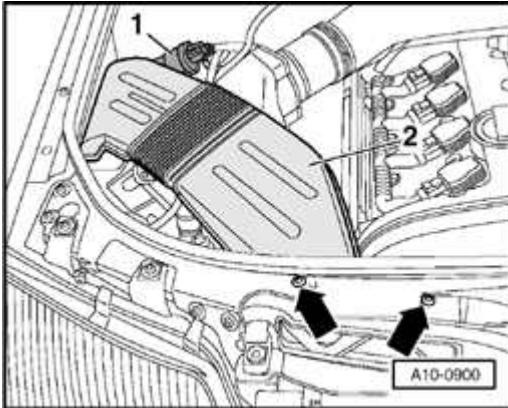


Fig. 35: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Remove air duct - **2** -.

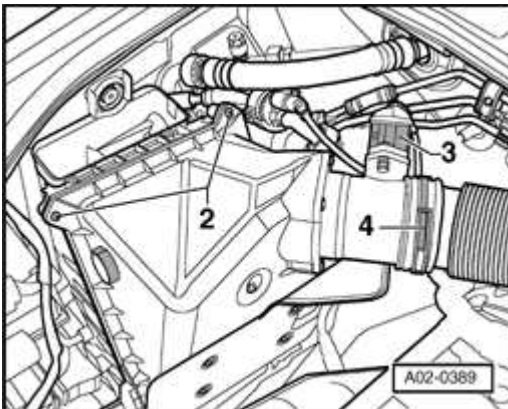


Fig. 36: Identifying Air Intake Hose, Electrical Connector, And Mass Air Flow (MAF) Sensor G70
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air intake hose - **4** - and disconnect electrical connector - **3** - from Mass Air Flow (MAF) Sensor G70.
- Remove both screws - **2** - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

4-cyl. 1.8L Turbo engines

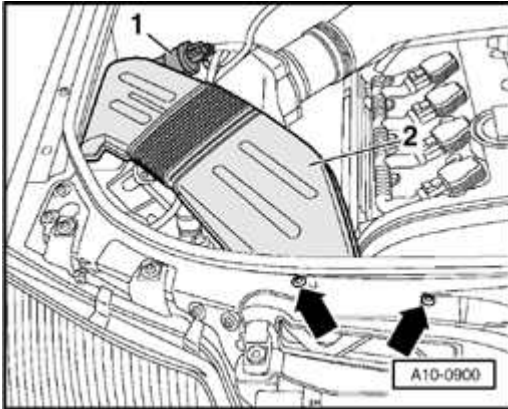


Fig. 37: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Remove air duct - **2** -.

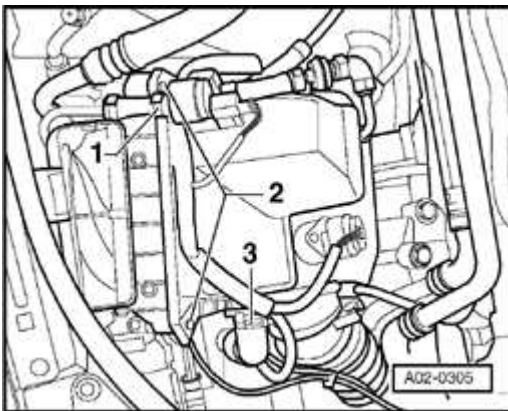


Fig. 38: Identifying Hose Clamp And Evaporative Emission (EVAP) Canister Valve
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Open hose clamp - **1** - and remove line from Evaporative Emission (EVAP) canister valve.
- Remove line - **3** - and remove both screws - **2** -.
- Remove upper part of air filter from bracket and pivot toward engine side.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

6-cyl. 3.0L MPI engines

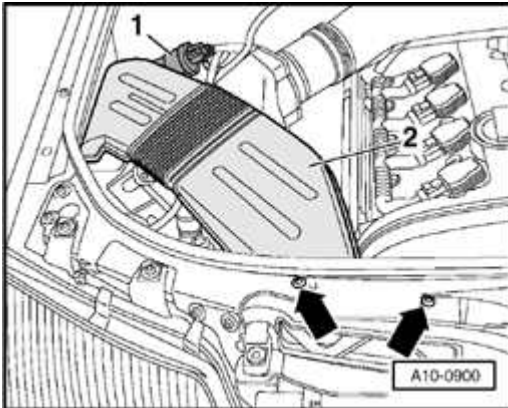


Fig. 39: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage Evaporative Emission (EVAP) Canister Purge Regulator Valve N80 - 1 - at air duct.
- Remove bolts - **arrows** -.

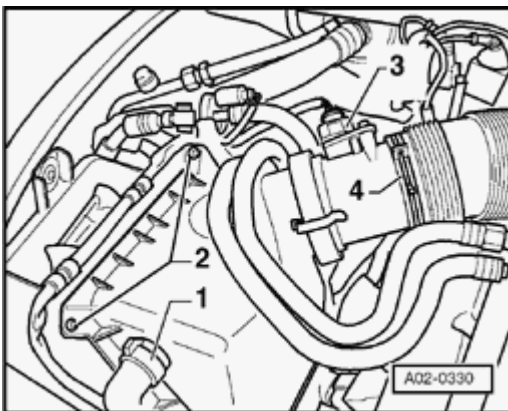


Fig. 40: Identifying Air Duct, Air Intake Hose, Electrical Connector And Mass Air Flow (MAF) Sensor G70
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - 2 -.
- Remove air intake hose - 4 - and disconnect electrical connector - 3 - from Mass Air Flow (MAF) Sensor G70.
- Remove both fuel lines from bracket on upper part of air filter housing.
- Disconnect pipe connection - 1 -.
- Remove both screws - 2 - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

6-cyl. 3.2L FSI engines

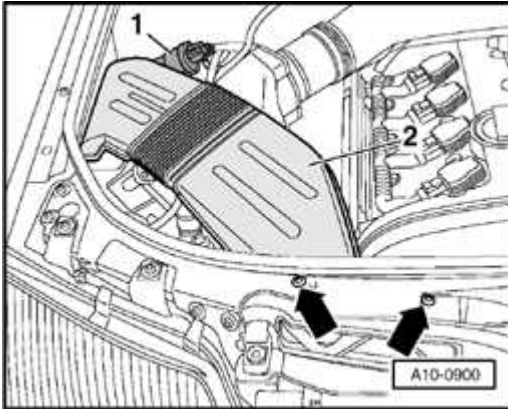


Fig. 41: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.

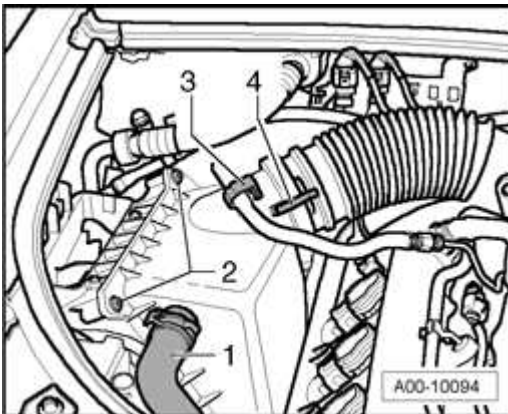


Fig. 42: Identifying Air Duct, Clean Air Tube Clamp, Fuel Line, And Pipe Connection
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - **2** -.
- Open clean air tube clamp - **4** - and remove from air filter housing.
- Unclip fuel line - **3** -.
- Disconnect pipe connection - **1** -.
- Remove both screws - **2** - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

8-cyl. 4.2L MPI engines

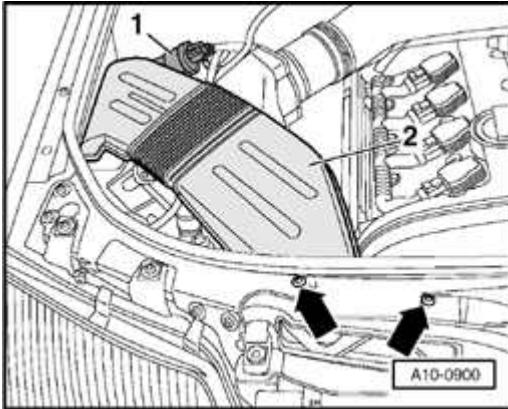


Fig. 43: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage Evaporative Emission (EVAP) Canister Purge Regulator Valve N80 - 1 - at air duct.
- Remove bolts - **arrows** -.
- Remove air duct - 2 -.

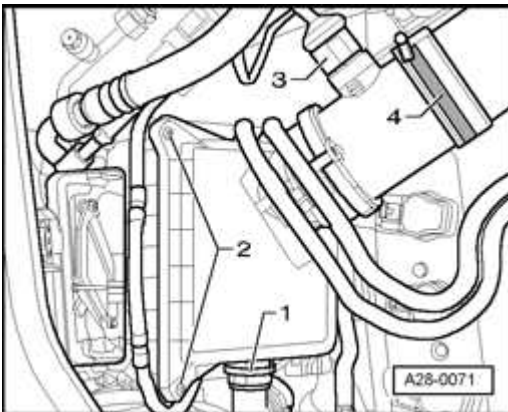


Fig. 44: Identifying Air Intake Hose, Electrical Connector, And Mass Air Flow (MAF) Sensor G70
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air intake hose - 4 - and disconnect electrical connector - 3 - from Mass Air Flow (MAF) Sensor G70.
- Remove line -1- and remove both screws - 2 -.
- Remove both fuel lines from bracket on upper part of air filter and remove this upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

8-cyl. 4.2L engines (RS4)

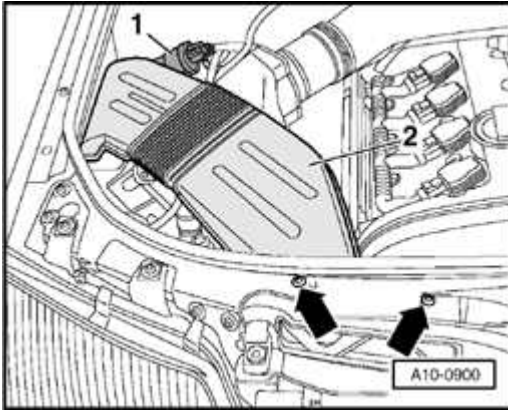


Fig. 45: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage fuel line - 1 - at upper part of air filter housing.
- Remove bolts - **arrows** -.

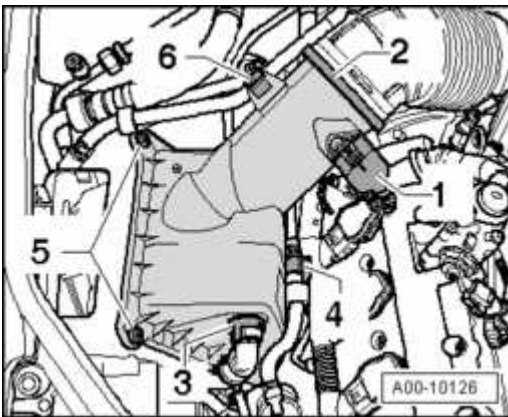


Fig. 46: Identifying Air Duct And Mass Air Flow Sensor G70 Electrical Connector
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - 2 -.
- Loosen hose clamp - 2 - and remove air intake hose from upper part of air filter.
- Disconnect electrical connector - 1 - from Mass Air Flow Sensor G70.
- Remove hoses - 6 - , - 4 - and - 3 - from bracket.
- Now remove screws - 5 - and remove upper part of air filter housing upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.

○ Further assembly occurs in reverse order.

- Follow notes * See footnote

*- Note

NOTE:

- If the air filter insert is heavily soiled or soaked, dirt particles or moisture can reach the Mass Air Flow Sensor G70 and cause an incorrect air flow reading. This causes lack of performance because a lower injection amount is calculated.
- Always use an original air filter insert.
- Hose supports and charge air system hoses must be free of oil and grease before installation. Do not use any lubricant containing silicone when installing.
- Air filter housing must be clean.
- Secure all hose connections with hose clamps that match current standard production.
- When cleaning air filter housing with compressed air, observe the following: To avoid malfunctions, cover critical air carrying engine components such as Mass Air Flow (MAF) sensor, air inlet tube, etc. with a clean cloth.
- Check drain hose in bottom side of air filter for dirt and adhesion (clean, if necessary).
- Check mass air flow sensor and air guide hose (clean air side) for salt residue, dirt and leaves.
- Check air duct from lock carrier to air filter housing for dirt and leaves.
- When installing air filter insert, ensure it is centered in mount on bottom of air filter.
- Carefully and gently place upper part of air filter on lower part. Ensure upper part of air filter is not sitting crooked on air filter insert (note air filter insert sealing lip).
- Ensure secure fit from air guide hose to Mass Air Flow (MAF) Sensor G70.
- Observe waste disposal regulations!

Engine oil: Fill

NOTE:

- Please follow specified engine oil capacity and oil standards in the ELSA maintenance table.
- Engine oil conforming to standard VW 507 00 must be used in vehicles equipped with diesel particle filter.

Engines with turbocharger:

12:53:57 AM	Page 35	

- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
 - As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely
 - The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes

All:

- Check engine oil level --> **Engine: Oil level, checking**

Engine: Oil level, checking

NOTE:

- Oil temperature at least 140F (60C).
- Vehicle must be in level position.
- After stopping engine, wait a few minutes to allow oil to flow back into oil pan.
- Pull out oil dipstick and wipe with clean rag. Replace dipstick and push down to stop.
- Pull out dipstick again and read oil level.

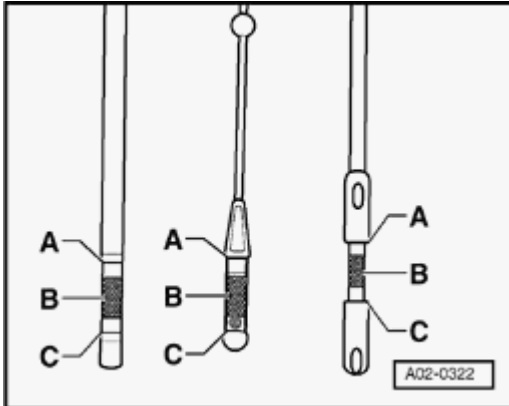


Fig. 47: Identifying Markings On Dipstick

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Markings on dipstick:

NOTE:

- Oil level must not exceed - a - mark on dipstick.

Engine cover: Removing

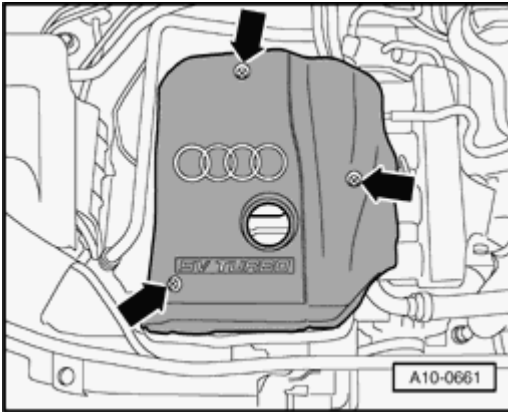


Fig. 48: Removing Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

4-cyl. gasoline engines

- Remove bolts or nuts - **arrows** - and remove engine cover(s).

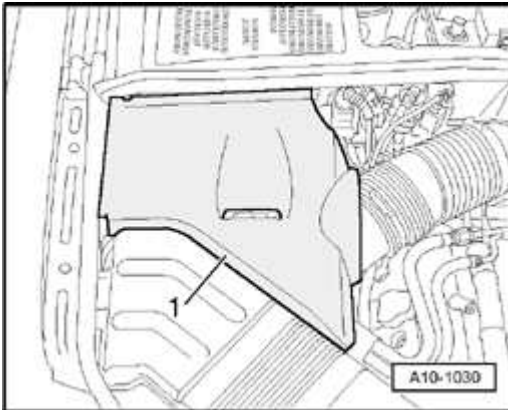


Fig. 49: Removing Cover In Engine Compartment (Right Side)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

6-cyl. 5V 3.0L engines

Remove cover - **1** - at right in engine compartment.

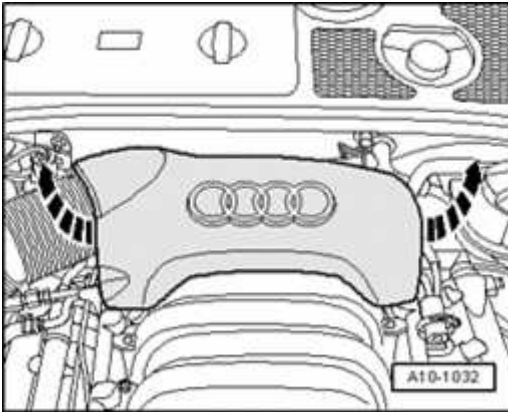


Fig. 50: Removing Rear Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Remove rear engine cover upward.

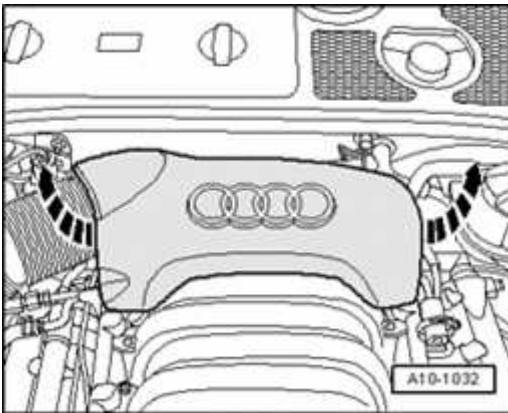


Fig. 51: Removing Rear Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

V8 4.2 gasoline engines

Remove rear engine cover upward.

Engine (from above and below) and engine compartment: Visual inspection for leaks and damage

Perform visual check as follows:

- Remove engine --> **Engine cover: Removing**
- Check engine and engine compartment for leaks and damage.
- Check lines, hoses and connections on following systems for leaks, chafing, porosity and cracks:
 - Fuel system
 - Cooling and heating system
 - Brake system

- Perform visual inspection from below using same viewpoints as when vehicle was on lift and noise insulation removed.

WARNING: Malfunctions found must be rectified (repair measure).

Hood safety catch: lubricating

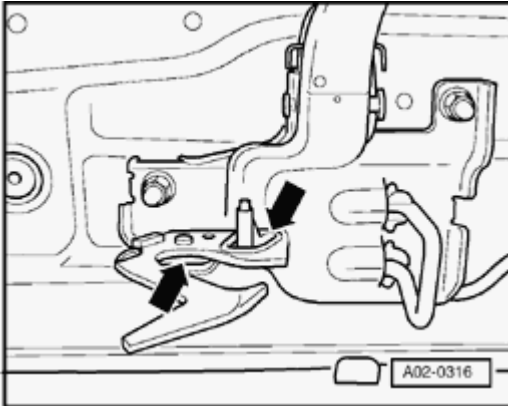


Fig. 52: Identifying Lubrication Points On Hood Safety Catch
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lubricate hood safety catch only on lubrication places indicated - **arrows** -.
- Lubricant: "G 052.778 A2"

Continuously Variable transmission (CVT) 01J: Changing ATF

- Continuously Variable (CVT) transmission 01J: Change ATF --> - **37 - AUTOMATIC TRANSMISSION - CONTROLS, HOUSING**

Engine oil: Drain/extract, replace oil filter

WARNING: Oil extraction not permitted with various engine types! See maintenance table.

NOTE: ● Perform oil change at operating temperature.

Special tools, testers and auxiliary items required

- Hazet tension band 2.71-1
- or
- Oil filter wrench 3417

- Oil extractor V.A.G 1.82

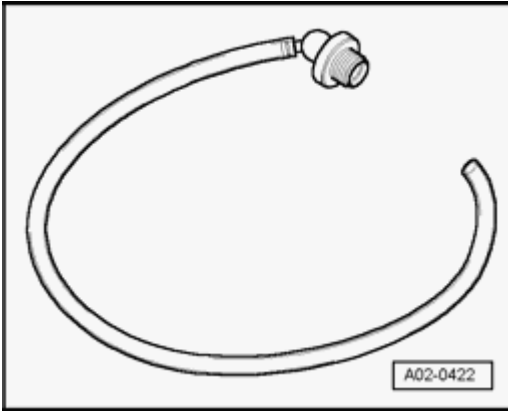


Fig. 53: Identifying Oil Drain Adapter T 40057 (2.0 TFSI)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Oil Drain Adapter T 40057 (2.0 TFSI)

NOTE:

- **Observe waste disposal regulations!**

4-cyl. gasoline engines --> **4-cyl. gasoline engines**

4-cyl. TFSI engines --> **4-cyl. TFSI engines**

6-cyl. 3.2L FSI gasoline engines --> **6-cyl. 3.2L FSI gasoline engines**

8-cyl. 4.2L MPI gasoline engines --> **8-cyl. 4.2L MPI gasoline engines**

8-cyl. 4.2L FSI gasoline engines, RS4 --> **8-cyl. 4.2L FSI gasoline engines, RS4**

4-cyl. gasoline engines

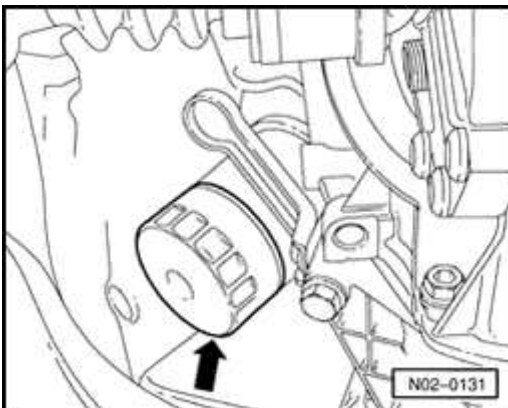


Fig. 54: Identifying Oil Filter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen oil filter - **arrow** - using oil filter wrench 3417 or tension band Hazet 2.71-1.
- Remove oil filter.

NOTE:

- Observe waste disposal regulations!
- Observe installation note on oil filter.
- Open oil drain plug or extract engine oil.
- Clean oil filter sealing surface on engine.
- Lubricate rubber seal lightly with oil.

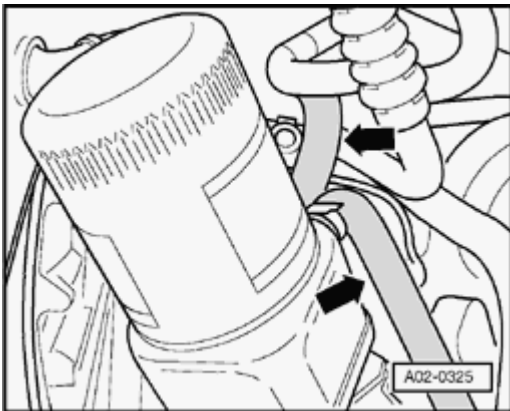


Fig. 55: Identifying Oil Filter Unit And Hoses

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install new filter and tighten.

WARNING: After changing oil filter unit, check clearance of hoses - arrows - going from oil cooler to adjacent components. Correct the position of the oil cooler, if necessary.

- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill**

NOTE:

- Engines with turbocharger:
- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
- As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely.
- The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes
- Check for cleanliness.

4-cyl. TFSI engines

- Remove noise insulation --> **Noise insulation: Removing**

NOTE:

- Before removing oil filter, motor oil must be drained from filter so that it does not drain onto engine and attached parts.

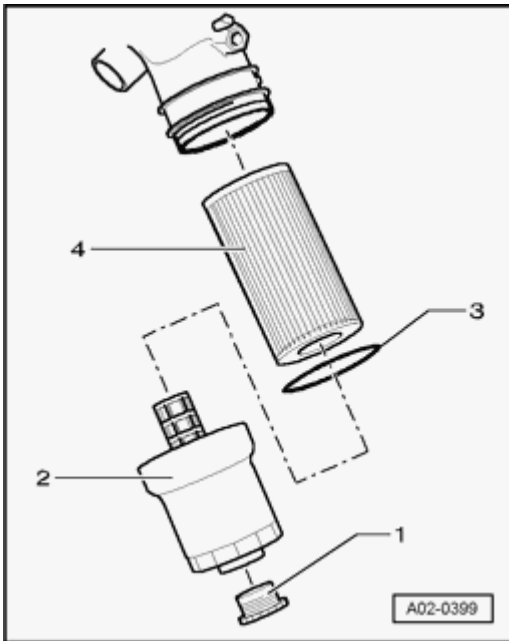


Fig. 56: Identifying Valve Protection Cap And Oil Filter Housing Bottom
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bottom valve protective cap - 1 -.
- Remove ball head hose from Oil Drain Adapter T 40057 and turn threaded bolt in bottom oil filter housing bottom valve - 2 - under a slight resistance is felt.
- Now place ball head hose on threaded bolts and turn Oil Drain Adapter T 40057 to stop - a clear snap of the drain valve will be heard.
- Allow oil filter to run empty.

WARNING: Hot engine oil

- Open oil drain plug or extract engine oil.

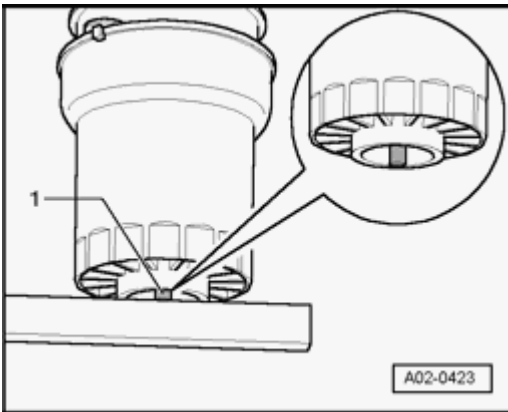


Fig. 57: Identifying Remove Oil Drain Adapter T 40057
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove Oil Drain Adapter T 40057.
- Check whether bottom valve - 1 - is flush and not crooked, as in illustration (A02.0423).
- Remove protective cap.
- Open oil filter housing - 2 - with Oil Filter Wrench 3417 or with socket AF 36, e.g. Socket AF 36 T10125 and remove oil filter.

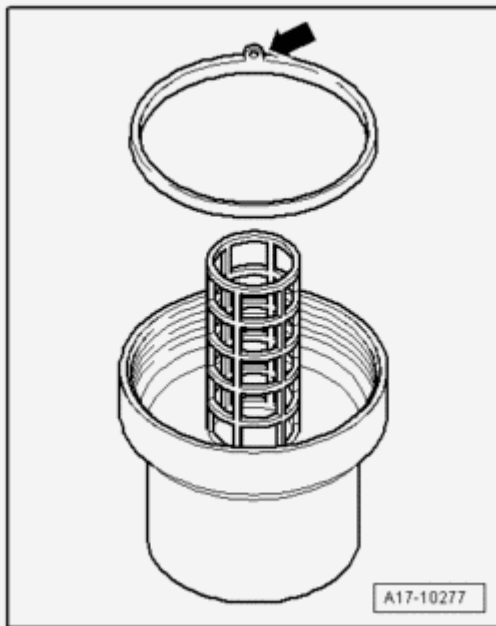


Fig. 58: Identifying Filter Insert And Gasket
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace filter insert - 4 - and gasket - 3 -.
- Note position of service flag on sealing ring (see arrow)

NOTE: • **Observe waste disposal regulations!**

- Clean sealing surface on oil filter housing.
- Lubricate rubber seal lightly with oil.
- Smooth side of sealing ring must face toward outside
- Screw on filter housing and tighten.
- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> Engine oil: Fill

NOTE:

- Engines with turbocharger:
- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
- As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely.
- The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes
- Check for cleanliness.

6-cyl. 3.2L FSI gasoline engines

NOTE:

- Loosen the cap before draining / extracting, so that the engine oil can run out of the oil filter housing.

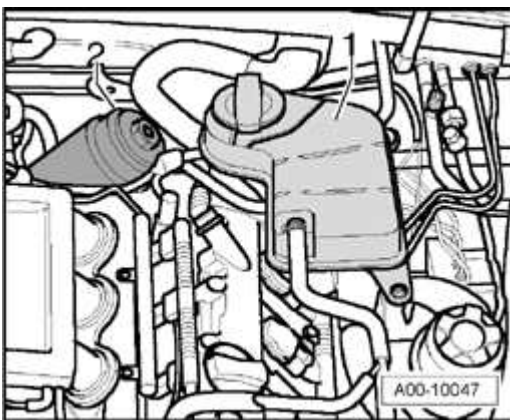


Fig. 59: Identifying Coolant Reservoir And Oil Filter Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir - 1 - and lay aside.
- Remove oil filter cover with socket wrench SW 36 - 2 -.
- Clean sealing surfaces oil filter cover and at oil filter housing.
- Replace oil filter insert..

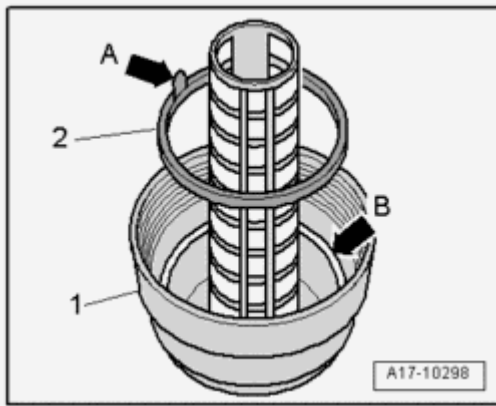


Fig. 60: Identifying Sealing Ring On Cap
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Sealing ring on cap, replacing

- Remove sealing ring at pull tab - **arrow A** - from cap - **1** -.
- Insert new sealing ring - **2** - with semicircular profile in groove - **arrow B** - on cap.
- The pull tab - **arrow A** - must face upward.
- Smooth side of sealing ring - **2** - must face toward outside

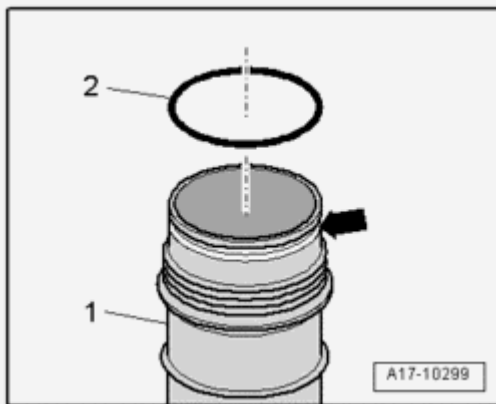


Fig. 61: Identifying Oil Filter Housing O-Ring
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

O-ring, inserting in oil filter housing

- Insert O-ring - **2** - in groove - **arrow** - on oil filter housing - **1** -.

NOTE:

- Observe waste disposal regulations!
- Engage new oil filter insert in oil filter cover.
- Install oil filter cover.

- Install coolant reservoir.
- Remove noise insulation
- Open oil drain plug on oil pan or extract engine oil.
- Install oil drain plug.

NOTE:

- Oil drain plug is installed without seal.
- Check for cleanliness.

- Fill motor oil. --> **Engine oil: Fill**

8-cyl. 4.2L MPI gasoline engines

- Remove engine cover upward.

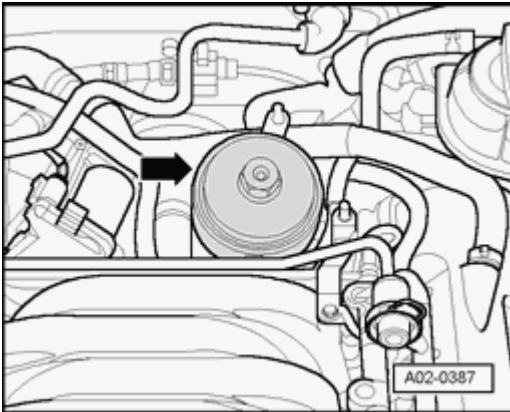


Fig. 62: Identifying Oil Filter Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil filter cover - **arrow** - using socket wrench SW24.
- Filter element, removing

NOTE:

- Removing the filter element will open a valve and oil in the filter housing will flow automatically into the crankshaft housing.

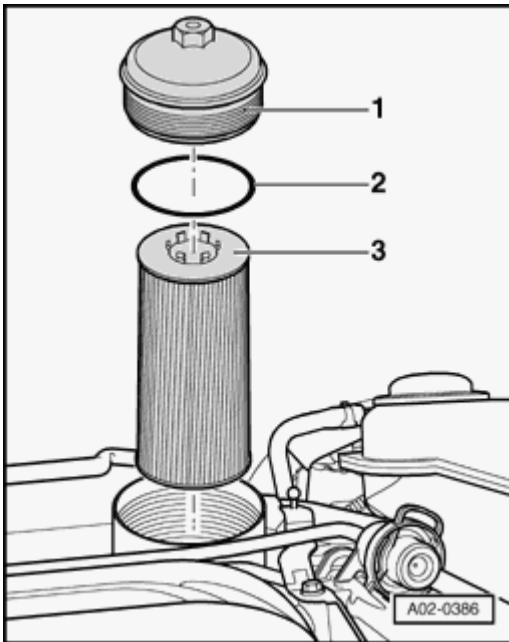


Fig. 63: Identifying O-Ring And Oil Filter Insert
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace O-ring - 2 - as well as oil filter insert - 3 -.

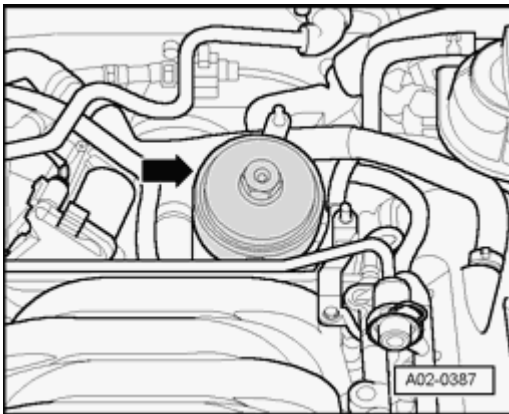


Fig. 64: Identifying Oil Filter Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cover - **arrow** -.
- Open oil drain plug or extract engine oil.
- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill**

NOTE: • **Check for cleanliness.**

8-cyl. 4.2L FSI gasoline engines, RS4

- Remove engine cover upward.

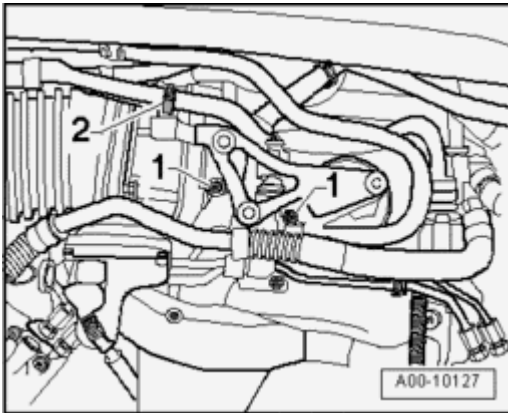


Fig. 65: Identifying Screws And Line

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen screws - **1** - and unclip line - **2** -.
- Lay aside bracket.

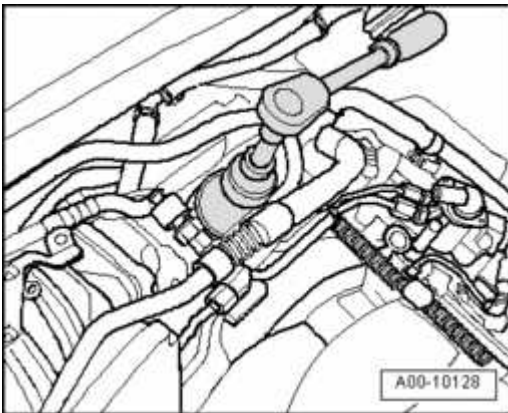


Fig. 66: Identifying Oil Filter Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil filter cover - **arrow** - using socket wrench SW32.
- Filter element, removing

NOTE:

- Removing the filter element will open a valve and oil in the filter housing will flow automatically into the crankshaft housing.

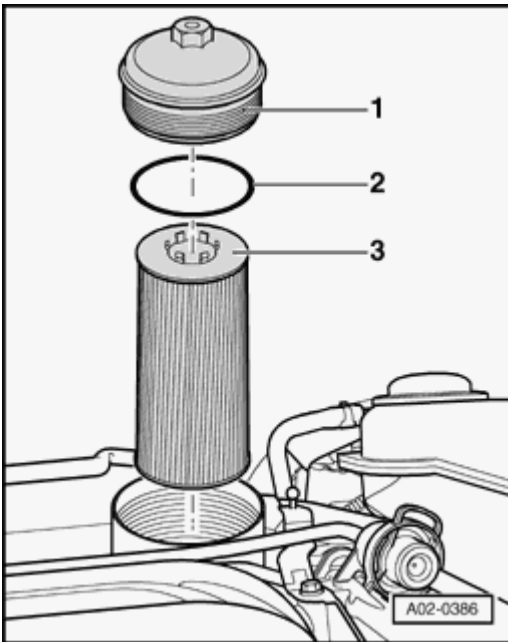


Fig. 67: Identifying O-Ring And Oil Filter Insert
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace O-ring - 2 - as well as oil filter insert - 3 -.

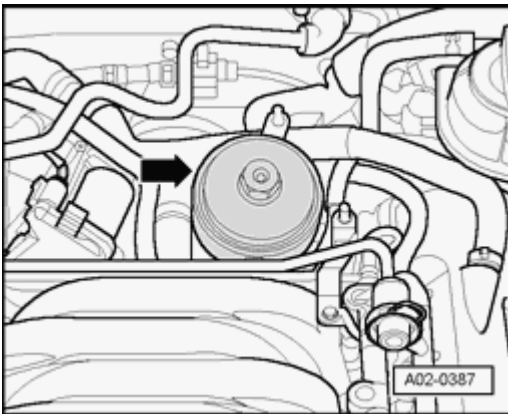


Fig. 68: Identifying Oil Filter Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cover - **arrow** -.
- Open oil drain plug and drain engine oil.
- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill**

NOTE:

- Check for cleanliness.
- Do not extract engine oil!

Navigation: Eject button, unlocking

- Follow these steps in sequential order.

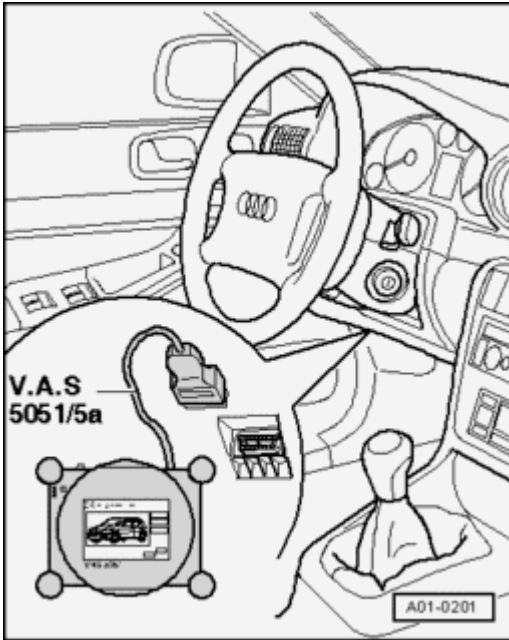


Fig. 69: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Guided functions
- Go to - function/component selection
- Service work
- J401 - Navigation, Eject button, locking/unlocking
- Now follow guided program

Test drive: Perform

To what extent the following can be checked is dependent upon the vehicle equipment and local conditions (urban/country).

- The following should be checked by means of a road test:
 - Engine: Output, misfiring, idling speed, acceleration
 - Clutch: Pulling away, pedal pressure, odors
 - Gear selection: Ease of operation, shift lever position
 - Automatic transmission: Selector lever position, shift lock / ignition key removal lock, shift behavior,

instrument panel insert display

- Foot and parking brake: Function, free travel and effectiveness, pulling to one side, juddering, squeal
- ABS function: When braking with activated ABS, the brake pedal must pulse noticeably.
- Steering: Function, steering free play, steering wheel centralized when wheels are in straight ahead position
- Tilt/slide sunroof: Function
- Cruise Control System (CCS): Function
- Radio: reception, SCV, interference
- Driver Information System (DIS): Functions
- A/C system: Function
- Vehicle: Moving off line when traveling straight ahead (level road)
- Imbalance: Wheels, drive shafts
- Wheel bearings: Noises
- Engine: Hot starting behavior

Radio: Activate anti-theft coding by entering security code

Radio units are shipped with a fixed code. Fixed code means that every radio unit with anti-theft coding has been programmed with its own code. This code is not active from the factory. To increase anti-theft protection, there is no longer a radio card in the radio and navigation system owners manual. The entry of the radio code is no longer described in the owners manual.

The Anti-theft coding on a unit that is ready to play is activated by entering the fixed code.

On chorus II+, concert II+ and symphony II+ radio systems, enter the radio code as follows

- Switch on radio. "Code 1000" appears in the display.
- Press upper left control button "X___" -arrow- until first digit of radio code appears in display.
- Enter remaining three radio code digits with other three control buttons
- Press "ENTER" control button. The radio is coded.

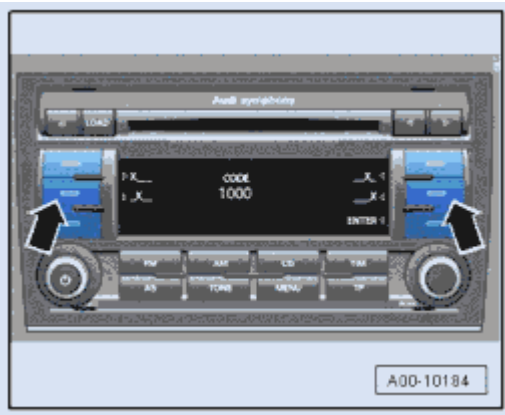


Fig. 70: Identifying Radio Controls

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Dispose of sticker with radio code.

If the radio code is entered incorrectly two times and "Code Safe 2" appeared in the display, use the following procedure

Leave radio switched on approx. 60 minutes. After 60 min., "Code Safe / Code 1000" appears in the display and the radio is switched off

Enter radio code again.

On navigation system BNS 5.0, enter radio code as follows

- Switch on navigation system
- Enter PIN using Speller
- Confirm entry with "OK"
- Dispose of sticker with radio code.

NOTE:

- Please inform the customer that he can only learn the anti-theft radio code from the service advisor
- That way, thieves really cannot use the radio!

Radio/navigation system Plus (Chorus, Concert, Symphony): Deactivating transport mode

Transport mode can be activated in "Instrument cluster 17" and in "Radio 56".

- Deactivating transport modes, e.g. in instrument cluster 17, is described as follows.

Deactivating for Radio 50 is the same procedure

- Connect Vehicle Diagnosis, Testing and Information System VAS 5051 --> **DTC memory: Retrieving**

with VAS 5051/ 5052

- Switch ignition on.

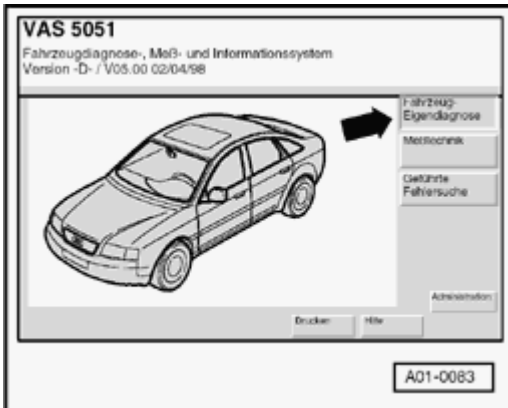


Fig. 71: Identifying Vehicle Self-Diagnosis Button On Scan Tool Display
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

Select mode of operation:

- Press button for "Vehicle Self-Diagnosis" on display.

NOTE:

- If the indications shown in the work procedure are not indicated on the display: User manual for VAS 5051 tester

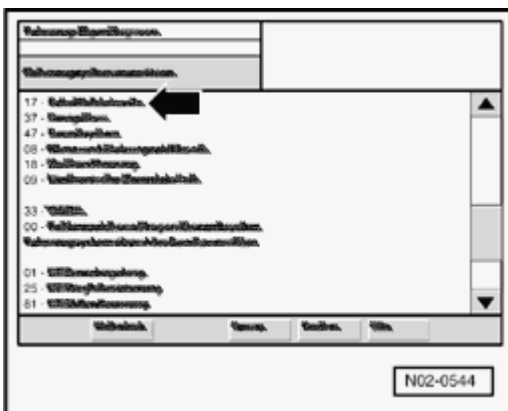


Fig. 72: Identifying Selection Screen On Scan Tool
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

Select vehicle system:

- Press "17 - Instrument panel insert" on display - **arrow** -.

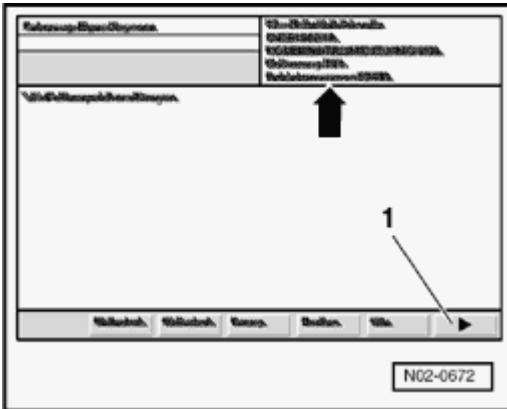


Fig. 73: Diagnosis System Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

Control module identification and the coding will be displayed - **arrow** -.

- Press the arrow button - **1** - on the screen display.

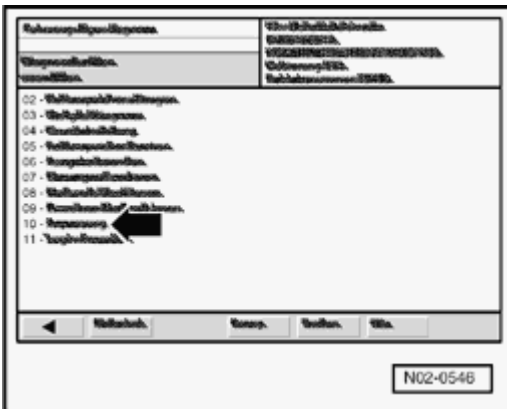


Fig. 74: Diagnosis System Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Press "10 - Adaptation" on display - **arrow** -.

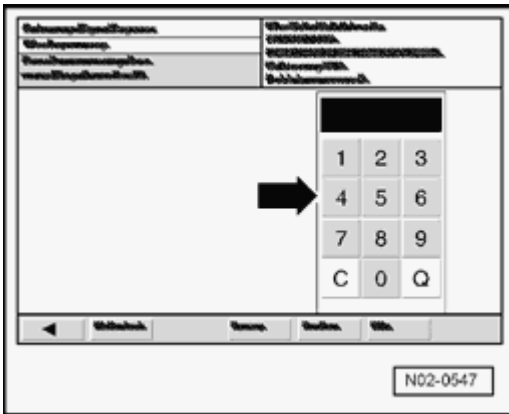


Fig. 75: Diagnosis System Display: Displayed Number Block
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Press button 9 twice on number block display - **arrow** -.

Transport mode is activated or deactivated in adaptation channel 99.

- Confirm entry with Q button on display number block.

NOTE:

- "0" Transport mode not active
- "1" Transport mode active

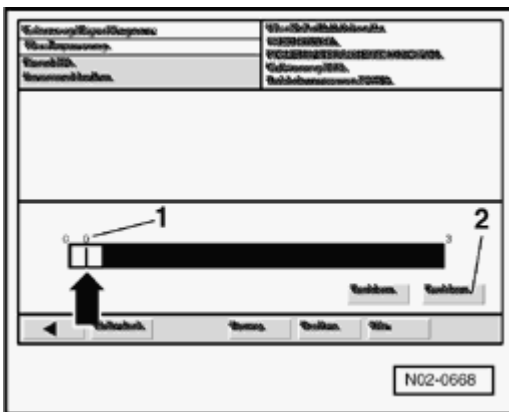


Fig. 76: Identifying Diagnosis System Display Functions
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Drag the cursor - **arrow** - on the display to the left, until 0 is indicated above the scroll bar - **1** -.
- 0 Transport mode not active

- Press the "Save" button - **2** - on display.

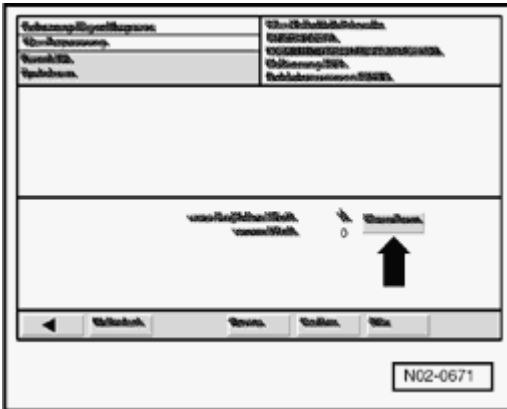


Fig. 77: Identifying Diagnosis System Display
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Press the "Accept" button - **arrow** - on display.

End procedure

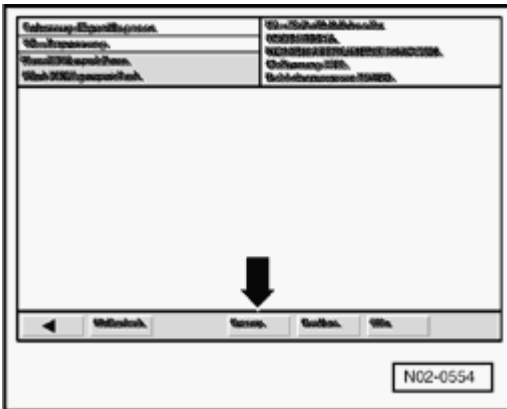


Fig. 78: Identifying "Go To" Button On Scan Tool Display
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Press the "Go to" button - **arrow** - on display.

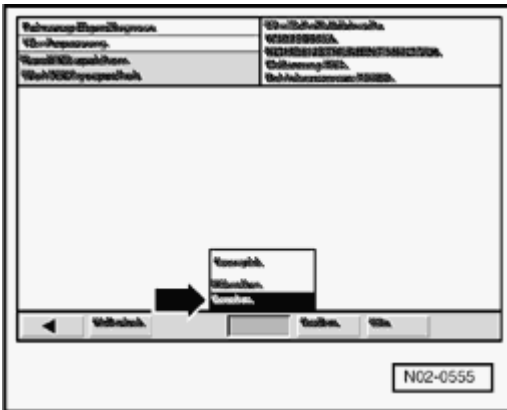


Fig. 79: Identifying "Exit" Button On Scan Tool Display
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Indicated on display:

- Press "exit" button - **arrow** - on display.
- Press "exit" button in exit menu.
- Turn off ignition.

NOTE:

- VAS 5051 must remain connected for additional tests and possibly for emissions testing.

Tire repair kit: Checking



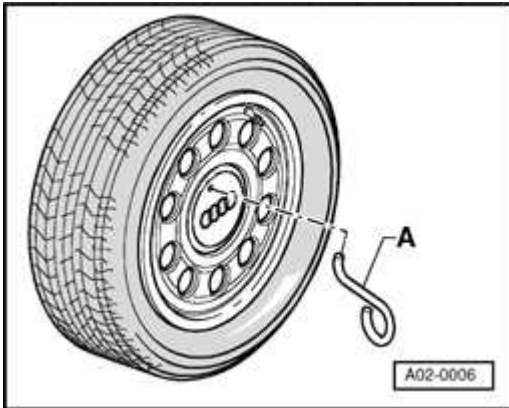
Fig. 80: Identifying Durability Date In Tire Repair Kit
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

On vehicles with a tire repair kit, check durability date - **arrow** -.

NOTE:

- If expiration date has passed, replace bottle.

Wheel bolts: Tighten to correct torque setting

Center cap**Fig. 81: Identifying Removal Hook**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The removal hook - **A** - for removing the center cap is located in the vehicles tool kit.

Wheel bolts

The adapter to loosen/tighten the anti-theft wheel bolts is located with the vehicle tool kit.

NOTE:

- **Be sure to tighten wheel bolts in diagonal sequence to the following specified torque:**
- **Place adapter with vehicle tool kit after completing work.**

Correct wheel installation

- When installing wheels, you must observe the following points to ensure wheels fit securely:
 - Always tighten wheel bolts to the specified torque so the wheel bolt seats in rim are not deformed.
 - When installing a wheel, do not tighten first wheel bolt immediately (for example, with an impact wrench). This would prevent other bolts from centering rim properly when they are screwed in. Rim could then become loose, even if tightened to specified torque.
 - Before installing wheels, check for rust/corrosion in wheel bolt seats and contact surfaces between rims and hubs, removing if necessary. Otherwise, the wheel bolts can lose tension after installation and the rim can come loose.

WARNING:

- **If the above points are not observed, wheels can come loose and the wheel bolt seats in rim can be deformed.**
- **The deformity could be so small that you can't see it.**
- **But even small deformities in the wheel bolt seats can prevent the wheel from fitting securely, so that it becomes looser and looser.**

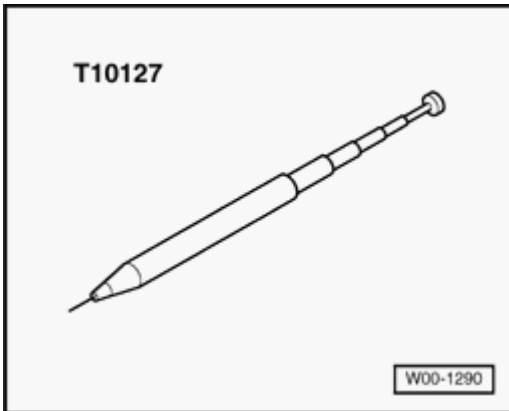
Windshield washer system: Checking nozzle setting, adjusting nozzles if necessary

Fig. 82: Identifying Adjustment Tool T10127 Equipped With Needle 3125/ 5 A
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Necessary special tools

- Windshield washer aiming tool T10127 equipped with replacement tip 3.25/5A

NOTE:

- **Never use a needle or a similar object, since it may damage the water hoses in the spray nozzle!**

Windshield spray jet setting

- Mark four points on windshield using water-soluble pen.

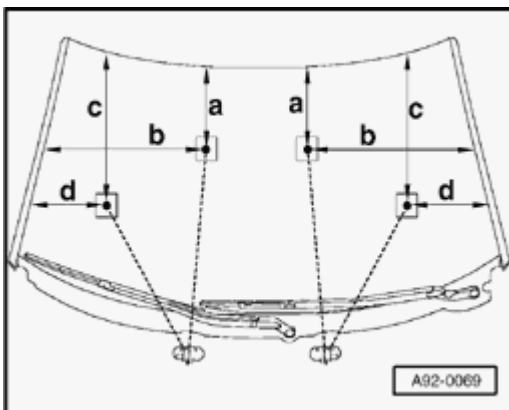


Fig. 83: Identifying Windshield Dimensions
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Adjusting dimension:

- Dimension - **a** - = 2.0 to 2.5 mm
- Dimension - **b** - = 465 to 490 mm

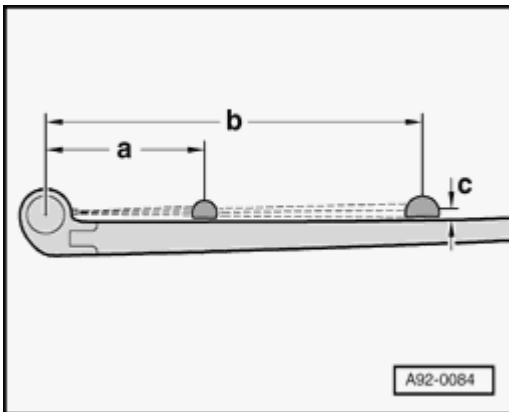
- Dimension - **c** - = 2.0 to 415 mm
- Dimension - **d** - = 140 to 2.5 mm

NOTE:

- Adjusting dimensions are calculated from outer edge of windshield.
- Locate individual spray jet points using windshield washer aiming tool T10127 with replacement tip 3.25/5A..

NOTE:

- If the spray field is uneven or does not adjust to the aforementioned specifications, replace the washer jet (repair measures).

Rear window spray jet setting**Fig. 84: Identifying Windshield Wiper Dimensions**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adjust spray nozzle with windshield washer aiming tool T10127 so that washer fluid sprays onto areas shown on rear window above wiper.
- Dimension - **a** - = approx. 125 mm
- Dimension - **b** - = approx. 2.5 mm
- Dimension - **c** - = approx. 5 mm

Washer jet adjustment, front window (Cabriolet)

- Mark four points on windshield using water-soluble pen.

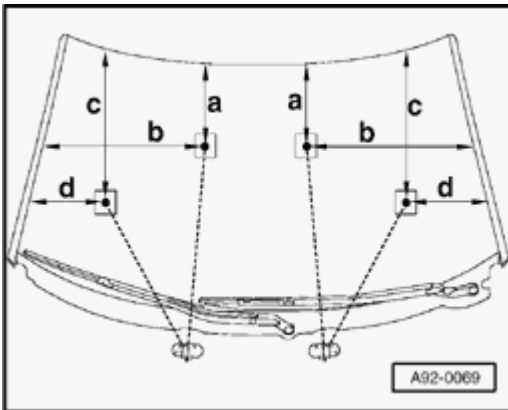


Fig. 85: Identifying Windshield Dimensions

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Adjusting dimension:

- Dimension - **a** - = 3.0 mm
- Dimension - **b** - = 500 mm
- Dimension - **c** - = 450 mm
- Dimension - **d** - = 2.0 mm

NOTE:

- The adjustment dimensions are figured from the aluminum edge on the trim.
- Locate individual spray jet points using windshield washer aiming tool T10127 with replacement tip 3.25/5A..

NOTE:

- If the spray field is uneven or does not adjust to the aforementioned specifications, replace the washer jet (repair measures).

Service display: Resetting or adapting

NOTE:

- Service display serves to remind the driver of service needed. The display appears in the center display.
- Service indicators appears 1 month or 2.000 km before reaching service interval. It disappears after 100 km. Example display: After a total driving distance of 28,700 km, "SERVICE IN 13.0 KM" appears.

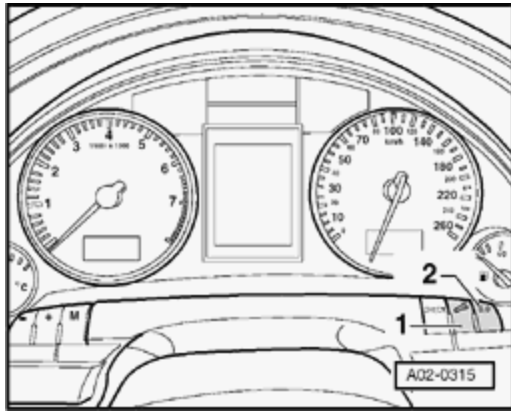


Fig. 86: Identifying Service Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The distance remaining to the service interval can be viewed via the center display menu by press button - 1 - once.
- When a service interval arrives, the text information appears in the center display for 5 seconds after switching ignition on. It is shown after automatic transmission message and a possible navigation system destination. Display: "SERVICE!".

Service display, resetting

- Follow these steps in sequential order.

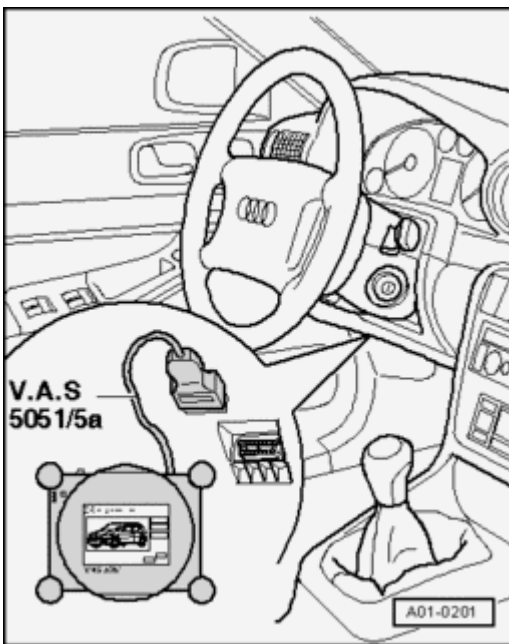


Fig. 87: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Combination Processor, reset WIV
- Now follow guided program

NOTE:

- Please follow guided program function description
- WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)

Oil quality, adapting

- Follow these steps in sequential order.

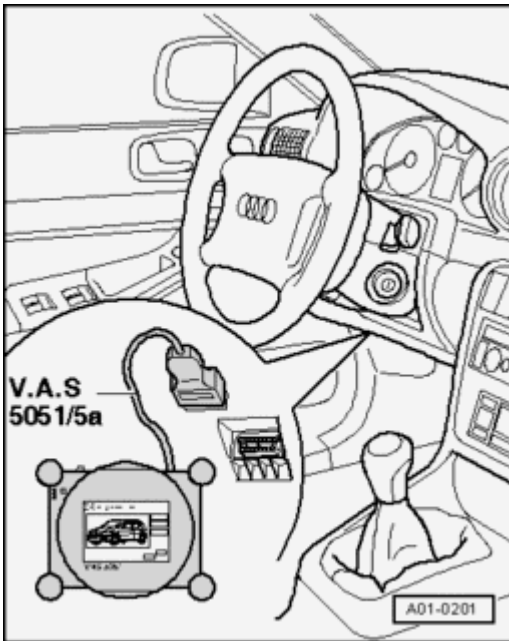


Fig. 88: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work

- Combination Processor, changing oil quality
- Now follow guided program

NOTE:

- It is necessary to change oil quality if changed between inspection or Long Life Service.
- Inspection Service = Oil quality 1
- Long Life Service = Oil quality 2
- WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)
- Please follow guided program function description

Maximum values, adapting

- Follow these steps in sequential order.

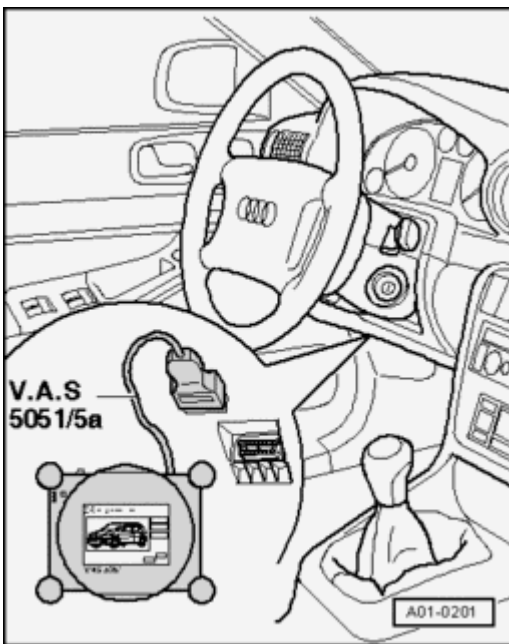


Fig. 89: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Combination Processor, adjusting maximum WIV value
- Now follow guided program

Fixed interval maximum values

NOTE:

- **WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)**
- **Please follow guided program function description**

Service display, resetting without VAS 5051/5052

NOTE:

- **If reset without VAS 5051 or VAS 5052 , service display is automatically set to fixed interval (15,000 km).**

Resetting can be carried out using tester VAS 5051 or VAS 5052 in "Adaptation" function --> **Service display: Resetting or adapting**

Service display can also be reset using the following procedure:

- Turn off ignition.

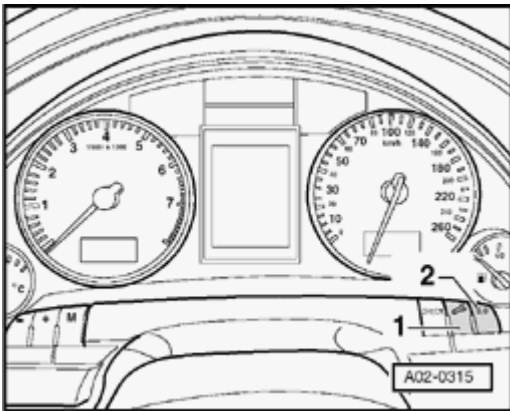


Fig. 90: Identifying Service Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press Taste button - **1** - and switch on ignition at the same time.

After releasing button, display shows: "SERVICE IN ???Km" or "SERVICE!".

- Hold down button Taste - **2** - until text is reset to "SERVICE IN ???Km" or "SERVICE!".
- Turn off ignition.

Headlamp washer system: Check spray jet setting.

Headlamp cleaner spray jets are set at the factory and do not need to be adjusted.

Front axle joints: Seal boots, checking play and secure fit.

NOTE: • Perform this test with vehicle on lift (wheels hanging freely).

Tie rod ends

- Check play by moving tie rods and wheels.
- You should not feel or see any play.
- Check all around ball joint boots - **arrow** - for damage and correct seating. Use a mirror, if necessary.
- Ball joint boots can usually be recognized by leaking lubrication.

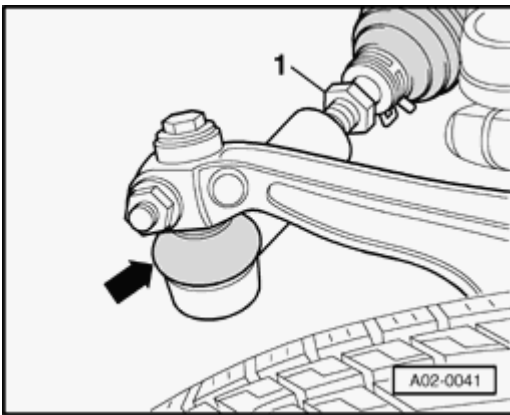


Fig. 91: Identifying Lock Nut

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Make sure lock nut - **1** - is tightened to 40 Nm.

All control arms

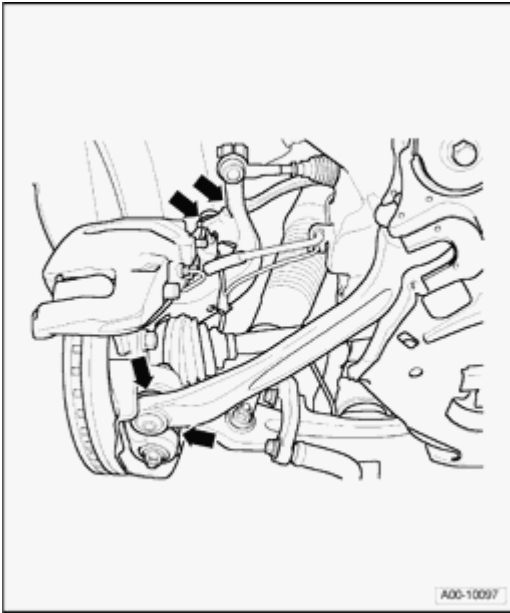


Fig. 92: Identifying Ball Joint Boots

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check all around ball joint boots - **arrows** - for damage and correct seating. Use a mirror, if necessary.
- Ball joint boots can usually be recognized by leaking lubrication.
- You should not feel or see any play.

Control arm

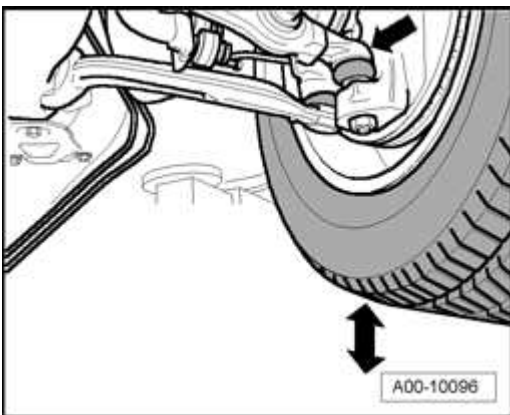


Fig. 93: Identifying Bearing Housing And Control Arm

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- With unloaded wheels, check relative movement of wheel bearing housing to control arm.
- By raising and lowering the wheels several times by hand - **arrow** - the relative movement between wheel bearing housing and control arm can be observed.
- If relative movement when lifting or lowering gives evidence of play that can be felt or seen, control arm

must be replaced.

Drive shaft boot

- Check all around interior and exterior drive shaft boot for damage and correct seating. Turn wheel, if necessary.
- By turning the front wheels, tears can be found in their early stages.
- Drive shaft boot damage can usually be recognized by leaking lubrication.

Windshield wiper blades: Checking park position (Cabriolet)

- Switch windshield wipers on and off and allow to run to end position.

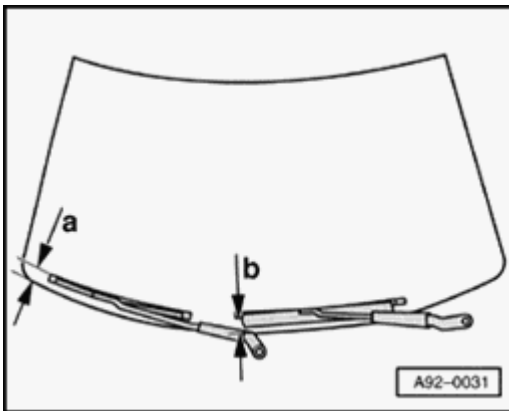


Fig. 94: Checking Windshield Wiper Blade Tips Position
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether wiper blades rest again front window in indicated position.

NOTE:

- Dimensions indicate distance of wiper blades to plenum chamber cowl panel grille on lower window edge.
- If necessary, unscrew wiper arm, align and tighten nuts.
- Activate mist wipe and check adjustment.

Headlamps: Check setting, adjust if necessary

The following test- and adjustment instructions are applicable to all countries. National guidelines or regulations of the country must be observed.

Check and adjustment conditions

- Tire pressure OK.
- Lenses must not be damaged or dirty.
- Reflectors and bulbs OK.

- Vehicle must be properly loaded.

Load: Vehicle must be loaded with one person on the drivers seat, weighing 75 kg, otherwise vehicle must be empty (curb weight).

The curb weight is the weight of the vehicle ready for operation with completely filled fuel tank (at least 90%), including the weight of all equipment items carried for operation (e.g. spare wheel, tool, vehicle jack, fire extinguisher etc.).

If the fuel tank is not at least 90% full, adjust the weight as follows:

- Read fuel level from fuel gauge. Calculate additional weight needed using the following table. Place extra weight in luggage compartment.

Tank filling table

Example:

If the fuel tank is half full, place a weight of 35 kg in the luggage compartment.

NOTE:

- **For additional weight use containers filled with water. A container filled with 5 liters of water weighs approx. 5kg.**

Vehicle must be rolled for several meters or the front and rear suspension must be bounced several times so that the springs settle.

- Vehicle and headlamp adjuster must be on a level surface operating instructions for headlamp adjuster.
- Vehicle and headlamp adjuster must be aligned.

Ensure headlight adjuster is about 30 cm in front of headlight.

- Inclination must be set.

Inclination measurements are stamped in "%" at top of headlamp. The headlamps must be adjusted according to these measurements. Percentage information is based on a projection distance of 10 meters. For example: inclination of 1.0 % converts to approx. 10 cm.

Vehicles with manual headlight range adjuster:

- The headlight range adjuster thumb wheel must be in basic setting - 0 -.

Vehicles with automatic headlight range adjusting

NOTE:

- **To check/adjust headlights, they must always be placed in the basic setting with the VAS 5051.**

- Performing basic setting with VAS 5051 :
- connect VAS 5051 with ignition switched off.

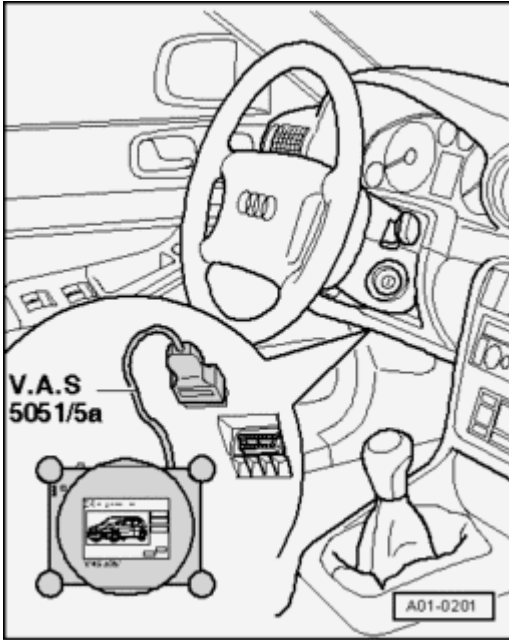


Fig. 95: Connecting Diagnostic Lead Connector VAS 5051/1 Or VAS 5051/3 At Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use K-lead adapter VAS 6017B.
- Switch ignition on.
- Select "Guided Fault Finding"

Enter vehicle information; all control modules are interrogated.

- Press the following selections in the order shown:
 - Go To
 - Functions and component selection
 - Body
 - Electrical Equipment
 - 01 - On Board Diagnostic (OBD) capable systems
 - 55-Dynamic Headlamp Range Control
 - J 431-Dynamic Headlamp Range Control, Functions
 - J 431-Headlamp Range Control Module, basic setting
- Press button

Follow the steps of the tester and confirm the entry until the following text appears:

J 431-Headlamp Range Control Module, basic setting

- Press button
- Follow test sequence

Headlamps, checking adjustment (with new test screen without 15 setting line)

- Switch ignition and low beams on

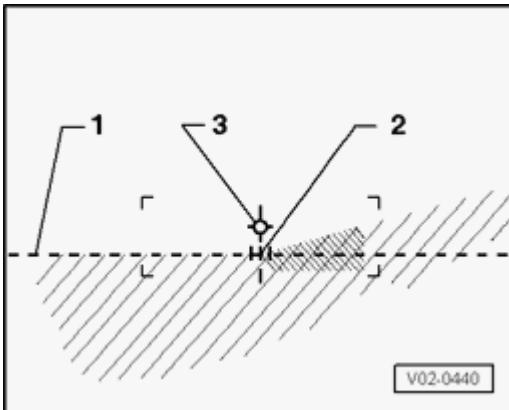


Fig. 96: Identifying Headlight Setting Line, Break-Away Point & Center Point
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Horizontal light-dark border must contact hyphenated line - 1 - on test surface.
- Break-away point - 2 - between left horizontal part and rising part on right of light-dark border must run vertically through central point - 3 -. The bright core of the light beam must be on the right of the vertical line.

NOTE:

- To make it easier to find break-away point - 2 - cover and uncover left half of headlamp (as viewed when looking forward) a few times. Next, check low beam again.
- After correct adjustment of dipped beams the center point of the main beam must lie on the center mark - 3 -.
- For the previous test screen with 15 -setting line, adjust as for new test screen. To avoid incorrect settings, ignore 15 setting line.
- If headlight adjustment is not OK: Adjust headlights:

Headlamps, adjusting

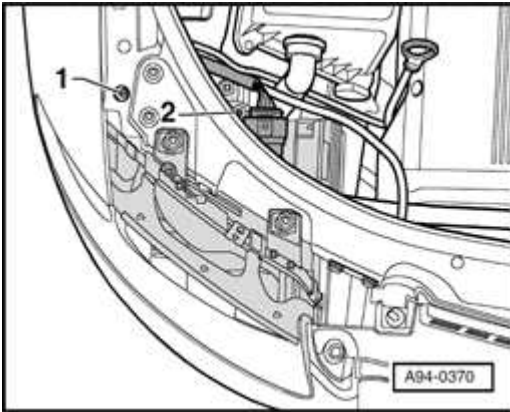


Fig. 97: Identifying Adjustment Screws For Main Headlight (Right)
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Main headlight (right)

Adjusting screw on right headlight:

Placement on left headlight is similar.

- To adjust height, turn adjustment screws - 1 - and - 2 - with same number of revolutions.
- To adjust laterally, turn only adjustment screw - 2 -.

Fog lights:

Inclination figures:

- Fog lights 20 cm

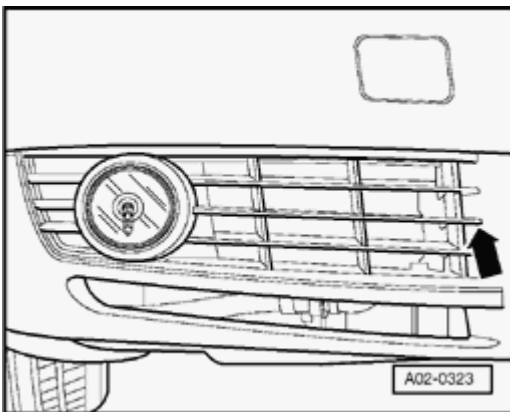


Fig. 98: Checking Whether Upper Light-Dark Border Touches Adjusting Line And Runs Across Entire Test Screen Width Horizontally
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether upper light-dark border touches adjusting line and runs across entire test screen width horizontally.

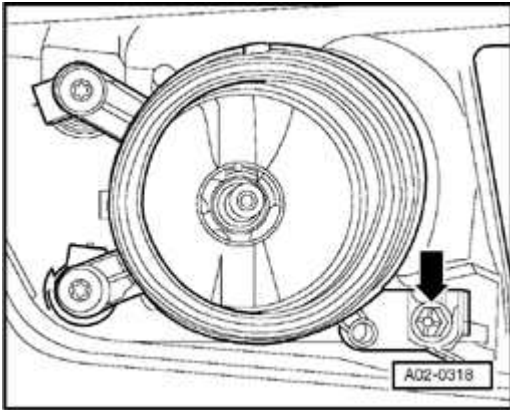


Fig. 99: Identifying Air Duct Grille, Bumper, And Adjustment Screw
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct grille on inner side of bumper - **arrow** -.
- To change lamp range, turn adjustment screw - **arrow** -. Lateral adjustment is not possible.

NOTE:

- **Right fog light is shown in illustration. Adjusting screw on left fog light is arranged symmetrically.**

Other additional headlamps:

Accessory auxiliary headlamp systems must be checked and adjusted according to the guidelines valid for them.

Vehicle Electrical System Control Module - J519: coding

- Connect VAS 5051 --> **DTC memory: Retrieving with VAS 5051/ 5052**
- Select "Guided Fault Finding"

Enter vehicle information; all control modules are interrogated.

- Press the following selections in the order shown:
 - Go To
 - Functions and component selection
 - Body
 - Electrical Equipment
 - 01 On Board Diagnostic (OBD) capable systems
 - Electrical system (Highline or Lowline depending on vehicle equipment)
 - Electrical system function
 - J519 Vehicle Electrical System Control Module, coding
 - Press button

Follow tester steps and confirm entry until following text appears:

OK J519 Vehicle Electrical System Control Module, coding

○ Press the following selections in the order shown:

- Go To
- End

Dust and pollen filter: Replacing

NOTE:

- Filter insert is available in different versions (with and without activated charcoal insert as integrated odor filter).
- The filter is located beneath the fresh air plenum cover on the right side.
- Remove plenum chamber cover --> Plenum chamber cover: Removing

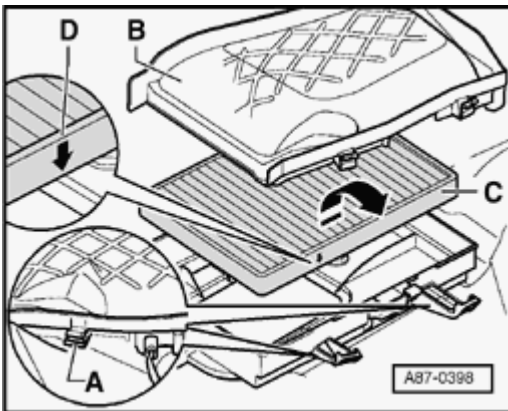


Fig. 100: Identifying Plenum Chamber Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unclip cover - **B** - and remove forward.
- Remove dust and pollen filter - **C** - from housing.

NOTE:

- When inserting filter in filter frame, observe flow-through direction "arrow" - **D** -
- When installing, ensure cover - **B** - is seated correctly. It must be clipped in at both catches - **A** - , otherwise water will run on dust and pollen filter and into A/C unit.

Manual transmission/final drive: Check oil level, add oil if necessary

--> -

- **34 MANUAL TRANSMISSION - CONTROLS, HOUSING** for 5 SPD. MANUAL TRANSMISSION

012/01W FRONT WHEEL DRIVE

- **34 MANUAL TRANSMISSION - CONTROLS, HOUSING** for 6 SPD. MANUAL TRANSMISSION 01E ALL WHEEL DRIVE
- **34 - CONTROLS, HOUSING** for 6 SPD. MANUAL TRANSMISSION 0A3 ALL WHEEL DRIVE, INTERNAL COMPONENT SERVICING
- **34 CONTROLS, HOUSING** for 6-SPEED MANUAL TRANSMISSION 01X, FRONT-WHEEL DRIVE
- **34 CONTROLS, HOUSING** for 6-SPEED MANUAL TRANSMISSION 02X, FOUR-WHEEL DRIVE
- **34 CONTROLS, HOUSING** for 6-SPEED MANUAL TRANSMISSION 0A3, ALL WHEEL DRIVE

Windshield/headlamp wiper system: Filling with fluid

- Fill washer fluid fully.

NOTE:

- Always add a neutral pH window cleaner to washer fluid (freeze protection in winter).

Door arrester and lock cylinder: Lubricate

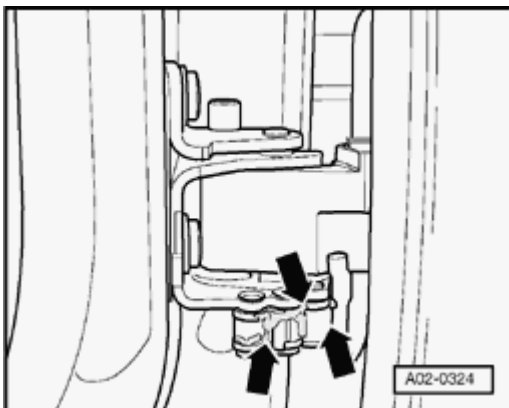


Fig. 101: Identifying Greasing Points For Door Latches

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Grease door latches only at lubrication points shown -arrows-.
- Lubricant: "G 052.778 A2"
- Lubricate lock cylinder.
- Lubricant: "G 052.778 A2"

Telematics: Emergency battery, replacing

NOTE:

- Emergency battery should be replaced every 4 years on vehicles with

Telematics.

Telematics control module is located in right footwell E-box (passenger side, below floor covering).

- Lower A-pillar trim, removing and installing; Floor covering, raising: --> - 70 - INTERIOR TRIM

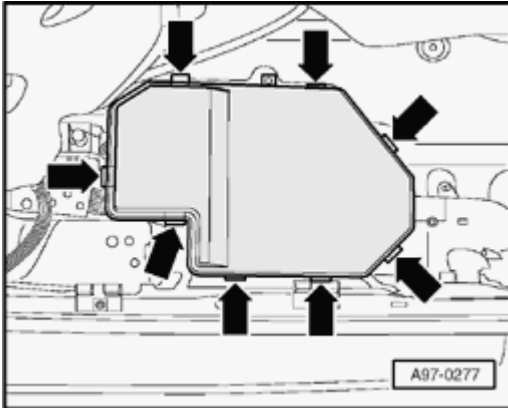


Fig. 102: Identifying Passenger Side Electronics Box Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release passenger side electronics box cover - **arrows** -.
- Remove Telematics control module from E-box (do not disconnect control module).

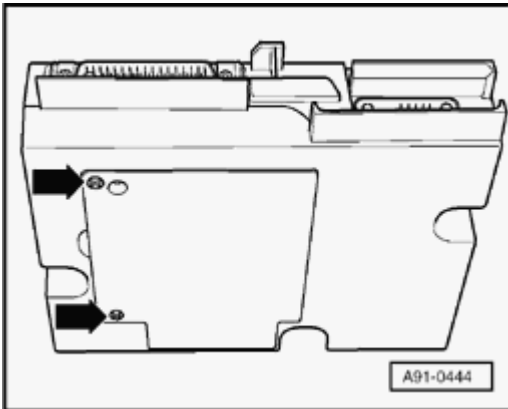


Fig. 103: Identifying Screws On Bottom Side Of Telematics Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both screws - **arrows** - on bottom side of Telematics control module and remove cover.

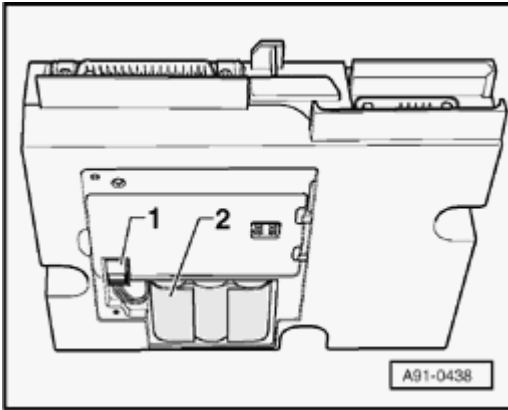


Fig. 104: Identifying Connector And Emergency Battery
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect connector - 1 - and remove emergency battery - 2 -.
- Perform installation in reverse order of removal.

Note before disconnecting battery.

WARNING: Activate Telematics control module Service Mode before disconnecting battery.

Vehicle Diagnostic, Testing and Information System VAS 5051; Guided Fault Finding; Adaptation;
Telephone/Telematics

NOTE:

- Retrieve radio/navigation unit anti-theft coding before disconnecting battery.
- If battery is reconnected, activate vehicle equipment (radio/navigation, clock, electric windows, engine) according to operating instructions and deactivate Telematics control module service mode. Vehicle Diagnostic, Testing and Information System VAS 5051; Guided Fault Finding; Adaptation; Telephone/Telematics

Transport protection: Remove front and rear strut transportation protection devices

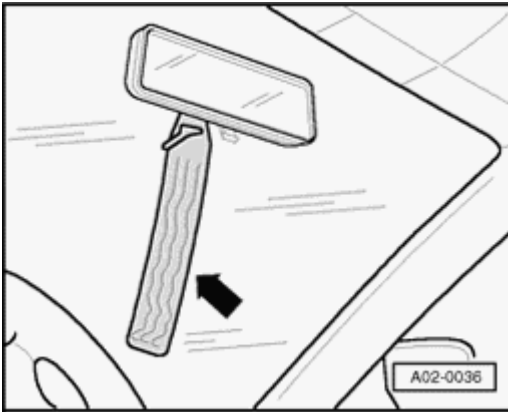


Fig. 105: Identification Tag Attached At Mirror

Courtesy of VOLKSWAGEN UNITED STATES, INC.

For some models the front and rear suspension struts have transportation protection devices installed. These models can be identified by a tag attached at the mirror - **arrow** -.

- Release coil spring (for example, put vehicle on lift)

NOTE:

- It is not necessary to remove the wheels.
- Be careful not to damage surface of coil springs.

Remove transportation protection devices --> **Front strut**

Front strut

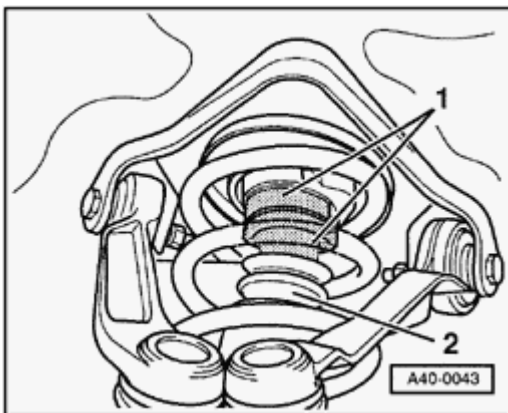


Fig. 106: Identifying Auxiliary Strut, And Transportation Protection Devices

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull auxiliary strut - 2 - downward.
- Remove 2 transportation protection devices at each strut - 1 -.
- Install auxiliary strut - 2 - by sliding up in spring retainer.

Rear strut

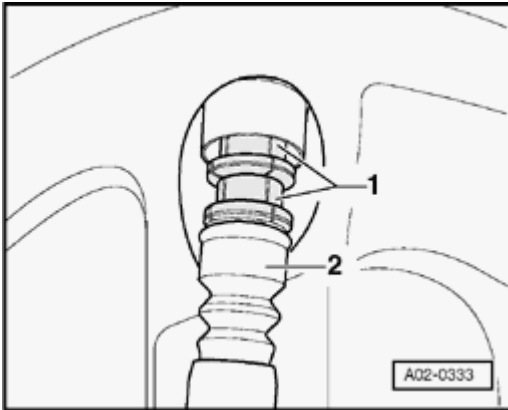


Fig. 107: Identifying Auxiliary Strut, And Transportation Protection Devices
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull auxiliary strut - 2 - downward.
- Remove 2 transportation protection devices at each strut - 1 -.
- Install auxiliary strut - 2 - by sliding up in spring retainer.

Underbody protection: Visual inspection for damage

- When inspecting visually, observe underbody, wheel housings and sills!

WARNING: Malfunctions found must be rectified (repair measure).

Anti-roll protection: Checking function (Cabriolet)

- Connect VAS 5051 --> **DTC memory: Retrieving with VAS 5051/ 5052**
- Select "Guided Fault Finding"

Enter vehicle information; all control modules are interrogated.

- Press the following selections in the order shown:
 - Go To
 - Functions and component selection
 - Body
 - Body work
 - 01 On Board Diagnostic (OBD) capable systems
 - Airbag 8.4E
 - Airbag 8.4E functions
 - Airbag control module output diagnostic test

- Follow guided program.

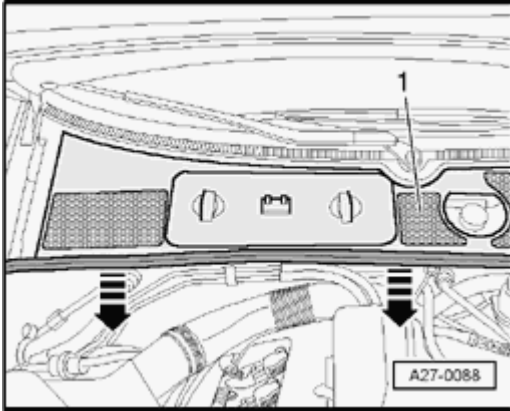
Plenum chamber cover: Removing

Fig. 108: Identifying Plenum Chamber Cover & Removing Rubber Seal
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove plenum chamber cover rubber seal in direction of arrow.
- Remove plenum chamber cover - **1** - forward.

Winter tires from factory

On vehicles that were delivered from factory with winter tires, check for correct pressure during delivery inspection.

The excessive speed warning sticker should be placed in drivers field of vision.

Spark plugs: Replacing**Necessary special tools**

- Spark plug wrench 3.22 B

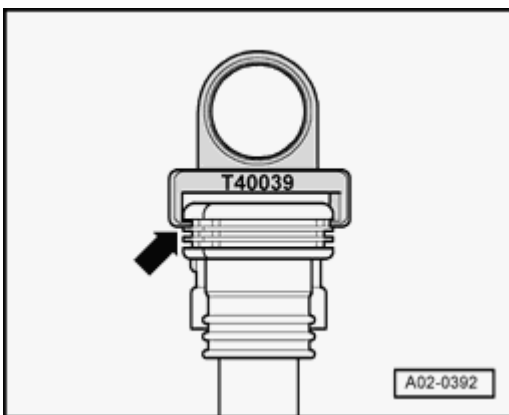


Fig. 109: Placing Ignition Coil Puller T40039 On Top Most Thick Rib Of Ignition Coils

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Ignition Coil Puller T40039

WARNING: Place Ignition Coil Puller T40039 on top rib - arrow - of ignition coil and pull this from spark plug. Placing on bottom rib can cause damage.

NOTE:

- Plug designation --> -
 - 28 IGNITION/GLOW PLUG SYSTEM for 1.8 LITER 4-CYL. 5V TURBO FUEL INJECTION & IGNITION, ENGINE CODE(S): AMB
 - 28 - IGNITION/GLOW PLUG SYSTEM for 2.0 LITER 4-CYL. 4V TURBO FUEL INJECTION IGNITION, ENGINE CODE(S): BPG, BWT
 - 28 IGNITION/GLOW PLUG SYSTEM for 3.0 LITER 6-CYL. 5V FUEL INJECTION & IGNITION, ENGINE CODE(S): AVK, BGN
 - 28 - IGNITION SYSTEM for 3.2 V6 4V FUEL INJECTION IGNITION, ENGINE CODE(S): BKH
 - 28 - IGNITION/GLOW PLUG SYSTEM for 4.2 LITER V8 4V FUEL INJECTION AND IGNITION, ENGINE CODE(S): BNS
 - 28 IGNITION/GLOW PLUG SYSTEM for 4.2 LITER V8 5V FUEL INJECTION AND IGNITION, ENGINE CODE(S): BHF
- Observe waste disposal regulations!

4-cyl. 1.8L 5V engines --> 4-cyl. 1.8L

4-cyl. 4V/5V 2.0L, 2.0L FSI and 2.0L TFSI engines --> 4-cyl. 2.0L FSI and 2.0L TFSI engines

6-cyl. 4V/5V 3.0L and 3.2L FSI engines --> 6-cyl. engines 3.0L and 3.2L FSI:

8-cyl. 4V/5V 4.2L MPI engines, --> 8-cyl. engines 4.2L MPI

8-cyl. 4V 4.2L FSI (RS4) engines, --> 8-cyl. engines 4.2L (RS4)

4-cyl. 1.8L

- Remove engine cover --> Engine cover: Removing
- Switch ignition off.

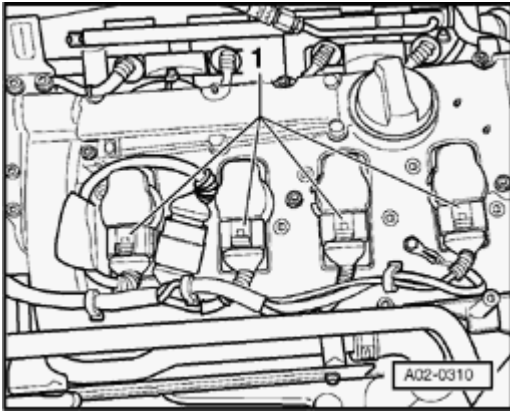


Fig. 110: Identifying Connectors At Spark Plugs

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove connector - 1 - at spark plugs.
- Push connector - 1 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

4-cyl. 2.0L FSI and 2.0L TFSI engines

- Switch ignition off.
- Remove engine cover (if present) --> **Engine cover: Removing**

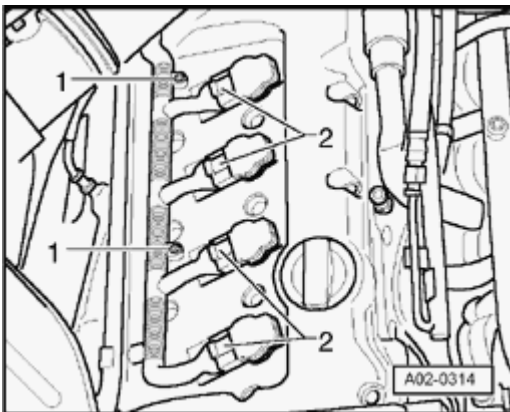


Fig. 111: Identifying Bolts And Connectors

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.

- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

- **Push ignition coils by hand into intended resources in cylinder head cover.**

6-cyl. engines 3.0L and 3.2L FSI:

- Switch ignition off.
- Remove engine cover (if present) --> **Engine cover: Removing**

Right cylinder bank

- Remove upper part of air filter --> **Air cleaner: Clean air filter housing and replace filter**

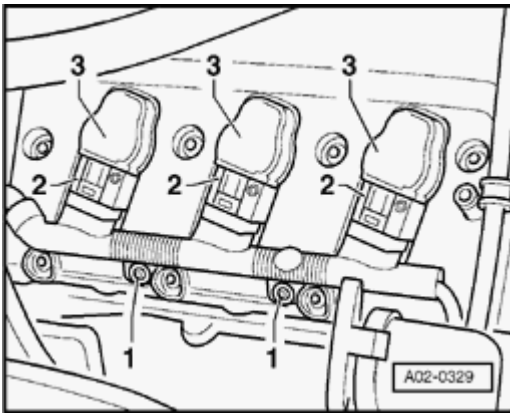


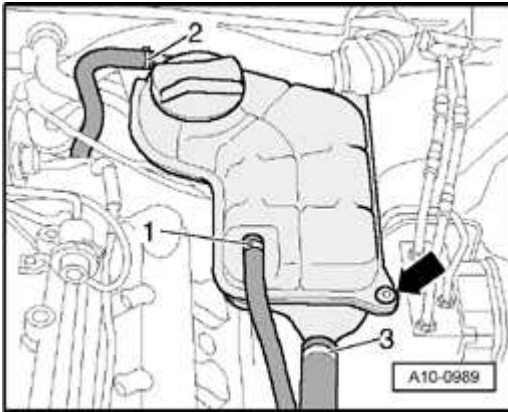
Fig. 112: Identifying Bolts, Connector, And Ignition Coil
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

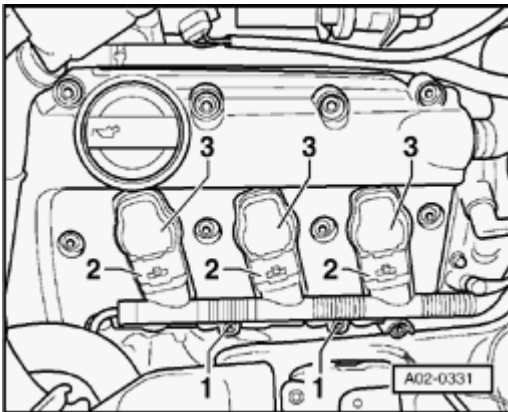
- **Push ignition coils by hand into intended resources in cylinder head cover.**

Left cylinder bank

**Fig. 113: Removing Coolant Hoses**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.
- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

**Fig. 114: Identifying Bolts, Connector, And Ignition Coil**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

- **Push ignition coils by hand into intended resources in cylinder head cover.**

8-cyl. engines 4.2L MPI

- Switch ignition off.

Right cylinder bank

- Remove upper part of air filter --> **Air cleaner: Clean air filter housing and replace filter**

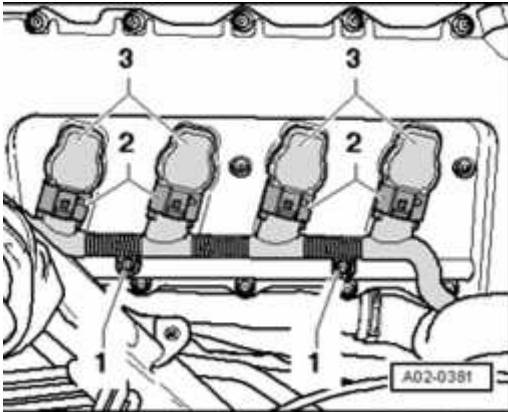


Fig. 115: Identifying Bolts, Connector, And Ignition Coil
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Left cylinder bank

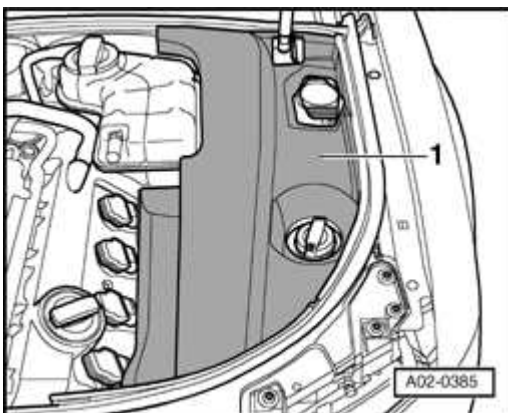


Fig. 116: Removing Cover Upward
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover upward.

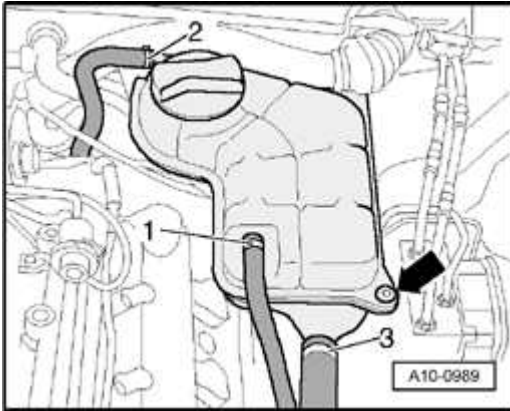


Fig. 117: Removing Coolant Hoses

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.
- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

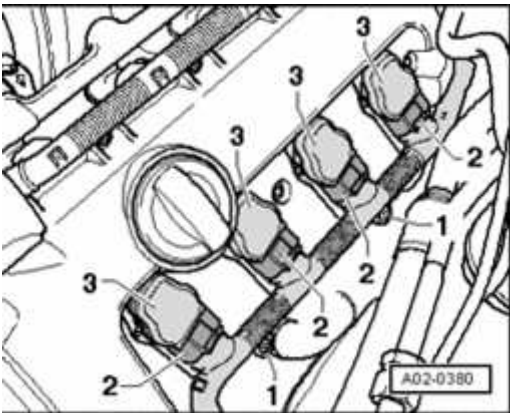


Fig. 118: Identifying Bolts, Connector, And Ignition Coil

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench 3.22 B.
- Install new spark plugs.

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

8-cyl. engines 4.2L (RS4)

- Switch ignition off.

Right cylinder bank

- Remove upper part of air filter --> **Air cleaner: Clean air filter housing and replace filter**

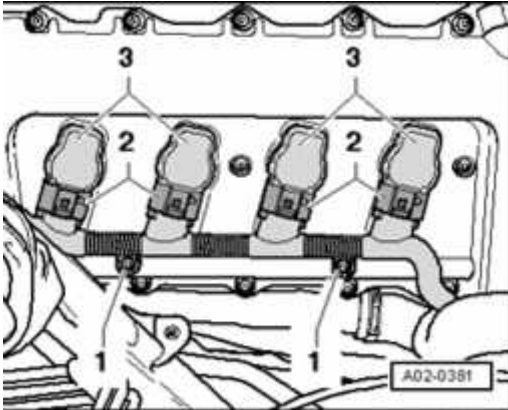


Fig. 119: Identifying Bolts, Connector, And Ignition Coil
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Left cylinder bank

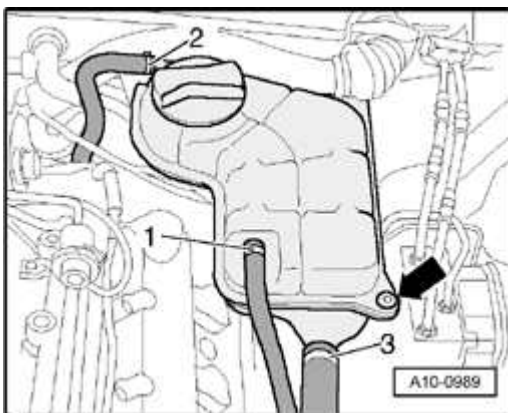


Fig. 120: Removing Coolant Hoses

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.
- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

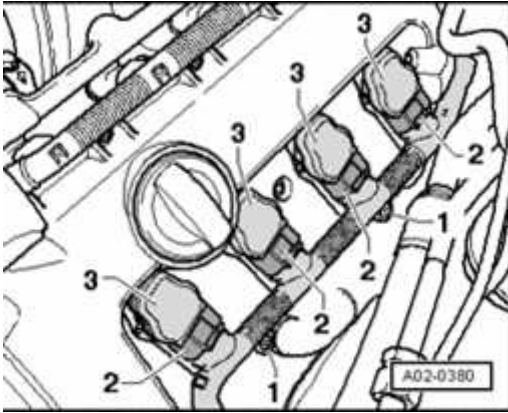


Fig. 121: Identifying Bolts, Connector, And Ignition Coil
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Headlights: Aiming using Hella Universal Beamsetter IV

Service

Align vehicle headlights using the Hella Universal Beamsetter IV VAS 5107 and the following procedure:

Additional instructions and diagrams Instruction Manual for the Hella Beamsetter Series IV

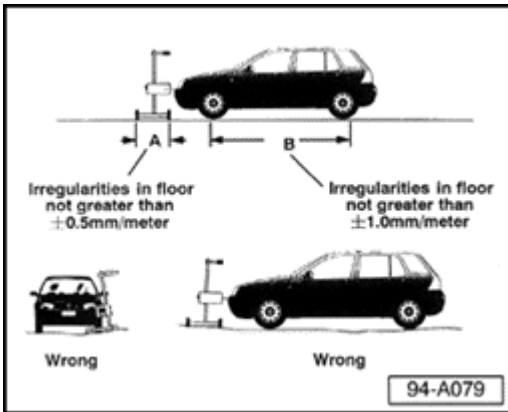


Fig. 122: Identifying Floor Surface Specifications For Vehicle
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position vehicle on a flat floor surface that meets the following (ISO 10640) specifications:
 - 0.5mm or less slant from front wheel to back wheel of the Hella Universal Beamsetter IV VAS 5107 - **A** -
 - 1mm or less slant per meter for the length of the vehicle - **B** -
- Clean headlight lenses.
- Adjust vehicle tire pressure to specifications.

Have a second technician sit in the drivers seat while aligning the headlights.

- Bounce front and rear of vehicle up and down several times to settle vehicle suspension.

Setting low beam alignment of drivers side headlight

- Move Hella Universal Beamsetter IV VAS 5107 into position in front of the vehicle so it is aligned with the vehicle and Hella Universal Beamsetter IV VAS 5107 is 30 to 70cm (12 to 28 in.) from the drivers side headlight.
- Switch headlights ON in low beam position.
- Align Hella Universal Beamsetter IV VAS 5107 so it is centered on the headlight (align vertically then horizontally).

NOTE:

- Use the arrows on the Hella Universal Beamsetter IV VAS 5107 housing as a guide.
- You may want to use a straight edge or tape measure, because alignment must be within 3cm (1.2 in.) of the center of the headlight.
- Without moving the Hella Universal Beamsetter IV VAS 5107 , slide Broad-band sight toward center of vehicle (Broad-band sight can also be moved up and down for a better position).

Use Broad-band sight to make final alignment of Hella Universal Beamsetter IV VAS 5107 to vehicle by:

- Loosening hand-wheel that locks column in place.
- Sighting down through the slit in the Broad-band sight and rotating Hella Universal Beamsetter IV VAS 5107 and column until two similar points on vehicle are aligned

NOTE:

- Try using corners of the headlight housings or two screws that are the same height and as far apart as possible on the vehicle.
- Carefully tighten hand wheel without changing Hella Universal Beamsetter IV VAS 5107 position.
- Set Inclination to 1.0 %.
- Set Hella Universal Beamsetter IV VAS 5107 "Scaled wheel" to the proper low beam inclination %.
- Adjust height (vertical) alignment first. Turn headlight height adjuster screw to align the upper edge of the flat portion of the beam with the center horizontal line of the grid on the Hella Universal Beamsetter IV VAS 5107 pattern screen.

NOTE:

- VOL is the correct beam pattern for both right and left headlights.

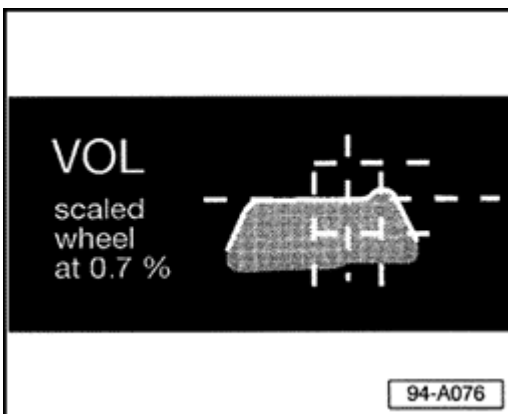


Fig. 123: Identifying Specifications For Drivers Side Headlight Beam Angle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adjust lateral (horizontal) alignment of drivers side headlight so that the peak (highest point) of the headlight beam pattern aligns with the right edge of the target box of the grid on the pattern screen (it should match the VOL pattern shown on the Hella Universal Beamsetter IV VAS 5107).

NOTE:

- If the height alignment changed, readjust.

Checking drivers side headlight high beam alignment

- Switch headlights ON in high beam position.

- Realign Hella Universal Beamsetter IV VAS 5107 with the high beam headlight if necessary.

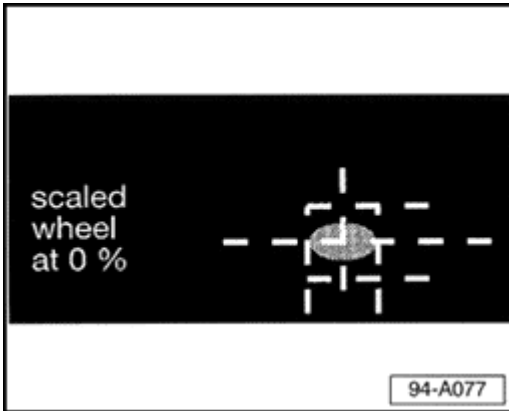


Fig. 124: Identifying Beamsetter "Scaled Wheel" At 0%
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set Beamsetter "Scaled wheel" to 0%.
- Cover low beam lamp (use hand or small piece of cardboard) and check that the "hot spot" of high beam pattern is centered on the square target box of the pattern screen.

NOTE: • **High beam pattern is built into the reflector design and cannot be adjusted separately.**

If high beam pattern is way out of adjustment:

- Inspect for reflector damage.
- Replace reflector if needed.

NOTE: • **Always align headlight in the low beam position.**

Aligning fog lamp

- Switch fog lamps ON.
- Align Hella Universal Beamsetter IV VAS 5107 with fog lamp (make sure it is between 30 and 70cm from the fog lamp lens).

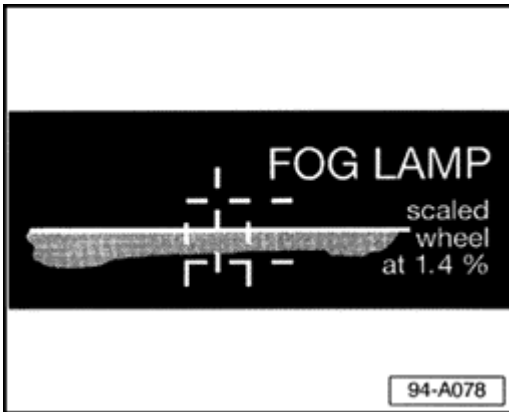


Fig. 125: Identifying Hella Universal Beamsetter IV VAS 5107 Scaled Wheel At 1.4%
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set Hella Universal Beamsetter IV VAS 5107 scaled wheel to 1.4%.

Adjust fog lamp so the top of the beam pattern aligns with the centerline of the target grid on the beam pattern screen.

Passengers side headlight, alignment

- Move Hella Universal Beamsetter IV VAS 5107 to the passenger side of the vehicle and follow the same procedures to align the Hella Universal Beamsetter IV VAS 5107 to the headlamp.
- Align headlight low beam, check high beam and align fog lamp.

NOTE:

- Make sure to reset the Hella Universal Beamsetter IV VAS 5107 "Scaled wheel" to the proper setting each time you change from low beam to high beam or to fog lamp.
- Ensure that headlights and vehicle body are clean and free of fingerprints.

RAPGARD, inspection: Removal and disposal

From my 2.02

Service

Within 48 Hours after arrival at Dealer:

Inspection

- Inspect RAPGARD for damage or peeling.

If RAPGARD is disturbed (dented, scratched, etc.):

- You must note the damage on the Carrier Delivery Receipt, including damage type, extent and location.

Failure to note damage on the Carrier Delivery Receipt will result in non-payment of the repair.

NOTE:

- **RAPGARD must be removed from the vehicle no later than six months after application. See sticker (location on vehicle body varies) for detailed information.**

Within 72 Hours prior to delivery to the Customer:

- Remove RAPGARD from vehicle.
- Wash vehicle exterior.
- Inspect paint surfaces, moldings and glass.
- Protect the paint surface of all new vehicles by applying 3M Perfect-It Paste Wax (3M Part No. 39526) or equivalent.

Removal

- Vehicle must be at room temperature.
- The ideal body surface temperature for RAPGARD removal is 60F (15.5C) to 80F (26.6C).

If body surface temperatures are below 60F (15.5C) or above 80F (26.6C) then:

- Removal procedure should be performed indoors after surface temperatures have been allowed to stabilize within the given range.
- Rinse vehicle thoroughly with water to remove surface dirt or dust and to help stabilize body surface temperatures.
- Starting at the corners of each panel, carefully remove RAPGARD from vehicle.

RAPGARD, paint inspection after removal

- Inspect painted surfaces under one of the following lighting conditions:
 - Indoors under fluorescent lighting.
 - Outdoors under bright sunlight.

Important!

If any defects on the exterior have been identified (scratches, dings, dents and other types of body damage):

- Contact your Service Manager and arrange to repair defects immediately.

NOTE:

- **After removal of RAPGARD, some vehicles may exhibit temporary paint discoloration or paint swelling (caused by trapped moisture under the RAPGARD).**

- This temporary swelling is caused by the paint finish absorbing moisture trapped under the RAPGARD film.
- This swelling will disappear with exposure to the sun or heat lamps within 2 - 3 hours. Severe Paint swelling may require 2 - 3 days to recover.

DO NOT buff or refinish paint for this condition!

Adhesive residue removal

WARNING: Always read and follow manufacturer Cautions and Warnings regarding use of product.

If RAPGARD adhesive residue remains on paint finish, remove with a non-abrasive polishing product such as, (3M Part No. 59.5) light colors or (3M Part No. 5996) dark colors or equivalent.

Thick lines of adhesive residue can be removed with general purpose adhesive cleaner (3M Part No. 08987-aerosol, or Part No, 08984-qt. can) or equivalent.

NOTE:

- Paint discoloration (looks like shaded or dark magic marker lines) can be removed with a heat gun using the following procedure:
- Hold heat gun approximately 3 in. away from affected paint surfaces and apply heat using slow oscillating motions until discoloration is gone.
- If discoloration remains, wipe the heated area with Isopropyl alcohol and repeat procedure to increase surface drying.

Important!

After inspecting and removing RAPGARD, washing vehicle, inspecting and repairing any defects in paint surfaces, moldings and glass:

- Protect the vehicle paint surface by applying 3M Perfect-It Paste Wax (3M Part No. 39526) or equivalent.

RAPGARD Disposal

RAPGARD can be disposed as normal paper waste. If unsure about proper disposal procedures in your area, check local regulations.

Tire Pressure Monitoring System: Programming tire pressures

Specified values should also be saved with every tire pressure adaptation, e.g. when vehicle load condition changes, so that Tire Pressure Monitoring System can be as useful as possible. Do this as follows:

- Press Reset button on windshield washer lever.
- Select Tire Pressure Monitoring System.

- Select Save tire pressures.

NOTE:

- **Saving of tire pressures must be started after each deliberate change to specified values.**

Timing belt: Replacing**4-cyl. 5V 1.8L Turbo engines**

- Toothed belt, removing and installing --> -
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 1.8 LITER 4-CYL. 5V TURBO ENGINE MECHANICAL, ENGINE CODE(S): AMB

4-cyl. 2.0L 5V engines

- Toothed belt, removing and installing: --> -
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 1.8 LITER 4-CYL. 5V TURBO ENGINE MECHANICAL, ENGINE CODE(S): AMB
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 2.0 LITER 4-CYL. 4V TURBO ENGINE MECHANICAL, ENGINE CODE(S): BPG, BWT

4-cyl. 4V 2.0L FSI engines

- Toothed belt, removing and installing: --> -
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 2.0 LITER 4-CYL. 4V TURBO ENGINE MECHANICAL, ENGINE CODE(S): BPG, BWT

4-cyl. 4V 2.0L TFSI engines

- Toothed belt, removing and installing: --> -
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 2.0 LITER 4-CYL. 4V TURBO ENGINE MECHANICAL, ENGINE CODE(S): BPG, BWT

6-cyl. 5V engines 2.4L; 3.0L;

- Toothed belt, removing and installing: --> -
 - **13 ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 3.0 LITER 6-CYL. 5V ENGINE MECHANICAL, ENGINE CODE(S): AVK, BGN
 - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK** for 3.2 V6 4V ENGINE MECHANICAL, ENGINE CODE(S): BKH

Toothed belt change, filling out sticker - all

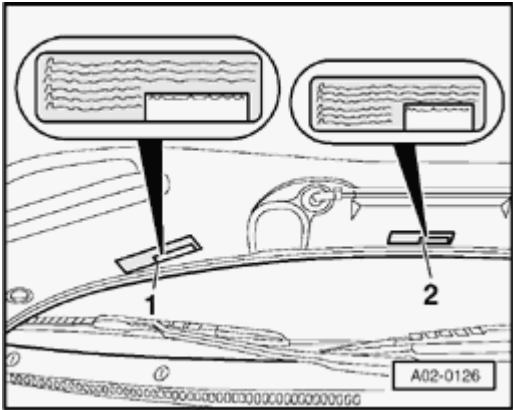


Fig. 126: Locating Toothed Belt Change Sticker At Rear Of Engine Compartment
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fill out toothed belt change sticker - 2 - at rear of engine compartment, attach new sticker if necessary.

TYPE PLATE / VEHICLE IDENTIFICATION NUMBER (VIN)

Type plate / Vehicle Identification Number (VIN)

Meaning of Vehicle Identification Number (VIN):

Vehicle data sticker

The vehicle data sticker is in the customers service schedule and in the vehicle in the spare wheel recess or on the luggage compartment floor.

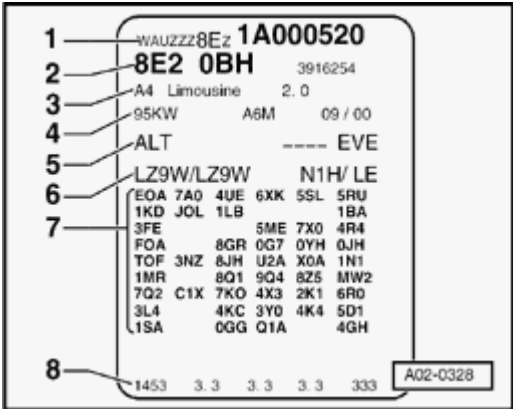


Fig. 127: Identifying Vehicle Data Sticker
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Sticker contains the following vehicle data:

Engine code and engine identification

NOTE:

- The "engine code" is on the vehicle data sticker in the service schedule and in the spare wheel recess or on the luggage compartment floor.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. 5V 1.8L Turbo gasoline engine:

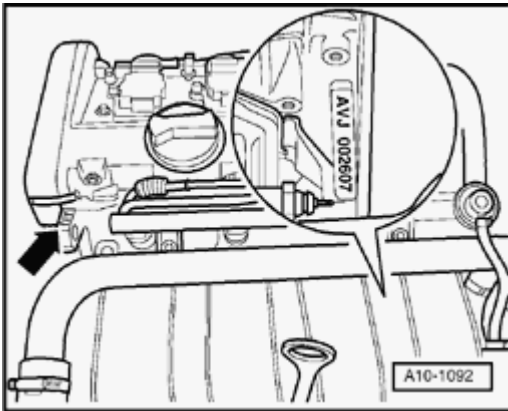


Fig. 128: Identifying Engine Number On Left Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left of cylinder block.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. 5V 2.0L gasoline engine:

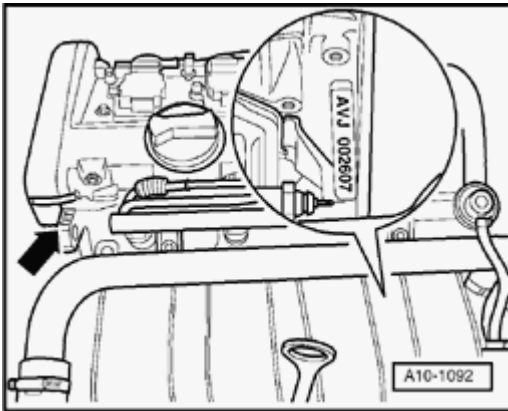


Fig. 129: Identifying Engine Number On Left Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left of cylinder block.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. 2.0L TFSI engine:

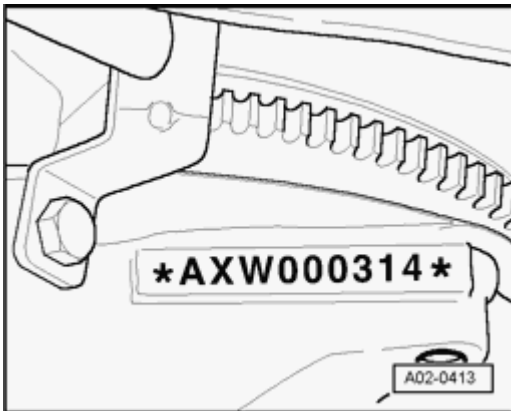


Fig. 130: Identifying Engine Number Stamped On Engine Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped onto engine block - **arrow** -

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

V6 3.0 gasoline engines:

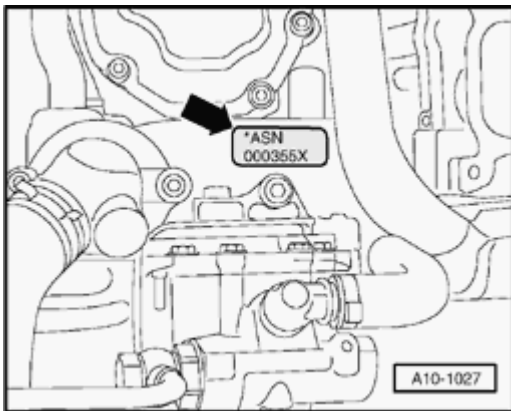


Fig. 131: Identifying Engine Code Stamped On Right Inner Side Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped on right inner side of cylinder block between cylinder head and hydraulic pump.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

V6 3.2 gasoline engines:

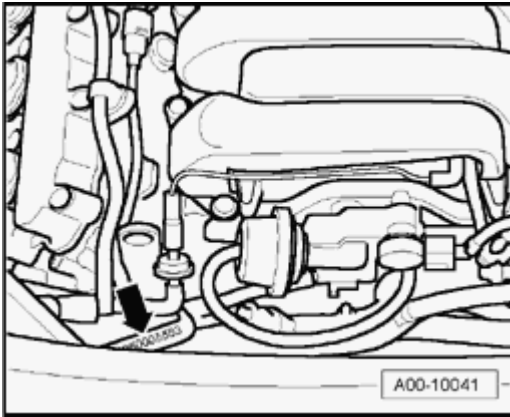


Fig. 132: Identifying Engine Number On Left Front Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left front of cylinder block - **arrow** -.

V8 gasoline engines:

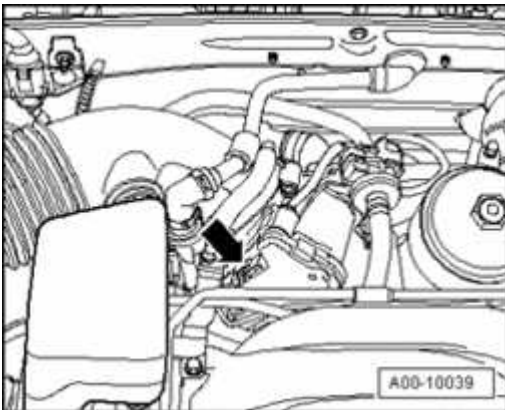


Fig. 133: Identifying Engine Number Stamped On Engine Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped onto engine block - **arrow** -

VEHICLE LIFTING

Vehicle lifting

WARNING:

- Vehicle may only be lifted at points indicated in illustration in order to avoid damaging vehicle floor pan and to prevent vehicle from tipping.
- Never start engine and engage a gear with vehicle lifted so long as even one wheel has contact with the floor. There is a risk of an accident if this is not observed!
- If work is to be performed under vehicle it must be supported by

suitable stands.**Floor jack**

Always use a suitable rubber or wooden block between the jack and the vehicle.

A floor jack must be attached only at the mounting points depicted in the illustration.

Do not lift the vehicle at the engine oil pan, transmission, or on front or rear axles as serious damage may result.

Workshop hoist

Before driving on to a lifting platform ensure there is sufficient clearance between low lying vehicle components and lifting platform.

Lifting points for lifting platform and floor jack

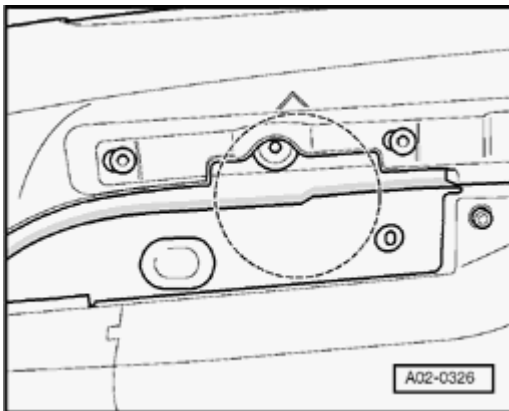


Fig. 134: Identifying Front Side Member Vertical Stiffener
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Front:

At side member vertical stiffener in area of marking for onboard vehicle jack.

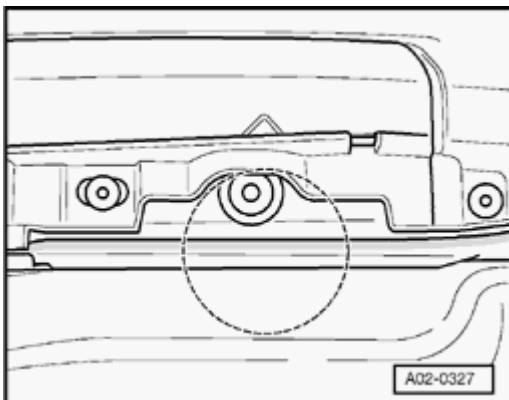


Fig. 135: Identifying Rear Side Member Vertical Stiffener

Courtesy of VOLKSWAGEN UNITED STATES, INC.

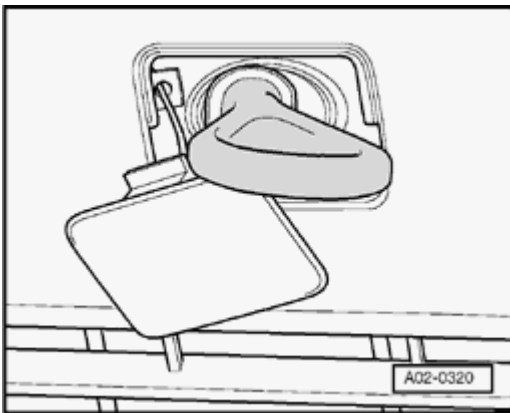
Rear:

At side member vertical stiffener in area of marking for onboard vehicle jack.

TOW STARTING/TOWING**Tow starting/towing**

- Attach tow rope or bar only at following eyes:

Front towing eye

**Fig. 136: Identifying Front Towing Eye**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover from right bumper.
- Remove towing eye from vehicle tool kit compartment.
- Screw in towing eye until stop and tighten eye with wheel bolt wrench.

Rear towing eye

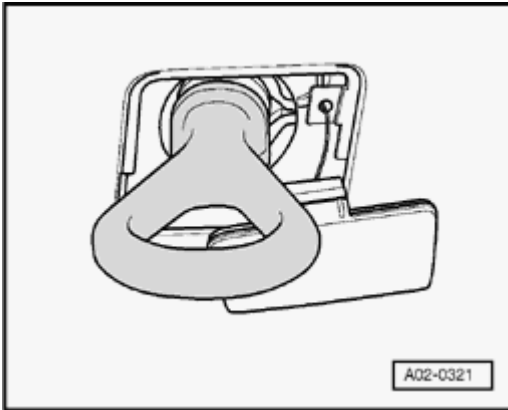


Fig. 137: Identifying Rear Towing Eye

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover from right bumper.
- Remove towing eye from vehicle tool kit compartment.
- Screw in towing eye until stop and tighten eye with wheel bolt wrench.

Remove towing eye after use and return to vehicle tool kit storage compartment. Towing eye must always be in vehicle.

NOTE:

- **The tow-rope should be able to stretch to reduce the risk of damage to both vehicles. It is advisable to use synthetic fiber ropes or ropes of similar elastic material only. However, it is safer to use a tow-bar!**
- **Avoid excessive towing effort and do not jerk. During towing operations on unsurfaced roads there is always a danger that the attachment points will be overstressed and damaged.**
- **Vehicle towing should only be done if it is not possible to start the engine with the starting assist cable.**

If the vehicle must ever tow or be towed, observe the following:

- Regulations concerning towing must be observed.
- Both drivers must be familiar with the specifics of towing procedures. Inexperienced drivers should not attempt to tow start or tow.
- When using a tow rope the driver of the towing vehicle must engage the clutch very gently when moving off and changing gear.
- The driver of the vehicle being towed must ensure that the tow rope is always taut.
- The emergency lights must be switched on both vehicles - unless local regulations differ.
- The ignition must be switched on, so that the steering wheel is not locked and the turn signals, horn, windshield wipers, and windshield washer system can be operated.
- Since the brake booster only works with the engine running, the brake pedal must be stepped on with

substantially more force when the engine is switched off.

- With the engine switched off, the power steering also does not work, increasing the amount of steering effort.
- Without lubricants in the manual transmission and/or automatic transmissions the car may only be towed with raised drive wheels.

When towing vehicles with manual transmission, observe the following:

- Before tow starting, push in clutch pedal and hold, and select gear 2 or 3.
- Switch ignition on.
- When both vehicles are moving, release clutch pedal.
- As soon as engine starts, depress clutch and move gear stick into neutral to avoid running into the towing vehicle.

NOTE:

- **Vehicles with catalytic converter (gasoline engine only) must not be started when the catalytic converter is at operating temperature and pulling the vehicle over a longer distance of more than 50 m. Otherwise unburned fuel may pass into the catalytic converter and cause damage.**
- **Tow starting vehicles with an automatic transmission is for technical reasons not possible.**

When towing vehicles with front wheel drive and automatic transmission, observe the following:

- Selector lever must be in the "N" position.
- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

For longer distances, the front end of the vehicle must be raised.

Reason: When the engine is not running the transmission oil pump is not working and the transmission is not adequately lubricated for high speeds or long distances.

Using a breakdown vehicle, the vehicle may only be towed suspended at the front.

Reason: If given a rear suspended tow, the drive shafts turn backward. This would cause the planetary gears in the automatic transmission to achieve such high RPM that the transmission would be heavily damaged within a very short time.

When towing vehicles with all wheel drive and manual transmission, also observe the following:

- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

Using a breakdown vehicle the vehicle may be towed suspended at front or rear.

NOTE:

- If normal towing of the vehicle is not possible, the vehicle must be transported with a special transporter or trailer. This is also valid for distances greater than 50 km (30 miles).

When towing vehicles with all wheel drive and automatic transmission, also observe the following:

- Selector lever must be in the "N" position.
- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

The vehicle must not be towed by a tow truck with front or rear axle raised.

NOTE:

- If normal towing of the vehicle is not possible, the vehicle must be transported with a special transporter or trailer. This is also valid for distances greater than 50 km (30 miles).

VEHICLE CHECKS WITHIN INSPECTION AND**Vehicle checks within inspection and service framework**

For vehicle checks, we recommend interactive acceptance VAS 5000 and performance test stand V.A.G 1858.

Brake check

Information for checking brakes on front and all wheel drive vehicles is in the corresponding brake system repair manual.

Performance check

Perform performance check on performance test stand recommended by Audi. The corresponding correction factors for automatic transmissions and all wheel drive are provided in these test stands. Vehicles with all wheel drive may only be tested on a four-wheel performance test stand. The four-wheel performance test stand V.A.G 1858 has movable rollers in order to be able to test vehicles with different axle spacing.

Tachometer check

With the tachometer test, the vehicle wheels are driven. Vehicles with all wheel drive may only be tested on a four-wheel test stand.

Shock absorber check

Information on testing shock absorbers can be found in the suspension repair manual.

Maintenance

Maintenance Procedures

01 - MAINTENANCE

ENGINE OVERVIEW

NOTE:

- Some engines listed below are applicable to European vehicles.

Gasoline engines

Engine code		ALZ	AVJ	BFB	ALT	AWA	BEX	BKB	BGB
Emissions category		EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU III	EU IV
Number of cylinders/valves per cylinder		4 / 2	4 / 5	4 / 5	4 / 5	4 / 4	4/5	4/5	4/4
Displacement	L	1.6	1.8	1.8	2.0	2.0	1.8	1.8	2.0
Output	kW at RPM	75/5600	110/5700	120/5700	96/5700	110/6000	140/5700	120/5700	147/5700
Torque	Nm at RPM	148/3600	210/1750 ... 4600	225/1950...4700	195/3300	200/3500	240/1980...5400	220/1750	280/2000
Stroke	mm	77.4	86.4	86.4	92.8	92.8	86.4	86.4	92.8
Bore	mm	81.0	81.0	81.0	82.5	82.5	81.0	81.0	82.5
Compression ratio		10.3	9.3	9.5	10.3	11.5	9.5	9.5	10.5
Fuel injection/Ignition		Simos 3.4	ME 7.5 Motronic	ME 7.1 Motronic	ME 7 Motronic	MED 7.1 Motronic	MED 7.1 Motronic	MED 7.1 Motronic	TFSI Motronic
RON	min.	95 (unleaded) 1*)	95 (unleaded) 1*)	95 (unleaded) 1*)	95 (unleaded) 1*)	98 (unleaded) 2*)	98 (unleaded) 2*)	95 (unleaded) 1*)	98 (unleaded) 2*)

1*) 91 RON standard unleaded gasoline is permissible, however with decreased power output.

2*) 95 RON Super unleaded gasoline is permissible, however with decreased power output.

Gasoline engines

Engine code	BDV	AMM	ASN	BBJ	AUK	BBK	BNS
Emissions category	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV
No. of cylinders	6	6	6	6	6	8	8

2005 Audi A4 Quattro

Maintenance Maintenance Procedures

Valves per cylinder		5	5	5	5	4	5	4
Displacement	L	2.4	2.4	3.0	3.0	3.2	4.2	4.2
Output	kW at RPM	125/6000	120/6000	162/6300	160/6300	188/6400	253/7000	309/7800
Torque	Nm at RPM	230/3200	230/3200	300/3200	300/3200	320/3400	410/3500	430/5500
Bore	mm	81.0	81.0	82.5	82.5	84.5	84.5	84.5
Stroke	mm	77.4	77.4	92.8	92.8	92.8	92.8	92.8
Compression ratio		10.5	10.5	10.5	10.5	12.5	11.0	12.5
Fuel injection/ Ignition system		Motronic ME 7.1.	Motronic ME 7.1.	Motronic ME 7.1.	Motronic ME 7.1.	FSI Motronic Hitachi	Motronic ME 7.1.1	Motronic MED 9.1
RON	min.	95 (unleaded) 1*)	95 (unleaded) 1*)	98 (unleaded) 2*)	98 (unleaded) 2*)	98 (unleaded) 2*)	98 (unleaded) 2*)	98 (unleaded) 2*)

1*) 91 RON standard unleaded gasoline is permissible, however with decreased power output.

2*) 95 RON Super unleaded gasoline is permissible, however with decreased power output.

Diesel engines

Engine code		AVB	AWX, AVF	AKE	AYM, BCZ, BDG	BFC	BAU, BDH	BSG	BPP	BKN
Emissions category		EU III	EU III	EU III	AYM, BCZ EU III BDG EU III + D4	EU III	BAU EU III BDH EU III + D4	EU IV	EU IV	EU IV
Number of cylinders/valves per cylinder		4 / 2	4 / 2	6 / 4	6 / 4	6/4	6 / 4	6/4	6/4	6/4
Displacement	L	1.9	1.9	2.5	2.5	2.5	2.5	2.7	2.7	3.0
Output	kW at RPM	74/4000	96/4000	132/4000	114/4000	120/4000	132/4000	120/4000	132/4000	150/4000
Torque	Nm at RPM	250/1900	* See footnote 285/1750 ...2750	370/1500 ... 2500	310/1500 ... 2500	310/1400 - 3600	370/1500... 2500	380/1500-3200	380/1500-3200	450/1500-3000
Bore	mm	79.5	79.5	78,3	78,3	78,3	78,3	83.0	83.0	83.0
Stroke	mm	95.5	95.5	86.4	86.4	86.4	86.4	83,1	83,1	91,5
Compression ratio		18.5	18.5	18.5	18.5	18.5	19.5	17.5:1	17.5:1	19.5
Fuel		Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel	Diesel

2005 Audi A4 Quattro

Maintenance Maintenance Procedures

injection/Ignition	(direct injection)	(direct injection)	(direct injection)	(direct injection)	(direct injection)	(direct injection)	(direct injection)	(direct injection)	(direct injection)
CZ min.	51	51	51	51	51	51	51	51	51

* Engine code AVF 310 Nm

Diesel engines

Engine code	BKE	BLB	BNA	BPW	BRC	BRF	BVF	BRD	BRE	BF
Emissions category	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV	EU IV
Number of cylinders/valves per cylinder	4/2	4/4	4/4	4/2	4/2	4/4	4/4	4/4	4/4	4/4
Displacement	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Output kW/rpm	85/4000	103/4000	100/4000	103/4000	100/4000	100/4000	93/4000	125/4000	103/4000	89/4000
Torque	285/1900	320/1750-2500	320/1750-2500	320/1750-2500	320/1750-2500	320/1750-2500	320/1750-2500	350/1750-2500	320/1750-2500	320/1750-2500
Bore	79.5	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0	81.0
Stroke	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5	95.5
Compression ratio	19,0	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
Fuel injection/Ignition	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)	Diesel (direct injection)
Diesel particle filter	-	-	-	X	X	X	X	X	X	Inst po
CZ min.	51	51	51	51	51	51	51	51	51	51

Gasoline engines

Code letters	BPG	BWT
Displacement	1.984	1.984
Output	147/5700	147/5700
Torque	280/2000	280/1800
Bore	82.5	82.5
Stroke	92.8	92.8
Compression ratio	10.5	10,5
RON	98 1)	98 1)
Fuel injection and ignition system	FSI	FSI
Ignition sequence	1-3-4-2	1-3-4-2
Knock control	yes	yes

2005 Audi A4 Quattro

Maintenance Maintenance Procedures

Charging	yes	yes
Exhaust gas recirculation	no	no
Variable intake manifold	no	no
Variable valve timing	yes	yes
Secondary air injection (AIR)	no	no
• 1) Unleaded RON 95 is also permissible, although with reduced power.		

DELIVERY INSPECTION

Delivery inspection

--> ServiceNet; Delivery Satisfaction Program; Perfect Delivery Inspection (PDI) Checklists for appropriate model and year

OIL CHANGE SERVICE

Oil change service

For engine oil specifications and capacities please refer to --> Fluid Capacity Chart for appropriate model and year

Also, for appropriate service intervals refer to --> ServiceNet; Maintenance Schedule for appropriate model year

INSPECTION SERVICE

Inspection service

--> ServiceNet; Delivery Satisfaction Program; Perfect Delivery Inspection (PDI) Checklists for appropriate model and year

Also, for appropriate service intervals refer to --> ServiceNet; Maintenance Schedule for appropriate model year

DESCRIPTION OF WORK

All switches, all electrical components, all displays and other operating elements: Checking function

- Check following:
 - Lighting, headlamps, fog lights, turn signals, hazard warning flashers, taillights, rear fog lights, backup lights, brake lights, parking lights
 - Interior and reading lights (automatic shutoff on interior lights), illuminated storage compartment, illuminated ashtray, luggage compartment lighting, illuminated ignition
 - Warning buzzer for lights and/or radio left on

- All switches in console
- Driver Information System (DIS)
- Instrument unit with all displays, meters and lights
- Two-tone horn
- Windshield/headlamp wipers, headlamp cleaning system
- Cigarette lighter
- Electric exterior mirrors (heated, adjustable)
- Electric windows
- Electric tilt/slide sunroof
- Central locking, remote control operation, comfort closing
- Electric seat
- Heated seat
- Radio

Final drive (automatic transmission): Check oil level, add oil if necessary

Automatic transmission

--> -

- **39 - FINAL DRIVE, DIFFERENTIAL** for 5 SPD. AUTOMATIC TRANSMISSION 01V
- **39 FINAL DRIVE - FRONT DIFFERENTIAL** for 6 SPD. AUTOMATIC TRANSMISSION 09L ALL WHEEL DRIVE

Continuously Variable Transmission (CVT) transmission

--> - **39 - FINAL DRIVE, DIFFERENTIAL**

Battery: Check

Battery with "magic eye"

Battery is located in plenum chamber between engine compartment and windshield or in spare wheel well on RS4.

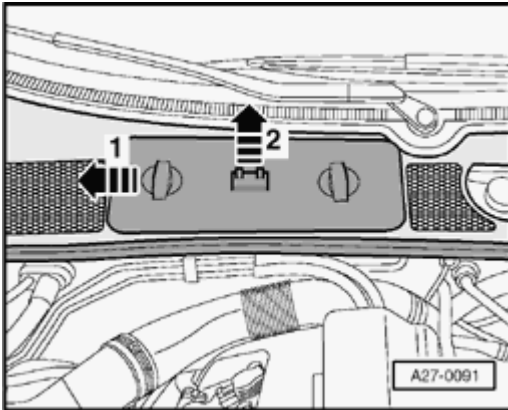


Fig. 1: Pushing Cover Over Battery Toward Right And Removing It Upward
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Slide cover over battery to right - **arrow 1** - and remove upward - **arrow 2** -.

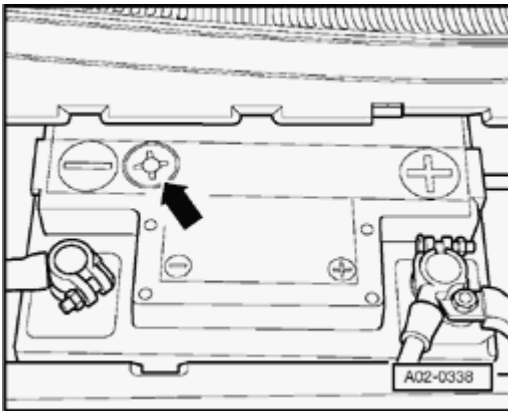


Fig. 2: Identifying The Visual Indicator
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The visual indicator - **arrow** - gives information about electrolyte level and battery charge.
- Switch ignition off.

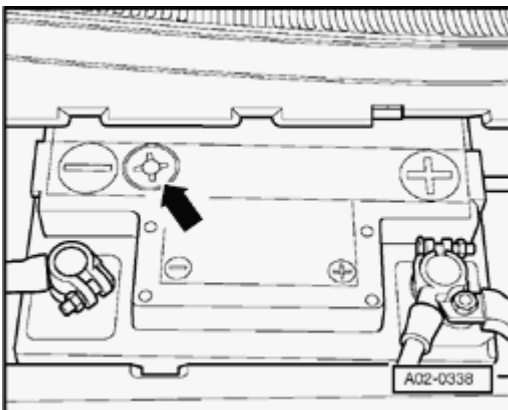


Fig. 3: Identifying The Visual Indicator

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check electrolyte level at visual indicator - **arrow** -
- Tap lightly on battery housing with a blunt object, air bubbles under the visual indicator can cause a false reading.
- Green --> battery charge is OK.
- Black --> no charge or charge too low
- No color or yellow --> critical electrolyte level has been reached, battery must be replaced --> - **27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL**

NOTE:

- **Observe before disconnecting battery --> Note before disconnecting battery.**

Battery sealing plugs

- On batteries with visible min and max markings, electrolyte level only needs to be checked visually.
- Electrolyte level must be between min. and max. markings.
- On batteries where the outer min. and max. markings are difficult to see or the visibility of the electrolyte level cannot be guaranteed due to the opaque battery housing, the sealing plugs must be removed. Then it is possible to check electrolyte level by a visual inspection of the battery interior.
- The electrolyte level must meet the inner electrolyte level marking (plastic bar). This corresponds to the outer max. mark.

NOTE:

- **If electrolyte level is too low, battery loses capacity (loses performance) because the cell plates dry out. If the cell plates are not covered by electrolyte, the plates and plate bridges start to corrode causing the function of the battery to diminish. After a while the battery does no longer function. The battery becomes useless.**

WARNING: If the electrolyte level is below them in. marking, the battery must be replaced! --> - **27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL**

Valve-regulated lead acid battery or absorbed glass mat (AGM) battery**NOTE:**

- **Valve-regulated lead acid or AGM batteries are sealed, they cannot and must not be opened. --> - 27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL**

Battery: No load voltage, checking before starting engine for the first time

Necessary test equipment

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- Digital multimeter V.A.G 1715

or

- Portable multimeter V.A.G 1526 B

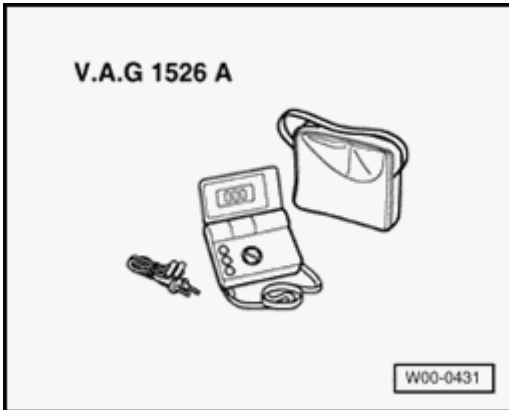


Fig. 4: Special Tool - Multimeter V.A.G 1526 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Portable multimeter

NOTE:

- Battery must not be loaded by connected components for at least 12 hours before testing.
- Battery must not be charged for at least 12 hours before testing.
- Measure voltage between terminals with engine switched off.

WARNING: Always follow procedure exactly, otherwise measured values could be incorrect.

Battery: Ensure battery cable fits securely

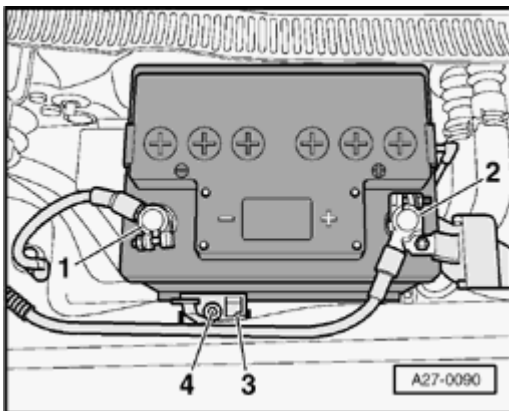


Fig. 5: Locating Battery Terminals On Battery

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check battery terminals on vehicle battery for secure fit, tighten nuts on -terminal -1- and + terminal - 2 - if necessary.

WARNING: If the battery clamp is not seated securely on the positive terminal, disconnect battery Ground (GND) strap on battery negative terminal first, to prevent possible accidents.

NOTE:

- Observe before disconnecting battery --> Note before disconnecting battery..

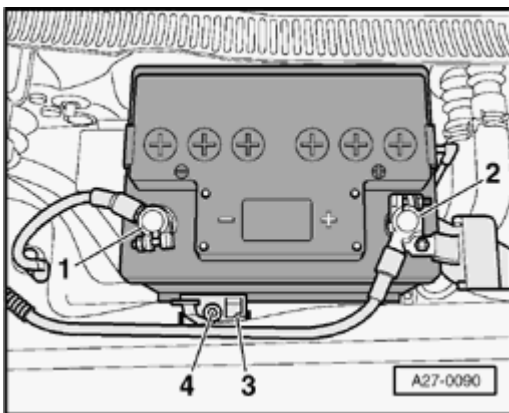


Fig. 6: Locating Battery Terminals On Battery

Courtesy of VOLKSWAGEN UNITED STATES, INC.

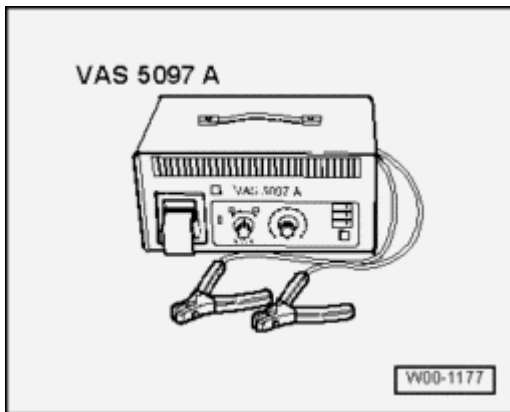
- Check battery for secure fit, tighten screws - 4 - on securing bracket - 3 - if necessary.

Tightening torque	Nm
Battery connection to battery terminal	6
Screw to securing bracket	12

Battery: Perform battery load test

Battery load test indicates battery condition.

Special tools, testers, and measuring equipment

**Fig. 7: Battery VAS Tester**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Battery tester VAS 5097 A

NOTE:

- If battery tester VAS 5097A is used, it is not necessary to remove battery. The battery does not need to be disconnected either.

Perform battery load test

- Switch ignition off.
- Read battery tester operating instructions.
- Connect test lead clamps to battery terminals as shown in battery tester operating instructions.

The clamps must make good contact with battery poles.

- Load current depends on battery capacity and must be adjusted on the tester --> battery tester operating instructions.
- Perform battery load test according to operating instructions.

Tester display during battery load test**Note following tester evaluations:****Tester Evaluations**

Display on battery tester	Delivery inspection	Inspection service
Starting output very good	Battery OK	Battery OK
Starting output good	Battery OK	Battery OK
Starting output sufficient	Replace battery	Recharge battery 1)
Starting output poor	Replace battery	Recharge battery 1)
Starting output very poor	Replace battery	Replace battery 2)
Not testable	Replace battery	Replace battery 2)

- Replace battery. --> - **27 BATTERY, STARTER, GENERATOR, CRUISE CONTROL**

Regarding battery load test:

Because of the high load on the battery during this test (a high current flows) the battery voltage lowers.

If the battery is OK, the voltage only goes down to the minimum voltage specification.

If the battery is malfunctioning or only faintly charged, the battery voltage will drop rapidly to below the displayed minimum voltage.

After the test, this low voltage remains steady over a longer time before the voltage slowly increases.

Brake system: Visual inspection for leaks and damage

- Check the following components for leaks and damage:
 - Brake master cylinder
 - Brake booster
 - ABS Hydraulic unit
 - Brake calipers
- Check that brake hoses are not twisted.
- Ensure brake hoses do not come in contact with any vehicle components when steering is at full lock.
- Check brake hoses for porosity, bubbles and cracks.
- Check brake hoses and pipes for chafing.
- Check all brake line connections for secure mounting, leaks, or corrosion.

WARNING: Malfunctions found must be rectified (repair measure).

Brake pads: Checking thickness

WARNING: At a pad thickness of 7 mm (including backing plate) the brake pads have reached their wear limit and must be replaced (repair measure). Inform the customer.

Front disc brake pads:

- Determine thickness of outer pads by checking visually (using a flashlight through a hole in wheel).

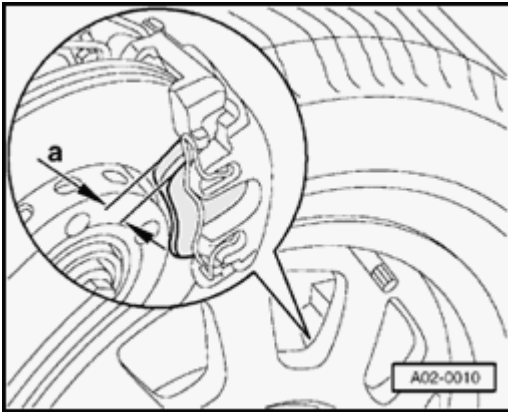


Fig. 8: Determining Thickness Of Inner Pad By Visual Check
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine thickness of the inner pad by visual check (using a flashlight through a hole in the wheel).

Rear disc brake pads:

- Determine thickness of outer pads by checking visually (using a flashlight through a hole in wheel).

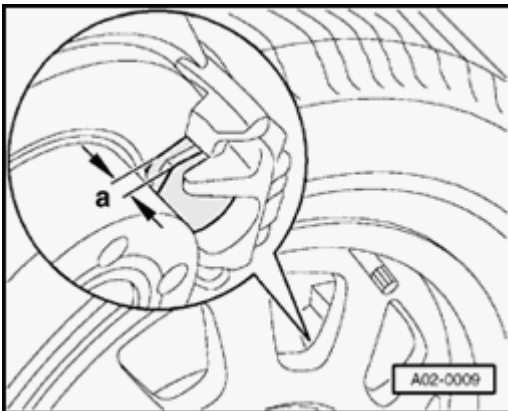


Fig. 9: Identifying Thickness Of The Inner Pad
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Determine thickness of the inner pad by visual check (using a flashlight through a hole in the wheel).

Tires: Checking condition, wear pattern and tread depth and adjusting tire pressure.

Tires, checking

NOTE:

- For reasons of safety only tires of same type and tread pattern should be fitted on a vehicle!
- On All Wheel Drive vehicle tires of the same type and tread pattern must be used. Otherwise the center differential may be damaged.

Delivery inspection

- Check running surfaces and side walls for damage, remove foreign bodies, if necessary.

Inspection service

- Check running surfaces and side walls for damage, remove foreign material, if necessary.
- Check tires for scuffing, one sided wear, porous side walls, cuts and fractures.

WARNING: Report any damage to customer and mark repair order accordingly.

Checking tire wear pattern

- The wear pattern of the front wheels can be used to assess whether a check of the track and camber is necessary:
 - Feathered edges of the treads may indicate faulty toe adjustment.
 - One-sided tread wear is mainly attributed to incorrect camber.

NOTE:

- When wear of this nature is noticed determine cause by performing alignment checks (repair measure).

Check tread depth.

- Minimum depth: 1.6 mm

NOTE:

- This value may vary for individual countries due to different legislative regulations.

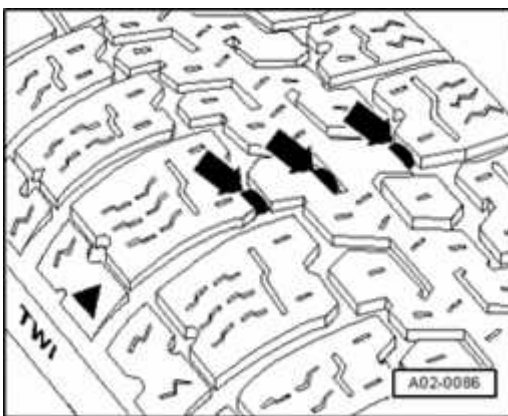


Fig. 10: Checking Tire Tread Depth

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The minimum tread depth is reached when the tires have worn down level with the 1.6 mm high tread wear indicators - **arrows** - positioned at intervals around the tire.
- If the tread depth is approaching the legal minimum permissible depth, the customer must be informed.

Tire pressure, adjusting

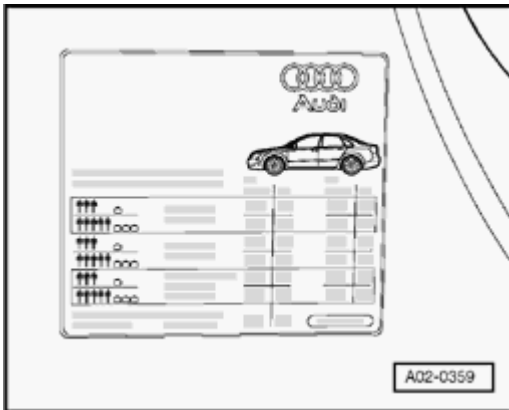


Fig. 11: Identifying Tire Pressure Values For Summer Tires On Sticker
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Tire pressure values for summer tires are on the sticker on the inside of the fuel tank lid.

NOTE:

- Observe that the inflation pressure specifications on the sticker refer to the air pressure of cold tires. Do not reduce increased pressures on warm tires.
- On vehicles with Tire Pressure Monitoring System, changed tire pressures must be stored. --> Tire Pressure Monitoring System: Programming tire pressures
- When using winter tires, the tire pressure must be increased about 0.2 bar.

Spare wheel

- Spare wheel with standard tire

Keep the highest pressure intended for the vehicle

- Mini spare tire

Pressure is on side of tire

- Tire repair kit

Check --> Tire repair kit: Checking

NOTE:

- Tire valves must be sealed with valve caps. Otherwise, dirt can enter valve needle which becomes jammed and can no seal shut.

Brake fluid level, dependent on lining wear: Check

NOTE:

- Use only new Original VW / Audi brake fluid, see ETKA

WARNING:

- Brake fluid is poisonous. Due to its caustic nature, it must also never be brought into contact with paint.
- Brake fluid is hygroscopic, meaning that it absorbs moisture from the surrounding air, and must therefore always be stored in air-tight containers.

- Please observe the following:

Delivery inspection

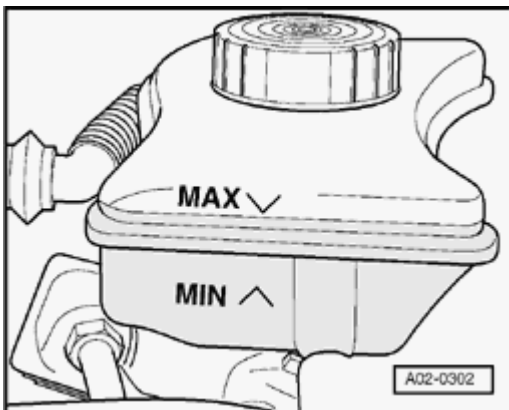


Fig. 12: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fluid level must be at MAX mark

NOTE:

- To prevent the brake fluid from overflowing from the reservoir, the level must not be over the MAX mark.

Inspection service

When driving, fluid level drops slightly from use and automatic brake pad adjustment.

- Always check fluid level in conjunction with brake pad wear:

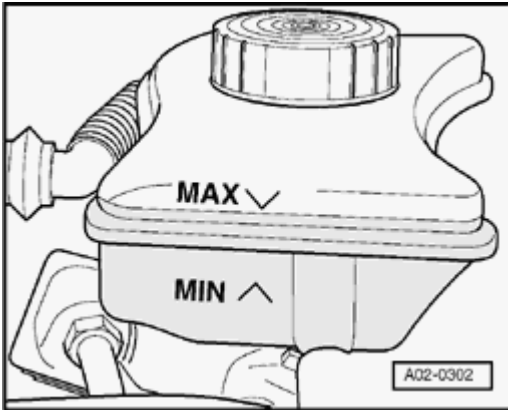


Fig. 13: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- When brake pads are new or if there is still enough brake lining left, the brake fluid level must be between MIN and MAX marks.
- With brake fluid at MIN mark or slightly above, topping off brake fluid is not necessary when wear limit of brake pads has been almost reached.

WARNING: If brake fluid level is below MIN mark, check brake system (repair procedure), before adding brake fluid.

Brake fluid: Changing

Special tools, testers, and measuring equipment



Fig. 14: Identifying Brake Filler And Bleeder Unit VAS 5234

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- VAS 5234 Brake filling and bleeding tool



Fig. 15: Identifying Brake Filler And Bleeder Unit V.A.G 1869
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- V.A.G 1869 Brake filling and bleeding tool with Adapter set V.A.G 1869/4

NOTE:

- Use only new Original VW / Audi brake fluid, see ETKA

WARNING:

- Brake fluid must never come into contact with fluids containing mineral oils (oil, gas, cleaning solutions). Oils containing minerals damage seals and sleeves on brake systems.
- Brake fluid is poisonous. Due to its caustic nature, it must also never be brought into contact with paint.
- Brake fluid is hygroscopic, which means that it absorbs moisture from the air. Always store brake fluid in air-tight containers.
- Wash off brake fluid spillage using plenty of water.
- Observe waste disposal regulations!

Observe operating instructions for VAS 5234 or for V.A.G 1869 !

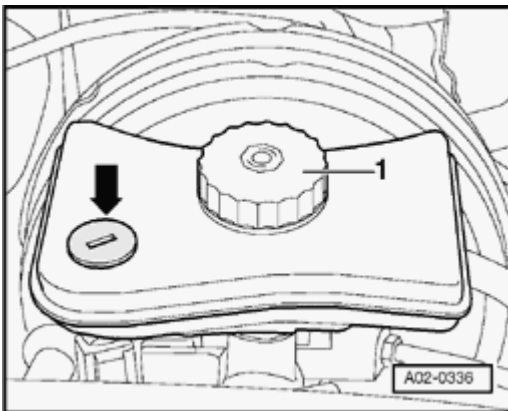


Fig. 16: Identifying Brake Fluid Reservoir Cap
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove brake fluid reservoir cap - **1** -.

WARNING: • The strainer in the brake fluid reservoir must not be removed.

- Remove brake fluid reservoir plug - **arrow** -.

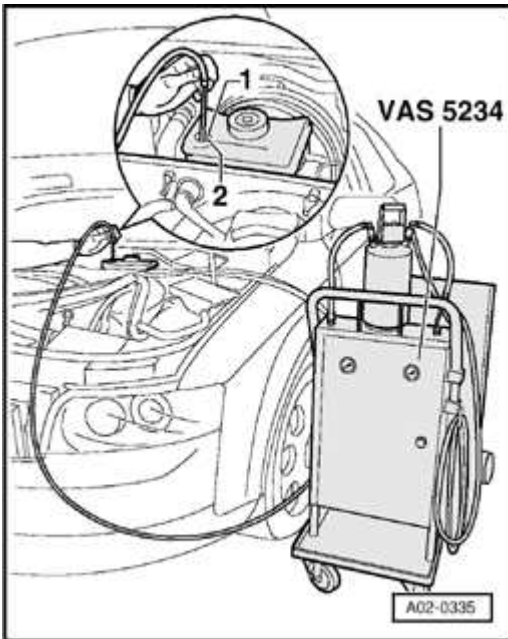


Fig. 17: Connecting Suction Hose From VAS 52.4 Or V.A.G 1869 To Tube Of Brake Fluid Reservoir
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect suction hose from VAS 5234 or V.A.G 1869 to tube - **1** - of brake fluid reservoir.
- Extract as much brake fluid as possible using suction hose from VAS 5234 or from V.A.G 1869 or with extractor bottle.
- Disconnect suction hose.
- Install brake fluid reservoir plug.

WARNING: Do not reuse, (used) extracted brake fluid.

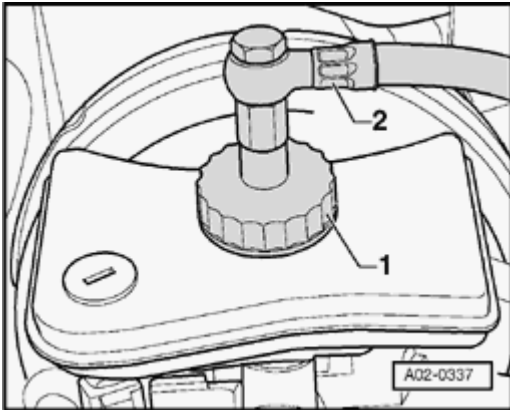


Fig. 18: Connecting Suction Hose From VAS 52.4 Or V.A.G 1869 To Tube Of Brake Fluid Reservoir
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install adapter - 1 - to brake fluid reservoir.
- Connect filler hose - 2 - from VAS 5234 or V.A.G 1869 to adapter.

Vehicles with manual transmission:

- Pull cover cap off clutch slave cylinder bleed screw.

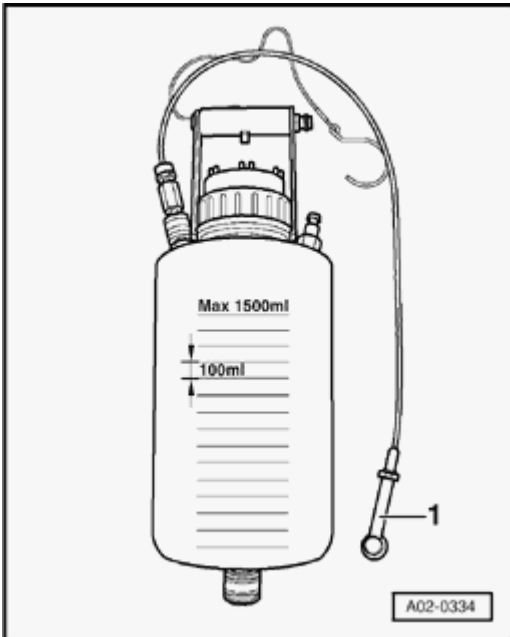


Fig. 19: Connecting Filler Hose From VAS 52.4 Or V.A.G 1869 To Adapter
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place extractor bleeder hose - 1 - on clutch slave cylinder bleeder screw, open bleeder screw, and let about 100 ml drain out. Close bleeder screw and install cover cap.
- Operate clutch pedal several times.

Continued for all vehicles:

- Remove caps from the bleeder screws.
- Connect extractor bleeder hose - **1** - to front left bleeder screw, open bleeder screw and allow about 200 ml to flow out. Close bleeder screw.

Repeat work sequence on other side of vehicle at front.

- Connect extractor bleeder hose - **1** - to rear left bleeder screw, open bleeder screw and allow about 200 ml to flow out. Close bleeder screw.

Repeat work sequence on other side of vehicle at rear.

Table - Sequence / quantity of brake fluid

front left	200 ml
front right	200 ml
Left rear	200 ml
Right rear	200 ml
Total amount * See footnote	1,000 ml

* Including brake fluid extracted from brake fluid reservoir and quantity from clutch slave cylinder.

- Fit cover caps to brake caliper bleed screws.
- Move filler lever on VAS 5234 or V.A.G 1869 to position - **B** - (see operating instructions).
- Take filler hose off adapter.
- Unscrew adapter from brake fluid reservoir.

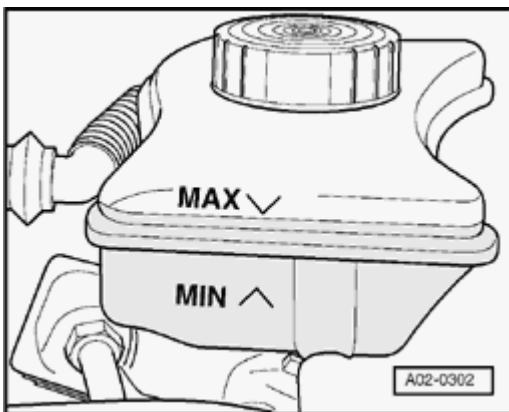


Fig. 20: Identifying Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check brake fluid level and correct if necessary.
- Install cap to brake fluid reservoir.

- Check pedal pressure and brake pedal free play. Free play: Max. $\frac{1}{3}$ of pedal travel

Set digital clock

Vehicle is equipped with a radio or quartz clock.

Radio clock

If an acceptable radio clock signal is received, clock automatically switches to "radio-controlled quartz clock" operating mode. The radio clock reception symbol (radio tower radiating waves) appears in display. If the clock does not receive a valid signal, it automatically switches to "quartz clock" mode after 3 days and radio clock reception symbol goes out.

Quartz clock

Set hour

- Press "MODE" button; hour display blinks.
- Press "+" button to advance hour display.
- Press "-" button to reverse hour display.

Set minute

- Press "MODE" button until minute display blinks.
- Press "+" button to advance minute display.
- Press "-" button to reverse minute display.

Set date

- Press "MODE" button until date display blinks.
- Press "+" or "-" button to set day.
- Press "MODE" button again, month display blinks.
- Press "+" or "-" button to set month.
- Press "MODE" button again, year display blinks.
- Press "+" or "-" button to set year.

Electric windows: Check positioning

Electric windows forget current position and automatic lowering and raising function when battery is disconnected.

Activate automatic lowering/raising function as follows:

- Switch ignition on.

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- Raise windows with electric window regulators up to stop.
- Then operate all window switches again for at least 1 second in "close" position to activate automatic lowering/raising.
- Press switch down. Window must lower to stop by itself.

DTC memory: Retrieving with VAS 5051/ 5052

- Follow these steps in sequential order.

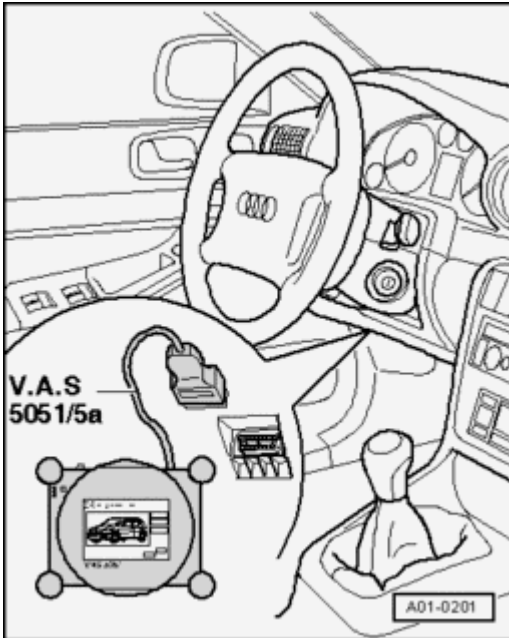


Fig. 21: Connecting Data Link Connector (DLC)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Vehicle - Self-diagnosis
- Gateway - Installation list
- Read control module with stored DTC memory.
- Correct relevant malfunctions with customers approval.

Check vehicle key function

- Separate keys so that each can be checked individually for function.
- Mechanically lock and unlock drivers door with each key.
- Remove radio operation (press a remote control operation button)
- Insert each key in ignition and switch ignition on. Immobilizer key symbol in instrument cluster must go

out after two seconds. If key symbol blinks, key is not programmed to immobilizer. Guided Fault Finding; Program vehicle key

- Remove radio operation (press a remote control operation button)

NOTE:

- Enter number of keys checked and delivered to customer in delivery protocol.

Front axle joints: Seal boots, checking play and secure fit.

NOTE:

- Perform this test with vehicle on lift (wheels hanging freely).

Tie rod ends

- Check play by moving tie rods and wheels.
- You should not feel or see any play.
- Check all around ball joint boots - **arrow** - for damage and correct seating. Use a mirror, if necessary.
- Ball joint boots can usually be recognized by leaking lubrication.

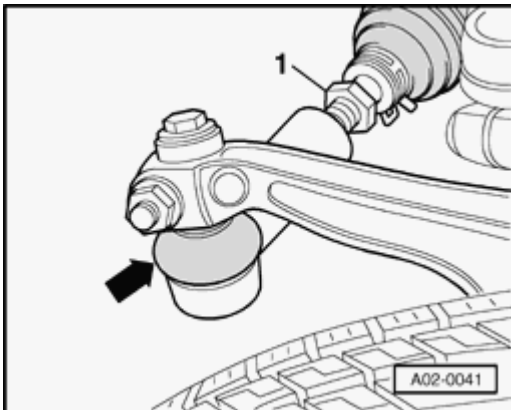


Fig. 22: Identifying Lock Nut

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Make sure lock nut - 1 - is tightened to 40 Nm.

All control arms

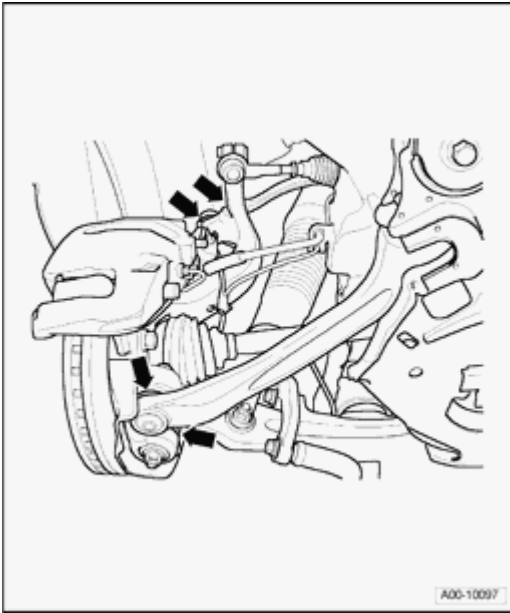


Fig. 23: Identifying Ball Joint Boots

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check all around ball joint boots - **arrows** - for damage and correct seating. Use a mirror, if necessary.
- Ball joint boots can usually be recognized by leaking lubrication.
- You should not feel or see any play.

Control arm

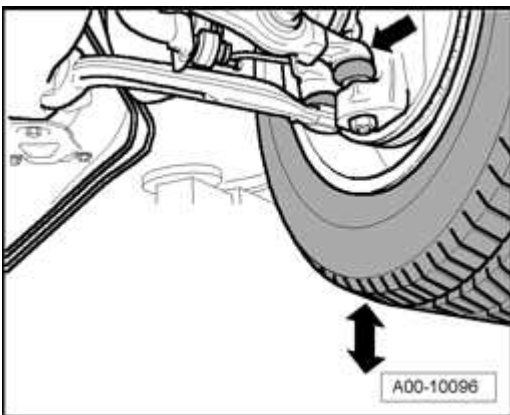


Fig. 24: Identifying Bearing Housing And Control Arm

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- With unloaded wheels, check relative movement of wheel bearing housing to control arm.
- By raising and lowers the wheels several times by hand - **arrow** - the relative movement between wheel bearing housing and control arm can be observed.
- If relative movement when lifting or lowering gives evidence of play that can be felt or seen, control arm

must be replaced.

Drive shaft boot

- Check all around interior and exterior drive shaft boot for damage and correct seating. Turn wheel, if necessary.
- By turning the front wheels, tears can be found in their early stages.
- Drive shaft boot damage can usually be recognized by leaking lubrication.

Noise insulation: Removing

Vehicles with auxiliary heater:

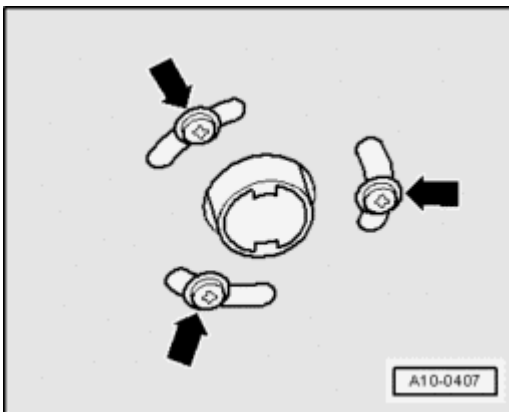


Fig. 25: Identifying Exhaust Pipe Fasteners

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove parking/auxiliary heater exhaust pipe screws - **arrows** - on noise insulation.

All:

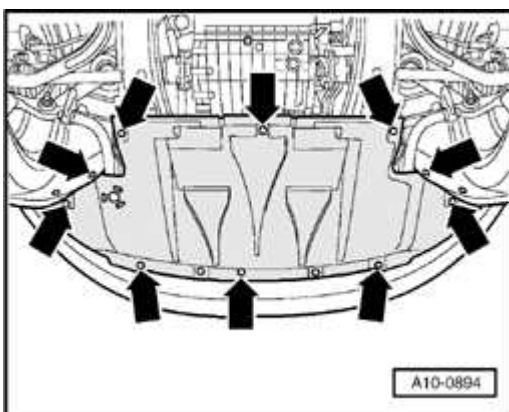


Fig. 26: Removing Sound Insulation

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove quick-release screws - **arrows** -.

Power steering: Check for leaks and fluid level, top off power steering fluid, if necessary

- With engine not running, move front wheels in straight-ahead position.

Cold fluid (exterior temperature approx +20 ° C)

- Remove cover.
- Clean dipstick with clean cloth.
- Screw cap on hand-tight and remove again.

Screw cap fully in to get an accurate fluid level reading.

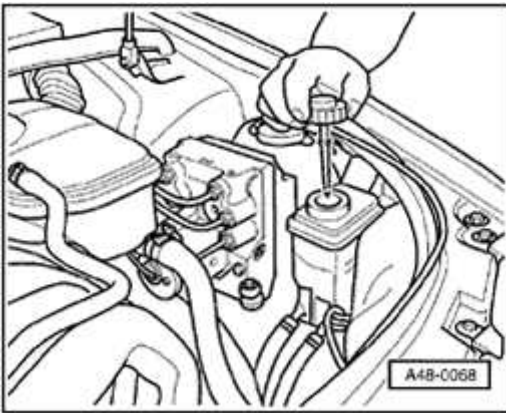


Fig. 27: Checking Fluid Level

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check fluid level: Fluid level must be in area of "MAX" marking.

Warm fluid (engine fluid temperature +80 ° C)

- Check fluid level: Fluid level must be 10 mm above "MAX" marking.

NOTE:

- If fluid level is above specified range, fluid must be extracted off.
- If the fluid level is below the specified level, check the hydraulic system for leaks. It is not enough to simply top off with fluid.
- Do not use power steering fluid that has drained out.

Rear lid hinges: Lubricate

- Open rear lid
- Remove left/right lid hinge cover if present.

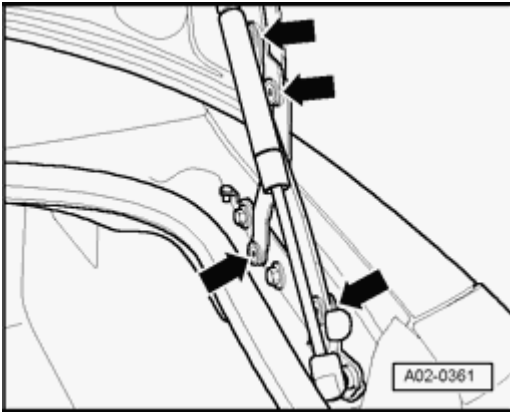


Fig. 28: Lubricating Hinge Joints

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lubricate each of the four hinge joints on both rear lid hinges - **arrows** -.
- Lubricant: "G 000 115 A2"

NOTE:

- Included spray tube must be inserted in sprayer head to aim spray.
- Shake spray can about five times.
- Spray must not be shaken too long or hard because otherwise spray oil will foam up and its lubricating ability is reduced.
- Clean excess fluid from body and joints.

Calibrate rearview mirror with compass

--> - **68 - INTERIOR EQUIPMENT**

Instrument cluster: Adapt language version

- Follow these steps in sequential order.

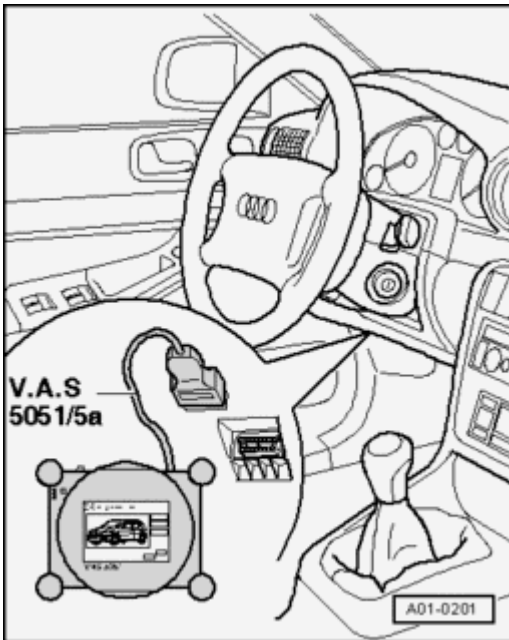


Fig. 29: Connecting Data Link Connector (DLC)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Language adaptation
- Now follow guided program

NOTE:

- Please follow guided program function description
- K-lead adapter VAS 6017B must be used.

A/C system: Check function, set temperature to 72 F (22 C)

- Check all climate control functions: Owners manual

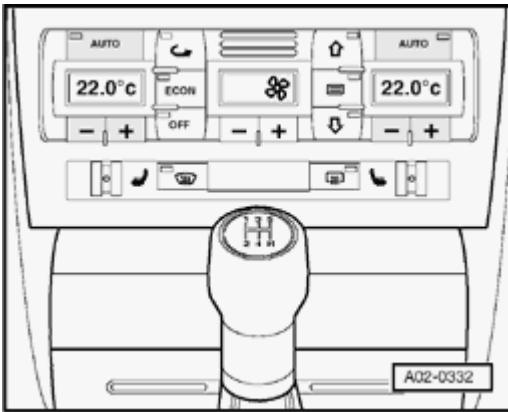


Fig. 30: Checking Whether 72F (22C) Is Set In Both Display Fields
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether 72 ° F (22 ° C) is set in both display fields.
- Set temperature as follows, if necessary:
- Press the "AUTO" button.
- Set temperature on drivers and passengers side to 72 ° F (22 ° C) with "+" and "-" buttons.

Cooling system: Check freeze protection, add coolant, if necessary

NOTE:

- All new engines are filled with coolant additive G 12 Plus according to TL VW 774 F (purple color). G 12 Plus can be mixed with the previous coolant additives G 11 and G 12 (red). Ensure that the system is replenished only with G12 Plus (due to its positive properties).
- G 12 Plus is suitable as a filled-for-life filling for cast iron and all-aluminum engines and gives optimum protection against freezing, corrosion damage, scaling and over-heating.
- G 12 Plus increases the boiling point to 275 ° F (135 ° C) and ensures for a better heat dissipation.
- The coolant portion of the mixture must amount to at least 40% (freeze protection to -13 ° F [-25 ° C]) and should not exceed 60% (freeze protection to -40 ° F [-40 ° C]). Otherwise the freeze protection will be reduced and the cooling efficiency will be worsened.
- The freeze protection must be ensured to approximately -13 ° F (-25 ° C).

Checking freeze protection and adding coolant additive if necessary

Special tools, testers and auxiliary items required

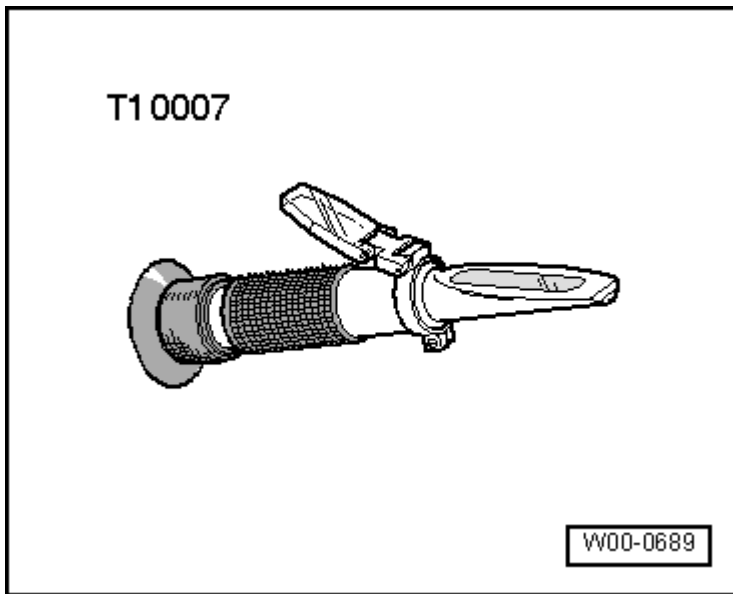


Fig. 31: Identifying Refractometer T10007

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Refractometer T10007

NOTE:

- Read the bright/dark boundary to obtain an accurate reading for the following tests. Place a drop of water on the glass to improve the readability of the bright/dark boundary. The bright/dark boundary can be clearly recognized on the "WATERLINE".
- Check the concentration of the coolant additive using refractometer T10007 (operating instructions).

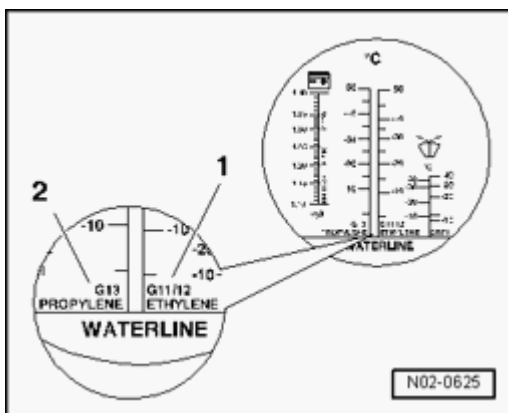


Fig. 32: Identifying Refractometer Scales

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The scale - 1 - of the refractometer is designed for coolant additives G 12; G12 Plus and G11.

Scale - 2 - refers only to coolant additive G 13. (previously L80)

NOTE:

- The freeze protection must be ensured to approximately -13 ° F [-25 ° C].
- If for climatic reasons greater freeze protection is required, the amount of G 12 Plus can be increased, but only up to 60% (freeze protection to about -40 ° F [-40 ° C]), otherwise freeze protection and cooling effectiveness will be reduced.
- If freeze protection is insufficient, drain off required quantity shown in freeze protection table and add coolant additive G 12 Plus.

NOTE:

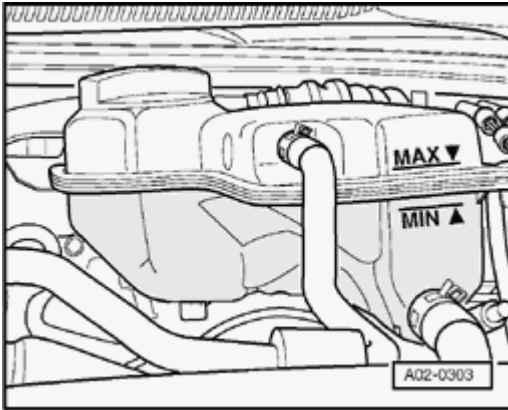
- Observe waste disposal regulations!

Freeze protection to ° C		Difference amount in liters		
Actual value	Specified value	4-cylinder engines	6-cylinder engines	8-cylinder engines
0	-25	3,5	5,0	5,0
	-35	4,0	6,0	6,0
-5	-25	3,0	4,5	4,5
	-35	3,5	5,5	5,5
-10	-25	2,0	3,5	3,5
	-35	3,0	4,5	4,5
-15	-25	1,5	2,5	2,5
	-35	2,0	3,5	3,5
-20	-25	1,0	1,5	1,5
	-35	1,5	2,5	2,5
-25	-35	1,0	1,5	1,5
-30	-35	0,5	1,0	1,0
-35	-40	0,5	0,5	0,5

- Check coolant additive concentration after test drive again.

Checking coolant level and adding coolant if necessary

- Check coolant level in expansion tank with engine cold.

**Fig. 33: Checking Coolant Level**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Delivery inspection: Coolant level above the "MIN marking" - **arrow** -.
- Inspection service: Coolant level above the "MIN marking" - **arrow** -.
- If coolant is too low, add required amount according to mixture ratio.

NOTE:

- Determine cause of fluid loss which cannot be attributed to normal use and rectify (repair measure).

Mixture ratio:

Freeze protection to	Coolant additive G 12 Plus / TL VW 774 F	Water
-25 ° C	approx. 40%	approx. 60 %
-35 ° C	approx. 50 %	approx. 50 %
-40 ° F	approx. 60 %	approx. 40%

NOTE:

- Coolant additive G 12 Plus conforming to TL VW 774 F prevents freeze and corrosion damage, scaling, and raises the boiling point. For these reasons, the cooling system must be filled with radiator freeze and corrosion protection fluid all year round.
- Especially in countries with tropical climates or when vehicle is driven under heavy load, the coolant improves the engine reliability by its increased boiling point.
- The coolant concentration must not be reduced by adding water, even during the warmer season. The coolant additive ratio must be at least 40%.

Ribbed belt: Replacing

8-cyl. 5V engines 4.2L

- Ribbed belt, removing and installing: --> - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK**

Air cleaner: Clean air filter housing and replace filter

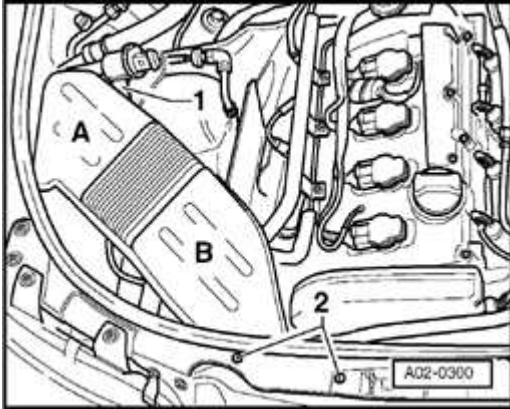


Fig. 34: Identifying Intake Hose And EVAP Valve Retainer
Courtesy of VOLKSWAGEN UNITED STATES, INC.

NOTE:

- In various engine versions, a snow screen is located in intake hose - A -. Snow screen must be removed and cleaned.

4-cyl. 1.8L 5V Turbo engines --> **4-cyl. 1.8L 5V Turbo engines:**

4-cyl. 2.0L Turbo FSI engines --> **4-cyl. 2.0L TFSI engines**

6-cyl. 3.0L engines --> **6-cyl. 3.0L engines**

6-cyl. 3.2L engines --> **6-cyl. 3.2L engines**

8-cyl. 4.2L MPI engines --> **8-cyl. 4.2L MPI engines**

8-cyl. 4.2L engines (RS4) --> **8-cyl. 4.2L engines (RS4)**

4-cyl. 2.0L TFSI engines

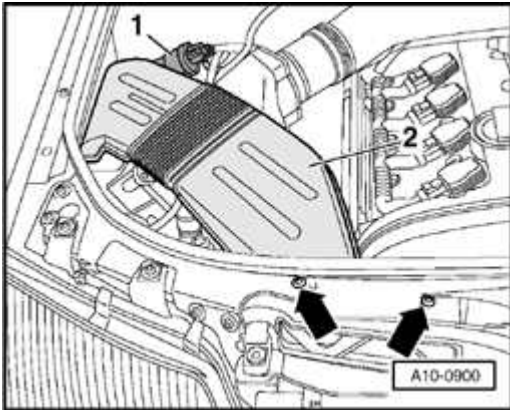


Fig. 35: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.

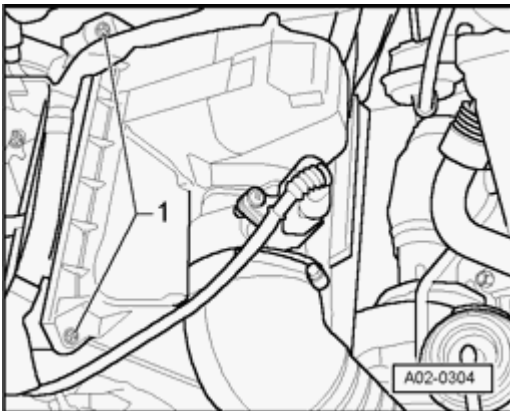


Fig. 36: Identifying Upper Part Of Air Filter Bolts
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - **2** -.
- Disconnect electrical connector from Mass Air Flow (MAF) Sensor G70.
- Open clamp from air guide hose to turbocharger and remove this at Mass Air Flow (MAF) Sensor G70.
- Remove both screws - **1** - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.
- Follow notes * See footnote

4-cyl. 1.8L 5V Turbo engines:

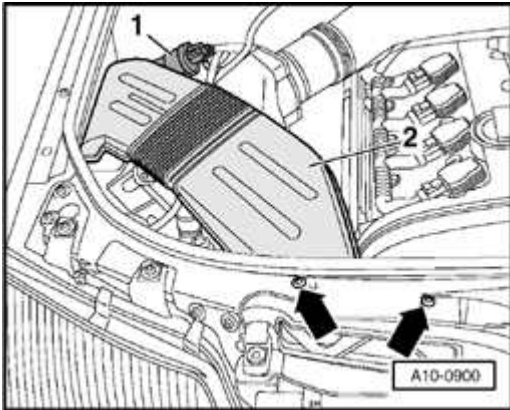


Fig. 37: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.
- Remove air duct - **2** -.

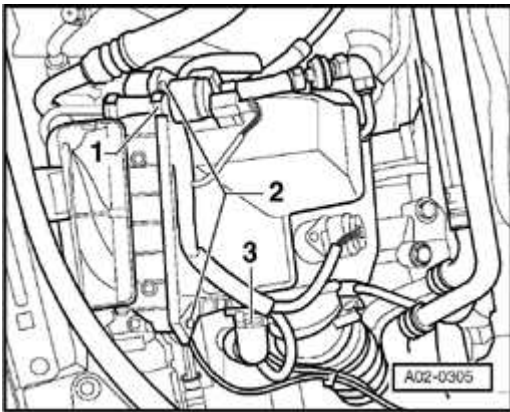


Fig. 38: Identifying Hose Clamp And Evaporative Emission (EVAP) Canister Valve
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Open hose clamp - **1** - and remove line from Evaporative Emission (EVAP) canister valve.
- Remove line - **3** - and remove both screws - **2** -.
- Remove upper part of air filter from bracket and pivot toward engine side.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

6-cyl. 3.0L engines

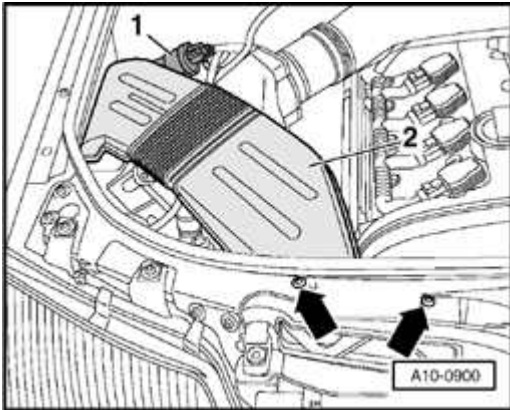


Fig. 39: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage Evaporative Emission (EVAP) Canister Purge Regulator Valve N80 - 1 - at air duct.
- Remove bolts - **arrows** -.

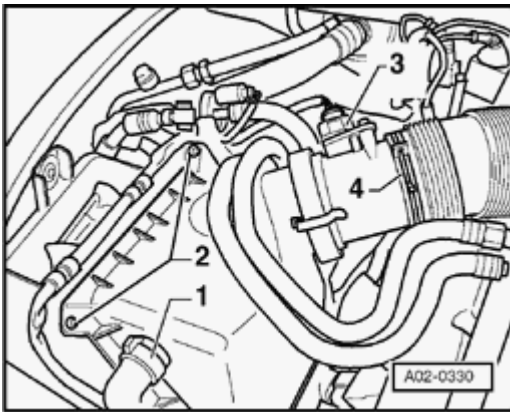


Fig. 40: Identifying Air Duct, Air Intake Hose, Electrical Connector And Mass Air Flow (MAF) Sensor G70

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - 2 -.
- Remove air intake hose - 4 - and disconnect electrical connector - 3 - from Mass Air Flow (MAF) Sensor G70.
- Remove both fuel lines from bracket on upper part of air filter housing.
- Disconnect pipe connection - 1 -.
- Remove both screws - 2 - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

6-cyl. 3.2L engines

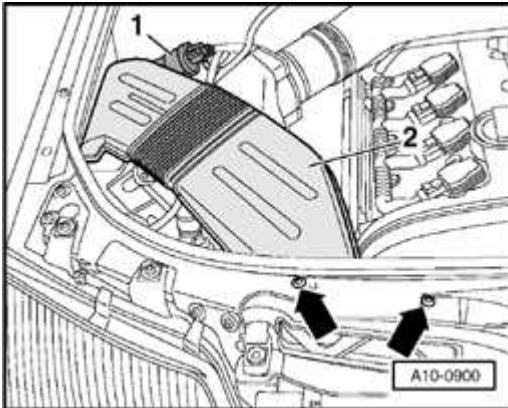


Fig. 41: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bolts - **arrows** -.

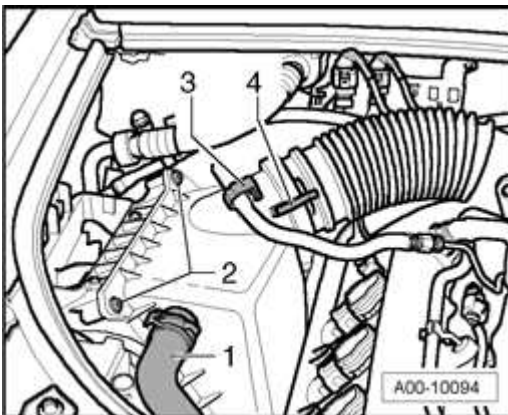


Fig. 42: Identifying Air Duct, Clean Air Tube Clamp, Fuel Line, And Pipe Connection
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - **2** -.
- Open clean air tube clamp - **4** - and remove from air filter housing.
- Unclip fuel line - **3** -.
- Disconnect pipe connection - **1** -.
- Remove both screws - **2** - at upper part of air filter and remove upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

8-cyl. 4.2L MPI engines

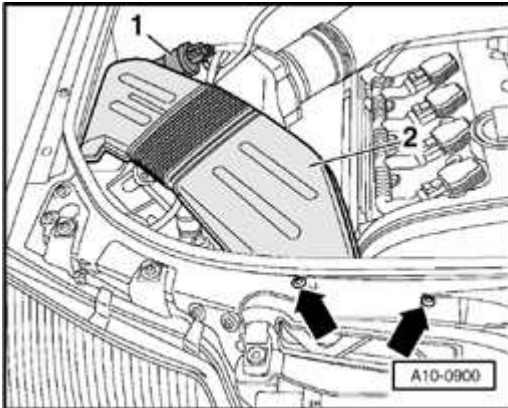


Fig. 43: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage Evaporative Emission (EVAP) Canister Purge Regulator Valve N80 - 1 - at air duct.
- Remove bolts - **arrows** -.
- Remove air duct - 2 -.

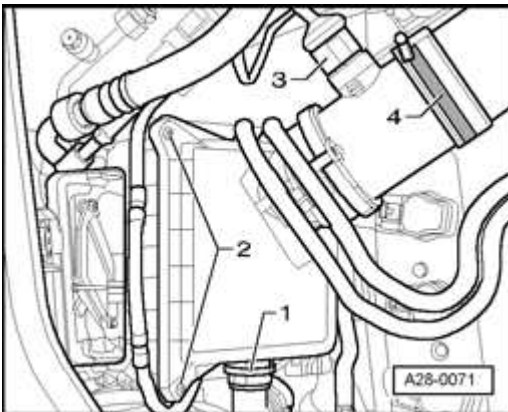


Fig. 44: Identifying Air Intake Hose, Electrical Connector, And Mass Air Flow (MAF) Sensor G70
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air intake hose - 4 - and disconnect electrical connector - 3 - from Mass Air Flow (MAF) Sensor G70.
- Remove line -1- and remove both screws - 2 -.
- Remove both fuel lines from bracket on upper part of air filter and remove this upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See footnote

8-cyl. 4.2L engines (RS4)

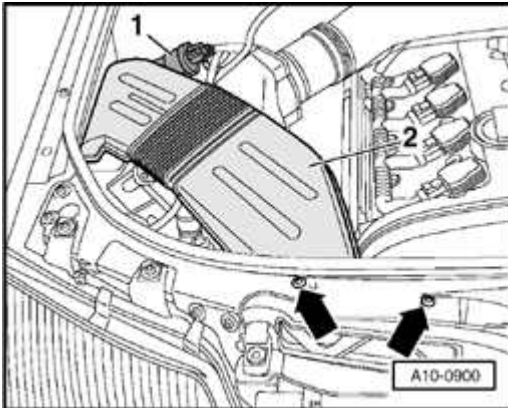


Fig. 45: Evaporative Emission Canister Purge Regulator Valve N80 And Air Duct
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disengage fuel line - 1 - at upper part of air filter housing.
- Remove bolts - **arrows** -.

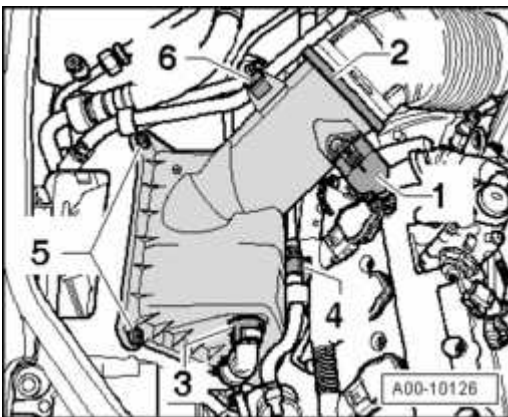


Fig. 46: Identifying Air Duct And Mass Air Flow Sensor G70 Electrical Connector
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct - 2 -.
- Loosen hose clamp - 2 - and remove air intake hose from upper part of air filter.
- Disconnect electrical connector - 1 - from Mass Air Flow Sensor G70.
- Remove hoses - 6 - , - 4 - and - 3 - from bracket.
- Now remove screws - 5 - and remove upper part of air filter housing upward.
- Remove old air filter element.
- Clean filter housing and install new air filter element.
- Further assembly occurs in reverse order.

- Follow notes * See note

NOTE:

- If the air filter insert is heavily soiled or soaked, dirt particles or moisture can reach the Mass Air Flow Sensor G70 and cause an incorrect air flow reading. This causes lack of performance because a lower injection amount is calculated.
- Always use an original air filter insert.
- Hose supports and charge air system hoses must be free of oil and grease before installation. Do not use any lubricant containing silicone when installing.
- Air filter housing must be clean.
- Secure all hose connections with hose clamps that match current standard production.
- When cleaning air filter housing with compressed air, observe the following: To avoid malfunctions, cover critical air carrying engine components such as Mass Air Flow (MAF) sensor, air inlet tube, etc. with a clean cloth.
- Check drain hose in bottom side of air filter or dirt and adhesion (clean, if necessary).
- Check mass air flow sensor and air guide hose (clean air side) for salt residue, dirt and leaves.
- Check air duct from lock carrier to air filter housing for dirt and leaves.
- When installing air filter insert, ensure it is centered in mount on bottom of air filter.
- Carefully and gently place upper part of air filter on lower part. Ensure upper part of air filter is not sitting crooked on air filter insert (note air filter insert sealing lip).
- Ensure secure fit from air guide hose to Mass Air Flow (MAF) Sensor G70.
- Observe waste disposal regulations!

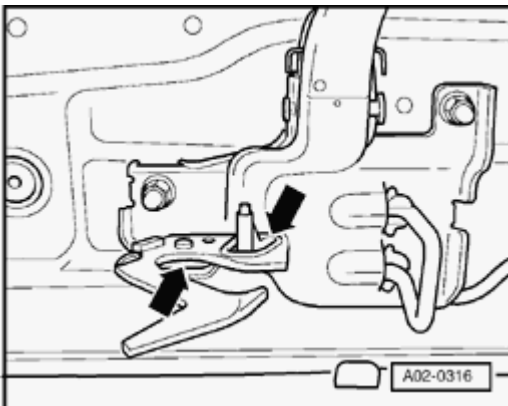
Hood catch: lubricating

Fig. 47: Identifying Lubrication Points On Hood Safety Catch
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Lubricate hood safety catch only on lubrication places indicated - **arrows** -.
- Lubricant: "G 052 778 A2"

Engine cover: Removing

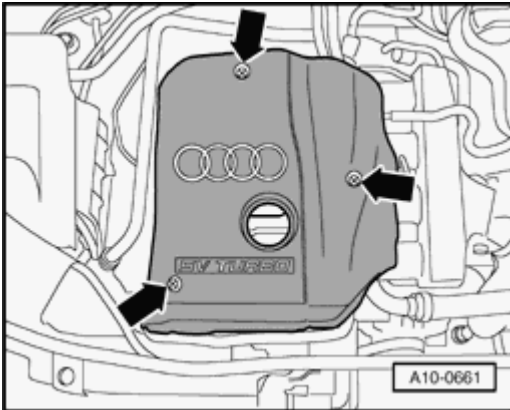


Fig. 48: Removing Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

4-cyl. Gasoline engines

- Remove bolts or nuts - **arrows** - and remove engine cover(s).

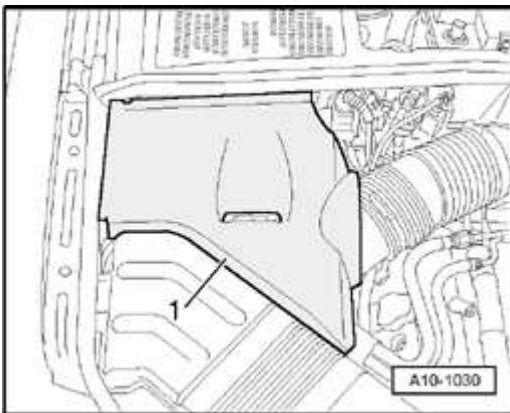


Fig. 49: Removing Cover In Engine Compartment (Right Side)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

6-cyl. 5V engines 3.0L

Remove cover - 1 - at right in engine compartment.

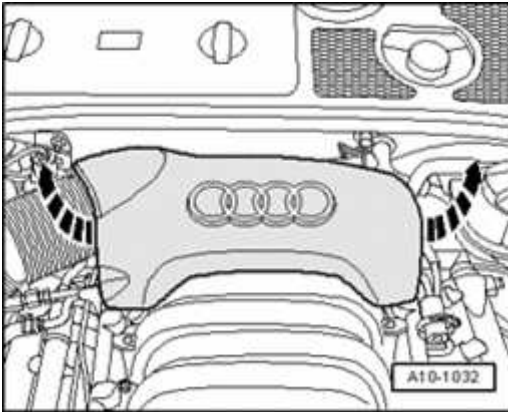


Fig. 50: Removing Rear Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Remove rear engine cover upward.

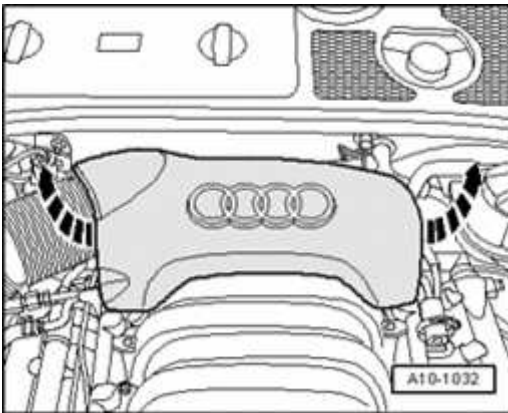


Fig. 51: Removing Rear Engine Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

V8 4.2 gasoline engines

Remove rear engine cover upward.

Engine (from above and below) and engine compartment: Visual inspection for leaks and damage

Perform visual check as follows:

- Remove engine cover --> **Engine cover: Removing.**
- Check engine and engine compartment for leaks and damage.
- Check lines, hoses and connections on following systems for leaks, chafing, porosity and cracks:
 - Fuel system
 - Cooling and heating system
 - Brake system

- Perform visual inspection from below using same viewpoints as when vehicle was on lift and noise insulation removed.

WARNING: Malfunctions found must be rectified (repair measure).

Continuously Variable Transmission (CVT) 01J: Changing ATF

- Continuously Variable Transmission (CVT) 01J: Change ATF --> - **37 - AUTOMATIC TRANSMISSION - CONTROLS, HOUSING**

Engine oil: Drain/extract, replace oil filter

WARNING: Oil extraction not permitted with various engine types! See maintenance table.

NOTE: • Perform oil change at operating temperature.

Special tools, testers and auxiliary items required

- Hazet tension band 2171-1
- or
- Oil filter wrench 3417
- Oil extractor V.A.G 1782

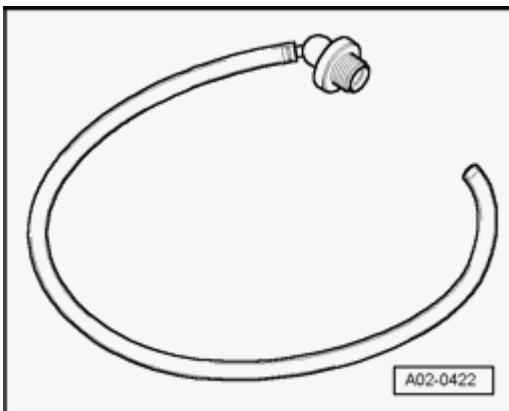


Fig. 52: Identifying Oil Drain Adapter T 40057 (2.0 TFSI)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Oil Drain Adapter T 40057 (2.0 TFSI)

NOTE: • Observe waste disposal regulations!

4-cyl. gasoline engines --> 4-cyl. gasoline engines

4-cyl. TFSI engines --> 4-cyl. TFSI engines

6-cyl. 3.2L FSI gasoline engines --> 6-cyl. 3.2L FSI gasoline engines

8-cyl. 4.2L MPI gasoline engines --> 8-cyl. 4.2L MPI gasoline engines

8-cyl. 4.2L FSI gasoline engines, RS4 --> 8-cyl. 4.2L FSI gasoline engines, RS4

4-cyl. gasoline engines

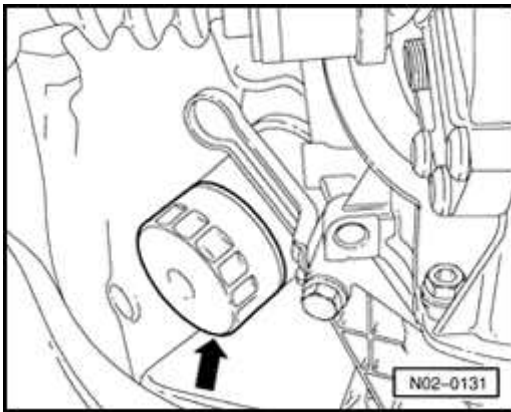


Fig. 53: Identifying Oil Filter

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen oil filter - **arrow** - using oil filter wrench 3417 or tension band Hazet 2171-1.
- Remove oil filter.

NOTE:

- Observe waste disposal regulations!
- Observe installation note on oil filter.
- Open oil drain plug or extract engine oil.
- Clean oil filter sealing surface on engine.
- Lubricate rubber seal lightly with oil.

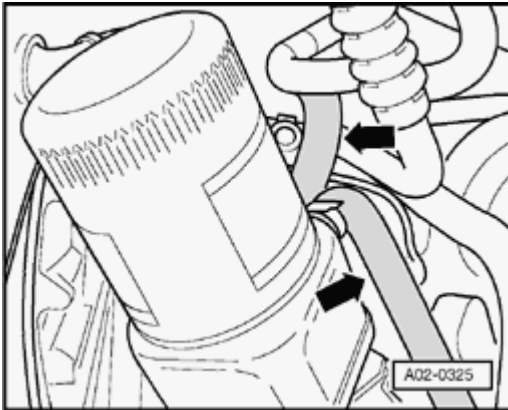


Fig. 54: Identifying Oil Filter Unit And Hoses

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Install new filter and tighten.

WARNING: After changing oil filter unit, check clearance of hoses - arrows - going from oil cooler to adjacent components. Correct the position of the oil cooler, if necessary.

- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill.**

Tightening torque	Nm
Oil drain plug 4-cyl. gasoline engines	30

NOTE:

- Engines with turbocharger:
- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
- As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely.
- The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes
- Check for cleanliness.

4-cyl. TFSI engines

- Remove noise insulation --> **Noise insulation: Removing.**

NOTE:

- Before removing oil filter, motor oil must be drained from filter so that it does not drain onto engine and attached parts.

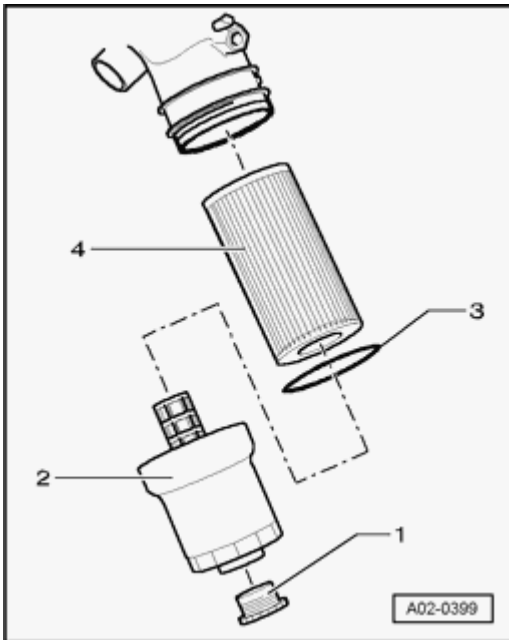


Fig. 55: Identifying Valve Protection Cap And Oil Filter Housing Bottom
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove bottom valve protective cap - 1 -.
- Remove ball head hose from Oil Drain Adapter T 40057 and turn threaded bolt in bottom oil filter housing bottom valve - 2 - under a slight resistance is felt.
- Now place ball head hose on threaded bolts and turn Oil Drain Adapter T 40057 to stop - a clear snap of the drain valve will be heard.
- Allow oil filter to run empty.

WARNING: Hot engine oil

- Open oil drain plug or extract engine oil.

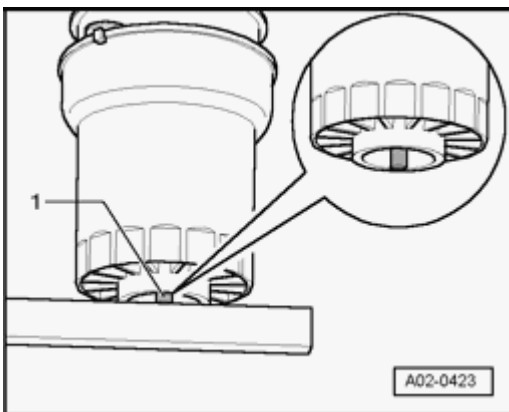


Fig. 56: Identifying Remove Oil Drain Adapter T 40057

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove Oil Drain Adapter T 40057.
- Check whether bottom valve - 1 - is flush and not crooked, as in illustration (A02-0423).
- Remove protective cap.
- Open oil filter housing - 2 - with Oil Filter Wrench 3417 or with socket AF 36, e.g. Socket AF 36 T10125 and remove oil filter.

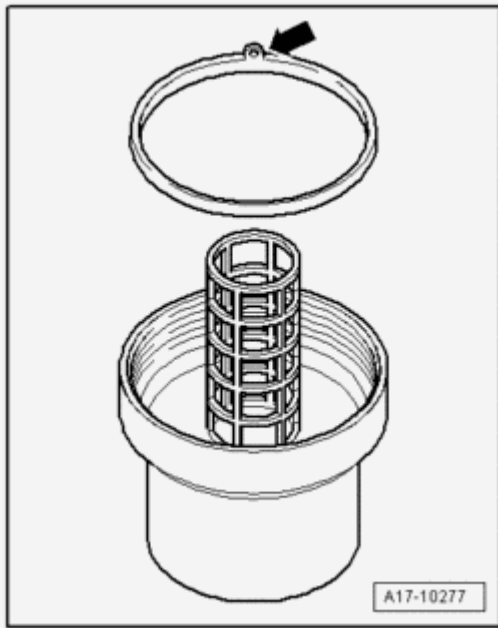


Fig. 57: Identifying Filter Insert And Gasket

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace filter insert - 4 - and gasket - 3 -.
- Note position of service flag on sealing ring (see arrow)

NOTE:

- **Observe waste disposal regulations!**
- **Clean sealing surface on oil filter housing.**
- **Lubricate rubber seal lightly with oil.**
- **Smooth side of sealing ring must face toward outside**
- **Screw on filter housing and tighten.**
- **Install oil drain plug with new gasket.**
- **Fill up with engine oil, specifications --> Engine oil: Fill.**

Tightening torque	Nm
Oil filter	25+5
Oil drain plug	30

NOTE:

- Engines with turbocharger:
- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
- As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely.
- The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes
- Check for cleanliness.

6-cyl. 3.2L FSI gasoline engines

NOTE:

- Loosen the cap before draining / extracting, so that the engine oil can run out of the oil filter housing.

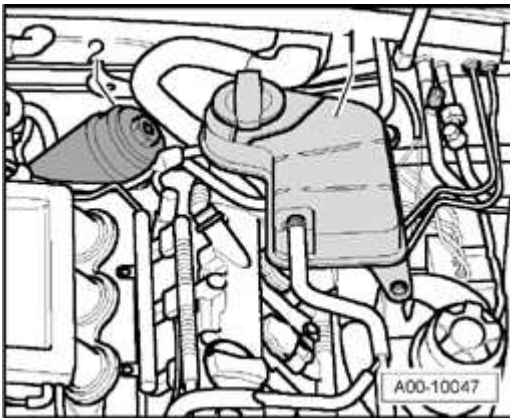


Fig. 58: Identifying Coolant Reservoir And Oil Filter Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir - 1 - and lay aside.
- Remove oil filter cover with socket wrench SW 36 - 2 -.
- Clean sealing surfaces oil filter cover and at oil filter housing.
- Replace oil filter insert..

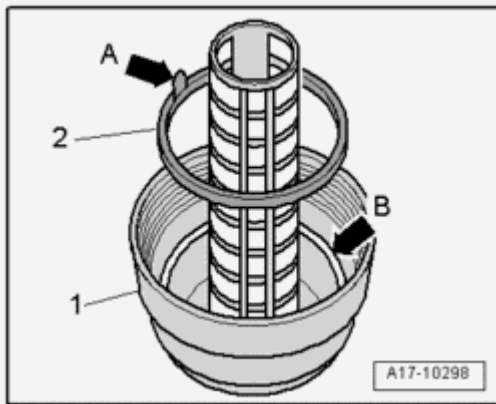


Fig. 59: Identifying Sealing Ring On Cap

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Sealing ring on cap, replacing

- Remove sealing ring at pull tab - **arrow A** - from cap - **1** -.
- Insert new sealing ring - **2** - with semicircular profile in groove - **arrow B** - on cap.
- The pull tab - **arrow A** - must face upward.
- Smooth side of sealing ring - **2** - must face toward outside

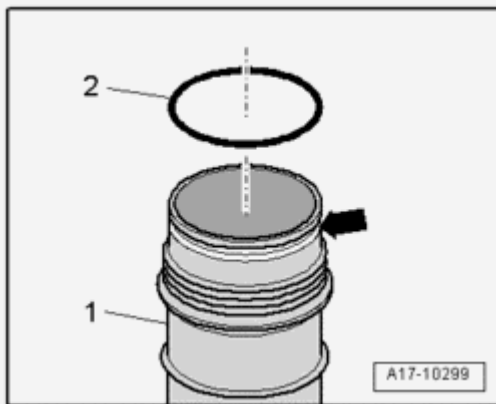


Fig. 60: Identifying Oil Filter Housing O-Ring

Courtesy of VOLKSWAGEN UNITED STATES, INC.

O-ring, inserting in oil filter housing

- Insert O-ring - **2** - in groove - **arrow** - on oil filter housing - **1** -.

NOTE:

- Observe waste disposal regulations!
- Engage new oil filter insert in oil filter cover.
- Install oil filter cover.

- Install coolant reservoir.
- Remove noise insulation.
- Open oil drain plug on oil pan or extract engine oil.
- Install oil drain plug.

NOTE:

- Oil drain plug is installed without seal.
- Check for cleanliness.

Tightening torque	Nm
Oil filter cover	25
Oil drain plug on oil pan	30

- Fill motor oil. --> **Engine oil: Fill**

8-cyl. 4.2L MPI gasoline engines

- Remove engine cover upward.

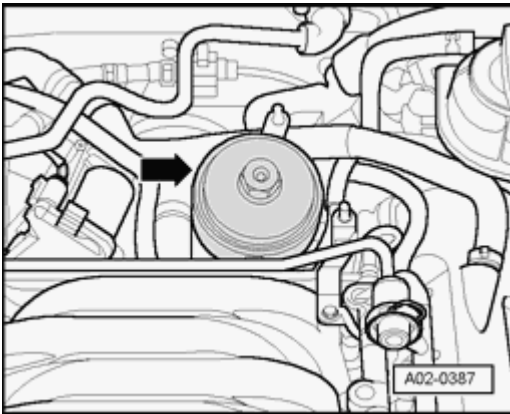


Fig. 61: Identifying Oil Filter Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil filter cover - **arrow** - using socket wrench SW24.
- Filter element, removing

NOTE:

- Removing the filter element will open a valve and oil in the filter housing will flow automatically into the crankshaft housing.

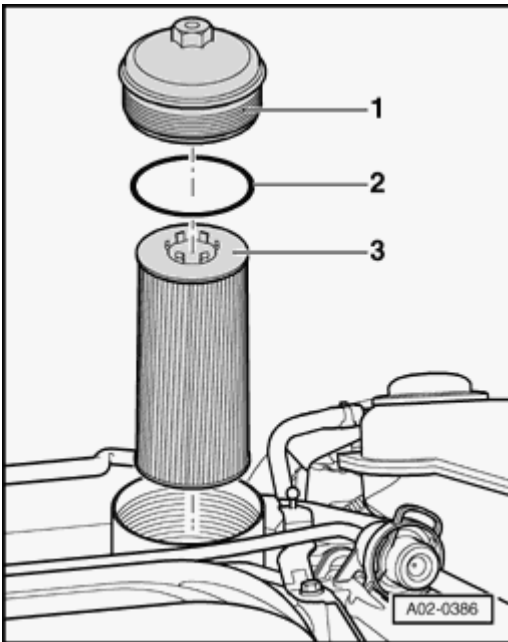


Fig. 62: Identifying O-Ring And Oil Filter Insert
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace O-ring - 2 - as well as oil filter insert - 3 -.

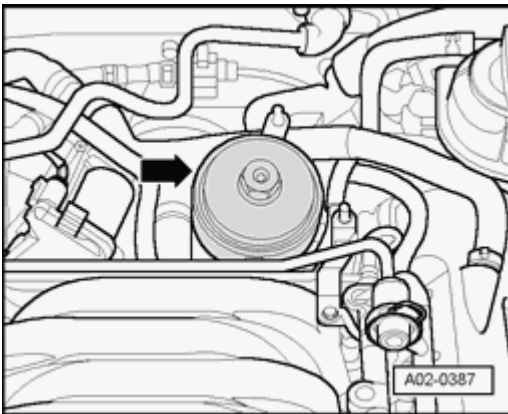


Fig. 63: Identifying Oil Filter Cover
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cover - **arrow** -.
- Open oil drain plug or extract engine oil.
- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill.**

Tightening torque	Nm
Oil filter cover	25
Oil drain plug	50

NOTE: • Check for cleanliness.

8-cyl. 4.2L FSI gasoline engines, RS4

- Remove engine cover upward.

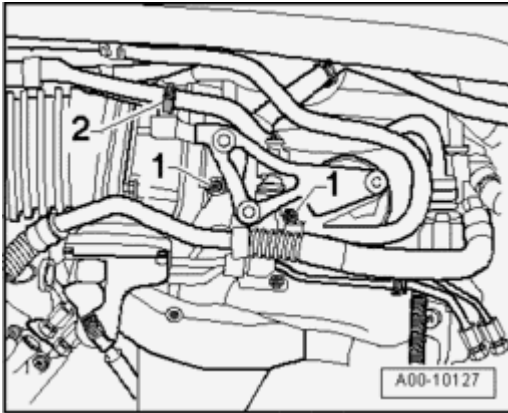


Fig. 64: Identifying Screws And Line

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Loosen screws - **1** - and unclip line - **2** -.
- Lay aside bracket.

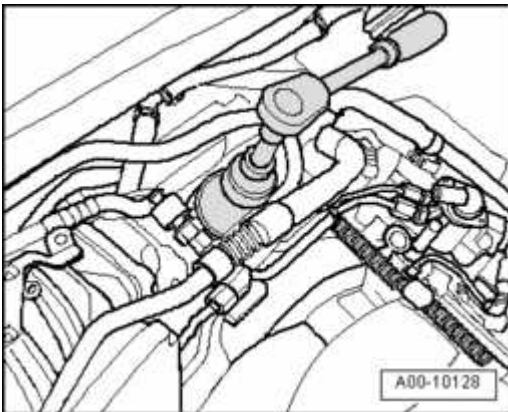


Fig. 65: Identifying Oil Filter Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove oil filter cover - **arrow** - using socket wrench SW32.
- Filter element, removing

NOTE: • Removing the filter element will open a valve and oil in the filter housing will flow automatically into the crankshaft housing.

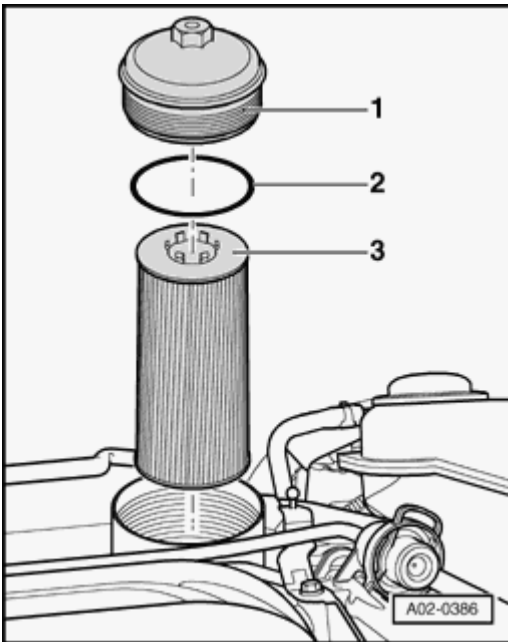


Fig. 66: Identifying O-Ring And Oil Filter Insert
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Replace O-ring - 2 - as well as oil filter insert - 3 -.

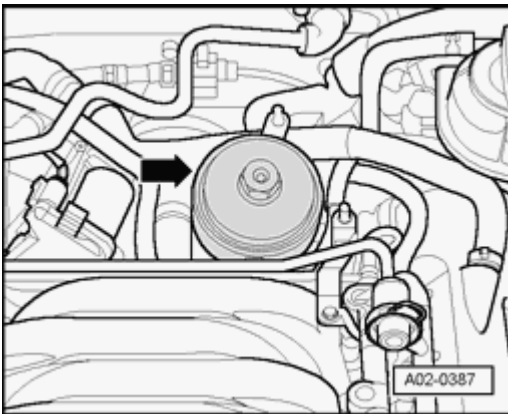


Fig. 67: Identifying Oil Filter Cover
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Tighten cover - **arrow** -.
- Open oil drain plug and drain engine oil.
- Install oil drain plug with new gasket.
- Fill up with engine oil, specifications --> **Engine oil: Fill.**

Tightening torque	Nm
Oil filter cover	25
Oil drain plug	25

NOTE:

- Check for cleanliness.
- Do not extract engine oil!

Engine oil: Fill**NOTE:**

- Please follow specified engine oil capacity and oil standards in the ELSA maintenance table.

Engines with turbocharger:

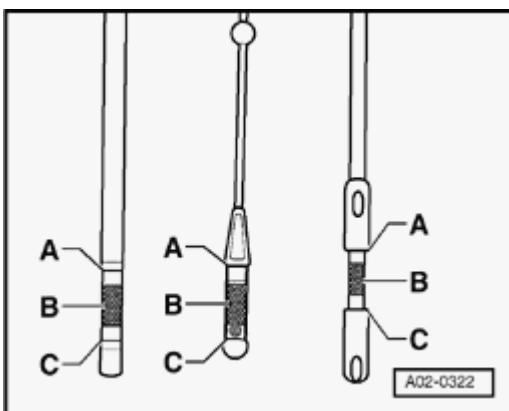
- After the engine oil and oil filter have been replaced, observe the following when first starting the engine:
 - As long as the oil pressure warning light in the instrument panel insert flashes, the engine is only to run at idle. Do not touch the accelerator pedal! Bumping the accelerator pedal can damage the turbocharger or destroy it completely
 - The full oil pressure achieved and the engine can be accelerated only when the warning light extinguishes

All:

- Check engine oil level --> **Engine: Oil level, checking.**

Engine: Oil level, checking**NOTE:**

- Oil temperature at least 140 ° F (60 ° C).
- Vehicle must be in level position.
- After stopping engine, wait a few minutes to allow oil to flow back into oil pan.
- Pull out oil dipstick and wipe with clean rag. Replace dipstick and push down to stop.
- Pull out dipstick again and read oil level.

**Fig. 68: Identifying Markings On Dipstick**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Markings on dipstick:

NOTE:

- Oil level must not exceed - a - mark on dipstick.

Navigation: Eject button, unlocking

- Follow these steps in sequential order.

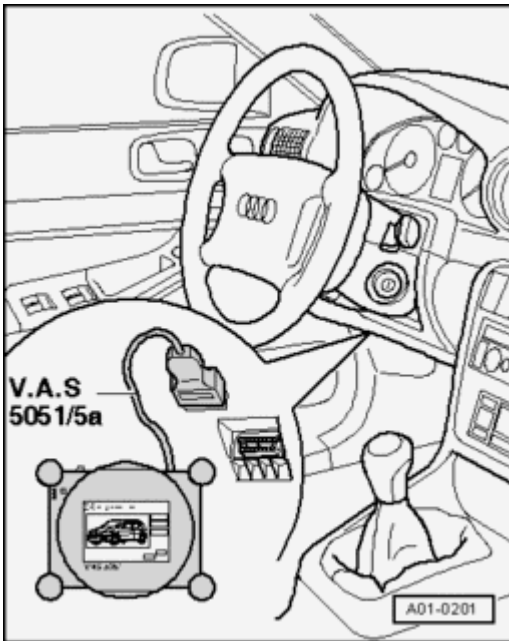


Fig. 69: Connecting Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Guided functions
- Go to - function/component selection
- Service work
- J401 - Navigation, Eject button, locking/unlocking
- Now follow guided program

Test drive: Perform

To what extent the following can be checked is dependent upon the vehicle equipment and local conditions (urban/country).

- The following should be checked by means of a road test:

- Engine: Output, misfiring, idling speed, acceleration
- Clutch: Pulling away, pedal pressure, odors
- Gear selection: Ease of operation, shift lever position
- Automatic transmission: Selector lever position, shift lock / ignition key removal lock, shift behavior, instrument panel insert display
- Foot and parking brake: Function, free travel and effectiveness, pulling to one side, juddering, squeal
- ABS function: A pulsing at the brake pedal must be felt when performing ABS controlled braking
- Steering: Function, steering free play, steering wheel centralized when wheels are in straight ahead position
- Tilt/slide sunroof: Function
- Cruise Control System (CCS): Function
- Radio: reception, SCV, interference
- Driver Information System (DIS): Functions
- A/C system: Function
- Vehicle: Moving off line when traveling straight ahead (level road)
- Imbalance: Wheels, drive shafts
- Wheel bearings: Noises
- Engine: Hot starting behavior

Wheel bolts: Tighten to correct torque setting

Center cap

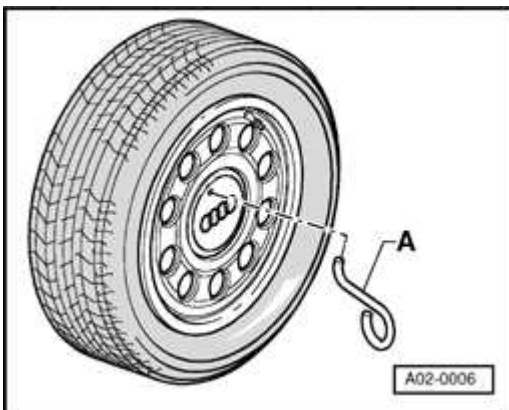


Fig. 70: Identifying Removal Hook

Courtesy of VOLKSWAGEN UNITED STATES, INC.

The removal hook - **A** - for removing the center cap is located in the vehicles tool kit.

Wheel bolts

The adapter to loosen/tighten the anti-theft wheel bolts is located with the vehicle tool kit.

Place adapter with vehicle tool kit after completing work.

NOTE:

- **Be sure to tighten wheel bolts in diagonal sequence to the following specified torque:**

Tightening torque	Nm
Wheel bolts	120

Correct wheel installation

- When installing wheels, you must observe the following points to ensure wheels fit securely:
 - Always tighten wheel bolts to the specified torque so the wheel bolt seats in rim are not deformed.
 - When installing a wheel, do not tighten first wheel bolt immediately (for example, with an impact wrench). This would prevent other bolts from centering rim properly when they are screwed in. Rim could then become loose, even if tightened to specified torque.
 - Before installing wheels, check for rust/corrosion in wheel bolt seats and contact surfaces between rims and hubs, removing if necessary. Otherwise, the wheel bolts can lose tension after installation and the rim can come loose.

WARNING:

- **If the above points are not observed, wheels can come loose and the wheel bolt seats in rim can be deformed.**
- **The deformity could be so small that you can't see it.**
- **But even small deformities in the wheel bolt seats can prevent the wheel from fitting securely, so that it becomes looser and looser.**

Radio: Activate anti-theft coding by entering security code

Radio units are shipped with a fixed code. Fixed code means that every radio unit with anti-theft coding has been programmed with its own code. This code is not active from the factory. To increase anti-theft protection, there is no longer a radio card in the radio and navigation system owners manual. The entry of the radio code is no longer described in the owners manual.

The Anti-theft coding on a unit that is ready to play is activated by entering the fixed code.

On chorus II+, concert II+ and symphony II+ radio systems, enter the radio code as follows

- Switch on radio. "Code 1000" appears in the display.
- Press upper left control button "X__" -arrow- until first digit of radio code appears in display.
- Enter remaining three radio code digits with other three control buttons
- Press "ENTER" control button. The radio is coded.

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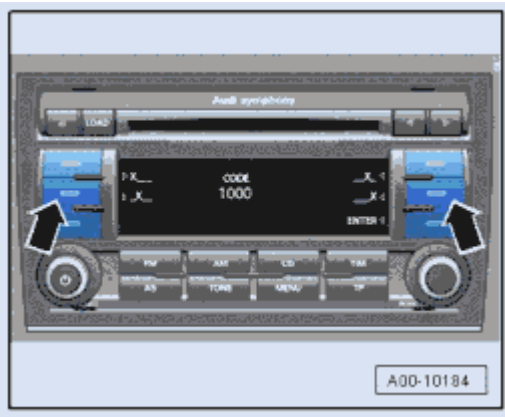


Fig. 71: Identifying Radio Controls

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Dispose of sticker with radio code.

If the radio code is entered incorrectly two times and "Code Safe 2" appeared in the display, use the following procedure

Leave radio switched on approx. 60 minutes. After 60 min., "Code Safe / Code 1000" appears in the display and the radio is switched off

Enter radio code again.

On navigation system BNS 5.0, enter radio code as follows

- Switch on navigation system
- Enter PIN using Speller
- Confirm entry with "OK"
- Dispose of sticker with radio code.

NOTE:

- Please inform the customer that he can only learn the anti-theft radio code from the service advisor
- That way, thieves really cannot use the radio!

Tire Pressure Monitoring System: Programming tire pressures

Specified values should also be saved with every tire pressure adaptation, e.g. when vehicle load condition changes, so that Tire Pressure Monitoring System can be as useful as possible. Do this as follows:

- Press Reset button on windshield washer lever.
- Select Tire Pressure Monitoring System.
- Select Save tire pressures.

NOTE:

- Saving of tire pressures must be started after each deliberate change to specified values.

Tire repair kit: Checking

Fig. 72: Identifying Durability Date In Tire Repair Kit
Courtesy of VOLKSWAGEN UNITED STATES, INC.

On vehicles with a tire repair kit, check durability date - **arrow** -.

NOTE:

- If expiration date has passed, replace bottle.

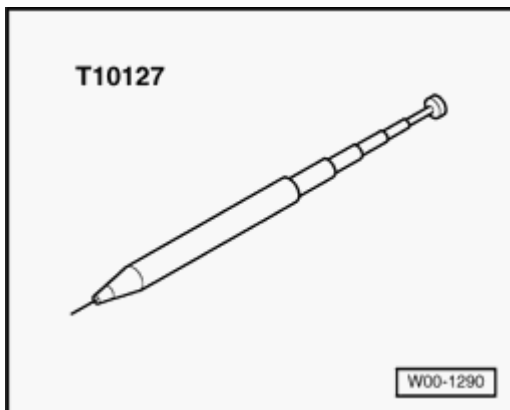
Windshield washer system: Checking nozzle setting, adjusting nozzles if necessary**Necessary special tools****Special tools, testers and auxiliary items required**

Fig. 73: Identifying Adjustment Tool T10127 Equipped With Needle 3125/ 5 A
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Windshield washer aiming tool T10127 equipped with replacement tip 3125/5A.

NOTE:

- Never use a needle or a similar object, since it may damage the water hoses in the spray nozzle!

Windshield spray jet setting

- Mark four points on windshield using water-soluble pen.

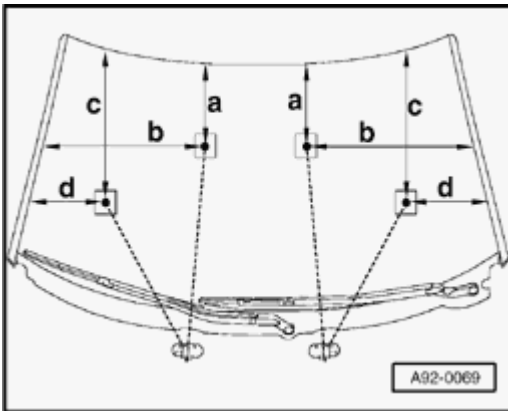


Fig. 74: Identifying Windshield Dimensions

Courtesy of VOLKSWAGEN UNITED STATES, INC.

Adjusting dimension:

- Dimension - **a** - = 250 to 275 mm
- Dimension - **b** - = 465 to 490 mm
- Dimension - **c** - = 270 to 415 mm
- Dimension - **d** - = 140 to 225 mm

NOTE:

- Adjusting dimensions are calculated from outer edge of windshield.
- Locate individual spray jet points using windshield washer aiming tool T10127 with replacement tip 3125/5A.

NOTE:

- If the spray field is uneven or does not adjust to the aforementioned specifications, replace the washer jet (repair measures).

Rear window spray jet setting

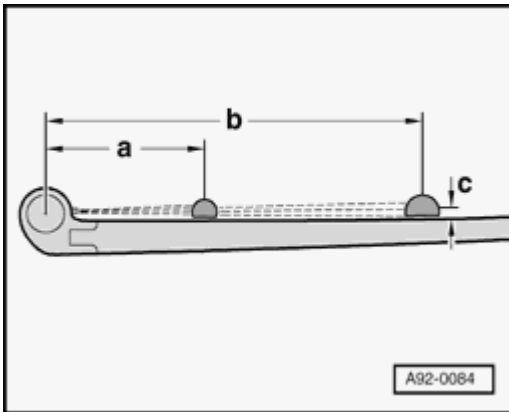


Fig. 75: Identifying Windshield Wiper Dimensions

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adjust spray jets with Washer Jet Adjuster T10127 so fluid sprays over the wiper onto the rear window at the places shown.
- Dimension - **a** - = approx. 125 mm
- Dimension - **b** - = approx. 295 mm
- Dimension - **c** - = approx. 5 mm

Headlamp washer system: Check spray jet setting.

Headlamp cleaner spray jets are set at the factory and do not need to be adjusted.

Windshield wiper blades: Checking park position

Front windshield wiper blade park position

- Switch windshield wipers on and off and allow to run to end position.

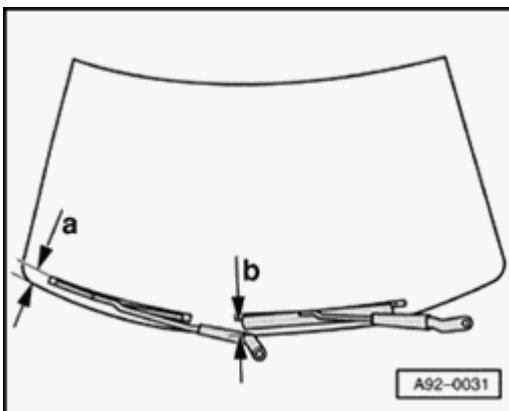


Fig. 76: Checking Windshield Wiper Blade Tips Position

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether wiper blades rest again front window in indicated position.

- Dimension - **a** - = 24 mm
- Dimension - **b** - = 44 mm

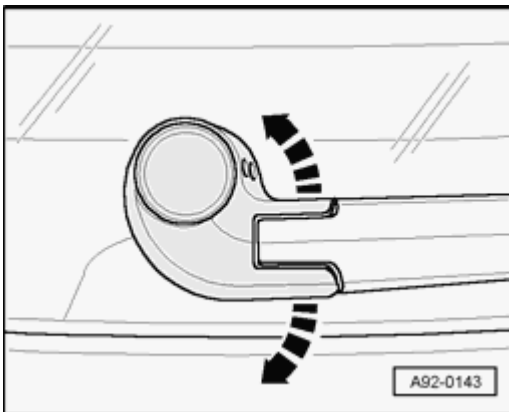
NOTE:

- Dimensions indicate distance of wiper blades to plenum chamber cowl panel grille on lower window edge.
- If necessary, unscrew wiper arm, align and tighten nuts.
- Activate mist wiper and check adjustment.

Tightening torque	Nm
Wiper arm to wiper shaft	21

Wiper blade park position, rear window

- Let wiper motor run to end position.
- Switch ignition off and remove ignition key.

**Fig. 77: Identifying Cover**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully spread cover - **arrows** - and lift.

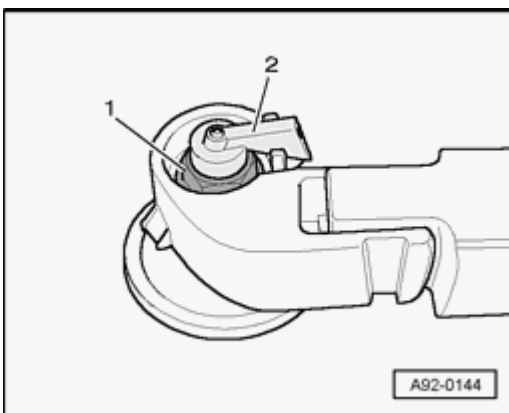


Fig. 78: Identifying Spray Jets And Hex Head Nuts
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Carefully remove spray jets - 2 -.
- Loosen hex head nuts - 1 - a few turns.
- Loosen wiper arms by tilting wiper shaft slightly.

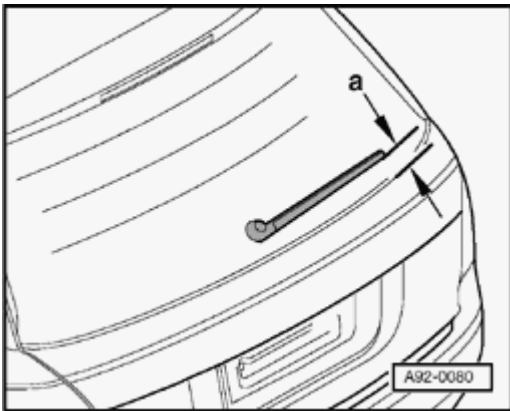


Fig. 79: Identifying Dimensions For Wiper Blade On Rear Window
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Place wiper blade on rear window and adjust as follows:
 - Dimension - a - = 15 to 20 mm

NOTE:

- Dimension gives distance of wiper blade point to lower edge of window.
- Tighten wiper arm nut to 12 Nm.
- Activate wiper.
- Adjust wiper arm again, if necessary, and tighten nut.
- Check spray jet adjustment --> Windshield washer system: Checking nozzle setting, adjusting nozzles if necessary.

Service interval display: resetting or adapting

NOTE:

- Service display serves to remind the driver of service needed. The display appears in the center display.
- Service indicators appears 1 month or 2.000 km before reaching service interval. It disappears after 100 km. Example display: After a total driving distance of 28,700 km, "SERVICE IN 1300 KM" appears.

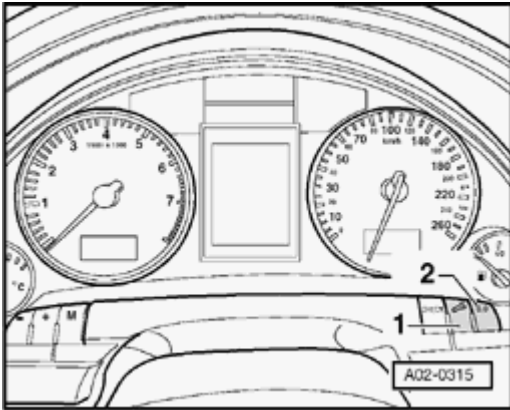


Fig. 80: Identifying Service Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- The distance remaining to the service interval can be viewed via the center display menu by press button - 1 - once.
- When a service interval arrives, the text information appears in the center display for 5 seconds after switching ignition on. It is shown after automatic transmission message and a possible navigation system destination. Display: "SERVICE!".

Service display, resetting

- Follow these steps in sequential order.

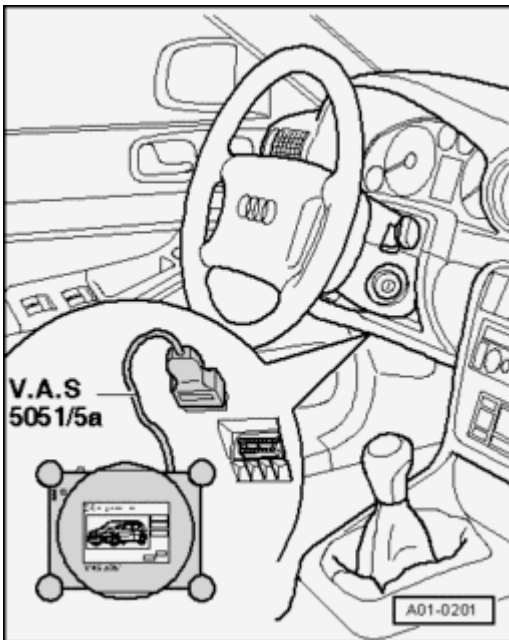


Fig. 81: Connecting Data Link Connector (DLC)

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052

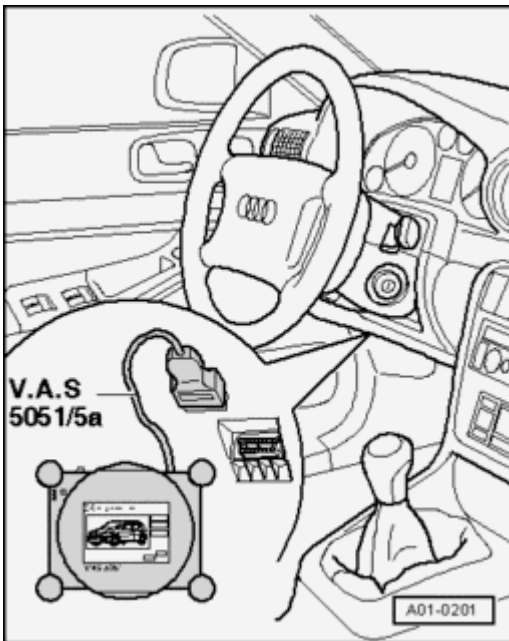
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Combination Processor, reset WIV
- Now follow guided program

NOTE:

- Please follow guided program function description
- WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)

Oil quality, adapting

- Follow these steps in sequential order.

**Fig. 82: Connecting Data Link Connector (DLC)**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

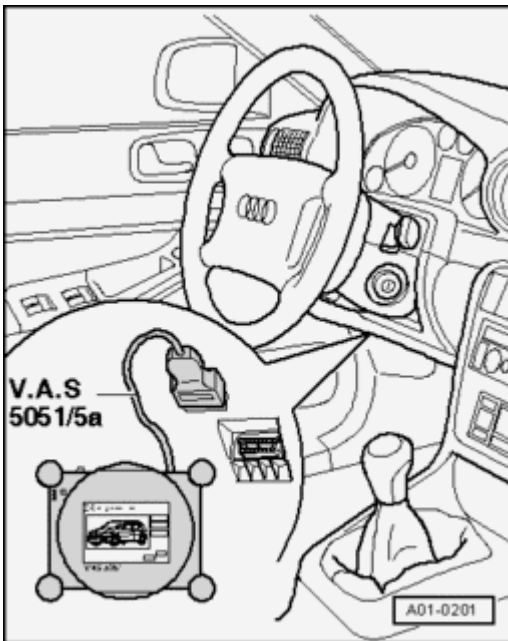
- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Combination Processor, changing oil quality
- Now follow guided program

NOTE:

- It is necessary to change oil quality if changed between inspection.
- Inspection Service = Oil quality 1
- WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)
- Please follow guided program function description

Maximum values, adapting

- Follow these steps in sequential order.

**Fig. 83: Connecting Data Link Connector (DLC)**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions
- Go to - function/component selection
- Service work
- Combination Processor, adjusting maximum WIV value
- Now follow guided program

Fixed interval maximum values

Minimum mileage in Km	15000
Maximum mileage in Km	15000
Maximum time interval in days	365

NOTE:

- WIV = Wartungsintervall - Verlängerung (Maintenance Interval Extension)
- Please follow guided program function description

Service display, resetting without VAS 5051/5052

NOTE:

- If reset without VAS 5051 or VAS 5052 , service display is automatically set to fixed interval (15,000 km).

Resetting can be carried out using tester VAS 5051 or VAS 5052 in "Adaptation" function --> **Service interval display: resetting or adapting.**

Service display can also be reset using the following procedure:

- Turn off ignition.

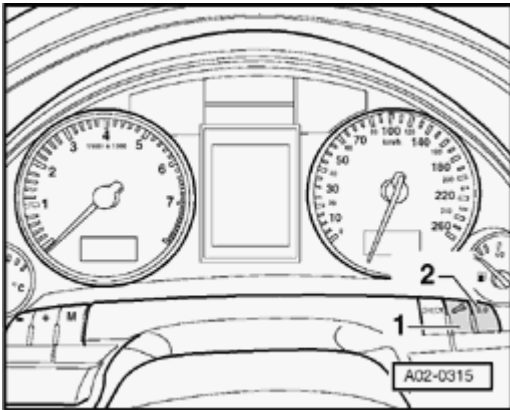


Fig. 84: Identifying Service Display

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Press Taste button - 1 - and switch on ignition at the same time.

After releasing button, display shows: "SERVICE IN ???Km" or "SERVICE!".

- Hold down button Taste - 2 - until text is reset to "SERVICE IN ???Km" or "SERVICE!".
- Turn off ignition.

Windshield/headlamp wiper system: Filling with fluid

- Fill washer fluid fully.

NOTE:

- Always add a neutral pH window cleaner to washer fluid (freeze protection in winter).

Vehicle Electrical System Control Module - J519: coding

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- Connect VAS 5051 --> **DTC memory: Retrieving with VAS 5051/ 5052.**
- Select "Guided Fault Finding"

Enter vehicle information; all control modules are interrogated.

- Press the following selections in the order shown:
 - Go To
 - Functions and component selection
 - Body
 - Electrical Equipment
 - 01 On Board Diagnostic (OBD) capable systems
 - Electrical system (Highline or Lowline depending on vehicle equipment)
 - Electrical system function
 - J519 Vehicle Electrical System Control Module, coding
 - Press button

Follow tester steps and confirm entry until following text appears:

OK J519 Vehicle Electrical System Control Module, coding

- Press the following selections in the order shown:
 - Go To
 - End

Dust and pollen filter: Replacing

NOTE:

- Filter insert is available in different versions (with and without activated charcoal insert as integrated odor Parts catalog.
- The filter is located beneath the fresh air plenum cover on the right side.
- Remove plenum chamber cover --> **Plenum chamber cover: Removing.**

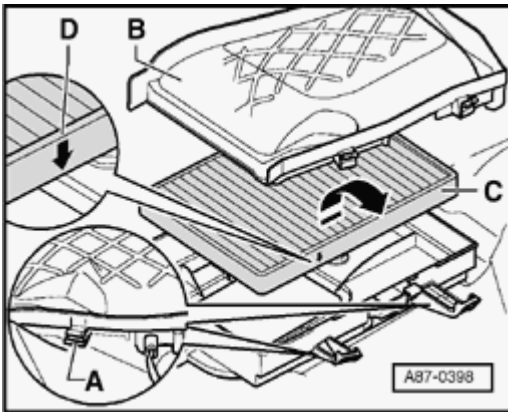


Fig. 85: Identifying Plenum Chamber Cover

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Unclip cover - **B** - and remove forward.
- Remove dust and pollen filter - **C** - from housing.

NOTE:

- When inserting filter in filter frame, observe flow-through direction - arrow **D** -
- When installing, ensure cover - **B** - is seated correctly. It must be clipped in at both catches - **A** - , otherwise water will run on dust and pollen filter and into A/C unit.

Sunroof: Check function, clean guide rails and spray on lubricant spray

- Check sunroof for leaks.
- Clean guide rails.
- Spray guide rails.
- Lubricant: "G 052 778 A2"
- Check sunroof function.

Manual transmission/final drive: Check oil level, add oil if necessary

--> -

- **34 MANUAL TRANSMISSION - CONTROLS, HOUSING** for 5 SPD. MANUAL TRANSMISSION 012/01W FRONT WHEEL DRIVE
- **34 MANUAL TRANSMISSION - CONTROLS, HOUSING** for 5 SPD. MANUAL TRANSMISSION 01A ALL WHEEL DRIVE
- **34 MANUAL TRANSMISSION - CONTROLS, HOUSING** for 6 SPD. MANUAL TRANSMISSION 01E ALL WHEEL DRIVE
- **34 - CONTROLS, HOUSING** for 6 SPD. MANUAL TRANSMISSION 0A3 ALL WHEEL DRIVE,

INTERNAL COMPONENT SERVICING

- **34 CONTROLS, HOUSING** for 6-SPEED MANUAL TRANSMISSION 01X, FRONT-WHEEL DRIVE
- **34 CONTROLS, HOUSING** 6-SPEED MANUAL TRANSMISSION 02X, FOUR-WHEEL DRIVE
- **34 CONTROLS, HOUSING** for 6-SPEED MANUAL TRANSMISSION 0A3, ALL WHEEL DRIVE

Headlamps: Check setting, adjust if necessary

The following test- and adjustment instructions are applicable to all countries. National guidelines or regulations of the country must be observed.

Check and adjustment conditions

- Tire pressure OK.
- Lenses must not be damaged or dirty.
- Reflectors and bulbs OK.
- Vehicle must be properly loaded.

Load: Vehicle must be loaded with one person on the drivers seat, weighing 75 kg, otherwise vehicle must be empty (curb weight).

The curb weight is the weight of the vehicle ready for operation with completely filled fuel tank (at least 90%), including the weight of all equipment items carried for operation (e.g. spare wheel, tool, vehicle jack, fire extinguisher etc.).

If the fuel tank is not at least 90% full, adjust the weight as follows:

- Read fuel level from fuel gauge. Calculate additional weight needed using the following table. Place extra weight in luggage compartment.

Tank filling

Fuel level according to fuel gauge	Additional weight in kg
1/4	52
1/2	35
3/4	17
Full	0

Example:

If the fuel tank is half full, place a weight of 35 kg in the luggage compartment.

NOTE:

- **For additional weight use containers filled with water. A container filled with 5 liters of water weighs approx. 5kg.**

Vehicle must be rolled for several meters or the front and rear suspension must be bounced several times so that the springs settle.

- Vehicle and headlamp adjuster must be on a level surface operating instructions for headlamp adjuster.
- Vehicle and headlamp adjuster must be aligned.

Ensure headlight adjuster is about 30 cm in front of headlight.

- Inclination must be set.

Inclination measurements are stamped in "%" at top of headlamp. The headlamps must be adjusted according to these measurements. Percentage information is based on a projection distance of 10 meters. For example: inclination of 1.0 % converts to approx. 10 cm.

Vehicles with manual headlight range adjuster:

- The headlight range adjuster thumb wheel must be in basic setting - 0 -.

Vehicles with automatic headlight range adjusting

NOTE:

- To check/adjust headlights, they must always be placed in the basic setting with the VAS 5051.
- Performing basic setting with VAS 5051 :
- connect VAS 5051 with ignition switched off.

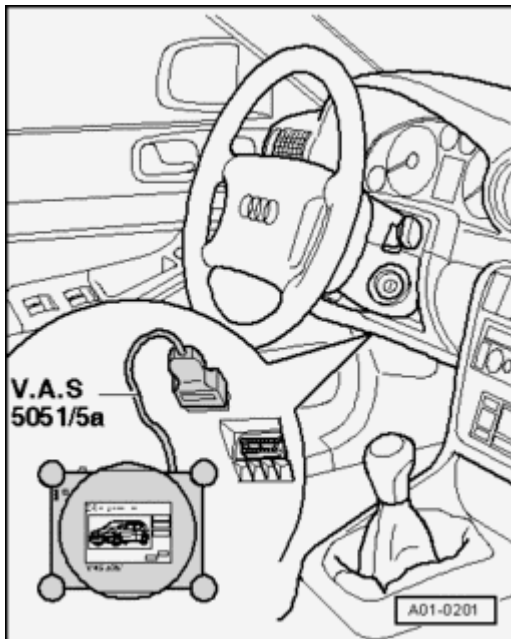


Fig. 86: Connecting Data Link Connector (DLC)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Use K-lead adapter VAS 6017B.
- Switch ignition on.
- Select "Guided Fault Finding"

Enter vehicle information; all control modules are interrogated.

- Press the following selections in the order shown:
 - Go To
 - Functions and component selection
 - Body
 - Electrical Equipment
 - 01 - On Board Diagnostic (OBD) capable systems
 - 55-Dynamic Headlamp Range Control
 - J 431-Dynamic Headlamp Range Control, Functions
 - J 431-Headlamp Range Control Module, basic setting
- Press button

Follow the steps of the tester and confirm the entry until the following text appears:

J 431-Headlamp Range Control Module, basic setting

- Press button
- Follow test sequence

Headlamps, checking adjustment (with new test screen without 15 ° setting line)

- Switch ignition and low beams on

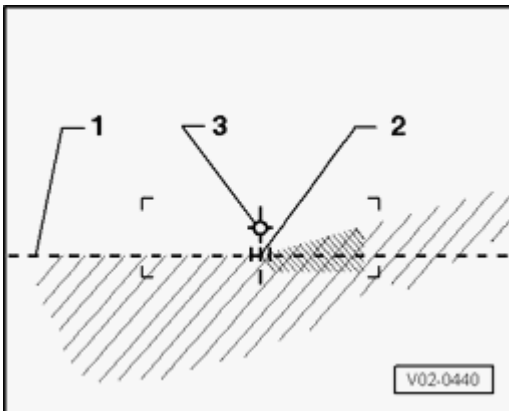


Fig. 87: Identifying Headlight Setting Line, Break-Away Point & Center Point
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Horizontal light-dark border must contact hyphenated line - 1 - on test surface.
- Break-away point - 2 - between left horizontal part and rising part on right of light-dark border must run vertically through central point - 3 -. The bright core of the light beam must be on the right of the vertical line.

NOTE:

- To make it easier to find break-away point - 2 - cover and uncover left half of headlamp (as viewed when looking forward) a few times. Next, check low beam again.
- After correct adjustment of dipped beams the center point of the main beam must lie on the center mark - 3 -.
- For the previous test screen with 15 ° -setting line, adjust as for new test screen. To avoid incorrect settings, ignore 15 ° setting line.
- If headlight adjustment is not OK: Adjust headlights:

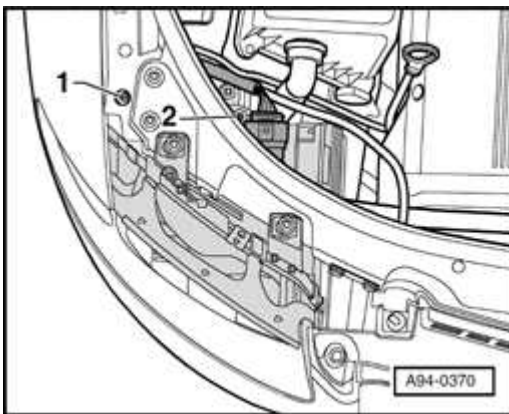
Headlamps, adjusting

Fig. 88: Identifying Adjustment Screws For Main Headlight (Right)
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Main headlight (right)

Adjusting screw on right headlight:

Placement on left headlight is similar.

- To adjust height, turn adjustment screws - 1 - and - 2 - with same number of revolutions.
- To adjust laterally, turn only adjustment screw - 2 -.

Fog lights:

Inclination figures:

- Fog lights 20 cm

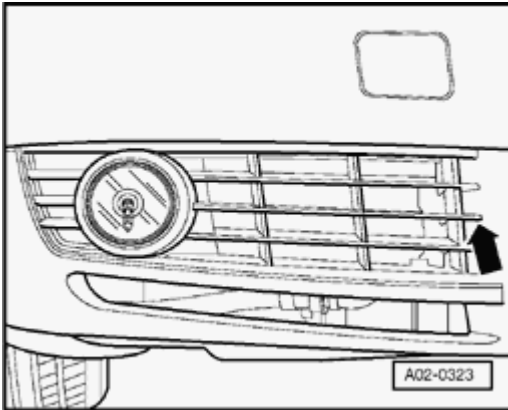


Fig. 89: Checking Whether Upper Light-Dark Border Touches Adjusting Line And Runs Across Entire Test Screen Width Horizontally

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Check whether upper light-dark border touches adjusting line and runs across entire test screen width horizontally.

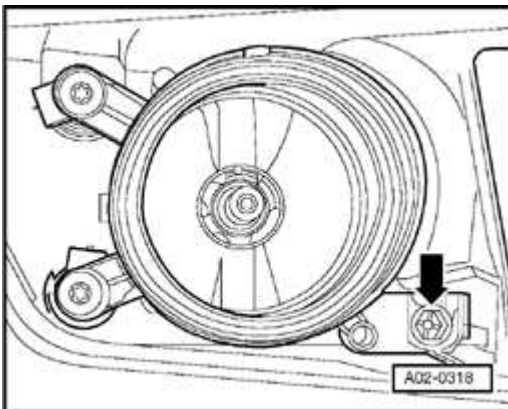


Fig. 90: Identifying Air Duct Grille, Bumper, And Adjustment Screw

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove air duct grille on inner side of bumper - **arrow** -.
- To change lamp range, turn adjustment screw - **arrow** -. Lateral adjustment is not possible.

NOTE:

- Right fog light is shown in illustration. Adjusting screw on left fog light is arranged symmetrically.

Other additional headlamps:

Accessory auxiliary headlamp systems must be checked and adjusted according to the guidelines valid for them.

Deactivate transport mode

Transport mode can be activated in instrument panel insert and in radio.

Transport mode activated in instrument cluster has the following effects in comfort system central module.

- SAFE LED in doors is no longer controlled
- Interior light, footwell lights and luggage compartment lights can no longer be switched on at terminal 15.
- At terminal 15, interior light is switched on for a maximum of 30 seconds when a door is opened.
- Anti-theft system (DWA) can no longer be armed. If anti-theft system is already armed, transport mode is ignored and only accepted after anti-theft system is deactivated.

Transport mode activated in Chorus, Concert, Symphony and Navigation Plus (RNSD with CD) radio has the following effects.

- Device does not draw any current and cannot be operated.

NOTE:

- K-lead adapter VAS 6017B must be used.
- Transport mode can be reset in Navigation Plus (RNSD with DVD).

Deactivate transport mode using guided fault finding or guided functions.

- Follow these steps in sequential order.

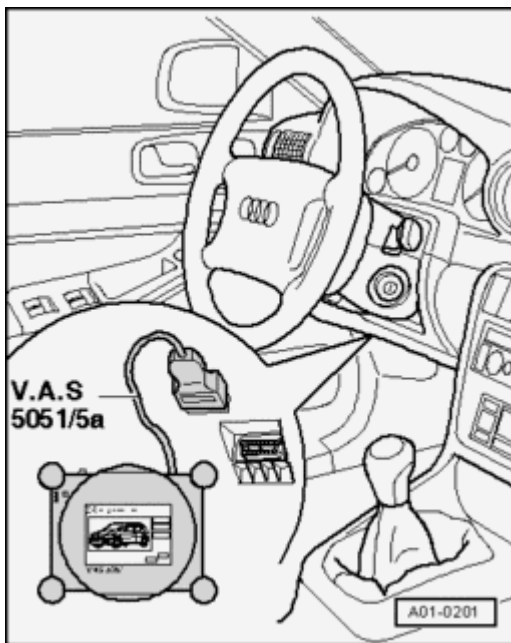


Fig. 91: Connecting Data Link Connector (DLC)
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Connect VAS 5051/5052
- Use auxiliary K-lead adapter VAS 6017B
- Guided Fault Finding or Guided Functions

- Go to - function/component selection
- Service work
- Transport mode, activating/deactivating
- Now follow guided program

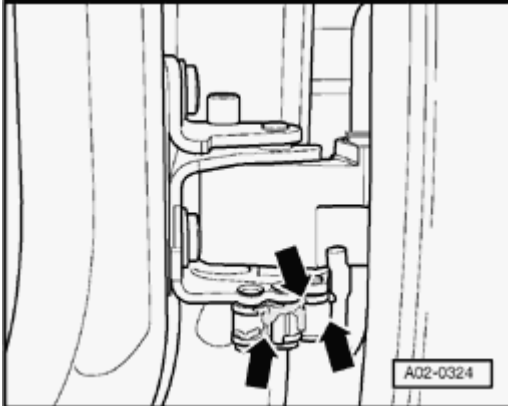
Door arrester and lock cylinder: Lubricate

Fig. 92: Identifying Greasing Points For Door Latches

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- lubricate door latches only at lubrication points shown - **arrows** -.
- Lubricant: "G 052 778 A2"
- Lubricate lock cylinder.
- Lubricant: "G 052 778 A2"

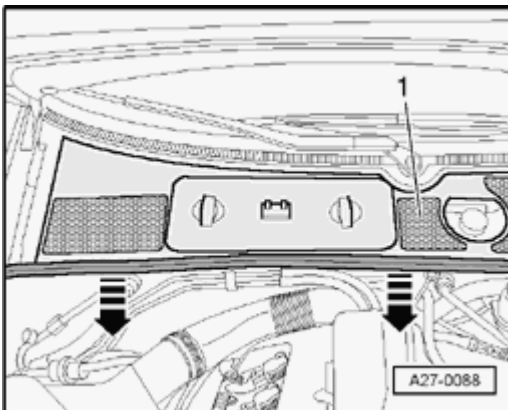
Plenum chamber cover: Removing

Fig. 93: Identifying Plenum Chamber Cover & Removing Rubber Seal

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove plenum chamber cover rubber seal in direction of - **arrow** -.
- Remove plenum chamber cover - **1** - forward.

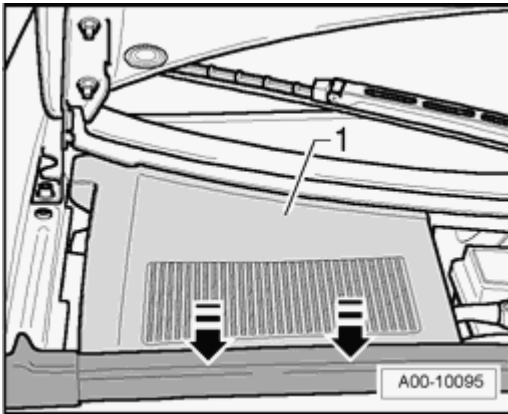


Fig. 94: Identifying Plenum Chamber Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

On vehicles from VIN >8E Z 5 A 400 001

- Remove plenum chamber cover rubber seal in direction of - **arrow** -.
- Remove plenum chamber cover - **1** - forward.

Telematics: Emergency battery, replacing

NOTE:

- **Emergency battery should be replaced every 4 years on vehicles with Telematics.**

Telematics control module is located in right footwell E-box (passenger side, below floor covering).

- Lower A-pillar trim, removing and installing; Floor covering, raising: --> - **70 - INTERIOR TRIM**

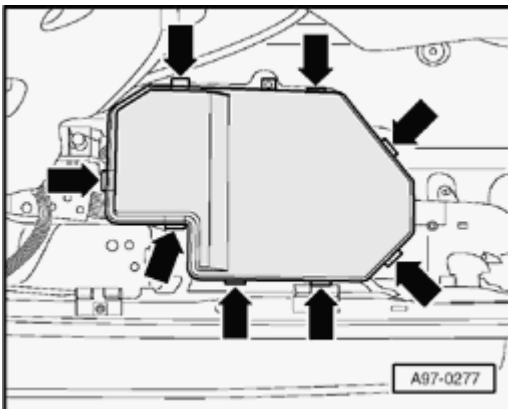


Fig. 95: Identifying Passenger Side Electronics Box Cover
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Release passenger side electronics box cover - **arrows** -.
- Remove Telematics control module from E-box (do not disconnect control module).

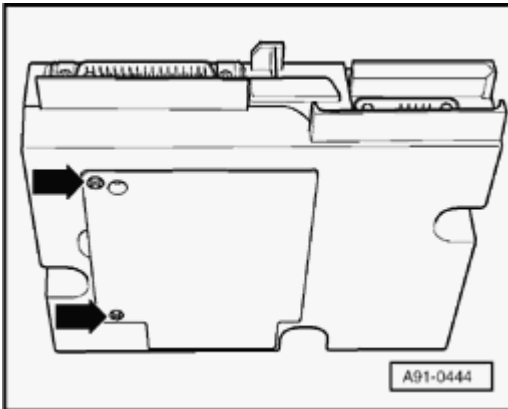


Fig. 96: Identifying Screws On Bottom Side Of Telematics Control Module
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both screws - **arrows** - on bottom side of Telematics control module and remove cover.

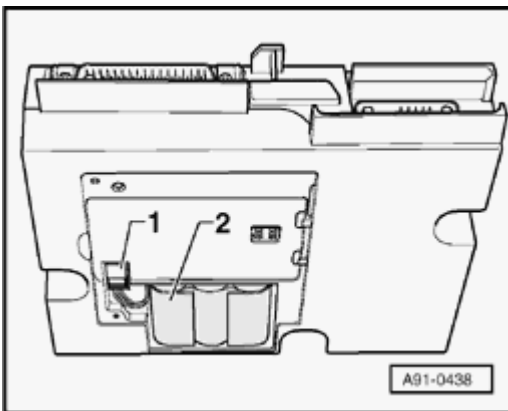


Fig. 97: Identifying Connector And Emergency Battery
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Disconnect connector - **1** - and remove emergency battery - **2** -.
- Perform installation in reverse order of removal.

Note before disconnecting battery.

WARNING: Activate Telematics control module Service Mode before disconnecting battery.

Vehicle Diagnostic, Testing and Information System VAS 5051; Guided Fault Finding; Adaptation;
Telephone/Telematics

NOTE:

- Retrieve radio/navigation unit anti-theft coding before disconnecting battery.
- If battery is reconnected, activate vehicle equipment (radio/navigation, clock, electric windows, engine) according to operating instructions and deactivate Telematics control module service mode. Vehicle Diagnostic, Testing and Information System VAS 5051; Guided Fault Finding; Adaptation; Telephone/Telematics

Transport protection: Remove front and rear strut transportation protection devices

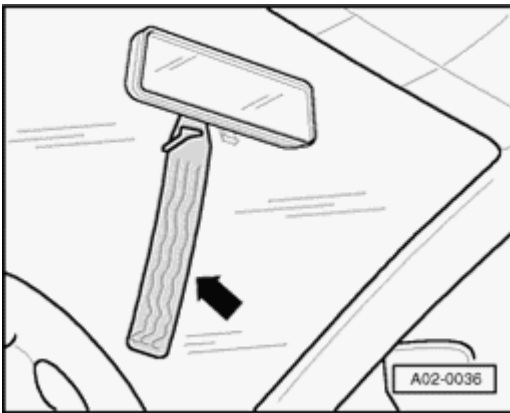


Fig. 98: Identification Tag Attached At Mirror

Courtesy of VOLKSWAGEN UNITED STATES, INC.

For some models the front and rear suspension struts have transportation protection devices installed. These models can be identified by a tag attached at the mirror - **arrow** -.

- Release coil spring (for example, put vehicle on lift)

NOTE:

- It is not necessary to remove the wheels.
- Be careful not to damage surface of coil springs.

Remove transportation protection devices --> Front strut

Front strut

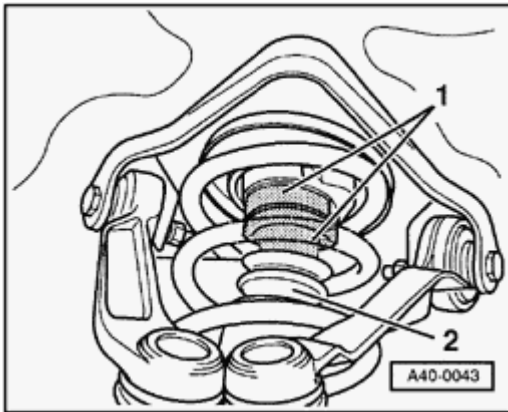


Fig. 99: Identifying Auxiliary Strut, And Transportation Protection Devices
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull auxiliary strut - 2 - downward.
- Remove 2 transportation protection devices at each strut - 1 -.
- Install auxiliary strut - 2 - by sliding up in spring retainer.

Rear strut

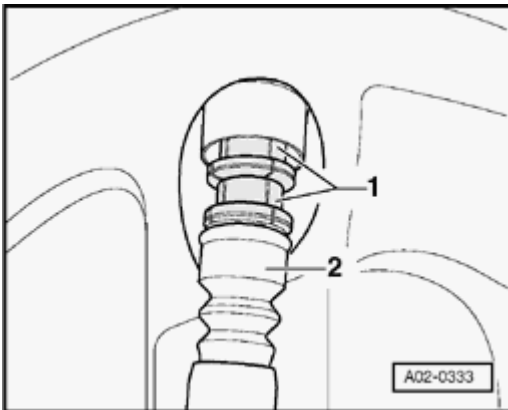


Fig. 100: Identifying Auxiliary Strut, And Transportation Protection Devices
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Pull auxiliary strut - 2 - downward.
- Remove 2 transportation protection devices at each strut - 1 -.
- Install auxiliary strut - 2 - by sliding up in spring retainer.

Underbody protection: Visual inspection for damage

- When inspecting visually, observe underbody, wheel housings and sills!

WARNING: Malfunctions found must be rectified (repair measure).

Winter tires from factory

On vehicles that were delivered from factory with winter tires, check for correct pressure during delivery inspection.

The excessive speed warning sticker should be placed in drivers field of vision.

Timing belt: Replacing**4-cyl. 5V engines 1.8L Turbo**

- Toothed belt, removing and installing --> - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK**

4-cyl. 5V engines 2.0L

- Toothed belt, removing and installing: --> - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK**

4-cyl. 4V engines 2.0L TFSI

- Toothed belt, removing and installing: --> - **13 - ENGINE - CRANKSHAFT, CYLINDER BLOCK**

6-cyl. 5V engines 3.0L;

- Toothed belt, removing and installing: --> - **13 ENGINE - CRANKSHAFT, CYLINDER BLOCK**

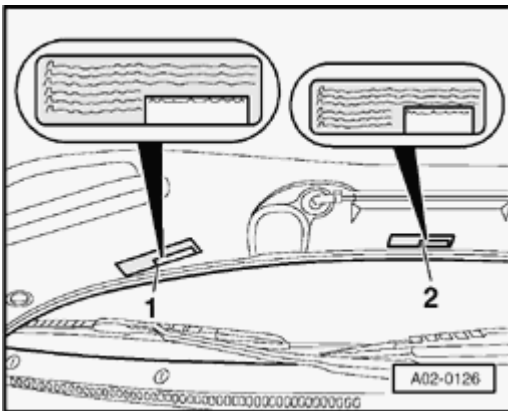
Toothed belt change, filling out sticker - all

Fig. 101: Locating Toothed Belt Change Sticker At Rear Of Engine Compartment

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Fill out toothed belt change sticker - 2 - at rear of engine compartment, attach new sticker if necessary.

Spark plugs: Replacing**Necessary special tools**

- Spark plug wrench 3122 B

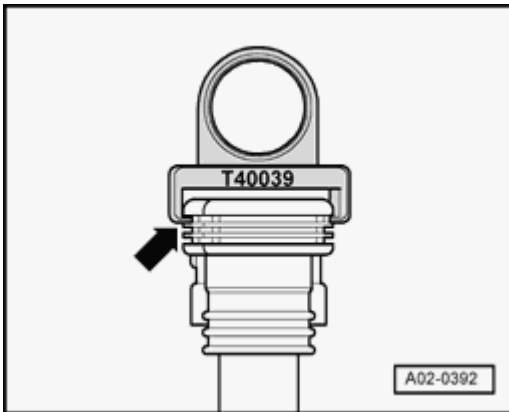


Fig. 102: Placing Ignition Coil Puller T40039 On Top Most Thick Rib Of Ignition Coils
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Ignition Coil Puller T40039

WARNING: Place Ignition Coil Puller T40039 on top rib - arrow - of ignition coil and pull this from spark plug. Placing on bottom rib can cause damage.

NOTE:

- Plug designation --> -
 - 28 IGNITION/GLOW PLUG SYSTEM for 1.8 LITER 4-CYL. 5V TURBO FUEL INJECTION & IGNITION, ENGINE CODE(S): AMB
 - 28 - IGNITION/GLOW PLUG SYSTEM for 2.0 LITER 4-CYL. 4V TURBO FUEL INJECTION IGNITION, ENGINE CODE(S): BPG, BWT
 - 28 IGNITION/GLOW PLUG SYSTEM for 3.0 LITER 6-CYL. 5V FUEL INJECTION & IGNITION, ENGINE CODE(S): AVK, BGN
 - 28 - IGNITION SYSTEM for 3.2 V6 4V FUEL INJECTION IGNITION, ENGINE CODE(S): BKH
 - 28 - IGNITION/GLOW PLUG SYSTEM for 4.2 LITER V8 4V FUEL INJECTION AND IGNITION, ENGINE CODE(S): BNS
 - 28 IGNITION/GLOW PLUG SYSTEM for 4.2 LITER V8 5V FUEL INJECTION AND IGNITION, ENGINE CODE(S): BHF
- Observe waste disposal regulations!

4-cyl. 5V engines 1.8L Turbo --> 4-cyl. 5V engines 1.8L Turbo:

4-cyl. 5V engines 2.0L and 2.0L TFSI --> 4-cyl. 5V engines 2.0L and 2.0L TFSI

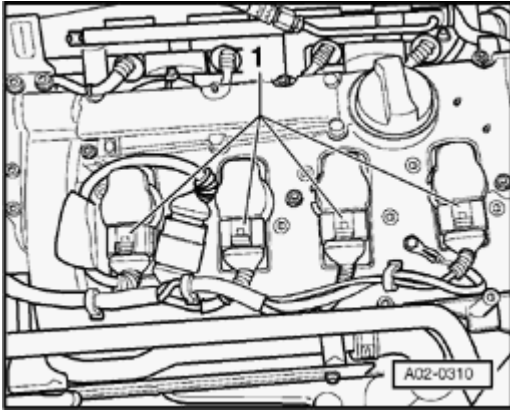
6-cyl. 3.0L and 3.2L FSI 5V engines --> 6-cyl. engines 3.0L and 3.2L FSI:

8-cyl. 4.2L MPI 5V engines --> 8-cyl. engines 4.2L MPI.

8-cyl. 4.2L 5V engines (RS4) --> 8-cyl. engines 4.2L (RS4)

4-cyl. 5V engines 1.8L Turbo:

- Remove engine cover --> **Engine cover: Removing.**
- Switch ignition off.

**Fig. 103: Identifying Connectors At Spark Plugs**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove connector - **1** - at spark plugs.
- Push connector - **1** - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

4-cyl. 5V engines 2.0L and 2.0L TFSI

- Switch ignition off.
- Remove engine cover (if present) --> **Engine cover: Removing**

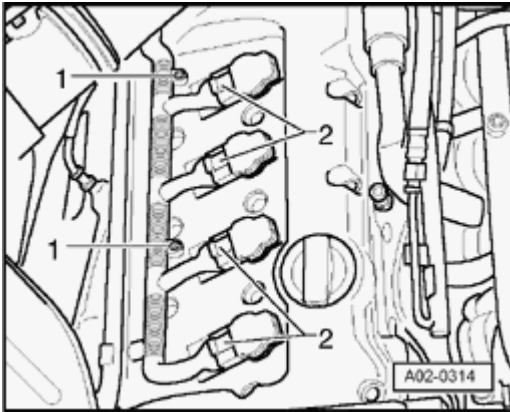


Fig. 104: Identifying Bolts And Connectors

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - **1** -.
- Push connector - **2** - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- **Push ignition coils by hand into intended resources in cylinder head cover.**

6-cyl. engines 3.0L and 3.2L FSI:

- Switch ignition off.
- Remove engine cover (if present) --> **Engine cover: Removing.**

Right cylinder bank

- Remove upper part of air filter --> **4-cyl. 1.8L 5V Turbo engines:.**

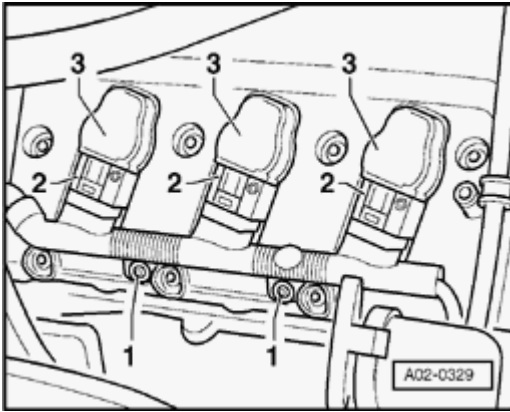


Fig. 105: Identifying Bolts, Connector, And Ignition Coil
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Left cylinder bank

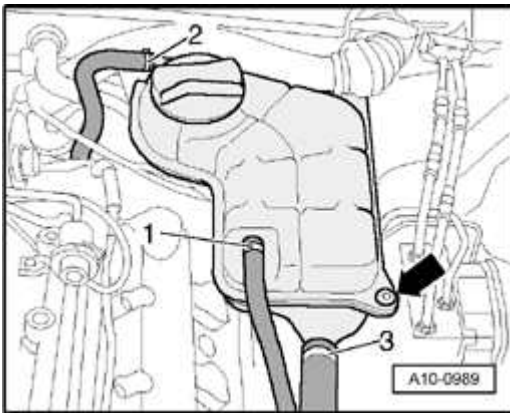


Fig. 106: Removing Coolant Hoses
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.

- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

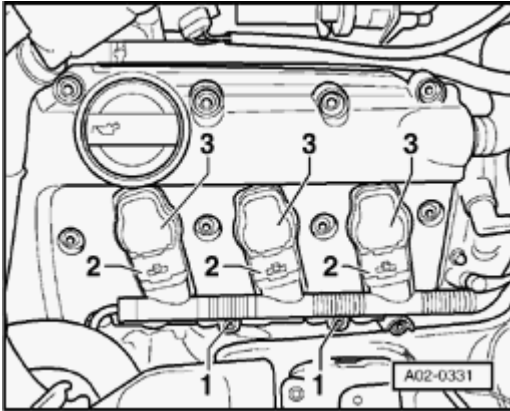


Fig. 107: Identifying Bolts, Connector, And Ignition Coil
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - **1** -.
- Push connector - **2** - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - **3** - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

8-cyl. engines 4.2L MPI

- Switch ignition off.

Right cylinder bank

- Remove upper part of air filter --> **Air cleaner: Clean air filter housing and replace filter.**

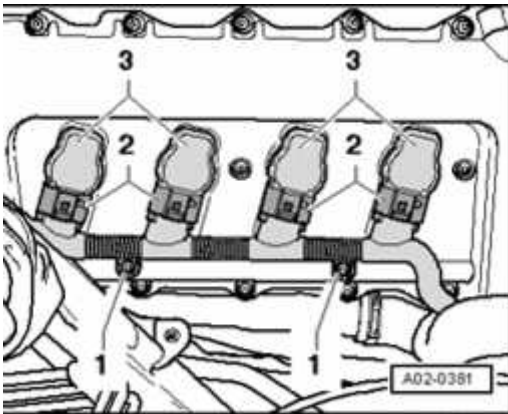


Fig. 108: Identifying Bolts, Connector, And Ignition Coil
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Left cylinder bank

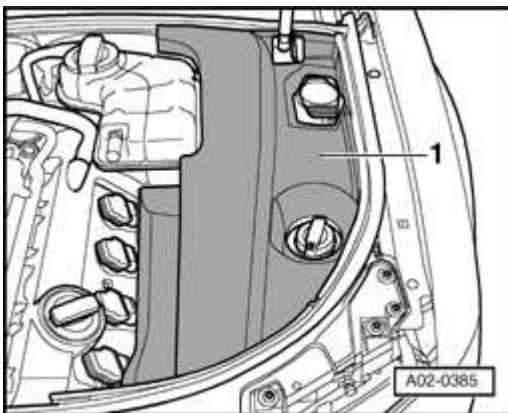
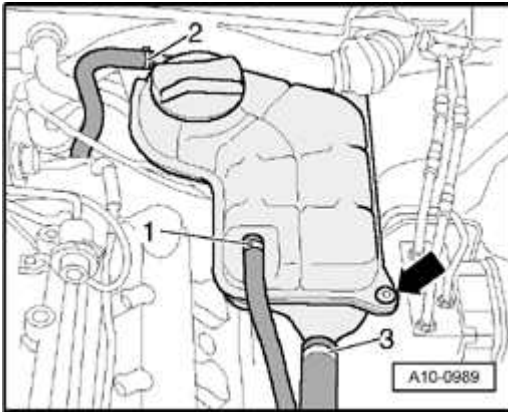


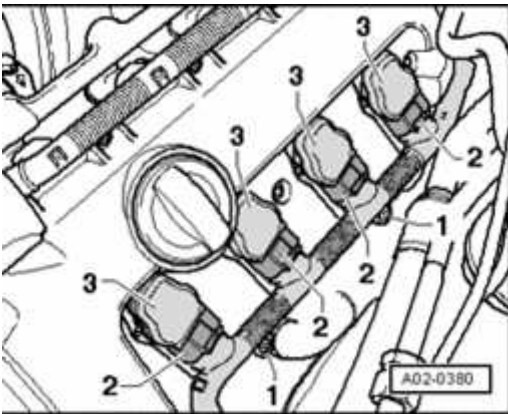
Fig. 109: Removing Cover Upward
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover upward.

**Fig. 110: Removing Coolant Hoses**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.
- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

**Fig. 111: Identifying Bolts, Connector, And Ignition Coil**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

8-cyl. engines 4.2L (RS4)

- Switch ignition off.

Right cylinder bank

- Remove upper part of air filter --> **Air cleaner: Clean air filter housing and replace filter.**

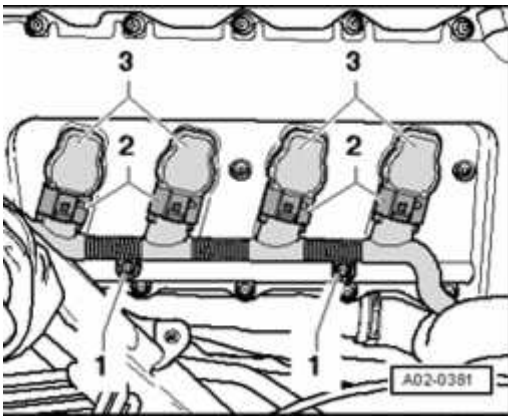


Fig. 112: Identifying Bolts, Connector, And Ignition Coil
Courtesy of VOLKSWAGEN UNITED STATES, INC.

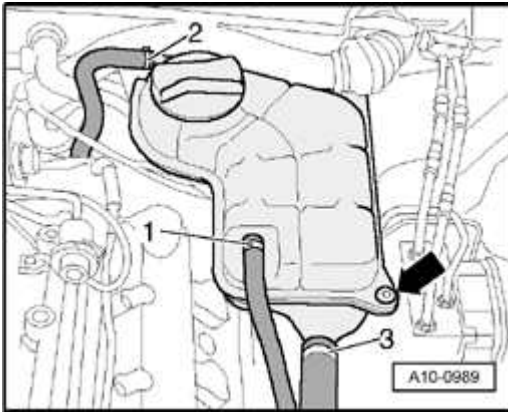
- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

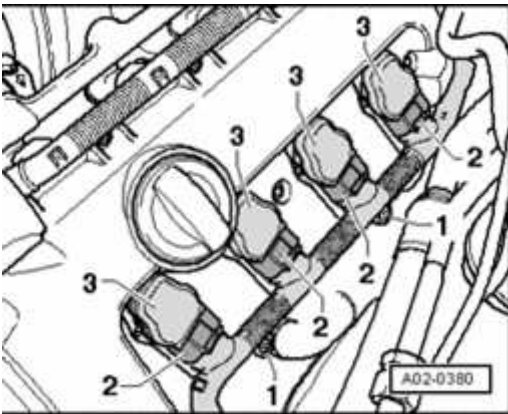
- Push ignition coils by hand into intended resources in cylinder head cover.

Left cylinder bank

**Fig. 113: Removing Coolant Hoses**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove coolant reservoir -arrow-.
- Tie aside coolant reservoir with coolant hoses 1 to 3 connected.

**Fig. 114: Identifying Bolts, Connector, And Ignition Coil**

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove both bolts - 1 -.
- Push connector - 2 - toward ignition coil, press on catch with hand and remove connector.
- Remove ignition coil - 3 - from spark plug using Ignition Coil Puller T40039.
- Remove spark plugs using spark plug wrench T40039.
- Install new spark plugs.

Tightening torque	Nm
Spark plugs in cylinder head	30

NOTE:

- Push ignition coils by hand into intended resources in cylinder head cover.

Headlights: Aiming using Hella Universal Beamsetter IV**Service**

Align vehicle headlights using the Hella Universal Beamsetter IV VAS 5107 and the following procedure:

Additional instructions and diagrams Instruction Manual for the Hella Beamsetter Series IV

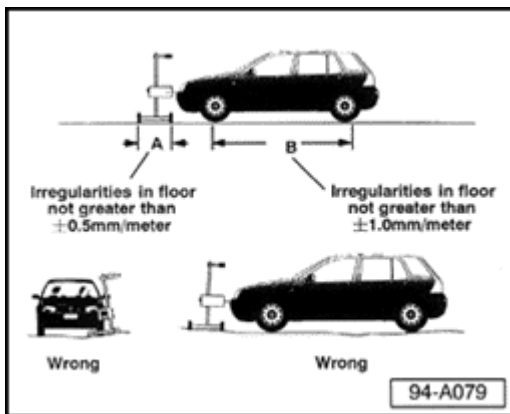


Fig. 115: Identifying Floor Surface Specifications For Vehicle
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Position vehicle on a flat floor surface that meets the following (ISO 10640) specifications:
 - 0.5mm or less slant from front wheel to back wheel of the Hella Universal Beamsetter IV VAS 5107 - **A** -
 - 1mm or less slant per meter for the length of the vehicle - **B** -.
- Clean headlight lenses.
- Adjust vehicle tire pressure to specifications.

Have a second technician sit in the drivers seat while aligning the headlights.

- Bounce front and rear of vehicle up and down several times to settle vehicle suspension.

Setting low beam alignment of drivers side headlight

- Move Hella Universal Beamsetter IV VAS 5107 into position in front of the vehicle so it is aligned with the vehicle and Hella Universal Beamsetter IV VAS 5107 is 30 to 70cm (12 to 28 in.) from the drivers side headlight.
- Switch headlights ON in low beam position.
- Align Hella Universal Beamsetter IV VAS 5107 so it is centered on the headlight (align vertically then horizontally).

NOTE:

- Use the arrows on the Hella Universal Beamsetter IV VAS 5107 housing as

a guide.

- You may want to use a straight edge or tape measure, because alignment must be within 3cm (1.2 in.) of the center of the headlight.
- Without moving the Hella Universal Beamsetter IV VAS 5107 , slide Broad-band sight toward center of vehicle (Broad-band sight can also be moved up and down for a better position).

Use Broad-band sight to make final alignment of Hella Universal Beamsetter IV VAS 5107 to vehicle by:

- Loosening hand-wheel that locks column in place.
- Sighting down through the slit in the Broad-band sight and rotating Hella Universal Beamsetter IV VAS 5107 and column until two similar points on vehicle are aligned

NOTE:

- Try using corners of the headlight housings or two screws that are the same height and as far apart as possible on the vehicle.
- Carefully tighten hand wheel without changing Hella Universal Beamsetter IV VAS 5107 position.
- Set Inclination to 1.0 %.
- Set Hella Universal Beamsetter IV VAS 5107 "Scaled wheel" to the proper low beam inclination %.
- Adjust height (vertical) alignment first. Turn headlight height adjuster screw to align the upper edge of the flat portion of the beam with the center horizontal line of the grid on the Hella Universal Beamsetter IV VAS 5107 pattern screen.

NOTE:

- VOL is the correct beam pattern for both right and left headlights.

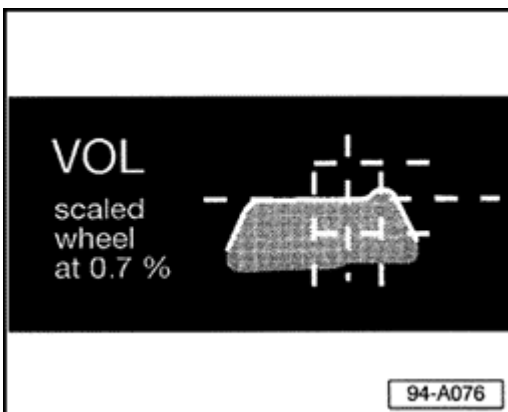


Fig. 116: Identifying Specifications For Drivers Side Headlight Beam Angle
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Adjust lateral (horizontal) alignment of drivers side headlight so that the peak (highest point) of the headlight beam pattern aligns with the right edge of the target box of the grid on the pattern screen (it

should match the VOL pattern shown on the Hella Universal Beamsetter IV VAS 5107).

NOTE:

- If the height alignment changed, readjust.

Checking drivers side headlight high beam alignment

- Switch headlights ON in high beam position.
- Realign Hella Universal Beamsetter IV VAS 5107 with the high beam headlight if necessary.

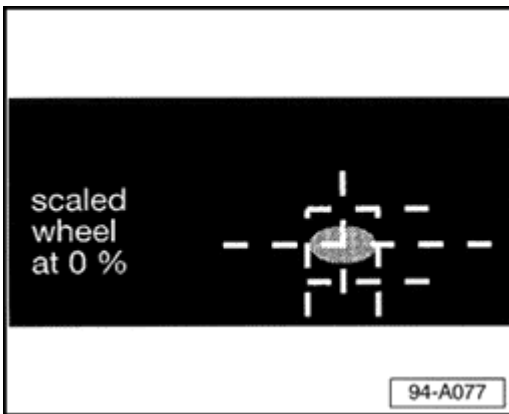


Fig. 117: Identifying Beamsetter "Scaled Wheel" At 0%
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set Beamsetter "Scaled wheel" to 0%.
- Cover low beam lamp (use hand or small piece of cardboard) and check that the "hot spot" of high beam pattern is centered on the square target box of the pattern screen.

NOTE:

- High beam pattern is built into the reflector design and cannot be adjusted separately.

If high beam pattern is way out of adjustment:

- Inspect for reflector damage.
- Replace reflector if needed.

NOTE:

- Always align headlight in the low beam position.

Aligning fog lamp

- Switch fog lamps ON.
- Align Hella Universal Beamsetter IV VAS 5107 with fog lamp (make sure it is between 30 and 70cm from the fog lamp lens).

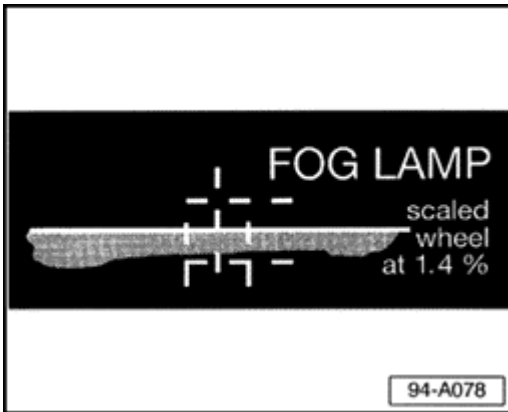


Fig. 118: Identifying Hella Universal Beamsetter IV VAS 5107 Scaled Wheel At 1.4%
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Set Hella Universal Beamsetter IV VAS 5107 scaled wheel to 1.4%.

Adjust fog lamp so the top of the beam pattern aligns with the centerline of the target grid on the beam pattern screen.

Passengers side headlight, alignment

- Move Hella Universal Beamsetter IV VAS 5107 to the passenger side of the vehicle and follow the same procedures to align the Hella Universal Beamsetter IV VAS 5107 to the headlamp.
- Align headlight low beam, check high beam and align fog lamp.

NOTE:

- Make sure to reset the Hella Universal Beamsetter IV VAS 5107 "Scaled wheel" to the proper setting each time you change from low beam to high beam or to fog lamp.
- Ensure that headlights and vehicle body are clean and free of fingerprints.

RAPGARD: Inspection, removal and disposal

From my 2002

Service

Within 48 Hours after arrival at Dealer:

Inspection

- Inspect RAPGARD for damage or peeling.

If RAPGARD is disturbed (dented, scratched, etc.):

- You must note the damage on the Carrier Delivery Receipt, including damage type, extent and location.

Failure to note damage on the Carrier Delivery Receipt will result in non-payment of the repair.

NOTE:

- **RAPGARD must be removed from the vehicle no later than six months after application. See sticker (location on vehicle body varies) for detailed information.**

Within 72 Hours prior to delivery to the Customer:

- Remove RAPGARD from vehicle.
- Wash vehicle exterior.
- Inspect paint surfaces, moldings and glass.
- Protect the paint surface of all new vehicles by applying 3M Perfect-It Paste Wax (3M Part No. 39526) or equivalent.

Removal

- Vehicle must be at room temperature.
- The ideal body surface temperature for RAPGARD removal is 60 ° F (15.5 ° C) to 80 ° F (26.6 ° C).

If body surface temperatures are below 60 ° F (15.5 ° C) or above 80 ° F (26.6 ° C) then:

- Removal procedure should be performed indoors after surface temperatures have been allowed to stabilize within the given range.
- Rinse vehicle thoroughly with water to remove surface dirt or dust and to help stabilize body surface temperatures.
- Starting at the corners of each panel, carefully remove RAPGARD from vehicle.

RAPGARD, paint inspection after removal

- Inspect painted surfaces under one of the following lighting conditions:
- Indoors under fluorescent lighting.
- Outdoors under bright sunlight.

Important!

If any defects on the exterior have been identified (scratches, dings, dents and other types of body damage):

- Contact your Service Manager and arrange to repair defects immediately.

NOTE:

- **After removal of RAPGARD, some vehicles may exhibit temporary paint discoloration or paint swelling (caused by trapped moisture under the RAPGARD).**

- This temporary swelling is caused by the paint finish absorbing moisture trapped under the RAPGARD film.
- This swelling will disappear with exposure to the sun or heat lamps within 2 - 3 hours. Severe Paint swelling may require 2 - 3 days to recover.

DO NOT buff or refinish paint for this condition!

Adhesive residue removal

WARNING: Always read and follow manufacturer Cautions and Warnings regarding use of product.

If RAPGARD adhesive residue remains on paint finish, remove with a non-abrasive polishing product such as, (3M Part No. 5995) light colors or (3M Part No. 5996) dark colors or equivalent.

Thick lines of adhesive residue can be removed with general purpose adhesive cleaner (3M Part No. 08987-aerosol, or Part No, 08984-qt. can) or equivalent.

NOTE:

- Paint discoloration (looks like shaded or dark magic marker lines) can be removed with a heat gun using the following procedure:
- Hold heat gun approximately 3 in. away from affected paint surfaces and apply heat using slow oscillating motions until discoloration is gone.
- If discoloration remains, wipe the heated area with Isopropyl alcohol and repeat procedure to increase surface drying.

Important!

After inspecting and removing RAPGARD, washing vehicle, inspecting and repairing any defects in paint surfaces, moldings and glass:

- Protect the vehicle paint surface by applying 3M Perfect-It Paste Wax (3M Part No. 39526) or equivalent.

RAPGARD Disposal

RAPGARD can be disposed as normal paper waste. If unsure about proper disposal procedures in your area, check local regulations.

TYPE PLATE / VEHICLE IDENTIFICATION NUMBER (VIN)

Type plate / Vehicle Identification Number (VIN)

Meaning of Vehicle Identification Number (VIN):

WAU	ZZZ	8E	Z	1	A	000 520
12:49:52 AM			Page 96			

Manufacturer-code	Filler characters	Model	Filler characters	Model year 2001	Production location	Serial number
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Vehicle data sticker

The vehicle data sticker is in the customers service schedule and in the vehicle in the spare wheel recess or on the luggage compartment floor.

- NOTE:
- Service plan vehicle data plate is located in spare wheel well on "Avant vehicles". Vehicle data plate that remains in vehicle is located under rear seat bench.

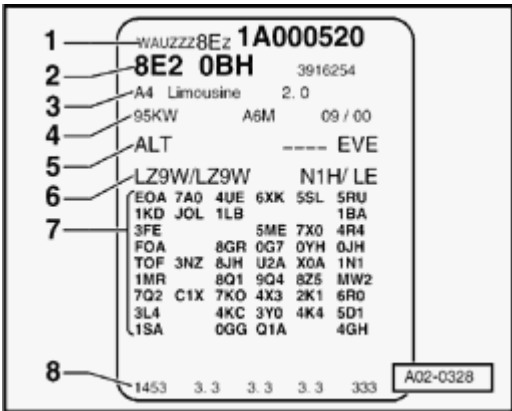


Fig. 119: Identifying Vehicle Data Sticker
 Courtesy of VOLKSWAGEN UNITED STATES, INC.

Sticker contains the following vehicle data:

Engine code and engine identification

- NOTE:
- The "engine code" is on the vehicle data sticker in the service schedule and in the spare wheel recess or on the luggage compartment floor.

4-cyl. - 2V gasoline engine:

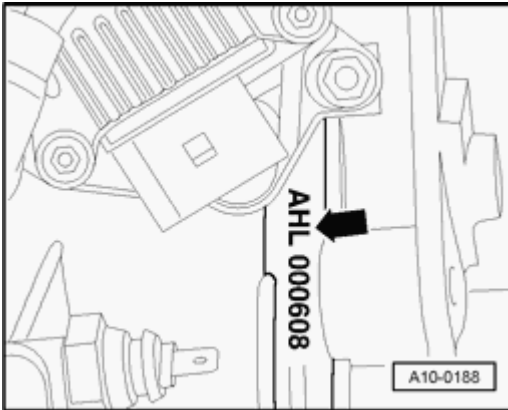


Fig. 120: Identifying Engine Number Is Located At Left Of Engine/Transmission Connecting Point
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left of engine/transmission connecting point.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. - 5V gasoline engine 1.8L Turbo:

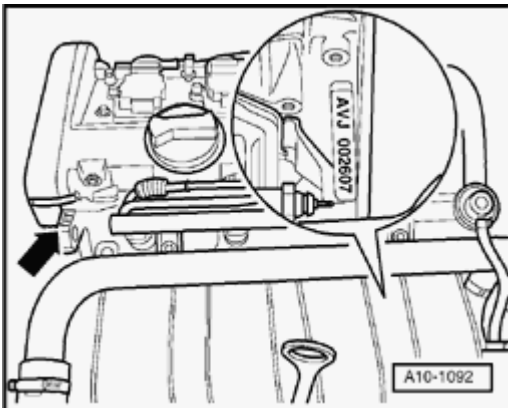


Fig. 121: Identifying Engine Number On Left Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left of cylinder block.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. - 5V gasoline engines 2.0L:

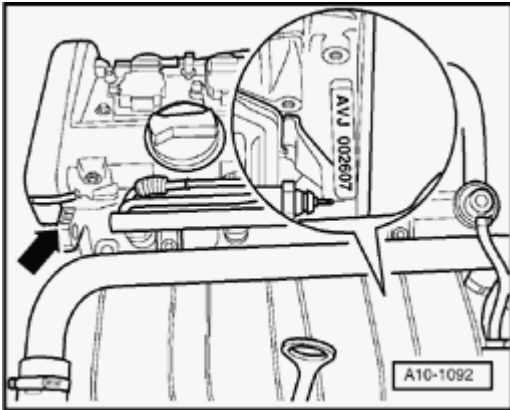


Fig. 122: Identifying Engine Number On Left Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left of cylinder block.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

4-cyl. - 2.0 TFSI engines:

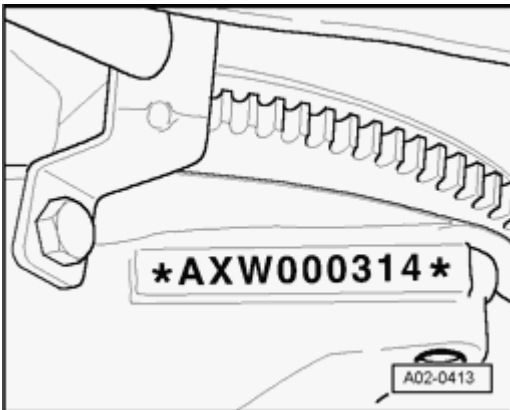


Fig. 123: Identifying Engine Number Stamped On Engine Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped onto engine block - **arrow** -

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

V6 3.0 gasoline engines:

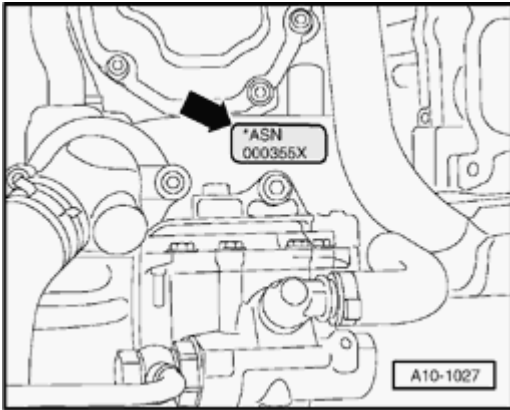


Fig. 124: Identifying Engine Code Stamped On Right Inner Side Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped on right inner side of cylinder block between cylinder head and hydraulic pump.

A sticker with "engine code" and "serial number" is also attached to toothed belt guard.

V6 3.2 gasoline engines:

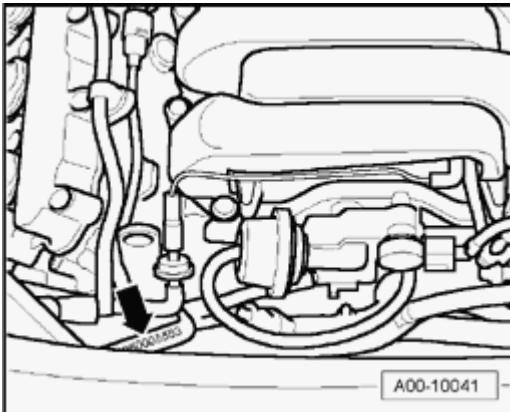


Fig. 125: Identifying Engine Number On Left Front Of Cylinder Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is located at left front of cylinder block - **arrow** -.

V8 gasoline engines:

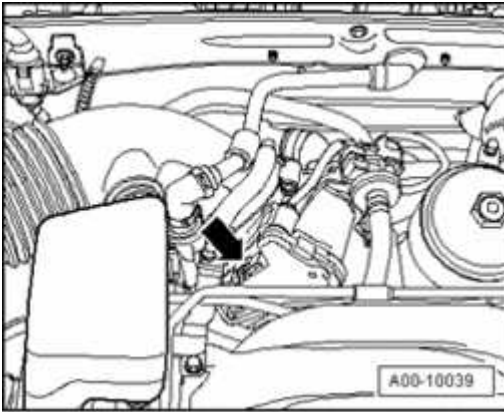


Fig. 126: Identifying Engine Number Stamped On Engine Block
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped onto engine block - **arrow** -

V8 gasoline engines RS4

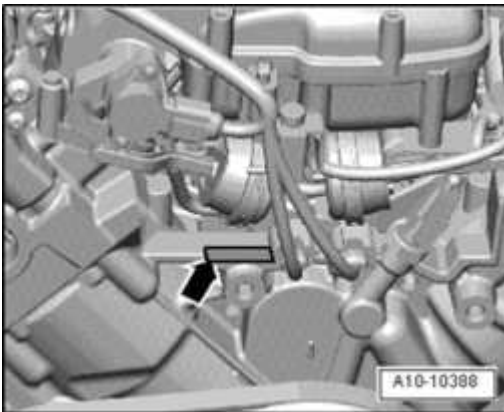


Fig. 127: Locating Engine Number
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Engine number ("engine code" and "serial number") is stamped onto engine block - **arrow** -

VEHICLE, LIFTING

Vehicle, lifting

WARNING:

- Before driving on to a hoist ensure there is sufficient clearance between low lying vehicle components and hoist.
- Before driving a vehicle onto a lifting platform it must be ensured that the vehicle weight does not exceed the permissible lifting capacity of the platform.
- Vehicle may only be lifted at points indicated in illustration in order to avoid damaging vehicle floor pan and to prevent vehicle from

tipping.

- **Never start engine and engage a gear with vehicle lifted so long as even one wheel has contact with the floor. There is a risk of an accident if this is not observed!**
- **If work is to be performed under vehicle it must be supported by suitable stands.**

Floor jack

Always use a suitable rubber or wooden block between the jack and the vehicle.

A floor jack must be attached only at the mounting points depicted in the illustration.

Do not lift the vehicle at the engine oil pan, transmission, or on front or rear axles as serious damage may result.

Lifting points for lifting platform and floor jack

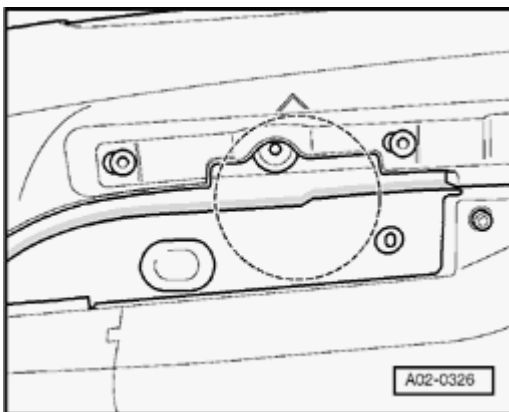


Fig. 128: Identifying Front Side Member Vertical Stiffener
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Front:

At side member vertical stiffener in area of marking for onboard vehicle jack.

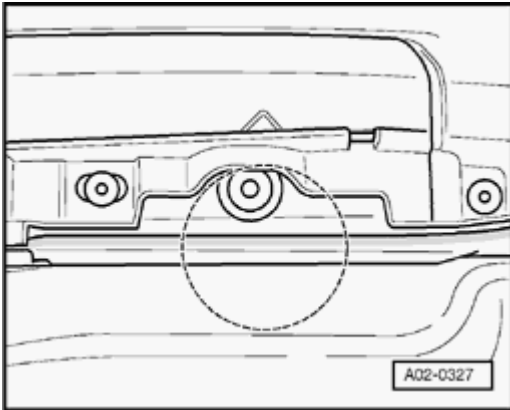


Fig. 129: Identifying Rear Side Member Vertical Stiffener
Courtesy of VOLKSWAGEN UNITED STATES, INC.

Rear:

At side member vertical stiffener in area of marking for onboard vehicle jack.

TOW STARTING/TOWING

Tow starting/towing

- Attach tow rope or bar only at following eyes:

Front towing eye

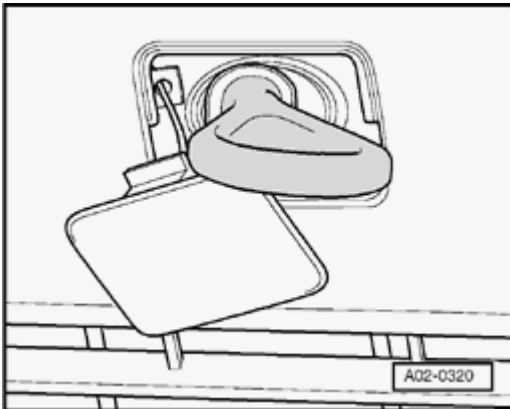


Fig. 130: Identifying Front Towing Eye
Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover from right bumper.
- Remove towing eye from vehicle tool kit compartment.
- Screw in towing eye until stop and tighten eye with wheel bolt wrench.

Rear towing eye

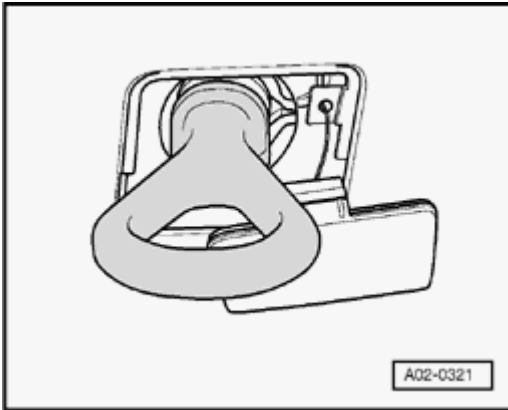


Fig. 131: Identifying Rear Towing Eye

Courtesy of VOLKSWAGEN UNITED STATES, INC.

- Remove cover from right bumper.
- Remove towing eye from vehicle tool kit compartment.
- Screw in towing eye until stop and tighten eye with wheel bolt wrench.

Remove towing eye after use and return to vehicle tool kit storage compartment. Towing eye must always be in vehicle.

NOTE:

- The tow-rope should be able to stretch to reduce the risk of damage to both vehicles. It is advisable to use synthetic fiber ropes or ropes of similar elastic material only. However, it is safer to use a tow-bar!
- Avoid excessive towing effort and do not jerk. During towing operations on unsurfaced roads there is always a danger that the attachment points will be overstressed and damaged.
- Vehicle towing should only be done if it is not possible to start the engine with the starting assist cable.

If the vehicle must ever tow or be towed, observe the following:

- Regulations concerning towing must be observed.
- Both drivers must be familiar with the specifics of towing procedures. Inexperienced drivers should not attempt to tow start or tow.
- When using a tow rope the driver of the towing vehicle must engage the clutch very gently when moving off and changing gear.
- The driver of the vehicle being towed must ensure that the tow rope is always taut.
- The emergency lights must be switched on both vehicles - unless local regulations differ.
- The ignition must be switched on, so that the steering wheel is not locked and the turn signals, horn, windshield wipers, and windshield washer system can be operated.
- Since the brake booster only works with the engine running, the brake pedal must be stepped on with

substantially more force when the engine is switched off.

- With the engine switched off, the power steering also does not work, increasing the amount of steering effort.
- Without lubricants in the manual transmission and/or automatic transmissions the car may only be towed with raised drive wheels.

When towing vehicles with manual transmission, observe the following:

- Before tow starting, push in clutch pedal and hold, and select gear 2 or 3.
- Switch ignition on.
- When both vehicles are moving, release clutch pedal.
- As soon as engine starts, depress clutch and move gear stick into neutral to avoid running into the towing vehicle.

NOTE:

- **Vehicles with catalytic converter (gasoline engine only) must not be started when the catalytic converter is at operating temperature and pulling the vehicle over a longer distance of more than 50 m. Otherwise unburned fuel may pass into the catalytic converter and cause damage.**
- **Tow starting vehicles with an automatic transmission is for technical reasons not possible.**

When towing vehicles with front wheel drive and automatic transmission, observe the following:

- Selector lever must be in the "N" position.
- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

For longer distances, the front end of the vehicle must be raised.

Reason: When the engine is not running the transmission oil pump is not working and the transmission is not adequately lubricated for high speeds or long distances.

Using a breakdown vehicle, the vehicle may only be towed suspended at the front.

Reason: If given a rear suspended tow, the drive shafts turn backward. This would cause the planetary gears in the automatic transmission to achieve such high RPM that the transmission would be heavily damaged within a very short time.

When towing vehicles with all wheel drive and manual transmission, also observe the following:

- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

Using a breakdown vehicle the vehicle may be towed suspended at front or rear.

NOTE:

- If normal towing of the vehicle is not possible, the vehicle must be transported with a special transporter or trailer. This is also valid for distances greater than 50 km (30 miles).

When towing vehicles with all wheel drive and automatic transmission, also observe the following:

- Selector lever must be in the "N" position.
- Do not tow vehicle faster than 50 km/h (30 mph).
- Do not tow further than 50 km (30 miles).

The vehicle must not be towed by a tow truck with front or rear axle raised.

NOTE:

- If normal towing of the vehicle is not possible, the vehicle must be transported with a special transporter or trailer. This is also valid for distances greater than 50 km (30 miles).

VEHICLE CHECKS WITHIN INSPECTION AND SERVICE FRAMEWORK**Vehicle checks within inspection and service framework**

For vehicle checks, we recommend interactive acceptance VAS 5000 and performance test stand V.A.G 1858.

Brake check

Information for checking brakes on front and all wheel drive vehicles is in the corresponding brake system repair manual.

Performance check

Perform performance check on performance test stand recommended by Audi. The corresponding correction factors for automatic transmissions and all wheel drive are provided in these test stands. Vehicles with all wheel drive may only be tested on a four-wheel performance test stand. The four-wheel performance test stand V.A.G 1858 has movable rollers in order to be able to test vehicles with different axle spacing.

Tachometer check

With the tachometer test, the vehicle wheels are driven. Vehicles with all wheel drive may only be tested on a four-wheel test stand.

Shock absorber check

Information on testing shock absorbers can be found in the suspension repair manual.