IVDB01

PETROL DOHC ENGINE
1/2 CUTAWAY MODEL

https://autoedu.lt/

https://bads.lt/

https://automotivetrainingequipment.com/

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CONTENTS

1. SAFETY REQUIREMENTS

Attention:

Before using the training board, take a look at the user manual.

Training equipment may only be used for the training purposes specified in the instructions.

The staff conducting the training (lecturer, teacher, instructor and others) must be familiar with the instructions for the training equipment, know the methods and principles of use, settings, control of the equipment.

The training staff (lecturer, teacher, instructor and others) acquaint those working and learning with the training equipment with the work safety requirements.

It is forbidden to work with educational equipment for children, unqualified staff.

It is forbidden to work with training equipment for persons under the influence of alcohol or other psychotropic substances.

It is prohibited to improve, modify or otherwise change the design of training equipment without the written consent of the manufacturer.

Do not ignore the information on possible dangers provided by the warning signs on the training equipment. Beware of the hazards indicated on the warning signs.

Before working with training equipment, check that:

- Equipment is not mechanically damaged, broken;
- All protective shields are assembled;
- All heated, rotating parts (e.g., heating plugs, pulleys, gears, etc.) are covered;
- The equipment components are free of foreign bodies;
- The training equipment is properly constructed and locked (e.g., the equipment is placed on a sufficiently solid base, the transport wheels are locked);
- During operation, the equipment will not pose any danger to those working with it and the surrounding staff;
- There are other factors not specified in the instructions that may endanger the health of personnel working with the equipment and others.

Observe during work with the equipment:

- There are no factors or processes other than those specified in the instructions that could endanger the health of personnel working with the equipment or other persons.

2. GENERAL INFORMATION

2.1. Purpose of training equipment

Educational equipment is designed for educational activities. This is a visual tool for the interpretation and demonstration of the structure and operation of various car parts, assemblies, structures, systems. The equipment is used as a teaching and learning tool for monitoring, analysing the working processes of various car systems. The equipment is prepared and manufactured in order to provide learners with maximum clarity and convenience information about the structure of the node, the composition of the system and the principle of operation.

The training equipment is designed for demonstration, training and learning of the design and structure of the internal combustion engine, the principle of operation, settings and adjustments.

2.2. Training equipment parameters

Manufacturer	Volkswagen
Model	Lupo (6E1)
Engine code	ARR
Power kW, HP	77 (105) 6200 min^{-1}
Production year	2000-2005

2.3. Transport and storage conditions

Training equipment is installed in a dedicated box. Do not overturn or lay the equipment during transport. During transport, the equipment must be protected from falling, tipping, shocks, humidity, temperature, vibration.

Put the training equipment only on a suitable, solid base (table, cupboard).

Export or import procedures must take into account the legislation in force between the countries. Import export procedures and various taxes apply to various technical fluids, oils, batteries, tires and more.

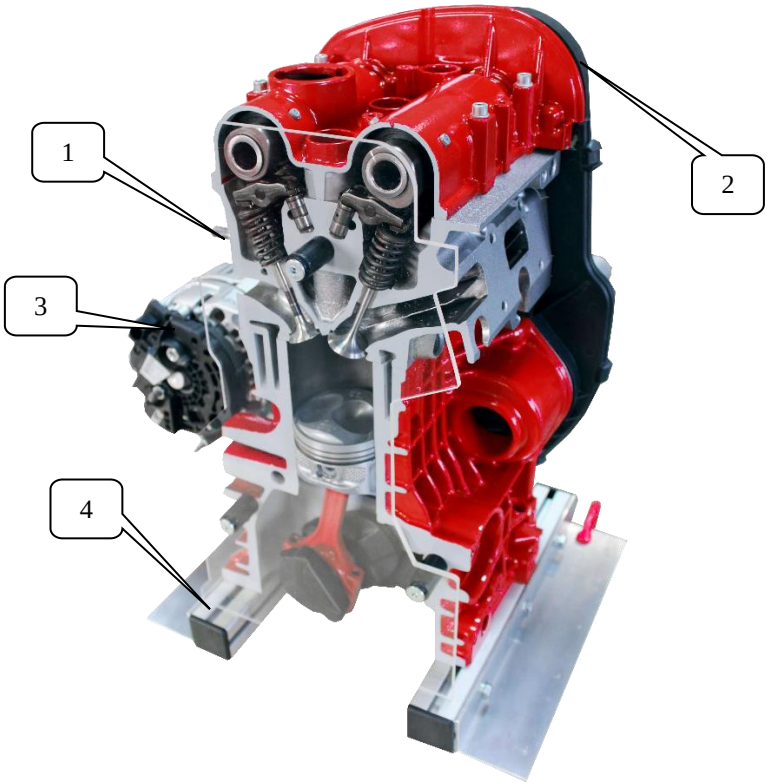
Training equipment must be stored in a room with a minimum ambient temperature of at least +10 ° C. Relative humidity not more than 60 %.

Training equipment must not be exposed to direct sunlight. Equipment must be covered by protective equipment if it is stored in a place exposed to direct sunlight.

Unused training equipment is kept completely switched off. The training stands are switched off with the control key and by disconnecting the power supply.

3. TRAINING EQUIPMENT

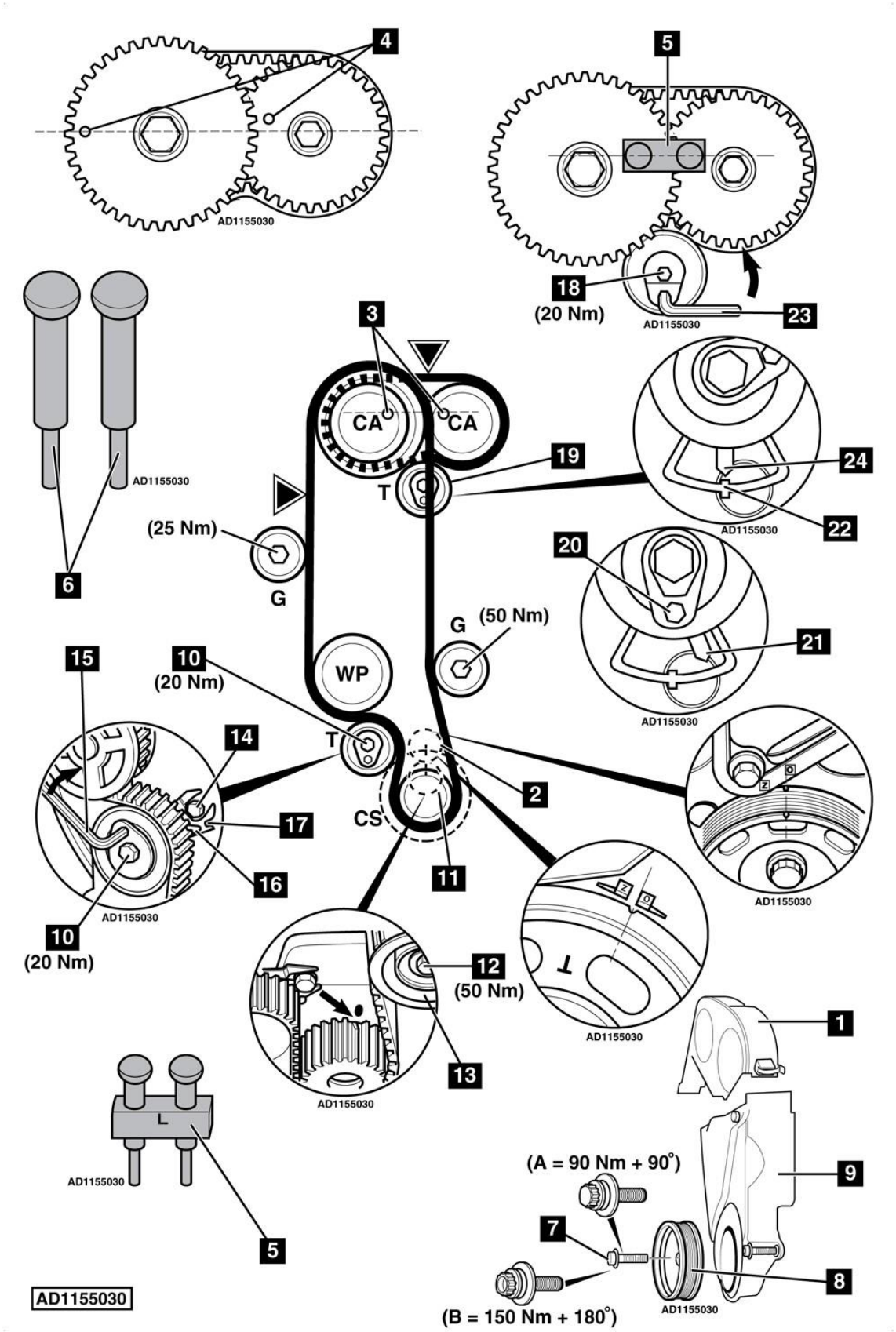
A general view and structure of the training equipment is given in the illustrations below.



Petrol DOHC engine 1/2 cutaway model

1. Engine
2. Timing belt
3. Alternator
4. Stand

Timing belt Volkswagen Lupo ARR/1.4 (6E1)



Checking intervals

Important Note

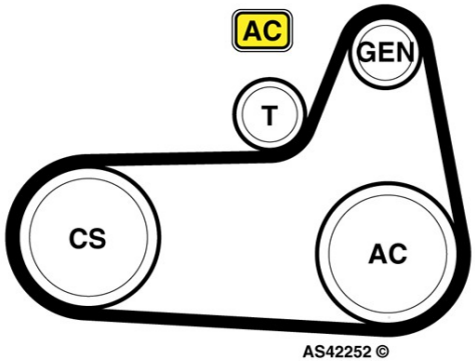
Timing belt replacement intervals quoted by the manufacturer should be regarded as the maximum. Due to variations in vehicle usage and operating conditions the belt may need to be replaced earlier than specified.

If there is any doubt as to the serviceability of the belt and its associated components, they should be replaced.

It is important that you consider the items listed in the section below and discuss them with your customer.

Annual mileage less than 10 000 miles/15 000 km
Timing belt - check/report
At 90000 km regardless of months and then every 30000 km
Annual mileage more than 10 000 miles/15 000 km
Timing belt - check/report
At 90000 km regardless of months and then every 30000 km

Auxiliary drive belt



Engine Damage

Caution: Although in the event of a timing belt failure engine damage will NORMALLY occur, a compression check of all cylinders should be performed before removing the cylinder head.

Special tools

Camshaft locking tool (except ARC/ARR/AVY) - Volkswagen No. T10016.

Camshaft locking tools (ARC/ARR/AVY) - Volkswagen No. T10074.

Crankshaft pulley holding tool (except ARC/ATN/AUS/AVY/AZD/BCB) - Volkswagen No.3415.

Crankshaft pulley holding tool pins (except ARC/ATN/AUS/AVY/AZD/BCB) - Volkswagen No.3415/1.

Crankshaft pulley holding tool (ARC/ATN/AUS/AVY/AZD/BCB) - Volkswagen No. T10028.

Special precautions

Disconnect battery earth lead.
DO NOT turn crankshaft or camshaft when timing belt removed.
Remove spark plugs to ease turning engine.

Turn engine in normal direction of rotation (unless otherwise stated).
DO NOT turn engine via camshaft or other sprockets.
Observe all tightening torques.

Timing Belt

Removal

Raise and support front of vehicle.

Remove:

- Engine upper cover.
- Air filter assembly.
- Timing belt upper cover **1**.
- RH wheel arch liner (if necessary).

Turn crankshaft clockwise to TDC on No.1 cylinder. Ensure timing marks on crankshaft pulley aligned **2**.

Ensure camshaft sprocket locating holes aligned:

- Except ARC/ARR/AVY: **3**.
- ARC/ARR/AVY: **4**.

If locating holes not aligned: Turn crankshaft one turn clockwise.

Fit locking tool(s) to camshaft sprockets:

- Except ARC/ARR/AVY: Tool No. T10016 **5**.
- ARC/ARR/AVY: Tool No. T10074 **6**.

Note: Ensure locking tool(s) located correctly in cylinder head.

Remove:

- PAS reservoir. DO NOT disconnect hoses.
- RH engine under shield.

Except Polo Classic: Support engine.

Except Polo Classic: Remove:

- RH engine mounting.
- RH engine mounting bracket.

Except Polo Classic: Lower engine until crankshaft pulley bolt accessible.

- Remove auxiliary drive belt.

Note: Mark direction of rotation on belt with chalk if belt is to be reused.

Fit crankshaft pulley holding tool:

- Except ARC/ATN/AUS/AVY/AZD/BCB: Tool Nos. 3415 & 3415/1.
- ARC/ATN/AUS/AVY/AZD/BCB: Tool No. T10028.

Slacken crankshaft pulley bolt **7**.

Remove:

- Holding tool.
- Crankshaft pulley bolt **7**.
- Crankshaft pulley **8**.

Fit two washers to crankshaft pulley bolt **7**.

Fit crankshaft pulley bolt **7**. Lightly tighten bolt.

Remove:

- Auxiliary drive belt guide pulley (models with AC).
- Auxiliary drive belt tensioner.
- Timing belt lower cover **9**.

Slacken tensioner pulley bolt **10**.
Turn tensioner pulley anti-clockwise to release tension on belt.
Remove timing belt.

Note: Mark direction of rotation on belt with chalk if belt is to be reused.

Installation
Ensure locking tool(s) fitted to camshaft sprockets:
Except ARC/ARR/AVY: Tool No. T10016 **5**.
ARC/ARR/AVY: Tool No. T10074 **6**.
Ensure timing mark on crankshaft sprocket aligned **11**.

Note: Align ground tooth on crankshaft sprocket.

Remove - ARC/ARR/AVY:
Guide pulley bolt **12**.
Guide pulley **13**.
Tighten tensioner pulley bolt finger tight **10**. Ensure baseplate is supported by bolt **14**.
Fit timing belt in anti-clockwise direction, starting at water pump sprocket.
Fit - ARC/ARR/AVY:
Guide pulley **13**.
Guide pulley bolt **12**.
Tighten guide pulley bolt **12**. Tightening torque: 50 Nm.
Turn tensioner pulley clockwise **15** until pointer **16** aligned with notch **17** in baseplate.
Tighten tensioner pulley bolt to 20 Nm **10**.
Remove locking tool(s) from camshaft sprockets:
Except ARC/ARR/AVY: Tool No. T10016 **5**.
ARC/ARR/AVY: Tool No. T10074 **6**.
Turn crankshaft two turns clockwise to TDC on No.1 cylinder. Ensure timing marks on crankshaft sprocket aligned **11**.
Ensure locking tool(s) can be inserted into camshaft sprockets:
Except ARC/ARR/AVY: Tool No. T10016 **5**.
ARC/ARR/AVY: Tool No. T10074 **6**.
Ensure pointer **16** aligned with notch **17** in baseplate. If not: Repeat tensioning procedure.
Apply firm thumb pressure to belt at ▼ . Pointer **16** and notch **17** in baseplate must move apart.
Release thumb pressure from belt at ▼ .
Turn crankshaft two turns clockwise to TDC on No.1 cylinder.
Ensure pointer **16** aligned with notch **17** in baseplate.
Remove crankshaft pulley bolt **7**.
Install:
Timing belt lower cover **9**.
Crankshaft pulley **8**.
New oiled crankshaft pulley bolt **7**.
Fit crankshaft pulley holding tool:
Except ARC/ATN/AUS/AVY/AZD/BCB: Tool Nos. 3415 & 3415/1.
ARC/ATN/AUS/AVY/AZD/BCB: Tool No. T10028.
Tighten crankshaft pulley bolt **7**. Tightening torque:

A (bolt with plain head) = 90 Nm + 90°.
B (bolt with recessed head) = 150 Nm + 180°.
Remove holding tool. Tool Nos. 3415 & 3415/1 or T10028.
Install components in reverse order of removal.
Except Polo Classic: Tighten bolts securing engine mounting bracket to engine. Tightening torque: 50 Nm.
Lupo/Polo →2002: Tighten engine mounting:
Bolts securing engine mounting to body - 20 Nm + 45°. Use new bolts.
Bolts securing intermediate bracket to engine mounting bracket - 40 Nm + 90°. Use new bolts.
Bolt securing intermediate bracket to engine mounting - 50 Nm.
Polo 2002→: Tighten engine mounting:
Bolts securing engine mounting to body - 20 Nm + 90°. Use new bolts.
Bolts securing intermediate bracket to engine mounting bracket - 30 Nm + 90°. Use new bolts.
Golf/Bora: Tighten engine mounting:
Long bolts securing engine mounting to body - 40 Nm + 90°. Use new bolts.
Short bolts securing engine mounting to body - 25 Nm.
Bolts securing engine mounting to engine mounting bracket - 60 Nm + 90°. Use new bolts.
Caddy: Tighten engine mounting:
Long bolts securing engine mounting to body - 40 Nm + 90°. Use new bolts.
Short bolts securing engine mounting to body - 20 Nm + 90°. Use new bolts.
Bolts securing engine mounting to engine bracket - 60 Nm + 90°. Use new bolts.

Exhaust Camshaft Drive Belt

Removal
Remove timing belt as described previously.
Slacken tensioner pulley bolt **18**.
Turn tensioner pulley clockwise to release tension on belt.
Remove:
Tensioner pulley bolt **18**.
Tensioner pulley **19**.
Drive belt.

Note: Mark direction of rotation on belt with chalk if belt is to be reused.

Installation
Ensure locking tool(s) fitted to camshaft sprockets:
Except ARC/ARR/AVY: Tool No. T10016 **5**.
ARC/ARR/AVY: Tool No. T10074 **6**.
Fit drive belt in clockwise direction, starting at top of inlet camshaft sprocket.
Ensure belt is taut between sprockets on non-tensioned side.
Hold tensioner pulley and turn eccentric clockwise until Allen key hole at 6 o'clock position 20.

Note: Tensioner pulley pointer at position shown **21**.

Install:
Tensioner pulley **19**.

Tensioner pulley bolt **18**.

Tighten tensioner pulley bolt finger tight **18**.

Note: Ensure lug **22** in baseplate is located in cylinder head hole.

Turn tensioner pulley anti-clockwise **23** until pointer **24** aligned with lug **22** in baseplate.

Tighten tensioner pulley bolt to 20 Nm **18**.

Fit timing belt as described previously.

Remove locking tool(s) from camshaft sprockets:

Except ARC/ARR/AVY: Tool No. T10016 **5**.

ARC/ARR/AVY: Tool No. T10074 **6**.

Turn crankshaft two turns clockwise to TDC on No.1 cylinder. Ensure timing mark on crankshaft sprocket aligned **11**.

Ensure locking tool(s) can be inserted into camshaft sprockets:

Except ARC/ARR/AVY: Tool No. T10016 **5**.

ARC/ARR/AVY: Tool No. T10074 **6**.

Ensure pointer **24** aligned with lug **22** in baseplate. If not: Repeat tensioning procedure.

Apply fi rm thumb pressure to belt at ▼ . Pointer **24** and lug **22** in baseplate must move apart.

Release thumb pressure from belt at ▼ .

Turn crankshaft two turns clockwise to TDC on No.1 cylinder.

Ensure pointer **24** aligned with lug **22** in baseplate.

Install components in reverse order of removal.

4. WARRANTY CONDITIONS

Our products meet modern technical standards. We guarantee that our product is perfectly constructed and manufactured. They operate reliably if used correctly and in accordance with the provided maintenance rules.

Educational training board is used for educational purposes and can be used only with the components and operating fluids that are fitted on the board.

The guarantee of ____ months is provided for the educational training board. The guarantee begins to run from the sale date of the stand.

In order to warrant the setting of the appropriate date of sale, we ask the buyer to save the relevant contract documents: purchase check, invoice, transfer-acceptance act, warranty card with a product name filled correctly and clearly, number, date of sale, store stamp, signature and the signature of the seller.

The warranty is not applied:

- if the user did not comply with the usage, transportation and storage conditions, used not appropriate operating fluids and aggressive cleaning agents;
- if the stand was damaged by the third parties, force majeure (fire, catastrophe etc.) or another side effect;
- for mechanical breakings and other breaches;
- for warn out parts of the stand, fuses and if non-original spare parts are used;
- when the stand is regulated, improved or remade by unauthorized persons who cannot carry out this work;
- for naturally worn parts such as collars, straps and filters;
- in case of the fluid spill;
- when using the incomplete kit;
- if extraneous objects or some water gets into the product;
- when operating incorrectly or plugging into a messy electric network.

Warranty conditions do not cover the costs related with dismantlement of the product and transportation to the authorized warranty service enterprise. Also, it does not cover consultation, actuation and adjustment work costs. If the elements necessary for repairing the board have to be ordered from the supplier, the repair work may be prolonged.

Warranty repair is done at technical service stations authorized by the manufacturer. During the warranty period defective product components are repaired or replaced free of charge. Technical service station has the right to make a decision about the repair or replacement of the components. The elements that are being changed become the property of the service station.

After completion of the warranty repairs, the guarantee is not extended but remains valid until the time limit provided. The manufacturer reserves the right to change the appearance, design and structure of the product. Service center has the right to suspend the guarantee if the stand was used for other purposes.

Warranty maintenance coupon

Name	_____
Product number	
Date of sale	
Training equipment owner	_____
Trading partner / representative	_____

Description of work performed

Data	Description of the fault and its elimination process	Technician / Signature
	_____ _____ _____ _____ _____	
	_____ _____ _____ _____ _____	
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NOTES

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