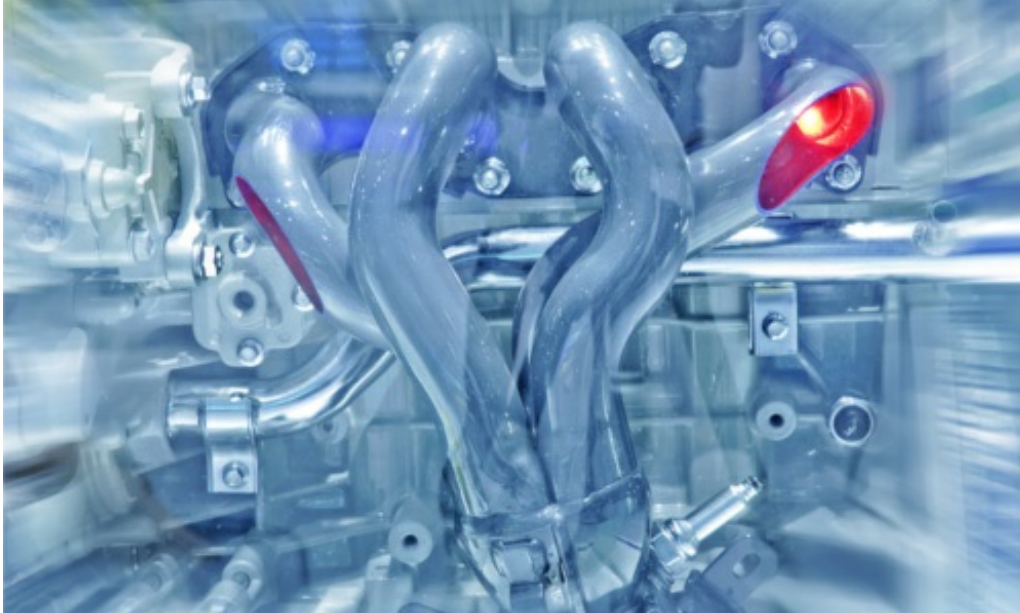




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Diesel Engine Trainers



Diesel Engine Trainers

Other than Otto's four-stroke engine, the diesel engine, developed by Rudolf Diesel in 1892, is the most important type of engine used to power all kinds of vehicles nowadays. Thanks to their superior efficiency, high torque and low revs, diesel engines have long become established for all types of vehicles. Ongoing development has also made them both quiet and clean. Diesel engines are characterised by their direct injection and unaided ignition. The power of such engines is not regulated by the volume of air but by the injected fuel. This is sometimes called quality management. A diesel motor usually operates with a lean fuel mixture. Developments over recent years have meant that normally aspirated diesel engines are largely obsolete. Modern engines are usually supercharged by means of an exhaust gas turbocharger in order to achieve optimum fuel supply.

Engine Management Trainer



Engine Management Trainer

The engine control unit is the central control element for an engine. In modern vehicles, all the engine functionality is stacked together in this one controller; it implements the entire engine management functionality. The controller obtains all the necessary information by means of its own sensors. It utilises the IPO model (input-process-output) to assess incoming data and then send out signals to operate the necessary actuators. It is necessary for trainees to understand not only the individual components but also the complex control loops involved. Understanding an engine management system is a basis for more advanced investigation of a given engine as a whole.

CarTrain



CarTrain

Please choose your product:

Changing Timing Belts in Overhead Camshaft Engines



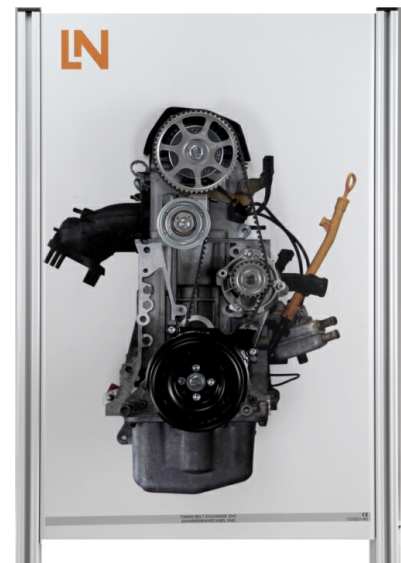
Changing Timing Belts in Overhead Camshaft Engines

Changing timing belts is one of the key jobs to be carried out when servicing vehicles with overhead camshafts. It is especially vital to maintain valve timing accurately and not to alter the positions of the cams with respect to the crankshaft. This training system teaches you the best and safest way to change a timing belt.

List of articles:

Pos.	Product name	Bestell-Nr.	Anz.
1	Changing timing belts in overhead camshaft engines	CO3221-9D	1

The training system on changing the timing belts in overhead camshaft engines provides an effective and efficient learning platform on the subject of automotive technology. Practical work, use of special tools in conjunction with an educational conception lead to outcome-oriented training. The experiment hardware comprises authentic vehicle components. The disadvantages of the lightweight construction methods used in motor vehicles are evened out by the training system itself. For instance, threads are implemented in solid steel to ensure a long service life. Students can plan the testing, maintenance and regular replacement of engine management components and then carry them out. As part of the maintenance procedure, the students will use the specified tools, machines, operational and auxiliary equipment and apply workplace safety and environmental protection regulations. They will test component modules of the engine management system for reusability. The hardware can be used for both theoretical and practical education.



Training contents:

- General engine management
- Interaction of components in an engine management system
- Interpretation of set-point data for a vehicle
- Use of set-point data for a vehicle at work
- Development of practical skills
- Use of tools and measuring instruments typical to a vehicle repair shop
- Limitation of faults and problems by the following means
 - Function testing
 - Use of human senses
- Measurement and checking of mechanical variables
- Adjustment of engine management systems
- Technical communication
- Compiling test reports, assessing and documenting
- Use of expert systems

The training system consists of the following:

- Original components, set up on an engine replacement platform made of tough steel plate
- The engine replacement platform is power coated and printed and varnished using a special process

- All threads are implemented using a tough steel design
- Adjustment of torque for consistency of crankshaft
- Adjustment equipment for drive torque and detent torque for camshaft drive

The system includes the following items:

- Engine replacement platform
- Belt pulley for external equipment
- Toothed belt pulley for crankshaft
- Water pump
- Toothed belt tensioner
- Camshaft drive
- Flat toothed belt housing

Includes:

- Training system
- Special tools
- Instruction manual

Technical data:

- Dimensions: 530 x 850 x 150 mm (WxHxD)
- Weight: 40 kg

Additionally required:

Pos.	Product name	Bestell-Nr.	Anz.
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2 10-piece tool set for "Changing timing belts" training system

ST8070-5B

1

10-piece tool set for "Changing timing belts" training system consisting of:

- Torque spanner, 1/4" with vernier scale
- 2x Double-ended ring spanner with large offset, 10/13 mm and 17/19 mm
- Connector/adapter for 1/4" to 3/8"
- 2x Socket spanner inserts, 13 mm and 19 mm, 3/8", hex
- 2x Socket spanner hex inserts, 5 mm and 6mm, 1/4"
- 50-mm extension, 1/4"
- Reversible ratchet spanner, 1/4", fine-toothed, length 145 mm
- Recess for timing belt double-holed nut spanner





Media:



Pos.	Product name	Bestell-Nr.	Anz.
3	ILA Replacement of a timing belt at a OHC engine	SO2803-1G	1

The multimedia course “Changing timing belts in overhead camshaft engines” provides a detailed description of the procedure for changing toothed belts in an engine with an overhead camshaft and explains the specific aspects in a comprehensible way. The course not only explains precisely how a timing belt works but also makes reference to the necessary theoretical background which is necessary to understand the course contents. This theory is imparted by means of numerous animations, pictures and video in a way that is easy for trainees to understand. The interactive experiments and tests of knowledge enhance and monitor the theory learned, allowing the essential diagnostic skills to be taught. Thanks to the practical educational focus of the course, the knowledge gained can be directly applied in practice. For example, the course includes diagnostic instructions for checking a belt drive when the engine is not running properly. Documentation of measurement results makes it possible for trainees to recapitulate the things they have learned in preparation for exams.



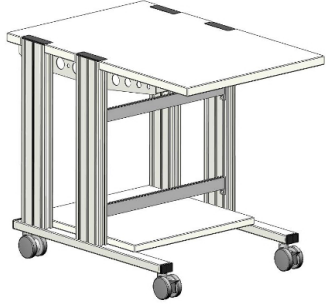
Training contents

- Fundamentals for understanding control timing
 - Valve control for a four-stroke engine
 - The meaning of timing
 - Checking timing values and belt tension
- Components of a belt drive system
 - Crankshafts and cam wheels
 - Belts
 - Tensioning pulleys
 - Auxiliary drives
- Function of a timing belt drive system
 - Benefits
 - Design of a belt drive system
 - Servicing belt drives
 - Pre-tensioning
- Diagnostic possibilities for a badly running engine
 - Checking timings
 - Checking the tensioner
 - Assessing the components

System requirements

- PC with Windows 7/Windows 8 (32-bit or 64-bit version)
- CD-ROM drive for installation of software
- USB port for connection to measuring hardware

Accessories for LN tabletop assembly:

Pos.	Product name	Bestell-Nr.	Anz.
4	Mechatronics aluminium profile carriage without table-top frame	ST7200-3R	1
	<p>This enables the combination of mechatronics sub-systems with the training panel system.</p> <ul style="list-style-type: none">• Sides made of aluminium profiles with grooves for attachment of a wide variety of add-on components (e.g. monitor holders, C-profile rails, safety and signalling equipment)• 2 Natural brushed aluminium profile rails to accommodate DIN A4 experiment panels under the table top• Inward-facing brush strips guarantee that training panels are protected and ensure that plug connections can be plugged in and out without any noise during experiments.• Suitable for use as a support for 3 HU power supply ducts• Aluminium profile with grooves for attachment of a wide variety of add-on components (e.g. PC holders, extension boards, C-profile rails)• 4 Steerable double casters, 2 with brakes• Table top 600x30x900 mm (WxHxD), base plate 525x30x525 mm made of highly compressed multi-layer chipboard conforming to DIN EN 438-1, colour light grey, with 0.8-mm slightly textured veneer (Resopal) conforming to DIN 16926• Frame with solid, impact-resistant protective edging made of 3-mm thick plastic, coloured grey RAL 7047 throughout• Coatings and glue are PVC-free• Attached 5-way socket strip with switch• Height of table top 760 mm• Supplied as a kit for self-assembly		
5	PC holder for SybaPro experiment trolleys, height/width adjustable	ST7200-5F	1

Shelf for desktop PC made of 2 mm sheet steel punched with holes, suitable for all furniture in the SybaPro aluminium profile range

- Adjustable assembly height
- for slim PCs, adjustable width (60 - 160 mm)
- Can be mounted to left or right
- Includes all equipment necessary for assembly (4 bolts and 4 tenon blocks)
- Acid-resistant epoxy-resin powder coating, 80 µm thick approx., colour RAL7047



6 **Monitor holder for flat screen monitor of weight up to 15kg / 33lbs** ST8010-4T

1

Pivoting monitor holder for attachment to aluminium profiles of furniture in the SybaPro range. Allows a monitor to be placed in the optimum position so that work and experiments are less tiring.



- Pivoting arm with two-part joint
- Quick-lock for adjustment to any height on extruded aluminium profile
- VESA fastening 7.5 x 7.5cm
- Includes VESA 75 (7.5x7.5) - VESA 100 (10x10) adapter
- 2 Cable clips
- Adequate carrying capacity 15kg / 33lbs
- TFT monitor can be turned parallel to the table edge
- Separation can be adjusted to anywhere between 105 and 480mm

Additionally included:

Cable management set for installing cables along the profiles of the aluminium lab system furniture in the SybaPro range, consisting of:

- 3 Cross cable binders for front and rear grooves of aluminium profile
- 3 Cross cable binders for side grooves of aluminium profile
- 12 Cable binders
- 4 Aluminium cover profiles for covering and enabling wires to be run along the grooves of an aluminium profile

7 **Attachment set for timing belt system on mobile trolley**

ST8010-6Q

1



Accessories for universal tabletop assembly:

Pos.	Product name	Bestell-Nr.	Anz.
8	Aluminium-profile attachment for mounting on table, 1 pcs	ST8010-8U	2

For mounting aluminium profiles on a table top.

