



# Training Courses Rolling Bearings and Condition Monitoring

For Beginners and Advanced Students



# FAG Industrial Services · F'IS training programme

## FAG Industrial Services

FAG Industrial Services GmbH (F'IS), with headquarters in Herzogenrath near Aachen, is an independent company that is responsible for the worldwide service business of Schaeffler Group Industrial covering the brands INA and FAG.

Helping customers reduce maintenance costs, optimise plant availability and prevent unforeseen machine downtimes is one of F'IS topmost goals.

The services are provided regardless of the brand of the machine components used.

F'IS is therefore the specialist contact for the maintenance of rotating components.

### The F'IS range

F'IS offers products, services and training in the following five areas:

- Mounting/Repair
- Lubrication
- Alignment
- Condition monitoring
- Maintenance management

## F'IS training programme

F'IS offers, in relation to its portfolio of products and services, both standard training and customer-specific training. The individual training units are based on a modular concept with the result that customers can compile their own customised training course on the basis of these elements. The training courses are offered both at Schaeffler Group locations and also on site at the customers.

In all **standard training courses** sound theoretical knowledge is combined with practical exercises. Experienced trainers communicate their tried and tested knowledge in a competent and up-to-date format. In the training courses, demonstration materials simulating practical operation are used. The participants can work hands-on, which serves to immediately apply and deepen the theoretical knowledge just gained.

**Customer-specific training courses** are always an appropriate option when a large group of participants is to be trained or it seems advisable to carry out the practical parts of the training directly on the customer's plant and machinery. In this case, a trainer will bring the necessary training material to the customer's location. In this way, the customer receives training that is specifically matched to him and his facility.

The **current training programme**, including dates for the standard training courses, can be found at [www.fis-services.com](http://www.fis-services.com) in the section Training.

If you have any further questions about our seminar programme, the organisation of seminars or to register, please send an e-mail to [info@fis-services.com](mailto:info@fis-services.com).





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# Training overview

## F'IS training courses

Training module	Training format Standard	Customer-specific
<b>Mounting</b>		
Basic training: Rolling bearing technology	•	•
Product training: Mounting tools		•
Basic training: Spindle bearing technology	•	•
Rolling bearing maintenance for rail vehicle maintenance personnel (general)	•	•
Rolling bearing maintenance for TAROL bearings		•
<b>Lubrication</b>		
Product training: FAG lubrication systems Motion Guard		•
Product training: FAG Arcanol lubricants		•
<b>Alignment</b>		
Product training: FAG Top-Laser TRUMMY2, SMARTY2 and INLINE		•

Training module	Training format Standard	Customer-specific
<b>Condition monitoring</b>		
Product training: FAG Detector III Basic	•	
Product training: FAG Detector III Balancing	•	
Product training: FAG Detector III Advanced	•	
Product training: F'IS Administrator 4	•	
Product training: FAG DTECT X1 (with F'IS Administrator 4)	•	
Product training: FAG ProCheck (with F'IS Administrator 4)	•	
Product training: FAG VibroCheck: Installation (hardware)	•	
Product training: FAG VibroCheck: Application (software)	•	
Product training: FAG DTECT X1 (with F'IS Administrator 3.8)		•
Product training: FAG Detector II		•
<b>Maintenance management</b>		
User training for implemented CMMS		•
CMMS administrator training		•

More detailed information about the individual training courses can be found on the following pages.

# Training descriptions

## Mounting

### Mounting

#### Basic training: Rolling bearing technology

**Training content:** This training communicates basic knowledge on rolling bearings and their use. Our rolling bearing experts will explain types, characteristics and designations of rolling bearings. In the practically-based part of the training, correct mounting and dismounting will be communicated. Rolling bearing failures will be discussed, together with their symptoms and causes.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** The participants will learn the correct and professional handling of rolling bearings and gain basic knowledge of mounting and dismounting.

**Duration:** 1–2 days

#### Product training: Mounting tools

**Training content:** This training focuses on various tools for the correct mounting and dismounting of rolling bearings. Particular emphasis is placed on the correct use of tools on a day-to-day basis. The content of this customer-specific training is always agreed with the customer.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** The participants will learn the correct handling of mounting and dismounting tools that they use day to day.

**Duration:** By agreement

#### Basic training: Spindle bearing technology

**Training content:** In this training, the participants will acquire basic knowledge of spindle bearings and their use. Our spindle bearing experts will explain the types, characteristics and designations of spindle bearings. In the practically-based part of the training, correct mounting and dismounting of spindle bearings will be communicated. Specific spindle bearing failures will be discussed.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** The participants will gain basic knowledge of spindle bearings and their mounting, dismounting and maintenance.

**Duration:** 1 day



## Training descriptions

### Mounting

#### Rolling bearing maintenance for rail vehicle maintenance personnel (general)

**Training content:** This training covers the maintenance of wheelset bearings based on cylindrical and tapered roller bearings. Rolling bearing experts from Application Engineering – Railway will communicate current knowledge on the bearings and their applications. Experienced setting supervisors will pass on their knowledge concerning manual work for rolling bearing maintenance and show correct handling using selected demonstration items.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from railway vehicle maintenance workshops.

**Training objective:** The course participants will receive practical guidance on the maintenance of wheelset bearings based on simple cylindrical and tapered roller bearings.

**Duration:** 1–2,5 days

#### Rolling bearing maintenance for TAROL bearings

**Training content:** The subject of this training is the maintenance of TAROL wheelset bearings. These double row tapered roller bearing units are adjusted, greased and sealed on both sides. Rolling bearing experts from Application Engineering – Railway will communicate current knowledge on the bearings and their applications. Experienced setting supervisors will pass on their knowledge concerning manual work for the maintenance of TAROL

bearings and show the particular aspects of this maintenance using selected demonstration items.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from railway vehicle maintenance workshops.

**Training objective:** The course will enable the participants to carry out maintenance of TAROL bearings independently.

**Duration:** 1 day (by agreement only)





# Training descriptions

## Lubrication · Alignment

### Lubrication

**Product training:**  
**FAG lubrication systems**  
**Motion Guard**

**Training content:** This training covers the FAG lubrication systems “Motion Guard” in relation to functionality, possible applications, usage and handling. The focus is on the safe handling and boundary operating conditions of FAG lubrication systems.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** Following the course, the participants will be able to correctly select and use the various products in the lubrication system “Motion Guard”. This ensures that unplanned machine downtime due to defective lubrication is avoided.

**Duration:** By agreement



**Product training:**  
**FAG Arcanol lubricants**

**Training content:** In this training, the participants will acquire further knowledge of the FAG lubricant family “Arcanol” in relation to possible applications, usage and handling. It will be shown how the choice of the correct lubricant can increase the performance capacity and life of rolling bearings.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** Following the course, the participants will be able to select the correct grease for their particular application.

**Duration:** By agreement

### Alignment

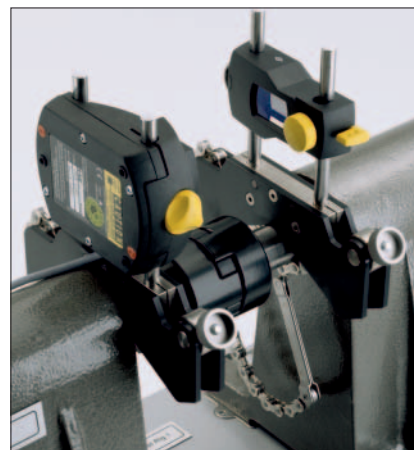
**Product training:**  
**FAG Top-Laser**  
**SMARTY2, TRUMMY2 and INLINE**

**Training content:** This course communicates sound knowledge on the alignment of belt drives and shafts and the measurement of belt tension. The functionality, possible applications and handling of the measuring systems Top-Laser TRUMMY2, SMARTY2 and INLINE are explained. The focus is on the safe handling and boundary operating conditions of the measuring systems.

**Target group:** The course is aimed at head foremen, foremen and mounting personnel from maintenance shops as well as interested employees. No special knowledge is required.

**Training objective:** Following the course, the participants will be able to carry out the required alignment work using the measuring systems.

**Duration:** By agreement



# Training descriptions

## Condition monitoring

### Condition monitoring

**Product training:**  
**FAG Detector III Basic**

**Training content:** This training conveys basic knowledge both of vibration theory and vibration monitoring as well as the handling of the measuring system FAG Detector III. The course participants will receive an overview of the functionality, possible applications, configuration and use of the measuring system.

**Target group:** The course is aimed in particular at technicians and engineers working in maintenance as well as interested employees. No special knowledge is required.

**Training objective:** The participants can subsequently detect simple machine defects by means of trend analysis and determine the cause on the basis of the time signal and spectrum.

**Duration:** 3 days



**Product training:**  
**FAG Detector III Balancing**

**Training content:** The course covers in particular the subject of balancing using the FAG Detector III in theory and practice and is aimed at participants who have completed the course “FAG Detector III Basic” and now wish to learn about using the “Balancing Kit”. The participant will learn to use the device safely and independently carry out balancing operations with the FAG Detector III.

**Target group:** The course is aimed at participants who are already familiar with the use of the FAG Detector III. Participants must have previously attended the product training course “FAG Detector III Basic”.

**Training objective:** The participants will learn how to safely use the FAG Detector III during a balancing process.

**Duration:** 1 day

**Product training:**  
**FAG Detector III Advanced**

**Training content:** Building on the training “FAG Detector III Basic”, this course goes into greater detail on the theory of vibration analysis and monitoring covered in the above mentioned course. This course comprehensively covers special subjects such as the symptomatic form of individual machine defects. Aspects relating to the condition monitoring of individual machine parts will be discussed in detail in relation to defects and problems and reconstructed in some cases using practical exercises.

**Target group:** This course is aimed in particular at technicians and engineers working in maintenance as well as interested employees who have already attended the course “FAG Detector III Basic” or have at least one year’s experience in the use of measuring systems.

**Training objective:** After the training, the participant will be in a position to identify the symptomatic form of individual machine defects and determine their cause.

**Duration:** 2 days

## Training descriptions

### Condition monitoring

#### **Product training:** **F'IS Administrator 4**

**Training content:** This training deals with the installation and the individual modules of the software F'IS Administrator 4. The focus is on the function of the individual modules and the use of the Data Viewer – a special analysis tool. The principles of communication technologies are also presented.

**Target group:** The course is aimed in particular at participants who have already attended the training units “FAG Detector III Basic/Advanced”. Alternatively, at least one year's practical experience with an offline or online condition monitoring system is required.

**Training objective:** After the training, the participant can securely install the software and is familiar with the function of the individual modules.

**Duration:** 2 days

#### **Product training:** **FAG DTECT X1\*** **(with F'IS Administrator 4)**

**Training content:** On the basis of the training units “FAG Detector III Basic/Advanced” and “F'IS Administrator 4”, this course gives sound knowledge on the online condition monitoring system “FAG DTECT X1” in relation to functionality, possible applications, usage and handling. In particular, the versatile possible configurations of the system are communicated intensively in practical use.

**Target group:** The course is aimed in particular at technicians and engineers working in maintenance as well as interested employees. Participants must have previously attended the product training course “F'IS Administrator 4”.

**Training objective:** With this online monitoring system the participant will be able to identify machine defects and damages per telediagnosis based on vibration analysis.

**Duration:** 2 days

\* Also usable for FAG WiPro.

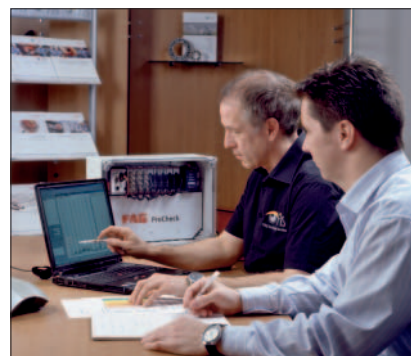
#### **Product training:** **FAG ProCheck** **(with F'IS Administrator 4)**

**Training content:** In this training, the participant will learn to apply the knowledge acquired in the training unit “F'IS Administrator 4” to the online measuring system FAG ProCheck. The focus is on configuration and independent preparation, implementation and evaluation of a measurement process using examples.

**Target group:** The course is aimed in particular at technicians and engineers working in maintenance as well as interested employees. Participants must have previously attended the product training course “F'IS Administrator 4”.

**Training objective:** After attending this course, the participant should be in a position to configure the monitoring system FAG ProCheck and independently prepare, implement and evaluate measurement processes.

**Duration:** 2 days



# Training descriptions

## Condition monitoring

**Product training:**  
**FAG VibroCheck:**  
**Installation (hardware)\***

**Training content:** The course communicates knowledge on the use of the VibroCheck (VC) hardware. The focus is on the interaction between the VC hardware and software (e.g. in hardware tests, sensor tests). The participant will learn to use terminal and circuit plans so that he can independently undertake an extension of the VC hardware.

**Target group:** This course is intended in particular for those persons who are responsible for the installation and maintenance of the measuring system "FAG VibroCheck". Important preconditions are therefore PC and Windows knowledge as well as knowledge of electrical installation work.

**Training objective:** The participants will be in a position to maintain the measuring system in relation to hardware extension and troubleshooting as well as independently carry out hard- and software installations.

**Duration:** 2 days

**Product training:**  
**FAG VibroCheck:**  
**Application (software)\***

**Training content:** The knowledge acquired in the course "Detector III Advanced" on the vibration analysis will be expanded and deepened on the measuring system "FAG VibroCheck (VC)". The focus will be on the monitoring configuration and evaluation of the recorded measurement data.

**Target group:** This course is aimed at persons who have already attended the training "Detector III Advanced" or have at least one year's experience in the use of measuring systems and wish to add the specifics concerning the measuring system "FAG VibroCheck".

**Training objective:** The participants will be able to work confidently with the online condition monitoring system "FAG VibroCheck". The focus of the training is on the configuration. The course participant can subsequently visualise the plant machinery using the VC software and analyse trend data, time signals and frequency spectra. He can assess and interpret parameter and expert alarms and handle the alarm logbook.

**Duration:** 2 days

\* Please note that the product training courses FAG VibroCheck: Installation (hardware) and FAG VibroCheck: Application (software) are only bookable as a single package (total duration: 4 days).

**Product training:**  
**FAG DTECT X1\*\***  
**(with F'IS Administrator 3.8)**

**Training content:** On the basis of the training unit "FAG Detector III Basic", this course gives sound knowledge both on vibration diagnosis as well as of the online condition monitoring system "FAG DTECT X1" in relation to functionality, possible applications, usage and handling. In particular, the versatile possible configurations of the system are communicated intensively in practice. In addition, the principles of communication technology for teleservice are presented.

**Target group:** The course is aimed in particular at technicians and engineers working in maintenance as well as interested employees.

**Training objective:** With this online monitoring system the participant will be able to identify machine defects and damages per telediagnosis based on vibration analysis.

**Duration:** 4 days (by agreement only)

\*\* Also usable for FAG WiPro.



# Training descriptions

## Condition monitoring · Maintenance management

### Product training: FAG Detector II

**Training content:** In this course, sound knowledge will be communicated on the measuring system “FAG Detector II” in relation to functionality, possible applications, usage and handling.

**Target group:** The course is aimed in particular at technicians and engineers working in maintenance as well as interested employees. No special knowledge is required.

**Training objective:** Based on trend analysis the participant will be able to identify machine defects and damage using the measuring system.

**Duration:** By agreement

### Maintenance management

#### User training for an established CMMS

**Training content:** This course focuses on the installation and use of the Computerized Maintenance Management System (CMMS) established at the customers. Upon customer request the contents will be defined according to the participants.

**Target group:** The course is for personnel who are to operate the CMMS in their company. No special knowledge is required.

**Training objective:** The participants will learn how to safely use the CMMS and will acquire sound knowledge relating to the relevant key points of the training.

**Duration:** By agreement

### CMMS administrator training

**Training content:** This training covers the support and maintenance of the CMMS established at the customers. The contents will be defined according to customer request from the areas of database management, internet technology, server support and authorisation concepts.

**Target group:** The course is aimed at system administrators and key users.

**Training objective:** The participants will be capable of independent support and maintenance of a CMMS.

**Duration:** By agreement



Schaeffler Technical Training Centre, Hirschaid

# Training aids for apprenticeship

## Rolling bearing mounting cabinet and mounting sets: Basic course for vocational training

There is plenty of literature available on the the correct mounting of bearings. However, there is a general lack of parts on which apprentices can train under realistic conditions. The trainers from the Schaeffler training workshops therefore have compiled a basic course.

The aim of this two-part rolling bearing course is to communicate knowledge on the selection of the correct bearing, proper mounting and dismounting and the maintenance of bearing positions. A theoretical part covers the basic knowledge of rolling bearing technology, while the practical part covers the basic skills involved in mounting and dismounting. In the theoretical part, knowledge on technical drawing, calculation and theory is communicated. The practical part uses exemplary simplified mating parts (shafts, hous-

ings) on which the mounting and dismounting of common types of bearings can be practised with the aid of mechanical or hydraulic devices.

The teaching material is divided into smaller modules and is aligned to the degree of difficulty of the vocational training.

Building on this basic course, other assemblies such as gearboxes, pumps, spindles, road vehicle wheels etc. can be prepared for training.

### Handbook 1 (Theoretical part)

- Technical theory
- Technical calculation
- Technical drawing

### Handbook 2 (Practical part)

- Mounting of bearings with cylindrical bore
- Mounting of bearings with tapered bore
- Hydraulic methods
- Exercises on shafts and housings

### Technical data

Mounting cabinet:  
Dimensions 1135×710×380 mm  
Mass (including contents) 94 kg  
Designed for 10 mounting exercises:  
on 5 shafts  
on 2 housings  
on 3 shafts and housings  
Smallest shaft diameter: 15 mm  
Largest shaft diameter: 55 mm

(mounting cabinet with contents and mounting bracket)

**Ordering designation inside Europe:**

**TRAINING-CABINET-MOD-1A-D**

**Ordering designation outside Europe:**  
**MOUNTING.CABINET**

Further demonstration models for training are always available on request. Please contact: [info@fis-services.com](mailto:info@fis-services.com)



# Training · Training aids for apprenticeship

## Mounting set 1

Mounting set 1 is an **additional exercise** to the FAG mounting cabinet and facilitates the mounting of a self-aligning ball bearing in a housing.

### Mounting set 1: Plummer block housing

Suitable for the following exercises:

- Checking the bearing position
- Mounting of adapter sleeve and bearing
- Mounting as locating bearing
- Mounting as non-locating bearing
- Mounting as through shaft
- Mounting in housing closed on one side
- Dismounting of bearing and adapter sleeve

Ordering designation inside Europe:  
**TRAINING-CABINET-MOD-1B**  
Ordering designation outside Europe:  
**MOUNTING.CABINET.SET1**



## Mounting sets 2 und 3

The trainer can use the FAG mounting sets 2 and 3 – **individual exercises** from the FAG mounting cabinet – to demonstrate the mounting and dismounting of rolling bearings during teaching or have the apprentices carry these out. The shaft and housing parts can be clamped in a vice for mounting.

### Mounting set 2: Shaft with housing

Suitable for the following exercises:

- Selection of fits
- Checking the bearing positions
- Mounting the bearing on the shaft
- Axial location of the bearing
- Mounting of the rotary shaft seal
- Assembly (locating bearing)
- Dismounting using extractor

Ordering designation inside Europe:  
**TRAINING-CABINET-MOD-2**  
Ordering designation outside Europe:  
**MOUNTING.CABINET.SET2**



### Mounting set 3: Hydraulic mounting

Suitable for the following exercises:

- Mounting with the aid of pressure screws
- Mounting using a hydraulic nut
- Setting and checking the radial internal clearance
- Axial location using a locknut and tab washer
- Dismantling using an oil injector

Ordering designation inside Europe:  
**TRAINING-CABINET-MOD-3**  
Ordering designation outside Europe:  
**MOUNTING.CABINET.SET3**



## Notes



## Notes

## Notes



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