



MU335: 4-Stroke Diesel Engine Crankshaft Run-Out Measurement & Reconditioning

Training Description:

This intensive training course provides participants with **in-depth knowledge** and **practical skills to assess, measure, and recondition crankshafts in 4-stroke diesel engines**. The training course covers crankshaft fundamentals, run-out measurement procedures, damage identification, repair and reconditioning methods, balancing, and quality control standards. Participants will gain both theoretical understanding and hands-on workshop practice to ensure precision and reliability in crankshaft maintenance.

Training Objectives:

By the end of the training, participants will be able to:

- ✓ Understand the function, design, and operational stresses of crankshafts in 4-stroke diesel engines
- ✓ Identify causes and effects of crankshaft wear, distortion, and misalignment
- ✓ Correctly perform crankshaft run-out measurement using industry-standard tools and techniques
- ✓ Evaluate damage severity and determine suitable repair or replacement actions
- ✓ Apply proper crankshaft reconditioning techniques, including grinding, polishing, and balancing
- ✓ Implement quality control checks to ensure repaired crankshafts meet OEM tolerances and standards

Training Designed for:

This training course is intended for Marine engineers and shipyard technicians, Diesel engine maintenance engineers and mechanics, Power plant maintenance staff, Workshop foremen and supervisors, Quality control and inspection personnel in engine repair facilities and Mechanical engineering trainees specializing in engine repair.

Training Requirement:

“Hand’s on practical sessions, equipment and software will be applied during the course if required and as per the client’s request.”

Contents can be adapted to your specific wishes. It is therefore possible to focus on specific modules of the training course as per client’s learning needs and objectives. Further, it should be forwarded to us a month prior to the course dates.

Training Program:

DAY ONE:

- ❖ **Crankshaft Fundamentals & Operational Principles**
 - Introduction to 4-stroke diesel engine crankshafts
 - Functions of the crankshaft in power transmission
 - Crankshaft design features: main journals, crankpins, counterweights, oil passages
 - Metallurgy of crankshafts: forged steel vs. cast iron
 - Operational stresses and fatigue factors
 - Common failure modes (fatigue cracks, scoring, journal wear, torsional vibration damage)
 - OEM specifications and tolerance importance
- ❖ **Practical Component:**
 - Visual inspection of sample crankshafts

- Identifying damage types with inspection lights and magnifiers

DAY TWO:

❖ Crankshaft Run-Out: Principles & Measurement Techniques

- Definition of run-out and its effects on engine performance
- Causes of crankshaft bending and distortion
- Measurement tools: dial indicators, V-blocks, precision micrometers
- Step-by-step procedure for crankshaft run-out measurement
- Recording and interpreting measurement results
- OEM run-out limits and tolerance charts
- Safety precautions during measurement

❖ Practical Component:

- Setting up a crankshaft for run-out measurement on V-blocks
- Measuring and documenting run-out readings

DAY THREE:

❖ Damage Assessment & Repair Decision-Making

- Wear patterns and their causes (oil starvation, misalignment, improper lubrication)
- Crack detection methods: magnetic particle inspection (MPI), dye penetrant testing (DPT)
- Evaluating whether to repair, straighten, or replace
- Straightening techniques for bent crankshafts
- Risks and limitations of crankshaft repairs
- Workshop vs. in-situ assessment considerations

❖ Practical Component:

- Performing MPI or DPT on a sample crankshaft
- Hands-on straightening demonstration (if workshop-equipped)

DAY FOUR:

❖ Crankshaft Reconditioning Procedures

- Grinding techniques for main and crankpin journals
- Undersizing and oversizing bearings after grinding
- Journal polishing and surface finish requirements
- Oil hole chamfering and cleaning after reconditioning
- Counterweight removal and installation procedures
- Dynamic balancing principles and equipment
- Maintaining concentricity and surface hardness

❖ Practical Component:

- Grinding and polishing a crankshaft journal
- Measuring journal diameters and surface roughness post-reconditioning

DAY FIVE:

❖ Final Quality Control, Documentation & Case Studies

- Final run-out verification post-reconditioning
- Hardness testing and surface integrity checks
- Assembly considerations and lubrication priming
- Documentation for quality control and traceability
- Review of international standards (ISO, ASTM, OEM) for crankshaft repairs
- Case studies of crankshaft failures and successful repairs
- Troubleshooting common post-repair issues

❖ Practical Component:

- Complete measurement and inspection on a reconditioned crankshaft
- Reviewing and preparing a final inspection report

❖ POST-ASSESSMENT and EVALUATION

Training Methodology:

This interactive training course includes the following training methodologies as a percentage of the total tuition hours:

- 30% Lectures, Concepts, Role Play
- 70% Workshops & Work Presentations, Techniques, Based on Case Studies & Practical Exercises, Gamification, Software & General Discussions
- Pre and Post Test

Training Certificate(s):

CMCT Internationally recognized certificate(s) will be issued to each participant who completed the course.

Training Fees:

TBA as per the course location - This rate includes participant's manual, hand-outs, buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Note: The 5% VAT (Value Added Tax), will be effective starting 01st of January 2018 as per the new regulation from the UAE Government. The VAT applies for all quotation both for local and abroad.

Group and Corporate Discounts:

- We offer group and corporate discounts on many courses. These discounts are available for clients who want to maximize their return on investment.

Individual Discounts:

- We offer individual discounts on many courses for people who are self-sponsored and make their payment in full and upfront at the time of registration

Training Timings:

Daily Timings:

07:45 - 08:00	Morning Coffee / Tea
08:00 - 10:00	First Session
10:00 - 10:20	Recess (Coffee/Tea/Snacks)
10:20 - 12:20	Second Session
12:20 - 13:00	Recess (Prayer Break & Lunch)
13:00 - 14:00	Last Session

For training registrations or in-house enquiries, please contact:

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