



Accredited Africa Training Institute for Capacity Development

Unit FO409, Hatfield Plaza · 1122 Burnett St, Hatfield 0028 · Pretoria, Gauteng · South Africa

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COURSE BROCHURE

Steam Locomotive Operation

Services / Transport, Operations and Logistics

Unit Standard 256196 · NQF Level 4 · 14 Credits · 11 Days

COURSE OVERVIEW

This course equips learners with the theoretical and practical knowledge required to safely and efficiently operate a steam locomotive. It covers pre-operational checks, starting, driving, stopping, and basic troubleshooting, ensuring compliance with relevant safety regulations and operational standards.

Category	Services
Subfield	Transport, Operations and Logistics
Unit Standard	256196
Accreditation	SAQA Accredited · NQF Level 4 · 14 Credits
Duration	11 days
Training Method	Online, On-Campus, In-House
Certificate	Issued via AATICD LMS – verifiable online

LEARNING OUTCOMES

- Apply pre-operational safety checks and inspections on a steam locomotive.
- Demonstrate correct procedures for starting, moving, and stopping a steam locomotive.
- Analyze operational conditions and respond appropriately to signals, gradients, and emergencies.
- Implement basic maintenance and troubleshooting techniques for steam locomotive systems.
- Evaluate compliance with relevant health, safety, and environmental regulations during operation.

WHO SHOULD ATTEND

- This course is designed for locomotive drivers, trainee drivers, and railway operations personnel seeking to obtain or upgrade their steam locomotive operating competency.

COURSE OUTLINE

Day 1: Introduction to Steam Locomotive Principles

- History of steam locomotives in South Africa
- Basic thermodynamics: heat, steam, and pressure
- Overview of locomotive types and configurations
- Main components: boiler, firebox, cylinders, wheels
- Safety introduction: personal protective equipment and hazards
- Introduction to operational terminology
- Steam locomotive vs. diesel/electric
- Overview of course structure and assessment

Day 2: Boiler Construction and Water Management

- Boiler types: fire-tube and water-tube
- Boiler fittings: safety valves, water gauges, injectors
- Water treatment: scale prevention and chemicals
- Feedwater systems and preheating
- Blowdown procedures and frequency
- Boiler inspections and testing
- Steam pressure and temperature relationships
- Common boiler issues and troubleshooting

Day 3: Firebox, Fuel, and Combustion

- Fuel types: coal, wood, oil (characteristics)
- Firebox design: grates, ashpan, brick arch
- Combustion air: primary and secondary
- Firing techniques: spreading, stoking, and maintaining fire
- Draft and exhaust steam injector
- Smoke and emission control
- Heat transfer to boiler tubes
- Fuel consumption and efficiency calculations

Day 4: Steam Distribution and Cylinder Operation

- Steam circuit: dome, throttle, dry pipe, superheater
- Valve gear types: Stephenson, Walschaerts, Baker
- Piston and cylinder mechanics
- Steam admission and exhaust events
- Reversing gear and cutoff adjustment
- Cylinder lubrication and drains
- Power output and tractive effort
- Common valve gear issues

Day 5: Lubrication, Bearings, and Running Gear

- Lubrication systems: mechanical lubricators, grease nipples
- Bearing types: plain, roller, and thrust
- Running gear: frames, springs, equalizers
- Wheels, axles, and journal boxes
- Wheel arrangements: Whyte notation

- Brake gear and rigging
- Couplers and drawgear
- Inspection and maintenance schedules

Day 6: Brake Systems and Safety Appliances

- Westinghouse air brake system
- Steam brake operation
- Hand brake and parking brake
- Whistle, bell, and warning devices
- Speedometers and recorders
- Safety valves and fusible plugs
- Emergency brake application and reset
- Regulatory compliance: SAQA, OHSA, railway standards

Day 7: Pre-Start Checks and Lighting Up Procedures

- Pre-start checklist: boiler, running gear, brakes
- Lighting up: fuel preparation, fire building
- Raising steam: gradual heating, pressure increase
- Water level management during startup
- Testing safety valves and gauges
- Warming cylinders and steam chest
- Communication with ground crew
- Logbook entries and shift handover

Day 8: Driving Techniques and Controls

- Cab layout and control identification
- Throttle handling: notching and slipping
- Reverser and cutoff adjustment for efficiency
- Brake application: automatic and independent
- Maintaining boiler pressure and water level
- Handling gradients and curves
- Responding to signals and track warrants
- Fuel management on the road

Day 9: Shunting, Coupling, and Train Handling

- Shunting signals and hand signals
- Coupling: knuckle, link-and-pin, automatic
- Brake pipe continuity test
- Marshalling and train make-up
- Handling light engines vs. heavy trains
- Switching in yards
- Coupling air hoses and electrical connections
- Safety in shunting operations

Day 10: Troubleshooting and Emergencies

- Fault diagnosis: loss of power, steam leaks, brake issues
- Boiler emergencies: low water, foaming, priming
- Hot bearings and axle failures

- Broken couplings and drawgear
- Emergency stop procedures
- Fire in locomotive: extinguisher use
- Evacuation and passenger safety
- Logging incidents and reporting

Day 11: Final Assessment and Integration

- Review of all systems and procedures
- Written assessment: theory and regulations
- Practical assessment: pre-start, lighting up, driving
- Troubleshooting simulation
- Shunting and coupling exercise
- Brake test and emergency drill
- Debrief and feedback
- Certification requirements and next steps

ASSESSMENT & CERTIFICATION

Delegates are assessed through exercises and a final test. A mark of **50% or above** earns an **AATICD Certificate of Completion**, issued digitally with a unique verification code. This course carries **14 NQF credits** at **NQF Level 4**.

PRICING (PER DELEGATE, EX-VAT)

Delegates	Training Method	Price per Delegate	Total
1	Online	R 38,400.00	R 38,400.00
1	In-House	R 49,900.00	R 49,900.00
1	On-Campus (Pretoria)	R 57,600.00	R 57,600.00

UPCOMING SESSIONS

Start	End	Method	Venue
04 Aug 2026	18 Aug 2026	On-Campus	Johannesburg, South Africa
05 Aug 2026	19 Aug 2026	On-Campus	Mauritius
06 Aug 2026	20 Aug 2026	On-Campus	Cape Town, South Africa
07 Aug 2026	21 Aug 2026	On-Campus	Dubai, UAE
10 Aug 2026	24 Aug 2026	On-Campus	Abu Dhabi, UAE
11 Aug 2026	25 Aug 2026	On-Campus	Durban, South Africa
11 Aug 2026	25 Aug 2026	On-Campus	Mauritius
12 Aug 2026	26 Aug 2026	On-Campus	Cape Town, South Africa

Contact us if no suitable date is listed — on-demand sessions can be arranged for groups.

HOW TO GET A QUOTE OR APPLY

1. **Get an instant quotation online:** visit www.aaticd.co.za, open the page for this course (Unit Standard 256196) and click **Get A Quote / Apply**. Select your training method and number of delegates – your quotation is generated immediately and emailed to you with the course brochure attached.
2. **Apply by email:** send the course title, your preferred training method (Online, In-House or On-Campus Pretoria), the number of delegates and your preferred dates to apply@aaticd.co.za – our team will reply with a formal quotation.
3. **Apply by phone or WhatsApp:** call +27 12 004 8389 or WhatsApp +27 65 077 6310 and we will prepare your quotation and reserve your seats.
4. **Confirm your booking:** accept the quotation and settle the invoice. As soon as payment is confirmed your delegates are enrolled and receive their AATICD LMS login details by email, along with joining instructions for their chosen training method.

Group discounts apply automatically – the more delegates you enrol, the lower the price per delegate. No payment is required to request a quotation.

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