

RESIDENTIAL AIR CONDITIONING 313D

CHALLENGE TRAINING 60hrs

- 10 – 6 hr. days, 60 hrs. total
- Review safety imperatives
- Intensive in-class study of:
 - Thermodynamics: 1st and 2nd Law
 - Gas laws: Boyle, Charles, Dalton
 - Pascal's Law
 - Psychrometrics: DB WB DP RH
 - Pressure Enthalpy Charts
 - Terminology
 - Endotherm/Exotherm
 - Sensible Heat/Latent Heat
 - Super Heat/Sub-Cooling
 - Evaporator Saturation
 - Condenser Saturation
 - Exposure Time/Contact Time
 - Flooding/Starving
 - Underload/Overload
 - Net refrigeration effect
 - Gross heat rejection
 - Compression ratio
 - Heat of compression
 - Absolute temperatures
 - Absolute pressures
 - Refrigerants, Zeotropes Azeotropes
 - CFC HCFC HFC PFC HC
 - Fractionation, Flammability
 - Toxicity, Ozone depletion, Global warming
 - Lubricants:
 - MO POE PAG AB
 - Miscibility, Solubility, Hygroscopicity
 - Compression cycle theory
 - The 4 main components & the 4 lines
 - Compressor, Condenser, Metering, Evaporator
 - Brazing, sweeping, purging
 - Pressure testing, Evacuating, Charging
 - Recovery, Recycling, Reusing, Reclaiming
 - Hermetic compressors; Recip. & Scroll
 - Split phase motors: SP ISIR CSIR CSCR PSC
 - Heat pumps, ASHP, GSHP
 - Electrical theory, power, controls
 - Causes of evaporator freeze up
 - Confirming correct charge
 - Causes of compressor failure
 - TX valves, Metering orifices
 - Troubleshooting charts
- 8 Intensive practice exams
 - More than 600 different questions

PETTITECH

RHVAC TRAINING, CONSULTING

HARRISTON ONTARIO

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SPRING 2025 SCHEDULE

RESIDENTIAL AIR CONDITIONING 313D

STARTS: MONDAY MAY 5, 2025
9am to 4pm ~ 10 MONDAYS ~ 60 hrs
ENDS: MONDAY JULY 28, 2025
COST: **\$2450.00** (\$2168.14 + 13%)
IMPORTANT: TEXT BOOK: **\$259.90** (\$230.00 + 13%)
(Heating & Cooling Essentials, 5th Ed. GW - Killinger, Crawshaw)

GAS TECHNICIAN 3

EVENINGS: 6pm - 9pm. Mondays and Wednesdays

STARTS: MONDAY MAY 5, 2025
16 EVENINGS ~ 48 hrs

ENDS: MONDAY JUNE 30, 2025

COURSE COST: **\$2145.00** (\$1898.23 + 13%)

TSSA EXAM: WEDNESDAY JULY 2, 2025, 8:30am

EXAM COST: **\$450.00** (398.23 + 13%)

TEXT BOOKS & CODE BOOK:

- CSA G3 ONT MODULES 1-9, 7th Ed. \$ 338.85
- CSA CODE B149.1.20 bundle \$ 340.00
- ONTARIO TSS ACT & REGs \$ 80.00
- 13% \$ 98.65

TEXT BOOK TOTAL: **\$ 857.50**

OIL BURNER TECHNICIAN 3

STARTS: FRIDAY MAY 16, 2025

9am to 4pm ~ 8 FRIDAYS ~ 48 hrs

ENDS: FRIDAY JULY 11, 2025

COURSE COST: **\$2145.00** (\$1898.23 + 13%)

TSSA EXAM: MONDAY JULY 14, 2025, 8:30am

EXAM COST: **\$450.00** (398.23 + 13%)

TEXT BOOKS & CODE BOOK:

- OBT 3 TRAINING BINDER (chptrs 1-17) \$ 250.00
- CSA CODE B139-24 \$ 260.00
- 13% \$ 66.30

TEXT BOOK TOTAL: **\$ 576.30**

OIL BURNER TECHNICIAN 2

STARTS: THURSDAY MAY 8, 2025

9am to 4pm ~ 8 THURSDAYS ~ 48 hrs

ENDS: THURSDAY JUNE 26, 2025

COURSE COST: **\$2145.00** (\$1898.23 + 13%)

TEXT BOOKS & CODE BOOK:

- OBT 2 TRAINING BINDER (chptrs 1-10) \$ 250.00
- 13% \$ 32.50

TEXT BOOK TOTAL: **\$ 282.50**

TO REGISTER: CALL 519 270 8645 or 519 372 4615

GAS-TECH 3 CHALLENGE TRAINING CONTENT

CSA MODULES, 1– 9

(48 hrs)

1. Safety

- a. Construction site hazards
- b. Fire extinguishers
- c. Electrical safety
- d. Fuel safety
 - i. Carbon monoxide
 - ii. Flammability / Explosion

2. Fasteners, Tools, Testing Devices

- a. Fastening pipes and devices onto:
 - i. Wood, Concrete, Steel
- b. Basic hand tools & Power tools
- c. Testing devices:
 - i. VOA meters
 - ii. Manometers & pressure gauges
 - iii. Combustion analysers

3. Properties of Fluids

- a. Physics and Chemistry of HydroCarbon Fuels
 - i. Flammability limits
 - ii. Explosive limits
 - iii. Density – specific gravity
 - iv. Caloric values

4. Codes, Provincial Acts, Regulations

- a. CSA B149
- b. TSS Act
- c. Ontario Provincial Regulations

5. Electricity

- a. Atomic theory
- b. Valence electrons
- c. Conductors, resistors, insulators, Ohms Law
- d. Magnetism – motors, solenoids, transformers
 - i. Inductive reactance
- e. Capacitors
 - i. phase shift
 - ii. capacitive reactance
- f. Voltage, Amperage, Resistance, Wattage
- g. Circuits and circuit protection
 - i. Series / parallel & line / load
 - ii. Fuses, breakers, terminals, switches
- h. Thermostats, pressure switches, limit switches electronic controls

6. Technical Documents

- a. Manufacturer instructions, Specifications
- b. Diagrams, charts, graphs

7. Consumer Relations

8. Piping and Tubing (Code Sizing and Fitting Practices)

- a. Steel pipe
- b. Copper tube
- c. Corrugated Stainless Steel tubing
- d. PEX

9. Appliances

- a. Furnace, water heater, fire place, dryer, range

OIL BURNER TECHNICIAN 3 CHALLENGE TRAINING CONTENT – 17 TSSA MODULES

(48 hrs)

1. **Safety**
 - a. Jobsite hazards
 - b. Electrical hazards
 - c. Fuel hazards
2. **Tools**
 - a. Hand tools, power tools
 - b. Specialty tools
3. **Fasteners**
 - a. Wood, concrete, steel, plastics
4. **Math**
 - a. Various formulas and calculations
5. **Laws, codes & regulations**
 - a. The TSS Act & fuel oil regulations
 - b. The CSA B139 code
6. **Fuel oil properties**
 - a. Hydro-carbon synthesis & refining
 - b. Classifications
 - c. Calorific values
7. **Combustion theory**
 - a. The combustion triangle
 - b. Perfect, stoichiometric combustion
 - c. Complete combustion
 - d. Incomplete combustion
 - e. Flame temperatures
8. **Efficiency**
 - a. Establishing and confirming the perfect rate of:
 1. Combustion air flow
 2. Fuel flow
 3. Endothermic flow
9. **Piping & tubing**
 - a. Working with steel pipe & copper tube
10. **Fuel oil storage and delivery**
 - a. Various tanks - codes & regulations
11. **Burners & nozzles**
 - a. Atomization & vapourization
12. **Controls**
 - a. Safety limit controls & operational controls
13. **Oil fired appliances**
 - a. Furnaces, water heaters, boilers, space heaters
14. **Vents, chimneys, draft & combustion**
 - a. Convection vrs. Power venting
15. **Electricity**
 - a. Atomic theory, valence electrons
 - b. Voltage, amperage, resistance, wattage
 - c. Conductors, insulators, resistors
 - d. Circuits – parallel, series
 - e. troubleshooting
16. **Technical manuals and diagrams**
17. **Annual maintenance**

IMPORTANT!!

(CHALLENGE PROCESS ESSENTIALS)

RESIDENTIAL AIR CONDITIONING 313D CHALLENGE

SKILLED TRADES ONTARIO, ALONG WITH THE ONTARIO MINISTRY OF TRAINING ISSUES A CERTIFICATE OF QUALIFICATION FOR THE 313D RESIDENTIAL AIR CONDITIONING SYSTEMS MECHANIC TO THOSE WHO PASS THE EXAM WITH AT LEAST 70%. HOWEVER, TO GAIN CANDIDACY FROM SKILLED TRADES ONTARIO FOR CHALLENGING THE EXAM, THE APPLICANT MUST PROVIDE WRITTEN PROOF TO THEM THAT VALIDATES 4500 HOURS (2.5 YRS.) OF FIELD EXPERIENCE, INCLUDING TRAINING.

GAS TECHNICIAN 3 CHALLENGE

TSSA ISSUES A GAS TECHNICIAN 3 LICENSE TO THOSE WHO PASS THE EXAM WITH AT LEAST 75%. HOWEVER, FOR THE CHALLENGE PROCESS, THE TECHNICIAN MUST THEN ALSO PASS A PRACTICAL EXAM PERFORMED BY A TSSA INSPECTOR. THE PETTITECH COURSE PROVIDES THE OPTION FOR THE FIRST WRITTEN EXAM AT A VALUE OF \$450.00 WHICH IS SUPERVISED BY A TSSA INVIGILATOR. HOWEVER, THE PRACTICAL EXAM IS NOT INCLUDED IN THIS COURSE. NOTE: THE ABOVE IS ALL AS PER TSSA REQUIREMENTS.

OIL BURNER TECH 3 CHALLENGE

TSSA ISSUES AN OIL BURNER TECHNICIAN 3 LICENSE TO THOSE WHO PASS THE EXAM WITH AT LEAST 75%. HOWEVER, FOR THE CHALLENGE PROCESS, THE TECHNICIAN MUST THEN ALSO PASS A PRACTICAL EXAM PERFORMED BY A TSSA INSPECTOR. THE PETTITECH COURSE PROVIDES THE OPTION FOR THE FIRST WRITTEN EXAM AT A VALUE OF \$450.00 WHICH IS SUPERVISED BY A TSSA INVIGILATOR. HOWEVER, THE PRACTICAL EXAM IS NOT INCLUDED IN THIS COURSE. NOTE: THE ABOVE IS ALL AS PER TSSA REQUIREMENTS.

OIL BURNER TECH 2 CHALLENGE

TSSA ISSUES AN OIL BURNER TECHNICIAN 2 LICENSE TO THOSE TECHNICIANS WHO HAVE HELD A LEVEL 3 LICENSE FOR AT LEAST 2 YEARS AND THEN PASS THE LEVEL 2 WRITTEN EXAM WITH AT LEAST 75%. HOWEVER, FOR THE CHALLENGE PROCESS, THE TECHNICIAN MUST THEN ALSO PASS A PRACTICAL EXAM PERFORMED BY A TSSA INSPECTOR. THE WRITTEN EXAM AND THE PRACTICAL EXAM ARE NOT INCLUDED IN THIS COURSE. TECHNICIANS WHO WISH TO CHALLENGE THE LEVEL 2 LICENSE ARE REQUIRED TO CONTACT TSSA TO CONFIRM AND SCHEDULE FOR A LEVEL 2 WRITTEN EXAM AND A LEVEL 2 PRACTICAL EXAM.

NOTE: THE ABOVE IS ALL AS PER TSSA REQUIREMENTS.

QUESTIONS?... Call Gord: 519 372 4615
or Email: gord@pettitech.com

OIL BURNER TECHNICIAN 2 CHALLENGE TRAINING CONTENT – 10 TSSA MODULES

(48 hrs)

1. **Advanced Combustion**
 - a. Fuel oil properties
 - b. Storage and Delivery Systems
 - c. Burner Types and Components
 - d. Combustion
 - e. Heat Transfer and Appliance Controls
 - f. Air Supply and Venting
 - g. Heating System Efficiency
2. **The Building as a Comfort System**
 - a. Comfort Principles
 - b. The Building as a System
 - c. The flow of air, heat, and moisture
 - d. Components of the Building System
 - e. Oil Fired appliances and the Building System
3. **Advanced Electrical**
 - a. Overcurrent Protection
 - b. Using your MultiMeter
 - c. Stack Relay and Primary Control
 - d. Industrial and Commercial controls
 - e. Modulating Controls
 - f. Wiring Diagrams
 - g. Motors
4. **Forced Warm Air Heating Systems**
 - a. Air Handling
 - b. Mechanical Ventilation
 - c. Air Handlers
 - d. Forced Warm Air Furnaces
5. **Forced Air Add-Ons**
 - a. Humidifiers
 - b. Air Filters
 - c. Heat Pump and Cooling Coils
6. **Hydronic Heating Systems**
 - a. Advantages of Hydronic Heating
 - b. Piping
 - c. Valves, Fittings and Controls
 - d. Circulators
 - e. Steam systems
 - f. In-Floor systems
 - g. Troubleshooting
7. **Venting and Air Supply**
 - a. Domestic Hot Water Heaters
 - b. Combo Systems
 - c. Equipment Sizing
 - d. Configurations and Components
8. **Troubleshooting**
 - a. Fuel flow
 - b. Air flow
 - c. water flow
 - d. electrical checks
9. **Laws, Regulations and Codes**