



# Automotive Service Technology

Worldskills proud supporter

## OFFERING YOU INTUITIVE SOLUTIONS

For more than 50 years, ConsuLab has devoted our business plan to offering intuitive solutions to educators. This is more than just a catch phrase or a marketing line; this is at the core of ConsuLab's beliefs. Since our beginnings in 1969, ConsuLab has specialized in manufacturing and distributing high-quality training equipment to help you teach ever-evolving technology.

Over this time, we have developed a reputation for quality and innovation in the fields of transportation technology, truck and heavy equipment and many programs dealing with electricity, electronics, hydraulics and pneumatics. We do not build simulators, we build training equipment that can be used for years. All of our educational training aids are built to better utilize instructors' time, to help students meet the requirements for their specific program and to prepare them to become a productive and successful part of the workforce.

We are devoted to the technical education industry. We employ former educators, we design and build training aids with educators in mind, and we take the concept of helping you teach technology very seriously by offering intuitive solutions through highly engineered and well-crafted training aids.

We partner with many organizations in the industry because we are passionate about developing the highest quality truck and heavy equipment technicians and assisting you in helping shape the future of the trades.

We thank you for this opportunity and encourage you to take time to look through this catalog to find intuitive solutions to today's transportation technology.

Kevin Boden, President



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### Icon legend

	Electrical		Automobile vehicle platform
	Mechanical		Truck vehicle platform
	Pneumatic		
	Defective part		Recycled parts

### Documents provided

Operation manual	Student Assignments	Instructors Guide
PDF / Paper	PDF	PDF

#### Operation manual:

Setup, Safety and Use

#### Student Assignments:

Worksheets and any theory

#### Instructors Guide:

Schematics, Faults, Tips and Tricks

### Engine Mechanical diagnosis trainer

EM-141S-TY01

This is a running engine with permanent, repeatable, measurable mechanical faults for your students to diagnose!

Designed to teach mechanical engine component failure diagnosis. A time-saving package allowing instructors to instantly provide a "turn-key" engine mechanical fault diagnosis.

- A bad head gasket, a bad valve, and bad compression, all measurable and repeatable in a brand-new engine bench!
- Demonstrates all negative operational symptoms based on the faults.
- Saves significant instructor setup time.
- Permanent bad compression fault



Faults 3 | 1

Operation manual	Student Assignments	Instructors Guide
✓	5	✓



### Starting station, engine & swivel stand - 1.8L GM

EM-145S-GM05

Bring your engine mechanical program to life with a running engine!

Students can tear down and rebuild a GM Ecotec 1.8L LUW engine, gaining hands-on experience and mastering the intricacies of engine repair.

This product boosts engagement, evaluates practical skills, and creates intrinsic motivation.

- Starting station allows for rapid hookup and preparation to run each mechanical engine.
- Typical ratio of 5 engines to 1 starting station.
- Saves an enormous amount of instructor setup time.
- Leak-proof quick-connect fittings for fuel injection supply and return lines.
- Easy inventory, everything has its place.



Operation manual	Student Assignments	Instructors Guide
✓	20	✓



### Driveshaft working angle trainer

EM-200-28

- Variances in speed caused by the universal joint flexing can be audibly demonstrated using toothed wheels.
- Incorporates a slip clutch so the driveshaft can be handled and stopped by hand without injury.
- Different driveshaft angles can be selected using the adjustment system.



Operation manual



### Planetary gear set trainer

EM-1100

- Easy student visualization of planetary operation.
- Sun, ring gear and carrier can be held, driven, or allowed to react.
- Demonstration of seven gear ratios is available.
- Tabletop portability.



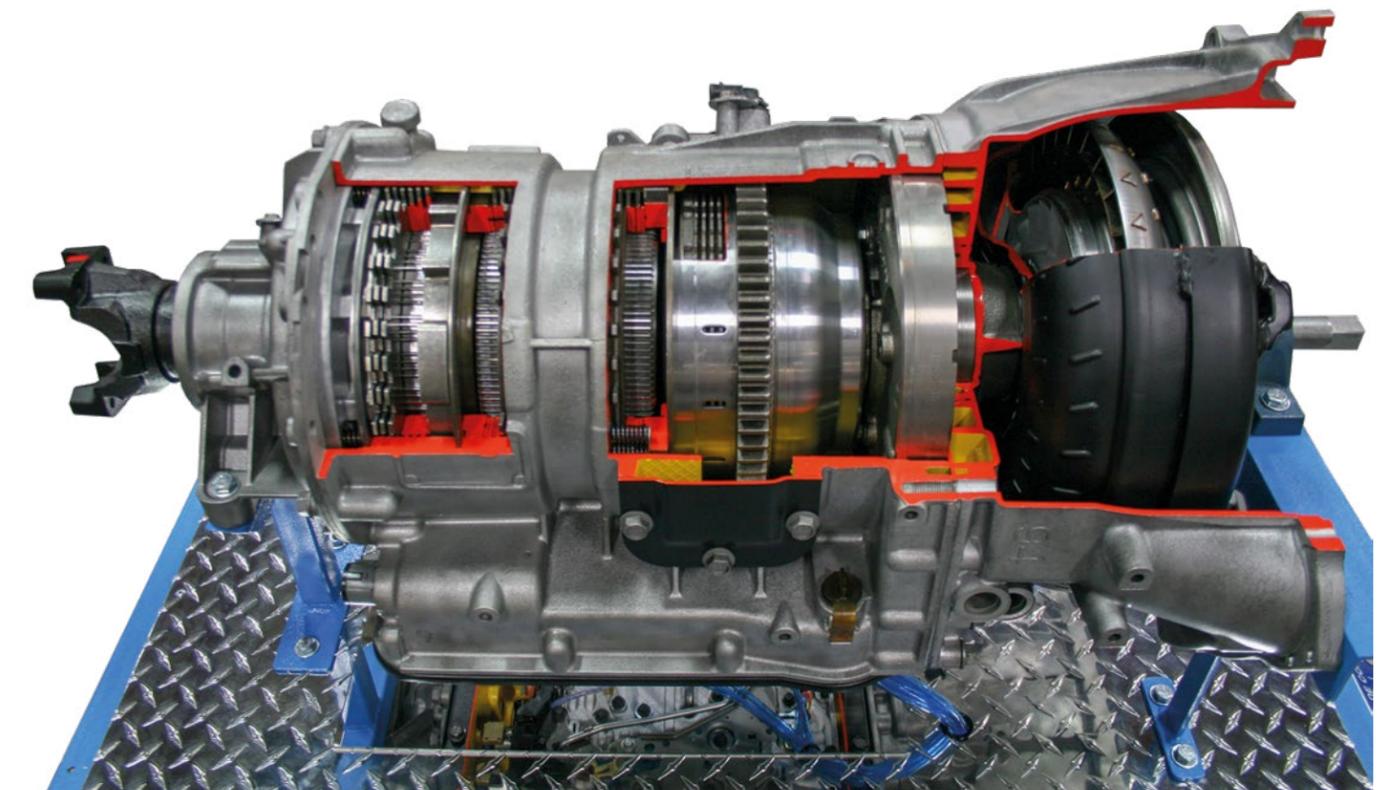
### Cutaway allison transmission - 1000 series

EC-1106-01

- All clutches and bands activated by air pressure.
  - Demonstrate all transmission speeds.
- Allison 3000 series also available (EC-1106-03)



Operation manual



### Cutaway open adjustable differential trainer

EC-431

Provides visualization of:

- Backlash adjustment
- Pinion depth position
- Calculating gear ratio

NOT intended for precision marking compound (prussian blue)

Operation manual ✓



### Cutaway hydraulic clutch system trainer

EC-1120

- Demonstrates complete hydraulic clutch system function.
- Tabletop portability.
- Cutaway allows visualization of clutch and pressure plate action.

Operation manual	Student Assignments	Instructors Guide
✓	12	✓



### Suspension and steering trainer

EM-130

Complete Macpherson strut suspension, manual rack and pinion system in your classroom.

- Exaggerated, toolless camber/caster/toe adjustments.
- Adjust ride height and corner weights.
- Allows full range of motion of suspension.
- Includes magnetic camber/caster gauge.

Operation manual ✓



**SRS restraints & air bag diagnostic trainer**

EM-300-07

**Teach supplemental restraints and airbags safely!**

- Perform system analysis & diagnosis without the worry of airbag or seatbelt tensioner deployment.
- All inflators are already detonated, yet the circuits function as normal.

**No more broken or worn-out connectors**

- Every single connector has its own test points and a connector disconnect/connect switch.

**What's in it for me?**

- Time savings.
- Accessibility to a complete supplemental restraint system without disassembling a car.
- The size and portability of this trainer saves space in a cramped classroom and makes moving it to multiple classrooms easy.
- Student engagement.
- There is a fault for every circuit to enable students to troubleshoot the whole system.

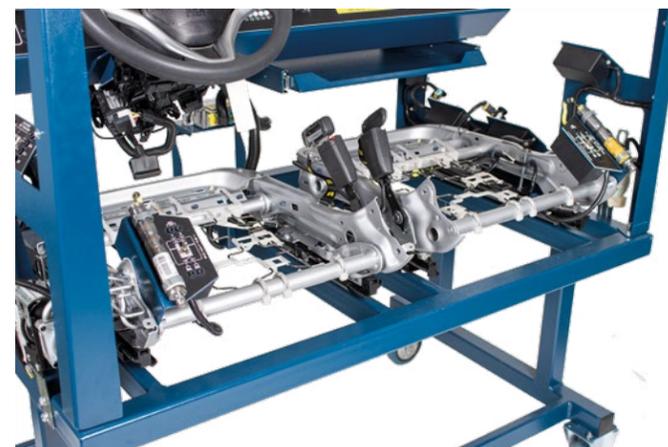
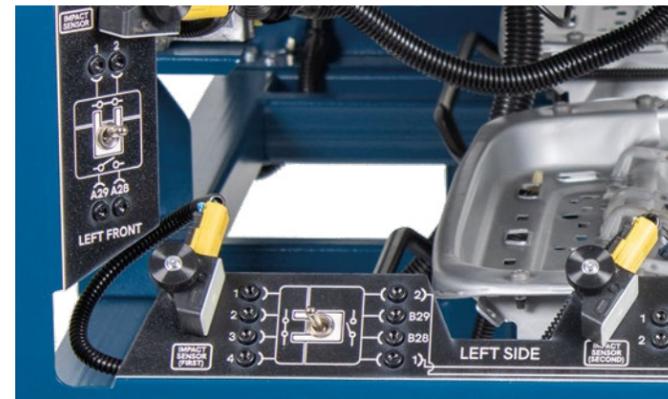
**Diagnosis**

- No permanent codes.
- All faults can be diagnosed using OEM service procedures & the fault location can be identified.

Operation manual	Student Assignments	Instructors Guide
✓	12	✓



2015-2017 Honda Fit



**Disc & drum ABS brake trainer with faults**

EM-122-HN02

**Perform an ABS braking event & road test in your classroom.**

- Students can feel the ABS activation through the brake pedal.
- All electrical, mechanical & hydraulic systems function as on the vehicle.

**Real-world mechanical faults**

- Measurable problems with brake pads, discs, and drums.

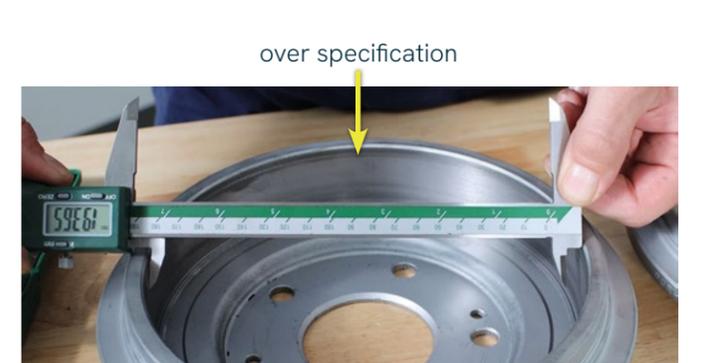
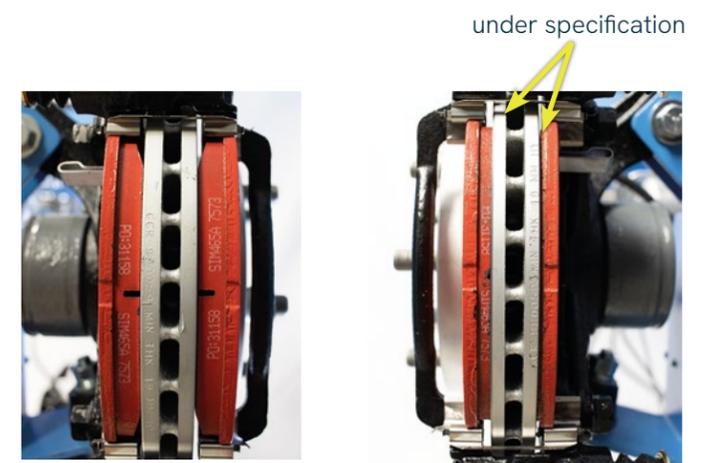
**What's in it for me?**

- Time savings.
- Accessibility to a complete functional braking system.
- Pre-written student labs.
- Space.
- The size and portability of this trainer saves space in a cramped classroom and makes moving it to multiple classrooms easy.
- Repeatability

Operation manual	Student Assignments	Instructors Guide
✓	16	✓



2006-2010 Honda Civic



### Two wheel hydraulic brake system

EM-123-2

- Accessibility to a complete functional braking system.
- Pre-written student labs.
- The size and portability of this trainer saves space in a cramped classroom and makes moving it to multiple classrooms easy.

Operation manual	Student Assignments	Instructors Guide
✓	5	✓



### Disc & drum brake trainer with faults

EM-123-4HN02

Real-world mechanical faults

- Measurable problems with brake pads, discs, and drums.

What's in it for me?

- Time savings.
- Accessibility to a complete functional braking system.
- Pre-written student labs.
- Space.
- The size and portability of this trainer saves space in a cramped classroom and makes moving it to multiple classrooms easy.
- Repeatability

Diagnosis

Operation manual	Student Assignments	Instructors Guide
✓	16	✓



### Brake trainer for hydraulic diagnostic

EM-123-TY05

Simulate real hydraulic faults, and practice disc & drum service safely

- Demonstrating the principles of braking systems used on today's vehicles, pedal feeling diagnosis for soft pedal, dropping pedal, and hard pedal concerns
- Trainer designed to simulate real braking systems using OEM components and all mechanical & hydraulic systems function as on the vehicle
- All routine brake service procedures can be performed on this trainer including component replacement, adjustments and hydraulic bleeding
- Fully functional brake booster

Real-world mechanical faults

- Measurable problems with brake pads, discs and drums

What's in it for me?

- Time savings
- Accessibility to a complete functional braking system
- Pre-written student labs
- Space
- The size and portability of this trainer save space in a cramped classroom and makes moving it to multiple classrooms easy
- Repeatability

Other info

- Based on the 2019 Toyota Corolla Sedan
- (Dot 4) biodegradable brake fluid
- Compatible with the Pro-Cut™ brake lathe
- 9 insertable faults
- Power Supply: 120 VAC, 7.5 A, 1 PH, NEMA 5-15P



### Multiplex network diagnostic trainer

MP-750

Help your students become multiplexing experts

Do you teach advanced networking classes?  
Want to bring your students further?

Teaches advanced multiplex networks and diagnosis:

- Fully functional OEM CAN Bus system with all modules.
- For use with a scan tool and oscilloscope (required).
- 25-100 hours of instructional time (potential).

Teaches real-world diagnostic strategies for the following types of faults:

- Lack of communication.
- Voltage drops.
- Open circuits.
- All faults are diagnosable.

Saves teacher's time.

- Consistency across multiple units, easy setup, pre-written labs.
- Network communication wires have been run in a separate harness with special aftermarket connectors allowing for multiple disconnect and connect cycles without failure of terminals.

Proven design.

- Designed for the Worldskills competition.
- Robust hardware, additional connectors prevent damage.

Operation manual	Student Assignments	Instructors Guide
✓	15	✓



### Automotive lighting system trainer

CL-1918-4

Hands-on learning for lighting systems

- Saves teacher's time.
- Students can begin building circuits with less than 5 minutes of introduction!
- Consistency across multiple units, easy setup, pre-written labs.
- Exquisite top-quality gold-plated jumper leads minimize voltage drops.
- Full answer keys for all exercises and tests.
- Industry leading curriculum package (500+ pages).
- Complete course on lighting systems.
- Student tested, proven design.
- In use at hundreds of schools.
- Robust hardware.
- Protected power supply.
- Available as combination with other trainers (multiplex, heavy truck etc.).
- Teaches diagnostic procedures.
- Voltage drops.
- Open circuits.
- All faults are diagnosable.

Operation manual	Student Assignments	Instructors Guide
✓	37	✓

Configurations available:



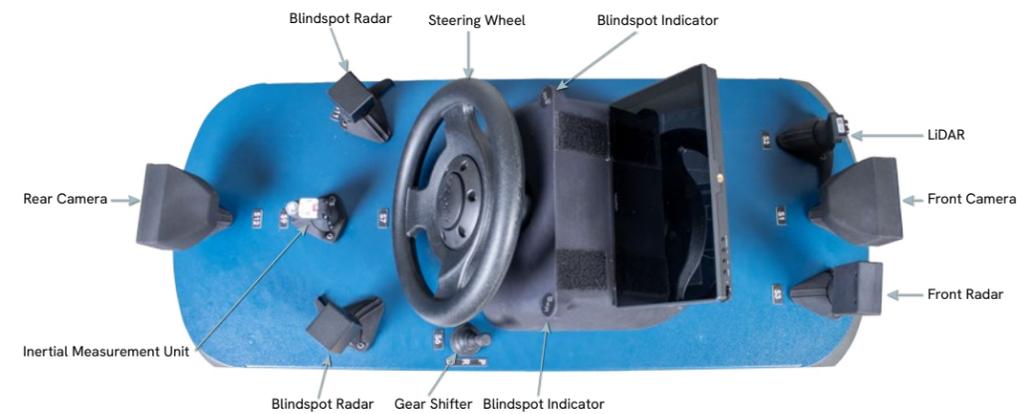
## ADAS (Advanced Driver Assist Systems) Trainer

EV-360

Become part of an automobiles Advanced Driver Assistance System by viewing the information that all the ADAS sensors see!

- This trainer allows a student to visualize an assortment of actual sensor readings used in an ADAS assisted vehicle
- Comparing the strengths and weaknesses of the various sensors and technologies to one another
- Sensor Fusion is experienced by the student

Operation manual	Student Assignments	Instructors Guide
✓	16	✓



### uScope classroom kit

AE-73-CK

- uScope master kit for instructor.
- 10 x basic uScope kits for students.
- Distribution harness.

Also available in custom quantity



### uScope digital storage oscilloscope - basic kit

AE-70-BK

- Small powerful single channel oscilloscope.
- Boots up in 4 seconds.
- 12-bit A/D converter, samples at 1 MHz.
- Includes test leads and charge cable.



### uScope digital storage oscilloscope - master kit

AE-71-MK

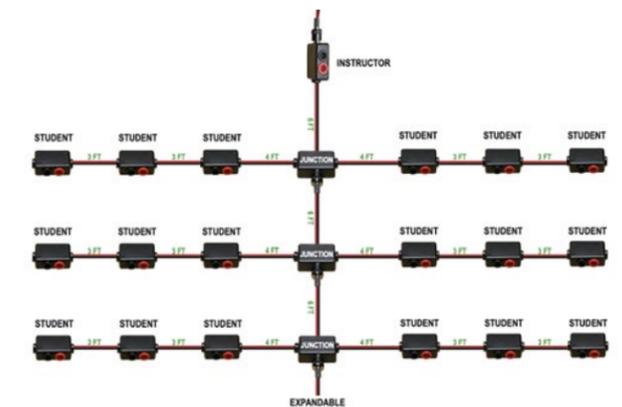
- Small powerful single channel oscilloscope.
- Boots up in 4 seconds.
- 12-bit A/D converter, samples at 1 MHz.
- Includes carrying case, low amp probe, COP paddle & accessories.



### Signal distribution harness

AE-72-SD

- Flexible configurations for any classroom.
- Bring signals to each student.
- Easy to use BNC connectors.



### Connector Trainer - circuit and signal acquisition

CL-1930

**A robust, reliable way to teach back-probing and oscilloscope use!**

The Connector Trainer is not just a training aid; it's a purpose-built system designed for mastering the art of back-probing connectors, promoting intricate oscilloscope readings, and honing advanced diagnostic skills. It is the opposite of a breakout box; it provides the ideal learning environment for students to practice real-world back-probing techniques.

- Diverse signal exploration, from digital square waves to sine waves and variable voltage outputs.
- Practice oscilloscope use, using various time bases and voltage scales.
- 9 fault scenarios, demonstrating frequency changes, voltage drops, and the effects on electronics.
- Field serviceable, easily provisioned, and replaceable terminals and connectors.



Classroom kit

Operation manual	Student Assignments	Instructors Guide
✓	21	✓

### Electromagnetism trainer

CL-1902

**Equip your students for the electrified future. Apply theory hands-on.**

Do your students struggle with electricity? Do you have challenges capturing their attention and getting them interested in how electric motors work? Do you want to equip them with the skills and knowledge necessary to work on hybrid and electric vehicles?

The ConsuLab CL-1902 Electromagnetism trainer can help challenge your students and keep them engaged.

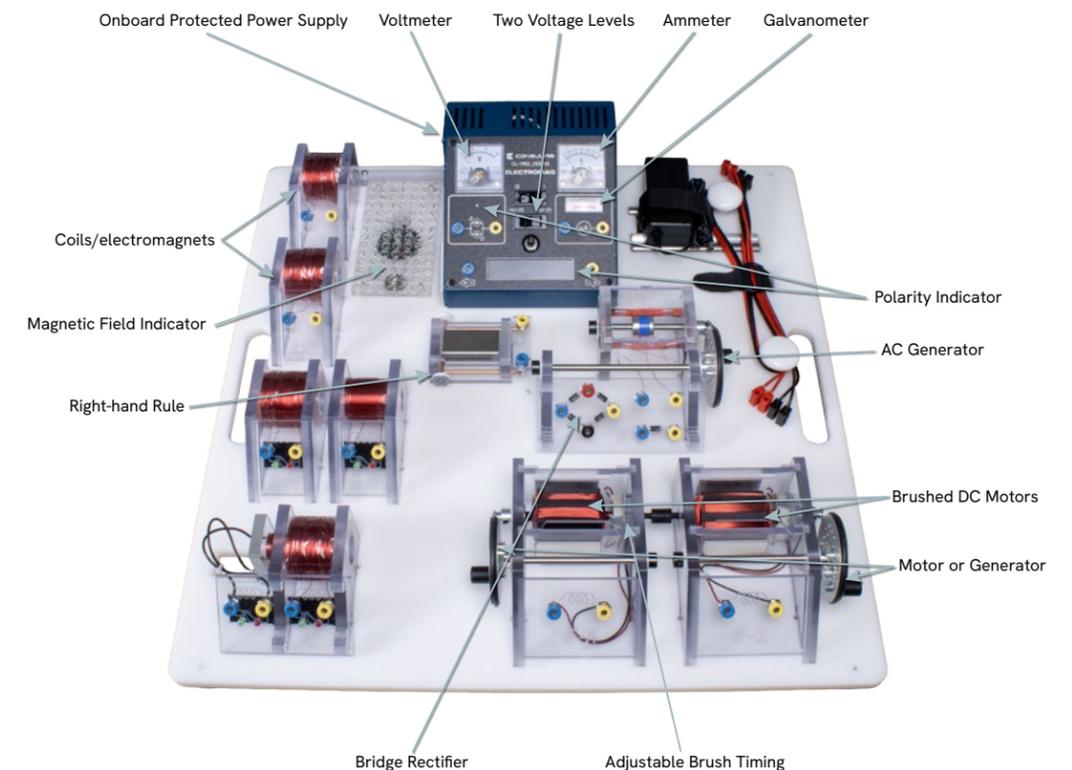
This trainer will challenge your students and keep them engaged.

- Minimal setup time < 5 minutes.
- Easy to inventory
- Up to 50+ hours of instructional time



Classroom kit

Operation manual	Student Assignments	Instructors Guide
✓	21	✓



### Ohm's law and DC circuits trainer

CL-1919-06

**Best selling ConsuLab product ever! Student tested proven design.  
In use at 500+ schools around the world**

The CL-1919-06 Ohm's Law and DC Circuits Trainer has been certified by CSA Group a Nationally Recognized Test Laboratory, to meet the applicable standards for quality and safety in North America. This product is certified for use by persons 14 years and older only. This certification applies to both Canada and the U.S.

- Built-in adjustable protected power supply.
- All components protected against incorrect wiring & short circuits!
- 1000s of students have learned ohm's law using this trainer !
- Industry leading curriculum package (350+ pages).
- Complete course on Ohm's law, series parallel and more.
- Proven robust hardware.
- All components fixed to trainer.
- Easily sourced consumables (#194, 3157 etc.)
- Built-in multimeter
- Consistency across multiple units, easy setup, pre-written labs.
- Exquisite top-quality gold-plated jumper leads minimize voltage drops.

Operation manual	Student Assignments	Instructors Guide
✓	33 + 14 tests	✓



Classroom kit



### CAN Bus multiplex trainer

MP-1918-2

#### Help your students become multiplexing experts

Are your students struggling with multiplexing? Build their understanding & diagnostic confidence hands-on!

Multiplexing made easy:

- Students perform wiring hands-on, building a 4-module multiplex system.
- Follows SAE J1939 protocols.

Teaches real-world diagnostic strategies:

- Lack of communication.
- Voltage drops.
- Open circuits.
- All faults are diagnosable.
- Complete course on multiplex systems.
- Full schematics
- Saves teacher's time.
- Consistency across multiple units, easy setup, pre-written labs.
- Exquisite top-quality gold-plated jumper leads minimize voltage drops.
- Student tested, proven design.
- In use at hundreds of schools.
- Robust hardware.
- Protected power supply.
- Available as combination with other trainers (multiplex, heavy truck, etc.).

#### Configurations available:



Operation manual	Student Assignments	Instructors Guide
✓	20	✓

### Speed & position sensors trainer

EM-200-25

- Demonstrates the operation, diagnosis, and testing of common types of analog and digital speed and position sensors.
- Demonstrates analog and passive sensors; Magnetoresistive, hall effect, inductive.
- For use with an oscilloscope. (Required)
- Includes a complete curriculum with student exercises.
- Shaft with tone wheels and speed control.
- Uses real vehicle sensors.

Operation manual	Student Assignments	Instructors Guide
✓	13	✓



### Cutaway battery

EC-520

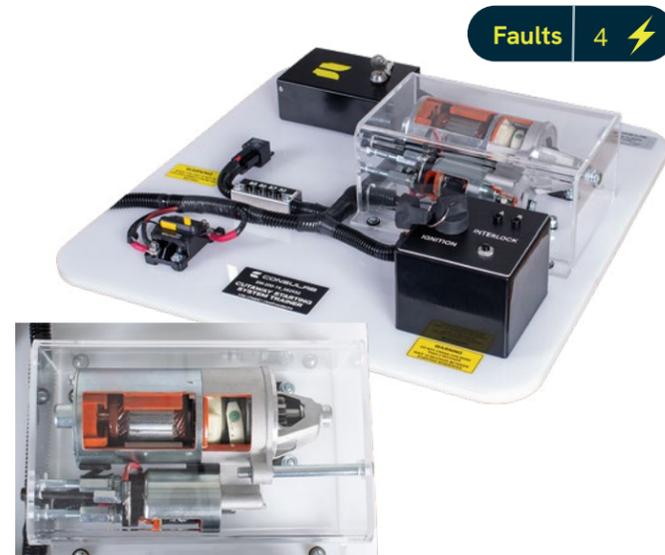
- Small (14A-A2) 12 V lead acid battery.
- Battery case is cutaway to view internal plates.
- No electrolyte present.



### Cutaway starting system trainer

EM-200-19

- Cutaway starter that still operates.
- Students can see the solenoid plunger move, planetary gears rotate and sparks fly!
- Complete system includes ignition switch and relay.
- All rotating components enclosed and safe.



Faults 4 ⚡

Operation manual	Student Assignments	Instructors Guide
✓	4	✓

### Advanced electronics kit

MD-4000-22

- This is for teaching advanced electronics, after students have learned the basics of electricity and ohm's law.
- Fully self-contained.
- Student-led hands-on learning.
- Automotive electronics components.
- Industry leading curriculum package.
- Full schematics.
- Saves teacher's time.
- Consistency across multiple units, easy setup, pre-written labs.
- Can be upgraded/changed over time.



Moduponents™

Classroom kit

Operation manual	Student Assignments	Instructors Guide
✓	14	✓

### Drivability electronics kit

MD-4000-23

This trainer brings the fundamentals of engine performance sensors to the classroom environment. Equip your students with confidence before working on an engine bench or the real vehicle.

- Hands-on learning.
- Automotive drivability components.
- Saves teacher's time.
- Consistency across multiple units, easy setup.
- Modular design.
- Can be upgraded/changed over time.
- Industry leading curriculum package.

Operation manual	Student Assignments	Instructors Guide
✓	14	✓



Moduponents™

Classroom kit

### ConsuKit Student-Built Brushless DC Motor

#### EV-100

Give your students hands-on experience by building a working 3-phase permanent magnet motor with the EV-100. Designed for middle school to college, this classroom-ready kit makes concepts in electricity, magnetism, and energy systems come alive—connecting directly to technologies in EVs, robotics, and STEM. Students learn by doing as they assemble, test, and prove their motor works.

- Complete 3-phase permanent magnet motor assembly kit. Everything you need is in each kit
- Students wind, connect, and arrange their own stator coils.
- Configurable as motor or generator for dual functionality. (M/G)
- Operates safely from 12V DC supply.
- Motors that are found increasingly in automotive (fuel pumps, EVs, fans, actuators)
- Testable with standard multimeters for resistance and AC output.
- Supports coil insulation and continuity checks with meggers.
- Allows oscilloscope analysis of 3-phase waveforms.
- Demonstrates magnetic field rotation and torque production.
- Provides measurable performance outcomes during operation.
- Enables efficiency testing in motor and generator modes from troubleshooting.
- Mirrors BLDC/EV motor operation principles in small and large applications.
- Designed for repeatable builds from one kit by students
- Comes with build guide, worksheets and troubleshoot guide for the instructor



Operation manual	Instructors Guide
✓	✓

### HVAC electronics kit

#### MD-4000-24

This trainer brings the fundamentals of HVAC system electrical sensors to the classroom environment. Equip your students with confidence before working on an engine bench or the real vehicle.

- Hands-on learning.
- Automotive HVAC components.
- Saves teacher's time.
- Consistency across multiple units, easy setup.
- Can be upgraded/changed over time.

Operation manual	Student Assignments	Instructors Guide
✓	14	✓



Classroom kit

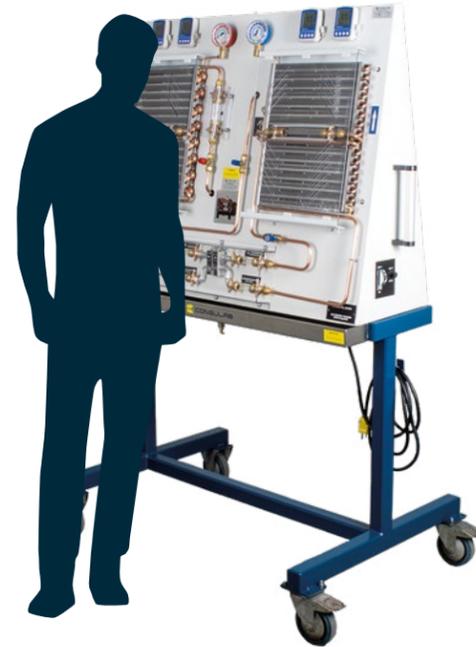
### Cutaway TXV H-block

#### EC-2100

- Allows easy visualization of valve function.



- Utilizes a hermetically sealed and internally protected compressor.
- 30 inch wide, fits through a classroom door.
- 15A circuit.
- Larger drip pan.



Operation manual	Student Assignments	Instructors Guide
✓	3	✓

**A/C system with TXV**

EM-2000-TXV

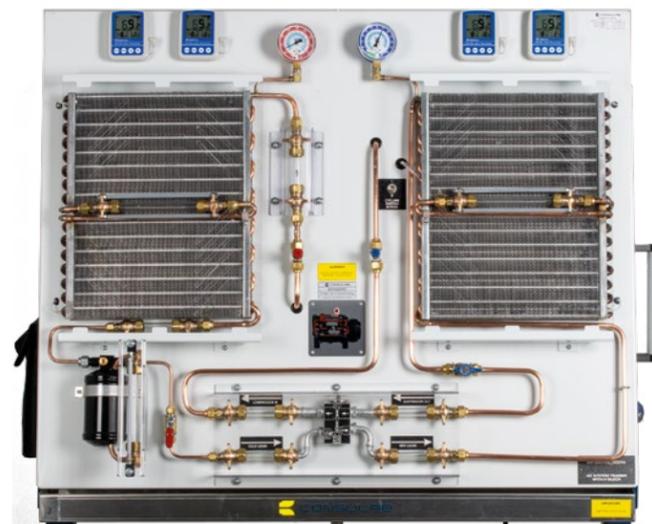


- Uses the TXV (Thermal Expansion Valve) design of refrigerant flow control.



**A/C system with H-block (TXV)**

EM-2000-HB



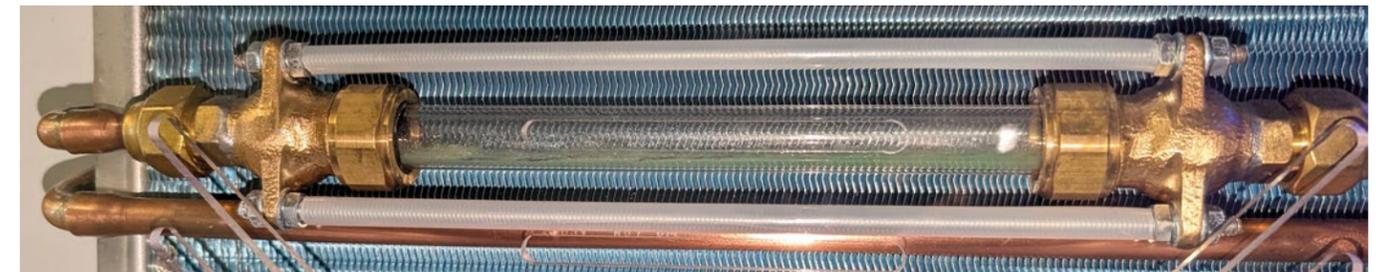
- Uses the H-Block TXV design of refrigerant flow control.



**The EM-2000 Series A/C systems trainers**

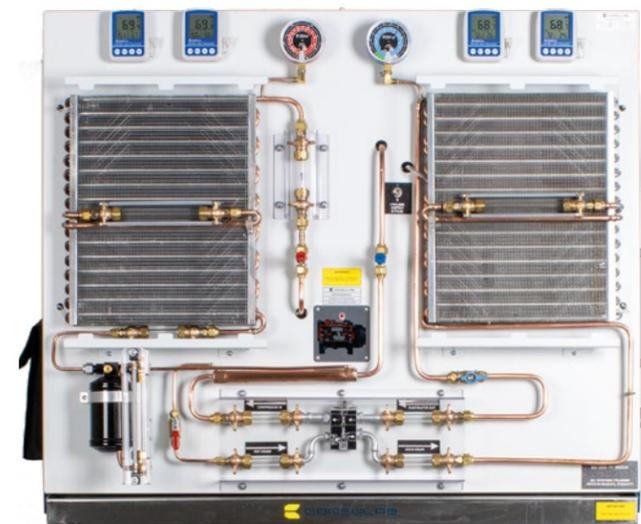
The ConsuLab EM-2000 Air Conditioning trainers are a complete A/C system with unique features designed to enhance the instruction of air conditioning physics.

Seeing refrigerant change of state is believing how it works

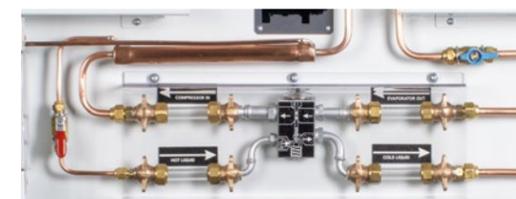


**AC system trainer with H-Block, R1234YF**

EM-2000-YF



- Uses the H-Block TXV design with R1234yf flow control.



**A/C system with orifice tube**

EM-2000-OT



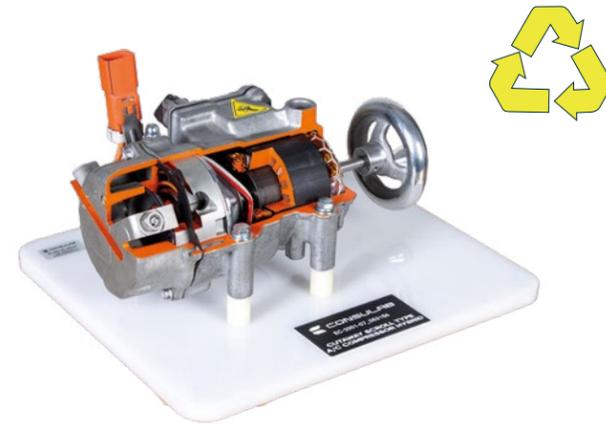
- Uses the orifice tube design of refrigerant flow control.



### Cutaway hybrid scroll type A/C compressor

EC-2001-07

- 3-phase electric AC compressor cutaway.
- Driven by hand crank.



Operation manual ✓

### ConsuLink™ GM 1.4L Engine trainer, AC & Stop-start

EM-140S-GM06A

#### The first ever engine bench with functional stop-start system!

- Take your students for a road test !
- Two pedals means you can do a road test\* & Load test.

- See how misfires and data PIDs react to a stall test load.

ConsuLink™ student learning platform, a new way for you and your students to interact with the trainer.

- Case studies.
- Scenarios.
- Instructor lead lessons.
- All integrated into a touchscreen interface.

#### What's in it for me ?

- Time savings.
- Pre-set student activities, case studies, scenarios, and instructor lessons mean you can be setup and teaching rapidly with minimal prep time. .
- The size and portability of this trainer saves space in a cramped classroom and makes moving it to multiple classrooms easy.
- Student engagement.

#### Diagnosis

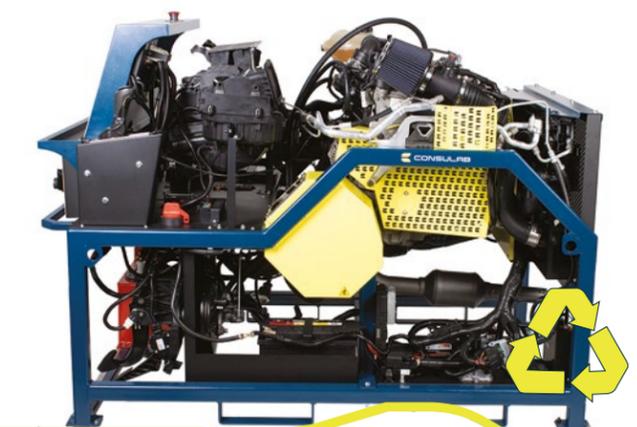
- No permanent codes in engine ECU.
- Dozens of faults, case studies and lessons for engine performance trigger OEM DTC's.

\*Road test speed limited to 15mph (25kmh).

Operation manual	Student Assignments	Instructors Guide
✓	9	✓

Student Led Case Study	Instructor Led Case Study
9	14

2016-2019 Chevrolet Cruze GM



# CONSULINK™

## ConsuLink™ Student Learning Platform

You can now interact with ConsuLab product in the new following ways.

ConsuLink is another intuitive solution we now offer with some of our products. This tablet-based learning platform resonates with today's students as it has a familiar touchscreen interface and all assignments, faults, schematics and tasks are preloaded onto the tablet.

Reference information — No more hunting paperwork

### Student mode

Student case studies

We give the students the customer complaint and instructions for them to diagnose the problem.

Scenario numbers

Allow an instructor to assign students any pre-set fault or case study, without the students knowing what it is. Liberating instructor time.

### Instructor mode

Instructor case studies

Gives you all the answer keys and reasoning for each student case study.

Instructor led lessons

Instructions and pre-sets prepared by educational experts like having a room full of mentors!

Faults & Schematics

Gives you all the information you need on each fault.

Manual fault insertion

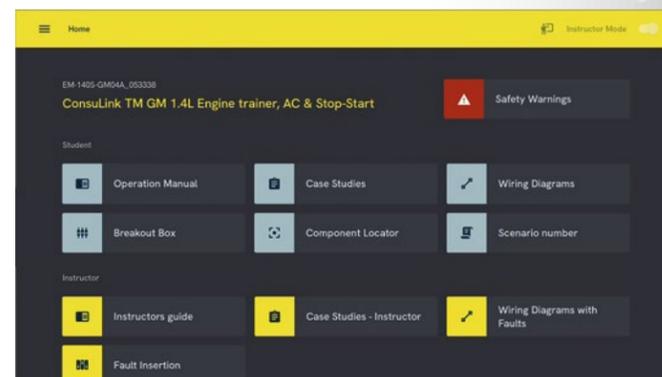
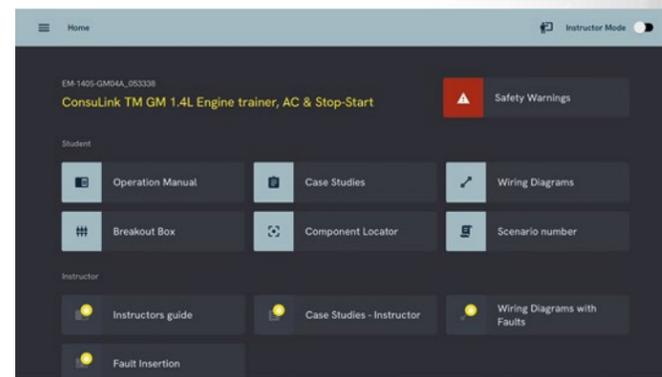
Ability to create your own customized case studies.

### Products with ConsuLink

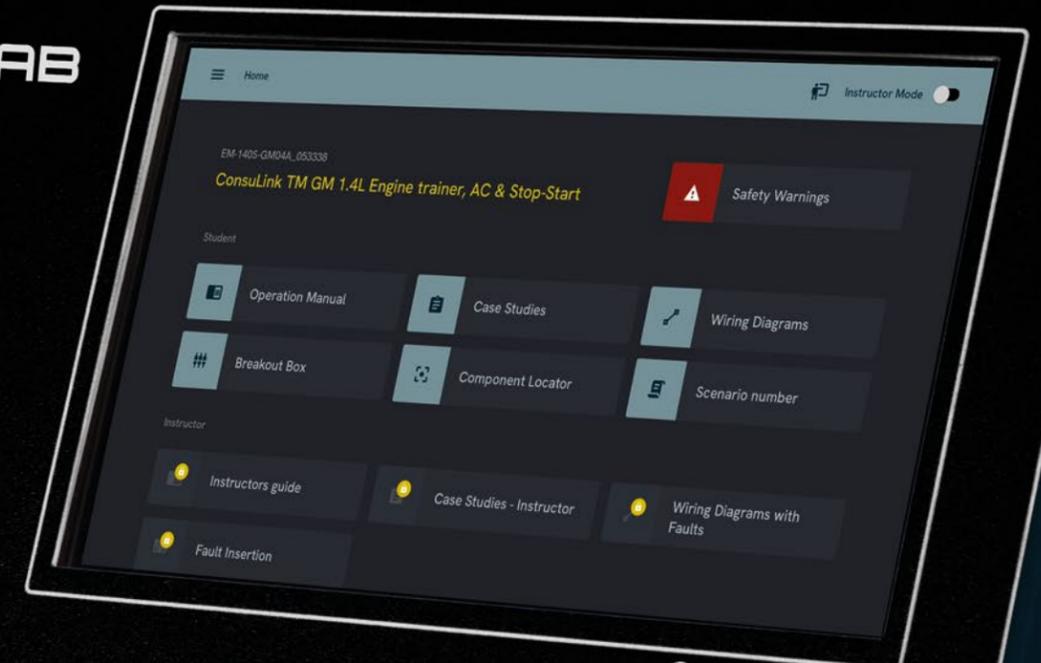
ConsuLink™ GM 1.4L Engine trainer, AC & Stop-start, ConsuLink™ 2016-2012 Hyundai GDI 1.6L engine, ConsuLink 2017 Ram 6.7L diesel engine trainer and ConsuLink engine bench Cummins B6.7 EPA 2021 new

[consulab.com](http://consulab.com)

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CONSULAB



CONSULINK™

KMHCT5AE6CU040734

HYUNDAI ACCENT 1.6L  
EM-140S-HY03\_035039

[consulab.com](http://consulab.com)

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### ConsuLink™ 2016-2012 Hyundai GDI 1.6L engine

EM-140S-HY04

One of our most popular, smallest engine benches for engine performance – now with ConsuLink™!

ConsuLink™ Student learning platform including:

- Case studies.
- Scenarios.
- Instructor lead lessons.

Operation manual	Student Assignments	Instructors Guide
✓	9	✓

Student Led Case Study	Instructor Led Case Study
7	15



### Fuel injection and GM engine management trainer

EM-330-1

- Teaches engine advanced performance.
- Adjust four major sensors to demonstrate cause/effect: MAP, MAF, ECT & IAT.
- Visible fuel injectors and spray pattern.
- Includes complete curriculum, operation manual, instructor manual & student assignments.
- Fits in any classroom, no exhaust, no gasoline, no battery.
- Breakout box for easy oscilloscope measurements.

Operation manual	Student Assignments	Instructors Guide
✓	17	✓



ConsuLab Engine benches are optimal for demonstrating engine performance while saving space and setup time. We build our engine benches with OEM components (VIN included). Fault insertion maximizes student learning and diagnosis.

### 2018-2014 Corolla 1.8L engine trainer with A/C

EM-140C-TY02A

- Heat & A/C system (H-Block TXV) with clear sight glasses or pressure gauges
- Port fuel injection, double overhead camshafts with variable valve timing.

Operation manual	Student Assignments	Instructors Guide
✓	9	✓

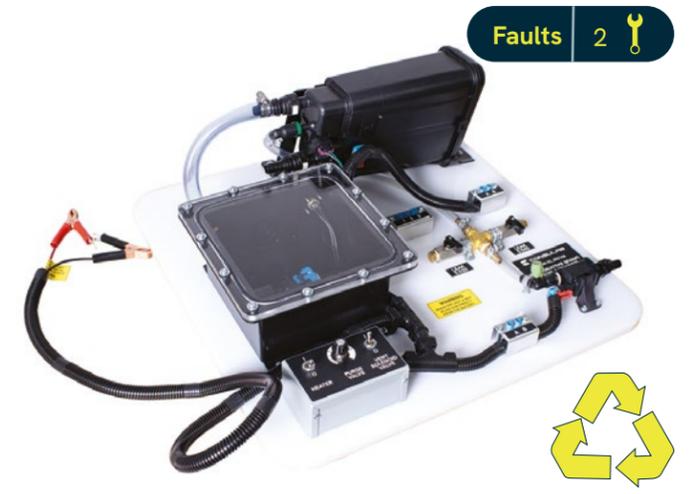


### EVAP system trainer

EM-200-22

- Demonstrates the operation, diagnosis, and testing of common EVAP (evaporative emissions) systems on North American vehicles.
- Includes two different leaks for use with smoke testing.
- Pressure sensor and heat lamp allow variation of signal.
- Includes a complete curriculum with student exercises.
- Uses real vehicle sensors.

Operation manual	Student Assignments	Instructors Guide
✓	4	✓



### 2019-2017 F series 6.7L diesel engine trainer

EM-140D-FD02

A complete running diesel engine, transmission & after treatment exhaust system without the truck.

Designed to teach diesel engine performance and diagnosis. A time-saving package allowing instructors to instantly provide a “turn-key” engine performance demonstrations and fault diagnosis.

- Saves significant instructor setup time.



Operation manual	Student Assignments	Instructors Guide
✓	9	✓

### Consulink 2017 Ram 6.7L diesel engine trainer

EM-140D-FC03

Trainer equipped with tablet-based Consulink™ Student Learning Platform designed to enhance student engagement. Trainer is easy to work on and all major components, wiring and connectors match OEM configuration. It's equipped with safety guards covering all rotating components.

- Saves significant instructor setup time.



Operation manual	Student Assignments	Instructors Guide
✓	9	✓

Student Led Case Study	Instructor Led Case Study
10	13

### Electric Vehicle thermodynamic systems trainer

EV-2000

Teach the most complex part of EV thermal management by letting students see refrigerant paths, feel heat movement, and measure every exchange point.

This product is designed to teach the thermodynamic systems found in modern vehicles including electric, hydrogen powered, hybrid, and combustion platforms, covering powertrain, power electronics, battery, and cabin heating and cooling. It combines a refrigerant based heat pump, multiple heat exchangers such as condensers and evaporators, a multi-circuit glycol cooling system with dedicated pumps, a chiller, and electronically controlled valves and expansion valves to demonstrate real system behavior. Students can observe changes of state and track how energy moves through every part of the system.

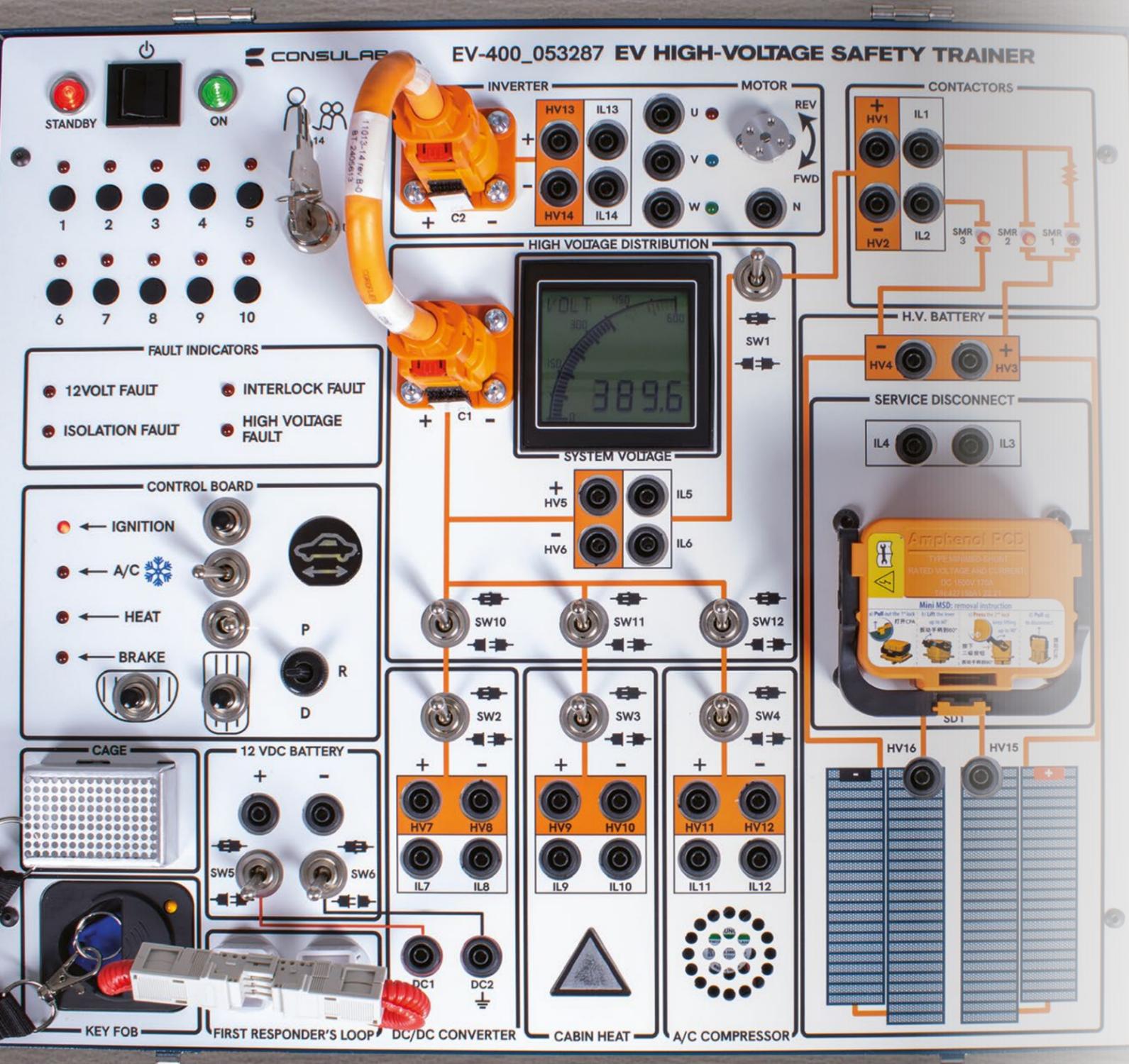
The trainer includes a full suite of diagnostic scenarios that replicate real-world issues such as restricted airflow, iced evaporators, non-activating pumps, and malfunctioning expansion valves. Students can observe how each fault affects system pressures, temperatures, and flow behavior, allowing them to trace symptoms back to root causes. Each fault is paired with clear system reactions, giving learners hands-on experience in interpreting abnormal operation across both refrigerant and glycol circuits.

- Operational heat pump, chiller, heat exchangers, and electronic expansion valves
- Multi-circuit glycol cooling with dedicated pumps for battery, power electronics, and cabin
- Ten selectable operating modes
- Visualized refrigerant and glycol flow, temperature shifts, and state changes
- Integrated sensors for pressure, temperature, and energy measurement
- Simulated restricted-airflow scenarios across all heat exchangers



- Expansion valve, PTC heater, and glycol pump fault simulations
- Simulated evaporator or external heat-exchanger icing
- Observable system reactions in pressure, flow, and temperature for diagnostics

Operation manual	Student Assignments	Instructors Guide
✓	24	✓



### EV High-Voltage Safety Trainer

Faults 10 ⚡ 1 ⚙️

EV-400

**Measure 400V DC in a completely safe, controlled, classroom environment.**

Teach High-Voltage Safety in a compact classroom sized package through an intuitive, hands-on experiences for high-voltage testing, Personal Protective Equipment (PPE) use including gloves and insulated tools, high voltage isolation testing with a mega-ohmmeter, high voltage interlock circuits, first responders' loops, three phase motor control, high voltage power distribution, and much more.

The product has a fault box and a faulty component, allowing diagnostic practice. The system reacts as a real EV, demonstrating functions of various scenarios and components.

EV-400 transcends the limitations of traditional trainers. It's not just about demonstration; it's about active engagement, hands-on learning, and real-world application.

- High voltage loss of isolation
- High voltage interlock loop
- 12V supply problems
- Air condition faults
- PTC heater faults
- Component faults
- Harness faults
- Contactor problems



Classroom kit

This product is perfect for the following:

- Technical training programs: automotive, electrical engineering, emergency response.
- Educational institutions: motive power trades, vocational schools, community colleges, and high schools.
- EV manufacturers and repair shops: upskilling technicians and ensuring safety protocols.

Includes an isolation meter and a set of large high voltage gloves.

Operation manual	Student Assignments	Instructors Guide
✓	27	✓



### Cutaway hybrid engine and drive train Prius

EC-140H

A complete hybrid drive system in your classroom !

Demonstrates the following driving modes :

- Reverse.
- Engine start.
- Low speed and low acceleration (stealth).
- Normal drive (cruise).
- High speed and full-throttle acceleration.
- High speed energy recirculation.
- Coasting.
- Regenerative braking.
- Observe the CVT function of the power split device.



2010-2015 Toyota Prius

Operation manual	Student Assignments	Instructors Guide
✓	2	✓

### Hybrid planetary gear set trainer

EM-200-29

Demonstrates power flow in a hybrid drive-train.

- Students can direct power flow to determine the operation and interaction of different drive line components.
- Focuses on the planetary gear set system, or "Power-Split device".



Operation manual
✓

### Interactive Demonstrative Electric Vehicle

EV-601-TS

The EV-601 is a cutting-edge educational tool that brings the world of electric vehicles into the classroom.

Designed specifically for training purposes, this vehicle offers a range of benefits to students, teachers, and educational institutions, through its interactive screens and full component layout. The EV-601 is an Electric Vehicle (EV TESLA Model 3) that still retains all its functional systems and it's high voltage system has been replaced with Consulabs simulated safe High Voltage system.

The EV-601 provides a unique opportunity for students to engage in hands-on learning experiences through the Consulab interactive display. The biggest advantage of the EV-601, is it will have students learning the inner workings of an electric vehicle, drive systems, charging, thermal systems, battery systems without the risk associated with high voltage.

- HV Components : Inverter, contactors, DCDC, AC HV compressor, motor, HV cables, charger, PTC heater
- Thermal battery system components
- Functional TESLA™ Service Mode
- Battery management system
- HV cable layout
- Interlock function
- Isolation function
- ADAS system cameras and components
- First responder's functional loop

Teach real EV training with an EV vehicle in a safe and controlled vehicle

Minimal set up – Move EV-601 into a shop or lab and turn on power and set park brake.

Operation manual	Student Assignments	Instructors Guide
✓	40	✓



2018-2020 Tesla Model 3

## Main Features of ConsuLab products

- Mobility
- Short set-up time
- Circuit components arranged in logical order
- Components and corresponding symbols are visible
- Occupies only a small area of the work bench
- Easily stored
- Additional components may be added to modules
- Designed with student safety in mind
- In tune with industry practices

## Limited warranty

ConsuLab warrants that all systems which it manufactures are free from defects in workmanship and materials, provided that they are used under normal conditions and within the limits of the relevant specifications. This warranty is effective for one year from the date of delivery, and excludes any other warranty, whether oral or implied, such as (but not restricted to) any warranty as to fitness for a particular use.

ConsuLab will repair or replace at its sole discretion any part found to be defective during the period of the warranty. The liability of ConsuLab is limited to repairing or replacing parts in the system found to be defective and under no circumstances will ConsuLab assume responsibility for losses or other expenses which arise directly or indirectly from any malfunction of the system.

In no circumstances can ConsuLab be held liable for any personal injury or material loss or damage to any person or equipment, which is caused by any defect in the system other than as covered in this warranty. This warranty is not transferable. Any unauthorized modification in the system, or any falsification or removal of the serial number will immediately render this warranty null and void.

## Catalog Contents

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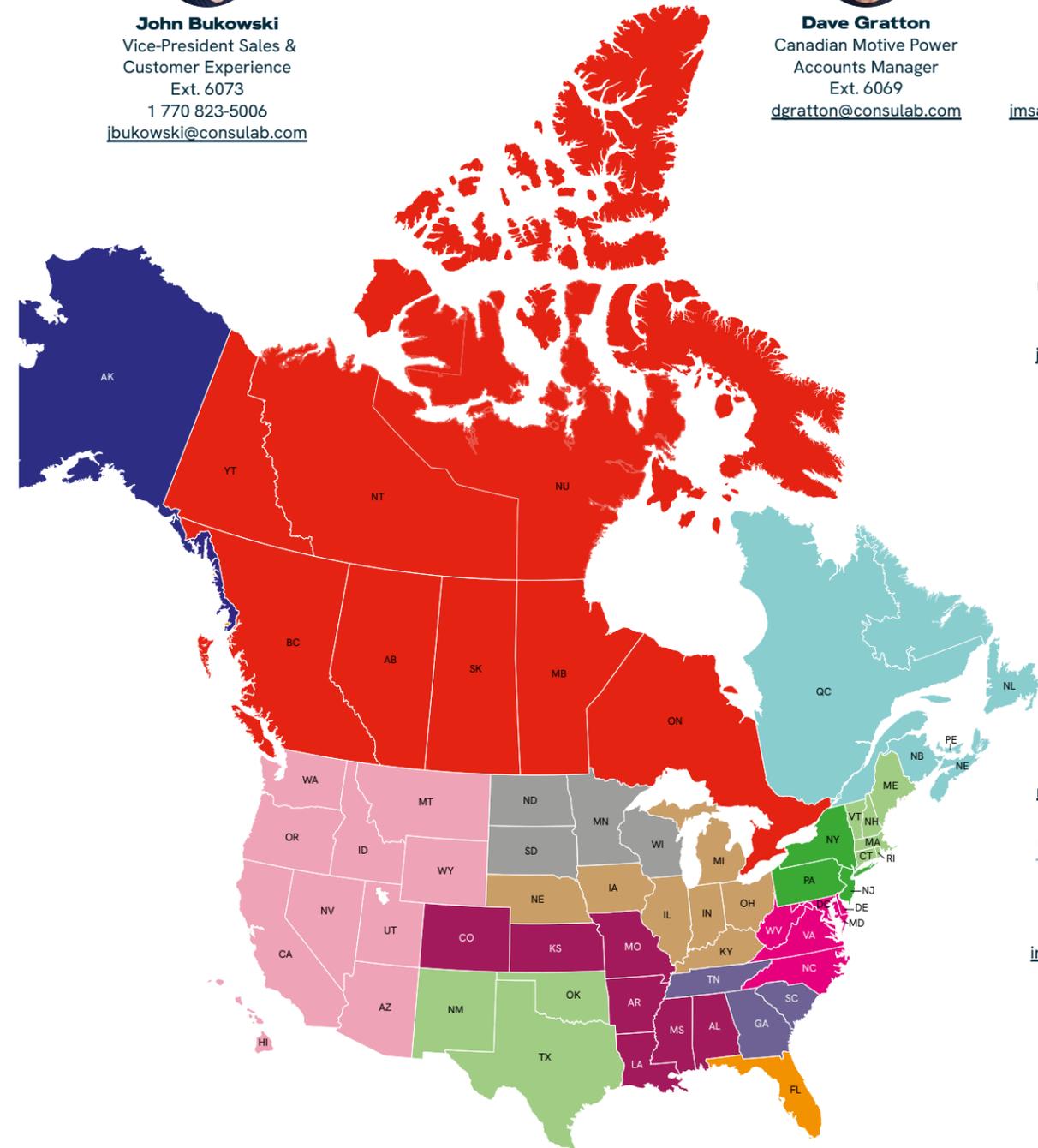
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