

Issued: February 27, 2017

Program: Automotive Service Technician

To: ITA Training Providers
Articulation Chair
System Liaison Person
School Districts

Subject: **Automotive Service Technician (AST) Program Update**

OPSN No.: **OPSN 2017 002**

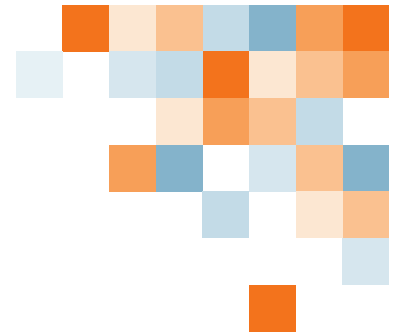
Effective Date: September 1, 2017

Summary of Change: Please be advised that a new Program Outline has been posted to the Industry Training Authority (ITA) [website](#). For details, please see ***Automotive Service Technician Program Outline Review Details*** (attached).

Please note, the following changes have been made to the AST program in BC:

- The final level will be called Automotive Service Technician (not AST 4)
- **An increase in work-based training (WBT) hours:** from 6,000 hours to 6,360 hours
- **An increase in the hours of technical training:** 30 hours at Level 2 and 30 hours at Level 4

Rationale: The AST National Occupational Standard (NOA, 2011) was reviewed and updated as part of **the Harmonization Initiative** (see *General Information* below for more details). After a series of consultations, workshops and pan-Canadian webinars, a new Red Seal Occupational Standard (RSOS) was developed to replace the NOA, including the following finalized priorities for AST:



AST	Changing in BC?	What will it be?
TRADE NAME	YES	Automotive Service Technician*
NUMBER OF TRAINING LEVELS	NO	4
TOTAL HOURS Technical + work-based training	YES	7200 hours Increased by 420
TRAINING SEQUENCE order of subjects taught	YES	Some changes to sequence

* BC will maintain the progressive credential model (i.e. a Certificate of Qualification at each of the 4 levels), but the final certificate will be called Automotive Service Technician, not Automotive Service Technician (AST 4).

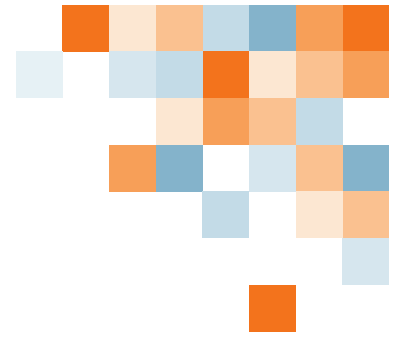
The revised RSOS and the finalized harmonization recommendations triggered a full program review in BC. As part of this program review and because of the change to the content mandated by the RSOS, a training duration analysis was also conducted, followed by industry consultation.

Details:

A review of the BC AST Program to align it to the (draft) RSOS was conducted in September 2016. During the Program Outline review, a need for more technical training time was identified. A training duration analysis was conducted and resulted in a proposal to increase the hours as detailed in the attached document, **AST Total Training Time: Details**.

Subsequently, ITA consulted more broadly with industry and this consultation validated the need for more technical training time. **The increase has been approved and will be in effect as of September 1, 2017.**

ITA will be working with the training providers to identify strategies for transitioning to the harmonized program. ITA is also working on a communication plan to inform apprentices and employers of the changes to the program.



GENERAL INFORMATION: The Harmonization Initiative

At the request of industry, the Canadian Council of Directors of Apprenticeship (CCDA)'s Harmonization Initiative was launched in Fall 2013, and endorsed by the Forum of Labour Market Ministers (FLMM) in 2014. The goal of Harmonization is to *substantively align* apprenticeship systems across Canada by making apprenticeship training requirements more consistent in Red Seal trades.

In consultation with stakeholders, the CCDA identified four harmonization priorities:

1. Use of Red Seal **trade name**
2. Consistent **total training hours** (in-school and on-the-job)
3. Same number of **training levels**
4. Consistent **sequencing** of training content, including use of most recent National Occupational Analysis.

For more information on the Harmonization Initiative, please visit our website at <http://www.itabc.ca/our-trades-training-system/pan-canadian-harmonization-initiative>.

Attachments: ***Automotive Service Technician Program Outline Review Details***

This attachment provides details of the revisions made to the AST Program Outline during the review process.

AST Total Training Time: Details

This attachment provides details of the increased technical training time and work-based training time.

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Automotive Service Technician (AST) Harmonization Training Hours Details

The following changes to training time for AST will come into effect **September 1, 2017**:

- Increased technical training hours in order to accommodate content added to the Red Seal Occupational Standard (RSOS) (**increase of 30 hours at Level 2 and 30 hours at Level 4**)
- Increased work-based training (WBT) hours in order to align with the harmonized standard of 7,200 hours of total training (**increase of 360 hours**)

Apprenticeship Pathway

Current Program	Hours
Technical Training	780
Level 1 = 210 hours	
Level 2 = 180 hours	
Level 3 = 210 hours	
Level 4 = 180 hours	
Work-based Training Hours	6,000
Current Total Training Hours	6,780

Harmonized Program	Hours
Technical Training	840
Level 1 = 210 hours	
Level 2 = 210 hours	
Level 3 = 210 hours	
Level 4 = 210 hours	
Work-based Training Hours	6,360
Harmonized Total Training Hours	7,200

Challenge Pathway and Sign-off Authority

Current Program	Hours
Work-based Training Hours	6,000
ITA Formula for Calculating Challenge WBT	X 1.5
Current Challenge WBT Hours	9,000

Harmonized Program	Hours
Harmonized Work-based Training Hours	6,360
ITA Formula for Calculating Challenge WBT	X 1.5
Harmonized Challenge WBT Hours	9,540



Automotive Service Technician (AST) Program Outline Review Details

Key

Blue Text = Content moved to new level

Green Text = New content added

Summary - Competency Migration

Overall: The Red Seal Occupational Standard (RSOS) includes technology from vehicles from the year 2000 and later. The Occupational Analysis Charts (OACs) for AST have been combined and aligned to the Red Seal Occupational Standard. Therefore, **all of the competencies have been renamed and restructured**. This chart shows the finalized competency distribution for the Harmonized AST program. It summarizes the major changes to the competencies, specifically the level they are taught in and any new competencies that were added.

AST HARMONIZED LEVEL 1		AST HARMONIZED LEVEL 2		AST HARMONIZED LEVEL 3		AST HARMONIZED LEVEL 4	
Line A	Perform Safety-Related Functions	Line A	Perform Safety-Related Functions	Line A	Perform Safety-Related Functions	Line A	Perform Safety-Related Functions
	A1: Maintain safe work environment						
	A2: Use personal protective equipment (PPE) and safety equipment						
Line B	Use Tools, Equipment and Documentation	Line B	Use Tools, Equipment and Documentation	Line B	Use Tools, Equipment and Documentation	Line B	Use Tools, Equipment and Documentation
	B1: Use tools and equipment						
	B2: Use fasteners, tubing, hoses and fittings						
	B3: Use hoisting and lifting equipment						
	B4: Use technical information						
Line C	Use Communication and Mentoring Techniques	Line C	Use Communication and Mentoring Techniques	Line C	Use Communication and Mentoring Techniques	Line C	Use Communication and Mentoring Techniques
	C1: Use communication techniques						
						New	C2: Use mentoring techniques
Line D	Diagnose and Repair Engine Systems	Line D	Diagnose and Repair Engine Systems	Line D	Diagnose and Repair Engine Systems	Line D	Diagnose and Repair Engine Systems
			D1: Diagnose and repair cooling systems				



Automotive Service Technician (AST) Program Outline Review Details

AST HARMONIZED LEVEL 1		AST HARMONIZED LEVEL 2		AST HARMONIZED LEVEL 3		AST HARMONIZED LEVEL 4	
			D2: Diagnose and repair lubricating systems				
			D3: Diagnose and repair engine assembly				
			D4: Diagnose and repair accessory drive systems				
Line E	Diagnose and Repair Gasoline Engine Support Systems	Line E	Diagnose and Repair Gasoline Engine Support Systems	Line E	Diagnose and Repair Gasoline Engine Support Systems	Line E	Diagnose and Repair Gasoline Engine Support Systems
					E1: Diagnose and repair advanced wiring and electronics		
					E2: Diagnose and repair gasoline fuel delivery and injection systems		
					E3: Diagnose and repair gasoline ignition systems		
					E4: Diagnose and repair engine management systems		
				L2 → L3	E5: Diagnose and repair gasoline intake and exhaust systems		
					E6: Diagnose and repair gasoline emissions control systems		
Line F	Diagnose and Repair Diesel Engine Support Systems	Line F	Diagnose and Repair Diesel Engine Support Systems	Line F	Diagnose and Repair Diesel Engine Support Systems	Line F	Diagnose and Repair Diesel Engine Support Systems
						Enhanced and moved L3 → L4	F1: Diagnose and repair diesel fuel delivery and injection systems
						Enhanced and moved L2 → L4	F2: Diagnose and repair diesel intake and exhaust systems
						Enhanced and moved L3 → L4	F3: Diagnose and repair diesel emission control systems



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AST HARMONIZED LEVEL 1		AST HARMONIZED LEVEL 2		AST HARMONIZED LEVEL 3		AST HARMONIZED LEVEL 4	
Line G	Diagnose and Repair Vehicle Networking Systems	Line G	Diagnose and Repair Vehicle Networking Systems	Line G	Diagnose and Repair Vehicle Networking Systems	Line G	Diagnose and Repair Vehicle Networking Systems
					G1: Identify type of networking system		
				New	G2: Diagnose and repair networking systems		
Line H	Diagnose and Repair Driveline Systems	Line H	Diagnose and Repair Driveline Systems	Line H	Diagnose and Repair Driveline Systems	Line H	Diagnose and Repair Driveline Systems
L1 ← L4	H1: Diagnose and repair drive shafts and axles						
		L2 ← L4	H2: Diagnose and repair manual transmissions and transaxles				
							H3: Diagnose and repair automatic transmissions and transaxles
		L2 ← L4	H4: Diagnose and repair clutches				
				L3 ← L4	H5: Diagnose and repair mechanical transfer cases		
							H6: Diagnose and repair all-wheel drive (AWD) systems
		L2 ← L4	H7: Diagnose and repair final drive assemblies				
Line I	Diagnose and Repair Electrical Systems and Components	Line I	Diagnose and Repair Electrical Systems and Components	Line I	Diagnose and Repair Electrical Systems and Components	Line I	Diagnose and Repair Electrical Systems and Components
	I1: Diagnose and repair basic wiring and electrical systems						
	I2: Diagnose and repair starting and charging systems and batteries		I2: Diagnose and repair starting and charging systems and batteries				
			I3: Diagnose and repair lighting and wiper systems				



Automotive Service Technician (AST) Program Outline Review Details

AST HARMONIZED LEVEL 1		AST HARMONIZED LEVEL 2		AST HARMONIZED LEVEL 3		AST HARMONIZED LEVEL 4	
				L2 → L3	I4: Diagnose and repair electrical options and accessories		
						L2 → L4	I5: Diagnose and repair instrumentation, entertainment systems and displays
Line J	Diagnose and Repair Heating, Ventilation and Air Conditioning (HVAC) and Comfort Control Systems	Line J	Diagnose and Repair Heating, Ventilation and Air Conditioning (HVAC) and Comfort Control Systems	Line J	Diagnose and Repair Heating, Ventilation and Air Conditioning (HVAC) and Comfort Control Systems	Line J	Diagnose and Repair Heating, Ventilation and Air Conditioning (HVAC) and Comfort Control Systems
						L2 → L4	J1: Diagnose and repair air flow control and heating systems
						L2 → L4	J2: Diagnose and repair refrigerant systems
Line K	Diagnose and Repair Steering and Suspension, Braking, Control Systems, Tires, Wheels, Hubs and Wheel Bearings	Line K	Diagnose and Repair Steering and Suspension, Braking, Control Systems, Tires, Wheels, Hubs and Wheel Bearings	Line K	Diagnose and Repair Steering and Suspension, Braking, Control Systems, Tires, Wheels, Hubs and Wheel Bearings	Line K	Diagnose and Repair Steering and Suspension, Braking, Control Systems, Tires, Wheels, Hubs and Wheel Bearings
	K1: Diagnose and repair steering and control systems	L1 → L2	K1: Diagnose and repair steering and control systems				
	K2: Diagnose and repair suspension and control systems	L1 → L2	K2: Diagnose and repair suspension and control systems				
	K3: Diagnose and repair braking and control systems	L1 → L2	K3: Diagnose and repair braking and control systems				
	K4: Diagnose and repair tires, wheels, hubs and wheel bearings						
Line L	Diagnose and Repair Restraint Systems, Body Components, Accessories and Trim	Line L	Diagnose and Repair Restraint Systems, Body Components, Accessories and Trim	Line L	Diagnose and Repair Restraint Systems, Body Components, Accessories and Trim	Line L	Diagnose and Repair Restraint Systems, Body Components, Accessories and Trim
						L2 → L4	L1: Diagnose and repair restraint systems
	L2: Diagnose and repair wind noises, rattles and water leaks						



Automotive Service Technician (AST) Program Outline Review Details

AST HARMONIZED LEVEL 1		AST HARMONIZED LEVEL 2		AST HARMONIZED LEVEL 3		AST HARMONIZED LEVEL 4	
	L3: Diagnose and repair interior and exterior components, accessories and trim						
	L4: Diagnose and repair latches, locks and movable glass						
Line M	Diagnose and Repair Hybrid and Electric Vehicles (EV)	Line M	Diagnose and Repair Hybrid and Electric Vehicles (EV)	Line M	Diagnose and Repair Hybrid and Electric Vehicles (EV)	Line M	Diagnose and Repair Hybrid and Electric Vehicles (EV)
L1 ← L2	M1: Implement specific safety protocols for hybrid and electric vehicles (EV)						
						Enhanced	M2: Diagnose and repair hybrid and electric vehicle (EV) systems

Automotive Service Technician (AST) Program Outline Review Details

Key

Blue Text = Content moved to new level

Green Text = New content added

Red Text = Removed

Details of Changes

Overall: The Red Seal Occupational Standard (RSOS) includes technology from vehicles from the year 2000 and later. The Occupational Analysis Charts (OACs) for AST have been combined and aligned to the Red Seal Occupational Standard. Therefore, **all of the competencies have been renamed and restructured**. The following provides a side by side comparison with notes of major changes.

	Current Level 1		Harmonized Level 1	Description of Changes
Line A	WORKPLACE SAFETY	Line A	PERFORM SAFETY-RELATED FUNCTIONS	
A1	Describe WorkSafeBC regulations	A1	Maintain safe work environment	Re-structured and renamed
A2	Describe WHMIS regulations	A2	Use personal protective equipment (PPE) and safety equipment	Re-structured and renamed
A3	Describe safe vehicle operation			Re-structured and renamed
A4	Demonstrate safe work practices			Re-structured and renamed
Line B	EMPLOYABILITY SKILLS			
B1	Describe business practices			Removed/ teach in context of tasks
B2	Demonstrate communication skills			Moved to Line C
Line C	TOOLS AND EQUIPMENT	Line B	USE TOOLS, EQUIPMENT AND DOCUMENTATION	Tools and Equipment moved to Line B
C1	Use hand tools	B1	Use tools and equipment	Re-structured and renamed
C2	Use measuring instruments	B2	Use fasteners, tubing, hoses and fittings	Re-structured and renamed
C3	Use power tools	B3	Use hoisting and lifting equipment	Re-structured and renamed
C4	Use fasteners	B4	Use technical information	Re-structured and renamed
C5	Use shop tools and equipment			Re-structured and renamed
C6	Use reference resources			Re-structured and renamed
		Line C	USE COMMUNICATION AND MENTORING TECHNIQUES	



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 1		Harmonized Level 1	Description of Changes
		C1	Use communication techniques	Moved from Line B
Line D	GENERAL AUTOMOTIVE MAINTENANCE			General Auto Maintenance was distributed across several lines
D1	Select lubricants and fluids			Moved to Line B
D2	Describe belts and hoses			Moved to Line B
D3	Describe exterior lamps			Moved to Level 2
D4	Describe body trim and hardware			Moved to Line L
D5	Service tires and wheels			Moved to Line K
D6	Service non-friction bearings			Moved to Line K
D7	Service spindles and hubs			Move to Line K
Line E	GENERAL AUTOMOTIVE PRACTICES			General Automotive Practices was distributed across several lines
E1	Describe diagnostic procedures			Teach in context of other tasks
E2	Demonstrate welding safety			Moved to Line B
Line F	BASIC ELECTRICAL SYSTEMS			Basic Electrical moved to Line I
F1	Describe principles of electricity			Re-structured and renamed
F2	Use electrical test equipment			Re-structured and renamed
F3	Service wiring systems			Re-structured and renamed
F4	Service 12-volt batteries			Re-structured and renamed
F5	Use scan tools			Re-structured and renamed
Line G	BRAKE SYSTEMS			
G1	Service brake tubing and fittings			Moved to Line K
G2	Service brake hydraulic systems			Moved to Line K
G3	Service drum brake systems			Moved to Line K



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 1		Harmonized Level 1	Description of Changes
G4	Service disc brake systems			Moved to Line K
G5	Inspect power assist systems			Moved to Line K
G6	Service anti-lock brake systems			Moved to Level 2
Line H	STEERING SYSTEMS			
H1	Service steering gears			Moved to Line K
H2	Service passenger restraint systems			Moved to Level 4
H3	Inspect steering columns			Moved to Line K
H4	Service steering linkage			Moved to Line K
H5	Service power steering systems			Moved to Line K Electronic steering moved to Level 2
H6	Perform wheel alignment			Moved to Line K
		Line H	DIAGNOSE AND REPAIR DRIVELINE SYSTEMS	
		H1	Diagnose and repair drive shafts and axles	Moved from Level 4
Line I	SUSPENSION SYSTEMS			
I1	Describe frame types			Moved to Line K
I2	Describe suspension geometry			Moved to Line K
I3	Describe suspension components			Moved to Line K
I4	Service suspension systems			Moved to Line K
I5	Describe electronic suspension systems			Moved to Level 2
		Line I	DIAGNOSE AND REPAIR ELECTRICAL SYSTEMS AND COMPONENTS	
		I1	Diagnose and repair basic wiring and electrical systems	Moved from Line F
		I2	Diagnose and repair starting and charging systems and batteries	Moved from Line F
		Line K	DIAGNOSE AND REPAIR STEERING AND SUSPENSION, BRAKING, CONTROL SYSTEMS, TIRES, WHEELS, HUBS AND WHEEL BEARINGS	



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 1		Harmonized Level 1	Description of Changes
		K1	Diagnose and repair steering and control systems	Moved from Line H
		K2	Diagnose and repair suspension and control systems	Moved from Line I
		K3	Diagnose and repair braking and control systems	Moved from Line G
		K4	Diagnose and repair tires, wheels, hubs and wheel bearings	Moved from Line D
		Line L	DIAGNOSE AND REPAIR RESTRAINT SYSTEMS, BODY COMPONENTS, ACCESSORIES AND TRIM	
		L2	Diagnose and repair wind noises, rattles and water leaks	Moved from Line D
		L3	Diagnose and repair interior and exterior components, accessories and trim	Moved from Line D
		L4	Diagnose and repair latches, locks and movable glass	Moved from Line D
		Line M	DIAGNOSE AND REPAIR HYBRID AND ELECTRIC VEHICLES (EV)	
		M1	Implement specific safety protocols for hybrid and electric vehicles (EV)	Moved from Level 2



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 2		Harmonized Level 2	Description of Changes
Line A	ADVANCED ELECTRICAL SYSTEMS			
A1	Perform advanced electrical testing			Moved to Line I
A2	Service starting systems			Moved to Line I
A3	Service charging systems			Moved to Line I
A4	Diagnose passenger restraint systems			Moved to Level 4
A5	Service electrical accessories			Moved to Level 3
Line B	HEATING, VENTILATION AND AIR CONDITIONING SYSTEMS			
B1	Service heating and ventilation systems			Moved to Level 4
B2	Service air conditioning systems			Moved to Level 4
Line C	ENGINES			
C1	Describe principles of gasoline internal combustion engines			Moved to Line D
C2	Describe principles of diesel internal combustion engines			Moved to Line D
C3	Evaluate engine mechanical condition			Moved to Line D
C4	Describe engine removal and installation procedures			Moved to Line D
C5	Disassemble and assess engines			Moved to Line D
C6	Service gaskets and seals			Moved to Line D
Line D	ENGINE SUPPORT SYSTEMS	Line D	DIAGNOSE AND REPAIR ENGINE SYSTEMS	
D1	Service lubrication systems	D1	Diagnose and repair cooling systems	Re-structured and renamed
D2	Service cooling systems	D2	Diagnose and repair lubricating systems	Re-structured and renamed
D3	Describe air induction and exhaust systems			Moved to Level 3
		D3	Diagnose and repair engine assembly	Moved from Line C
		D4	Diagnose and repair accessory drive systems	Moved from Line A



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 2		Harmonized Level 2	Description of Changes
Line E	HYBRID AND ELECTRIC VEHICLE SAFETY			
E1	Describe hybrid and electrical vehicle safety			Moved to Level 1
		Line H	DIAGNOSE AND REPAIR DRIVELINE SYSTEMS	
		H2	Diagnose and repair manual transmissions and transaxles	Moved from Level 4
		H4	Diagnose and repair clutches	Moved from Level 4
		H7	Diagnose and repair final drive assemblies	Moved from Level 4
		Line I	DIAGNOSE AND REPAIR ELECTRICAL SYSTEMS AND COMPONENTS	
		I2	Diagnose and repair starting and charging systems and batteries	Re-structured and renamed
		I3	Diagnose and repair lighting and wiper systems	Re-structured and renamed
		Line K	DIAGNOSE AND REPAIR STEERING AND SUSPENSION, BRAKING, CONTROL SYSTEMS, TIRES, WHEELS, HUBS AND WHEEL BEARINGS	
		K1	Diagnose and repair steering and control systems	Moved from Level 1; electronic steering is in L2; mechanical remains in L1
		K2	Diagnose and repair suspension and control systems	Moved from Level 1; electronic suspension is in L2; mechanical remains in L1
		K3	Diagnose and repair braking and control systems	Moved from Level 1; electronic braking is in L2; mechanical remains in L1



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 3		Harmonized Level 3	Description of Changes
Line A	ELECTRICAL AND ELECTRONIC SYSTEMS			
A1	Describe advanced electrical and electronic principles			Moved to Line E
A2	Interpret advanced wiring diagrams			Moved to Line E
A3	Describe advanced diagnostic procedures			Teach in context of other tasks
A4	Use advanced electrical test equipment			Moved to Line E
A5	Describe computer control systems			Moved to Line E
A6	Describe multiplex and network systems			Moved to Line G
Line B	FUEL DELIVERY SYSTEMS			
B1	Describe fuel types			Moved to Line E
B2	Service fuel delivery components			Moved to Line E
B3	Service gasoline fuel injection components			Moved to Line E
B4	Describe electronic diesel fuel injection systems			Moved to Level 4; Moved to Line E
Line C	ELECTRONIC IGNITION SYSTEMS			
C1	Describe electronic ignition principles			Moved to Line E
C2	Service electronic distributor ignition systems			Removed
C3	Service electronic ignition systems			Moved to Line E
Line D	ENGINE MANAGEMENT SYSTEMS			
D1	Describe engine management systems			Moved to Line E
D2	Test engine management input sensors			Moved to Line E
D3	Test engine management output actuators			Moved to Line E

Automotive Service Technician (AST) Program Outline Review Details

	Current Level 3		Harmonized Level 3	Description of Changes
D4	Analyze on-board diagnostic system data			Moved to Line E
D4	Describe gasoline direct injection			Moved to Line E
Line E	EMISSION CONTROL SYSTEMS			
E1	Describe vehicle emissions			Re-structured and renamed
E2	Describe emission legislation			Re-structured and renamed
E3	Service pre-combustion emission systems			Re-structured and renamed
E4	Service post-combustion emission systems			Re-structured and renamed
E5	Describe diesel emissions systems			Moved to Level 4
E6	Test OBD II evaporative emission systems			Re-structured and renamed
E7	Perform exhaust gas analysis			Re-structured and renamed
		Line E	DIAGNOSE AND REPAIR GASOLINE ENGINE SUPPORT SYSTEMS	
		E1	Diagnose and repair advanced wiring and electronics	Re-structured and renamed
		E2	Diagnose and repair gasoline fuel delivery and injection systems	Re-structured and renamed
		E3	Diagnose and repair gasoline ignition systems	Re-structured and renamed
		E4	Diagnose and repair engine management systems	Re-structured and renamed
		E5	Diagnose and repair gasoline intake and exhaust systems	Moved from Level 2
		E6	Diagnose and repair gasoline emissions control systems	Re-structured and renamed
		Line G	DIAGNOSE AND REPAIR VEHICLE NETWORKING SYSTEMS	
		G1	Identify type of networking system	Re-structured and renamed
		G2	Diagnose and repair networking systems	New to RSOS; enhanced content for BC
		Line H	DIAGNOSE AND REPAIR DRIVELINE SYSTEMS	
		H5	Diagnose and repair mechanical transfer cases	Moved from Level 4



Automotive Service Technician (AST) Program Outline Review Details

	Current Level 3		Harmonized Level 3	Description of Changes
		Line 1	DIAGNOSE AND REPAIR ELECTRICAL SYSTEMS AND COMPONENTS	
		I4	Diagnose and repair electrical options and accessories	Moved from Level 2

Automotive Service Technician (AST) Program Outline Review Details

	Current Level 4		Harmonized Level 4	Description of Changes
Line A	CLUTCH SYSTEMS			
A1	Service clutch systems			Moved to Level 2
A2	Describe transmission removal and installation procedures			Moved to Level 2
Line B	MANUAL TRANSMISSIONS			
B1	Calculate gear ratios			Moved to Level 2
B2	Service transmission shifting linkages			Moved to Level 2
B3	Overhaul manual transmissions			Moved to Level 2
		Line C	USE COMMUNICATION AND MENTORING TECHNIQUES	
		C2	Use mentoring techniques	New to RSOS
		Line F	DIAGNOSE AND REPAIR DIESEL ENGINE SUPPORT SYSTEMS	
		F1	Diagnose and repair diesel fuel delivery and injection systems	New to RSOS; enhanced content for BC; moved from Level 3
		F2	Diagnose and repair diesel intake and exhaust systems	New to RSOS; enhanced content for BC; moved from Level 2
		F3	Diagnose and repair diesel emission control systems	New to RSOS; enhanced content for BC; moved from Level 3
Line C	AUTOMATIC TRANSMISSIONS			
C1	Describe torque converters			Moved to Line H
C2	Describe planetary gear trains			Moved to Line H
C3	Overhaul automatic transmissions			Moved to Line H
C4	Service hydraulic and electrical control systems			Moved to Line H
Line D	DRIVE LINES			
D1	Service drive lines			Moved to Line H
D2	Service final drives, differentials and axles			Moved to Line H



Automotive Service Technician (AST) Program Outline Review Details

Current Level 4		Harmonized Level 4		Description of Changes
		Line H	DIAGNOSE AND REPAIR DRIVELINE SYSTEMS	
		H3	Diagnose and repair automatic transmissions and transaxles	Moved from Line C
		H6	Diagnose and repair all-wheel drive (AWD) systems	Moved from Line E
Line E	ALL-WHEEL AND FOUR-WHEEL DRIVE SYSTEMS			
E1	Inspect all-wheel drive systems			Moved to Line H
E2	Service mechanical and electronic four-wheel drive systems			Moved to Line H
		Line I	DIAGNOSE AND REPAIR ELECTRICAL SYSTEMS AND COMPONENTS	
		I5	Diagnose and repair instrumentation, entertainment systems and displays	Moved from Level 2
		Line J	DIAGNOSE AND REPAIR HEATING, VENTILATION AND AIR CONDITIONING (HVAC) AND COMFORT CONTROL SYSTEMS	
		J1	Diagnose and repair air flow control and heating systems	Moved from Level 2
		J2	Diagnose and repair refrigerant systems	Moved from Level 2
		Line L	DIAGNOSE AND REPAIR RESTRAINT SYSTEMS, BODY COMPONENTS, ACCESSORIES AND TRIM	
		L1	Diagnose and repair restraint systems	Moved from Level 2
Line F	HYBRID DRIVE LINE TECHNOLOGY	Line M	DIAGNOSE AND REPAIR HYBRID AND ELECTRIC VEHICLES (EV)	
F1	Describe hybrid vehicle systems	M2	Diagnose and repair hybrid and electric vehicle (EV) systems	Moved from Level 2; re-structured and renamed
F2	Describe hybrid drive systems			Moved from Level 2; re-structured and renamed