

Issued: June 22, 2021

Program: Motorcycle Mechanic (Motorcycle and Power Equipment Technician)

To: ITA Training Providers
Articulation Chair
System Liaison Person
Youth Train in Trades School Districts

Subject: **Motorcycle Mechanic (Motorcycle and Power Equipment Technician) Program Update**

OPSN No.: **OPSN 2020 006**

Effective Date: April 1, 2022

Summary of Change: Please be advised that a new Program Outline and Program Profile have been posted to the Industry Training Authority (ITA) [website](#). Changes were made to trade name, technical training (TT) hours, work-based training (WBT) hours, and program content.

Details: Changes to the Motorcycle Mechanic (Motorcycle and Power Equipment Technician) program in BC are as follows:

- Trade name changed from **Motorcycle Mechanic (Motorcycle and Power Equipment Technician)** to **Motorcycle Technician**
- Technical training (TT) increased by 60 hours over 4 levels:

Technical Training	Current	Harmonized	Difference
Level 1	150 hours	150 hours	No change
Level 2	120 hours	150 hours	Increase of 30 hours
Level 3	150 hours	150 hours	No change
Level 4	120 hours	150 hours	Increase of 30 hours
Total	540 hours	600 hours	Increase of 60 hours

- Work-based training (WBT) decreased from 6,720 to 5,800 total hours
- Hours required to challenge certification decreased from 10,080 to 8,700 hours
- Program content changes include an updated Occupational Analysis Chart (OAC), changes to competency distribution across program levels, a revised occupational description, and the **removal of Outdoor Power Equipment content** (see new Program Profile and Program Outline posted to ITA's [website](#) for details).

- The changes to trade name and the removal of Outdoor Power Equipment content will be reflected in the Foundation Program.

Rationale: In early 2020, BC endorsed the Canadian Council of Directors of Apprenticeship (CCDA) recommendations for harmonization and the adoption of a revised Red Seal Occupational Standard (RSOS). Over the course of 2020, BC conducted a review of the Motorcycle Mechanic (Motorcycle and Power Equipment Technician) program with the engagement of BC industry and training providers. The review aligned the provincial program to the RSOS and harmonization recommendations.

Attachments: **Motorcycle Technician Program Outline Review Details.** This document contains a detailed breakdown of program revisions.

For more information contact: Program Standards
email: programstandards@itabc.ca

cc: All Staff

Program Outline Review Details

Key

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Summary - Competency Migration

The BC Occupational Analysis Chart (OAC) was aligned to the structure of the Red Seal Occupational Standard (RSOS). Therefore, **all of the competencies have been renamed and restructured**. This chart shows the finalized competency distribution for the Harmonized Motorcycle Technician program. It summarizes the major changes to the competencies. For details, see the charts below.

Note: Content related to Outdoor Power Equipment was removed from the harmonized program.

HARMONIZED LEVEL 1 (HL1)		HARMONIZED LEVEL 2 (HL2)		HARMONIZED LEVEL 3 (HL3)		HARMONIZED LEVEL 4 (HL4)	
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	PERFORM ROUTINE WORK PRACTICES	Line B	PERFORM ROUTINE WORK PRACTICES	Line B	PERFORM ROUTINE WORK PRACTICES	Line B	PERFORM ROUTINE WORK PRACTICES
	B1 Use trade-related consumables						
	B2 Perform periodic maintenance of lubrication systems						
	B3 Perform periodic maintenance of cooling systems						
	B4 Perform periodic maintenance of bearings						
	B5 Perform storage procedures						
	B6 Prepare new motorcycles						
						New	B7 Conduct safety inspections
Line C	USE TOOLS, EQUIPMENT AND DOCUMENTATION	Line C	USE TOOLS, EQUIPMENT AND DOCUMENTATION	Line C	USE TOOLS, EQUIPMENT AND DOCUMENTATION	Line C	USE TOOLS, EQUIPMENT AND DOCUMENTATION
	C1 Use diagnostic tools and equipment	New	C1 Use diagnostic tools and equipment	New	C1 Use diagnostic tools and equipment		
HL1←CL2	C2 Use precision measuring instruments						

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HARMONIZED LEVEL 1 (HL1)		HARMONIZED LEVEL 2 (HL2)		HARMONIZED LEVEL 3 (HL3)		HARMONIZED LEVEL 4 (HL4)	
	C3 Use hand tools						
	C4 Use heating/cutting tools and equipment						
	C5 Use pneumatic and electric power tools and equipment						
	C6 Use shop equipment						
	C7 Use documentation						
Line D	USE COMMUNICATION AND MENTORING TECHNIQUES	Line D	USE COMMUNICATION AND MENTORING TECHNIQUES	Line D	USE COMMUNICATION AND MENTORING TECHNIQUES	Line D	USE COMMUNICATION AND MENTORING TECHNIQUES
	D1 Use communication techniques						
						New	D2 Use mentoring techniques
Line E	MAINTAIN CHASSIS AND COMPONENTS	Line E	MAINTAIN CHASSIS AND COMPONENTS	Line E	MAINTAIN CHASSIS AND COMPONENTS	Line E	MAINTAIN CHASSIS AND COMPONENTS
		HL2/HL3←CL3	E1 Maintain frames		E1 Maintain frames		
		HL2←CL3	E2 Maintain steering heads				
		New	E3 Maintain steering systems for multi-wheeled motorcycles	New	E3 Maintain steering systems for multi-wheeled motorcycles		
			E4 Maintain chassis standard and accessory components		E4 Maintain chassis standard and accessory components		
Line F	MAINTAIN SUSPENSION SYSTEMS	Line F	MAINTAIN SUSPENSION SYSTEMS	Line F	MAINTAIN SUSPENSION SYSTEMS	Line F	MAINTAIN SUSPENSION SYSTEMS
		HL2/HL3←CL3	F1 Maintain front suspension components		F1 Maintain front suspension components		
		New	F2 Maintain front suspension components for multi-wheeled motorcycles	New	F2 Maintain front suspension components for multi-wheeled motorcycles		
		HL2/HL3←CL3	F3 Maintain rear suspension components		F3 Maintain rear suspension components		
Line G	MAINTAIN WHEELS AND TIRES	Line G	MAINTAIN WHEELS AND TIRES	Line G	MAINTAIN WHEELS AND TIRES	Line G	MAINTAIN WHEELS AND TIRES
	G1 Maintain tires						
					G2 Maintain spoked wheels		
HL1←CL3	G3 Maintain cast wheels						

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HARMONIZED LEVEL 1 (HL1)		HARMONIZED LEVEL 2 (HL2)		HARMONIZED LEVEL 3 (HL3)		HARMONIZED LEVEL 4 (HL4)	
Line H	MAINTAIN BRAKING SYSTEMS	Line H	MAINTAIN BRAKING SYSTEMS	Line H	MAINTAIN BRAKING SYSTEMS	Line H	MAINTAIN BRAKING SYSTEMS
	H1 Maintain hydraulic braking systems						
	H2 Maintain mechanical braking systems						
						New	H3 Maintain braking control systems
Line I	MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES	Line I	MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES	Line I	MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES	Line I	MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES
			I1 Apply principles of engines and engine construction	CL2→HL2/HL3	I1 Apply principles of engines and engine construction		
				CL2→HL3/HL4	I2 Maintain cylinder heads	CL2→HL3/HL4	I2 Maintain cylinder heads
			I3 Maintain valve systems on two-stroke engines	CL2→HL2/HL3	I3 Maintain valve systems on two-stroke engines		
				CL2→HL3/HL4	I4 Maintain valve train on four-stroke engines	CL2→HL3/HL4	I4 Maintain valve train on four-stroke engines
			I5 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	I5 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	I5 Maintain cylinders and pistons
				CL2→HL3/HL4	I6 Maintain crankshaft assemblies	CL2→HL3/HL4	I6 Maintain crankshaft assemblies
				CL2→HL3/HL4	I7 Maintain counterbalance assemblies	CL2→HL3/HL4	I7 Maintain counterbalance assemblies
				CL2→HL3/HL4	I8 Maintain engine cases	CL2→HL3/HL4	I8 Maintain engine cases
			I9 Maintain lubrication systems	CL2→HL2/HL3/HL4	I9 Maintain lubrication systems	CL2→HL2/HL3/HL4	I9 Maintain lubrication systems
			I10 Maintain cooling systems	New	I10 Maintain cooling systems		
Line J	MAINTAIN CLUTCHES AND PRIMARY DRIVES	Line J	MAINTAIN CLUTCHES AND PRIMARY DRIVES	Line J	MAINTAIN CLUTCHES AND PRIMARY DRIVES	Line J	MAINTAIN CLUTCHES AND PRIMARY DRIVES
		HL2←CL3	J1 Maintain primary drives and driven gears				
		HL2←CL3	J2 Maintain primary drive chains and sprockets				
		HL2←CL3	J3 Maintain primary drive belts and pulleys (sprockets)				
		HL2←CL3	J4 Maintain manual clutches				
		HL2←CL4	J5 Maintain automatic clutches				

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			J6 Maintain manual starting systems				
Line K	MAINTAIN TRANSMISSIONS	Line K	MAINTAIN TRANSMISSIONS	Line K	MAINTAIN TRANSMISSIONS	Line K	MAINTAIN TRANSMISSIONS
					K1 Maintain constant mesh transmissions	CL3→HL3/HL4	K1 Maintain constant mesh transmissions
		HL2←CL4	K2 Maintain continuously variable transmissions (CVT)				
Line L	MAINTAIN FINAL DRIVE SYSTEMS	Line L	MAINTAIN FINAL DRIVE SYSTEMS	Line L	MAINTAIN FINAL DRIVE SYSTEMS	Line L	MAINTAIN FINAL DRIVE SYSTEMS
HL1←CL3	L1 Maintain final drive chains and sprockets						
					L2 Maintain final drive shafts and gears		
HL1←CL3	L3 Maintain final drive belts and pulleys (sprockets)						
Line M	MAINTAIN ELECTRICAL SYSTEMS	Line M	MAINTAIN ELECTRICAL SYSTEMS	Line M	MAINTAIN ELECTRICAL SYSTEMS	Line M	MAINTAIN ELECTRICAL SYSTEMS
	M1 Apply electrical and electronic principles			CL1→HL1/HL3	M1 Apply electrical and electronic principles		
	M2 Maintain batteries						
	M3 Maintain electrical standard and accessory components	New	M3 Maintain electrical standard and accessory components		M3 Maintain electrical standard and accessory components		
		CL1→HL2	M4 Maintain wiring harness systems	New	M4 Maintain wiring harness systems		
					M5 Maintain ignition systems		
			M6 Maintain electric starting systems				
			M7 Maintain charging systems				
Line N	MAINTAIN VEHICLE MANAGEMENT SYSTEMS	Line N	MAINTAIN VEHICLE MANAGEMENT SYSTEMS	Line N	MAINTAIN VEHICLE MANAGEMENT SYSTEMS	Line N	MAINTAIN VEHICLE MANAGEMENT SYSTEMS
HL1←CL4	N1 Read diagnostic trouble codes (DTC)						
							N2 Use specialized equipment
							N3 Interpret diagnostic trouble codes (DTC) results
							N4 Maintain system circuitry and components
							N5 Update software

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Line O	MAINTAIN FUEL AND EXHAUST SYSTEMS	Line O	MAINTAIN FUEL AND EXHAUST SYSTEMS	Line O	MAINTAIN FUEL AND EXHAUST SYSTEMS	Line O	MAINTAIN FUEL AND EXHAUST SYSTEMS
		HL2/HL3←CL4	O1 Maintain fuel tanks and fuel delivery components	HL2/HL3←CL4	O1 Maintain fuel tanks and fuel delivery components		
		HL2/HL3←CL4	O2 Maintain air delivery systems	HL2/HL3←CL4	O2 Maintain air delivery systems		
		HL2/HL3←CL4	O3 Maintain carburetor systems	HL2/HL3←CL4	O3 Maintain carburetor systems		
			O4 Maintain exhaust systems	CL2→HL2/HL3	O4 Maintain exhaust systems		
							O5 Maintain fuel injection systems
Line P	MAINTAIN ELECTRIC MOTORCYCLES	Line P	MAINTAIN ELECTRIC MOTORCYCLES	Line P	MAINTAIN ELECTRIC MOTORCYCLES	Line P	MAINTAIN ELECTRIC MOTORCYCLES
						New	P1 Implement specific safety protocols for electric motorcycles
						New	P2 Maintain electric motorcycles

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Details – Competency Migration

This chart shows where content from the current Motorcycle and Power Equipment Technician (MPET) program moved to in the harmonized Motorcycle Technician program and includes details of content that was moved or split across levels.

CURRENT LEVEL 1 (CL1) TO HARMONIZED LEVEL 1 (HL1)

CURRENT LEVEL 1 (CL1)	HARMONIZED LEVEL 1 (HL1)	MIGRATION	DETAILS
Line A SAFE WORK PRACTICES	Line A PERFORM SAFETY-RELATED FUNCTIONS		
A1 Describe shop safety	A1 Maintain safe work environment	N/A	
A2 Describe personal equipment safety	A2 Use personal protective equipment (PPE) and safety equipment	N/A	
A3 Describe fire safety	A1 Maintain safe work environment	N/A	
A4 Apply WHMIS legislation to workplace	A1 Maintain safe work environment	N/A	
Line B BUSINESS PROCEDURES	Line C USE TOOLS, EQUIPMENT AND DOCUMENTATION Line D USE COMMUNICATION AND MENTORING TECHNIQUES		
B1 Describe workplace skills	D1 Use communication techniques	N/A	
B2 Describe general shop administration	D1 Use communication techniques	N/A	
B3 Describe parts inventory records and controls	C7 Use documentation	N/A	
B4 Describe service department record keeping	C7 Use documentation	N/A	
B5 Describe customer relations skills	D1 Use communication techniques	N/A	
B6 Utilize service information	C7 Use documentation	N/A	
Line C HAND AND SHOP TOOLS	Line C USE TOOLS, EQUIPMENT AND DOCUMENTATION		
C1 Identify hand tools	C3 Use hand tools	N/A	
C2 Identify shop power tools	C5 Use pneumatic and electric power tools and equipment C6 Use shop equipment	N/A	
C3 Describe fastening devices	C3 Use hand tools B1 Use trade-related consumables	N/A	
C4 Utilize shop equipment	C6 Use shop equipment	N/A	
C5 Introduce threading and thread repair tools	C3 Use hand tools	N/A	

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CURRENT LEVEL 1 (CL1)	HARMONIZED LEVEL 1 (HL1)	MIGRATION	DETAILS
C6 Identify welding safety	C4 Use heating/cutting tools and equipment	N/A	
C7 Demonstrate equipment for heating and cutting applications	C4 Use heating/cutting tools and equipment	N/A	
C8 Introduce MIG (GMAW) welding procedures and techniques	C6 Use shop equipment	N/A	
N/A	C2 Use precision measuring instruments	HL1←CL2	Content was moved from CL2 to HL1. HL1 = Describe precision measuring instruments and their use; Perform basic measurements using precision measuring instruments
Line D LUBRICATION AND COOLING SYSTEMS	Line B PERFORM ROUTINE WORK PRACTICES		
D1 Describe classification of oils and greases	B1 Use trade-related consumables B2 Perform periodic maintenance of lubrication systems	N/A	
D2 Describe two and four stroke lubrication systems	B2 Perform periodic maintenance of lubrication systems	N/A	
D3 Describe lubrication maintenance	B2 Perform periodic maintenance of lubrication systems	N/A	
D4 Describe lubrication and filter systems service	B2 Perform periodic maintenance of lubrication systems	N/A	
D5 Describe two and four stroke cooling systems	B3 Perform periodic maintenance of cooling systems	N/A	
D6 Perform cooling system maintenance on selected units	B3 Perform periodic maintenance of cooling systems	N/A	
Line E BEARING DESIGN, CONSTRUCTION AND SERVICE	Line B PERFORM ROUTINE WORK PRACTICES		
E1 Describe bearing design and construction	B1 Use trade-related consumables B4 Perform periodic maintenance of bearings	N/A	
E2 Describe bearing cleaning and inspection	B4 Perform periodic maintenance of bearings	N/A	
E3 Perform bearing service	B4 Perform periodic maintenance of bearings	N/A	
Line F WHEELS, TIRES AND SUSPENSION	Line G MAINTAIN WHEELS AND TIRES		
F1 Describe tire construction	G1 Maintain tires	N/A	
F2 Describe tire change and repair techniques	B1 Use trade-related consumables G1 Maintain tires	N/A	
F3 Perform tire change and repair	G1 Maintain tires	N/A	
F4 Describe wheel assemblies	G3 Maintain cast wheels	N/A	
F5 Describe suspension systems	G1 Maintain tires	N/A	

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CURRENT LEVEL 1 (CL1)	HARMONIZED LEVEL 1 (HL1)	MIGRATION	DETAILS
	G3 Maintain cast wheels		
N/A	G3 Maintain cast wheels	HL1←CL3	Content was moved out of CL3 and into HL1. HL1 = Inspect and service cast wheels
Line G CHAIN, BELT AND SHAFT DRIVE SYSTEMS	Line L MAINTAIN FINAL DRIVE SYSTEMS		
G1 Describe chain drive systems	L1 Maintain final drive chains and sprockets	N/A	
G2 Describe belt drive systems	L3 Maintain final drive belts and pulleys (sprockets)	N/A	
G3 Describe shaft drive systems	L1 Maintain final drive chains and sprockets L3 Maintain final drive belts and pulleys (sprockets)	N/A	
Line H BRAKE SYSTEMS	Line H MAINTAIN BRAKING SYSTEMS		
H1 Describe mechanical brake systems	H2 Maintain mechanical braking systems	N/A	
H2 Describe theory of hydraulic brakes	H1 Maintain hydraulic braking systems	N/A	
H3 Describe hydraulic brake and clutch systems	H1 Maintain hydraulic braking systems H2 Maintain mechanical braking systems	N/A	
H4 Troubleshoot mechanical and hydraulic brake systems	H1 Maintain hydraulic braking systems H2 Maintain mechanical braking systems	N/A	
H5 Service hydraulic brake systems	H1 Maintain hydraulic braking systems	N/A	
Line I ELECTRICAL AND ELECTRONICS	Line M MAINTAIN ELECTRICAL SYSTEMS		
I1 Describe principles of electricity	M1 Apply electrical and electronic principles	N/A	
I2 Describe electrical circuits	M1 Apply electrical and electronic principles	N/A	
I3 Interpret electrical diagrams	M1 Apply electrical and electronic principles	CL1→HL1/HL3	Content was split across HL1 and HL3. Only the content in HL3 creates an overlap. HL1=Describe electrical principles, circuits, diagrams, and schematics HL3=Interpret electrical diagrams; describe electrical troubleshooting
I4 Use digital and analog multimeters	C1 Use diagnostic tools and equipment	CL1→HL1 HL2/HL3 (new)	Basic content remains in HL1 New content was added to HL2 and HL3 around more advanced diagnostic tools and equipment. This doesn't create an overlap.
I5 Describe storage batteries	M2 Maintain batteries	N/A	
I6 Service storage batteries	B1 Use trade-related consumables	N/A	

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CURRENT LEVEL 1 (CL1)	HARMONIZED LEVEL 1 (HL1)	MIGRATION	DETAILS
	M2 Maintain batteries		
I7 Describe electrical troubleshooting	M1 Apply electrical and electronic principles	N/A	
Line J NEW UNIT ASSEMBLY AND SERVICE PROCEDURES	Line B PERFORM ROUTINE WORK PRACTICES		
J1 Describe pre-delivery inspection procedures	B6 Prepare new motorcycles	N/A	
J2 Perform pre-delivery inspection	B6 Prepare new motorcycles	N/A	
J3 Describe ancillary and accessory components	B6 Prepare new motorcycles M3 Maintain electrical standard and accessory components	N/A	
J4 Describe unit showroom preparations	B6 Prepare new motorcycles	N/A	
J5 Perform pre-storage preparations	B5 Perform storage procedures	N/A	
	CONTENT MOVED INTO HL1		
N/A	L1 Maintain final drive chains and sprockets	HL1←CL3	Content was moved out of CL3 and into HL1. HL1 = Clean, lubricate, and adjust final chain drive systems
N/A	L3 Maintain final drive belts and pulleys (sprockets)	HL1←CL3	Content was moved out of CL3 and into HL1. HL1 = Inspect, clean, and adjust final drive belt and pulleys (sprockets).
N/A	N1 Read diagnostic trouble codes (DTC)	HL1←CL4	HL1=Read and record DTCs Note: Retrieve and interpret DTCs is in HL4 in the competency N3 Interpret diagnostic trouble code (DTC) results, so this content will be covered and extended in HL4.

**This is the end of the CL1 to HL1 comparative.
 The CL2 to HL2 comparative begins on the next page.**

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CURRENT LEVEL 2 (CL2) TO HARMONIZED LEVEL 2 (HL2)

CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
Line D LUBRICATION AND COOLING SYSTEMS	Line I MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES		
D7 Service lubrication system on four -stroke engine	I9 Maintain lubrication systems	CL2→HL2/HL3/HL4	Service lubrication systems content was split between HL2, HL3 and HL4 with two -stroke engines remaining in HL2 (no overlap) and four -stroke engines moving to HL3 and HL4 (overlap). HL2=Describe diagnosing lubrication systems on two-stroke engines; Service lubrication systems on two-stroke engines. HL3= Describe diagnosing lubrication systems on four-stroke engines; Service lubrication systems on four-stroke engines HL4= Diagnose lubrication systems on four-stroke engines; Describe lubrication systems accessories
D8 Service cooling system on four -stroke engine	I10 Maintain cooling systems	CL2→HL2 HL3 (new)	Service cooling systems content was split between HL2 and HL3 with servicing remaining in HL2 and new , more advanced diagnostic procedures, i.e., gas analysis, added to HL3 (new content). HL2= Describe diagnosing and servicing cooling systems on two-stroke and four-stroke engines; Diagnose and service cooling systems on liquid-cooled engines HL3= Diagnose cooling systems on two-stroke and four-stroke engines
D9 Service lubrication system on two -stroke engine	I9 Maintain lubrication systems	N/A	Service lubrication systems content split between HL2, HL3 and HL4 with two -stroke engines remaining in HL2 (no overlap) and four -stroke engines moving to HL3 and HL4 (overlap).
D10 Service cooling system on two -stroke engine	I10 Maintain cooling systems	CL2→HL2 HL3 (new)	Service cooling systems content was split between HL2 and HL3 with servicing remaining in HL2 and new , more advanced diagnostic procedures, i.e., gas analysis, added to HL3 (new content). HL2= Describe diagnosing and servicing cooling systems on two-stroke and four-stroke engines; Diagnose and service cooling systems on liquid-cooled engines HL3= Diagnose cooling systems on two-stroke and four-stroke engines
Line K ENGINES	Line I MAINTAIN TWO-STROKE AND FOUR-STROKE ENGINES		
K1 Describe engine design and combustion process	I1 Apply principles of engines and engine construction	CL2→HL2/HL3	Content was split between HL2 and HL3. Combustion content is an overlap. HL2= Describe two-stroke and four-stroke engines HL3= Describe engine principles (combustion and measurement)
K2 Describe two-cycle operation and component design	I1 Apply principles of engines and engine construction	N/A	New competency was split between HL2 and HL3, but two-cycle operation is not an overlap.

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CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
K3 Describe four-cycle operation and design	I1 Apply principles of engines and engine construction	N/A	New competency was split between HL2 and HL3, but four-cycle operation is not an overlap.
K4 Describe two and four-cycle selected top-end component design	I1 Apply principles of engines and engine construction	N/A	New competency was split between HL2 and HL3, but top-end component design is not an overlap.
K5 Describe four-cycle valve train component design	I1 Apply principles of engines and engine construction	N/A	New competency was split between HL2 and HL3, but valve train component design is not an overlap.
K6 Describe counterbalance shafts	I1 Apply principles of engines and engine construction	N/A	New competency was split between HL2 and HL3, but counterbalance shaft theory is not an overlap.
K7 Describe operating principals of diesel internal combustion engines	N/A	Removed	Content related to outdoor power equipment was removed
K8 Assess engine condition	In context of engine components and systems	Removed N/A	Content related to outdoor power equipment was removed Engine assessment was integrated with the maintenance of engine components and systems and with C1 Use diagnostic tools and equipment
K9 Service cylinder heads on four-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See charts for Level 3 and 4 below for details.
K10 Service valve train on four-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See charts for Level 3 and 4 below for details.
K11 Service cylinders and pistons on four-stroke engines	I5 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	Content was split between HL2, HL3 and HL4. The content related to four-stroke engines was moved to HL4, which creates an overlap. HL2 = Describe construction of cylinders and pistons on two-stroke engines HL3 = Service cylinders and pistons on two-stroke engines HL4 = Diagnose and service cylinders and pistons on four-stroke engines
K12 Service crankshaft assembly on four-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and is split between HL3 and HL4. See charts for Level 3 and 4 below for details.
K13 Service counterbalance assemblies on four-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See the Level 3 and 4 charts below for details of the overlap.
K14 Service engine cases on four-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See the Level 3 and 4 charts below for details of the overlap
K15 Assess engine condition	In context of engine components and systems	Removed N/A	Content related to outdoor power equipment was removed Engine assessment was integrated with the maintenance of engine components and systems and with C1 Use diagnostic tools and equipment

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CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
K16 Service cylinder heads on two-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See Level 3 and 4 charts below for details of overlap.
K17 Service valve train on two-stroke engines	I3 Maintain valve systems on two-stroke engines	CL2→HL2/HL3	Content was split between HL2 and HL3. HL2 = Describe servicing valve systems on two-stroke engines HL3 = Diagnose and service valve systems on two-stroke engines
K18 Service cylinders and pistons on two-stroke engines	I5 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	Content was split between HL2, HL3 and HL4. The content related to two-stroke engines was moved to HL3, which creates an overlap. HL2 = Describe construction of cylinders and pistons on two-stroke engines HL3 = Service cylinders and pistons on two-stroke engines HL4 = Diagnose and service cylinders and pistons on four-stroke engines
K19 Service crankshaft assembly on two-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See Level 3 and 4 charts below for details of overlap.
K20 Service counterbalance assemblies on two-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See Level 3 and 4 charts below for details of overlap.
K21 Service engine cases on two-stroke engines	N/A	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. See Level 3 and 4 charts below for details of overlap.
Line L GASKET AND SEAL CONSTRUCTION AND SERVICE	N/A		
L1 Describe soft gasket construction and use	In context of components and systems	N/A	Content related to gaskets and seals was integrated with components and systems.
L2 Describe hard gasket construction and use	In context of components and systems	N/A	Content related to gaskets and seals was integrated with components and systems.
L3 Describe seal construction and use	In context of components and systems	N/A	Content related to gaskets and seals was integrated with components and systems.
L4 Describe sealant composition and application	In context of components and systems	N/A	Content related to gaskets and seals was integrated with components and systems.
Line M PRECISION MEASURING INSTRUMENTS	N/A		
M1 Utilize precision measuring instruments on select components	N/A	HL1←CL2	Content was moved from CL2 to HL1. See chart for Level 1 above for details of gap.

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CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
Line N EXHAUST SYSTEMS	Line O MAINTAIN FUEL AND EXHAUST SYSTEMS		
N1 Describe exhaust system design and maintenance	O4 Maintain exhaust systems	CL2→HL2/HL3	Content was split between HL2 and HL3 HL2 = Service exhaust systems HL3 = Diagnose and service exhaust systems
N2 Service two and four-stroke exhaust systems	O4 Maintain exhaust systems	CL2→HL2/HL3	Content was split between HL2 and HL3 HL2 = Service exhaust systems HL3 = Diagnose and service exhaust systems
Line O STARTING AND CHARGING SYSTEMS	Line M MAINTAIN ELECTRICAL SYSTEMS		
O1 Describe starting systems	M6 Maintain electrical starting systems	N/A	
O2 Service manual starting systems	J6 Maintain manual starting systems	N/A	
O3 Describe diagnosing starting systems	M6 Maintain electrical starting systems J6 Maintain manual starting systems	N/A	
O4 Service selected starters	M6 Maintain electrical starting systems J6 Maintain manual starting systems	N/A	
O5 Describe charging systems	M7 Maintain charging systems	N/A	
O6 Diagnose charging systems	M7 Maintain charging systems	N/A	
O7 Service selected charging systems	M7 Maintain charging systems	N/A	
	CONTENT MOVED INTO OR ADDED TO HL2		
N/A	C1 Use diagnostic tools and equipment	CL1→HL1 HL2/HL3 (new)	Basic content remains in HL1. New content was added to HL2 and HL3 about more advanced diagnostic tools and equipment. This doesn't create an overlap. HL2 = Perform tests using diagnostic tools and equipment HL3 = Describe advanced use of diagnostic measuring tools and equipment; describe maintenance of diagnostic tools and equipment.
N/A	E1 Maintain frames	HL2/HL3←CL3	Some content was split between HL2 and HL3. HL2 = Describe frames; describe performing a visual inspection of frames HL3 = Diagnose frames; describe replacing frames

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CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
N/A	E2 Maintain steering heads	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Service steering heads for 2-wheeled motorcycles
N/A	E3 Maintain steering systems for multi-wheeled motorcycles	HL2/HL3 (new)	HL2 = Describe diagnosing steering systems for multi-wheeled motorcycles HL3 = Diagnose and service steering systems for multi-wheeled motorcycles; describe LMW technology
N/A	F1 Maintain front suspension components	HL2/HL3←CL3	Content was split between HL2 and HL3. HL2 = Describe diagnosing and servicing front-suspension components HL3 = Diagnose and service front-suspension components
N/A	F2 Maintain front suspension system components for multi-wheeled motorcycles	HL2/HL3 (new)	Content was added. Includes ATVs and 3-wheeled motorcycles. HL2 = Describe diagnosing front suspension components for multi-wheeled motorcycles; service ATV front suspension components HL3 = Diagnose and service front suspension components for multi-wheeled motorcycles
N/A	F3 Maintain rear suspension components	HL2/HL3←CL3	Content was split between HL2 and HL3. HL2 = Perform adjustments on rear suspension components HL3 = Diagnose and service rear suspension components
N/A	J1 Maintain primary drives and driven gears	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Diagnose primary drives and driven gears
N/A	J2 Maintain primary drive chains and sprockets	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Maintain and adjust primary drive chains
N/A	J3 Maintain primary drive belts and pulleys (sprockets)	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Describe primary drive belts and pulleys (sprockets)
N/A	J4 Maintain manual clutches	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Diagnose and service manual clutches Note: Content related to clutches on outdoor power equipment was removed.
N/A	J5 Maintain automatic clutches	HL2←CL4	Content was moved out of CL4 and into HL2. HL2 = Diagnose centrifugal force (automatic) clutches; describe servicing centrifugal force (automatic) clutches.
N/A	K2 Maintain continuously variable transmission (CVT)	HL2←CL4	Content was moved out of CL4 and into HL2. HL2 = Describe CVT, centrifugal clutch and belt drives, and hydrostatic drives; describe maintaining hydrostatic drives; maintain centrifugal clutch and belt drives.

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CURRENT LEVEL 2 (CL2)	HARMONIZED LEVEL 2 (HL2)	MIGRATION	DETAILS
N/A	M3 Maintain electrical standard and accessory components	New	This competency is spread across HL1/HL2/HL3. There is alignment at HL1 and HL3, but new content was added to HL2. HL2 = Install electrical accessory components (specifically upgrades, e.g., rider assistance systems, audio, GPS)
N/A	M4 Maintain wiring harness systems	CL1→HL2 HL3 (new)	Some content was moved out of CL1 and into HL2 and some new content was added. HL2 = Interpret wiring diagrams; repair connections on wiring harness systems HL3 = Diagnose wiring harness systems
N/A	O1 Maintain fuel tanks and fuel delivery components	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. HL2 = Describe diagnosing and servicing fuel tanks and delivery components HL3 = Diagnose and service fuel tanks and fuel delivery components
N/A	O2 Maintain air delivery systems	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3 HL2 = Diagnose and service air delivery systems (specifically visual inspections, replacing air filters, cleaning throttle bodies) HL3 = Diagnose and service air delivery systems (specifically, vacuum leaks, throttle bodies and carburetors)
N/A	O3 Maintain carburetor systems	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3 HL2 = Diagnose and service carburetor systems (on single-cylinder engines) HL3 = Diagnose and service carburetor systems (advanced, using exhaust gas analysis)

**This is the end of the CL2 to HL2 comparative.
 The CL3 to HL3 comparative begins on the next page.**

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CURRENT LEVEL 3 (CL3) TO HARMONIZED LEVEL 3 (HL3)

CURRENT LEVEL 3 (CL3)	HARMONIZED LEVEL 3 (HL3)	MIGRATION	DETAILS
Line F WHEELS, TIRES AND SUSPENSION	Line G MAINTAIN WHEELS AND TIRES		
F6 Describe wheel servicing	G2 Maintain spoked wheels	N/A	
F7 Service spoked wheels	G2 Maintain spoked wheels	N/A	
F8 Service solid wheels	N/A	HL1←CL3	Content was moved out of CL3 and into HL1. See Level 1 chart above for details on gap.
F9 Service two-piece wheels	N/A	HL1←CL3	Content was moved out of CL3 and into HL1. HL1 = inspect and service cast wheels
Line I ELECTRICAL AND ELECTRONICS	Line M MAINTAIN ELECTRICAL SYSTEMS		
I8 Describe principles of electricity	M1 Apply electrical and electronic principles	N/A	Content was split across HL1 and HL3 but doesn't create an overlap because the competency in CL1 is repeated in CL3. HL1=Describe electrical principles, circuits, diagrams, and schematics HL3=Describe electrical and electronic components; interpret electrical diagrams; describe electrical troubleshooting
I9 Identify common electrical and electronic components	M1 Apply electrical and electronic principles	CL1→HL1/HL3	Content was split across HL1 and HL3 HL1=Describe electrical principles, circuits, diagrams, and schematics HL3=Interpret electrical diagrams; describe electrical troubleshooting
I9 Identify common electrical and electronic components	M3 Maintain electrical standard and accessory components	N/A	
I10 Describe ignition system types and operations	M5 Maintain ignition systems	N/A	
I11 Service electronic distributor ignition systems	N/A	Removed	Content related to outdoor power equipment was removed.
I12 Service electronic ignition systems	M5 Maintain ignition systems	N/A	
Line P CHASSIS AND SUSPENSION	Line E MAINTAIN CHASSIS AND COMPONENTS		
P1 Describe various frame and suspension styles	E1 Maintain frames	HL2/HL3←CL3	Some content was split between HL2 and HL3 HL2 = Describe frames; describe performing a visual inspection of frames HL3 = Diagnose frames; describe replacing frames
P2 Describe servicing select frames	E1 Maintain frames	HL2/HL3←CL3	Some content was split between HL2 and HL3 HL2 = Describe frames; describe performing a visual inspection of frames HL3 = Diagnose frames; describe replacing frames

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CURRENT LEVEL 3 (CL3)	HARMONIZED LEVEL 3 (HL3)	MIGRATION	DETAILS
P3 Inspect and service select steering heads and dampers	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. See Level 2 chart above for details.
P4 Inspect and service front suspension components	F1 Maintain front suspension system components E4 Maintain chassis standard and accessory components	HL2/HL3←CL3	Some content was split across between HL2 and HL3 HL2 = Describe diagnosing and servicing front-suspension components HL3 = Diagnose and service front-suspension components
P5 Inspect and service rear suspension components	F3 Maintain rear suspension system components	HL2/HL3←CL3	Some content was split across between HL2 and HL3 HL2 = Perform adjustments on rear suspension components HL3 = Diagnose and service rear-suspension components
P6 Inspect and service swing arms	F3 Maintain rear suspension system components	HL2/HL3←CL3	Some content was split across between HL2 and HL3 HL2 = Perform adjustments on rear suspension components (includes swing arm) HL3 = Diagnose and service rear-suspension components
N/A	F2 Maintain front suspension system components for multi-wheeled motorcycles	HL2/HL3 NEW	Content was added. Includes ATVs and 3-wheeled motorcycles. HL2 = Describe diagnosing front suspension components for multi-wheeled motorcycles; service ATV front suspension components HL3 = Diagnose and service front suspension components for multi-wheeled motorcycles
Line Q MANUAL TRANSMISSIONS	Line K MAINTAIN TRANSMISSIONS		
Q1 Describe clutch systems	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Diagnose and service manual clutches
Q2 Service clutches on selected systems	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. HL2 = Diagnose and service manual clutches Note: Content related to clutches on outdoor power equipment was removed.
Q3 Describe transmission design and operation	K1 Maintain constant mesh transmissions	CL3→HL3/HL4	Content was split between HL3 and HL4. HL3 = Describe diagnosing constant mesh transmissions; service constant mesh transmissions HL4 = Diagnose constant mesh transmissions
Q4 Describe shifter mechanisms and kick starter design and operation	N/A	N/A	Content was moved out of CL3 and into HL2 but doesn't create a gap because kick starters was also covered in CL2 in <i>O2 Service manual starting systems</i> .
Q5 Disassemble, inspect and assess manual transmission parts	K1 Maintain constant mesh transmissions	CL3→HL3/HL4	Content was split between HL3 and HL4. HL3 = Describe diagnosing constant mesh transmissions; service constant mesh transmissions HL4 = Diagnose constant mesh transmissions
Line R PRIMARY DRIVE SYSTEMS	N/A		

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CURRENT LEVEL 3 (CL3)	HARMONIZED LEVEL 3 (HL3)	MIGRATION	DETAILS
R1 Describe various primary drive systems	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. See Level 2 chart above for details.
R2 Service primary drive chains and sprockets	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. See Level 2 chart above for details.
R3 Service primary drive belts and pulleys	N/A	HL2←CL3	Content was moved out of CL3 and into HL2. See Level 2 chart above for details.
R4 Service primary drive shafts	N/A	Removed	Content related to outdoor power equipment was removed.
R5 Service power take-offs	N/A	Removed	Content related to outdoor power equipment was removed.
Line S FINAL DRIVE SYSTEMS	Line L MAINTAIN FINAL DRIVE SYSTEMS		
S1 Describe final drive systems and variations	L2 Maintain final drive shafts and gears	N/A	
S2 Describe final drive chains and sprockets	L2 Maintain final drive shafts and gears	N/A	
S3 Service final drive chains and sprockets	N/A	HL1←CL3	Content was moved out of CL3 and into HL1. See Level 1 chart above for details.
S4 Describe final drive shafts and gears	L2 Maintain final drive shafts and gears	N/A	
S5 Service final drive shafts and gears	L2 Maintain final drive shafts and gears	N/A	
S6 Describe final drive belts, sprockets and pulleys	L2 Maintain final drive shafts and gears	N/A	
S7 Service final drive belts, sprockets and pulleys	N/A	HL1←CL3	Content was moved out of CL3 and into HL1. See Level 1 chart above for details.
Line T HYDRAULIC SYSTEMS	N/A		
T1 Describe hydraulic systems and components	N/A	Removed	Content related to outdoor power equipment was removed.
T2 Service hydraulic pumps	N/A	Removed	Content related to outdoor power equipment was removed.
T3 Service hydraulic valves	N/A	Removed	Content related to outdoor power equipment was removed.
T4 Service hydraulic actuators	N/A	Removed	Content related to outdoor power equipment was removed.
T5 Utilize hydraulic schematic diagrams	N/A	Removed	Content related to outdoor power equipment was removed.
	CONTENT MOVED INTO OR ADDED TO HL3		
N/A	C1 Use diagnostic tools and equipment	CL1→HL1 HL2/HL3 (new)	Basic content remains in HL1. New content was added to HL2 and HL3 around more advanced diagnostic tools and equipment. This doesn't create an overlap. HL2 = Perform tests using diagnostic tools and equipment

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CURRENT LEVEL 3 (CL3)	HARMONIZED LEVEL 3 (HL3)	MIGRATION	DETAILS
			HL3 = Describe advanced use of diagnostic measuring tools and equipment; describe maintenance of diagnostic tools and equipment.
N/A	E3 Maintain steering systems for multi-wheeled motorcycles	HL2/HL3 (new)	HL2 = Describe diagnosing steering systems for multi-wheeled motorcycles HL3 = Diagnose and service steering systems for multi-wheeled motorcycles; describe LMW technology
N/A	I1 Apply principles of engines and engine construction	CL2→HL2/HL3	Content was split between HL2 and HL3. Combustion content is an overlap. HL2= Describe two-stroke and four-stroke engines HL3= Describe engine principles (combustion and measurement)
N/A	I2 Maintain cylinder heads	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Describe diagnosing cylinder heads on two-stroke engines; Service cylinder heads on two-stroke engines HL4 = Diagnose and service cylinder heads on 4-stroke engines
N/A	I3 Maintain valve systems on two-stroke engines	CL2→HL2/HL3	Content was moved out of CL2 and split between HL3 and HL4. HL2 = Describe servicing valve systems on two-stroke engines HL3 = Diagnose and service valve systems on two-stroke engines
N/A	I4 Maintain valve trains on four-stroke engines	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Describe diagnosing valve trains on four-stroke engines; service valve trains on four-stroke engines HL4 = Diagnose and service valve trains on four-stroke engines
N/A	I5 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	Content was split between HL2, HL3 and HL4. HL2 = Describe construction of cylinders and pistons on two-stroke engines HL3 = Service cylinders and pistons on two-stroke engines HL4 = Diagnose and service cylinders and pistons on four-stroke engines
N/A	I6 Maintain crankshaft assemblies	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Describe diagnosing crankshaft assemblies; service one-piece crankshaft assemblies. HL4 = Diagnose crankshaft assemblies; Describe servicing multi-piece (built-up) crankshaft assemblies.
N/A	I7 Maintain counterbalance assemblies	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Diagnose and service counterbalance assemblies HL4 = Verify repair of counterbalance assemblies; Describe specialized designs of counterbalance assemblies
N/A	I8 Maintain engine cases	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Diagnose and service engine cases HL4 = Assess engine cases

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CURRENT LEVEL 3 (CL3)	HARMONIZED LEVEL 3 (HL3)	MIGRATION	DETAILS
N/A	I9 Maintain lubrication systems	CL2→HL2/HL3/HL4	Service lubrication systems content split between HL2, HL3 and HL4 with two -stroke engines remaining in HL2 (no overlap) and four -stroke engines moving to HL3 and HL4 (overlap). HL2=Describe diagnosing lubrication systems on two-stroke engines; Service lubrication systems on two-stroke engines. HL3= Describe diagnosing lubrication systems on four-stroke engines; Service lubrication systems on four-stroke engines HL4= Diagnose lubrication systems on four-stroke engines; Describe lubrication systems accessories
N/A	I10 Maintain cooling systems	CL2→HL2 HL3 (new)	Service cooling systems content was split between HL2 and HL3 with servicing remaining in HL2 and new , more advanced diagnostic procedures, i.e., gas analysis, added to HL3 (new content). HL2= Describe diagnosing and servicing cooling systems on two-stroke and four-stroke engines; Diagnose and service cooling systems on liquid-cooled engines HL3= Diagnose cooling systems on two-stroke and four-stroke engines
N/A	M4 Maintain wiring harness systems	CL1→HL2 HL3 (new)	Some content was moved out of CL1 and into HL2 and some new content was added. New content was added to HL3. HL2 = Interpret wiring diagrams; repair connections on wiring harness systems HL3 = Diagnose wiring harness systems
N/A	O1 Maintain fuel tanks and fuel delivery components	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. HL2 = Describe diagnosing and servicing fuel tanks and delivery components HL3 = Diagnose and service fuel tanks and fuel delivery components
N/A	O2 Maintain air delivery systems	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. HL2 = Diagnose and service air delivery systems (specifically visual inspections, replacing air filters, cleaning throttle bodies) HL3 = Diagnose and service air delivery systems (specifically, vacuum leaks, throttle bodies and carburetors)
N/A	O3 Maintain carburetor systems	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. HL2 = Diagnose and service carburetor systems (on single-cylinder engines) HL3 = Diagnose and service carburetor systems (advanced, using exhaust gas analysis)
N/A	O4 Maintain exhaust systems	CL2→HL2/HL3	Content was split between HL2 and HL3. HL2 = Service exhaust systems HL3 = Diagnose and service exhaust systems

This is the end of the CL3 to HL3 comparative. The CL4 to HL4 comparative begins on the next page.

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CURRENT LEVEL 4 (CL4) HARMONIZED LEVEL 4 (HL4)

CURRENT LEVEL 4 (CL4)	HARMONIZED LEVEL 4 (HL4)	MIGRATION	DETAILS
Line I ELECTRICAL AND ELECTRONICS	Line N MAINTAIN VEHICLE MANAGEMENT SYSTEMS		
I13 Describe computer control systems	In context across Line N	N/A	
I14 Interpret wiring diagrams	N4 Maintain system circuitry and components	N/A	
I15 Describe diagnostic procedures	N3 Interpret diagnostic trouble codes (DTC) results	N/A	
I16 Utilize electrical test equipment	N2 Use specialized equipment	N/A	
I17 Service computer control systems	H3 Maintain braking control systems N5 Update software	N/A	
I18 Describe engine management systems	In context across Line N	N/A	
I19 Test engine management input sensors	N2 Use specialized equipment	N/A	
I20 Test engine management output actuators	N2 Use specialized equipment	N/A	
I21 Analyze on board diagnostic system data	N3 Interpret diagnostic trouble codes (DTC) results	N/A	
I22 Describe new vehicle technology	In context across Line N	N/A	
Line U FUEL SYSTEMS	Line O MAINTAIN FUEL AND EXHAUST SYSTEMS		
U1 Describe fuel types	N/A	Removed	Content related to outdoor power equipment was removed.
U2 Service carbureted fuel delivery components	N/A	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. See Level 2 and Level 3 chart for details.
U3 Describe carburetors	N/A	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. See Level 2 and Level 3 chart above for details.
U4 Describe gasoline fuel injection types and controls	O5 Maintain fuel injection systems	N/A	

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CURRENT LEVEL 4 (CL4)	HARMONIZED LEVEL 4 (HL4)	MIGRATION	DETAILS
U5 Service gasoline fuel injection components	O5 Maintain fuel injection systems	N/A	
U6 Describe diesel delivery systems	N/A	Removed	Content related to outdoor power equipment was removed.
U7 Service diesel delivery systems	N/A	Removed	Content related to outdoor power equipment was removed.
U8 Describe alternate fuels	N/A	Removed	Content related to outdoor power equipment was removed.
U9 Perform fuel system tuning with an exhaust analyzer	N/A	HL2/HL3←CL4	Content was moved out of CL4 and split between HL2 and HL3. See Level 2 and Level 3 chart above for details.
U10 Describe power enhancement equipment	N/A	HL2/HL3←CL4	Content was moved out of CL4 and into HL2. See Level 2 and Level 3 chart above for details.
Line V AUTOMATIC DRIVE SYSTEMS			
V1 Describe centrifugal force clutches	N/A	HL2←CL4	Content was moved out of CL4 and into HL2. See Level 2 chart above for details.
V2 Service selected centrifugal force clutches	N/A	HL2←CL4	Content was moved out of CL4 and into HL2. See Level 2 chart above for details.
V3 Describe automatic transmission function	K1 Maintain constant mesh transmissions	N/A	
V4 Service automatic transmission clutches and components	N/A	HL2←CL4	Content was moved out of CL4 and into HL2. See Level 2 chart above for details.
V5 Describe hydrostatic drive and power steering systems	N/A	Removed	Content related to outdoor power equipment was removed.
V6 Service hydrostatic drive and power steering systems	N/A	Removed	Content related to outdoor power equipment was removed.
CONTENT MOVED INTO OR ADDED TO HL4			
N/A	B7 Conduct safety inspections	New	Content added to HL4 to align with the RSOS HL4 = Describe conducting safety inspections (regulations, inspectors, inspection facility designation)
N/A	D2 Use mentoring techniques	New	Content added to HL4 to align with the RSOS HL4 = Describe mentoring; describe maintain a healthy workplace environment
N/A	H3 Maintain braking control systems	New	Content added to HL4 to align with the RSOS HL4 = Diagnose and service braking control systems
N/A	I2 Maintain cylinder heads	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Describe diagnosing cylinder heads on two-stroke engines; Service cylinder heads on two-stroke engines HL4 = Diagnose and service cylinder heads on 4-stroke engines
N/A	I4 Maintain valve trains on four-stroke	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4.

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 HL = Harmonized level

Blue Text = Content moved to lower level = HL←CL. Creates a gap.
 Purple Text = Content moved to higher level = CL→HL. Creates an overlap.
 Green Text = New content added
 Red Text = Removed

CURRENT LEVEL 4 (CL4)	HARMONIZED LEVEL 4 (HL4)	MIGRATION	DETAILS
	engines		HL3 = Describe diagnosing valve trains on four-stroke engines; service valve trains on four-stroke engines HL4 = Diagnose and service valve trains on four-stroke engines
N/A	15 Maintain cylinders and pistons	CL2→HL2/HL3/HL4	Content was split between HL2, HL3 and HL4. The content related to four-stroke engines was moved to HL4, which creates an overlap. HL2 = Describe construction of cylinders and pistons on two-stroke engines HL3 = Service cylinders and pistons on two-stroke engines HL4 = Diagnose and service cylinders and pistons on four-stroke engines
N/A	16 Maintain crankshaft assemblies	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Describe diagnosing crankshaft assemblies; service one-piece crankshaft assemblies. HL4 = Diagnose crankshaft assemblies; Describe servicing multi-piece (built-up) crankshaft assemblies.
N/A	17 Maintain counterbalance assemblies	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Diagnose and service counterbalance assemblies HL4 = Verify repair of counterbalance assemblies; Describe specialized designs of counterbalance assemblies
N/A	18 Maintain engine cases	CL2→HL3/HL4	Content was moved out of CL2 and split between HL3 and HL4. HL3 = Diagnose and service engine cases HL4 = Assess engine cases
N/A	19 Maintain lubrication systems	CL2→HL2/HL3/HL4	Service lubrication systems content split between HL2, HL3 and HL4 with two -stroke engines remaining in HL2 (no overlap) and four -stroke engines moving to HL3 and HL4 (overlap). HL2=Describe diagnosing lubrication systems on two-stroke engines; Service lubrication systems on two-stroke engines. HL3= Describe diagnosing lubrication systems on four-stroke engines; Service lubrication systems on four-stroke engines HL4= Diagnose lubrication systems on four-stroke engines; Describe lubrication systems accessories
N/A	K1 Maintain constant mesh transmissions	CL3→HL3/HL4	Content was split between HL3 and HL4. HL3 = Describe diagnosing constant mesh transmissions; service constant mesh transmissions HL4 = Diagnose constant mesh transmissions
N/A	P1 Implement specific safety protocols for electric motorcycles	New	HL4 = Describe electric motorcycle safety
N/A	P2 Maintain electric motorcycles	New	HL4 = Describe diagnosing and servicing electric motorcycles