

BUS TECHNICIANS

Technician/ Senior Technician/ Section Supervisor/ Foreman/ Workshop Supervisor/ Senior Foreman/ Technical Specialist/ Senior Technical Specialist/ Master Technical Specialist/ Deputy Workshop Manager/ Workshop Manager

Job description: The Technician/ Technical Specialist performs routine general and/or specific bus sub system servicing and preventive corrective maintenance activities. He prepares work activities, performs assigned servicing and maintenance tasks, performs general housekeeping of workshop tools and equipment and adheres to Workplace Safety and Health (WSH) procedures. He also supports on-the-road bus breakdown assistance and recovery. The seniors/ masters coordinate the routine scheduled bus maintenance operations of the team/ section, plan and assign daily work tasks, provide technical guidance and on-the-job coaching and propose workflow improvements. The managers support coordination of cross functional teams, supports budget forecasting and conducts engineering studies for improvement initiatives

Current Job Tasks	Future view of job tasks	Impact at task-level
1. Utilise ICE vehicle tools and diagnostic equipment to conduct routine preventive maintenance such as oil, filter changing, tire rotations or specific bus sub system servicing such as air condition maintenance, engine system maintenance, mechanical drivetrain system and body work maintenance	<ul style="list-style-type: none"> Utilize EV specific tools and diagnostics equipment to conduct inspection and maintenance for buses, interpret bus health data collected from various sensors such as temperature and voltage sensors Replace electrical based components instead of mechanical components such as batteries and electrical drivetrain parts 	
2. Coordinate routine scheduled bus maintenance operations based on last maintenance session and condition of bus vehicles; ensure bus vehicles completes routine maintenance sessions	<ul style="list-style-type: none"> Frequency of maintenance will drop as EVs have lesser repairs required Maintenance of specific EV parts which differ from ICE based vehicles will be allocated to specialists on the shop floor 	
3. Perform general housekeeping of workshop ICE tools and diagnostic equipment via a log system and maintenance scheduling system	<ul style="list-style-type: none"> While the tools utilized for maintaining EVs are different from conventional ICE based vehicles, housekeeping remains a general task that must be performed by each technician in their work regime 	
4. Support on-the-road bus breakdown assistance and recovery using ICE diagnostic tools to identify faults, complete simple repairs on-site or transport buses to workshops for more complicated works	<ul style="list-style-type: none"> EV diagnostic tools instead of ICE diagnostic tools will be used to ascertain if a fault is recoverable on-site Less specialized repairs can be done on-site while more complicated repairs such as drive train faults will need to be conducted in the workshops with proper gears and equipment 	



A MEDIUM proportion of the job tasks will be impacted by the key trend, thus minimising or changing the current job tasks

MEDIUM degree of change



Current/future skills

To take on adjacent/ new job role(s) the skills below will observe these changes:

- Bus Engine System Maintenance
- Bus Drivetrain System Maintenance
- Bus Regulatory Compliance
- Bus Body Work Maintenance
- Workplace Facilities Safety Management
- Data and Statistical Analytics
- Internet of Things Application
- Robotics and Automation Application
- EV Dashboard Diagnostic
- Bus Battery System Maintenance
- Bus Electric Drivetrain System Maintenance
- Bus High Voltage System Maintenance



Within the next **5 – 10 years**, the job role(s) could potentially undergo

REDESIGN



Job Adjacency

The job holder could potentially take on adjacent job roles as:

- Car Mechanic
- EV Bus Technician
- EV Technician

Legend for job tasks & skills

- High impact
- Medium impact
- Low impact
- Declining skills
- Adjacent skills
- Emerging skills

Legend for job adjacency

Pivot score shows job fit between current to future job role derived from Faethm. The higher the score, the easier the transition. A pivot score of >75 is deemed as a good fit for the future role.

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Current Job Tasks	Future view of job tasks	Impact at task-level
1. Utilise ICE vehicle tools and diagnostic equipment to conduct routine preventive maintenance such as oil, filter changing, tire rotations or specific bus sub system servicing such as air condition maintenance, engine system maintenance, mechanical drivetrain system and body work maintenance	<ul style="list-style-type: none"> Utilize AV specific tools and diagnostics equipment to conduct inspection and maintenance for vehicles Replacement and repair of sensor perception systems, network and vehicular communications, vehicle control system and more 	
2. Coordinate routine scheduled bus maintenance operations based on last maintenance session and condition of bus vehicles; ensure bus vehicles completes routine maintenance sessions	<ul style="list-style-type: none"> Frequency of maintenance will drop as AVs are mostly electric and have less components which require repair work Maintenance of specific AV parts which differ from ICE based vehicles will be allocated to specialists on the shop floor 	
3. Perform general housekeeping of workshop ICE tools and diagnostic equipment via a log system and maintenance scheduling system	<ul style="list-style-type: none"> Housekeeping remains a general task that must be performed by each technician in their work regime for AV equipment and tools 	
4. Support on-the-road bus breakdown assistance and recovery using ICE diagnostic tools to identify faults, complete simple repairs on-site or transport buses to workshops for more complicated works	<ul style="list-style-type: none"> AV diagnostic tools instead of ICE diagnostic tools will be used to ascertain if a fault is recoverable on-site Less specialized repairs can be done on-site while more complicated repairs such as drive train faults will need to be conducted in the workshops with proper gears and equipment 	



A MEDIUM proportion of job tasks will be automated by key technologies, tasks performed will have a

MEDIUM degree of change



Current/future skills

To take on adjacent/ new job role(s) the skills below will observe these changes:

- Bus Engine System Maintenance
- Bus Drivetrain System Maintenance
- Maintenance Scheduling
- Equipment Maintenance and Housekeeping
- Workplace Facilities Safety Management
- Bus Electric Drivetrain System Maintenance
- Bus High Voltage System Maintenance
- AV Dashboard Diagnostic
- Perception System Sensor Diagnostic and Replacement
- Remote Diagnostic Recovery Management



Within the next **20 years or beyond**, the job role(s) could potentially undergo

REDESIGN



Job Adjacency

The job holder could potentially take on adjacent job roles as:

- AV Maintenance Technician

Legend for job tasks & skills

- High impact
- Medium impact
- Low impact
- Declining skills
- Adjacent skills
- Emerging skills

Legend for job adjacency

Pivot score shows job fit between current to future job role derived from Faethm. The higher the score, the easier the transition. A pivot score of >75 is deemed as a good fit for the future role.

5-year skills impact analysis for bus technicians

















Job tasks today	Job tasks in 5 years	Job skills in 5 years	task Job impact	Job role impact	Job role transition
1. Utilise ICE vehicle tools and diagnostic equipment to conduct routine preventive maintenance	 Utilize EV specific tools and diagnostics equipment to conduct inspection and maintenance for buses, interpret bus health data, replace electrical based components	 Bus Engine System Maintenance  Bus Drivetrain System Maintenance  EV Dashboard Diagnostic  Bus Battery System Maintenance	 Medium degree of impact	 Redesign	1. Car Mechanic 2. EV Bus Technician 3. EV Technician
2. Coordinate routine scheduled bus maintenance operations	 Frequency of maintenance will drop as EVs have lesser repairs which require repair work and specific EV parts maintenance will be allocated to specialists	 Maintenance Scheduling  Bus Regulatory Compliance			
3. Perform general housekeeping of workshop ICE tools and diagnostic equipment	 Continue to perform general housekeeping of workshop ICE tools and diagnostic equipment	 Workplace Facilities Safety Management  Equipment Maintenance and Housekeeping			
4. Support on-the-road bus breakdown assistance and recovery using ICE diagnostic tools to identify faults, complete simple repairs on-site or transport buses to workshops for more complicated works	 Support on-the-road vehicle breakdown with EV diagnostic tools, only less specialized repairs can be done on-site, complicated repairs will require proper gears and equipment	 Bus Recovery and Towing  EV Dashboard Diagnostic			
Declining Functions	Repair and maintenance of ICE vehicles and their components				
Emerging Functions	Replacement and maintenance of EV vehicles and their components				

Table 24: 5-year skills impact for bus technicians

10-year skills impact analysis for bus technicians

















Job tasks today	Job tasks in 10 years	Job skills in 10 years	task Job impact	Job role impact	Job role transition
1. Utilise ICE vehicle tools and diagnostic equipment to conduct routine preventive maintenance	 Utilize EV specific tools and diagnostics equipment to conduct inspection and maintenance for buses, interpret bus health data, replace electrical based components	 Bus Engine System Maintenance  Bus Drivetrain System Maintenance  EV Dashboard Diagnostic  Bus Battery System Maintenance	 Medium degree of impact	 Redesign	1. Car Mechanic 2. EV Bus Technician 3. EV Technician
2. Coordinate routine scheduled bus maintenance operations	 Frequency of maintenance will drop as EVs have lesser repairs which require repair work and specific EV parts maintenance will be allocated to specialists	 Maintenance Scheduling  Bus Regulatory Compliance			
3. Perform general housekeeping of workshop ICE tools and diagnostic equipment	 Continue to perform general housekeeping of workshop ICE tools and diagnostic equipment; maintenance and housekeeping will be automated	 Workplace Facilities Safety Management  Equipment Maintenance and Housekeeping			
4. Support on-the-road bus breakdown assistance and recovery using ICE diagnostic tools to identify faults, complete simple repairs on-site or transport buses to workshops for more complicated works	 Support on-the-road vehicle breakdown with EV diagnostic tools, only less specialized repairs can be done on-site, complicated repairs will require proper gears and equipment	 Bus Recovery and Towing  EV Dashboard Diagnostic			
Declining Functions	Repair and maintenance of ICE vehicles and their components				
Emerging Functions	Replacement and maintenance of EV vehicles and their components				

Table 25: 10-year skills impact for bus technicians

20-year skills impact analysis for bus technicians

















Job tasks today	Job tasks in 20 years	Job skills in 20 years	Job task impact	Job role impact	Job role transition
1. Utilise ICE vehicle tools and diagnostic equipment to conduct routine preventive maintenance	 Utilize AV specific tools and diagnostics equipment to conduct inspection and maintenance, replace and repair components such as sensors, network communication system and vehicle control system	 Bus Engine System Maintenance  Bus Drivetrain System Maintenance  AV Dashboard Diagnostic  Perception System Sensor Diagnostic and Replacement	 Medium degree of impact	 Redesign	1. AV Maintenance Technician
2. Coordinate routine scheduled bus maintenance operations	 Frequency of maintenance will drop as AVs have less components which require repair work and specific AV parts maintenance will be allocated to specialists; scheduling will be automated	 Maintenance Scheduling  Bus Regulatory Compliance			
3. Perform general housekeeping of workshop ICE tools and diagnostic equipment	 Continue to perform general housekeeping of workshop EV/ AV tools and diagnostic equipment; maintenance and housekeeping will be automated	 Equipment Maintenance and Housekeeping  Workplace Facilities Safety Management			
4. Support on-the-road bus breakdown assistance and recovery using ICE diagnostic tools to identify faults, complete simple repairs on-site or transport buses to workshops for more complicated works	 Support on-the-road vehicle breakdown with AV diagnostic tools, only less specialized repairs can be done on-site, complicated repairs will require proper gears and equipment	 Bus Recovery and Towing  AV Dashboard Diagnostic			
Declining Functions	Repair and maintenance of ICE vehicles and their components				
Emerging Functions	Replacement and maintenance of EV and AV vehicles and their components				

Table 26: 20-year skills impact for bus technicians