

**The First World Vocational College Skills
Competition
Test Project
for
Rail Transit Driving Technology**

Workstation_____

Module A: Operation of Urban Rail Transit Train Drivers

Task time

100 minutes

I. Preparation Operation for Urban Rail Transit Train Drivers

Points for Attention

1. The task is marked when the first competitor of operation of this module requests access to the site.
2. During the operation, a certain number of vehicle faults or other operational problems are arranged, and the competitor must correctly point out the corresponding problems, without the need to restore or handle them.
3. Static inspection requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

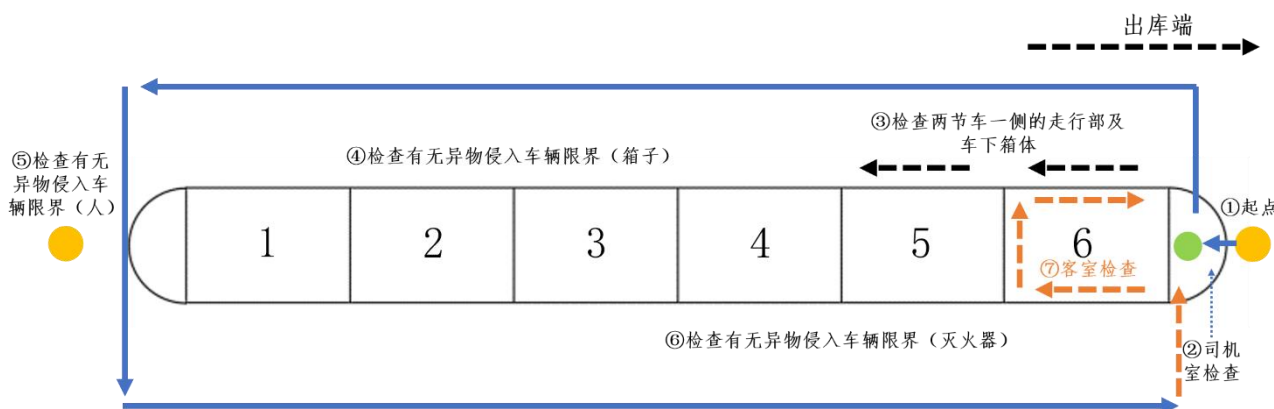
Before train outbound operation, the driver on duty should inspect and test the outbound train in all aspects to ensure that the train can complete its operation safely and smoothly.

The inspection operation before the vehicle departure is divided into two parts, i.e. vehicle and surrounding environment status confirmation and inspection.

The inspection process requires pointing finger and calling out to confirm the status of each component, and any abnormalities must be specially pointed out. The inspection routes are shown in the diagrams:

Inspection route 1

车辆外观、司机室、走行部及车下结构
巡视检查路线示意图

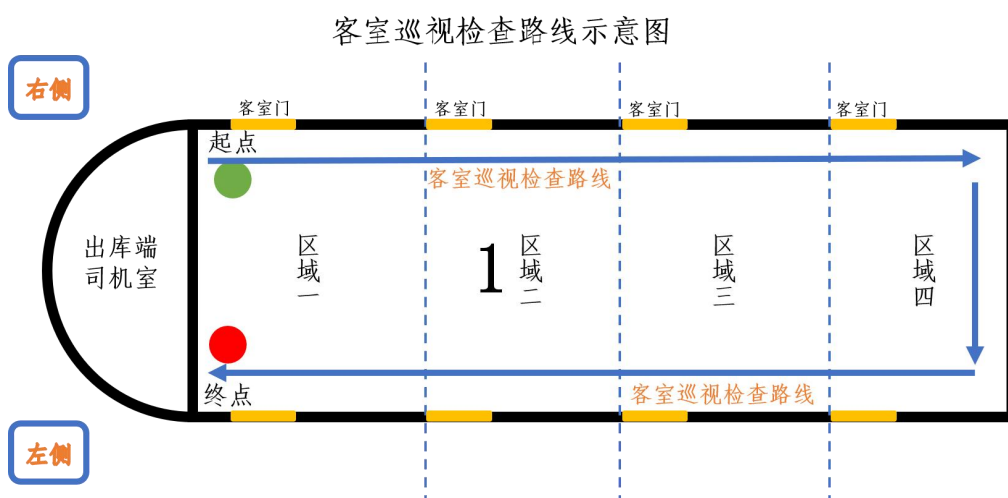


Inspection Route Diagram for Vehicle Appearance, Driver's Cab, Running Gear and Under Vehicle Structure	Inspection Route Diagram for Vehicle Appearance, Driver's Cab, Running Gear and Under Vehicle Structure
Outbound end	Outbound end
From	From
Inspection on the driver's cab	Inspection on the driver's cab
Check the running gear on the side of two	Check the running gear on the side of two

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compartments and the under vehicle box	compartments and the under vehicle box
Check for foreign objects intruding into the vehicle boundary (box)	Check for foreign objects intruding into the vehicle boundary (box)
Check for foreign objects intruding into the vehicle boundary (person)	Check for foreign objects intruding into the vehicle boundary (person)
Check for foreign objects intruding into the vehicle boundary (fire extinguisher)	Check for foreign objects intruding into the vehicle boundary (fire extinguisher)
Inspection on passenger compartment	Inspection on passenger compartment

Inspection route 2



Inspection Route Diagram for Passenger Compartment	Inspection Route Diagram for Passenger Compartment
Right	Right
Left	Left
Passenger compartment door	Passenger compartment door
From	From
Outbound end	Outbound end
Driver's cab	Driver's cab
Area 1	Area 1
Area 2	Area 2
Area 3	Area 3
Area 4	Area 4
Passenger compartment inspection route	Passenger compartment inspection route
Endpoint	Endpoint

II. Driving operation for urban rail transit train drivers

i. Train dynamic performance test

Points for Attention

1. The task is set up with “disqualification items”, e.g., not sounding the horn when raising the pantograph, etc. If a competitor’s operation for the corresponding contents is incorrect, the result of this item is zero.

2. Dynamic inspection requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

On the basis of preparation operation, inspecting the dynamic performance of the train, including dynamic tests of the doors, train braking system, traction system, and auxiliary control system. The competitor needs to operate the relevant vehicle components one by one to test whether their performance can meet the technical standards for train operation and ensure that the train can be put into operation without faults.

Inspection contents include: Putting in the battery and activating the train, checking the working status of the auxiliary system, starting the passenger compartment service facilities, door opening/closing test, train brake performance test, train traction test, inspection of the train broadcast system, inspection of the wipers, sprays, sirens, headlights, etc.

ii. Train outbound operation

Points for Attention

1. The task is set up with “disqualification items”, e.g., approach mis-arrangement, over-speed operation, etc. If a competitor’s operation for the corresponding contents is incorrect, the result of this item is zero.
2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

Operation contents include: Train probe operation, interlock control with the signal box attendant, outbound approach arrangement, yard operation, driving mode switch, interlock control with the train scheduler, training outbound driving, etc.

iii. Driving operation

Points for Attention

1. During the task, extra points will be deducted for circumstances such as over-speeding, exceeding the impulse value, and stopping without reason.
2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

It mainly assesses the competitor’s ability to control the urban rail transit vehicle and drive smoothly, including interval on-time operation, benchmark stop, and door opening and closing operations. Three competitors to complete this module are required to work together to complete the running tasks of the specified line.

iv. Contingency troubleshooting

Points for Attention

1. The task is set up with “disqualification items”, e.g., unauthorized removal of on-board signal

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equipment, etc. If a competitor's operation for the corresponding contents is incorrect, the result of this item is zero.

2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

During the driving operation, temporary vehicle faults are set up to assess the competitor's judgment ability, the ability to adapt to the changes in the situation, coordination and contact ability; to assess the competitor's professional quality, including but not limited to: The electrical principles of urban rail transit vehicles, the role of the air switch and operational knowledge; meaning and identification methods of indicator lights, meters, display on the screen on the driver's console; the roles of related buttons and equipment on the driver's console and operational knowledge; train operation stop, rescue conditions, etc. Three vehicle faults are randomly selected for assessment, and possible fault types include brake system faults, traction system faults, auxiliary system faults, door system faults, and other system faults. The competitor is required to be able to judge the fault phenomena; report the fault information correctly; and handle the faults according to the procedure.

Take the assessment requirements for one of the faults as an example:

Contingency Troubleshooting - Fault of XXX						
Competitor's signature				Examiner's signature		
Date and time						
Examination requirements	1. During the examination, the competitor shall strictly implement the rules and regulations, obey the examiner's command. If the competitor violates the rules and is disqualified, no points will be awarded.					
	2. Time limit: The competitor shall complete the item within the specified time. If the handling exceeds the time limit, the mark of contents that have been done is valid, and no points will be awarded to the overtime contents. The calling out and confirmation items are subject to manual marking, and operation items are subject to computer marking.					
	3. Operation items in the examination contents shall be actually done, regardless of the state and position of relevant switches, fuses, buttons, which shall be re-operated to the corresponding position described in the marking sheet. If the items are not actually done, no points will be awarded.					
	4. The full mark of the examination is 100 points. If the operation is not performed in the required order, ten points will be deducted (by the computer) from the total mark.					
Handling time						
No.	Inspection description	Inspection standards	Marks	Assessment method	Notes	Points
1	Determine the fault phenomenon	Description of the fault phenomenon: "xxxxxx."	Disqualification items	Manual marking	Disqualification items	
2	xx operation	(1) Reporting scope 1: The train scheduler;	-	No marking	For the part subject to manual marking, if reporting and communication are correctly conducted, points will be awarded accordingly. If any item is missed, no points will be awarded.	
		(2) Reporting scope 2: The station staff;	-	No marking		
		(3) Operation: Press the driver intercom button to initiate a call;	10	Computer marking		
		(4) Reporting	4	Manual		

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		<p>contents: “Report to the train scheduler and staff of XX Station. xx fault has occurred to Table XXX No. XXX Train XXX at XX Station. I request the station concerned to coordinate personnel to assist in troubleshooting.”</p>		marking		
		(5) The train scheduler replies: “The train scheduler understands.”	1	Manual marking		
		(6) Operation: xxxx button.	10	Computer marking		
3	xx operation	<p>(1) Observation and description 1: Check whether the xxx fuse of the fuse screen at both ends is disconnected. Point (xxx) using the finger and call out Confirmation Content 1: “The xxx fuse at both ends is (not) disconnected.”</p>	5	Manual marking	Get marks for correct calling out	
		<p>(2) Observation and description 2: Check whether the xxx fuse of the fuse screen at both ends is disconnected. Point (xxx) using the finger and call</p>	5	Manual marking		

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		out Confirmation Content 2: “The xxx fuse at both ends is (not) disconnected.”				
		(3) Operation: Close the disconnected fuses respectively.	40	Computer marking		
		(4) Point (xxx) using the finger and call out Confirmation Content 1: “The xxx fuse at both ends is (not) disconnected.”	5	Manual marking	Get marks for correct calling out	
		(5) Point (xxx) using the finger and call out Confirmation Content 2: “The xxx fuse at both ends is (not) disconnected.”	5	Manual marking		
4	xx operation	(1) If there is no automatic broadcast after restoration, use manual broadcast and maintain operation, and drop off all passengers and stop train operation at the terminal.	5	Manual marking		
		(2) If the manual broadcast and automatic broadcast functions are still not available after the above handling, request the station staff to	5	Manual marking		

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		go to the tail-end and assist in the manual broadcast.				
5	xx operation	If the handling is still ineffective, immediately drop off all passengers and stop train operation. Standard phrases: “Table XXX No. XXX Train XXX still has no automatic broadcast and manual broadcast after handling. Request dropping off all passengers and stopping train operation.”	5	Manual marking		

v. Contingency response of emergencies

Points for Attention

1. The task is set up with “disqualification items”, e.g., unauthorized removal of on-board signal equipment, door opening by mistake, etc. If a competitor’s operation for the corresponding contents is incorrect, the result of this item is zero.
2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

During the driving operation, temporary vehicle faults are set up to assess the competitor’s judgment ability, the ability to adapt to the changes in the situation, coordination and contact ability; to assess the professional quality, the mastery of urban rail transit contingency response methods, etc. of the competitor. Two kinds of emergencies are randomly selected for assessment, and possible emergencies include: The handling of foreign objects hanging on the contact net during train operation; the handling of waterlogging during train operation; the handling of foreign objects intruding into the boundary during train operation; the handling of fire during train operation; the handling of passenger alarm during train operation; the handling of insufficient lookout distance in special weather; the handling of foreign objects caught in the door when the door is closed for operation. The competitor is required to be able to judge the contingency level of the emergency; report the emergency information correctly; and handle the emergency according to the procedure.

Take the assessment requirements for one of the emergencies as an example:

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Emergency Handling Procedure - In the Event of XXX						
Competitor's signature				Examiner's signature		
Date and time						
Examination requirements	<p>1. During the examination, the competitor shall strictly implement the rules and regulations, obey the examiner's command. If the competitor violates the rules and is disqualified, no points will be awarded.</p> <p>2. Time limit: The competitor shall complete the item within the specified time. If the handling exceeds the time limit, the mark of contents that have been done is valid, and no points will be awarded to the overtime contents. The calling out and confirmation items are subject to manual marking, and operation items are subject to computer marking.</p> <p>3. Operation items in the examination contents shall be actually done, regardless of the state and position of relevant switches, fuses, buttons, which shall be re-operated to the corresponding position described in the marking sheet. If the items are not actually done, no points will be awarded.</p> <p>4. The full mark of the examination is 100 points. If the operation is not performed in the required order, ten points will be deducted (by the computer) from the total mark.</p>					
Handling time						
No.	Inspection description	Inspection standards	Marks	Assessment method	Notes	Points
1	Determine the phenomenon	Phenomenon description: "xxxxx."	Disqualification items	Manual marking	Disqualification items	
2	xx operation	(1) Operation: Turn xxxx to xxx position	15	Computer marking		
		(2) Point (xxx) using the finger and call out the confirmation content: "xxx."	5	Manual marking		
		(3) Operation: Press xxx and perform xxx operation.	10	Computer marking		
		(4) Point xxx using the finger in order and call out: "xxx."	5	Manual marking		
3	xx operation	(1) Operation: Press xxxx button on the driver's console and perform xxxx operation.	10	Computer marking		
		(2) Broadcast content: "xxxxxx."	15	Manual marking		
		(3) Perform a second manual broadcast.	15	Manual marking		
		(4) Operation: Press xxx button on the driver's console and perform xxxx operation.	5	Computer marking		
4	xx operation	(1) After the operation, the train scheduler performs xxxx operation.	10	Computer marking		
		(2) Operation: Press xxxx button on the driver's console and perform xxxx operation.	10	Computer marking		
		(3) Point xxxx using	-	No marking	Mark here and	

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		the finger in order and call out: “xxxx.”			fill in the standardized operation table	
5	xx operation	(1) Point xxxx using the finger in order and call out: “xxx.”	-	No marking		
		(2) Point (xxx) using the finger and call out the confirmation content: “xxx.”	-	No marking		
		(3) Point (xxx) using the finger and call out the confirmation content: “xxx.”	-	No marking		

vi. Train turn-back operation

Points for Attention

1. The competitor shall perform the handover operation after completing the turn-back operation.
2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

The competitor’s operation procedures of automatic turn-back are assessed. The operation contents include (in no particular order): Automatic turn-back operation, handover operation, etc.

vii. Train inbound operation

Points for Attention

1. The task is set up with “disqualification items”, e.g., approach mis-arrangement, over-speed operation, etc. If a competitor’s operation for the corresponding contents is incorrect, the result of this item is zero.
2. The operation requires video and audio recording of the whole process, and make records of calling out in accordance with the rules.

Operation contents

Operation contents include: Driving the train in the ATO mode, stopping the train at the inbound signal, interlock control with the signal box attendant, inbound approach arrangement by the signal box attendant, driving mode switch, yard operation, train inbound and shutdown operation, etc.

Module B: Driving Operation of Multiple Units

Task time

50 minutes

I. Main Track Driving

Points for Attention

1. Five minutes before the start of the vehicle, it is required to forecast the departure time, and it is prohibited to leave the driver's cab.
2. If the ATP emergency brake is triggered during driving, it is treated as a disqualification.

Operation contents

1. Before driving, the locking status of the door and window of the driver's cab should be checked, and the driver's cab door should be locked.
2. Put the brake handle at the brake position, and enter the data related to the train-controlled on-board equipment and CIR.
3. After entering, confirm the departure request with the judge.
4. After receiving the departure order, ask the accompanying mechanic to confirm whether closing the door is allowed. Close the train door after getting the order of permission to close the door.
5. Release the full train parking brake, and confirm that the full train parking brake is released.
6. Put the direction handle in the forward direction, relieve the service brake, and sound the horn.
7. Pull the traction handle.
8. Then drive in the manual driving mode.
9. During operation, calling out is required in accordance with the regulations when leaving the station, entering the station, passing by the signal, and switching the neutral section. The video equipment of the competition site records the video and audio of the whole process. Pre-break and main break safety preparation is required when crossing the neutral section.
10. When the train arrives at the station, park the vehicle to the parking spot. After the train stops, it is required to immediately confirm the position of the vehicle, apply the parking brake, and prevent it from loading again.
11. It is required to complete the opening action within 10 s after the train completely stops.
12. Then exit the driver's cab, introduce the operating status of the locomotive to the judge, and fill in the status record.

II. En route contingency troubleshooting

Points for Attention

If serious consequences such as damage to train equipment are caused during troubleshooting, it is treated as a disqualification.

Operation contents

1. Three contingency troubleshooting items are set up during main track driving.
2. After finding the fault, the driver should notify the accompanying mechanic immediately of such fault, and handle it as required.
3. After the handling is completed, perform a status check according to the requirements, and continue the operation after confirming that there are no errors.

1. Appendices:

i. Standard phrases for the confirmation calling of drivers of multiple units

No.	Timing of calling	Standard phrase of calling
1	Confirm the equipment position in static inspection	** Position of Train * is (on/off/left/right, etc.)
2	Confirm the status of the door and window of the driver's cab	The door and window of the driver's cab is locked, and the status is normal.
3	Confirm the status of meters and display equipment on the driver's console	The display of all meters and indicator lights is normal
4	Before pantograph raising	Wind pressure is ***, the conditions for pantograph raising are met
5	After the conditions for pantograph raising are met	Attention to pantograph raising. Pantograph raising is completed.
6	After pantograph raising	Pantograph raising is completed for Train *, the grid voltage is **. The grid voltage is normal
7	Apply parking brake	Full train parking brake has been applied
8	Release parking brake	Full train parking brake has been released
9	Driving safety equipment data entry	Train-controlled on-board equipment/CIR equipment settings (item by item selection and interchange; train number and other entry also requires calling out) ** is set up correctly (after entering an item setting) ** has been set up (when finishing)
10	Meet the conditions for departure	The signal is open, doors are closed, and it is time to drive
11	Confirm the time of driving	No. **, driving on time (** minutes late)
12	Equipment indicates information on crossing the neutral section	Attention to crossing the neutral section
13	In front of the power-off mark	Power has been off
14	After passing by the power-on mark	Power has been on