

Technical Test - Practical

Vacuum Excavator - A78



Resources required (Endorsement A to F)

Machine	<ul style="list-style-type: none"> Fully equipped vacuum excavator that meets the requirements of the endorsement, equipped with air or water lance delivery capabilities
Area	<p>Ground clear of hazards and includes:</p> <ul style="list-style-type: none"> Flat surface for travelling and manoeuvring Clear straight run not less than 20 metres in length Area for spoil discharging Area for soil excavation work and arm manipulation exercise as per exercises 1 to 4 Area for cleaning and preparation work Specified buried services that meet the required test specification (exercises 3 and 4) Segregated area installed with suitable barriers to prevent unauthorised access, with entry/exit gates for the vehicle/trailer
Other equipment	<ul style="list-style-type: none"> Appropriate air or water equipped ground breaking tools Equipment to segregate the working area and exposed excavations Equipment to create restrictions for manoeuvring Equipment for marking out the nozzle control exercise (1) Replacement nozzle of a different diameter
Notes	<ul style="list-style-type: none"> The machine selected for the test must meet the specification for the required endorsement, be in serviceable condition and conform with current legislation The operator's manual for the host vehicle/chassis and excavator unit must be available Trailer mounted units to be manoeuvred by a suitable vehicle. For non-LGV and trailer mounted endorsements, the candidate must have had suitable training for the driving of the machine/vehicle, Inc. trailer connecting and de-coupling An excavating specification must be available for the candidate to refer to as per the specification in the resources and activity section of the test documentation The remote unit must be guarded to prevent inadvertent movement of controls <p>The area for excavating buried services excavation activity must have (inert) buried services (replicating gas/water piping and low-voltage cabling) that meets the following specification:</p> <ul style="list-style-type: none"> Service 1: 1 x pipe of a 90mm diameter, buried to a depth of 750mm

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Resources required (*Continued*)



<p>Notes (Continued)</p>	<ul style="list-style-type: none"> - Service 2: 1 x pipe of a 125mm diameter running parallel to and directly beneath service 1, buried to a depth of 900mm - Service 3: 1 x large diameter cable (min of 200mm) buried to a depth of 300mm at a distance of at least four times the nozzle hose diameter from service 1, (e.g. nozzle diameter 250mm, then distance from service 1 to service 2 = 500mm) - Service 4: 1 x electrical cable parallel to service 3 with a length of at least 100mm from service 3 and buried to a depth of 400mm - Service 5: 1 x electrical cable at a 90 degree angle to services 1 to 4, buried to a depth of 200mm - Service 6: 1 x electrical cable at a 45 degree angle to services 1 to 4, buried to a depth of 250mm • The length of each pipe and cable shall be beyond the intended excavating area for the type of machine being used on the test • The buried services shall be marked according to industry guidance (except for exercise 4) • The area for the excavating tasks should be pre-marked according to the given dimensions and ensured that the ground is sufficiently compacted following previous excavating tests • An total exclusion zone must be pre-constructed around the excavating area • Exercise 1: <ul style="list-style-type: none"> - The equipment for the nozzle control exercise needs to ensure a straight line marked can be followed by the candidate, and that the accuracy of placing the nozzle at each given point can be measured • Exercise 3: <ul style="list-style-type: none"> - For endorsements A to D only a cross section of the marked services has to be exposed. The area is identified by the three hashed circles on the plan - For endorsements E and F all the marked services has to be exposed within the full dimensions • Exercise 4: <ul style="list-style-type: none"> - For endorsement A to D an area of 500mm x 500mm for excavating that contains an unmarked and (to the candidate) unknown buried service situated at between 300mm and 600mm depth - For endorsements E & F and area of 1500mm x 1500mm for excavating that contains an unmarked and (to the candidate) unknown buried service situated at between 300mm and 600mm depth
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Activity instructions (Pre-use checks) Endorsements A to F

Sequence	<ul style="list-style-type: none"> Activities 1 to 3 must be undertaken at the start of the test
Preparing for work	<ol style="list-style-type: none"> Using the operator's manual, convey (to the tester) the pre-use or daily checks stipulated by the host vehicle or trailer, and vacuum excavating unit manufacturers Complete all manufacturers' pre-start checks with supporting commentary Complete full pre-use running checks and prepare the vehicle/trailer and unit for travelling activities
Notes (Pre-use checks)	<ul style="list-style-type: none"> The candidate must provide a running commentary to pre-start checks being carried out in order to provide supporting information to visual checks (e.g. components) and physical checks (e.g. brakes etc.) being made. The tester may prompt the candidate to outline specific information but not ask direct questions that requires a technical answer The operator's manual must be referenced during activities 2 and 3 For trailer mounted units, the trailer may be pre-coupled to the towing vehicle

Activity instructions (Operational) Endorsements A to F

Sequence	<ul style="list-style-type: none"> Activity 1 must be undertaken at the start of the test Activity 15 must be undertaken at the end of the test All activities must be undertaken in the given order <p>The test must be completed within a given time. The specifications' section gives further information</p>
Travelling and manoeuvring <i>(refer to activity measurements)</i>	<ol style="list-style-type: none"> Travel/tow the unit to the working area Endorsements C-F; in both a loaded and unloaded state: <ul style="list-style-type: none"> travel over uneven terrain pass through a chicane executing full right- and left-hand turns in a forward and reverse direction
Setting up for work	<ol style="list-style-type: none"> Check and prepare the working area in accordance with the site plan Position and configure the machine for all activities Maintain an exclusion zone for the working area Replace a nozzle with a different diameter version Exercise 1 – From minimum radius, undertake the arm manipulation exercise as per the plan. At each marker, ground the hose at the specified point Exercise 2 – Excavate a straight trench 90 degrees to the machine's centre line Exercise 3 – Excavate an area according to the given site plan and expose marked Services (exercise 3)

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Activity instructions (Operational) Continued

Working tasks	<p>13. Exercise 4 – Excavate a given marked area</p> <p>14. Change the nozzle to a difference diameter</p> <p>15. On completion of exercises 2-4, position the vehicle away from the excavation and segregate the exposed services and excavated areas</p>
Discharging and completing work	<p>16. Discharge the excavated material at a given point</p> <p>17. Travel/tow the machine to a cleaning area</p> <p>18. Carry out relevant cleaning activities</p>
Shutting down	<p>19. Park the machine and carry out shut-down and securing procedures</p>
Notes	<ul style="list-style-type: none"> • Exercise 1 must be undertaken in a single sequence from start to finish • For exercise 3, both types of ground engaging tools must be used in equal proportion for the activity • For activity 9, the tester may provide assistance but limited to basic functions such as steadying the nozzle and following the directions of the candidate • For activity 14, the nozzle must be changed during exercise 3 • For activity 16, the discharge point must be at least 30 metres from the excavating area

Activity measurements (Endorsements A to F)

Manoeuvring restriction (activities 5)	<ul style="list-style-type: none"> • Maximum clearance less than 300 mm or 10% of the machine's width (the greater applies) between the machine and chicane/restriction sides when undertaking each turn, or passing through the restriction
Exercise 1	<ul style="list-style-type: none"> • Maximum deviation from the route = +/- 100mm • Maximum tolerance for nozzle placing = 25 mm • Maximum ground to nozzle height = 100 mm
Exercise 2	<ul style="list-style-type: none"> • Trench length = 3 metres +/- 100 mm • Trench straightness = 150 mm maximum deviation • Trench Depth = 300 mm +/- 100 mm
Exercise 3	<ul style="list-style-type: none"> • For endorsements A to D a cross section of services exposed as per plan • For endorsements E & F All services exposed • Excavation limit = 100mm outside of outer services and below deepest service
Exercise 4	<ul style="list-style-type: none"> • Service exposed • For endorsements A to D - Excavation = 500mm x 500mm + 100mm maximum • For endorsements E & F - Excavation = 1 metre x 1 metre + 100mm maximum • Maximum depth = 700mm
Test timings	<ul style="list-style-type: none"> • The test must be completed within 3 hours

<p>Machine</p>	<ul style="list-style-type: none"> Fully equipped vacuum excavator that meets the requirements of the endorsement, equipped with air or water lance delivery
<p>Area</p>	<ul style="list-style-type: none"> Ground clear of hazards and includes: <ul style="list-style-type: none"> Area for spoil discharging Area for soil excavation work and arm manipulation exercise as per exercises 1 to 4 Area for cleaning and preparation work Specified buried services that meet the required test specification (exercises 3 and 4) Segregated area installed with suitable barriers to prevent unauthorised access, with entry/exit gates for the vehicle/trailer
<p>Other equipment</p>	<ul style="list-style-type: none"> Appropriate air or water equipped ground breaking tools Equipment to segregate the working area and exposed excavations Equipment for marking out the nozzle control exercise (1) Replacement nozzle of a different diameter
<p>Notes</p>	<ul style="list-style-type: none"> The host vehicle/chassis and excavator unit selected for Endorsement G must meet the specifications for endorsement E The host vehicle/chassis and excavator unit selected for Endorsement H must meet the specifications for endorsement F The operator's manual for the host vehicle/chassis and excavator unit must be available An excavating specification must be available for the candidate to refer to as per the specification in the resources and activity section of the test documentation The remote unit must be guarded to prevent inadvertent movement of controls The area for excavating buried services excavation activity must have (inert) buried services (replicating gas/water piping and low-voltage cabling) that meets the following specification: <ul style="list-style-type: none"> Service 1: 1 x pipe of a 90mm diameter, buried to a depth of 750mm Service 2: 1 x pipe of a 125mm diameter running parallel to and directly beneath service 1, buried to a depth of 900mm Service 3: 1 x large diameter cable (min of 200mm) buried to a depth of 300mm at a distance of at least four times the nozzle hose diameter from service 1, (e.g. nozzle diameter 250mm, then distance from service

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Resources required (*Continued*)



<p>Notes (Continued)</p>	<ul style="list-style-type: none">- Service 4: 1 x electrical cable parallel to service 3 with a length of at least 100mm from service 3 and buried to a depth of 400mm- Service 5: 1 x electrical cable at a 90 degree angle to services 1 to 4, buried to a depth of 200mm- Service 6: 1 x electrical cable at a 45 degree angle to services 1 to 4, buried to a depth of 250mm• The length of each pipe and cable shall be beyond the intended excavating area for the type of machine being used on the test• The buried services shall be marked according to industry guidance (except for exercise 4)• The area for both excavating tasks should be pre-marked according to the given dimensions and ensured that the ground is sufficiently compacted following previous excavating tests• An total exclusion zone must be pre-constructed around the excavating area• Exercise 1:<ul style="list-style-type: none">- The equipment for the nozzle control exercise needs to ensure a straight line marked can be followed by the candidate, and that the accuracy of placing the nozzle at each given point can be measured• Exercise 3:<ul style="list-style-type: none">- All the marked services has to be exposed within the full dimensions• Exercise 4:<ul style="list-style-type: none">- Area of 1500mm x 1500mm for excavating that contains an unmarked and (to the candidate) unknown buried service situated at between 300mm and 600mm depth
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Activity instructions (Pre-use checks) Endorsements G & H

Sequence	<ul style="list-style-type: none"> Activities 20 to 22 must be undertaken at the start of the test
Preparing for work	<p>20. Using the operator's manual, convey (to the tester) the pre-use or daily checks stipulated by the vacuum excavating unit manufacturers</p> <p>21. Complete all manufacturers' pre-start checks with supporting commentary</p> <p>22. Complete full pre-use running checks and prepare the unit for excavating activities</p>
Notes (Pre-use checks)	<ul style="list-style-type: none"> The candidate must provide a running commentary to pre-start checks being carried out in order to provide supporting information to visual checks (e.g. components) and physical checks (e.g. hoses etc.) being made. The tester may prompt the candidate to outline specific information but not ask direct questions that requires a technical answer The operator's manual must be referenced during activities 21 and 22

Activity instructions (Operational) Endorsements G & H

Sequence	<ul style="list-style-type: none"> Activity 20 must be undertaken at the start of the test Activity 32 must be undertaken at the end of the test All activities must be undertaken in the given order <p>The test must be completed within a given time. The specifications' section gives further information</p>
Setting up for work	<p>23. Check and prepare the working area in accordance with the site plan</p> <p>24. Configure the machine for all activities</p> <p>25. Maintain an exclusion zone for the working area</p> <p>26. Replace a nozzle with a different diameter version</p> <p>27. Exercise 1 – From minimum radius, undertake the arm manipulation exercise as per the plan. At each marker, ground the hose at the specified point</p> <p>28. Exercise 2 – Excavate a straight trench 90 degrees to the machine's centre line</p> <p>29. Exercise 3 – Excavate an area according to the given site plan and expose all marked services (exercise 3)</p>
Working tasks	<p>30. Exercise 4 – Excavate a given marked area</p> <p>31. Change nozzle to a different diameter</p> <p>32. On completion of exercises 2-4, the host vehicle must be positioned away from the excavation to allow the candidate to segregate the exposed services and excavated area</p> <p>33. Carry out relevant cleaning activities</p>

Notes	<ul style="list-style-type: none"> • Exercise 1 must be undertaken in a single sequence from start to finish • For exercise 3, both types of ground engaging tools must be used in equal proportion for the activity • The tester must travel the unit to the working area • For activity 26, the tester may provide assistance but limited to basic functions such as steadying the nozzle and following the directions of the candidate • For activity 31, the nozzle must be changed during exercise 3 • For activity 32, the tester must position the vehicle away from the excavation to allow the candidate to segregate the exposed services and excavated area • The tester must travel the unit to the given discharge point and may also discharge the excavated material • For activity 33, the tester must travel the unit to the cleaning area to allow the candidate to carry out relevant cleaning activities
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Activity measurements Endorsements G & H

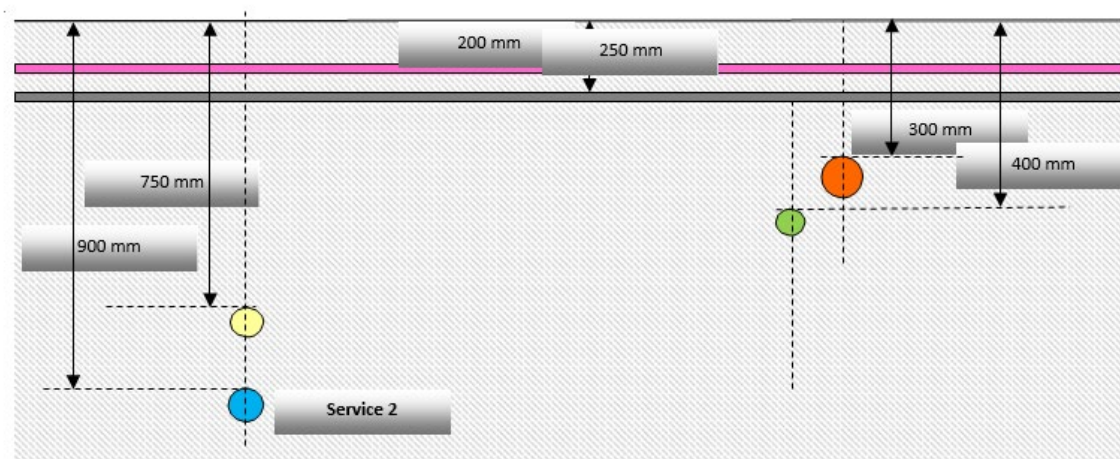
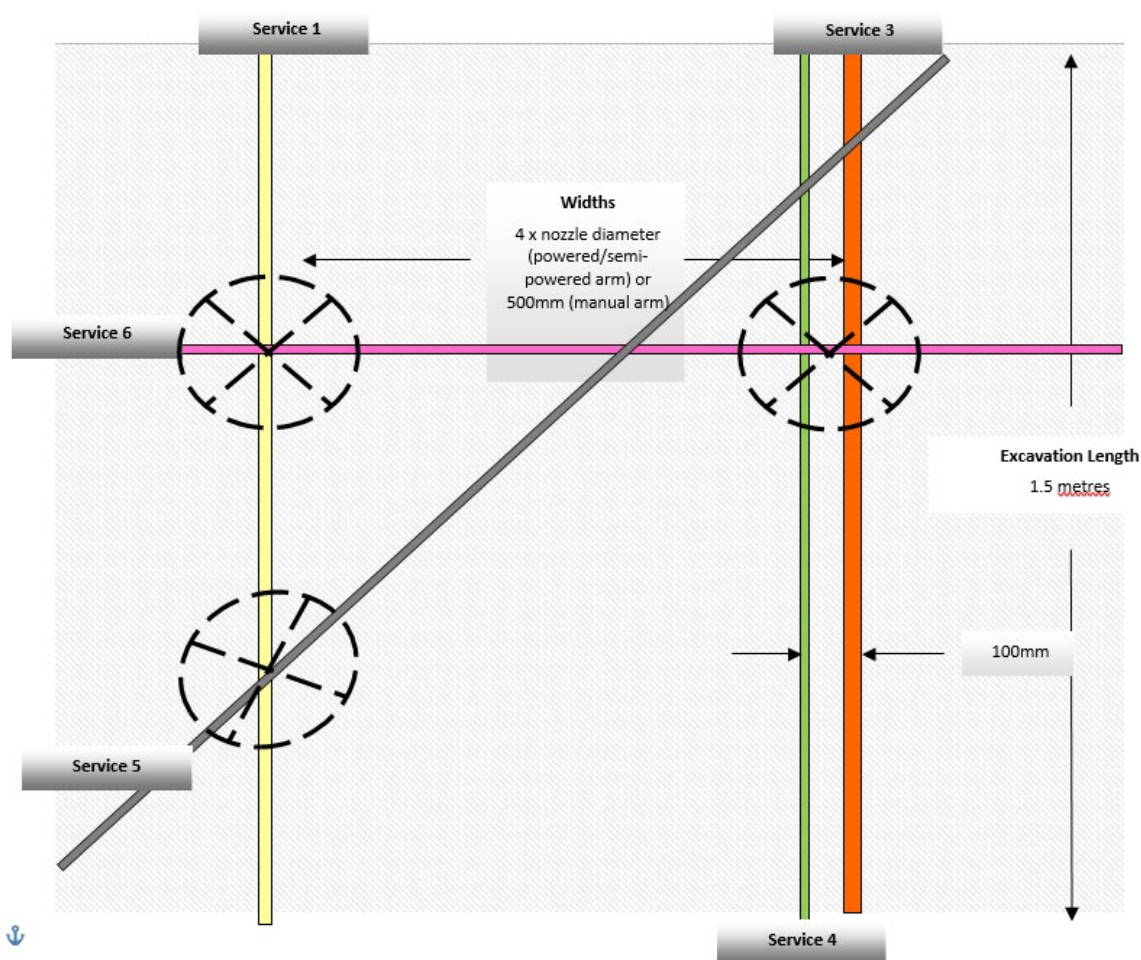
Exercise 1	<ul style="list-style-type: none"> • Maximum deviation from the route = +/- 100mm • Maximum tolerance for nozzle placing = 25 mm • Maximum ground to nozzle height = 100 mm
Exercise 2	<ul style="list-style-type: none"> • Trench length = 3 metres +/- 100 mm • Trench straightness = 150 mm maximum deviation • Trench Depth = 300 mm +/- 100 mm
Exercise 3	<ul style="list-style-type: none"> • All services exposed • Excavation limit = 100mm outside of outer services and below deepest service
Exercise 4	<ul style="list-style-type: none"> • Service exposed • Excavation = 1 metre x 1 metre + 100mm maximum • Maximum depth = 700mm
Test timings	<ul style="list-style-type: none"> • The test must be completed within 3 hours

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Simulated buried services layout (exercise 3)



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Basic details

Test ref:	Candidate name:
Tester ref:	Candidate ref:
Tester ref:	Date of test:
Endorsement: A <input type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/>	Start time of test:
F <input type="checkbox"/> G <input type="checkbox"/> H <input type="checkbox"/>	
Make and model:	Duration:

Mandatory	Correctly carried out during the test?	Y/N
Preparing	1 All pre-start and running checks (or responses to relevant questions)	
	2 Remote control unit functional check (where relevant)	
Travelling	3 Restrictions cleared	
	4 Machine set for travel	
	5 Encountered hazards cleared	
Setting up	6 Allocated area checked and clear of hazards prior to each activity	
	7 Machine positioned for each activity	
	8 Exclusion zone set correctly for each activity	
	9 Exclusion zone maintained for each activity	
Working	10 Air and water lance connected and checked	
	11 Nozzle kept vertical during arm manipulation exercise	
	12 Trenches conformed to given size and within tolerances (depth, straightness and clearances)	
	13 Kept clear of underside of nozzle	
	14 Ground engaging tools used efficiently with lance aimed towards nozzle	
	15 No damage applied to underground services	
	16 Appropriate personal protective equipment worn and maintained at all times	
	17 Remote units isolated when required	
	18 Nozzle kept within segregated area	
	19 Nozzle held (by hand) above isolating area	
	20 Maintained safe situations at all times including operator positioning	
	21 Nozzle angle not exceeding safe limits during operation	
	22 Candidate clear of trench area during boom movements (hydraulically-operated units only)	
23 Stability of the machine maintained at all times		
Completing	24 Material discharged in given area	
	25 Machine cleaned in accordance with procedures	
	26 Tools and equipment securely stowed	
	27 Area for cleaning left tidy and safe	
Shutdown	28 All shutdown and securing procedures	
Other	29 Legislation, manufacturers' and health and safety requirements complied with	
	30 Test completed within the given time	

All of these items must be awarded Achieved / Not achieved

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Faults

Candidate incorrectly carried out the following:

		Fault	Mark	Penalty
Travelling	1	Machine mounting and dismounting		1
	2	Identify information from the Operator's Manual		2
	3	Full observation before moving		2
	4	Full observation whilst travelling		2
	5	Travel speed matched to the ground type and conditions		1
	6	Minimising ground damage when turning/manoeuvring		1

Working	7	Observation before starting work		2
	8	Observation before slewing boom/components		1
	9	Observation of surrounding area constantly made during work		2
	10	Nozzle height within tolerance during exercise 1		1
	11	Nozzle placed within given tolerances during exercise 1		2
	12	Nozzle kept with straight line tolerance during exercise 1		1
	13	Nozzle height kept to minimum during all exercises		1
	14	Sideswiping material with the nozzle		1
	15	Edges of excavation clean and clear		2
	16	Minimal contact made with services		2
	17	Correct function of operating controls used		2
	18	Debris/material splatter minimised during lance use		1
	19	Smooth use of operating controls		1

Not exceeded eight penalties

Total penalties

Achieved / Not achieved

Note: The following are not applicable for the endorsements G and H:

- Mandatory Items: 3,4,5 and 24
- Fault Items: 2,3,4 and 5