

KNOWLEDGE ASSESSMENT

Name: _____ Location: _____ Date: _____

1. Plan and prepare for excavator operations

1.1 Access, interpret and apply excavator operations documentation and ensure the work activity is compliant

1. What is the relevant WHS legislation?

- (a) WHS Act 2011
- (b) WHS Regulation 2011
- (c) All answers are correct

2. Health and safety responsibilities are defined in

- (a) The WHS Act 2011
- (b) The WHS Regulation 2011
- (c) Approved Codes of Practice
- (d) All answers are correct

3. Who is responsible for ensuring safe work practices are established and followed on a construction site?

- (a) The principal contractor or site Controller
- (b) The WorkCover inspector
- (c) The site safety officer and/or union delegate
- (d) The site HS committee

4. What instructions are you required to read, interpret and sign before work?

5. What is a safe work method statement (SWMS)?

6. What is the meaning of the following safety sign?



(white on blue background)

- (a) Pedestrian access allowed
- (b) Hearing Protection must be worn
- (c) Footwear cleaning station
- (d) Emergency exit

7. Which of the following signs indicates the location of the emergency exit?

- (a)  (black on yellow background)
- (b)  (white on green background)
- (c)  (white on blue background)
- (d)  (black text and red circle on white background)

1.2 Obtain, read, interpret, clarify and confirm work requirements

8. What would you be required to obtain from the relevant authority to operate an excavator in a hazardous working area?

9. On a construction site who would you contact to confirm the job requirements for the work to be performed with the excavator?

1.3 Identify and address risks, hazards and environmental issues and implement control measures

10. What precautions should you take when cutting a trench across a footpath?

11. What underground services would you check for before starting to excavate?

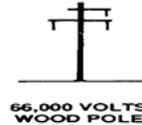
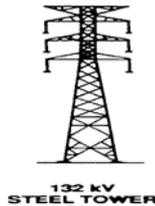
12. Who should be contacted in order to find out the location of underground services?

Excavator Operations

13. What is the minimum distance any part of the excavator is allowed to operate from:

- a) Distribution power lines. Circle the correct answer. 3m 6m or 8m
- b) High voltage transmission lines. Circle the correct answer. 3m 6m or 8m

14. Which power device would you stay 3 m away from? Circle the correct answer.



15. If you are operating an excavator and it makes contact with power lines what should you do?

16. How would you dismantle a machine that contacted live power lines, which could not be released, or the power turned off?

17. If you accidentally damaged an underground electrical cable, whom would you immediately contact to render the power supply safe?

18. What is the danger of starting and running an internal combustion engine in an enclosed space?

19. What action must be taken before starting up and whilst operating an internal combustion engine in an enclosed space?

20. What must be provided and maintained on the exhaust of an internal combustion engine when operated in a confined space?

21. If using an excavator to lay pipes in a trench, what precautions should be taken?

Excavator Operations

22. What precautions would you take if a person were in a trench while you are lowering pipes into the trench?

23. An excavator is conducting operations (see photo). Identify five (5) hazards involved in this job.



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24. Why is it important to keep the floor plates free from oil, grease and tools?

25. What must be provided to prevent a person falling into a trench?

Excavator Operations

1.4 Select and wear personal protective equipment appropriate for work activities

26. When should hearing protection (ear muffs) be worn? Circle the correct answer.

- a) 32db
- b) 58db or
- c) 85db

27. When should an operator wear a safety helmet?

28. Circle the minimum type of footwear that an operator should wear to operate excavators.



1.5 Obtain, identify and implement traffic management signage requirements

29. How would you know where to place traffic control signs?

30. Where would you find the Traffic Control Plans (TCP's)?

1.6 Select, and check for faults, equipment and/or attachments for work activities

31. What checks does an operator make to ensure the bucket is secure?

32. What damage would you check for on the excavator bucket?

1.7 Obtain and interpret emergency procedures, and be prepared for fire/accident/emergency

33. What would you do if you came across a dangerous situation?

34. What are three things you would tell the ambulance?

Excavator Operations

35. How would you be notified of an emergency?

- a) Air horn
- b) Siren
- c) Alarm
- d) Radio transmission
- e) All answers are correct

36. If you are injured at work you should

- (a) notify your employer
- (b) seek first aid if required
- (c) seek medical attention if required
- (d) All answers are correct

2. Operate excavator

2.1 Carry out pre-start, start-up, park, shutdown and secure equipment procedures

37. What precautions must be taken when inspecting under a raised attachment?

38. When should slings be inspected?

39. What % wear in a shackle would cause it to be discarded?



- a) 5%
- b) 10%
- c) 15%
- d) 20%

40. Name three defects to look for when inspecting the hydraulic system.

41. How would you know when the machine that you are operating should be serviced?

42. Can a chain sling be joined with a bolt? YES or NO

43. What percentage of broken wires within a rope lay or eight diameters of a wire rope sling would cause it to be discarded?

44. Would you use a flexible steel wire sling if a strand were broken? YES or NO

45. List six defects that would condemn a flexible steel wire rope (FSWR) from safe use?

46. List six defects that would condemn a lifting chain and hook from safe use?

47. What must you do if the SWL tag is missing from the chain sling?

48. What defects would you look for on the hydraulic rams and hydraulic pressure hoses?

49. What checks would you conduct on the tracks of an excavator?



50. What effect would a hydraulic leak in the quick hitch line have on the security of the bucket on an excavator?

51. What would you look for on an attachment to ensure it will not fall off?



52. What action would you take if during the routine check you found excessive wear in the power arms and connections that made the excavator dangerous to operate?

53. What must be done to a lowered bucket before travelling on a road?

54. What must be provided on an excavator before it is used as a crane?

2.2 Coordinate activities with others at the site prior to commencement of, and during, the work activity

55. How would you know the access and path of movement to a work area for loads?

56. How would you know the excavator was suitable for ground conditions?

Excavator Operations

2.3 Continually monitor hazards and risks, and ensure safety of self, other personnel, plant and equipment

57. When a danger exists on a site what should be posted or erected to warn people of the danger?

58. What action would you take if you noticed a bulge form in one of the machines hydraulic hoses?

59. Describe how you would safely mount/dismount an excavator.

60. Where can the start-up/shut down procedures for each excavator be found?

61. Before performing the work with an excavator, what should you do if you have not used the machine before?

62. On mounting the excavator what should you do before attempting to start the engine?

63. Once sitting in the operator's seat and before driving off, what should you do for safety and comfort?

64. Before moving off what should be done with grounded attachments?

65. Before reversing an excavator, what action should you take?

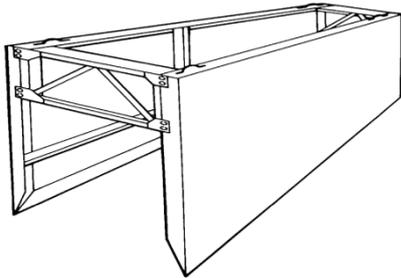
66. Your excavator has run out of diesel, you refill the tank but the motor will not start. What could be the possible cause?

67. What action would you take with damage and defects found on the machine?

Excavator Operations

2.4 Drive and operate excavator, and modify the operating technique to meet changing work conditions

68. When would you be required to shore an excavation?

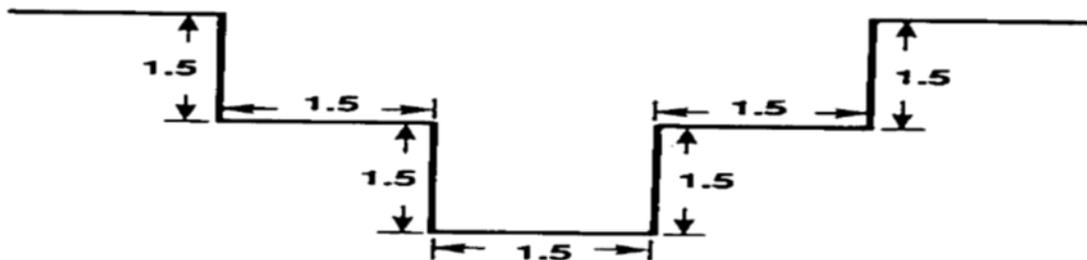


69. What is this thing (above) and what is it used for?

70. What are two conditions that would result in a trench shield or shoring been used?

71. You have to cut an excavation deeper than 1.5m. The workers have to enter this excavation and there is a likelihood that the walls may collapse. Using the excavator what could you do to make the excavation safe to enter?

72. What is this method of trench support called?



73. Under what conditions can a passenger ride on a machine with the operator?

74. How do you calculate the cubic capacity of the bucket of an excavator?

75. You have to load a truck with large boulders using your excavator. You are on the same level as the truck. What are the dangers?

76. When travelling on a sloping surface which is the safest route of travel?

77. What hazards would you check for on a travel route before moving the excavator to perform work?

78. You are required to operate an excavator on soft and uneven ground. What effect would this have on the load you could raise and carry with the excavator?

3. Lift, carry and place materials

3.1 Conduct communication practices associated with transportation and lifting of materials

79. Name three methods of communication?

3.2 Establish weight of load and ensure it is within safe operational limits of the machine

80. State the rule of thumb formula to calculate the SWL of wire rope.

81. State the rule of thumb formula to calculate the diameter of the wire rope sling required to lift a specified load?

82. State the rule of thumb formula to calculate the SWL of a grade 80 lifting chain?

83. State the formula for calculating the WLL of grade 30 to grade 75 lifting chain?

84. What is the SWL of a 12mm diameter wire rope sling?

85. What is the diameter of a single leg wire rope sling that is required to hoist a 2048 kg load?

86. What is the SWL of a flexible steel wire rope (FSWR) 16mm in diameter?

87. What is the SWL of an 8mm diameter flexible steel wire rope (FSWR)?

88. What is the SWL of a 12mm mild steel chain?

89. What is the SWL of a 7.1mm diameter 80-grade chain?

90. How would you establish the load that can be safely lifted by an excavator?

91. List two ways that you would assess the weight of a load to be hoisted?

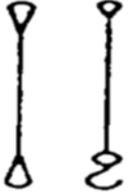
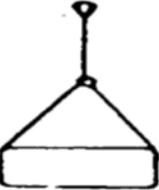
92. What is the approximate weight of cubic metre of concrete?

93. Of topsoil or clay, which is harder to excavate, push and spread?

Excavator Operations

3.3 Select, attach and use slings and lifting gear in accordance with safe working load requirements

94. What must be provided on an excavator to attach slings so that the excavator may be used as a crane?

DIRECT LOADED	CHOKE HITCH	
		
—	—	—
1.00	0.75	0.50

95. Using the chart above what effect does a choker hitch around a square load have on the SWL?

96. Using the same chart what effect does a reeved hitch around a round load have on the SWL?

COLOUR NO STRIPES	TONNE							
		VERTICAL	CHOKE	BASKET	30°	60°	90°	120°
VIOLET 1	1	1	0.8	2	1.9	1.7	1.4	1.00
GREEN 2	2	2	1.6	4	3.8	3.4	2.8	2.00
YELLOW 3	3	3	2.4	6	5.7	5.1	4.2	3.00
ORANGE 4	4	4	3.2	8	7.6	6.8	5.6	4.00
RED 5	5	5	4.0	10	9.5	8.5	7.0	5.00
BROWN 6	6	6	4.8	12	11.4	10.2	8.4	6.00
BLUE 8	8	8	6.4	16	15.2	13.6	11.2	8.00
OLIVE 10	10	10	8.0	20	19.0	17.0	14.0	10.00
GREY 12	12	12	9.6	24	22.8	20.4	16.8	12.00

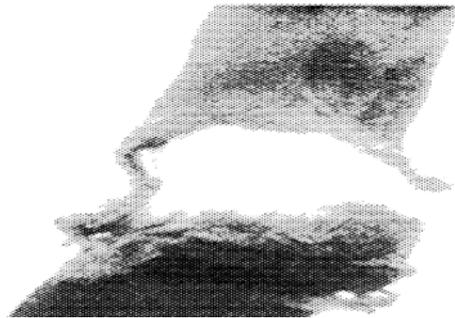
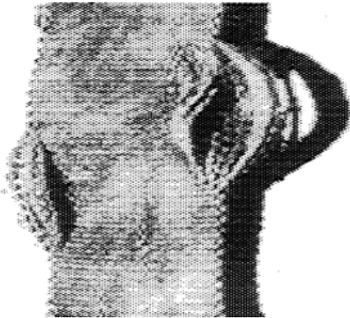


97. Using the above chart. Which colour sling would you choose for a 2 tonne straight lift?

Excavator Operations

98. Would you use either of these webbing slings?

YES or NO



99. Would you use this FSWR slings?

YES or NO



Draw an arrow to the safety tag.



100. A four legged bridle sling arrangement is attached to a rigid load. How many and which sling legs would be assumed to support the load?

101. Are you allowed to hoist persons with the bucket of an excavator?

YES or NO

102. Are you allowed to attach slings to the teeth of the bucket?

YES or NO

Excavator Operations

103. Which is the minimum diameter size tag line that can be used to control loads?

- a) 15mm
- b) 16mm
- c) 17mm
- d) 18mm

3.4 Position machinery and ensure stability and locate to effectively shift materials according to job specifications

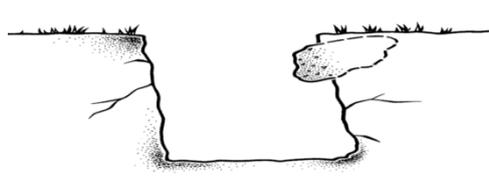
104. What is the danger of slewing with a load when the turntable is not level?

105. Is it permissible for loads to be slewed over the cabin of the truck been loaded? Explain your answer.

106. List three precautions that must be considered when dumping material into a truck using an excavator?



107. What action should be taken if you discover a large rock in the side of a trench that you are digging?



- a) Remove it or
- b) Leave it there.

Excavator Operations

108. How far must people be kept away from the excavator when it is digging?

109. Name two methods that should be used to prevent a cave in of a trench or excavation?

110. What would be the indications that you are excavating quiet close to an underground service?

111. While excavating you suspect there could be an underground service in the area of the excavation, what action would you take?

112. The load you are going to lift is likely to swing, how would you prevent this from happening?

113. Before reversing a machine what precaution should be taken?

114. When loading trucks using an excavator, where should the truck driver be?

115. How are vehicles/machines stopped from coming too close to an excavation?

116. What are the dangers of driving your excavator close to the edge of an excavation?



Excavator Operations

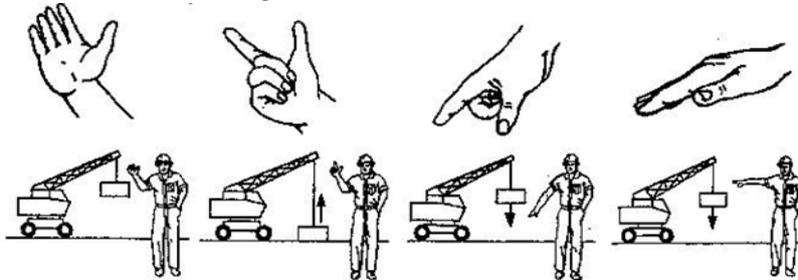
117. If the slings shifted on a load been hoisted, what action would you take?

118. The excavator you are operating overheats and needs to be checked for coolant level. What precautions would you take prior to removing the radiator cap and topping up the coolant?

3.5 Shift load safely and effectively

3.6 Move load using hand/audible/communication signals

119. Circle the hand signal for STOP?



120. What is the whistle for STOP?

- a) One short
- b) Two short
- c) Three short

4. Select, remove and fit attachments

4.1 Select attachment for the task

121. What attachment would you fit to an excavator to break up reinforced concrete?

122. When an excavator is used in a demolition process what must be provided on the machine to protect the operator?

123. How do you select the appropriate bucket to perform the excavation work?

Excavator Operations

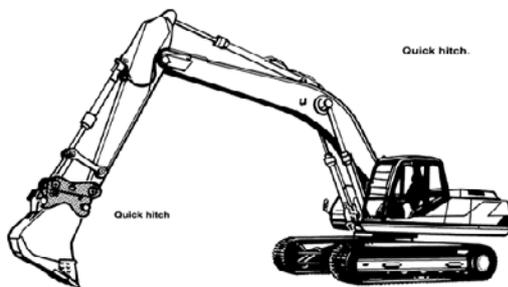


124. What bucket above would you chose to excavate to lay pipes? a) b) or c)

125. What bucket would you select to tidy up a work site? a) b) or c)

4.2 Remove and fit attachment according to manufacturer's manual and site requirements

126. Circle the quick hitch.



127. How would you know the requirements of a specific quick hitch for an excavator?

4.3 Test attachment and ensure correct fitting and operation

128. How would test the bucket is fitted correctly?

4.4 Use attachment in accordance with recommendations and design limits

129. Where would you find the capabilities of an attachment?

4.5 Remove, clean and store attachments in designated location

130. Where would you store excavator buckets in a suburban area over night?

5. Relocate the excavator

5.1 Prepare excavator for relocation

131. What must be lowered before travelling?

132. What shall be provided when an excavator has to be parked on float/low-loader?

133. For what reason should the key be removed from the ignition of the machine?

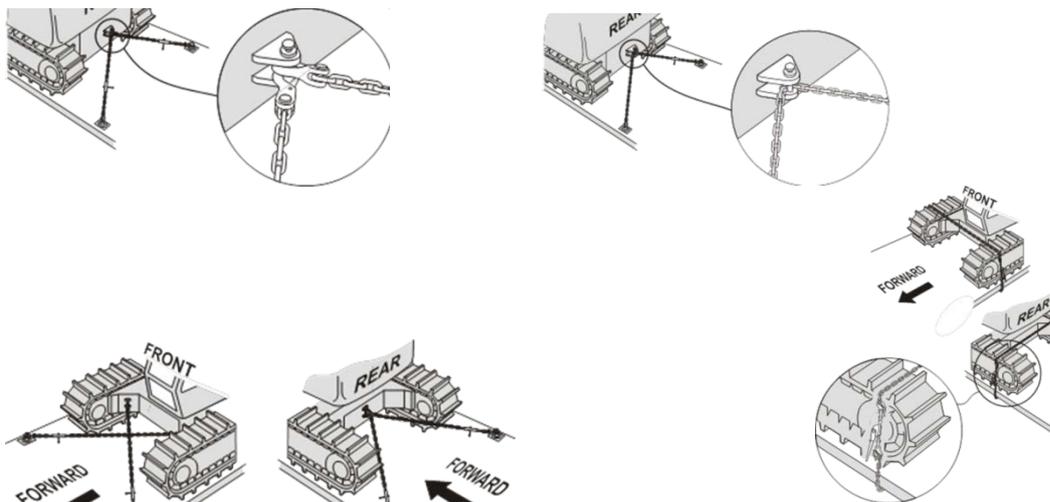
5.2 Move excavator safely between worksites, observing relevant codes and traffic management requirements

134. What would you check for before moving an excavator between sites on a float?

5.3 Load and unload machine from float/trailer

135. Where would you find the tie down requirements for an excavator on a float?

136. Which are the correct 2 methods (circle) of lashing the plant item?



6. Carry out machine operator maintenance

6.1 Prepare machine for maintenance

137. Name three areas where you would not park the excavator.

138. When leaving the excavator what should be done with all hydraulically raised attachments?

139. What type of surface is the ideal type to park an excavator on?

140. What is the danger of parking near an excavation?

141. Describe the correct way to park an excavator.



142. What shall be provided when an excavator has to be parked on or protrudes on to an access way?

143. For what reason should the key be removed from ignition of the machine?

144. Before leaving the site what must be provided to restrict access to the site?

145. List six things that must be done when parking the machine?



6.2 Conduct inspection and fault finding

146. What post-operational checks of an excavator should the operator carry out?

6.3 Carry out scheduled maintenance tasks

147. Where are excavator servicing requirements to be found?

6.4 Process written maintenance records

148. What are some of the maintenance records that must be kept as a requirement of excavator operations?

7. Conduct housekeeping activities

7.1 Clear work area and dispose of or recycle materials

149. Where would you dispose of unwanted materials?

7.2 Process records

150. What are some of the records that must be kept as a requirement of excavator operations?

KNOWLEDGE ASSESSMENT SUMMARY

Element	Result (Comp/NYC)
1. Plan and Prepare for work	
2. Conduct Pre-operational checks	
3. Operate excavator	
4. Lift, carry and place materials	
5. Select, remove and fit attachments	
6. Relocate the excavator	
7. Carry out machine operator maintenance	
8. Clean up	

Operator Declaration: I declare that the information contained above in the assessment summary is accurate and is a true reflection of the underpinning knowledge and practical assessment I undertook. I am aware that it is an offence under any WHS legislation to provide false, misleading or incomplete information.

Name of Operator: _____ **Signature:** _____ **Date:** __/__/____

Assessor Declaration: I the person conducting the assessment declare that the above mentioned applicant undertook the appropriate underpinning knowledge and practical assessment in accordance with this assessment instrument. The information recorded above is a true reflection of this applicant’s assessment. I am aware that it is an offence under any WHS legislation to provide false, misleading or incomplete information on this assessment summary.

Name of Assessor: _____ **Signature:** _____ **Date:** __/__/____

Comments/Feedback (Assessor to make additional comments in support of assessment results)

EXCAVATOR THEORY ASSESSMENT

ANSWERS

1. C. All answers are correct
2. D. All answers are correct
3. A. The principal contractor or site controller
4. SWIMS [safe work method statement] and pre-start
5. Details the hazards and control measures to be applied to a high risk task
6. B. hearing protection must be worn
7. B. Exit, white on green background
8. The required safe or hazardous work permits
9. The site supervisor or foreman
10. 13. Check council plans and maps and dig slowly
11. Check for power, telephone, gas, water, sewer, drainage, fibre optic cables
12. The site supervisor who will contact the supply authorities or council for maps of the worksite
13. (a) At least 2 metres from distribution powerlines
(b) At least 6 metres from high voltage transmission lines

NOTE: Assessors must ensure that the applicant is aware of Statutory Authority regulations.

Excavator Operations

14. 66,000 volts on wooden pole



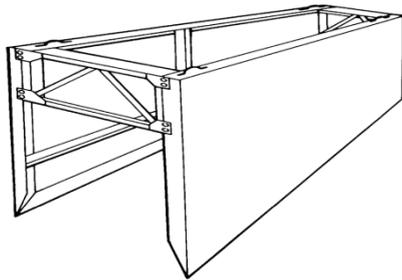
15. *Stay calm, remain in seat, warn other to keep away don't climb down off the machine
 - *If you think the machine could catch fire or if you are alone jump well clear of the machine, don't make contact with the ground and the machine at the same time, if you have contacted underground power be aware the area around could be electrified
 - *Remain near to the machine to warn others to keep clear, have someone notify the site manager/supervisor who should report immediately to the appropriate authority
16. Jump well clear, making sure that you do not make contact with the ground and machine at the same time
17. The site supervisor who would contact the electricity supply company
18. Exhaust fumes given off by an internal combustion engine in an enclosed space can kill
19. The 'enclosed space' must be adequately ventilated
20. An approved exhaust control unit, catalytic converter (scrubber)
21. Attach slings to an approved lifting lug, make sure weight of pipe is with machine's swl, don't place excavator where trench could collapse
22. Ensure that the trench is shored and persons are well clear of pipe being lowered
23. Loose material, other plant, personnel, vehicles, open trench, power poles, no tag line on load
24. *To prevent the foot plates from becoming slippery and causing operator to slip when mounting or dismounting
 - *To prevent the tools from fouling controls
25. Barricades, guardrails or fencing

26. When the noise level could contribute to hearing loss or exceeds 85 decibels
27. When there is a possibility that the person could be struck on the head.
28. A. Footwear that encloses the foot and has a non-slip sole
29. Outlined in the Traffic Control Plans
30. RTA TCAWS Manual version 4.0 June 2010 or state equivalent
31. Locking pins, keeper plates
32. Worn or missing teeth or a worn cutting edge and other damage to the actual bucket and bucket pivot pins and keeper plates.
33. Report it
34. Name of company, full address, symptoms or signs of the injured
35. E, all answers are correct
36. D, all answers are correct
37. Chocks, Blocks or safety bars must be used to prevent the bucket from falling.
38. Prior to and after their use. (AS1666.1).
39. 10%
40. *Oil leaks
 - *Loose connections
 - *Splits, fractures or bulges in hoses
 - *Bent piston rod
 - *Damaged rams
41. By the machine's service log or hour metre
42. No. The bolt is not an approved joining method and does not have a load rating.
43. 10% of the wires
44. No

Excavator Operations

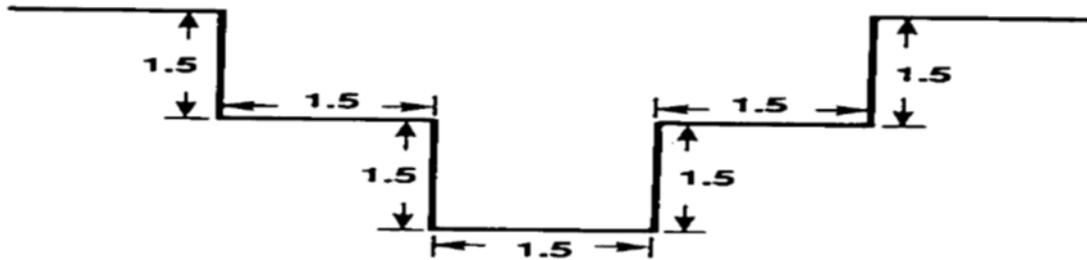
- 45.
- *Abrasion and core collapse
 - * Kinks and fractures
 - * Birdcaging
 - *10% of broken wires in 8 diameter of rope
 - *Affected by heat
 - * Corrosion.
 - * Crushed and jammed strands
 - * Damaged splices.
 - * Stretched.
 - * No tag line
- 46.
- *Cracks in links
 - *Over 10% elongation
 - *Over 10% wear in bite hook
 - *Rust marks
 - *Spot-welded links
 - *Knotted
 - * Over 10% wear.
 - * Over 5% wear or stretch in throat of hook.
 - * Twisted or damaged links.
 - * Chain had been affected by heat.
 - * Stretched or locked links
 - * No tag line
47. Discard it and it should never be used
48. Leaks from seals, split or fractured hoses, and bent or damaged rams
49. Track tension, damage or defects to the shoes [tracks]
50. The quick hitch could release allowing the bucket/attachment to drop off
51. Ensure that all pins, clips and keeper plates are not worn, damaged or missing
52. Inform supervisor, tag equipment and refrain from operating the loader until repairs were carried out
53. Raise to a safe travel height
54. An approved lifting lug and SWL marking
55. Vehicle Movement Plans [VMP's]
56. Check ground conditions prior to undertaking work
57. Warning signs, barricades, fences, guardrails
58. Inform supervisor, tag equipment and refrain from operating the excavator until repairs were carried out

59. Facing the machine use the grab rail or hand rail and steps to mount/dismount the machine (Three points of contact)
60. In the appropriate manufacturer's manual
61. Read the operator's manual to familiarise yourself with the machine (e.g. controls and decal information)
Seek training and supervision from your employer if you consider you cannot competently operate the equipment
62. Make sure controls are in neutral or park and park brake is on
63. Adjust seat until comfortable, adjust mirror (if applicable) and secure safety belt
64. Raised to a safe travel height to provide maximum vision for travel
65. Look over both shoulders to ensure the path of travel is clear and sound horn twice before moving unless there is a reversing alarm fitted. Continue to look in direction of travel.
66. Air in the fuel system and it needs to have the air bled from the system
67. Tag out the machine, put it out of service and report the damage or defects to the authorised person/supervisor
68. When people are to enter the trench and when the excavation is deeper than 1.5 metres and/or material is unstable or backfill
69. Trench shield which protects workers in the trench when working within the length of the shield/box



70. When the trench is deeper than 1.5m or material is unstable or backfill
71. Batter or bench the sides of the trench or place trench shields in the excavation

72. Benching



73. A special seat and seat belt must be provided within the safety confines of the machine for the passenger

74. Length x Width x Height divided by 2 [L x W x H divided x 2]

75. As you raise the bucket the boulders could tip out of the bucket onto the truck

76. Straight up or down the slope

77. *Personnel
*Drop offs
*Overhead obstructions
*Overhead power lines
*Other obstructions that could be dangerous.

*Hidden holes,
*Embankments,
*Underground services,
*Telephone lines

78. It would reduce the load that could be raised and safely carried

79. Radio, hand signals, verbal

80. Diameter in mm squared x 8 = SWL in kg

81. Square root of the load in kg divided by 8

82. Diameter in mm squared x 32 = SWL in kg **or**
Diameter in mm squared x 80 x 0.4 = SWL in kg

83. Diameter in mm squared x grade of chain x 0.3 = SWL in kg

84. 12 x 12 x 8 = 1152kg

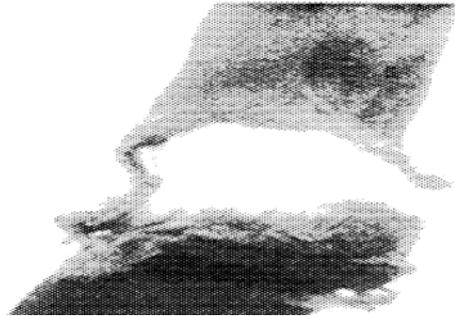
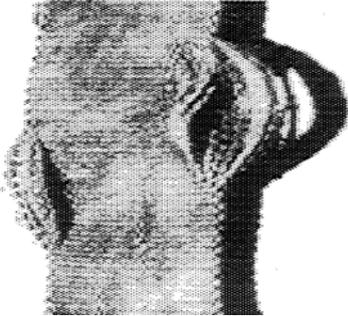
Excavator Operations

- 85. Square root of the load in kg divided by 8
 = Square root of 2048/8 = 256
 = Square root of 256 = 15.858mm
 = 16mm diameter sling required. [rounded up to nearest full number from 15.858mm]
- 86. 16x16x8 = 2048kg
- 87. 8 x 8 x 8 = 512kg
- 88. 111. 12 x 12 x 30 x 0.3 = 1296kg
- 89. 7.1x7.1 x 32 = 1613.12kg
- 90. By the load plate on the loader or by the manufacturer's recommendations
- 91. Delivery docket, weighbridge ticket, by calculation
- 92. 2.4 tonne
- 93. Clay
- 94. A manufacturer's approved lifting lug with the SWL marked on the machine
- 95. The sling's SWL is reduced by half
- 96. It reduces the WLL/SWL of the sling by 25%. The sling will only be safe to lift 75% of its rated capacity
- 97. Green



COLOUR NO STRIPES	TONNE							
		VERTICAL	CHOKE	BASKET	30°	60°	90°	120°
VIOLET 1	1	1	0.8	2	1.9	1.7	1.4	1.00
GREEN 2	2	2	1.6	4	3.8	3.4	2.8	2.00
YELLOW 3	3	3	2.4	6	5.7	5.1	4.2	3.00
ORANGE 4	4	4	3.2	8	7.6	6.8	5.6	4.00
RED 5	5	5	4.0	10	9.5	8.5	7.0	5.00
BROWN 6	6	6	4.8	12	11.4	10.2	8.4	6.00
BLUE 8	8	8	6.4	16	15.2	13.6	11.2	8.00
OLIVE 10	10	10	8.0	20	19.0	17.0	14.0	10.00
GREY 12	12	12	9.6	24	22.8	20.4	16.8	12.00

98. No



99. No



Draw an arrow to the safety tag

100. Two legs of the sling which are diagonally opposite

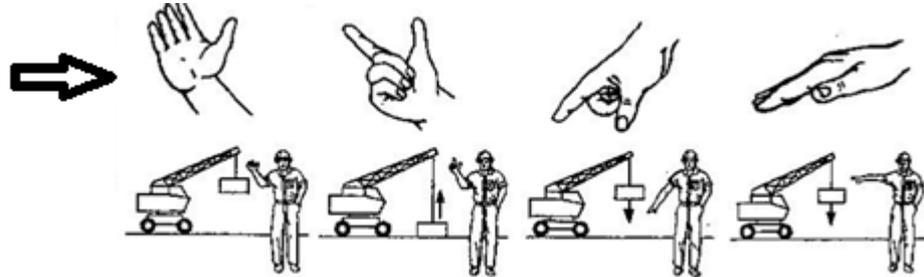
101. No

102. No

103. 16mm

104. The excavator could overturn
105. No. The driver could be in the cabin and the load could fall from the bucket or strike the cabin
- 106.
- *The truck must be correctly positioned,
 - *No load must pass over the cabin of the truck,
 - *A layer of soil must be laid first to take the impact if large rocks are to be loaded
107. Remove it
108. Outside the working radius
109. Shoring, benching, battering
110. Observe the spoil, the appearance of any of the following would be an indication of previous excavation work.
- *Crushed blue metal
 - *Plastic tape
 - *Clean sand
 - *Sand bags
 - *Broken tiles
 - *Moisture
 - *Any other unusual material
111. Stop operating immediately and hand dig to investigate further. Check with appropriate authority to ascertain what maps/ plans are available for the area
112. Attach a tag line
113. Look over both shoulders to ensure the path of travel is clear. Sound the horn twice before moving unless there is a reversing alarm fitted. Whilst moving continue to look in the direction of travel
114. Within view of the operator and outside the working radius
115. Barricades, fencing, signs, guardrails
116. The weight of the excavator could cause the excavation to cave in particularly if the ground is effected by rain.
117. Carefully lower the load and have the slings re-positioned and secured
118. Allow the machine to cool down, loosen radiator cap to release pressure using a cloth to protect from hot water burns then remove the radiator cap slowly. Top up using manufacturer's recommended coolant

119. First picture



120. One short blast

121. Hydraulic hammer

122. FOPS [falling object protection structure]

123. The size of excavation and type of material to be excavated

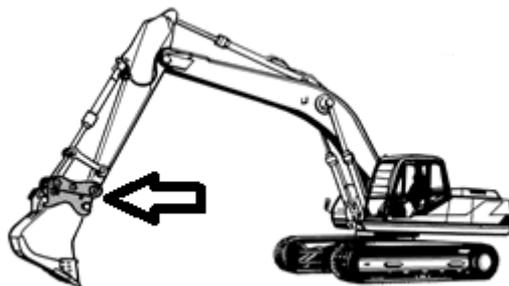


124. A

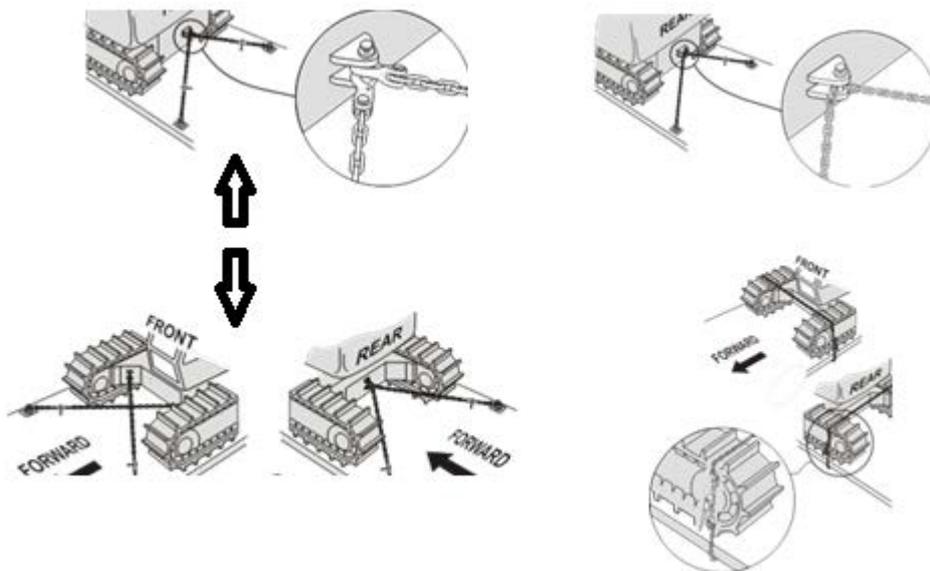


125. C

126. Shaded area above the bucket



- 127. By consulting the quick hitch's manufacturer's manual
- 128. Crowding it in and out
- 129. In the attachment's manufacturer's manual
- 130. With the boom lowered down over the buckets to prevent theft
- 131. All hydraulically raised attachments
- 132. Dogs and chains
- 133. To prevent unauthorised movement
- 134. Route of travel, low trees, bridge clearance, obstructions, dogs and chains, park brake on
- 135. In the operator's manual and sometimes on the stickers fixed to the machine
- 136. First top and bottom pictures



- 137. *Access ways
- *Refuelling sites
- *Adjacent to an excavation
- *Near overhangs,
- *Tidal or flood areas

Excavator Operations

138. *Attachments lowered *Cutting edge flat on ground
 *Lever placed in float position *Pressure removed from hydraulic lines
139. A firm level surface
140. The excavation could collapse causing the excavator to overturn or to fall into the excavation
141. *Attachments lowered *Cutting edge flat on ground
 *Lever placed in float position *Pressure removed from hydraulic lines
142. Barricades, fencing, signs, lights
143. To prevent unauthorised movement
144. Barricades, fencing, signs, lights
145.
 * Park clear of access ways overhangs and fuelling site * Park clear of fire hazards
 * Park clear of excavations and trenches * Park clear of entrances, exits
 * Park clear of tidal and flood areas * Remove the keys
 * Park on a firm level ground or if on an incline facing slope
 * Lower the bucket with cutting edge on ground
 * Engine is stopped in accordance with manufacturer's manual (idle engine before turning off)
 * Secure parking brake, leave controls in park position or in neutral
 * Secured the machine against unauthorised movement
 * Parked clear of fire-fighting and electrical equipment
146. *Look under and around the loader for leaks or defects. Check the structure and equipment for defects and wear
 *Check the oil, fuel and water level when the machine is cool
147. Service log or manufacturer's manual
148. Fuel logs, service intervals, any previous maintenance, any current defects
149. Skip bins, approved tip site
150. Service books