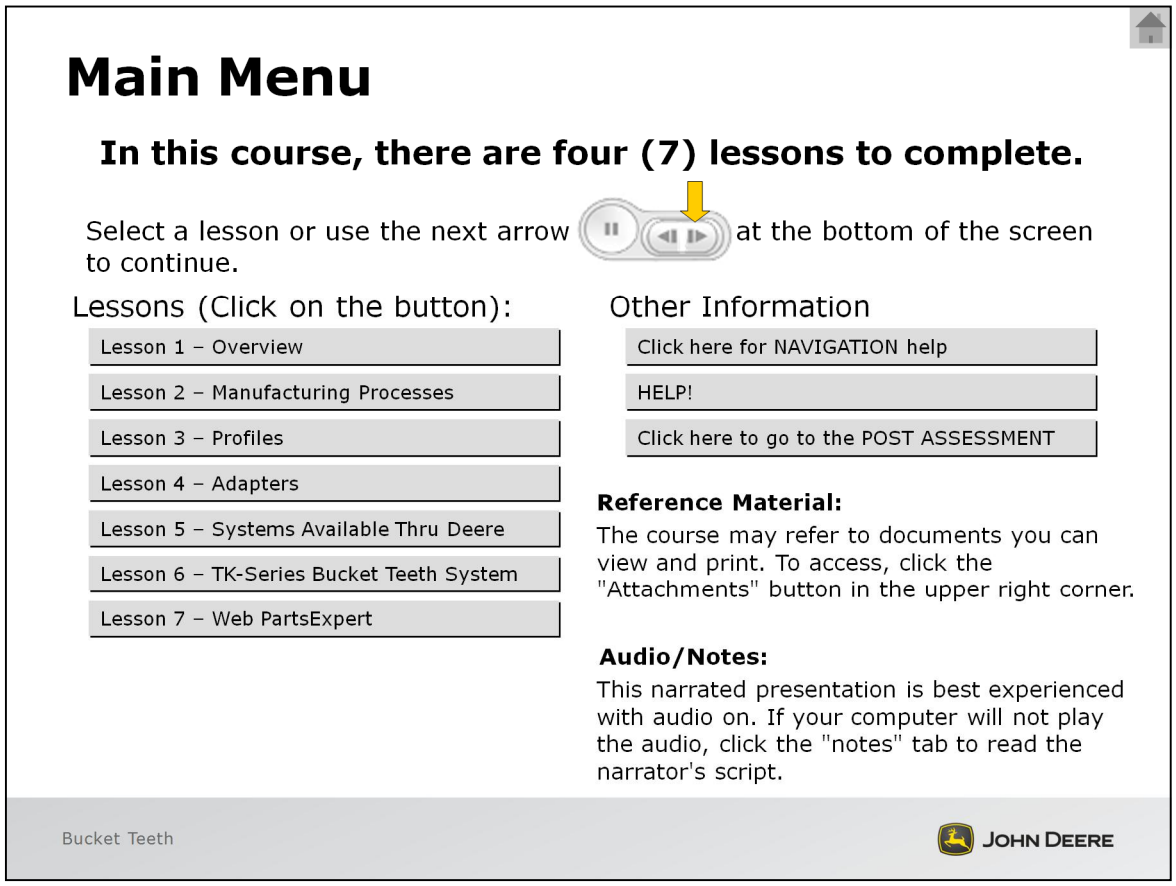
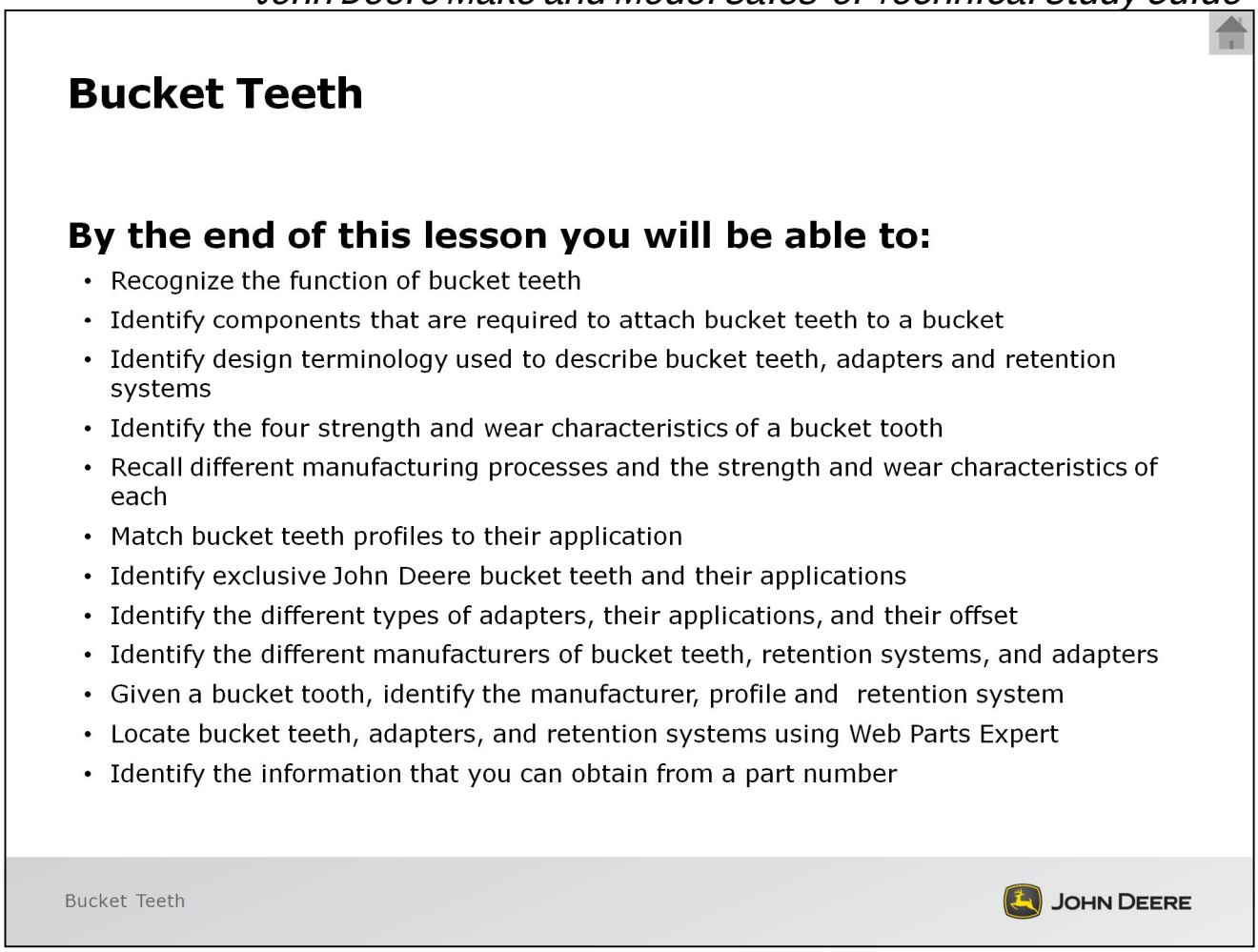
Welcome to the Parts Product Course on Bucket Teeth.

In addition to the John Deere exclusive TK-Series bucket tooth system, we offer a wide variety of bucket teeth which fit all John Deere and most other brands of equipment. Given the frequency with which bucket teeth are replaced, this allows for maximum machine contact. This course will help you answer the question, which bucket tooth is best for your customer's application?



Click on one of the buttons to begin a lesson.



All bucket teeth protect the cutting edge, but the right bucket tooth profile will penetrate material with minimum power to produce maximum bucket fill and faster cycle times. This course will help you identify the right bucket tooth for the job.

By the end of the bucket teeth lesson, you will be able to:

- Recognize the function of bucket teeth
- Identify the components that are required to attach bucket teeth to a bucket
- Identify the design terminology used to describe bucket teeth, adapters and retention systems
- Identify the four strength and wear characteristics of a bucket tooth
- Recall the different manufacturing processes and the strength and wear characteristics of each
- Match bucket teeth profiles to their application
- Identify exclusive John Deere bucket teeth and their application
- Identify the different types of adapters, their applications, and their offset
- Identify the different manufacturers of bucket teeth, retention systems, and adapters
- Given a bucket tooth, identify the manufacturer, profile and retention system
- Locate bucket teeth, adapters, and retention systems using Web Parts Expert
- Identify the information that you can obtain from a part number

What Machines Use Bucket Teeth?

Bucket Teeth

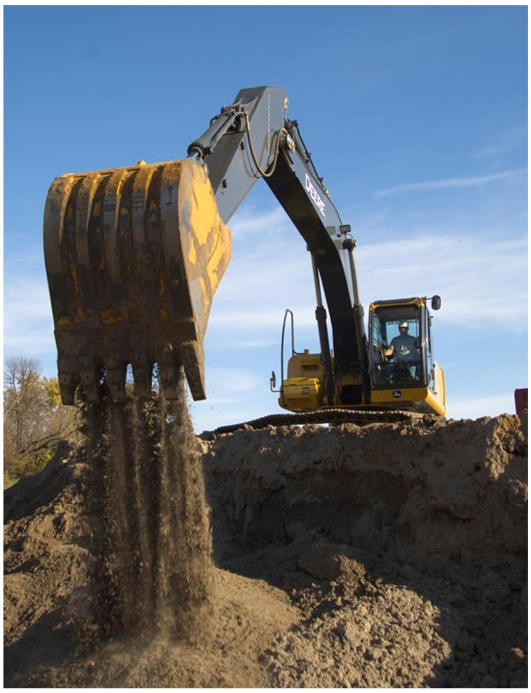
JOHN DEERE

Bucket teeth are used on:

- Excavator buckets
- Backhoe buckets
- 4WD Loader buckets
- Crawler Loader Buckets
- Rippers

Function of a Bucket Tooth

TERM TIP: *Cycle time is the time it takes to penetrate material, fill and empty the bucket while digging or loading.*



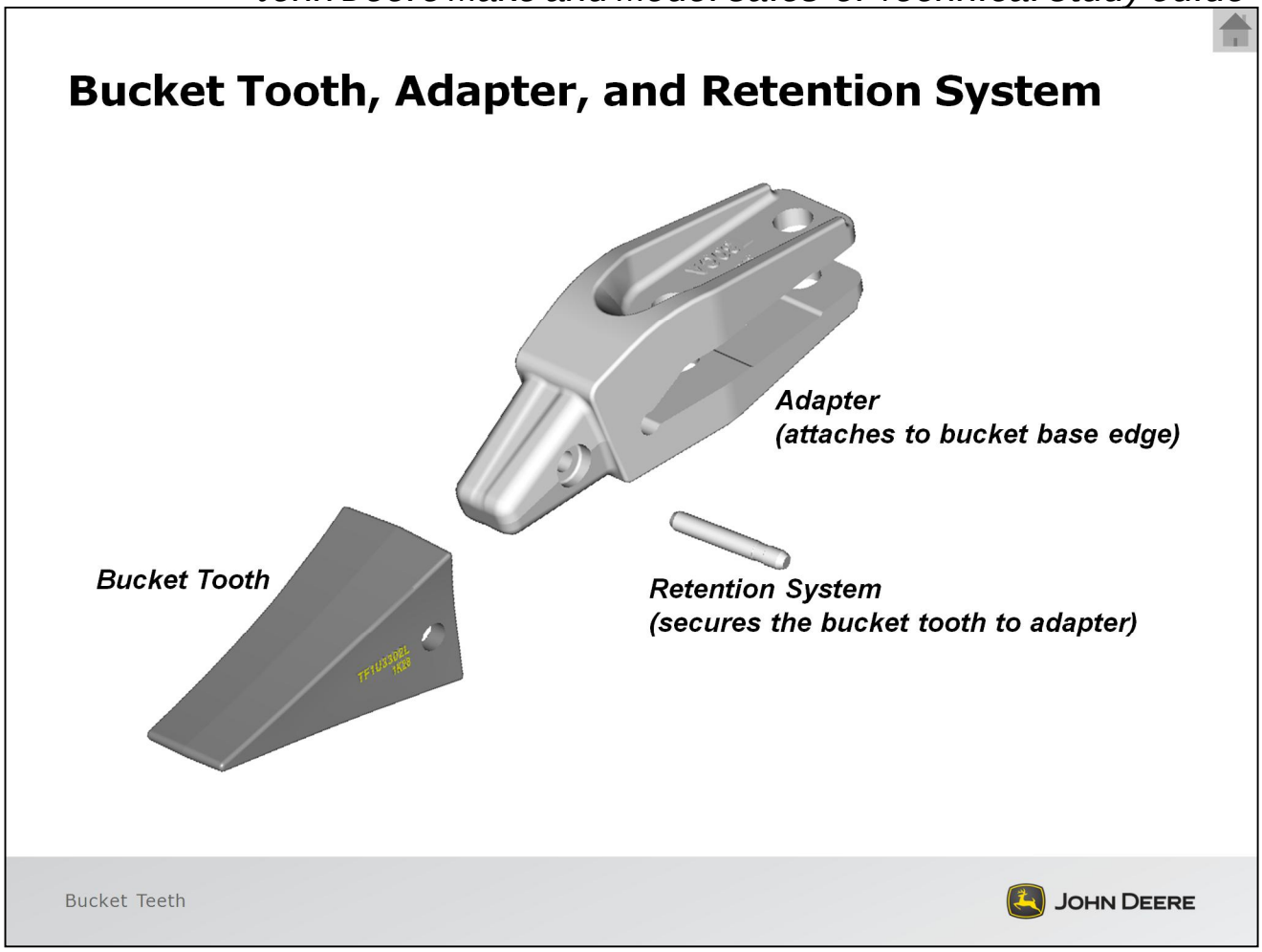
Bucket Teeth

JOHN DEERE

Bucket teeth serve two important functions:

- They protect a bucket edge from wear and damage
- They help penetrate material

Bucket edge wear directly impacts operating costs. Base edges are far more expensive and time consuming to replace than bucket teeth. Bucket teeth also work to penetrate and break up the material being excavated. Improved penetration reduces overall wear on the equipment, provides faster cycle times and increases bucket fill – increasing uptime and productivity.



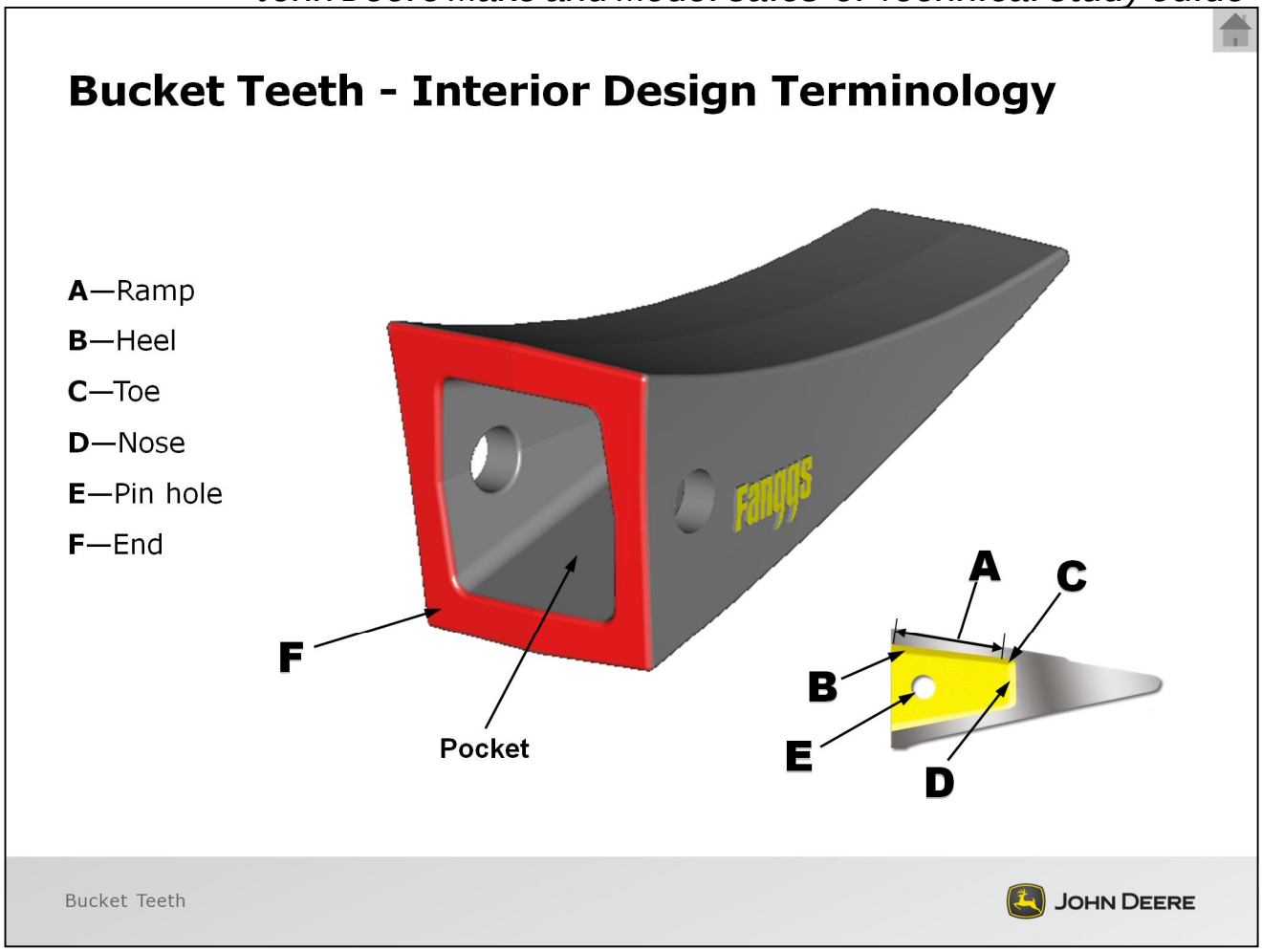
There are two components that attach a bucket tooth to a bucket, an adapter and a retention system.

The adapter attaches to the bucket base edge.

The retention system secures the bucket tooth to the adapter.

Customers use bucket teeth in a variety of applications and materials. For this reason there are many different types of bucket teeth profiles, adapters, and retention systems on the market. Becoming familiar with all these components will help you match a bucket tooth to an application.

Next, we'll cover the design terminology used to identify teeth, adapters and retention systems.



In modern two piece systems, bucket teeth are described by unique terminology. First, let's take a look at the interior parts of a bucket tooth. The pocket is the part of the bucket tooth which forms the bucket tooth interior and mates with the adapter. Pocket shapes and dimensions vary depending on the manufacturer.

The interior pocket parts include:.

Ramp (A)- The ramps are the top and bottom walls of the pocket

Heel (B) - The heel is the part of the ramp which is closest to the end of the pocket.

Toe (C) - The toe is the part of the ramp that is closest to the nose.

Nose (D) - The nose is the bottom of the pocket

Pin hole (E) - The pin hole is the opening where the retention system holds the bucket tooth to the adapter. Depending on the manufacturer, the pin hole can be either vertical or horizontal. The shape and location of the pin hole can be key in identifying the manufacturer of the bucket tooth.

End (F) - The end is the back surface of the pocket.

Bucket Teeth - Exterior Design Terminology

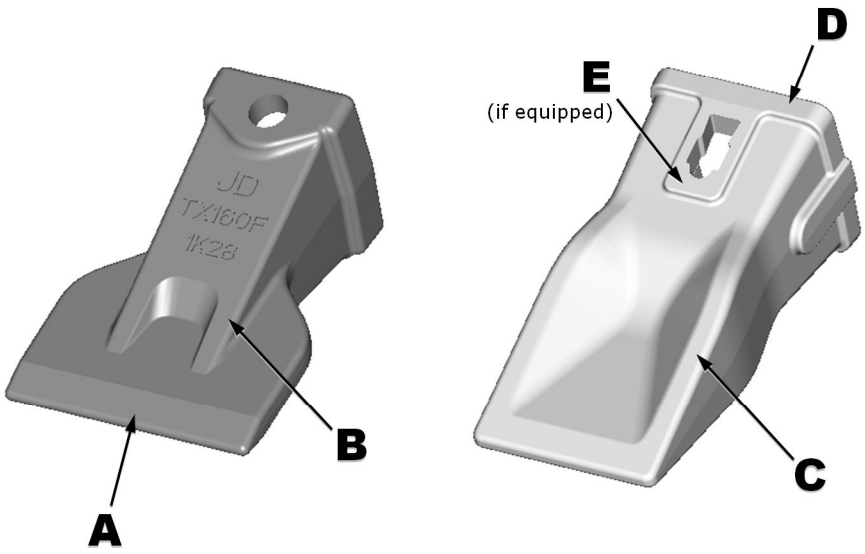
A—Tip

B—Ribbing

C—Paneling

D—Shoulder

E—Pin Protector (if equipped)



Bucket Teeth

JOHN DEERE

The terms used to describe the exterior parts of the bucket tooth refer primarily to the profile or shape of the tooth. With the exception of the tip, you may ***not*** find all of these elements on every bucket tooth.

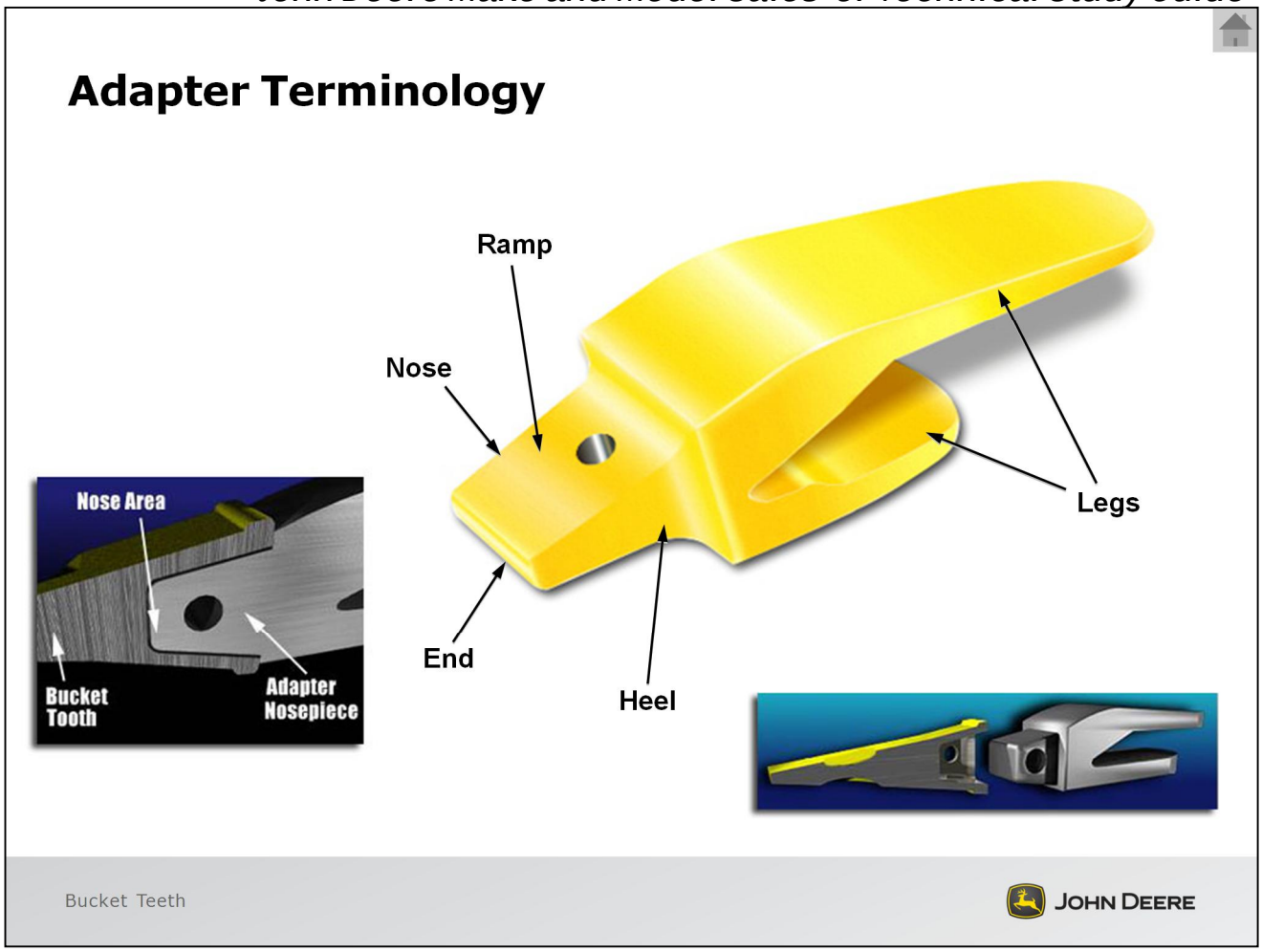
The tip (A) or point of the bucket tooth, takes most of the load and abrasion from the work. The width and thickness of a bucket tooth tip will vary based upon the application it's designed for.

Ribbing (B), or gussets, provide added strength to a tooth.

Paneling (C) gives longer life to bucket teeth used in highly abrasive applications. Panels give added strength and wear material while maintaining the shape and size of the tooth's point.

A shoulder (D), or collar around the rear of the bucket tooth reinforces the most stressed part of the pocket.

A pin protector (E) may be positioned ahead of the pin hole to deflect material away from the retaining pin.



Adapters connect the bucket teeth to the bucket. The terminology used to describe adapters is similar to what's used to describe teeth. The area of the adapter that mates with the bucket tooth shares all of the same terms used to describe the tooth pocket.

- Ramp
- Nose
- End
- Heel

The parts of the adapter that connect to the bucket edge are referred to as legs.

The space between the adapter legs is the opening for the bucket base edge.

Retention Systems Terminology

Types of Retention Systems:

Pin and washer

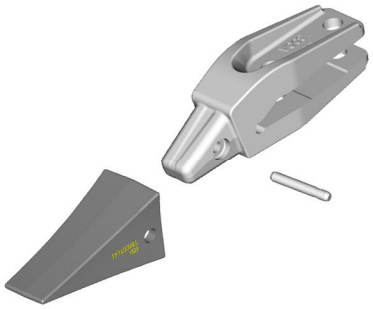
Vertical roll pin

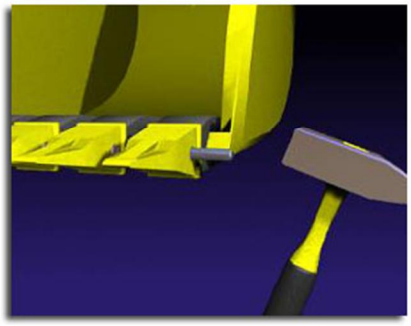
Flex pin

Steel key

Pin and rubber lock

Quadrilok™





Bucket Teeth

JOHN DEERE

A bucket tooth is secured to an adapter by a retention system. Typically, this is through a hole in the bucket tooth.

Retention systems come in a variety of types and styles depending on size and manufacturer. They are one of the easiest ways to identify what type of replacement tooth your customer needs.

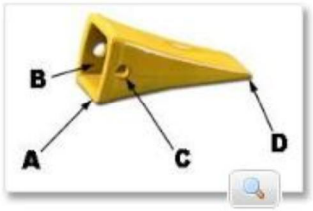
Listed are several types of retention systems. Different manufacturers of bucket teeth uses slightly different retention systems. You'll learn more about these later in the course.

Practice 1

Question 1 of 5 ▾ Point Value: 1

Identify the letter that best corresponds to the pocket of a bucket tooth.

- ○ A
- ○ B
- ○ C
- ○ D



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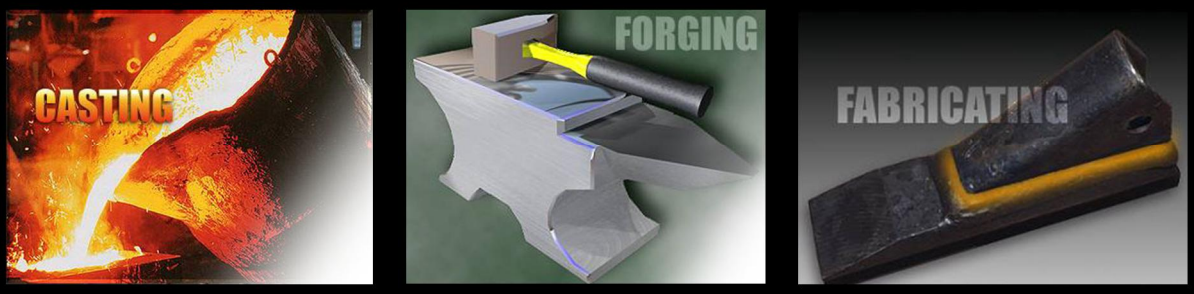
Manufacturing Processes

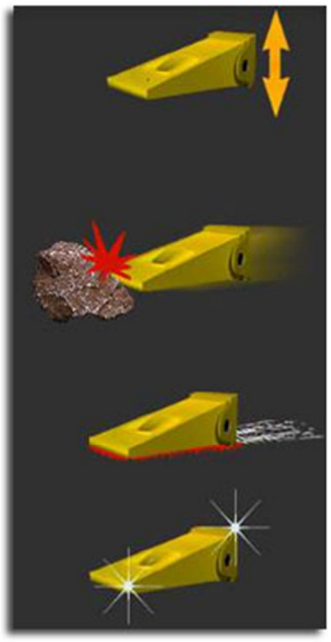


John Deere manufactures bucket teeth using two main metals, and three main manufacturing processes. The metals are iron and steel, and the processes are

- Cast steel and iron
- Forged steel
- Fabricated steel

The manufacturing process and the addition of other raw materials will determine the strength and wear characteristics of a bucket tooth. Understanding the different manufacturing processes and materials will help you explain why there are performance differences between certain teeth.

Strength and Wear Characteristics of a Bucket Tooth



Tensile Strength

Impact Resistance

Wear Resistance

Hardness vs. Toughness

Bucket Teeth

JOHN DEERE

Tensile strength, impact resistance, wear resistance, and hardness of a bucket tooth are determined by the manufacturing process and metal additives used.

Tensile strength measures how much stretching load a metal can take before breaking. The higher the tensile strength, the harder the metal. A tooth with high tensile strength will have the best ability to withstand breakage in heavy prying applications.

Impact resistance describes a tooth's ability to absorb impact without breaking. Impact resistance is influenced by the direction of the grain of the metal. If the grain is multidirectional, as in cast teeth, the tooth can handle impacts from all directions. If the grain is one directional, as in forged teeth, the tooth can withstand extreme impacts in the direction of the grain, but not as well in other directions

Wear resistance relates to how long a bucket tooth will last. Wear resistance depends on tooth hardness and the application it's working in. The harder the tooth, the longer the wear life. Hardness reflects how well the tooth resists indentation, abrasion and scratching.

There is always a trade-off between hardness and toughness. Harder teeth have a longer wear life; tougher teeth are more impact resistant.

That trade-off is achieved through the use of heat treatment processes. The most common process used is a secondary heat treatment process called tempering. Tempering increases the toughness of a metal. By tempering a bucket tooth, toughness increases but hardness is decreased.

Cast steel bucket teeth have nickel and molybdenum added for impact resistance. Silicon and chromium are added to increase hardness. Cast steel teeth are first through hardened by heating to a high temperature and then rapidly quenching in cool water. After the initial quench, they are tempered by heating a second time to a lower temperature and cooled gradually. The rapid cooling from the quench increases the bucket tooth's hardness but causes a loss of toughness. The second heating returns toughness to the bucket tooth giving the cast steel tooth a balance of wear resistance and impact resistance.

Cast steel teeth have multi-directional grain which the can handle impacts from all directions. Cast steel teeth also work well in applications where abrasive conditions lead to concerns about short wear life.

Cast steel teeth are better for jobs that involve prying, side impacts and off-center loading.

Cast Iron

- Austempered ductile iron (ADI)
- Good tensile strength
- High wear resistance
- Wear longer in high abrasion applications
- Moderate impact resistance

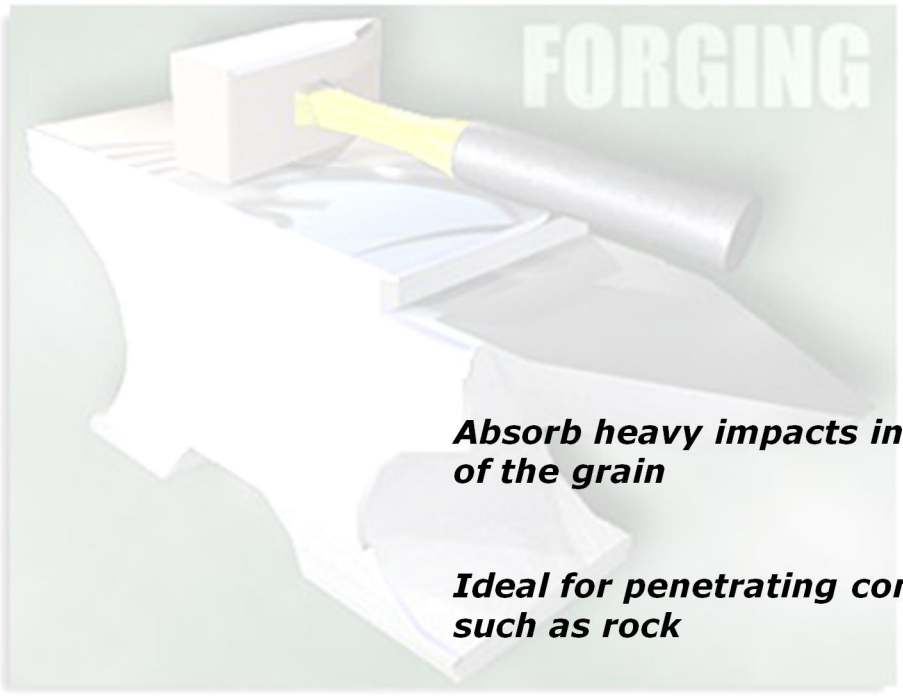
Bucket Teeth

JOHN DEERE

Cast iron teeth are manufactured using austempered ductile iron, or A-D-I. The process for A-D-I differs from the process used for cast steel. The austempering process heats the cast iron tooth for a prolonged period then lets them cool slowly in a controlled atmosphere to temper them.

The higher carbon content in A-D-I bucket teeth gives them moderate tensile strength, good hardness and high wear resistance, but lower impact resistance than cast steel. A-D-I bucket teeth work well in highly abrasive materials such as sand, clay, or frozen ground. Their low impact resistance generally restricts the use of A-D-I teeth to smaller sizes used on smaller equipment.

Forged Steel



Absorb heavy impacts in the direction of the grain

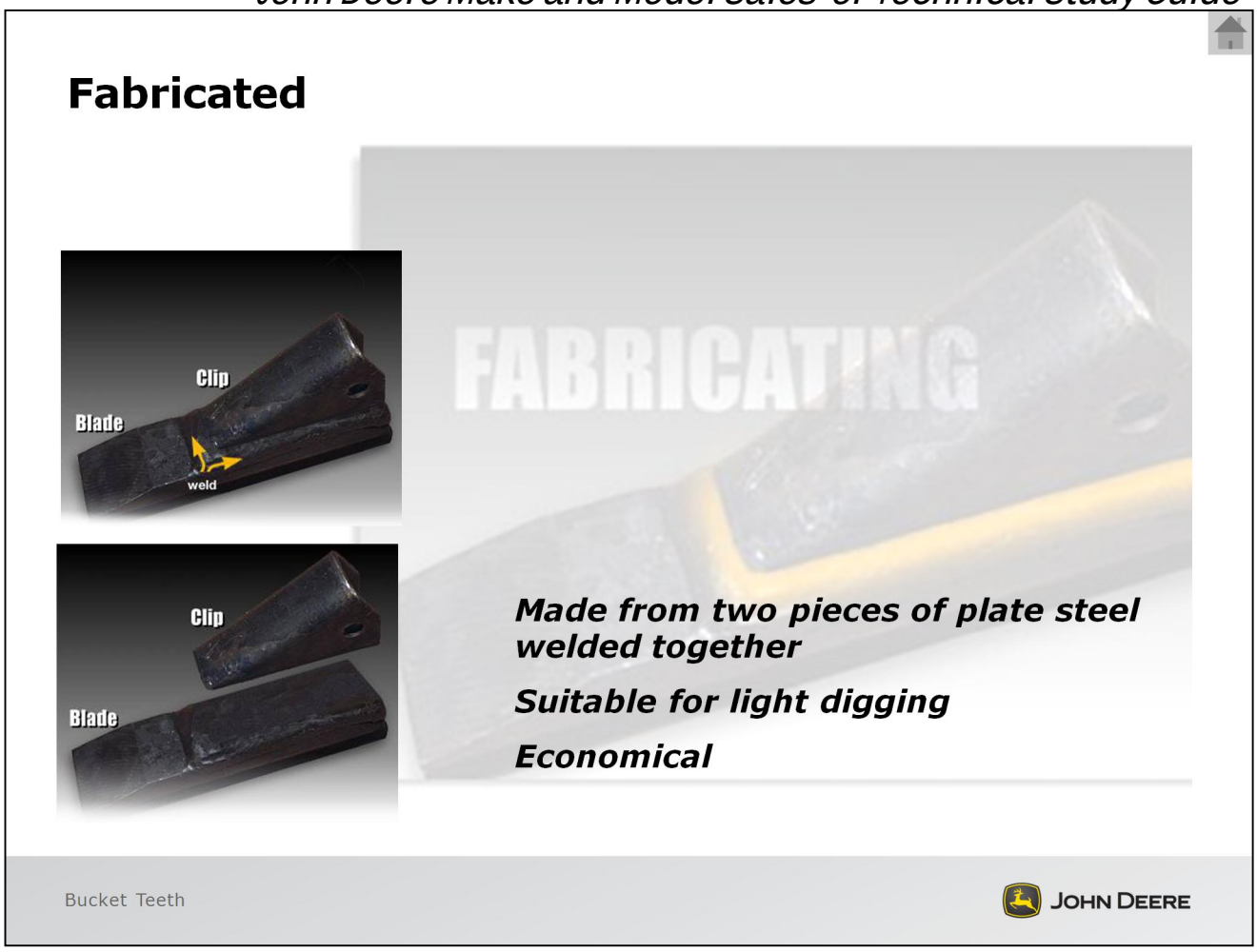
Ideal for penetrating compact material such as rock

Bucket Teeth

JOHN DEERE

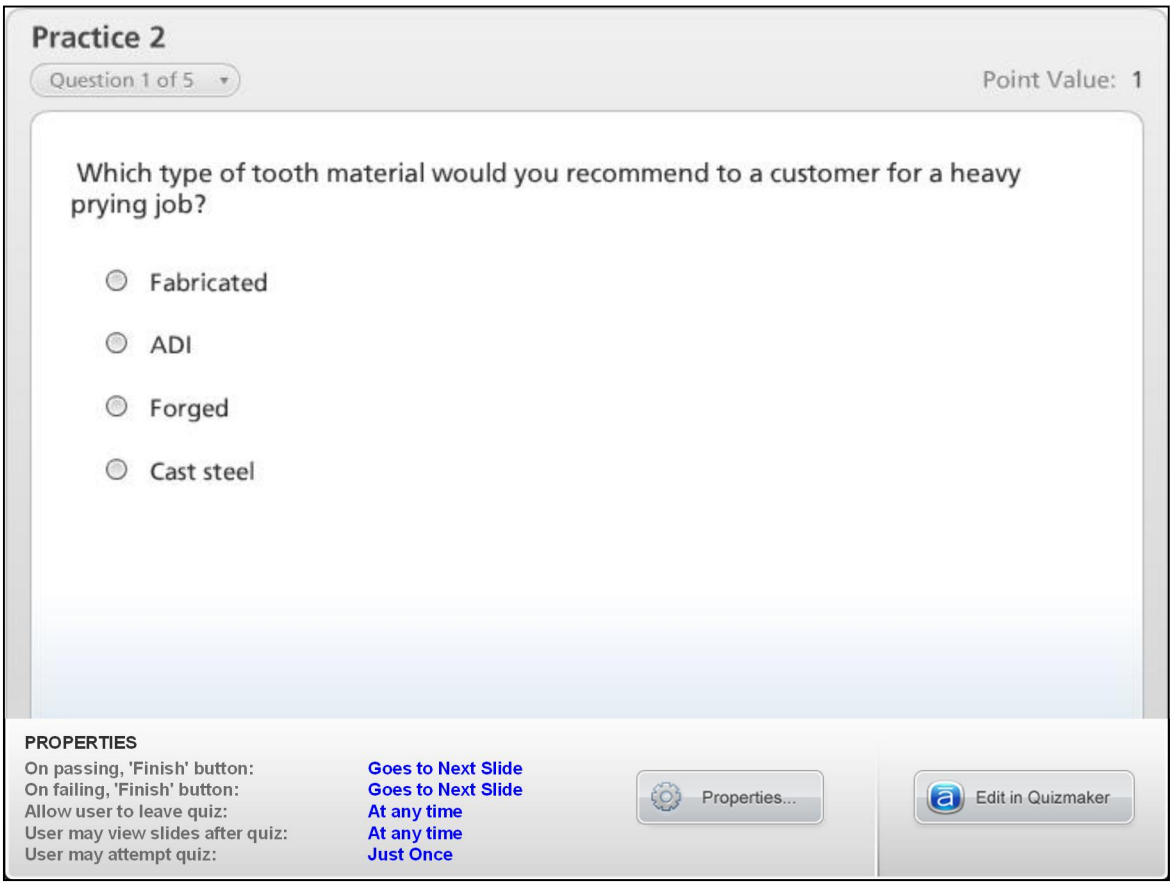
Forged bucket teeth are manufactured from specially formulated steel billets. Unlike the casting process, the metal in forging remains solid. Ovens heat the steel to the proper temperature. The heated billets are then placed in forging dies where and a machine presses them into the desired bucket tooth shape. Then, a forge die then hammers the pocket into the tooth and punches out the pin hole.

The forging process results in teeth with a single grain direction giving them the ability to handle heavy impact in the direction of the grain. Because of this, forged teeth perform well in applications where the teeth take extreme impact on the tip. Forged teeth are ideal for penetrating tight, compact materials such as rock. They are less desirable for prying applications since lack strength in the cross-grain direction.



Fabricated bucket teeth are made of formed plate steel in two parts. They are the blade and the clip which are welded together. The blade experiences most of the wear, and the clip forms the tooth's pocket.

Fabricated teeth are economical, light duty teeth used on small equipment such as backhoes, skid steers or mini excavators where abrasion and high impacts are not a factor.


Practice 2
Question 1 of 5
Point Value: 1
Which type of tooth material would you recommend to a customer for a heavy prying job?
Fabricated
ADI
Forged
Cast steel
PROPERTIES
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Customers use bucket teeth in a variety of applications and in a variety of materials. For this reason, bucket teeth have many different shapes, or profiles to match different applications. An improper match of tooth shape to the job can result in teeth wearing out quickly, breaking or performing poorly.

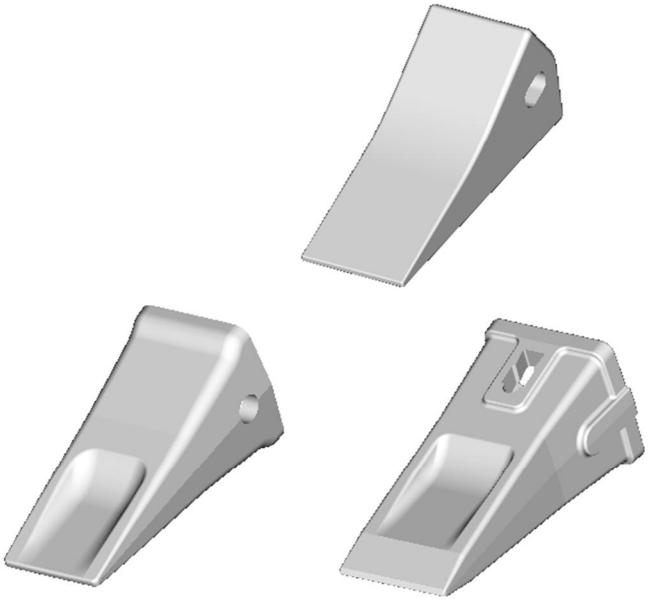
Standard Bucket Tooth

Best in:

General purpose digging or loading

Profile Possibilities:

- Long
- Short
- Ribbed Sharp
- Standard
- General Purpose



Bucket Teeth

JOHN DEERE

With a sharp tip and slim profile, standard teeth are used for general purpose digging. Standard teeth come in various lengths and widths depending on manufacturer or brand.

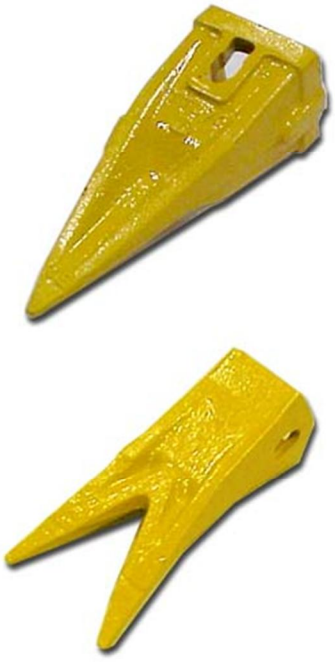
A standard tooth profile can be used on many different machines in a variety of applications.

Depending on brand, this profile may also be called long, short, sharp, ribbed sharp, standard or general purpose.

Tiger and Twin Tiger Bucket Teeth

Designed to penetrate compacted material

Can be used independently or together



Bucket Teeth

JOHN DEERE

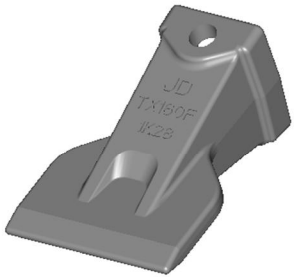
Tiger and Twin Tiger bucket teeth are designed for the most aggressive penetration. They are intended for breaking tight, compacted material. Tiger and Twin Tiger teeth can be used independently or together. Used together, Twin Tiger teeth are installed on the outsides of the bucket edge with Tiger teeth filling the center. Placing the Twin Tigers on the outside edge of the buckets provides clearance for the sides of the bucket as it digs.

This is the most commonly used profile when penetration is important. Because Tigers and Twin Tigers have a sharp profile to maximize penetration there is less wear material, resulting in shorter life.

Flare Bucket Tooth

Best in:

- Loose material
- Mud
- Light to medium duty applications
- Flat bottom trenching



Avoid:

- Highly compacted material
- High impact applications

Bucket Teeth

JOHN DEERE

Flare teeth are extra wide to fill the gaps between bucket teeth. This helps keep material from falling between the teeth and increases bucket fill. Flare teeth also leave a flat bottom in a trench.

Flare teeth work best for loose material or mud-like conditions and in light to medium duty applications.

Avoid using flare teeth with highly compacted material, such as dry clay, or high impact applications, such as rock.

Abrasion Paneled Bucket Tooth

Highly abrasive materials

Profile maintains a sharp tip

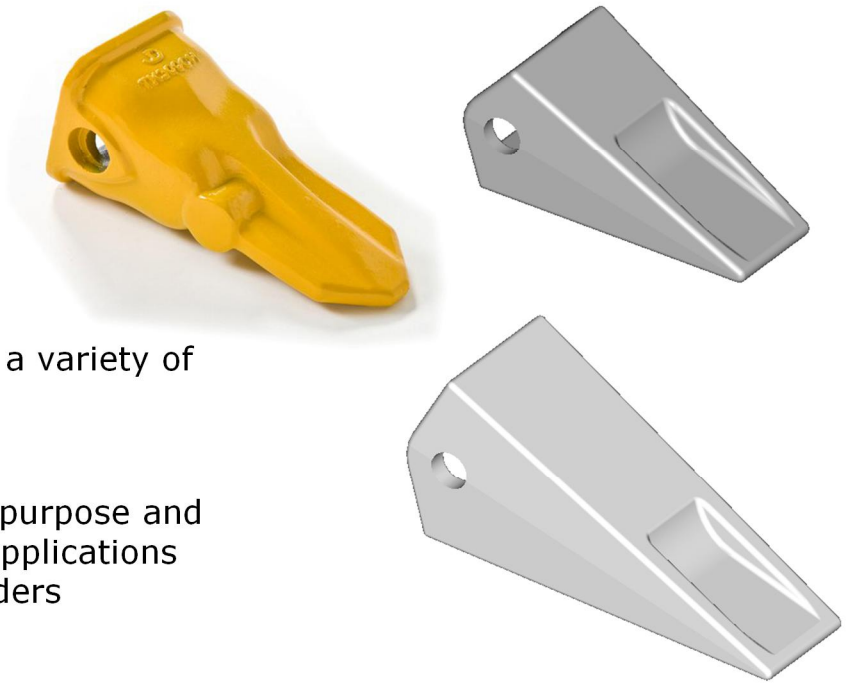
Bucket Teeth

JOHN DEERE

Abrasion paneled teeth are designed for long life when working with highly abrasive materials, such as sand, gravel or loose rock. These teeth have two panels or ribs along the sides of the tooth to improve strength and wear life. The recessed center maintains a sharp tip even in

Even in heavy wear applications, these teeth maintain a sharp tip due to the recessed center.

Chisel Bucket Tooth



Better penetration in a variety of materials

Primarily for general purpose and heavy-duty digging applications for excavators or loaders

Bucket Teeth

JOHN DEERE

Chisel teeth have a slim profile and narrow point for better penetration in a variety of materials. Chisel teeth work well in general purpose and heavy-duty digging applications for excavators or loaders.

Star Bucket Tooth

Good penetration and wear in extreme work conditions

Bucket Teeth

JOHN DEERE

Star teeth are V shaped and ribbed for good penetration and wear in extreme work conditions.

Abrasion Teeth

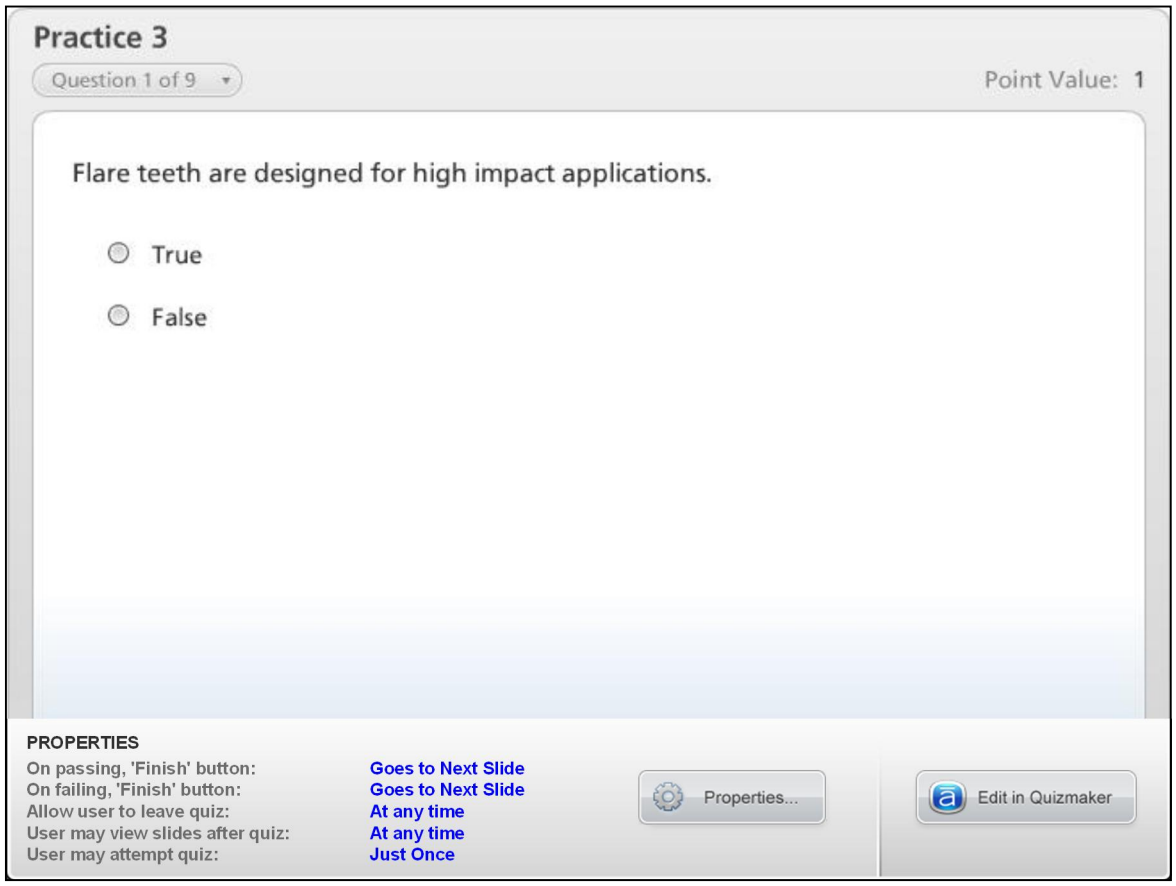
Loader buckets

Bottom wear surface

Bucket Teeth

JOHN DEERE

Abrasion teeth are commonly used on loader buckets and come in standard and heavy duty models. The Abrasion profile is off-set to provide a bottom wear surface that is parallel to the bottom of the bucket. The heavy duty model has more metal on the bottom to provide longer wear life.


Practice 3
Question 1 of 9
Point Value: 1
Flare teeth are designed for high impact applications.
True
False
PROPERTIES
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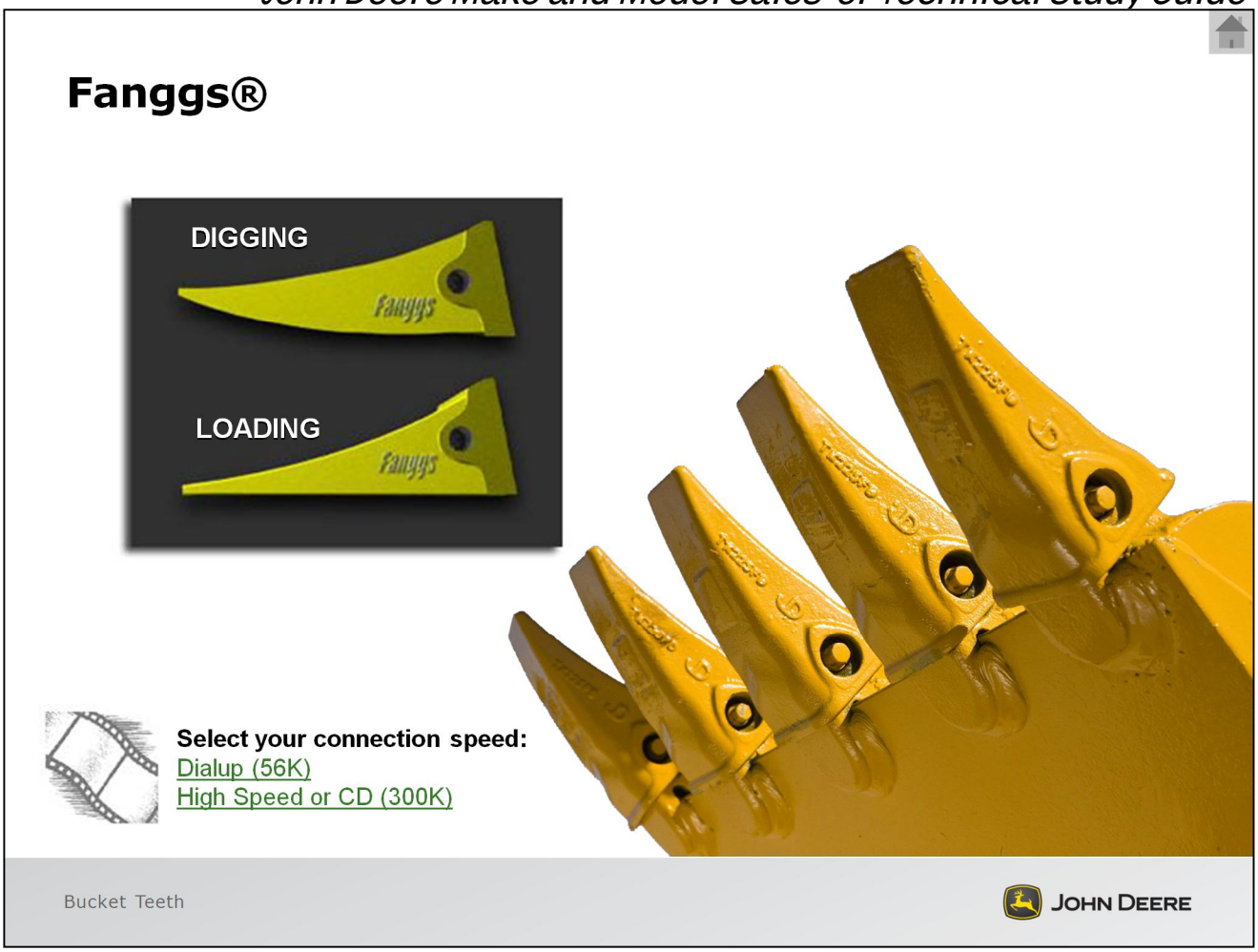
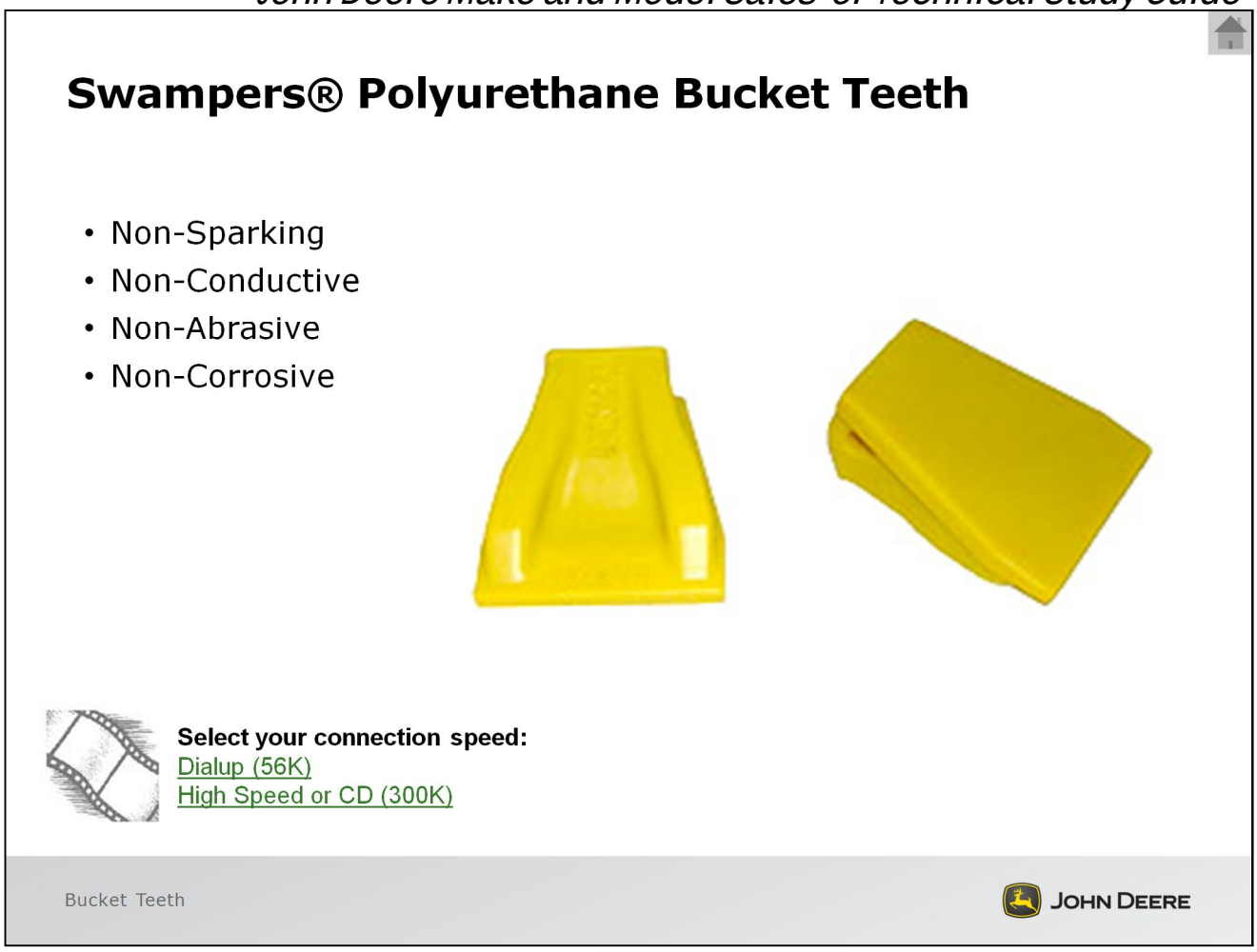


The Fanggs® profile design is exclusive to John Deere. The curved surfaces on the Fanggs profile make it possible to dig with twenty-three percent less effort than standard profile teeth – resulting in better bucket fill and faster cycle times. Fanggs profile teeth are perfect for general purpose to heavy-duty digging applications.

Fanggs® come in two profile designs, one for digging and one for loading. Available in a variety of pocket configurations, there are ***Fanggs®*** that fit all John Deere equipment and a wide range of competitor bucket tooth adapters.

Click on the appropriate connection speed link below to view a video on how John Deere ***Fanggs®*** compare to the competition.



John Deere Swampers® Bucket Teeth are made entirely of polyurethane to reduce the risk of fire, explosion, and damage to work surfaces or underground utilities.

Swampers® are:

•Non-sparking

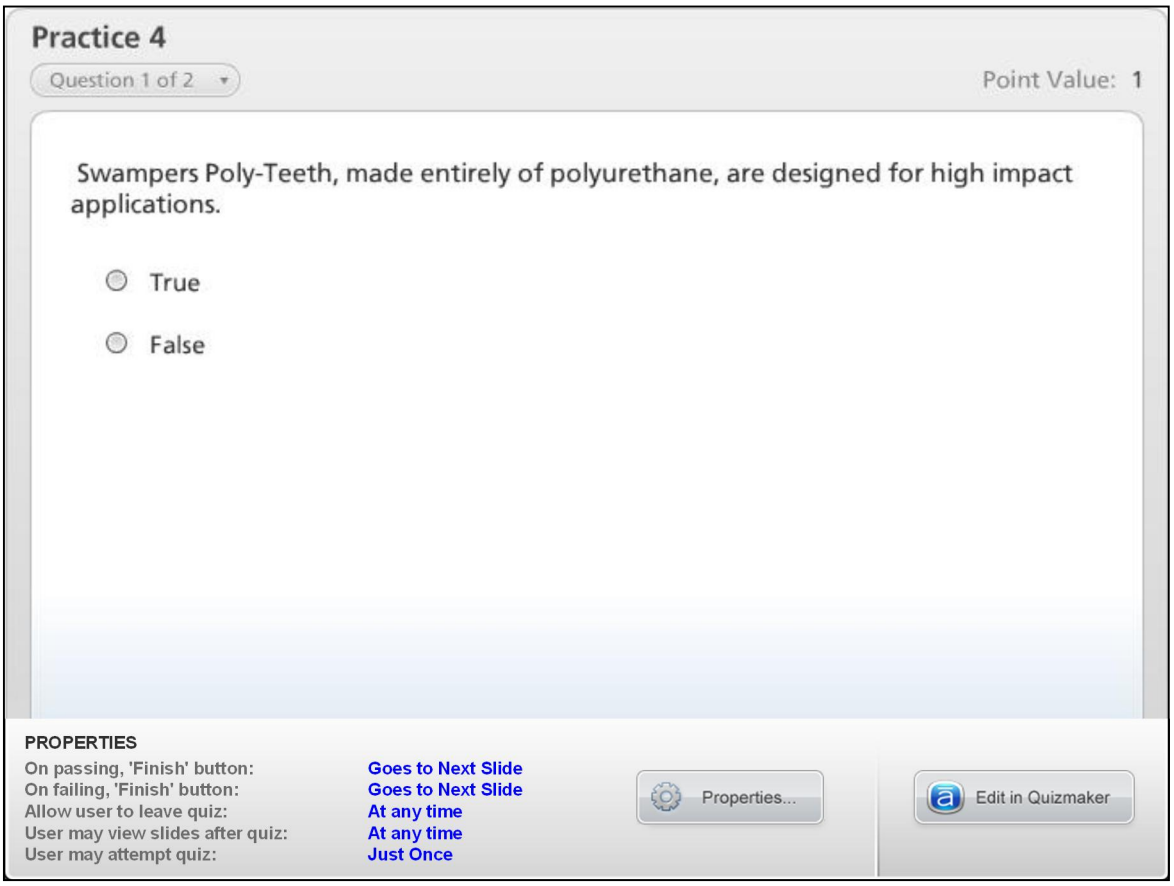
•Non-conductive

•Non-abrasive

•Non-corrosive

Swampers® are all-makes compatible and will fit most brands of backhoes, skid steers and many mini-excavators.

To find out more about Swampers®, click on the appropriate connection speed link below to view a short video.


Practice 4
Question 1 of 2
Point Value: 1
Swampers Poly-Teeth, made entirely of polyurethane, are designed for high impact applications.
True
False
PROPERTIES
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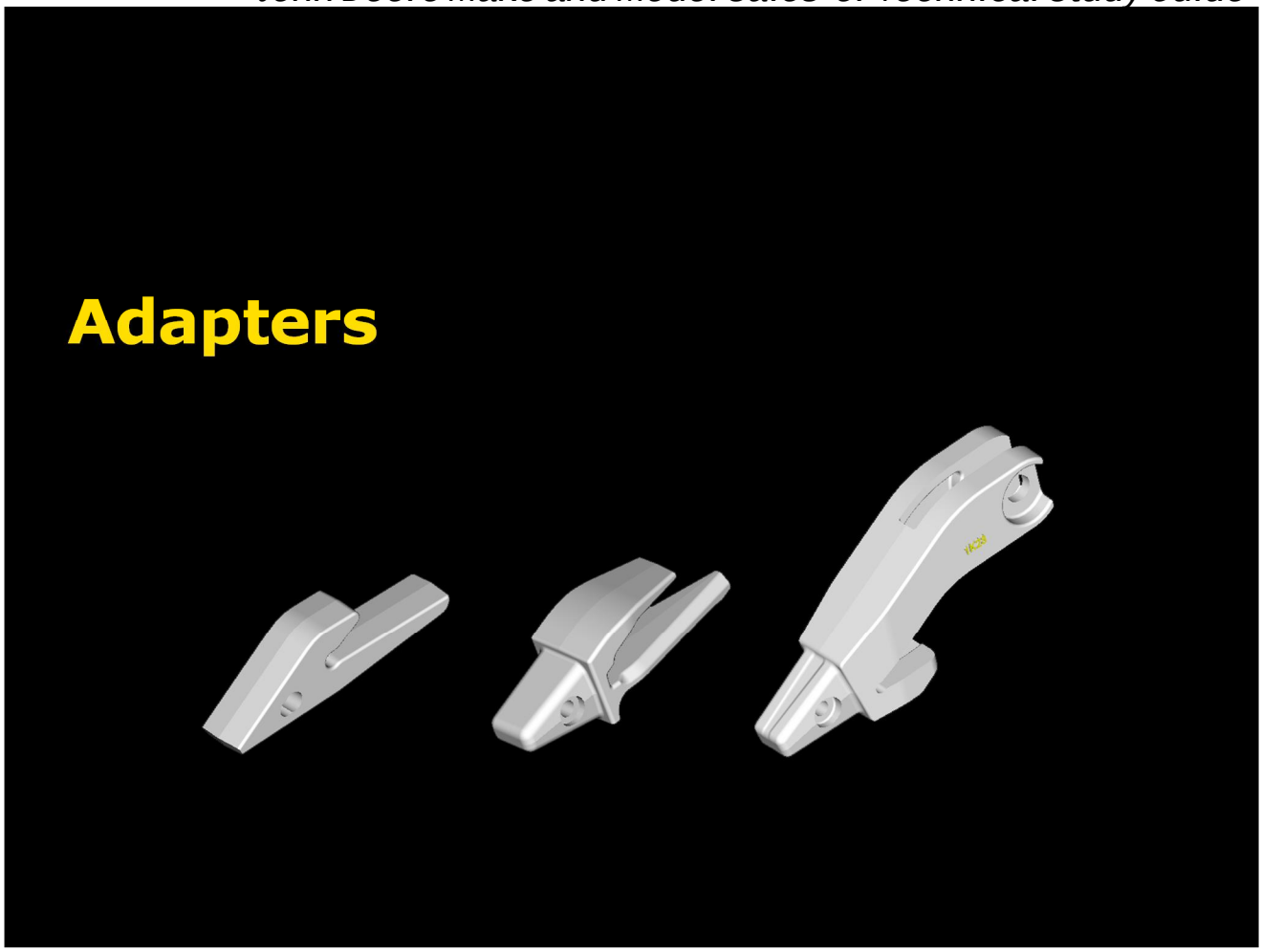
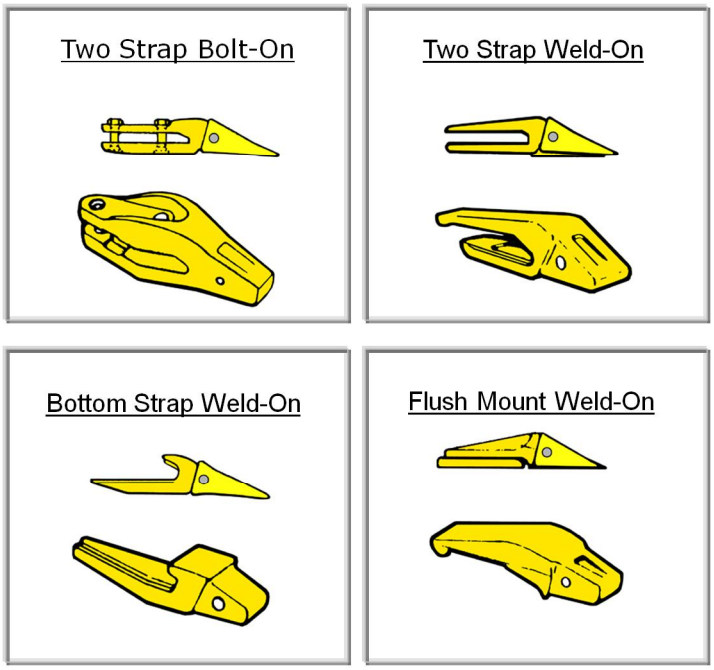


As we mentioned previously, adapters are how the bucket teeth are connected to the bucket.

Since adapters have a wear life approximately 10 times that of bucket teeth, they are replaced less frequently. However, they still need to be properly maintained as excessively worn adapters can lead to broken teeth and premature bucket wear.

They play an important role in the bucket's performance and vary in terms of off-set, leg length, and means of attaching to the bucket. It's important to select the right adapter for the machine and application. Let's take a look at the different characteristics of adapters and the applications they are best suited for.

Adapter Mounting Configurations



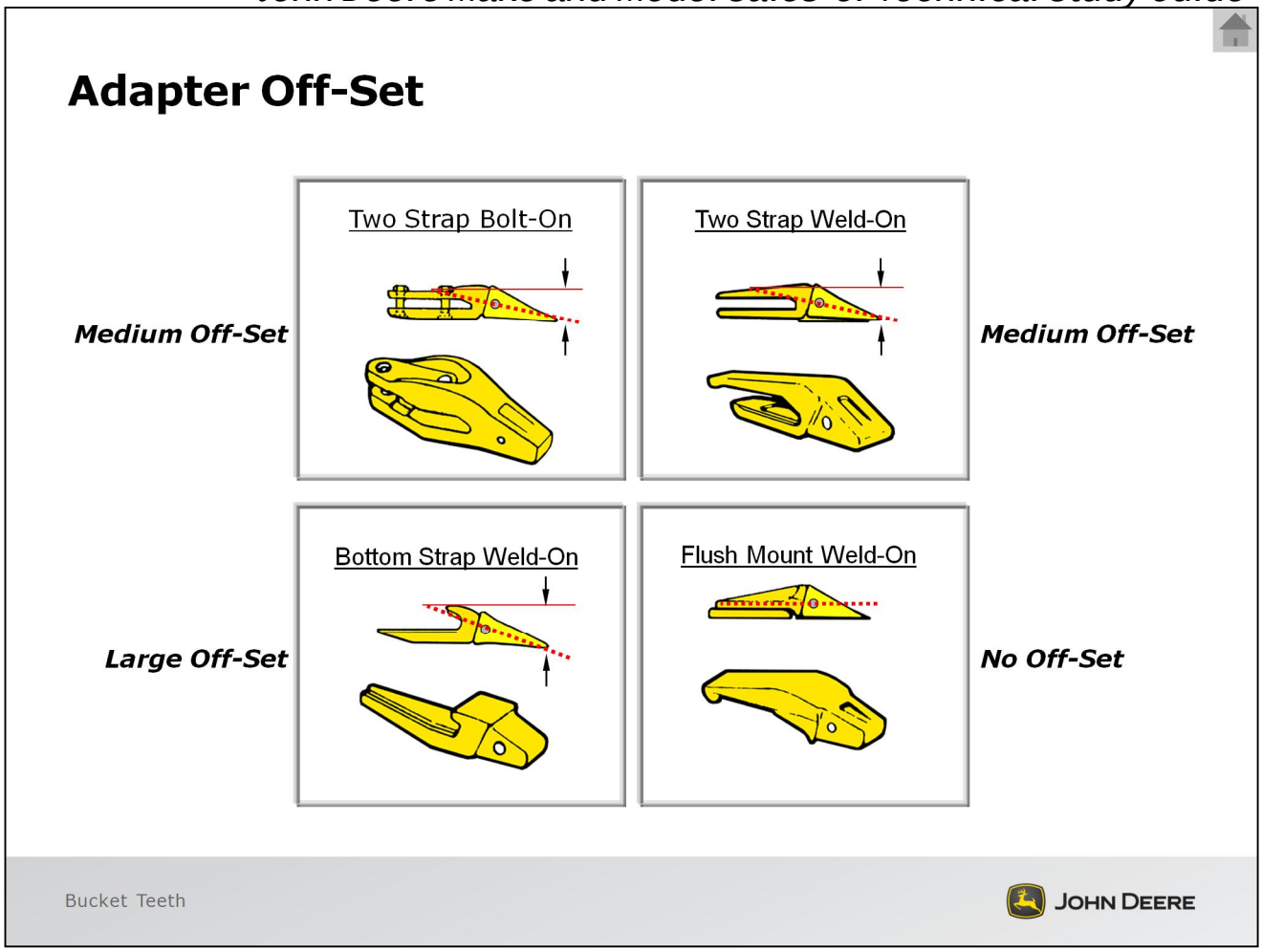
Bucket Teeth

JOHN DEERE

Different applications require different adapter designs and mounting configurations. Later, we'll learn about which configurations are best suited to which applications, but first here's an overview.

The most common adapter mount configurations are:

- Two-strap bolt-on
- Two-strap weld-on
- Bottom-strap weld-on
- Flush-mount weld-on



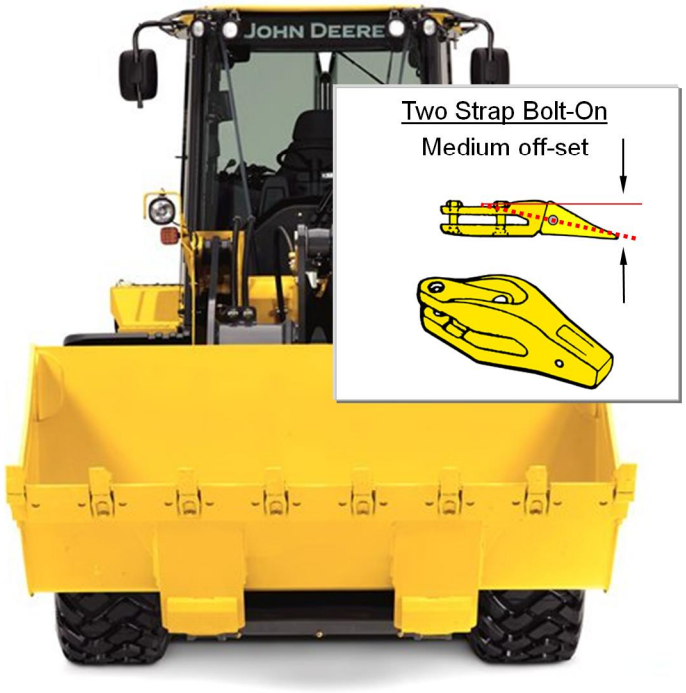
Adapter off-set is the tooth's position with respect to the bucket edge. The angle and direction of the off-set affects how aggressively a bucket tooth will dig. Certain applications require more off-set than others. We'll get to those shortly, but first a brief overview:

- Bottom-strap weld-on adapter with a steep angle has the most aggressive off-set.
- Two-strap bolt-on and weld-on adapters have medium off-set.
- Flush mount adapters have no off-set.

Two-Strap Bolt-On Adapters

- General loading applications
- Medium off-set

Frequently used on:
4WD loaders



Bucket Teeth

JOHN DEERE

Two-strap bolt-on adapters have a leg on either side of the cutting edge opening. The adapter attaches to the bucket edge with two or more bolts.

Two-strap bolt-on adapters provide good edge protection, are easily removed and installed, and work well in general loading applications.

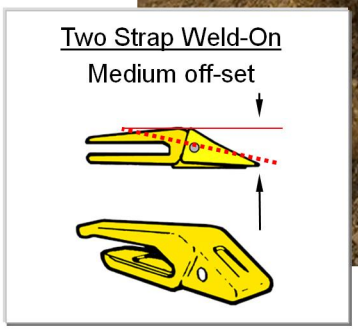
Two-strap bolt-on adapters have a medium off-set and are most frequently used on 4WD loaders.

Two-Strap Weld-On Adapters

- Digging applications where adapter retention is important
- High impact applications
- Medium off-set

Frequently used on:

- Backhoe buckets
- Excavator buckets



Bucket Teeth

JOHN DEERE

Two-strap weld-on adapters are arc welded to the bucket. This requires more time for installation and removal. However, they provide outstanding adapter retention in high impact applications.

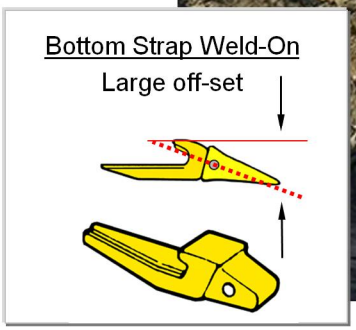
Two-strap weld-on adapters work best in digging applications where adapter retention is important. These adapters have a medium off-set and are frequently used on backhoe and excavator buckets.

Bottom-Strap Weld-On Adapters

- Digging applications where adapter retention is less important
- Large off-set

Frequently used on

- Backhoe buckets
- Excavator buckets



Bucket Teeth

JOHN DEERE

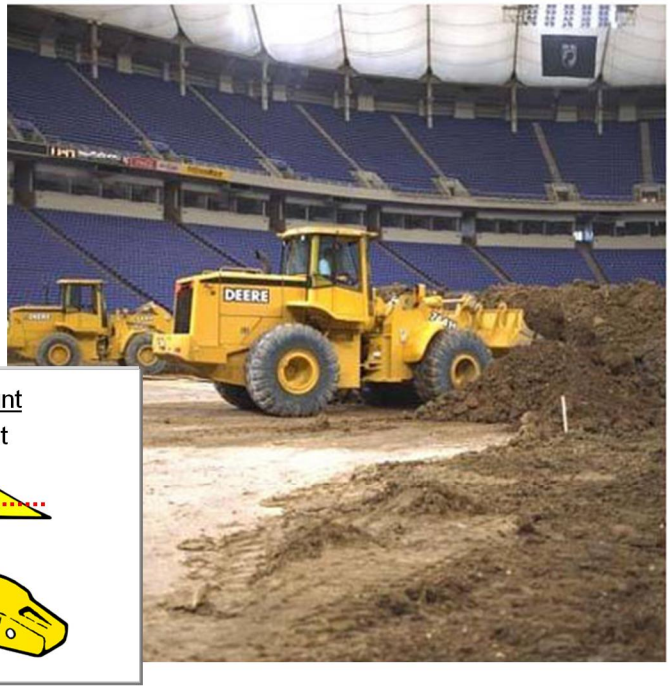
Bottom-strap weld-on adapters attach to the bottom of the bucket edge. The advantage of a bottom-strap adapter is that the adapter strap is out of the way and allows material to flow in and out of the bucket easily. On the other hand, the bottom strap is not as strong or durable as a two-strap adapter.

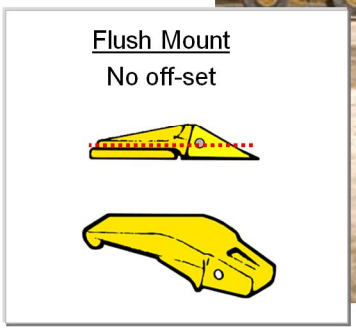
Bottom-strap weld-on adapters have a large offset and are used in aggressive digging applications on backhoe and excavator buckets. This provides the bucket tooth with the greatest angle to the material.

Flush-Mount Weld-On Adapters

- Leave clean work floor
- No off-set

Frequently used on:
Large 4WD Loaders



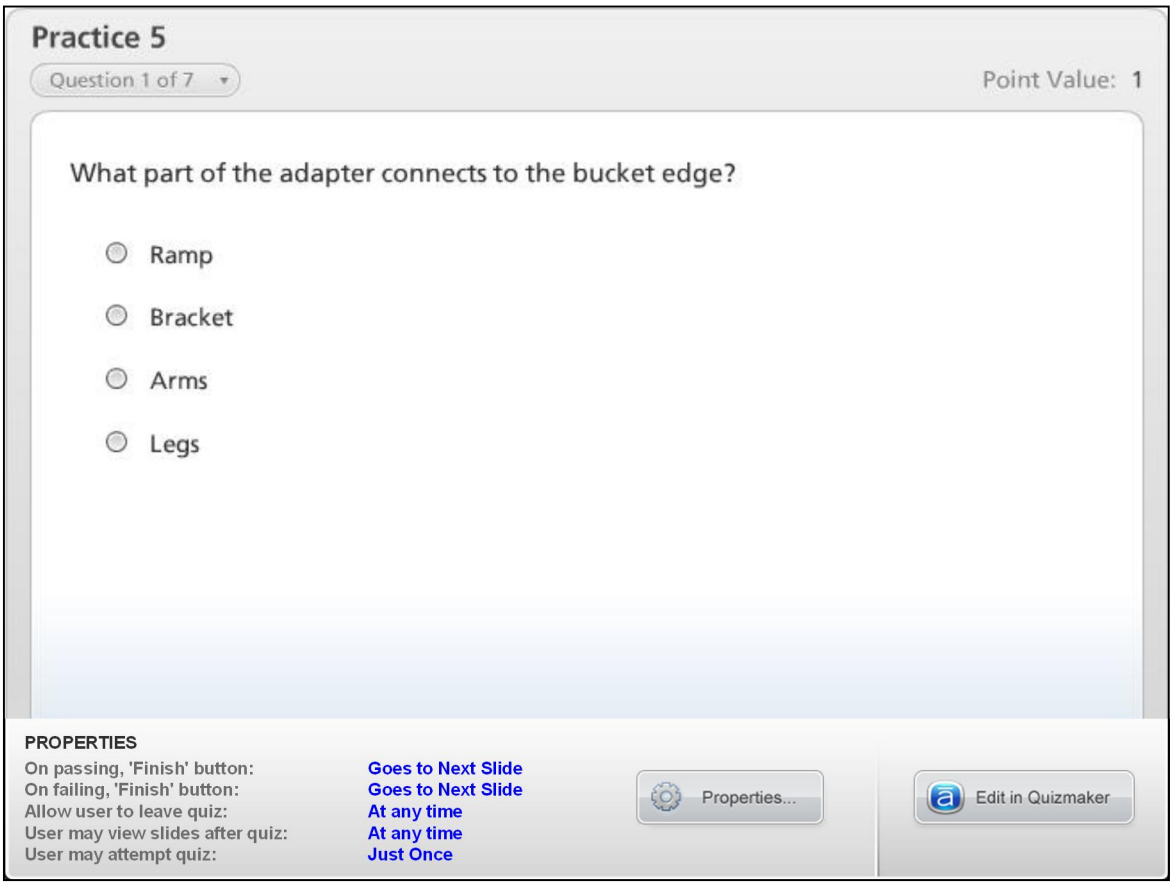


Bucket Teeth

JOHN DEERE

Flush-mount weld-on adapters attach to the top of the bucket edge, leaving a smooth surface on the bucket bottom. Flush mount adapters leave a clean work floor when scraping or digging.

These adapters, which are primarily used on large loaders, have no off-set. A bucket tooth on a flush mount adapter is parallel to the bottom edge of the bucket.


Practice 5
Question 1 of 7
Point Value: 1
What part of the adapter connects to the bucket edge?
Ramp
Bracket
Arms
Legs
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: At any time
User may view slides after quiz: At any time
User may attempt quiz: Just Once
Properties...
Edit in Quizmaker

Now that you know the basics of bucket teeth, adapters and retention systems, it's time to put it all together.

What if a customer were to bring in a bucket tooth and sit it on your counter? What would you recommend for a replacement? How long would it take you to identify the bucket tooth? Would you know who manufactured it? Would you know what retention system it used?

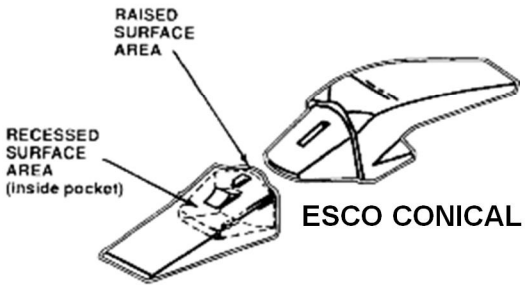
In order to answer these questions, you will need to become familiar with the major manufacturers of these products, which include John Deere, Caterpillar, Hensley, H&L, and Esco.

In this topic you will learn how to recognize the differences between manufacturers and how to identify bucket teeth, adapters and retention systems.

Manufacturer Indicators

- Part Number
- Pin Location
  - Vertical
  - Horizontal
- Pin Hole Size & Shape
- Pocket Shape
- Retention System

HENSLEY



ESCO CONICAL DESIGN

CATERPILLAR

Bucket Teeth

JOHN DEERE

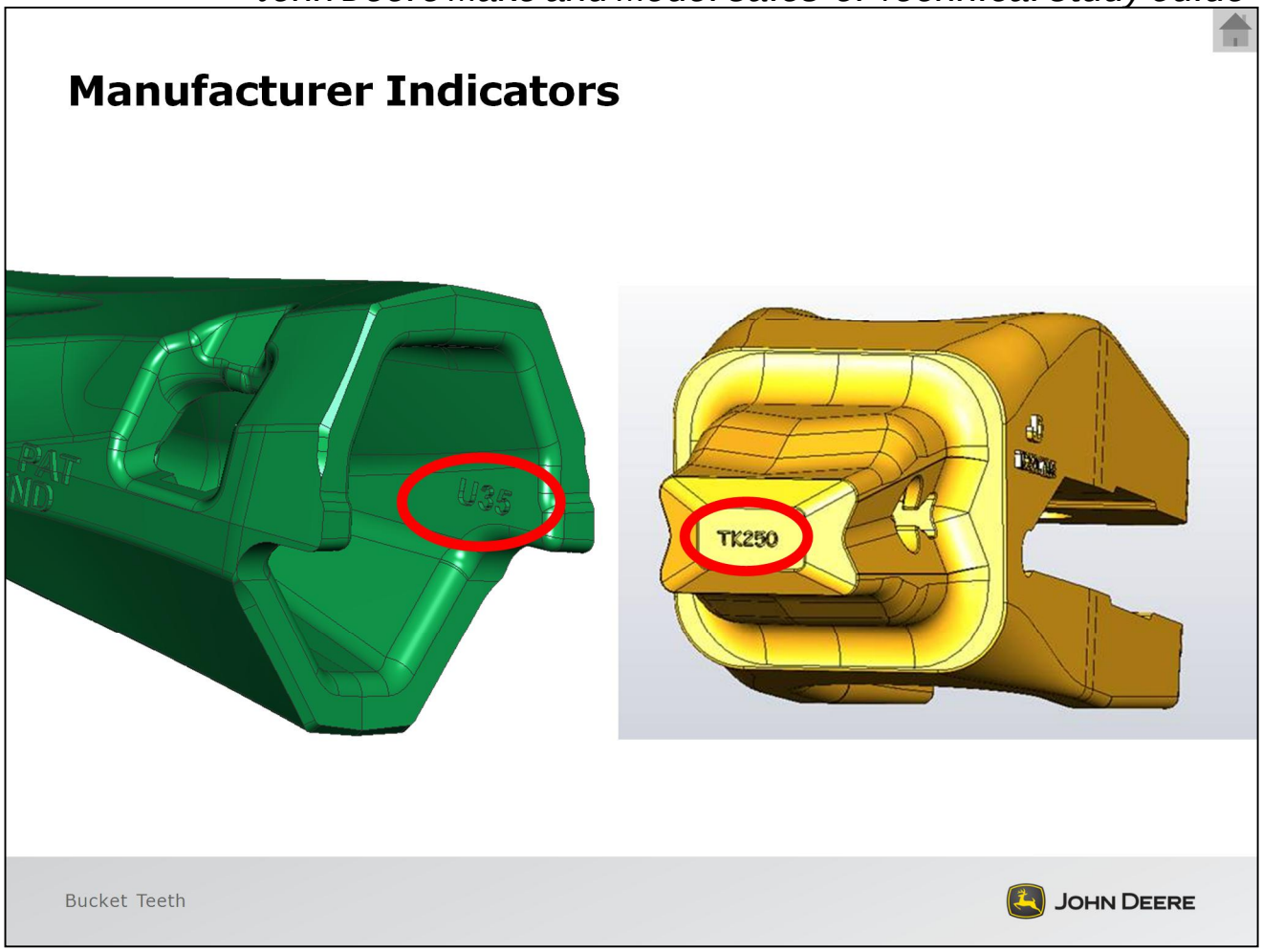
When a customer brings in a bucket tooth for replacement, the first thing you should do is look for a part number or manufacturer's name on the tooth. If there is none you should ask the customer if they know who made it.

It's also helpful to be able to visually identify a bucket tooth. The position, shape and size of the pin hole is your first clue to the manufacturer. For instance, Caterpillar uses a horizontal pin hole design and Hensley uses a vertical pin hole design.

The shape of the pocket is also important because manufacturers have different pocket dimensions. For example, an Esco conical design is unique in that it is dished-out, making it easy to identify.

Sometimes the customer might only bring in a pin or retainer, rather than the bucket tooth. The type of pin or key they bring in will also narrow the manufacturer.

Since some manufacturers bucket teeth look similar, it may be difficult to visually identify the manufacturer of every bucket tooth. In these instances, you may have to compare two teeth side-by-side or take measurements of the pocket to verify the tooth's dimensions.



As bucket tooth systems have evolved, manufacturers have provided additional means for identifying the tooth system and size. This way, if the part numbers from the outside of the tooth are worn off, you will still be able to identify the appropriate size tooth the customer needs.

The John Deere TK-Series teeth have tooth size identification marks at the end of the adapter nose. You can see the series information in the example above. Notice “TK250” circled on the graphic of the John Deere TK-Series adapter on the left.

Esco SuperV and Ultralok teeth have the tooth series (or size) located on the inside of the tooth pocket for identification purposes. In the graphic of an Ultralok tooth on the lower right, you can see in the red circle the tooth size “U35” is marked.

John Deere TK-Series Hammerless Retention System

Insert the video of just the portion of how the pin installs and locks.

Bucket Teeth

JOHN DEERE

John Deere's exclusive TK-Series Bucket Tooth System is a hammerless pin design. The Turn Kam pin is installed and locked in place by turning it a half turn with a socket wrench. A helical ramp on the pin draws the pin into the adapter, locking in place on a rubberized lock. Once locked, the pin cannot be removed without turning it – and the only way to turn it is to use a socket wrench. Both the pin and lock are reuseable and can be installed from either side of the adapter.

John Deere Original Retention Systems

Two Piece Pin and Split Washer

John Deere Fanggs® Bucket Tooth

Horizontal Roll Pin

TERM TIP: Pin Walk *occurs when a retention pin works itself out of a pin hole*

Bucket Teeth

JOHN DEERE

Of all of the manufacturers, John Deere original teeth and Caterpillar are the most similar in their retention system design. These are the most easily confused, and it is important that you know the characteristics of each.

John Deere original design bucket teeth have a horizontal pin hole. They may use either a two-piece pin and split washer method or a horizontal toll pin for retention.

The pocket size of the John Deere original design is smaller than the pocket size of a comparable Caterpillar tooth.

The horizontal two-piece pin and split washer design is a reliable system which is strong and not subject to pin walk. Both the pin and washer are reusable.

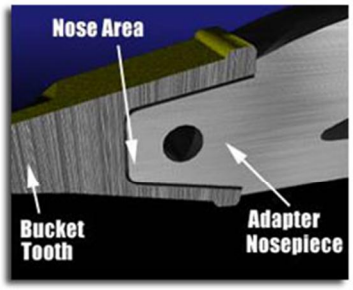
The horizontal roll pin design is a low cost reliable method. It can be reused if not damaged.

Caterpillar Retention Systems

Caterpillar Replacement Tooth

Steel Pin and Split Washer

Nose Fit:



E-Pin

SELLING TIP: *Tell your customers that they should not mix the two pin and split washer retention systems.*

Bucket Teeth

JOHN DEERE

John Deere has replacement bucket teeth for various all-makes systems, including Caterpillar. The Caterpillar bucket teeth use a horizontal pin system. The Caterpillar adapter style uses an extended adapter nosepiece. One way you can identify a Caterpillar tooth is by it's oversized pocket, large flat pocket bottom and round horizontal pin hole.

Caterpillar retention systems include a solid steel pin and split washer retainer. The pin has a flat-bottomed groove on one end to connect the pin and the split washer. This 2-piece retention method makes tooth removal fast and easy. Both the pin and washer are reusable.

A newer version of the Caterpillar horizontal pin and split washer retainer is the E pin. The E pin has a deeper, radial groove at the end of the pin for the washer to fit into. The washer has a plastic jacket that helps align it to the pin hole.

You should recommend to customers that they should not mix the two pin and split washer retention systems.

Hensley Retention Systems

Steel Key *Vertical Roll Pin* *Flex Pin*

TERM TIP: *The bucket tooth* ***series*** *refers to the size of a bucket tooth.*

Bucket Teeth

JOHN DEERE

John Deere also offers a variety of replacement teeth for Hensley products. Hensley's bucket tooth's parabolic, dished-out design creates a wedging and self-tightening fit. A recessed channel on the inside side-wall matches a tapered extension on the adapter nosepiece creating a very tight fit.

Most Hensley bucket teeth have a vertical pin hole and use three unique styles of retention systems: Vertical roll pin, flex pin, and steel key. The retention system used for each Hensley tooth is dictated by it's series.

Hensley's series 156, 160, 220, and 310 teeth are retained with a vertical roll pin. The roll pin allows easy removal and installation and is reusable. The pin hole shape is round.

Hensley series 350, 400, 475 teeth use a vertically mounted flex pin. Flex pins are made of two hardened steel forgings with vulcanized neoprene between them. The shape of the pin hole will be oblong on teeth using this system. The flex pin is reusable

A steel key, or keeper, retains the 290, 330, 370 , 410, 500, and 550 series Hensley replacement teeth. This key provides outstanding retention in all types of applications and is <u>not</u> reusable. The pin hole on these teeth is oblong to fit the steel key.

H&L Retention System

Horizontal Flex Pin

H&L Replacement Tooth

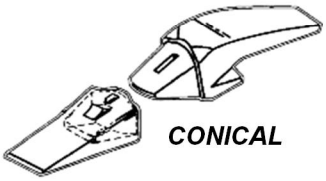
Bucket Teeth

JOHN DEERE

H & L bucket teeth have a horizontal pin hole design and use a flex pin for retention. The flex pin, which fits into an oblong pin hole, has two steel halves and a rubber center. When the pin is driven into place the rubber compresses to create a secure fit. This pin design withstands shock and maintains a tight fit with small amounts of adapter wear.

Esco Conical Retention System

Esco Replacement Teeth



CONICAL

Pin and Rubber Lock

Bucket Teeth

JOHN DEERE

John Deere offers replacement parts for several Esco bucket tooth systems. The first Esco system we will review is the Esco Conical.

The term “conical” describes the mating surface between the adapter nose and tooth pocket. The raised center area on the top and bottom of the adapter nosepiece fits tightly into the formed area on the top and bottom of the tooth pocket. This reduces tooth movement both vertically and horizontally.

All John Deere replacement teeth for Esco conical products are retained with a two piece vertical pin and rubber lock.

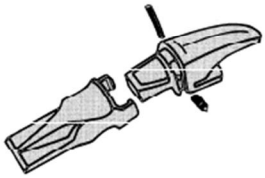
For more aggressive retention, a ratchet style pin and lock is also available.

Esco Helilok® / Vertalok® Retention Systems

HELILOCK® ADAPTER

Quadrilok™

VERTALOK® ADAPTER



Pin and Rubber Plug

Bucket Teeth

JOHN DEERE

Esco Helilok / Vertalok teeth can be used on Helilok or Vertalok adapters. The bucket tooth is mounted with a quarter turn of the tooth. The helical twist of the adapter nose creates a locking force which keeps the tooth tight on the adapter. This allows the tooth to perform well with head-on loads.

Esco Helilok/Vertalok bucket teeth fit a Helilok adapter by using a one-piece, horseshoe shaped pin called the Quadrilok pin. This tooth does not have a pin hole.

Esco Helilok/Vertalok bucket teeth fit a Vertalok adapter by using a drive-through pin and rubber plug retention system.

Both Esco Helilok and Vertalok retention systems are reusable if not damaged during removal.

Esco Super V™ Retention System

- Retained by a vertical drive through one piece flex pin
- Mounted on the adapter nose with a quarter turn

Flex Pin

Bucket Teeth

JOHN DEERE

The Esco Super V bucket teeth design are also mounted with a quarter turn. Though similar to the previous Esco systems, Super-V teeth will not fit on a Helilok or Vertalok adapter.

To secure the SuperV tooth to the adapter, a one-piece flex pin is driven into a vertical slot created by the “ears” on the tooth. The pin can be reused on the V29-series and larger.

Esco Ultralok™ Bucket Tooth System

- Lower nose profile and unique triangular nose shape
- Hammerless bucket tooth system
- The retention lock is integrated into the tooth point
- Unlocked using a common pry bar

Bucket Teeth

JOHN DEERE

The Esco Ultralok™ system has a lower profile nose with a unique triangular shape. Ultralok is a hammerless system with a locking mechanism that is an integral part of the tooth. This provides for quick and easy tooth replacement. Since the lock is integral to the tooth, you will not order a separate part number for the lock. A common pry bar is used to lock and unlock the tooth from the adapter.


Practice 6
Question 1 of 6
Point Value: 1
John Deere original design teeth use a horizontal pin hole design.
True
False
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: At any time
User may view slides after quiz: At any time
User may attempt quiz: Just Once
Properties...
Edit in Quizmaker

TK-Series Bucket Teeth System

Exclusive John Deere design

Hammerless system

No special tools required

Faster removal and install

Add full length animation/video to this slide – is a good introduction to the system

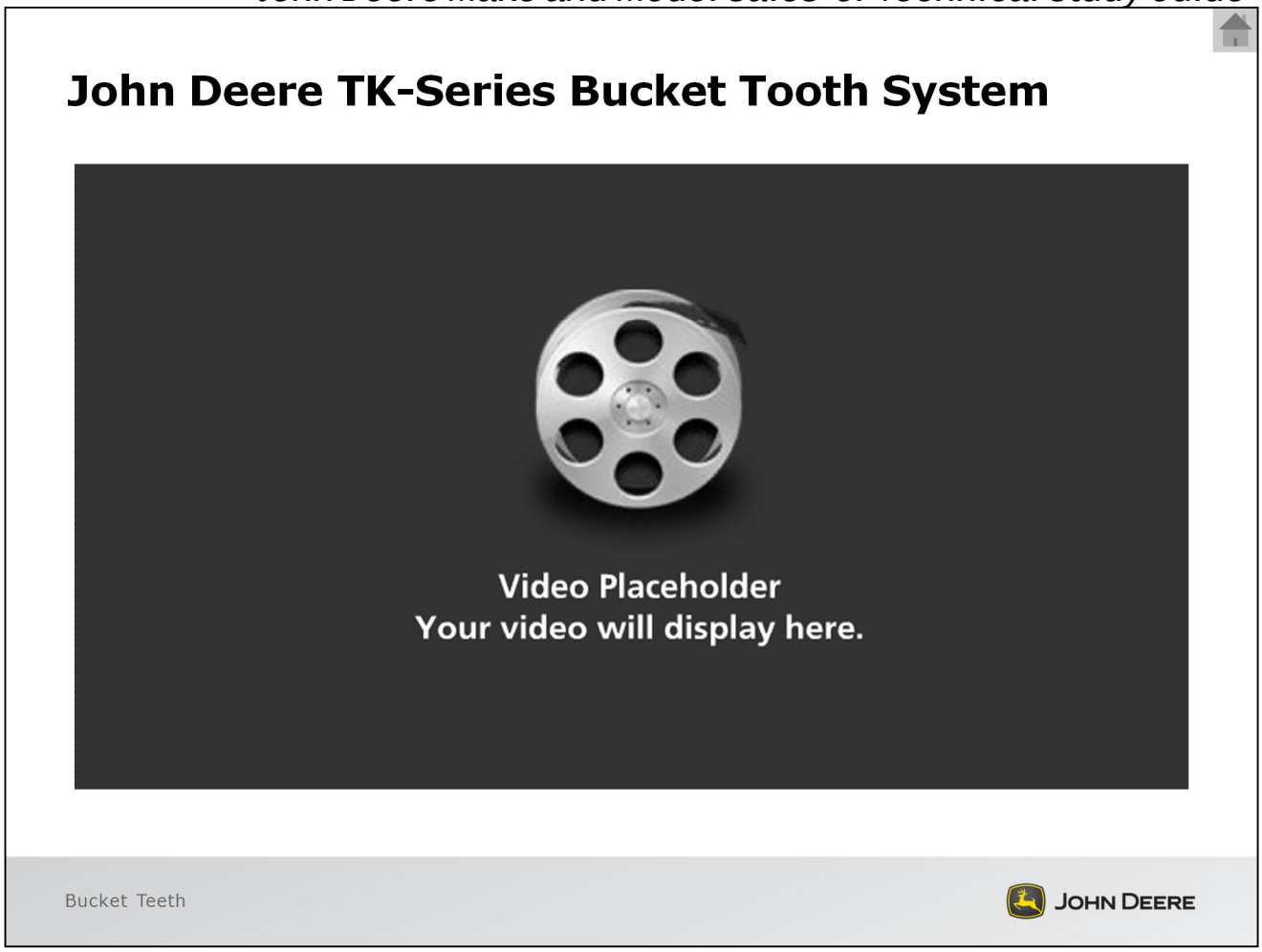
Click on the link below to view a video of the new TK-Series Teeth

www.JohnDeere.com/tkseriesteeth

The John Deere TK-Series Bucket Tooth System is a unique design that is exclusive to John Deere.

The ease of change-out that a hammerless system provides means quicker tooth change-out times. The patented Turn Kam pin is unlocked and removed with a single motion – just a half-turn of the pin using a standard socket wrench. This is unique to John Deere because, most competitors' hammerless systems require the pin to be unlocked with a tool and then tapped out of the adapter.

TK-Series teeth and adapters are available to fit a wide range of sizes to fit excavators, wheel loaders, crawler loaders and backhoe loaders.



The patented Turn Kam pin is the heart of the TK-Series system.

The helical ramp on the pin is what draws the pin into the adapter when locking and “walks” the pin out when unlocking. The ramp is also what compresses the rubber lock as the pin is being locked and unlocked. Watch how the lock is compressed when locking until it reaches the detent in the ramp of the pin. Once the pin is in its locked position, it cannot be removed without being turned. The lock provides enough resistance that the pin won’t turn without the use of a socket wrench.

John Deere TK-Series Bucket Tooth System

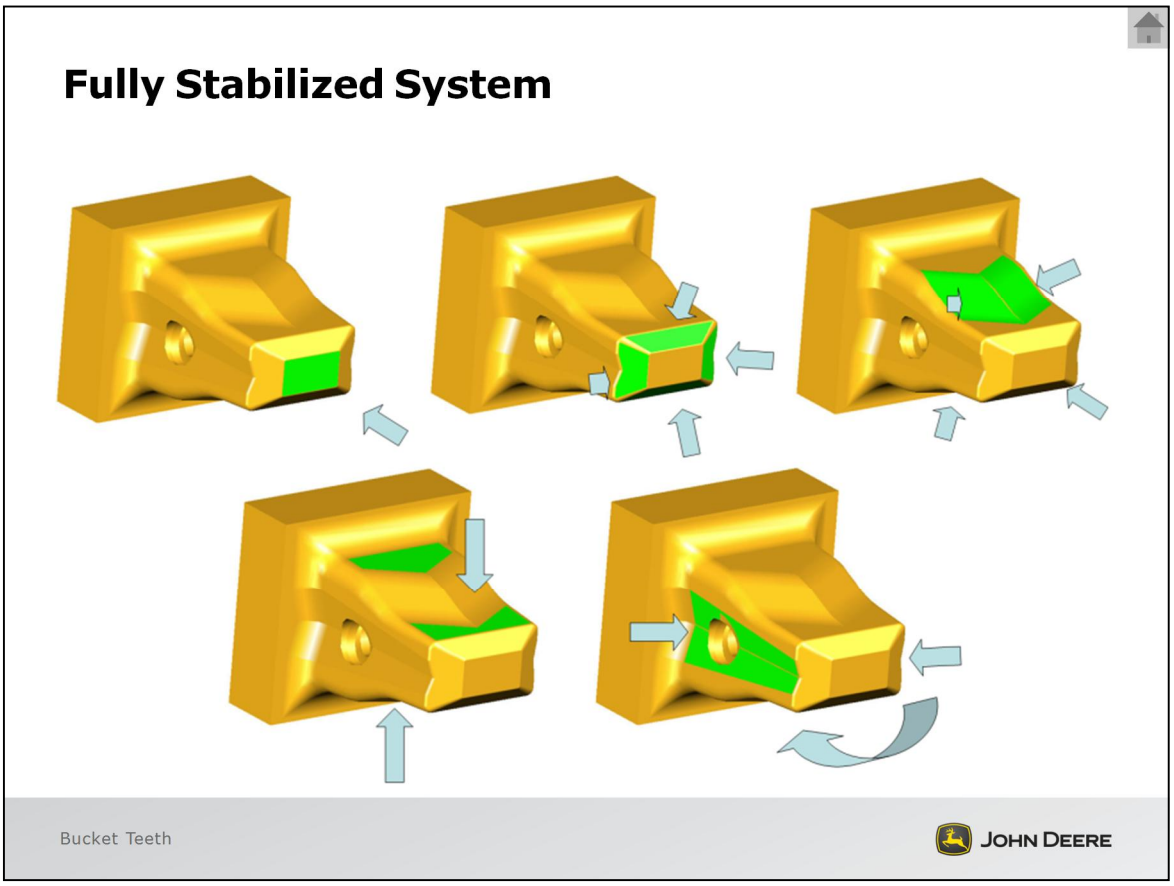
Series	Socket Size		Square End Female
	Metric	Inch	Inch
TK225	10mm	3/8	1/4
TK250	11mm	7/16	1/4
TK300	11mm	7/16	1/4
TK350	14mm	9/16	3/8
TK400	16mm	5/8	3/8
TK450	16mm	5/8	3/8
TK550	19mm	3/4	3/8
TK600	19mm	3/4	1/2
TK700	24mm	15/16	1/2
TK800	24mm	15/16	1/2

Bucket Teeth

JOHN DEERE

The Turn Kam pin is locked and unlocked by turning it using a socket wrench. The hex-head on the pin is machined to the tight overlap in tolerances for metric and inch sockets. This allows for the use of either a metric or inch socket. We always recommend that you use a 6-pointed socket to avoid damaging the hex-head. The pin locks by turning the hex head to the right and unlocks by turning it to the left.

If for some reason the hex-head becomes damaged, the opposite end of the pin has the female couple to a square drive. This can provide secondary access if needed. Keep in mind though, if using the square drive, you will need to turn to the right to unlock the pin and to the left to lock it.



In addition to the ease of operation provided by the Turn Kam pin, the TK-Series is a fully stabilized system. The patented adapter nose and tooth pocket shape feature surfaces designed to evenly distribute load – resulting in a very durable system.

These drawings help to show how those multi-planar surfaces work to distribute load.

Top row from left to right:

•Large, flat contact surface evenly distributes primary digging load

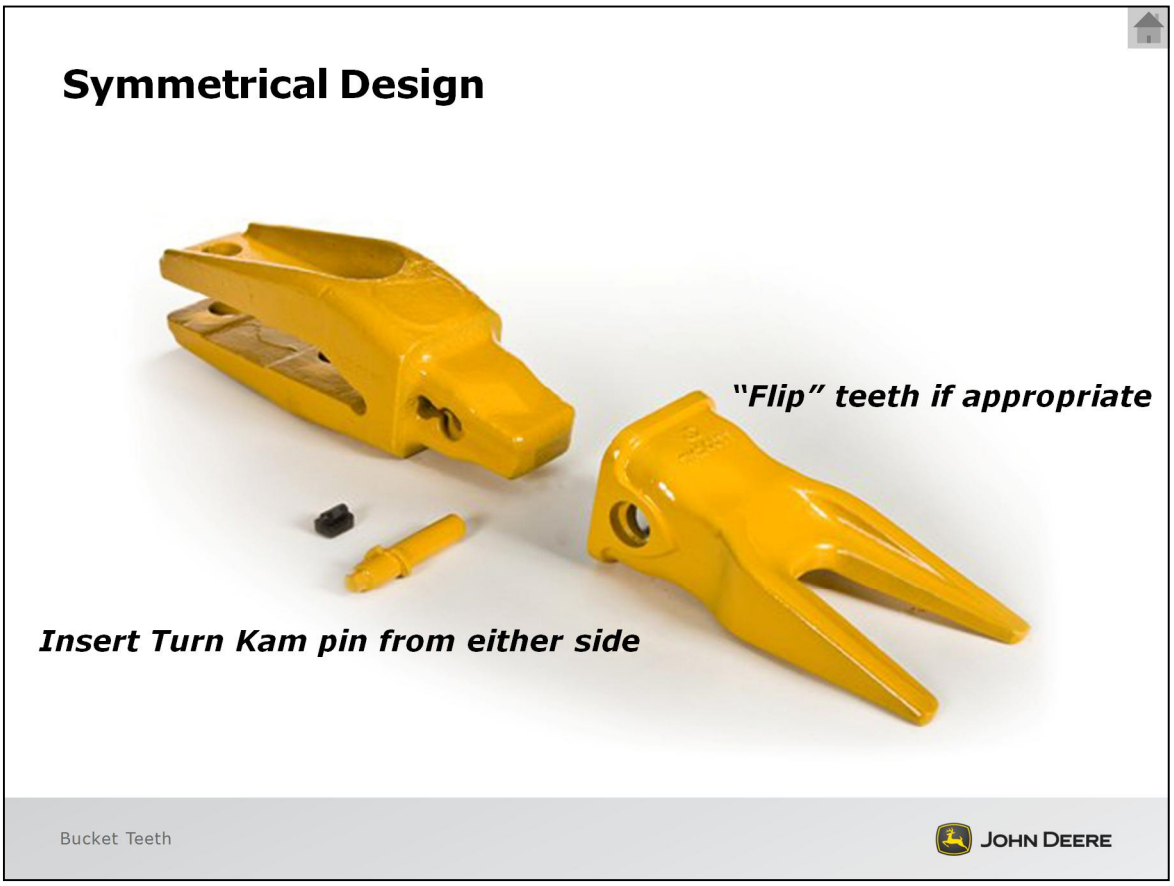
•Additional flat contact surfaces stabilize the tooth to resist off-center digging loads

•Secondary contact surfaces for distributing primary digging loads. The angled planes also serve to center the tooth vertically on the adapter nose

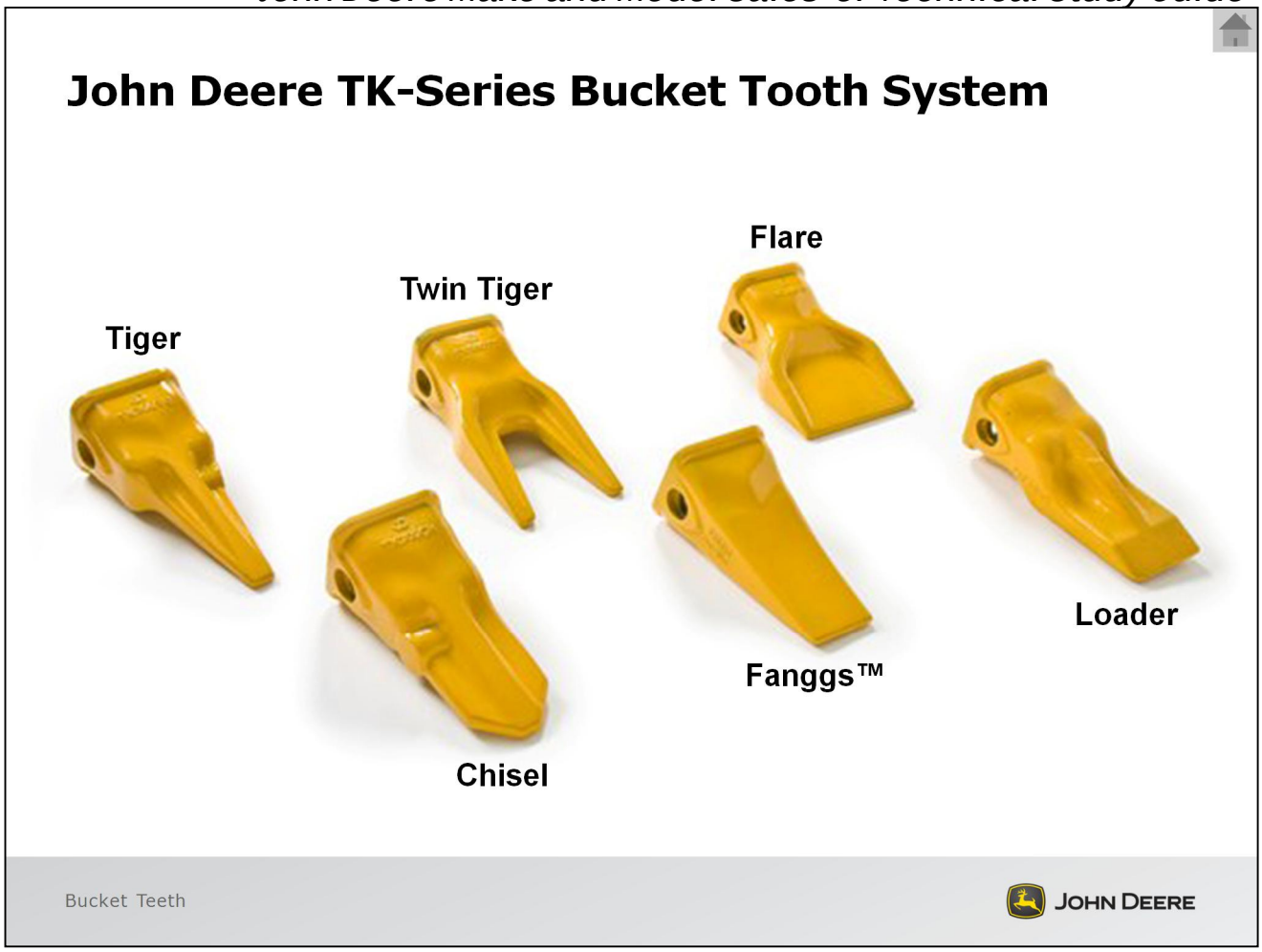
Second row, left to right:

•Parallel surfaces distribute vertical loads evenly through the adapter nose. These surfaces work to prevent vertical loads from damaging the pin.

•Side loads are distributed throughout the adapter nose by nearly parallel surfaces. The tapered side surfaces further stabilize the tooth against rotational loads that are often encountered when using twin tiger or flare profile teeth.

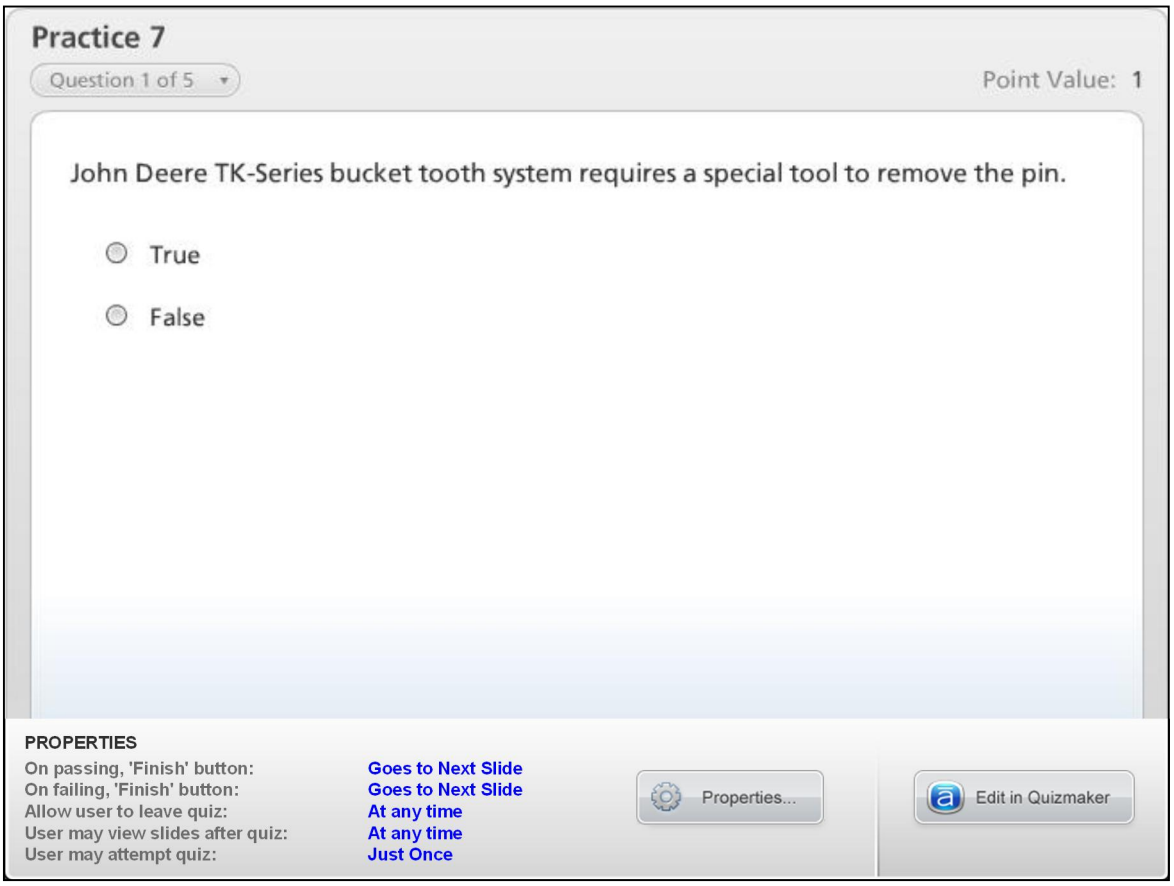


The multi-planed surfaces of the TK-Series adapter nose are symmetrical on both the horizontal and vertical axis. This means the Turn Kam pin can be inserted from either left or right side for easier access. The symmetrical adapter nose also allows for teeth to be flipped for extended wear life in some applications such as the Twin Tiger profile tooth shown here.



The TK-Series bucket tooth system is available in a wide variety of sizes – from those that fit small excavator and backhoe bucket all the way up to our largest excavators and wheel loaders. They are also available in a variety of profiles as well, including:

- Fanggs™
- Tiger
- Twin Tiger
- Flare
- Loader
- Chisel


Practice 7
Question 1 of 5
Point Value: 1
John Deere TK-Series bucket tooth system requires a special tool to remove the pin.
True
False
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: At any time
User may view slides after quiz: At any time
User may attempt quiz: Just Once
Properties...
Edit in Quizmaker

Bucket Teeth Information on Web PartsEXPERT

Fanggs®

John Deere TK-Series

John Deere original line

Caterpillar Replacement

Esco Conical Replacement

Esco Helilok®/Vertalok® Replacement

Esco Super V™

Esco Ultralok®

H&L Replacement

Hensley Replacement

Rippers and Scarifiers

Open DealerNet with your web browser in a separate window to follow along in this lesson.

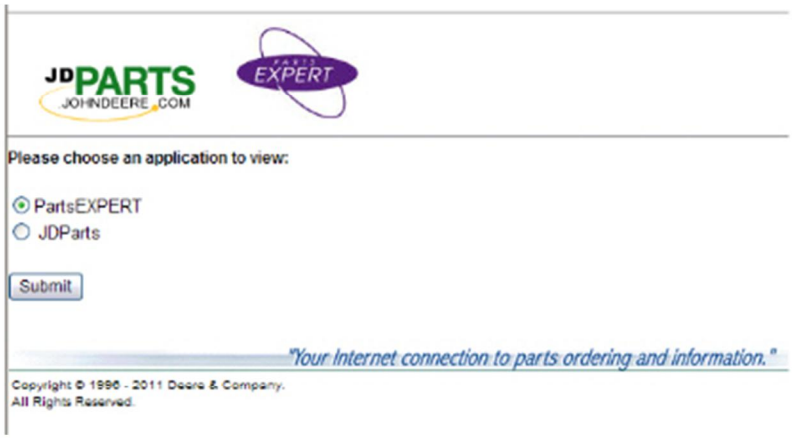
Bucket Teeth

JOHN DEERE

Helpful information about bucket teeth, adapters and retention systems can be found on DealerNET. On Web PartsEXPERT you will find the most up to date bucket tooth information. This includes product features, applications, and specifications for the product lines listed on your screen.

In this lesson, you will learn how to navigate Web PartsEXPERT to locate part numbers for bucket teeth, adapters and retention systems. This information will be helpful as you work with your customers to identify the bucket tooth system and solution that is right for them.

Log On to Web PartsEXPERT



Click the link below to see a demonstration

Log On to Web PartsEXPERT Demo

Bucket Teeth

JOHN DEERE

Before we begin, you will need to be able to log on to Web PartsEXPERT. To start, open DealerNet with your web browser in a separate window.

From Dealer Net “Parts Tab” select PartsEXPERT under “Sales / Marketing Tools”

Pick PartsEXPERT, select Submit

Pick C&F, select Submit

Identifying Replacement Teeth from a Competitor's Partial Part Number

A customer comes in with a worn tooth. You can only make out a partial part number on the tooth "1U325". You know from training and from what the customer tells you that this is a Caterpillar style tooth. The customer also tells you he needs a Tiger profile tooth. What part number would you offer your customer?

Click the link below to see a demonstration

Competitor Partial Part Number Demo

Bucket Teeth

JOHN DEERE

Let's start with an example where you have a competitor's part number (or partial part number) and would like to identify if John Deere offers a replacement tooth and related parts.

•Make sure you are on the "Part Search" tab in Web PartsEXPERT

•In the "Non-John Deere Part Number Search (JD Cross-Search)" section at the bottom of the page, enter the partial part number in the box under "(1) Enter a Part Number." Use "*1u325*" since you don't know what prefix or suffix may make up the remainder of the part number you are looking for.

•Select "Bucket Teeth" from the Part Category list

•Click "Find Parts"

•PartsEXPERT returns a list of all the Bucket Teeth part numbers containing "1U325"

The column labeled "Part No." contains the John Deere part number. You can retrieve more information about each part number by clicking on part number. If you select a part number and the information retrieved reveals it's not the tooth you are looking for, use the back button on your web browser and select another from the list.

After trying a few options, you discover that TT1U3252 is the Tiger tooth your customer is looking for.

•Select the "Application Search" tab from the top of the window

•In the second box at the center of the page (with the heading "Select a Manufacturer from the list below"), select "Hensley" from the list. This can be done by either clicking in the box and beginning to type "Hen" and then selecting "Hensley" from the list or by scrolling through the list until you locate "Hensley"

•Highlight "Hensley" in the list and then click "Next Step"

Note: *For bucket teeth, the "Machine Type" describes either the type of machine the teeth are used on, or in some cases, the type of system a particular tooth manufacturer offers (such as Esco Helilok or SuperV teeth).*

•Since you know your customer is looking for a tooth to use on excavators, select "Excavator Teeth" and click "Next Step"

Note: *For bucket teeth, we use the "Model" to show the series or size of teeth you are looking for*

•Since your customer knows the series teeth he is using already, select "400 SERIES TEETH" from the list and click "Next Step"

•Select "Bucket Teeth" as the Part Type and then click "Find Parts"

Note: *PartsEXPERT returns a list of all the Hensley 400-series excavator teeth, adapters and pins that John Deere offers. You can see here that the description provided tells you the profiles available and more details about the adapters as well. The "Note" column provides additional information about what applications a particular tooth may be more appropriate for use in.*

•You recall from this training course that flare profile teeth are used to leave clean, level bottoms in trenching applications. Locate part number TX400F which is the flare profile tooth.

•Click on the link for the Flare profile tooth in the notes column to reveal the note. PartsEXPERT will open a pop-up window with additional information. Review the information and click on "close" when you want to return to the list of parts.

•Click on the TX400F part number to see additional part number information. This will provide you with specifications and links to additional information. When you are done, use your browser's back button to return to the list of Hensley 400-series parts.

Note: *You can print out the list of all the 400-series parts available to give to your customer – just select "Printer-friendly Page" from just above the top of the list.*

Identifying a Bucket Tooth Using Pocket Dimensions

Your customer brings in a worn tooth with no part number identification on it. The tooth is small, and your customer tells you it's "a Fanggs tooth on a John Deere backhoe." The tooth is a side pin design, and you suspect it is an H&L style tooth, but you want to be certain. You measure the inside of the pocket to be 1½ inches in one direction and 1-5/8 inches in the other. What manufacturer and size teeth does your customer need?

Click the link below to see a demonstration

Pocket Dimensions Demo

Bucket Teeth

JOHN DEERE

•Select the "Part Spec. Search" tab in Web PartsEXPERT

•From the list below "Select a Part Group from the list below" locate "Tooth"

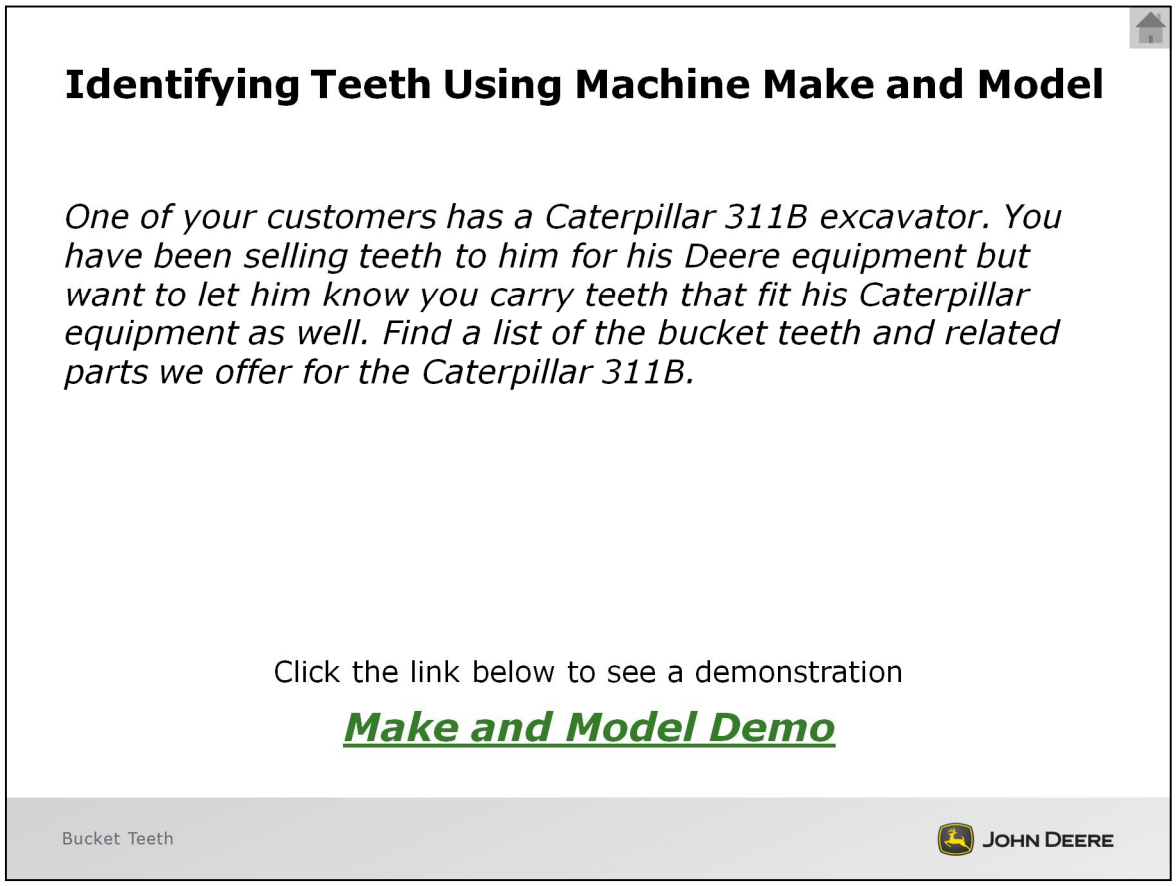
•Highlight "Tooth" and select "Next Step"

•Choose "Bucket" for the Part Class and select "Next Step"

•Choose "Fanggs" as the Part Type and select "Find Parts"

PartsEXPERT returns Search Results in a table format that may be one or more pages of information. Since you know the pocket size, look in those columns to find one that matches. You will have to click to the second page to find the correct one.

The pocket size dimensions confirms that your customer needs an H&L style, 23-series tooth. You recommend TF23D, which is the Fanggs part number.



•Select the “Application Search” tab in Web PartsEXPERT

•Under “Search by Model Number” Enter “311B”

•Uncheck the box that says “Search John Deere models only”

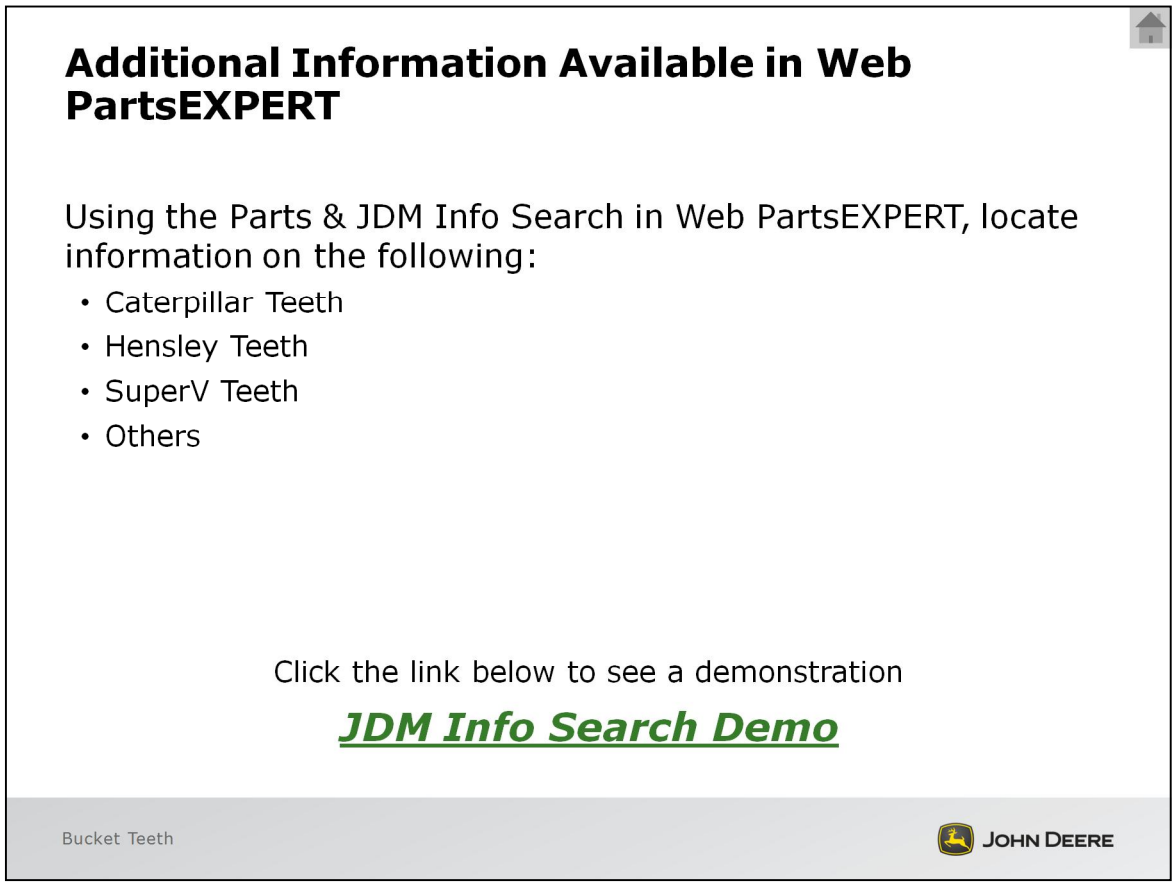
•Select Submit

PartsEXPERT returns a list of make machine and models that meet your criteria.

•Click on the model 311B for Make: Caterpillar, Machine: Excavator

•Select “Bucket Teeth” from box (4) “Select a Part Type from the list below” and click “Find Parts”

PartsEXPERT will return the list of all the parts John Deere offers that will fit the Caterpillar 311B excavator. You can print out a copy of the list for your customer by clicking on the link for “Printer-friendly Page”



•Chose the “Parts & JDM Info Search” tab in Web PartsEXPERT

•In the window for “Search by Part Group” choose “Bucket parts” by either scrolling through the list or typing “Bucket parts” in the box above the list

Web PartsEXPERT returns a list of topics in a box under the heading “Change Commodity Code:”

•From that list, select “Teeth, Caterpillar” and click on “Search”

Below the box containing the heading “Change Commodity Code,” Web PartsEXPERT will return a list of links to “Product Information Documents” and “Dealer Information Documents”

•Choose the link to “Caterpillar Replacement Part Number Explanation”

PartsEXPERT opens the link to a page displaying the explanation for how part numbers are determined for Caterpillar bucket teeth and related parts.

•When you are done reviewing the part number explanation, use your browser’s back button to return to the previous screen in PartsEXPERT

•Select any of the other links to see what additional information is available to you

Practice 8

Question 1 of 4 ▾ Point Value: 1

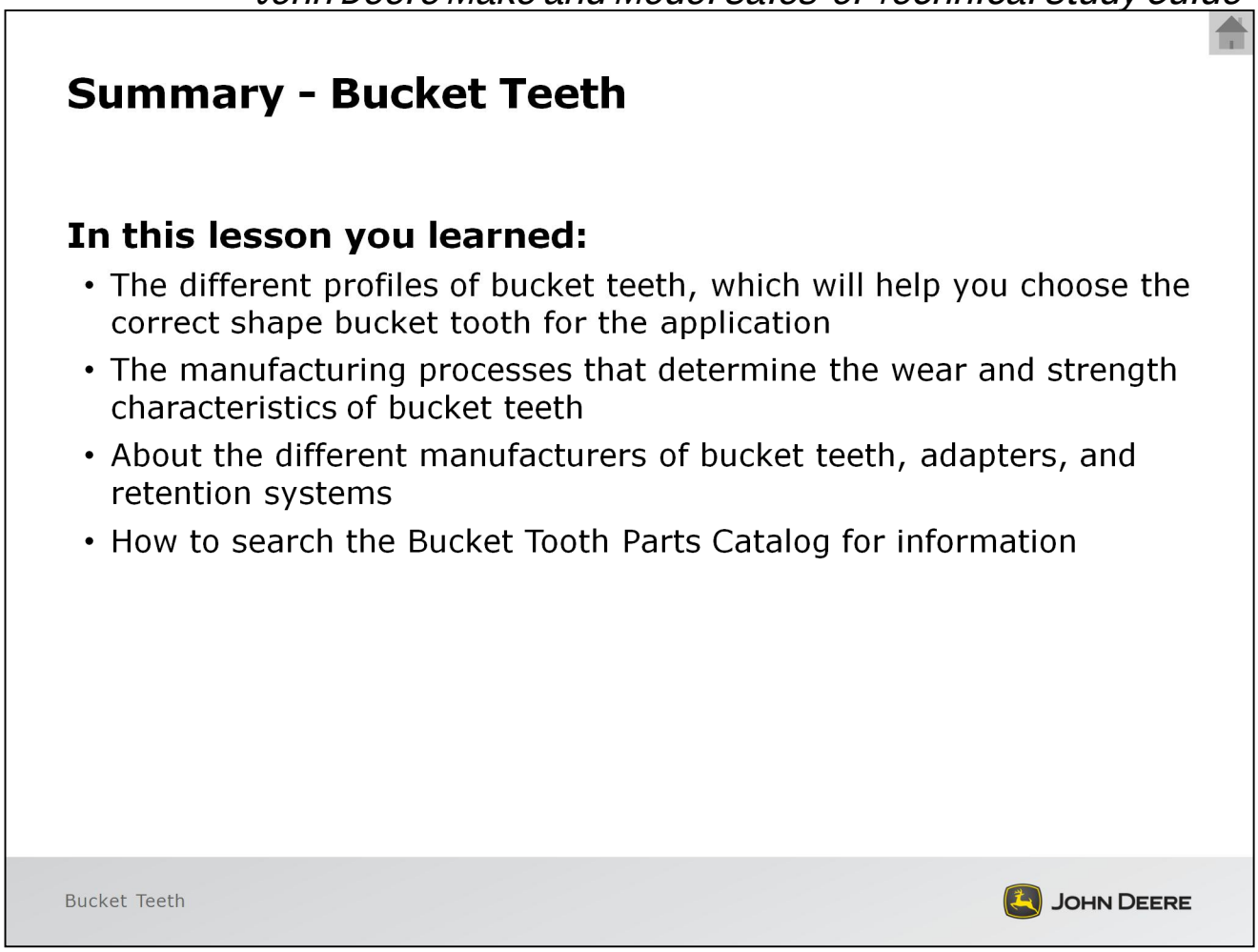
Let's say that a customer has come in with this bucket tooth. Which of the following are true about this tooth? (click on all that apply)

- ☐ Partial part number
- ☐ Flare profile
- ☐ Horizontal pin hole
- ☐ Vertical pin hole
- ☐ Fanggs profile

PROPERTIES

On passing, 'Finish' button:	Goes to Next Slide
On failing, 'Finish' button:	Goes to Next Slide
Allow user to leave quiz:	At any time
User may view slides after quiz:	At any time
User may attempt quiz:	Just Once

Properties... Edit in Quizmaker



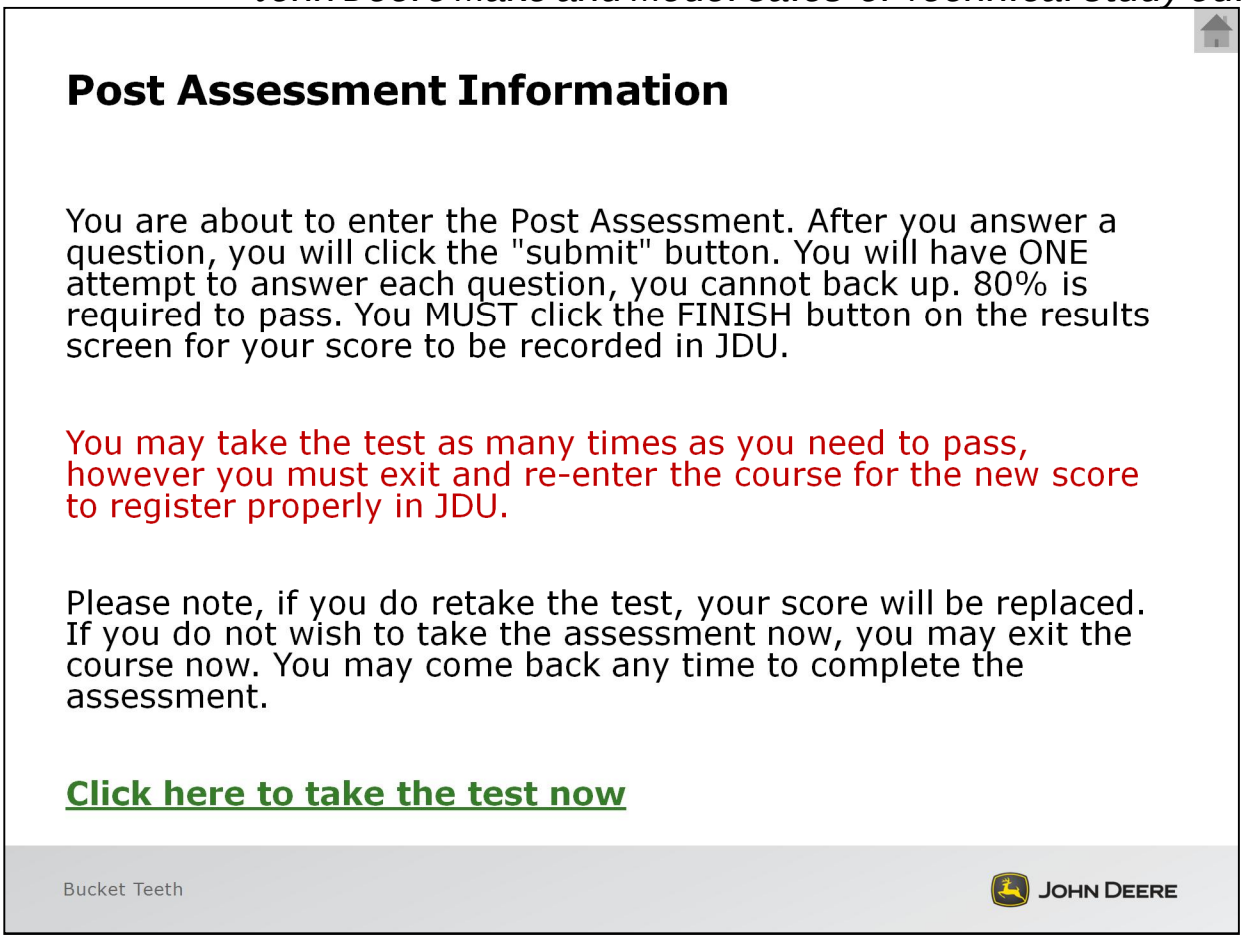
In the bucket tooth lesson:

You have learned the different profiles of bucket teeth, which will help you choose the correct shape bucket tooth for the application.

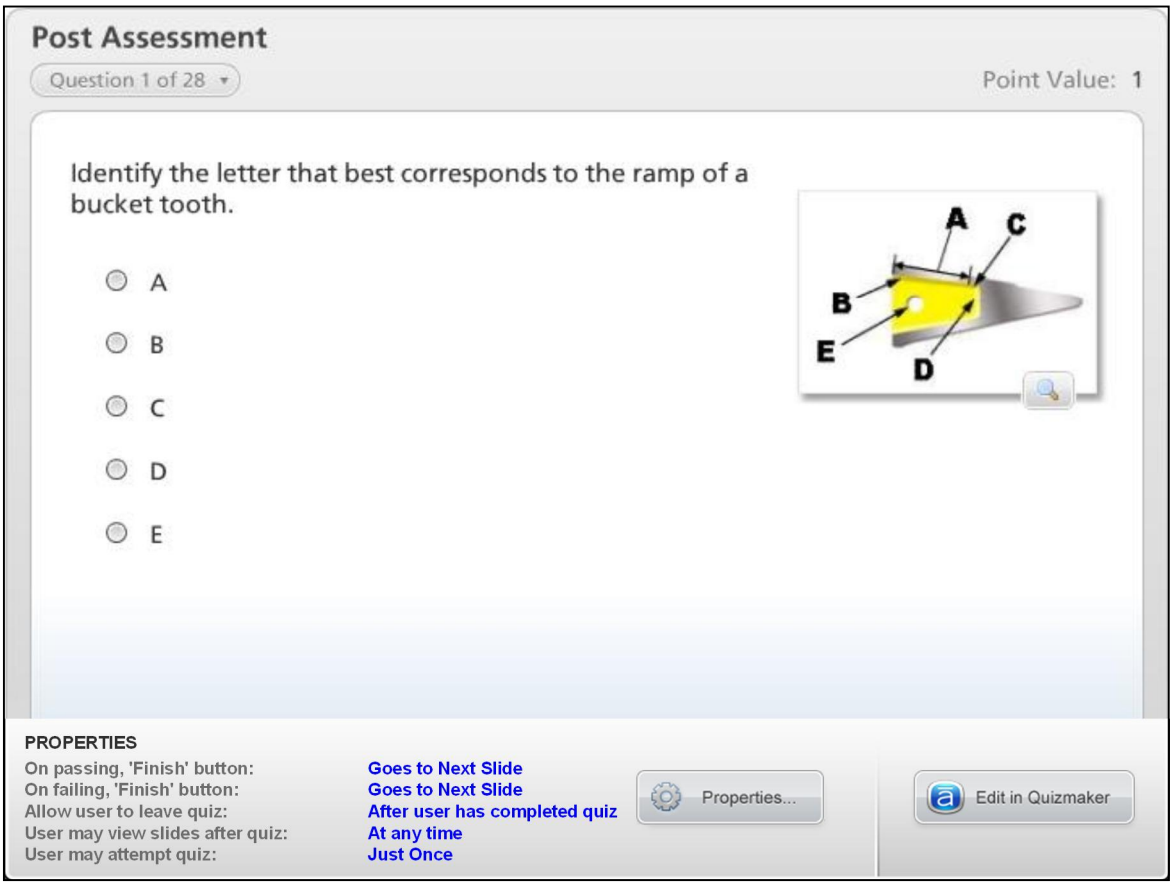
You learned the manufacturing processes that determine the wear and strength characteristics of bucket teeth. This will help you select the right tooth for the job.

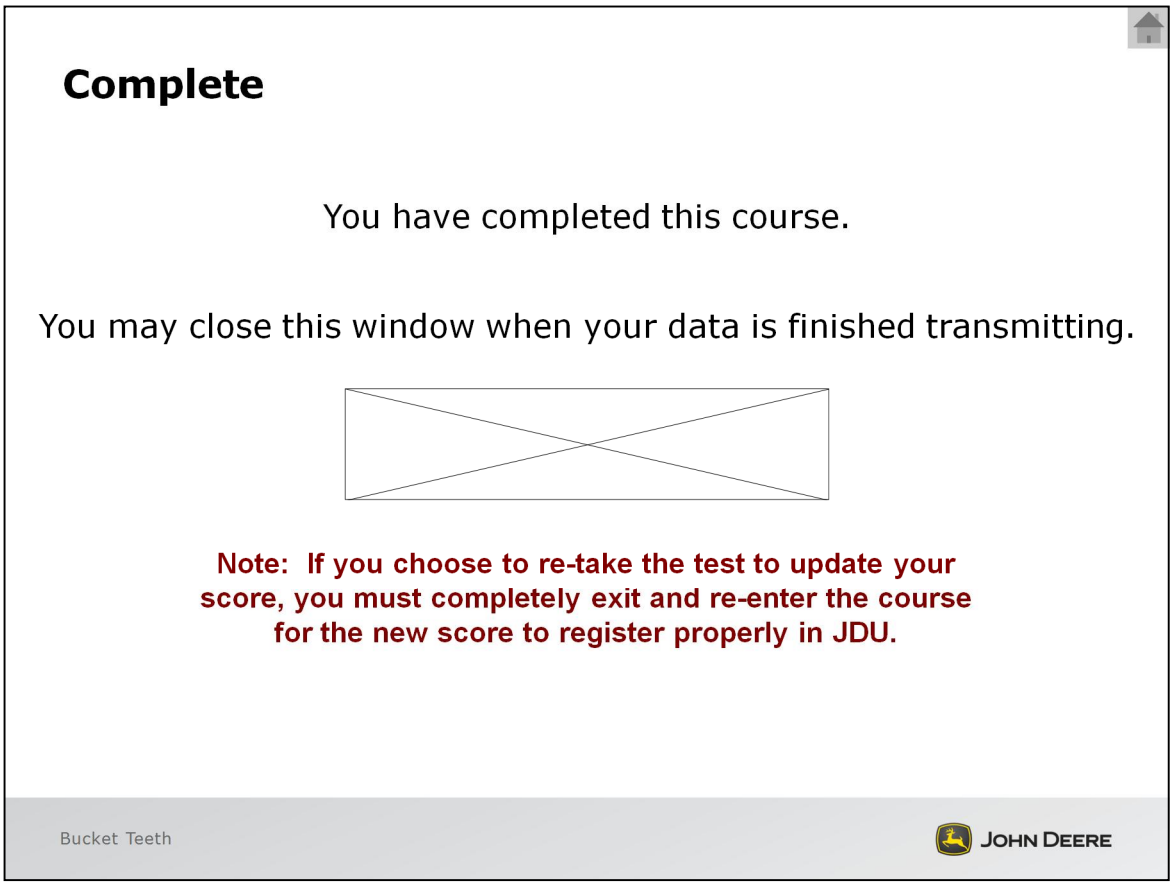
You also learned about the different manufacturers of bucket teeth, adapters, and retention systems.

And last you learned how to search the Bucket Tooth Parts Catalog for a partial part number and other information you can research.



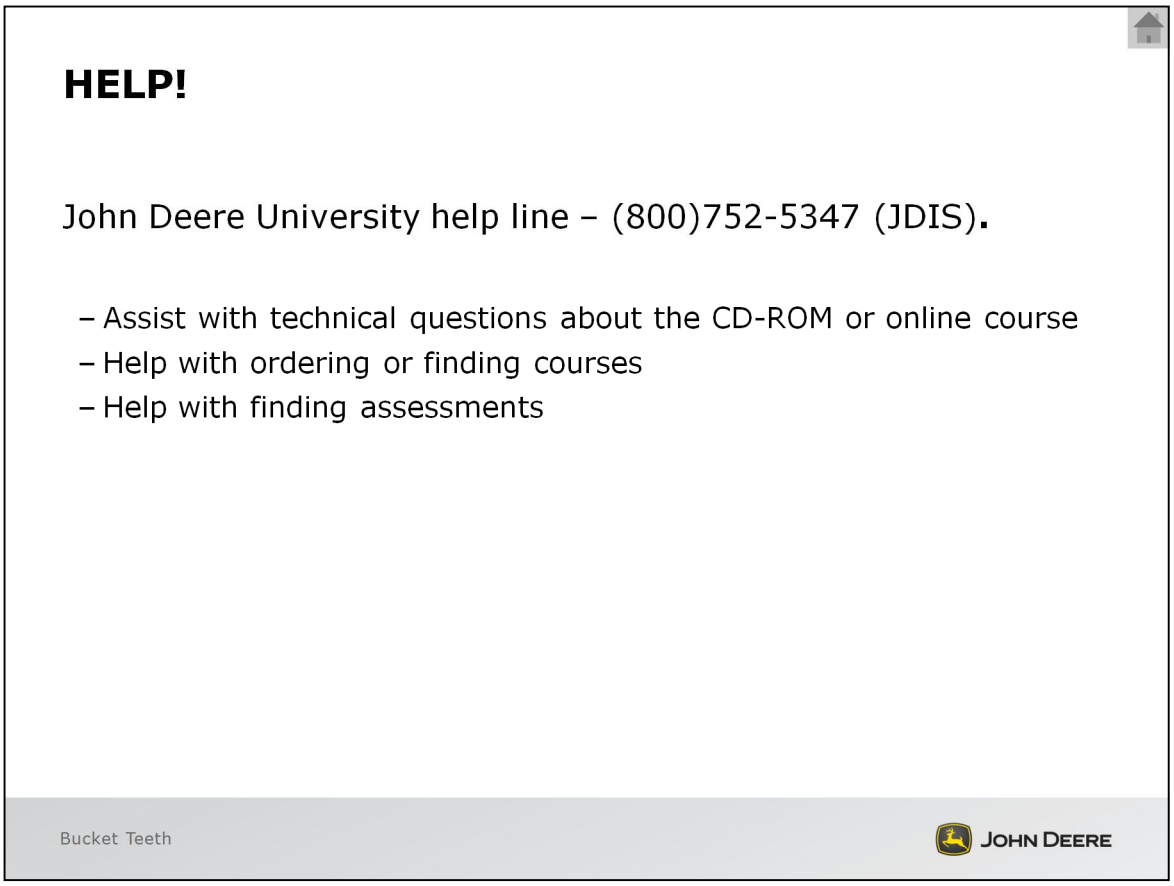
You are about to enter the Post Assessment. After you answer a question, you will click the "submit" button. You will have ONE attempt to answer each question, you cannot back up. However, you can take the test as many times as you need. 80% is required to pass. You MUST click the FINISH button on the results screen for your score to be recorded in JDU. Please note, if you have taken the assessment before, your score will be replaced. If you do not wish to take the assessment now, click the X in the upper right corner of your screen. You may come back any time to complete the assessment.


Post Assessment
Question 1 of 28
Point Value: 1
Identify the letter that best corresponds to the ramp of a bucket tooth.
A
B
C
D
E
A
C
B
E
D
PROPERTIES
On passing, 'Finish' button: Goes to Next Slide
On failing, 'Finish' button: Goes to Next Slide
Allow user to leave quiz: After user has completed quiz
User may view slides after quiz: At any time
User may attempt quiz: Just Once
Properties...
Edit in Quizmaker

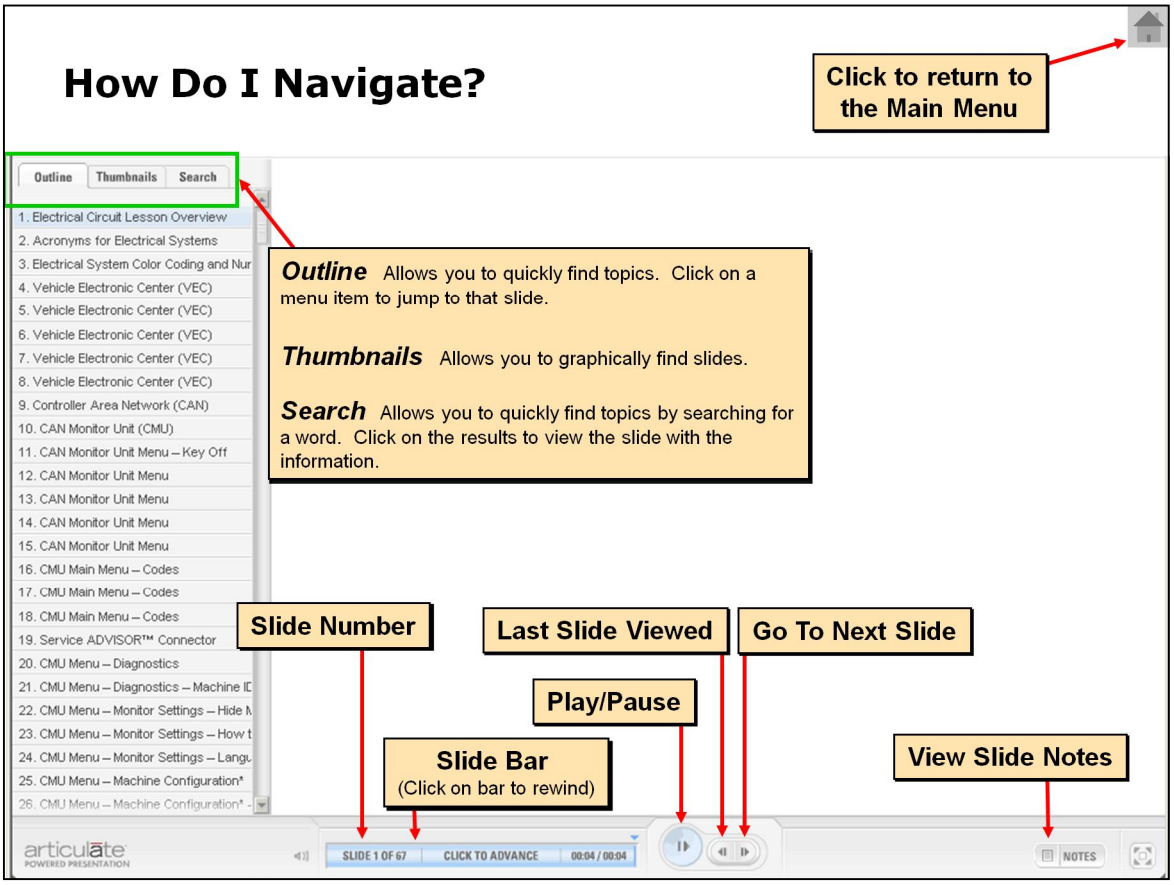


Note: If you choose to re-take the test to update your score, you must completely exit and re-enter the course for the new score to register properly in JDU.

You have completed this course. Click the X in the upper right corner of this window to close it.



For technical assistance with this course, call toll free to the JDU helpdesk.



Click on the Main Menu Button to return to the main menu.