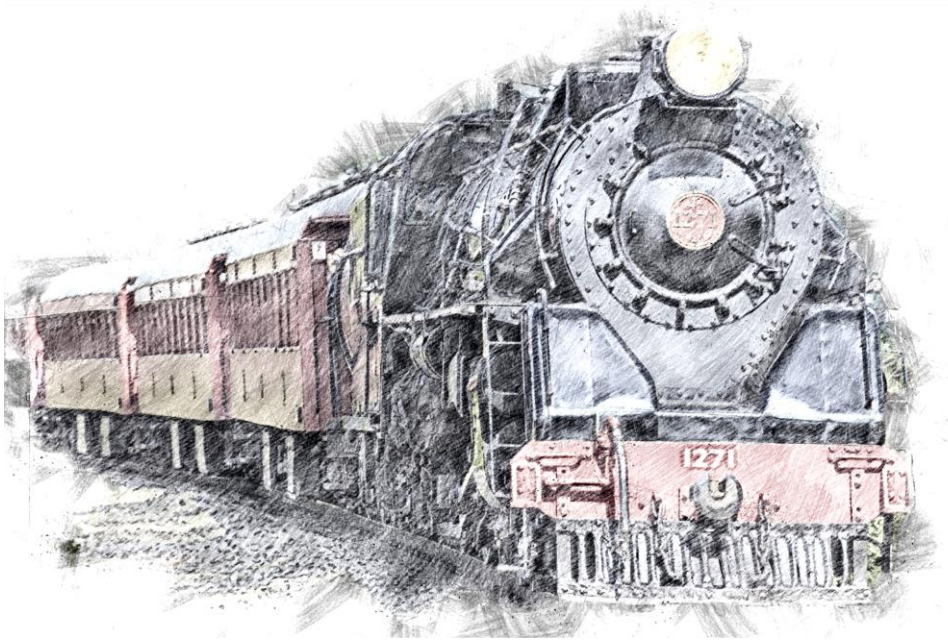
Sinterklaas Station Railroading Digest



Steam Locomotives Digest

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The Sinterklaas Station books imprint with a steam locomotive illustration encircled by the green words “Sinterklaas Station Railroading Digests” on each glossy front cover of the Sinterklaas Station books, as shown in the upper left corner of this page, is the hallmark of our children’s books as nonfiction railroading digests and fictional short story readers that entertain young engineers about trains, railroading, and associated topics.

Contents

What Is a Steam Locomotive?

Surprise Your Friends with this Answer

Definition of Steam Locomotive

A steam locomotive is a self-propelled railroad vehicle that produces its pulling power through a steam engine.

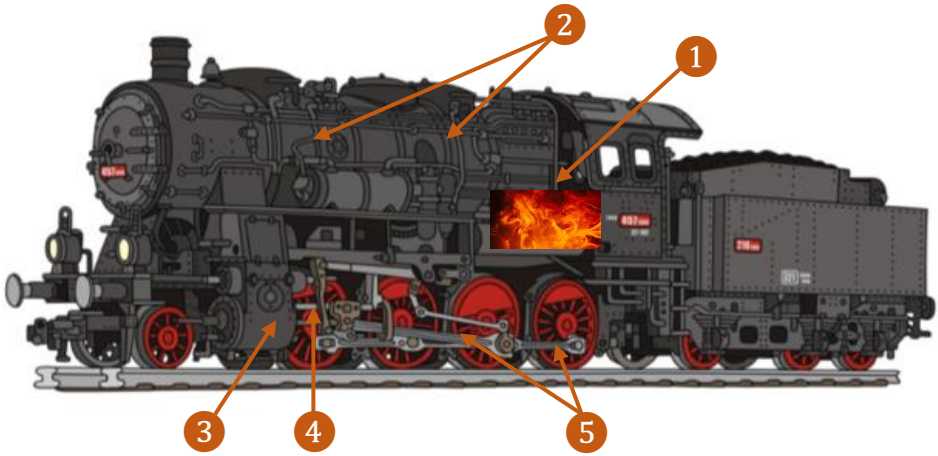
Some people call a steam locomotive a steam engine. But that's not really correct. The steam engine inside the locomotive produces the power it needs to pull lots of passenger and freight cars. Let's explain how steam makes all the other locomotive parts work.

How Do Steam Locomotives Work?

A steam locomotive contains a ***steam engine*** that produces the power to drive the ***locomotive*** forward or backward. The word "locomotive" simply refers to a powered vehicle. Technically, the locomotive and the steam engine are separate, but not independent, of each other. The steam engine produces the power needed so the locomotive can pull rolling stock.

Rolling stock refers to railroad cars that require locomotives to move them. That's because they have no power of their own. Examples of rolling stock are box cars, coal cars, tank cars, passenger cars, and cabooses—to name a few.

Refer to the illustration below for a graphic representation of how a steam engine propels a locomotive.



Basically, the ***firebox* (1)** is a large metal box that burns coal and provides heat to the ***boiler* (2)**. The boiler is filled with water, like a giant teapot. The firebox and the boiler are the main parts of the steam engine; the steam engine is a part of the locomotive. The boiling water produces steam under high pressure inside the locomotive's boiler and the steam flows down into a ***cylinder* (3)** that pushes a ***piston* (4)**. The piston is connected to the locomotive's large wheels by the ***connecting rods* (5)**. The connecting rods turn the large wheels and moves the locomotive forward or backward. There is a cylinder and piston, and connecting rods, on each side of the locomotive that moves both the left-side and the right-side wheels.

Some people define a train as "rolling stock connected together." That is, freight cars or passenger cars coupled to one another without a locomotive. This is not the correct definition. A train must consist of a locomotive and at least one rolling stock. For example, a locomotive is not a train; two or three rolling stock connected together is not a train. You will learn about the definition of a train in the next section of this book.

What Have You Learned?

Let's see what you have learned about how a ***steam locomotive*** works. Answer all the questions. Use a pencil to mark your answers so you can erase incorrect entries. The correct answers follow the quiz pages.

1. This is where the coal is burned in a steam locomotive.
    - ❑ Boiler
    - ❑ Firebox
    - ❑ Cylinder
2. This is the part of the steam locomotive that is filled with water that is turned into steam.
    - ❑ Boiler
    - ❑ Firebox
    - ❑ Cylinder
3. The main parts of the steam engine are:
    - ❑ Firebox and Cylinders
    - ❑ Firebox and Boiler
    - ❑ Cylinders, Pistons, and Connecting Rods
4. The steam engine is a part of the steam locomotive.
    - ❑ True
    - ❑ False
5. Steam flows into the cylinders that pushes:
    - ❑ Pistons
    - ❑ Connecting Rods
    - ❑ Wheels
6. The pistons are connected to the steam locomotive's large wheels by the:
    - ❑ Cylinders
    - ❑ Connecting Rods
    - ❑ Boiler

7. The cylinders and the pistons turn the large wheels and moves the locomotive forward or backward.
    - ❑ True
    - ❑ False
8. Railroad cars that require a locomotive to move them are called:
    - ❑ Trains
    - ❑ Rolling Stock
    - ❑ Freight Cars
9. Cylinders and pistons and connecting rods are located on one side of the locomotive.
    - ❑ True
    - ❑ False
10. A train must consist of:
    - ❑ A locomotive and at least one rolling stock.
    - ❑ At least two locomotives connected together.
    - ❑ Two or more rolling stock connected together.
11. Technically, a steam engine is not a locomotive.
    - ❑ True
    - ❑ False
12. Select the reason for your answer in question 11.
    - ❑ Steam engines and locomotives are the same things; that's why people call locomotives steam engines.
    - ❑ The locomotive and the steam engine are separate, but not independent, of each other.

This page is intentionally blank so you cannot see the answers to the questions on page 4.

Quiz Answers: What Is a Steam Locomotive?

1. Firebox
2. Boiler
3. Firebox and Boiler
4. True
5. Pistons
6. Connecting Rods
7. False. The connecting rods turn the large wheels.
8. Rolling Stock
9. False. Cylinders and pistons and connecting rods are located on *both* sides of the locomotive.
10. A locomotive and at least one rolling stock.
11. True
12. The locomotive and steam engine are separate, but not independent, of each other.

Watch a fun video about how a steam locomotive works. Type this address into the URL field of your web browser: **https://youtu.be/0wL1W_9U9JI**

What Is a Train?

What Many People Call a Train… Is Not!

Definition of a Train

A train is one or more railroad cars (rolling stock) connected together by couplers and moved as a unit by a locomotive.

Railroad cars by themselves or connected together are called ***rolling stock*** and not trains. Rolling stock, such as freight cars or passenger cars, cannot move by themselves and require a powered machine to pull or push them along a set of rails. These powered machines are referred to as ***locomotives*** and are powered by diesel fuel, steam, electricity, or gas turbines. Other technically incorrect definitions of a train include:

- A locomotive by itself or two connected locomotives.
- A single railroad car by itself.
- Two or more railroad cars connected together without a locomotive.

A train can consist of a locomotive and a single railroad car connected together, but two locomotives connected together without rolling stock is not a train. A locomotive and a ***tender car*** may or may not be a train. If the tender car is a structurally integrated part of the locomotive (that is, the tender car cannot be separated from the locomotive—there are no couplers), then the locomotive and the tender car do not represent a train.

If the tender car can be ***separated*** from the locomotive, then the tender car becomes rolling stock and, in this case, the two separate units (the locomotive and the tender car) when connected together by couplers become a train. Think of the tender car as a coal car that's attached to a locomotive.

Glossary

Words Used In this Discovery Book

Boiler: The part of a steam locomotive that is filled with water.

Bunker: A bin on board a tank locomotive that stores coal or oil to run the train.

Coalbrookdale: The world's first full-scale working steam locomotive.

Connecting Rods: Used for turning the large wheels of a steam locomotive.

Cylinder: A housing that contains a piston.

Firebox: A large metal box located inside a steam locomotive for burning coal.

Iron Horse: A name for a steam locomotive in the 1800s.

Piston: A part that is housed in a cylinder and operated by steam for operating another moving part.

Rocket: A locomotive that used a single driver instead of connecting rods to move its wheels.

Steam Engine: An engine that produces steam from a boiler filled with water and powers a locomotive.

Steam Locomotive: A railroad vehicle that is powered by a steam engine and used for pulling rolling stock.

Tank Locomotive: A locomotive that carries large water tanks mounted on its sides.

Tender: A separate or permanently attached car that is pulled by a steam locomotive and carries coal for fuel and water for the locomotive's boiler.

Tender Locomotive: A steam locomotive that pulls a tender.

Tom Thumb: The first American-built steam locomotive used on a common-carrier railroad.

Train: One or more railroad cars (rolling stock) connected together and moved as a unit by a locomotive.

Water Stop: A water tower along railroad tracks where steam locomotives could fill their boilers.

Wheel Configuration: The number of wheels and their arrangement on any steam locomotive for identifying a type of locomotive (such as 2-6-4 or 4-8-8-4).

2-6-4: A steam locomotive that has 2 small front wheels, 6 large middle wheels, and 4 small back wheels.

4-8-8-4: A steam locomotive that has 4 small front wheels, two separate groups of 8 large middle wheels, and 4 small back wheels.

A Special Message Just for Kids

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Happy railroading!