

Railway Emergency Response Awareness / Guide



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ABOUT THE RAILWAY ASSOCIATION OF CANADA

RAC represents close to 60 railway companies and more than 60 associate members (suppliers, consultants, etc.). Our railways get millions of people and \$380 billion worth of goods across our country and to global markets each year. RAC advocates on behalf of its members and associate members to ensure that the rail sector remains globally competitive, sustainable, and most importantly, safe. Learn more at railcan.ca.

Follow us on Twitter: @RailCanada or LinkedIn: ca.linkedin.com/company/railway-association-of-canada

MISSION STATEMENT

RAC will educate and collaborate with supply chain partners, governments, regulators and other stakeholders and advocate to ensure rail's ongoing role in safely and efficiently moving Canada's goods, resources and people.

VISION STATEMENT

Rail will be valued as Canada's safest, most innovative and fastest growing mode of transportation in the future.

SAFETY

Safety is our first priority. Everything we do stems from doing it safely and securely.



Railway Association
of Canada

Section 1 / Introduction

Dangerous Goods are an indispensable part of our way of life, and each year millions of dangerous goods shipments are transported by rail.

Canada's rail network spans eight provinces in Canada and sixteen U.S. States, connecting ports on three coasts: the Atlantic, Pacific and the Gulf of Mexico. Railways transport a wide range of products across its networks, products which are essential to the economy and to communities across North America, including dangerous goods. These dangerous goods account for only a small part of the overall commodities that shipped by rail.

MOVING DANGEROUS GOODS SAFELY

Whether moving dangerous goods or any other freight on our networks, we know that safe operations are the first priority and are critical to all stakeholders: employees, customers and the communities through which our trains travel.

As rail transportation companies in North America, we are legally required to serve all customers under our common carrier obligations. While we cannot refuse goods from customers, we recognize the important role we have to ensure the safety of communities when transporting dangerous goods.

HOW THESE PRODUCTS ARE MOVED

Dangerous goods can be transported in many different types of cars, including tank cars. These cars are built to federal regulations and specifications by railcar manufacturers. Railways own very few tank cars and those are used mainly to transport materials necessary for the operation of the railroad, such as lube oil, non-potable water and diesel fuel. The primary owners of the tank cars used to transport dangerous goods are chemical shippers and third-party leasing companies.



RAC Railway Emergency Response Awareness Guide was developed to assist local emergency response organizations in their efforts to plan for and respond to railway-related incidents or emergencies.

RAILWAY SAFETY INITIATIVES: RAILWAYS ARE COMMITTED TO SAFETY

This Emergency Response Guide has been developed to assist local Emergency Response Organizations in their efforts to plan for and respond to railway related incidents or emergencies. It is also designed to be a reference resource, and as a hand-out to supplement training programs presented by RAC to the emergency response community.

Because this guide is designed to augment local response plan(s), it is purposely brief and designed to cover only the key information needed by planners and response organizations in the event a Dangerous Goods incident involving the railway should occur.

This information may assist local planners to prepare for and respond to potential rail incidents or emergencies. This guide is also designed to provide responders with accurate and efficient access to RAC's Dangerous Goods Team members, which may also assist in engaging local and/or private resources.

Prevention

Safe transportation of Dangerous Goods and incident prevention is a primary focus and challenge of RAC's Dangerous Goods team, with the goal of minimizing risks and maximizing employee and transportation safety and protection of the environment. These goals are achieved through an effective program of employee training, first responder outreach training, inspections and regulatory compliance. In addition, RAC actively engages with the shipper following rail incidents to identify factors given rise to the incident and minimize the potential of the incident reoccurring.

Enhancing Safety Practices

Railways are continuously working to further reduce the potential for, and impact of, accidents on our networks. We've strengthened our robust train securement practices and restricted the speeds of trains hauling highly flammable liquids. We have invested in our flaw detection capabilities and conducted corridor risk-assessments to assess risk factors such as population, waterways, and volumes of dangerous goods along key corridors on our network.

Replacing Tank Cars

RAC supports the retrofitting or phase-out of older model tank cars used to transport flammable liquids, and reinforced standard for new tank cars built in the future.

Working with Communities

We believe the rail industry can enhance safety by working more closely with communities. We engage first responders and civic officials, sharing information about our safety programs, notification and response protocols, and the training we can offer in our mutual goal to protect public safety.

Section 2 / Emergency Planning and Preparedness

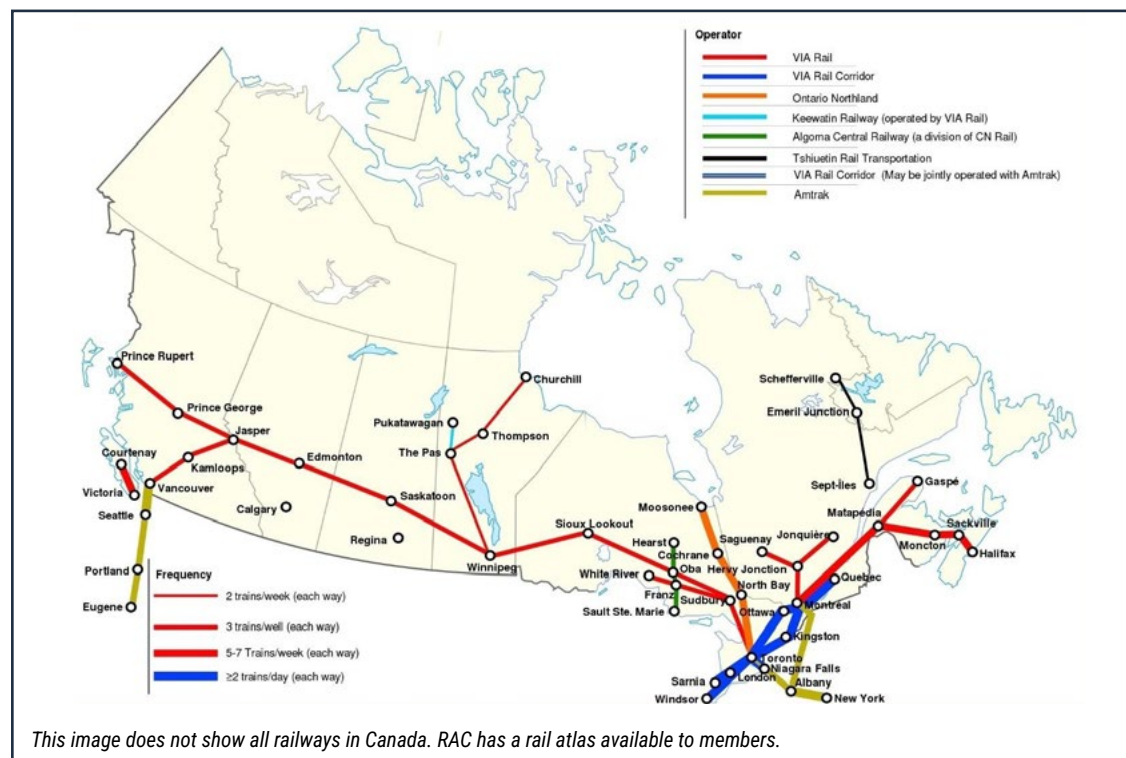
Effective emergency response begins with planning and preparation. This can be accomplished through assembly of an emergency plan, conducting training and emergency response exercises and by the performance of regular evaluations to test the effectiveness of the response plans.

GET TO KNOW THE RAILWAYS WITHIN YOUR COMMUNITY

The first step in planning for a railway incident is for emergency planners to familiarize themselves with local rail lines in their area to determine ownership of the line.

Although there are only seven major Class 1 rail ways in North America, there are hundreds more shortlines and regional railways in operation.

These railways operate independently of each other; therefore it is imperative that you properly identify those lines in your community.



In Canada, the Railway Association of Canada online atlas can help to identify the railways in your community: <https://rac.jmaponline.net/canadianrailatlas/>

IDENTIFY YOUR LOCAL RAILWAY(S)

The first step in creating a railway incident response plan is to identify the railways within your jurisdiction. It is critical that emergency planners familiarize themselves with local rail lines to determine ownership of the rail line, establish emergency contacts with that railway, and plot out potential access routes for emergency response vehicles.

If there are multiple rail lines within the area, ensure that each has been correctly identified.

Railroads will have identifiers at every public road crossing, which display the name of the railway, the mile post and the emergency telephone number for that railroad.

This crossing information may be affixed to crossbucks, railroad signal masts and lights, or nearby signal bungalows and relay houses, and can be a decal or the new standard blue railway information plate.



Mile post markers may also be found along the tracks mounted to posts in the ground. As railways operate thousands of track miles with multiple repetitive mile post numbers, the mile post number alone cannot accurately indicate your location. You will require subdivision information as well.

For assistance in determining the track mile post numbers and subdivisions in your community, contact the appropriate railway.

ESTABLISH COMMUNICATION WITH THE RAILWAY(S)

Once it has been determined which railway(s) have rail lines within your community, it's important to establish communication with them. The railways can assist in your emergency planning in a number of ways, with vital information regarding their local tracks, yards, terminals, and train traffic specific to your area. Phone numbers for RAC DG Team, RAC Member Railways including Class I railways operating in Canada are found in section 3.

ESTABLISH COMMUNICATION WITH THE RAILWAY'S DANGEROUS GOODS/HAZMAT TEAM

The Railway Association of Canada (RAC) promotes the efficient operation of the Canadian railway industry and established a Dangerous Goods team in 1999 to serve the industry in the safe transportation of dangerous goods. This team is made up of Transportation of Dangerous Goods Specialists (TDGS) who are a resource to all RAC members, the shipping community, regulators and emergency services personnel.

RAC maintains a staff of three (3) specialists trained to respond to rail-related incidents and emergencies. These Dangerous Goods Specialists are strategically located in Montreal, Toronto and Edmonton to assist company personnel and local emergency responders in mitigating emergency situations. These RAC DG Team members have a variety of response tools and resources available to them and will work with other Member Railways (through an MOU) and local incident command personnel to ensure a safe and efficient handling of an incident.

RAC Dangerous Goods Specialists can provide assistance and guidance in your emergency planning efforts, as well as training in railway emergency response and tank cars.

Section 3 / Railway Contacts & Resources

RAILWAY ASSOCIATION OF CANADA DANGEROUS GOODS TEAM

Scott Croome Director, Dang. Goods Toronto, ON (C): 647.206.2896	Nicholas (Nick) Hodge TDG Specialist, Eastern Canada (c) 514.891.8935	Curtis Myson TDG, Specialist, Western Canada Edmonton, AB (C): 780.619.2763
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RAILWAY EMERGENCY PHONE NUMBERS

RAIL COMPANY	EMERGENCY PHONE #
ArcelorMittal	1-418-766-2000 ext. 2998
BNSF Railway	1-800-832-5452 (option 1)
Barrie-Collingwood Railway (ON)	1-705-734-1275
Battle River Railway (AB)	1-780-678-0327
Big Sky Rail (SK)	1-306-992-5920 (Option 1)
Cape Breton & Nova Scotia Railway	1-802-527-3490
Carlton Trail Railway (SK)	1-800-533-9416
CN Rail Police	1-800-465-9239
CPKC Rail Police	1-800-716-9132
CSX Railroad (ON/QC)	1-800-232-0144
Eastern Maine Railway	1-506-632-4692
Essex Terminal Railway	1-519-973-8222 ext. 228
Goderich Exeter Railway (ON)	1-802-527-3490
Great Western Railway (SK)	1-306-297-2777
Huron Central Railway (QC)	1-802-527-3490
Knob Lake and Timmins Railway (QC)	1-888-641-2177
New Brunswick Southern Railway	1-506-632-4692
Ontario Northland Railway	1-800-558-4129 ext. 141
Ottawa Valley Railway	1-802-527-3490
Quebec Gatineau Railway	1-888-641-2177
Saint-Lawrence & Atlantic Railway (US)	1-802-527-3490
Saint-Lawrence & Atlantic Railway (Quebec)	1-888-641-2177
Southern Ontario Railway	1-802-527-3490
Southern Railway of British Columbia	1-604-521-4821
St. Paul and Pacific Northwest Railway (BC)	1-612-578-5646

CHEMICAL RESOURCES

CANUTEC (Canadian Transport Emergency Center)

Operated by Transport Canada, providing a bilingual (English and French) advisory service for incidents involving dangerous goods.

1-613-996-6666

1-888-CANUTEC (226-8832)

By cell phone (in Canada only) *666

24-hour non-emergency: 1-613-992-4624

CHEMTREC (Chemical Transport Emergency Center)

A service of the American Chemistry Council, providing 24-hour assistance to first responders for incidents involving hazardous materials.

1-800-424-9300

Outside the U.S.: 1-703-741-5500

EMERGENCY RESPONSE PLANS



If there are railway tracks and operations within your jurisdiction, it is important to have an emergency plan to safely and effectively respond to potential railway emergencies.

The railway will play a critical role in response and recovery operations; therefore, it is recommended to coordinate with them in the planning.

Canadian railways must have comprehensive emergency response plans in place to ensure an immediate effective response in the event of an incident involving dangerous goods. They must also provide municipalities with regular reports about the dangerous goods moving through their communities (*recommendation 30 from the TC Emergency Response Task Force*).

DANGEROUS GOODS INFORMATION FOR YOUR COMMUNITY

Canada's railways worked with Transport Canada and the Federation of Canadian Municipalities to develop a process for providing valuable information on the dangerous goods transported through communities to assist emergency planners in developing effective and realistic emergency response plans.

This process, Transport Canada Protective Direction 36, allows communities to designate and register an Emergency Planning Officer (EPO) through the Canadian Transport Emergency Centre (CANUTEC).

Railways then provide the designated EPO of each municipality through which dangerous goods are transported with reports. The EPO will also receive an annual report (differences between Class I vs. NonClass I) on dangerous goods transported through their jurisdiction that may be shared with the public.

How to Register an EPO with CANUTEC

The municipality must send their designated EPO's contact information to the following address:

Canadian Transport Emergency Centre (CANUTEC)

Place de Ville, Tower C

330 Sparks Street, 14th Floor

Ottawa, Ontario, K1A 0N5

Attention: Director of CANUTEC

Or by email to: TC.ProtectiveDirection-OrdrePreventif.TC@tc.gc.ca

FIRST RESPONDER RESOURCES

AskRail™

The **AskRail™** mobile app is one of many ways Canada's railways are working to protect communities and first responders along rail lines. **AskRail™** is a safety tool that gives responders immediate access to timely and accurate data about railcar contents, so they can make informed decisions in the event of a rail emergency. **AskRail™** is a backup resource if information from the train conductor or train consist is not available.

- Use a simple railcar ID search to see whether a railcar on a train is carrying dangerous goods.
- View the contents of the entire train.
- All Class I railroads in North America use the app.
- Access information from the North American Emergency Response Guidebook.
- Available in English and French.



HOW TO REQUEST FULL ACCESS TO THE APP

The **AskRail™** App is available from the App store or Google Play and you need to indicate the supporting railway – CN or CPKC.

DETAILS ON HOW TO SIGN UP ARE HERE: [HTTP://ASKRAIL.US/](http://askrail.us/)

1. Download the app from the Google Play Store, the Apple App Store, or download the Windows Desktop Application.
2. Complete the registration process in the app on your device.
3. You will receive an email notification once your registration has been approved. The approval process may take up to several weeks.
4. Once you have been approved to use the app, the app will become fully functional and ready for use.

For AskRail™ app help at:

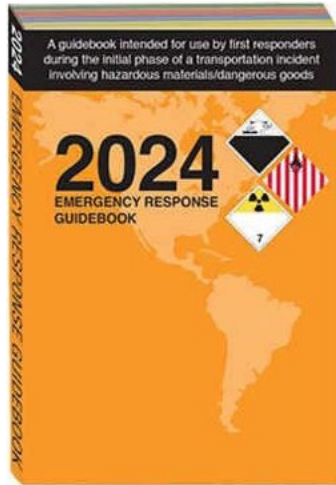
CN – askrail@cn.ca

CPKC – HMReports@cpr.ca (community_connect@cpr.ca)

The **#AskRail** app, launched in 2014, is a collaborative effort by all North American Class 1 railways, the Association of American Railroads, the Railway Association of Canada, Railinc Corp. and the Transportation Technology Center Inc.

2024 Emergency Response Guidebook

The 2024 Emergency Response Guidebook (ERG) was developed jointly by Transport Canada (TC), the U.S. Department of Transportation (DOT), the Secretariat of Transport and Communications of Mexico (SCT) and with the collaboration of CIQUIME (Centro de Información Química para Emergencias) of Argentina, for use by fire fighters, police, and other emergency services personnel who may be the first to arrive at the scene of a transportation incident involving dangerous goods.



The ERG2024 is primarily a guide to aid first responders in quickly identifying the specific or generic hazards of the material(s) involved in the incident and protecting themselves and the general public during the initial response phase of the incident.

This guidebook will assist responders in making initial decisions upon arriving at the scene of a dangerous goods incident. It should not be considered as a substitute for emergency response training, knowledge, or sound judgment. ERG2024 does not address all possible circumstances that may be associated with a dangerous goods incident.

[Download the mobile app version of the 2024 guidebook](#) on Canutec's Website

OTHER MOBILE APPLICATIONS FOR FIRST RESPONDERS



FIRST Responder Support Tool

An app providing police, firefighters, security and emergency management personnel easy access to map-based standoff distances and hazmat spill evacuation areas. The app is available from Apple iTunes and Google Play stores.



NFPA Hazmat FLIC

Providing on-scene Incident Commanders with guidance material for managing emergency responses for high hazard flammable train and petroleum pipeline emergencies. The app is available from Apple iTunes and Google Play stores.



NIOSH Pocket Guide to Chemical Hazards

The NIOSH Pocket Guide to Chemical Hazards (NPG) is a source of general industrial hygiene information on several hundred chemicals and classes. The information found in the NPG can help users recognize and control occupational chemical hazards. The NPG is available in pdf or for download as an app on iPhone and Android devices.

www.cdc.gov/niosh/npg/

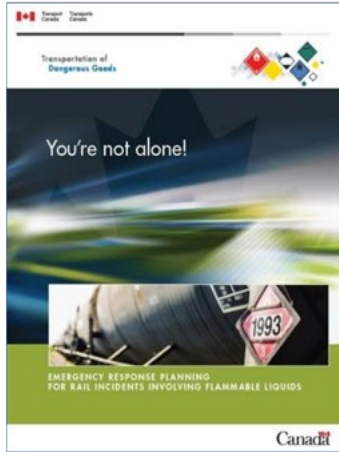


Canadian Emergency Response to Flammable Liquids in Transport Level I – Online Training

Canadian Association of Fire Chiefs (CAFC) & Canadian Association of Petroleum Producers (CAPP), the Rail and Chemical Industries jointly developed this online training.

This presentation provides first responders with the information they need to be able to: a) assess hazards at the scene of a rail incident involving flammable liquids; b) identify who to contact and the available resources; and c) respond appropriately in an emergency involving rail cars.

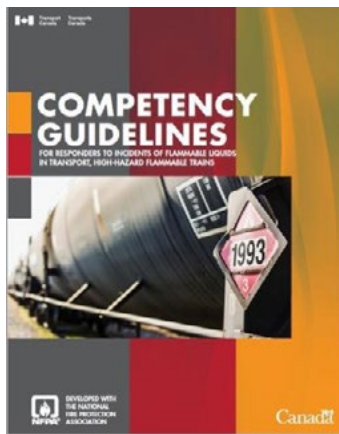
www.rail.capp.ca



You're Not Alone! Emergency Response Planning for Rail Incidents involving Flammable Liquids

This document is intended for local Emergency Response planners as well as Firefighter's, Police and Emergency Medical Responders. It assists communities prepare for potential rail incidents involving the transportation of dangerous goods such as flammable liquids (crude oil, diesel fuel and gasoline).

Downloadable PDF copy: <https://www.tc.gc.ca/eng/tdg/safety-menu-1318.html>



Competency Guidelines for Responders to Incidents of Flammable Liquids in Transport, High Hazard Flammable Liquids Trains

Transport Canada's Emergency Response Task Force (the Task Force) developed this Guideline in partnership with the National Fire Protection Association. It is designed to enhance first responder safety during an incident involving flammable liquids transported by rail, frequently referred to as High-Hazard Flammable Trains (HHFT).

The Task Force was established by then Minister of Transport, Lisa Raitt in April 2014, to propose ways to enhance the response capacity to large scale rail incidents involving flammable liquids. Its members include experts from the first responder community, chemical and oil producers and distributors, rail carriers and other key industry stakeholders.

EMERGENCY RESPONSE ASSISTANCE PLAN (ERAP)

An ERAP describes how the shipper of higher risk dangerous goods will respond in the event of a transportation incident. The Transportation of Dangerous Goods Regulations require ERAPs for dangerous goods that require special expertise and response equipment to respond to an incident. The plan can help local emergency responders by providing them with technical experts and specially trained and equipped emergency response personnel at the scene of an incident.

The ERAP will:

- describe the specialized response capabilities.
- equipment and procedures the shipper has available to support a response to incidents involving high risk dangerous goods.
- address emergency preparedness, including personnel training, response exercises and equipment maintenance.

The ERAP plans supplement those of the local and provincial authorities and must be integrated with other organizations to help mitigate the consequences of an incident.

This integration is usually accomplished by working within an incident management system – usually an Incident Command System or Incident Command Structure.



EMERGENCY RESPONSE TRAINING AND TRANSCAER®

Railway Emergency Response Course

The Railway Association of Canada DG Team hosts 2 Railway Emergency Response Courses at the Justice Institute of British Columbia (JIBC) Fire and Safety Campus Maple Ridge, BC each year.

This **40+** hour course is a must attend by Railway and Industry personnel, First Responders, E/R Contractors, and Regulators. The main goal of this specialized course is to provide specific, rail-based emergency response training to persons who are already trained in technical response to dangerous goods incidents.

This Canadian based course consists of lecture sessions in tank car construction, site safety, dangerous goods, tank car damage assessment, incident command, tank car valve construction, transfer techniques, flaring techniques, site assessment, documentation, plugging/patching and TDG regulations. We have recently added an introduction of Flammable Liquids by Rail session as well.

TRANSCAER® (TRANSPORTATION COMMUNITY AWARENESS AND EMERGENCY RESPONSE)



The **TRANSCAER®** initiative is a voluntary program led by the Chemistry Industry Association of Canada (CIAC) and RAC in partnership with chemical producers, fuel producers, railways, trucking and chemical distribution companies from coast to coast.

Through **TRANSCAER®**, Canada's railways provide free training to First Responders (Fire, Police and EMS) on how to handle a transportation incident involving dangerous goods. RAC's participation in **TRANSCAER®** is further proof of the railway industry's commitment to the safe handling and transportation of dangerous goods.

For more information on **TRANSCAER®** in Canada or to find outreach training events in your area, go to the **TRANSCAER®** website transcaer.ca.



OPERATION LIFESAVER CANADA



[Operation Lifesaver Canada \(OL\)](#) is a not-for-profit, funded by Transport Canada and the Railway Association of Canada, that works with the rail industry, governments, law enforcement, labour groups, the media, and communities from coast to coast to prevent collisions at rail crossings and railway trespassing incidents.

OL's goal is to create safety-conscious attitudes toward railways, promote safe driving skills, and encourage Canadians to adhere to railway signs and warnings—because we know this will result in fewer collisions and trespassing incidents, and fewer lives lost. We promote rail safety through a variety of partnerships, campaigns and other initiatives, including:

- [Look. Listen. Live](#) — a campaign that uses virtual-reality to get Canadians thinking—and acting—differently around railway crossings, property and trains;
- [Look. Listen. Live. Community Safety Partnerships](#) — a program that encourages municipalities to install Look. Listen. Live. decals near crossings in their communities;
- [#STOPTrackTragedies](#) — a video campaign that tells the personal stories of people affected by railway crossing and trespassing incidents; and
- [Train to Drive](#) — a training tool that immerses drivers in a virtual-reality environment and asks them to make real-time decisions behind the wheel near virtual rail crossings.

For more information about Operation Lifesaver, please contact:

admin@operationlifesaver.ca 613-564-8100

www.operationlifesaver.ca



RAILWAY SAFETY – BASIC AWARENESS

The railway can be a challenging environment with many hazards. SAFETY is everyone's priority while on railway property.

The number one rule to observe is to expect a train or rail equipment on any track, in either direction, and at any time.

Basic Safety on Railway Property

- The walking surface (ballast) is comprised of rock and may be uneven. Care should be used when walking on ballast and all rights-of-way. If possible, cross only at a grade crossing, as these provide a more level walking surface.
- Don't cross tracks near switches or any other movable track structure, and never step on rails or other parts of the structure which may be slippery.
- If you must cross tracks, stay at least 25 feet from the ends of railroad cars, locomotives or on-track equipment and look both ways; be sure no equipment is moving toward you. When near any track, expect a train to move in either direction at any time. Cross tracks at a right angle to maximize the field of vision within the fouling space.
- Ensure there is at least 50 feet of clearance between two pieces of standing cars, locomotives, or on-track equipment before attempting to cross between them.
 - **Never step on the rail. Step over the rail. The rail can be a slip or trip hazard.**
 - **Never stand between the rails.**

Expect a train or rail equipment on any track, in either direction, at any time.



RAILWAY SAFETY FOR FIRST RESPONDERS

- **DO NOT** enter railway property without informing the railway.
- **Confirm all rail traffic is stopped.**
- **Confirm track is locked out and you are protected.**
- Follow all railway safety rules and instructions of railway personnel.
- **DO NOT** Foul (obstruct) the track or drag hoses across tracks.
- **Never** climb over, under, or through rail equipment unless railway representatives inform you the area has been secured and is being protected by railway personnel.
- Position yourself or equipment at least 25 feet away from the nearest rail. If you and your equipment are within four feet of the nearest rail, there is immediate danger of being struck either by equipment or material carried by rail cars. If you find that you must obstruct the track, then you must contact the railway and receive positive verification from the railway that it is safe to do so before the track is obstructed. Bear in mind that rail equipment extends out over the outside limits of the rail.
- Be careful when you must cross more than one track, parallel tracks may belong to two different companies or be under control of two different employees of the same company.

CONFIRM ALL RAIL TRAFFIC IS STOPPED

CONFIRM THAT THE TRACK AND EQUIPMENT ARE SECURED AND PROTECTED BY RAILWAY PERSONNEL

Stopping a Train

- Because of the weight of trains, stopping requires a long distance. To request a train to stop, contact the Railway.
- The train may require more than one mile to stop. Plan and prepare in advance for adequate stopping distance.
- Never foul the tracks until the Railway acknowledges the train has stopped.
- Remember to provide lookouts in both directions along the track for protection.

Climbing Equipment



- If it is necessary to climb rail equipment, **always use three points of contact**.
- The ladders on rail equipment may curve around the car allowing little access for your feet. The first step on to rail equipment is typically some distance off the ground. When descending the ladder, do not jump from the last step.
- If you use your own ladders, remember to block the feet and tie off at the top.
- Locomotive steps are considered ladders. Always face the locomotive going up and coming down. Keep three points of contact.
- Never climb or walk on the roof of a locomotive.

Obstructing (Fouling) the Track

If a situation occurs where you must obstruct the track, either with equipment (such as hoses or trucks) or personnel, then you must contact the railway and receive positive verification from the railway that it is safe to do so before obstructing the track.

Be aware: equipment extends out over the outside limits of the rail.



Driving Across Tracks

As vehicles can easily become hung up on tracks, cross only at grade crossings, heeding all crossing warning devices.

Conducting Work on or Near Tracks

IF YOU ARE GOING TO BE ON OR NEAR THE TRACKS WE NEED TO KNOW!



Contact must always be made with the railway before conducting work on or near rail property.

Once you have called, confirm the tracks are safe... You can ask for someone from the railway to attend!

There may be pipelines, fiber optic cables or other buried communication lines on the railways right-of-way. These lines will usually be marked with signs on posts. To be certain not to affect these utilities, you must always verify with railway personnel before digging on any right-of-way.

Railway Safety – Remote Control Locomotives

Before entering a rail yard, responders should be aware that some locomotives may not be manned during switching operations but are instead controlled remotely.

An operator may very well be up to half a mile away from the locomotive. These remote-control locomotives will have flashing lights when operated in "remote" mode. Exercise extreme caution and allow for plenty of room when crossing tracks occupied by a remote-control locomotive.



As always, before entering any railway has confirmed its understanding that you are on site.

Section 4 / Response

INCIDENT RESPONSE

Railway accidents present a unique challenge; therefore, it is crucial that responders follow the necessary steps if confronted with such an incident.

NOTIFY THE RAILWAY

Important To Note:

Contact the railway for all emergencies involving railway property, not just in the cases of derailments or dangerous goods incidents.

Other types of incidents may include crossing accidents, vehicles stuck on the tracks, fires, medical emergencies, trespassing and utility issues.

It is vital to also notify the railway of incidents and accidents that are not on railway property but may affect the railway. These incidents may require the movements of trains to be stopped or slowed.

CONFIRM YOUR LOCATION

Confirm your location and which railway. Look for mile posts or grade crossing numbers.

LOCATE THE TRAIN CREW

When you respond to a railway incident, locating the train crew is one of the first things you should do when arriving on the scene.

They will have the most current and updated list of the train's consist on the scene. This will assist you to identify the material in each car.

If the crew is unavailable, use the railway's emergency number to establish communication with the railway. You can also query the contents of a rail car on the train through the AskRail app, if the train crew cannot be located.

As well, all responding railway officers should have a copy of the consist or paperwork, or a means to obtain it.

Examples of train consist are in Section 4. Pages 36-37 and appendix B of this guide.

COMMUNICATION WITH THE RAILWAY AND ITS RESPONDERS WILL HELP TO FACILITATE A COORDINATED RESPONSE.

The following are the actions to consider when managing a railway incident.

SECURE THE AREA

The incident may span a large distance and securing this area may require many personnel.

ESTABLISH THE PROPER HAZARD ZONES

Consult the North American Emergency Response Guidebook (ERG) to establish an isolation zone if necessary.

BEGIN A SITE ASSESSMENT

This must always be done from a safe distance, upwind and uphill.

ESTABLISH INCIDENT COMMAND

It is critical that Incident Command (ICS) be established as early as possible during the incident, to coordinate resources, achieve response objectives and help to ensure a safe, secure response. When a railway incident occurs, the most senior Transportation officer on scene will act as the railway's representative within the Incident Command Structure.

DETERMINE AVAILABLE RESOURCES

When managing an incident, it is important to be aware of the resources available to you. This may mean equipment, but also includes the railway and its' dangerous goods officers (DGO), or personnel that have been specifically trained to respond to dangerous goods incidents involving railway equipment, as well as its' environment officers, who will work with state/provincial and federal environmental regulators.

CANUTEC/CHEMTREC can also provide assistance; as well as the chemical shippers who are the technical specialists on the products involved.



Use all the resources available to you to ensure a safe and efficient response

Site Assessment

If dangerous goods/hazardous materials are involved in the incident, only trained and properly equipped responders should approach.

Remember: DO NOT RUSH IN – be sure to build a clear picture of the incident from outside the hot zone

At an incident site, you must always keep the following in mind:

- **Your own safety**
- Your capabilities
- Your resources
- Respond/assess from upwind, uphill if possible.
- Conduct the identification and assessment from a safe distance and ensure this for all locations if assessments need to be done from multiple locations.
- An assessment must be conducted by observing the scene carefully, taking note of and recording details of the site.
- Even without having the rail consist there are clues that can help to determine the impact of the incident, such as the presence of placards, container shape, vapour clouds.

Not every railway incident will be alike, as the location, commodities involved, and circumstances will change. The following is a general list of items to consider when conducting your assessment, keeping in mind that circumstances may require additional considerations. Consider the location, terrain and geography, as these can impact the response.

Rail car initials and numbers	Record the numbers of all cars involved, including those in proximity to the cars involved
Commodities or materials involved	Use the consist, placards and hazard markings to determine the commodities
Severity of the incident	Specifically identify situations that may pose immediate danger to life, health, and the environment
Possible injuries	If rescue is required, how many, nature and extent of injuries
Weather conditions	These include wind direction and speed, humidity, pressure, and the forecast
Status of rail cars involved	Identify the condition of the cars involved
Identify hazards of the materials involved	Include potential hazards, and consider compatibility with other commodities involved
Distance to nearest populated areas	Considering potential evacuation
Nearby waterways	Include possible impact from run-off
Additional hazards	Roads, power lines, pipelines, as well as nearby facilities, tunnels, bridges

Site Safety

When responding to a railway incident, be aware that the accident site itself can present additional hazards to the responder, even if no dangerous goods are involved.



BE ALERT FOR BENT AND STRESSED RAIL

These rails may be under pressure and could lash out suddenly.



THE WRECKAGE MAY BE UNSTABLE

You must be aware of tipping and leaning equipment which can move suddenly. Do not climb on or under any of the equipment - it is advised to stay at least 15 feet from all equipment.



BE AWARE OF DOWNED POWER LINES AND DAMAGED UNDERGROUND GAS PIPELINES

Power lines frequently run alongside the railway right-of-way and may be affected when there is an incident. Pipelines can also run underground in close proximity to the railroad right-of-way. When at an incident, always check for the presence of pipelines.



BE AWARE OF THE PRESENCE OF HEAVY EQUIPMENT

Once the initial response phase has ended, clean up at an incident will require heavy equipment. Stay aware of this equipment, which may include cranes, side booms, bulldozers, and excavators.

Incident Command System

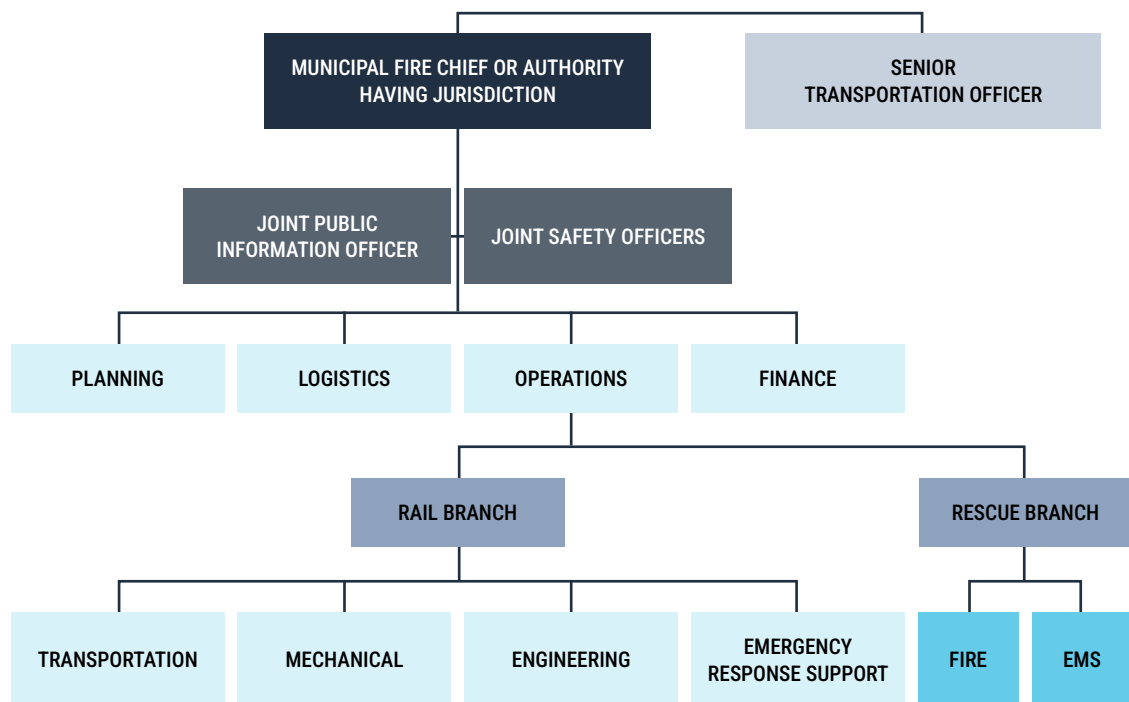
The Incident Command System (ICS) is a standardized on-site management system designed to enable effective, efficient incident management by integrating a combination of facilities, equipment, personnel, procedures, and communications operating within a common organizational structure.

The ICS system is used to manage an incident or a non-emergency event and can be used equally well for both small and large situations.

ICS helps to ensure:

1. The safety of responders and others.
2. The achievement of response objectives.
3. The efficient use of resources

COMMAND STRUCTURE



Railway ICS Functions

Note: Railways will never take over Incident Command; that is a function of the Authority Having Jurisdiction (AHJ). The Railway will work with the AHJ in a Unified Incident System.

Railway Sector: establish its own sectors and “dove-tails” into the ICS structure.

Transportation Branch: stops trains, provides power, calls crews, re-schedules traffic.

Mechanical Branch: wrecking operations, re-railing cars.

Engineering Branch: track repairs, signals, ballast.

Emergency Response Support Branch: Dangerous Goods Officers, safety, environment, claims, loss prevention

Staging becomes very important at an incident as many pieces of heavy equipment and other resources will be arriving on scene very quickly.



Recognition and Identification

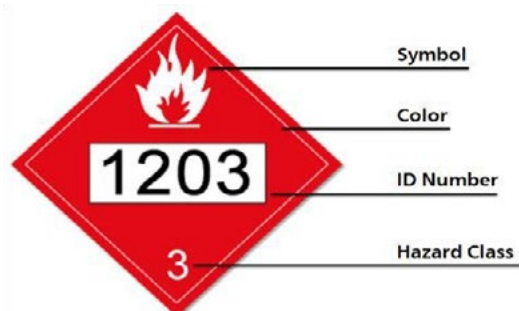
This section demonstrates the various methods of recognizing and identifying dangerous goods shipments by rail, in the event of a railroad incident. There are many ways to properly determine if dangerous goods are involved: This is crucial to a safe response.

TDG Regulations pertaining to dangerous goods require that the hazards of the shipments are properly communicated using placards, shipping papers and rail car markings.

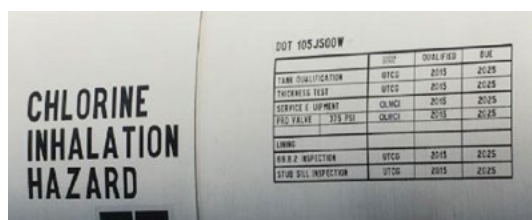
Placarding, Marking and Hazard Classes

Transport of Dangerous Goods Regulations (TDG) in Canada require that the hazards of dangerous goods be communicated through markings, commodity names and hazard warnings. The most commonly seen markings, known as placards, are square-on-point shaped, and placed on the exterior of rail cars that are transporting dangerous goods or residues of these materials.

These placards provide responders with information on the hazards present within the container. It must be noted that many materials possess characteristics belonging to more than one hazard class, and therefore the hazard class information should be used in conjunction with information derived from other sources, such as shipping documents.







































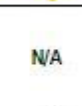










Commodity names/proper shipping names will be on both sides of the car, in letters of at least 4 inches high. An example of a hazard warning



An example of a hazard warning on a Chlorine tank car














Other markings that can be found on rail cars are hazard warnings, specific to certain commodities. These warnings can include “Inhalation Hazard”, “Marine Pollutant” and “HOT”.

Dangerous goods are classified according to their chemical and/or physical properties. There are 9 numeric classes, some of which may be further divided into what are called divisions. A dangerous good is assigned to only one primary hazard class, even if it meets the definition of more than one hazard class.

<p>The chart to the right lists the hazard classes and divisions in Canada and the US, along with the associated placards.</p> <p>Placards</p> <p>Canadian (TDGR) and IMDG placards are the same.</p> <p>United States (49CFR) placards are worded.</p> <p>UN Number</p> <p>When the UN Number is required, it is indicated as follows:</p> <p>Within a white rectangle across the middle of the placard;</p> <p>OR</p> <p>On an orange panel immediately adjacent to the placard.</p> <p>Note that for United States placards, when required, the UN Number takes the place of the word.</p>	Hazard Class	 49 CFR	 TDGR	Hazard Class	 49 CFR	 TDGR
	1.1 Explosive with mass explosion hazard			3 Flammable liquid		
	1.2 Explosive with projection hazard			4.1 Flammable solid		
	1.3 Explosive with predominantly fire hazard			4.2 Spontaneously combustible material		
	1.4 Explosive with no significant blast hazard			4.3 Dangerous when wet material		
	1.5 Very insensitive explosive; blasting agent			5.1 Oxidizer		
	1.6 Extremely insensitive detonating substance			5.2 Organic peroxide		
	2.1 Flammable gas			6.1 Poisonous (toxic) material		
	2.2 Non-flammable, non-poisonous (non-toxic) compressed gas			6.2 Infectious substance		
	2.2 Oxidizing gases			7 Radioactive material		
	2.3 (8) Anhydrous Ammonia in large package	N/A		8 Corrosives		
	2.3 Gas poisonous (toxic) by inhalation			9 Miscellaneous Dangerous Goods		

ADDITIONAL MARKING

The following table demonstrates additional markings that may be found on bulk packages such as tank cars and intermodal containers.

Mark	 49 CFR	 TDGR	Description
Combustible Liquid		N/A	The Combustible Liquid hazard class designation does not exist in Canada, however, these are permitted to be transported in Canada with these placards if they are moving to or from the United States
Marine Pollutant mark			These indicate that a release of the product into a waterway will harm the environment
Limited quantity mark		N/A	Indicate a shipment of dangerous goods transported in smaller quantities in smaller packages
Mixed Loads			Certain dangerous goods in mixed loads can be marked with a miscellaneous placard provided the packages do not exceed a certain size and the total quantity does not exceed a certain limit
Elevated temperature mark			Indicate an elevated temperature hazard for a product in a bulk package
Fumigation sign			When a container is fumigated using a dangerous good, the sign is affixed next to the entryways of the container, warning of the date of fumigation, name of fumigant, etc.
Orange panel			A panel containing the UN Number may be placed next to the primary class placard in lieu of on the placard itself

Documentation

Train crews are required by regulation to carry documentation which can provide emergency responders with important information about dangerous goods on the train. There are subtle differences between rail companies regarding paperwork, so responders should familiarize themselves with documentation from their local railway. Terminology may vary as well.

First action of First Responder at an incident should be;

Obtain documentation from the train crew

The following are definitions used related to documentation:

Train Consist Outbound Wheel Report	This lists each car in the train by initial and number beginning with the engine(s) followed by the first car in the train listed as numerical position 001. Any cars containing dangerous goods are indicated with special instructions of "dangerous" and list the UN number for that railcar. The number of hazardous railcars is also tallied at the beginning of the Train Consist/Outbound Wheel Report.
Compressed Waybills	<p>A compressed waybill is generated for a single car and/or multcars for each series of cars that are in sequential order on a train.</p> <p>This document contains the shipment information for the dangerous goods commodities. It includes the position in train, the proper shipping description that includes the proper shipping name, hazard class, name of the shipper and receiver of the shipment as well as the Standard Transportation Commodity Code (STCC), weight, UN number. Also includes emergency 24-hour contact numbers.</p>
Hazardous Commodities Document	This document lists the position on the train where the dangerous goods/ hazardous materials are located. This document is updated if cars are lifted and set off enroute.
Emergency Response Document	This document describes the Emergency Handling Precautions for cars listed as dangerous on the consist. Emergency Response information provided is intended as a supplement to the ERG. It is not a required document for train movement.
Tonnage Profile	Also displayed are the total number of loaded and empty cars, total weight of their contents, tare weights of the railcars and the length of the train.

Examples of consists, shipping papers and waybills are provided in Appendix B

Shipping Papers/Shipping Documents

Shipping Document Information: What They Tell You as an Emergency Responder!!

Car Initials and Numbers: One of the most important pieces of information to obtain in order to access information on the car's contents.

Package Type: This will describe how the commodity is packaged. This could be a tank car, hopper car or in non-bulk package such as drums, totes and bags.

Quantity: The shipping document will indicate how much product is being shipped, if loaded.

Load or Empty: The shipping document will indicate if the car is loaded or contains a residue. Placards no longer indicate load or residue status on rail cars.

Shipper and Consignee: Shipper area will show who shipped the car and where it originated; Consignee area will show who is receiving the shipment and the destination.

Identification Number: Indicates the four-digit UN (United Nations) or NA (North American) identification number.

Proper Shipping Name: Name of the dangerous good.

Hazard Class: Shows the appropriate hazard class or division number of the product. A secondary hazard class must be shown if required.

Packing Group (PG): A grouping of dangerous goods indicating relative severity of a material within its hazard class. (PG) 1 or I shown using roman numerals, great danger; (PG) II or 11, medium danger; (PG) III or III minor danger.

Marine Pollutant: Release of the product into a waterway will harm the environment. Limited Quantity (LTD QTY) As required by TDG Regulations.

Poison Inhalation Hazard/Toxic Inhalation Hazard (PIH/TIH): Indicates certain gases or liquids that may cause health problems if inhaled.

Reportable Quantity: The letters "RQ", where required indicate that the material is also classified as a hazardous substance and that a release of the dangerous good, over a specified amount, necessitates notifying the National Response Center.

Emergency Response Phone Number: 24-hour phone numbers supplied by the shipper.

Emergency Response Assistance Plan (ERAP): 24-hour phone numbers supplied by the shipper.

Standard Transportation Commodity Code (STCC): A number assigned by railroads for the specific product being shipped. Dangerous goods STCC's begin with the numbers "49" or "48".

Transport Canada Temporary Certificate: Permits an exception to Transport Canada dangerous goods regulations.

The shipping paper/shipping document contains vital information about the dangerous good in the rail car. This example below displays what you will see, and the next page explains the terms on the documentation and what they will tell you as an emergency responder:

K K EEEE Y Y	TTTT RRRR AAA IIIII N N	
K K E Y Y	T R R A A I NN N	
KKK EEE Y	T RRRR AAAAA I N N N	1
K K E Y	T R R A A I N NN	
K K EEEE Y	T R R A A IIIII N N	

***** S U M M A R Y *****	
SPECIAL DANGEROUS - 1	DANGEROUS - 16 A
BAD ORDER - 2	DIMENSIONAL - 16
POISONOUS INHALATION - 1 C	ESTOPPEL - 0
ERAP - 17 D	RSSM - 1
RESIDUE - 1 B	SPEED RESTRICTED - 1
	HEAVY AXLE LOAD - 5

1 ATW 318337 FB7 L LUMBER SUPERI UP 129 80 IDAHOTIMLLC	
MOVING ON MMB - REQUIRES FULL BILL TO DELIVER	

2 TILX 280985 TSI L	FLMLQD PULJCT NS 133 59 CRUDESUPP	3
A2	HAZMAT-US TRAIN PLACEMENT GROUP 2	
JC	CDN MARSHALLING GROUP C	
JR	ERAP PULLBY REQUIRED (CANADA)	

***** DANGEROUS *****	
W/B 691984 - 2016-11-21 ** DANGEROUS GOODS SHIPPING DOCUMENT **	
TO: DUCK LAKE MS	FROM: APPA AB
CRUDE OIL SUPPLY CO	CRUDE CO
2100 JOHN BEAMER PARKWAY S	HIGHWAY 180 EAST RANGE ROAD 8
TUSCALOOSA AL 35102	APPA AB 50H2T0

1 TANK CAR / 82528 KG	6
-----------------------	---

UN1267	
PETROLEUM CRUDE OIL	
(PETROLEUM CRUDE OIL)	
CLASS 3//PG II	7

EMERGENCY 24-HOUR NUMBER USA (800) 424-9300	
CCN 1234	
EMERGENCY 24-HOUR NUMBER CDN (613) 996-6666	
2-A-1234	8

ERP 2-1933-078 TEL (800) 265-0212	9
-----------------------------------	---

HAZMAT STCC 4910165	
---------------------	--

SHIPPER'S CERTIFICATION: BOB SMITH	
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.	

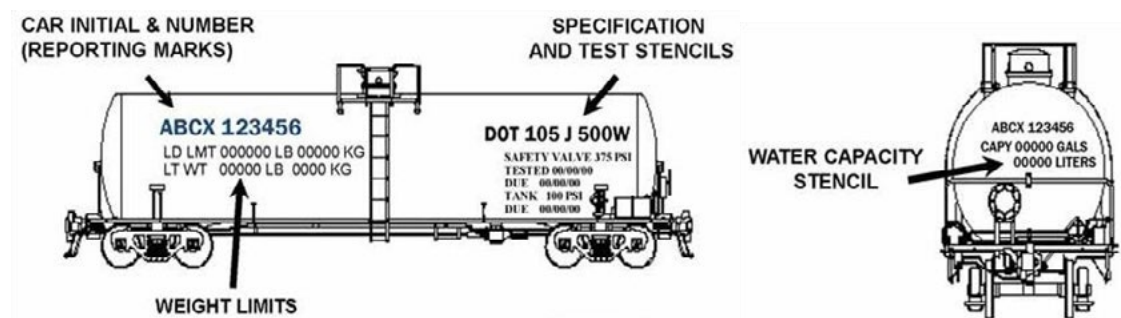
3 BCOL 730298 FB7 L LUMBER SUPERI UP 118 79 HOMEDEPOT	
4 CRDX 20384 C3G L ASHES FTROUG 128 41 LAFARGCANADA	
5 FRPX 11300 A36 L PLYWD DARTMO 106 66 CANWELBUIMAT	
6 TTPX 804561 FB7 E REDLAK 31 57 PRIMEDISSERV	

Train Consist Legend

ITEM	DESCRIPTION
1	Train descriptor: "Key Train" means that this train is carrying either one loaded Toxic Inhalation Hazard (TIH) rail car OR 20 or more rail cars loaded with dangerous goods.
2	<p>Train Summary: This shows the number of rail cars that fall under the Transportation of Dangerous Goods Regulations and/or have some other risk associated with them (i.e., heavy axle load). Relevant information in the summary includes:</p> <ul style="list-style-type: none"> A. The number of rail cars containing commodities that are considered to be dangerous goods. Special dangerous goods have an increased public safety risk. B. The number of rail cars containing the residue of a dangerous good. C. The number of rail cars containing commodities with a toxic inhalation hazard (TIH). D. The number of rail cars containing commodities that require an ERAP.
3	<p>Rail Car Information: From the consist on the previous page the rail car information is given as "2 TILX 280985 T5I L". This grouping indicates the following key pieces of information:</p> <ul style="list-style-type: none"> • 2 is the rail car's position in the train counting from the locomotive end. In this instance, this car would be the second car after the locomotive. • TILX 280985 is the unique car identification number. This pairs the rail car with the consist, such that each rail car's contents can be known at any time. • T5I is railway coding for the type of rail car. In this case it is a general service tank car. • L is the load status. L stands for loaded, as in loaded with commodities. E stands for empty. <p>However, if an empty car contains residue of a dangerous good that it once contained, this will be indicated as such on the consist (see 4 below).</p>
4	Dangerous Marking: This indicates that the contents of this rail car are considered to be dangerous goods. RESIDUE will replace the DANGEROUS in the marking for an empty tank car containing dangerous goods residue.
5	Shipper and consignee information: This shows by whom the dangerous goods were shipped and from where, as well as their destination and whom they will be received by.
6	Package Type and Quantity: This describes the primary means of containment for the commodity (i.e., tank car, hopper car, drums, etc.) as well as its total mass.
7	Product Information: This section will contain the UN Identification Number, Proper Shipping Name, Hazard Class and Packing Group (if applicable) of the dangerous good.
8	Emergency Telephone Number: This is the 24 hour phone number supplied by the shipper of the dangerous goods.
9	ERAP Information: If the dangerous goods being carried in this rail car require an Emergency Response Assistance Plan (ERAP) for transport in Canada, the ERAP plan number and the telephone number to talk to a person associated with the plan are included here.
10	Shipper's Declaration: Each person who offers a dangerous good for transportation shall certify that the commodity is being offered for transport in accordance with the regulations.

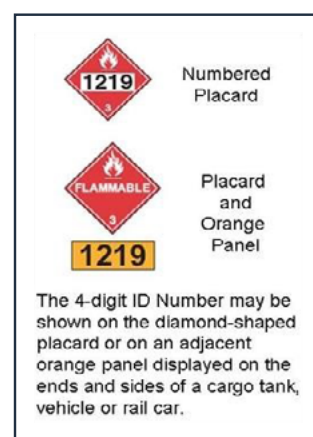
Railcar Markings And Identification

Car Initial and Number – These are unique to every car in North America and are used to identify the car. They will be on the left side of the car (as you face it) and both ends. The letter prefix often indicates the owner/shipper of the car. Rail cars will also feature additional information via markings. More information is found on page 51.



Commodity Name – Regulations require that certain dangerous goods have their proper shipping name stenciled on the side of the tank car

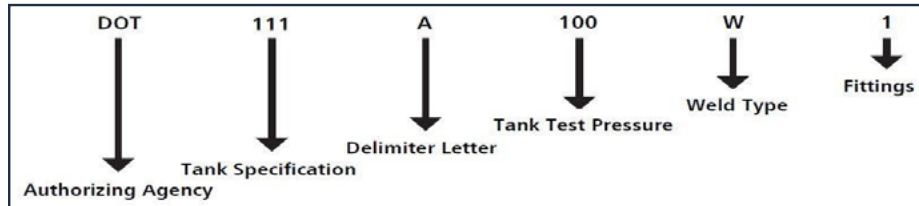
Hazard Warnings – Other markings that may be seen on rail cars are warnings specific to certain commodities, such as "Inhalation Hazard".



Placards – These indicate that the commodity is dangerous and may feature the product identification number on a numbered placard or on an orange panel (PIN). Placards provide the hazard class of the material.

Tank Car Specification

The specification is stenciled on the side of the car. As an example, the following is a breakdown of the marking system for a 111A100W1 specification tank car:



AUTHORIZING AGENCY

DOT	US Department of Transportation
CTC	Canadian Transport Commission
TC	Transport Canada
AAR	Association of American Railroads

TANK SPECIFICATION

Non-Pressure	Pressure Tanks	Cryogenic
111, 115, 117	105, 109 112, 114, 120	103, 214

DELIMITER LETTER

- A – No special feature
- S – Equipped with head puncture protection
- T – Thermal protection and head protection
- J – Jacketed with thermal protection and head protection
- R – Car has been retrofitted with safety feature
- I – May be used to indicate interim design standards for a PIH/TIH tank car

TANK TEST PRESSURE

Hydrostatic test pressure

WELD TYPE

- W – Fusion welded tank
- If constructed of material other than carbon steel, will be indicated by letters AL

DELIMITER LETTERS FOR CRYOGENIC LIQUID TANK CARS:

- A – authorized for minus 423 F loading.
- C – authorized for minus 260 F loading.
- D – authorized for minus 155 F loading.

Designator	Tank Material	Bottom Outlet	Bottom Washout
ALW1	Aluminum Alloy	Optional	Optional
ALW2	Aluminum Alloy	No	Optional
W1	Carbon Steel	Optional	Optional
W2	Carbon Steel	No	Optional
W3	Carbon Steel (Insulated)	Optional	Optional
W4	Carbon Steel (Insulated)	No	No
W5	Carbon Steel (Elastomer Lined)	No	No
W6	Alloy (Stainless) Steel	Optional	Optional
W7	Alloy (Stainless) Steel	No	No

W9 Enhancements to the outer tank for Cryogenic liquid Tank Cars

NON-ODORIZED or NOT ODOORIZED for shipments of unodorized Liquefied Petroleum Gases (LPGs). These markings may appear on a tank car used for both unodorized and odorized LPG.

REGULATING VALVE(S) VENTING NORMAL, REGULATING VALVE(S), RELIEF VALVE, or RUPTURE DISC, as appropriate, over/under the discharge pipe for tank cars in argon, carbon dioxide, nitrogen, and oxygen service.

DOT-SP***** for a tank car operating under the provisions of a DOT Special Permit. (DOT-SP***** replaces DOT-E*****; which stood for DOT Exemption.)

SR-**** for a tank car that is operating under the provisions of a Canadian Safety Permit-Rail.

AAR ST-*** for a tank car that is operating under an AAR Service Trial.

	STATION STENCIL	QUALIFIED	DUE
TANK QUALIFICATION	ALM	2009	2019
THICKNESS TEST	ALM	2009	2019
SERVICE EQUIPMENT	ALM	2009	2014
PRD: VALVE	75 PSI	ALM	2009
INT HTRS		JBK	2009
LINING		JBK	PP
88.B.2 INSPECTION	CJW	2009	2019
STUB-SILL INSPECTION	CJW	2009	2019

Note: The following is an explanation of some of the information found in the qualification stencil.

Station stencil: an alpha code assigned by the AAR to the tank car facility performing the inspection.

Service equipment: filling/discharge, venting, safety (other than pressure relief devices), heating, and measuring devices.

PRD: pressure relief device.

Valve: reclosing pressure relief valve.

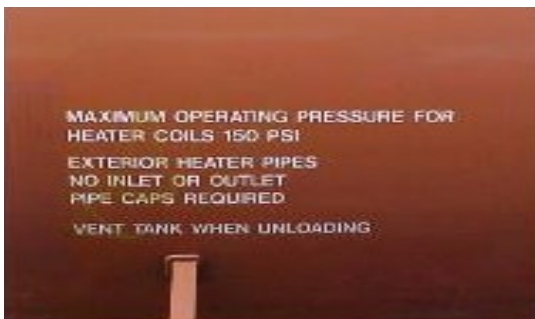
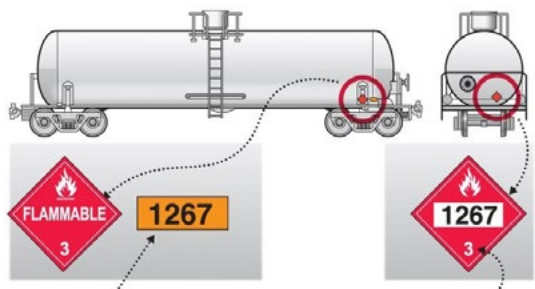
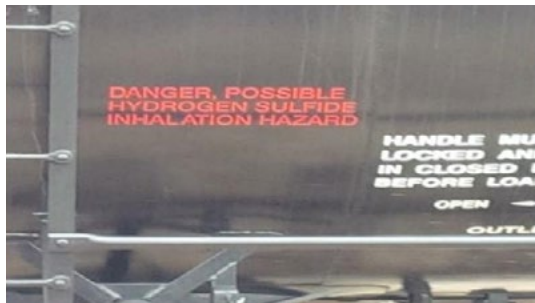
Vent: nonreclosing safety vent with rupture disc.

Comb PRD: combination pressure relief device (reclosing valve with a rupture disc or breaking pin).

None: no pressure relief device (total containment).

INT HTRS: interior heater system. Exterior heater systems do not require requalification.

Lining PP: indicates the lining is applied to maintain product purity, not to protect the tank from the corrosive effects of the lading. PP linings do not require requalification.



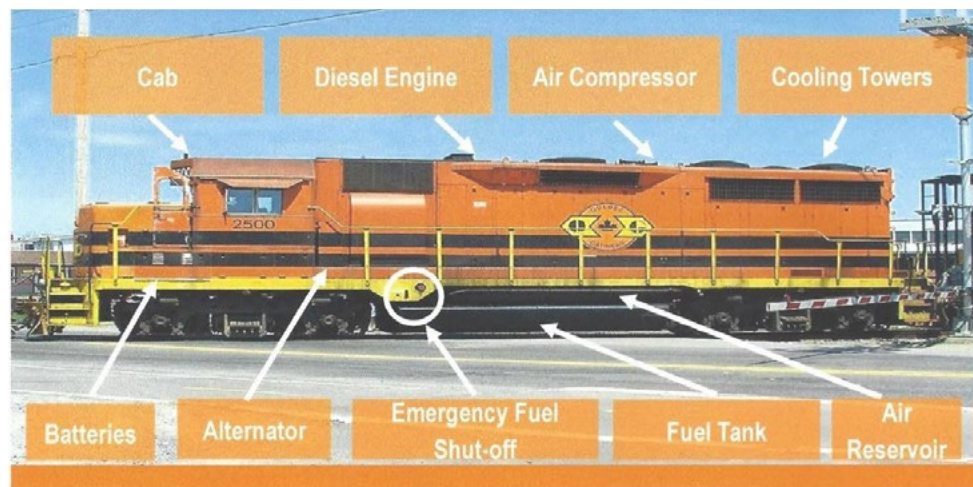
Section 5 / Railway Equipment

LOCOMOTIVES

Railway locomotives can present hazards of their own that first responders must be aware of.

- Some features of locomotives:
- Diesel fuel tanks - up to 6,000 gallons
- Electrical - 600 volts DC, 220 volts AC
- Lube oil - up to 410 gallons
- Coolant - up to 380 gallons
- Battery acid - up to 50 gallons
- Compressed air

Be aware that a typical Main Line locomotive will have a weight of over 400,000 pounds



Located on :



Each side of the engine

Inside the cab



NOTE: In case of fire involving locomotive, first responders should consult with train crew or railway personnel before applying any water.

RAILWAY ROLLING STOCK

Dangerous Goods may be transported in many different car types. Below are descriptions of these cars and the typical commodities they carry.



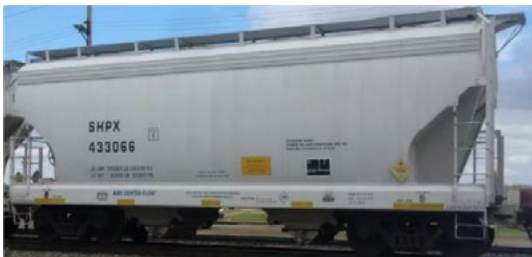
Flat Cars

These transport lumber, pipe, and machinery, and may have bulkheads at each end or be equipped to carry autos, containers or trailers.



Box Cars

Box cars transport a vast array of commodities, including many in small packages. These cars may be insulated.



Covered Hopper Cars

These cars often transport dry dangerous goods in bulk, such as fertilizer, sodium chlorate (an oxidizer). Other commodities can include flour, grain, soda ash, potash and cement.



Automobile Carriers

These cars may be carrying up to 18 vehicles. Potential dangers posed are from: fuel, battery acid, air bag inflators and refrigerants.

GENERAL RAILWAY EQUIPMENT



Gondola Cars

These are often used to transport scrap metal, pipe, and contaminated soil/waste, and specialized coil gondola cars carry coiled steel products. If carrying dangerous goods, they will usually have a cover on top.



Open Top Hopper Cars

Transport dry commodities, such as stone and coal. Will seldom carry dangerous goods.



Air Cars

Generally used in colder seasons and placed in the middle or end of train. These are used to assist in generating air for braking control in trains. Potential dangers may include air compressor, diesel fuel, and battery acid.



Mechanical Refrigeration (Reefer) Cars

Refrigeration units – hazards posed: fuel tank and batteries with acid.

Intermodal Container

These units may contain a wide variety of goods, including dangerous goods. They may also be refrigerated/temperature controlled. Intermodal containers are used in all modes of transportation and are interchanged between countries. Intermodal containers can ship just about anything that can fit through the doors. The container sizes typically range from 20, 40 and 53 feet.

Dangerous goods are packaged in non-bulk containers prior to being loaded in the container. It is very common to see mixed commodities within containers, and a single container could have several different types of dangerous goods. Loads within containers can shift, so caution must be used when opening container doors.



**Container in a Well Car Five
Platforms Double Stack Cars**

**Can be double-stacked, and
may have mixed freight or
dangerous goods**

Intermodal Tank Containers

Intermodal tanks are used in all modes of transportation and interchanged between countries. These types of tanks are mounted in an ISO supporting frame. Intermodal tanks are categorized into three separate types: Pressure, non-pressure, and cryogenic. Most are made of stainless steel.

Intermodal Tank Type	UN Tank Type	Maximum Allowable Working Pressure (MAWP)
Non-pressure tank	T1 to T22 (IM 101)	25.4 - 100 psi
Non-pressure tank	T1 to T22 (IM 102)	14.5 - 24.5 psi
Pressure tank	T50 (Spec 51)	100 - 500 psi
Cryogenic tank	T75	Varies depending on commodity

T1 through T22 (US DOT IM 101 & 102), pictured here, are non-pressure tanks. The fittings on these tanks may include top servicing equipment such as a liquid and vapor valve, manway, pressure relief device and a vacuum relief device.



A bottom outlet may be located on one side in the bottom corner. Unlike a tank car valve, there is an internal spring valve then an outer valve. A remote shut off should be located on the right side of the tank as you face the valve.



T50 (Spec 51) – pictured below. These tanks are designed for liquefied gases such as LPG or ammonia and have a capacity of around 5000 gallons. Their pressure relief device is mounted on the top and is recessed into the tank. The off-loading valves are located on the bottom corner inside a protective housing. A remote shut-off should be located on the right side of the tank, when facing the valve.



Train Information Braking System (TIBS)

Mounted on the trailing coupler of the last car of the train and connected to the train brake pipe via a glad hand connection



TANK CAR CONSTRUCTION & ANATOMY

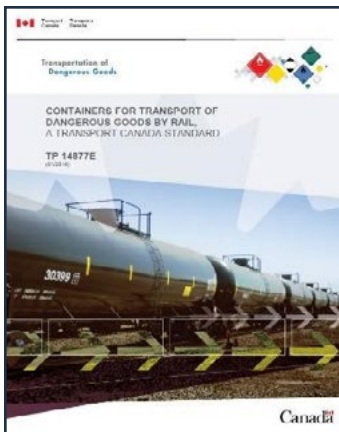
Given the varying characteristics of the different commodities being shipped daily and the differing needs and uses, it is impossible to cover all the various types of tank cars and fittings uses. This guide provides a general overview of common tank car types and fittings, currently used to transport both regulated and non-regulated commodities. All railway tank cars are built to specifications, standards and requirements, established, implemented and published by:

- Transport Canada (TP 14877) (note: to be changed to CGSB 43-147)
- US Department of Transportation (DOT) (CFR 49)
- Association of American Railroads (AAR) (M-1002 Section C-III)

These specifications, standards and requirements address tank car design, type and thickness of material used in construction, types of fittings, welding procedures, inspection, maintenance, repair and quality assurance system requirements.



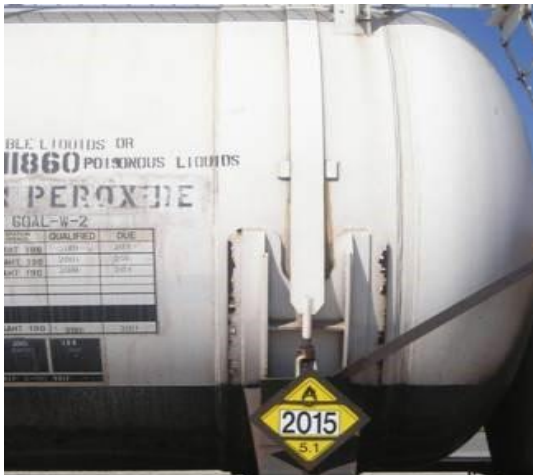
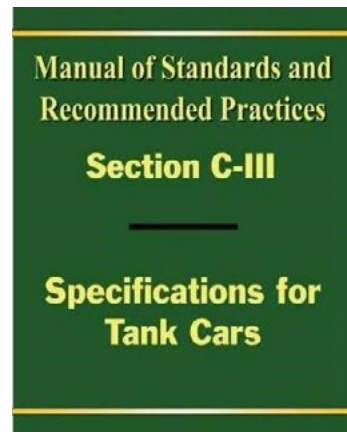
Transport
Canada



U.S. Department
of Transportation



ASSOCIATION OF
AMERICAN RAILROADS



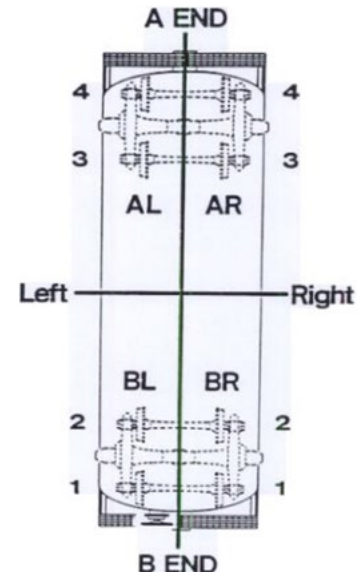
Materials of Construction

Tank Cars can be constructed of various metals including:

- Carbon Steel
- Nickel
- Aluminum
- Aluminum tank cars use a turnbuckle and strap method to attach to the car center sill.

Tank Car Orientation

A basic skill in incident damage assessment is the correct dissemination of information concerning the location and position of damage to containers. A system has been established to identify the left and right side for rail tank cars, regardless of the position of the car. All orientation begins with the "B" end of the car. The "B" end is that end of the car that has the handbrake. The end opposite the brake end is called the "A" end. To determine which side of the car is left and which is right, stand facing the "B" end. To the right is right, to the left is left. Left or right side of the tank car is always referenced from the "B" (handbrake) end.

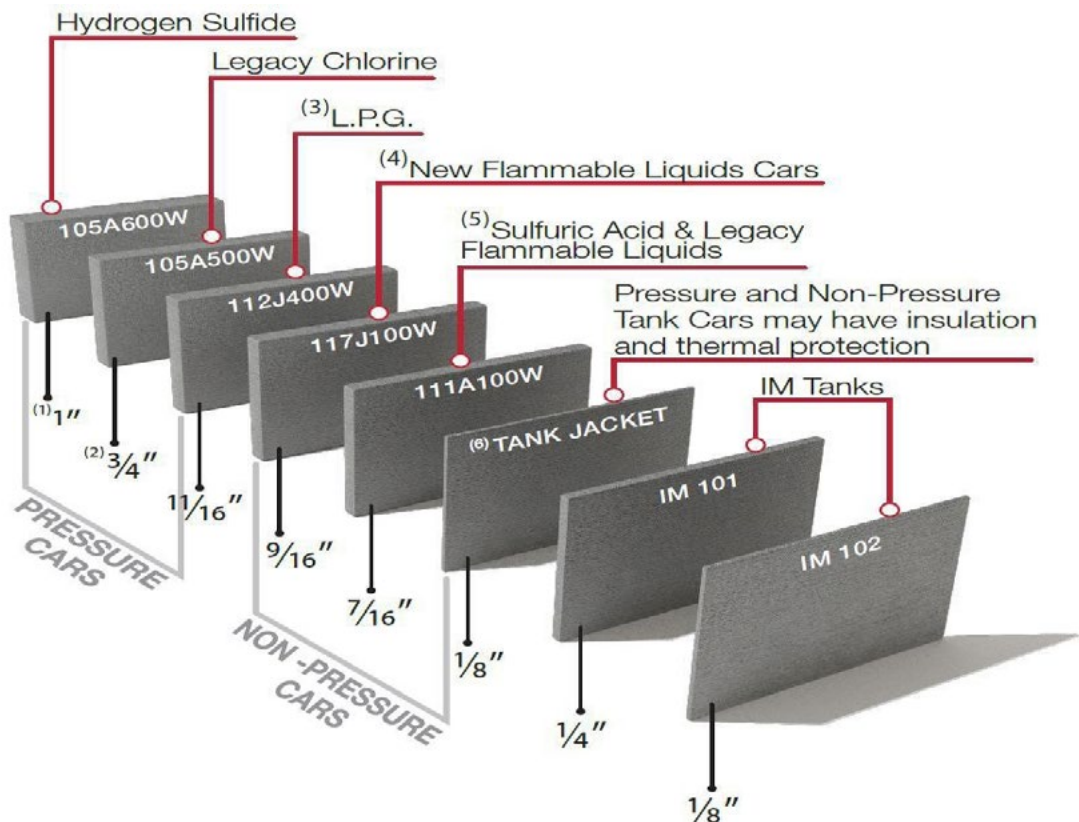


Truck orientation (1-4) starts at the "B" end

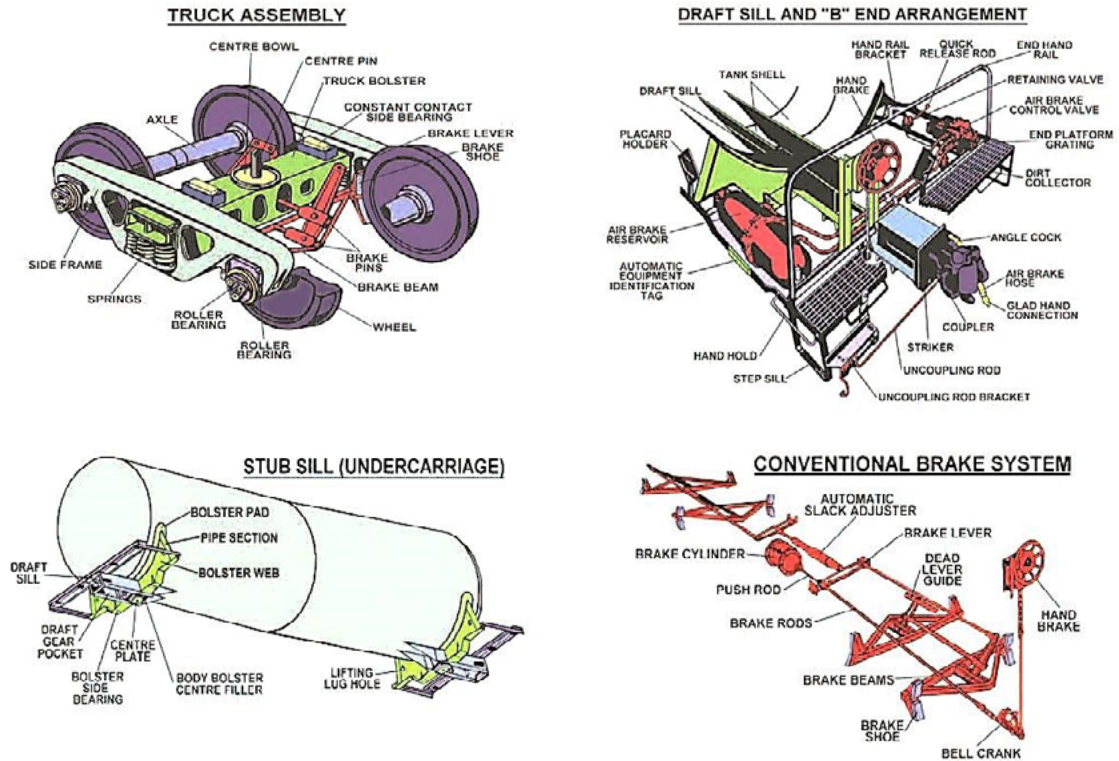
Tank Car Shell Thickness

Tank cars may or may not have a jacket. Jackets are applied over the thermal protection and/or insulation to protect against damage from weather.

The 1/8" inch (11-gauge metal) jacket **has no structural integrity**.



Undercarriage Components and Running Gear



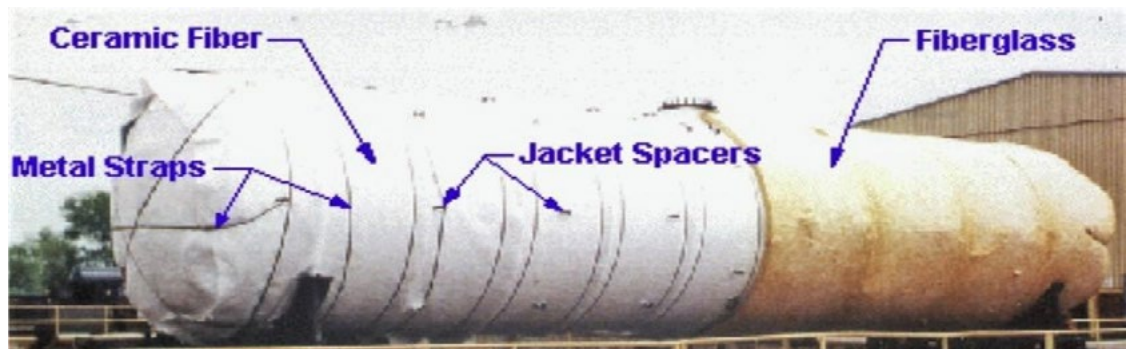
Thermal Protection

Some tank cars will have thermal protection, which is made of a ceramic fiber and applied directly to the outside of the tank. This thermal protection system is intended to provide thermal resistance when subjected to a pool fire for 100 minutes or a torch fire for 30 minutes.

Insulation

Fiberglass insulation is applied to protect the commodity from ambient temperature. The insulation can be ceramic, fiberglass or poured in and maybe 4"-6" thick. Metal straps/bands hold it in place.

A 1/8-inch steel jacket is applied over the thermal protection and fiberglass insulation for protection from the weather.



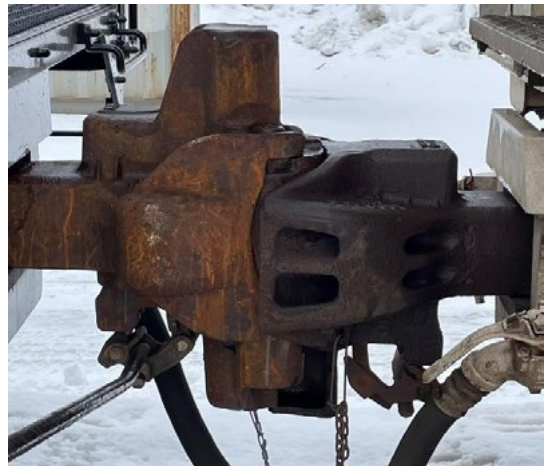
TANK CAR SAFETY FEATURES

There are several safety features that are required on tank cars to protect the tank and its fittings from damage in the event of an accident.

Emergency responders should be aware of these safety features and how they can provide safety during an incident.

Double Shelf Couplers

All tank cars, regardless of commodity, are equipped with double shelf couplers which are designed to prevent an override situation causing head ruptures and punctures.



Head Shields

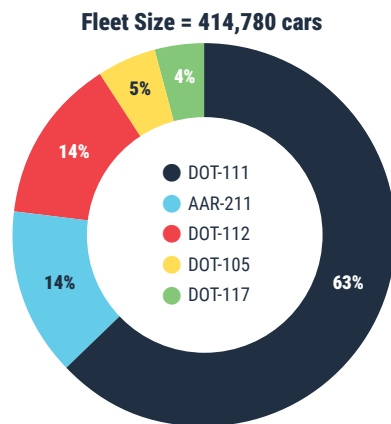
Tank cars that transport specified products must have a head shield that is intended to prevent the puncture of the tank head in the event of a derailment. This is accomplished by either an exterior mounted 1/2" inch plate at both ends of a car or a full head shield as part of the construction.



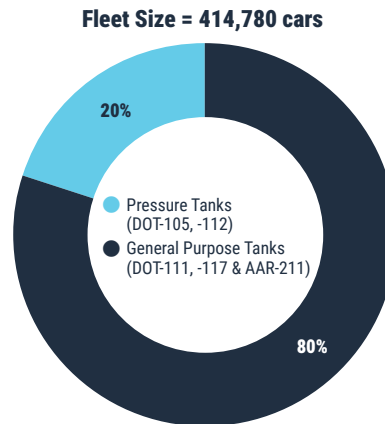
TANK CAR OVERVIEW

There are 414,000+ tank cars (pressure and non-pressure) in today's fleet, of which 331,000+ are DOT-111 tank cars. All DOT-111 tank cars operating today meet both current federal regulatory requirements and AAR-North American Tank Car Committee standards and continue to operate safely. **(note: at the time of publication, DOT/TC 111 tank cars are no longer used in Crude or Ethanol service)**

Tank Car Fleet



Source: AAR UMLER File 5/1/2017



Source: AAR UMLER File 5/1/2017

Railways do not own many tanks cars; majority are owned by shippers and leasing companies. Railways just transport them.

Required Markings

All tank cars are required by regulation to legibly display the following markings:

- Reporting Marks
- Weights
- Capacity
- Qualification Stencil (more information found on page 40)

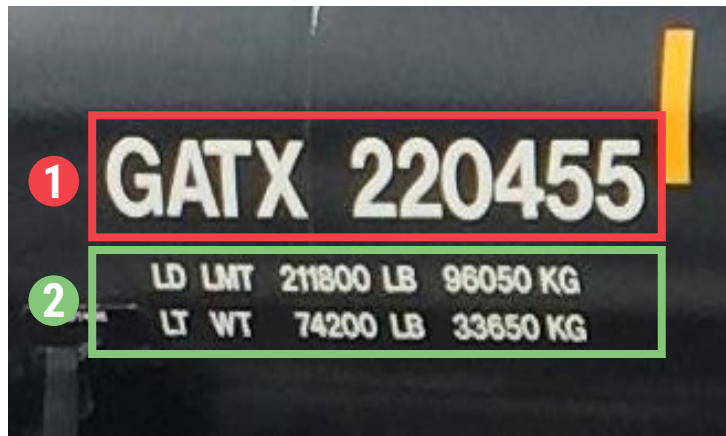
Location of Key Stenciling



On the left-hand side of the car, as you face it, are the “reporting marks”. The reporting marks contain the car’s initial and number, (alpha-numeric), which indicate the owner and serial number of the car. The car’s initial and number are vital to retrieving information concerning the car’s lading, shipper, and consignee. In the event of an emergency involving a rail car, every attempt should be made to determine the car’s initial and number, so that information concerning the specific car can be obtained.

Rail car initials and numbers are one of the most important pieces of information that emergency responders can obtain at the scene of a railway emergency.

- Responders should attempt to accurately record and report the initials and numbers of any cars involved in a derailment or other emergency situation.
- Remember the rail car’s initials and number is stenciled on both sides of the car (to the left) and on both ends of the rail car; sometimes it may also be located on top of the car.



1 - Reporting mark – This **unique number** provides all required information about the **specific tank car** and its contents (from the waybill/consist). Listed on the left side and on each end of a railcar.

2 - Capacity – Used if car is loaded by weight instead of outage (volume). Listed on both ends of a railcar.

Weights

Light Weight/LT WT – empty weight or tare weight of cars or of the train. The light weight is stenciled in pounds and kilograms on every rail freight car and is abbreviated **LT. WT.**

Load Limit/LD LMT – the maximum weight of lading that can be loaded in a railcar. Load limit is stenciled in pounds and kilograms on every rail freight car and is abbreviated **LD. LMT.**

Capacity

Capacity/CAPY – the volumetric capacity (stenciled in gallons and liters) of a tank car’s tank head. The capacity may also be shown in imperial gallons.

Although, there are many different tank cars, they can generally be divided into (3) categories:

Non -Pressure Tank Cars	Pressure Cars	Cryogenic Cars
<ul style="list-style-type: none">• Also called general services or low-pressure cars• Transport low vapour pressure commodities• Regulated products• Non-regulated commodities	<ul style="list-style-type: none">• Built with thicker tank shell to withstand higher internal pressures• Stronger than low-pressure cars• Transport liquefied, compressed gases, poison (PIH)/toxic (TIH) inhalation hazard materials	<ul style="list-style-type: none">• Vacuum insulated cars, with inner tank and carbon steel outer shell (tank, not jacket)• Transport refrigerated products with boiling points below -130F at atmospheric pressure

Most Common Tank Car Classes

NON-PRESSURE (LOW) TANK CARS
(PRESSURES: 0-100 PSI)



DOT 111*
DOT 113 (cryogenic)
DOT 115
DOT 117* (replacing 111's in FL service)
AAR 211 (non -DG)

PRESSURE (HIGH) TANK CARS
(PRESSURES: 100-600 PSI)



DOT 105*
DOT 112*
DOT 114
DOT 120 (* bottom outlet)

*most common

NON-PRESSURE (GENERAL SERVICE OR LOW-PRESSURE) TANK CARS



Non-pressure tank cars are also known as General Service, Low Pressure, or General-Purpose tank cars. Acid Service tank cars are a subset of non-pressure cars. These will be referred to throughout this guide as General Service cars. Despite the name, these cars will have some pressure during transportation. The tank test pressure range is between 60 psi to 100 psi. These are the most common type of tank car in use today, transporting a wide variety of liquid commodities. A typical tank thickness is 7/16" - 9/16" inch thick, with capacities of 6,000 to 33,500 gallons and a loaded weight of up to 286,000 pounds. Materials in the following hazard classes may be transported in non-pressure tank cars:

HAZARD CLASS NUMBER	TYPICAL COMMODITIES
3	Petroleum Products, Ethanol
4	Molten Sulfur
5	Hydrogen Peroxide 70%, Ammonium Nitrate Solution
6	Phenol
8	Sulfuric Acid, Hydrochloric Acid, Sodium Hydroxide
9	Ethylene Glycol, Coal Tar
Non-regulated	Syrup, Food, Clay Slurry, Citric Acid

The most common non-pressure tank cars in use today are DOT-111 and AAR-211. Notable differences in the most common non-pressure tanks cars in use today are DOT-111 and AAR-211. Notable differences in the non-pressure tank cars are as follows:

CAR TYPE	UNIQUE FEATURES
DOT/TC 111	Most common tank car, wide variety of fittings/configurations, min 7/16" thick tank
DOT/TC 115	A tank within a tank construction with insulation between the tanks.
DOT/TC 117	Min 9/16" thick tank, full head shield, thermal protection, detachable bottom outlet valve handle, protected pressure relief valve (PRV) - more details on following page
AAR 206	Temperature-sensitive products, very efficient insulation, may be divided into compartments, 60 psi test pressure
AAR 211	General weld construction is different from the 111 cars. Additional/special fittings for AAR cars

Evolution of DOT-117 Tank Car

In 2009, the rail industry, working together with producers and shippers, voluntarily instituted an interchange rule improving the specifications of the DOT-111, dubbed the CPC-1232. The rule required that all DOT-111 tank cars built after September 2011 and used in flammable liquid service, packing groups I and II, should be upgraded to the new specification. The CPC-1232 upgrade included thicker tank shell, top fittings protection (protective housing) and a minimum of a half-height head shield.

In 2015, legislation was introduced in both Canada and the US, requiring a new enhanced tank car specification, the DOT-117, to be used for the transportation of all flammable liquids. A risk-based retrofitting schedule is assigned to phase out transportation of these products from the older DOT-111 (known as the legacy DOT-111) to the new DOT-117 specification tank car.

Details of the DOT-117 safety features:



ENHANCEMENTS TO DOT-117 SPECIFICATION TANK CAR

Full-height head shields, at least 1/2 inch thick

Thermal protection system

Increased tank shell thickness to 9/16 inch

Enhanced bottom outlet valve handle, if equipped

Top fittings protection

High capacity pressure relief device

Thicker steel jacket

Syrup, Food, Clay Slurry, Citric Acid

General Service Tank Cars – Valves and Fittings

General Service tank cars carry a wide variety of commodities; therefore, several different types of features may be found on them:

- Manway
- Top loading/unloading valves
- Vacuum relief device
- Safety relief vent
- Heater coils
- Insulation
- Bottom outlets
- Thermal protection

MANWAY

Manways are openings in non-pressure cars used as access points for loading and unloading the contents of the car, and will normally have 6 to 8 bolts, and a gasket used to form a seal. Some manways may have a vacuum relief device mounted on the lid, which allows air into the car.



Manway Cover and Bolts

PRESSURE RELIEF DEVICE (PRD)

During the normal course of transportation, the pressure relief device should not activate, as the device is there to relieve pressure in case of emergency.

There are two types of pressure relief devices: *spring loaded valves and rupture disc*. A spring-type PRD is the type which can be internally exposed to the product or external. Each performs the same function, which is to relieve pressure in the car. If pressure rises within the car, the spring will collapse, and vapours (pressure) will be released from the car. Once the pressure is relieved, the spring will reseal the car.



The other type of pressure relief device is the rupture disc. Rupture discs are used on corrosive commodity cars and will not reseal the car once pressure has been relieved.

Safety Vents Break Open at an engineered pressure (commonly 165 psi). Tank cars carrying flammables must not be equipped with safety vents.

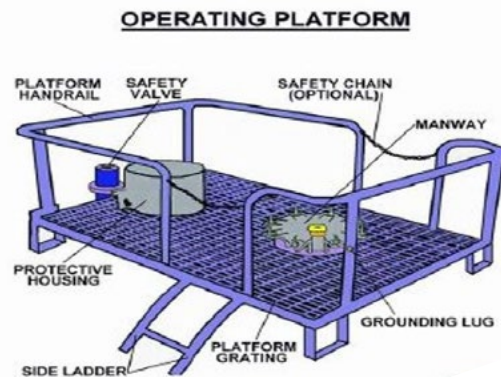


COMBINATION HOUSING/PROTECTIVE HOUSING

CPC-1232 specification DOT-111 cars and all DOT-117 cars will have a protective housing which contains all the valves and fittings (except the manway).

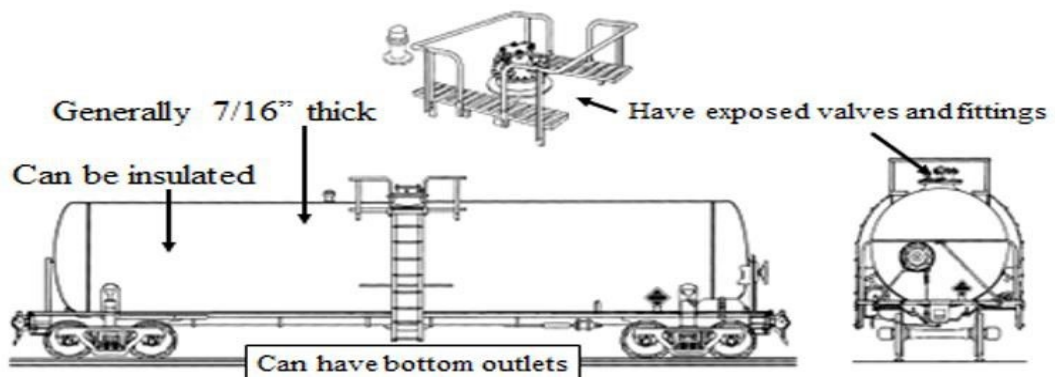


Legacy DOT-111 tank cars have combination housings. Combination housings are located on the top of these non-pressure tank cars, and house various valves and fittings.



The above photo shows the liquid and vapour valves, the liquid valve usually being the larger of the two. These are situated in line with the center of the car's curvature. Mounted below the liquid valve is an eduction tube used to draw liquid from the bottom of the tank car.

Depending on the type of commodity transported, the combination housing may also contain fittings such as vacuum relief devices, thermometer wells and gauging devices.



BOTTOM OUTLET VALVES (BOV)

Bottom outlets are commonly used valves on non-pressure tank cars, used to load and unload product from the bottom of the car. There are many different types of BOV: ball valve, wafer-sphere or butterfly style, all operated from underneath the car. The valves can be internal or external. Some cars are equipped with top-operated bottom outlet valves, which are a type of valve attached to a rod that passes up through the tank car and through a stuffing box on top of the tank. Typically, what you can see from the bottom of the valve is a series of reducers for off-loading purposes. When in transportation the valve handle must be in the closed position, pinned in place so the valve does not vibrate open, and all caps or plugs must be tool tight.

CUT-AWAY OF THE BALL VALVE



SPRING CLOSURE BOTTOM OUTLET VALVE

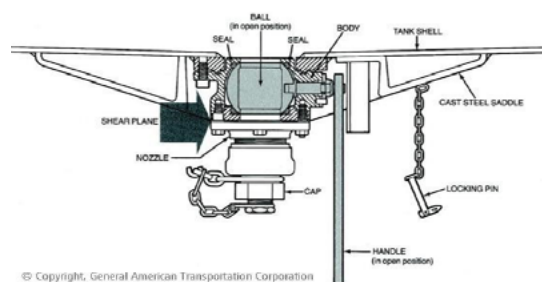


With external valves, the valve body itself is protected by a bottom discontinuity protection system also known as “skid protection”. Continuation of the valve assembly below the tank shell or skid must be designed so that it will fail without damaging the valve, causing a release of product. This system is designed to allow the loading/unloading attachments to be sheared off during an accident, leaving the bottom outlet intact and preventing a release of product.

BOTTOM OUTLET VALVE ON TANK CAR, SKID PROTECTION – EXTERNAL VIEW



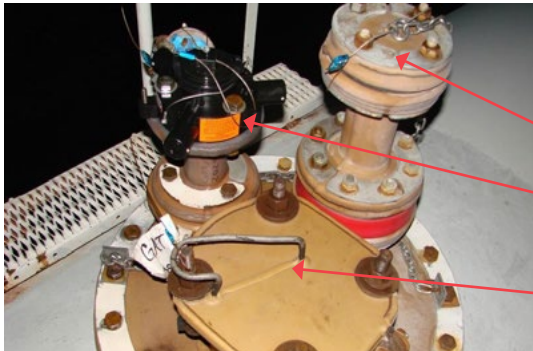
BOTTOM OUTLET VALVE ON TANK CAR – INTERNAL



© Copyright, General American Transportation Corporation

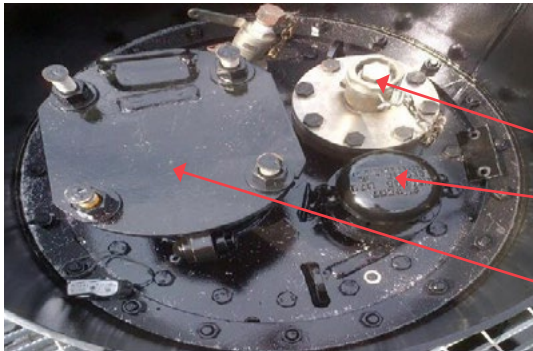
General Service Tank Cars – Acid Service

Corrosive commodities are shipped in a general-purpose tank car with a different type of valve arrangement. To fill the car there is a fill hole, which is typically a three or four bolt arrangement. For off-loading there is a liquid line and an air-line. It is very common for a corrosive car to be shipped with blank flanges instead of valves. Lastly, there is a pressure relief device. Acid cars usually have a rupture disc but may have an external-type spring pressure relief device. Dependent on product, some acid cars (HCl) will have a rubber lining in the tank. Bottom outlets and washouts are prohibited on DOT111A100W5 cars.



HYDROCHLORIC ACID VALVE ARRANGEMENT

1. Liquid Line Assembly
2. Pressure Relief Device: Rupture Disc Type
3. Fill Hole



SULFURIC ACID VALVE ARRANGEMENT

4. Liquid Line Assembly
5. Pressure Relief Device: Rupture Disc Type
6. Fill Hole



HCL PROTECTIVE HOUSING (RUBBERIZED)

7. Liquid Line
8. Air Inlet Valve
9. Fill Hole

PRESSURE TANK CARS



Pressure tank cars have a tank test pressure ranging from **100 psi to 600 psi** and are used for the transportation of liquefied compressed gases (class 2 commodities) or the over-packaging of liquids. Below are common commodities transported in pressure cars:

HAZARD CLASS NUMBER	TYPICAL COMMODITIES
2	Butane/Propane/Vinyl Chloride/Chlorine/Ammonia
3	Natural Gasoline

This car is identified by the characteristic feature of a single protective housing on top of the car where all the valves and other devices are located.

Typically, the tank is **11/16" to 1-1/4" inches thick** with capacities up to 33,500 gallons and a loaded weight of 286,000 pounds.

Transporting such a wide variety of commodities within the Class 2 family requires a variety of features that may be found on a pressure tank car. The following features may be found on a pressure tank car depending on the commodity being transported:

- Top loading/unloading valves
- Safety relief device(s)
- Insulation
- Thermal protection
- Sample valve
- Thermometer wells
- Magnetic gauging device

Pressure Car Features

Feature and Class	Double Shelf Couplers	Head Shields	Spray-on Thermal Protection	Jacket Thermal Protection	Jacket Insulation
105 A	X				X
105 S	X	X			X
105 J	X	X		X	X
112 A	X				
112 S	X	X			
112 T	X	X	X		
112 J	X	X		X	

DOT 105's are always insulated (with foam, fiberglass, ceramic fiber, or cork) and are always jacketed to protect the insulation. If either of these types of cars (105 /112) is used to transport flammable gases, they will have thermal protection.

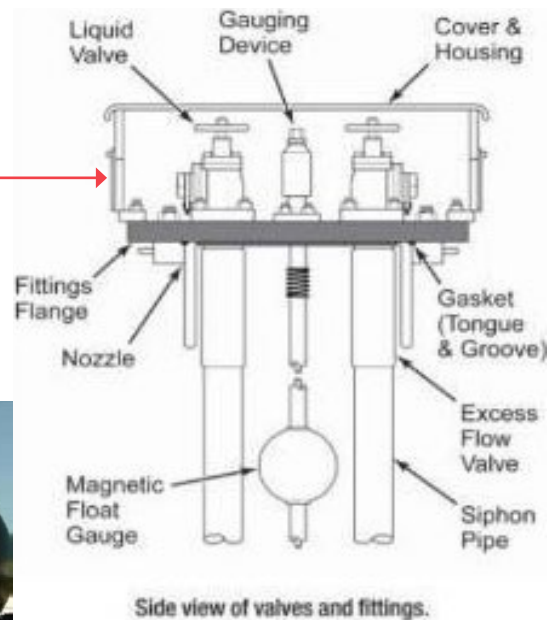
Bottom outlets are not permitted, and neither are fittings outside the protective housing.

Valves and Fittings

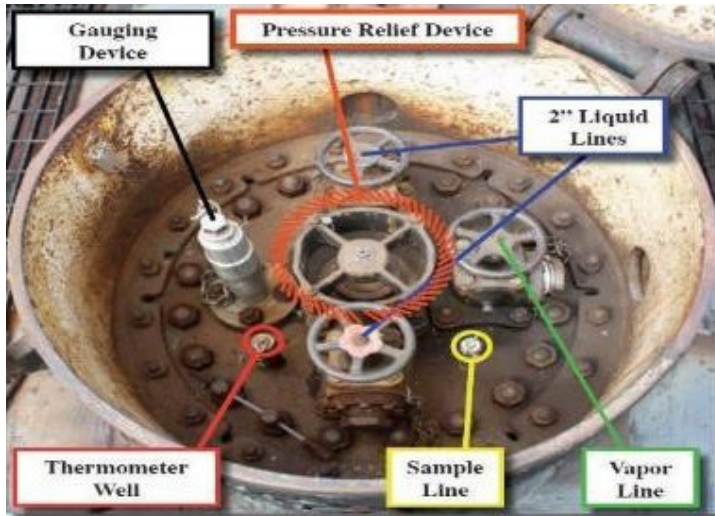
All valves and fittings, including the safety valve are located inside the **protective housing** (not a "dome"). The protective housing is constructed of $\frac{3}{4}$ " steel and affords valve protection in case of impact or rollover. Liquid valves are positioned in length with car, while vapour valves are cross axis to center in the housing. The following pages display the various valves found on pressure cars within the single protective housing.



Valving inside the $\frac{3}{4}$ " protective housing



PRESSURE CAR VALVE ARRANGEMENT INSIDE THE PROTECTIVE HOUSING



All valves are required to be equipped with a shipping plug that is installed tool tight when in transportation. Most pressure cars will have a two-inch NPT outlet.



*Angle Valve –
Plug style Valve is primary
containment; plug is secondary.*

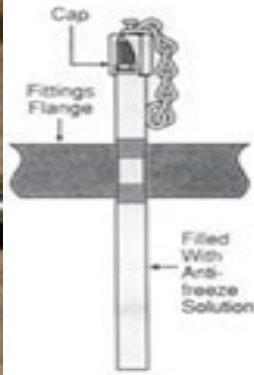


PRESSURE RELIEF DEVICE (PRD – VALVE)

A “spring-type” reclosing valve is used on pressure cars. The size of the pressure relief device (PRD) will differ depending on the commodity being transported. The larger a valve is, the more cubic feet per minute (CFM) of vapour the valve can release from the car. The size of the valve is not an indicator of when it is set to discharge.

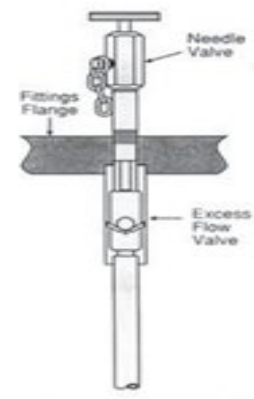
The spring of the valve is set to discharge at a given pressure. This pressure is on the qualification stencil.





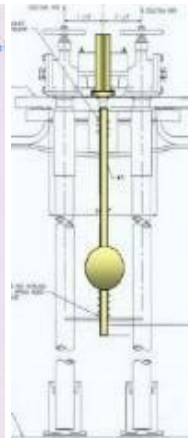
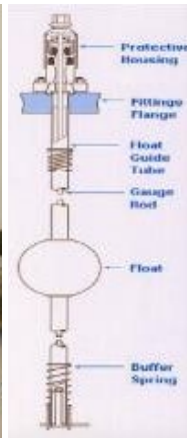
SAMPLE LINE

Sample Lines are used to take a sample of the commodity for purity or specification testing. The sample line is open to the product in the car, so for this reason it will have an excess flow device in the reduction tube.



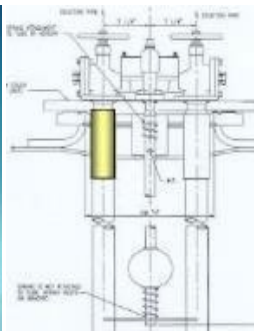
THERMOMETER WELL

The thermometer well is a sealed system and is closed to the product. The tube is filled with anti-freeze liquid. There is no thermometer in the well, it is only called that as it is the location where the temperature is capable of being taken.



MAGNETIC GAUGE ROD

A magnetic gauge is used to determine how much product is in a tank car. It is a closed system which uses a ball float with a magnet on a gauge rod.



EXCESS FLOW VALVE

Mounted underneath valves that are open to the product is an excess flow valve. This device is intended to slow the flow of product if the valve is sheared off the car. The excess flow valve comes in a variety of sizes depending on the weight of the commodity.

Special Commodity Pressure Tank Cars

CRYOGENIC TANK CARS

Cryogenic tanks are designed as a tank-within-a-tank configuration. The inner tank is a stainless steel or a nickel metal which is rated for a temperature of -130F or colder. The outer tank is made of carbon steel. There is insulation between the tanks and a vacuum is applied. Tank test pressures can range from 60 to 120 psi.



Note: In addition to other stenciling, cryogenic liquid tank cars must be stenciled **DO NOT HUMP OR CUT OFF WHILE IN MOTION** and Vacuum Jacketed on both sides in lettering at least 1 ½" inches high.

All valves are in ground level cabinets that will be in the center of the tank car on either side or opposite corners on either side of the tank car. Vent pipes must direct any product up and away from the cabinet or tank.



It is important to remember that these commodities are extremely cold and proper protective equipment is required to handle cryogenic emergencies.

CARBON DIOXIDE (CO2) TANK CARS

CO2 is shipped in DOT 105's. CO2 tank cars are different from a typical pressure tank car. The protective housing will have several pipes protruding from it, with each pipe being marked with its function.

Venting from the regulating valve is a **normal function**, and a notice stating this will be marked on the protective housing next to the regulating valve pipes.



CHLORINE SERVICE TANK CARS – CURRENT

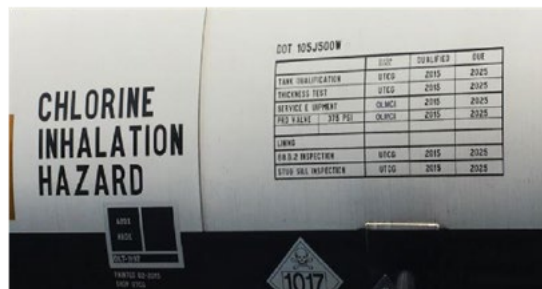
Chlorine service tank cars have two liquid valves with excess flow devices and two vapour valves without excess flow devices. The valves and piping are (1") one inch. There is no sample line, thermowell or gauging device on a chlorine car. They are loaded by scale (meter) to 90 tons. Cl₂ cars are 1" – 1½" in thickness with 2" inches of insulation and 2" inches of thermal protection covered by a jacket.

Chlorine car pressure relief devices are known as combination devices and have either a break pin assembly or a rupture disc mounted below the external spring valve. This variation is meant to protect the spring from the corrosive properties of chlorine.



CHLORINE SERVICE TANK CARS – NEXT GENERATION

Next Generation chlorine service cars use a different valve arrangement and a new type of valve. The housing is larger than the current housing and there is only one vapour valve. The valve does not use an excess flow device but is instead equipped with a spring-type flow device.

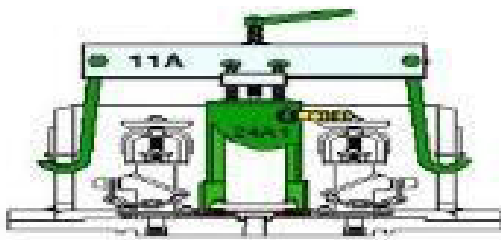


CHLORINE EMERGENCY KIT "C"

The Emergency Kit "C" is designed for use with the standard DOT 105J500W chlorine tank car, DOT MC331 chlorine cargo tank and DOT 51 portable tank in chlorine service. The Emergency Kit "C" contains devices and tools to contain leaks in and around the pressure relief device and angle valves. Proper training on use of the "C" kit and donning of appropriate PPE/CPC should be adhered to before using the kit in an emergency.

Note: The Chlorine Institute Emergency Kit "C" is the only chlorine emergency kit for chlorine tank cars/trucks that is manufactured to the design specifications of The Chlorine Institute.

The Chlorine Institute has issued a **Bulletin** regarding the application of the Emergency Kit "C" to the Next Generation Rail Tank Car fittings. It is available on the Chlorine Institute's website.



SUMMARY: SAFETY POINTS TO REMEMBER

Basic Rail Safety

SAFETY IS PRIORITY #1

- Expect a train or rail equipment on any track, in either direction, at any time.
- Communicate with the railway.
- Before commencing any operation on or near any railway tracks you must contact the railway.
- Do not enter or onto rail property without railway's knowledge.
- Ensure and confirm track protection is in place; train traffic is stopped.
- Never assume that all trains are stopped until you are notified by a responsible railway official that movements have been halted.
- Do not step on rail; step over it.
- Avoid walking between the rails. Watch where you step at all times.

Documentation; get the consist (paperwork) from the railway

- Before working on or around any car, make sure the hand brake is set and the car wheels are chocked.
- Make sure blue flags are in place and switches are lined away and locked prior to climbing on equipment in a railyard.
- Place hose lines under tracks, by digging out ballast.
- Look in both directions before stepping across or getting close to tracks.
- Keep a safe distance, at least 30 feet, from passing trains and equipment.
- Never place anything on the track unless it is required by a specific task.
- Always leave 25 feet between you and any standing rail car when crossing tracks.
- Always face the direction from which a train is traveling.
- Be aware of electrical hazards in and around locomotives.

REMINDERS WHEN WORKING ON TANK CARS

Documentation, documentation, documentation; get the paperwork!

- Make sure you have positively identified the contents of the car and understand all the properties and hazards.
- Know and understand the valves, relief devices, and mechanical appliances and how they operate.
- Ensure that there will be no movement on the track on which you are working ("blue flag" and "lockout").
- Always use the safety handles, platforms, and ladders provided.
- Never stand, step, or cross on the center sill or coupler.
- Never jump off a car...Use the ladder.
- When climbing a tank car use 3 points of contact.
- Never put your body over or in front of any valve, gauge, or other opening.
- A good first step is to ISOLATE and DENY ENTRY to the scene until the hazards and conditions have been evaluated.
- Railway personnel can assist responders in performing a thorough damage assessment.
- Rail car initials and numbers are one of the most important pieces of information that emergency responders can obtain at the scene of a railroad emergency. All information related to the rail car is referenced by using the car initials and number.
- Responders should attempt to accurately record and report the initials and numbers of any cars involved in a derailment or other emergency situation.
- Remember the rail car's initials and number is stenciled on both sides of the car (to the left) and on both ends of the rail car; sometimes it may also be located on top of the car.

Appendix

APPENDIX A: GLOSSARY OF RAILWAY TERMS

AAR – the Association of American Railroads, a trade association comprised of North American railroads. The AAR, among other activities, issues specifications and rules regarding the interchange of railcars between the various railroads. The AAR's requirements for tank cars are contained in the AAR Manual of Standards and Recommended Practices (MSRP) C-III, Specification M-1002.

AAR Specification Tank Car – a tank car built, altered, or converted in accordance with the tank car specifications of the Association of American Railroads.

A-end – the end of a railcar, opposite the end equipped with the hand brake (see B-end.)

B-end – the end of a railcar on which the hand brake of a railcar is attached. If both ends of the railcar have a hand brake, the car will be stenciled A-END and B-END. When facing the B-end, the sides of the railcar are identified as the Right Side and Left Side, respectively.

Body Bolster – the structural members at each end of a car body that support the car on its truck assemblies. Otherwise known as a Tank Saddle.

BOE – “Bureau of Explosives” is a railway organization dedicated to helping carriers, shippers, and container manufacturers continually improve dangerous goods/hazardous materials (hazmat) transportation safety.”

Bottom Outlet Valve – a valve located in the bottom of the tank for loading or unloading.

Bottom Washout – a plugged and flanged opening in the bottom of a tank to facilitate cleaning of a tank car that does not have a bottom outlet.

Brake Rigging – the assembly of cylinders, levers and/or rods under a railcar that provides and transmits brake action to the wheels.

Breather Vent – a device having an operating part that is a permeable disc or a disc having a breather hole or slit. Breather vents are typically applied to tank cars transporting hydrogen peroxide to allow vapors created by the commodities decomposition to be vented from the tank.

Burst Pressure (Disc) – the value of the inlet static pressure at which a safety vent or breaking-pin device functions.

Burst Pressure (Tank) – the internal pressure at which a tank will theoretically burst. For a tank car tank, the minimum burst pressure is a function of the tank's inside diameter, welding joint efficiency, minimum tensile strength of the plate material, and the minimum thickness of the plate after forming.

CAER – Community Awareness and Emergency Response – **Community Awareness** – is the branch of CAER that keeps the community informed. Emergency Response, function that drove the formation of CAER, bringing municipal and industrial emergency responders together to identify potential risks associated with industrial operations and to develop emergency plans around them.

CANUTEC – acronym for the Canadian Transport Emergency Centre. CANUTEC is operated by the Transport of Dangerous Goods Directorate of Transport Canada and provides a national bilingual (English and French) advisory service, including emergency response advice for incidents involving dangerous goods. Call 613-996-6666 (24hours), *666 cellular (Canada only) or 1-888-226-8832 (CAN-UTEC). Call 613992-4624 (24 hours) for nonemergency inquiries.

Capacity/CAPY – the volumetric capacity (stenciled in gallons and liters) of a tank car's tank head. The capacity may also be shown in imperial gallons.

Center Sill – the center longitudinal structural member of a car underframe that forms the backbone of the underframe and transmits most of the buffing shocks from one end of the car to the other (also see Stub Sill Tank Car).

CFR – Code of Federal Regulations – is an annual codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal Government.

CHEMTREC® – acronym for the Chemical Transportation Emergency Center, a 24-hour emergency response service that provides assistance in the handling of incidents involving hazardous materials/ dangerous goods. Call toll free at 800-424-9300 in the U.S. and Canada (outside calls: collect at 703-527-3887).

C-Kit/Capping Kit – a set of components used to cap (cover) and contain leakage from a fitting on a tank car. C-Kits are specifically designed for use on chlorine and sulfur dioxide tank cars.

Clad/Cladding – the bonding of dissimilar metal sheets to form a composite material. The more corrosion resistant metal acts as an interior protective coating after a tank car tank is fabricated.

Class (Tank Car) – a general designation of tank cars, usually including several specifications; e.g., Class DOT-111 or Class AAR-204. The word –ClassII is used if the designation embraces several specifications.

Combination Pressure Relief Device – a PRD that incorporates a non- reclosing device (breaking pin or rupture disc assembly) in conjunction with an outboard reclosing pressure relief valve.

Commodity/Lading – the product inside a tank car.

Coupler Vertical Restraint System – see Double-Shelf Coupler.

Cryogenic Liquid Tank Car – a vacuum-insulated tank car, consisting of an inner container (tank) enclosed within an outer steel shell (tank, not jacket), designed for the transportation of refrigerated liquefied gases having a boiling point colder than minus 130°F at atmospheric pressure, such as liquid hydrogen, oxygen, ethylene, nitrogen and argon.

DOT – acronym for the Department of Transportation, which is the governmental department that regulates the transportation of hazardous materials within the United States and Canada.

DOT/TC Specification Tank Car – the U. S. Department of Transportation or Transport Canada specification to which a tank car was built, altered, or converted.

Double-Shelf Coupler/Coupler Vertical Restraint System – a railcar coupler having top and bottom shelves designed to prevent vertical disengagement of mating couplers in the event of an excessive end-to-end impact. Double-shelf couplers are fully compatible with all other railcar couplers and required by DOT regulation on all DOT specification tank cars and any tank car transporting hazardous materials/ dangerous goods.

Eduction Line – the combination of the eduction valve and eduction pipe.

Eduction Pipe – the pipe that runs from the eduction valve into the tank.

Eduction Valve – a valve used to load or unload liquid product or to introduce or remove vapour from a tank car tank.

ERAC – Emergency Response Assistance Canada (Flammable Liquid ERAP Response Teams)

ERAP – Emergency Response Assistance Plan. Describes what is to be done in the event of a transportation accident involving certain higher risk dangerous goods that require special expertise and response equipment. Assisting local emergency responders by providing them with technical experts and specially trained and equipped emergency response personnel at the scene of an incident.

Excess Flow Valve – a device installed in a liquid, vapour, or sample line, or a gauging device rod designed to stop the outward flow of product in the event the fitting is removed during transportation, such as the device being sheared-off during an accident. When not in operation, the device allows the flow of liquid or vapour in two directions. Do not confuse this valve with a check valve, which is a device that allows the flow of liquid or vapour in only one direction.

Fill Hole – an opening in the manway cover, closed with a fill-hole cover, through which product may be loaded or unloaded. Typically found on tank cars in sulfuric or hydrochloric acid service.

Flange – a disc-shaped device that is part of a nozzle or fitting (valve, PRD), used to create a bolted attachment to the tank car. Also, it may be a solid disc (blind flange) or have a threaded hole for a plug or secondary valve bolted to the eduction valve to provide closure.

Frangible Disc – see Rupture Disc.

FRA – Federal Railroad Administration – was created by the DOT. It is one of ten agencies within the U.S. DOT concerned with intermodal transportation.

Gasket – material inserted in the joint between two mating surfaces to prevent leakage through the joint.

Gauging Device – a device used to measure the level of liquid or vapour space in a tank car tank, which may be a fixed gauge bar/outage scale or T-bar attached to the top of the tank (in non- pressure tank cars), or a magnetic-ball, fixed-length (telltale) tube, or an electronic device.

Head – one of the ellipsoidal ends of a tank car tank.

Hand Brake – A device mounted on railcars and locomotives to provide a means for applying brakes manually without air pressure. Common types include vertical wheel, horizontal wheel, and lever type, named because of the configuration or orientation of their operating handles.

Head Shield – A method of providing tank head puncture-resistance by mounting a metal shield on the end of a tank car to protect against punctures from the coupler of another railcar. Head shields may be separate attachments or may be incorporated into a tank's jacket.

Heel – common term used for the product or residue remaining in a tank car tank after it has been unloaded.

ICS – Incident Command System - systematic tool used for the command, control, and coordination of emergency response.

Insulation – a material, typically fiberglass or foam, enclosed within a metal jacket, used to maintain or moderate the temperature or aid in the unloading of the lading contained within a tank car. For cryogenic liquid tank cars, in addition to a vacuum and insulation system, perlite or an alternating wrap of multiple layers of aluminum foil and paper is used. Not all tank cars are insulated. Do not confuse insulation with thermal protection.

Internal Valve – a type of bottom outlet valve located inside a tank car tank to prevent damage in the event of an accident.

Jacket – a metal covering (minimal thickness of 11gauge) surrounding a tank car tank designed to protect and secure the insulation and/or thermal protection systems on a tank car. A jacket is not an outer tank.

Light Weight/LT WT – empty weight or tare weight of cars or of the train. The light weight is stenciled in pounds and kilograms on every rail freight car and is abbreviated LT. WT.

Liquid Eduction Line – a pipe, equipped with a valve, cap, or blind flange closure that extends to the bottom of a tank car tank for the loading and unloading of the lading.

Load Limit/LD LMT – the maximum weight of lading that can be loaded in a railcar. Load limit is stenciled in pounds and kilograms on every rail freight car and is abbreviated LD. LMT.

Manway – a general term designating the circular shaped opening located at the top of a tank car tank to allow access into the tank's interior for maintenance, inspection, and loading or unloading. Depending upon a tank car's class or product service, the manway will be closed with either a hinged and bolted manway cover (typical for non-pressure tank cars) or a semi permanently bolted manway cover or pressure plate, typical for pressure and cryogenic liquid tank cars.

Nitrogen Blanket/Nitrogen Pad – nitrogen gas inserted into a tank car tank to provide an inert atmosphere for a lading that may react with air in order to protect the lading's purity or to prevent the entry of moisture.

Non pressure or Low-Pressure Tank Car – a tank car with a tank test pressure of 60 or 100 psi. Non pressure tank cars are also referred to as general service or low-pressure tank cars.

Nozzle – a circular or oval-shaped attachment applied to openings in a tank for the application of a manway cover (or pressure plate), valves, pressure relief devices, and other fittings.

OL – Operation Lifesaver Canada

Outage – the vacant space left in a tank car tank after filling to allow for product expansion during transportation so it will not reach shell-full capacity (maximum volume of a tank). Governmental regulations prescribe minimum outages for hazardous materials/dangerous goods at specified reference temperatures. In addition to minimum outage by volume, tank cars may not be loaded-in by weight excess of their gross weight on rail limit as determined by their truck capacity. Another term for outage is ullage.

Pressure Relief Device – a fitting that opens at a predetermined setting to reduce the pressure within a tank car tank resulting from exposure to abnormal conditions. PRDs may be reclosing (spring-loaded) pressure relief valves, regulating valves, non- reclosing (frangible/rupture disc) vents, or combination PRDs (incorporating both a frangible disc/breaking pin and a reclosing pressure relief valve).

Packing – a general term denoting the various substances and devices used to prevent leakage of fluids or gases through openings (valve body and valve stem) that cannot be closed by ordinary contact of the parts concerned.

Packing Gland – the portion(s) of a device used to contain packing on a valve body or other fitting to prevent leakage.

PIH/TIH (Poison/Toxic Inhalation Hazard) – a gas or liquid that meets the definition of a material poisonous by inhalation

Pressure Plate – on a pressure tank car, the circular shaped steel plate closing the manway nozzle to which the valves, pressure relief device(s), and other fittings are mounted. Some non -pressure tank cars may be equipped with a pressure plate assembly in lieu of a hinged and bolted manway cover.

Pressure Relief Valve (PRV) – a spring-loaded device, actuated by inlet static pressure, that relieves excess pressure and recloses after normal conditions are restored. Pressure relief valve has replaced the term safety relief valve.

Pressure Tank Car – a tank car with a tank test pressure of 100 to 600 psi.

Protective Housing – on pressure and on some non-pressure tank cars; a heavy, circular steel housing that surrounds the fittings to protect them in the event of an accident and from unauthorized access. Nonpressure tank cars may be equipped with light gauge steel protective housings (referred to as combination housings) that provide weather and tamper protection. Do not confuse with an expansion dome as found on some (obsolete) non pressure tank cars. The protective housings for cryogenic liquid tank cars are boxes or cabinets on the sides or end of the tank car.

RAC – Railway Association of Canada

Regulating (Regulator) Valve – a reclosing (spring loaded) pressure relief device applied to tank cars transporting certain refrigerated liquids (e.g., carbon dioxide and argon) to maintain internal pressure below a certain point. If the pressure exceeds a specific point, the valve will open, relieving vapour, which results in auto-refrigeration, lowering the product's temperature and pressure.

Reporting Mark and Number – the alphanumeric initial stenciled (typically 2 or 4 letters ending with an X for non-railroad owned cars, followed by 2 to 6 numerals; e.g., BOEX 2010) on the sides and ends of every freight car to identify the railroad or private car line that owns the car. Reporting marks are assigned by the Association of American Railroads.

Residue – the dangerous goods remaining in a packaging after its contents have been unloaded to the maximum extent practicable and before the packaging is either refilled or cleaned of dangerous goods and purged to remove any vapours.

RQ – Reportable Quantity (CFR49)

Rupture Disc – the operating part of a safety vent, also called a frangible disc. When used in conjunction with a spring-loaded reclosing pressure relief valve, the device is called a combination pressure relief device.

Safety Relief Valve – See Pressure Relief Valve. Pressure relief valve has replaced the term safety relief valve.

Safety Vent (Rupture Disc Device) – a device consisting of a rupture disc and rupture disc holder. A non-reclosing pressure relief device actuated by static pressure and designed to function by the burst of a pressure-containing disc.

Sample Line – a pipe (typically 1/4 inch in diameter), equipped with a needle valve that extends to near the bottom of a tank car tank for drawing a sample of the lading.

Service Equipment – equipment used for filling, sampling, emptying, venting, vacuum relief, pressure relief, heating (if internal to the tank), lading temperature measurement, or measuring the amount of lading within the tank. Commonly referred to as valves and fittings.

Shell – the cylindrical section of a tank car tank, without heads. Do not confuse with jacket. (See also Tank Car and Head.)

Shipping Paper (Hazardous Materials/Dangerous Goods) – a shipping order, bill of lading, manifest, or other shipping document serving a similar purpose and containing the information required by Governmental regulations.

Skid Protection – a device attached to the bottom of a tank car to protect the bottom outlet, washout and/or sump (referred to as bottom discontinuities) from damage in the event of a derailment.

Specification – the specific designation within a tank car class; e.g., DOT 111A100W2.

STC Code or STCC – abbreviation for Standard Transportation Commodity Code, which is a 7-digit freight description coding system used by the North American railroad industry. For hazardous materials/dangerous goods, the STCC is referred to as the Hazmat Code, and begins with 49 or 48 for hazardous wastes. The Hazmat Code may be found on shipping papers and may be used to access computer-based emergency response information.

Stenciling – a term used to describe all forms of lettering on cars regardless of the actual method of application. Specific information that is required to be marked on the exterior surface of a tank car.

Stub Sill Tank Car – a tank car design with draft sills at each end of the tank instead of a continuous center sill that utilizes the tank as part of the car structure. (Also see Center Sill).

Stuffing Box – the portion of a top-operated bottom outlet valve assembly through which the valve operating rod passes to the exterior of the tank. The stuffing box contains packing that, when compressed by the packing gland nut, forms a seal around the rod to prevent leakage and keeps the rod from vibrating. The stuffing box cover, when removed and inverted, is used as a wrench to open and close the internal valve.

Sump or Siphon Bowl – a small depression located near the longitudinal center of a tank bottom where the liquid eduction line extends, thereby allowing the maximum amount of product to be removed from the tank.

Surge Pressure Reduction Device – a device designed to reduce the internal surge pressures of the pressure relief devices. These devices are primarily used on tank cars equipped with non-reclosing pressure relief devices (safety vents) and are intended to reduce pressure surges that can cause the rupture disc to fail.

Tank Car/Tank Car Tank – a railcar that has a tank for its body for transporting liquids, solids, and liquefied gases, consisting of a shell and heads together with connections welded directly to it. In accordance with AAR specifications, –tank means –tank car tank. The head of a tank is one of the end closures. Tank cars may be pressure or non-pressure and are often equipped with special equipment to enhance their usefulness for handling specific commodities. For pressure class tank cars, the tank includes the manway nozzle as well.

Tank Test Pressure – the pressure (psig) at which a tank car tank is to be hydrostatically tested at the time of construction. Depending upon the specification, the tank test pressure varies from 20 percent to 40 percent of the minimum burst pressure. Tank test pressure is also known as service pressure.

TC or Transport Canada – the Governmental agency that regulates the Transportation of Dangerous Goods in Canada.

Thermal Protection – a material or system applied to certain tank cars to limit the transfer of heat to the tank in the event of exposure to pool or torch fires. It is intended to reduce the likelihood of tank failure under such conditions. Thermal protection is not the same as insulation, which is intended to maintain or moderate lading temperature under ambient conditions.

Thermometer Well – a small diameter pipe, usually 3/4 inch, filled with an antifreeze solution or oil that extends into the tank and is closed at the top with a removable cap. The temperature of the lading transfers to the liquid in the pipe. A thermometer or probe is lowered into the pipe to obtain the lading's temperature.

TIH/PIH (Toxic/Poison Inhalation Hazard) – a gas or liquid that meets the definition of a material poisonous by inhalation

TRANSCAER® – Transportation Community Awareness and Emergency Response, a voluntary national outreach effort that focuses on assisting communities to prepare for and to respond to a possible hazardous materials transportation incident. Representatives from the chemical manufacturing, transportation, distributor, and emergency response industries, as well as the government.

Train Consist – for purposes here, a document (also referred to as a Train List or Wheel Report) that sequentially lists the location of each railcar in a train. A consist may also serve as the shipping paper for a railcar containing hazardous materials/dangerous goods, provided it contains all the information required by governmental regulations.

Truck – the assembly of wheels, axles, roller bearings, springs, side bearings, side frames, and bolster that supports each end of a railcar and enables it to move on the rails.

TSB – Transportation Safety Board (Canada)

Type (Tank Car) – for tank cars, designates the approving agency; e.g., AAR, DOT, and TC, which is the preferred form of designating.

UN – United Nations

Vacuum Relief Valve – a spring-loaded valve mounted at the top of some non- pressure tank cars, designed to open and allow air into the tank if an excessive vacuum is formed that may cause the tank to collapse. A vacuum relief valve should not be depressed to determine if there is pressure in the tank. Doing so may dislodge the sealing component causing the device to leak vapor or liquid.

Vapour Line – a pipe equipped with a valve, cap, or blind flange closure that extends to the top of the tank through which vapour is introduced or removed during loading or unloading. On a non- pressure tank car, this device is usually called an airline and is used to introduce compressed air or vapour, or an inert gas to unload the car.

Vapour Space – the space in a tank above the liquid; may also be referred to as outage.

APPENDIX B: DOCUMENTATION (SHIPPING PAPERS)

What is a shipping document?

A “shipping document” is defined under Section 1.4 of the TDG Regulations. Simply put, it is a paper document that contains required information about dangerous goods being handled, offered for transport or transported.

Rail shipments require an additional document called a “consist”. A consist numerically identifies the railcars, in a train, that contain dangerous goods. The consist will also identify the type of dangerous goods present in the railcar. You must keep the consist with the shipping document(s).

Ref. TDGR Section 3.3

Formatting of consists varies by railway so know the railway in your area and how to read their paperwork (or have the train crew explain it to you.)

1 3 CBTX 727969 TSI L FLMLQD PULJCT NS 133 59 CRUDESUPP

A2 HAZMAT-US TRAIN PLACEMENT GROUP 2
JC CDN MARSHALLING GROUP C
JR ERAP PULLBY REQUIRED (CANADA)

* DANGEROUS *

W/B 691975 - 2017-03-21 ** DANGEROUS GOODS SHIPPING DOCUMENT **

TO:DUCK LAKE MS FROM:APPA AB
CRUDE OIL SUPPLY CO CRUDE CO
2100 JOHN WALKER PARKWAY S HIGHWAY 123 EAST RANGE ROAD 2
TUSCALOOSA AL 35102 APPA AB 50H2T0

5 1 TANK CAR / 82789 KG 6

UN1267 7

PETROLEUM CRUDE OIL 8

9 CLASS 3 / PG II 10

EMERGENCY 24-HOUR NUMBER USA (800) 424-9300 11

CCN 1234

EMERGENCY 24-HOUR NUMBER CDN (613) 996-6666

2-A-1234

ERP 2-1933-078 TEL (800) 265-0212 12

13 HAZMAT STCC 4910165 14

SHIPPERS CERTIFICATION: BOB SMITH
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

1. Position in Train	Indicates the location of the car in the train - the cars in a CN train are listed from front to rear.
2. Car Initials and Numbers	Also known as "Reporting Marks", these are the letters and numbers on the side of a rail car and are unique to each one. This is one of the most important pieces of information to obtain in order to access information on the contents of the rail car.
3. Load or Empty	The shipping paper/document will indicate if the car is loaded or contains a residue. A car will contain a residue of dangerous goods if it has not been cleaned and purged. Placards do not indicate the load or residue status of a rail car.
4. Shipper and Consignee	These indicate the shipper of the car and where it originated from, and the consignee section will show who will be receiving the shipment and the destination of the car.
5. Package Type	This describes how the commodity is packaged. This can be a tank car, hopper car or a non-bulk package such as drums, totes, and bags.
6. Quantity	The shipping paper/document will indicate how much product is being shipped, if loaded.
7. Identification Number	Indicates the 4-digit UN (United Nations) or NA (North American) identification number.
8. Proper Shipping Name	The name of the dangerous good.
9. Hazard Class	Displays the hazard class or division number of the commodity. There are 9 hazard classes. *Further details and descriptions of the 9 hazard classes is found on page 36. A secondary hazard class must be shown if one is required.
10. Packing Group (PG)	A grouping of dangerous goods indicating relative severity of a material within its hazard class. Required for all except Classes 2, 7 or ORMDs (Other Regulated Materials). PG displayed in roman numerals: PG I = great danger PG II = medium danger PG III = minor danger
11. Emergency Response Phone Number	A phone number supplied by the shipper, which can be called to receive information on the dangerous good/hazardous material 24 hours/day.
12. ERAP: Emergency Response Assistance Plan	Canadian regulations require that certain dangerous goods have an Emergency Response Assistance Plan (ERAP) when transported in Canada. The plan number and a telephone number to activate the plan are required to be displayed on the documentation.
13. Standard Transportation Commodity Code (STCO)	A number assigned to the specific product by railroads. Dangerous goods STCCs will begin with the number "48" or "49".
14. Shipper Certification	A certification of the shipment made by the consignor or by an individual acting on behalf of the consignor.

CN Consist

Train number and the station the train departed from

User ID: 117475
Train list contains Canadian dangerous goods shipping records.
Cars in this train are counted from front to rear

TRAIN # < M 34371 22 > DEPARTING MATTESON IL generated 2015-01-01 AT 09:13
Train ID M MEMSYM1 22 Departing MEMPHIS TN

Rail cars on CN trains are listed beginning from the first rail car behind the locomotive towards the rear of the train

The summary box provides a quick view of the dangerous goods carried on the train

S U M M A R Y

SPECIAL DANGEROUS - 0 DANGEROUS - 6 RESIDUE - 0
BAD ORDER - 5 DIMENSIONAL - 0 SPEED RESTRICTED - 0
POISONOUS INHALATION - 1 ESTOPPEL - 0 HEAVY AXLE LOAD - 0
ERAP - 1 RSEM - 0

Dir	Op	Dyn		Cuml										
Locomotive	Fac	DP Code	HP	Avl HP	Feet	Ten	Brk	DU	Axle	Fr Stn	To Stn			
CN	2605	F	N	LN	4300	4300	73	197	62F N	6	MEMPHI	SYMINGT		
Total					4300	4300	73	197						

Seq	Car	L	Online	GRS	S/C-ZTS	DATE
Num	Init	Number	End	E	Conten	Destin
RAJP	TON	IGT	CONSIGNEE	S/C-STN	TIME	
Block MEMPF Setout MEMPHIS TN						
1	NW	140089	C5P	L	SAND	EFFING CSXT 127 68 EXXONMCHEMIC
2	CN	32805	C5P	E		EFFING CSXT 132 68 EXXONMCHEMIC
3	UP	32054	FB7	E		EFFING CSXT 126 68 EXXONMCHEMIC

Position in train

Car initial and number

Signifies loaded or empty

80

Dangerous
goods hazard
information will
immediately
follow the entry
on a CN train
consist

Package type / Quantity of product	
Product identification number	
Proper shipping name of the product	
Hazard class / Packing group assigned to	
Emergency contact phone number(s)	

CN Intermodal Consist

1*

2*

7 DTTX 766627 Q53 L FLMLQD CHIINT
HAZMAT-US TRAIN PLACEMENT GROUP 2
CDN MARSHALLING GROUP C
DO NOT HUMP, KICK, DROP SWITCH OR HUMP INTO
DXR - DIMENSIONAL-HEIGHT - SEE BLANKET MESSAGE FOR RESTRICTIO
IN TRANSIT MOVE, BONDED THROUGH CANADA

ZIMU 239450 KC1 L MDSE CHIINT 20C 20 ZIMINTSHICAN
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS

CLHU 341717 KC1 L MDSE CHIINT 20C 20 ZIMINTSHICAN
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS

ZCSU 258324 KC1 L MDSE CHIINT 40C 40 ZIMINTSHICAN
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS

EXFU 527231 KC1 L MDSE CHIINT 20C 20 ZIMINTSHICAN
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS

CPIU 300312 KC1 L MDSE CHIINT 20C 20 ZIMINTSHICAN
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS


SNIU 122791 KC1 L FLMLQD CHIINT 20C 20 ZIMINTSHICAN
HAZMAT-US TRAIN PLACEMENT GROUP 2
CDN MARSHALLING GROUP C
IN TRANSIT MOVE, BONDED THROUGH CANADA
VESSEL SAILING DATE, SEATTLE EXPRESS

* DANGEROUS *

W/B 416970 - 2012-09-20 ** DANGEROUS GOODS SHIPPING DOCUMENT **
TO: CHIINTTER IL FROM: ROBBANK BC
ZIM INTEGRATED SHPG SVCS (CDA) CO ZIM INTEGRATED SHPG SVCS (CDA) CO
CHICAGO INTER TERM IL 1167 COVINGTON ST
VANCOUVER BC

1 TANK / 19500 KG
UN1126
1-BROMOBUTANE
(1-BROMOBUTANE)
CLASS 3//PG II
EMERGENCY 24 HOUR NUMBER 800 251-1128
HAZMAT STCC 4909129

**Dangerous Goods
information for
container within this
3pack**



**1* : Car initial and
number (Reporting
Mark)**

**2* : Containers on the
rail cars**

82

CPKC Consist (Outbound Wheel Report)

CARS IN THIS CONSIST COUNT FROM HEAD TO REAR

OUTBOUND WHEEL REPORT FOR TRAIN 204EA04

PRINTED: SEP 06 2013 0929EDT

```
$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$$  
$   YOU ARE IN CHARGE OF HANDLING TRAIN  204EA04      FOR OUR VALUED CUSTOMERS $  
$  
$ TO MAINTAIN OUR ON TIME PERFORMANCE THIS TRAIN IS SCHEDULED TO DEPART: $  
$  
$           MEDICINE HAT                               7:50 AM $  
$           SWIFT CURRENT                             12:00 PM $  
$
```

CLASS CODES IN THIS TRAIN						
CLASS CODE	HEAD CAR	REAR CAR	LOADS	EMPTIES	TONS	LENGTH
UNIT	CP 008921	CP 008921	0	1	210	74
6300MA1	SOO 601561	CP 216180	18	7	2404	1377
7330MA1	ADMX 028801	ADMX 028801	0	1	39	61
6300MA1	PROX 032592	UTLX 208229	4	14	963	1010
6026EX1	DTTX 658020	DTTX 658300	3	0	77	218
5206EX1	DTTX 655174	DTTX 655948	7	0	244	713
UNIT	CP 008709	CP 008709	0	1	210	74
3410EA1	TTGX 930223	ETTX 802824	0	41	2205	3846
SBU	CPT 058785	CPT 058785	0	1	0	0

SEQ	INIT	NUMBER	TYPE	E	COMDTY	TON	CLASS	CD	CONSIGNE	LTH	FDOL	TIME/TRACK
000	CP	E008921	D127	E	E		UNIT		74			NO WAYBILL
ENGINE ASSIGNED BY LOCOMOTIVE MANAGEMENT SYSTEM												
001	SOO	601561	F483	L	LUMBE	123	6300MA1	REMBOS	I	81	5198CN	
Cushioned Draw Bars												
Car LENGTH exceeds 80 feet												
002	CP	419537	M190	L	WHEEL	94	6300MA1	WESTON	S	56	5205	
Do not Hump or cut off in motion												
Car Restricted in I/C by AAR Reason: Age												
003	GBRX	035046	G719	E	EMPTY	38	6300MA1	EVRAZ	IN	72	6016	
004	GBRX	035116	G719	E	EMPTY	38	6300MA1	EVRAZ	IN	72	6016	
005	GBRX	035082	G719	E	EMPTY	38	6300MA1	EVRAZ	IN	72	6016	
006	CP	428329	M190	L	SCPTI	109	6300MA1	FRAEDRIC		58	4955	
Car Restricted in I/C by AAR Reason: Age												
007	CP	428248	M190	L	SCPTI	107	6300MA1	FRAEDRIC		58	4955	
Car Restricted in I/C by AAR Reason: Age												

CPKC Consist (Waybills – Residue Cars)

```
***** RESIDUE CARS *****

PAGE 1 OF 1

UTLX900946 WB 917063 09/03/13 NET MASS 0 KG 029 FM ENG.
UTLX900967 WB 917065 09/03/13 NET MASS 0 KG 030 FM ENG.
UTLX667936 WB 917066 09/03/13 NET MASS 0 KG 031 FM ENG.
UTLX900925 WB 917064 09/03/13 NET MASS 0 KG 032 FM ENG.

CANADIAN PACIFIC RAILWAY
401 9TH STREET SOUTH WEST
SUITE 500
CALGARY AB

SHIPMENT DESTINATION : SHIPMENT ORIGIN :
PINE BLUFF SK CENTER BC

TO: FROM:
LITTLE SASK GAS CHEV CHEV CANADA
12 GRAVEL AVE 123 MAIND AVE
PINE BLUFF SK CENTER BC
S5S1S4 CA V5V1V4 CA

4 TANK CARS STCC 4910165
UN 1267 EMERGENCY 24-HOUR NUMBER 613-555-5555
RESIDUE LAST CONTAINED CONTRACT HOLDER: CANUTEC
PETROLEUM CRUDE OIL ERP NO 2-0000-999
CLASS 3 ERP PHONE 6045555555
PG II
```

84

CPKC Consist (Waybills – Compressed)

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***** DANGEROUS COMMODITIES *****

PAGE 1 OF 1

TILX194703 WB 962634 09/06/13 NET MASS 83770 KG 049 FM ENG.

CANADIAN PACIFIC RAILWAY
401 9TH STREET SOUTH WEST
SUITE 500
CALGARY AB

SHIPMENT DESTINATION : SHIPMENT ORIGIN :
WIDESPOT SK RESUME SPEED AB

TO: FROM:
MESA REFINING CO TWO CENTS GAS COMPANY
177 CRAZY RD 15671 1ST AVE SW
WIDESPOT SK BUXTAHOOTIE AB
S2K 3H7 R5L 4H8 CA

1 TANK CAR STCC 4910165
UN 1267 EMERGENCY 24-HOUR NUMBER 666) 555-5555
PETROLEUM CRUDE OIL CONTRACT HOLDER:
CLASS 3 EMERGENCY CONTACT (24 HRS)
PG I EMERGENCY 24-HOUR NUMBER 800 555-5555
SHIP CERT: JOE DIRT CONTRACT HOLDER: CCN 12345
BROKER: RIDERS BROKERAGE LLC
```


Key Trains

"Key Train" means an engine with cars:

- that includes one or more loaded tank cars of dangerous goods that are included in Class 2.3, Toxic Gases and of dangerous goods that are toxic by inhalation subject to Special Provision 23 of the Transportation of Dangerous Goods Regulations; or
- that includes 20 or more loaded tank cars or loaded intermodal portable tanks containing dangerous goods, as defined in the Transportation of Dangerous Goods Act, 1992 or any combination thereof that includes 20 or more loaded tank cars and loaded intermodal portable tanks.

K	K	E	E	E	E	Y	Y	T	T	T	T	R	R	R	R	A	A	A	I	I	I	I	N	N
K	K	E	E	E	E	Y	Y	T	T	T	T	R	R	R	R	A	A	A	I	I	I	I	N	N
K	K	E	E	E	E	Y	Y	T	T	T	T	R	R	R	R	A	A	A	I	I	I	I	N	N
K	K	E	E	E	E	Y	Y	T	T	T	T	R	R	R	R	A	A	A	I	I	I	I	N	N
K	K	E	E	E	E	Y	Y	T	T	T	T	R	R	R	R	A	A	A	I	I	I	I	N	N

1

SUMMARY			
SPECIAL DANGEROUS - 1	DANGEROUS - 16	A	RESIDUE - 1
BAD ORDER - 2	DIMENSIONAL - 16		SPEED RESTRICTED - 1
POISONOUS INHALATION - 1	ESTOPPEL - 0		HEAVY AXLE LOAD - 5
ERAP - 17	RSSM - 1		

2

1 ATW 318337 FB7 L LUMBER SUPERI UP 129 80 IDAHO TIM LLC
MOVING ON MMB - REQUIRES FULL BILL TO DELIVER

2 TILX 280985 TSI L FLMLQD PULJCT NS 133 59 CRUDESUPP
A2 HAZMAT-US TRAIN PLACEMENT GROUP 2
JC CDN MARSHALLING GROUP C
JR ERAP PULLBY REQUIRED (CANADA)

3

***** DANGEROUS *****
W/B 691984 - 2016-11-21 ** DANGEROUS GOODS SHIPPING DOCUMENT **
TO: DUCK LAKE MS
CRUDE OIL SUPPLY CO
2100 JOHN BEAMER PARKWAY S
TUSCALOOSA AL 35102
FROM: APPA AB
CRUDE CO
HIGHWAY 180 EAST RANGE ROAD 8
APPA AB 58H2T0

4

1 TANK CAR / 82528 KG

5

UN1267
PETROLEUM CRUDE OIL
(PETROLEUM CRUDE OIL)
CLASS 3/PG II

6

EMERGENCY 24-HOUR NUMBER USA (800) 424-9300
CCN 1234
EMERGENCY 24-HOUR NUMBER CDN (613) 996-6666
2-A-1234

7

ERP 2-1933-078 TEL (800) 265-0212

8

HAZMAT STCC 4910165

SHIPPERS CERTIFICATION: BOB SMITH
I hereby declare that the contents of this consignment are fully and accurately described above by the proper shipping name, and are classified, packaged, marked and labeled/placarded, and are in all respects in proper condition for transport according to applicable international and national governmental regulations.

9

3 BCOL 730298 FB7 L LUMBER SUPERI UP 118 79 HOMEDEPOT
4 CRDX 20384 C3G L ASHES FTROUG 128 41 LAFARGCANADA
5 FRPX 11300 A36 L PLYWD DARTMO 106 66 CANWELBUIMAT
6 TTPX 804561 FB7 E REDLAK 31 57 PRIMEDISSERV

10

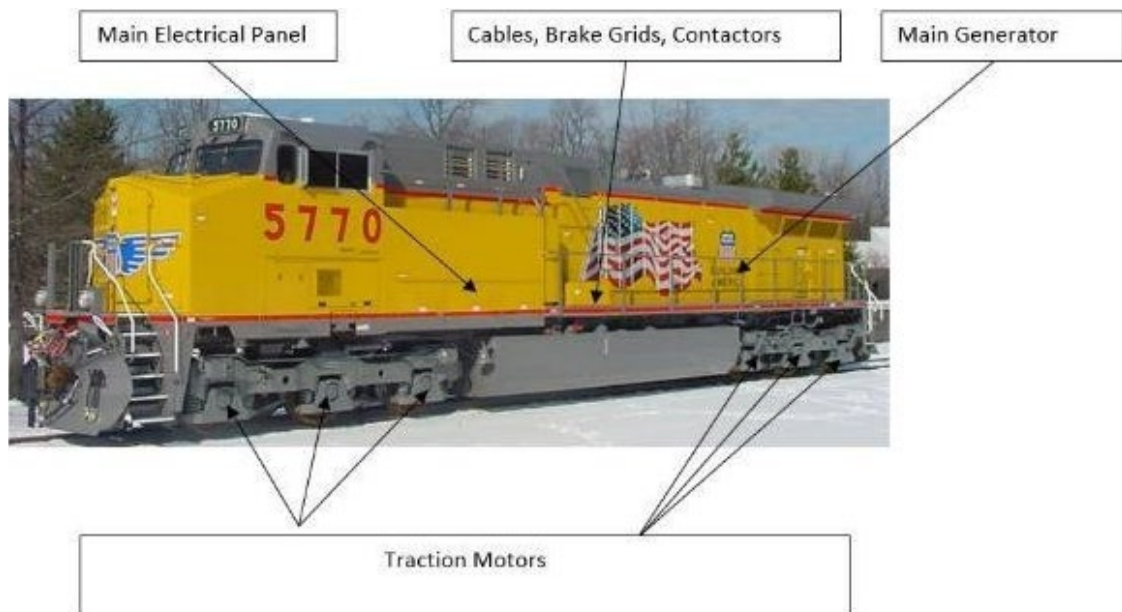
Train Consist Legend

ITEM	DESCRIPTION
1	Train descriptor: “Key Train” means that this train is carrying either one loaded Toxic Inhalation Hazard (TIH) rail car OR 20 or more rail cars loaded with dangerous goods.
2	<p>Train Summary: This shows the number of rail cars that fall under the Transportation of Dangerous Goods Regulations and/or have some other risk associated with them (i.e., heavy axle load). Relevant information in the summary includes:</p> <ul style="list-style-type: none"> A. The number of rail cars containing commodities that are considered to be dangerous goods. Special dangerous goods have an increased public safety risk. B. The number of rail cars containing the residue of a dangerous good. C. The number of rail cars containing commodities with a toxic inhalation hazard (TIH). D. The number of rail cars containing commodities that require an ERAP.
3	<p>Rail Car Information: From the consist on the previous page the rail car information is given as “2 TILX 280985 T5I L”. This grouping indicates the following key pieces of information:</p> <ul style="list-style-type: none"> • 2 is the rail car’s position in the train counting from the locomotive end. In this instance, this car would be the second car after the locomotive. • TILX 280985 is the unique car identification number. This pairs the rail car with the consist, such that each rail car’s contents can be known at any time. • T5I is railway coding for the type of rail car. In this case it is a general service tank car. • L is the load status. L stands for loaded, as in loaded with commodities. E stands for empty. <p>However, if an empty car contains residue of a dangerous good that it once contained, this will be indicated as such on the consist (see 4 below).</p>
4	Dangerous Marking: This indicates that the contents of this rail car are considered to be dangerous goods. RESIDUE will replace the DANGEROUS in the marking for an empty tank car containing dangerous goods residue.
5	Shipper and consignee information: This shows by whom the dangerous goods were shipped and from where, as well as their destination and whom they will be received by.
6	Package Type and Quantity: This describes the primary means of containment for the commodity (i.e., tank car, hopper car, drums, etc.) as well as its total mass.
7	Product Information: This section will contain the UN Identification Number, Proper Shipping Name, Hazard Class and Packing Group (if applicable) of the dangerous good.
8	Emergency Telephone Number: This is the 24 hour phone number supplied by the shipper of the dangerous goods.
9	ERAP Information: If the dangerous goods being carried in this rail car require an Emergency Response Assistance Plan (ERAP) for transport in Canada, the ERAP plan number and the telephone number to talk to a person associated with the plan are included here.
10	Shipper’s Declaration: Each person who offers a dangerous good for transportation shall certify that the commodity is being offered for transport in accordance with the regulations.

APPENDIX C: LOCOMOTIVES

Locomotives represent an ever-present source of potential hazards for responders. The modern diesel-electric locomotive can carry up to 5,600 gallons of fuel. This can pose significant problems if the tank is ruptured in an accident. In addition to the potential for a fuel spill, locomotives can pose an electrocution hazard if they are not properly shut down. Diesel-electric locomotives use large diesel generators to provide electric power to traction motors. These traction motors provide the motive power to move the locomotive and in turn the train. These generators can develop upwards of 600 volts of DC power or 23,000 volts of AC power at 800 amps. Clearly coming into contact with an energized circuit of this magnitude would cause serious injury. **Do not use water on locomotive fires as there is high voltage.**

Because a locomotive is a complicated piece of machinery, emergency responders should only attempt to shut down the locomotive using the fuel cut-offs. Any other measures should only be attempted by trained personnel. If the locomotive has been involved in a derailment and the trucks have disengaged from the locomotive take caution of exposed cables. This has lethal potential if the capacitors have not discharged. If the fire is a crankcase explosion or turbo fire, isolate, evacuate, protect exposures, withdraw, and allow the fire and fuels to consume themselves.



Marked areas noted in the diagram can carry lethal voltage even with the unit shut down

- Do not climb on top of the locomotive at any time.
- Always consult with train crew before attempting any response actions.



Locomotive Statistics

- Weight 420,000 lbs.
- Develop up to 6,000 HP
- 65 ft. long/16 ft. high
- 5,600 gal. of diesel fuel
- 380 gal. of cooling water
- 410 gal. of lube oil
- 74 volt starting de operating system
- Up to 600 volts DC power
- Up to 23,000 volts AC power

**Batteries with 30+ gallons of
H₂SO₄ (Sulphuric acid)**

APPENDIX D: REGULATORY INFORMATION

GOVERNING BODIES FOR RAILWAYS IN CANADA FEDERAL REGULATIONS

Railway Safety Act
Canadian Rail Operating Rules (CROR)
Transportation of Dangerous Goods Act and Regulations
TDG by Rail Security Regulations

PROVINCIAL REGULATIONS

Provincial Rail Safety Acts
Industrial Railway Operating Rules (IROR)
AAR Interchange Rules

Regulatory And Provincial Emergency Phone Numbers

REGULATORY/PROVINCIA/TERRITORIAL

AGENCIES	CONTACT NUMBERS
CANUTEC	1-888-CANUTEC (226-8832) or 1-613-996-666 or Cellular in Canada (star)*666 Non-emergency information line 1-613-992-4624 (24 hour)
CHEMTREC	1-800-424-9300
Alberta	Local police or 1-800-272-9600
British Columbia	Local police or 1-800-663-3456
Manitoba	Local Police or Fire (as appropriate) or Provincial Authority 1-204-945-4888
New Brunswick	Local Police or 1-800-565-1633 or 1-902-426-6030
Newfoundland and Labrador	Local Police or 709-772-2083
Northwest Territories	1-867-920-8130
Nova Scotia	Local Police or 1-800-565-1633 or 1-902-426-6030
Nunavut	Local Police or 867-920-8130 or 1-800-693-1666
Ontario	Local Police
Prince Edward Island	Local Police or 1-800-565-1633 or 902-426-6030
Quebec	Local Police
Saskatchewan	Local Police or 1800-667-7525
Yukon Territory	1-867-667-7244

All Railway derailments involving DG's must be reported to CANUTEC.

More information about reporting requirements for Dangerous Goods can be found in the Transportation of Dangerous Goods Regulations – Part 8

APPENDIX E: INTRODUCTION TO FLAMMABLE LIQUIDS BY RAIL

The following pages are re-produced from the Transport Canada publication: “You’re Not Alone”

Introduction

Petroleum products are widely used commodities transported by rail across the country daily. Amongst all petroleum products, flammable liquids, such as gasoline, diesel, ethanol and crude oil, represent a large portion of the products being transported in our country. In contrast to many other dangerous goods, flammable liquids present a different level of risk during a rail incident due to their flammability and the large volume involved during transport.

Rail incidents can vary in severity, however, even a minor rail incident in or near a community could cause disruptions to the community. For example, rail incidents could result in blocked rail tracks, vehicle traffic disruption, and personal injuries or casualties. A major rail incident could include massive wreckage, casualties and the uncontrolled release of dangerous goods cargo requiring extensive response resources. Consequently, any kind of rail incident could overwhelm local resources if the community is not adequately prepared.

Emergency response falls under the local community’s jurisdiction¹ and as such, local officials are in command of response operations pertaining to the response and recovery of the municipality and its residents. Provincial and local response organizations, while operating under their own command and control structure, must coordinate their activities with local community officials. Community authorities should be aware that there is guidance and assistance available from agencies and specialized response teams that are trained, staffed and equipped to handle large scale incidents. Nevertheless, the first priority in the response must be to ensure the safety of emergency responders and the public. In all cases, preparedness is the key to ensuring an appropriate response to incidents of any magnitude.

Pre-Planning

Pre-planning is the process that identifies the key elements of a possible rail incident involving flammable liquids and determines in advance the steps that may need to be taken.

These steps include:

- Conducting a hazard identification and risk assessment (HIRA) for dangerous goods in transport;
- Identifying available response resources;
- Networking with rail carriers, shippers and response organizations; and
- Developing the necessary knowledge and skills within local response organization.

A critical element of pre-incident planning involves communication with all relevant organizations, particularly the shippers and carriers, in order to learn about the products being transported through or near the community and the availability of emergency response resources.

Traditional structural firefighting strategies and tactics may not be appropriate when dealing with situations involving massive amounts of flammable liquids.

Such incidents need to be approached and managed by involving different response protocols that take into account the dangerous goods involved. This concept must be addressed in emergency response plans, procedures and training programs.

Planning

Know the risks – Although the transportation of dangerous goods (TDG) by rail is strictly regulated and controlled, there are still potential risks. Local communities located along rail tracks need to prepare accordingly for dangerous goods being transported within their jurisdiction. In order to assist communities in their planning efforts, Transport Canada issued Protective Direction 36 (PD36) that grants emergency planners the authority to request information regarding the transportation of dangerous goods from any rail operator in Canada. Upon request, any Canadian Class 1 railway company (i.e., Canadian National Railway and Canadian Pacific Railway) that transports dangerous goods must provide the designated Emergency Planning Official of each jurisdiction through which dangerous goods are transported by rail, with aggregate information on the nature and volume of dangerous goods the respective carrier transports by rail through the jurisdiction. They must also provide statistical information to the municipality, including the percentage of railway cars that operate through the jurisdiction containing dangerous goods and the top ten dangerous goods by volume transported within the jurisdiction.

Any railway operating in Canada, that is not a Canadian Class 1 railway company, must also provide the designated Emergency Planning Official of each jurisdiction through which dangerous goods are transported by railway vehicle with:

- Aggregate information on the nature and volume of dangerous goods the company transports by railway vehicle through the jurisdiction; and
- Any significant change to the information provided as soon as it is known.

Certain conditions and obligations are attached to the Protective Direction; therefore, communities should refer to the official document. The document is available on the Transportation of Dangerous Goods Website.

<https://tc.canada.ca/en/dangerous-goods/transportation-dangerous-goods/protective-directions>

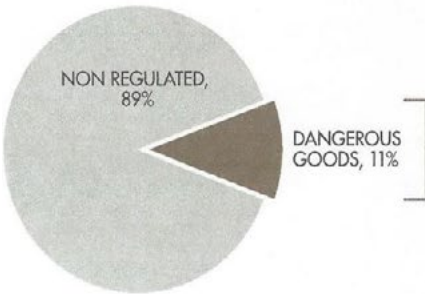
A summary of this document can also be viewed in the Safety Awareness Kit for Communities/ Municipalities in the Safety Awareness tab of the website.

<https://tc.canada.ca/en/dangerous-goods/transportation-dangerous-goods/safety-awareness-kitcommunities-municipalities>

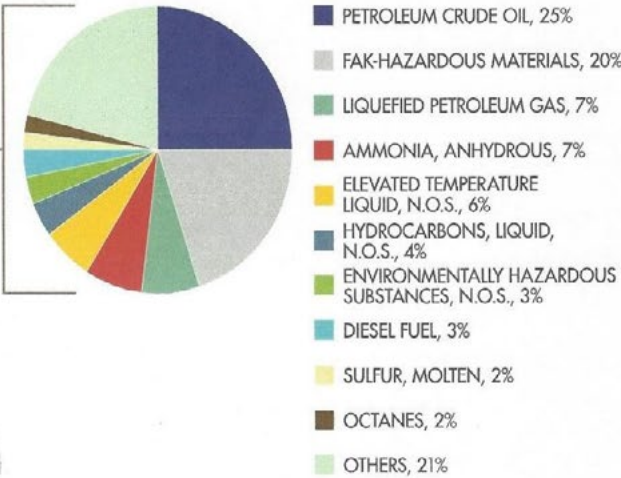
PUBLIC INFORMATION EXAMPLE

Only 11% of loaded shipments are regulated dangerous goods. The remaining 89% of loaded shipments are non-regulated products.

Rail Shipments in Canada 2015



Dangerous Goods – Breakdown of the 11%



2015 Dangerous Goods Shipments in: Province A

These top 10 products comprise 79% of the dangerous goods shipments in Province A. The remaining 21% are many different products, each comprising less than 2% of the total.

	PROPER SHIPPING NAME	% OF DG SHIPMENTS LOCALLY
1	PETROLEUM CRUDE OIL	25%
2	FAK-HAZARDOUS MATERIALS	20%
3	LIQUEFIED PETROLEUM GAS	7%
4	AMMONIA, ANHYDROUS	7%
5	ELEVATED TEMPERATURE LIQUID, N.O.S.	6%
6	HYDROCARBONS, LIQUID, N.O.S.	4%
7	ENVIRONMENTALLY HAZARDOUS SUBSTANCES, N.O.S.	3%
8	DIESEL FUEL	3%
9	SULFUR, MOLTEN	2%
10	OCTANES	2%
11	OTHERS	21%

Preparedness

Preparedness involves actions designed to save lives and mitigate damages. It includes planning and training prior to an incident. All emergency response planners should oversee the following:

- Maintain an inventory of human and material resources, including specialized equipment.
- Develop and maintain the municipal/community emergency response plan (ERP):
- Train personnel in the responsibilities and emergency duties required under the plan;
- Conduct periodic exercises that will test the effectiveness of the plan;
- Review and update the plan as needed, based on exercises, emergency response or changes in policy; and
- Follow the established communications network identified in the plan when activated.
- Be knowledgeable of the tools available, including CANUTEC, Transport Canada's 24/7 Transport Emergency Centre. CANUTEC technical advisors are highly trained in emergency response and can provide immediate and professional advice on all aspects of incidents involving dangerous goods.
- Be knowledgeable about Transport Canada's Emergency Response Assistance Plan (ERAP) program.

Flammable Liquids Properties and Initial Response

Should an incident occur, response partners will need to be prepared and informed about the properties of the dangerous goods.

Flammable liquids have varying properties. Gasoline, diesel, ethanol, crude oil and bitumen are all flammable, but they behave differently under spill and fire conditions. When dealing with flammable liquids, the most important properties to know are viscosity, density, flash point and toxicity. Detailed information on flammable liquids properties can be found in the Competency Guidelines for Responders to Incidents of Flammable Liquids in Transport, High-Hazard Flammable Trains, published by Transport Canada in 2016, available on the TDG website:

<http://publications.gc.ca/site/eng/9.812478/publication.html>

Crude Oil

Special considerations should be given to crude oil. This petroleum product is a mixture of flammable liquids and gases. It is volatile and its properties are variable. Nevertheless, crude oils can be categorized into:

LIGHTER CRUDES (SWEET CRUDES):

- They have a lower density, which means they float on water.
- They have a lower viscosity, which means they tend to flow more easily, depending on environmental conditions.

HEAVIER CRUDES (SOUR CRUDES):

- They have a higher density, which means they tend to sink when spilled on water.
- They have a higher viscosity, which means they tend to flow less easily, depending on environmental conditions.

Toxic gases will be released from spilled product (e.g., hydrogen sulfide (H₂S), benzene). **Air monitoring is an important aspect of safety at the scene.** Note that heavier crudes contain a greater content of H₂S than lighter crudes, and therefore pose a much greater risk when spilled or on fire.

Additional considerations for crude oil:

- Physical and chemical properties vary depending on the source of the product, where it was extracted.
- Behavior of crude oil may vary depending on its composition.
- Thorough knowledge of the properties of the product is critical during a hazard assessment on scene.

Initial Response

First Responders should not rush in at the scene. On scene, they should make a preliminary assessment from a safe distance and notify the dispatcher of all information available. The dispatcher will immediately notify agencies according to an established protocol. Refer to the aide-memoire at the end of this document for the five key steps to follow when dealing with flammable liquids incidents.

Identification of the product(s) involved in an incident is key to planning the appropriate response. There are several indicators and tools that will help identify the dangerous goods that have been released. These are addressed in the section below.

A free e-learning titled Emergency Preparedness for Rail Incidents Involving Flammable Liquids in Canada is available at: <http://rail.capp.ca/>. This online presentation, developed by the Canadian Association of Petroleum Producers in collaboration with the Canadian Association of Fire Chiefs, provides awareness information to First Responders for them to be better prepared to respond safely and effectively to rail incidents involving flammable liquids.

FIRST RESPONDERS' TOOLS AND RESOURCES

Valuable and immediate information from Transport Canada and industry leaders is available to help First Responders identify the products involved when a dangerous goods incident occurs.

TOOLS FOR PRODUCT IDENTIFICATION DURING THE INITIAL PHASE OF AN INCIDENT

EMERGENCY RESPONSE GUIDEBOOK (ERG)

The ERG is first and foremost a guide that can help first responders quickly identify the specific or general hazards of the dangerous goods involved, protect themselves and the general public during the initial response phase of the incident.

CANUTEC (CANADIAN TRANSPORTATION EMERGENCY CENTER)

CANUTEC is Transport Canada's Canadian Transport Emergency Centre which is available 24/7. The Centre is staffed by scientists who are fully trained in emergency response and Incident Command Systems. CANUTEC's advisors can assist emergency response personnel by providing advice over the phone during an incident involving dangerous goods. They can also help locate the train consist, which is the shipping document listing the goods transported in each rail car CANUTEC may be reached at:

- *666 (any cellphone in Canada), 613-996-6666 or
- 1-888-CAN-UTEC (226-8832)

AskRail™

The AskRail™ app is a safety tool for First Responders that provides immediate access to accurate, timely data about what dangerous goods a railcar is carrying so that an informed decision can be made on how to respond to a rail emergency.

AskRail™ is a backup resource if information from the train conductor or if a train consist is not available. Access to the app is granted only to qualified emergency responders who have successfully completed a railway emergency response training course. For information on AskRail™, see www.railcan.ca/racinitatives/askrail/.

THE TRAIN CONSIST AND THE SHIPPING DOCUMENT

Rail carriers will provide the train consist immediately to CANUTEC upon being informed of an incident. The consist lists each car, in the order in which they are placed in the train and shows the UN number (as on the placards) of the cars' contents. CANUTEC can forward the train consist to the Incident Commander. Additionally, each shipment of dangerous goods must be accompanied by a shipping document. This document must provide mandatory information as required in the Transportation of Dangerous Goods Regulations. If an Emergency Response Assistance Plan (ERAP) is required for the product involved in the rail incident, an ERAP reference number and the ERAP telephone number will be displayed on the shipping document. Anyone can call this phone number for information and assistance.

Note: If the shipping document is not accessible, CANUTEC can find the ERAP reference number and the ERAP telephone number using alternate sources of information.

Resources for Assistance

RAILWAY COMPANIES' EMERGENCY RESPONSE PLANS (ERP)

A railway dispatcher will typically be the first to be alerted to an impending or actual emergency through their normal communications network. Depending on the location of the emergency and the materials involved, there may be a need to implement emergency response plans (ERP).

Railway companies have their own emergency response plans (ERP). The ERP are designed to mitigate incidents quickly and professionally, using the railway companies' own resources (including sub-contracted parties who may bring special expertise and equipment to the scene). A railway company's ERP may be relied upon for incidents that do not require an ERAP.

Note: that the Railway's ERP are not reviewed and/or approved by Transport Canada.

Note: Railway's have a duty to report and respond under the Transportation of Dangerous Goods Act.

EMERGENCY RESPONSE ASSISTANCE PLANS (ERAP)

Companies that ship flammable liquids by rail may be required to have an approved ERAP if the quantity in the tank car exceeds 10,000L and is one of the listed dangerous goods in Subsection 7.1(6) of the Transportation of Dangerous Goods Regulations. ERAP are reviewed and approved by Transport Canada and are designed for incidents involving dangerous goods that require special technical knowledge and/or equipment not typically available to First Responders or railway companies. ERAP are generally held by the persons offering for transport or importing the dangerous goods and the plan must identify their response to several scenarios.

The plan must include information such as, but not limited to:

- The ERAP holder's technical advisor(s);
- The level of training and experience of the technical advisor and response team members regarding flammable liquid releases;
- The location(s) of available specialized equipment for the response; and
- The approximate time to respond.

An ERAP response team may consist of employees of the ERAP holder or a professional response organization (ER Contractor or TERSP – Transportation Emergency Response Service Provider) that is contracted to respond on behalf of the ERAP holder. ER Contractors/TERSP's complete verification assessments through CERCA/TEAP III or the company themselves.

Regardless of which model the ERAP holder uses, technical advisors must be trained in an incident command system.

WHAT IS AN EMERGENCY RESPONSE ASSISTANCE PLAN?

An Emergency Response Assistance Plan (ERAP) is required by certain persons such as manufacturers, producers or distributors in accordance with the Transport of Dangerous Goods Regulations. Dangerous goods subject to an ERAP are considered a greater risk for harm and require technical expertise and specialized equipment not normally held by firefighting services. Transport Canada approves ERAP that are deemed effective for the response to incidents involving particular dangerous goods.

- ERAP technical advisors (TA) are representatives of the ERAP holder and have specialized knowledge of the dangerous goods involved in an incident.
- TA have been trained in Incident Command System (ICS) as well as specialized training related to the dangerous goods in their plan.

For each dangerous good requiring an ERAP, the shipping document will indicate the ERAP number (YYYYY-ZZZ) as well as the ERAP telephone number. After calling that number, a TA will be available by phone within approximately 10 minutes of the initial call. Based on the discussion and the severity of the situation, the level of assistance may range from assistance over the phone to the deployment of a specialized response team or equipment. When the TA attends the incident, he or she can be expected to be on-site within six hours of the initial request*. (NOTE: * Response times may vary given the site location, weather conditions, accessibility, or other circumstances). When an ERAP is activated, ERAP holders are required to exercise due diligence and mobilize and deploy as soon as possible, within a reasonable time frame.

Transport Canada can assist by providing technical advice on the types of products involved. Once an incident has been made safe, Transport Canada may also monitor the transferring product for removal. A Remedial Measures Specialist (RMS) will monitor the situation over the phone or by attending on site. Every RMS has a technical and chemical background, has been trained in ICS, rail tank car emergencies and emergency response and can provide technical and emergency advice to First Responders responding to dangerous goods incidents.

INCIDENT COMMAND AND UNIFIED COMMAND

Most First Responders operate or are familiar with the Incident Command System. Railways train their employees to ICS Levels 100-300 depending on job function, thus allowing integration to a Unified Command System.

Note: Railways are never in charge of an incident, as that falls under the jurisdiction of the Authority Having Jurisdiction (AHJ). Railways will work in a Unified Command System.

UNIFIED COMMAND SYSTEM

Unified Command (UC) will be employed to facilitate a coordinated response by all local, provincial and federal agencies, as well as private entities. UC offers the following advantages:

- A shared understanding of priorities and restrictions;
- A single set of incident objectives;
- The use of collaborative strategies;
- Improved internal and external information flow;
- Less duplication of effort;
- Better resource utilization;
- An on-scene Incident Commander from the local fire service;
- Railway company emergency responders trained and prepared to operate within ICS as part of a UC;
- Resource provision by railway companies and dangerous goods shippers; and
- Engagement with railway companies during planning and preparedness phase to understand capabilities.

OTHER CONSIDERATIONS

Closure of Rail Tracks: The rail dispatcher (RTC) will stop all rail traffic in the affected area. If this has not been done, the Incident Commander can request the closure of rail tracks around the incident by asking the railway representative on site or by calling CANUTEC to obtain assistance on this matter.

Closure of Roads: The Incident Commander can request the closure of roads around the incident. If a temporary road closure is granted, the police service for the AHJ will be responsible for the direction of road traffic in proximity to the scene, with immediate closure of roads around the area.

Closure of Air Space: The Incident Commander can request the closure of airspace around the incident by asking CANUTEC to relay the request to Transport Canada's Civil Aviation Directorate. Note that this closure will also apply to aircraft used in support of the response (i.e., a helicopter used to assess the incident). Closure of air space should be considered when there is a risk of explosion due to the incident as well as in densely populated areas where aircraft not involved in the response may congregate.

REPORTING REQUIREMENTS

Emergency response begins as soon as a rail incident is identified or reported. If there is a release or an anticipated release of dangerous goods, an emergency report is required under the Transportation of Dangerous Goods Regulations by the person having charge, management or control of the dangerous goods. This report must be made as soon as possible to the local authority responsible for emergency response if the dangerous goods are, or could be, in excess of the set quantity in Section 8.2 of the Transportation of Dangerous Goods Regulations and thus a potential danger to public safety.

Additional Planning and Training Resources

COMPETENCY GUIDELINES FOR RESPONDERS TO INCIDENTS OF FLAMMABLE LIQUIDS IN TRANSPORT, HIGH-HAZARD FLAMMABLE TRAINS

Transport Canada's Emergency Response Task Force (ERTF) developed the Competency Guidelines for Responders to Incidents of Flammable Liquids in Transport, High-Hazard Flammable Trains in partnership with the National Fire Protection Agency. These Guidelines are designed to enhance first responder safety during an incident involving flammable liquids transported by rail, frequently referred to as High-Hazard Flammable Trains (HHFT). These Guidelines address product- and incident-specific competencies for first responders and private sector personnel when responding to HHFT incidents. They also provide information on flammable liquids properties and response strategies.

NFPA HAZMAT FLIC

The National Fire Protection Association (NFPA) NFPA's HAZMAT FLIC is an application that provides the on-scene incident commander with pertinent guidance materials, including two Fire Protection Research Foundation reports, a multi-tiered size-up checklist, and a collection of additional resources for managing emergency responses for high hazard flammable train and liquid petroleum pipeline emergencies. The app can be downloaded for free and more information is available at: www.nfpa.org.

TDG DIRECTORATE SAFETY AWARENESS PROGRAM

This program provides awareness to targeted audiences on the TDG program, the services Transport Canada can provide, and information on the Transportation of Dangerous Goods Act & Regulations requirements. For more information, contact the TDG Safety Awareness Team at: TC.TDGSafetyAwareness-Sensibilisation@tc.gc.ca.

TRANSCAER®

The Transportation Community Awareness and Emergency Response initiative (TRANSCAER®) was started in Canada in 1985 by the Chemistry Industry Association of Canada (CIAC). Today, it is led by CIAC and the Railway Association of Canada (RAC).

TRANSCAER® exists to ensure that communities are informed about the products being moved through their area by road and rail, and what measures are in place to ensure their safe transportation.

TRANSCAER® members work with municipal officials, emergency responders, and residents along transportation routes, to assist them in developing and evaluating their community emergency response plans. TRANSCAER® also hosts dozens of outreach events across Canada each year. Their Safety Training Tank Car (a classroom on wheels) helps to train firefighters, police, and emergency medical personnel, so they are better prepared in the event of a transportation incident involving dangerous goods.

CIAC and RAC also partner with other associations (i.e., manufacturers, distributors, transportation companies, and emergency responders) in Canada and the U.S. to ensure that transportation safety best practices are shared, and that consistent, state-of-the-art training and emergency preparedness activities are carried out across North America. www.transcaer.ca

CERCA – CANADIAN EMERGENCY RESPONSE CONTRACTORS ALLIANCE

The Canadian Emergency Response Contractors' Alliance (CERCA) is an industry association comprised of stakeholders from all facets of the Canadian dangerous goods emergency response industry. The mission of CERCA is to foster the establishment of a sound emergency response network in Canada.

www.cerca-aceiu.ca

TEAP III – TRANSPORTATION EMERGENCY ASSISTANCE PROGRAM

The Chemistry Industry Association of Canada's Transportation Emergency Assistance Program, TEAP III, aims to maintain a national emergency response network capable of safely and efficiently mitigating the impacts of a chemical transportation incident anywhere in the country. TEAP III provides a forum for CIAC members, transportation companies, and emergency response service providers to share information and successful practices and encourage continuous improvement around chemical transportation emergency preparedness and response. www.teap3.ca

FAQ

How can I prepare adequately if I have no knowledge of the dangerous goods being transported in my municipality?

Under Protective Direction 36 (www.tc.gc.ca/eng/tdg/safety-menu-1281.html), an Emergency Planning Officer (EPO) can register with CANUTEC in order to receive the information pertaining to dangerous goods being transported in his or her municipality. With this information, the EPO will be able to plan adequately if a dangerous goods incident was to occur in his or her municipality.

How can we coordinate the response of a dangerous goods incident when there are multiple agencies/ organizations/stakeholders present on site?

Transport Canada strongly recommends including an incident management system during the planning phase of the municipality's emergency response plan (ERP). Incident Command System (ICS) and Unified Command (UC) are examples of incident management systems that can be used during an emergency and that have proven to be effective.

What does CANUTEC mean and what services can they provide to my municipality and first responders?

CANUTEC is the Canadian Transport Emergency Centre. Its advisors can provide advice on the phone and help in many areas, like locate a train consist. In collaboration with the U.S., Mexico and Argentina, they develop the Emergency Response Guidebook (ERG), a valuable tool for First Responders. They also participate in training exercises with fire departments, public authorities and industry.

In addition to CANUTEC's services, can Transport Canada provide resources during a dangerous goods incident?

Absolutely. In addition to CANUTEC, Transport Canada may send Remedial Measures Specialists (RMS) or TDG inspectors to incident sites to support and oversee the remediation and provide guidance to the person in charge of the incident response (generally, the incident commander). RMS have a technical and chemical background and are trained in ICS, rail tank cars and emergency response.

What can an Emergency Response Assistance Plan (ERAP) do for me? Can I see an ERAP?

An ERAP can provide technical expertise as well as specialized equipment to First Responders dealing with incidents involving dangerous goods. A sample ERAP is published on the TDG website: www.tc.gc.ca/eng/tdg/erap-example-109.htm.

Can First Responders call CANUTEC to simulate dangerous goods incidents?

Yes. If a fire service wishes to simulate a dangerous goods incident, CANUTEC can assist in pre-planning and participate in training exercises with fire departments. Contact CANUTEC prior to doing the simulation by calling the information line at 613-992-4624.

ADDITIONAL RAC DANGEROUS GOODS TEAM TRAINING

Better Education Means Safer Railways

Since it was first started back in 1999, RAC's DG Team has helped to ensure that Canada's railways can meet the challenges of handling and transporting dangerous goods. The DG Team provides training, as well as support and guidance to railway employees and shippers on the proper labelling, safe loading and unloading of railcars and other containers. The team also inspects and audits facilities (chemical, energy and railway) to make sure that railcars and containers carrying dangerous goods comply with regulations. By sharing information on the goods moving through communities and training emergency responders on how to deal with potential incidents through specialized courses and the Transportation Community Awareness and Emergency Response (TRANSCAER®) initiative, the DG Team assists municipalities with their emergency response planning. Made up of specialists with emergency response, technical and regulatory experience, as well as extensive knowledge of tank car design, construction and damage assessment, the DG Team helps RAC members and communities to prepare for any transportation incidents that may occur. For more information on the services provided by RAC's DG Team, please contact the team member in your area:

Scott Croome

Director, Dangerous Goods – (Toronto)
(647) 206-2896

Nicholas Hodge

Transportation of Dangerous Goods Specialist – (Montreal)
(514) 891-8935

Curtis Myson

Transportation of Dangerous Goods Specialist – (Edmonton)
(780) 619-2763

UPGRADE YOUR RESPONSE TO RAILWAY EMERGENCIES

Rail emergencies are rare in Canada. But when they happen, you need to be at your best. The Railway Association of Canada (RAC)'s Railway Emergency Response Courses can help!

Justice Institute of British Columbia (JIBC) Fire and Safety Campus, Maple Ridge, BC.

These must-attend 40+ hour courses are geared to Railway Industry personnel, first responders, emergency response contractors and regulators. Participants will get specialized rail-based emergency response training that will complement technical responses to dangerous goods incident.

Get the latest local (Canadian) information from skilled instructors of varied backgrounds.

Learning is in-class and hands-on.

Don your personal protective equipment and get the most out of the JIBC's world-class facilities.

You'll see firsthand site assessments, tank car valving, transfer techniques, plugging holes in leaking tank cars and the flaring of live product from a tank car.

The week culminates with a mock derailment scenario that involves a release of dangerous goods where your fellow participants will be on the frontlines.

The week wraps up with a final exam and critiques.

www.railcan.ca

WHAT YOU'LL LEARN

- Site Assessment & Safety
- Incident Command
- Tank Car Anatomy, valving & Damage Assessment
- Plugging & Patching
- Capping Kits
- Transfer Techniques
- Flaring Techniques
- Static Electricity Control
- Introduction to Flammable Liquids
- TDG Regulations
- Railway & Derailment Safety



Railway Emergency Response Course

The Railway Association of Canada hosts its annual **Railway Emergency Response Courses** at the Justice Institute of British Columbia (JIBC) Fire and Safety Campus, Maple Ridge BC.

This **40+** hour course is a must attend by Railway and Industry personnel, First Responders, E/R Contractors, and Regulators. The main goal of this specialized course is to provide specific, rail-based emergency response training to persons who are already trained in technical response to dangerous goods incidents.

This Canadian based course consists of lecture sessions in tank car construction, site safety, dangerous goods, tank car damage assessment, incident command, tank car valve construction, transfer techniques, flaring techniques, site assessment, documentation, plugging/patching and TDG regulations. We have recently added an introduction of Flammable Liquids by Rail session as well. These lectures are given by a variety of skilled instructors with varied backgrounds.

Classroom lecture is important, but, outside, hands-on instruction is paramount. The participants are required to don their personal protective equipment and make use of the world class facilities and props of the JIBC by taking part in demonstrations of site assessments, tank car valving, transfer techniques, plugging holes in leaking tank cars and flaring of live product from a tank car.

The week culminates with a derailment scenario that involves a "release" of dangerous goods that the class is required to respond to. The week is completed with a final exam and critiques.

For more information on the course or the Railway Association of Canada visit our website: www.railcan.ca

APPENDIX F: AIDE MEMOIRE



Transport
Canada

Transports
Canada



FIRST RESPONDERS AIDE-MEMOIRE

CLASS 3 – FLAMMABLE LIQUIDS

This document outlines the most important safety measures, grouped in a series of five steps, to be considered during emergency planning and response to a transport incident involving flammable liquids.

INITIAL CONSIDERATIONS

- Safety of responders and the public is a priority.
- Non-intervention may be the preferred course of action when large volumes of flammable liquids are involved.
- Rail incidents involving flammable liquids on fire require a specialized response, a solid knowledge of the products involved and the high risk hazards such as Heat Induced Tears (HIT), as well as the firefighting techniques specific to such fires.
- Response actions must be carefully planned with personnel present on scene, at risk of making a situation worse.

CANUTEC can provide information and assistance during any step of an incident and can be reached at 613-996-6666, 1-888-CAN-UTEC (226-8832) or *666 from a cell phone (in Canada)

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STEP 1: DO NOT RUSH

PROTECT FIRST RESPONDERS AND THE PUBLIC

- ☐ **Keep** personnel and vehicles at a safe distance from the scene: **use** Emergency Response Guidebook (ERG) – GUIDE 127 until the flammable liquid has been identified
- ☐ When approaching the scene of an incident, **do so** from uphill and upwind (be aware of the field topography)
- ☐ **Stay clear** of vapours, fumes, smoke, spills and physical hazards
- ☐ **Wear** appropriate personal protective equipment (PPE)
- ☐ **Monitor** air quality, oxygen level and flammability (e.g., 4-gas detector)
- ☐ **Eliminate** all ignition sources

2

STEP 2: SECURE THE SCENE

ISOLATE THE AREA AND SECURE THE PERIMETER

- ☐ **Contact** local authorities to secure the scene
- ☐ In the case of rail incidents, **contact** the rail traffic control centre to ensure shut down of the rail line

3

STEP 3: IDENTIFY THE HAZARDS AND ASSESS THE SITUATION

FROM A SAFE DISTANCE, IDENTIFY THE HAZARDS AND THE DANGEROUS GOODS (DG)

- ☐ **Assess** for fire, smoke, fumes, vapours, leaks, spills, container damage and DG other than flammable liquids (e.g., corrosive, toxic, explosive DG)
- ☐ **Assess** for potential risks of ruptures, called Heat Induced Tears (HIT)
- ☐ **Assess** for physical hazards (e.g., electrical lines, pipelines, bent rails)
- ☐ **Determine** all the DG involved and their UN numbers, by:
 - ☐ **Identifying** the types of means of containment and the safety marks (**refer** to ERG), or
 - ☐ **Requesting** the shipping document from the carrier (for rail, train consist can be obtained through rail crew, CANUTEC or AskRail app)
- ☐ **Monitor** any changes in the situation

CONFIRM THE ISOLATION ZONES FOLLOWING SITE AND HAZARDS IDENTIFICATION

- ☐ Once all the UN numbers are identified, **refer** to the specific **Orange** ERG GUIDE for each UN number and the tables in the **Green** pages, if applicable, to **confirm** isolation and evacuation zones

If the orange page of the ERG guide has this information, the product may require ERAP (see next page for additional details)



In Canada, an Emergency Response Assistance Plan (ERAP) may be required for this product. Please consult the shipping document and/or the ERAP Program Section (page 391).

Canada

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STEP 4: GET HELP

COMMUNICATE AND INFORM

- ☐ **Call** an emergency number located on the shipping document:
 - 24 hour number, or
 - Emergency Response Assistance Plan (ERAP) telephone number adjacent to the number X-YYYY-(ZZZ), or
 - CANUTEC
- ☐ If needed, **request** mutual aid assistance from nearby communities or **contact** other organizations as planned in your local emergency preparedness plan

PREPARE TO COORDINATE ALL RESOURCES UNDER A COMMAND STRUCTURE

- ☐ **Be prepared** to work with external organizations (e.g., industry specialists, emergency response contractors, government representatives, other responders)
- ☐ **Organize** the site and resources according to what may be required (e.g., physical zones, water supply, fire fighting foam, specialized equipment)
- ☐ **Re-evaluate** isolation zones as necessary, as conditions on site change

FOR DANGEROUS GOODS WITH AN APPROVED ERAP

If an ERAP is activated, assistance is generally provided as shown below. The response will vary based on the nature, the severity of the incident or the assistance required.

WHEN	Within approximately 10 minutes of the initial request	Within 6 hours* of the initial request	Within 12 hours* of the initial request
WHO	Technical Advisor	Technical Advisor	Response Team(s)
WHAT	Technical or emergency response advice over the phone	Technical Advisor on site with or without equipment	Personnel on site with equipment

* When an ERAP is activated, ERAP holders are required to exercise due diligence and mobilize as soon as possible, within a reasonable time frame. Response times may vary given the site location, weather conditions, accessibility, or other circumstances.

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STEP 5: RESPOND

ESTABLISH AN INCIDENT ACTION PLAN WITH PERSONNEL* ON SITE UNDER UNIFIED COMMAND

Critical considerations:

- ☐ For rail incidents involving fire, **evaluate** potential risks for Heat Induced Tear (HIT), boilover, frothover, slopover
- ☐ **Ensure** the response is **Timely, Appropriate, Safe and Coordinated (TASC)**
- ☐ **Integrate** site safety plan and site safety briefing

*Personnel that may be present on site:

- ☐ Carrier
- ☐ Industry specialists (e.g., ERAP holder)
- ☐ Emergency response contractors
- ☐ Other organizations: municipal, provincial, territorial, federal (e.g., Transport Canada Remedial Measures Specialist (RMS) or Inspector, other ministry representatives)

Potential response strategies and actions:

- ☐ Rescue / protection / evacuation
- ☐ Detection and air monitoring
- ☐ Firefighting: strategies and tactics specific to flammable liquid fires (non-intervention, defensive, offensive)
- ☐ Mitigation of spills / containment / confinement
- ☐ Vapour suppression with compatible fire-fighting foam with confinement of run-off
- ☐ DG transfer / recovery

REASSESS / MODIFY THE INCIDENT ACTION PLAN

- ☐ **Establish** follow-up response steps based on current progress, environmental concerns and existing mitigation measures

END THE INCIDENT RESPONSE

- ☐ **Transfer** operational site management for recovery, restoration and rehabilitation

