Canadian Fuels
ASSOCIATION



PROFESSIONAL PETROLEUM

DRIVER'S MANUAL

SEPTEMBER 2026

Statement of Disclaimer

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The Canadian Fuels Association

The Canadian Fuels Association (Canadian Fuels) was established in 1989 as a non-profit association of Canadian refiners and marketers of petroleum products.

The Association today represents a membership of Canadian companies involved in the refining, distribution and marketing of fuels and lubricants for transportation, home energy and industrial uses.

Canadian Fuels' mission is to serve and represent the refining, marketing, and distribution sectors of the transportation fuels industry with respect to environment, health and safety, and business issues.

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Introduction

As a professional petroleum driver, you perform a potentially hazardous and important function in the distribution of petroleum products. As such, it is critical that your training and expertise is sufficient to ensure that safety is never compromised with respect to life, property, and our environment.

To assist you in learning about the industry and your duties, the petroleum industry in conjunction with various petroleum carriers, has produced this manual to acquaint you with safe product handling practices. This manual contains information and guidelines that are standard throughout the industry. It represents the minimum level of professional knowledge and understanding that is required to safely deliver products to all of our customers. The manual is split into Two Parts.

Part One of the manual covers items that every petroleum driver should know including the certification process, information on various petroleum products including their characteristics and hazards, how to prepare for driving your petroleum truck, how to handle emergencies and general loading and unloading procedures.

Part Two reviews the loading and unloading procedures for the specific products or situations that you may be handling. It is a good idea to review all of these sections, but you should focus on the one(s) that pertains to you.

It is impossible to cover every situation in the manual. Drivers need to ask for assistance from their dispatch or personnel at the facility where they are dealing with an unknown situation.

The manual will be reviewed and updated from time to time to ensure that it reflects current industry and regulatory requirements.

Canadian Fuels wishes to recognize and thank those involved, from its member companies to the bulk petroleum carriers' industry, whose efforts and participation were instrumental in the development and implementation of the Professional Driver's Manual.

Request for Change to the Manual

This manual may require revisions, as a result of a member request, legislative or corporate influences or as a continuous improvement initiative.

When revisions are produced, they will be sent to the Canadian Fuels National Distribution Committee, who will in turn incorporate them into the manual.

Anyone wishing to make a change should contact the Canadian Fuels National office via email: info@canadianfuels.ca. Please note the section and page number of the item in question. Also, indicate the reason for the proposed change.

Table of Contents

Statement of Disclaimer		ii
The Canadian Fuels Association		iii
Introduction		iv
Request for Change to the Manual		v
Table of Contents		vi
Part 1	**What Every Petroleum Driver Should Know**	
1.	**Becoming a Certified Petroleum Driver**	**2**
1.1	Introduction	2
1.2	Driver Certification Requirements	2
1.3	Terminal Specific Training	3
2.	**Terms & Definitions You Should Know**	**5**
3.	**Introduction to Petroleum Products**	**8**
3.1	Introduction	8
3.2	Gasoline	8
3.3	Middle Distillates	9
3.4	Aviation Fuels	9
3.5	Heavy Fuel Oil	9
3.6	Lubricating Oils	9
3.7	Solvents	10
3.8	Asphalt	10
3.9	The Canadian Fuels Colour Symbol System	10
4.	**Petroleum Product Characteristics & Potential Hazards**	**13**
4.1	General	13
4.2	Petroleum Liquids	13
4.3	Foaming Hazards	13
4.4	Hydrogen Sulphide Hazard	13
4.5	Petroleum Product First Aid	14
4.6	Personal Protective Equipment (PPE)	15
4.7	Fire Knowledge	16

5.	**Preparing to Drive Your Petroleum Truck**	**18**
5.1	The Essentials of a Professional Petroleum Driver	18
5.2	Petroleum Trucks & Trailers	18
5.3	Before You Start, Check Your Vehicle (Pre-loading 360 Walk-around Inspection)	19
5.4	Transportation of Dangerous Goods	20
5.5	Driving Your Vehicle	20
6.	**Handling Spills, Fires & Other Emergencies**	**22**
6.1	General	22
6.2	Vehicle Accidents	22
6.3	Incidents Resulting in Spills	22
6.4	Spill Containment Kits	23
6.5	Mixes (Crossovers) or Contamination	24
6.6	Fire Emergency Procedures	24
7.	**General Loading & Unloading Procedures**	**27**
7.1	Overview	27
7.2.	Accessing Terminals	27
7.3	Approaching the Loading/Unloading Area	27
7.4	Accessing Customer Sites	28
7.5	Loading/Unloading Site Safety Inspection	28
7.6	Procedures for Loading & Unloading	29
Part 2	**Specific Loading & Unloading Procedures**	
8.	**Specific Loading & Unloading Procedures Gasoline & Middle Distillates**	**39**
8.1	Overview	39
8.2	Specific Loading Procedures	39
8.3	Specific Unloading Procedures	45
8.4	Bulk Fuel Trailer Unloading Procedures to Underground or Aboveground Tanks	45
8.5	Hose Reel Truck Unloading Procedures to Underground or Aboveground Tanks	49
9.	**Aviation**	**54**
9.1	Introduction	54
9.2	Loading Procedures	54
9.3	Quality Control Tests	54

10.	**Asphalt & Heavy Oil (Bunker)**	**61**
10.1	Overview	61
10.2	Loading Procedures	61
10.3	Unloading Tank Trucks: Precautions	64
10.4	Unloading Procedures	64
11.	**Truck to Marine Vessel Transfer**	**68**
11.1	Introduction	68
11.2	Spill Reporting	68
11.3	Responsibilities	69
11.4	Oil Transfer Locations	70
11.5	Truck Safety	70
11.6	Static Discharge Protection	71
11.7	Hoses and Adaptors	72
11.8	Unloading Procedures	73
12.	**Truck to Truck Transfer**	**78**
12.1	Introduction	78
12.2	Responsibilities	78
12.3	Preparing for the Transfer	78
12.4	Check the Truck Equipment	81
12.5	Operating Procedures	82
Appendix		**85**
Appendix A – Home Heat Safe Discharge Certificate		86
Appendix B – Truck to Marine Transfer – Bulk Products		87
Appendix C – Carrier Checklist – Truck-to-truck Transfer		89
Appendix D – Canadian Fuels Driver Qualification Form		90
Appendix E – Summary of Changes/Updates to the Driver's Manual		91

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SECTION

01 BECOMING A CERTIFIED PETROLEUM DRIVER

Becoming a Certified Petroleum Driver

1.1 Introduction



The Canadian Fuels Driver Certification Program helps to ensure that fuels are handled safely as they're being transported by truck from terminals to customers and retail sites. Only drivers who have completed the requirements of the program are allowed access to Canadian Fuels member terminal loading facilities. This Program is available to all bulk petroleum carriers operating in Canada and is used to train bulk petroleum drivers employed by those carriers in the proper procedures for loading and delivering petroleum products.

Successful candidates will receive a Canadian Fuels Association certificate indicating that they are a qualified professional petroleum driver.

For training purposes, individuals without Canadian Fuels certification may load at a terminal if they are under the direct supervision of someone with a valid Canadian Fuels certificate.

NOTE | In addition to Canadian Fuels certification, drivers must also complete individual terminal orientations for locations where they will be loading and unloading.

1.2 Driver Certification Requirements

In order for someone to obtain a new Canadian Fuels certification they must meet the following requirements:

- Hold a valid Driver's License
- Hold a valid TDG certificate (drivers need only be trained in TDG Class 3: Flammable Liquids)
- Have received Workplace Hazardous Materials Information System (WHMIS) training
- US equivalency for TDG / WHMIS is HazMat Endorsement Training Certificate
- Complete a review of the Canadian Fuels Driver training manual and obtain at least 85% on the web-based driver examination
- Be familiar with loading rack rules and procedures
- Have loaded and unloaded ten (10) times under the supervision of a certified driver
- Have received basic emergency response training (for minimum requirements see the Canadian Fuels Land Transportation Emergency Response Guideline for Petroleum Spills).

Upon successful completion of the Examination, a Certificate of Training will be issued to the driver:

- Driver Certification is approved for a term of three years
- An electronic copy of the Qualification Form will be maintained on the Driver Certification database
- Upon expiry, active drivers must refresh their training by applying for re-certification which involves reviewing the training materials and successfully completing the web-based driver examination.

1.3 Terminal Specific Training



All new drivers must complete 10 supervised loads at a Canadian Fuels member's terminal in order to fulfill the requirements to obtain a completed Canadian Fuels certificate, which is valid only for the terminal where the driver completed his or her 10 training loads.

When a currently certified driver is applying to load for the first time at a new terminal, that driver must be authorized by the new terminal staff before being granted access.
This authorization process will include:

- Up to three loads under supervision of a driver trainer or terminal operator
- On the last load, the driver will be tested and oriented by terminal staff on site specific issues
- If the test is successfully completed, the terminal will issue a loading badge/card
- If the test is not successfully completed, the terminal can request that the driver repeat the terminal-specific training until the prescribed level of competency is reached.
- Terminal specific training including 3 supervised loads will need to be refreshed if a currently certified driver has not accessed a specific terminal for a period exceeding 12 months.

NOTE | Each terminal may have their own specific training that provides an equivalent or more stringent level of safety. In such cases, drivers will have to follow each Canadian Fuels member Terminal Specific Training requirements.

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SECTION

02 TERMS & DEFINITIONS YOU SHOULD KNOW

Terms & Definitions You Should Know

Biodiesel	Is a renewable fuel produced by transesterification of animal fats or oilseeds, typically blended at low levels (2-20%) with diesel at the terminal truck rack.
Bonding	Maintaining contact between two metal objects so that a charge does not pass from one to the other. e.g. between two trailers or between a filling spout and the trailer dome.
Bottom Loading	Transferring product from the terminal through the bottom of the receiving tank.
Catch Pail	See drip container.
Combustible Liquids	Petroleum products that have a flash point at or above 60.0°C (e.g. diesel, jet fuel).
Delivery Meter	Mechanical meter head that measures temperature compensated volumes of delivery.
Denatured Ethanol	Ethanol blended with various additives to render it unfit for human consumption.
Density	The mass per unit volume of an object such as pounds per cubic foot or kilograms per cubic metre.
Drip Container/Pail	Grounded pails used to collect hose or valve drippings.
Envirotank	Double walled tank normally protected by dikes.
Ethanol	Grain alcohol produced from the fermentation of sugar using feedstocks like corn and wheat, typically blended at low levels (10-15%) with gasoline blendstock at the terminal truck rack.
Flammable Liquids	Petroleum products that have a flash point below 60°C. (e.g. gasoline) Where a combustible liquid is heated above its flash point, it shall be treated as a flammable liquid.
Flash Point	The temperature level where a petroleum product will release sufficient vapours to allow it to burn.
Grounding	The process of removing the excess charge on an object by transferring the charge to the "ground". Petroleum trucks/trailers are equipped with grounding cables or grounding balls.
Internal Valve	A safety valve inside the trailer that will shut off the flow of product.
Loose-Connected Nozzle Deliveries	Hose reel deliveries where the nozzle is inserted into the tank's inlet fitting. This type of delivery is completed with an automatic shutoff nozzle and must not be used to fill storage tanks through overfill protection devices.

Terms & Definitions You Should Know

Middle Distillates	A general classification of fuels that includes heating oil, diesel fuel and kerosene.
PPE – Personal Protective Equipment	Equipment to be worn by petroleum workers to protect them from coming in contact with the product.
Renewable Diesel	Is produced by hydrotreating of animal fats, oilseeds or other bio-oils. Renewable diesel is fully compatible with diesel engines, and can be used as a direct replacement of diesel (drop-in fuel) or blended with diesel at the terminal truck rack.
Scupper	An opening in the side of a ship at deck level to allow water to run off.
Scully	An electronic sensor used between the loading rack and trailer to indicate that the equipment is properly grounded and to stop loading when the tank is full.
Splash Loading	When the product being transferred in Top Loading is poured on top of the product already in the receiving tank.
Static Electricity	The buildup of an electric charge in an object which can create an electric "shock" when the charge moves from one object to another.
Switch Loading	The loading of low volatility products, such as kerosene or diesel, into a compartment which previously contained a high volatility product such as gasoline.
Tight-Connected Nozzle Deliveries	Hose reel deliveries where the nozzle is camlock-connected to the tank's inlet fitting. This is a closed liquid delivery system and storage tanks must be vented.
Top Loading	Transferring product from the terminal through the top of the receiving tank.
Ullage	The amount by which a container falls short of being full.
Ultra Low Sulphur Diesel	A diesel product with a low sulphur content (15 parts per million or less).
Volatility	The rate at which a liquid vapourizes.
Water Paste	A water indicating paste used with petroleum products to determine the level of water in tanks.
WHMIS – Workplace Hazardous Materials Information System	A Canada wide communication system for transmitting information about hazardous materials used in the workplace.

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03 INTRODUCTION TO PETROLEUM PRODUCTS

Introduction to Petroleum Products

3.1 Introduction

Petroleum products can be split into several categories. These include gasolines, middle distillates and a number of other products including aviation fuel, heavy fuel oil, solvents and asphalt. Below is a breakdown of the various product groups.

3.2 Gasoline

3.2.1 General



These are the most common products and are used to fuel our vehicles and other engines. Gasolines are highly flammable so many precautions are taken to minimize the risk. **There are several grades of gasoline which include:**

- Super Premium
- Premium
- Mid Grade
- Regular

The industry uses the above names as a standard to reduce confusion between companies.

3.2.2 Fuel Ethanol

Federal and provincial renewable fuel mandates served to make ethanol blended fuels widely available in most regions of Canada. Ethanol, or ethyl alcohol, is grain alcohol made from agricultural products, primarily corn. The manufacturing process is similar to making beverage alcohol, except that all moisture is removed for fuel use.

Ethanol is not to be confused with Methanol which is made from natural gas or coal.

Grades sold in Canada typically contain up to10% ethanol and are blends of LVB (low volatility gasoline blendstock or RBOB) and ethanol.

Ethanol blended gasolines have the same properties as conventional gasolines, e.g. octanes, vapour pressure and additives.

Before dropping a load of ethanol blended gasoline, drivers may be required by their company to test for water in the tank using a water paste. If the level of water in the tank bottom is greater than 2.5 cm, do not proceed and inform the distribution manager/terminal manager.

3.2.3 Additive & Dye Injection

When additives or dye is added to gasolines, there must be strict adherence to customer specifications. Any irregularities in additive injection must be reported to your supervisor or terminal personnel.

If the terminal's loading system prints additive amount on the Bill of Lading, check that the correct quantities are indicated.

3.3 Middle Distillates

3.3.1 Introduction

Middle Distillates are similar to gasoline but have a higher flash point and will not burn as readily. These include diesel, stove oil, furnace oil and kerosene.

Diesel Fuel is commonly used to fuel trucks, buses and locomotives while Stove, Furnace and Kerosene are typically for heating purposes. Though the chance of them catching fire is less than that of gasoline, the same precautions are still taken. One additional concern with middle distillates is when they are mixed in error with gasolines. The mixture may lower the overall flash point of the product, increasing the risk of fire and/or explosion.

Like gasolines, diesel can be blended to make a more environmentally friendly product such as Biodiesel. Biodiesel may be used in place of diesel and will work with most diesel engines.

Ultra Low Sulphur Diesel (ULSD) has been developed with an extremely low sulphur content to help improve air quality and reduce related health effects. The Sulphur in Diesel Regulations prescribe different sulphur content limits depending on the application with on-road diesel limited to 15 parts per million of sulphur content.

Special procedures must be followed including product testing at various points in the distribution system and flushing the system before loading ULSD into a tank that previously did not contain it.

3.4 Aviation Fuels

3.4.1 Introduction

Aviation fuels are at the top of the spectrum with respect to care, testing, quality control and handling. Drivers loading/unloading and transporting these fuels require upgraded training for quality control, product testing, documentation and delivery. The following products fall into the aviation class: Jet A, Avgas 100 and Avgas 100LL. Jet fuel is used for large turbine-engine aircraft. Avgas is for smaller piston-engine aircraft.

3.5 Heavy Fuel Oil

3.5.1 Introduction

Heavy Fuel Oil (HFO) or Bunker is commonly used to power ships. Due to the thick nature of this fuel, it must be transported at high temperatures. Normal loading temperatures vary between 65°C (150°F) and 93°C (200°F). This high temperature creates an additional risk with this product known as "foaming". It occurs when water or ice residue in the tank is heated by the heavy oil causing steam to form and resulting in boiling-over or foaming. This is why it is very important to remove all water from the tank before filling it.

3.6 Lubricating Oils

3.6.1 Introduction

Lubricating Oils are typically used for vehicles and equipment that require some type of lubrication while they are running. These products are often delivered in bulk to service centres or manufacturing plants.

3.7 Solvents

3.7.1 Introduction

Solvents are commonly used in manufacturing plants in a wide variety of applications.

3.8 Asphalt

3.8.1 Introduction

In the petroleum industry, asphalt is the product that is mixed with other products to produce the asphalt for roads or shingles. It is a thick black liquid that must be stored and transported at high temperatures so it will not solidify.

3.8.2 Types of Asphalt

There are 3 main categories of asphalt products. All will burn violently or can explode under the right conditions. Possible sources of ignition must be kept away from the product and its vapours.

1) Asphalt cements are mostly used for paving and roofing products. Asphalt cements are heavy viscous materials usually maintained at a temperature above 149°C (300°F).

2) Cutback asphalts are the most volatile of the asphalt products. They are diluted with a petroleum solvent such as naphtha or fuel oil. This thins out the paving asphalts allowing them to be used at lower temperatures, generally in the range of 100°C (212°F). Mixing asphalt with a solvent lowers the flash of the product from 149°C (300°F) to that of the solvent (as low as 10°C (50°F) and consequently it is more flammable.

There are 3 types of cutback asphalt:

1. RC – rapid curing
2. MC – medium curing
3. SC – slow curing

Cutbacks are generally stored and shipped at temperatures above their flashpoint. Therefore, never use torches or an open flame around them.

3) Asphalt emulsions are asphalt cements that are mixed with water and chemicals to make an emulsion (asphalt in water). They are used from 21°C (70°F) to 93°C (200°F) and must be stored and shipped below the boiling point of water 100°C (212°F). Asphalt cements can also be mixed with light oils to produce emulsions.

3.9 The Canadian Fuels Colour Symbol System

3.9.1 Introduction

The Canadian Fuels Colour Symbol System is used for identifying the equipment used to store bulk petroleum products. Colours, tags and standard names help to identify each product so they do not become confused.

3.9.2 Standard Product Tag Colours & Symbols

Three components make up a standard product tag.

1) **Colours** – each product tag is identified by a different colour – e.g. regular gasoline has a white tag, while diesel is yellow and furnace oil is green.

2) **Shape** – each tag has a different shape – e.g. gasoline is hexagonal, middle distillates are round and aviation fuels are square.

3) **Written Names** – each product tag has the name of the product written on it – e.g. "Regular", "Diesel", "Avgas 100".

Please refer to the Canadian Fuels Colour Symbol System document on the Canadian Fuels website for further information and details.

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04 PETROLEUM PRODUCT CHARACTERISTICS & POTENTIAL HAZARDS

Petroleum Product Characteristics & Potential Hazards

4.1 General

Petroleum products in general are solvents and are stored in a liquid state. Under many conditions these products also give off vapours which when exposed to the air and a source of ignition will burn. In addition, continual contact with liquid petroleum or breathing their vapours can also cause health hazards. Anyone handling petroleum products must be familiar with their properties and the potential hazards associated with them.

For specific information on the products you will be handling, refer to the Workplace Hazardous Materials Information System (WHMIS) and Safety Data Sheets (SDS).

4.2 Petroleum Liquids



Fuel Resistant Gloves

Because petroleum products are solvents, getting them on your skin can cause skin irritation and leave skin cells susceptible to disease such as dermatitis. Good work habits include using Personal Protective Equipment to protect yourself against them.

Certain petroleum products, such as asphalt, are transported at high temperatures. Exposure to this hot material can cause thermal burns to the skin. The metal surfaces containing these products can also be dangerously hot.

4.3 Foaming Hazards

On occasion, a tank trailer may get water in it. This usually happens when it has been repaired, steam cleaned or rain gets into it.

When water is mixed with hot products such as asphalt or heavy oil, steam will develop rapidly. This could cause a violent boil-over or "foaming" and may result in trailer rupture and serious injuries. Drivers must ensure that the inside tank walls are free of water or ice residue prior to loading.

Hoses must also be kept covered when not in use to prevent moisture from accumulating which could cause foaming at time of delivery.

Dome covers need to be secured to prevent moisture from getting inside the tank.

All loading sites should be checked for specific change of service requirements and use of an antifoam agent should a foaming hazard occur.

4.4 Hydrogen Sulphide Hazard

Under certain conditions during the loading of asphalt, hydrogen sulphide (H_2S) can be given off. Drivers should be aware of the rotten egg smell given off by the H_2S.

At low concentrations, H_2S deadens the sense of smell. At high concentrations, it can be fatal. Drivers must avoid breathing H_2S vapours or fumes.

4.5 Petroleum Product First Aid

4.5.1 Skin Contact (Gasolines & Middle Distillates)



In case of skin contact, wash thoroughly with soap and water.

If product is sprayed on the face, avoid rubbing eyes; flush eyes immediately with large quantities of water for at least 10 minutes.

If product is spilled on clothing:

1) Avoid all sources of ignition.
2) Slowly remove clothing immediately after drenching.
3) Rinse contaminated clothing with water before laundering.

NOTE | Drivers should know where the safety showers and eyewash stations are before loading or unloading any petroleum products.

NOTE | Drivers should refer to current WHMIS SDS.

4.5.2 Skin Contact (Cold Heavy Fuel Oil)



Remove cold heavy fuel oil from skin with waterless hand cleaner, warm mineral oil, or petroleum jelly. Wash skin thoroughly with soap and water. If skin is irritated, get medical assistance.

Flush out eyes using water for a period of 20 minutes. Apply a damp cloth and get medical assistance immediately.



4.5.3 Hot Product Burns (Asphalt & Heavy Fuel Oil)

If hot asphalt contacts your skin, DO NOT TRY TO REMOVE IT or contaminated clothing. Completely submerge affected areas in ice cold water or cold running water and get medical attention immediately.

In case of burns to the head, neck, shoulders, chest, abdomen or to the back, apply a cold damp cloth on the burned surface. To maintain the cooling effect, change the cloth frequently.

Flush out eyes using water for a period of at least 20 minutes. Apply a damp cloth.

4.5.4 Petroleum Vapour Exposure

If someone is affected from exposure to petroleum vapours, rapidly provide them with fresh air. If they are having a difficult time breathing, a sore throat, cough, etc. seek medical attention.

Should the person stop breathing, proceed with emergency first aid (CPR) (if qualified) and arrange for medical attention.

4.6 Personal Protective Equipment (PPE)

4.6.1 General



If loading or unloading at terminals, drivers‹ must always follow the terminal's PPE requirements. Refer to WHMIS Safety Data Sheets (SDS) for details of appropriate PPE and safety measures for all hazardous materials you are handling and transporting.

Wear only clothing made of 100% cotton or cotton blended materials. Fire resistant clothing provides the best protection. Outermost layers of clothing, including hoods, must be flame resistant and not impede vision when worn.
Clothing made of 100% synthetic or nylon materials (parkas, snow suits) must be avoided due to static electricity risks and is not permitted at Canadian Fuels member terminals.

NOTE | Traction aids must be accessible for driver use at all times of the year, either in the truck cab or carried on person. During winter months, drivers shall use embedded or over-the-shoe intrinsically safe traction aids as hazards dictate.

Wear oil resistant rubber gloves, CSA approved eyewear, hard hats, high top safety footwear that covers the ankles and fire resistant clothing that covers the arms and legs (coveralls).

When top loading (to be covered later), wear approved respirator for gasoline based products as protection against exposure to benzene.

4.6.2 Special Protection for Asphalt



When dealing with asphalt, loose fitting, fire retardant clothing must be worn with the collar closed and long sleeves buttoned at the wrist.

Heat resistant insulated gloves with gauntlets are to be worn.

Wear CSA approved high top steel toe boots with a heel that cover the ankles.

Pants without cuffs are to be worn over the tops of the boots.

Hard hats, goggles and face shields should be worn.

4.7 Fire Knowledge

4.7.1 Introduction

Because petroleum products are flammable under certain conditions, petroleum drivers should be familiar with the nature of fire and the proper ways to control it.

4.7.2 The Nature of Fire

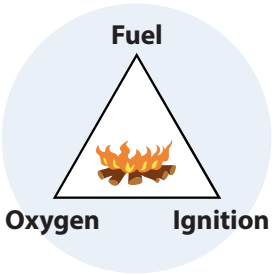
Vapours of petroleum products provide fuel for fire. Any uncontrolled burning of petroleum vapour is a major threat to life and property.

To produce fires, three things are necessary: **Fire Triangle**

Fuel → Combustible Vapours

Ignition → Source of Ignition

Oxygen → As Present in Air



If any one element is missing, fire will not occur. Therefore, the following actions should be taken to minimize the risk of fire.

1) Contain the fuel properly and if there is a fire, eliminate the source of the fuel if safe to do so.

2) Minimize exposure to ignition sources.

3) Have fire extinguishers available which can eliminate the oxygen fuelling a fire.

4.7.3 Fire Extinguisher Classifications

Trucks, trailers, terminals and customer sites have fire extinguishers in case there is a fire. There are 4 classes of extinguishers based on the type of fire it is used for. Class B extinguishers are used for petroleum fires. Most extinguishers used in the industry are rated for Class A, B, & C.

CLASS A Combustible Materials (paper, wood, etc.)
CLASS B Flammable Liquids (petroleum, grease)
CLASS C Fire Extinguisher Agent is non-conductive (electrical)
CLASS D Metals



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SECTION

05 PREPARING TO DRIVE YOUR PETROLEUM TRUCK

Preparing to Drive Your Petroleum Truck

5.1 The Essentials of a Professional Petroleum Driver



Petroleum drivers carry a large responsibility when loading, transporting and unloading their cargo. It is therefore essential that they abide by the following general guidelines.

Stay focussed, think, practice and enforce safety.

Ensure you and your unit are properly equipped to make a safe delivery.

Always perform a last minute risk assessment to identify possible hazards and ensure that the work can be done safely.

Comply with hours of service regulations.

Have appropriate paperwork, Transportation of Dangerous Goods (TDG) certificate and shipping documents, Air Brake Endorsement, Workplace Hazardous Material Information System (WHMIS) certificate, placards and access cards. Preplan your route to comply with Transportation of Dangerous Goods (TDG), weight and dimension regulations.

Respect your customer's loading/unloading facility and safety requirements.

Never leave your unit unattended while loading or unloading.

Never leave valuables in your cab and always keep it locked when you are away from it.

Never pick up unauthorized passengers.

If you encounter aggressive customers or pets, check with your dispatcher prior to trying to complete the delivery.

Deliver on schedule or advise if delayed.

Respect your load – petroleum products are dangerous if not handled properly.

Refer to WHMIS Safety Data Sheets (SDS) for details of appropriate PPE and safety measures for all hazardous materials you are handling and transporting.

5.2 Petroleum Trucks & Trailers

5.2.1 Bulk Fuel Trailers



As a petroleum driver, you may be involved in driving a variety of different vehicles depending upon the load that you will be carrying. For the most part, large loads are carried in a bulk fuel tractor trailer unit. These may include a tractor with a trailer and a "pup" (B train) or may be multi-axle unit trailers. Trailers may have several compartments which can be used to deliver different products to customers in the same trip. Mostly, these units pick up their product at large terminals and deliver to the large customers who will take a full compartment of product.

Asphalt and Heavy Fuel Oil (Bunker) deliveries require tractors and special trailers because both of these products must be shipped at high temperatures. Double walled trailers and heaters may be used to maintain the high temperatures during shipment. Normally, loading is done in special areas at the terminals and full loads are dropped off at customer sites.

5.2.2 Hose Reel Trucks



Furnace oil, lubricating oils, kerosene, solvent and small shipments of diesel or gasoline may be carried in hose reel trucks. Even though these are smaller units, the loading procedures are basically the same as with the bulk fuel trailers. Deliveries however, may be quite different as many of these are pumped off and metered. Quite often these trucks pick up the product at a local distributor and deliver to smaller customers. Many of these vehicles are single axle or tandems and are commonly known as furnace oil trucks.

5.3 Before You Start, Check Your Vehicle (Pre-loading 360 Walk-around Inspection)



Before any petroleum driver starts out to either pick up or deliver a load, they must ensure that their truck and trailer are in the proper condition. Drivers should follow their company policies and procedures or provincial requirements to check the vehicle both inside and out. Any defects must be recorded on the company vehicle inspection report and corrected prior to leaving.



Inside Cab Checklist
Steering Wheel
Brakes
Lights
Windshield Wipers/Washers
Mirrors
Defroster/Heater
Horn
Seat Belts
Parking Brakes
Emergency Equipment



Outside the Vehicle Checklist
Lights & Reflectors
Wheels & Fasteners
Exhaust System
Fifth Wheel
Suspension
Load
Air Brakes
Hydraulic Brake Fluid
Mirrors
Placards
Hoses
Spill Kits

When a driver takes over a unit from another driver, he/she should check each of the compartments to ensure that they are clean and empty. This will help to ensure that they know the tank capacities and do not load a compartment that already has product in it.

5.4 Transportation of Dangerous Goods

Most petroleum products are considered by Transport Canada to be "dangerous goods" and under the Transportation of Dangerous Goods Act and Regulations, they must be identified while being transported.

Any driver transporting dangerous goods must therefore, be trained and have a Transportation of Dangerous Goods (TDG) certificate (note that drivers need only be trained in TDG Class 3: Flammable Liquids). This certificate will be obtained in a special TDG course arranged by your employer.

As part of the driver's responsibilities, they must ensure that the load is identified by the appropriate placards. Details will be provided as part of the TDG training program.







5.5 Driving Your Vehicle



Because of the nature of the product being hauled, it is vitally important that petroleum drivers follow all company policies, procedures and rules of the road. As such, drivers must:

1) Ensure the route being taken allows access with maximum rated Gross Vehicle Weight (GVW) and is not affected by bridge weight restrictions or highway weight restrictions. Drivers should be familiar with how the GVW will change depending upon the products they are carrying.
2) Ensure the customer site is located on a dangerous goods route or alternate routing has been identified and is in compliance with local or regional laws.
3) Have sufficient room to manoeuvre the truck to where you can load/unload properly.
4) Drivers must engage seat belts at all times when driving, including during truck movements at all Canadian Fuels members' fuel terminal sites.
5) Backing up is hazardous and is prohibited at Canadian Fuels members' terminals unless authorized by terminal personnel. If absolutely necessary, drivers must obtain case specific direction from terminal personnel for backing approval and protocols.

Canadian Fuels
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SECTION

06 HANDLING SPILLS, FIRES & OTHER EMERGENCIES

Handling Spills, Fires & Other Emergencies

6.1 General

As long as there are deliveries of petroleum product, drivers will need to be prepared for a product spill or fire. In order to deal with these, the driver must follow the proper procedures.

Ensure the safety of yourself and others.

Notify authorities (Fire, Police, Ambulance).

Secure the area if authorities have not yet arrived at the scene.

Contain the leak/fire if safe to do so.

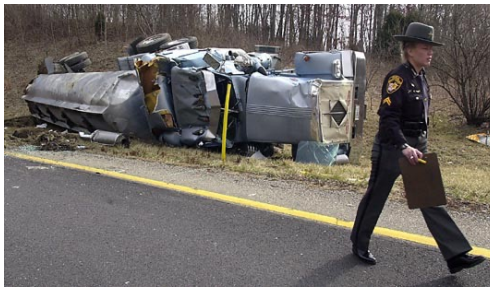
Remain at the scene to provide assistance to the first responders (Fire, Police, Ambulance).

Inform authorities of the response expected from the employer, including the role of emergency response contractors and mutual aid plans.

Understand the role of the emergency responders.

Report the incident to your employer (as per your emergency response plan).

If the media is at the scene, the driver is not required to speak with them.



6.2 Vehicle Accidents

If involved in a vehicle accident, the professional driver should always follow his/her company's procedures.

6.3 Incidents Resulting in Spills

6.3.1 General



In the event of a spill, taking action in those first critical moments after the incident can greatly reduce injuries and damage to the environment.

Take a few seconds to determine the fire and safety risk. **If safe to do so, take the following actions:**

1) Stop the flow of product.

2) Stop all sources of possible ignition.

3) Get clear and move people from the immediate area so that they are clear of danger.

4) Get help. Call or have someone call the fire department, police and your dispatch with information concerning:

- **A)** spill location
- **B)** product spilled
- **C)** injuries
- **D)** potential contamination



5) If possible, assist police and fire department.

6) If danger of fire/explosion is removed, then proceed with the following actions.

- **A)** If authorities have not yet arrived, secure the immediate area.
- **B)** Contain the spill using earth or absorbent materials and block off, drains, manholes, culverts, dykes and ditches. Any materials used as absorbents must be removed to a safe disposal area.
- **C)** Assist authorities in cleanup and reporting.

7) Never leave the scene of an accident or spill unattended.

6.4 Spill Containment Kits



6.4.1 Minimum Requirements for Petroleum Tank Truck Spill Containment Kit

10	Sorbent Pads (min. 18"x18"x3/16")
4	Plastic Disposal Bags, 5 mm
1	20 Litre Metal Pail with bonding/grounding cable and lid
1	Neoprene drain stoppers 48"x48" (manhole cover)
1	Shovel (aluminum)
1	1m Boom Sock
1	List of Contents
1	Broom (optional)
1	Floor Dry
1	Plug & Dyke (optional)

6.4.2 Minimum Requirements for Asphalt Tank Truck Spill Containment Kit

1 20 litre Metal Pail and lid (no grounding cable)
4 Plastic Disposal Bags, 5 mm
1 1m x 1m Heavy Canvas Tarp of Heat Resistant Material (manhole cover)
1 Shovel (aluminum)
2 List of Contents

It is recommended that the kits be contained in the metal bucket and maintained separate from other equipment on the truck.

NOTE | Plastic pails and plastic carrying handles are NOT permitted.

6.5 Mixes (Crossovers) or Contamination

Product quality must be maintained. Never mix products. IMMEDIATELY REPORT ANY PRODUCT MIX TO YOUR DISPATCHER.

It is imperative that the flashpoint on middle distillates such as diesel fuel, heating oil, and stove oil not be lowered by mixing with gasoline. For example, putting gasoline into a furnace fuel tank creates a very dangerous situation.

Contamination of an asphalt tank with moisture may result in a serious foaming hazard (boil over).

In the event of a product mix, the driver should follow this procedure:

1) stop the flow of product.

2) immediately advise the receiver.

3) ensure all product withdrawals stop.

4) calculate the individual quantities of mixed products.

5) advise your dispatcher, report details and actions taken, and wait for instructions.

Do not allow any contaminated product to be sold.

Remain on site until help can be provided.

6.6 Fire Emergency Procedures

6.6.1 General



All drivers must be thoroughly familiar with the location and operation of all fire safety equipment.

Personnel involved with the transportation of flammable products must be familiar with the operation and use of portable fire extinguishers. In the interest of safety, many professional bulk petroleum drivers are enrolling in fire training courses to improve their fire fighting capabilities and skills. For more information, contact your supervisor.

6.6.2 Fire at Loading Facilities

Ensure the safety of yourself and others. If necessary, leave the area and call for help. Only if you feel safe to do so should you carry out the following procedures.



1) Immediately implement the terminal's fire emergency procedures.
2) Shut off source of fuel, use emergency shutdown.
3) Disconnect all loading arms and close dome covers.
4) Experience has shown that most fires can be extinguished in the early stages by prompt action with portable extinguishers. Try to smother the fire by directing the fire extinguisher's stream at the base of the flame, but not at the actual product.
5) If practical and safe, remove truck from the area.
6) Always follow terminal fire procedures, even for minor fires that appear to be under control.

6.6.3 Fire en Route

DO NOT PANIC. Bring your unit to a controlled stop away from public areas and other vehicles if possible. If the fire is in the engine compartment, use extreme care in raising the hood to prevent the flames from billowing in your face.

Should a tire of your tractor/tanker catch on fire while in transit, bring the vehicle to a stop. Although sometimes difficult, the fire can be managed with the efficient use of dry chemical extinguishers. Remember to save some extinguishing powder after the initial attack to fight frequent flashbacks that may occur.

6.6.4 Fire at Customer Unloading Facility



1) Shut off source of fuel. Stop unloading.
2) If possible, attempt to extinguish the fire with your hand portable unit.
3) If practical, move vehicle to a safe location.
4) Contact the Fire Department.
5) Evacuate the immediate area.
6) Notify the agent/dealer/customer immediately.

6.6.5 Electrical Fire on Truck

If practical and safe to do so, shut off the battery switches or disconnect the truck's battery to remove the source of the problem.

6.6.6 Clothing Fire



If clothing catches on fire, extinguish with dry powder or water. Direct the dry powder or water at the base of the flame and watch for re-flash. If neither is available, wrap in a blanket or coat and roll on the ground until the fire is out. Assist the person away from the fire but prevent running, as this will only fan the flame. Keep the victim protected with clothing or blanket after extinguishment to reduce shock while awaiting medical assistance.

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SECTION

07 GENERAL LOADING & UNLOADING PROCEDURES

General Loading & Unloading Procedures

7.1 Overview

Petroleum products are generally loaded at terminals. These may be anything from a small local agent facility to a large refinery. Drivers must be aware of the specific terminal procedures for each location. Unloading may also be done at a refinery or bulk plant but mostly at industrial or commercial sites, service stations or residential customer sites. Again, the drivers must be aware of the basic procedures to be followed at each one.

7.2 Accessing Terminals



Access to terminals is usually through an automated gate control. Do not allow another vehicle access with your card or to follow you through the gate for safety and security reasons.

When entering a supplier's facility for the first time, you must contact terminal personnel for instruction, training and paperwork requirements.

The maximum speed limit at Canadian Fuels member terminals is 15 kmph and may be lower as determined by each terminal. Obey all stop signs and speed limits posted at the terminal.

Failure to comply with refinery and/or terminal rules and regulations could result in the suspension or loss of loading privileges.

7.3 Approaching the Loading/Unloading Area





Follow proper terminal traffic patterns.

Wait at the STOPLINE until a position is available (15 metres, or as required by terminal, from the loading/unloading area).

Only the engine of the truck is to be operated to/from the truck loading/unloading position. All hand-held and portable electronic devices including, but not limited to, radios, pagers and cell phones must be left in the cab of the truck. On site use of only intrinsically safe radios or other communication devices must first be approved by the terminal operator.

Do not boost and/or jump start vehicles without the approval of distribution terminal personnel.

Do not drive to a loading/unloading position if there is evidence of a product spill.

To change position once at the loading /unloading rack, drive forward and re-enter. **DO NOT BACK UP.**

7.4 Accessing Customer Sites

7.4.1 General

When entering customer sites, make sure the direction of access and exit minimizes any opportunity for conflict with other traffic, school bus stops, structures, curbs or ditches.

Watch for overhead, under carriage or side clearance objects which may be struck by the unit.

Ensure that you park where a spill or run-off will be directed away from storm drains, manholes, creeks, lakes, etc.

7.4.2 Service Stations



At service stations and other high traffic areas, the driver needs to be extra cautious of other vehicles on the lot. All other vehicles must be kept a safe distance from the delivery vehicle.

7.4.3 Commercial/Industrial/Residential Heating Oil Deliveries



Deliveries to commercial/industrial and heating oil sites may be to off-road or rural areas. Special precautions must be taken due to mud, snow, trees and other obstacles.

7.5 Loading/Unloading Site Safety Inspection

When loading or unloading, the driver should always complete a safety inspection to ensure that everything is in order.

Drivers should:

- keep the loading/unloading area free of debris & other hazards.
- ensure that walkways, platforms and fall protection devices are installed and in good repair.
- ensure that lighting is sufficient for night operation.
- make sure fire extinguishers (type B/C) are in clearly marked location.
- confirm that storage tanks are in good repair & free of leaks.
- ensure that no one is smoking/vaping or is carrying matches or lighters.
- use only ULC or CSA approved explosion proof flashlights.
- never leave your vehicle unattended.
- never load/unload during an electrical storm. Follow the "30/30 Rules": If lightning is visually seen and the count between the flash and the thunderclap is fewer than 30 seconds, all work on site must stop immediately and all personnel take shelter. Do not resume work operations until at least 30 minutes has passed with no further lightning flashes/thunderclap observed within the 30 seconds count or as otherwise directed by terminal staff.
- use fall protection devices/equipment if you are working on top of a trailer.



7.6 Procedures for Loading & Unloading

No matter which type of truck you are driving or where you are loading/unloading, there are some general procedures that should be followed. In addition, there are specific procedures for each of the different products.

This section outlines the general procedures that apply to ALL petroleum products while the specific procedures for individual products are outlined in later sections.

The Overall Loading/Unloading Procedures include 8 Main Steps. Steps 1, 2, 3, 4, 5, 7 and 8 apply to ALL situations where Step 6 will vary and is specific to the product being loaded/unloaded.

Throughout the remaining sections of the manual, the following 8 Main Steps will be highlighted with a box around them. Within the 8 Main Steps, specific steps will be detailed.

7.6.1 General Loading / Unloading - 8 Main Steps

- ☐ **1)** ***Review Terminal/Delivery Instructions*** – Prior to entering a terminal/customer location, the driver must understand the terminal/delivery instructions.
- ☐ **2)** ***Position Vehicle*** – Position the vehicle in the correct location for proper loading or unloading to prevent backing up situations.
- ☐ **3)** ***Put on PPE*** – Put on the appropriate personal protective equipment.
- ☐ **4)** ***Prepare Site*** – Prepare the site for the loading or unloading.
- ☐ **5)** ***Check Compartments/Tanks*** – Check the receiving compartment to ensure that it is clean and that it has sufficient capacity.
- ☐ **6)** ***Follow Product Specific Load/Unload Procedures*** – Follow the specific procedures for the product that is being loaded or unloaded (to be covered in the following sections).
- ☐ **7)** ***Complete Walk Around Inspection*** – Complete a walk around inspection to ensure that everything is in the proper order before leaving the site.
- ☐ **8)** ***Finalize Paperwork –*** Complete the appropriate paperwork prior to exiting the site.

7.6.2 Loading/Unloading - 8 Main Steps – *Detailed*

1) *Review Terminal/Delivery Instructions*

Before either loading or unloading their truck, drivers must become familiar with the instruction or procedures to be followed at the site they are going to.

In most cases, terminals have written procedures that must be followed and these will be reviewed with the driver prior to their first loading.

For customer sites, drivers will be provided with delivery instructions by the dispatcher to ensure that they can find the site and complete the delivery properly.



General Loading / Unloading - 8 Main Steps





2) *Position Vehicle*

1. Park in the correct position for loading/unloading. The truck must be sufficiently close to the loading/unloading rack or customer tank.
2. Set the parking brake.
3. Turn off all ignition sources, except truck engine if the truck pump is being used. Cell phones must stay in the cab of the truck. Lights and any other external electrical equipment must all be turned off.
4. Set chock blocks.





NOTE | All trucks must always supply and carry their own chock blocks. Use of chock blocks is required under the TDG Regulations by reference to CSA Standard B.621, Clause 7.1 (h) which says, in part: "a minimum of two chock blocks are required to prevent unintended vehicle movement during loading/unloading operations."



3) *Put on PPE*

No matter what petroleum product is being loaded/unloaded some personal protection equipment (PPE) must be worn. Refer to WHMIS Safety Data Sheets (SDS) for details of appropriate PPE and safety measures for all hazardous materials you are handling and transporting. In general, clothing made of nylon materials or other synthetic materials which are known to generate static electricity are prohibited. Outermost layers of clothing, including hoods, must be flame resistant and not impede vision when worn. In the sections following, it will outline the specific PPE that must be worn when loading/unloading each product.

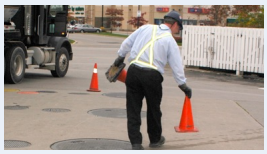
NOTE | Traction aids must be accessible for driver use at all times of the year, either in the truck cab or carried on person. During winter months, drivers shall use embedded or over-the-shoe intrinsically safe traction aids as hazards dictate.

These symbols will be used to indicate the PPE Required.



General Loading / Unloading - 8 Main Steps

4) *Prepare Site*



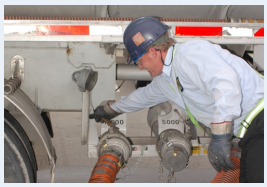
1. Set safety cones.



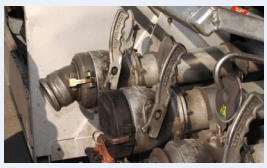
2. Connect grounding cable/bonding cable to reduce the potential for static build-up. All grounding/bonding cables and their associated clips, plugs, posts and connections must be kept clean, unpainted and in good condition.



3. Connect Scully (for bottom loading only). This device grounds the tank and monitors the level of the product being put into it. In addition, it will shut off the system if the level becomes too high. This is a requirement when bottom loading.



4. Check any hoses, valves or couplings for wear or damage. Also, ensure that gaskets are in place and in good condition.

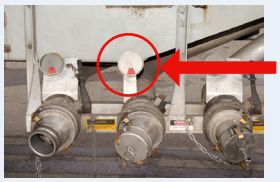


5. Ensure the manifold and unloading valves are closed.

6. For bottom loading, loading arms must be connected one at a time, and product flow must be confirmed in a connected arm before beginning connection of another loading arm.



7. Put grounded drip containers under the loading/unloading valve. These are metal pails used to collect hose or valve drippings. They have non-insulated handles and a ground strap to eliminate static build up. Plastic pails are known to collect static electricity so only metal ones may be used.



8. Remove or replace previous load product identification tags. Replace tags in regions where removal is prohibited by law and install as per load requirements



9. As per TDG Regulation 4.4.3, ensure proper TDG placards are in place prior to the commencement of loading operations.

General Loading / Unloading - 8 Main Steps

5) *Check Compartments/Tanks*

Whether you are loading a tank truck or unloading into a customer tank, you must ensure that the receiving tank can accommodate the amount of product that is to be put into it. This may be done as follows.

NOTE | This may have been done as part of a pre-trip inspection.

Tank Trucks

Engage fall protection railings on truck/trailer or put on fall protection equipment (whichever is appropriate).

Open only dome cover of compartment to be loaded.

Ensure pressure has been relieved before fully opening.

Ensure compartments are clean, free of foreign objects and completely drained.

Determine if a flush is required and if so follow terminal procedures.

Ensure compartment will hold quantity to be loaded.

Ensure correct product is being loaded into correct compartment.





Underground Tanks

Use a dip stick and dipping tank chart to determine how full the tank currently is. This will allow you to determine how much product the tank can hold. All underground tanks are required to have a tag indicating which product is in that tank. Some companies will also include the capacity on the tag.

Underground tanks with gauging equipment still require a manual dip to verify the ullage. Tank gauges should not be solely relied upon unless advised by your employer.

General Loading / Unloading - 8 Main Steps



Aboveground Tanks

Some of these tanks can be checked by using an electronic dip.

Others, such as heating oil tanks, are not checked prior to filling. The driver starts filling and does so until the vent alarm changes pitch or stops working, indicating the tank is full.

For some of the other deliveries, the dispatcher or driver will check with the customer ahead of time to ensure that there is sufficient room in the tank.



Checking Tanks for Water

Another important part of a driver's responsibility may be to ensure that the tanks being loaded are free of water (refer to company policies for specifics). This is especially important for products blended with ethanol. In checking for water, water indicating paste is used. The following provides some guidelines for using water paste and the proper procedures.



Using Water Indicating Paste

- Store water paste in a warm place.
- Keep the end of the dip stick dry when applying the paste.
- Most water paste is still OK to use if it should become frozen, and then allowed to warm up.
- Water paste can be used for dipping ethanol gasoline, non-ethanol gasoline and diesel fuel tanks.

Proper Use of Water Indicating Paste

- The dip stick should be wiped clean and dry each time before using.
- Apply a very thin coat of paste between the rails, i.e. over the numbers. The paste should be thin enough to be transparent. Make sure that the paste is applied over at least the bottom 10 cm of the dip stick.
- Leave the stick in the tank while counting to twenty in thousands, i.e. 1001, 1002, 1003…1019, 1020.
- When the dip is completed, wipe the stick clean and immediately return it to its container.

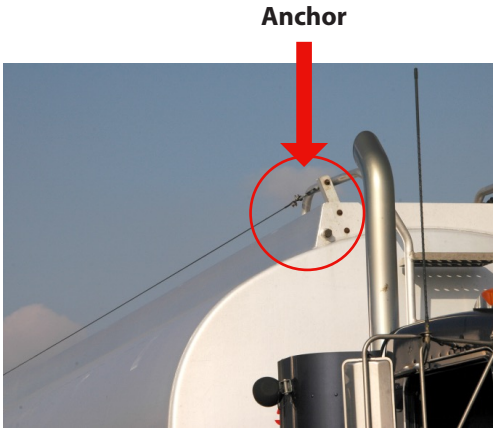
General Loading / Unloading - 8 Main Steps

Other Safety Guidelines

Some provincial regulations and company policies require employees working at heights to have adequate fall protection. If required to do so, drivers should first check with their employer.

Guardrails

- Most top loading racks and some of the trucks/trailers are equipped with guardrails which are used to protect workers who are on top of the trucks/trailers.
- When working above 2.4 m (or per provincial regulation), drivers need to wear fall protection harnesses which are then attached to anchor points on the rack or trailer. Drivers should check with their dispatcher about the specific requirements for their equipment.



6) *Follow Product Specific Loading/Unloading Procedures*

Loading and unloading procedures vary depending upon the type of vehicle being used, whether or not it is a metered delivery and in the case of loading, whether it is being top or bottom loaded. These specific product procedures are detailed in the sections following the General Procedures. These include loading and unloading procedures for:



- Gasoline & Middle Distillates
- Aviation Fuels
- Asphalt
- Truck to Marine Vessel Transfers
- Truck to Truck Transfers

Though there are some differences in the specific loading/unloading procedures for each of the above products, each one will follow four major steps. These include:

- select product – badging in and/or resetting the meter / selecting the correct product to load or unload.
- connect loading arms/hoses - ensure and double-check that loading arms or hoses are properly connected to the correct compartments or tanks.
- start loading/unloading - opening the proper valves and starting the pump (where required), and confirm no leaks during the fuel transfer operation.
- stop loading/unloading – turning the pump off and/or valves off and disconnecting hoses, grounding cables and scullys.

NOTE | Whenever possible, trailer compartments should be loaded from front to back. To unload, the sequence is reversed.



Transportation of Dangerous Goods Regulations require that all petroleum product compartments are not to be filled beyond the manufacturer's filling limit. Provincial requirements allow for between 2%-3% expansion space. Canadian Fuels member terminals require a headspace of at least 250 litres per compartment or 3% whichever is greater.

General Loading / Unloading - 8 Main Steps

As part of the shared responsibility for axle weight compliance, terminals, carriers and drivers are responsible for gross weight compliance. Overloading may create a potentially unsafe vehicle. Professional petroleum drivers must know the capacity of their vehicles, the weight of various products and not knowingly overload their vehicle. They must also follow company policy for weight distribution and consider how it affects the drive axle traction.

Switch Loading

Switch loading is the loading of low volatile products, such as kerosene or diesel, into a compartment which previously contained high volatility products such as gasoline.



Products such as gasoline are so volatile that the vapours they produce create a condition inside a tank where it is too "rich" to burn. In other words, there is too much gasoline vapour and not enough air for the mixture to burn. When you add more gasoline to the tank, the mixture stays "rich" so there is less risk of fire.

If, however, you add low volatility product such as kerosene or diesel to the compartment that had gasoline in it, the vapour concentration becomes less "rich" and can create a condition where the mixture moves into the flammable range. If a static spark or other ignition source is introduced, it could cause a very dangerous situation. This is especially true during top loading where the tank is exposed to the air.

Switch Loading Procedures



When loading middle distillates into a tank truck that previously contained gasoline **you must:**

- ensure that there are no sources of ignition near the loading area.
- flush the manifold that contained the gasoline.
- ensure that all bonding and grounding connections are maintained during the entire loading/unloading procedure.
- disconnect the bonding and grounding only when the operation is over.

Other Switch Loading Guidelines

If there is a prohibitive load combination, it should be identified by the shipper and they will supply flushing or change of service guidelines.

Gasoline or other low flash products must not be carried in compartments adjacent to those carrying middle distillate unless separated by double bulkheads.

General Loading / Unloading - 8 Main Steps

When using a truck pump and/or manifolded unit for split loads, unloading should be performed in the following sequence:



1. Middle Distillates (diesel, stove, etc)
2. Middle Distillates (dyed)
3. Premium Gasoline
4. Midgrade Gasoline
5. Regular Gasoline
6. Regular Gasoline (dyed)

The above unloading sequence is important to minimize the danger of lowering the flash point of middle distillates.

Flushing Tanks

Whenever a tank is being filled with a different product than it previously contained, the driver must know if the tank and equipment is to be flushed prior to filling. This is especially important for Low Sulphur Diesel.

Drivers must consult the individual company's policies for site specific requirements.

Procedures are subject to all local, provincial and federal government regulation. In the event of a conflict, government regulations will supersede.

A report must be used by all drivers to report all safety, environmental or procedural deficiencies that are encountered during the delivery of bulk products.

Management of Ultra Low Sulphur Diesel (ULSD)

As stated earlier in the manual, ULSD contains a very low concentration of sulphur and as such, can easily be contaminated if mixed with even a small quantity of regular diesel product. In order to minimize the risk of this happening, many companies will try to dedicate a truck or specific trailer compartments and pumps to ULSD only. If that is not possible, the equipment must be flushed to ensure that any other product is removed prior to filling the tank with ULSD. Drivers should follow the terminal procedures or the following steps must be taken in order to prepare the pumps and tanks to accept ULSD.

- Before loading, confirm last contents using shipping documentation and/or industry-standard product tags.
- If change of service is required, drain the compartments dry (note: truck should be on level ground)
- If tanks can be drained dry using gravity, the driver can check that it is dry by doing a "pail check" (putting a pail under the spout to catch any remaining product that may be in the tank or manifold). This should be done after checking the compartment retain sensor and the site glass upstream of the manifold.
- If a pump has been used to unload the previous product for hose reel truck compartments, the tank, manifold, pump, meter and hose reel all have to be flushed with ULSD prior to the loading. A proper flush includes pumping at least 3 times the collective internal volume of the complete system through it.
- Complete the documentation confirming the procedures were followed.

General Loading / Unloading - 8 Main Steps



7) *Complete Post-loading 360 Walk-Around Inspection*

Before leaving the terminal or customer location, the driver must complete a walk-around to check for leaks and ensure that their vehicle is in good condition.

In addition, they should:

- ensure all equipment is safely stored.
- ensure doors and valves are closed.
- verify that product tags and placards are correct.
- remove and store chock blocks.



8) *Finalize Paperwork*

The last thing the driver must do is complete their paperwork.

At a terminal, the vehicle can be driven to the staging area where the paperwork is completed, signed and dropped off.

At customer locations, the driver completes the paperwork, leaves a copy with the appropriate person and keeps a copy for his/her records.

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SECTION

08 SPECIFIC LOADING & UNLOADING PROCEDURES GASOLINE & MIDDLE DISTILLATES

Specific Loading & Unloading Procedures Gasoline & Middle Distillates

8.1 Overview

A large percent of petroleum products delivered falls into the gasoline and middle distillates areas. As outlined in Section 3, there are several grades of gasoline while middle distillates include diesel, stove oil, furnace oil and kerosene. Gasolines and diesel are generally transported in large drop units while furnace oil and stove oil are commonly delivered in small drop trucks.

Whether they are small or large trucks, petroleum tanks are loaded in 2 basic ways. They can be "top loaded" whereby the product enters the tank from the top, or "bottom loaded" where the product is pumped into the tank through the bottom side of it. Though the majority of loading today, especially at terminals, is "bottom loading", "top loading" is still used too.

This section outlines the specific procedures for top loading and bottom loading. The main steps outlined in Section 7 will be used to guide us through these procedures.

8.2 Specific Loading Procedures

Gasoline & Middle Distillates – Top Loading – 8 Steps

8.2.1 Top Loading

Top loading involves transferring product from the terminal in through the top of the receiving tank. As a result, the top of the tank is exposed to the air and the possibility of fire or explosion is increased. It is very important in top loading to keep all sources of ignition away from the loading area. Because of the amount of vapour in this area, drivers should always stand up-wind of the filling area.

The following procedures must be followed very carefully when top loading:

1) ***Review Terminal Instructions***

2) ***Position Vehicle***

1. Position truck.
2. Set brakes.
3. Turn off ignition sources.
4. Set chock blocks.



Gasoline & Middle Distillates – Top Loading – 8 Steps

3) *Put on PPE*


Hard Hat


Safety Glasses


Flame Resistant Clothing


Fuel Resistant Gloves


Safety Boots


Reflective Vest


Respirator

NOTE | Drivers should follow site requirements for respirator use.

4) *Prepare for Loading*

1. Set safety cones (where required).
2. Connect grounding/bonding cables.
3. Check hoses and valves for wear or damage.
4. Ensure valves are closed.
5. Replace ID tags and placards.
6. Remove all loose objects from upper pockets so they do not fall into the tank being loaded.
7. Lower the ramp to the truck/trailer catwalk.
8. Ensure rails are in place and/or use fall protection.





5) *Check Compartments*

1. Ensure compartments are clean and have capacity to hold product.
2. Flush (if necessary).

Gasoline & Middle Distillates – Top Loading – 8 Steps

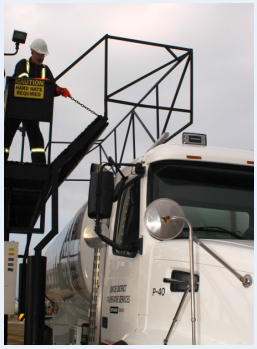
6) *Top Loading Procedures*











A) Select Product

1. Badge in and reset meter.
2. Select product.
3. Preset volume (where applicable) and verify.

B) Connect Loading Arm

1. Lower loading arm (or extension) fully into compartment.
2. Ensure downspout always touches bottom of compartment.
3. Maintain metal contact between spout and side of dome.
4. Ensure downspout is in a vertical position.

C) Start Loading

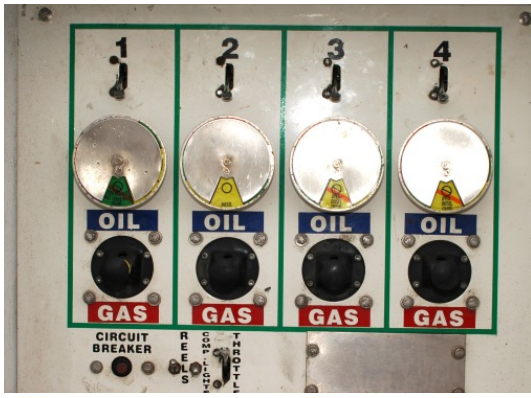
1. Turn pump switch on and begin loading per terminal instructions.
2. Hold loading valve open by hand.
3. Load at slow flow until nozzle of spout is covered by liquid.
4. Open to full flow.
5. **NEVER TIE OR BLOCK A LOADING VALVE OPEN.**

D) Stop Loading

1. Reduce flow rate when loading the final 300 litres.
2. When full, shut off loading valve and pump.
3. After 2 minutes waiting time, remove loading arm slowly while maintaining metal to metal contact between downspout and edge of dome.
4. Allow to drain before returning to proper position.
5. Close dome cover securely.
6. Raise ramp when leaving truck/trailer.
7. Print meter ticket and remove ID card (if required).
8. Detach ground cable.

Gasoline & Middle Distillates – Top Loading – 8 Steps

7) *Complete Post-loading 360 Walk-Around Inspection*



1. Check for leaks and ensure valves are closed.
2. Store equipment.
3. Confirm placards are correct.
4. Remove chock blocks.
5. Put away safety cones.

8) *Complete Paperwork*

1. Pick up shipping document & verify proper products have been loaded.
2. Leave copy at terminal.

8.2.2 Bottom Loading

Gasoline & Middle Distillates – Bottom Loading – 8 Steps

As mentioned earlier, bottom loading is when product is "pumped" in through the bottom side of a tank. The advantage of this is that there is less exposure to the air during filling. This reduces the potential for fire or explosion. Drivers still need to be careful and to follow these procedures.

1) *Review Terminal Instructions*



2) *Position Vehicle*

1. Position truck.
2. Set brakes.
3. Turn off ignition sources.
4. Set chock blocks.

3) *Put on PPE*


Hard Hat


Safety Glasses


Flame Resistant Clothing


Fuel Resistant Gloves


Safety Boots


Reflective Vest

Gasoline & Middle Distillates – Bottom Loading – 8 Steps







4) *Prepare for Loading*

1. Set safety cones (where required).
2. Connect grounding/bonding cables.
3. Connect overfill protection cable (Scully).
4. Check hoses and valves for wear or damage.
5. Put drip pails under valves.
6. Change/Replace ID tags and placards.

5) *Check Compartments*

1. Ensure compartments are clean and have capacity to hold product (if not done already). Check retain sensor if equipped.
2. Pail check or flush (as required).

NOTE | Dome hatches may be opened **except during loading/unloading** for inspection to a maximum of 3 minutes or according to local legislation.





6) *Bottom Loading Procedures*

A) Select Product

1. Badge in and reset meter.
2. Select product.
3. Preset volume (where applicable).

B) Connect Loading Arm

1. Connect vapour recovery hose (where equipped).
2. Remove adaptor dust caps.
3. Connect terminal hose coupler on loading arm to adaptor on trailer.

NOTE | Only matching probe fittings to be used to check poppetted adaptors.



4. Loading arms must be connected one at a time, and product flow must be confirmed in a connected arm before beginning connection of another loading arm.
5. Open internal valves.

Gasoline & Middle Distillates – Bottom Loading – 8 Steps

C) Start Loading

1. Open compartment valve.
2. Turn pump switch on and begin loading per terminal instructions.

NOTE | Driver should remain in the emergency stop area during loading.



D) Stop Loading

1. When compartment has been loaded, turn pump switch off, if not automated.
2. Close compartment valve and internal valve.
3. Disconnect loading arms and return to proper position.
4. Reinstall dust caps on trailer adaptors.
5. Remove vapour recovery hoses (where used).
6. Print meter ticket and remove ID card (if required).
7. Disconnect overfill protection cable (Scully).
8. Detach ground/bonding cable.

NOTE | If it is necessary to gauge a tank vehicle, obtain a sample or take the temperature after filling. A delay of at least 5 minutes after the cessation of turbulence shall be required before conducting these operations, to allow static electricity to dissipate.



7) *Complete Post-loading 360 Walk-Around Inspection*

1. Check for leaks.
2. Store equipment.
3. Ensure all doors and valves are closed.
4. Confirm placards are correct.
5. Remove chock blocks.
6. Put away safety cones.

8) *Complete Paperwork*

1. Drive vehicle to exit staging area.
2. Proceed to office to pick up bill of lading (BOL).
3. Check product/volume against dispatch instructions.
4. Sign bill of lading.
5. Ensure proper copies are left with terminal and kept by driver.

8.3 Specific Unloading Procedures

8.3.1 General

The following procedures are subject to all local, provincial and federal government regulations. In the event of a conflict, government regulations will supersede. Consult individual companies' policies for site specific requirements.
Drivers need authorization from dispatch prior to diverting loads.

The method of product delivery from tank trucks into tank systems will depend on the quantity delivered, truck type, tank connection type and metering method. Briefly, filling modes use either gravity feed, a facility pump or truck's pump. The fill connection is made at either a grade-level for underground tanks or directly on the tank top for above ground tanks. In this section, we will split the deliveries into two major areas.

8.3.2 Product Deliveries

Bulk Fuel Trailer – These are generally high volume deliveries from tractor and trailer units (B train, 4 axle, semi-trailer) to underground or aboveground tanks. The majority of these drops will be gravity fed but some will be pumped off. Large drop customers will include service stations, bulk plants and large industrial customers.

Hose Reel Trucks – These are normally from a small tank truck (3 axle or tandem) and the majority of drops will be metered. These customers include residential furnace oil customers, as well as, commercial and industrial customers who need a range of products such as lubricating oils, diesel and gasoline.

The following are important considerations for product deliveries to tank systems.

- Before any delivery is made, the tank must be gauged and the available capacity calculated or otherwise determined.
- Deliveries will be either metered or not metered. Non-metered deliveries must be full truck compartments only.
- Loose-fill (nozzle) deliveries should be avoided for gasoline, due to vapour exposure concerns. The driver may require an organic cartridge respirator to provide adequate protection from benzene exposure. Loose-fill nozzle deliveries for any product should never be made into a tank system fitted with a fill-stem mounted overfill protection device due to the likelihood of splashback, creating a spill. Even though the tank will be fitted with a spill containment device at the fill connection, splashback spills often create a shower that will impact the driver. Further, this delivery mode does not provide for an indication of the 95% fill limit.
- An extended nozzle tip should be used, or delivery should be made into an extended fill stem to avoid splash loading. An extended nozzle tip should be long enough to allow for submerged fill.

8.4 Bulk Fuel Trailer Unloading Procedures to Underground or Aboveground Tanks

Bulk Fuel Trailer Unloading – 8 Steps

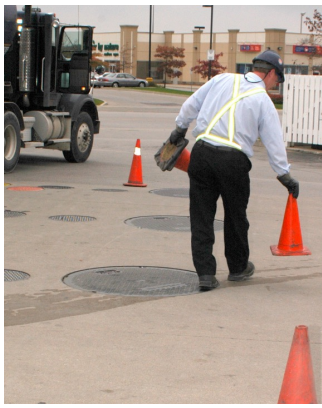
1) ***Review Delivery Instructions***

   1. Verify address on delivery document.
   2. Check for any special instruction or directions.

Bulk Fuel Trailer Unloading – 8 Steps

For Unattended Facilities

3. Obtain facility keys, site map and charts before leaving the terminal.
4. Ensure the facility operator has signed a waiver and that the tank capacity, dip reading and ullage calculations are completed by the site facility operator and documented on the unattended delivery instructions.



2) *Position Vehicle*

1. Position truck.
2. Set brakes.
3. Turn off ignition sources.
4. Set chock blocks.
5. Set safety cones.

3) *Put on PPE*


Hard Hat


Safety Glasses


Flame Resistant Clothing


Fuel Resistant Gloves


Safety Boots


Reflective Vest



4) *Prepare for Unloading*

1. Check in with facility operator.
2. Connect grounding/bonding cables.
3. Test/set level overfill alarms where applicable.
4. Position drip pails under appropriate fittings.

Bulk Fuel Trailer Unloading – 8 Steps



5) *Check Tanks/Compartments*

Underground Tanks

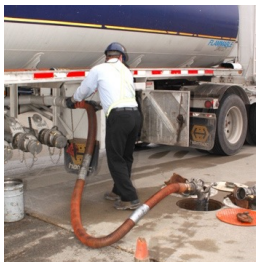
1. Complete dips, water test where required and record on appropriate documentation.
2. Where tanks siphon together, the driver must re-dip the 2nd tank prior to off-loading.

NOTE | Never exceed 95% tank capacity and never split compartments.

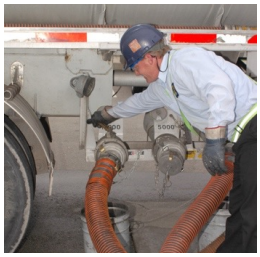
Aboveground Tanks

1. Computerized or tape dips are generally used for checking aboveground tanks.









6) *Bulk Fuel Trailer Unloading Procedures*

A) Select Product

B) Connect Hoses

Vapour Recovery Hoses (Dual point or coaxial) (where applicable)

1. Connect vapour (or coaxial) elbow adapter to vapour adapter on underground tank (orange).
2. Connect vapour return hose to vapour (or coaxial) elbow adapter.
3. Connect vapour return hose to vapour recovery adapter on trailer.

Liquid Fill Hoses

1. Connect hoses to facility valves first.
2. Connect hoses to truck pump or trailer discharge valve if required.
3. Secure camlock ears and tie them off if product is being pumped.
4. Ensure correct product is being loaded into correct tank and do not cross hoses if possible.

C) Start Unloading

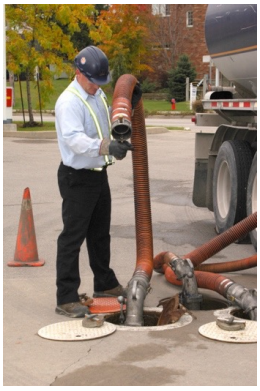
1. Open the receiving valve (where required).
2. Open the compartment emergency and discharge valves.
3. Start the engine if utilizing a truck pump, or start the facility off-loading pump. (where required).
4. Start unloading slowly and check all hose connections to ensure no leaks.
5. Increase the engine rpm's to pumping speed if utilizing a truck off-loading pump or open discharge valve fully.

NOTE | Driver should remain in the emergency stop area during loading.

Bulk Fuel Trailer Unloading – 8 Steps

NOTE | Leave product ID tags on empty compartments until refilled unless provincial regulations state otherwise.







D) Stop Unloading

1. When unloading is completed, the hose should remain connected to the discharge valve.
2. Verify that compartments are empty using dome check, retain sensor, site glass or method established by the carrier.
3. Shut off pump or disengage the truck power take-off (PTO) and shut off the truck engine (where required).
4. **For Aboveground Tanks:** Using the hand over hand method, lift and walk the length of the hose to drain it into the truck pump or facility spill preventer (hands should be kept below shoulder height). Disconnect the hose at the tank.
5. **For Underground Tanks:** Using the hand over hand method, lift and walk the length of the hose to drain it into the underground tank (hands should be kept below shoulder height). Disconnect the hose at the trailer.
6. To clear hose, drain excess into a grounded drip pail.
7. Close the facility valve and compartment valves.
8. Disconnect the other end of the hose and drain into drip pail.
9. Disconnect vapour recovery system (if applicable) and using hand over hand method, lift and walk the length of the hose to drain it into the underground tank.
10. Disconnect the bonding/grounding cable.
11. Dip the tanks (where required) and record the results on the appropriate documentation.
12. Replace fill caps, locks and covers.

7) *Complete Walk-Around Inspection*

1. Check for leaks.
2. Store equipment.
3. Ensure all doors and valves are closed.
4. Verify that product tags and placards are correct.
5. Remove chock blocks.
6. Put away safety cones.

8) *Complete Paperwork*

1. Complete delivery dips (where applicable).
2. Complete delivery and TDG requirements on delivery document.
3. Have customer sign documents and leave copy with them.
4. If site is unattended, leave document in secure place and lock all facility valves.

8.4.1 Differences for Deliveries to Aboveground Tanks

For aboveground tanks, the same above procedures should be followed with the following differences:

- These tank systems are more likely to be used at industrial and commercial locations where petroleum handling is not the primary activity; the tank owner may not specify delivery requirements.
- Nozzle deliveries may be required.
- Deliveries could be either metered or delivered directly from the truck pump, bypassing the meter.
- Deliveries may be either full compartments (not necessarily metered) or partial (metered) compartments.
- Unattended deliveries (attended only by the driver, unattended by the owner) may be more common, requiring the driver to dip the tank before making the delivery.
- Site-specific information outlining the driver's responsibilities should be provided either on-site or as part of the load instruction given to the driver; this information will include pre-delivery requirements such as, testing the overfill protection alarm if so equipped, closing outlet and siphon valves, etc.
- A dip chart must be provided and that dip chart must be identified as belonging to the tank.

A site plan must also be provided with noted access and product tank identification.

8.5 Hose Reel Truck Unloading Procedures to Underground or Aboveground Tanks

Hose Reel Truck Unloading – 8 Steps

1) *Review Terminal Instructions*

1. Verify address on delivery document.
2. Check for any special instruction or directions.

Hose Reel Truck Unloading – 8 Steps

2) *Position Vehicle*

1. Park truck on level surface with most direct route to pull delivery hose to customer's fill pipe.

NOTE | Do not drive into customer's driveway unless absolutely necessary.

NOTE | Never drive across wooden bridges on customer's property and check for low clearance power and telephone lines.

2. Position truck so that hoses do not run beneath the truck.
3. Turn off ignition sources.
4. Set brakes.
5. Set chock blocks.
6. Set safety cones (where required).
7. Activate 4-way flashers (where required).

NOTE | It is illegal to deliver product with the unit parked on the street (except for domestic fuel oil deliveries).

NOTE | Drivers should check for soft shoulders as many rollovers are as a result of this.

3) *Put on PPE*


Hard Hat


Safety Glasses


Flame Resistant Clothing


Fuel Resistant Gloves


Safety Boots


Reflective Vest

Hose Reel Truck Unloading – 8 Steps



4) *Prepare for Unloading*

1. Open compartment emergency valve (if manually operated) and engage power take-off to operate delivery pump.
2. Set up meter or onboard computer.
3. Pull hose to the fill pipe area, keeping nozzle pointed upward.
4. Confirm that tank vents are not plugged.

NOTE | If you can't hear the overflow whistle on the vent pipe, someone must assist you in making the delivery.

NOTE | For metered pump offs, check with facility operator, connect grounding/bonding cable where required and position drip pails under valves.

NOTE | To assist the driver with ensuring a safe delivery, a Home Heat Safe Discharge Certificate could be used (Appendix A).

5) *Check Tanks/Compartments*

1. Confirm that you are at a legitimate heating oil fill pipe or dip tank where appropriate.
2. Confirm that the tank will take the product.



6) *Hose Reel Truck Unloading Procedures*

A) Select Product

B) Connect Hoses

1. Touch nozzle or delivery elbow to bare metal on the fill cap.
2. Remove fill cap. Don't use the nozzle to loosen it.
3. Fully insert downspout into fill pipe or attach fitting.

NOTE | The nozzle must be equipped with an Ever-Tite System, a permanent sealing device and/or rubber cover fitting, which slips over the nozzle, to prevent product flow-back or accidental splashes during unloading.

Hose Reel Truck Unloading – 8 Steps

C) Start Unloading

1. Open nozzle valve slowly.



NOTE | Do not stand with face directly above fill pipe.

2. Confirm that the vent alarm is working. If not, stop unloading immediately.
3. Do not leave the nozzle unattended while pumping.

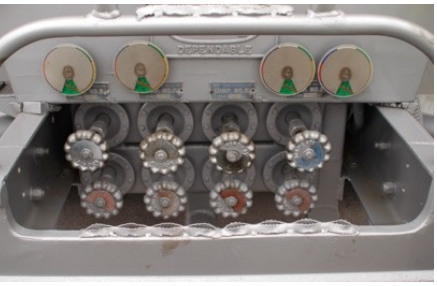
D) Stop Unloading

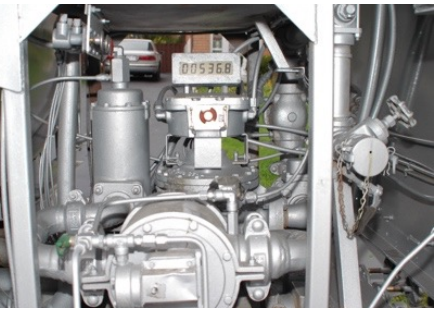
1. When unloading is complete or when vent alarm changes pitch or stops working, shut off flow of product.
2. Allow downspout to drain before removing the nozzle from the fill pipe. Replace fill cap.
3. Carry nozzle back to your vehicle with the spout held upward.
4. Reel in hose neatly onto the hose reel while at the same time checking it for signs of cuts, cracking or abnormal wear.



NOTE | The entire length of the hose should be checked for bulges, cuts or other signs of wear at least once a week.

5. Place nozzle on drip tray or holder.
6. Disengage power take-off and close emergency valve (if manually operated).





7) *Complete Walk-Around Inspection*

1. Close gates that were opened.
2. Clean up any drips of oil that occurred during delivery.
3. Store equipment.
4. Ensure all doors and valves are closed.
5. Remove chock blocks.
6. Put away safety cones.
7. Turn off 4-way flashers.

8) *Complete Paperwork*

1. Print ticket and complete paperwork as per your employer's instructions.
2. For metered pump offs, complete tank dips and record them on the invoice.
3. Record delivery on your declining balance inventory report per TDG regulations.

Canadian Fuels
ASSOCIATION

SECTION

09 AVIATION

Aviation

9.1 Introduction



Aviation fuels (Jet fuel, Avgas) are at the top spectrum in terms of the care, testing quality control and strict delivery procedures that must be followed. Typically, drivers loading/unloading and transporting aviation fuels require upgraded training in each of those different areas, as well as, documentation and specific delivery equipment knowledge. Please refer to the Canadian Fuels Colour Symbol System document on the Canadian Fuels website for further information and details.

All aviation products are produced to exact standards and all batch blends are tested and retested each time the product is moved. To ensure quality and product integrity, the product is tested against the original batch blend. Product control testing requirements and practices may vary by supplier/shipping terminal. Drivers should confirm product quality requirements from shipping terminal personnel.

Quite often trailers are dedicated to aviation product. Dedication can be achieved through modifying equipment loading accessories to a standard provided by the shipper.

It is recommended that equipment used to transport bulk aviation product shall be equipped with single discharge piping for each and every compartment (for some suppliers this is mandatory).

9.2 Loading Procedures

The loading procedures for Aviation Fuel are basically the same as for gasolines and middle distillates in Section 8, whether it is top loading or bottom loading.

Put on PPE



NOTE | Drivers should follow site requirements for respirator use.

Especially with aviation fuels however, the driver must ensure that the equipment has been drained completely from the previous delivery.

The driver must also ensure that there is no water or foreign substances in the tank.

The shipper's requirement for flushing must be adhered to and completed as per the terminal's procedures, if needed.

Upon completion of loading, the driver must allow the tank 5 minutes to settle and then complete the various tests that are required.

Where customers require the load to be sealed, the driver must do so and record the seal numbers on the shipping document.

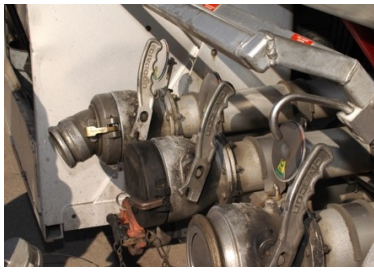
9.3 Quality Control Tests

Each and every load of aviation product is to be inspected by completing the tests describe in this section. These include a visual check, as well as, water and density tests. These are the standard procedures but suppliers at the terminal may have slightly different requirements.

Deviation from the test may be allowed in the following two situations:

1) **Dedicated Equipment –** When the carrier and shipper agree to use dedicated equipment, the carrier shall modify the equipment. This can be done by adding pins to the bottom loading adapters of each and every compartment or by reducing the diameter of the loading hatches, so that the top loading downspout access is restricted. Modification requirements shall be determined according to the loading facility that is the source of the aviation product. When such dedication is achieved, the carrier will not be required to flush nor complete density testing.





2) **Manifold System –** When the carrier is authorized by the shipper to use equipment that has a manifold system, then the sampling procedure by the driver shall be:

    1. Open the manifold outlet and ensure that the manifold is empty.
    2. Open the valve of the first compartment, which shall be the compartment furthest from the manifold outlet, for a sufficient time to flush a product sample through the manifold and fill the sampling container.
    3. Complete the quality control tests required for this compartment.
    4. Drain the manifold completely.
    5. Repeat each step for each and every compartment connected through the manifold.

In all other loading situations, the carrier agrees to complete the following quality control tests and record the results of these tests in a manner further described in this section.

9.3.1 Visual Checks

Take a sample from each and every compartment and check each product sample for contaminants by:



1) Swirling the container gently to concentrate the contaminants at the centre;
2) Visually examine the product sample for solid particles, fibres and water droplets;
3) Differentiate between water droplets falling and air bubbles rising;
4) If more than a trace of dirt or water is observed, then another product sample should be drawn and examined. Upon retest, if the contaminants persist, then notify the shipping terminal.

Take a sample from each and every compartment and check each product sample for Clear and Bright and Colour.

9.3.1.1 Clear & Bright

Observe the product sample in the sample container and determine if it is free of undissolved water, haze or cloudiness, sediment, and suspended matter. If it is free of all items, then it is Clear & Bright.

NOTE | Jet A may be a straw colour and still be Clear and Bright.

9.3.1.2 Colour

Ensure that the container is clean. Swirl the sample to create a vortex. When the swirling action stops, undissolved (free) water appears as a separate layer below the product. A hazed sample indicates suspended free water or fine particulate matter.



NOTE | Since Jet fuel varies in colour from dark straw to clear, it is possible to mistaken an all-water sample as fuel. When unsure, contact terminal personnel. Verify the sample colour matches the expected colour for the product being loaded. Jet fuel can vary from straw colour to clear; Avgas should be bluish.

9.3.2 Checks for Water

Checks for water are at the discretion of the shipping terminal. Testing techniques may vary from supplier to supplier.

9.3.2.1 Water Detector Capsule Test

Take a sample from each and every compartment and check each product sample with a water detector capsule by:

1) Removing one detector capsule from the container. Replace the screw cap on the capsule container immediately to prevent humidity from discolouring the remaining capsules;

2) Ensure the disc in the detector capsule is a uniform yellow colour;

3) Attach the detector capsule to the syringe;

4) Immerse the capsule and half the syringe into the product sample;

5) Withdraw the plunger unit until the product reaches the 5ml mark on the syringe;



6) Slowly swirl the syringe and capsule throughout the sample container for 10-20 seconds;

7) Check the colour of the inner wet portion of the capsule and the outer portion protected by the plastic moulding;

8) If the centre of the detector paper changes to a light green, then there is approximately 10 ppm water contamination. As water contamination increases to 30 ppm, the paper becomes a distinct green. At very high levels of water contamination, it becomes blue/green and then blue/black;

9) If there is a sudden change in normal water content, then a second 5ml sample shall be taken using a new capsule. If both readings are higher than usual, the driver shall notify the terminal staff;

10) Capsules shall only be used once.

11) If any capsule indicates a distinct green that is consistent with water contamination of 30 ppm, then the product shall not be delivered.

9.3.2.2 Water Detecting Paste Test



Take a sample from each and every compartment and check each product sample for water with water detecting paste.

9.3.3 Check for Density



The density of aviation fuels has to be determined for a variety of purposes. These include product identification, quality control and stock control. Determining density with a thermohydrometer (or hydrometer) uses the fact that the depth of immersion of thermohydrometer (or hydrometer) is a standardized, calibrated float. The hydrometer must be wiped clean and dry prior to using.

All equipment tank compartments must be sampled. Density shall be checked against the posted terminal density by using the following steps on each product sample:

1) Determine the observed density and temperature using equipment provided by the shipper (hydrometer);

2) Correct the observed density to the standard temperature of 15°C;

3) Compare the observed density with the expected posted terminal density deviation. Tolerance to the posted density may vary from shipper to shipper. Drivers should confirm shipper requirements prior to performing tests or leaving the terminal.

9.3.3.1 Procedure for Obtaining Observed Density Measurements

Density measurements can be obtained through the use of a thermohydrometer or a thermometer and hydrometer. The testing procedures are the same.





1) Take a sample and transfer it into a clean hydrometer jar without splashing in order to avoid bubbles.

2) Put the hydrometer jar in a vertical position in a place free from air currents to ensure that the temperature of the sample does not change appreciably during the time necessary to complete the test.

3) Wipe the thermohydrometer to ensure it is clean and then gently lower it into the sample. Once it has settled, depress it about 2 scale divisions into the liquid and release it. Gently spin the thermohydrometer when releasing it to help bring it to rest.

4) Once the thermohydrometer comes to rest (ensure that it is not rubbing the sides of the jar) and shows a steady reading, record the temperature of the sample to the nearest 0.5°C.

5) Read the hydrometer scale to the nearest 0.0005 reading. The correct reading is that point on the scale at which the principal surface of the liquid cuts the scale.

6) The reading is the "observed" or "measured" value. Record this figure with the fuel temperature observed at the time of measurement:

- **A)** On the Bill of Lading and/or
- **B)** On the Shipper's Quality Control Document

9.3.4 Shipment Documentation

Each and every shipment document for bulk aviation product must comply with TDG regulations and have verification that applicable quality control tests have been successfully completed.

Drivers must complete shipment documents for bulk aviation product such that quality control testing has been successfully completed in a manner described by the shipper.

Shipment Documentation should include the following information:

1) A description of the product that was loaded;

2) The quantity of product that was loaded;

3) The batch number of the product;

4) The density of the product batch;

5) The product that was contained in the tanks of the equipment from the delivery form that immediately preceded the loading of aviation product;

6) If flushing was completed, then the document reference number of the record of the product flushed;

7) Results of the water detector tests, if required;

8) Results of the colour tests;

9) Results of the Clear and Bright tests;

10) Results of the density tests;

11) Signature of the driver that completed the tests;

12) Seal numbers, if required.

Shipment documents may also include information on the conductivity of the product. If the loading terminal has provided information on the conductivity of the product that is being loaded, then the driver shall record such information on the shipment document.

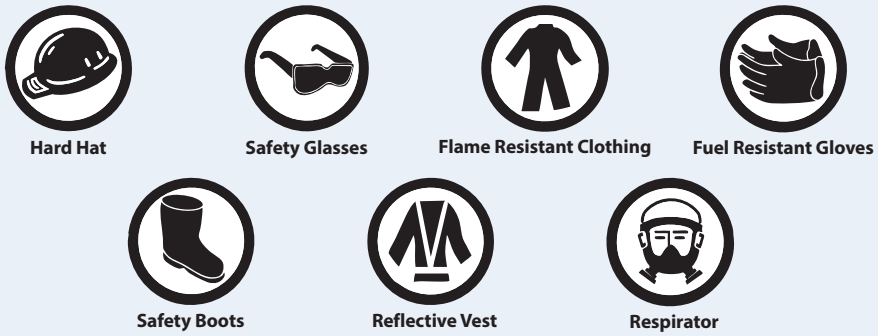
A driver must advise the shipper when he/she is aware of problems with equipment required for quality control testing and/or equipment required to complete the shipping document.

Drivers must leave a copy of the shipment document with the receiving facility that clearly identifies the information that is required including, but not limited to, the results from the quality control tests that were completed and the product batch number and density.

9.3.5 Unloading Procedures – Guidelines

Drivers must adhere to the standard unloading procedures for the industry and/or customer requirements. The basic procedures are the same as for gasoline and middle distillates in Section 8.

Put on PPE



NOTE | Drivers should follow site requirements for respirator use.





As well, the driver must be aware of the following:

1) Before any unloading takes place, the driver shall obtain authorization from a staff member of the receiving facility.

2) Staff from the receiving facility shall check the shipment document for seal numbers (if required) and test results.

3) Staff from the receiving facility shall complete tests on each compartment of the equipment. Authorization to begin unloading will be given to the driver upon acceptable test results, which should include the receiver's signature confirming acceptance of the load.

4) Once authorization has been given to the driver by the receiving facility, the driver shall unload product according to accepted industry procedures/standards.

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SECTION

10 ASPHALT & HEAVY OIL (BUNKER)

Asphalt & Heavy Oil (Bunker)

10.1 Overview



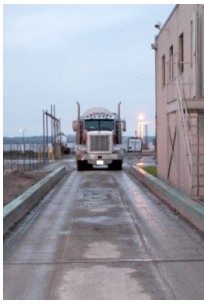
Asphalt and Heavy Fuel Oil are both transported at very high temperatures; asphalt at 300°F and heavy fuel oil at 65°C (150°F) to 93°C (200°F). To ensure that the product stays hot during transport, they must be carried in special double walled trailers.

The loading and unloading procedures are similar to those of the other petroleum products. As such, the 8 Basic Steps outlined in Section 7 can be used for these products.

10.2 Loading Procedures

Asphalt & Heavy Oil (Bunker) – Loading – 8 Steps







1) *Review Terminal Instructions*

1. Drive the truck onto the scale.
2. Check in with the supplier.
3. Obtain bill of lading.

2) *Position Vehicle*

1. Position truck.
2. Turn off ignition sources.
3. Set brakes.
4. Set chock blocks.

3) *Put on PPE*



NOTE | Where fire retardant/flame resistant clothing is required, sleeves on the clothing should be buttoned at the wrist and collars buttoned up. Gloves should be heat resistant and have gauntlets. Pants should have no cuffs and be placed over top of the boots.

Asphalt & Heavy Oil (Bunker) – Loading – 8 Steps



4) *Prepare for Loading*

1. Connect grounding/bonding cables (where applicable).
2. Check hoses and valves for wear or damage.
3. Ensure valves are closed.
4. Change/Replace ID tags & placards (if necessary).
5. Remove all loose objects from upper pockets.
6. Lower loading ramp to truck/trailer catwalk.
7. Ensure safety rails are in place and/or use fall protection.

NOTE | The use of propane torches or oil fired burners is occasionally required when unloading tank trucks of asphalt or heavy fuel oil. They are never permitted for tank trucks loading blended bunker (cutbacks) or in the blending areas. See supervisor for specific hazards and required training.





5) *Check Compartments*

1. Open dome lid slowly ensuring pressure has been relieved before fully opening.
2. Ensure compartments are clean and have capacity to hold product.
3. Check tank for moisture and if so, remove using terminal procedures.
4. Flush (if necessary).

NOTE | Some asphalts are not compatible – check WHMIS SDS sheet or with supervisor for switch loading procedures.

6) *Top Loading Procedures*

A) Select Product

1. Badge in and reset meter.
2. Select product.
3. Preset volume (where applicable).

B) Connect Loading Arm

1. Remove drip pail from loading spout.
2. Lower loading arm to at least 12 inches below trailer hatch.
3. The loading arm must be held in place by a mechanical or hydraulic device (pop-it) or other suitable means.
4. Secure spout with hold down chain.
5. Maintain metal to metal contact between spout and side of dome.
6. Ensure downspout is in a vertical position.
7. Place suction nozzle over hatch and start odour abatement system where provided.





Asphalt & Heavy Oil (Bunker) – Loading – 8 Steps

C) Start Loading

1. Open loading valve.
2. Turn pump switch on and begin loading per terminal instructions.
3. Load at slow flow initially to ensure that there is no foaming.
4. Open to full flow.
5. The driver should remain close to the valve during loading.





D) Stop Loading

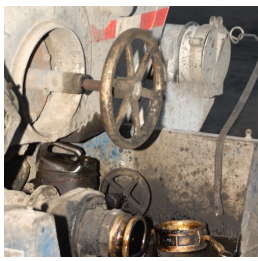
1. Reduce flow rate when loading the final 300 litres.
2. When full, shut off loading valve and pump.
3. After 2 minutes waiting time, remove loading arm slowly while maintaining metal to metal contact.
4. Shut off odour abatement system and remove suction nozzle.
5. Loosen hold down chain or other device and remove spout.
6. Attach drip pail to end of spout.
7. Close dome cover securely.
8. Raise ramp when leaving truck/trailer.
9. Print meter ticket and remove ID card (if required).

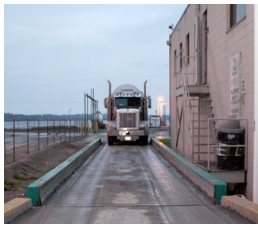




7) *Complete Post-loading 360 Walk-Around Inspection*

1. Check for leaks and valves are closed.
2. Store equipment.
3. Confirm placards are correct (where necessary).
4. Remove grounding/bonding cable.
5. Remove chock blocks.





8) *Complete Paperwork*

1. Drive vehicle onto scales and weigh out.
2. Proceed to office to pick up bill of lading.
3. Check product/volume against dispatch instructions.
4. Sign bill of lading.
5. Ensure proper copies are left with terminal and kept by driver.



NOTE | Heavy oil delivery documents must indicate the temperature of the product at time of loading into the tank truck.

10.3 Unloading Tank Trucks: Precautions





Before connecting the hoses to unload, it is strongly recommended that you examine them for cracks or any other damage. Ensure that the gasket on the female end of the hose is in good condition.

Be aware when unloading asphalt and heavy oil tank trucks, the steel hoses are heated and may create a build-up of pressure within them. The removal of caps and plugs from the hoses should be done with caution.

Always stand to one side, never directly in front of the product line when removing plugs or dust covers.

Drivers must use face shields and safety gloves whenever opening hatches, dome covers and outlet caps. Stand upwind to one side to avoid any possible injury from splashes. Avoid breathing vapours when opening hatch covers.

If the site requires a product sample, it is to be provided according to site and/or carrier directions using the sample valve.

Unless specifically arranged for, asphalt cements should not be unloaded from a trailer using the truck transfer pump (extremely high product temperature will damage the truck transfer pump).

10.4 Unloading Procedures

Asphalt & Heavy Oil (Bunker) – Unloading – 8 Steps

1) ***Review Terminal Instructions***

2) ***Position Vehicle***

1. Position truck.
2. Turn off ignition sources.
3. Set brakes.
4. Set safety cones (where required).
5. Set chock blocks.

Asphalt & Heavy Oil (Bunker) – Unloading – 8 Steps

3) *Put on PPE*



NOTE | Where fire retardant/flame resistant clothing is required, sleeves on the clothing should be buttoned at the wrist and collars buttoned up. Gloves should be heat resistant and have gauntlets. Pants should have no cuffs and be placed over top of the boots.

4) *Prepare for Unloading*

1. Check in with facility operator.
2. Connect grounding/bonding cable.
3. Take sample if required by site operator.



NOTE | The driver should always open the hatch on top of the trailer so that it will vent during the unloading.

5) *Check Tanks/Compartments*

Confirm that tank will hold the quantity to be unloaded.



NOTE | Use either an automatic tank gauging system installed on the tank or the receiver's authorization (preferably written) before proceeding.

NOTE | For Bunker: The driver must confirm that he/she is at a legitimate bunker fill pipe. If in doubt, check with the customer or dispatcher.

Asphalt & Heavy Oil (Bunker) – Unloading – 8 Steps





6) *Unloading Procedures*

A) Select Product

B) Connect Hoses

1. Connect and verify the hose connection according to carrier unloading procedures.
2. Secure locking ears with tie wraps or other securing devices. (Do not use wire as it can cut gloves, hands etc.)

C) Start Unloading

1. If a delivery site pump is used, delivery site personnel start the pump.
2. If carrier pump is used, open internal valve and external valve. Delivery site personnel open delivery tank valve.
3. Start-up unit pump.
4. Check hose temperature to ensure product is flowing.



NOTE | Driver should remain in the emergency stop area during loading.



D) Stop Loading

1. Continue pumping until all product has been discharged.
2. Disconnect the hose.
3. Disconnect the grounding/bonding cable.
4. If carrier pump was used for delivery, it must be flushed with diesel before departing job site.
5. Clean cap with oil to prevent sticking for next load.
6. Replace caps.



7) *Complete Walk-Around Inspection*

1. Check for leaks.
2. Store equipment.
3. Ensure doors and valves are closed.
4. Confirm product tags and placards are correct.
5. Remove chock blocks.

8) *Complete Paperwork*

Complete documents and have customer sign.

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SECTION

11 TRUCK TO MARINE VESSEL TRANSFER

Truck to Marine Vessel Transfer

11.1 Introduction

The procedures and action portrayed in this section represent current petroleum industry practices for the transfer of refined petroleum products in marine environments. For detailed information, refer to the Tank Truck to Marine Vessel Oil Transfer Procedures, a joint industry/government document, which can be obtained by contacting the Canadian Fuels Ottawa office.

This document is to be used as a guideline that describes procedures and equipment that, when used properly, will help minimize the risks involved in carrying out oil transfer operations in marine environments and to ensure that oil deliveries from tank trucks to vessels are conducted with a high level of safety and environmental protection.



NOTE | This document is not intended to address the transfer of oil to or from any vessels from fixed oil handling facilities.

All oil transfer operations carry the risk of a spill. Marine environments are particularly sensitive to the impacts of an oil spill. When it is necessary to carry out oil transfer operations in marine environments, they must be done safely and carefully using proper equipment and procedures. These procedures do not supersede any local, provincial or federal legislation.

11.2 Spill Reporting

Spills must be reported without delay. Reporting regulations vary among jurisdictions. As a minimum, spill reports should include the following information:

- The caller's name and number.
- Location and time of spill.
- Type and quantity of the spilled substance.
- Cause and effect of the spill.
- Details of actions taken or proposed to minimize the effects.

11.3 Responsibilities

11.3.1 Driver's Responsibilities

The driver is ultimately responsible for the decision to carry out the oil transfer operation since he has care and control of the product from loading to delivery. The driver must demonstrate due diligence by making sure that the equipment and operating procedures meet the high level required for safety and environmental protection.

The driver has the authority and the responsibility to cease operations if an unsafe condition exists. The driver's responsibilities include, but are not limited to, the following:

- The driver will confirm with the marine representative that the vessel's available tank capacity (ullage) can accommodate the schedule load.
- The driver and marine representative agree on the unit of volume measurement being used (imperial gallons, litres).
- The pre-transfer checklist has been completed with the marine representative including all safety precautions (Appendix B).
- An effective communication system between the driver and marine representative is in place. Two-way radios may be required to facilitate communication. These radios must be intrinsically safe and approved by the terminal operator.
- The driver remains at the truck, maintaining control of the oil discharge throughout the operation.
- Any spillage from the truck system should be responded to in accordance to the carrier's contingency plan.
- All supplier requirements, such as taking samples, are carried out as instructed.



NOTE | The marine representative may not be familiar with his/her responsibilities regarding the safe operating procedures required for oil transfer. The driver is not to carry out the operation unless the marine representative is fully involved and carrying out his or her responsibilities.

11.3.2 Marine Representative's Responsibilities

Responsibilities of the marine representative are similar to those of the driver. The representative must attend all deliveries and is responsible to ensure the following:

- Ensure that the vessel and its tank filling system are in good condition, meeting all legal requirements.
- The vessel is securely moored at an acceptable location and if required, the local authority has been notified.
- Where required, an acceptable contingency plan exists.
- The pre-transfer checklist has been completed with the driver. An effective communication system is in place.
- Scuppers are plugged.
- Control is maintained throughout the operation.
- The hose and nozzle are secured at the fill connection.
- The tank capacity is constantly monitored to prevent overfilling.
- The vessel's tank vents are monitored to ensure they are not a source of spillage.
- The marine representative must stay in attendance at the tank connection.

- Any spillage on board the vessel, or originating from the vessel, is reported and responded to in accordance with vessel requirements and regulations.
- The flow must be controlled at the truck; the marine representative must give the driver at least 5 minutes notice before shutdown is required. Good communication procedures are a must.

Additional people may be required to watch the hose or relay messages between the driver and the marine representative if they are not in direct and constant communication; all key personnel must be able to communicate clearly and fluently.

11.4 Oil Transfer Locations

11.4.1 Site Characteristics

The truck unloading area must meet the following conditions:

- The area must be clear of ignition sources.
- If on a wharf, that wharf must have a known adequate load capacity greater than the gross weight of the tank truck. The GVW (Gross Vehicle Weight) of the delivery truck may include an allowance for a trailer; the truck alone may weigh considerably less. The driver should carry documentation as to the truck's approximate loaded weight.

The unloading area should also have the following characteristics:

- Adequate lighting.
- Restricted public access.
- Near emergency services (fire department, spill cleanup).
- Clear of any right of way (placement of safety cones to restrict access to the driver's work site must be used).

11.4.2 Wooden Wharves

Extra precautions are required if an oil transfer operation is to be carried out on a wooden wharf. Use bonded drip pails under the truck fittings to collect any drips and spills.

Sudden braking may cause excessive stress and sway on wooden wharves.

Wooden wharves can be extremely slippery when wet.



11.5 Truck Safety

Extra care must be taken when manoeuvring trucks and making deliveries in the marine environment. Drivers must adhere to the following:

- Warning notices and/or pylons/safety cones should be displayed to alert bystanders of the potential dangers of the operation.
- Take extra care when backing up. A spotter should assist the driver.

11.5.1 Truck Pumps



Truck-mounted pumps can yield high pressures resulting in hose ruptures and fitting failures. The truck pump pressure-relief should be set to prevent excessive pressure.

Suggested maximum pumping pressure is 400 kPa (60psi). This will allow pumping into aboveground tanks while not exceeding the working pressure of properly rated hoses and nozzles.

The pump system should be tested periodically to ensure the pressure relief is working and is properly limiting the pump discharge pressure.

The operating speed of the truck pump should not exceed the manufacturer's recommended speed which, in most cases is 900 RPM.

11.6 Static Discharge Protection

Static electricity remains one of the greatest dangers in handling petroleum products. All personnel must be properly trained and must carry out proper operating procedures.

11.6.1 Bonding and Grounding

The delivering company should have detailed procedures for bonding and grounding depending on the operation and the fuel being transferred. If carrying out a transfer at a marine terminal, then that terminal may have a bonding or isolating protocol that must be observed.



In the absence of company-specific requirements, the following procedures should be used.

1) To neutralize the static discharge of both, ground the receiving tank (or the vessel if the tank is bonded to the vessel) and the tank truck to an earthing stud or other ground at the dock.
2) If earthing points are not available, then the vessel and truck are to be bonded together to equalize any difference in potential.
3) Before the vessel's fill cap is opened, bond the nozzle to the vessel to ensure there is no difference in the electrical potential between them.
4) If a nozzle bonding cable is not available, then touch the nozzle to the cap of the vessel structure to discharge any difference. During transfer, the nozzle must be kept in contact with the fill fitting to bleed away any charge build-up due to fuel flow.
5) When transfer is complete, allow two minutes waiting period for any possible static charges which have accumulated in the fuel to equalize.
6) Remove the nozzle and close the fill cap. Disconnect bonding cables in reverse order.

11.6.2 Drip Collection

Drip containers must be bonded to the fitting from which they are collecting the drip.

Use metal pails only. Never use a plastic pail to collect leakage of flammable or combustible liquids.

Plastic handles should be taken off metal pails to ensure an electrical bond takes place between the pail and the fitting.

Any leaking fittings must be contained and then repaired before next use.

11.6.3 Splash Loading

- Properly mounted fuel tanks are usually fitted with fill spouts that safely accept a normal nozzle tip without creating a splash loading hazard. Cargo tanks however, often have a fill opening without an extended spout that can lead to splash loading.
- Splash loading can be avoided by using an extended fill spout that reaches the bottom of the tank being filled. If splash loading cannot be avoided, the following precautions can help minimize the risk:

1. Limit the flow rate to minimize turbulence.
2. Keep the nozzle in contact with the side of the container being filled to ensure a continuous electrical bond.
3. Do not lower any objects into the tank for at least 5 minutes after the flow has stopped.

11.7 Hoses and Adaptors

11.7.1 General

The type of nozzle required will depend on the product being dispensed and the type of receiving vessel.

For large bulk deliveries, the flow is usually controlled at the pump or tank truck outlet valve. In these cases, it may be acceptable to connect the hose or nozzle to the receiving tank with a camlock connector, securely fastened in a closed position. Hose should be a single length from tank truck to vessel. If more than one length of hose is required, then special precautions are necessary to minimize risks.



11.7.2 Inspection of Hoses

Hoses must be visually inspected before each use, checking for signs of wear and fatigue. Do not use hoses that appear to be in poor condition.

11.7.3 Testing Hoses

A driver should be aware that all pressure hoses must be hydrostatically pressure-tested at least once per year, to at least 1 ½ times their maximum working pressure; the hose must bear a test tag showing the date, test pressure and name of the person or company carrying out the test. More frequent pressure-testing is encouraged.

Hoses should also be tested for electrical continuity when they are pressure-tested.

11.7.4 Protection of Hoses

When in use, hoses must be protected from damage. Do not allow hoses to be driven over, dragged over sharp objects, or damaged in any way.

Hoses must not lay in the water where they can be damaged by marine traffic, floating logs, or pinched between the vessel and the dock.

11.7.5 Tidal Action – Hoses

Hoses must be of suitable length to allow for tidal variations without being stressed. The time required for oil transfer and the estimated tidal action must be accounted for as part of the pre-delivery check list.

11.7.6 Hose Connections

Connections may be either camlock, threaded or other suitable type; the locking ears of camlock connections must be secured in the locked position.

Hoses must be properly supported, avoiding stress on the connections.

Connections must be liquid-tight and secure; no leakage will be tolerated. Connections must not be made over water and all connections should be contained by drip trays.

11.8 Unloading Procedures

Truck to Marine – Unloading – 8 Steps

1) *Review Delivery Instructions*

Before making the delivery, it may be helpful for the driver to have a clear understanding of the pertinent features of the vessel. Before arranging for the delivery, the marine representative should provide the driver with the following information:

1. Proximity of the vessel to the truck parking location.
2. A sketch of fill and vent locations on the vessel.
3. Fill Connection type and size.
4. Number of tanks.



NOTE | Pleasure Craft - Drivers should not refuel pleasure craft from tank trucks for the following reasons:

- **A)** Pleasure craft are normally used in public areas without good access for tank trucks.
- **B)** The volumes carried by pleasure craft tanks are generally very small and not suited for the high flowrate provided by tank truck systems.
- **C)** The venting systems in pleasure craft are generally intended for low flowrates and create the potential for spillage if filled at too high a flowrate.

Truck to Marine – Unloading – 8 Steps

2) *Position Vehicle*

1. Position truck.
2. Turn off ignition sources.
3. Set brakes.
4. Set safety cones (where required).
5. Set chock blocks.
6. The tank truck must be safely and securely located to prevent damage to its surroundings.
7. A spill contingency plan must be in place to enable a quick, effective and sustained response to any emergency at that specific location.
8. Containment around the fill opening is required to protect against spillage.
9. The size of the containment basin or drip pan is set out in the Oil Pollution Prevention Regulations (CSA), and depends on the diameter of the delivery hose:
   a. Hose diameter up to 2" (51mm): containment volume 0.08 m^3 (80 litres)
   b. Hoses larger than 2" (51mm) require containment volume 0.16 m^3 (160 litres)

3) *Put on PPE*



4) *Prepare for Unloading*

1. Connect grounding/bonding cable.
2. Take sample if required by site operator.
3. Ensure nozzle or extended fill tube is properly inserted in the fill stem and in contact with the side of the fill opening.
4. The marine representative must be present at the fill opening and signal when ready for flow to begin.
5. At the first signs of an electrical storm, the operation must be shut down.
6. Heavy seas or high winds may require the delivery to be terminated.
7. The transferring company should have a checklist appropriate for the operation being carried out. This safety checklist must be filled out and kept available during the transfer operation.
8. The purpose of the checklist is to ensure that both parties, the driver and marine representative, have had a "meeting of minds" and understand the particulars of the transfer operation. It also provides a double check that required precautions are in place.

Truck to Marine – Unloading – 8 Steps

9. See Appendix B, Truck to Marine Transfer Checklist, for a sample checklist. It provides a model for company-specific checklists. By filling out and signing the checklist, the driver and marine representative agree that their responsibilities have been met.
10. The fuel transfer safety checklist must be completed with a copy retained by the driver and a copy left with the vessel.
11. Additional information on a company-specific checklist might include:
    - **a.** Bonding and grounding in place
    - **b.** Fire extinguishers in place
    - **c.** Tidal action accounted for
    - **d.** Hose connections secured

5) *Check Tanks/Compartments*

1. Confirm that tank will hold the quantity to be loaded.
2. The driver and marine representative must agree on the amount to be transferred, making allowance for:
    - **a.** Thermal expansion: the tank should not be filled above 95% capacity.
    - **b.** Sufficient additional tank capacity to accept the hose's line fill after the pumping is complete.

6) *Unloading Procedures*

A) Select Product

B) Connect Hoses

1. Connect and verify hose connection according to carrier unloading procedures.
2. Secure locking ears with tie wraps or other securing devices. (Do not use wire as it can cut gloves, hands, etc.)

C) Start Unloading

1. The driver must be present at the truck controls, starting flow only when signalled by the marine representative. Start the flow slowly until the bottom of the fill tube is completely submerged.
2. If any significant pressure build-up is noticed, the driver shall immediately halt the filling process until it is safe to resume.

D) Stop Loading

1. Slow down the flow when nearing the top of the tank; throttle the flowrate at the truck for best control. Watch the tank level through the fill opening.
2. When disconnecting from the fill pipe or removing the nozzle, take care to avoid dripping product. Contain all drips.
3. Disconnect at the end nearest the truck and drain into the vessel tank or other suitable container – not plastic!
4. If using a portable container, ensure solid footing so the container cannot be inadvertently knocked over.
5. Plug or cap the hose ends to prevent drips.
6. After all oil connections are released and capped, remove bonding/grounding cable.

Truck to Marine – Unloading – 8 Steps

7) *Complete Walk-Around Inspection*

1. Check for leaks
2. Store equipment
3. Ensure doors and valves are closed
4. Confirm product tags and placards are correct
5. Remove chock blocks

8) *Complete Paperwork*

Complete documents and have customer sign.

Canadian Fuels
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SECTION

12 TRUCK TO TRUCK TRANSFER

Truck to Truck Transfer

12.1 Introduction

PLEASE NOTE: Truck to truck transfers are not supported by all Canadian Fuels members as a normal business practice. In many jurisdictions, this practice is prohibited by law unless for emergency reasons.



This guideline describes procedures to be followed when carrying out authorized truck to truck transfers of petroleum products. Special precautions are required for these operations because of the absence of the controlled environment of a loading terminal. The intent is to provide "best practices" for transfer of cargo from one tank truck or tank trailer to another tank truck or tank trailer. Its target audience is the delivering driver.

The guideline is applicable for emergency transfer procedures. It does not address procedures for dealing with overturned or otherwise damaged tankers. It is not intended to cover transfer to the running tanks of equipment, portable storage tanks or fixed tanks other than tank vehicles.

This section does not contain information specific to the quality control requirements when handling aviation fuels. Refer to company policies and procedures for handling aviation fuels.



12.2 Responsibilities

Only a qualified driver may perform a truck to truck transfer but management authorization must be obtained before carrying out the transfer.

As a guide, the driver must use the Truck to Truck Carrier Checklist (Appendix C).

If, in the driver's opinion, the situation is unsafe, the driver should not proceed.

12.3 Preparing for the Transfer

12.3.1 Transfer Locations



Truck to truck transfers can only be carried out where there is adequate protection against collision and fire hazards.

They must be located away from watercourses and drains.

Transfers should only be done on a level surface where the tank can be stable.

Keep away from ignition sources – Fire Codes require 7.5 metres clearance.

For gasoline transfers, take into consideration wind direction and the proximity of operating equipment and other sources of ignition to any vapour sources. Remember that gasoline vapours are heavier than air and tend to accumulate in low places.

Never perform truck to truck transfers during thunder and lightning storm conditions. Follow the "30/30 Rules": If lightning is visually seen and the count between the flash and the thunderclap is fewer than 30 seconds, all work on site must stop immediately and all personnel take shelter. Do not resume work operations until at least 30 minutes has passed with no further lightning flashes/thunderclap observed within the 30 seconds count or as otherwise directed by terminal staff.

12.3.2 Visual Inspection of Trailer

Prior to the transfer, a vehicle inspection must be conducted. Included in this will be:

- Check for corroded areas, dents, gouges, scrapes or defects in welds.
- Leakage around piping, valves, couplings and other areas of concern.
- Check dome covers for proper closing and latching.
- Inspect inside receiving compartment for cleanliness and loose metallic objects.
- Ensure that emergency valve controls operate properly.
- Connections and fittings must be properly secured.
- Inspect all spring-loaded safety relief devices to ensure operability.
- Check that all required markings are legible.
- Ensure that each unit of the tanker has a safe means of access.
- Inspect the static bonding and grounding cables and connections.





12.3.3 Trailer Support

Ensure that the parking area for any tanker can provide adequate support. It should not be up to the driver to decide whether or not the trailer support is adequate.

Consider unstable soil/ground conditions and the tank supporting mechanism.

Consider the effects of freezing and thawing ground conditions when setting and securing trailers in position.



12.3.4 Driver Equipment

Keep the required minimum of spill containment material on-hand in case of emergency.

The driver must wear adequate safety equipment.

Anyone climbing onto a tank must remove anything likely to fall out of his/her pockets. Eyeglasses of any kind must be secured with a strap.

Personnel on the receiving tank are required to wear a respirator when transferring gasoline to protect from benzene exposure.

Proper fall protection must be provided if the driver must work at elevations above 2.4 metres (or per provincial requirements).

All trucks must carry at least one fire extinguisher rated at least 20 BC in compliance with the Fire Code. The fire extinguisher is to be removed from the truck and placed in an immediately accessible position near the driver during unloading.

12.3.5 Eliminating Static

Equipment must be fully grounded and bonded.



Make or break all bonding connections with fill caps closed, clear of any potential vapour sources.

Disconnect bonding connections only when fuel transfer has ended, fill caps are closed, the static charges have dissipated and the area is clear of any flammable vapours.

Minimize turbulence during flow by controlling flow rates as follows:

- Start the transfer at slow flow - for 2 inches transfer system, the maximum rate is 125 L/min.; for 3 inches transfer system, the maximum flow rate is 280 L/min. until the downspout is fully submerged in the product (minimum of 8 inches in depth).
- Then pump at maximum flow - for 2 inches transfer system, the maximum rate is 400 L/min.; for 3 inches transfer system, the maximum flow rate is 900 L/min.
- Fill the final 6 inches, or 100 litres, of each compartment at slow flow – same as the start/slow flow rate above.

Never splash load. For top loading, use an extended fill spout that reaches the bottom of the tank being filled. This spout must be kept in constant metal to metal contact with the filling opening. Ideally, bond the spout to avoid turbulence.

Never sample or place any object into a compartment while loading.

After loading, allow 2 minutes minimum before removing downspout.

Remove the downspout slowly while maintaining metallic contact with rim of dome cover and then close the dome cover.

Wait for the static charges to dissipate before sampling, gauging and taking the temperature of the product.

12.3.6 Bonding and Grounding

Ensure a proper grounding rod or grounded structure/pipe is available and has been verified. The resistance to ground should be equal or less than 10 ohms to ensure adequate grounding of equipment/structure.

Supply and use single "Y" shape grounding/bonding link. Follow this sequence for grounding:

1) Connect the base of the Y to earth.

2) Connect one of the branches of the Y to the tank truck to be emptied.

3) Connect the second branch of the Y to the receiving tank truck.

At completion of the operations, remove the grounding cables in the reverse order.

Use bare cables for grounding and bonding (sheathed cables can hide breaks in the wire). If sheathed cables are used, check them to ensure proper continuity.

Ensure the grounding and bonding connections are effective. Use clean connections (no painted surfaces) and adequate grounding clamps.

Keep all grounding and bonding cables away from the transfer/pumping equipment to avoid trip hazards. This will also reduce the risks of ignition from sparks when the earth contact is being connected or disconnected.

Before pumping/delivering through the dome cover, bond the delivery nozzle and downspout assembly directly to the dome opening of the receiving tank truck and ensure the stability of the downspout (i.e. avoid free movement and secure the downspout to the dome opening).

12.3.7 Sampling and Gauging



Do not sample during tank filling and settling. Wait at least 10 minutes after load clean for single-phase liquids (with no water) and 30 minutes after loading multi-phase liquids.

Use appropriate conducting materials for sampling and gauging devices.

Ensure sampling and gauging devices are securely grounded.

Ensure you have the proper gloves on before opening the dome cover.

12.4 Check the Truck Equipment



12.4.1 Truck Pump

Truck mounted pumps can yield high pressures resulting in hose ruptures and fitting failures. Therefore, truck pump pressure-relief should be set to prevent excessive pressure.

Suggested maximum pumping pressure is: 400 kPa (60 psi). This will allow pumping into aboveground tanks, while not exceeding the working pressure of properly rated hoses and nozzles.

The pump system should be tested periodically to ensure pressure relief is working and is properly limiting the pump discharge pressure. Pumping pressure must not exceed working pressure of the hose, nozzle and fittings.

12.4.2 Transfer Hose

Transfer hose must be conductive type or anti-static. If no test is available or has been made to ensure the hose being used is conductive or anti-static, it is very important to use a separate bonding cable to bond each metal coupling/connection along the hose and connect this cable to ground. This is to prevent the metal connections from becoming insulated conductors.

Visually inspect the hose before each use, checking for wear and fatigue. Do not use hoses that appear to be in poor condition.

All pressure hoses should be hydrostatically pressure tested once per year, to at least 1 ½ times their maximum work pressure, and be identified as tested. A record should show the test date, test pressure and name of the person or company carrying out the test.

Connectors, when used on pressure hoses, should have their ears tied back or otherwise secured in position.

Hose sizes should be chosen to allow adequate flow and be easy to handle. Although 3" and 4" hoses facilitate high flow rates, they are heavy and may be awkward to handle. For top loading, hoses 2" or smaller may be preferred.

Drip containers should be provided where hose connections are made.

12.5 Operating Procedures

Truck to Truck Transfer – 8 Steps

1) *Review Terminal Instructions*

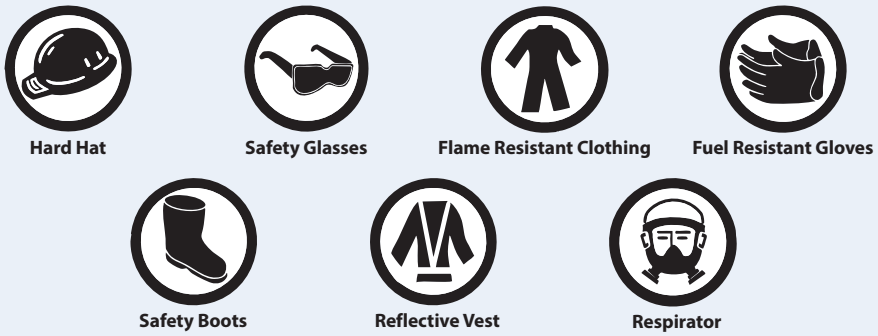
Drivers should review all of the above instructions prior to beginning the transfer.

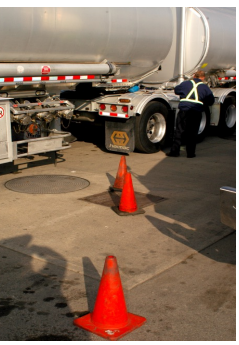
2) *Position Vehicle*



1. Ensure you are parked in an acceptable location. Always position both tractors and pumping equipment upwind to ensure the flammable vapours are pushed from the working area, especially important to prevent diesel engine racing due to gasoline vapours that are carried by the wind.
2. Position your unit to unload on the same side as the receiving valves.
3. Do not position the truck so that hoses run beneath it, unless instructed by supervisor.
4. Turn off ignition sources except engine if required to operate the transfer pump.
5. Ensure there are no ignition sources within 8 metres of either truck.
6. Set brakes.
7. Set chock blocks.

3) *Put on PPE*







4) *Prepare for Transfer*

1. Set out pylons or other suitable barriers appropriate for conditions to establish a safe area.
2. Set out fire extinguisher near the unloading valves.
3. Close all discharge valves on the receiving tanker.
4. Close all interconnecting valves that could allow product to flow between compartments on the receiving tanker unless the entire tanker is included in the transfer (i.e. all compartments will be loaded with the same product).
5. Verify the product tags on receiving truck match the tags on the delivering truck to avoid contamination and switch loading risks. If attended, have customer verify products as per bill of lading.
6. Connect grounding/bonding cables on trucks.
7. Connect hoses and set up fill spout. Transfer only one product, one compartment at a time.

Truck to Truck Transfer – 8 Steps



5) *Check Tanks/Compartments*

1. Check for any product remaining in receiving tanker. Do a visual check of each compartment's contents. Be aware that any product or contaminants trapped in the manifold will remain unseen.
2. Confirm that the tank will hold the quantity to be loaded and will not exceed the safe working capacity.

NOTE | The delivering compartment may be smaller than the receiving tank

3. An operator should stand on the receiving tanker to visually check the volume or the delivery may be metered.
4. The operator must be able to shut off the flow before the receiving tank reaches 97.5% of compartment capacity, or 250 litres outage as per normal operating standards at Canadian Fuels fuelling terminals, taking into consideration the operator may become incapacitated. One of the following methods could be used:
   - **a.** A valve readily at hand that can be operated by the operator as required (preferred is a spring-loaded or deadman valve).
   - **b.** An overfill alarm, tied into the truck pump, a second person in control of the pump.

NOTE | When transferring product into or out of a trailer that is not supported by a tractor, care must be taken to maintain stability. Unload the full tanker starting with the front compartment. Load the receiving tanker starting with the rear compartment. This ensures that, when the load is unbalanced, most of the weight is concentrated over the rear wheels.

6) *Transfer Procedures*

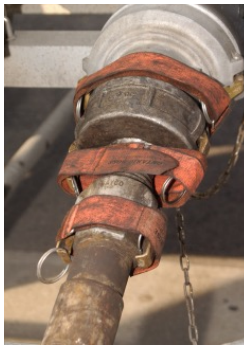
A) Select Product

Choose product to be transferred and ensure it is being transferred to the correct compartment.

B) Connect Hoses

Top Transfer

Where a self closing nozzle is not used, a shut off valve may be provided on top of the receiving truck, allowing the driver to stop the flow while on top of the truck. This valve should be operated slowly, taking care not to create hydraulic shock in the line. It is mandatory to wear a respirator for benzene gasoline vapour protection when gasoline is handled. When distillate is handled, the respirator is not required. Fall protection is also required when working at elevations greater than 3 metres.



Bottom Transfer

The receiving tanker must have a connection designed as an inlet. Do not pump into a tank through a manifold, as the valves in the manifold are designed for outlet flow only. Dry break connections may be used to help minimize spillage. One way to achieve this is to use a bottom loading coupler to connect to the receiving truck.

Truck to Truck Transfer – 8 Steps

C) Start Transfer



1. Start truck pump at idle speed.
2. Open the receiving tank valves.
3. Open the delivering vehicle's emergency faucet and discharge valves in that order.
4. Check hose connections, confirm no leakage is occurring and the product is flowing into the proper receiving compartment.
5. Increase pump speed to normal pumping speed.
6. The person in control must have access at hand to shut down the flow:
   a. Unless the product is metered off into a compartment of known size that is known to be empty, or the delivered volume is known to be less than receiving compartment capacity, a person must attend the top of the truck.
   b. A two-person operation is preferred; one person on the ground to control the flow and one on top of the tank to check volume.
   c. With a one-person operation, where someone must attend the top of the receiving truck, there must be a shut-off valve on top of the truck.
7. When stopping the flow, valves and/or nozzles should be closed slowly to avoid over pressuring the hose by line shock.
8. Do not exceed the safe capacity of the tank; a 250 litre outage must be left. Allow room for thermal expansion.

D) Stop Transfer

1. Verify that the delivery is complete and compartments are empty.
2. Shut off the pump and close all valves.
3. Disconnect hoses carefully to avoid spillage; drain into a drip pail.
4. Secure all valves and covers on the receiving tanker.
5. Remove bonding cables.
6. Ensure proper product tags are in place on each.
7. Complete the paperwork including "residue last contained" and leave proper documentation with the tanker. Prior to departing, do a walk around ensuring all equipment is safely stowed and doors and valves are closed and secured.

NOTE | The above procedures are subject to all local, provincial and federal government regulations. In the event of a conflict, government regulation will supersede.

NOTE | Drivers must report in writing any and all safety, environmental or procedural deficiencies that are encountered during the delivery of bulk products.

7) *Complete Walk-Around Inspection*

8) *Complete Paperwork*

Canadian Fuels
ASSOCIATION

APPENDIX

Appendix A – Home Heat Safe Discharge Certificate

Date: _____

Driver: _____

Customer Account Number: _____

Customer Name: _____

	YES	NO
Are there safety issues identified at this location? (If yes, please continue with form.)*	☐	☐
CONCERN ITEM(S) – only answer applicable question(s)		
Is there more than one fill pipe location, or more than one outdoor tank potentially causing confusion?	☐	☐
As product flow is started, is there evidence of a strong vent whistle? If no, stop delivery immediately.	☐	☐
Are all pipes on the exterior part of the building (indoor tanks)?	☐	☐
Are any of the fill pipes too high to reach safely?	☐	☐
Do any of the pipes appear to have blockage (i.e. animal nest)?	☐	☐
Does the tank level gauge work?	☐	☐
Are the (outdoor) tanks situated on solid or level ground?	☐	☐
Do the (outdoor) tanks seem excessively corroded or damaged?	☐	☐
Are there signs of current leaks or other potential problems with the tank system?	☐	☐
Is there evidence of residual contamination in the area?	☐	☐
Is the path to and around the fill pipe clear and unobstructed?	☐	☐
Are there overhead hazards while on foot (i.e. ice, loose tree limbs)?	☐	☐
Can the truck be driven in, parked and driven out safely (i.e. no obstacles, enough turning radius, ploughed, etc)?	☐	☐
Are there other concerns (i.e. animals, fence, traffic, yellow or red tagged fill pipe)?	☐	☐
Additional Detail:		

*This is to be filled out where a driver/carrier representative has not already done so, or where it appears new safety concerns have been introduced.

*It is the driver's responsibility to properly assess the risks **before** proceeding with a delivery.*

Appendix B – Truck to Marine Transfer – Bulk Products

Location: _____ **Date:** _____

Ship: _____ **Chief Engineer:** _____

1) Bunkers/Fuel to be transferred

Grade	Tonnes	Vol. At loading Temp (Litres)	Max. Transfer Rate	Topping Off Rate	Max. Line Pressure

2) Bunkers/Fuel Tanks to be Loaded

Tank ID	Grade	Max useable vol. of tank (Litres)	Vol. in tank Before loading (Litres)	Available Volume (Litres)	Volume to be loaded (Litres)	Total Vols. by grade (Litres)

3) Checks Prior to Transfer

	Item	Ship	Shore	Remarks
1	Port authority notified per local requirements? Document Port Authority Phone # in Remarks			
2	Is there an Emergency response plan?			Emergency Contact #
	2a) Is the Plan Available?			
	2b) Are you familiar with the plan?			
	2c) Are you in compliance with the plan?			
3	The vessel is securely moored.			
4	Ship red flag or red light must be on.			
5	Tank truck and or pump truck work area is barricaded with at least 6 safety cones.			
6	There is a safe means of access between the ship and shore. A safety net is deployed under gangway unless equip with ridge handrail and mid rail. Gangway should not be position at an angle of not more than 45°.			
7	Effective communications have been established between responsible persons on ship and shore.: (VHF/UHF Ch .....) Agree on sign or signal.			Primary System: Backup System: Emergency Stop Signal:
8	There is an effective watch on board the ship receiving bunkers/Fuel and ashore. During transfer operation a competent person will be continuously in attendance of the pump truck manifold and ship manifold. When transfer operation ceases or is temporarily stopped valves will be closed.			
9	Ship Chief Engineer agrees that ullage (available volume) & product quantity to be transferred indicated above is accurate and correct.			
10	Has agreement been reached on responsibility for stopping transfer? Truck or Receiving Vessel? Document in Remarks.			
11	Has the emergency shut down procedure been agreed? State procedure. Verify that pump engine emergency stop is operational.			

APPENDIX

B

TRUCK TO MARINE TRANSFER – BULK PRODUCTS

	Item	Ship	Shore	Remarks
12	Has the procedure for draining delivery hoses on completion of transfer been agreed?			
13	Fire hoses and fire fighting equipment on ship are ready for immediate use and 2 extinguishers are in place at the pump truck.			
14	All scuppers are effectively plugged. Temporarily removed scupper plugs will be monitored at all times. Drip trays are in position on decks under hose connections and bunker tank vents. Static bucket available and in place for drips. No signs of leakage from pump.			
15	Unused fuel connections are blanked and fully bolted.			
16	Transfer hose have been rated for pump use (tagged and dated) and tested for conductivity?			
17	Static bonding wires attached from vessel to pump and pump to road tanker are in place?			
18	The transfer hoses are in good condition & protected from abrasion, securely bolted to manifold & all cam lock connection are secured in place. No hose joint suspended over water and hose is supported on ship and pump truck.			
19	Fuel tank contents will be monitored at intervals not exceeding ……. Minutes & check completed for leaks and or fault.			
20	Chief engineer will ensure that bunker tank valves are not closed against flow & valves are set correctly for tank to receive fuel product, tank valves opened before start of discharge pump.			
21	There is a supply of oil spill clean up material readily available for immediate use.			
22	Smoking/vaping rooms have been identified on board and smoking/ vaping restrictions are being observed.			Nominated Smoking/Vaping Rooms Ship: Restriction observed
23	Naked light regulations are being observed and hand torches and portable radios are of approved types?			
24	All external doors and ports in the accommodation are closed.			
25	Are hand torches and portable radios of approved types?			
26	Are required delivery warning notices in position?			

Declaration:

We have checked, where appropriate jointly, the items of the checklist in accordance with the instructions and have satisfied ourselves that the entries we have made are correct to the best of our knowledge. If to our knowledge the status of any item changes, we will immediately inform the other party.

For Ship

Name: _____

Rank: _____

Signature: _____

Date: _____

Time: _____

For Shore (Min. of 2 persons on wharf available for duration of delivery)

Person #1

Name: _____

Rank: _____

Signature: _____

Date: _____

Time: _____

Person #2

Name: _____

Rank: _____

Signature: _____

Date: _____

Time: _____

*Refusal by ship's staff to complete and sign a checklist must be reported immediately to the local Marine Product Supplier department and **no delivery** should be made.*

Appendix C – Carrier Checklist – Truck-to-truck Transfer

The carrier representative/driver must complete this list before the transfer.
Do not proceed with the transfer if the answer to any of the following questions is No.
Return the completed list to the carrier office for retention.

Yes	No	N.A.	
☐	☐	☐	Have the carrier's representative and driver(s) been properly trained on the dangers of electricity, on loading and truck-to-truck transfers?
☐	☐	☐	Is the transfer location off public roadways and away from ignition sources?
☐	☐	☐	Are emergency means of communication available?
☐	☐	☐	If gasoline is to be transferred, are the trucks located at least 7.5 m from each other?
☐	☐	☐	Have the truck engines and the electrical systems been shut off, unless required to operate the pump?
☐	☐	☐	Have the No Smoking/Vaping signs and the orange traffic pylons been installed?
☐	☐	☐	Is at least a 20-lb. chemical fire extinguisher on hand?
☐	☐	☐	Are the two tankers or the trailer and its tractor properly bonded to each other?
☐	☐	☐	Is all the equipment properly grounded?
☐	☐	☐	In the case of a middle distillate, will it be loaded in a compartment that last contained a middle distillate?
☐	☐	☐	Will bottom loading take place, if possible and permitted by law?
☐	☐	☐	Do the receiving compartments have the capacity to receive the product?
			In the case of top loading:
☐	☐	☐	Is the receiving tanker equipped with a metal downspout that reaches the bottom of the receiving compartment?
☐	☐	☐	Is the metal downspout secured mechanically or bonded to the receiving tanker?
☐	☐	☐	Is the transfer hose secured mechanically or bonded to the downspout?

SPECIAL REQUIREMENTS FOR AVIATION FUEL TRANSFERS: To preserve the quality of the product, please refer to Oil Company-specific procedures and draining & flushing chart.

Name of Carrier: _____ **Receiving Tanker Number:** _____

Signature: _____ **Transfer Location:** _____

Carrier Representative: _____ **Transfer Date:** _____

Accepted by Oil Company Representative: _____

Appendix D – Canadian Fuels Driver Qualification Form

Please see the on-line Driver Qualification Form (New and Existing Driver)

Appendix E – Summary of Changes/Updates to the Driver's Manual

2026

- Provided additional clarity that footwear should be high top safety boots that cover the ankles
- Provided additional clarity that electronic devices need to be intrinsically safe and approved by the terminal operator

2025

- Section 7.3 - provided additional clarity around the use of personal electronic devices
- Section 7.6.2 (6) - added two points: to confirm no leaks and also to ensure loading the right product in the correct compartment
- Use of chock blocks - updated to reflect is required under the TDG Regulations by reference to CSA Standard B.621

2024

- Updated Section 1 - Driver Certification training requirements were revised to indicate that the renewal period should be 12 months along with some other revisions to update and clarify the section

2023

- Updated Section 3 to reflect revisions that were made to the ***Canadian Fuels Colour-Symbol System to Identify Equipment and Vehicles for Product Identification*** (and removed the tag graphics)

2021

- Mandatory traction aids required as conditions warrant (no dates specified) – available to driver (in truck or on person) added to Sections 4.6.1 and 7.6.2 (Put on PPE)
- Outermost layers of clothing, including hoods, must be flame resistant and not impede vision when worn added to Sections 4.6.1 and 7.6.2 (Put on PPE)
- Drivers must engage seat belts at all times when driving, including during truck movements at all Canadian Fuels members' fuel terminal sites added to Section 5.5
- Added in Sections 4.6.1, 5.1, and 7.6.2 (Put on PPE) that WHMIS Safety Data Sheets (SDS) should be referred to for details of appropriate PPE and safety measures for all hazardous materials being handled and transported
- Added further clarity that a 360 circle pre and post load check be mandatory by revising titles in Sections 5.3, 7, 8, and 10
- In Section 5.5, clarified to identify backing up as a hazard and that each terminal has to approve backing up if necessary and to also instruct drivers to get specific direction from terminal for backing protocol
- Added a reference to TDGR 4.4.3 to Section 7.4 to add clarity that proper TDG placards must be in place prior to commencing loading operations
- Load arm connection sequence - Added a new step to Sections 7.6.2 and 8.2 to require one arm connected at a time and flow confirmed before next connection

2019

- Maximum speed limit of 15 kmph added to Section 7.2
- Follow the 30/30 Rules added to electrical storm protocol in Sections 7.5 and 12.3.1
- Added clarification in Section 7.6.2 that chock blocks to be provided by driver/truck (not terminal)
- Added Appendix E: Summary of Changes/Updates to the Driver's Manual

2017

- Section 2: Driver Safety Profile deleted
- Product tags for biodiesel and LSD updated in Section 3.9.3
- Spill kit requirements in Section 6.4 updated to align with LTER listing descriptions
- Appendix D updated to reflect the electronic Q-form now available on-line
- Appendix 1 updated
- Appendix 2 updated