



TruckingHR Canada
**Learning and
Development
Centre**

National Occupational Standard –
Commercial Transport Truck Operator

SUPPLEMENT #1
Driving Steep Inclines



 **TruckingHR
Canada**

APRIL 2024

ABOUT TRUCKING HR CANADA

As a national, non-profit organization, Trucking HR Canada (THRC) advances modern HR solutions for the trucking and logistics workforce. One of our strategic priorities is to make a company's job easier by delivering a comprehensive collection of up-to-date guides, reports, templates and more to support effective human resources management and recruitment and retention efforts.

Visit **truckinghr.com** to find out more.

GENERAL DISCLAIMER

The information contained within this document does not constitute legal advice. Trucking HR Canada, and all content contributors, bear no responsibility for any circumstances arising out of or related to the adoption, or decision not to adopt, any of the recommendations contained in this document.

BACKGROUND

Trucking HR Canada (THRC) publishes a National Occupational Standard for Commercial Transport Truck Operators (NOS-O). The NOS-O defines the knowledge, skills, and abilities ("competencies") required for this occupation.

This document is a supplemental resource to the NOS-O. For the full suite of supplemental resources, visit **truckinghr.com**.

ACKNOWLEDGMENT

THRC would like to extend our sincere thanks to the following organizations for sharing their time and expertise to the development of this resource:

AIG Insurance Company of Canada
Alberta Motor Transport Association
Armour Transportation
Arrow Transportation Systems Inc.
Association du Camionnage du Québec
Bison Transport Inc.
C.A.T Inc.
Centre de Formation du Transport Routier de
Saint-Jérôme (CFTR)
Challenger
CIFFA
Eassons Transport Ltd.
Infrastructure Health and Safety Association
(IHSA)

Laidlaw Carriers Van
KAG (Kenan Advantage Group, Inc.)
Kriska Holdings Ltd.
KRTS Transportation Specialists Inc.
Manitoba Trucking Association
Northbridge Insurance
Northern Resource Trucking
Old Republic Insurance Canada
Private Motor Truck Council of Canada
Saskatchewan Trucking Association
South Country Co-op Limited
Steve's Livestock Transport
Tandet

FUNDER ACKNOWLEDGEMENT

Funded in part by the government of Canada's Sectoral Workforce Solutions Program.

Canada

The opinions and interpretations in this publication are those of the author and do not necessarily reflect those of the Government of Canada.

TABLE OF CONTENTS

Purpose of this Standard	1
Who can use this Standard	1
How to use this Standard	1
Background	2
Competencies	2
Block 1: Understand risks	3
Block 2: Plan	4
Block 3: Prepare vehicle	5
Block 4: Ascend	6
Block 5: Descend	7



PURPOSE OF THIS STANDARD

This standard is a supplement to the National Occupational Standard for Commercial Transport Truck Operator. It sets out the additional occupational competencies needed for individuals to successfully operate commercial vehicles on steep roads and highway inclines such as mountainous terrain.

WHO CAN USE THIS STANDARD

This standard is designed to be used by training developers and training providers.

HOW TO USE THIS STANDARD

This standard consists of five blocks of competencies. The first block contains knowledge competencies; the remaining four contain applied competencies. Together, these blocks inform the complexity, duration, and learning environment of training content and delivery methods for all aspects of training curriculum on the topic of driving steep inclines.

If you have questions or are interested in more information, contact info@truckinghr.com



BACKGROUND

Short stretches of steep inclines exist in every Canadian province and territory. A substantial portion of the Canada's highway system passes through regions with mountainous terrain, particularly in the western provinces of British Columbia and Alberta. These highways include steep inclines, winding sections, and large elevation changes to navigate through mountain ranges.

Ascending and descending steep inclines is among the most challenging environments for commercial transport truck operators. This reality is displayed by common incidents of transport trucks losing control during long steep descents – some resulting in fatal incidents.

While a commercial transport truck operator licence permits operation in all types of terrain, having the following additional competencies is helpful.

COMPETENCIES

There are five blocks, a knowledge block (in blue) and four practical skills blocks (in orange) that make up the competencies needed to operate on steep inclines safely and successfully.



BLOCK 1 UNDERSTAND RISKS

The commercial transport truck operator that drives on steep inclines understands the risks involved.

This means the operator knows:

- 1) Commercial transport truck operators should familiarize themselves with the route, terrain, and steepness of ascents and descents, as well as alternate routes or detours, before driving any route that includes steep inclines.

- 2) Road surface conditions and visibility can change dramatically as road elevation changes on steep inclines.

- 3) Shadowing an experienced commercial transport truck operator is a helpful way to develop experience before driving steep inclines alone.

- 4) A commercial transport truck operator can lose control of their vehicle during a steep descent.

- 5) There are safe descent speeds for all road conditions.

- 6) Safe descent speed varies based on the vehicle being driven, the load being transported, road surface condition, weather, and visibility.

- 7) Descent speed and gear selection is different for a vehicle without an engine brake than it is for a vehicle with an engine brake.

- 8) Correct use of a vehicle's transmission, engine brake (if equipped), and selecting the correct engine speed are critical elements of a safe descent on a steep incline.

- 9) A descent on a steep incline is risky when a vehicle has defective service brakes, a defective engine brake, or a defective transmission.

- 10) Overuse of service brakes can cause brake overheating resulting in loss of brake force.

- 11) The safest way to use service brakes during descents is the "snub" method.

- 12) Starting at the correct speed and carefully using service brakes is necessary to avoid brake overheating during descent on a steep incline.

- 13) Commercial transport truck operators must keep enough service brake capacity in reserve to be able to stop at any time during a descent on a steep incline.

- 14) Proper use of the engine brake is a critical element of steep incline descents for heavier vehicles with an engine brake.

- 15) The location and proper use of emergency runaway mitigation resources such as arrestor beds, escape ramps, pull outs, etc.

- 16) When the exhaust system of a commercial vehicle is modified, damaged, or removed, engine brake use can cause excessive noise that is prohibited in certain areas.

- 17) Proper methods for tire chain installation, usage requirements and locations where tire chains can be installed.

BLOCK 2 PLAN

The commercial transport truck operator that drives on steep inclines plans their trip before departure

This means the operator will:

- 1) Plan their steep incline driving route and check weather forecasts and road condition reports.

- 2) Familiarize themselves with routes that include steep inclines by using maps, guides, navigation systems, dispatchers, and other drivers.

- 3) Understand the source and meaning of official road, highway, and driving condition reports.

- 4) Understand the potential alternate and detour routes associated with their planned route.

- 5) Anticipate and understand road signs, signals, and notifications that may be encountered on their planned and possible alternate routes.

- 6) Know the location of emergency pull-out areas, and runaway lanes on their planned and possible alternate routes.

- 7) Carry the required emergency attire and equipment.

- 8) Know vehicle gross weight and the weight of their load.

- 9) Check weather forecasts and road condition reports before departing.

BLOCK 3 PREPARE VEHICLE

The commercial transport truck operator that drives on steep inclines prepares their vehicle before departure.

This means the operator will:

- 1) Confirm their vehicle is carrying required tire chains that are the correct size and type, are in good working order and install the chains when conditions warrant, or local laws require them to be used.

- 2) Conduct inspection of vehicle to confirm critical operating components are in optimal working condition.

- 3) Inspect tire tread to ensure it is suitable for anticipated weather conditions.

- 4) Confirm any required follow-up repair or maintenance work on wheels, tires, and brakes has been completed.

- 5) Confirm required emergency equipment and supplies are present and in good condition.

- 6) Confirm correct adjustment of rearview mirrors.



BLOCK 4 ASCEND

The commercial transport truck operator that ascends steep inclines in a safe, efficient, and courteous manner.

This means the operator will:

- 1) Ascend steep inclines with engine operating at the speed where it produces the most torque, as recommended by the manufacturer.

- 2) Monitor engine and transmission, select correct gear, and check for signs of loss of tire traction.

- 3) Operate vehicle at a speed that is suitable for weather and visibility.

- 4) Execute lane changes and passing of other vehicles maintaining safe following distance.

- 5) Increase following distance and reduce speed as required for operating conditions.

- 6) Show courtesy to other motorists, make space when needed, and avoid crowding other vehicles.

- 7) Maintain appropriate following distance.

- 8) Activate 4-way warning flashers when vehicle is likely to obstruct other vehicles, when visibility is poor, or there is a large differential in speed between their vehicle and other traffic.

- 9) Respond immediately to traffic congestion, reduced traction, or reduced visibility.

- 10) Check weather forecasts and road condition reports periodically when stopped.

- 11) Install tire chains when required and operate at suitable vehicle speed.



BLOCK 5 DESCEND

The commercial transport truck operator that descends steep inclines in a safe and efficient manner.

This means the operator will:

- 1) Initiate descent at the speed that is appropriate for vehicle weight, road conditions, and visibility.

- 2) Descend in the correct gear and change gears as required to allow engine to be at optimum operating speed for engine brake performance as recommended by the manufacturer.

- 3) Select optimum engine brake setting for slope severity as recommended by the manufacturer.

- 4) Maintain vehicle speed using the engine brake that requires application of the service brakes for no more than about 5 seconds out of every 60 seconds, or more frequently depending on specific conditions.

- 5) Use “snubbing” braking method during descents rather than dragging brakes.

- 6) Identify when vehicle descent speed must be decreased or can be increased.

- 7) Maintain appropriate following distance.

- 8) Activate 4-way warning flashers when vehicle is likely to obstruct other vehicles, when visibility is poor, or there is a large differential in speed between their vehicle and other traffic.

- 9) Respond immediately to traffic congestion, reduced traction, or reduced visibility.

- 10) Stop at brake check areas to comply with local laws, check equipment prior to descent, allow service brakes to cool, and read posted information about grade steepness.

- 11) Check weather forecasts and road condition reports periodically during inclement weather when stopped.

- 12) Install tire chains when required and operate at suitable vehicle speed for tire chain use.



© Trucking HR Canada 2024. All rights reserved.

All rights reserved. The use of any part of this publication, whether it is reproduced, stored in a retrieval system, or transmitted in any form or by any means (including electronic, mechanical, photographic, photocopying or recording), without the prior written permission of the Trucking Human Resources Canada, is an infringement of copyright law.

truckinghr.com