Caster Chalmers

Learning material for operator license

course

This document contains learning material for the operator course as well as the quiz that has replaced the first of the three required operator license sessions.

Background

This document was created by the Caster board 23/24 in spring 2024 Last edited: 2024-01-23 Credits: Konrad Billing

With help from: Oscar Lindfors Sam Grolander

As of the spring 2024, the first of the three operator license sessions will be replaced by a quiz on canvas. This quiz must be completed before attending the remaining two sessions. This means that you will only need to book two sessions for the operator license course. After you have booked two slots you will be invited to a canvas page containing the quiz.

The operator course can be roughly divided into three parts: Safety inspection, startup and operation. This version of the learning material so far only contains information about the safety inspection and basic principles for operating the simulator.

Safety inspection

Inspecting the simulator is vital to ensure the safety of the people using it and to detect faults that might damage the expensive hardware. A full inspection is required once every day the simulator is to be used. A folder with inspection papers at the back can be found on top of the cabinet. When done you must sign the safety check with your signature and place it back at the front of the folder before using the simulator.

If faults are found these should be noted on the paper. Depending on severity, and if the simulator can't be operated safely you should not try to use the simulator and should contact the Caster board @casterchalmers on instagram or by email: info@casterchalmers.com.

Below are all items from the safety checklist, numbered from top to bottom.

Pit area

1,2. Ground attachment and actuator fixation bolts

Visually inspect all bolts attaching the simulator to the ground, as well as all bolts connecting the actuators to the ground attachment. The white marks on the bolt and the ground/nut should all line up. A good tip is to use the flashlight on your phone to see better.



Ground attachment bolts. *2 more on other side.



Actuator fixation bolts 1.



Actuator fixation bolts 2.



Actuator fixation bolts 3.



3. Wiring connectors

Physically check and twist the electrical connection to all actuators. They should be finger tight: lefty-loosey righty-tighty. It is important to not forget the actuator behind the steering actuator.



Wiring connectors. Screw style fitting.

4. Computer cabinets

Make sure the cabinets are closed properly and that they are within the tape markers on the floor. The doors might require you to turn the handle.



1 of 2 computer cabinets, note the tape marking on the floor.

5,6. Access stand and bridge

To check the access stand it is sufficient to try to physically move or wiggle the stand. The access bridge has been removed from the simulator.

7,8. Pedal box wiring, connectors and fixation

To check the pedal box wiring and connectors it is sufficient to visually confirm that the screw holding the connector is in place and to give the connector a gentle wiggle. The pedalbox fixation can be confirmed by giving the metal frame that holds the pedals a small tug.

9. Check brake system

The brake system is checked for leaks by physically following the brake line from the brake pedal reservoir with your hand as far down as you can reach. Don't forget to do the same for the hand brake.

10,11,12. Pedals

The brake pedal is checked by depressing it and checking that the brake cylinders compress by roughly the same amount. Do the same for the clutch and throttle pedal but instead check that they do not impact their sensors when fully bottomed out. A trick to confirm this is to wiggle the sensor while checking for resistance when their respective pedal is fully depressed.



Pedals, sensors, fluid reservoir

13. Screen attachments

These are checked the same way as the ground and actuator attachment bolts, check that all screws on the back side of the screens line up with their white marker.

Upper platform

14. General condition of seat and fixation

Note any defects and give the seat a small tug to see it is fixated in place. Some movement can be expected.

15. Seatbelt and attachment

Tug at the seatbelt where it connects to the seat. Also buckle the seatbelt to check for defects in the 5-point connector.

16. Subwoofer

The subwoofer is situated under the seat. Slide the seat to its most forward position and visually check for any debris on the subwoofer.

17. Seating position adjuster

Test for smooth operation by sliding the seat.

18. Steering wheel and control loader attachment

Tug gently at the actuator base and turn the steering wheel and check for excessive movement.

19. General condition of H-pattern shifter

Note any defects.

20. Fixation of H-pattern shifter to upper platform

Gently tug to check for excessive movement.

21. Clean upper platform

Note and check for excessive debris/dirt. General cleaning is done by the Caster board.

Basic principles for operating the simulator

This is not necessarily part of the safety check, but is even more important to always keep track of when operating the simulator.

- While the simulator is being operated with motion, no person can be present inside the pit area except the person in the driver's seat.
- While the simulator is being operated with motion, the pit area has to be closed off from the rest of the course lab by either the sliding wall or the red band.
- While the simulator is being operated with motion, the door to the pit area has to be fully opened or closed, computer cabinets must be closed and within their designated area and the storage cabinets have to be closed.

Neglecting any of these points can bring great harm to persons and equipment. Their importance can not be overstated.

Remarks on safety inspection form below

If you read through the safety inspection form below you will notice it contains more chapters than what have been gone through above. In regards to the actual safety inspection only the top two parts: *Pit area* and *upper platform*, are necessary to complete the daily safety inspection. The rest of the chapters are checklists for starting the simulator, starting different softwares or to check even more safety items while driving, however by managing to start the simulator and drive you will already have completed all items under *Safety check*. Therefore it is both impossible and unnecessary to include it in the safety inspection which is done before start up.



Pit are		Chalmers	Remarks
	Inspect ground attachment bolts		
	Inspect actuator fixation (top & bottom)		
	Inspect wiring & connectors of all actuators		
	Inspect computer cabinet		
	Inspect access stands and its fixation		
	Inspect access bridge and its fixation		
	Inspect pedalbox wiring & connectors		
	Inspect pedalbox fixation		
	Check brake system for oil leaks		
	Inspect brake pedal travel & balance		
	Inspect throttle pedal endstops		
	Inspect clutch pedal endstops		
	Inspect screen attachements		
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	Inspect seating position adjuster		
	Inspect steering wheel & control loader attachment		
	Inspect general condition of H-pattern shifter		
	Inspect fixation of H-pattern to upperplatform		
	Clean upper platform		
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Start ı		Chalmers	Remarks
	Switch on motion system		
	Release E-Stop and press red reset button		
	Start operator computer		
	Start Race Manager		
	Turn on all computers		
	Start Racer on all sims		
	Start Setup Tool, Telemetry Analyzer and Matlab if desired		
	Check if all computers have Racer running		
	Check if all computers have Racer running Start a new heat and select demo (no driver)		
	Check if all computers have Racer running Start a new heat and select demo (no driver) Inspect if motion is properly working		
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Date: Operator name: Operator signature

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