MACHINE CruiseMachine
SEES CruiseCtx
VARIABLES

cruise_system_state
cruise_speed_up
cruise_speed_down
brake_pedal_perc
acc_pedal_perc
cruise_start_stop
current_speed
acc_pedal_command
brake_pedal_command
cruise_speed

INVARIANTS

inv1: $cruise\_system\_state \in BUTTON\_STATE$
inv2: $cruise\_speed\_up \in BUTTON\_STATE$
inv3: $cruise\_speed\_down \in BUTTON\_STATE$
inv4: $brake\_pedal\_perc \in \mathbb{N}$
inv5: $brake\_pedal\_perc \geq 0$
inv6: $brake\_pedal\_perc \leq 100$
inv7: $acc\_pedal\_perc \in \mathbb{N}$
inv8: $acc\_pedal\_perc \geq 0$
inv9: $acc\_pedal\_perc \leq 100$
inv10: $cruise\_start\_stop \in BUTTON\_STATE$
inv11: $cruise\_speed \in \mathbb{N}$
inv13: $cruise\_speed \geq 1000$
inv14: $cruise\_speed \in \mathbb{N}$
inv15: $current\_speed \geq 0$
inv16: $current\_speed \leq CAR\_MAX\_SPEED$
inv17: $acc\_pedal\_command \in PEDAL\_COMMAND$
inv18: $brake\_pedal\_command \in PEDAL\_COMMAND$

EVENTS

Initialisation

begin

act1: $cruise\_system\_state := FALSE$
act2: $cruise\_speed\_up := FALSE$
act3: $cruise\_speed\_down := FALSE$
act4: $cruise\_start\_stop := FALSE$
act5: $cruise\_speed := 50000$
act6: $acc\_pedal\_perc := 0$
act7: $brake\_pedal\_perc := 0$
act8: $acc\_pedal\_command := 0$
act9: $brake\_pedal\_command := 0$
act10: $current\_speed := 0$

end

Event cruise_increase_speed ⟨ordinary⟩ $\widehat{=}$

when

grd1: $cruise\_system\_state = FALSE$
grd2: $cruise\_speed\_up = TRUE$
grd3: $cruise\_speed\_down = FALSE$
grd4: $cruise\_speed \leq CRUISE\_MAX\_SPEED - 2500$

then

act1: $cruise\_speed := cruise\_speed + 2500$

end

Event cruise_decrease_speed ⟨ordinary⟩ $\widehat{=}$
when
grd1: $cruise\_system\_state = FALSE$
grd2: $cruise\_speed\_down = TRUE$
grd3: $cruise\_speed\_up = FALSE$
grd4: $cruise\_speed \geq 3500$
then
act1: $cruise\_speed := cruise\_speed - 2500$
end

Event cruise_start_stop ⟨ordinary⟩ $\widehat{=}$
when
grd1: $cruise\_start\_stop = TRUE$
then
act1: $cruise\_system\_state := CHANGE\_STATE(cruise\_system\_state)$
end

Event accelerate_vehicle ⟨ordinary⟩ $\widehat{=}$
when
grd1: $current\_speed < cruise\_speed$
grd2: $cruise\_system\_state = TRUE$
grd3: $brake\_pedal\_perc = 0$
grd4: $brake\_pedal\_command = 0$
then
act1: $acc\_pedal\_command := 1$
end

Event decelerate_vehicle ⟨ordinary⟩ $\widehat{=}$
when
grd1: $current\_speed > cruise\_speed$
grd2: $cruise\_system\_state = TRUE$
grd3: $brake\_pedal\_perc = 0$
grd4: $acc\_pedal\_perc > 0$
then
act1: $acc\_pedal\_command := 2$
end

Event increase_acc_pedal ⟨ordinary⟩ $\widehat{=}$
when
grd1: $acc\_pedal\_command = 1$
grd2: $acc\_pedal\_perc \leq 98$
grd3: $cruise\_system\_state = TRUE$
then
act1: $acc\_pedal\_command := 0$
act2: $acc\_pedal\_perc := acc\_pedal\_perc + 2$
end

Event decrease_acc_pedal ⟨ordinary⟩ $\widehat{=}$
when
grd1: $acc\_pedal\_command = 2$
grd2: $acc\_pedal\_perc \geq 2$
grd3: $cruise\_system\_state = TRUE$
then
act1: $acc\_pedal\_command := 0$
act2: $acc\_pedal\_perc := acc\_pedal\_perc - 2$
end

Event increase_brake_pedal ⟨ordinary⟩ $\widehat{=}$
when
grd1: $brake\_pedal\_command = 1$
grd2: $brake\_pedal\_perc \leq 98$
grd3: $cruise\_system\_state = TRUE$
then
act1: $brake\_pedal\_command := 0$

act2: $brake\_pedal\_perc := brake\_pedal\_perc + 2$

end

Event decrease_brake_pedal ⟨ordinary⟩ $\widehat{=}$

when

grd1: $brake\_pedal\_command = 2$

grd2: $brake\_pedal\_perc \geq 2$

grd3: $cruise\_system\_state = TRUE$

then

act1: $brake\_pedal\_command := 0$

act2: $brake\_pedal\_perc := brake\_pedal\_perc - 2$

end

END