



Winterization

Presented by
Frontier Supply Chain Solutions Inc.

TOPIC 3 CONTINUED

Overview of the Topic



THE FORCES ACTING ON THE VEHICLE

AS ROB DRIVES, THERE ARE DIFFERENT FORCES THAT AFFECT HIS VEHICLE. THESE FORCES INCLUDE:

INERTIA
CENTRIFUGAL FORCE
TRACTION

THE BIGGEST PROBLEM WITH WINTER ROADS IS REDUCED TRACTION (THE GRIP TIRES HAVE ON THE ROAD). IF ROB'S TIRES DON'T HAVE THAT FORCE PRESENT, HIS STOPPING DISTANCE WILL BE MUCH LONGER. INERTIA AND CENTRIFUGAL FORCE WILL PUSH ROB'S VEHICLE MORE EASILY INTO A SKID, JACKKNIFE OR COLLIDE WITH ANOTHER VEHICLE.

GOOD WINTER TIRES THAT ARE PROPERLY INFLATED WILL DO A LOT TO MAXIMIZE TRACTION AS ROB DRIVES. IN SEVERE WINTER CONDITIONS, CHAINS MAY ALSO BE REQUIRED. REMEMBER - THE MORE TRACTION ROB'S TIRES HAVE WITH THE ROAD'S SURFACE, THE MORE CONTROL HE CAN MAINTAIN OVER HIS VEHICLE.

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Overview of the Topic



DRIVING IN SLIPPERY CONDITIONS

WHEN ROADS ARE COVERED IN SNOW OR ICE, ROB'S TIRES WILL HAVE REDUCED TRACTION AND HIS VEHICLE WILL HAVE A TENDENCY TO SLIP. SLIPPING TENDS TO OCCUR IN TWO SITUATIONS: FIRST AS YOU START MOVING FROM A STOPPED POSITION AND SECONDLY WHEN YOU ARE TRYING TO COME TO A STOP. IF YOU FEEL A WHEEL SLIP AT ANY TIME, YOU ARE ACCELERATING TOO QUICKLY, SO EASE OFF.

SLIPPING IS EXTREMELY DANGEROUS, ESPECIALLY WHEN DRIVING A LARGE, HEAVY VEHICLE. THE ACTION OF TIRES SPINNING AND SLIDING ON SNOW AND ICE TENDS TO POLISH THE SURFACE AND REDUCES YOUR TRACTION BY ABOUT HALF. ROB NEEDS TO AVOID SPINNING THE WHEELS AT ALL TIMES. GETTING STUCK AT AN INTERSECTION, IN A PARKING SPOT, ON A HILL OR AT AN ENTRANCE CAN CAUSE AGGRAVATING DELAYS AND COLLISIONS. FOLLOW THESE TIPS TO KEEP THE SPIN TO A MINIMUM:

STOPPING

- ALWAYS SLOW DOWN EARLY WHEN YOU APPROACH AN INTERSECTION, CURVE OR HILL (IT MAY BE NECESSARY TO GEAR DOWN).
- EVEN A SUDDEN RELEASE OF THE ACCELERATOR CAN CAUSE PROBLEMS, SO MAKE SURE THAT YOU KEEP IT SMOOTH
- IF YOU ARE PARKING IN DEEP SNOW, MOVE YOUR VEHICLE BACK AND FORTH 1 TO 2 METRES (4 TO 5 FEET) BEFORE YOU TURN OFF THE IGNITION. THIS PACKS THE HEAVY SNOW FOR EASIER STARTING.

STARTING

- IN ORDER TO KEEP YOUR GRIP, ALWAYS START OFF SLOW AND EASY. USE A LIGHT FOOT ON THE ACCELERATOR AND KEEP IT SMOOTH.
- IN DEEP SNOW, TRY TURNING YOUR WHEELS FROM SIDE TO SIDE TO PUSH THE SNOW.
- CHECK THE FEEL OF THE ROAD BEFORE YOU START OFF.

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CURVES AND LANE CHANGES

ROB HAS LEARNED THAT THE KEY TO WINTER DRIVING IS STAYING SMOOTH AND PRECISE AND AVOIDING JERKY OR RAPID MOVEMENTS. FAST AND SUDDEN MOVEMENTS OF THE STEERING WHEEL GENERATE FORCES THAT WILL THROW YOUR VEHICLE INTO A SKID AS YOU ENTER A TURN. ALL VEHICLES, WHEN ON A CURVED SECTION OF THE HIGHWAY ARE MORE SENSITIVE TO OVER-ACCELERATING, OVER-BRAKING AND OVER-STEERING, WHICH CAN CAUSE A LOSS OF CONTROL.

CURVES

THE CURVES THAT CAUSE THE MOST DIFFICULTY IN THE WINTER ARE HIGHWAY RAMPS. THESE TEND TO HAVE A VERY SHARP CURVE AND CAN BE MORE SLIPPERY THAN THE HIGHWAY ITSELF. IF ROB ENTERS OR EXITS TOO FAST, CENTRIFUGAL FORCE CAN EITHER SEND HIS VEHICLE INTO A JACKKNIFE OR OVERTURN IT. HE NEEDS TO ALWAYS FOLLOW THE POSTED SPEED LIMIT. GOING SLOWER MAY TAKE MORE TIME, BUT IT WILL KEEP HIM AND HIS VEHICLE SAFE. FOLLOW THESE GUIDELINES:

SLOW DOWN WHEN YOU APPROACH A CURVE. DON'T BRAKE SUDDENLY WHILE YOU'RE IN THE MIDDLE OF ONE. ON A CURVE TO THE RIGHT, KEEP THE FRONT WHEELS CLOSE TO THE CENTRE LINE TO PREVENT THE REAR WHEELS DROPPING OFF THE PAVEMENT. ON A CURVE TO THE LEFT, KEEP THE FRONT WHEELS CLOSE TO THE RIGHT EDGE OF THE PAVEMENT TO PREVENT THE REAR WHEEL FROM CROSSING INTO THE OTHER TRAFFIC LANE.

LANE CHANGES

PLAN LANE CHANGES AND SIGNAL WELL IN ADVANCE.
MAKE LANE CHANGES AS SMOOTH AS POSSIBLE.
WATCH OUT FOR YOUR TRAILER PUSHING YOU ON CURVES AND TURNS.
REMEMBER THAT IN THE WINTER, STRIPS OF SNOW AND ICE MAY BE LEFT BETWEEN THE LANES AFTER A PLOW GOES BY. THIS STRIP CAN BE VERY SLIPPERY SO WHEN CHANGING LANES, MAKE SURE YOU GO OVER IT GRADUALLY AND SMOOTHLY.

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BRAKING IN THE WINTER

HOW ROB BRAKES IS GOING TO MAKE A VERY BIG DIFFERENCE IN HOW MUCH CONTROL HE MAINTAINS OVER HIS VEHICLE. SUDDEN, JERKY MOTIONS ARE MORE LIKELY TO LOCK HIS WHEELS AND CAUSE A SKID, SO HE NEEDS TO KEEP IT AS SMOOTH AS POSSIBLE AND KEEP ALL HIS WHEELS ROLLING. ROB HAS A LONGER BRAKING DISTANCE IN THE WINTER BECAUSE OF SLIPPERY SURFACES - HE NEEDS TO REMEMBER TO NEVER SLAM ON THE BRAKES! HERE ARE SOME OTHER BRAKING TIPS THAT ROB HAS LEARNED ABOUT.

BRAKING WITHOUT ABS BRAKES

TO MAINTAIN STEERING CONTROL, LIGHTLY AND RAPIDLY PUMP THE BRAKES ON SLIPPERY SURFACES.

BRAKING WITH ABS BRAKES

ANTI-LOCK BRAKE SYSTEMS WILL AUTOMATICALLY PUMP THE BRAKES FOR YOU IF YOUR VEHICLE WHEELS BEGIN TO LOCK UP.

AIR BRAKES

WITH AIR BRAKES, BE CAREFUL TO AVOID REDUCING THE AIR PRESSURE TO A LOW LEVEL IN THE WINTER. WHEN AIR PRESSURE DROPS BELOW 420 KILOPASCALS (60 LBS), THE TRAILER BRAKES WILL AUTOMATICALLY LOCK. THE AIR PRESSURE REQUIRED TO LOCK WHEELS ON ICE CAN BE AS LITTLE AS 70 KILOPASCALS (10 LBS), SO A GREAT DEAL OF PUMPING CAN BE DONE WITH A GENTLE TOUCH ON THE BRAKE.

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Overview of the Topic



PREPARING FOR GRADES

ROB IS GOING TO HAVE TO TRAVEL UP AND DOWN SOME STEEP GRADES THIS WINTER. HE KNOWS THAT IT'S A CHALLENGING TASK EVEN WITHOUT ANY ICY CONDITIONS, SO WHEN TEMPERATURES DROP, HE KNOWS IT'S EVEN MORE IMPORTANT TO BE CAUTIOUS.

BEFORE ROB DRIVES ON STEEP GRADES OR IN THE MOUNTAINS, HE NEEDS TO INSPECT HIS VEHICLE. HE SHOULD CHECK THE FOLLOWING:

- IF HE REQUIRES CHAINS, HE MUST MAKE SURE THAT THEY'RE INSTALLED PROPERLY AND THAT THERE IS NO SNOW BUILD-UP. HE NEEDS TO CLEAN THEM REGULARLY TO MAXIMIZE THEIR EFFECTIVENESS.
- AIR LEAKS (WHEN THE BRAKES ARE BOTH ON AND OFF)
- THE PRESSURE DROP WHEN BRAKES ARE FULLY APPLIED ARE WITHIN NORMAL LIMITS
- ICE BUILD-UP ON HIS SERVICE BRAKES
- SECURE GLAD-HANDS AND AIR LINES
- BRAKE DRUMS ARE NOT OVERHEATING
- THE TRAILER SUPPLY VALVE IS WORKING

IN THE MOUNTAINS, WINTER WEATHER CAN BE SEVERE AND CHANGE RAPIDLY. ROB NEEDS TO BE PREPARED FOR THE FOLLOWING:

- WIND GUSTS. THESE OCCUR IN EXPOSED AREAS AND STRONG SIDE WINDS.
- EMERGENCY VEHICLES AND SNOWPLOWS. THESE MAY BE AT THE SIDE OF THE ROAD OR IN FRONT.
- AVALANCHE ZONES. DO NOT STOP IN THESE AREAS.

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DRIVING ON GRADES

WHEN ROB DRIVES ON A STEEP GRADE, HE MUST USE CARE WHEN SHIFTING DURING WINTER DRIVING, ESPECIALLY WHILE DOWNSHIFTING. DOWNSHIFTS CAN BREAK HIS TRACTION SO HE NEEDS TO MAKE EACH SHIFT AS SMOOTH AS POSSIBLE. HE ALSO NEEDS TO MAKE SURE THAT HE ISN'T GOING FASTER THAN THE POSTED MAXIMUM SPEED.

DRIVING ON UPGRADES

WHEN ROB'S RPM FALLS, HE NEEDS TO:

- DOWNSHIFT TO THE NEXT LOWEST GEAR
- COMPLETE THE SHIFT QUICKLY BEFORE THE RPM REACHES THE BOTTOM OF THE RANGE
- DOWNSHIFT UNTIL HE FINDS A GEAR THAT WILL MAINTAIN THE DESIRED RPM

ROB KNOWS TO WATCH HIS COOLANT AND WATER GAUGES OFTEN TO MAKE SURE THAT THE VEHICLE ISN'T OVERHEATING.

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DOWNGRADES

ROB MUST ALWAYS DOWNSHIFT TO THE DESIRED GEAR BEFORE HE STARTS DOWN THE HILL, AS HE WON'T BE ABLE TO GET INTO A LOWER GEAR AS HE INCREASES SPEED. THE RULE OF THUMB IS TO USE THE SAME GEAR GOING DOWN AS YOU DID GOING UP. HOWEVER, SOME DRIVERS USE A GEAR OR TWO LOWER. HE NEVER SHIFTS INTO NEUTRAL AND COASTS. IF HE USES HIS BRAKES TOO OFTEN, THEY WILL HEAT UP, FADE, AND EVENTUALLY FAIL. ONCE THE VEHICLE IS IN THE PROPER LOW GEAR, YOU AND ROB CAN USE THE FOLLOWING TECHNIQUE FOR DESCENDING:

- APPLY THE BRAKES JUST HARD ENOUGH TO FEEL A DEFINITE SLOWDOWN
- WHEN SPEED HAS BEEN REDUCED APPROXIMATELY 5 MPH BELOW YOUR SAFE SPEED (I.E., THE POSTED LIMIT), RELEASE THE BRAKES. BRAKE APPLICATION SHOULD LAST ABOUT 3 SECONDS.
- WHEN YOUR SPEED HAS INCREASED TO YOUR SAFE SPEED, REPEAT THE FIRST TWO STEPS.

FOR EXAMPLE, IF THE POSTED SPEED IS 40 MPH, DON'T PUT ON THE BRAKES UNTIL YOU REACH THAT SPEED. THEN BRAKE HARD ENOUGH TO SLOW DOWN TO 35 MPH. RELEASE THE BRAKES AND REPEAT AS OFTEN AS YOU NEED TO.

REMEMBER! IN THE WINTER, DON'T USE THE ENGINE BRAKE WHEN GOING DOWN A STEEP GRADE.

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GETTING STUCK

REMEMBER, IF YOU OR ROB GETS STUCK, DON'T SPIN THE TIRES OR ROCK BACK AND FORTH AS THIS WILL RESULT IN THE VEHICLE GETTING EVEN MORE STUCK. DO THE FOLLOWING:

- USE TRACTION AIDS. DIG UNDER THE FRONT OF THE DRIVE WHEELS AND SCATTER SAND, GRAVEL, OR KITTY LITTER IN THEIR PATH.
- USE A LOW GEAR AND LOCK THE INTERAXLE DIFFERENTIAL. THIS WILL HELP KEEP THE WHEELS FROM SPINNING.
- START WITH THE STEERING WHEELS STRAIGHT AHEAD. IF YOU HAVE TO START WITH THE WHEELS TURNED, ACCELERATE GENTLY. TURN THE STEERING WHEEL BACK AND FORTH GENTLY (LESS THAN AN INCH) TO PREPARE A PATH FOR THE WHEELS.
- ACCELERATE GENTLY. AS YOU START TO MOVE, GO AS SMOOTHLY AND GENTLY AS POSSIBLE. EASE OFF THE ACCELERATOR IF YOU START TO SLIDE.

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JACKKNIFING

A JACKKNIFE CAN HAPPEN AT ANY TIME OF THE YEAR, BUT IN ICY CONDITIONS, THEY ARE MUCH MORE COMMON AND ROB NEEDS TO BE AWARE OF WHAT CAUSES A JACKKNIFE AND WHAT TO DO IN CASE HE FINDS HIMSELF IN A JACKKNIFE SITUATION.

WHAT HAPPENS DURING A JACKKNIFE?

JACKKNIFING GETS ITS NAME FROM THE SIMILARITY TO A FOLDING KNIFE. AS THE TRUCK ATTEMPTS TO MAKE A TURN OR A TRAILER LOSES ITS TRACTION, THE PORTION OF THE TRUCK BEING TOWED CAN BEGIN TO FOLD INTO THE CAB OR TOW TRUCK. BY THE TIME THAT THE TRACTOR AND TRAILER ARE AT A 15-DEGREE ANGLE TO ONE ANOTHER, IT IS ALMOST IMPOSSIBLE TO RECOVER FROM A JACKKNIFE. AND IT HAPPENS FAST - IT CAN OCCUR IN ABOUT ONE AND A HALF SECONDS.

WHAT CAUSES A JACKKNIFE?

- HAULING AN EMPTY OR VERY LIGHT UNIT AND YOU OVER-BRAKE
- OVER-ACCELERATING ON AN ICY UPGRADE AND SPINNING THE DRIVE WHEELS
- OVER-BRAKING TOO HEAVILY ON A CURVE

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DEALING WITH A JACKKNIFE

THE BEST WAY TO HANDLE A JACKKNIFE IS TO PREVENT ONE FROM HAPPENING IN THE FIRST PLACE. THE FOLLOWING TIPS WILL HELP YOU AVOID THEM:

- AVOID SLAMMING ON THE BRAKES
- KEEP A SAFE DISTANCE FROM OTHER VEHICLES TO AVOID HAVING TO BRAKE HARD
- CHECK YOUR MIRRORS FOR TRAILER SWING FREQUENTLY AND EVERY TIME YOU HAVE TO BRAKE HARD
- DECELERATE SLOWLY ON THE LONG STRETCH BEFORE THE BEND OR CURVE
- BE EXTRA CAUTIOUS WHEN HAULING A LIGHTER LOAD
- WHEN AN EMERGENCY SITUATION OCCURS, DO YOUR BEST TO AVOID BRAKING AND SWERVING AT THE SAME TIME. THIS MIGHT MEAN BRAKING, LETTING GO OF THE BRAKE, SWERVING AND THEN BRAKING AGAIN.
- DO NOT ACCELERATE SUDDENLY

WHEN YOU CAN'T PREVENT IT

IF YOU CAN'T PREVENT A JACKKNIFE, DO THE FOLLOWING:

- START RECOVERING AS SOON AS YOU CAN
- RELY ON STEERING - DO NOT USE THE ACCELERATOR OR BRAKE

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WHEN ROB'S NOT DRIVING

THE BEST WAY TO HANDLE A JACKKNIFE IS TO PREVENT ONE FROM HAPPENING IN THE FIRST PLACE. THE FOLLOWING TIPS WILL HELP YOU AVOID THEM:

- AVOID SLAMMING ON THE BRAKES
- KEEP A SAFE DISTANCE FROM OTHER VEHICLES TO AVOID HAVING TO BRAKE HARD
- CHECK YOUR MIRRORS FOR TRAILER SWING FREQUENTLY AND EVERY TIME YOU HAVE TO BRAKE HARD
- DECELERATE SLOWLY ON THE LONG STRETCH BEFORE THE BEND OR CURVE
- BE EXTRA CAUTIOUS WHEN HAULING A LIGHTER LOAD
- WHEN AN EMERGENCY SITUATION OCCURS, DO YOUR BEST TO AVOID BRAKING AND SWERVING AT THE SAME TIME. THIS MIGHT MEAN BRAKING, LETTING GO OF THE BRAKE, SWERVING AND THEN BRAKING AGAIN.
- DO NOT ACCELERATE SUDDENLY

WHEN YOU CAN'T PREVENT IT

IF YOU CAN'T PREVENT A JACKKNIFE, DO THE FOLLOWING:

- START RECOVERING AS SOON AS YOU CAN
- RELY ON STEERING - DO NOT USE THE ACCELERATOR OR BRAKE

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IF YOU GET STRANDED

IF YOU HAPPEN TO GET STRANDED IN WINTER WEATHER, DON'T PANIC! IF YOU'VE PREPARED, YOU SHOULD HAVE EVERYTHING YOU NEED. HERE ARE SOME TIPS TO FOLLOW:

- ACTIVATE HAZARD LIGHTS AND PLACE WARNING DEVICES IN CLEAR VIEW OF ONCOMING TRAFFIC. DEVICES SHOULD BE PLACED 30 METRES IN FRONT AND TO THE REAR OF THE VEHICLE. WATCH FOR TRAFFIC OR RESCUERS.
- SECURE THE VEHICLE (APPLY THE PARKING BRAKE, BLOCK THE WHEELS AND CLOSE ALL DOORS). DO NOT LEAVE THE VEHICLE FOR ASSISTANCE UNLESS HELP IS VISIBLE WITHIN ABOUT 100 YARDS (90 METRES).
- AVOID OVER-EXERTION AND OVER-EXPOSURE TO THE COLD. COLD WEATHER CAN PUT EXTRA STRESS ON THE HEART AND CONTRIBUTE TO THE HAZARDS OF OVER-EXERTION. SWEATY CLOTHES NEXT TO THE SKIN ARE NOT GOOD INSULATORS AGAINST THE COLD.
- RUN THE ENGINE OCCASIONALLY (ABOUT 10 MINUTES EVERY HOUR) TO PROVIDE HEAT (AND TO CONSERVE FUEL). A CANDLE IN A TIN CAN PROVIDES HEAT AND LIGHT IF YOU NEED IT.
- BUNDLE UP IN A BLANKET. IF THERE IS MORE THAN ONE PERSON IN THE CAR, SHARE - TWO PEOPLE SHARING BLANKETS WILL BE WARMER THAN EITHER PERSON ALONE IN A BLANKET.
- MONITOR FOR ANY SIGNS OF FROSTBITE OR HYPOTHERMIA. WEAR A HAT AND SCARF - THE HEAD AND NECK ARE MAJOR SOURCES OF HEAT LOSS FROM THE BODY.
- DO NOT STAY IN ONE POSITION TOO LONG. DO SOME EXERCISES TO HELP THE CIRCULATION - MOVE YOUR ARMS AND LEGS, CLAP YOUR HANDS, ETC.
- DO NOT FALL ASLEEP. IF THERE IS MORE THAN ONE PERSON IN THE CAR, TAKE TURNS SLEEPING.

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TOPIC THREE REVIEW: ADJUST

THE FORCES THAT NORMALLY ACT ON YOUR TRUCK INCLUDE TRACTION, INERTIA AND CENTRIFUGAL FORCE. THESE FORCES CAN BE MAGNIFIED AND CAUSE MORE SERIOUS HARM DURING THE WINTER MONTHS AS YOU LOSE TRACTION IN ICE AND SNOW. ROB KNOWS THAT OVER-BRAKING, OVER-ACCELERATING AND OVER-STEERING CAN SEND HIS VEHICLE INTO A SKID AND POSSIBLY A JACKKNIFE, SO HE MAKES SURE THAT HE SLOWS DOWN AND DRIVES AS SMOOTHLY AS POSSIBLE.

ROB KNOWS THAT THE KEY TO STARTING AND STOPPING IS TO BE SMOOTH, GRADUAL AND SLOW. THIS WILL PREVENT THE WHEELS FROM SPINNING AND WHEN THEY DO, IT'S MUCH EASIER TO STOP THEM. IN ADDITION, HE MAKES SURE THAT HIS LANE CHANGES ARE SMOOTH AND THAT HE SIGNALS WELL IN ADVANCE TO WARN OTHER DRIVERS OF HIS ACTIONS.

CURVES, ESPECIALLY ON AND OFF-RAMPS CAN BE VERY HAZARDOUS IN THE WINTER DUE TO THE ICE THAT BUILDS UP ON THEM. ROB KNOWS THAT HE NEEDS TO SLOW DOWN BEFORE HE STARTS MAKING THE CURVE SO THAT HE CAN KEEP HIS VEHICLE UNDER CONTROL. HE KNOWS THAT BRAKING SUDDENLY IS VERY DANGEROUS AND TAKES EXTRA CARE WHEN HIS TRAILER IS LIGHT OR EMPTY.

BEFORE DRIVING ON STEEP GRADES, IT IS IMPORTANT TO REMEMBER TO CHECK YOUR BRAKING SYSTEMS. ROB KNOWS THAT HE SHOULD BE CHECKING HIS GLAD-HANDS, AIR LINES, SERVICE BRAKES, BRAKE DRUMS AND TRAILER SUPPLY VALVE. LOSING YOUR BRAKES ON A STEEP DOWNGRADE CAN BE DANGEROUS! WHEN DRIVING ON A DOWNGRADE, SLOW DOWN BEFORE YOU START THE DESCENT AND APPLY THE BRAKES GRADUALLY. RELEASE THEM WHEN YOUR SPEED IS 5 MPH BELOW THE LIMIT AND REPEAT UNTIL YOU GET TO THE BOTTOM OF THE GRADE.

TO PREVENT A JACKKNIFE, WHICH IS IMPOSSIBLE ONCE THE TRACTOR AND TRAILER ARE 15 DEGREES AWAY FROM EACH OTHER, THE BEST METHOD IS TO AVOID SKIDDING AT ALL. HOWEVER, IF ROB DOES FIND HIMSELF IN A JACKKNIFE SITUATION, HE NEEDS ACT QUICKLY, RELY ON HIS STEERING AND AVOID THE ACCELERATOR AND BRAKE.