

جمعية الشرق الاوسط
للغازات الصناعية

MEGA

Driver's Manual

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Driver's Manual

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1. OBJECTIVE

To create an outline of measures to be taken by the drivers for transporting compressed gases and cryogenic liquids safely by road.

2. SCOPE

This document is intended to specify the following;

- Precautions to be taken by the drivers carrying compressed gases cylinders or cryogenic liquids.
- Actions to be taken by the driver in case of a Highway emergency.
- PPE & Safety Equipment to be carried in the vehicle.
- Steps to be taken for the safe decantation of cryogenic liquids.
- A brief overview of defensive driving techniques.

3. GENERAL SAFETY RULES

A. Alertness

Driving a heavy vehicle is hard work. Professional drivers are often required to be on the road for long periods, which is very tiring. You will become less alert. There are many things that good drivers do to prevent becoming tired. If you are drowsy and are not alert, the consequences may be severe. You may fall asleep and drive into the path of other vehicles, causing serious injury or even death, to both yourself and others. Remember that you are driving a very heavy vehicle that can cause a lot of damage.

The best way to be alert and avoid dozing at the wheel is to not get tired in the first place. Here are some suggestions.

1. Get Plenty of Sleep

If you have a long trip to make, be sure that you get a good night's sleep before you go. Never start a long trip if you are already tired.

2. Timing Your Trip

Your body gets used to sleeping during certain hours. If you drive during these hours, you will be tired. If possible, try to make long trips during the hours when you would normally be awake. This will not always be possible because of traffic restrictions that limit heavy vehicles to driving at night. If you need to drive at night you need to be extra careful.

3. Avoid Medicines

Some medicines may cause drowsiness. Always ask your doctor or pharmacist about possible effects on driving while on medication, whether the medication is prescribed by your doctor or bought over the counter.

Common medicines that may cause drowsiness are cold tablets, hay-fever and allergy medicines. If you have to drive while you have a cold, hay fever or allergy, it is much safer to drive with these symptoms than to take medicines which will cause drowsiness at the wheel.

4. Do Not Use Drugs

There are no known drugs that can overcome your feeling of tiredness. Some substances may keep you awake for a while, but will not make you alert. Later on, you may be even more tired

than if you had not taken them at all! Sleep is the only thing that can overcome tiredness, so if you have started driving and begin to feel tired, stop and sleep. You will know when you are getting tired. You may start to yawn or find that you are blinking more often, finding it difficult to keep your eyes open.

5. Do Not Drink Alcohol and Drive

Alcohol affects your judgment and makes it more difficult to judge risks, such as speed of your own vehicle as well as the speed of others. It makes it difficult to assess distance. Alcohol also gives you a false sense of confidence, which may encourage you to take risks that you would not otherwise take. It makes it difficult to concentrate and do more than one thing at a time, slows your reaction time and makes you more likely to crash.

Alcohol is a major cause of fatal road crashes.

6. Take Breaks

Short breaks keep you alert. Take them before you become tired. Never drive for more than 10 hours in any 24 hour period. Walk around and inspect the vehicle. It also helps to do some simple physical exercises, such as stretching, touching your toes or knee-bends.

7. Keep Your Mind on the Road

You can also do many things to keep your mind alert, like counting cars with different number plates or noting landmarks as you approach them. Invent your own ways of keeping your mind on the road and on the job. Long, straight roads can become very boring, especially at night.

8. Watch Your Food

Fresh fruit and vegetables are much better for you at any time. Eating these foods on a trip will stop you from being tired after a meal. Do not eat foods such as bread, potatoes, and French fries while you are on a long trip. Do not eat a heavy meal before you begin driving because big meals will make you tired. Eating smaller quantities of food more frequently will help you to stay alert. Special caution and care to be taken during the fasting periods.

9. Keep Comfortable

Adjusting the driving seat is very important for drivers. If you are uncomfortable, you get tired more quickly and you spend less time looking at the road.

If you can adjust your seat, this is what you should do:

- Sit in the seat with your back and shoulders against the back rest.
- Put your feet flat on the floor in front of the seat.
- Sit comfortably so your feet can reach the pedals.
- Adjust your seat forward and back so that your foot can push the clutch pedal completely to the floor while your leg still has a small bend at the knee (about 15 to 20 degrees).

10. Keep Cool

Try to keep as cool as possible. Depending on the weather, keep the windows and vents open to get fresh air into the cabin. Use the air conditioner if the vehicle is fitted with one.

11. Personal Safety

Make sure you follow these basic safety steps.

- Before driving, always make sure that there are no loose objects in the cabin like drink cans or clip-boards. Be careful about loose things on the floor of the cab that could get in the way of your foot connecting with the brake, clutch and accelerator pedal. Make sure you can push the clutch, brake and accelerator pedals all the way to the floor.
- If your vehicle is parked on the road, approach the vehicle from the front so that you are facing the oncoming traffic. As you leave the cab, climb out facing it, but watch for oncoming traffic. Be careful when you are climbing into or leaving the cab. It is easy to injure yourself. Always use the vehicle steps, foot-holds and grab handles. When you climb down from or up into the cab, make sure that you face towards the vehicle.
- Always use the dedicated steps provided on the trucks to get in and out of the truck. Do not step on tires as they can cause a slip or fall especially when the tires are wet.

B. Vehicle Checks

As a heavy vehicle driver, you should carry out daily inspections of your vehicle before you drive it. The time you spend checking your vehicle is an investment in your own safety as well as that of other drivers. Remember that as the driver you have final responsibility for your vehicle and what it does on the road.

Pre-trip Inspection

You should carry out these checks every day before you drive.

1. Around the Vehicle

Walk around the vehicle and look for any of the following problems:

- Vehicle tilt- If the vehicle sags to one side, look for a flat tire. The problem could also be overloading or incorrect loading. There could also be something wrong with the suspension.
- Load- Check that the trailer doors or load doors are closed and locked. Check that all lashings are secure.
- Load security- Check to see that the load is well packed and evenly distributed. A shifting load is dangerous. Check all lashings. Make sure all area load doors are locked. Check that tailgate, lift-gate, sliding ramp and other equipment are put away ready for travel. On an open trailer, the load may be covered. Make sure the cover is fastened down. Unsecured tarpaulins and loads can fall off and cause crashes.
- Load height- Make sure you know what the highest point of your vehicle is from road level. You need to know your height when you plan your route so you can avoid low bridges.
- Vehicle damage- Check for cracks, and missing or loose parts.
- Leaks- Check under the vehicle for signs of any leaks of oil, coolant, grease or fuel.
- Wheels and rims- Check for rim damage on each wheel. A bent or damaged rim might let a tire lose pressure or come off the rim.
- Check wheel nuts- If some are missing, the others have to take extra strain and may fail. Check for rust streaks around the wheel nuts. This is a possible sign that the wheel nuts are loose. Also check the wheels for signs of leaks from wheel bearings and seals.

Spilled or leaking grease can cause a fire or a wheel to lock. If any nut is missing or if they break off while being tightened, do not drive the vehicle.

- Tires- Check all tires for tread wear, damage and proper fit. Worn tires can cause loss of steering control. Never drive the vehicle if there are any signs of damage or excessive wear, such as bulges or bald spots. These might cause the tire to blow out. This applies to all tires. Just because heavy vehicles have more wheels and more tires than smaller vehicles, does not mean that problems with one or two tires can be ignored. A blow out of any tire can create a dangerous situation. All tires must be roadworthy.
- Tire pressure- Check the tire pressure with a gauge. Low pressure in tires on steering axles makes steering harder and causes heat build-up in tires. Low pressure in dual tires can cause them to rub together at the bottom and start a tire fire or cause a blow-out. The vehicle also will not brake or corner as safely as it should. If the pressure is too high the tire will wear more quickly than it should.
- Spacing between dual wheels- Check the space between dual wheels. Rocks or mud caught between the wheels can unbalance a wheel and damage the tire side walls and wheel bearings.
- Spacing between brake drum and wheel- Check the space between the brake drum and the wheel. Things caught in there may damage the brakes and the tire.
- Fuel system- Check that fuel tanks are firmly attached. Test fuel caps by hand to make sure they are properly closed. Check for leaking fuel.
- Cryogenic equipment (Transfer hoses / Pump / Pressure / No leaks etc.)

2. Engine Checks

Visually check the engine area for any signs of damage, particularly to the steering mechanism or suspension.

Then go through the following checklist:

- Fluid levels. Check crank case oil, radiator coolant, battery fluid and windscreen washer fluid. Check automatic transmission and the oil make-up tank, if fitted. Check the power steering fluid reservoir. Top up all fluids.
- Leaks. Look for signs of oil leaks, water or brake fluid. If there are leaks, have them checked before you leave.
- Electrical system. Check for loose electrical wires and get them fixed before you leave.
- Belts and pulleys. Check the belts on the generator, alternator, water pump, air conditioner and air compressor. Make sure they are intact and are not frayed or cracked. If you need to adjust them, look at the vehicle manufacturer's handbook.
- Finally. Securely close the bonnet or lower the cab, locking it in position. Failure to undertake these checks may result in fluid levels becoming so low that steering, brakes or transmission fail.

3. Checking Driver's Controls

- Vehicle entry. Check that everything is safe. For trucks, check the ladder, grab handles and door handles.
- Emergency and safety equipment. Make sure you have all the proper equipment. This should include:

- fully charged fire extinguisher
- first-aid kit
- at least three, two-faced reflective triangles
- spare fuses
- seat belts.
- Mirrors and glass. Clean all windows and mirrors and make sure they are not cracked. Check that the windscreen wipers and washers work. Replace worn wiper blades and clear blocked washer jets. Check that mirrors are adjusted properly.
- Engine start-up. Before starting up the engine, check that the parking brake is on. Start the engine and let it idle until full oil pressure shows on the dashboard gauge. Increase the engine revs slightly until the water temperature gauge starts to rise.
Instruments and gauges. With the engine running, check that all instruments and gauges are working.
- In the case of oil levels, the dipstick will tell you the level. Always make sure that the oil level as shown on the dipstick is just under 'MAX'. As far as other levels are concerned, make sure that the levels are maintained at the required level as shown on the reservoir. If these levels are not maintained, serious damage can be done to the operating systems of the vehicle – transmission, steering, and electrical equipment – resulting in loss of control and increased risk of serious crash.
- Primary controls
 - With the engine still running, check the following:
 - steering wheel for any slackness
 - press the clutch until you feel a slight resistance (some free play is normal)
 - that the accelerator and brake are operating properly.
- Secondary controls
 - Check the following:
 - switches and signal lamps
 - interior and dashboard lights
 - horn
 - indicator lights for left and right turn signals
 - that the cabin is clear of rubbish and loose equipment is stowed away
 - that all lights are working including, low and high beam, hazard warning lights, number plate and running lights
 - the brake lights
 - reflectors.
 - You will need to get out of the vehicle to check external lights. Wipe any dust and grease from all lights and reflectors.

4. Final Checks

These are the checks you need to make for different vehicle types.

1. Air Brake Vehicles

Check the following:

- Air intake filter is not clogged. Open the air tank taps and if there is oil in the air that comes out, there may be a problem with the compressor. This must be checked by a mechanic. Do not forget to close the taps afterwards.

- Low air pressure warning gauge works. The gauge should show a steady increase after the engine has been turned on. This should take less than 3 minutes. If it takes longer, adjustments are needed. Note the air pressure loss since the last stop. If the loss is more than 70kpa, there may be a problem. Seek help from a mechanic.
- Low pressure emergency systems. Stop the engine and reduce air pressure by pressing the brake pedal.
- Trailer brake check. Apply trailer brakes only and try to move forward gently. The vehicle should not move. Check that air hoses are not damaged or leaking and are properly connected to the towing vehicle.

2. Hydraulic Brake Vehicles

- Pump the brake pedal 3 times. Push the pedal firmly and hold it down for 5 seconds. If, after 5 seconds, you feel the brake pedal sinking, there is a leak in the system. You must have these leaks fixed before driving.

3. All vehicles

For all vehicles you must check the following:

- Parking brake check. Try to drive forward in low gear while the parking brake is on. The vehicle should not move.
- Full brake check. In first gear move forward at no more than 5 km/h. Apply the brakes firmly. If the brakes feel slow to respond or if the vehicle pulls to one side, the brakes need attention from a mechanic.
- Final steering check. Pay close attention to steering performance as you move off.

4. Prime Movers and Semi-trailers

- Check for slack in the coupling by moving gently forward and back. For all prime movers and trailers it is important to check that there is no turntable slack. With the trailer brake on, gently pull forward and reverse to make sure there is no slack in the turntable connection.
- Make sure that the trailer legs are wound up and that the winding handle is put away.
- Check that all electrical leads are connected properly and that trailer lights and indicators are working.

5. After Departure Checks

Visually check that your load is secure, using all your mirrors. At your next stop do a quick check around the vehicle. With your hand, check the temperatures of tires and brake drums. Look for smoke or feel for excessive heat radiating from brake drums. Be careful not to burn yourself. You will be able to feel heat coming from the brake drums without touching them. Look for under-inflated tires and over-heated brakes. Look for any liquid leaks which may have become visible. Each time you stop, repeat these checks.

C. Use of PPEs

1. Safety Helmets



- Helmets/hard hats are to be worn by all persons in all areas with signs instructing to wear helmet and also wherever the possibility of an overhead hazard exists. E.g. distribution facility and customer deliveries where construction or heavy works exists.
- Helmets/Hard Hats can protect employees from head impact, penetration injuries, and electrical injuries such as those caused by falling or flying objects, fixed objects, or contact with electrical conductors.

2. Safety Footwear



- Safety shoes or boots shall be worn by all persons engaged on the plant or moving about the workplace.
- Safety footwear should have soles which are slip resistant and provide appropriate resistance to oil, static, heat, chemical abrasive etc hazards based on the intended use. For cylinder handling the shell strength that is recommended is 200 J.
- Safety shoes can help prevent injuries by protecting employees from hazards such as falling or rolling objects, sharp objects, wet and slippery surfaces, molten metals, hot surfaces, and electrical hazards.
- Safety footwear should be designed according to ISO standards 1989, 3738 or 5557.

3. Ear Protection



- Ear muffs are to be worn when continuously operating items of equipment or working in areas where the noise level exceeds acceptable levels.
- Wearing earplugs or earmuffs help prevent damage to hearing. Exposure to high noise levels can cause irreversible hearing loss or impairments as well as physical and psychological stress. Earplugs are made from foam, waxed cotton, or fiber glass wool that are self-forming and fit well.

4. Protective Clothing

- A full overall has to be worn by the drivers and the workers on entering the plant facilities.
- Overalls protect the body against hazards such as exposure to heat and radiation as well as hot metals, scalding liquids, hazardous materials or waste, and other hazards. Overalls are made of special fire-retardant wool and fire-retardant cotton to protect the whole-body.
- Protective clothing should be designed according to ISO standards 8897, 6994 (part1).

5. Safety Gloves



- Safety gloves have to be worn by workers while handling or working on the flat beds, tankers, trailers, gas cylinders, iron pallets, cylinder valves etc.
- Gloves protect workers from being exposed to harmful substances through skin absorption, electric shock severe cuts or lacerations, severe abrasions, chemical burns, thermal burns, and harmful temperature extremes.
- Cotton gloves: for general use, including maintenance.
- Leather gloves: to be used only for cryogenic work. The cleanliness of these is of utmost importance.
- These gloves should be designed according to ISO standards 8897, 6994 (part1)

6. Safety Goggles /



Shield

- Safety goggles can protect employees from the hazards of flying fragments, harmful dust, gas light radiations, chemical burns/irritation to the eyes and other serious irreversible damage to the eyes.

- The face shield is to be used compulsorily at the time of filling and decanting the tanker, ISO and the tube trailers.
- Safety goggles should be designed according to ISO standards 8520, 1179 or 5983.

7. Respiratory



Protection:

- Dust masks or filter cartridge respirator should be used when working in situations e.g. Deserts, polluted weather conditions or dealing with toxic gases like Anhydrous Ammonia bulk, cylinders and drums or any emergency situations.
- Dust masks should be used according to ISO standards 8520, 1179 or 5983.

D. Defensive Driving

The driver should follow the recommended defensive driving practices as outlined below in all their trips.

- Search the horizon
- Maintain space and visibility
- Always move your eyes
- Recognize and respond
- Take control – be seen.

1. Search the horizon

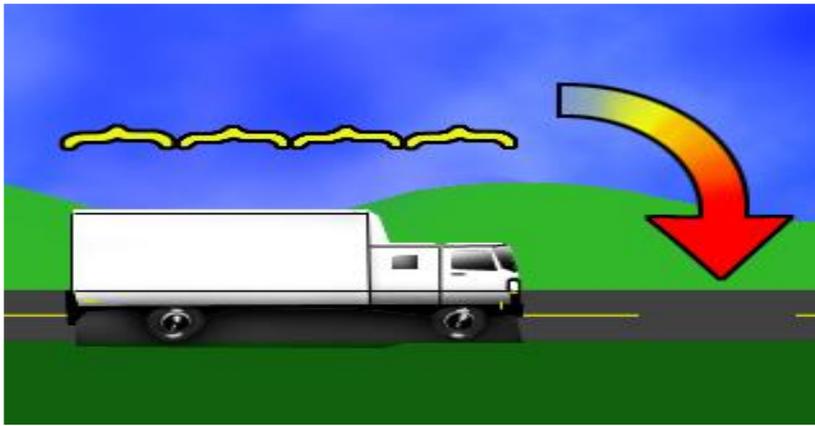
The driver must search as far ahead as possible to observe potential hazards so that they can take the appropriate action.

- Center the vehicle
 - Helps you be seen by other drivers
 - Gives you some room to maneuver if needed
 - Focus on center of lane.
- Spot problems early
 - Erratic drivers.
- Never plan to go into opposite lane, oncoming driver may attempt to swerve back onto his side of the road.

2. Maintain Space and Visibility

The driver must create adequate space and visibility which will allow him to perceive and act according to the changing road and traffic conditions.

- Don't get distracted, keep your eyes on the road
- Keep your brain connected to the road
- Avoid fixed vision
- "Understand the road" rather than "looking at the road".
- Safe Distance
 - 1 second for every 3 meters or 10 feet of vehicle length



- Plus 2 seconds think/act time under ideal conditions
- If you are being tailgated, treat them like a trailer and add more following distance.
- Areas around your vehicle unable to be seen with mirrors must be searched with a positive shoulder check.
- A positive shoulder check is a glance over your shoulder into the lane signaled; this is to clear any areas around the vehicle unable to be seen with mirrors alone.

3. Always Move Your Eyes

Train yourself to;

- Move your eyes every 2 seconds
- Scan from side to side
- Check your mirrors every 5 to 8 seconds
- Check left-right-left at intersections.

Internal, driver related

- Fatigue
- Impatience

4. How to overtake

Before passing

- Turn signal
- Mirror check
- Positive glance over shoulder
- Accelerate - Not legal to go over speed limit
- Change lane
- Need 5 MPH / 8 KPH to pass

After passing

- Turn signal
- Mirror check (should see the whole face of the passed vehicle in your center mirror)
- Positive glance
- Move back into original lane
- Maintain Speed

Safe reversing practices

- Check the rear of the vehicle.
- Sound the horn before you start to move.
- Reverse immediately.
- Reverse slowly.
- As you reverse, check both side-mirrors.
- Don't reverse further than necessary.
- Reverse to the driver's side.
- Use a ground guide.
- Always park so the first move in the vehicle is forward.
- Engage your 4-way flashers (hazard lights) prior to reversing and when finished turn off flashers.

5. Take Control and Be Seen

1. Be decisive and ensure that you are visible on the road
 - Use your
 - Horn
 - Lights
 - Turn Signals
 - Hand Signals
 - Position yourself where you can be SEEN
2. How to prevent a pedestrian collision?
 - Slow Down
 - Get eye contact, use your horn
 - Look for feedback
 - Repeat these steps until you get feedback. If no feedback STOP!!
3. Other Drivers:
 - Checked intentions of oncoming traffic.
 - Use your signals well in advance.
 - Wait for response.
 - Eye contact.
 - Adapt your communication signals to the local conditions.

E. Parking Procedure

Parking for Tube Trailers, ISO's & Tankers must be done as per the Parking Plan/Layout designed by the concerned facility.

Because you cannot see what is directly behind you, reversing is risky. If you reverse, make sure you do the following:

Inspect your path. Check your line of travel before you begin. Make sure the road or surface will support the vehicle.

Check your clearance. Check for low, over-hanging objects.

Reverse slowly. This way you can easily correct steering errors and stop quickly.

Reverse and turn to driver's side. Because you see more in the left mirror than the right mirror, it is safer to reverse in by reversing to the left (driver's) side, where you can see more.

Reverse and turn to the driver's side wherever you can. When turning towards the driver's side, you can watch the rear of your vehicle out the side window and in the left mirror. You cannot see as much in the right mirror. With a box trailer you will see nothing but the front right corner of the trailer in the right mirror.

Use a person to help guide you. You cannot see directly behind your vehicle. There are other blind spots. So use a person to guide you wherever you can. The guiding person should stand where they get the clearest view of your vehicle and can signal to you. You probably will not be able to hear your guide properly, so work out some hand signals for communication before you start.

A guide can see your blind spots and guide you through them.

F. Driving Rule according to GCC Laws

- Driving a vehicle under the influence of alcohol or drugs is punishable by up to a year in prison and/or a fine. The court can also confiscate the driving license in case of repetitive offences.
- Reckless driving, driving without a valid driving license or driving a vehicle not permitted to drive as per the driving license, is punishable by fines and/or imprisonment.
- Breaking a red light is punishable by imprisonment and fine.
- Speeding, unauthorized racking, wrong side driving are punishable.
- Failure to fasten the seat belt, failure to produce a driver's license or the vehicle registration book upon request by traffic police or security men is punishable.
- The police have the power to detain drivers for the following reasons:
 - Driving without a valid driving license
 - Driving under the influence of alcohol or drugs
 - Causing an accident which may result in death or serious injury
 - Racing on the public roads.
 - Attempting to flee after being involved in an accident in which people may have been injured or after being ordered to stop
 - Failing to stop at a red traffic light
 - Driving recklessly so as to endanger others

G. Emergency measures

A product leak is when a product leaves a container in an uncontrolled manner and the response to the leak will depend on the characteristics of the product that is leaking. Refer to the 'TREM Card' for immediate control measures.

- Move the vehicle to a suitable area away from the general public, if possible.
- Stop the engine
- Locate the leak and assess characteristics.
- Put wheel chocks.

- Cut the battery tap
- Set up the appropriate traffic signs (triangle, cones, lights...)
- Inform the immediate supervisor
- Attend to the vehicle from a safe distance if necessary; stay upwind.
- Request the by-standers to stay at a safe distance.

4. CYLINDER TRUCK DRIVER

A. General:

- Deliver the trucks/ trailers to customers as per distribution supervisor's instructions.
- Carry out daily check list by filling vehicle inspection form and ensures that vehicles are in good condition.
- Reporting any mechanical problems to supervisor

B. Unloading and Loading of Cylinders

- All cylinders should be loaded and unloaded with the cylinder caps fitted on them properly threaded till the end. In case of valve guards fixed on the cylinders it will not be taken off.
- In case of the delivery through the trailer, the drivers have to make sure that the pallets are safely locked while loading and unloading the pallets full of cylinders using a the trailer mounted forklift.
- Secure all cylinders properly.
- Cylinders should be loaded in an upright position.
- The use of open vehicles or trailers is highly recommended.
- Load vehicle only up to safe carrying limit.
- Smoking is strictly forbidden when loading, transporting, and unloading, flammable or oxidizing gases
- Toxic or pyrophoric gases must not be transported in enclosed vehicles.
- Safety devices in valves or on cylinders shall not be tampered.
- Never force a cap or regulator. The cap should be hand tight.
- Cylinders shall not be exposed in extreme temperature, spark producing electrical tools, cigarettes, and open flame nor stored in the vicinity of combustibles.
- Cylinders shall not be exposed to excessive dampness, or to corrosive chemicals or fumes.
- Chains or a clamp-plus-strap assembly are the most common methods of keeping cylinders in upright position. Ensure the chain or strap is attached appropriately to prevent the cylinder(s) from falling over.
- No transfer of Gases shall be carried out from one cylinder to another, do not try to refill compressed gas cylinders.
- Under no circumstances should any attempt be made to repair a cylinder or valve.
- If leaking cylinder is discovered move it to safe place (if it is safe to do so) and inform "Emergency Control / Response Center or Technical Support center within the organisation and inform your supervisor/ safety team.

5. BULK TRUCK DRIVER

A. Coupling Procedures



1. Before Coupling
 - Check if the fifth wheel handle is fully open and that there is nothing sitting on the chaise or the fifth wheel so it is ready to couple.
 - Check the trailer to ensure that there is no Pin Lock fitted, and that there is nothing obvious that could prevent the trailer from connecting to the fifth wheel.
 - Check for enough Grease on the Fifth wheel to ensure safe coupling.
 - Check if the trailer hand break is applied.

2. While reversing
 - The trailer should be lifted by the fifth wheel while backing up.
 - Ensure that the trailer rubbing plate is touching the fifth wheel during the reversing.
 - Lift the trailer with the tractor to ensure continuous contact.
 - DO NOT Reverse the tractor in to position with the suspension lowered, then raise the fifth wheel under the king pin.
 - This will damage the fifth wheel.
 - Will not allow a safe coupling.
 - SHOULD NEVER BE DONE
 - Reverse in steady speed of 2-3 KM/H.
 - Keep the fifth wheel in line with the center of the trailer at all times.
 - Until you can feel or hear the king pin entering the fifth wheel.

3. After reversing
 - Get out and check if the handle is fully closed (to check, try to pull the inter lock handle out, without touching the inner handle).
 - Check visually that the lock of the fifth wheel is in place, by looking inside the fifth wheel.
 - If not closed, NEVER close it by hand. The whole coupling process must be repeated.
 - Test the coupling by trying to move the tractor head without releasing the trailer breaks.

4. After coupling
 - Remove the static release clamp.
 - Connect air and electrical connection.
 - Check the trailer / tanker is not connected to any equipment or assets externally.
 - Raise-up the trailer legs.
 - Release the trailer hand brake.
 - Drive Away.

Uncoupling procedure

- Park the combination in a straight line.
- Apply the tractor unit parking brake, stop the engine and remove the keys.
- Apply the trailer parking brake.
- Remove and stow the trailer number plate and lower the landing legs.
- Disconnect all of the air and electrical services and stow safely.
- Remove the security "dog clip" and pull the release handle to disengage the 5th wheel jaws.
- Slowly draw the tractor unit away from the trailer. If the tractor unit has mechanical suspension stop when the trailer is clear of the fifth wheel.
- Apply the tractor unit parking brake, stop the engine and remove the keys.
- Before leaving the trailer, walk round it to check that it is in a safe condition.

B. Guidelines for Loading/Unloading Cryogenic Tankers

The loading and unloading of cryogenic liquids are activities which could give rise to significant safety risks. The hazards may be in the form of asphyxiation, fire or bursting at high pressures. When the driver comes to take the trailer for dispatching the products the dispatcher will inspect the tanker with the driver with the check list.

As a minimum, operators who handle cryogenic liquids should be equipped with the following Personal Protective Equipment (PPE):

- Safety shoes
- Full length trousers
- Long sleeve shirt
- Gloves suitable for use with cryogenic liquids
- Eye protection

The preferred fabric for the clothes is pure cotton or flame retardant materials.

Contact with Cryogenic Liquids

Always handle cryogenic liquids carefully. At their extremely low temperatures, they can produce frostbite on skin and exposed eye tissue. When spilled, they tend to cover a surface completely, cooling a large area. The vapours issuing from these liquids are also extremely cold. Delicate tissues, such as those of the eyes, can be damaged by exposure to these cold gases, even when the contact is too brief to affect the skin of the hands or face.

Never allow any unprotected part of the body to touch un-insulated pipes or vessels which contain cryogenic fluids. The extremely cold metal will cause the flesh to stick fast and tear when one attempts to withdraw from it.

Even non-metallic materials are dangerous to touch at low temperatures. Use tongs to withdraw objects immersed in a cryogenic liquid. In addition to the hazards of frostbite or flesh sticking to cold materials, objects that are soft and pliable at room temperature; such as rubber or plastics, are easily broken because they become hard and brittle at these extremely low temperatures. Carbon steels also become brittle at low temperatures and will easily fracture.

Following are the recommended emergency treatments for a cold-contact burn while awaiting medical assistance:

- Remove any clothing that may restrict the circulation to the frozen area. Do not rub frozen parts as tissue damage may result. Obtain medical assistance as soon as possible
- As soon as practical, place the affected part of the body in a warm-water bath, which has a temperature of not less than 105 °F or more than 115 °F (40 °C to 46 °C). Never use dry heat. The victim also should be in a warm room if possible
- If there has been massive exposure so that the general body temperature is depressed, the patient must be re-warmed by total immersion into a warm-water bath. Supportive treatment for shock should be provided.
- Frozen tissues are painless and appear waxy with a possible yellow colour. They will become swollen, painful and prone to infection when thawed. Do not re-warm rapidly if the accident occurs in the field and the patient cannot be transported to medical attention immediately. Thawing may require from 15 to 60 minutes and should be continued until the pale blue tint of the skin turns pink or red. Narcotics, such as morphine or tranquilizers may be required to control the pain during thawing and should be administered under professional medical supervision
- If the frozen part of the body has thawed by the time medical attention has been obtained, cover the area with dry sterile dressings with a large bulky protective covering
- Alcoholic beverages and smoking decreases blood flow to the frozen tissues and should not be used. Warm drinks and food may be administered to a conscious victim

Protective Clothing and Equipment:

Eye and hand protection for handling cryogenic liquids should be used by all workers with any chance of exposure to liquids or boil-off vapour. Adequate eye and hand protection serves primarily to protect workers against splashing and possible cold-contact burns.

Safety glasses are recommended during transfer and normal handling of cryogenics. If severe spraying or splashing may occur, a face shield or chemical goggles should be worn for additional protection.

Insulated gloves should always be worn when handling anything that comes in contact with cold liquids and vapour. Gloves should be loose fitting so that they can be removed quickly if liquids are spilled into them. Trousers should be left outside of boots or work shoes.

Special Oxygen Precautions:

Keep all combustible materials, especially oil or grease, away from oxygen. Do not permit smoking or open flames in any area where liquid oxygen is stored or handled.

Oxygen is non-flammable but it vigorously accelerates and supports combustion. Substance that burns in air will burn much more vigorously in oxygen. The upper flammable limit for a flammable gas in air is raised in oxygen-enriched air atmospheres, which means that fire or explosion is possible over a wider range of gas mixtures.

Do not permit liquid oxygen or oxygen-rich air atmosphere to come in contact with organic materials or flammable substances of any kind. Some of the organic materials that can react violently with oxygen when ignited even by a hot spark are oil, grease, asphalt, kerosene, cloth, tar and dirt that may contain oil or grease. If liquid oxygen spills on asphalt or other surfaces contaminated with combustibles, (e.g., oil-soaked concrete or gravel) do not walk on or roll equipment over the area of the spill. Keep sources of ignition away for at least 30 min after all frost or fog has disappeared.

Always operate valves in oxygen slowly. Abruptly starting and stopping oxygen flow may ignite any contaminants that might be in the system.

Any clothing that has been splashed or soaked with liquid oxygen should be removed immediately and aired for at least an hour until it is completely free of excess oxygen. If you are exposed to high-oxygen atmospheres, leave the area, avoid all sources of ignition, particularly smoking, and wait for a half hour until clothing and the exposed area are both completely ventilated. Clothing saturated with oxygen is readily ignitable and will burn vigorously.

Preparation before unloading

On reaching the delivery point and before starting the unloading operation, the driver must do the following:

- Once the vehicle is parked, chock the wheels of the vehicle.
- Put on the individual protection equipment, making sure that they conform to the safety equipment rules.
- Verify that the delivery point complies with operational standards.
- Verify that nothing abnormal has occurred since the last delivery: there is no leakage, the pressure and level gauges are in working order, there is no functional anomaly at the customer delivery point.
- Verify that the relief valves and bursting disks of the overpressure safety device are in good condition.
- If the delivery will be made using a pump driven by an electrical motor, confirm that the socket and the earthing of the delivery point are in good condition.
- Verify that the discharge pressure of the pumping unit of the vehicle is suitable for the maximum service pressure of the storage to be filled. Even though there is a safety system for preventing overpressure at the end of filling, the driver should take measures to prevent such an incident. See EIGA 59/98 'Prevention of excess pressure in cryogenic tanks during filling'.

- Lastly, note the pressure and the level in the storage before the delivery, in order to determine the operating rate of the pump to be used and to estimate the quantity to be transferred.

After connecting the transfer hose between the storage and the vehicle, it is purged in the direction from the storage to the vehicle by first opening the hose purge valve of the vehicle, then opening very slightly the valve connecting the gas phase of the storage with the hose.

Unloading operation

- Adjust the pressure in the tanker of the vehicle to ensure under-cooling of the liquid and a sufficient suction pressure at the pump.
- If the vehicle does not have a pump, adjust the pressure of the tank on the vehicle to 2 or 3 bars above the pressure of the storage to allow the transfer to take place.
- Start the pump. For pumps with an electric motor, it is recommended that the vehicle be equipped with an automatic system to check the order of phases to prevent the risk of running the pump in reverse. At a minimum, the installation of a manual phase switch is required.
- When the pump is primed and its by-pass is closed, adjust the pump discharge valve to set the desired pressure and flow. Then adjust the distribution of the flow between the liquid phase and the gaseous phase in the storage in order to maintain the pressure at the level required by the customer.

During filling, the pressures of the vehicle tank and the storage of the customer should be constantly monitored and adjusted. It is absolutely essential that the driver remain at the controls.

Completion of unloading

On completing the unloading, the driver should do the following:

- Disconnect the hose from the storage and return it to its place. The pressure regulator of the storage is put back in service. Close the filling valves, ensure no safety valves are blowing or about to open, and ensure the filling inlet connector is closed and sealed by a plug or a solid flange.
- Carefully close the enclosure around the storage, if there is one.
- On the vehicle, verify the pressure, ensure the valves are closed, especially the pressure building valve and the main liquid outlet valve in the tanker bottom, which have to be closed during transport. Also ensure that the rear door of the vehicle is properly closed.

6. DO'S AND DON'T'S- A SUMMARY

Before You Drive

- DO check the trucks according to the check list provided at least twice a week and ensure the cleanliness of the vehicle, oil and water level check etc. and that it is safe to operate before every trip.
- DO wear safety belts, goggles, a hard hat, safety shoes and other personal protective gear.

- DO check if you are carrying all necessary documents showing you are qualified to operate your vehicle.
- DO NOT drive if you are ill, exhausted or under any such physical limitations.
- DO ensure that the load transported does not exceed the vehicles capacity.
- DO ensure that all loads are secured and tied down properly.

While You Drive

- Do abide by all the Traffic regulations and also the warning signs/notices placed in the plant.
- DO remember the 2 second rule and never fail to follow it.
- (2 second rule signifies the distance to be kept between 2 vehicles in order for the vehicle to stay in control in case of any sudden traffic mishap).
- DO maintain the warehouse speed limits.
- DO use your horn at corners, crossings or before reversing.
- DO NOT operate cell phones/radios while driving park at a safe spot before responding to any calls.
- DO switch off cell phones before entering petrol stations, restricted areas e.g. (KNPC refinery, Equate etc.) and comply with attendant's instructions.

- DO use hazard warning lights to alert other drivers on the road if any hazardous situation is ahead.
- DO reduce your vehicle's speed under bad weather or road conditions.
- DO NOT fuel your vehicle with a running engine.
- DO be aware that a warning notice will be issued to drivers who violate traffic regulations and after 2 such warnings the driver will be dismissed from the job.
- DO avoid driving through the desert. If unavoidable make sure to use rig roads.
- DO NOT smoke while driving or anytime when the driver and labour are in the truck.

After You Drive

- DO Report to the supervisor about any problems regarding the vehicle or driving issues.
- DO Park the trucks in the proper order and lanes at the designated areas when present in the company.
- DO NOT park vehicles next to fire hydrants, firefighting equipment, building exits, walkways etc.
- DO set the parking brake every time vehicle is parked, and vehicles parked at inclination must have their wheels chocked.
- DO inform the customers of the potential hazards and proper regulations regarding the handling of the cylinders

7. EMERGENCY CONTACT

- In case of accident on the road, you need to contact your Supervisor.
- Dial the local emergency number.

8. OTHERS

Traffic signals



Aware of your speed limits in your driving locations in and out of regions.

