AIGA 2008 MEETING

Product Vehicle Safety & Accident Prevention

AIGA

Asia Industrial
Gases Association

FMM MIGMA

Co-organiser:

FMM Malaysian Industrial Gases Manufacturers Group

Safe Transport of Packaged Gases
Best Practices

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Aug. 26-27
Kuala Lumpur

Agenda

- Horizontal Cylinder Delivery—High Risks
- Advantage of Vertical Cylinder Delivery
- Cylinders Handling Techniques
  - Manual
  - Mechanical
- Secure of individual and pallets/bundles
- Load Distribution

Why safe cylinders handling is important?

Risks with Horizontal Cylinder Delivery

- Full cylinder may be propelled out of the vehicle and possible to hurt the third party
- Cylinders roll on their own
- High Probability of hand and foot injuries
- Difficult to secure cylinders, high possibility of valve damaged and gas release

Risks with Horizontal Cylinder Delivery

- Valves are used to bring cylinders to upright or down position
- Personnel usually bend on their back—possible back injure
- Personnel stand on the cylinders to roll them, easy to be injured

Advantages of Vertical Cylinder Delivery

- Cylinders are used in the vertical position
- Cylinders are stored both at the customer and the supplier in the vertical position
- Cylinder is handled vertically at filling station

Advantages of Vertical Cylinder Delivery

- Easier to put cylinders together in a pallet/basket for mass loading and unloading
- Heavier cylinders with high pressure gas make it more difficult to move cylinders between vertical to horizontal positions

Horizontal Cylinder Transportation is not Recommended

Manual cylinder handling techniques

1. Rotate on its base

Manual cylinder handling techniques

2. Dock Edge Roller

Manual cylinder handling techniques

3. Loading/unloading pallet

Bump mat

Manual cylinder handling techniques

1. Trolley

Cylinder Handling Technique - Mechanical

1. Trolley

Cylinder Handling Technique - Mechanical

2. Hand truck

Cylinder Handling Technique - Mechanical

3. Forklift Truck for Pallets/Bundles

Cylinder Handling Technique - Mechanical

4. Truck with Crane

Cylinder Handling Technique - Mechanical

5. Truck with Lift Gate

Rear Lift Gate

Side Lift Gate

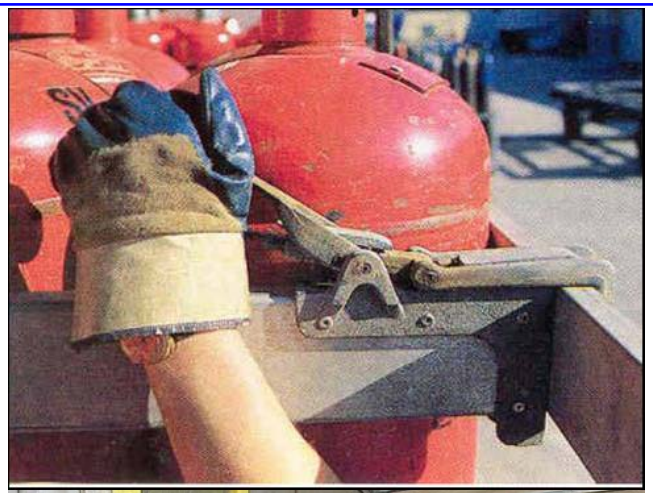
Cylinder Handling Technique - Mechanical

5. Truck with Lift Gate

Unsafe Area

Don’t place yourself in harms way

Secure of individual cylinders



- Cylinders must always have caps on during handling and transport
- Cylinders should be properly secured
  - Securing straps/chains
  - Ratchet type binders
- If cylinders are to be unloaded individually
  - Truck must have a center aisle
  - Equipped with lift gates

Secure of pallets and Bundles

- Cylinders must be properly strapped to the pallets
- Pallets must be properly designed for the full load
- Truck must have specially designed pallet locating system to hold the pallets in place during transportation
- When using cranes, bundles/pallets must have properly designed lifting spots

Securing Liquid Cylinder

Securing to the Side Panel with Straps

Liquid Cylinder Pallet

Secure of Pallet/Bundle on Truck

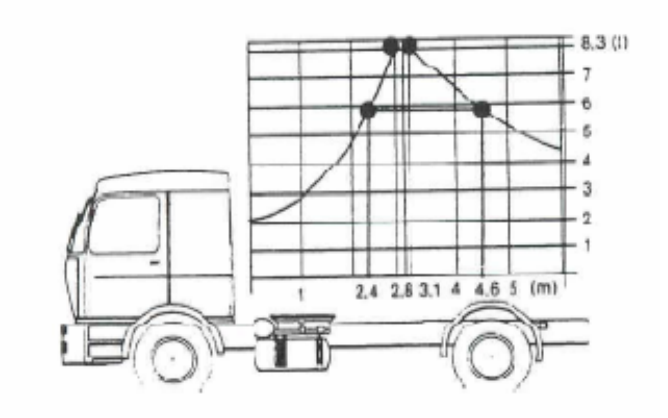
Truck with Locating Pins &

Pallets with Locating Pockets

Truck with Hooks at the Middle of the Platform

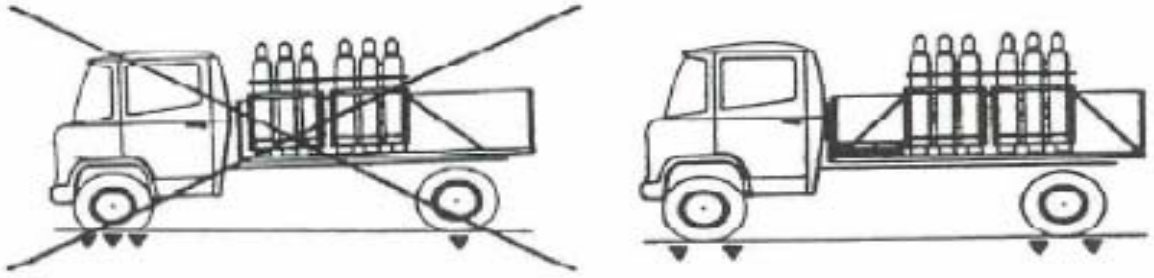
Load Distribution

- Load distribution diagrams are a valuable aid in determining the most favourable or the permissible distribution of the load.

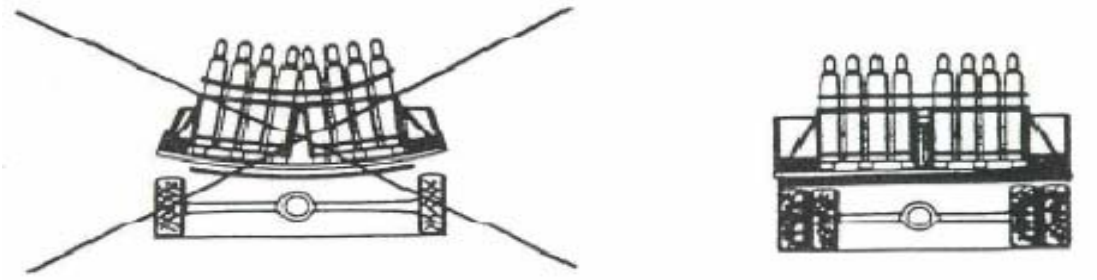


- The vehicle manufacturer's technical data should be checked for the effect of load distribution on the maximum permissible loads.
- Do not exceed the permissive loading

Load Distribution

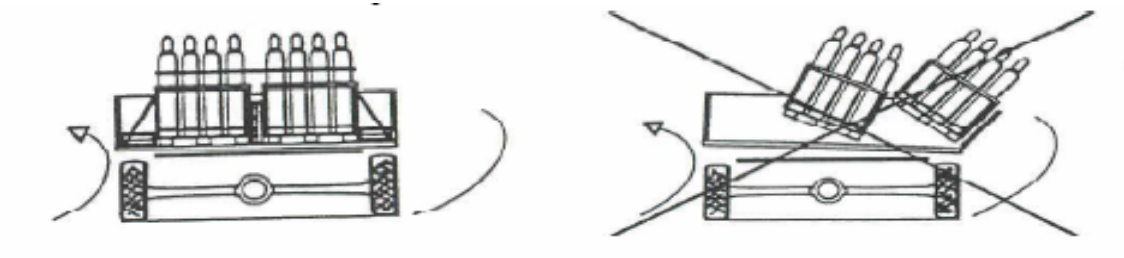


Distribute load correctly



Do not exceed load capacity of the cargo area

Load Distribution



Maintain transverse load security