EUROPEAN
RENTAL
ASSOCIATION

# TIE DOWN AND LIFTING POINTS, LIFTING POCKETS

TECHNICAL COMMITTEE – JANUARY 2016

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RENTAL
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# Structure

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PART ONE

# GENERAL RECOMMENDATIONS

## GENERAL RECOMMENDATIONS – 1 - SHAPE AND PLACE

- The tie down points should be **round** were possible (not sharp).
- There should be some tie down points not only at the back of the machine but also **on the side**.
- The tie down points should be **outside of the machine** but shouldn’t take extra-dimensions.
- Tie down points need to be **easily accessible**.
- They have to be **part of the chassis** or **welded** rather than screwed

## GENERAL RECOMMENDATIONS – 2 - MEASURE AND IDENTIFICATION

- The tie down points should be **far away from the tyres** (not to damage them) and **from the ground** (at least 40cm from ground). There should be an angle of almost 45°.
- The **inside diameter** should be at least 10cm. The **thickness** of the point shall fit to the hook.
- The rental companies recommend having **stickers** on the machines showing as an overview where all the tie down points and lifting points are.
- There should be **no possible confusion** between tie down points and lifting points.

## GENERAL RECOMMENDATIONS – 2 - MEASURE AND IDENTIFICATION

- Rental companies recommend to make tie down and lifting points **recognisable** by colour and /or shape.
- Rental companies recommend to make **different shapes** for lifting points and tie down points.
- There should be **no other holes** in the area of lifting points or tie down points.

PART TWO

# TIE DOWN AND LIFTING POINTS - ACCESS EQUIPMENT

# Round tie down points (not sharp)

NOT A GOOD SOLUTION

- The corners are sharp.
- The eyelet points need to be round (not angular).
- Straps with hooks cannot be used.

# Not only at the back but also on the side

GOOD SOLUTION

- Tie down points should be as much as possible on the flanks, not at the head or tail side of the machines.
- Better to reach for the driver.
- In order to load always more machines on a trailer, rental companies need to store them side by side. Consequently they cannot reach tie down point at the front or at the back.

# Outside of the machine but no extra-dimensions

GOOD SOLUTION

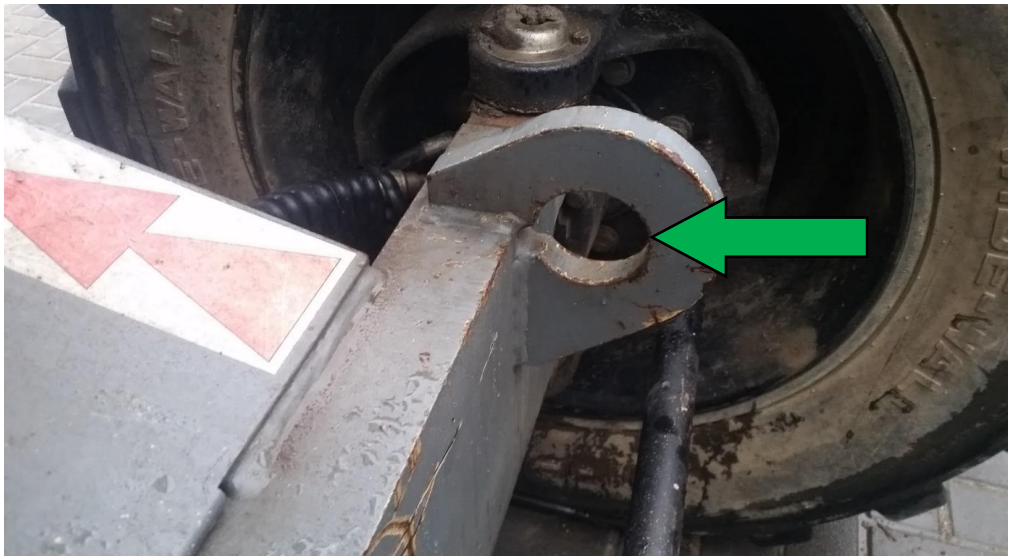
- Tie  down points must be, as much as possible, to the outside of the machine but not extending the dimensions of the machine.
- The rental companies put machines next to each others (side by side).
- When points are on the flank, there is no obstacle in the line to strap.

# Easily accessible

GOOD SOLUTION

- Lifting points are located in good places. The access is easy even for a large hook. They are placed widely increasing the stability during raising.

- Easy access to lifting points from both sides. **Manual shows possibility loading/unloading by crane.**



# Easily accessible

NOT A GOOD SOLUTION

- The points are not accessible from the side.

# Far away from the tyres and from the ground

**NOT A GOOD SOLUTION**

- The tie down points are too low, too small and behind the wheels. It can damage the tires.

# Diameter should be large enough

GOOD SOLUTION

- In this model, lifting points in the back are well located and big enough to enable even big hook.

# Diameter should be large enough

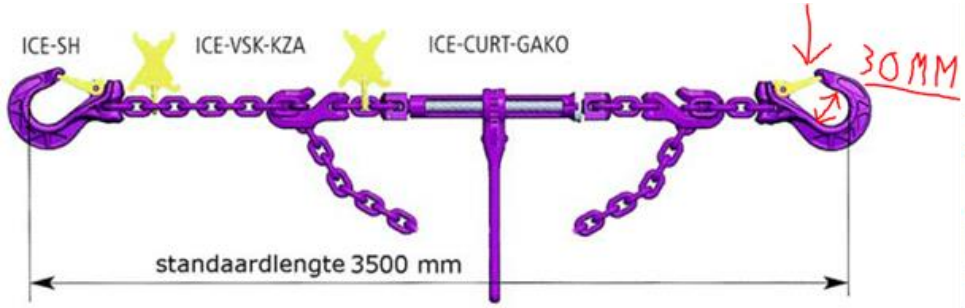
NOT A GOOD SOLUTION

- Holes to small and not visible as such.

# Thickness should fit to the hook

NOT A GOOD SOLUTION

- Most used tie down tool:




Product ID: 1824

| | |
|---|---|
| Ketting diameter | 8 |
| Sjorcapaciteit LC (daN) | 6.000 |
| Type spanner | ICE-CURT-8-GAKO |
| STF in daN | 2.800 |
| Slag (mm) | 170 |
| L-min (mm) | 1.040 |
| Gewicht (kg) | 8,0 + 5,2 |

- The hook should have enough space to turn. The thickness is limited to the opening of the hook. In this example it should not be thicker then 30 mm.

PART THREE

# TIE DOWN AND LIFTING POINTS - CONSTRUCTION EQUIPMENT

# Round tie down points (not sharp)

GOOD SOLUTION

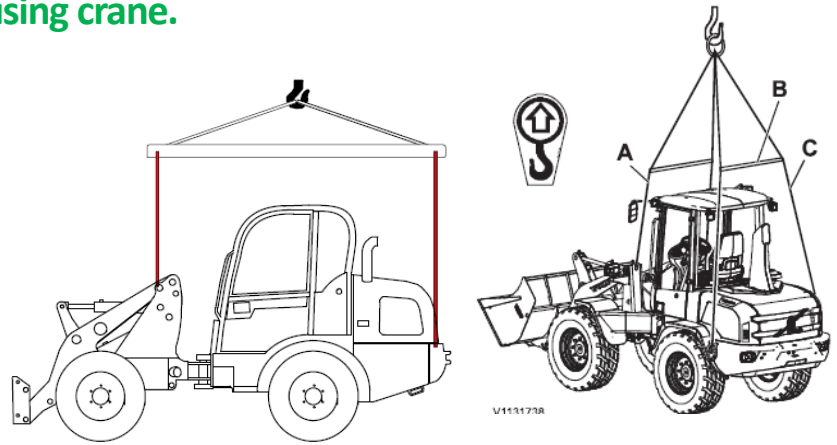
- Tie down and lifting points are round

# Not only at the back but also on the side

GOOD SOLUTION

- Very similar solution for both manufacturers. Two lifting points located on each side.
- In Volvo, lifting points (at front) are located on the outer part of the frame and are slightly larger. as a result, the access is easier.


- In both models we need to use additional equipment (strut).
- **Manual show in detail how to load/unload using crane.**

# Outside of the machine but no extra-dimensions

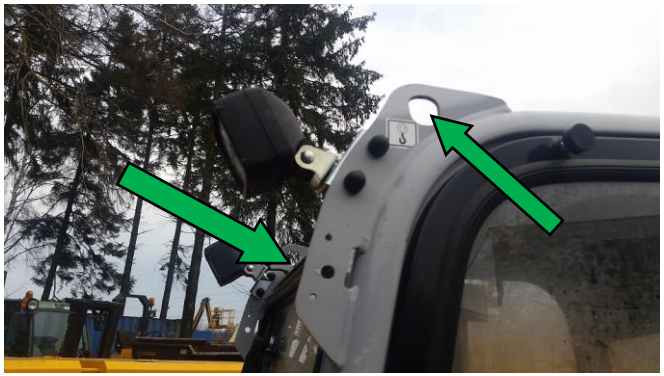
GOOD SOLUTION

- The location is good.
- It is safe.

# Easily accessible

GOOD SOLUTION

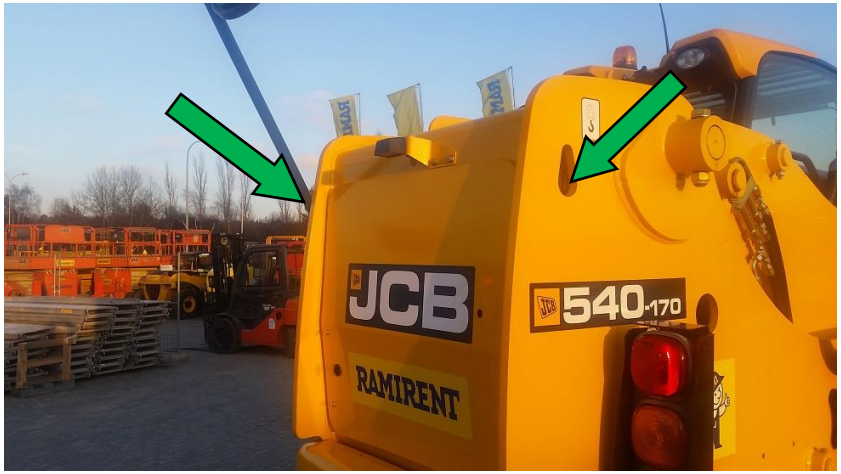
- Very easy access to lifting points (although could be a little wider for a bigger hook).
- **Only two points.** There is no need to use any extra lifting equipment (strut). **Very convenient and easy solution.**
- **Manual show in detail how to load/unload using crane.**

# Far away from the tyres and from the ground

GOOD SOLUTION

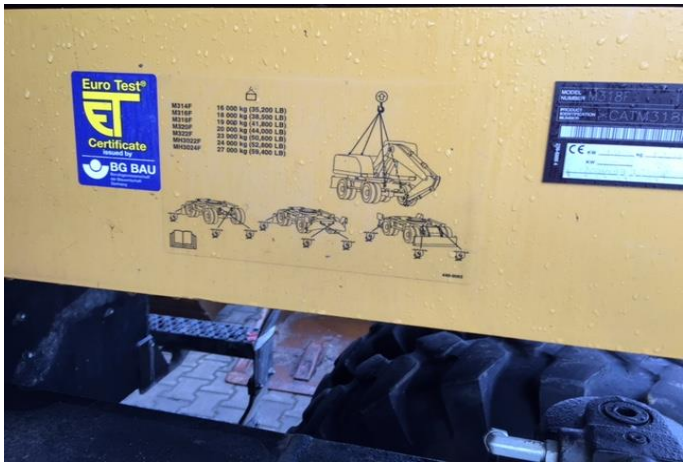
- Points located in the upper part of the frame. **<u>This solution minimizes damage and scratches.</u>**
- Four lifting points with very easy access. (although could be a little wider for a bigger hook).
- **Manual show in detail how to load/unload using crane.**

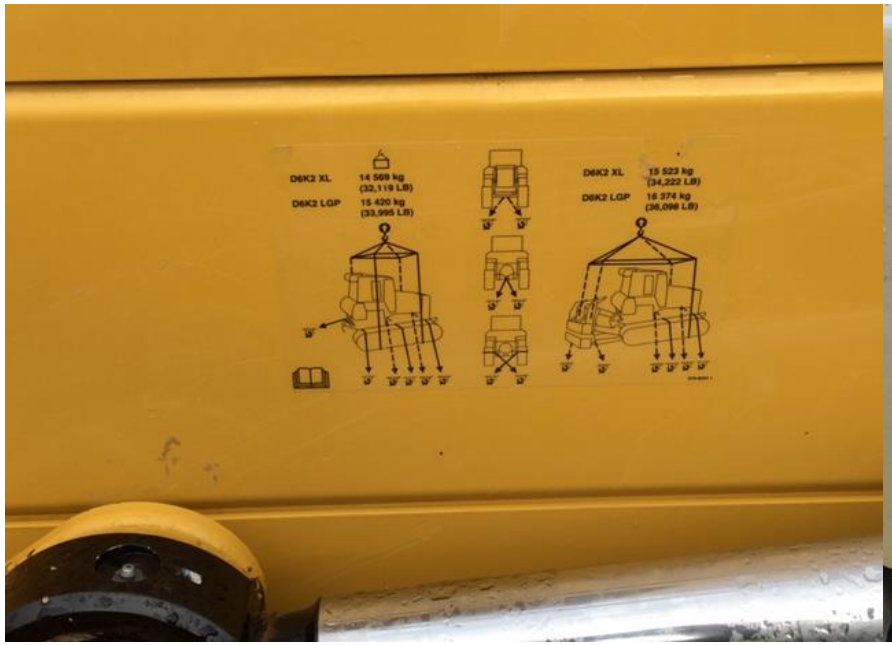



# Stickers on the machines

GOOD SOLUTION

- Description of how to tie down or lift the machine




# Part of the chassis, welded not screwed

**NOT A GOOD SOLUTION**

- Tie down points are not welded to the main frame of the machine
- The tie down points are too sharp

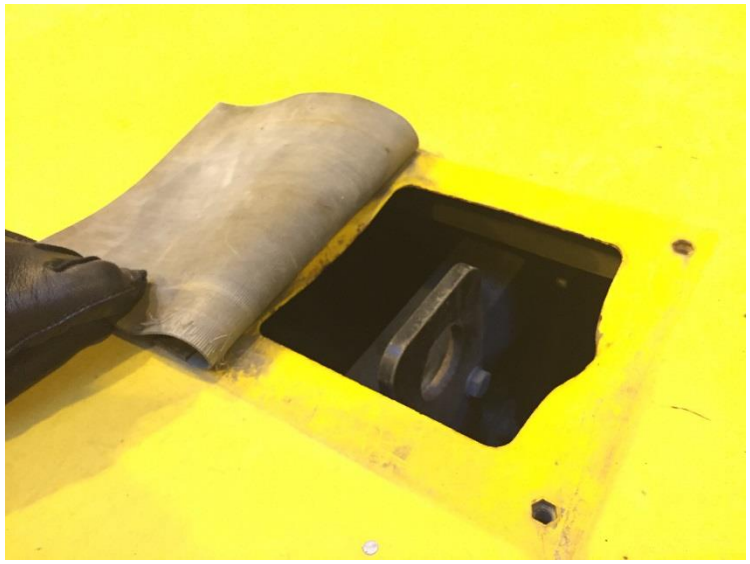
PART FOUR

# TIE DOWN AND LIFTING POINTS – GENERATORS AND COMPRESSORS

# Easily accessible

GOOD SOLUTION

- The lifting point is accessible, can be hooked with one arm.
- The size is decent size (although it could be bigger).



# Easily accessible

NOT A GOOD SOLUTION

- In general, tie down points for generators and compressors is a weak area. Obviously, since they are mounted on trailers, manufacturers must have considered that the machines are not to be fixed on truck.

  For the rental companies, this is an important area, since they are moving around and delivering the machines on trucks.

# Part of the chassis, welded not screwed

GOOD SOLUTION

- Good design – the lifting hook mounted on the trailer not on the engine

# Part of the chassis, welded not screwed

**NOT A GOOD SOLUTION**

- Bad design – hook is mounted directly on engine (L shape)

# Diameter should be large enough

NOT A GOOD SOLUTION

- Tie down points are too small and not high enough for stability.
- They are also not on the side.

# No confusion between tie down and lifting points

**NOT A GOOD SOLUTION**

- Confusing design – there are 4 holes.

APPENDIX

# LIFTING POCKETS

# Access equipment - Lifting pockets

GOOD SOLUTION

- Lifting pockets – located on both sides, open – you can load lift from left and right side. When loading, you can use a smaller forklift, shorter forks and less lifting capacity is then required. Very much appreciated solution for construction sites and small rental branches where there is no loading dock or big forklift.

# Access equipment - Lifting pockets

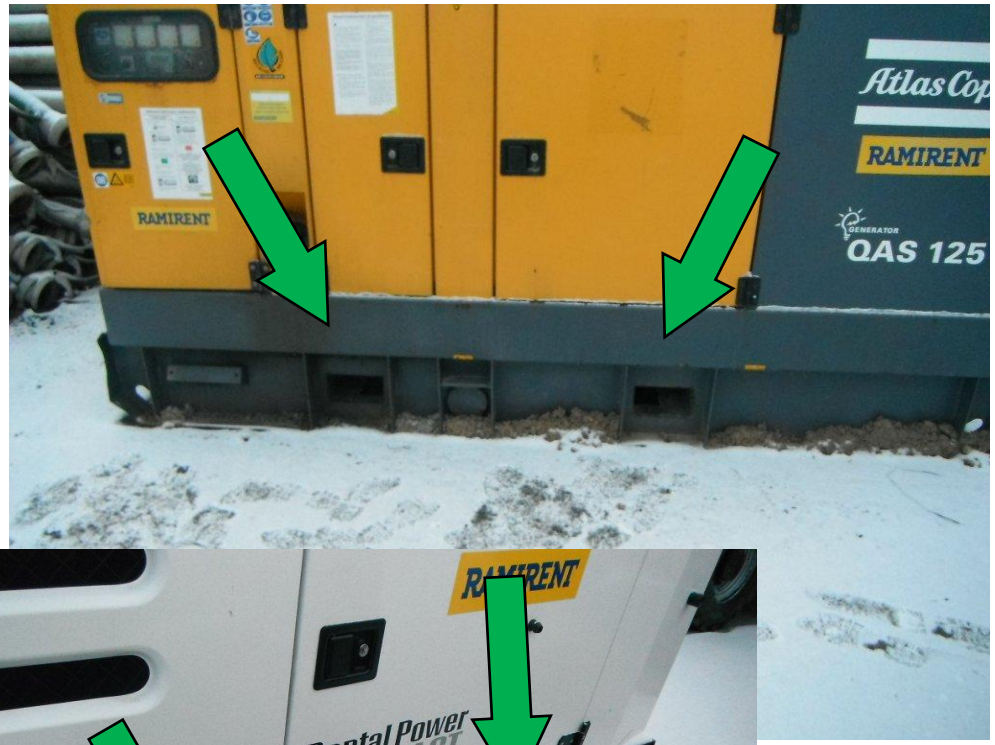
NOT A GOOD SOLUTION

- Lifting pockets – located at the back of the lift, so to safely load machine with the forklift you need to have big one – lifting capacity of 6 ton. Many users do not have such big ones forklifts on the site so they unload that kind of lifts from one side. That way of unloading may be dangerous because lift do not have lifting pockets on the side, and during unloading/loading is unstable. Also that kind of unloading may damage lower stabilizers.

# Generators: lifting pockets

GOOD SOLUTION

- Lifting pockets – located on the side of the generator. Located on the center of gravity. Very popular method  loading and unloading - good stability.

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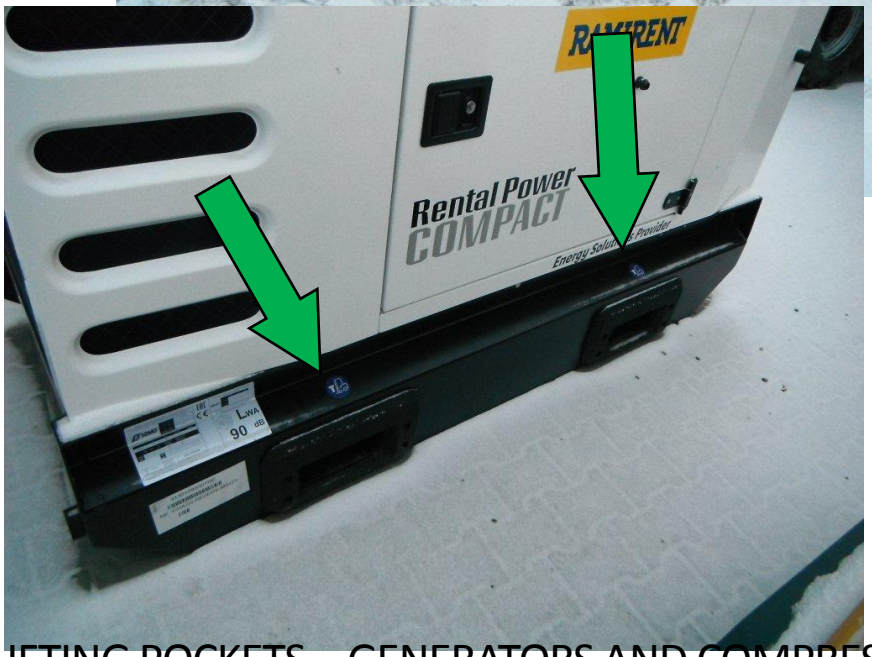

# Generators: lifting pockets

GOOD SOLUTION

- Lifting pockets – located on the back of the generator. Very popular method  loading and unloading - good stability.
- Lifting pockets are too small for bigger forklift

# Compressors: lifting pockets, suggestions as a loading solution

For the smaller compressors (as M26/XAS37 ), the solution might be placing lifting pockets the same way as in lighting mast (Himoinsa Apolo Compact).



Very easy solution. Two lifting pockets placed on the back.

# Compressors: lifting pockets, suggestions as a loading solution

**All uniaxial compressors are designed for loading and unloading from the top.**

For the same reason as in mini-excavators (improve load/unload), we suggest the introduction of lifting pockets.

- Lifting pockets can be placed on both sides of the wheel. Paying attention to load centre and a possible collision with other parts.

**Using only fork extensions (to minimize scratching) we can easily load/unload compressor from both sides.**