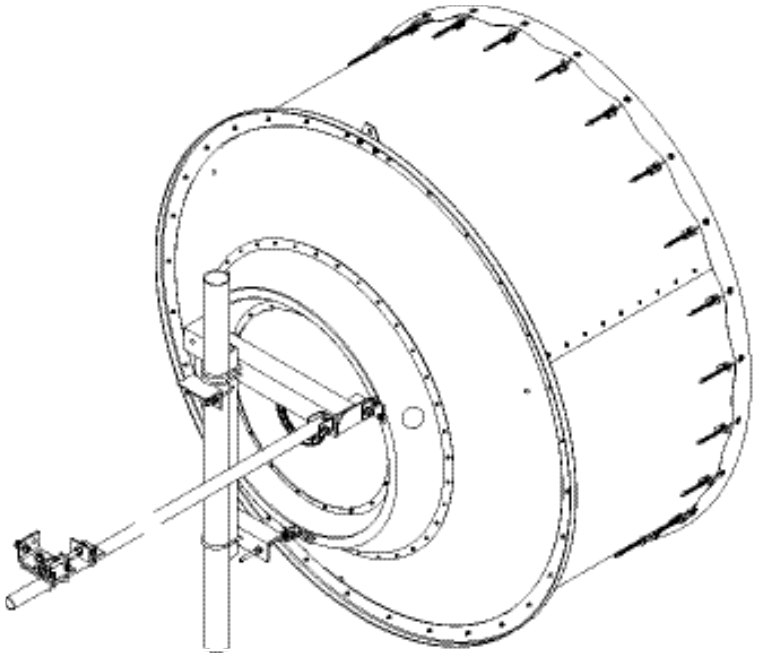
Installation Instructions
8 ft Antennas

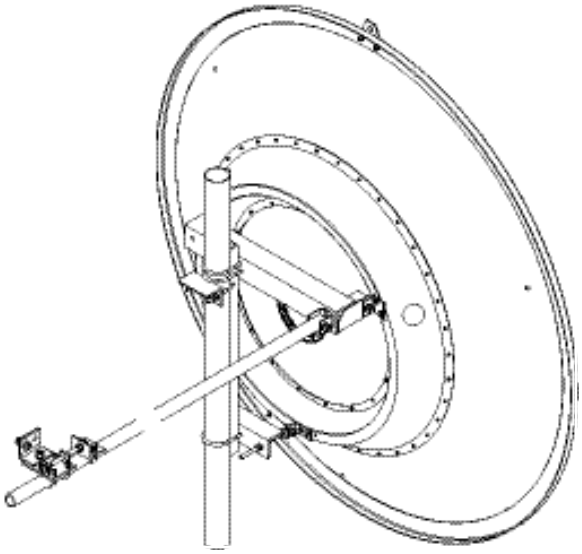
PA, PAL, PAD, PAX, PADX
DA, UA, DAX, UDA, UXA

HTT 81.221-15 (e)

These installation instructions have been written for qualified, skilled personnel. The antenna shall be inspected once per year by qualified personnel to verify proper installation, maintenance, and condition of equipment. It is important to adhere precisely to all parts of the installation instructions. RFS disclaim any responsibility resulting from improper or unsafe installation. RFS reserves the right to alter details at any time, especially with respect to technical improvements.



DA, UA, DAX, UDA, UXA



PA, PAL, PAD, PAX, PADX

These Installation Instructions are valid for antennas in the following version :

- Reflector Ø2.4 m (8 ft)
- Waveguide feed system **Single** or **Dual** polarized
- Pipe mount for installation on pipe Ø115 mm (or Ø219 mm on request at the order)
- Antenna offset to the left or the right
- Safety collar for easy installation
- 2 spindles for fine adjustment of **Azimuth** & **Elevation of ±5°**
- 1 sway bar Ø60 mm x 3 m
- Reflector with shroud, the aperture covered by **a flexible planar radome**, or without shroud (see sketch above)

Note : The assembly of the reflector and backring for antennas with "split" reflector is described in the dedicated Installation Instructions.

Sales department : Radio Frequency Systems
Kabelkamp 20, D-30179 Hannover (Germany) • Tel +49-511 676-2520 • Fax +49-511 676-2521
Plant: RFS France Trignac (France) • Tel +33 (0)2 40 45 95 45 • Fax +33 (0)2 40 90 41 43

1 - Tools required for installation (Tools are not included)

- Hoisting device for 400 daN (4000N ~400kg)
- Torque wrench from 0,5 to 25 daNm (5 to 250 Nm)
- Wrenches for hexagon bolts : M5(8), M6(10), M10(16/17), M12(18/19), M14(21/22), M16(24), M20(30)
- Carabiner, shackle, steel eye, square, mallet
- 2 strong ropes (tower height), 3 lifting straps, 1 short rope
- Water balance and compass
- Hand or electric winch

(values in brackets = openings of spanners)

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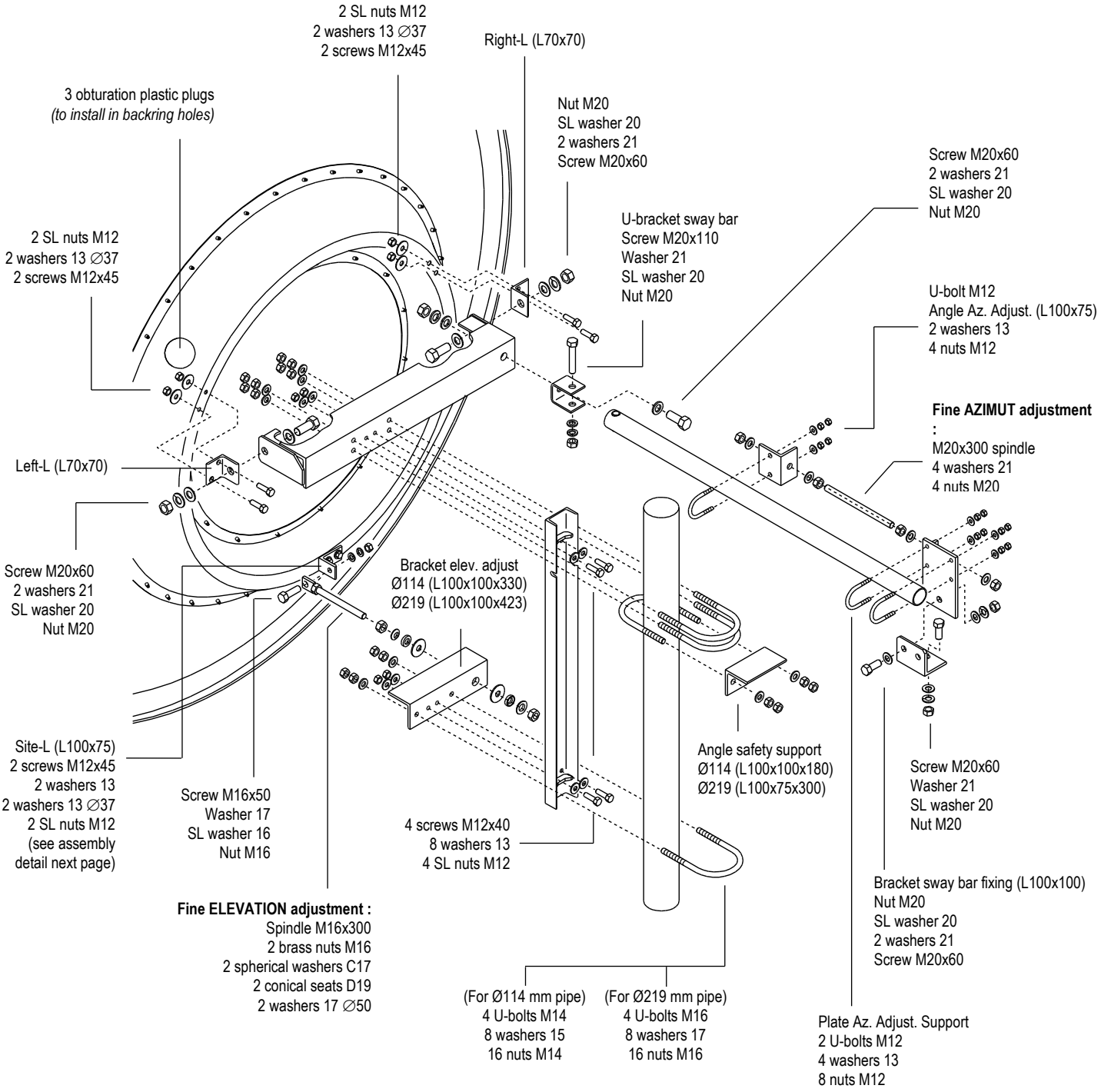
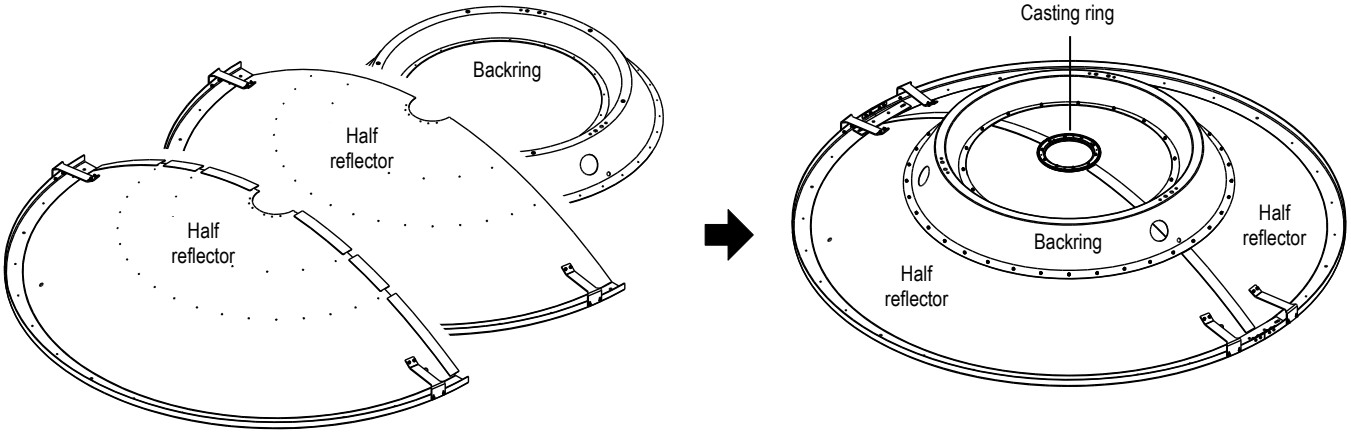
2 - Assembly of the mount (For an installation offset right)

For easy operation of the bolted joints, and correct torque tightening, « Anti Seize » Installation Paste must be applied to all threads of bolts and fine adjustment spindles. After this, keep the lubricated threads free of dust and dirt ! (a torque table is attached for specifications)



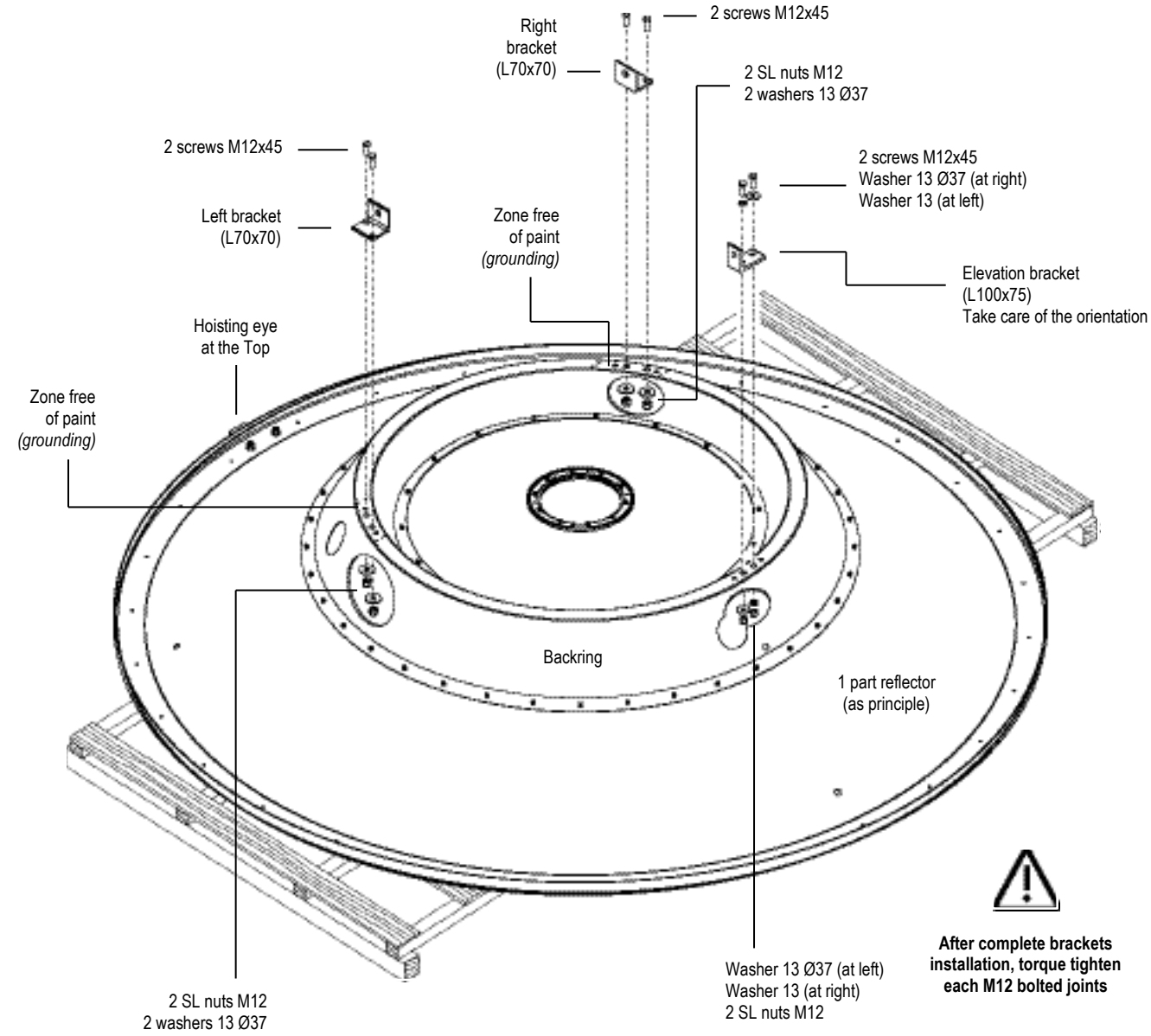
3 - Antenna with “split” reflector (otherwise skip this step)

If you have ordered an antenna with a “split” reflector, refer carefully to specific installation instructions joined, for half-reflector parts & backring assembly.



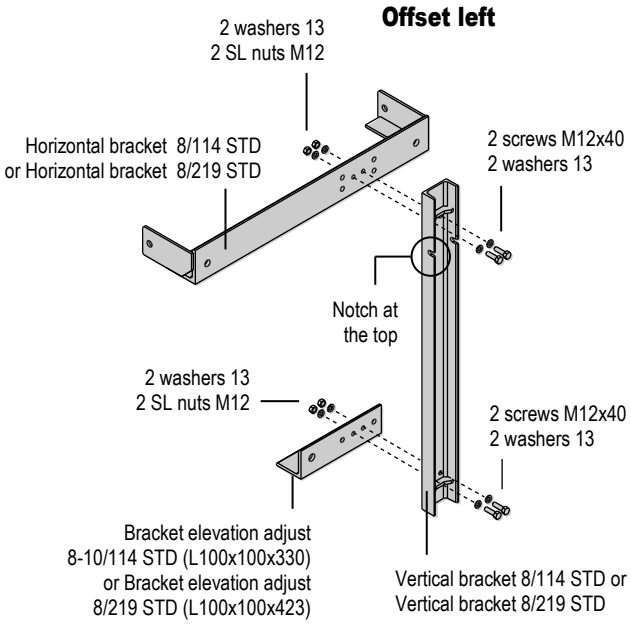
4 - Brackets installation on backring (valid for an antenna installation offset left or right)

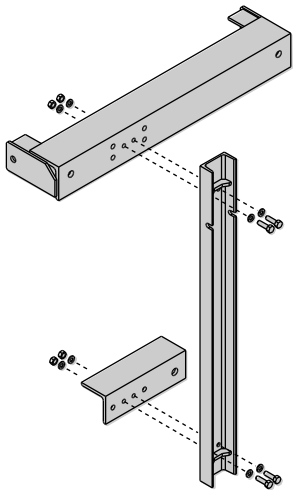
Before starting the installation of the brackets on the backring, install the antenna reflector on a thick cardboard or wooden planks to protect the antenna during the assembly *(or the antenna top packing case for e.g.).*



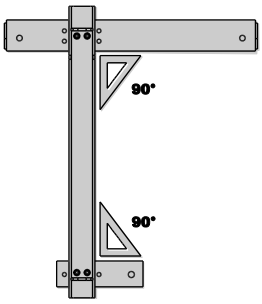
5 - Pre-assembly of the T-Mount & antenna offset

T-Mount Pre-assembly





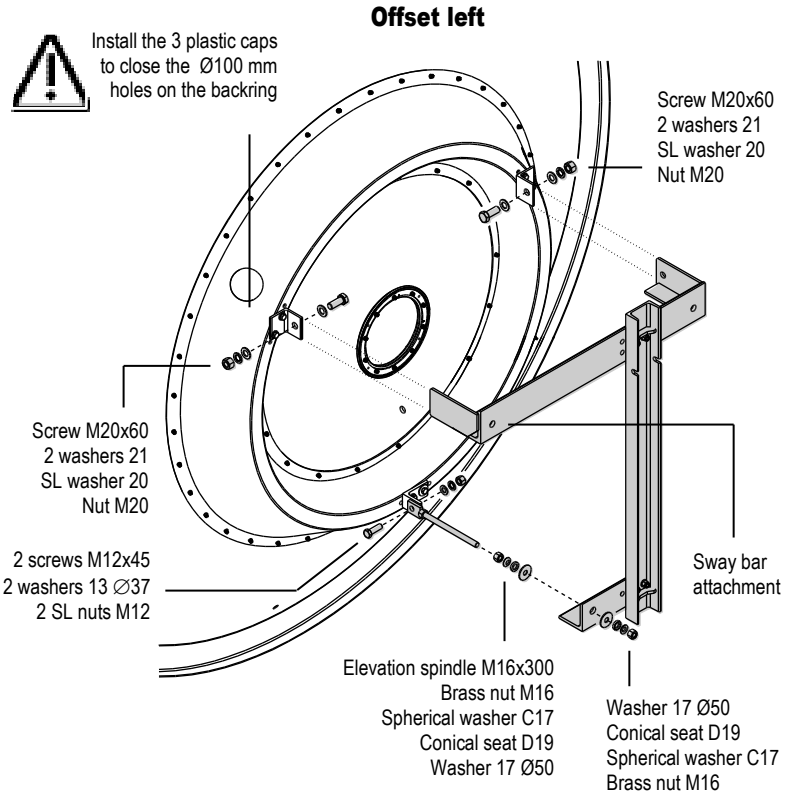
Perpendicularity

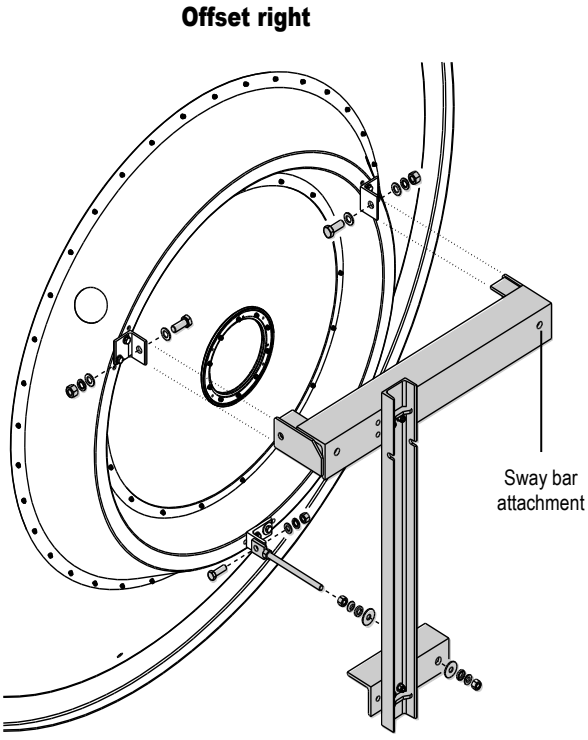


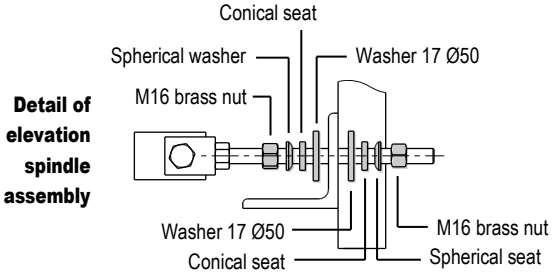
(Rear view)
for an offset right

After perpendicularity check, torque tighten the M12 bolts to lock the assembly. *(Without square, you can help you with a sheet of paper).*

T-Mount install on backring

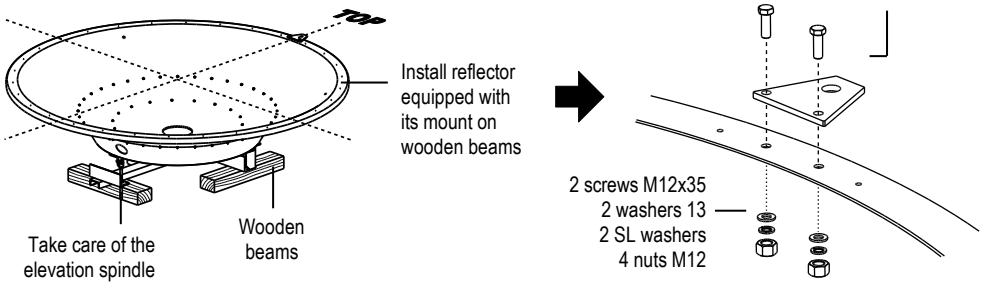




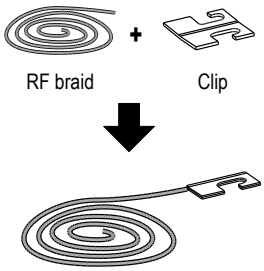


It is mandatory to tighten all bolted joints of the mount according to the torque table joined, before lifting the antenna.

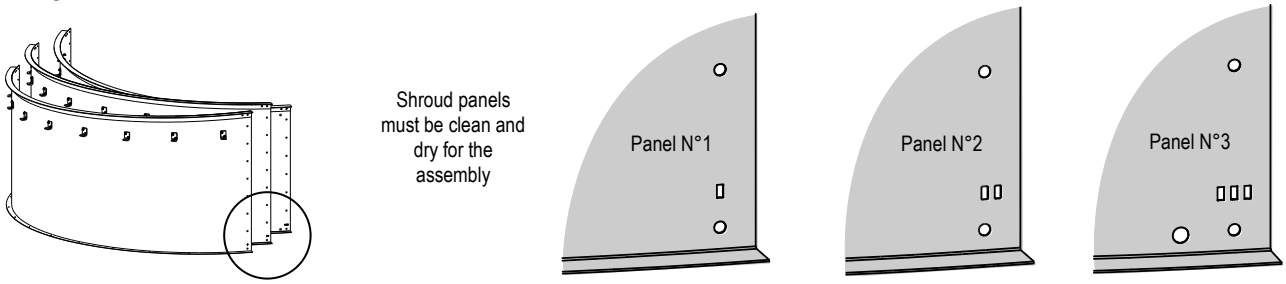
6 - Installation of the shroud panels (for antennas with shroud)



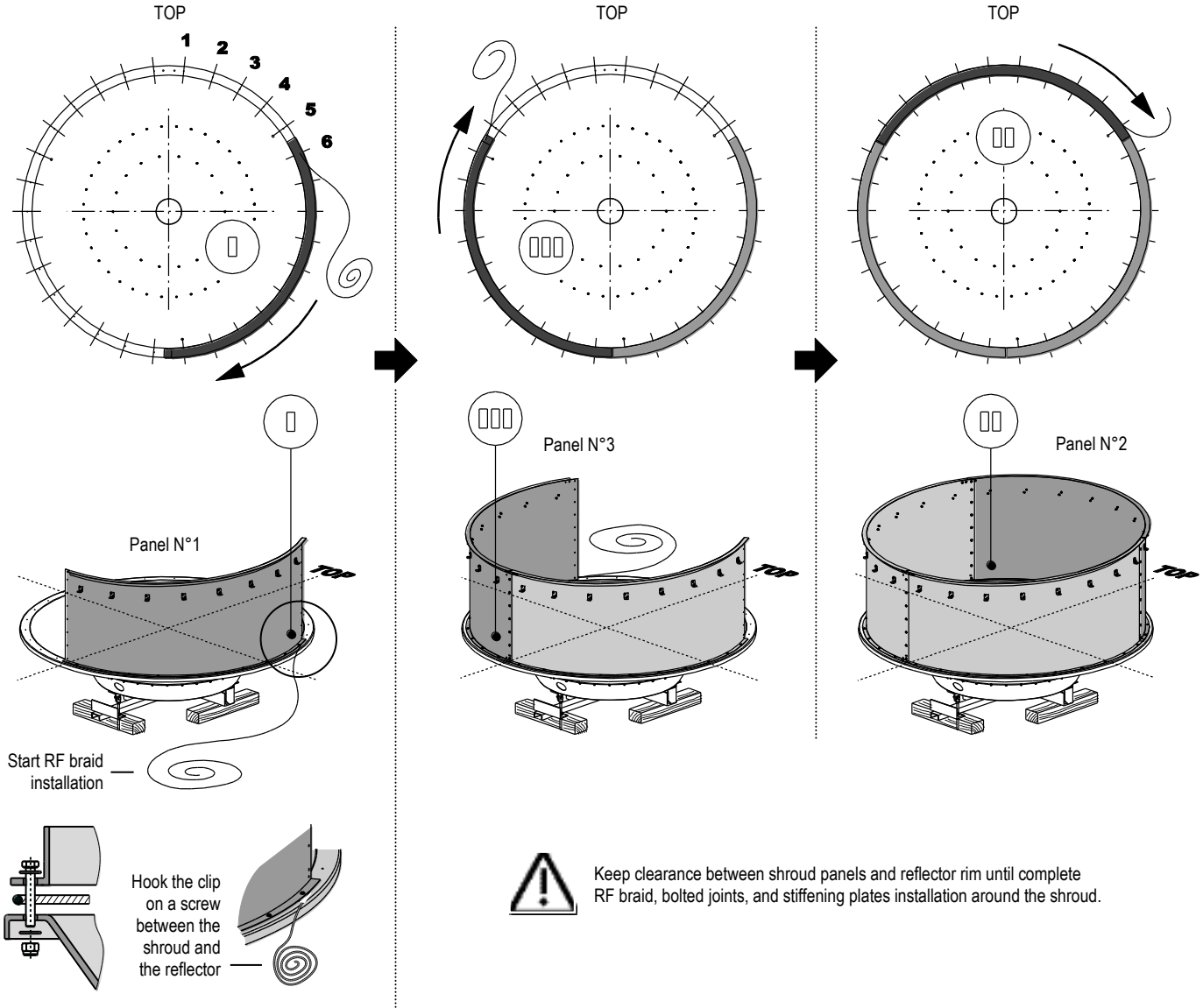
RF braid preparation



Shroud panels identification



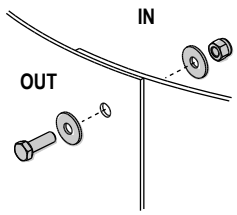
Shroud panels positioning on reflector



Keep clearance between shroud panels and reflector rim until complete RF braid, bolted joints, and stiffening plates installation around the shroud.

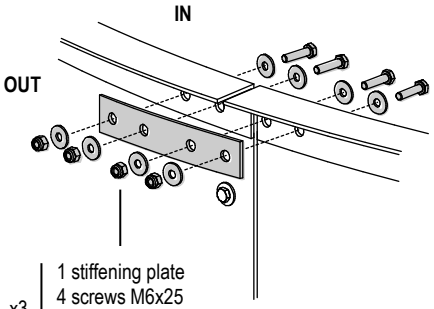
Hardware detail for shroud panels assembly (for antennas with shroud)

For the 3 shroud panels junctions

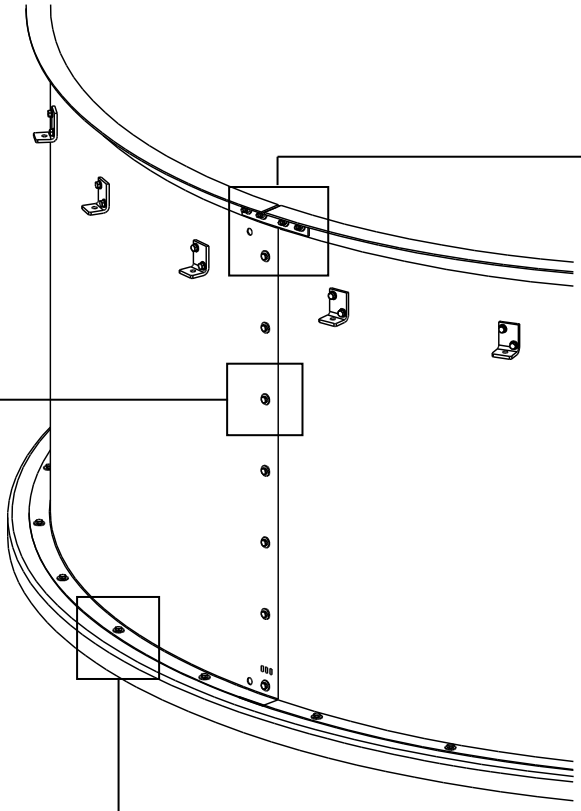


	Long shroud (Short panel length)	Short shroud (Short panel length)
	9 screws M6x16 18 washers 6.4 ∅18 9 sl nuts M6	7 screws M6x16 14 washers 6.4 ∅18 7 sl nuts M6
	x1	x1
	(Long panel length)	**(Long panel length)**
	10 screws M6x16 20 washers 6.4 ∅18 10 sl nuts M6	8 screws M6x16 16 washers 6.4 ∅18 8 sl nuts M6
	x2	x2

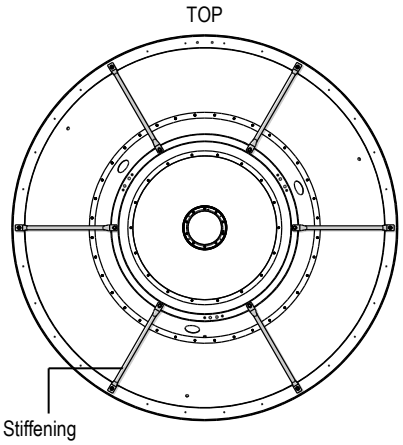
Stiffening plates installation



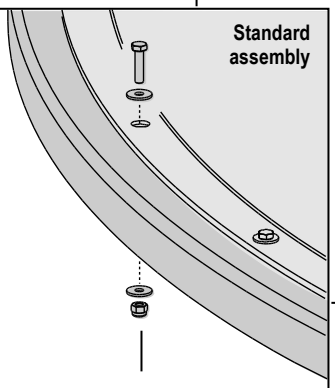
x3 | 1 stiffening plate
4 screws M6x25
8 washers 6.4 ∅18
4 sl nuts M6



8 ft equipped with 250 km/h windkit

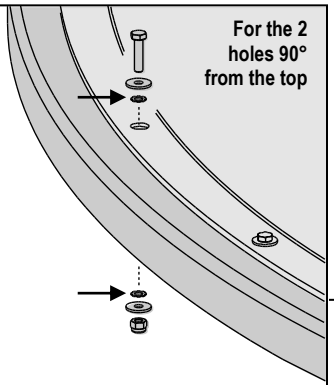


Standard assembly



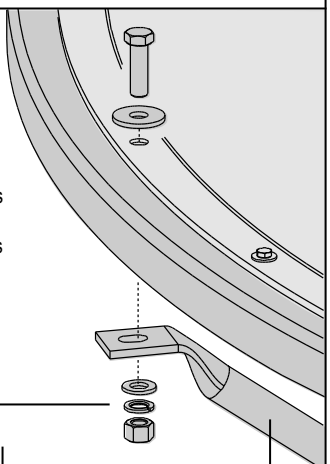
30 screws M6x25
60 washers 6.4 ∅18
30 sl nuts M6

For the 2 holes 90° from the top



Add 2 serrated washers 6.4

For antennas provided with 250 km/h windkit



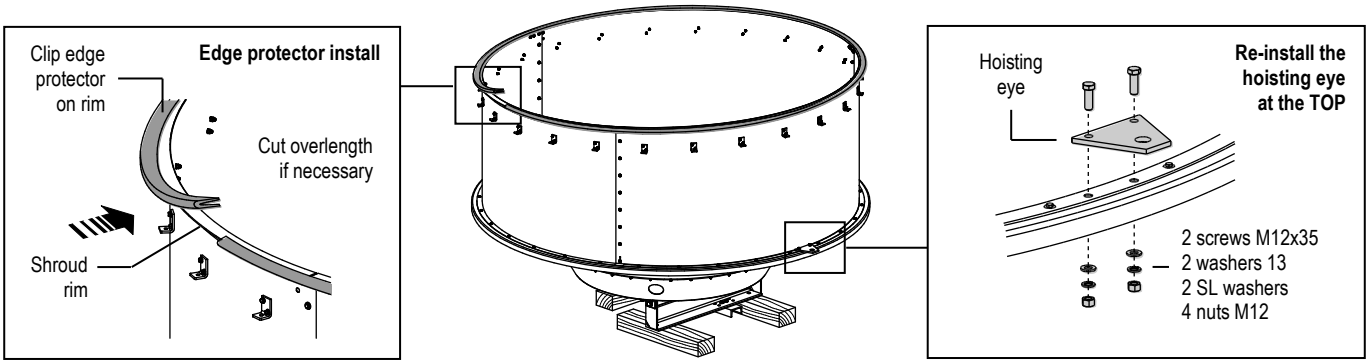
For the 6 holes receiving the stiffening pipes

1 screws M12x40
1 washer 13 ∅37
1 washer 13
1 sl washer 12
1 nut M12
x6

Stiffening pipe

7 – Hoisting eye and radome protection installation (for antennas with shroud)

Re-install the hoisting eye at the TOP, torque tighten all bolted joints of the shroud panels, then clip the edge protector around the shroud rim

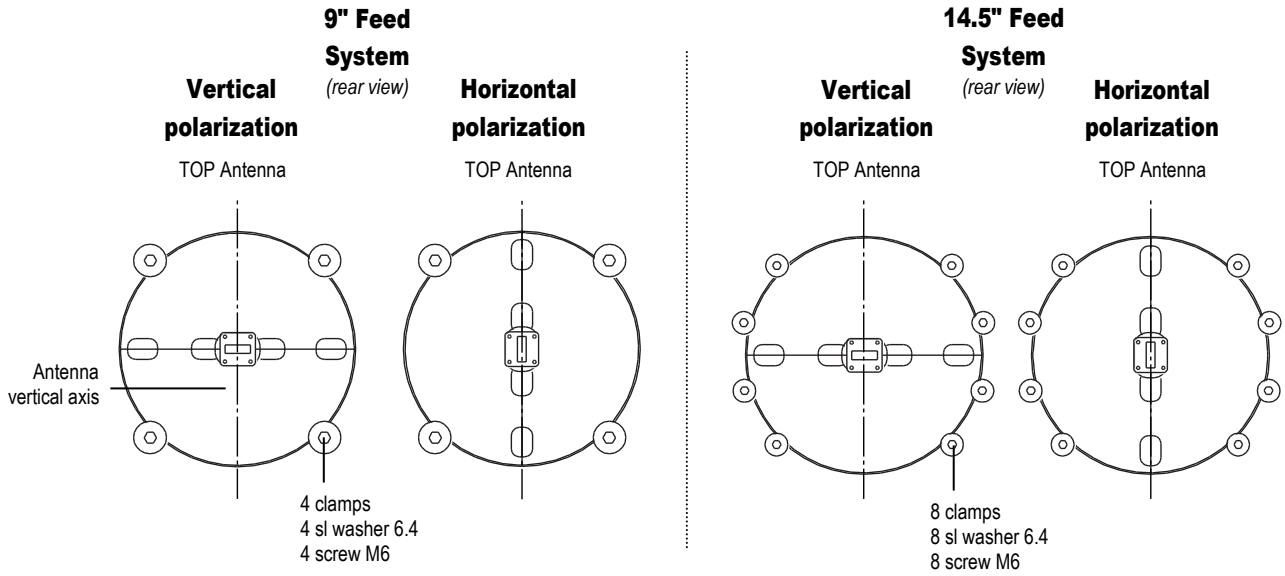


8 - Feed Installation (for customized antennas, see specific feed installation instructions joined)

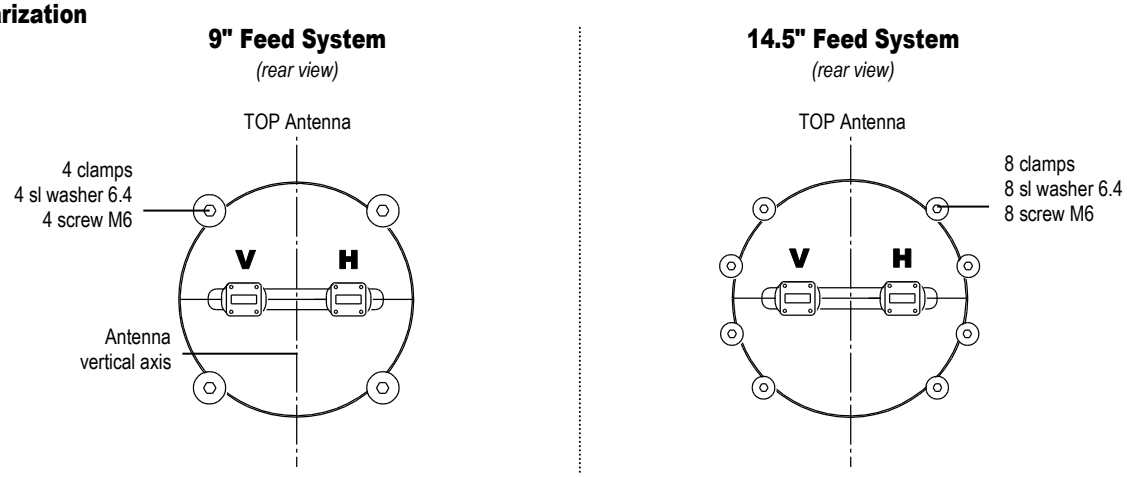
The feed is a precision component which should be handled with special care during installation. For instance, always carry the feed, supporting casting plate side. Any damage may degrade the antenna's performance. Repair of feeds is not possible in the field.

8.1 - Polarization choice

Single polarization

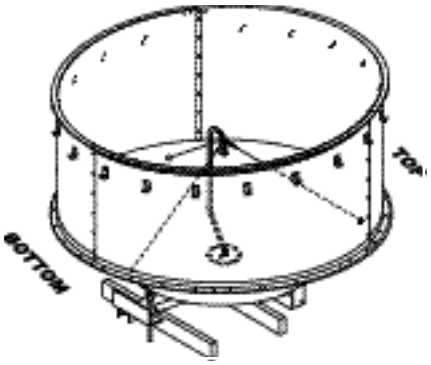


Dual polarization

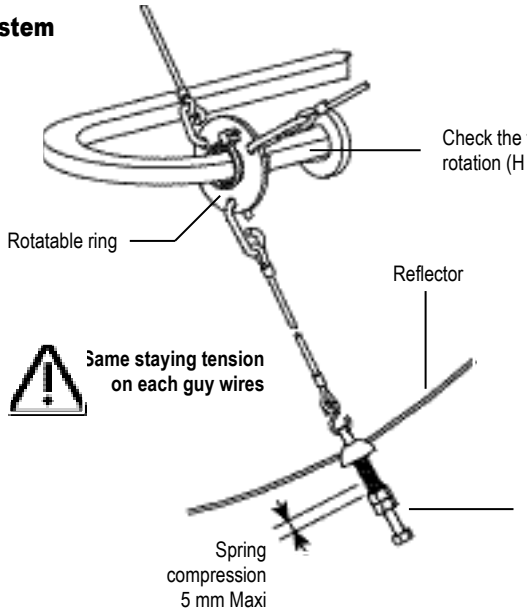


8.2 - Guy wires assembly

- Insert the 3 guy wires in the mounting holes from the rear of the reflector.
- Move the feed assembly partway through the connecting ring.
- Hook the guy wires into rotatable ring.
- Move the feed and fix it, with the M6 screws in the connecting ring.



Staying with spring system



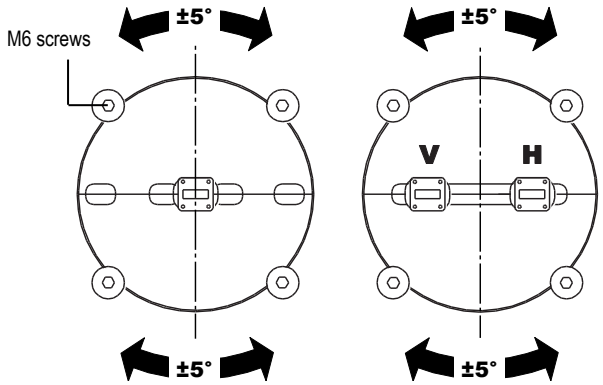
After control that each guy wires have the same tension, lock the 2nd M8 nut on the 1st one with another wrench, keeping the first nut in his position.

8.3 - Polarization fine adjustment

The final adjustment will be made after the antenna installation on tower

9" Feed System

(rear view)



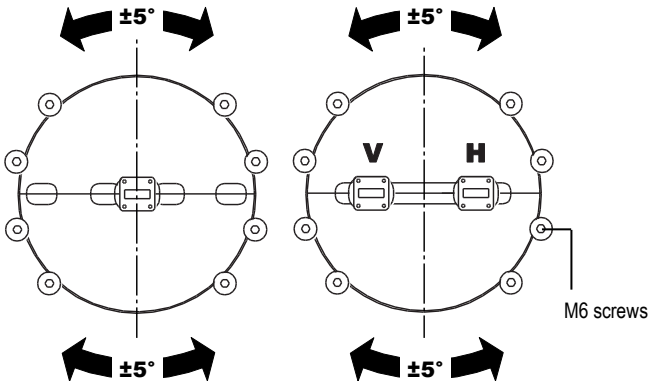
Single polar. Feed system

Dual polar. Feed system

Loosen the 4 screws M6 and adjust polarization by rotation of the feed system

14.5" Feed System

(rear view)



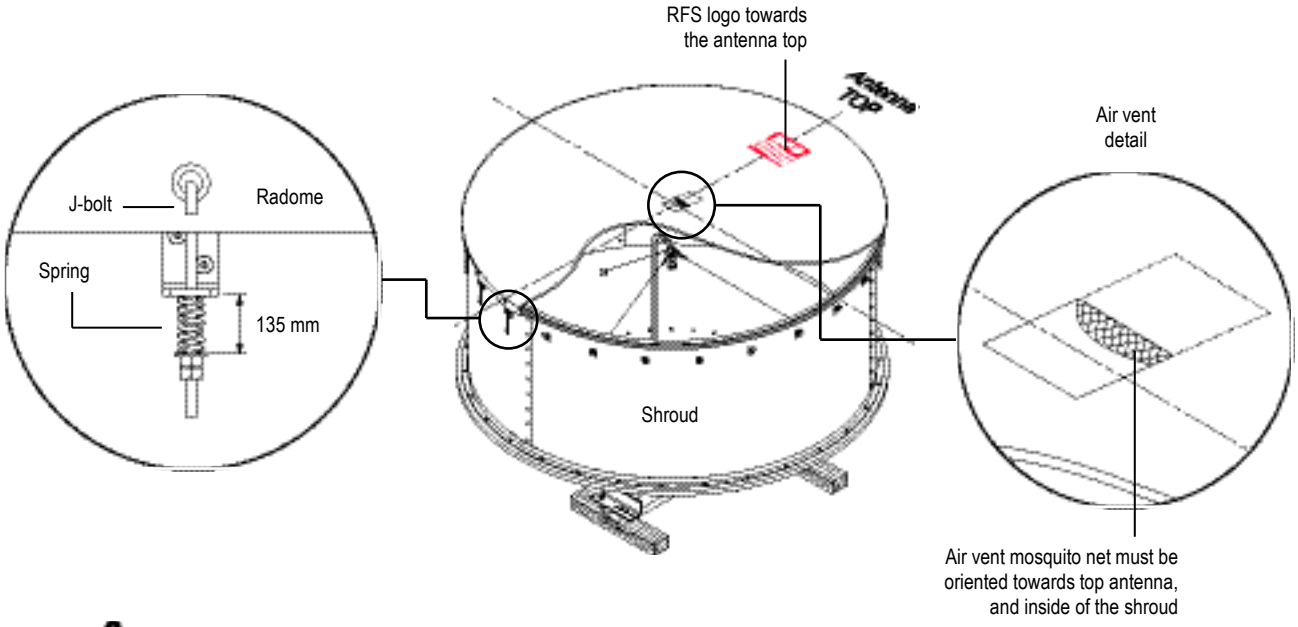
Single polar. Feed system

Dual polar. Feed system

Loosen the 8 screws M6 and adjust polarization by rotation of the feed system

9 - Installation of the planar radome (for antennas with shroud)

- Unpack the radome and carefully stretch it over the shroud aperture
- Center it over the shroud aperture
- For radome with RFS logo, align it with the vertical axis of the antenna
- For radome without RFS logo, the central air vent mosquito net aperture must be oriented towards the antenna top
- Attach J-bolt with springs and smooth radome down as the springs are attached, but do not displace the edge protector on the shroud rim.
- Align the length of the springs to approximately 135 mm at each J-bolt, this will provide proper radome tension.



Take care to not kink radome during installation. Kinking will destroy the radomes, which are non-repairable

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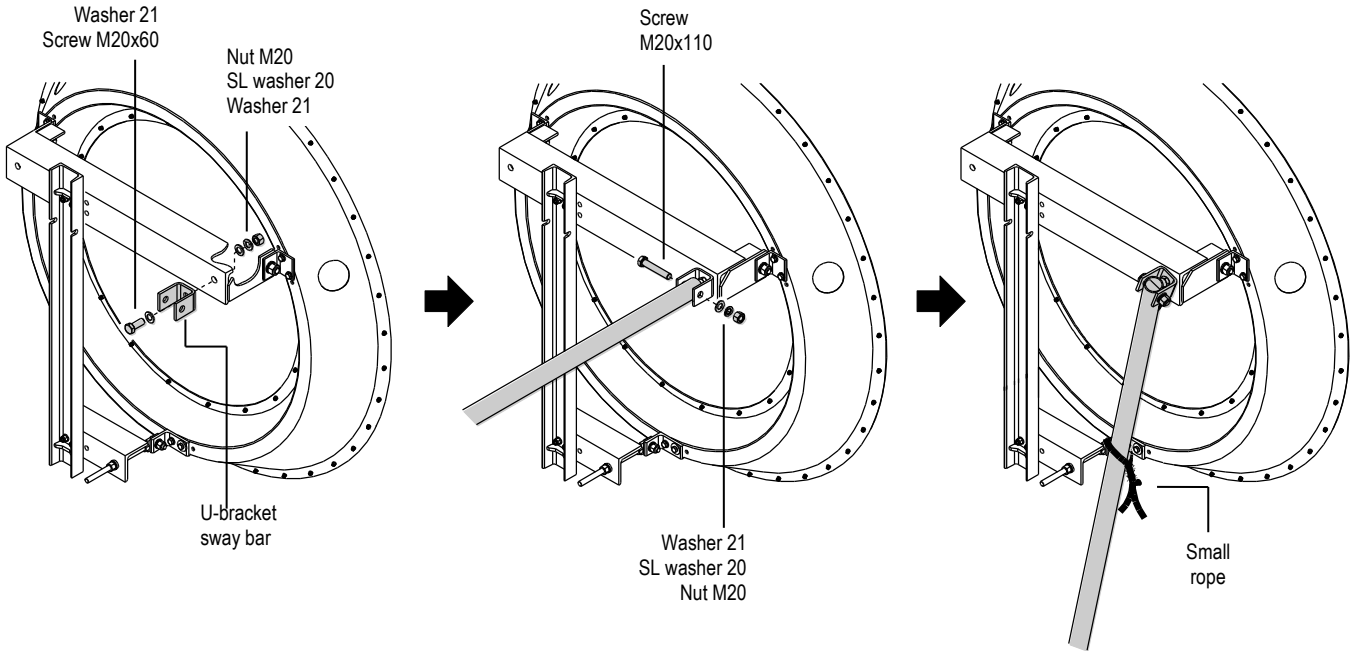
10 - Sway bar assembly (principle for an offset right)

U-Bracket sway bar installation

For an easier sway bar orientation, keep the U-bracket sway bar free in rotation without gap until sway bar final attachment to the tower. (After sway bar final orientation, torque tighten all bolted joints)

Sway bar pipe installation

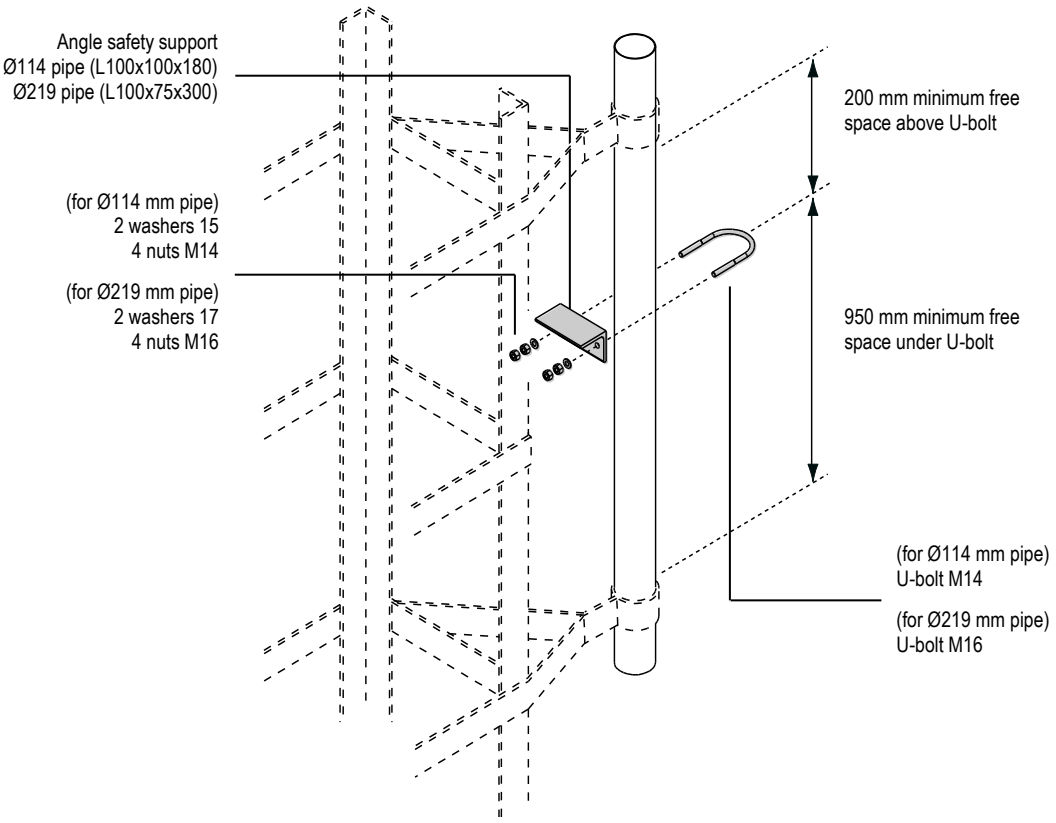
Before antenna hoisting on the tower, attach the sway bar in vertical position at the elevation spindle with a small rope, to avoid possible shock during the hoisting.



11 - WindKit 250 km/h installation

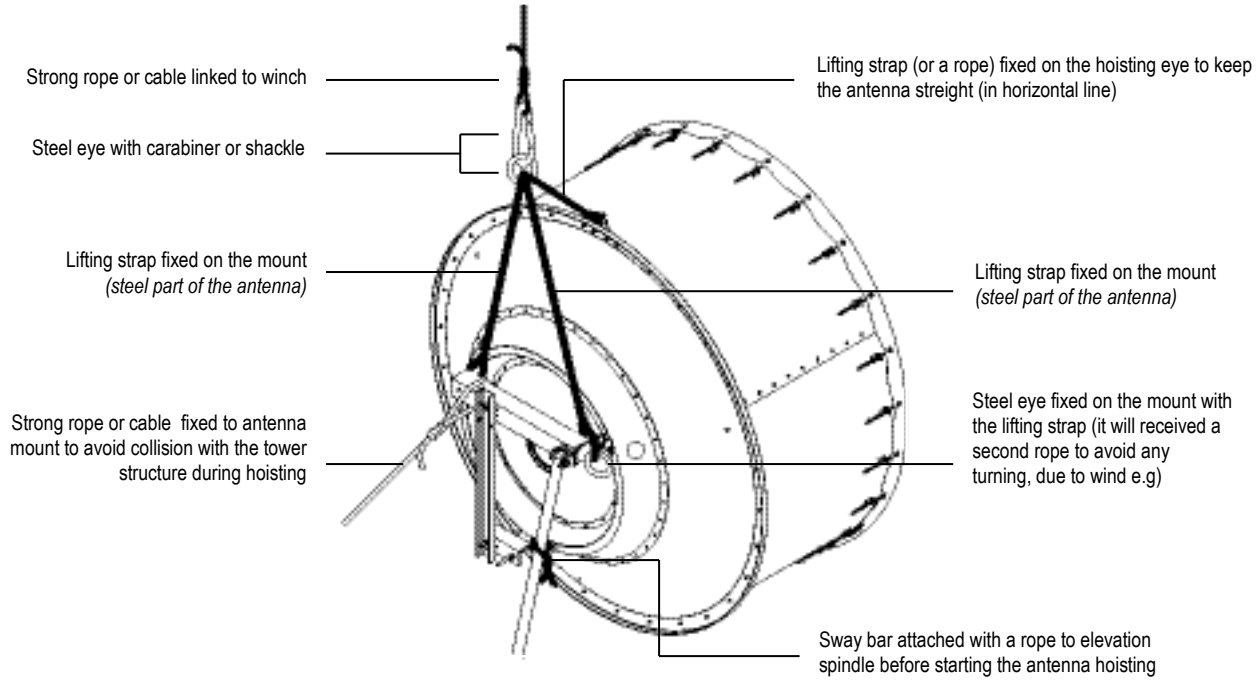
If you have order a 250 km/h WindKit separately, refer to specific installation instructions joined with the kit, otherwise skip this step.

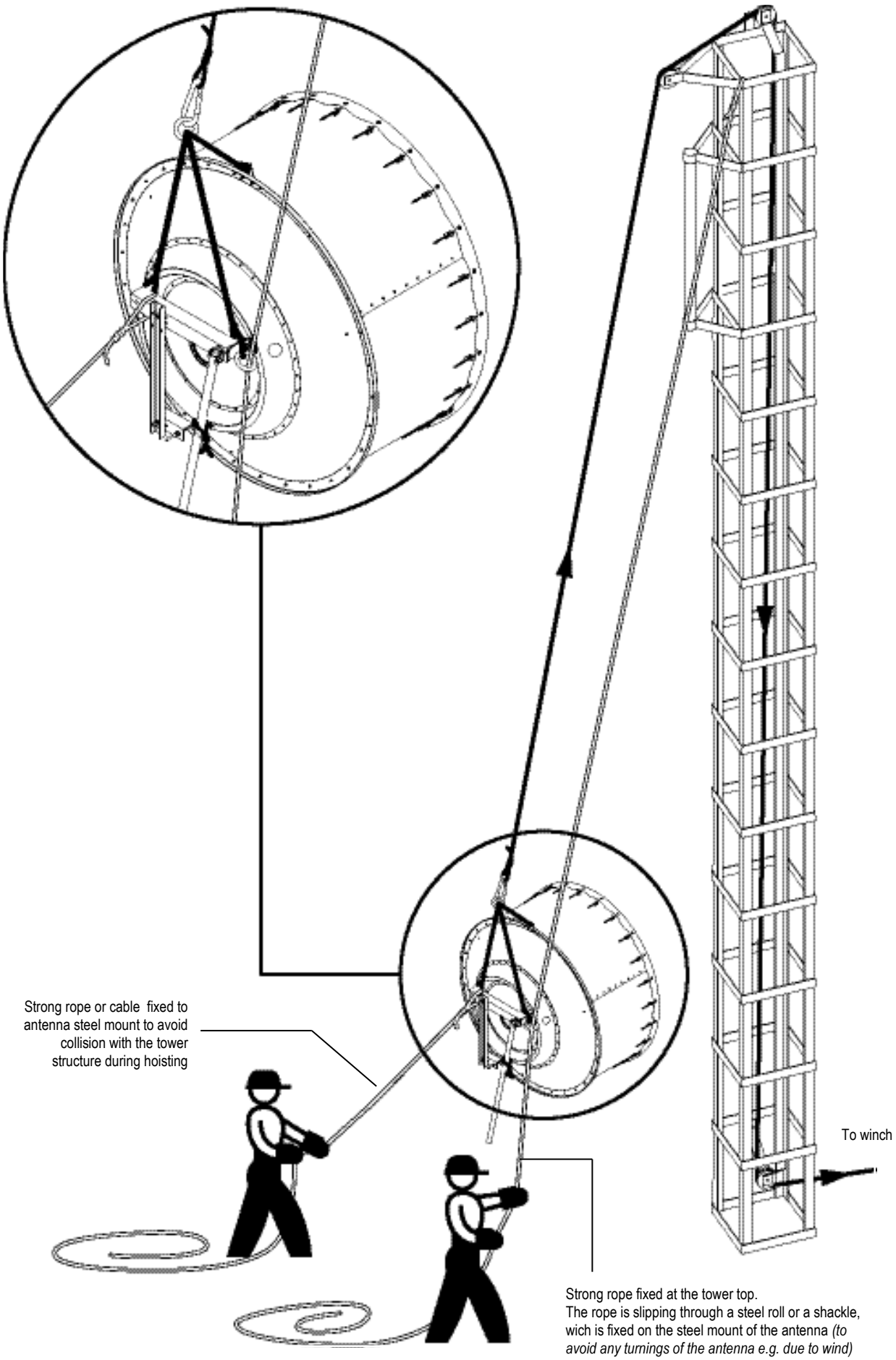
12 - Safety collar installation on tower pipe support



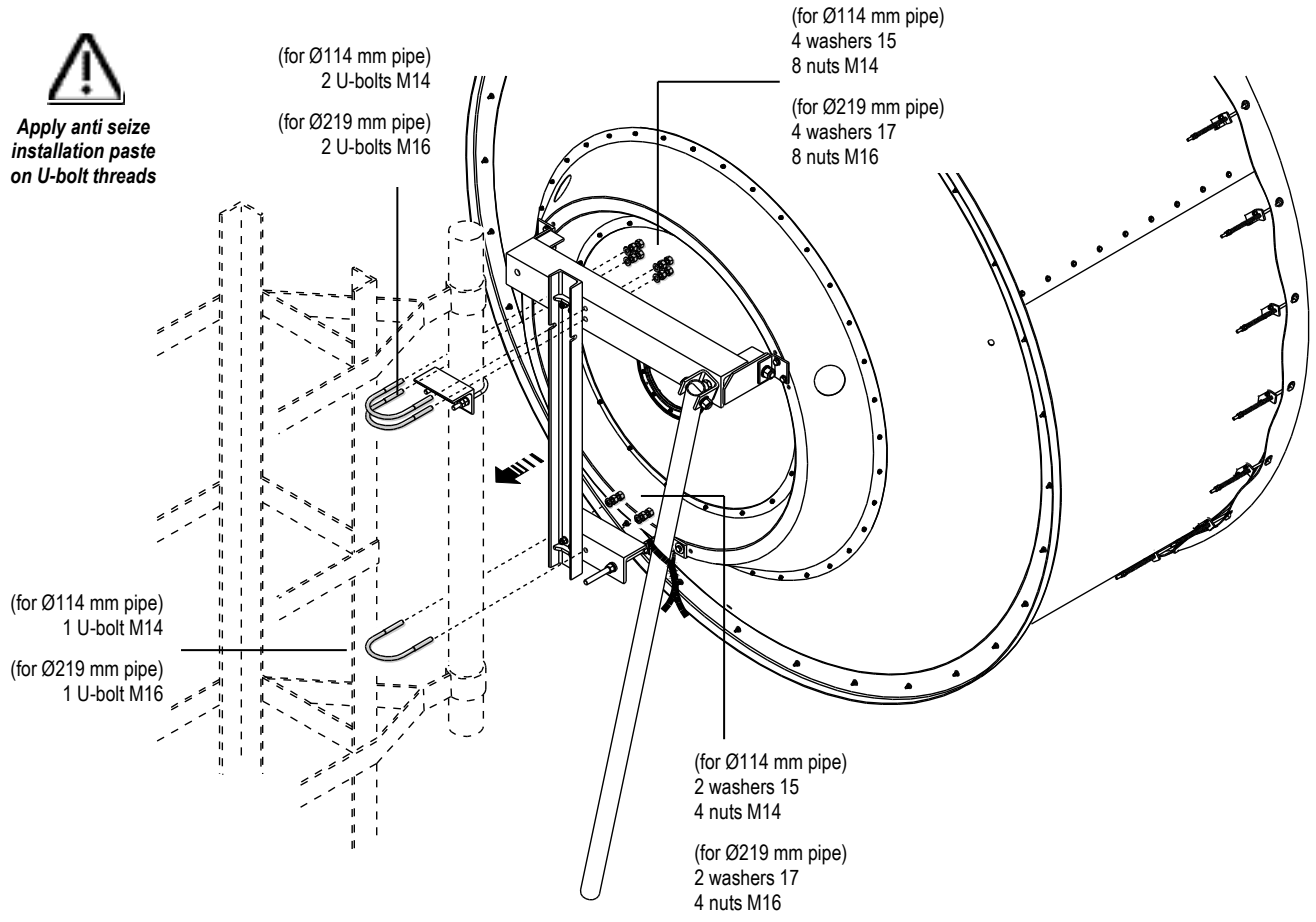
13 - Hoisting on Tower

Before antenna hoisting on the pylon, verify that all the bolted joint of the T-Mount structure on the antenna have been torque tighten, otherwise the installation on the pipe support could be problematic.

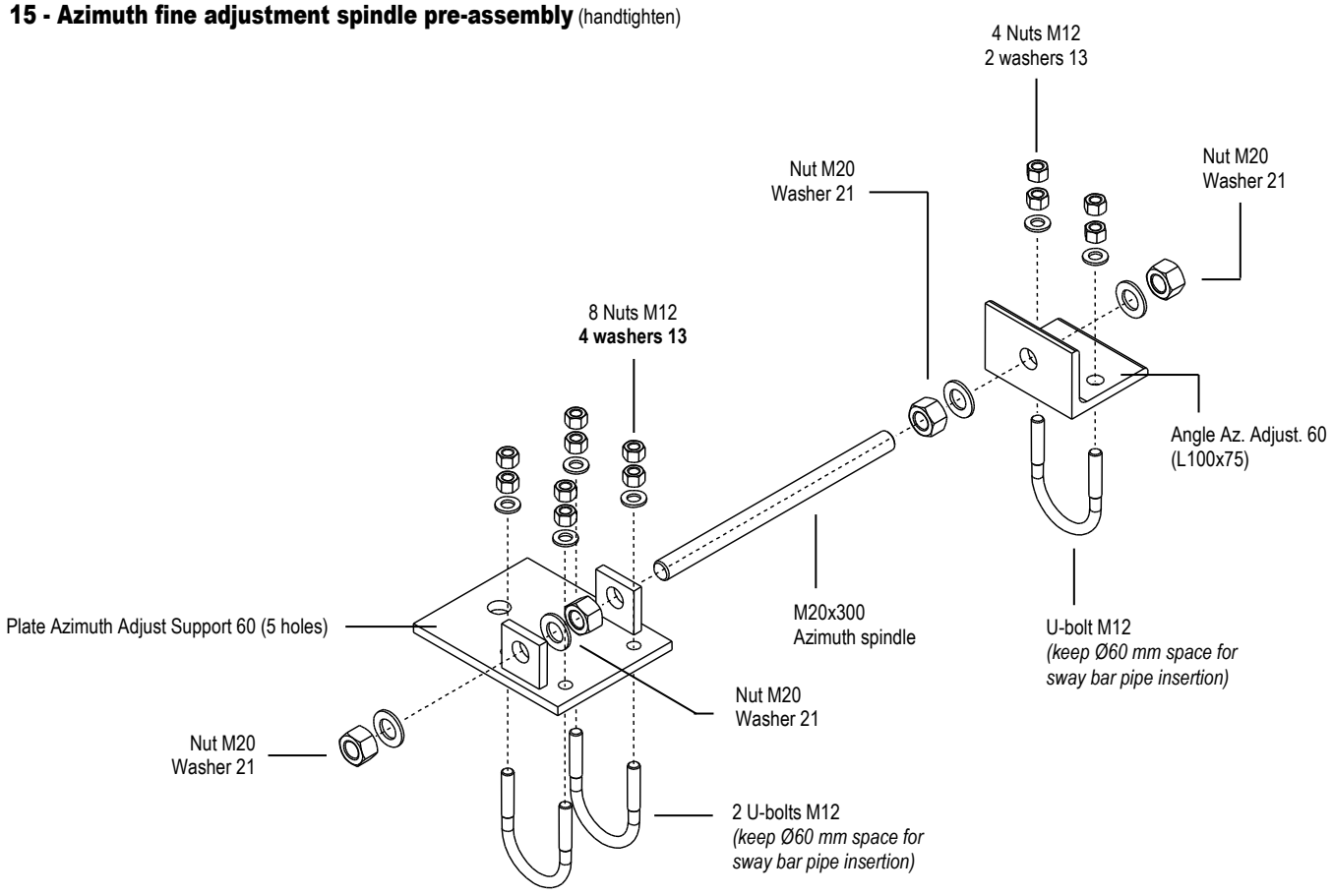



Strong rope or cable fixed to antenna steel mount to avoid collision with the tower structure during hoisting
To winch
Strong rope fixed at the tower top.
The rope is slipping through a steel roll or a shackle, wich is fixed on the steel mount of the antenna *(to avoid any turnings of the antenna e.g. due to wind)*

14 - Antenna installation on tower pipe (lifting accessories are not shown)

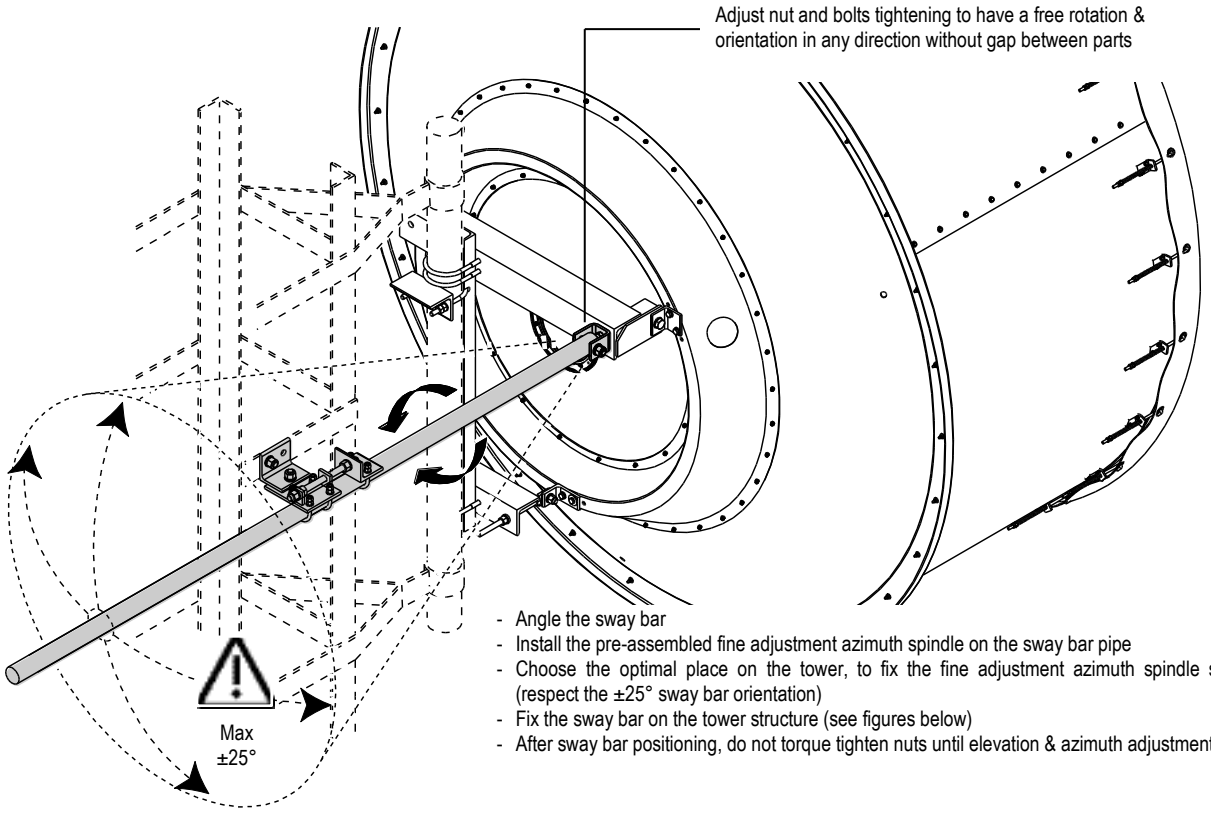


15 - Azimuth fine adjustment spindle pre-assembly (handtighten)



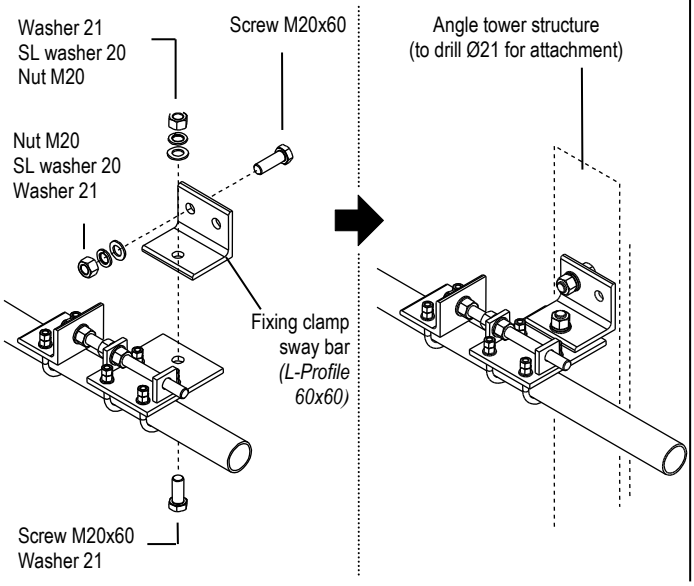
For more details refer to install. Instruction provided with this sway bar option kit

16 - Sway bar positioning



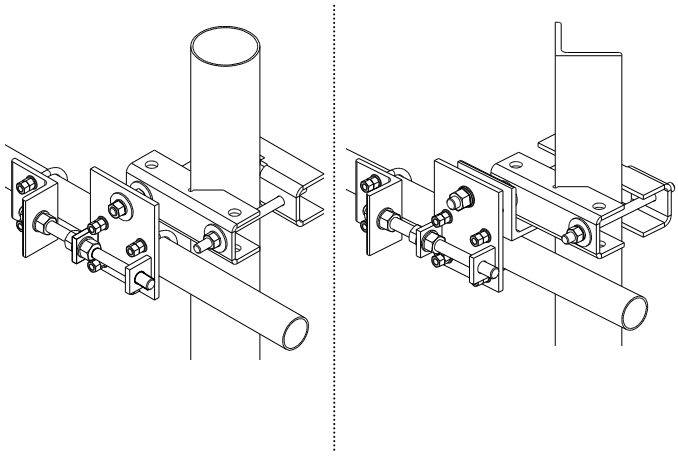
- Angle the sway bar
- Install the pre-assembled fine adjustment azimuth spindle on the sway bar pipe
- Choose the optimal place on the tower, to fix the fine adjustment azimuth spindle system (respect the ±25° sway bar orientation)
- Fix the sway bar on the tower structure (see figures below)
- After sway bar positioning, do not torque tighten nuts until elevation & azimuth adjustments

Sway bar installation on tower <u>without</u> sway bar kit option



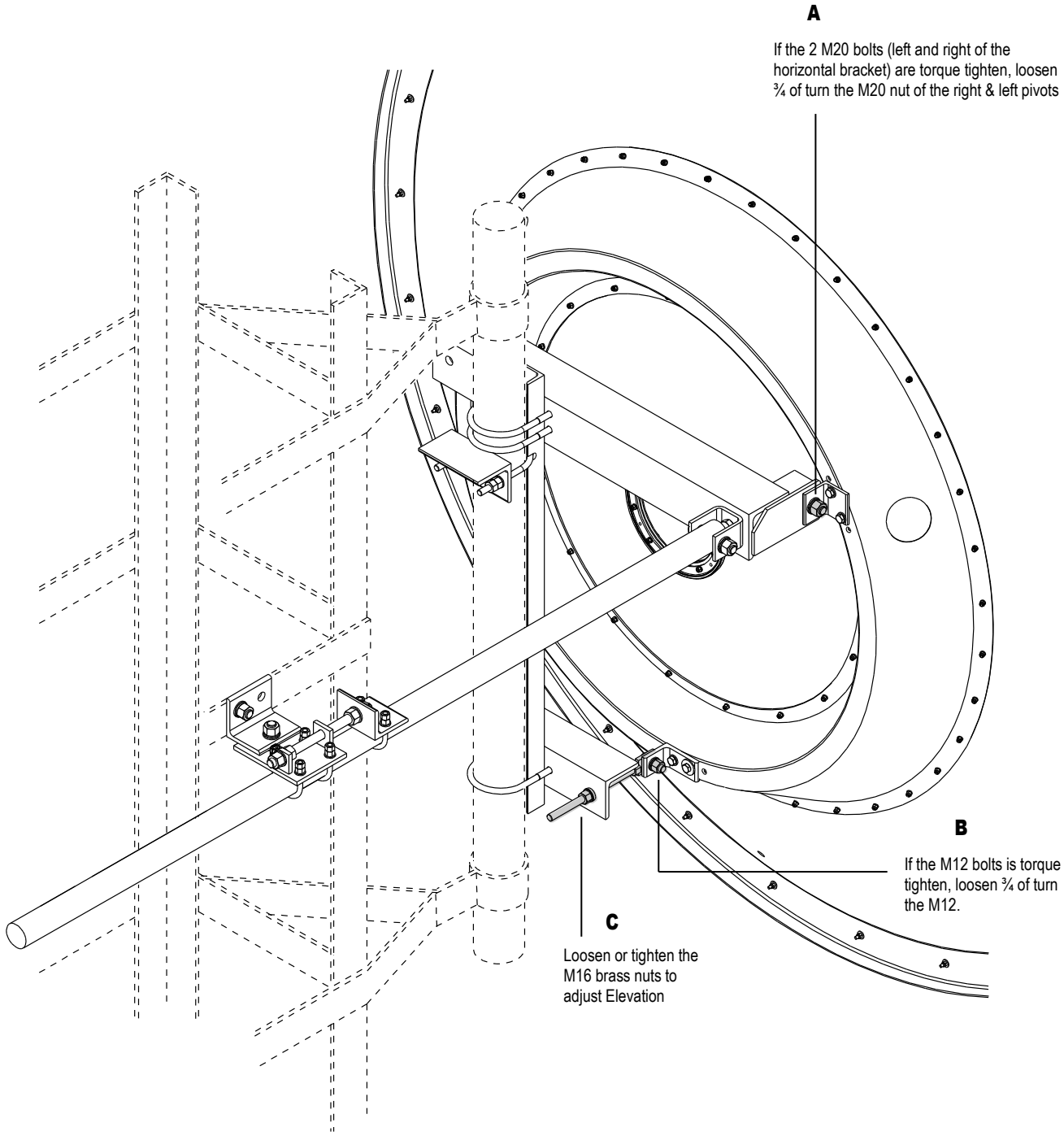
Sway bar installation on tower <u>with</u> sway bar kit option: SMA-SKO-UNIVERSAL-L

Refer to install. Instruction provided with this sway bar option kit



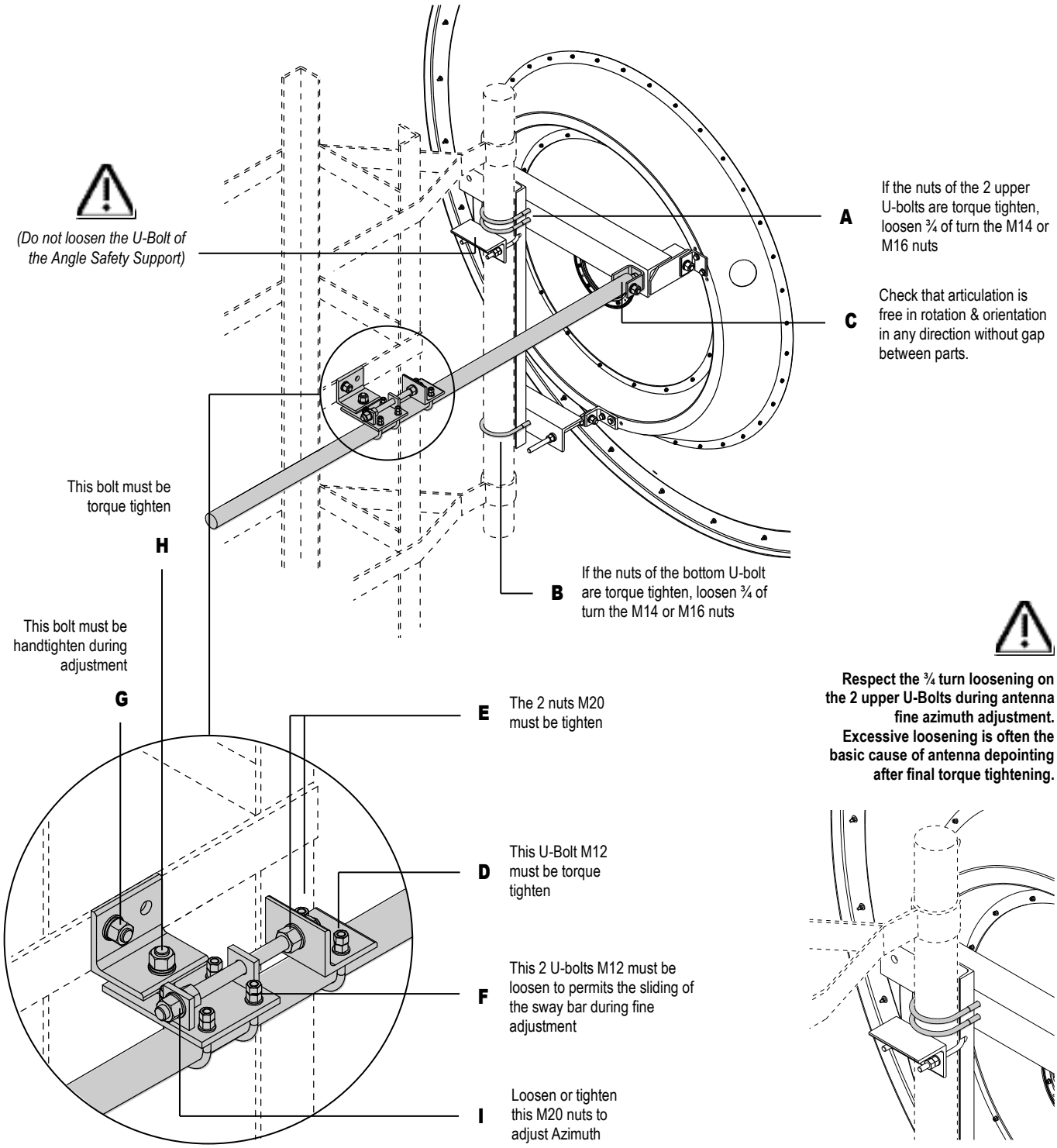
Pipe Ø 60 up to 114 mm **or** **L-profile 60x60 up to 110x110 mm**

17 - Elevation adjustment



After Elevation fine adjustment, lock each M20 and M12 nuts on the pivots at the specific torque value specified on the torque table joined *(the threads must have been greased before torque tightening).* Then torque tighten the 2 M16 brass nuts of the Elevation spindle.

18 - Azimuth adjustment



Respect the ¾ turn loosening on the 2 upper U-Bolts during antenna fine azimuth adjustment. Excessive loosening is often the basic cause of antenna depointing after final torque tightening.

After azimuth adjustment, lock each first nut on the M14 or M16 U-bolts at the specific torque value specified on the torque table joined *(the U-bolt threads must have been greased before torque tightening)*, then tighten the second nut against the first one using usual wrench (*counter-nut function).* Then torque tighten all bolted joints of the Azimuth spindle.

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19 - Final Check

When the installation of the antenna has been completed, it is necessary to make sure that the installation instructions have been followed in all aspects. It is especially important to check that all bolted joints are torque tightly locked.