

# HYDRAULIC MOUNTS

## DESCRIPTION

The AMC MECANOCAUCHO® Hydraulic mounts combine a spring and a hydraulic damper in a single compact unit that allows tuning of the spring and damper independently.

This provides flexibility in matching the dynamic characteristics of the isolator to the requirements of the application.

The internal architecture of the mount is composed of a new system that bonds the rubber to the metal parts in order to eliminate any leakage of the dampening fluid when the mount is submitted to high magnitude shocks.

For good isolation, low damping is required. For motion control, high dampening is required. The MECANOCAUCHO® hydraulic mounts accommodate these conflicting requirements. The fluid cavity is divided into two chambers with an orifice in between, so that motion of the elastomeric element causes fluid to flow from one chamber to the other, dissipating energy and thus creating damping in the system.

These mounts are particularly interesting for those installations that require a soft isolator for good isolation but still require motion control under transient (shock) inputs or when operating close to the isolation system's resonant frequency.

## TECHNICAL CHARACTERISTICS

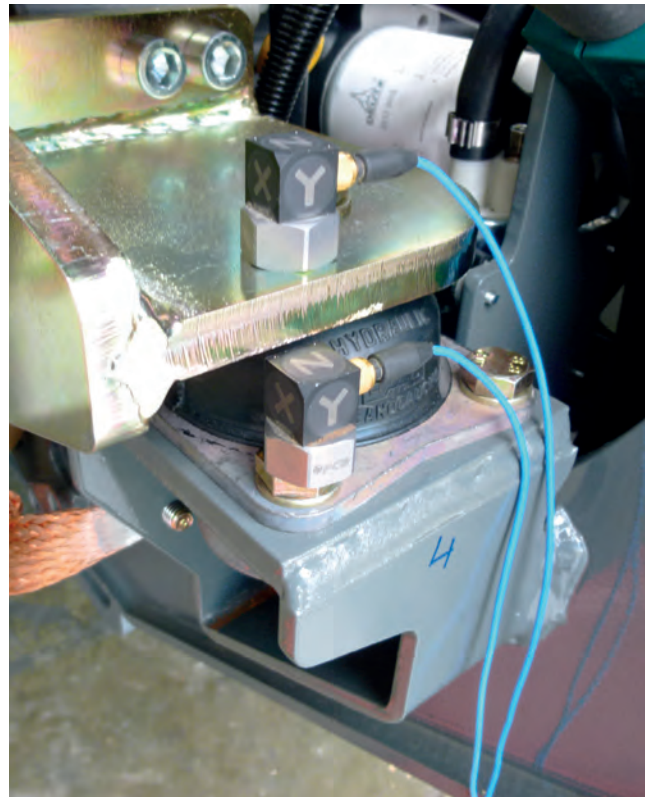
- The AMC MECANOCAUCHO® Hydraulic mounts have an interlocking metal component that provides a fail-safe protection for mobile applications. This device limits the ascending vertical movement when the mounting is submitted to shocks at traction.
- The thickness of the metal parts make this mount robust and suitable for off-road applications. The metal parts have a suitable anticorrosive treatment for outdoor applications. RoHS compliant.

## APPLICATIONS

The AMC MECANOCAUCHO® Hydraulic mounts have been primarily designed as engine and operator cab isolator in vehicular off highway and agricultural applications.

It is particularly interesting for those engines that operate on a variable rotating speed that must pass the natural frequency of the system during its normal functioning. Examples of this may be engines of 1,2,3 or 4 cylinders used on construction or agricultural equipment.

It is also interesting for cabins where vibration isolation is required for operator comfort purposes but as well stability when the cabin is submitted to transient shocks.



Picture of an engine application.



HYDRAULIC MINI	HYDRAULIC SMALL	HYDRAULIC SMALL RECT.
HYDRAULIC MEDIUM	HYDRAULIC MEDIUM RECT.	HYDRAULIC MEDIUM HS2
HYDRAULIC MEDIUM HS4	HYDRAULIC XR C	HYDRAULIC XR
HYDRAULIC LARGE	HYDRAULIC LARGE RECT.	

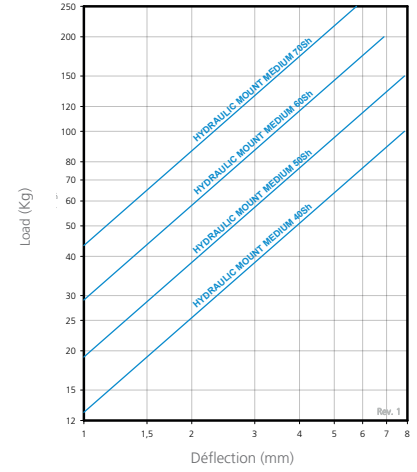
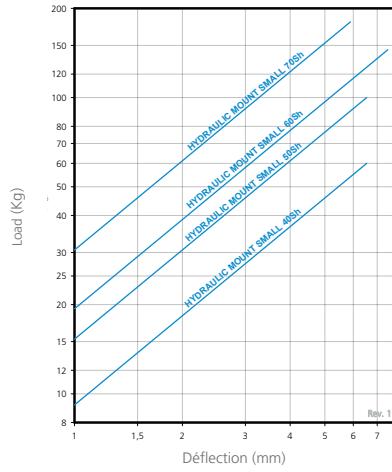
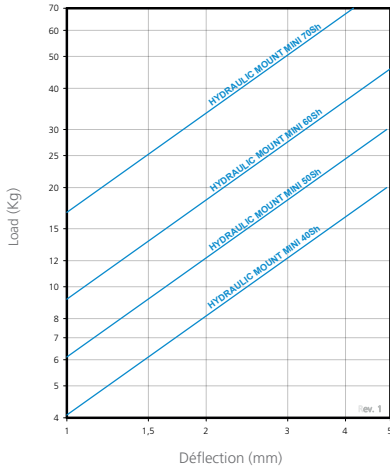
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MINI	41	335	40 Sh	20	177031
			50 Sh	30	177032
			60 Sh	50	177033
			70 Sh	70	177034
SMALL	41	917	40 Sh	60	177001
			50 Sh	100	177002
			60 Sh	145	177003
			70 Sh	180	177013
SMALL RECT.	41	938	40 Sh	60	177015
			50 Sh	100	177016
			60 Sh	145	177017
			70 Sh	180	177018
MEDIUM	71	1030	40 Sh	100	177004
			50 Sh	150	177005
			60 Sh	200	177006
			70 Sh	250	177011
MEDIUM RECT.	71	1050	40 Sh	100	177022
			50 Sh	150	177021
			60 Sh	200	177023
			70 Sh	250	177024
MEDIUM HS 2	71	1030	40 Sh	125	177045
			50 Sh	180	177046
			60 Sh	250	177047
			70 Sh	300	177048
MEDIUM HS 4	71	1050	40 Sh	125	177035
			50 Sh	180	177036
			60 Sh	250	177037
			70 Sh	300	177038
XR C	-	1400	40 Sh	125	177392
			50 Sh	180	177393
			60 Sh	250	177358
			70 Sh	300	177395
XR	-	1600	40 Sh	125	177396
			50 Sh	180	177397
			60 Sh	250	177398
			70 Sh	300	177399
LARGE	350	2445	40 Sh	235	177007
			50 Sh	295	177008
			60 Sh	345	177009
			70 Sh	410	177014
LARGE RECT.	350	2713	40 Sh	235	177041
			50 Sh	295	177042
			60 Sh	345	177043
			70 Sh	410	177044

MINI

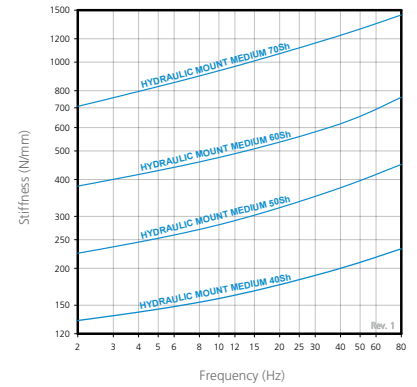
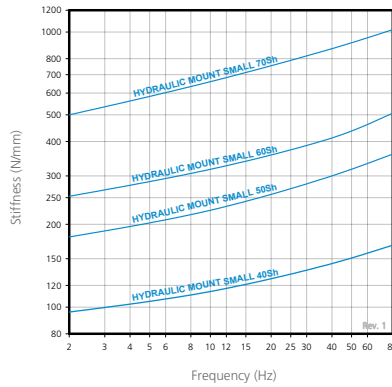
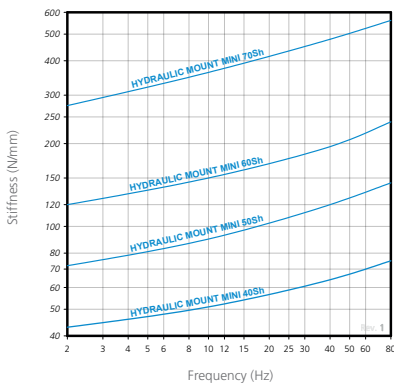
SMALL

MEDIUM

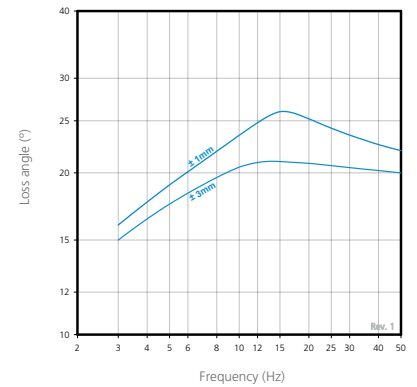
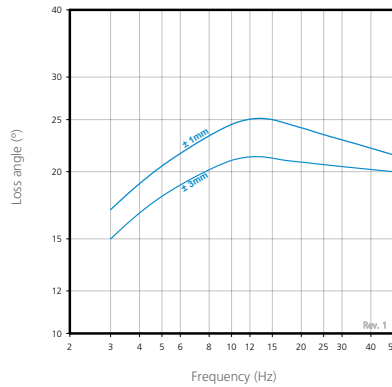
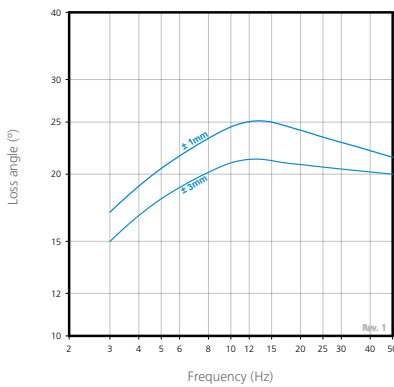
LOAD DEFLECTION



DYNAMIC STIFFNESS



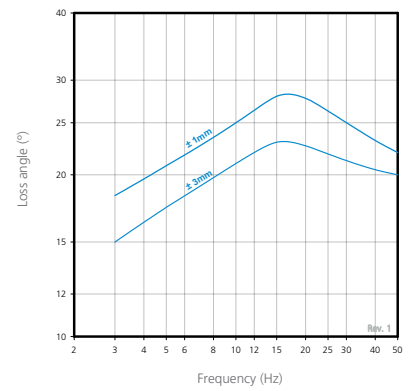
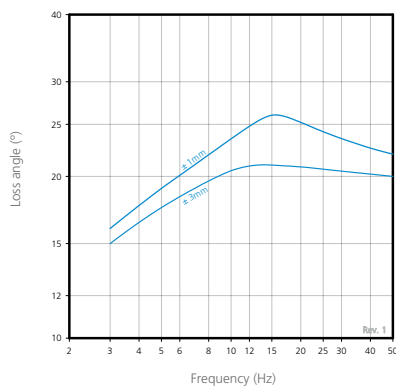
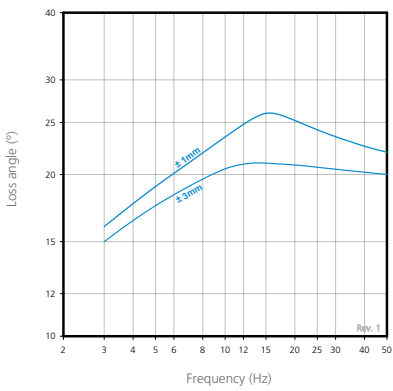
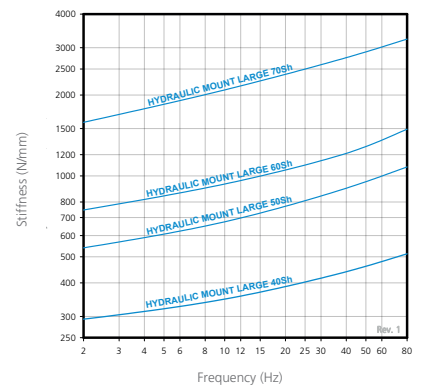
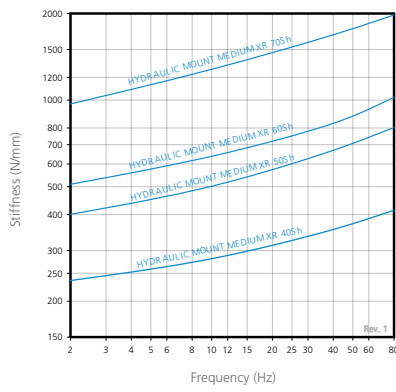
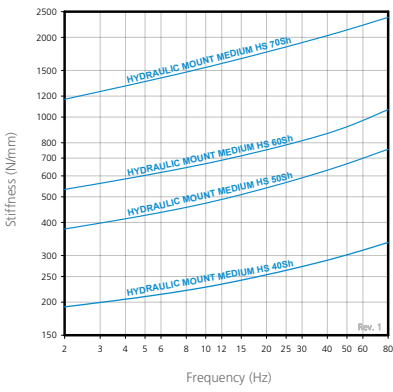
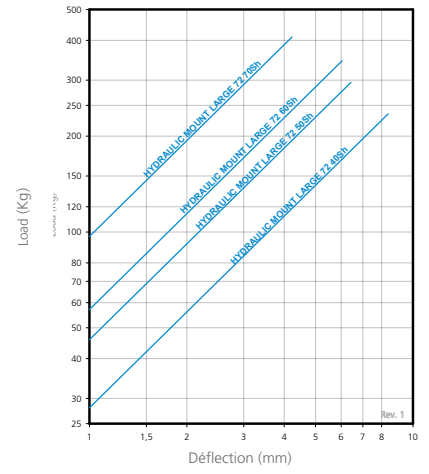
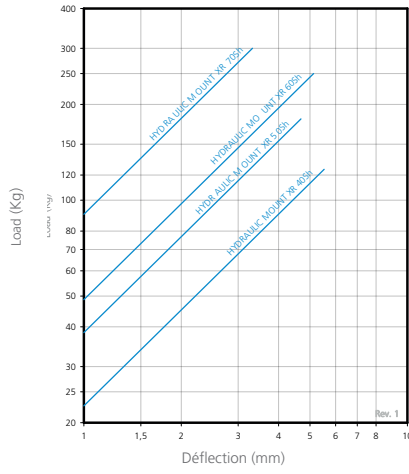
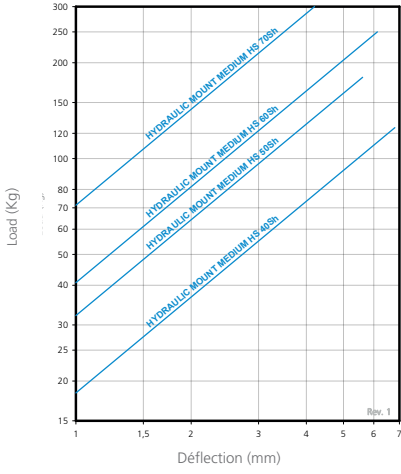
DAMPING COEFFICIENT



MEDIUM HS

XR

LARGE



**OPERATION AND ASSEMBLY**

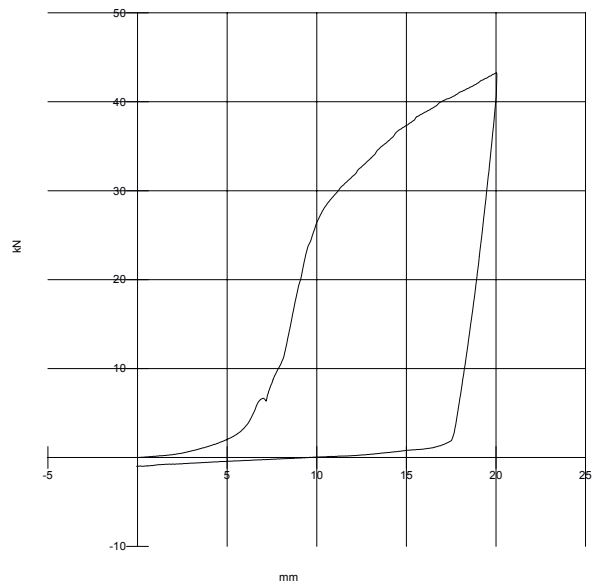
A hook wrench should be used in the slots to avoid the rotation movement of the rubber.

**TECHNICAL ADVICE FOR FOPS ROPS APPROVAL**

AMC-MECANOCAUCHO's technical department will be pleased to offer you advice on correct installation procedures to achieve FOPS/ROPS tests approvals.

These pictures show a typical traction test on rectangular hydraulic medium mount subjected to loads up to 4 Tonnes without destruction of the part. For more information on this topic, please contact our technical department.

TRACTION TEST (Hydraulic medium square)

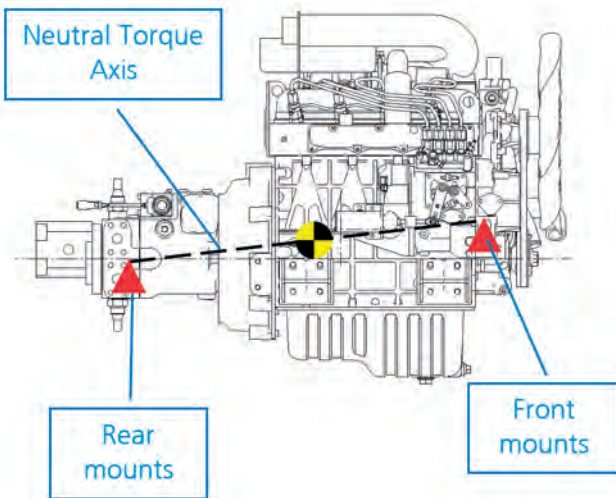


# INSTALLATION ADVICE FOR HYDRAULIC MOUNTS

The correct position of the mounts will affect the vibration modes and reduce the natural frequencies of the suspended element, therefore increasing the vibration isolation.

Key factors to consider are:

- All the mounts should withstand a similar static load. In the longitudinal direction, the mounts should be installed symmetrically around the total COG.
- To achieve the lowest natural frequencies possible and to improve dynamic load distribution, the mounts should be installed symmetrically around the total COG in the transverse direction.
- To minimize the dynamic forces transmitted by the mounts, it is recommended to install the mounts on the imaginary Neutral Torque Axis (referred to as the NTA), this connects the front & rear mounts with the total centre of gravity.
- If the mounts are soft (to minimize the transmitted forces) and they are installed on the NTA, the dynamic forces can be effectively isolated.



It is recommended to install the Hydraulic Mounts in the upright vertical position. If they are installed in an inclined position, the weight of the suspended equipment would create a static radial load. This could result in the internal piston directly contacting on the internal wall of the hydraulic chamber, this would dramatically increase the mounts stiffness and therefore reduce the vibration isolation.

Another effect of an inclined installation is that it can create an unwanted hammering effect, due to the piston hitting the internal wall of the hydraulic chamber.

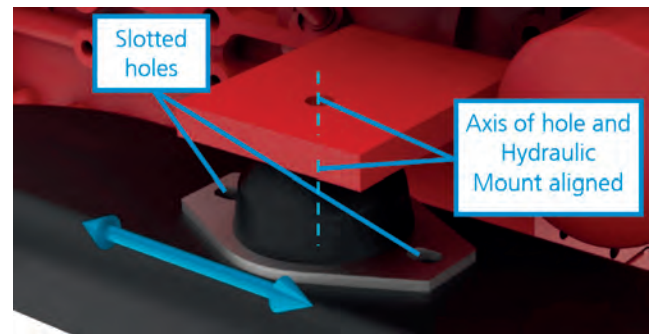
Due to this, AMC recommends installing Hydraulic Mounts in the upright vertical position, so the weight of the suspended system acts in the axial direction of the mounts.



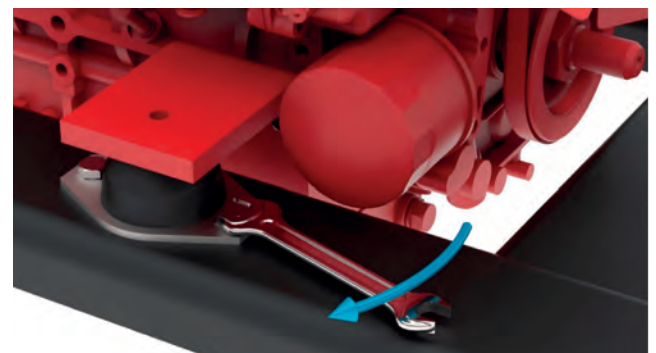
It is important to keep the alignment between the anti-vibration mount and the fixation brackets. Fastening the mounts misaligned can result in the internal piston of the Hydraulic Mounts touching the internal wall of the hydraulic chamber, dramatically increasing the mounts stiffness and therefore reducing the vibration isolation. It can also produce a hammering effect.

Furthermore any misalignment in the installation is absorbed by the rubber element itself, this places additional unwanted stress on to it.

The slotted holes help to accommodate the position of the Hydraulic Mounts to keep the alignment correct.



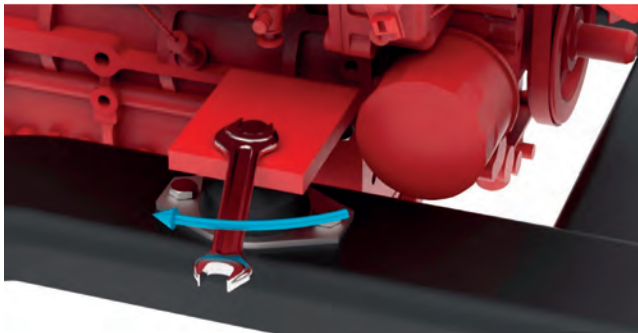
Once aligned, the flange of the Hydraulic Mounts can be fastened:



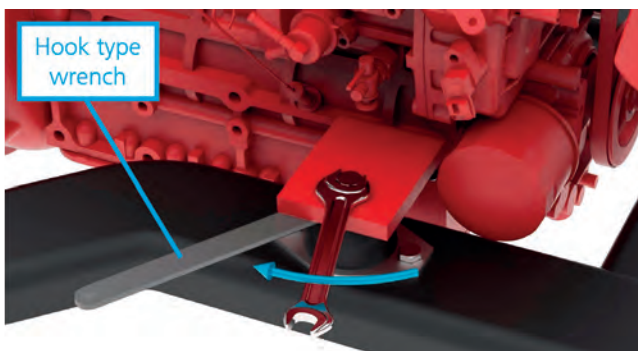
During the fastening of the top screw, it is important to not twist the rubber. Twisting the rubber unnecessarily increases the stress on the rubber and can introduce damage to the bonding surfaces. This might lead to premature appearance of cracks or premature failure of the adhesion between the rubber and the metal parts.

**TO AVOID THE TWISTING OF THE RUBBER, THERE ARE SEVERAL METHODS:**

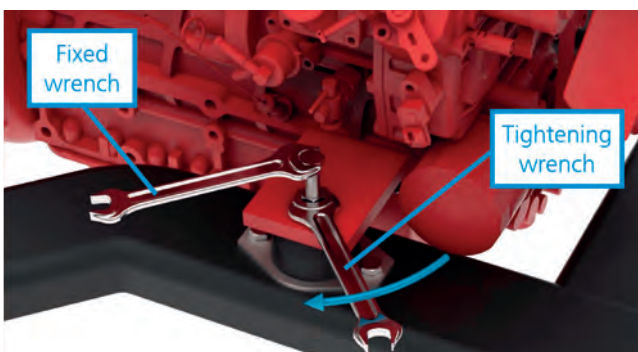
- Sometimes the friction between surfaces is enough to avoid twisting the rubber.



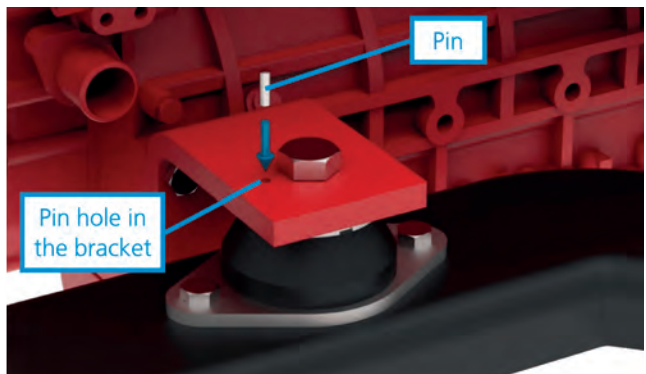
- Hold the top washer with a hook type wrench, using the slots of the top washer.



- Tighten the top screw using a pair of wrenches. While one wrench holds the bolt, the other can tighten the nut.



- The Hydraulic Mounts Large are provided with pin holes. Using them prevents the twisting of the rubber.



The Hydraulic Mounts can also be installed upside down, providing that they are still working in compression. However it is important to note that the damping fluid inside the hydraulic chamber will tend to go downward due to the gravity. Although this factor is not critical to the mounts performance, it might somehow reduce the damping level provided by the mount.

