

TECHNICAL DATA SHEET

DS 038

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QCF 56 Issue 5

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DATE

5 February 2024

APPROVED

P.J.B

TITLE.

Instructions for Installation and Maintenance of Shock Isolator Type X and XM.

For details of isolator dimensional and stiffness/load characteristics see Leaflet PL021 for X mounting and Data Sheet No. DS 016. For XM see Leaflet PL071.

For details of isolator soleplate for concrete floors see Drawing No. S 077.

Each isolator is made in a range of sizes which are identified by Nominal load, eg 45 kg, stencilled on outer casing.

All isolator metal parts are stainless steel, with X mountings containing a damping compound and XM a stainless steel mesh. High impact nylon washers and stainless steel backing washer are supplied for fixing bolts. Soleplates are mild steel with a matt paint finish.

Please consult our application engineers about problem installation areas such as corrosive atmospheres and special paint finish requirements (soleplates only).

A. FIXINGS REQUIRED

The fixings should, as a minimum comply with the following:

- Bolts: Machine Precision Hexagon Head to BS 3692, Steel Strength Designation 8.8
Nuts: a) Plain, Precision Hexagon to BS 3692, Steel Strength Designation 8.8
b) Self Locking (Nylon Insert) Hexagon, Steel Strength Designation 8.8 Washers:
Plain to BS 4320, Steel to BS 1449 CS4

Fixings of other materials can be used as appropriate, provided they are equivalent to the minimum strength designations as above.

Hexagon headed bolts should only be used and other head types such as cap head should not be used as these may restrict the available shock deflection.

Isolators can be installed without the use of soleplates but it is recommended this only be done when isolators are mounted between equipment and steel frame work seating. This should then be carried out using the following procedure;

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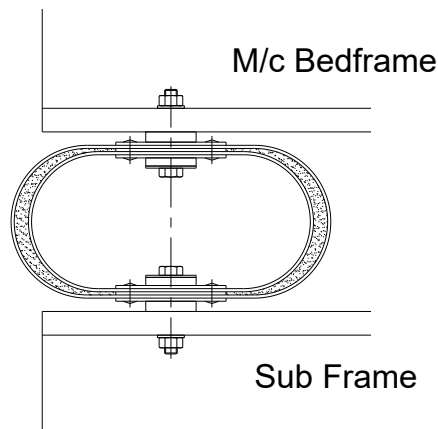
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B. WITHOUT SOLEPLATES

1. The structure beneath the machines should be constructed to form a rigid and reasonably level seating for each group of isolators. For British Naval applications M.O.D. (N) Shock mount BR3021 or MAP01-473 should be consulted.
2. The isolators should be examined to ensure they are of the correct size. If appropriate, the positions and orientation for different sizes should be located in accordance with our recommendations or drawings.
3. Bolt the isolators to the underside of the machine base before lowering the machine into position, ensuring that the bolt heads are within isolators - see Figure 1.

Figure 1.



4. Jacks or blocks should be used to support the machine in a level state with a small clearance below each isolator. The clearances must be measured and if they vary by more than 1.0 mm then steel or other rigid packing pieces should be fitted before transferring the machine weight onto the isolators. These packing pieces should be of adequate size.
5. After the equipment weight has been transferred, isolator hold down bolts should be fitted - these must not strain the isolator in any direction. The isolators are not designed to accommodate angular misalignment or variations in level.

Fully tighten the fixing bolts, starting with the foundation, then the item being mounted. The following torque figures should be used as guidance:

M8 20 Nm, 14.5 lb-ft

M12 48 Nm, 35 lb-ft

M20 68 Nm, 50 lb-ft

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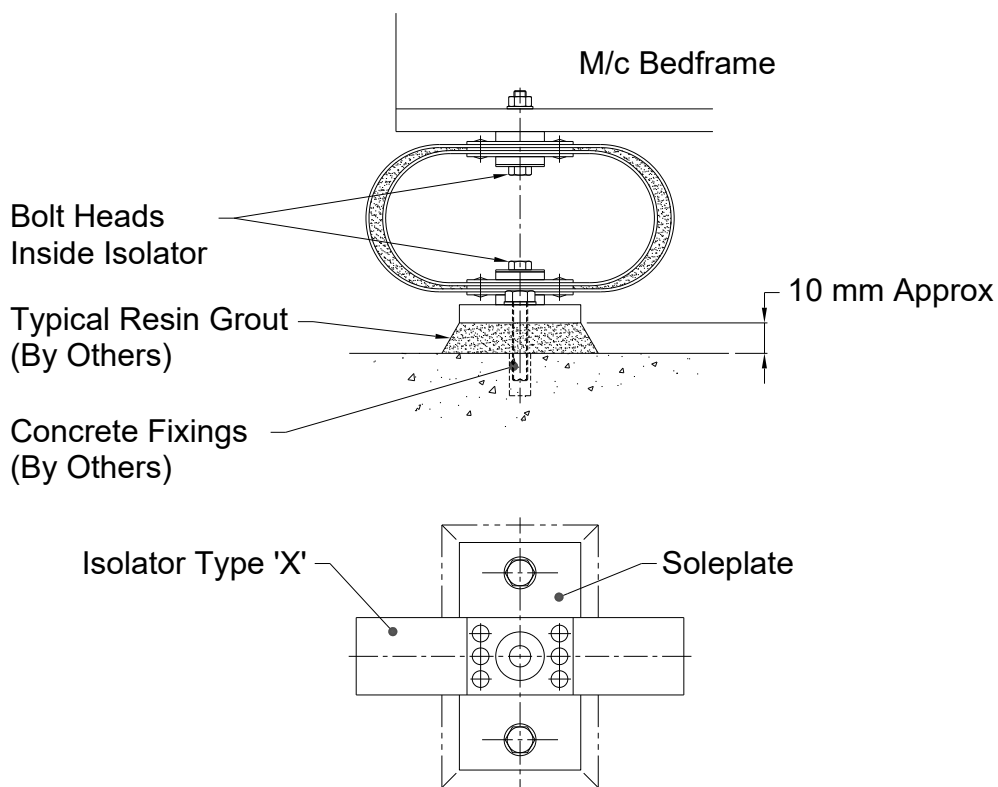
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Isolators installed on concrete floors must use soleplates - as detailed on Drg No. S077. This should then be carried out using the following procedure:

C. WITH SOLEPLATES

1. The structure beneath the machines should be constructed to form a rigid and reasonably level seating for each group of isolators.
2. The isolators should be examined to ensure they are of the correct size. If appropriate, the positions and orientation for different sizes should be located in accordance with our recommendations or drawings.
3. Assemble the isolators to the soleplates with a central set screw. This should be well greased to facilitate later removal. Fix the isolators to the machine ensuring that the bolt heads are within the isolators - See Figure 2.
4. Support and level the machine to be isolated on solid packing with the soleplates approximately 10 mm clear of the floor.
5. Insert the concrete fixings into the two outer holes in each soleplate leaving sufficient thread beneath the nut to allow for tightening down. Fill the slots in the concrete with grout or resin as required ensuring adequate compaction to remove air and keep the concrete fixings vertical.

Figure 2.

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6. After the grout or resin has achieved load bearing strength, the upper fixing screws should be loosened and the machine jacked up just sufficient to remove the solid packing. The machine is then to be lowered onto the isolators which will compress about 7mm. All fixing bolts should then be tightened before connecting services to the machine. (Note: We recommend the use of "Chock-Fast Orange" type resin grout).

When tightening fixing bolts start with the foundation bolts, then the item being mounted. The following torque figures should be used as guidance:

M8 20 Nm, 14.5 lb-ft

M12 48 Nm, 35 lb-ft

M20 68 Nm, 50 lb-ft

7. The efficiency of an isolator system can be seriously impaired if the system is connected to rigid pipes, electrical conduits, ducts or shafts. It is essential that such external connections be as flexible as possible, not only to prevent transmission of vibration through the connections and allow the system freedom of movement, but also to avoid possible failure of the connections.

D. INSPECTION AND MAINTENANCE

Typically the Type 'X' and 'XM' mounts should be inspected every four years, although it may not need to be changed.

Inspection Routine

There must be no obvious damage to the mount leaves.

1. For 'X' mountings, the damping compound should be intact. Mounts are acceptable providing no more than 20% of the compound is missing. For 'XM' the mesh inserts should be free from obvious damage.
2. The mount must not be wrapped, taped, or covered in any way.
3. The nylon washer, insert, and backing washer should be fitted correctly and free from obvious damage.
4. The dimensions between inner faceplates should be within the following tolerances.

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Part No.	Nominal Load, kg	Acceptable tolerance between inner face plates (mm)			
		Tensile Loaded		Compression loaded	
		Max	Min	Max	Min
X.006A	6	82.0	63.0	63.0	44.0
X.010 XM.010	10	98.0	85.0	80.0	67.0
X.020 XM.020	20	96.0	83.0	78.0	65.0
X.045 XM.045	45	111.5	100.5	93.0	82.0
X.070 XM.070	70	111.5	98.0	91.5	80.0
X.110 XM.110	110	104.0	95.0	89.0	80.0
X.180 XM.180	180	144.0	135.5	133.5	125.0
X.320 XM.320	320	141.0	132.5	128.5	120.0
X.450 XM.450	450	134.5	128.0	124.5	118.0

5. The shock clearances around the equipment should be checked and be at least:
 - a. 40 mm in the horizontal direction to allow for shock deflection.
 - b. 60 mm in the vertical direction to allow for shock deflection.
 - c. For equipment mounted adjacent to the pressure hull in submarines, it is recommended that an additional 70 mm be allowed.
 - d. Additional clearance may be required to allow for rocking. This will be dependent upon the mounting configuration and dimensions of the mounted item.
6. Any obstructions around the mounts should be removed, particularly any item that may be within the shock deflection zone underneath a piece of equipment.
7. All external connections to the equipment should be checked to ensure they do not restrict the movement of the equipment. Movement equal to or greater than the extreme travel of the mounting system must be allowed. This is to allow free movement of the mounting systems and to avoid failure of the external connections.
8. External connections should add a maximum total of 25% to the overall stiffness.

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Maintenance

Both Type 'X' and 'XM' mount are not serviceable items. Any mount found to fail points 1 - 4 above should be replaced as soon as possible.

Service Life

The service life of both Type 'X' and 'XM' mount depends upon the environment in which the mounts are used and the extent of shock and vibration experienced in service. In general, the mounts can be used for twelve years. The inspection routine described above should be used to determine whether or not mounts need to be changed. In many cases the twelve years can be extended.

Please contact our Technical Department at the address below if you have any problems relating to installation or selection.



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