

As the majority of cores for heavy equipment and industrial applications are solder bonded fin and tube cores, it is essential that engine vibration is not transferred to the radiator.

Under certain frequency conditions, cyclic engine vibration will crystallise the solder, break the bond down, and subsequently loss of heat transfer and leakage from the tubes occurs.

To prevent vibration racking and stress, radiators must be totally insulated from the engine/body with adequate mounting.

Stationery Equipment – Bed Frames

If the engine is solid mounted, the radiator must be rubber mounted.

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Heavy Vehicle – Mobile Equipment

Where racking of chassis or sub-frame may be encountered the radiator must be rubber mounted to eliminate stress to mounting brackets. The radiator mounts should permit the radiator to “move as a body” without strain, twist or racking.

Under no circumstances should the radiator form part of a vehicle structural member.

Anti-recirculation baffles – (particularly in blower fan applications) should be fitted to eliminate recirculation of hot air.

Recirculation can be checked with an anemometer, or paper strips, to establish air flow patterns.

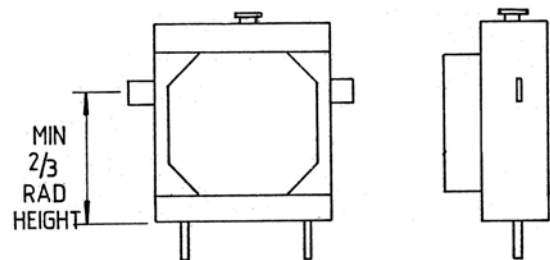
On silenced canopy applications, extra care is required to positively seal the radiator inlet/outlet due to the pressure differential over both sides.

Mounting – there are various mounting options, depending on the application, and/or compatibility with other equipment requirements.

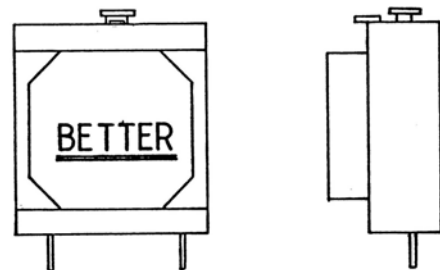
Industrial Mounting - Stationery Equipment

Internal Side Support - Stud mounted at the base, upper supports to the tie bars must be a minimum of 2/3 of the radiator height.

Mounting studs should be as wide as possible to minimise radiator movement.



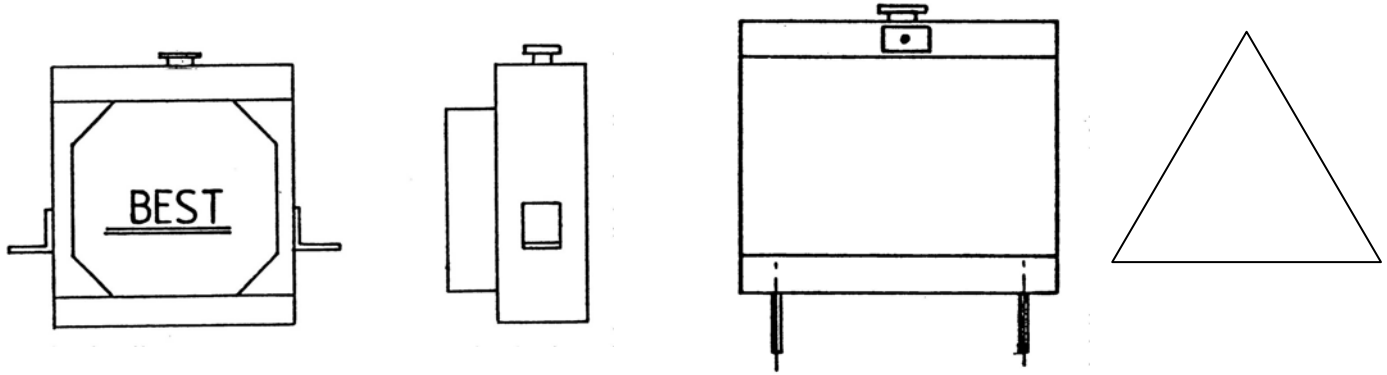
Alternative Centre Top Mount – must NOT be mounted off the fan cowl.



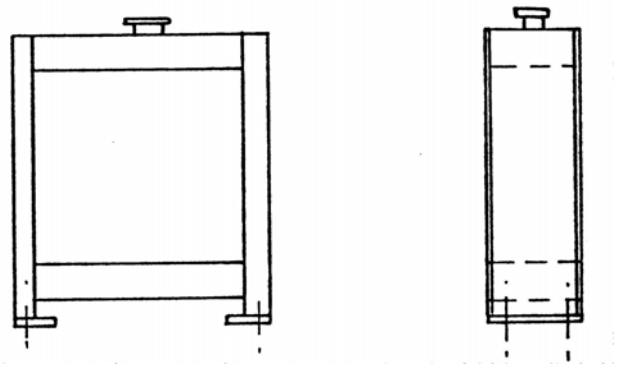
Radiator Mounting



Alternative Side Support Mount.

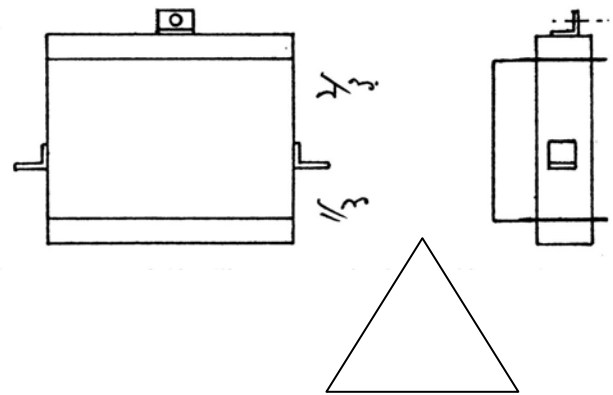


External Side Support Mount - Stud mount small units self standing with plenum on larger units self standing.



Maximum width for stability

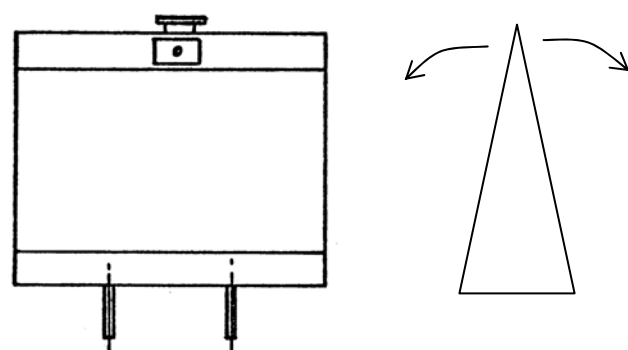
The Tiebar should be as horizontal as possible, and not connected to the engine. Minimal length of 600mm.



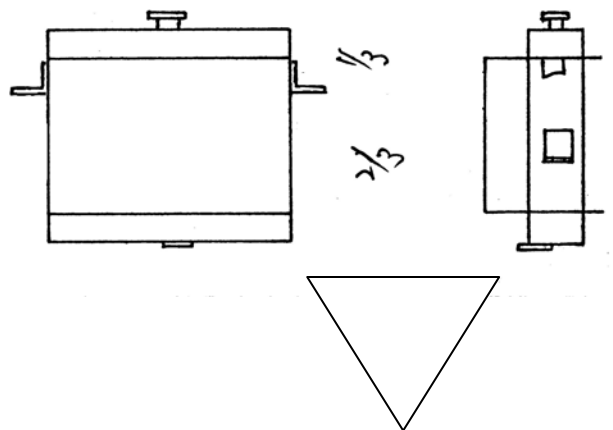
Automotive Mounting - Mobile Equipment.

Base Mount - A 3 point mount is the best choice for automotive mounting where chassis racking is encountered.

Lower mounts should be located and sized to accept the inertia load of the radiator upper mount for front and rear stability.



A narrow mount is less stable.



Rubber Mounting.

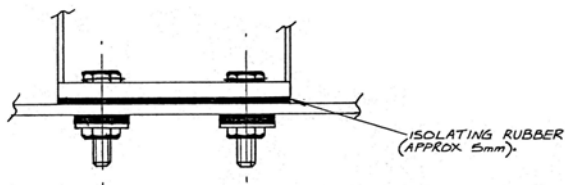
When selecting the type of rubber mount to use in the mounting of a radiator, the following criteria should be considered:

- (a) Installation – stationery or mobile.
- (b) Style of mounting
- (c) Operation – Earthmoving, off road, highway
- (d) Mass of radiator (wet)
- (e) Durometer – amount of deflection required.

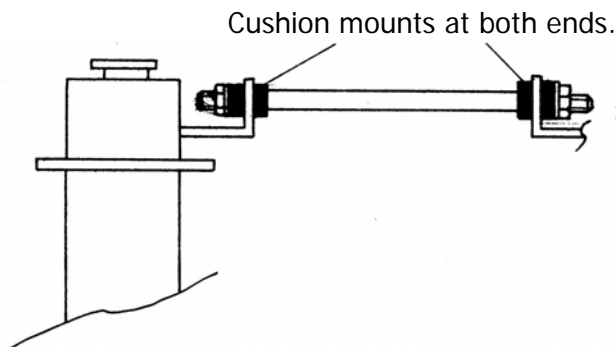
Durometer of rubber, based on the mass of the radiator.

A 'Nyloc' or self-locking style nut must be used in the retention and adjustment of rubber mountings. Over compression of rubber mounts will induce the premature hardening and deterioration of the rubber, and render the isolating capacity of the mount ineffective.

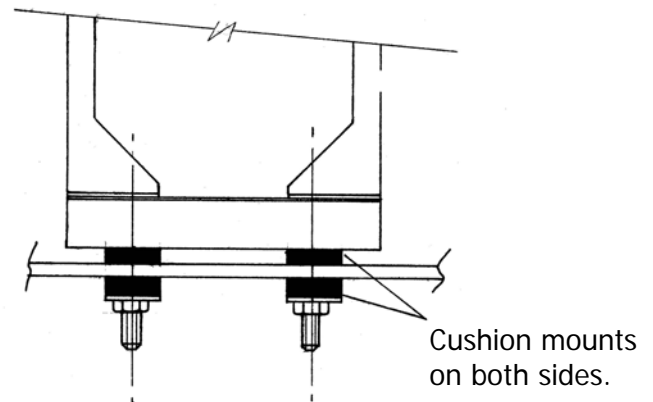
Industrial external side support radiator.



Tie Bars

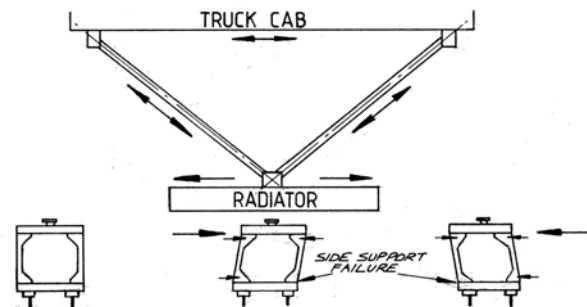


Stud or side support mounts.



Mounting Methods

'A' Frame style (NOT to be used)



The 'A' Frame style of mount usually incorporates a lower stud mounting along with two upper tie bars running from each corner of the vehicle's cab, and meeting at a central point on the top of the radiator.

When this style of mounting is fitted to mobile equipment, the action of side to side cab oscillation and chassis weave join together to force the radiator into a parallelogram, via the upper and lower mounts.

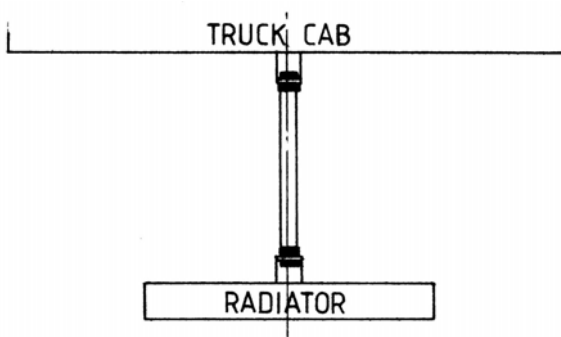
Once these types of loads are imposed on a radiator, failure of the core and steel work are imminent. The initial signs of fatigue are, failure of the tube to header joints in each

Radiator Mounting



corner of the core, and fracturing of the side supports at the point of mounting to the tanks.

A simple method of remedying this problem, is by the application of a single upper tie bar from a central point of the cab to a central point on the top of the radiator. This would allow the cab to move independently, from the radiator and thus the radiator should maintain a natural position.



Some of the more common types of radiator mounting in mobile equipment are the upper diagonal tie bars, and the chassis to upper radiator tie bars.

Upper diagonal tie bar mounting - there is usually a tie bar running from each corner of the vehicles cab to the opposite corner of the radiator top tank. In some installations, there is also a further two tie bars connecting each corner of the cab to its corresponding corner of the radiator.

In both cases, these types of upper mounting can induce fatigue and failure of the radiator.

The combined action is of front axle and cabin oscillation, together with chassis weave.

For further information, contact Air Radiators.

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Issue : 1

Date : 31/05/01

ECN :

Approval :

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