



Installation Guide

Vibrator Motor Fixing Bolts



P3085 Issue B



Company Profile

Invicta Vibrators is a division of Grantham Engineering Ltd., a company founded in 1946 specialising in electrical engineering.

Our founder, Sidney Pask, recognised a requirement in the market for high quality industrial vibrators.

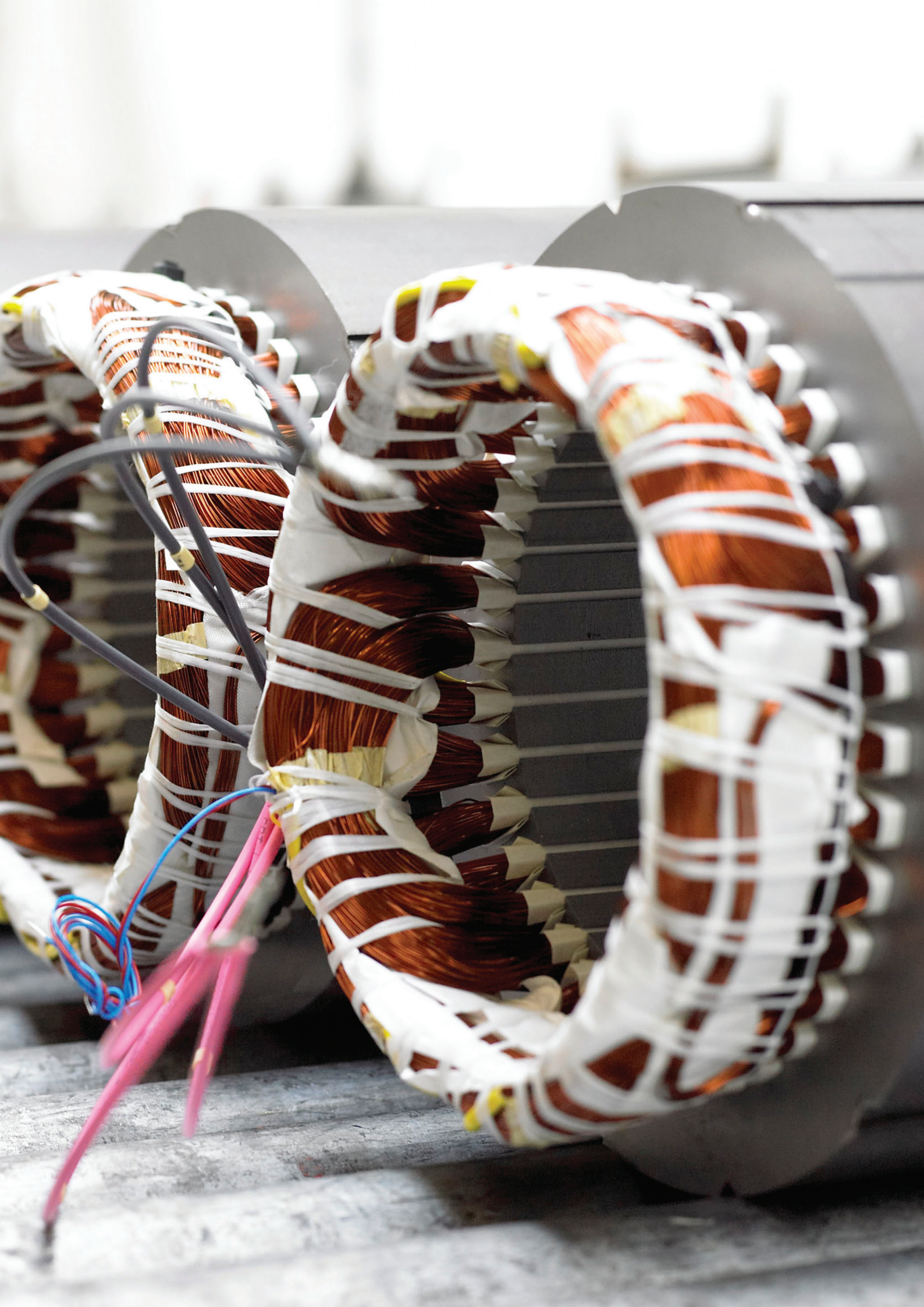
In 1958 he established the division of Invicta Vibrators, dedicated to the design and manufacture of electrical, pneumatic and hydraulic vibrator motors for the material handling and process industries.

Grantham Engineering remains a family business, being in the third generation, underlining the emphasis and commitment to stability and the transition of experience in a specialist industry.

This allows the company to maintain its core focus on quality and excellent customer service to a constantly changing world market.

Our commitment to quality and reliability is evidenced by the continual investment in improvement through design and manufacturing technology and our pledge continues with the availability of technical support world-wide.

Our extensive manufacturing facilities located in Grantham, England, allow us to continually develop and manufacture the complete product and therefore to have total control over quality and costs.



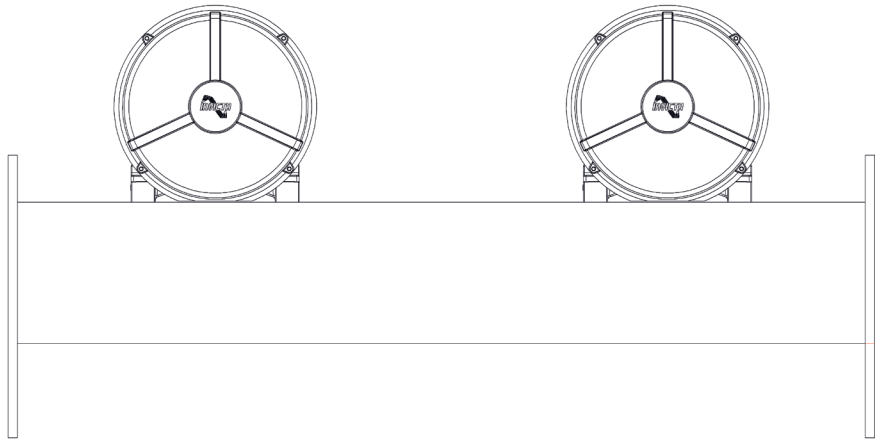
Warning

The installation procedure for Vibrator motors is significantly different to installing standard electric motors. Vibrator motors require a precise and structured approach for the tightening of fixing bolts as outlined below. Failure to follow these instructions could lead to early vibrator failure.

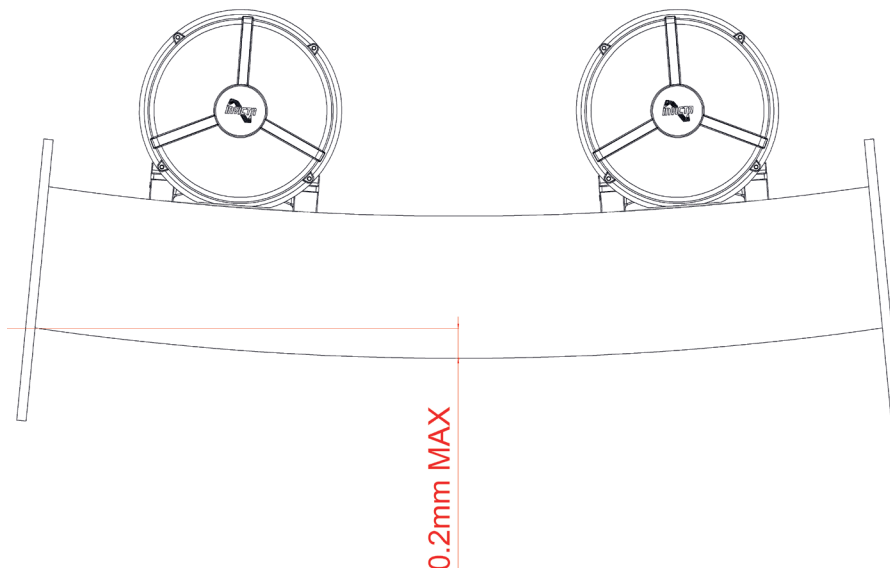
Mounting Structure

The structure to which the vibrator is mounted must be sufficiently stiff to withstand the out of balance forces imposed on it by the vibrators. Deflection of the structure will lead to relative movement of the mating surfaces of the bolted joint and lead to bolt loosening and failure. Static deflections when loading with maximum centrifugal force should not exceed 0.2mm. Please ensure there is at least 50mm of clearance between the vibrator and any surrounding structure.

Static

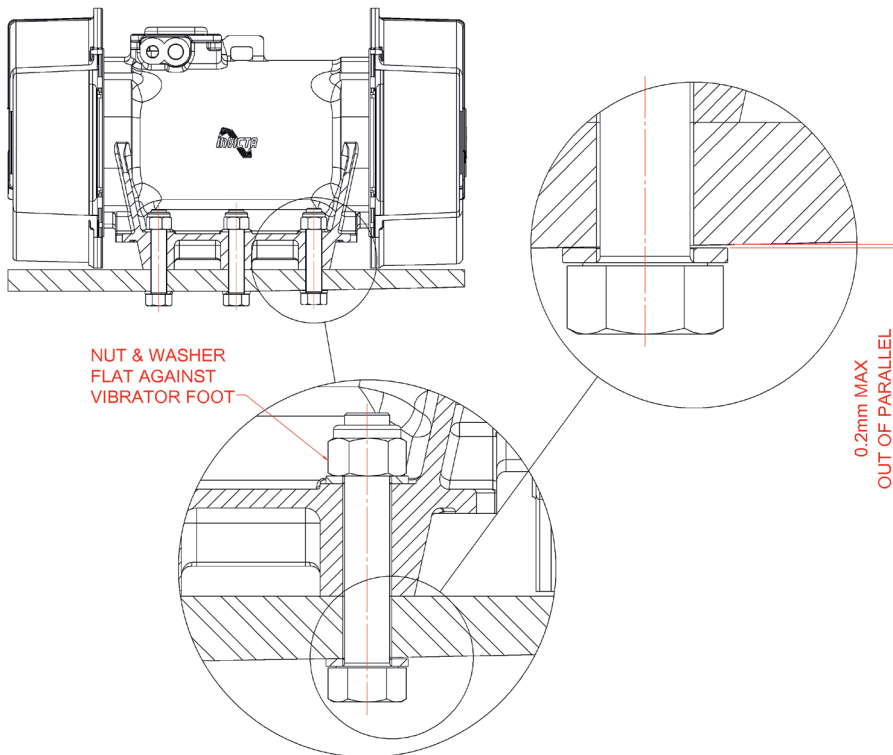
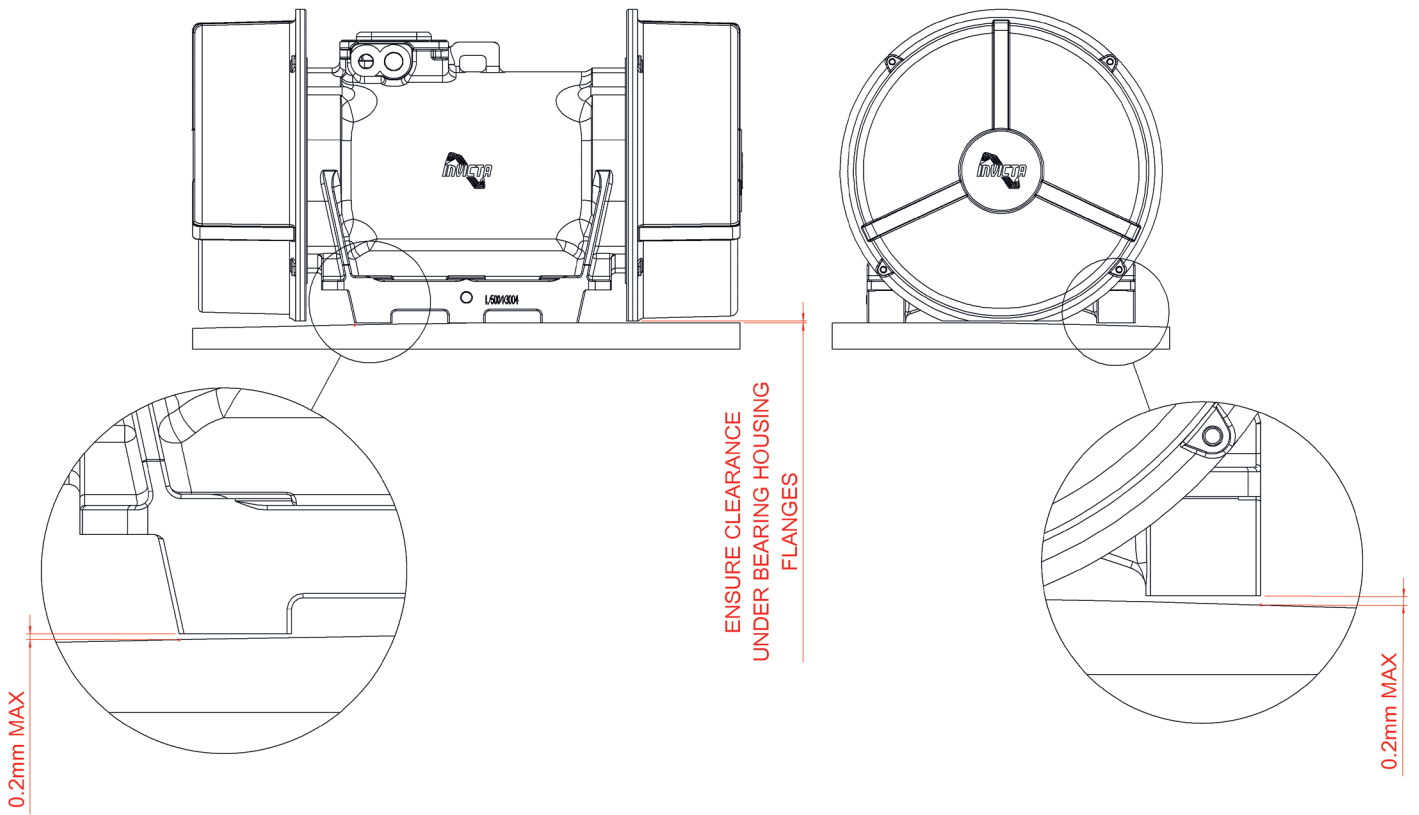


Running



Mating Surfaces

All mating surfaces of the bolted joint should be clean and free of any paint or scale. Metal to metal contact must be observed at the mounting surfaces of both the motor and the mounting beam. Flatness of the mounting surface should be within 0.2mm. These measurements should be checked before any bolts are tightened.



Motor mounting surface and bolt head mounting surfaces should be flat and parallel to ensure bolt heads are not edge loaded. Invicta recommend that the bolting surfaces for vibrator motors should be machined to ensure the faces are flat and parallel.

These checks should be carried out before any bolts are tightened.

Fixings

High tensile bolts of grade 8.8 should be used with grade 8 self locking nuts. Plain hardened washers should be fitted under the nut and bolt head. Tighten the nut to the torque values listed below using a calibrated torque wrench. It is recommended to always tighten the nut and not the bolt head. Bolts and nuts should not be reused.

Tightening the head of the bolt rather than the nut could lead to a different preload on the bolt if the frictional characteristics of the bolt head surface and washer assembly are different to that of the nut and washer assembly (e.g. different surface areas or clearance hole sizes). If in doubt, consult Invicta technical department.

For larger bolts (M30 upwards) a torque multiplier will be required.

The torque figures are for dry black bolts ('Dry' bolts would still be expected to have some residual machine oil lubrication).

Bolt Size	Torque (Nm) Setscrews/Bolts Grade 8.8
M8	27
M10	56
M12	96
M16	242
M20	473
M24	818
M30	1634*
M36	2854*

With figures marked * a torque multiplier will be required.



Torque Multiplier, torque wrench & socket

When torque wrenches are not available, the half turn method may be used (see page 5) . Note: if a slogging spanner is employed to tighten the nut, a special high strength nut is required, standard grade 8 nuts are not suitable for slogging.



Slogging Spanner

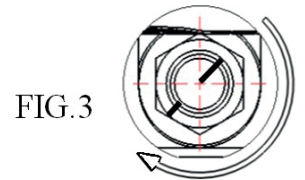
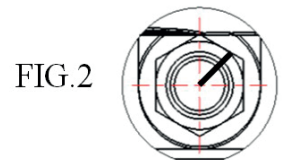
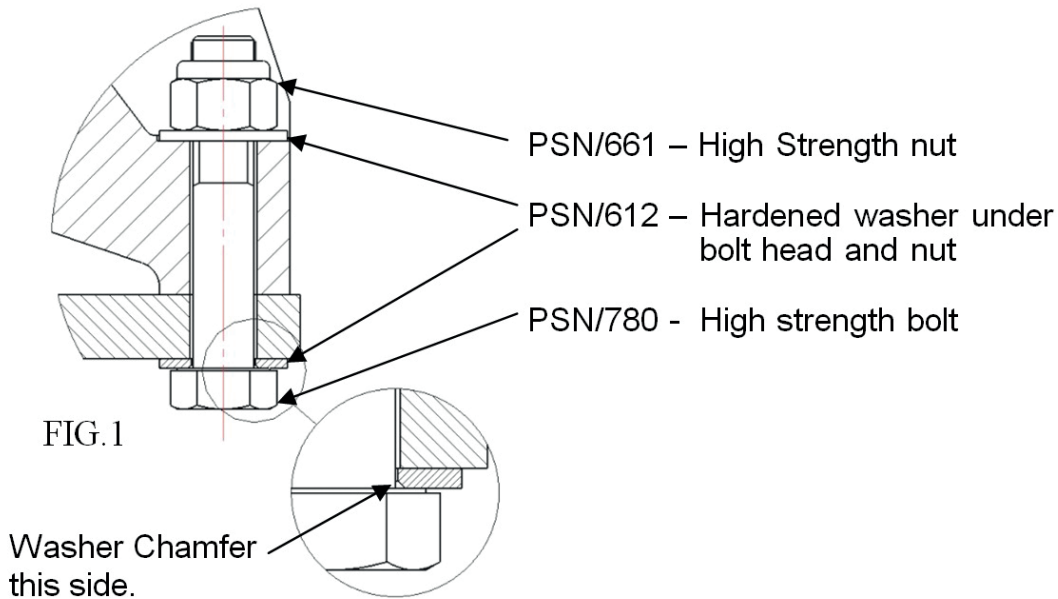
Bolt length

Bolts should be long enough so that, after tightening, at least two full threads protrude from the nut.

Bolt Condition

Plated or lubricated bolts will have significantly different friction coefficients compared to dry black bolts and may require different torque values for tightening. If bolts other than dry/black bolts are to be used please consult Invicta technical department.

Half turn method



Remove any paint, dirt or scale from all mating surfaces.

Fit hardened washer (PSN/612) under bolt head and nut. Pre-tighten until all mating surfaces are in contact. Mark nuts and bolts as shown in fig. 2 and slog nut one half turn until marks are as shown in fig. 3.

Running Checks

After initial installation, there will be a period of joint settling which could lead to a loss of clamping force in the bolted joint. Therefore it is important that periodic checks of bolt tightness are made. We recommend re-torquing the bolts after the first 4 hours of operation, after seven days, then after one month. After this initial period, bolt tightness should continue to be checked as part of the regular maintenance regime. However, if abnormal noise is heard from the motor at anytime in the periods between checks, the machine should immediately be switched off and the bolt tightness checked. Running the vibrator even for a short period of time with loose fixing bolts can cause serious damage to the vibrator and mounting structure.

Invicta Vibrators
A Division of
Grantham Engineering Limited
Harlaxton Road
Grantham
Lincolnshire
NG31 7SF
United Kingdom

Telephone
+44 (0) 1476 566301
Fax
+44 (0) 1476 590145
Website
www.invictavibrators.co.uk
Email
sales@invictavibrators.co.uk



P3085 Issue B