INSTALLATION & MOUNTING OF TECNADYNE DC BRUSHLESS THRUSTERS

1. Introduction

The purpose of this application note is to describe the most common methods of mounting Tecnadyne thrusters to ROV frames and to the fuselages of faired ROV's and AUV's. While this application note discusses the four most common mounting methods, other approaches that better suit the specific requirements of the customer's system may be warranted. Please consult the factory for assistance and recommendations when alternate mounting methods are being considered.

2. Saddle Mount

The saddle mount is the simplest of the four mounting solutions. It is also practical and rugged. A representative saddle mount is shown in Figure 2.1.

The saddle shown in Figure 2.1 could be made from aluminum, stainless steel, titanium or plastic and would most likely be welded to the frame of the vehicle, although it could also be bolted to the frame. The tubular frame member shown in Figure 2.1 could also be oriented orthogonally, so that the saddle would bolt or weld to the side wall of the frame member, rather than to the end of the tube as shown. Alternately, the frame member could be a different shape, such as a square tube, channel, I-beam or plastic plates. It is a good idea to place a thin (1-1.5mm) pad of rubber sheet between the thruster and the saddle – this rubber pad will prevent the thruster from moving in the saddle and will also protect the thruster. The saddle should have an inner radius equal to ½ the diameter of the thruster housing plus the thickness of the rubber pad. The saddle can be manufactured by machining or by precision roll forming.

With the saddle mount, the thruster is held to the saddle using two (or more) stainless steel worm drive hose clamps. The best clamps are the Type 316 stainless steel smooth band clamps manufactured by AWAB in the US – these clamps are available worldwide or directly from Tecnadyne. Cover the hose clamps with electrical heat shrink tubing to prevent the clamp from damaging the anodized surface of the thruster.

Once the thruster is installed, tighten the hose clamps very tight so as to compress the rubber pad slightly and prevent the thruster from moving during use.

3. Clamp Mount

The clamp mount is shown in Figure 3.1. Specific details of the clamp design and its attachment to the vehicle frame or fuselage are the responsibility of the vehicle system designers. Unlike the saddle mount discussed in Section 2, above, in which a certain amount of imprecision can be tolerated, the clamp mount requires that the clamp be machined to fairly high tolerances. The inside diameter of the clamp should exactly match the outside diameter of the thruster housing (to within 0.1mm). 1 – 1.5mm of gap should exist between the clamp base and the clamp cap when lightly tightened, to ensure sufficient compression to prevent movement of the thruster. The clamp assembly should be machined from aluminum or plastic material. Plastic material is best since it does not damage the outer surface of the

TECNADYNE
A TECNOVA INC. COMPANY

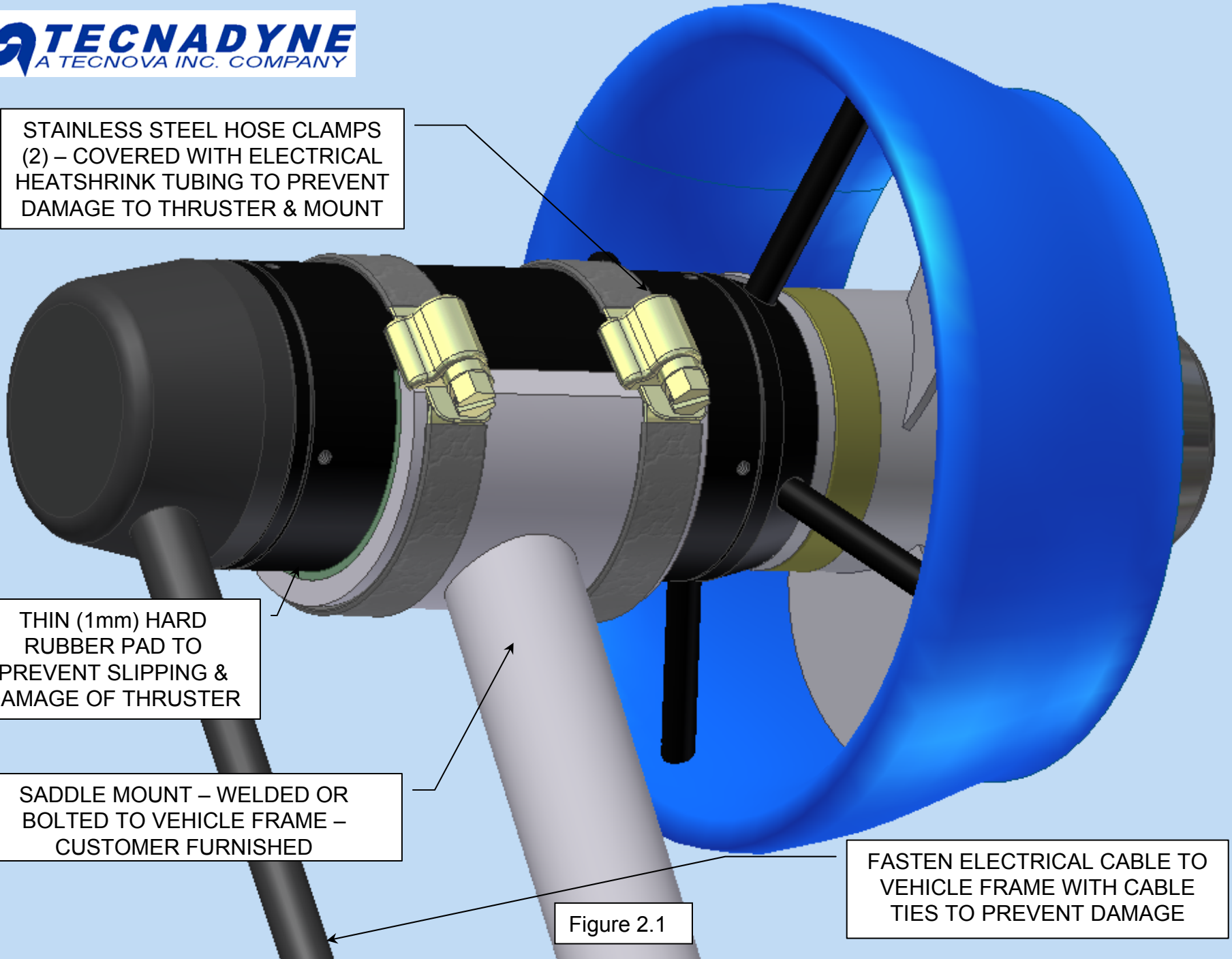

Figure 2.1

TECNADYNE
A TECNOVA INC. COMPANY

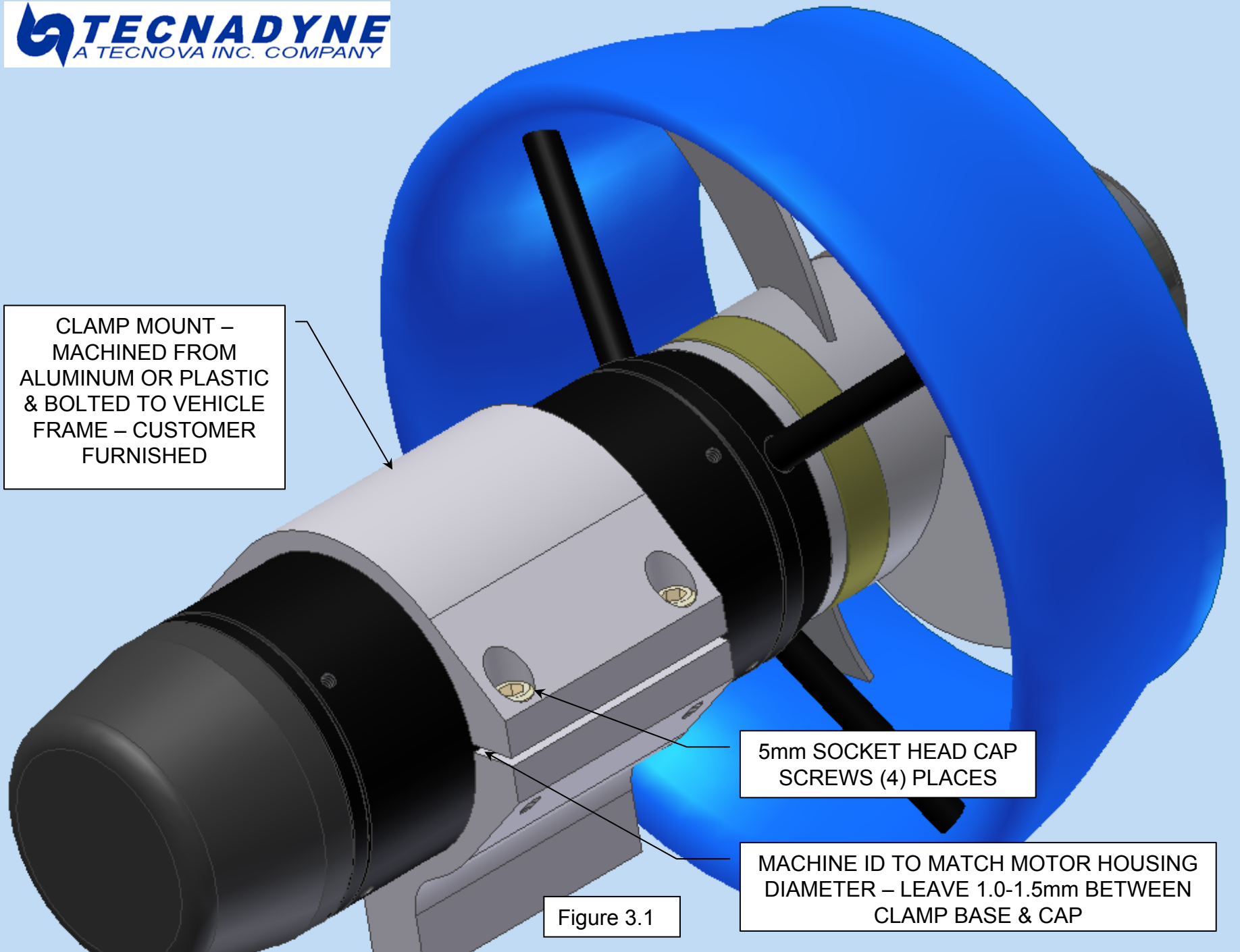

Figure 3.1

thruster and create a corrosion cell, as could happen with an aluminum clamp. Take care to design the clamp for minimum size, so as to not interfere with the water flow into the thruster propeller and nozzle. Secure the clamp cap to the clamp base using 5mm stainless steel socket head cap screws (use 2 screws for Models 250 & 300, 4 screws for Models 520, 560, 1020 & 1060, 6 screws for Models 2010 & 2020).

Tecnadyne can design and manufacture clamp mount assemblies to suit all Tecnadyne thrusters and to meet specific customer requirements. Please consult the factory for further details.

4. Blade Mount

Whereas the saddle mount and clamp mount use the standard thruster configuration, the blade mount requires that the thruster housing have integral mounting tabs. Blade mount thrusters are available from Tecnadyne as special order options. Please refer to Figure 4.1 for an illustration of a typical blade mount.

Due to the cantilever design of the blade mount option, it is necessary that the blade be constructed from high strength material (generally aluminum). The thruster bolts to the frame using two stainless steel flat head Phillips screws (6 on the Model 8020). As with the design of the clamp mount, specific details of the blade design and its attachment to the vehicle frame are the responsibility of the vehicle system designers. Tecnadyne can furnish the dimensional details necessary to fit the blade to the mounting tabs on the thruster housing.

Please consult the factory for additional mounting details of the blade mount option.

5. Nozzle Mount

A mounting technique for faired ROV’s and AUV’s, the nozzle mount is illustrated in Figure 5.1. Nozzle mount thrusters are available as special order options from Tecnadyne.

Since the nozzle mount employs the nozzle as the structural attachment of the thruster to the vehicle, it is necessary to use additional nozzle struts for strength and stiffness. This is illustrated in Figure 5.1. On Model 1020 & 1060 thrusters (and on all larger thrusters) Tecnadyne additionally installs a load bearing stainless steel ring in the outside surface of the nozzle due to the high loads resulting from normal operation and also from wave slap during launch and recovery operations. With the nozzle mount option, the thruster attaches to the vehicle frame or fuselage using four stainless steel flat head screws (6 on the Model 2010 & 2020, 8 on the Model 8020) that are installed from the inside of the nozzle. The nozzle is separated from the frame or fuselage by tubular struts (generally aluminum) – the length of these struts is determined by the system designers.

The nozzle mount option requires careful integration with the vehicle system -- please consult the factory for additional mounting details prior to system design.

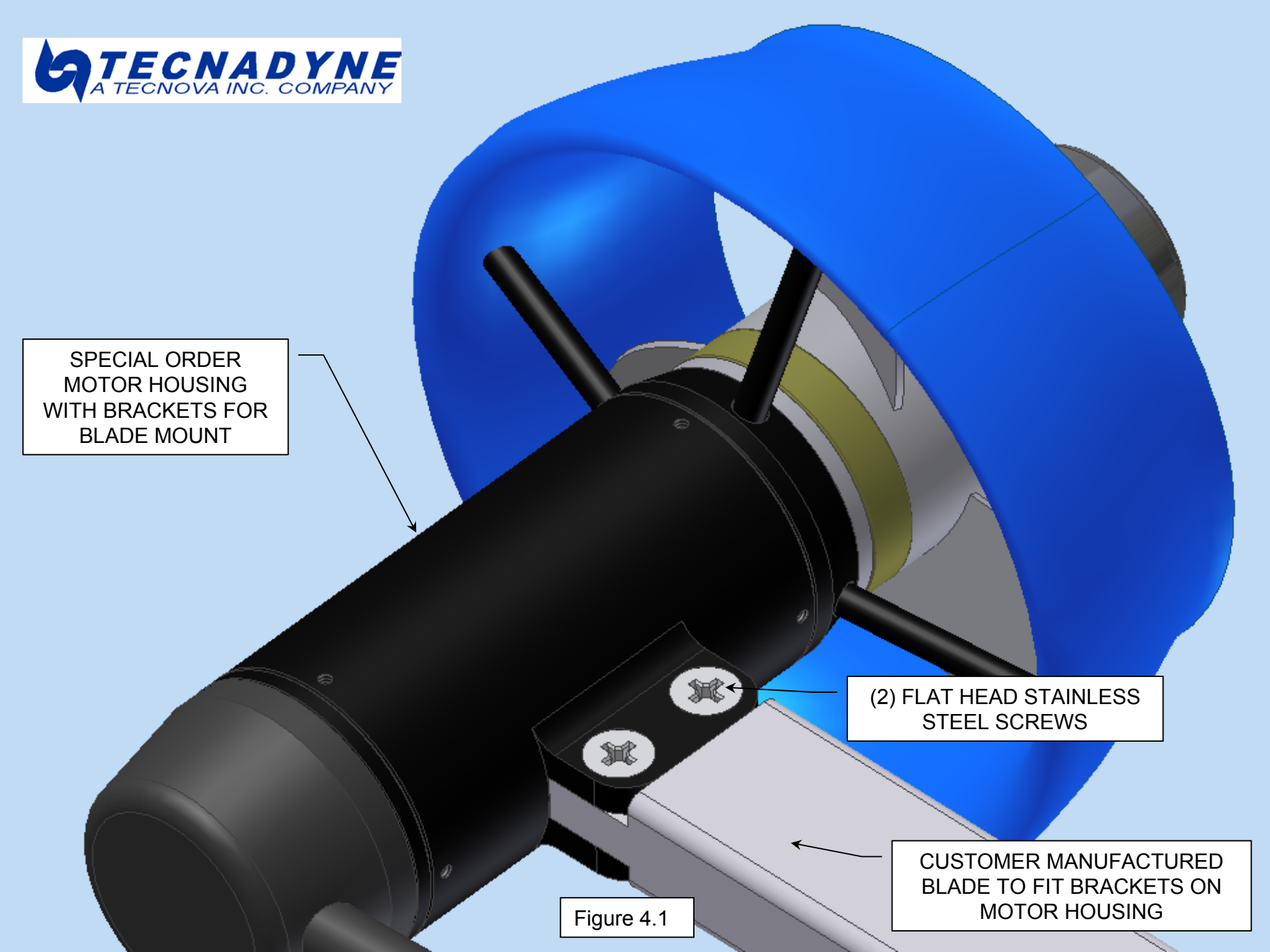
TECNADYNE
A TECNOVA INC. COMPANY
SPECIAL ORDER MOTOR HOUSING WITH BRACKETS FOR BLADE MOUNT
(2) FLAT HEAD STAINLESS STEEL SCREWS
CUSTOMER MANUFACTURED BLADE TO FIT BRACKETS ON MOTOR HOUSING

Figure 4.1

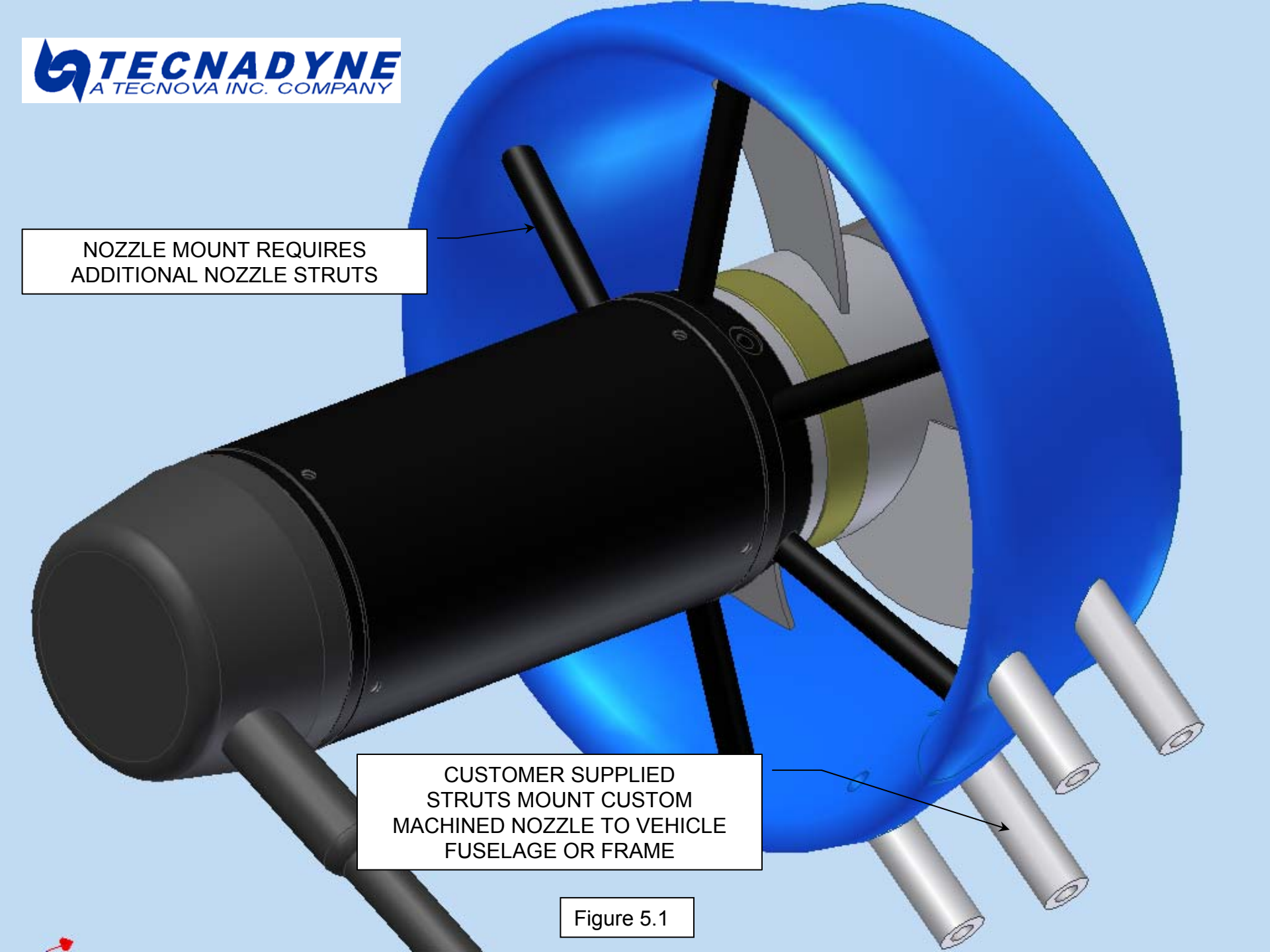
TECNADYNE
A TECNOVA INC. COMPANY
NOZZLE MOUNT REQUIRES ADDITIONAL NOZZLE STRUTS
CUSTOMER SUPPLIED STRUTS MOUNT CUSTOM MACHINED NOZZLE TO VEHICLE FUSELAGE OR FRAME

Figure 5.1