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TECHNICAL BULLETIN #2

**TO: ALL VCNZ CERTIFIERS, VCNZ APPROVED ENGINEERS,
AND NZHRA MEMBER CLUBS**

REVISION #00

1673/25E

USE OF STAINLESS STEEL FASTENERS

This Bulletin takes effect as at the 1st of January 1996

INTRODUCTION:

This Bulletin is to show comparisons between strengths of common mild steel and high tensile steel bolt types, and stainless steel bolts, for the purposes of establishing which type of stainless steel fasteners may be used in critical (high load or stress) applications such as steering, suspension and brakes.

Research by the NZHRA Technical Advisory Committee on this subject has become necessary due to the common use of stainless steel fasteners as an alternative to normal high tensile steel fasteners.

The conclusion has been reached on the subject that only the stainless steel bolt types specified in this Bulletin as having been approved may be used as an alternative in any areas where the NZHRA Code of Construction Manual requires a Grade 5 or better high tensile bolt.

Consultation has taken place between the NZHRA Technical Advisory Committee and D.S.I.R, Fastener Importers and Distributors, Air New Zealand, and many local and overseas written reference sources have been studied.

RULES AMENDMENTS:

1. New Code

Rules affected by this change are:

1.34(a), Page 53; 2.41, Page 66; 3.17, Page 74; 6.38, Page 88

To the end of each of these rules is to be added the following sentence:

"Only NZHRA approved stainless steel fastener types may be used as an alternative to a high tensile steel fastener".

2. Retrospective Code Rules affected by this change are:

1.34(a), Page 195; 2.5, Page 202; 2.33, Page 205; 3.2, Page 209; 6.36, Page 219

To the end of each of these rules is to be added the following sentence:

“Only NZHRA Approved stainless steel fastener types may be used as an alternative to a high tensile steel fastener”.

BACKGROUND

Over recent years, stainless steel fasteners have proven popular in the assembly of all special interest motor vehicles, especially Hot Rods. The main reasons for their popularity are:

1. They provide a high quality show finish look;
2. They are becoming more readily available;
3. They provide better durability with continued use;
4. Their use avoids any problems with Hydrogen embrittlement;
5. They offer excellent corrosion resistance.

These reasons are all quite valid, and there is no arguments with them, however there is one more common reason for the use of stainless steel bolts, and that is because many people are of the mistaken belief that:

6. They are all high tensile products and are therefore the ultimate fastener in terms of strength.




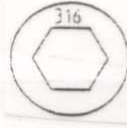



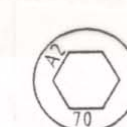
Unfortunately this latter reason is not correct. The truth of the matter is this:

The tensile strength of many readily available stainless steel bolts are in fact less than that of a normal mild steel bolt, and are only on the market for applications such as the marine, food and beverage industry where corrosion resistance is important.



Therefore, most common stainless steel bolts have tensile strengths well below an acceptable tensile strength required for critical (high stress or load) automotive applications, and when a stainless steel bolt is chosen as an alternative to a Grade 5 (metric 8.8) high tensile bolt, only those identified on the following chart as an NZHRA Approved stainless steel fastener may be used.

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COMMON BOLD I.D. MARKING:

MARKING	IDENTIFICATION	CRITICAL APPLICATION APPROVAL STATUS
	Hex head bolt, "316" marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Hex head bolt, "304" marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Hex head bolt, no marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Internal hex cap screw, "316" marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Internal hex cap screw, "304" marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Internal hex cap screw, no marking. Equivalent or less than mild steel. 25-35 tons per square inch.	<u>NOT</u> approved.
	Hex head bolt, A270 marking. Almost equivalent to Grade 5. 46 tons per square inch.	NZHRA approved stainless steel fastener
	Internal hex cap screw. A270 marking. Almost equivalent to Grade 5. 46 tons per square inch.	NZHRA approved stainless fastener.

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	Hex head bolt. A480 marking. Equivalent to Grade 5. 52 tons per square inch.	NZHRA approved stainless fastener.
	Internal hex cap screw A480 marking. Equivalent to Grade 5. 52 tons per square inch.	NZHRA approved stainless fastener.

Note: A2-"70" denotes tensile strength of 700 MPa which is the metric equivalent to 46 tons per square inch, A4-"80" denotes tensile strength of 800 MPa which is the metric equivalent of 52 tons per square inch.

IMPORTANT NOTES:

1. In all cases, the requirement to use only NZHRA Approved Stainless Fasteners as an alternative to high tensile steel items only applies to critical (high stress or load) applications, or where the NZHRA Code of Construction Manual specifically requires the use of Grade 5 (Metric 8.8) or better fasteners, such as the clauses listed in the previous section of this bulletin. Any stainless steel fasteners may be used where their function is of a purely decorative nature.
2. Head markings of NZHRA approved stainless steel fasteners may not be removed. All markings must remain for the purpose of providing identification of the fastener by the NZHRA Certifier.
3. Stainless steel fasteners may not be electroplated.



Signed: Date: 20/11/96

Tony Johnson
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New Zealand Hot Rod Association (Inc)

Any enquires relating to the information provided within this Bulletin may be directed to the Project Manager, Tony Johnson at the NZHRA Office.

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