I N F O R M A T I O N S H E E T
#01-2013 May 2013

LOW VOLUME VEHICLE TECHNICAL ASSOCIATION Inc

Unsafe Aftermarket Steering Columns

Introduction:

A serious safety risk has been identified during April and May of 2013 relating to poorly designed and manufactured aftermarket steering columns, of the type typically used in the custom car/modified classic car/hot rod industry. Traditionally, such aftermarket columns have been manufactured in the United States of America, and have historically been of good quality. However, the industry has changed in recent years, and LVVTA has established that there are a number of aftermarket steering column brands that are being cheaply manufactured in Asian countries - in particular China - with serious safety defects. Specifically, the issues are:

1. poor quality welding of steering shaft sections; and
2. poorly-designed tilt mechanisms which are not by design 'fail-safe'; and
3. poor quality materials used within the components inside the tilt mechanisms.

In some cases the poorly-designed tilt mechanisms are wearing prematurely (and in fact have unacceptable play even in brand new condition), and the tilt mechanisms and the sub-standard welding both have the potential to fail, causing a complete loss of steering control of vehicles to which such columns are fitted.

The objective of this LVVTA Information Sheet is to explain what LVVTA has learnt on the subject, and provide guidance for LVV Certifiers when presented with a vehicle for LVV certification which incorporates an aftermarket steering column, particularly in relation to: - recognising brands, detailing inspection requirements, specifying a clear pass/fail criteria, and appropriate technical advice for customers when a column is failed.

It should be noted that the information contained within this LVVTA Information Sheet is LVVTA's opinions, based on evidence and data that has been presented and assessed, and, given the urgency of the situation, best efforts have been made to ensure the accuracy of the information within a compressed time-frame.

Relevant technical requirements:

Firstly, it is appropriate to set out the applicable technical requirements (which determine the required inspection process) for the correct LVV certification inspection of aftermarket steering columns.

Original version of NZ Hobby Car Technical Manual:

When the original version of the NZ Hobby Car Technical Manual (HCTM) was released in 2007, a toughening-up approach was taken toward welding of critical components or systems (a critical component being a component, that upon its failure, could lead to either a total loss of braking control or directional control) within low volume vehicles. A blanket ban was imposed within the original version of the HCTM on the subject of welding within steering components. This was specified in Chapter 7, paragraph 7.41, which stated that:

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"A component within a steering system in a low volume vehicle must not be welded except:

a) in the case of a vehicle manufacturer's original equipment operating in the same application for which it was originally designed; or

b) where a steering component has been modified or custom-manufactured, due to no other practical option being available, in which case…" (various requirements are met, including obtaining written TAC approval).

In addition to this requirement, a side-margin note referring to 7.41 said: *"Note that welding is, as a rule, not permitted within any 'critical' steering components. Any welding referred to here is restricted to situations where no other option is available."* In the case of steering columns, the shafts are able to be made without welding.

1st Amendment of Hobby Car Technical Manual:

After the release of the HCTM in 2007, LVVTA became aware that some aftermarket steering column manufacturers incorporated welding into the manufacturing processes of their columns. Although there were no known safety issues associated with these manufacturers at the time, LVVTA wanted to clarify and emphasise the basic principle at the heart of the matter (no welding of critical components), so when the HCTM was updated (Amendment 1), in addition to continuing with the existing requirement in 7.41, the specific subject of steering column welding was clarified in detail.

The additional relevant requirements were specified in Chapter 7, paragraph 7.82 of the HCTM, which say that *"A steering column fitted to a low volume vehicle must not have any part, other than an outer housing which is not relied upon for the directional control of the vehicle, welded, unless the welded section is the vehicle manufacturer's unmodified original equipment."*

In addition to this requirement, a side-margin note referring to 7.82 says: *"No safety-critical part of a steering column may be welded, unless the welded section is the vehicle manufacturer's unmodified original equipment."*

The intention of this wording was to enable any OEM welding within a GM tilt column mechanism to remain when the GM mechanism was incorporated within an aftermarket column, as has been common practice.

Current technical requirements:

A requirement has, therefore, been in place since 2007, disallowing welded steering columns, and further reinforced in more clear terms since 2010.

The requirements within the HCTM have not specifically addressed the issues associated with poor quality materials and design flaws within the tilt mechanisms, as these issues only come to light in early 2013.

Recent events:

Initial concerns & responses from retailers:

In 2011, LVVTA reminded LVV Certifiers about the requirement for the disassembly of columns for internal inspection within the December 2011-March 2012 LVVTA Newsletter. After the release of that newsletter, LVV Certifiers started to apply this requirement relatively uniformly, however, LVVTA started to receive some communications from aftermarket parts retailers who felt that these requirements (stripping and inspecting) were inappropriate for the high quality aftermarket brands that they were importing and distributing.

In response to these concerns, LVVTA began the process of assessing whether or not the requirements for stripping and inspecting were in fact reasonable, and whether the better known brands should be subject to the same stripping and inspecting process as the lesser-known brands.

During this same period, LVVTA began to make some startling discoveries around the general subject of aftermarket steering columns. LVV Certifiers were identifying potential problems within the tilt mechanisms during their inspections for evidence of welding, and started to forward LVVTA information on what they were seeing within some aftermarket columns, and in some cases shipping the whole columns to LVVTA for assessment. Some tilt mechanisms that were inspected exhibited a significant amount of play, even with the column in brand new unused condition, and the poor quality of the plastic parts used within the mechanism suggested that a complete failure of the mechanism – and therefore the steering system – may be possible.

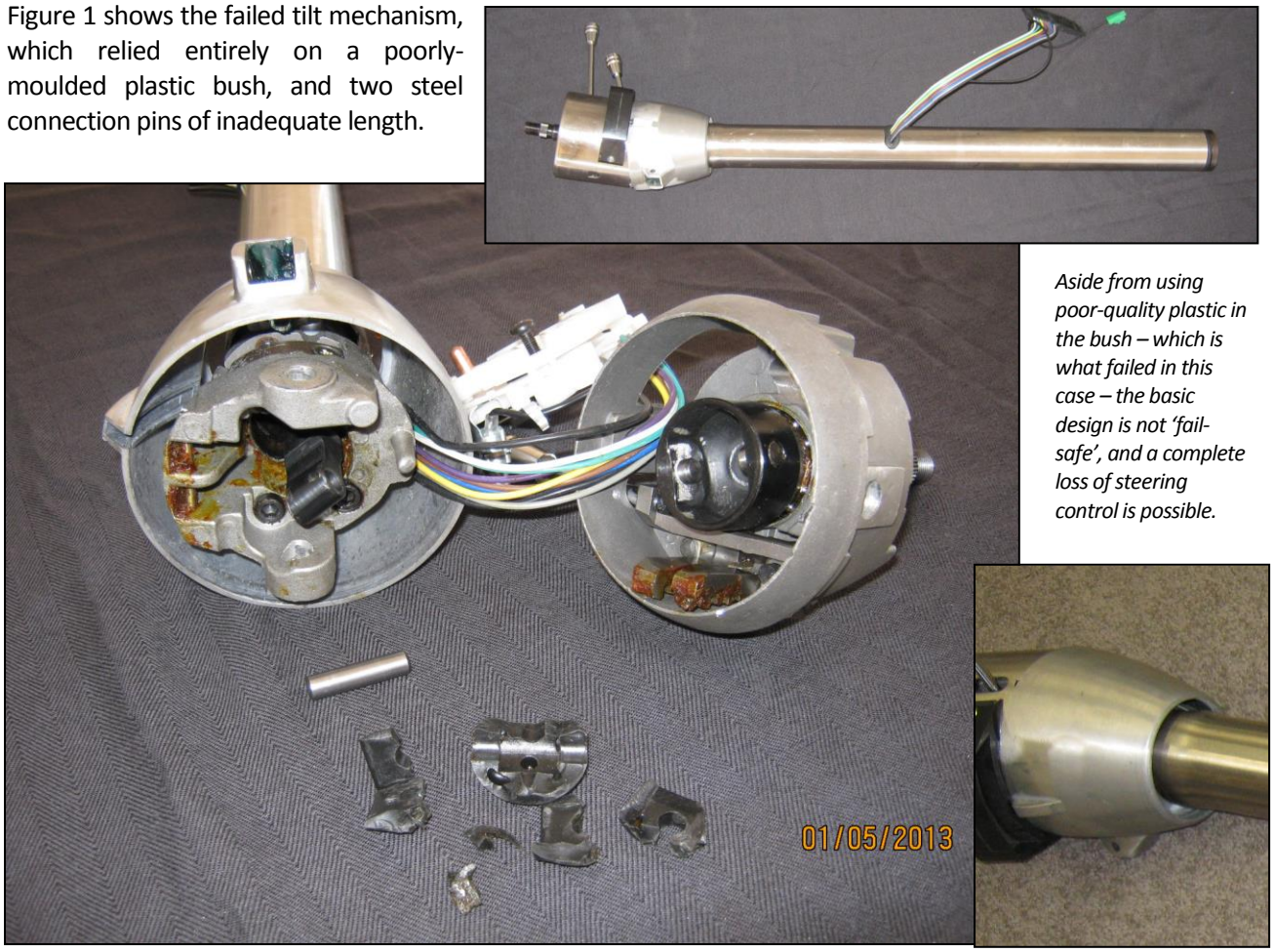
This situation has been taken very seriously, for the obvious reason that a steering column is one of the most safety-critical components in a vehicle, but also because, unlike all other components (except for a steering rack or box) the internal steering column shaft is externally invisible. This makes having knowledge and confidence in an aftermarket steering column at LVV certification time extra-critical.

With help from a number of LVV Certifiers, co-operative parts retailers, and the LVVTA Technical Advisory Committee, LVVTA's investigation process during March and April 2013 has enabled the identification of a number of very poor designs used within some aftermarket tilt mechanisms, and poor quality butt-weld joins used to connect various internal shaft sections. By April 2013, LVVTA had come to realise how serious the situation actually is in regard to the sub-standard and unsafe designs and manufacturing processes involved in many aftermarket steering columns.

Failure of Helix brand column:

The situation became even more urgent when, on Monday 29th of April, the poorly-designed and made tilt mechanism in a brand new 'Helix' aftermarket steering column made by the Hoffman Group collapsed, leaving the driver of the vehicle completely without steering during an initial 'around-the-block' test-drive.

Figure 1 shows the failed tilt mechanism, which relied entirely on a poorly-moulded plastic bush, and two steel connection pins of inadequate length.



Aside from using poor-quality plastic in the bush – which is what failed in this case – the basic design is not 'fail-safe', and a complete loss of steering control is possible.

Figure 1: 'Helix' brand column, with collapsed plastic tilt mechanism

As a result of what has been learnt, and the 'Helix' brand failure of April 29, more detailed research has been carried out by LVVTA during late April and May. The findings of this research, together with a process for LVV Certifiers to apply when presented with an aftermarket steering column, has been collated and presented within this LVVTA Information Sheet, in order to minimise as much as possible the risk of any more unsafe aftermarket steering columns being fitted to low volume vehicles.

Recognised steering column manufacturers:

Recognition process:

There are some long-established aftermarket steering column manufacturers who are not the subject of LVVTA's concern at this time. The focus is on unbranded columns, and identifiable columns made by manufacturers who either have no track record, or manufacturers who have a reputation for manufacturing or distributing unsafe products.

The key points of difference between reputable manufacturers of steering columns and those not so, appear to be two-fold; - one, that the reputable companies have been heavily and directly immersed in the specialist automotive industry for decades, and have a good understanding of sound automotive engineering principles; and two, that problems occur where the product manufacturing processes are outside of the control of the manufacturer/distributor. The brands that have been found through LVVTA's research to be reputable all have in common that their columns are manufactured by the manufacturers within their own facilities. These companies appear to have, through their 'in-house' controls, the means by which to ensure that consistent and repeatable manufacturing processes are applied and adhered to.

Four aftermarket steering column manufacturers have provided to LVVTA's satisfaction, detailed information on their product designs, component sources, material types, manufacturing processes, and quality control systems. As a result of the provision of this information, LVVTA has confidence that these manufacturers can be relied upon to produce good quality products on a repeatable basis. On that basis, these four manufacturers carry a 'recognised manufacturer' status, and accordingly, can be accepted at face value for LVV certification by an LVV Certifier, provided only that the LVV Certifier can confidently determine the brand of column.

List of recognised steering column manufacturers:

The four recognised aftermarket steering column manufacturers are:

- 'Ididit'
- 'Flaming River'
- 'Billet Specialties'
- 'Limeworks' (Note that 'Limeworks' only produce fixed (non-tilt) columns)

At the present time, LVVTA is not aware of any historical safety issues associated with 'Limeworks', 'Ididit', 'Flaming River', or 'Billet Specialities', and so, in order to limit the focus of the assessment process to where the greatest risk lies, for now, LVVTA is allowing columns manufactured by the four listed companies to be accepted at face-value.

LVV Certifiers are therefore not required to disassemble and inspect these four column brands, and although three of the four brands incorporate welding within their columns, these three manufacturers are effectively 'excluded' from requirements 7.41 and 7.82 of the NZ Hobby Car Technical Manual which disallow welding.

Recognition is 'provisional' only:

It should be noted that this concession to these four manufacturers is provisional only, and at the time of the issue of this LVVTA Information Sheet, there may be some further documentation required to be provided in order to fully satisfy LVVTA that all critical processes carried out by each manufacturer are as well-controlled as can be reasonably expected.

Further, the current position may be reviewed when the initial concerns in relation to unsafe steering columns have been dealt with, and time allows closer analysis of what should be allowed into the future. There will be further assessment in certain areas, in particular relating to welding, and tilt mechanism designs.

Upon failure of any of the four manufacturers to provide any further information that may be required by LVVTA in a timely manner, or the information provided is not found to be satisfactory, this recognition will no longer apply to that company, and LVV Certifiers will be advised accordingly.

All non-recognised aftermarket steering columns to be rejected or assessed:

As of the date of the introduction of this LVVTA Information Sheet, any aftermarket steering column manufactured by any manufacturer other than those four (provisionally) recognised brands listed above, must be either rejected entirely, or disassembled and assessed for compliance with the requirements of this LVVTA Information Sheet by an authorised LV1D Certifier before the vehicle to which the column is fitted can be approved for LVV certification.

As this is a critical safety item, this requirement for rejection, or disassembly and assessment, applies to any vehicle presented for LVV certification, regardless of modification, vehicle type, or construction date.

Specific technical issues:

There are three specific problems that exist with aftermarket steering columns. The first relates to the design of the tilt mechanism, the second relates to welding, and the third relates to the materials used in the construction of the components used within the column.

Tilt mechanisms within aftermarket steering columns:

Most reputable aftermarket steering column manufacturers use a proper connection system which looks like a miniature constant velocity-like joint that replicates the OEM system used by General Motors in their tilt columns. Other tilt mechanisms of concern that have been seen within some columns produced in Asian countries use designs that look like GM tilt mechanisms but which incorporate low grade plastic components, and various different (non-OEM style) designs that incorporate low-grade plastic bush and pin systems. These latter systems are of poor design, and incorporate very poor-grade plastic bushes that wear prematurely. In some cases these bushes can – and have – fallen apart during operation, leaving no connection whatsoever between the steering wheel and the steering shaft.

Figure 2 shows a connection system which looks like a miniature constant velocity joint that is, or replicates, the OEM system used by General Motors in their tilt columns, which cannot disconnect within the column housing (the two sections have to be turned at 90 degrees to each other before they can be disconnected, which obviously cannot occur within the column housing). This system is used by most reputable brands.

Figure 2: ‘GM-style’ tilt mechanism assembly, featuring upper and lower yoke shafts

As a general sound engineering principle associated with tilt steering columns, any tilt mechanism should be 'fail-safe', meaning that if any component within the tilt mechanism - such as the tilt ball, shaft, or pin – should for some reason fail, the two forks at each end of the shaft sections (in the case of the GM system) will still remain connected and 'drive'. Even with the plastic tilt-ball completely removed from the GM system, the two yokes will still remain engaged and drive, albeit with approximately 1/8th of a turn of free-play. See Figure 3.

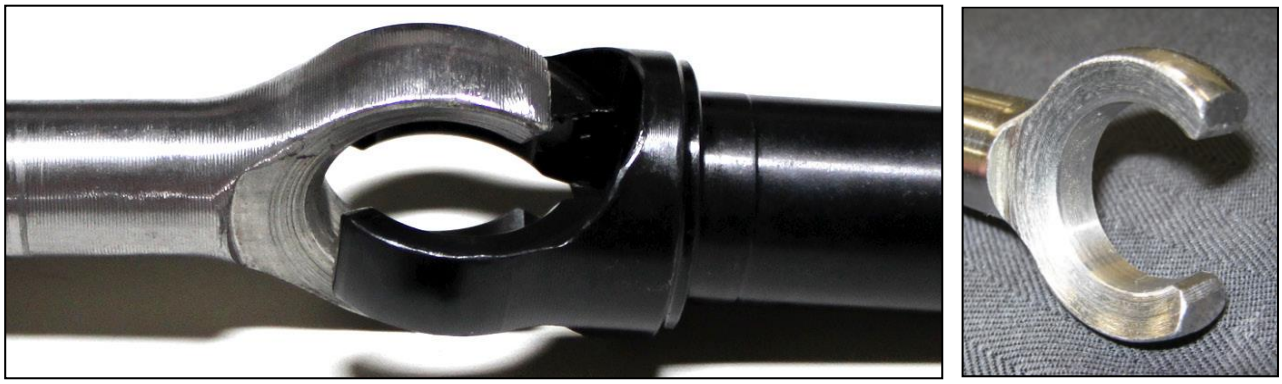


Figure 3: Two 'yokes' of the 'GM-style' tilt mechanism with bush removed, showing 'fail-safe' nature of system

Welding within aftermarket steering columns:

Any welding upon which the directional control of the vehicle relies may not be accepted for LVV certification, with the exception of the three LVVTA-recognised aftermarket steering column manufacturers who incorporate welding within their columns ('Billet Specialties' do not have any welding within their columns).

LVVTA has reviewed information relating to the welding processes employed by the three recognised manufacturers who weld their components and is satisfied that those three manufacturers operate properly and professionally, and are credible companies. Therefore it would be reasonable to expect that they follow processes that ensure a high standard of welding on a repeatable basis.

Figure 4 shows two different types of typical welded sections within aftermarket tilt steering columns. Neither example is from one of the 'recognised' brands. The photo at left of Figure 4 shows a poor-quality weld connecting two sections together, and on other examples from the same brand the weld appears to simply butt-weld the two sections together. The photo at right of Figure 4 shows another type of welded connection of two sections within a lower steering shaft (below the tilt mechanism) commonly seen in poor quality columns.

Any such welds in any aftermarket steering column (other than within one of the three recognised manufacturers' columns which include welding within their manufacturing process) must never be accepted for LVV certification.

Figure 4: Non-OEM welds within tilt mechanisms in aftermarket steering columns

Some aftermarket column manufacturers use the same 'double-D' tubes used for collapsible systems for non-collapsible systems also, and then connect the two sections of 'double-D' by welding. This is a convenient way for the manufacturers to fix the length of the particular column, which vary on the application of the column. This welded connection method is shown in Figure 5.

This welding can be accepted on any column regardless of brand, as the vehicles' directional control does not rely on the weld.

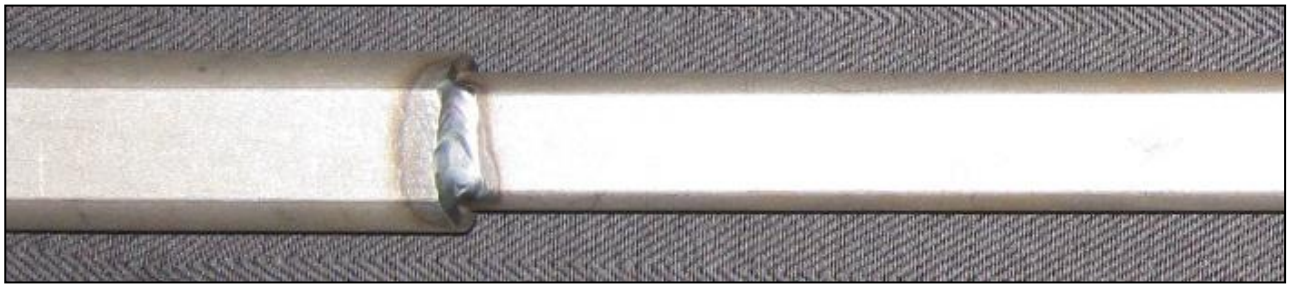


Figure 5: Welding holding two 'double-D' sections together within aftermarket steering column

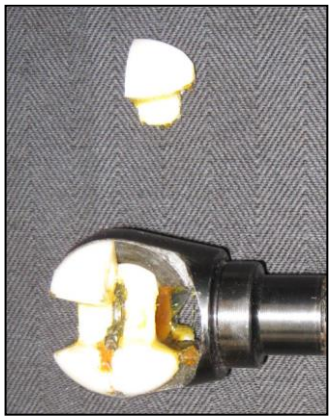
Materials used for components within aftermarket steering columns:

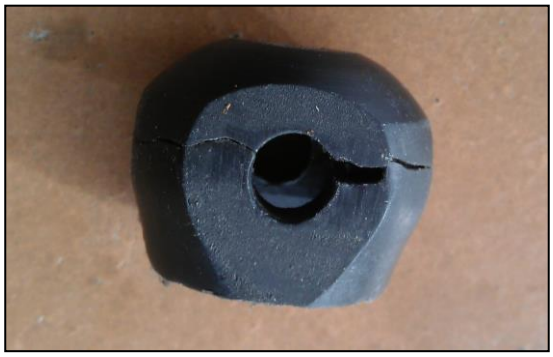
The third issue relates to the materials that some aftermarket steering column manufacturers use for the production of the various components that make up the tilt mechanisms within aftermarket steering columns. In a short space of time, LVVTA has identified a number of different components made by several aftermarket steering column manufacturers which are clearly sub-standard and unsafe.

In some cases plastics are used where steel should be used, and some cases where poor-grade plastics are used where high-volume vehicle manufacturers such as GM used very high grade plastics. In other situations, aftermarket column manufacturers use plastics where there is no 'fail-safe' system within the tilt mechanism.

In support of sound automotive engineering practise, many international automotive standards require steel components in critical locations. For example, UN/ECE Regulation 79, paragraph 5.3.1.1 states *"…Where the failure of any such (steering) part would be likely to result in loss of control of the vehicle, that part must be made of metal or of a material with equivalent characteristics…"* This also supports basic common sense.

Figure 6 shows some examples of plastic components that have broken, or have free-play when still brand new.





Above: Plastic swivel-joint bush with excessive play in brand new column.
Above right: Failed plastic bush & pin system in brand new column.
Right: Poorly-made injection-moulded plastic bush in brand new column.
Left: Low-grade plastic tilt ball that fell apart during disassembly of tilt mechanism in brand new aftermarket GM-style column.

Figure 6: Various failed or excessively loose plastic bushes & balls within brand new aftermarket steering columns

Identification, and process for aftermarket steering column brands:

To follow is some specific information on each of the main aftermarket steering column manufacturers that have been investigated. The information will assist LVV Certifiers identify the brand, provide details of what can and can't be accepted for the LVV certification of a vehicle to which such a column is fitted, and detail what (if any) repair processes may be carried out on the column in question.

'Flaming River' brand:

Identification:

'Flaming River' brand steering columns are all clearly branded with 'Made in the USA Flaming River' laser-etched onto the exterior housing at the base of the column, as shown in Figure 7. The Flaming river logo and telephone number are also on the turn signal cancelling cam found inside the steering column head.

Figure 7: Laser-etched branding on 'Flaming River' column

Technical information:

'Flaming River' uses a 'swivel-joint' tilt mechanism. Although not a proper automotive CV-like joint (as used by 'Ididit' and 'Billet Specialties') it never-the-less appears to be a robust system, and LVVTA has never heard of any problems with this system. An important part of this system is that it uses a proper brass disc-shaped bush as shown in Figure 8, as opposed to the inferior and cheaper plastic bush used by one of the cheap Asian copies.

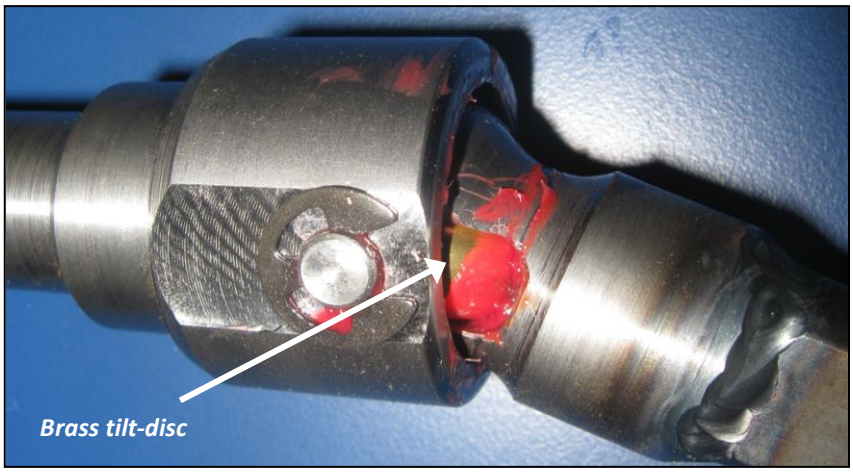


Figure 8: 'Flaming River' brand swivel-joint tilt mechanism assembly.

'Flaming River' incorporates a welded connection at the upper end of the lower steering shaft as shown in Figure 8. 'Flaming River' has confirmed that it uses only TIG-welding, the welds have been tested by an external accredited laboratory, and an on-going quality control system is in place to ensure consistency and repeatability.

LVV Certifier action required:

LVV Certifier may approve a 'Flaming River' column for LVV certification on the basis that it is one of the four 'recognised' aftermarket steering column manufacturers. No disassembly is required, provided that the brand can be positively identified, and there is no reason to believe that post-manufacture modifications exist.

Approved repair process:

None required.

'Ididit' brand:

Identification:

'Ididit' brand aftermarket steering columns are all clearly branded with a foil label, and feature a 6-digit serial-number as part of their branding system. This is the only aftermarket steering column LVVTA is aware of that provides an individual serial number for each steering column.

The branding is located on the inside of the steering column 'head' (see Figure 9) and consists of a red and silver foil tag, with the serial number mechanically stamped onto the foil label.

Note that the steering wheel and steering wheel adaptor must be removed in order to be able to see the 'Ididit' branding.

Figure 9: 'Ididit' branding & serial number

Technical information:

'Ididit' use a 'fail-safe' remanufactured GM-style tilt mechanism as shown in Figure 10. 'Ididit' have confirmed that all of the critical components used in the manufacture of their mechanisms are made by ISO-accredited facilities, and the captured tilt ball within the joint is a high-quality acetal copolymer, a material designed for high-load applications.

'Ididit' incorporates a weld connecting one 'yoke' to the lower shaft (as seen in Figure 10).

The welding process, which is carried out by an independently certified specialist, uses an inertia welding system which penetrates a controlled amount of depth and uses only the parent material.

Figure 10: 'Ididit' remanufactured GM-style tilt mechanism & inertia-welded shaft

LVVTA has detailed information and testing information on file relating to 'Ididit's' established testing programme and quality control processes.

LVV Certifier action required:

LVV Certifier may approve an 'Ididit' column for LVV certification on the basis that it is one of the four 'recognised' aftermarket steering column manufacturers. No disassembly is required, provided that the brand can be positively identified, and there is no reason to believe that post-manufacture modifications exist.

Approved repair process:

None required.

'Billet Specialities' brand:

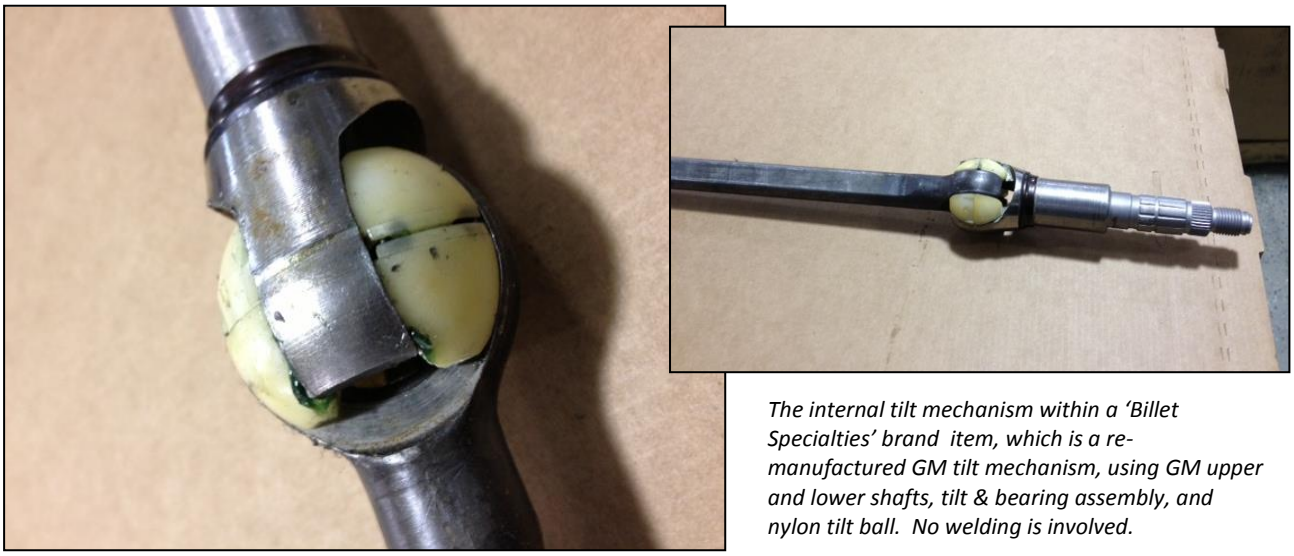
Identification:

'Billet Specialties' columns have no visual brand identification on them, therefore they will have to be verified by visual recognition. 'Billet Specialities' steering columns are identifiable by being made of highly-polished 6061-T6 billet aluminium (almost all Asian import brands are chromed mild steel) and an easy test is simply using a magnet. Also, they are not available with column shift, or with a built in ignition switch - if the vehicle being inspected has either of those features, it is not a 'Billet Specialties' column. The base of the column has a tapered finish, not replicated by any other column manufacturers, and the upper housing also has a unique shape (use the photographs in Figure 11 for visual comparison).

Figure 11: Photographs of tapered base (at left) and shaped upper end (at right) of 'Billet Specialities' column

Technical information:

From LVVTA's research to date, 'Billet Specialities' – as shown in Figure 12 - is the only aftermarket column manufacturer who uses all remanufactured GM components internally and are assembled without any welding.



The internal tilt mechanism within a 'Billet Specialties' brand item, which is a re-manufactured GM tilt mechanism, using GM upper and lower shafts, tilt & bearing assembly, and nylon tilt ball. No welding is involved.

Figure 12: GM-style constant-velocity joint tilt mechanism assembly within 'Billet Specialities' column

LVV Certifier action required:

LVV Certifier may approve a 'Billet Specialties'' column for LVV certification on the basis that it is one of the four 'recognised' aftermarket steering column manufacturers. No disassembly is required, provided that the brand can be positively identified, and there is no reason to believe that post-manufacture modifications exist.

Approved repair process:

None required.

'Limeworks' brand:

Identification:

'Limeworks' columns have no visual brand identification on them, either inside or out, therefore they will have to be verified by documented evidence such as a credible-looking receipt. If no credible receipt or other clear and irrefutable evidence of origin is available, the column will have to be treated as unknown, and disassembled and assessed in the same way as any other unknown column.

Technical information:

'Limeworks' do not manufacture an aftermarket tilt steering column, so the only issue associated with this brand is their welding at the top end of the column. The 'Limeworks' traditional old Ford-style columns known as the 'Banjo' style and the 'Forty' style do not incorporate any welding anywhere, whereas their straight 'Hot rod' style columns (as shown in Figure 13) for use with three and four-spoke steering wheels are welded at the steering column head. 'Limeworks' old -version 'Hot Rod'-style column is welded on the underside of the steering wheel hub, and the new-version 'Hot Rod'-style column is welded on the top-side of the steering wheel hub.

'Limeworks' is a small California-based specialist fabrication shop, and all welding is carried out by one of two highly skilled welders on-site. The company has a long-standing and good reputation for high-quality products.

Figure 13: 'Limeworks' new-version 'Hot Rod'-style column at left, and old-version 'Hot Rod'-style column at right

LVV Certifier action required:

LVV Certifier must first establish whether clear and irrefutable evidence of origin exists to verify that the column in question is in fact a 'Limeworks' column.

- If evidence of origin exists:

  LVV Certifier may approve a 'Limeworks' column for LVV certification on the basis that it is one of the four 'recognised' aftermarket steering column manufacturers. No disassembly is required, provided that the brand can be positively identified, & there is no reason to believe that post-manufacture modifications exist.

- If evidence of origin does not exist:

  Column must be disassembled and assessed in the same way as required for an unbranded or non-recognised column. Any welding within the column (other than welding of the outer housing which is not relied upon for directional control of the vehicle) must be rejected.

Approved repair process:

Where no evidence of origin exists, either, the steering column must be discarded in its entirety, or the steering column shaft and steering wheel hub must be re-made with a one-piece shaft and a method of attachment at the steering wheel hub that avoids welding.

'Borgeson' brand:

Identification:

'Borgeson' columns have no visual brand identification on them, either inside or out, therefore they will have to be treated as unknown, and disassembled and assessed in the same way as any other unknown column.

Technical information:

'Borgeson' do not manufacture an aftermarket tilt steering column, so the only issue associated with this brand is the welding of the upper end of the steering column shaft to the machined three-bolt stainless steel steering wheel hub.

The method of attachment of the shaft to the hub is both splined (for rotational engagement) and then welded to prevent someone from pulling the hub off the steering shaft.

While LVVTA holds the Borgeson company in high regard as a component manufacturer in general terms, LVVTA has a concern with this particular connection system, in that the welded steering wheel hub assembly is machined smooth (as shown in the photo to the left of Figure 14) removing most of the weld, and there is no welding on the back -side (as shown in the photo to the right of Figure 14) as a safeguard against the potential for the weld to be 'over-machined'. This is poor engineering practice. The position of the top bearing will prevent an un-machined weld from being carried out on the back-face of the hub.

In such a system, it is good practice to use a secondary securement method with the spline, so that the on-going rotational forces that the connection will be subjected to are not reliant entirely on a spline alone.

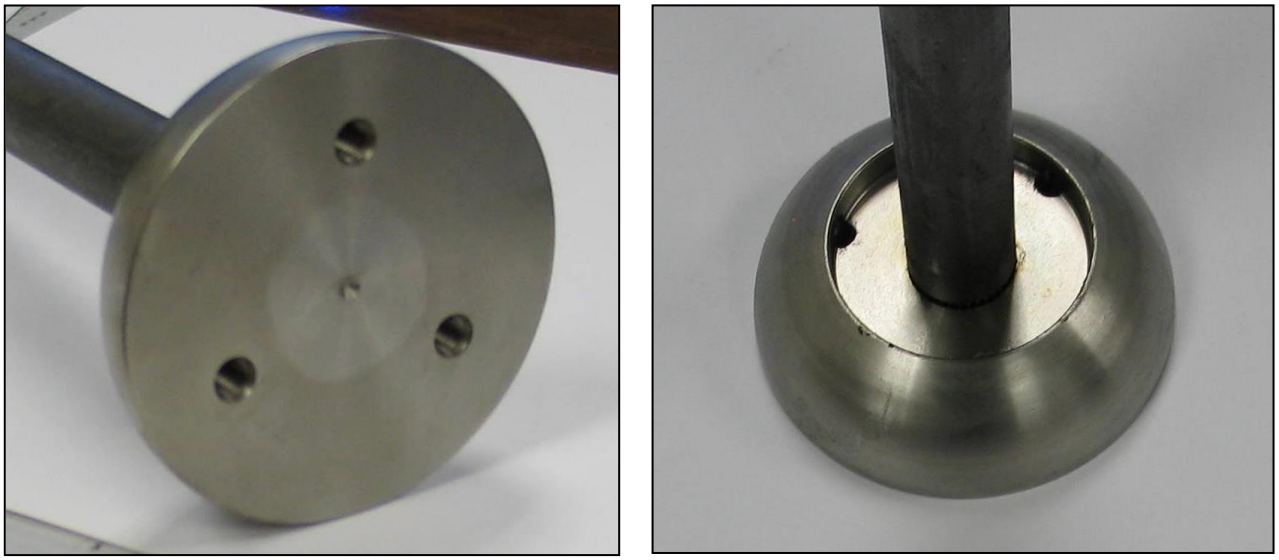


Figure 14: Welded and machined steering wheel hub face on left; back-side of steering wheel hub on right

LVV Certifier action required:

Column must be disassembled and assessed in the same way as required for an unbranded or non-recognised column. Any welding within the column (other than an outer housing which is not relied upon for the directional control of the vehicle) must be rejected.

Approved repair process:

Either, the steering column must be discarded in its entirety, or the steering column shaft and steering wheel hub must be re-made with a one-piece shaft and a method of attachment at the steering wheel hub that avoids welding.

'CPP (Classic Performance Products)' brand:

Identification:

'CPP' (Classic Performance Products) brand aftermarket steering columns are all clearly branded via a gold-coloured laser-etching process on the exterior housing at the base of the column. The letters 'CPP' will be present on a 'CPP' brand column, followed by a part number, and the manufacture date, as shown in Figure 15.

Figure 15: 'CPP' branding at base of housing

Technical information:

The design of the tilt mechanism within the 'CPP' brand column is based on the GM-style double-yoke system (as shown in Figure 16), however the origin and quality of the 'CPP' mechanism is unknown, and therefore cannot be assured of being fit for use as a critical-function component such as a steering column. LVVTA believes that 'CPP' began manufacturing their own columns during 2012, and that the columns are manufactured in China.

The 'CPP' brand column incorporates a welded connection to join the lower yoke of the tilt mechanism to the main steering column shaft. Figure 17 shows a typical welded section from a 'CPP' brand tilt steering column, with a poor-quality weld. On other 'CPP' columns that LVVTA has inspected, this weld appears to simply butt-weld the two sections together (without the plug-weld that appears to exist in the example shown in Figure 16).

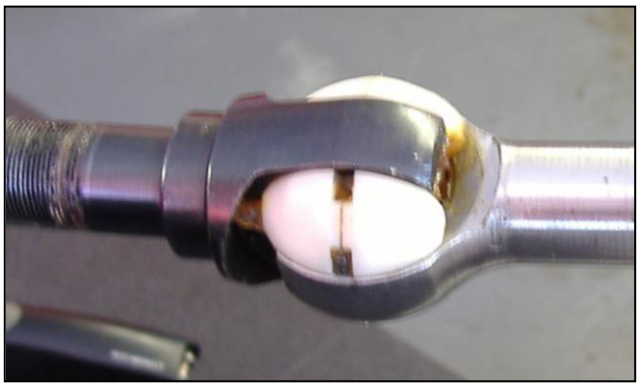


Figure 16: 'CPP' double-yoke tilt mechanism

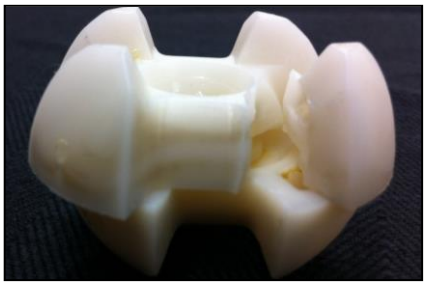
Figure 17: Welded 'CPP' yoke-to-shaft connection

An additional serious safety problem associated with 'CPP' brand columns is that the tilt ball used to connect the upper and lower shafts is made from a poor quality plastic that is very weak.

The tilt ball shown in Figure 18 with the corner piece broken away (shown as a separate piece at the top of photograph) was fractured in brand new unused condition, and fell apart during the disassembly process. No force was used to dismantle the mechanism.

Figure 18: Plastic ball in unused 'CPP' column as found during disassembly

A further problem with the plastic tilt ball is that it has been manufactured via a very poor injection-moulding process that has left the tilt ball riddled with cavities and air pockets, as shown in Figure 19, which will assist in the collapse of the low-grade plastic ball under load. There is little likelihood that this tilt mechanism will be sufficiently strong and durable to withstand the high torque loads that will be imposed on it throughout its life, particularly in a vehicle without power steering.



When in position the ball looks normal, but where the ball has collapsed, cavities caused by a very poor moulding process which have massively weakened this critical plastic component are evident.

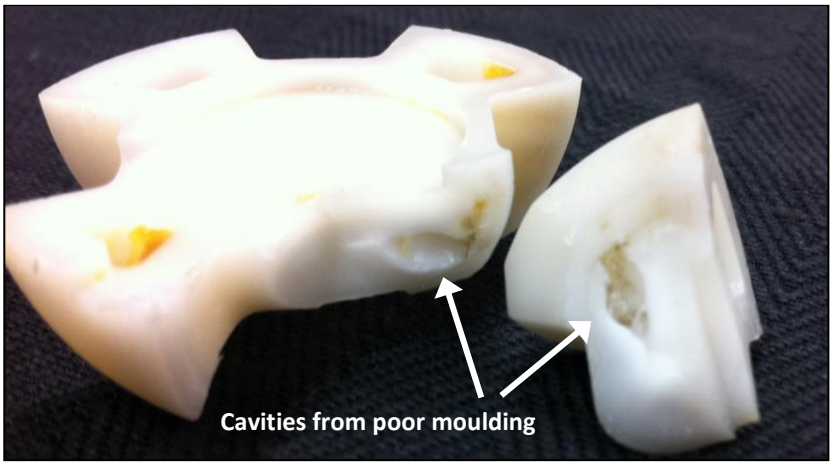


Figure 19: Injection-moulded plastic tilt-ball within brand new 'CPP' column, showing breakage and cavities

LVV Certifier action required:

Column is to be rejected by LVV Certifier as unsafe. Upon vehicle owner's request, column may be disassembled and assessed by LVV Certifier for the purpose of visual comparison to that shown above. If verified as that shown above, column must be rejected. If internal components and systems fundamentally differ to that shown above, LVV Certifier should contact LVVTA technical staff for advice.

Approved repair process:

No approved repair process exists for this brand of steering column on a one-off basis.

The aftermarket steering column manufacturer may design a proposed generic repair and apply to LVVTA for LVVTA 'Component Type Approval' for the repair, as detailed in LVVTA Information Sheet # 11-2012 'LVVTA Approval Application Guide', which is available for download under the 'Documents' section of the LVVTA website, www.lvvta.org.nz .

*It should be noted that the LVVTA Technical Advisory Committee (TAC) considered a number of proposed repair ideas to make these columns safe on an individual basis.

The proposal of converting the tilt columns to fixed (non-tilt) columns was considered, however there are many potential issues with the internal die-cast head not being designed to take excessive loads, in particular risk of top & bottom bush misalignment of the tilt mechanism, potentially causing a casting failure in the steering column head where the bearing is situated.

'Helix' brand:

Identification:

'Helix' columns have no external visual brand identification on the outer housing, however they incorporate a stamping on the bottom end of the internal lower column shaft, which features the word 'Hoffman' within an oval line (see Figure 20). 'Hoffman' denotes the Hoffman Group, the company that manufactures and markets 'Helix' columns. The column may have to be disconnected in order to be able to see this branding.

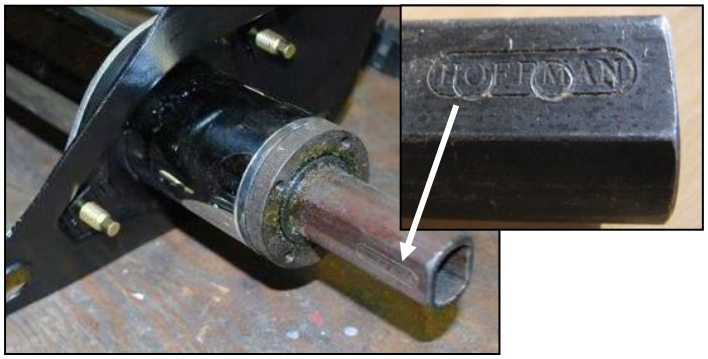


Figure 20: 'Hoffman' branding on 'Helix' internal steering shaft

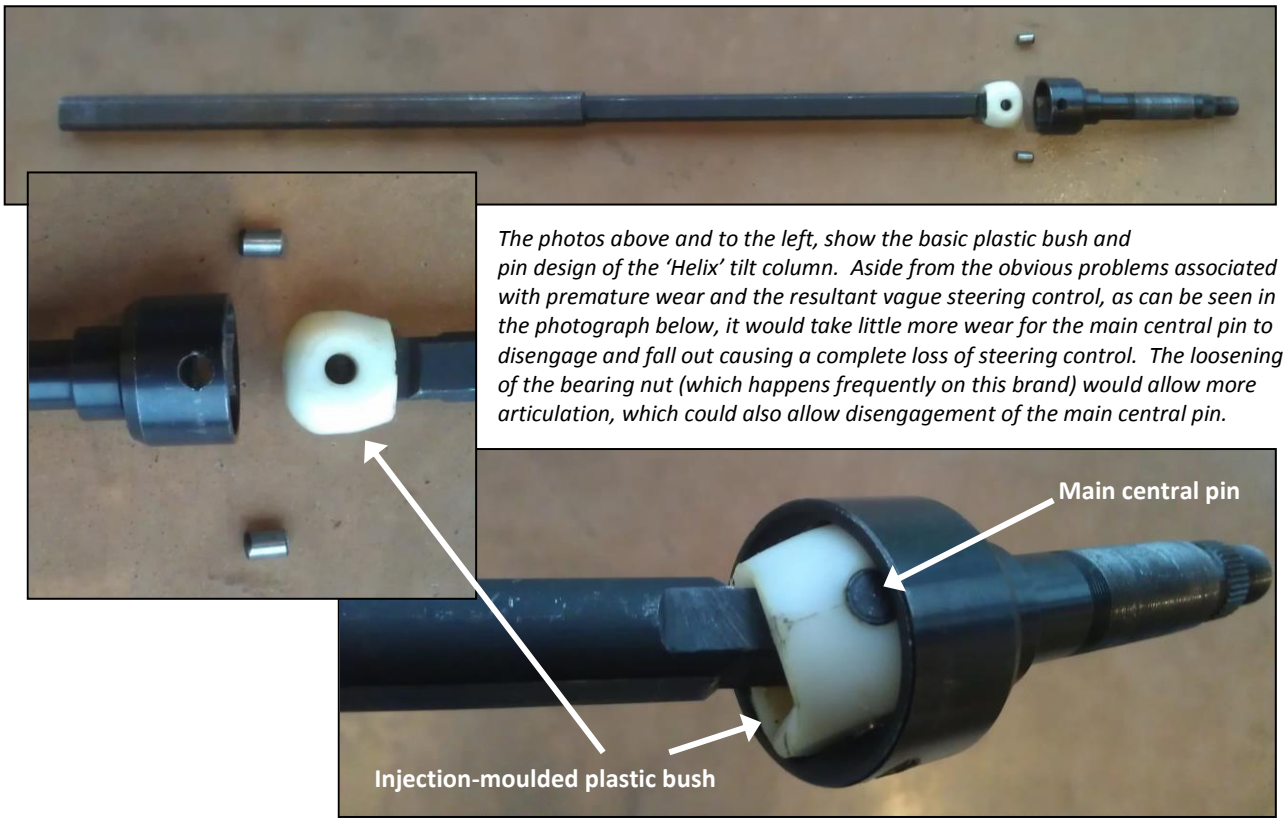
'Helix' brand columns sometimes come in marked packaging, such as the two examples shown in Figure 21, however LVVTA has had reports of 'Helix' columns, or columns that look identical to 'Helix' columns arriving in plain packaging, with the columns sometimes wrapped up in Chinese newspapers.

Figure 21: Examples of 'Helix' & 'Hoffman Group' packaging

Technical information:

The group of photographs shown in Figure 22 below illustrate the plastic bush and pin system used in the 'Helix' brand as sold by the Hoffman Group. The 'Helix' system is a very rudimentary system, which is not 'fail-safe'. Due to the design of the tilt mechanism system and the poor quality of the components used, the 'Helix' system is considered by LVVTA to be of very poor design and quality, and the most dangerous system seen to date.

The tilt mechanism of the Chinese-made 'Helix' column shown in Figure 22 had so much play (without ever having been fitted to a vehicle) that it would have failed a warrant of fitness inspection.



The photos above and to the left, show the basic plastic bush and pin design of the 'Helix' tilt column. Aside from the obvious problems associated with premature wear and the resultant vague steering control, as can be seen in the photograph below, it would take little more wear for the main central pin to disengage and fall out causing a complete loss of steering control. The loosening of the bearing nut (which happens frequently on this brand) would allow more articulation, which could also allow disengagement of the main central pin.

Figure 22: Plastic bush and pin design of the 'Helix' brand steering column tilt mechanism assembly

A further problem with this system, is that, aside from the overall poor design, one plastic bush (as shown in Figure 23) from this type of column that LVVTA inspected is so poorly moulded that – in brand new unused condition – was so full of casting flaws and cavities that it is likely to collapse with very little use. The column in which this bush was fitted, was reportedly sold as a 'Helix' brand but may in fact be of a different brand; - this identification problem is symptomatic of brand-copying and a lack of visual identifiers.

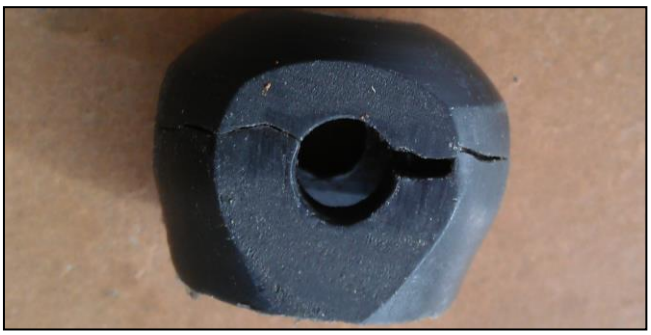


Figure 23: Poor-quality moulded bush with cavities & cracks

In addition to the overall design, a number of other technical problems exist within the 'Helix' brand columns.

The top end of the lower steering shaft is made from solid D-shape bar, which has been machined to create a pin-eye for the plastic bush to swivel from, as shown in Figure 24. Poor machining tolerances of that pin-eye lead to an inconsistent shape around the pin-eye opening, which in turn leads to a lack of uniformity and wall thickness in some areas of the pin-eye area. It is unlikely that sufficient quality control processes exist in order to ensure that the machining process involved is consistent and repeatable.

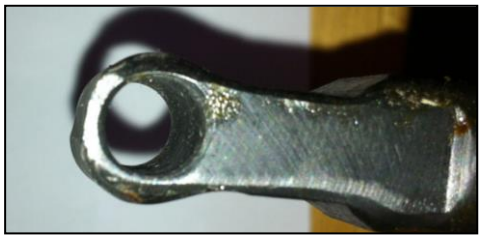


Figure 24: 'Helix' plastic bush pin-eye

Some 'Helix' columns have, from brand new, a huge amount of free-play, both up and down, and side-to-side. The reason for the play is that the main nut used to retain the upper steering shaft into the upper bearing housing (see Figure 25) had completely loosened itself off. This occurs because there is no locking mechanism to prevent it from undoing, which is poor design, and process control.

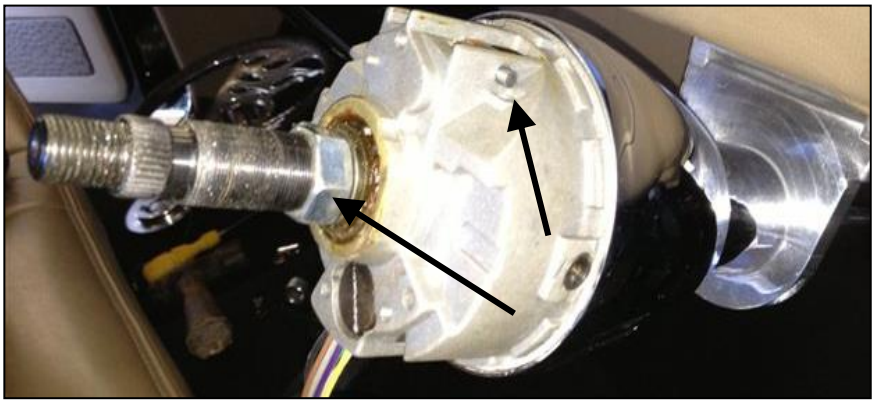


Figure 25: Main retaining nut with no locking system in 'Helix' column

Additionally, the removal of the steering wheel and upper steering column components to enable the inspection for the play at the upper housing also showed that the tilt mechanism pivot lock pin (see arrows in Figure 26) for the tilt mechanism had almost completely fallen out. Again, there was no locking mechanism to prevent it from doing so.

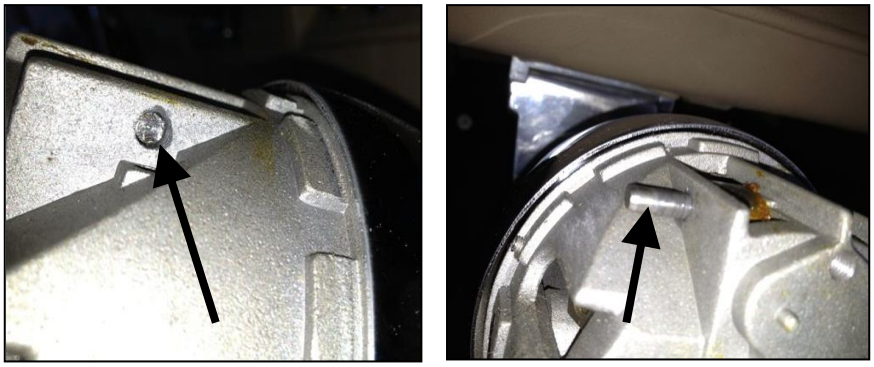


Figure 26: Tilt mechanism pivot lock pin falling out of 'Helix' upper housing

Underlining how poorly-designed and unsafe the 'Helix' steering column is, one such column completely failed leaving the driver totally without any directional control of his vehicle. The principal failure was the poor-quality plastic bush described previously, however, the fact that the basic system is not 'fail-safe' turned a tilt mechanism component failure into a complete steering system failure. See Figure 27.

Figure 27: 'Helix' column in vehicle at left; collapsed remains of the plastic bush which caused steering failure at right

LVV Certifier action required:

Column is to be rejected by LVV Certifier as unsafe. Upon vehicle owner's request, column may be disassembled and assessed by LVV Certifier for the purpose of visual comparison to that shown above. If verified as that shown above, column must be rejected. If internal components and systems fundamentally differ to that shown above, LVV Certifier should contact LVVTA technical staff for advice.

Approved repair process:

No approved repair process exists for this brand of steering column on a one-off basis*.

The aftermarket steering column manufacturer may design a proposed generic repair and apply to LVVTA for LVVTA 'Component Type Approval' for the repair, as detailed in LVVTA Information Sheet # 11-2012 'LVVTA Approval Application Guide', which is available for download under the 'Documents' section of the LVVTA website, www.lvvta.org.nz .

*It should be noted that the LVVTA Technical Advisory Committee (TAC) considered a number of proposed repair ideas to make these columns safe on an individual basis.

The TAC first considered a proposal to allow the replacement of the plastic bush with a more suitable bush that features the required strength and self-lubricating properties, however, all such proposals for localised repairs of the system ignore the inescapable fact that the column is fundamentally not 'fail-safe' - the resolution of which would require a complete re-design of the whole system. Another significant problem with the existing system is that there is a very high reliance on two very small side pins that absorb the entire steering load, and this vulnerability is exacerbated when the staking is ground out to remove the pins during disassembly, and then re-staked together during re-assembly.

The proposal of converting the tilt columns to fixed (non-tilt) columns was then considered, however there are many potential issues with the internal die-cast head not being designed to take excessive loads, in particular risk of top & bottom bush misalignment of the tilt mechanism, potentially causing a casting failure in the steering column head where the bearing is situated.

'Procomp' brand:

Identification:

LVVTA understands that the 'Procomp' brand columns are, like many other of the lesser-known brands, manufactured in China.

'Procomp' columns have no external visual brand identification on the outer housing, however they incorporate a stamping – much like the 'Helix' brand have - on the bottom end of the internal lower column shaft, which features the word 'Procomp' within an oval line (see Figure 28).

The column may have to be disconnected in order to be able to see this branding.

Figure 28: 'Procomp' branding at base of lower column shaft

Technical information:

The photographs shown in Figure 29 below illustrate the same plastic bush and pin system as used in the 'Helix' brand, which failed and caused a complete loss of steering control. The 'Procomp' system is, like the 'Helix' column, a very rudimentary system, which is not 'fail-safe'. Due to the design of the tilt mechanism system and the poor quality of the components used, in particular the injection-moulded plastic bush (upon which the entire directional control of the vehicle relies), the 'Procomp' system is considered by LVVTA to be of extremely poor design and quality, and may be just as dangerous as the 'Helix' brand steering columns.

Below: as with the 'Helix' column, it would take very little wear for the main central pin to disengage and fall out causing a complete loss of steering control.

Figure 29: Tilt mechanism with plastic bush & pin system in 'Procomp' brand steering column

The 'Procomp' column looks identical in every respect to the 'Helix' column. LVVTA suspects that the 'Procomp' steering column is made in the same factory in China as the 'Helix' columns, and they may in fact be exactly the same columns with the only difference being the brand-name stamped into the lower column shaft. If this is the case, then all of the other safety issues associated with the 'Helix' steering column – such as no locking mechanisms for critical fastening systems, poorly-machined bush pin-eye, and poor-quality injection-moulded plastic bushes - will all exist within the 'Procomp' columns.

Particularly because of the plastic bush and pin system within the tilt mechanism, there is nothing that LVVTA is aware of to prevent a 'Procomp' brand column having the same complete and catastrophic failure as experienced by the owner of the 'Helix' brand column depicted earlier in this Information Sheet.

LVV Certifier action required:

Column is to be rejected by LVV Certifier as unsafe. Upon vehicle owner's request, column may be disassembled and assessed by LVV Certifier for the purpose of visual comparison to that shown above. If verified as that shown above, column must be rejected. If internal components and systems fundamentally differ to that shown above, LVV Certifier should contact LVVTA technical staff for advice.

Approved repair process:

No approved repair process exists for this brand of steering column on a one-off basis*.

The aftermarket steering column manufacturer may design a proposed generic repair and apply to LVVTA for LVVTA 'Component Type Approval' for the repair, as detailed in LVVTA Information Sheet # 11-2012 'LVVTA Approval Application Guide', which is available for download under the 'Documents' section of the LVVTA website, www.lvvta.org.nz .

*It should be noted that the LVVTA Technical Advisory Committee (TAC) considered a number of proposed repair ideas to make these columns safe on an individual basis.

The TAC first considered a proposal to allow the replacement of the plastic bush with a more suitable bush that features the required strength and self-lubricating properties, however, all such proposals for localised repairs of the system ignore the inescapable fact that the column is fundamentally not 'fail-safe' - the resolution of which would require a complete re-design of the whole system. Another significant problem with the existing system is that there is a very high reliance on two very small side pins that absorb the entire steering load, and this vulnerability is exacerbated when the staking is ground out to remove the pins during disassembly, and then re-staked together during re-assembly.

The proposal of converting the tilt columns to fixed (non-tilt) columns was also considered, however there are many potential issues with the internal die-cast head not being designed to take excessive loads, in particular risk of top & bottom bush misalignment of the tilt mechanism, potentially causing a casting failure in the steering column head where the bearing is situated.

'RPC' (Racing Power Company) brand:

Identification:

LVVTA understands that the 'RPC' brand columns are also manufactured in China.

'RPC' brand aftermarket steering columns are all clearly branded via a silver-coloured etching process on the bottom end of the lower column shaft, which features the letters 'RPC' followed by a date (see Figure 30).

The column may have to be disconnected in order to be able to see this branding.

Figure 30: 'RPC' branding at base of lower shaft

Technical information:

The design of the tilt mechanism within the 'RPC' brand column is based on the GM-style double-yoke system (as shown in Figure 31), however the origin and quality of the 'RPC' mechanism is unknown, and therefore cannot be assured of being fit for use as a critical-function component such as a steering column.

Figure 31: 'RPC' brand uses 'double-yoke' GM-style tilt mechanism

As can be seen in Figure 31 above, the 'RPC' brand column incorporates a welded connection to join the lower yoke of the tilt mechanism to the lower steering column shaft. Figure 32 shows a close-up image of the welded section from an 'RPC' brand tilt steering column, with an obvious defect visible within the photograph of the poor-quality weld. Despite the presence of a plug-weld, LVVTA cannot have any confidence in the quality controls of the welding, or the suitability in either the parent or filler materials used in the manufacturing and welding processes, particularly given that the entire directional control of the vehicle relies upon this weld.

Figure 32: Welded connection in 'RPC' steering shaft

An additional potential safety problem associated with 'RPC' brand columns is that the plastic tilt-ball used to connect the upper and lower shafts may be made from a poor quality plastic that is very weak, or that has injection-moulding defects, as has come to light on the similarly-made 'CPP' brand columns.

LVV Certifier action required:

Column is to be rejected by LVV Certifier as unsafe. Upon vehicle owner's request, column may be disassembled and assessed by LVV Certifier for the purpose of visual comparison to that shown above. If verified as that shown above, column must be rejected. If internal components and systems fundamentally differ to that shown above, LVV Certifier should contact LVVTA technical staff for advice.

Approved repair process:

No approved repair process exists for this brand of steering column on a one-off basis*.

The aftermarket steering column manufacturer may design a proposed generic repair and apply to LVVTA for LVVTA 'Component Type Approval' for the repair, as detailed in LVVTA Information Sheet # 11-2012 'LVVTA Approval Application Guide', which is available for download under the 'Documents' section of the LVVTA website, www.lvvta.org.nz .

*It should be noted that the LVVTA Technical Advisory Committee (TAC) considered a number of proposed repair ideas to make these columns safe on an individual basis.

The proposal of converting the tilt columns to fixed (non-tilt) columns was considered, however there are many potential issues with the internal die-cast head not being designed to take excessive loads, in particular risk of top & bottom bush misalignment of the tilt mechanism, potentially causing a casting failure in the steering column head where the bearing is situated.

'Wysco' brand:

Identification:

The column shown below in Figure 33 was sold to its owner by a New Zealand retailer as a 'Wysco' brand column. Because there is no visual brand identification anywhere on this column, LVVTA has tried to make contact with 'Wysco' in the USA to ensure that this is in fact correct. However, the California-based sales person that the website led us to had no technical knowledge, but confirmed that 'Wysco' columns are made in China, and stated that the only technical people within 'Wysco' are based in China - and that they cannot be contacted. This situation illustrates the difficulties associated with buying steering columns – or any products for that matter – from a website-based business that sits in front of a Chinese manufacturing plant, and for which no technical support exists. Even the New Zealand retailer wasn't really sure what the column is. Based on the information LVVTA has been able to find, this column is being treated as a 'Wysco' brand.

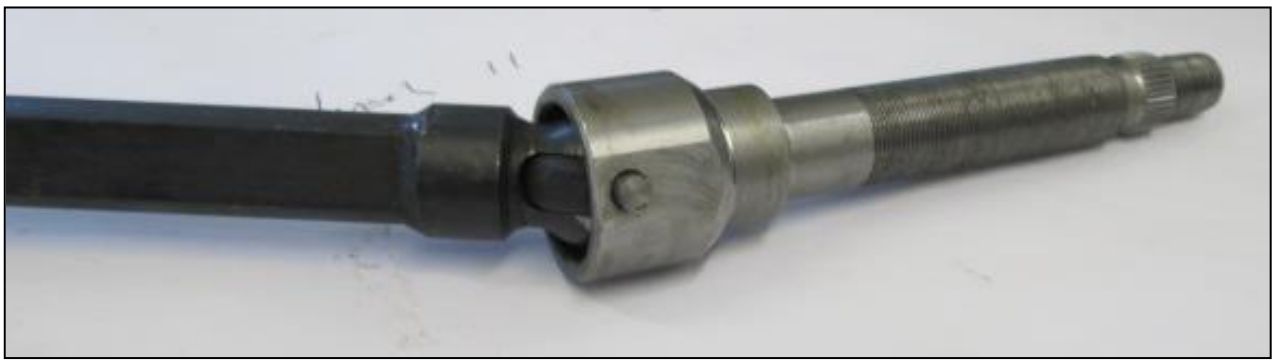


Figure 33: 'Wysco' column with a swivel-joint tilt mechanism

Technical information:

'Wysco' brand steering columns use a swivel joint system (as shown in Figure 34) which appears to be a poorly-designed copy of the 'Flaming River' system, but instead of using a brass tilt-disc to allow rotation between the two shaft sections, it incorporates a poor-quality plastic bush which, in brand new unused condition, during LVVTA's inspection of one such unit, had so much play that it would have failed a warrant of fitness inspection.

Although difficult to tell in the photos, the plastic bush was full of cavities as a result of a poor injection-moulding process.

Figure 34: Poor-quality injection-moulded plastic tilt-disc on 'Wysco' column

The 'Wysco' brand aftermarket steering column incorporates a welded connection of unknown and unverified quality to join the tilt-ball housing of the tilt mechanism to the main lower steering column shaft. Figure 35 shows a welded connection, joining the swivel-joint housing to the lower shaft within a 'Wysco' brand tilt steering column – upon which the entire directional control of the vehicle relies.

Figure 35: Welded shaft connection on 'Wysco' column

Given the poor quality components used in other parts of this column, LVVTA cannot have any confidence in the quality controls of the welding, or the suitability in either the parent or filler materials used in the manufacturing and welding processes.

LVV Certifier action required:

Column is to be rejected by LVV Certifier as unsafe. Upon vehicle owner's request, column may be disassembled and assessed by LVV Certifier for the purpose of visual comparison to that shown above. If verified as that shown above, column must be rejected. If internal components and systems fundamentally differ to that shown above, LVV Certifier should contact LVVTA technical staff for advice.

Approved repair process:

No approved repair process exists for this brand of steering column on a one-off basis*.

The aftermarket steering column manufacturer may design a proposed generic repair and apply to LVVTA for LVVTA 'Component Type Approval' for the repair, as detailed in LVVTA Information Sheet # 11-2012 'LVVTA Approval Application Guide', which is available for download under the 'Documents' section of the LVVTA website, www.lvvta.org.nz .

*It should be noted that the LVVTA Technical Advisory Committee (TAC) considered a number of proposed repair ideas to make these columns safe on an individual basis.

The TAC first considered a proposal to allow the replacement of the plastic tilt-disc with a more suitable bush that features the required strength and self-lubricating properties, however, all such proposals for localised repairs of the system ignore the inescapable fact that the column is fundamentally not 'fail-safe' - the resolution of which would require a complete re-design of the whole system.

The proposal of converting the tilt columns to fixed (non-tilt) columns was also considered, however there are many potential issues with the internal die-cast head not being designed to take excessive loads, in particular risk of top & bottom bush misalignment of the tilt mechanism, potentially causing a casting failure in the steering column head where the bearing is situated.

Other unknown brands:

In addition to the aftermarket steering columns detailed within this Information Sheet that can be identified by brand name, there are at least three other brands that – as of the date of release of this Information Sheet – have been inspected by LVVTA and which feature safety defects which make them illegal in New Zealand, and potentially unsafe.

'Unknown brand A':

'Unknown brand A' is an aftermarket steering column which incorporates a welded connection of unknown and unverified quality to join the tilt-ball housing of the tilt mechanism to the main lower steering column shaft. This is a weld upon which the entire directional control of the vehicle relies.

As shown in Figure 36, unlike the 'Wysco' brand steering column which featured an injection-moulded plastic tilt-ball, the tilt-ball within the 'Unknown brand A' swivel joint housing is made from steel. While this will have the required strength properties, there will, over time be binding and wearing problems that result from the steel tilt-ball's inability to self-lubricate.

Figure 36: 'Unknown brand A' swivel-joint

Another concern with this column is that the main central pin, of only 6 mm diameter – upon which the vehicle's entire steering control relies – is made from non-hardened normal mild steel. Of further concern is that the circlips which hold the 6 mm pin in position are what could only be described as 'cheap and nasty'.

'Unknown brand B':

'Unknown brand B' is another aftermarket steering column brand which incorporates the GM-style tilt mechanism design, but which incorporates a welded connection of unknown and unverified quality to join the upper yoke of the tilt mechanism to the main lower steering column shaft, as shown in Figure 37. Again, the entire directional control of the vehicle relies on this one very poor-quality weld.

The New Zealand purchaser, when buying this column from the website-based company, was assured the column was made in America, but upon arrival, the steering column was in a plain white box with no branding, and the column was wrapped up in Chinese newspapers.

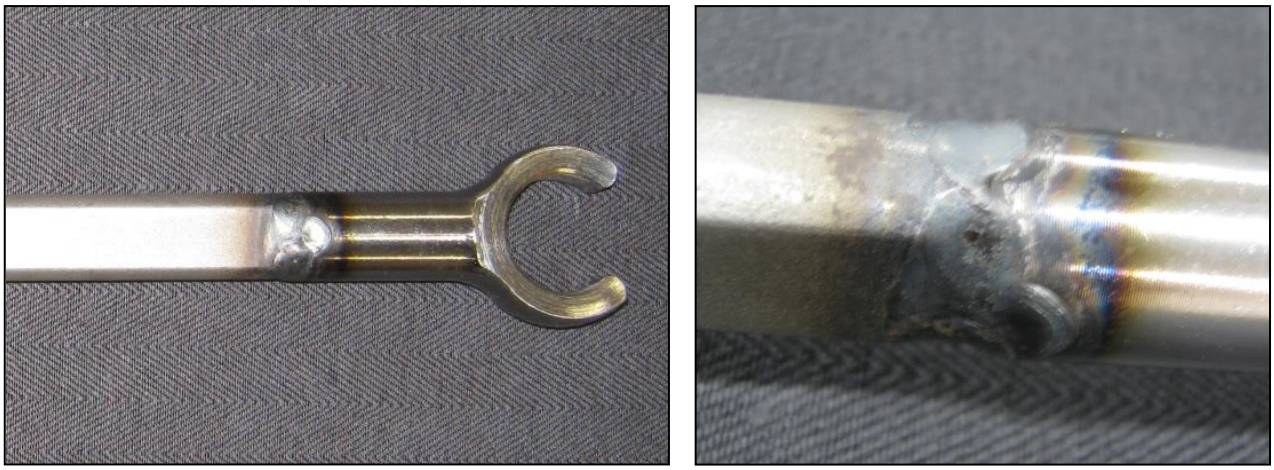


Figure 37: 'Unknown brand B' with GM-style 'double yoke' tilt mechanism, and poor-quality welded connection

'Unknown brand C':

'Unknown brand C' is an aftermarket steering column featuring the same plastic bush and pin system as used in the 'Helix' and 'Procomp' brands. Although its brand is unknown, this photograph provides another good view of one of the areas of concern with the plastic bush and pin systems such as those used by 'Helix' and Procomp'.

The whole steering system of the vehicle is reliant on the thickness of the material from which the bush pin-eye is formed at the top end of the lower steering shaft, as shown in Figure 38. Poor machining tolerances of that pin-eye can lead to an inconsistent shape around the pin-eye opening, which in turn leads to a lack of uniformity and wall thickness in some areas of the pin-eye area. It is unlikely that sufficient quality control processes exist in order to ensure that the machining process involved is consistent and repeatable.

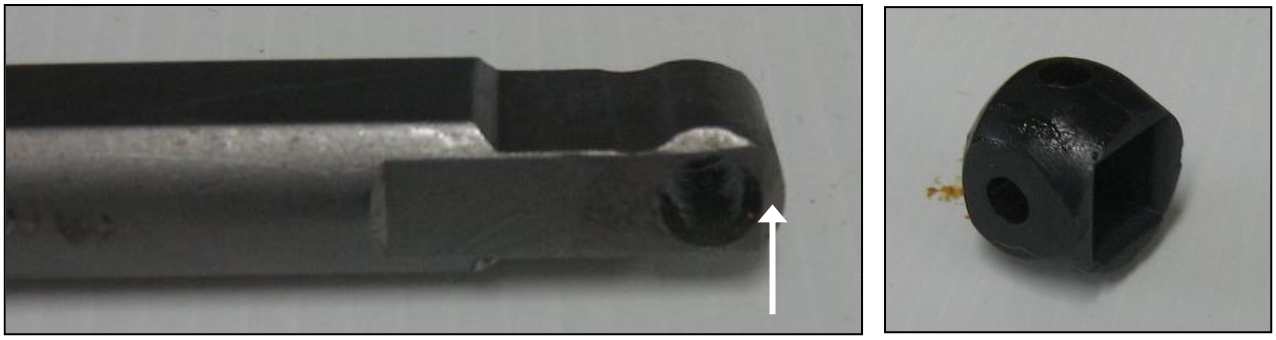


Figure 38: 'Unknown brand C' with unsafe plastic bush and pin system, & inconsistent forming of bush pin-eye

Summarised pass/fail criteria:

In summary, the key technical requirements that LVV Certifiers are required to apply during any LVV certification inspections of aftermarket steering columns, with immediate effect, are:

- Provided that an 'Ididit' or 'Flaming River' column can be visually identified by the manufacturer's branding, or 'Billet Specialties' by its physical attributes, and there is no reason to believe that any post-manufacture modifications have taken place, these brands can be approved at face-value due to their 'LVVTA-recognised' product status, and therefore do not need to be stripped & assessed.

- Provided a column can be confirmed as a 'Limeworks' column by the presence of a receipt or other clear and irrefutable evidence of origin, and there is no reason to believe that any post-manufacture modifications have taken place, it can be approved at face-value due to its 'LVVTA-recognised' product status, and therefore does not need to be stripped & assessed.

- All other columns that are made by a manufacturer who is other than one of the four recognised brands, or cannot have its brand established, must be rejected by the LVV Certifier as unsafe.

- Upon the vehicle owner's request, a column may be disassembled and assessed by LVV Certifier. The column must be rejected if either:

    - the column incorporates any tilt mechanism other than an original or correctly remanufactured GM tilt mechanism (documented evidence must be provided to, and verified by, LVVTA); or

    - the column incorporates any welding within its construction (other than an outer housing which is not relied upon for the directional control of the vehicle); or

    - the column incorporates any non-steel (eg plastic or nylon) components within the tilt-mechanism; or

    - the column incorporates any friction-surface components that are not self-lubricating by design; or

- the column incorporates any features which do not follow sound automotive engineering principles such as critical fastening systems that are not vibration-proof or self-locking.

- A non-compliant aftermarket steering column may not be further modified or repaired, except via written authorisation from LVVTA subsequent to a repair process approved under the LVVTA Component Type Approval system. (Note that LVVTA Component Type Approval process may only be entered into by the originating steering column manufacturer).

Final comments:

Review of vehicles with columns of concern:

During May 2013, LVVTA staff-members are identifying, through the LVVTA database, every low volume vehicle which has been through the LVV certification process within the last two and a half years that may be fitted with an aftermarket steering column, of which there are 209 vehicles. These owners are being advised in writing of the general unsafe aftermarket steering column situation, and advising them that they should contact their LVV Certifier to ensure that the column fitted to their vehicle is not one of the unsafe columns. The assessment of the column by the LVV Certifier will be a contractual arrangement between the vehicle owner and the LVV Certifier.

LVVTA has asked LVV Certifiers to also make contact with owners of vehicles which may have been LVV Certified with one of the unsafe aftermarket steering columns detailed within this Information Sheet. It should be noted that the biggest safety risk – the unsafe tilt mechanisms - has only come to light during April 2013, and LVV Certifiers would not have had any way of knowing that these safety risks existed within vehicles that they were certifying previous to May 2013.

LVVTA has discussed the aftermarket steering column issue with the New Zealand Transport Agency, and proposed that NZTA notify their Authorised Vehicle Inspectors (WoF issuers) about the issue, asking them to be extra vigilant in assessing steering play in any modified vehicle, particularly if the AVI is able to recognise that the vehicle is fitted with an aftermarket steering column.

Column disassembly:

It is not the responsibility of an LVV Certifier in the course of his LVV certification activities to remove and disassemble a steering column. If a vehicle owner wishes to engage an LVV Certifier who is a motor mechanic to carry out this removal and disassembly as paid work, that is a contractual arrangement between the vehicle owner and the LVV Certifier.

It should be noted that in the case of some aftermarket steering columns, it is very difficult to disassemble a steering column, particularly without inflicting some minor damage, so if an LVV Certifier is requested to do this for a customer, he should warn the customer about 'all care and no responsibility'.

Use of vehicles with columns of concern:

An LVV Certifier must not, under any circumstances drive a vehicle which may be fitted with one of the columns that have been deemed to be unsafe – which effectively means any aftermarket steering column other than one made by the four recognised manufacturers.

An LVV Certifier should also take all practical steps to prevent vehicle owners from driving such a vehicle. For example, if a vehicle may have one of these columns, an LVV Certifier should make it very clear to the owner that he should not drive the vehicle to the LVV Certifier's place of inspection, but instead transport it. It would be prudent for an LVV Certifier to put this in writing where practicable.

The LVV system must not become an accessory to someone getting killed or injured as a result of one of these columns, especially when LVVTA and the LVV Certifiers know the extent of the seriousness of the issues to hand.

Failed unsafe aftermarket steering columns:

People who have been sold unsafe aftermarket steering columns should note that legislation has always existed that requires steering systems and components to be safe, durable, and fit for their purpose, and sellers have a legal obligation – under both Transport Law and the Consumer Guarantees Act - to ensure that products they sell are both legal and fit for their intended purpose.

There is some concern as to what will happen to an unsafe aftermarket steering column once it has been identified and rejected by an LVV Certifier, particularly if the owner is not able to return the column to the retailer he or she purchased it from. Unfortunately, if an unsafe column is someone else's property, then neither LVVTA nor an LVV Certifier has any legal right to demand that an unsafe steering column is destroyed. LVVTA advises LVV Certifiers to strongly recommend to owners of unsafe steering columns that, the columns should be destroyed or somehow otherwise be permanently taken out of circulation.

Further investigation:

As in all new and complex technical situations, especially amongst those where such a high safety risk exists, and therefore a high level of urgency is required, there can be much more to learn than there is time available to do it in. LVVTA will be learning more about the unsafe aftermarket steering column issue over the coming weeks and months, and updated information will be provided to LVV Certifiers and uploaded to the LVVTA website for the public to access as it becomes available. LVVTA advises that it may, depending on new information that might come to hand in the near future and the results of more in-depth assessment and testing of some manufacturers products that will be scrutinised in greater depth, revise its position on the recognised aftermarket steering column brands. Once better informed, LVVTA may add to, or reduce the list of recognised aftermarket steering column manufacturers recorded in this Information Sheet.

LVVTA invites any LVV Certifiers, product retailers, and members of the motoring public to assist us with our research about unsafe aftermarket steering columns by contacting either of our technical team members, Justin Hansen or Dan Myers on (04) 238-4343, or tech@lvvta.org.nz. We will be very appreciative of any help.

Further advice:

Any LVV Certifiers requiring any further technical information or advice, or wishing to seek any clarification or guidance, should contact Justin Hansen or Dan Myers at the LVVTA office in Wellington on (04) 238-4343.

Tony Johnson
Chief Executive Officer
Low Volume Vehicle Technical Association, Inc