

## Exclusion of Warranty

The items in this catalog are intended for use in motorsport competition, i.e. AUTO RACING. No warranty of these components, express or implied, is offered by Woodward Machine Corporation or its subsidiaries, for the following reasons, among others:

***(1) Motorsport is inherently dangerous. The conditions of end use of the components are normally hazardous and unpredictable, and are entirely beyond our control; and***

***(2) The decision as to the suitability of said components for a particular manner of use, or in a particular installation, is made by the user and is likewise beyond our control; and***

***(3) The application of said components is therefore understood to be experimental.***

Liability of Woodward Machine Corporation is therefore limited to the replacement or repair, at our option, of any of our products that we find, upon our inspection, to be defective in materials or workmanship, specifically excluding items damaged as a result of collision, misuse, or neglect.

***Warning: The approval of your state department of motor vehicles or your country's Ministry of Transport or other relevant authority, for the use of racing equipment on the public highways should not be assumed.*** Woodward Machine Corporation does not support nor participate in efforts to obtain such approval. The end user is responsible for not utilizing Woodward racing components in any manner which may contravene local law.

Original Equipment Manufacturers installing Woodward components in vehicles licensed for use on the public highways are responsible for complying with all applicable safety standards.

Purchasers of Woodward equipment for use in race cars subject to homologation by a sanctioning body, e.g. FIA, NASCAR, IMSA, etc. are responsible for ensuring that the equipment does in fact conform to current rules.

### **DOMESTIC AND INTERNATIONAL PRICING:**

The prices published in this catalog are in US Dollars and apply to all purchases made with Visa, Mastercard, Discover, or American Express cards, whether issued by US or foreign banks.

Surcharges, previously necessitated by unpredictable and exorbitant fees charged by the credit card brands for processing sales across international borders, no longer apply.

Credit card sales are invoiced and shipped by our subsidiary Racor, Inc.

Business-to-business purchases arranged directly with Woodward Machine Corporation are payable by bank wire transfer.

Please note that any customs duties or clearance fees imposed by the destination country are the responsibility of the recipient. We will gladly include your VAT registration number on the shipping documents but we do not collect or remit taxes.



## Terms and Conditions of Sale

Toll-free in USA: 1-888-STEER-US • International: 1-307-472-0550 • E-mail: sales.woodwardsteering@gmail.com

### **PACKAGING FOR INTERNATIONAL SHIPMENT:**

In some cases, international air freight imposes more stringent requirements for packaging. Should this be necessary, any extra cost will be included in our freight quote.

### **OUR STANDARD FREIGHT CARRIERS AND INSURANCE:**

We ship via Federal Express or United Parcel Service, FOB our plant in Mills, Wyoming. Next Day Air and Early AM delivery are available at extra cost for most ZIP codes in the continental US, as is Saturday delivery. Freight insurance is provided free by the carrier up to USD100.00 value, and rises on a very reasonable sliding scale. We ship everything insured for its full value. We can also ship freight collect on your FedEx or UPS account. *We do not ship via Postal Service, as delivery cannot be guaranteed and if your parcel is lost or undelivered it is difficult or impossible to obtain compensation.*

Orders for parts in stock will generally ship the same day if received before noon Mountain Standard Time.

### **USING OTHER CARRIERS:**

Alternatively, we can hold for pickup by the carrier of your choice. However, in these cases we cannot create waybills or submit the export declaration electronically. If your carrier requires that we manually complete their shipping documents we will have to charge for the time. Also, you should be aware that freight companies not having a base of operations in the US will subcontract the pickup to UPS or FedEx and sometimes this can add a week or more before the parcel can actually be placed in transit.

### **RETURNS OF MERCHANDISE, DOMESTIC:**

Returned parts may be subject to a charge of up to 20% to defray the cost of inspection, restocking, and repackaging. Returned merchandise must be unused, unmarked and not over 30 days old. We will make adjustment via exchange or credit only. Special order parts, damaged or rusted parts, or "basket cases" are not returnable except in connection with repair orders.

### **RETURNS OF MERCHANDISE, INTERNATIONAL:**

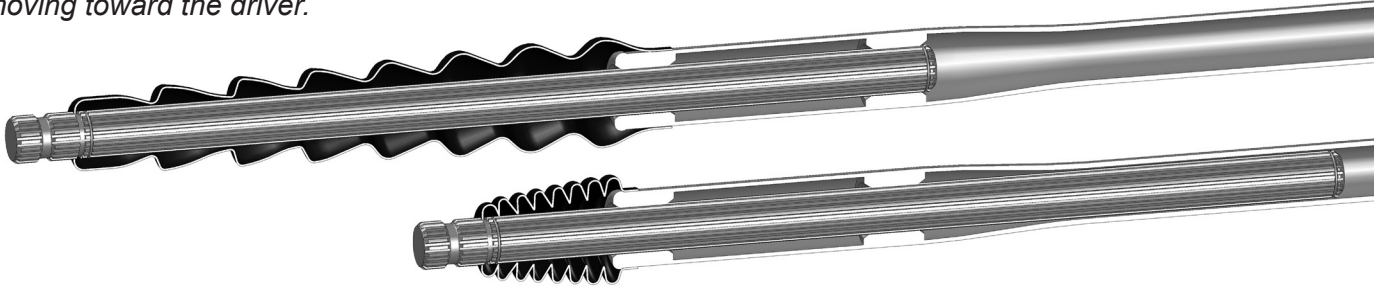
Make absolutely sure to specify in the customs declaration that you are returning goods *manufactured in the U.S.* If this is not done and we receive a bill for import duties, it will be charged to your account.

### **SPECIAL ORDER PARTS:**

In this catalog, many categories of parts are only manufactured on a made-to-order basis. Please note that parts built or assembled to customer specifications are generally specialized enough to be otherwise unsalable, and consequently these are not returnable.

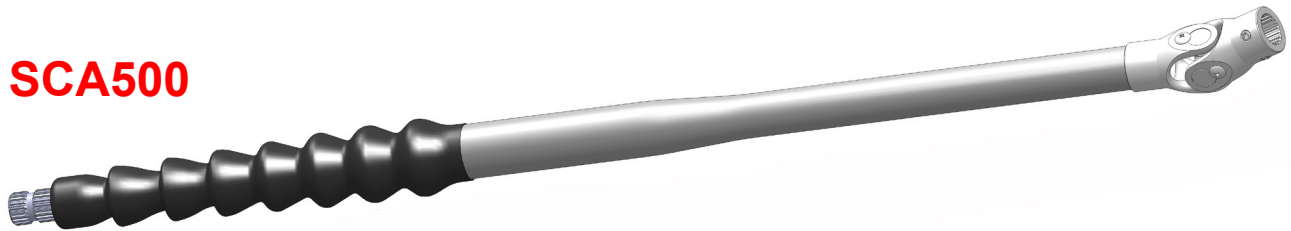
## Principle of Operation

The safety column is designed to collapse in any crash which displaces the front end rearward. With modern race car chassis incorporating a crush/crumple zone to absorb energy, a solid steering shaft would present an obvious danger of injury to the driver. The telescoping construction of the Woodward safety column permits up to nine inches of rearward collapse of the front crush zone *before the steering wheel can start moving toward the driver.*



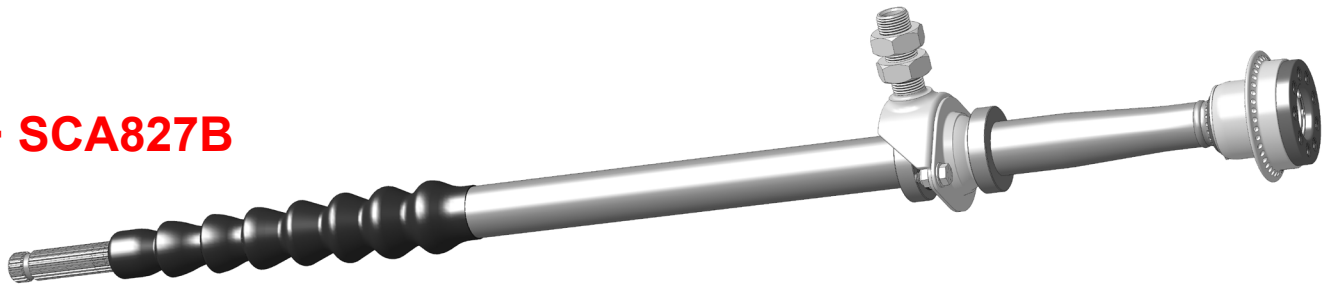
The coarse-tooth spline provides a far more positive drive than the flatted tube typically used in OEM road cars. Its sliding action has almost no resistance; it is free of shear pins or tension clips and can be easily tested for function by simply disconnecting it at one end and collapsing it by hand. This basic mechanism is built into all the Woodward models shown below.

### · SCA500

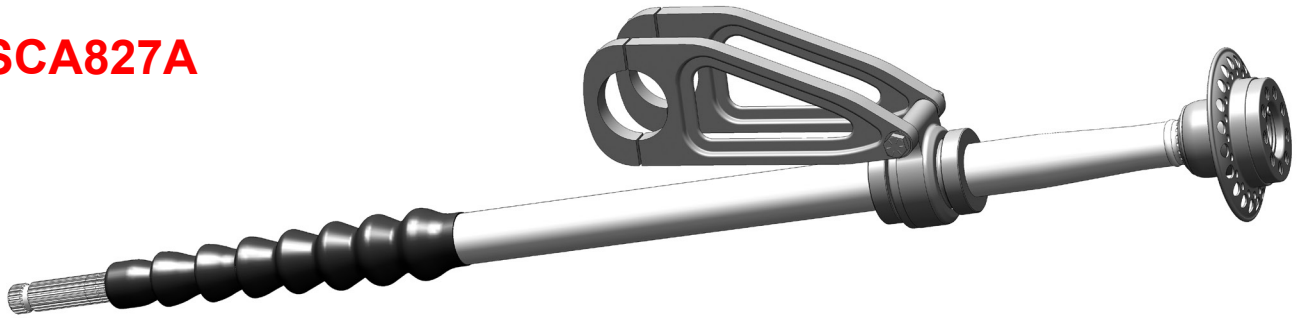


Introduced in 1989, this collapsible section can be spliced into a steering column at any convenient point, normally in the front bay between firewall and steering gear. It provides a significant safety element where class rules require retention of the OEM upper column and dashboard mounting. The tube, which can be cut to the required length, features a reduced diameter to clear headers and other obstructions. It accepts a variety of weld-in extensions, both plain and splined, shown elsewhere in the catalog. This one is shown with a U-joint welded in place with the aid of the ST501 alignment plug.

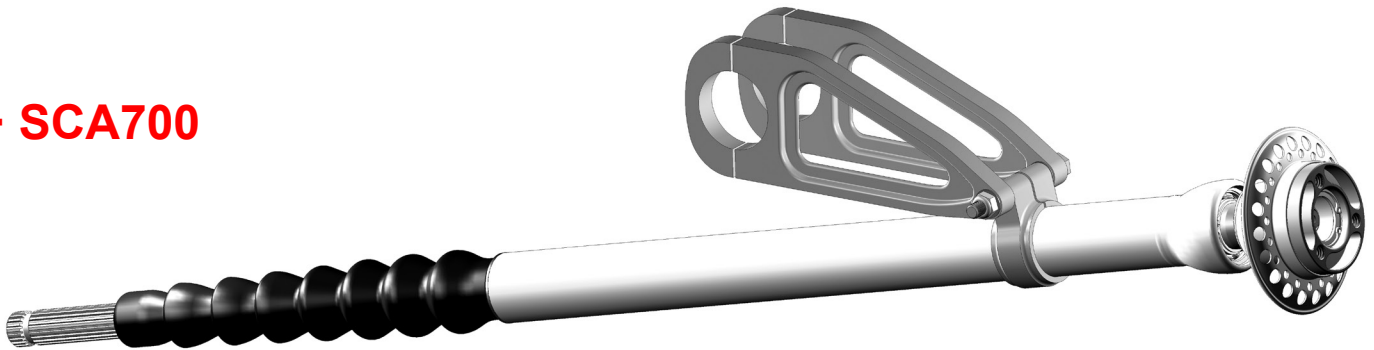
### · SCA827B



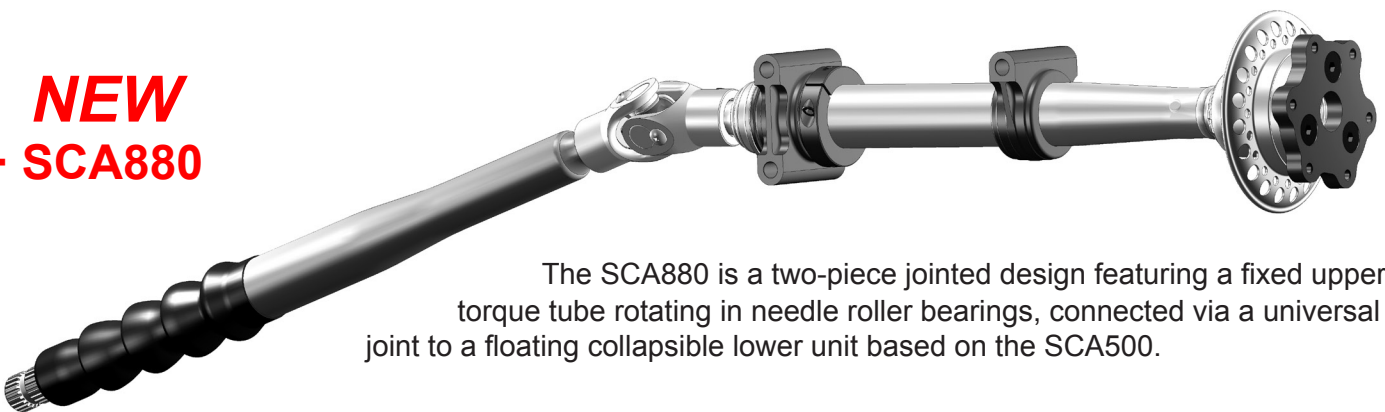
The SCA827B lightweight collapsible column has an integral spline at the upper end which directly accepts any Woodward quick release hub with no adapter needed. It is the lowest-cost cockpit-mounted safety column. Its torque tube is zinc plated for corrosion resistance, and turns in a spherical Delrin® bearing which is hung from a simple tab welded to the dash bar—the same as is commonly used to hang a 3/4 rod end. The SCA827 torque tube is 1.25OD x .065 wall and it will not flex or bend like a plain 3/4 tube. It is available in a range of lengths to fit any race car from late models to dwarf cars. The column can be repositioned in or out by moving the two clamp collars.

**- SCA827A**

Many race car chassis are now being produced without a fixed steering column bracket welded to the dash bar, instead utilizing a clamp-on mounting system which allows convenient vertical and horizontal repositioning of the steering wheel. We have made this system available on the SCA827A column, which is otherwise identical to the 827B.

**- SCA700**

Long considered the world standard for collapsible safety columns, the SCA700 torque tube is housed inside a non-rotating polished aluminum jacket. The SCA700 was in use in the NASCAR Cup series for 27 years (from 1994 through 2021) and is currently approved for the Xfinity and Truck series. Internationally popular in many forms of sedan racing, including drifting. Has a ball-bearing supported splined and tapered post at the upper end of the torque tube to accept any Woodward bolt-on style quick release hub.

**NEW**  
**- SCA880**

The SCA880 is a two-piece jointed design featuring a fixed upper torque tube rotating in needle roller bearings, connected via a universal joint to a floating collapsible lower unit based on the SCA500.

A variant of this model is used in the current NASCAR Cup series Nextgen car, and is excellent for any installation where a conventional straight one-piece column cannot be made short enough. An integral spline at the upper end directly accepts any Woodward quick release hub with no adapter needed. Both upper and lower torque tubes have splined connections. The typical mounting method is between plates, either welded or clamped to the dash bar structure.



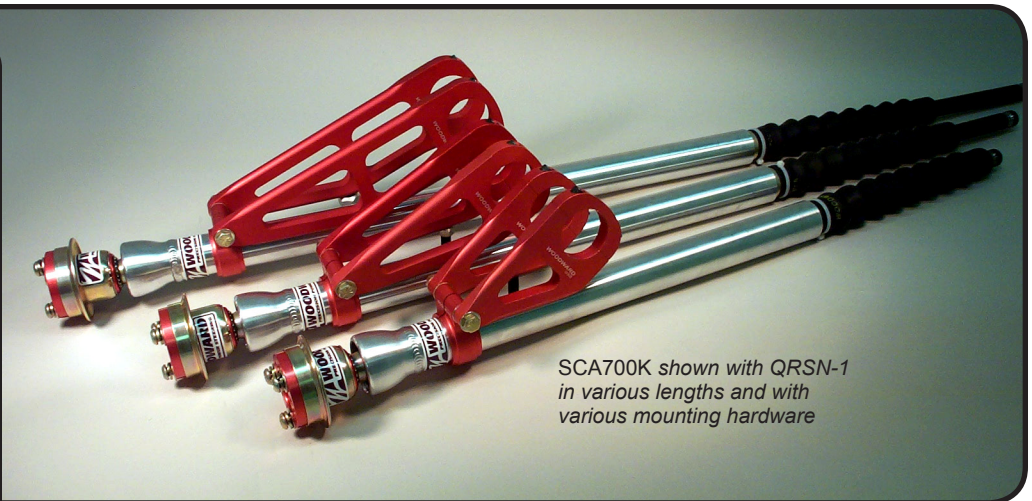
**COLUMN KIT** (shown at right) includes your choice of MB177, MB178, or MB179 mounting brackets, SBC80-1 or SBC80-3 jacket clamp, and *QRSN-1* or *QRAN-1* quick release.

**SCA700K-A**..... 648.06  
Above kit with *QRSN697-1* or *QRAN697-1* quick release:  
**SCA700K-B**..... 696.23

Above kit with *QRSN-2* or *QRAN-2* quick release:

**SCA700K-C**..... 698.96  
Above kit with *QRSN697-2* or *QRAN697-2* quick release:  
**SCA700K-D**..... 734.25

Column ONLY, w/out quick release or mounting hardware  
**SCA700**..... 394.10

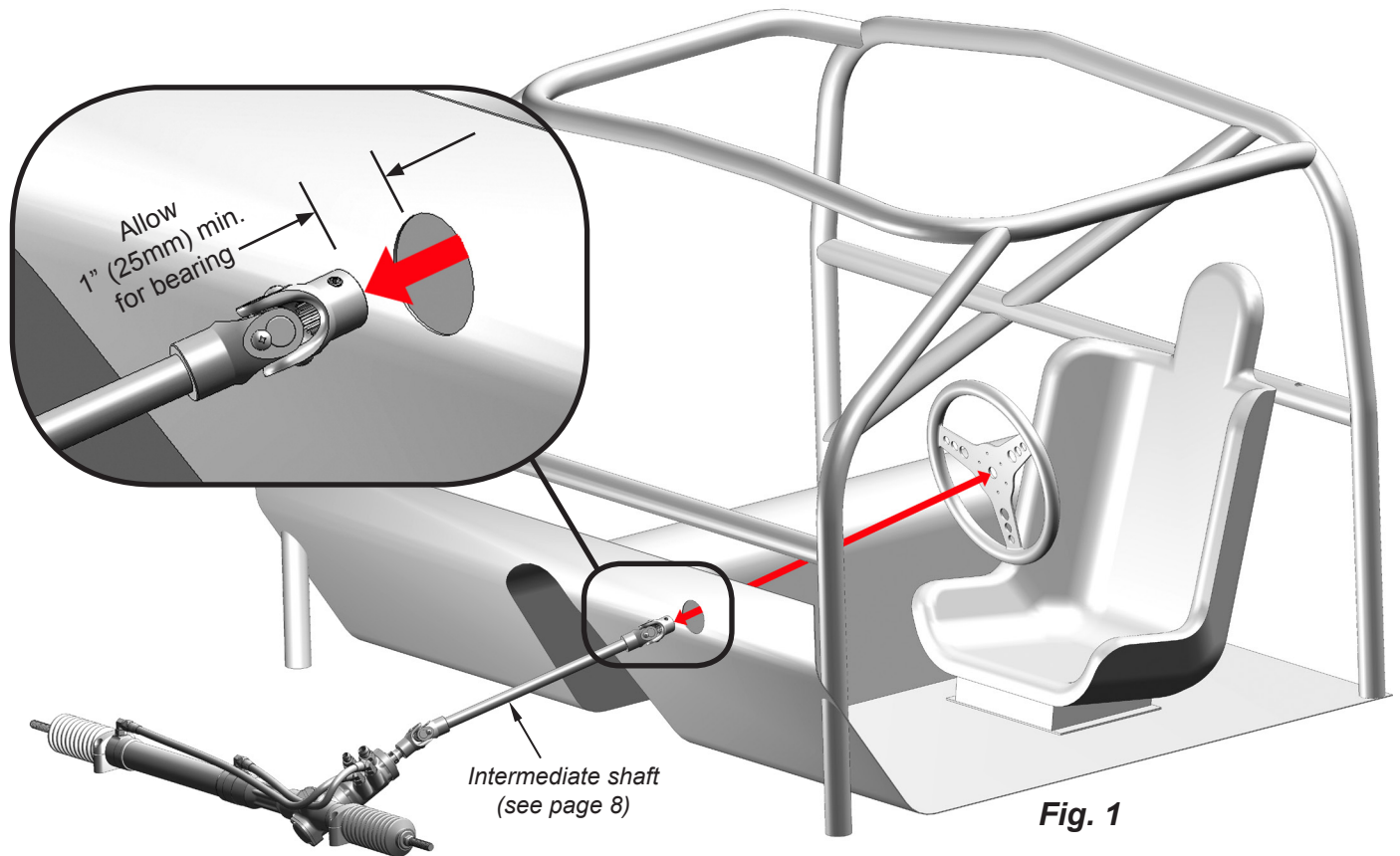


SCA700K shown with *QRSN-1* in various lengths and with various mounting hardware

## How to fit and order an SCA700 safety column (5 steps):

1. Referring to **figure 1** below, locate the upper U-joint. If there is no existing U-joint, decide where you will put one. The ideal location is just outside the firewall as shown, so that the lower end of the column will pass through, and be supported by, one of the bearing styles shown on the following pages.
2. Sit in the car and hold the steering wheel where you want it. Have a helper measure the **overall distance** from the mounting surface of your steering wheel straight down to the near end of the U-joint, as represented by the **red line** in the drawing below. **Record this overall distance; your choice of component parts will be based on it.**

Note that this process of accurately fitting the steering column requires that the roll cage, pedals, and seat be already in place. There is no need to shortcut the process, as the lead time to build a column is very short, usually 1-2 days.



**Fig. 1**

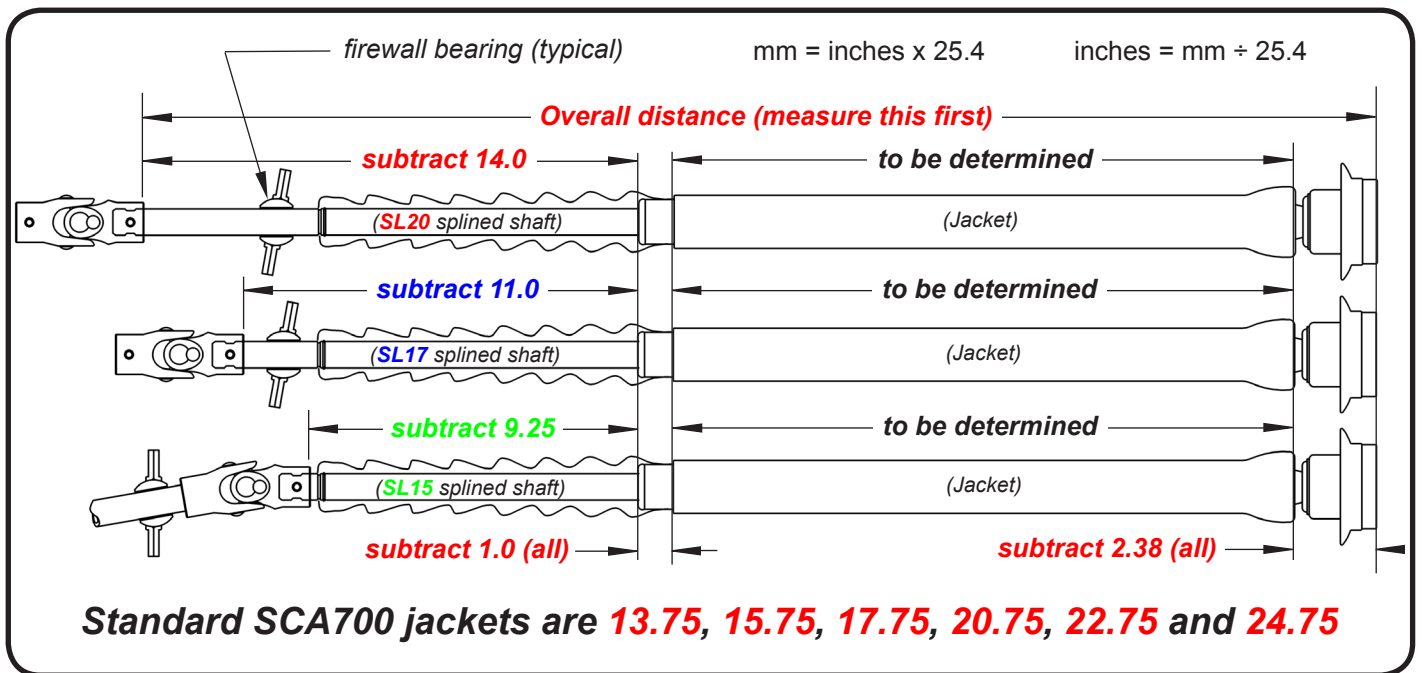
**CAUTION:** When calculating column length, bear in mind that this is a telescoping SAFETY column, **which in order to be effective must be installed as close to fully extended as practical.** A column that is too long and has to be installed in the car in a collapsed position obviously defeats the purpose.

**3.** From **Figure 2** below, select the splined telescoping shaft (SL20, SL17 or SL15) that will best fit your installation. Note that the SL20 and SL17 shafts are intended to pass through a support bearing and connect to a U-joint outside the firewall. In some cases the U-joint may be *inside* the firewall, with the intermediate shaft passing through the support bearing as in the illustration at the bottom of figure 2. In this case you would select the SL15.

**4.** Subtract from your **overall distance** the amount which corresponds to your chosen **splined shaft** (**14**, **11**, or **9.25** inches).

**5.** The only remaining part is the **jacket**. To determine its length, subtract an additional **1.0** inch for the boot cuff and **2.38** for the quick release steering wheel hub. The remainder is the length of your column jacket. Now select the closest jacket from the list. In general it is better to round the result upward—for example, for a calculated length of 21.50, use a 22.75 jacket. In this case, to fit the car the column will have to be compressed 1.25 inch, which will reduce its available collapse stroke by the same amount. For most applications, up to 2.0 inches is usually acceptable. If you cannot get it closer than this, recalculate using the other splined shaft.

**Fig. 2**



The part number for your SCA700 Safety Steering Column is composed of its **jacket** and its **splined lower shaft** in that order—for example SCA700-1575-SL15, SCA700-2475-SL20, SCA700-2075-SL17, etc.

## SCA700 Calculation Examples (inch):

**1. Calculated using SL17 splined lower shaft:**

Overall distance **37.5**; Lower shaft chosen **SL17**; Jacket (calculated from fig. 2): **37.5 minus 11.0 minus 1.0 minus 2.38 = 23.12**  
Closest jacket from list is **24.75**—the part number for this column would be **SCA700-2475-SL17** (install slightly compressed).

**2. Same as above, but recalculated using SL20 splined lower shaft:**

Overall distance **37.5**; Lower shaft chosen **SL20**; Jacket (calculated from fig. 2): **37.5 minus 14.0 minus 1.0 minus 2.38 = 20.12**  
Closest jacket from list is **20.75**—the part number for this column would be **SCA700-2075-SL20** (results in a closer fit than #1).

**3. Overall distance 28.0**; Lower shaft chosen **SL15**; Jacket (calculated from fig. 2): **28.0 minus 9.25 minus 1.0 minus 2.38 = 15.37**  
Closest jacket from list is **15.75**; the part number for this column would be **SCA700-1575-SL15**

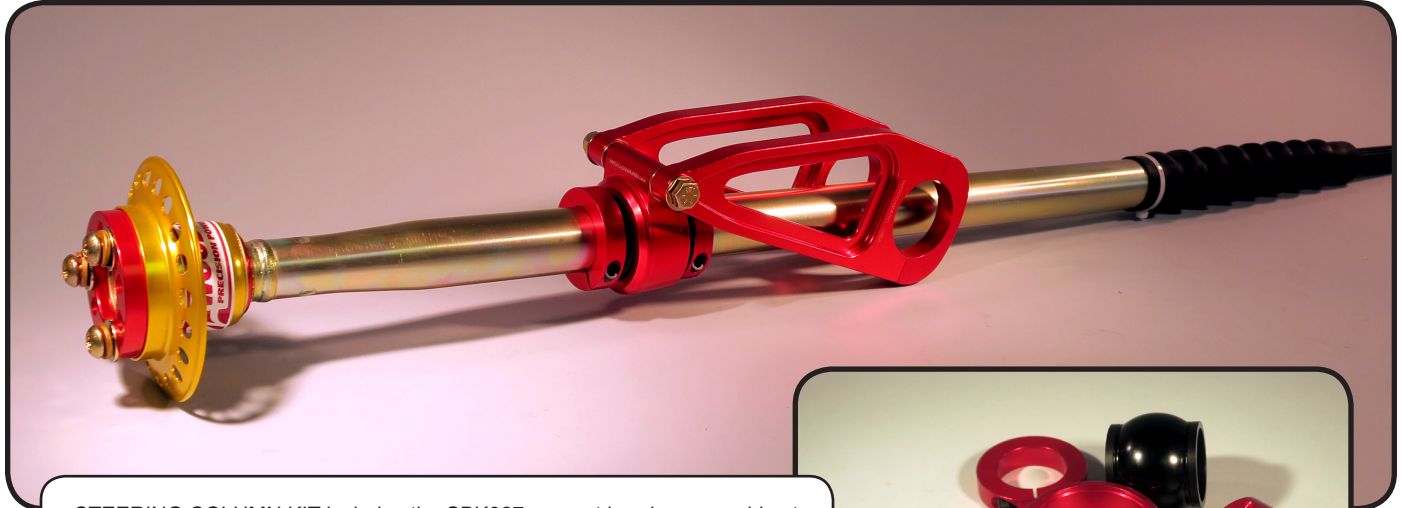
**4. Overall distance 32.0**; Lower shaft chosen **SL17**; Jacket: **32.0 minus 11.0 minus 1.0 minus 2.38 = 17.62**  
Closest jacket from list is **17.75**; the part number for this column would be **SCA700-1775-SL17**



## SCA827A

The SCA827 columns feature an open torque tube in a lightweight self-aligning Delrin sleeve bearing. Like an SCA700, its splined lower shaft can telescope inside the torque tube for a full nine inches. Although light in weight, an 827 column has a 1.25 (31.73mm) diameter torque tube which is about 240% stiffer than a one-inch tube and provides a more stable and positive feel at the steering wheel. To reposition an SCA827A closer to or farther away from the driver, back off the thrust collars and slide the tube in or out. It is not necessary to unlock the self-aligning ball, as it is full-floating inside the hanger. With the collars loose, the main brackets can be unclamped from the dash bar and swung up or down. Last, reset the thrust collars for .005 clearance. This column has an integral spline and is furnished standard with the QRA-2 quick release hub.

In keeping with more modern chassis built with a plain dash bar, the SCA827A uses the same selection of clamp brackets made for the SCA700.



STEERING COLUMN KIT includes the SBK827 support bearing assembly at right, plus your choice of dash-bar brackets with split sleeves to clamp to 1-1/2 or 1-5/8 tubing, plus the QRA-2 quick release, as shown.

SCA827A ..... 524.56

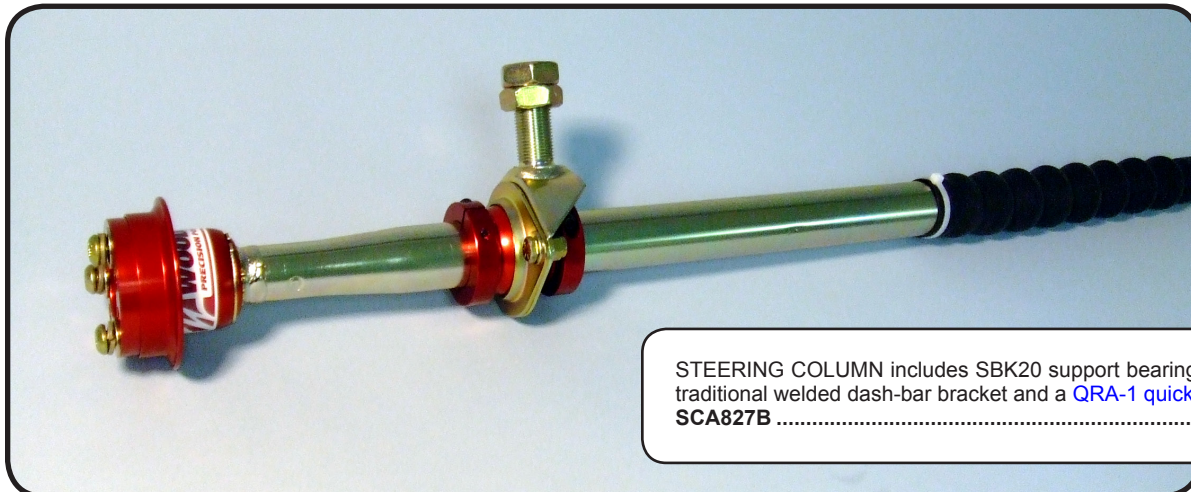


**To select the correct length SCA827 column for your race car, refer to the instructions on the next page.**

## SCA827B

The SCA827B is built to directly replace the simplest form of steering column, a 3/4 tube and Heim joint. The SBK20 bearing hanger fits in the 3/4 hole or slot in a typical support bracket welded to the dash bar. To reposition an SCA827B column, back off the thrust collars and loosen the flange to unclamp the bearing ball. After sliding the torque tube closer to or farther from the driver and/or adjusting it up or down with the jam nuts, reclamp the bearing ball, making sure the column turns freely. Last, reset the thrust collars for .005 clearance. If you steam-clean the car's interior, blow the bearing dry and apply WD-40 to prevent rust; otherwise, no lubrication is necessary.

This column has an integral spline and includes the QRA-1 quick release. A QRA-2, shown on the following pages, is available at extra cost.

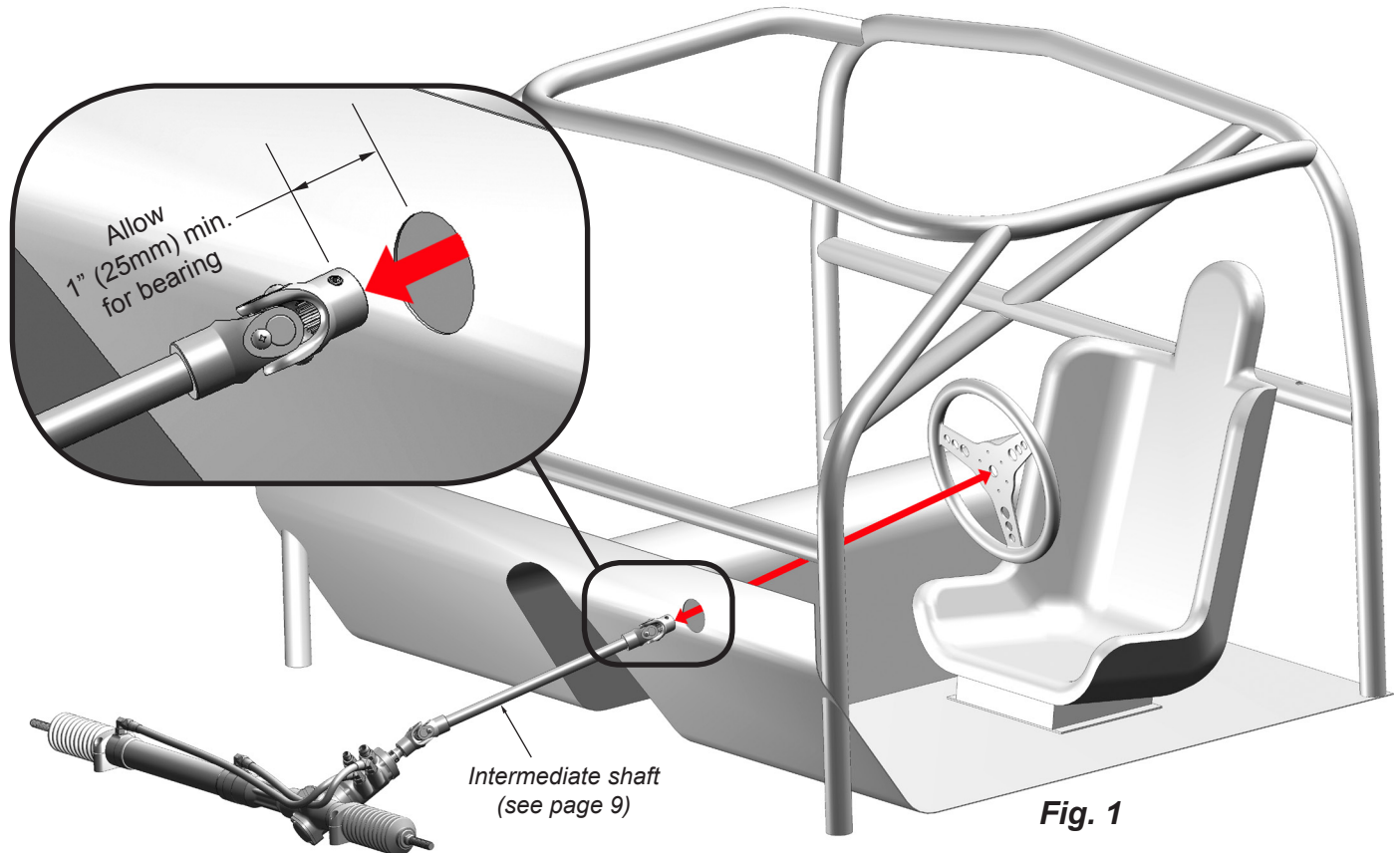


STEERING COLUMN includes SBK20 support bearing assembly to fit a traditional welded dash-bar bracket and a [QRA-1 quick release](#)

SCA827B ..... 437.64

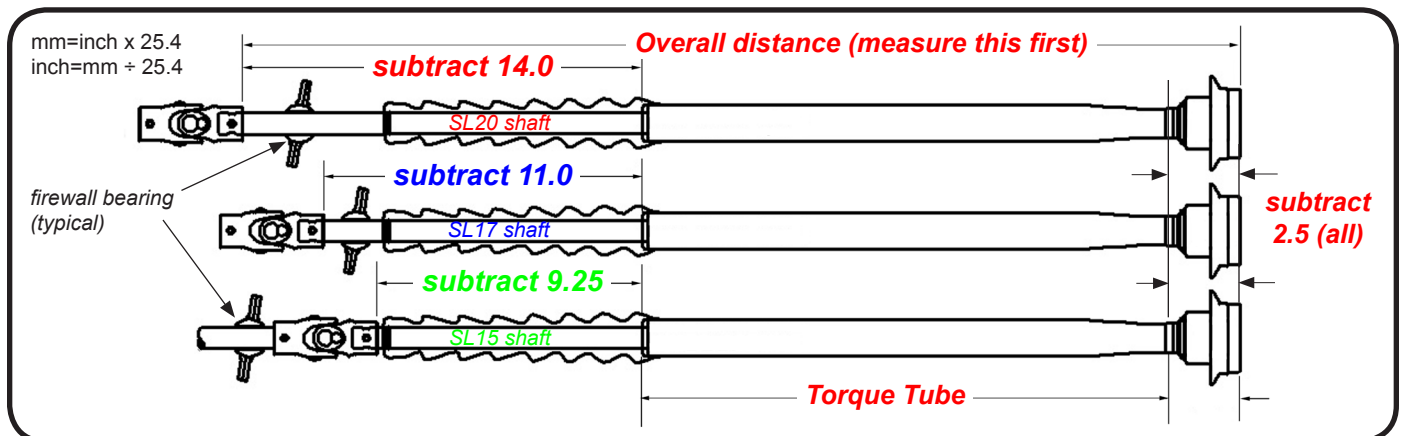
**How to fit and order an SCA827 safety column (5 steps):**

1. Referring to **figure 1** below, locate the upper U-joint. If there is no existing U-joint, decide where you will put one. The ideal location is just outside the firewall as shown.
2. Sit in the car and hold the steering wheel where you want it. Have a helper measure the **overall distance** from the mounting surface of your steering wheel straight down to the near end of the U-joint, as represented by the **red line** in the drawing below. **Record this overall distance; your choice of component parts will be based on it.**



3. From **Figure 2** below, select the splined telescoping shaft (SL20, SL17 or SL15) that will best fit your installation. Note that the SL20 and SL17 shafts are intended to pass through a support bearing and connect to a U-joint outside the firewall. In some cases the U-joint may be *inside* the firewall, with the intermediate shaft passing through the support bearing as in the illustration at the bottom of figure 2. In this case you would select the SL15.

**Fig. 2**



Standard SCA827 torque tubes are **13.75, 15.75, 17.75, 18.75, 20, 20.75, 22.75, 24.75, 26.75, 28.50 and 31.50**



4. Subtract from your **overall distance** the amount which corresponds to your chosen **splined shaft** (**14**, **11**, or **9.25** inches).
5. The only remaining part is the **torque tube**. To determine its length, subtract an additional **2.5** for the quick release steering wheel hub. The remainder is the length of your torque tube. Now select the closest torque tube from the list:

**Standard SCA827 torque tubes are 13.75, 15.75, 17.75, 18.75, 20, 20.75, 22.75, 24.75, 26.75, 28.50 and 31.50**

## SCA827 Calculation Examples (inch):

### 1. Calculated using SL20 splined lower shaft:

Overall distance **38.0**; Lower shaft chosen **SL20**; Torque tube (calculated from fig. 2): **38.0 minus 14.0 minus 2.5 = 21.5**  
 The closest torque tube from the list is **24.75**. The part number for this column would be **SCA700-2475-SL20** (this combination would have to be installed partly collapsed because it is 3.25 inches too long—reducing its safety margin).

### 2. Same as above, but recalculated using SL17 splined lower shaft:

Overall distance **38.0**; Lower shaft chosen **SL17**; Torque tube (calculated from fig. 2): **38.0 minus 11.0 minus 2.5 = 24.5**  
 The closest torque tube from the list is **24.75**. The part number for this column would be **SCA700-2475-SL17** (this would be installed collapsed no more than 1/4 inch, leaving a larger safety margin—a much better combination of parts).

### 3. Overall distance 32.0; Lower shaft chosen SL20; Torque tube (calculated from fig. 2): 31.0 minus 14.0 minus 2.5 = 15.5

The closest torque tube from the list is **15.75**—the part number for this column would be **SCA700-1575-SL20**

### 4. Overall distance 32.0; Lower shaft chosen SL17; Torque tube (calculated from fig. 2): 32.0 minus 11.0 minus 2.5 = 18.5

The closest torque tube from the list is **18.75**—the part number for this column would be **SCA700-1875-SL17**

**Note that 4 gives the same result as 3 while using a different combination of parts.**

## SCA500



COLLAPSIBLE SECTION for installation between the steering gear and the firewall area. Cut or extend to fit. Unit is approx. 27 inches long fully extended. Instructions included.  
**SCA500.....307.88**

There are certain cases in which a safety steering column cannot be accommodated in the cockpit because the space under the dash is occupied by a universal joint or similar part which is not practical to relocate. An alternative for these cars, as well as for street stocks and other classes required to retain the OEM column, is to install a telescoping section between the rack or steering box and the upper U-joint as a first line of defense in the front "crush zone." Installation is fairly simple. Just shorten or extend the tube as necessary and weld the appropriate U-joint or splined adapter to the open end. See the Steering Universal Joints section for U-joints to connect its splined end to most popular steering-gear splines.

Important: the SCA500 torque tube has a reduced diameter for header clearance, and a relatively thin wall, and is NOT intended to take side loads from the steering wheel of a full-size automobile. *It should be installed floating, like a driveshaft, with a universal joint at each end.* This component is designed to replace the intermediate steering shaft in the front or engine bay, NOT the steering wheel shaft. **Although various mail-order houses sell adapters to attach a steering wheel to the SCA500, this is an unapproved and unsafe practice for anything heavier than a mini-sprint.**

A custom-built version (SCA580) is part of the new SCA880 jointed safety column shown on the next page.

WELD-IN EXTENSIONS for SCA500 column sections are inserted in the ID of the swaged tube and welded in place using 3 plug welds and a fillet weld as shown in the top example. Splined extensions are the preferred method of supporting the section against side loads, since the u-joint is removable and the rod end (or firewall bearing) is not captive. Because the ID of the swaged tube can vary up to .005, the pilot is made oversize and must be machined to fit.

<b>ST2011</b> w/1" straight section .....	<b>24.53</b>
<b>ST2012</b> w/2" straight section .....	<b>25.68</b>
<b>ST2013</b> w/3" straight section .....	<b>28.45</b>
<b>ST2014</b> w/4" straight section .....	<b>31.13</b>
<b>ST2015</b> w/5" straight section .....	<b>34.00</b>
<b>ST501</b> Plain splicer for weld-on u-joint .....	<b>13.41</b>





## SCA880

TWO-PIECE JOINTED SAFETY COLUMN for installation anywhere an SCA one-piece type will not fit. Has full needle bearing support. Requires fabricated sandwich-style mount fitted to the mounting holes (see ordering instructions). Supplied standard with QRA697-2

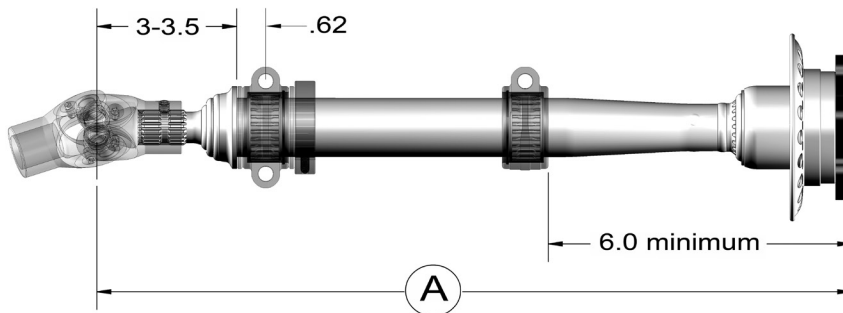
SCA880 ..... 1125.75



### How to fit and order an SCA880 safety column

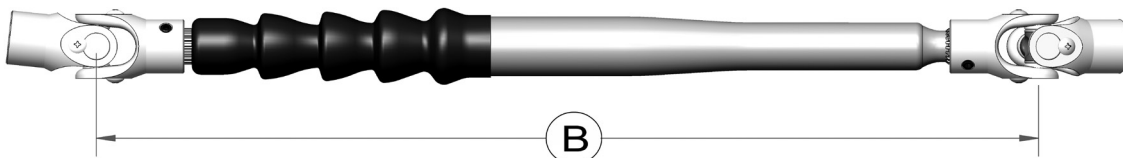
#### Upper (fixed) column:

1. Establish a location for the upper universal joint.
2. Have the driver sit in the car, holding the wheel in driving position.
3. Measure from the back or mounting surface of the wheel to the center of the U-joint. This value is length A of the upper (fixed) column. This dimension is used to create the part number (e.g. SCA880-1875 for 18.75 inches).

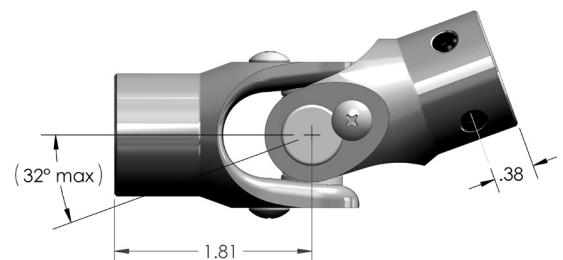


#### Lower (collapsible) column:

3. Determine the center distance from the upper U-joint to the lower U-joint. This distance is length B of the lower (collapsible) column. This dimension is used in the part number (e.g. SCA580-2350 for 23.50 inches).



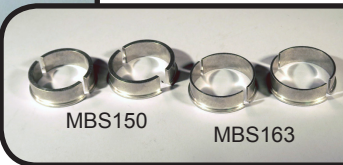
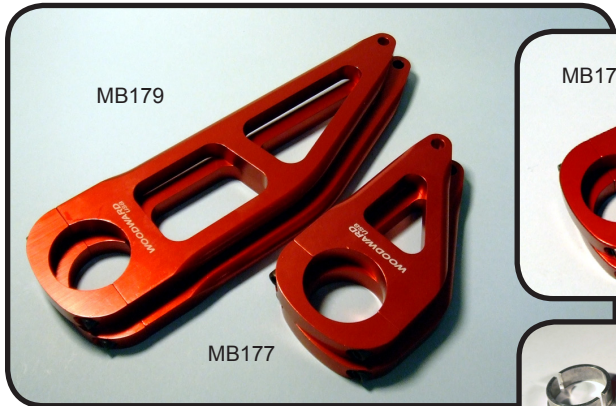
For universal joint dimensions, refer to the drawing at right. Note that the set screws engage a locking groove on the splined shaft. The screws are located 3/8" from the end of the joint and 1/2" from the end of ANY Woodward splined shaft. An equivalent feature is found on most OEM input shafts, usually a half-round slot or groove that the screws can lock into (if that feature is lacking, make a suitable groove in the shaft; never tighten set screws directly against spline teeth).



**SCA700 & 827A Installation Hardware**



JACKET CLAMP for SCA700 bolts between MB brackets below. Hardware included.  
**SBC80-1** ..... **34.23**  
 JACKET CLAMP for SCA700, 3-hole adjustable, for use with old style welded dash brackets. Hardware included. **SBC80-3** ..... **35.99**



DASH BAR BRACKETS for both SCA700 and SCA827 are infinitely adjustable for any driver position. Aluminum, very light, very rigid and secure. Introduced in NASCAR in 1997.

BRACKET PAIR 6-1/2 centers  
 clamps to 1-3/4 tubing **MB178** ..... **122.90**  
 clamps to 40mm tubing **MB178-40** ..... **122.90**

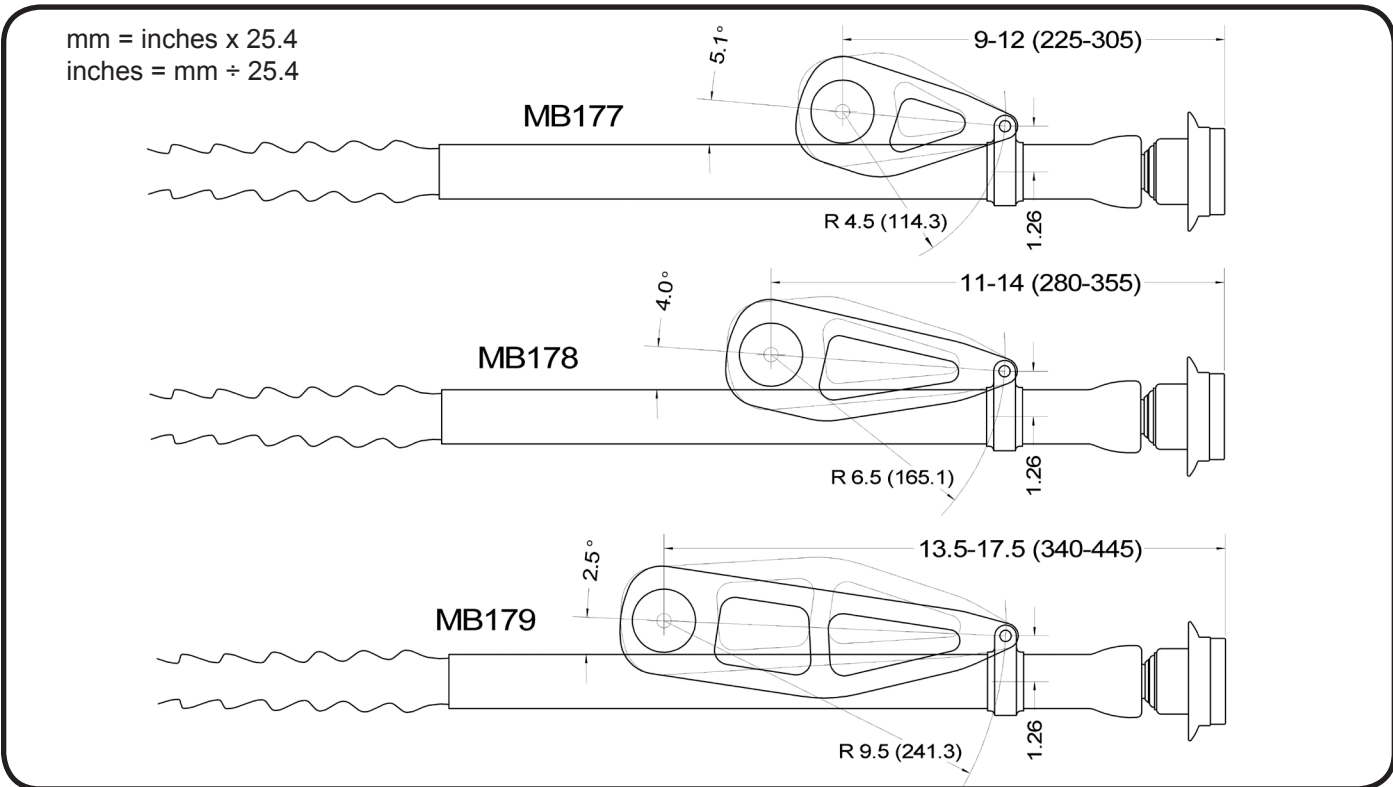
BRACKET PAIR 9-1/2 centers  
 clamps to 1-3/4 tubing **MB179** ..... **146.95**  
 clamps to 40mm tubing **MB179-40** ..... **146.95**

BRACKET PAIR 4-1/2 centers  
 clamps to 1-3/4 tubing **MB177** ..... **110.21**  
 clamps to 40mm tubing **MB177-40** ..... **110.21**

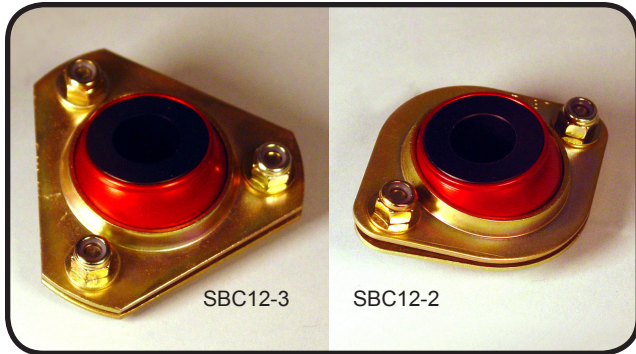
**SPLIT SLEEVE SETS** to adapt 1-3/4 brackets  
 for clamping to 1-1/2 tubing **MBS150** ..... **13.63**  
 for clamping to 1-5/8 tubing **MBS163** ..... **13.63**

**Mounting your SCA700 for maximum stability:**

The MB brackets will provide a tight grip on the dash bar, but stability depends on minimizing how far the steering wheel extends from the support point. Choose brackets that will support the column *as closely as possible to the steering wheel*. With the driver holding the wheel in the desired position, measure from its mounting surface to the centerline of the dash bar. Choose brackets corresponding to the distances shown below; for example, if the wheel is 13 inches (330mm) from the centerline of the dash bar, use the MB178 brackets.







FIREWALL BUSHINGS with steel flanges, aluminum ball and Delrin® sleeve are direct replacements for 3/4 inch industrial flange bearings.  
with 3 bolts **SBC12-3**.....51.26  
with 2 bolts **SBC12-2**.....51.26

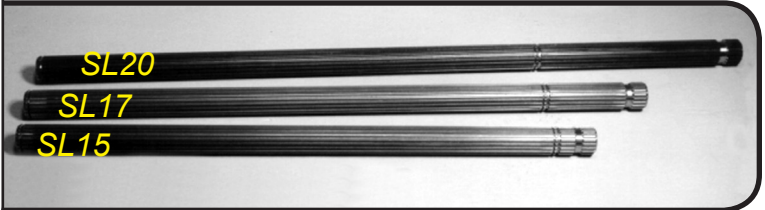
NEW LIGHTWEIGHT MINI-BUSHING is all aluminum with a Delrin® liner and a full-floating ball, sealed with o-rings. Very high operating angle; requires a 1.50 hole. **SBC6-2** .....68.57

Bushing bores are sized for the SL17 and SL20 shafts below. Please specify if they will be used for 3/4 tubing. *Install on one side only of the firewall sheet metal; do not sandwich.*

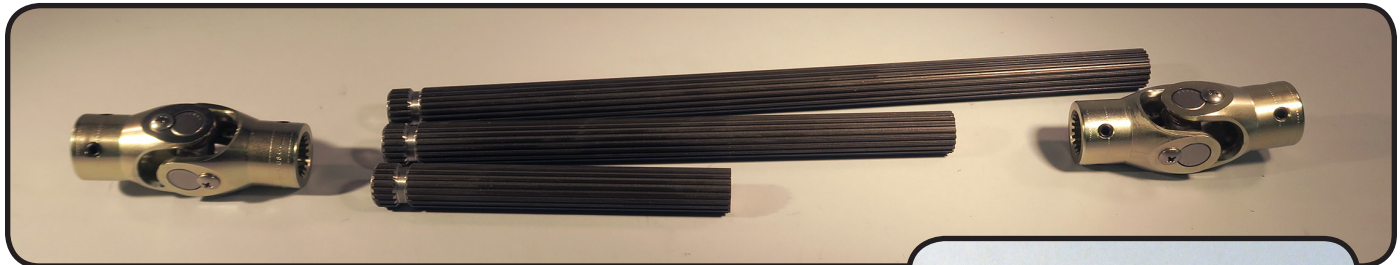
SPLINED LOWER SHAFTS fit all Woodward columns. Retained by a spring clip, the shaft can be removed from the torque tube with a sharp pull.

- SL20 .....57.26
- SL17 .....53.36
- SL15 .....49.46

Note: NASCAR rules require the u-joint to be outside the firewall. The SL17 and SL20 extend beyond the boot far enough to pass through the firewall bushings shown above; the SL15 does not (check your rules before ordering).



## Assembling an intermediate shaft:

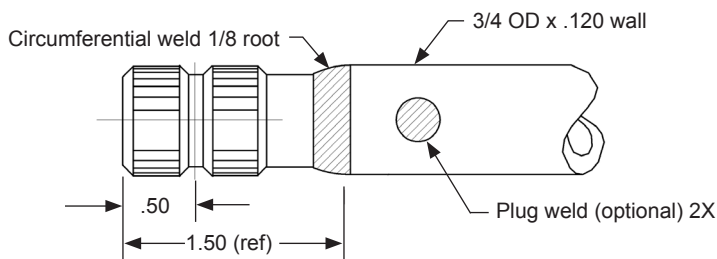


As shown in figure 1 on pages 5 and 8, virtually every car built with rack and pinion steering requires an angled intermediate shaft to connect the steering column to the input spline on the rack.

A very convenient (and mechanically sound) way to make this is with upper and lower U-joints and a splined shaft to connect them. Splined shafts are available in various lengths, premachined on one end with groove for the U-joint set screws to lock into, and the other end left for cutting to length.

For very long shafts it may be more convenient to weld splined stubs (shown at right) into the ends of a suitable length of steel tubing as shown below.

See the [Universal Joints](#) section of the catalog for detailed descriptions and prices of these and other useful steering shaft components.



**Recommended welding procedure:**  
**ER80S-D2 or ER90S-D2 wire with 75%Ar/25%CO2**

## SLA200 and 220

### Slide Yoke

A slide yoke allows a rack and pinion to be mounted on a straight axle. As the axle moves up and down, the distance from the chassis to the pinion changes, so the steering shaft must be capable of sliding in and out like a driveshaft. Note that the sliding travel required of a slide yoke depends on its mounting angle. Mounted horizontally it will need less than an inch of movement; inclined at 45 degrees it will require a stroke equaling almost three-quarters of the total suspension travel. This may require the custom-built SLA220 unit.



STANDARD SLIDE YOKE has 8 inch tube with about 3 inches of stroke. Shipped dry to make welding easier. Special grease for the spline is supplied in a separate container. **SLA200**..... **174.56**

CUSTOM SLIDE YOKE can be provided with a longer combination of tube and shaft for increased travel, and/or a U-joint or splined shaft extension welded in place. This is *built to print*; we need your dimensioned sketch to issue a quote.

**SLA220** .....inquire, starts @ **239.80**

Replacement splined shaft **SL10**.....**64.58**

*Extension shafts for welding into the tube are shown on page 9*

BOOT fits all Woodward columns. An absolutely essential part, to keep out dirt and water and maintain the collapsibility of your safety steering column. To use the boot on a slide yoke, just trim back the large end as necessary. For extra short units, the small end can be opened to fit onto the u-joint. Includes high-strength Panduit cable tie. **SCA360** ..... **19.89**



## Parts for use with 3/4 inch tubular steering shafts



SPLINED INSERTS for welding into steel tubing. Better than splined tube—the solid end can't be crushed by screws or clamps.

For 3/4 OD x .120 wall:

**ST201A** .....**8.81**

For 3/4 OD x .065 wall:

**ST201B** .....**8.81**

Oversize, .660 diameter pilot:

**ST201C** .....**8.81**

Oversize, .750 diameter pilot:

**ST201X**.....**26.62**

Oversize, .875 diameter pilot:

**ST201GM** .....**26.89**



SHAFT HANGER for TUBING is a 3/4" RH male rod end with an oversize (.757) bore to pass tubing (unlike bar stock and bolts, which have clearance, tubing is slightly oversize and will not pass through a standard rod end).

Includes two jam nuts.  
**SB12**.....**22.87**



SHAFT HANGER for SOLID BAR is a 3/4" RH male rod end with a standard bore. Use this with round bar stock or tubing that has been centerless-ground to size. Also fits the .750-20 splined shaft of Woodward safety steering columns.

Includes two jam nuts.  
**SB13**.....**22.87**



SPLINED SHAFT KIT is a 36 inch tube with one ST201A splined stub already welded in, and the other end loose to allow cutting to length.

**WS201-36**..... **52.78**



The Woodward quick release mechanism features a square-contact spline with a two-inch engaged length. This robust low-profile form provides highly positive transmission of torque without the spreading effect of the common involute spline, and is the key to the hub's compact design and extremely light weight. The cupped pull ring is a slip-resistant fit for gloved fingers. **All Woodward quick releases are certified to SFI specification 42.1.**

**NEW WEDGE-LOCK QR Hubs**

*Both sizes of Wedge-Lock QR hubs are also available in FIA required yellow.*



WEDGE-LOCK QUICK RELEASE with 4-inch (100mm) pull ring for **WELD-IN** installation *includes the splined post for welding into a Woodward SCA880 or 827 torque tube*

- QRW-2R (red) ..... 454.75
- QRW-2Y (FIA yellow) ..... 454.75

WEDGE-LOCK QUICK RELEASE with 4-inch (100mm) pull ring for **BOLT-ON** installation *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube*

- QRWN-2R (red) ..... 454.75
- QRWN-2Y (FIA yellow) ..... 454.75



WEDGE-LOCK QUICK RELEASE with 3-inch (75mm) pull ring for **weld-in** installation *includes splined post for welding into a Woodward SCA880 or 827 torque tube*

- QRW-1R (red) ..... 449.50
- QRW-1Y (FIA yellow) ..... 449.50

WEDGE-LOCK QUICK RELEASE with 3-inch (75mm) pull ring for **bolt-on** installation *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube*

- QRWN-1R (red) ..... 449.50
- QRWN-1Y (FIA yellow) ..... 449.50

**INDIVIDUAL SPLINE ADAPTERS**

STEERING POST *for welding into a Woodward SCA880 or SCA827 swaged torque tube; internally contoured for extreme light weight*

- SCA890-SP ..... 44.78
- SPLINE ADAPTER *fits the spline and taper on the SCA700 column; includes recess locknut*
- QR890A ..... 44.78

- WELD-ON SPLINE *for plain 3/4 OD tubing*
- QR891W ..... 44.78



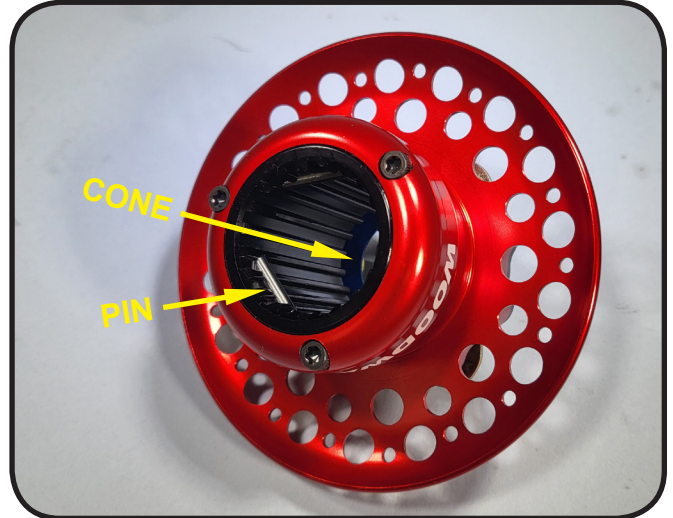


Packaged within the same dimensional envelope as the reliable Ball-Lock style, the new Wedge-Lock design features locking pins guided by ramps. Spring pressure is maintained after the wheel is installed, which keeps the splined post wedged into a tapered socket. This mechanism creates a very solid engagement and prevents both radial and end play without adding any removal effort.

The centering element is a replaceable cone located in the upper end of the hub closest to the steering wheel. The three locking pins are guided in slotted ramps and force the splined post against the cone **from the opposite end of the post**. This layout provides an extremely long spline engagement and maximum stability.

### Weight Reduction

*The Wedge-Lock hub has been made as light as safely possible through removal of non-essential material from its interior spaces and the use of titanium locking pins. The large 4-inch model weighs only 308 grams including its steel splined post.*



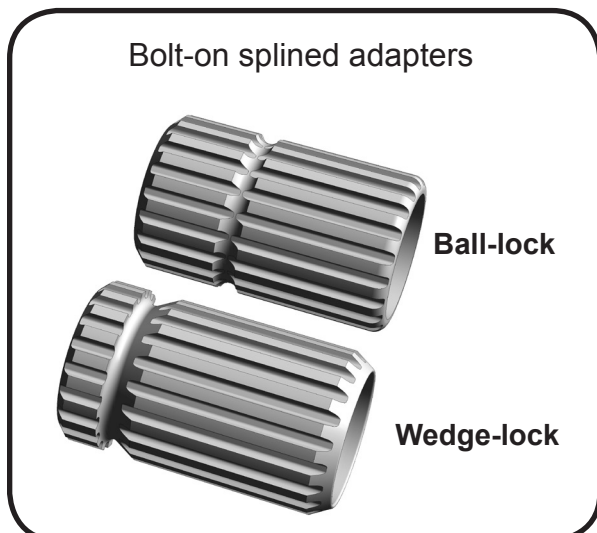
### Added Safety Feature

During actuation of the pull ring, a warning stripe on the hub will remain exposed until the locking pins are completely engaged.



### Steering Wheel Timing

A more precisely centered steering wheel has become an important part of race car preparation. All Woodward QR hub flanges are equipped with the triple three-bolt pattern to allow timing the steering wheel to within two degrees with respect to the 20 spline teeth. To visualize this, *two degrees is one-third of a minute space on a clock.*



**Note: A Wedge-Lock QR hub will not work with a Ball-Lock splined post, nor vice versa. Their parts are not interchangeable!**

### Retrofitting a Wedge-Lock QR hub

To switch from a Ball-Lock hub to a Wedge-Lock hub on an SCA827 or SCA880 column, the original welded-in post must be cut out and the correct post welded in. On an SCA700 column, the splined adapter can simply be unbolted and switched as at left.

Be sure your intended steering column is equipped with the correct adapter or one of the splined posts shown on the preceding page.



**QRAN-1R**

**BALL-LOCK QR Hubs**

The reliable Woodward Ball-Lock quick release has been in continuous use in NASCAR Cup Series competition since 1995 and is available in both bolt-on and weld-on styles. Certified to SFI 42.1, both the 3-inch and 4-inch pull ring diameters feature the cupped positive grip used on all Woodward QR hubs.

BALL-LOCK QUICK RELEASE with 3-inch (75mm) pull ring for bolt-on installation *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*

QRAN-1R (red—shown at left).....	172.35
QRAN-1Y (yellow per FIA rules).....	172.35
QRAN-1B (blue).....	172.35
QRAN-1P (purple).....	172.35



**QRAN-2R**

BALL-LOCK QUICK RELEASE with 4-inch (100mm) pull ring for bolt-on installation *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*

QRAN-2R (red—shown at left).....	181.52
QRAN-2B (blue—shown below).....	181.52
QRAN-2Y (FIA yellow).....	181.52



**QRA-2B**

BALL-LOCK QUICK RELEASE with 4-inch (100mm) pull ring for weld-on installation *includes adapter for welding onto plain 3/4 OD tubing*

QRA-2R (red—shown at left).....	181.52
QRA-2B (blue—shown below).....	181.52
QRA-2Y (FIA yellow).....	181.52



**QRA-1P**

BALL-LOCK QUICK RELEASE with 3-inch (75mm) pull ring for weld-on installation *includes adapter for welding onto plain 3/4 OD tubing*

QRA-1R (red—shown at left).....	172.35
QRA-1Y (yellow per FIA rules).....	172.35
QRA-1B (blue).....	172.35
QRA-1P (purple).....	172.35





## BALL-LOCK QR Hubs with STEEL PULL RINGS

Formerly required by Cup rules, the steel pull ring has remained popular as it is practically impossible to damage from hard impact against the locking balls, including from repeated crashes. Somewhat heavier than the aluminum pull ring but still preferred by many as a longtime standard. The yellow zinc plating conforms to the FIA color requirement.

Available in bolt-on models to fit the SCA700 safety column and weld-on models for 3/4 and 5/8 OD tubing.

BALL-LOCK QUICK RELEASE with 3-inch (75mm) STEEL pull ring *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*  
**QRSN-1 (yellow zinc plated)** ..... 172.35

BALL-LOCK QUICK RELEASE with 4-inch (100mm) STEEL pull ring *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*  
**QRSN-2 (yellow zinc plated)** ..... 181.52



**All Ball-Lock hubs will fit directly on existing SCA827 and SCA880 columns equipped with the correct spline (see spline adapter identification on page 15).**

BALL-LOCK QUICK RELEASE with 3-inch (75mm) STEEL pull ring *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*  
**QRSN-1 (yellow zinc plated)** ..... 172.35

BALL-LOCK QUICK RELEASE with 4-inch (100mm) STEEL pull ring *includes adapter and nut to fit the spline and taper on a Woodward SCA700 torque tube.*  
**QRSN-2 (yellow zinc plated)** ..... 181.52





**Steering Wheel Bolt Pattern Adapters**



**QR697**

STEERING WHEEL ADAPTER for Momo, Sparco and other European steering wheels with the 6 x 70 mm bolt pattern. The kit includes both standard and countersunk Torx Plus® screws. Less than 9 mm thick, this part is very strong and fits any steering hub with the US pattern of 3 x 5/16 on a 1.75 bolt circle.

**QR697** ..... 57.42



**QR698**

STEERING WHEEL ADAPTER for Moto-Lita custom steering wheels uses all nine bolts on the Woodward QR hub to match the Moto-Lita's nine bolts. Plain machined aluminum, suitable for polishing or anodizing. Supplied with Torx Plus® fasteners. **QR698** ..... 61.55

**QR Hubs for 6-BOLT WHEELS**

All Woodward quick release hubs are available with the QR697 flange preinstalled. These accept Momo, Sparco, OMB and other European steering wheels with a 6 x 70mm bolt circle. All include Torx Plus® screws for both straight and countersunk holes. Adds approximately .34 inch (9mm) thickness.

**NOTE: The four inch (100mm) pull ring provides easier access for the driver's gloved hands behind the larger center in a 6-bolt wheel, as well as better access by track safety workers.**



**QRAN697-2Y**

**BALL-LOCK 6-bolt QR hubs**

3 inch (75mm) with <b>WELD-ON</b> spline	
<b>QRA697-1R (red)</b> .....	221.52
<b>QRA697-1B (blue)</b> .....	221.52
<b>QRA697-1P (purple)</b> .....	221.52
<b>QRA697-1Y (FIA yellow)</b> .....	221.52
3 inch <b>STEEL</b> pull ring:	
<b>QRS697-1</b> .....	221.52
4 inch (100MM) with <b>WELD-ON</b> spline	
<b>QRA697-2R (red)</b> .....	230.69
<b>QRA697-2B (blue)</b> .....	230.69
<b>QRA697-2Y (FIA yellow)</b> .....	230.69
4 inch <b>STEEL</b> pull ring:	
<b>QRS697-2</b> .....	230.69
3 inch (75mm) with <b>BOLT-ON</b> spline	
<b>QRAN697-1R (red)</b> .....	221.52
<b>QRAN697-1R (blue)</b> .....	221.52
<b>QRAN697-1R (purple)</b> .....	221.52
<b>QRAN697-1R (FIA yellow)</b> .....	221.52
with 3 inch <b>STEEL</b> pull ring:	
<b>QRSN697-1</b> .....	221.52
4 inch (100MM) with <b>BOLT-ON</b> spline	
<b>QRAN697-2R (red)</b> .....	230.69
<b>QRAN697-2B (blue)</b> .....	230.69
<b>QRAN697-2Y (FIA yellow)</b> .....	230.69
with 4 inch <b>STEEL</b> pull ring:	
<b>QRSN697-2</b> .....	230.69

**WEDGE-LOCK 6-bolt QR hubs**

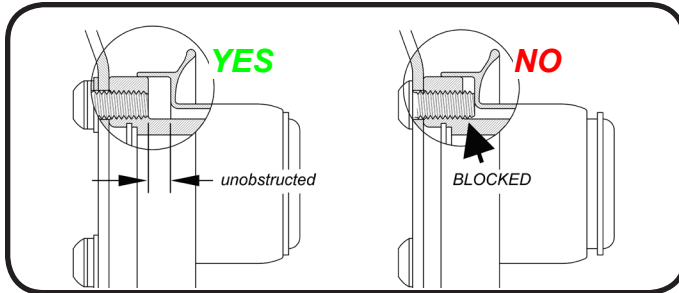
3 inch (75mm) with <b>WELD-ON</b> spline	
<b>QRW697-1R (red)</b> .....	489.50
<b>QRW697-1Y (FIA yellow)</b> .....	489.50
4 inch (100MM) with <b>WELD-ON</b> spline	
<b>QRW697-2R (red)</b> .....	494.75
<b>QRW697-2Y (FIA yellow)</b> .....	494.75
3 inch (75mm) with <b>BOLT-ON</b> spline	
<b>QRWN697-1R (red)</b> .....	489.50
<b>QRWN697-1Y (FIA yellow)</b> .....	489.50
4 inch (100MM) with <b>BOLT-ON</b> spline	
<b>QRWN697-2R (red)</b> .....	494.75
<b>QRWN697-2Y (FIA yellow)</b> .....	494.75

**NOTE:**  
Steering wheels may be furnished with either through or countersunk mounting holes. Both button head and flat head Torx Plus® screws are included with the hub to accommodate either style.



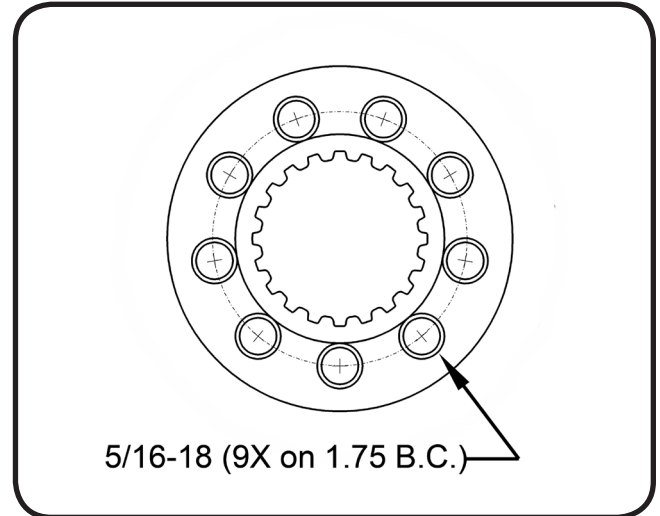
**QRSN697-1**

## Installing steering wheels on QR hubs



When bolting a steering wheel to the QR hub, use the appropriate number of washers to obtain correct engagement of the cap screws. The depth of the tapped holes in the hub is 7/16 inch (11,1mm). The button head Torx cap screws supplied with a Woodward hub include flat and lock washers which can be used in combination to obtain a minimum of 3/8 (9,5mm) thread engagement and a maximum of 7/16 (11,1mm) with a given thickness of steering wheel.

**CAUTION:** Failure to use the correct washer stack, especially on a thin steering wheel, may allow the screws to protrude far enough through the hub to stop the release travel short. Always verify that the mechanism will still work properly after you have tightened all the bolts.

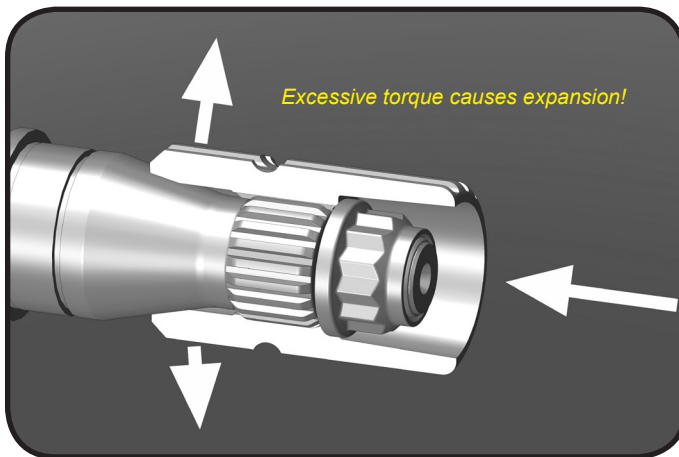


The hub flange is provided with three equally spaced instances of the standard US bolt pattern to allow timing the steering wheel relative to the 20 splines on the column. Indexing the wheel through each of the nine possible orientations on the hub advances or retards it 2° with respect to the spline pattern. The extra bolt holes also enable continued use of the hub in case of stripped or worn holes.

The splined hub is anodized for wear resistance, but is nevertheless aluminum and can be burred or otherwise damaged if not treated with reasonable care. Wipe off any obvious dirt from the shaft spline before you put the wheel on, and let the teeth get aligned and started with as little pressure as possible. A Ball-Lock hub will slide onto the spline for a full half inch (13mm) before you need to actuate the pull ring; it doesn't need to be forced on. A Wedge-Lock hub can be pushed on *without* actuating the pull ring, although all the parts will wear much longer if the ring is held open and released only when the hub is fully seated.

When a Ball-Lock hub seats, it will release spring pressure from the balls with a fairly loud snap or clang. When a Wedge-Lock hub seats, it maintains spring tension against the pins and is somewhat quieter. **To reveal an unseated condition, a high-visibility safety stripe is exposed whenever the pull ring is actuated, and is concealed when the hub is seated.**

Should you disassemble the unit for cleaning, repack the locking balls or pins with a very light grease with minimum solid content such as Aeroshell 14. The spline contact surfaces themselves are normally left dry so as not to attract dirt.



**Caution:** Use care when installing the spline adapter onto the taper of the SCA700 torque tube. The adapter is fairly thin walled and can be permanently expanded by overtightening the nut. The lock nut is an all-steel deformed type and needs only enough torque to overcome its own friction. The adapter will mate very securely to the male column taper with minimal force. Always make sure the hub will still go onto the spline adapter after you have tightened it.