

INSTALLATION - SERVICE INSTRUCTIONS



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Bulletin NO. SB0115

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DECEMBER 2024

Castle nut with
cotter pin

www.markwilliams.com

Part Numbers:

50230-KITAxle, Corvette Next-Step 31 spline spindle for C2-C3, circa: '63-'82

Parts Included:

See the parts list on page 2 or page 6 for all the items included in the kit. The kit has all the parts required including Timken® bearings and seals.

Assembly Features:

This kit improves the yoke-shaft torsion capability by improving the stock 17 spline to a more modern and stronger 31 tooth involute profile. The axle flange (spindle), is produced from a 4340 aircraft alloy forging that utilizes a double heat-treat process and features shot peening for improved cycle life. The universal joint yoke replaces the two parts of the original design, eliminating the 4-bolt flange. The splined yoke is through hardened steel and features removable heat-treated billet caps that simplify the installation. The universal joint cap is attached with ARP fasteners and is drilled for safety wire locking. The axle-shaft features a 1"-20 thread with special castle nut for a cotter key. The axle comes with installed 1/2"-20 x 3" ARP wheel studs that feature a nut-aligning quick start. They are installed with a threaded connection into the axle flange. There is a second pattern, 5/16"-18 thread 5 hole, for holding the brake disc tight against the axle when removing the wheels. The kit comes with all the parts required for assembly including Timken® bearings and seals.

Primary Applications: High performance street and road race applications for the C2 and C3 Chevrolet Corvettes.

Installation Overview: The assembly is designed to be a bolt-in conversion replacement for the original 17 spline axle (spindle) and bolt on universal flange. The kit includes bearings, seals, and a solid-pre-load shim that is over-length. The pre-load shim is intended to be machined to the proper length to precisely control the tapered roller bearing pre-load. The splined yoke features removable caps that simplify the installation. We recommend setting the bearing preload without the seal being installed. Step by step instructions are on pages 3 - 6.

Torque Specs:

The wheel stud-bolts are factory installed with #621 Loctite and torqued to 110 foot-pounds. If the wheel stud bolts should require removal, pre-heat the flange with a heat gun to soften the locking compound prior to removing. The 1"-20 flange nut (#21, pg. 2) is castelated flange nut. We recoment using Loctite retaining compound in addition to the cotter key to retain in the nut. Use the castle nut, without Locktite nut for the trial assembly and setting the spacer length for the proper preload. A hard-ened washer (#9, pg.2) is used between the u-joint flange and the nut. Torque to 240 foot-pounds. Set the preload without the seals before the final assembly process. Torque the 50226-1 U-Joint billet cap 5/16"-24 12-point bolts (#16, pg. 2) to 17-20 foot-pounds. Caution, over torquing will cause damage to the u-joint and will bind roller bearings and cause failure. We recommend using safety wire on the u-joint cap bolts.

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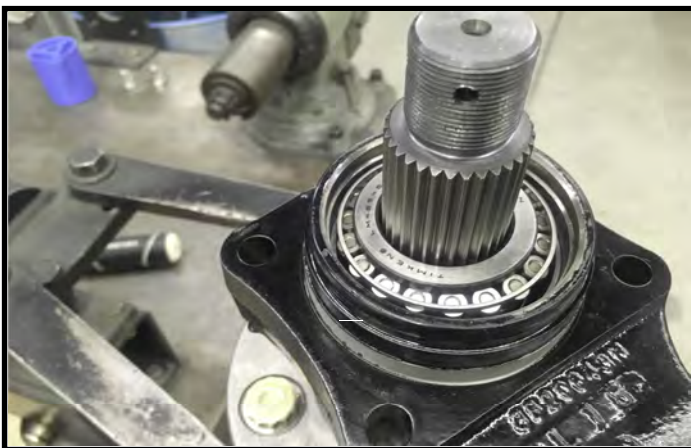
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1) The bearing is pressed on the axles without the seals. The seals will be installed later.



2) The axle with the studs, bearing, and preload spacer is placed in a work holding Bench Mule. This tool allows you to hold the axle when torquing the assembly.



3) Install the carrier with both races over the axle. Seals are not used during the pre-assembly and preload setting. Place the outer bearing over the spline. The bearing has a light press fit, and it may be required to press the bearing against the preload spacer.



4) The yoke (2) is placed on the axle, then the washer (9) with radius edge against the yoke, and the red painted flange nut. The castle nut is used when setting preload. Note: The cotter pin hole is now used in axles produced after December 2024 Axle P/N 50235 revision "C". The flange locking nut with locktite and the cotter key is the retaining method.



5) Torque the flange nut to 240 ft lbs. Tightening this nut will draw the outer bearing cone to the solid preload spacer.

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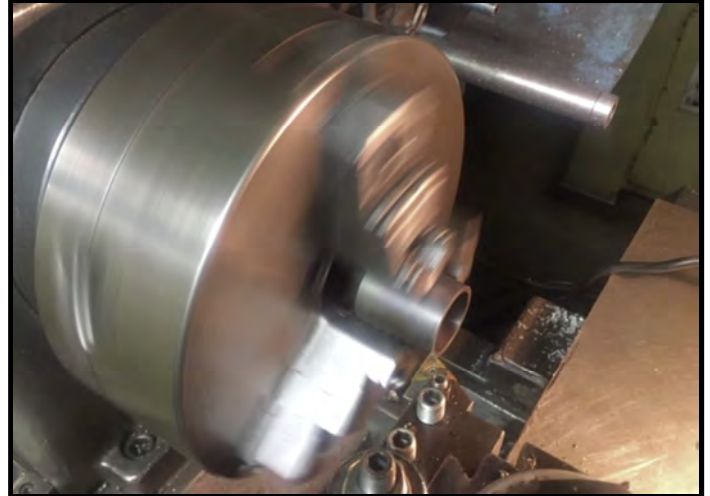
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6) A dial indicator is clamped to the housing and the amount of axial movement is noted. The spacer is trimmed by the indicator movement plus a certain amount for bearing preload.



7) The preload spacer is trimmed to the indicator movement plus several thousandths for the preload. The trial set up in these instructions required .005" additional to make the preload five inch-pounds of torque.



8) A lathe or surface grinding can do the trimming. The surface grinding method is more accurate and assures both ends are parallel.



9) The preload is checked with an indicating torque wrench. The torque drag for tapered bearings of this size is 5 inch pounds. After verifying the acceptable preload, re-assemble with the greased bearings and the seals installed.



10) The red seal is pressed in the seal adaptor. Make sure the seal is bottomed against the shoulder. The seal might be pre-installed in the adaptor from the factory.

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11) The flange (spindle) bearing is removed to install the seal.



12) Bearings are greased with a bearing greaser cup tool



13) The pre-lubed outer bearing is placed in the carrier. The outer seal is pressed in carrier.



14) The lubed inboard bearing and preload spacer is placed into the carrier. The red seal with the adaptor-ring is pressed in the carrier.



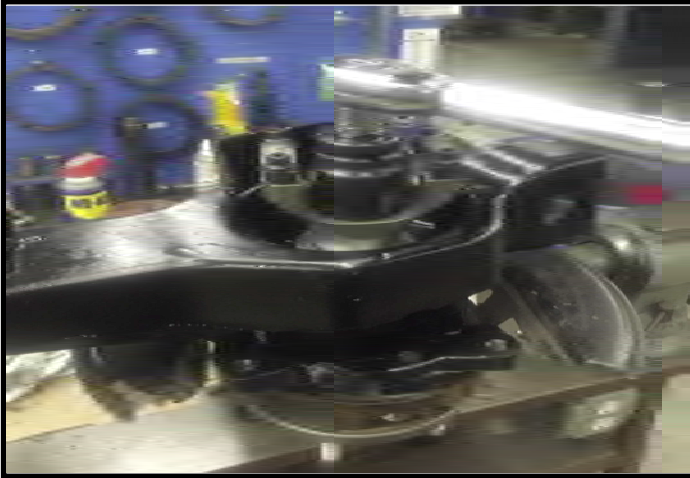
15) The carrier with the caliper mount, backing plate, and trailing arm bolted together is pushed onto the axle. This requires a press because of the bearing's interference fit. With this method, a tubular spacer that clears the spline is used to press against the inboard bearing cone.

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15) The assembly is torqued with a castelated nut to 240 foot-pounds. We recomend using Loctite retaining compound in addition to the cotter key in the nut. A 5 ml of #2701 is included in the kit. Make sure the wheel stud bolts clear the parking brake mechanism (if you have one). The drag with the new seals will be much greater than the initial preload settings.

This is the assembly method that was used in our plant. We realize that the methods will vary depending on the assembler's tools and preferred methods. If there are any questions do not hesitate to call for additional information. 1-800-525-1963.



50230 Kit for (one side)

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CORVETTE RACING QUALITY COMPONENTS

ADDITIONAL PARTS FOR IMPROVING THE CORVETTE RELIABILITY



50230-KIT • C2-C3 Corvette Next-Step Rear Axle-Yoke Assembly • Replaces the weak 17-spline axles with 31-spline, and a one-piece u-Joint flange yoke.



50245-KIT • C2-C3 Rear Inner Yoke Shafts (2) • 30 Spline. Uses 12-Bolt car axle side gear to increase strength, and replaces the bolt on u-joint flange. This is the solution for the failure prone 17-spline OEM flange yokes.



50248-KIT • C2-C3 Rear Inner Yoke Shafts for modified C2-C3 Differentials for rears that have the Tom's Gears modified 12 bolt carrier and special ring and pinion gears.



ACG-020



ACG-012

ACG-020 & ACG-012 • C2-C3 Corvette Front Upper and lower Lower Control Pivot Shaft • Heat-treated and shot peened alloy steel.

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CORVETTE RACING QUALITY COMPONENT



58922 30 SPLINE BILLET SPIDER KIT
SF-58922 Shot Peened and Polished
Used in ACG-030 Case



50247 MACHINABLE C-CLIP



58919 PINION NUT & WASHER



58914 PINION SOLID PRELOAD SPACER



S98-001 PRELOAD SPACER FRONT HUB
C 2 and C3 Spindle

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CORVETTE RACING QUALITY COMPONENT



ACG-030 • C2-C3 Replacement Case for the Eaton™ 19670 Positraction • The is Case produced from thru-hardened alloy steel that solves the problem with cracked and failed cases while increasing gear life. It use 12 Bolt GM axle side and pinion gears for the 30 spline inner shafts. Internal parts not included.



58100 • C2-C3 Steel Main Cap Replacement for Cast Iron Cap.



**39038 • C2-C3 Pinon Yoke
1350 Seies u-joint upgrade.**



**ACG-030-3Cross Pin for C2-C3 M/W Case
Uses 12 Bolt Spiders
.809 Dia.**



**39810 AXLE DRIVE SHAFT 4130
TUBE AND END FITTINGS SPICER
JOINTS (PAIR)**



50225-KIT • C4 '88-'96 Corvette Rear Hub and Yoke Shaft Kit • Features new Timken™ hubs with a larger 32-spline and matching 300M Yoke with Billet Caps.



**50210 • C5 Corvette 300M Intermediate
Shaft • Replaces GM part number
88893900.**



**50220 • C5 Corvette CV Shaft • 300M
steel replaces GM part number
10311201.**

For more information on these parts go to www.markwilliams.com/corvette-parts.html