INSTALLATION GUIDE

CHRIS ALSTON'S Chassisworks
THE HOME OF HIGHER TECHNOLOGY

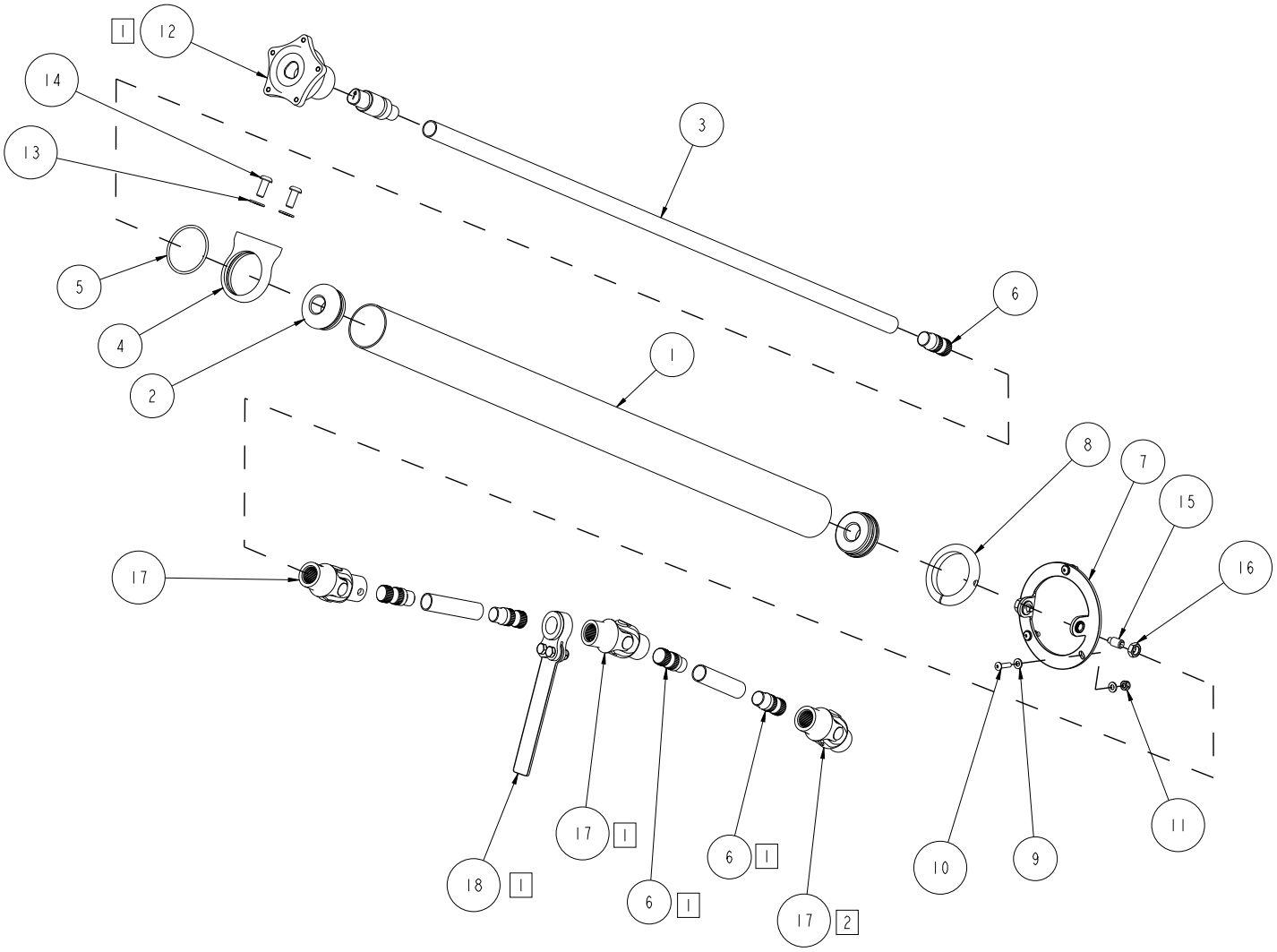
6135

STAINLESS DRAG-RACE STEERING COLUMN

Description: STEERING COLUMN 2” STAINLESS TUBE x 34” LONG, DUAL 3/4-36 SPLINE 3/4 x 48” TUBULAR COLUMN SHAFTS, BILLET MOUNTS, DUAL ALUMINUM U-JOINTS & QUICK RELEASE HUB

1	PART IS OPTIONAL
2	THIS U-JOINT VARIES BASED ON APPLICATION

ITEM	QTY	PART NO.	DESCRIPTION
1	1	S32.065-34.000	CUT TUBE, 304 STAINLESS, ∅2 x .065 WALL x 34 LONG
2	2	3161-2460-28	BEARING, STEERING COLUMN, ∅2 x .065 WALL TUBE
3	2	A12.049-048.000	CUT TUBE, ∅3/4 x .049 WALL 4130, 48 LONG
4	1	1415	COLUMN MOUNT, 2"
5	1	3116-2.000-10B	O-RING, #136, 2 ID x 2 3/16 OD x 3/32 WIDE, BUNA-N, 70 DUROMETER
6	5	1159	TUBE ADAPTER 3/4-36 SPLINE x .647
7	1	7900-139	FIREWALL BRACKET, COLUMN SUPPORT
8	1	7900-164	CLAMP, ∅2 COLUMN
9	6	3157-019S-S	WASHER, #10 SAE, STAINLESS, 7/32 ID x .7/16 OD x 3/64 THICK
10	3	3104-019F0.75S	BUTTON HEAD SOCKET CAP SCREW 10-32 x 3/4, STAINLESS STEEL
11	3	3101-019-32C	LOCKNUT 10-32, GRADE 5, NYLON INSERT, CLEAR ZINC
12	1	6163	Q/R COLLAR HUB GRANT GT 5 HOLE 2.84 BOLT CIRCLE
13	2	3157-031S-C	WASHER, 5/16 SAE, ZINC PLATED, 11/32 ID x 7/8 OD x 1/16 THICK
14	2	3104-031C0.75C	BUTTON HEAD SOCKET CAP SCREW, 5/16-18 x 3/4, CLEAR ZINC
15	2	3106-38FD0.75B	SET SCREW, FULL DOG 3/8-24 x 3/4, SOCKET
16	2	3102-038-24RC	JAM NUT, 3/8-24 RIGHT, CLEAR ZINC
17	3	3128-ALS-3434	U-JOINT, 3/4-36 x 3/4-36 SERRATION, ALUMINUM
18	1	6160	STEERING SHAFT AUXILIARY BUSHING ASSEMBLY



DESCRIPTION

STEERING COLUMN, 2" TUBE, 3/4-36 SPLINE U-JOINTS

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PART NO. 6135

2/12/09 | DWG: 916135

PARTS LIST

300-3101 - Steering Column Kit

QTY	PART	DESCRIPTION
2	A12-049-048.000	Tube 3/4 x .049 x 48” long, 4130
1	S32-065-034.000	Tube 2 x .065 x 34” long, stainless steel

906135.12 - Hardware Bag 1 of 2

QTY	PART	DESCRIPTION
1	1415	Column mount 2” diameter
1	3128-ALS-3434	U-joint 3/4-36 x 3/4-36, aluminum, 42° misalignment
1	7900-139	Lower column support
1	7900-164	Collar clamp, 2” diameter

906135.22 - Hardware Bag 2 of 2

QTY	PART	DESCRIPTION
3	1159	Tube adapter 3/4-36 x .647”
3	3101-019-32C	Locknut 10-32 nylon insert
2	3102-038-24RC	Jam nut 3/8-24 right hand thread
3	3104-019F0.75S	Button head 10-32 x 3/4” cap screw
2	3104-031C0.75C	Button head 5/16-18 x 3/4” cap screw
2	3106-38FD0.75B	Set screw 3/8-24 x .750 long
1	3116-2.000-10B	O-ring 2.0 ID x 2-3/16 OD x .103”
6	3157-019S-S	Washer #10 stainless
2	3157-031S-C	Washer 5/16” SAE
2	3161-2460-28	Bearing 2 x .065 x .75” bore

OPTION - Quick Release Hub (includes one)

QTY	PART	DESCRIPTION
1	6162	Standard 3-hole quick release steering hub
1	6163	Grant GT 5-hole quick release steering hub
1	6168	Blank (no holes) quick release steering hub

OPTION - Universal Joint

QTY	PART	DESCRIPTION
1	3128-ALS-0934	U-joint 9/16-26 x 3/4-36, aluminum, 42° misalignment
1	3128-ALS-3434	U-joint 3/4-36 x 3/4-36, aluminum (billet manual rack), 42° misalignment

OPTION - Additional Support

QTY	PART	DESCRIPTION
2	1159	Tube adapter 3/4-36 x .647”
1	3128-ALS-3434	U-joint 3/4-36 x 3/4-36, aluminum, 42° misalignment
1	6160	Auxillary bushing assembly, 3/4” OD shaft

INSTRUCTIONS

When installing the steering column, it is important to position the steering wheel where it is comfortable for the driver. You should use the actual steering wheel being installed when positioning the column.

Installation begins by roughly positioning the components to determine placement of the upper and lower column mounts, to correctly trim the column tube if desired, and to measure and cut the steering-shaft tubes. After all components have been measured, cut, verified for correct fit, the tube adapters can welded and final assembly and installation can be completed.

Center the Steering Rack or Box

1. Turn the input shaft of the rack or steering box all the way one direction until it stops.
2. Turn it in the opposite direction, counting the number of turns until the rack or box stops again.
3. Divide the number of turns by two and turn the steering rack or bax back that umber of turns. It will now be centered. Example: If it is 4-1/2 turns lock to lock, it would be 2-1/4 turns to the center of travel.

Install Steering Hub Adapter

4. Drill three evenly spaced 3/16”-diameter holes, 3/8” from the end in one of the 3/4” steering shaft tubes.
5. Insert the steering shaft-to-hub tube adapter (packaged with the quick release hub) into the steering shaft and plug weld through the drilled holes to form rosette welds.
6. TIG weld the tube-to-hub adapter joint completely around the circumference of the tube. Set the welded assembly aside to completely cool before attaching the quick release hub.
7. Carefully file the welds smooth with the outside of the tube so the 3/4” tube will rotate freely inside the column bearing.

Place Mounts Over Column Tube

8. Check the threads in the upper and lower column support brackets. Chase threads with tap if needed. The upper billet mount is 5/16-18, and the lower steel mount is 3/8-24.
9. Slide the upper column mount over the end of the stainless column tube. DO NOT install the o-ring into the column mount at this time.
10. Slide the 2” diameter collar clamp over the opposite end of the column tube.
11. Thread the 3/8” set screws into the lower-column-support threaded inserts.
12. With the bent tabs pointing toward the upper column mount, slide the lower firewall support over the column clamp, aligning the set screws with the holes in the clamp. Hand tighten the set screws evenly, just enough to hold the lower mount in place and still allow the assembly to be slid along the column tube.

Temporarily Install the Column Bearings and Upper Shaft

At this time the column bearings are just being used to center the steering shaft while the entire column assembly is mocked-up for fitting and trimming.

13. Press the upper bearing into the column tube until it is completely seated.
14. Insert the open end of the welded steering shaft through the upper column bearing and out the opposite end of the column tube.
15. Place the lower bearing over the steering shaft and into the column tube, but DO NOT press the bearing all the way into the tube. The lower bearing needs to engage the column tube just enough to stay in position while working with the column. One-eighth to one-quarter inch of engagement is sufficient, and allows both bearings to be easily removed in a later step.
16. Attach the steering wheel to the quick release hub and then install onto the hub adapter. Slide the steering shaft into the column tube until there is approximately 1/2” of clearance between the rosette welds and the column bearing. The clearance distance can be increased if needed, but a position closer to the bearing will provide the greatest amount of support.

Determine Column Position Using Driver

17. Place the column into the vehicle to estimate its mounting position. The lower end of the column may have to extend through the firewall.
18. Have the driver seated in the car and holding the steering wheel in a comfortable driving position. Simulate driving by turning the wheel to ensure the position is correct for a range of driving motions. Wheel height, fore/aft position, and column angle should be matched to the driver's requirements.
19. The column tube may need to be shortened once the steering wheel is correctly positioned for the driver.
20. Use string to hang the steering wheel from the vehicle roll cage or dash at the correct position so that mounting methods and steering-column and -shaft lengths can be figured out.

Upper Column Mounting Bracket

21. The upper column mount can be slid along the column tube to align with the dashboard or dash support tube. Spacers or an additional bracket may be needed to securely mount the bracket at the correct height. The upper mount holes are 5/16" and spaced 1-3/4" apart, center to center.
22. Once the mounting method has been mocked up and temporarily secured using the 5/16-18 x 3/4" button heads and flat washers we can move on to the lower mount.

Lower Column Firewall Mounting Bracket

23. The lower column mount pivots and can be slid along the column tube to meet the firewall. With the pivot axis is horizontal to the ground the single centered hole must be at the top and the two holes at the bottom as shown in the assembly diagram.
24. Use a center punch to clearly mark each of the holes in the firewall bracket onto the firewall.
25. Verify that the opposite side of the firewall is clear before drilling through the firewall with a 3/16" drill bit.
26. Temporarily secure the lower column mount to the firewall using one or two of the 10-32 button-head cap screws, flat washers, and locknuts.

Column Tube Length Guidelines

At a minimum, the column tube must be long enough to extend through the lower collar-clamp mount. The lower end of the column tube can extend past the firewall, but be aware that the column tube and lower column bearing should be kept a safe distance from moving parts and heat sources such as the exhaust headers. If desired, the column tube can also be shortened AFTER the lower steering shaft length has been determined.

Lower Steering Shaft Length Guidelines

Ideally, the lower steering shaft length should be as long as possible to keep the steering shaft linkage close to a straight line and minimize u-joint angles. However, due to clearance issues with vehicle components, such as exhaust headers, some installations will require a shorter lower shaft to "jog" the linkage around clearance issues. If shortening the lower shaft to move the upper u-joint further from the firewall does not provide adequate clearance, a third u-joint can be used, but also requires an additional shaft support. The third u-joint and support bracket with bearing is available as an option with this column kit.

Fit the Lower Steering Shaft

27. Place the lower u-joint over the rack-and-pinion shaft and secure with the set screw. Make sure the set screw is seated properly against the flat or in the groove depending upon what type of rack you are using.
28. Place a splined tube adapter (#6) into the other end of the lower u-joint and secure it with the set screw. The set screw must seat in the tube-adapter's groove.
29. Insert the remaining two splined tube adapters into the second u-joint and secure with the set screws.
30. Place the lower steering shaft over the tube adapter at the lower u-joint and point it toward the upper (firewall) u-joint. The shaft may need to be cut to a length that allows it to be more easily worked with before cutting to the final length.

31. Once the lower shaft is angled so that it clears everything and will meet with the upper shaft, mark the lower shaft where it meets the shoulder of the tube adapter at the upper u-joint.
32. Remove the lower shaft and cut to length before putting back into position.

If the lower shaft cannot be angled to clear vehicle components and meet with the upper shaft a third u-joint and shaft support is required.

Optional - Third U-Joint and Shaft Support

The addition of a third u-joint now allows the lower shaft to be angled along a plane different from the upper steering shaft. The additional steering shaft support bearing should be positioned just above or below the third or center u-joint without being too close to heat sources or moving parts. The metal support bracket must be welded or bolted to the chassis and can be bent if needed.

33. Place the tube adapters into the third u-joint and secure with the set screws.
34. Place the lower steering shaft over the tube adapter at the lower u-joint and angle it for proper clearance. Both shafts may need to be cut to lengths that allow them to be more easily worked with before cutting to their final lengths.
35. Once both shafts can be angled to clear everything and meet with the upper shaft, mark them where they meet the shoulders of the tube adapters at each u-joint.
36. Remove the shafts and cut to length before putting back into position.

Trim the Upper Steering Shaft

37. With both tube adapters installed, place the upper u-joint onto the open end of the lower steering shaft.
38. Mark the upper steering shaft where it meets the shoulder of the tube adapter at the upper u-joint.
39. Remove the column tube assembly from the vehicle and cut the steering shaft to the mark before putting the column back into position.
40. Insert the upper tube adapter into the end of the steering shaft and verify that all lengths are correct before proceeding.

Check for Binding

41. Remove the steering shafts from the vehicle.
42. Make a small tack weld at each adapter to the steering shaft joint. Place the tack weld <u>at the adapter to tube joint</u>, NOT AT THE DRILLED HOLE. The tube adapter must be removed if the tube has to be shortened.
43. Once tacked together reassemble the steering linkage.
44. Turn the steering wheel to full lock in both directions to check for binding. If it binds check the u-joint angles, steering shaft lengths, and support bearing placement, if equipped.

Steering Shaft Welding

45. Once all the shafts have been cut to length and verified for correct fit, remove all steering column components, including the mounts, from the vehicle and disassemble the column tube and bearings.

46. Drill three 3/16”-diameter holes, 3/8” from the ends of each 3/4” steering shaft tube.
47. Remove the tube adapter from the u-joints and insert them into the steering shafts.
48. The u-joints must be correctly phased/indexed against one another as shown.
49. Phasing the u-joints is most easily done by installing the u-joints onto the tube adapters, inserting the adapters into the steering shaft, and placing the u-joints against a flat working surface.
50. Rotate the u-joints until both are settled against the work surface and are clocked at the same position.
51. Plug weld through the drilled holes to form rosette welds.

52. TIG weld the tube adapters to the steering shafts around the circumference of the tube and allow to completely cool.
53. Carefully file the plug welds and tube-to-adapter joint weld on the column steering shaft. This is to allow the shaft to be inserted through the column bearings.

Final Assembly

54. With the column mount removed from the dash, complete any fabrication required to finish the mounting base for the upper column mount.
55. Apply a small amount of grease onto the o-ring and insert into the groove inside the upper column mount.
56. Place the upper and lower mounts back onto the column tube prior to installing the column end bushings.
57. The column bushings are held inside the column tube by silicone sealant. Thoroughly clean the inside wall of the column tube (a minimum of two inches into the tube) using denatured alcohol or similar solvent to remove any oily residue that may prevent the silicone from bonding to the steel.
58. Apply a bead of silicone sealant onto the bushing to completely fill the 1/8”-wide groove in each bushing.
59. Press a bushing into each end of the column tube and wipe away any excess silicone.
60. Insert the upper steering shaft into the column tube and through the lower column bearing. Support the lower bearing while inserting the steering shaft to prevent the bushing from being forced out of the column tube.
61. Position the column inside the vehicle and secure the lower mount to the firewall using the button-head fasteners, flat washers, and locknuts.
62. Raise the upper end of the column into position and secure the upper mount to the dash.
63. Reassemble the steering shaft linkage starting at the rack and pinion. The column can be slid up or down through the mounts to fit the last steering shaft as long as the two lower collar set screws are loose.
64. Tighten all the set screws in the u-joints.
65. Turn the steering wheel to full lock in both directions to check for binding. If it binds check the u-joint angles, steering shaft lengths, and support bearing placement, if equipped. Make corrections if needed.
66. Once the steering wheel moves freely, the lower column mount set screws can be tightened.
67. Apply a small amount of 277 Loctite™ on the set screw and jam nuts threads before tightening.

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