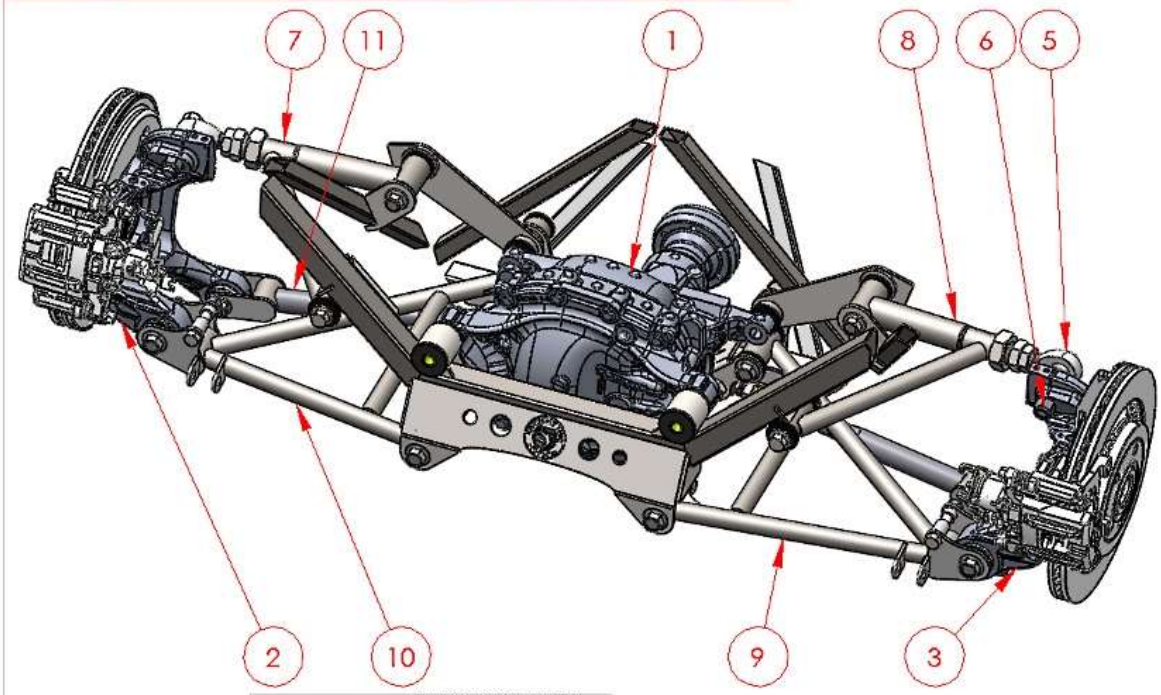
Controlled Documentation

Part Number: 33658	*Revision:* A	*Effective Date:* 8/3/15	*By:* J. INGERSLEV

IRS

INSTALLATION INSTRUCTIONS

ITEM NO.	PART NUMBER	DESCRIPTION	Roadster/QTY.
1	CENTER SECTION		1
2	LEFT SIDE SPINDLE		1
3	RIGHT SIDE SPINDLE		1
4	15857	ANGLED MOUNT ADAPTER	2
5	HBOLT 0.6250-18x3.5x1.5-N		2
6	NLN-625C	NYLON INSERT LOCKNUT	2
7	16078	IRS LEFT UPPER CONTROL ARM	1
8	15898	IRS RIGHT UPPER CONTROL ARM	1
9	15911	IRS RIGHT LOWER CONTROL ARM	1
10	15907	IRS LEFT LOWER CONTROL ARM	1
11	15902	IRS TOE ADJUSTMENT ARM COMPONENTS	2



DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION ROADSTER/COUPE
PRINTED 8/4/2015

Factory Five Racing, Inc.

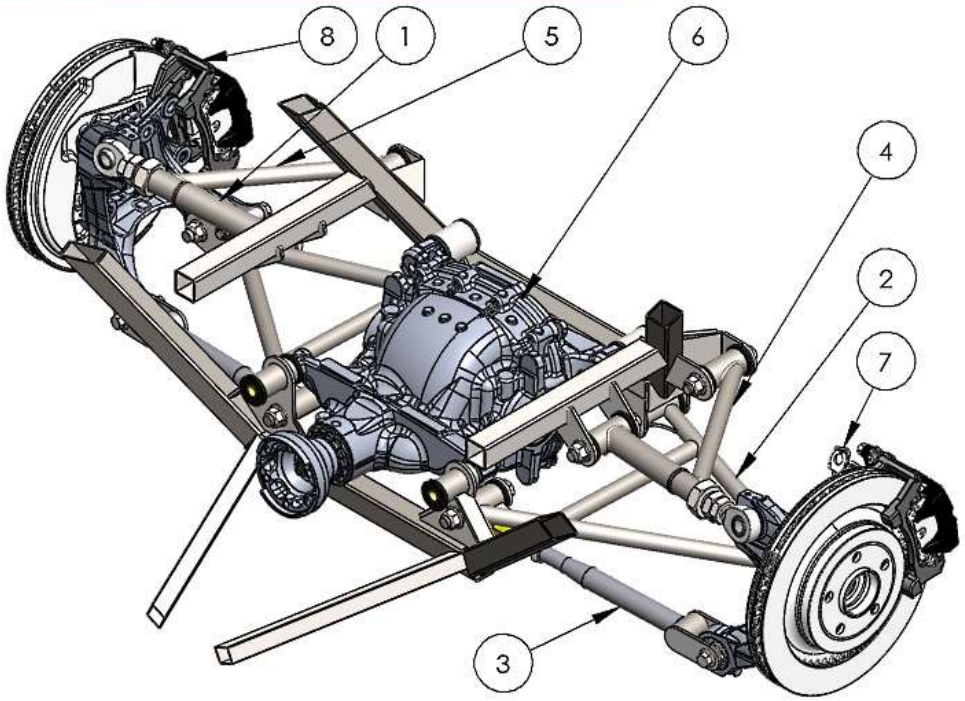
ROADSTER/COUPE IRS COMPONENTS

	NAME	DATE
DRAWN	JI	3/23/15
COMMENTS		

SIZE A | DWG. NO. IRS Assembly | REV. A
SCALE:1:9 | WEIGHT:

Roadster/Coupe

ITEM NO.	PART NUMBER	DESCRIPTION	Hot Rod/QTY.
1	15911	IRS RIGHT LOWER CONTROL ARM	1
2	15906	IRS LWR CNTRL ARM COMP.	1
3	15902	IRS TOE ADJUSTMENT ARM COMPONENTS	2
4	33998	UPPER CONTROL ARM	1
5	34025	34025 - IRS RIGHT UPPER CNTRL ARM	1
6	CENTER SECTION		1
7	LEFT SIDE SPINDLE		1
8	RIGHT SIDE SPINDLE		1



PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FACTORY FIVE RACING, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FACTORY FIVE RACING, INC. IS PROHIBITED.

DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
USED ON
APPLICATION HOT ROD
PRINTED 8/17/2015

	NAME	DATE
DRAWN	JI	3/23/15
CHECKED		
ENG APPR.		
MFG APPR.		
Q.A.		
COMMENTS:		

Factory Five Racing, Inc.

HOT ROD IRS COMPONENTS

SIZE A | DWG. NO. IRS Assembly | REV. A
SCALE:1:8 | WEIGHT: | SHEET 4 OF 4

Hot Rod

Table of Contents

Parts Included in Kit

IRS frame mount (welded to frame)
L&R lower control arms
L&R upper control arms
Toe arms
L&R CV axles
Koni coil-over shocks
Springs
Fasteners
Driveshaft adapter

Parts needed

- 2015 or newer Ford Mustang IRS parts
  Super 8.8” center section

  L&R spindles

  L&R brake parts

Mustang IRS Specifications

	2.3L Ecoboost	3.7L V6	5.0L Coyote
Housing	Steel	Aluminum	Steel
Weight	93lb	78lb	93lb
Gear Ratios	3.15:1, 3.31:1, 3.55:1	3.15:1, 3.55:1	3.15:1, 3.55:1
Brakes	12.6" (320mm) Solid rotor, 45mm single piston aluminum caliper	12.6" (320mm) Solid rotor, 45mm single piston aluminum caliper	13.0" (330mm)Vented rotor, 45mm single piston iron caliper

Tools required

Philips head screwdriver
5/8" Drill bit
13/16", 15/16" wrenches
13/16", 15/16" 18mm Sockets
Large adjustable wrench – up to 1 5/8"
1/8" Hex Key
Marker
Ruler
Hacksaw
Drill
Plastic mallet
Hammer
Torque wrench

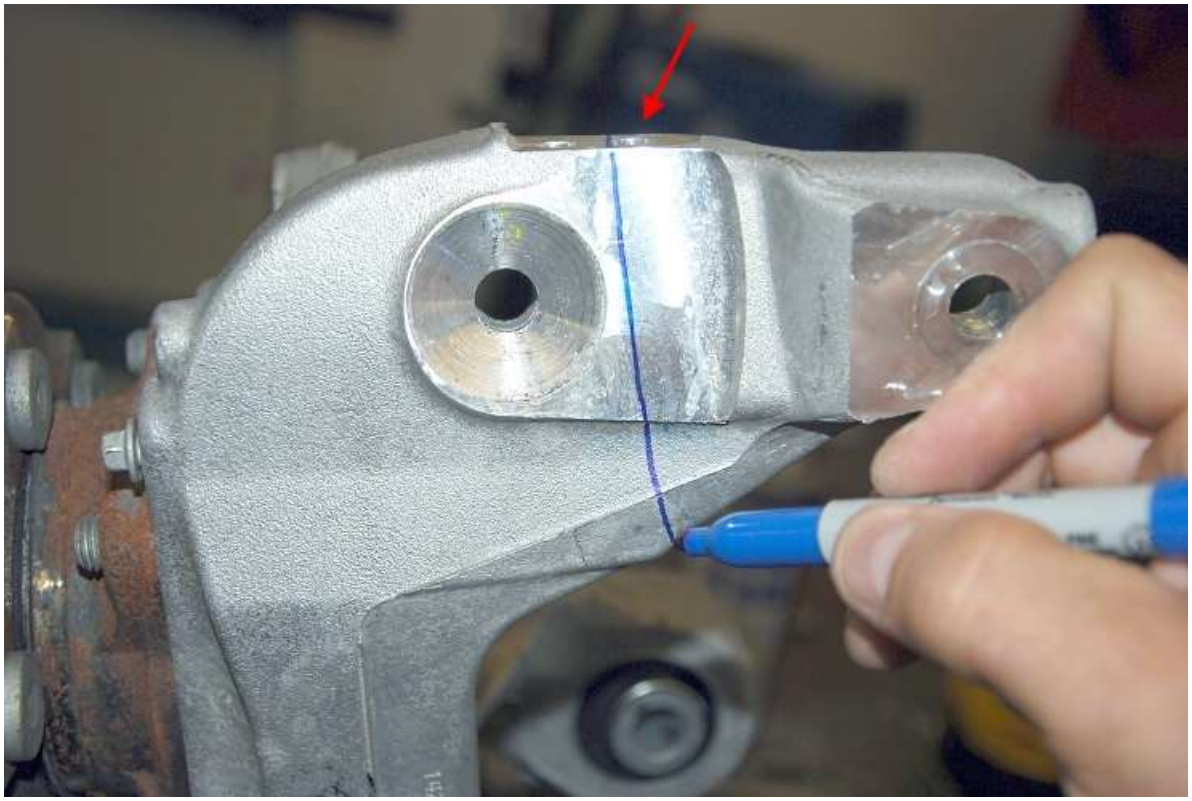
Parts preparation

Spindles

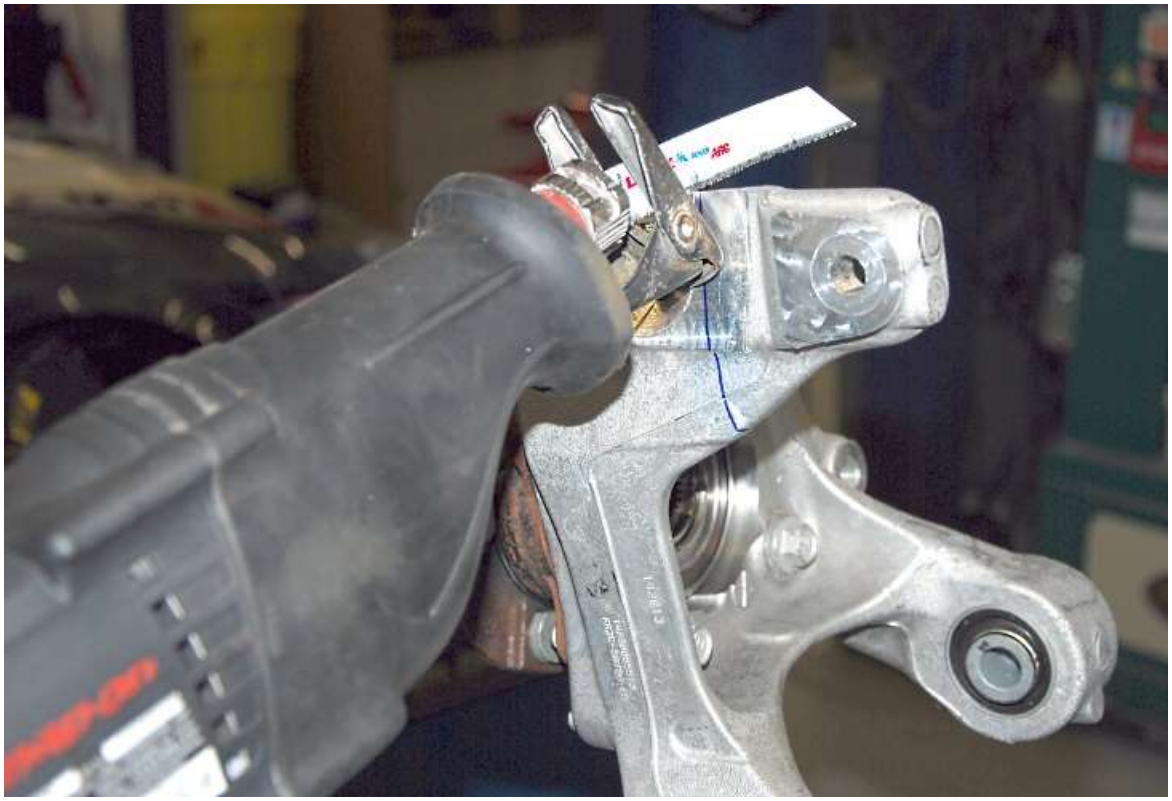
🛠 5/8" drill bit, drill, saw, marker

Remove the brake calipers from the spindle if they are mounted. They will be reinstalled after the spindle is put on the car.

Use a 5/8" drill bit to drill out the tapered hole at the top of the spindle.



Mark the spindle starting at the top just to the inside of the top inside hole down to the corner of the small boss at the bottom of the ear.

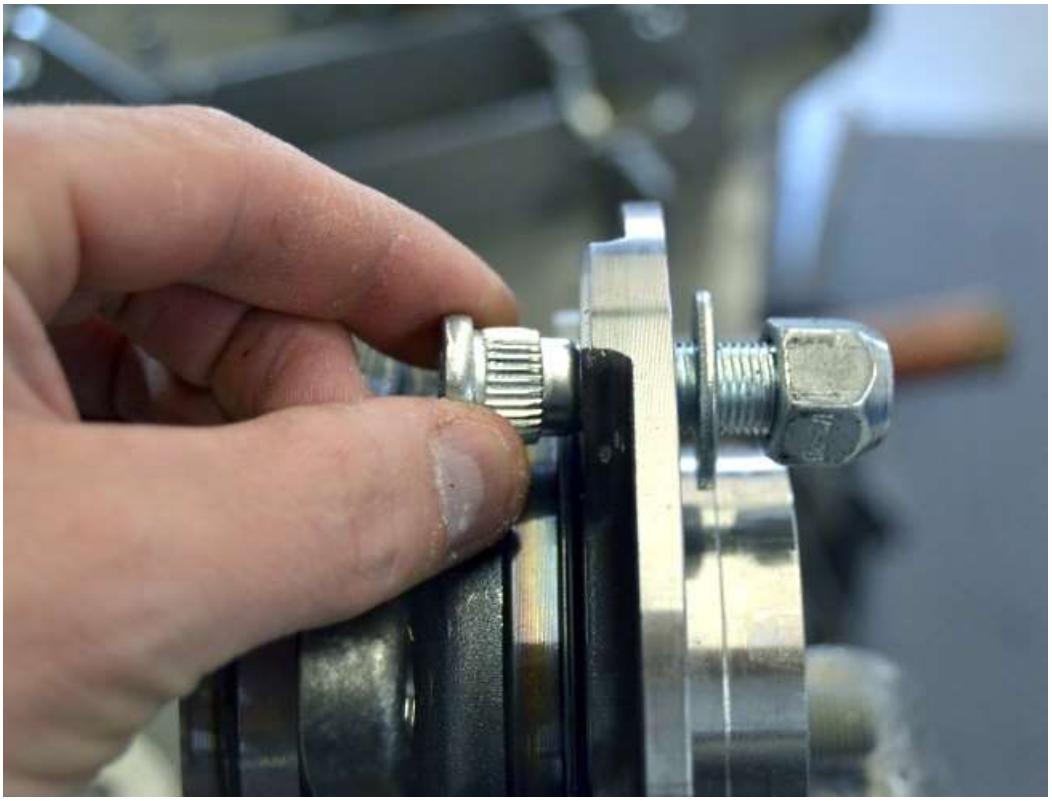


Use a saw to cut the ear off the spindle. If using a Sawzall or similar, use a wood blade; a 14tpi blade or finer will just get gummed up with the aluminum.

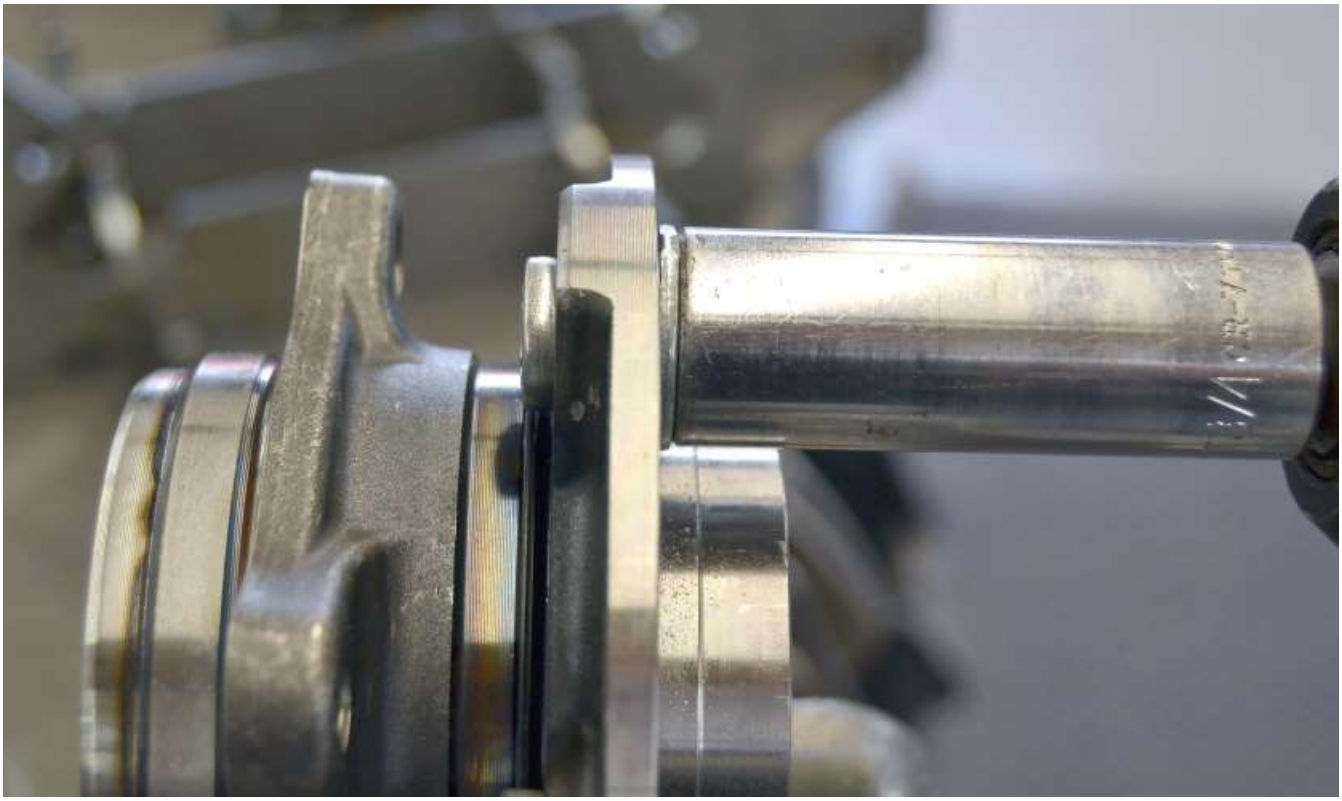
Hubs

🛠 Hammer, vise, ratchet, ½”-20 lugnut, torque wrench.
🚘 Rear wheel studs.
✋ Removal of the hub from the spindle is not necessary but can make things easier.

Use a vise to lightly hold the side of the wheel stud head then use a hammer to bang out the Mustang studs. Repeat for all of the studs.



Insert one of the included wheel studs into the hub from the back and use a washer and lug nut on the front side.



Use a ratchet to draw the wheel stud into the hub and torque the stud to **135Nm (100lb-ft)**.

Repeat for the other wheel studs.

If the Hub was removed, use Loctite on the threads and reattach to the spindle.

Torque the bolts to **133Nm (98ft-lb)**.

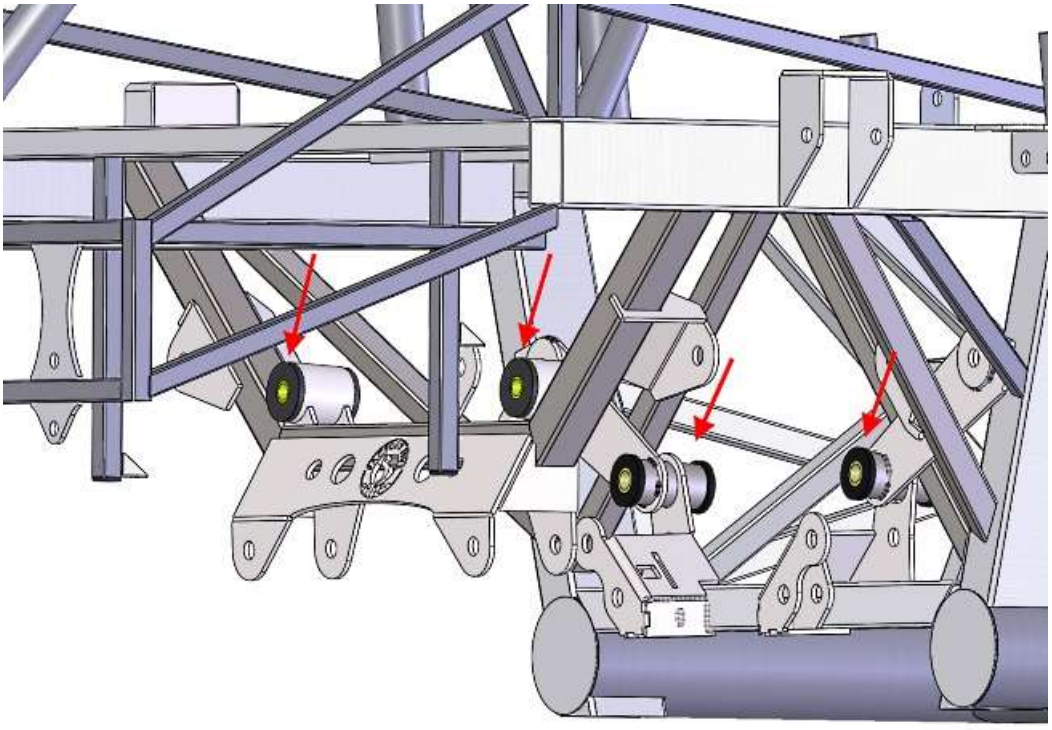
Center section

🛠 $^5/_8$” drill bit, drill.

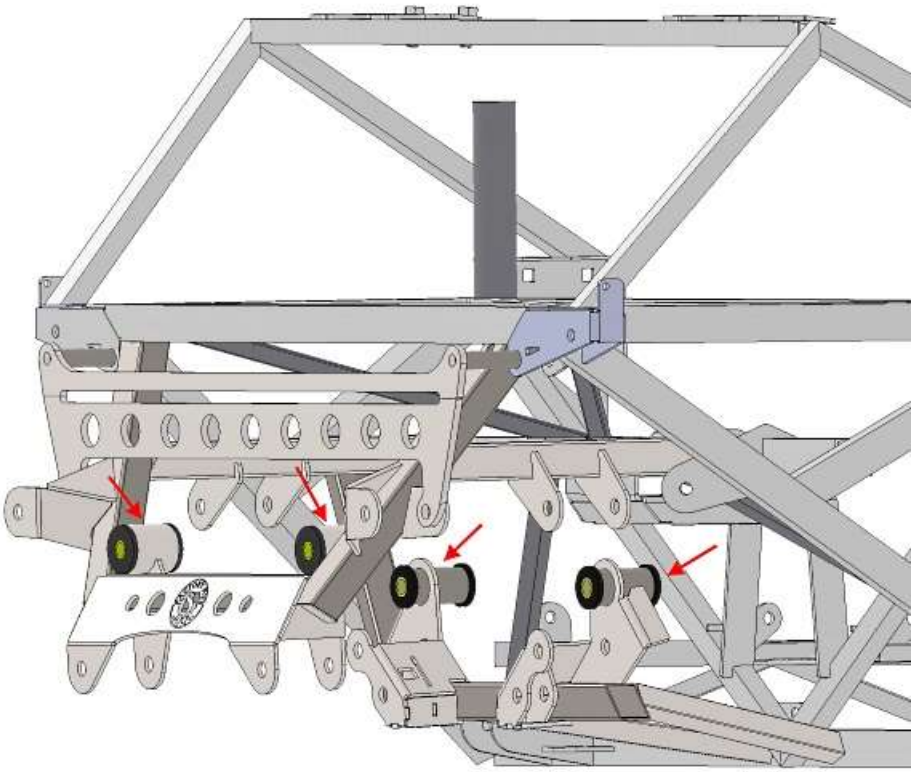
Use a $^5/_8$” drill bit to chase the front mount holes on the center section.

Frame

🛠 Rubber/plastic mallet
🚗 Differential mounting components



Roadster/Coupe bushing locations.



Hot Rod bushing locations.

Use a plastic mallet to install the polyurethane bushings marked 2048 and the longer ($3^{1}/_{16}$”) sleeves where the front of the center section will mount.

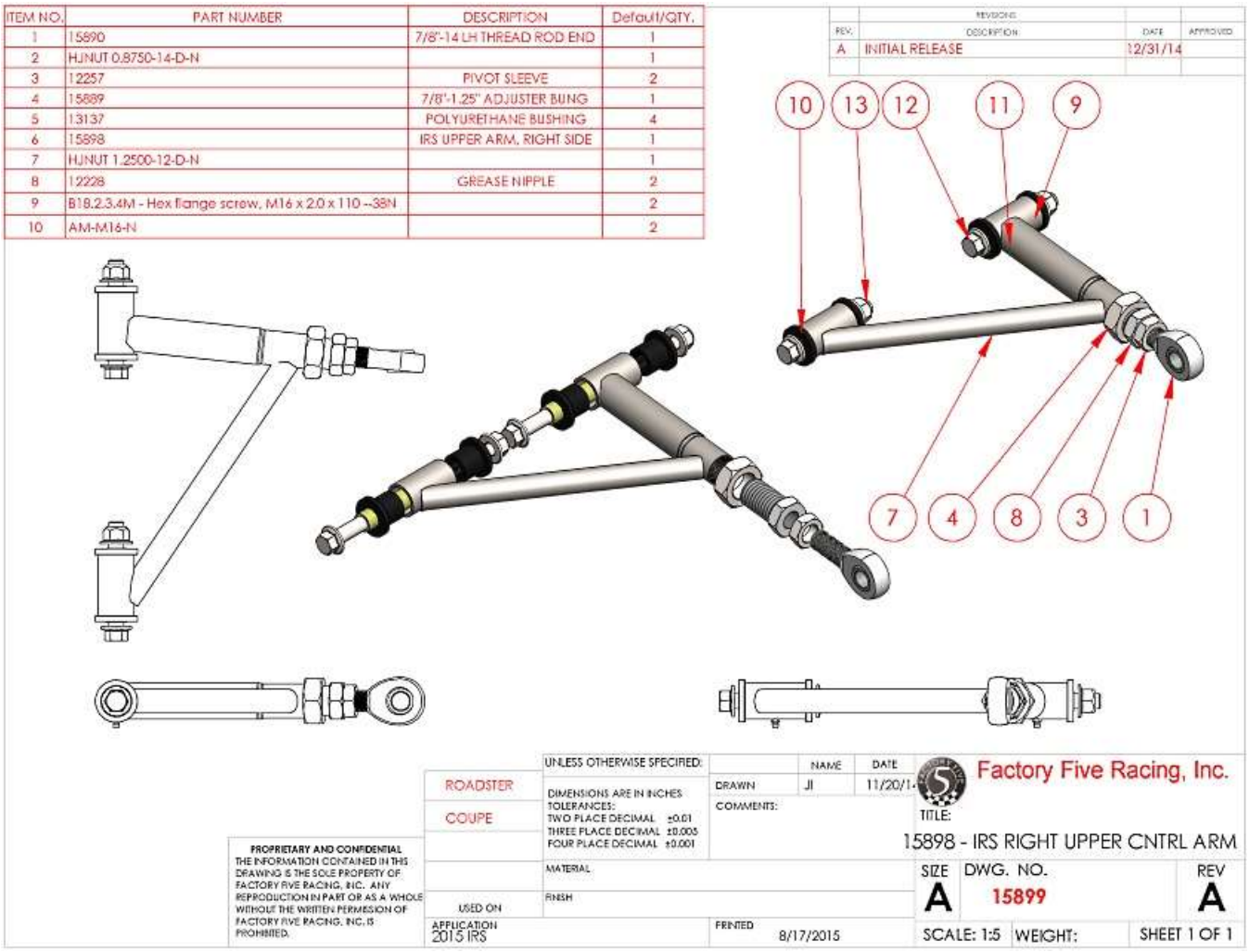
Use a plastic mallet to install the polyurethane bushings marked 2123 and the shorter (2.40”) sleeves where the rear of the center section will mount.

Upper control arms

Upper control arm components
Grease gun

Roadster

ITEM NO.	PART NUMBER	DESCRIPTION	Default/QTY.
1	15890	7/8"-14 LH THREAD ROD END	1
2	HJNUT 0.8750-14-D-N		1
3	12257	PIVOT SLEEVE	2
4	15889	7/8"-1.25" ADJUSTER BUNG	1
5	13137	POLYURETHANE BUSHING	4
6	15898	IRS UPPER ARM, RIGHT SIDE	1
7	HJNUT 1.2500-12-D-N		1
8	12228	GREASE NIPPLE	2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 110 --38N		2
10	AM-M16-N		2



REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	12/31/14	

UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001
MATERIAL
FINISH
NAME DATE
DRAWN JI 11/20/14
COMMENTS:

ROADSTER
COUPE
USED ON
APPLICATION 2015 IRS

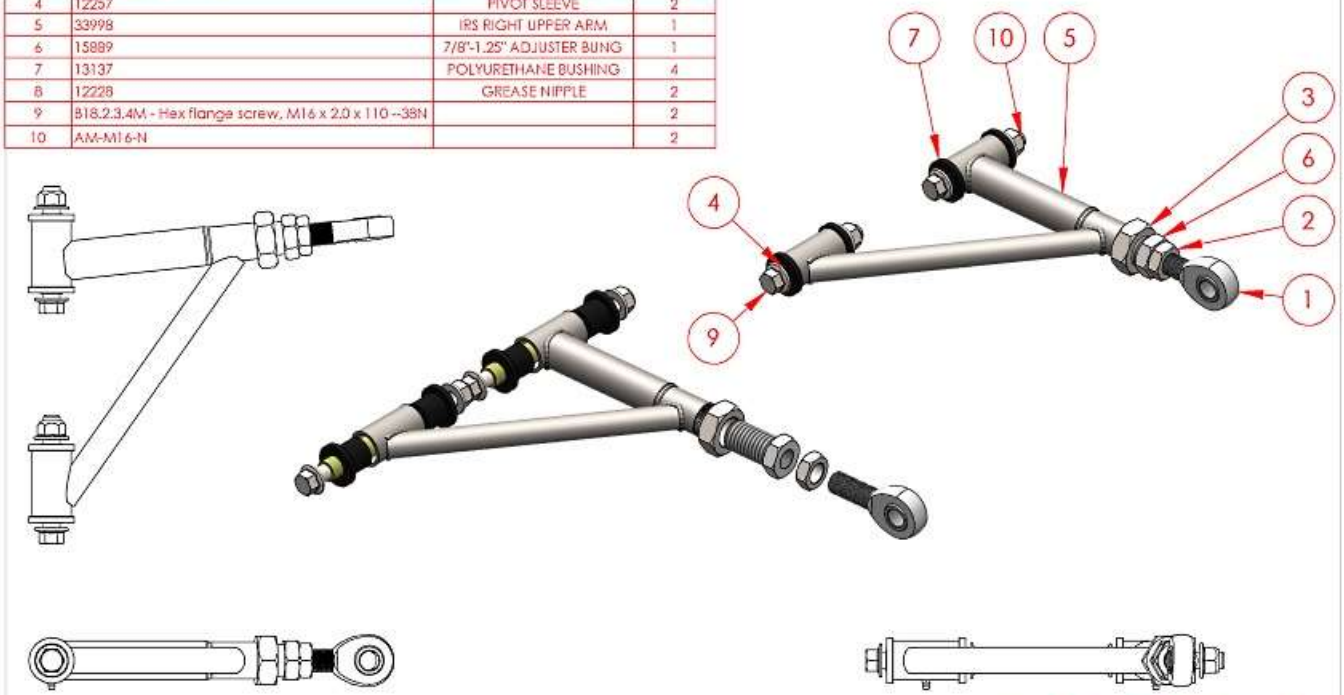
Factory Five Racing, Inc.
TITLE: 15898 - IRS RIGHT UPPER CNTRL ARM
SIZE A | DWG. NO. 15899 | REV A
FRINTED 8/17/2015
SCALE: 1:5 | WEIGHT: | SHEET 1 OF 1

Assemble each of the upper control arms as shown.
Grease the control arms using chassis grease until the grease comes out of the flutes in the bushings next to the pivot sleeves.

Hot Rod

ITEM NO.	PART NUMBER	DESCRIPTION	34025/QTY.
1	15890	7/8"-14 LH THREAD ROD END	1
2	HJNUT 0.8750-14-D-N		1
3	HJNUT 1.2500-12-D-N		1
4	12257	PIVOT SLEEVE	2
5	33998	IRS RIGHT UPPER ARM	1
6	15889	7/8"-1.25" ADJUSTER BUNG	1
7	13137	POLYURETHANE BUSHING	4
8	12228	GREASE NIPPLE	2
9	B18.2.3.4M - Hex flange screw, M16 x 2.0 x 110 --38N		2
10	AM-M16-N		2

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	3/15/15	



HOT ROD	UNLESS OTHERWISE SPECIFIED: DIMENSIONS ARE IN INCHES TOLERANCES: TWO PLACE DECIMAL ±0.01 THREE PLACE DECIMAL ±0.005 FOUR PLACE DECIMAL ±0.001		NAME	DATE
		DRAWN	JI	11/20/14
		COMMENTS:		
	MATERIAL			
USED ON	FINISH			
APPLICATION 2015 IRS		PRINTED	8/17/2015	

PROPRIETARY AND CONFIDENTIAL
THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF FACTORY FIVE RACING, INC. ANY REPRODUCTION IN PART OR AS A WHOLE WITHOUT THE WRITTEN PERMISSION OF FACTORY FIVE RACING, INC. IS PROHIBITED.

Factory Five Racing, Inc.

TITLE: 34025 - IRS RIGHT UPPER CNTRL ARM

SIZE	DWG. NO.	REV
A	33997	A

SCALE: 1:5 | WEIGHT: | SHEET 1 OF 1

Assemble each of the upper control arms as shown.

Grease the control arms using chassis grease until the grease comes out of the flutes in the bushings next to the pivot sleeves.

Lower control arms

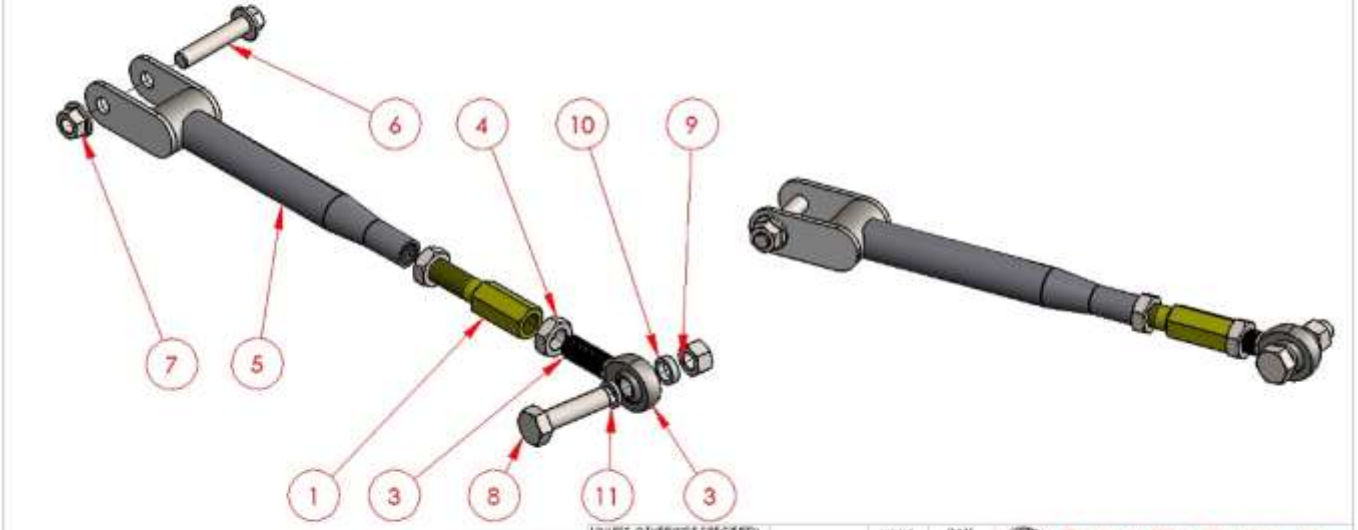
🛠 Grease gun

Grease the control arms using chassis grease until the grease comes out of the flutes in the bushings next to the pivot sleeves.

Toe adjustment arms

ITEM NO.	PART NUMBER	DESCRIPTION	QTY.
1	33366 - LINKAGE ADJUSTER	LINKAGE ADJUSTER	1
2	44757161		1
3	44757161		1
4	HJNUT 0.7500-16-D-N		2
5	15905	IRS TOE ARM	1
6	B18.2.3.4M - Hex flange screw, M14 x 2.0 x 70 --3N		1
7	B18.2.2.4M - Hex flange nut, M14 x 2 --N		1
8	HHBOLT 0.6250-11x2.5x1.25-N		1
9	HNUT 0.6250-11-D-N		1
10	33240	0.25" SPACER	1
11	15908	0.25" SPACER	1

REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	1/23/15	



UNLESS OTHERWISE SPECIFIED:
DIMENSIONS ARE IN INCHES
TOLERANCES:
TWO PLACE DECIMAL ±0.01
THREE PLACE DECIMAL ±0.005
FOUR PLACE DECIMAL ±0.001

	NAME	DATE
DRAWN	JI	1/6/15
COMMENTS		

ROADSTER
COUPE
MATERIAL
FINISH
USED ON
APPLICATION 2015 IRS
PRINTED 8/4/2015

Factory Five Racing, Inc.
TITLE: IRS TOE ADJUSTMENT ARM COMPONENT
SIZE A | DWG. NO. 15902 | REV A
SCALE: 1:4 | WEIGHT: | SHEET 1 OF 1

Assemble each of the toe adjustment arms as shown.

Installation

Center section

- Rubber/plastic mallet, torque wrench, 18mm, $^{13}/_{16}$" sockets, $^{15}/_{16}$" wrench.
- Differential mounting components.
- Roadster is shown but Coupe and Hot Rod installation is similar.
- Use a friend to help with the heavy center section in the next steps.

Use rags to protect between the front center section mount on the frame.

With the help of a friend, lift the center section nose up into the frame and over the front mount.

Flatten the center section out so it is horizontal then back it up so it is above the mount locations and lower it down so the bolts can be installed. The smaller/shorter bolts are used for the rear mounts.

The larger/longer bolts and nuts are used for the front mounts.

Torque both the front and rear bolts to **135Nm (100 ft-lb)**.

Toe Adjustment arms

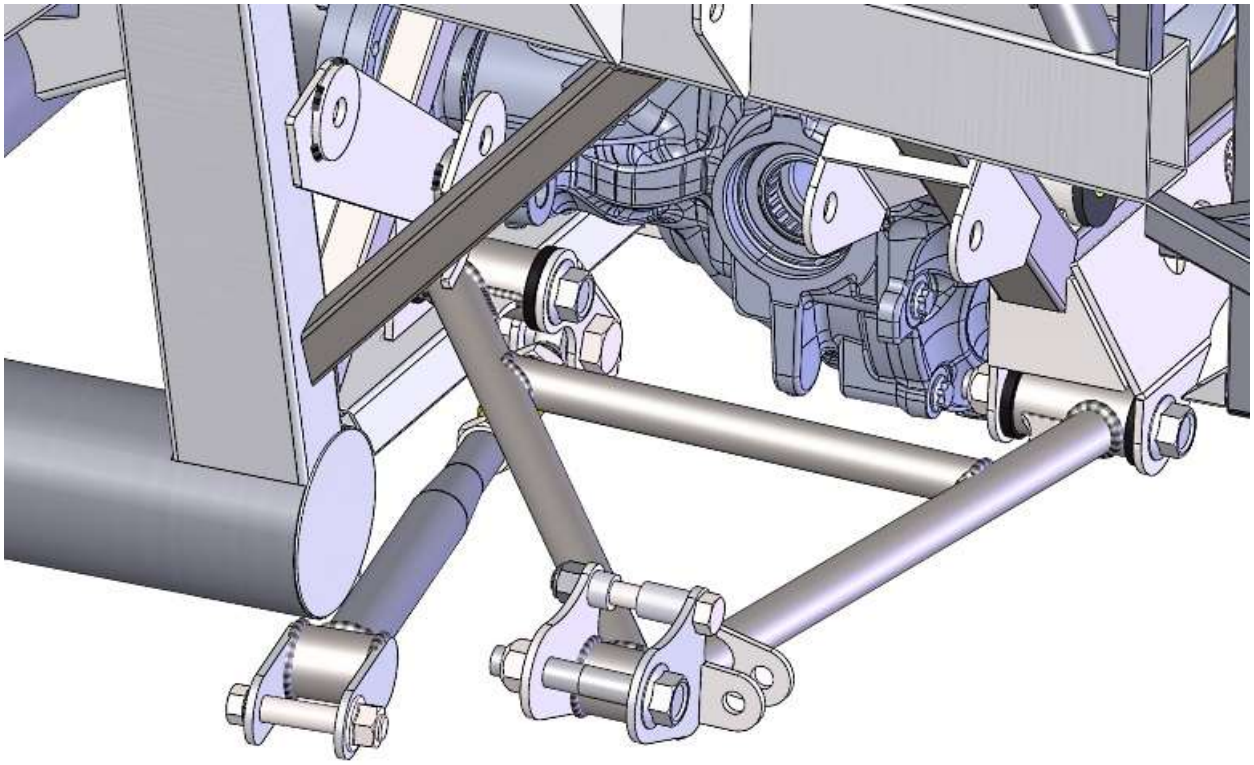
- IRS Toe adjustment arm components
- 13/16" socket, 15/16" wrench, torque wrench.
- For Roadster and Coupe only, if using the sway bar option, pass the bolt through the frame mount bracket when installing the toe arms.
- Swaybars are not available for the Hot Rod.

Attach the toe arms to the frame below the front lower arm mount using the 1/8" thick spacer in the back and the ¼" spacer on the front side of the rod end. Use the 5/8" x 2.25" bolts to attach them to the frame.

Torque bolts to **135Nm (100 ft-lb)**.

Lower control arms

- IRS lower control arm components
- 13/16" socket, 15/16" wrench, torque wrench.



Attach the control arms to the frame with the shock mount towards the rear and spindle brackets up. Use the longer M16 x 110mm (~4 5/16") bolts.

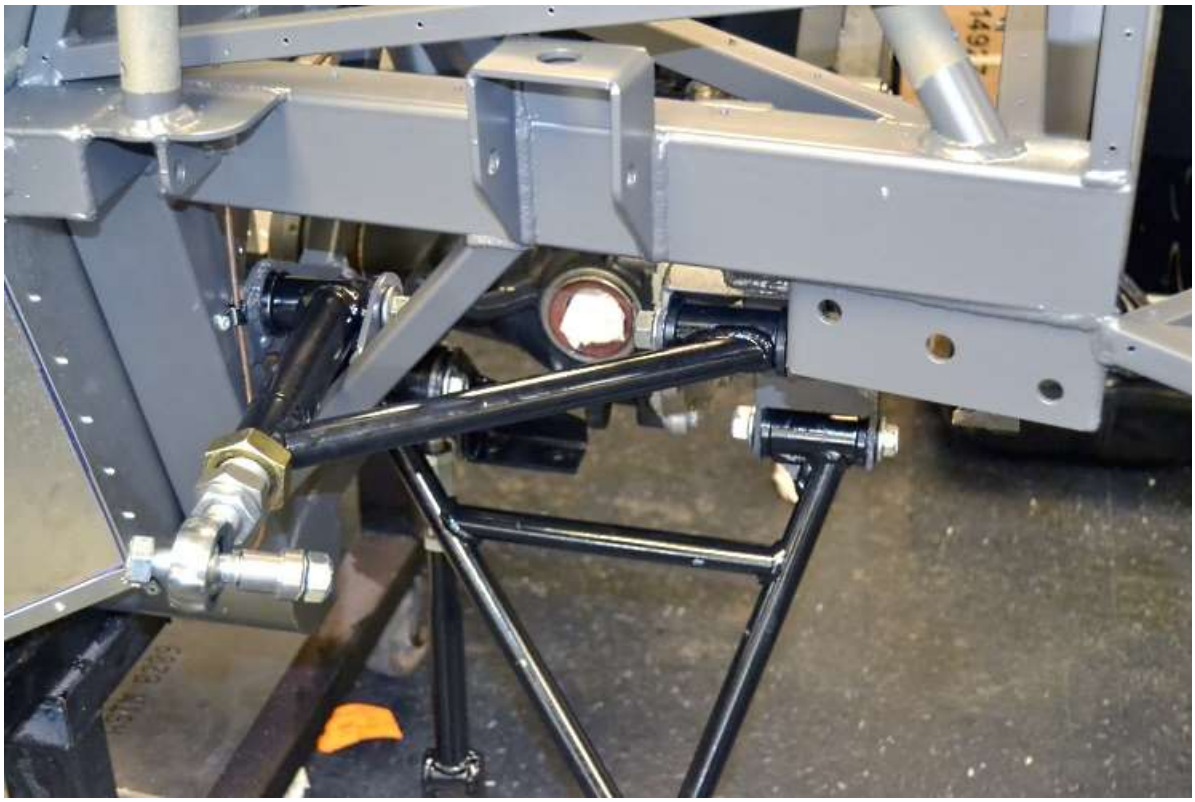
Hold the arm horizontal and torque the bolts to **135Nm (100 ft-lb)**.

Upper control arms

IRS upper control arm components

13/16" socket, 15/16" wrench, torque wrench.

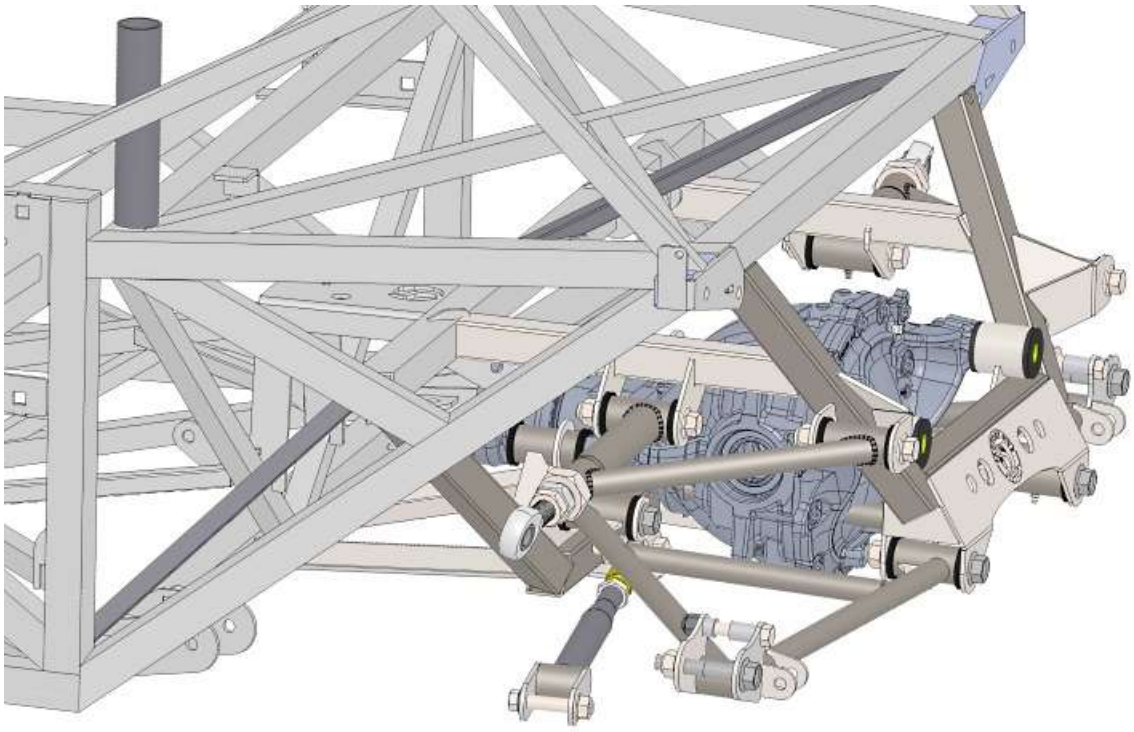
Roadster/Coupe



Pass the upper control arm thick tube through the triangular area as shown in between the frame mounts. Use the longer M16 x 110mm (~4 5/16") bolts.

Hold the arm horizontal and torque the bolts to **135Nm (100 ft-lb)**.

Hot Rod

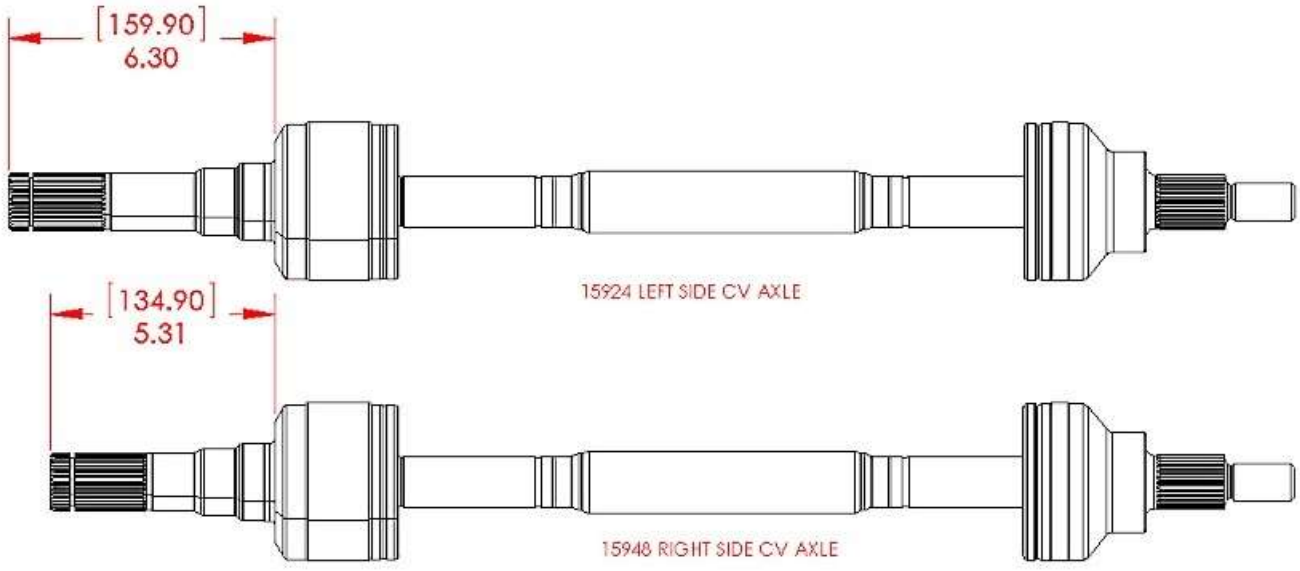


Attach the upper control arms to the frame with the thick tube at the front. Use the longer M16 x 110mm (~$4^{5}/_{16}$") bolts.

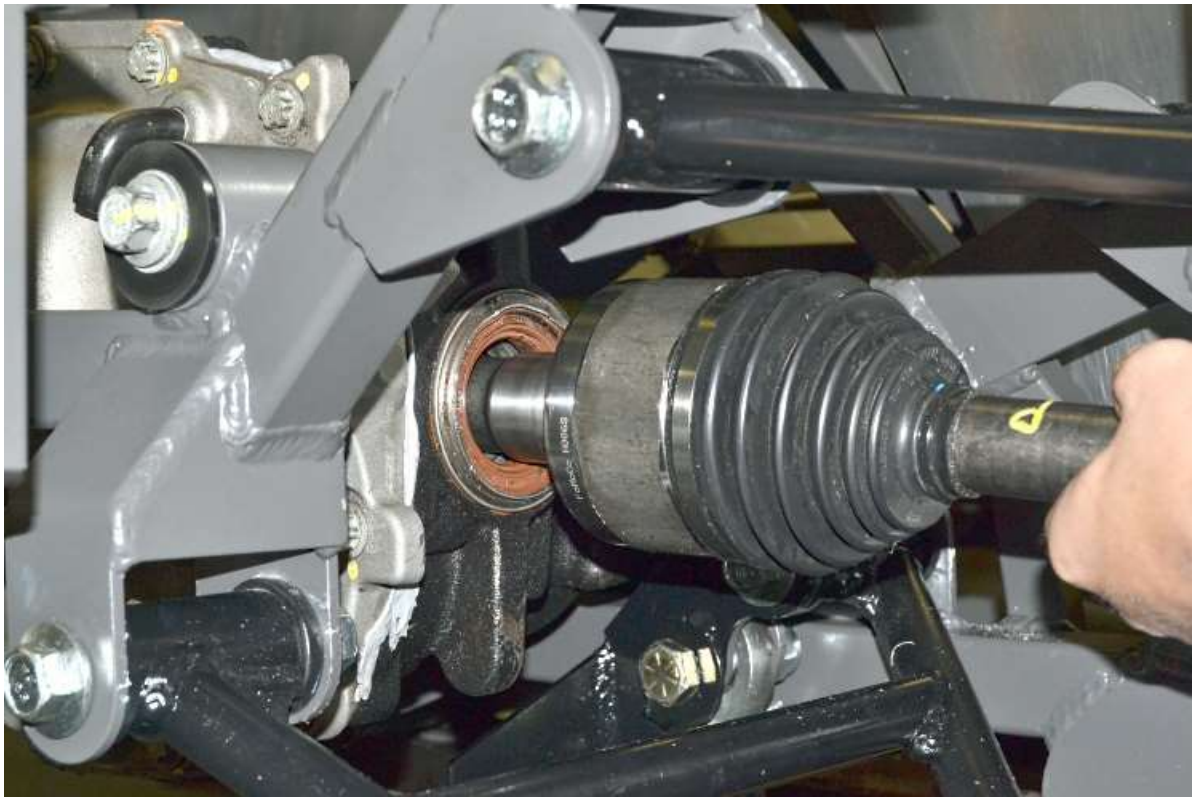
Hold the arm horizontal and torque the bolts to **135Nm (100 ft-lb)**.

CV Axle

- CV Axles, spindles

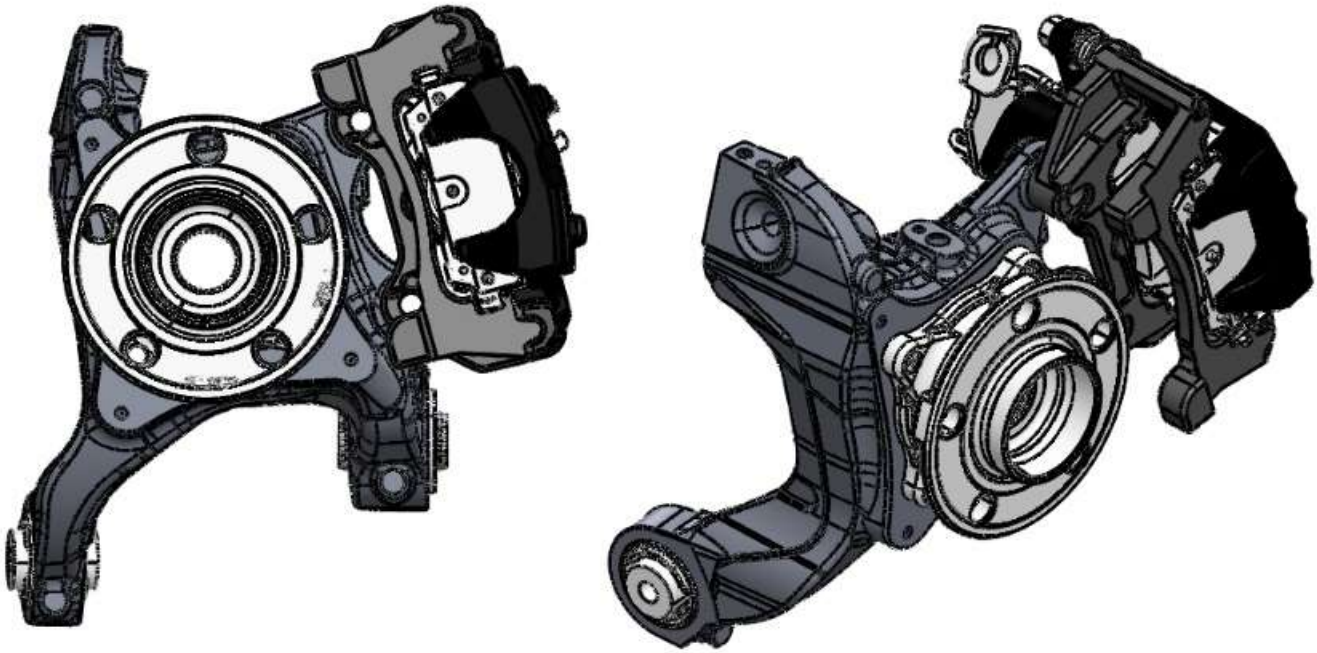


The inside CV joint is different for each side of the car, make sure to use the correct one when installing.



Using the correct axle, push the inner CV joint into the center section.

- When fully installed there should be an $^{1}/_{8}$" (~3mm) gap between the inside of the CV joint and the center section. If necessary, compress the CV axle and with the CV axle nut on the end hit the CV axle in with a plastic mallet. Pull on the inner CV joint to make sure that it does not come out.



LEFT SIDE SPINDLE

Slide the spindle onto the outer CV joint and start the nut on the end.

Spindle

Lower arm

Connect the bottom of the spindle to the lower control arm using the M16 x 90mm bolts and locknuts. Right side shown.

Wait to torque the bolts until after the other arms are installed.

Upper arm

Insert the angled mount adapter into the upper arm rod end.

Attach the upper control arm to the spindle using the $^{5}/_{8}$" x 3.50" bolt and locknut.

Wait to torque the bolts until after the other arms are installed.

Toe Link

Attach the Toe link arm to the spindle using the M14 x 70mm bolt and locknut.

Repeat for the right hand side.

Use the torque specifications page at the back of the instructions to torque the control arm to spindle bolts.

Coil-Over Shock Assembly

- Snap ring pliers, ¾" wrench, ¾" socket, Ratchet, floor jack
- Front shock set, IFS Components, Insulated clip hardware.
- The shocks are pre-valved at the factory in compression and rebound for good street use. The shocks can be adjusted in rebound as per Koni's instructions if so desired.
- The Roadster/Coupe IRS springs are 400lb. The Hot Rod IRS springs are 300lb. Other springs are available for different ride characteristics.
- WARNING! Incorrect assembly and maintenance of this part can cause serious injury or death.

Unpack the shocks, coil-over's and hardware.

Double check the jam nut under the rod end and bump stop to make sure that it is tight.
Screw the spring seat down on the sleeve so it is closer to the unthreaded end.

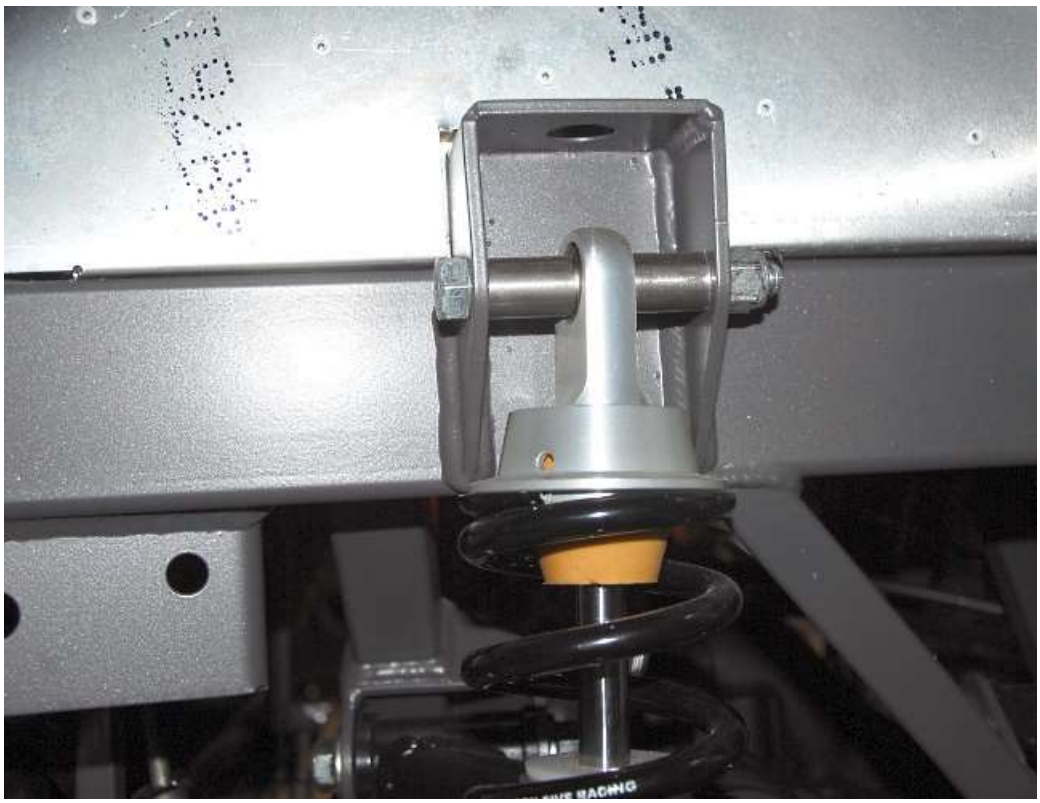
Slide the coil sleeve over the body of the damper beginning at the end which has the rubber bump stop.
The unthreaded end of the sleeve goes first so that it will sit on the snap ring on the shock body.

The coil-over hats have a snap ring which holds it in place. Remove this snap ring to assemble the coil over shock.

Slide the rubber bumper about two inches down on the shaft.

Put the spring and hat on the shock and rotate the spring seat back up the sleeve so that the spring pushes the hat tight against the end of the shock.

Install the snap ring on the spring hat so that it holds onto the shock end. Make sure that the slot in the snap ring and the slot in the spring hat are not aligned.



Roadster/Coupe - Attach the rod end of the shock to the upper shock mount using the two equal length 1.09” kit spacers.

Hot Rod - Attach the rod end of the shock to the upper shock mount using the two equal length 0.32" kit spacers. Make sure to insert the bolt from the front placing the nut to the rear of the car (allows you to remove the shocks when the car is complete).

Torque the upper shock bolt to **54Nm (40 ft-lb)**.

Jack the spindle up so the body end of the shocks can be mounted on the shock mount on the control arm using the longer 1.09" spacer on the back and $^{7}/_{16}$" spacer in front of the shock.

Torque the lower shock bolt to **54Nm (40 ft-lb)**.
Remove the floor jack.

Brakes

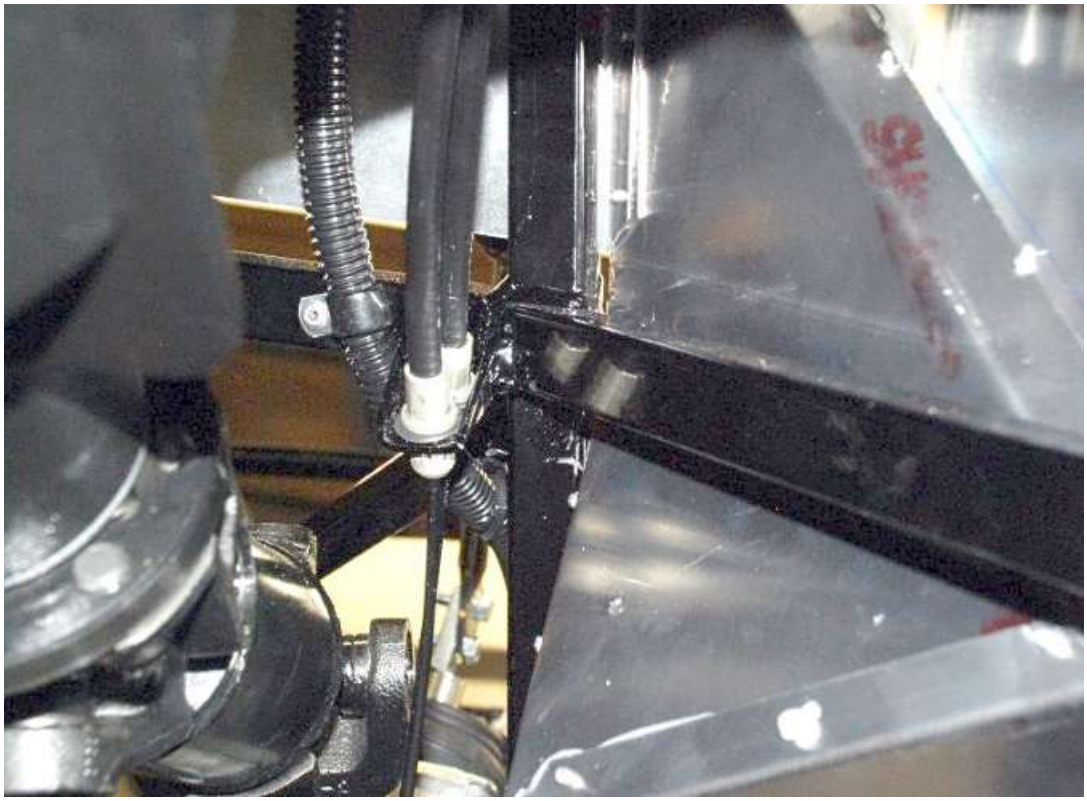
Reinstall the rotor and caliper on the spindle.
Torque the brake caliper bracket to spindle bolts to **175Nm (129 ft-lb)**.

Connect the brake hose to the brake caliper.

Torque the banjo bolt to **39 Nm (29 ft-lb)**.
Run the brake hose over to the frame while the suspension is in droop and keep the brake line slack to locate the frame mount.
Run the hard brake lines in the kit to the brake line mount.

Roadster/coupe E-brake cables

If the e-brake cables are already connected to the e-brake handle, disconnect them now.



Make sure the FFR cables go through the upper bracket in the transmission tunnel until the sheath end clicks in place.

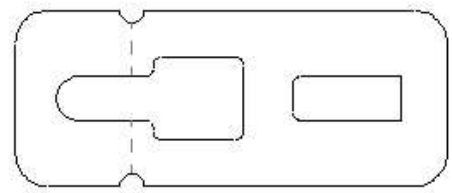
Ford brake routing

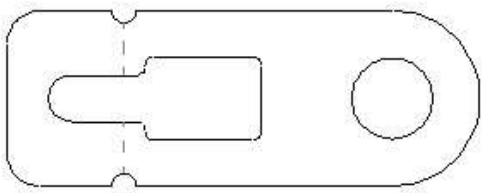
Run the e-brake cables over the top of the center section and over to the brake calipers.

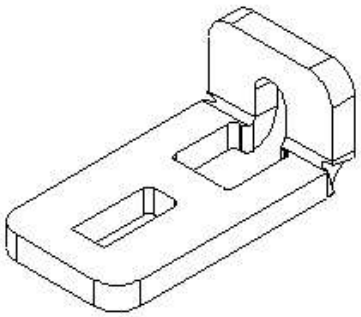
Wilwood brake routing

Run the left e-brake cable over the top of the center section and left rear mount then down and over to the brake caliper.

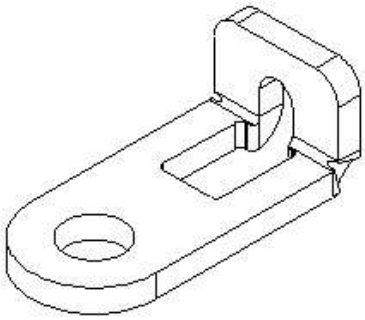
Run the right cable over the center section and right rear mount then down and over to the brake caliper.







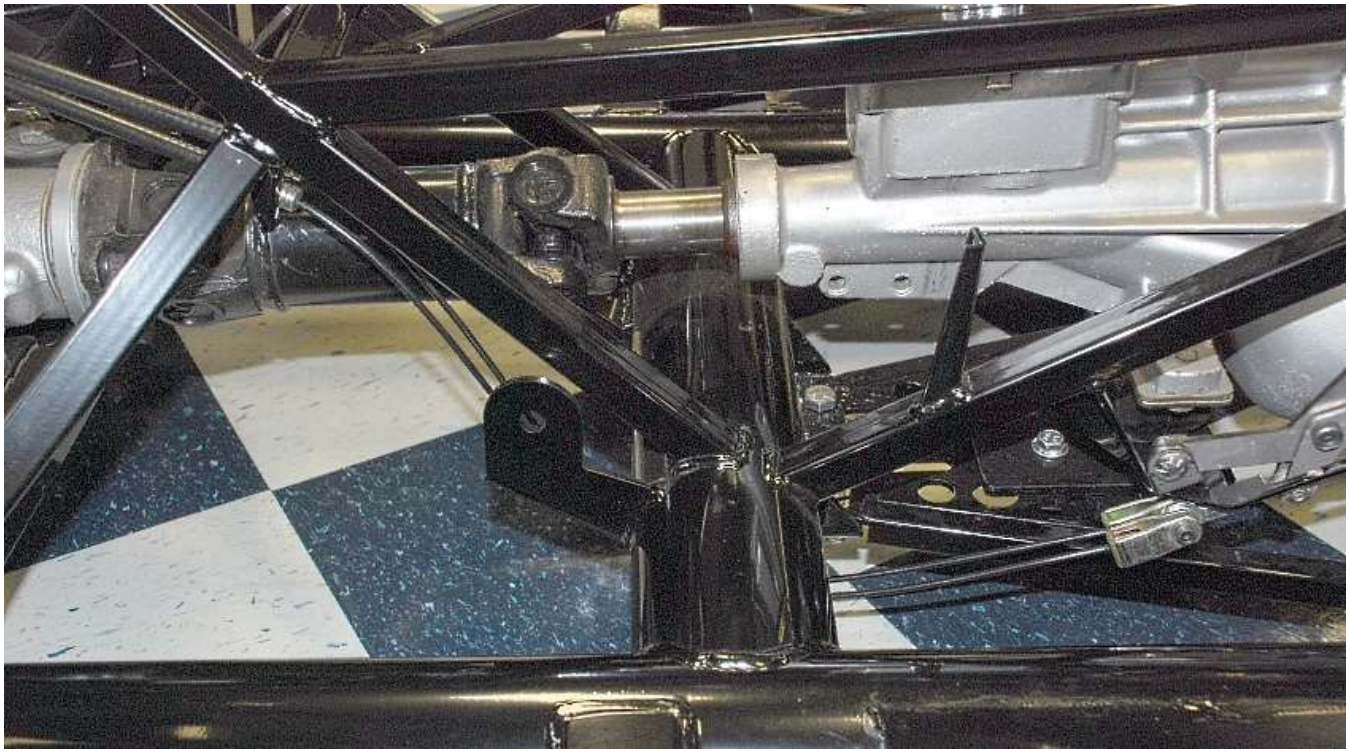
FORD CALIPER E-BRAKE ADAPTER



WILWOOD CALIPER E-BRAKE ADAPTER

Ford e- brake adapter

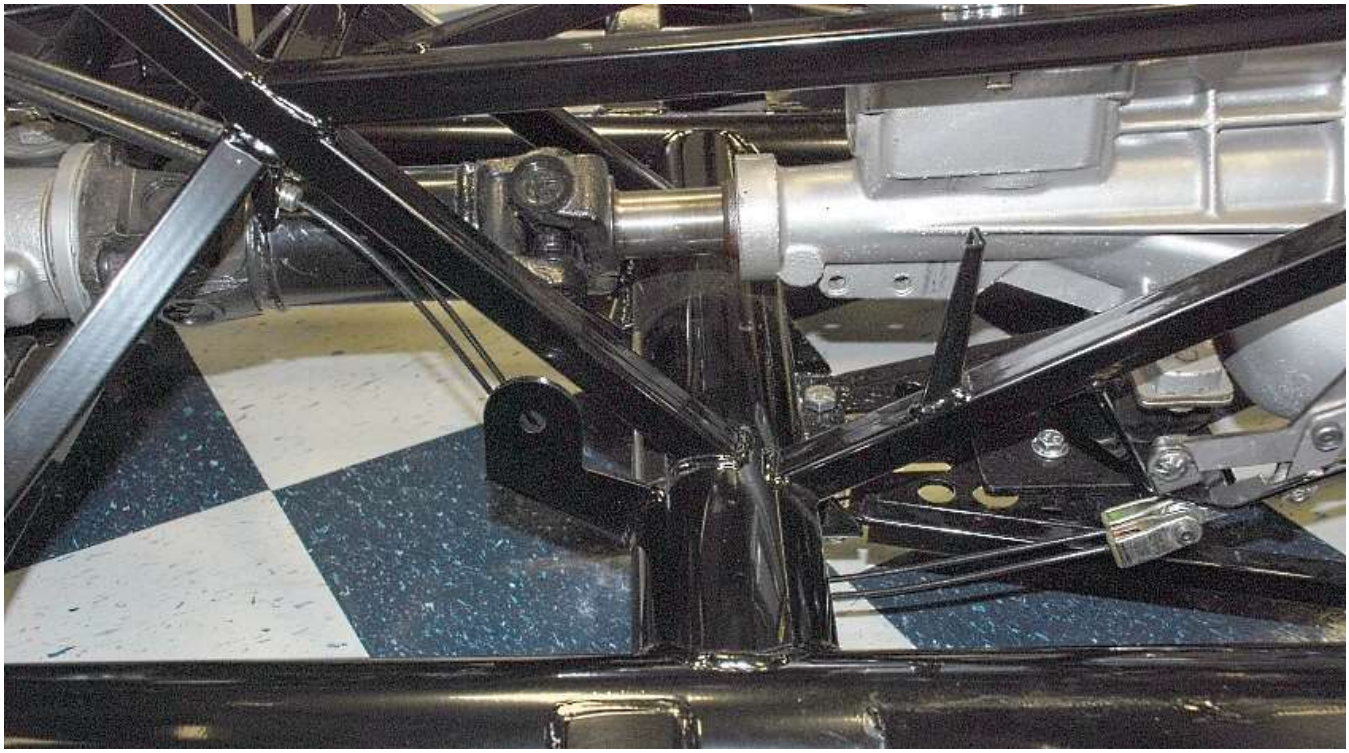
Insert the cable end into the bent bracket then hook the bracket over the stock e-brake lever.



Make sure to run the other end of the brake cables under the 4” crossmember and connect them to the e-brake handle and adjust.

Wilwood e-brake adapter

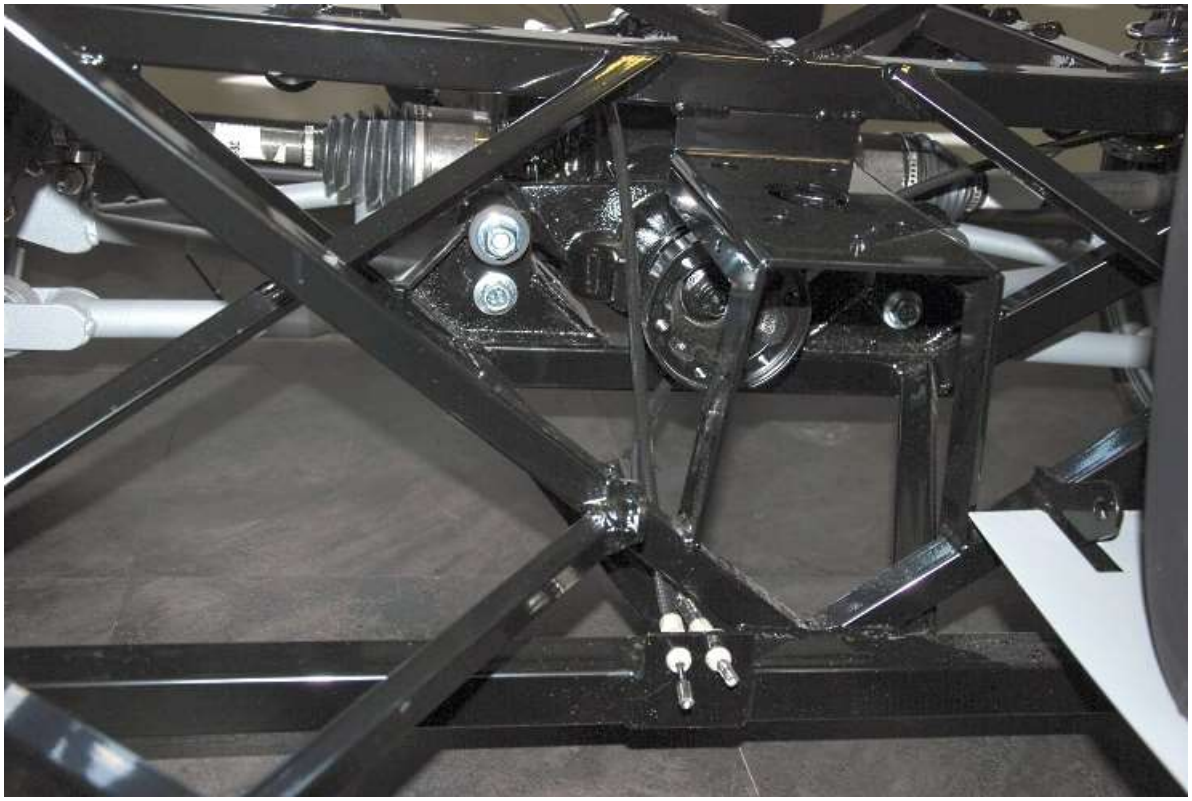
Insert the cable end into the bent bracket then bolt the bracket to the e-brake lever.



Make sure to run the other end of the brake cables under the 4” crossmember and connect them to the e-brake handle and adjust.

Hot Rod

If the e-brake cables are already connected to the e-brake handle, disconnect them now.



Push the cables into the bracket forward and to the right of the center section on the frame.

Ford brake routing

Run the left side cable under the front of the center section then over the left front center mount, under the under the upper control arm front mount, over the upper control arm and to the caliper.

Run the right cable up over the right front center section mount, over the upper control arm front mount tube and arm then back to the caliper.

Driveshaft adapter

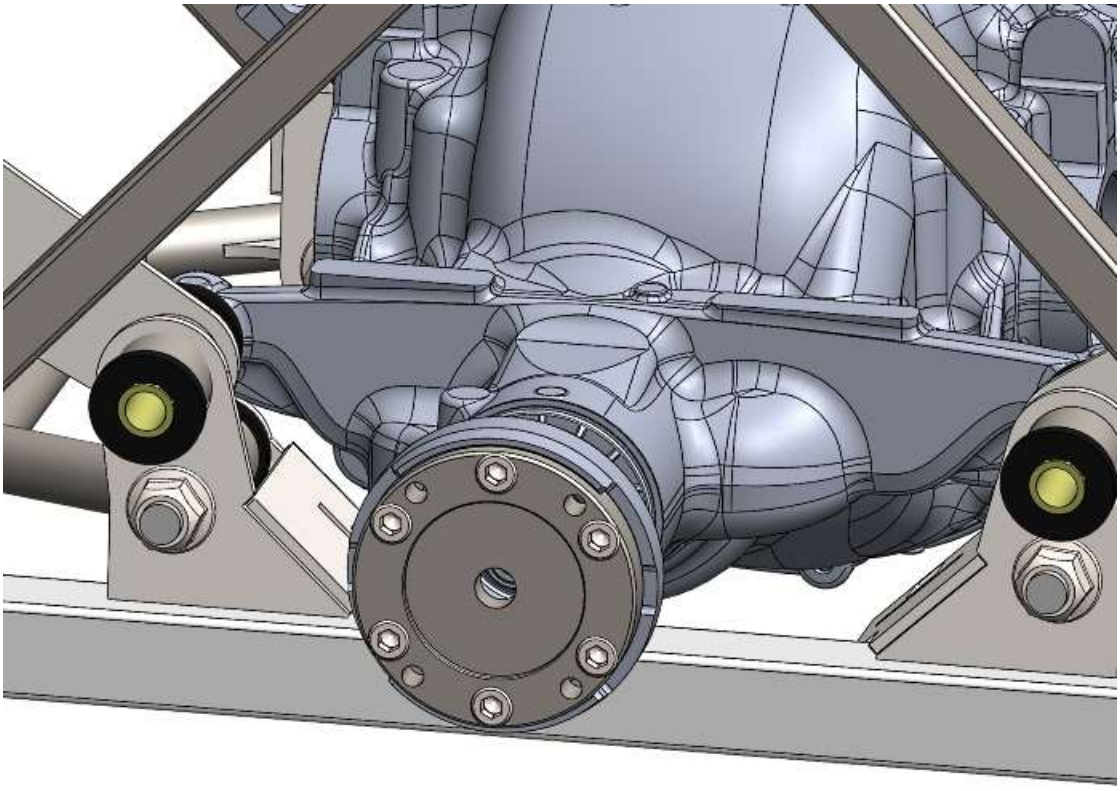
There are two different Driveshaft adapters, one for center sections from automatic cars which is coated clear zinc. The Driveshaft adapter for center sections from manual cars is coated yellow zinc.

Driveshaft adapter, fasteners

8mm hex socket, torque wrench, Loctite.

Apply the emergency brake.

Apply Loctite to the (6) M10 x 25mm socket head screws.



Attach the driveshaft adapter to the center section pinion flange and torque the bolts in a star pattern to **55Nm (41 ft-lb)**.

Insert the driveshaft into the transmission, bolt the rear flange to the driveshaft adapter and torque the bolts to **109Nm (80 ft-lb)**.

Fluids

Name	Specification
Motorcraft® Additive Friction Modifier (U.S.) XL-3 (U.S.)	EST-M2C118-A
Motorcraft® SAE 75W-85 Synthetic Hypoid Gear Lubricant XY-75W85-QL	WSS-M2C942-A

Fill the rear axle with fluids.

Capacities

Fluid	Amount
SAE 75W-85 Synthetic Hypoid Gear Lubricant	3.15-3.30 pt (1.49-1.56 L)
Friction Modifier	3.0-3.5 oz (0.089-0.104 L)

Alignment specs

Camber: -0.5°to -0.75°
Total Toe: 1/8" Toe in

Torque Specifications

	LB-FT	Nm	
CENTER SECTION TO FRAME FRONT	129	175	
CENTER SECTION TO FRAME REAR	129	175	
BRAKE CALIPER TO CALIPER BRACKET	24	32	
BRAKE CALIPER BRACKET TO SPINDLE	129	175	
BRAKE HOSE BANJO BOLT TO CALIPER	29	39	
LOWER CONTROL ARM TO FRAME	100	135	
LOWER CONTROL ARM TO SPINDLE	100	135	
TOE LINK TO FRAME	100	135	
TOE LINK TO SPINDLE	100	135	
UPPER CONTROL ARM TO FRAME	100	135	
UPPER CONTROL ARM TO SPINDLE	100	135	
HUB TO SPINDLE	98	133	
CV AXLE NUT	98	133	THEN ROTATE 45°
DRIVESHAFT ADAPTER TO PINION FLANGE	41	55	
DRIVESHAFT TO DRIVESHAFT ADAPTER	80	109	