

# project Scion tC

## Part I: Improving stick

BY AARON BONK • PHOTOGRAPHY BY AARON BONK

By some accounts, the Scion tC just doesn't cut it. Like the scrawny new kid on the block, Project tC doesn't fit in with the powerhouses that fill the *Sport Compact Car* garage. It could be better in virtually every performance category. Its power-to-weight ratio, handling and braking all leave room for improvement.

Perhaps the bar has been set too high, though. To be fair, look around and you'll be hard-pressed to find anything else that will outperform the tC and carry its \$16K price tag. For that, along with the fact that the tC is equipped with a 160-hp, 2AZ-FE VVT-i powerplant, we give this econobox a thumbs-up.

It's clear there's room for improvement. Give the tC too much throttle rounding that on-ramp and its Bridgestone Potenza's break loose in a pavement-gripping struggle that they'll ultimately lose. Regain control, hammer it around the next twist and feel the body roll like a ship at sea.





# project SCIONtC

To help rid the tC of these handling habits and enhance its cornering prowess, we signed on Hotchkis Tuning and **The Progress Group**. A Hotchkis Tuning front strut tower brace stiffens

## THE PARTS LIST

Most of the parts are related to one another mechanically, so installing everything at once is most logical. We broke it into five stages. Here's what we used and how much it cost.

PART	PART NUMBER	COST
Hotchkis Tuning strut tower brace	TBA	TBA
<b>Progress Group coil-overs</b>	<b>75.2180</b>	<b>\$1199.00</b>
Hotchkis Tuning Sport anti-roll bar set	22425	\$328.95
Hotchkis Tuning rear camber links	12425	\$230.00
17x7-in. 5Zigen FND1R-C w/ 48mm offset	N/A	\$800.00
225/45-17 Kumho ECSTA MX	N/A	\$550.00

the chassis while the company's front and rear anti-roll bars virtually eliminate body roll. **Progress Group coil-overs lower the ride height and increase the spring and damping rates.** Hotchkis Tuning rear camber links allow rear camber adjustment.

Eventually, we'd like to see a set of camber plates on the front of the tC, but as of our press time, none were available.

## PROGRESS GROUP COIL-OVERS

Progress coil-overs feature threaded struts with on-car height adjustability. Height can be adjusted between 1 and 3 inches lower than stock. Compression and rebound and damping rates are preset internally. The bodies of the coil-overs are shortened to achieve added compression height and are nickel-plated to reduce corrosion.

In the front, the stock strut's upper mount must be removed and swapped onto the coil-overs before installation. Provisions for the ABS wire and the brake line are provided and both use the OEM hardware.

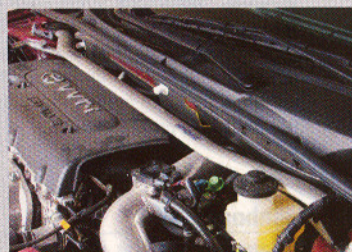
Out back, the shocks' upper mount



Installing coil-overs and the strut tower brace at the same time will save some labor. The Hotchkis Tuning strut brace brackets bolt directly to the front strut upper mounting plates, which need to be removed anyway when installing the coil-overs.



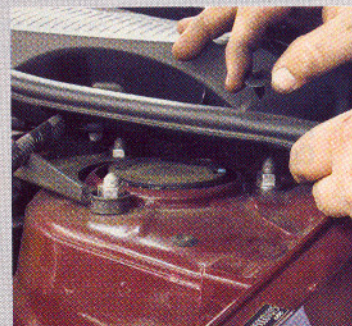
Hotchkis Tuning recommends zip-tying the mass air sensor wires out of the way when using its upper strut tower brace in combination with the stock intake pipe. However, our car came with this AEM intake, which affords plenty of room.



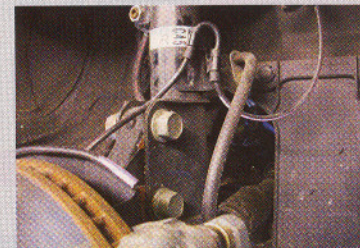
Everything on the tC is a tight fit. The strut tower brace is no exception. To install the brace, slide it behind the brake fluid reservoir first, then under the cowl, starting from the passenger side.



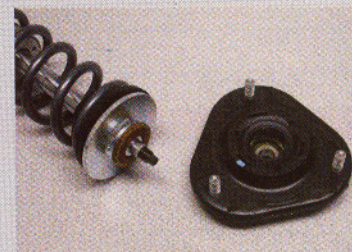
**The coil-overs' spring rates are 250 lb/in. up front and 350 lb/in. out back. Those are 80-percent and 46-percent increases over stock, respectively.**



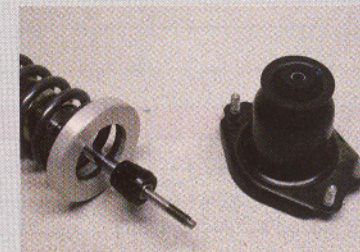
Two plastic clips on each side of the cowl must be removed in order to gain access to the strut's rearmost upper mounting nuts. Even with cowl pried out of the way, clearances are still tight and only a wrench will fit.



Unbolt the brake line bracket and unclip the ABS wire from the strut. The two bolts connecting the strut to the upper control arm must be removed, allowing the arm to drop. Note: Although front camber is nonadjustable, a slight amount of play may be found here by pulling or pushing on the upright before these two bolts are tightened.



The stock upper mount must be reinstalled on the Progress coil-over. Everything else is included from Progress, including the nut that holds it in place.



Like the front, the rear coil-overs use the mounting plates from the old shocks. Slide it over the coil-over and secure it with the supplied nut.



nuts are located behind the rear seats. Some rear interior panels will need to be removed to access them. The spare tire cover and trunk carpeting must be unclipped and pulled out of the way, and the dust cover along with the upper mounting plate from the rear damper assembly must be transferred to the coil-over. The threaded collar can then be adjusted to the desired ride height.

**Progress Group set up Project tC with a 1.38-inch total drop.** This ride height creates equal cross weights that provide symmetrical handling in both directions.

## ANTI-ROLL BARS

The Hotchkis Tuning anti-roll bars are constructed of hollow, mild-steel tubing and are powdercoated to prevent rust. The hollow bars are lightweight without sacrificing rigidity.

Both the front and rear bars have three positions of adjustability. Positioning the end links inward increases roll stiffness, while moving them outward does the opposite. Depending on the setting, the front bar ranges in stiffness from 40- to 68-percent stiffer than stock. The rear bar increases stiffness from 273- to 338-percent stiffer than stock.

If you don't have access to a lift, then you may want to reconsider installing Hotchkis Tuning's front anti-roll bar yourself. It's about as difficult and time-consuming as bolt-ons get.

The crossmember needs to be lowered about 3 inches to finagle the old anti-roll bar out and the new one in. Support the crossmember and remove the two nuts in the front and the eight bolts in the rear. Remove the single nut and four bolts that fasten the rear engine mount to the crossmember. The



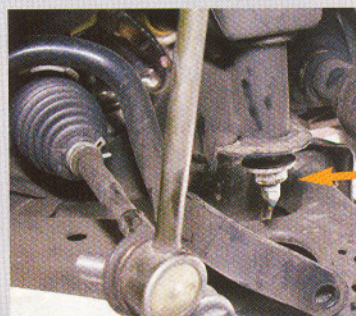
The original rear dust covers won't slide over the coil-overs unless they're trimmed. Cut them in half and use only the thin, ring-shaped portion.



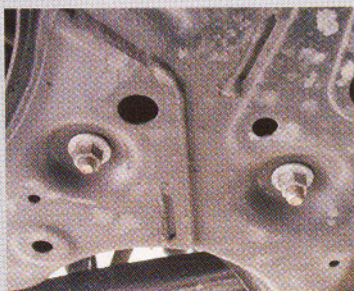
Before installing the rear coil-overs, rotate their upper mounting plates in proper orientation with their lower mounts. The upper mounting plates only attach to the car one way and can be difficult to turn once the coil-overs are compressed.



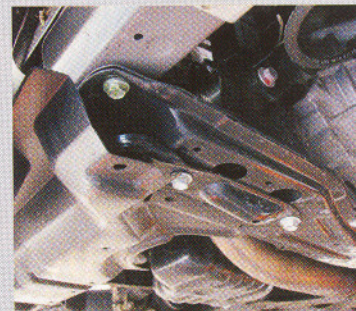
The Hotchkis Tuning anti-roll bars can be purchased as a kit or separately. Either way, they come with all the necessary brackets, bushings, hardware, grease and instructions. The front bar, on the bottom, is 24mm in diameter. The rear bar is slightly thicker, at 27mm. Due to their hollow construction, they're only slightly heavier than the stock bars, despite being significantly stiffer.



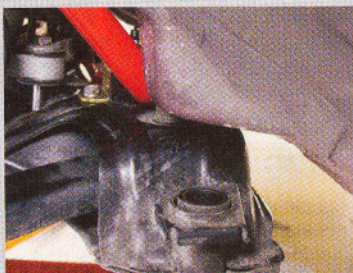
The nut in the center must be removed to drop the crossmember. To access it through the hole in the lower control arm, use a 19mm socket and an extension.



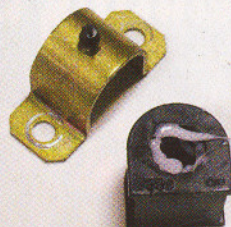
These are two of the four steering rack nuts. Their torque ratings are only 45 ft-lb, but they feel like much more. The base of the nuts feature anti-slip grooves that grab the metal and make them difficult to loosen.



The front splashguards must be removed in order to access the bolts for the bridge bracket. A series of plastic screws and rivets must be popped out in order to remove the two pieces.



Notice the gap between the crossmember and the frame. If the crossmember is lowered this much, the stock anti-roll bar will have room to come out.



Since clearances are tight underneath the tC, it's best to wait to install the bushings and brackets until after the bar is finagled into place. Hotchkis provides grease for the bushings. Use it to avoid squeaks.



four nuts holding the steering rack to the crossmember must also be removed from below.

Before the crossmember can be lowered, the plastic splashguard beneath the front bumper must be removed. Once out of the way, the bridge bracket running from the radiator support to the crossmember is exposed and can be unbolted.

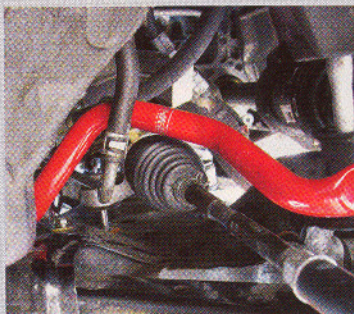
It's easiest to pull the old anti-roll bar out and slide the new one in from the driver's side. First, unbolt the two brackets and remove them from the bar. Slide the new bar into place, snap the supplied bushings and brackets onto the anti-roll bar and bolt it to the original holes in the crossmember. Be sure to lube the bushings before sliding them on.

When reinstalling the crossmember, partially thread the nuts and bolts a few turns before tightening anything down. Tighten the steering rack nuts next. Reach above the rack with a wrench to keep the bolts from spinning.

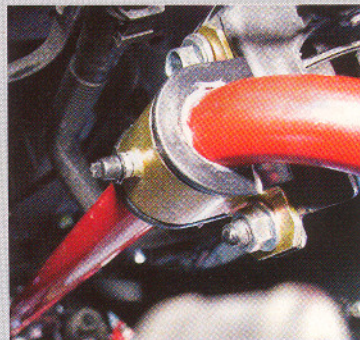
Thankfully, installing the rear bar is much easier. The procedure is similar, only there's no crossmember to drop. When removing the nuts that attach the rear anti-roll bar to the end links, insert a 6mm Allen wrench on the



The Hotchkis Tuning rear camber links feature quiet, polygraphite bushings and a double-adjustable design. Once the jam nuts are loosened, camber may be adjusted by spinning the turnbuckle.



Looking from the passenger-side wheel well, be sure the anti-roll bar is located on the inboard side of this power steering hose. Positioning the bar on the outer side will ultimately kink the hose.



Grease fittings are integrated into the new anti-roll bar brackets to add additional lubricant. New hardware is also included.



The Hotchkis anti-roll bars offer three-position adjustability. For maximum roll stiffness, bolt the end link to the innermost hole. Moving the end link outward decreases stiffness. The front bar can be set to a maximum of 68-percent stiffer than stock and the rear a maximum of 338 percent.

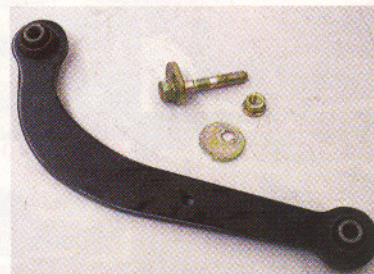
back side to prevent the ball joint from spinning. Unbolt the anti-roll bar brackets from the rear subframe and drop the driver's side end down first. The Hotchkis Tuning anti-roll bar slips in the same way, right over the exhaust pipe.

## CAMBER LINKS

Lowering the tC puts its rear suspension into an aggressive part of the camber curve. Hotchkis' adjustable camber links are a fairly simple solution to this problem. The old non-adjustable links are removed by unbolting two fasteners;

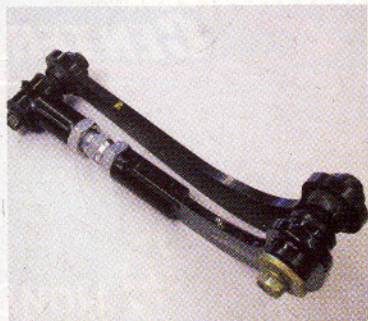


When removing the stock camber links, loosen the 17mm bolt connecting to the upper control arm first. It's easier to reach the inner bolt once the arm is swung upward.

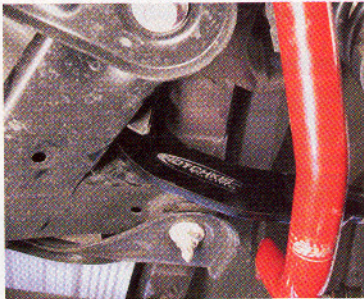


Rear camber adjustments are made on stock tCs using this camber bolt, which is retained even when using the adjustable camber links. Before tightening the cam bolt, make sure they're adjusted to their maximum outboard position.





To get the alignment close, place the stock link and adjustable link side by side and adjust the turnbuckle assembly until they're the same length.



As the rear suspension unloads, the inner end of the camber link has a tendency to rub against the subframe. The solution is to adjust the factory cam bolts, to push the camber link as far out as possible.

a bolt connecting to the upper control arm and a cam bolt attached through the rear subframe. We found it's also a good idea to disconnect the rear anti-roll bar's end links in order to free some extra space.

The new camber links are accompanied by an assortment of polygraphite bushings and grease. Grease the bushings and slip them into the appropriate end of the camber link. Install the end of the link that attaches to the subframe first with the original cam bolt, but don't tighten it yet. Raise the upper control arm and connect the outer end of the link. Adjust the cam bolt so the hub is pushed as far outboard as possible. Finish by tightening the cam bolt nut and the outer camber link bolt.

### THE RESULTS

The coil-overs are adjusted so the car's diagonal corner weights are equal to one another. The front corners weigh 886 pounds on the left and 848 pounds on the right. The rears are adjusted accordingly to achieve the optimum balance; in our case, 560 pounds on the left and 527 pounds on the right. A simple comparison of the cross weight's sums conclude that we're off by an entirely acceptable 5 pounds.



**Progress coil-overs allow cross weights to be adjusted within 5 pounds—helping equalize left/right balance.**

We set the anti-roll bars to full stiff for maximum roll stiffness. Rear camber is set to negative 1.5 degrees while toe is left untouched. Up front, camber is nonadjustable, but we fudged things a little, thanks to some

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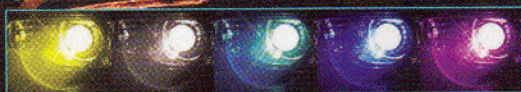
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degree of negative camber.

Numberwise, the upgrades appear to have paid off. On the skidpad, the stock tC circled at a very Camry-like .82g. After the suspension mods and a set of 17x7-inch, 48mm offset, 5Zigen FN01R-C wheels and 225/45-17 Kumho ECSTA MX tires, the tC produced an impressive .91g. Slalom numbers also improved dramatically. **The stock tC only mustered 66.1 mph but improved to 71.9 mph post-bolt-ons, which makes it only .4 mph slower through the slalom than the last EVO MR we tested. Not bad, considering the cost.**

Numbers aside, the tC handles like a different car. Body roll is almost nonexistent and responsiveness has significantly increased, making the tC much more predictable with much higher limits. Balance at the limit is relatively mild without the tail-happy nature that many of our project cars take on with these same mods. But with the adjustability left in the system we're guessing we can dial it in if we decide to.

With this grip and balance, the tC can hold its own with the other bad boys in the SCC garage. Now it just needs more power and better brakes. ■

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#### SOURCES

##### SUSPENSION

**Hotchkis Tuning**  
(877) 4-NOROLL  
[www.hotchkistuning.com](http://www.hotchkistuning.com)

**The Progress Group Inc.**  
(714) 575-1193  
[www.progressauto.com](http://www.progressauto.com)

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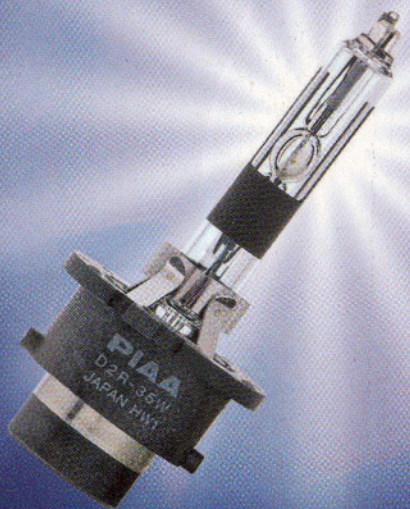
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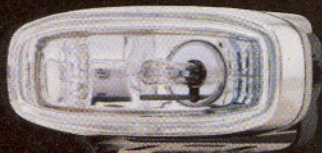
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