



**FD LSX (or other) Mounting and Trans**  
**Install Instructions**

**Joel Payne**  
**Revision 0**

**Waiver:**

In consideration of access to purchase automotive engine installation kit, you the purchaser, for yourself, you heirs, personal representatives or assigns, do hereby release, waive, discharge, and covenant not to sue Joel N. Payne, Ronin Speedworks or any future entities associated with said automotive components for any personal injury, accidents (including death and property loss) arising from, but not limited to, use, misuse, misinformation, outright design flaws, material failures resulting from modification/creation of components, or installation of said components (whether directed or misused).

**Indemnification and Hold Harmless:**

You (the purchaser/user of this document), for yourself, your heirs, personal representatives or assigns also agree to INDEMNIFY and HOLD HARMLESS Mr. Payne, Ronin Speedworks and any associated entities from any and all claims, actions, suits, procedures, costs, expenses, damages, and liabilities, including attorney's fees brought as a result of your involvement with said automotive components and to reimburse Mr. Payne/Ronin Speedworks for any such expenses incurred. This includes injury, accidents (up to and including death) and property damage incurred to third parties of no direct involvement with the this transaction. You acknowledge that the engine mounting system changes described within are for RACING USE ONLY and no effort has been made to seek Department of Transportation (DOT) approval for use on public roads.

**Severability:**

You, the purchaser/user, further expressly agrees that the foregoing waiver and assumptions of risks agreement is intended to be as broad and inclusive as allowed by the state of California, the United States of America, and that if any portion of the disclaimer/waiver herein is held invalid, it is agreed that the balance shall, notwithstanding, continue in full legal force and effect.

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## Full Kit Includes:

	Component	Qty	Notes
<b>Main Parts</b>	Main Subframe (AKA cradle)	1	
	Trans mount	1	
	Pedestals (L+R)	2	
	Engine Isolators Kit (Biscuits)	1 pair	Snug tight, 5-7 ft-lbs
	Trans Isolator Kit	1	
<b>Subframe Hardware</b>	m12 x 1.25 (fine) x 35, flange head hex bolts	6	60 ft-lbs
	m12 super heavy fender washer	6	
<b>Pedestal Hardware</b>	m10 x 1.5 x 25, flange head hex bolts	8	34 ft-lbs
	m10 washers	8	
<b>Trans Hardware</b>	Trans mount sandwich plates	2	
	m10 x 1.5 x 20, flange head hex bolts	6	34 ft-lbs
	m10 washers	6	
	m6 x 1.0 x 16, flange head hex bolts	4	6 ft-lbs
<b>Steering Kit (Parts)</b>	Steering Rack Interface Blocks	2	
	Steering Rack Spacers	8	
	Tie Rod Adaptors	2	
	Rod Ends (Heim Joints)	2	
	Speedway adjustable "pinto" spindle kit w/ hardware	2	See steering instructions
	Spindle Support - 6061 Al	2	
<b>Steering Hardware</b>	5/8-18 (fine) jam nyloc nut (for spindle supports)	2	Barely Snug
	m10 x 1.25 (fine) x 40, flange head hex bolts	4	34 ft-lbs
	m10 washers	4	

### OEM torque values (median of factory service manual recommendations)

Front Control Arm Eccentric bolts: 77 ft-lbs

Front Sway Bar Link to Front Lower Control Arm: 49 ft-lbs

Front Sway Bar Bushing Clamp bolts: 17 ft-lbs

Front Lower Shock Absorber bolt: 77 ft-lbs

Front Upper Shock Absorber bolts: 40 ft-lbs

Note: piece parts orders may only have part of these instructions applicable.

## Compatibility

The Ronin mounting kit is compatible with any of the LS family of motors, including the truck blocks (IE LQ4, LQ9, L33, etc). However, some car based accessories will be required for fitment.

- Only the F-body (97-02 Camaro/TransAm) oil pan is sufficiently narrow up front to clear the steering rack. If you're starting with a different engine, you will need an F-body pan, windage tray, and pickup tube. Holley makes an F-body replacement pan (p/n 302-2) that works as well.
- Front end accessories: AKA combined set of harmonic balancer, powersteering, alternator, etc. Note, these come in three offset belt spacings: Corvette is closest to the block, F-body/GTO has a mid spacing, and the truck offset protrudes the furthest. Car based accessories are required and we tend to prefer the F-body/GTO pieces for the low mount alternator placement
- Intake manifold and TB needs to be car based (any) to clear the hood. Truck manifolds won't clear. Fast 90s generally work, Fast 102 may required clearancing or hood modifications.

## Mating Pieces

The scope of this document covers only the mounting gear for the physical engine and transmission. Separate install instructions exist for the steering pieces. For details on just about any topic and options on configuration check out [www.norotors.com](http://www.norotors.com). If you're not already on that forum, it's by far the best RX7 swap resource on the web. This has since further branched into the "NoRotors.com V8 Rx7 Forum" Facebook group that is useful as well.

A few of the more common questions and recommendations:

- Several rear end options are available from Ronin. Our most popular is the conversion kit to install a Ford 8.8 IRS diff, available in standard and "grande" configurations. [http://www.roninspeedworks.net/index.php?route=product/product&path=59&product\\_id=70](http://www.roninspeedworks.net/index.php?route=product/product&path=59&product_id=70)
- We don't feel drive shafts are one size fits all so we leave that to users to procure. There are quite a few notes on driveshaft selection in our respective Ford 8.8 install instructions if desired.
- We're working on our own radiator setup but it's still a ways out. Several universal radiators are viable options.
- This kit is an ideal match for Ronin's long tube headers. [http://www.roninspeedworks.net/index.php?route=product/product&path=59&product\\_id=110](http://www.roninspeedworks.net/index.php?route=product/product&path=59&product_id=110)
- We recommend you consider oiling upgrades, it's the most obvious weakness of the LS engines. We recommend and run the trap door equipped baffle from Improved Racing on our personal cars. <http://www.improvedracing.com/oil-pan-baffles/ls1-camaro-firebird-body-racing-oil-pan-baffle-p-30.html> An accusump is also a very good idea.
- For powersteering, we recommend Turn One Power Steering. They have a flow adaptor which is perfect for stock pumps and a significantly reworked pump which is the hot ticket for road racing or drift. [http://www.turnone-steering.com/Mazda-RX7-LS1-Conversion-Pump\\_p\\_16.html](http://www.turnone-steering.com/Mazda-RX7-LS1-Conversion-Pump_p_16.html)

- With the emergence of more standalone options, Ronin has now discontinued our wiring services. For what it's worth, we've been hearing good things about PSI.  
<http://www.psiconversion.com>

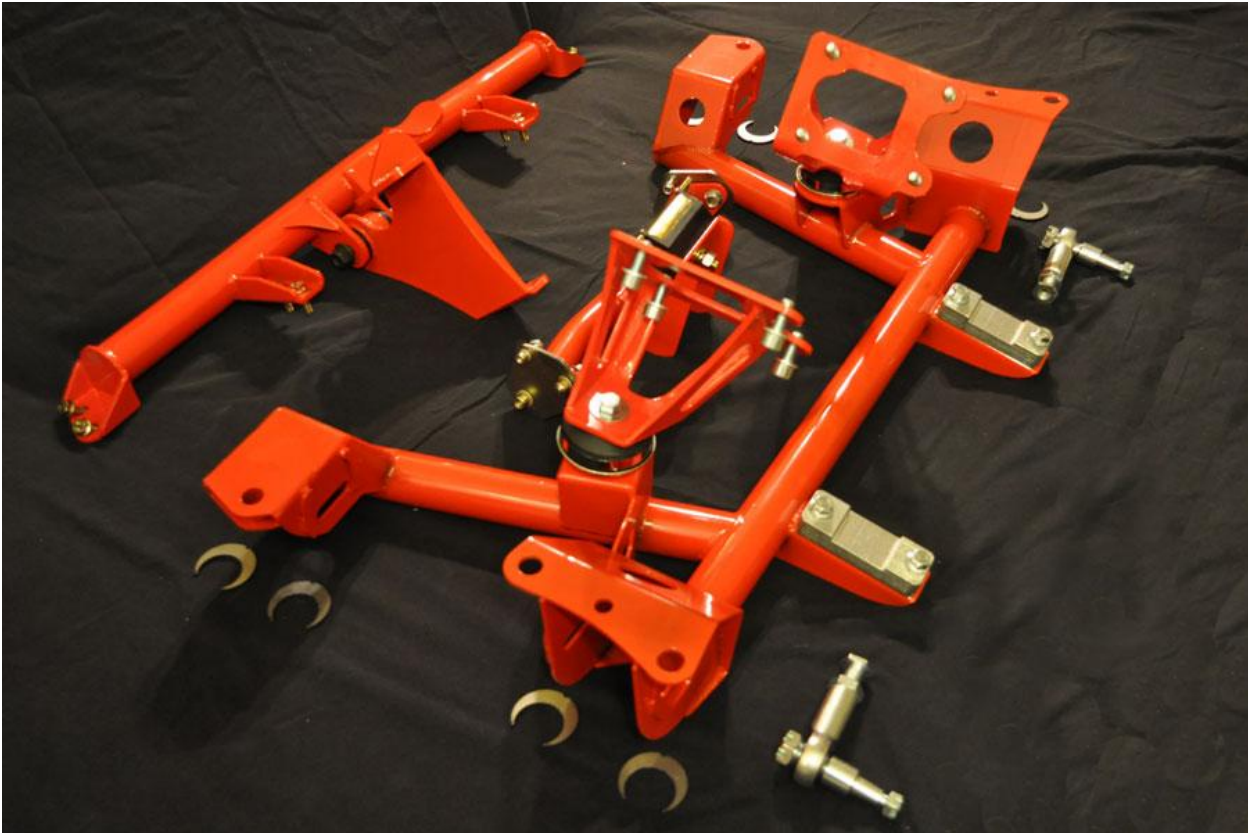
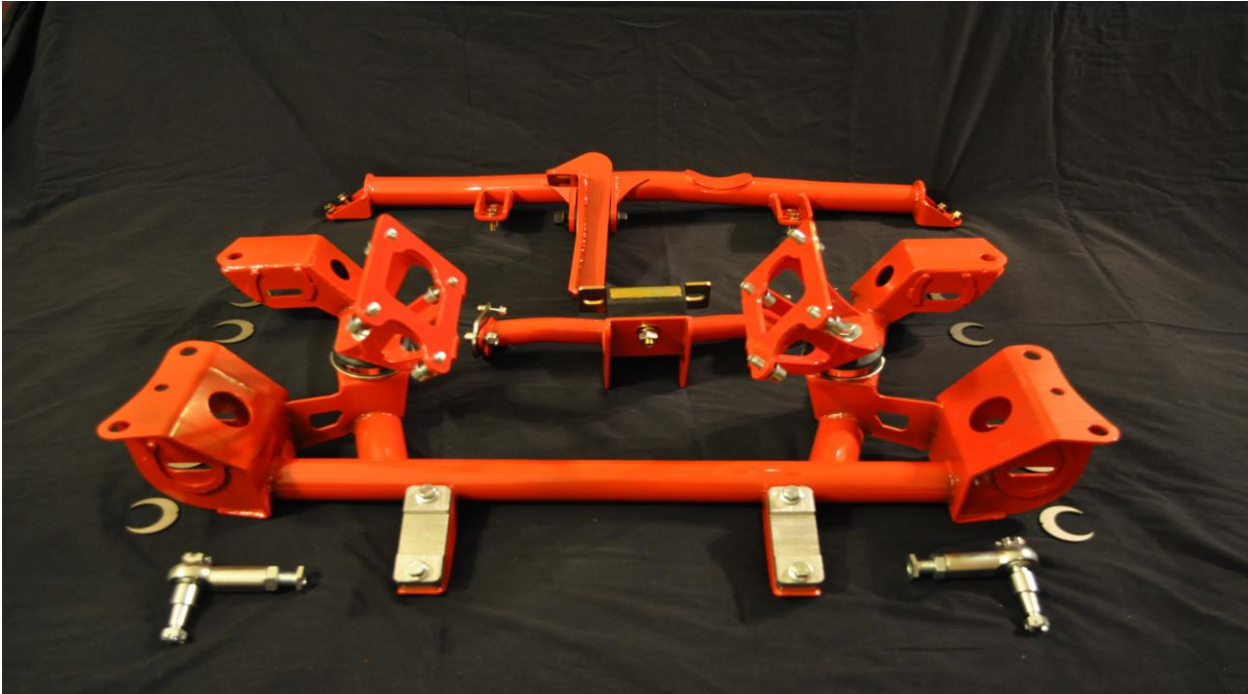
## Installation:

- Remove rotary (and repurpose as boat anchor, clock, or goldfish tank)
- Remove OEM subframe, setting aside the control arm eccentric bolts (we'll need those).
- Install the Ronin subframe, it only goes one way. The factory frame studs are maintained and can be useful for alignment.
  - 6x m12 bolts to the frame are provided and install using the 6x heavy fender washers. This ensures a good clamp on what the oversize holes used to be sure we have proper alignment.
- Pedestal Orientation is as shown (front bumper toward the top of the picture)



Pic from our FC kit (TO BE UPDATED)

For comparison, here's the orientation of all the pieces with the Samberg kit



Diff mount is upside down! (TO BE UPDATED)

- Pedestals use the forward most 4 holes on each side of the block.
- You may also wish to remove/fold flat the portion of the firewall lip immediately behind the intake manifold.
- Install pedestals to block (and torque)
- Drop in the motor and transmission combination
  - It's recommended this be done without radiator, shifter, exhaust or intake manifolds installed.
  - A load leveler is useful for the install and it's easiest done with the hood removed as well. The leveler may be mounted using the m8 bolt pattern for the intake valley cover. Use longer than normal bolts to ensure good engagement.
- Support the tail end of the transmission with a mechanics jack or other means to an approximate correct elevation.
- Assemble biscuit mounts as shown (nut end can be oriented up or down as you prefer) again, just snug tight.



Pic from FC kit (TO BE UPDATED)

- Install and torque the Prothane polyurethane to the transmission tailshaft.
- Install the bent Ronin transmission mount snug tight.

- Raise the tail end of the transmission until both sides of the bent Ronin trans mount are contacting each side of the tunnel.
  - You may wish to squeeze this slightly upward.
- Double check alignment of the mount, fit against both sides of the tunnel, and overall centering of the transmission.
  - You may wish to push and pull the assembly around slightly (hence the reason several components were only installed snug tight during trial fitment)
- Mark hole locations to drill for hardware in the tunnel.
- Remove seats and lift carpet in anticipation of drilling
- Disassemble and/or lower the motor and trans assembly to allow drilling of the tunnel.
  - Use of a step drill will result in an especially clean hole.
  - A 7/16" to 1/2" drill size will give you plenty of space for the m10 hardware.
- Remove all sound deadening from the affected area in a large enough area to not affect the internal plates. A hammer and chisel works well for this, cold helps it stay brittle.
  - Some tweaking of internal plates may help to ideally match your transmission tunnel. (VERIFY IF TRUE/NEEDED)
- We need to secure the capture plates to the interior walls of the transmission tunnel.
  - The extra m6 bolted positions are intended for this purpose. Note if you happen to be upgrading from a Samberg subframe and trans mount you can use your existing sandwich plates as we maintained the main interface positions.
- Once everything has been test fit with snug tight hardware and capture plates installed motor may be fully installed and everything torqued.
- Separate instructions for steering components are available on our website here: [http://www.roninspeedworks.net/index.php?route=information/information&information\\_id=7](http://www.roninspeedworks.net/index.php?route=information/information&information_id=7)

### Added Fitment Notes:

- This kit is intended to place the engine and trans fairly far aft (allows better weight distribution, clearance for the radiator and fan, as well as an optimal location for shifter vs. tunnel hole location). However, some additional clearancing for exhaust manifolds and/or headers may be required.
- For simplicity we've maintained the overall engine placement versus the Samberg performance subframe that Ronin sold for many years. However, it is nice to finally control our own destiny on these parts.
- The new transmission eliminates the Mazda Power Plant Frame (PPF) that formerly connected the FD transmission to differential. We offer several possible solutions for diff support ranging from OEM to Ford 8.8 alternatives.
- We recommend you maintain at least 5/32" clearance to the steering rack.



Finally, if you want a much longer winded read about all things related to swapping RX7's here's a link to my build thread on norotors: <http://www.norotors.com/index.php?topic=1274.0> It was written for an FC but a great many of the concepts apply and may help you think about this systematically.

I started playing with these cars and writing this thread back in 2005, long before Ronin ever existed. We launched Ronin partly because the other principals and I were dissatisfied with the offerings on the market and we wanted to make something better. We believe in these vehicles and we're proud to be part of this community.

Good luck and happy wrenching... Drop us a line if you need help.  
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-Joel Payne  
(for Ronin Speedworks, LLC)