

This guide is for using a generation 4 prius engine into a generation 3 prius body, and using the 4th gen EGR and Intake. If using the 3rd gen EGR and intake, [@Ragingfit](#) has an extensive 15 part youtube series that outlines the swap. This is written from memory so please let me know about any mistakes or things that can be improved. This is not a complete guide, and is mostly a summary of information from other users. A huge thank you for the contributions towards this topic from [@Ragingfit](#), [@Dave Hanson](#), [@cnc97](#), [@Sandog53](#), [@Mendel Leisk](#)

Background

2010-2014 have oil burning piston ring issues at high mileage. Also have head gasket issues at high mileage. The price of a 2016-2017 engine with low miles is often cheaper for most people than a used 2010-2015 engine. The 2016-2017 prius engines fit into any gen 3 Prius, Prius V, or Prius plug in, with modifications.

The engine in my 2014 plug-in hybrid blew a hole through the block at 94k miles unexpectedly. Decided to swap in a 2016 with 18k miles for \$1100 locally.

Ideas for places to buy an engine start with Car-parts, hollanderparts, or LKQ ebay. I believe any 2016 or 2017 engine with 5th digit vin A or B should work. Make sure it's from a Prius not a Prius C.

Tools needed

- Basic set of sockets, ratchets and wrenches. Lots of 10s,12s,14s,17s like all Toyotas. Plenty of extensions as well.
- Lisle toyota main fuel line disconnect tool
- Engine hoist (if you don't have one just go buy one from harbor freight for \$200)
- Some 12 point sockets for the flywheel bolts (14mm I think?)
- Several different pairs of pliers for grabbing various hose clamps.
- Flat head screw drivers for prying things.
- One or two decent propane torches, vice grips and pry bar.
- Car Jack and jackstands.
- 3/4 pex tee

Engine Removal

Not going to go into detail, key points are:

- Remove the under tray, windshield wiper tray, and just go ahead and remove the hood. It's not necessary to remove the hood I believe but it will make things slightly easier.
- Leave the wire harness in the engine bay and just disconnect all sensors on the engine.
- Unbolt the 3 AC compressor bolts and pull it out of the way. But leave it in the engine bay
- Engine can be removed with intake on, exhaust manifold on, and water pump removed. Water pump is removed to allow more space between the engine and the frame rail for the engine to pull out of the transmission.

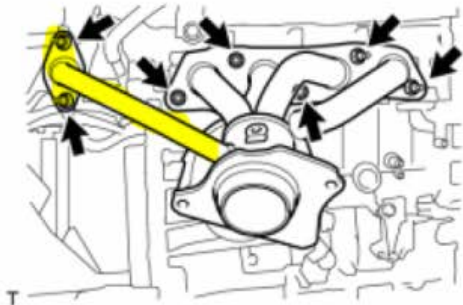
Engine Prep

Damper Swap

- Once the engine is removed from car, swap over the Gen 3 flywheel/ damper. 6 bolts of the damper and 8 bolts on the flywheel. Use locktite on the flywheel bolts because they used locktite when installing so it doesn't hurt. Haynes Manual says torque spec on the 8 flywheel bolts is 140ft/lbs, and torque spec on the 6 damper bolts is 22ft/lbs. The 4th gen flywheel cannot be used, the splines are larger.

Exhaust Swap and EGR tube bend

- Swap over the gen 3 exhaust manifold. It all lines up, except for the EGR tube to line up to the 4th gen egr. That tube must be bent (Pictured in yellow below, photo credit Mendel Leisk) .



(a) Install 2 new gaskets and the exhaust manifold with the 7 nuts.

Torque: 21 N·m (214 kgf·cm, 15ft·lbf)

Make sure the 4th gen egr is bolted to the engine first. There are several methods to bend the egr pipe, 1 is to bolt the manifold up to the engine, and then heat and bend the pipe in two places to make it fit the egr cooler flange, and then bolt it up. Switch the egr studs for bolts to make installation easier. 2nd method is to bolt the egr tube up to the 4th gen egr cooler, and then heat and bend it so it bolts up with the exhaust ports. The EGR tube on the exhaust manifold needs to get properly

hot, I needed to use two propane torches to do it, and I had to move mine to a vice to bend with a prybar.

Intake

Choose to either swap over 3rd gen intake, or keep 4th gen intake. The egr tubes line up from the 4th gen egr to the 3rd gen intake. I personally found it easier to swap over to 3rd gen intake for several reasons. They are outlined below. The intake can be installed before or after engine installation, it doesn't make either process any easier or more difficult.

If swapping to 4th gen intake-

- If using the 3rd gen wire harness the loom for the fuel injectors must be deloomed and the wires going to the throttle body need to be extended a bit to reach the new location. The 3rd gen map sensor plug needs to be depinned and replaced with the 4th gen map sensor plug, as well as rerouted to the new location for the 4th gen map sensor. (this could probably be done by delooming most of the harness and moving the wires over, or by cutting and extending the harness). The 4th gen MAP sensor has 3 wires in the plug, and the 3rd gen MAP sensor has 4. That sensor gets in the way of the 3rd gen air box, and so needs to be slid out of the way and to the side. The mounting bracket for the 4th gen map sensor on the 4th gen intake needs to be cut off to allow for the 3rd gen intake.
- The vacuum switch going to gas tank that is attached to the intake is in different places on the 4th and 3rd gen intakes. The 4th gen location of the vacuum switch interferes with the 3rd gen air box. The bracket that the vacuum switch is attached to must be removed and the vacuum switch must be located in a different spot. The wire harness may need to be deloomed and extended for the vacuum switch plug to reach. Reconnect the vacuum tube to where it is supposed to go - I needed to use a 6inch metal pipe in order to attach the two tubes.
- A piece of the air snorkel needs to be trimmed to make the 3rd gen air box fit.
- The third gen air box loses a mount on the 4th gen intake, so an L bracket should be added to allow for the air box to have at least two mounting points.

If not swapping to 4th gen intake-

- Everything seems much easier. All the wires should reach their original locations on the intake. 3rd gen air box mounts to intake. I recommend removing 3rd gen intake and cleaning thoroughly, Mine was filled with an oily sludge. The 3rd and 4th gen throttle bodies are identical, just rotated. Use whichever you have.

Swap over 3rd gen engine mount that bolts to engine

- 3 or 4 bolts on the engine mount. Haynes Manual says bolts are torqued to 44ft/lbs.

Extend temp sensor wires on wire loom.

- Before installing the engine, extend the wires for the temp sensor by the cylinder head water connections, either by delooming and pulling out the wires or by cutting and extending. It's easy to reach while the engine is out and possible but harder to do while the engine is in.

Dipstick tube

- The 4th gen dipstick tube gets in the way of the 3rd gen airbox. It is recommended to swap over to the 3rd gen dipstick tube, however just bending the 4th gen dipstick tube slightly will allow it to fit.

Consider cutting and teeing into the water tube that runs to the egr - easier to do outside of the engine bay.

Notes: I reused all of the old gaskets, for exhaust, egr, intake manifold, and throttle body with no issues. They're all high quality gaskets that should be fine.

Engine Install

Install with the water pump removed, intake manifold connected, and exhaust manifold connected. Be careful for the exhaust manifold clearance on the windshield, I found it to clear easily however. Use a hoist and lower it in slowly.

Bolt up to trans using 8 bolts (There is a space for a 9th on the top that seems to be unused on the prius) , then reinstall lefthand engine mount that bolts to frame rail (which I removed when removing engine)
Bolt it all up and get it seated, Unhook from the hoist.

Rebolt the AC compressor to the engine using the 3 bolts.

Reinstall water pump

Install Fuel Line

Slap wire harness back onto the engine, and start plugging stuff in.

Plug in all the fuel injectors, water pump, ac compressor, and whatever that little white plug for a sensor is underneath the intake. There is a small oil pressure level sender on the bottom of the engine on the 4th gen that is not on the 3rd, simply ignore it.

Plug in all the coil packs, other sensors, and sensors on the rear like the oil pressure sensor.

Repin egr using this diagram, Red and purple wires are switched on 4th gen egr valve compared to 3rd gen
Red / purple

Switched

Before picture



image credit Mendel Leisk

The two grounding connections by the fuel injector plugs should be drilled out to fit a larger bolt and then bolted onto the engine.
(Circled in red)

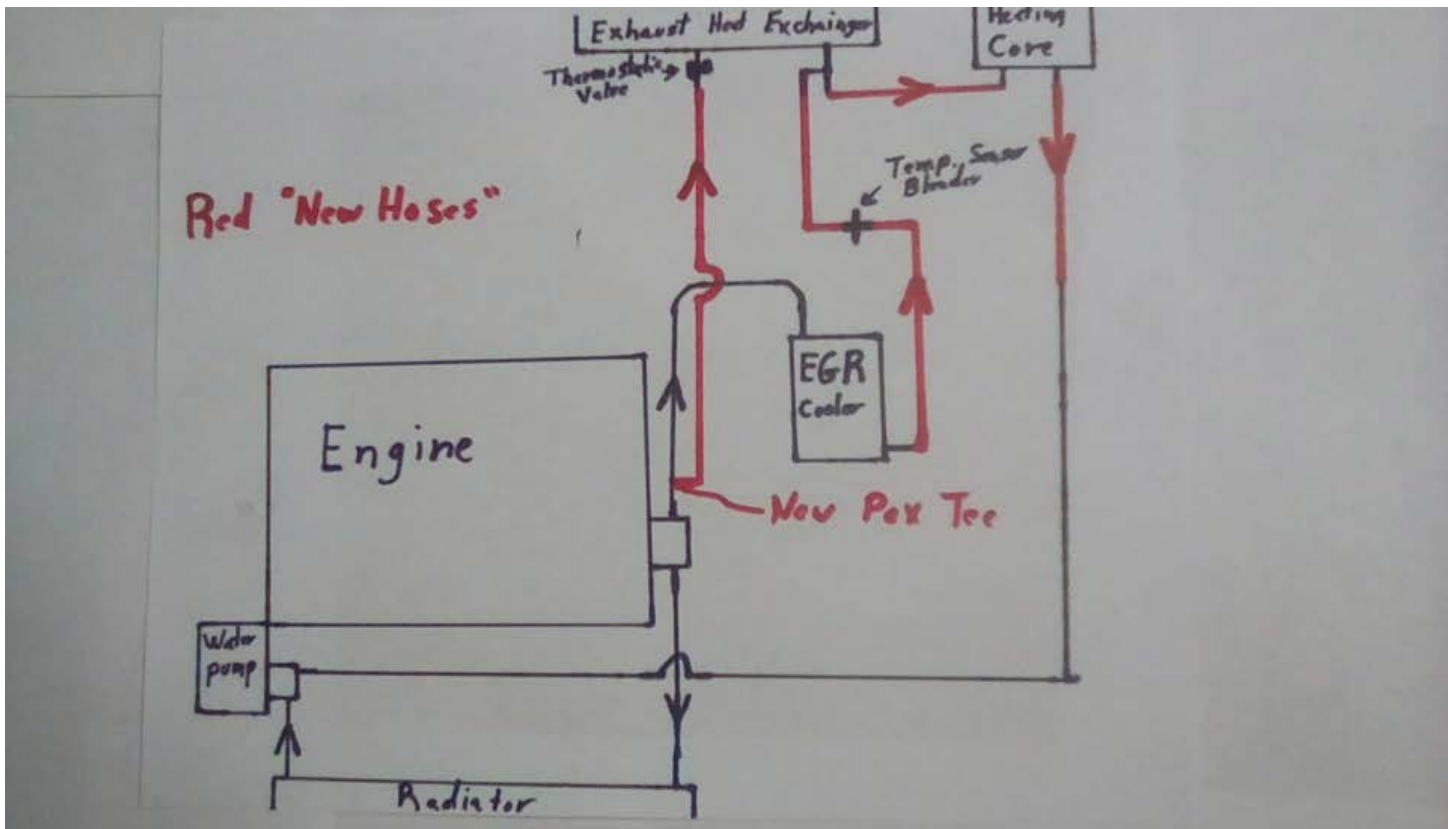


Connect the Main lower radiator tube to the engine - a roughly 6" section of straight metal pipe is needed to fill the gap between the tube and the new outlet. I cut the old bendy tube and used that rather than buying a new tube (as pictured). Sometimes the new engine will come with the tubing piece that hose is connected to, in which case that can be used instead.

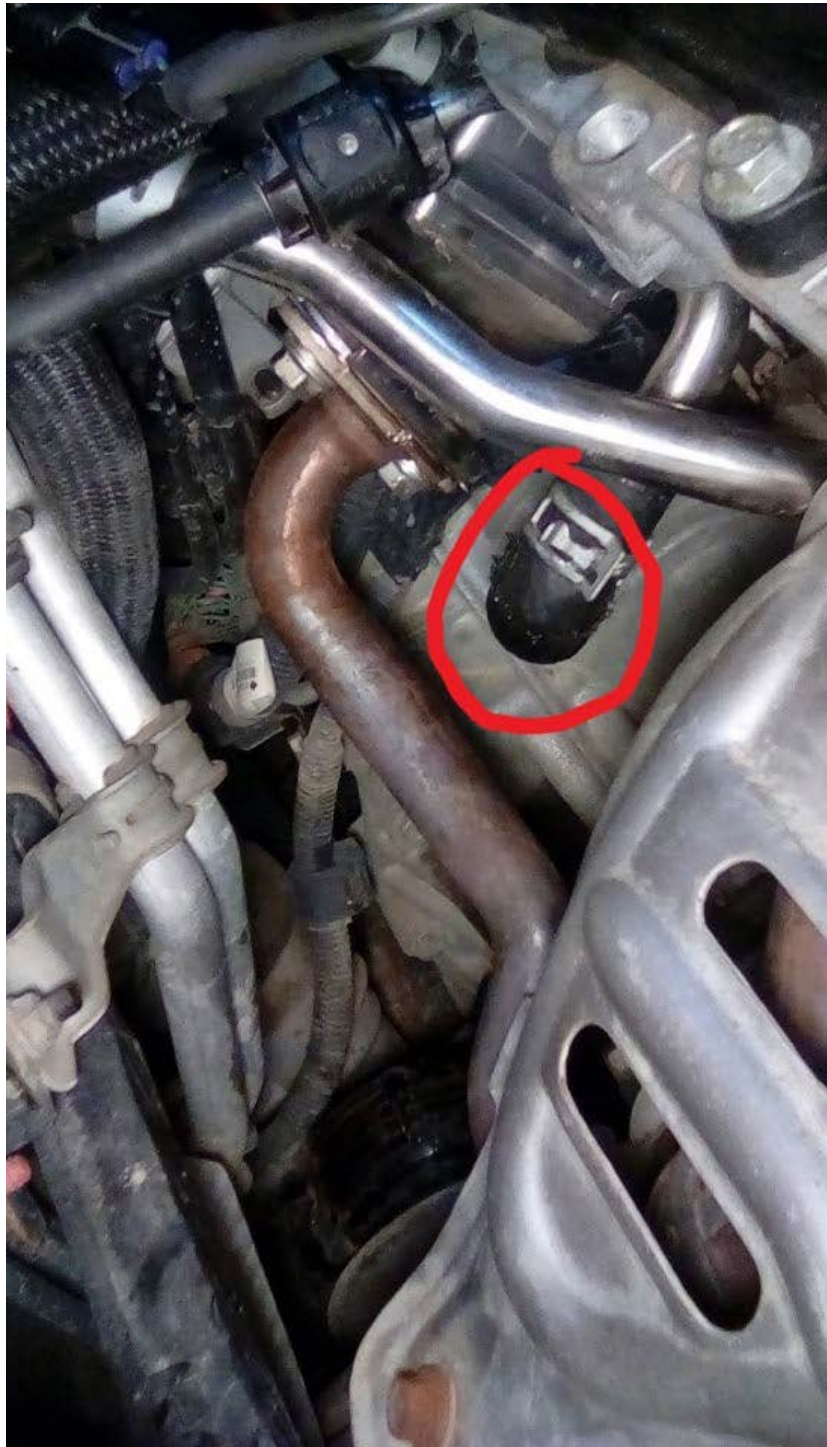


Connect the hosing connections around the rear. This can be the most confusing part of this swap.

- Key factor to consider - The EGR and the Exhaust HX must be routed in parallel, and then run to the heater core. This is how it's routed originally on the 3rd gen and this is how it needs to be modified to do. After the heater core the tubing connects back to the engine or something.
- There is already a tee lower down on the Exhaust HX piping. Add the new egr tube tee and route that to the intake of the Exhaust HX. Move the temp sensor(/bleeder on the 2010-2012 models) to the new line from the egr cooler to the exhaust hx intake pipe. The exhaust HX to heater core pipe was existing for me.
- Use this diagram from Dave Hanson : It is extremely helpful. (If using the 3rd gen egr, diagrams from ragingfit may be used). Red lines are new hoses black lines are existing. I believe the hose going from the exhaust HX to the Heater core was existing for me and did not need to be modified.



- In my case, the coolant tube going from the cylinder head to the egr came very close to the newly bent egr exhaust tube, as pictured. (coolant tube circled in red) I wrapped it with aluminum tape in order to hopefully help keep it cool. Picture Cred



goes to Dave Hanson as well.

Reinstall 3rd gen air box and air nose box, mounting where possible.

Reconnect Exhaust manifold to the rest of the exhaust. Use zip ties to compress the springs on the bolts for the flange when installing, then cut the zip ties once the bolts are tightened.

Once all the plugs are plugged in, fill the system up with coolant. Lift the reservoir up in order to help bleed, as done by [@Ragingfit](#). Check the engine for oil, and make sure its filled. At this point you could probably just plug the battery back in, plug back in the hybrid battery, and start the car. To start the ICE, either put the car into maintenance mode or turn the car on and put the heat and fans on the highest setting. This causes the ICE to turn on to heat the heater.

Hope everything works.

Fun facts: the engine only weighs about 200-250lbs, so it's fairly easy to maneuver or drag around.

Other useful forums :

[Swapping in a Gen 4 Prius' 2ZR Engine into the Prius v | PriusChat](#)

Swapping in a Gen 4 Prius' 2ZR Engine into the Prius v by Tideland Prius

[Gen4 to Gen3 engine swap using gen 4 intake and egr, DONE! | PriusChat](#)

Gen4 to Gen3 engine swap using gen 4 intake and egr, DONE! by Dave Hanson

Torque Specs as provided by [@Ragingfit](#)'s Hanes Manual

Torque specifications	Ft-lbs (unless otherwise indicated)
Note: One foot-pound (ft-lb) of torque is equivalent to 12 inch-pounds (in-lbs) of torque. Torque values below expressed in inch-pounds, because most foot-pound torque wrenches are not accurate at these smaller values.	
Camshaft bearing cap bolts	
2009 and earlier	
Number 1 journal	17
All others	110 in-lbs
2010 and later	
Bearing cap-to-cylinder head bolts	20
Bearing cap-to-camshaft housing bolts	144 in-lbs
Camshaft housing-to-cylinder head bolts	20
Camshaft sprocket/timing gear bolts	
2009 and earlier	47
2010 and later	40
Crankshaft pulley/vibration damper bolt	
2009 and earlier	95
2010 and later	140
Cylinder head bolts	
2009 and earlier	
Step 1	21
Step 2	Tighten an additional 90 degrees
Step 3	Tighten an additional 90 degrees
2010 and later	
Step 1	36
Step 2	Tighten an additional 90 degrees
Step 3	Tighten an additional 45 degrees
Damper-to-flywheel bolts	
2009 and earlier	15
2010 and later	22
Drivebelt tensioner bolts (2009 and earlier).....	
30	
Driveplate/flywheel bolts (use locking compound on threads)	
2001 and 2002	
Step 1	62
Step 2	Tighten an additional 90 degrees
2003 and later	
Step 1	36
Step 2	Tighten an additional 90 degrees
Engine mount bolts	44
Engine mount bracket-to-timing chain cover bolts (2009 and earlier)	35
Exhaust manifold fasteners	
2009 and earlier	20
2010 and later	15
Exhaust manifold heat shield bolts	
2009 and earlier	71 in-lbs
2010 and later	108 in-lbs
Exhaust pipe-to-manifold bolts	32
Intake manifold fasteners	
2009 and earlier	15
2010 and later	21

Pic of my finished swap



I will continue to update this thread as necessary.

[#1 Alexander D, Today at 12:16 PM](#)

Last edited: Today at 12:31 PM