

FieroAustin

Background

Prepared for [NIFE](#) February 2024

This document is uncontrolled and links may be subject to change.

FieroAustin - About

- 88 GT w/ a 3800 Series III Supercharged Engine
 - Intercooled, E85, posi, headers, XPZ camshaft, 2.55" pulley, etc.
- Saw first Fiero at 10 years old and had to have one since!
- Bought from a pawn shop
- Making videos since Jr. High



FieroAustin



FieroAustin - Other Projects



FieroAustin - Vertical Doors claim to fame!

- [Vertical Doors Installation video](#)
- Negotiated dealer discount - promo code “7979” for 30% off Fiero lambo doors at www.verticaldoors.com



FieroAustin - 3800 Swap claim to fame!

- 3800 Fiero Swap Instructions, est. 2017
 - All years 3800/Fiero Engine/Transmission variants with low cost **or** all-out performance builds (not series 1)
 - Near all optional 3800 performance mods **AND** repairs
 - Step-by-step guide with:
 - All parts needed
 - Videos & info on every step
 - Pictures & diagrams
 - Wiring & other routings
 - Torques & torque sequences
 - Other parts, my mods, tools, links, new vids, etc.
 - Currently actively improved
 - Customizable Build Sheets
 - YouTube Swap Playlist

Welcome to the One-Stop-Shop for modifying a 3800 engine and then also swapping it into a Fiero! You will likely not come across a more thorough collection of 3800 information, parts, diagrams, instructions, or videos than here.

[CLICK HERE TO DOWNLOAD A PRINTABLE/MOBILE FRIENDLIER VERSION](#)

TO SEARCH THIS PAGE, PRESS ctrl F (PC), command F (mac), or tap *** and "Find In Page" (mobile)

[CLICK HERE TO VIEW MY AMAZON STOREFRONT WITH LISTS OF MOST OF THESE PARTS](#)

[CLICK HERE TO VIEW NON-FIERO RELATED 3800 MODS ON AMAZON](#)

FOR CONSULTING, TIPS, AND ADVICE, contact me on Facebook at <https://www.facebook.com/FieroAustin/> or email me at fieroaustin@protonmail.me

Consider joining the 3800SC/3800 Fiero Swap Page Facebook group: https://www.facebook.com/gr...800_Fiero_Swap_Page/
Check out this information directory here for people who sell parts: <https://www.facebook.com/groups/12527463171014991>

James L. Brown (Tennessee), Trent Els (Florida), and Mitchell Davies (Ontario) charge you to do 3800 swaps for you.

What this thread is: A suggestion for a complete and/or modified 3800 Series II or Series III Fiero swap guide, with a **3800 Wear Part Repair Guide**. There are two COMPLETE ENGINE BUILDS detailed here:


1. A cheap and easy Series II direct drop-in swap (**build 1**)
2. An all-out modified Series III build including changing camshafts (**build 2**)

What this thread is NOT:

- A pricing guide (though I try to find the best prices on Amazon)
- A 3800 fix swap guide, though you will find MUCH overlap
- A computer (PCM/ECU) reprogramming or tuning guide (TBD)
- A guide for any car but a Fiero, though you will find virtually all 3800 modifications and repairs here
- A Fiero Repair Guide

All videos available in this playlist here - https://www.youtube.com/playlist?list=PL412a2nkff2RIPW8_0

VIDEO: GUIDE TO THIS BUILD THREAD:
https://www.youtube.com/watch?v=2nkff2RIPW8_0&index=1



CONTENTS:

- 1. How to pick out parts for your build: 3800 Performance and Specs of historical swaps
- Modification Selection Chart
- Camshafts
- Quarter Mile Times
- Dyno Wheel Horsepower
- Common Modifications
- Differences between 3800 Engines
- Transmission Options
- Wet Sump 2 and Gen 5 supercharger specs
- Miscellaneous Discussion

[FieroAustin](#) - Other Videos / Modifications (as of 2023)

Parts available in video descriptions & [Amazon store](#)

- [Vertical Doors](#)
- [3800 Swap](#)
- [Tools](#)
- [Sail Panels](#)
- [Shocks](#)
- [Mirror Motors](#)
- [3800 Overdrive Balancer / AC Bypass](#)
- [87-88 Headlights/Door Switches/Badge](#)
- [Heartland Fiero Show prep](#)
- [Bluetooth/AUX OEM style Radios](#)
- [Radiator](#)
- [Speakers](#)
- [Tires & Tire Paint](#)
- [Struts](#)
- [Exhaust Tip Shield, Console Tray, Switch Plate, Ash tray door, Seat Mechanism Cover](#)
- [88 Rear Suspension Bushings](#)
- [2022 Projects](#)
- [3800 Sealing Head Studs](#)
- [Window Switches](#)
- [GT Tail Lenses](#)
- [Turbo Sunbird Tachometer for boosted cars](#)
- [Brake Booster Upgrade](#)
- [Dew Wipes/Window Felt Guides](#)
- [Slim Popup Headlights](#)
- [GT Chin Spoiler](#)
- [Steering Wheel](#)
- [All Mods as of 2022](#)
- [Drag Racing Prep](#)

[Check back for new how-to videos by subscribing here and enabling notifications!](#) - 3800 Intercooler, E85 Conversion

[FieroAustin](#) - Web Stores & Parts Lists

Affiliate Links: I earn a commission on sales if links I provide are used.

- [3800 Fiero Swap Instructions](#) | [YouTube Swap Playlist](#)
- [Amazon Online Store Lists \(Click here to see all\)](#) - I try to find best deals on Amazon.
 - [Fiero Repairs](#) | [Fiero Mods](#) | [Fiero Drag Racing](#)
 - [3800 Wear Parts](#) | [3800 Repairs](#) | [3800 Swap build 1](#) | [3800 Swap build 2](#) | [3800 Mods](#) | [3800 E85 Conversion](#)
 - [Car Tools](#) | [Shop Tools](#) | [Consumable Car Hardware](#) | [Car Washing](#) | [Electrical Tools](#) | [House Project & Outdoor Tools](#)
- [eBay \(ZYP's store for example\)](#)
- [FieroAustin How-To videos Playlist](#) - Videos always have parts list in description!
- [Vertical Doors](#) - Use promo code "7979" for 30% off Fiero lambo doors at [verticaldoors.com](#)
- [Paypal](#) - Consulting & Tips

Amazon Online Recommendation Store Lists:

www.amazon.com/shop/FieroAustin

FieroAustin - Contact / Support

- Facebook
 - Contact/consulting: www.facebook.com/FieroAustin
 - Join supporters group: www.facebook.com/becomesupporter/FieroAustin
- YouTube
 - Channel: <https://www.youtube.com/FieroAustin>
 - Join supporters group: <https://www.youtube.com/channel/UCO4TFnFs99jd4U02QhkUsDA/join>
- Email
 - FieroAustin@proton.me
- Paypal
 - Send me tips for consulting! <https://www.paypal.com/donate/?business=8AFWKBTBVSKTJ>
- Amazon
 - www.amazon.com/shop/FieroAustin
- Pennock's Fiero Forum 3800 swap instructions (reply to the thread or PM me)
 - <https://www.fiero.nl/forum/Forum2/HTML/139530.html>

Fiero Cooling System Repair & Modification

By [FieroAustin](#)

Prepared for [NIFE](#) February 2024

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Contents

- Other Cooling System Articles
- Cooling System 101
- Diagnosis and Repair
- Upgrades
- Questions
- Contact

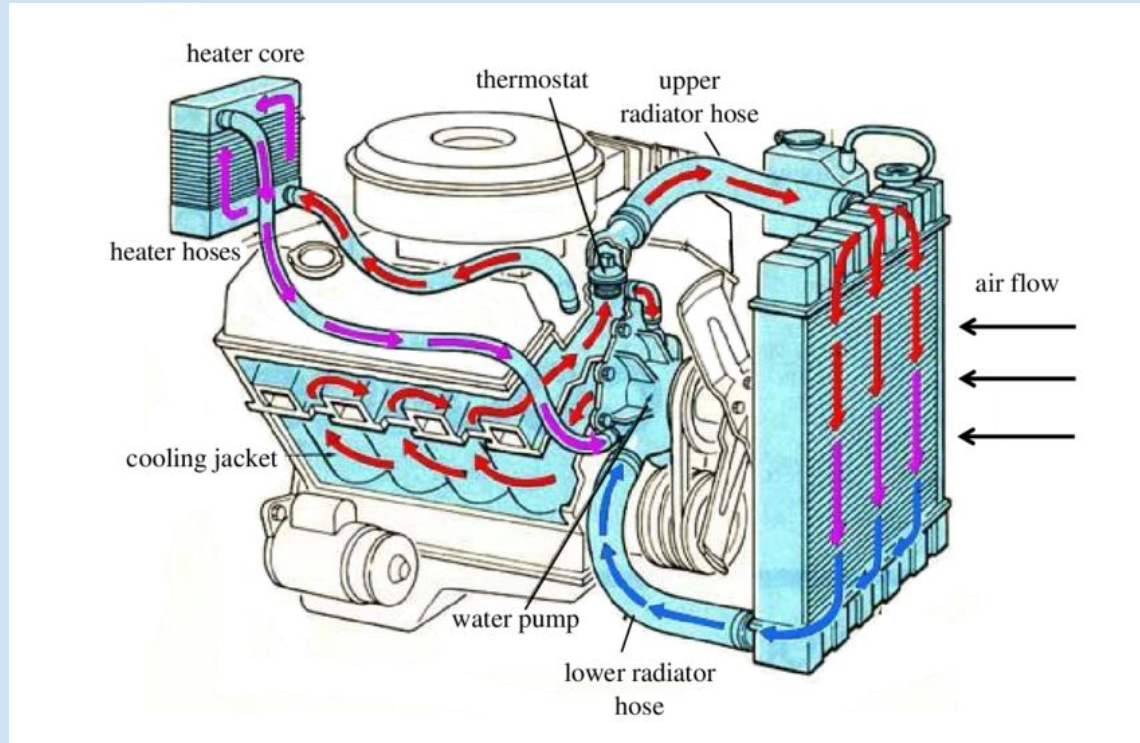
Other Cooling System Articles

This presentation will not cover the following topics, as these writeups are already excellent!

- The Pegging Temperature Gauge Fix: <https://www.fierofocus.com/articles/Tempgauge%20Tech%20Tip%20-%20MI%20Fiero%20Club.htm>
- Coolant Temperature Sensor (CTS): https://www.fierofocus.com/Tech%20Tips/Pdf's/Tech/Coolant%20Temperature%20Sensor%20_CTS_.pdf
- Changing the Water Pump, Filling/Burping, Venting, Radiator Caps: <https://www.fierofocus.com/Past%20Meeting%20Presentations/Cooling%20Systems.pdf>
- Changing the V6 Water Pump: <https://www.mtritter.org/fiero/fierohelp/waterpump.html>
- Coolant sensors/switches: https://www.fierofocus.com/articles/tt-clt_sens.html
- Coolant Empty, Flush, Fill Process: <https://www.mtritter.org/fiero/fierohelp/coolant.html>
- Coolant Hoses: <https://www.fierofocus.com/articles/0502%20CoolantHoses.htm>
- Online Service Guide: <http://www.calgaryfieros.com/OSGdocs/cooling-system.html>
- A Plug for Draining Coolant: <https://www.fierofocus.com/articles/Tech%20Tips%20-%20Christopher%20Sass.htm>
- Adding a Low Coolant Indicator: <http://www.fieros.de/en/articles/lowcool.html>
- Coolant fan switch: <https://web.archive.org/web/20171004115648/http://paulvargyas.com/techtips.htm#Coolant%20Fan%20Switch>
- Cooling Myths: <https://web.archive.org/web/20021211061742/http://www.gemair.com/~phorine/Articles-CoolingMyth.html>
- Code 14: <http://www.fieros.de/en/v6help/code14.html>
- Code 15: <http://www.fieros.de/en/v6help/code15.html>

Cooling System 101

- Engine runs
 - Belt drives coolant pump
- Engine heats up
- Thermostat opens at $\sim 195^{\circ}\text{F}$
- Coolant circulates in loop
- Radiator cools coolant
- At set temperature, fan turns on & draws more air through radiator, increasing cooling
 - Could be clutch, electric, or direct drive (always turning)
 - Turns off once temperature is lowered enough
- Some coolant diverted to Heater Core
 - Blower motor forces air thru
- Repeat



Belt drive cooling system diagram courtesy of ResearchGate

Cooling System 101: Symptoms of Issues

- Overheating (230F+)
 - Warped engine block, unsealed head gasket/leaks
 - Light brown frothy oil, white exhaust smoke
- Will not warm up (stuck thermostat)
- Coolant discolored, thick, smelly (old or mixed improperly)
- Low coolant pressure (<13 PSI)
- Fans will not turn on
- Gurgling/Surging (coolant low or system needs burping)
- Leaks
- Engine codes
- etc.

Diagnosis and Repair - Quick Tip

Overheating?

Turn the heater on full to get home!

This is a secondary radiator!

Slowly leaking coolant?

Just add distilled water! (Unless below freezing)

Need help on a repair? Try the [Fiero Factory Service Manuals!](#)



Heater on high

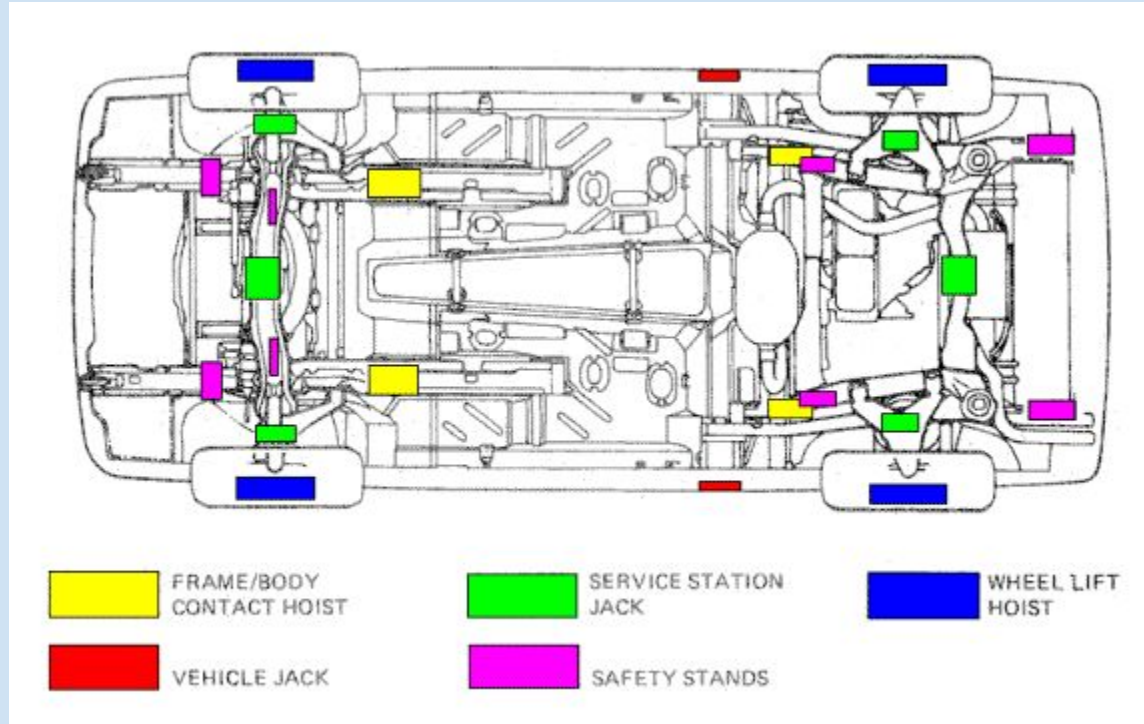
Diagnosis and Repair - Crushed Tubes From Jacks

- Rodney's replacement tubes (he is retiring, so grab them fast!)
 - [84-87](#)
 - [88](#)
 - [Installation Tips](#)
- Rodney's Kits
 - [Coolant Tube Patch Kit](#)
 - [Coolant Tube Repair Kit](#)
- Fiero Store 85-87 Manual Drivers' side tube
 - [85-87 heat coated](#)
 - [85-87 stainless](#)



Crushed tubes from jacks

Diagnosis and Repair - Crushed Tubes From Jacks



Safe Jack Points - [Fiero Ogre's Cave](#)

Diagnosis and Repair - Worn Baffles/Seals

- [Fiero Store Upper Radiator Seal](#)
- [Fiero Store Aero nose seal set](#)
- [FieroAustin installation video](#)
 - Parts and tools in video description!

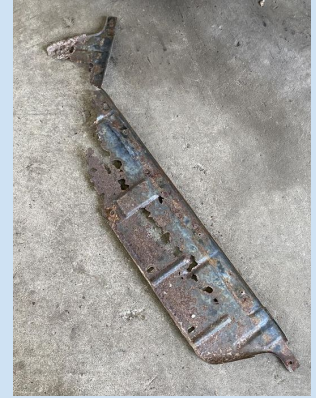


Radiator Seals

Diagnosis and Repair - Air Dam / Deflector

Are they there and in good shape?

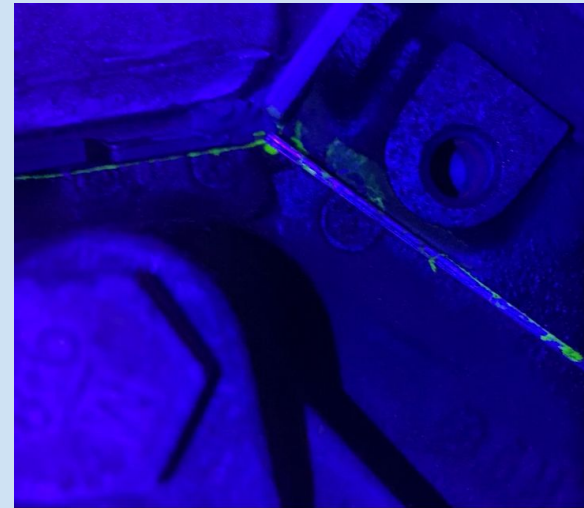
- [Fiero Store Air Dam](#)
- [The Fiero Factory Used Parts](#)
- Junkyards: <https://car-part.com/>
- Tip: The factory front license plate cover could restrict airflow.
Consider one like in [FieroKyle's video](#)



Air dam and deflector

Diagnosis and Repair - Leaks

- Checks
 - Hose Connections/Clamps/Radiator
 - Petcock Radiator Valve
 - Radiator Cap - [Gates 31528](#)
 - [Coolant Overflow Tank](#)
- Ultraviolet Dyes:
 - [UV Flashlight](#)
 - [Coolant Dye - GM 12378563](#)
 - [Fuel/Oil/Power Steering/Transmission Fluid Dye - ACDelco 1148963](#)
- Other Parts:
 - [Rodney Dickman's](#)
 - [The Fiero Store](#)



[UV Coolant Dye](#)

Diagnosis and Repair - Fan Motor / Relays

Radiator fan motors

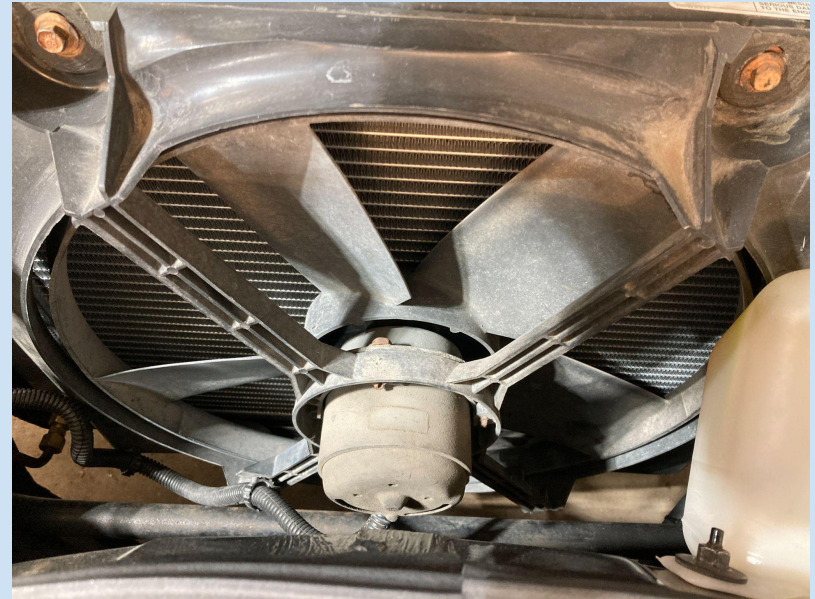
- 84 - [Four Seasons 35694](#)
- 85-88 with A/C - [Four Seasons 35656](#)
- 85-88 without A/C - [ACDelco 15-80051](#)

Radiator Fan Relays

- 84 - [Standard Motor Products RY83](#)
- 85-87 - [Standard Motor Products RY113](#)
- 88 - [Standard Motor Products RY109](#)

Blower (Heater / A/C)

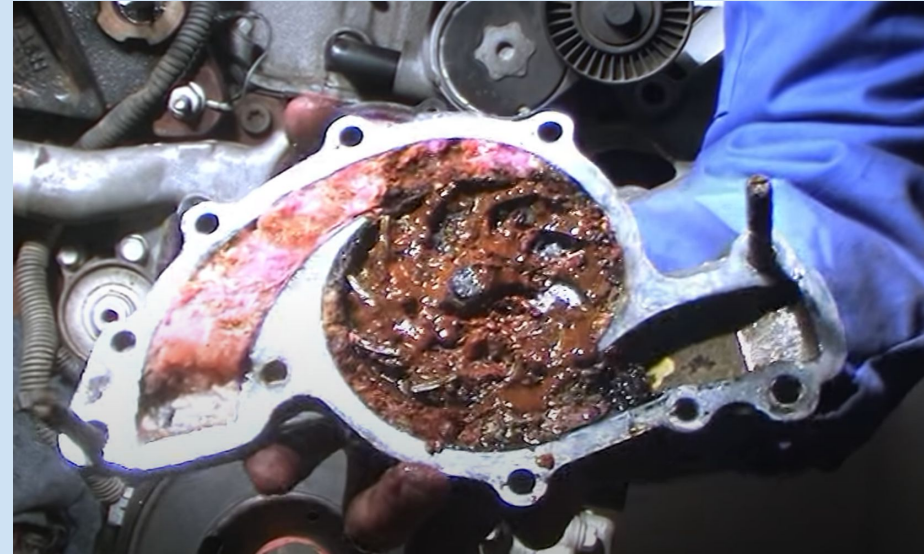
- Motor 84-88 - [Four Seasons 35582](#)
- Relay 84-88 - [ACDELCO 15-81090](#)



Fiero Radiator Fan

Diagnosis and Repair - Clogged or Bad Pump

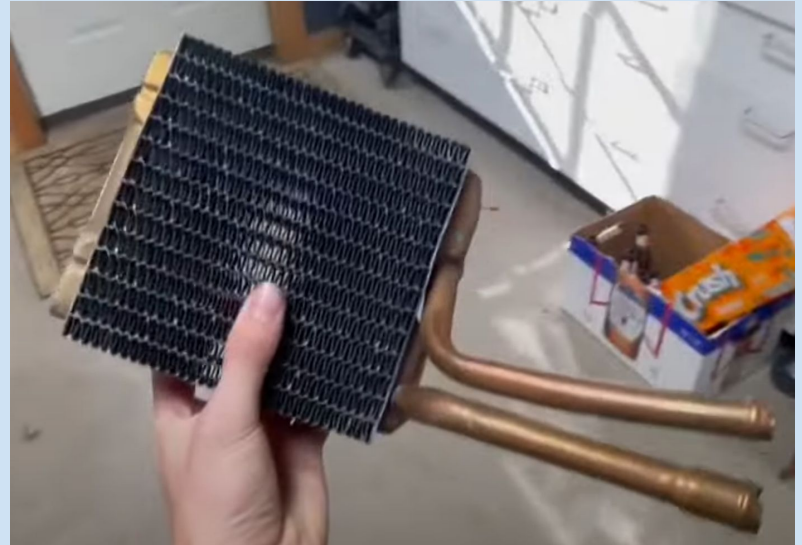
- Causes:
 - Old Coolant
 - Cooling System Stopleak
 - Mixing incompatible coolants
 - Kids dropping gifts in your tank
 - Pump going out
- Pump Kits:
 - [4cyl - GMB/FVP 1301050](#)
 - [6cyl - US Motor Works US5001](#)
 - [3800 - US Motor Works US5075](#)
 - [Metal Gasket - Fel-Pro 35804](#)



[LostNotForgotton's video](#)

Diagnosis and Repair - Heater Core

- [FieroKyle's Heater Core Video](#)
 - With A/C - [Spectra Premium 94498](#)
 - Without A/C - [Agility 9010204](#)



[FieroKyle's Heater Core Video](#)

Diagnosis and Repair - [Radiator](#)

- Look under the front bumper or hood!
 - A/C Condenser in front for A/C equipped cars protects the radiator but could be damaged/blocked
- Clean out
 - Blow out from rear if possible
- Bend fins back with a pen if possible
- Small leaks repairable by shop
- If all else fails, replace...
 - [Replacement Standard Radiator](#)
 - See next slides for upgrades



Radiator Fins

Diagnosis and Repair - Other Parts

- [Rodney Dickman's](#)
- [The Fiero Store](#)
- [RockAuto](#)
- [Amazon](#)

Upgrades - 3 Row Radiator Upgrade vs. OEM 2-row

- Champion 3-Row Radiator
 - Only modification: trim lower rubber mounts
 - Same install process as OEM otherwise
 - Auto works for manuals - leave transmission cooler holes plugged
 - 50% more fins than OEM
 - Similar price as OEM - a no-brainer!
- FieroAustin installation video
 - Likely to snap lower transmission oil line; spray with [Kroil](#) penetrating oil several days in advance!
 - [84-87](#) | [88](#) Replacements
 - OR [Union](#), [Cutter](#), & [Pre-Flared Line](#)
 - Parts in video description
- Cheaper 3-row radiators
 - You get what you pay for!
 - [Listing 1](#) | [Listing 2](#) | [Listing 3](#) | [Listing 4](#)

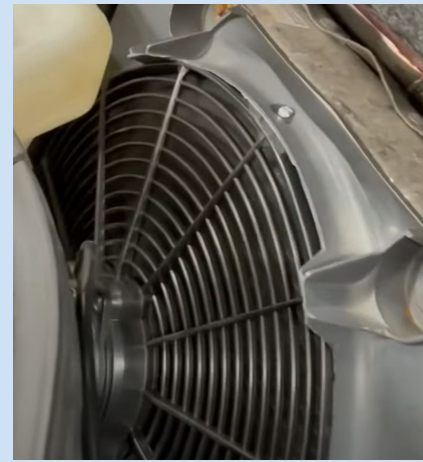


Champion 3-Row Radiator

Upgrades - Fan

- 8 Blade 16" Plastic Fan
 - [Proform 67016](#)
 - [FieroKyle's install video](#)
 - Cuts old fan housing

- 6 blade 16" Metal Fan
 - [Permacool 19115](#)
 - [FieroJoe's Instructions](#) (loads slowly)
 - Cuts old fan housing



[FieroKyle's Proform fan](#)



[FieroJoe's Permacool fan](#)

Upgrades - Hood Vents

- Vents air thru hood vs. under car
- Increases air thru radiator
- Headlight covers won't pop up at 115+ mph
- Keeps front wheels on ground at 150+ mph
- Parts:
 - [Trans Am/Firebird](#)
 - Simple install (cut two holes)
 - [Paul Angel's hood vents](#)
 - imthadriver@gmail.com
 - Difficult
 - Cut a hole, bend down, glass in



[Trans Am/Firebird](#)



[Paul Angel's "STM"](#)



Cut, bent, and
glassed

Upgrades - Electric Water Pump*

- Cools engine faster at idle
 - Spins at a constant RPM instead of with the Engine RPM
- Saves parasitic HP loss
- [Meziere's WP140 3800 Electric Pump](#)



[Meziere 3800 Electric Pump](#)

“Upgrades” - Underdrive Pulleys

- Decreases water flow and parasitic HP loss
- Water Pump Pulleys
 - Rodney's 2.8L underdrive kit - [88](#) | [85-87](#)
 - [ZZP 3800 8% Underdrive](#)
 - [Smoothflow 3800 Aluminum X% Underdrive](#)
 - Will make custom, maybe even OEM Fiero pulleys. Contact sales@smoothflowpulleys.com
- Accessory Belt Balancer Pulleys
 - [Dayco 3800 10% Underdrive - PBU81461SS10](#)
 - Underdrives pump, alternator & AC compressor
 - SFI rated, better than OEM balance
 - [Dayco 3800 5% Overdrive supercharger - PBO81461SC5](#)
 - [See my video for installation and parts!](#)



[Smoothflow Pulley](#)



[Dayco 3800 Underdrive Balancer](#)

“Upgrades” - Coolant

- Factory Fiero Coolant (green)
 - ~2 year / ~50,000 Miles
 - Crystalizes
- Factory 1995+ GM/3800 Coolant “Dexcool” (orange)
 - ~5 year / ~150,000 Miles
- Newer Universal coolant (typ. yellow) - Peak PXA0B3
 - ~10 year / ~300,000 miles (“Lifetime”)
 - Usually safely mixes with other colors!
 - Not significantly more expensive
 - Ideal if you can not completely flush your old system and change coolant color or do an engine swap
- Brief article on different colors
- 14L to fill up a Fiero! (Need at least two 1-gallon full strength/concentrate jugs before diluting)
- Tip: Antifreeze freezing point tester - Peak PKFOAB
- Tip: For intercooled cars, use different colors so you can tell which is leaking



Yellow Universal Antifreeze

“Upgrades” - Lower Temperature Thermostat

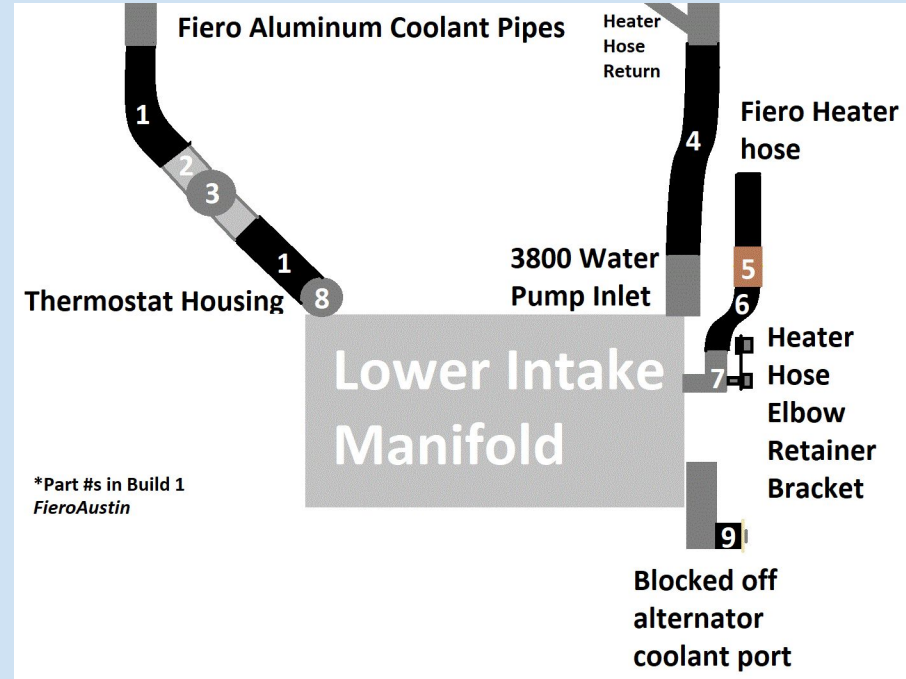
- Typical 195° from factory (can fail & be replaced)
- 180° common replacement
 - [OEM Fiero \(Motorad 211-180\) | 3800 \(Gates 33428\) | 3800 w/hole \(MotoRad 239-180\)](#)
 - Thermostat opens earlier to allow colder coolant flow
 - Can reduce knock (KR) by keeping block cooler, but nearly zero HP gains
 - **Does little on a hot day unless you:**
- Lower radiator fan set points
 - Replace fan switch on OEM Fieros
 - [Rodney's 195/185 plug and play fan switch](#)
 - [185/175 Colder. spade terminal Speedmaster PCE184.1001](#)
 - OR reprogram engine swapped PCM
- 160° not personally recommended
 - Cold oil loses lubrication performance
- Tip: Drill small hole/get thermostat with hole for easier burping
 - Could cause longer warm up, P0128 code, & slight warm up power loss



Left - [Rodney's Fan Switch](#)
Right - [3800 Thermostat with hole](#)

Upgrades - [3800 Swap](#) Cooling System Setup

- Old OEM radiator can be insufficient for engine swaps
- See the “Coolant and Hoses” section in the [3800 swap guide](#)



3800 87-88 Fiero Cooling System Diagram
Part numbers in [3800 swap guide](#)

FieroAustin - Contact / Support

- Facebook
 - Contact/consulting: www.facebook.com/FieroAustin
 - Join supporters group: www.facebook.com/becomesupporter/FieroAustin
- YouTube
 - Channel: <https://www.youtube.com/FieroAustin>
 - Join supporters group: <https://www.youtube.com/channel/UCO4TFnFs99jd4U02QhkUsDA/join>
- Email
 - FieroAustin@proton.me
- Paypal
 - Send me tips for consulting! <https://www.paypal.com/donate/?business=8AFWKBTBVSKTJ>
- Amazon
 - www.amazon.com/shop/FieroAustin
- Pennock's Fiero Forum 3800 swap instructions (reply to the thread or PM me)
 - <https://www.fiero.nl/forum/Forum2/HTML/139530.html>