

500 cid Caddy Engine Swap

presented by

Larry Weidner
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Handout courtesy of Jim Wagner



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Motor Selection

The ideal choice would be to find an Eldorado (i.e. front wheel drive) donor car. Not only would you have the needed parts for the swap, but also most of the front-end suspension parts will also fit our GMC's. See table below for applicable year groups.

Year	Drive	Vehicle	Engine CID
1968-74	RWD	Cadillac*	472
1975-76	RWD	Cadillac*	500
1970-76	FWD	Eldorado	500

* - Refers to full size cars and excludes Seville's.

Note: There is a General Engine Specifications table at the end of this document that contains further data on Caddy engines from 1968 thru 1976 that may be of interest to you.

If you don't find an Eldorado, the following 500 cid engined Eldorado parts are needed:

- Intake manifold
- Exhaust manifolds
- R/H axle bearing support bracket
- Oil pan
- Rear motor mount bracket
- 68-72 front motor mount and bracket

The transmission and torque converter from the GMC will bolt to the Caddy motor.

Cadillac offered HEI ignition beginning in mid 1974.

IMO...The ideal donor car would be the 71' or 72' Eldorado. It has the right combination of all of the right things you need for this swap.

Installing the Motor

The trick to the Caddy swap is to use the 1968-72 Eldorado front motor brackets and mount. You will have to drill new holes in the GMC front crossmember to locate the Caddy mounts.

The new holes are approximately 3/4" forward and 1 1/2" to the right of the original.

The far rear mounts are on the transmission and will bolt to the original GMC location.

The front motor mount will probably be bad when you get it. If so, Steel Rubber Products 800-544-8665 can remold it.

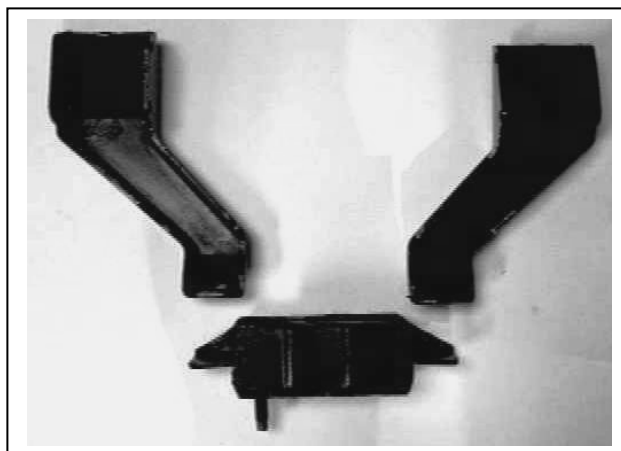


Fig 1. Front and rear Caddy motor mounts.

Cad company of Albuquerque is in the process of developing a mount that will work with the Olds front mount. You may want to check with them.

Axle Bearing Support

The original R/H Eldorado bearing support needs to be used since the GMC bearing support will not line up to the Caddy motor. It is off by ~ 1-05/8". However, the axle half shafts are the same. It is a good idea to replace the bearing at this time.



Fig 2. Caddy on the left and GMC original on the right. Note relative shape of both brackets.

Cooling

Water

The stock GMC radiator works fine with the Caddy. However, unlike the GMC, the Caddy motor has no provision for a heater return hose. Therefore, a 5/8" hose fitting needs to be soldered to the radiator side tank. This would also be a good time to have the radiator flushed, checked, and/or recored.

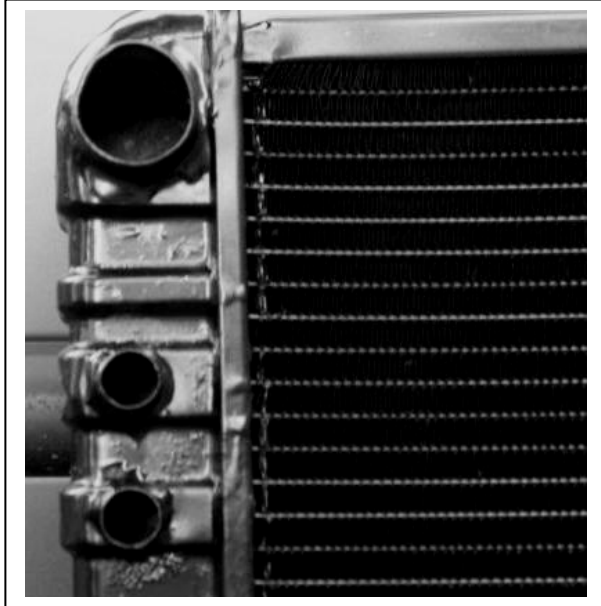


Fig. 3. Radiator side tank modification.

The heater hose outlet on the Caddy is located at the rear of the right head.

If you:

1. Don't have dash air conditioning, use the stock 75 Caddy upper radiator hose.
2. Have dash air, see the section below titled **AIR CONDITIONING** for the correct upper radiator hose information.

Use a:

1. Gates # 20603 hose from Carquest for the lower hose. You will need to trim about 1" off the bottom end. You can also use stock GMC lower hose with modification. (See Larry's photos)

2. Maximum Torque Specialties # MTS-CS09 high flow water pump.
3. Hayden # 2747 fan clutch or AC Delco #15-4208 can be used along with the original GMC fan blade.
4. NAPA # TS-6469 water temp sensor/sender.

The "horse collar" (i. e. the shroud found on the back side of the radiator in 73-76 GMC models) was removed and cut to make it a two-piece unit for easier servicing in the future. Also added was a 3" aluminum band to extend and encircle the shroud. For 77-78 years it is necessary to only split the shroud.

Oil

Transfer the original oil filter adaptor from the GMC for the cooler lines that go between the Caddy externally mounted oil filter on the front left side of the engine and the radiator. Shorter hoses need to be made up.



Fig. 4. Oil cooler line adaptor.

Contact JR Slaten (jrslaten@aol.com) for his ss oil cooler hoses. Be sure to let him know they are for a Cady 500 cid engine, though.

Fuel

Reroute the GMC gas line to the Caddy fuel pump, which is located at the front left corner of the engine. If a return line is used, it can be connected to the gas filler pipe. If desired, an optional electric fuel pump (e. g. Carter P4070) can also be added at this time to either replace or supplement the Caddy mechanical pump.

Note: Jim used a Carter #P-4070 electric fuel pump and the original mechanical pump on our GMC. He also has an Auto Meter fuel pressure gage.

The electric pump was originally installed between the selector valve and the mechanical pump. However, by using the fuel pressure gage, Jim found that when both pumps were used he had 6 psi. If he shut off the electric pump the pressure dropped to 3-½ psi. When the electric pump was bypassed, he had 5 1/2 psi.

He has since relocated the electric pump so that it is used on the reserve tank only.

The electric pump is wired through a 71-77 Vega oil pressure switch.

The Eldorado intake manifold was used along with the original GMC air cleaner. However, in doing so it will be necessary to raise the engine compartment cover 1-1/2" to clear the air cleaner. An alternative is a 2" high open-air filter available from C P Auto Products, p/n 10151, which does not require raising the engine compartment cover. If you use the Eldorado AC compressor, you must use the Caddy Air cleaner as it is designed to clear the rear of the compressor. It may be possible to use the 90's Jeep GC snorkel with a aftermarket filter in this application.

Electrical

If your GMC has a point type distributor (i. e. non-HEI type), run a new 12-volt wire to the Caddy HEI distributor. The later year (i. e. 1976+) GMC's with HEI distributors use an 18 AWG wire for this. You can also have your points type distributor converted to "Hall Effect" pointless by Springfield ignition. When Jim opened the loom to shorten the ignition wire he found about 12" of insulation had been melted off (no idea why). He replaced it with a 12 AWG wire.

You will also need to install an electric choke and run a 12-volt power supply wire to it.

The Caddy alternator must be relocated to the right side of the engine, in order for it to fit into the GMC. In mounting the alternator, use an assortment of Caddy and GMC brackets as shown below.



Fig. 5. Alternator bracket pieces.

I used the higher output alternator (i. e. 79 Cad) AutoZone part # DL-7157.

The alternator-to-isolator wire was replaced by a 6 AWG wire. However, 8 AWG wire is sufficient.

Exhaust

Use the stock Eldorado exhaust manifolds and mock up header pipes by welding small pieces of exhaust tubing together, as shown in Figure 6 below, to connect to the mufflers. Then take them to a muffler shop to be bent out of a single piece of exhaust pipe.

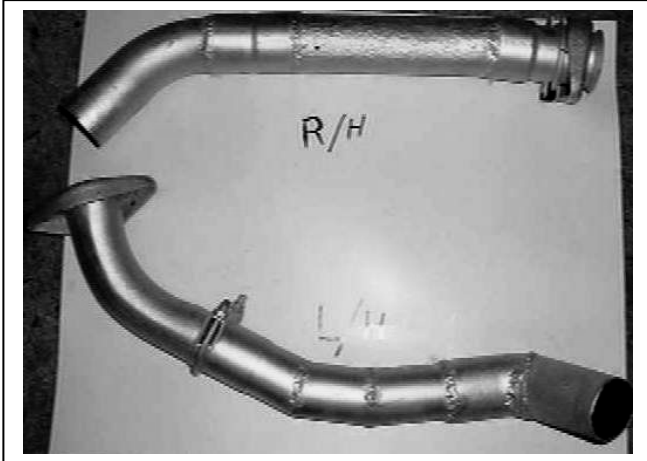


Fig. 6. Exhaust pipe segments welded together.

Headers are available from The Cad Company 505-823-9340. See table in the below section titled **HELP SOURCES** for contact information.

Headers can also be made by cutting off the flanges from BB Chevy headers and welding on Cadillac flanges.

Air Conditioning

Larry Weidner has an excellent photo site showing his Caddy swap. There are some photos and information on how he accomplished his air conditioning swap. Larry's photo site is at www.gmcmhphotos.com/gallery/showlist.php?uid=weidner1&dowhat=user. The photo below is just a sample of his photos.



Fig. 7. Note Caddy A/C compressor location on top of the intake manifold.

Note large aluminum colored bracket on the front cover, which holds up the front of the compressor.

Miscellaneous

Add a fitting to the right rocker cover for the oil filler tube.

The Caddy transmission kick down switch is located by the carb. However, you can choose to either use it or the original.

Use the Caddy power steering pump. See photo of the pump on next page. (fig. 8)



Fig. 8. Caddy PS pump on the left and GMC original on the right.

You will need a longer dipstick. One from a Chevy van will work.

This would be a good time to reroute the transmission vent away from the exhaust. Remove the vent and tap hole using a 1/8" pipe tap. Then add a hose to vent the transmission away from the exhaust.

CAUTION: If you install a new timing chain be careful what bolts you use to install the timing gear to the cam. If you use bolts that are too long they will go through the cam

flange and hit the webbing on the block.

Relocate cruise control actuator as shown in the picture below.

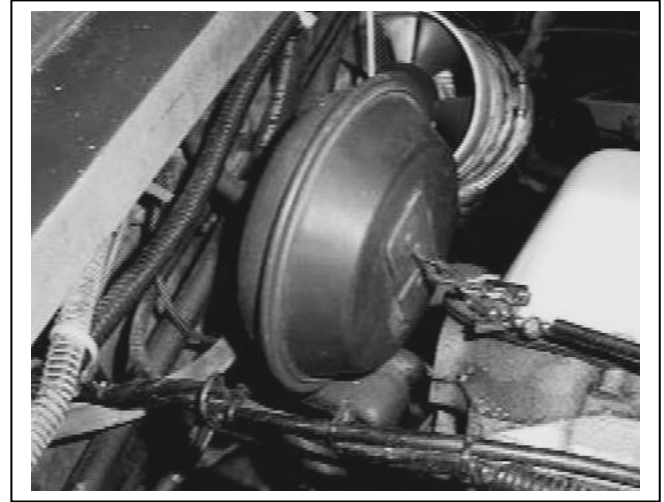


Fig. 9. Relocated original type cruise control actuator.

The throttle cable bracket was altered to fit.

Help Sources

Are listed in the table below.

Name	Phone	Web Page/E-Mail Address	Function
Larry Weidner	715-135-7422	WeidnerL@wwt.net	Technical help
Jim Wagner	216-433-1329	slwjmw@webtv.net	Technical help
Maximum Torque Specialties	262-740-1118	www.500cid.com	Parts
Cad Company (Chris)	505-823-9340	www.cad500parts.com	Parts and Tech Help
C P Auto Products			Parts
Rance Baxter	814-228-3800	www.rancefi.com	Fuel injection
Steele Rubber Products	800-554-8665	http://166.82.96.9/homeframes.html	Motor mount remold
GMCnet		www.gmcmotorhome.com	Technical help
GMCMPHphotos		www.gmcphotos.com	Pictures

History

Source:

<http://members.tripod.com/~CadillacMan/79cadpage.html>

Cadillac big block engines were made during the following years:

Years	CID	Liters	Cylinder head size (cc's)	Remarks
1968-74	472	7.7	76cc	
1970-76	500	8.2	76cc (1970-1972)	
			120cc (1972-1976)	
1977-79	425	7.0	96cc	Smaller ports than 472 or 500
1980-84	368	6.0		Cylinder heads do not interchange with 472 or 500

The early 76cc head must never be added to a later 120cc engine without changing the connecting rods and pistons. This could result in around 13:1 compression and some broken valves.

120cc heads on a 76cc engine will produce around 7:1 compression.

The 425's 96cc heads can be made to fit an earlier engine, but the ports must be machined to match the intake manifold ports.

The Cadillac big block engine weighs around 595 lbs complete, and with an aluminum intake manifold, 22 lbs is saved. This makes the Cadillac big block lighter than a big block Chevy, with more cubic inches, and only 75 lbs. more weight than a small block. The Cadillac big block is so light, yet reliable and strong, because of the high nickel alloy in the block. This is more expensive to produce, but results in less cylinder wear.

The big block Cadillac was not performance oriented coming from the factory. The intake and exhaust manifolds are the most restrictive ever made! The intake manifold weighs a ton,

and is actually a low riser; the air/fuel mixture must travel UP to get to the cylinders! This works, but is far from performance oriented.

The 472 and 500 intake manifolds are dual plane and the 425 manifold is a single plane, therefore not as much of a performer.

The exhaust manifolds, like on most cars, are not very efficient. The 472 and 500 manifolds flow better than the 368 or 425 manifolds, but are still terrible. A set of even poorly made headers with single exhaust is a great performance upgrade.

The stock camshaft is made with built in retard, and is also not a performer. The Cad Co. and MTS make cam kits that go from mild to wild. The stock valve springs can't be used on some of their hotter cams, but they sell spring kits that allow the use of their cams below 5,000 rpm's. Above 5,000 rpm's the stock rocker arm retainer clips can break off causing the cylinder to go dead. Several companies make roller rocker arms that are expensive, but add a few hp from less friction, and allow for higher revving and larger cams.

GENERAL ENGINE SPECIFICATIONS CHART

Year	Drive		CID	HP @ RPM*	Power (lb-ft)@ RPM	Compression
	FWD	RWD				
1968-70		X	472	375@4400	525@3000	10.5:1
1970	X		500	400@4400	550@3000	10.0:1
1971		X	472	345@4400	500@2800	8.5:1
	X		500	365@4400	535@2800	8.5:1
1972*-73		X	472	220@4000	365@2400	8.5:1
1973	X		500	235@3800	385@2400	8.5:1
1974		X	472	205@4000	365@2400	8.5:1
	X		500	210@3600	380@2000	8.5:1
1975	X	X	500	210@3600	380@2000	8.5:1
1976	X	X	500	190@3600	360@2000	8.5:1

* - The horsepower rating system was changed from SAE gross to net in 1972. As a rule of thumb, net HP is ~ 2/3rds of gross HP.

Between 1970-76 the fifth digit in the VIN code will either be a S (500 cid) or a R 472 cid).
The 6th digit in the VIN designates the year.

Additional personal notes:

- 1.) On engine assembly, you will find that internal parts may be hard to come by. While most parts are available at most parts houses you may have to wait up to several weeks or more, as they will be special order. On the other hand, The Cad Company and MTS have all parts that you need in stock and available for immediate delivery.
- 2.) I talked with Jim Bounds about the "Mystery Cam" (a special low RPM, high torque cam design by Arch and Jim in cooperation with Competition Cams) that they installed in Richard Archers "Koba Motor". Jim Bounds is willing to make that grind available on a Cad 500 core. Keep in mind, nobody had done this cam in a Cad 500, so you may be on your own on this one. Kind of an intriguing design though...I must admit ☺
- 3.) On a recommendation from Jim Patterson of Springfield Ignition. I used a Competition Cams 255DEH series cam in my 500. But I would also talk to Cad Co. about their Cam Kits. On advise from Chris Wisnewski of Cad Company, I also installed SS valves and Umbrella type seals. I had very good luck talking with Chris while building my engine. They are very responsive there if you buy your parts from them.
- 4.) This is **not** an install to be attempted by the light of heart. It is **not** a weekend project. If you are not a relatively skilled mechanic, with at least some experience in engine swapping, you may want to leave this to someone who knows what they are doing.