

NZ-1

OWNER'S GUIDE



TABLE OF CONTENT

1) MAINTENANCE

Maintenance Schedule

	Part #, \$(US)	
<u>Air Cleaner</u>	AY04-13-Z40	change every 25,000 - 50,000 km
<u>Fuel Filter</u>	AZ2820490, US\$40	Alternative: Fram G5237, \$10)
<u>Oil Filter</u>	Oil every 5,000km	Filter every 10,000 km
<u>Transmission Oil</u>	Wix 51360, Napa 1360, Mann 67/2, Mahle OC 215	50,000 - 100,000 km
<u>Radiator Coolant</u>	50,000 km	
<u>Thermostat</u>	100,000 km (or every major cooling repair)	
<u>Distributor + Rotor</u>	100,000km	
<u>Spark Plug + Wires</u>	Plugs: 50,000 km	Wires: 100,000 km
<u>Timing Belt / Water Pump</u>	100,000km	
<u>AC + Alternator Belt</u>	30,000 - 60,000 km	

Part #, \$(US)

2) SENSORS / VALVES

<u>AC Idle (3-way Valve)</u>	AZ0818741, \$45
<u>ISC (Idle Speed Controller)</u>	AZ0820660, 18117-64D01-000
<u>Idle Screw Adjuster</u>	950rpm, +/- 50
<u>Throttle Position Sensor</u>	13420-64D00-000, \$210
<u>Vacuum Solenoid Valve</u>	184600-1941
<u>EGR Valve</u>	AZ2820300, 18520-79B50-000, \$150
<u>MAP (Manifold Absolute Pressure)</u>	18590-64D00 or 100798-2180, \$220
<u>O2 Sensor</u>	18213-64D10-000 or 18213-64D11-000, \$100, 22mm wrench
<u>Air Intake Temperature</u>	13650-61B00-000. \$55
<u>Fan Thermostat</u>	17680-50F00-000, \$45, 24mm wrench
<u>Oil Pressure</u>	3006-292, 3007-036, 37820-82001, \$20
<u>Water-Temp Gauge Sensor</u>	34850-70B10-000, \$40
<u>Water Temperature</u>	SU4007, \$10

3) MISC

<u>Floor Pan Rust Check</u>	
<u>Door Shocks</u>	
<u>Side View Mirrors</u>	
<u>Fuel Pump</u>	
<u>Radiator</u>	
<u>Starter / Ignition Fix</u>	
<u>Others</u>	battery, bulbs, shift knob, stereo, tires

4) RESOURCES

Websites

1: MAINTENANCE SCHEDULE (from Cappuccino)

NORMAL CONDITION SCHEDULE

Interval: This interval should be judged by odometer reading or months, whichever comes first.		This table includes services as scheduled up to 80,000 km (48,000 miles) mileage. Beyond 80,000 km (48,000 miles), carry out the same services at the same intervals respectively.								
		Km (x 1,000)	10	20	30	40	50	60	70	80
		Miles (x 1,000)	6	12	18	24	30	36	42	48
		Months	6	12	18	24	30	36	42	48
1. ENGINE										
1-1. Generator belt (tension, damage)		—	I	—	R	—	I	—	R	
1-2. Camshaft timing belt		Replace every 100,000 km (60,000 miles)								
1-3. Engine oil and Engine oil filter	Oil: API Grade SF, SG or SH class	Replace every 5,000 km (3,000 miles)/6 months								
	Filter	R	R	R	R	R	R	R	R	
1-4. Cooling system hoses and connections (leakage, damage)		—	I	—	I	—	I	—	I	
1-5. Engine coolant		—	—	—	R	—	—	—	R	
1-6. Exhaust system (leakage, damage, tightness)		—	I	—	I	—	I	—	I	
1-7. Wiring harness and connections		—	—	—	I	—	—	—	I	
2. IGNITION SYSTEM										
2-1. Spark plugs		—	R	—	R	—	R	—	R	
2-2. Distributor cap and rotor (crack, wear)		—	—	—	I	—	—	—	I	
2-3. Ignition wiring		—	—	—	I	—	—	—	R	
2-4. Ignition timing		(I)	—	—	I	—	—	—	I	
3. FUEL SYSTEM										
3-1. Air cleaner filter element	Paved-road	—	I	—	R	—	I	—	R	
	Dusty condition	Refer to "Severe Driving Condition" schedule								
3-2. Engine idle speed		(I)	I	—	I	—	I	—	I	
3-3. Fuel tank, cap & lines (deterioration, leakage, damage)		—	—	—	I	—	—	—	I	
4. EMISSION CONTROL SYSTEM										
4-1. EVAP canister		—	—	—	—	—	—	—	I	
5. BRAKE										
5-1. Brake discs and pads (thickness, wear, damage)		I	—	I	—	I	—	I	—	
5-2. Brake hoses and pipes (leakage, damage, clamp)		I	—	I	—	I	—	I	—	
5-3. Brake fluid		—	I	—	R	—	I	—	R	
5-4. Brake lever and cable (damage, stroke, operation)		I	—	I	—	I	—	I	—	
5-5. Brake pedal		—	I	—	I	—	I	—	I	
6. CHASSIS AND BODY										
6-1. Clutch pedal free travel		I	I	I	I	I	I	I	I	
6-2. Tires/wheel discs (wear, damage, rotation)		I	I	I	I	I	I	I	I	
6-3. Drive axle boots (breakage, damage)		I	I	I	I	I	I	I	I	
6-4. Suspension system (tightness, damage, rattle, breakage)		I	I	I	I	I	I	I	I	
6-5. Steering system (tightness, damage, breakage, rattle)		I	I	I	I	I	I	I	I	
6-6. Propeller shafts		—	I	—	I	—	I	—	I	
6-7. Transmission oil and differential oil (leakage, level)		I	R	I	R	I	R	I	R	
6-8. Door hinges & Gear shift control lever/shaft		I	I	I	I	I	I	I	I	

"R": Replace or change
 "I": Inspect and correct or replace if necessary

Item 2-4 (I) and Item 3-2 (I) are applicable only to the 10,000 km inspection.

1: MAINTENANCE: Air Filter



OEM: AY04-13-Z40 | AZ1813320
Same As: Alto, Carol, Cervo, Wagon R

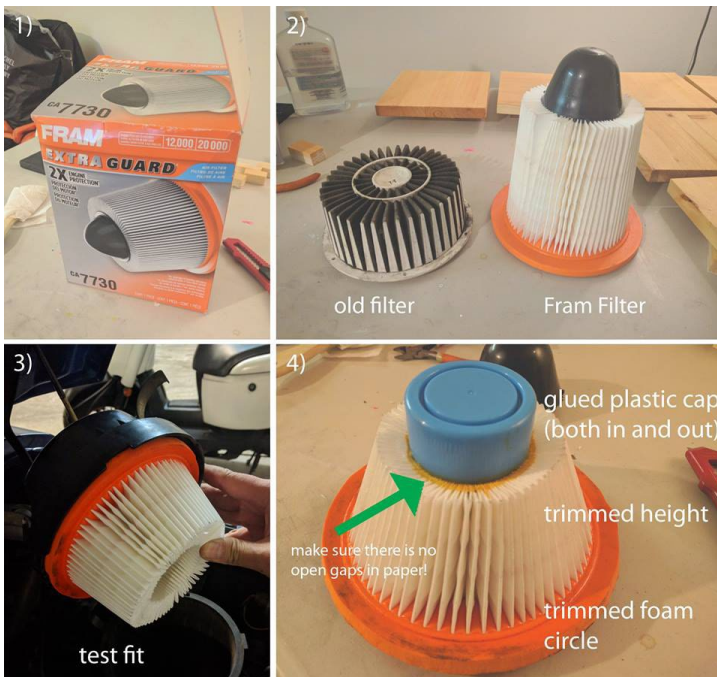
Change every 20,000km or every 1 year

Alternative: 70017-AK003

Follow Website for info:

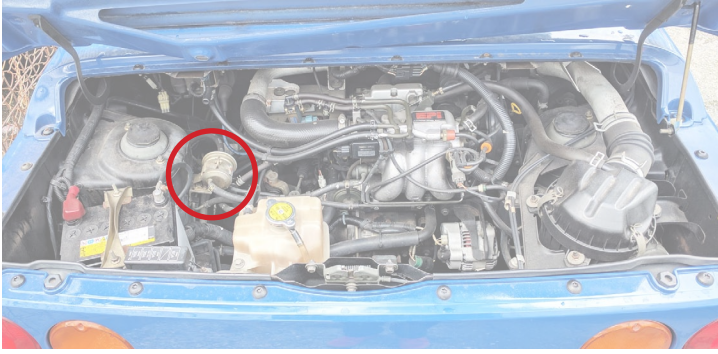
<http://diska.web.fc2.com/diy/diy3201.html>

Alternative: 70017-AK003



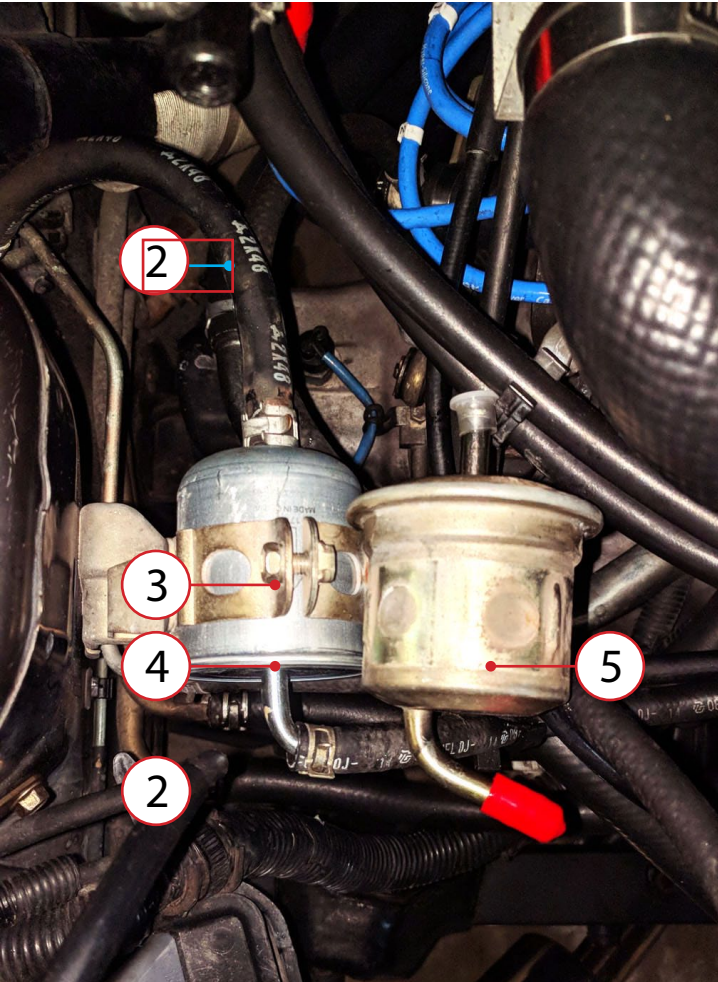
Alternative: Fram 7730 (modified)

1: MAINTENANCE: Fuel Filter



Part # AZ2820490 US\$40
OEM: Denso 186100-3040
Replacement: [Fram G5237](#) (\$10-15)

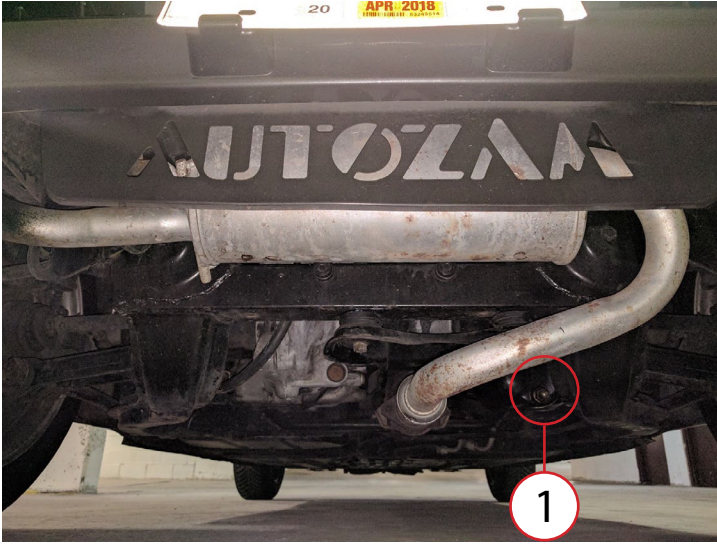
Change every 30,000-60,000 KM or every 1-2 years



Steps:

- 1) use [hose pinch pliers](#) to close off fuel hoses
- 2) remove hoses
- 3) loosen bolt from clamp
- 4) remove filter
 - a) old filter will be full of fuel
 - b) use new filter's hose caps on old filter
 - c) use papertowel to catch any fuel
- 5) install new filter
- 6) install hose, remove hose pinchers
 - a) may take a few cranks for engine to start
- 7) **check hoses to make sure there are no leaks**

1: MAINTENANCE: Oil Change + Oil Filter



Change Interval: oil 5,000km
oil filter 10,000km

Known Filters: Suzuki # 16510-82703
(old Suzuki # 16510-81400)
Wix 51360 / Napa 1360
Mahle OC 215
WIX 51394

Filter Specs 65mm diameter x 65mm H (Napa)
Thread side 3/4" - 16
pressure relief valve 8-11 psi

Change Oil 5,000 km or every 6 months
Change Oil Filter 10,000 km or 12 months

Oil Weight OEM: 10W40

Oil Pan Capacity 2.9 L / 6.1 Pint (US)
Oil Filter Capacity 0.2 L / 0.4 Pint (US)
Total Capacity 3.1L / 6.6 US Pint

Steps:

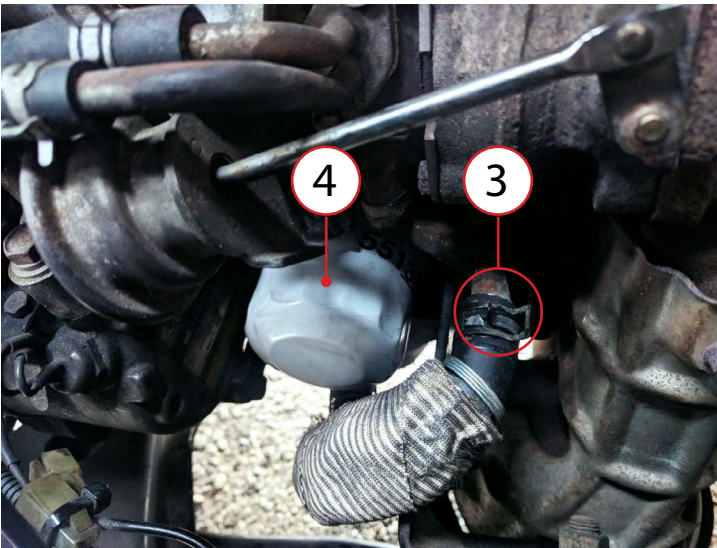
1: Oil Plug located at the rear right corner of the engine block
22-28.5 lb-ft

2: Remove interior engine access cover behind the driver seat

3: Unclip hose

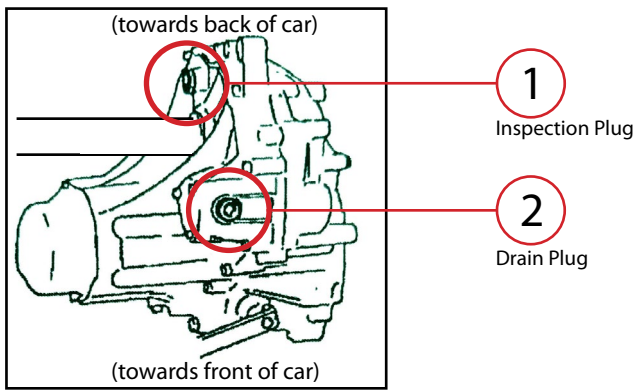
4: Oil Filter Location
8.5-11.5 lb-ft

5: Re-clip hose



view from interior engine access behind driver seat

1: MAINTENANCE: Transmission Oil



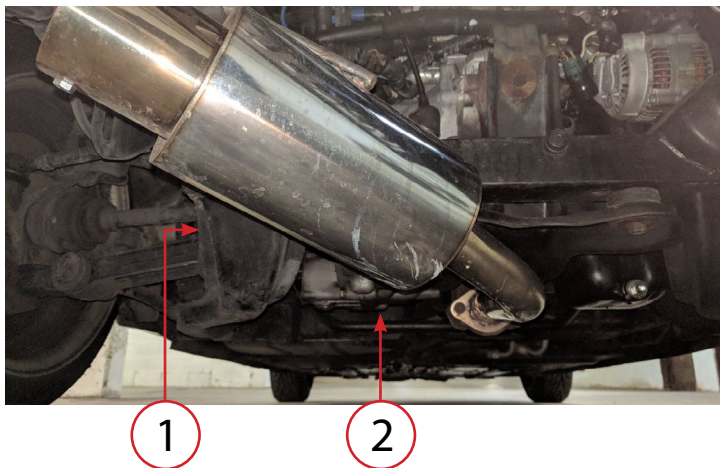
Change Interval: 50,000 - 100,000 km

Oil 75W90 ****for manual transmission****

Capacity 2.1 litre

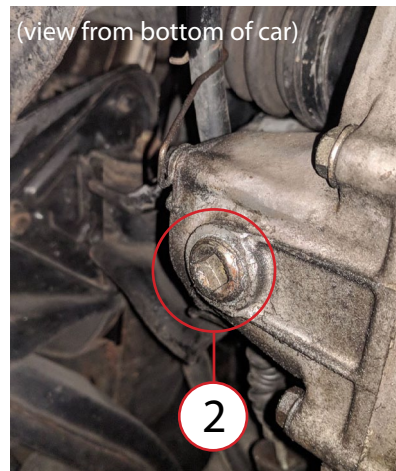
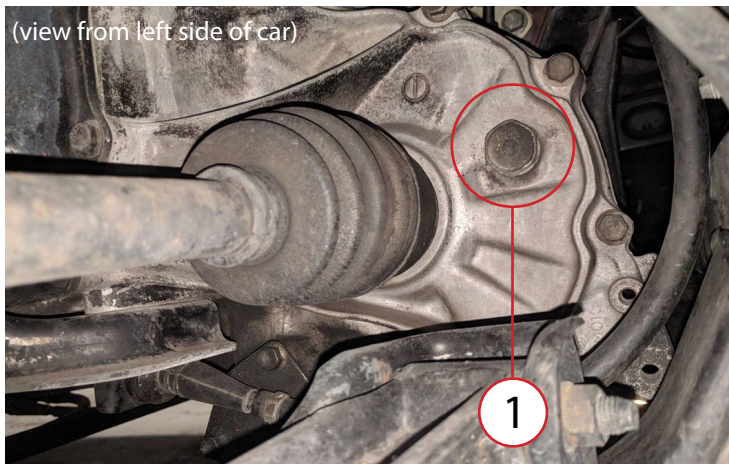
Oil Level Plug (top) Bolt: 40-49 Nm torque
 Drain Plug (bottom) Bolt: 25-29 Nm torque

view from bottom of car looking up



STEPS ****Make sure car is parked on a level service****

- 1: First test you can remove Oil Inspection Plug just in case you can't get to it to refill the oil after you have drained it
 tool required: 24mm wrench
- 2: Remove Oil Drain Plug
 tool required: 3/8" ratchet
- 3: "Apply Sealing Agent No 50"
 (Permatex 56521 Thread Sealant or similar)
 reinstall Drain Plug (25-29 Nm torque)
- 4: Fill oil from Oil Level Plug (may need to use a hose from a funnel) until oil drips out from Oil Level hole
 reinstall Oil Level Plug (40-49 Nm torque)



Oil Inspection Plug
 tool required: 24mm wrench

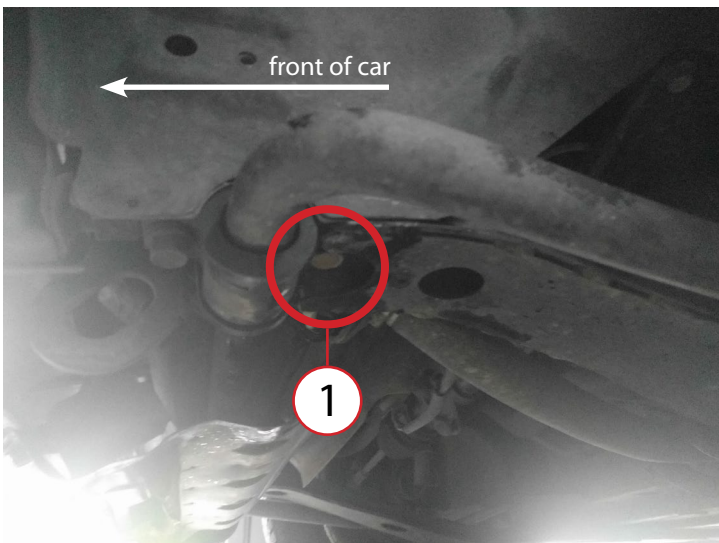
Oil Drain Plug
 tool required: 3/8" ratchet



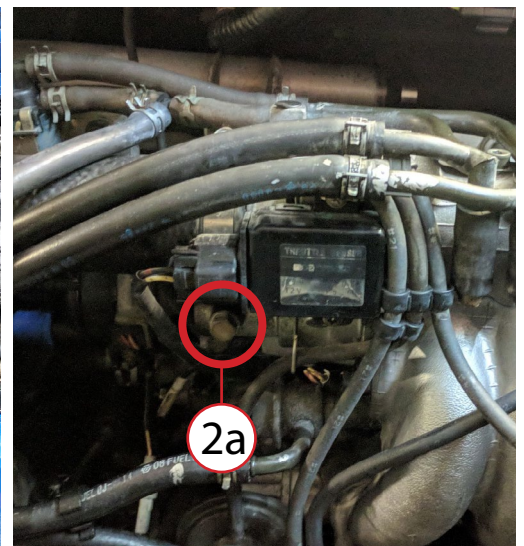
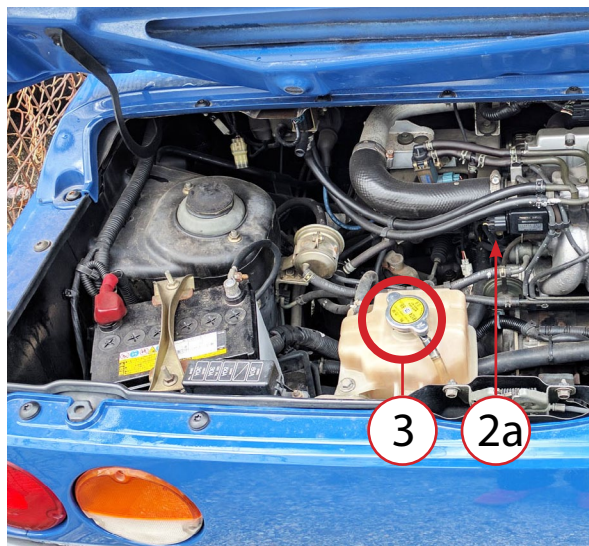
1: MAINTENANCE: Radiator Coolant



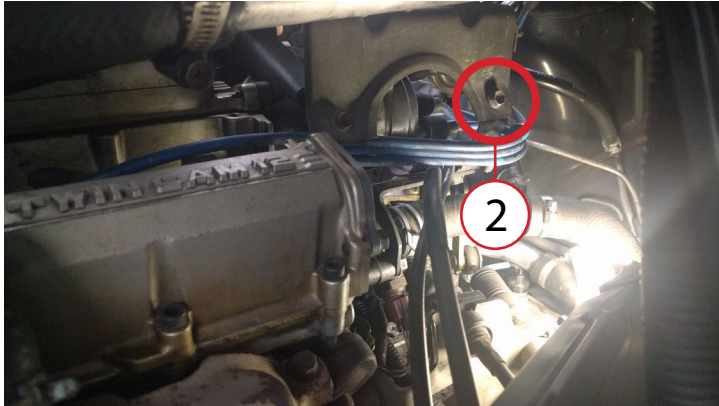
Change Interval: 50,000 km
Capacity: 4.2 L / 8.9 Pint (US)



- Steps:
- 1: Radiator Drain Plug located below the right headlight aligned with the tow hook
 - 2: Radiator Vent Plug located in front trunk
a: secondary vent in throttle body
 - 3: Coolant Reservoir in engine compartment

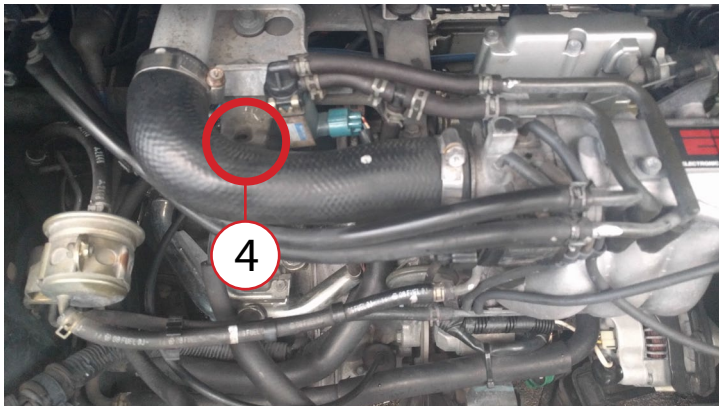


1: MAINTENANCE: Thermostat



Change Interval: 100,000k or every major coolant repair

Part # Suzuki Part # W44DF-82, 82°C
17600-85811



1: Drain radiator coolant

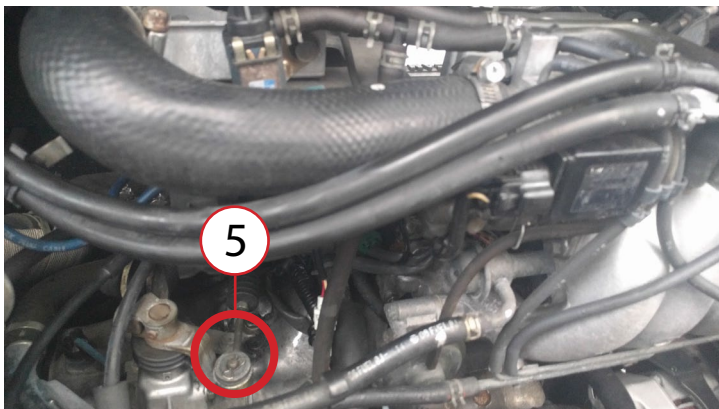
2: Open the engine interior access panel

3: Unbolt (from inside panel) to loosen bracket to free up space 10mm wrench

4: Unbolt (from exterior bay) to loosen bracket to free up space 10mm wrench

5: Unclip shifter (from exterior bay) to free up space

6: Unbolt thermostat bolts (under distributor) 12mm



7: Unbolt thermostat bolts (from inside engine access)

This should make things loose enough to make room to remove the thermostat.



from inside engine access

1: MAINTENANCE: Distributor + Rotor



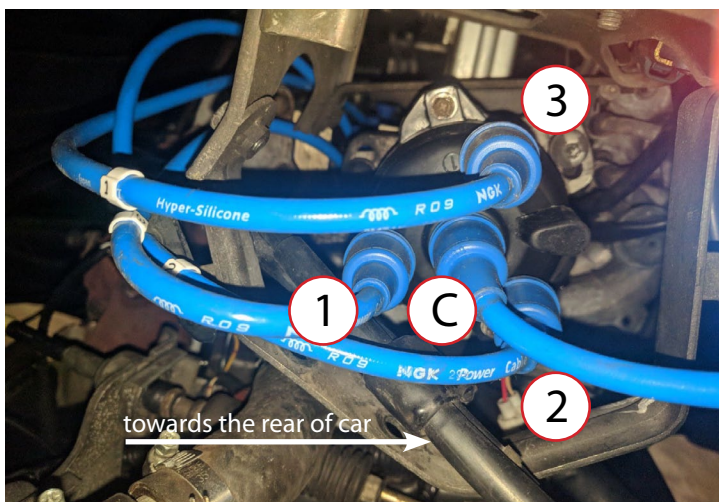
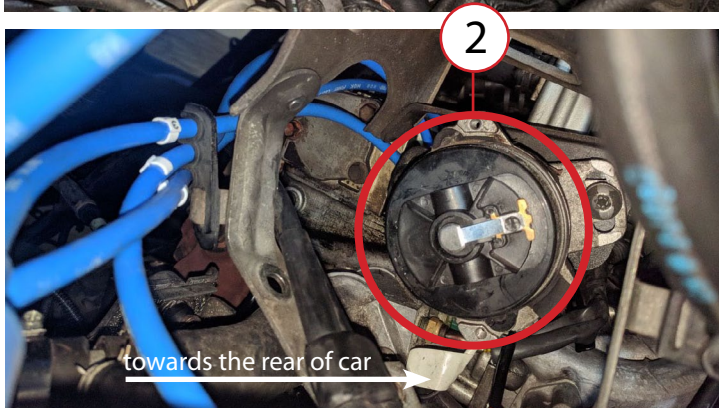
Part # SUZ-CRK-F6A
use screw type mounting, clip-on type won't work

1: Distributor is located on the left side of the engine.

Remove the 2 screws (around the 12 o'clock and 6 o'clock position) of the distributor cap. Use a 1/4" socket or a Phillips screwdriver.

2: Rotor pulls straight out. Take note of the position of rotor, make sure new rotor is installed in the same position

3. Reverse order to reassemble



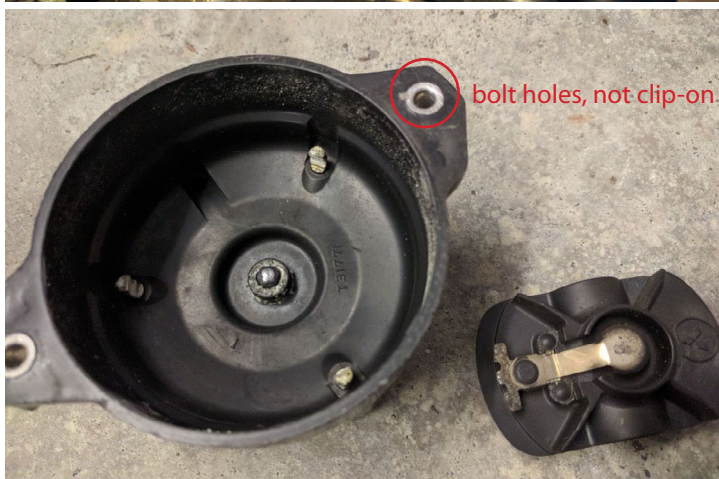
Wire Placement

1: short wire, cylinder 1

2: medium wire, cylinder 2

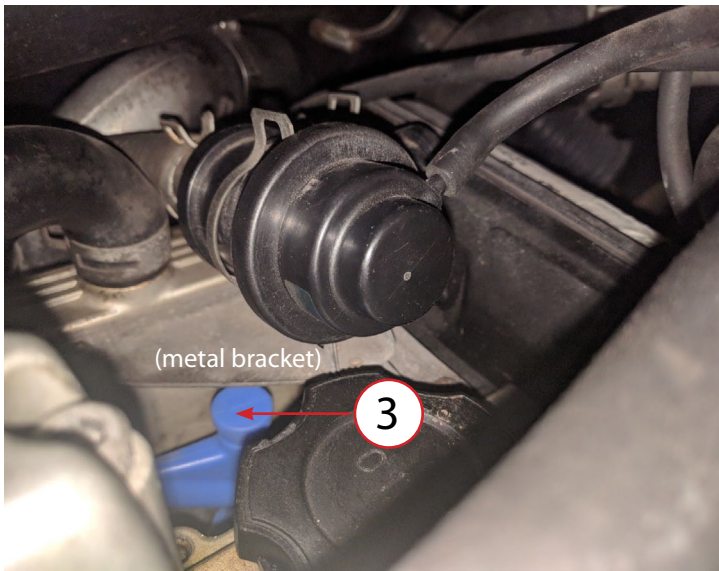
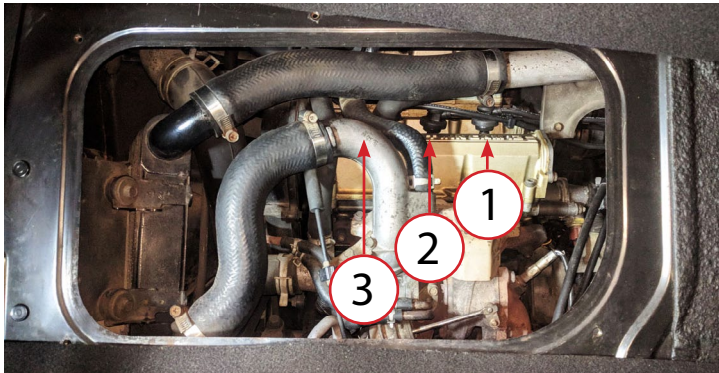
3: long wire, cylinder 3

C: coil



Note: some F6A motors have clip-on caps. AZ-1 has bolt on caps

1: MAINTENANCE: Spark Plugs + Wires



Note: there are different styles of plug covers. Both work, but the blue style (cover at bottom) has a better seal.

Some F6A motors have shorter cables. The short ones will fit but a very tight fit

Change Interval: Plugs: 50,000 km

Wires: 100,000 km

Spark Plug Part #

NGK DCPR7E
Denso XU22EPR-U
HKS 50003-M40X

Spark Cable Part #

33705-71B50-000

Gap:

0.8 - 0.9mm

Spark Plug Socket Size:

5/8"

A: Remove engine access panel from behind driver's seat

- 1: short wire, cylinder 1
- 2: medium wire, cylinder 2
- 3: long wire, cylinder 3

B: spark plugs 1 + 2 is straight forward to remove using a 5/8" (or 16mm) socket spark plug socket recommended (with internal rubber boot)

C: There is a metal bracket directly above cylinder 3 which greatly limits tool access, making spark plug 3 hard to get to



Recommended getting a U-joint and socket extensions, especially for #3

1: MAINTENANCE: Timing Belt / Waterpump

Change Intervals

Timing Belt / Waterpump 100,000km
change cam + crank seals during procedure

AC + Alternator Belt	30,000 - 60,000 km
Alternator belt	Suzuki part# 1752170D10 MAzda # AZ28-29-381A
AC belt	Mazda part# AZ2815908B
AC alternative	#13250 13/32" x 25" V-Belt 10x760mm

[watch video here](#)

2: SENSORS: AC Idle (3-Way Valve)

Part # AZ0818741, \$45



changes RPM idle speed when AC is turned on. Should be around 1500RPM.

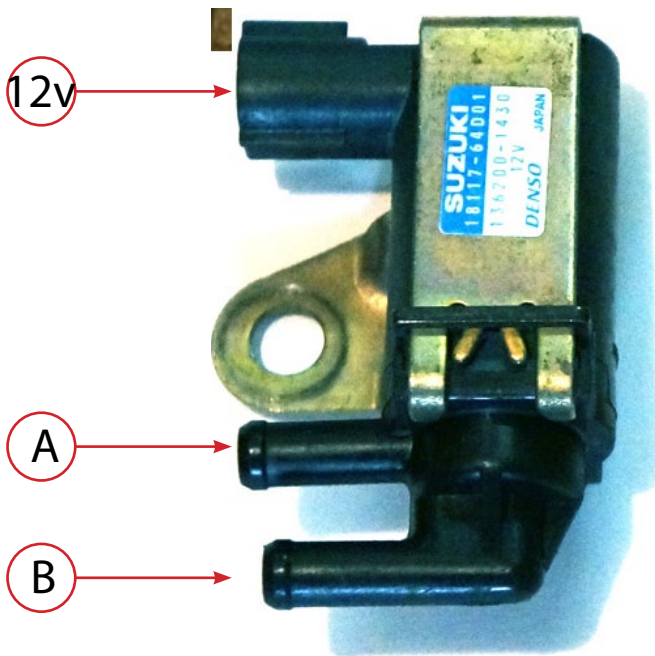
2: SENSORS: ISC (Idle Speed Controller)



Part # AZ0820660 , 18117-64D01-000

Symptoms of bad sensor:

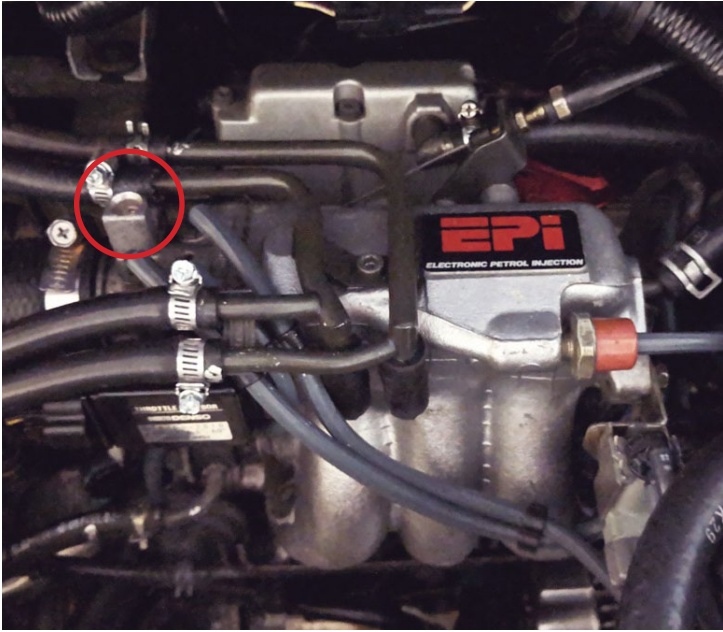
Irregular idle speed.
Check Engine Light comes on. ...
Engine stalling



To check for bad sensor

- 1) remove sensor
 - a) there should not be any wind coming out of Port B
- 2) blow into Port A
 - a) the valve should open up
 - b) do NOT apply more than 1 second of voltage
- 3) apply 12v circuit onto the sensor
 - a) the valve should open up
 - b) do NOT apply more than 1 second of voltage
- 4) blow into Port A
 - a) wind should come out of Port B
 - b) if the port is blocked (no wind), replace sensor

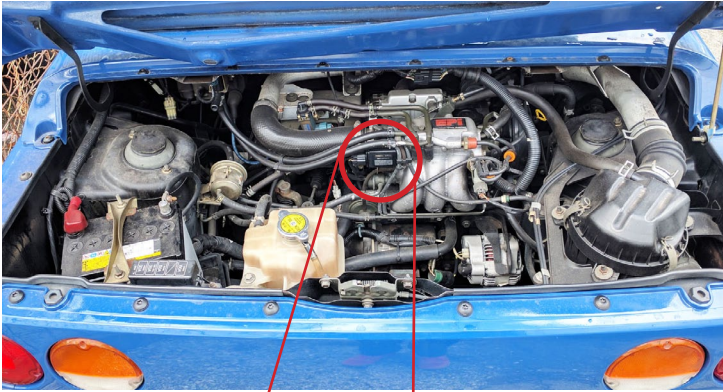
2: SENSORS: Idle Screw Adjustment



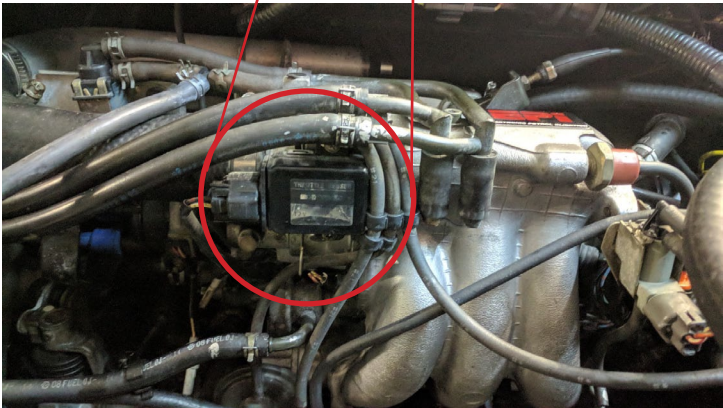
Idle Speed: 950rpm +/- 50 (900-100 RPM)

Maybe covered with rubber plug. May take a few turns to notice any difference

2: SENSORS: Throttle Position Sensor



Part # 13420-64D00-000, \$210

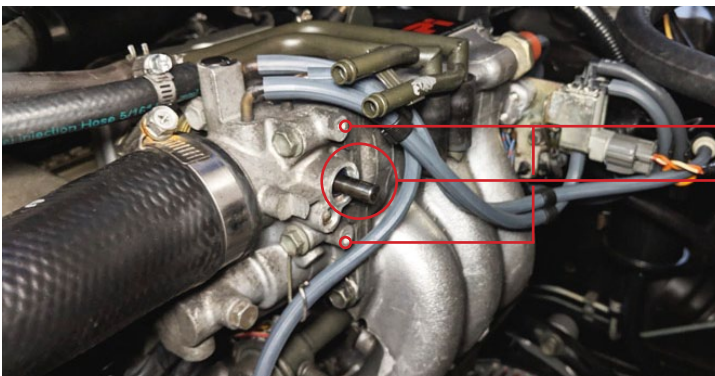


Symptoms of bad sensor:

- An unexplainable bucking and jerking in the vehicle
- Sudden idle surges
- Sudden engine stalling without any apparent reason
- Hesitation while accelerating
- Sudden surges in speed while driving on the highway
- Intermittently flashing of check engine light
- Difficulties in changing gears
- A drastic drop in fuel economy



back of sensor



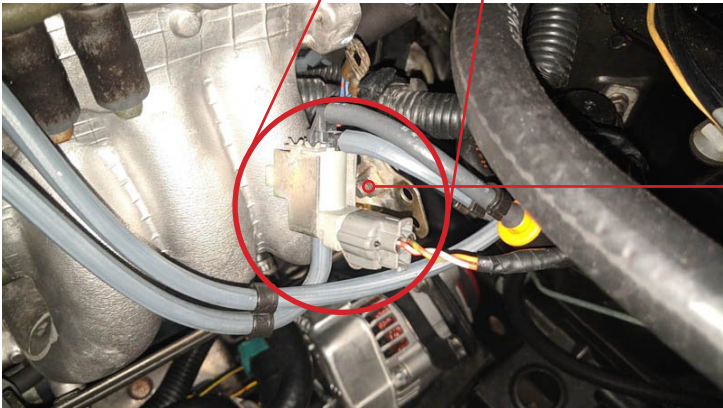
mounting screws

throttle rod

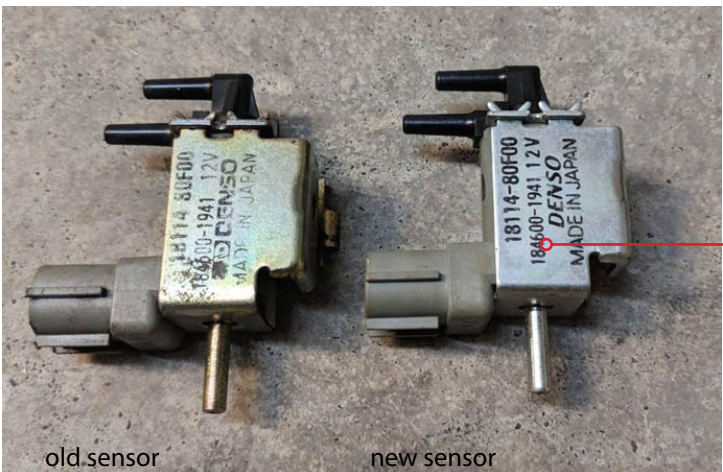
2: SENSORS: Vacuum Solenoid Valve



Part # 184600-1941, \$75



- 1) remove 2x bolts on side to remove bracket
- 2) remove screw from back of bracket to release the sensor
- 3) remove 3x hoses and electrical plug

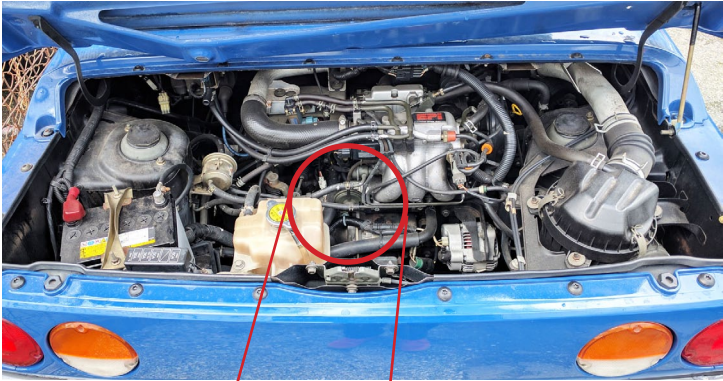


use this bottom number
top number only may give a different vacuum sensor with different electrical plug (by experience)

old sensor

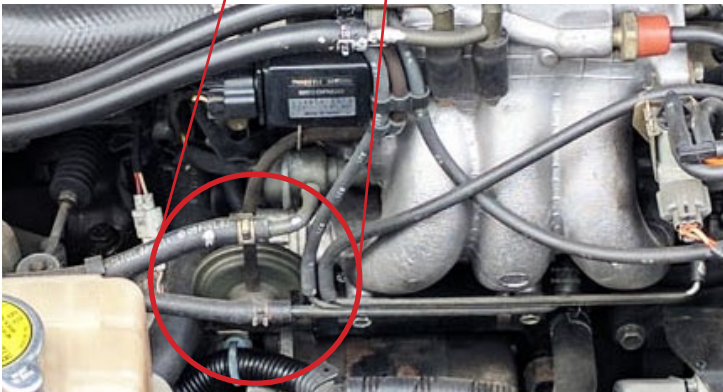
new sensor

2: SENSORS: EGR Valve



Part # AZ2820300, 18520-79B50-000, \$150

Emission based valve, recirculates pre-burned gas to reduce engine temperature, which reduce production of nitrogen oxides pollution.



Symptoms of bad sensor:

Engine performance issues
Rough idle
Check Engine Light comes on

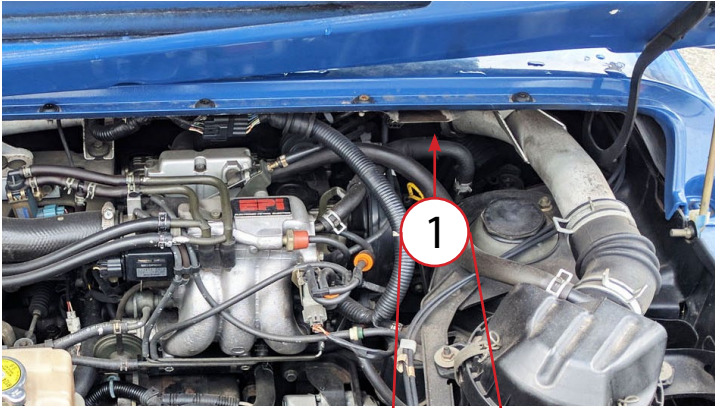
[Video of how to clean EGR valve](#)



dirty and clogged port from my AZ-1

clean the engine-side as well. I used q-tips and a screwdriver with paper towel to get deep inside the port

2: SENSORS: MAP (Manifold Absolute Pressure) Sensor



Part # 18590-64D00 (\$220)
100798-2180
(most likely needs cleaning, not replacement)
same as Suzuki Grand Vitara MK2, EA11 Cappuccino,
Wagon R, Alto, Cervo, Carry

Clean MAP every air filter change (20,000km or every year)

Symptoms of bad MAP sensor:

A rich or lean fuel mixture.
Gas smell after the engine has warmed up
Engine will knock or ping at times
Excessive fuel consumption
A rough idle
Hesitation or slight jerking during acceleration, or when
putting the vehicle into drive
The vehicle stalls or dies immediately after you try to give the
engine gas to start the car moving ([video here](#))
Engine won't idle unless gas pedal is fully pressed (see video)

Sensor is mounted upside down above the engine near the
right engine lid hinge

I was able to clean the sensor without removing it.

- 1: unplug MAP wiring
- 2: remove hose from the engine side
keep hose connected on the sensor
- 3: spray MAP sensor cleaner into the hose
(follow the instructions, **do NOT use carb cleaner**)
- 4: wait to dry, reinstall



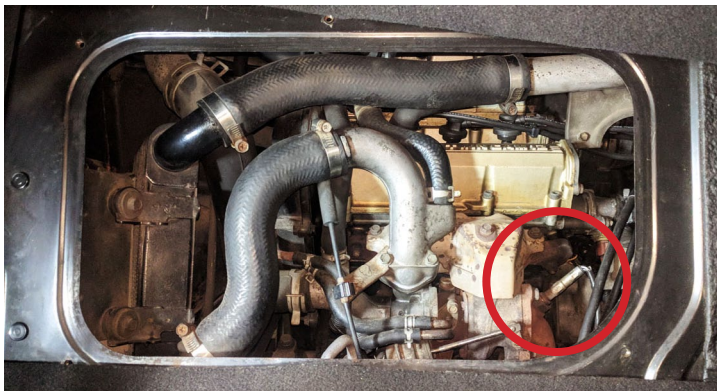
2: SENSORS: O2 Sensor



Part # 0ZA769-EJ1, \$100
18213-64D10-000 or 18213-64D11-000

Symptoms of bad sensor:

Sudden decrease in fuel mileage.
Flashing check engine light or malfunction indicator lamp
Overall poor vehicle performance; rough idling, stalling, hesitation on acceleration, etc



Interior Engine Access Hatch

Sensor can be accessed from the interior engine access.

To remove the bolt easier, spray with penetrating oil, drive as usual, repeat for 2-3 days. The bolt should be easily removed afterwards.

****Requires oversized 22mm wrench****

2: SENSORS: Air Intake Temperature



Part # 13650-61B00-000. \$55

Symptoms of bad sensor:

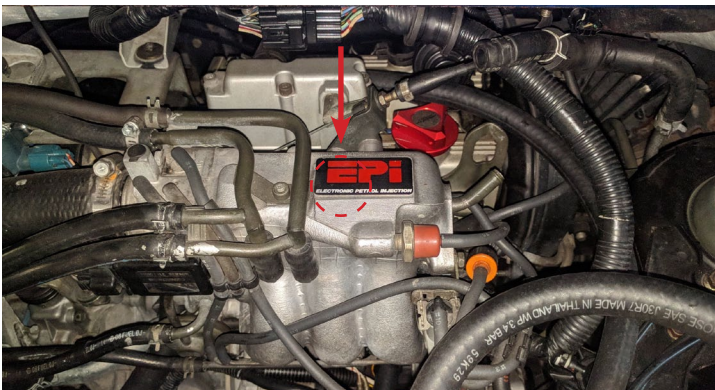
- Lack of power when accelerating
- Trouble with cold starts
- Decrease in fuel efficiency



Sensor can be accessed from the interior engine access.

Sensor is located behind the intake. I had to remove a couple hoses to have better access

19mm wrench



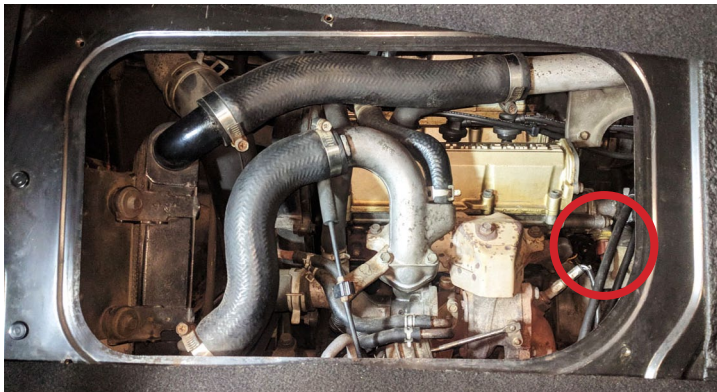
2: SENSORS: Fan Thermostat



Part # 17680-50F00-000, \$45

Symptoms of bad sensor:

Temperature gauge reading very high and engine overheating. The first and potentially most alarming symptom will be the temperature gauge reading high into the red within the first 15 minutes of your vehicle engine running. ...
Temperature changing erratically. ...



Sensor can be accessed from the interior engine access.

To remove the bolt easier, spray with penetrating oil, drive as usual, repeat for 2-3 days. The bolt should be easily removed afterwards.

****Requires oversized 24mm wrench****

2: SENSORS: Oil Pressure Sensor



Part # 3006-292, 3007-036, 37820-82001 (\$20)

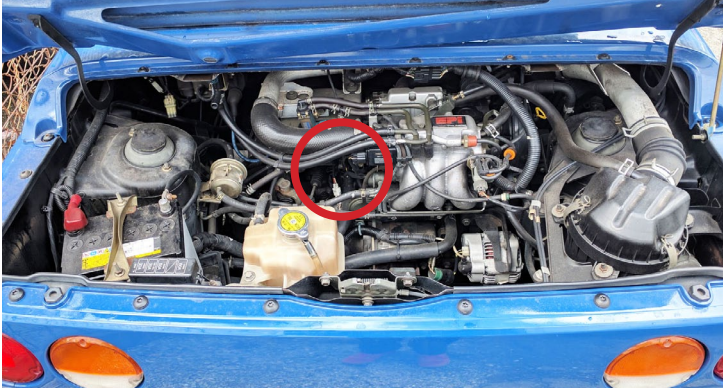
Alternatives:

Suzuki Cappuccino

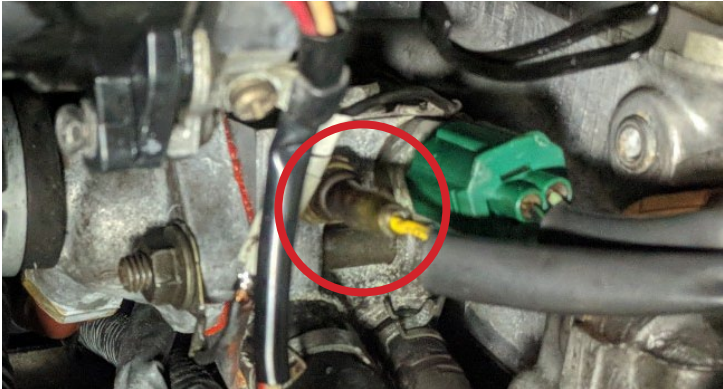
Chevy / Geo Tracker, Sprint, Metro.

alternator

2: SENSORS: Water-Temperature Gauge Sensor



Part # 0ZA769-EJ1, \$100



Attached to the thermostat housing

2: SENSORS: Water Temperature

Part # SU4007, \$10 (Miata, etc)

Symptoms of bad sensor:

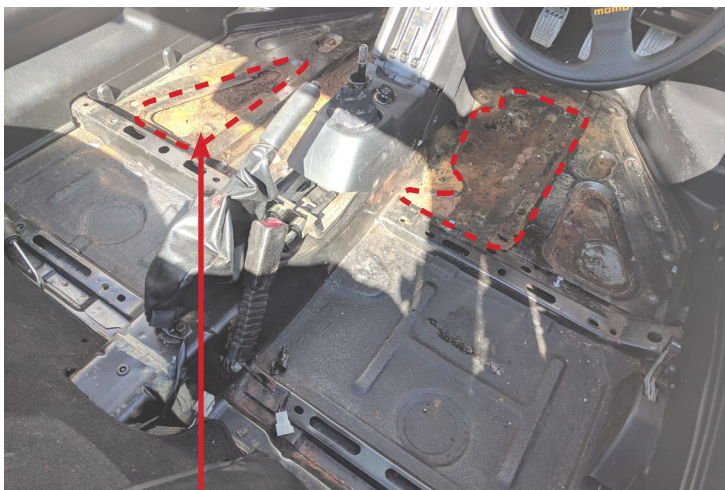
- Poor fuel economy
- Black smoke from engine
- Overheating engine
- Check Engine Light comes on



Attached to the thermostat housing



3: MISC: Floor Pan Rust Check



There are factory-installed sound-insulation material underneath the carpet (see dotted red line) Material acts like a sponge, which will or already has caused rust.

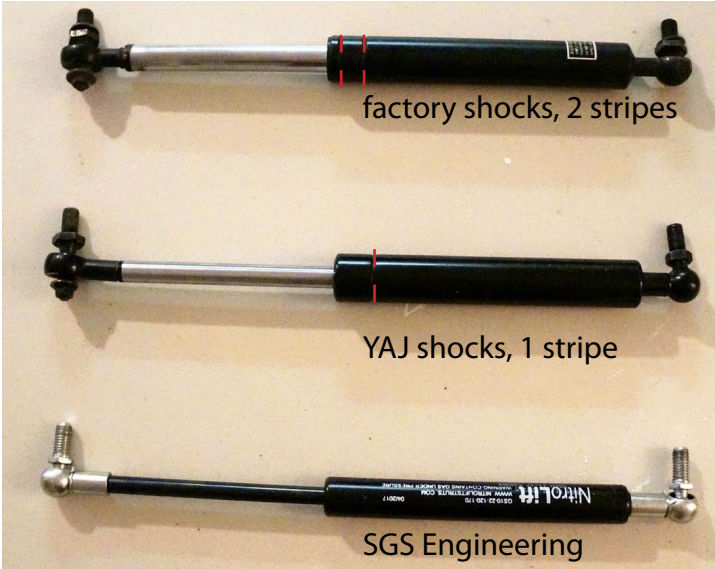
Remove carpet on both sides. Remove the sound-insulation material and replace with a modern non-water absorbing material.



repair or replace floor pan if rust is bad

factory sound-insulation mat
absorbs water = rust

3: MISC: Door Shocks



Newton Force 760Nm (Newton Metres) works great 50°F - 90°F
increase if living in mostly colder climate (850Nm?)

Door Weight 21 kg / 46 lbs
Ball Ends Fitting M10x1.25

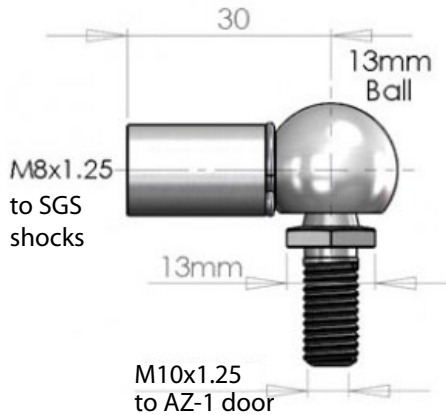
Yahoo Auction Japan (YAJ)shocks is way too powerful. It will open the door too quickly and force stop, making the car shake at the end. **Not recommended.**

VW Phaeton rear hatch shocks will work, but IMO is too underpowered (won't open fully under own force), around 500Nm?? But cheap (\$80 for all 4).

SGS-Engineering makes custom NM struts.

GS10-22-120-170

10mm rod diameter |120mm stroke | 170mm body | M8-1.25 thread
\$150 for all 4. Their M10x1.5 ball-ends are incorrect, may work but may strip the thread. Just tell them the Nm rating.
Video Here.



Buy the Ball End Fittings seperately
<https://www.liftsupportsdepot.com/>

Shock ends (M8x1.25 if using SGS shocks).
AZ-1 door thread: M10x1.25



AZ-1 door shock mounting nut is known to fall off. Can be fished out. Anchor Nut or pop-riivot nuts can work as a replacement.

If you have a welder, a flanged nut can be welded onto the door frame after drilling a larger hole from the factory nut.



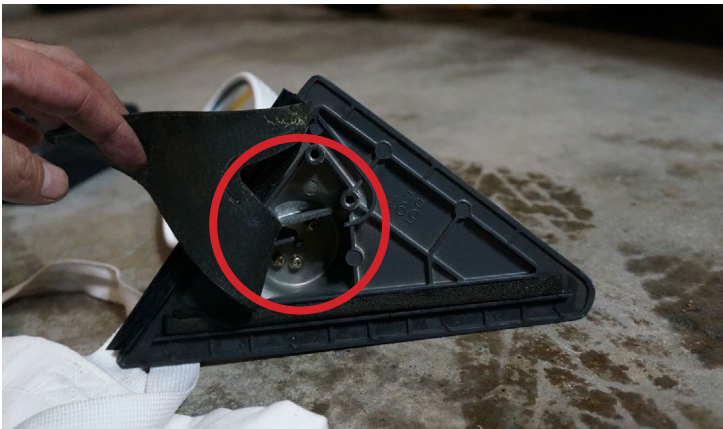
Anchor Nut

Flanged Nut

3: MISC: Side View Mirrors



Sideview Mirrors can be removed from 3 screws hidden behind the interior triangular panel



To remove mirror from panel, unscrew bolts from under the seal



If mirror is loose (moves when you shut the door), it can be tightened. Access the screw underneath and tighten.

People have been able to access the screw by removing the rubber boot without having to remove the mirror from the door.

3: MISC: Fuel Pump



TIME: 1-3 hour job
Part # E2111, Not confirmed (Suzuki Samurai, Geo, etc).
Pump flow rate 110 L / H
Pump diameter approx. 38 mm
Pump length 11.4 mm
approx. 11 mm Pump outlet port external diameter approx.
9 mm Pitch between pump terminals approx

remove access panel behind passenger seat



****Recommend to clean dirt before removing to minimize dirt from falling into the gas tank****

remove screws (small Phillips head)

unplug wiring

remove hoses (may need to be plugged or crimped)

Remove lid-assembly. Fuel pump assembly is slightly larger than the access hole...



old pump

old fuel sock



plug lock, press in to remove wiring

3: MISC: Radiator



TIME: 2-4 hour job

mounting brackets



vent plug

coolant intake

radiator fan mounts

coolant return

drain plug



1) drain coolant

2) remove fan shroud (jack up car and remove from below)

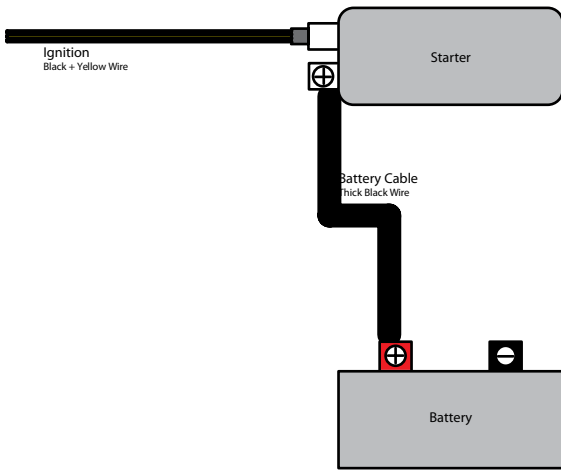
3) remove AC condenser bolts
gently bend out of way
condenser does not require removal



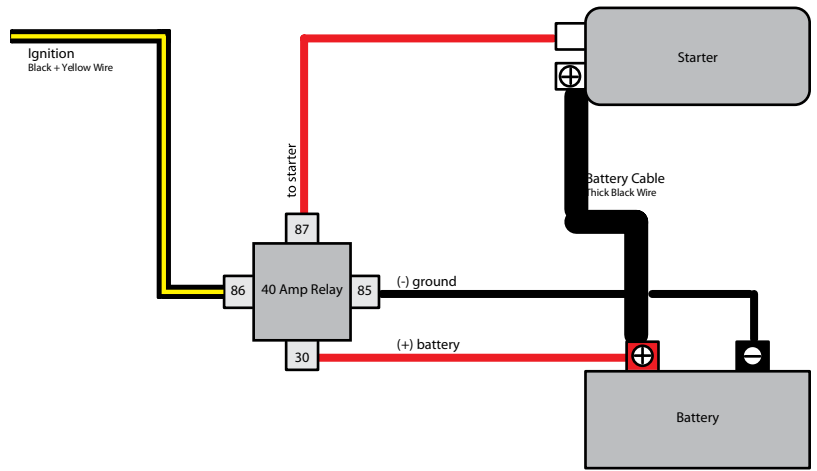
3: MISC: Starter / Ignition Fix

AZ-1 may have occasional starting problems due to aged/weakened ignition wires. This modification/fix will use the weakened ignition switch to trigger a relay-switch to crank the starter direct from the battery.

FACTORY WIRING



MODIFIED WIRING



Ignition Wire in factory wiring loom near the battery

3: MISC: Others

Battery
Miata is similar width and length, but shorter height.
OEM battery hold-down bolts threads does not go the entire length.
Buy new 8" battery hold-down bolts to lower the clamp-bar properly.
Wire clamp-ends may need to be replaced with larger diameter clamps



Dash Bulbs
T5 bulbs
Upgrade to LED, big improvement

Headlights
H4. Upgrade to LED of Xenon, big improvement

Shifter Knob
M12x1.25 thread size. Not the same from the smaller threaded Miata.

Stereo
Wiring Harness Adapter Miata
Stereo Speakers (OEM) 5" diameter (recommend to use correct 5" than making a 5.25" work)



Tires
155/65 R13 H (factory size)
Wheels
13x5 ET45

3: RESOURCES: Websites

(placeholder)