

N - REMOVE/INSTALL/OVERHAUL

Article Text

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

ARTICLE BEGINNING

1993 ENGINE PERFORMANCE

Mazda Removal, Overhaul & Installation

B2200, B2600i, Miata, MPV, MX-3, MX-6,
Navajo, Protege, RX7, 323, 626 & 929

INTRODUCTION

Removal, overhaul and installation procedures are covered in this article. If component removal and installation is primarily an unbolt and bolt-on procedure, only a torque specification may be furnished.

NOTE: On Miata, obtain code number and deactivate anti-theft alarm before disconnecting battery cable.

IGNITION SYSTEM

DISTRIBUTOR

NOTE: Miata, Navajo and RX7 are equipped with distributorless ignition system.

Refer to appropriate illustration when removing, overhauling or installing distributor. See Figs. 1-7.

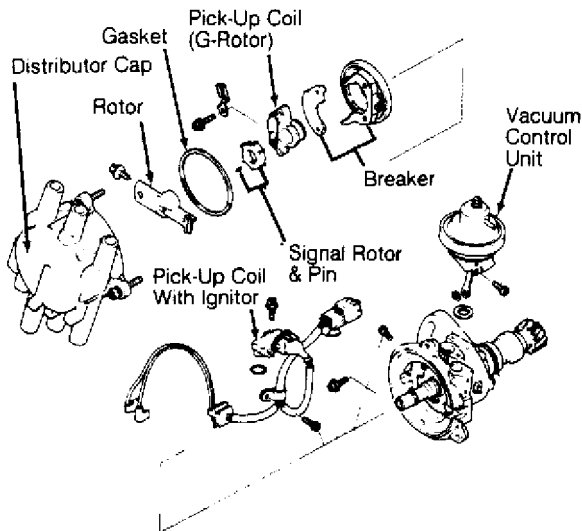


Fig. 1: Exploded View Of Distributor (B2200 Carbureted)
Courtesy of Mazda Motors Corp.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 2)

1993 Mazda 929

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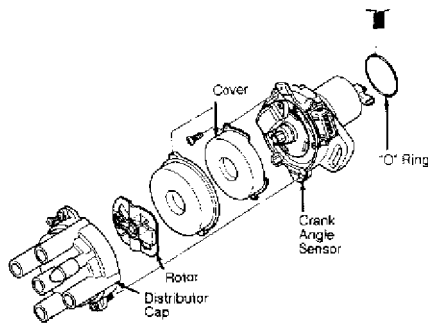
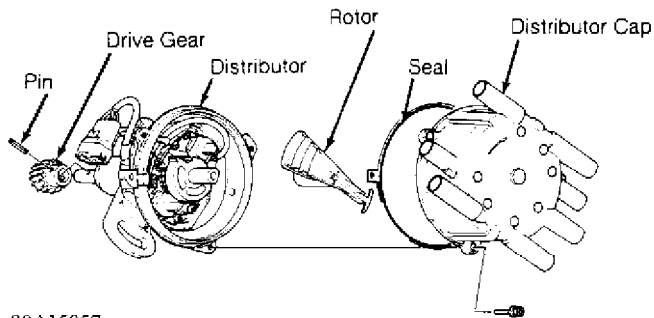


Fig. 2: Exploded View Of Distributor (B2200 PFI, B2600i, MPV 2.6L, Protege & 323)

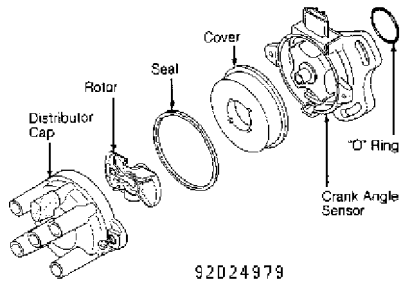
Courtesy of Mazda Motors Corp.



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Fig. 3: Exploded View Of Distributor (MPV 3.0L)

Courtesy of Mazda Motors Corp.



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Fig. 4: Exploded View Of Distributor (MX-3 1.6L)

Courtesy of Mazda Motors Corp.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 3)

1993 Mazda 929

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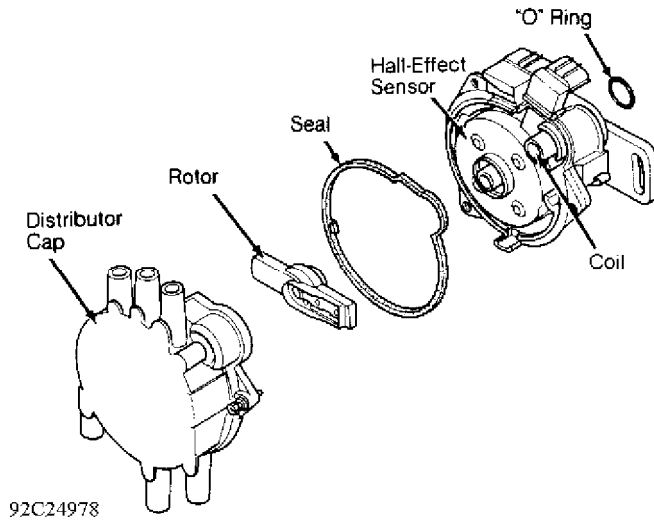


Fig. 5: Exploded View Of Distributor (MX-3 1.8L, MX-6 2.5L & 626 2.5L)

Courtesy of Mazda Motors Corp.

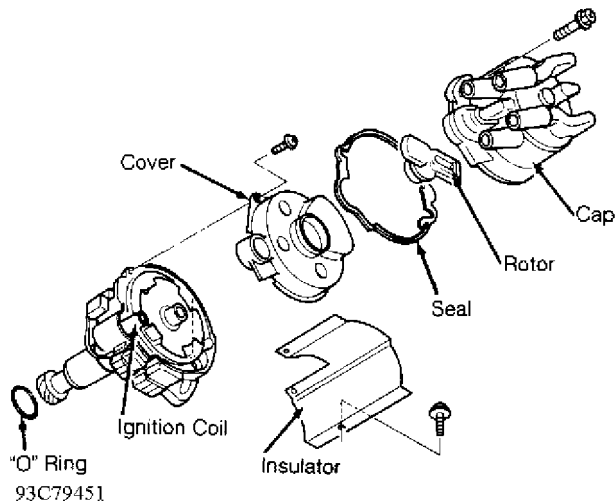


Fig. 6: Exploded View Of Distributor (MX-6 2.0L & 626 2.0L)

Courtesy of Mazda Motors Corp.

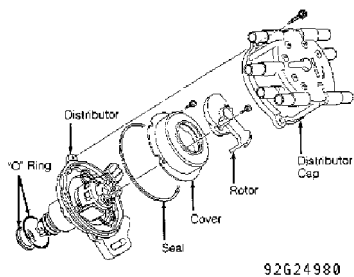


Fig. 7: Exploded View Of Distributor (929)

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N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 4)

1993 Mazda 929

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CRANK ANGLE SENSOR

Removal & Installation (Miata)

Disconnect sensor connector. Remove hold-down bolt. Remove sensor. To install, reverse removal procedure. Adjust ignition timing. See D - ADJUSTMENTS article. Tighten bolt to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal & Installation (MX-3 1.8L, MX-6 2.5L & 626 2.5L)

Crank angle sensor is located on front of engine near crank pulley. To remove, disconnect negative battery cable. Remove idle pulley bracket. Remove dipstick pipe. Disconnect sensor connector. Remove sensor. To install, reverse removal procedure. Tighten bolts to specification. See TORQUE SPECIFICATIONS table. Adjust ignition timing. See D - ADJUSTMENTS article.

Removal & Installation (RX7)

Disconnect negative battery cable. Remove drive belt. Remove crankshaft pulley and crank angle sensor plate. Remove nuts and sensor bracket. Disconnect electrical connectors. Remove crank angle sensors. To install, reverse removal procedure. Tighten sensor mounting nuts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal & Installation (929)

Crank angle sensor is located on front of engine, near crank pulley. To remove, disconnect sensor connector. Remove mounting bolt. Remove sensor. To install, reverse removal procedure. Adjust ignition timing. See D - ADJUSTMENTS article. Tighten bolt to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

CRANKSHAFT POSITION SENSOR

Removal & Installation (Navajo)

Disconnect negative battery cable. Disconnect crankshaft position sensor connector. See Fig. 8. Remove crankshaft timing sensor mounting screws, and remove sensor. To install, reverse removal procedure. Tighten screws to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

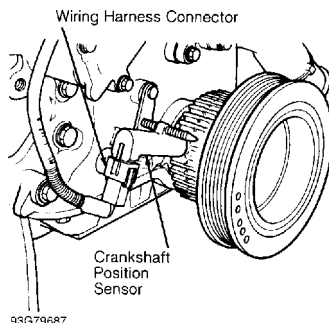


Fig. 8: Locating Crankshaft Position Sensor (Navajo)
Courtesy of Ford Motor Co.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 5)

1993 Mazda 929

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FUEL SYSTEM

WARNING: Always relieve fuel pressure before disconnecting any fuel injection-related component. DO NOT allow fuel to contact engine or electrical components.

FUEL SYSTEM PRESSURE RELEASE

Except Navajo

1) Start engine. On B2200 PFI, B2600i, Miata, MX-6, RX7, 626 and 929, disconnect fuel pump relay or circuit opening relay. See FUEL PUMP/CIRCUIT OPENING RELAY LOCATION table.

2) On MPV 3.0L, disconnect airflow sensor connector. On all other models, disconnect fuel pump connector near fuel tank (on MX-3, Protege and 323, fuel pump connector is accessible from under rear seat cushion).

3) On all models, allow engine to run until it stalls. Turn ignition off. Reconnect electrical connector.

FUEL PUMP/CIRCUIT OPENING RELAY LOCATION TABLE

AA

Application	Location
-------------	----------

B2200 PFI & B2600i Behind Left Kick Panel
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Miata Left Of Steering Column
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MX-6 & 626 Underhood Relay Panel
------------	-----------------------------

Protege & 323 Below Glove Box
---------------	-----------------------

RX7 & 929 Underhood Fuse Block
-----------	----------------------------

AA

Navajo

1) Disconnect negative battery cable. Remove snow/ice shield. Remove air intake tube between air cleaner and throttle body. Remove fuel filler cap to release fuel tank pressure. Connect Fuel Pressure Gauge (49-UN01-010) to fuel pressure relief valve (Schrader valve) on fuel supply manifold, near fuel pressure regulator. See Fig. 25.

2) As an alternate method, disconnect inertia switch connector behind instrument panel, under radio. Start engine and operate until it stalls.

FUEL LINE CONNECTORS (NAVAJO)

NOTE: Although push-connect fittings and spring lock couplers are similar in function, different procedures and tools are used to disconnect and connect these connectors. See Figs. 9 and 10.

Disconnect (Push-Connect Fitting)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove locking (safety) clip (if equipped).

2) Position Push-Connect Fitting Releaser (49-UN01-053 for 5/16" line; 49-UN01-054 for 3/8" line) over fuel line. See Fig. 9.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 6)

1993 Mazda 929

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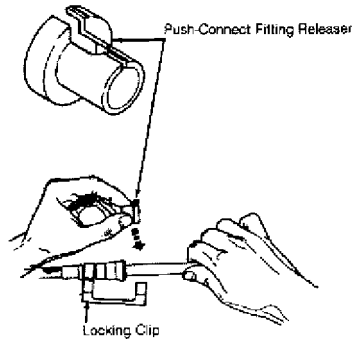
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Slide releaser into fitting. Pull fuel lines apart.

Connect

Press fuel lines together until a click is heard. Attempt to pull lines apart to ensure coupler is fully engaged. Install locking clip (if equipped).



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Fig. 9: Disconnecting Push-Connect Fitting (Navajo)
Courtesy of Ford Motor Co.

Disconnect (Spring Lock Coupler)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove locking (safety) clip (if equipped). Place Spring Lock Coupler Releaser (49-UN01-051 for 3/8" line; 49-UN01-052 for 1/2" line) over fuel line coupler. See Fig. 10.

2) Push spring lock coupler releaser to release female fitting from garter spring. Pull spring lock coupler apart. Remove releaser.

Connect (Spring Lock Coupler)

1) Check for damaged garter spring. If garter spring is damaged, remove using small hooked wire and replace spring. Wipe end of lines using clean cloth. Place new "O" rings onto tube. Lubricate ends of lines with clean refrigerant oil.

2) Push fitting together using a slight twisting motion. Ensure garter spring is over flared end of female fitting. Attempt to pull lines apart to ensure coupler is fully engaged. Install locking clip (if equipped).

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 7)

1993 Mazda 929

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Warning-Relieve fuel system pressure before disconnecting coupling

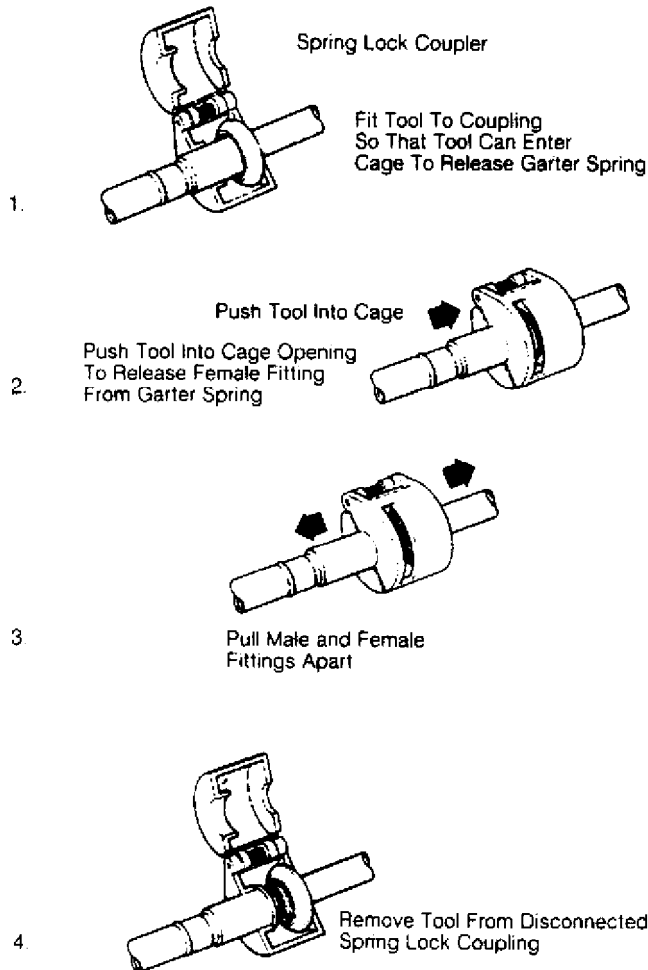


Fig. 10: Disconnecting Spring Lock Coupler (Navajo)
Courtesy of Ford Motor Co.

FUEL SYSTEM PRIMING

CAUTION: After performing fuel system repairs, use following procedure to prime fuel system before starting engine . This prevents excessive engine cranking and allows system to be leak-tested.

Except Navajo

1) On B2200 PFI, B2600i, and MPV, connect jumper wire between terminals of Yellow 2-pin connector. See FUEL PUMP TEST CONNECTOR LOCATION table.

2) On all others, connect jumper wire between GND and F/P terminals of data link connector. See Fig. 11. On all models, turn ignition on for about 10 seconds and then off. Disconnect jumper wire.

Navajo

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 8)

1993 Mazda 929

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Without starting engine, turn ignition on and off 5-10 times.

FUEL PUMP TEST CONNECTOR LOCATION TABLE

AA

Application	Location
-------------	----------

B2200 PFI & B2600i	Right Rear Corner Of Engine Compartment
--------------------	---

MPV	Left Front Corner Of Engine Compartment
-----	---

AA

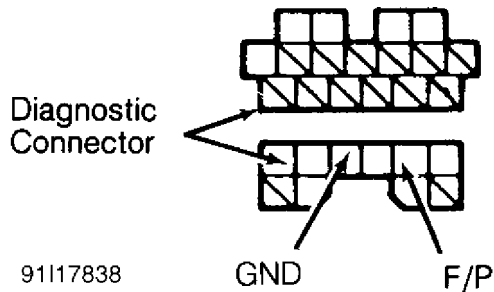


Fig. 11: Data Link Connector Terminal ID (Except B2200, B2600i, MPV & Navajo)

Courtesy of Mazda Motors Corp.

CARBURETOR (B2200)

Removal & Installation

Disconnect negative battery cable. Remove air cleaner. Disconnect accelerator cable, cruise control cable (if equipped), all necessary vacuum hoses, fuel hoses and electrical connectors. Remove carburetor mounting nuts. Remove carburetor. To install, reverse removal procedure.

Disassembly (Air Horn & Choke Assembly)

1) DO NOT remove choke valve and shaft from air horn. Disconnect vacuum hose from choke opener (pull-off) diaphragm. Remove accelerator pump connecting rod, spring and lever. See Fig. 22. Remove spring. Disconnect air vent solenoid valve wire from connector.

2) Disconnect choke rod. Remove air horn retaining bolts. Remove air horn and choke assembly from main body. Remove air vent solenoid valve, spring and gasket from air horn.

Disassembly (Needle Valve & Float)

Remove float, pin and gasket. See Figs. 15 and 22. Remove needle valve assembly. Remove sight glass assembly from main body.

CAUTION: Note location and size of air bleeds and jets before removal. Ensure components are installed in correct locations.

Disassembly (Air Bleeds & Jets)

1) Remove secondary slow jet, secondary slow bleed, secondary main bleed and secondary main jet from main body. See Figs. 12 and 22.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 9)

1993 Mazda 929

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Remove primary main bleed, slow jet and plug, primary slow bleed and primary main jet from main body.

2) Remove richer air bleed, primary slow bleed, coasting richer air bleed and coasting richer jet from air horn. See Figs. 13 and 22.

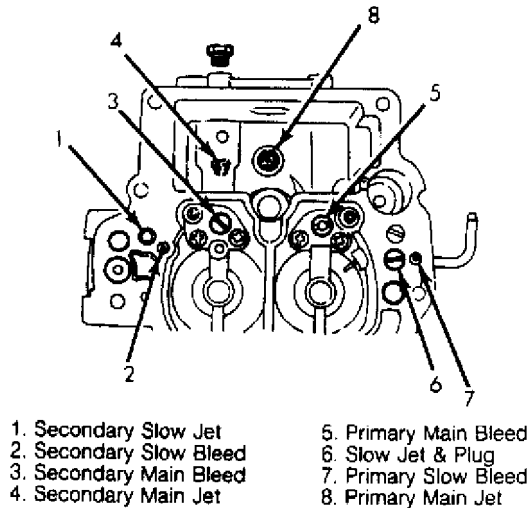


Fig. 12: Locating Air Bleeds & Jets (Main Body)
Courtesy of Mazda Motors Corp.

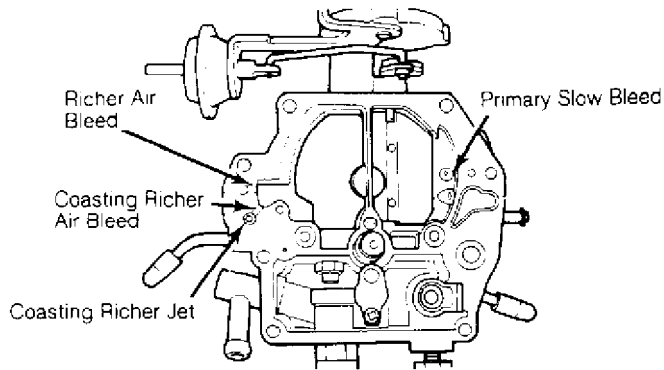


Fig. 13: Locating Air Bleeds & Jets (Air Horn)
Courtesy of Mazda Motors Corp.

Disassembly (Main Body)

1) DO NOT remove venturi's from main body. Remove coasting richer solenoid valve and "O" ring. See Fig. 22. Remove idle switch and spring. Remove slow fuel-cut solenoid valve, needle valve, spring and gasket. Remove dashpot (M/T).

2) Remove accelerator pump plunger and spring assembly. Remove retaining clip, strainer and inlet check ball. Remove outlet check ball plug, outlet check ball and spring.

3) Disconnect throttle link, vacuum diaphragm connecting rod

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 10)

1993 Mazda 929

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and throttle return spring. Remove throttle body-to-main body retaining bolts (one bolt is located inside throttle body). Separate throttle body from main body.

Disassembly (Throttle Body)

DO NOT remove throttle valve and shaft from throttle body. Remove vacuum (secondary) diaphragm assembly. Remove diaphragm cover screws. Remove cover, spring and diaphragm. Using small punch and hammer, remove spring pin located in front of mixture adjusting screw. Remove mixture adjusting screw.

NOTE: DO NOT immerse diaphragms, electrical components or synthetic parts in carburetor cleaner.

Cleaning & Inspection

1) Thoroughly clean metal parts in carburetor cleaner. Using compressed air, dry all components and blow out all passages. DO NOT use wire or pointed metal objects for cleaning. Inspect air horn, main body and throttle body for cracks.

2) Inspect choke shaft and throttle shaft for wear. Check all jets and air bleeds for open passages. Inspect needle and seat for wear. Inspect float and accelerator pump cup for damage. Replace all damaged components.

3) Inspect vacuum diaphragm for damage. Inspect idle mixture screw for wear and burrs. Apply battery voltage to solenoids to ensure solenoids operate (indicated by valve stem movement).

4) Check electric choke heater by connecting an ohmmeter to wire connector and heater ground. If continuity does not exist, replace electric choke heater.

5) To check Mixture Control (M/C) solenoid, apply battery voltage across solenoid using solenoid connector. See Fig. 14. From bottom of air horn, blow air through valve in direction indicated. If air does not flow through valve with solenoid energized, replace air horn assembly (M/C solenoid and air horn are replaced as an assembly).

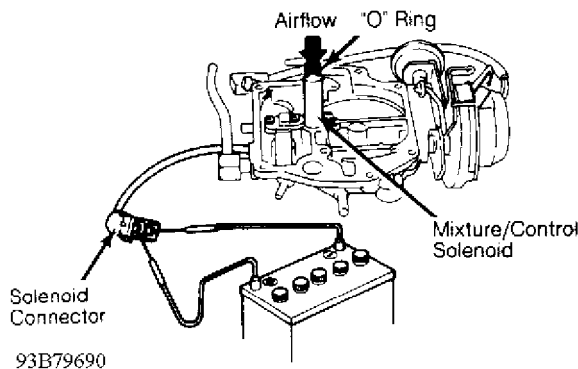


Fig. 14: Checking Mixture Control (M/C) Solenoid
Courtesy of Mazda Motors Corp.

Reassembly (All Parts)

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 11)

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

1) To reassemble, reverse disassembly procedure using NEW gaskets. DO NOT install spring pin in front of mixture screw until idle mixture has been adjusted with engine running. Before installing air horn on main body, adjust float level and float drop. Install NEW "O" ring on M/C solenoid and coat "O" ring with gasoline.

2) After reassembly and before installing carburetor, adjust choke pull-off diaphragm, fast idle cam (throttle opening angle), fast idle cam (choke opening angle), choke unloader, secondary throttle valve and accelerator cable.

3) After installing carburetor, adjust curb (hot) idle speed, fast (cold) idle speed and idle mixture. See D - ADJUSTMENTS article.

Adjusting Float Level

With air horn upside-down and gasket removed, allow float to hang by its weight. Measure distance between top of float and air horn gasket surface. See Fig. 15. If distance is not .42-.46" (10.7-11.7 mm) on A/T models or .46-.50" (11.7-12.7 mm) on M/T models, bend float seat as necessary.

Adjusting Float Drop

With air horn upright and gasket removed, allow float to hang by its weight. Measure between bottom of float and air horn gasket surface. See Fig. 16. If distance is not 1.81-1.85" (46.0-47.0 mm), bend float stop as necessary. See Fig. 15.

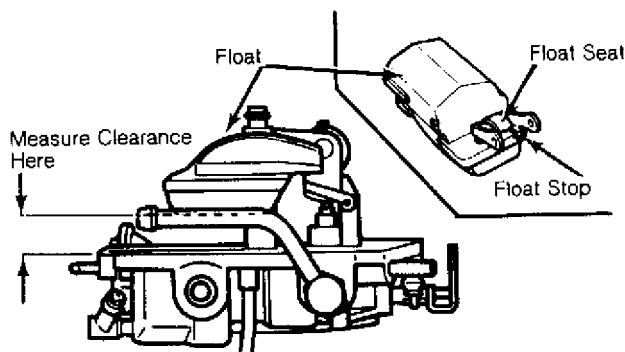


Fig. 15: Adjusting Float Level
Courtesy of Mazda Motors Corp.

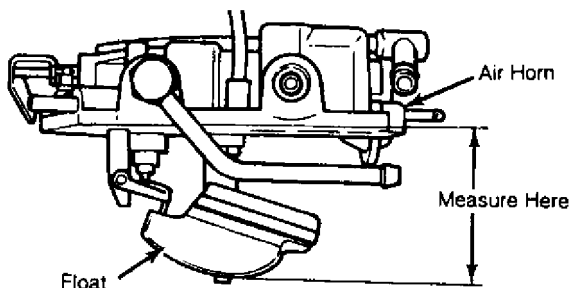


Fig. 16: Adjusting Float Drop
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Adjusting Choke Pull-Off Diaphragm

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Article Text (p. 12)

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

Apply about 16 in. Hg vacuum to choke pull-off diaphragm. Lightly push choke plate toward closed position. Measure clearance between top of choke plate and air horn. See Fig. 17. If clearance is not .067-.085" (1.70-2.16 mm), bend choke lever until clearance is within specification.

Adjusting Fast Idle Cam (Throttle Opening Angle)

Set fast idle cam on second highest position. Measure between primary throttle valve and throttle bore. See Fig. 18. If clearance is not .033-.041" (0.84-1.04 mm), turn fast idle adjusting screw as necessary.

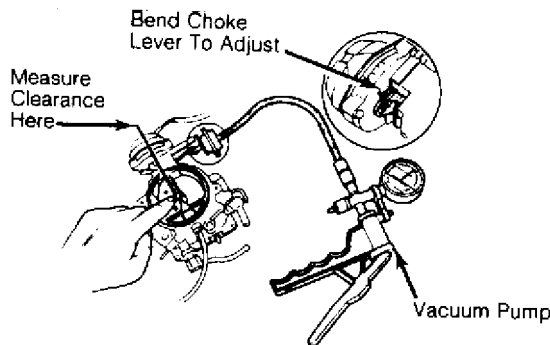


Fig. 17: Adjusting Choke Pull-Off Diaphragm
Courtesy of Mazda Motors Corp.

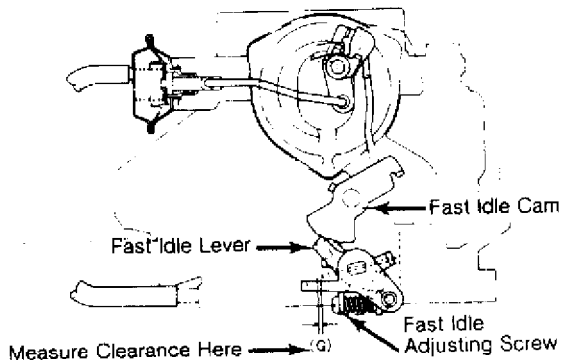


Fig. 18: Adjusting Fast Idle Cam (Throttle Valve Angle)
Courtesy of Mazda Motors Corp.

Adjusting Fast Idle Cam (Choke Valve Angle)

Set fast idle cam on second highest position. Measure clearance between top of choke plate and air horn. See Fig. 19. If clearance is not .024-.045" (0.60-1.14 mm), bend starting arm. If large adjustment is required, bend choke rod.

Adjusting Choke Unloader

Fully open primary throttle valve. Measure clearance between top of choke plate and air horn. See Fig. 20. If clearance is not .110-.143" (2.80-3.62 mm), bend tab as necessary.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 13)

1993 Mazda 929

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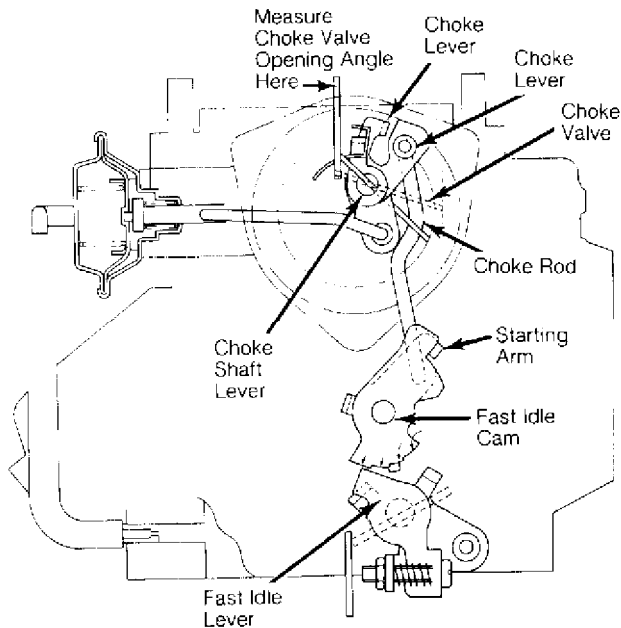


Fig. 19: Adjusting Fast Idle Cam (Choke Opening Angle)
Courtesy of Mazda Motors Corp.

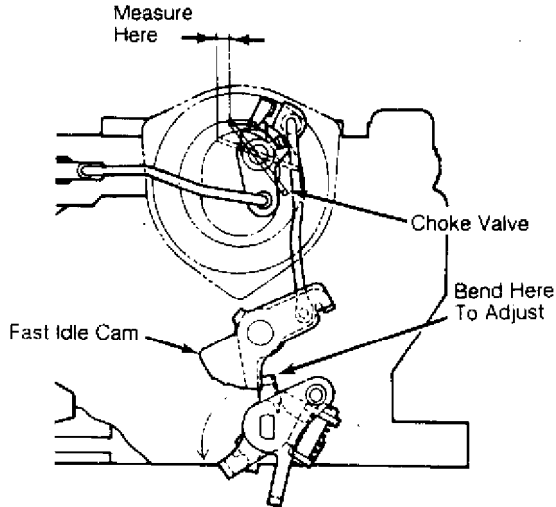


Fig. 20: Adjusting Choke Unloader
Courtesy of Mazda Motors Corp.

Adjusting Secondary Throttle Valve

Secondary throttle valve should start to open when primary throttle valve opens 50-54 degrees and should be fully open when primary throttle valve is fully open. Measure clearance between primary throttle valve and throttle bore when secondary throttle valve starts to open. See Fig. 21. If clearance is not .289-.325" (7.35-8.25 mm), bend tab as necessary.

Adjusting Accelerator Cable

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Article Text (p. 14)

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Thursday, March 25, 1999 12:06AM

Check accelerator cable deflection (free play) at carburetor. If deflection is not .039-.118" (1.0-3.0 mm), turn cable adjusting nuts as needed. Fully depress accelerator pedal. If primary throttle valve does not fully open, turn accelerator stop bolt (above accelerator pedal) as needed to obtain full valve opening.

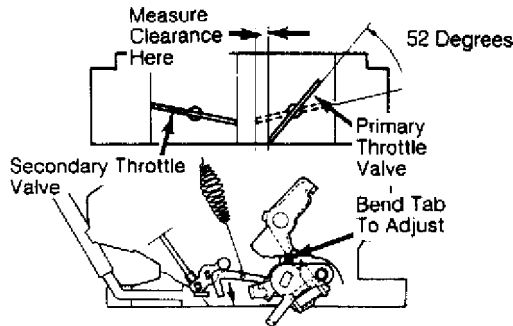
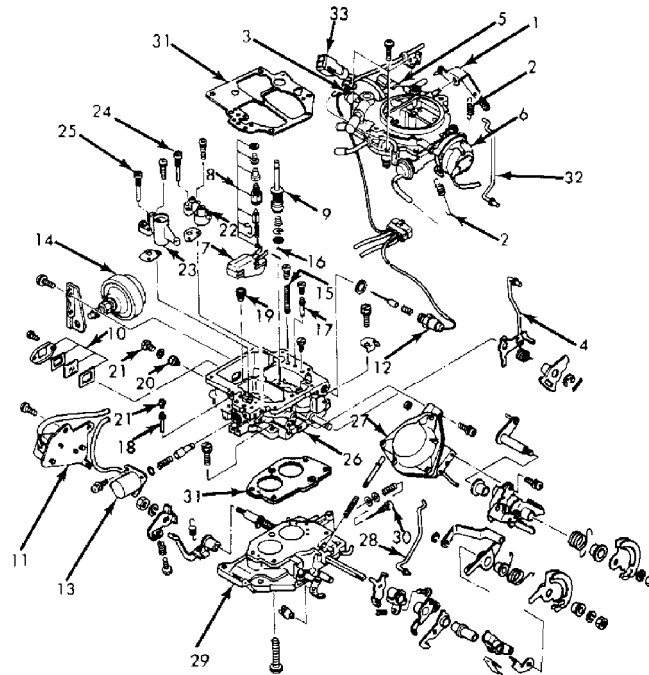


Fig. 21: Adjusting Secondary Throttle Valve
Courtesy of Mazda Motors Corp.



- | | | |
|------------------------------------|------------------------------------|--------------------------------|
| 1. Accelerator Pump Connecting Rod | 12. Slow Fuel-Cut Valve | 23. Secondary Venturi & Nozzle |
| 2. Spring | 13. Coasting Richer Solenoid Valve | 24. Primary Main Bleed |
| 3. Air Vent Solenoid Valve | 14. Dashpot | 25. Secondary Main Bleed |
| 4. Choke Rod | 15. Outlet Check Ball & Spring | 26. Main Body |
| 5. Air Horn | 16. Inlet Check Ball | 27. Vacuum Diaphragm Assembly |
| 6. Choke Assembly | 17. Primary Slow Jet | 28. Throttle Link |
| 7. Float | 18. Secondary Slow Jet | 29. Throttle Body |
| 8. Needle Valve Assembly | 19. Primary Main Jet | 30. Mixture Adjust Screw |
| 9. Accelerator Pump Plunger | 20. Secondary Main Jet | 31. Gasket |
| 10. Sight Glass Assembly | 21. Plug | 32. Accelerator Pump Linkage |
| 11. Idle Switch | 22. Primary Venturi & Nozzle | 33. M/C Solenoid Connector |

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Fig. 22: Exploded View Of 2-Barrel Carburetor (B2200)
Courtesy of Mazda Motors Corp.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 15)

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

FUEL PUMP

CAUTION: After performing fuel system repairs, prime fuel system before starting engine. See FUEL SYSTEM PRIMING.

Removal (B2200 Carbureted With Electric Pump, B2200 PFI & B2600i)

Release fuel system pressure (except B2200 Carbureted). See FUEL SYSTEM PRESSURE RELEASE. Remove fuel tank. Remove fuel pump and sending unit assembly. Remove fuel pump from assembly.

Installation (B2200 Carbureted With Electric Pump, B2200 PFI & B2600i)

Install new pump in sending unit assembly. Ensure fuel pump wire terminals do not touch hose clamps or bracket assembly. To complete installation, reverse removal procedure.

Removal (Miata, Protege, RX7 & 323)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE.

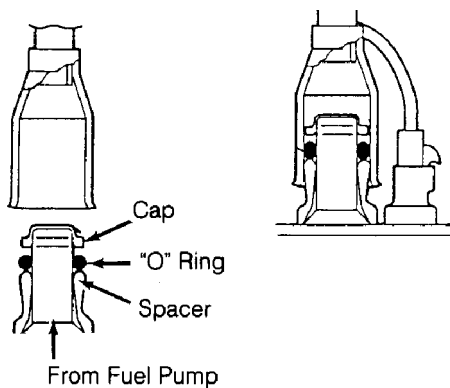
2) On Miata, remove rear package trim (behind seat). On Protege and 323, remove rear seat. On RX7, remove carpet in luggage compartment.

3) On all models, remove fuel pump access cover. Disconnect fuel hoses and electrical connector. Remove fuel pump and sending unit assembly. Remove fuel pump from assembly.

Installation (Miata, Protege, RX7 & 323)

1) Install fuel pump to assembly using NEW "O" ring, cap and spacer between fuel pump and outlet pipe (coat components with oil or gasoline before installing). See Fig. 23. After installing fuel pump to assembly, blow through outlet pipe (at top of assembly) toward pump to confirm sealing of "O" ring.

2) If air flows through pump, shake pump several times to dislodge check ball. To complete installation, reverse removal procedure.



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Fig. 23: Installing Fuel Pump (Miata, Protege, RX7 & 323)
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N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 16)

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

Removal (MPV & MX-3)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove rear seat. On MPV, lift rear floor mat.

2) On all models, remove fuel pump cover. Disconnect fuel hoses and electrical connector. Remove fuel pump and sending unit assembly. Remove fuel pump from assembly.

Installation (MPV & MX-3)

1) Replace fuel hose between pump and outlet pipe (DO NOT apply excessive force when installing onto pump nipple). Install hose clamps.

2) Install pump with wire terminals positioned to avoid contact with metal parts. To complete installation, reverse removal procedure.

Removal (MX-6 & 626)

Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove fuel tank. Turn lock ring counterclockwise. Remove lock ring. Remove fuel pump and sending unit assembly.

Installation (MX-6 & 626)

Clean seal area on tank and assembly flange. Lightly coat NEW "O" ring with molybdenum grease. Install seal in groove. Carefully install assembly into fuel tank, ensuring filter is not damaged and seal remains in groove. Install and turn lock ring clockwise until tight. Install fuel tank.

Removal & Installation (929)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE.

2) Remove rear seat mounting bolts, located between seat bottom and seat back cushions. Remove seat cushions. Remove amplifier and CD changer (if equipped) and lift luggage compartment carpeting. Remove hole cover.

3) Disconnect fuel hoses and electrical connector. Remove fuel pump and sending unit assembly. Remove fuel pump from assembly. To install, reverse removal procedure.

Removal (Navajo)

Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove fuel tank. Using Fuel Tank Lock Ring Wrench (T86T-9275-A), turn lock ring counterclockwise. Remove lock ring. Remove fuel pump and sending unit assembly. Remove fuel pump from assembly.

Installation (Navajo)

Clean seal area on tank and assembly flange. Lightly coat NEW "O" ring with molybdenum grease. Install seal in groove. Carefully install assembly into fuel tank, ensuring filter is not damaged and seal remains in groove. Install and turn lock ring clockwise until tight using Fuel Tank Lock Ring Wrench (T86T-9275-A). Install fuel tank.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 17)

1993 Mazda 929

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FUEL PRESSURE REGULATOR

CAUTION: After performing fuel system repairs, prime fuel system before starting engine. See FUEL SYSTEM PRIMING.

Removal & Installation (Except Navajo)

1) Disconnect negative battery cable. Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. On 929, remove dynamic chamber. On all models, disconnect vacuum and fuel hose(s) from regulator. Remove regulator mounting bolts. Remove regulator, gasket and "O" ring (if equipped).

2) To install, reverse removal procedure. Install NEW gasket and "O" ring (if equipped). On 929, install dynamic chamber with NEW gasket. Tighten bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal & Installation (Navajo)

1) Disconnect negative battery cable. Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Disconnect vacuum hose from regulator. Disconnect fuel line coupling at regulator. See FUEL LINE CONNECTORS (NAVAJO).

2) Remove regulator mounting screws. Remove regulator, "O" ring and washer. To install, reverse removal procedure using NEW washer and "O" ring. Lubricate NEW "O" ring with light oil. DO NOT use silicone grease.

FUEL RAILS & INJECTORS

CAUTION: After performing fuel system repairs, prime fuel system before starting engine. See FUEL SYSTEM PRIMING.

Removal & Installation (B2200 PFI, B2600i & MPV 2.6L)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE under FUEL SYSTEM. Remove throttle body. See THROTTLE BODY under FUEL SYSTEM.

2) Remove support brackets and injector harness bracket from dynamic chamber. Disconnect vacuum hoses, PCV hose, intake air thermosensor connector and ground wire from dynamic chamber. Remove dynamic chamber.

3) Disconnect vacuum hose and fuel hoses from fuel rail. Disconnect injector electrical connectors. Pull fuel rail with injectors and pressure regulator upward to remove. Remove insulators, injectors and "O" rings from fuel rail.

4) To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings, and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article. Install dynamic chamber with NEW gasket.

Removal & Installation (Miata)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Disconnect negative battery cable. Remove air valve and PCV

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 18)

1993 Mazda 929

For Techdoc Ltd.

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Thursday, March 25, 1999 12:06AM

valve hose from intake manifold. Disconnect vacuum and fuel hoses from fuel rail. Disconnect injector electrical connectors. Remove insulators, injectors and "O" rings from fuel rail.

2) To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal & Installation (MPV 3.0L)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove air intake tube. See Fig. 24. Remove throttle body. See THROTTLE BODY.

2) Remove intake air pipe, extension manifolds and upper intake manifold. Disconnect fuel hoses from fuel rail. Disconnect injector electrical connectors. Remove fuel rail and injectors as an assembly. Remove insulators, injectors and "O" rings from fuel rail.

3) To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings, and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting nuts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article. Install NEW extension manifold and intake air pipe gaskets.

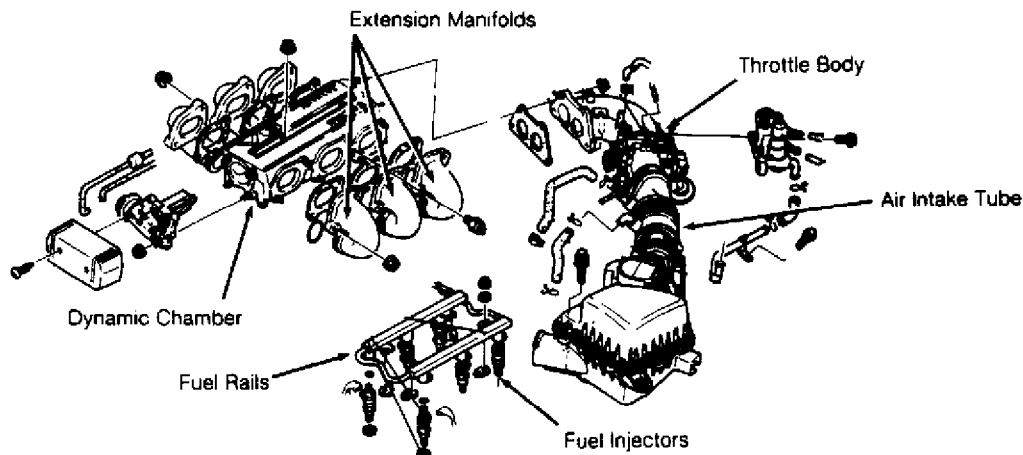


Fig. 24: View Of Upper Intake Manifold Components & Fuel Rail (MPV 3.0L)

Courtesy of Mazda Motors Corp.

Removal & Installation (MX-3 1.6L, MX-6 & 626 2.0L, Protege & 323)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Disconnect injector electrical connectors. Remove injector harness from fuel rail. Remove fuel rail mounting bolts. Remove fuel rail, injectors and pressure regulator as an assembly.

2) Remove insulators, injectors and "O" rings from fuel rail. To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 19)

1993 Mazda 929

For Techdoc Ltd.

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Thursday, March 25, 1999 12:06AM

Removal & Installation (MX-3 1.8L, MX-6 & 626 2.5L)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Disconnect negative battery cable. Remove air intake tube. Disconnect vacuum and fuel hoses from fuel rail. Disconnect injector electrical connectors. Remove fuel rail, injectors and pressure regulator as an assembly. Remove insulators, injectors and "O" rings from fuel rail.

2) To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal (Navajo)

1) Thoroughly clean engine. Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Disconnect negative battery cable. Remove upper intake manifold and throttle body as an assembly.

2) Disconnect fuel supply line from fuel supply manifold. See FUEL LINE CONNECTORS (NAVAJO). Disconnect fuel return line from fuel pressure regulator. Remove fuel supply manifold. See Fig. 25. Disconnect injector electrical connectors and retaining clips. Remove injectors from fuel supply manifold.

Installation (Navajo)

1) Lubricate NEW injector "O" rings with light oil. DO NOT use silicone grease. Carefully install injectors into fuel supply manifold. Carefully install fuel supply manifold into lower manifold using NEW manifold gasket.

2) Clean and oil fuel supply manifold bolt threads. Install fuel supply manifold bolts. Tighten bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article. To complete installation, reverse removal procedure.

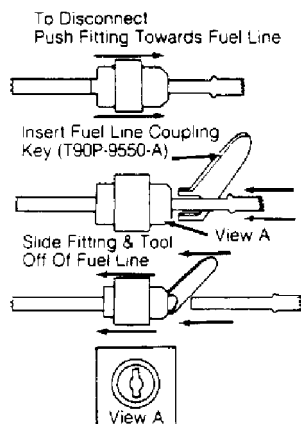


Fig. 25: Exploded View Of Fuel Supply Manifold Assembly (Navajo)
Courtesy of Ford Motor Co.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 20)

1993 Mazda 929

For Techdoc Ltd.

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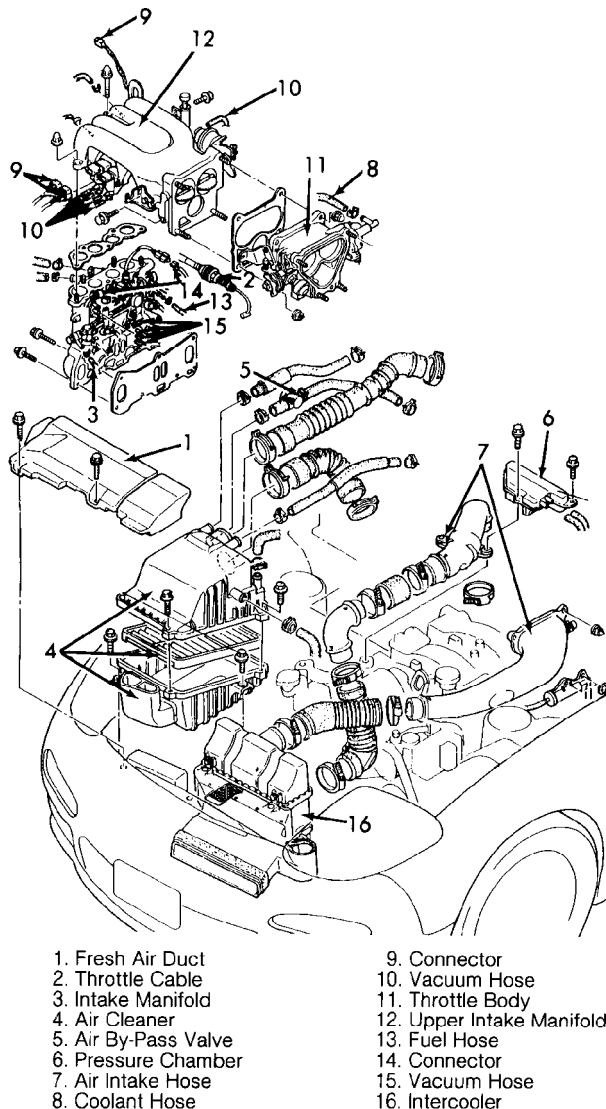
Thursday, March 25, 1999 12:06AM

Removal & Installation (RX7)

1) Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove air intake duct. See Fig. 26. Remove throttle body. See THROTTLE BODY.

2) Remove upper intake manifold. Disconnect fuel hoses from fuel rail. Disconnect injector electrical connectors. Remove idle speed control solenoid. Remove fuel rail and injectors as an assembly. Remove insulators, injectors and "O" rings from fuel rail.

3) To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings, and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting nuts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article. Install NEW manifold gaskets.



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Fig. 26: Exploded View Of Air Intake System
Courtesy of Mazda Motors Corp.

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 21)

1993 Mazda 929

For Techdoc Ltd.

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Thursday, March 25, 1999 12:06AM

Removal & Installation (929)

1) Disconnect negative battery cable. Release fuel system pressure. See FUEL SYSTEM PRESSURE RELEASE. Remove dynamic chamber and throttle body as an assembly. Disconnect injector electrical connectors. Disconnect vacuum and fuel hoses. Remove fuel rail, injectors and pressure regulator as an assembly.

2) Remove insulators, injectors and "O" rings from fuel rail. To install, reverse removal procedure. Apply coat of engine oil to NEW "O" rings, and install rings on injectors. Install NEW insulators. Tighten fuel rail mounting bolts to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article.

OXYGEN SENSOR

Removal

Disconnect oxygen sensor electrical connector. Sensor may be difficult to remove when engine temperature is less than 120°F (48°C). If sensor is difficult to remove, use rust penetrant to avoid damaging threads. Carefully remove sensor.

Installation

Apply anti-seize to sensor threads (if reusing old sensor or if new sensor is not coated with anti-seize). Install sensor and tighten to specification. See TORQUE SPECIFICATIONS TABLE at the end of this article. Reconnect sensor electrical connector.

THROTTLE BODY

CAUTION: After performing fuel system repairs, prime fuel system before starting engine. See FUEL SYSTEM PRIMING.

Removal & Installation (Except Navajo)

1) On MPV 3.0L, drain about 2 qts. (1.9 L) of coolant from cooling system. On all models, disconnect negative battery cable. Remove air intake tubes.

2) Disconnect accelerator cable, coolant hoses and electrical connectors from throttle body as necessary. On 929, remove by-pass air control valve. On all models, remove throttle body. To install, reverse removal procedure using NEW throttle body gasket. See TORQUE SPECIFICATIONS TABLE at the end of this article.

Removal (Navajo)

1) Disconnect throttle position sensor electrical connector. Remove snow/ice shield to expose throttle linkage. Remove throttle cable bracket.

2) Disconnect cable from ball stud on throttle body. Remove air cleaner-to-throttle body air inlet tube. Disconnect canister purge hose from fitting beneath throttle body.

3) Remove 4 throttle body bolts. Remove throttle body from upper intake manifold.

Installation (Navajo)

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 22)

1993 Mazda 929

For Techdoc Ltd.

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Thursday, March 25, 1999 12:06AM

Install NEW throttle body gasket. To complete installation, reverse removal procedure.

TURBOCHARGER

Removal (RX7)

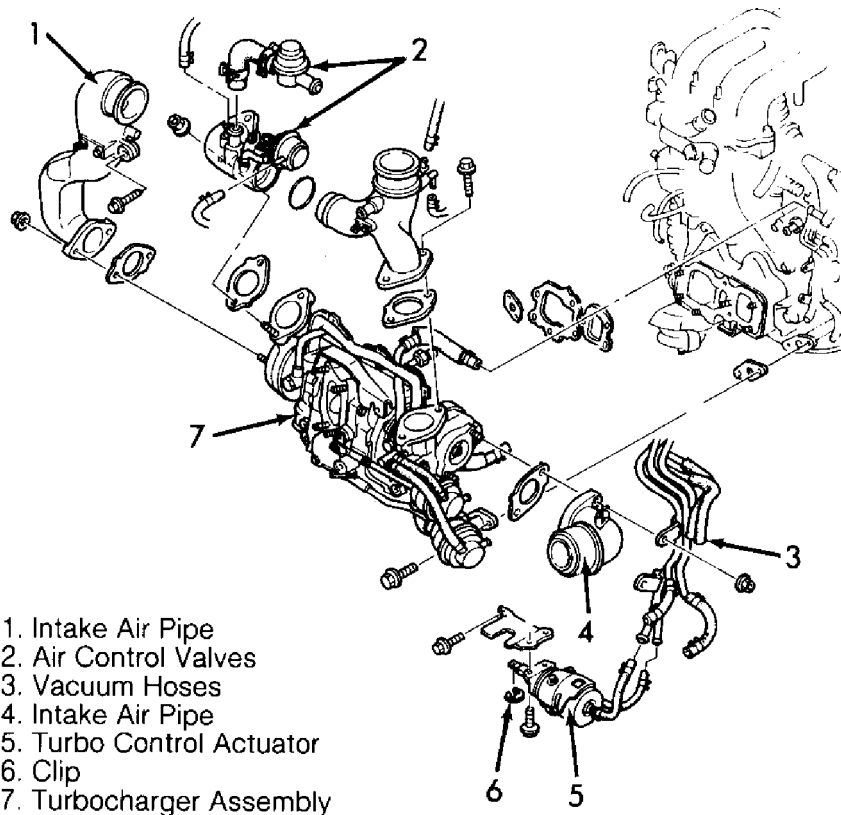
1) Raise and support vehicle. Drain coolant. Disconnect negative battery cable. Remove air cleaner, intake air hoses and pressure chamber. See Fig. 26. Remove air control valve assembly. Disconnect vacuum hoses.

2) Remove drive belt and air injection pump. Disconnect oxygen sensor, exhaust downpipe and catalytic converter. Disconnect turbo control valve rod and actuator. See Fig. 27. Disconnect oil pipes from turbocharger. Remove coolant hoses.

3) Remove bolts securing turbocharger to exhaust manifold. Remove turbocharger assembly.

Installation (RX7)

Install turbocharger with NEW gaskets, "O" rings and exhaust manifold studs. Tighten nuts and bolts to specification. See Fig. 28. See TORQUE SPECIFICATIONS TABLE at the end of this article. To complete installation, reverse removal procedure. Prime oil system.



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Fig. 27: Exploded View Of Turbocharger Assembly
Courtesy of Mazda Motors Corp.

N - REMOVE/INSTALL/OVERHAUL

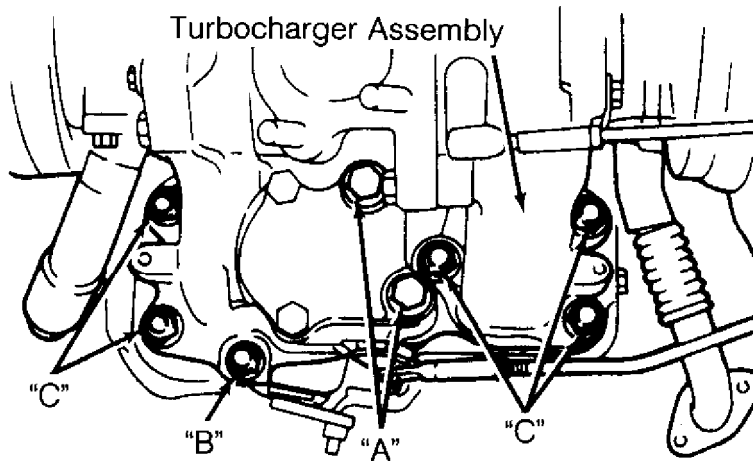
Article Text (p. 23)

1993 Mazda 929

For Techdoc Ltd.

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Thursday, March 25, 1999 12:06AM



"A" : Tighten To 28-38 Ft. Lbs (38-51 N.m)

"B" : Tighten To 16-21 Ft. Lbs (22-29 N.m)

"C" : Tighten To 32-42 Ft. Lbs (44-57 N.m)

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Fig. 28: Installing Turbocharger

Courtesy of Mazda Motors Corp.

TORQUE SPECIFICATIONS

TORQUE SPECIFICATIONS TABLE

AA

Component	Ft. Lbs (N.m)
Crank Angle Sensor Mounting Bolt (Miata)	14-20 (19-27)
Distributor Mounting Bolts	14-18 (19-25)
Fuel Rail Mounting Bolt/Nut	14-18 (19-25)
Idle Pulley Bracket Bolts (MX-3 1.8L)	14-19 (19-26)
Oxygen Sensor	
B2200 Carbureted	(1)
Navajo	30 (41)
All Others	22-36 (30-49)
Throttle Body-To-Manifold Bolts	
(Except Navajo)	14-18 (19-25)
Turbo-To-Exhaust Manifold Bolts/Nuts (RX7)	
"A" Bolts (2)	28-38 (38-51)
"B" Nuts (2)	16-21 (22-29)
"C" Nuts (2)	32-42 (44-57)
Turbo-To-Exhaust Pipe Nut (RX7)	28-38 (38-52)
Upper Intake Manifold Bolt/Nut	
Except Navajo	14-18 (19-25)
Navajo	15-18 (20-24)

INCH Lbs. (N.m)

Carburetor Mounting Nuts (B2200)	62-97 (7-11)
Crank Angle Sensor Mounting Bolt	
MX-3 1.8L, MX-6 2.5L & 626 2.5L	95 (10.7)

N - REMOVE/INSTALL/OVERHAUL

Article Text (p. 24)

1993 Mazda 929

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Thursday, March 25, 1999 12:06AM

RX7 & 929	71-97 (8-11)
Crankshaft Position Sensor Bolts (Navajo)	79-106 (9-12)
Dipstick Pipe Bolts (MX-3 1.8L)	71-97 (8-11)
Fuel Pressure Regulator Bolts	71-97 (8-11)
Fuel Supply Manifold Bolts (Navajo)	89-124 (10-14)
Throttle Body-To-Manifold Bolts (Navajo)	71-106 (8-12)
Turbo Oil Return Pipe Nut (RX7)	71-97 (8-11)

(1) - Information is not available from manufacturer.

(2) - See Fig. 28 for nut/bolt identification.

AA

END OF ARTICLE