A/C INSTALLATION
INSTRUCTIONS FOR

MAZDA
MX-5 Miata

REVISED DATE: 11-27-89

PRIOR TO INSTALLING THE A/C UNIT, CONFIRM THAT YOU HAVE ORDERED THE CORRECT A/C AND SUB-KIT ACCORDING TO THE CHART BELOW.

A/C KIT REFERENCE CHART

<table>
<thead>
<tr>
<th>MODEL</th>
<th>A/C KIT NO.</th>
</tr>
</thead>
<tbody>
<tr>
<td>FOR POWER STEERING MODEL</td>
<td>NA01 YV 410</td>
</tr>
</tbody>
</table>

THE INSTALLER MUST BE AWARE OF THE FOLLOWING IMPORTANT POINTS.

1. SYMBOL MARK — The following symbols are used to indicate the type of service operation to be performed.

   • Steps within a block group.

   • Lubricate all fittings and O-rings with new refrigerant oil before connecting them.

   • When tightening or loosening line fittings, use two wrenches for equalized support.

   • All fittings and connectors must be tightened to the correct torque specification. See torque specification charts.

   O. E. M. — Original equipment from manufacturer.

2. All wires and hoses must be routed properly in order to avoid interference with surrounding parts.

3. • Do not remove the protective caps from the fittings until they are to be connected.
   • Follow the refrigerant manufacturer's recommendation for handling R-12 containers.

b. Bolt Torque

<table>
<thead>
<tr>
<th>BOLT DIAMETER</th>
<th>ft-lb</th>
<th>TORQUE (kg-m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 mm Bolt/Nut</td>
<td>4.9 - 7.2</td>
<td>0.7 - 1.0</td>
</tr>
<tr>
<td>8 mm Bolt/Nut</td>
<td>10.5 - 15.4</td>
<td>1.5 - 2.2</td>
</tr>
<tr>
<td>10 mm Bolt/Nut</td>
<td>21.0 - 28.0</td>
<td>3.0 - 4.0</td>
</tr>
</tbody>
</table>

TORQUE

<table>
<thead>
<tr>
<th>NUT</th>
<th>UNION</th>
<th>SOCKET</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>17</td>
<td>—</td>
</tr>
<tr>
<td>27</td>
<td>24</td>
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<td>22</td>
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<td>12</td>
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<td>12</td>
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<tr>
<td>14</td>
<td>—</td>
<td>14</td>
</tr>
<tr>
<td>12</td>
<td>—</td>
<td>12</td>
</tr>
</tbody>
</table>

WRENCH SIZE (m/m)

WARNING:
When working with refrigerant R-12, extreme caution must be exercised. Always wear eye and skin protection. Make sure all safety procedures have been carried out. Failure to do so could result in serious injury.

6 8 10

130 120 110 100 90 80 70 60 50 40 30 20 10 0
BOLT LENGTH RULER
**BLOCK 1**  **STEPS 1-3**  **VEHICLE PREPARATION**

※ CAUTION:

REFER TO OWNER'S MANUAL FOR DETAILS ON HOW THE AUDIO ANTI-THEFT SYSTEM WORKS AND HOW TO DEACTIVATE THIS SYSTEM.

1. RAISE THE FRONT OF THE VEHICLE AT LEAST 300 mm AND PULL THE EMERGENCY BRAKE.
2. INSTALL FENDER COVERS.
3. DISCONNECT THE NEGATIVE TERMINAL CLAMP FROM BATTERY. ※ SEE CAUTION.

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**BLOCK 2**  **STEPS 1-6**  **PASSENGER COMPARTMENT PREPARATION**

1. REMOVE (3) SCREWS SECURING GLOVE BOX BRACE.
2. REMOVE GLOVE BOX AND LAY ASIDE.

- REMOVE & RETAIN
- DISCARD PINS AND AIR DUCT.
- REMOVED (2) BLIND PLUGS FROM FIREWALL INSULATION.
- DISCARD (2) RUBBER BLIND PLUGS IN FIREWALL.
- DISCARD (1) RUBBER BLIND PLUG IN TRANSMISSION TUNNEL UNDER CARPET.
BLOCK 3  STEPS 1-9  COOLING UNIT INSTALLATION

1. INSTALL COOLING UNIT PIPE GROMMETS FROM ENGINE COMPARTMENT.
2. INSTALL DRAIN HOSE ONTO COOLING UNIT IN THE POSITION SHOWN.
3. LOOSELY INSTALL LEFT SEAL PLATE AND SLIDE TO FAR LEFT.
   NOTE: CLAMP MUST BE AT UPRIGHT POSITION.
4. LOOSELY INSTALL PRE-ASSEMBLED RIGHT SEAL PLATE AND SLIDE TO FAR RIGHT.
5. SLIDE COOLING UNIT INTO POSITION AND LOOSELY INSTALL (2) 6mm FLANGE NUTS. POSITION DRAIN HOSE INTO THE HOLE AT THE TRANSMISSION TUNNEL.
6. SLIDE BOTH SEAL PLATES TOWARDS COOLING UNIT UNTIL THEY CONTACT WITH STOPS AND CLAMP THE BANDS.
7. TIGHTEN BOTH NUTS PREVIOUSLY INSTALLED IN STEP 5.

LOCATE THE O. E. M. THERMOSTAT HARNESS (MARKED WITH BLUE TAPE) ABOVE THE COOLING UNIT.
RELEASE THE HARNESS FROM THE TAPE AND CONNECT WIRES TO THERMOSTAT.
NOTE: MAKE SURE THE CONNECTORS ARE FULLY SEATED.
8. TIE-WRAP THE THERMOSTAT HARNESS TO O.E.M. HARNESS USING (1) 140 mm BAND.
   NOTE: CUT OFF EXCESS.
**BLOCK 4  STEPS 1-3  A/C SWITCH INSTALLATION**

1. Pull out and discard the heater blower switch knob.
2. Install the open centered blower switch knob provided in the kit.
3. Install the A/C on/off button into the center of blower switch knob.

**BLOCK 5  STEPS 1-2  UNDERBODY PREPARATION**

1. Remove and retain splash shield by removing (2) nuts & (9) bolts.
2. Remove air guide by removing (6) bolts & (2) clips and release (1) tab.

- Splash Shield
- Air Guide
- Tab
- Clip
**BLOCK 6**

**STEPS 1-2**

UNDERBODY PREPARATION

1. REMOVE AND RETAIN LOWER (2) BOLTS OF O. E. M. FAN.
2. INSTALL THE DRAIN HOSE GROMMET.

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**BLOCK 7**

**STEPS 1-6**

CONDENSER INSTALLATION

1. PLACE THE RECEIVER DRIER TANK INTO THE BRACKET AND CONNECT INLET FITTING.
   - NOTE: SAFETY FUSE MUST FACE FRONT.

2. CONNECT PIPE NO. 2 (NA01 61 466A) TO OUTLET FITTING OF RECEIVER/DRIER.

3. INSTALL CLIP (BF67 61 471) ONTO PIPE NO. 2 USING (1) 6x16mm BOLT.
   - NOTE: VENDOR PART NO. ON CLIP: 67-A40A-6F

4. INSTALL AND TIGHTEN THE BOLT, (6x16mm BOLT)

5. TORQUE BOTH FITTINGS OF RECEIVER/DRIER TANK 7.2 - 14.4 ft-lb, 1.0 - 2.0 kg-m

6. INSTALL CONDENSER ASSY IN FRONT OF RADIATOR USING (1) 6mm NUT & (3) 6x25mm BOLTS.
1. Remove & retain
2. Discard
3. Remove & retain
4. Release
5. Disconnect
6. Disconnect
7. Disconnect
8. Disconnect
9. NA02 61 474A
10. NA01 61 474

- Remove and retain (2) bolts which secure washer fluid tank.
- Remove and discard bolt which secures bracket.
- Remove and retain (2) bolts of O.E.M. fan.
- Release fan harness from clip.
- Disconnect O.E.M. fan connector.

Lay aside fan.
Disconnect washer fluid pump connector.
Lay aside washer fluid tank.
Install bracket (NA02 61 474A) using (1) 6x16mm bolt.
Install bracket (NA01 61 474) using (1) 6x6mm bolt.
**BLOCK 9**
**STEPS 1 - 2**
**BELT REMOVAL FOR P/S MODEL ONLY**

1. TURN THE CRANKSHAFT SO THAT THERE IS ACCESS TO NUT A.
2. LOOSEN A B C D BOLTS & NUTS. REMOVE AND DISCARD POWER STEERING BELT.
   NOTE: IF VEHICLE IS STANDARD STEERING MODEL, GO TO BLOCK 10.

**BLOCK 10**
**STEPS 1 - 3**
**COMPRESSOR & BRACKET INSTALLATION**

1. REMOVE AND DISCARD (1) FRONT COVER BOLT.
2. INSTALL COMPRESSOR BRACKET USING (4) 10 x 20 mm BOLTS AND (1) 8 x 75 mm BOLT.
   NOTE: (4) 10 x 20 mm BOLTS MUST BE TORQUED FIRST. THEN TORQUE (1) 8 x 75 mm BOLT TO SPECIFICATION.

   - **TORQUE SPECIFICATIONS**
     - 10 x 20 mm BOLT: 27-38 ft-lb, 3.8 - 5.3 kg-m
     - 8 x 75 mm BOLT: 14-19 ft-lb, 1.9 - 2.6 kg-m

3. INSTALL COMPRESSOR & BRACKET (NA02 61 472A) USING (4) 8 x 85 mm BOLTS.
   NOTE: INSTALL BRACKET TOGETHER WITH UPPER REAR MOUNTING BOLT.
   TORQUE TO 14-19 ft-lb, 1.9-2.6 kg-m

   **NA02 61 472A**

   **8x85mm**
   **10x20mm**
   **TORQUE**
**BLOCK 11**

**STEPS 1 - 3**

**BELT INSTALLATION**

**VEHICLES WITH POWER STEERING**

1. INSTALL DRIVE BELT OVER PULLEYS (CRANKSHAFT, A/C COMP., P/PUMP)
2. APPLY BELT TENSION BY TURNING ADJUSTING BOLT D CLOCKWISE UNTIL BELT TENSION IS WITHIN SPECIFICATION.
3. TIGHTEN BOLT & NUTS A B C.

**VEHICLES WITH STANDARD STEERING**

1. INSTALL IDLE PULLEY BRACKET ASSY USING (3) 10x40mm BOLTS. TORQUE TO 27-38 ft-lb, 3.8-5.3 kg-m

**BELT MEASURING LOCATION**

- P/S MODEL:
- S/S MODEL:

**BELT TENSION SPECIFICATION**

<table>
<thead>
<tr>
<th>WHEN NEW</th>
<th>TENSION (KG)</th>
<th>DEFLECTION (mm at 10kg)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>50-60</td>
<td>8-9</td>
</tr>
</tbody>
</table>
1. Route H. Pipe between body & canister hose from underneath the vehicle and connect to evaporator & pipe no. 2 fittings by hand as much as possible.

2. Route L. Pipe between body & canister hose from underneath the vehicle and connect to evaporator fitting by hand as much as possible.

3. Install (4) clips.

4. Install additional fan by installing it on the O.E.M. fan side then slide it to right.

5. Secure the additional fan to radiator using bracket (NA01 61 4H1) & (3) 6x16mm bolts. (Upper side only at this time.)

   Note: Make sure the notched end of bracket is to the additional fan.

6. Re-install the O.E.M. cooling fan and secure upper mountings using (2) O.E.M. bolts retained.
**WIRE HARNESS INSTALLATION**

3. Install Bracket (NA01 61 695) to Flange using (1) 6x16mm Bolt.
4. Connect A/C Harness Connector (AC-01) to Relay and Install Relay to Bracket.
5. Connect Following Connectors:
   - FAC-01: 6 Pin to O.E.M. Harness
   - REMOVE & DISCARD BLIND PLUG FROM O.E.M. CONNECTOR.
   - AC-03: 2 Pin to Pressure Switch
   - AC-04: 2 Pin Additional Fan
6. Tie-Wrap A/C Harness to O.E.M. Harness at the area shown using (1) 140mm Band.
7. Cut off excess.

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**STEP 1-3**

8. Remove and Discard Bolt from Rear Mounting of P/S Fluid Reservoir. Install Clip (99276 0506) using (1) 6x16mm Bolt.
10. Secure Magnetic Clutch Wire into Clip. Tie-Wrap Wire to P/S hose at the area shown using (1) 200mm Band.

**NOTE:** Cut off excess.

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**IF THE VEHICLE IS STANDARD STEERING MODEL, FOLLOW THE PROCEDURES BELOW INSTEAD OF 7 & 8.**

11. Install Clip (99276 0506) using (1) 6x16mm Bolt.

**NOTE:** Eliminate the slack between Compressor and Clip so that wire does not interfere with belt.
**BLOCK 14 | STEPS 1-6 | BRACKET, PIPE INSTALLATION**

1. INSTALL BRACKET (NA01 61 472) TO LOWER RIGHT ADDITIONAL FAN MOUNTING HOLE USING (1) 6x16 mm BOLT.
2. INSTALL BRACKET (NA02 61 471A) TO LOWER LEFT ADDITIONAL FAN MOUNTING HOLE USING (1) 6x16 mm BOLT.
3. INSTALL RUBBER INSULATOR TO BRACKET. NOTE: RUBBER INSULATOR SHOULD BE TIGHTENED USING OPEN END WRENCH.
4. SECURE LOWER MOUNTINGS USING (2) O.E.M. BOLTS RETAINED.
5. CONNECT PIPE NO. 1 TO CONDENSER INLET FITTING BY HAND AS MUCH AS POSSIBLE.
6. INSTALL CLIP (BR71 61 46Y) TO PIPE NO. 1 AND TO BRACKET USING (1) 6mm NUT.

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**BLOCK 15 | STEPS 1-4 | SUCTION HOSE INSTALLATION**

1. SLOWLY REMOVE BLIND COVER FROM COMPRESSOR SUCTION PORT AND DISCARD BLIND COVER, O-RING AND BOLT.
2. CONNECT SUCTION HOSE TO COMPRESSOR USING (1) 8x35mm BOLT.
3. NOTE: TIGHTEN THE BOLT UNTIL BLOCK FITTING IS COMPLETELY SEATED.
4. CONNECT THE OTHER END FITTING TO PIPE NO. 5 BY HAND AS MUCH AS POSSIBLE.
5. INSTALL CLIP (BR76 61 46Y) TO SUCTION HOSE AND TO BRACKET USING (1) 6mm NUT.
**BLOCK 16**  
**STEPS 1-5**  
**DISCHARGE HOSE INSTALLATION**

1. SLOWLY REMOVE BLIND COVER FROM COMPRESSOR DIS-CHARGE PORT AND DISCARD BLIND COVER, O-RING & BOLT.
2. CONNECT DISCHARGE HOSE TO COMPRESSOR USING (1) 8x35mm BOLT.
3. INSTALL CLIP (BR77 61 46Y) TO THE PIPE AND BRACKET USING (1) 6x16mm BOLT.
4. INSTALL CLIP (NA01 61 46YB) TO THE HOSE AND BUBBER INSULATOR USING (1) 6mm NUT.
5. NOTE: TIGHTEN THE BOLT UNTIL BLOCK FITTING IS COMPLETELY SEATED.
6. CONNECT THE OTHER END FITTING TO PIPE NO. 1 BY HAND AS MUCH AS POSSIBLE.

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**BLOCK 17**  
**INSTALLING CAUTION LABEL**

1. PEEL BACKING FROM LABEL AND APPLY TO UNDERHOOD AS SHOWN.

NOTE: MAKE SURE THE AREA IS FREE FROM DUST, WAX AND OIL.
TIGHTENING TORQUE

TORQUE ALL JOINTS ACCORDING TO THE CHART BELOW:

<table>
<thead>
<tr>
<th>TORQUE</th>
<th>CONNECTOR SIZE (m/m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ft-lb</td>
<td>NUT</td>
</tr>
<tr>
<td>A</td>
<td>7.2-14.4</td>
</tr>
<tr>
<td>B</td>
<td>14.4-21.6</td>
</tr>
<tr>
<td>C</td>
<td>10.8-18.0</td>
</tr>
<tr>
<td>H</td>
<td>10.2-15.8</td>
</tr>
</tbody>
</table>

A : 2 PLACES
B : 2 PLACES
C : 2 PLACES
H : 2 PLACES

NOTE: YOU HAVE ALREADY TORQUED IN & OUTLET FITTINGS ON RECEIVER/DRIER TANK IN BLOCK 7.

EVACUATION AND CHARGING

START EVACUATION
EVACUATION COMPLETE
HOLD VACUUM 5-10 MIN
NORMAL GAUGE PRESSURE
PURGE AIR FROM CHARGING HOSE
SMALL GAS CHARGE
LEAK TEST COMPLETE SYSTEM
NORMAL
GAS CHARGE
OPERATION TEST

MUST REACH 29 INCHES (740mm Hg) VACUUM OR HIGHER FOR 5 MINUTES (TOTAL EVACUATION TIME 10-15 MINUTES)
CHECK ALL FITTINGS & CONNECTIONS (TIGHTEN IF NECESSARY)

RECOMMENDED FULL CHARGE 28.2 OUNCES (0.80 KG) REFRIGERANT 12
**BLOCK 20**
**READJUSTING BELT TENSION**

1. START ENGINE AND RUN FOR (5) MINUTES WHILE OBSERVING FOLLOWING TEST CONDITION.
   - TURN A/C ON AND BLOWER TO LOW POSITION
   - MOVE TEMPERATURE CONTROL LEVER TO THE FULL LEFT POSITION
   - TURN ON HEAD LIGHT
2. TURN OFF ENGINE.
3. CONFIRM THAT THE BELT TENSION IS WITHIN THE SPECIFIED AMOUNT. IF NOT, ADJUST IT ACCORDING TO SPECIFICATION CHART BELOW.

<table>
<thead>
<tr>
<th>TENSION (KG)</th>
<th>DEFLECTION mm at 10kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHEN USED</td>
<td>43-50</td>
</tr>
<tr>
<td></td>
<td>9-10</td>
</tr>
</tbody>
</table>

**BLOCK 22**
**INSPECTION & REGISTRATION FORM**

1. MAKE SURE THERE IS NO TRASH LEFT IN THE VEHICLE. WIPE OFF ANY SURFACE THAT MIGHT HAVE BEEN MADE DIRTY OR OILY. REMOVE AND DISCARD ANY PLASTIC HOSE FITTING PROTECTIVE CAP THAT MIGHT HAVE FALLEN IN ENGINE COMPARTMENT OR ANY FOREIGN MATERIAL THAT MIGHT HINDER THE QUALITY OR PERFORMANCE OF VEHICLE.
2. FILL IN QUALITY CHECK SHEET AND REGISTRATION FORM WHICH IS LOCATED IN THE VEHICLE WARRANTY INFORMATION BOOKLET. CONFIRM EVAPORATOR SERIAL NO. HAS BEEN RECORDED ONTO REGISTRATION FORM.

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**BLOCK 21**
**REINSTALLATION AND INSPECTION**

<table>
<thead>
<tr>
<th>BLOCK REFERENCE NO.</th>
<th>REINSTALLATION ITEM</th>
<th>INSPECTION</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NEGATIVE TERMINAL CLAMP TO BATTERY</td>
<td>TURN IGNITION SWITCH TO &quot;ON&quot; POSITION AND SET BLOWER CONTROL SWITCH TO HIGH. CHECK FOR AIR LEAKS AROUND SEAL PLATES. ADJUST IF NECESSARY. AFTER INSPECTION, TURN OFF IGNITION.</td>
</tr>
<tr>
<td>2</td>
<td>GLOVE BOX</td>
<td>CONFIRM OPERATION</td>
</tr>
<tr>
<td>5</td>
<td>AIR GUIDE SPLASH SHIELD</td>
<td>AIR GUIDE SPLASH SHIELD FRONT REAR STRAP NUT</td>
</tr>
<tr>
<td>8</td>
<td>WASHER FLUID TANK</td>
<td>CONFIRM OPERATION NOTE: CONNECTOR MUST BE FASTENED.</td>
</tr>
</tbody>
</table>

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WIRING DIAGRAM

- PRESSURE SWITCH
- MAGNETIC CLUTCH
- ADDITIONAL FAN
- WATER TEMP SWITCH
- ENGINE CONTROL UNIT
- MAIN FUSE BOX
- FIRECALL
- BLOWER MOTOR
- AIR CON UNIT
- FUSE BOX
- THERMO SWITCH
- HEATER CONTROL UNIT
- A/C SWITCH
- REGISTER
- IGNITION SWITCH
- FUEL LEVEL SWITCH
- IGNITION CONTROL UNIT

AC-01 A/C MAIN RELAY
AC-02 ADDITIONAL FAN MOTOR
AC-03 PRESSURE SWITCH
F-03 MAGNETIC CLUTCH
F-52 BLOWER UNIT
F-53 BLOWER UNIT

F-01 FRONT (F) - A/C (AC)
F-01 FRONT (F) - INSTRUMENT PANEL (I)
F-01 FRONT (F) - INSTRUMENT PANEL (I)

BL-01 BLOWER MOTOR
BL-01 BLOWER MOTOR
BL-01 BLOWER MOTOR

AC-01 A/C MAIN RELAY (AC)
AC-02 ADDITIONAL FAN MOTOR (AC)
AC-03 PRESSURE SWITCH (AC)
F-03 MAGNETIC CLUTCH (F)

F-01 FRONT (F) - A/C (AC)
F-01 FRONT (F) - INSTRUMENT PANEL (I)
F-01 FRONT (F) - INSTRUMENT PANEL (I)