

<b>Subject:</b>  <b>ENGINE CRANKS NO START</b>	<b>Bulletin No:</b> 01-004/05
	<b>Last Issued:</b> 2/11/2005

## BULLETIN NOTE

- This bulletin supersedes the previous bulletin 01-004/05, issued 1/20/05. The DESCRIPTION, REPAIR PROCEDURE “A” - DECHOKE / ENGINE STARTING, PART(S) INFORMATION and WARRANTY INFORMATION sections have been changed.

## APPLICABLE MODEL(S) / VINS

2004-2005 RX-8

## DESCRIPTION

Some vehicles may experience difficulty starting (cranks no start). This occurs after driving the vehicle a short distance without engine reaching normal operating temperature. Examples: starting a vehicle and moving it to wash it, engine stall due to mis-application of clutch then restart.

A cranks, no start condition may be caused either by flooded spark plugs or lower than normal compression due to fuel flooding.

Because some early calibrations do not have the improvements to cold start performance, it is important to update the vehicle's PCM to prevent possible no start concerns. Make sure to update the PCM to the latest calibration if the vehicle exhibits a no-start concern due to fuel flooding.

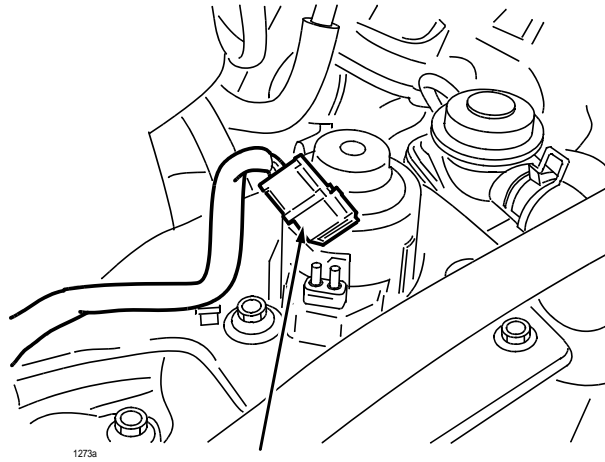
**NOTE:** After repairs, provide customers with DE-CHOKING PROCEDURE WHEN ENGINE CRANKS BUT DOES NOT START information on page 13 (for customers to try after a “CRANKS, NO START” condition, before towing to dealership).

## REPAIR PROCEDURE “A” - DECHOKE / ENGINE STARTING

1. Verify concern.
2. Verify battery is fully charged.

**NOTE:** Hard/no start concerns may be caused by lower than specification cranking compression at engine start. Charge and inspect vehicle battery, replace with 0000-80-MT35-WB if necessary (see service bulletin 01-042/04 - BATTERY REPLACEMENT - SERVICE TIP). For warranty reimbursement, Midtronics printout showing battery failed must be attached to repair order & readings must be documented on warranty claim.

3. Disconnect the secondary air injection pump electrical connector (B1-04).



SECONDARY  
AIR INJECTION PUMP  
CONNECTOR (B1-04)

**NOTE:** This will protect the catalytic converter by preventing rapid light off due to unburned fuel purging from the engine in the following steps.

4. Attempt to start the engine observing the following:
- A. Fully depress the accelerator pedal to the floor (dechoke (clear flood) mode prevents fuel injection operation while cranking).
  - B. Crank the engine for up to ten seconds.
    - If the engine starts, proceed to STEP 5.
    - If the engine fails to start, proceed to next step.
  - C. Release ignition key from start position (shut engine off) for 5-seconds.
  - D. Crank the engine for up to ten seconds (DO NOT depress accelerator pedal).
    - If the engine starts, proceed to STEP 5
    - If the engine fails to start, perform REPAIR PROCEDURE "B" - COMBUSTION CHAMBER CLEANING & SPARK PLUG REPLACEMENT.
5. Keep engine running between 1500-2000 RPM until engine speed has stabilized. Maintain this engine speed until all smoke has dissipated and / or engine has come to full operating temperature.
- NOTE:** Do not race the engine, this may cause catalyst damage.
6. Shut engine off.
7. Connect the secondary air injection pump connector B1-04.
8. Reprogram PCM using WDS. Update WDS to version B35.5 or later if necessary.
9. Clear all stored DTCs.

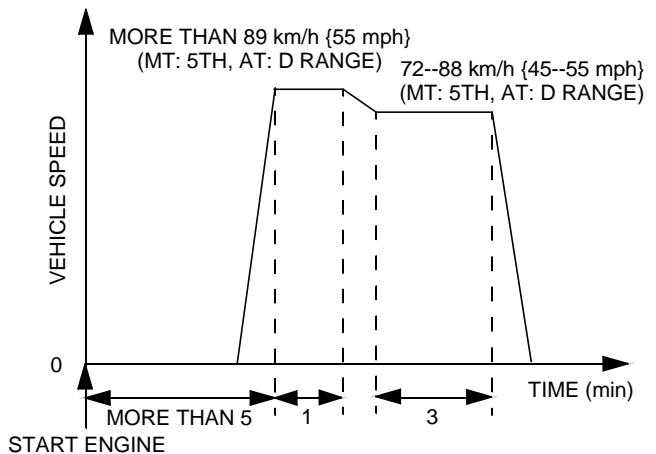
10. Perform drive mode 1 & 3 as follows:

**Mode 1 (PCM Adaptive Memory Produce Drive Mode)**

1. Start the engine and warm it up completely.
2. Verify the following conditions and correct if necessary:
  - All accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
  - Initial ignition timing and idle speed are within specification.
3. Run engine at a no load speed of 2500-3500 RPM for more than 15 seconds.
4. Continuously run engine at a no load speed of 4500-5000 RPM for more than 15 seconds.
5. Idle the engine for more than 60 seconds after the cooling fan has stopped.
6. Turn the ignition switch off.

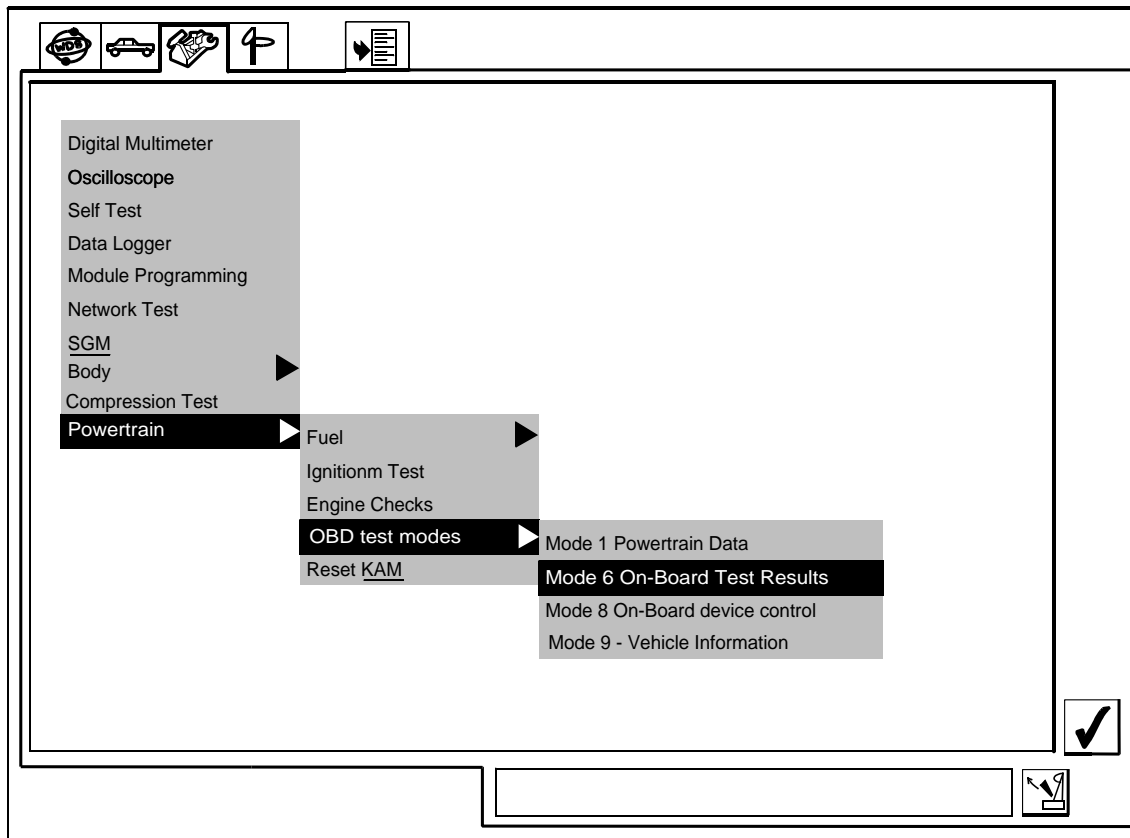
**Mode 3 (HO2S Heater, HO2S, and TWC Repair Verification Drive Mode)**

1. Perform the Mode 1 first.
2. Verify that all accessory loads (A/C, headlights, blower fan, rear window defroster) are off.
3. Drive vehicle as shown in the graph. The driving condition before driving at constant speed is not specified.
4. Stop the vehicle and access the ON BOARD SYSTEM READINESS to inspect the Drive Mode completion status.
  - If completed, RFC changes from NO to YES.
  - If not completed, turn the ignition switch off, then go back to STEP 3 of this (Mode 3) procedure.
5. Access the DIAGNOSTIC MONITORING TEST RESULTS to inspect monitor results.
  - If MEAS are not within specification, repair has not been completed.
6. Verify that no DTCs are available.



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11. Access "DIAGNOSTIC MONITORING TEST RESULT (Mode 6) data using WDS.



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12. Record MIN MAX VALUE from CATALYST BANK 1 MONITOR - REAR TO FRONT SWITCHING RATION - TEST ID 10:21:80.

Description	OBDMID	Test ID	Min	Max	Value
Oxygen sensor monitor bank1	1				
Response Lean to Rich	1	80	0.348	255.993	1.47
Response Rich to Lean	1	81	0.293	255.993	0.996
HO2SB1S2 Monitor	2				
Rich to lean sendor threshold voltage (constant).	2	1	0.550V	0.550V	0.550V
Low sensor voltage for switch time calculation (constant).	2	3	0.300V	0.300V	0.300V
High sensor voltage for switch time calculation (constant).	2	4	0.400V	0.400V	0.400V
Rich to lean sensor switch time (calculated).	2	5	0ms	80ms	32ms
Catalyst monitor bank 1	21				
<b>Rear to front switch ration</b>	<b>21</b>	<b>80</b>	<b>0</b>	<b>8.0</b>	<b>1.203</b>
EVAP monitor (large)	3A				
EVAP monitor large leak check	3A	80	0.656mA	255.996mA	2.223mA
EVAP monitor (0.040 inch)	3B				
EVAP monitor 0.040 inch leak check	3B	80	2.223mA	255.996mA	2.223mA
EVAP monitor (0.020 inch)	3C				
EVAP monitor 0.020 inch leak check	3C	80	0.051	1.999	0.103
Purge flow monitor	3D				
Purge flow monitor	3D	80	0mA	19.832mA	19.750mA
Secondary Air Monitor (Bank 1)	71				
Secondary Air Flow Test	71	80	0ms	4992ms	0ms

Complete

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13. If measured value is not within MIN and MAX range, replace the catalytic converter.

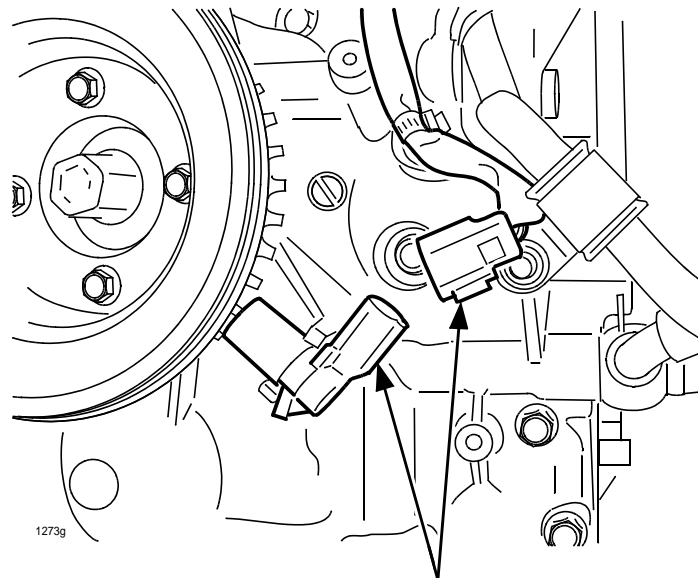
14. Erase all DTCs and confirm repairs.

## REPAIR PROCEDURE "B" - COMBUSTION CHAMBER CLEANING & SPARK PLUG REPLACEMENT

**CAUTION:** The following steps will force un-burnt fuel from the combustion chambers through the spark plug holes. Use caution not to create sparks or other sources of ignition during these steps. Perform this procedure in a well ventilated area.

1. Remove all 4 spark plugs from the engine.
2. Disconnect eccentric shaft position sensor (ESPS) B1-27.

**NOTE:** This will cut fuel injection & spark while performing the procedure.



DISCONNECT ECCENTRIC  
SHAFT POSITION SENSOR

3. Place cloth near spark plug holes to absorb fuel residue.
4. Crank the engine until all fuel is purged from spark plug holes. (Do not crank engine longer than 10 seconds. If more than 10 seconds is required, wait 5 seconds in between cranking.) Perform this procedure in a well ventilated area.
5. Connect ESPS connector B1-27.
6. Install new spark plugs.
7. Attempt to start engine without depressing accelerator pedal.
  - If engine starts, proceed to STEP 5 of REPAIR PROCEDURE "A" - DECHOKER / ENGINE STARTING.
  - If engine fails to start, perform REPAIR PROCEDURE "C" - RESTORE ENGINE COMPRESSION.

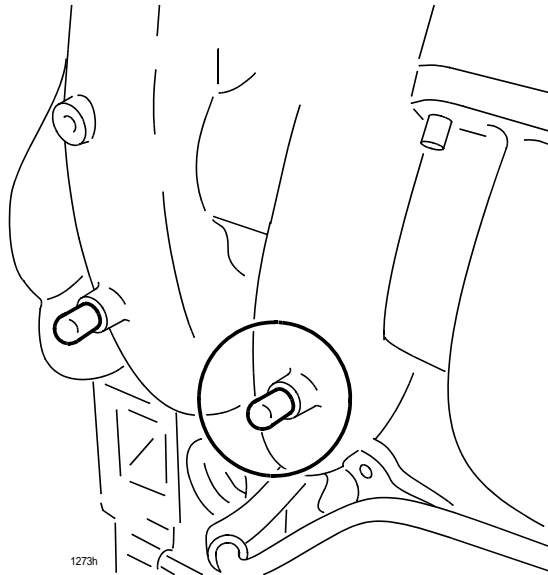
**NOTE:** If engine fails to start using the procedure above, the engine compression may be lower than specification due to fuel flooding. Perform REPAIR PROCEDURE "C" - RESTORE ENGINE COMPRESSION.

## REPAIR PROCEDURE "C" - RESTORE ENGINE COMPRESSION

1. Disconnect ESPS connector B1-27.

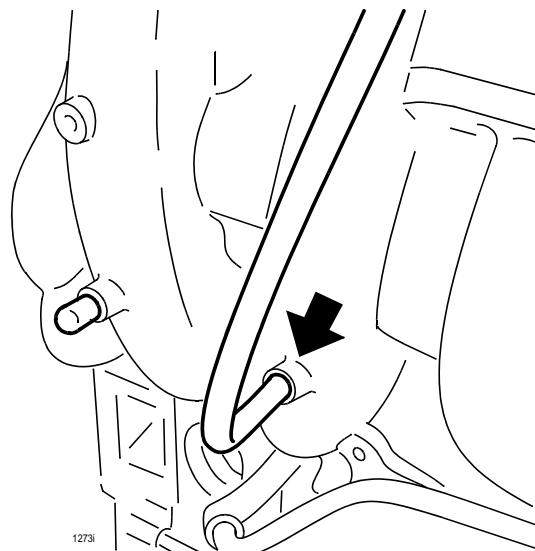
**NOTE:** This will cut fuel injection & spark while performing the procedure.

2. Remove the front vacuum plug from the passenger side of the lower intake manifold.



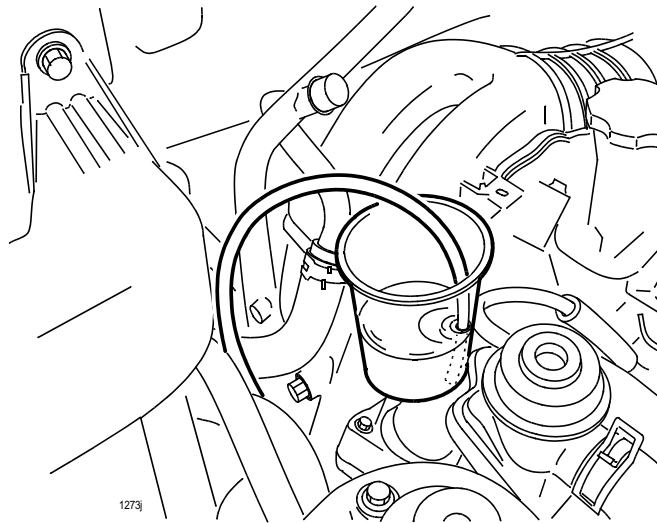
3. Fabricate a vacuum line (About 2 feet in length) & attach to front vacuum port as shown in the illustration.

**CAUTION:** DO NOT attempt to service both vacuum ports at the same time. Perform procedure for front port, then perform procedure for rear port.



4. Add 10-15cc's of 5W-20 engine oil to a small container.

5. Insert vacuum line into the bottom of the container.



6. Crank over engine until all oil is drawn into the intake manifold. (Do not depress accelerator pedal during this step.)  
**NOTE:** If oil cannot be drawn into engine due to low vacuum, add oil through leading spark plug holes, or use a syringe & inject through vacuum lines & into the intake manifold. Add about 10ccs to each rotor.
7. Disconnect vacuum line from intake manifold & reinstall vacuum plug. Reinstall leading spark plug if removed during STEP 6
8. Repeat steps 2-7 for rear vacuum port.
9. Connect ESPS connector B1-27.
10. Attempt to start engine without depressing accelerator pedal.
  - If engine starts, proceed to STEP 5 in REPAIR PROCEDURE "A" - DECHOKE / ENGINE STARTING.
  - If engine fails to start, check engine compression & follow diagnosis according to workshop manual page 01-03-28, NO.6 CRANKS NORMALLY BUT WILL NOT START.



## PART(S) INFORMATION

### NOTE:

- The spark plug information has changed. The leading spark plug has been redesigned to improve cold start performance. Complete sets which contain redesigned leading plugs are now available, revised leading plugs are still available individually. Also, there is not a redesigned optional "HOT" leading spark plug available. Please refer to the revised parts information for ordering. Service information will be issued when the optional "HOT" plugs become available.

Part Number	Description	Qty.	Notes
N3Y3-18-S30	Spark plug set	1	Set includes (2) redesigned leading plugs N3Y8-18-110 & (2) standard trailing plugs 0000-18-N3Y1
N3Y8-18-110	Leading spark plug	2	Redesigned leading spark plug, heat range 7
0000-18-N3Y1	Trailing spark plug	2	Standard trailing spark plug, heat range 9
N3H4-20-55XL	Catalytic Converter	1	
0000-80-MT35-WB	Battery	1	640 CCA

## WARRANTY INFORMATION

**NOTE:**

- This information applies to verified customer complaints on vehicles covered under normal warranty.
- Refer to the SRT microfiche for warranty term information.
- Additional diagnostic time cannot be claimed for this repair.
- Complete Required Repairs must be entered on a Single Warranty Claim.

	Repair Procedure "A"	Repair Procedures "A" + "B"	Repair Procedures "A" + "B" + "C"
Warranty Type	A	A	A
Symptom Code	02	02	02
Damage Code	93	93	93
Part Number Main Cause	N3H2-02-200 (Short Engine AT) N3H3-02-200 (Short Engine MT)	N3H2-02-200 (Short Engine AT) N3H3-02-200 (Short Engine MT)	N3H2-02-200 (Short Engine AT) N3H3-02-200 (Short Engine MT)
Part Quantity	0	0	0
Related Part Number	-	N3Y3-18-S30	N3Y3-18-S30
Part Quantity	-	1	1
Operation Number	XX610XR1	XX610XR2	XX610XR3
Labor Hours	0.8 Hrs. (Max. actual time)	1.3 Hrs. (Max. actual time)	1.5 Hrs. (Max. actual time)

Additional Labor And Parts If Required	PCM Reprogramming	Catalyst Replacement
Related Part Number	-	N3H4-20-55XL
Part Quantity	-	1
Labor Operation	XX651XRX	XX652XRX
Labor Hours	0.3 Hrs. (SRT)	0.6 Hrs. (SRT)

**NOTE:** After repairs, provide customers with a copy of this page to try during a “CRANKS, NO START” condition. If necessary, fax or scan and e-mail this page to customers who are experiencing a crank/no start condition in the field, before towing to dealership.

## **WARMING THE ENGINE**

The Mazda RENESIS Rotary Engine provides exceptional performance dynamics and reduces exhaust emissions, allowing the RX-8 to meet the strict Tier 2 emissions classification in the U.S. Mazda achieved this in part by the design of the engine ports and adopting a sequential dynamic air intake system. Because of its unique design, it is important to warm up the engine before shutting it off. Ideally, the engine coolant temperature gauge needle should reach the middle of the normal operating range before shutting off the engine.

## **DE-CHOKING PROCEDURE WHEN ENGINE CRANKS BUT DOES NOT START**

If the engine does not start, try the following procedure to start the engine using the de-choke mode. Failure to do so may aggravate the no start condition.

1. Depress and hold the accelerator pedal to the floor and crank the engine for 7-8 seconds. (This will clean out any unburned fuel from the combustion chamber)
2. Release the ignition key to stop cranking.
3. Release the accelerator pedal and start the engine. If the engine starts while performing Step 1, the engine will rev up. Immediately release the ignition key to stop cranking and remove your foot from the accelerator pedal.
  - Do not keep holding the ignition switch in the START position over 10 seconds if the engine does not start. This may result in a weakened or dead battery.
  - Avoid racing the engine or sudden take off right after starting the engine.
  - If the engine still fails to start following the De-choking procedure, have your vehicle inspected by your Mazda Dealer.