

Subject: ENGINE CRANKS NO START	Bulletin No: 01-004/05
	Last Issued: 12/1/2005

BULLETIN NOTE

- This bulletin supersedes the previous bulletin 01-004/05, issued 11/29/05. The WARRANTY INFORMATION has been changed.

APPLICABLE MODEL(S) / VINS

2004-2005 RX-8

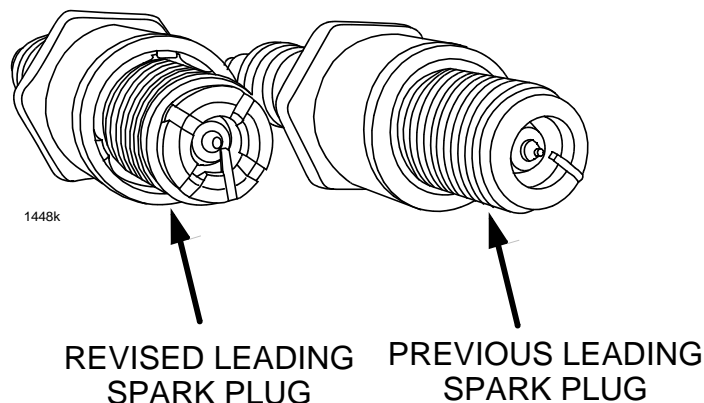
DESCRIPTION

Some vehicles may experience difficulty starting (cranks no start). This may occur 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. This commonly occurs at port facilities or dealer lots where vehicles are frequently started cold, moved for short distances and then turned off. This concern may also occur due to low cranking RPM during engine starting.

A cranks, no start condition may be caused by fuel flooding resulting in either fouled spark plugs or lower than normal compression. Carefully follow REPAIR PROCEDURE "A" and refer to VIN application to determine necessary repair action.

The following vehicle mass production changes have been implemented to improve starting performance:

- PCM calibration - The PCM calibration was modified to reduce fuel injection amount during cold conditions. PCM calibration was modified in vehicle production on 3/12/04.
- Battery - A higher capacity battery was introduced (6/1/04).
- Engine starter - Revised to increase cranking compression at engine start. Implemented into vehicle production 11/8/04 (For AT models), 12/1/04 (For MT models).
- Leading spark plugs - The leading spark plugs have been revised to reduce the possibilities of fuel flooding at cold engine start. Revised leading spark plugs were implemented in vehicle production on 3/22/05.



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 as directed in repair procedure if the vehicle exhibits a no-start concern due to fuel flooding.

NOTE:

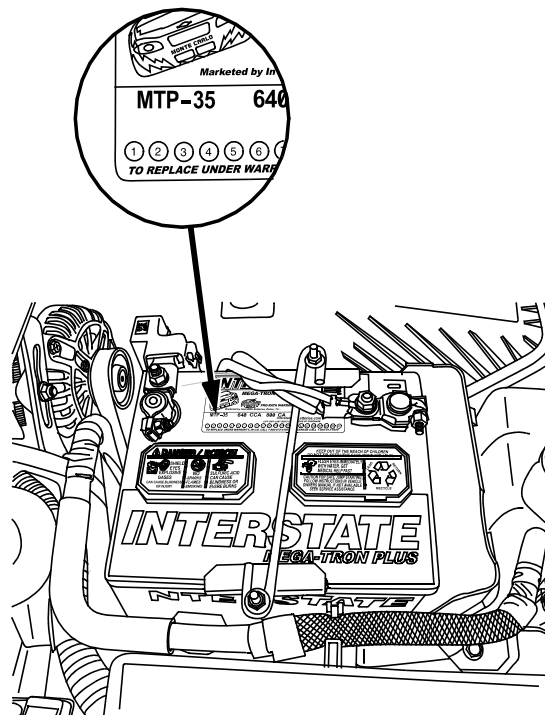
- After repairs, provide customers with CUSTOMER INFORMATION on the last page of this bulletin (for customers to try after a "CRANKS, NO START" condition, before towing to dealership).

REPAIR PROCEDURE "A"

1. Inspect battery.

Some vehicles will require battery replacement depending on VIN / production range, and / or visual identification. 2005 Model Year vehicles DO NOT require battery replacement unless battery fails testing. Use the inspection procedure below to determine if battery replacement is necessary.

- a. Is the vehicle built after June 1, 2004 (starting with VIN JM1FE17*****139714)
 - YES – Battery type is OK (Panasonic JIS 75D23L), go to STEP 2.
 - NO – Battery inspection is required, proceed to STEP 1b.
- b. Remove battery cover and inspect battery label. The following batteries are approved and DO NOT require replacement. If the vehicle's battery type matches one of the following descriptions, proceed to STEP 2.
 - OEM Panasonic battery JIS specification "75D23L"
 - Mazda Genuine replacement battery part number 0000-80-6535-WB
 - Interstate brand "MTP35" battery.
 - If the vehicle's battery type matches one of the following descriptions, proceed to STEP 2.
 - If the vehicles battery type does not match the above descriptions, replace with Mazda Genuine replacement battery # 0000-80-6535-WB. Proceed to STEP 3 after battery replacement.



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NOTE:

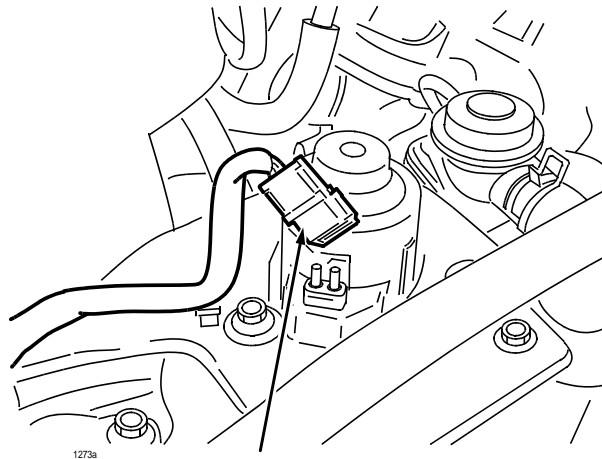
- Dark current reading fluctuates with PATS light.
2. Verify battery is fully charged and charge if necessary. If battery charge is low, check for dark current (back-up current) draw. Revised max current draw is 40-50 MA.

NOTE:

- Hard/no start concerns may be caused by lower than specification cranking compression at engine start. Charge and inspect vehicle battery, replace with 0000-80-6535-WB if necessary. If battery replacement is necessary, make sure to order through the Mazda parts system. DO NOT place orders through Interstate directly. Also, inspect battery for correct part number (0000-80-6535-WB) and CCA rating (640) before installation. It is not necessary to test batteries, and / or attach Midtronics printout to the repair order when battery is replaced that is not on the approved list of batteries in STEP 1b. For warranty reimbursement of batteries listed under STEP 1b, Midtronics printout indicating battery failure must be attached to repair order and readings must be documented on warranty claim.
3. Disconnect the secondary air injection pump electrical 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.



1273a
SECONDARY
AIR INJECTION PUMP
CONNECTOR (B1-04)

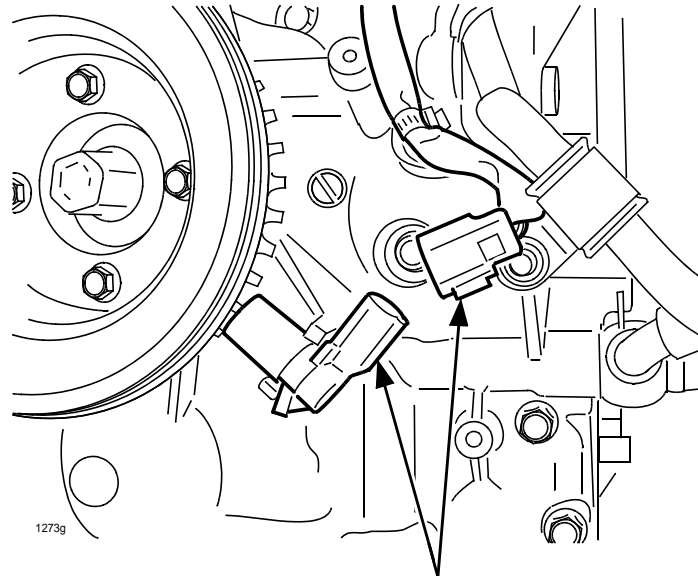
CAUTION:

- 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.
4. Remove all 4 spark plugs from the engine. See workshop manual section 01-18 SPARK PLUG REMOVAL / INSTALLATION.

5. Disconnect Eccentric Shaft Position Sensor (ESPS) B1-27.

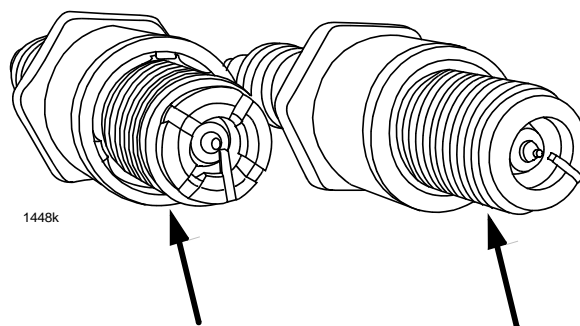
NOTE:

- This will cut fuel injection and spark while performing the procedure.



DISCONNECT ECCENTRIC
SHAFT POSITION SENSOR

6. Place cloth near spark plug holes to absorb fuel residue.
7. 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.
8. Connect ESPS connector B1-27.
9. Install revised spark plugs. See PART(S) INFORMATION.



REVISED LEADING
SPARK PLUG

PREVIOUS LEADING
SPARK PLUG

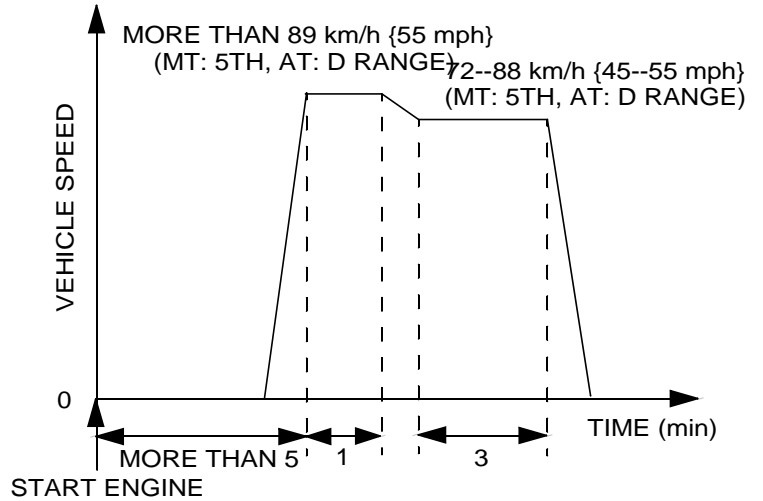
10. Go to ENGINE STARTER INSPECTION / IDENTIFICATION on to determine if engine starter replacement is necessary.
11. Attempt to start engine without depressing accelerator pedal.
 - If the engine starts, go to STEP 12.
 - If engine fails to start, the engine compression may be lower than specification due to poor sealing. Go to REPAIR PROCEDURE "B".
12. 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.

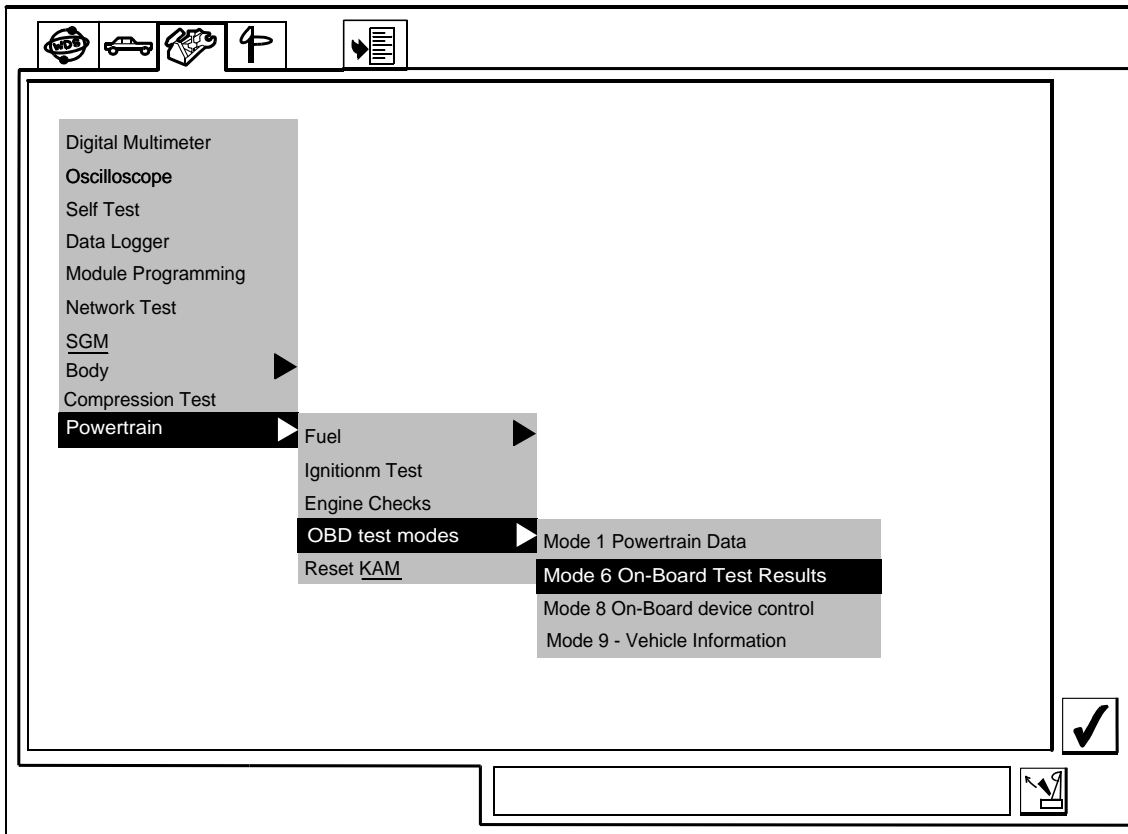
13. Shut engine off.
14. Connect the secondary air injection pump connector B1-04.
15. Reprogram PCM using WDS. Go to PCM REPROGRAMMING.
16. Clear all stored DTCs.
17. Perform drive mode 1 & 3 as follows:
 - Mode 1 (PCM Adaptive Memory Produce Drive Mode)**
 1. Start the engine and warm it up completely.
 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.



1273d

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



1273e

19. 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				
Rear to front switch ration	21	80	0	8.0	1.203
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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20. If measured value is not within MIN and MAX range, replace the catalytic converter.

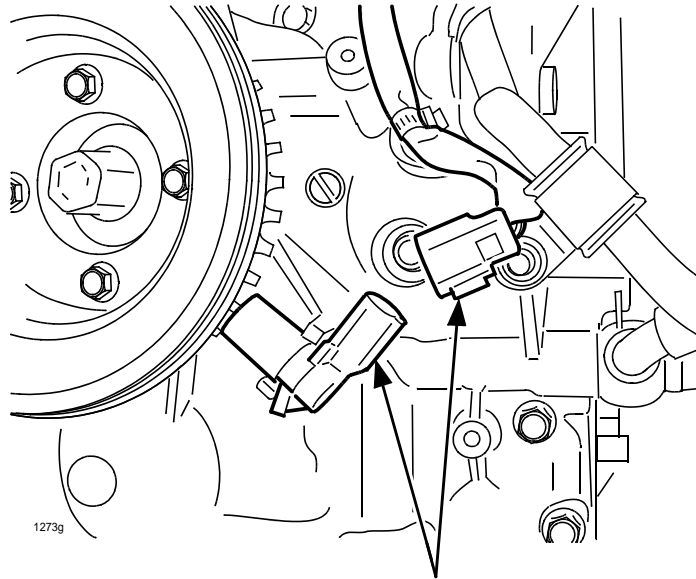
21. Erase all DTCs and confirm repairs.

REPAIR PROCEDURE "B"

1. Disconnect Eccentric Shaft Position Sensor (ESPS) B1-27.

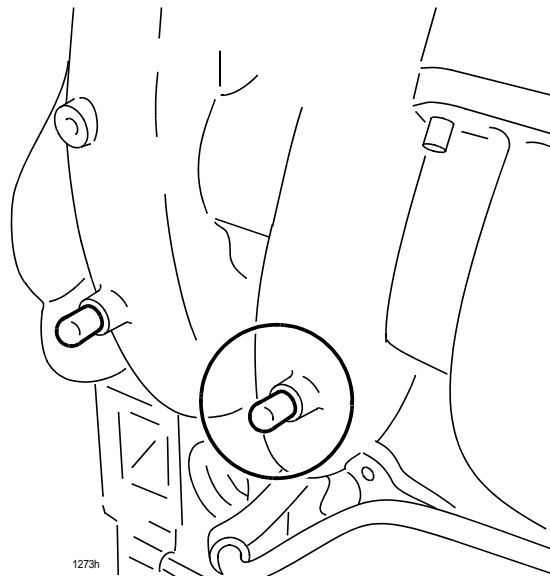
NOTE:

- This will cut fuel injection & spark while performing the procedure.



DISCONNECT ECCENTRIC
SHAFT POSITION SENSOR

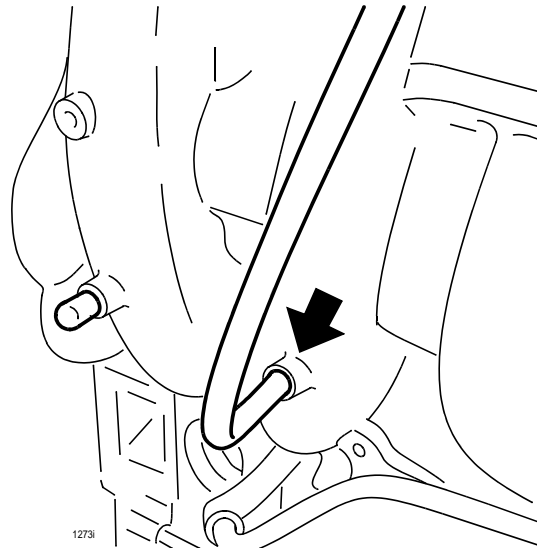
2. Remove the front vacuum plug from the passenger side of the lower intake manifold.



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

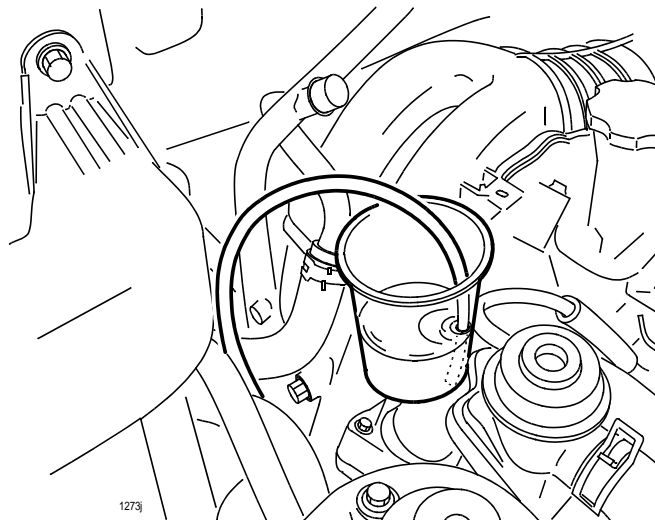
CAUTION:

- 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 10-15cc's of 5W-20 engine oil 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 12 in REPAIR PROCEDURE "A".
 - If engine fails to start, check engine compression & follow diagnosis according to workshop manual section 01-03 NO.6 CRANKS NORMALLY BUT WILL NOT START.

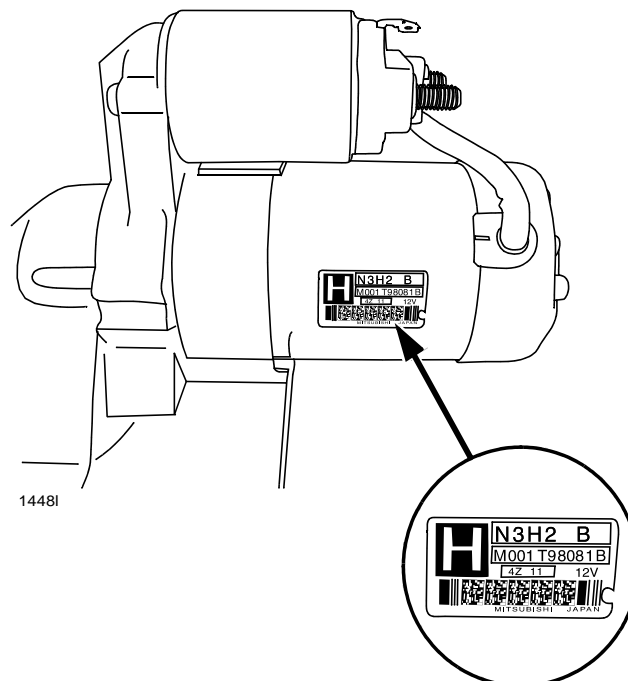
ENGINE STARTER INSPECTION / IDENTIFICATION

Some vehicles will require engine starter replacement depending on VIN / production range, and / or visual identification. Use the inspection procedure below to determine if starter replacement is necessary.

AUTOMATIC TRANSMISSION VEHICLES:

1. Is the VIN at or below JM1FE17N* ** 148961?
 - NO – Starter replacement is not necessary, go to STEP 11 in REPAIR PROCEDURE "A".
 - YES – Go to STEP 2.
2. Inspect vehicle's starter label to determine starter type. Starter label can be seen under hood on driver's side.
 - If label indicates "N3H2 A", replace starter. See workshop manual section 01-19 STARTER REMOVAL / INSTALLATION. After starter replacement, go to STEP 11 in REPAIR PROCEDURE "A".
 - If label indicates "N3H2 B" or later, do not replace starter, go to STEP 11 in REPAIR PROCEDURE "A".

AUTOMATIC TRANSMISSION

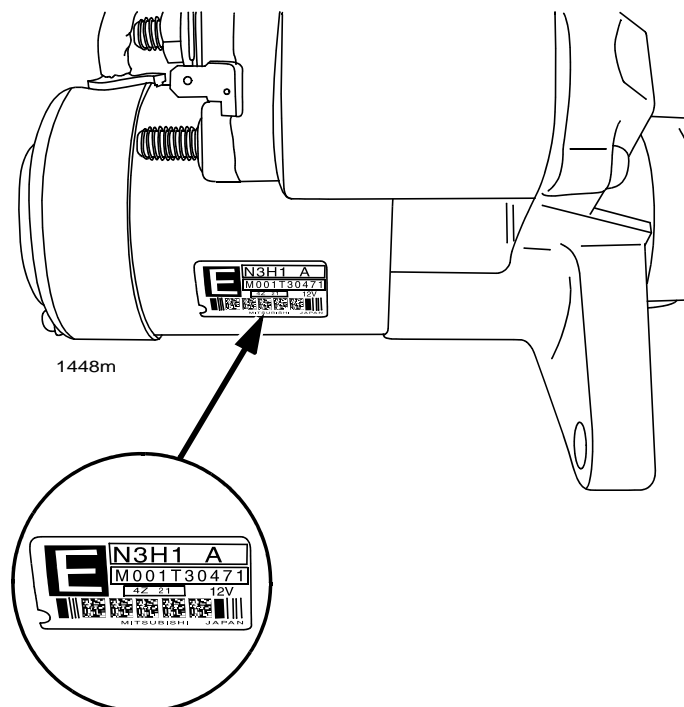


MANUAL TRANSMISSION VEHICLES:

1. Is the VIN at or below JM1FE173*** ** 150745?
 - NO – Starter replacement is not necessary, go to STEP 11 in REPAIR PROCEDURE “A”.
 - YES – Go to STEP 2.
2. Inspect vehicle’s starter label to determine starter type. Starter label can be seen with vehicle on hoist and using a mirror.
 - If label indicates “N3H1”, replace starter. See workshop manual section 01-19 STARTER REMOVAL / INSTALLATION. After starter replacement, go to STEP 11 in REPAIR PROCEDURE “A”.
 - If label indicates “N3H1 A” or later, do not replace starter, go to STEP 11 in REPAIR PROCEDURE “A”.

CAUTION:

- When installing the new starter, use care that the starter terminals “B” and “S” and related wire harness do not come in contact with the heat shield. Clearance between the heat shield and the terminals should be as follow:
 - 10mm between corner of heat shield and White “B” terminal cover.
 - 15mm between heat shield and Black “S” terminal connector.
- If clearance is not as specified, bend heat shield as necessary. Ensure that after bending heat shield at least 10mm clearance is present between bent section of heat shield and vehicle body.
- **USE CARE THAT THE BLACK “S” TERMINAL CONNECTOR DOES NOT COME IN CONTACT WITH HEAT SHIELD AFTER INSTALLATION.**

MANUAL TRANSMISSION

PCM REPROGRAMMING

1. Reboot the WDS PTU to clear memory before reprogramming.
2. Using WDS B39.4 or later software, reprogram the PCM to the latest calibration (refer to “CALIBRATION INFORMATION” table) by following the “Module Reprogramming” procedure.

NOTE:

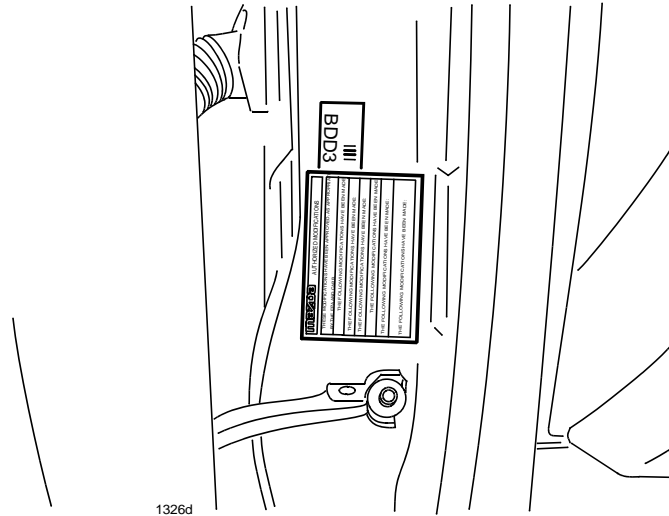
- Always update the WDS PTU first, then install the needed calibration file that WDS shows during PCM reprogramming. Go to “WDS Calibration” on ESI and download the “update” file. If the PTU is not updated to the latest WDS calibration level, the calibration file will not install into the PTU.
 - It is not necessary to remove any fuses or relays during PCM reprogramming when the WDS screen prompts you to do so. You may accidentally stop power to one of the PCM terminals and cause the PCM to be blanked, or you may receive error messages during the WDS reprogramming procedure.
 - WDS shows the calibration part numbers after programming the PCM.
 - Please be aware that PCM calibration part numbers and file names listed in any Service Bulletin may change due to future releases of WDS software, and additional revisions made to those calibrations for service related concerns.
 - When reprogramming a PCM, WDS will always display the “latest” calibration P/N available for that vehicle. If any calibration has been revised/updated to contain new information for a new service concern/issue, it will also contain all previously released calibrations.
 - **When performing this procedure, if the WDS PTU is not docked and connected to 115V-120V, we recommend that a battery charger be installed on the vehicle battery and turned ON to a maximum charge of no more than 20 AMPS to keep the vehicle battery up to capacity. If you exceed 20 AMPS, it will damage the WDS PTU. Also the external battery power supply cable should be connected to the vehicle battery and the PTU.**
3. After performing the PCM reprogramming procedure, verify the repair by starting the engine and making sure there are no MIL illumination or abnormal warning lights present.

NOTE:

- If any DTCs should remain after performing DTC erase, diagnose the DTCs according to the appropriate Troubleshooting section of the Workshop Manual.
4. Place an “Authorized Modification” label (P/N 9999-95-AMDC-97) with the new calibration information on the “A” pillar above the tear tag in the driver door jamb.

mazda AUTHORIZED MODIFICATIONS
THESE MODIFICATIONS HAVE BEEN APPROVED, AS APPROPRIATE, BY THE EPA AND CARB.
THE FOLLOWING MODIFICATIONS HAVE BEEN MADE:

1326c



CALIBRATION INFORMATION

Year	Transmission	New PCM Calibration Part Number	File Name	Note
2004	A/T	N3Z1-18-881S	SW-N3Z1ES000	All
2004	M/T	N3Z2-18-881R	SW-N3Z2ER000	All
2005	A/T	N3K6-18-881F	SW-N3K6EF000	Fed/Canada
2005	M/T	N3K7-18-881E	SW-N3K7EE000	Fed/Canada
2005	A/T	N3K8-18-881F	SW-N3K8EF000	California
2005	M/T	N3K9-18-881E	SW-N3K9EE000	California

NOTE:

- The PCM Calibration Part Numbers listed above are provided for PCM reprogramming purposes only. These are not necessarily the same Mazda part numbers used to order an actual PCM through the Mazda Parts System. It is not necessary to order a PCM as part of this repair procedure.

PART(S) INFORMATION

NOTE:

- When vehicles experience a engine cranks but does not start concern due to fuel flooding, Mazda recommends the use of the optional "HOT" type leading spark plugs (NGK RE6C-L). The optional "HOT" type spark plug retains more heat which may prevent fouling of spark plugs when the engine is started during cold ambient temperatures. Continue to use the standard spark plug set (N3Y3-18-S30) when spark plug replacement is necessary for vehicle concerns other than no start due to fuel flooding. EXAMPLE: Scheduled maintenance replacement interval, engine misfire, etc....

Part Number	Description	Qty.	Notes
N3Y2-18-S70	Starter and spark plug set	1	For AT vehicles. Includes (2) leading spark plugs (N3Y9-18-110) and one engine starter. Use this set when both engine starter and spark plugs require replacement. Also needed are (2) trailing spark plugs 0000-18-N3Y1
N3Y1-18-S70	Starter and spark plug set	1	For MT vehicles. Includes (2) leading spark plugs (N3Y9-18-110) and one engine starter. Use this set when both engine starter and spark plugs require replacement. Also needed are (2) trailing spark plugs 0000-18-N3Y1
N3Y9-18-110	Leading spark plug	2	Leading spark plug, heat range 6
0000-18-N3Y1	Trailing spark plug	2	Standard trailing spark plug, heat range 9
N3H4-20-55XL	Catalytic Converter	1	
0000-80-6535-WB	Battery	1	640 CCA

WARRANTY INFORMATION

NOTE:

- This warranty information applies only to verified customer complaints on vehicles eligible for warranty repair. Refer to the Warranty Wizard 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"
Warranty Type	A	A
Symptom Code	02	02
Damage Code	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)
Part Quantity	0	0
Related Part Number	-	-
Part Quantity	0	0
Operation Number	XX610XR2	XX610XR3
Labor Hours	0.9 Hrs. (Max. actual time)	1.1 Hrs. (Max. actual time)

Engine Starter / Spark Plug Replacement				
	Automatic Transmission		Manual Transmission	
	Before VIN 148961 Starter & Plug Kit*	After VIN 148960 Plugs Only	Before VIN 150745 Starter & Plug Kit*	After VIN 150744 Plugs Only
Related Part Number	N3Y2-18-S70	N3Y9-18-110	N3Y1-18-S70	N3Y9-18-110
Part Quantity	1	2	1	2
Labor Operation	XXB046R7	XXB046R1	XXB046R8	XXB046R1
Labor Hours	0.8 Hrs. (SRT)	0.4 Hrs. (SRT)	0.7 Hrs. (SRT)	0.4 Hrs. (SRT)

* - Applies only to vehicles without previous starter replacement history.

Bulletin No: 01-004/05
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Last Issued: 12/1/2005

Additional Labor And Parts If Required	PCM Reprogram	Catalyst Replacement	Battery Replacement
Related Part Number	-	N3H4-20-55XL	0000-80-6535-WB
Part Quantity	-	1	1
Labor Operation	XX651XRX	XX652XRX	XXB046R4
Labor Hours	0.3 Hrs. (SRT)	0.6 Hrs. (SRT)	0.2 Hrs. (SRT)

CUSTOMER INFORMATION

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.