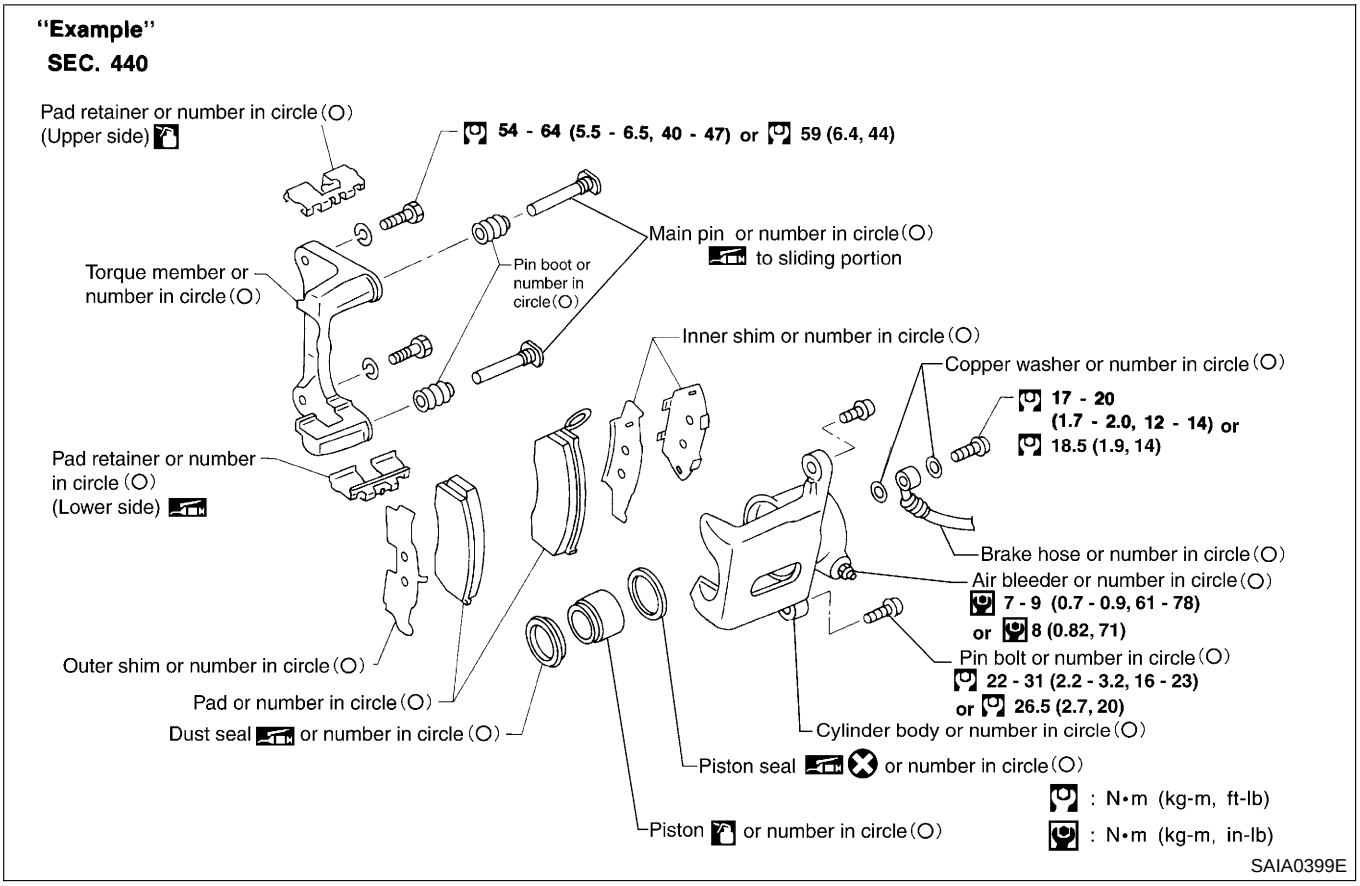
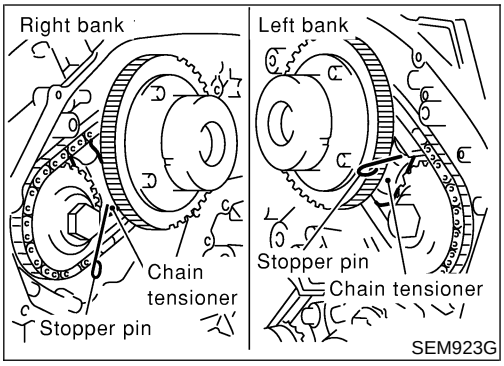
HOW TO USE THIS MANUAL

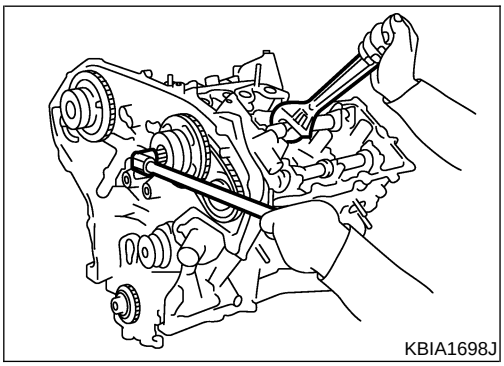
- The captions **WARNING** and **CAUTION** warn you of steps that must be followed to prevent personal injury and/or damage to some part of the vehicle.
  WARNING indicates the possibility of personal injury if instructions are not followed.
  CAUTION indicates the possibility of component damage if instructions are not followed.
  BOLD TYPED STATEMENTS except **WARNING** and **CAUTION** give you helpful information.
- **ALPHABETICAL INDEX** is provided at the end of this manual so that you can rapidly find the item and page you are searching for.
- **A QUICK REFERENCE INDEX**, a black tab (e.g. BR) is provided on the first page. You can quickly find the first page of each section by matching it to the section's black tab.
- **THE CONTENTS** are listed on the first page of each section.
- **THE TITLE** is indicated on the upper portion of each page and shows the part or system.
- **THE PAGE NUMBER** of each section consists of two letters which designate the particular section and a number (e.g. "BR-5").
- **THE LARGE ILLUSTRATIONS** are exploded views (See below.) and contain tightening torques, lubrication points, section number of the **PARTS CATALOG** (e.g. SEC. 440) and other information necessary to perform repairs.
  The illustrations should be used in reference to service matters only. When ordering parts, refer to the appropriate **PARTS CATALOG**.
  In order to indicate name of some parts written in the following component, numbers in a circle are occasionally used. In such a case, the part names are written in the illustration below.



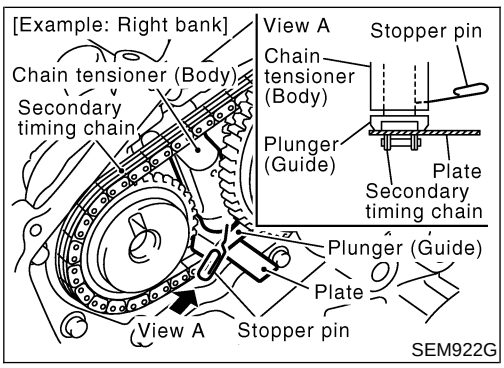
- **THE SMALL ILLUSTRATIONS** show the important steps such as inspection, use of special tools, knacks of work and hidden or tricky steps which are not shown in the previous large illustrations.
  Assembly, inspection and adjustment procedures for the complicated units such as the automatic transaxle or transmission, etc. are presented in a step-by-step format where necessary.
- The **UNITS** given in this manual are primarily expressed as the SI UNIT (International System of Unit), and alternatively expressed in the metric system and in the yard/pound system.
  Also with regard to tightening torque of bolts and nuts, there are descriptions both about range and about the standard tightening torque.



34. Attach a suitable stopper pin to RH and LH camshaft chain tensioners. (For secondary timing chains)



35. Loosen intake and exhaust camshaft sprocket bolts.
- **Secure the hexagonal portion of the camshaft using a spanner to loosen mounting bolts.**



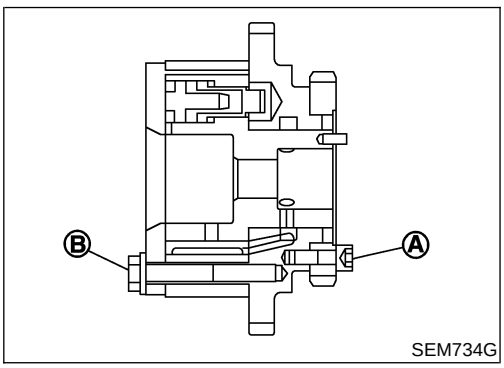
36. Remove secondary timing chains with camshaft sprockets.

a. Rotate camshaft lightly, and slacken timing chain of timing chain tensioner-side.

b. Insert metal or resin plate [thickness: 0.5 mm (0.020 in)] into guide between timing chain and chain tensioner plunger. Remove cam sprocket and secondary timing chain with timing chain floated from guide groove.

CAUTION:

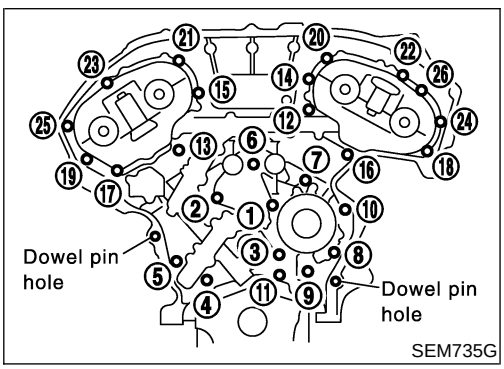
Chain tensioner plunger may move, while fixed stopper pin and plunger both come off when timing chain is removed. Use caution during removal.



- Intake camshaft sprocket is two-for-one structure of primary and secondary sprockets.
- Handle intake camshaft sprocket, taking care of the following.

CAUTION:

- **Avoid impact.**
- **Do not disassemble (Never loosen bolts A and B).**



37. Remove chain tension guide.

38. Remove rear timing chain case as follows.

a. Loosen mounting bolts in reverse order shown in figure, and remove them.

b. Disconnect liquid gasket applied portion using seal cutter (special service tool: KV10111100) or an equivalent tool. Then remove rear timing chain case.

Overheating Cause Analysis

NHLC0029

	Symptom		Check items	
Cooling system parts malfunction	Poor heat transfer	Water pump malfunction	Worn or loose drive belt	—
		Thermostat stuck closed	—	
		Damaged fins	Dust contamination or paper clogging	
			Physical damage	
		Clogged radiator cooling tube	Excess foreign material (rust, dirt, sand, etc.)	
	Reduced air flow	Cooling fan does not operate	Refer to DTC P1217 in EC section.	—
		High resistance to fan rotation	Fan assembly	
		Damaged fan blades		
	Damaged radiator shroud	—	—	—
	Improper coolant mixture ratio	—	—	—
	Poor coolant quality	—	Coolant density	—
	Insufficient coolant	Coolant leaks	Cooling hose	Loose clamp
				Cracked hose
			Water pump	Poor sealing
			Radiator cap	Loose
				Poor sealing
			Radiator	O-ring for damage, deterioration or improper fitting
				Cracked radiator tank
				Cracked radiator core
			Reservoir tank	Cracked reservoir tank
		Overflowing reservoir tank	Exhaust gas leaks into cooling system	Cylinder head deterioration
				Cylinder head gasket deterioration

Worksheet Sample

NHEC0036S0101

Customer name MR/MS		Model & Year	VIN
Engine #		Trans.	Mileage
Incident Date		Manuf. Date	In Service Date
Fuel and fuel filler cap		☐ Vehicle ran out of fuel causing misfire ☐ Fuel filler cap was left off or incorrectly screwed on.	
Symptoms	☐ Startability	☐ Impossible to start ☐ No combustion ☐ Partial combustion ☐ Partial combustion affected by throttle position ☐ Partial combustion NOT affected by throttle position ☐ Possible but hard to start ☐ Others [ ]	
	☐ Idling	☐ No fast idle ☐ Unstable ☐ High idle ☐ Low idle ☐ Others [ ]	
	☐ Driveability	☐ Stumble ☐ Surge ☐ Knock ☐ Lack of power ☐ Intake backfire ☐ Exhaust backfire ☐ Others [ ]	
	☐ Engine stall	☐ At the time of start ☐ While idling ☐ While accelerating ☐ While decelerating ☐ Just after stopping ☐ While loading	
Incident occurrence		☐ Just after delivery ☐ Recently ☐ In the morning ☐ At night ☐ In the daytime	
Frequency		☐ All the time ☐ Under certain conditions ☐ Sometimes	
Weather conditions		☐ Not affected	
	Weather	☐ Fine ☐ Raining ☐ Snowing ☐ Others [ ]	
	Temperature	☐ Hot ☐ Warm ☐ Cool ☐ Cold ☐ Humid ˚F	
Engine conditions		☐ Cold ☐ During warm-up ☐ After warm-up Engine speed 0 2,000 4,000 6,000 8,000 rpm	
Road conditions		☐ In town ☐ In suburbs ☐ Highway ☐ Off road (up/down)	
Driving conditions		☐ Not affected ☐ At starting ☐ While idling ☐ At racing ☐ While accelerating ☐ While cruising ☐ While decelerating ☐ While turning (RH/LH) Vehicle speed 0 10 20 30 40 50 60 MPH	
Malfunction indicator lamp		☐ Turned on ☐ Not turned on	

MTBL0017

6	PERFORM IDLE AIR VOLUME LEARNING	
Refer to "Idle Air Volume Learning", EC-70. **Is Idle Air Volume Learning carried out successfully?**		
	Yes or No	
Yes	▶	GO TO 7.
No	▶	1. Follow the instruction of Idle Air Volume Learning. 2. GO TO 4.

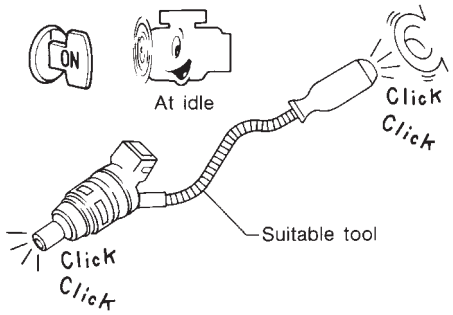
7	CHECK TARGET IDLE SPEED AGAIN	
With CONSULT-II 1. Start engine and warm it up to normal operating temperature. 2. Read idle speed in "DATA MONITOR" mode with CONSULT-II. **675±50 rpm (in P or N position)**		
Without CONSULT-II 1. Start engine and warm it up to normal operating temperature. 2. Check idle speed. **675±50 rpm (in P or N position)**		
	OK or NG	
OK	▶	GO TO 10.
NG	▶	GO TO 8.

8	DETECT MALFUNCTIONING PART	
Check the following. ● Check camshaft position sensor (PHASE) and circuit. Refer to EC-323. ● Check crankshaft position sensor (POS) and circuit. Refer to EC-316.		
	OK or NG	
OK	▶	GO TO 9.
NG	▶	1. Repair or replace. 2. GO TO 4.

9	CHECK ECM FUNCTION	
1. Substitute another known-good ECM to check ECM function. (ECM may be the cause of a malfunction, but this is the rarely the case.) 2. Perform initialization of IVIS (NATS) system and registration of all IVIS (NATS) ignition key IDs. Refer to "IVIS (INFINITI VEHICLE IMMOBILIZER SYSTEM — NATS)", EC-90.		
	▶	GO TO 4.

4	CHECK INJECTOR

Does each injector make an operating sound at idle?



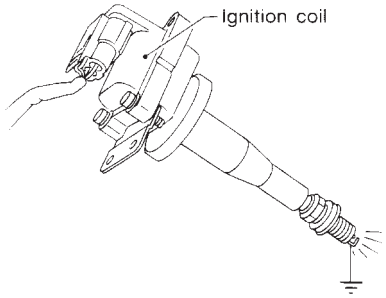
MEC703B

Yes or No

Yes	▶	GO TO 5.
No	▶	Check injector(s) and circuit(s). Refer to EC-696.

5	CHECK IGNITION SPARK

1. Turn ignition switch OFF.
2. Remove ignition coil assembly from rocker cover.
3. Connect a known good spark plug to the ignition wire.
4. Disconnect all injector harness connectors.
5. Place end of spark plug against a suitable ground and crank engine.
6. Check for spark.



SEF575Q

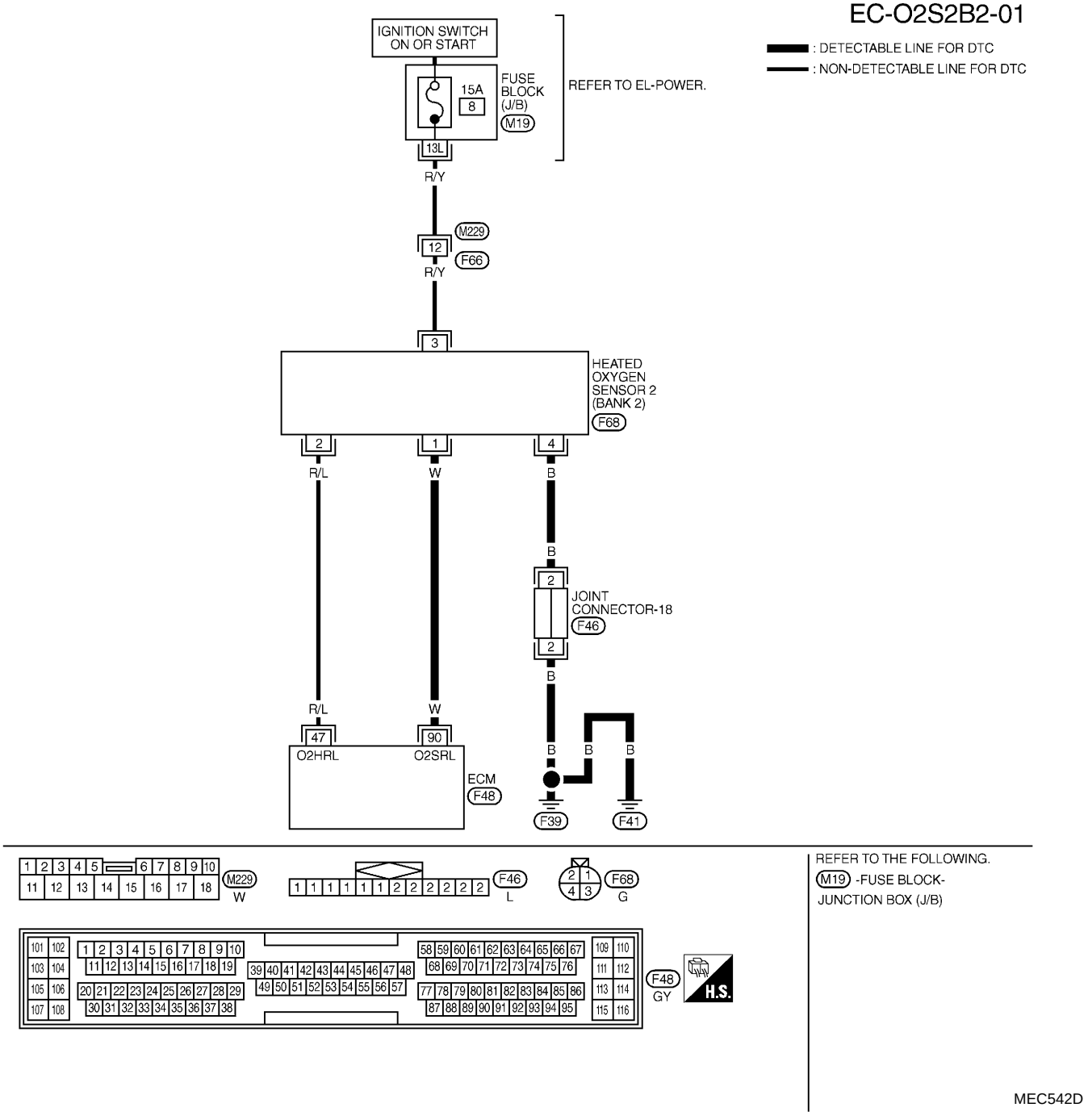
OK or NG

OK	▶	GO TO 6.
NG	▶	Check ignition coil, power transistor and their circuits. Refer to "IGNITION SIGNAL", EC-685.

Wiring Diagram (Cont'd)

BANK 2

NHEC1175S02



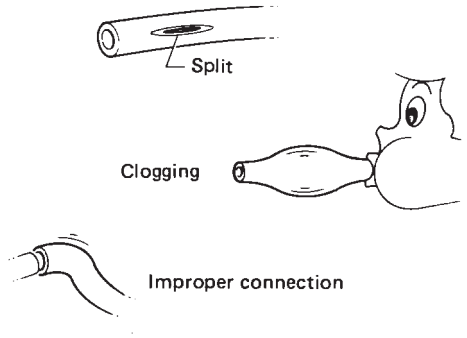
ECM TERMINALS AND REFERENCE VALUE MEASURED BETWEEN EACH TERMINAL AND GROUND.
CAUTION:
DO NOT USE ECM GROUND TERMINALS WHEN MEASURING INPUT/OUTPUT VOLTAGE. DOING SO MAY RESULT IN DAMAGE TO THE ECM'S TRANSISTOR. USE A GROUND OTHER THAN ECM TERMINALS, SUCH AS THE GROUND.

TERMINAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
90	W	HEATED OXYGEN SENSOR 2 (BANK 2)	**[ENGINE IS RUNNING]** • **WARM-UP CONDITION** • REVVING ENGINE FROM IDLE UP TO 3,000 RPM QUICKLY AFTER THE FOLLOWING CONDITIONS ARE MET. • AFTER KEEPING ENGINE SPEED BETWEEN 3,500 AND 4,000 RPM FOR 1 MINUTE AND AT IDLE FOR 1 MINUTE UNDER NO LOAD	0 - APPROX. 1.0V

SEC662DC

3	CHECK VACUUM HOSE

1. Stop engine.
2. Check hoses and tubes between intake manifold and power valve actuator for crack, clogging, disconnection or improper connection.



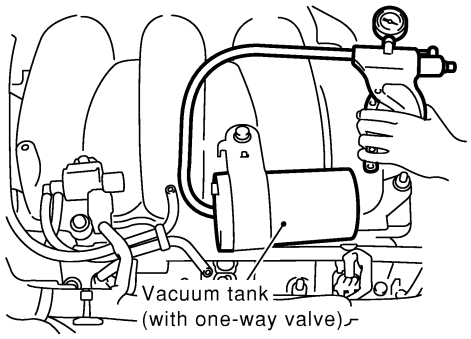
SEF109L

OK or NG

OK	▶	GO TO 4.
NG	▶	Replace vacuum hose.

4	CHECK VACUUM TANK

1. Disconnect vacuum hose connected to vacuum tank.
2. Connect a vacuum pump to port (at the center) of vacuum tank.
3. Apply vacuum and make sure that vacuum exists at another port.



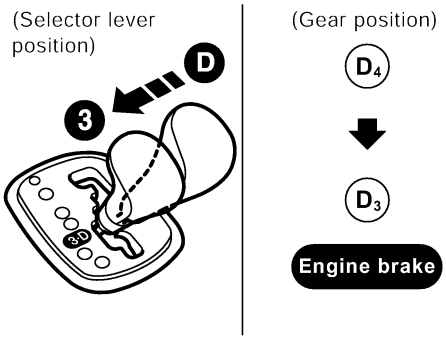
SEC131D

OK or NG

OK	▶	GO TO 5.
NG	▶	Replace vacuum tank.

2	CHECK ENGINE BRAKE

Does vehicle decelerate by engine brake?



SAT677K

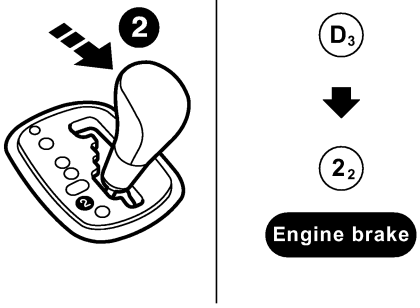
Yes or No

Yes	▶	GO TO 3.
No	▶	Mark the box of "Engine Speed Does Not Return To Idle (Light Braking $D_4 \rightarrow D_3$)" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.

3	CHECK SHIFT DOWN (D_3 TO D_2)

1. Move selector lever from 3rd to 2nd position while driving in D_3.
2. Does A/T shift from D_3 to 2_2?

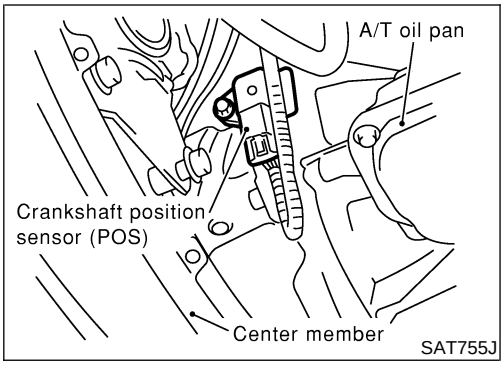
Read gear position.

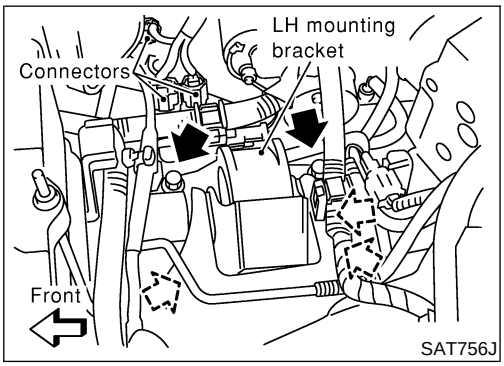


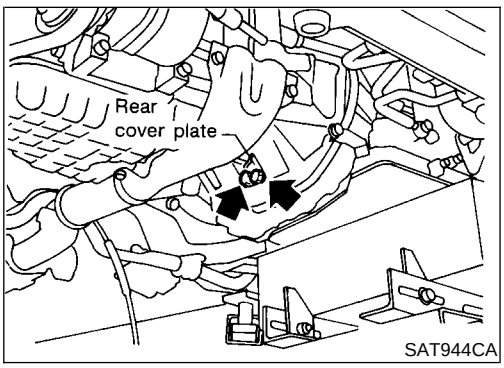
SAT678K

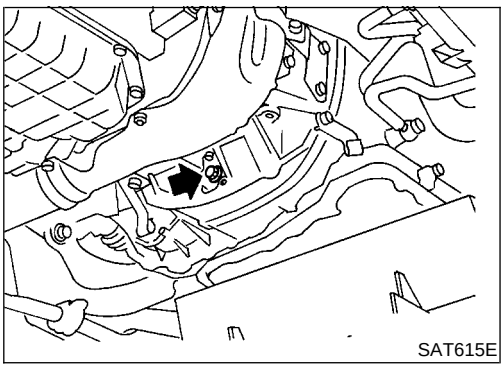
Yes or No

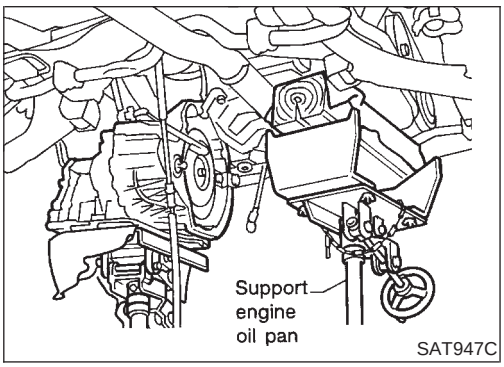
Yes	▶	GO TO 4.
No	▶	Mark the box of "A/T Does Not Shift: $D_3 \rightarrow D_2$, When Selector Lever 3rd → 2nd Position" on the DIAGNOSTIC WORKSHEET. Continue ROAD TEST.











Removal

NHAT0119

CAUTION:

When removing the transaxle assembly from engine, first remove the crankshaft position sensor (POS) from the assembly.

Be careful not to damage sensor edge.

1. Remove battery and bracket.
2. Remove air cleaner and resonator.
3. Disconnect terminal cord assembly harness connector and park/neutral position (PNP) switch harness connectors.
4. Disconnect harness connectors of revolution sensor, ground and vehicle speed sensor.
5. Remove crankshaft position sensor (POS) from transaxle.
6. Remove LH mounting bracket from transaxle and body.
7. Disconnect control cable at transaxle side.
8. Drain ATF.
9. Remove exhaust front tube.
10. Remove drive shafts. Refer to AX-9, “Drive Shaft”.
11. Disconnect fluid cooler hoses.
12. Remove starter motor from transaxle.
13. Support engine by placing a jack under oil pan.

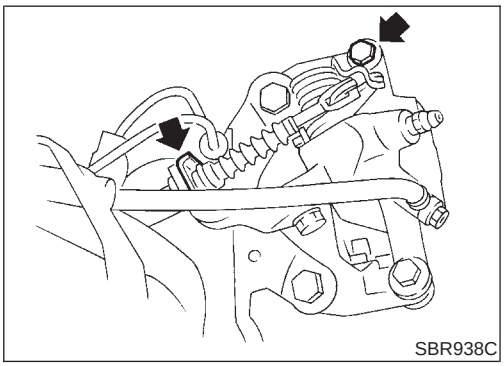
- **Do not place jack under oil pan drain plug.**

14. Remove center member.
15. Remove rear cover plate and bolts securing torque converter to drive plate.

- **Rotate crankshaft for access to securing bolts.**

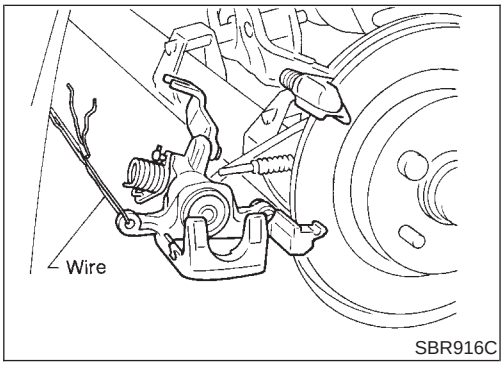
16. Support transaxle with a jack.
17. Remove bolts fixing A/T to engine.
18. Lower transaxle while supporting it with a jack.

- **It is not necessary to remove connecting bolt except for disassembly or replacement of caliper assembly. In this case, suspend cylinder body with wire so as not to stretch brake hose.**
- **Burnish the brake contact surfaces after refinishing or replacing drums or rotors, after replacing pads or linings, or if a soft pedal occurs at very low mileage.**
  Refer to "Brake Burnishing Procedure", "ON-VEHICLE SERVICE", BR-7.

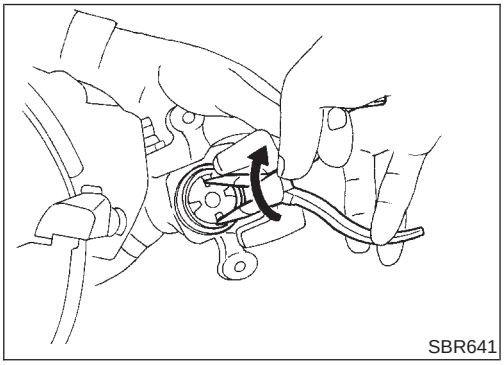

SBR938C

1. Remove master cylinder reservoir cap.
2. Remove brake cable mounting bolt and lock spring.
3. Release parking brake control lever, then disconnect cable from the caliper.
4. Remove upper pin bolt.
5. Open cylinder body downward. Then remove pad retainers and inner and outer shims.

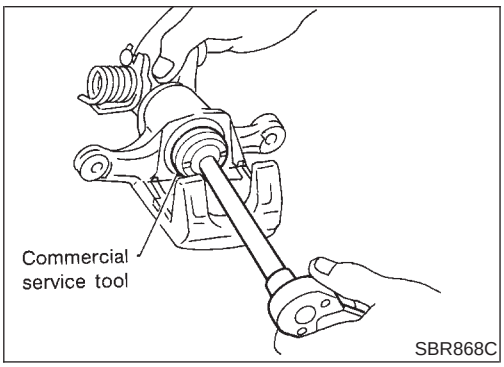
   Standard pad thickness:
   10 mm (0.39 in)
   Pad wear limit:
   1.5 mm (0.059 in)



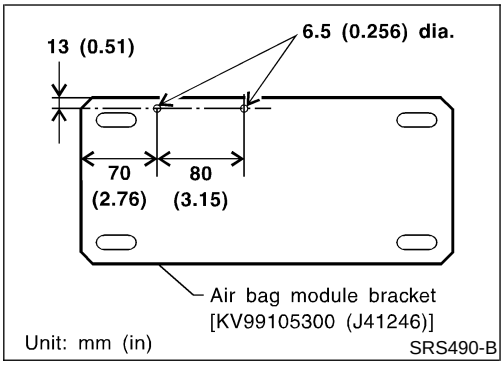
SBR916C


SBR641

6. When installing new pads, push piston into cylinder body by gently turning piston clockwise, as shown.
   Carefully monitor brake fluid level because brake fluid will return to reservoir when pushing back piston.



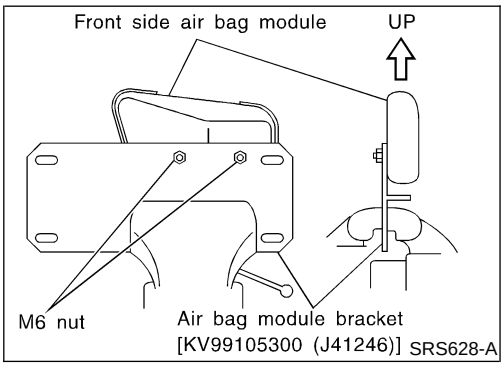
SBR868C



Deployment of Side Air Bag Module (Outside of vehicle)

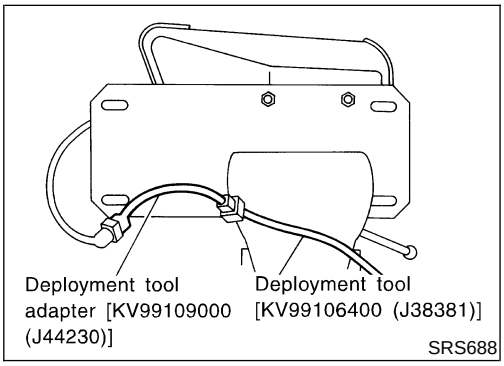
NHRS0022S0203

1. Make 6.5 mm (0.256 in) diameter holes in air bag module bracket [SST: KV99105300 (J41246)] at the position shown in figure at left.

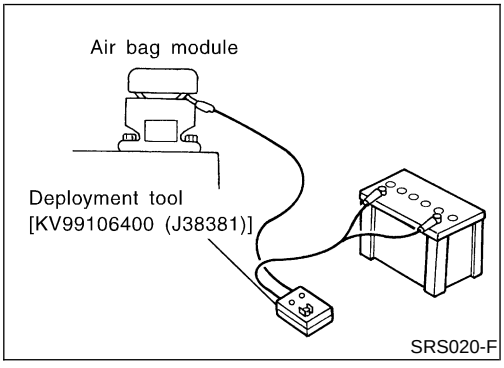


2. Firmly secure air bag module bracket [SST: KV99105300 (J41246)] in a vise.
3. Insert the stud bolts of side air bag module into the two holes in air bag module bracket (held in vise) and fix them with two M6 nuts.

CAUTION:
Side air bag module should be secured to air bag module bracket [SST: KV99105300 (J41246)] in a vise with stud bolt side setting bottom.

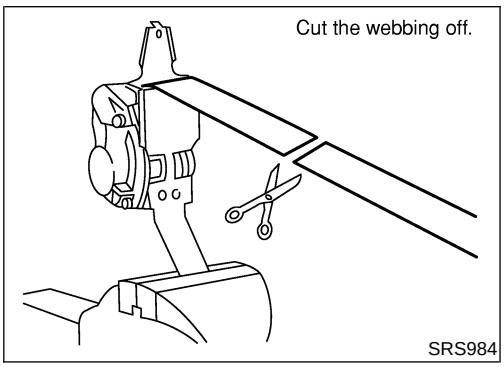


4. Connect deployment tool adapter [SST: KV9910900 (J44230)] to deployment tool [SST: KV99106400 (J38381)] connector and connector on air bag module.



5. Connect red clip of deployment tool to battery positive terminal and black clip to negative terminal.
6. The lamp on the right side of the tool, marked "deployment tool power", should glow green, not red.
7. Press the button on the deployment tool. The left side lamp on the tool, marked "air bag connector voltage", will illuminate and the air bag module will deploy.

CAUTION:
When deploying the air bag module, stand at least 5 m (16 ft) away from the air bag module.



DEPLOYMENT PROCEDURES FOR SEAT BELT PRE-TENSIONER (OUTSIDE OF VEHICLE)

NHRS0022S05

1. Firmly grip pre-tensioner in a vise and cut the webbing off.

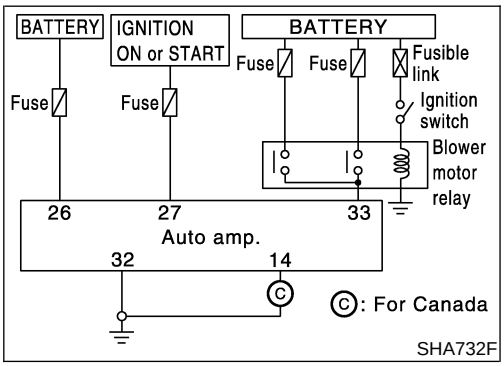
MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

=NHHA0180

Power Supply Circuit Check

NHHA0180S03

Check power supply circuit for air conditioner system.
Refer to EL-12, "Wiring Diagram — POWER —".



DIAGNOSTIC PROCEDURE

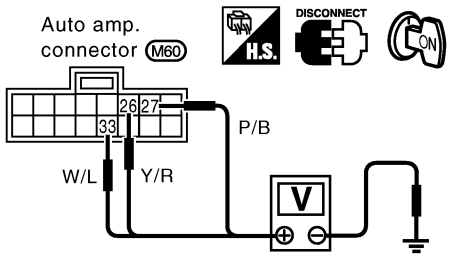
NHHA0181

SYMPTOM:

- **A/C system does not come on.**

1	CHECK POWER SUPPLY CIRCUIT FOR AUTO AMP.

Measure voltage across harness connector M60 terminal Nos. 26, 27, 33 and ground.



Voltmeter terminal (+)	Voltmeter terminal (–)	Voltage
26	Ground	Battery voltage
27		
33		

OK or NG

OK	▶	GO TO 2.
NG	▶	**Check auto amp. ground circuit.** ● Check 10A fuse [Nos. 12 and 28, located in the fuse block (J/B) and 15A fuses Nos. 51 and 52, located in the fuse and fusible link box]. ● If fuses are OK, check for open circuit in wiring harness. Repair or replace as necessary. ● If fuses are NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

- to headlamp LH relay terminal 2 from smart entrance control unit terminal 21
- through smart entrance control unit terminal 22
- from lighting switch terminal 12, and
- to headlamp RH relay terminal 2 from smart entrance control unit terminal 59
- through smart entrance control unit terminal 60
- from lighting switch terminal 12.

Headlamp relays (LH and RH) are energized and then power is supplied to headlamps (LH and RH).

Low Beam Operation

NHEL0262S0103

When the lighting switch is turned to 2ND and LOW ("B") positions, ground is supplied

- to terminal 4 of the headlamp LH
- through body grounds E11, E22 and E53.

Ground is also supplied

- to terminal 4 of the headlamp RH
- through body grounds E11, E22 and E53.

With power and ground supplied, the low beam headlamps illuminate.

High Beam Operation/Flash-to-pass Operation

NHEL0262S0104

When the lighting switch is turned to 2ND and HIGH ("A") or PASS ("C") positions, ground is supplied

- to terminal 2 of headlamp LH
- through daytime light control unit terminals 10 and 13, and
- through lighting switch terminals 6 and 5
- through body grounds E11, E22 and E53.

Ground is also supplied

- to terminal 2 of headlamp RH
- through daytime light control unit terminals 9 and 14
- to combination meter terminal 27 for the HIGH BEAM indicator
- through lighting switch terminals 9 and 8
- through body grounds E11, E22 and E53.

With power and ground supplied, the high beam headlamps and HIGH BEAM indicator illuminate.

EXTERIOR LAMP BATTERY SAVER CONTROL

NHEL0262S06

While the headlamp is turned ON by "2ND" of light switch, the 5 minute timer is activated when the ignition switch is turned from ON (or START) to OFF (ACC OFF).
Continuity between terminals 21 and 22, and between terminals 59 and 60 of smart entrance control unit will be disturbed after 5 minutes, then the headlamps will be turned off.
While the headlamp is turned ON by "AUTO" of light switch, the 5 minute timer is activated when the ignition switch signal changes from ON (or START) to OFF (ACC OFF), and either one of front door switch LH or RH ON signal is input.
The auto light delay off timer is activated as the following:

- When the door switch signal changes from ON to OFF while the timer is activated, the timer in operation is discontinued and the 45 second timer is reset.
- When the door switch signal changes from OFF to ON while the timer is activated, the timer is discontinued and the 45 second timer is reset.
- When the one of four door switch signals changes from OFF to ON while the timer is activated, the timer is discontinued and the 5 minute timer is reset.
- When all the door switch ON signals are input while the timer is activated, the timer is discontinued and the 45 second timer is reset.

Exterior lamp battery saver control mode and auto light delay off timer period can be changed by the function setting of CONSULT-II (EL-47).
When the lighting switch is turned from OFF to 2ND after headlamps are turned to off by the battery saver control, ground is supply

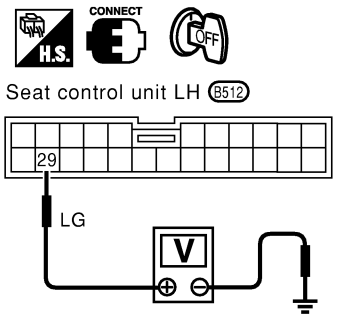
- to smart entrance control unit terminals 20 and 58 from lighting switch terminal 11, and then
- to headlamp LH and RH relays terminal 2 from smart entrance control unit terminals 21 and 59
- through smart entrance control unit terminals 22 and 60, and

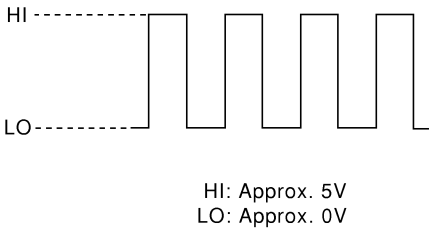
DIAGNOSTIC PROCEDURE 3
(Reclining encoder check)

=NHEL0277S06

1	CHECK RECLINING ENCODER OUTPUT SIGNAL

Measure voltage between seat control unit LH terminal 29 and ground with CONSULT-II or oscilloscope when power seat reclining is operated.





HI: Approx. 5V
LO: Approx. 0V

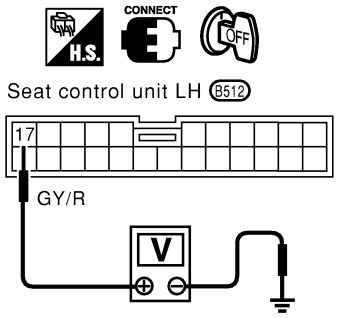
SEL607W

OK or NG

OK	▶	Reclining encoder is OK.
NG	▶	GO TO 2.

2	CHECK RECLINING ENCODER INPUT SIGNAL

Check voltage between seat control unit LH terminal 17 and ground.



Battery voltage should exist.

SEL608W

OK or NG

OK	▶	GO TO 3.
NG	▶	Replace seat control unit LH.