### Precautions

Observe the following precautions to ensure safe and proper servicing. These precautions are not described in each individual section.

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#### PRECAUTIONS FOR SUPPLEMENTAL RESTRAINT SYSTEM (SRS) "AIR BAG" AND "SEAT BELT PRE-TENSIONER"

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to INFINITI G20 is as follows:

• For a frontal collision

The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.

• For a side collision

The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

#### WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance should be performed by an authorized INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the RS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual.
   SRS wiring harnesses (except "SEAT BELT PRE-TEN-SIONER" connector) can be identified by yellow harness connector.

# PRECAUTIONS FOR IVIS (INFINITI VEHICLE IMMOBILIZER SYSTEM — NATS)

IVIS (NATS) will immobilize the engine if someone tries to start it without the registered key of IVIS (NATS). Both of the originally supplied ignition key IDs have been IVIS (NATS) registered.

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### HOW TO USE THIS MANUAL

- The captions **WARNING** and **CAUTION** warm 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. **ER**) 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**.



- **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.
   "Example"

#### **Tightening torque:**

#### 59 - 78 N·m (6.0 - 8.0 kg-m, 43 - 58 ft-lb)

• **TROUBLE DIAGNOSES** are included in sections dealing with complicated components.

# **CYLINDER BLOCK**

#### Crankshaft main journal grade number: 2 Main bearing grade number = 1 + 2 = 3 (D, Yellow)



rear view

### Connecting Rod Bearing (Big end)

- 1. Install connecting rod bearing to connecting rod and cap.
- 2. Install connecting rod cap to connecting rod.

#### Tighten bolts to the specified torque. Refer to EM-65.

- 3. Measure inner diameter "C" of each bearing.
- 4. Measure outer diameter "Dp" of corresponding crankshaft pin journal.
- 5. Calculate connecting rod bearing clearance.

### Connecting rod bearing clearance = C – Dp Standard: 0.020 - 0.045 mm (0.0008 - 0.0018 in) Limit: 0.065 mm (0.0026 in)

If it exceeds the limit, replace bearing.

- If clearance cannot be adjusted within the standard of any bearing, grind crankshaft journal and use undersized bearing. Refer to EM-60 for fillet roll remarks, grinding crankshaft and available service parts.
- If crankshaft is replaced with a new one, select connecting rod bearing according to the following table.

#### Connecting rod bearing grade number:

These numbers are punched in either Arabic or Roman numerals.

Crank pin grade number	Connecting rod bearing grade number
0	0
1	1
2	2

# Identification color:

Grade 0; No color Grade 1; Black

Grade 2; Brown

SEM204D

### DTC P0110 INTAKE AIR TEMPERATURE SENSOR

Diagnostic Procedure (Cont'd)



IDX

#### **Diagnostic Procedure** NCEC0211 1 **RETIGHTEN GROUND SCREWS** Loosen and retighten engine ground screws. Engine ground Intake manifold MA collector LC EC SEF839X GO TO 2. ► FE 2 **CHECK INPUT SIGNAL CIRCUIT-1** 1. Turn ignition switch "OFF". 2. Disconnect ECM harness connector and knock sensor harness connector. MT View from under the vehicle Knock sensor harness connector AT ∠ Drive shaft AX SEF856X 3. Check harness continuity between knock sensor terminal 1 and ECM terminal 81. Refer to Wiring Diagram. Continuity should exist. 4. Also check harness for short to ground and short to power. OK or NG OK GO TO 4. NG GO TO 3. 3 DETECT MALFUNCTIONING PART Check the following. HA Harness connectors F6, E123 Harness for open or short between knock sensor and ECM Repair open circuit or short to ground or short to power in harness or connectors. Þ SC 4 CHECK KNOCK SENSOR EL Knock sensor Refer to "Component Inspection", EC-332. OK or NG OK GO TO 5.

### EC-331

Replace knock sensor.

NG

## DTC P1447 EVAPORATIVE EMISSION (EVAP) CONTROL SYSTEM PURGE FLOW MONITORING

Diagnostic Procedure (Cont'd)

3	CHECK PURGE FLOW		
() Wit 1. Sta	<ul> <li>Without CONSULT-II</li> <li>Start engine and warm it up to normal operating temperature.</li> <li>Stop engine</li> </ul>		GI
3. Dise inst	connect vacuum hose con all vacuum gauge.	nected to EVAP canister purge volume control solenoid valve at EVAP service port and	MA
		View with intake air duct removed Brake fluid	EM
			LC
		EVAP service port	EC
4 01-	SEF850X		FE
4. Sta 5. Che	<ol> <li>Start engine and let it idle for at least 80 seconds.</li> <li>Check vacuum gauge indication when revving engine up to 2,000 rpm. Vacuum should exist.</li> </ol>		CL
6. Rei	Vacuum should not exist		Mar
OK or NG			UVU U
ОК		GO TO 7.	AT
NG		GO TO 4.	
			- - AX
4	CHECK EVAP PURGE	LINE	
1. Turi 2. Che Ref	<ol> <li>Turn ignition switch "OFF".</li> <li>Check EVAP purge line for improper connection or disconnection. Refer to "EVAPORATIVE EMISSION LINE DRAWING", EC-37.</li> </ol>		SU
		OK or NG	BR
ОК		GO TO 5.	
NG		Repair it.	ST

RS

BT

HA

SC

EL

IDX

### Introduction

The A/T system has two self-diagnostic systems.

The first is the emission-related on board diagnostic system (OBD-II) performed by the TCM in combination with the ECM. The malfunction is indicated by the MIL (malfunction indicator lamp) and is stored as a DTC in the ECM memory but not the TCM memory.

The second is the TCM original self-diagnosis indicated by the O/D OFF indicator lamp. The malfunction is stored in the TCM memory. The detected items are overlapped with OBD-II self-diagnostic items. For detail, refer to AT-41.

### **OBD-II Function for A/T System**

The ECM provides emission-related on board diagnostic (OBD-II) functions for the A/T system. One function is to receive a signal from the TCM used with OBD-related parts of the A/T system. The signal is sent to the ECM when a malfunction occurs in the corresponding OBD-related part. The other function is to indicate a diagnostic result by means of the MIL (malfunction indicator lamp) on the instrument panel. Sensors, switches and solenoid valves are used as sensing elements.

The MIL automatically illuminates in One or Two Trip Detection Logic when a malfunction is sensed in relation to A/T system parts.

# One or Two Trip Detection Logic of OBD-II

### ONE TRIP DETECTION LOGIC

NCAT0019 NCAT0019S01

If a malfunction is sensed during the first test drive, the MIL will illuminate and the malfunction will be stored in the ECM memory as a DTC. The TCM is not provided with such a memory function.

### TWO TRIP DETECTION LOGIC

When a malfunction is sensed during the first test drive, it is stored in the ECM memory as a 1st trip DTC (diagnostic trouble code) or 1st trip freeze frame data. At this point, the MIL will not illuminate. — First Trip If the same malfunction as that experienced during the first test drive is sensed during the second test drive, the MIL will illuminate. — Second Trip

A/T-related parts for which the MIL illuminates during the first or second test drive are listed below.

Itomo	MIL		
items	One trip detection	Two trip detection	
Shift solenoid valve A — DTC: P0750	Х		
Shift solenoid valve B — DTC: P0755	Х		
Throttle position sensor or switch — DTC: P1705	Х		
Except above		Х	

The "trip" in the "One or Two Trip Detection Logic" means a driving mode in which self-diagnosis is performed during vehicle operation.

# **OBD-II** Diagnostic Trouble Code (DTC)

NCAT0020

DTC and 1st trip DTC can be read by the following methods.

( with CONSULT-II or ( GST) CONSULT-II or GST (Generic Scan Tool) Examples: P0705, P0710, P0720, P0725, etc.

These DTCs are prescribed by SAE J2012.

(CONSULT-II also displays the malfunctioning component or system.)

• 1st trip DTC No. is the same as DTC No.

HOW TO READ DTC AND 1ST TRIP DTC

 Output of the diagnostic trouble code indicates that the indicated circuit has a malfunction. However, in case of the Mode II and GST they do not indicate whether the malfunction is still occurring or occurred in the past and returned to normal. CONSULT-II can identify them as shown below. Therefore, using CONSULT-II (if available) is recommended.

Samples of CONSULT-II display for DTC and 1st trip DTC are shown in the next page. DTC or 1st trip DTC of a malfunction is displayed in SELF DIAGNOSIS mode for "ENGINE" with CONSULT-II. Time data indicates how many times the vehicle was driven after the last detection of a DTC.

NCAT0017

### TROUBLE DIAGNOSES FOR SYMPTOMS

4. In "N" Position, Vehicle Moves

# 4. In "N" Position, Vehicle Moves

#### SYMPTOM:

=NCAT0084

Vehicle moves forward or backward when selecting "N" position.





# **ON-VEHICLE SERVICE**

- a) Air bubbles in reservoir tank
- b) Clicking noise in oil pump
- c) Excessive buzzing in oil pump

Fluid noise may occur in the valve or oil pump. This is common when the vehicle is stationary or while turning the steering wheel slowly. This does not affect the performance or durability of the system.

### **Checking Steering Wheel Turning Force**

- 1. Park vehicle on a level, dry surface and set parking brake.
- 2. Start engine.
- 3. Bring power steering fluid up to adequate operating temperature. [Make sure temperature of fluid is approximately 60 to 80°C (140 to 176°F).]

#### Tires need to be inflated to normal pressure.

4. Check steering wheel turning force when steering wheel has been turned 360° from the neutral position.

#### Steering wheel turning force: 39 N (4 kg, 9 lb) or less

- 5. If steering wheel turning force is out of specification, check rack sliding force.
- a. Disconnect steering column lower joint and knuckle arms from the gear.
- b. Start and run engine at idle to make sure steering fluid has reached normal operating temperature.
- c. Pull tie-rod slowly to move it from neutral position to  $\pm 11.5$  mm ( $\pm 0.453$  in) at speed of 3.5 mm (0.138 in)/s. Check that rack sliding force is within specification.

#### Average rack sliding force:

#### 167 - 226 N (17 - 23 kg, 37 - 51 lb) Maximum force deviation: 98 N (10 kg, 22 lb)

d. Check sliding force outside the above range.

### Rack sliding force:

#### Not more than 294 N (30 kg, 66 lb)

- 6. If rack sliding force is not within specification, overhaul steering gear assembly.
- 7. If rack sliding force is OK, inspect steering column. Refer to ST-13.

### **Checking Hydraulic System**

Before starting, check belt tension, driving pulley and tire pressure.

- 1. Set Tool. Open shut-off valve. Then bleed air. Refer to "Bleeding Hydraulic System", ST-7.
- 2. Run engine at idle speed or 1,000 rpm.

# Make sure temperature of fluid in tank rises to 60 to 80°C (140 to 176°F).







### TROUBLE DIAGNOSES

Blower Motor (Cont'd)

AUTO

6	CHECK BLOWER MOT	OR ROTATION
Is blower motor rotate when fan speed 1 position with ignition switch at ON?		
Yes or No		
Yes		Replace fan control amp.
No		GO TO 7.

7	CHECK CIRCUIT BETV	VEEN AUTO AMP. AND FAN CONTROL AMP.	
1. Dis 2. Ch	sconnect auto amp. and far neck circuit continuity betwe <b>Continuity should exist</b> .	n control amp. harness connector. een auto amp. harness terminal No. 35 and fan control amp. harness terminal No. 2.	
		Fan control amp. Auto amp.	
		RHA056H	
If OK	, check harness for short		
OK or NG			
OK		GO TO 8.	
NG		Repair harness or connector.	



# **TROUBLE DIAGNOSES**

Blower Motor (Cont'd)







8	CHECK RESISTOR AF	TER DISCONNECTING IT
(Refer to Electrical Components Inspection.) (HA-173)		
OK or NG		
OK	►	GO TO 9.
NG	•	Replace resistor.

9	CHECK RESISTOR HA	RNESS CONNECTOR
Reconnect resistor harness connector.		
OK or NG		
1	►	GO TO 12.
2, 3, 4	►	GO TO 10.

# TAIL HARNESS

NCEL0008S07

GI

View with trunk room rear trim removed			MA EM
			LC
			EC
			FE
Body ground	CON- NECTOR NUMBER	CONNECT TO	CL
↓	- T3	Rear side marker lamp RH	UMI U
	T5	Rear combination lamp RH (Fender) (Stop/Tail)	AT
•	<u>T4</u>	Rear combination lamp RH (Fender) (Turn signal)	0.00
•	<b>T</b> 9	Rear combination lamp LH (Fender) (Turn signal)	AX
•	T21	Trunk lid opener actuator	
• · · · · · · · · · · · · · · · · · · ·	<b>Т</b> 8	Rear combination lamp LH (Fender) (Stop/Tail)	SU
	T10	Rear side marker lamp LH	
			BR
Body ground			ST

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# WARNING LAMPS

Flectrical Components Inspection

GI

MA

LC

EC



		Electrical Components inspection
	Electrical Components Ins	spection
	FUEL WARNING LAMP OPERA	
	1. Turn ignition switch "OFF".	NCEL0051501
	2. Disconnect fuel level sensor un	it harness connector B107.
	<ol> <li>Connect a resistor (80Ω) betwee ness connector terminals 1 and</li> </ol>	een fuel level sensor unit har-
	4. Turn ignition switch "ON".	
	The fuel warning lamp should co	me on.
	NOTE:	
EL843VA	ECM might store the 1st trip DTC inspection.	P0180 and P0464 during this
	If the DTC is stored in ECM memor	ry, erase the DTC after recon-
	Refer to EC-79, "HOW TO ERASE	EMISSION-RELATED DIAG-

D DIAG-NOSTIC INFORMATION", "Emission-related Diagnostic Information" "ON BOARD DIAGNOSTIC SYSTEM DESCRIPTION". FE

CL







### **OIL PRESSURE SWITCH CHECK**

		NCEL0051S02	~T
	Oil pressure kPa (kg/cm <sup>2</sup> , psi)	Continuity	/A11
Engine start	More than 10 - 20 (0.1 - 0.2, 1 - 3)	NO	AX
Engine stop	Less than 10 - 20 (0.1 - 0.2, 1 - 3)	YES	SU

Check the continuity between the terminals of oil pressure switch BR and body ground.

### **DIODE CHECK**

Check continuity using an ohmmeter. •

Diode is functioning properly if test results are as shown in the figure at left.

Check diodes at the combination meter harness connector • instead of on the combination meter assembly. Refer to EL-99, BT "Wiring Diagram — WARN —, "WARNING LAMPS".

#### NOTE:

•

Specification may vary depending on the type of tester. Before HA performing this inspection, be sure to refer to the instruction manual for the tester to be used.

SC

ST

NCEL0051S03

# AUTOMATIC SPEED CONTROL DEVICE (ASCD)

Trouble Diagnoses (Cont'd)



SEL417V

#### FAIL-SAFE SYSTEM CHECK

- 1. Turn ignition switch to ON position.
- 2. Turn ASCD main switch to ON and check if the "set indicator" blinks.

=NCEL0099S02

If the indicator lamp blinks, check the following.

- ASCD steering switch. Refer to EL-159.
- SET/COAST switch "ON"
- 3. Drive the vehicle at more than 40 km/h (25 MPH) and push SET/COAST switch.
  - If the indicator lamp blinks, check the following.
- Vehicle speed sensor. Refer to EL-160.
- ASCD pump circuit. Refer to EL-160.
- Replace control unit.
- Brake pedal
- Depress brake pedal slowly (brake pedal should be depressed more than 5 seconds).
   If the indicator lamp blinks, check the following.
- If the indicator lamp blinks, check the following.
  ASCD brake/stop lamp switch. Refer to EL-158.

5. END. (System is OK.)

# VEHICLE SECURITY (THEFT WARNING) SYSTEM

System Description

	System Description	NOTION	
DESCRIPTION 1. Operation Flow		NCEL0120 NCEL0120S01 NCEL0120S0101	G]
SYSTEM phase	SECURITY indicator lamp output		MA
> DISARMED	$\begin{array}{c} \text{ON} & & \\ & \Rightarrow & _{T4} \\ \text{OFF} & & & & \\ \end{array}$	T3 = 0.2 sec T4 = 2.4 sec	EM
PRE-ARMED	ON	T2 = 30 sec	LC
ARMED	ON $T_{T4}$ OFF $T_{T4}$	T3 = 0.2 sec T4 = 2.4 sec	EC FE
↓ ALARM	ON		CL
		SEL334W	MT
2. Setting The Vehicle Security Initial condition	System	NCEL012050102	AT
<ol> <li>Close all doors.</li> <li>Close engine hood and trunk lid</li> </ol>			AX
<b>Disarmed phase</b> When the vehicle security system is onds.	in the disarmed phase, the security indicator lamp b	olinks every 2.6 sec-	SU
The vehicle security system turns into the "pre-armed" phase when engine hood, trunk lid and all doors are closed and the doors are locked by key or multi-remote controller. (The security indicator lamp illuminates.) After about 30 seconds, the system automatically shifts into the "armed" phase (the system is set). (The			BR
3. Canceling The Set Vehicle S	2.6 seconds.) ecurity System		91
When the following 1) or 2) operation 1) Unlock the doors with the key of	n is performed, the armed phase is canceled.	NCEL0120S0103	RS
<ol> <li>Open the trunk lid with the key. When the trunk lid is closed after opening the trunk lid with the key, the system returns to the armed phase.</li> </ol>			BT
<b>4. Activating The Alarm Operat</b> Make sure the system is in the arms When the following operation 1) or 2 for about 50 seconds.	<b>4. Activating The Alarm Operation of The Vehicle Security System</b> Make sure the system is in the armed phase. (The security indicator lamp blinks every 2.6 seconds.) When the following operation 1) or 2) is performed, the system sounds the horns and flashes the headlamps for about 50 seconds.		
<ol> <li>Engine hood, trunk lid or any do</li> <li>Door is unlocked without using k</li> </ol>	or is opened before unlocking door with key or multi- key or multi-remote controller.	-remote controller.	SC
POWER SUPPLY AND GROUN	D		EL
<ul> <li>Power is supplied at all times</li> <li>through 7.5A fuse [No. 5, located</li> <li>to security indicator lamp termination</li> <li>Power is supplied at all times</li> </ul>	d in the fuse block (J/B)] al 1.	NCEL0120S07	IDX
<ul> <li>through 30A fusible link (letter d</li> <li>to smart entrance control unit te</li> </ul>	, located in the fuse and fusible link box) rminal 11.		

EL-215