

AUTOMATIC TRANSMISSION

SECTION AT

MODIFICATION NOTICE:

- The QD32 engine model has been added.

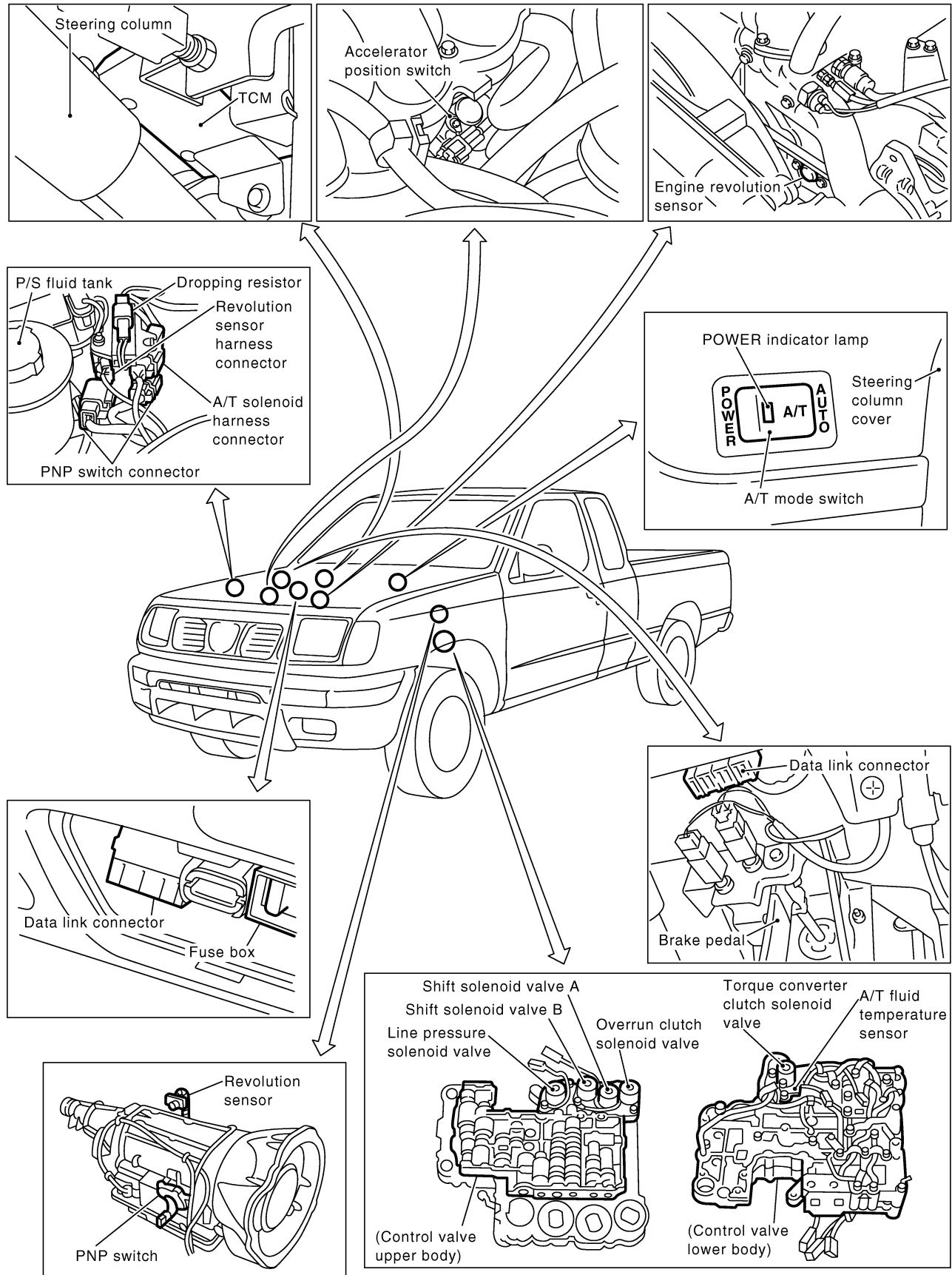
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OVERALL SYSTEM

A/T Electrical Parts Location

NEAT0007



SAT784K

QD32 ENGINE MODEL

NEAT0008

NEAT0008S01

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

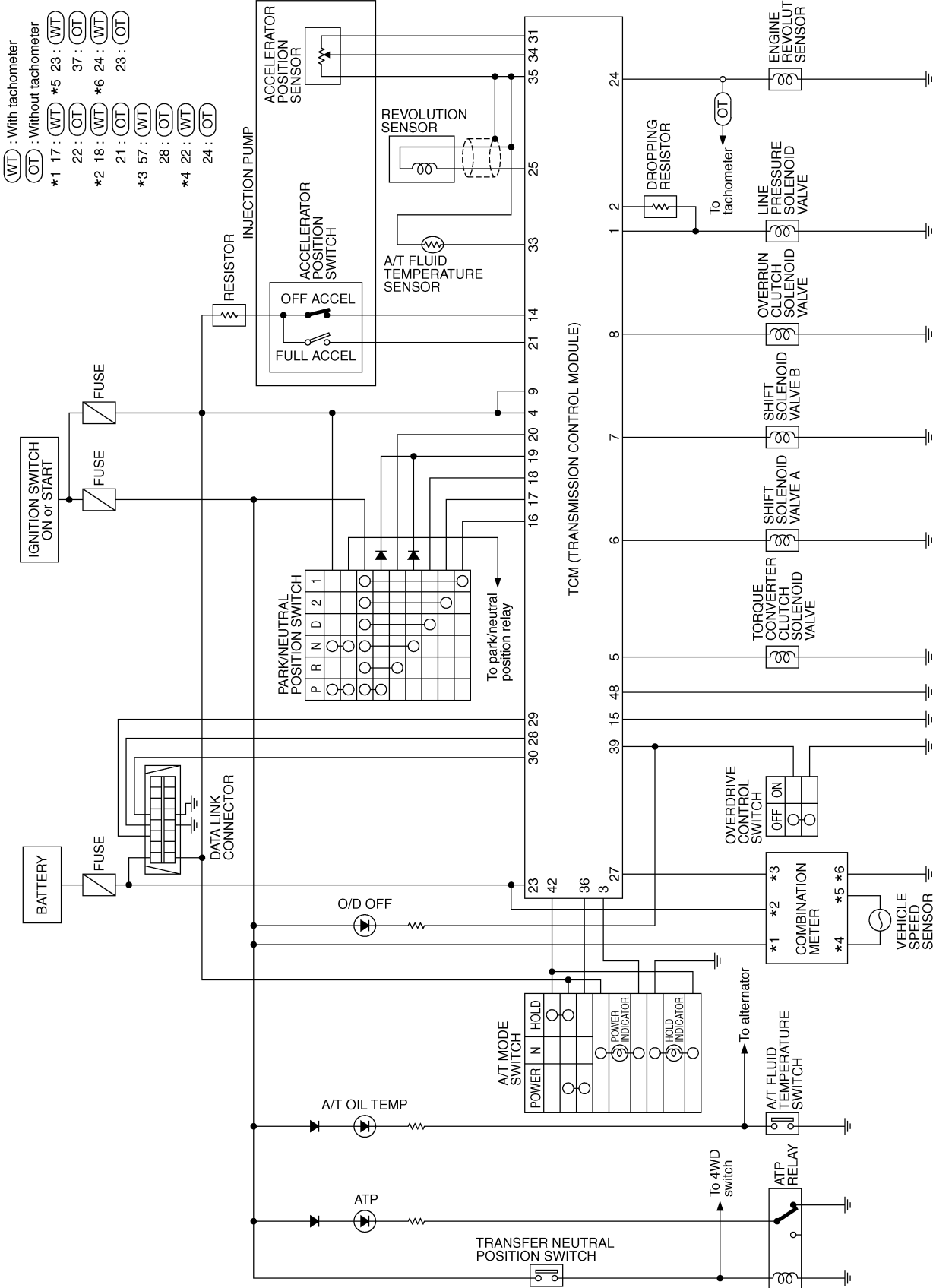
RS

BT

HA

EL

IDX



GAT129A

OVERALL SYSTEM

Control System

Control System

=NEAT0013

OUTLINE

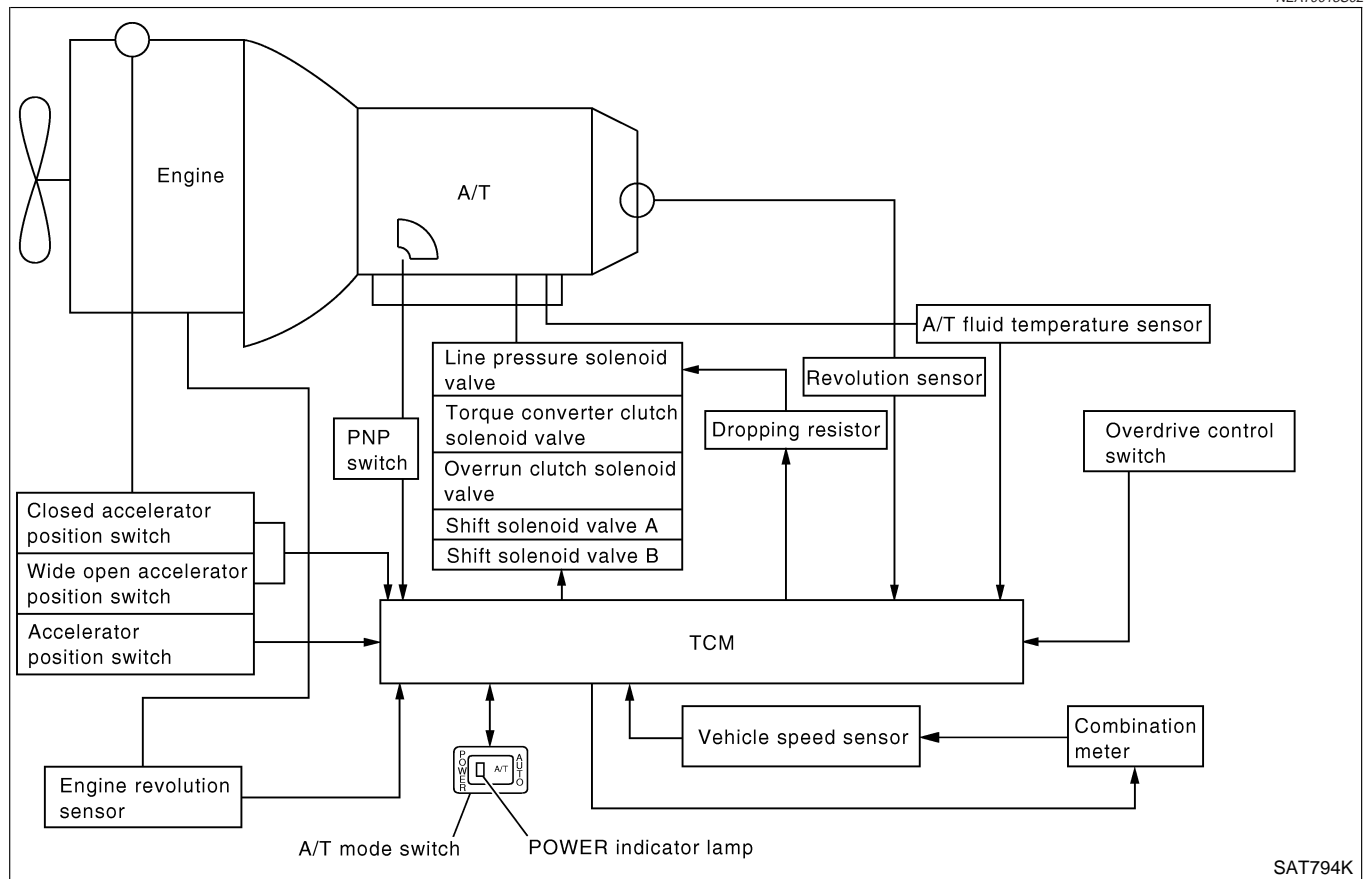
NEAT0013S01

The automatic transmission senses vehicle operating conditions through various sensors. It always controls the optimum shift position and reduces shifting and lock-up shocks.

SENSORS		TCM		ACTUATORS
PNP switch Accelerator position switch Closed throttle position switch Wide open throttle position switch Engine revolution sensor A/T fluid temperature sensor Revolution sensor Vehicle speed sensor Overdrive control switch A/T mode switch	▶	Shift control Line pressure control Lock-up control Overrun clutch control Timing control Fail-safe control Self-diagnosis	▶	Shift solenoid valve A Shift solenoid valve B Overrun clutch solenoid valve Torque converter clutch solenoid valve Line pressure solenoid valve POWER indicator lamp

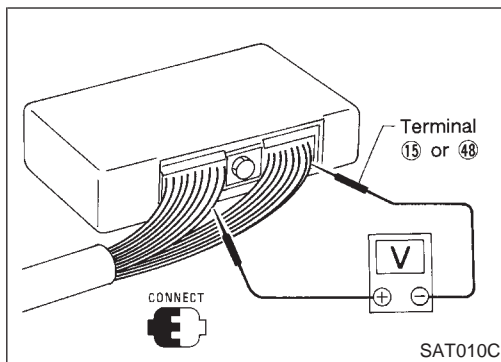
CONTROL SYSTEM

NEAT0013S02



TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

TCM Terminals and Reference Value



TCM Terminals and Reference Value

NEAT0253

PREPARATION

NEAT0253S01

- Measure voltage between each terminal and terminal 15 or 48 by following "TCM INSPECTION TABLE".

TCM HARNESS CONNECTOR TERMINAL LAYOUT

NEAT0253S02

1	2	3	4	9	10	11	12	13	14	15	23	24	25	26	27	28	29	30	31	32	33	34	35
5	6	7	8	16	17	18	19	20	21	22	36	37	38	39	40	41	42	43	44	45	46	47	48



SAT2071

TCM INSPECTION TABLE




(Data are reference values.)

NEAT0253S03

Terminal No.	Wire color	Item	Condition	Judgement standard
1	G/Y	Line pressure solenoid valve	When releasing accelerator pedal after warming up engine.	1.5 - 3.0V
			When depressing accelerator pedal fully after warming up engine.	0.5V or less
2	BR/Y	Line pressure solenoid valve (with dropping resistor)	When releasing accelerator pedal after warming up engine.	4 - 14V
			When depressing accelerator pedal fully after warming up engine.	0.5V or less
3	L/G	POWER indicator lamp	When setting A/T mode switch in other position.	1V or less
			When setting A/T mode switch in POWER position.	Battery voltage
4	G/Y	Power source	When turning ignition switch to "ON".	Battery voltage
			When turning ignition switch to "OFF".	1V or less


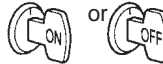




TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

TCM Terminals and Reference Value (Cont'd)

Terminal No.	Wire color	Item	Condition		Judgement standard	
5	G/OR	Torque converter clutch solenoid valve		When A/T performs lock-up.	8 - 15V	
				When A/T does not perform lock-up.	1V or less	
6	L/W	Shift solenoid valve A		When shift solenoid valve A operates. (When driving in "D ₁ " or "D ₄ ".)	Battery voltage	
				When shift solenoid valve A does not operate. (When driving in "D ₂ " or "D ₃ ".)	1V or less	
7	L/R	Shift solenoid valve B		When shift solenoid valve B operates. (When driving in "D ₁ " or "D ₂ ".)	Battery voltage	
				When shift solenoid valve B does not operate. (When driving in "D ₃ " or "D ₄ ".)	1V or less	
8	L/B	Overrun clutch solenoid valve		When overrun clutch solenoid valve operates.	Battery voltage	
				When overrun clutch solenoid valve does not operate.	1V or less	
9	G/Y	Power source			Same as No. 4	
10	—	—			—	—
11	—	—			—	—
12	—	—			—	—
13	—	—			—	—
					—	—
14	OR	Closed accelerator position switch (in accelerator position switch)			When releasing accelerator pedal after warming up engine.	8V
					When depressing accelerator pedal after warming up engine.	1V or less
15	B	Ground			—	—
16	G/W	PNP switch "1" position			When setting selector lever to "1" position.	Battery voltage
			When setting selector lever to other positions.		1V or less	
17	L	PNP switch "2" position	When setting selector lever to "2" position.		Battery voltage	
			When setting selector lever to other positions.		1V or less	
18	G/R	PNP switch "D" position	When setting selector lever to "D" position.		Battery voltage	
			When setting selector lever to other positions.		1V or less	



TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

TCM Terminals and Reference Value (Cont'd)

Terminal No.	Wire color	Item	Condition		Judgement standard	
19	Y	PNP switch “N” or “P” position		When setting selector lever to “N” or “P” position.	Battery voltage	GI
				When setting selector lever to other positions.	1V or less	MA
20	R/B	PNP switch “R” position		When setting selector lever to “R” position.	Battery voltage	EM
				When setting selector lever to other positions.	1V or less	LC
21	L/Y	Wide open accelerator position switch (in accelerator position switch)		When depressing accelerator pedal more than half-way after warming up engine.	8V	EC
				When releasing accelerator pedal after warming up engine.	1V or less	FE
22	—	—	—	—	CL	
23	R/G	Power source (Memory back-up)		When turning ignition switch to “OFF”.	Battery voltage	MT
				When turning ignition switch to “ON”.	Battery voltage	AT
24	W	Engine revolution sensor		When engine runs at idle speed.	Approximately 0V	TF
				When engine runs at 2,000 rpm.	Approximately 0.1V	PD
25	W/B	Revolution sensor (Measure in AC range)		When vehicle cruises at 30 km/h (19 MPH).	1V or more Voltage rises gradually in response to vehicle speed.	FA
				When vehicle parks.	0V	RA
26	—	—	—	—	BR	
27	W/L	Vehicle speed sensor		When moving vehicle at 2 to 3 km/h (1 to 2 MPH) for 1 m (3 ft) or more.	Voltage varies between less than 1V and more than 4.5V	ST
28*	G/B	Data link connector (RX)	—	—	—	RS
29*	Y/R	Data link connector (CLK)		—	—	BT
30*	GY/L	Data link connector (TX)		—	—	HA
31	G/L	Accelerator position sensor (Power source)		—	4.5 - 5.5V	EL
32	—	—		—	—	IDX

TROUBLE DIAGNOSIS — GENERAL DESCRIPTION

TCM Terminals and Reference Value (Cont'd)

Terminal No.	Wire color	Item	Condition		Judgement standard
33	R	A/T fluid temperature sensor	 	When ATF temperature is 20°C (68°F).	Approximately 1.5V
				When ATF temperature is 80°C (176°F).	Approximately 0.5V
34	G/Y	Accelerator position sensor		When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to accelerator position.)	Fully-closed accelerator: Approximately 0.7V Fully-open accelerator: Approximately 3.5V
35	G/R	Accelerator position sensor (Ground)		—	—
36	BR/W	A/T mode switch (“POWER”)		When setting A/T mode switch in “POWER” position.	Battery voltage
				When setting A/T mode switch in other positions.	1V or less
37	—	—		—	—
38	—	—		—	—
				—	—
39	G/Y	Overdrive control switch		When setting overdrive control switch in “ON” position.	Battery voltage
				When setting overdrive control switch in “OFF” position.	1V or less
40	—	—		—	—
				—	—
41	—	—		—	—
			—	—	
42	L/OR	A/T mode switch (“HOLD”)	When setting A/T mode switch in “HOLD” position.	Battery voltage	
			When setting A/T mode switch in other position.	1V or less	
43	—	—	—	—	
44	—	—	—	—	
45	—	—	—	—	
46	—	—	—	—	
47	—	—	—	—	
48	B	Ground	—	—	

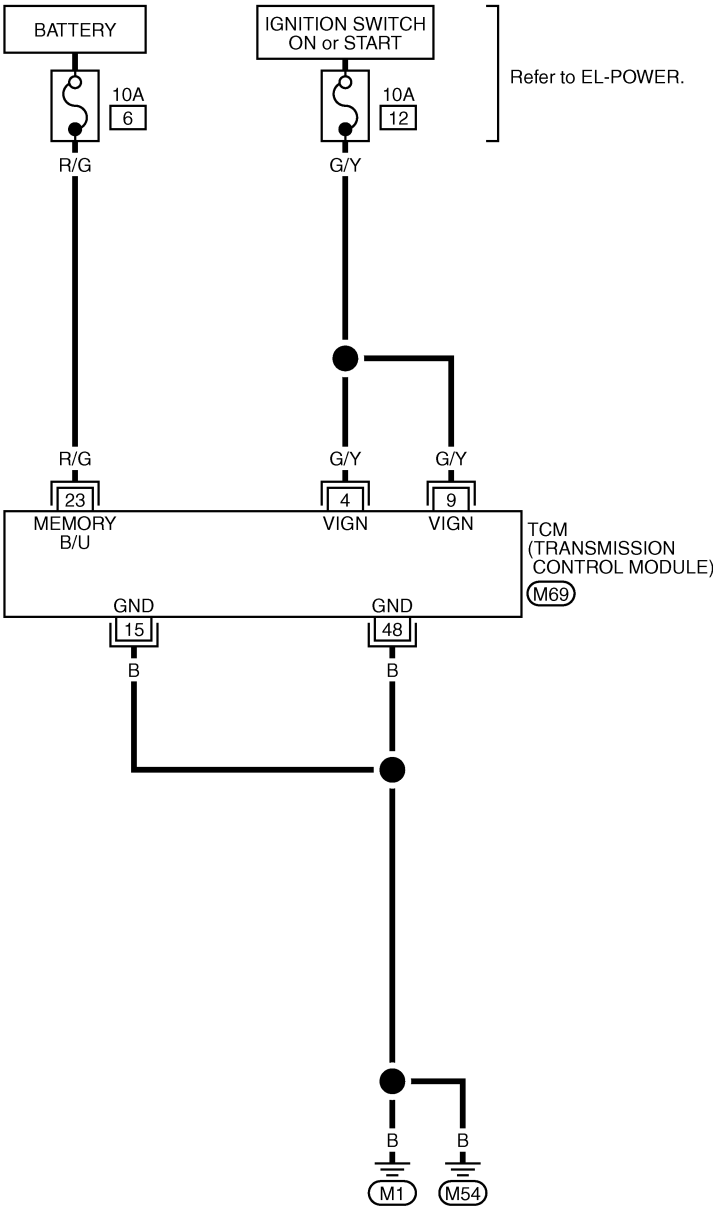
*: These terminals are connected to Data link connector for CONSULT-II.

Wiring Diagram — AT — MAIN

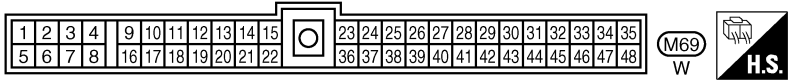
QD32 ENGINE MODEL

NEAT0185
NEAT0185S02

AT-MAIN-01



GI
MA
EM
LC
EC
FE
CL
MT
AT
TF
PD
FA
RA
BR
ST
RS
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EL
IDX



TROUBLE DIAGNOSIS FOR VHCL SPEED SEN-A/T (REVOLUTION SENSOR)

Wiring Diagram — AT — VSSA/T

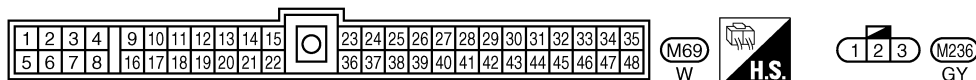
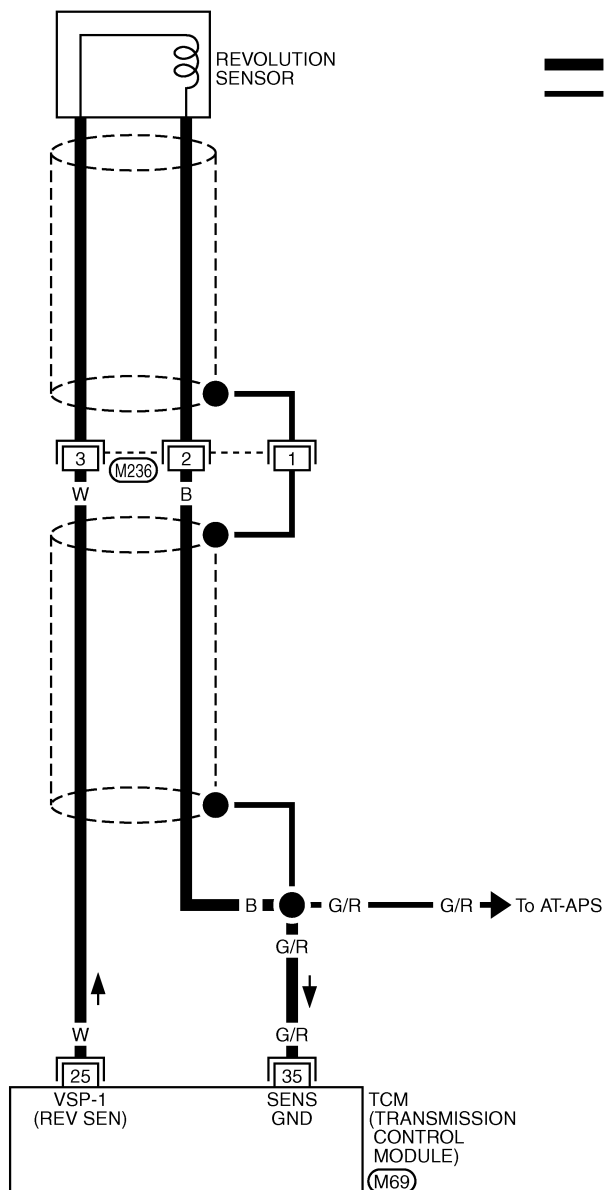
QD32 ENGINE MODEL

Wiring Diagram — AT — VSSA/T

NEAT0188

NEAT0188S01

AT-VSSA/T-01



TROUBLE DIAGNOSIS FOR VHCL SPEED SEN-MTR

Wiring Diagram — AT — VSSMTR

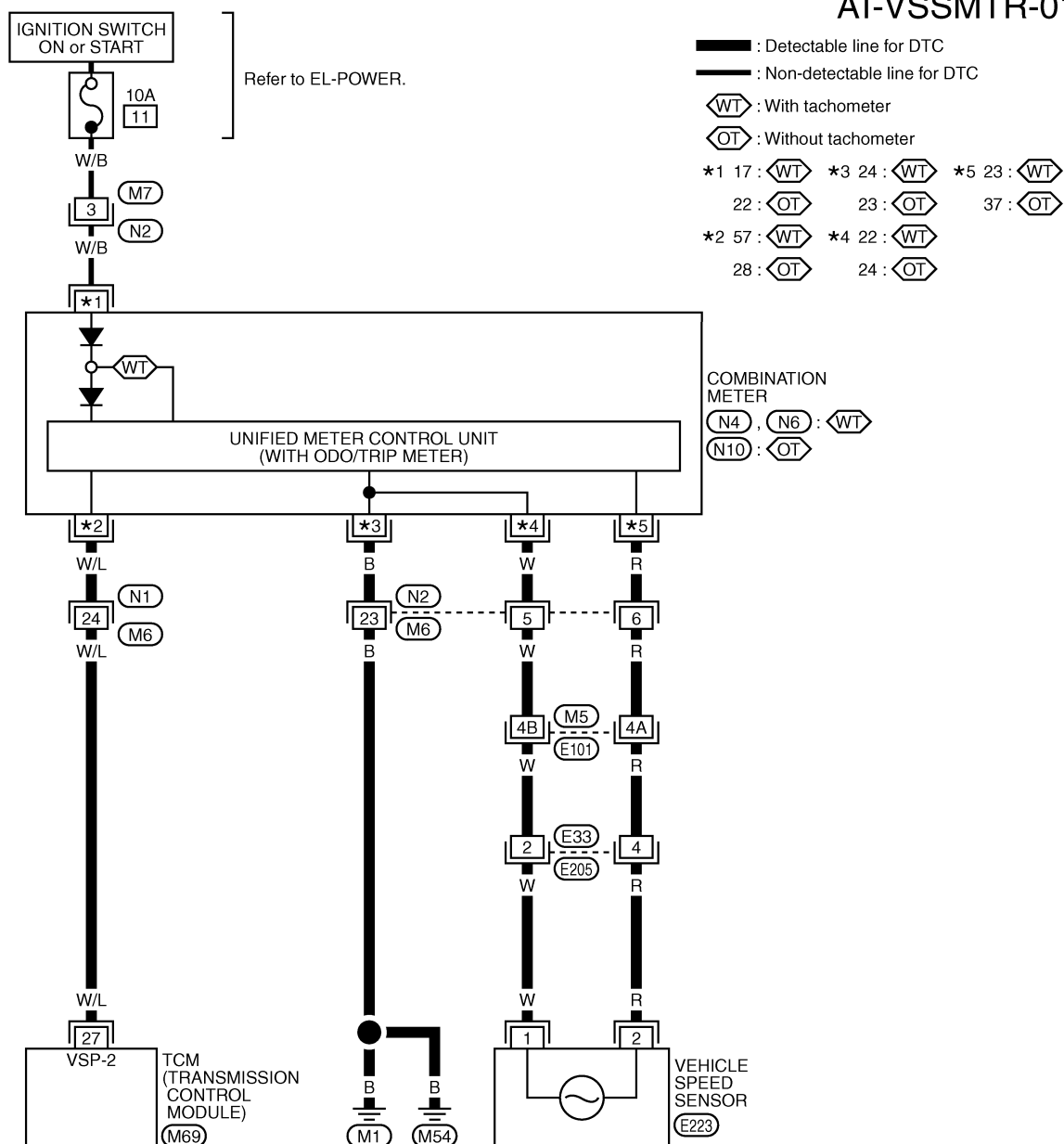
Wiring Diagram — AT — VSSMTR

QD32 ENGINE MODEL

NEAT0218

NEAT0218S01

AT-VSSMTR-01



GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

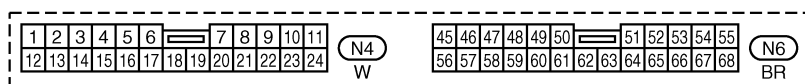
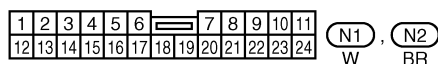
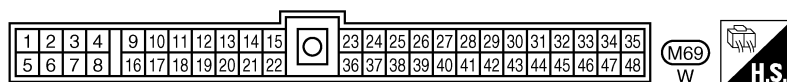
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BT

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EL

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Refer to last page (Foldout page).

M5 , E101

TROUBLE DIAGNOSIS FOR ACCELERATOR POSI SEN

Description

Description

CONSULT-II REFERENCE VALUE IN DATA MONITOR MODE

NEAT0254

NEAT0254S01

Remarks: Specification data are reference values.

Monitor item	Condition	Specification
Accelerator position sensor	Fully-closed accelerator	Approximately 0.7V
	Fully-open accelerator	Approximately 3.5V

TCM TERMINALS AND REFERENCE VALUE

NEAT0254S02

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition	Judgement standard (Approx.)
14	OR	Closed accelerator position switch (in throttle position switch)	When releasing accelerator pedal after warming up engine.	8V
			When depressing accelerator pedal after warming up engine.	1V or less
21	L/Y	Wide open accelerator position switch (in throttle position switch)	When depressing accelerator pedal more than half-way after warming up engine.	8V
			When releasing accelerator pedal after warming up engine.	1V or less
31	G/L	Accelerator position sensor (Power source)	—	4.5 - 5.5V
34	G/Y	Accelerator position sensor	When depressing accelerator pedal slowly after warming up engine. (Voltage rises gradually in response to accelerator position.)	Fully-closed accelerator: 0.7V Fully-open accelerator: 3.5V
35	G/R	Accelerator position sensor (Ground)	—	—



TROUBLE DIAGNOSIS FOR ACCELERATOR POSI SEN

Wiring Diagram — AT — APS

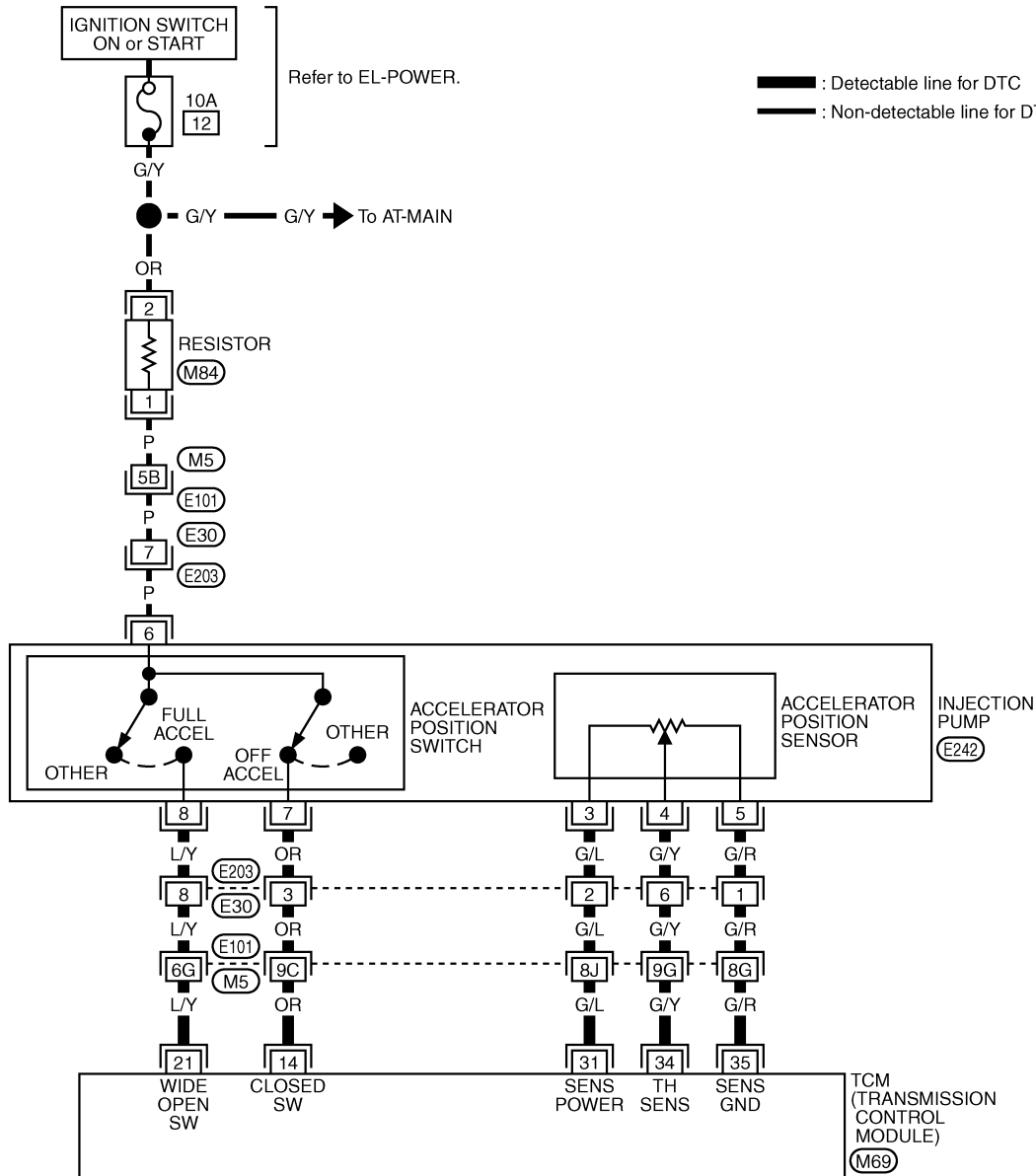
Wiring Diagram — AT — APS

QD32 ENGINE MODEL

NEAT0221

NEAT0221S03

AT-APS-01



1	2	3	4	9	10	11	12	13	14	15	23	24	25	26	27	28	29	30	31	32	33	34	35
5	6	7	8	16	17	18	19	20	21	22	36	37	38	39	40	41	42	43	44	45	46	47	48

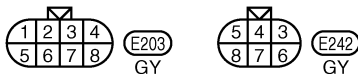
M69
W



1
2
M84
BR

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M5, E101



TROUBLE DIAGNOSIS FOR ACCELERATOR POSI SEN

Diagnostic Procedure

Diagnostic Procedure

NEAT0255

1 CHECK INPUT SIGNAL



With CONSULT-II

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.
3. Read out the value of "THRTL POS SEN".

Voltage:

Fully-closed throttle:

Approximately 0.7V

Fully-open throttle:

Approximately 3.5V

DATA MONITOR	
MONITORING	
VHCL/S SE-A/T	XXX km/h
VHCL/S SE-MTR	XXX km/h
THRTL POS SEN	XXX V
FLUID TEMP SE	XXX V
BATTERY VOLT	XXX V

SAT614J



Without CONSULT-II

1. Turn ignition switch to "ON" position.
(Do not start engine.)
2. Check voltage between TCM terminals 34 and 35 while accelerator pedal is depressed slowly.

Voltage:

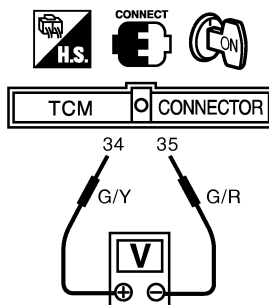
Fully-closed throttle valve:

Approximately 0.7V

Fully-open throttle valve:

Approximately 3.5V

(Voltage rises gradually in response to throttle position.)




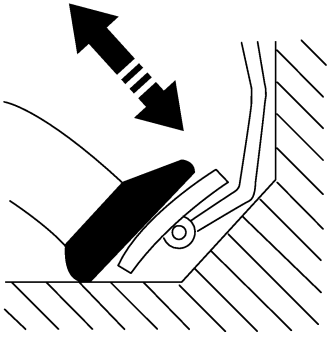
SAT803K

OK or NG

OK (With CONSULT-II)	▶	GO TO 2.
OK (Without CONSULT-II)	▶	GO TO 4.
NG	▶	GO TO 3.

TROUBLE DIAGNOSIS FOR ACCELERATOR POSI SEN


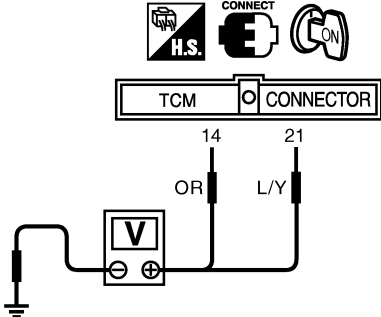
Diagnostic Procedure (Cont'd)

2	CHECK THROTTLE POSITION SWITCH CIRCUIT (With CONSULT-II)														
<p> With CONSULT-II</p> <ol style="list-style-type: none">Turn ignition switch to "ON" position. (Do not start engine.)Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II.Read out "CLOSED THL/SW" and "W/O THRL/P-SW" depressing and releasing accelerator pedal. Check the signal of throttle position switch is indicated properly.															
<table border="1"><thead><tr><th rowspan="2">Accelerator pedal condition</th><th colspan="2">Data monitor</th></tr><tr><th>CLOSED THL/SW</th><th>W/O THRL/P-SW</th></tr></thead><tbody><tr><td>Released</td><td>ON</td><td>OFF</td></tr><tr><td>Fully depressed</td><td>OFF</td><td>ON</td></tr></tbody></table>		Accelerator pedal condition	Data monitor		CLOSED THL/SW	W/O THRL/P-SW	Released	ON	OFF	Fully depressed	OFF	ON			
Accelerator pedal condition	Data monitor														
	CLOSED THL/SW	W/O THRL/P-SW													
Released	ON	OFF													
Fully depressed	OFF	ON													
<div><table border="1"><thead><tr><th colspan="2">DATA MONITOR</th></tr><tr><th>MONITORING</th><th></th></tr></thead><tbody><tr><td>POWERSHIFT SW</td><td>OFF</td></tr><tr><td>CLOSED THL/SW</td><td>OFF</td></tr><tr><td>W/O THRL/P-SW</td><td>OFF</td></tr><tr><td>HOLD SW</td><td>OFF</td></tr><tr><td>BRAKE SW</td><td>ON</td></tr></tbody></table></div>		DATA MONITOR		MONITORING		POWERSHIFT SW	OFF	CLOSED THL/SW	OFF	W/O THRL/P-SW	OFF	HOLD SW	OFF	BRAKE SW	ON
DATA MONITOR															
MONITORING															
POWERSHIFT SW	OFF														
CLOSED THL/SW	OFF														
W/O THRL/P-SW	OFF														
HOLD SW	OFF														
BRAKE SW	ON														
<p>MTBL0011</p> <p>SAT646J</p> <p>OK or NG</p>															
OK	▶ GO TO 5.														
NG	▶ GO TO 3.														

3	DETECT MALFUNCTIONING ITEM
<p>Check the following items:</p> <ul style="list-style-type: none">Accelerator position switch Refer to "Component Inspection", AT-17.Harness for short or open between ignition switch and accelerator position switch (Main harness)Harness for short or open between accelerator position switch and TCM (Main harness)	
<p>OK or NG</p>	
OK	▶ GO TO 5.
NG	▶ Repair or replace damaged parts.

TROUBLE DIAGNOSIS FOR ACCELERATOR POSI SEN

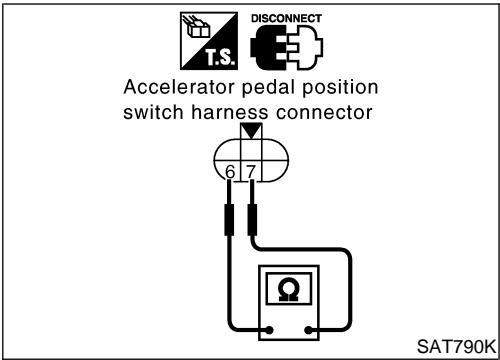
Diagnostic Procedure (Cont'd)

4	CHECK THROTTLE POSITION SWITCH CIRCUIT (Without CONSULT-II)											
<p>⊗ Without CONSULT-II</p> <ol style="list-style-type: none"> Turn ignition switch to "ON" position. (Do not start engine.) Check voltage between TCM terminals 14, 21 and ground while depressing, and releasing accelerator pedal slowly. (after warming up engine) 												
<table border="1"> <tr> <th rowspan="2">Accelerator pedal condition</th><th colspan="2">Voltage</th></tr> <tr> <th>Terminal No. 14</th><th>Terminal No. 21</th></tr> <tr> <td>Released</td><td>8V</td><td>1V or less</td></tr> <tr> <td>Fully depressed</td><td>1V or less</td><td>8V</td></tr> </table>		Accelerator pedal condition	Voltage		Terminal No. 14	Terminal No. 21	Released	8V	1V or less	Fully depressed	1V or less	8V
Accelerator pedal condition	Voltage											
	Terminal No. 14	Terminal No. 21										
Released	8V	1V or less										
Fully depressed	1V or less	8V										
												
												
<p align="center">OK or NG</p>												
OK	▶ GO TO 5.											
NG	▶ GO TO 3.											

MTBL1800

SAT805K

5	CHECK TCM INSPECTION
<ol style="list-style-type: none"> Perform TCM input/output signal inspection. If NG, recheck TCM pin terminals for damage or loose connection with harness connector. 	
<p align="center">OK or NG</p>	
OK	▶ INSPECTION END
NG	▶ Repair or replace damaged parts.



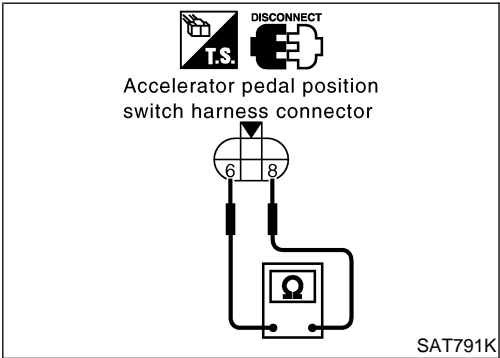
Component Inspection

ACCELERATOR POSITION SWITCH

Closed Accelerator Position Switch (Idle position)

- Check continuity between terminals 6 and 7.

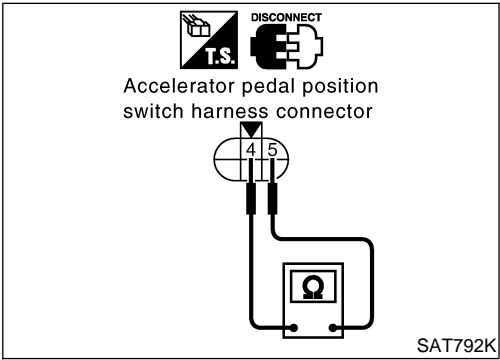
Accelerator pedal condition	Continuity
Released	Yes
Depressed	No



Wide Open Accelerator Position Switch

- Check continuity between terminals 6 and 8.

Accelerator pedal condition	Continuity
Released	No
Depressed	Yes



ACCELERATOR POSITION SENSOR

- Check resistance between terminals 4 and 5.

Accelerator pedal condition	Resistance (Approx.)
Released	1.2 kΩ
Depressed	4.1 kΩ

TROUBLE DIAGNOSIS FOR SHIFT SOLENOID/V A

Wiring Diagram — AT — SSV/A

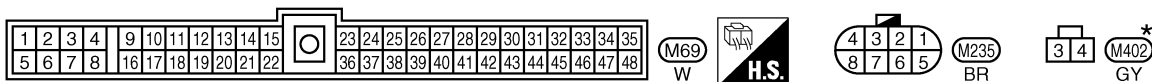
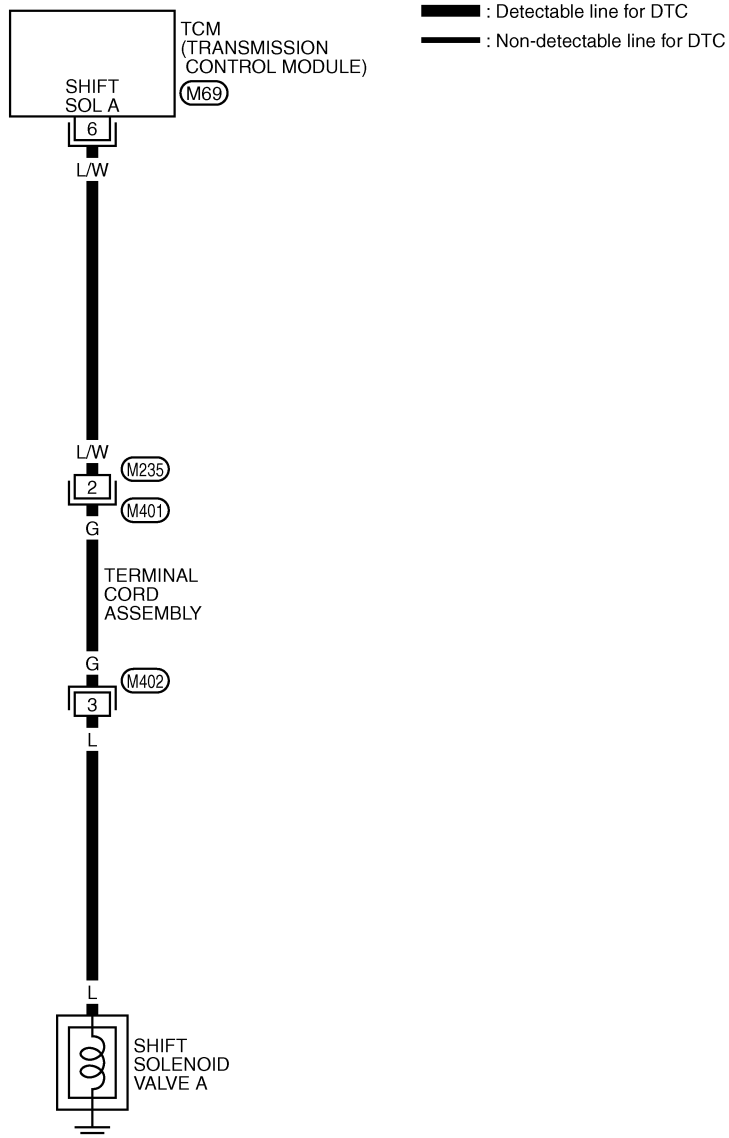
Wiring Diagram — AT — SSV/A

NEAT0225

NEAT0225S01

QD32 ENGINE MODEL

AT-SSV/A-01



GAT134A

TROUBLE DIAGNOSIS FOR SHIFT SOLENOID/V B

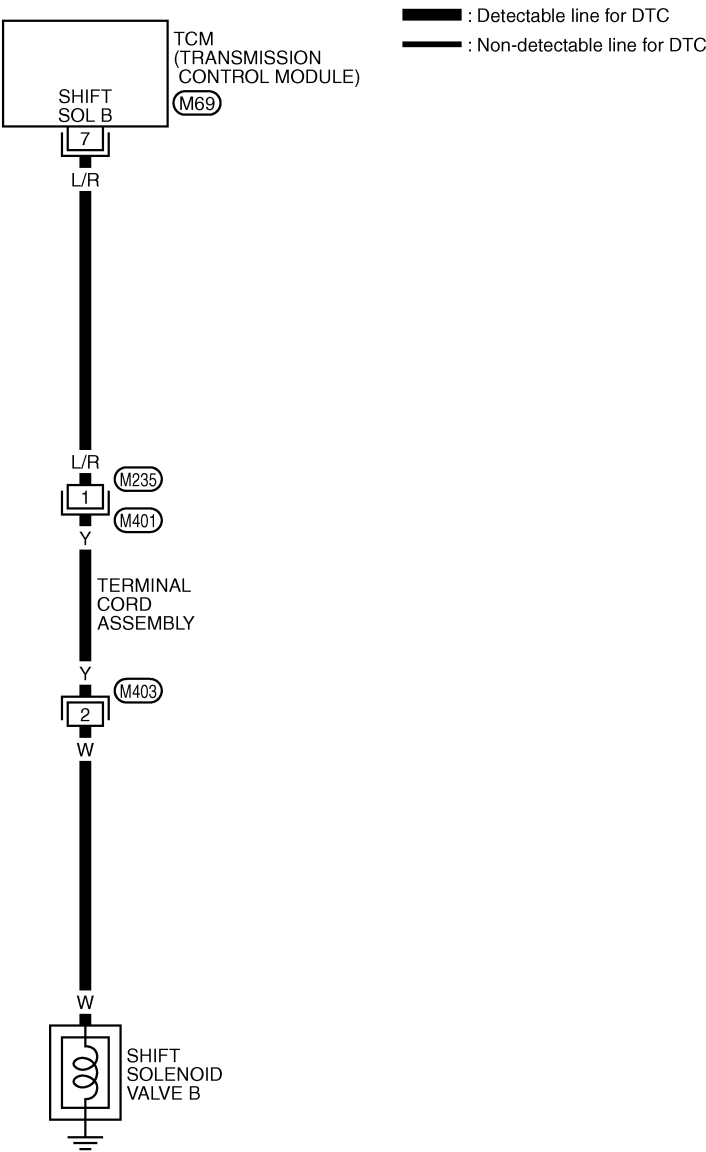
Wiring Diagram — AT — SSV/B

QD32 ENGINE MODEL

Wiring Diagram — AT — SSV/B

NEAT0229
NEAT0229S01

AT-SSV/B-01



GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

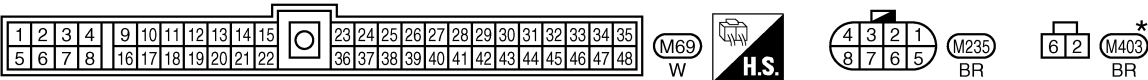
RS

BT

HA

EL

IDX



TROUBLE DIAGNOSIS FOR OVERRUN CLUTCH S/V

Wiring Diagram — AT — OVRCSV

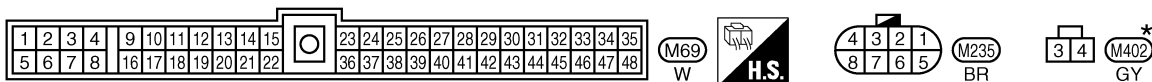
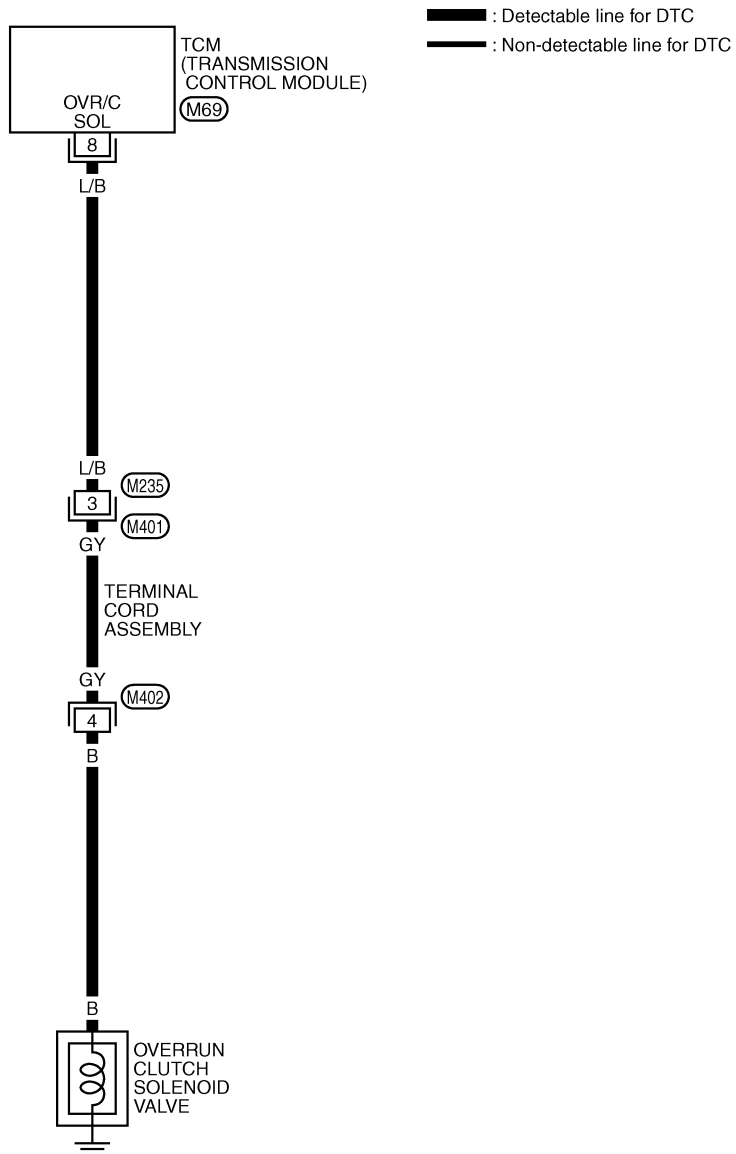
Wiring Diagram — AT — OVRCSV

NEAT0233

NEAT0233S01

QD32 ENGINE MODEL

AT-OVRCSV-01



★: This connector is not shown in "HARNESS LAYOUT", EL section.

GAT136A

TROUBLE DIAGNOSIS FOR T/C CLUTCH SOL/V

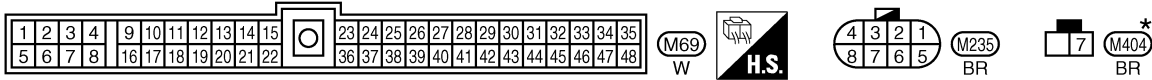
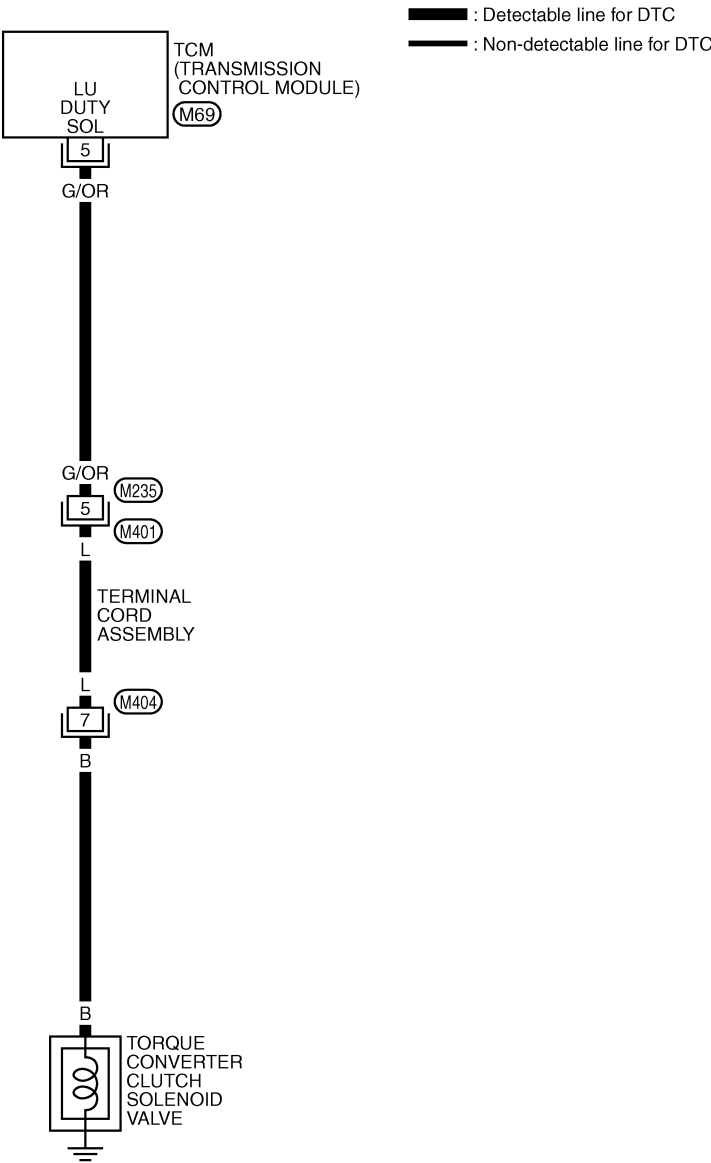
Wiring Diagram — AT — TCV

QD32 ENGINE MODEL

Wiring Diagram — AT — TCV

NEAT0237
NEAT0237S01

AT-TCV-01



★: This connector is not shown in "HARNESS LAYOUT", EL section.

TROUBLE DIAGNOSIS FOR BATT/FLUID TEMP SEN

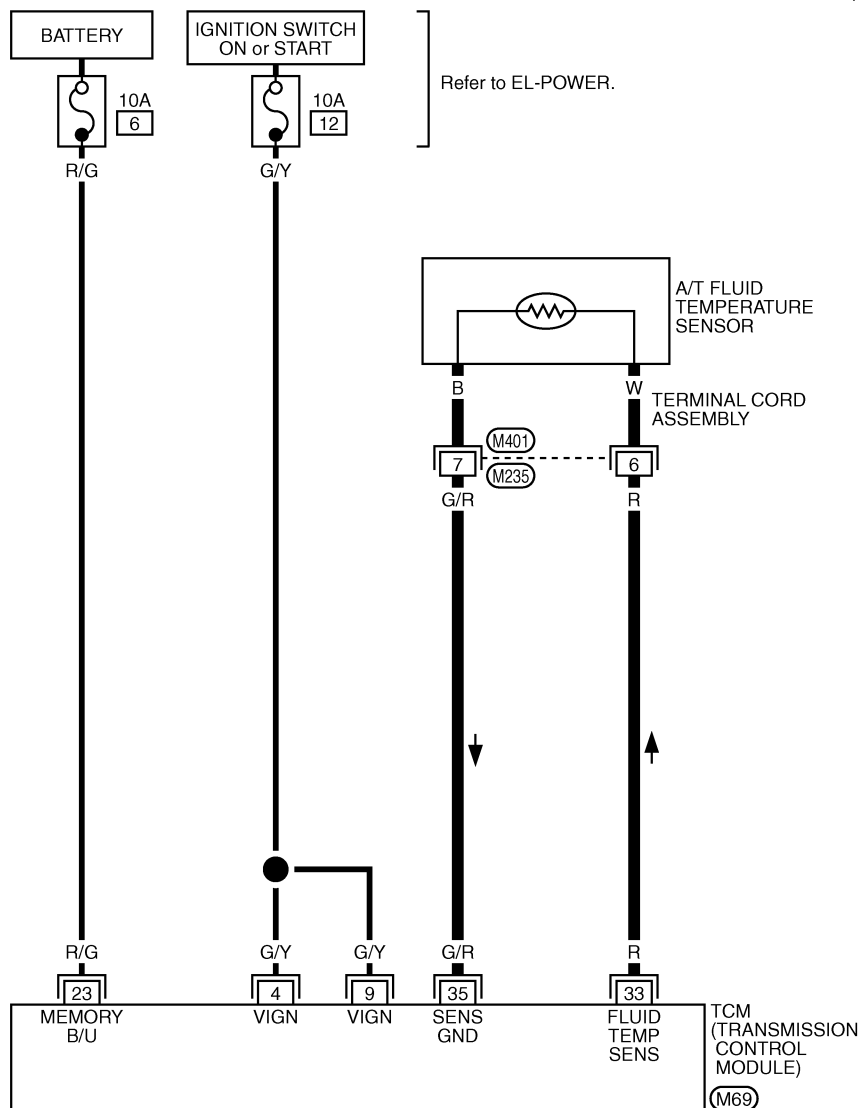
Wiring Diagram — AT — BA/FTS

Wiring Diagram — AT — BA/FTS

NEAT0241

AT-BA/FTS-01

: Detectable line for DTC
 : Non-detectable line for DTC



1	2	3	4	9	10	11	12	13	14	15	23	24	25	26	27	28	29	30	31	32	33	34	35
5	6	7	8	16	17	18	19	20	21	22	36	37	38	39	40	41	42	43	44	45	46	47	48

M69
W



4	3	2	1	M235
8	7	6	5	BR

TROUBLE DIAGNOSIS FOR ENGINE REVOLUTION SEN

Description


Description

TCM TERMINALS AND REFERENCE VALUE

NEAT0257

NEAT0257S01

Remarks: Specification data are reference values.

Terminal No.	Wire color	Item	Condition		Judgement standard (Approx.)
24	W	Engine revolution sensor		When engine runs at idle speed.	Approximately 0V
				When engine runs at 2,000 rpm.	Approximately 0.1V

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

HA

EL

IDX

TROUBLE DIAGNOSIS FOR ENGINE REVOLUTION SEN

Wiring Diagram — AT — ENGSS

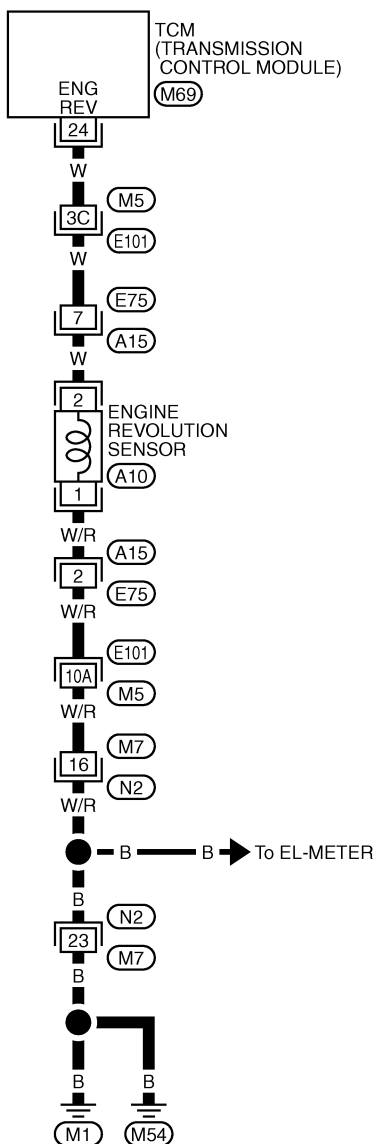
Wiring Diagram — AT — ENGSS

NEAT0245

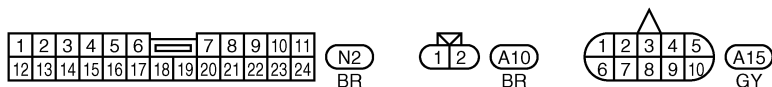
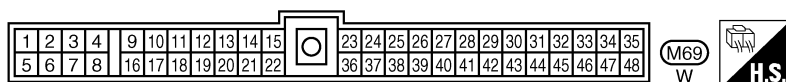
NEAT0245S01

QD32 ENGINE MODEL

AT-ENGSS-01



 : Detectable line for DTC
 : Non-detectable line for DTC




Refer to last page (Foldout page).


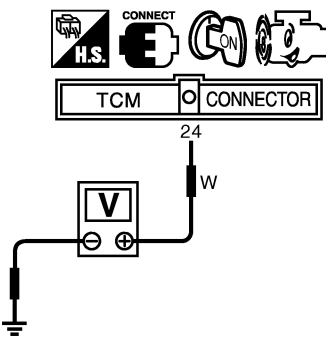
(M5) , (E101)

Diagnostic Procedure

NEAT0258

1	CHECK INPUT SIGNAL (WITH CONSULT-II)															
<p> With CONSULT-II</p> <ol style="list-style-type: none"> Start engine. Select "TCM INPUT SIGNALS" in "DATA MONITOR" mode for "A/T" with CONSULT-II. Read out the value of "ENGINE SPEED". <p>Check engine speed changes according to throttle position.</p> <table border="1" data-bbox="682 403 941 726"> <thead> <tr> <th colspan="2">DATA MONITOR</th> </tr> <tr> <th colspan="2">MONITORING</th> </tr> </thead> <tbody> <tr> <td>ENGINE SPEED</td> <td>XXX rpm</td> </tr> <tr> <td>TURBINE REV</td> <td>XXX rpm</td> </tr> <tr> <td>OVERDRIVE SW</td> <td>ON</td> </tr> <tr> <td>PN POSI SW</td> <td>OFF</td> </tr> <tr> <td>R POSITION SW</td> <td>OFF</td> </tr> </tbody> </table> <p style="text-align: right;">SAT645J</p> <p style="text-align: center;">Yes or No</p>			DATA MONITOR		MONITORING		ENGINE SPEED	XXX rpm	TURBINE REV	XXX rpm	OVERDRIVE SW	ON	PN POSI SW	OFF	R POSITION SW	OFF
DATA MONITOR																
MONITORING																
ENGINE SPEED	XXX rpm															
TURBINE REV	XXX rpm															
OVERDRIVE SW	ON															
PN POSI SW	OFF															
R POSITION SW	OFF															
Yes	▶	GO TO 4.														
No	▶	GO TO 2.														

2	DETECT MALFUNCTIONING ITEM	
<p>Check the following items:</p> <ul style="list-style-type: none"> ● Harness for short or open between TCM and engine revolution sensor. ● Harness for short or open between engine revolution sensor and ground. ● Engine revolution sensor. Refer to "Component Inspection". <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 4.
NG	▶	Repair or replace damaged parts.

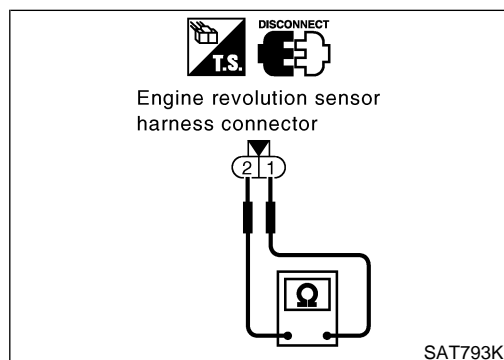
3	CHECK INPUT SIGNAL (WITHOUT CONSULT-II)	
<p> Without CONSULT-II</p> <ol style="list-style-type: none"> Start engine. Check voltage between TCM terminal 24 and ground. <div style="text-align: center;">  </div> <p style="text-align: right;">SAT806K</p> <p style="text-align: center;">Yes or No</p>		
Yes	▶	GO TO 4.
No	▶	GO TO 2.

TROUBLE DIAGNOSIS FOR ENGINE REVOLUTION SEN

Diagnostic Procedure (Cont'd)

4	CHECK DTC
Perform Self-diagnosis.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ GO TO 5.

5	CHECK TCM INSPECTION
1. Perform TCM input/output signal inspection. 2. If NG, recheck TCM pin terminals for damage or loose connection with harness connector.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Repair or replace damaged parts.



Component Inspection

ENGINE REVOLUTION SENSOR

NEAT0259

NEAT0259S01

- Check resistance between terminals 1 and 2.

Terminal No.		Resistance (Approx.)
1	2	1.41 - 1.45 kΩ

TROUBLE DIAGNOSIS FOR LINE PRESSURE S/V

Wiring Diagram — AT — LPSV

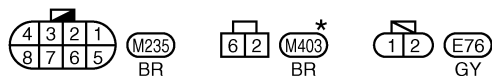
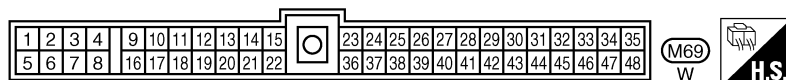
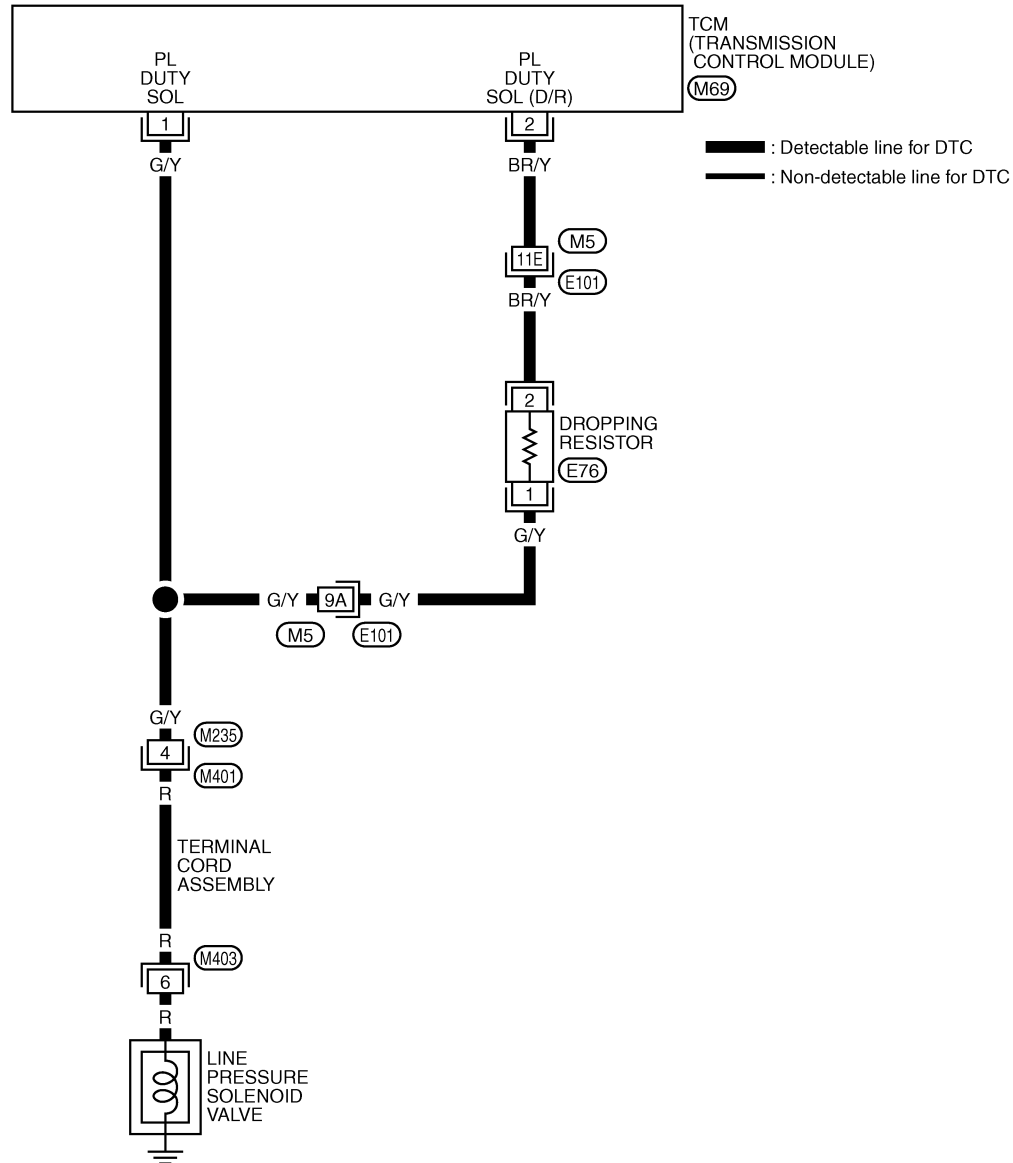
Wiring Diagram — AT — LPSV

QD32 ENGINE MODEL

NEAT0248

NEAT0248S01

AT-LPSV-01



★: This connector is not shown in "HARNESS LAYOUT", EL section.

Refer to last page (Foldout page).

(M5), (E101)

TROUBLE DIAGNOSES FOR SYMPTOMS

Wiring Diagram — AT — NONDTC

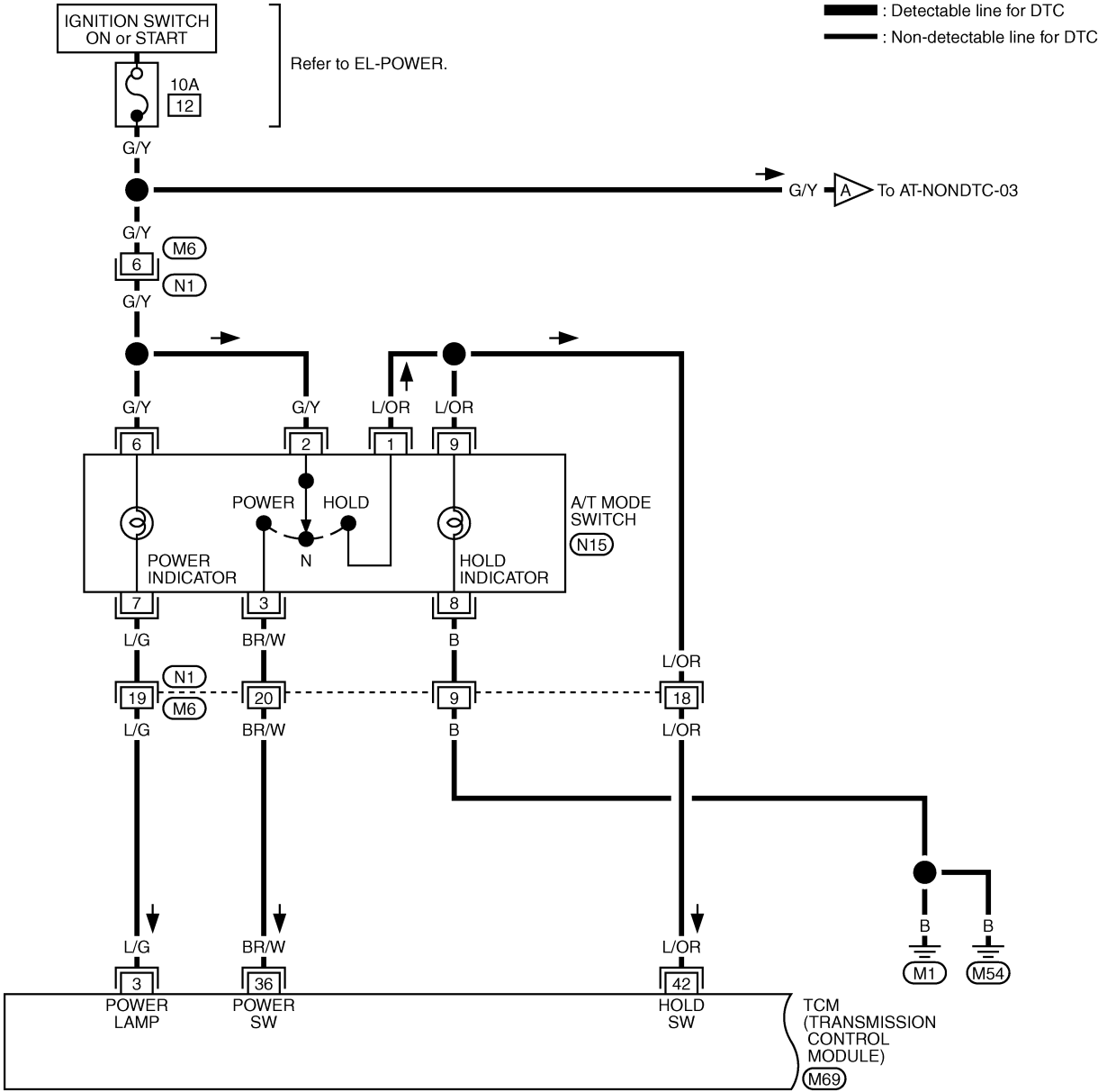
Wiring Diagram — AT — NONDTC

NEAT0203

NEAT0203S03

QD32 ENGINE MODEL


AT-NONDTC-01



1	2	3	4	9	10	11	12	13	14	15	23	24	25	26	27	28	29	30	31	32	33	34	35
5	6	7	8	16	17	18	19	20	21	22	36	37	38	39	40	41	42	43	44	45	46	47	48

(M69)
W



1	2	3	4	5	6			7	8	9	10	11
12	13	14	15	16	17	18	19	20	21	22	23	24

N1

W

(N1)
W

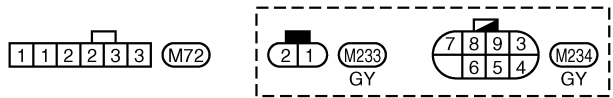
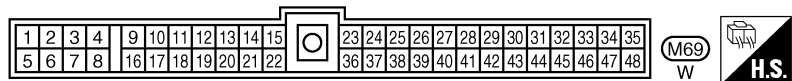
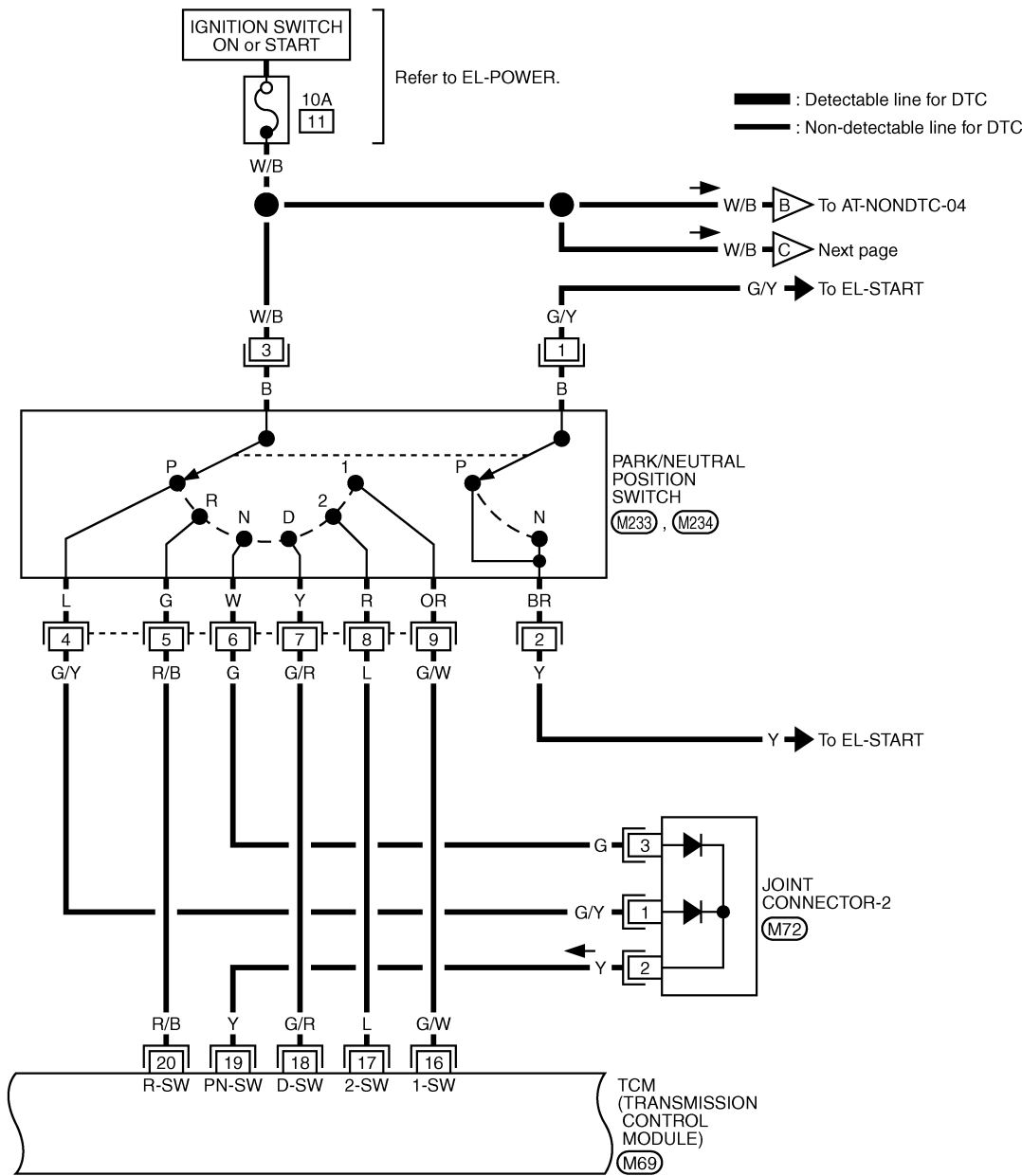
6	3	○		(N15)
7	2	1	8	9

W

TROUBLE DIAGNOSES FOR SYMPTOMS

Wiring Diagram — AT — NONDTC (Cont'd)

AT-NONDTC-02

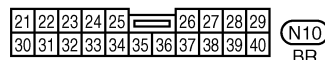
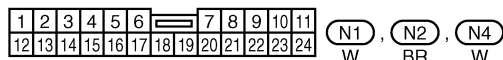
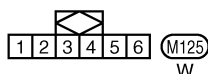
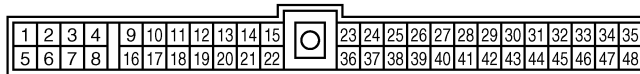
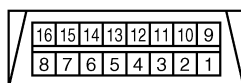
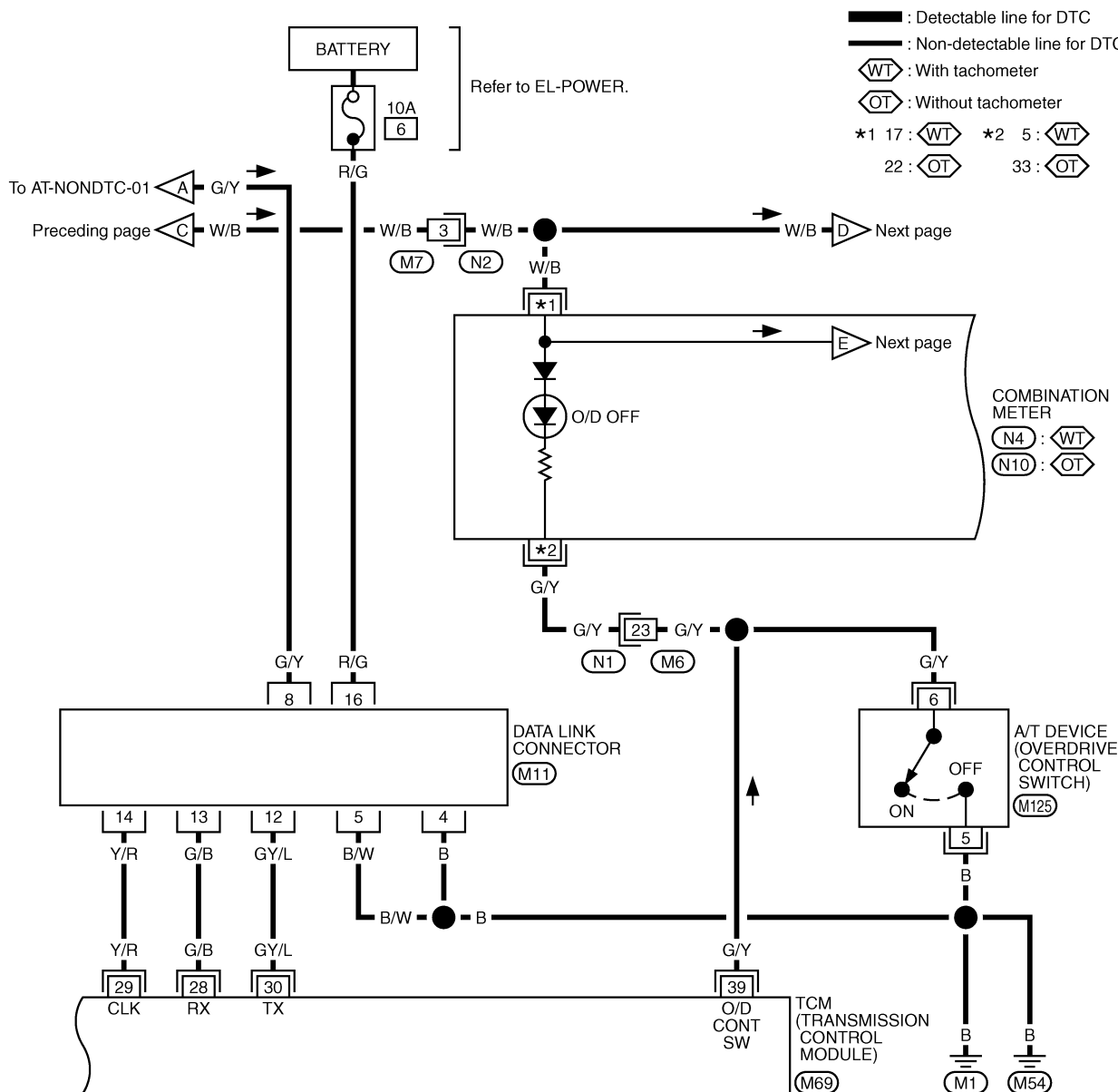


Refer to last page (Foldout page).
(M5, E101)

TROUBLE DIAGNOSES FOR SYMPTOMS

Wiring Diagram — AT — NONDTC (Cont'd)

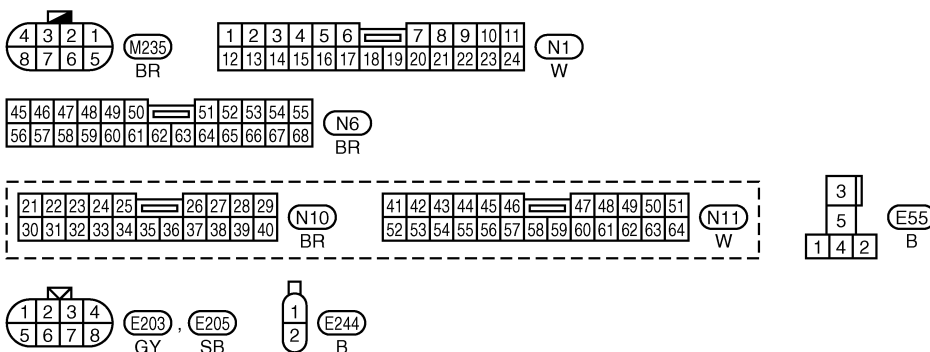
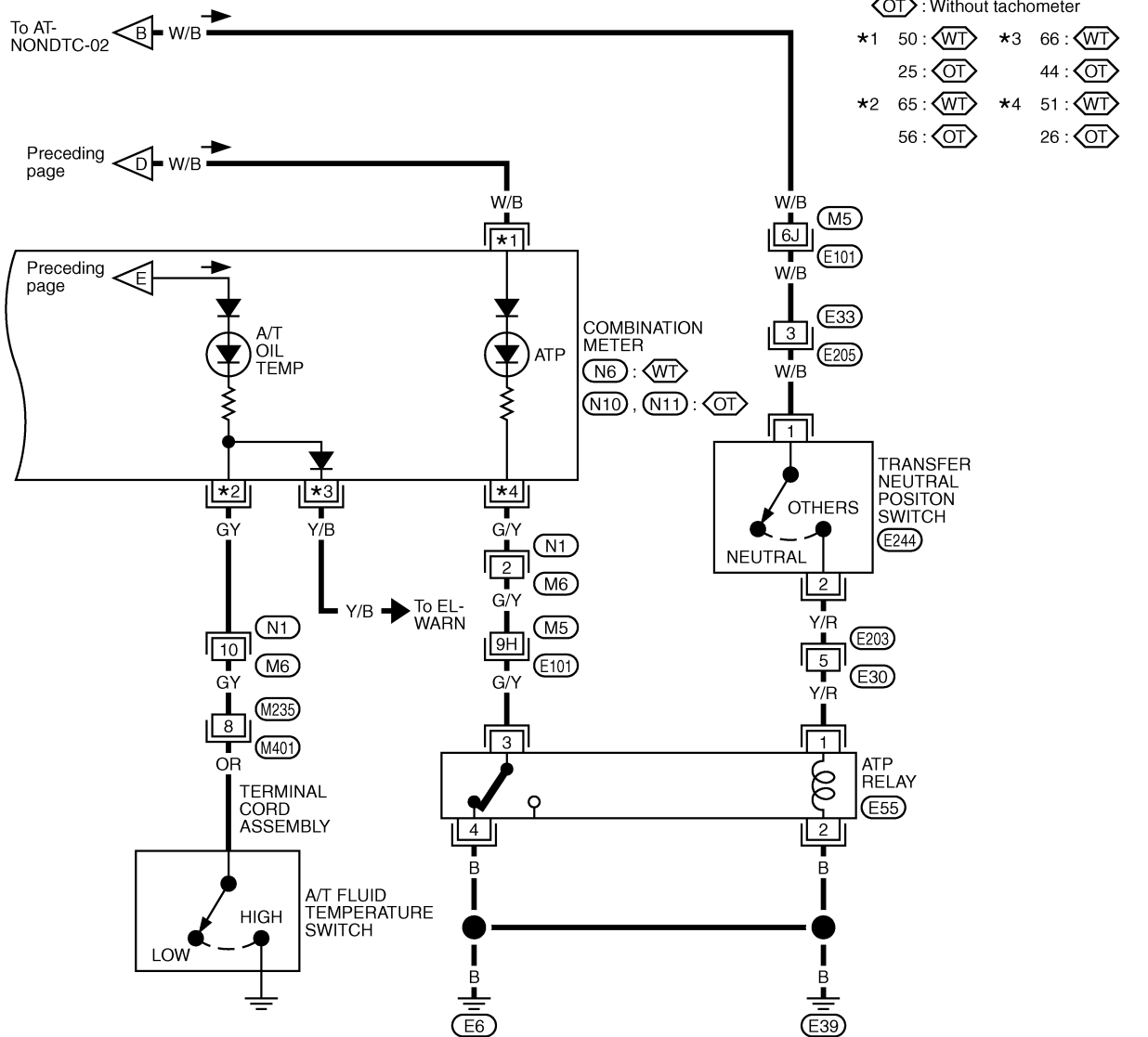
AT-NONDTC-03



GAT143A

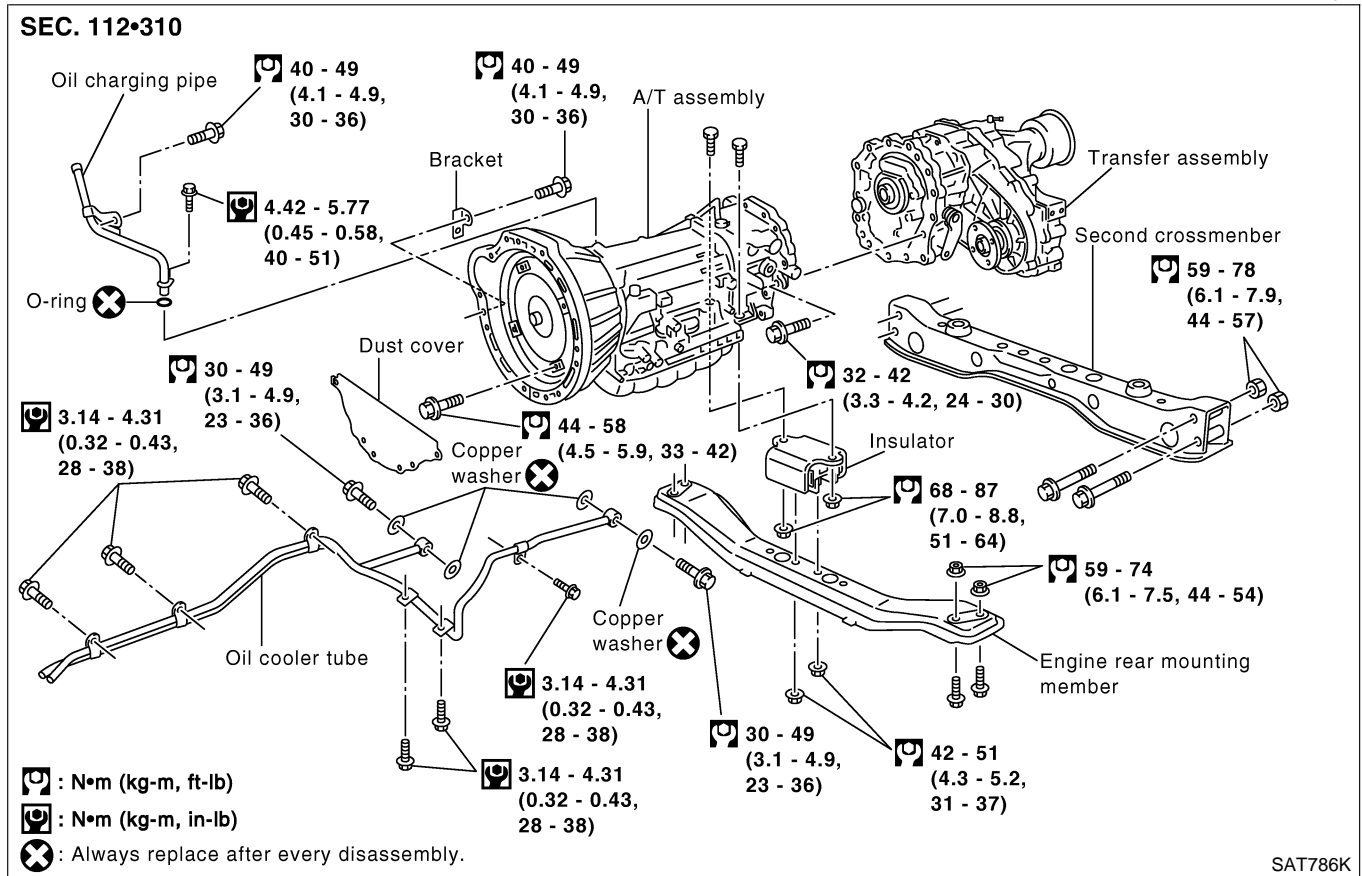
Wiring Diagram — AT — NONDTC (Cont'd)

AT-NONDTC-04

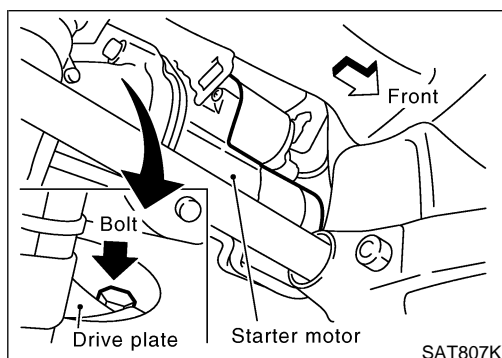


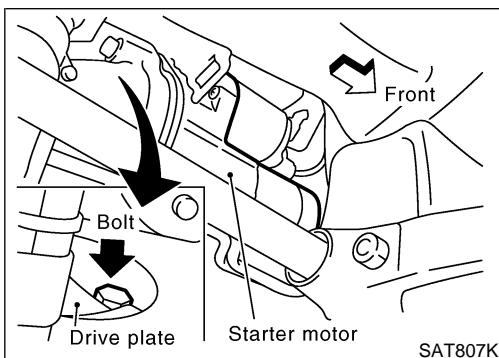
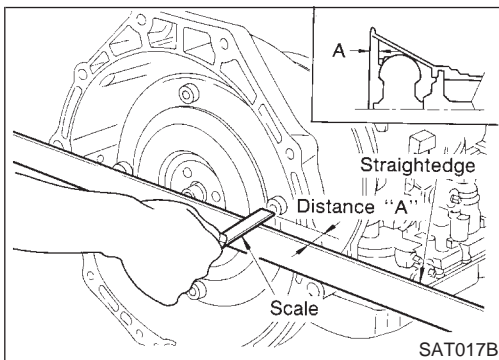
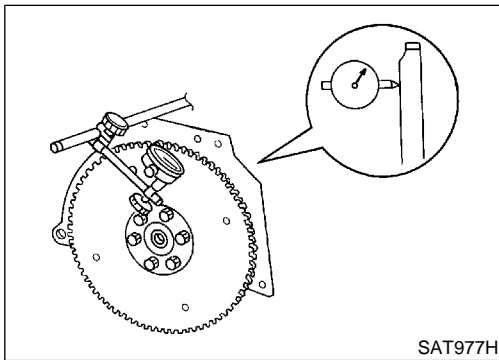
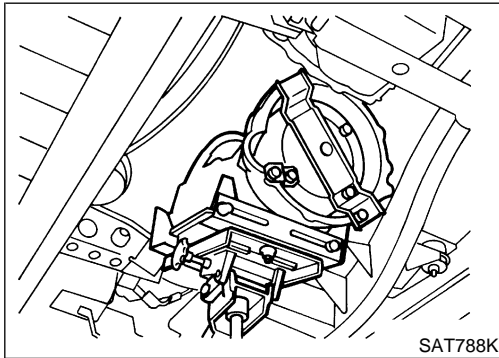
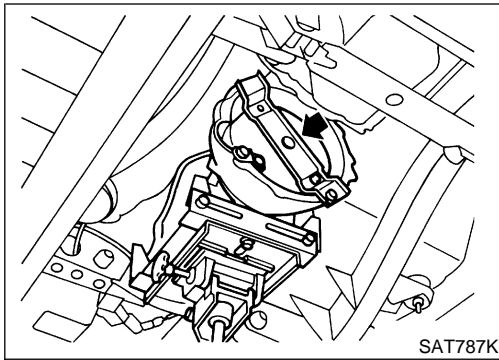
Refer to last page (Foldout page).

M5, E101



1. Remove battery negative terminal.
2. Remove exhaust tube.
3. Remove fluid charging pipe from A/T assembly.
4. Remove oil cooler pipe from A/T assembly.
5. Plug up openings such as the fluid charging pipe hole, etc.
6. Remove propeller shaft. Refer to PD section ("Removal", "PROPELLER SHAFT").
- **Insert plug into rear oil seal after removing rear propeller shaft.**
- **Be careful not to damage spline, sleeve yoke and rear oil seal.**
7. Remove A/T control cable from A/T assembly.
8. Disconnect PNP switch, solenoid, revolution sensor and speedometer sensor harness connectors.
9. Remove starter motor.
10. Remove torsion bar spring.
11. Remove engine rear mounting member.
12. Remove dust cover from A/T assembly.
13. Remove bolts securing torque converter to drive plate.
- **Remove the bolts by turning crankshaft.**





14. Support A/T with a jack.
15. Remove rear engine mounting member from body and A/T assembly. Tighten rear engine mounting member to the specified torque. Refer to EM section ("ENGINE REMOVAL").
16. Remove bolts securing A/T assembly to engine.
 - **Secure torque converter to prevent it from dropping.**
 - **Secure A/T assembly to a jack.**
17. Lower A/T assembly.

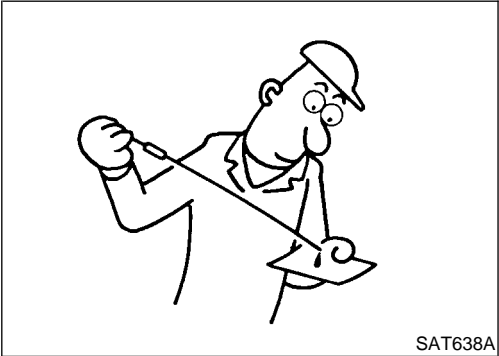
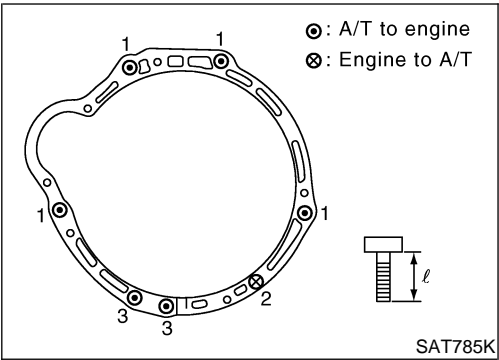
Installation

NEAT0107

1. Drive plate runout
 - Maximum allowable runout:**
Refer to EM section ("Inspection", "CYLINDER BLOCK").
 - If this runout is out of specification, replace drive plate with ring gear.
2. When connecting torque converter to transmission, measure distance "A" to be certain that they are correctly assembled.
 - Distance "A":**
26.0 mm (1.024 in) or more
3. Install converter to drive plate.
 - **After converter is installed to drive plate, rotate crankshaft several turns and check to be sure that transmission rotates freely without binding.**

REMOVAL AND INSTALLATION

Installation (Cont'd)



4. Tighten bolts securing transmission.

Bolt No.	Tightening torque N·m (kg-m, ft-lb)	Bolt length " ℓ " mm (in)
1	40 - 49 (4.1 - 4.9, 30 - 36)	58 (2.28)
2	18 - 21 (1.9 - 2.1, 14 - 15)	16 (0.63)
3	30 - 39 (3.1 - 3.9, 23 - 28)	90 (3.54)

5. Reinstall any part removed.

6. Check fluid level in transmission.
7. Move selector lever through all positions to be sure that transmission operates correctly.
With parking brake applied, rotate engine at idling. Move selector lever through "N" to "D", to "2", to "1" and to "R" positions. A slight shock should be felt by hand gripping selector each time transmission is shifted.
8. Perform road test. Refer to "ROAD TEST", AT-53 in the original Service Manual (SM9E-D22BG0).

Forward and Overrun Clutches COMPONENTS

NEAT0260

GI

MA

EM

LC

EC

FE

CL

MT

AT

TF

PD

FA

RA

BR

ST

RS

BT

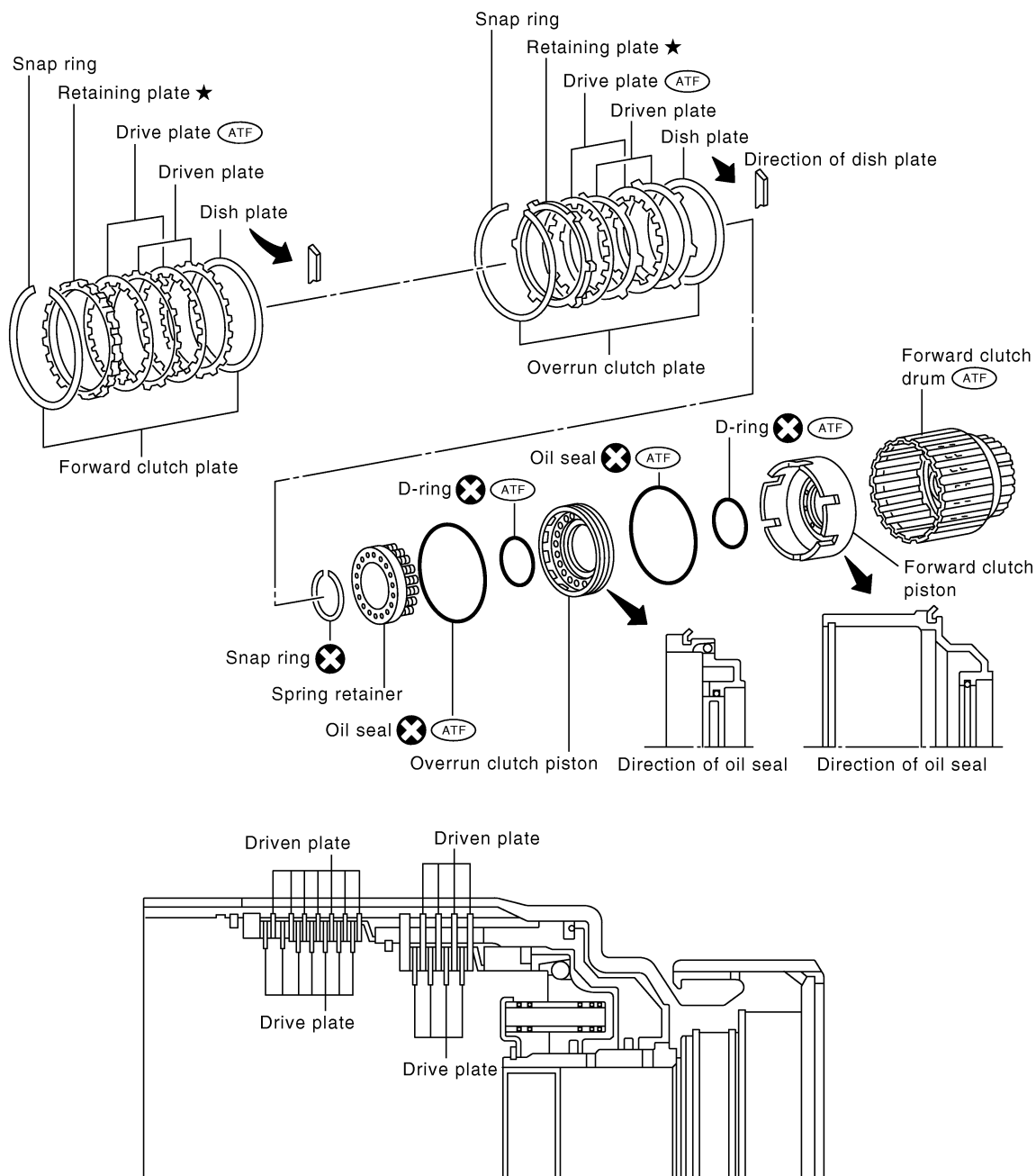
HA

EL

IDX

SEC. 315

For the number of clutch sheets (drive plate and driven plate), refer to the below cross-section.



✕ : Always replace after every disassembly.

ATF : Apply ATF.

★ : Select with proper thickness.

SERVICE DATA AND SPECIFICATIONS (SDS)

General Specifications

General Specifications			NEAT0160
Applied model	QD32		
	4WD		
Automatic transmission model	RE4R01A		
Transmission model code number	4GX20		
Stall torque ratio	2.0 : 1		
Transmission gear ratio	1st	3.027	
	2nd	1.619	
	Top	1.000	
	OD	0.694	
	Reverse	2.272	
Recommended fluid	Genuine Nissan ATF or equivalent*1		
Fluid capacity	8.5ℓ (7-1/2 Imp qt)		

*1: Refer to MA section ("Fluids and Lubricants", "RECOMMENDED FLUIDS AND LUBRICANTS").

Shift Schedule

VEHICLE SPEED WHEN SHIFTING GEARS THROTTLE POSITION

Throttle position	Vehicle speed km/h (MPH)							NEAT0178
	D ₁ → D ₂	D ₂ → D ₃	D ₃ → D ₄	D ₄ → D ₃	D ₃ → D ₂	D ₂ → D ₁	1 ₂ → 1 ₁	NEAT0178S01
Full throttle	28 - 32 (17 - 20)	58 - 66 (36 - 41)	104 - 114 (65 - 71)	99 - 109 (62 - 68)	53 - 61 (33 - 38)	23 - 27 (14 - 17)	23 - 27 (14 - 17)	
Half throttle	15 - 19 (9 - 12)	28 - 34 (17 - 21)	42 - 50 (26 - 31)	21 - 29 (13 - 18)	14 - 20 (9 - 12)	6 - 10 (4 - 6)	6 - 10 (4 - 6)	

VEHICLE SPEED WHEN PERFORMING AND RELEASING LOCK-UP

Throttle position	Overdrive control switch [Shift position]	Vehicle speed km/h (MPH)		NEAT0178S02
		Lock-up "ON"	Lock-up "OFF"	
Full throttle	ON [D ₄]	105 - 113 (65 - 70)	100 - 108 (62 - 67)	
Half throttle	ON [D ₄]	92 - 100 (57 - 62)	74 - 82 (46 - 51)	

Stall Revolution

Stall revolution rpm	2,240 - 2,440	NEAT0163
----------------------	---------------	----------

Line Pressure

Engine speed rpm	Line pressure kPa (bar, kg/cm ² , psi)		NEAT0164
	D, 2 and 1 positions	R position	
Idle	422 - 461 (4.22 - 4.61, 4.3 - 4.7, 61 - 67)	667 - 706 (6.67 - 7.06, 6.8 - 7.2, 97 - 102)	
Stall	1,020 - 1,098 (10.20 - 10.98, 10.4 - 11.2, 148 - 159)	1,422 - 1,500 (14.22 - 15.00, 14.5 - 15.3, 206 - 218)	

SERVICE DATA AND SPECIFICATIONS (SDS)

Return Springs

Return Springs

Unit: mm (in) ^{NEAT0165}

Parts			Item		
			Part No.*	Free length	Outer diameter
Control valve	Upper body	Torque converter relief valve spring	31742-41X23	38.0 (1.496)	9.0 (0.354)
		Pressure regulator valve spring	31742-41X24	44.02 (1.7331)	14.0 (0.551)
		Pressure modifier valve spring	31742-41X19	31.95 (1.2579)	6.8 (0.268)
		Accumulator control valve spring	—	—	—
		Shuttle shift valve D spring	31762-41X01	25.0 (0.984)	7.0 (0.276)
		4-2 sequence valve spring	31756-41X00	29.1 (1.146)	6.95 (0.2736)
		Shift valve B spring	31762-41X01	25.0 (0.984)	7.0 (0.276)
		4-2 relay valve spring	31756-41X00	29.1 (1.146)	6.95 (0.2736)
		Shift valve A spring	31762-41X01	25.0 (0.984)	7.0 (0.276)
		Overrun clutch control valve spring	31762-41X03	23.6 (0.929)	7.0 (0.276)
		Overrun clutch reducing valve spring	31742-41X65	32.5 (1.280)	7.0 (0.276)
		Shuttle shift valve S spring	31762-41X04	51.0 (2.008)	5.65 (0.2224)
		Pilot valve spring	31742-41X13	25.7 (1.012)	9.0 (0.354)
		Torque converter clutch control valve spring	31742-41X22	18.5 (0.728)	13.0 (0.512)
	Lower body	Modifier accumulator valve spring	31742-27X70	31.4 (1.236)	9.8 (0.386)
		1st reducing valve spring	31756-41X05	25.4 (1.000)	6.75 (0.2657)
		3-2 timing valve spring	31742-41X06	23.0 (0.906)	6.7 (0.264)
		Servo charger valve spring	31742-41X06	23.0 (0.906)	6.7 (0.264)
Reverse clutch		16 pcs	31521-41X02 (Assembly)	19.7 (0.766)	11.6 (0.457)
High clutch		10 pcs	31521-41X03 (Assembly)	24.2 (0.953)	11.6 (0.457)
Forward clutch (Overrun clutch)		20 pcs	31521-41X04 (Assembly)	35.77 (1.4083)	9.7 (0.382)
Low & reverse brake		18 pcs	31655-41X00 (Assembly)	22.3 (0.878)	11.2 (0.441)
Band servo		Spring A	31605-41X05	45.6 (1.795)	34.3 (1.350)
		Spring B	31605-41X00	53.8 (2.118)	40.3 (1.587)
		Spring C	31605-41X01	29.7 (1.169)	27.6 (1.087)
Accumulator		Accumulator A	31605-41X02	43.0 (1.693)	18.0 (0.709)
		Accumulator B	31605-41X10	66.0 (2.598)	20.0 (0.787)
		Accumulator C	31605-41X09	45.0 (1.772)	29.3 (1.154)
		Accumulator D	31605-41X06	58.4 (2.299)	17.3 (0.681)

*: Always check with the Parts Department for the latest parts information.

SERVICE DATA AND SPECIFICATIONS (SDS)

Accumulator O-ring

Accumulator O-ring

NEAT0166

Accumulator	Diameter mm (in)			
	A	B	C	D
Small diameter end	29 (1.14)	32 (1.26)	45 (1.77)	29 (1.14)
Large diameter end	45 (1.77)	50 (1.97)	50 (1.97)	45 (1.77)

Clutches and Brakes

NEAT0167

REVERSE CLUTCH

NEAT0167S01

Code number		4GX20	
Number of drive plates		2	
Number of driven plates		2	
Thickness of drive plate mm (in)	Standard	1.90 - 2.05 (0.0748 - 0.0807)	
	Wear limit	1.80 (0.0709)	
Clearance mm (in)	Standard	0.5 - 0.8 (0.020 - 0.031)	
	Allowable limit	1.2 (0.047)	
Thickness of retaining plate		Thickness mm (in)	Part number*
		4.8 (0.189)	31537-42X02
		5.0 (0.197)	31537-42X03
		5.2 (0.205)	31537-42X04
		5.4 (0.213)	31537-42X05
		5.6 (0.220)	31537-42X06

*: Always check with the Parts Department for the latest parts information.

HIGH CLUTCH

NEAT0167S02

Code number		4GX20	
Number of drive plates		5	
Number of driven plates		5	
Thickness of drive plate mm (in)	Standard	1.52 - 1.67 (0.0598 - 0.0657)	
	Wear limit	1.40 (0.0551)	
Clearance mm (in)	Standard	1.8 - 2.2 (0.071 - 0.087)	
	Allowable limit	3.2 (0.126)	
Thickness of retaining plate		Thickness mm (in)	Part number*
		3.4 (0.134)	31537-41X71
		3.6 (0.142)	31537-41X61
		3.8 (0.150)	31537-41X62
		4.0 (0.157)	31537-41X63
		4.2 (0.165)	31537-41X64
		4.4 (0.173)	31537-41X65
		4.6 (0.181)	31537-41X66
		4.8 (0.189)	31537-41X67

*: Always check with the Parts Department for the latest parts information.

SERVICE DATA AND SPECIFICATIONS (SDS)

Clutches and Brakes (Cont'd)

FORWARD CLUTCH

NEAT0167S03

Code number		4GX20		GI
Number of drive plates		7		
Number of driven plates		7		MA
Thickness of drive plate mm (in)	Standard	1.52 - 1.67 (0.0598 - 0.0657)		
	Wear limit	1.40 (0.0551)		EM
Clearance mm (in)	Standard	0.35 - 0.75 (0.0138 - 0.0295)		
	Allowable limit	1.95 (0.0768)		LC
Thickness of retaining plate		Thickness mm (in)	Part number*	
		4.6 (0.181)	31537-42X13	EC
		4.8 (0.189)	31537-42X14	
		5.0 (0.197)	31537-42X15	
		5.2 (0.205)	31537-4AX00	FE
		5.4 (0.213)	31537-4AX01	
		5.6 (0.220)	31537-4AX02	
		5.8 (0.228)	31537-4AX03	CL

*: Always check with the Parts Department for the latest parts information.

OVERRUN CLUTCH

NEAT0167S04

Code number		4GX20		MT
Number of drive plates		4		AT
Number of driven plates		4		
Thickness of drive plate mm (in)	Standard	1.90 - 2.05 (0.0748 - 0.0807)		TF
	Wear limit	1.80 (0.0709)		
Clearance mm (in)	Standard	1.0 - 1.4 (0.039 - 0.055)		PD
	Allowable limit	2.0 (0.079)		
Thickness of retaining plate		Thickness mm (in)	Part number*	FA
		4.2 (0.165)	31537-41X80	
		4.4 (0.173)	31537-41X81	RA
		4.6 (0.181)	31537-41X82	
		4.8 (0.189)	31537-41X83	
		5.0 (0.197)	31537-41X84	BR

*: Always check with the Parts Department for the latest parts information.

GI
MA
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SERVICE DATA AND SPECIFICATIONS (SDS)

Clutches and Brakes (Cont'd)

LOW & REVERSE BRAKE

NEAT0167S05

Code number		4GX20	
Number of drive plates		6	
Number of driven plates		6	
Thickness of drive plate mm (in)	Standard	1.52 - 1.67 (0.0598 - 0.0657)	
	Wear limit	1.40 (0.0551)	
Clearance mm (in)	Standard	0.8 - 1.1 (0.031 - 0.043)	
	Allowable limit	2.3 (0.091)	
Thickness of retaining plate		Thickness mm (in)	Part number*
		6.4 (0.252)	31667-41X16
		6.6 (0.260)	31667-41X17
		6.8 (0.268)	31667-41X11
		7.0 (0.276)	31667-41X12
		7.2 (0.283)	31667-41X13
		7.4 (0.291)	31667-41X14
		7.6 (0.299)	31667-41X07
		7.8 (0.307)	31667-41X08

*: Always check with the Parts Department for the latest parts information.

BRAKE BAND

NEAT0167S06

Anchor end bolt nut tightening torque	40 - 51 N·m (4.1 - 5.2 kg-m, 30 - 38 ft-lb)
Anchor end bolt tightening torque	4 - 6 N·m (0.4 - 0.6 kg-m, 35 - 52 in-lb)
Number of returning revolution for anchor end bolt	2.5

Oil Pump and Low One-way Clutch

NEAT0168
Unit: mm (in)

Oil pump clearance	Cam ring — oil pump housing	Standard	0.01 - 0.024 (0.0004 - 0.0009)
	Rotor, vanes and control piston — oil pump housing	Standard	0.03 - 0.044 (0.0012 - 0.0017)
Seal ring clearance		Standard	0.10 - 0.25 (0.0039 - 0.0098)
		Allowable limit	0.25 (0.0098)

Total End Play

NEAT0169

Total end play "T ₁ "	0.25 - 0.55 mm (0.0098 - 0.0217 in)	
Thickness of oil pump cover bearing race	Thickness mm (in)	Part number*
	0.8 (0.031)	31435-41X01
	1.0 (0.039)	31435-41X02
	1.2 (0.047)	31435-41X03
	1.4 (0.055)	31435-41X04
	1.6 (0.063)	31435-41X05
	1.8 (0.071)	31435-41X06
	2.0 (0.079)	31435-41X07

*: Always check with the Parts Department for the latest parts information.

SERVICE DATA AND SPECIFICATIONS (SDS)

Reverse Clutch Drum End Play

Reverse Clutch Drum End Play

NEAT0170

Reverse clutch drum end play "T ₂ "	0.55 - 0.90 mm (0.0217 - 0.0354 in)	
Thickness of oil pump thrust washer	Thickness mm (in)	Part number*
	0.9 (0.035)	31528-21X01
	1.1 (0.043)	31528-21X02
	1.3 (0.051)	31528-21X03
	1.5 (0.059)	31528-21X04
	1.7 (0.067)	31528-21X05
	1.9 (0.075)	31528-21X06

*: Always check with the Parts Department for the latest parts information.

Removal and Installation

NEAT0171

Manual control linkage	Number of returning revolutions for lock nut	RHD	LHD
		1	2
	Lock nut tightening torque	11 - 14 N·m (1.1 - 1.5 kg-m, 8 - 10 ft-lb)	
Distance between end of converter housing and torque converter		26.0 mm (1.024 in) or more	