



2001 RANGER WL3 EVEREST W LT3 REPAIR MANUAL Supplement

FOREWORD

This Manual has been prepared to provide information covering normal service repairs and maintenance for the RANGER SERIES.

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SCHEDULED MAINTENANCE

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)												
	Months	12	24	36	48	60	72	84	96	108	120	132	144
	× 1000 Km	15	30	45	60	75	90	105	120	135	150	165	180
	(× 1000 Miles)	(9)	(18)	(27)	(36)	(45)	(54)	(63)	(72)	(81)	(90)	(99)	(108)
Brake lines, hoses & connections		I	I	I	I	I	I	I	I	I	I	I	I
Brake fluid *5		I	R	I	R	I	R	I	R	I	R	I	R
Parking brake		I	I	I	I	I	I	I	I	I	I	I	I
Power brake unit & hoses		I	I	I	I	I	I	I	I	I	I	I	I
Disc brakes		I	I	I	I	I	I	I	I	I	I	I	I
Drum brakes		I	I	I	I	I	I	I	I	I	I	I	I
Manual steering gear oil (if installed)			I		I		I		I		I		I
Power steering fluid & lines		I	I	I	I	I	I	I	I	I	I	I	I
Steering operations & gear housing			I		I		I		I		I		I
Steering linkages, tie rod ends & arms			I		I		I		I		I		I
Manual transaxle oil				R			R			R			R
Rear differential oil (2WD)				R			R			R			R
Front and rear differential oil (4WD)		R	I	R	I	R	I	R	I	R	I	R	I
Transfer oil		R	I	R	I	R	I	R	I	R	I	R	I
Propeller shaft joints (4WD)			L		L		L		L		L		L
Front wheel bearing grease					R				R				R
Front suspension & ball joints				I		I		I		I		I	
Driveshaft dust boots (4WD)				I			I			I			I
Bolts & nuts on chassis & body		T	T	T	T	T	T	T	T	T	T	T	T
Wheel nuts		T	T	T	T	T	T	T	T	T	T	T	T
Exhaust system heat shields			I		I		I		I		I		I

WLT-3

Maintenance Item	Maintenance Interval (Number of months or km (miles), whichever comes first)																
	Months	6	12	18	24	30	36	42	48	54	60	66	72	78	84	90	96
	× 1000 Km	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160
	(× 1000 Miles)	(6)	(12)	(18)	(24)	(30)	(36)	(42)	(48)	(54)	(60)	(66)	(72)	(79)	(84)	(90)	(96)
ENGINE																	
Engine valve clearance (for Europe)			I			I			I			I			I		
Engine timing belt	*1	Replace every 100,000 km (60,000 miles)															
Drive belts	*2	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
Engine oil	*3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
Oil filter	*3	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R	R
COOLING SYSTEM																	
Cooling system		I		I		I		I		I		I		I		I	
Engine coolant (for Europe)		Replace at first 4 years or 100,000 km (60,000 miles) ; after that, every 2 years															
FUEL SYSTEM																	
Air cleaner element	*4	C	R	C	R	C	R	C	R	C	R	C	R	C	R	C	R
Fuel filter				R				R				R					R
Fuel lines & hoses		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I
EMISSION CONTROL SYSTEM																	
E.G.R. system (if installed)						I						I					
ELECTRICAL SYSTEM																	
Battery electrolyte level & specific gravity		I		I		I		I		I		I		I		I	
CHASSIS & BODY																	
Brake & clutch pedal		I	I	I	I	I	I	I	I	I	I	I	I	I	I	I	I

CONTROL SYSTEM

PCM DESCRIPTION

ZCF404018880W01

Euro 3 Regulation Models

Function

- Based on the signal from each input sensor, the PCM outputs a drive (operation) signal to the drive parts (solenoid, etc.), which require an optimum control amount according to the engine condition (engine speed, engine coolant temperature, etc.).
- The PCM is located in the underfoot area of the right side seat.

4Y	4W	4U	4S	4Q	4O	4M	4K	4I	4G	4E	4C	4A	3O	3M	3K	3I	3G	3E	3C	3A	2K	2I	2G	2E	2C	2A	1U	1S	1Q	1O	1M	1K	1I	1G	1E	1C	1A
4Z	4X	4V	4T	4R	4P	4N	4L	4J	4H	4F	4D	4B	3P	3N	3L	3J	3H	3F	3D	3B	2L	2J	2H	2F	2D	2B	1V	1T	1R	1P	1N	1L	1J	1H	1F	1D	1B

ZCF4040W035

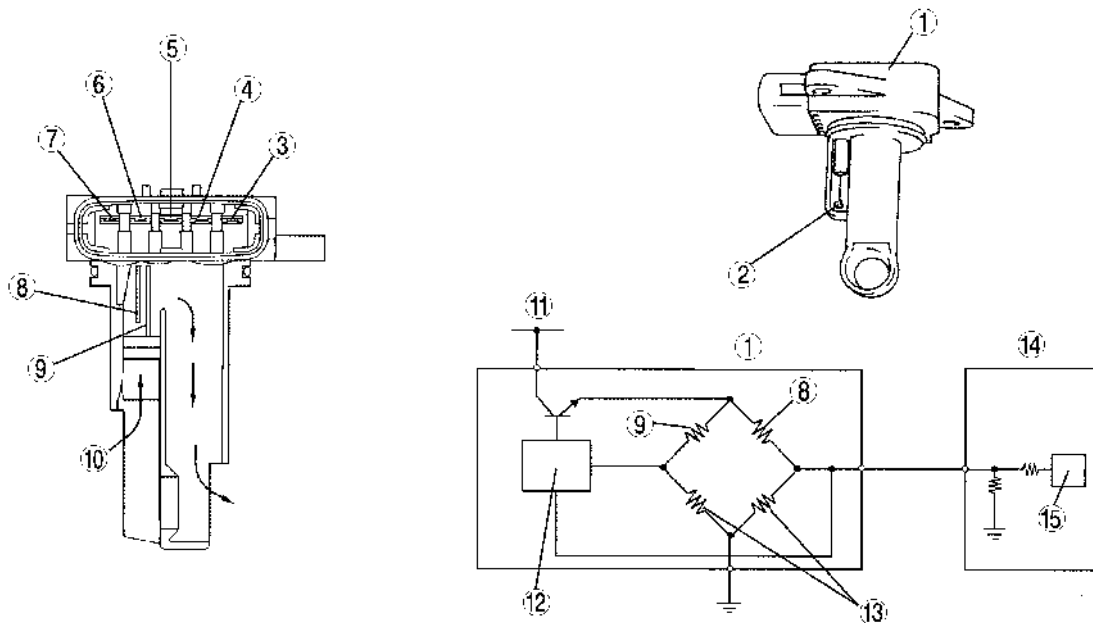
MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR DESCRIPTION

ZCF404013210W01

Euro 3 Regulation Models

Structure

- A hot-wire type MAF sensor is used.
- IAT sensor No.1 has integrated into the MAF/IAT sensor.



ZCF4040W037

1	MAF sensor
2	IAT sensor No.1
3	MAF sensor power supply
4	MAF sensor GND
5	MAF sensor output
6	IAT sensor No.1 output
7	IAT sensor No.1 GND
8	Hot wire

9	Cold wire
10	Intake airflow
11	From PCM control relay
12	Comparison circuit
13	Constant resistor
14	PCM
15	CPU

ON-BOARD DIAGNOSTIC

STEP	INSPECTION		ACTION
5	CLASSIFY IF IAT SENSOR No. 1 MALFUNCTION OR HARNESS MALFUNCTION <ul style="list-style-type: none"> ● Turn engine switch to ON (Engine OFF). ● Access IATDC PID using WDS or equivalent. ● Is IATDC PID below 0.13 V? 	Yes	Go to next step.
		No	Go to Step 10.
6	INSPECT IAT SENSOR No. 1 SIGNAL CIRCUIT FOR SHORT TO GND <ul style="list-style-type: none"> ● Turn engine switch to OFF. ● Disconnect PCM connector. ● Check for continuity between IAT sensor No. 1 terminal D (harness-side) and body GND. ● Is there continuity? 	Yes	Repair or replace shorted harness, then go to Step 16.
		No	Go to next step.
7	INSPECT IAT SENSOR No. 1 CIRCUITS FOR SHORT <ul style="list-style-type: none"> ● Check for continuity between IAT sensor No. 1 terminals D and E (harness-side). ● Is there continuity? 	Yes	Repair or replace shorted harness, then go to Step 16.
		No	Go to Step 16.
8	INSPECT IAT SENSOR No. 1 CONNECTOR FOR POOR CONNECTION <ul style="list-style-type: none"> ● Turn engine switch to OFF. ● Disconnect IAT sensor No. 1 connector. ● Check for poor connection (damaged, pulled-out pins, corrosion, etc.). ● Is there a malfunction? 	Yes	Repair or replace terminal, then go to Step 16.
		No	Go to next step.
9	INSPECT IAT SENSOR No. 1 <ul style="list-style-type: none"> ● Inspect IAT sensor No. 1. (See F2-65 MASS AIR FLOW (MAF)/INTAKE AIR TEMPERATURE (IAT) SENSOR INSPECTION) ● Is it okay ? 	Yes	Go to next step.
		No	Replace IAT sensor No. 1, then go to Step 16.
10	INSPECT IAT SENSOR No. 1 SIGNAL CIRCUIT FOR SHORT TO POWER <ul style="list-style-type: none"> ● Turn engine switch to ON (Engine OFF). ● Measure voltage between IAT sensor No. 1 terminal D (harness-side) and body GND. ● Is voltage B+? 	Yes	Repair or replace shorted harness, then go to Step 16.
		No	Go to next step.
11	INSPECT IAT SENSOR No. 1 GND CIRCUIT FOR SHORT TO POWER <ul style="list-style-type: none"> ● Measure voltage between IAT sensor No. 1 terminal E (harness-side) and body GND. ● Is voltage B+? 	Yes	Repair or replace shorted harness, then go to Step 16.
		No	Go to next step.
12	INSPECT PCM CONNECTOR FOR POOR CONNECTION <ul style="list-style-type: none"> ● Turn engine switch to OFF. ● Disconnect PCM connector. ● Inspect PCM terminals 3D and 1B (damaged, pulled-out pins, corrosion, etc.). ● Is there a malfunction? 	Yes	Repair or replace terminal, then go to Step 16.
		No	Go to next step.
13	INSPECT IAT SENSOR No. 1 SIGNAL CIRCUIT FOR OPEN <ul style="list-style-type: none"> ● Check for continuity between IAT sensor No. 1 terminal D (harness-side) and PCM terminal 3D. ● Is there continuity? 	Yes	Go to next step.
		No	Repair or replace open harness, then go to Step 16.
14	INSPECT IAT SENSOR No. 1 GND CIRCUIT FOR OPEN <ul style="list-style-type: none"> ● Check for continuity between IAT sensor No. 1 terminal E (harness-side) and PCM terminal 1B (harness-side). ● Is there continuity? 	Yes	Go to next step.
		No	Repair or replace open harness, then go to next step.

TROUBLESHOOTING

× : Applicable

Troubleshooting item		Possible factor															
		Engine overheating	Air cleaner element clogging or restriction	intake-air system restriction	Air leakage from intake-air system (Loose tubes, cracks, gaskets breakage)	Incorrect idle speed	Incorrect injection timing	Injection pump malfunction	Fuel filter restriction or clogging	Fuel system restriction	Injection nozzle and/or gasket malfunction	Fuel leakage from fuel system	Restriction in exhaust system	EGR system malfunction	Intake shutter valve malfunction	PCM control relay malfunction	Pump speed sensor
1	Melting of main or other fuses																
2	Will not crank																
3	Hard to start/long crank/erratic start/erratic crank			×		×	×	×	×	×	×	×	×	×			×
4	Engine stalls.	After start/at idle	×	×		×	×	×	×	×	×	×		×		×	×
5	Cranks normally but will not start			×			×	×	×	×	×	×		×		×	×
6	Slow return to idle/fast idle					×	×										
7	Engine runs rough/rolling idle		×			×	×	×	×	×	×	×		×			×
8	Runs on																
9	Engine stalls/quits.	Acceleration/cruise	×	×	×	×	×	×	×	×	×		×	×			×
	Engine runs rough.	Acceleration/cruise	×	×	×	×	×	×	×	×	×		×	×			×
	Misses	Acceleration/cruise	×	×	×	×	×	×	×	×	×		×	×			×
	Buck/jerk	Acceleration/cruise/deceleration	×	×	×	×	×	×	×	×	×		×	×			×
	Hesitation/stumble	Acceleration	×	×	×	×	×	×	×	×	×		×	×			×
	Surges	Acceleration/cruise	×	×	×	×	×	×	×	×	×		×	×			×
10	Lack/loss of power	Acceleration/cruise	×	×	×	×	×	×	×	×	×		×	×	×		×
11	Poor fuel economy		×			×	×	×			×	×	×	×			×
12	High oil consumption/leakage																
13	Cooling system concerns	Overheating	×											×			×
14	Cooling system concerns	Runs cold															
15	Excessive black smoke		×				×	×			×			×	×		×
16	Engine noise						×	×			×			×			×
17	Vibration concerns (engine)																
18	A/C does not work.																
19	A/C is always on or A/C compressor runs continuously.																
20	Intermittent concerns						×							×		×	×
21	Constant voltage																

ZCF4080W001

IMMOBILIZER SYSTEM

CODE WORD INPUT PROCEDURE

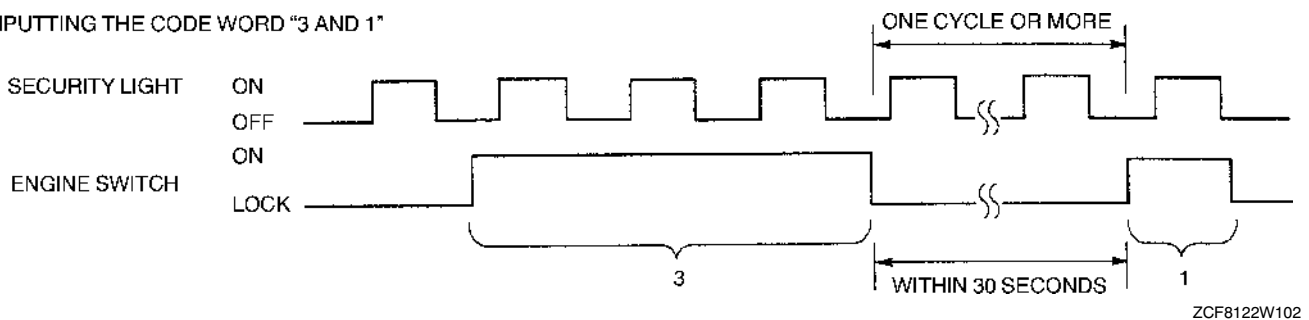
ZCF81226700W04

Note

- A code word is composed of eight digits from 1—9 and is part of the immobilizer unit from the manufacturer. Each unit has its own code word. To obtain the code word, you need to have the immobilizer serial number, then ask the distributor.
- To input the code word into the PCM, turn the engine key and count the number of flashes of the security light. The calculation of the number of flashes of the security light comes with the timing of the turning of the key.

1. Wait for **5 minutes** until security light flashes slowly. (**300 ms ON—300 ms OFF → 1.2 s ON—1.2 s OFF**)
2. Input the code word as shown in the example below.

INPUTTING THE CODE WORD "3 AND 1"



- (1) Turn engine switch to ON position while security light is off and count three illumination cycles. As the light goes out after the third illumination, turn key to LOCK position.
- (2) Wait at least one illumination cycle and **within 30 seconds** of going to LOCK position, turn engine switch to ON position while security light is off and count one illumination cycle. As the light goes out after the first illumination, turn key to LOCK position.
- (3) Repeat Step (2) for rest of six digits.
3. When code word is registered correctly in the PCM, the security light stops flashing and illuminates.
4. As soon as the security light stops flashing and illuminates, the following immobilizer system reprogram procedure should be started.

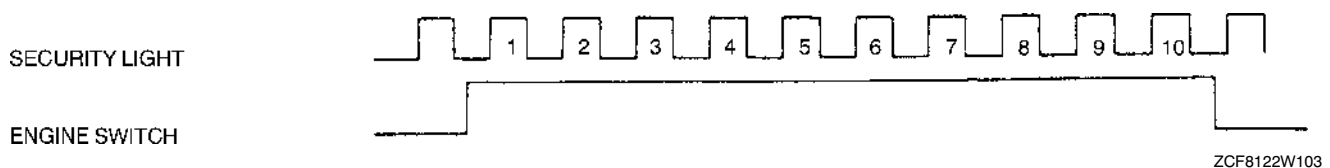
Note

- If the code word is not input correctly, the security light goes out after all eight digits are input. In this case, perform the "Code Word Input Error Recovery Procedure."

Examples of Incorrect Input of Code Word

Note

- The security light must flash one or more times between the digits of the code word.
 - If the code word is input incorrectly, the security light goes out. Remove and insert key **five times** and repeat the procedure to input all eight figures for the code word.
 - When an error occurs during the reprogram procedures except when both the immobilizer unit and PCM are replaced, repeat the procedure from Step 1. If you still cannot reprogram, confirm how many keys can start the engine. Then, perform the key replacement or addition reprogram procedure according to the valid key number.
- The security light flashes ten or more times while the engine switch is at ON position.



EXHAUST SYSTEM

EXHAUST SYSTEM

EXHAUST SYSTEM REMOVAL/INSTALLATION

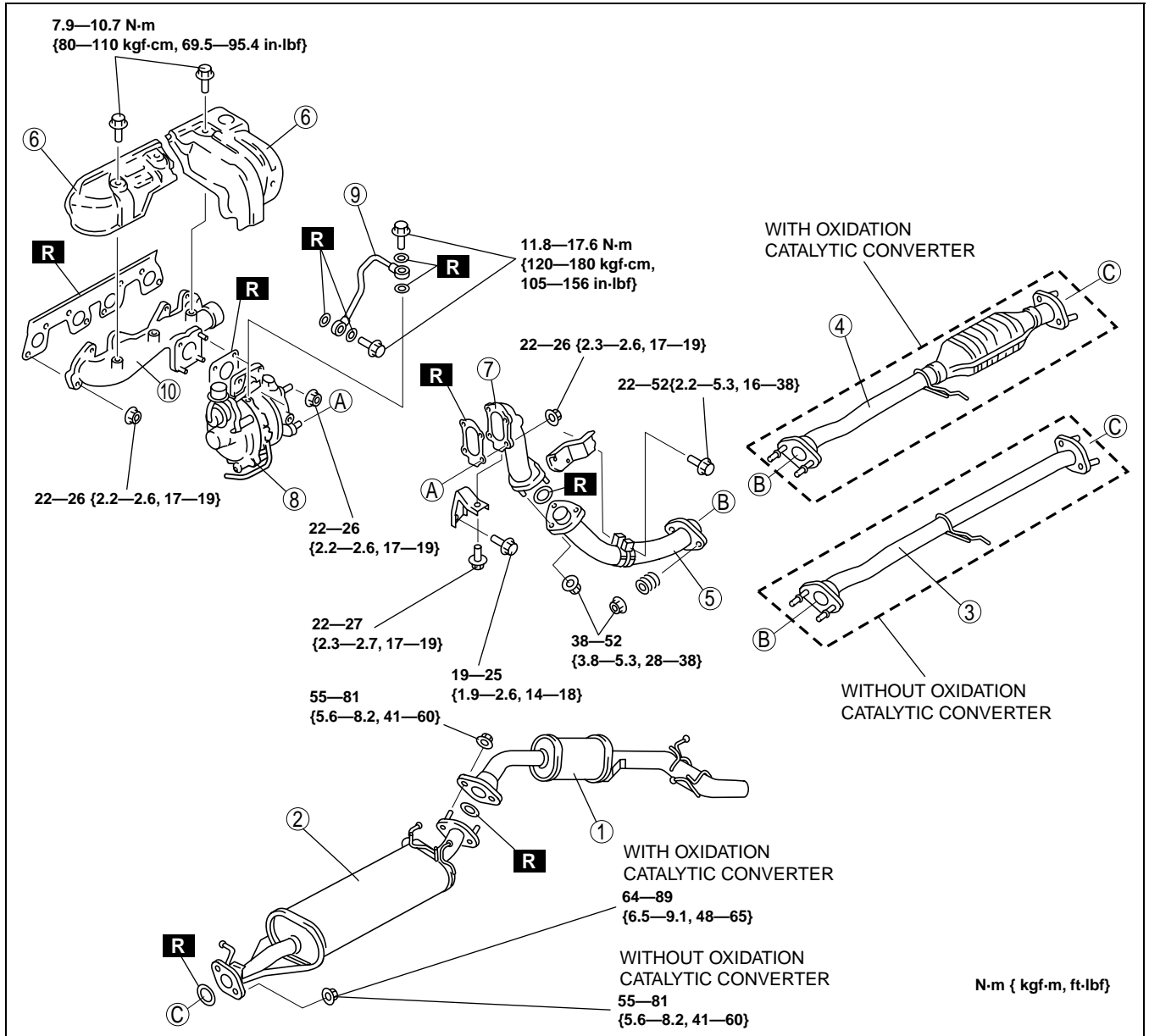
AVF401440000W03

Warning

- When the engine and exhaust system are hot, they can badly burn. Turn off the engine and wait until they are cool before removing the exhaust system.

- Disconnect the negative battery cable.
- Remove in the order indicated in the table.
- Install in the reverse order of removal.

F2



AVF4014W001

1	After silencer
2	Main silencer
3	Middle pipe
4	Oxidation catalytic converter
5	Front pipe
6	Exhaust manifold insulator

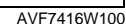
7	Joint pipe
8	Turbocharger (See F2-12 Turbocharger Removal Note) (See F2-12 Water Pipe Installation Note)
9	Oil pipe (See F2-12 Oil Pipe Installation Note)
10	Exhaust manifold

REAR SUSPENSION

AVF741605910W01

- Use safety stands for support of the left and right axle casings, and while supporting the differential casing with a jack, raise or lower the jack as necessary.

1. Remove in the order indicated in the table.
2. Install in the reverse order of removal.



13	Stopper rubber
14	Nut and washer
15	Shackle pin
16	Shackle plate
17	Leaf spring component
18	Leaf spring bushing (front side) (See R-7 Leaf Spring Bushing (Front Side) Removal Note) (See R-7 Leaf Spring Bushing (Front Side) Installation Note)
19	Leaf spring bushing (rear side) (See R-7 Leaf Spring Bushing (Rear Side) Removal Note) (See R-7 Leaf Spring Bushing (Rear Side) Installation Note)

REFRIGERANT SYSTEM SERVICE PROCEDURES

REFRIGERANT SYSTEM SERVICE PROCEDURES

CHARGING

AVF851478834W02

Caution

- Do not exceed the specification when charging the system with refrigerant. Doing so will decrease the efficiency of the air conditioner or damage the refrigeration cycle parts.

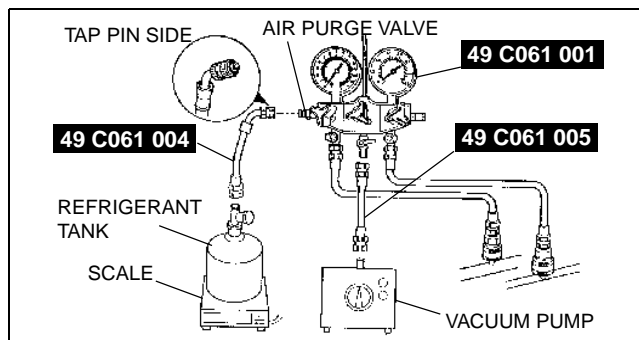
Charging Recycled R-134a Refrigerant

- Connect an R-134a recovery/recycling/recharging device to the vehicle and follow the device manufacturer's instructions.

Charging Preparation

- Install the **SSTs** (gas charging set).
- Connect the tap pin side of the SST (49 C061 004) to the air purge valve of the SST (49C061 001).
- Connect the **SST** (49 C061 005) to the center joint of the **SST** (49 C061 001).
- Connect the **SST** (49 C061 005) to the vacuum pump.
- Connect the **SST** (49 C061 004) to the refrigerant tank.
- Place the refrigerant tank on the scale.

Regular amount of refrigerant (approximate quantity)
675 g {23.8 oz}



A6E8514W004

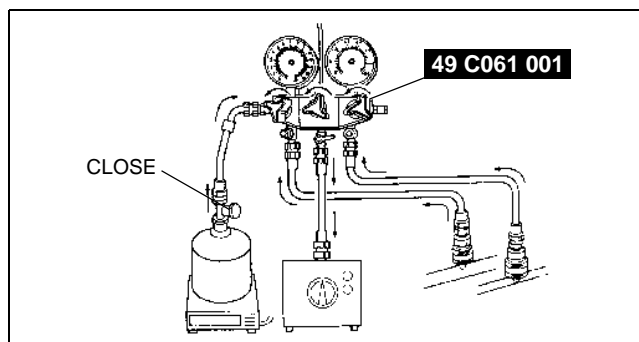
Evacuation

- Open all the valves of the **SST** (49 C061 001).

Caution

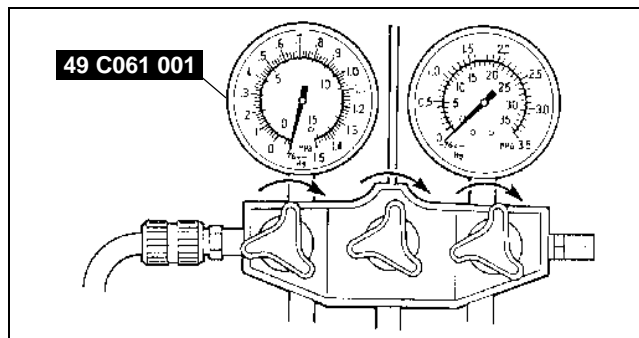
- Close the **SST** (49 C061 001) valve immediately after stopping the vacuum pump. If the valve is left open, the vacuum pump oil will flow back into the refrigeration cycle and cause a decrease in the efficiency of the air conditioner.

- Start the vacuum pump and let it operate for **15 min.**



A6E8514W005

- Verify that high- and low-pressure side readings of the **SST** (49 C061 001) are at **-101 kPa {-760 mmHg, -29.9 inHg}**. Close each valve of the **SST** (49 C061 001).



A6E8514W006

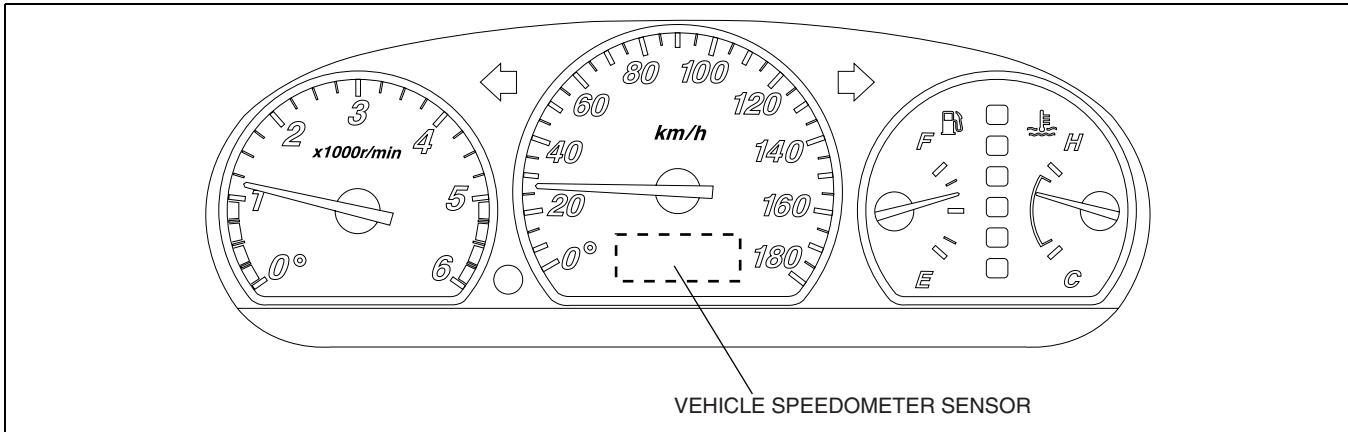
AUTOMATIC TRANSMISSION

VEHICLE SPEEDOMETER SENSOR DESCRIPTION

BVF561046030W05

Outline

- The vehicle speedometer sensor is located in the speedometer (instrument cluster).
- The vehicle speedometer sensor acts as a substitute for output speed sensor if it malfunction.



BVF0513T048

NE SENSOR DESCRIPTION

BVF561046030W06

Outline

- The NE sensor detects the rotation speed of the FIP gear, which is inputted to the TCM as an engine speed signal.
- The structure and operation of the NE sensor are the same as those of the current Ranger WL Turbo model. (See RANGER Training Manual F326-10-99A Section F2.)

ENGINE COOLANT TEMPERATURE (ECT) SENSOR DESCRIPTION

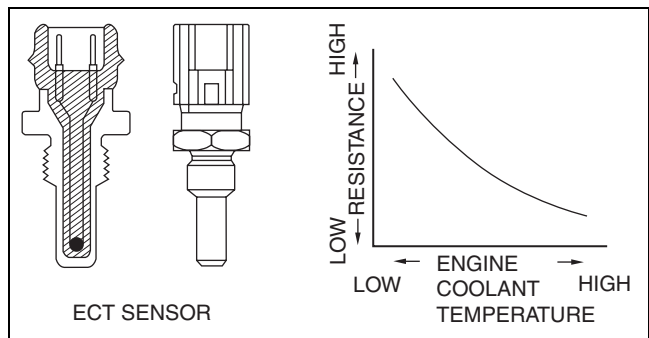
BVF561019200W01

Function

- The ECT sensor detects the engine coolant temperature.

Structure

- The ECT sensor is thermistor type, and is installed in the water outlet.
- The ECT sensor inputs the thermistor resistance, which changes according to the engine coolant temperature, to the TCM as a voltage.



DBA517ZT1001

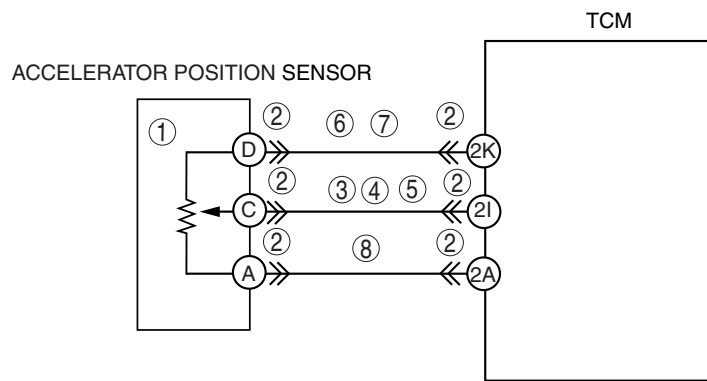
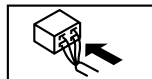
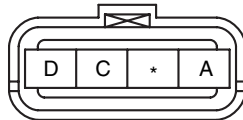
ON-BOARD DIAGNOSTIC

DTC 12

BVF567018901W09

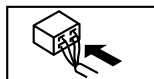
WL Turbo Stage-III

DTC 12	Accelerator position sensor circuit malfunction
DETECTION CONDITION	<ul style="list-style-type: none"> When all condition below satisfied. <ul style="list-style-type: none"> Idle switch is ON. Accelerator position sensor signal voltage is 0.1 V or below or 4.9 V or above. Diagnostic support note: <ul style="list-style-type: none"> HOLD indicator light flashes. DTC is stored in TCM memory.
POSSIBLE CAUSE	<ul style="list-style-type: none"> Open circuit between accelerator position sensor terminal C and TCM terminal 2I Short to power between accelerator position sensor terminal C and TCM terminal 2I Short to ground between accelerator position sensor terminal C and TCM terminal 2K Open circuit between accelerator position sensor terminal D and TCM terminal 2K Short to ground between accelerator position sensor terminal D and TCM terminal 2K Open circuit between accelerator position sensor terminal A and TCM terminal 2A Accelerator position sensor malfunction TCM malfunction

ACCELERATOR POSITION SENSOR
HARNESS SIDE CONNECTOR

TCM HARNESS SIDE CONNECTOR

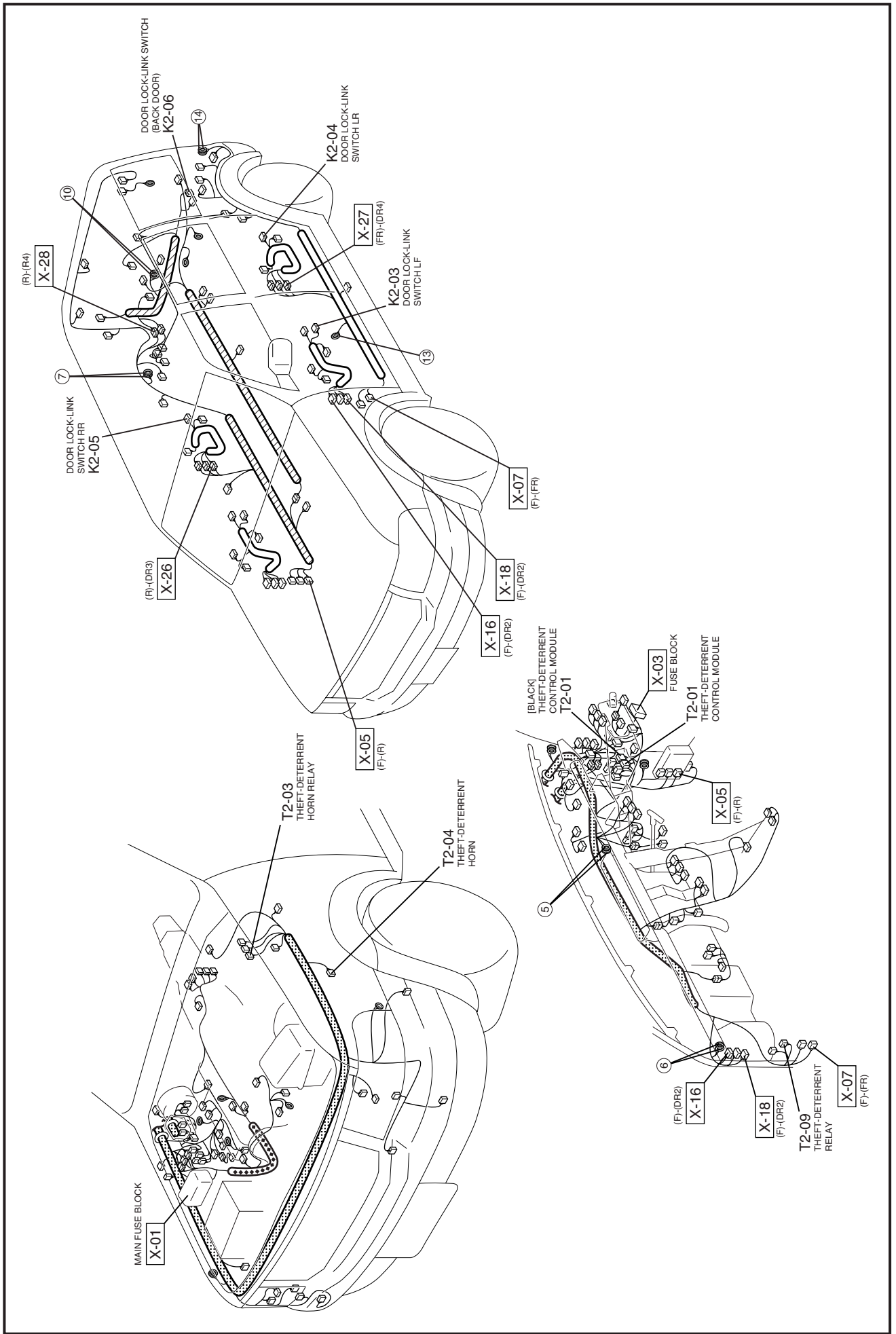
3Y	3W	3U	3S	3Q	3O	3M	3K	3I	3G	3E	3C	3A	2O	2M	2K	2I	2G	2E	2C	2A	1K	1I	1G	1E	1C	1A
3Z	3X	3V	3T	3R	3P	3N	3L	3J	3H	3F	3D	3B	2P	2N	2L	2J	2H	2F	2D	2B	1L	1J	1H	1F	1D	1B



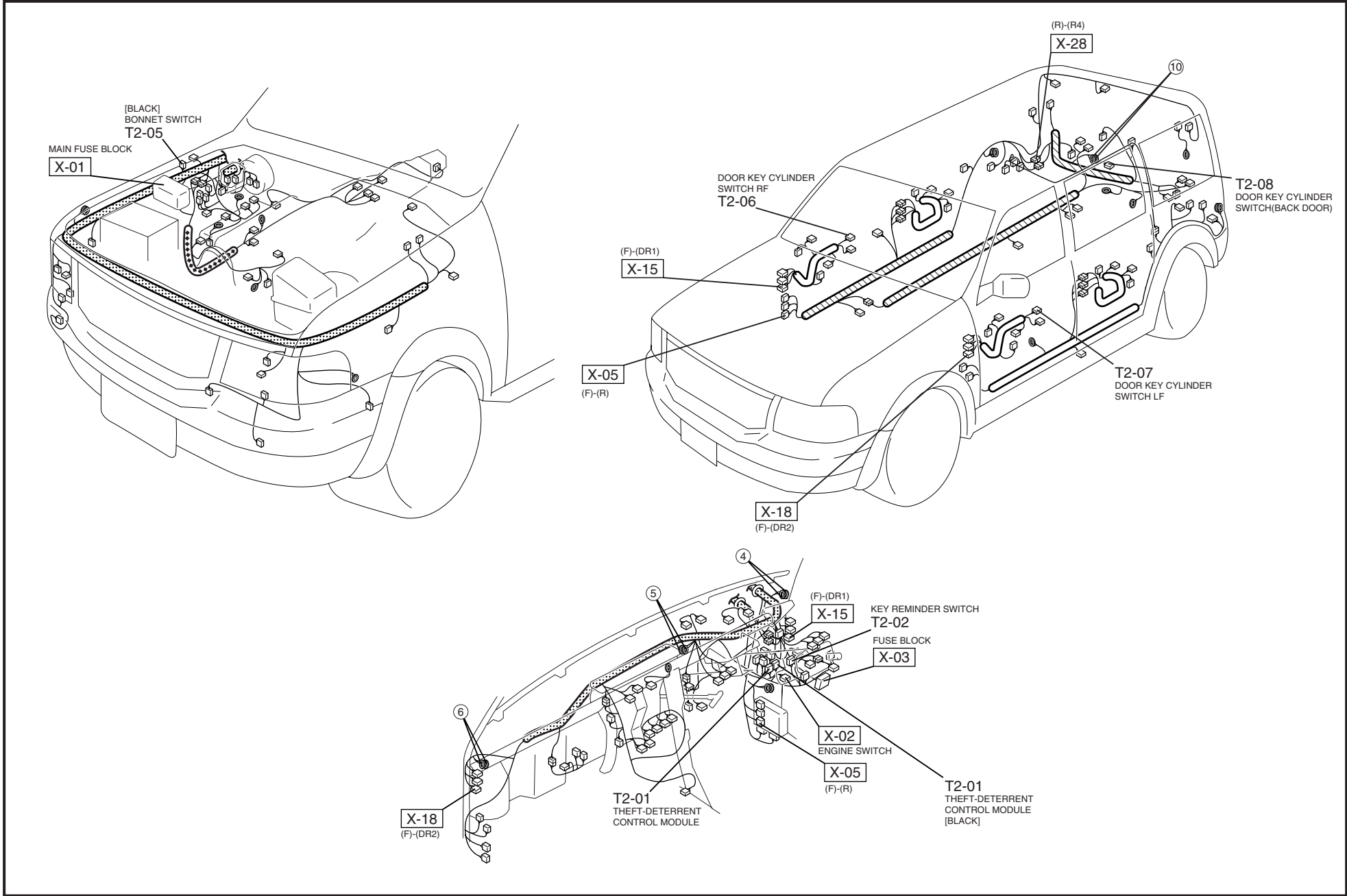
Diagnostic procedure

STEP	INSPECTION	ACTION
1	INSPECT ACCELERATOR POSITION SENSOR <ul style="list-style-type: none"> Inspect accelerator position sensor. (See K1-64-1 ACCELERATOR POSITION SENSOR, IDLE SWITCH INSPECTION.) Is result normal? 	<div>Yes</div> Go to next step. <div>No</div> Repair or replace accelerator position sensor, then go to Step 10.

HARNESS SYMBOL: (F) (E) (R)



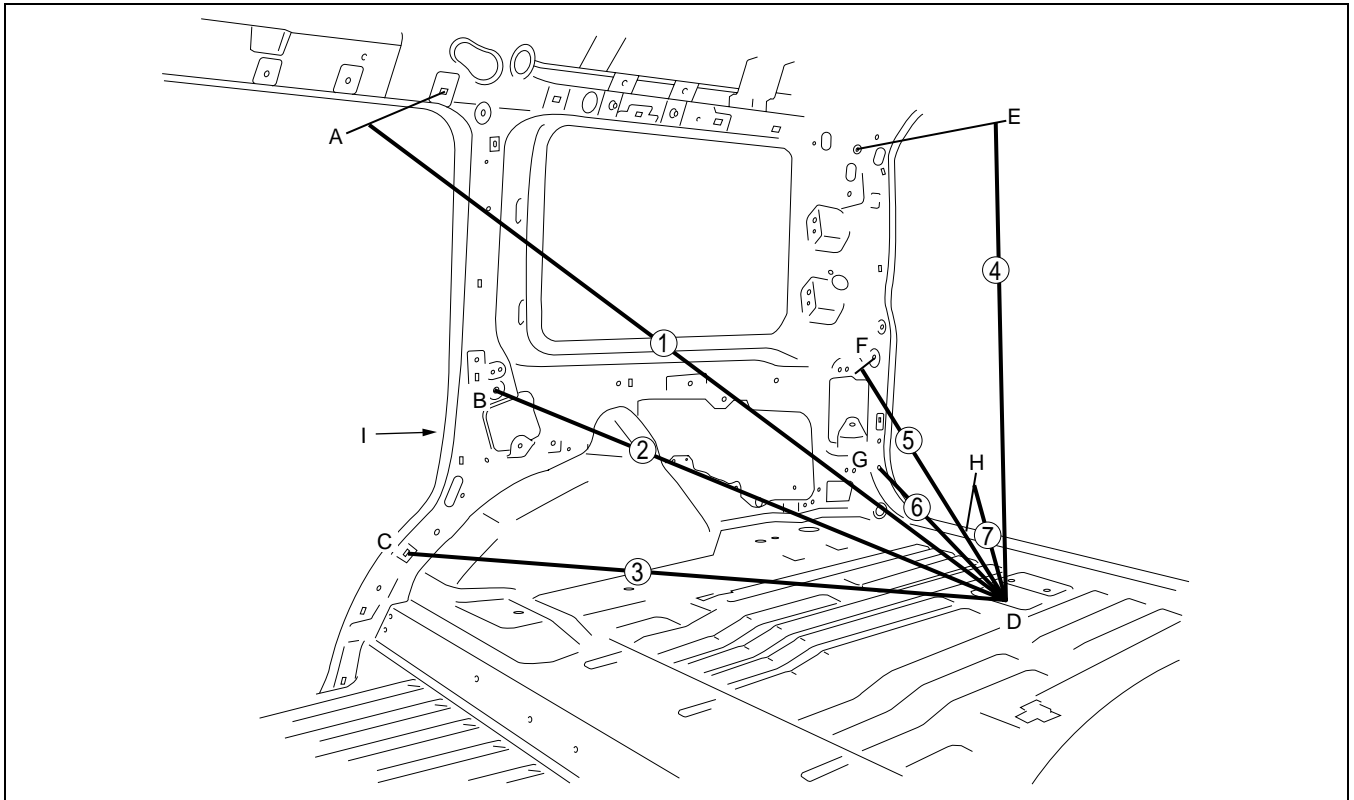
HARNESS SYMBOL:  (F)  (E)  (R)



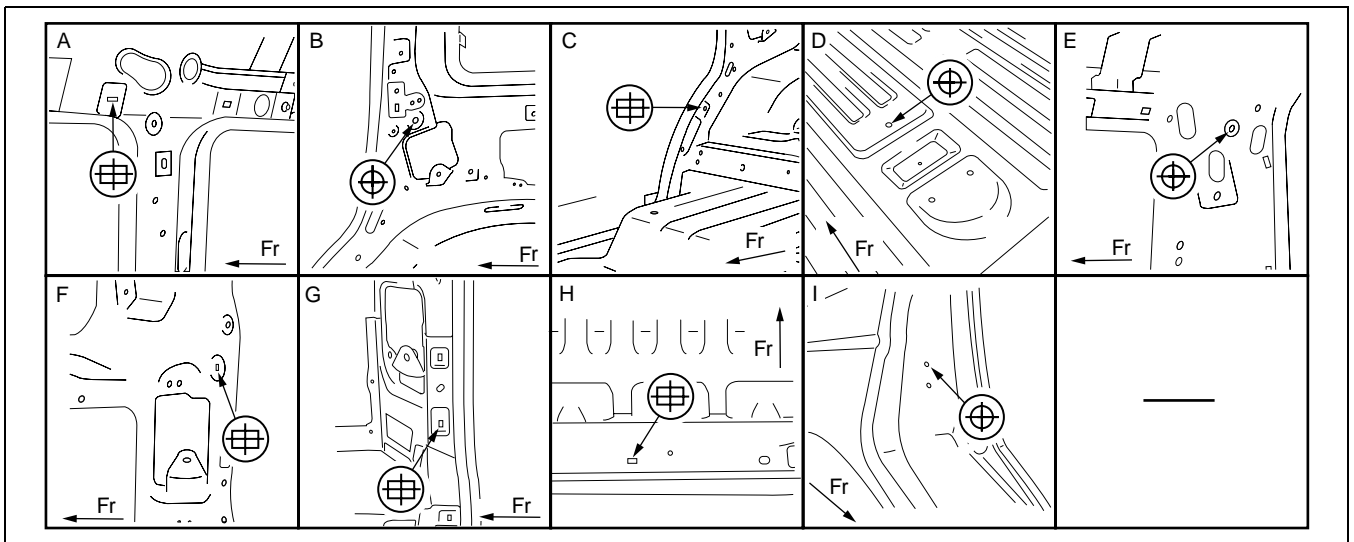
DIMENSIONS

ROOM STRAIGHT-LINE DIMENSIONS (3)

AVF981670001B03



AVF9816B013



AVF9816B014

Mesured location	Dimensions mm{in}
1	1,288 {50.71}
2	983 {38.70}
3	1,050 {41.34}
4	1,023 {40.28}

Mesured location	Dimensions mm{in}
5	801 {31.54}
6	712 {28.03}
7	483 {19.02}
I-I'	1,529 {60.20}

AUTOMATIC TRANSMISSION

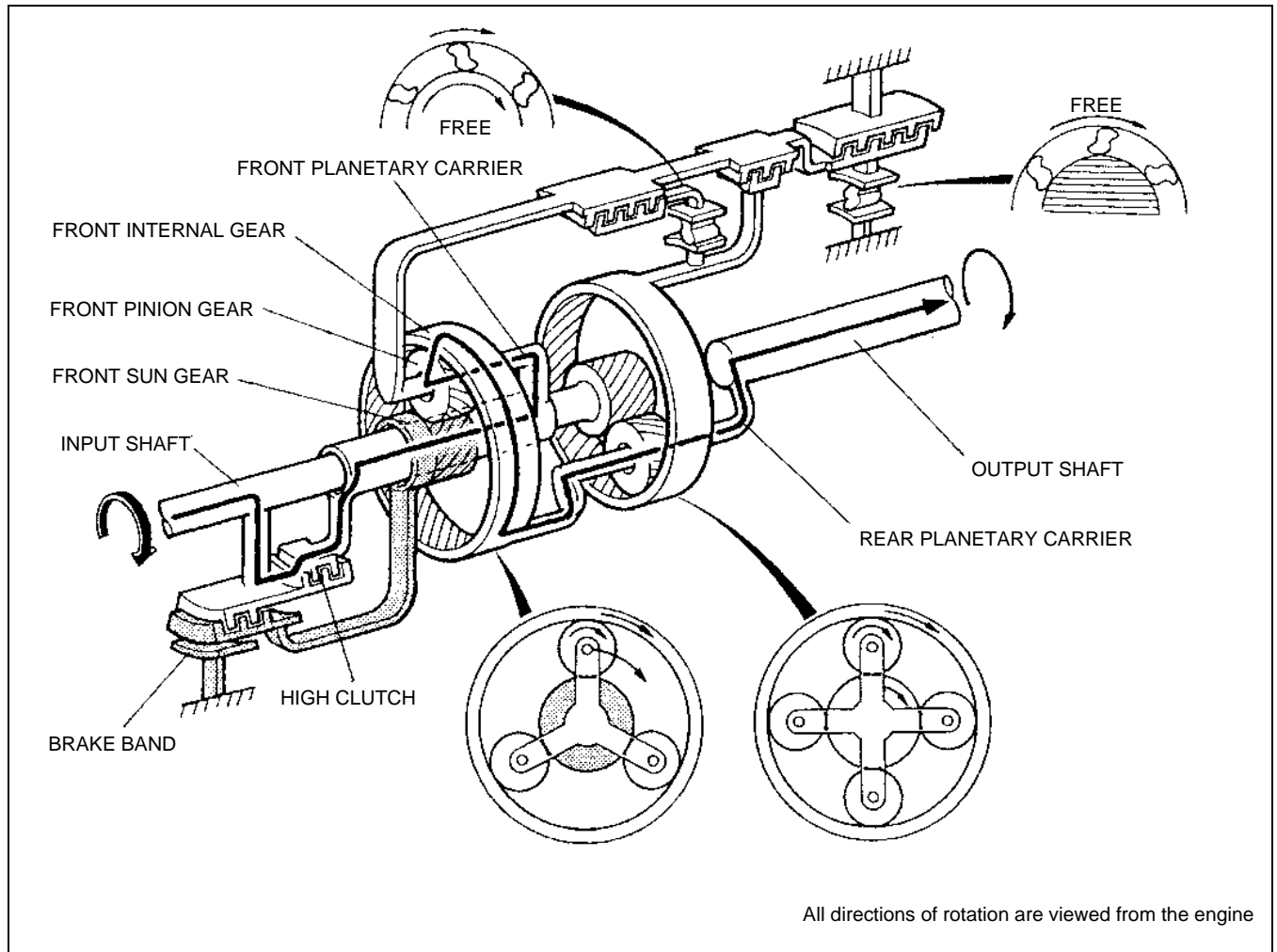
FOURTH GEAR (D RANGE, TCC NON-OPERATION)

CBG561000000A17

The driving force of the input shaft is transmitted to the front planetary gear via the high clutch, causing it to rotate clockwise.

As a result, the front pinion gear rotates clockwise. This rotation causes the front internal gear to rotate at an increased speed and the rear planetary carrier to rotate clockwise. The driving force of the rear planetary carrier, whose speed has also been increased, is transmitted to the driving wheels. The driving force during deceleration actuates the engine brake and is transmitted in the opposite direction during acceleration.

K



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