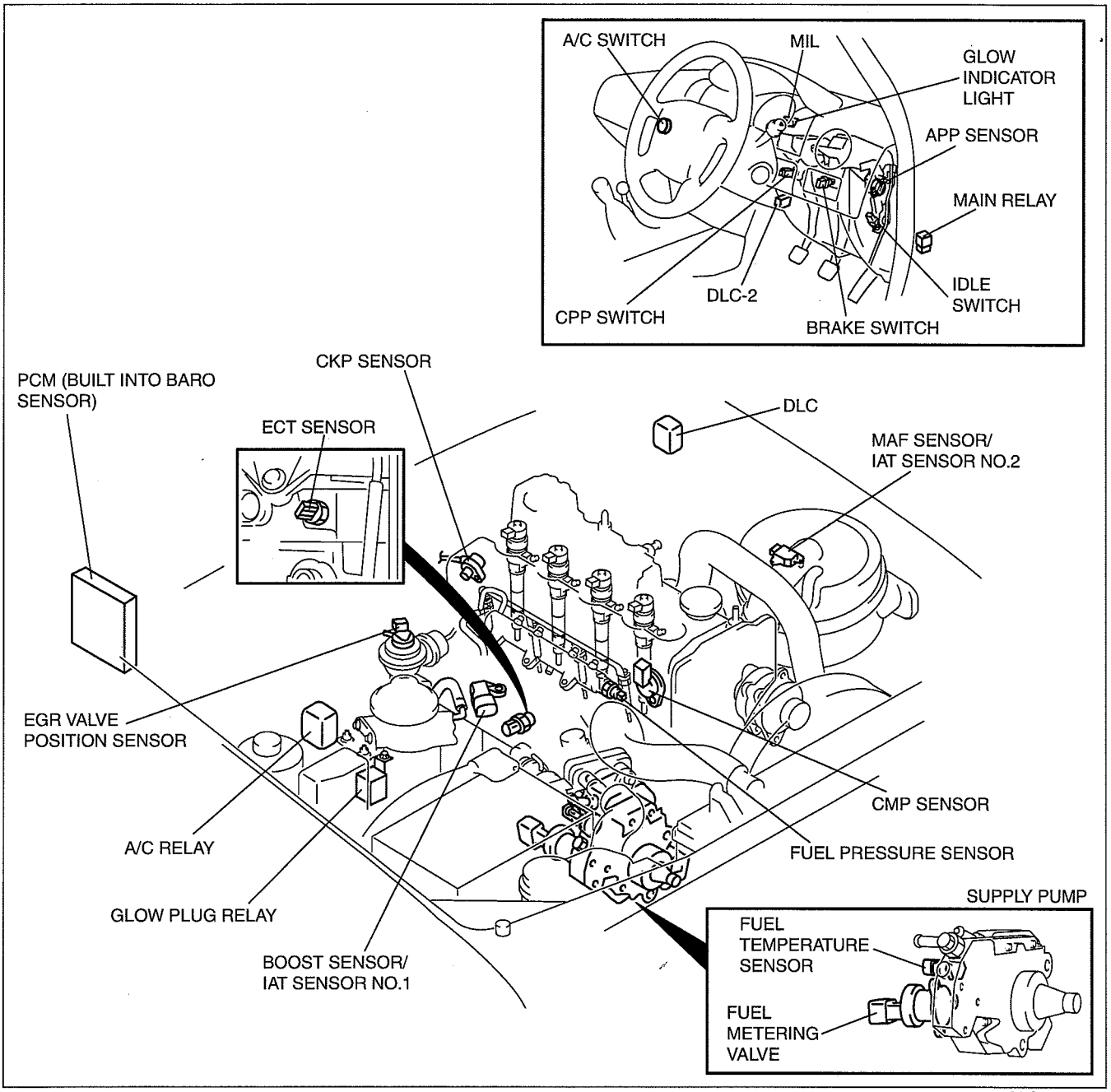
ENGINE CONTROL SYSTEM STRUCTURAL VIEW [WL-C, WE-C]

dcf014000000t23



DBG140BTB001

DRIVELINE/AXLE SPECIFICATIONS [RANGER (5R55S)]

id030000100211

Item				Specification		
Engine				**WL-C**	**WE-C**	
Transmission type				**5R55S**		
Vehicle type				**4×2**	**4×2 Hi-Rider**	**4×4**
Front axle						
Bearing type				Taper roller bearing		
Rear axle						
Bearing type				Taper roller bearing		
Support type				Semi-floating		
Casing				Banjo type		
Length			(mm {in})	739 {29.1}		
Diameter			(mm {in})	35.0 {1.4}		
Rear differential						
Reduction gear				Hypoid gear		
Differential gear				Straight bevel gear		
Ring gear size			(Inches)	8.9		
Final gear ratio				3.416	3.727	
Differential oil	Type	Grade		API service GL-5		
		Viscosity		SAE 90		
		Capacity (approx. quantity) (L {US qt, Imp qt})		2.45 {2.32, 2.04}	2.35 {2.22, 1.96}	
Front differential						
Reduction gear				–		Hypoid gear
Differential gear				–		Straight bevel gear
Ring gear size			(Inches)	–		8.00
Final gear ratio				–		3.727
Differential oil	Type	Grade		–		API service GL-5
		Viscosity		–		Above -18 °C {0 °F}: SAE90 Below -18 °C {0 °F}: SAE80
		Capacity (approx. quantity) (L {US qt, Imp qt})		–		1.9 {1.8, 1.6}
Front drive shaft						
Joint type		Wheel side		–		Bell joint
		Differential side		–		Double offset joint
Shaft diameter			(mm {in})	–		30.0 {1.18}
Front propeller shaft						
Length (front)			L1	–		13.2 {0.52}
			L2	–		588.4 {23.17}
			L3	–		34.3 {1.35}
Outer diameter (front)			D	–		26.5 {1.04}
Rear propeller shaft						
Length (rear)			L1	192.5 {7.579}		41.1 {1.62}
			L2	677.6 {26.68}	691.6 {27.23}	443.6 {17.46}
			L3	909.8 {35.82}	890.3 {35.05}	896.3 {35.29}
Outer diameter (rear)			D	63.5 {2.50}		
Joint type				Cross-shaped joint		

04-12 PARKING BRAKE SYSTEM

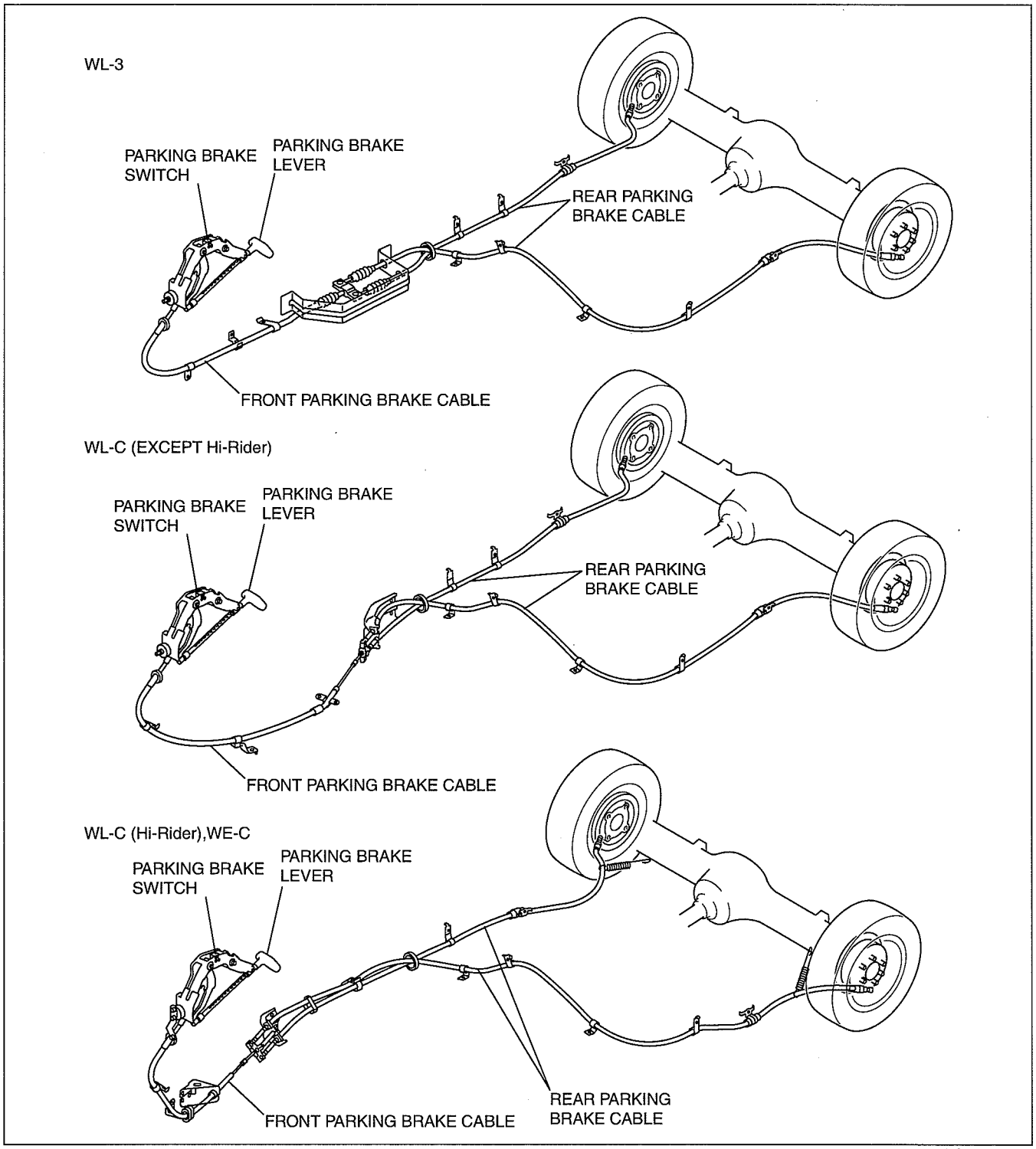
PARKING BRAKE SYSTEM OUTLINE

dcf041200000t01

- A stick lever type parking brake has been adopted, improving operability.

PARKING BRAKE SYSTEM STRUCTURAL VIEW

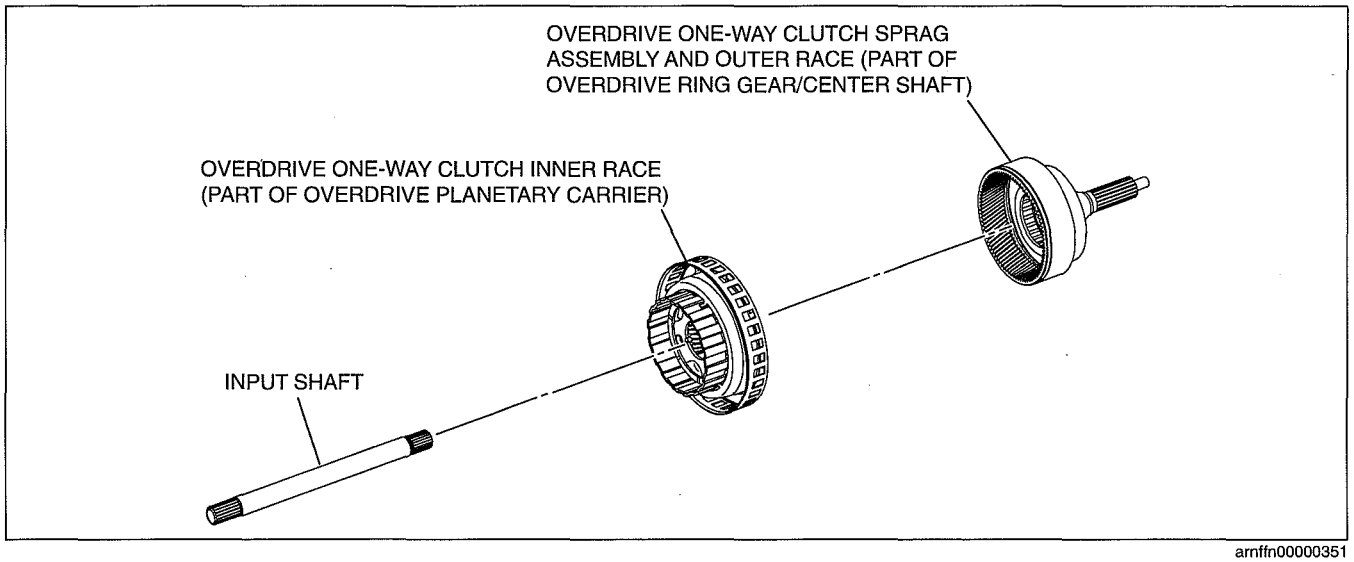
dcf041200000t02



DCF412ZTB001

Overdrive One-Way Clutch

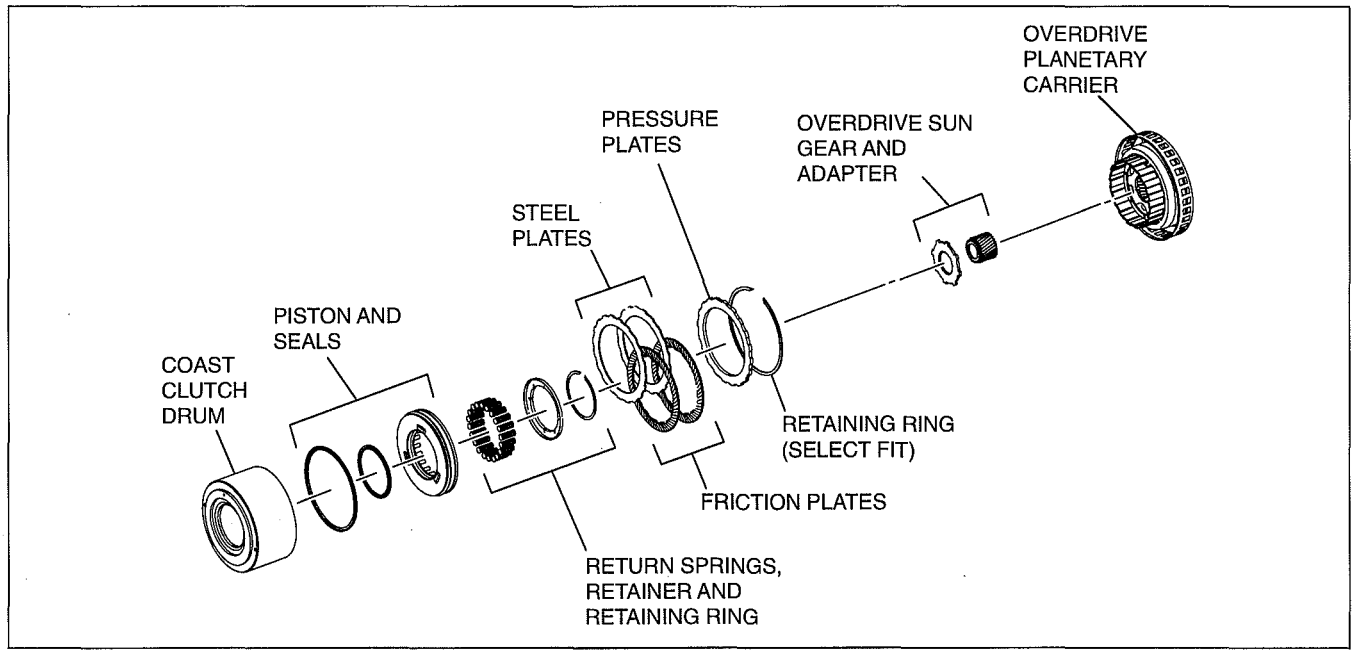
- The overdrive one-way clutch connects the input shaft to the center shaft during drive operation.
- The overdrive one-way clutch transmits torque in Reverse, 1GR, 3GR and 4GR, as well as in manual 3GR.
- The direct one-way clutch is a sprag-type one-way clutch that is pressed into the center shaft.
  - — The overdrive one-way clutch is driven by the ring gear of the overdrive planetary carrier.
  - — The overdrive one-way clutch holds and drives the outer splines of the center shaft in 1GR, 3GR, 4GR and Reverse gears.
  - — The overdrive one-way clutch overruns during all coast operations and at all times in 2GR and 5GR.



arnffn00000351

Coast Clutch

- The coast clutch connects the overdrive planetary carrier component to the overdrive sun gear.
- The coast clutch is applied in manual 1GR, manual 3GR, manual 4GR (D range O/D OFF mode) and Reverse positions.
- The coast clutch is a multi-disc clutch made up of steel and friction plates.
  - — The coast clutch is applied with hydraulic pressure and disengaged by return springs and the exhaust of the hydraulic pressure.
  - — The coast clutch is housed in the overdrive drum.
  - — When applied, the coast clutch locks the overdrive sun gear to the overdrive planetary carrier, thus preventing the one-way clutch from overrunning when the vehicle is coasting.
  - — This allows the use of engine compression to help slow the vehicle and provide engine braking.

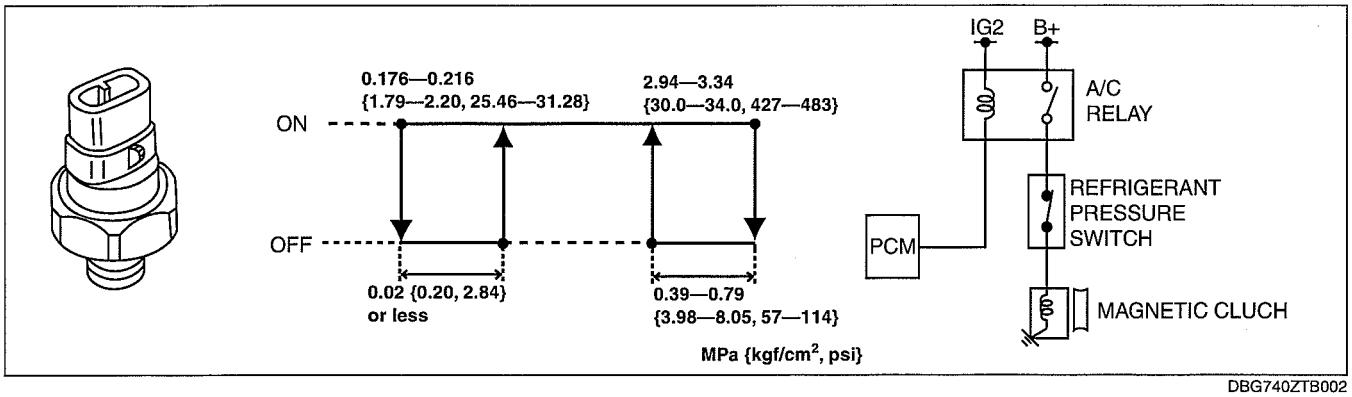


arnffn00000352

REFRIGERANT PRESSURE SWITCH CONSTRUCTION

dcf074061503t01

- The refrigerant pressure switch is fitted to the cooler pipe and senses the refrigerant pressure.
- A dual-pressure refrigerant pressure switch is used to respond to both abnormally high and abnormally low pressures.
- When pressure is abnormal, the refrigerant pressure switch turns off and cuts the voltage sent from the magnetic clutch, thereby stopping the A/C compressor.

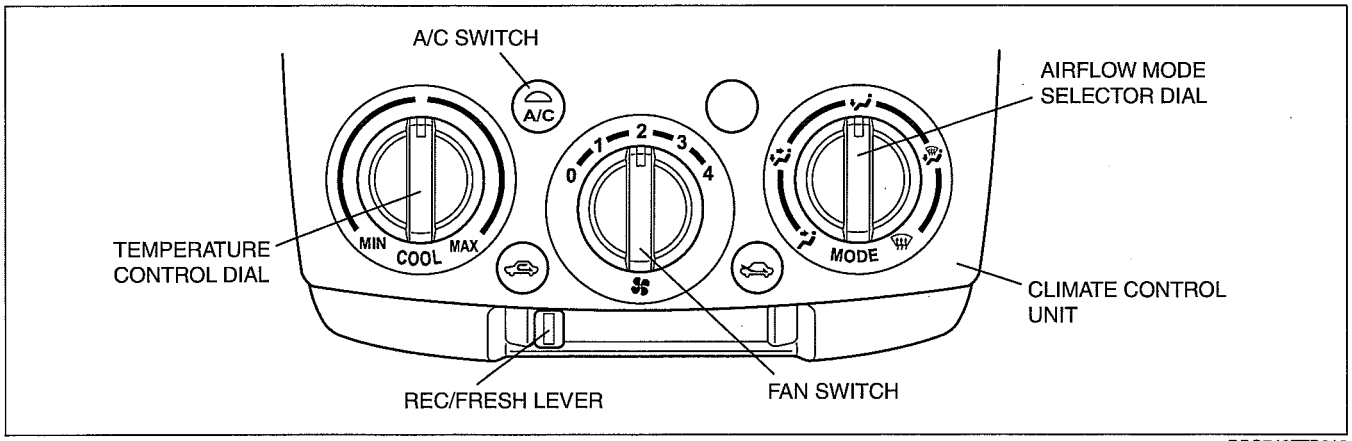


DBG740ZTB002

CLIMATE CONTROL UNIT CONSTRUCTION

dcf074061190t01

- Each switches and dials have been enlarged to improve ease of operation.



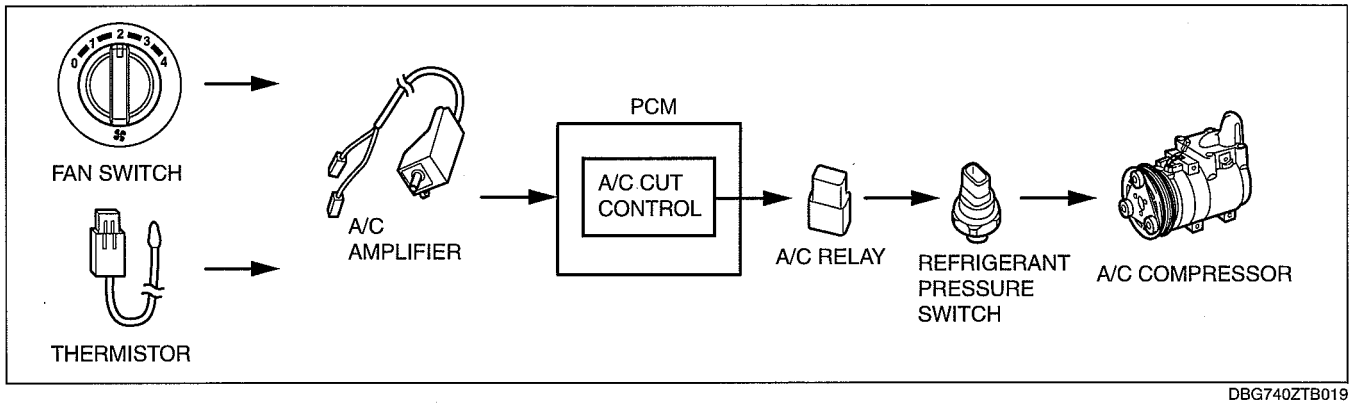
DBG740ZTB012

MANUAL AIR CONDITIONER CONTROL SYSTEM

dcf074000005t01

Block Diagram

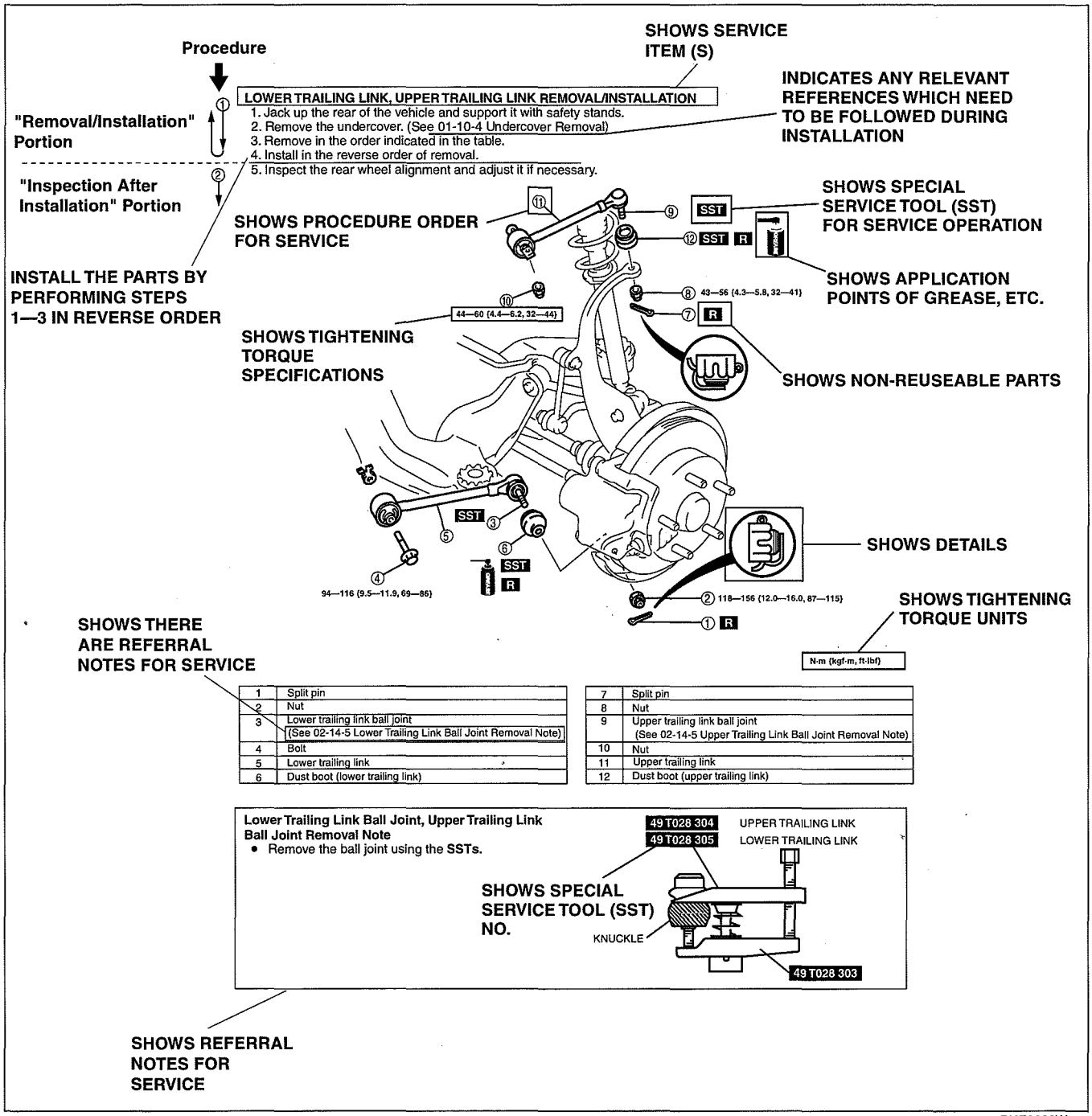
- The fan switch and thermistor sends an A/C signal to the PCM via the A/C amplifer.



DBG740ZTB019

Repair procedure

1. Most repair operations begin with an overview illustration. It identifies the components, shows how the parts fit together, and describes visual part inspection. However, only removal/installation procedures that need to be performed methodically have written instructions.
2. Expendable parts, tightening torques, and symbols for oil, grease, and sealant are shown in the overview illustration. In addition, symbols indicating parts requiring the use of special service tools or equivalent are also shown.
3. Procedure steps are numbered and the part that is the main point of that procedure is shown in the illustration with the corresponding number. Occasionally, there are important points or additional information concerning a procedure. Refer to this information when servicing the related part.

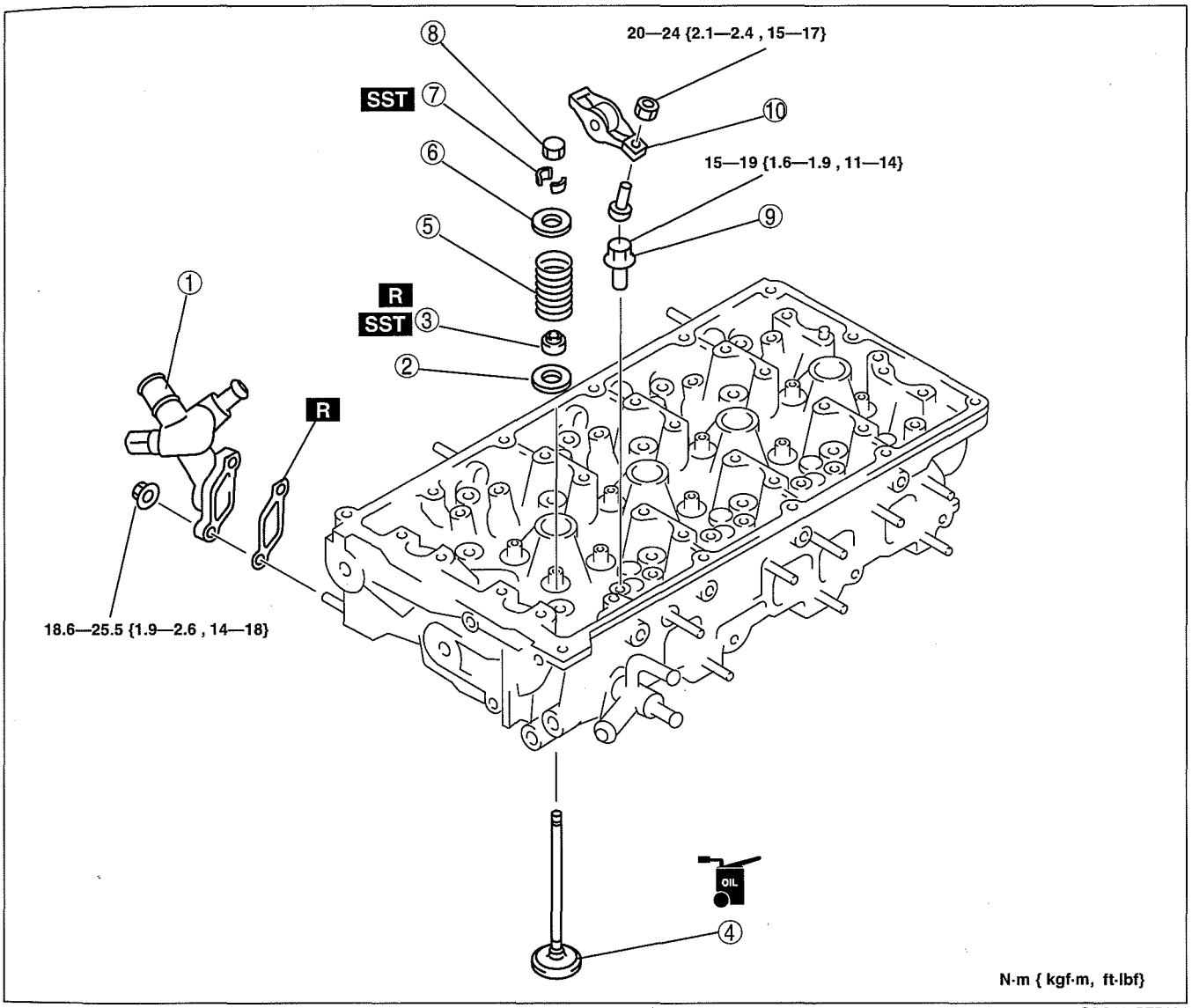


BHE0000W104

CYLINDER HEAD ASSEMBLY (I) [WL-C, WE-C]

DCF011002000W27

1. Assemble in the order indicated in the table.



DBG110BEB065

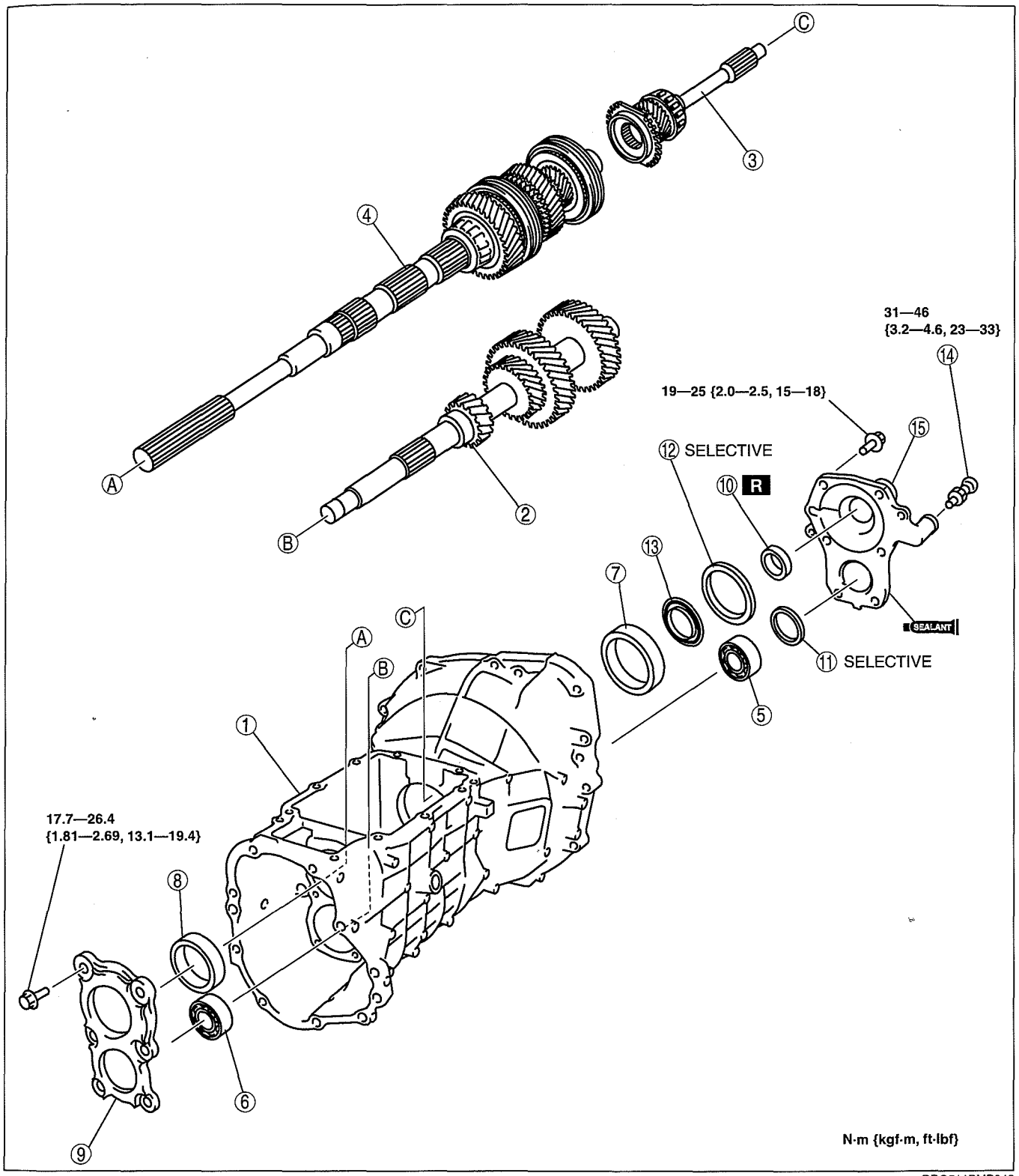
1	Water outlet pipe
2	Lower valve spring seat
3	Valve seal (See01–10B–46 Valve Seal Assembly Note.)
4	Valve
5	Valve spring
6	Upper valve spring seat

7	Valve keeper (See01–10B–46 Valve Keeper Assembly Note.)
8	Valve cap
9	Pivot (See01–10B–46 Pivot Assembly Note.)
10	Rocker arm (See 01–10B–46 Rocker Arm Assembly Note.)

MAINSHAFT COMPONENT, COUNTERSHAFT COMPONENT AND TRANSMISSION CASE ASSEMBLY [S15M-D, S15MX-D]

DCF051117040W08

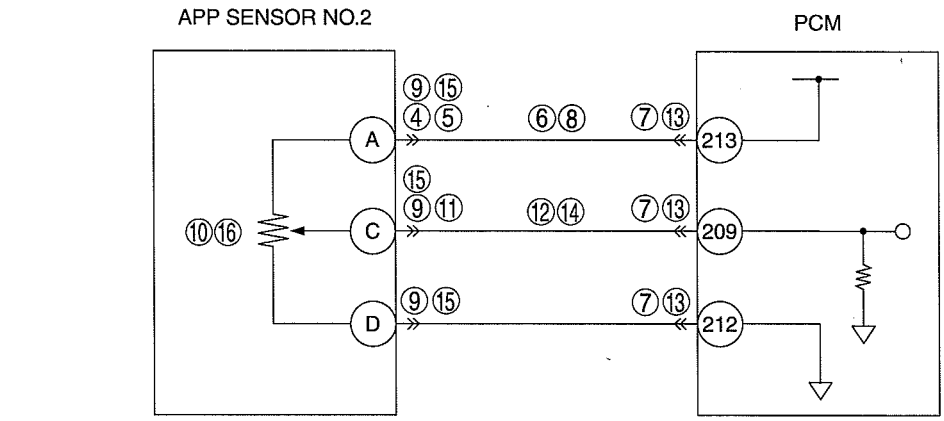
1. Assemble in the order indicated in the table.



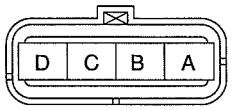
DBG511BMB048

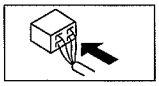
1	Transmission case
2	Countershaft component (See 05–11B–32 Maindrive Gear Component, Mainshaft Component and Countershaft Component Assembly Note.)
3	Mainshaft component (See 05–11B–32 Maindrive Gear Component, Mainshaft Component and Countershaft Component Assembly Note.)

DTC P0222	Accelerator pedal position (APP) sensor No.2 circuit low input

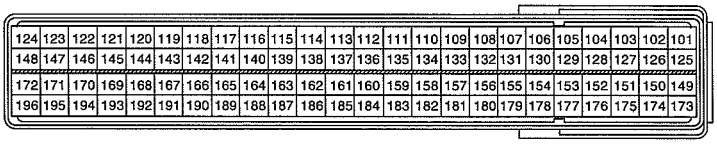


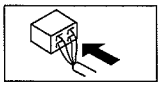
APP SENSOR
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR

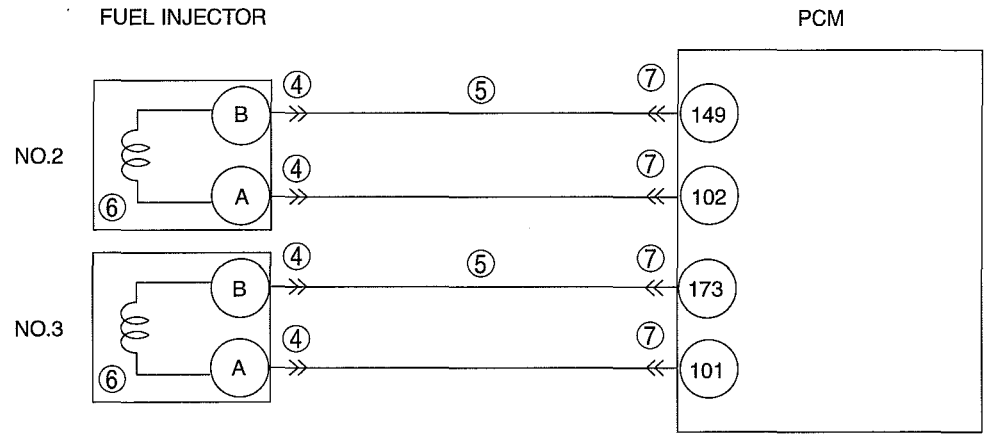




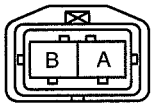
Diagnostic procedure

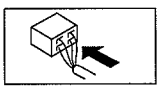
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT?** • Connect the current diagnostic tool to the DLC-2. • Clear the DTC from the PCM memory using the current diagnostic tool. • Start the engine. • Is the same DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERN TROUBLESHOOTING". (See 01-03B-60 INTERMITTENT CONCERN TROUBLESHOOTING [WL-C, WE-C].)
4	**CLASSIFY 5V CONSTANT VOLTAGE CIRCUIT OR OTHER RELATED MALFUNCTION** • Turn the engine switch to the ON position (Engine off). • Measure the voltage between the APP sensor terminal A (wiring harness-side) and body ground. • Is the voltage **5 V constant voltage** ?	Yes	Go to Step 11.
		No	Go to the next step.
5	**CLASSIFY 5V CONSTANT VOLTAGE CIRCUIT OR APP SENSOR RELATED MALFUNCTION** • Disconnect the APP sensor connector. • Turn the engine switch to the ON position (Engine off). • Measure the voltage between the APP sensor terminal A (wiring harness-side) and body ground. • Is the voltage **5 V constant voltage** ?	Yes	Go to Step 9.
		No	Go to the next step.

DTC P2150	Fuel injector No.2 and No.3 power supply circuit low input

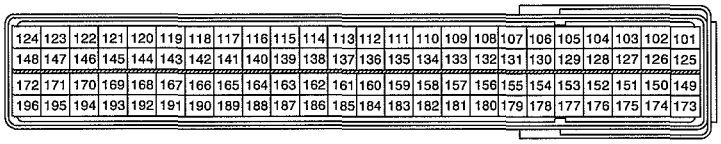


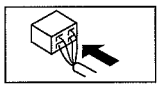
FUEL INJECTOR NO.2, NO.3
WIRING HARNESS-SIDE CONNECTOR





PCM
WIRING HARNESS-SIDE CONNECTOR





Diagnostic procedure

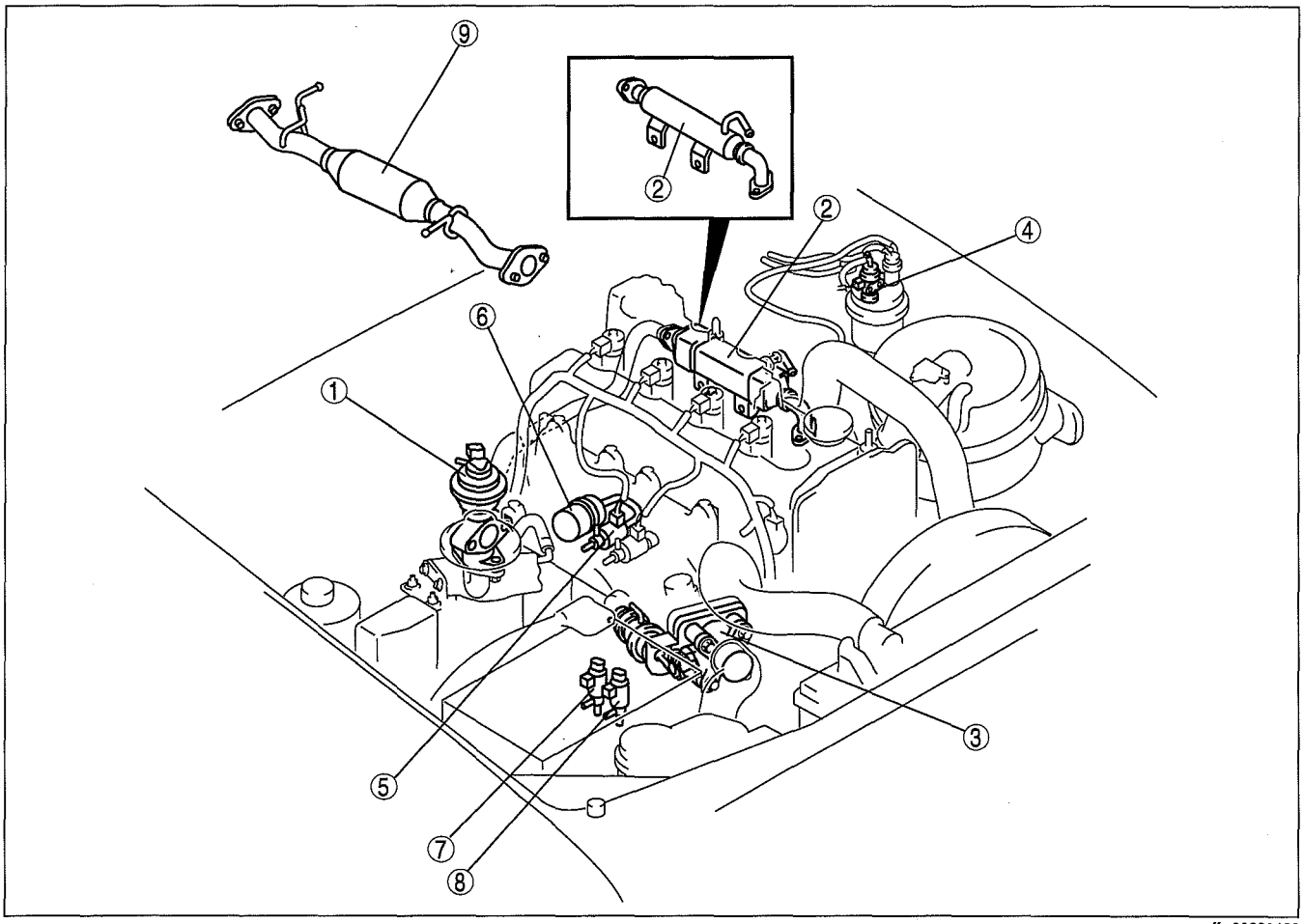
STEP	INSPECTION		ACTION
1	**VERIFY FREEZE FRAME DATA HAS BEEN RECORDED** • Has FREEZE FRAME DATA been recorded?	Yes	Go to the next step.
		No	Record the FREEZE FRAME DATA on the repair order, then go to the next step.
2	**VERIFY RELATED REPAIR INFORMATION AVAILABILITY** • Verify related service repair information availability. • Is any related repair information available?	Yes	Perform the repair or diagnosis according to the available repair information. • If the vehicle is not repaired, go to the next step.
		No	Go to the next step.
3	**VERIFY CURRENT SIGNAL STATUS: IS CONCERN INTERMITTENT OR CONSTANT?** • Connect the current diagnostic tool to the DLC-2. • Clear the DTC from the PCM memory using the current diagnostic tool. • Start the engine. • Is the same DTC present?	Yes	Go to the next step.
		No	Intermittent concern exists. Perform the "INTERMITTENT CONCERN TROUBLESHOOTING". (See 01-03B-60 INTERMITTENT CONCERN TROUBLESHOOTING [WL-C, WE-C].)
4	**INSPECT FUEL INJECTOR CONNECTOR FOR POOR CONNECTION** • Turn the engine switch to the ON position. • Inspect for poor connection. (such as damaged/pulled-out terminals, corrosion). • Is there any malfunction?	Yes	Go to the next step.
		No	Repair or replace the terminal, then go to Step 8.
5	**INSPECT FUEL INJECTORS CIRCUIT FOR SHORT TO GROUND** • Turn the engine switch to off. • Inspect for continuity between the following terminals and body ground. — Fuel injector No.2 terminal B — Fuel injector No.3 terminal B • Is there continuity?	Yes	Repair or replace the wiring harness for a short to ground, then go to Step 8.
		No	Go to the next step.

01-16B EMISSION SYSTEM [WL-C, WE-C]

EMISSION SYSTEM LOCATION INDEX [WL-C, WE-C]

dcf011600000w03

Engine Room Side



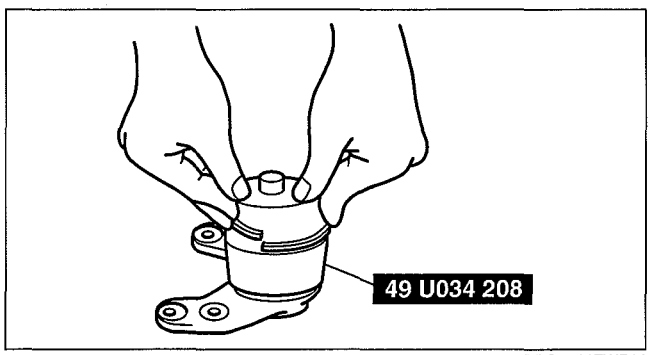
arnffw00000460

1	EGR valve (See 01-16B-4 EGR SYSTEM REMOVAL/ INSTALLATION [WL-C, WE-C].) (See 01-16B-5 EGR VALVE INSPECTION [WL-C, WE-C].)
2	EGR cooler (See 01-16B-4 EGR SYSTEM REMOVAL/ INSTALLATION [WL-C, WE-C].)
3	Intake shutter valve (See 01-13B-3 INTAKE-AIR SYSTEM REMOVAL/ INSTALLATION [WL-C, WE-C].) (See 01-16B-7 INTAKE SHUTTER VALVE INSPECTION [WL-C, WE-C].)

4	EGR solenoid valve (See 01-16B-5 EGR SOLENOID VALVE INSPECTION [WL-C, WE-C].)
5	EGR control solenoid valve (See 01-16B-6 EGR CONTROL SOLENOID VALVE INSPECTION [WL-C, WE-C].)
6	Air filter
7	Intake shutter solenoid valve (half) (See 01-16B-6 INTAKE SHUTTER SOLENOID VALVE (HALF) INSPECTION [WL-C, WE-C].)
8	Intake shutter solenoid valve (full) (See 01-16B-7 INTAKE SHUTTER SOLENOID VALVE (FULL) INSPECTION [WL-C, WE-C].)

Clip Installation Note

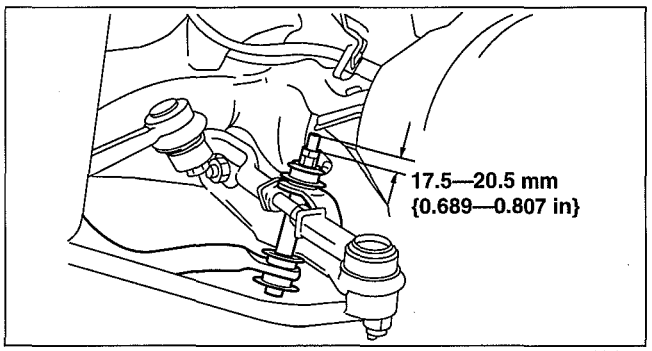
1. Install the **SST** to the ball joint stud with the stud stands straight up.
2. Install the clip in the dust boot groove.



DBG0213ZWB00

Stabilizer Bolt, Bushing, Retainer, Spacer, And Nut Installation Note

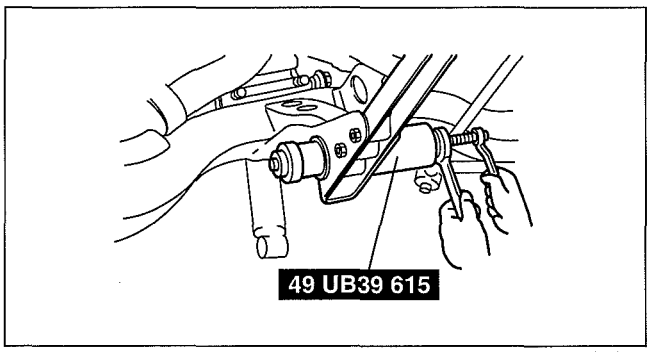
1. Tighten the nuts so that **17.5—20.5 mm {0.689—0.807 in}** of thread is exposed at the end of the bolt.



DBG0213ZWB00

Rubber Bushing Installation Note

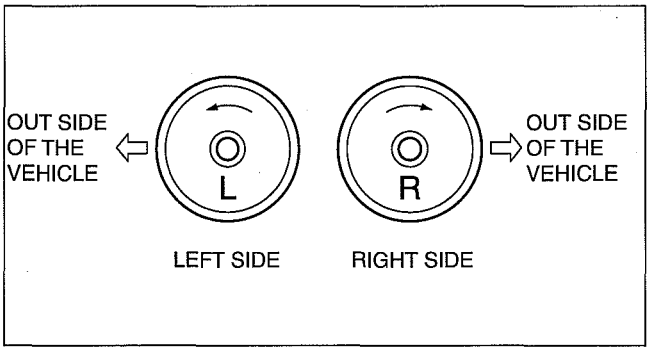
1. Install a new bushing using the **SST**.



DBG0213ZWB01

Torsion Bar Spring Installation Note

1. Before installation, check the identification mark on the end of the torsion bar spring.

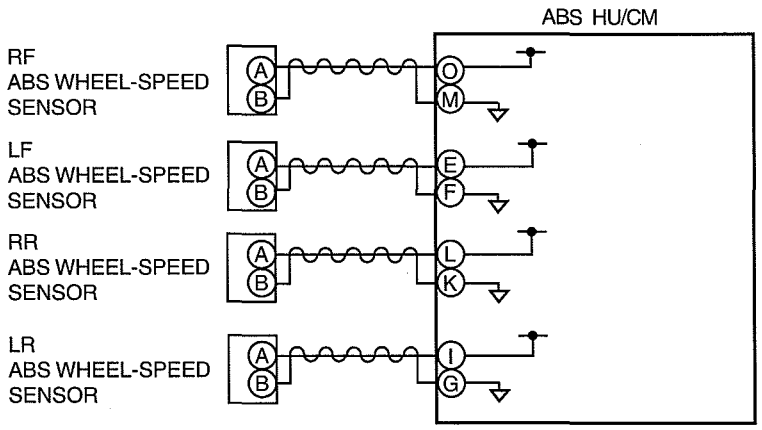


DBG213ZWB031

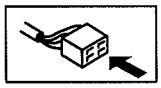
DTC C1145, C1155, C1165, C1175 [4W-ABS]

dcf040200000w21

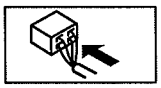
DTC	C1145 C1155 C1165 C1175	**RF ABS wheel-speed sensor system** **LF ABS wheel-speed sensor system** **RR ABS wheel-speed sensor system** **LR ABS wheel-speed sensor system**
DETECTION CONDITION	• Open circuit or short to ground has been detected in the ABS wheel-speed sensor wiring harness on any of the four vehicle wheels.	
POSSIBLE CAUSE	• Open circuit or short to ground in the wiring harness between the following ABS HU/CM terminal and the ABS wheel-speed sensor terminal: — ABS HU/CM terminal O—RF ABS wheel-speed sensor terminal A — ABS HU/CM terminal M—RF ABS wheel-speed sensor terminal B — ABS HU/CM terminal E—LF ABS wheel-speed sensor terminal A — ABS HU/CM terminal F—LF ABS wheel-speed sensor terminal B — ABS HU/CM terminal L—RR ABS wheel-speed sensor terminal A — ABS HU/CM terminal K—RR ABS wheel-speed sensor terminal B — ABS HU/CM terminal I—LR ABS wheel-speed sensor terminal A — ABS HU/CM terminal G—LR ABS wheel-speed sensor terminal B • ABS wheel-speed sensor malfunction • Poor connection at connectors (female terminal)	



ABS WHEEL-SPEED SENSOR WIRING HARNESS-SIDE CONNECTOR



ABS HU/CM WIRING HARNESS-SIDE CONNECTOR



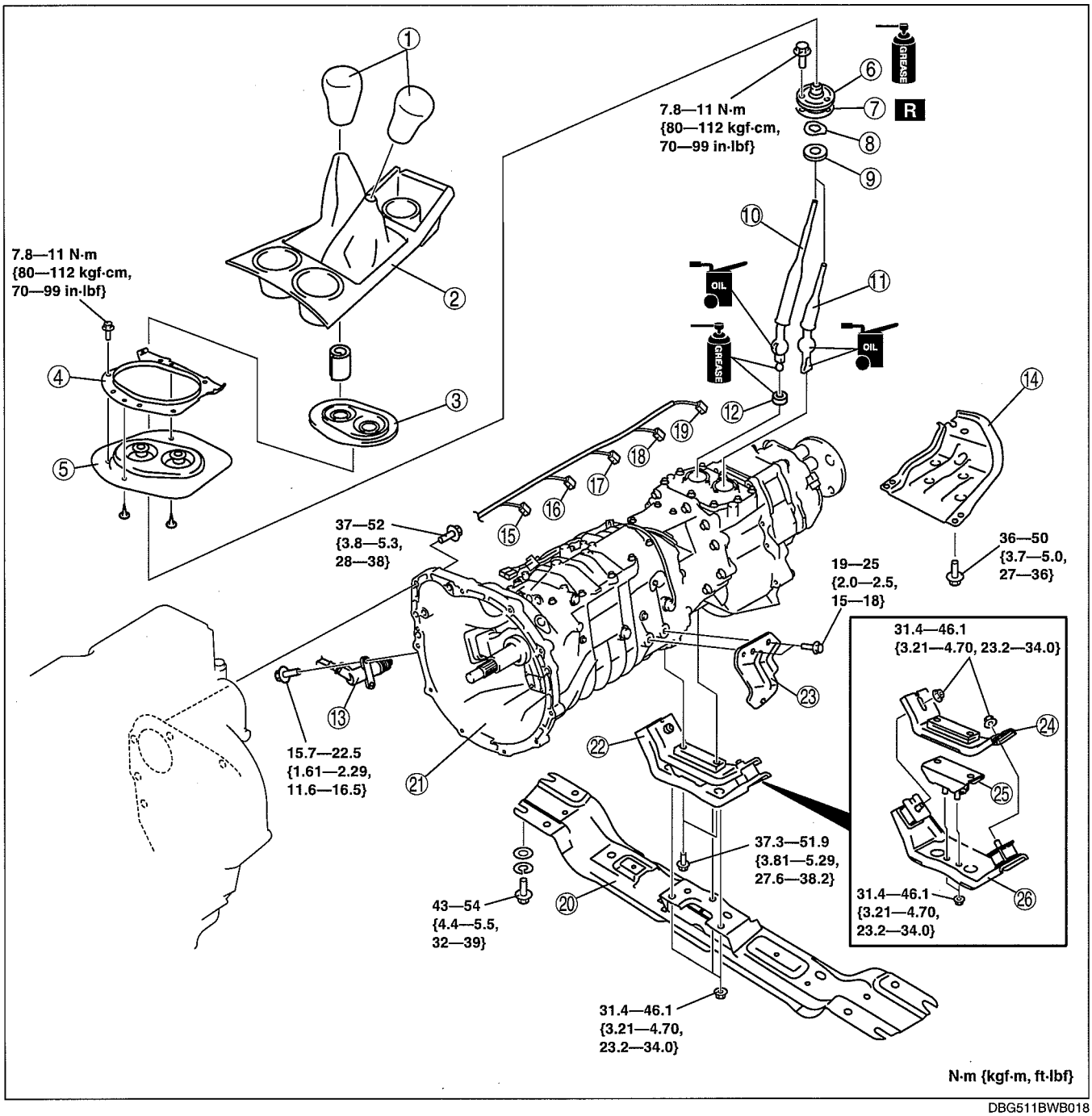
Diagnostic procedure

STEP	INSPECTION		ACTION
1	**INSPECT PID TO VERIFY THAT WHEEL SPEED-SIGNALS ARE TRANSMITTED FROM ABS WHEEL- SPEED SENSOR USING CURRENT DIAGNOSTIC TOOL** • Turn the engine switch off. • Connect the current diagnostic tool to the DLC-2. • Select the following PIDs using the current diagnostic tool: WSPD_LF WSPD_LR WSPD_RF WSPD_RR • Drive the vehicle. • Verify that the wheel speed-signals are transmitted from each ABS wheel-speed sensor. • Are the wheel-speed signals transmitted?	Yes	Go to Step 3.
		No	Go to the next step.

TRANSMISSION AND TRANSFER REMOVAL/INSTALLATION [S15MX-D]

dcf051100000w08

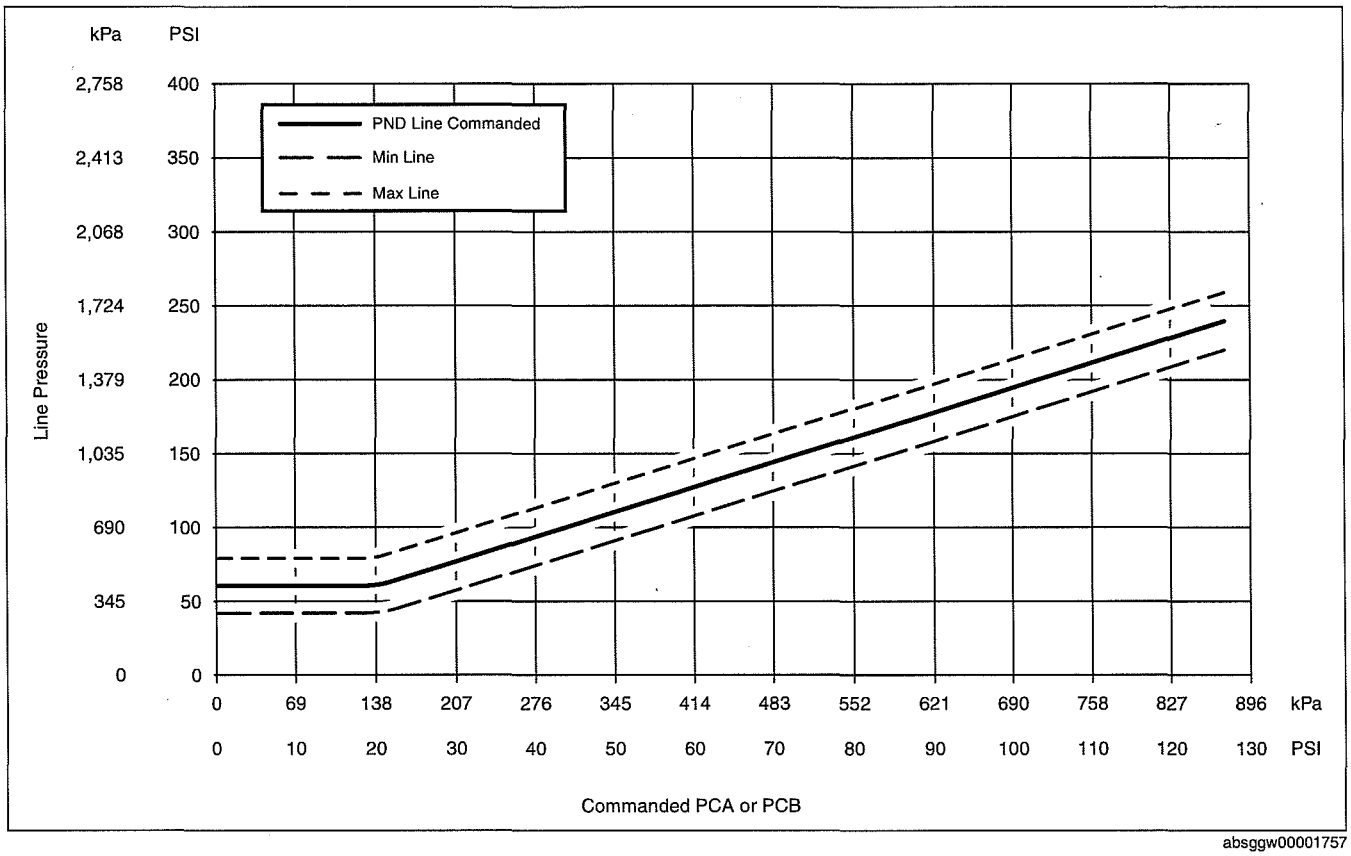
1. Disconnect the negative battery cable.
2. Remove the front propeller shaft and rear propeller shaft. (See 03-15-2 PROPELLER SHAFT REMOVAL/ INSTALLATION.)
3. Remove the front pipe and oxidation catalytic converter. (See 01-15B-2 EXHAUST SYSTEM REMOVAL/ INSTALLATION [WL-C, WE-C].)
4. Remove in the order indicated in the table.
5. Install in the reverse order of removal.
6. Perform the 'INSPECTION AFTER TRANSMISSION INSTALLATION', and verify that there is no abnormality. (See 05-11B-12 INSPECTION AFTER TRANSMISSION AND TRANSFER INSTALLATION [S15MX-D].)



DBG511BWB018

1	Shift lever knob
2	Boot panel (See 09-17-12 CONSOLE REMOVAL/ INSTALLATION.)
3	Dust boot
4	Change boot upper plate

5	Boot
6	Dust boot
7	Gasket
8	Wave washer
9	Change bush
10	Shift lever



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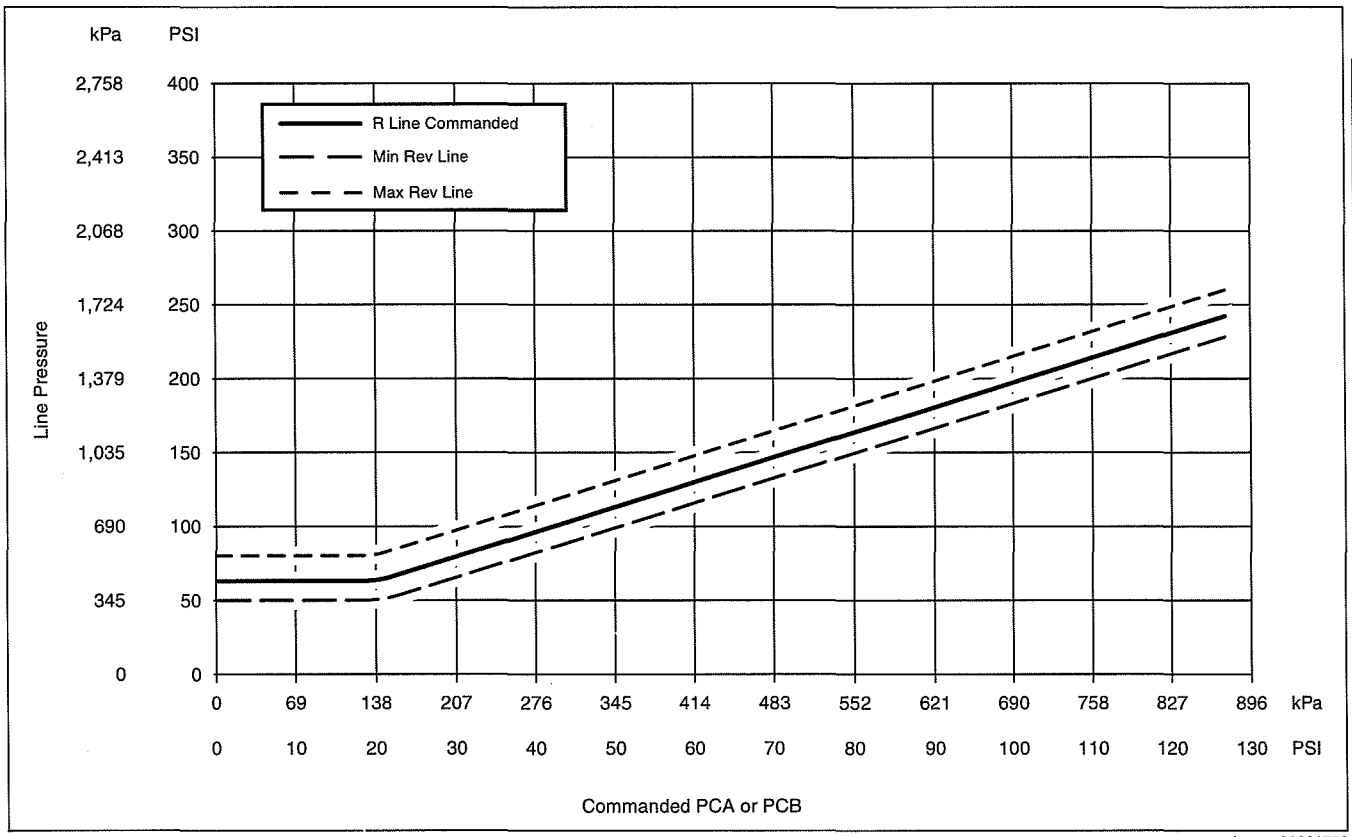

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05

5. Install the line pressure tap.

Tightening torque
10—15 N·m {102—152 kgf·cm, 89—132 in·lbf}

6. Go to the Pressure Control C Pressure Test in this section.