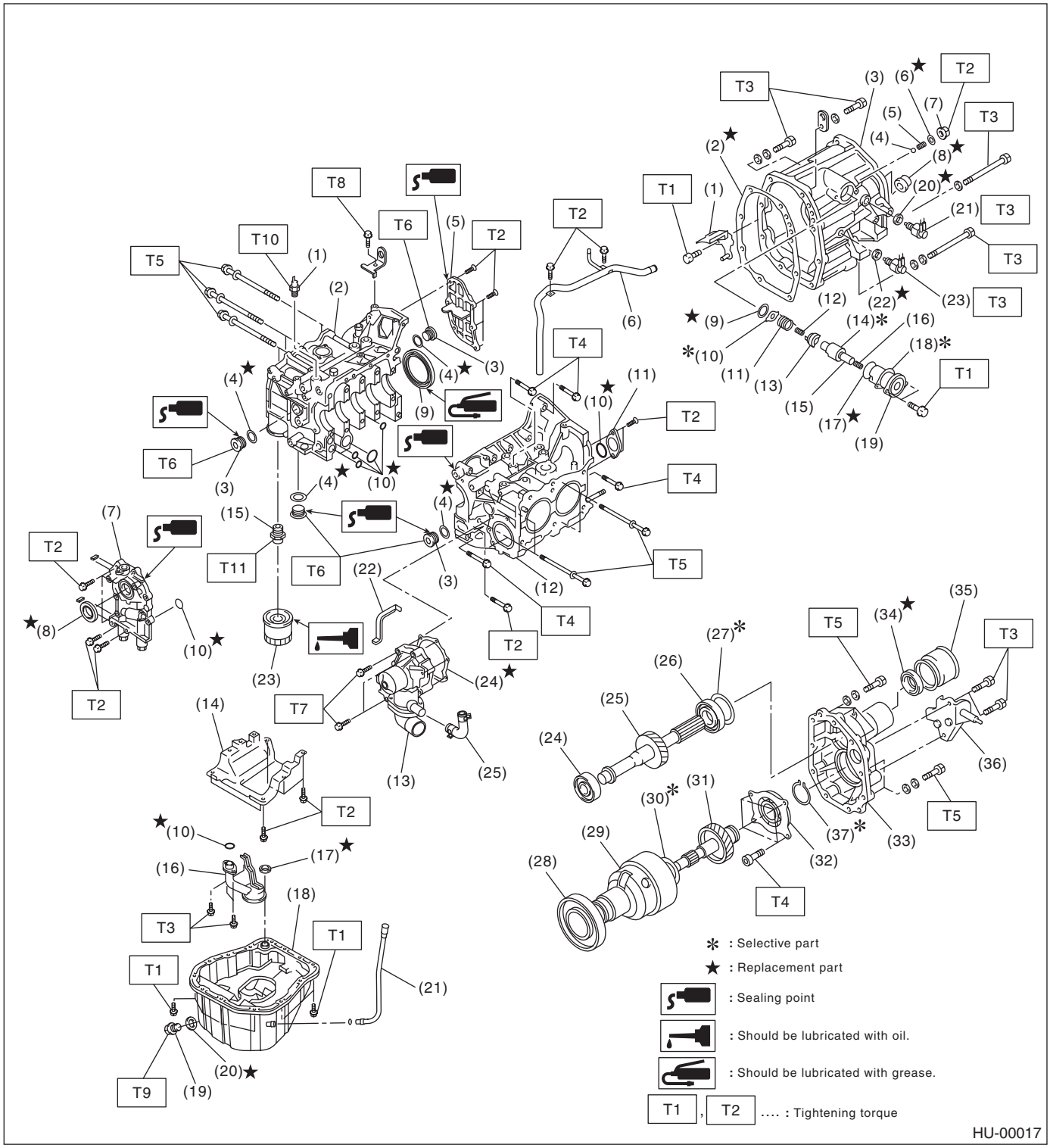
3. COMPONENT

Illustrations are provided for each component. The information necessary for repair work (tightening torque, grease up points, etc.) is described on these illustrations. Information is described using symbol.
To order parts, refer to parts catalogue.

Example:



9. SI UNITS

Measurements in these manuals are according to the SI units. Metric and yard/pound measurements are also included.

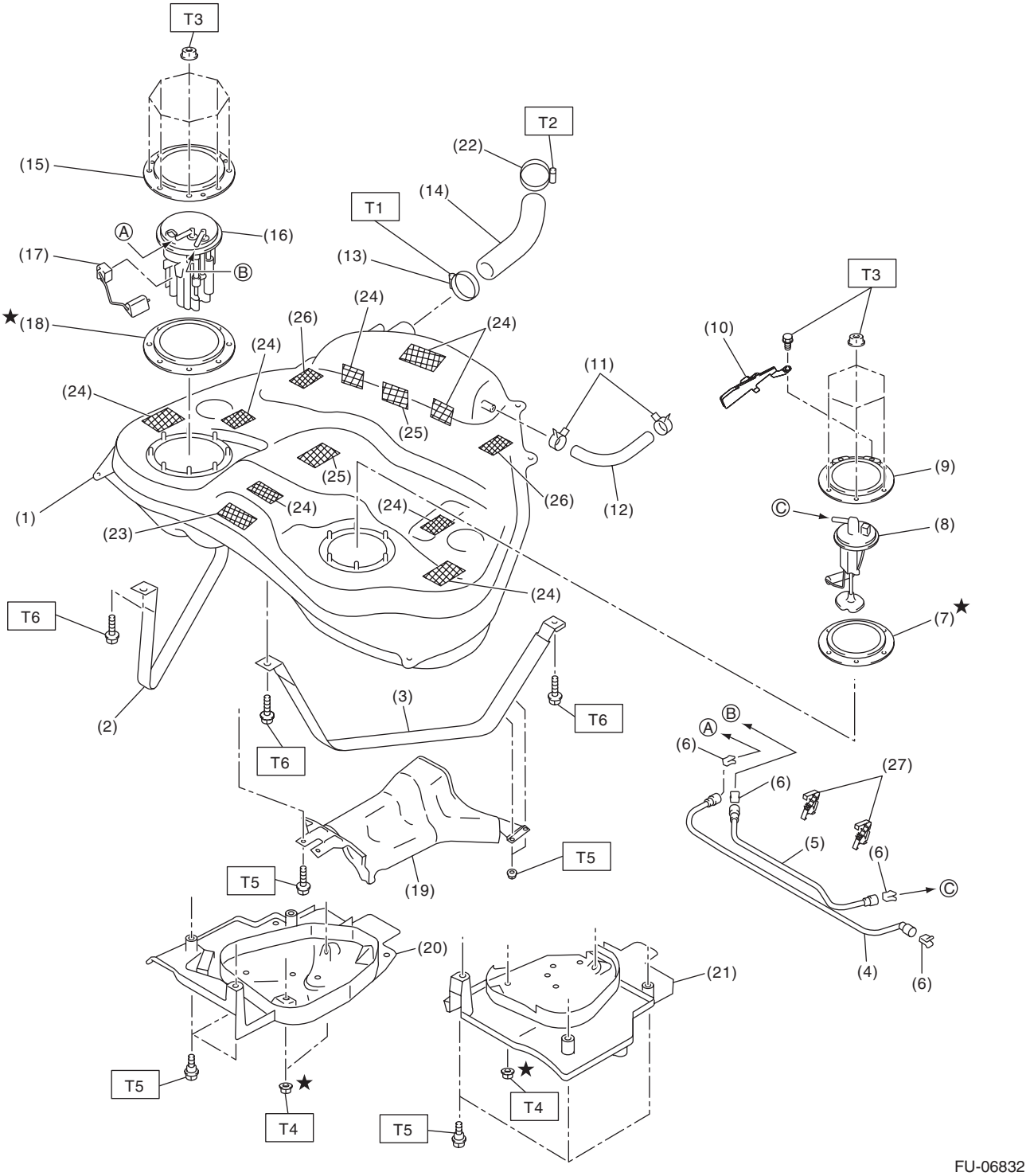
Example:

Tightening torque:
44 N·m (4.5 kgf-m, 33 ft-lb)

Item	SI units	Conventional unit	Remarks
Force	N (Newton)	kgf	1 kgf = 9.80655 N
Mass (Weight)	kg, g	kg, g	
Capacity	ℓ, mℓ or cm^3	ℓ or cc	1 cc = 1 cm^3 = 1 mℓ
Torque	N·m	kgf-m, kgf-cm	1 kgf-m = 9.80655 N·m
Rotating speed	rpm	rpm	
Pressure	kPa (kilopascal)	kgf/cm^2	1 kgf/cm^2 = 98.0655 kPa
		mmHg	1 mmHg = 0.133322 kPa
Power	W	PS	1 PS = 0.735499 kW
Calorie	W·h	cal	1 kcal = 1.16279 W·h
Fuel consumption rate	g/kW·h	g/PS·h	1 g/PS·h = 1.3596 g/kW·h

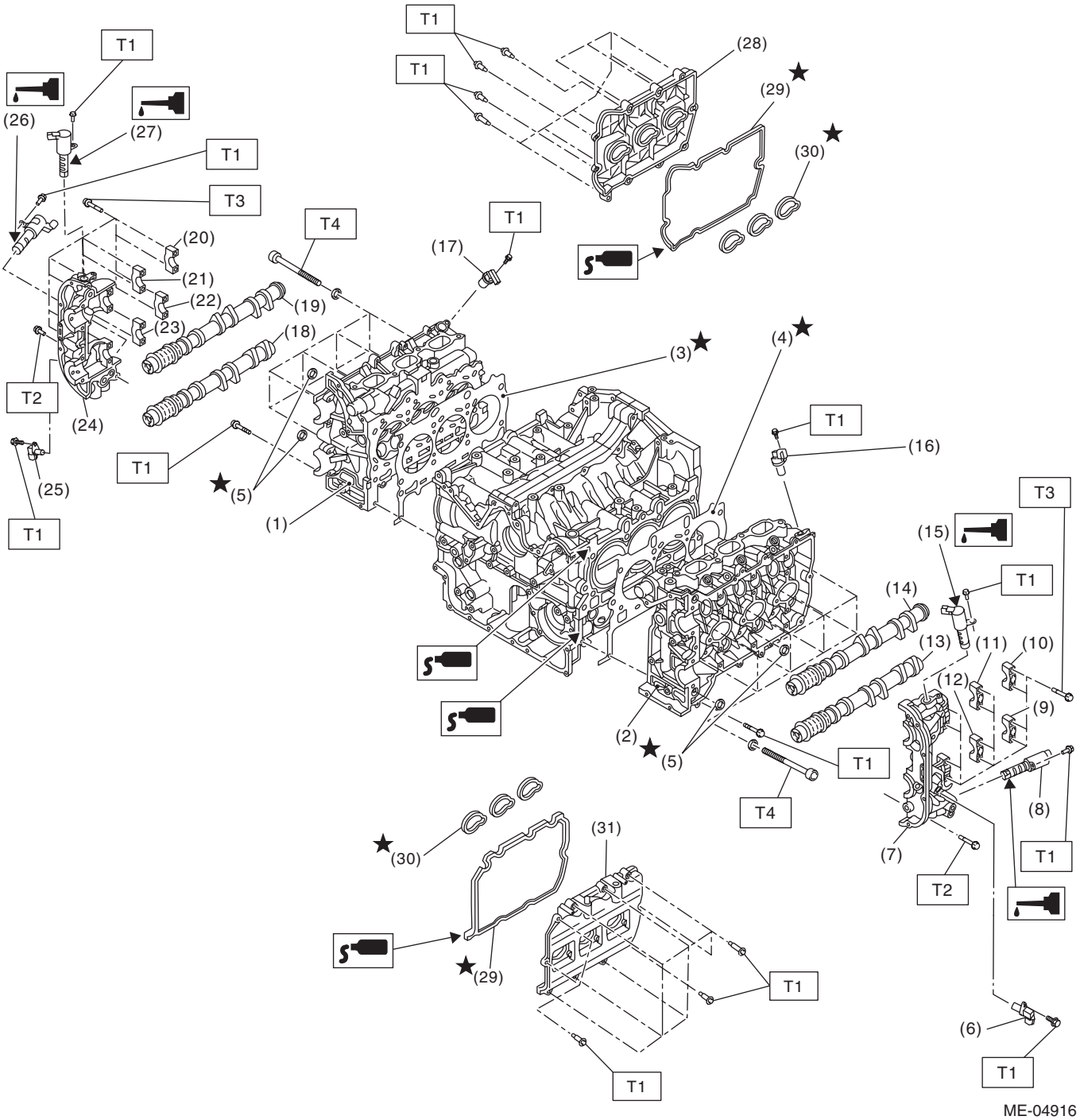
The figure used in these manuals are described in the SI units and conventional units are described in ( ).

6. FUEL TANK



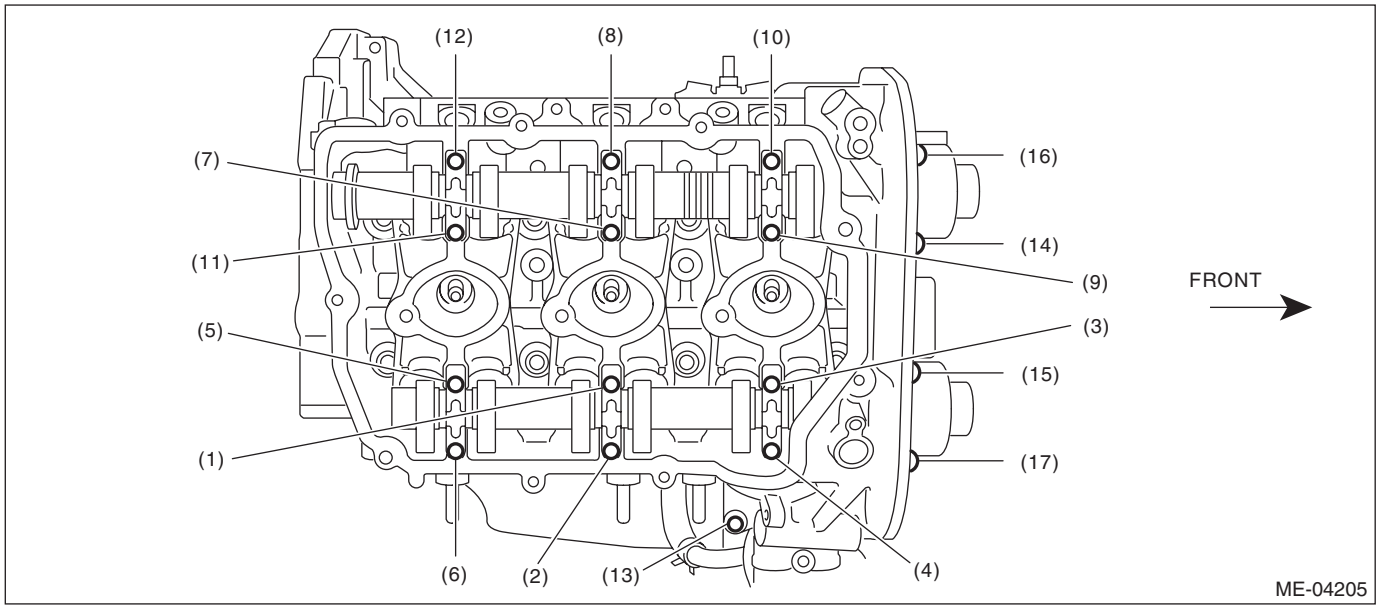
FU-06832

4. CYLINDER HEAD AND CAMSHAFT



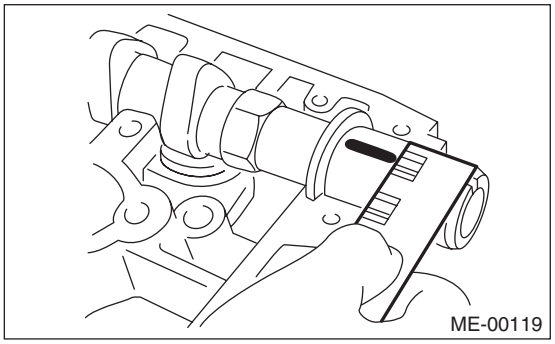
7) Measure the oil clearance of camshaft journal.
(1) Clean the camshaft cap and cylinder head camshaft journal.
(2) Place the camshaft on cylinder head. (Without installing the valve lifter)
(3) Place a plastigauge across each camshaft journals.
(4) Gradually tighten the camshaft cap in at least two stages in the numerical order shown in the figure, then tighten to specified torque. Do not turn the camshaft.

Tightening torque:
(1) — (12): 16 N·m (1.6 kgf-m, 11.8 ft-lb)
(13) — (17): 9.75 N·m (1.0 kgf-m, 7.2 ft-lb)



(5) Remove the camshaft cap.
(6) Measure the widest point of the plastigauge on each journal. If oil clearance exceeds the standard, replace the camshaft. If necessary, replace the camshaft caps and cylinder head as a set.

Camshaft oil clearance:
Standard
0.037 — 0.072 mm (0.0015 — 0.0028 in)



(7) Completely remove the plastigauge.

8) Measure the thrust clearance with setting the dial gauge at end surface of camshaft. If the thrust clearance is not within the standard or there is offset wear, replace the camshaft caps and cylinder head as a set. If necessary replace the camshaft.

Camshaft thrust clearance:

Standard
Intake
0.075 — 0.135 mm (0.0030 — 0.0053 in)
Exhaust
0.075 — 0.135 mm (0.0030 — 0.0053 in)

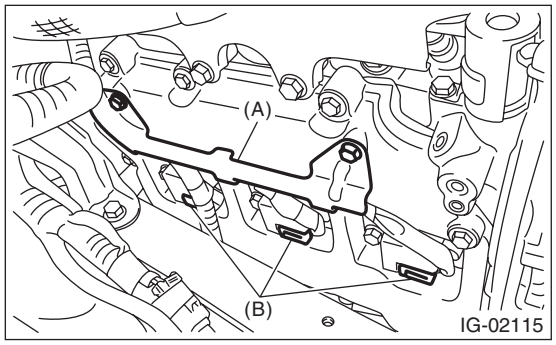
2. Spark Plug

A: REMOVAL

Spark plug:
<Ref. to IG(H6DO)-2, SPECIFICATION, General Description.>

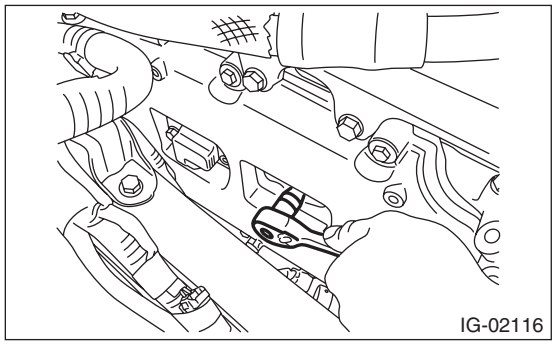
1. RH SIDE

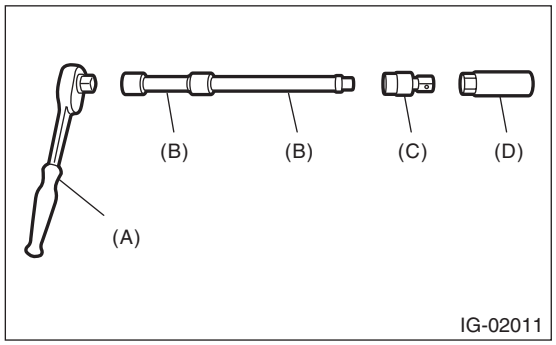
1) Remove the collector cover.
2) Disconnect the ground cable from battery.
3) Remove the air cleaner case. <Ref. to IN(H6DO)-6, REMOVAL, Air Cleaner Case.>
4) Remove the engine harness stay (A).
5) Disconnect the connector (B) from ignition coil.



6) Remove the ignition coil.

NOTE:
Turn the #5 ignition coil to remove it.
7) Remove the spark plug with a spark plug socket.

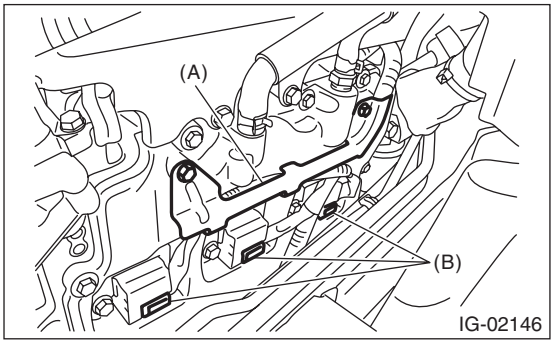




(A) Ratchet handle
(B) Extension bar
(C) Universal joint
(D) Spark plug socket

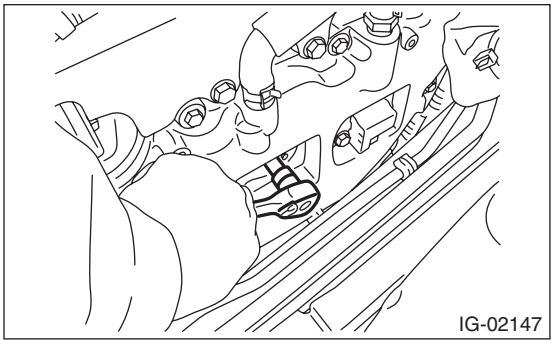
2. LH SIDE

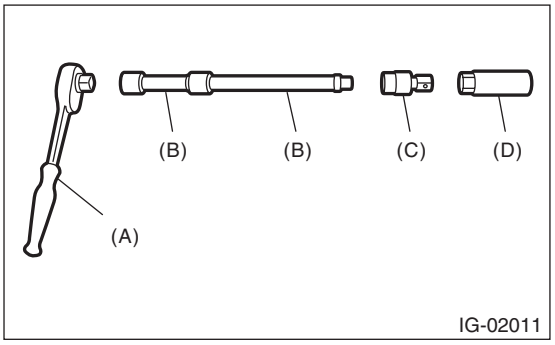
1) Remove the collector cover.
2) Remove the battery and battery carrier. <Ref. to SC(H6DO)-19, REMOVAL, Battery.>
3) Remove the engine harness stay (A).
4) Disconnect the connector (B) from ignition coil.



5) Remove the ignition coil.

NOTE:
Turn the #6 ignition coil to remove it.
6) Remove the spark plug with a spark plug socket.





(A) Ratchet handle
(B) Extension bar
(C) Universal joint
(D) Spark plug socket

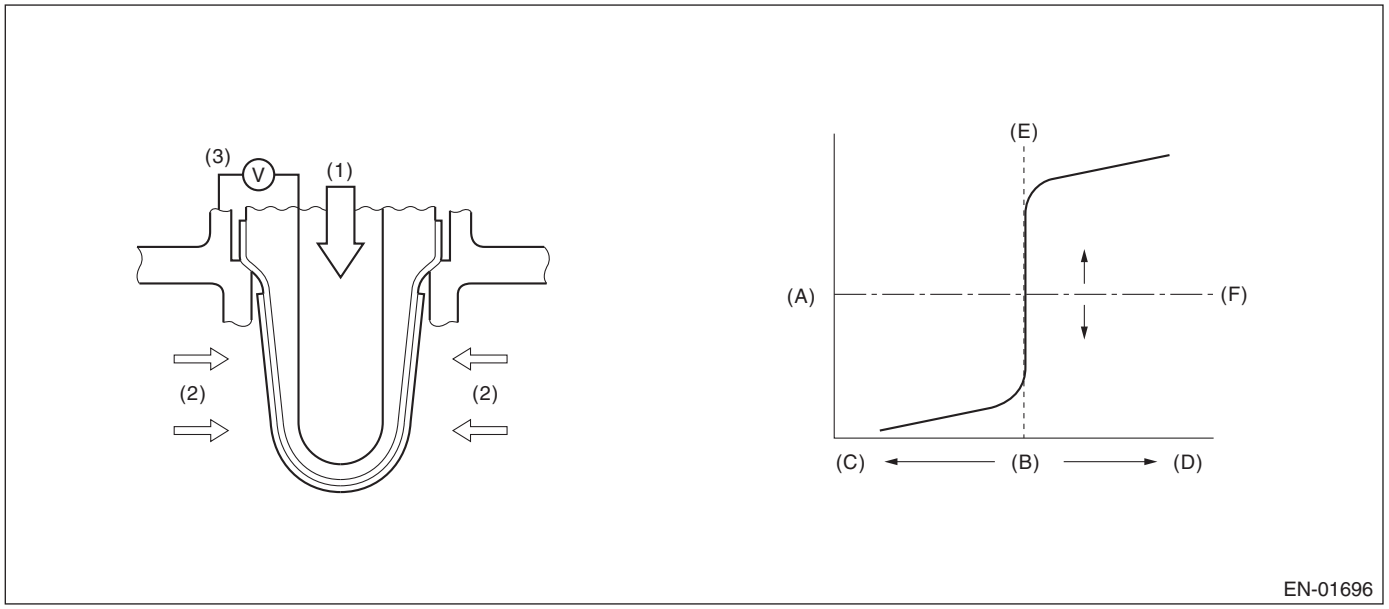
	Step	Check	Yes	No
1	**CHECK POWER SUPPLY CIRCUIT TO FUEL PUMP CONTROL UNIT.** 1) Turn the ignition switch to OFF. 2) Disconnect the connector from fuel pump control unit. 3) Turn the ignition switch to ON. 4) Measure the voltage between fuel pump control unit and chassis ground. ***Connector & terminal*** ***(R122) No. 10 (+) — Chassis ground (–):***	Is the voltage 10 V or more?	Go to step **2**.	Repair the power supply circuit. NOTE: In this case, repair the following item: • Open circuit or short circuit to ground in harness between fuel pump relay connector and fuel pump control unit connector • Poor contact of fuel pump relay connector • Poor contact of coupling connector
2	**CHECK GROUND CIRCUIT OF FUEL PUMP CONTROL UNIT.** 1) Turn the ignition switch to OFF. 2) Measure the resistance of harness between fuel pump control unit and chassis ground. ***Connector & terminal*** ***(R122) No. 5 — Chassis ground:***	Is the resistance less than 5 Ω?	Go to step **3**.	Repair the open circuit in harness between fuel pump control unit connector and chassis ground.
3	**CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.** 1) Disconnect the connector from fuel pump. 2) Measure the resistance of harness between fuel pump control unit and fuel pump connector. ***Connector & terminal*** ***(R122) No. 7 — (R58) No. 5:*** ***(R122) No. 6 — (R58) No. 6:***	Is the resistance less than 1 Ω?	Go to step **4**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between fuel pump control unit connector and fuel pump connector • Poor contact of coupling connector
4	**CHECK HARNESS BETWEEN FUEL PUMP CONTROL UNIT AND FUEL PUMP CONNECTOR.** Measure the resistance between fuel pump control unit and chassis ground. ***Connector & terminal*** ***(R122) No. 7 — Chassis ground:*** ***(R122) No. 6 — Chassis ground:***	Is the resistance 1 MΩ or more?	Go to step **5**.	Repair the short circuit to ground in harness between fuel pump control unit connector and fuel pump connector.
5	**CHECK HARNESS BETWEEN ECM AND FUEL PUMP CONTROL UNIT.** 1) Disconnect the connector from ECM. 2) Measure the resistance of the harness between the ECM and fuel pump control unit. ***Connector & terminal*** ***(B136) No. 33 — (R122) No. 8:*** ***(B135) No. 10 — (R122) No. 9:***	Is the resistance less than 1 Ω?	Go to step **6**.	Repair the harness and connector. NOTE: In this case, repair the following item: • Open circuit in harness between ECM and fuel pump control unit connector • Poor contact of coupling connector

AR:DTC P013E O2 SENSOR DELAYED RESPONSE - RICH TO LEAN (BANK 1 SENSOR 2)

1. OUTLINE OF DIAGNOSIS

Detect the delayed response of rear oxygen sensor output for rich → lean.
After the deceleration fuel cut has started, detect the trouble by calculating the time when the rear oxygen sensor output decreases to the predetermined voltages.
Judge as NG when the response time is larger than the threshold value.

2. COMPONENT DESCRIPTION



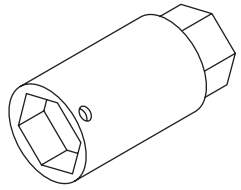
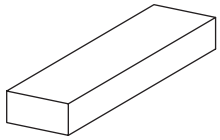
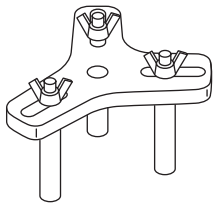
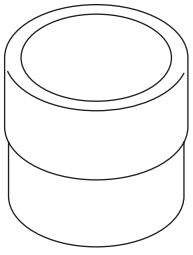
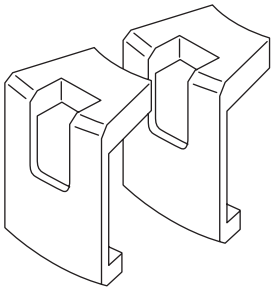
(A)	Electromotive force	(B)	Air fuel ratio	(C)	Rich
(D)	Lean	(E)	Theoretical air fuel ratio	(F)	Comparative voltage
(1)	Atmosphere	(2)	Exhaust gas	(3)	Electromotive force

3. ENABLE CONDITIONS

Secondary Parameters	Enable Conditions
Battery voltage	> 10.9 V
Rear oxygen sensor closed loop control	Operation
Engine speed when fuel cut starts	≥ 1400 rpm
Rear oxygen sensor voltage when fuel cut starts	≥ 0.55 V
Fuel cut time	≥ 5000 ms
Engine coolant temperature when fuel cut starts	≥ 75 °C (167 °F)
Estimated temperature of rear oxygen sensor element when fuel cut starts	≥ 480 °C (896 °F)

4. GENERAL DRIVING CYCLE

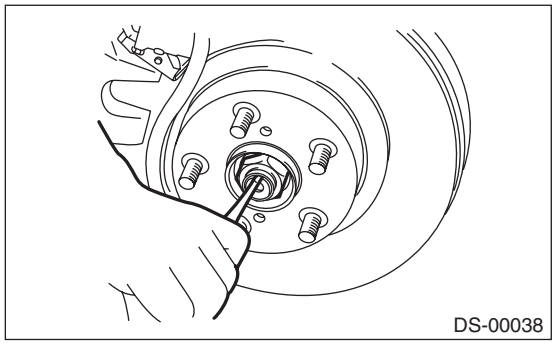
Perform diagnosis once during deceleration fuel cut from a constant and high speed driving, when rear oxygen sensor is warmed up sufficiently.

ILLUSTRATION	TOOL NUMBER	DESCRIPTION	REMARKS
 ST-499787500	499787500	ADAPTER	Used for removing and installing drive pinion lock nut.
 ST-499575400	499575400	GAUGE	Used for measuring height of total end play.
 ST18762AA000	18762AA000	COMPRESSOR SPECIAL TOOL	Used for disassembling multi-plate clutch for shift transmission.
 ST-499755602	499755602	PRESS	Used for installing the parking gear.
 ST18680AA010	18680AA010	HOLDER GEAR	Used for removing reduction driven gear assembly. (2-piece set)

4. Rear Axle

A: REMOVAL

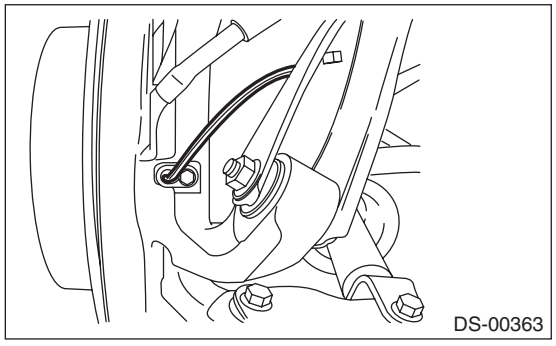
1) Disconnect the ground cable from battery.
2) Lift up the vehicle, and then remove the rear wheels.
3) Lift the crimped section of axle nut.



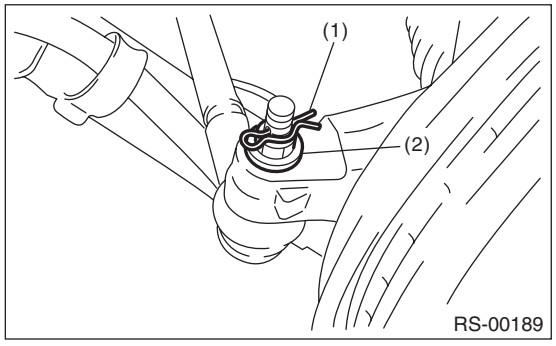
4) Remove the axle nut using a socket wrench while depressing the brake pedal.

CAUTION:
Remove the wheel before loosening the axle nut. Failure to follow this rule may damage the wheel bearings.

5) Remove the parking brake cable from parking brake assembly. <Ref. to PB-7, REMOVAL, Parking Brake Assembly (Rear Disc Brake).>
6) Remove the rear ABS wheel speed sensor.

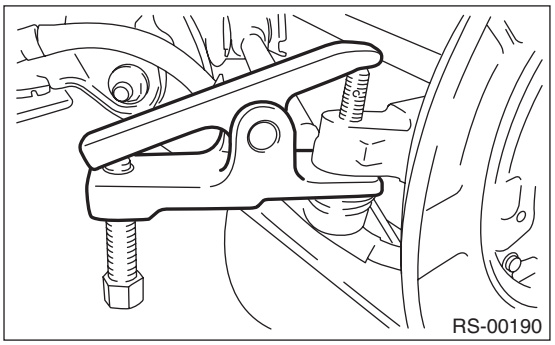


7) Remove the snap pin and nut from the front lateral link.

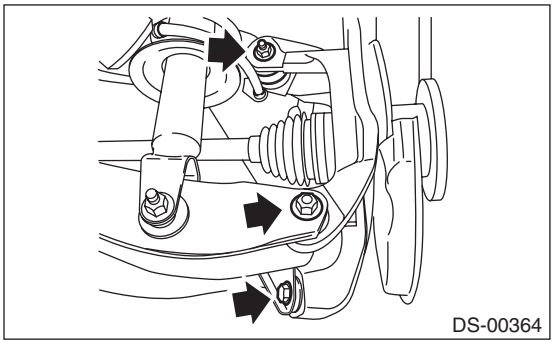


(1) Snap pin
(2) Nut

8) Using a puller, separate the rear housing and ball joint.



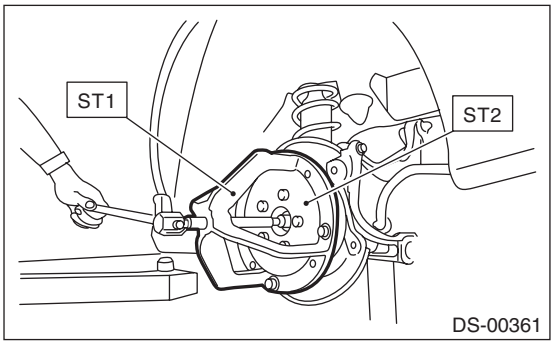
9) Detach the upper arm, trailing link, and rear lateral link from the rear housing.



10) Remove the rear axle.

NOTE:
If it is hard to remove, use the ST.

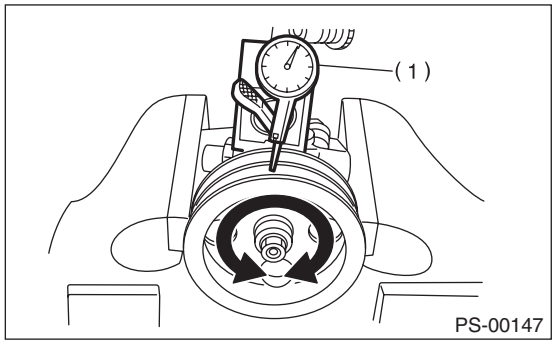
ST1	926470000	AXLE SHAFT PULLER
ST2	28099PA110	AXLE SHAFT PULLER PLATE



2) Deflection of the pulley groove

Service limit:
1.0 mm (0.039 in) or less

NOTE:
Read the value for one surface of V ditch, and then the value for another off the dial.

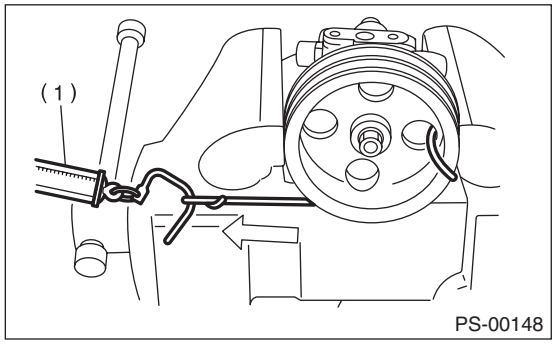


(1) Dial gauge

3) Rotating resistance of pulley

Service limit:
Maximum load: 9.22 N (0.94 kgf, 2.07 lb) or less

NOTE:
• A rather higher value may be indicated when pulley starts turning.
• Measure the load during rotation to make a judgment.



(1) Spring scale

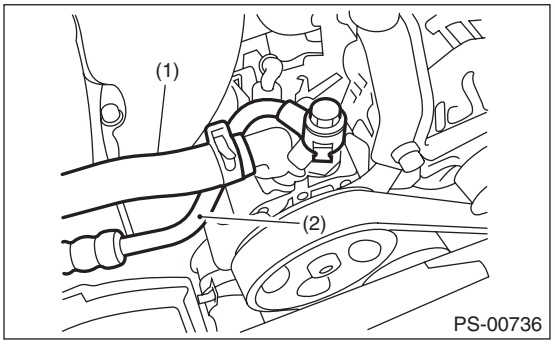
3. HYDRAULIC PRESSURE

NOTE:
• To measure hydraulic pressure correctly, be sure to complete all the items in “INSPECTION”, prior to performing the measurement. <Ref. to PS-49, INSPECTION, General Diagnostic Table.>
• Do not leave the valve of pressure gauge closed or hold the steering wheel at lock for 5 seconds or more in any case, this can damage the oil pump.
• Before attaching a pressure gauge, place cloth at locations where fluid is expected to spill. Wipe off any spilt fluid completely after the measurement.

1) Regular pressure measurement
(1) Connect the ST1, ST2 and ST3.

ST1 925711000 PRESSURE GAUGE
ST2 34099AC020 ADAPTER HOSE B
ST3 34099AC010 ADAPTER HOSE A

(2) Remove the air intake duct.
(3) Disconnect the pipe C from pump.
(4) Using the gasket (Part No. 34621AC021) and bolt (Part No. 34620AC010), install the ST2 to pump instead of pressure hose.



(1) Suction hose
(2) Pressure hose

(5) Attach the ST3 to the end of pressure hose which is removed from pump.
(6) Replenish power steering fluid up to the specified level.
(7) Open the valve, and start the engine.

	Step	Check	Yes	No
5	**CHECK SUBARU SELECT MONITOR.**	Is Subaru Select Monitor powered on?	Go to step **7**.	Go to step **6**.
6	**CHECK FUSE.** Remove fuse No. 13 from the fuse & relay box, and perform visual inspection.	Is the fuse OK?	Repair the harness between the battery and the data link connector.	Replace the fuse. If the fuse is blown out again, check the power supply circuit.
7	**CHECK AIRBAG CONTROL MODULE CONNECTOR.** 1) Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more. 2) Confirm that the connectors of the airbag control modules (AB6, AB17, AB18) are securely connected.	Is the connector of the airbag control module securely connected?	Go to step **8**.	Connect the connector of the airbag control module.
8	**CHECK SUBARU SELECT MONITOR COMMUNICATION.** 1) Disconnect the airbag control module connector. 2) Connect the battery ground terminal. 3) Turn the ignition switch to ON. 4) Check whether communication to other systems can be executed normally.	Is the system name displayed on Subaru Select Monitor?	Replace the airbag control module. <Ref. to AB-20, Airbag Control Module.>	Go to step **9**.
9	**CHECK HARNESS CONNECTOR BETWEEN EACH CONTROL MODULE AND DATA LINK CONNECTOR.** 1) Turn the ignition switch to OFF. 2) Disconnect the airbag control module, VDCCM&H/U, body integrated unit, power steering CM, ECM and TCM. 3) Measure the resistance between data link connector and chassis ground. ***Connector & terminal*** ***(B402) No. 7 — Chassis ground:***	Is the resistance 1 MΩ or more?	Go to step **10**.	Repair the harness and connector between each control module and data link connector. (Replace the entire harness if repair is necessary for airbag harness.)
10	**CHECK OUTPUT SIGNAL TO THE AIRBAG CONTROL MODULE.** 1) Turn the ignition switch to ON in the condition of step 9. 2) Measure the voltage between data link connector and chassis ground. ***Connector & terminal*** ***(B402) No. 7 (+) — Chassis ground (–):***	Is the voltage less than 1 V?	Repair each control module.	Repair the harness and connector between each control module and data link connector. (Replace the entire harness if repair is necessary for airbag harness.)
11	**CHECK FUSE.** Remove fuse No. 25 from the fuse & relay box, and perform visual inspection.	Is the fuse OK?	Go to step **12**.	Replace the fuse. If the fuse is blown out again, check the power supply circuit.
12	**CHECK AIRBAG CONTROL MODULE CONNECTOR.** 1) Turn the ignition switch to OFF, disconnect the battery ground cable, and wait for 60 seconds or more. 2) Confirm that the connectors of airbag control module (AB6, AB17, AB18) are securely connected.	Is the connector of the airbag control module securely connected?	Go to step **13**.	Connect the connector of the airbag control module.

4. Rearview Camera System

A: WIRING DIAGRAM

<Ref. to WI-131, WIRING DIAGRAM, Rearview Camera System.>

B: INSPECTION

- When the display does not come on

The screen of rear view camera is not displayed. (The navigation screen is displayed normally.)

1. Check the back sensor for each connection: Make sure that the back sensor is ON. <Ref. to ET-4, CHECK THE BACK SENSOR, INSPECTION, Navigation System.>
2. Check the rear view camera connection.
3. Check the rear view camera control module.

- When marker does not show

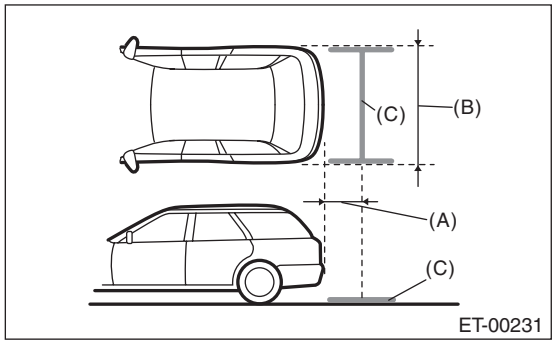
1. Check the rear view camera connection.
2. Check the rear view camera control module.

C: ADJUSTMENT

1. MARKER ADJUSTMENT MODE

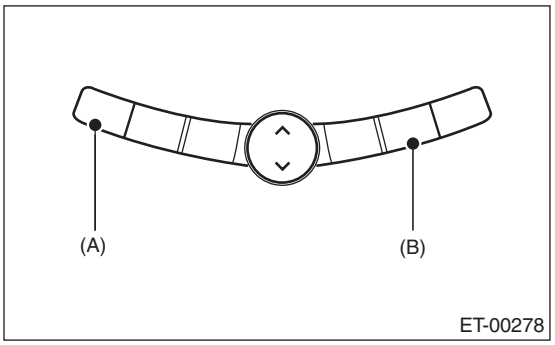
1) Park vehicle on a level surface with wide space around the vehicle rear side.
2) Adhere tapes on the floor of the vehicle rear side as shown in the figure, as the datum point of makers.

NOTE:
Use a tape of approx. 30 mm width in bright colors as a criterion.



(A) 500 mm (19.7 in)
(B) 2,180 mm (85.8 in)
(C) Tapes as criteria

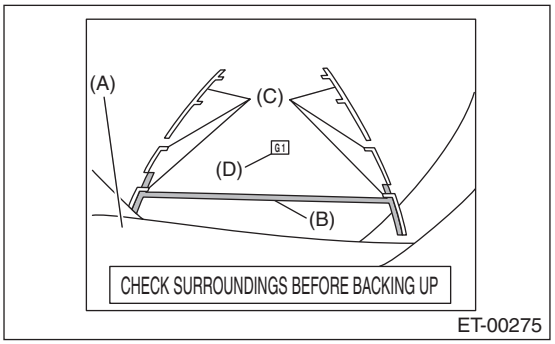
3) While pressing key (A) and key (B) of navigation switch, turn the ignition switch to ACC to enter the test mode.



4) Touch REAR CAMERA MODE in the monitor and go to the maker adjustment mode.

CAUTION:
Do not select other than REAR CAMERA MODE; the navigation system or the navigation monitor may not operate normally.

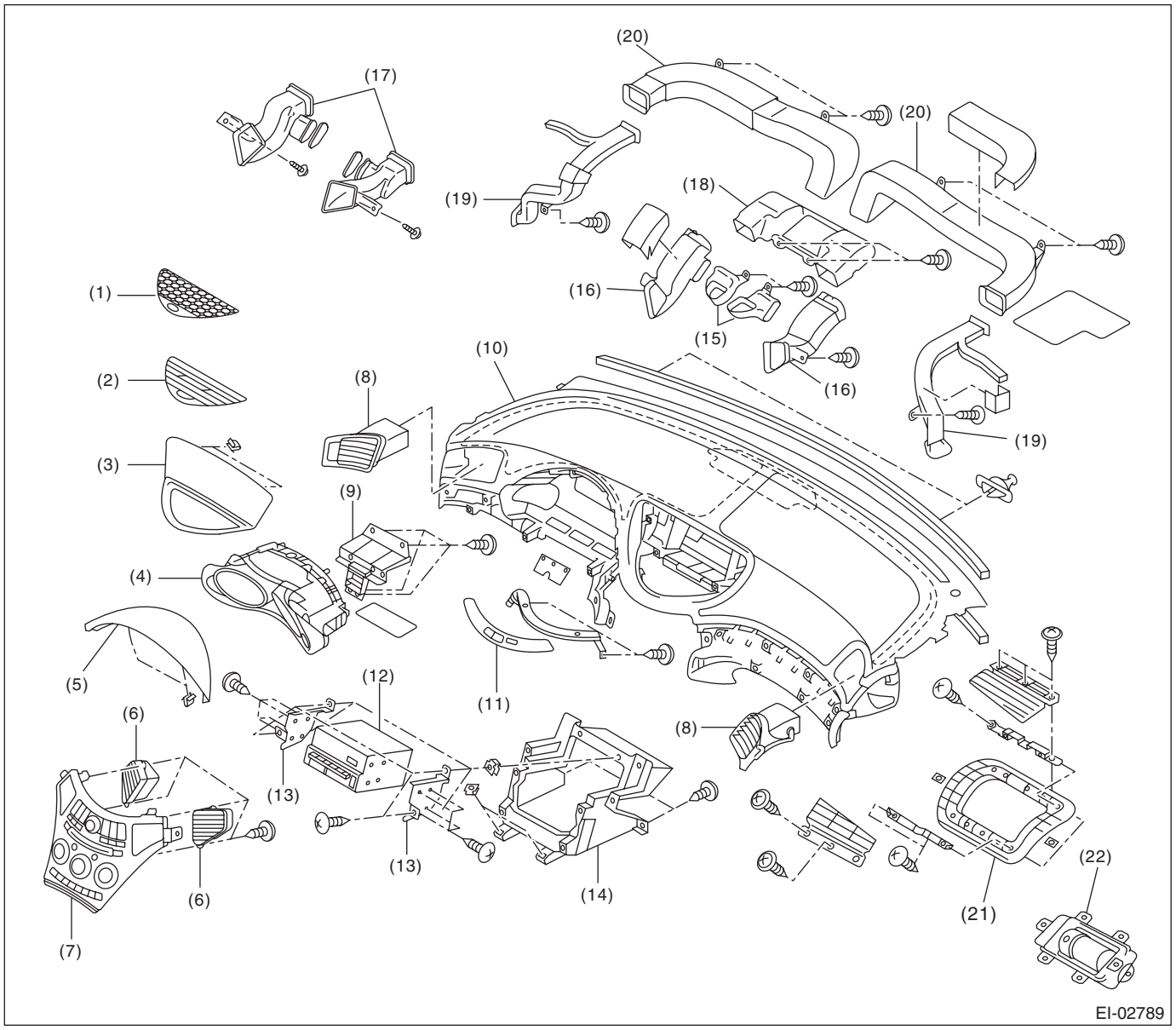
5) Touch the monitor to change maker pattern.
6) Marker pattern will be stored by turning ignition switch to OFF.



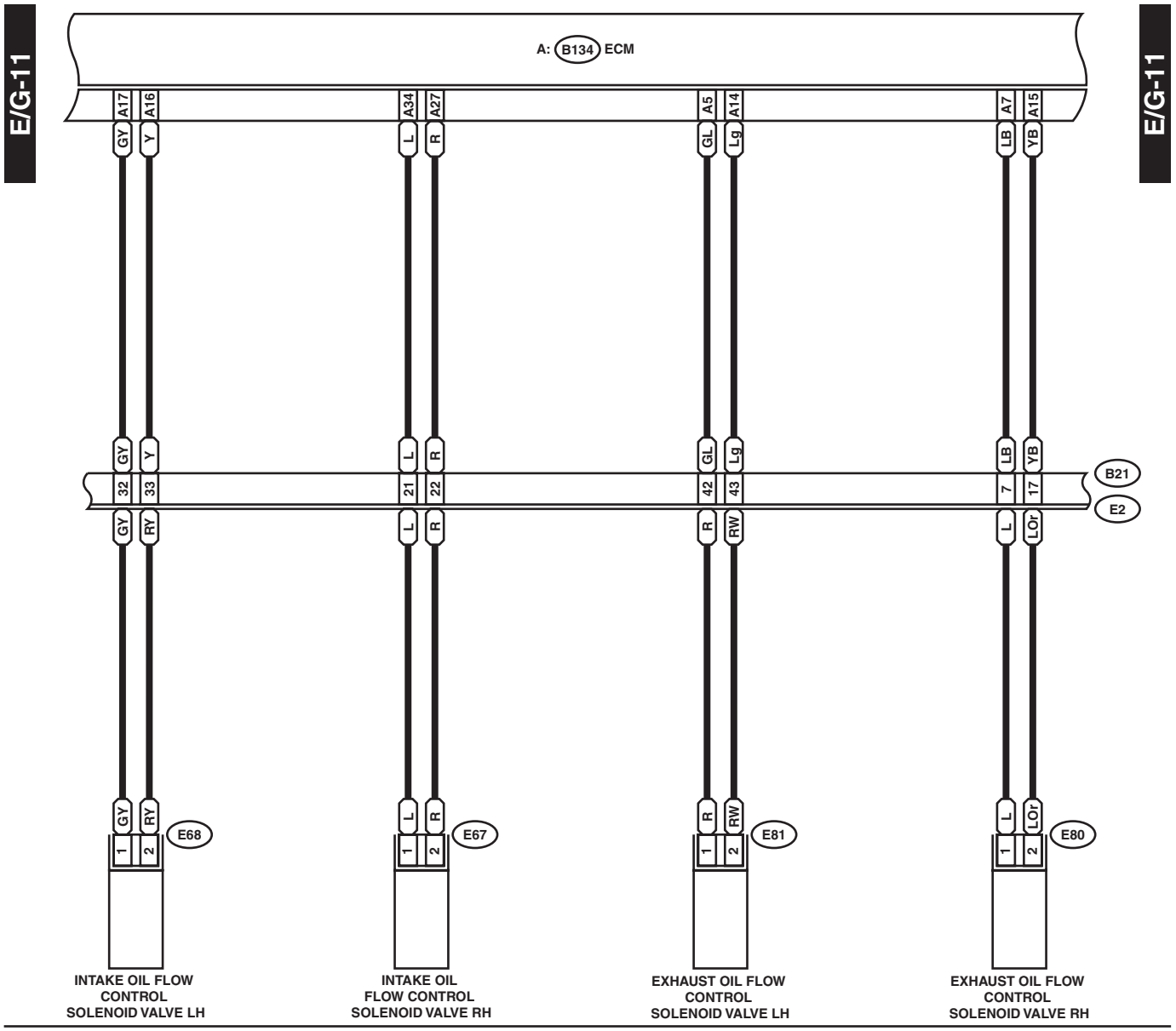
(A) Rear bumper
(B) Tapes adhered in step 2)
(C) Marker
(D) Marker No.

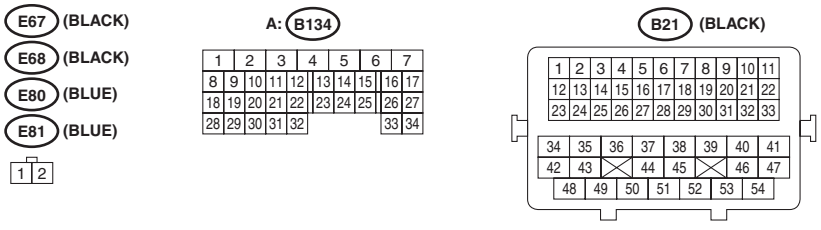
NOTE:
Adjust the marker so that the marker laps over the tape or is placed outside of the tape.

13.INSTRUMENT PANEL



(1) Speaker grille (for harman/kardon audio)
(2) Air vent upper grille
(3) Display cover
(4) Combination meter ASSY
(5) Meter visor
(6) Air vent center grille
(7) Control panel
(8) Air vent side grille
(9) Meter stay
(10) Instrument panel upper ASSY
(11) Upper control switch
(12) Audio ASSY
(13) Audio bracket
(14) Center console frame
(15) Upper duct
(16) Center duct
(17) Center duct (for harman/kardon audio)
(18) Center ventilation duct
(19) Side defroster duct
(20) Side ventilation duct
(21) Passenger's airbag stay
(22) Passenger's airbag module ASSY


E/G-11
E/G-11
A: B134 ECM
A17
A16
A34
A27
A5
A14
A7
A15
GY
Y
L
R
GL
Lg
LB
YB
32
33
21
22
42
43
7
17
B21
E2
GY
RY
L
R
R
RW
L
LOr
1
2
E68
E67
E81
E80
INTAKE OIL FLOW CONTROL SOLENOID VALVE LH
INTAKE OIL FLOW CONTROL SOLENOID VALVE RH
EXHAUST OIL FLOW CONTROL SOLENOID VALVE LH
EXHAUST OIL FLOW CONTROL SOLENOID VALVE RH


E67 (BLACK)
E68 (BLACK)
E80 (BLUE)
E81 (BLUE)
1 2
A: B134
1 2 3 4 5 6 7
8 9 10 11 12 13 14 15 16 17
18 19 20 21 22 23 24 25 26 27
28 29 30 31 32 33 34
B21 (BLACK)
1 2 3 4 5 6 7 8 9 10 11
12 13 14 15 16 17 18 19 20 21 22
23 24 25 26 27 28 29 30 31 32 33
34 35 36 37 38 39 40 41
42 43 44 45 46 47
48 49 50 51 52 53 54

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