7. Crankshaft Position Sensor

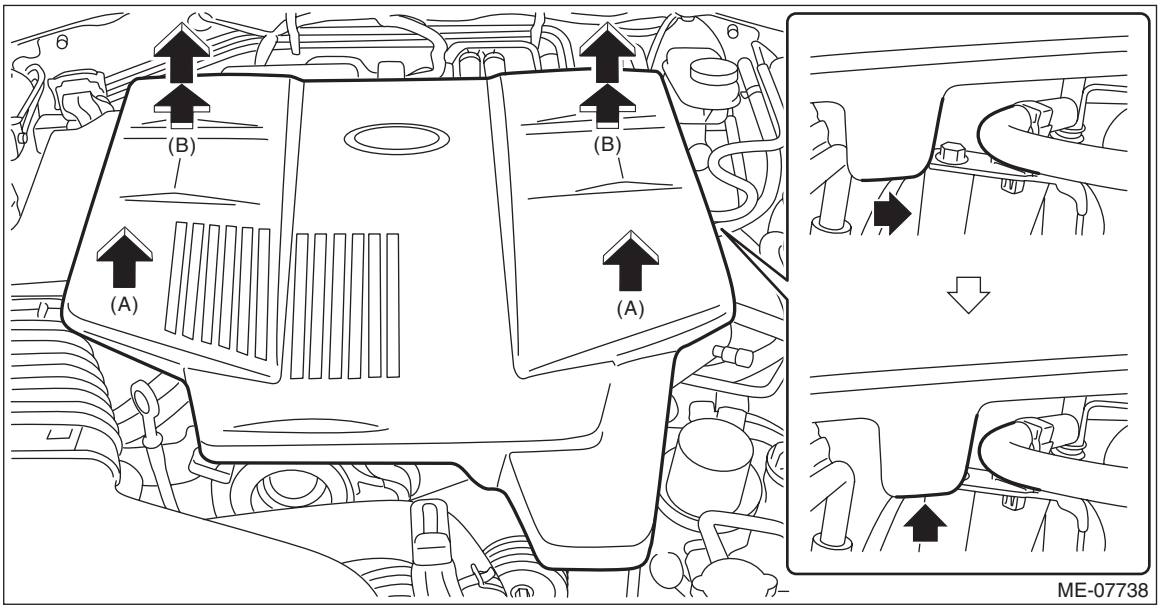
A: REMOVAL

1) Disconnect the ground cable from battery. <Ref. to NT-5, BATTERY, NOTE, Note.>

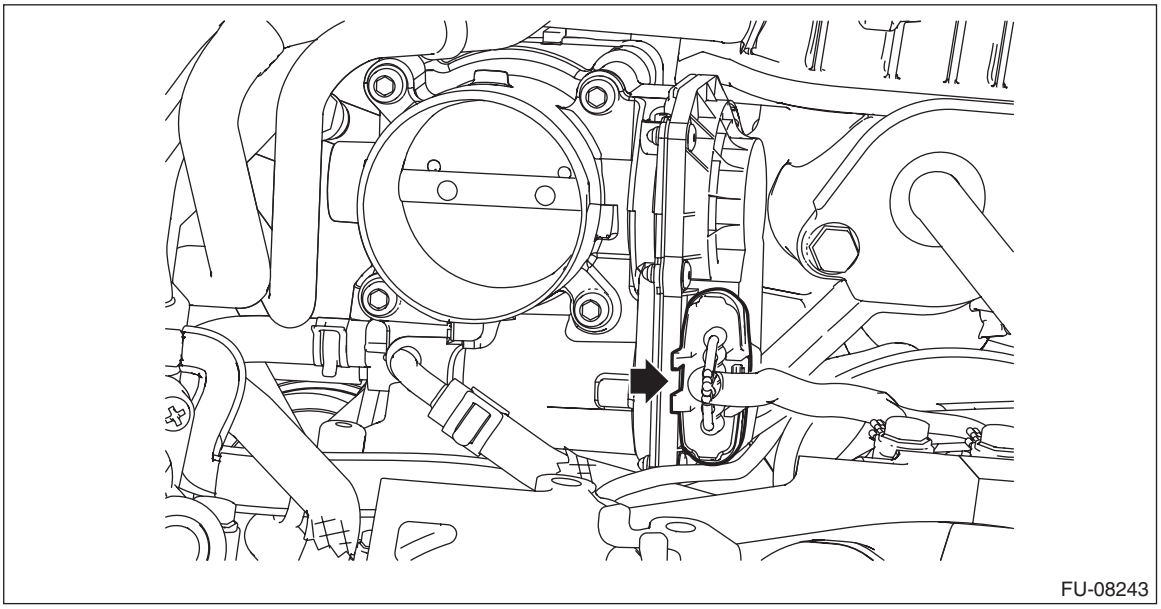
NOTE:
For the 12 volt engine restart battery, disconnect the ground terminal from 12V engine restart battery sensor.

2) Remove the collector cover.
   (1) Carefully pull up the front of collector cover at two positions (A).
   (2) Carefully pull up the rear of collector cover at two positions (B) while moving it backward.

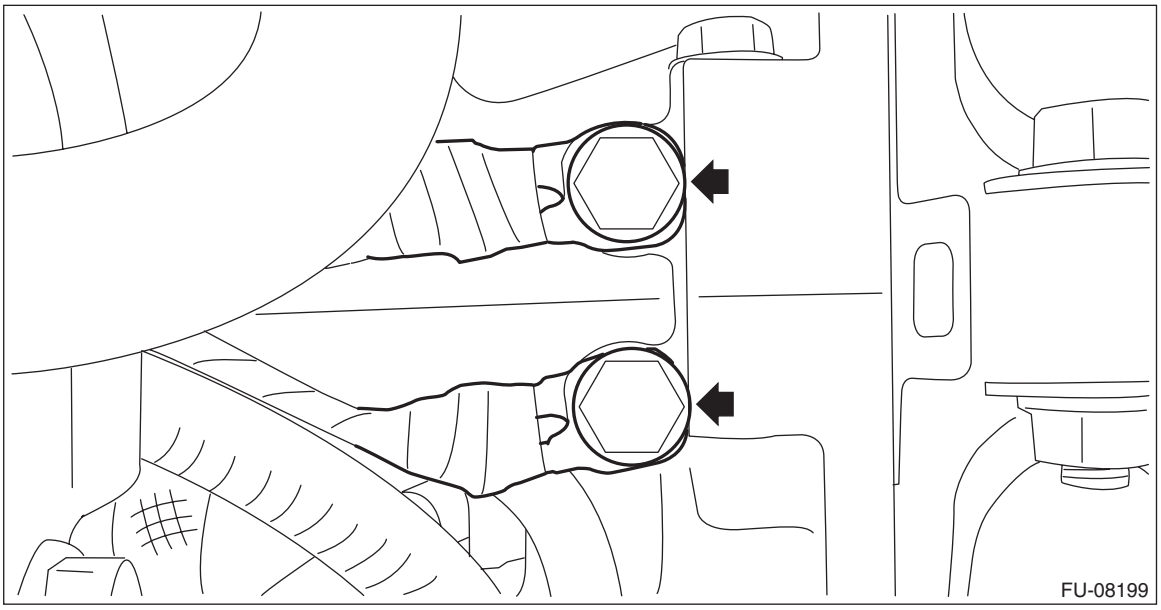
NOTE:
Be careful not to contact the fuel delivery tube when moving the collector cover rearward.



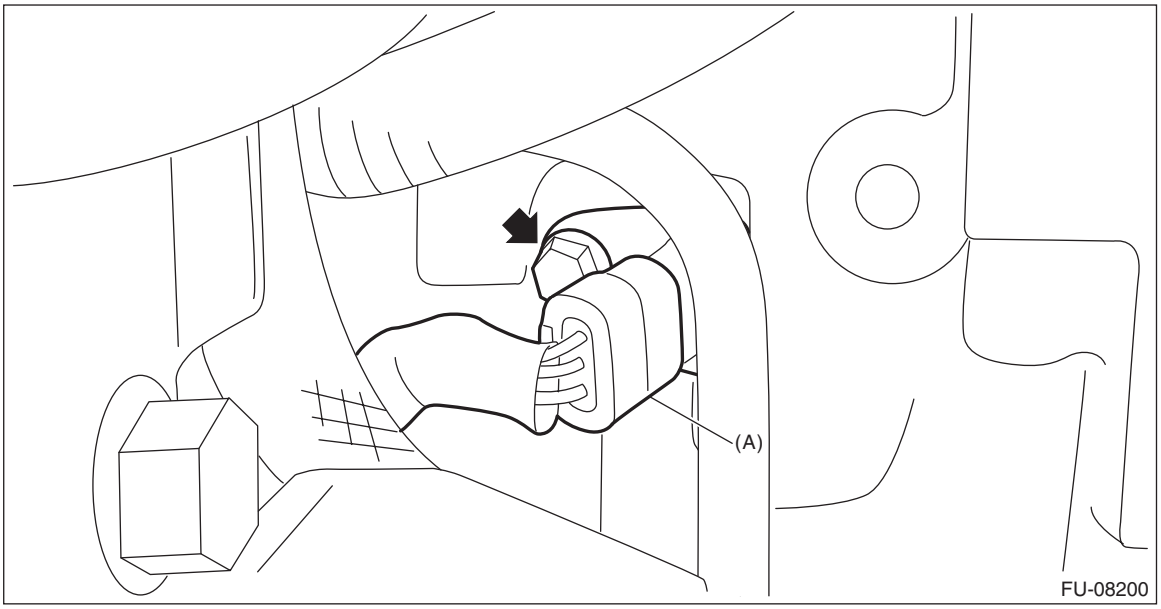
3) Remove the air cleaner case. <Ref. to IN(H4DO(HEV))-6, REMOVAL, Air Cleaner Case.>
4) Remove the air intake boot No. 2. <Ref. to IN(H4DO(HEV))-11, AIR INTAKE BOOT NO. 2, REMOVAL, Air Intake Boot.>
5) Disconnect the connector from the throttle body.



6) Disconnect the engine ground from the engine assembly.



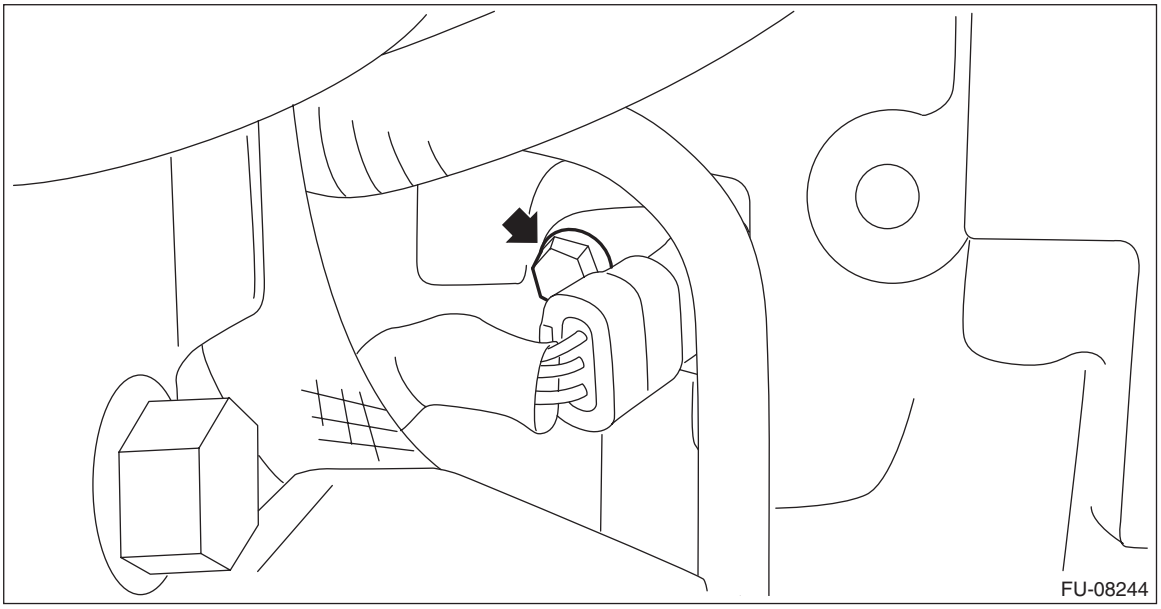
7) Disconnect the connector (A) from the crankshaft position sensor, and remove the crankshaft position sensor from the cylinder block.



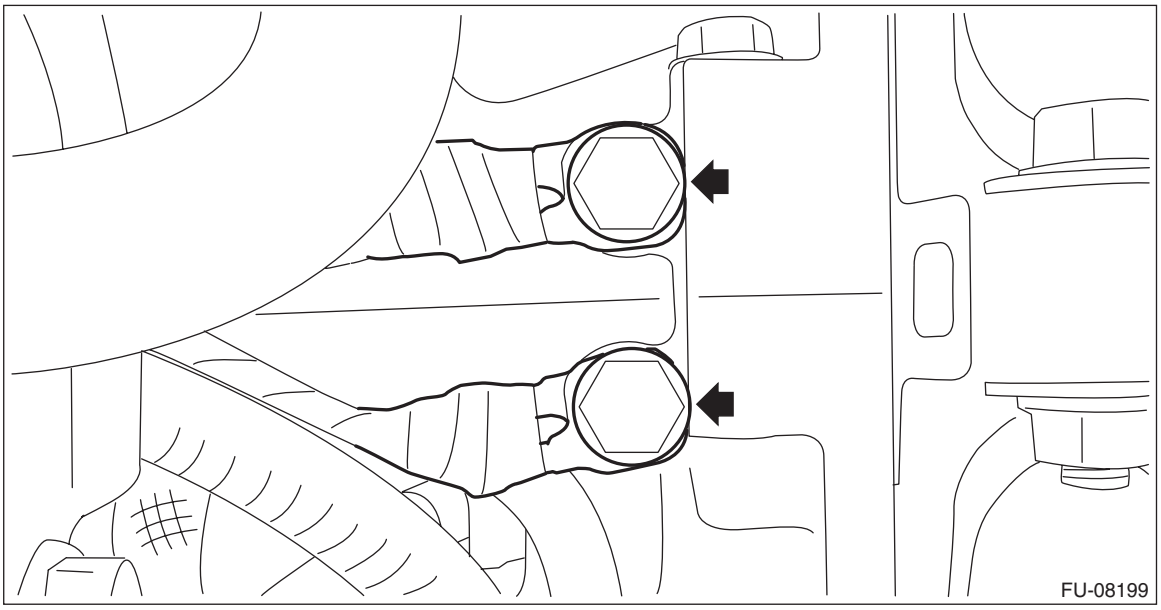
B: INSTALLATION

Install in the reverse order of removal.

Tightening torque:
6.4 N·m (0.7 kgf-m, 4.7 ft-lb)



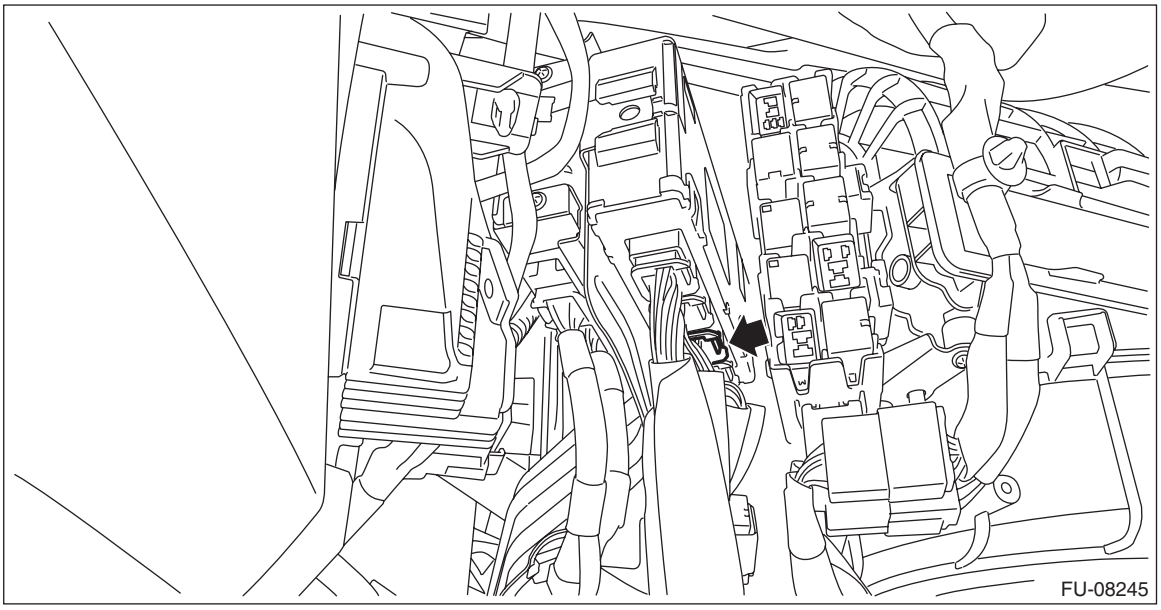
Tightening torque:
19 N·m (1.9 kgf-m, 14.0 ft-lb)

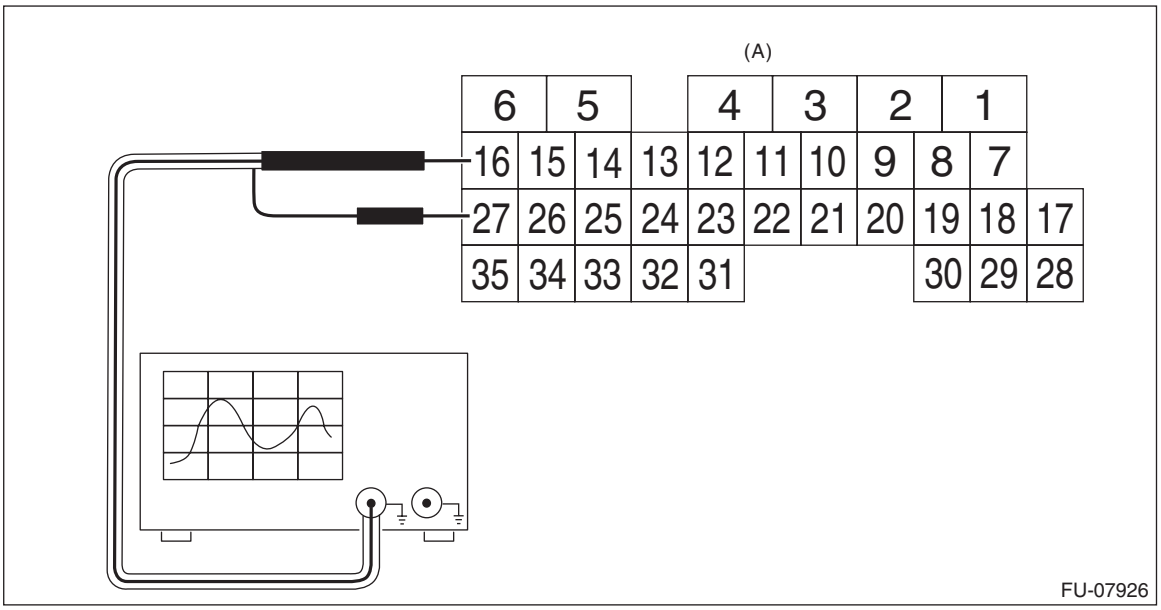


C: INSPECTION

1. CRANKSHAFT POSITION SENSOR (METHOD WITH OSCILLOSCOPE)

1) Prepare an oscilloscope.
2) Remove the glove box. <Ref. to EI-78, REMOVAL, Glove Box.>
3) Connect the probe to ECM connector.





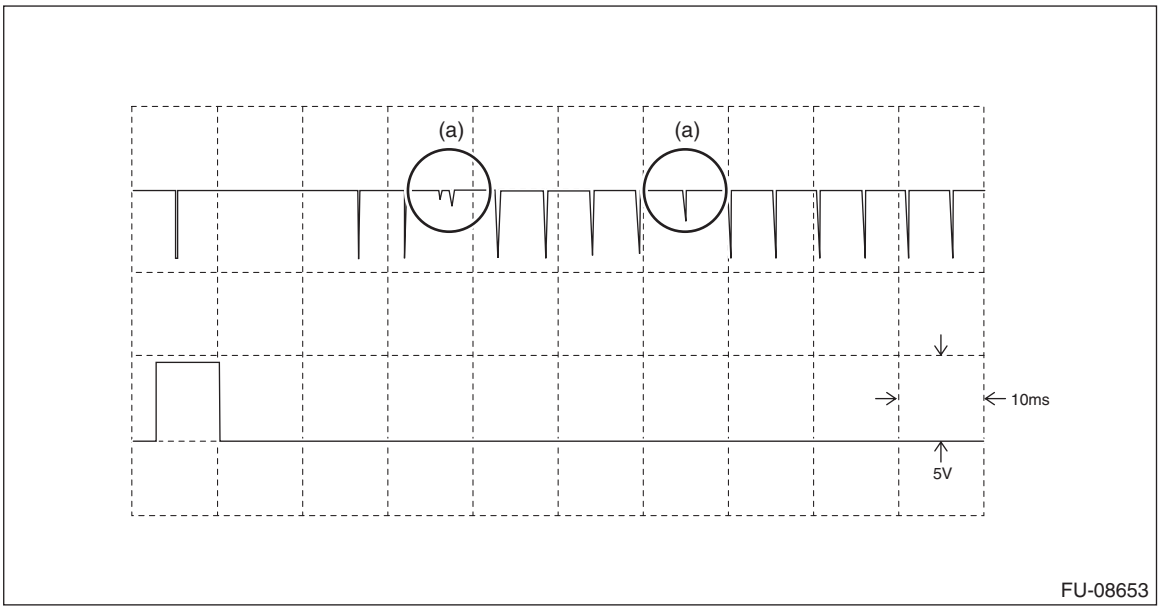
(A) To ECM connector

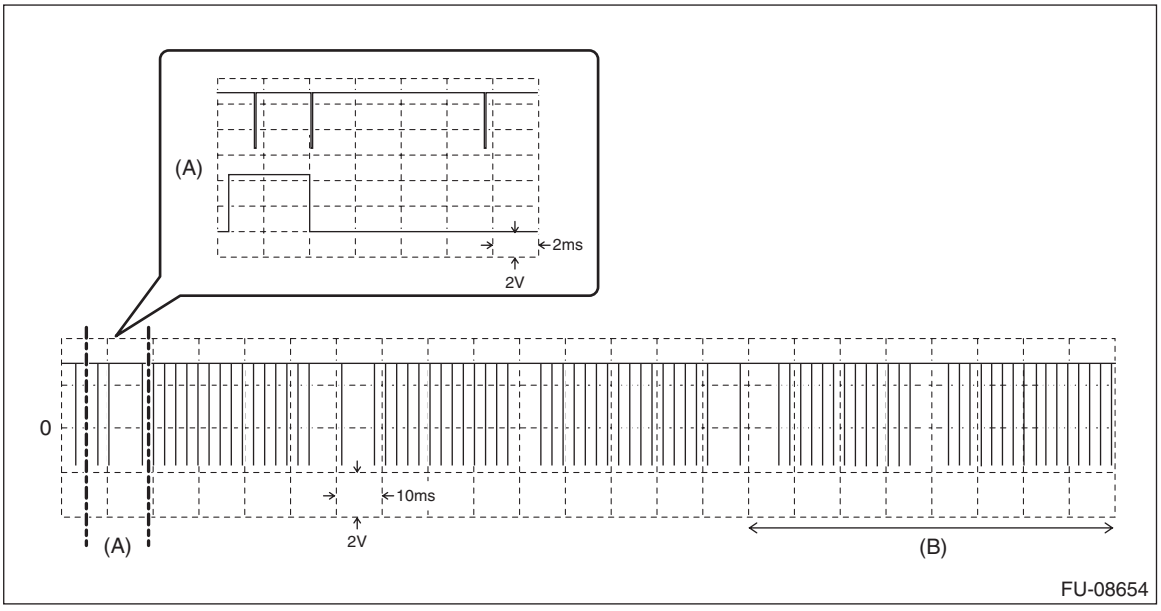
Terminal No.	Probe
16	+
27	–

4) Start the engine and let it idle.

5) Check the pattern is the same as the waveform and voltage shown below.

NOTE:
The waveform of the crankshaft position sensor may be shown as in diagram (a) using the oscilloscope function of the Subaru Select Monitor. This is not a malfunction of Subaru Select Monitor or crankshaft position sensor, because the output unit of the crankshaft position sensor is 45 μseconds, which is smaller than the minimal measurement unit of the Subaru Select Monitor that is 50 μseconds.





(A) Magnified waveform of crankshaft position sensor
(B) One crankshaft rotation

6) After inspection, install the related parts in the reverse order of removal.

2. OTHER INSPECTIONS

Check that the crankshaft position sensor has no deformation, cracks or other damages.