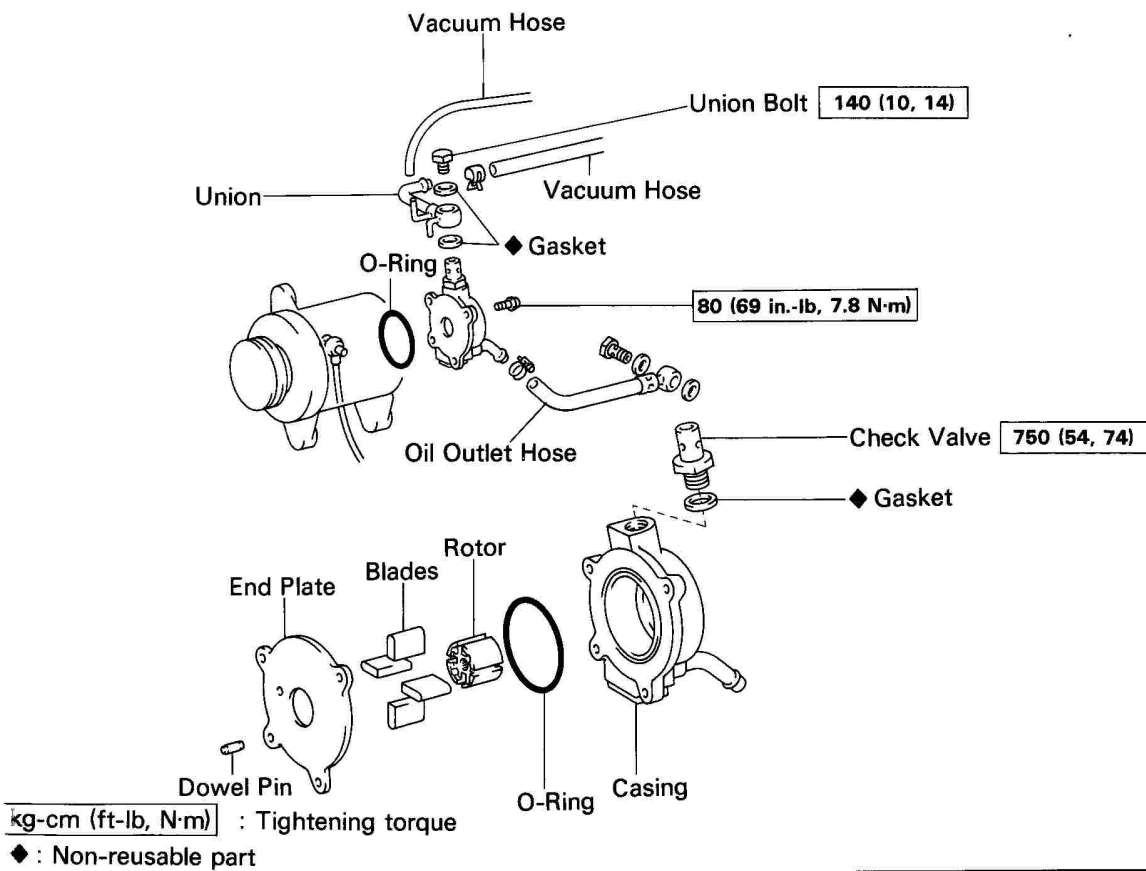


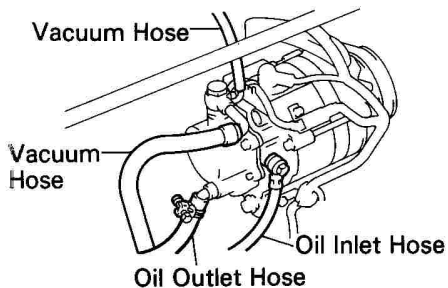
VACUUM PUMP B Series Engine COMPONENTS



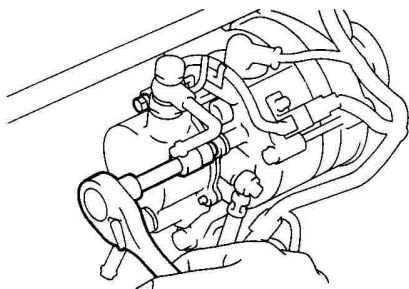
D1816

REMOVAL OF VACUUM PUMP

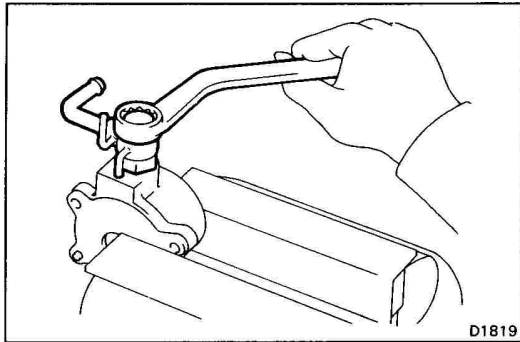
1. DISCONNECT VACUUM HOSE
2. DISCONNECT OIL OUTLET HOSE
3. REMOVE VACUUM PUMP AND O-RING
 - (a) Remove the three mounting bolts.
 - (b) Remove the pump.
 - (c) Remove the O-ring.



D1817



D1818

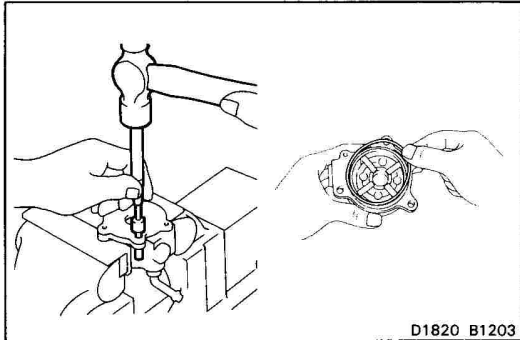


DISASSEMBLY OF VACUUM PUMP

(See page BR-29)

1. REMOVE UNION BOLT, UNION AND CHECK VALVE

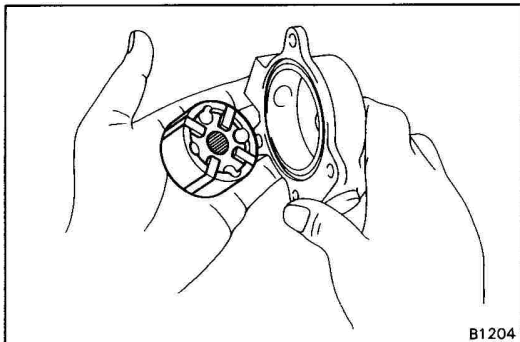
- (a) Remove the union bolt, union and gaskets.
- (b) Remove the check valve and gasket.



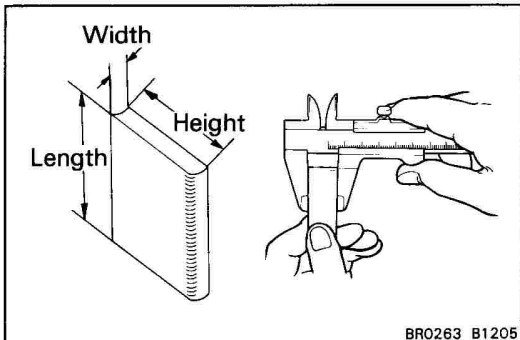
2. REMOVE VACUUM PUMP END PLATE

Using a pin punch and hammer, tap out the dowel pin rearward and remove the end plate.

3. REMOVE O-RING



4. REMOVE ROTOR AND BLADES



INSPECTION OF VACUUM PUMP COMPONENTS

1. INSPECT BLADE

- (a) Check for wear or damage.
- (b) Using calipers, measure the height, width and length of the blade.

Minimum height: 13.80 mm (0.5433 in.)

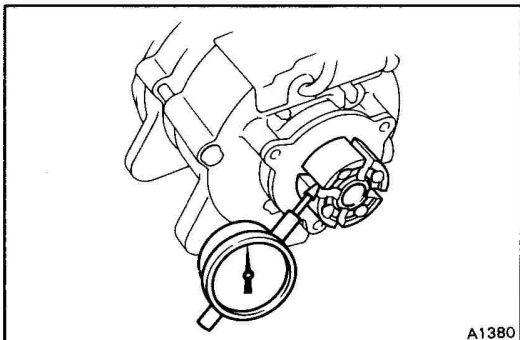
Minimum width: 5.95 mm (0.2343 in.)

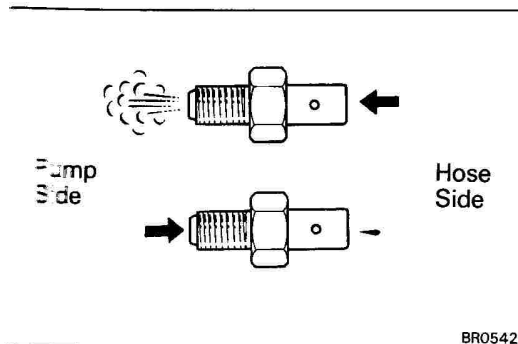
Minimum length: 39.98 mm (1.5740 in.)

2. INSPECT ROTOR

- (a) Check for wear or damage.
- (b) Assemble the rotor to the alternator and check the amount of play in the direction of rotor spline rotation.

Maximum play: 1.0 mm (0.039 in.)

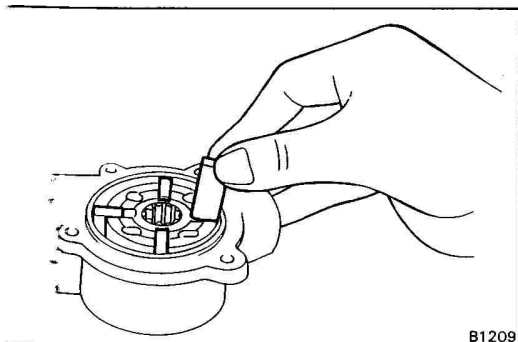




3. INSPECT CHECK VALVE OPERATION

- Check that air flow from the union side to the pump side.
- Check that air does not flow from the pump side to the hose side.

If necessary, replace the check valve.



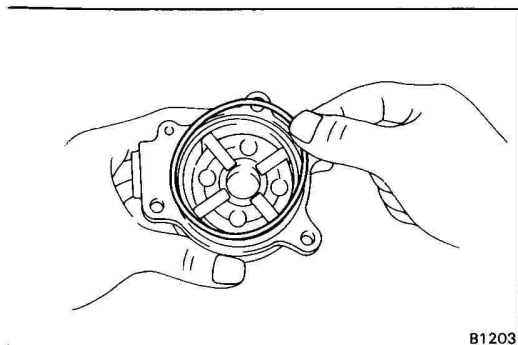
ASSEMBLY OF VACUUM PUMP

(See page BR-29)

1. INSTALL ROTOR AND BLADES

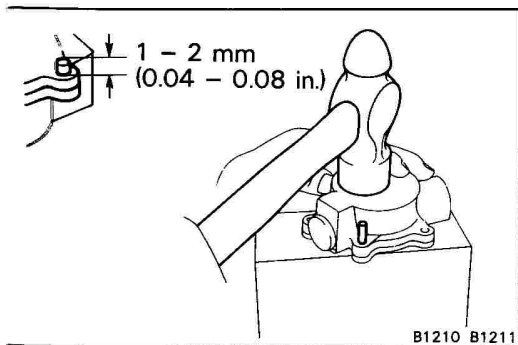
- Apply engine oil to the rotor and blades.
- Place the rotor into the casing.
- Insert the blades with round end facing outward.

NOTE: Be sure that the blade and rotor surface are even.



2. INSTALL O-RING AND END PLATE

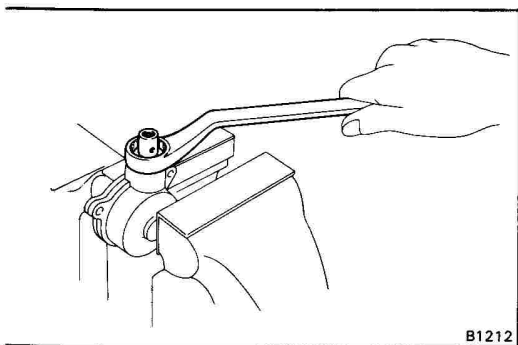
- Install the O-ring into the groove.



- Place the end plate onto the casing.

- Align the pin hole and tap in the pin.

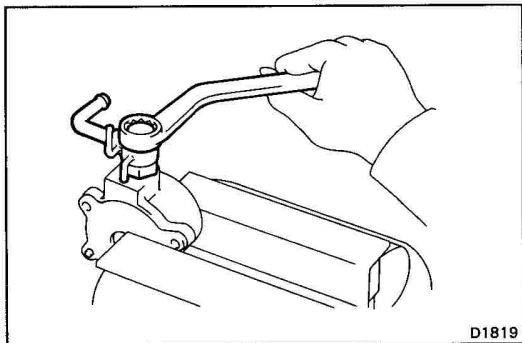
NOTE: Be careful not to damaged the casing and end plate.



3. INSTALL CHECK VALVE

Install and torque the check valve with a new gasket.

Torque: 750 kg-cm (54 ft-lb, 74 N·m)



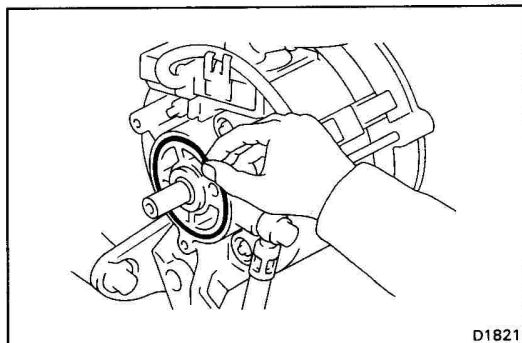
D1819

4. INSTALL UNION AND BOLT

Install the union and bolt with a new gaskets. Torque the bolt.

Torque: 140 kg-cm (10 ft-lb, 14 N·m)

NOTE: Be sure to align the alignment pin of union and groove of casing.



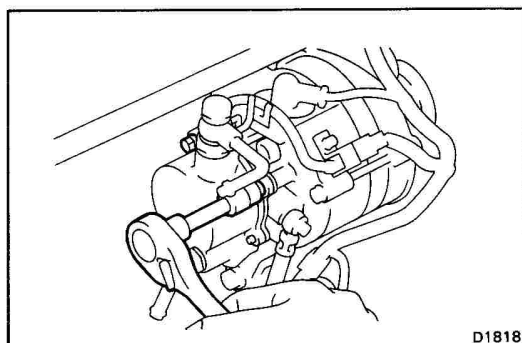
D1821

INSTALLATION OF VACUUM PUMP

(See page BR-29)

1. INSTALL O-RING

Install the O-ring into the groove of the alternator.

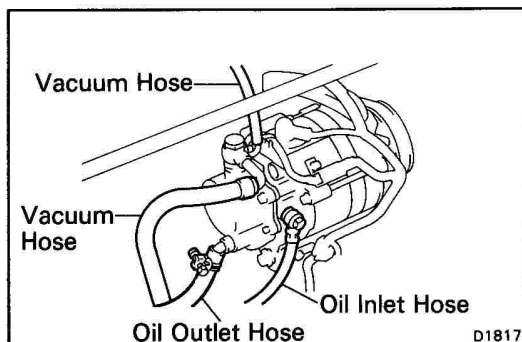


D1818

2. INSTALL VACUUM PUMP

Install the vacuum pump with three bolts. Torque the bolts.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)



D1817

3. CONNECT OIL OUTLET HOSE

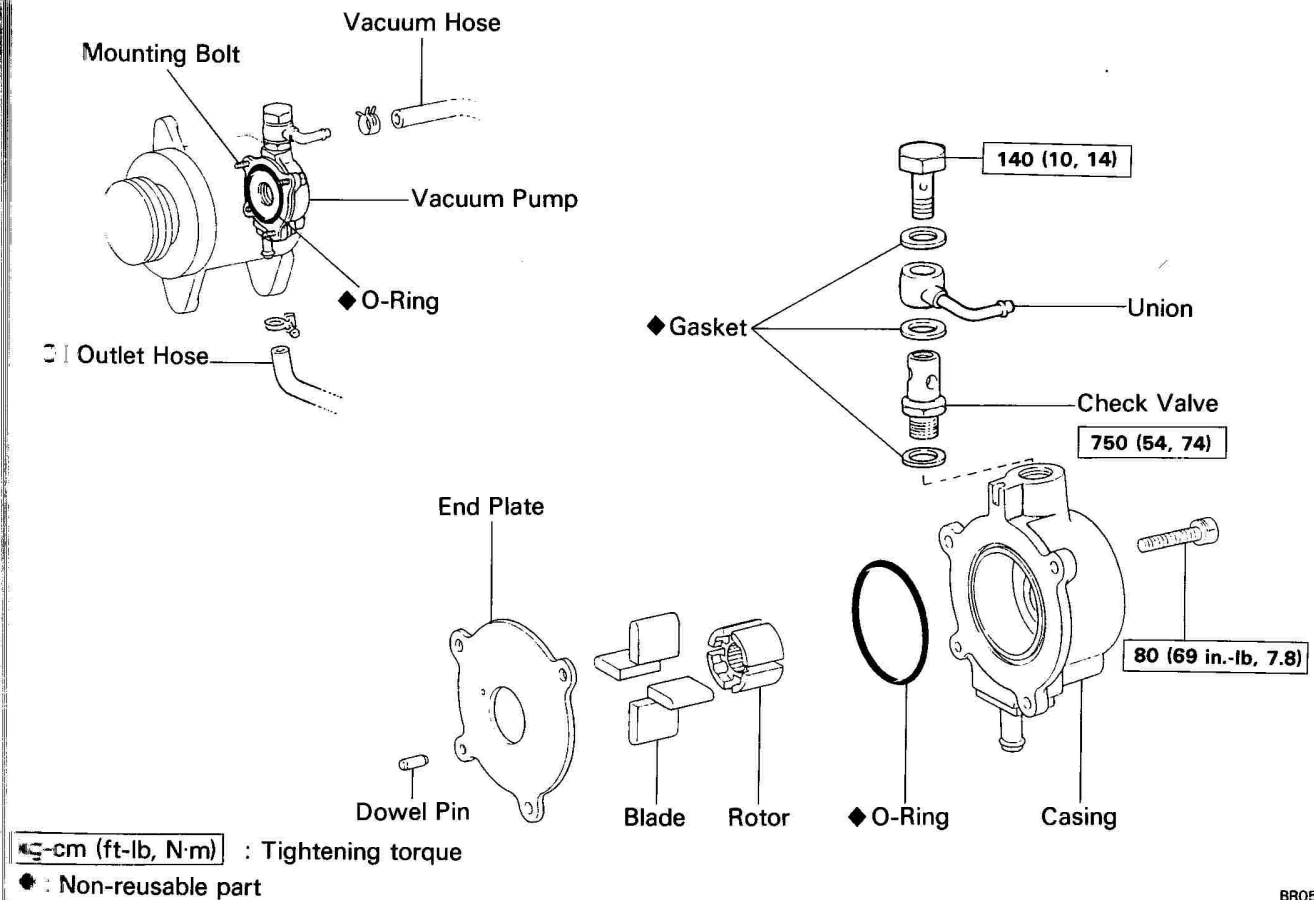
Connect the oil outlet hose on the fitting and tighten the clamp.

4. CONNECT VACUUM HOSE

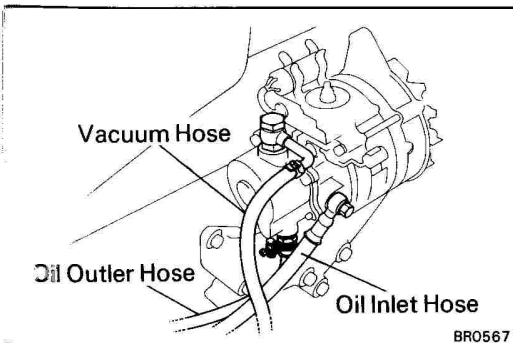
Connect the vacuum hose on the fitting and install the clip

5. CHECK VACUUM PUMP OPERATION

1W Engine with 12 Volt COMPONENTS

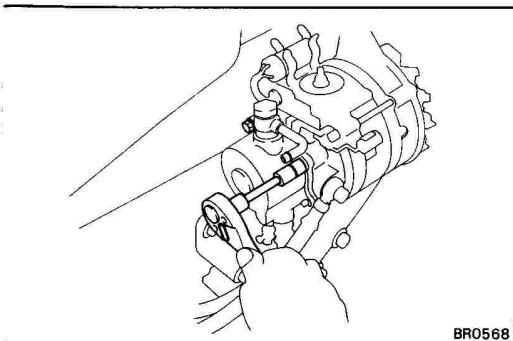


BR0566

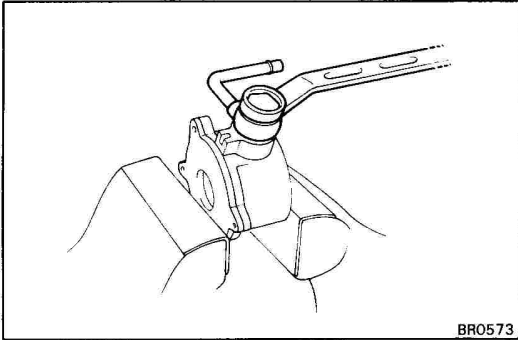


REMOVAL OF VACUUM PUMP

1. DISCONNECT VACUUM HOSE
2. DISCONNECT OIL OUTLET HOSE



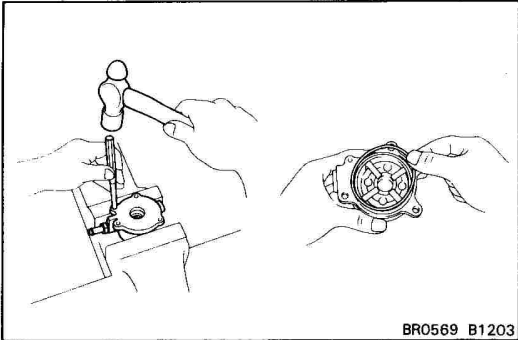
3. REMOVE VACUUM PUMP AND O-RING
 - (a) Remove the three mounting bolts.
 - (b) Remove the pump.
 - (c) Remove the O-ring.



DISASSEMBLY OF VACUUM PUMP

(See page BR-33)

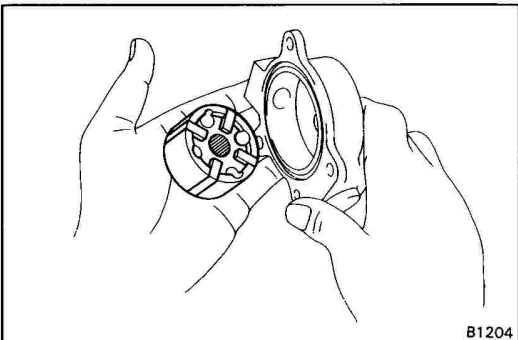
1. REMOVE UNION AND CHECK VALVE



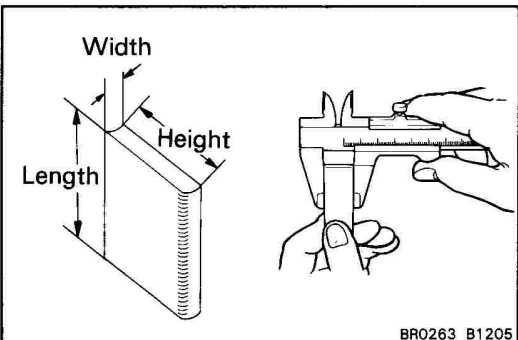
2. REMOVE VACUUM PUMP END PLATE

Using a pin punch and hammer, tap out the dowel pin rearward and remove the end plate.

3. REMOVE O-RING



4. REMOVE ROTOR AND BLADES



INSPECTION OF VACUUM PUMP

1. INSPECT BLADE

- Check for wear or damage.
- Using calipers, measure the height, width and length of the blade.

Minimum height: 13.80 mm (0.5433 in.)

Minimum width: 5.95 mm (0.2343 in.)

Minimum length: 39.98 mm (1.5740 in.)

2. INSPECT ROTOR

(See step 2 on page BR-30)

3. INSPECT CHECK VALVE OPERATION

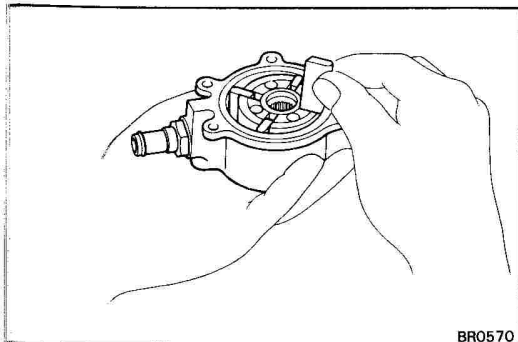
(See step 3 on page BR-31)

ASSEMBLY OF VACUUM PUMP

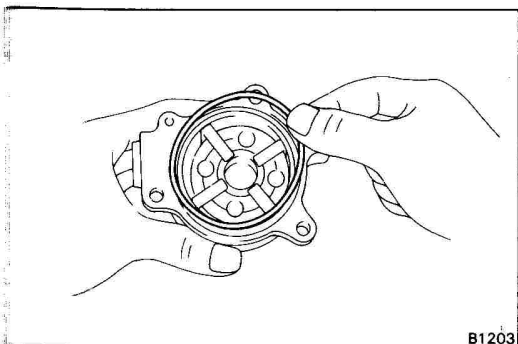
(See page BR-33)

1. INSTALL ROTOR AND BLADES

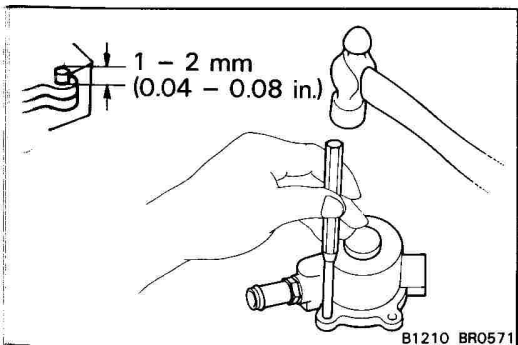
- (a) Apply engine oil to the rotor and blades.
 - (b) Place the rotor into the casing.
 - (c) Insert the blades with round end facing outward.
- NOTE: Be sure that the blade and rotor surface are even.

**2. INSTALL O-RING AND END PLATE**

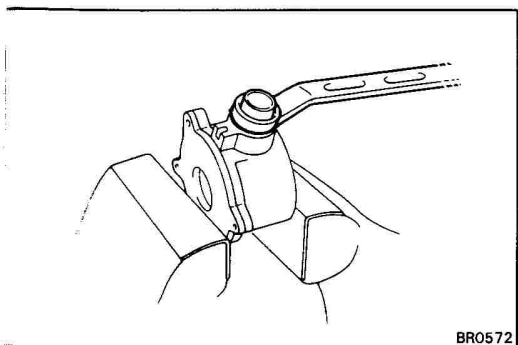
- (a) Install the O-ring into the groove.



- (b) Place the end plate onto the casing.
- (c) Align the pin hole and tap in the pin.

**3. INSTALL CHECK VALVE**

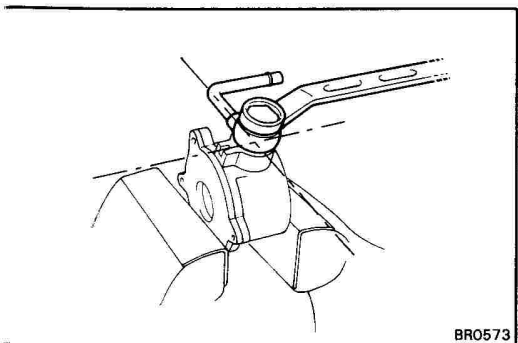
Install and torque the check valve with a new gasket.

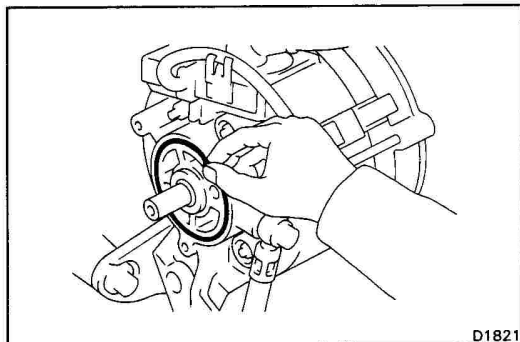
Torque: 750 kg-cm (54 ft-lb, 74 N·m)**4. INSTALL UNION AND BOLT**

Install the union and bolt with a new gaskets. Torque the bolt.

Torque: 140 kg-cm (10 ft-lb, 14 N·m)

NOTE: Install in proper direction only.



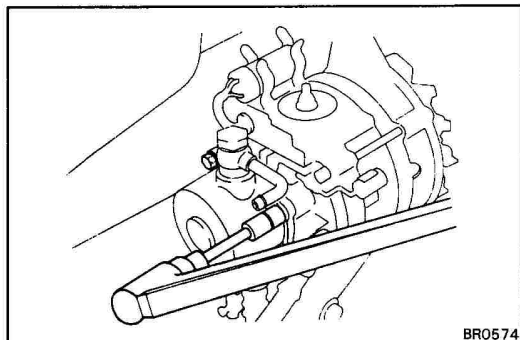


INSTALLATION OF VACUUM PUMP

(See page BR-33)

1. INSTALL O-RING

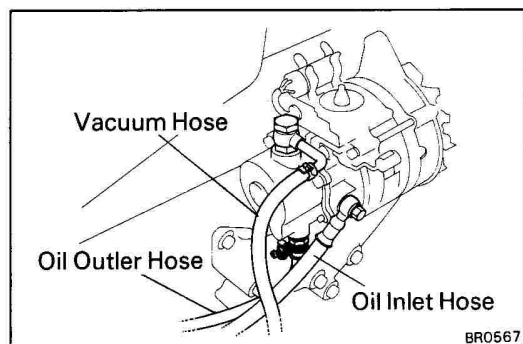
Install the O-ring into the groove of the alternator.



2. INSTALL VACUUM PUMP

Install the vacuum pump with three bolts. Torque the bolts.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)



3. CONNECT OIL OUTLET HOSE

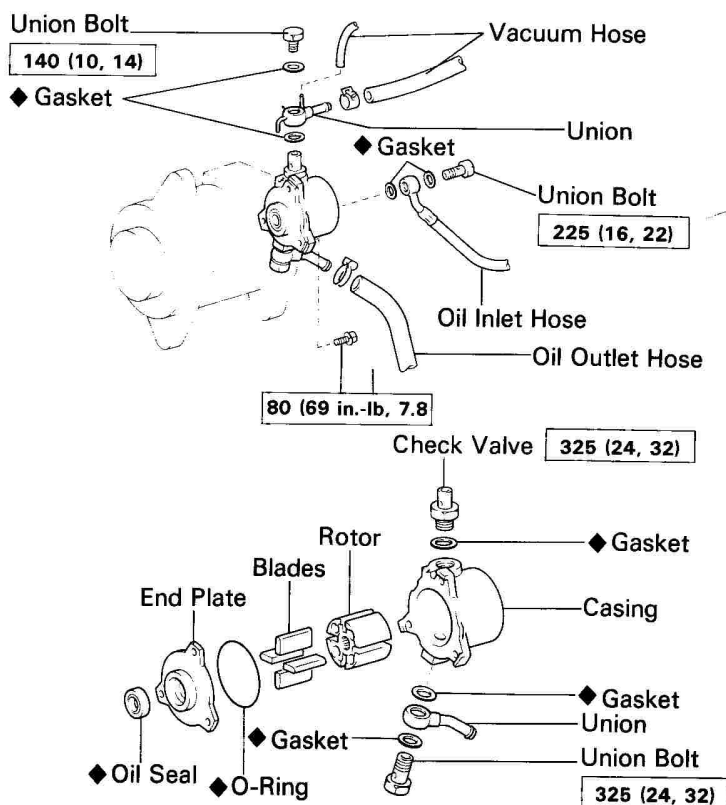
Connect the oil outlet hose on the fitting and tighten the clamp.

4. CONNECT VACUUM HOSE

Connect the vacuum hose on the fitting and install the clip.

5. CHECK VACUUM PUMP OPERATION

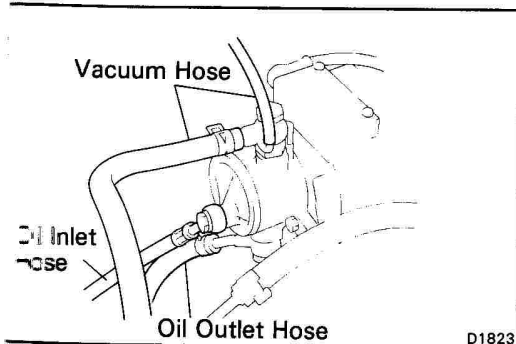
1W Engine with 24 Volt COMPONENTS



cm (ft-lb, N-m) : Tightening torque

◆ : Non-reusable part

D1822

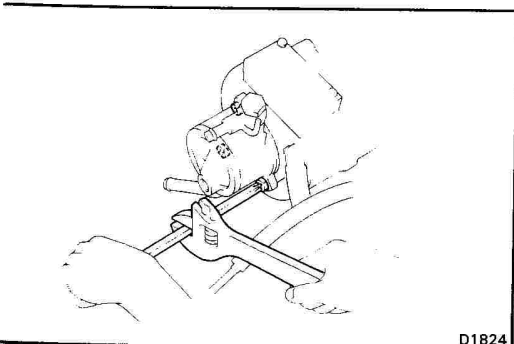


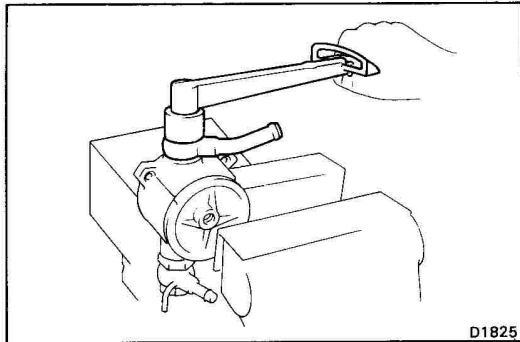
REMOVAL OF VACUUM PUMP

1. DISCONNECT VACUUM HOSE
2. DISCONNECT OIL HOSES

3. REMOVE VACUUM PUMP

- (a) Remove the three mounting bolts.
- (b) Remove the pump.



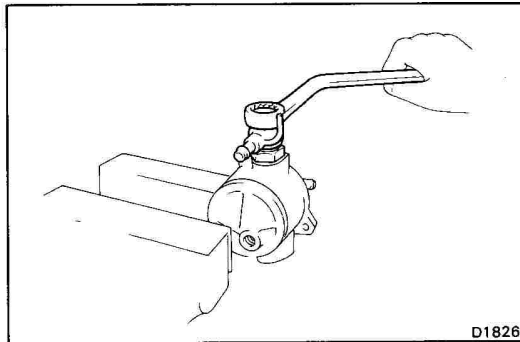


DISASSEMBLY OF VACUUM PUMP

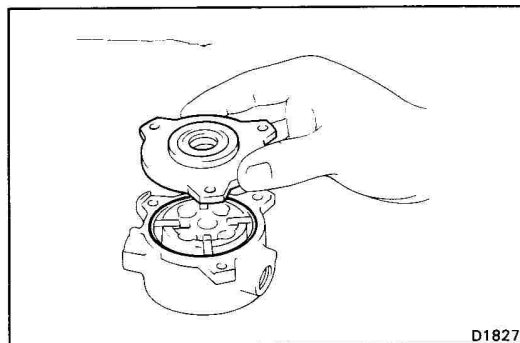
(See page BR-37)

1. REMOVE OIL OUTLET UNION

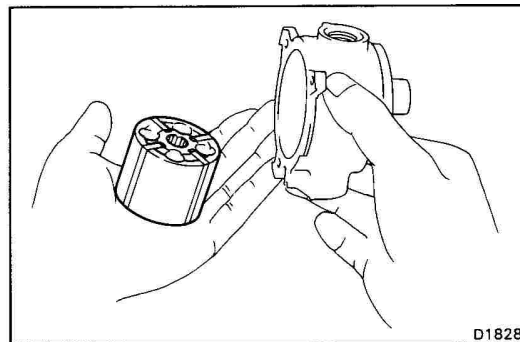
NOTE: If placing the vacuum pump in a vise, be sure to place with the end cover.



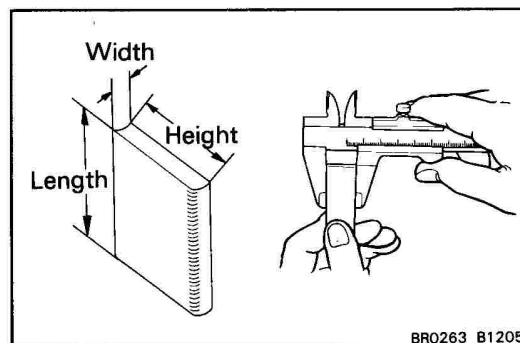
2. REMOVE VACUUM HOSE UNION AND CHECK VALVE



3. REMOVE END FRAME AND O-RING



4. REMOVE ROTOR AND BLADES



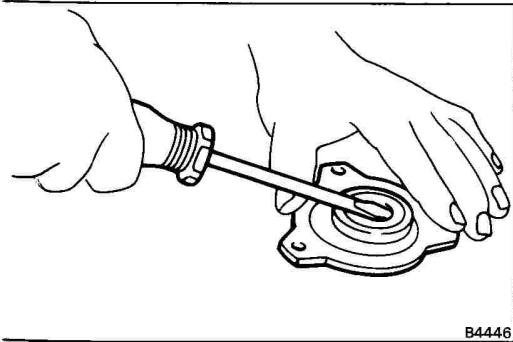
INSPECTION AND REPAIR OF VACUUM PUMP COMPONENTS

1. INSPECT BLADE

- Check for wear or damage.
- Using calipers, measure the height of the blade.

Minimum height: 14.8 mm (0.583 in.)

2. **INSPECT ROTOR**
(See step 2 on page BR-30)
3. **INSPECT CHECK VALVE OPERATION**
(See step 3 on page BR-31)

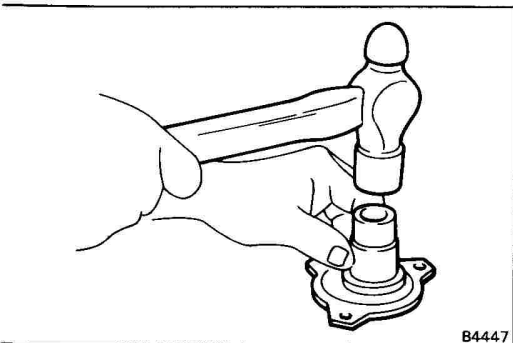


4. **INSPECT VACUUM PUMP OIL SEAL**

Check for wear or damage.

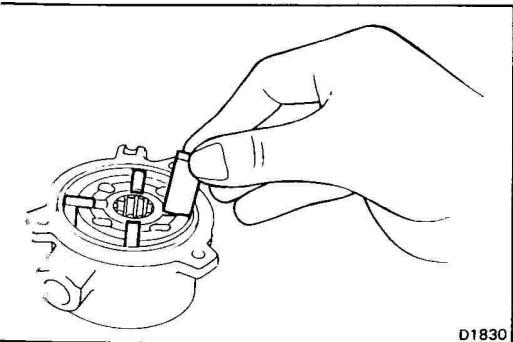
5. **IF NECESSARY, REPLACE OIL SEAL**

- (a) Using a screwdriver, pry out the oil seal.



- (b) Using a 22 mm socket wrench and press, press in a new oil seal.

- (c) Apply MP grease to the oil seal.



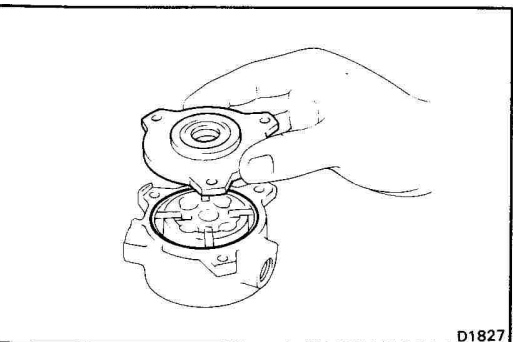
ASSEMBLY OF VACUUM PUMP

(See page BR-37)

1. **INSTALL ROTOR AND BLADES**

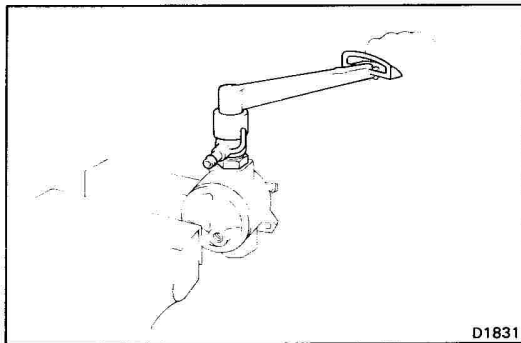
- (a) Apply engine oil to the rotor and blades.
- (b) Place the rotor into the casing.
- (c) Insert the blades with round end facing outward.

NOTE: Be sure that the blade and rotor surface are even.



2. **INSTALL O-RING AND END COVER**

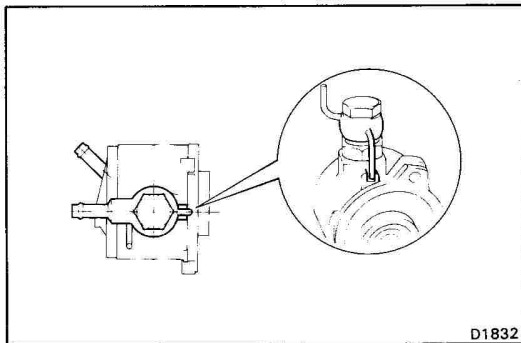
Install the O-ring into the groove of the casing.



3. INSTALL CHECK VALVE

Install and torque the check valve with a new gasket.

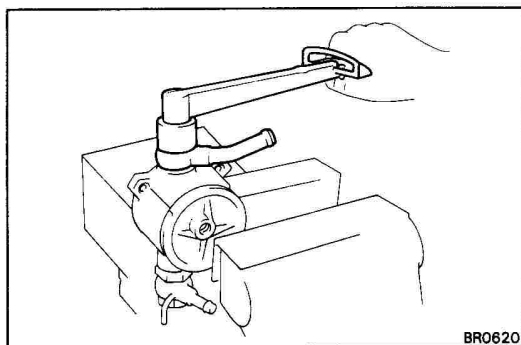
Torque: 325 kg-cm (24 ft-lb, 32 N·m)



4. INSTALL VACUUM HOSE UNION AND BOLT

Install the union and bolt with a new gaskets. Torque the bolt.

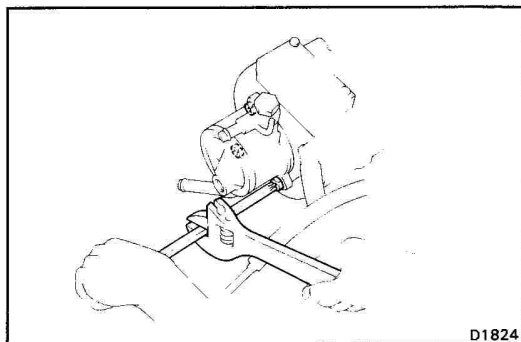
Torque: 140 kg-cm (10 ft-lb, 14 N·m)



5. INSTALL OIL OUTLET UNION AND BOLT

Install the union and bolt with a new gaskets. Torque the bolt.

Torque: 325 kg-cm (24 ft-lb, 32 N·m)



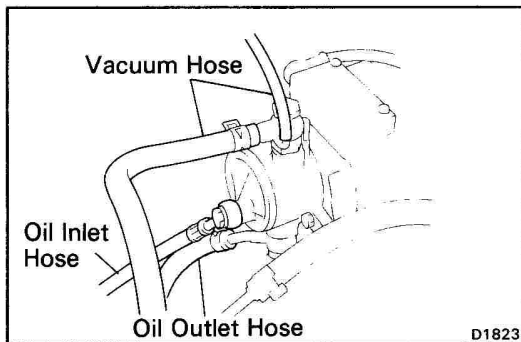
INSTALLATION OF VACUUM PUMP

(See page BR-37)

1. INSTALL VACUUM PUMP

Install the vacuum pump with three bolts. Torque the bolts.

Torque: 80 kg-cm (69 in.-lb, 7.8 N·m)



2. CONNECT OIL INLET HOSE

Install the union and bolt with a new gasket. Torque the bolt.

Torque: 225 kg-cm (16 ft-lb, 22 N·m)

3. CONNECT OIL OUTLET HOSE

4. CONNECT VACUUM HOSE

5. CHECK VACUUM PUMP OPERATION