COOLING

CONTENTS

E14AA--

SPECIFICATIONS

GENERAL SPECIFICATIONS

E14CA--

Items		Specifications
Cooling method		Water-cooled pressurized, forced circulation with electrical fan
Radiator		
Type		Pressurized corrugated fin type
Performance	J/h (kcal/h, BTU/h)	
<4G13>		100,465 × 10^3 (24,000, 95,238)
<4G92-2WD-M/T>		164,093 × 10^3 (39,200, 155,555)
<4G92-2WD-A/T, 4D68>		202,186 × 10^3 (48,300, 191,666)
<4G92-4WD, 4G93>		184,186 × 10^3 (44,000, 174,603)
Radiator cap		
High pressure valve opening pressure	kPa (kg/cm^2, psi)	75–105 (0.75–1.05, 11–15)
Vacuum valve opening pressure	kPa (kg/cm^2, psi)	−5 (−0.05, −0.7) or less
Automatic transmission oil cooler <Vehicles with A/T>		
Performance	J/h (kcal/h, BTU/h)	
<4G92>		6,195 × 10^3 (1,480, 5,873)
Thermostat		
Type		Wax pellet type with jiggle valve
Water pump		
Type		Impeller of centrifugal type

SERVICE SPECIFICATIONS

E14CB--

Items		Specifications
Standard value		
Range of coolant antifreeze concentration	%	30–60
Thermostat		
<4G13>		
Valve opening temperature of thermostat	°C (°F)	88 (190)
Full-opening temperature of thermostat	°C (°F)	100 (212)
<4D68>		
<4G92, 4G93–Vehicles built up to June, 1992>		
Valve opening temperature of thermostat	°C (°F)	76.5 (170)
Full-opening temperature of thermostat	°C (°F)	90 (194)
<4G92, 4G93–Vehicles built from July, 1992>		
Valve opening temperature of thermostat	°C (°F)	82 (180)
Full-opening temperature of thermostat	°C (°F)	95 (203)

LUBRICANTS

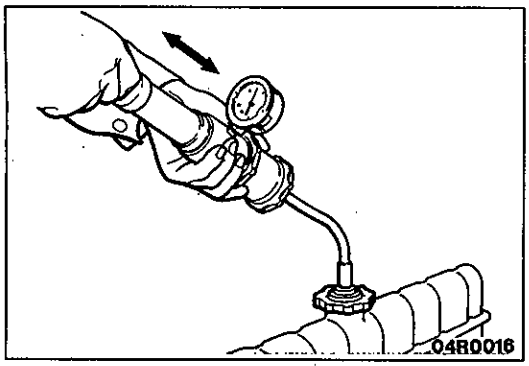
E14CD--

Items	Quantity		
	dm3	U.S. qts.	Imp. qts.
Engine coolant HIGH QUALITY ETHYLENE GLYCOL ANTIFREEZE COOLANT			
<4G1>	5.0	5.3	4.4
<4G9>	6.0	6.3	5.3
<4D68>	8.0	8.5	7.0

SEALANT

E14CE--

Items	Specified sealant	Remarks
Cylinder block drain plug	3M Nut Locking Part No. 4171 or equivalent	Drying sealant
Water pump <4G9>	Mitsubishi Genuine Parts No. MD970389 or equivalent	Semi-Drying sealant
Thermostat case <4G9>	Mitsubishi Genuine Parts No. MD970389 or equivalent	Semi-Drying sealant



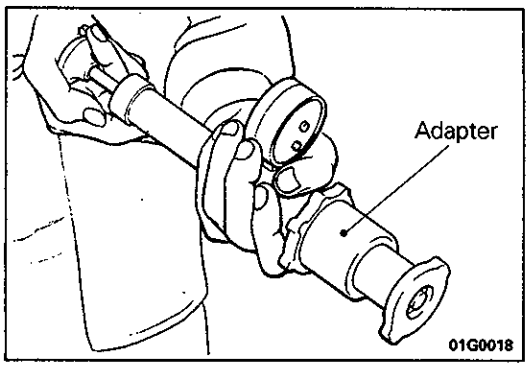
SERVICE ADJUSTMENT PROCEDURES

E14FAAA

COOLANT LEAK CHECKING

1. Confirm that the coolant level is up to the filler neck. Install a radiator cap tester and apply 160 kPa (1.6 kg/cm2, 23 psi) pressure, and then check for leakage from the radiator hose or connections.

   Caution
   1. **Be sure to completely clean away any moisture from the places checked.**
   2. **When the tester is taken out, be careful not to spill any coolant from it.**
   3. **Be careful, when installing and removing the tester and when testing, not to deform the filler neck of the radiator.**
2. If there is leakage, repair or replace the appropriate part.



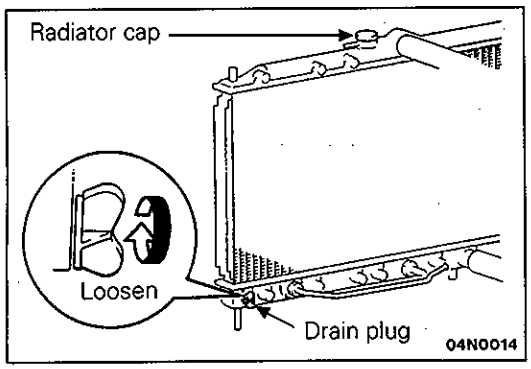
RADIATOR CAP VALVE OPENING PRESSURE CHECKING

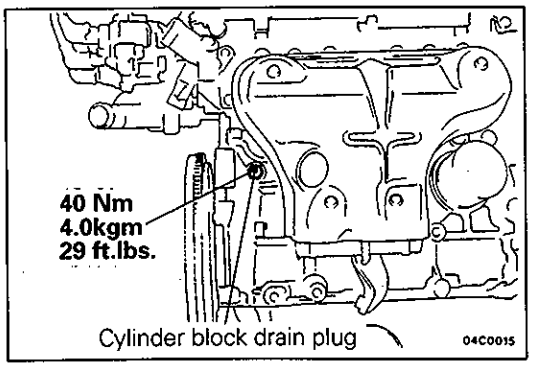
E14FBAD

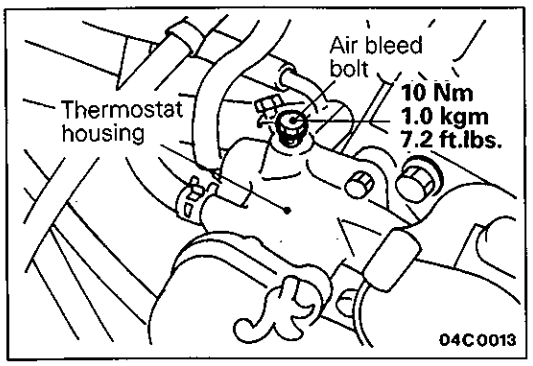
1. Use a adapter to attach the cap to the tester.
2. Increase the pressure until the indicator of the gauge stops moving.

   Limit: 65 kPa (0.65 kg/cm^2, 9.2 psi)
   Standard value: 75–105 kPa (0.75–1.05 kg/cm^2, 11–15 psi)
3. Replace the radiator cap if the reading does not remain at or above the limit.

   NOTE
   Be sure that the cap is clean before testing, since rust or other foreign material on the cap seal will cause an improper indication.







COOLANT REPLACEMENT E14FCAV

1. Drain the engine coolant by removing the drain plug and then the radiator cap.
2. Remove the drain plug from the cylinder block to drain the engine coolant.
3. Open the air bleed bolt. <4G92, 4G93>
4. Remove the reserve tank to drain the engine coolant.
5. When the engine coolant has drained, pour in water from the radiator cap to clean the engine coolant line.
6. Coat the thread of the cylinder block drain plug with the specified sealant and tighten to the specified torque.

Specified sealant: 3M Nut Locking Part No. 4171 or equivalent

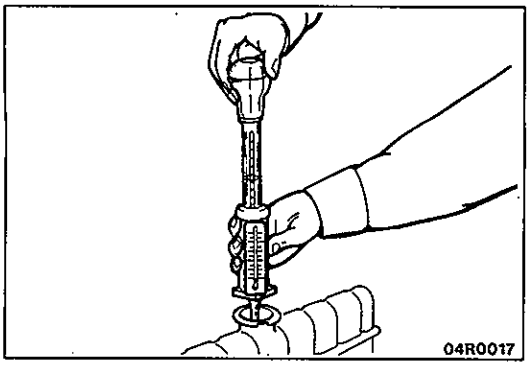
7. Securely tighten the radiator drain plug.
8. Install the reserve tank.
9. Fill the radiator until the engine coolant flows from the air bleed bolt section, and then close the air bleed bolt. <4G92, 4G93>
10. Slowly pour the engine coolant into the mouth of the radiator until the radiator is full, and pour also into the reserve tank up to the FULL line.

Recommended antifreeze:
HIGH QUALITY ETHYLENE GLYCOL ANTIFREEZE COOLANT

Quantity	**dm^3 (U.S. qts., Imp. qts.)**
	5.0 (5.3, 4.4)

NOTE
For Norway, the non-amine type of antifreeze should be used.

11. Install the radiator cap securely.
12. Start the engine and warm the engine until the thermostat opens. (Touch the radiator hose with your hand to check that warm water is flowing.)
13. After the thermostat opens, race the engine at 3,000 r/min 3 times.
14. After the engine is stopped, wait until the engine has cooled down, and then remove the radiator cap to check the level of the liquid. If the level is low, repeat the operation from step 10.
    Lastly, if the level does not drop, fill the condense tank with coolant up to the FULL line.



CONCENTRATION MEASUREMENT E14FDAB

Measure the temperature and specific gravity of the engine coolant to check the antifreeze concentration.

Standard value: 30–60 % (allowable concentration range)

RECOMMENDED ANTIFREEZE

Antifreeze	Allowable concentration
HIGH QUALITY ETHYLENE GLYCOL ANTIFREEZE COOLANT	30–60 %

Caution
If the concentration of the antifreeze is below 30 %, the anti-corrosion property will be adversely affected. In addition, if the concentration is above 60 %, both the anti-freezing and engine cooling properties will decrease, affecting the engine adversely. For these reasons, be sure to maintain the concentration level within the specified range.

THERMOSTAT

E14GA--

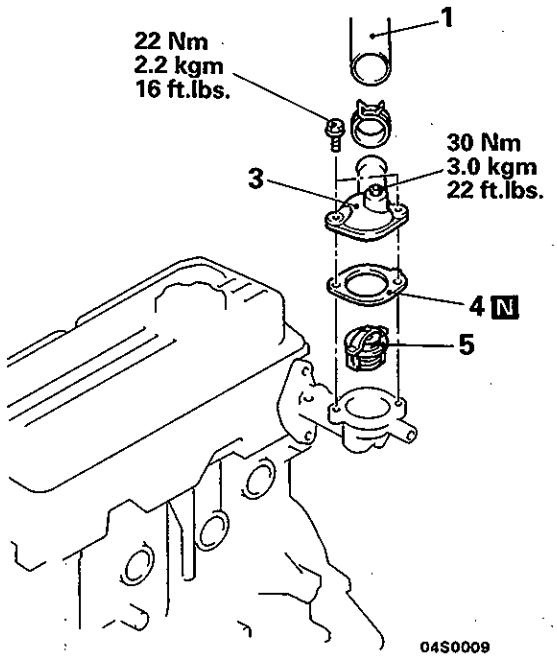
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)
- Removal and Installation of Air Intake Hose and Air Cleaner Body (Refer to GROUP 15 – Air Cleaner.)

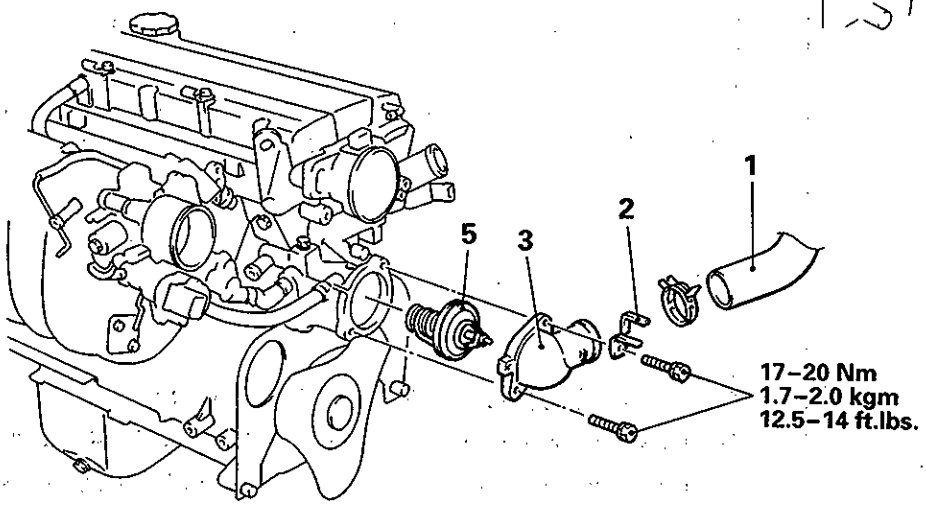
Removal Steps

1. Radiator upper hose <4G13> or radiator lower hose <4G92, 4G93, 4D68>
2. Harness clamp <4G92, 4G93>
3. Water outlet fitting <4G13> or water inlet fitting <4G92, 4G93, 4D68>
4. Water outlet fitting gasket <4G13>
5. Thermostat

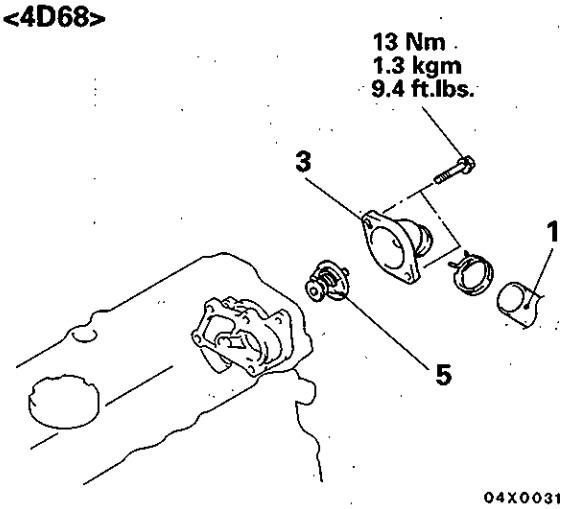
<4G13>

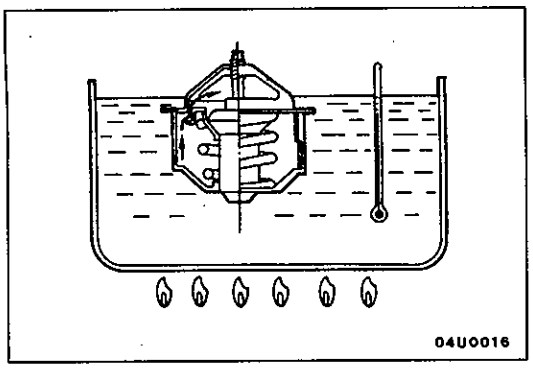


<4G92, 4G93>

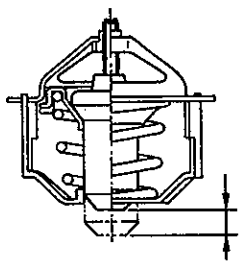


<4D68>

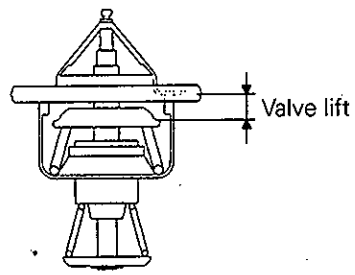




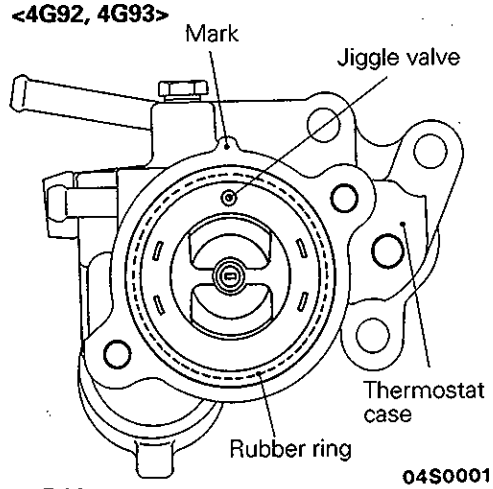
4G1



4G9, 4D6



<4G92, 4G93>



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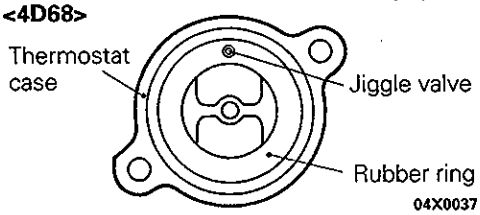


INSPECTION E14GCAW

Immerse the thermostat in water, and heat the water while stirring. Check that the thermostat valve opening and fully open temperatures.

NOTE
1. Measure valve height when fully closed. Calculate lift by measuring the height when fully open.
2. If valve opens even a little at normal temperature, the thermostat should be replaced.
3. If there is any serious warping, visible damage or breakage, the thermostat should be replaced.
4. Remove any rust or deposits if present.

Standard value:

Item	4G13	4G92*1, 4D68	4G93*1	4G92*2, 4G93*2
Valve opening temperature °C (°F)	88 (190)	76.5 (170)	76.5 (170)	82 (180)
Fully open temperature °C (°F)	100 (212)	90 (194)	90 (194)	95 (203)
Valve lift amount mm (in.)	8 (0.31)	10 (0.39)	8 (0.31)	8.5 (0.33)

NOTE
(1) The *1 symbol is applicable to vehicles built up to June, 1992.
(2) The *2 symbol is applicable to vehicles built from July, 1992.

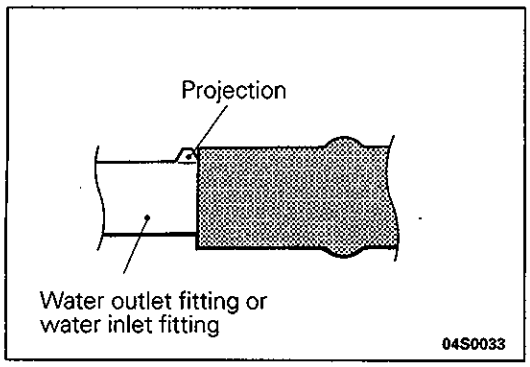
SERVICE POINTS OF INSTALLATION E14GDAN

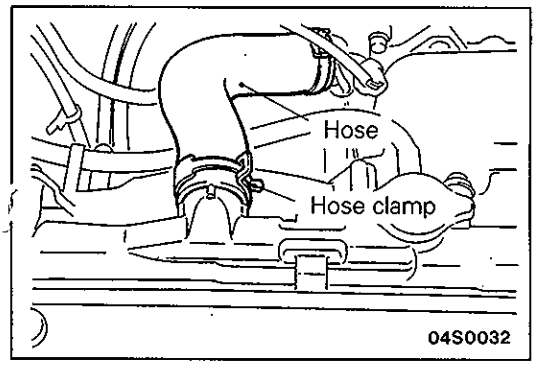
5. INSTALLATION OF THERMOSTAT <4G92, 4G93, 4D68>

(1) Install the thermostat so that the jiggle valve of the thermostat is facing straight up (mark position shown in the illustration).

Caution
Be sure that there is no oil adhering to the rubber ring of the thermostat.

(2) Install the thermostat so that the rubber ring is not curled or damaged.





1. INSTALLATION OF RADIATOR UPPER HOSE <4G13> OR RADIATOR LOWER HOSE <4G92, 4G93>

(1) Insert each hose as far as the projection of the water outlet fitting or water inlet fitting.

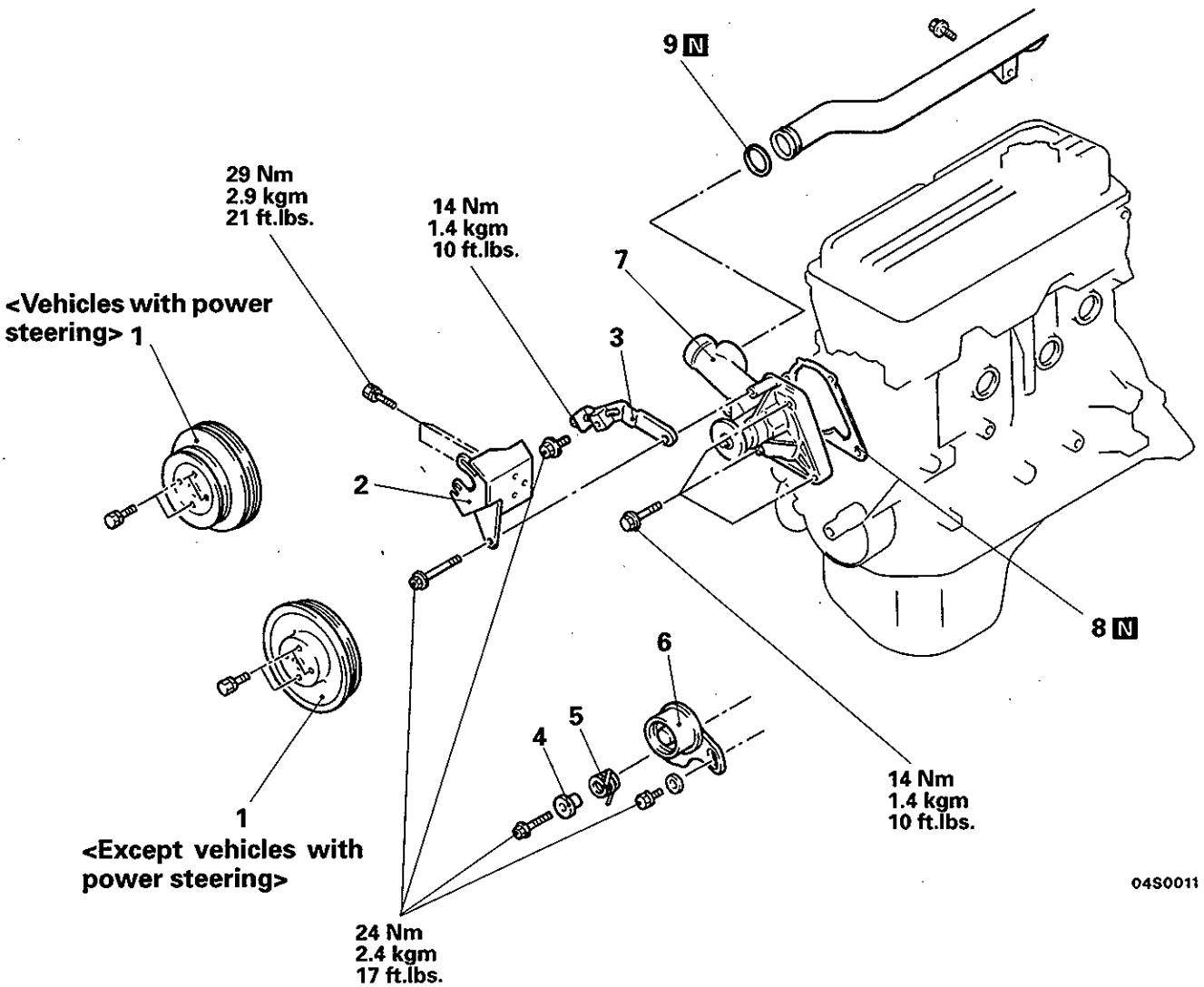
(2) The hose clamp should always be installed at the previous hose clamp installation position.

WATER PUMP <4G13>

E14MA-1

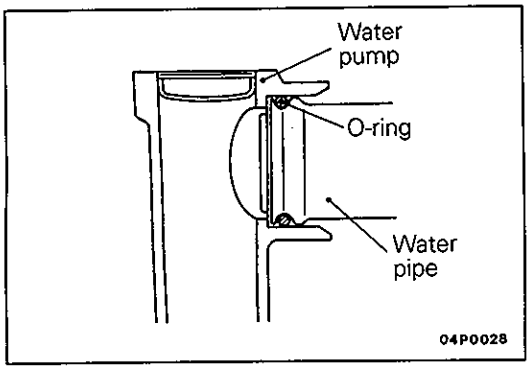
REMOVAL AND INSTALLATION

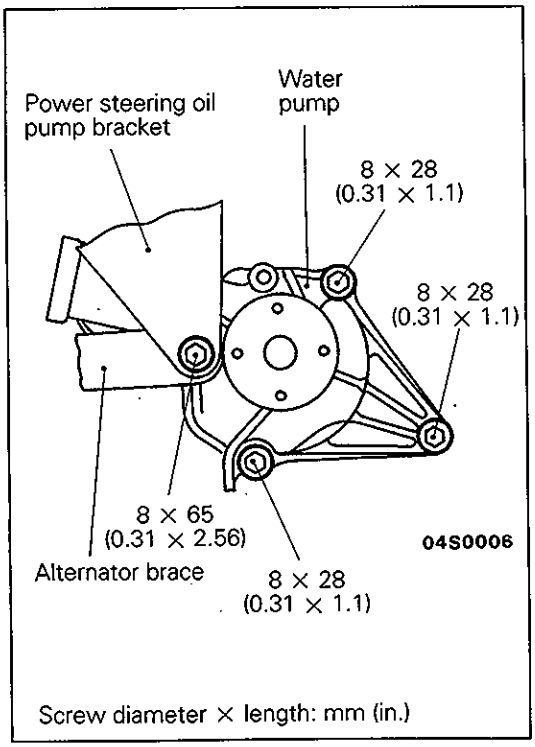
Pre-removal and Post-installation Operation
- Draining and Supplying of Engine Coolant (Refer to P. 14-5.)
- Removal and Installation of Timing Belt (Refer to GROUP 11 – Timing Belt.)
- Removal and Installation of Power Steering Oil Pump (Refer to GROUP 37A – Power Steering Oil Pump.)



Removal steps

1. Water pump pulley
2. Power steering oil pump bracket <Vehicles with power steering>
3. Alternator brace
4. Tensioner spacer
5. Tensioner spring
6. Timing belt tensioner
7. Water pump
8. Water pump gasket
9. O-ring





SERVICE POINTS OF INSTALLATION E14MDAN

9. INSTALLATION OF O-RING

Insert the O-ring to the water inlet pipe, and coat the outlet circumference of the O-ring with water. By coating with water, the insertion to the water pump will become easier.

Caution

1. **Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**
2. **When inserting the pipe, check to be sure that there is no sand, dirt, etc. on its inner surface.**

7. INSTALLATION OF WATER PUMP

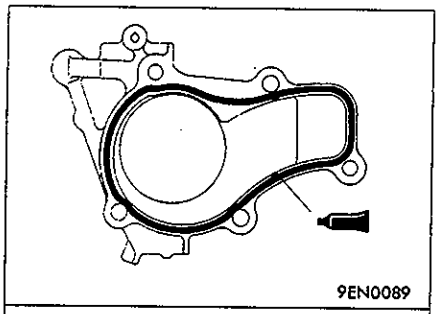
Water pump installation bolt size are different and caution must be paid to ensure that they are properly installed.

WATER PUMP <4G92, 4G93>

E14MA-2

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Engine Coolant (Refer to P. 14-5.)
- Removal and Installation of Timing Belt (Refer to GROUP 11 – Timing Belt.)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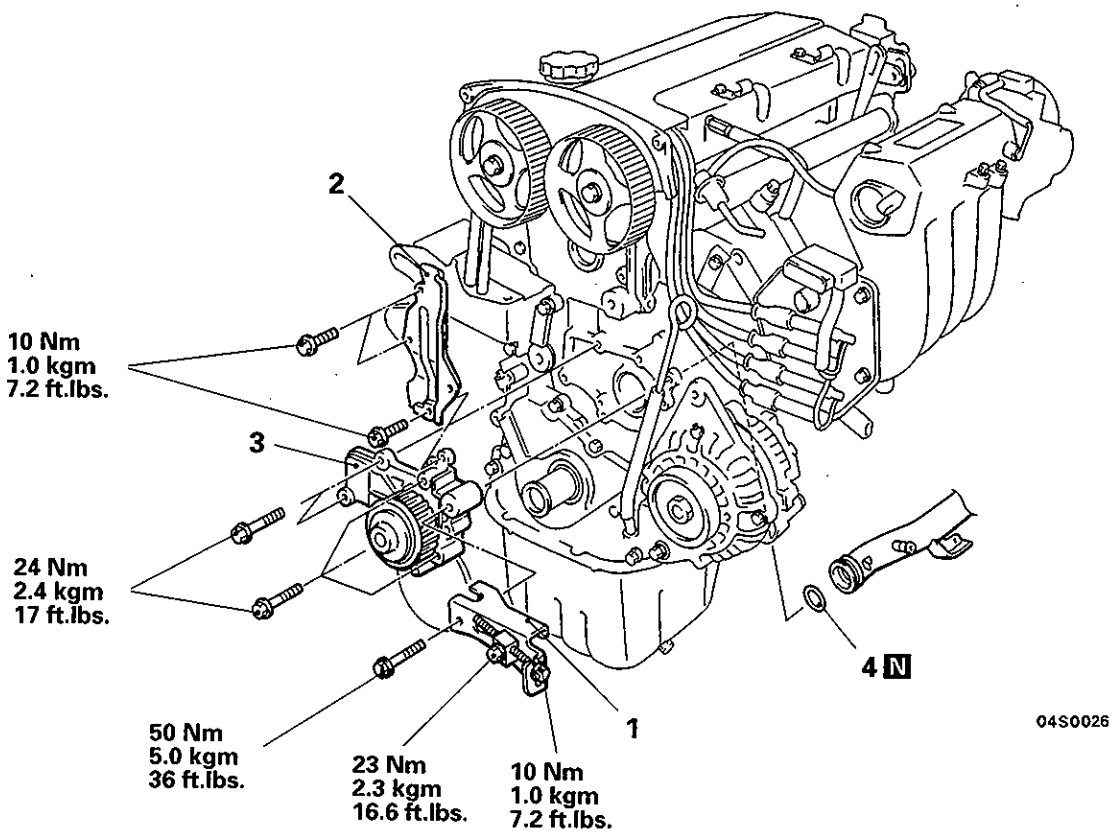
Specified Sealant:
Mitsubishi Genuine Parts No. MD970389 or equivalent

Removal steps
1. Alternator brace
2. Timing belt cover rear left
3. Water pump
4. O-ring (Refer to P. 14-11.)



SERVICE POINTS OF REMOVAL

E14MBAS

3. REMOVAL OF WATER PUMP

When removing the sealant remaining on the water pump and cylinder block, be sure to use a scraper made of brass so as not to damage the surface of the seal.

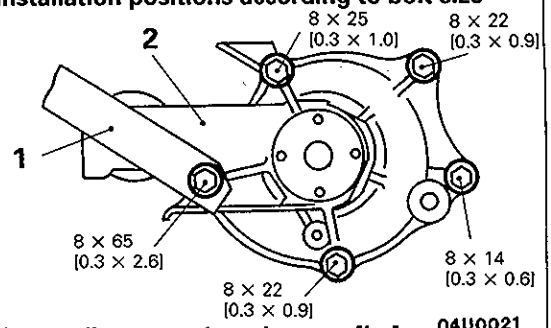
WATER PUMP <4D68>

E14TA--

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Engine Coolant (Refer to P. 14-5.)
- Removal and Installation of Timing Belt (Refer to GROUP 11 – Timing Belt and Timing Belt B.)

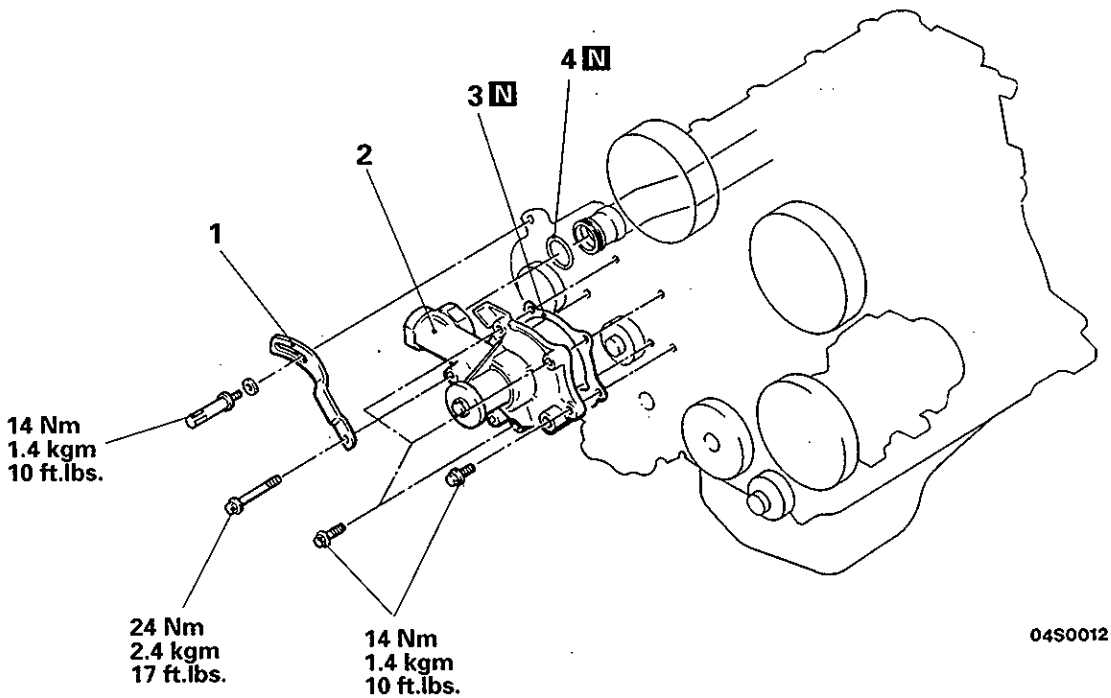
Installation positions according to bolt size



Screw diameter x length mm [in.] 04U0021

Removal steps
1. Alternator brace
2. Water pump
3. Water pump gasket
4. O-ring

◆◆ ◆◆



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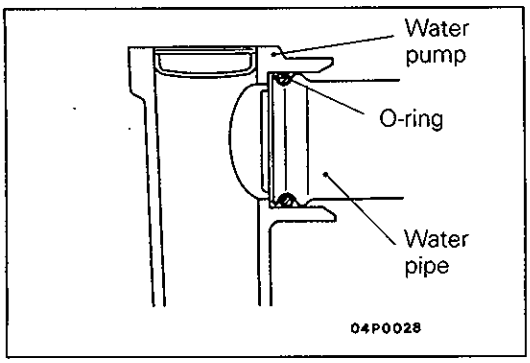

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SERVICE POINTS OF INSTALLATION

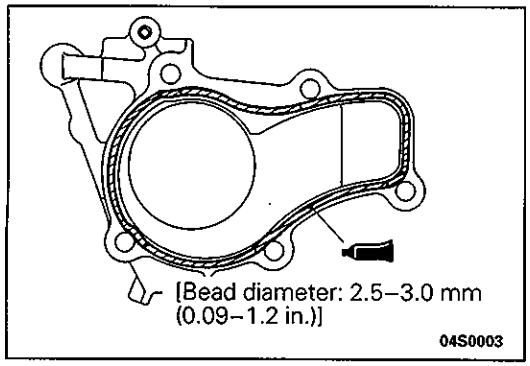
E14MBAN

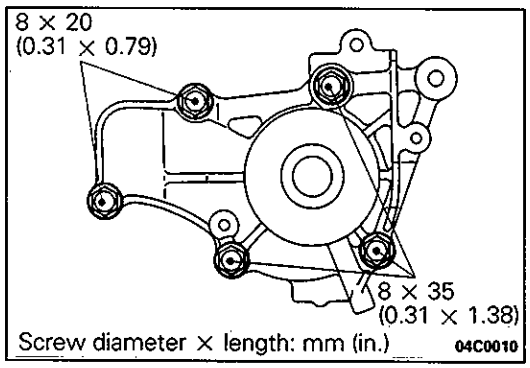
4. INSTALLATION OF O-RING

Insert the O-ring to the water inlet pipe, and coat the outlet circumference of the O-ring with water. By coating with water, the insertion to the water pump will become easier.

Caution
1. **Care must be taken not to permit engine oil or other greases to adhere to the O-ring.**
2. **When insertion the pipe, check to be sure that there is no sand, dirt, etc. on its inner surface.**

NOTES





SERVICE POINTS OF INSTALLATION E14MDBF

3. INSTALLATION OF WATER PUMP

(1) Squeeze out the sealant from the tube evenly and apply it so that there is not too much sealant and no places without sealant.

Specified Sealant: Mitsubishi Genuine Parts No. MD970389 or equivalent

(2) Water pump installation bolt size are different and caution must be paid to ensure that they are properly installed.

WATER HOSE AND WATER PIPE <4G1, 4G9>

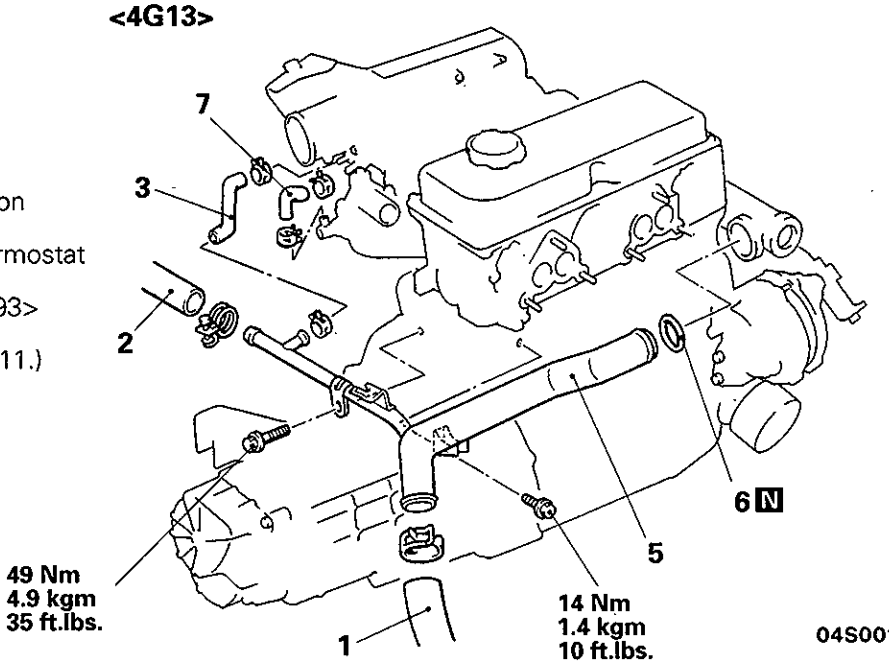
E14TA--

REMOVAL AND INSTALLATION

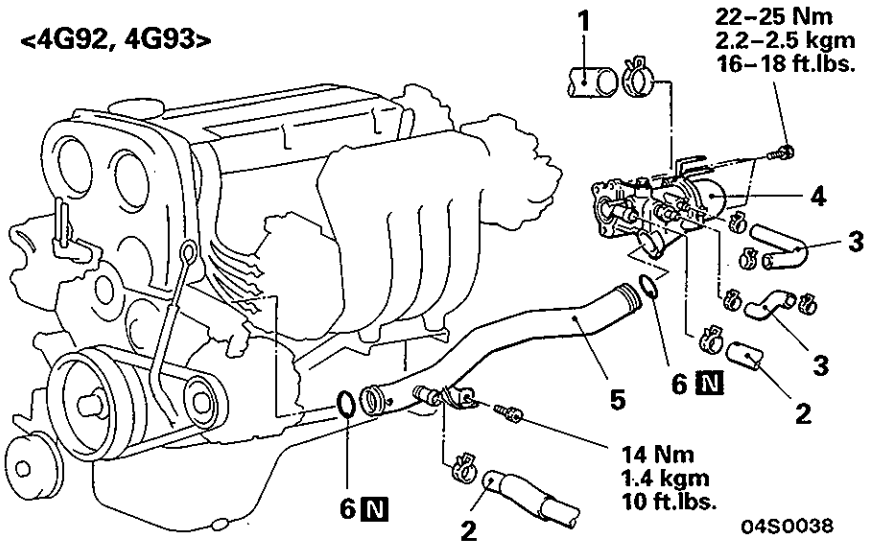
Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)

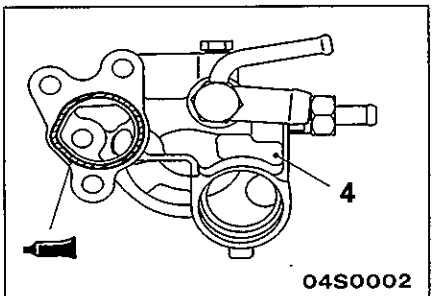
Removal steps
1. Radiator lower hose connection
2. Heater hose connection
3. Water hose
4. Thermostat case, thermostat and water inlet fitting assembly <4G92, 4G93>
5. Water inlet pipe
6. O-ring (Refer to P. 14-11.)
7. Bypass hose <4G13>

<4G13>



<4G92, 4G93>



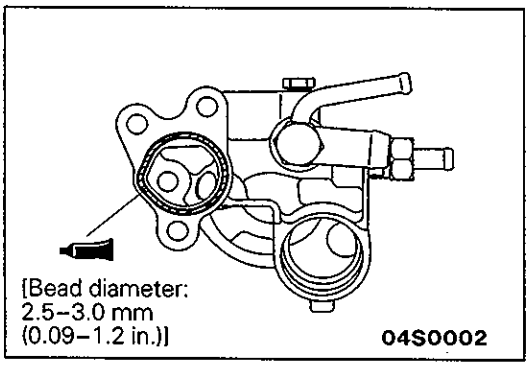


Specified Sealant:
Mitsubishi Genuine Parts No. MD970389 or equivalent

SERVICE POINTS OF INSTALLATION E14TDAI

7./3./2./1. INSTALLATION OF HOSES

The hose clamp should always be installed at the previous hose clamp installation position.



4. INSTALLATION OF THERMOSTAT CASE, THERMOSTAT AND WATER INLET FITTING ASSEMBLY

Squeeze out the sealant from the tube evenly and apply it so that there is not too much sealant and no places without sealant.

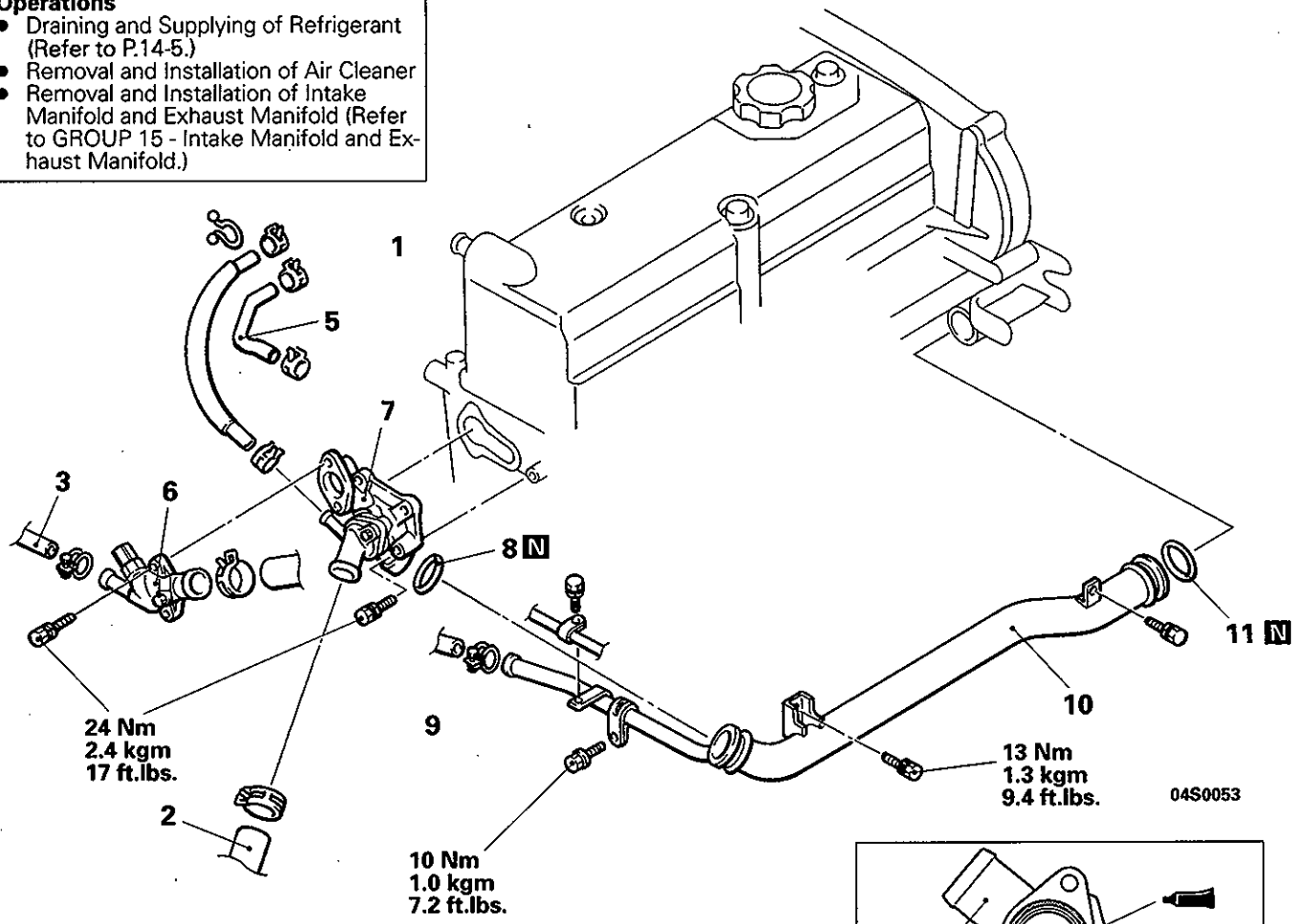
Specified sealant: Mitsubishi Genuine Parts No. MD970389 or equivalent

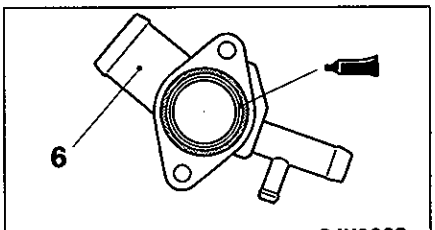
WATER HOSE AND WATER PIPE <4D68>

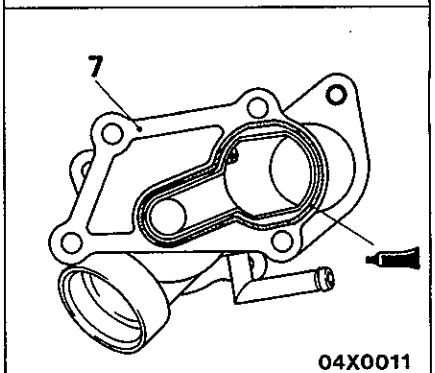
E14TA--

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operations
- Draining and Supplying of Refrigerant (Refer to P.14-5.)
- Removal and Installation of Air Cleaner
- Removal and Installation of Intake Manifold and Exhaust Manifold (Refer to GROUP 15 - Intake Manifold and Exhaust Manifold.)

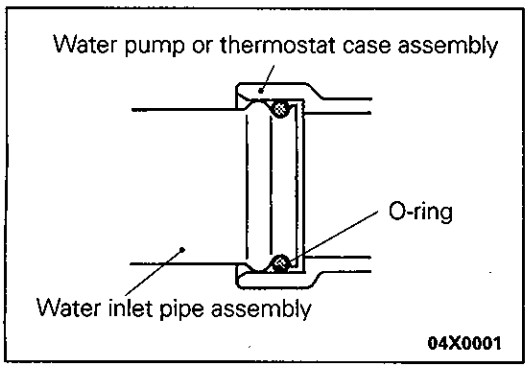






Specified Sealant:
Mitsubishi Genuine Parts No. MD970389 or equivalent

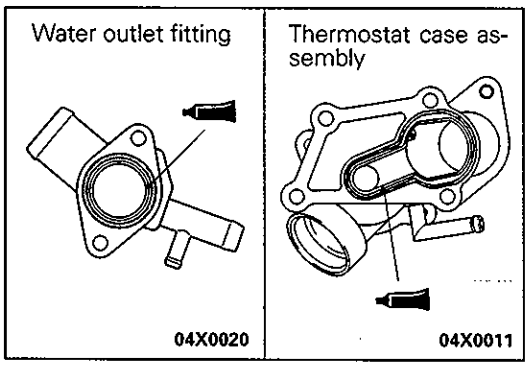
Removal steps
- ◆◆ 1. Radiator lower hose connection
- ◆◆ 2. Heater hose connection
- 3. Heater hose connection
- 4. Water hose
- 5. Water hose
- ◆◆ 6. Water outlet fitting
- ◆◆ 7. Thermostat case assembly
- ◆◆ 8. O-ring
- 9. Heater hose connection
- 10. Water inlet pipe assembly
- ◆◆ 11. O-ring



SERVICE POINTS OF INSTALLATION E14MDBG

11./8. INSTALLATION OF O-RING

Insert the O-rings into the grooves at both ends of the water inlet pipe assembly, rinse the outside of the O-rings and the inside surface of the pipe installation locations with water, and insert the pipe.

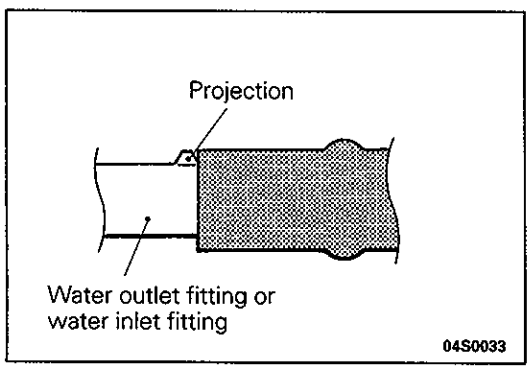


7./6. INSTALLATION THERMOSTAT CASE ASSEMBLY AND WATER OUTLET FITTING

(1) Use a brass wire brush to thoroughly clean all foreign particles from the surface of the gasket.
(2) Apply specified sealant, leaving no bare patches.

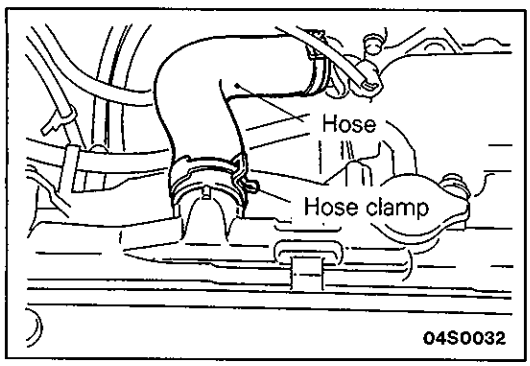
Specified sealant: Mitsubishi Genuine Parts No. MD970389 or equivalent

(3) While the sealant is still wet (within 15 minutes), install the thermostat case assembly and the water outlet fitting.
Be sure not to apply sealant anywhere other than in the places necessary.



2./1. INSTALLATION OF RADIATOR LOWER HOSE <4G13> OR RADIATOR UPPER HOSE

(1) Insert each hose as far as the projection of the water outlet fitting or water inlet fitting.



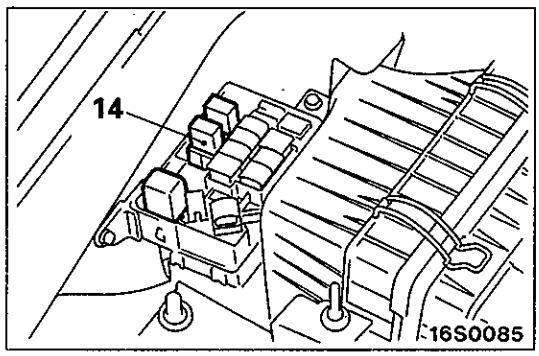
(2) The hose clamp should always be installed at the previous hose clamp installation position.

RADIATOR <4G13>

E14QA-1

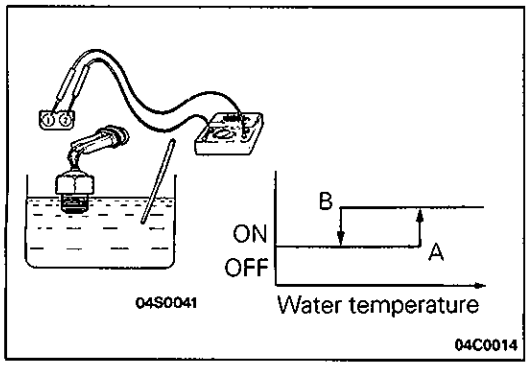
REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)
- Removal and Installation of Condenser Fan and Motor Assembly (Refer to GROUP 55 – Condenser and Condenser Fan Motor.)



Removal steps

1. Overflow hose
2. Reserve tank
3. Drain hose
- ◆◆ 4. Radiator upper hose
- ◆◆ 5. Radiator lower hose
6. Radiator fan motor connector
7. Upper insulator
8. Radiator and radiator fan assembly
9. Engine coolant temperature switch connector
10. Blower assembly
11. Engine coolant temperature switch
12. Radiator
13. Lower insulator
14. Radiator fan motor relay



INSPECTION

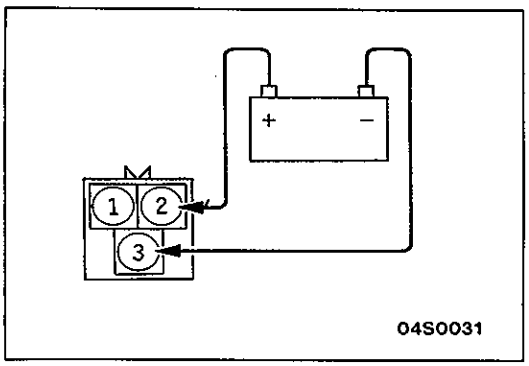
E14QCAN

ENGINE COOLANT TEMPERATURE SWITCH CHECK

(1) Immerse the engine coolant temperature switch into warm water or engine oil as shown in the illustration.
(2) Check the continuity with a circuit tester as the temperature of the liquid changes, and the condition is normal if it is within the following ranges.

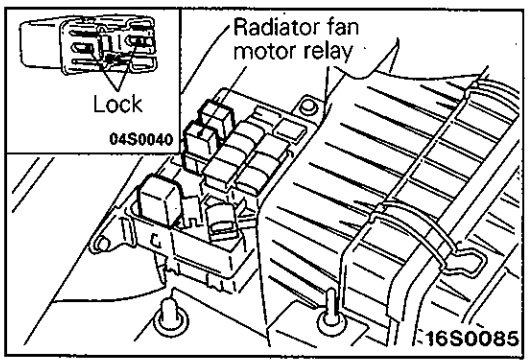
Standard value

Items	For radiator fan
Temperature at point A (OFF → ON)	82–88°C (180–190°F)
Temperature at point B (ON → OFF)	78°C (172°F) or less



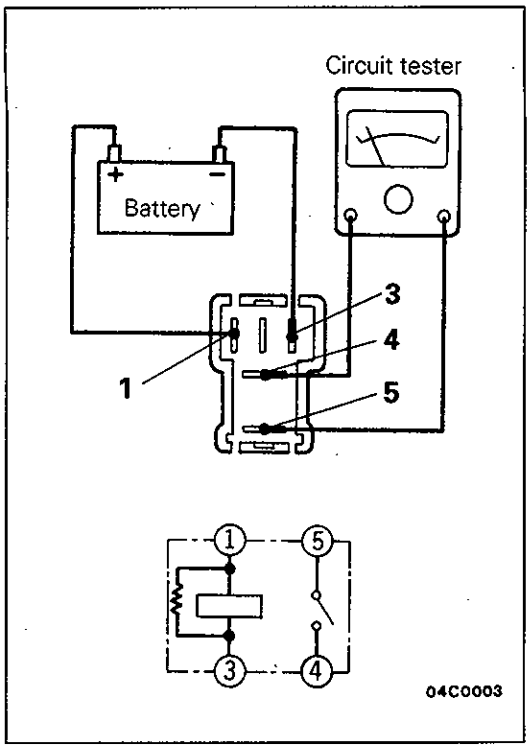
RADIATOR FAN MOTOR INSPECTION

(1) Check to be sure that the radiator fan rotates when battery voltage is applied between terminals (as shown in the figure).
(2) Check to see that abnormal noises are not produced, while motor is turning.



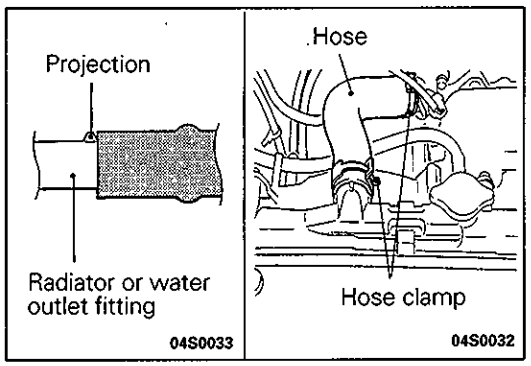
RADIATOR FAN MOTOR RELAY CHECK

(1) Remove the radiator fan motor relay from the relay box inside the engine compartment



(2) Check the continuity between terminals 4–5 when battery voltage is applied between terminals 1–3.

When current is flowing	Between terminals 4–5	Continuity
When current is not flowing	Between terminals 1–3	Continuity
	Between terminals 4–5	No continuity



SERVICE POINTS OF INSTALLATION E14QDAH

5./4. INSTALLATION OF RADIATOR LOWER HOSE AND RADIATOR UPPER HOSE

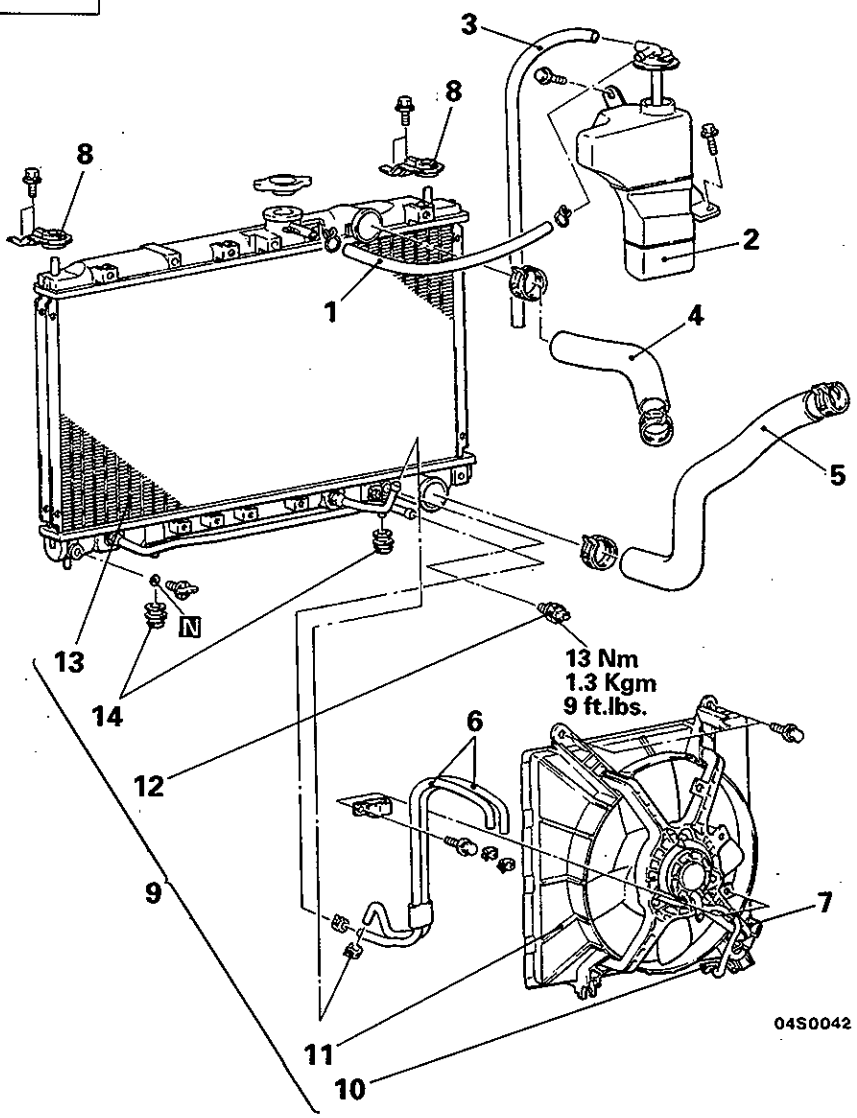
(1) Insert each hose as far as the projection of the radiator or water outlet fitting.
(2) The hose clamp should always be installed at the previous hose clamp installation position.

RADIATOR <4G92-2WD>

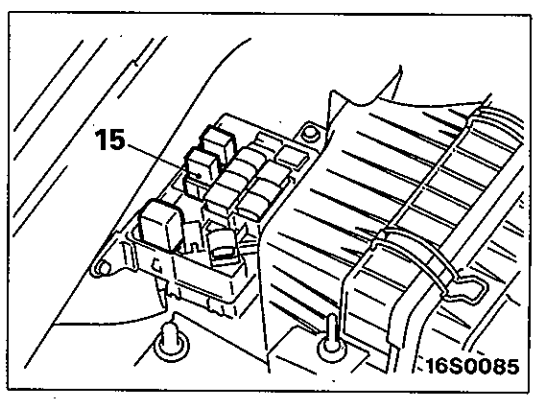
E14QA-2

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)
- Removal and Installation of Condenser Fan and Motor Assembly (Refer to GROUP 55 – Condenser and Condenser Fan Motor.)



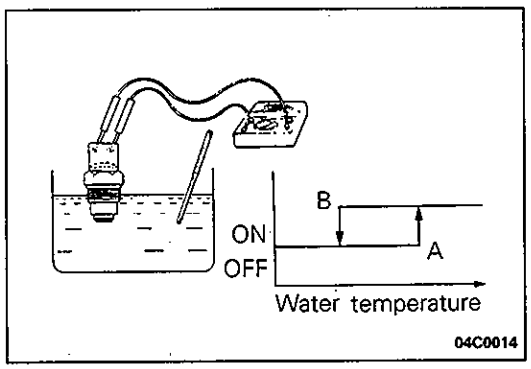
Removal steps
1. Overflow hose
2. Reserve tank
3. Drain hose
4. Radiator upper hose } (Refer to
5. Radiator lower hose } P. 14-18)
6. Transmission fluid cooler hose <A/T>
7. Radiator fan motor connector
8. Upper insulator
9. Radiator and radiator fan assembly
10. Engine coolant temperature connector
11. Blower assembly
12. Engine coolant temperature switch
13. Radiator
14. Lower insulator
15. Radiator fan motor relay



SERVICE POINTS OF REMOVAL E14QBAK

6. REMOVAL OF TRANSMISSION FLUID COOLER HOSE

After removing the hose from the radiator, plug the hose and the radiator nipple to prevent dust or foreign particles from getting in.



INSPECTION E14QCAN

ENGINE COOLANT TEMPERATURE SWITCH CHECK

(1) Immerse the engine coolant temperature switch into warm water or engine oil as shown in the illustration.
(2) Check the continuity with a circuit tester as the temperature of the liquid changes, and the condition is normal if it is within the following ranges.

Standard value

Items	For radiator fan
Temperature at point A (OFF → ON)	81–89°C (178–192°F)
Temperature at point B (ON → OFF)	77°C (171°F) or less

RADIATOR FAN MOTOR INSPECTION

Refer to P.14-17.

RADIATOR FAN MOTOR RELAY CHECK

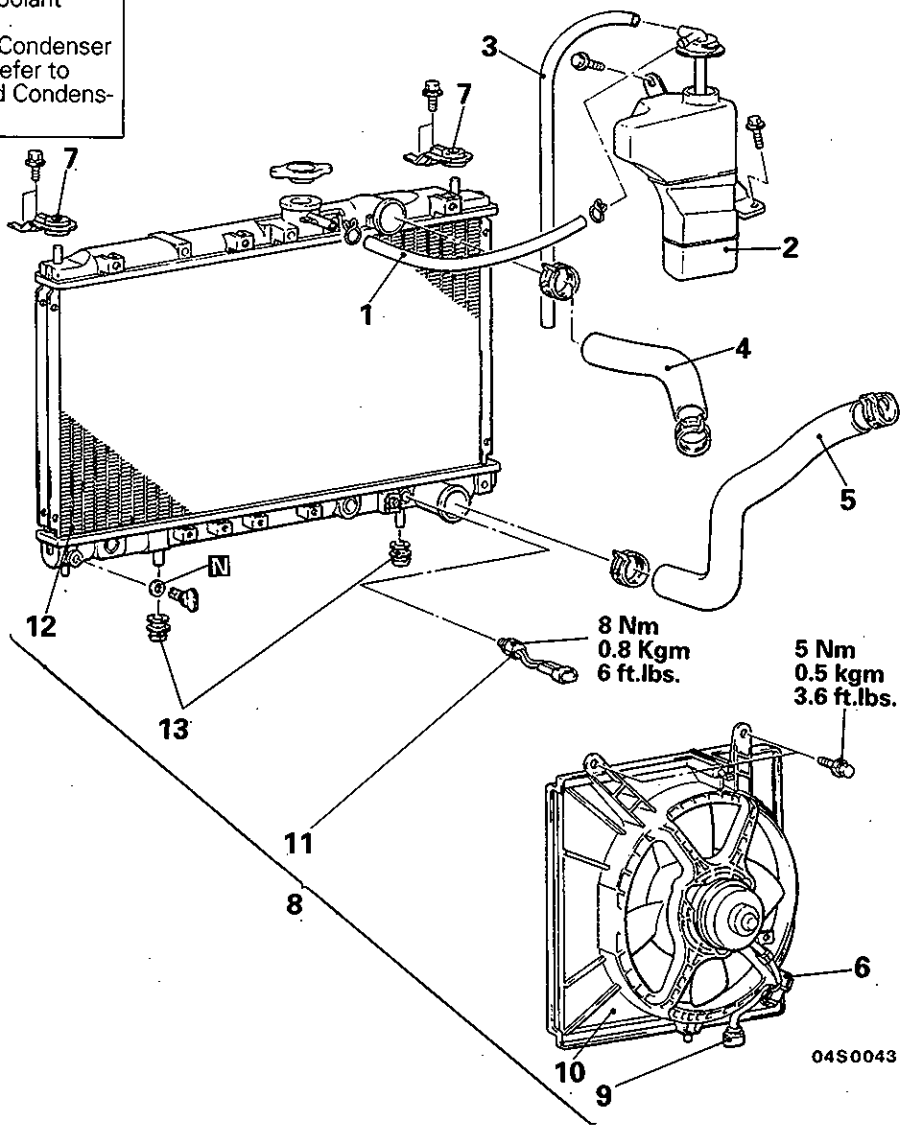
Refer to P.14-17.

RADIATOR <4G92-4WD, 4G93>

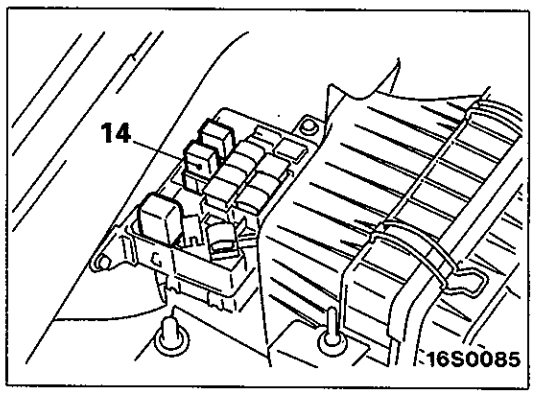
E14QA-3

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)
- Removal and Installation of Condenser Fan and Motor Assembly (Refer to GROUP 55 – Condenser and Condenser Fan Motor.)



Removal steps
1. Overflow hose
2. Reserve tank
3. Drain hose
4. Radiator upper hose } (Refer to P. 14-18.)
5. Radiator lower hose }
6. Radiator fan motor connector
7. Upper insulator
8. Radiator and radiator fan assembly
9. Engine coolant temperature switch connector
10. Blower assembly
11. Engine coolant temperature switch
12. Radiator
13. Lower insulator
14. Radiator fan motor relay



INSPECTION

E14QCAO

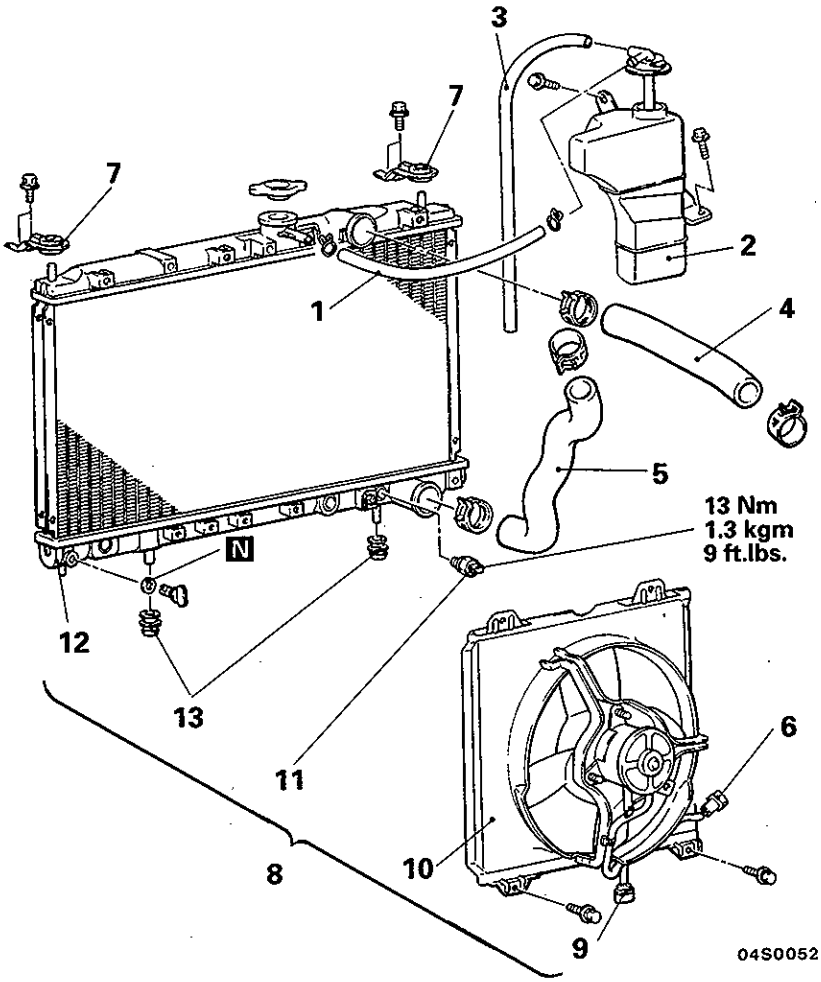
Refer to P. 14-17.

RADIATOR <4D68>

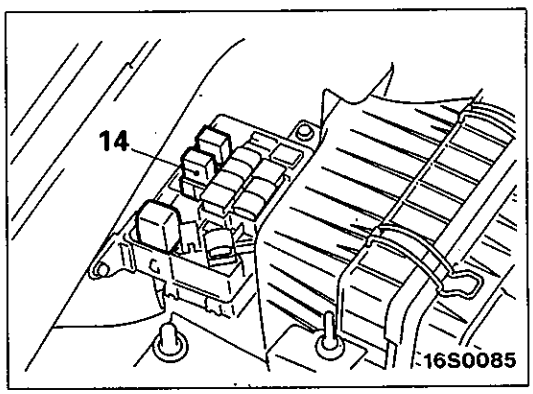
E14QA-4

REMOVAL AND INSTALLATION

Pre-removal and Post-installation Operation
- Draining and Supplying of Coolant (Refer to P. 14-5.)
- Removal and Installation of Condenser Fan and Motor Assembly (Refer to GROUP 55 – Condenser and Condenser Fan Motor.)



Removal steps
1. Overflow hose
2. Reserve tank
3. Drain hose
4. Radiator upper hose } (Refer to P. 14-18.)
5. Radiator lower hose }
6. Radiator fan motor connector
7. Upper insulator
8. Radiator and radiator fan assembly
9. Engine coolant temperature switch connector
10. Blower assembly
11. Engine coolant temperature switch
12. Radiator
13. Lower insulator
14. Radiator fan motor relay



INSPECTION

E14QCAO

Refer to P. 14-20.