

POWER STEERING SYSTEM

PRECAUTION

1. HANDLING PRECAUTIONS FOR STEERING SYSTEM

- (a) Care must be taken when replacing parts. Incorrect replacement could affect the performance of the steering system and result in driving hazards.

2. HANDLING PRECAUTIONS FOR SRS AIRBAG SYSTEM

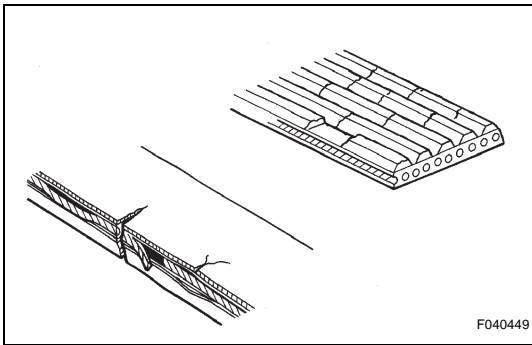
- (a) The vehicle is equipped with SRS (Supplemental Restraint System), such as airbags. If service operation is not carried out properly in the correct sequence, the airbag may suddenly deploy and this may result in serious injury. Before servicing (including inspection, replacement, removal and inspection of parts), be sure to read the precautionary notices for the supplemental restraint system (See page [RS-1](#)).

PROBLEM SYMPTOMS TABLE

HINT:

Use the table below to help you find the cause of the problems. The numbers indicate the ranked order of probability of each of the possible causes. Check each part in the order suggested. If necessary, replace these applicable parts.

Symptom	Suspected area	See page
Hard steering	1. Tires (Improperly inflated)	TW-1
	2. Power steering fluid level (Low)	PS-3
	3. Drive belt (Loose) (2TR-FE)	EM-5
	4. Drive belt (Loose) (1GR-FE)	EM-5
	5. Front wheel alignment (Incorrect) (2WD)	SP-2
	6. Front wheel alignment (Incorrect) (4WD and Pre-Runner)	SP-7
	7. Steering system joints (Worn)	-
	8. Suspension arm ball joints (Worn) (2WD)	SP-36
	9. Suspension arm ball joints (Worn) (4WD and Pre-Runner)	SP-43
	10. Steering column (Binding)	-
	11. Vane pump (2TR-FE)	PS-21
	12. Vane pump (1GR-FE)	PS-11
	13. Power steering link (2WD)	PS-35
	14. Power steering link (4WD and Pre-Runner)	PS-60
Poor return	1. Tires (Improperly inflated)	TW-1
	2. Front wheel alignment (Incorrect) (2WD)	SP-2
	3. Front wheel alignment (Incorrect) (4WD and Pre-Runner)	SP-7
	4. Steering column (Binding)	-
	5. Power steering link (2WD)	PS-35
	6. Power steering link (4WD and Pre-Runner)	PS-60
Excessive play	1. Steering system joints (Worn)	-
	2. Suspension arm ball joints (Worn) (2WD)	SP-36
	3. Suspension arm ball joints (Worn) (4WD and Pre-Runner)	SP-43
	4. Intermediate shaft, Sliding yoke (Worn)	-
	5. Front wheel bearing (Worn)	AH-1
	6. Power steering link (2WD)	PS-35
	7. Power steering link (4WD and Pre-Runner)	PS-60
Abnormal noise	1. Power steering fluid level (Low)	PS-3
	2. Steering system joints (Worn)	-
	3. Vane pump (2TR-FE)	PS-21
	4. Vane pump (1GR-FE)	PS-11
	5. Power steering link (2WD)	PS-35
	6. Power steering link (4WD and Pre-Runner)	PS-60



ON-VEHICLE INSPECTION

1. INSPECT DRIVE BELT

- (a) Visually check the belt for defects, such as excessive wear and frayed cords.

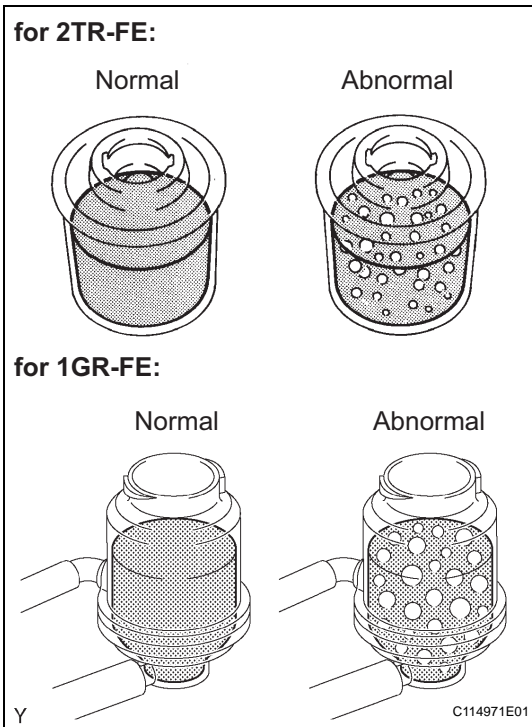
If any defects are found, replace the drive belt.

HINT:

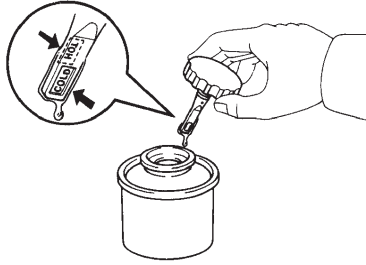
Cracks on the rib side of a belt are considered acceptable. Replace the belt if there are any missing ribs.

2. BLEED POWER STEERING SYSTEM

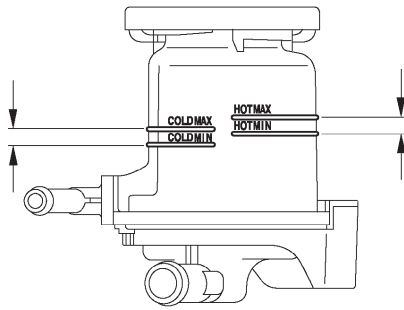
- (a) Check the fluid level.
- (b) Jack up the front of the vehicle and support it with stands.
- (c) Turn the steering wheel.
- (1) With the engine stopped, turn the wheel slowly from lock to lock several times.
- (d) Lower the vehicle.
- (e) Start the engine.
- (1) Run the engine at idle for a few minutes.
- (f) Turn the steering wheel.
- (1) With the engine idling, turn the wheel to the left or right full lock position and keep it there for 2 to 3 seconds. Then turn the wheel to the opposite full lock position and keep it there for 2 to 3 seconds (step A).
- (2) Repeat step A several times.
- (g) Stop the engine.
- (h) Check for foaming or emulsification. Especially, if the system has to be bled twice because of foaming or emulsification, check for fluid leakage in the system.
- (i) Check the fluid level.



for 2TR-FE:



for 1GR-FE:



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3. INSPECT FLUID LEVEL

- (a) Keep the vehicle level.
- (b) With the engine stopped, check the fluid level in the oil reservoir.
If necessary, add fluid.

Fluid:**ATF "DEXRON" II or III****HINT:**

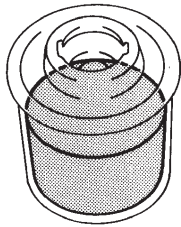
Check that the fluid level is within the HOT level range in the reservoir tank. If the fluid is cold, check that it is within the COLD level range.

- (c) Start the engine and let it idle.
- (d) Turn the steering wheel from lock to lock several times to raise fluid temperature.

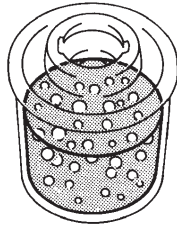
Fluid temperature:**75 to 80°C (167 to 176°F)**

for 2TR-FE:

Normal

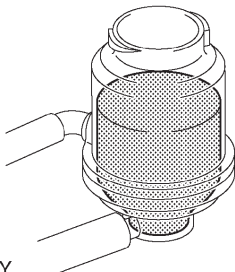


Abnormal

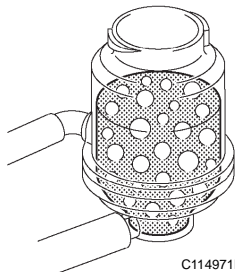


for 1GR-FE:

Normal



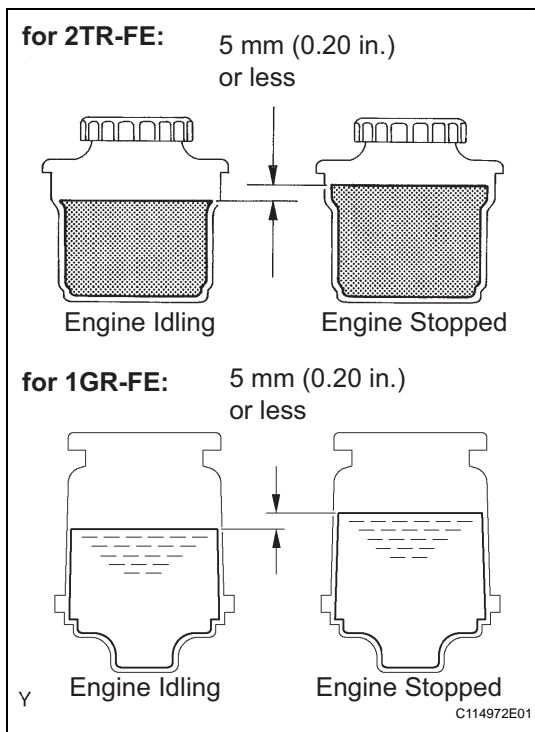
Abnormal



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- (e) Check for foaming or emulsification.
If any foaming or emulsification is identified, bleed the power steering system.



- (f) With the engine idling, measure the fluid level in the oil reservoir.
- (g) Stop the engine.
- (h) Wait a few minutes and measure the fluid level in the oil reservoir again.

Maximum fluid level rise:

5 mm (0.20 in.)

If any problems are found, bleed the power steering system.

- (i) Check the fluid level.

4. INSPECT STEERING FLUID PRESSURE

- (a) for 2TR-FE:
 - (1) Disconnect the pressure feed tube from the vane pump (See page PS-19).
- (b) for 1GR-FE:
 - (1) Disconnect the pressure feed tube from the vane pump (See page PS-9).
- (c) Connect SST as shown in the illustration.

SST 09640-10010 (09641-01010, 09641-01030, 09641-01060)

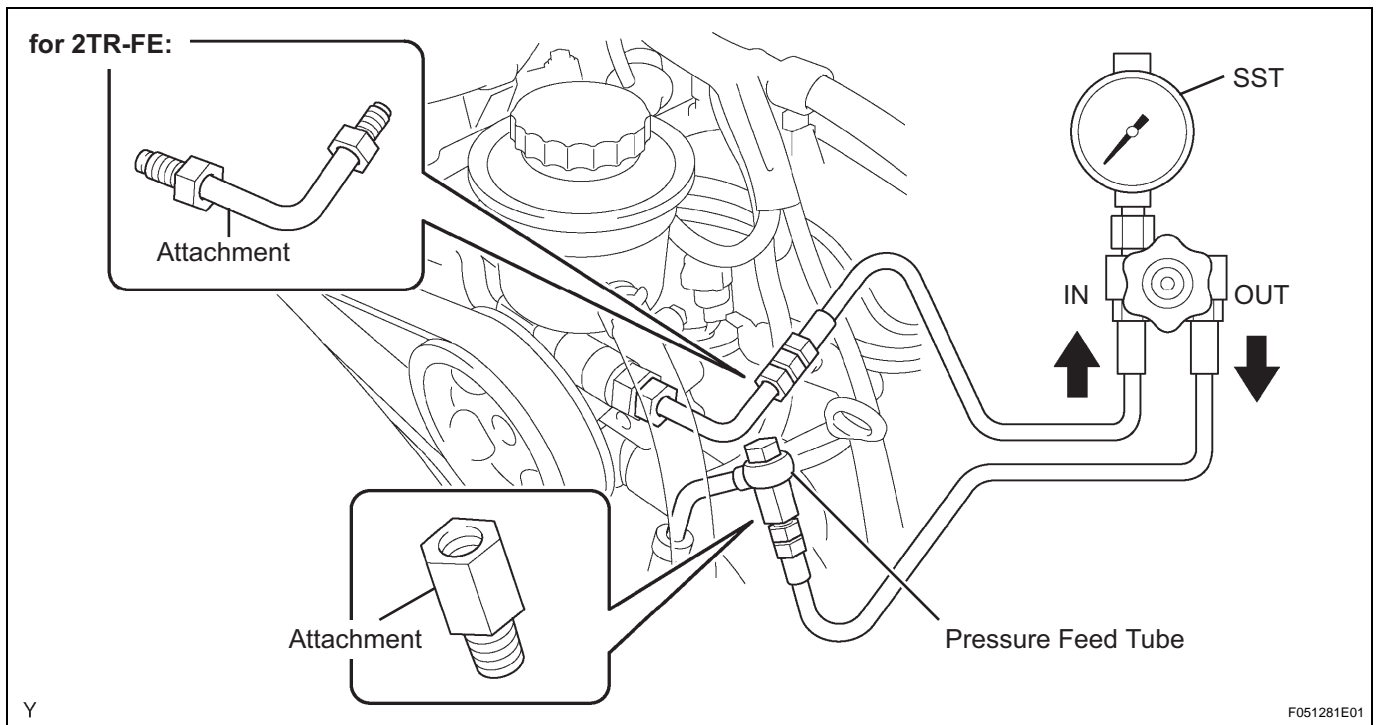
NOTICE:

Check that the valve of SST is in the open position.

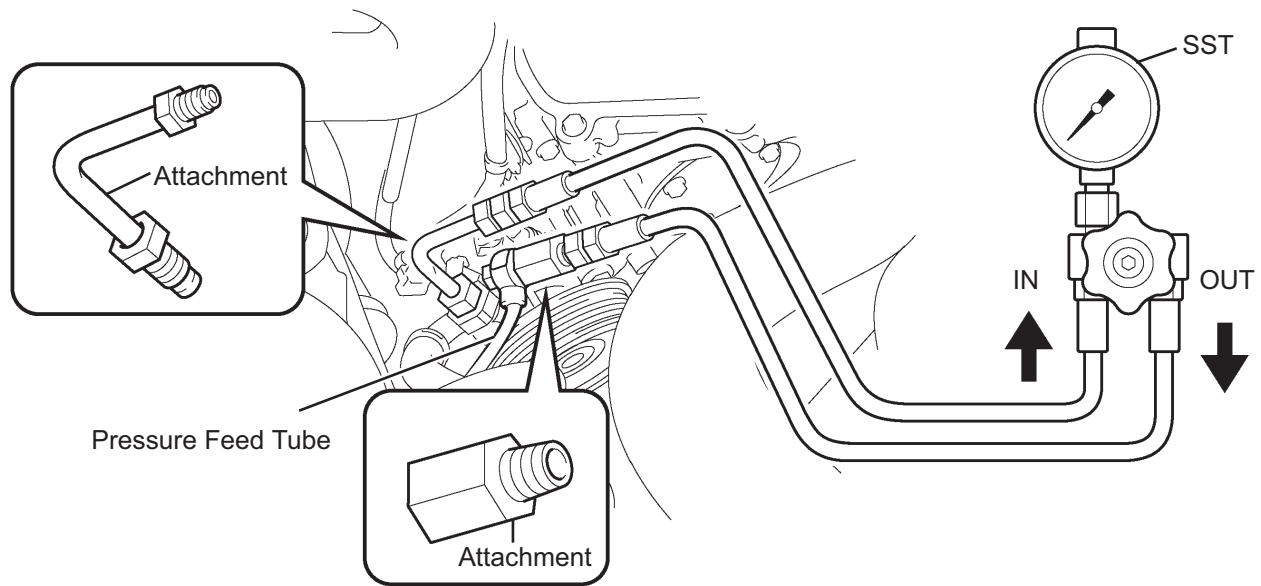
- (d) Bleed the power steering system.
- (e) Start the engine and let it idle.
- (f) Turn the steering wheel from lock to lock several times to raise the fluid temperature.

Fluid temperature:

75 to 80 °C (167 to 176 °F)

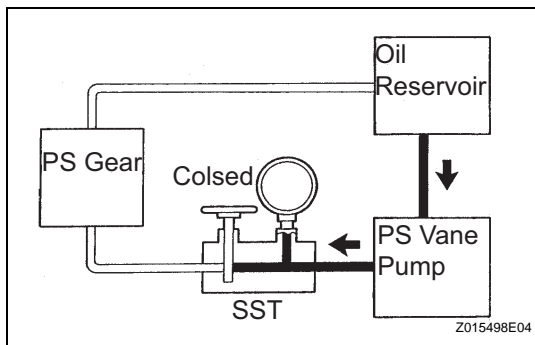


for 1GR-FE:



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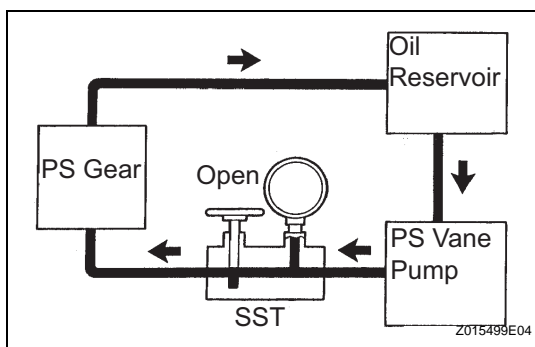
- (g) With the engine idling, close the valve of SST and check the reading on SST.

Fluid pressure:

8,300 to 8,800 kPa (85 to 90 kgf/cm², 1,209 to 1,280 psi)

NOTICE:

- Do not keep the valve closed for more than 10 seconds.
- Do not let the fluid temperature become too high.



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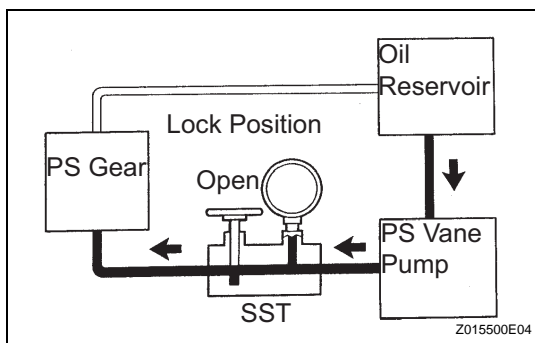
- (h) With the engine idling, fully open the valve.
(i) Measure the fluid pressure at the engine speeds of 1,000 rpm and 3,000 rpm.

Fluid pressure difference:

490 kPa (5 kgf/cm², 71 psi) or less

NOTICE:

Do not turn the steering wheel.



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- (j) With the engine idling and valve fully open, turn the steering wheel to the full lock position.

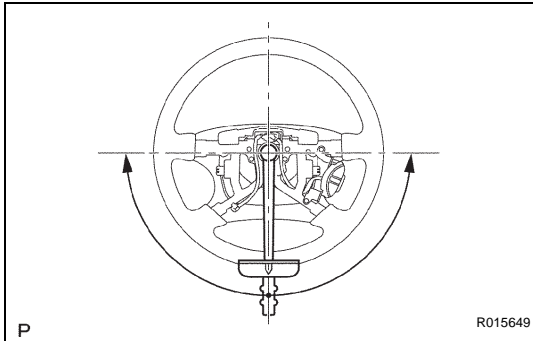
Fluid pressure:

8,300 to 8,800 kPa (85 to 90 kgf/cm², 1,209 to 1,280 psi)

NOTICE:

- Do not keep the steering wheel in the full lock position for more than 10 seconds.
- Do not let the fluid temperature become too high.

- (k) Disconnect SST.
- (l) for 2TR-FE:
 - (1) Connect the pressure feed tube to the vane pump (See page [PS-25](#)).
- (m) for 1GR-FE:
 - (1) Connect the pressure feed tube to the vane pump (See page [PS-15](#)).
- (n) Bleed the power steering system.



5. INSPECT STEERING EFFORT

- (a) Center the steering wheel assembly.
- (b) Remove the horn button assembly (See page [RS-558](#)).
- (c) Start the engine and let it idle.
- (d) Measure the steering effort in both directions.

Steering effort (Reference):

6.0 N*m (60 kgf*cm, 53 in.*lbf) or less

HINT:

Check the tire type, pressure and contact surfaces before making a diagnosis.

- (e) Install the steering wheel assembly set nut.
Torque: 50 N*m (510 kgf*cm, 37 ft.*lbf)
- (f) Install the horn button assembly (See page [RS-558](#)).