

## ST-2

## Steering System

## General Information

## Specifications

Item		Specification
Type		Motor Driven Power Steering
		Hydraulic Power Steering System
Steering gear	Type	Rack & Pinion
	Rack stroke	153mm
Steering angle(Max.)	Inner	$39.5^{\circ} \pm 1.30^{\circ}$
	Outer	$31.9^{\circ}$
Power steering pump	Type	Vane
	Relief pressure	95~100 kgf/cm <sup>2</sup> (1351~1422 psi)
Power steering oil		PSF

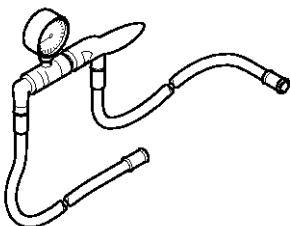
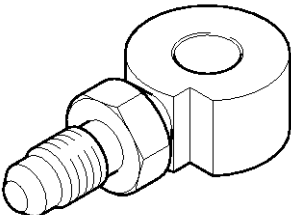
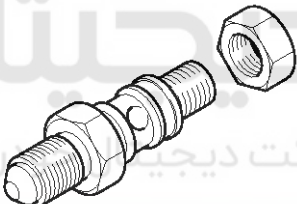
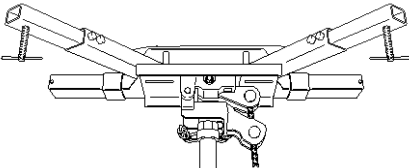
## Tightening Torques

Item	Tightening torque (kgf.m)		
	Nm	kgf.m	lb-ft
Hub nuts	88.3 ~ 107.9	9.0 ~ 11.0	65.1 ~ 79.6
Steering wheel lock nut	39.2 ~ 49.0	4.0 ~ 5.0	28.9 ~ 36.2
Steering column mounting bolts and nuts	12.7 ~ 17.7	1.3 ~ 1.8	9.4 ~ 13.0
Universal joint to pinion of steering gear	32.4 ~ 37.3	3.3 ~ 3.8	23.9 ~ 27.5
Tie rod end castle nut	23.5 ~ 33.3	2.4 ~ 3.4	17.4 ~ 24.6
Lower arm ball joint bolt and nut	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Steering gear box mounting bolts	58.8 ~ 78.5	6.0 ~ 8.0	43.4 ~ 57.9
Stabilizer link nut	98.1 ~ 117.7	10.0 ~ 12.0	72.3 ~ 86.8
Sub frame mounting bolts & nuts	176.5 ~ 196.1	18.0 ~ 20.0	130.2 ~ 144.7
Roll rod mounting bolt & nut	107.9 ~ 127.5	11.0 ~ 13.0	79.6 ~ 94.0

## General Information

## ST-3

## Special Service Tools

Tool (Number and Name)	Illustration	Use
09572-21000 Oil pressure gauge	 EPRF001F	Measurement of oil pressure (Use with 09572-22100, 09572-21200)
09572-22100 Oil pressure gauge adaptor	 EPRF001H	Measurement of oil pressure (Use with 09572-21000, 09572-21200)
09572-21200 Oil pressure gauge adaptor	 EPRF001G	Measurement of oil pressure (Use with 09572-22100, 09572-21000)
09624-38000 Crossmember supporter	 EKBF005A	Supporting of the crossmember.

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## Steering System

## Troubleshooting

Symptom	Probable cause	Remedy
play in steering	Loose yoke plug	Retighten
	Loose steering gear mounting bolts	Retighten
	Loose or worn tie rod end	Retighten or replace as necessary
Steering wheel operation is not smooth (Insufficient power assist)	V-belt slippage	Readjust
	Damaged V-belt	Replace
	Low fluid level	Replenish
	Air in the fluid	Bleed air
	Twisted or damaged hoses	Correct the routing or replace
	Insufficient oil pump pressure	Repair or replace the oil pump
	Sticky flow control valve	Replace
	Excessive internal oil pump leakage	Replace the damaged parts
	Excessive oil leaks from rack and pinion in gear box	Replace the damaged parts
	Distorted or damaged gear box or valve body seals	Replace
Steering wheel does not return properly	Excessive turning resistance of tie rod end	Replace
	Yoke plug excessively tight	Adjust
	Tie rod and/or ball joint cannot turn smoothly	Replace
	Loose mounting of gear box mounting bracket Worn steering shaft joint and/or	Retighten
	Worn steering shaft joint and/or body grommet	Correct or replace
	Distorted rack	Replace
	Damaged pinion bearing	Replace
	Twisted or damaged hoses	Reposition or replace
	Damaged oil pressure control valve	Replace
	Damaged oil pump input shaft bearing	Replace

## General Information

## ST-5

Symptom	Probable cause	Remedy
Noise	<p>Hissing Noise in Steering Gear</p> <p>There is some noise with all power steering systems. One of the most common is a hissing sound when the steering wheel is turned and the car is not moving. This noise will be most evident when turning the wheel while the brakes are being applied. There is no relationship between this noise and steering performance. Do not replace the valve unless the "hissing" noise becomes extreme. A replaced valve will also make a slight noise, and is not always a solution for the condition.</p>	
Rattling or chucking noise in the rack and pinion	Interference with hoses from vehicle body	Reposition
	Loose gear box bracket	Retighten
	Loose tie rod end and/or ball joint	Retighten
	Worn tie rod and/or ball joint	
Noise in the oil pump	Low fluid level	Replenish
	Air in the fluid	Bleed air
	Loose pump mounting bolts	Retighten

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



## ST-6

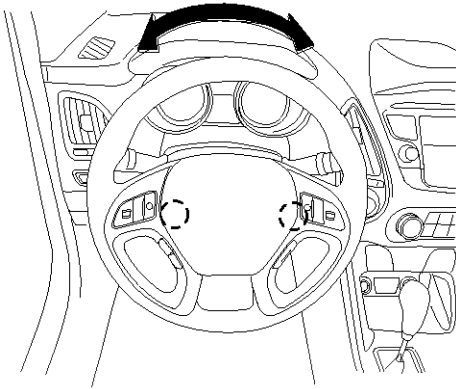
## Steering System

## Service Adjustment Procedure

## Steering Wheel Play Inspection

1. Turn the steering wheel so that the front wheels can face straight ahead.
2. Measure the distance that the steering wheel can be turned with out moving the front wheels.

**Standard value:** 0 ~ 30mm (1.18in.) or less



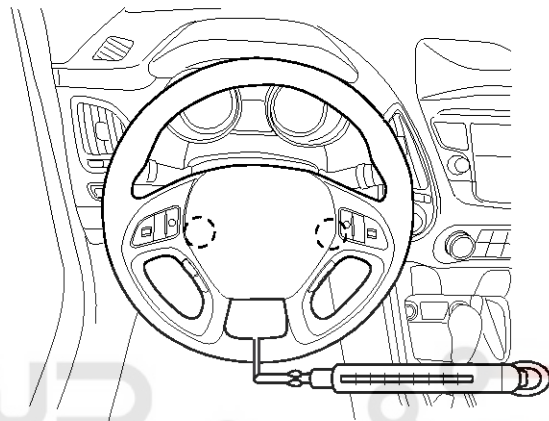
SSLST1001L

3. If the play exceeds standard value, inspect the steering column, shaft, and linkages.

## Checking Stationary Steering Effort

1. Position the vehicle on a level surface and place the steering wheel in the straight ahead position.
2. Start the engine and turn the steering wheel from lock to lock several times to warm up the power steering fluid.
3. Attach a spring scale to the steering wheel. With the engine speed 500 ~ 700RPM, pull the scale and read it as soon as the tires begin to turn.

**Standard value:** 3.0kgf



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4. If the measured value exceeds standard value, inspect the power steering gear box and pump.

## Power Steering Fluid Replacement

## ⚠ CAUTION

**Always use genuine PSF. Using other type of power steering fluid or ATF can cause increased wear and poor steering in cold weather.**

1. Raise the reservoir and then disconnect the return hose to drain the reservoir. Be careful not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.
2. Connect a tube of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Jack up the front wheels and turn the steering wheel from the lock to lock until fluid stops running out of the tube.
4. Reconnect the return hose to reservoir.
5. Fill the reservoir with the power steering fluid and then bleed the power steering system.

## General Information

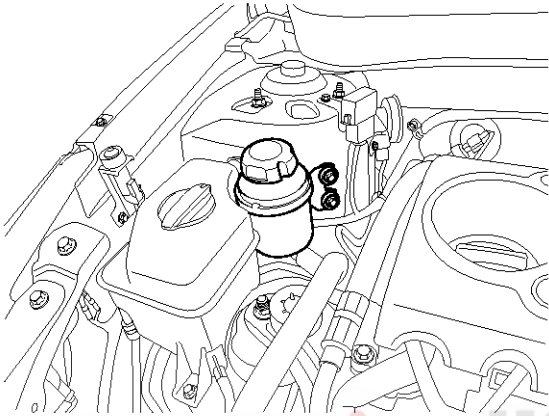
## ST-7

### Air Bleeding

#### ⚠ CAUTION

Always use genuine PSF. Using other type of power steering fluid or ATF can cause increased wear and poor steering in cold weather.

1. Jack up the front wheels.
2. Fill the reservoir with the power steering fluid up to the level of 'COLD MAX' marked on the reservoir.



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#### ⚠ CAUTION

Be careful not to start the engine. If starting the engine before performing the steps 3 through 4, it may cause an abnormal noise during power steering pump operation.

3. Turn the steering wheel from lock to lock 5 ~ 6 times for 15 ~ 20 seconds.
4. Crank the engine 1 ~ 2 times by turning the ignition key very quickly from the 'On' position to the 'Start' position, but do not start the engine.
5. Turn the steering wheel from lock to lock 5 ~ 6 times for 15 ~ 20 seconds.

Start the engine and keep turning the steering wheel from lock to lock until air bubbles stop appearing in the reservoir with the engine idle.

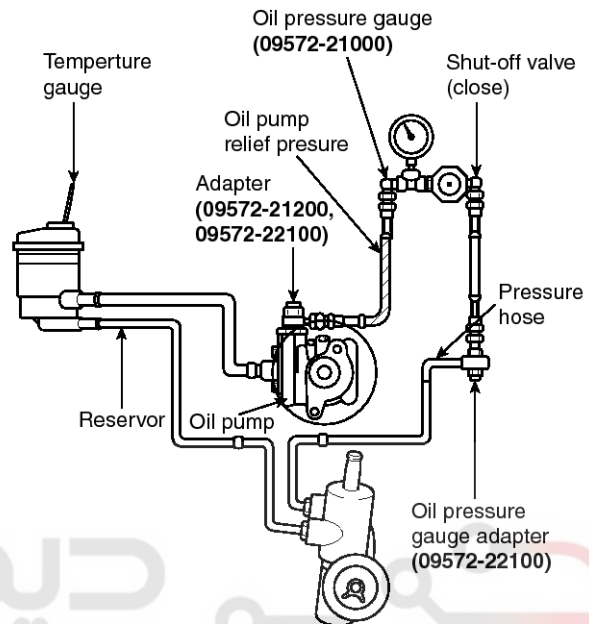
6. Check the color and level of the power steering fluid in the reservoir and then replenish the reservoir up to the 'COLD MAX' level as required.

#### 📌 NOTICE

If the fluid level moves up and down when turning the steering wheel, the fluid overflows out of the reservoir when turning off the engine or the fluid is a white color, it indicates that air bubbles have not been removed sufficiently from the power steering system. Therefore, repeat the steps 5 through 6 as required.

### Oil-Pump Pressure Test

1. Disconnect the pressure tube from the power steering motor and then install the special tools between the motor and the pressure tube as illustrated below.



EPRF002B

2. Start the engine and turn the steering wheel several times so that the fluid temperature rises to approx. 50 ~ 60 C (122 F).
3. Set the engine speed to approx. 600rpm.
4. Close the shut-off valve of the special tools and measure the fluid pressure.

**Relief pressure:** 95 ~ 100 kgf/cm<sup>2</sup> (1351 ~ 1422 psi)

#### ⚠ CAUTION

**Do not keep the shut-off valve on the pressure gauge closed for longer than 10 seconds.**

5. Remove the special tools, and then connect the pressure tube to the pump by tightening the eye bolt.
6. Bleed the power steering system.

## ST-8

## Steering System

## Electric Power Steering

## Description

EPS (Electric power steering, Column assist type) system uses an electric motor to assist the steering force and it is an engine operation independent steering system.

EPS control module controls the motor operation according to information received from the each sensor and CAN (Controller Area Network),

resulting in a more precise and timely control of steering assist than conventional engine-driven hydraulic systems. Components (Steering Angle Sensor, Torque Sensor, Fail-safe relay, etc.) of the EPS system are located inside the steering column & EPS unit assembly and the steering column & EPS unit assembly must not be disassemble to inspect or replace them.

## Note With Regard to diagnosis

Trouble factor	Check item	Trouble symptom	Explanation	Note
Drop, impact, and overload	Motor	Abnormal noise	- Visible or unvisible damage can occur. The steering wheel could pull to one side by using the dropped parts. - Precise parts of motor/ECU are sensitive to vibration and impact. - Overload can cause unexpected damage	- Do not use the impacted EPS.- Do not overload each parts.
	ECU	Circuit damage- Wrong welding point- Broken PCB- Damaged precise parts		
	Torque sensor	Insufficient steering effort	Overload to INPUT shaft can cause malfunction of the torque sensor	- Do not impact the connecting parts (When inserting and torquing) - Use the specified tool to remove the steering wheel. (Do not hammer on it)- Do not use the impacted EPS
	Shaft	Insufficient steering effort (Uneven between LH and RH)		Do not use the impacted EPS
Pull/Dent	Harness	- Malfunction-impossible power operation- Malfunction of EPS	Disconnection between harness connecting portion and harness	Do not overload the harness
Abnormal storage temperature	Motor/ECU	Abnormal steering effort by improper operation of the motor/ECU	- Waterproof at the normal condition- Even a little moisture can cause malfunction of the precise parts of the motor/ECU	- Keep the normal temperature and proper moisture, while storing- Avoid drowning

1. Do not impact the electronic parts, if they are dropped or impacted, replace them with new ones.
2. Avoid heat and moisture to the electronic parts.
3. Do not contact the connect terminal to avoid deformation and static electricity.

4. Do not impact the motor and torque sensor parts, if they are dropped or impacted, replace them with new ones.
5. The connector should be disconnected or connected with IG OFF.



# Electric Power Steering

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## General Inspection

After or before servicing the EPS system, perform the troubleshooting and test procedure as follows. Compare the system condition with normal condition in the table below and if abnormal symptom is detected, perform necessary remedy and inspection.

Test condition	Normal condition: Motor must not supply steering assist.		
	Symptom	Possible cause	Remedy
IG Off	Motor supplies steering assist.	ASP is not calibrated.	Perform the ASP calibration using a scan tool.
		IG power supplies	Inspect the IG power supply line.
Test condition	Normal condition: Motor must not supply steering assist, Warning lamp is illuminated.		
	Symptom	Possible cause	Remedy
IG On/Engine Off	Motor supplies steering assist.	ASP is not calibrated.	Perform the ASP calibration using a scan tool.
		EMS CAN signal is not received.	Inspect the CAN line.
	Warning lamp is not illuminated.	Cluster fault	Inspect the cluster and cluster harness
Test condition	Normal condition: Motor supplies steering assist, Warning lamp is not illuminated.		
	Symptom	Possible cause	Remedy
IG On/Engine On	Warning lamp is illuminated and Motor does not supply steering assist.	EPS (Hot at all times) and IG power supply fault	Inspect the connector and harness for EPS (Hot at all times) and IG power supply line.
		DTC is detected by system.	Perform the self test using a scan tool and repair or replace.
	Warning lamp is illuminated and Motor supplies steering assist.	ASP is not calibrated.	Perform the ASP calibration using a scan tool.
		CAN communication between EPS and cluster is fault.	Inspect the CAN line.

ASP: Absolute Steering Position

CAN: Controller Area Network

EMS: Engine Management System

### CAUTION

The following symptoms may be occurred during normal vehicle operation and if there is no EPS warning light illumination, it is not malfunction of EPS system.

- After turning the ignition switch on, the steering wheel becomes heavier while it performs EPS system diagnostics, for about 2 seconds, then it becomes normal steering condition.
- After turning the ignition switch on or off, EPS relay noise may occur but it is normal.
- When it is steered, while the vehicle is stopped or in low driving speed, motor noise may occur but it is normal operating one.



## ST-10

## Steering System

### Caution when ASP (Absolute Steering Position) calibration or EPS type recognition

- Check if the battery is fully charged before ASP calibration or EPS type recognition.
- Be careful not to disconnect any cables connected to the vehicle or scan tool during ASP calibration or EPS type recognition.
- When the ASP calibration or EPS type recognition is completed, turn the ignition switch off and wait for several seconds, then start the engine to confirm normal operation of the vehicle.

### Scan tool (Hi-Scan Pro) installation

1. Attach the CAN interface module to the Hi-Scan Pro main body and securely tighten the two bolts.
2. Install the CAN interface module to the Data Link Cable and securely tighten the two bolts.

### ASP Calibration

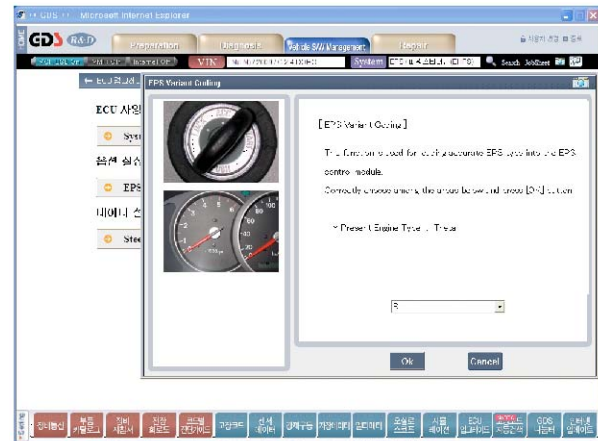
1. Select "Steering Angle Sensor".
2. Proceed with the test according to the screen introductions.



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### EPS Type Recognition Procedure

1. Select "EPS Variant Coding".
2. Proceed with the test according to the screen introductions.



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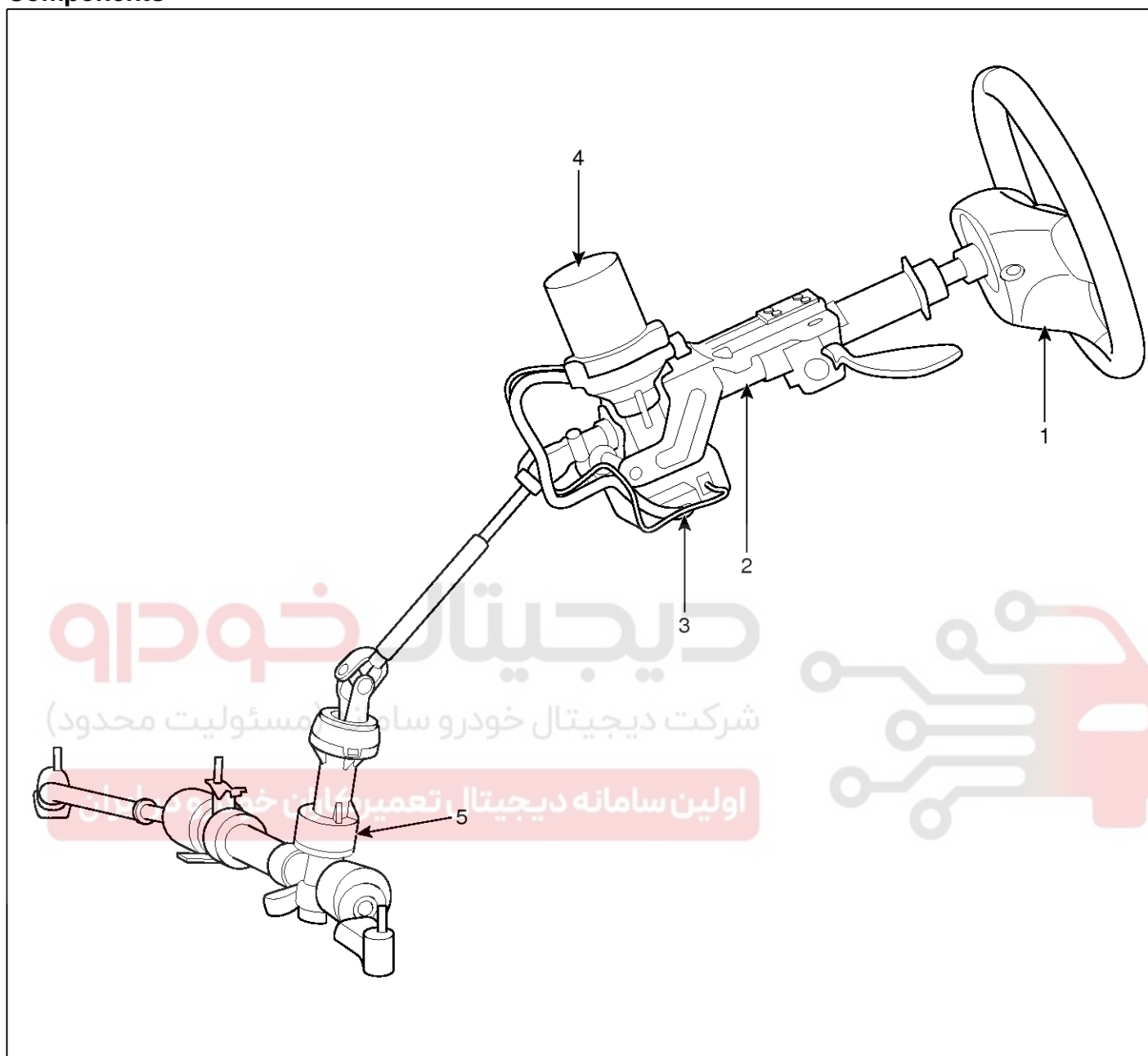


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# Electric Power Steering

**ST-11**

## Components



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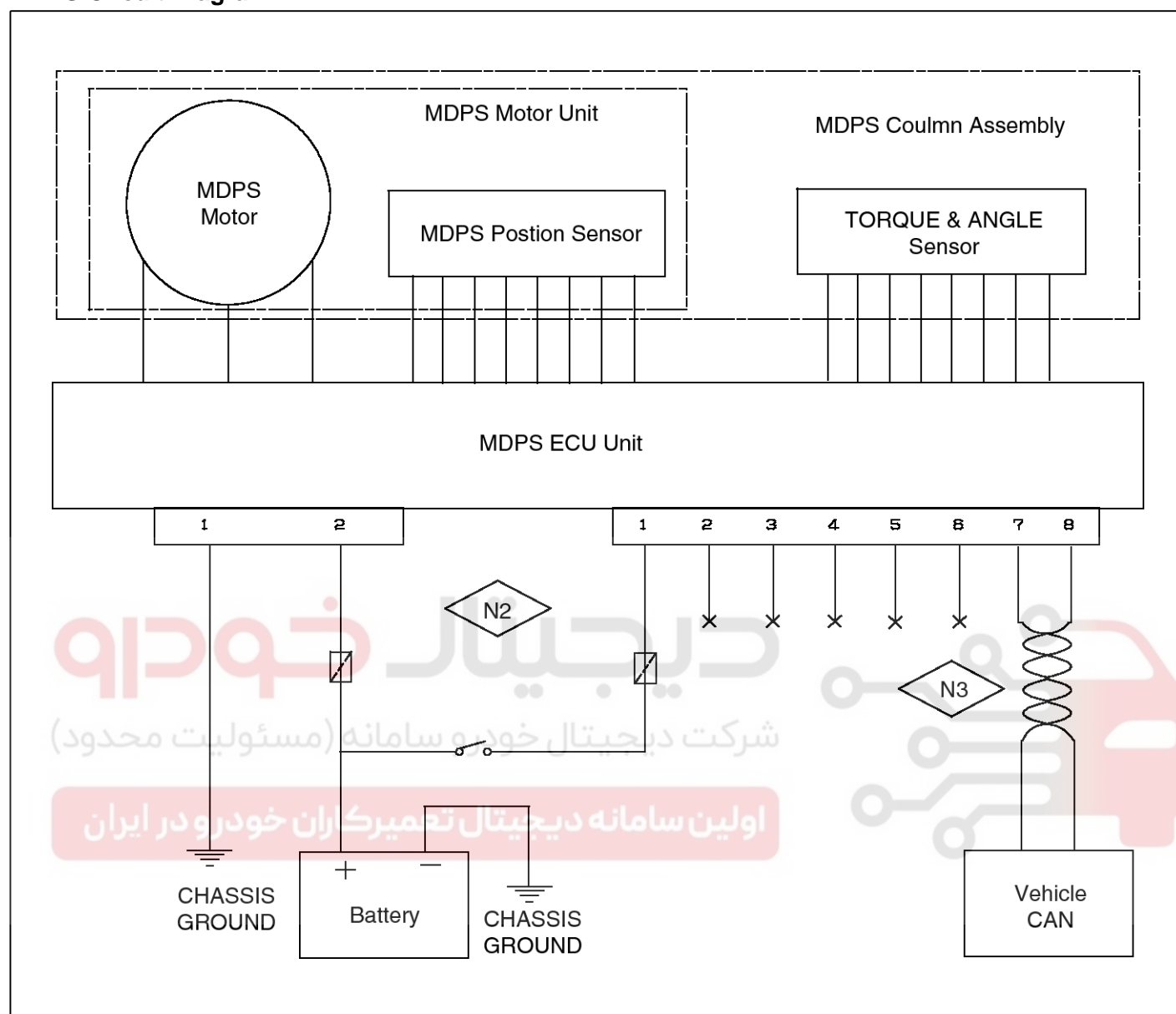
- 1. Steering wheel
- 2. Steering column
- 3. ECU

- 4. Motor
- 5. Steering gear box

## ST-12

## Steering System

MDPS Circuit Diagram

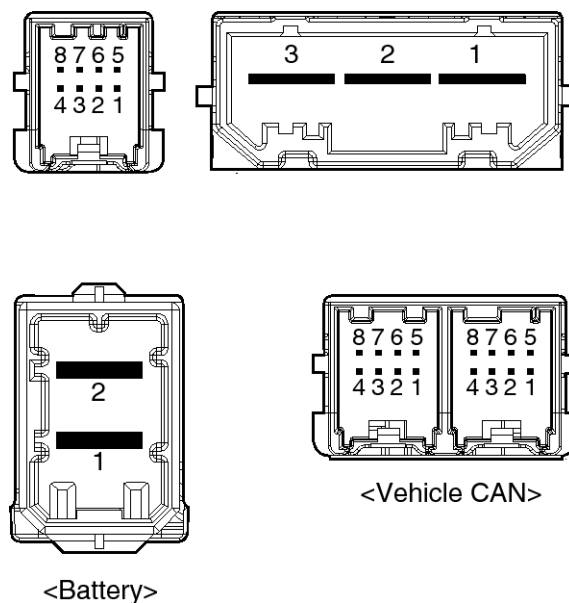


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## Electric Power Steering

ST-13

## Harness Connector



SSLST1002N

Type	Pin No	Description
Battery	1	Battery -
	2	Battery +
Vehicle	1	IGN
	2	-
	3	-
	4	-
	5	-
	6	-
	7	High_CAN
	8	Low_CAN

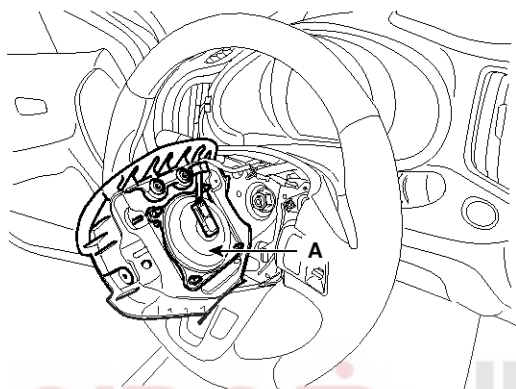
## ST-14

## Steering System

## Steering Column and Shaft

## Replacement

1. Disconnect the battery negative cable from the battery and then wait for at least 30 seconds.
2. Turn the steering wheel so that the front wheels can face straight ahead.
3. Remove the airbag module (A).  
(Refer to "Airbag Module" in RT group)

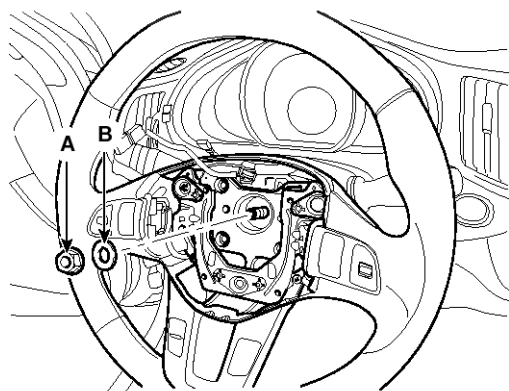


SSLST1004D

4. Disconnect the locknut (A) & washer (B) and then remove the steering wheel from the steering column shaft.

## Tightening torque :

39.2 ~ 49.0N.m (4.0 ~ 5.0kgf.m, 28.9 ~ 36.2lb-ft)

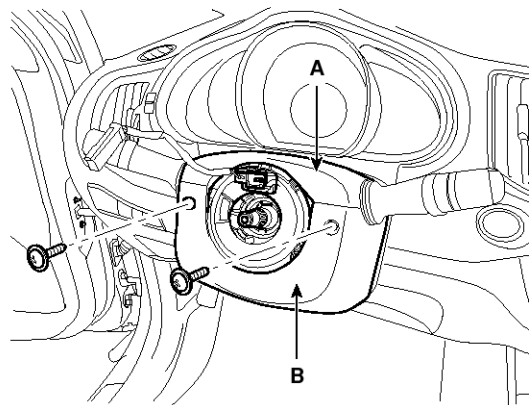


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## ⚠ CAUTION

Do not hammer on the steering wheel to remove it may damage the steering column.

5. Remove the steering column upper (A) and lower (B) shroud.



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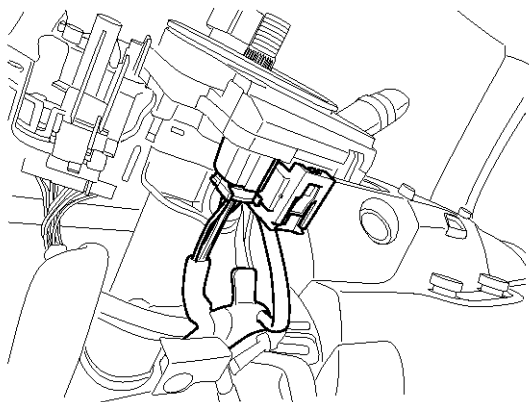


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# Electric Power Steering

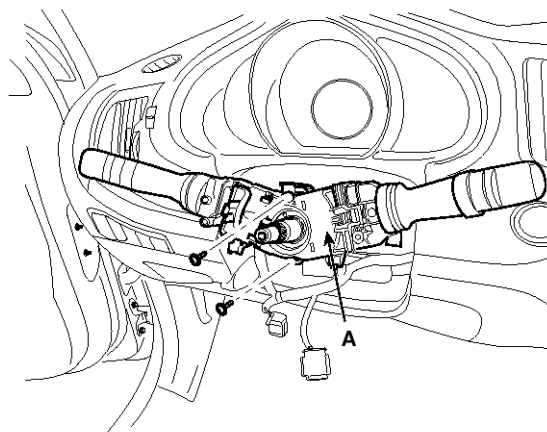
## ST-15

6. Remove the clock spring (A).

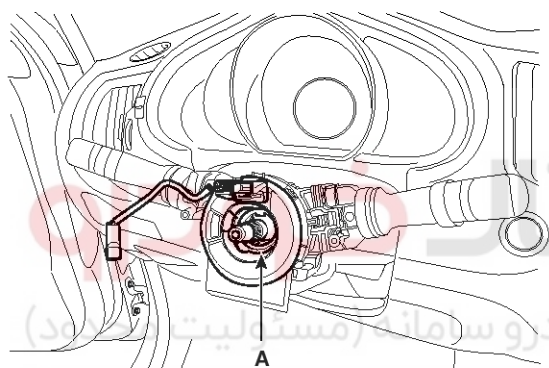


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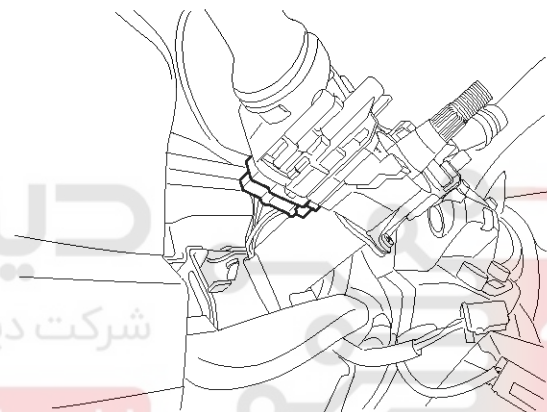
7. Remove the multifunction switches (A).



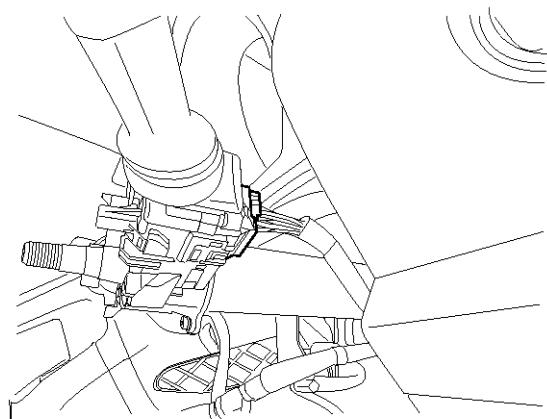
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SSLST1008D



SSLST1011D



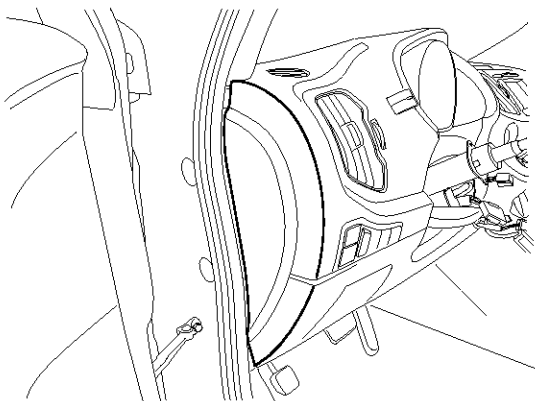
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## ST-16

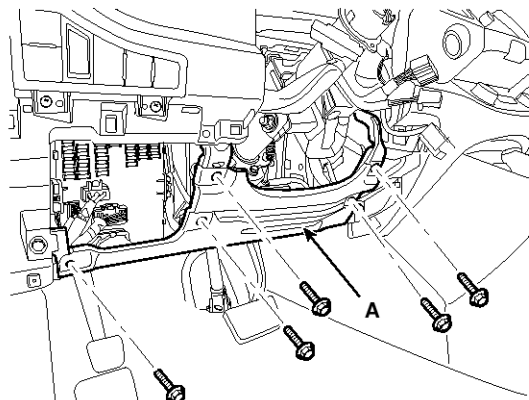
## Steering System

8. Remove the crash lower panel (A).



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9. Loosen the bolt & nut and then remove the panel (A).



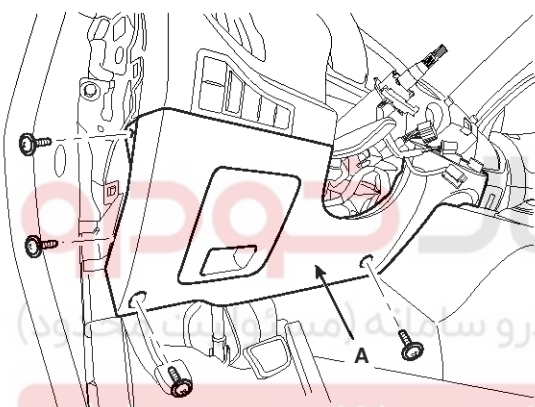
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10. Remove the dust cover.

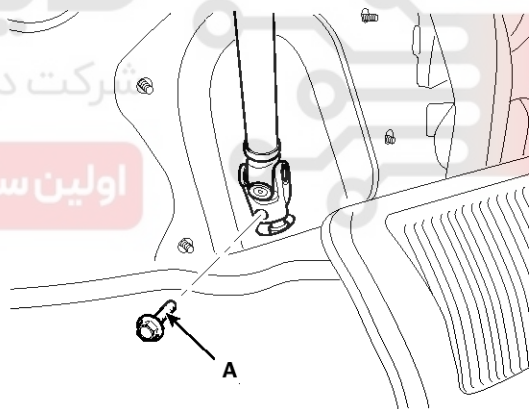
11. Loosen the bolt (A) and then disconnect the universal joint assembly from the pinion of the steering gear box.

#### Tightening torque :

32.4 ~ 37.3N.m (3.3 ~ 3.8kgf.m, 23.9 ~ 27.5lb-ft)



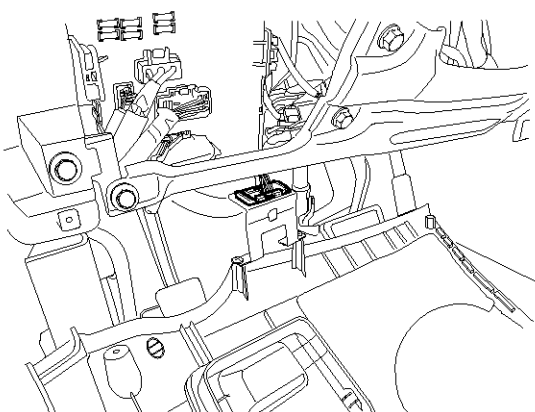
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#### CAUTION

- Do not use the bolt again.



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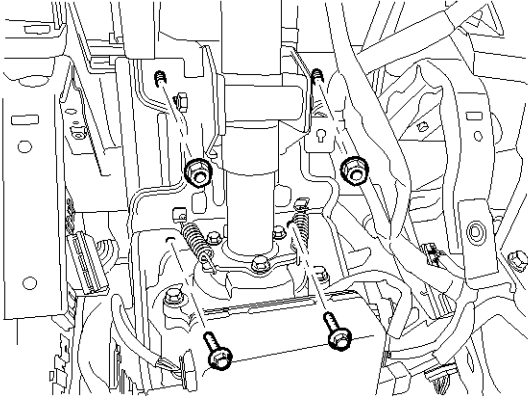
# Electric Power Steering

## ST-17

12. Disconnect all connectors connected the steering column.
13. Remove the steering column by loosening the mounting bolts and nuts..

### Tightening torque :

12.7 ~ 17.7N.m (1.3 ~ 1.8kgf.m, 9.4 ~ 13.0lb-ft)



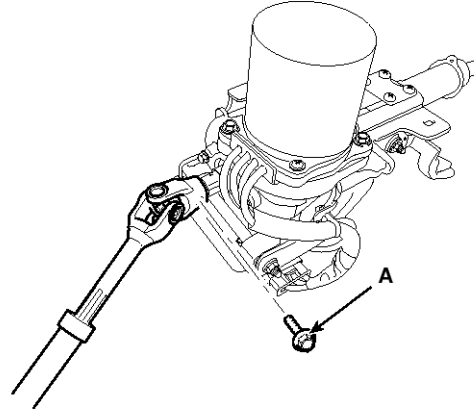
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14. Installation is the reverse of the removal.

### Disassembly

#### Universal joint assembly

1. Loosen the bolt (A) and then disconnect the universal joint assembly from the steering column assembly.



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2. Reassembly is the reverse of the disassembly.

### Inspection

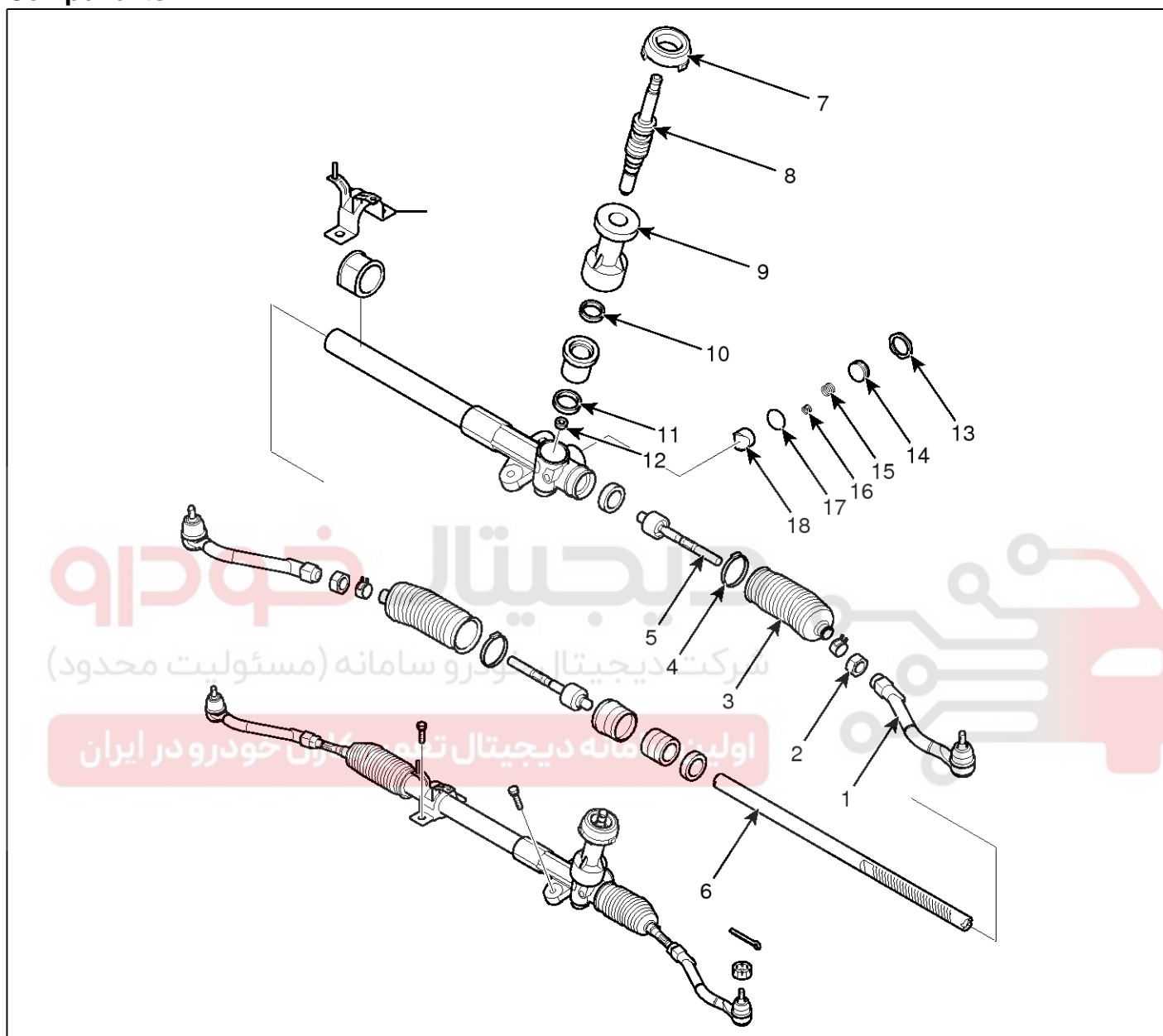
1. Check the steering column for damage and deformation.
2. Check the join bearing for damage and wear.
3. Check the tilt bracket for damage and cracks.
4. Check the key lock assembly for proper operation and replace it if necessary.

## ST-18

## Steering System

## Steering Gear box

## Components



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- |                 |                    |                           |
|-----------------|--------------------|---------------------------|
| 1. Tie rod end  | 7. Dust packing    | 13. Lock nut              |
| 2. Lock nut     | 8. Pinion assembly | 14. Yoke plug             |
| 3. Bellows      | 9. Dust cap        | 15. Yoke spring           |
| 4. Bellows band | 10. Oil seal       | 16. O-ring                |
| 5. Tie rod      | 11. Ball bearing   | 17. Spring                |
| 6. Rack bar     | 12. Needle bearing | 18. Support yoke assembly |

# Electric Power Steering

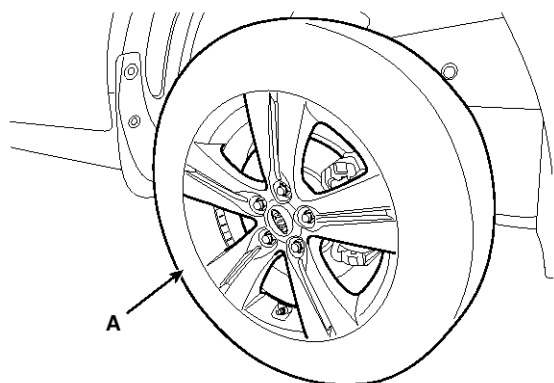
ST-19

## Replacement

1. Remove the front wheel & tire.

### Tightening torque :

88.3 ~ 107.9N.m (9.0 ~ 11.0kgf.m, 65.1 ~ 79.6lb-ft)



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### ⚠ CAUTION

Be careful not to damage to the hub bolts when removing the front wheel & tire (A).

2. Disconnect the stabilizer link (B) with the front strut assembly (A) after loosening the nut.

### Tightening torque :

98.1 ~ 117.7N.m (10.0 ~ 12.0kgf.m, 72.3 ~ 86.8lb-ft)

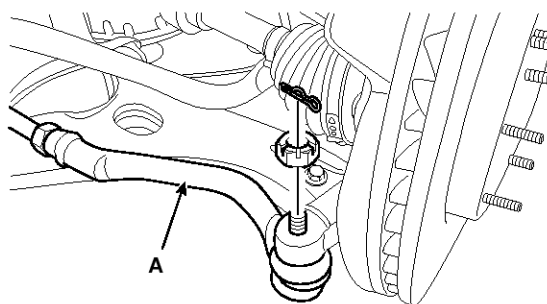


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3. Remove the split pin and castle nut and then disconnect the tie-rod end (A) from the front knuckle.

### Tightening torque :

23.5 ~ 33.3N.m (2.4 ~ 3.4kgf.m, 17.4 ~ 24.6lb-ft)

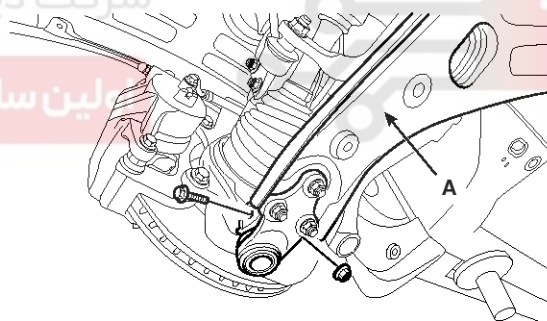


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4. Loosen the bolt & nut and then remove the lower arm (A).

### Tightening torque :

98.1 ~ 117.7N.m (10.0 ~ 12.0kgf.m, 72.3 ~ 86.8lb-ft)



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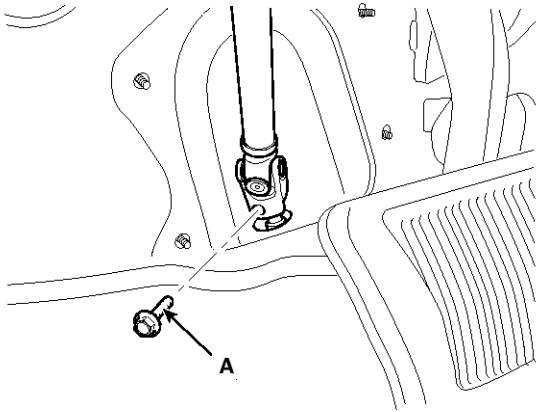
## ST-20

## Steering System

5. Remove the dust cover.
6. Loosen the bolt (A) and then disconnect the universal joint assembly from the pinion of the steering gear box.

**Tightening torque :**

32.4 ~ 37.3N.m (3.3 ~ 3.8kgf.m, 23.9 ~ 27.5lb-ft)

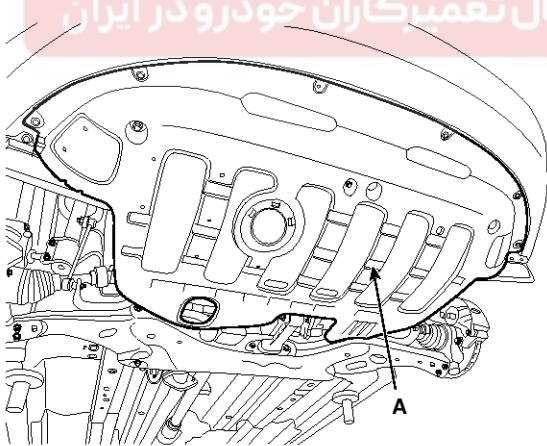


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**CAUTION**

- Keep the neutral-range to prevent the damage of the clock spring inner cable when you handle the steering wheel.
- Do not use the bolt again.

7. Remove the under cover (A).

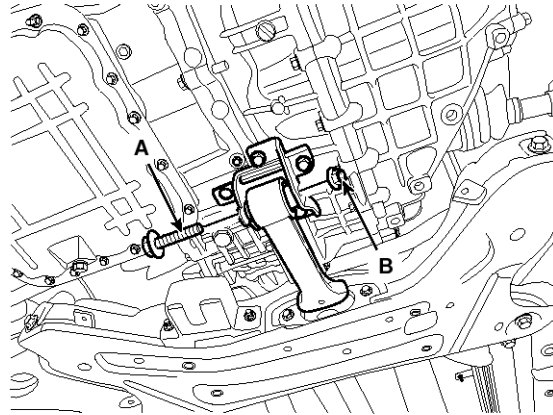


SSLSS1010D

8. Loosen the bolt (A) & nut (B) and then remove the roll rod stopper.

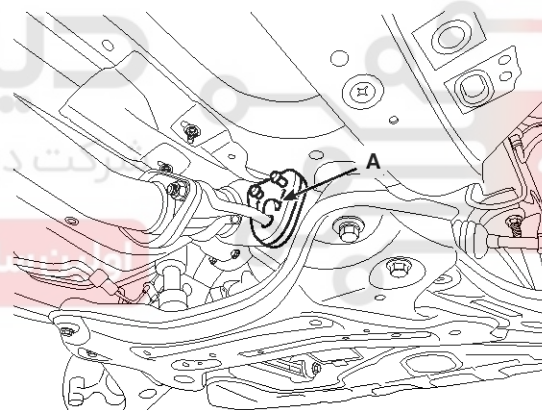
**Tightening torque :**

107.9 ~ 127.5N.m (11.0 ~ 13.0kgf.m, 79.6 ~ 94.0lb-ft)



SSLSS1011D

9. Disconnect the muffler rubber hanger (A).



SSLSS1012D

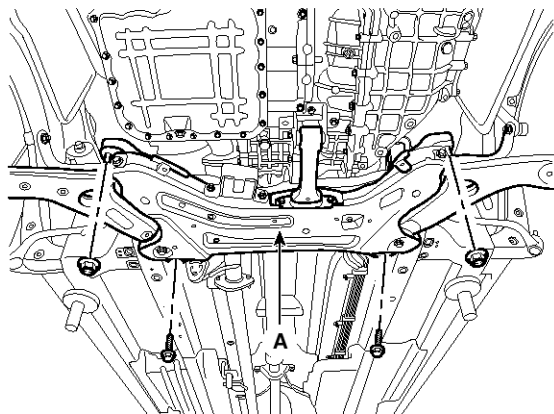
# Electric Power Steering

## ST-21

10. Loosen the bolts & nuts and then remove the sub frame.

### Tightening torque :

176.5 ~ 196.1N.m (18.0 ~ 20.0kgf.m, 130.2 ~ 144.7lb-ft)

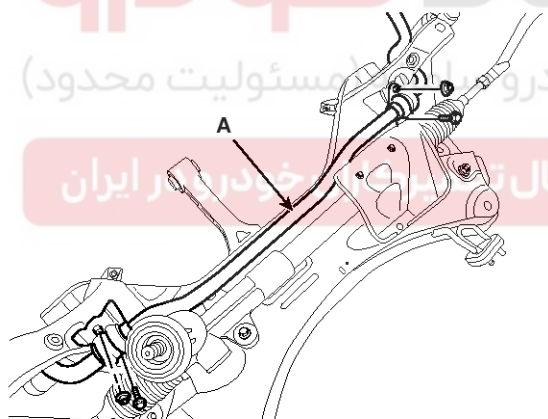


SSLSS1013D

11. Loosen the bolt and then remove the stabilizer (A).

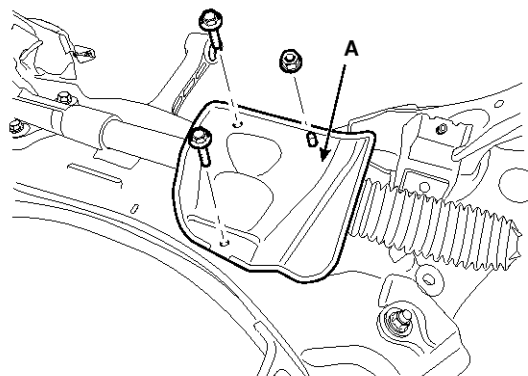
### Tightening torque :

44.1 ~ 53.9N.m (4.5 ~ 5.5kgf.m, 32.5 ~ 39.8lb-ft)



SSLSS1014D

12. Loosen the bolt & nut and then remove the protector (A).

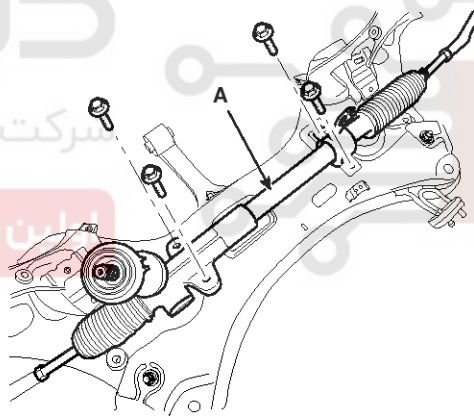


SSLST1019D

13. Loosen the bolt and then remove the steering gear box (A).

### Tightening torque :

58.8 ~ 78.5N.m (6.0 ~ 8.0kgf.m, 43.4 ~ 57.9lb-ft)



SSLST1020D

14. Installation is the reverse of the removal.

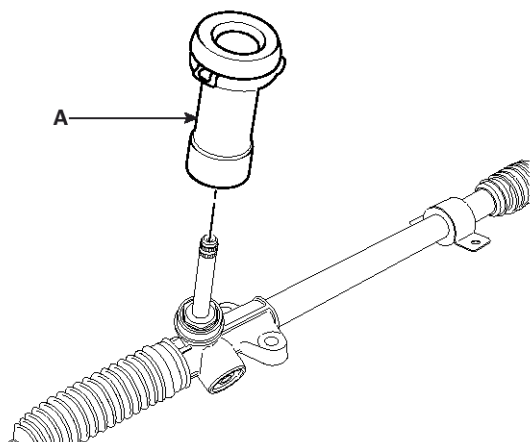


## ST-22

## Steering System

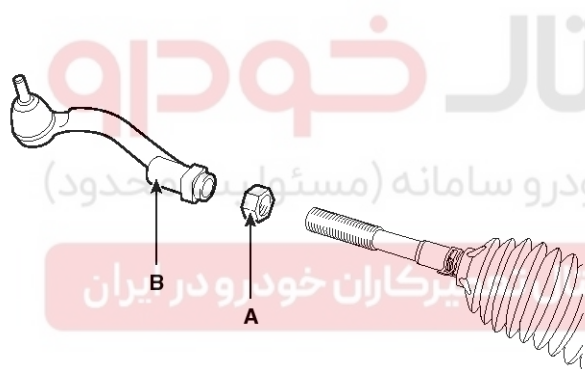
## Disassembly

1. Remove the dust packing & cap (A) from the pinion housing.



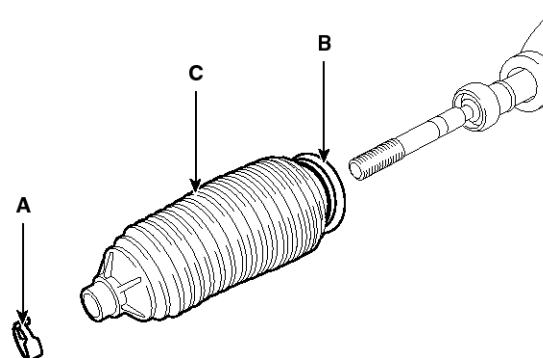
SHDST6027D

2. Loosen the lock nut and then remove the tie rod end (B) and lock nut (A) from the tie rod.



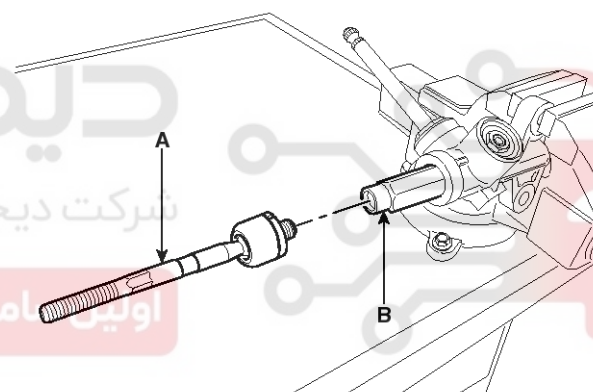
SUNST6032D

3. Remove the bellows clip (A) and band (B) and then pull the bellows (C) away from the end of the tie rod.



SUNST6033D

4. Remove the tie rod (B) from the rack bar (A) by unscrewing the tie rod inner ball joint.

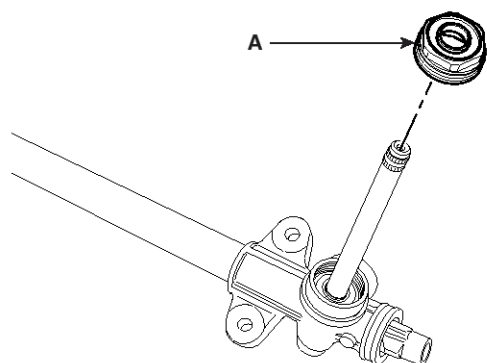


SHDST6028D

# Electric Power Steering

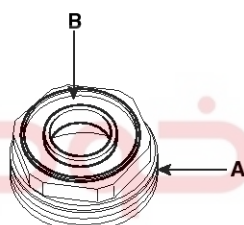
## ST-23

5. Remove the plug (A) from the pinion housing.



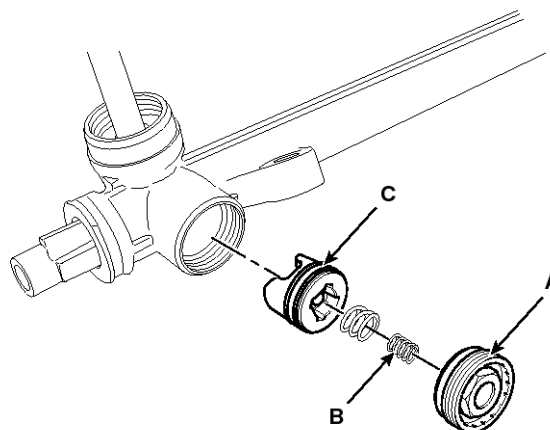
SHDST6029D

6. Remove the oil seal (B) from the plug (A).



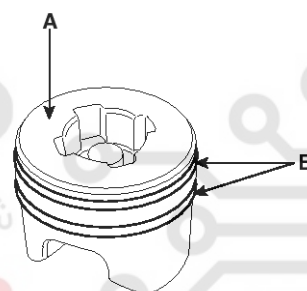
SHDST6030D

7. Remove the yoke plug (A) and spring (B) and then pull out the support yoke (C).



SSLST1029D

8. Remove the O-ring (B) from the support yoke assembly (A).

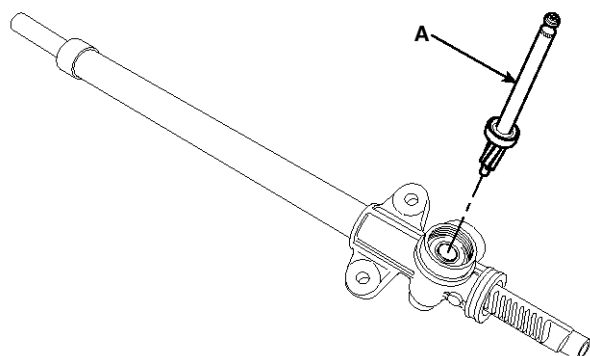


SHDST6032D

## ST-24

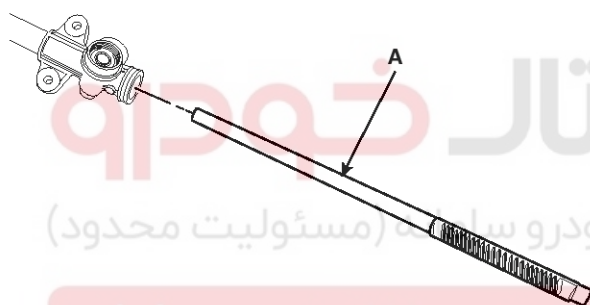
## Steering System

9. Pull the pinion assembly (A) out of the pinion housing.



SHDST6033D

10. Pull the rack bar (A) out of the rack housing.



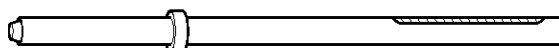
SHDST6034D

11. Reassembly is the reverse of the disassembly.

## Inspection

## 1. Rack bar

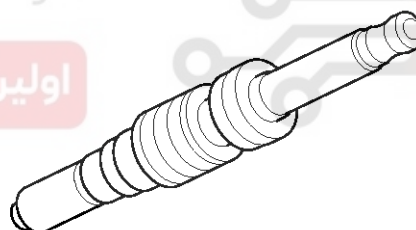
- Check the rack gear for damage.
- Check the rack bar for bend and deformation.



SSLST1021D

## 2. Pinion assembly

- Check the pinion gear for damage
- Check the oil seal for damage.



SSLST1030D

3. Check the inside of rack housing for damage.
4. Check the bellows for being torn.

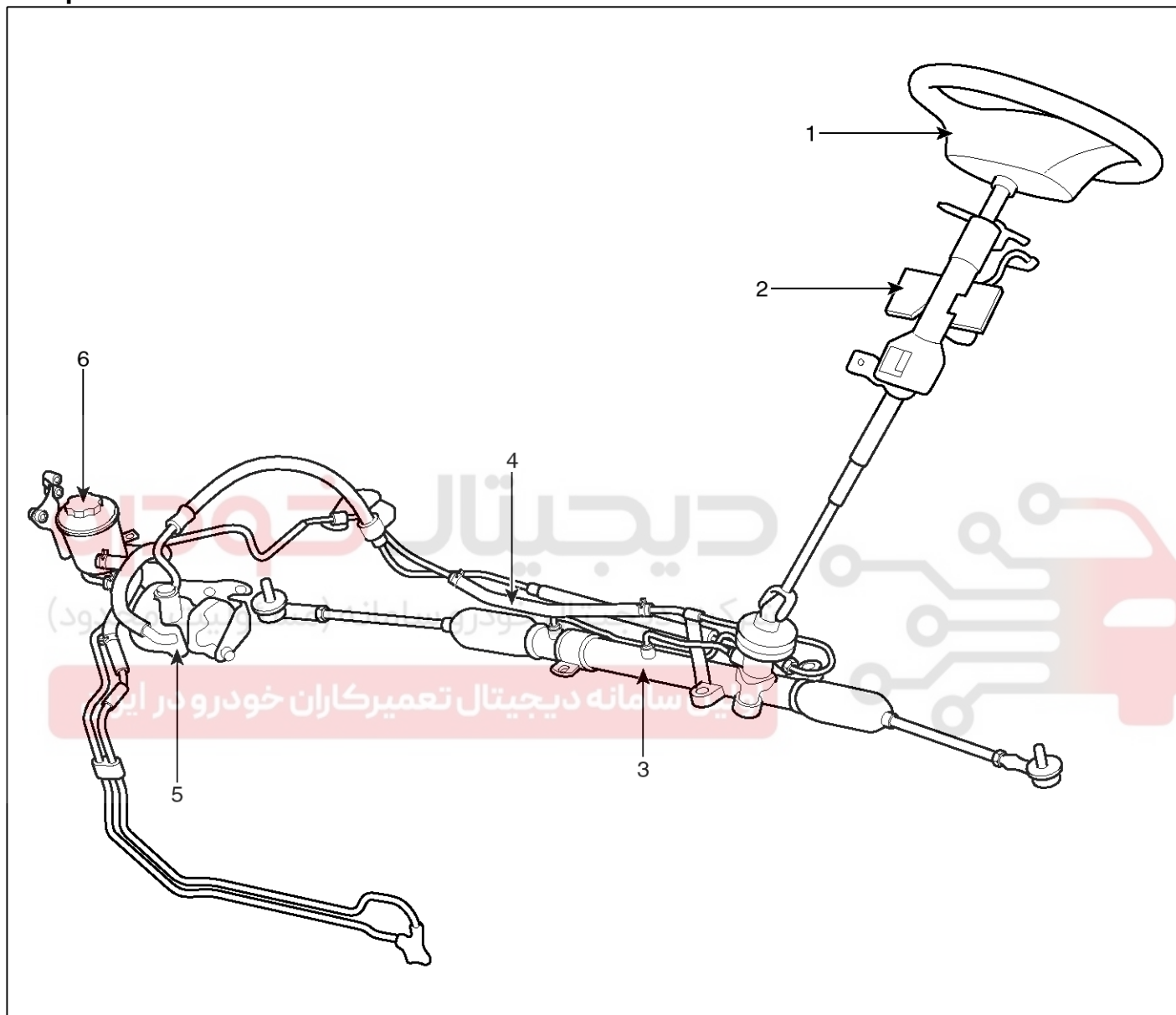
# Hydraulic Power Steering System

ST-25

## Hydraulic Power Steering System

### Power Steering Gear Box

#### Components



SLMST0019N

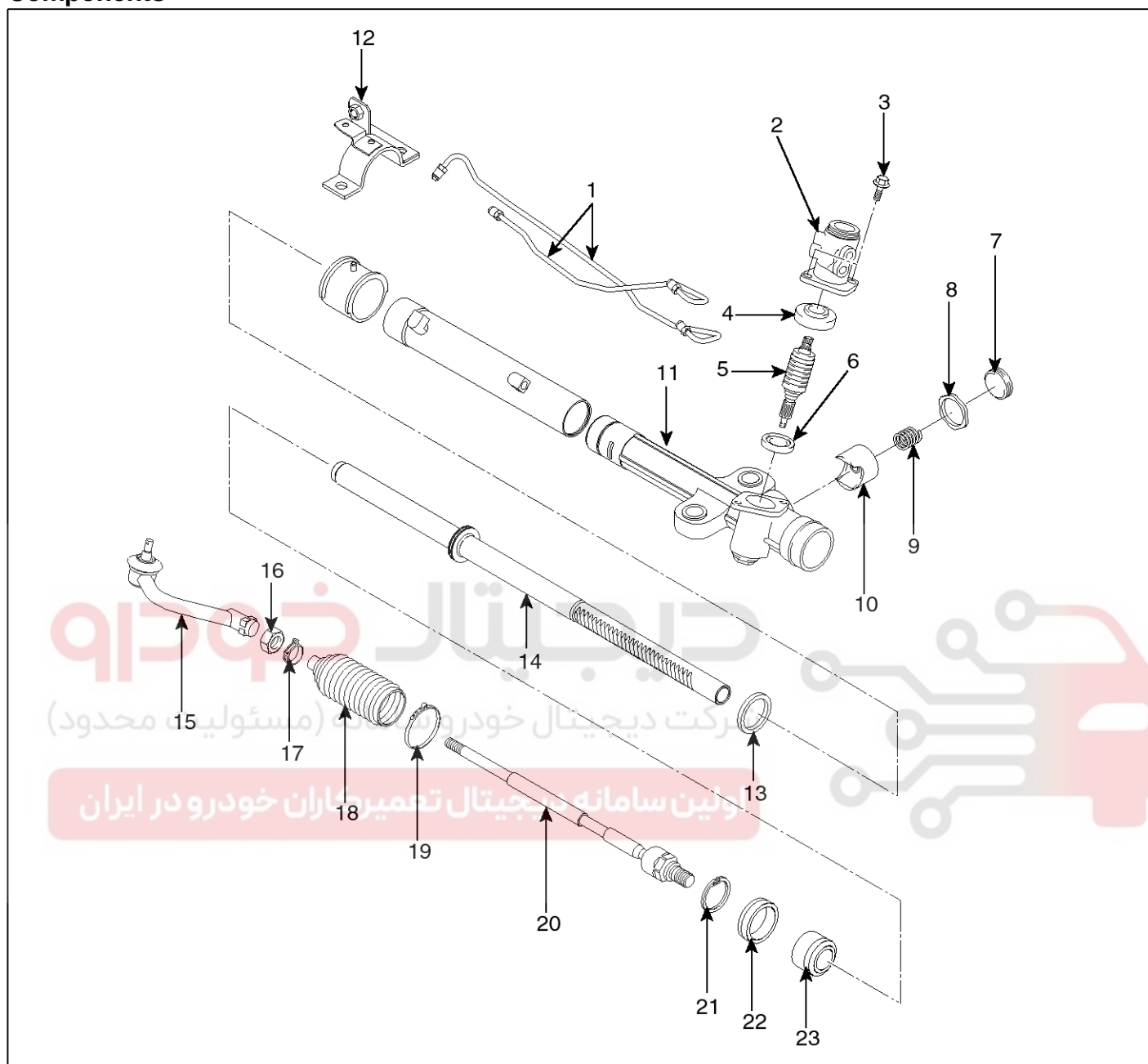
- 1. Steering wheel
- 2. Steering column
- 3. Steering gearbox

- 4. Steering hose
- 5. Oil pump
- 6. Reservoir

## ST-26

## Steering System

## Components



SCMST0003D

- |                          |  |                       |                  |
|--------------------------|--|-----------------------|------------------|
| 1. Feed tube             | 9. Rack support spring                     | 10. Rack support yoke | 17. Bellows clip |
| 2. Valve body housing    | 11. Rack housing                           |                       | 18. Bellows      |
| 3. Bolt                  | 12. Power steering gear box mounting clamp |                       | 19. Bellows band |
| 4. Oil seal              | 13. Oil seal                               |                       | 20. Tie rod      |
| 5. Pinion valve assembly | 14. Rack                                   |                       | 21. Seal clip    |
| 6. Oil seal              | 15. Tie rod end                            |                       | 22. Oil seal     |
| 7. Yoke plug             | 16. Lock nut                               |                       | 23. Rack stopper |
| 8. Lock nut              |  |                       |                  |

# Hydraulic Power Steering System

ST-27

## Replacement

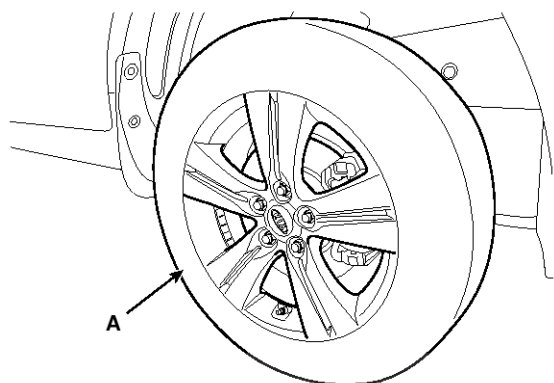
1. Remove the front wheel & tire.

### Tightening torque:

88.3 ~ 107.9N.m (9.0 ~ 11.0kgf.m, 65.1 ~ 79.6lb-ft)

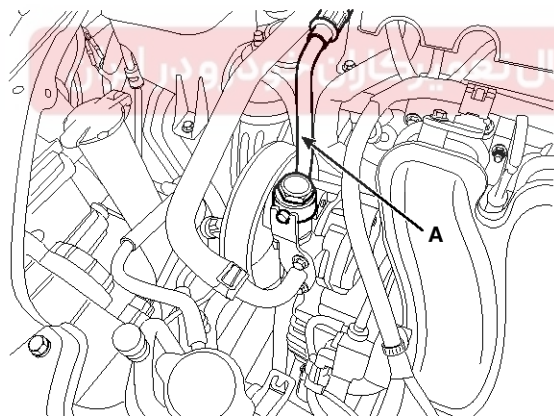
### ⚠ CAUTION

Be careful not to damage to the hub bolts when removing the front wheel & tire.

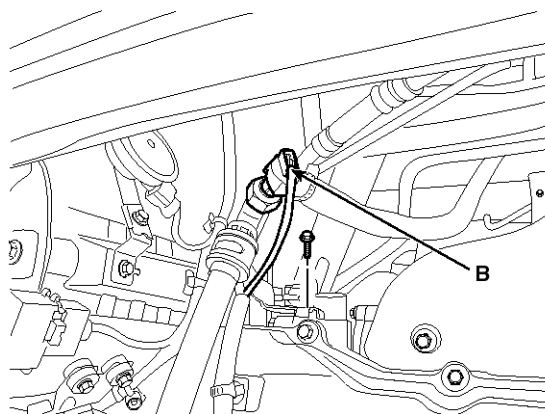


SSLSS1018D

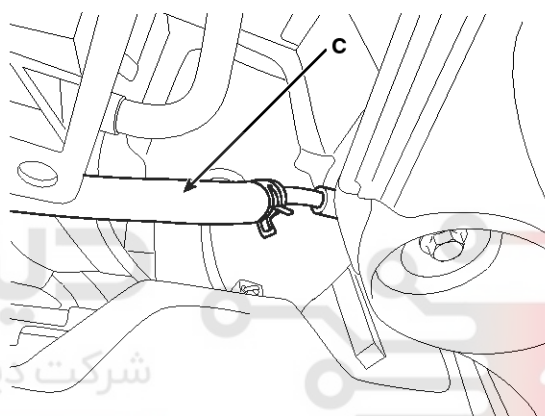
2. Disconnect the pressure hose (A), pressure switch (B), return hose (C) and then drain the power steering fluid.



SYFST0001D

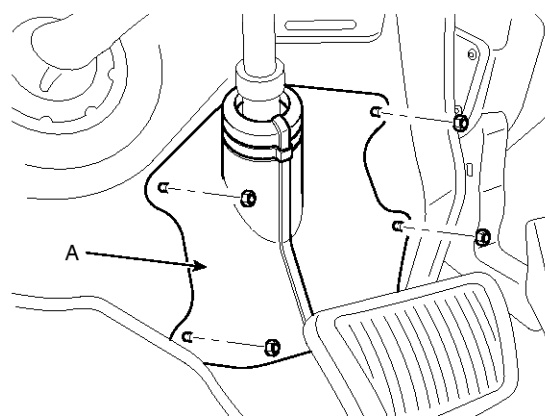


SYFST0002D



SYFST0003D

3. Loosen the nut and then remove the dust cover (A).



SLMST0010D



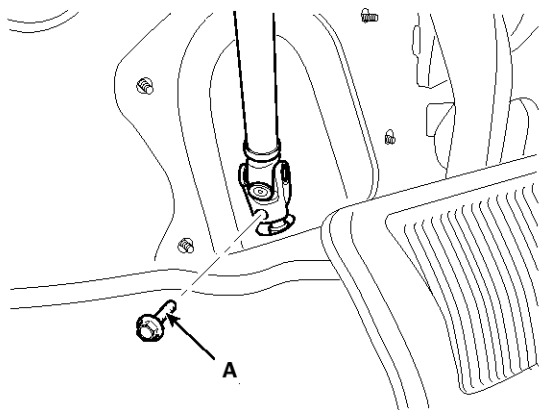
## ST-28

## Steering System

4. Loosen the bolt (A) and then disconnect the universal joint assembly from the pinion of the steering gear box.

**Tightening torque:**

32.4 ~ 37.3N.m (3.3 ~ 3.8kgf.m, 23.9 ~ 27.5lb-ft)

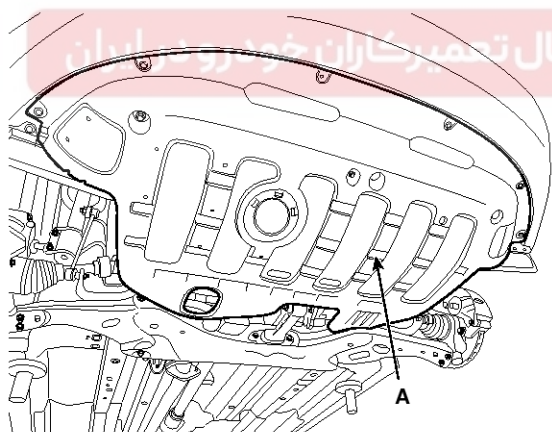


SSLST1001D

**CAUTION**

Lock the steering wheel in the straight ahead position to prevent the damage of the clock spring inner cable when you handle the steering wheel.

5. Remove the under cover (A).

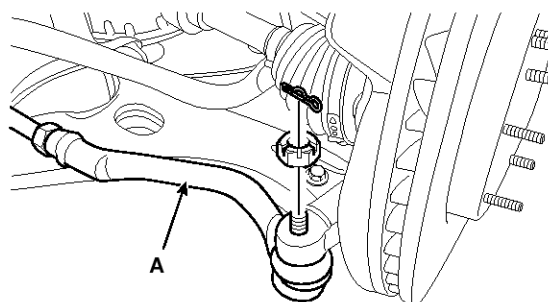


SSLSS1010D

6. Remove the sprit pin and castle nut and then disconnect the tie-rod end (A) from the front knuckle.

**Tightening torque:**

23.5 ~ 33.3N.m (2.4 ~ 3.4kgf.m, 17.4 ~ 24.6lb-ft)

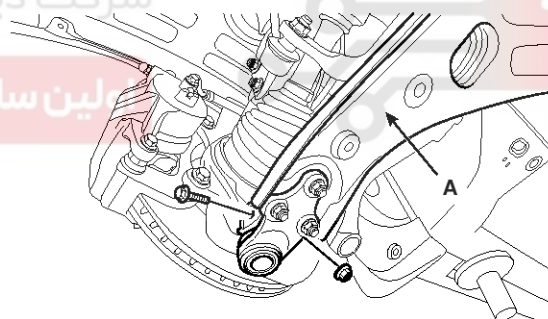


SSLSS1009D

7. Loosen the bolt & nut and then remove the lower arm (A).

**Tightening torque:**

98.1 ~ 117.7N.m (10.0 ~ 12.0kgf.m, 72.3 ~ 86.8lb-ft)



SSLSS1006D

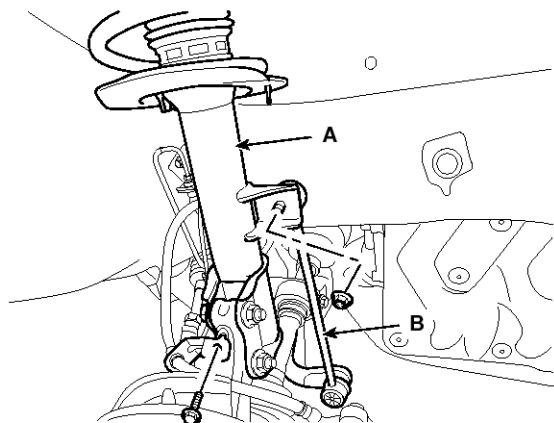
# Hydraulic Power Steering System

## ST-29

8. Disconnect the stabilizer link (B) with the front strut assembly (A) after loosening the nut.

### Tightening torque:

98.1 ~ 117.7N.m (10.0 ~ 12.0kgf.m, 72.3 ~ 86.8lb-ft)

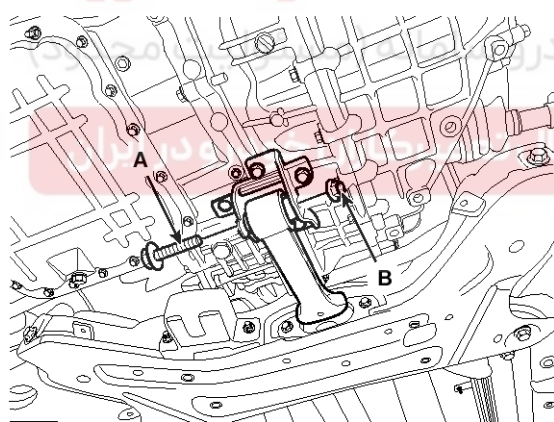


SSLSS1003D

9. Loosen the bolt (A) & nut (B) and then remove the front roll stopper.

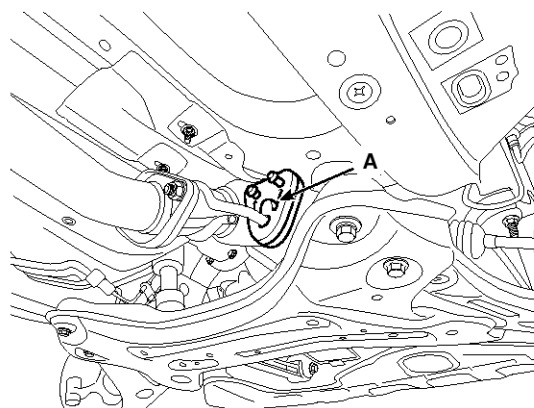
### Tightening torque:

107.9 ~ 127.5N.m (11.0 ~ 13.0kgf.m, 79.6 ~ 94.0lb-ft)



SSLSS1011D

10. Disconnect the muffler rubber hanger (A).

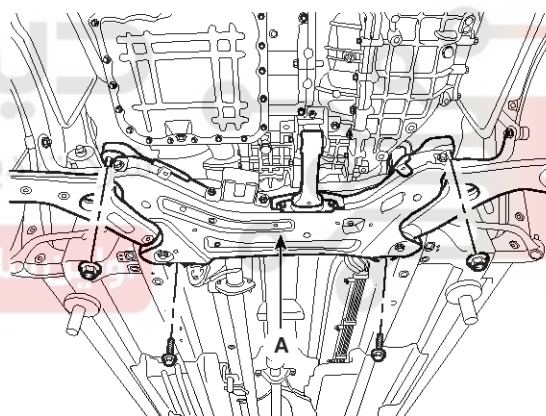


SSLSS1012D

11. Loosen the bolts & nuts and then remove the sub frame.

### Tightening torque:

176.5 ~ 196.1N.m (18.0 ~ 20.0kgf.m, 130.2 ~ 144.7lb-ft)



SSLSS1013D

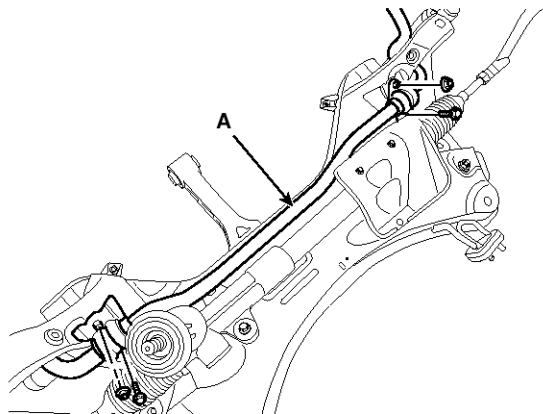
## ST-30

## Steering System

12. Loosen the bolt and then remove the stabilizer (A) from the sub frame.

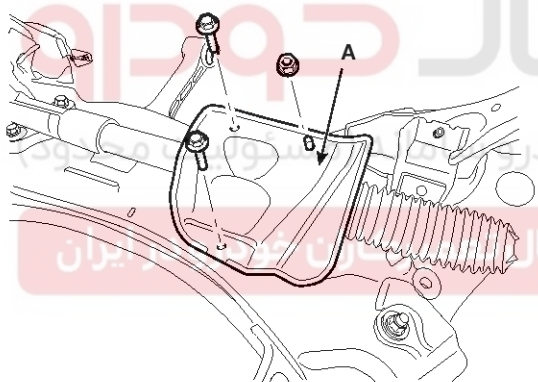
**Tightening torque:**

44.1 ~ 5.39N.m (4.5 ~ 5.5kgf.m, 32.5 ~ 39.8lb-ft)



SSLSS1014D

13. Remove the protector (A).

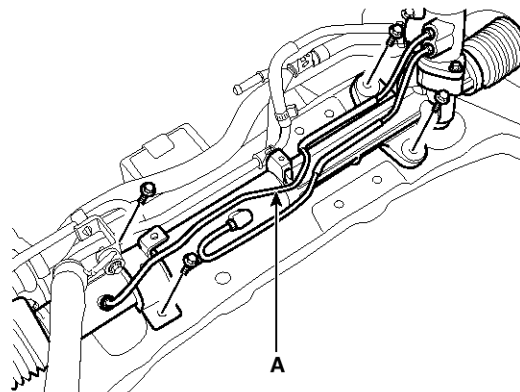


SSLST1019D

14. Loosen the bolt and then remove the steering gearbox (A).

**Tightening torque:**

88.3 ~ 107.9N.m (9.0 ~ 11.0kgf.m, 65.1 ~ 79.6lb-ft)



SYFST0018D

15. Installation is the reverse of the removal.

16. Add power steering fluid to reservoir.

17. Bleed the power steering system.

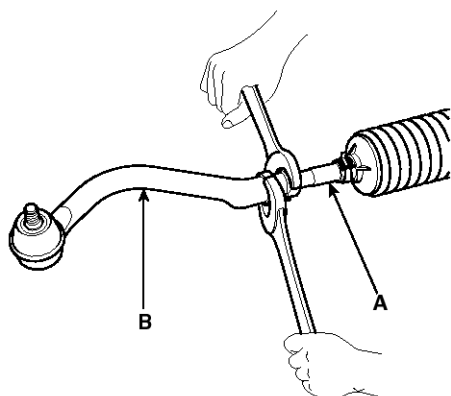
(Refer to Air bleeding)

# Hydraulic Power Steering System

ST-31

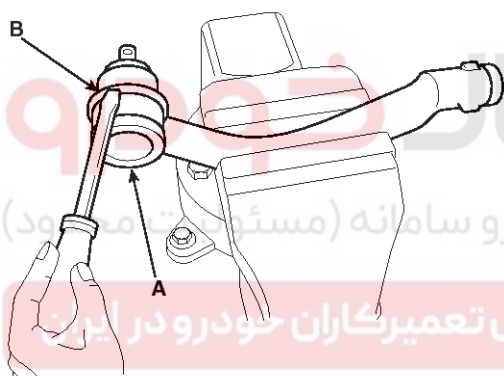
## Disassembly

1. Remove the tie rod end (B) from the tie rod (A).



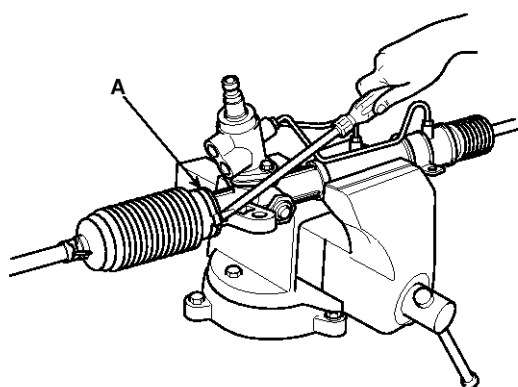
KPB202A

2. Remove the dust cover (B) from the ball joint (A).



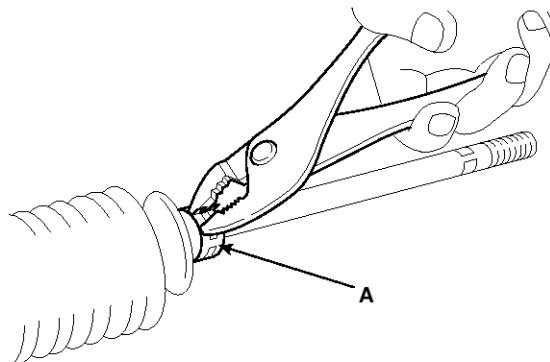
EPBF500H

3. Remove the bellows band (A).



KPB006F

4. Remove the bellows clip (A).



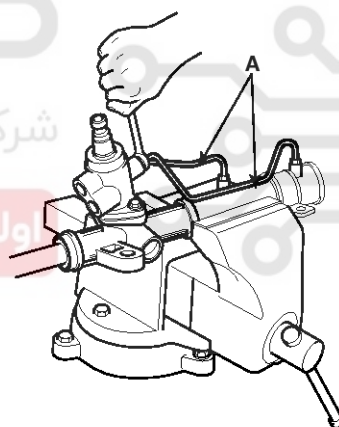
EPKE013I

5. Pull the bellows out toward the tie rod.

### NOTICE

*Check for rust on the rack when the bellows are replaced.*

6. Remove the feed tube (A) from the rack housing.

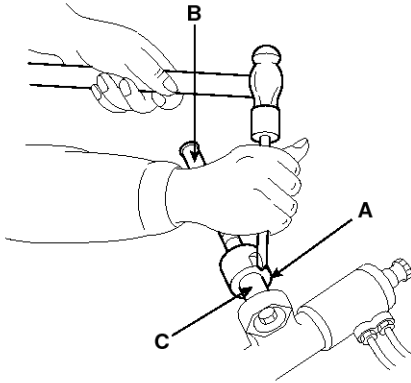


APHE006H

## ST-32

## Steering System

7. While moving the rack slowly, drain the fluid from the rack housing.
8. Un stake the tab washer (A) which fixes the tie rod (B) and rack (C) with a chisel.

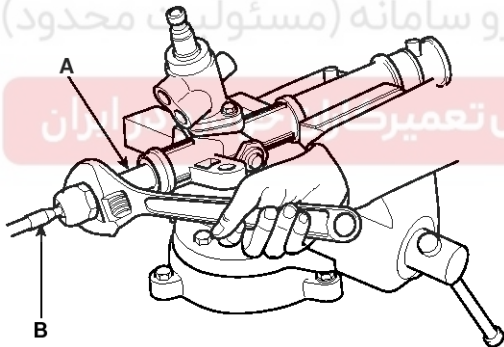


EPKE037A

9. Remove the tie rod (B) from the rack (A).

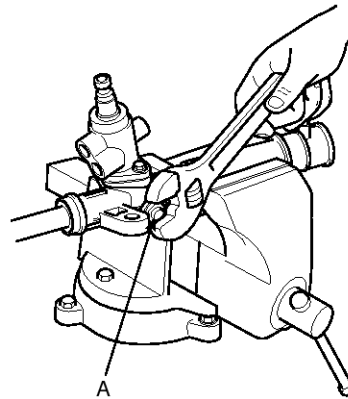
**⚠ CAUTION**

Remove the tie rod (B) from the rack (A), taking care not to twist the rack.



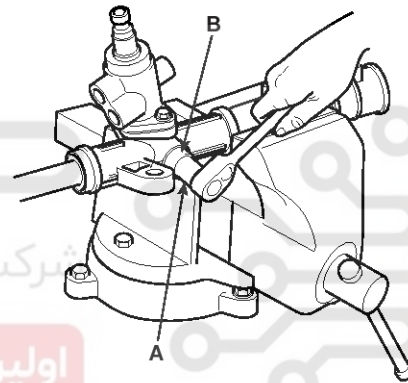
KPBF006J

10. Remove the yoke plug locking nut (A).



KPBF006K

11. Remove the yoke plug (B) with a 14mm socket (A).

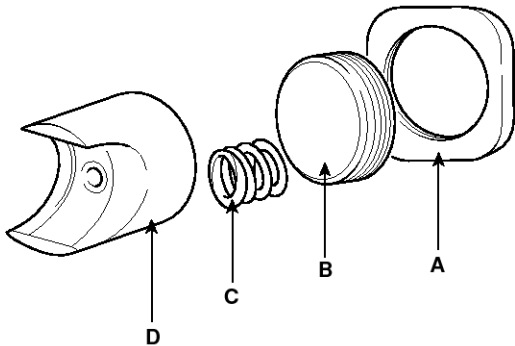


KPBF006L

# Hydraulic Power Steering System

## ST-33

12. Remove the lock nut (D), yoke plug (C), rack support spring (B) and rack support yoke (A) from the gear box.

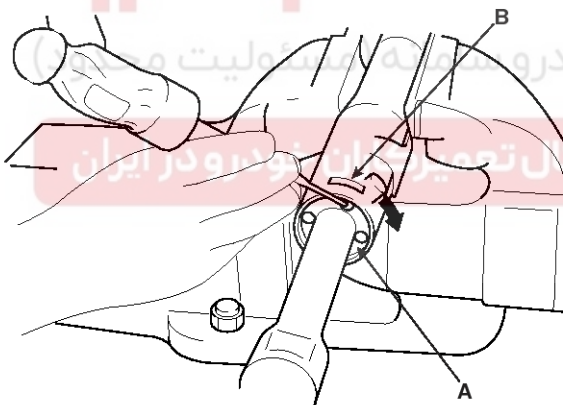


APJF005L

13. When the end of the circlip comes out of the notched hole of the housing rack cylinder, turn the rack stopper (A) clockwise and remove the circlip.

### ⚠ CAUTION

Be careful not to damage the rack.

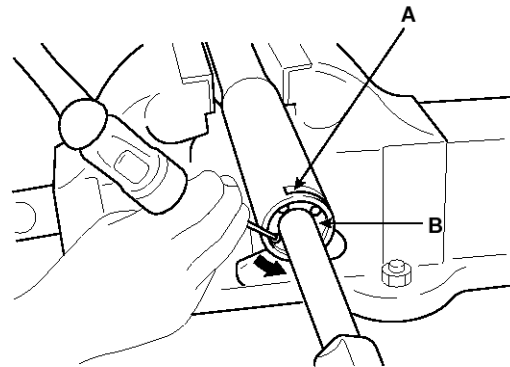


UPBG500K

14. When the end of the circlip comes out of the notched hole (A) of the housing rack cylinder, turn the rack stopper (B) counterclockwise and remove the circlip.

### ⚠ CAUTION

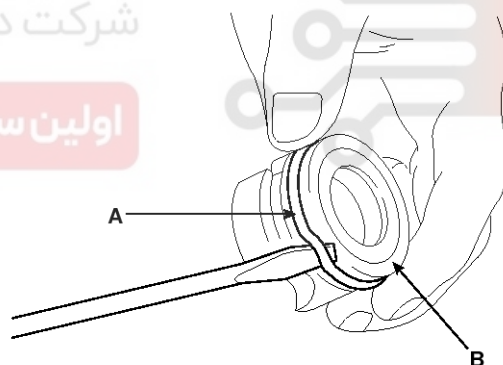
Be careful not to damage the rack.



EPKE013R

15. Remove the rack bushing and rack from the rack housing.

16. Remove the O-ring (A) from the rack bushing (B).



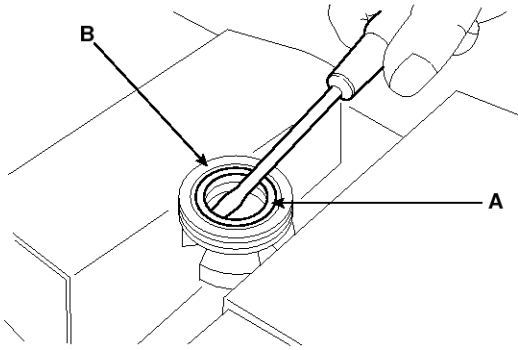
EPKE013T



## ST-34

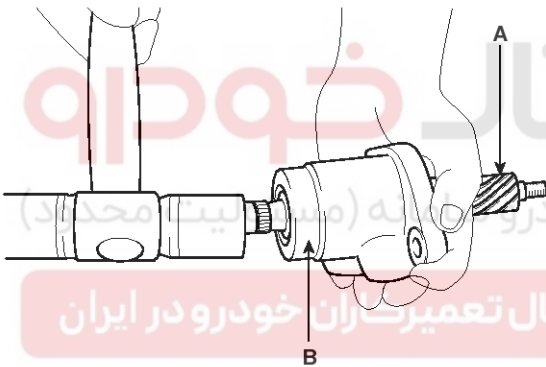
## Steering System

17. Remove the oil seal (B) from the rack bushing (A).



EPKE013U

18. Remove the valve body (A) from the valve body housing (B) with a soft hammer.



UPBG500L

19. Using the special tool, remove the oil seal and ball bearing from the valve body.

20. Remove the oil seal and O-ring from the rack housing.

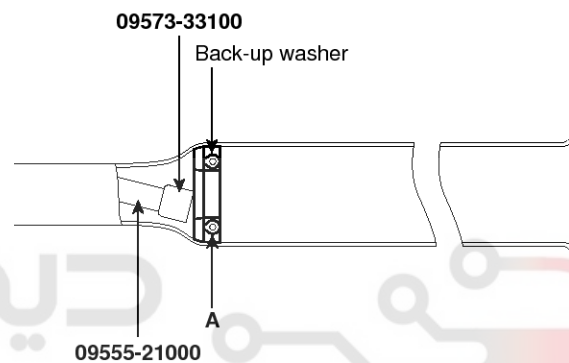
**⚠ CAUTION**

Be careful not to damage the pinion valve cylinder inside of the rack housing.

21. Using the special tool (09573-33100, 09555-21000), remove the oil seal (A) from the rack housing.

**⚠ CAUTION**

Be careful not to damage the rack cylinder inside of the rack



EPRF210B

22. Reassembly is the reverse of the disassembly.

# Hydraulic Power Steering System

**ST-35**

## Inspection

### 1. Rack

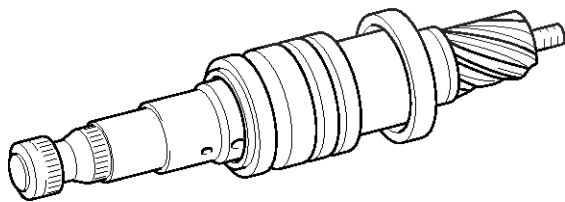
- 1) Check for rack tooth face damage or wear.
- 2) Check for oil seal contact surface damage.
- 3) Check for rack bending or twisting.
- 4) Check for oil seal ring damage or wear.
- 5) Check for oil seal damage or wear.



LPJF006C

### 2. Pinion

- 1) Check for pinion gear tooth face damage or wear.
- 2) Check for oil seal contact surface damage.
- 3) Check for seal ring damage or wear.
- 4) Check for oil seal damage or wear.



APJF013Z

### 3. Bearing

- 1) Check for seizure or abnormal noise during a bearing rotation.
- 2) Check for excessive play.
- 3) Check for missing needle bearing rollers.

### 4. Others

- 1) Check for damage of the rack housing cylinder bore.
- 2) Check for boot damage, cracking or aging.

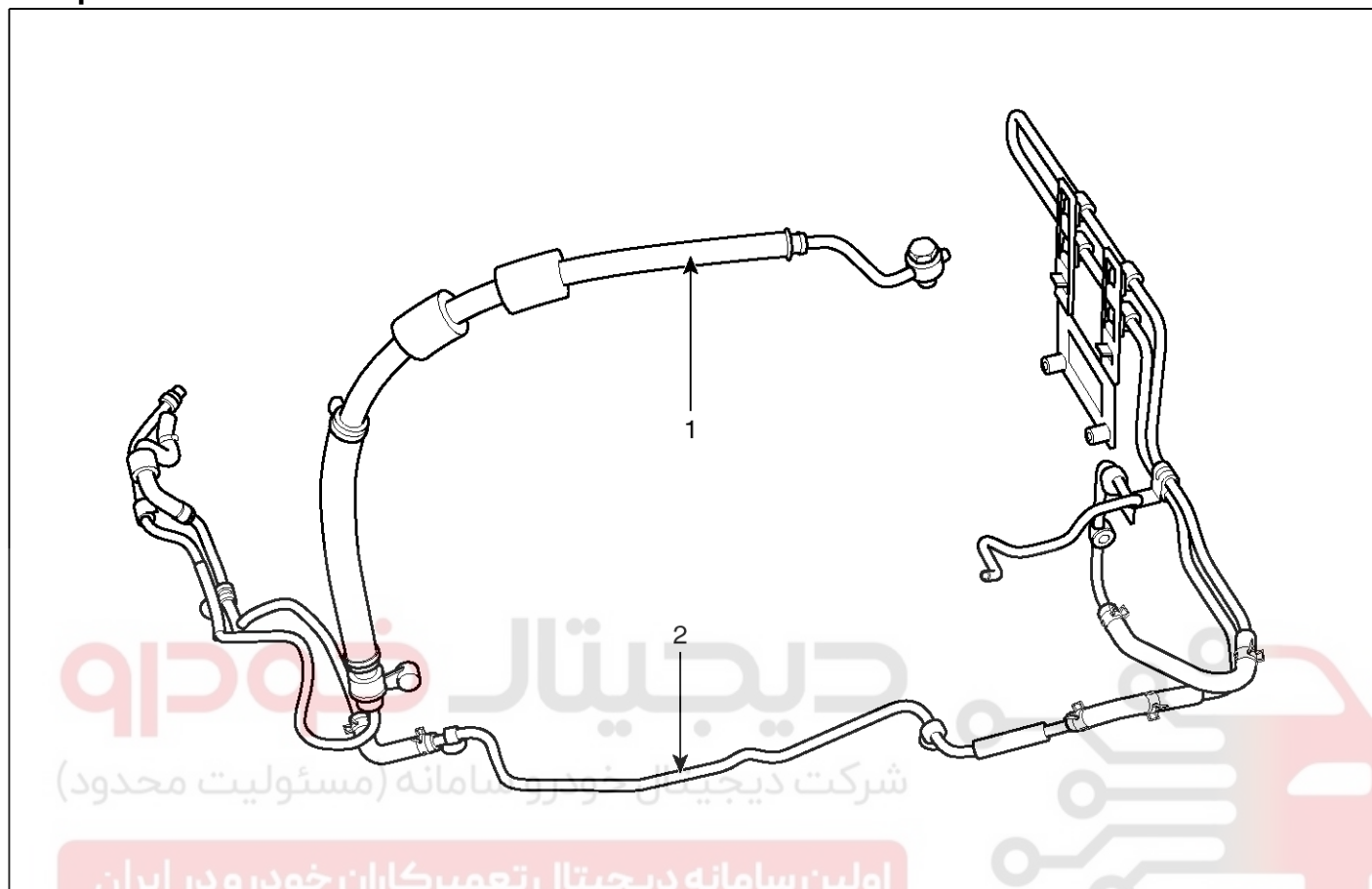


## ST-36

## Steering System

## Power Steering Hoses

## Components



SLMST0016N

1. Suction hose

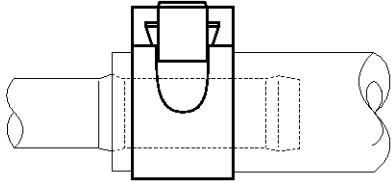
2. Return hose

# Hydraulic Power Steering System

ST-37

## Replacement

- Refer to the components illustration during removal or installation.
- When installing, be sure to connect between hose to tube using a clamp as shown in the illustration.



SUNST6512D

- Check all clamps for deterioration or deformation; replace with the clamps new one if necessary.
- Add the recommended power steering fluid and bleed the power steering system.

# دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

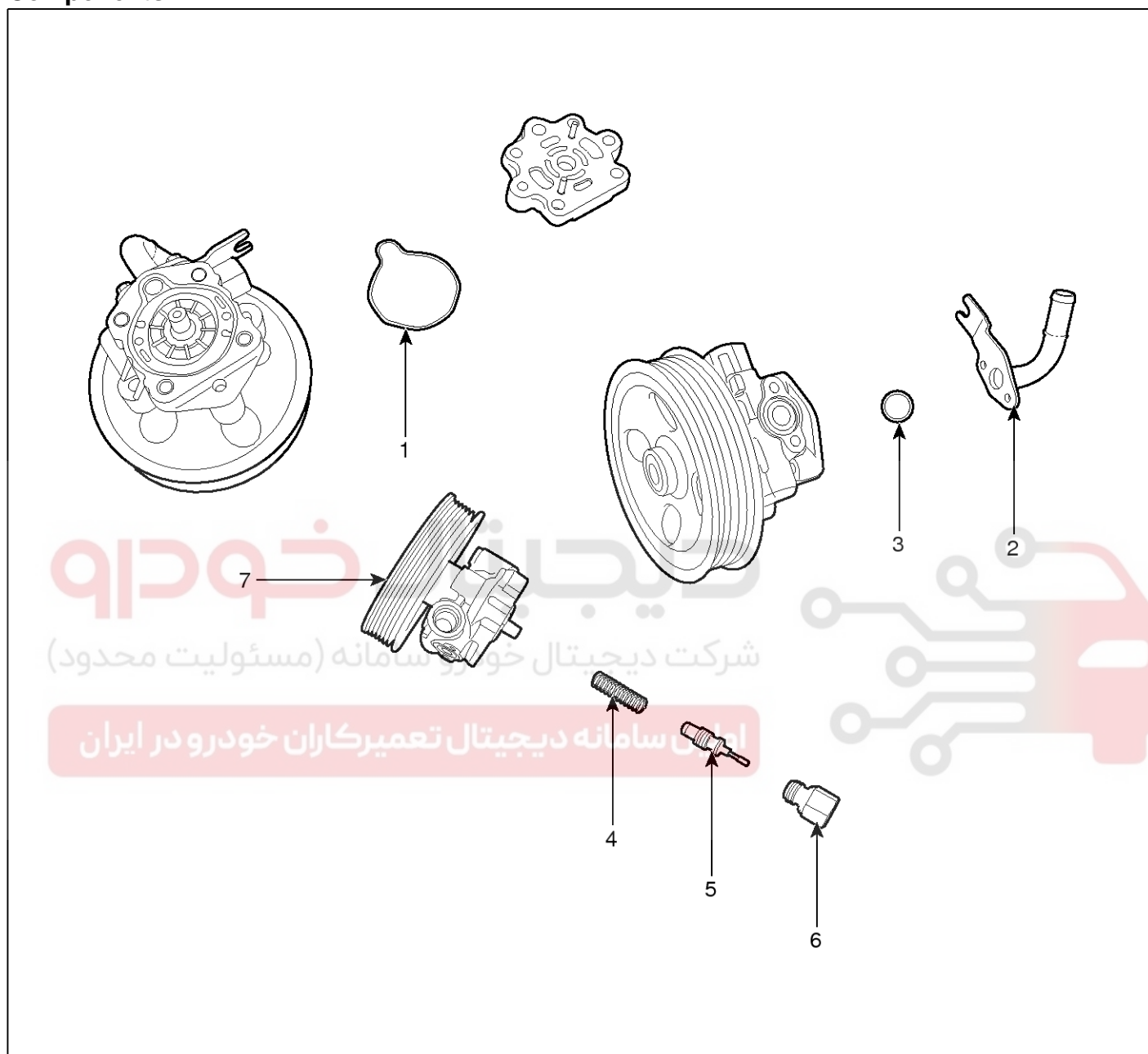


## ST-38

## Steering System

## Power Steering Oil Pump

## Components



SYFST0100D

1. O-ring
2. Suction pipe
3. O-ring
4. Flow control spring

5. Flow control valve
6. Flow control connector
7. Pump pulley

# Hydraulic Power Steering System

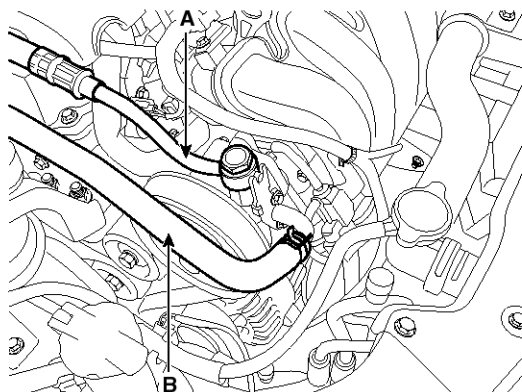
ST-39

## Replacement

1. Remove the drive belt.
2. Disconnect the pressure tube (A) and suction hose (B) from the power steering pump assembly.

### Tightening torque:

53.9 ~ 63.7N.m (5.5 ~ 6.5kgf.m, 39.8 ~ 47.0lb-ft)

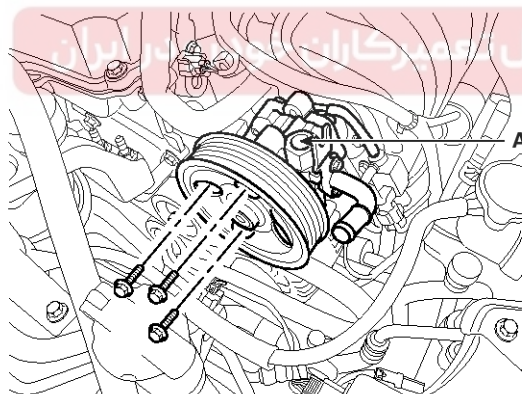


SYFST0021D

3. Loosen the bolts and then remove the power steering oil pump (A).

### Tightening torque:

16.7 ~ 27.5N.m (1.7 ~ 2.8kgf.m, 12.3 ~ 20.3lb-ft)

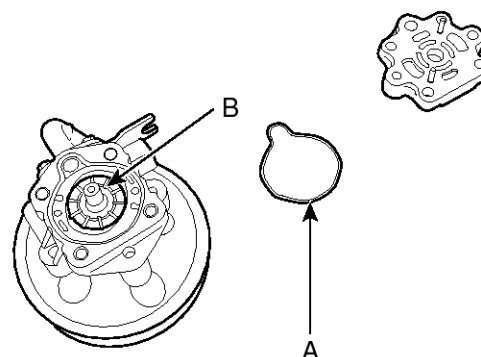


SYFST0022D

4. Installation is the reverse of the removal.

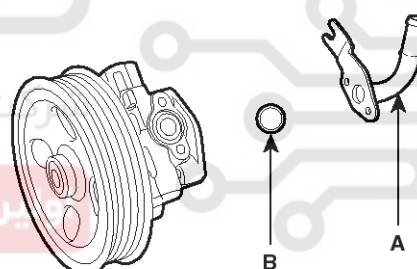
## Disassembly

1. Loosen the bolt and then disconnect the O-ring (A) & cam ring (B).



SYFST0023D

2. Loosen the bolt and then remove the suction pipe (A) and O-ring (B).



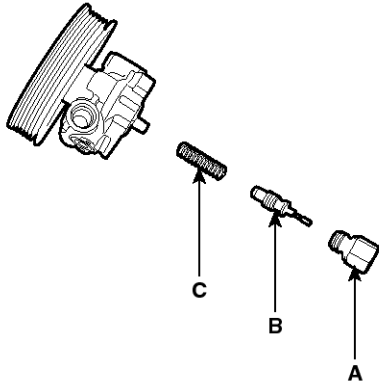
SYFST0024D



## ST-40

## Steering System

3. Disconnect the flow control connector (A) and then flow control valve (B), flow control spring (C).



SYFST0025D

4. Reassembly is the reverse of the disassembly.

**Inspection**

1. Check that the flow control valve is not bent.
2. Check the shaft for wear and damage.
3. Check the V-belt for wear and deterioration
4. Check the grooves of the rotor and vanes for stratified abrasion.
5. Check the contact surface of the cam ring and vanes for stratified abrasion.
6. Check vanes for damage.
7. Check that there is no striped wear in the side plate or contacting part between the shaft and the pump cover surface.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

