

| 074 (Rev 1, 9/13/2016) | August 2016     |
|------------------------|-----------------|
| NUMBER                 | DATE            |
|                        |                 |
| СНА                    | Multiple Models |
| GROUP                  | MODEL           |

# TECHNICAL SERVICE BULLETIN

SUBJECT:

### MDPS FLEXIBLE COUPLING REPLACEMENT

### **\*** NOTICE

This bulletin has been revised to include additional information. New/revised sections of this bulletin are indicated by a black bar in the margin area.

This bulletin is issued to provide information about the replacement of the flexible coupling in the MDPS motor of some vehicles which might experience a "knock" noise originating from the MDPS, when moving the steering wheel to right or left when the vehicle is stopped. This is caused by premature wear of the flexible coupling in the MDPS motor. If any "knock" noise from the MDPS occurs, replace the affected flexible coupling only with an improved one, following the Replacement Procedure below.

Please note that Replacement Procedures 1, 2 and 3, as shown below, vary depending on the model. Calibration Procedures only apply to Replacement Procedures 1 and 3. For reference, there are 2 types of torque sensors to detect revolution and torque in the MDPS system. One is the optical type which detects when light is transmitted and the other is the magnetic type which detects changes in polarity.

| Procedure | Model/Year             | Applicable Production Range        | Replacement<br>Part |
|-----------|------------------------|------------------------------------|---------------------|
| 1         | Forte (TD) / 2012~2013 | From Jan. 05, 2012 ~ Mar. 31, 2013 |                     |
| 2         | Soul (AM) / 2010~2013  | From Sep. 01, 2009 ~ Aug. 15, 2013 | She                 |
| Z         | Forte (YD) / 2014      | From Jan. 7, 2013 ~ Dec. 18, 2013  | 200                 |
| 3         | Cadenza (VG) / 2014    | From Feb. 01, 2013 ~ Apr. 19, 2014 |                     |

#### File Under: <Chassis>

Circulate To:Image: Circulate To:Image:

#### Page 2 of 16

SUBJECT:

### MDPS FLEXIBLE COUPLING REPLACEMENT

#### Replacement Procedure 1: This procedure applies to Forte (TD) models.

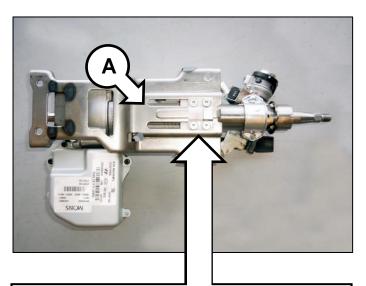
1. Remove the MDPS unit by referring to the applicable procedure on KGIS.

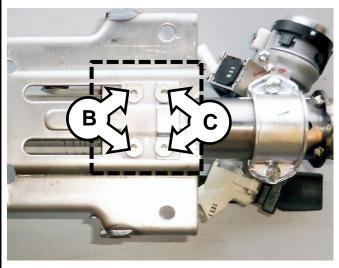
### **\*** NOTICE

Before removing the MDPS unit, make sure to align the steering wheel to the center position.

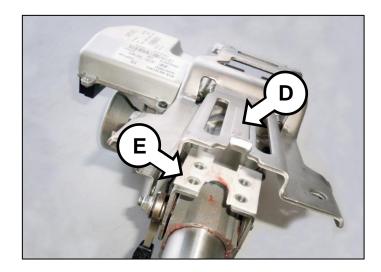
 Locate the steering column guide bracket (A) and remove four (4) Torx<sup>®</sup> head screws (B/C) securing it to the steering column.

> Tightening torque: B: 3.6 lb-ft (4.9 Nm) C: 2.2 lb-ft (2.9 Nm)





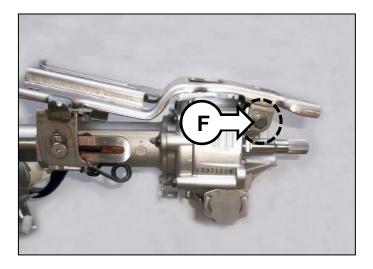
 Lift the steering column guide bracket (D) and remove the plastic spacer (E). Retain all parts as they will be reused.



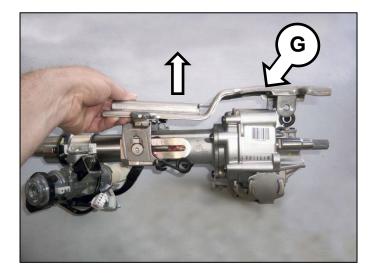
### MDPS FLEXIBLE COUPLING REPLACEMENT

4. Remove the steering column guide bracket hinge bolt (F)

Tightening torque: 13~14.5lb-ft (17.7~19.6 Nm)

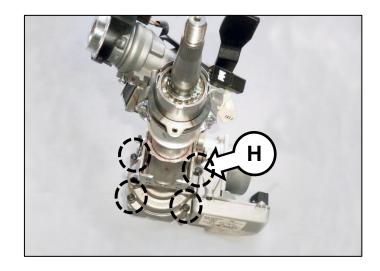


5. Remove the steering column guide bracket (G) from the steering column.



 Hold the MDPS upright and loosen four Torx<sup>®</sup> head screws (H) securing the column to the motor housing.

> Tightening torque: 6.5~9.4lb-ft (8.8~12.7 Nm)

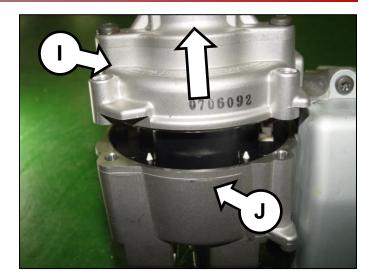


#### Page 4 of 16

#### SUBJECT:

# MDPS FLEXIBLE COUPLING REPLACEMENT

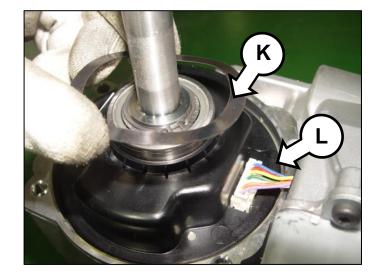
7. Separate the upper half (I) of the motor housing from the lower half (J).



8. Remove the washer-gasket (K) and connector (L) from lower portion of the MDPS.

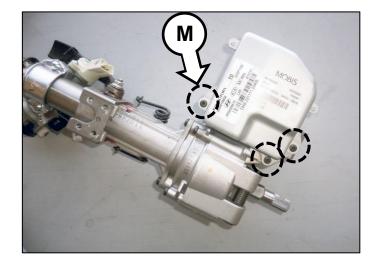


To avoid damage, use caution when removing the connector.



9. Remove the 3 Torx<sup>®</sup> head screws (M) securing the MDPS ECU cover.

Tightening torque: 3.6~5.1lb-ft (4.9~6.9Nm)



#### Page 5 of 16

#### SUBJECT:

### MDPS FLEXIBLE COUPLING REPLACEMENT

10. Remove the 4 Torx<sup>®</sup> head screws (N) securing the MDPS motor cover.

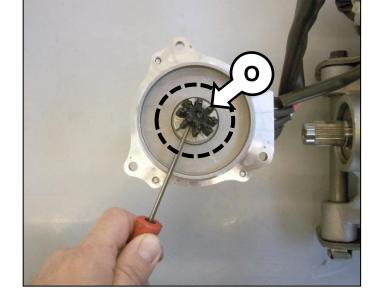
Tightening torque: 3.6~5.1lb-ft (4.9~6.9Nm)

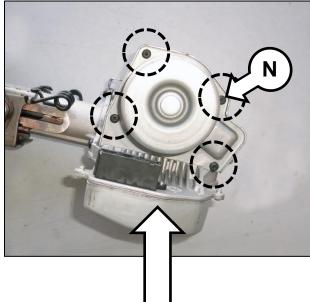
11. Remove the MDPS motor cover.



To avoid damage, use caution when removing the connector and the wiring harness.

 Remove the original flexible coupling (O) from the housing. In addition, use an air gun to remove any foreign matter from the motor and/or the housing.







#### Page 6 of 16

SUBJECT:

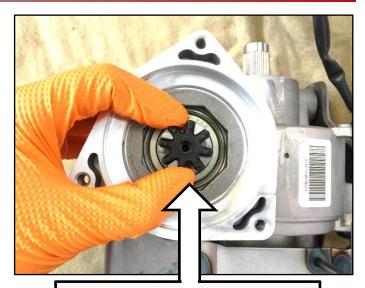
### MDPS FLEXIBLE COUPLING REPLACEMENT

13. Install the new improved flexible coupling onto the steering column.

# **\*** NOTICE

Before installing the new part, make sure it has "HNBR" embossed on the surface.

The position of the flexible coupling is not specific and can be installed facing upward or downward.





14. Reinstall all removed components by reversing the order of removal. Perform the **Calibration Procedure found on page 13.** 

# \* NOTICE

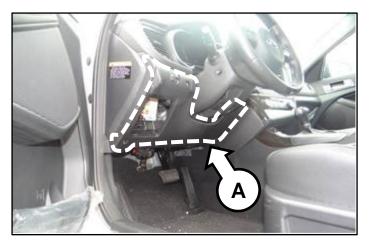
Before re-installing the MDPS unit, make sure the front wheels are pointing straight ahead.

### MDPS FLEXIBLE COUPLING REPLACEMENT

#### Replacement Procedure 2: This procedure applies to Soul (AM), and Forte (YD) models.

NOTE: Images shown are for general information and not representative of each model's actual configuration.

 Remove the crash pad lower panel (A) by referring to "Body (Interior and Exterior) → Interior → Crash Pad → Repair procedures" on KGIS.



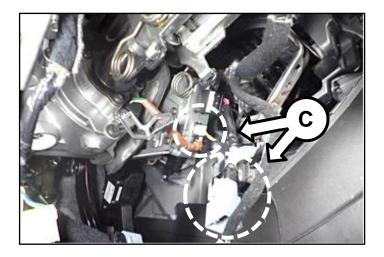
 Loosen three (3) steering column shroud retaining screws (B) and then remove the steering column upper and lower shrouds.

# **\*** NOTICE

When loosening the steering wheel column shroud fixing screws, turn the steering wheel 90° to the left/right from aligned position.

3. Disconnect the MDPS electrical connectors (C).





#### Page 8 of 16

#### SUBJECT:

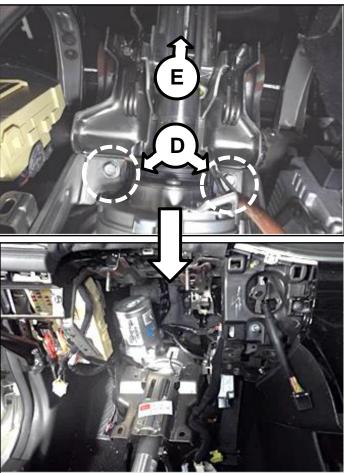
# MDPS FLEXIBLE COUPLING REPLACEMENT

4. Disconnect the multifunction switch, wiper and washer switch, airbag, and heated steering wheel electrical connectors.

 Loosen both steering column retaining bolts (D) and rear bolt (E) and lower the steering column assembly.

> Tightening torque: 9.4~13.0 lb-ft (12.7~17.7 Nm)

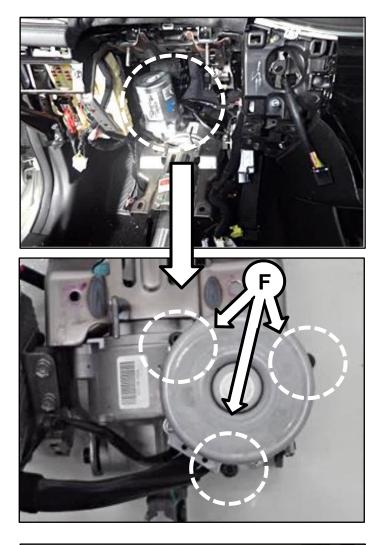




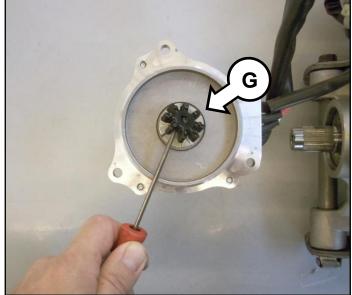
### MDPS FLEXIBLE COUPLING REPLACEMENT

6. Loosen the three MDPS motor retaining bolts (F) and lift the MDPS motor and set it to the side.

Tightening torque: 5.8~8.7 lb-ft (7.8~11.8 N-m)



 Remove the original flexible coupling (G) from the motor. In addition, use an air gun to remove any foreign matter from the motor and/or the housing.



#### Page 10 of 16

SUBJECT:

# MDPS FLEXIBLE COUPLING REPLACEMENT

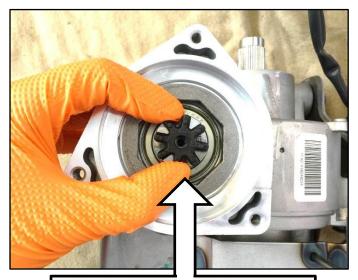
8. Install the new improved flexible coupling onto the steering column.

### **\*** NOTICE

Before installing the new part, make sure it has "HNBR" embossed on the surface.

The position of the flexible coupling is not specific and can be installed facing upward or downward.

9. Reinstall all removed components by reversing the order of removal.





### MDPS FLEXIBLE COUPLING REPLACEMENT

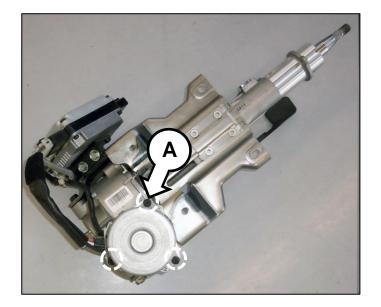
#### Replacement Procedure 3: This procedure applies to Cadenza (VG) models.

NOTE: Images shown are for general information and not representative of each model's actual configuration.

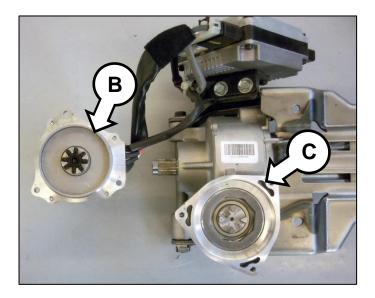
# \* NOTICE

Before removing the MDPS unit, make sure to align the steering wheel to the center position.

- 1. Remove the MPDS unit by referring to the applicable procedure on KGIS.
- 2. Remove 3 bolts (A) securing the MPDS motor to the housing.



3. Separate the MDPS motor (B) from the housing (C), as shown.

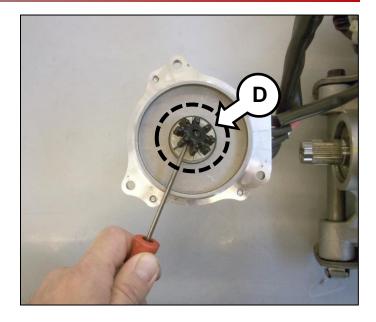


#### Page 12 of 16

#### SUBJECT:

# MDPS FLEXIBLE COUPLING REPLACEMENT

 Remove the original flexible coupling (D) from the motor. In addition, use an air gun to remove any foreign matter from the motor and/or the housing.

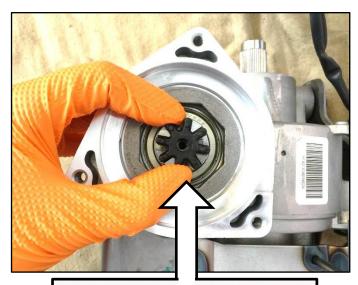


5. Install the new improved flexible coupling onto the steering column.

### **\*** NOTICE

Before installing the new part, make sure it has "HNBR" embossed on the surface.

The position of the flexible coupling is not specific and can be installed facing upward or downward.





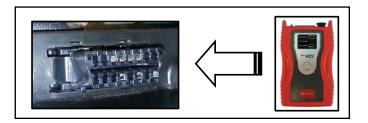
# **\*** NOTICE

Before re-installing the MDPS unit, make sure the steering wheel is aligned to the center position, with the front wheels pointing straight ahead.

6. Reinstall all removed components by reversing the order of removal. Perform **Calibration Procedure**.

#### Calibration Procedure used after procedure 1 and 3 ONLY:

- 1. Connect the power supply cable to the GDS.
- 2. Connect the USB cable between the VCI and the GDS.
- 3. Connect the Main 16-pin DLC cable (GHDM 241000) to the VCI.
- Connect the Main 16-pin DLC cable (GHDM – 241000) to the OBD-II connector, located under the driver's side of the instrument panel.



5. Select **EPS** and click on **OK**.

| OPT                           | MA(TF/QF)     | 2014       | G 2.0 T-GDI                   |
|-------------------------------|---------------|------------|-------------------------------|
| System                        | EPS.          |            |                               |
|                               | Select System | Select All | Selected System Clea          |
| ENGINE AT<br>THMS BSD<br>CODE |               |            | 🧭 Motor Driven Power Steering |
| (                             | Group         |            | Symptom                       |

#### Page 14 of 16

#### SUBJECT:

7.

# MDPS FLEXIBLE COUPLING REPLACEMENT

6. Select **Option Treatment** under the Vehicle S/W Management tab.



|                                   | 💽 VCI : V              | VLAN On 💿 VMI : Off            | 💽 Internet : On            |                                     | -×                     |
|-----------------------------------|------------------------|--------------------------------|----------------------------|-------------------------------------|------------------------|
| GD                                | Preparation            | Diagnosis                      | Vehicle S/W Managemen      | Repair                              | 0                      |
| Vehicle > OPTIMA(TF               | QF)/2014/G 2.0 T-GDI   | System                         | Steering/Motor Dr          | ven Power Steering                  | 0 🖴                    |
| Vehicle S/W Management            | Vehicle S/W Management |                                |                            |                                     |                        |
| ECU Upgrade                       | ID Register            |                                |                            |                                     |                        |
| Audio Update                      | System Identifi        | ication                        |                            |                                     |                        |
| ID Register                       | - ojotom raonan        | oution                         |                            |                                     |                        |
| Option Treatment 🛛 🗈              | Data Treatment         |                                |                            |                                     |                        |
| This item is not supporte         |                        |                                |                            |                                     |                        |
|                                   | ASP Calibration        | n                              |                            |                                     |                        |
|                                   | Seps Type Reco         | gnition                        |                            |                                     |                        |
|                                   |                        |                                |                            |                                     |                        |
|                                   |                        |                                |                            |                                     |                        |
|                                   |                        |                                |                            |                                     |                        |
|                                   |                        |                                |                            |                                     |                        |
|                                   |                        |                                |                            |                                     |                        |
| <                                 |                        |                                |                            |                                     |                        |
| Data Treatment                    |                        |                                |                            |                                     |                        |
| Inspection / Test                 |                        |                                |                            |                                     |                        |
| ECU Mapping Verification <b>X</b> |                        |                                |                            |                                     |                        |
| Selup FeedBack Ma                 | nual TSB DTC           | Current Data Actuation<br>Test | Flight Record Oscilloscope | Fault Code<br>Searching ECU Upgrade | Internet Update        |
| 🗿 🩋 🚞 I                           | 🔰 📴 🍕 📴                | s 🕌 🎾                          | 16 N P 2 4 4 L             | a n <b>17 é i 1</b> d               | () 7:51 AM<br>5/7/2014 |

GD Preparation Repair 0 **I** ECU Upg Audio Up ASP Calibration I ID Regis This function is used for initiating ASP Calibration. Perform this replace EPS ECU or do wor k related to EPS ready, press (OK) button Data Treat Cancel Inspection CurrentData Actuation Test Flight Record Oscilloscope Fault Code Searching ECU Upgrade TSB DIC . 828657**4**94488868840

Select ASP Calibration.

8. Click **OK** to continue with ASP calibration.

10.

and click OK.

# MDPS FLEXIBLE COUPLING REPLACEMENT

9. Start the engine and center the steering wheel. Then, click **OK**.

Turn the ignition OFF and wait 15

seconds. Then, turn the ignition ON

 VCI: VXLAL Ca: VALI. Off @ Internet: Cn:

 Preparation

 Diagnosis

 Vehicle SW Management

 Repair

 OPTIMATE/CPP204/G 20 T-GOI

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|--|-------------------------|---|---|---------------|-------------------------|------------|--------------------|----|
| GD   | Preparation             | Diagnosis   | Vehicle S/W N   | lanagement    | Re                      | epair      | 0                  |    |
| Vehicle OPTIMA   | TF/QF)/2014/G 2.0 T-GDI |   | Steerin   | ng/Motor Driv | en Power S              | teering    | 02                 |    |
| Vehicle S/WM CASP Cal                                      | ibration                |   |   |               |                         | 0          | 10                 | Ð  |
| ECU Upgr   |                         |   |   |               |                         |            |                    |    |
| Audio Upd  |                         | [ASP Calibration ]  |   |               |                         |            |                    |    |
| ID Registe   |                         |   |   |               |                         |            |                    |    |
| Option Treatr  |                         | The second properties of the  | for initiating ASP Calibr   |               | related to EPS          |            |                    |    |
| This item is   |                         | 1939.0  |   | or do work    | related to EPS.         |            |                    |    |
|  |                         | Initiatizing comp<br>et utning the inpution kay to<br>tor 15 sec<br>Turn neat i,piniton kay to<br>and Press (MK<br>Check the steering a<br>is within ±5° at data<br>b | the Off position, wait<br>he on position<br>button,<br>ngle sensor<br>analysis. |               |                         |            |                    |    |
| Data Treatr<br>Inspection /<br>ECU Mapping Verification II |                         |   | Canc  | 9             |                         |            | J                  |    |
| Setup  | Manual TSB DTC          | Current Data Actu   | ation<br>st Flight Record   | Oscilloscope  | Fault Code<br>Searching | CU Upgrade | Internet<br>Update | >  |
|  | D 605 🔍                 | GDS   | 2 K 5 P 2   | 614 L 1       | N 15 4                  |            | 10 754 AM          | r. |

- 11. Access **Current Data** and verify the Steering Angle Sensor value is at 0.0  $\pm$  5.0 degrees.

### MDPS FLEXIBLE COUPLING REPLACEMENT

#### AFFECTED VEHICLE PRODUCTION RANGE:

| Model                | Applicable Production Range   |
|----------------------|-------------------------------|
| Forte (TD) 2012~2013 | Jan. 05, 2012 ~ Mar.31, 2013  |
| Forte (YD) 2014      | Jan. 7, 2013 ~ Dec.18, 2013   |
| Soul (AM) 2010~2013  | Sep. 01, 2009 ~ Aug. 15, 2013 |
| Cadenza (VG) 2014    | Feb. 01, 2013 ~ Apr.19, 2014  |

#### PART INFORMATION:

| Part Name         | Part No.       | Qty. | Replacement Part |
|-------------------|----------------|------|------------------|
| Flexible Coupling | 56315 2K000FFF | 1    |                  |

#### WARRANTY INFORMATION:

#### N CODE = N29 C CODE = C63

| Model        | Claim<br>Type | Causal<br>P/N  | Qty. | Repair<br>Description         | Labor Op<br>Code | Op<br>Time | Replacement<br>P/N | QTY. |
|--------------|---------------|----------------|------|-------------------------------|------------------|------------|--------------------|------|
| Soul (AM)    |               | 56310<br>2K625 |      | (CHA 074)<br>MDPS<br>Flexible | 56315F00         | 1.0 M/H    | 56315<br>2K000FFF  | 1    |
| Forte (TD)   | W             | 56310<br>1M550 | 0    |                               | 56315F02         | 1.6 M/H    |                    |      |
| Cadenza (VG) | W .           | 56310<br>3R561 | U    | Coupling<br>Replace           |                  | 1.5 M/H    |                    |      |
| Forte (YD)   |               | 56310<br>A7410 |      |                               |                  | 0.8 M/H    |                    |      |

# **\*** NOTICE

The repair procedure to replace the flexible coupling of the MDPS Soul (AM) and Forte (YD) has been modified from the original repair procedure outlined in KGIS and previously in TSB CHA 044 (removal of certain parts as currently shown in the service procedure on KGIS is not necessary to complete the replacement of the flexible coupling). As a result, the labor time for the repairs for these models (includes inspection) have been adjusted.