



GROUP  
CHA

MODEL  
All Applicable  
Models with  
C-MDPS

NUMBER  
084 (Rev 7, 3/25/2021)

DATE  
November 2018

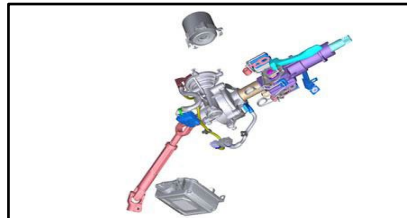
## TECHNICAL SERVICE BULLETIN

SUBJECT: PARTIAL REPAIR OF C-MDPS MOTOR, ECU, WORM GEAR  
AND/OR STEERING COLUMN HOUSING

### \* 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 provides information regarding the partial repair of the Motor Driven Power Steering (MDPS) Motor, Electronic Control Unit (ECU), Steering Column Housing, or Worm Gear Assembly. When the steering wheel is rotated a scraping noise can be heard originating from the lower bearing on the Worm Gear Assembly on some 2010MY~ Kia models listed on page 8, equipped with a Column Motor Driven Power Steering (C-MDPS) unit. On vehicles with this condition, the steering effort is not affected. Follow the MDPS Repair Flowchart (page 2) and the C-MDPS Common Concerns Flowchart (page 3), along with the MDPS DTC Table (page 4), and procedure outlined in this bulletin before replacing the C-MDPS Motor, ECU, Worm Gear Assembly, or Steering Column Housing.



### ! WARNING\*

To prevent personal injury and damage to the clockspring, keep the steering wheel in the straight-ahead position whenever disconnecting any portion of the steering column.

### \* NOTICE

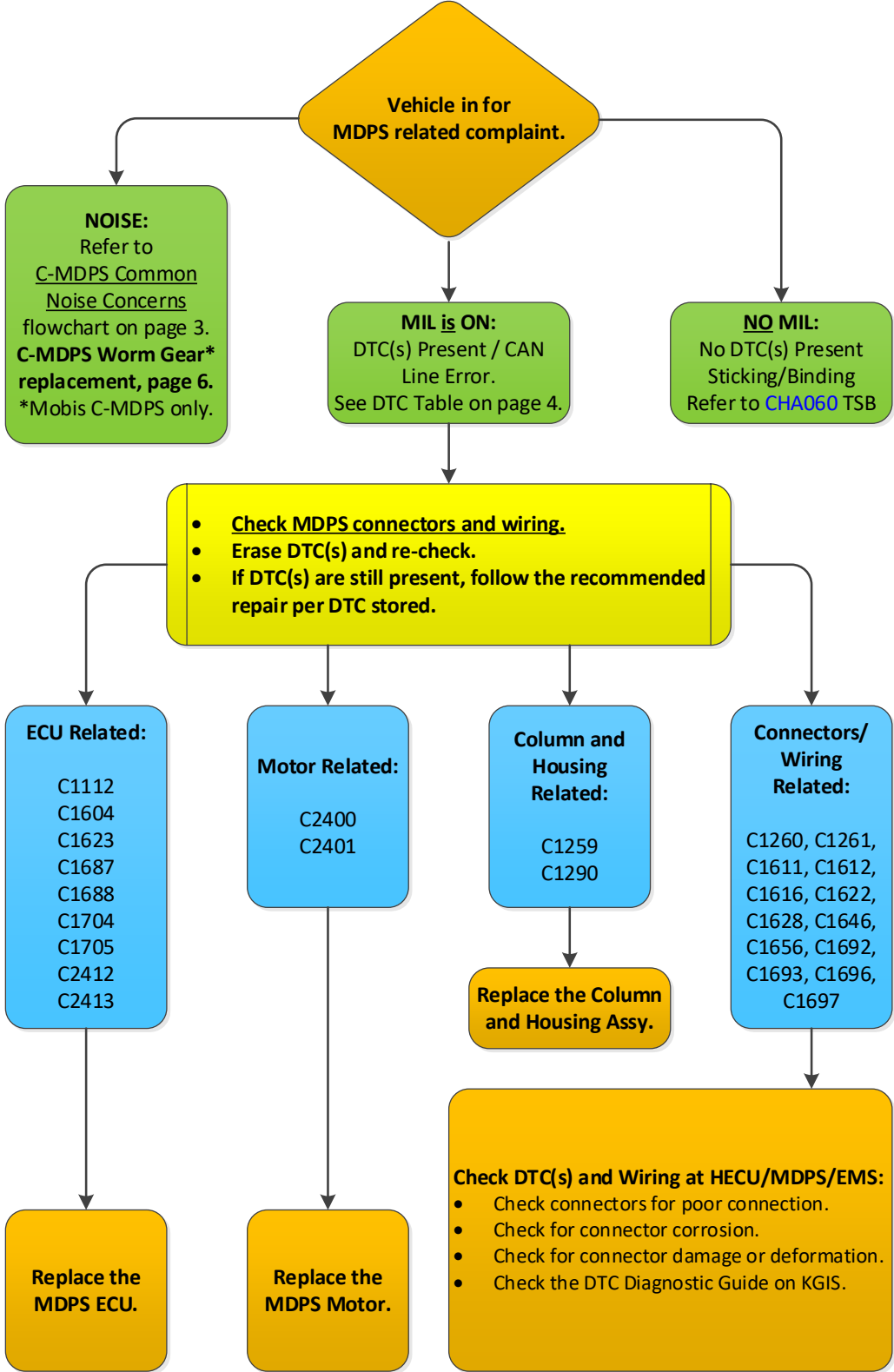
- MDPS Repair Flowchart and Common Noise Flowchart are meant to be used as a reference guide only. See MDPS DTC table for more details.
- Note that some DTC(s) may be found in systems other than Electric Power Steering (EPS) in KDS. They may be found in the Brake/ABS/ESC system. Check all systems for DTC(s).
- Replacing the complete C-MDPS Steering Column Assembly is NOT allowed when the components failure is identified in the flowchart. In addition, replacing the Steering Column Housing is NOT allowed when the problem source is the C-MDPS Worm Gear Assembly (for applicable models).

Printed TSB copy is for reference only; information may be updated at any time.  
Always refer to KGIS for the latest information.

Circulate To:  General Manager  Service Manager  Parts Manager  
 Service Advisors  Technicians  Body Shop Manager  Fleet Repair

**SUBJECT: REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING**

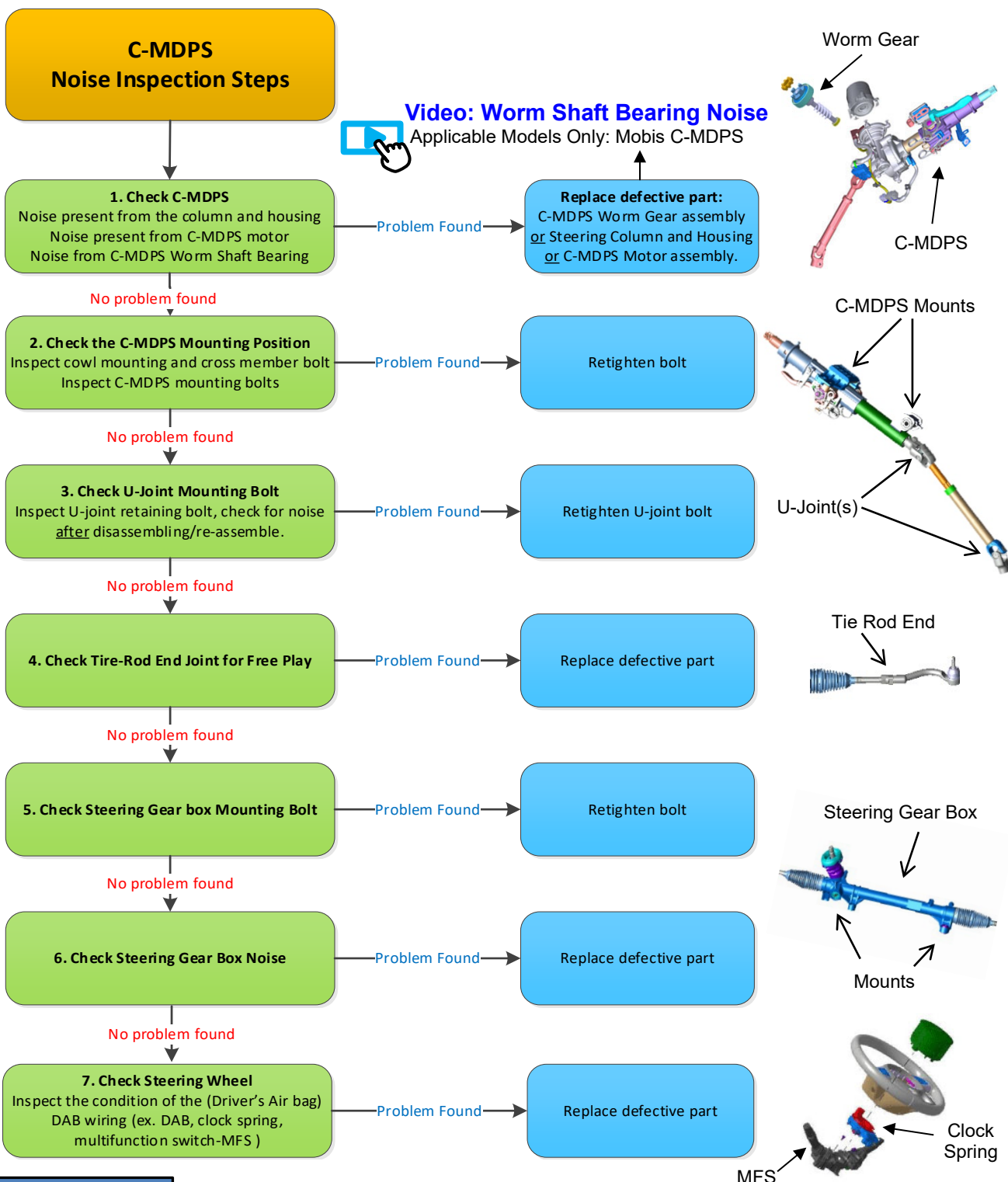
**MDPS Repair Flowchart**



SUBJECT:

# REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING

## C-MDPS Common Noise Concerns Flowchart



**\* IMPORTANT**

The Clockspring must be kept on center during installation of the Clockspring to prevent cable damage, this is also true when the MDPS column is removed – the steering shaft must be locked in position to prevent the Clockspring cable from becoming off-center. Failure to follow these instructions may result in a damaged Clockspring and will be subject to a dealer chargeback.



SUBJECT:

## REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING

MDPS DTC TABLE			
DTC	Concern	Inspection Procedure	Recommendation
C1102	Battery Voltage Problem	Check battery voltage condition.	Recharge battery voltage.
C1603	MDPS Thermal Protection	Investigate driving conditions if DTC is set. This DTC protects the motor from overheating.	No replacement necessary.
C1611	CAN Time Out EMS	Check GDS condition.	Check EMS Can line.
C1616	CAN BUS OFF	Check wiring and connector condition. Check ECU CAN line.	Check the chassis CAN line.
C1622	Vehicle Speed Signal Error	Check MDPS ground.	Check the EMS
C1696 C1697	SPAS Signal Error	Check SPAS and associated wiring.	Repair as necessary. Erase DTC(s). MDPS Assy is <u>not</u> to be replaced.
C1612 C1646	TCU Signal Error	Check TCU and associated wiring.	
C1628 C1656	Instrument Cluster Signal Error	Check instrument cluster and Associated wiring.	
C1692 C1693	VSM Signal Error	Check VSM and associated wiring.	
C1259	Steering Angle Sensor Signal Error	Reset steering angle sensor calibration and erase DTC(s). Check wiring and connector condition.	
C1260	Steering Angle Sensor Signal Error	Reset steering angle sensor calibration.	If DTC returns, inspect wiring and connector condition.
C1261	Zero-Setting Error		
C1290	Torque Sensor Error	First, erase DTC, then check wiring And connector condition.	If DTC returns, replace column And housing assembly.
C1112	Torque Sensor Voltage Error	Check wiring and connector condition Between torque sensor and ECU.	If DTC returns, replace the MDPS ECU.  If DTC returns, replace the MDPS motor.
C1704	ECU Fail-Safe Relay Fault	First, erase DTC. Then check the wiring and connector at the ECU.	
C1705	ECU Hardware Error		
C1604	ECU Over/Discharge Error		
C2413	ECU Hardware Error		
C2400	Motor Signal Error		
C2401	Motor Circuit Error		
C2412	Motor Voltage Supply Error		First, erase DTC. Then check the wiring and connector between the ECU and motor.
C1623	CAN Time Out SAS	<ol style="list-style-type: none"> <li>1. Check MDPS power connector and fuse.</li> <li>2. Check MDPS ground line.</li> <li>3. Check MDPS ECU/VSM CAN line.</li> <li>4. Check communication status with GDS.</li> <li>5. Check for DTC C1259.</li> </ol> If present, replace the column and housing assembly.	If DTC returns, replace the MDPS ECU.  If DTC returns and MDPS is inoperable, replace MDPS ECU. If DTC returns and MDPS operation is normal, continue investigation into wiring issues.
C1687	CAN Time Out VSM		
C1688	VSM Signal Error		

SUBJECT:

## REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING

### Replacement Procedure for Worm Gear Assembly (Mobis Only):

1. Remove the MDPS column and housing by referring to the “Steering System → Motor Driven Power Steering → MDPS Column and Housing → Repair Procedures” chapter in the applicable Shop Manual on KGIS.

**Note:** Be sure mark the steering column shaft to the intermediate shaft for re-assembly purposes.

**\*Refer to Clockspring Warning on page 1.**

2. Using the worm shaft plug SST (B) loosen the worm shaft nut (C) and remove the worm shaft.

**Torque Specifications for nut (C) Refer to page 8 for applicable model:**

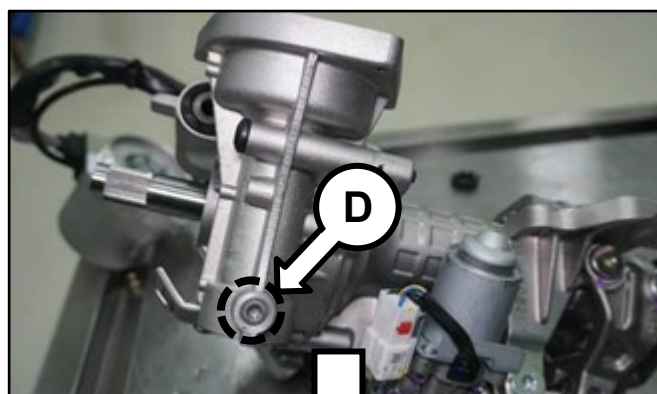
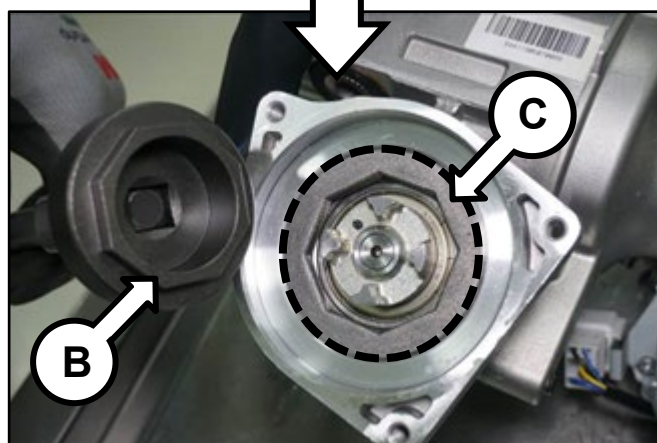
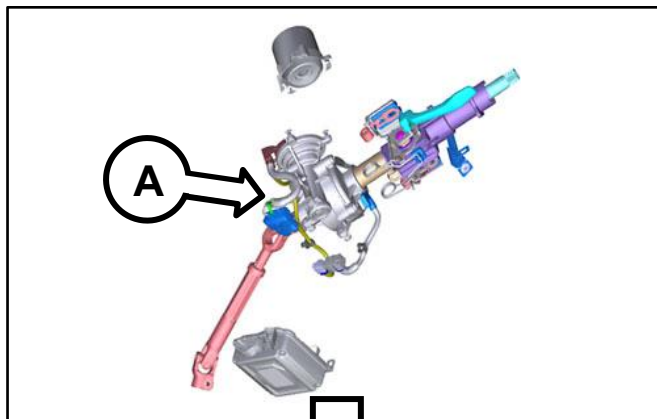
**0K563 T9100FFF (34.9mm):** 27.5 – 34.7 lb.ft (37.2 – 47.0 N.m (3.8 – 4.8 kgf.m)

**0K563 Q2100FFF (42.0mm):** 51.7 – 59.0 lb.ft (70.0 – 80.0 N.m (7.2 – 8.2 kgf.m)

**0K563 D6100FFF (44.9mm):** 81.2 – 103.2 lb.ft (110.0 – 140.0 N.m (11.3 – 14.3 kgf.m)

3. Loosen the 5mm hex plug (D) and then remove the anti-rattle plug assembly.

**Torque Specifications for plug (D):**  
7.3 - 9.4 lb.ft (9.8 - 12.8 N.m,  
1.0 - 1.3 kgf.m)

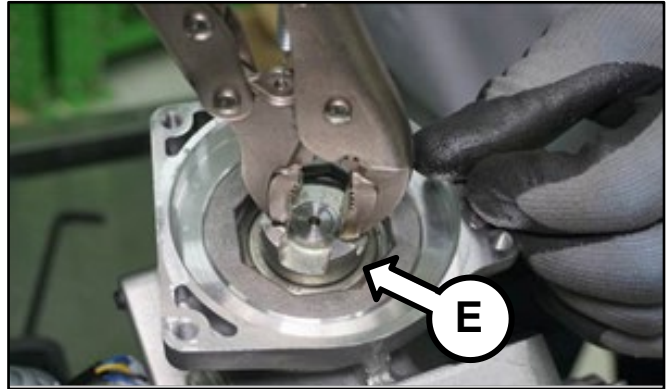




SUBJECT: **REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING**

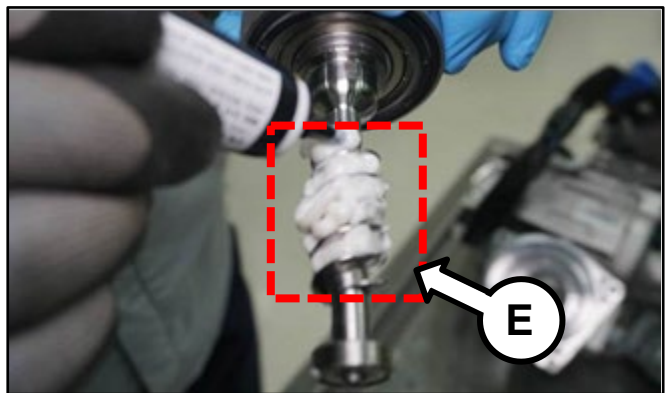
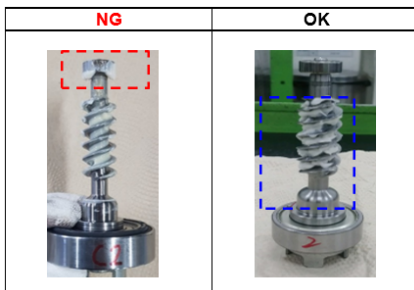
- Using a set of vise grips, remove the worm shaft assembly (E).

**Note:** Reuse the flexible coupling unless there is visible damage or wear. Replace as needed.



- Apply grease to worm gear shaft (E) portion only (OK). Grease should not be applied to the bearing (NG).

**Note:** Grease is included (20g) with worm gear assembly.



- Install the new worm shaft assembly (E) in the reverse order of removal.



- Using a torque wrench and SST (B), tighten the shaft nut (C).

Refer to torque specifications on step 2.

- Re-install all removed parts in the reverse order of removal.

**Note:** Be sure to follow the SAS Calibration, EPS Type Recognition as outlined on KGIS.



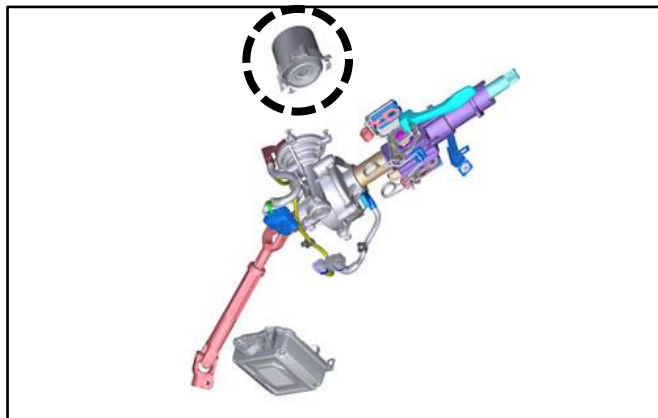
SUBJECT:

## REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING

### Replacement Procedure for MDPS Motor:

1. Replace the MDPS motor by referring to the “Steering System → Motor Driven Power Steering → MDPS Motor → Repair Procedures” chapter in the applicable Shop Manual on KGIS.

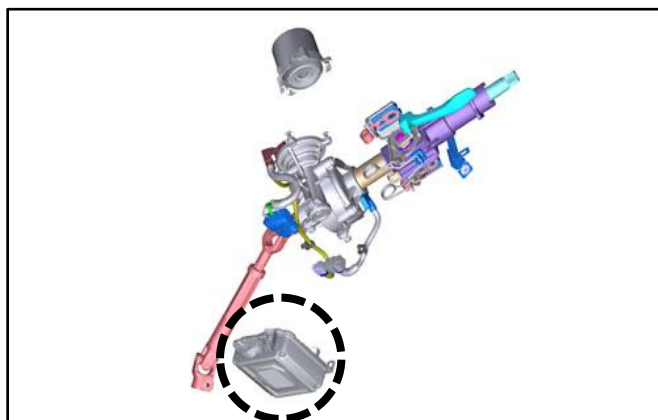
**Note:** Be sure mark the steering column shaft to the intermediate shaft for re-assembly purposes if removing the steering column and housing assembly.



### Replacement Procedure for MDPS ECU:

1. Replace the MDPS ECU by referring to the “Steering System → Motor Driven Power Steering → MDPS ECU → Repair Procedures” chapter in the applicable Shop Manual on KGIS.

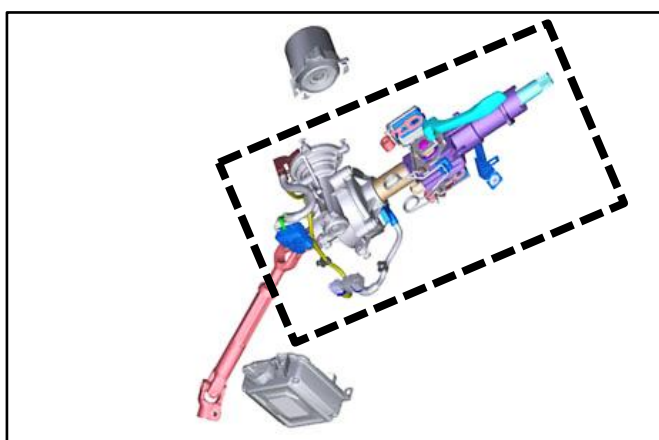
**Note:** Be sure mark the steering column shaft to the intermediate shaft for re-assembly purposes if removing the steering column and housing assembly.



### Replacement Procedure for Steering Column & Housing:

1. Replace the MDPS column and housing by referring to the “Steering System → Motor Driven Power Steering → MDPS Column and Housing → Repair Procedures” chapter in the applicable Shop Manual on KGIS.

**Note:** Be sure mark the steering column shaft to the intermediate shaft for re-assembly purposes.



**\*Refer to Clockspring Warning on page 1.**

### ★ IMPORTANT

Ensure all steps are closely followed within the Service information as additional KDS-related procedures are required. Ensure the Steering Angle Sensor (SAS) is calibrated and there are no DTCs after replacement of the MDPS Motor and/or ECU. Verify proper operation of the steering system and vehicle.




## SUBJECT:

REPLACEMENT OF C-MDPS MOTOR, ECU,  
WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING


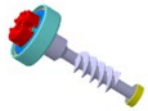
## AFFECTED VEHICLE RANGE:

Model	MDPS Supplier	Model Year Range
Soul (AM), Optima (QF, TF, TF HEV), Cadenza (VG), and Forte (YD, YDm)	Mobis	All Applicable Models 2010MY~ with C-MDPS
Forte (BD, BDm, YD, YDm), Niro (DE, DE HEV/PHEV/ EV), Optima (JF/JFa, JF HEV/PHEV) Soul (PS, PS EV), Sorento (UMa) and Cadenza (YG)		
Rio (UB, SC), Sportage (SL, QL) and Sorento (XMa)	Mando	

## REQUIRED PART:

Part Name	Part Number	Figure
C-MDPS Motor	Refer to EPC	
C-MDPS ECU	Refer to EPC	
Steering Column Housing	Refer to EPC	

## REQUIRED TOOL AND WORM GEAR P/N (INCLUDES GREASE):

Model/ Model Year	MDPS Assy	Worm Shaft Kit Part Number	SST Part Number (Size)	Image
2017-2018 YD(m) 2018-2019 PS/PS EV	Refer to EPC	56351 B3AAA FFF	0K563 T9100FFF (34.9mm)	 (Non-Integrated)
2017-2018 JFa/UMa 2017 JF HEV		56351 C5AAA FFF	0K563 D6100FFF (44.9mm)	
2019-2020 JFa, UMa 2018-2020 JF HEV 2017-2020 YG		56351 F6AAAFFF		
2017 DE <b>See Note Below*</b>	56310-G5100 56310-G5300	56351 F2AAAFFF	0K563 Q2100FFF (42mm)	 (Integrated)
2019-2020 BD(m)	Refer to EPC	56351 G3AAAFFF		
2017 DE <b>See Note Below*</b>	56310-G5101 56310-G5301			
2018-2020 DE/DE EV/ DE PHEV	Refer to EPC			

**\*Note:** DE requires the reference to MDPS assembly to ensure the proper part is installed; Integrated vs. Non-Integrated.



SUBJECT:

## REPLACEMENT OF C-MDPS MOTOR, ECU, WORM GEAR ASSEMBLY AND/OR STEERING COLUMN HOUSING

WARRANTY INFORMATION:

**N Code: D61 C Code: ZZ4**

Model	Claim Type	Causal P/N	Qty.	Repair Description	Labor Op Code	Op Time	Replacement P/N	Qty.
All Models Listed	W	Refer to EPC	1	C-MDPS Motor Replacement	56330R00 56331R00	Refer to LTS	N/A	0
				C-MDPS ECU Replacement	56345R00	Refer to LTS		
				Steering Column Housing Replacement	56391R00	Refer to LTS		

WARRANTY INFORMATION (WORM GEAR):

**N Code: Q55 C Code: ZZ1**

Model	Claim Type	Causal P/N	Qty.	Repair Description	Labor Op Code	Op Time	Replacement P/N	Qty.
PS, PS EV, YD	W	*Refer to EPC	0	C-MDPS Worm Gear Replacement  (for applicable models only)	56351F01	1.4 M/H	56351 B3AAFF	1
JF, JF HEV, JFa						1.3 M/H	56351 C5AAFF	
DE						1.1 M/H	56351 F2AAFF	
JF, JF HEV, JFa, YG						1.3 M/H	56351 F6AAFF	
BD, BDm, DE, DE PHEV, DE EV						1.1 M/H	56351 G3AAFF	
UMa						1.2 M/H	56351 C5AAFF 56351 F6AAFF	

**\*Note: Refer to EPC for Steering Column and Housing Assembly.****WARNING\***

To prevent personal injury and damage to the clockspring, keep the steering wheel in the straight-ahead position whenever disconnecting any portion of the steering column.

