Description

Adaptive Front-Lighting System (AFS)

AFS (Adaptive Front-Lighting System) is a headlamp orientation control system that takes into account both steering angle and vehicle speed to orient the headlamps to an angle that provides better nighttime visibility.
Variable conditions make beam pattern of running vehicle kaleidoscope.

Component of AFS

1. Input part : It is provided that information of speed sensor, height sensor and so on related to condition of vehicle.
2. Control part (AFS Unit) : It controls Output part by analyzing/judging Input signal.
3. Output part : It drive Low beam of H/Lamp to upper/lower and left/right side optimum beam pattern according to output control signal of AFS Unit.

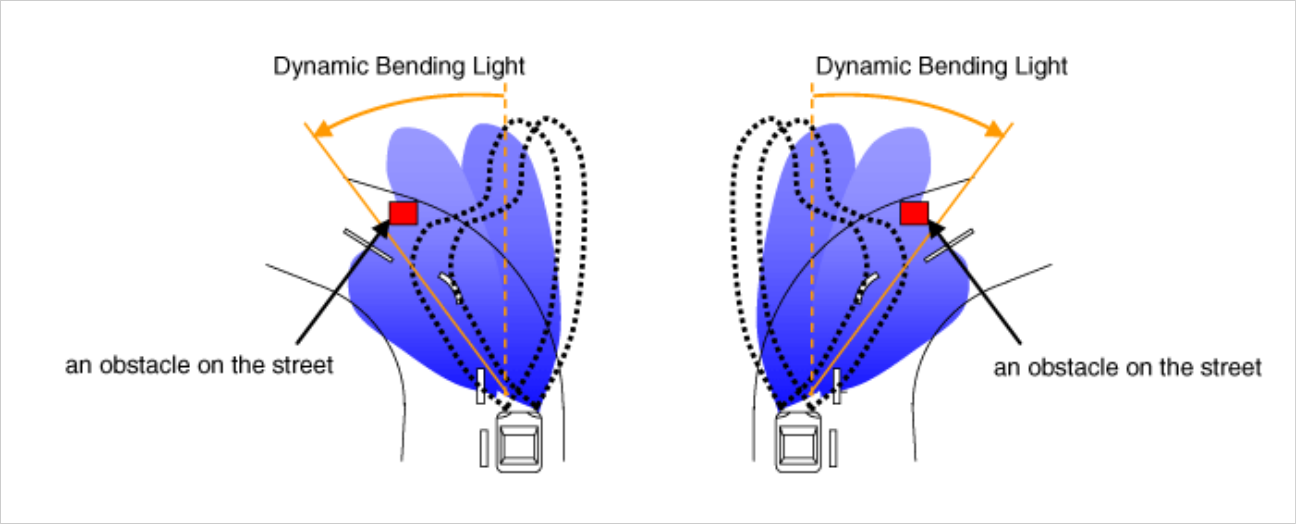
Main function of AFS

	Content	Description
1	Dynamic Bending (Swivelling)	• Providing optimum beam pattern in the curve road 1) Enhanced visibility in the curve road 2) Drive Low beam to left / right side
2	Automatic Leveling (Leveling)	• Compensating Low beam according to inclination of vehicle 1) Compensation according to static condition (Load) 2) Compensation according to dynamic condtion (Quick start, Sudden stop)
3	Fail-safe	• Fail-safe reaction while detecting system failure and malfunction 1) Detecting signal / communication error for Swivelling 2) Detecting signal /communication error for Leveling 3) Detecting system failure

Advantage of AFS

	Content	Description
1	Enhanced stability	• Visibility Guarantee In case of curve road • According to vehicle Speed/Steering angle, speed/angle of Swivel actuator is automatically controlled to provide optimum beam pattern • Fail-safe reaction application for Driver on opposite side road →In case error communication,automatically return initial position of Swivel actuator
2	Enhanced convenience	• AFS operating application by driver"s selection(AFS Off switch) • Providing Diagnostic function for detecting system failure and malfunction and check up data information (by using Diagnostic equipment) • Reduced wiring-harness by Applying CAN/LIN communication in vehicle • Fun Drving Function : Swivelling of Low beam → Increasing driver"s pride

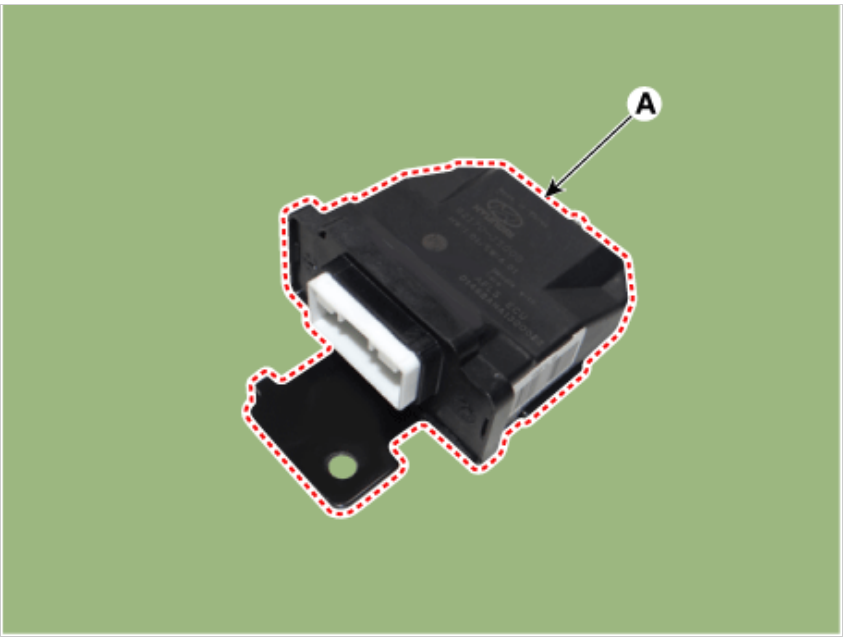
Block Diagram



Operation

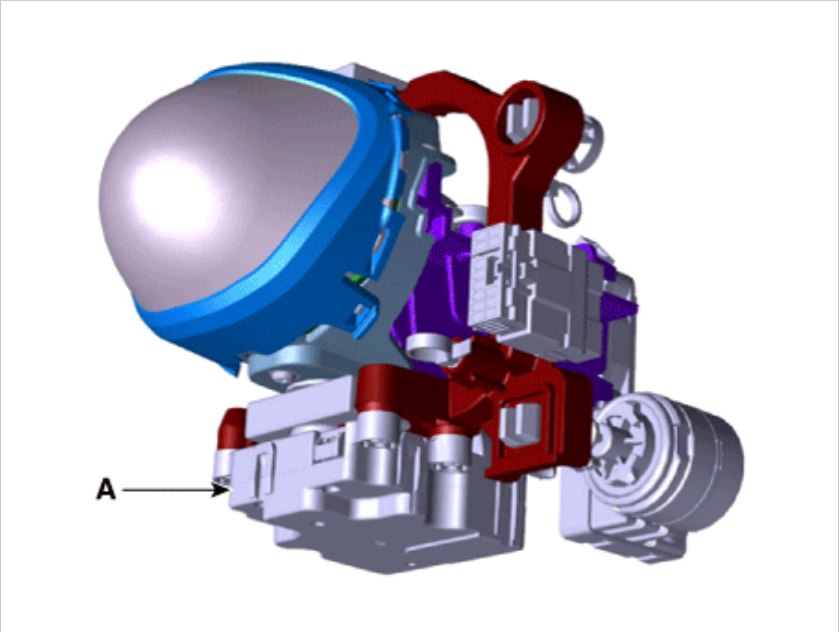
Component

AFS Unit (A)



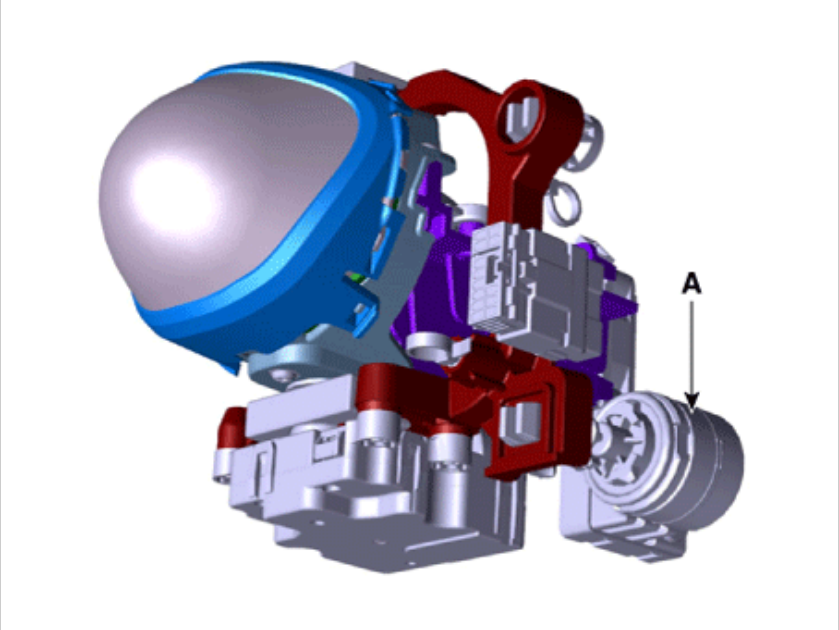
1. General
   System initialization, In case of input Engine signal (AFS ECU, Levelling /Swivelling motor)
   Adaptation of AFS OFF switch
   AFS operate normally, only under turning low beam switch on.
   Providing Tell-tale function of AFS (display ‘AFS’ on dashboard).
   In case of system failure, display light on ‘AFS’ on dashboard
2. Main function
   Swivelling function
   Levelling function
   Processing signal of Height sensor
   Control the shield drum to change the beam pattern
   Control the static bending light

Swivelling Motor (A)



1. General
   communicate AFS Unit through LIN protocol
   Robust control to Disturbance
   Doesn"t work out of rated voltage range.
2. Main function & Rating
   Drive Low beam to left / right side
   Fail-safe function : In case of detecting malfunction or system failure , drive to secure position

Levelling Motor (A)



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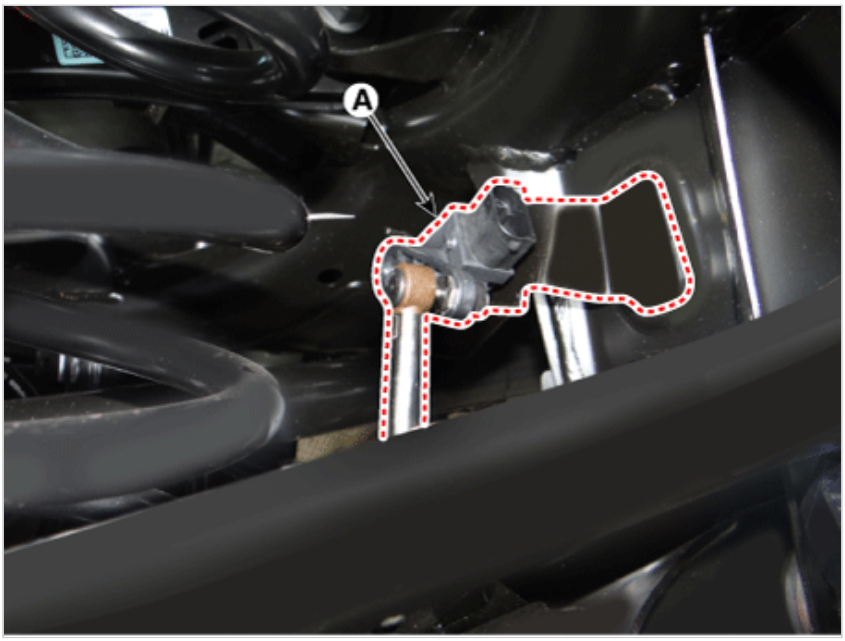
Height Sensor



1. General
   Height Sensor connecting body & suspension measures inclination information from load condition.
   Vehicle having the Steel-suspension system transmits inclination signal to AFS ECU by using Hard-wire.
2. Rating
   Rated Voltage : 5V ± 5%

LED Head lamp, LDM (A)

1. LDM system description.
   LED (Light Emitting Diode) BEAM is largely composed of LED module, cooling fan and LDM (LED Driver Module).
   LED module is composed of four units and each unit is composed of three LEDs.The cooling fan cools down the heat generated by LEDs.
   The fan fails, it sends the fail signal to LDM.
   LDM is a module that drives LEDs. It turns on or makes the warning lamp of the cluster flickering, if the fan or LED fails.