

As required by D.G.M.S. circular No 5 of 2010

Automation Controls has developed an **ABS System**, comprising three different **functions** in one control Unit.

- 1) Auto Dipper,
- 2) Body Lifting Indicator &
- 3) Seat Belt (Auto Rewind) with Reminder.



Individually the purposes of these equipment's are as below:

1. **AUTO DIPPER:** When the sharp high beam light of a vehicle coming from opposite direction falls on its windscreen AUTO-DIPPER switches headlights of vehicle, to dipper mode (low beam) automatically. When this approaching vehicle passes off, Auto-dipper switches back from dipper mode (low beam) to the original high beam position. It all happens within five seconds without any manual efforts.

In order to avoid glare of approaching vehicle from front with high beam, the driver (of both vehicles) is required to dip light of their vehicle. At present, this is being done manually with the help of dipper switch. If driver fails to operate dipper switch, driver of other vehicle may not be able to see approaching vehicle and may cause accident.

2. **BODY LIFTING INDICATOR:** Operators of HEMM, while operation, doesn't know the position of the dump body, whether it is in high or low position. If dumper moves in body lift position, overhead HT Lines may break, or hydraulic system may collide and may cause fatal accident. To avoid accident, an electronic safety device "BODY LIFT INDICATOR gives indication to the operator and also alerts him in HUMAN VOICE. it gives information to the dumper operator in Human voice i.e. "डाला ऊपर है"/
3. **SPRING LOADED SEAT BELT WITH INERTIAL LOCKING MECHANISM AND SWITCH FOR ALERT:** A seat belt is a safety device used to secure the Operator of a vehicle against a collision or a sudden stop. A seat belt functions to reduce casualty or serious injury. It is provided with covered spring-loaded Reel and an Inertial Locking mechanism.
 - a. The Seat Belt is rolled on the spring-loaded reel so that it can be pulled, slowly and gradually, when the operator is to fasten it. It will lock if pulled fast.
 - b. The seat Belt is rolled on the reel, which is properly covered when not in use. Therefore it is protected from dust and mud of the polluted environment of mines. If it is not covered like this, it will become dirty and operator may reluctant to use it.
 - c. Whereas the purpose of Inertial Locking mechanism is to provide the Seated Operator some free movement in normal situation but stop the belt from extending during sudden pull in severe collision or sudden stop, and thereby restrains the Driver/Operator in position.
4. **SEAT BELT WITH REMINDER:** is a safety device used to secure the occupant of a vehicle against harmful movement that may result during a collision or a sudden stop. A seat belt functions to reduce causality, serious injury in a traffic collision. These Seat Belts in the vehicle only serve purpose when Driver fastens it, therefore if he forgets, a **REMINDER** with Visual Indicator is necessary to remind him in Hindi - कृपया सीट बेल्ट बाँधे



ABS System Comprise of:

- A) **Control Unit:** A Microcontroller unit, it receive signal from individual sensors. Then it processes the signal and gives proper controller signal. Indication is provided for the entire three situations and for Power ON through bright LED to the dumper operator. This also gives the human voice alert to take proper alert to the operator. The reset button is also provided on the controlling unit to mute the voice, but LED indication will continue till the situation return back into normal position. This Control unit is installed in operators' cabin; in such a way that driver can see and hear the voice clearly. Operating voltage: 24 VDC. (Optional 12 VDC also available against order). Current consumption: 120 mA Maximum.
- B) **Auto dipper Sensor unit:** When high beam light of approaching vehicle falls on the sensor, it gives signals to the control unit which automatically dips the headlamp beam from high to low. The moment vehicle passes away, again control unit receive the signal from sensor and changes the beam back to high very efficiently.
- C) **Body lifting Indicator Sensor: Non-contact Magnetic type sensor** is provided to sense the body position. It is installed in such a way that when body is in normal (rest) position, it will sense its position through magnetic sensor and continue to send signal to the controller unit. **There is no mechanical contact between the body and sensor therefore the life of the sensor is very high.** These sensors are waterproof, dust proof, vibration proof and made to use in mining environment.
- D) **Harness:** A good quality harness suitable for system to connect Controller Unit, & Sensors is available as optional.
- E) **Seat Belt with Switch**

Salient Features:

- (i) All the three functions of Auto dipper, Seat belt with reminder and Body lift Indicator are comprised in one control Unit. **The equipment reminds the driver to fasten the 'Seat Belt' in Hindi, कृपया सीट बेल्ट बाँधे** It also alert the dumper operator in human voice that "डाला ऊपर है", so that he takes all necessary precautions to avoid accident.
- (ii) All the three conditions are also visually indicated through LED flash.
- (iii) It enhances driving comforts and also Safety by reducing manual operations.
- (iv) The equipment is able to withstand shocks & vibrations of heavy vehicles. It is lightweight and easy to install, without disturbing the existing arrangement.
- (v) The control Unit, Its circuits and Speaker are sealed with the chemicals so that nothing can enter in it
- (vi) A Timer to reduce the irritation to the operator and Noise Pollution is provided.

Special feature:

As soon as operator lifts the body to high position, Body Lifting Indicator after waiting for 2 Seconds immediately alert in human voice "डाला ऊपर है" This alarm continues for eight seconds. Since such voice should not disturb the operator, it discontinue for one minute. This cycle is repeated for 5 times for a period of approximately 5 minutes and then human voice stops, whereas LED blinking continue till body is lowered to the normal position.

It reminds the driver if he does not fasten the seat belt in Hindi - कृपया सीट बेल्ट बाँधे for three times and simultaneously LED also flashes. Still if driver do not respond, same reminder again continue after waiting for 52 Seconds. This process of reminding driver continue subsequently after interval of every one minute till either driver fasten the seat belt or he mute the equipment by pressing a button provided for this purpose.





TECHNICAL SPECIFICATION	
Functions	<p>a) Auto-dipper switches headlights of vehicle, to dipper mode (low beam) automatically. When this approaching vehicle passes off, Auto-dipper switches back from dipper mode (low beam) to the original high beam position. Performs its function of automatic dipping of head light beam and restore of head light beam.</p> <p>b) Body Lift Indicator gives indication to the operator and also alerts him in Human Voice in Hindi “डाला ऊपर है”</p> <p>c) SPRING LOADED SEAT BELT WITH INERTIAL LOCKING MECHANISM AND SWITCH FOR ALERT: A seat belt is a safety device used to secure the Operator of a vehicle against a collision or a sudden stop. A seat belt functions to reduce casualty or serious injury. It is provided with covered spring loaded Reel with Inertial Locking mechanism and Switch for Alert.</p> <p>d) Seat Belt is covered and therefore protected from becoming dirty in the polluted environment of mines.</p> <p>e) Seat Belts in the vehicle only serve purpose when Driver fastens it, therefore if he forgets, a REMINDER with Visual Indicator is necessary to remind him. It gives indication to the operator and also alerts him in Human Voice in Hindi - कृपया सीट बेल्ट बाँधे</p>
Controller unit	<p>Control Unit: A Microcontroller unit, when it receive signal from individual sensors it gives announcement in human voice in Hindi & all these three situations and are indicated through bright LED also. In Control Unit Power “ON” is also indicated through LED.</p> <p>The reset button is also provided to mute the voice, but LED indication will continue till the situation return back into normal position.</p> <p>Control unit works on the same battery voltage 24 VDC of the vehicle. This Control unit is installed in operators’ cabin; in such a way that driver can see and hear the voice clearly.</p>
Auto dipper contact current	<p>30 Amp. For Head Lamp, The maximum current consumption is 120 mA.</p>
Sensors	<p>a) Photo-Sensor for Auto dipper, b) Non-contact Magnetic sensors to sense the body position and c) Seat Belt with switch are provided</p> <p>These sensors are waterproof, dust proof, vibration proof and made to use in mining environment. To protect from dust & moisture Sensor are sealed with chemicals.</p>
Harness	<p>A good quality harness suitable for system to connect Controller Unit, & Sensors is available as optional. Only Fire retardant conduit pipes are used for the safety.</p>
Special features	<p>All the three functions of Auto dipper, Seat belt with reminder and Body lift Indicator are comprised in one control Unit, so that operator takes all necessary precautions to avoid accident.</p> <p>a) All these three conditions and power on are also visually indicated through LED flash.</p> <p>b) It enhances driving comforts and also Safety by reducing manual operations.</p> <p>c) The equipment is able to withstand shocks & vibrations of heavy vehicles. It is lightweight and easy to install, without disturbing the existing arrangement.</p> <p>d) The control Unit and sensor are sealed with the chemicals so that nothing can enter in it</p> <p>e) A Timer to reduce the Noise Pollution is also provided.</p>
Protection	<p>Withstand shocks & vibrations of heavy vehicles.</p> <p>Its electronic circuits and Speaker are sealed with the chemicals so that nothing can enter in it</p>
Timer	<p>a) Restore the head light beam within 5 seconds when vehicle from opposite direction passes.</p> <p>b) To avoid irritation to operator, a timer defined in “Special Feature”* as below is provided.</p>
Color	Black
Model	“ABS-12” & “ABS-24”

