

GROUP 9D

BODY ELECTRICAL

TABLE OF CONTENTS

General Description	9D-2	Component Of Lighting	9D-27
Notice : Repairing Electrical System	9D-2	Location Of Lamp	9D-31
Specification	9D-6	Horn And Audio System	9D-39
Diagnosis And Action Taken	9D-8	Wiper And Washer	9D-44
Check And Adjust	9D-10	Power Window	9D-61
Repair Of Each System	9D-13	Switch And Electrical System	9D-70
Instrument Panel Assembly	9D-13	Function Of Operation And The Characteristic	9D-76
Check And Repair	9D-17	Self Diagnosis	9D-84
Removal And Installation Of Instrument Panel	9D-20	Chart Of Diagnosis	9D-85
Switch Of Multi - Function	9D-22	Repair Of The System	9D-86

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



9D-2 BODY ELECTRICAL

GENERAL DESCRIPTION

NOTICE: REPAIRING ELECTRICAL SYSTEM

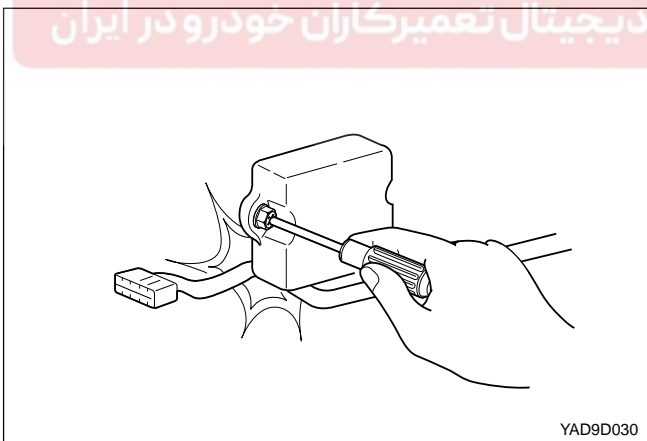
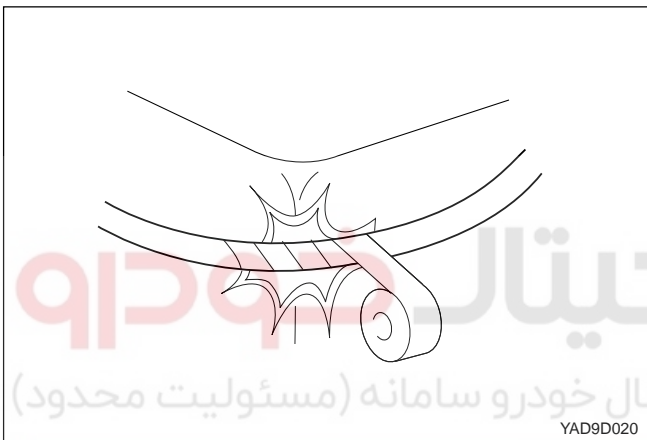
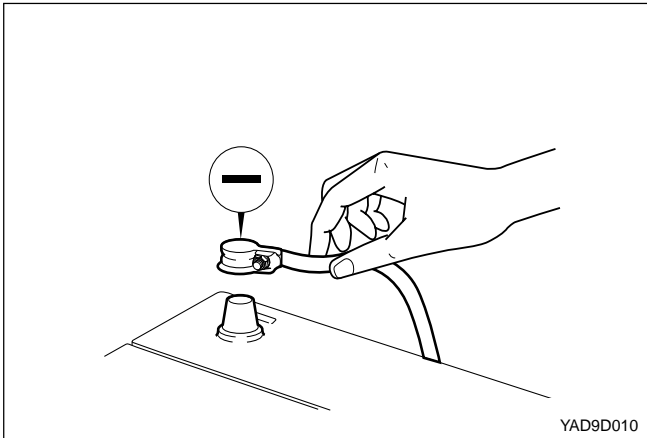
1. While electrical parts is repaired, first of all separate negative terminal of battery.

Notice: Before separate and link negative terminal, turn starting switch or all the switch of lamp off (if switches are not turned off, parts of semi-conductor may be impaired).

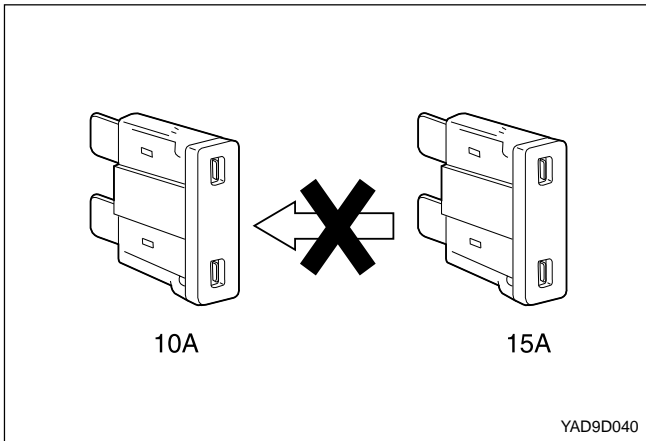
Notice: Memory values of electrical parts may be erased, so those value should be kept another place.

2. If harness is interfered by other sharp section, wrap them, and then, for protecting of harness.

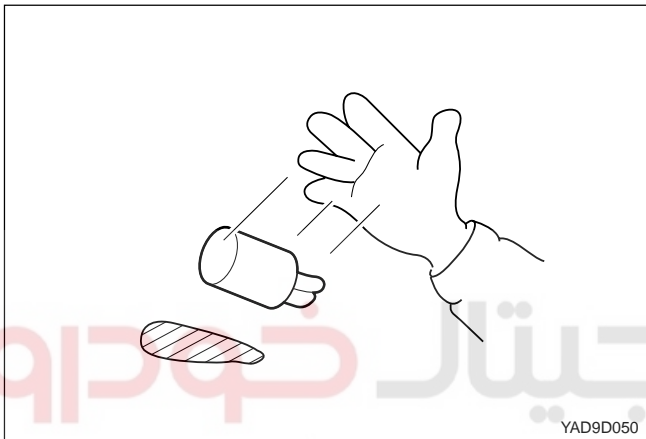
3. While parts is instsllod on the vehicle, keep in mind, in order not to tear or impair to the wiring harness.



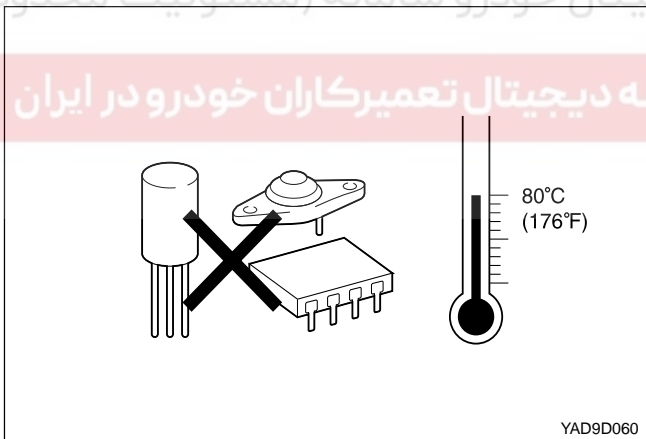
BODY ELECTRICAL 9D-3



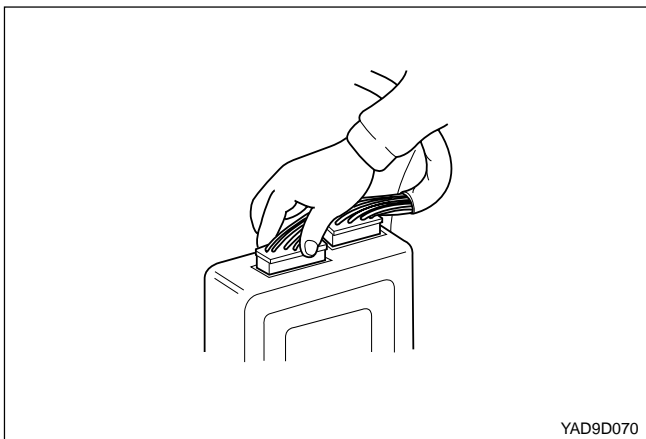
4. If fuse is damaged, fuse is replaced by rated capacity, if fuse is replaced by excessive rated capacity, parts may be impaired or fired.



5. Sensors and relays should not be influenced by impact and should not be dropped on the floor.

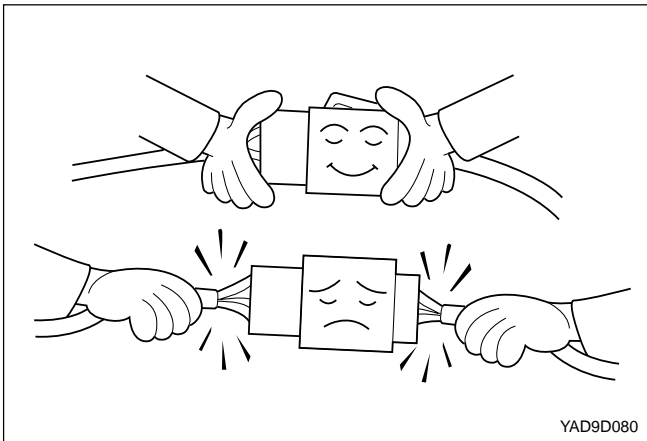


6. Electrical parts are impaired by heat, so if work of repair should be done excessive temperature of 8°C, remove electrical parts before done this.

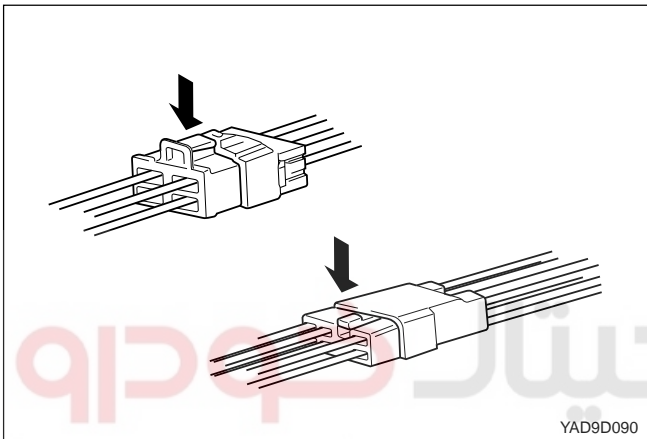


7. If connector is connecting loose, this cause to repair, make sure connecting of connector.

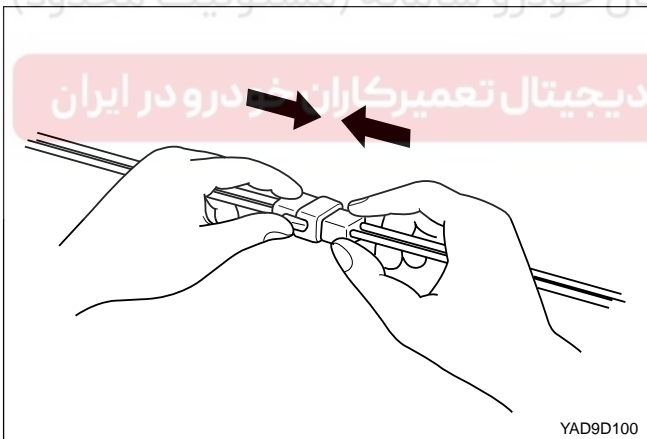
9D-4 BODY ELECTRICAL



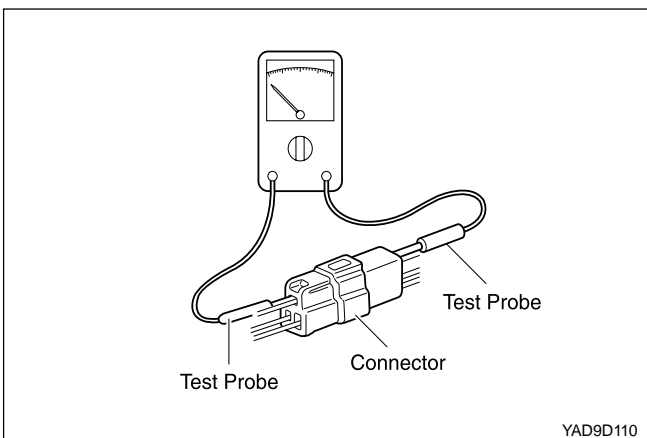
8. While harness is separated, connector should be pulled, harness should not be pulled, like the picture.



9. While connector is separated with the lock, pushing arrow indicated, remove the connector.



10. While connector is linked, insert this until sounds like tack!, tack!

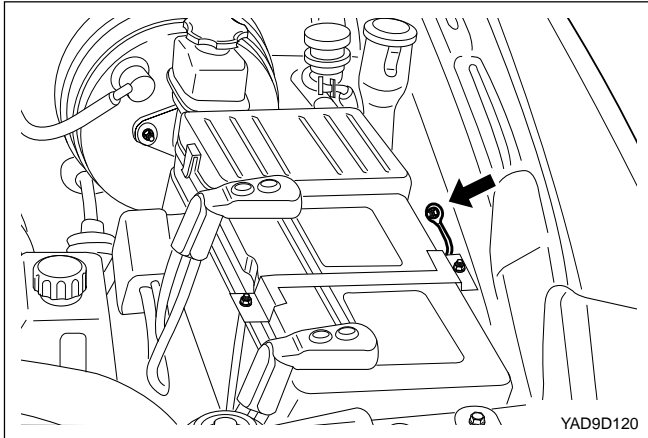


11. If electric current is sent or check voltage through tester of circuit, probe is set from the harness, if connector is kind of sealing type, probe is set through hole of cap in the wiring rubber.

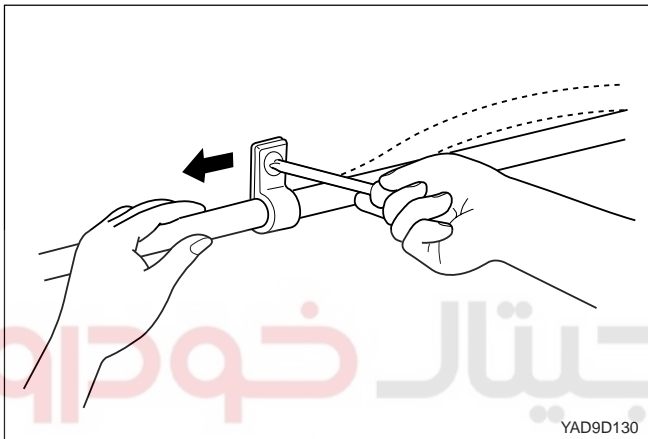
At this time, keep in mind, not to damage isolation of wiring, insert probe until contact connector of terminal completely.

Notice: Tester of circuit is not used on the air bag system, while this system is checked, scanner should be used.

BODY ELECTRICAL 9D-5

**Check Cable and Wire**

1. Check looseness of the connecting and corrosion.
2. Check the corrosion of terminal and wire by the eletrolyte.
3. Check open circuit for terminal and wire.
4. Check isolation of wire, damage, deformation.
5. Check interference between parts of terminal and other metal parts.



6. Check applying an electrical current complete between fixing bolt and body on the section of ground.
7. Check lay-out of wiring proper.
8. After fixing wiring completely, wiring should not be contacting by section of sharpness, section of high temp. (For example: exhaust manifold, exhaust pipe).
9. Keep the clearance between wiring and fan- pully, fan-belt, other parts.
10. After loosening wiring and fix, for vibration between section of body and the section of engine.

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9D-6 BODY ELECTRICAL

SPECIFICATION

Description		Spec	
Multi - function switch	Rated voltage	DC 12 V	
	Range for operating temp	-30 °C ~ +80 °C	
	Rated load	Light switch	Illumination: 1 A (Load of relay)
		Dimmer and passing switch	High beam: 9.2 A
			Lower beam: 1 A
		Switch of turn signal	Passing: 10 A
			6.6 ± 0.5
		Wiper switch	Lower: 5 A, High: 7 A
			Intermittent: 0.22 ± 0.05 A
			Fixing: MA X 28 A
	Washer switch	: 4 A	
	Intermittent wiper switch	MAX: 25 mmA	
	Horn connector	1 A	
Instrument panel	Turn signal lamp	14 V, 1.4 W	Green
	Seat belt	2.2 V, 20 mA	Red
	Charging lamp	2.2 V, 20 mA	Red
	Fuel indicator lamp	2.2 V, 20 mA	Orange
	High beam	14 V, 3 W	Blue
	Oil pressure lamp	2.2 V, 20mA	Red
	Brake lamp	2.2 V, 20 mA	Red
	Door open warning lamp	2.2 V, 20 mA	Red
	ABS warning lamp	14 V, 1.4 W	Orange
	Pre heating lamp	2.2 V, 20 mA	Orange
	Air bag warning lamp	14 V, 1.4 W	Red
	Hazard lamp	2.2 V, 20 mA	Red
	4WD check lamp	2.2 V, 20 mA	Red
	4WD high lamp	14 V, 1.4 W	Green
	4WD low lamp	2.2 V, 20 mA	Orange
	Winter lamp	14 V, 1.4 W	Green
	Power lamp	2.2 V, 20 mA	Orange
	EBD lamp	14 V, 1.4 W	Red
	Engine check warning lamp	2.2 V, 20 mA	Orange
	TCS lamp	14 V, 1.4 W	Orange
	Rear defogger lamp	2.2 V, 20 mA	Orange
Lamp	Head lamp	High beam	55 W X 2
		Low beam	55 W X 2
		Position lamp	5 W X 2
	Front combi lamp	Turn signal lamp	28 W X 2
		Fog lamp	27 W X 2
	Side mounted lamp	5 W X 2	
	High mounted lamp	5 W X 1	

BODY ELECTRICAL 9D-7

Description			Spec
Lamp	Rear combi lamp	Tail/ Stop	27 W X 2
		Tail lamp	8 W X 2
		Stop lamp	27 W X 2
		Turn signal lamp	27 W X 2
		Brake lamp	27 W X 2
	Licensee lamp		5 W X 2
	Room lamp	Front	8 W X 2
		Center	10 W X 1
		Rear	10 W X 1
	Door lamp		5 W X 4
	Glove box lamp		10 W

دیجیتال خودرو

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9D-8 BODY ELECTRICAL

DIAGNOSIS AND ACTION TAKEN**Gauge Panel and Warning System**

Nature of Defect	Cause of Defect	Action Taken
Tacometer is not operated	Cut of fuse Defective tacometer Defective wiring	Check short of fuse, replace fuse Check tacometer If necessary, repair wiring
Gauge of fuel is not operated	Cut of fuse Defective fuel gauge Defective fuel sender defective wiring	Check short of fuse, replace fuse Check gauge Check fuel sender If necessary, repair wiring
Warning lamp of fuel is not operated	Cut of fuse Failure of bulb Defective sensor of fuel Defective wiring or defective grounding	Check short of fuse replace fuse Replace bulb Check sensor If necessary, repair wiring or grounding
Gauge of temperature is not operated	Cut of fuse Defective gauge of coolant temp Defective coolant temp sender Defective wiring or defective grounding	Check short of fuse, replace fuse Check gauge Check sender If necessary, repair wiring or grounding
Warning lamp of oil pressure is not turned on	Cut of fuse Failure of bulb Defective sensor of oil pressure Defective wiring, and grounding	Check short of fuse, replace fuse Replace bulb Check sensor If necessary, repair wiring or grounding
Warning lamp of brake is not turned on	Cut of fuse Failure of bulb Defective warning switch of brake fluid Defective parking brake switch Defective wiring or defective grounding	Check short of fuse, replace fuse Replace bulb Check switch Check switch If necessary, repair wiring or grounding
Warning lamp of opening door or tail gate is not turned on	Cut of fuse Failure of bulb Defective door switch Defective wiring or defective grounding	Check short of fuse, replace fuse Replace bulb Check switch If necessary, repair wiring or grounding
Warning lamp of seat belt is not turned on.	Cut of fuse Failure of bulb Defective buckle switch Defective wiring or defective grounding	Check short of fuse Replace bulb Check switch If necessary, repair wiring or grounding

BODY ELECTRICAL 9D-9

Lighting System

Nature of Defect	Cause of Defect	Action Taken
On side of lamp only is turned on (All the lamp of outdoors)	Failure of bulb Defective socket, wiring defective grounding	Replace bulb If necessary replace socket, wiring
Head lamp is not turned on	Failure of bulb Defective fusible link Defective head lamp relay Defective lighting switch Defective wiring or grounding	Replace bulb Replace fusible link Check relay Check switch If necessary, replair wiring or grounding
Lamp of tail or lamp of license plate is not turned on	Cut of tail lamp fuse Defective fusible link Defective relay of tail lamp Defective lighting switch Defective wiring or grounding	Replace fuse, check short of fuse Replace fusible link Check relay Check switch If necessary, replair wiring or grounding
Stop lamp is not turned on	Cut of fuse Defective switch of stop lamp Defective wiring or grounding	Replace fuse check short of fuse Adjust switch, or replace switch If necessary, replair wiring or grounding
Stop lamp continue to turn on	Malfunction of relay of stop lamp Malfunction of switch of stop lamp.	Replace relay Adjust switch or replace switch.
Gauge lamp is not turned on	Malfunction of connector Malfunction of wiring or grounding	Check the state of connecting
One side of signal lamp is not turned on	The burned of bulb Malfunction of switch of turn signal lamp Malfunction of wiring or grounding	Replace bulb Check switch If necessary, replair wiring or grounding
Turn signal lamp is not operated	The burned of bulb Malfunction of flasher unit Malfunction of switch of turn signal Malfunction of wiring or grounding	Replace fuse, check short of fuse Check flasher unit Check switch of turn signal If necessary, replair wiring or grounding
Hazard lamp is not turned on	Cut of fuse Malfunction of flasher unit Malfunction of hazard lamp switch Malfunction of wiring or grounding	Check short of circuit replace fuse Check flasher unit Check switch If necessary, replair wiring or grounding
Frequency of flash is too quick or delaying	Standard of bulb is out of specification Cut of bulb, malfunction of connecting Malfunction of flasher unit	Replace bulb Check cut of bulb or connecting Replace flasher unit
Lamp of back up is not turned on	Cut of fuse Malfunction of switch of back up lamp Malfunction of wiring or grounding	Check short of circuit Check switch If necessary, replair wiring or grounding
Console lamp of over head is not turned on	Cut of fusible link Malfunction of wiring or grounding	Replace fusible link If necessary, replair wiring or grounding

9D-10 BODY ELECTRICAL

CHECK AND ADJUST**Adjust Focus of Head Lamp (Aiming)**

Beam adjusting equipment approved can adjust accurately focus of head lamp.

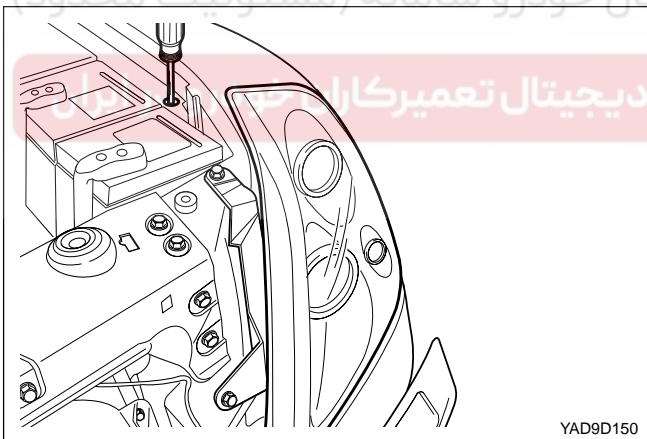
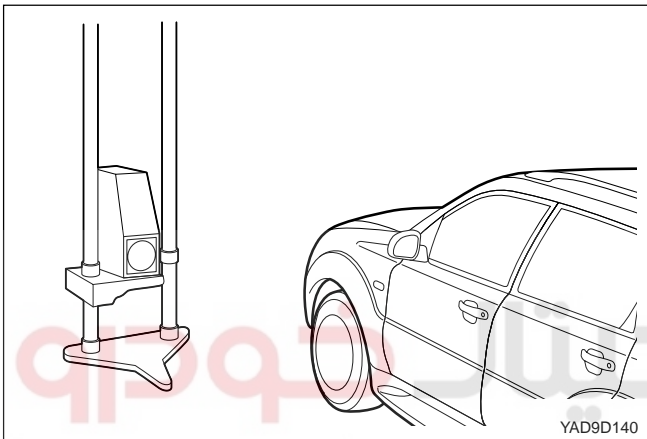
This equipment should be operated by manufacturer's operation manual.

While focus of head lamp is arranged, condition of vehicle keep air pressure of tire specified, except spare tire and tool of OVM, every thing is unloaded, and vehicle is parked on the even place.

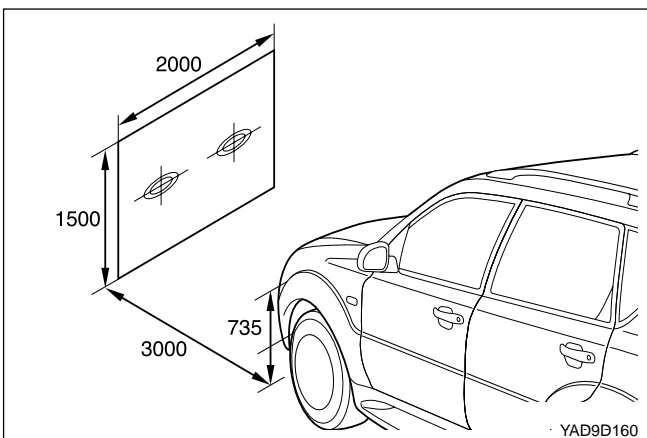
If beam adjusting is not installed, focus of head lamp can be arranged by using screen.

Using Beam Adjusting Equipment

1. Beam adjusting equipment should be arranged with vehicle.

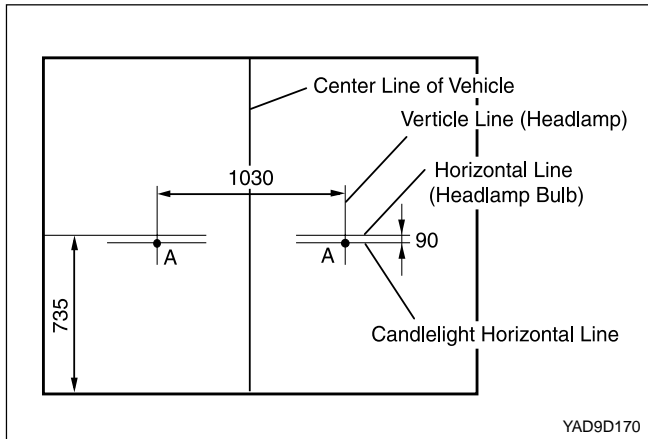


2. Switch on control lever of up and down, left and right by the screw, arrange focus of head lamp.

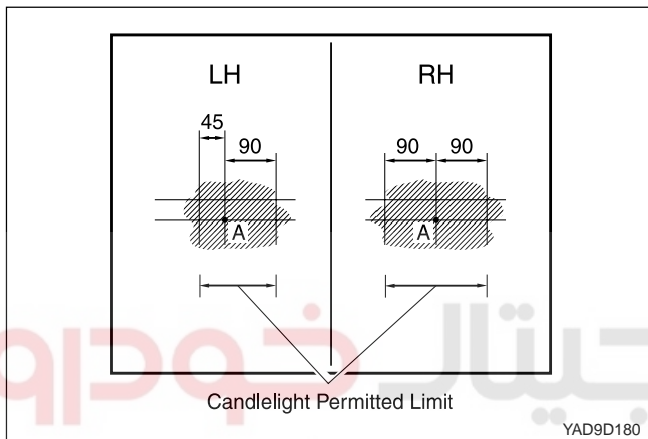
**Arrange Focus of Head Lamp by Screen (Unit: mm)**

1. After screen (2 m x 1.5 m) installs the verticalness position of 3m of distance from the front head lamp of vehicle, keep line of center between vehicle and screen such as the right below picture.

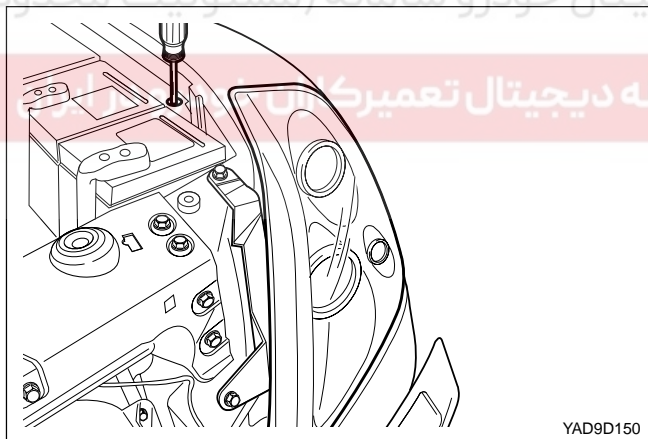
BODY ELECTRICAL 9D-11



2. Keep line of center between through horizontal line of center of head lamp and center of screen.

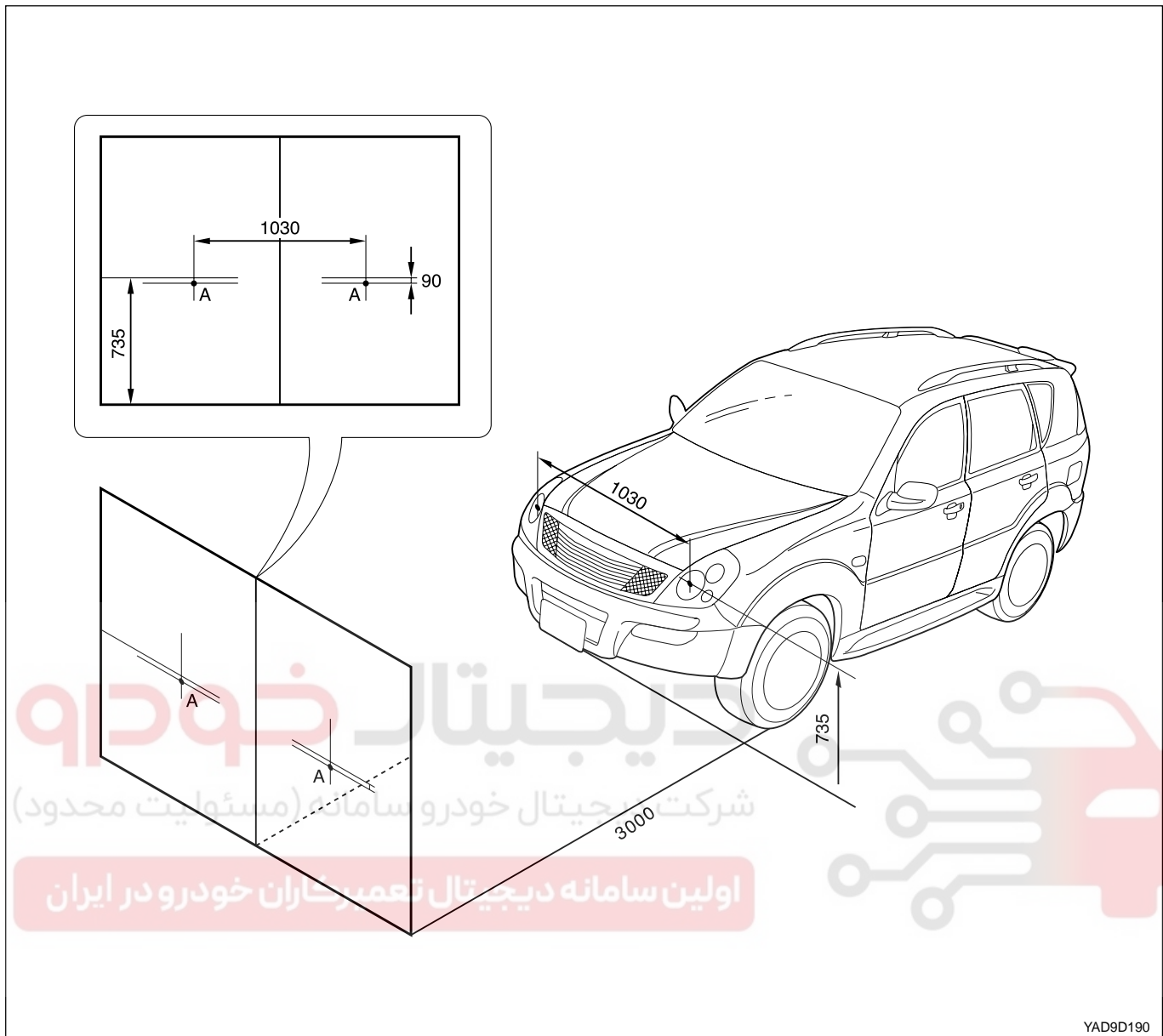


3. Keep engine R.P.M of 2000, and then switch head lamp on, at this time focus of head lamp should indicate position of "A" .



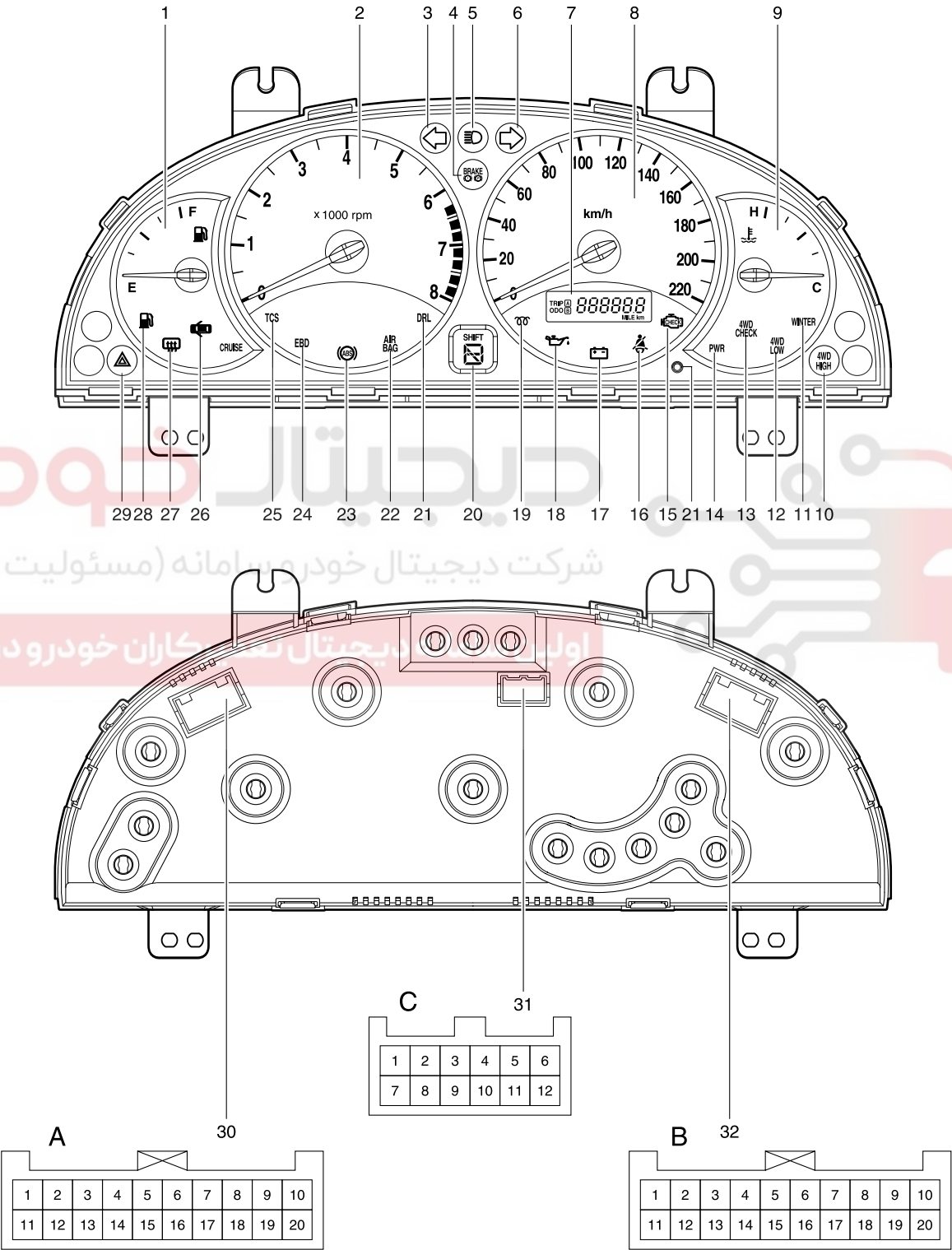
4. If focus of head lamp get out of specification, after switching control lever of up and down, left and right, arrange focus of head lamp.

9D-12 BODY ELECTRICAL



REPAIR OF EACH SYSTEM

INSTRUMENT PANEL ASSEMBLY



YAD9D200

9D-14 BODY ELECTRICAL

- | | |
|--|---|
| 1 Fuel Gauge | 18 Warning Lamp of Oil Pressure |
| 2 Speed Gauge | 19 Lamp of Pre Heating |
| 3 Turn Signal Lamp (Left) | 20 Lamp of Selector |
| 4 Lamp of Operating of Brake or Flude | Lever (Automatic Transmisson) |
| 5 Lamp of Position And High Beam | 21 Button of Reset |
| 6 Turn Signal Lamp (Right) | 22 Warning Lamp of Air Bag |
| 7 Speedometer Gauge | 23 Warning Lamp of ABS |
| 8 Speed Gauge | 24 Warning Lamp of EBD |
| 9 Temperature Gauge | 25 Lamp of TCS |
| 10 Lamp of High Speed of 4WD | 26 Warning Lamp of Door Opening |
| 11 Lamp of Winter (Automatic Transmission) | 27 Lamp of Outside And Lamp of Heat Line of |
| 12 Lamp of Low Speed of 4WD | Rear Glass |
| 13 Check Lamp of 4WD (Gasoline) | 28 Warning Lamp of fuel refilling |
| 14 Power Lamp (Automatic Transmission) | 29 Warning Lamp of Hazard |
| 15 Lamp of Engine Check (for Gasoline) | 30 Connector of White Color |
| 16 Warning Lamp of Seat Belt | 31 Colorless Connector (Auto) |
| 17 Warning Lamp of Charge | 32 Gray Connector |
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دیجیتال خودرو

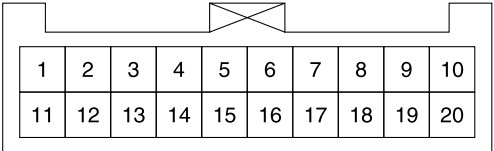
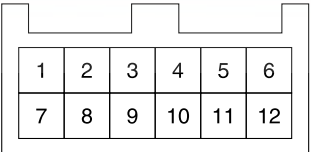
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اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

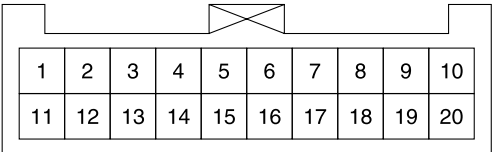


BODY ELECTRICAL 9D-15

Component of Connector Pin

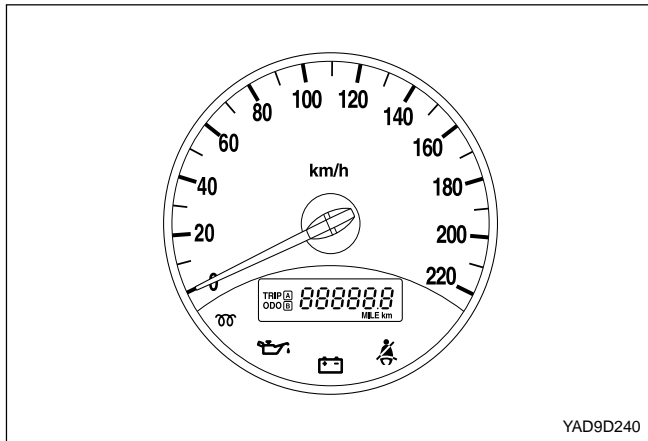
Layout of Connect	Number of Pin	Description
<p>Color of connect : gray color</p>  <p>YAD9D210</p>	A1	Opening of door
	A2	Oil pressure
	A3	Seat belt
	A4	Charging
	A5	ILL (-)
	A6	EBD
	A7	1GN (+), B
	A8	Ground2
	A9	ACC
	A10	B (+)
	A11	Checking of 4 WD (+)
	A12	Checking of 4 WD (-)
	A13	Low speed of 4 WD
	A14	ILL (+)
	A15	High speed of 4 WD
	A16	Turn signal lamp (Left)
	A17	High beam (Lamp of position)
	A18	Lamp of position
	A19	Turn signal lamp (Right)
	A20	Brake
<p>Color of connect</p>  <p>YAD9D220</p>	C1	Automatic transmission - D range
	C2	Automatic transmission - 3 range
	C3	Automatic transmission - 2 range
	C4	Automatic transmission - 1 range
	C5	-
	C6	-
	C7	Automatic transmission - R range
	C8	Automatic transmission - N range
	C9	Automatic transmission - NC
	C10	Automatic transmission - P range
	C11	Winter
	C12	Power

9D-16 BODY ELECTRICAL

Layout of Connect	Number of Pin	Description
Color of connect  YAD9D230	B1	Unit of tacometer
	B2	Speed sensor
	B3	Chime bell
	B4	Signal out of speed
	B5	-
	B6	-
	B7	ABS
	B8	Air bag
	B9	Engine check
	B10	TCS
	B11	Fuel sender
	B12	Temp sender
	B13	-
	B14	Gnd (ground1)
	B15	IGN (+), A
	B16	Emegency
	B17	-
	B18	Rear defogger
	B19	Pre - heat
	B20	-

شرکت دیجیتال خودرو (مسئولیت محدود)

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CHECK AND REPAIR

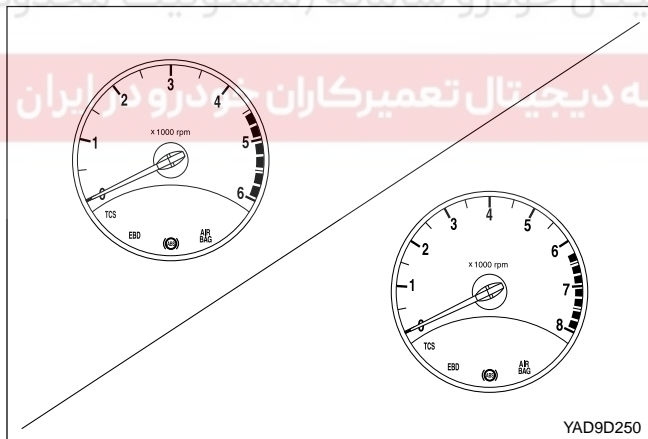
Speed Meter

1. Using tester of speed meter, check error of allowance of speed meter and operation of tacometer.

Standard of speed	20	40	60	80	100	120
Error of allowance	3	+4 0	+4 0	+5 0	+5 0	+5.5 +0.5
Standard of speed	140	160	180	200	220	-
Error of allowance	+5.5 +0.5	+5.5 +0.5	+6 +1	+6 +1	-	-

2. Check trembling of indicator of speed meter or noise of unusual
3. Tap speed meter, and then remove hysteresis.

Notice: If tire is weared or out of specification of air pressure, error allowed increase.



Tacometer

1. Connect tacometer of testing, start engine.
2. Comparing value indicated between tester and tacometer, error is big enough, replace tacometer.
3. While tacometer is inspected, tap tacometer, and then remove magnetic power.

Diesel vehicle

(rpm)

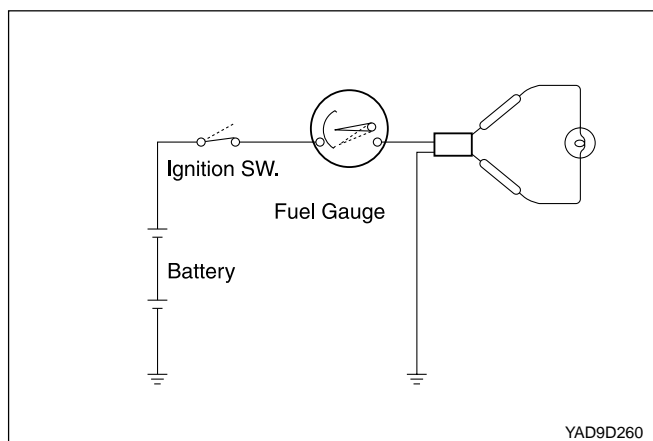
Standard of speed	1000	2000	3000	4000	5000	6000
Error of allowance	+137 - 67	+199 - 51	+261 - 39	+298 - 2	+335 +35	-

Gasoline vehicle

(rpm)

Standard of speed	1000	2000	3000	4000	5000	6000	7000	8000
Error of allowance	± 100	± 125	± 150	± 150	± 150	± 180	± 180	-

9D-18 BODY ELECTRICAL

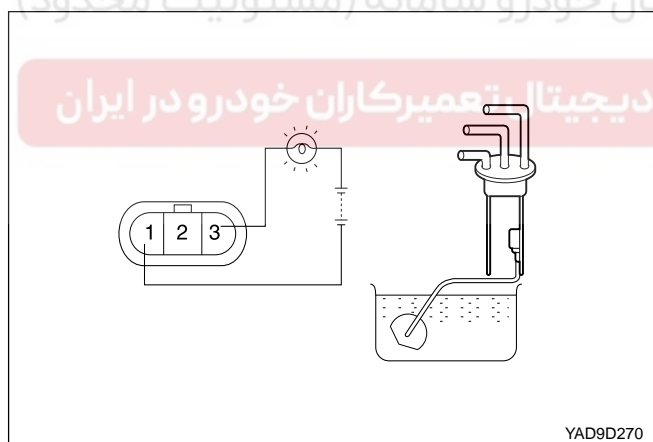
**Fuel System****Gauge of fuel**

1. Separate connector of fuel sender.
2. Ground connector (B11, B14) of direction of harness through bulb (12 V, 3.4 W).
3. Turn the start switch on.
4. See if bulb of testing turn on, and see if indicator of fuel gauge gradually move to position of 'F'.

Check resistance of fuel sender

1. Put float on the position of 'F' and 'E', and check resistance between B11 and B14.
2. While float is moving from position of 'E' to position of 'F', check if resistance change gradually.

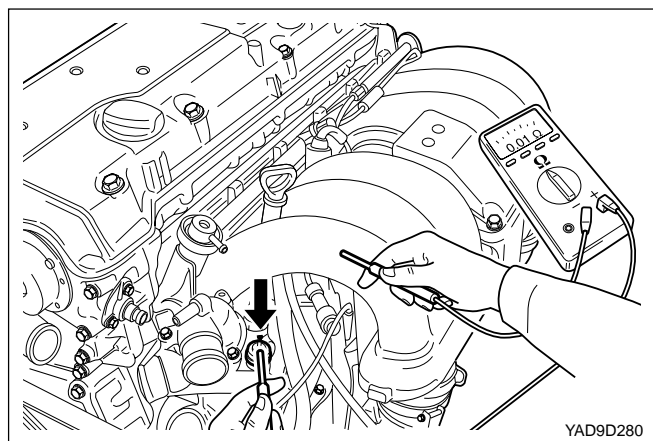
Position of float	Specified resistance
E	approximately 285 Ω
1/2	approximately 101.5 Ω
F	approximately 40 Ω

**Fuel sender**

1. Connect testing bulb (12 V, 3.4 W) of fuel gauge terminal deepen thermister in the water.
2. See if thermister is deepened in the water, light is off, and see if thermister get out of water, light is on.

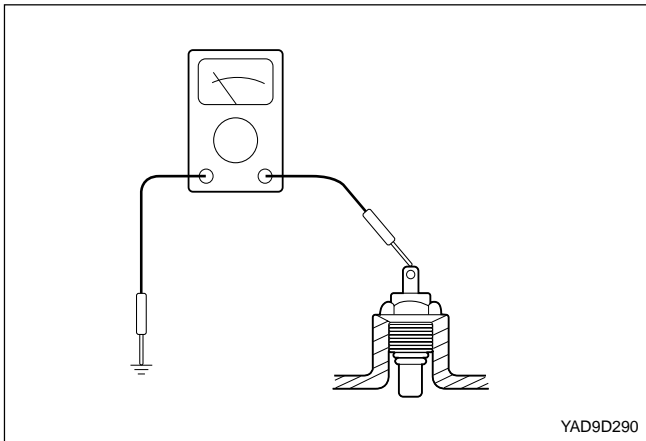
Notice:

- If malfunction may happen, replace fuel sender assembly.
- After this testing have done, before fuel sender is installed, fuel sender should dry up completely.

**Gauge of Temp**

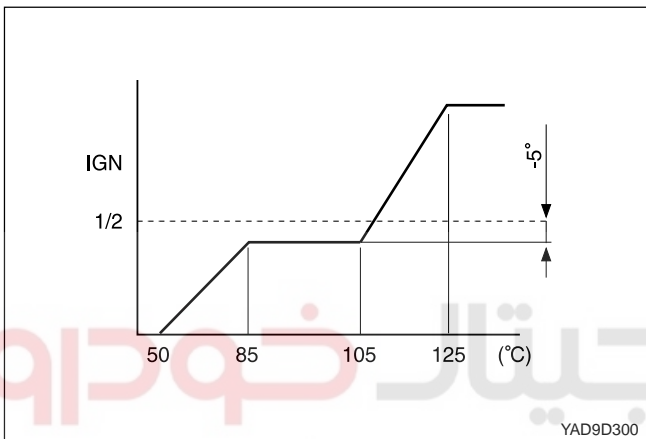
1. Separate wiring connector of water coolant in the engine room.
2. Ground between testing bulb (12 V, 3.4 W) and connector to harness in a series.
3. Turn ignition switch on.
4. See if testing light turns on or not, check if gauge of water temp operate or not.

BODY ELECTRICAL 9D-19

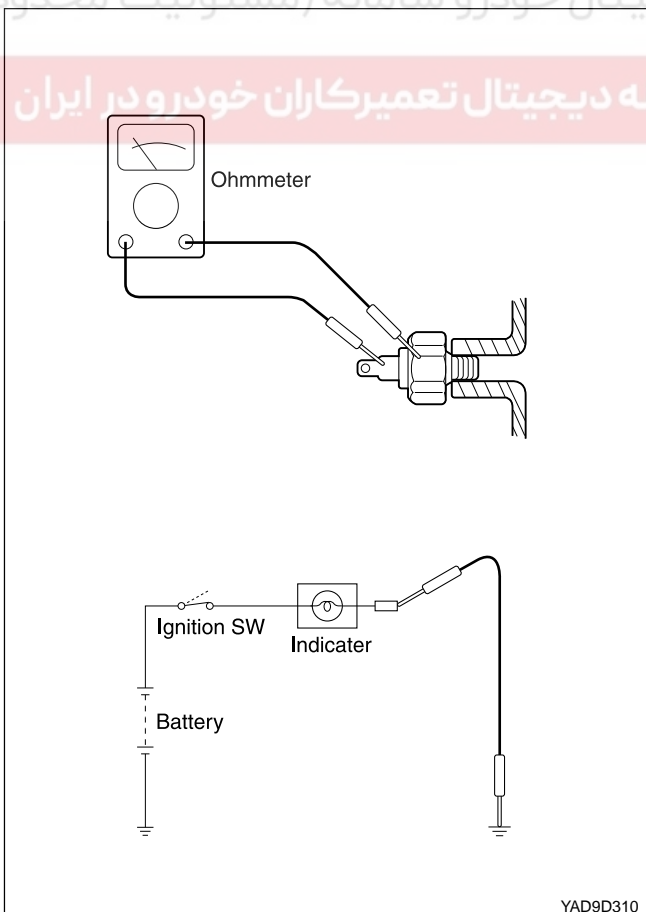
**Check resistance of sensor of water temp**

After checking resistance between terminal and ground with gage of resistance, if resistance get out of specification, replace it by new one.

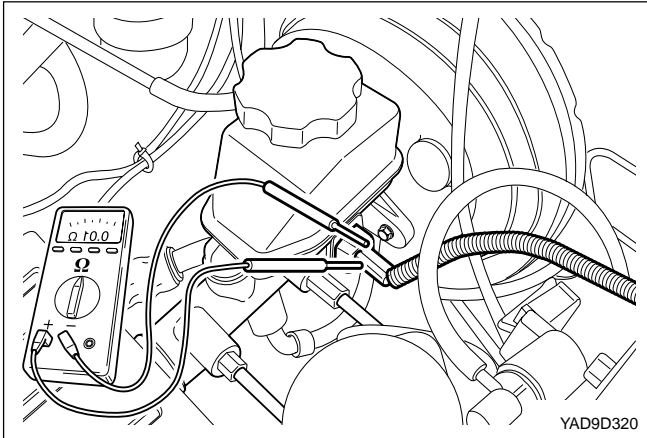
temp (°C)	C (50)	C (50)	C (50)	C (50)
resistance(Ω)	254	77	42.2	27.8

**Switch of Oil Pressure**

1. After stopping engine, check applying of electric current between terminal and ground.
2. After driving engine, check applying of electric current between terminal and ground.
3. Separate connector from terminal of ground and warning switch to wiring harness.
4. After ignition switch turn to "on" and then check if the light is on, if the light is not "on" test the bulb and check harness.



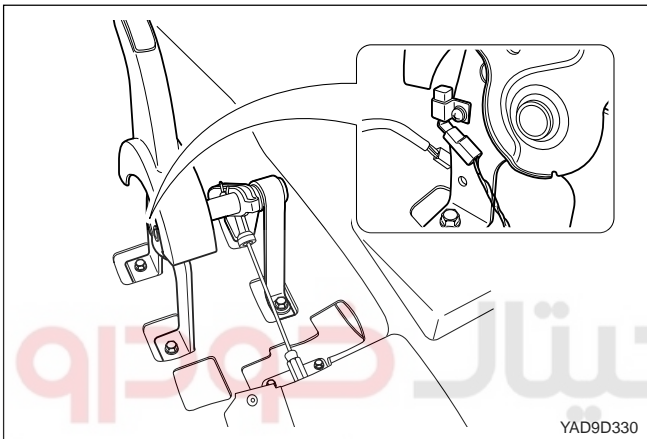
9D-20 BODY ELECTRICAL

**Brake**

If the switch of starting turns on, the fluid of brake is under specified level, or while lever of parking brake is pulling, sensor of brake or switch of parking brake is "on" and then warning of brake turns on.

Notice: Sensor of brake fluid is installed on the reservoir tank of master cylinder.

1. Separate gauge connector of brake fluid level.
2. While switch is turned off, check applying of electric current between terminal.
3. While switch is turned on, check applying of electric current between terminal.

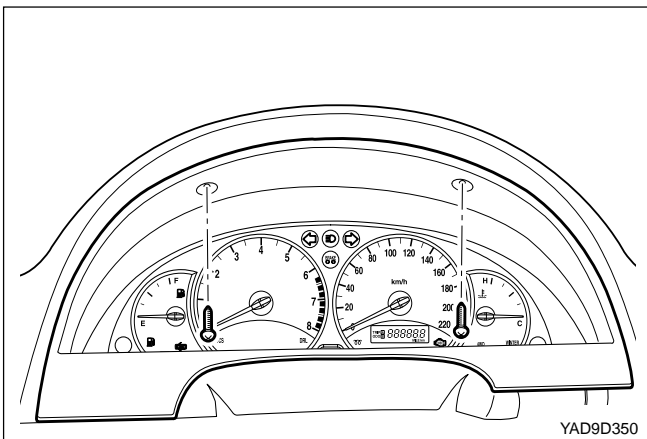
**Switch of parking brake**

Switch of parking brake is located under lever of parking brake, if switch of parking brake is adjusted, after releasing parking brake, switch of parking brake is installed .

1. While switch is turned on (lever is pulling), check applying of electric current between terminal and switch.
2. While switch is turned off (lever is released), check applying of electric current between terminal and switch, applying of electric current get out of specification, replace switch, or check grounding.

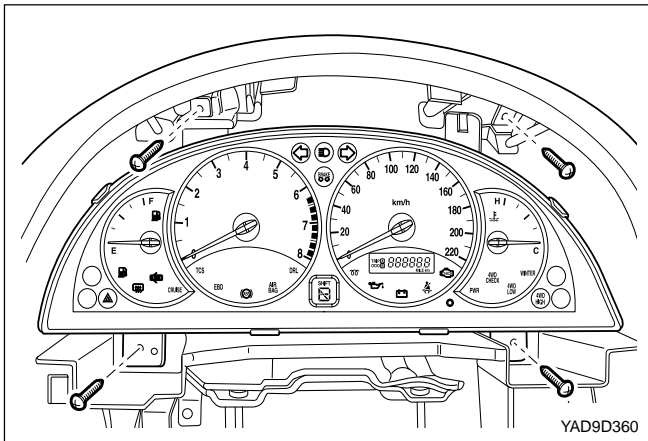
**Door Switch**

1. Switch of door is removed, check applying of electric current between terminals.
2. If applying of electric current between terminals get out of specification, replace switch of door.

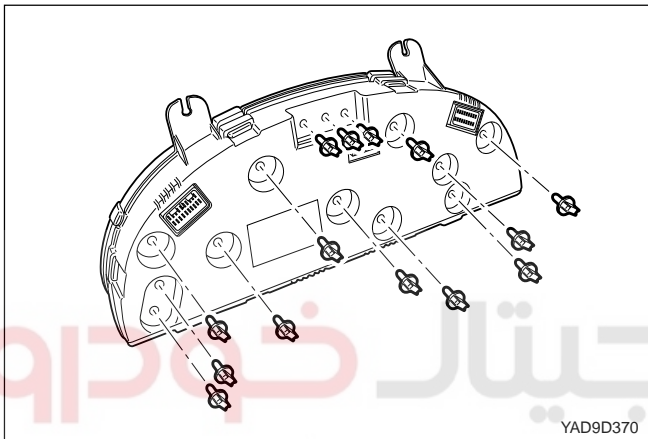
**REMOVAL AND INSTALLATION OF INSTRUMENT PANEL**

1. Remove negative terminal of battery.
2. After releasing screw (2ea), remove housing of instrument panel .

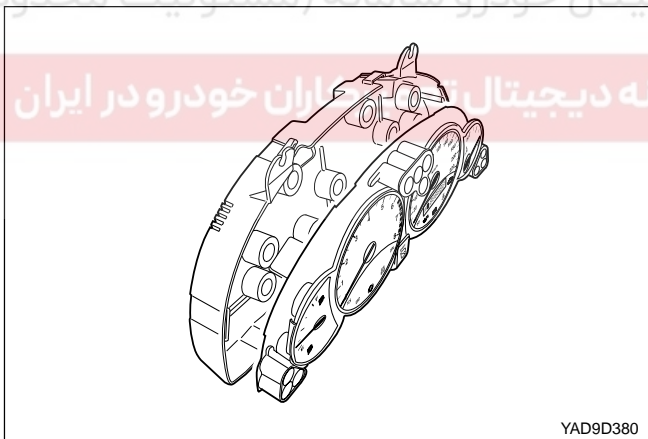
BODY ELECTRICAL 9D-21



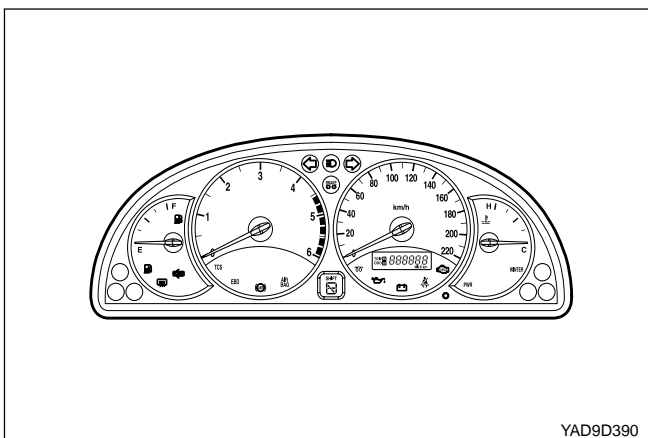
3. After releasing fixing screw (4ea) of instrument panel, separate connector (3ea), and then remove instrument panel.



4. Separate all the bulb from the instrument removed like the left picture.



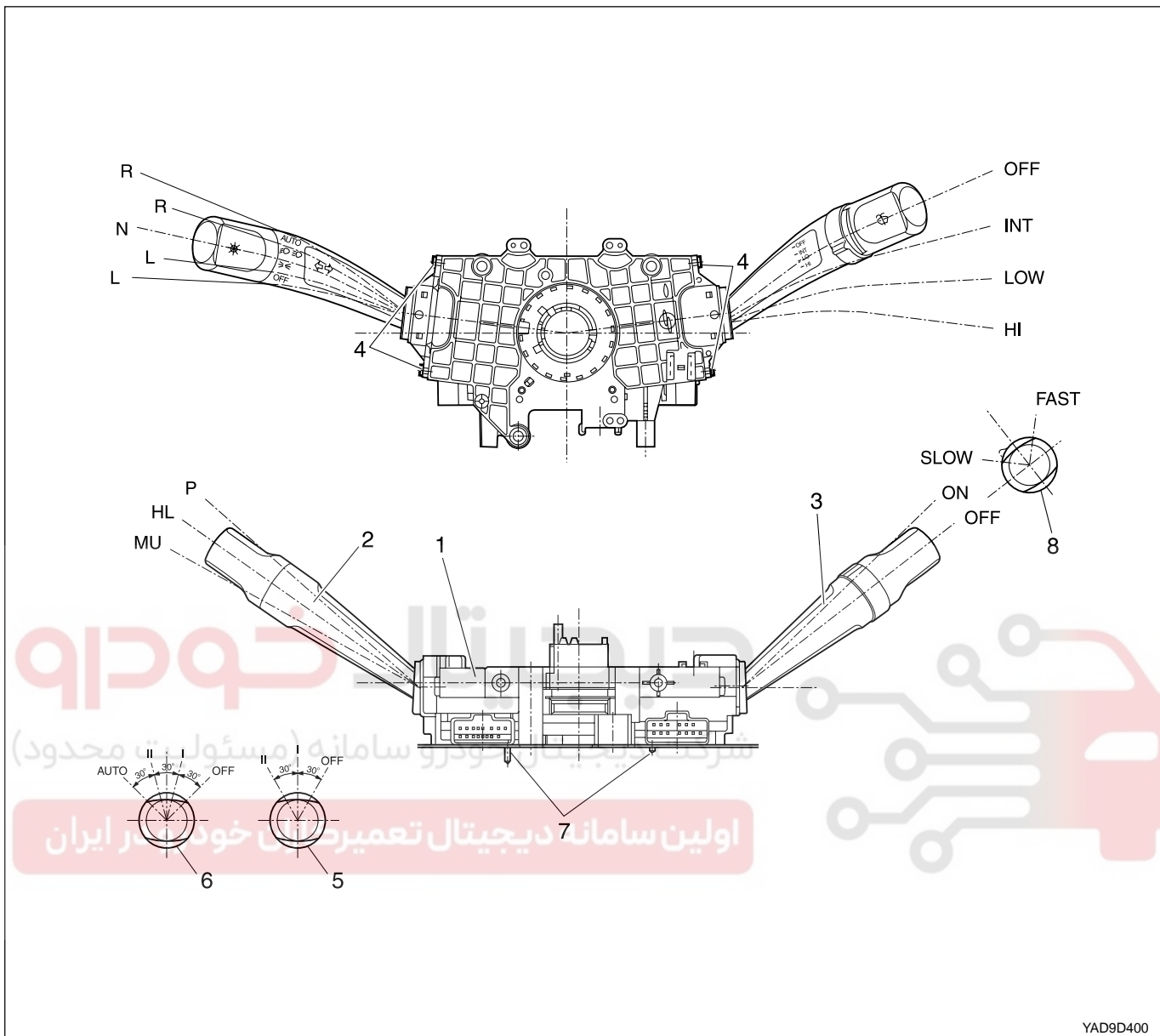
5. After separating the glass of instrument, and then release fixing screw (5ea), and separate instrument panel and housing.



6. Install reverse order of removal, after installing, check operation of instrument panel.

9D-22 BODY ELECTRICAL

SWITCH OF MULTI - FUNCTION

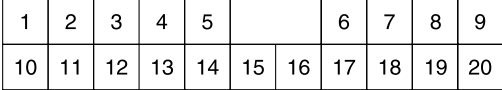


YAD9D400

- 1 Multi - Function Switch Assembly
- 2 Turn Signal Switch Assembly
- 3 Turn Signal Switch Assembly
- 4 Screw

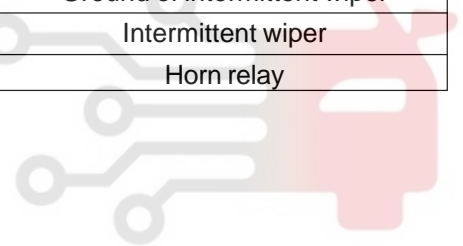
- 5 Switch of Light
- 6 Switch of Auto - Light
- 7 Connector
- 8 Switch of Wiper

Components of Connector Pin

Layout of connect										Number of pin	Name of connector	
 <p>YAD9D410</p>										1	TL	Switch of turn signal (LH)
										2	TB	Power of flasher unit
										3	TR	Switch of turn signal (RH)
										4	HU	Power of head lamp upper beam
										5	HS (2)	Switch passing of head lamp
										6	W	Front washer switch
										7	EW	Wiper and washer ground
										8	AUTO	Auto wiper
										9	P	Wiper parking
										10	ES	Ground of light switch
										11	A	Auto light switch
										12	HS (1)	Switch of head lamp
										13	TS	Switch of tail lamp
										14	EB	Ground of dimmer and passing switch
										15	-	-
										16	LO	Low speed of wiper
										17	HI	High speed of wiper
										18	ET	Ground of intermittent wiper
										19	INT	Intermittent wiper
										20	HORN	Horn relay

دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



9D-24 BODY ELECTRICAL

Check and Repair

Check applying of electric current below terminal at each position of multi-function switch, if each terminals are not applied of electric current, replace multi-function switch.

Light switch

Pos \ Ter	TS(13)	HS-1(12)	EL(10)
OFF			
I	○	○	○
II	○	○	○

YAD9D420

Dimmer and passing

Pos \ Ter	EB(14)	HS(1)	HU(4)	HS-2(5)
HU(High)	○	○	○	
HL(Low)	○	○		
P(Pass)	○		○	○

YAD9D450

Auto - light switch

Pos \ Ter	TS(13)	HS-1(12)	ES(10)	A(11)
OFF				
I	○	○	○	
II	○	○	○	
AUTO			○	○

YAD9D430

Washer

Pos \ Ter	W(6)	EW(7)
OFF		
ON	○	○

↓
EARTH

YAD9D460

Turn signal lamp

Pos \ Ter	TB(2)	TL(1)	TR(3)
Hazzard Lamp			
Turn Signal Lamp			
OFF			
L.L	○	○	
N			
R.R	○	○	○

YAD9D440

Wiper switch

Pos \ Ter	LO(16)	HI(17)	P(9)	AT(8)	EW(7)	ET(18)	INT(19)
OFF	○		○				
INT	○		○	○	○	○	○
LOW	○				○		
HI		○			○		

EARTH ←

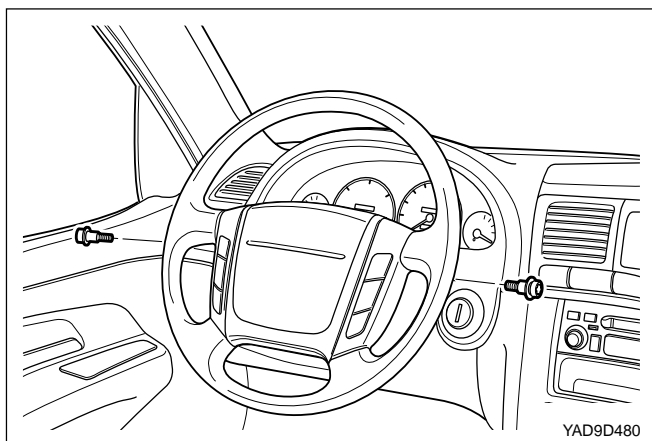
YAD9D470

Removal and Installation

Before multi-function switch is removed in the vehicle with air bag, keep in mind the following.

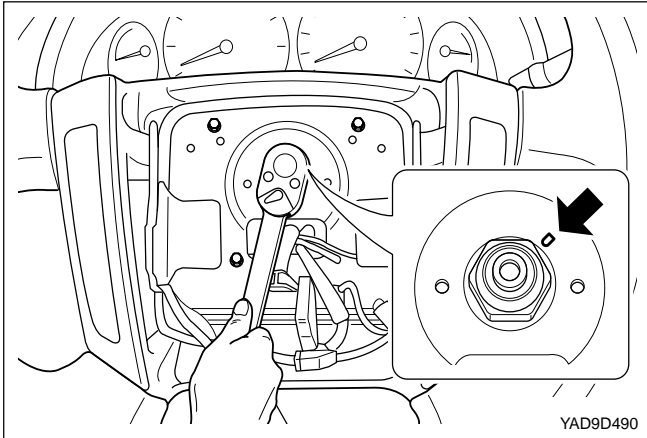
Notice:

- Do not separate module of air bag or coil of contact, if malfunction of air bag or coil of contact happen, replace them.
- Do not drop down module of air bag or coil of contact, do not contact module of air bag or coil of contact over water, grease, and oil, if crack deformation and corrosion are detected, replace them, if module of air bag keep in the place, put this on the even place, set the surface of pad on the above, do not put anything on them, module of air bag is not kept in the room temp 93 °C.
- After air-bag is exploded, coil of contact and module of air bag should be replaced. While exploded air bag is treated, wear glove and glasses of protection.
- In case for module of air bag not to explode, treat as the procedure described.
- While module of air bag and coil of contact are separated, do not force them to push excessively.
- Before coil of contact is not installed, after keep front tire forward in align, keep in line between mark of contact coil and mark of neutral and then install contact coil. If mark of contact coil does not keep in line properly, steering wheel does not revolve, flat cable can be damaged, air bag does not operate normally, so can cause driver to damage, if contact coil is inspected any situation, refer to the section of air bag.
- If module of air bag is not blown, module of air bag should be treated by procedure.
- If module of air bag and connector of contact coil are separated, excessive force does not be put in those one.
- Before contact coil is installed front wheel should be aligned to the forward, mark on the contact coil should keep on the one line with mark of NEUTRAL, and then contact coil should be installed.



1. Separate negative terminal of battery.
2. Put direction of wheel on the forward and moving direction of vehicle, after releasing screw (left and right), remove module of air bag.

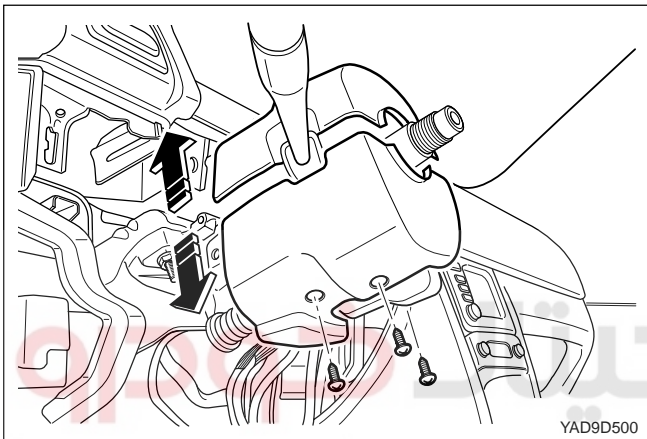
9D-26 BODY ELECTRICAL



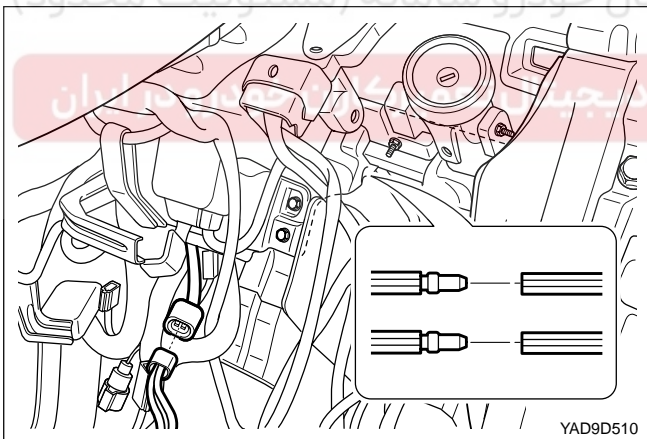
3. Mark installing mark on the wheel nut, release wheel nut.

4. Using the special tool, remove steering wheel.

Notice: Separate all the connector.

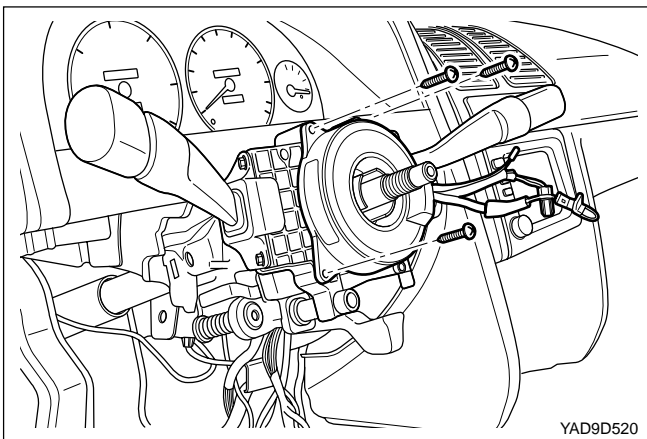


5. Separate cover equipped in the steering column shaft.



6. Separate vacuum hose of fuel cut and connector which is linked to switch of multi- function.

7. After separating coil connector of air bag contact, remove contact coil.



8. Remove switch of multi- function.

9. Install reverse order of removal.

COMPONENTS OF LIGHTING

General Description

Head lamp

Head lamp is controlled by light switch which is located in the left of steering column. If light switch is set on first stage, position lamp, lamp of license plate and lamp of instrument panel illumination is turned on, if light switch is set on two stage, head lamp is turned on.

If light switch is off, all the lamp are turned off.

High beam and low beam is controlled by operation of light switch.

As light switch is pushed and pulled, is switched to high beam and low beam, if head lamp is turned on by high beam, high beam is displayed on the instrument panel.

Aiming of head lamp is adjusted properly.

If new head lamp is replaced, aiming of head lamp should be inspected.

Front turn signal lamp / position lamp

If light switch is set on the first stage, lamp of position is turned on, if light switch is off, lamp of position is turned off.

Turn signal lamp is controlled by light switch which is located in the left of steering column, as light switch is operated by moving up and down, and then turn signal lamp is turned on and off.

Change of vehicle direction is finished completely, light switch back to original position, turn signal lamp is turned off, operating of steering wheel is small in the narrow road or in the narrow turn signal lamp so, light switch does not turn back to original position automatically, at this time, as light switch is operated by hand, and then light switch back to normal position, and turn signal lamp is turned off.

Fog lamp

Switch of fog lamp is located on the instrument panel of left gauge panel of audio system, after position lamp and head lamp are turned on, in the result of this, turn switch of fog lamp on, so fog lamp is "on", if switch of fog lamp is turned on, fog lamp is "on", indicated lamp also is turned on, in the instrument panel, instead of head lamp, fog lamp should not be used, in case new fog lamp is replaced, adjustment of aiming to the fog lamp should be inspected.

Tail lamp

Tail lamp consists of rear back lamp, tail lamp, back up lamp and turn signal lamp in the assembling part. If position lamp or head lamp are turned, rear back lamp is turned on. As rear back lamp and brake lamp consist of double lamp, if technician is put foot on the brake pedal, brake lamp is turned brighter. If lever of transmission is operated to backwards, back up lamp is turned on.

Assistant brake lamp

Assistant brake lamp is located on the upper section of back glass, if pedal of brake is operated, assistant brake lamp is turned on.

Lamp of license plate

If position lamp or head lamp is turned on, lamp of license is turned on, this lamp is attached rear deck lid of license plate.

Lamp for reading and room lamp

Lamp for reading and room lamp is attached on the head lining, if switch of lamp for reading is turned on, lamp for reading is "on" in the driver seat and passenger seat, if switch is touched one, lamp is "on", if switch is touched twice, lamp is "off". Switch of room lamp is the type of three point, if open door, in the state of pushing switch of door, room lamp is turned on, if door is closed, room lamp is gradually turned off.

In the state of switch "off", though door is opened, yet room lamp is not turned.

9D-28 BODY ELECTRICAL

Auto Light System

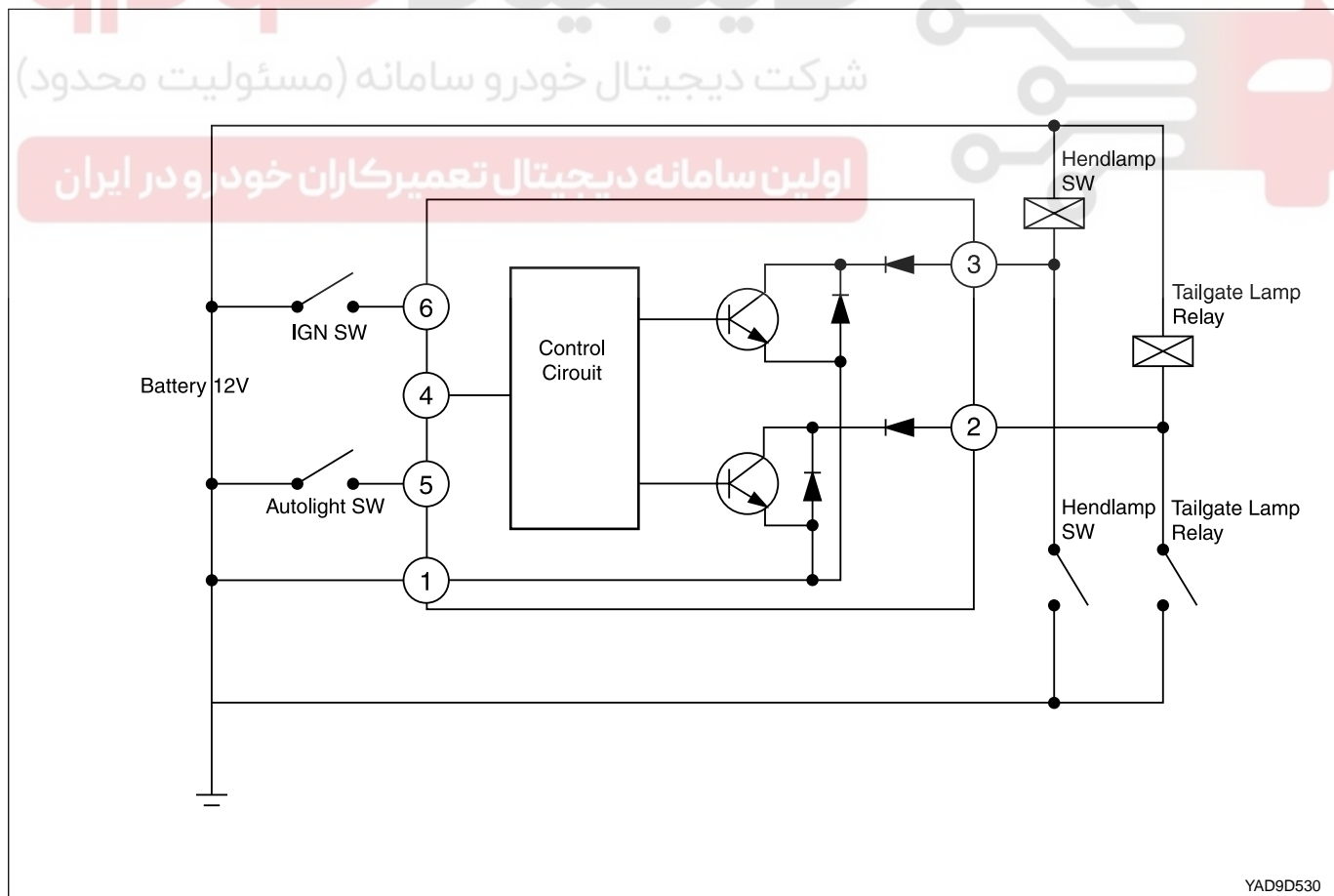
Summary

Controlling of auto light cause tail lamp or position lamp to turn on or off, sensor unit of auto light is attached on the upper panel of instrument, this unit is sensing change of illumination to atmosphere, though driver does not operate light switch, yet if mode is set on AUTO, head lamp and tail lamp is automatically turned on and off, during the vehicle is driven on the time of day through tunnel area, foggy area, rainy day, or snowy day, due to the low of illumination around atmosphere, this system is operating.

Specification

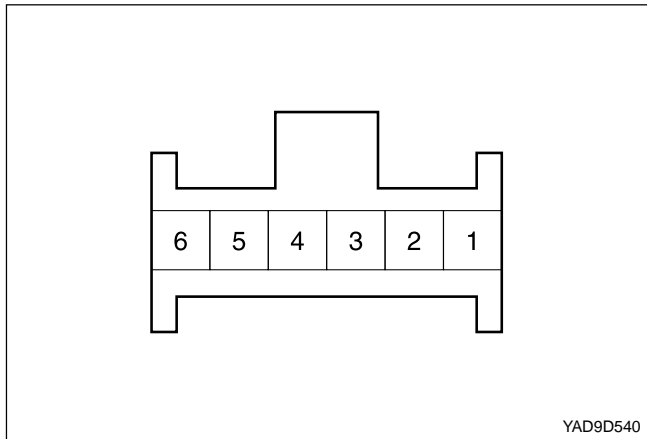
Name of part	Description	
Sensor unit of auto light	Voltage of load	9 -16 V
	Load	MAX 200 mA
	Temp available	- 30 ~ +85 °C
	Room temp for keeping	- 40 ~ +120 °C
	Position of attaching	Upper right section of instrument panel

Input and Output of Diagram



YAD9D530

SSANGYONG Y200



Sensor Unit Terminal of Auto Light

- 1 Power Supply For System
- 2 Auto Light Switch
- 3 Non-Use
- 4 Relay of Head Lamp
- 5 Relay of Tail Lamp
- 6 System Grounding

Operation of Auto Light and Operating Condition

Operation of switch function

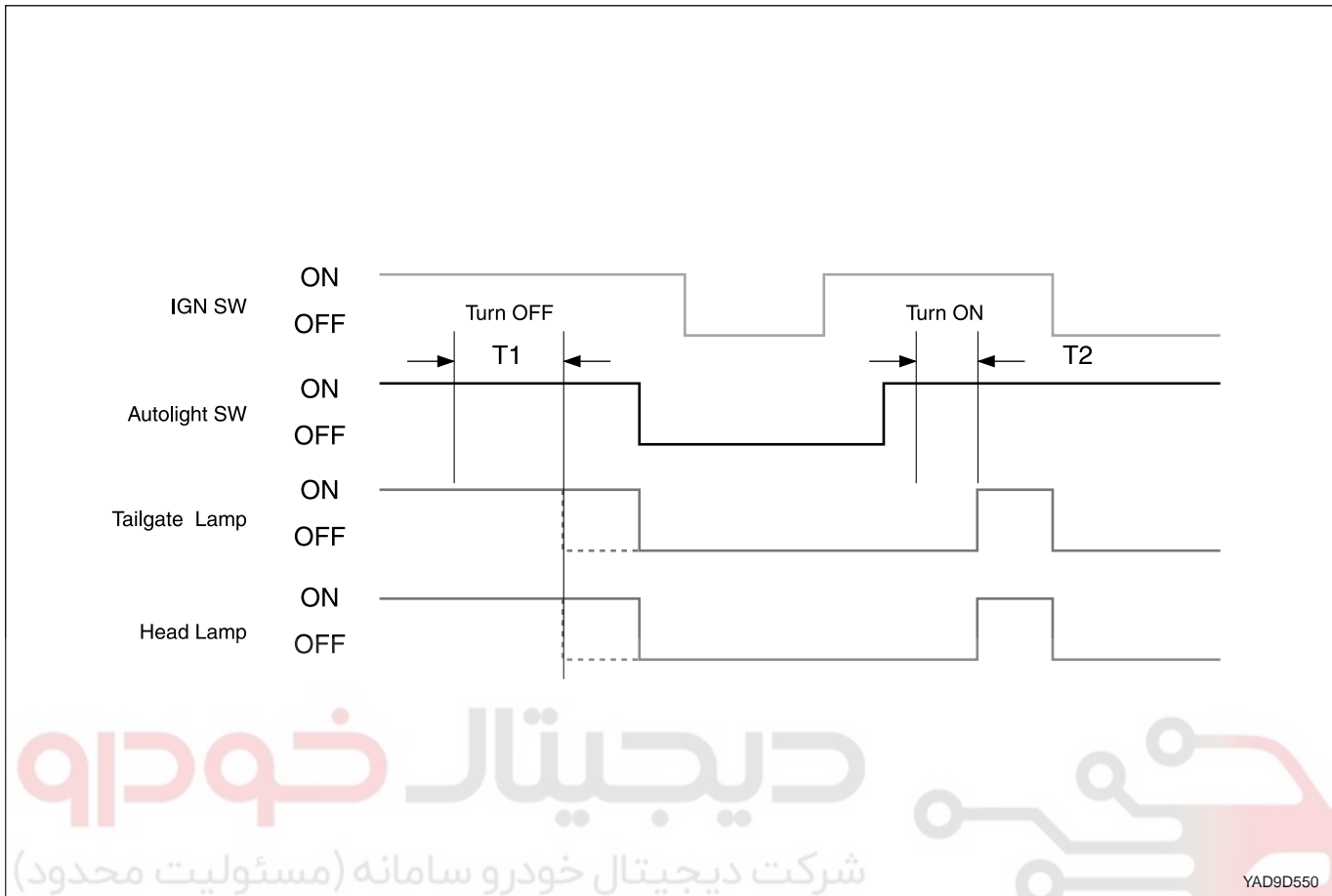
1. After turning ignition on, operate multi-function switch, OFF → TAIL LAMP → HEAD LAMP → AUTO switch.
2. Turn tail lamp, head lamp "on and off"
3. Turn switch of AUTO ON, While sensor is sensing illumination of light, which is set on the diode of photo. As quantity of illumination of light is equivalent to voltage which is set on the internal CPU, tail lamp and head lamp is turned on and off automatically.
4. Switch of tail lamp and head lamp is operated by hand, tail lamp and head lamp are not turned, on and off by sensor.
5. If switch of ignition is turned off, tail lamp and head lamp is turned off.

Operation Condition

Lamp	Condition of tail lamp	Condition of head lamp	Time of delaying
Illumination intensity			
Illumination intensity of light on	$30.5 \pm \frac{3}{4} 5$ (LUX)	8.9 ± 3 (LUX)	0.5 ± 0.1
Illumination intensity of light off	$60.5 \pm \frac{3}{4} 5$ (LUX)	17.2 ± 3 (LUX)	3 ± 1

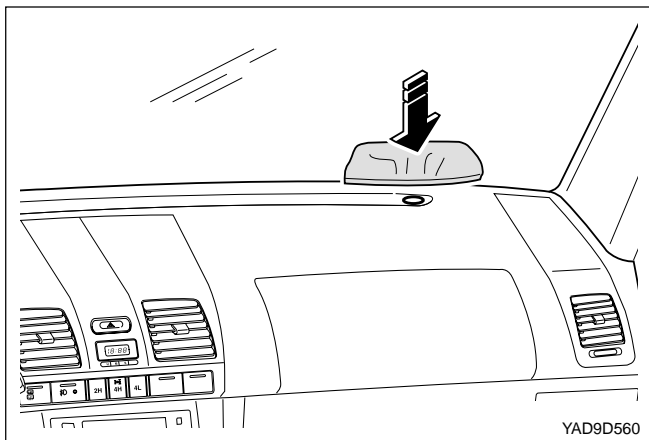
9D-30 BODY ELECTRICAL

The Characteristic of Operation



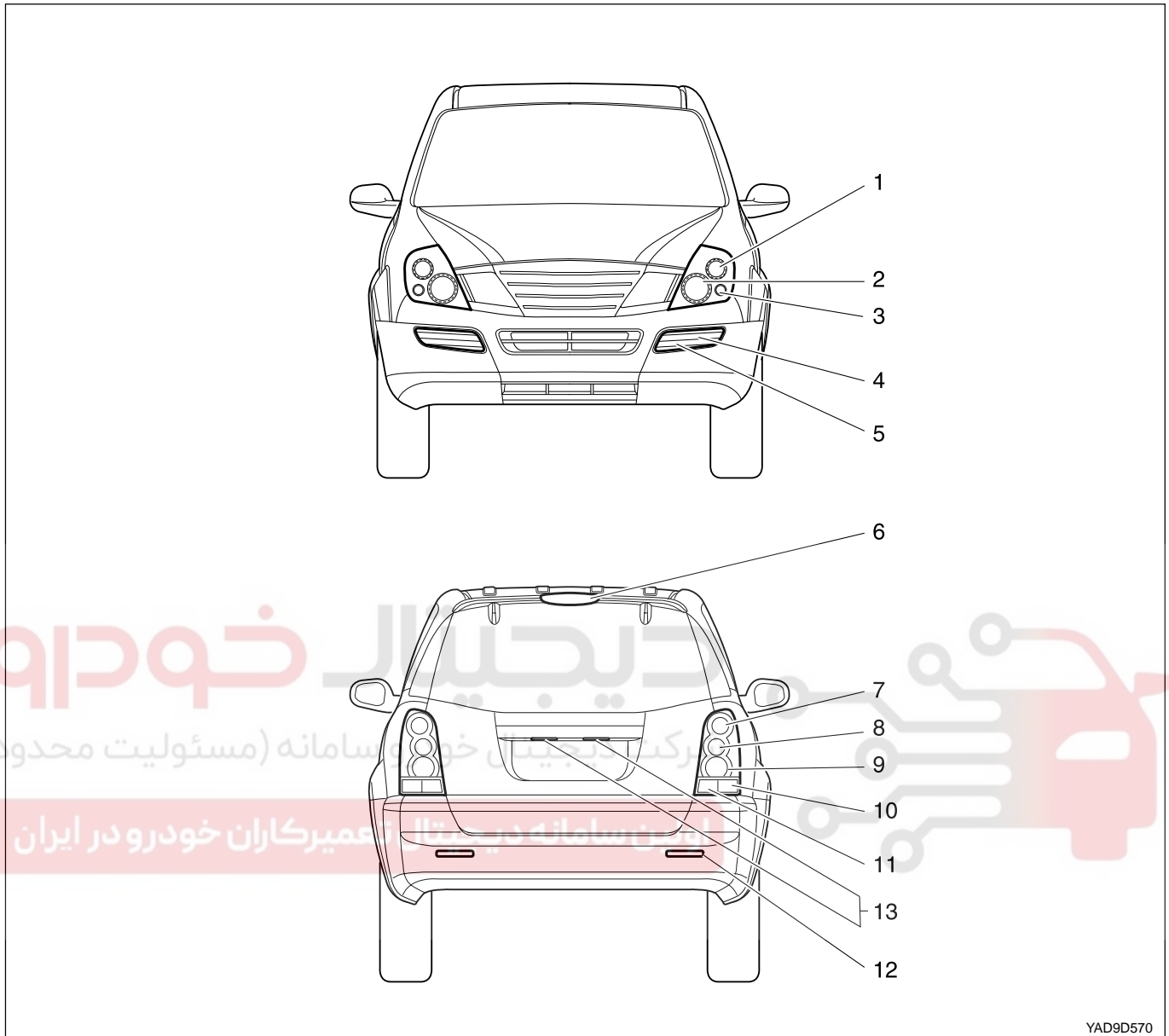
Operation condition should be under on and off range with tail lamp, head lamp

T1 : 3 ± 1.0 sec T2 : 500 ± 100 msec

**Check**

After turn to position of AUTO, put black cloth on the section of sensor, check if head lamp, tail lamp are turned on or not.

LOCATION OF LAMP

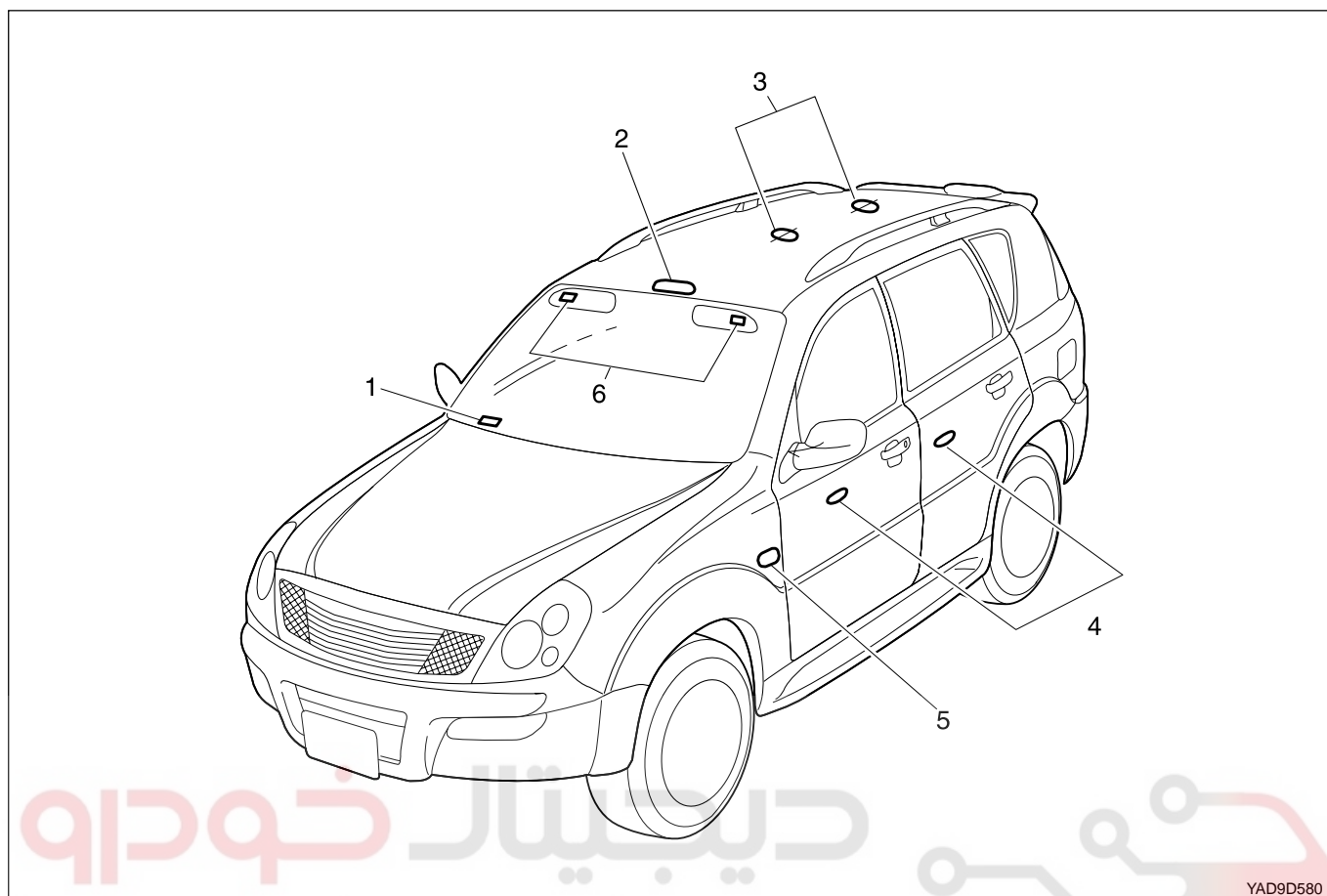


YAD9D570

- 1 Head Lamp - Low
- 2 Head Lamp - High Beam, Position Lamp
- 3 Position Lamp
- 4 Turn Signal Lamp
- 5 Fog Lamp
- 6 High Mounted Stop Lamp Plate
- 7 Tail and Stop Lamp

- 8 Tail Lamp
- 9 Stop Lamp
- 10 Turn Signal Lamp
- 11 Back up Lamp
- 12 Rear Back Mirror
- 13 Lamp of License

9D-32 BODY ELECTRICAL



- 1 Lamp of Glove
- 2 Room Lamp
- 3 Lamp of Center Room

- 4 Door Lamp
- 5 Turn Signal Lamp of Side
- 6 Lamp of Cosmetic Mirror

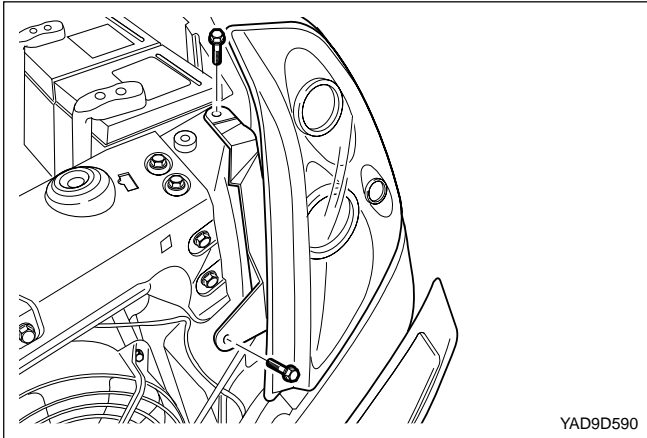
YAD9D580

BODY ELECTRICAL 9D-33

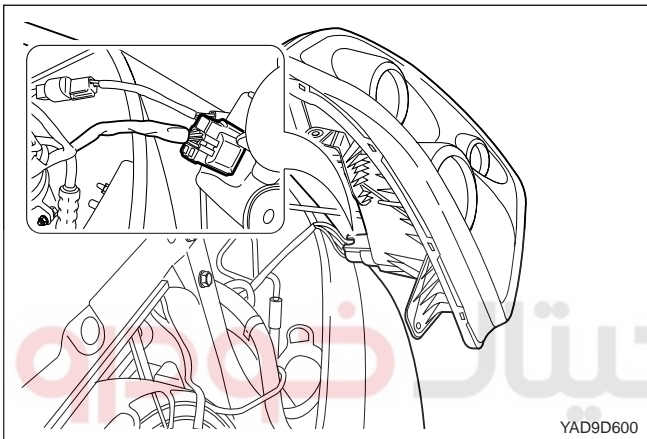
Specification of Lamp

Item		Quantity	Spe	Item		Quantity	Spe
Head lamp	Low beam	(L, R) (1, 1)	55 W	Rear combi lamp	Back up lamp	(L, R) (1, 1)	27 W
	High beam	(L, R) (1, 1)	55 W	Back mirror	Rear	(L, R) (1, 1)	-
	Position lamp	(L, R) (2, 2)	5 W	Lamp of license plate	Lamp of license plate	(2)	5 W
Front combi lamp	Fog lamp	(L, R) (1, 1)	27/ 8 W	Room	Glove box	(1)	10 W
	Turn signal lamp	(L, R) (1, 1)	28 W		Front room lamp	(2)	8 W
Rear	High mounted stop lamp	4 EA	5 W		Lamp of center room	(2)	10 W
Rear combi lamp	Tail/ stop	(L, R) (1, 1)	27/ 8 W		Door lamp	(4)	5 W
	Tail lamp	(L, R) (1, 1)	8 W	Side combi	Cosmetic mirror lamp	(L, R) (1, 1)	
	Stop lamp	(L, R) (1, 1)	27 W		Turn signal lamp	(L, R) (1, 1)	5 W
	Turn signal lamp	(L, R) (1, 1)	27 W				

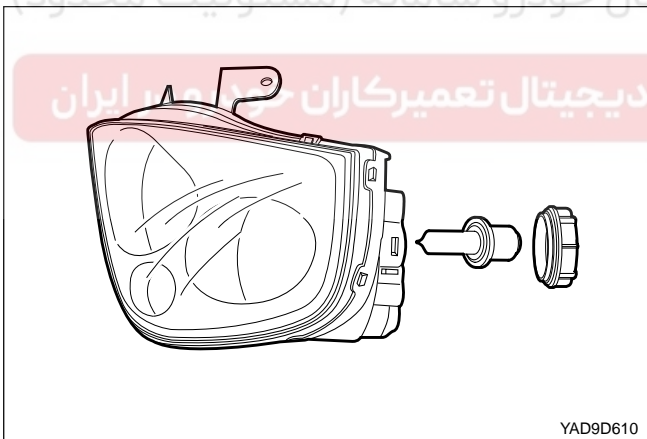
9D-34 BODY ELECTRICAL

**Removal and Installation****Head Lamp**

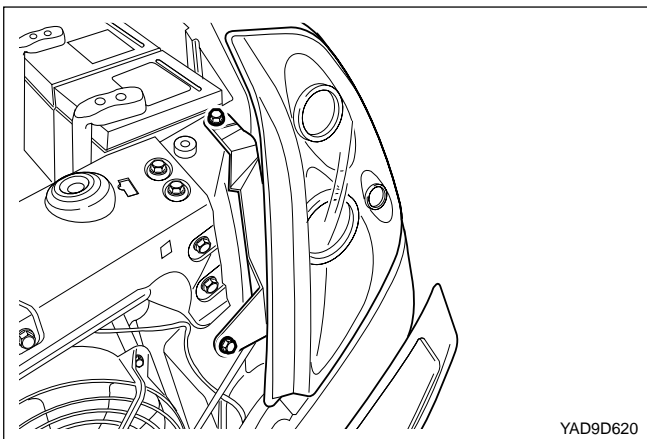
1. Remove negative terminal of battery.
2. Remove the grill of radiator.
3. Remove mounting bolt (3ea) of head lamp.



4. After separating connector of head lamp, remove the head lamp.

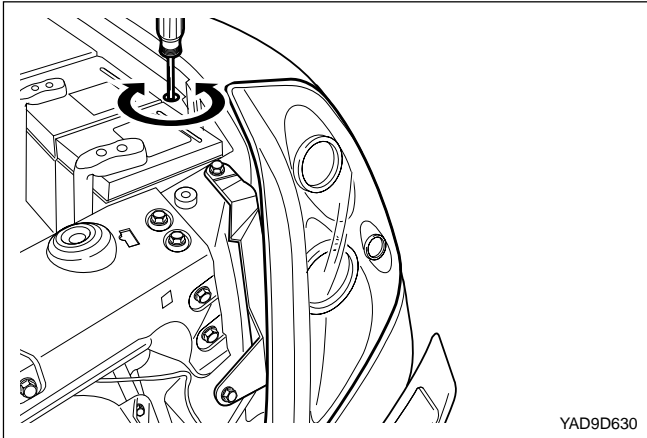


5. Separate cover of bulb, connector, and bulb orderly, from head lamp separated.

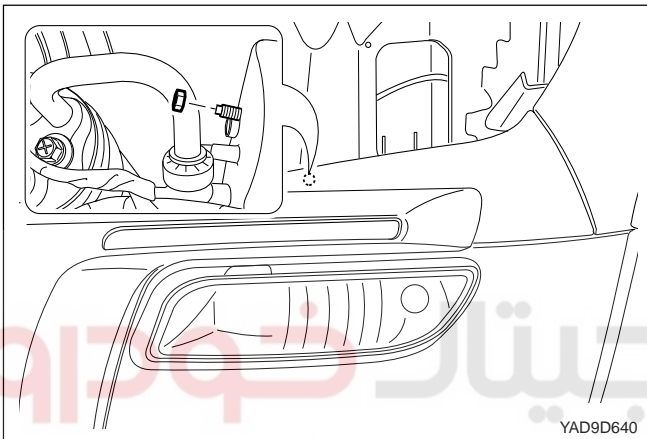


6. Install the reverse order of removal.

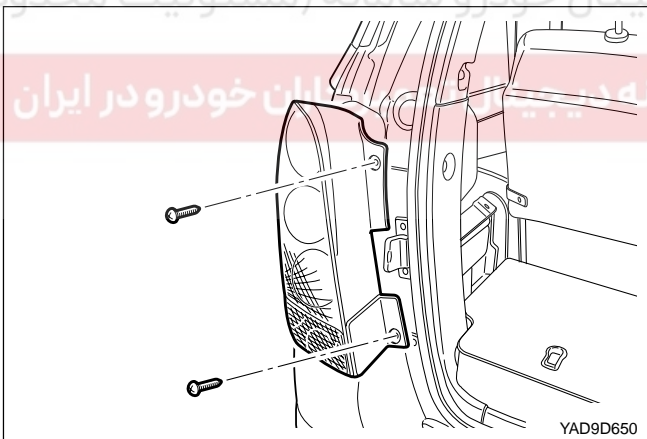
BODY ELECTRICAL 9D-35



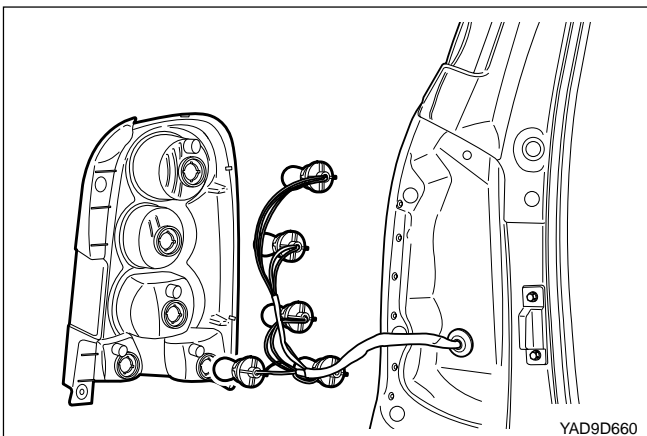
- After installing head lamp, proceed to arrange of focus.

**Turn signal lamp / fog lamp**

1. Remove the negative terminal of battery and head lamp.
2. After releasing fixing bolt of lamp of front turn signal lamp and fog lamp, remove connector.
3. Remove lamp assembly from the bumper.
4. Install the reverse order of removal.
 - Fix the left of lamp on the hook of bumper, and then tighten the right with fixing nut (2 ea).

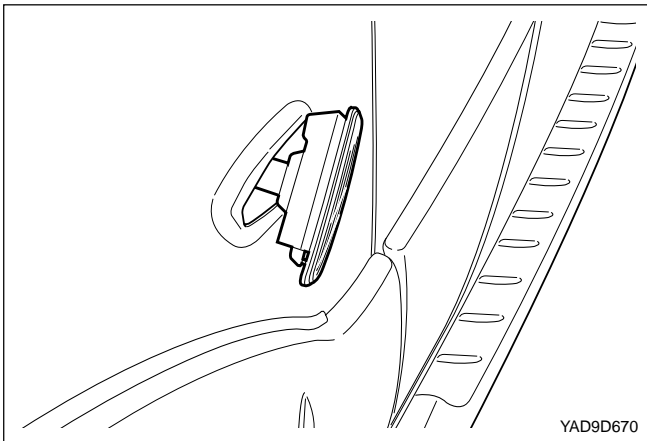
**Rear combi - lamp**

1. Remove the negative terminal from battery.
2. Separate fixing screw (2ea) of rear combi - lamp.

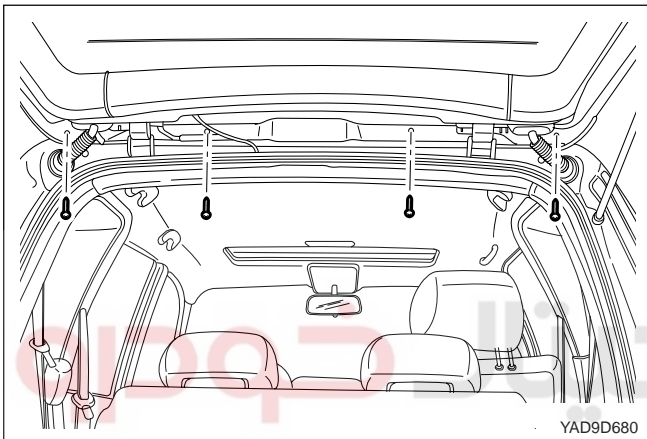


3. After separating bulb from rear combi-lamp and then remove rear combi - lamp.

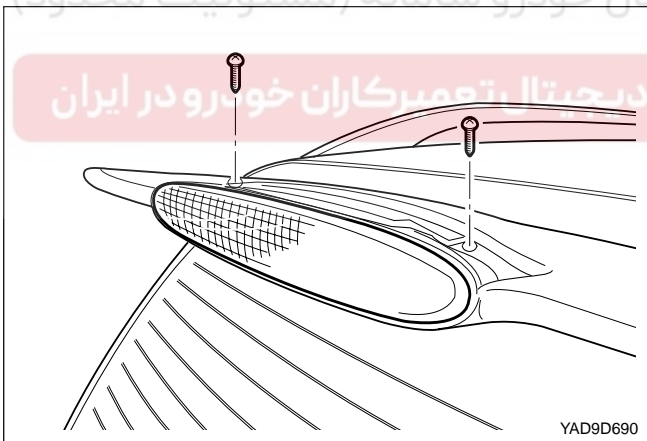
9D-36 BODY ELECTRICAL

**Side lamp**

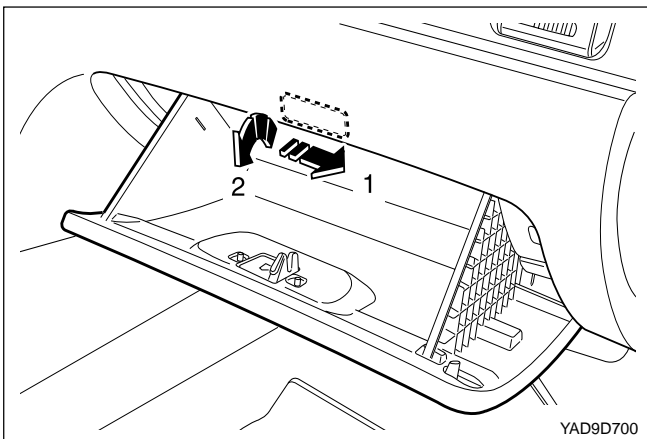
1. After pushing side lamp to front side, pulling rear of lamp, and then remove side lamp.
2. After removing the connector, remove side lamp.

**High mounted lamp**

1. Remove spoiler from the tail gate.

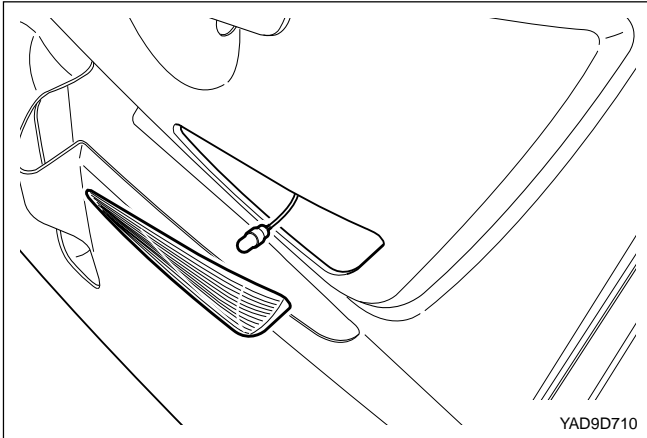


2. After separating fixing screw (2 ea) of lamp spoiler of tail gate, and then remove connector.
3. Remove lamp assembly.
4. Install the reverse order of removal.

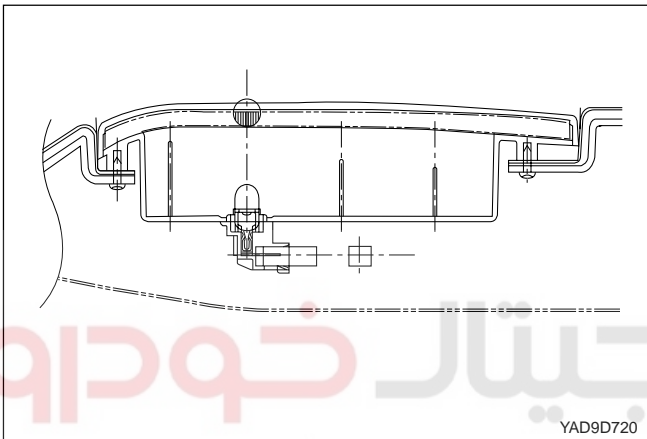
**Lamp of glove box**

1. Open up cover of glove box.
2. After pushing lamp as indicated mark, remove lamp of glove box.
3. After separating connector of lamp, remove lamp.
4. Install the reverse order of removal.

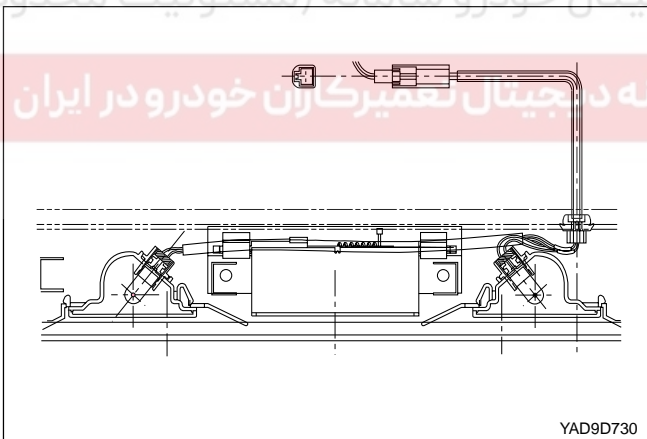
BODY ELECTRICAL 9D-37

**Door lamp**

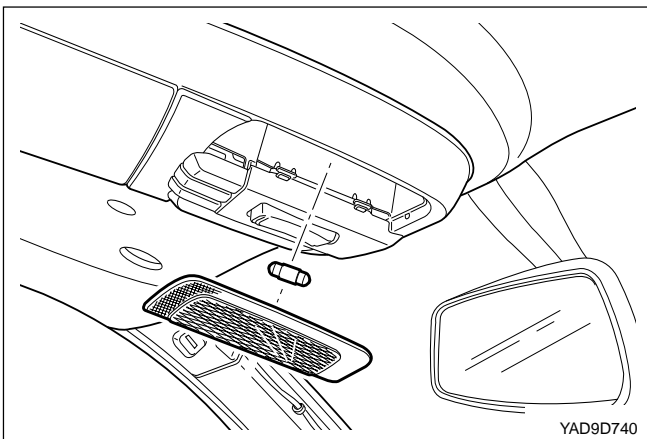
1. Remove the negative terminal of battery.
2. After removing door trim, and then separate connector of lamp.



3. After releasing fixing screw of lamp, remove lamp.
4. Install the reverse order of removal.

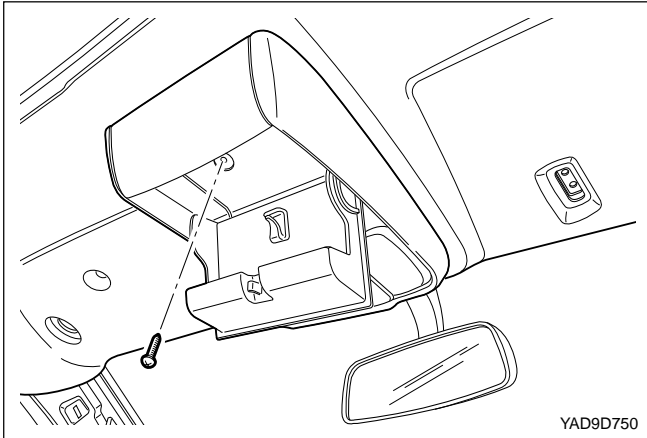
**Lamp of license plate**

1. Remove lamp of license plate.
2. Separate bulb from lamp.
3. After insert bulb into lamp, and then insert in the hole of mounting of tail gate.

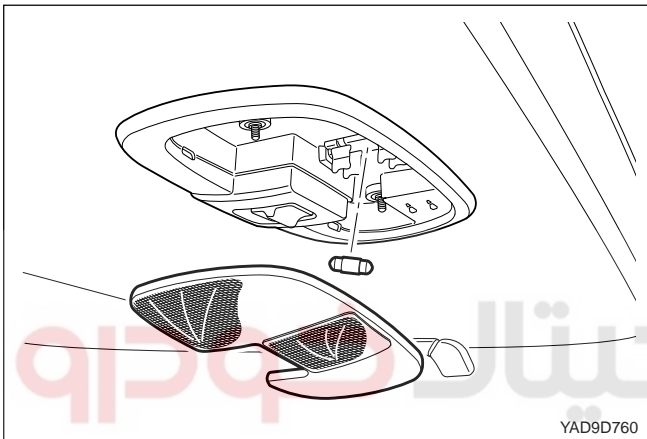
**Room lamp****Front lamp**

1. After removing lense of lamp, remove bulb.

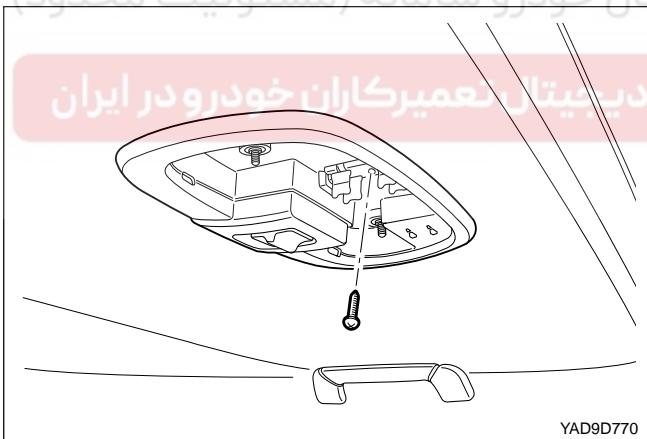
9D-38 BODY ELECTRICAL



2. After releasing the housing fixing screw of lamp, and then separate housing.
3. After separating connector of lamp housing, remove lamp housing.
4. Install the reverse order of removal.

**Center / rear lamp**

1. After removing lense of lamp, remove bulb.



2. After releasing housing fixing screw of lamp, separate the housing.
3. After removing connector from the lamp housing, remove lamp housing.
4. Install the reverse order of removal.

HORN AND AUDIO SYSTEM

General Description

Horn

Horn is located under the hood, is also installed near radiator in the front. Horn is operated by pushing pad of steering wheel which is linking to the electric circuit.

Audio system

Audio

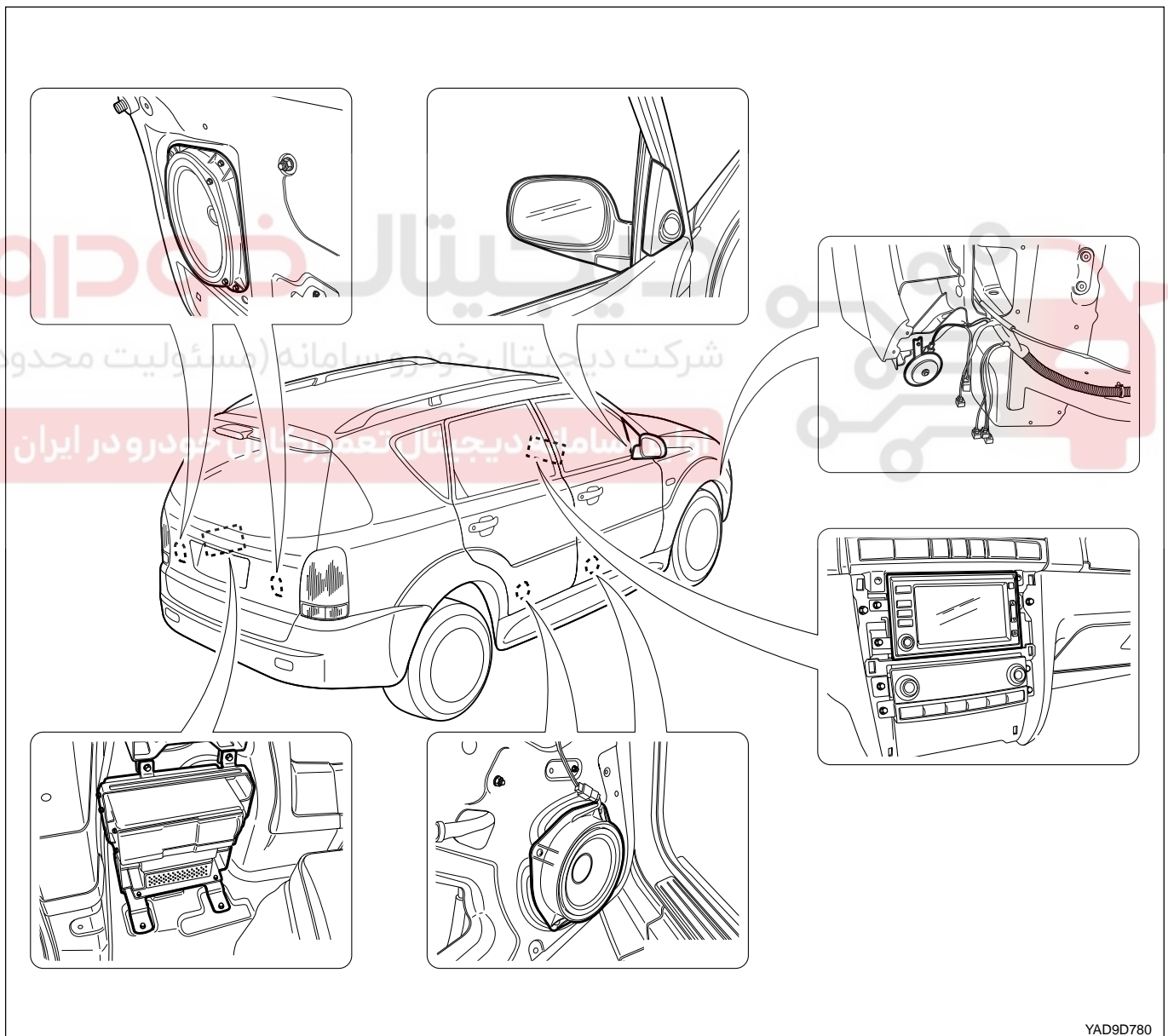
Radio and cassette are installed in the audio system by standard specification, changer of cd is applied option specification, which is installed on the room of trunk.

Front and rear speaker

Eight of speaker is installed in the vehicle, two of speaker is installed on the front door, rear door, and tail gate and an speaker is installed each side mirror (left, right).

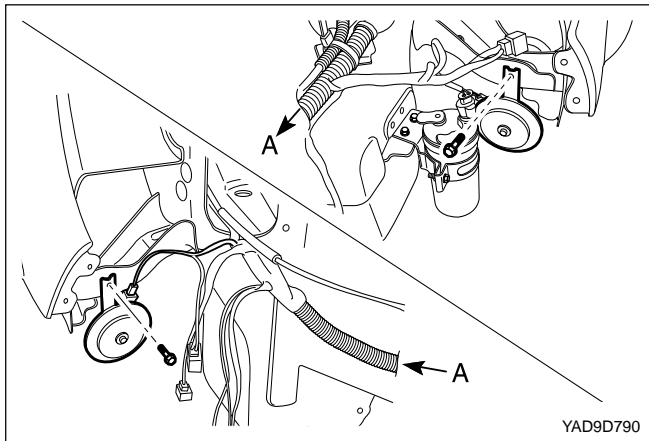
Glass antenna

Glass antenna is different from existing antenna, is not appeared external shape of antenna, this one is installed on the quarter glass, consists of module of glass antenna, harness, and connector. The sensitivity of reception are better than the existing antenna.



YAD9D780

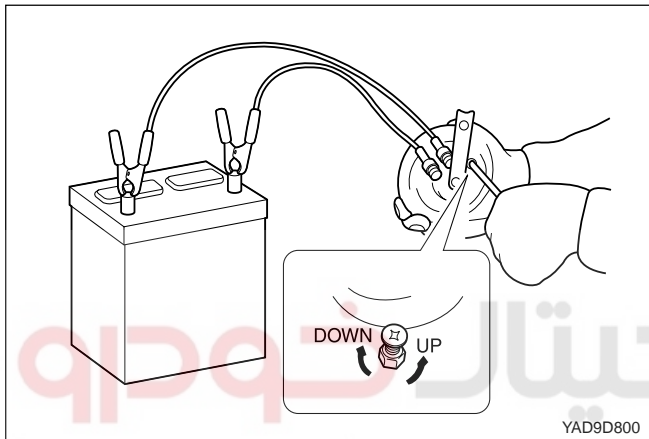
9D-40 BODY ELECTRICAL



Removal and Installation

Horn

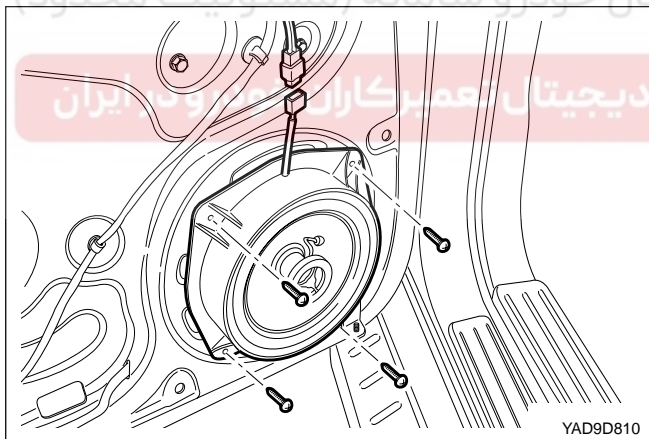
1. After releasing fixing bolt, remove horn.
2. Install the reverse order of removal.



3. Adjust

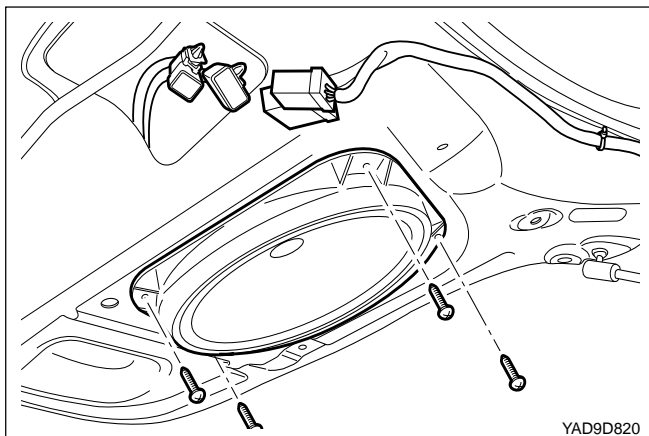
- After operating the horn, and then adjust tone of horn proper (adjust screw of controlling).

Notice: After adjusting screw, spread paint on the screw of adjusting, do not release screw of adjusting.



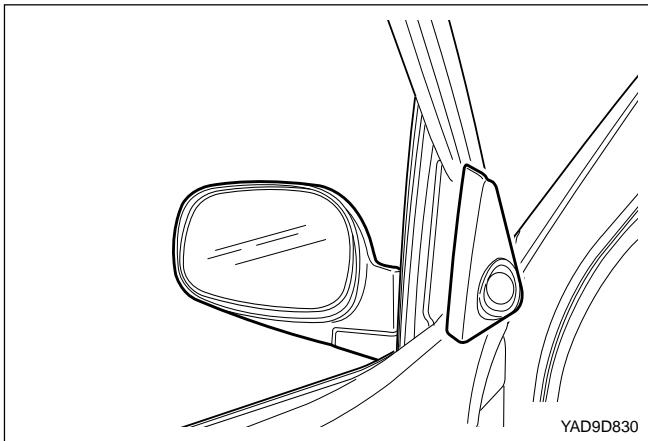
Speaker

1. Remove front door speaker and rear.
 - 1) Remove door trim and seal.
 - 2) After separating connector of speaker, and then release fixing screw of speaker.
 - 3) Remove speaker.
 - 4) Install the reverse order of removal.

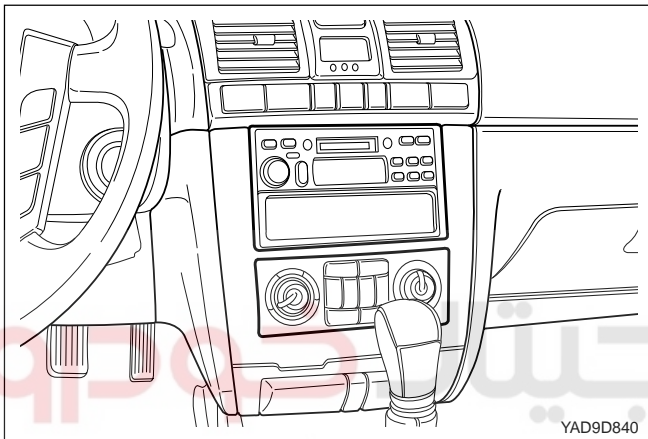


2. Remove speaker of tail gate.
 - 1) Remove trim of tail gate and seal.
 - 2) After releasing fixing screw and connector of speaker, remove speaker.
 - 3) Install the reverse order of removal.

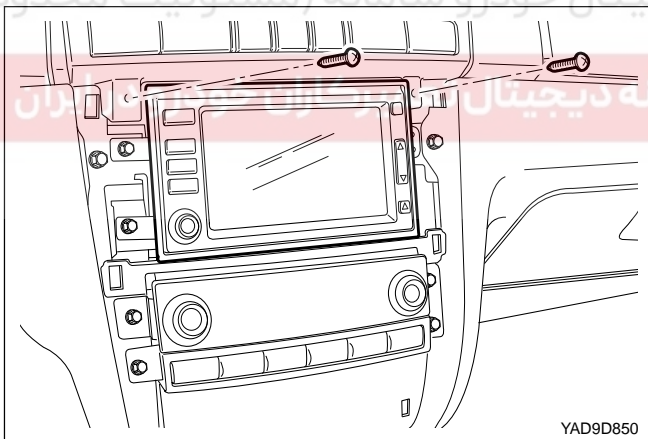
BODY ELECTRICAL 9D-41



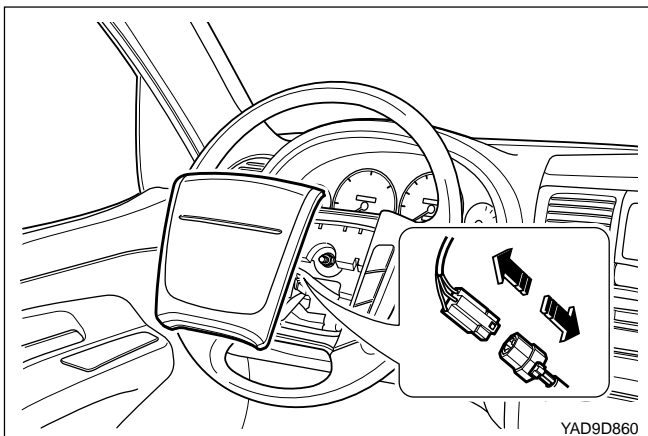
3. Remove speaker of side.
 - 1) Remove door trim.
 - 2) After removing speaker assembly, remove connector of speaker.
 - 3) Install the reverse order of removal.

**Accessory of audio system****Audio**

1. Separate the negative terminal of battery.
2. Remove center of instrument panel.

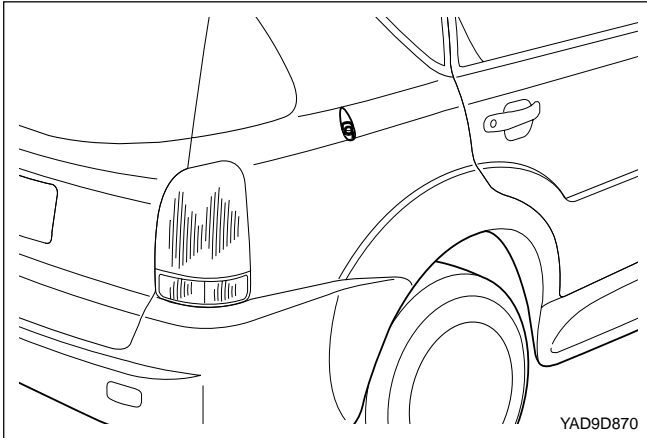


3. Remove audio
 - Release fixing screw of audio.
 - Separate cable of antenna and connector.
 - Remove audio.
4. Install the reverse order of removal.

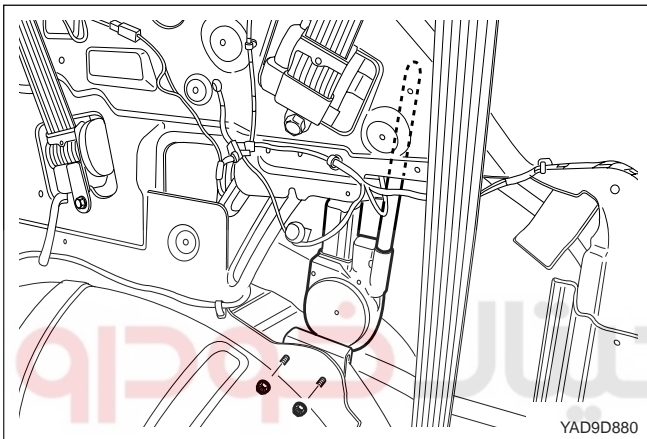
**Controller of audio remote**

1. Remove air bag module of steering wheel or horn pad on the driver seat.
2. After releasing connector and fixing screw, and then remove remote control.
3. Install the reverse order of removal.

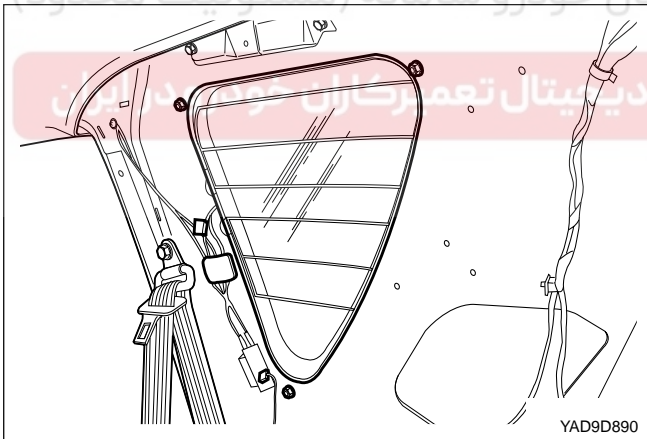
9D-42 BODY ELECTRICAL

**Power antenna and module****Power antenna**

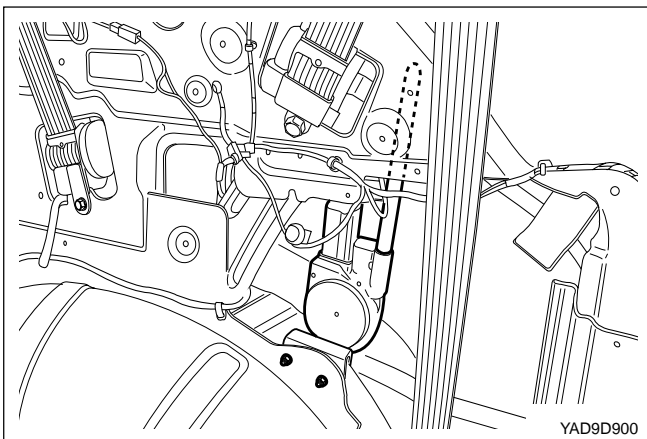
1. After separating the negative terminal, remove lower quarter panel of seat in the passenger seat.
2. Remove fixing cover of power antenna.



3. After separating motor connector of power antenna, and then release fixing nut of motor.
4. Remove power antenna assembly.

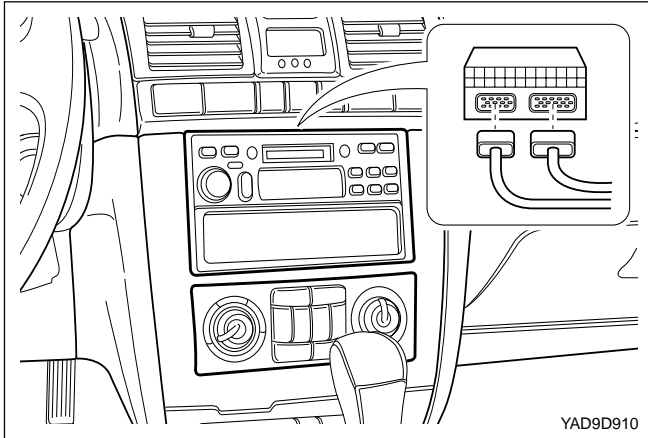
**Module of glass antenna**

1. Remove the upper quarter panel.
2. Remove module of glass antenna.
 - Separate connector of glass antenna.
 - Separate jack of antenna.
 - Release bolt (2ea).
 - Separate connector of rear heating line.
 - Remove module of glass antenna.

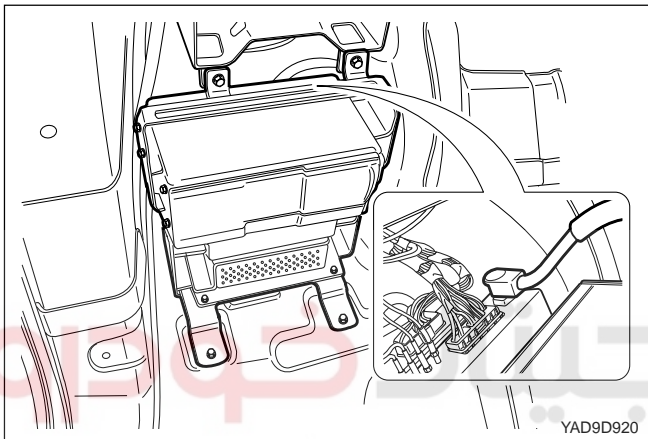


3. Install the reverse order of removal.

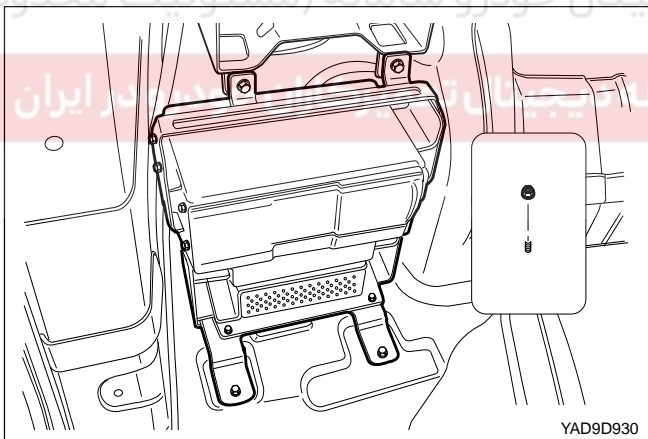
BODY ELECTRICAL 9D-43

**CD Changer**

1. Remove the negative terminal of battery and AUDIO.
2. Separate cable of CD changer from the AUDIO.



3. Remove rear lower quarter panel in the driver seat.
4. Remove cable from the changer of CD.

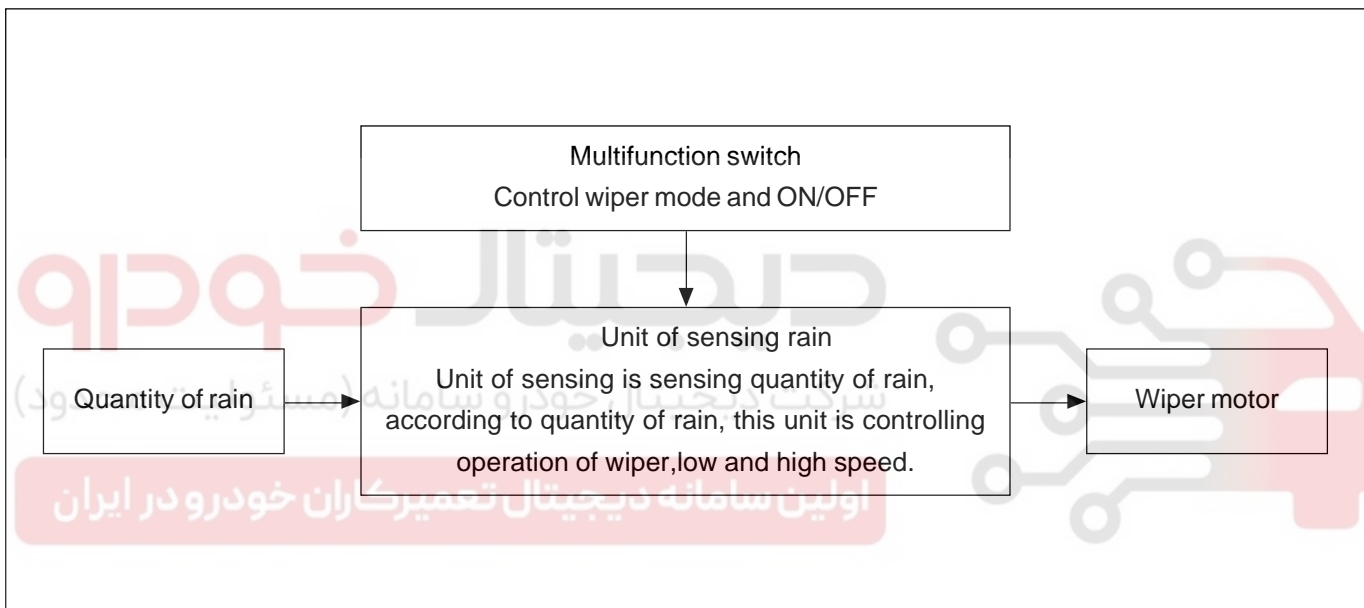


5. After releasing bracket fixing bolt of changer of CD, remove changer of CD.
6. After Installing the reverse order of removal, check unusual noise or state of operation.

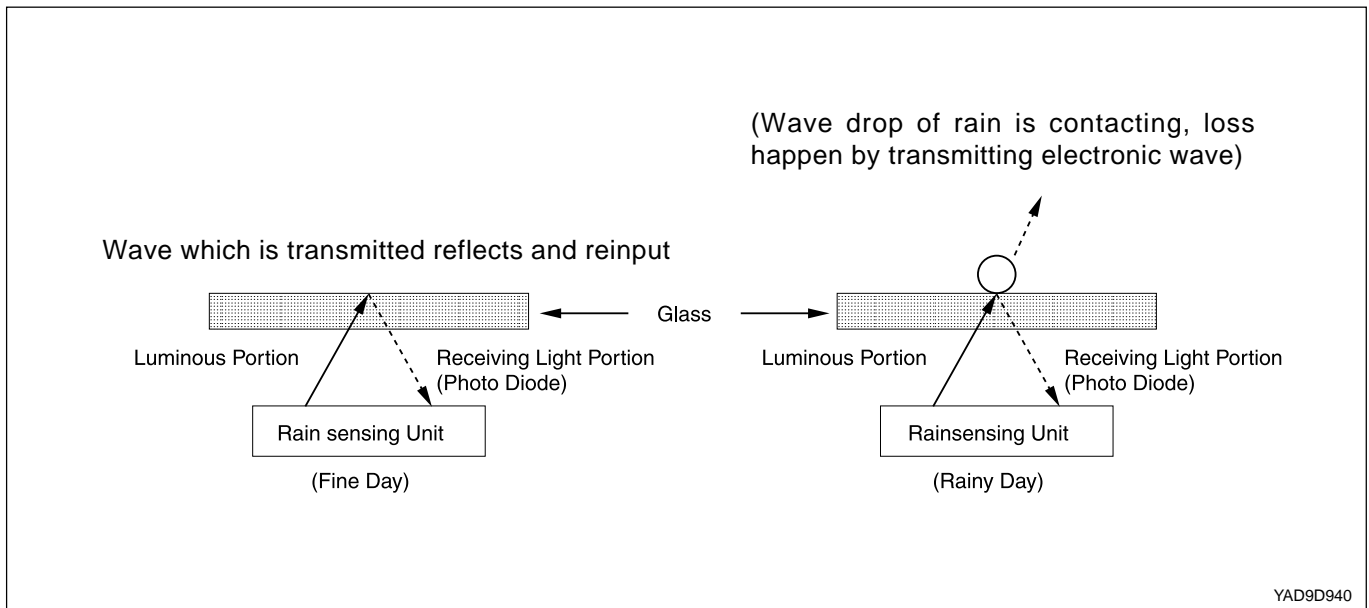
9D-44 BODY ELECTRICAL

WIPER AND WASHER**General Description****Wiper system of sensing rain****Summary**

Wiper motor of musso and korando is controlled by stics. In the case of this, time of operation of wiper is controlled by stics, driver should control time which is driven of stics. But wiper system of rextan is sensing quantity of rain by the unit of sensing rain which is installed on the upper center of windshield, this unit is controlling operation of wiper, low and high speed according to quantity of rain.

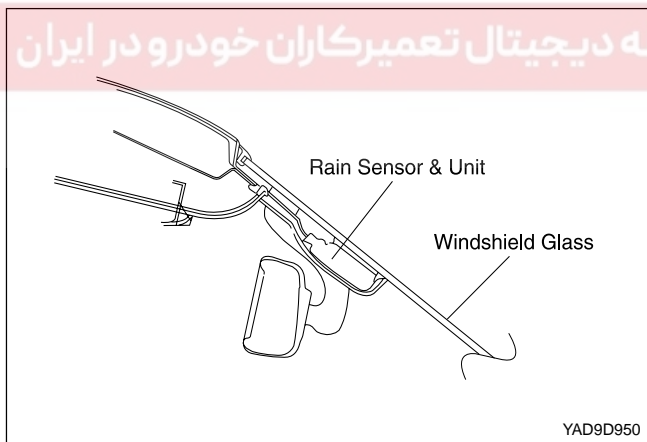
Diagram Of System

Principle of Rain Sensor



1. Unit of sensing rain is sensing by the LED and the diode of photo.
2. As infrared ray is emitting from LED, diode of photo which is reflected by drop of rain is sensing the quantity of rain.
3. Unit of sensing rain is correcting itself, so regardless of transmitting of windshield, this unit is constantly sensing rain.
4. This unit is sensing the area between the LED and diode of photo.

دیجیتال خودرو
شرکت دیجیتال خودرو سامانه (مسئولیت محدود)



Mode of operation

Wiper control system consist of OFF, MIST, LOW, WASHER, plus AUTO mode, if turn to the position of AUTO, rain sensor is sensing drop of rain, and then, is controlling time of operation, speed of operation with LOW, HIGH.

9D-46 BODY ELECTRICAL

1. OFF Mode

If switch of wiper is turned off and switch of ignition is turned on, at this time, rain sensor is operating with OFF MODE, under this mode, wiper mode is stopped, during rain sensor is OFF MODE, rain sensor is sensing the state of windshield, so that turn switch to proper position.

2. Auto Mode

If wiper switch is transferred OFF MODE into AUTO MODE, immediately wiper is operating once, that means wiper system is operating, after wiper is operating once, is calculated the time of gap between drop of rain and speed of wiper operation. After stopping time, rain sensor transfer signal into wiper motor, wipe out rain.

3. Automatic Intermittent Mode

At the automatic intermittent mode, wiper is operating once with low speed, and then this mode has variable stopping time.

4. Automatic Low Speed

This mode is operating beyond value of limit of automatic intermittent and automatic low speed.

5. Automatic High Speed

As quantity of rain beyond value of automatic low speed and automatic high speed is operating.

6. Washer Mode (48Page)

Rain sensor is sensing whether switch of wiper select function of washer or not. If switch of wiper is turned on more than 0.6 sec, wiper is operating for 2.5 - 3.8sec, under this value is operating only once. At washer mode, motor of wiper is operating with low speed.

7. Manual Mode

Switch operation of driver turn motor of wiper to low speed, high speed, at this time, wiper is operated by not rain sensor by but wiper switch.

Notice: As rain sensor is out of order, wiper is operating with low speed and high speed.

Characteristic of rain sensor**1. Supply power**

Power is supplying to rain sensor and within 250 msec, rain sensor is emitting the signal "OFF", until effective power is supplying, effective power is available for supplying power, after 2 second.

2. Speed of wiper and control frequency of revolution

Main function of rain sensor is controlling wiper speed and delaying of time to between the driving time, due to sensing and the accumulation of rain, algorithm of rain sensor is deciding mode of motion, automatic intermittent, automatic low speed, and automatic high speed.

If the stage is set, without the operation of driver, wiper is continuously operating.

3. Transfer between the modes

Algorithm of rain sensor is transferred automatic intermittent, automatic low speed, and automatic high speed under low stage so doesn't make noise.

4. Performance of sensing

Sensing of rain sensor is set 5 stage, due to accumulated drop of rain, driver can satisfy, range of adjusting can control from the short delaying time to the long delaying time, but, due to heavy rain, regardless of sensing which is set, is continuously operating with high speed.

5. Responding characteristic of automatic low speed

As wiper is operated from the zero state of dropping of rain to the automatic low mode.

Time is needed within only 9 second for high required signal.

6. Responding characteristic of automatic high speed

As wiper is operated from the zero state of dropping of rain to the automatic high mode.

Time is needed within only 9 second for high required signal

7. Responding characteristic from the automatic low speed to the automatic high speed

As wiper is operated from the automatic low speed to the automatic high speed mode, time is needed within only 6 second for high required signal.

8. Responding characteristic from the automatic high speed to the state of off (48 Page)

As wiper is operated from the automatic high speed mode to the the zero state of dropping of rain mode, times of wiper motion is under 19 times.

9. The instant operating of wiper

While system of wiper is operating by switch of wiper, before wiper back to the position of operating, wiper is operating once, such as once operating, is occurred at time from the lower stage to the high stage by operating of wiper switch, but if the high stage is moving to the low stage, once operating of wiper does not happen.

If the ignition switch is off and if wiper switch is set on any position, turn ignition switch on, the instant operation of wiper is occurred, signal to driver beginning of wiper operating, due to lack of rain drop, if wiper is not operated, rain sensor stay on the automatic intermittent mode.

Check unit of rain sensor

Check selection of sensing (check position of nob of variable resistant)

Check if variable resistant nob of multifunction switch is positioned in the middle of between S of position and F of position, if nob is positioned F (fast) or S (slow), sensing is much higher or much lower, so customer can complain this.

Self - diagnosis

1. Rain sensor has two kind of self diagnosis test mode.

1) Self diagnosis of FAULT A

In case operating point of rain sensor servo is beyond range of soft ware, that means sensor has a fault, if part of wind shield glass has a damage, or if sensor is removed from the coupler.

2) Self diagnosis of FAULT B

While rain sensor does not reaction with signal of rain, that means FAULT B, if wind shield glass which is equipped coupler has a damage or sensor is out of order.

2. Value of cohesion

While FAULT A is sensed, the cohesion is decided, the value of cohesion is 140, in this case, except heavily damage of wind shield glass, rain sensor is operating in the all conditions.

3. Failure which is occurred with adjustment of intermittent volume

Due to adjustment of sensing and motion of wiper, self diagnosis is described as below.

- 1) Wiper switch is transferred the intermittent into 5 step stage, under the state of " ignition on "
- 2) Under this state, sensing is changed 5 step stage into 4 step stage.
- 3) At this time, wiper is moving once, that means self diagnosis of FAULT A, check if wind shield glass has a damage or not, also check if sensor is installed completely on the coupler.
- 4) After check 3) article, sensing is changed 4 step stage into 3 step stage.
- 5) If wiper is operating once, this means self diagnosis of FAULT OF B.
Replace new rain sensor.

Wiper blade

Check the state of wear of wiper blade, due to excessive wear of wiper blade, if is not cleaned up over section of sensor, quantity of rain is not sensed accurately.

Coupler

Check if blister is shaped on the external section of coupler which is stuck on the wind shield.

If there is a blister in the internal section of sensor, is not sensed accurately, check if coupler is installed the right position or not, specially check if section of coupler sensor is positioned on the section of ceramic coating or not, if the space of sensing is shielded, infrared of sensor is not passed so sensing is not available accurately.

Wind shield glass

Check if wind shield glass surface of the external sensor has excessive wear, damage, and scratch or not. Wear of sensor is compensated little bit, if there come to beyond constant value, sensor is not sensing, such a kind of diagnosis is used self diagnosis.

Exterior cover

Check the state of exterior cover of rain sensor, check that sensor is impacted by shaking, owing to releasing fixing section of cover, also check interference with wind shield glass or head lining.

Spring clip

Check if rain sensor release from coupler or not, after removing exterior cover, check the state of spring clip.

Connector

After check the state of tightening between terminal of connector and wiring, check that the terminal is inserted into connector as the state of locking. Check the state of combination between the connector of wiring and the connector of rain sensor, check interference between them.

Relay

Check if low relay of wiper and high relay of wiper is operating normally, as relay is damaged by fire so motor of wiper is not operated, at the auto mode, blade of wiper is not operated.

Circuit

Check circuit, specially check if the value of variable resistance of multifunction switch is feeding properly or not, this can see by moving nob of variable resistance step by step from the state of slow to the state of fast (This is called Instant Wipe).

9D-48 BODY ELECTRICAL

If parking position of wipe motor is not feeding properly or not, if parking position of wipe motor is not feeding, wiper motor can be operated quickly rather than the state of normal, intermittent speed shifting time of wiper motor is not sensing, wiper motor is not operated normally.

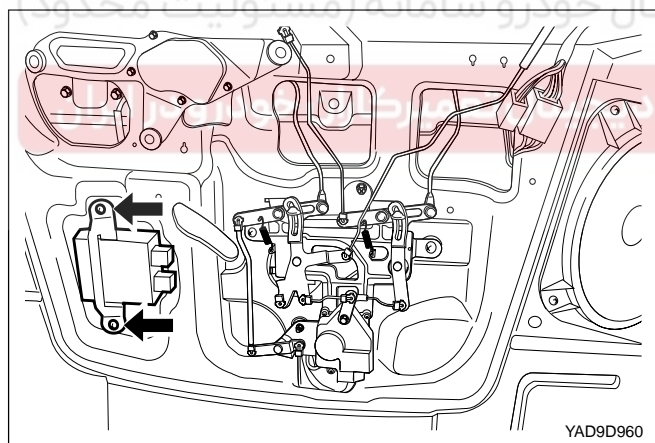
Notice: While unit of rain sensor is removed.

1. Remove exterior cover, at this time, if exterior cover is removed by compulsion, keep in mind not to break fixing hook of coupler, as exterior cover is removed, using hole of cover by driver, after section of fixing hook is pushing, and remove them.
2. As rain sensor is removed from coupler, using driver after open up spring clip, remove them.
3. Remove connector to the wiring from the sensor.

Rear Wiper System

Summary

Controlling of existing rear wiper is controlled by relay which is operated with switch, but rear wiper of Rexton is controlled by ECU, in the existing vehicle, brush of rear wipe is installed on the rear glass, but rear glass can be opened up, brush of rear wiper can not be installed, so, this one is installed on the back panel, wiper motor is operating by second stage.



Description of System Operation

Operation for wiping mode

1. Turn switch of wiper on, and then relay 1 of CONT is on, turn motor with clockwise
2. On the turning, Applying the current between contact point of W and contact point of C, after relay 2 of CONT is "OFF" relay 1 is "ON", turn motor counter clock-wise.

3. On the turning, Applying the current between contact point of W of CAM switch and contact point of C, relay 2 of CONT is "OFF" and relay 1 is "ON" and then, turn motor clock wise, wiper is operating between position of B and position of C by transferring pole of motor.

Operation of parking mode

1. Parking on the operation with the clockwise : Under the wiper is operating, switch of wiper is "off" On the turning, applying the current between contact point of W of CAM switch and contact point C, after relay 1 is off, stopping the motor, within approximately 1 second, relay 2 of CONT is on, turning motor counter-clockwise, apply the current between "P" ground of CAM switch and C ground, and then relay 2 of CONT is OFF, motor can stop.

Operation for washer mode

Turn washer switch on above 0.5 second, after operation of wiper mode is operating twice, after operation of parking mode is operating and then motor is stopped, but if washer switch is on below 0.5 second, wiper motor is not operating.

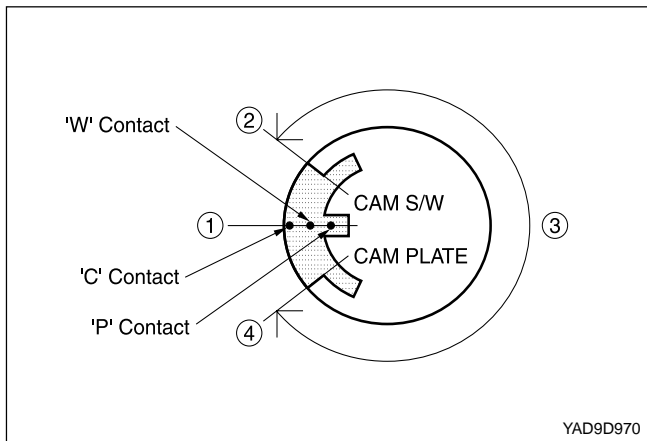
Mode operation of limit switch ON

1. Limit switch on: Under wiper is operating while wiper is operating, limit switch is "ON", immediately back to the position of parking, and then stop the motor.
2. Limit switch on at the position of parking.
Though turn wiper switch or intermittent switch on, motor is not operated.

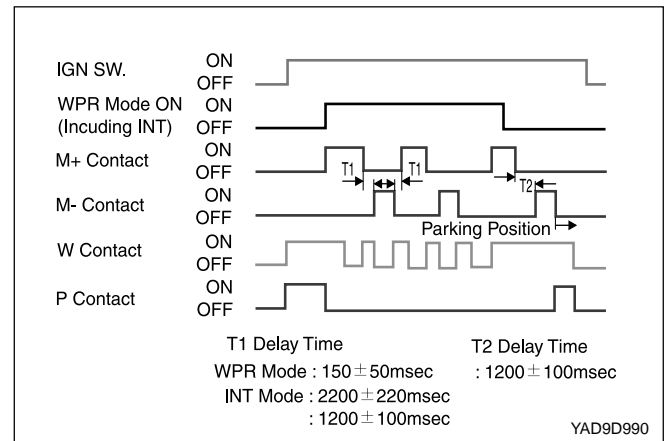
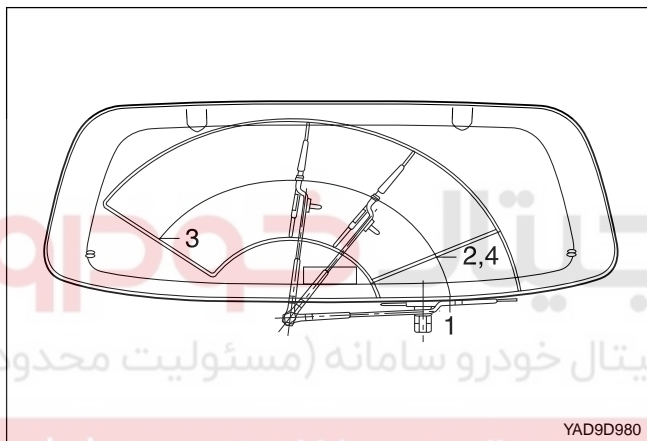
Description of system operation

1. Turn motor switch on, after relay 1 of controller is on, turn motor clockwise (operation order: (1) → (2) → (3) → (4))
2. On the turning, Applying the current between contact point of W of CAM switch and contact point of C, relay 2 of controller is "OFF" and relay 1 is "ON" and then, turn motor clock wise. CAM switch is operating between position of (2) and position of (4) by transferring pole of motor. (operation order : (2) → (3) → (4) → (3) → (2): motion of cycle)
3. Angle of DSP denote the angle between (1) and (2) or the angle between (1) and (4).
4. Turning motor from position of (3) to position of (4), stopping in the position of (1), turning from position of (3) to position of (2), stop in the position of (1), namely, as motor is parking, such as below the picture, contact point of W, C, and P are on the one line.

BODY ELECTRICAL 9D-49



Position of (1) : Position of soft contact
 Position of (2) and (4) : Reverse position

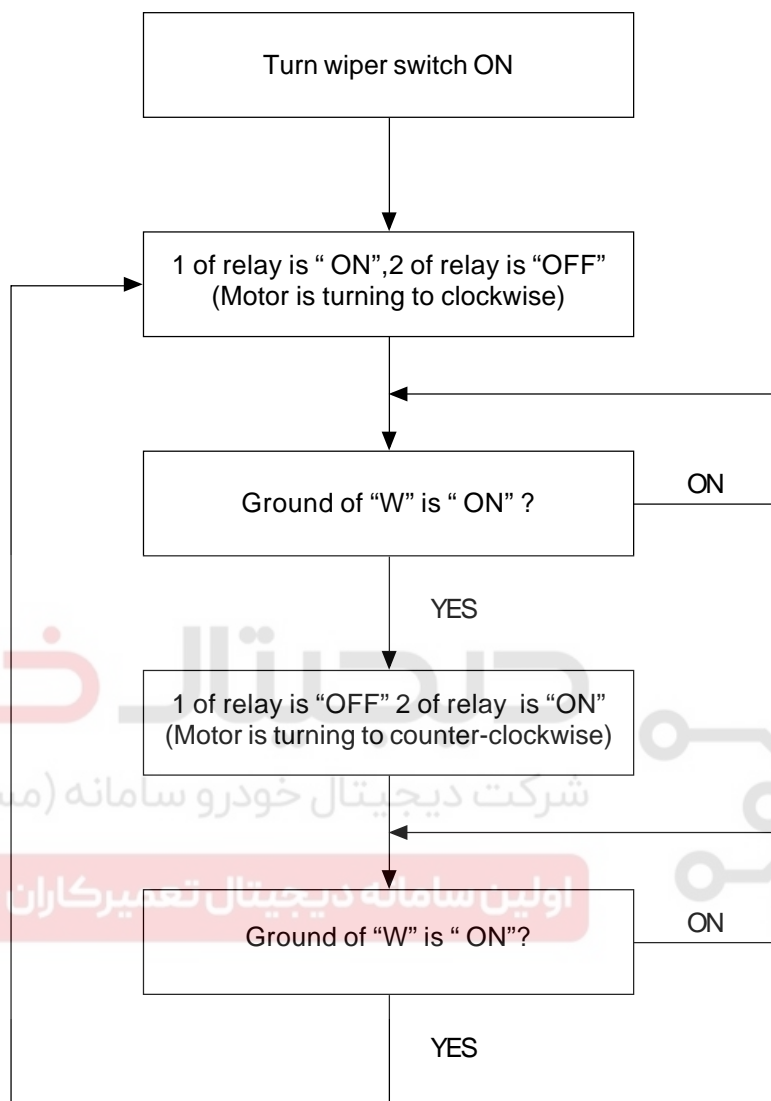
**Function of rear wiper**

1. While switch of ignition turns on, turning switch of wiper on, and then 1 of relay is operated, so wiper motor is controlled.
2. While wiper motor is operating, after contact signal of "W" is feeding, so 2 of relay is operated, cause wiper motor to reverse direction (angle of revolution of wiper motor : 260°)
3. As above the description, under the control of wiper motor, if wiper switch is "off", turn power of wiper motor until position of 'P' is feeding, and then back to the position of parking.

9D-50 BODY ELECTRICAL

Trouble Shooting

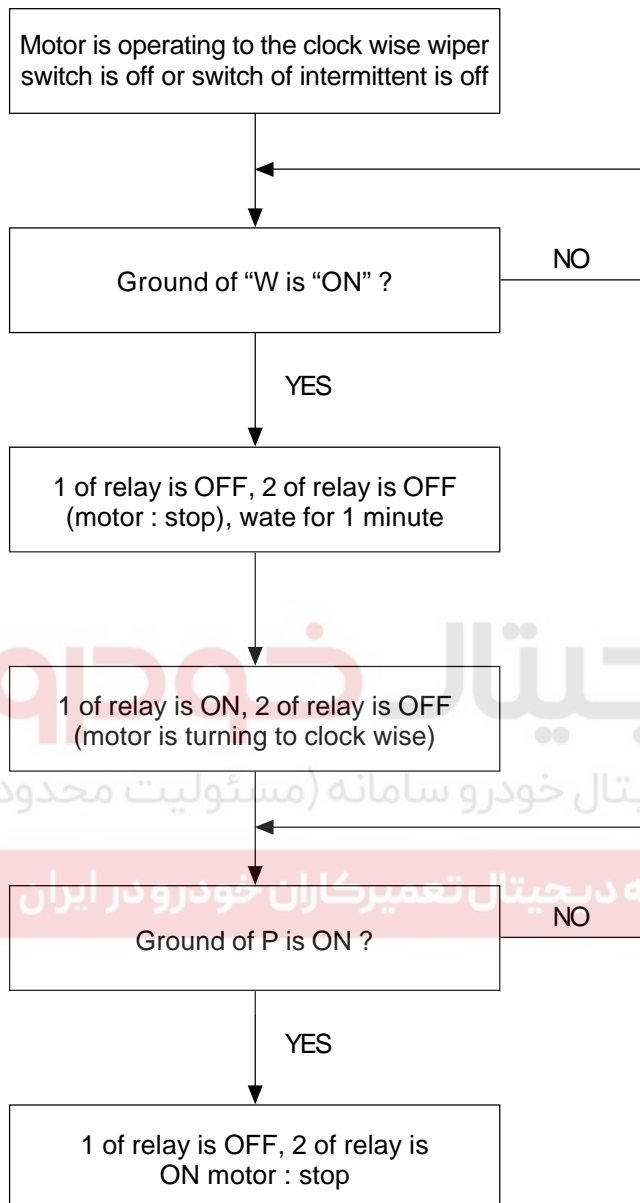
Flow Chart – Mode Of Wiper Operation



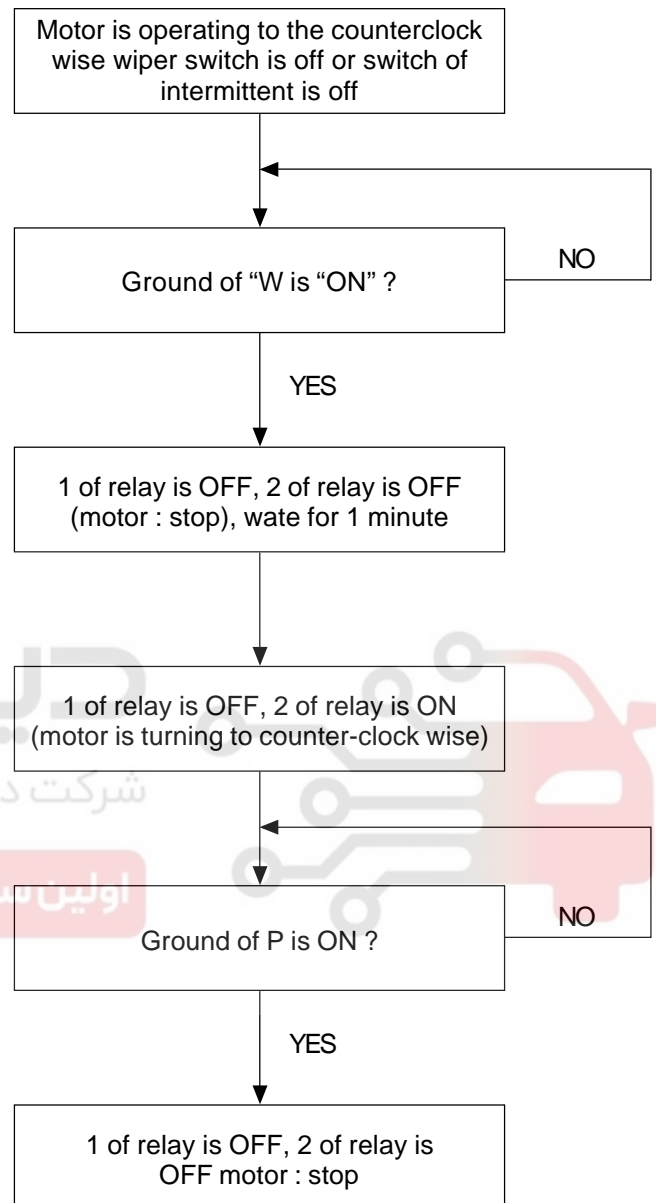
BODY ELECTRICAL 9D-51

Parking Mode

Parking is under operation of the clock wise.

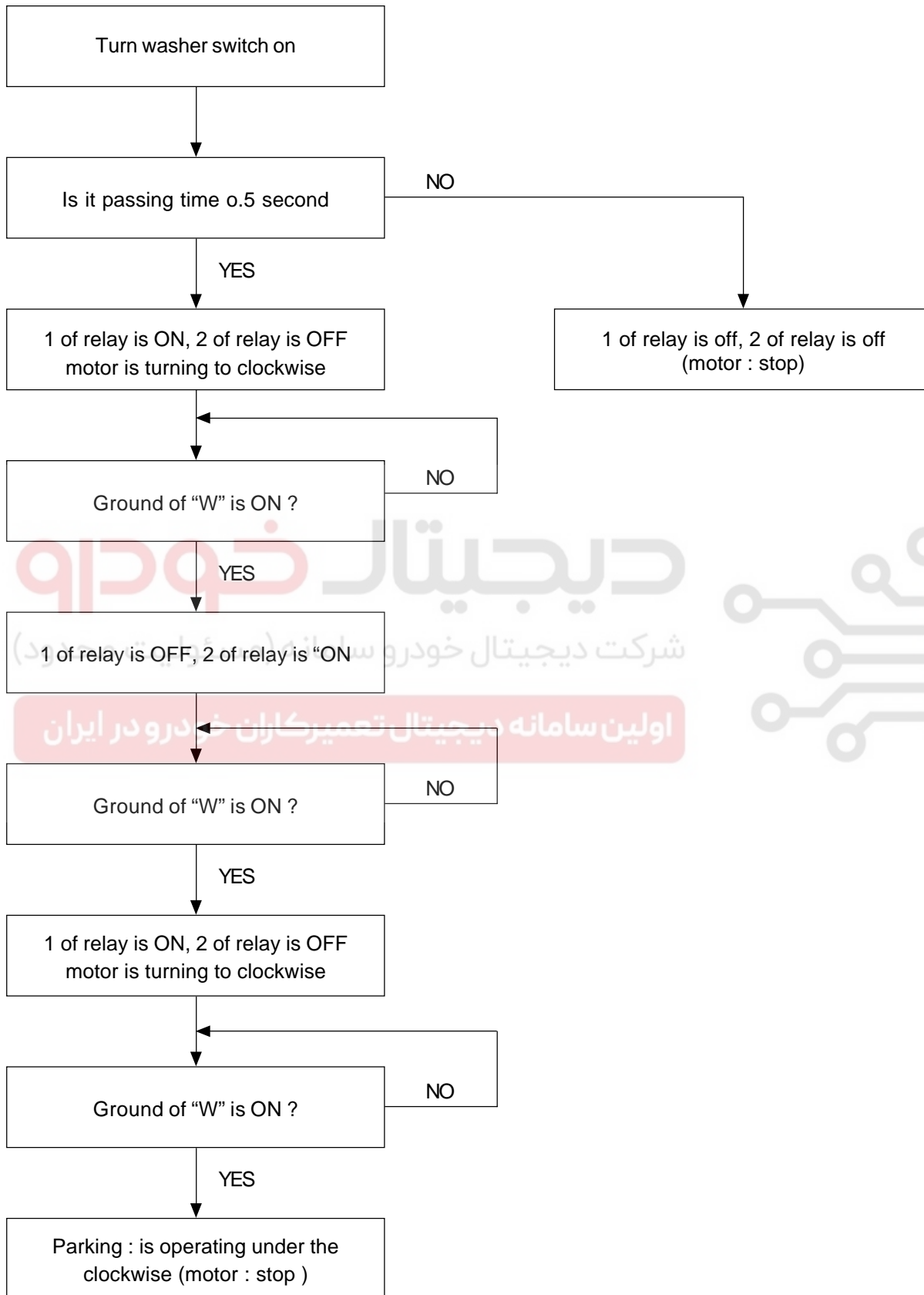


Parking is under operation of the counter clock wise.

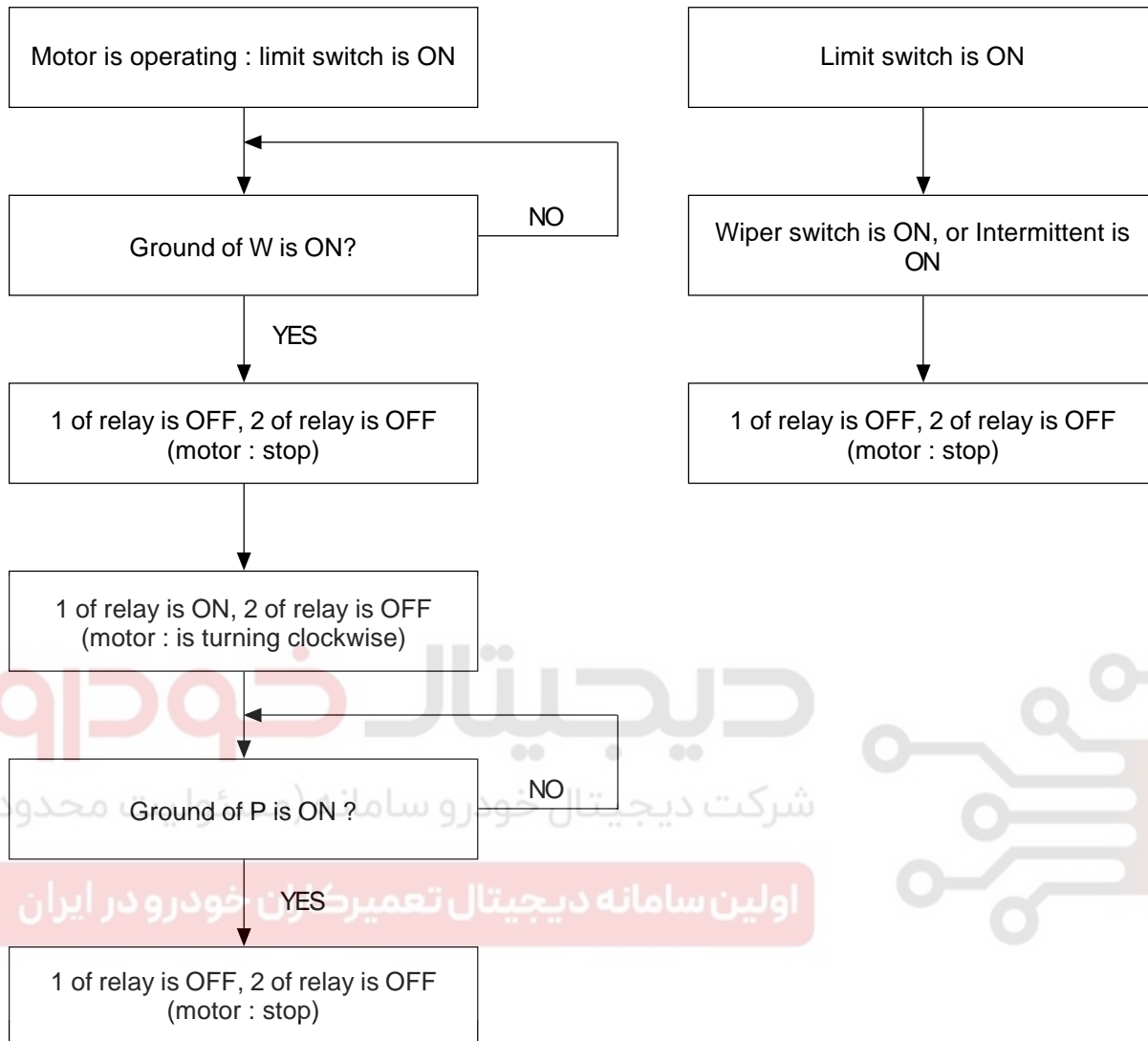


9D-52 BODY ELECTRICAL

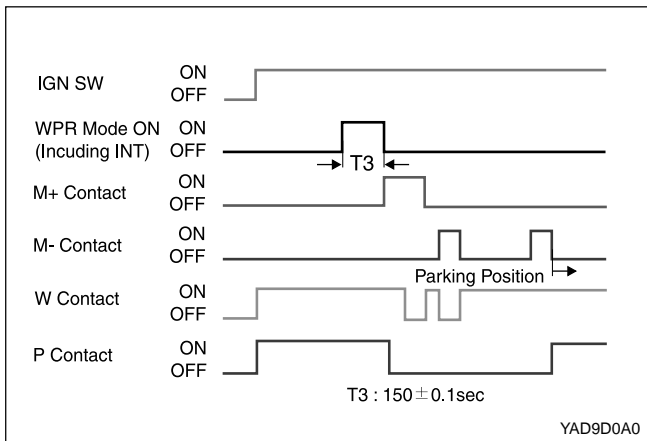
Operation Of Washer Mode



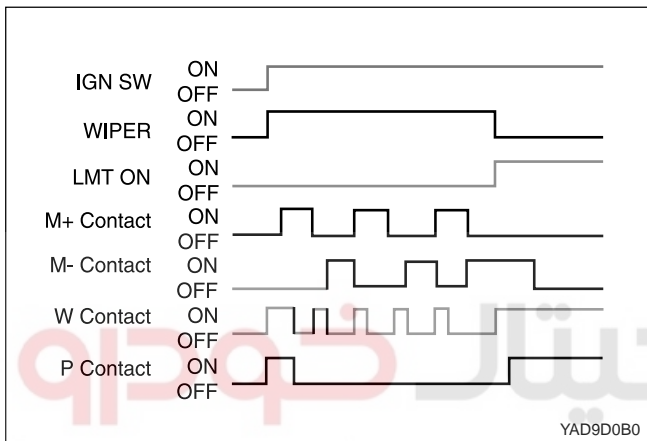
Operation of Limit Switch



9D-54 BODY ELECTRICAL

**Washer linked mode**

1. As turn ignition switch on, wiper switch is ON more than 0.6 seconds, and then, power of washer linked mode is "ON"
2. After turning washer switch off, operation of wiper mode is operating twice, and then back to parking position.
3. Power of wiper motor is operating with the same mode of wiper operation.

**Operation of limit switch: ON/ OFF mode**

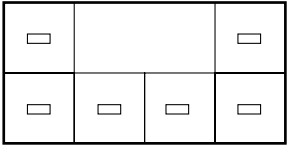
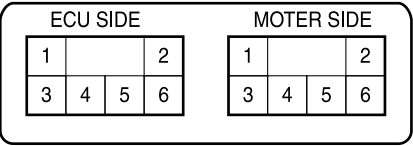
1. As turn ignition switch on, if wiper motor turn limit on, without delay, back to parking position and then stop motor.
2. Being state of turning on, stop control power of wiper motor.
(Namely, opening up rear glass, for wiper not to be interfered)



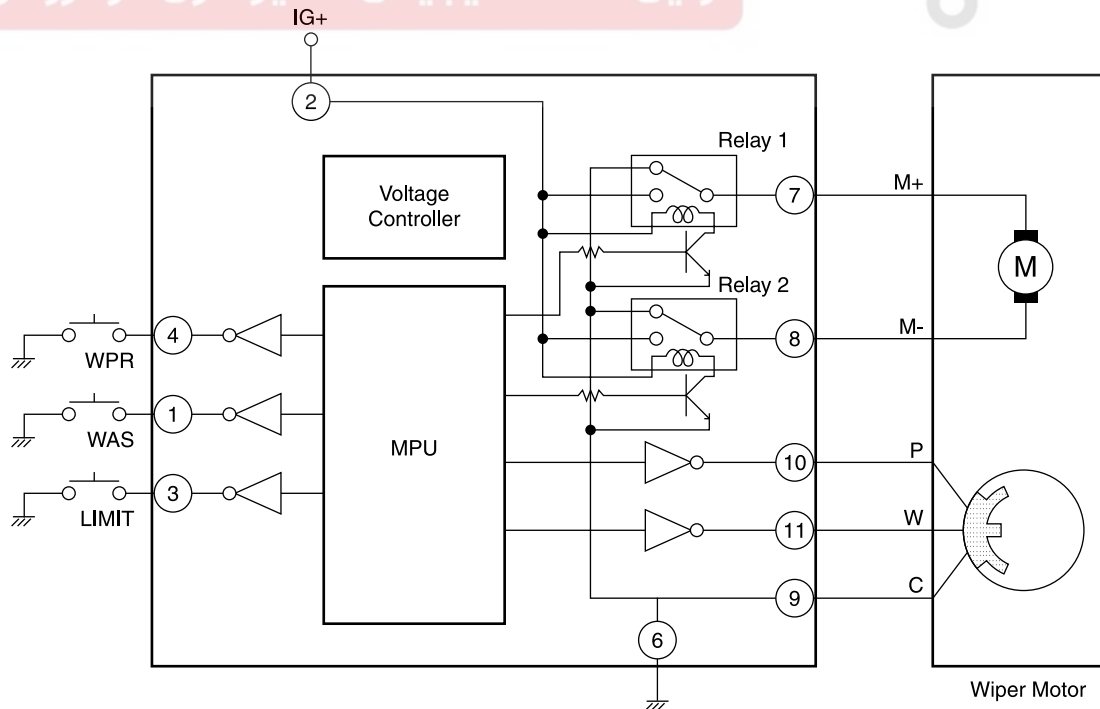
شرکت دیجیتال خودرو (مسئولیت محدود)

اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

Specification

Description		Specification
Motor  YAD9D0C0	Rated voltage	DC 12 V \pm 0.3 V
	Test voltage	DC 13.5 \pm 0.3 V
	Range of allowed voltage	DC 10 - 15 V
	Minimum operating voltage	DC 8 V
	Insulated resistance	500 V 1 M Ω
	Restraint test	Torque
		Current
	Range of atmosphere temp allowed	- 40 $^{\circ}$ C ~ + 80 $^{\circ}$ C
Control  YAD9D0D0	Rated voltage	DC 12 V
	Range of allowed voltage	DC 9 ~ 16 V
	Range of allowed temperature	- 30 $^{\circ}$ C ~ + 80 $^{\circ}$ C
	Range of conserved temperature	- 40 $^{\circ}$ C ~ + 90 $^{\circ}$ C
	Insulated resistance	1 M Ω (500 V)
	Voltage dropping	0.5 V
	Test voltage	14.0 \pm 0.5 A
	Load allowed current	10 A

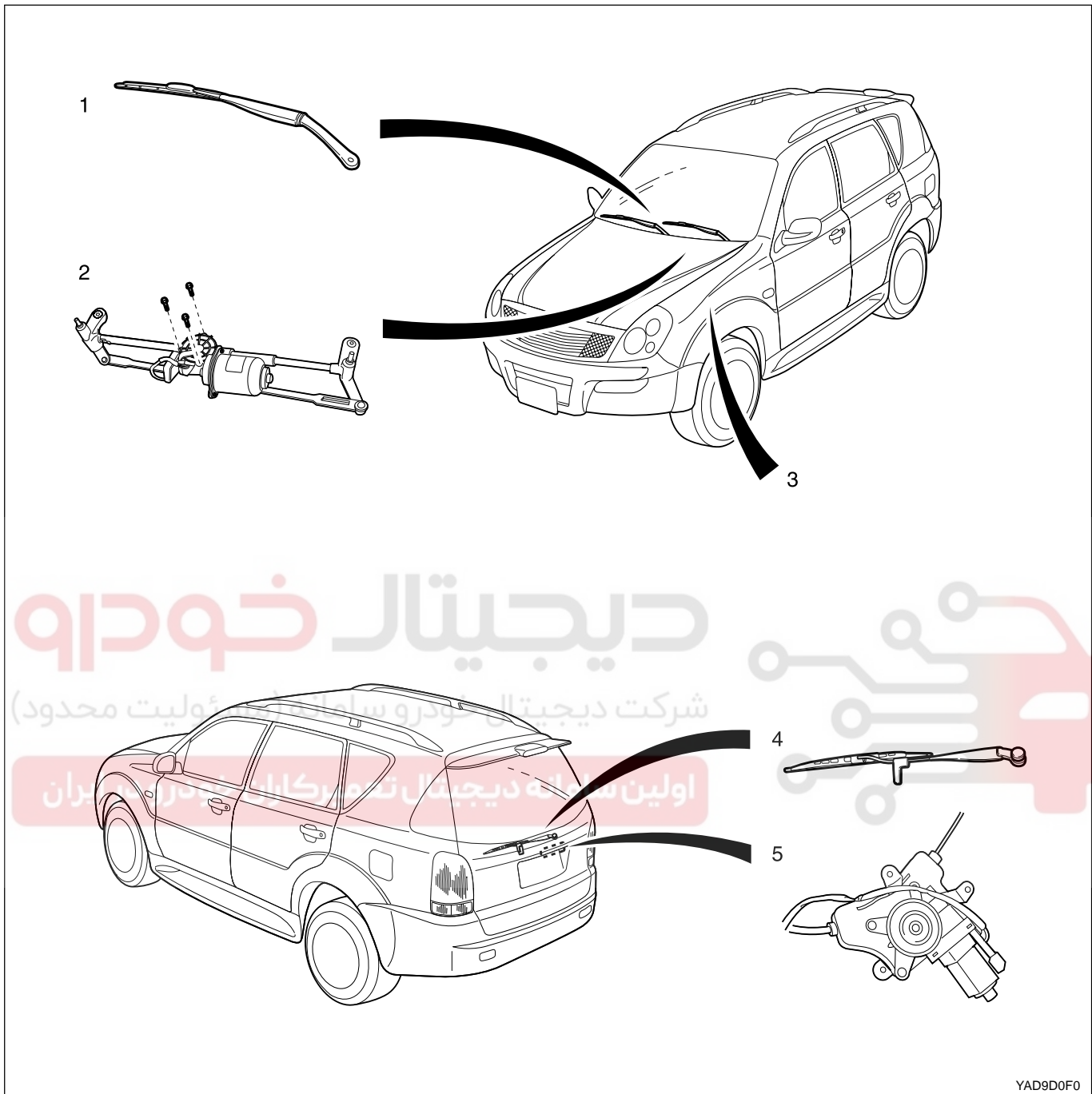
Circuit diagram



YAD9D0E0

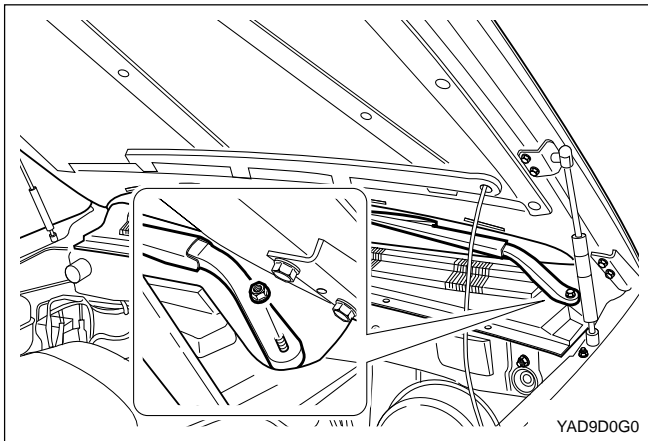
9D-56 BODY ELECTRICAL

Components



- 1 Wiper Blade
- 2 Wiper Motor And Link
- 3 Washer Tank Assembly

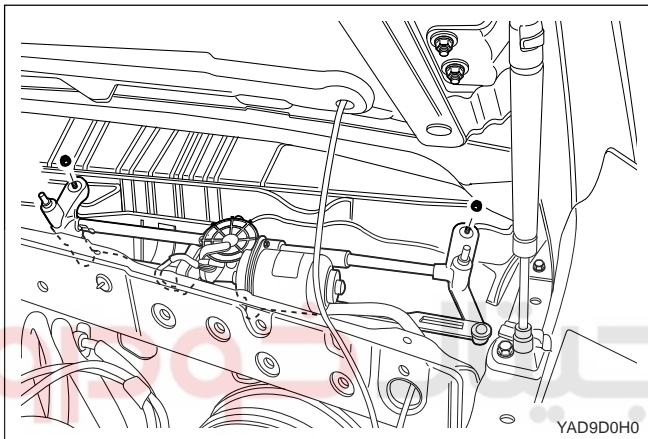
- 4 Wiper Blade
- 5 Wiper Motor



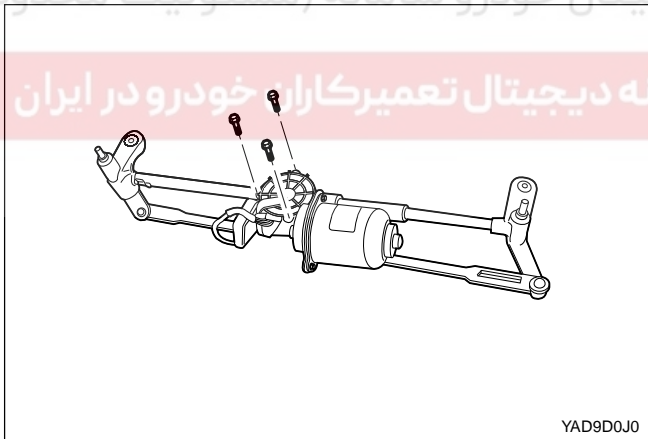
Removal and Installation

Front wiper Assembly

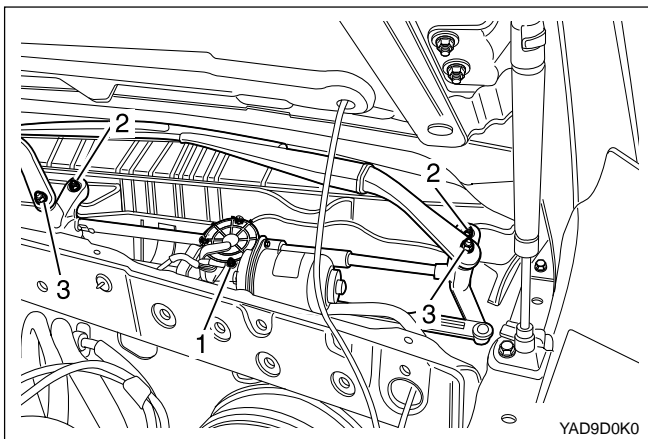
1. After opening up front hood, remove wiper arm.



2. After cowl left is removed, remove wiper linkage assembly. (At this time, separate connector of wiper motor)



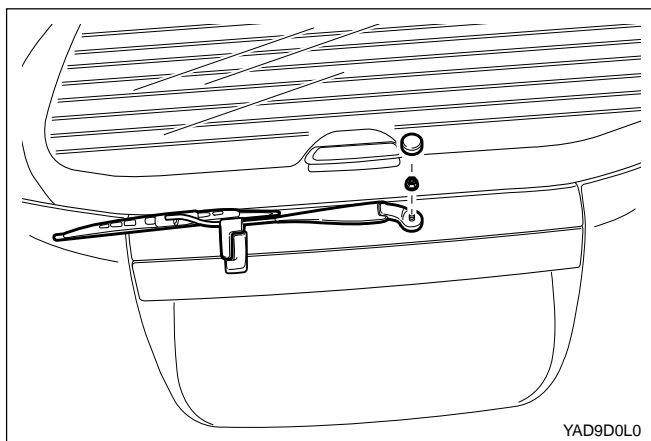
3. From linkage separated, releasing fixing bolt of wiper motor, separate linkage and motor.



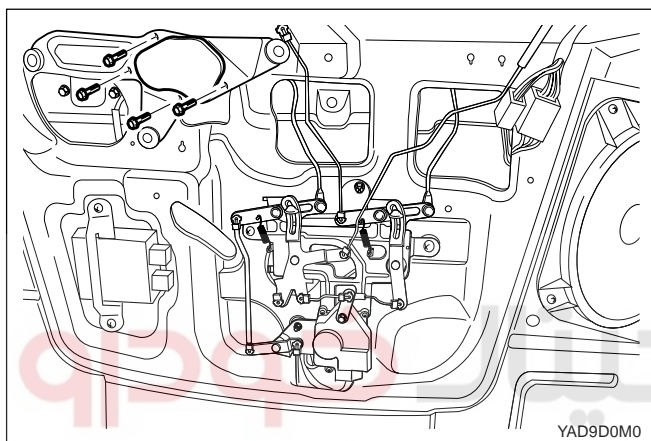
4. Install the reverse order of removal.

Fixing bolt of motor	7 - 11 N•m
Nut of linkage	4 - 6 N•m
Nut of blade	19 - 28 N•m

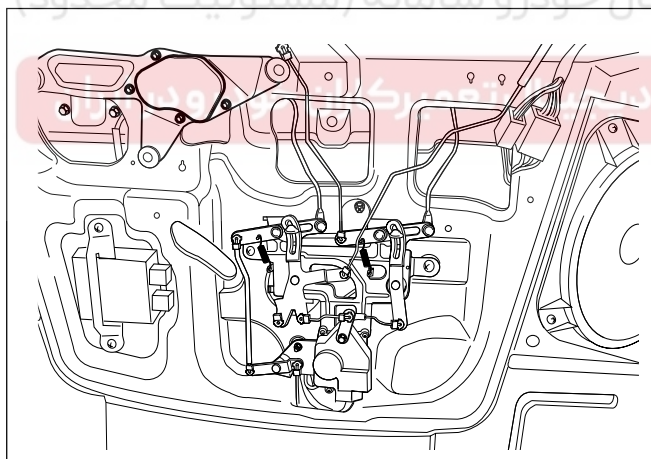
9D-58 BODY ELECTRICAL

**Rear wiper assembly**

1. After cap of wiper arm, remove nut of wiper and blade of wiper.



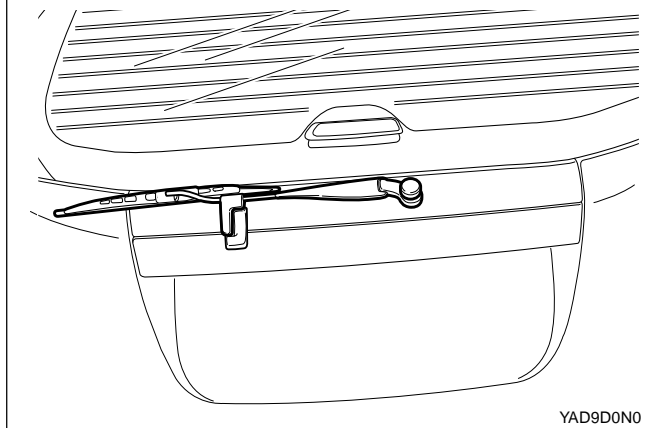
2. Remove trim of tail gate.
3. After connector of wiper motor is separated, release fixing nut.
4. Remove wiper motor assembly from the tail gate.



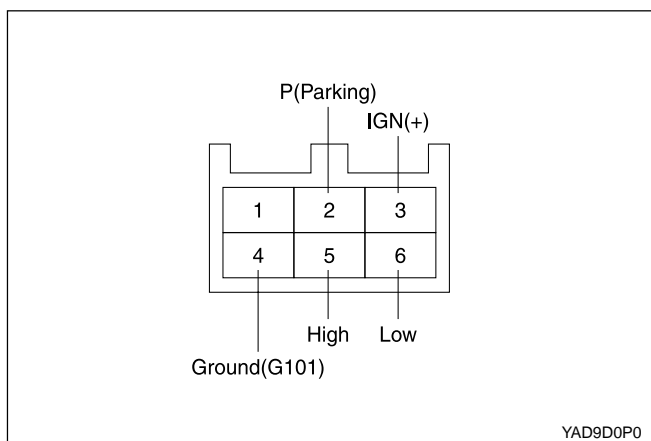
5. Install the reverse order of removal.

Wiper motor assembly

Bolt of motor	7 - 11 N•m
Bolt of motor bracket	7 - 9 N•m

**Rear wiper blade**

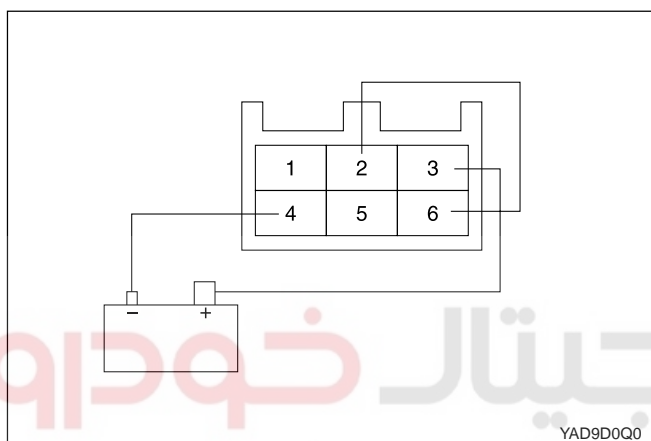
Torque of Tightening	19 - 28 N•m (44 - 52 lb-ft)
----------------------	--------------------------------



Check

Check speed of front wiper motor

1. Remove connector from the motor of wiper.
2. Connect positive terminal into 3 terminal and negative terminal into 6 terminal.
3. Check motor with low speed.
4. Connect positive terminal into 3 terminal and negative terminal into 5 terminal.
5. Check motor with high speed.

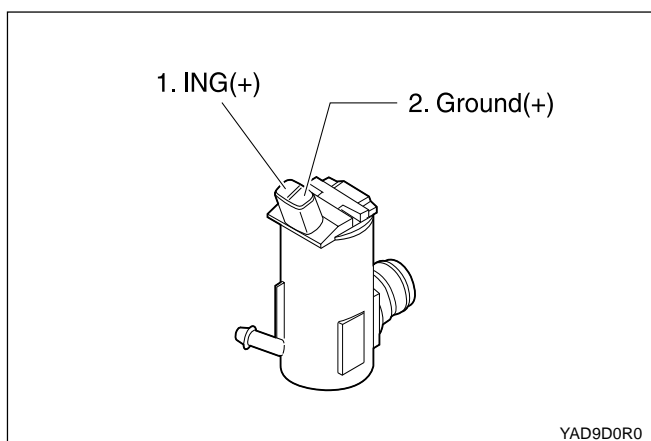


Check operation of automatic stop of front

1. Operate motor with low speed
2. After separating 6 terminal, stop operation of motor except position of "OFF"
3. Connect 2 terminal and 6 terminal.
4. After connecting positive terminal into 3 terminal, and then 4 terminal turn to the ground.
5. Check motor at the "OFF" position.

Check motor of rear wiper

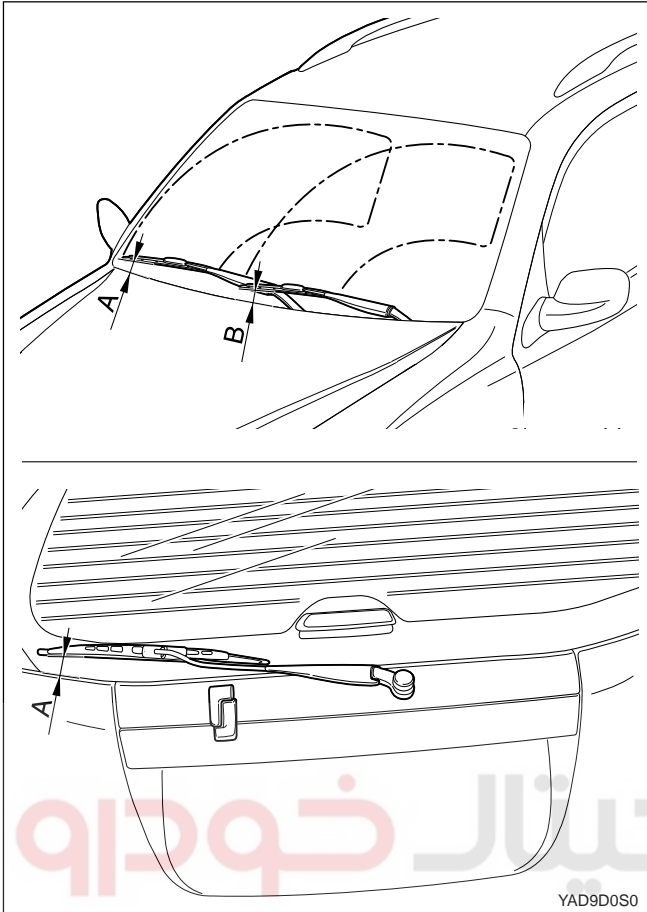
1. Remove connector from the motor of rear wiper
2. Connect positive terminal into 4 terminal and negative terminal into 3 terminal.
3. Check motor is operating normally, if motor has a problem, replace motor.



Check washer motor

1. After installing washer motor into washer tank, and then fill fluid of washer
2. Connect 1 terminal into positive terminal of battery and 2 terminal into 3 negative terminal
3. After motor of washer is operated, check the fluid of washer is operated.

9D-60 BODY ELECTRICAL

**Check position of wiper arm**

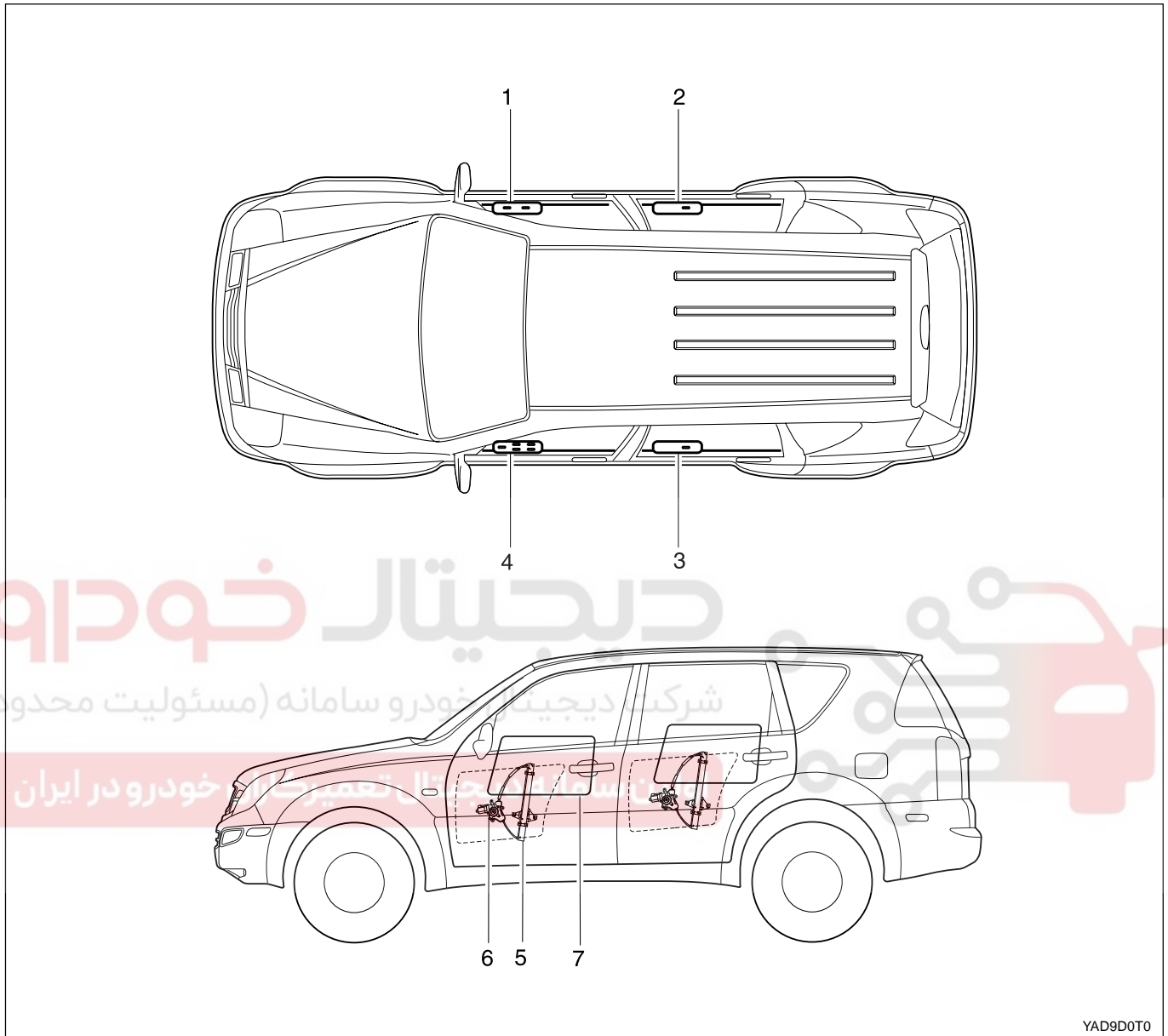
While installing wiper arm, check position of front wiper arm and rear wiper arm, and reinstall, to positioned original position.

- Front wiper arm: Distance from the end of cowl grill to the blade: 45 mm
- Rear wiper arm: Distance from the lower section of rear glass to the blade: 30 mm



شرکت دیجیتال خودرو (مسئولیت محدود)

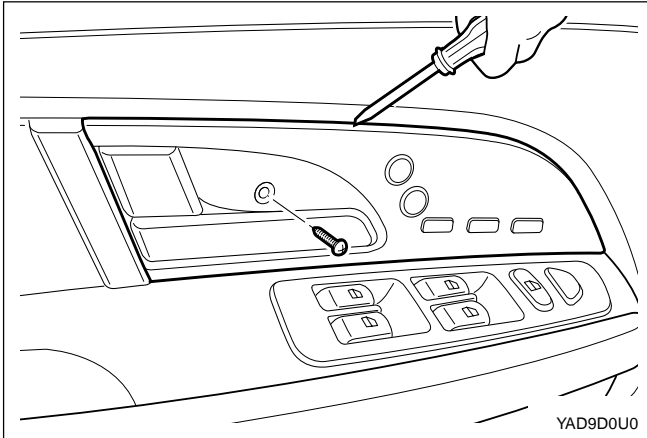
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران

POWER WINDOW**Components**

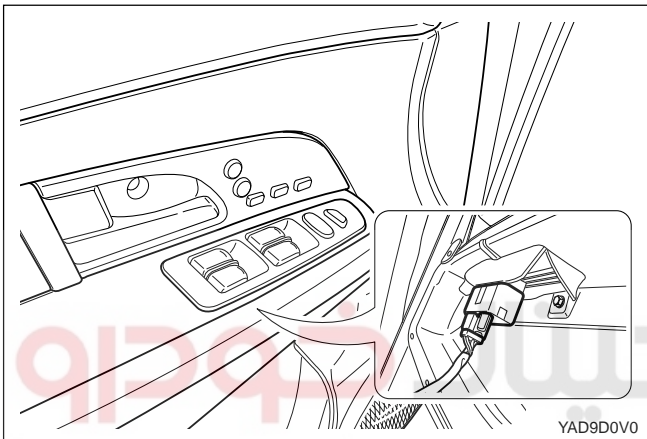
- 1 Power Window Switch Of Passenger Seat
- 2 Power Window Switch Of Rr Seat (LH)
- 3 Power Window Switch Of Rr Seat (RH)
- 4 Power Window Switch Of Driver Seat

- 5 Window Regulator
- 6 Window Motor
- 7 Window

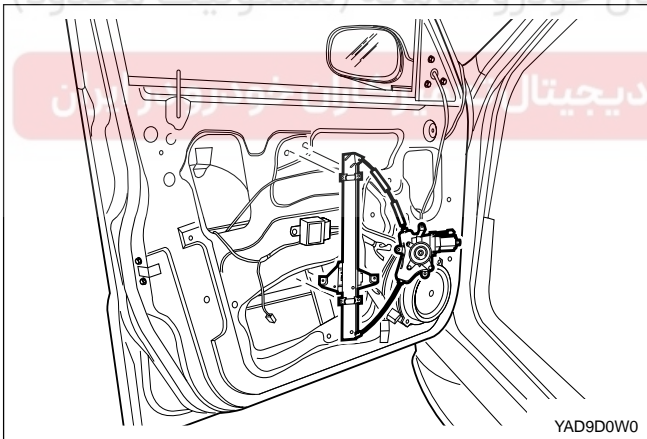
9D-62 BODY ELECTRICAL

**Removal and Installation**

1. After inserting switch of window in the door handle, separate grip of fixing hook.



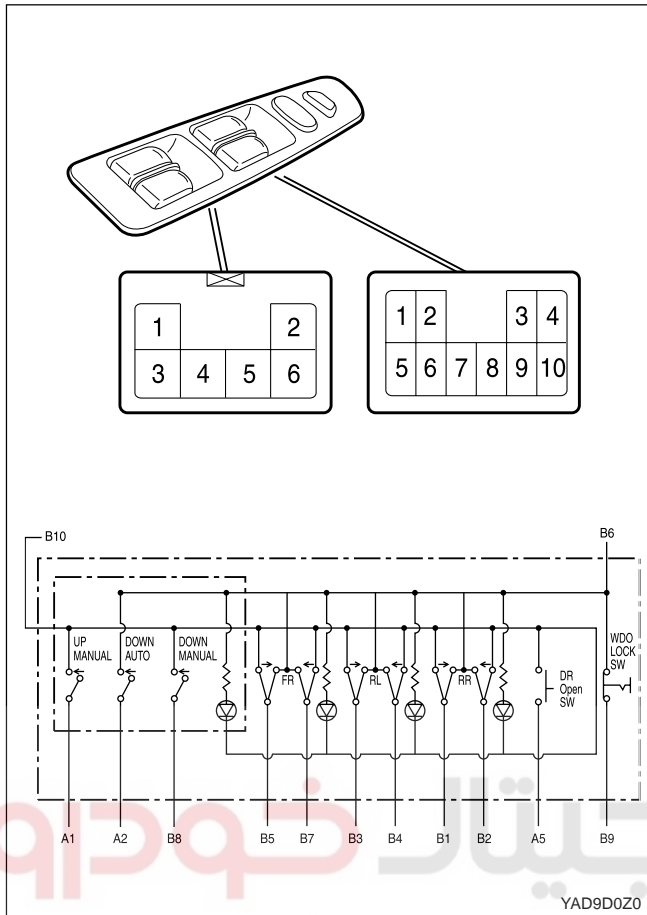
2. After connector of window switch is separated, remove window switch assembly.



3. Remove trim of door and seal.
4. After window glass is removed, remove regulator assembly.
5. Remove motor of window from the regulator which is separated.
6. Install the reverse order of removal.

Check and Repair

Main switch of power window



YAD9D0Z0

Ter	FRT Left					FRT Right			
	A1	A2	B6	B8	B10	B5	B6	B7	B10
SW Pos Up	○				○	○	○	○	○
Down			○		○	○	○	○	○
Auto Down		○	○						

Ter	RR Right				RR Left			
	B1	B2	B6	B10	B3	B4	B6	B10
SW Pos Up	○		○	○	○	○	○	○
Down	○		○	○	○	○	○	○
Auto Down								

YAD9D0X0

1. After main switch of power window is removed in the driver seat, check that applying an electric current of each terminal.

Pos	Ter	B9	B6
Unlock		○	○
Lock			

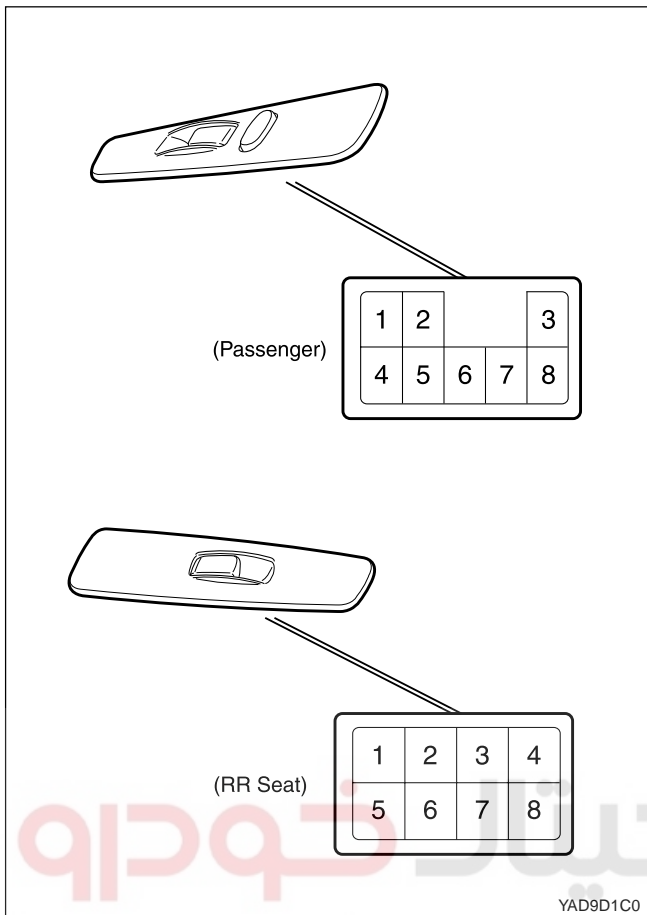
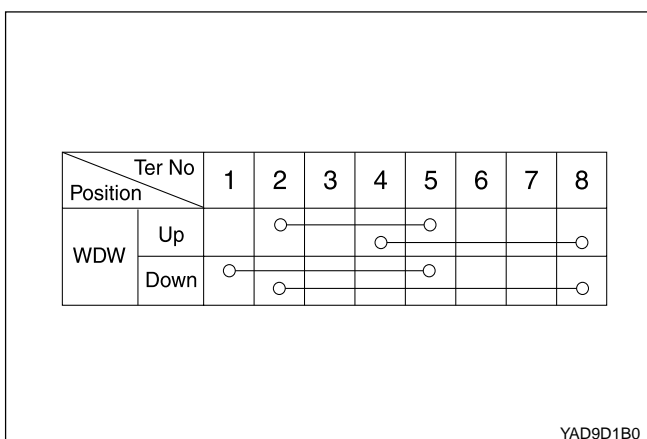
YAD9D0Y0

2. Lockong system of window.

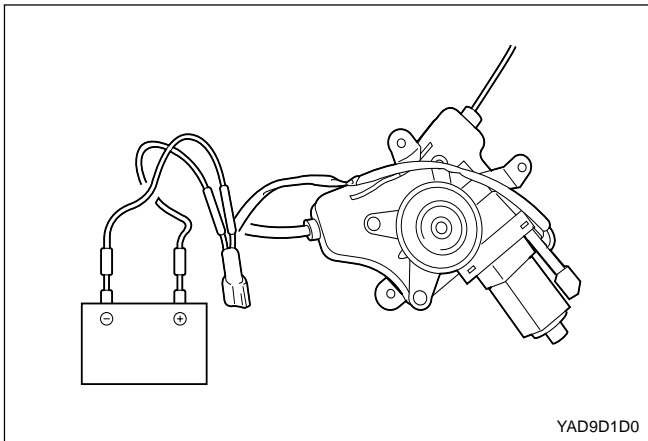
9D-64 BODY ELECTRICAL

Serve switch of passenger set and rear seat

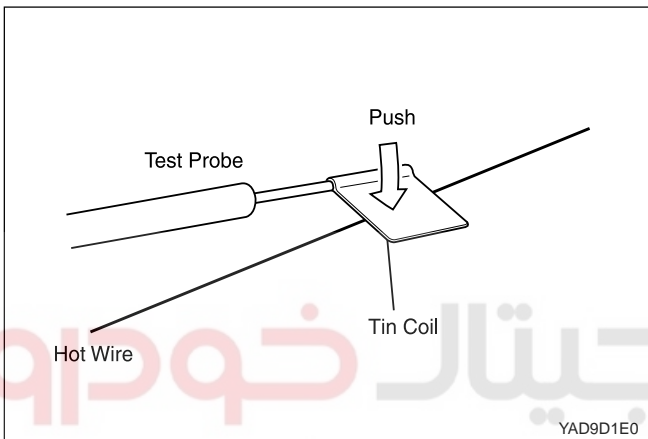
1. After switch is removed, check that applying an electric current of each terminal.

**Passenger seat****Rear seat**

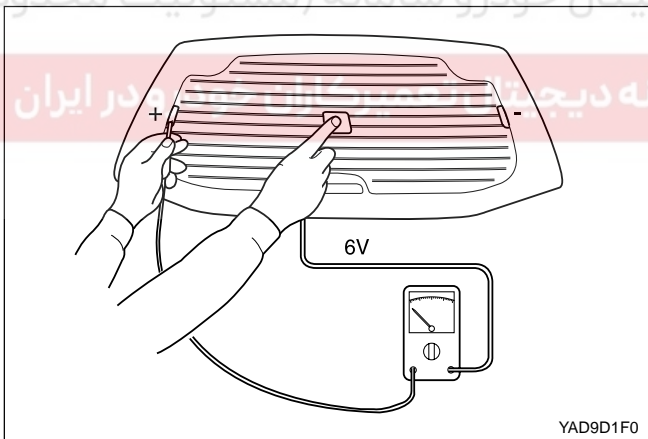
BODY ELECTRICAL 9D-65

**Check motor of power window**

After terminal of motor is connected, check that motor is operating softly, and then change pole of current, motor is operating to the reverse direction softly, if motor is operating unnormal, and then replace motor.

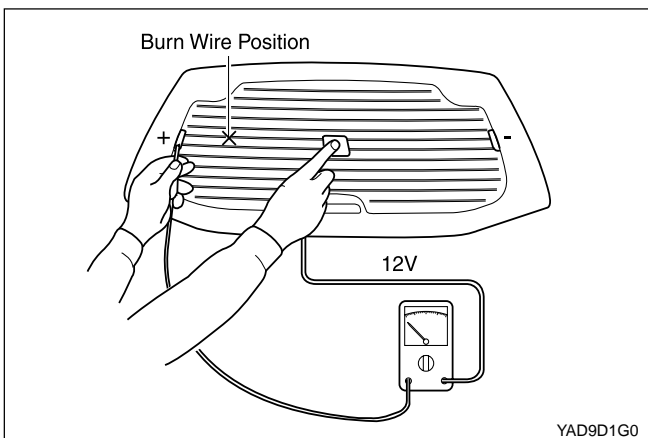
**Check rear window and defogger of quarter glass**

Notice: It is prevention for the defogger not to have a impact, so after taping foil of tin at the end of tester, foil of tin is moving along with line of grid for checking the circuit open or not.



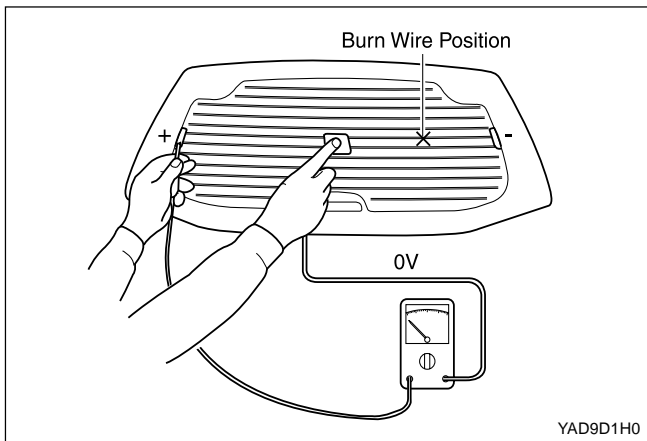
1. At the state of idling, after switch of defogger is turned on, check the below description.

1) After turn switch of defogger on, measure voltage of defogger with voltmeter in the center of glass, if value of voltage is 6V, heater line of rear window is normal.

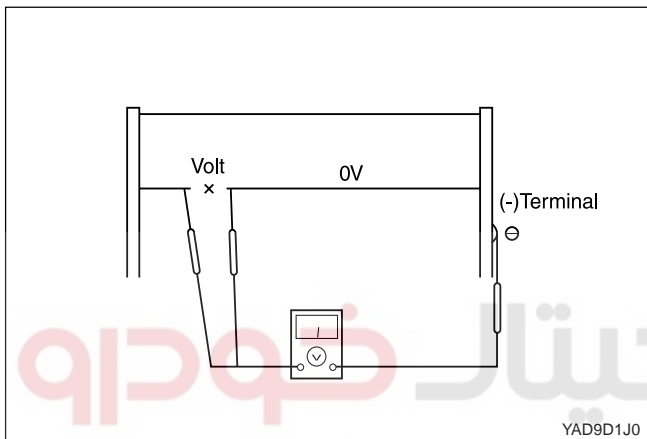


2) If defogger is damaged by a fire between center and positive terminal, value of voltage is indicated 12 V.

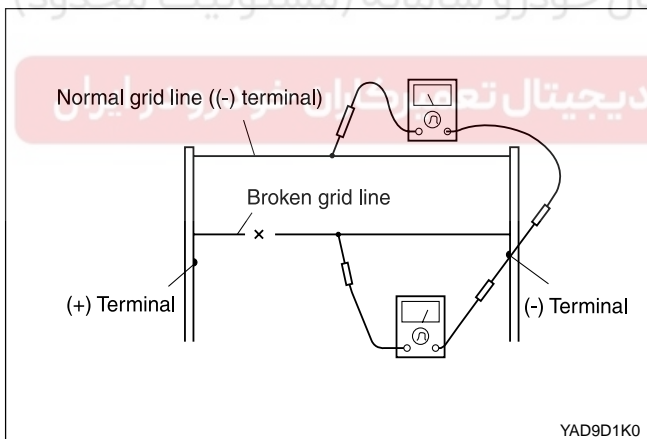
9D-66 BODY ELECTRICAL



3) If defogger is damaged by a fire between center and negative terminal, value of voltage is indicated 0 V.

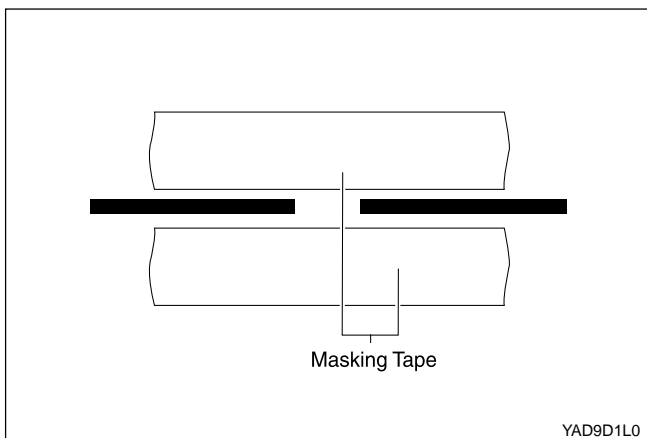


4) Lid of tester is moving into the section which is assumed circuit open, after measuring circuit open look for the section of 0 V, voltage which is changed in the section, which is open of circuit.



2. After turn switch of defogger off, check the below description.

Using voltmeter, measure resistance of each defogger in the center of grid line, resistance between the same terminal and defogger orderly. Broken section of defogger is 2 times rather than other the section of defogger, section which is impacted with the rapid change of resistance.



Method to repair grid line of defogger

After being prepared, repair section of defogger which is broken.

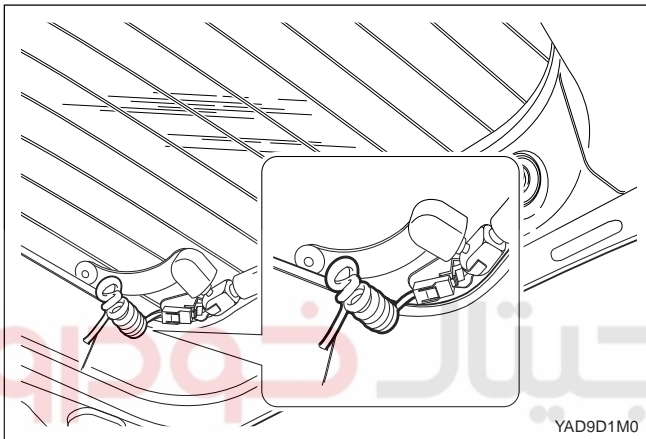
- 1) Paint of applying electric current
- 2) Thinner of paint
- 3) Masking tape
- 4) Alcohol

BODY ELECTRICAL 9D-67

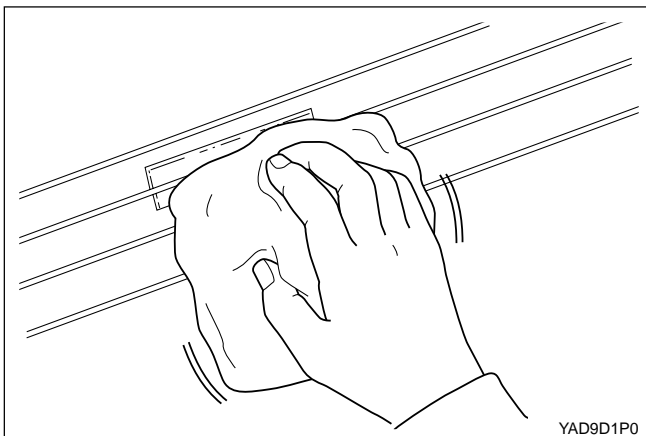
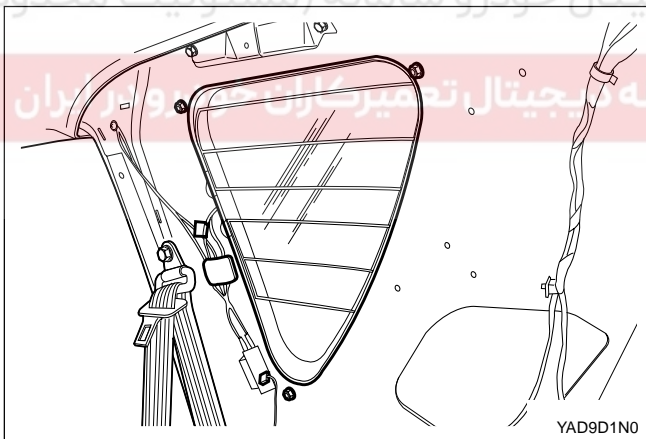
5) Slim brush

Clean up the section of defogger which is broken, indicating like left picture, with the state which is sticking masking tape, clean up with alcohol. After mixing between paint of applying electric current and thinner per interval of 15 minutes, paint 3 times. Before power is supplying, pull tape out of the section broken, to finish up better, after drying up completely (approximately after one day), remove the edge painting unnecessary with knife.

Notice: After repairing, clean up glass with the soft towel, grid line with the towel wet.

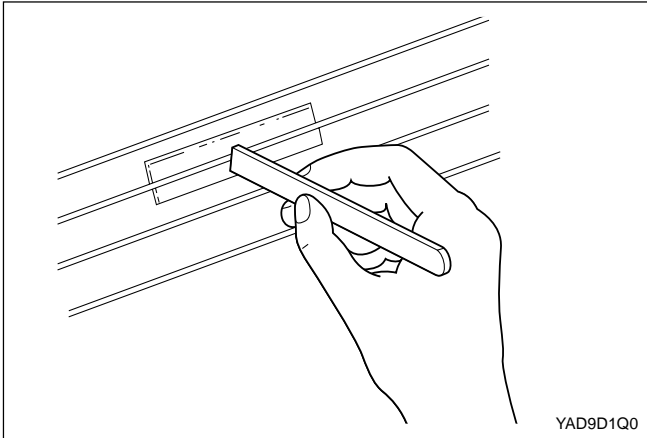


1. Disconnect cable of negative terminal of battery.
2. Disconnect defogger connector of tail gate.

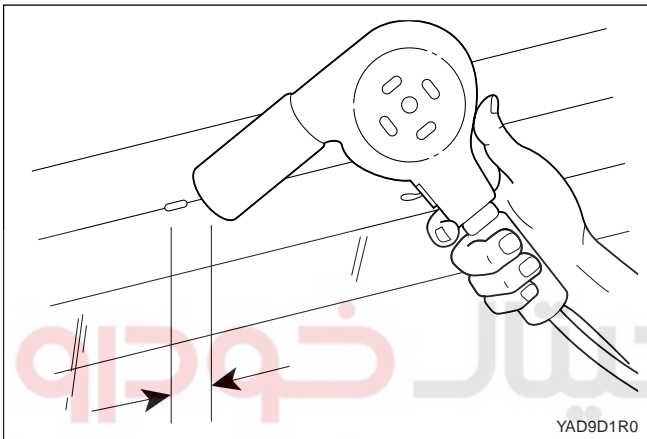


3. After checking grid line, scraping approximately 6 mm to both section from disconnection of a line with wooden spoon, clean up these section, a kind of cloth wet with alcohol.

9D-68 BODY ELECTRICAL



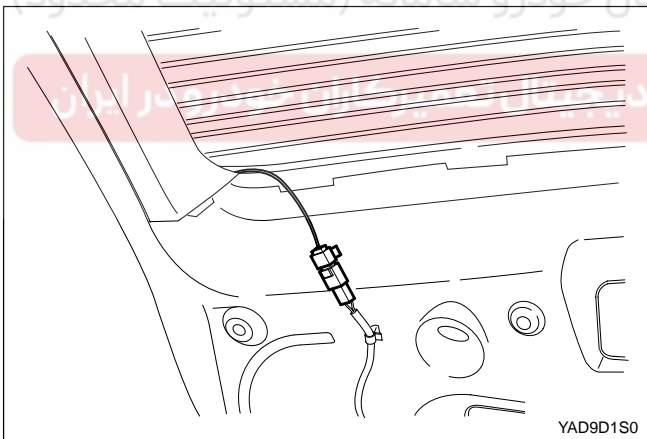
4. Attach tape of repair of grid line properly.
 - Attach tape to have a same width with grid line.
5. Spread material of repair with wooden spoon.
6. Remove tape carefully.



7. Heat up the section which is repaired, keep distance 25 mm from this section, with drier below 149°C for 1-2 minutes

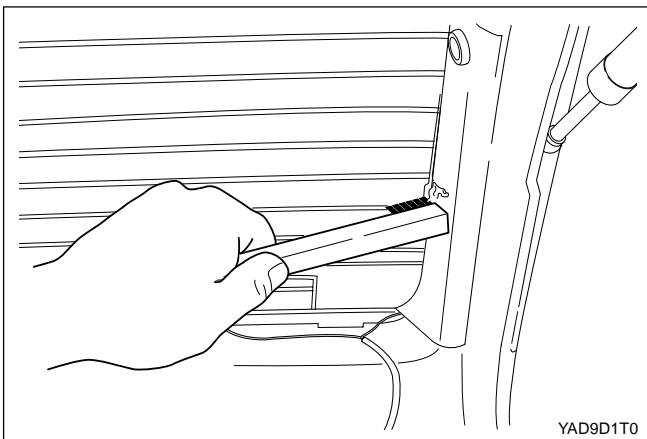
Notice: Repair material of grid line dry up with heating, while is heating repairing section trim which is linked should be protected from heating, pay attention to deformation of interior trim

8. If grid line of repairing is discolored, after spreading coating of paint of iodine on section discolored, if get spreading out of grid line, after half hour is passed, clean up grid line with soft wiper.



9. Check if grid line is repaired or not, operate glass defogger of back door.

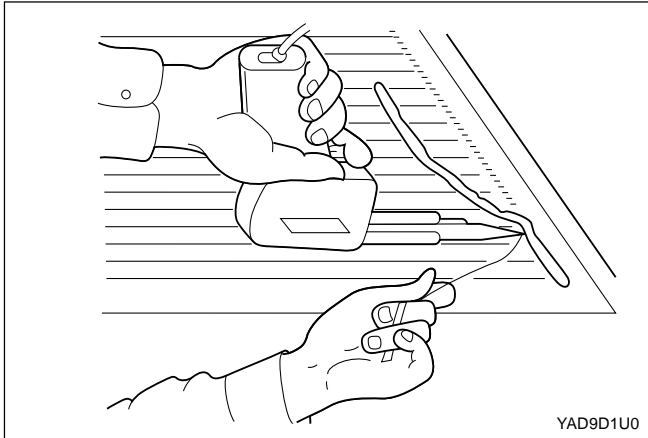
Notice: Until repair material is dried up completely, this is needed 24 hours at least, section repaired should be protected from unnormal material.

**Repair of defogger of tail gate**

Copper line of glass defogger have reinstallation available with soldering, soldering consists of 30 % silver solder and rosin solvent

1. Disconnect negative cable of battery.
2. Scrape the around section of repair with wooden spoon
3. After spreading on the copper line, clean up on the section which is repaired with brush.

BODY ELECTRICAL 9D-69



4. Put soldering on the the end of soldering gun.
5. If copper line is repaired with soldering, for copper line not to overheat, this work should be repaired under limit of temperature which can melt solder.

دیجیتال خودرو

شرکت دیجیتال خودرو سامانه (مسئولیت محدود)

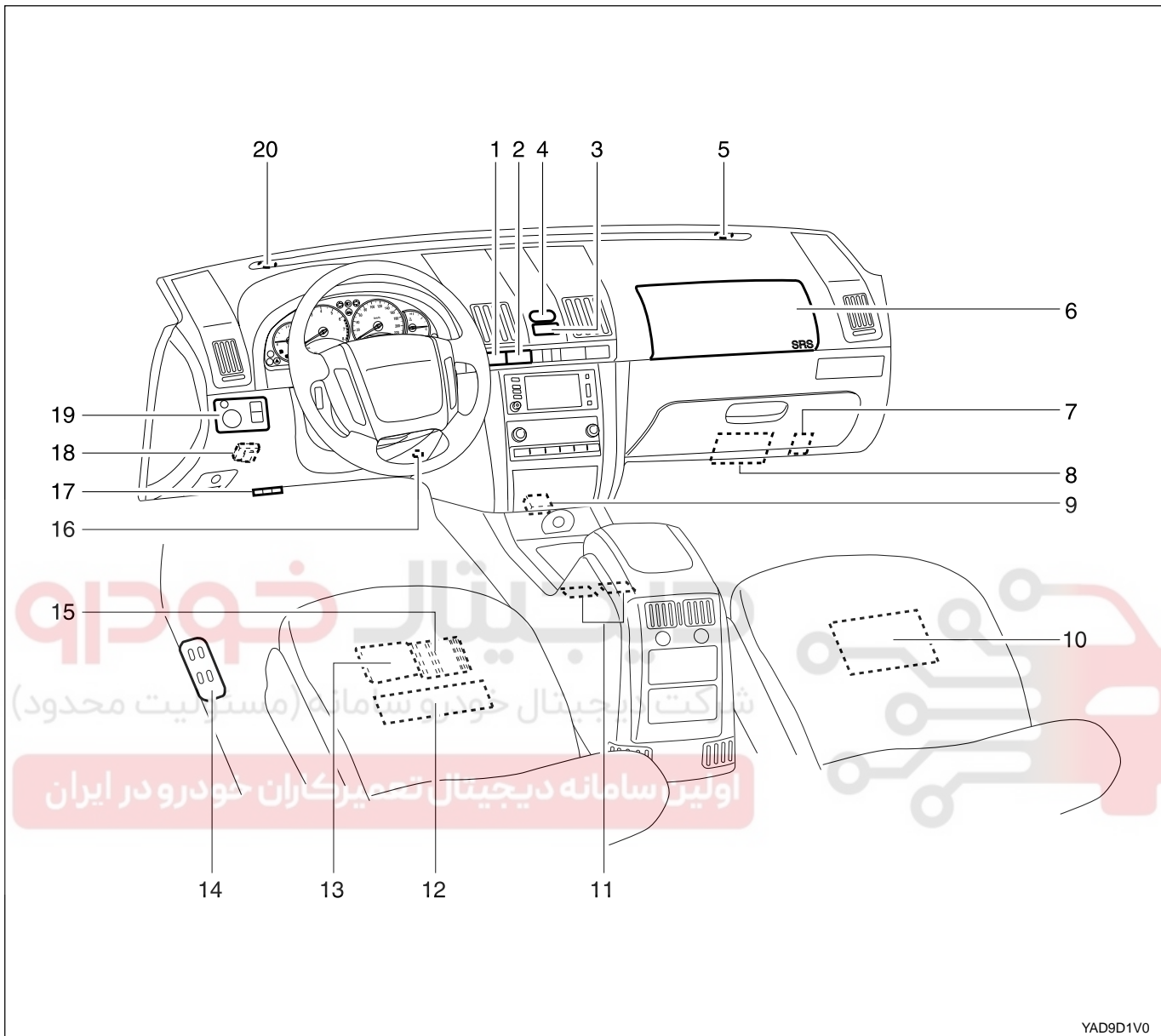
اولین سامانه دیجیتال تعمیرکاران خودرو در ایران



9D-70 BODY ELECTRICAL

SWITCH AND ELECTRICAL SYSTEM

Components

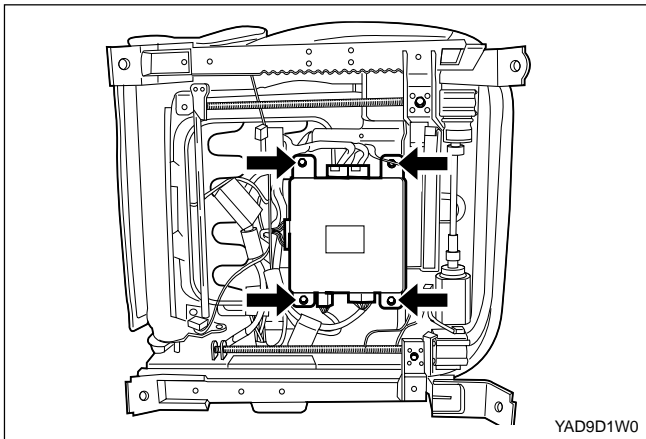


- | | |
|---------------------------------|--|
| 1 Defogger Switch | 11 Switch of Seat Warmer |
| 2 Front Switch of Fog Lamp | 12 Unit of Seat Position and Seat Warmer |
| 3 Digital Watch | 13 TCM |
| 4 Switch of Hazard Warning Lamp | 14 Switch of Position Memory |
| 5 Sensing Unit of Auto Lighting | 15 TOD, TCCU |
| 6 Air Bag of Passenger | 16 Internal Sensor of Temp |
| 7 Unit of EGR | 17 Connector of Self Dignosis |
| Unit of OVPR | 18 Stics / Rekes |
| 8 ECM | 19 Fold Switch of Side Mirror |
| 9 SDM | 20 Sensor of Sun |
| 10 Navigation System | |

YAD9D1V0

SSANGYONG Y200

BODY ELECTRICAL 9D-71



Description of System

Unit of seat position and seat warmer

This unit is located on the lower section of passenger which controls driver seat and out side mirror manual operation, put in memory, function of returning and also has a function which warm up seat and fold up outside mirror.

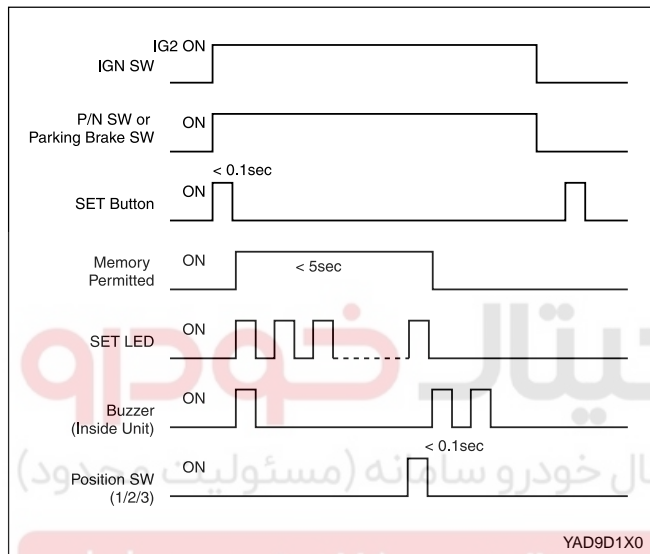
Function of Operation

Type	Description	Specification
SEAT Regardless of ignition switch	Operating voltage	DC 11 - 15 V
	Range of operating temp	-30 °C - 80 °C
	Operating speed of seat	Slide 20 ± 7 mm/sec
		Tilt 10.6 ± 5 mm/sec
		Height 7 ± 2 mm/sec
	Operating distance of seat	Slide 228 ± 3 mm
		Recline 23° ↔ 0 ↔ 48°
		Lift 30 ± 3 mm
	Operating current (at 13.5 V)	Slide 7 A
		Tilt and lift 8 A
Heater switch of seat	Rated load	DC 12 V / 1A
	Range of operating temp	35 °C - 45 °C
	Force of switch operation	0.3 - 0.7 kgf
Outside mirror	Angle of up and down	-8 ° - 8 °
	Angle of left and right	-8 ° - 8 °
	Angle of folding	± 67 °

9D-72 BODY ELECTRICAL

Seat and Out Side Mirror, With Memory

Part of function		Set memory	Release mory
Seat	Slide	1. Condition: If ignition is "ON" position of selector lever is "P and N 2. Parking brake is "ON" 3. Switch of set is "ON" 4. Switch of 1/2/3 is operating within 5 seconds	1. After switch of set is "ON" time is passed more than 5 seconds. 2. While switch of seat or switch of outside mirror (manual operati on is set) 3. Ignition switch is "OFF"
	Recline		
	Lift (front/rear)		
	Warmer (driver/passenger)		
Outside mirror	Up and down		
	Left and right		

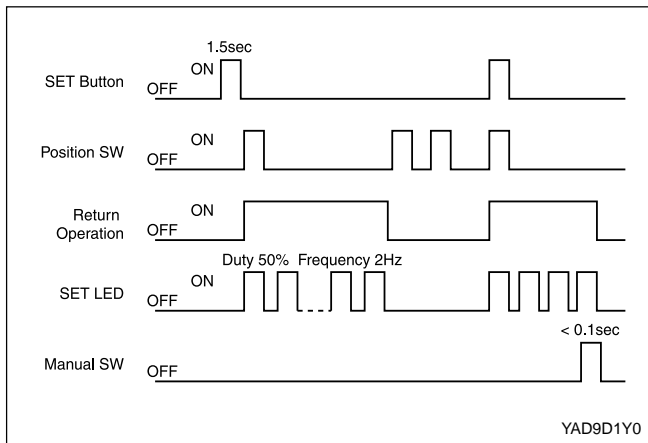


The characteristic of operation.

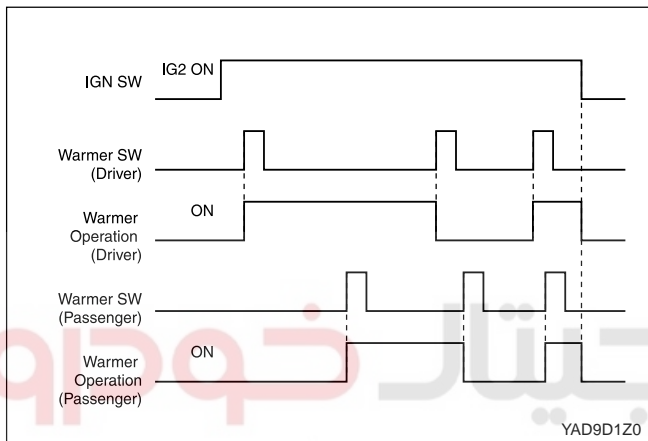
Function of Memory Return

Item	Description
Operation condition	1. Position of selector lever is " P and N on condition that, ignition switch is "ON" 2. Automatic vehicle: P/N or parking brake is "ON" 3. Manual transmission : parking brake is "ON" 4. Memory return is operating at the state of stop (vehicle speed : 0 km/h).
The state of operation: Another condition is set under function of memory is returning	1. If position button is operating while memory is returning, memory is returnng as memory is set on before. 2. While memory is returning, button of stop is set, return operation is stoping immediately.

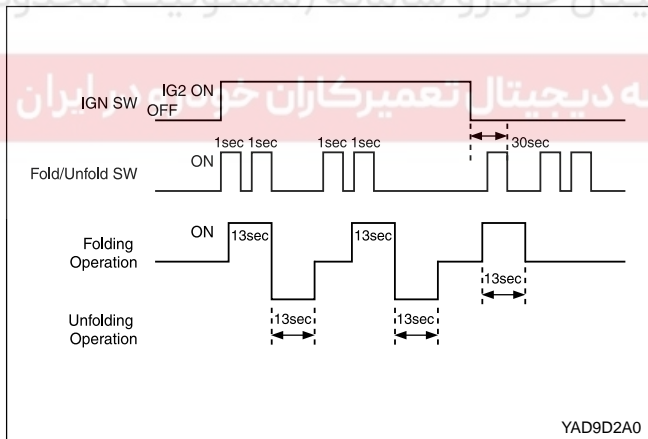
BODY ELECTRICAL 9D-73



The characteristic of operation

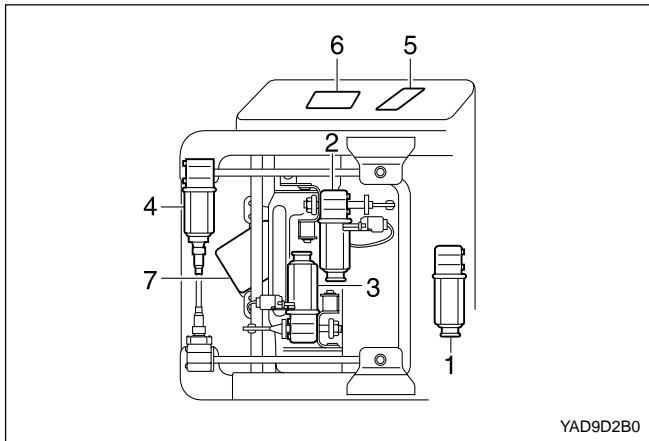


Function of outside mirror(folding /unfolding)



Function of seat warmer

9D-74 BODY ELECTRICAL

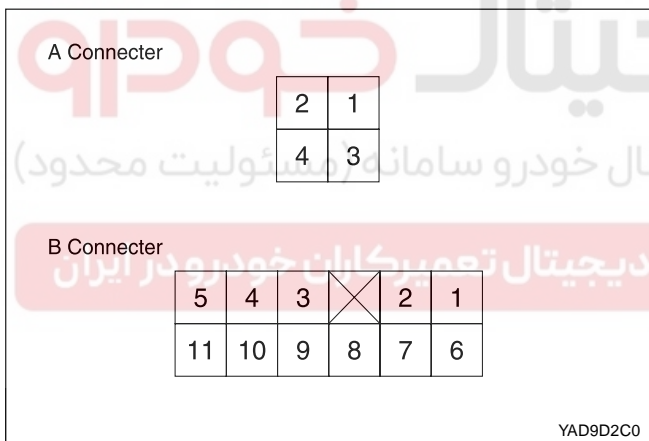


- | | |
|---------------------------|--|
| 1 Slide Adjusting Motor | 5 Driver Power Seat Recline Switch |
| 2 Height Adjusting Motor | 6 Driver Power Seat Switch (Slide, Height, Tilt) |
| 3 Tilt Adjusting Motor | 7 Seat Heater Control Unit |
| 4 Recline Adjusting Motor | |

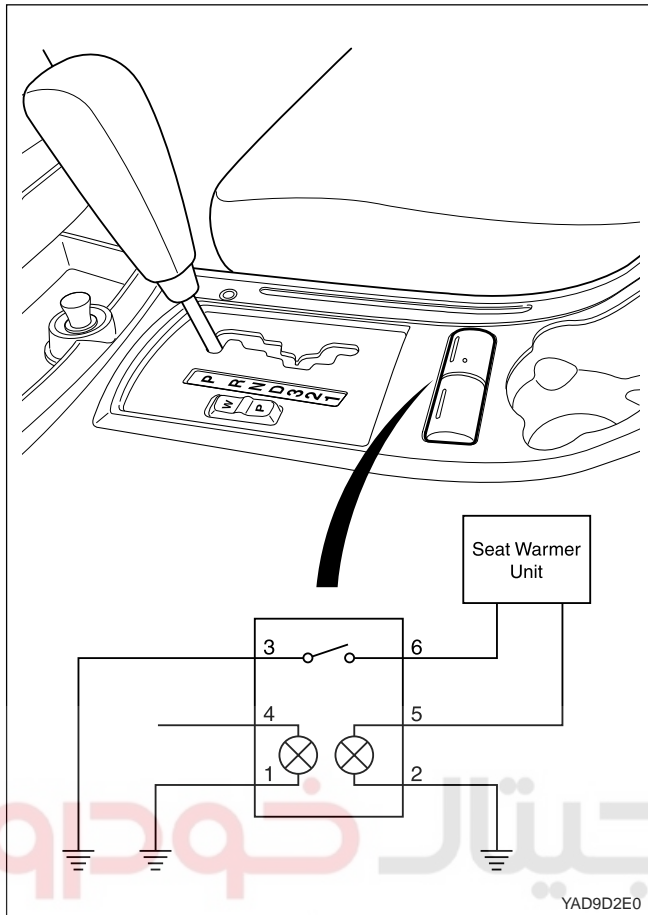
Power seat

Connector and connected circuit

NO.	Size / color	Connected circuit
A1, A2	BW	Battery
A3, A4	BLACK	Ground
B1	WB	Slide
B2	Y	Slide
B3	GB	Tilt
B4	RG	Tilt
B5	BY	Recline
B6	GY	Height
B7	BR	Height
B11	GB	Recline



BODY ELECTRICAL 9D-75

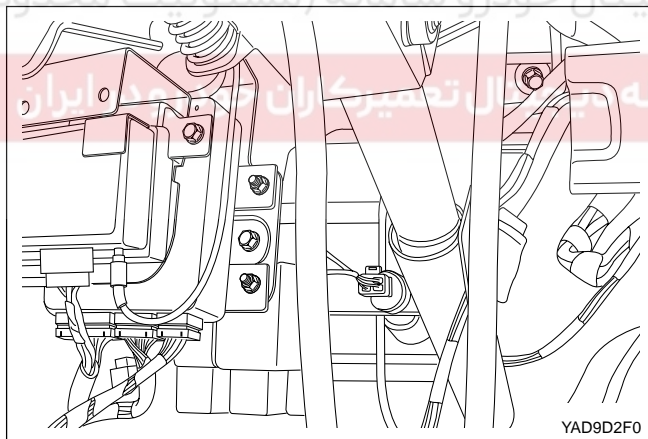


Seat warmer switch

Connected circuit

P	T	ON	OFF
(SIG) - 6		○	
(-) - 3		○	
(+) - 5		○	
(IND) - 2		○	
(ILL+) - 4		○	○
(ILL-) - 1		○	○

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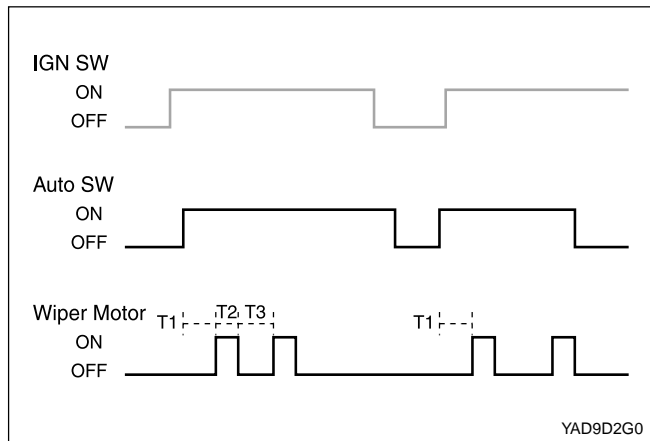


Stics

Summary

Stics which is electron control unit, has the function of sixteen, if stics is unnormal at the sensor or load, unit of stics has self –diagnosis.

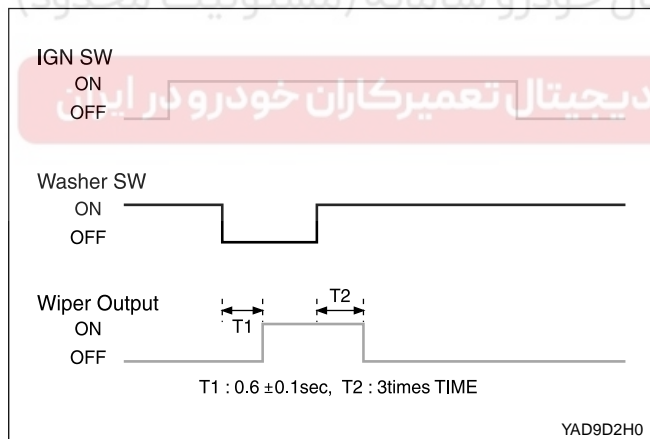
9D-76 BODY ELECTRICAL



FUNCTION OF OPERATION AND THE CHARACTERISTIC

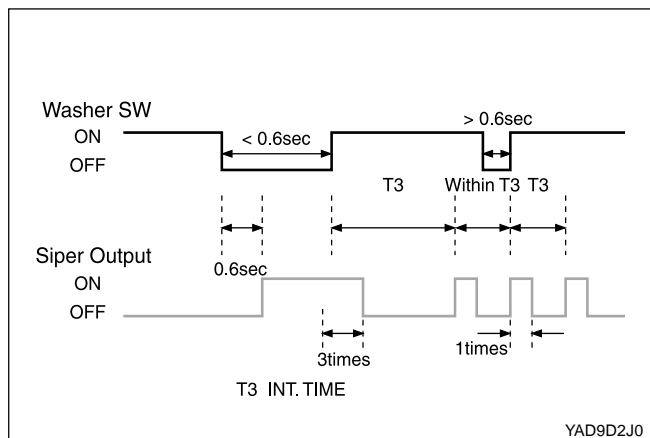
Intermittent Wiper of Velocity Induction Type

1. Intermittent wiper of velocity induction type which is linked according to velocity of vehicle, intermittent time is changed automatically a kind of wiper system, this one is controlled by below switch of control.
 - Auto switch : which is selected to the intermittent mode.
 - Time control switch of the intermittent : this one control the intermittent time
 - Intermittent time is set (at 0 km/h) : 2.6 ± 0.5 sec ~ 18 sec ± 2 sec
2. After IGN 2 switch is "ON", turn auto switch on, or after turn auto switch is "ON", turn IGN2 on, immediately, velocity linking mode is operating.

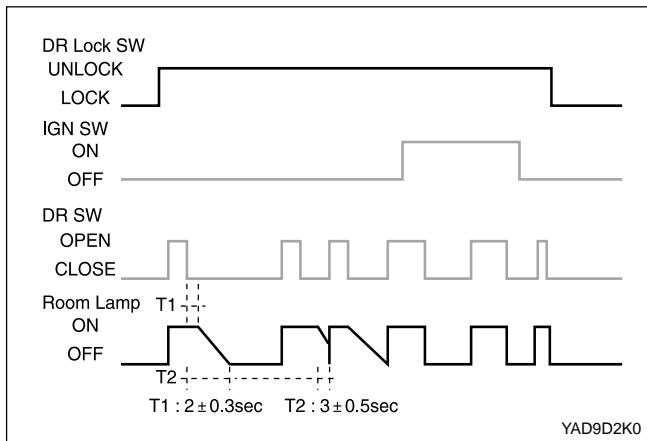


Washer linking wiper

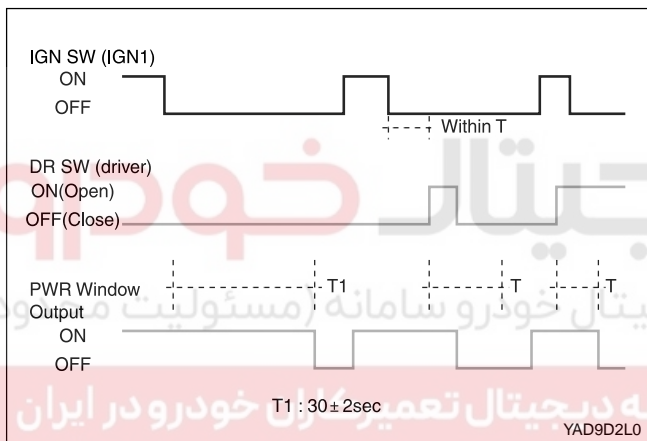
1. As ignition switch is turning on, if washer switch is "ON", after 0.6 second, wiper is operating, after washer switch is "OFF", wiper is operating 3 times and then wiper is turned "OFF"
2. While the intermittent wiper is operating, washer switch is turned on more than 0.6 seconds and then washer linked wiper is operating, if washer switch is turned between 0.2 and 0.6, such as MIST wiper, wiper is operating only once



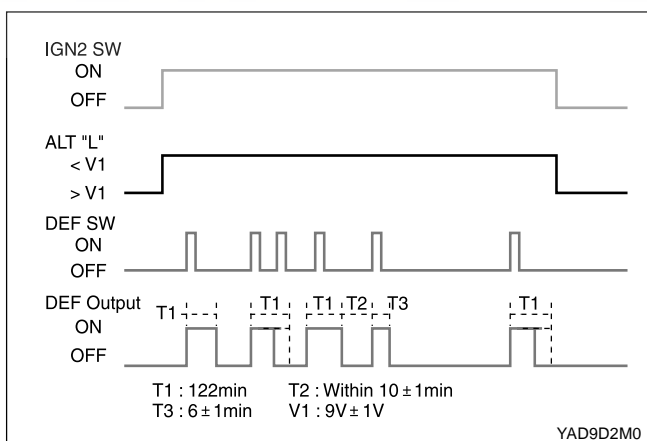
BODY ELECTRICAL 9D-77

**Room lamp of light sensitive type**

1. As switch of room lamp is set on the position of door is linked operation, release lock switch of driver or lock switch of passenger, turn the switch of ignition (IGN2) "OFF", and then open up door, lamp of room is turned on, after door is closed, after 2 seconds, light is "ON" and then gradually is sensing light, after 3 seconds approximately, should be turned off completely.
2. If switch of ignition (IGN2) is turned "ON" or lock switch of driver seat or passenger is set free, open up door and then the light is turned on and if door driver seat and passenger are closed, and then, immediately should be turned off (Disregard time of turning on which is less than 0.2 seconds).
3. Capacity of time resolving is more than 32 stem per 1 seconds.

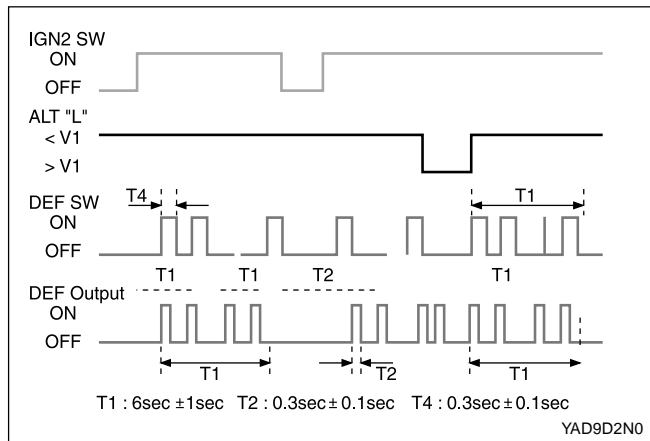
**Power window of time delaying**

After turn ignition switch (IGN1) OFF, during 30 seconds, switch of power window is operating available and within this time (30 seconds) if door is opened up, from at that time, time is extending for 30 minutes, if door is closed within a time extended, power is "OFF".

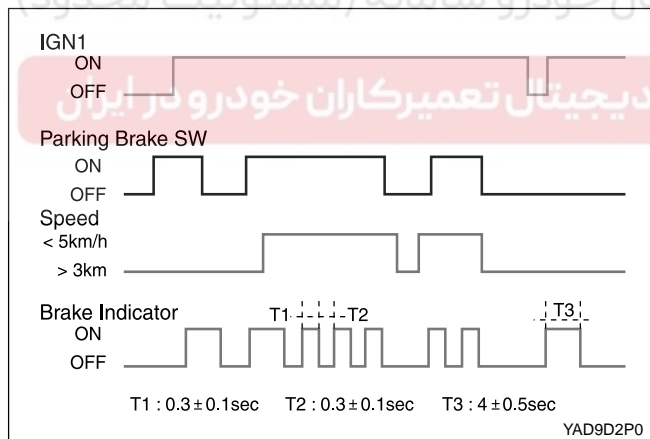
**Function of defogger timer**

1. At state of engine which is operated, if switch of defogger is operated, defogger is operated (12 minutes).
2. Under defogger is operating, if switch of defogger is reoperated, operating is stopped.
3. After operation of defogger is finished, within 10 minutes, again switch of defogger is turned on only once this one is operated for 6 minutes. (except that switch of defogger is turned off)
4. If ignition switch (IGN2) is "OFF" or if the VOLT of L terminal of alternator is less than 10 V, operating of defogger is stopped.

9D-78 BODY ELECTRICAL

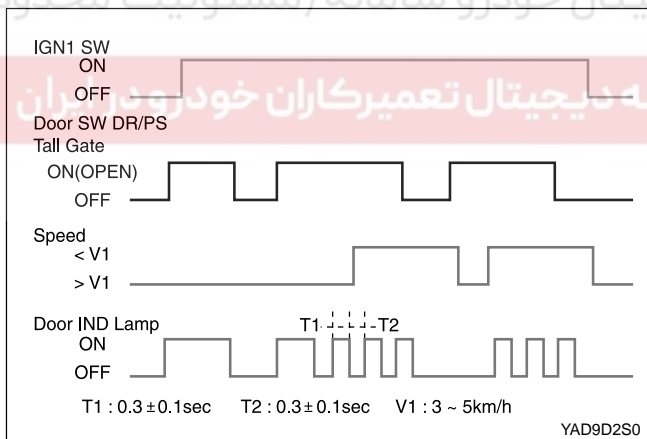
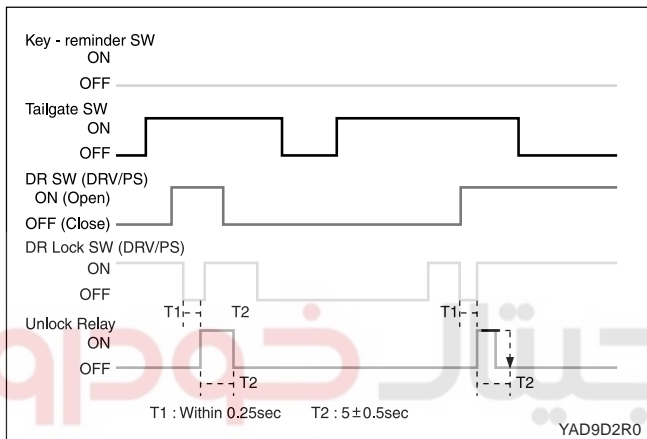
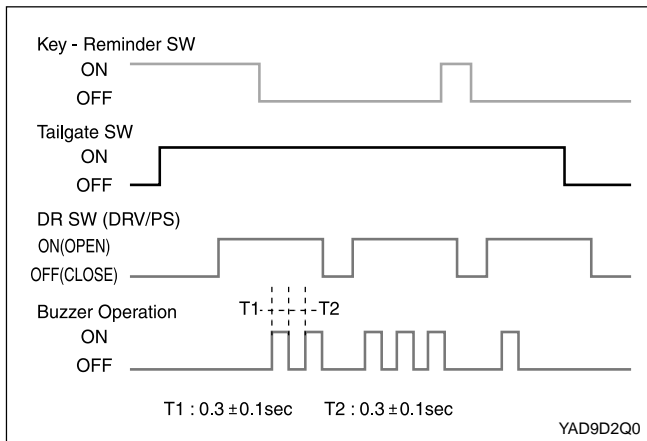
**Warning lamp of no wearing seat belt**

1. If switch of ignition is turned on, warning lamp of seat belt is lighting on for 6 seconds with 0.6 seconds of frequency duty 50 %, chime bell is sounding for 6 seconds with 0.6 seconds of frequency duty 50 %.
2. Within 6 seconds, if switch of ignition is "OFF", chime bell is not operated immediately.
Within 6 seconds, if switch of seat belt is "OFF", chime bell is not operated immediately, and warning lamp of seat belt is sounding for 6 seconds.
3. After seat belt is worn under ignition is "ON", on the every time that seat belt is taken off, chime bell is always operating.

**Warning lamp of parking brake**

1. Parking brake is pulling under vehicle's stopping, warning lamp is turned "ON", under this situation vehicle is running and then speed of vehicle goes up to 3 - 5 km/h or after speed of vehicle goes up more than 5 km/h if parking brake is pulled, lamp of warning should be turned off (After switch of ignition is turned on, after time is passed more than 1.5 seconds, speed of vehicle should be sensed).
2. While switch of IGN 1 is off in the above number 1, warning lamp of brake is "OFF"
3. While switch of parking brake under the state of "OFF", after key of ING 1 is OFF, as switch of ignition is "ON", after lighting is four times, and then "OFF"
(During lighting of 4 seconds, if key of ignition is "OFF", immediately is turned "OFF")

BODY ELECTRICAL 9D-79



The waring of operating tail lamp

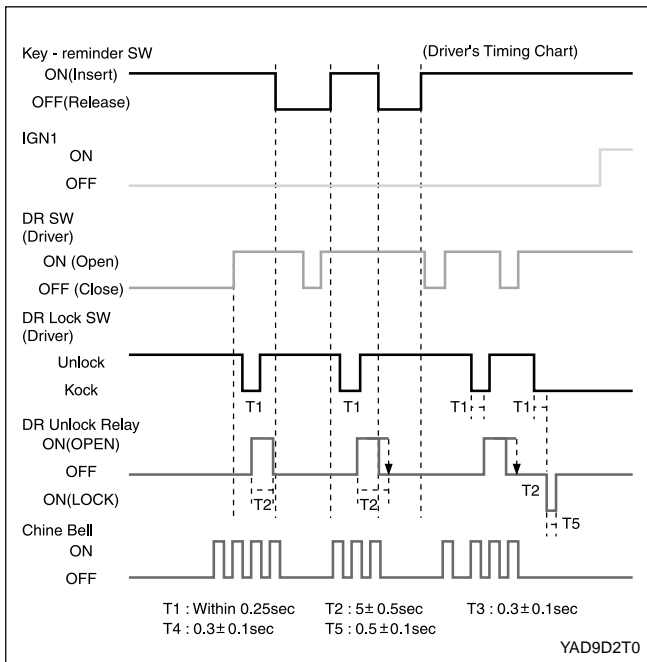
1. If switch of key reminder is "OFF" under the state of operating switch of tail lamp, rekes is also not operating. If there is no the vigilance of robbery or the condition of alarm, under this situation, open up door of passenger seat or driver seat, buzzer is "ON/OFF repeatedly by the frequency of 0.3 seconds.
2. If one of them is getting out of above 1 description, buzzer should be "OFF" immediately.

At this time, if lock switch of driver seat or passenger seat is locked, unlock relay is operating for 5 seconds at this time, if all the door of driver seat and passenger seat are closed or switch of tail lamp is "OFF", relay of unlock is "OFF" immediately.

The waring of opening door

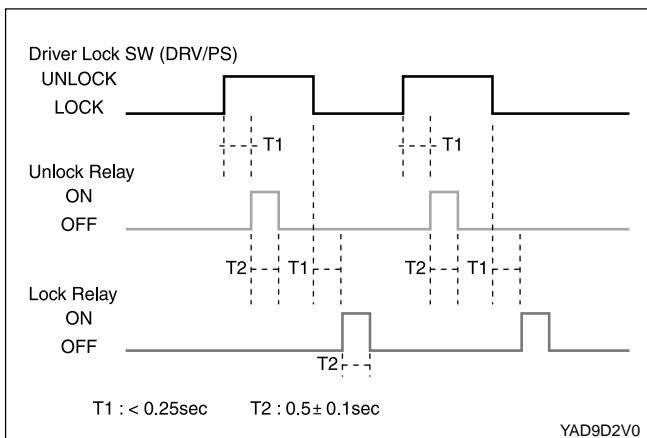
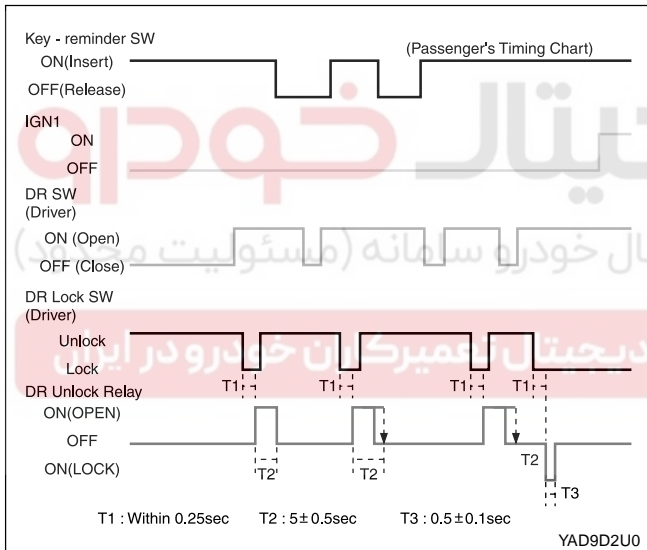
1. At state of warning lamp to the door which is opened, if door is opened up, the state of half closing, if velocity of vehicle is more than V1 (3 km/h – 5km/h), after speed of velocity is more than V1, the state of half closing or if door is opened up, the lamp of warning should be "ON AND OFF" repeatedly. (After switch of IGN 1 is "ON", after the time is passing more than 1.5 second, velocity of vehicle should be sensed.)

9D-80 BODY ELECTRICAL

**The warning of not being pulling key out of key hole**

1. If the switch of ignition is turned on and then open up the door, chime bell is operating, if nob of door lock is locking, nob is up from the original position, door should get back to the state of unlock.
2. This function should not be operated under the state of IGN 1 switch of BEING TURNED ON.

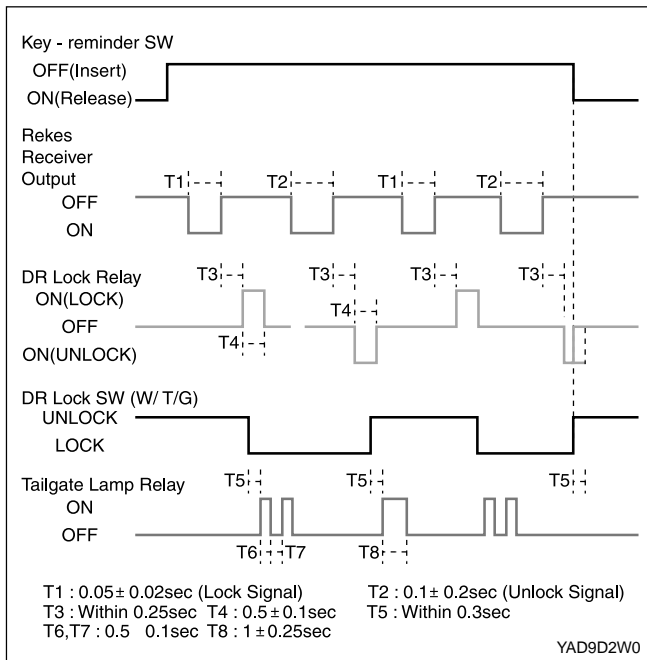
If the key is pulled or door is closed, the signal of operating should be "OFF", should be operated prior to warning lamp of "NOT BEING TURNED OFF".

**Central locking function**

1. If door lock nob of driver seat or passenger seat is downed, all the door are locked, and if door lock nob of driver seat or passenger seat is lifted, all the door are unlocked.

If door of driver seat or passenger seat is locked or unlocked by key at the external area, the same situation will be happen.

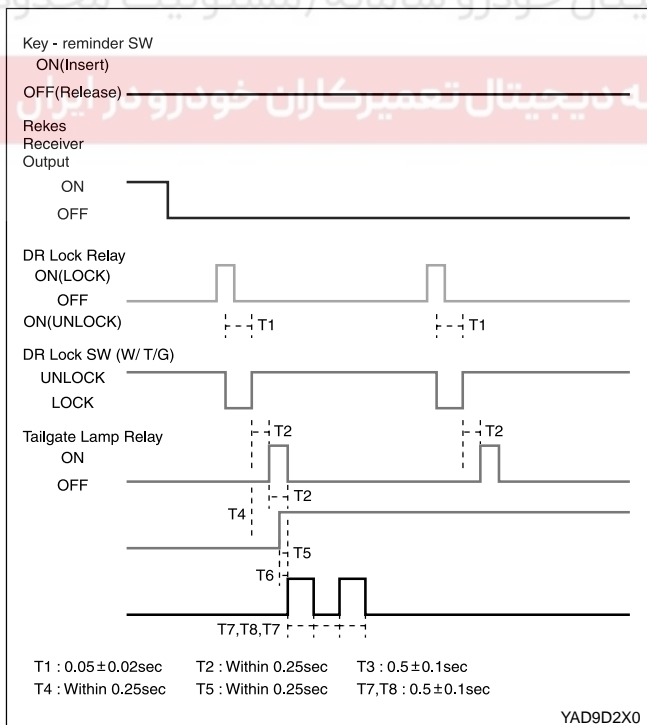
BODY ELECTRICAL 9D-81



Function which is linked with rekes

1. If switch of key reminder is "OFF", all the door are locked or unlocked according to the signal of rekes
2. If the rekes is unlocked, lock switch of driver seat door is locked, unlock relay of driver seat is "ON" for 0.5 seconds(multi-function), and then unlock of rekes is operating, relay of unlock is "ON" for 0.5 seconds.
3. Under the operation of above 2 number, after 0.5 second of operating the unlock relay to the driver seat, lock switch of driver seat door is locked, release function of the multifunction, before battery is "ON/OFF", while unlock of rekes is operating, only relay of unlock is operating.

After unlock is operating, within 30seconds, if opening of door is not operated, after 30 seconds, door should be locked automatically.

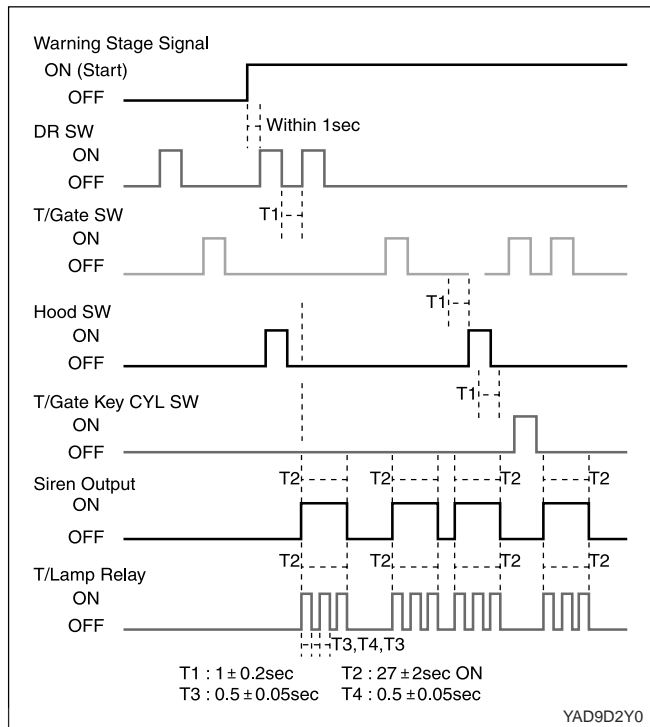


The alarming of robbery

Function of alarming robbery is made a alarming unrecognized method by intruder, which cause buzzer to make a alarming sound and notice to surrounding people, has operating mode as below .

1. set on the situation of vigilance.
 - Setting on the situation of vigilance is available on condition that door is locked by the transmitter of rekes, but if door is locked by key, state of vigilance should not be set.
 - If switch of ignition is removed, under all the door and hood are closed, signal of lock of operation from the receiver of rekes is transferred low speed into high speed, after that, within 0.5 seconds, lock switch of all the door are transferred ON into OFF, after happening of signal, 0.5 seconds later, should be set to the state of vigilance.
 - As the state of robbery vigilance is set on, siren is operating for 0.05 seconds, tail lamp is operating two times for 0.5 seconds.

9D-82 BODY ELECTRICAL

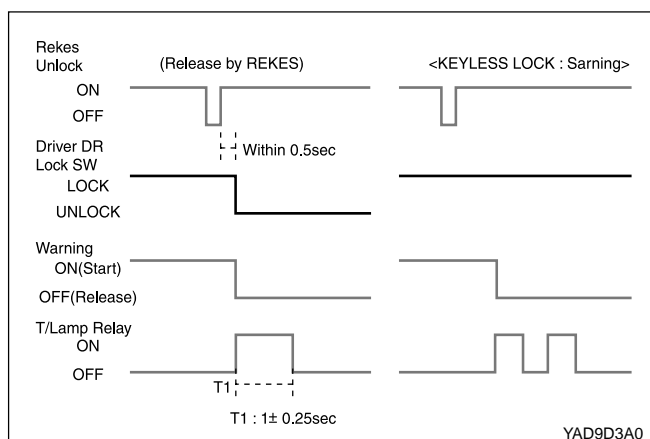
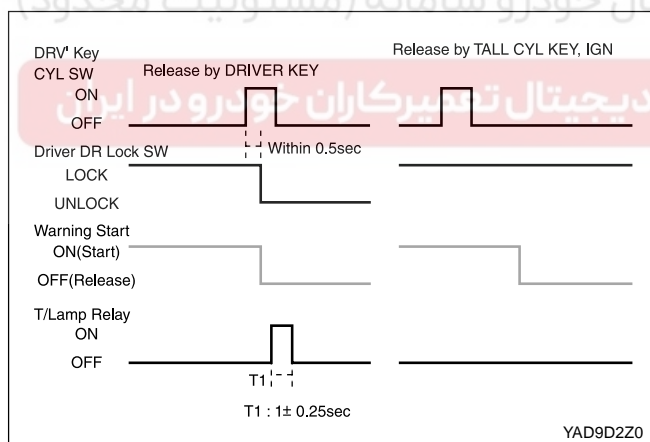


2. operation of alarm

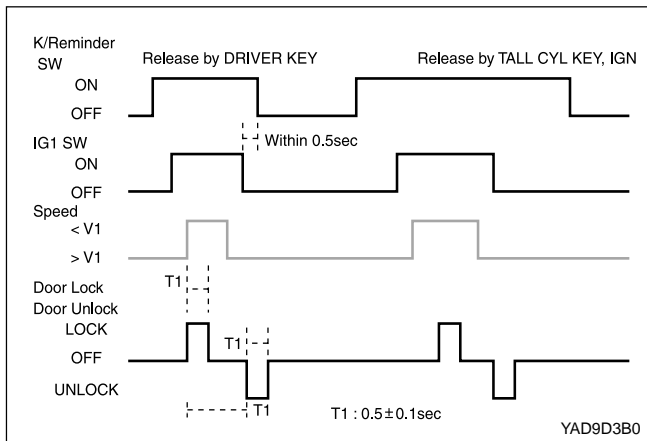
- After the situation of robbery vigilance is set on, not released the situation of robbery vigilance, with all the door, tail gate and hood are closing, after this situation are going on more than one second, if door, tail gate and hood is opened, alarm should be operating immediately.
 - If only one thing among alarm conditions is satisfied, immediately the operation should begin to start, siren is operating continuously for 27 seconds, after siren, condition of alarming is again satisfied, once again siren is operating continuously for 27 seconds.
 - Under the state of vigilance, if only tail gate is opened by key, the state of vigilance should be set on the regular state of vigilance into secondary state of vigilance. (At this time, proceed alarming as open up tail gate, hood, assist and rear door) In other words, while not being releasing condition of vigilance, although switch of tail gate is turned on, alarming is not operating, state of closing tail gate is going on more than one seconds, again back to regular state of vigilance, with siren once, tail lamp is "ON/OFF" two times for 0.5 seconds.
- Under the operation of alarming, if battery is removed, and then if the battery is installed, state of memory which is previously removed gets back, this state will be operating.

3. set vigilance of robbery free

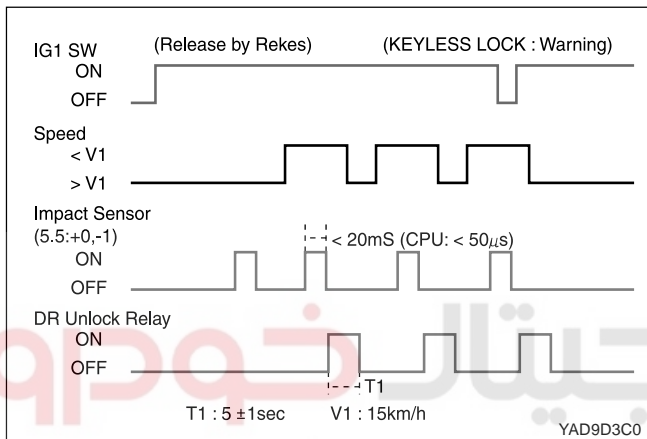
- In case switch of driver key cylinder is unlocked or rekes is unlocked, IGN1 OR IGN2 is turned, under the those condition only, should be set vigilance of robbery free. (while alarming of robbery is turned on, turn IGN1, IGN2 ON, relay of start inhibitor is "OFF", alarming of robbery is continuously operating for remaining times)
- Setting vigilance of robbery free is released by key of driver seat, key of tail gate, unlock of rekes and lock.



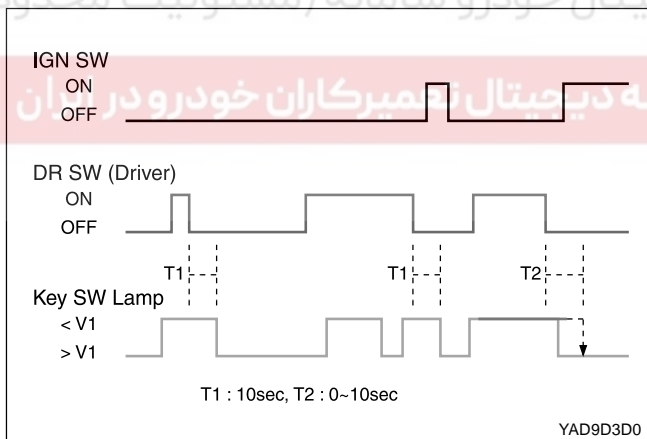
BODY ELECTRICAL 9D-83

**Function of auto door lock**

1. If switch of IGN is turned "ON", and if velocity of vehicle is more than V1(50km/h)all the door is locked automatically,and under this velocity of vehicle, if door is unlocked,but door is automatically locked (after switch of IGN1 is turned, from passing time of 1.5 seconds, velocity should be sensing)
2. After auto unlock of door is operating, should not operate auto lock of door by velocity of vehicle

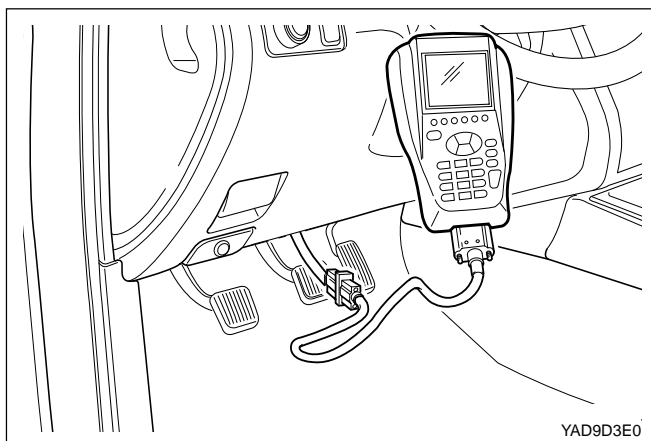
**Function of auto unlock of door**

1. Under turning ignition switch on, while vehicle is running more than 15km/h, if vehicle has a collision with other vehicle, automatically all the door should be unlocked.(After switch of IGN1 is turned on, and then passing time 1.5 seconds, velocity of vehicle should be sensed.)
2. Auto unlock of door with is operating with average of vehicle velocity which is setting for 8 seconds(While velocity of vehicle is reduced)

**Function of key hole which is illuminated**

1. If door is opened under vehicle's stop, as illuminating lamp round key hole, at time of stopping door, is lighting on for 10 seconds, but within 10 seconds, if signal of rekes is operating or if switch is turned "ON", should be turned "OFF"

9D-84 BODY ELECTRICAL



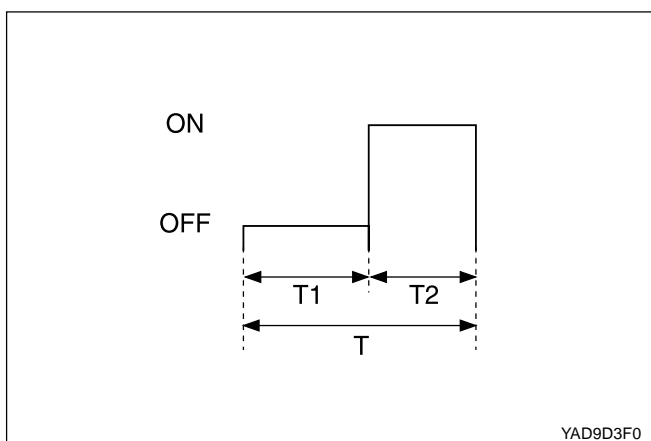
SELF DIAGNOSIS

Summary

After using the service connector which is installed on the instrument panel of lower driver seat, each failure is diagnosed internal unit of stics, can be checked the state of normal or mode of failure.

Method to Diagnose

1. While failure is checking, use buzzer
2. While the switch of diagnosis is turned "ON", (stics of diagnosis socket box : number 7 and ground 1 is connected), the following operation should not proceed.
 - warning : the first step of light is "ON"(buzzer is not operating, lock or unlock of door is not operating)
 - warning of seat belt(chime bell is not operating)
 - warning of key reminder (chime bell is not operating, lock or unlock of door is not operating)
 - central door lock(lock or unlock of door is not operating)
3. While switch of diagnosis is "OFF", function of number 2 should get back to original position
4. While switch of diagnosis is "ON," data which is diagnosed should output only once
5. If switch is operated by operation of other switch, among them, first input data will be output(buzzer is "ON"), and output is "OFF" for one seconds, and remaining input data is proceeding output.



6. Output of buzzer is as following

T1 : 0.3 ± 0.1 seconds

T2: 0.3 ± 0.1 seconds

T: 0.6 ± 0.2 seconds

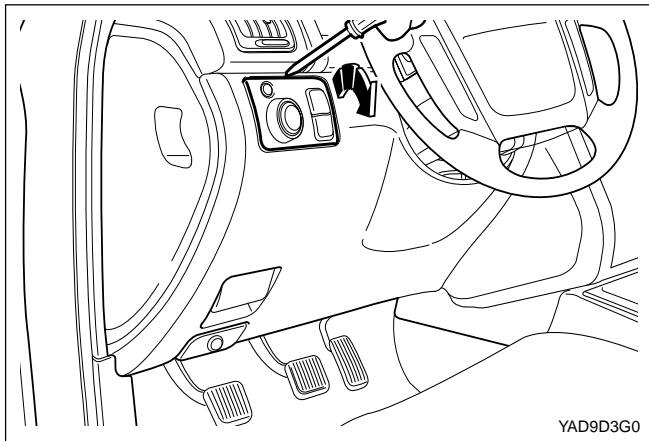
Notice:

- If system is diagnosed, switch of diagnosis should be always "ON"
- While the diagnosis of system is operated, if system is normal, buzzer is coming out, if system is out of order, buzzer is not coming out.

CHART OF DIAGNOSIS

NO	Conditions	Check	Normal	Remark
1	Switch of diagnosis is "ON"	Confirm Of beginning to diagnose	Buzzer,frequency: once	Switch of diagnosis is "ON"
2	Power of battery is supplied	Check battery	Buzzer,frequency: twice	
3	Battery plus: related	Tail gate, rear door lock switch	Buzzer,frequency: once	
4		Driver seat door lock switch	Buzzer,frequency: once	
5		Passenger seat door lock switch	Buzzer,frequency: once	
6		Driver seat door switch	Buzzer,frequency: once	
7		Passenger and rear door switch	Buzzer,frequency: once	
8		Rekes is operating	Buzzer,frequency: once	
9	Ignition switch is operating	Switch of key reminder	Buzzer,frequency: once	
10	Ignition plus related parts is operated	IGN and relay of power window	IGN2 : Buzzer,frequency: twice IGN1: Buzzer,frequency: once Power window: buzzer: Three times	
11		Switch parking brake	Buzzer,frequency: once	
12		Switch of seat belt	Buzzer,frequency: once	
13		Washer switch	Parking of wiper motor: 3 times Switch of washer :once Relay of wiper : twice	
14		Wiper auto switch	Wiper motor parking: 3times Wiper auto switch; once Relay of wiper : twice	
15		Switch of variable volume	Buzzer, frequency: once	
16	IGN, starting plus	ALT 'L'	Buzzer,frequency: once	
17	related parts is	Switch of defogger	Buzzer,frequency: once	
18	operating.	Signal of speed sensor	Buzzer,frequency: once	

9D-86 BODY ELECTRICAL

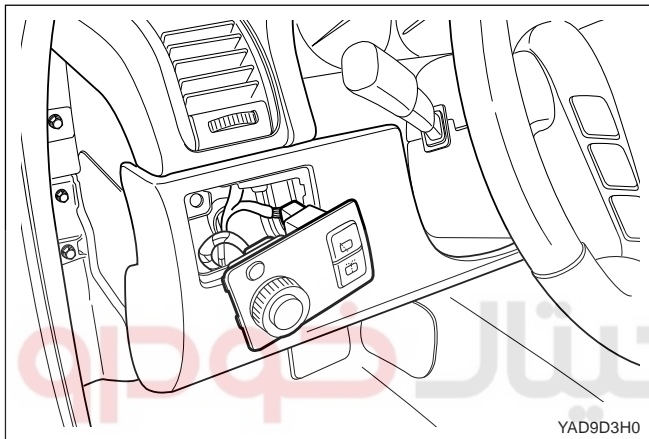


REPAIR OF THE SYSTEM

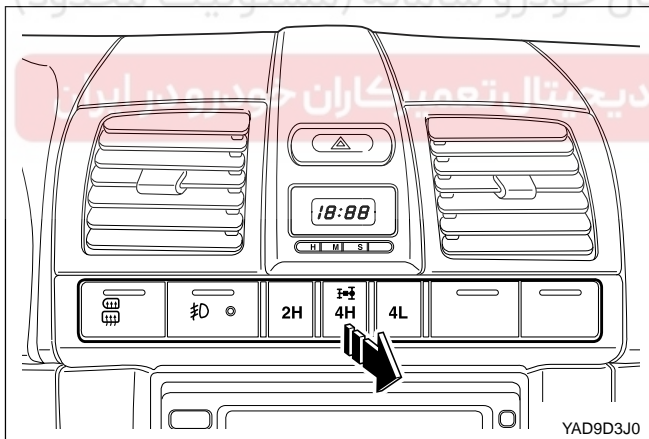
Switch of Outside Mirror

1. Remove upper section of switch (between IP and section of ground) with driver.

Notice: switch is attaching on the upper section



2. After disconnecting the connector, remove switch assembly.
3. Install the reverse order of removal

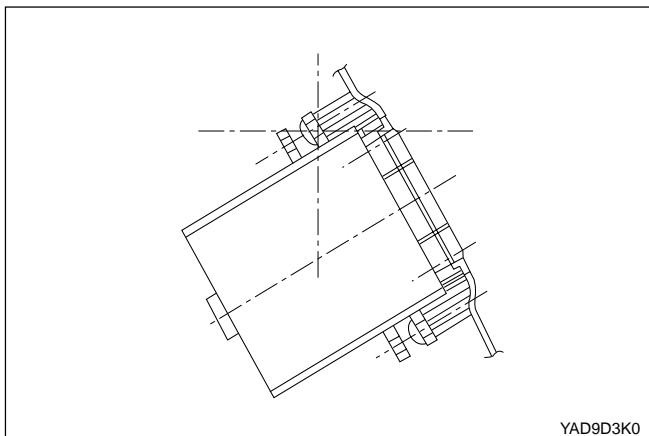


Switch of Center IP

1. After panel of center IP is removed, each switch can be separated.
2. After center panel is removed, disconnect connector
3. Separate each switch from removed panel.
4. Install the reverse order of removal.

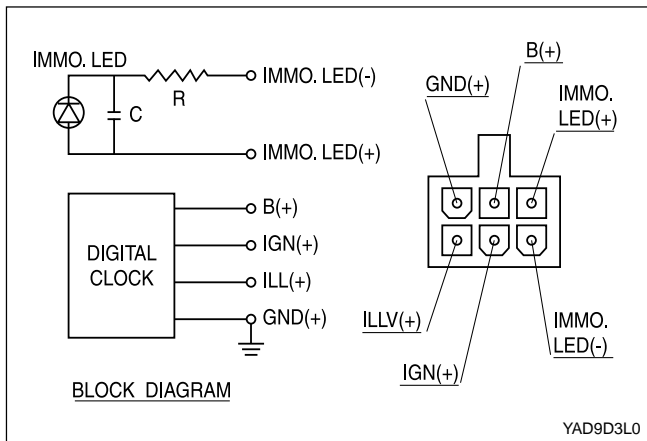
Notice: While each switch is checked, refer to the following circuit, and then check whether apply an electric current or not,

- Switch of front fog lamp

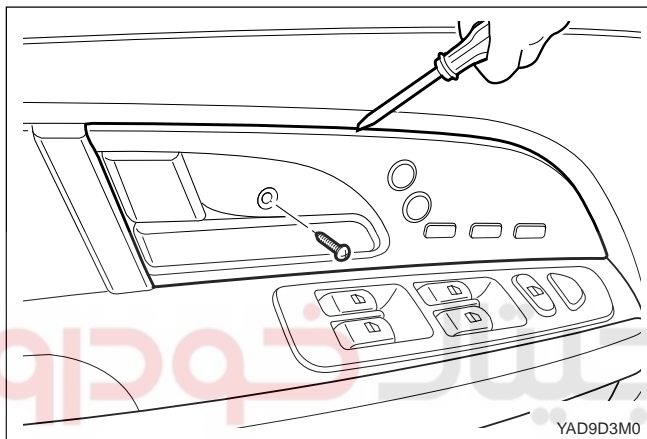


Digital Watch

1. Remove the center panel
2. After releasing fixing screw from the panel, remove the digital watch.
3. After digital watch is fixing on the panel, link the connector, and then install panel on the panel of IP.



Circuit of Digital Watch and Connector



Switch of Seat Memory

1. Release the fixing screw.
2. Using the (-) driver, like the left picture, separate switch cover of seat memory.
3. After disconnecting the connector, remove the switch.
4. Install the reverse order of removal.

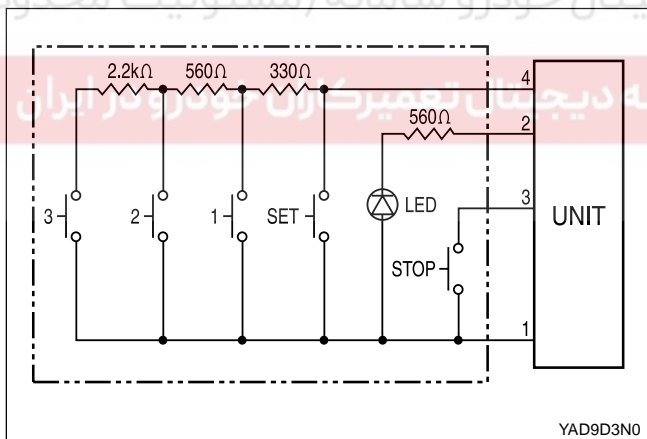
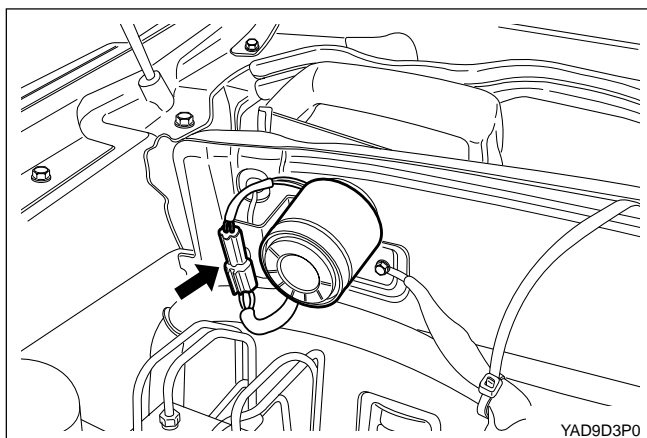


Diagram of Switch Circuit



Siren

1. After opening up the hood, disconnect the negative terminal of battery.
2. Disconnect the connector (indicating arrow) of siren.
3. After fixing bolt is released, remove the siren
4. Install the reverse order of removal.