

## SYSTEM OUTLINE \_

(FOR ABS)

THIS SYSTEM CONTROLS THE RESPECTIVE BRAKE FLUID PRESSURES ACTING ON THE DISC BRAKE CYLINDERS OF THE RIGHT FRONT WHEEL, LEFT FRONT WHEEL AND REAR WHEELS WHEN THE BRAKES ARE APPLIED IN A PANIC STOP SO THAT THE WHEELS DO NOT LOCK. THIS RESULTS IN IMPROVED DIRECTIONAL STABILITY AND STEERABILITY DURING PANIC BRAKING.

#### 1. INPUT SIGNALS

(1) SPEED SENSOR SIGNAL

THE SPEED OF THE WHEELS IS DETECTED AND INPUT TO **TERMINALS FL+**, **FR+**, **RL+** AND **RR+** OF THE ABS AND TRACTION FCU.

(2) STOP LIGHT SW SIGNAL

A SIGNAL IS INPUT TO TERMINAL STP OF THE ABS AND TRACTION ECU WHEN BRAKE PEDAL IS OPERATED.

(3) PARKING BRAKE SW SIGNAL

A SIGNAL IS INPUT TO **TERMINAL PKB** OF THE ABS AND TRACTION ECU WHEN THE PARKING BRAKE IS OPERATED.

#### 2. SYSTEM OPERATION

DURING SUDDEN BRAKING, THE ABS AND TRACTION ECU WHICH HAS SIGNALS INPUT FROM EACH SENSOR CONTROLS THE CURRENT FLOWING TO THE SOLENOID INSIDE THE ACTUATOR AND LETS THE HYDRAULIC PRESSURE ACTING ON EACH WHEEL CYLINDER ESCAPE TO THE RESERVOIR. THE PUMP, INSIDE THE ACTUATOR IS ALSO OPERATING AT THIS TIME AND IT RETURNS THE BRAKE FLUID FROM THE RESERVOIR TO THE MASTER CYLINDER, THUS PREVENTING LOCKING OF THE VEHICLE WHEELS.

IF THE ECU JUDGES THAT THE HYDRAULIC PRESSURE ACTING ON THE WHEEL CYLINDER IS INSUFFICIENT, THE CURRENT ACTING ON SOLENOID IS CONTROLLED AND THE HYDRAULIC PRESSURE IS INCREASED.

HOLDING THE HYDRAULIC PRESSURE IS CONTROLLED BY THE COMPUTER, BY REPEATED PRESSURE REDUCTION, HOLDING AND INCREASE ARE REPEATED TO MAINTAIN VEHICLE STABILITY AND TO IMPROVE STEERABILITY DURING SUDDEN BRAKING.

## (FOR TRACTION CONTROL)

THE TRACTION CONTROL SYSTEM IS A SYSTEM WHEREBY THE ABS AND TRACTION ECU CONTROLS THE ENGINE TORQUE AND THE HYDRAULIC PRESSURE OF THE WHEEL CYLINDER OF THE DRIVING WHEELS IN ORDER TO CONTROL SPINNING OF THE DRIVING WHEELS WHEN STARTING OFF AND ACCELERATING, AND PROVIDE THE MOST APPROPRIATE DRIVING FORCE IN RESPONSE TO THE ROAD CONDITIONS FOR VEHICLE STABILITY.

### TRACTION CONTROL OPERATION

VEHICLE SPEED SIGNALS FROM THE SPEED SENSOR INSTALLED ON EACH WHEEL ARE INPUT TO THE ABS AND TRACTION ECU.

WHEN THE ACCELERATOR PEDAL IS DEPRESSED WHILE DRIVING ON A SLIPPERY ROAD AND THE DRIVING WHEEL (REAR WHEEL) SLIPS, IF THE ROTATION OF THE REAR WHEEL EXCEEDS THE ROTATION OF THE FRONT WHEELS FOR A SPECIFIED PERIOD, THE ECU JUDGES THAT THE REAR WHEEL IS SLIPPING.

WHEN THIS OCCURS, CURRENT FLOWS FROM ABS AND TRACTION ECU TO SUB THROTTLE ACTUATOR TO CLOSE THE SUB THROTTLE VALVE. THE THROTTLE VALVE OPENING ANGLE SIGNAL IS OUTPUT FROM **TERMINAL VTA** OF SUB THROTTLE POSITION SENSOR TO **TERMINAL VTA** 2 OF ENGINE AND ECT ECU TO KEEP THE ENGINE RPM AT THE MOST SUITABLE LEVEL FOR THE DRIVING CONDITIONS AND REDUCE SLIP OF THE DRIVING WHEEL. AT THE SAME TIME, OPERATION OF THE ABS AND TRACTION ECU CAUSE THE TRACTION BRAKE ACTUATORS (ACC CUT, M/C CUT, RESERVOIR CUT SOLENOID) TO TURN ON TO SWITCH THE HYDRAULIC CIRCUIT TO "TRACTION" MODE.

IN THIS CASE. SIGNALS ARE INPUT FROM **TERMINAL SRR** OF ABS AND TRACTION ECU TO **TERMINAL (C)** 6 OF ABS ACTUATOR, AND FROM **TERMINAL SRL** OF ABS AND TRACTION ECU TO **TERMINAL (C)** 1 OF ABS ACTUATOR, CONTROLLING THE REAR WHEEL SOLENOID IN THE ABS ACTUATOR AND INCREASING THE HYDRAULIC PRESSURE OF THE WHEEL CYLINDER IN ORDER TO PREVENT SLIP.

TO MAINTAIN THE HYDRAULIC PRESSURE OF THE REAR WHEELS, THE REAR WHEEL SOLENOID INSIDE THE ABS ACTUATOR IS PUT IN "HOLD" MODE AND KEEPS THE HYDRAULIC PRESSURE TO THE BRAKE CYLINDER CONSTANT.

WHEN THE BRAKE CYLINDER HYDRAULIC PRESSURE IS REDUCED, THE PRESSURE REDUCTION MODE REDUCES AND CONTROLS THE HYDRAULIC PRESSURE.

# **ABS AND TRACTION CONTROL**

#### SERVICE HINTS

# A 1 (A), A 2 (B), A 3 (C) ABS ACTUATOR

(A) 1, (A) 2-GROUND : ALWAYS APPROX. 12 VOLTS

(B) 4-GROUND: ALWAYS CONTINUITY

(C) 1, (C) 5, (C) 4, (C) 6–GROUND : APPROX. 1.15 $\Omega$  (IGNITION SW OFF)

(C) 2 –GROUND : APPROX.  $5\Omega$  (IGNITION SW OFF)

# A 6, A 7, A32, A33 ABS SPEED SENSOR FRONT LH, RH, REAR LH, RH

1–2 : APPROX. **1.0**KΩ (**20**°C, **68**°F)

# A18 (A), A19 (B), A20 (C) ABS AND TRACTION ECU

(C) 11-GROUND: APPROX. **12** VOLTS WITH IGNITION SW AT **ON** POSITION (B) 12-GROUND: CONTINUITY WITH TRACTION CUT SW PUSHED ON

(C) 13, (C) 2, (A) 25-GROUND : ALWAYS CONTINUITY

(B) 1-GROUND: ALWAYS APPROX. 12 VOLTS

(C) 1, (A) 13, (A) 26, (C) 12-GROUND: APPROX. 12 VOLTS WITH IGNITION SW AT **ON** POSITION

(C) 19-GROUND: ALWAYS CONTINUITY

(B) 2-GROUND: CONTINUITY WITH PARKING BRAKE PEDAL DEPRESSED

(C) 22-GROUND: APPROX. 12 VOLTS WITH STOP LIGHT SW ON

#### P3 PARKING BRAKE SW

1-GROUND: CLOSED WITH PARKING BRAKE PEDAL DEPRESSED

# **S 6 SUB THROTTLE ACTUATOR**

2–1, 2–3 : APPROX. **0.9**Ω 5–4, 5–6 : APPROX. **0.9**Ω

#### S15 STOP LIGHT SW

1-3: CLOSED WITH BRAKE PEDAL DEPRESSED

## T 3 (B), T 4 (A) TRACTION BRAKE ACTUATOR

(B) 2 – (B) 1 : OPEN ABOVE APPROX. 134.5KG/CM<sup>2</sup> (13189KPA, 1910PSI) CLOSED BELOW APPROX. 95KG/CM<sup>2</sup> (9316KPA, 1349PSI)

(A) 1 - (A) 4 : APPROX.  $2\Omega$ (A) 2 - (A) 5 : APPROX.  $2\Omega$ (A) 3 - (A) 6 : APPROX.  $2\Omega$ 

## : PARTS LOCATION

CODE		SEE PAGE	CODE		SEE PAGE	CODE		SEE PAGE
A 1	Α	24	С	3	24	S	7	25
A 2	В	24	C12	Α	26	S1	5	27
A 3	С	24	C13	В	26	Т	3	25
A 4	Α	24	D	1	26	T 3	В	25
A 5	В	24	D	19	26	T 4	Α	25
Α	6	24	E 9	В	26	Т	5	25
Α	7	24	E10	Α	26	Т	6	25
A18	Α	26	E11	С	26	Т	7	25
A19	В	26	F	13	24	Т	8	27
A20	С	26	J	2	27	T1	5	27
A32		28	N 1		25	T1	6	27
Α	33	28 P 3		27	W	5	27	
В	1	24	S	6	25			

## : RELAY BLOCKS

	CODE	SEE PAGE	RELAY BLOCKS (RELAY BLOCK LOCATION)
Γ	7	18	R/B NO.7 RIGHT SIDE OF J/B NO.1)

# : JUNCTION BLOCK AND WIRE HARNESS CONNECTOR

CODE	SEE PAGE	JUNCTION BLOCK AND WIRE HARNESS (CONNECTOR LOCATION)		
1A	18	COWL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)		
1B	18	INSTRUMENT PANEL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)		
1G	18	COWL WIRE AND J/B NO.1 (LEFT SIDE OF STEERING COLUMN TUBE)		
3C	22	INSTRUMENT PANEL WIRE AND J/B NO.3 (BEHIND THE INSTRUMENT PANEL CENTER)		
4A				
4B	4B 23 COWL WIRE AND J/B NO.4 (BEHIND THE COMBINATION METER)			
4C	1			

# : CONNECTOR JOINING WIRE HARNESS AND WIRE HARNESS

CODE	SEE PAGE	JOINING WIRE HARNESS AND WIRE HARNESS (CONNECTOR LOCATION)			
EA2	32	COWL WIRE AND ENGINE ROOM MAIN WIRE (FRONT SIDE OF RIGHT FENDER)			
EA3	32	COWL WIRE AND ENGINE ROOM MAIN WIRE (INSIDE OF J/B NO.2)			
IH2	0.4	INCTELIMENT DANIEL WIDE AND COME WIDE (DELINID CLOVE DOV)			
IH3	34	INSTRUMENT PANEL WIRE AND COWL WIRE (BEHIND GLOVE BOX)			
IL1					
IL2	36	ENGINE WIRE AND COWL WIRE (UNDER THE GLOVE BOX)			
IL3					
IM1	36	FLOOR NO.1 WIRE AND COWL WIRE (UNDER THE GLOVE BOX)			
ВМ3	38	COWL WIRE AND FLOOR NO.1 WIRE (RIGHT KICK PANEL)			
BQ1	- 38	COWL WIRE AND FLOOR NO.2 WIRE (LEFT KICK PANEL)			
BQ3	30				

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# : GROUND POINTS

CODE	SEE PAGE	GROUND POINTS LOCATION
EC	32	REAR SIDE OF CYLINDER HEAD RH
IE	34	LEFT KICK PANEL
IF	34	INSTRUMENT PANEL BRACE LH
IH	34	RIGHT KICK PANEL

# : SPLICE POINTS

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CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS	CODE	SEE PAGE	WIRE HARNESS WITH SPLICE POINTS
E 6		ENGINE ROOM MAIN WIRE	I 76	- 36	COWL WIRE
E 13	32		I 78		
E 36		ENGINE WIRE	I 80		
E 44	32		I105		
E 55			I110		
E 76	- 32		l121		
E 78			l122		
E 81			I131		
E 93			I132		
E100			I135		
E118			I161	- 36	ENGINE WIRE
I 6	36	COWL WIRE	I164		
I 57			I166		
I 58			I168		
I 66			I177		
I 67			l190		
I 73					









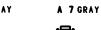
A 3 © GRAY



A 4 (A) BLACK A 5 (B) BLACK



A 6 GRAY

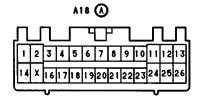


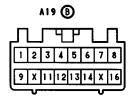


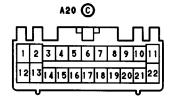












# **ABS AND TRACTION CONTROL**

