

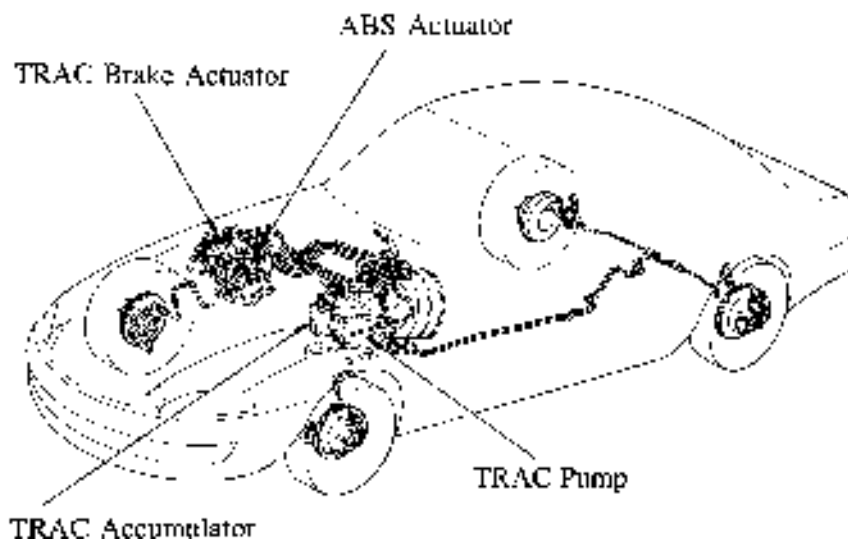
BRAKES

DESCRIPTION

The front and rear brakes of the SC400 are the same type of ventilated disc brakes as those used in the LS400. The ABS (Anti-Lock Brake System) is also standard equipment in the SC400 as in the LS400. The TRAC (Traction Control) system is available as an option.

The points which differ from the LS400 are as follows.

- The master cylinder and brake control valve have a unified construction.
- The brake booster is a 9" + 9" tandem type booster.
- The parking brake lever is the center lever type.
- In vehicles equipped with the TRAC system, an ABS ECU, which performs TRAC brake control, and a TRAC ECU, which controls the throttle, are included.



Specifications

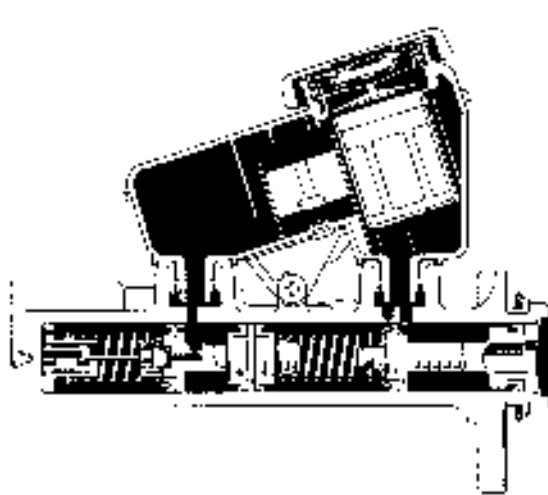
Master Cylinder	Type	Tandem	Brake Control Valve	Type	P & B Valve
	Diameter mm (in.)	27.0 (1.1)		Deflection point of hydraulic pressure kPa (psi, kg/cm ²)	1961 (284, 20)
Brake Booster	Type	Tandem	Parking Brake	Pressure reduction gradient	0.6
	Size in.	9" + 9"		Type	Duo-Servo
Front Brake	Pad Area cm ² (in. ²)	62 (9.61) x 2 x 2	ABS (Anti-Lock Brake System)	Size mm (in.)	190 (7.48)
	Wheel Cylinder Dia. mm (in.)	44.5 (1.75) x 2		Lever Type	Center Lever
	Rotor Size (D x T)* mm (in.)	296 (11.65) x 32 (1.26)			
Rear Brake	Type	Ventilated Disc	TRAC (Traction Control)		Option
	Pad Area cm ² (in. ²)	32 (4.96) x 2 x 2	* D: Outer Diameter T: Thickness		
	Wheel Cylinder Dia. mm (in.)	42.9 (1.69)			
	Rotor Size (D x T)* mm (in.)	307 (12.09) x 16 (0.63)			

■ MASTER CYLINDER WITH BRAKE CONTROL VALVE

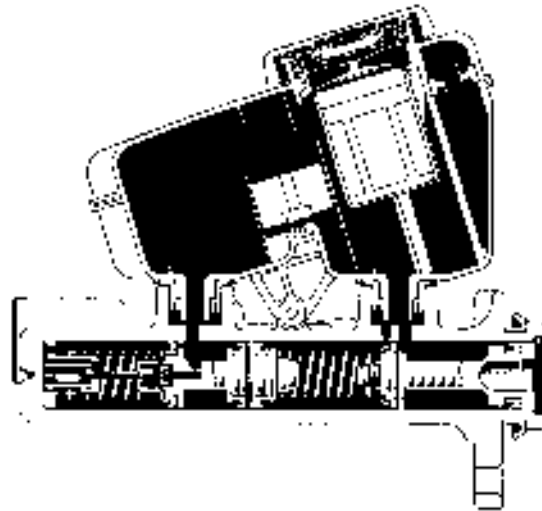
The construction of the master cylinder and brake control valve have been unified and the brake tubing has been simplified.

1. Master Cylinder

Master cylinder operation is the same as in the LS400.



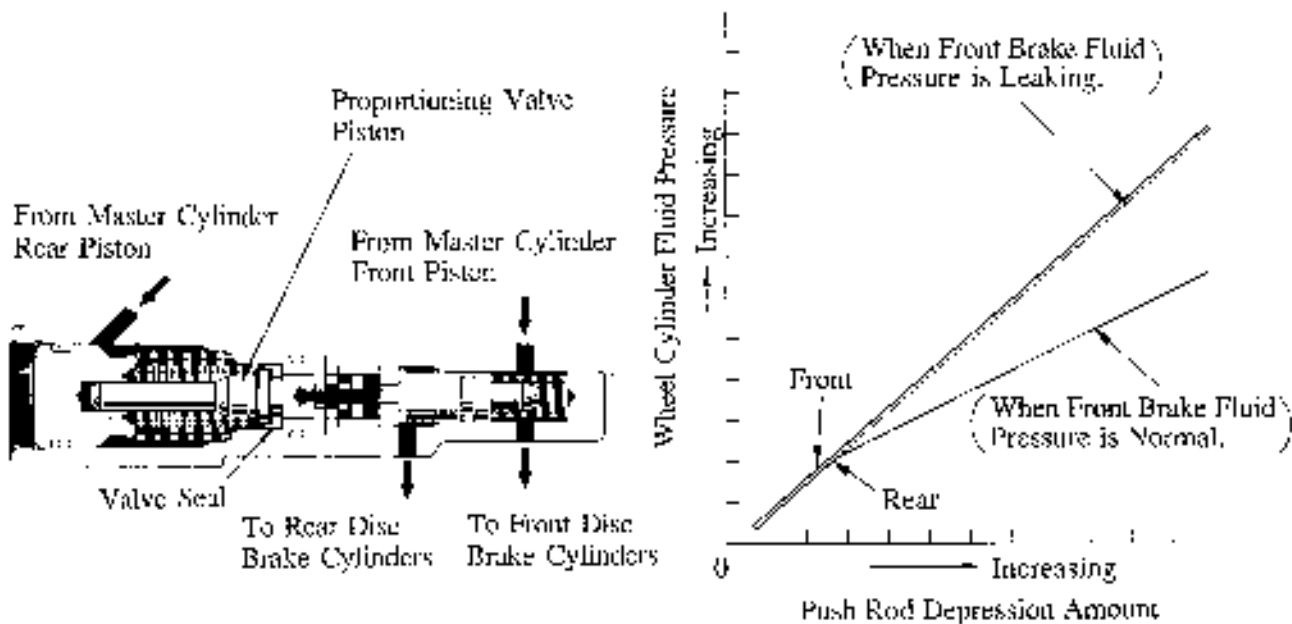
Standard



With TRAC System

2. Brake Control Valve

As in the LS400, the brake control incorporates a P & B (Proportioning and bypass) Valve to optimize distribution of the hydraulic pressure to the front and rear brakes.

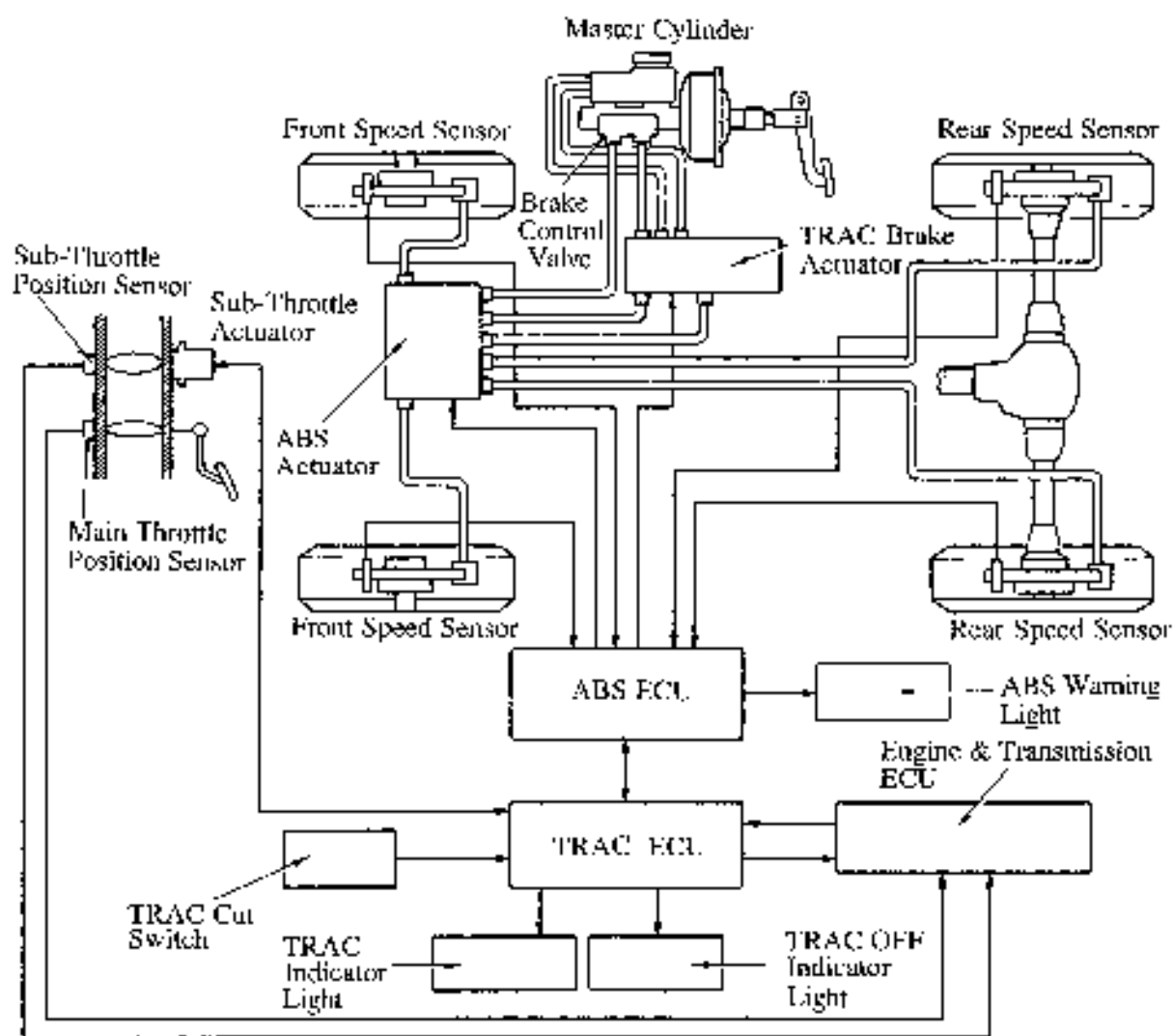


■ TRAC (Traction Control)

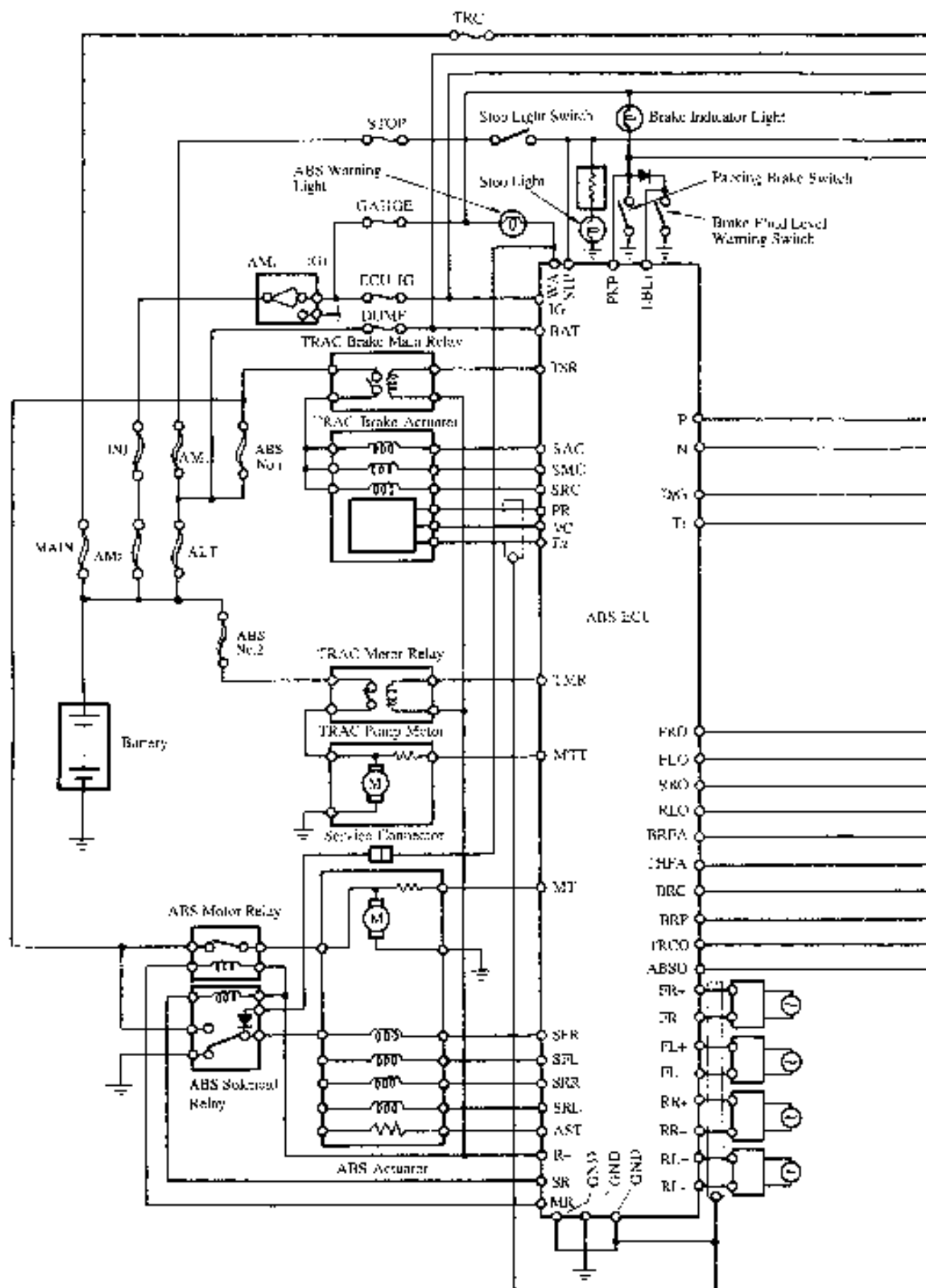
1. General

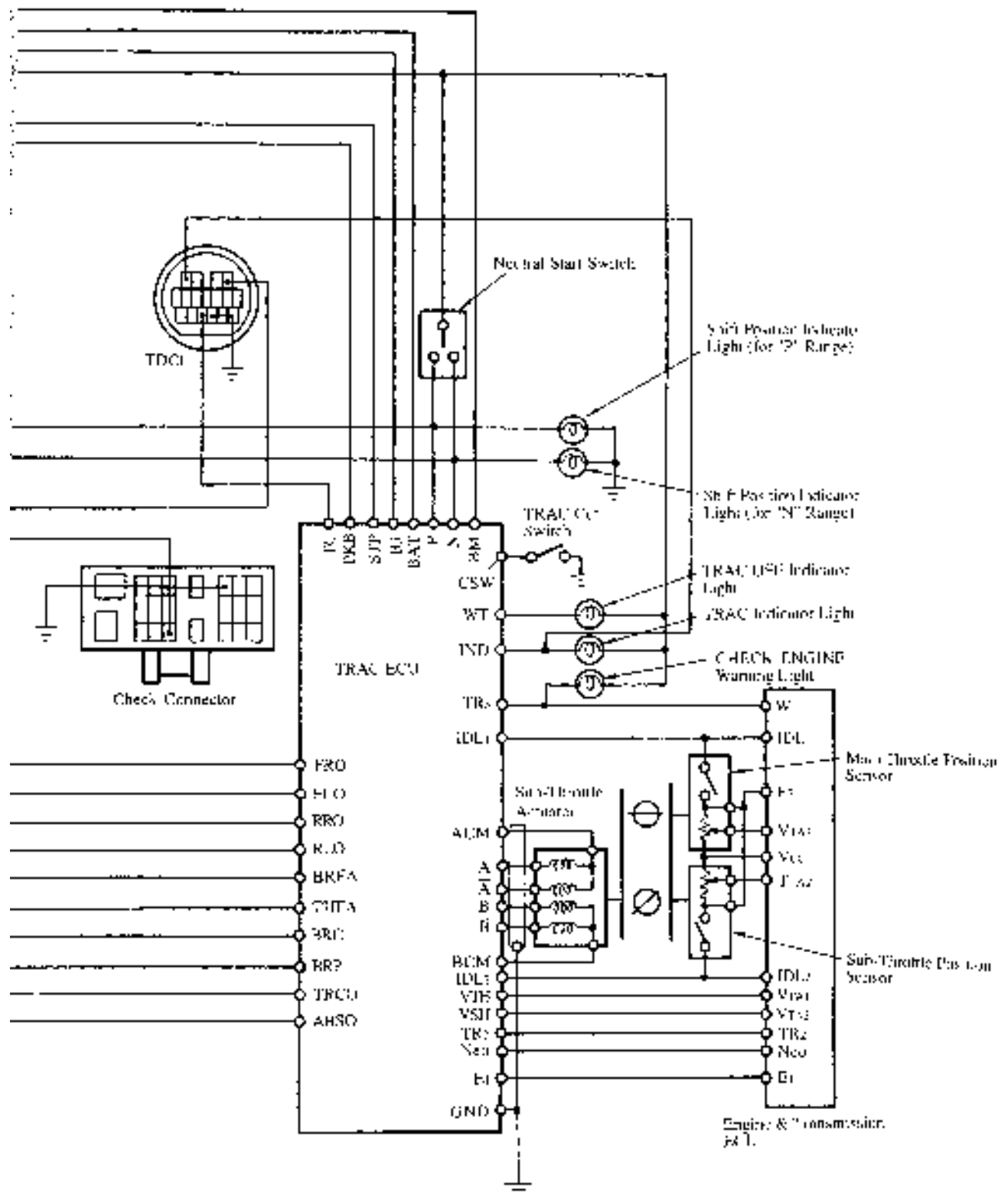
- The construction and operation of the TRAC (Traction Control) system are basically the same as in the LS400, but in the LS400, the ABS and TRAC ECU are included in a single unit, while in the SC400, they are divided into the ABS ECU, which carries out ABS and TRAC brake control, and the TRAC ECU, which carries out TRAC throttle control.
- The TRAC throttle relay in the LS400 has been deleted in the SC400. Furthermore, a pressure sensor is used in place of the pressure switch for accumulator pressure detection in the TRAC brake actuator to improve the precision.

2. TRAC System Diagram



3. Wiring Diagram





4. ABS ECU

The SC400 uses the ABS ECU for TRAC brake control. The diagnostic code of any malfunction of the sensor and actuators related to TRAC brake control is indicated by the ABS warning light. The following table shows the diagnostic codes for the SC400 compared with those for the LS400, for SC400 and LS400 vehicles equipped with the TRAC brake system.

►Diagnostic Items◀

Code No.	Model		Diagnosis
	SC400	LS400	
11	●*1	●	Open circuit in solenoid relay circuit
12	●*1	●	Short circuit in solenoid relay circuit
13	●*1	●	Open circuit in pump motor relay circuit
14	●*1	●	Short circuit in pump motor relay circuit
15	●*2	○ No. 11	Open circuit in TRAC brake main relay circuit
16	●*2	○ No. 12	Short circuit in TRAC brake main relay circuit
17	●*3	○ No. 54	Open circuit in TRAC motor relay circuit
18	●*3	○ No. 55	Short circuit in TRAC motor relay circuit
21	●*1	●	Open or short circuit in 3-position solenoid of front right wheel
22	●*1	●	Open or short circuit in 3-position solenoid of front left wheel
23	●*1	●	Open or short circuit in 3-position solenoid of rear right wheel
24	●*1	●	Open or short circuit in 3-position solenoid of rear left wheel
25	●*2	○ No. 21	Open or short circuit in master cylinder solenoid valve circuit of TRAC brake actuator
26	●*2	○ No. 22	Open or short circuit in accumulator cut solenoid valve circuit of TRAC brake actuator
27	●*2	○ No. 23	Open or short circuit in reservoir cut solenoid valve circuit of TRAC brake actuator
31	●*1	●	Front right wheel speed sensor signal malfunction
32	●*1	●	Front left wheel speed sensor signal malfunction
33	●*1	●	Rear right wheel speed sensor signal malfunction
34	●*1	●	Rear left wheel speed sensor signal malfunction
35	●*1	●	Open circuit in front left and rear right speed sensors
36	●*1	●	Open circuit in front right and rear left speed sensors

Code No.	Model		Diagnosis
	SC400	LS400	
41	●*1	●	Low battery voltage (9.5V or lower) or abnormally high battery voltage (17V or higher)
51	●*1	●	Pump motor locked or open circuit
53	●*3	○ No. 15	Electric supply to TRAC motor exceeded a predetermined period of time
54	●*3	○ No. 19	The number of TRAC motor on and off operations is higher than a predetermined level
55	●*3	○ No. 52	Fluid level of brake master cylinder reservoir dropped causing master cylinder reservoir level warning switch to go on
56	●*3	○ No. 16	Open circuit in pressure sensor or switch circuit
57	●*3	○ No. 17	Pressure sensor or switch does not turn on when TRAC brake control operation exceeded a predetermined number of times
61	●*3	● No. 49	Open or short circuit in circuit which inputs TRAC system operation to ABS ECU
62	●*3	—	Malfunction in ECU (Involving vehicle speed signal input inside ECU)
Always ON	●*1	●	Malfunction in ECU

●: Diagnostic code indicated by the ABS warning light

○: Diagnostic code indicated by the TRAC indicator light

—: Not applicable

*1 When a malfunction occurs, the TRAC OFF indicator light lights up together with the ABS warning light, and TRAC operation stops.

*2 This is a diagnostic code related to TRAC system brake control. When a malfunction occurs, the TRAC indicator light lights up together with the ABS warning light.

*3 This is a diagnostic code related to TRAC system brake control. When a malfunction occurs, only the TRAC indicator light lights up.

5. TRAC ECU

The TRAC ECU in the SC400 controls the sub-throttle valve to decrease the engine output. The functions are the same, but the self-diagnostic codes partially differ from those in the LS400.

►Diagnostic Items◀

Code No.	Model		Diagnosis
	SC400	LS400	
24	○	○	Open or short circuit in step motor circuit of sub-throttle actuator
25	○	○	Step motor does not move to a position decided by ECU.
26	○	○	Sub-throttle valve doesn't move even when sub-throttle actuator is controlled to fully open the sub-throttle valve by fail-safe function after a code No. 25 or 27 type malfunction has occurred.
27	○	○	When electric supply to step motor is stopped, sub-throttle valve does not reach its fully-open position.
31	○	● No. 31	Front right wheel speed sensor signal malfunction
32	○	● No. 32	Front left wheel speed sensor signal malfunction
33	○	● No. 33	Rear right wheel speed sensor signal malfunction
34	○	● No. 34	Rear left wheel speed sensor signal malfunction
41	○	● No. 41	Low battery voltage (9.5V or lower) or abnormally high battery voltage (17V or higher)
43	○*1	● Always ON	Malfunction in ABS ECU
44	○	○	Engine speed signal (Ne) is not input from the engine & transmission ECU during TRAC control.
45	○	○	Short circuit in IDL signal circuit of the main throttle position sensor.
46	○*2	○*2	Open or short circuit in V _{TA1} signal circuit of the main throttle position sensor.
47	○	○	Open or short circuit in IDL ₂ signal circuit of the sub-throttle position sensor.
48	○	○	Open or short circuit in V _{TA2} signal circuit of the sub-throttle position sensor.
49	○	○	Open or short circuit in circuit which inputs TRAC system operation to engine & transmission ECU.
51	○*1	○*1	Malfunction in engine control system causes CHECK ENGINE warning lamp to go on
61	○	—	Open or short circuit in one or more of the TRAC brake control signal circuit, estimated brake hydraulic pressure signal circuit or ABS control signal circuit.

●: Diagnostic code indicated by the ABS warning light

○: Diagnostic code indicated by the TRAC indicator light

—: Not applicable

*1 When a malfunction occurs, the TRAC indicator light remains off but the TRAC OFF indicator light lights up and TRAC operation stops. However, the code No. is stored in the memory.

*2 A malfunction which produces code No. 46 is not indicated to the driver, but the code No. is stored in the memory.