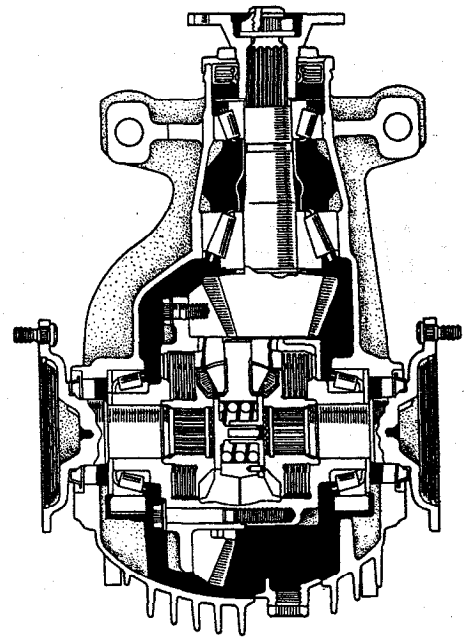
NEW CAR FEATURES

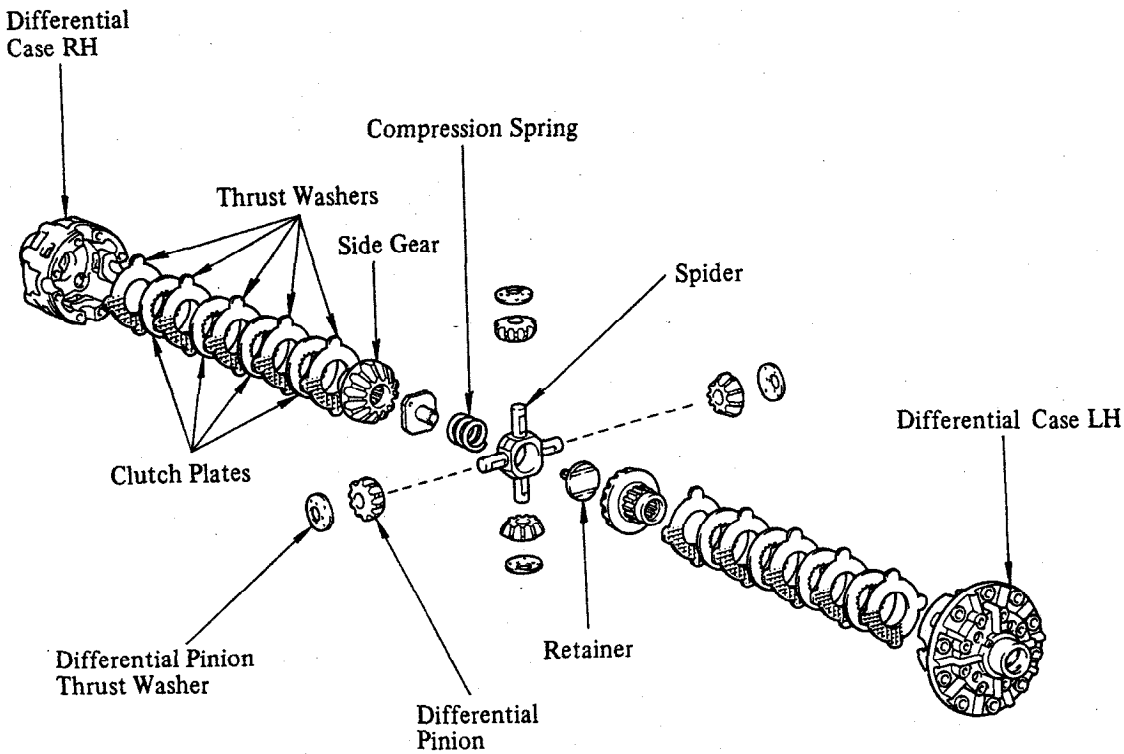
DIFFERENTIAL

LSD (Limited-Slip Differential)

CONSTRUCTION

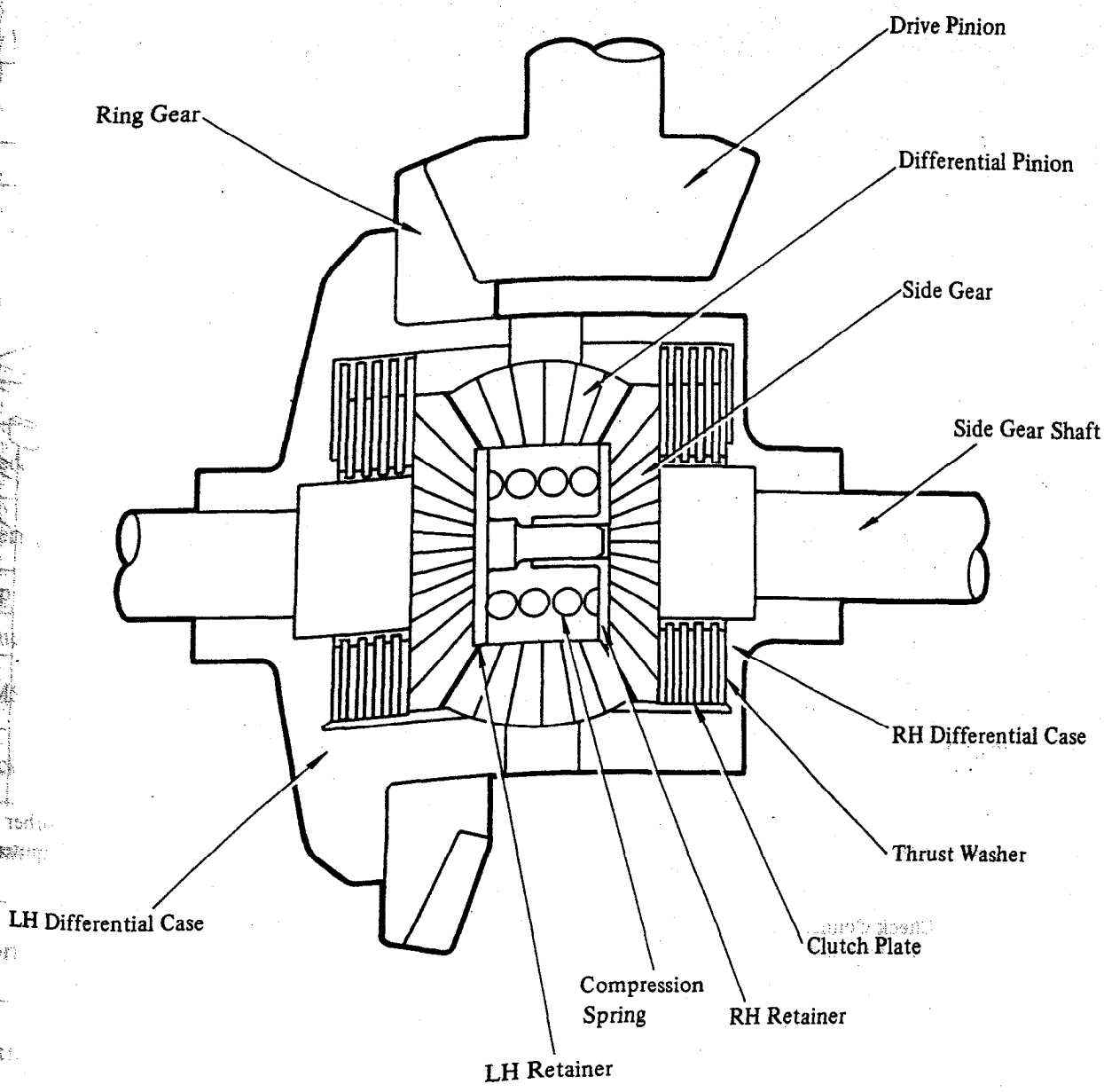
Thrust washers and clutch plates are mounted, in alternating sequence, between the side gears and the differential case.
Four projections of the thrust washers fit into the guide grooves of the differential case, and the clutch plates are splined to the side gears.
A barrel shaped compression spring is fitted between the left and right side gears to keep the thrust washers pressed up against the clutch plates via the retainers and side gears.
This means, in effect, that the side gears are kept pressed against the differential case (via the thrust washers and clutch plates) by the spring.





OPERATION

If there is a large difference in the rates at which the left and right wheels turn (as, for example, when the vehicle is cornering) a corresponding difference is produced in the rates at which the side gears and differential case turn. This difference would result in slippage between the thrust washers and clutch plates. Since these are pushed together by the spring, friction torque is created between the thrust washers and clutch plates (that is, between their surfaces, which are in direct contact with each other). This torque attempts to make the differential case and side gears rotate as a unit. This is called the "limited slip effect".

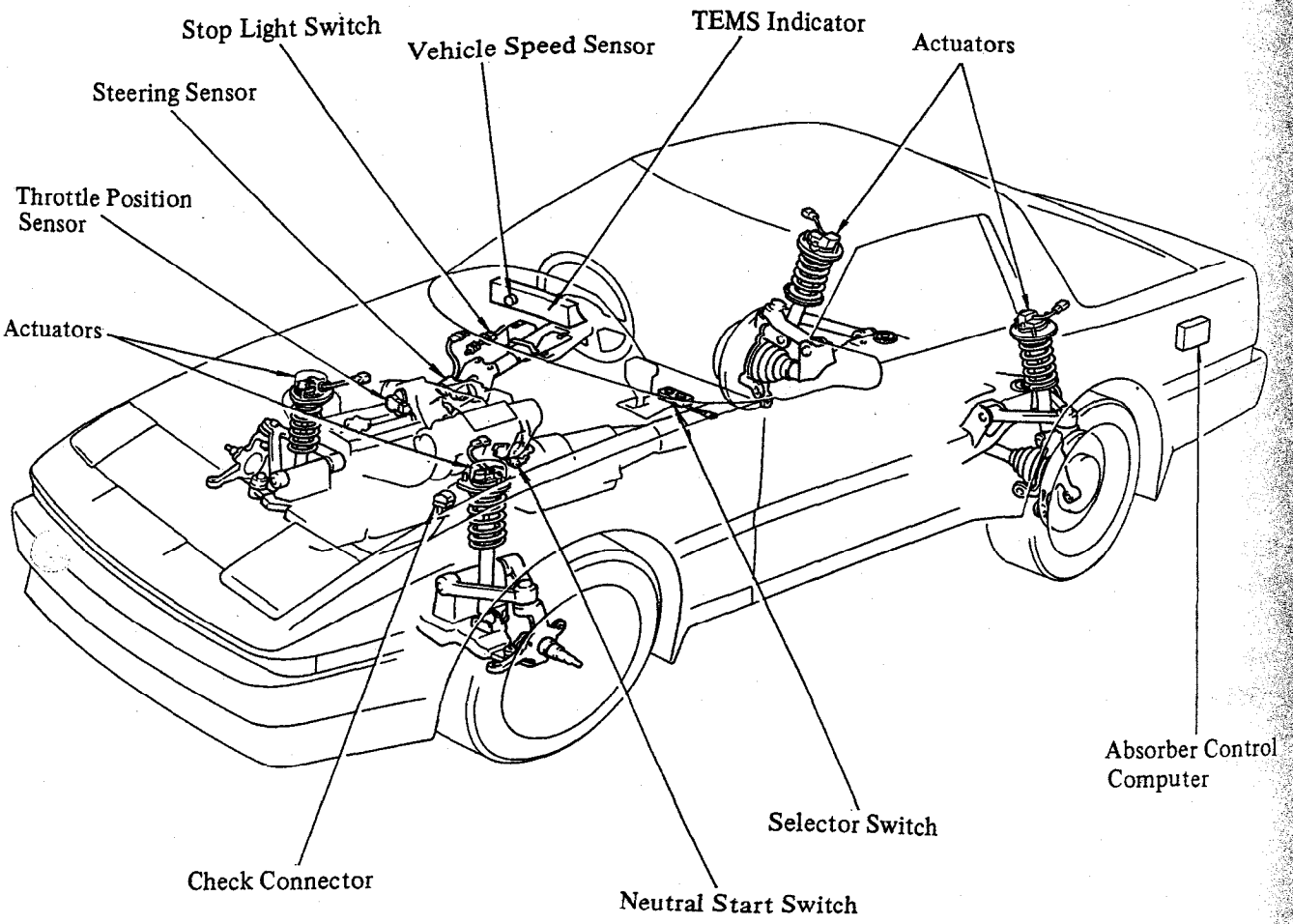


SUSPENSION

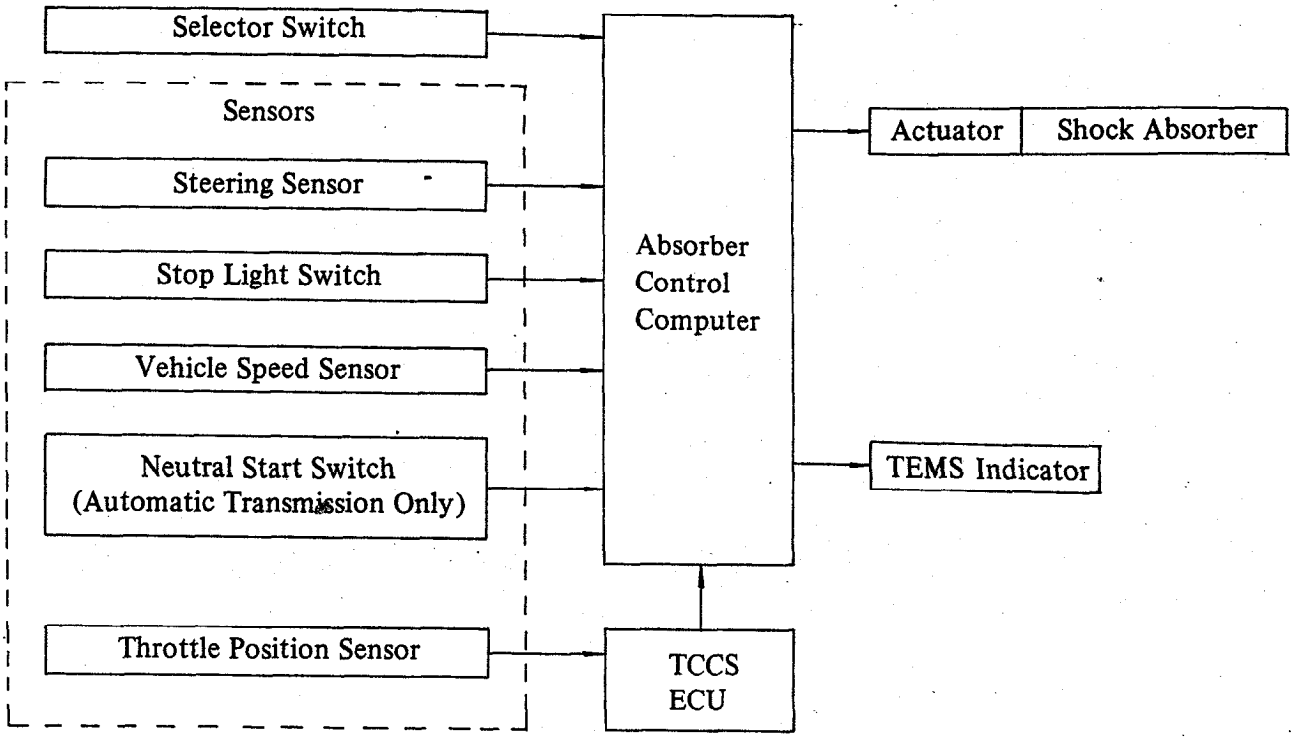
TEMS (For Australia Only)

TEMS stands for the Toyota Electronic Modulated Suspension.
This is a system in which the damping force of the 4 shock absorbers is changed automatically depending on the driving conditions and which delivers superb riding comfort and better driving stability.
The shock absorbers' damping force changes in 3 stages.
Also, the driver can select 2 modes. A diagnosis system and fail-safe function are also included.

LOCATION OF SYSTEM COMPONENTS

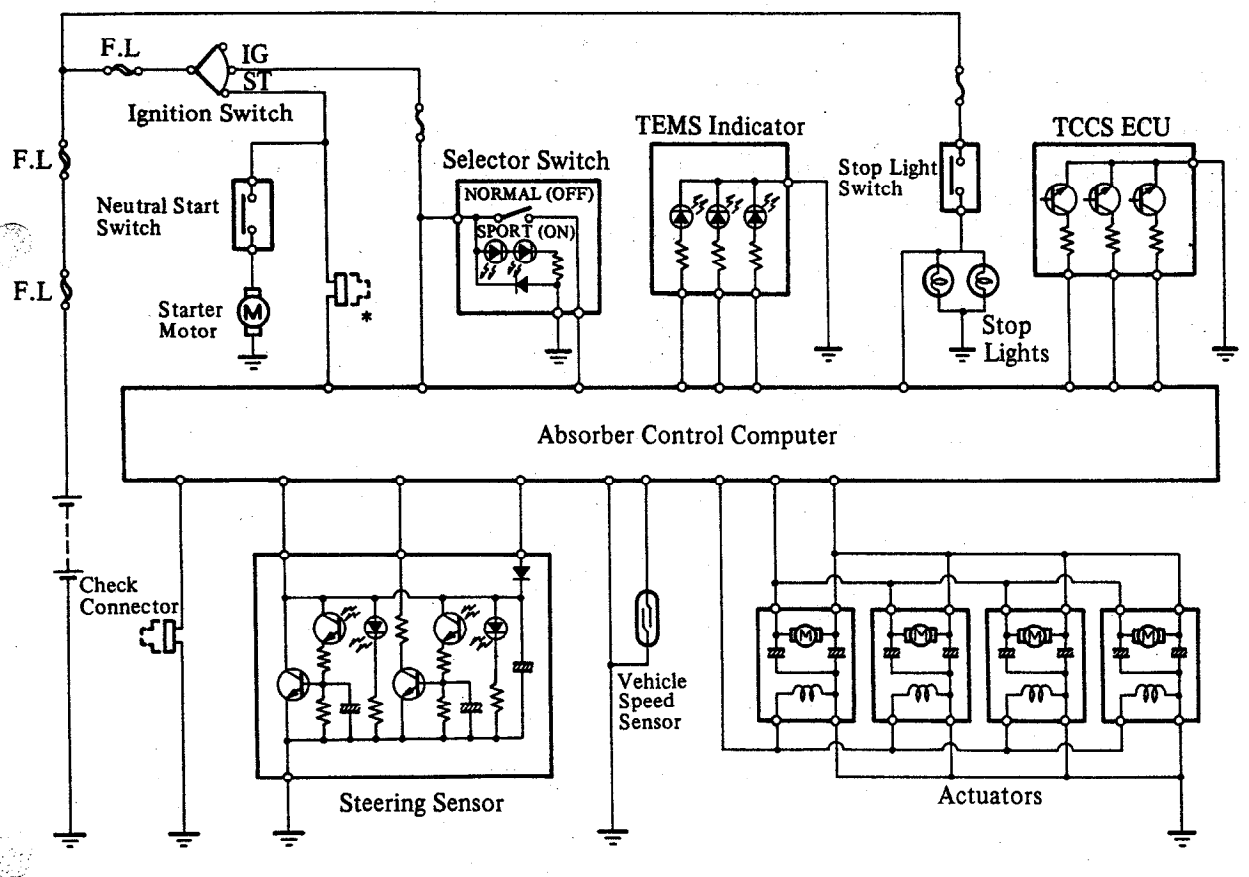


FUNCTION OF COMPONENTS



Component	Function
Selector Switch	There are 2 buttons, "Normal" and "Sport", by which the driver selects the damping force mode.
Steering Sensor	This detects the direction in which the steering wheel is turned and the turning angle.
Stop Light Switch	This sends a braking signal to the computer.
Vehicle Speed Sensor	This sends a vehicle speed signal to the computer.
TEMS Indicator	This indicates the damping force conditions of the shock absorbers.
Shock Absorber	These shock absorbers have a built-in rotary valve which changes the damping force in 3 stages.
Actuator	By a signal from the computer, the actuator drives the shock absorber control rod (rotary valve) and changes the damping force.
Absorber Control Computer	This computer uses signals from each sensor and controls the shock absorber damping force according to the mode selected.
Throttle Position Sensor	This detects the throttle valve opening angle and sends signals to the absorber control computer through the TCCS ECU.
Neutral Start Switch (Automatic Transmission only)	This sends signals to the computer that the shift position is the "N" or "P" range.

WIRING DIAGRAM



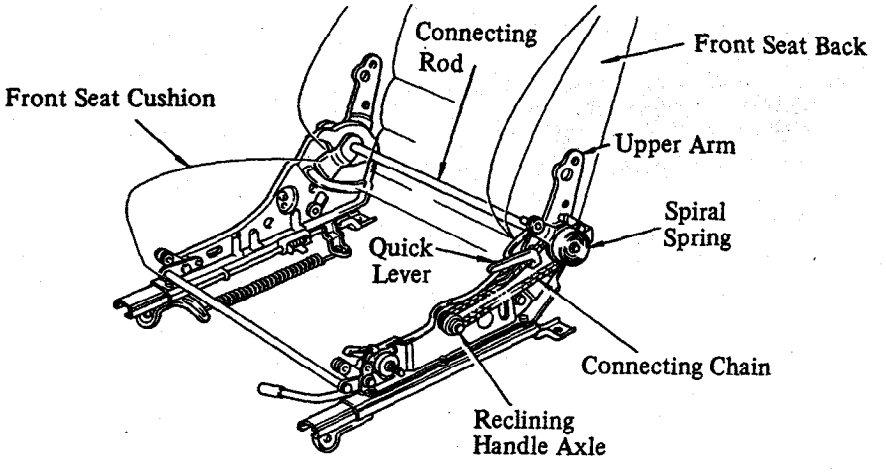
* M/T— Open
A/T— Short

FRONT SEAT

STEPLESS RECLINING ADJUSTER SYSTEM

1. Description

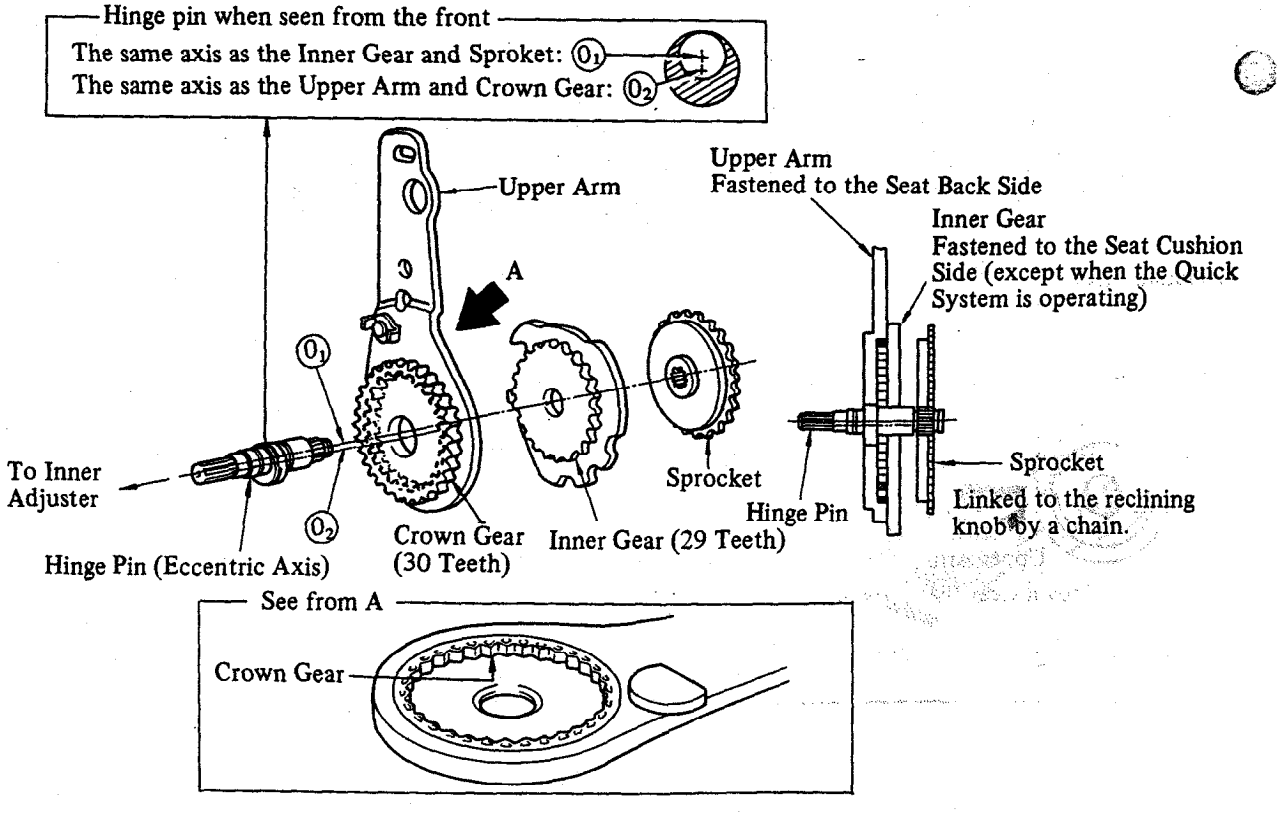
A stepless reclining adjuster system was adopted in which the reclining angle of the front seats (driver and passenger) can be steplessly adjusted.
Also, a Quick System was adopted in which the seat can be reclined forward or backward with one touch by operating the Quick Lever.



2. Construction and Operation

STEPLESS RECLINING ADJUSTMENT

1) Construction



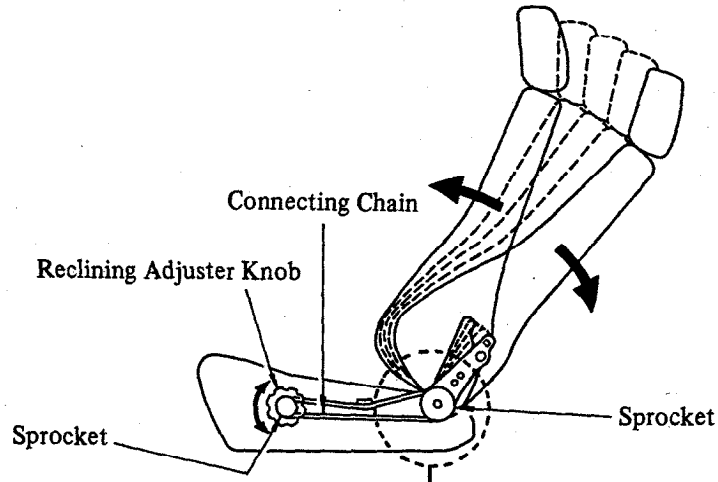
2) Operation

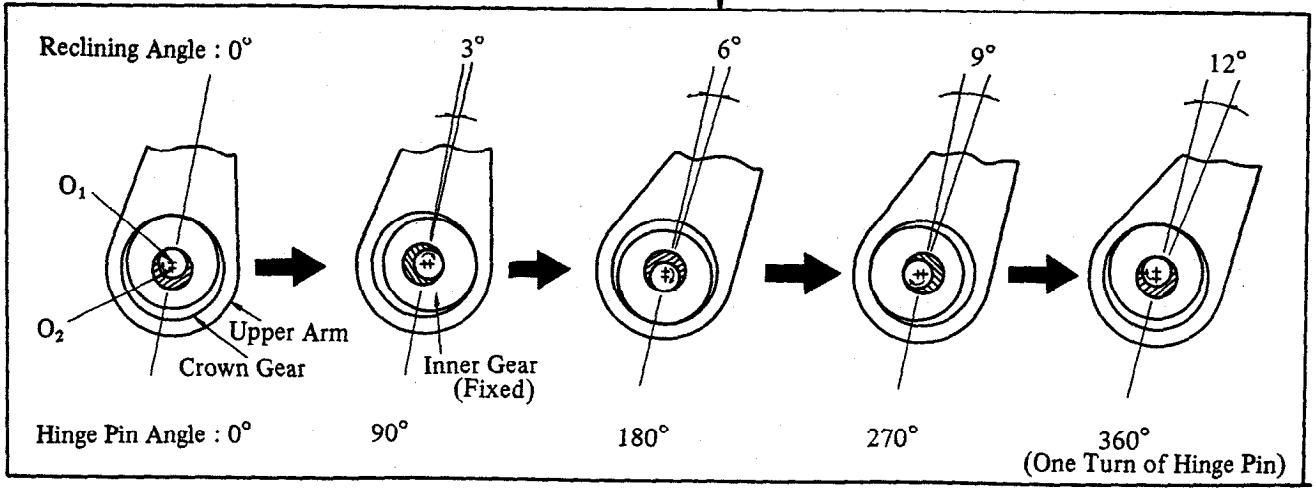
- If the reclining adjuster knob is turned, the sprocket, which is linked to the knob by a chain, and the hinge pin, which is linked to the sprocket by serrations, are turned.
- As the hinge pin rotates it raises the upper arm by sliding it against the inner gear.
- Since the inner gear is fastened to the seat cushion side, (except when the Quick System is operating), center O_2 of the upper arm crown gear fastened to the seat back turns with center O_1 of the inner gear as its axis.
- Therefore, the upper arm crown gear turns around the inner gear by the turning of the hinge pin. Furthermore, when the hinge pin has made N turns, the reclining angle of the seat back can be expressed by the flowing formula.

$$\alpha = N \times \frac{Z_2 - Z_1}{Z_2} \times 360°$$

α : Reclining Angle, N : No. of Turns of Hinge Pin
Z_1 : No. of Inner Gear Teeth (29)
Z_2 : No. of Crown Gear Teeth (30)

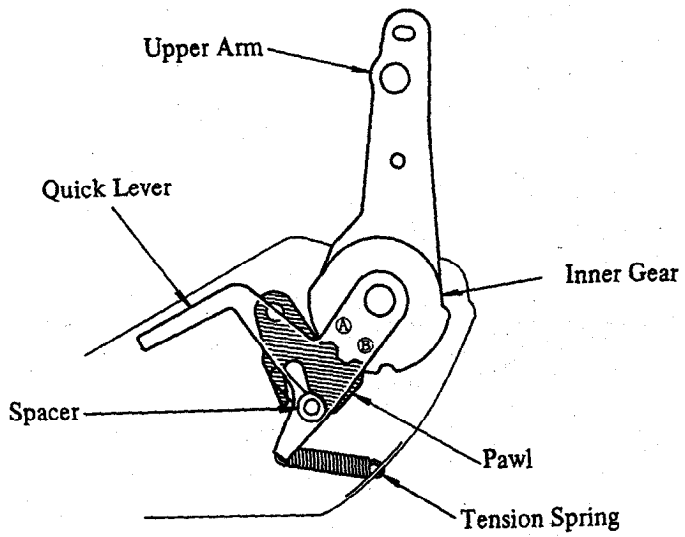
Therefore, $\alpha = 12° \times N$ and one turn of the hinge pin reclines the seat back 12°.





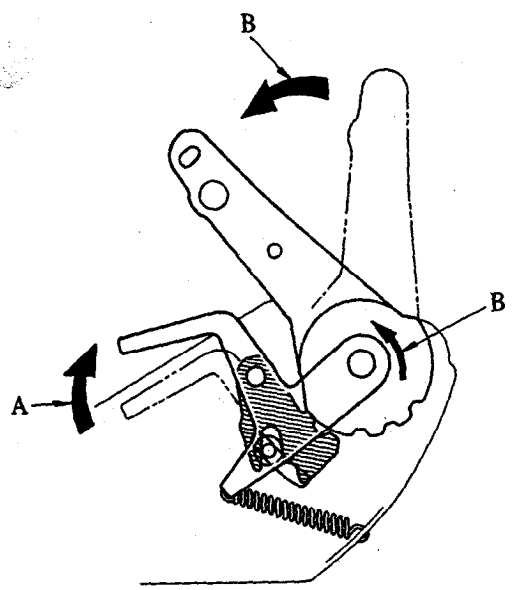
ormal Position

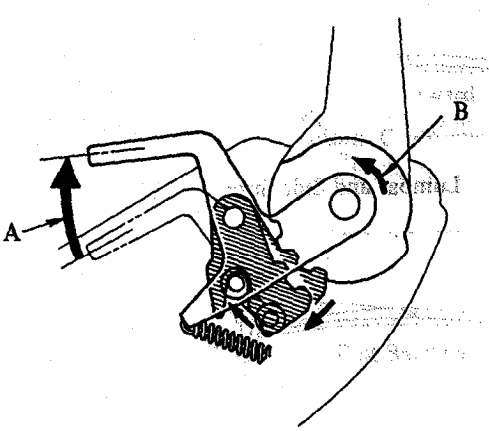
gure below shows the state where the seat back is locked in the normal position. At this time, wl is engaged in the latch on the outer circumference of the inner gear (Ⓐ, Ⓑ). Moreover, the which moves as one with the quick lever is pressed by the tension spring on the back surface of wl and the pawl is locked with the latch of the inner gear.
ermore, in the normal position, the seat back can be steplessly reclined.



Foward Reclining Position

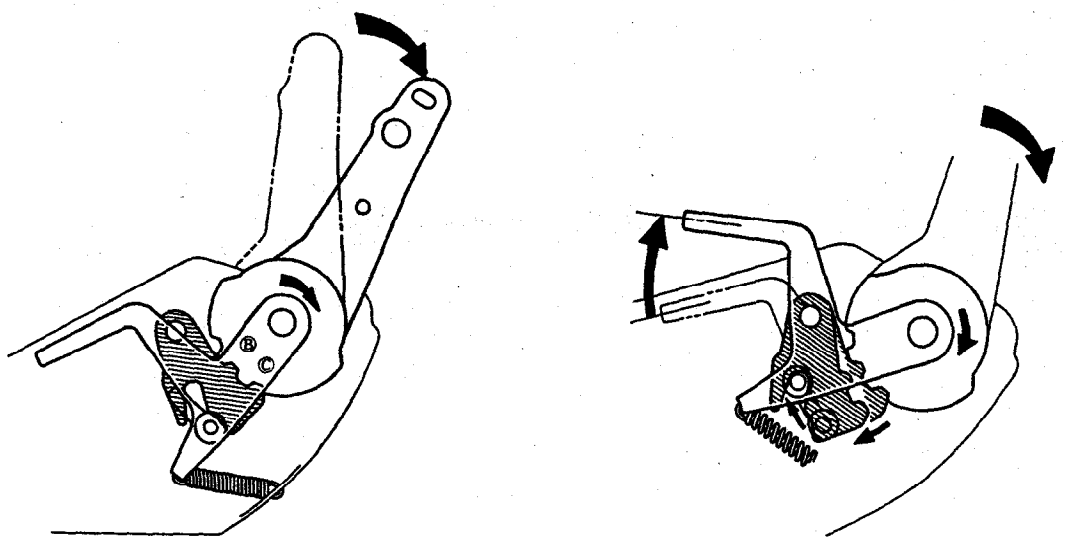
he figure below shows the seat back reclining forward. The quick lever is operated in direction A vith the seat back in the normal position. At this time, the spacer releases from the pawl and the orce of the pawl pressing on the latch is removed.
Therefore, with the hinge pin as the axis, the upper arm and the inner gear become one and the seat back reclines forward. (Direction B)
Also, even if the seat back returns to the normal position, it will return to the originally set reclining position.





3. Backward Reclining Lock Position

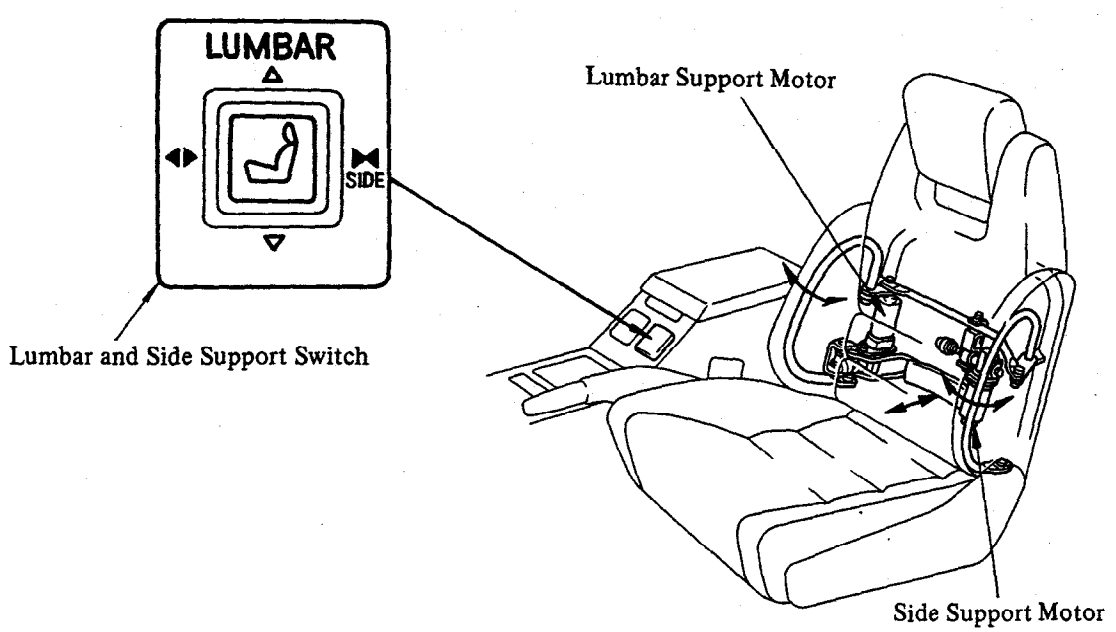
The figure below shows the seat back reclined backward.
As with forward reclining, the quick lever is operated and the pawl releases from the latch of the inner gear. Next the seat back reclines and the pawl is locked with the latch (Ⓑ, Ⓒ) of the inner gear.
Further, in the backward reclining lock position, stepless reclining of the seat back can be done. Also, even if the seat back is returned to the normal position, it will return to the originally set reclining position.



POWER SIDE SUPPORT AND POWER LUMBAR SUPPORT

1. Description

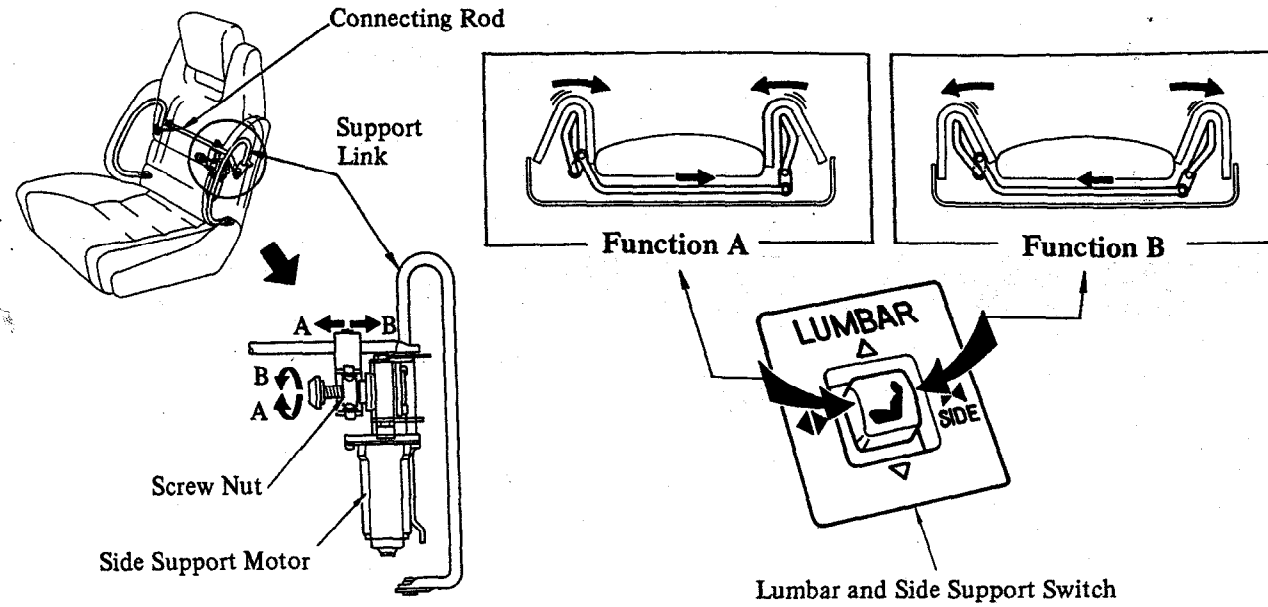
The previous manual side support and lumbar support systems have been changed to electrical systems to improve their manipulability.



2. Construction and Operation

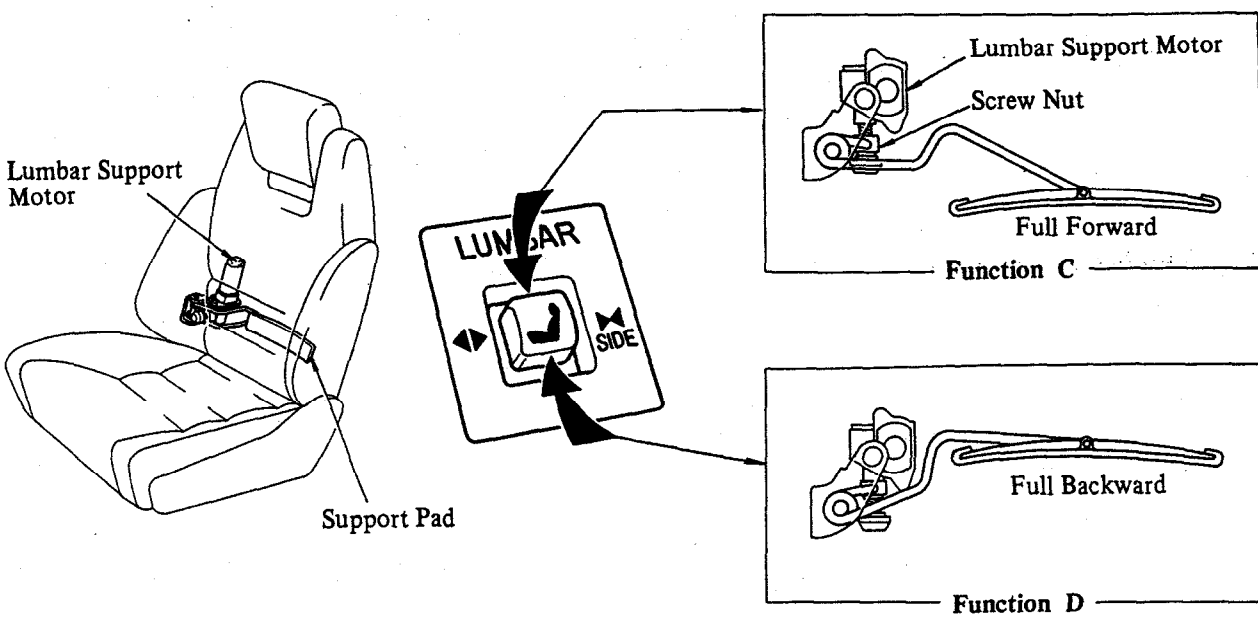
POWER SIDE SUPPORT ADJUSTMENT

Previously, by turning the adjustment knob on the side of the seat, the support link was moved to carry out side support adjustment.
As opposed to this, with the power side support adjustment system, a connecting rod connected to a screw nut on the side support motor is moved left or right, moving the support link and adjusting the side support.

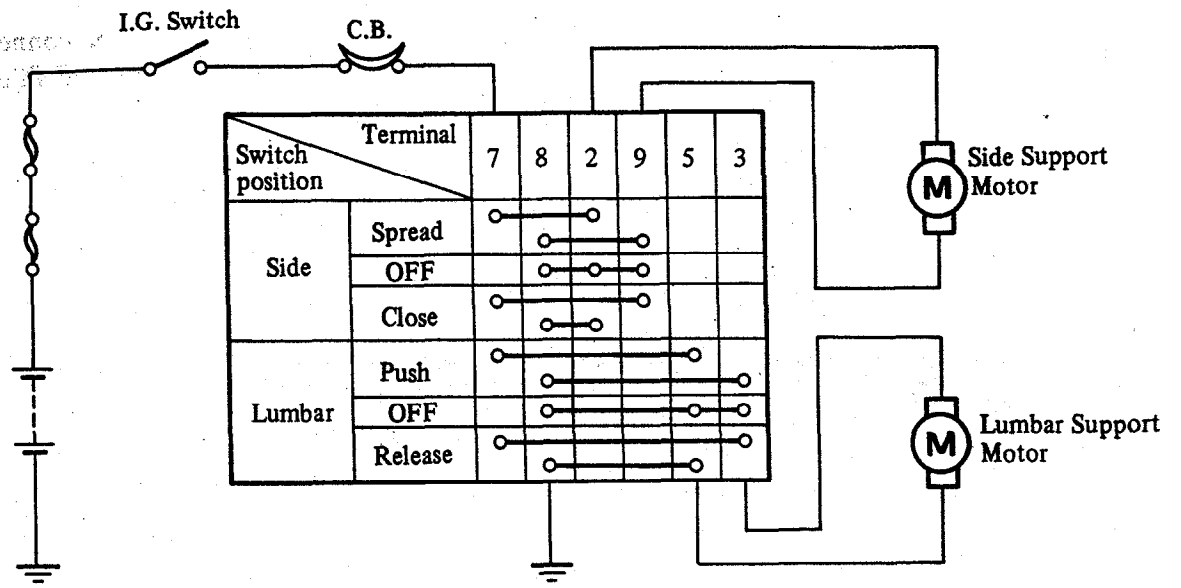


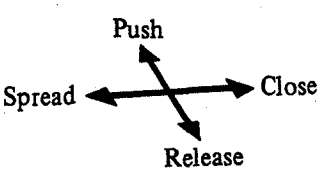
POWER LUMBAR SUPPORT ADJUSTMENT

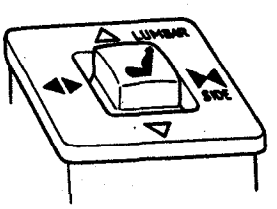
Previously, lumbar support adjustment was accomplished by moving a lever on the side of the seat which moved the support pad linked to the torsion bar forward or backward.
Now however, with power lumbar support adjustment, the screw nut on the lumbar support motor is moved and the torsion bar linked to it moves the support pad forward or backward, making stepless adjustment possible.



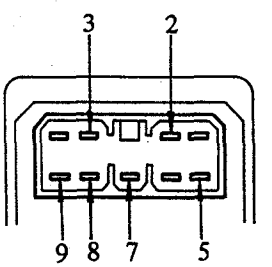
3. System Circuit





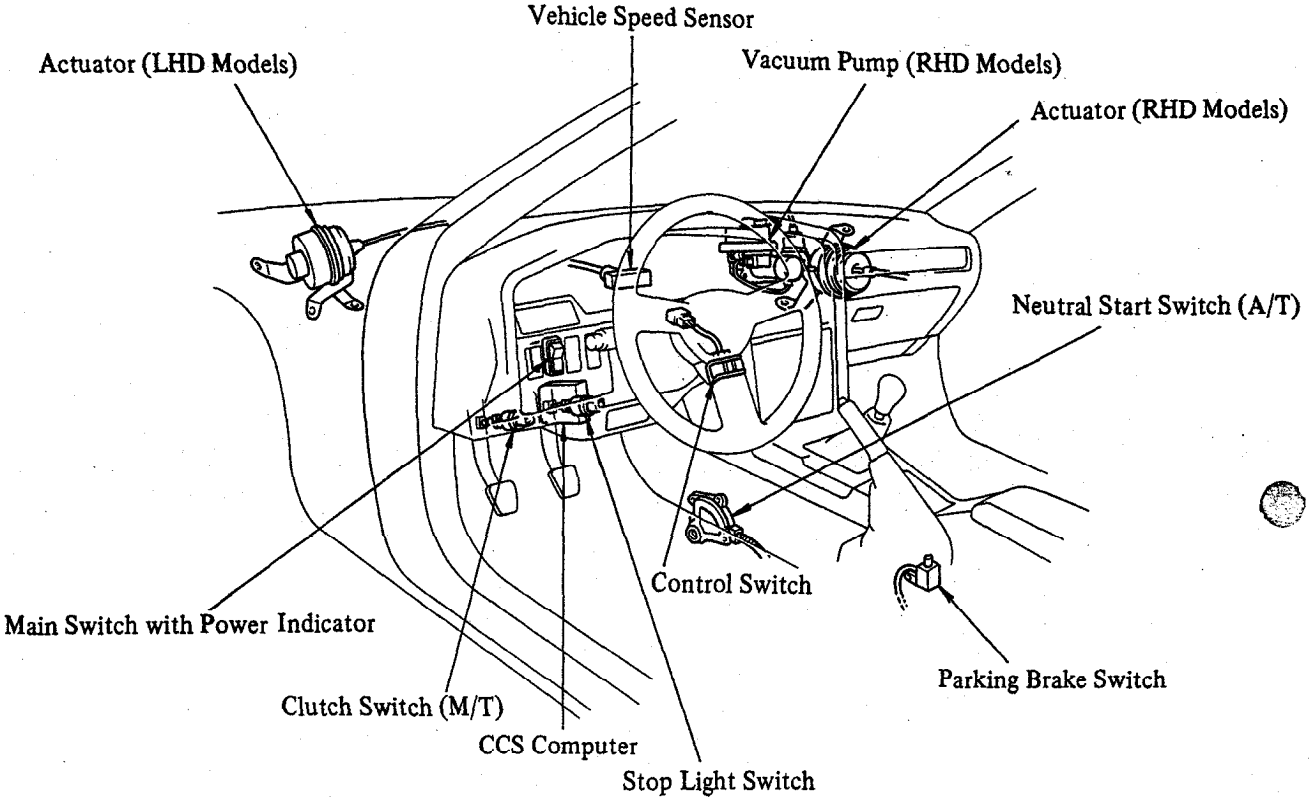


Lumbar and Side Support Switch



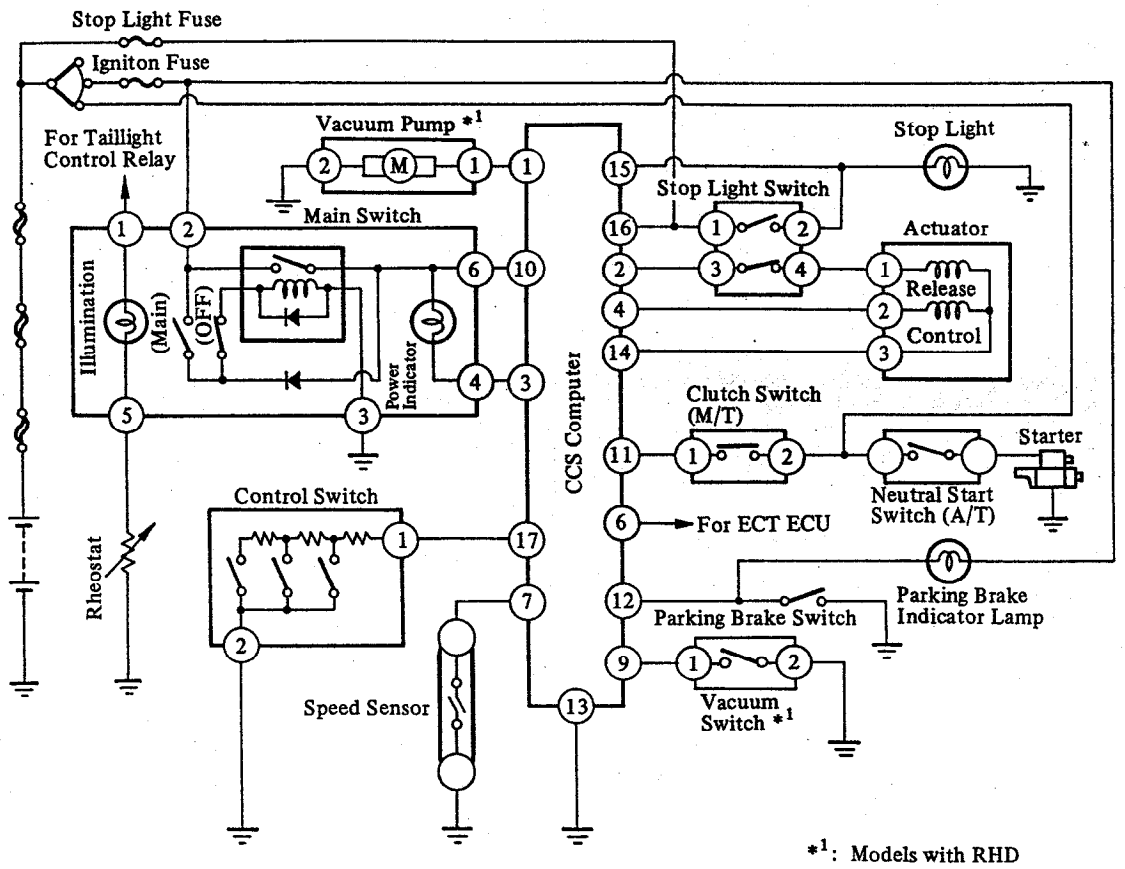
Connecter for Lumbar and Side Support Switch

CRUISE CONTROL SYSTEM (CCS)

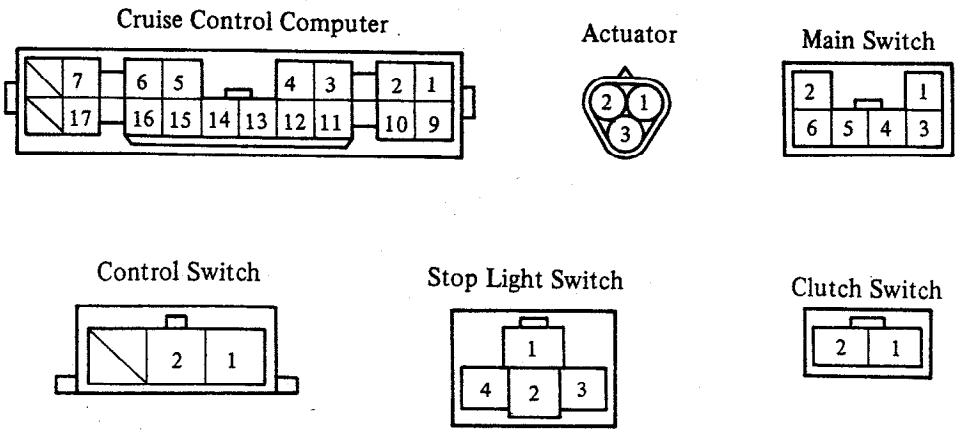


COMPONENT	FUNCTION
Vehicle Speed Sensor	This is mounted on the speedometer driven gear and produces pulse signals. The cruise control computer detects vehicle speed by sensing the pulse frequency.
CCS Computer	Receives signals from each sensor and controls total CCS functioning.
Actuator	This is controlled by the CCS computer, to increase or decrease the throttle valve opening angle.
Control Switch	This is used to control the CCS when setting the vehicle at a desired cruising speed or resetting it at another cruising speed, and to cancel the CCS.
Main Switch with Power Indicator	This is used to connect the CCS to the power source. Lights up when the main switch is ON, indicating that power is being supplied in the system.
Stop Light Switch	Output CCS release signals
Parking Brake Switch	
Clutch Switch (M/T)	
Neutral Start Switch (A/T)	
Vacuum Pump (RHD Models)	Supplies extra vacuum to the actuator when the vacuum in the manifold is not sufficient.

WIRING DIAGRAM



MAJOR CONNECTORS

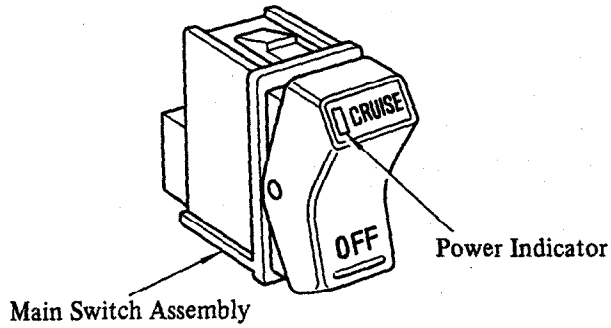


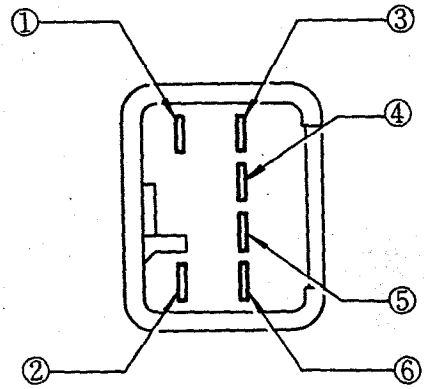
OPERATION

- The construction and operation of the cruise control system is the same as previous systems. (Basically, it is the same as that on the 1986 Celica ST 162 Series.)

Main Switch

- Even though the Main Switch is in the ON position, if the Ignition Switch is turned off, the Main Switch goes off at the same time. When the Ignition Switch is turned on again, the Main Switch remains off.



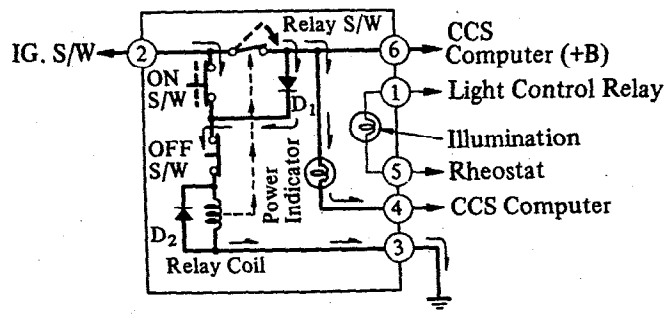


Connector for Main Switch

OPERATION

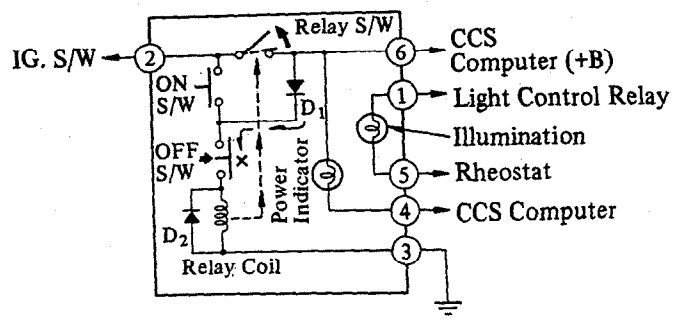
1) **Main Switch ON**

- With the Ignition Switch ON, if the Main Switch is turned ON, Terminal ③ is grounded by Terminal ② through the On Switch, Off Switch and Relay Coil.
- The Relay Switch goes on and current flows to Terminal ⑥.
  Also, since current is flowing through the Relay Coil through D_1, even if the Relay Switch is separated from the On switch, it remains ON. (Self-hold Circuit)
  The Power Indicator Lamp Lights up.



2) **Main Switch OFF**

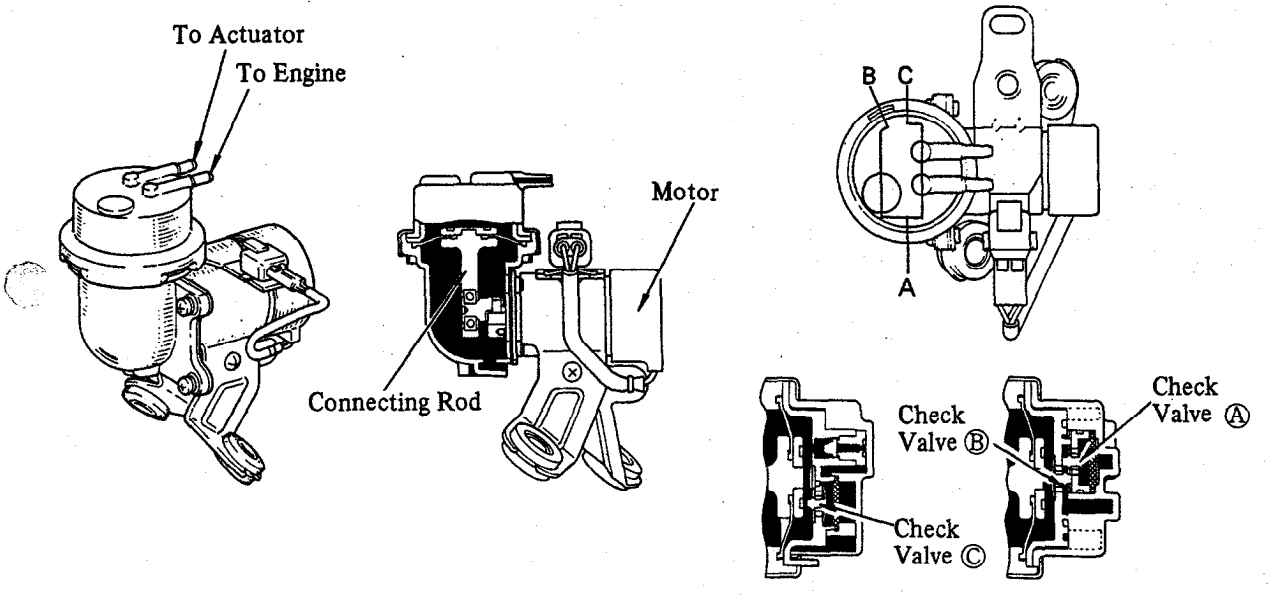
- When the Main Switch is ON, if the Off Switch is pressed, the current flowing from D_1 is cut off and the flow of current to the Relay Coil is stopped, causing the Main Switch goes off.
- Also, when the Ignition Switch is turned OFF, the Relay Coil is no longer charged and the Main Switch goes off.



2. Vacuum Pump (Models with RHD)

CONSTRUCTION

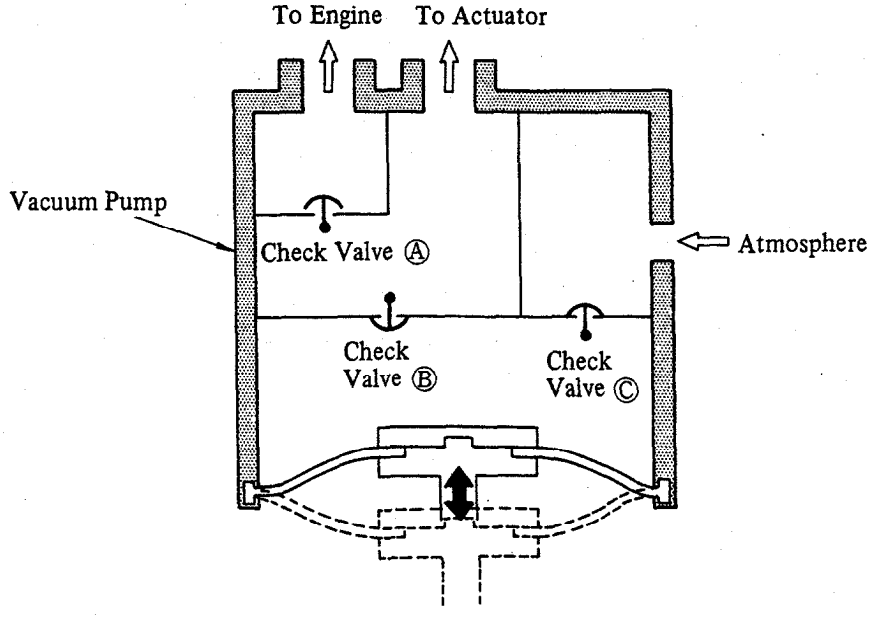
The vacuum pump is located between the vacuum outlet of the engine and the vacuum circuit of the actuator, and supplies extra vacuum to the actuator when the vacuum in the manifold is not sufficient (as when the vehicle is climbing a hill or during full acceleration).



A-B Cross Section A-C Cross Section

OPERATION

Check valve Ⓐ is normally kept open due to vacuum in the manifold, and supplies vacuum to the actuator. When manifold vacuum is low, the computer sends a signal to turn the vacuum pump on. As esult, vacuum is supplied to the actuator through check valve Ⓑ.



3. Vacuum Switch

This switch detects vacuum in the intake manifold.
It turns on when this vacuum is 170 mmHg or lower, and sends an ON signal to the computer.