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TRANSMISSION REMOVAL & INSTALLATION - A/T
Article Text
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ARTICLE BEGINNING

```
TRANSMISSION SERVICING
Mazda - Automatic Transmission Removal & Installation

RX7
```

AUTOMATIC

NOTE: On models with anti-theft radio system, obtain code number
          from customer to deactivate radio anti-theft system BEFORE
          disconnecting negative battery cable. To deactivate radio
          anti-theft system, turn ignition switch to ACC position.
          Press FF and REW buttons simultaneously until "cod e" is
          displayed. Press FF and REW buttons again until 4 bars are
          displayed. Use preset button No. 1 to enter first number.
          Use preset buttons No. 2, 3 and 4 to set other numbers.
          Press FF and REW buttons for about 2 seconds until a beep is
          heard. After 5 seconds, flashing "cod e" will go away and
          radio will operate.

RX7

```
     Removal
     1) Disconnect negative battery cable. Raise and support
vehicle. Drain transmission fluid. Remove pipe and heat insulator.
Mark drive shaft-to-differential assembly for reassembly reference.
     2) Support engine from above. Remove shaft. Insert plug in
rear of transmission to prevent leakage. Remove vacuum hose, shift
rod, oil cooler lines and speedometer cable from transmission.
     3) Remove starter and dipstick tube. Remove all wiring
harness connectors from transmission. Remove lower cover from
converter housing. Mark converter to drive plate for reassembly
reference. Using Wrench (49 0877 435) remove torque converter-to-drive
plate bolts.
     4) Support transmission from below using transmission jack.
Remove crossmember. Remove transaxle-to-engine bolts. Slowly lower
transmission assembly out of vehicle.

     Installation
     To install transmission, reverse removal procedure. Tighten
bolts to specification. See TORQUE SPECIFICATIONS. Fill transmission
with required amount of fluid, and check for external leaks.
```

TORQUE SPECIFICATIONS

```
TORQUE SPECIFICATIONS
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Application                                    Ft. Lbs. (N.m)

Companion Flange Bolt/Nut  .................. 37-43 (50-58)
```

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```
Crossmember Mounting Nut  ...................  14-19 (18-26)
Dipstick Stub Tube Mounting Bolt  .................  8 (11)
Starter Bolt  ............................  28-38 (38-51)
Torque Converter Bolt  ...................  26-36 (35-49)
Transmission-To-Engine Bolt  ................  28-38 (38-52)
```
ÄÄ

END OF ARTICLE

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ARTICLE BEGINNING

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        TRANSMISSION SERVICING
        Mazda - Automatic Transmission


        RX7
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NOTE: On models with anti-theft radio system, obtain code number
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disconnecting negative battery cable. To deactivate radio
anti-theft system, turn ignition switch to ACC position.
Press FF and REW buttons simultaneously until "cod e" is
displayed. Press FF and REW buttons again until 4 bars are
displayed. Use preset button No. 1 to enter first number.
Use preset buttons No. 2, 3 and 4 to set other numbers.
Press FF and REW buttons for about 2 seconds until a beep is
heard. After 5 seconds, flashing "cod e" will go away and
radio will operate.

IDENTIFICATION

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AUTOMATIC TRANSMISSION APPLICATIONS TABLE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Model                                           Transmission

RX7  ........................................... RB4A-EL
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
```

LUBRICATION

SERVICE INTERVALS

```
        Transmission Fluid
        Check fluid level every 7500 miles or 6 months.
```

CHECKING FLUID LEVEL

```
        Transmission
        Park vehicle on level ground. Apply parking brake. Warm
engine to normal operating temperature. Briefly place selector lever
in all gears and return it to "P" position. Clean dipstick and insert
it in tube. Remove dipstick. Level should be between "L" and "F"
marks. Check fluid for discoloration and unusual smell. If necessary,
add fluid. DO NOT overfill.
```

RECOMMENDED FLUID

```
        Transmission
        Use Dexron-II or M-III ATF.
```

FLUID CAPACITIES

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TRANSMISSION REFILL CAPACITIES TABLE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Application            Refill Qts. (L)      Dry Fill Qts. (L)

RX7 ................... 4.2 (4.0) ..... 9.1 Qts. (8.6L)
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
```

DRAINING & REFILLING

Disconnect negative battery cable. Loosen oil pan bolts to drain fluid. Remove oil pan, and discard old gasket. Clean oil pan, and install it using NEW gasket. Tighten oil pan bolts to specification. See TORQUE SPECIFICATIONS. Connect negative battery cable. Add fluid, and check level. DO NOT overfill.

ADJUSTMENTS

BRAKE BAND (2ND GEAR)

Loosen lock nut on band adjusting bolt. See Fig. 1. Tighten bolt to 35-53 INCH lbs (4-6 N.m). Loosen band adjusting bolt 2 1/2 turns. Tighten lock nut to 24-31 ft. lbs. (32-42 N.m).
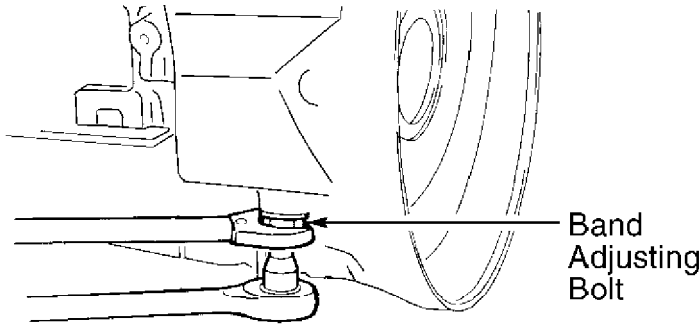

```
        91B01533
```
Fig. 1: Adjusting Brake Band
Courtesy of Mazda Motors Corp.

OVERDRIVE BRAKE BAND

NOTE: Overdrive brake band is not adjustable.

GEARSHIFT LINKAGE

1) Disconnect negative battery cable. Remove center console. Remove boot plate. Place gearshift lever in "P" position. Loosen lock nut on side of gearshift lever. See Fig. 2. Move adjustment lever forward to set transmission in "P" position.
2) Adjust lever so clearance between guide plate and guide pin with lever in position "P" is as specified. See Fig. 3. Also, see the GEARSHIFT LEVER ADJUSTMENT SPECIFICATIONS table.. Tighten rear

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lock nut to 14-21 ft. lbs. (19-28 N.m).
        3) Place gearshift lever in "N" and "D" positions to ensure
clearances are correct. See GEARSHIFT LEVER ADJUSTMENT SPECIFICATIONS
table. See Fig. 3. Adjust lever if necessary. Install boot plate,
center console, indicator panel, selector sleeve, selector knob and
upper panel. Connect negative battery cable.

GEARSHIFT LEVER ADJUSTMENT SPECIFICATIONS TABLE
ÄÄ
Application   (1) In. (mm)

Gearshift In Position "P"
  Clearance "A" (2) .... .035-.039 (.89-.99)
  Clearance "B" (2) .... .020-.024 (.51-.61)

Gearshift In Position "N" Or "D"
  Clearance "C" .... .024-.028 (.61-.71)
  Clearance "D" .... .024-.028 (.61-.71)

(1) - Clearance between guide plate and guide pin.
      See Fig. 3.
(2) - With push rod slightly depressed.
ÄÄ
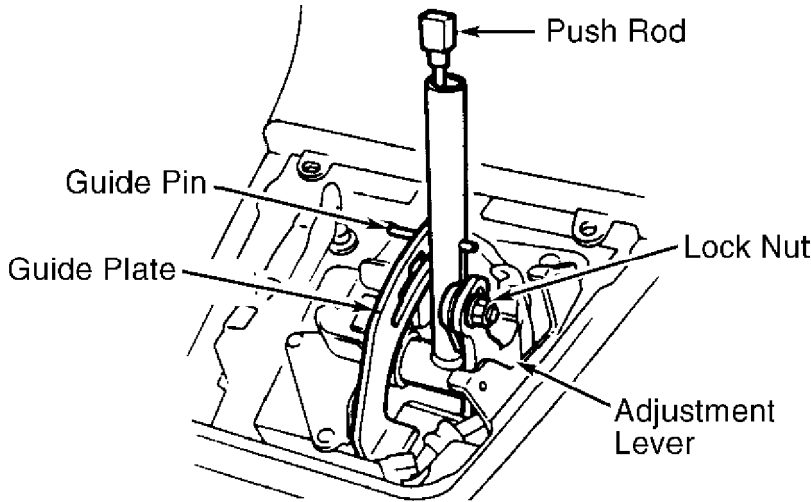
Fig. 2: Gearshift Lever Components ID
Courtesy of Mazda Motors Corp.
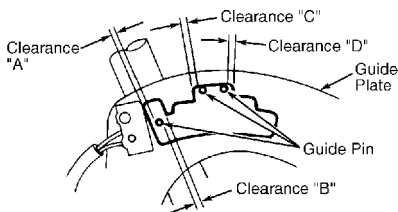
Fig. 3: Checking Gearshift Lever Adjustment Clearances
Courtesy of Mazda Motors Corp.

NEUTRAL SAFETY SWITCH

       1) Place gearshift lever in "N" position. Ensure gearshift linkage is adjusted correctly. See GEARSHIFT LINKAGE under ADJUSTMENTS. Loosen neutral safety switch mounting bolts at transmission. Remove screw from alignment pin hole at bottom of switch (if equipped).
       2) Rotate switch and insert a 5/32" (4.0 mm) alignment pin (or drill bit) through alignment holes.
       3) Tighten mounting bolts to specification. Refer to the TORQUE SPECIFICATIONS table. Remove alignment pin. Install alignment pin hole screw (if equipped), and check switch operation. Vehicle should start only with gearshift in "P" or "N" position.

TORQUE SPECIFICATIONS

```
TORQUE SPECIFICATIONS TABLE
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Application                             INCH Lbs. (N.m)

Neutral Safety Switch Mounting Bolt  ...... 22-35 (2.5-4.0)
Oil Pan Bolt  ............................. 61-78 (7.0-9.0)
Valve Body Bolt  .......................... 61-78 (7.0-9.0)
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
```

END OF ARTICLE

AUTO TRANS DIAGNOSIS - RA4A-EL & RB4A-EL
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ARTICLE BEGINNING

```
        AUTOMATIC TRANSMISSIONS
        Mazda RA4A-EL & RB4A-EL Diagnosis
```

### APPLICATION

```
TRANSMISSION APPLICATION
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Vehicle                     Transmission Model

RX-7 (1991-94)  ................... RB4A-EL
929 (1992-94)  ................... RA4A-EL
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
```

IDENTIFICATION

Transmission model number is identified by a stamped metal
plate attached to right side of transmission case. See Fig. 1.
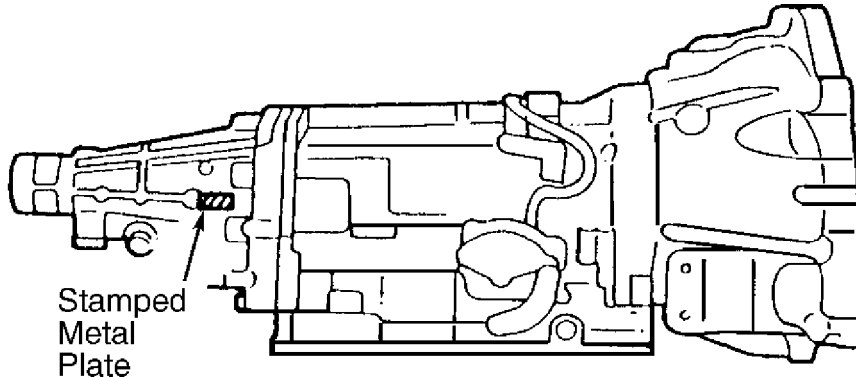
Fig. 1: Locating Transmission Identification Number
Courtesy of Mazda Motors Corp.

DESCRIPTION & OPERATION

RA4A-EL and RB4A-EL are electrically controlled, 4-speed
overdrive units. These units use 3-element lock-up torque converter
and 2 planetary gear sets. A Powertrain Control Module Transmission
(PCMT) unit controls all shifts according to road speed and throttle
position.
        The PCMT has 2 shift programs (modes) to choose from, ECONOMY
and POWER. In the RX7 & 929, modes can be manually selected from a
switch by the driver. These models are equipped with a Hold switch.
The Hold switch will cause transmission to remain in selected gear
position. If Hold switch is depressed while in 3rd gear, transmission
will downshift to 2nd on decel and upshift back to 3rd on acceleration
and hold in 3rd gear.
        The PCMT includes a self-diagnostic system, which diagnoses

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circuit problems of input sensors, solenoid valves and PCMT. Trouble
codes are stored in the PCMT. The PCMT tester and adapter are used to
access trouble codes.

LUBRICATION & ADJUSTMENT

LUBRICATION & ADJUSTMENT

        See the appropriate TRANSMISSION SERVICING - A/T article in
the AUTOMATIC TRANS SERVICING section. Refer to the following:

    * For RX7, see TRANSMISSION SERVICING - A/T

    * For 929, see TRANSMISSION SERVICING - A/T

SHIFT-LOCK SYSTEM

OPERATION

        All models are equipped with a shift-lock system. System
locks gear selector in Park unless brake pedal is pushed down. Shift-
lock actuator uses an integral relay to release a solenoid (mounted on
gear selector assembly).
        A mechanical control cable prevents ignition key from being
removed unless gear selector is in Park. With ignition key removed,
gear selector locks in Park.

FUNCTIONAL CHECK

        1) With ignition key removed, ensure gear selector cannot be
moved from Park. Insert key in ignition switch.
        2) Turn ignition on. Ensure gear selector can only be moved
with brake pedal pressed down. Move gear selector to Reverse.
        3) Ensure ignition key cannot be removed. Move gear selector
to Park. Ensure it is now possible to remove ignition key.
        4) If shift-lock system does not operate as described, check
gear selector, shift-lock solenoid and control cable.
        5) Place gear selector in Park. Using screwdriver, push down
the emergency override button on shifter console and verify gear
selector can be moved from Park position. See Fig. 2. If gear selector
cannot be moved out of Park, adjust or replace shift-lock actuator. To
adjust shift-lock actuator, refer to the appropriate TRANSMISSION
SERVICING - A/T article in the AUTOMATIC TRANS SERVICING section.
Refer to the following:

    * For RX7, see TRANSMISSION SERVICING - A/T

    * For 929, see TRANSMISSION SERVICING - A/T

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95J20650
Fig. 2: Locating RX7 & 929 Emergency Override Button
Courtesy of Mazda Motors Corp.

   SHIFT LOCK SYSTEM TESTING

NOTE: All electrical tests for RX7 and 929 are made at shift-lock
         control unit connector located at center console. To
         identify wire colors from connector locations, see
         appropriate SHIFT-LOCK CONTROL UNIT CONNECTOR I.D. table.

         RX7
         1) Disconnect negative battery cable. Remove gear selector
console panel. Place gear selector in Park. Turn ignition on.
              2) Check for battery voltage between terminal "G" and
ground. See Fig. 3. Battery voltage should be present with brake pedal
depressed.
         3) Check for battery voltage between terminal "I" and ground.
Disconnect shift-lock control unit connector and turn ignition off.
         4) Test for continuity between terminal "H" and "J".
Continuity should be present in Park with button depressed and all
other gear selector positions.
         5) Ensure continuity is present between terminal "J" and
ground at all times. If voltage or continuity is not as described,
repair wire harness and/or replace "P" range switch, shift-lock
solenoid and shift-lock control unit as an assembly.

SHIFT-LOCK CONTROL UNIT CONNECTOR I.D. (RX7)
ÄÄÄ
Connector I.D.   Wire Color

G .... Green
H .... Light Green
I .... Black/Yellow
J .... Black
ÄÄÄ

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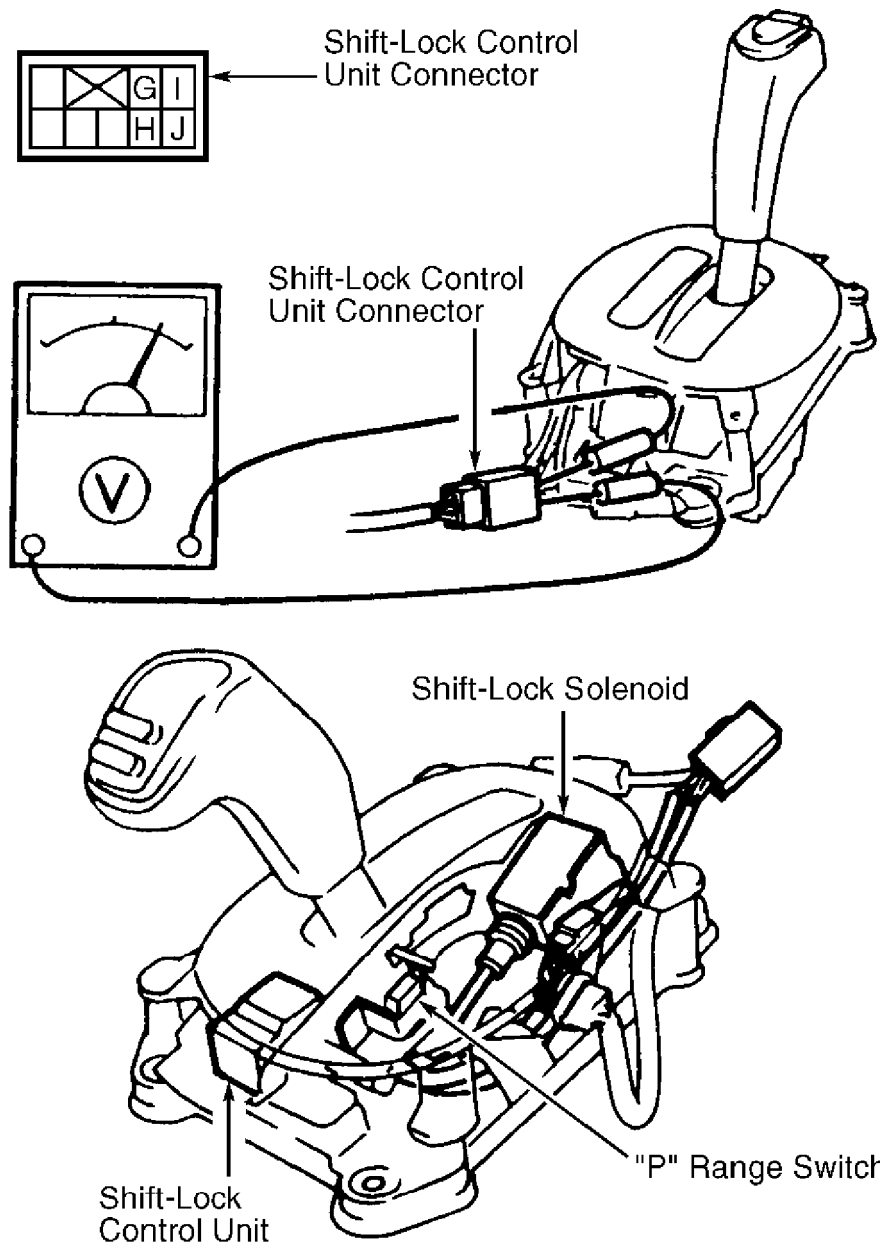
95A20651
Fig. 3: Testing RX7 Shift Lock Control System
Courtesy of Mazda Motors Corp.

929
1) Disconnect negative battery cable. Remove gear selector console cover. Disconnect "P" range switch connector. See Fig. 4.
2) Place gear selector in Park. Continuity should be present between wires. Depress gear selector release button and ensure no continuity is present. If "P" range switch works as described, go to next step. If "P" range switch does not work as described, replace "P" range switch.
3) Turn ignition on. Check for constant battery voltage

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between terminals "A" and "B", and terminals "A" and "C". See Fig. 5.
Check for battery voltage between terminal "D" and "C". Battery
voltage should be present with brake pedal depressed.
         4) Disconnect shift-lock actuator connector and turn ignition
off. Test for continuity between terminal "C" and ground. If voltage
or continuity is not as described, repair wire harness and/or replace
shift-lock actuator.

SHIFT-LOCK CONTROL UNIT CONNECTOR I.D. (929)
ÄÄ
Connector I.D.   Wire Color

A .... Blue/Red
B .... Black/Yellow
C .... Black
D .... White/Green
ÄÄ
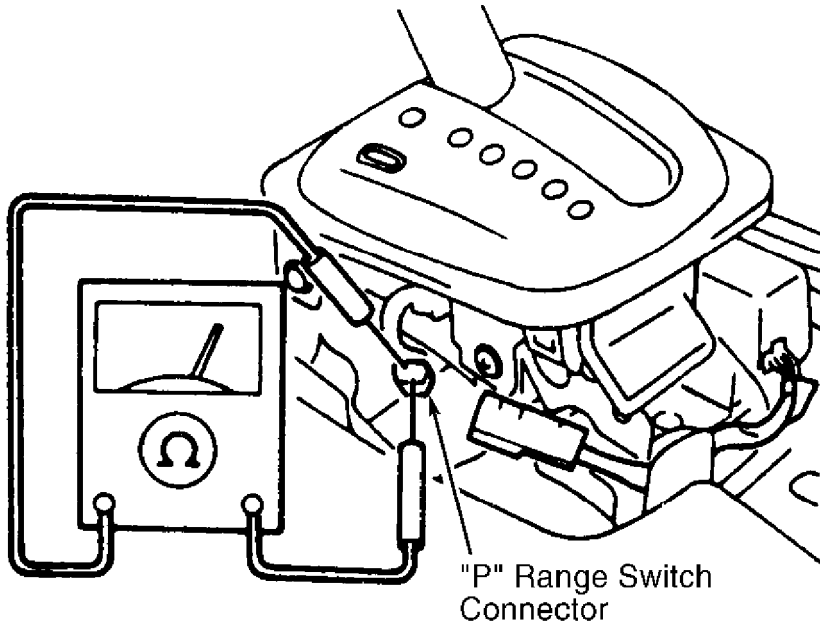
95B20652
Fig. 4: Testing 929 "P" Range Switch
Courtesy of Mazda Motors Corp.

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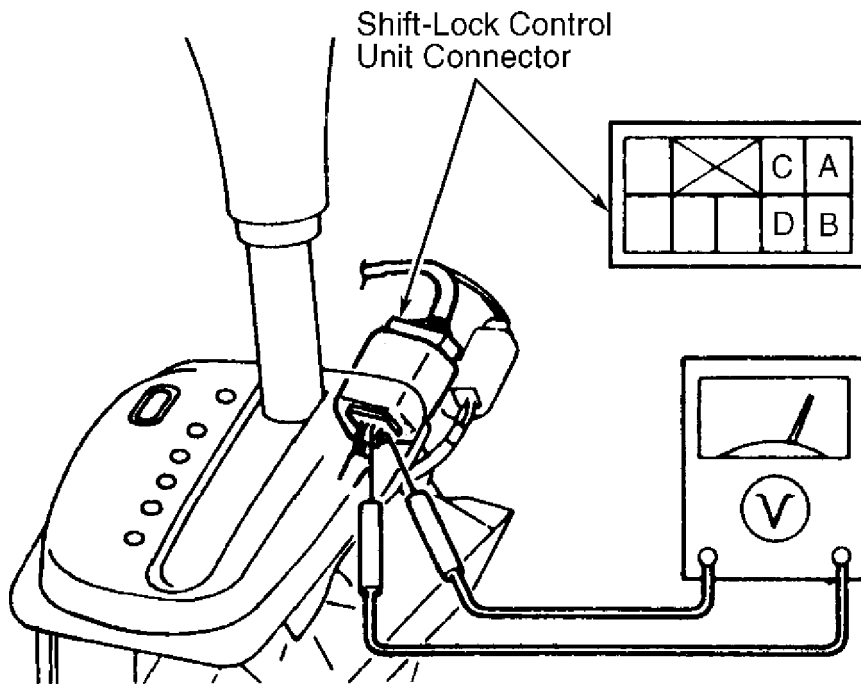
95C20653
Fig. 5: Testing 929 Shift Lock Actuator
Courtesy of Mazda Motors Corp.

TROUBLE SHOOTING

NOTE: For clutch, band, one-way clutch and overrunning clutch
           operation, see ELEMENTS IN USE under TESTING.

           System problems may be caused by engine, PCMT, hydraulic
control system or electronic control system. When trouble shooting,
start with those points that can be inspected quickly and easily.
Recommended trouble shooting sequence is as follows:

    *   Check for fault codes. See ELECTRONIC SELF-DIAGNOSTICS. If
        fault code is present, see appropriate TROUBLE CODE CHARTS.
    *   Check stall speed, time lag, line pressure and throttle
        pressure. See TESTING.
    *   Road test vehicle and check for proper transmission
        operation. See ROAD TEST.

           If previous trouble shooting sequence is followed, cause of
the problem should be located. Another way to find PCMT problems is to
use the QUICK DIAGNOSIS & TROUBLE SHOOTING CHART to find the correct
test. These charts show various problems and relationship of
components that might be cause of problem.

           Using Quick Diagnosis Chart
           1) Components listed under Self-Diagnosis are identified by
PCMT self-diagnosis function. Components listed under adjustment
indicate problem may be the result of an incorrect adjustment. Check

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adjustment of each component listed and readjust as necessary.
        2) Use electronic tester to check input and output signals of
components listed under Tester. Components listed under Stall Test may
be checked by results of stall test procedure. To perform stall test,
see STALL SPEED under TESTING.
        3) Components listed under Time Lag Test may be checked by
time lag test. To perform time lag test, see TIME LAG under TESTING.
        4) Components listed under Road Test may be checked using the
results of the road test. To perform the road test, see ROAD TEST. For
appropriate trouble shooting chart testing procedures, refer to the
QUICK DIAGNOSIS & TROUBLE SHOOTING CHART DIRECTORY table.

        Using Trouble Shooting Chart
        Use trouble shooting chart to diagnose a problem by symptom.
See the QUICK DIAGNOSIS & TROUBLE SHOOTING CHART DIRECTORY.

QUICK DIAGNOSIS & TROUBLE SHOOTING CHART DIRECTORY
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ-ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Application   See Fig.

Quick Diagnosis Chart
  RX7 & 929 (RA4A-EL & RB4A-EL) 6

Trouble Shooting Chart
  RX7 (RB4A-EL) 7
  929 (RA4A-EL) 8
ÄÄ

Fig. 6: Quick Diagnosis Chart - RX7 & 929 (RA4A-EL & RB4A-EL)
Courtesy of Mazda Motors Corp.

The chart below is a Troubleshooting Chart cross-referencing troubleshooting items against possible parts. Column group headings across the top are: **Possible parts** — **Preliminary**, **Electronic system**, **Hydraulic control system**, **Powertrain**.

Possible parts columns (left to right):

Preliminary: ATF level and condition; Selector lever; Idle speed and ignition timing; Ignition system and starter; Stall test; Time lag test; Line pressure test; Road test

Electronic system: Inhibitor switch; Throttle sensor; Speed sensor 1 (revolution sensor); Speed sensor 2 (speedometer sensor); Engine rpm signal; ATF thermosensor; Solenoid valve (shift A); Solenoid valve (shift B); Solenoid valve (line pressure); Dropping resistor; Solenoid valve (lockup); Solenoid valve (lockup control); Solenoid valve (overrunning clutch); Pulse generator; Inhibitor signal; Idle signal; O/D inhibit signal (ASC signal); Hold switch; A/C signal

Hydraulic control system: Slip lockup signal; Torque reduced signal; Reduce torque signal; Stoplight switch; Slip lockup OFF signal; Water thermoswitch; Atmospheric pressure sensor; Mileage switch; Control valve body; N-D accumulator; 1-2 accumulator; 2-3 accumulator; 3-4/N-R accumulator; Band servo; Oil pump; Hydraulic circuit

Powertrain: Torque converter; Reverse clutch; High clutch; Forward clutch; Forward one-way clutch; Overrunning clutch; Low one-way clutch; Low and reverse brake; Brake band (and servo); Parking mechanism

Troubleshooting items (row labels):

#	Troubleshooting Item
6	Engine starts in other than P and N ranges
14	Engine stalls — Idle when shifted from N or P to other ranges
18	Engine stalls — On deceleration
24	Engine rough — On deceleration
25	Poor acceleration — Drive away
26	Poor acceleration — On acceleration
30	Surges while cruising
31	Lack of power
32	Poor fuel economy
40	Vehicle does not move in D, S, L, and/or R ranges
40①	Vehicle does not move in D, S, and/or L ranges
40②	Vehicle does not move in D and/or S ranges
40③	Vehicle does not move in R range
41	Vehicle moves in N range
42	Vehicle moves in P range
43	Excessive creep
44	No shift
44①	Does not shift 1st to 2nd
44②	Does not shift 2nd to 3rd
44③	Does not shift to O/D
44④	Does not shift O/D to 3rd
44⑤	Does not shift O/D to 2nd, or 3rd to 2nd
44⑥	Does not shift 3rd to 1st, or 2nd to 1st
45	Abnormal shift
45①	Shifts directly from 1st to 3rd
45②	Does not kickdown when accelerator is depressed in O/D with in kickdown range
45③	Excessive engine speed when accelerated in O/D due to delayed kickdown
46	Frequent shifting
47	Shift point high or low
48	No lockup
49	No kickdown
50	Engine speed flares up — When accelerating
51①	When upshifting and/or downshifting
51②	When 1st to 2nd shifting
51③	When 2nd to 3rd shifting
51④	When 3rd to O/D shifting
51④	When O/D, or 3rd to 2nd shifting
51⑤	When 3rd, or 2nd to 1st shifting
52	Excessive shift shock — P, N to R and/or N to D
53	When upshifting and/or downshifting
53①	When 1st to 2nd shifting
53②	When 2nd to 3rd shifting
53③	When 3rd to O/D shifting
53④	When 2nd to 1st shifting in L range
53⑤	When coasting
53⑥	When lockup
54	No engine braking
55	No mode changes
56	Transmission noise — N and/or P ranges
57	Transmission noise — All ranges
58	Transmission overheat

Fig. 7: Trouble Shooting Chart - RX7 (RB4A-EL)
Courtesy of Mazda Motors Corp.

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The following is a troubleshooting chart ("Possible" cause vs. "Troubleshooting item"). The column groups are **Preliminary**, **Electronic system**, **Hydraulic control system**, and **Powertrain**. Columns, in order:

Preliminary: ATF level and condition; Selector lever and control linkage; Idle speed and ignition timing; Ignition system and starter; Stall test; Time lag test; Line pressure test; Road test.

Electronic system: Park/Neutral switch; Throttle position sensor; VSS1 (revolution sensor); VSS2 (speedometer sensor); Engine rpm sensor (Net signal); ATF thermosensor; Solenoid valve (shift A); Solenoid valve (shift B); Solenoid valve (line pressure); Dropping resistor; Solenoid valve (lockup); Solenoid valve (lockup control); Solenoid valve (overrunning clutch); Vehicle speed pulse generator; Inhibitor signal; Idle switch.

Hydraulic control system: O/D inhibit signal (ASC signal); Hold switch; A/C signal; Barometric absolute pressure sensor; Torque reduced signal; Reduce torque signal; Control valve body; N-D accumulator; 1-2 accumulator; 2-3 accumulator; 3-4/N-R accumulator; Band servo; Oil pump; Hydraulic circuit.

Powertrain: Torque converter; Reverse clutch; High clutch; Forward clutch; Forward one-way clutch; Overrunning clutch; Low one-way clutch; Low and reverse brake; Brake band (and servo); Parking mechanism.

Group	No.	Troubleshooting item	Values (column: number)
Accelerating	1	Vehicle does not move in D, S, L, and R ranges	ATF=1; Selector=4; Stall=2; Time lag=3; Park/Neutral=7; shift A=5; shift B=6; Control valve body=8; 3-4/N-R acc=9; Band servo=10; Hydraulic circuit=18; Torque converter=14; Reverse=17; High=11; Forward=16; Low & reverse brake=13; Brake band=12; Parking=15
	1①	Vehicle does not move in D, and S ranges	Selector=1; Forward clutch=3; Overrunning clutch=2
	1②	Vehicle does not move in R range	Selector=1; Stall=2; shift A=3; shift B=4; Control valve body=5; High=11; Reverse=6; High=7; Forward=8; Low & reverse brake=9; Brake band=10
	1③	Vehicle does not move in D, S, and L ranges	ATF=1; Stall=2; shift A=3; shift B=4; Control valve=5; N-D acc=6; Forward=12; Forward=7; one-way=8; Overrunning=9; Low one-way=10; Low & rev brake=11
	2	Vehicle moves in N range	ATF=1; Selector=3; Stall=2; Park/Neutral=6; shift A=4; shift B=5; Control valve=7; High=11; Forward=10; Forward=8; one-way=9
	3	Vehicle moves in P range, or parking gear does not disengage when P disengaged	Selector=1; Time lag=2; Parking=3
	4	Excessive creep	Idle=1; Ignition=3; Stall=2; Park/Neutral=9; Throttle=6; shift A=4; shift B=5; N-D acc=8; 1-2 acc=7; Control valve=10
	5	No creep at all	ATF=1; Selector=3; Stall=2; Throttle=6; shift A=4; shift B=5; Control valve=7; Forward one-way=9; Overrunning=10; Low one-way=11; Low & rev=8
	6	Low maximum speed and poor acceleration	ATF=1; Ignition=3; Stall=2; Line pressure=7; Park/Neutral=10; Throttle=6; VSS1=12; shift(lp)=8; Dropping=9; lockup=4; lockup control=5; Control valve=11; Band servo=13; Torque conv=14; Reverse=19; High=21; Forward=20; one-way=15; Overrunning=16; Brake band=18; Parking=17
Shifting	7	No shift	Road test=1; VSS1=5; Solenoid shift A=2; shift B=3; O/D inhibit=4; Control valve=6; 2-3 acc=7; Band servo=10; Forward one-way=9; Parking=8
	7①	Does not shift from 1st to 2nd	VSS1=4; shift A=2; shift B=3; O/D inhibit=1; Control valve=5; 2-3 acc=6; Band servo=9; Forward one-way=8; Parking=7
	7②	Does not shift from 2nd to 3rd	VSS1=2; shift B=1; Control valve=3; 2-3 acc=4; Band servo=7; Forward=6; Parking=5
	7③	Does not shift from O/D to 3rd	shift A=1; Control valve=2; 2-3 acc=3; Band servo=7; Low one-way=5; Low & rev=6; Parking=4
	8	Does not shift to O/D	Park/Neutral=5; ATF thermo=6; Engine rpm=1; shift A=2; shift B=3; overrunning sol=4; O/D inhibit=7; Hold switch=8; Control valve=9; Band servo=10; Hydraulic=12; Parking=11
	8①	Does not shift from O/D to 2nd or from 3rd to 2nd	ATF=1; Ignition=6; shift A=2; shift B=3; shift(lp)=4; O/D inhibit=5; Control valve=7; Band servo=9; Hydraulic=11; Overrunning=8; Parking=10
	8②	Does not shift from 3rd to 1st or from 2nd to 1st	ATF=1; Ignition=6; shift A=2; shift B=3; shift(lp)=4; O/D inhibit=5; Control valve=7; Band servo=10; Hydraulic=12; Overrunning=8; Brake band=9; Parking=11
	9	Abnormal shift	ATF=1; shift A=2; shift B=3; O/D inhibit=4; Band servo=5; Hydraulic=7; Parking=6
	9①	Shifts directly from 1st to 3rd	ATF=1; 2-3 acc=2; Band servo=3; Hydraulic=5; Parking=4
	9②	Does not kickdown when accelerator is depressed in O/D within kickdown range	Throttle=1; VSS1=2; shift A=3; shift B=4
	9③	Excessive engine speed when accelerated in O/D due to delayed kickdown	Throttle=2; VSS1=1; shift A=3; shift B=4
	10	Frequent shifting	Throttle=1; Band servo=2; Forward=3
	11	Shift point high or low	Throttle=1; VSS1=3; VSS2=2; Reduce torque=4; Band servo=5
	11①	Lockup point high or low	Throttle=1; VSS1=3; lockup control=4; Idle switch=2; Band servo=5
	12	No lockup	Park/Neutral=7; Throttle=4; ATF thermo=8; VSS2=6; Engine rpm=3; lockup=1; lockup control=2; Idle switch=5; Control valve=9; Forward one-way=11; Overrunning=10
	13	No kickdown	Throttle=1; shift B=5; O/D inhibit=2; Hold switch=3; Hold=4; Control valve=6
Slipping	14	Engine flares up or slips when accelerating vehicle	ATF=1; Selector=3; Stall=2; Throttle=6; shift A=4; shift B=5; Control valve=7; Reverse=13; High=15; Forward=14; one-way=11; Overrunning=8; Low one-way=9; Low & rev=10; Brake band=12
	14①	Slips when shifting from 1st to 2nd	ATF=1; Selector=2; Ignition=10; Stall=3; Throttle=6; ATF thermo=8; shift A=4; shift B=5; overrunning sol=7; Torque reduced=9; Control valve=8; 1-2 acc=9; Band servo=11; Brake band=10
	14②	Slips when shifting from 2nd to 3rd	ATF=1; Selector=2; Ignition=10; Stall=3; Throttle=6; ATF thermo=8; shift A=4; shift B=5; overrunning sol=7; Torque reduced=9; Control valve=11; 2-3 acc=12; Band servo=15; Overrunning=14; Brake band=13
	14③	Slips when shifting from 3rd to O/D	ATF=1; Selector=2; Ignition=10; Stall=3; Throttle=6; ATF thermo=8; shift A=4; shift B=5; overrunning sol=7; Torque reduced=9; Control valve=11; 3-4/N-R acc=12; Band servo=15; Overrunning=14; Brake band=13
	14④	Engine flares up or slips when shifting from O/D to 3rd	ATF=1; Selector=2; Ignition=8; Stall=3; Throttle=6; shift A=4; shift B=5; overrunning sol=7; Band servo=9; Hydraulic=12; Overrunning=11; Brake band=10
	14⑤	Engine flares up or slips when shifting from O/D to 2nd	ATF=1; Selector=2; Ignition=9; Stall=3; Throttle=6; Vehicle speed pulse=8; shift A=4; shift B=5; overrunning sol=7; Band servo=10; Hydraulic=12; Brake band=11
	14⑥	Engine flares up or slips when shifting from 3rd to 2nd	ATF=1; Selector=2; Ignition=8; Stall=3; Throttle=6; shift A=4; shift B=5; overrunning sol=7; Control valve=9; 2-3 acc=10; Band servo=13; Overrunning=12; Brake band=11
	14⑦	Engine flares up or slips when shifting from O/D or 3rd to 1st	ATF=1; Selector=2; Ignition=7; Stall=3; Throttle=6; shift A=4; shift B=5; Band servo=8; Hydraulic=12; Forward one-way=9; Overrunning=10; Low one-way=11
Slipping	15	Engine flares up or slips when upshifting or downshifting	ATF=1; Selector=3; Stall=2; Throttle=6; ATF thermo=8; shift A=4; shift B=5; overrunning sol=7; Band servo=9; Control valve=10; 2-3 acc=11; 3-4/N-R=12; Band servo=13; Hydraulic=19; Forward one-way=15; Overrunning=16; Low one-way=17; Brake band=18; Parking=14
	16	Shudders upon lockup	ATF=2; Selector=1; Throttle=7; ATF thermo=10; Engine rpm=9; lockup=5; lockup control=6; Idle switch=3; Control valve=8; Band servo=11; Low & rev=13; Brake band=12
Shift shock	17	Excessive N to D or N to R range shift shock	ATF=1; Idle=2; Ignition=4; Stall=3; Park/Neutral=10; Throttle=7; shift A=5; shift B=6; Control valve=9; N-D acc=8; Band servo=11; 1-2 acc=12; 3-4/N-R=13; Hydraulic=17; Overrunning=15; Low & rev=14; Brake band=16
	18	Excessive shift shock when upshifting and downshifting	ATF=1; Ignition=3; Stall=2; Throttle=6; VSS1=10; Net=8; shift A=4; shift B=5; Control valve=9; Torque reduced=7; N-D acc=11; 1-2 acc=12; 2-3 acc=13; 3-4/N-R=14; Band servo=15; =16; =17; Hydraulic=21; Reverse=20; Overrunning=19; Brake band=18
	18①	Excessive 1st to 2nd shift shock	Ignition=11; Stall=1; Throttle=4; VSS1=7; Net=5; shift A=2; shift B=3; Control valve=6; 1-2 acc=8; 2-3=9; 3-4/N-R=10; Band servo=12; accumulator=13; Hydraulic=15; Brake band=14
	18②	Excessive 2nd to 3rd shift shock	Ignition=11; Stall=1; Throttle=4; VSS1=7; Net=5; shift A=2; shift B=3; Control valve=6; 1-2 acc=8; 2-3=9; 3-4/N-R=10; Band servo=12; =13; Hydraulic=16; Overrunning=15; Brake band=14
	18③	Excessive 3rd to O/D shift shock	Ignition=9; Stall=1; Throttle=4; VSS1=7; Net=5; shift A=2; shift B=3; Control valve=6; Band servo=8; 3-4/N-R=10; =1; Hydraulic=14; Low & rev=13; Brake band=12
	18④	Excessive 2nd to 1st shift shock in L range	Ignition=11; Stall=1; Throttle=4; VSS1=7; Net=5; shift A=2; shift B=3; Control valve=6; 1-2 acc=8; 2-3=9; 3-4/N-R=10; Band servo=12; Hydraulic=15; Low & rev=13
	18⑤	Shift shock when accelerator released and deceleration occurs	Stall=2; Throttle=5; VSS1=8; Net=6; shift A=3; shift B=4; lockup=1; Idle switch=7; Vehicle speed pulse=9; Band servo=10
	19	Excessive lockup shift shock	ATF=1; VSS1=3; VSS2=7; Engine rpm=6; lockup control=2; Idle switch=5; Hold=4; Band servo=8; Forward=10; one-way=9
Noise	20	Noise at idle when vehicle stopped in all ranges	ATF=1; Throttle=4; ATF thermo=5; Engine rpm=6; O/D inhibit=2; Hold switch=3; Torque converter=7; High=8
	21	Noise at idle when vehicle stopped in R, D, S, and L ranges	ATF=1; High=2
Others	22	No engine braking	ATF=1; Stall=5; Time lag=3; Idle switch=2; O/D inhibit=4; Control valve=6; one-way=9; Low one-way=7; Low & rev=8
	23	No mode changes from/to hold mode	Hold switch=1
	24	Transmission overheats	ATF=1; Ignition=3; Stall=2; Throttle=6; shift A=4; shift B=5; lockup=7; Dropping=8; Control valve=9; Overrunning=10; Low one-way=18; Low & rev=17; High=11; Forward=12; one-way=14; Brake band=15; Torque converter=16; =13
	25	Hold indicator lamp flashes	(signals 1 across Electronic/Hydraulic columns; Reduce torque=1; =1)
	26	Engine does not start in N or P range, or starts in other ranges	Selector=3; Ignition=2; Park/Neutral=1
	27	Engine stalls when shifted to R, D, S, and L ranges	Selector=1; Park/Neutral=3; Engine rpm=5; lockup=4; lockup control=2; Overrunning=6; Overrunning=8; Low one-way=7
	27①	Rough idle when R,D,S, and L ranges selected from N and P ranges	Park/Neutral=3; lockup control=2; overrunning sol=1
	28	Engine stalls when driving at low speed or stopping	ATF=1; Idle=2; Throttle=4; ATF thermo=6; lockup=5; lockup control=3; Band servo=7; Overrunning=9; =8

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Fig. 8: Trouble Shooting Chart - 929 (RA4A-EL)
Courtesy of Mazda Motors Corp.

AUTO TRANS DIAGNOSIS - RA4A-EL & RB4A-EL
Article Text (p. 10)
1993 Mazda RX7
For www.iluvmyrx7.com
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Sunday, August 19, 2001 09:17PM

ROAD TEST

          Preparation
          Check all fluid levels and make corrections as necessary.
Warm engine and transmission to operating temperature. If any problems
occur during the road test, refer to ELECTRONIC SELF-DIAGNOSTICS and
TESTING, or repair transmission.

          "D" RANGE

NOTE: NORMAL/POWER mode are controlled by the PCMT.

          Inspection
          1) Check for shift point, shift pattern and shift shock.
Shift selector to "D" range. Accelerate vehicle at half and full
throttle, ensure 1-2, 2-3 and 3-OD upshifts, downshifts and lock-up
are obtained. Note speed and compare with appropriate SHIFT SPEED
CHARTS. See Figs. 9 and 10. Note upshifts for shift shock and
slippage.
          2) When driving in OD, shift to "S" and check that OD-3
downshift occurs immediately.
          3) Select HOLD mode. Check for 2-3 up and downshifts and
lock-up and no 1st or "OD".
          4) Decelerate vehicle. Check for engine braking in 3rd and
2nd gears when throttle is open 1/8 or less.
          5) Drive in 3rd and 4th gear to ensure no unusual noise or
vibration is heard. Check torque converter, driveshaft(s) and
differential for source of unusual noise. Ensure kickdown operates
properly and shift points match appropriate SHIFT SPEED CHARTS. See
Figs. 9 and 10.

NOTE: Throttle sensor voltage of PCMT tester represents throttle
          opening. OD does not operate when ATF temperature is below
          50øF (10øC), when cruise control is operating with a 5 MPH
          difference between preset cruise speed and vehicle speed on
          all 1994 models and 1993 RX7 and 13 MPH difference on
          remaining 1993 models. Lock-up does not operate when
          throttle is closed with vehicle below 74 MPH or when ATF
          is below 104øF (40øC).

Range	Mode	Throttle condition (throttle sensor voltage)	Shift	Vehicle speed km/h {MPH}
D	POWER	Fully open (4.0–4.5V)	D$_1$ → D$_2$	50–56 {31–35}
			D$_2$ → D$_3$	103–111 {64–69}
			D$_3$ → O/D	178–188 {111–117}
		Half throttle	D$_1$ → D$_2$	35–41 {22–25}
			D$_2$ → D$_3$	81–93 {50–58}
			D$_3$ → O/D	126–144 {78–89}
			Lockup ON (D$_3$)	94–106 {58–66} (81–93 {50–58})
			Lockup ON (O/D)	174–192 {108–119} (126–144 {78–89})
		Fully closed (0.1–1.1V)	O/D → D$_3$	39–45 {24–28}
			D$_3$ → D$_2$	13–19 {8–12}
			D$_2$ → D$_1$	5–11 {3–7}
		Kickdown	O/D → D$_3$	142–152 {88–94}
			D$_3$ → D$_2$	91–99 {57–62}
			D$_2$ → D$_1$	38–44 {24–27}
	NORMAL A/C ON	Fully open (4.0–4.5V)	D$_1$ → D$_2$	50–56 {31–35}
			D$_2$ → D$_3$	103–111 {64–69}
			D$_3$ → O/D	178–188 {111–117}
		Half throttle	D$_1$ → D$_2$	32–38 {20–24}
			D$_2$ → D$_3$	80–92 {50–57}
			D$_3$ → O/D	126–144 {78–89}
			Lockup ON (D$_3$)	94–106 {58–66} (80–92 {50–57})
			Lockup ON (O/D)	174–192 {108–119} (126–144 {78–89})
		Fully closed (0.1–1.1V)	O/D → D$_3$	39–45 {24–28}
			D$_3$ → D$_2$	13–19 {8–12}
			D$_2$ → D$_1$	5–11 {3–7}
		Kickdown	O/D → D$_3$	142–152 {88–94}
			D$_3$ → D$_2$	91–99 {57–62}
			D$_2$ → D$_1$	38–44 {24–27}
	NORMAL A/C OFF	Fully open (4.0–4.5V)	D$_1$ → D$_2$	50–56 {31–35}
			D$_2$ → D$_3$	103–111 {64–69}
			D$_3$ → O/D	178–188 {111–117}
		Half throttle	D$_1$ → D$_2$	32–38 {20–24}
			D$_2$ → D$_3$	80–92 {50–57}
			D$_3$ → O/D	126–144 {78–89}
			Lockup ON (D$_3$)	94–106 {58–66} (80–92 {50–57})
			Lockup ON (O/D)	174–192 {108–119} (126–144 {78–89})
		Fully closed (0.1–1.1V)	O/D → D$_3$	32–38 {20–24}
			D$_3$ → D$_2$	13–19 {8–12}
			D$_2$ → D$_1$	5–11 {3–7}
		Kickdown	O/D → D$_3$	142–152 {88–94}
			D$_3$ → D$_2$	91–99 {57–62}
			D$_2$ → D$_1$	38–44 {24–27}
D	HOLD	–	O/D → D$_3$	180–186 {112–116}
			D$_3$ → D$_2$	7–13 {4–8}
			D$_2$ → D$_3$	15–25 {9–16}
			Lockup ON (D$_3$)	94–106 {58–66} (39–51 {24–32})
S	EXCEPT HOLD	Fully open (4.0–4.5V)	S$_1$ → S$_2$	50–56 {31–35}
			S$_2$ → S$_3$	103–111 {64–69}
		Half throttle	S$_1$ → S$_2$	35–41 {22–25}
			S$_2$ → S$_3$	81–93 {50–58}
			Lockup ON (S$_3$)	94–106 {58–66} (81–93 {50–58})
		Fully closed (0.1–1.1V)	S$_3$ → S$_2$	13–19 {8–12}
			S$_2$ → S$_1$	5–11 {3–7}
		Kickdown	S$_3$ → S$_2$	91–99 {57–62}
			S$_2$ → S$_1$	38–44 {24–27}
	HOLD	–	S$_3$ → S$_2$	112–118 {70–73}
L	EXCEPT HOLD	Fully open (4.0–4.5V)	L$_1$ → L$_2$	50–56 {31–35}
		Half throttle	L$_1$ → L$_2$	35–41 {22–25}
		Fully closed (0.1–1.1V)	L$_2$ → L$_1$	5–11 {3–7}
		Kickdown	L$_2$ → L$_1$	38–44 {24–27}
	HOLD	–	L$_2$ → L$_1$	45–51 {28–32}

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Fig. 9: RX7 Shift Speed Chart
Courtesy of Mazda Motors Corp.

Range	Mode	Throttle condition (throttle position sensor voltage)	Shift	Vehicle speed km/h {mph}
D	POWER	Fully open (3.0—4.3V)	D₁→D₂	49—55 {30—34}
			D₂→D₃	94—102 {58—63}
			D₃→O/D	152—162 {94—100}
		Half throttle (1.7—2.7V)	D₁→D₂	40—46 {25—29}
			D₂→D₃	79—91 {49—56}
			D₃→O/D	133—151 {82—94}
			Lockup ON (D₃)	94—106 {58—66}
			Lockup ON (O/D)	144—162 {89—100}
		Fully closed (0.1—1.1V)	O/D→D₃	24—30 {15—19}
			D₃→D₂	12—18 {7—11}
			D₂→D₁	5—11 {3—7}
		Kickdown	O/D→D₃	142—152 {88—94}
			D₃→D₂	87—95 {54—59}
			D₂→D₁	43—49 {27—30}
	NORMAL A/C ON	Fully open (3.0—4.3V)	D₁→D₂	49—55 {30—34}
			D₂→D₃	94—102 {58—63}
			D₃→O/D	152—162 {94—100}
		Half throttle (1.7—2.7V)	D₁→D₂	40—46 {25—29}
			D₂→D₃	79—91 {49—56}
			D₃→O/D	129—147 {80—91}
			Lockup ON (D₃)	94—106 {58—66}
			Lockup ON (O/D)	144—162 {89—100}
		Fully closed (0.1—1.1V)	O/D→D₃	24—30 {15—19}
			D₃→D₂	12—18 {7—11}
			D₂→D₁	5—11 {3—7}
		Kickdown	O/D→D₃	142—152 {88—94}
			D₃→D₂	87—95 {54—59}
			D₂→D₁	43—49 {27—30}
	NORMAL A/C OFF	Fully open (3.0—4.3V)	D₁→D₂	49—55 {30—34}
			D₂→D₃	94—102 {58—63}
			D₃→O/D	152—162 {94—100}
		Half throttle (1.7—2.7V)	D₁→D₂	40—46 {25—29}
			D₂→D₃	79—91 {49—56}
			D₃→O/D	129—147 {80—91}
			Lockup ON (D₃)	94—106 {58—66}
			Lockup ON (O/D)	144—162 {89—100}
		Fully closed (0.1—1.1V)	O/D→D₃	24—30 {15—19}
			D₃→D₂	12—18 {7—11}
			D₂→D₁	5—11 {3—7}
		Kickdown	O/D→D₃	142—152 {88—94}
			D₃→D₂	87—95 {54—59}
			D₂→D₁	43—49 {27—30}
D	HOLD	—	O/D→D₃	154—160 {95—99}
			D₃→D₂	7—13 {4—8}
			D₂→D₃	15—25 {9—16}
			Lockup ON (D₃)	94—106 {58—66}
S	NORMAL	Fully open (3.0—4.3V)	S₁→S₂	49—55 {30—34}
			S₂→S₃	94—102 {58—63}
		Half throttle (1.7—2.7V)	S₁→S₂	40—46 {25—29}
			S₂→S₃	79—91 {49—56}
			Lockup ON (S₃)	94—106 {58—66}
		Fully closed (0.1—1.1V)	S₃→S₂	12—18 {7—11}
			S₂→S₁	5—11 {3—7}
		Kickdown	S₃→S₂	87—95 {54—59}
			S₂→S₁	43—49 {27—30}
	HOLD	—	S₃→S₂	95—101 {59—63}
L	NORMAL	Fully open (3.0—4.3V)	L₁→L₂	49—55 {30—34}
		Half throttle (1.7—2.7V)	L₁→L₂	40—46 {25—29}
		Fully closed (0.1—1.1V)	L₂→L₁	5—11 {3—7}
		Kickdown	L₂→L₁	43—49 {27—30}
	HOLD	—	L₂→L₁	45—51 {28—32}

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Fig. 10: 929 Shift Speed Chart
Courtesy of Mazda Motors Corp.

AUTO TRANS DIAGNOSIS - RA4A-EL & RB4A-EL
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1993 Mazda RX7
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"D" RANGE RESULTS

        Starts In "S" Or Shifts Directly From "L" To "OD"
        Stuck shift solenoid "A". Stuck shift valve "A".

        Starts In "OD"
        Stuck shift valve "B". Stuck shift solenoid "B".

        No Shift
        Stuck shift solenoid "A" and/or "B", or stuck shift valve "A"
and/or "B".

        Incorrect Shift Points
        Throttle sensor out of adjustment. Speed sensor No. 1 not
operating properly.

        Shift Shock Or Slipping Is Felt
        Stuck line pressure solenoid. Accumulator not operating
properly. Throttle sensor out of adjustment. Speed sensor No. 1 not
operating properly. ATF thermosensor not operating properly. Worn
clutches, one-way clutches and/or brakes.

        No Engine Braking
        Stuck overrunning clutch solenoid. Worn clutches and/or
brakes.

        No Lock-Up Shift
        Stuck lock-up solenoid. Stuck lock-up control valve.

KICKDOWN

        Drive vehicle and check for OD-3, OD-2, OD-1, 3-2, 3-1 and 2-
1 kickdown. See appropriate SHIFT SPEED CHARTS. See Figs. 9 and 10.

"S" RANGE

        1) Select "S" mode. Accelerate vehicle, check 1-2 and 2-3 up
and downshift with lock-up and no OD. Decelerate vehicle, check for
engine braking in 3rd and 2nd gears with throttle open 1/8 and less.
        2) Drive in "S" mode and ensure 3rd gear is held until 3-2
downshift point is achieved. Accelerate in "S" HOLD mode and ensure
that 2nd gear is held. Decelerate vehicle, check for engine braking
with throttle open 1/8 and less.

"L" RANGE

        1) Select "L" mode. Accelerate vehicle, ensure 1-2 upshifts
and downshifts are made and no 3rd gear, OD or lock-up occurs.
Decelerate vehicle and check for engine braking in 1st and 2nd gears.
        2) Drive vehicle with gear selector in "D" HOLD (3rd gear),
shift to "L" and ensure 3rd gear is held until 3-2 downshift point is
reached, then 2nd gear is held until 2-1 downshift point is reached.

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3) Accelerate vehicle in "L" HOLD and ensure 1st gear is held. Decelerate vehicle and check for engine braking.

ELEMENTS IN USE

NOTE: For diagnosing clutch, band, one-way clutch and overrunning clutch operation, see appropriate ELEMENTS IN USE chart. See Figs. 11 and 12.

Range	Mode	Gear	Shift	Reverse clutch	High clutch	Forward clutch	Overrunning clutch	Band servo piston			Forward OWC	Low OWC	Low and reverse brake
								2nd applied	3rd released	O/D applied			
P	–	–	–										
R	–	Reverse	–	O									O
N	–	–	–										
D	Except HOLD	1st	↕			O	■				●	●	
		2nd	↕			O	*3 ■	O			●		
		3rd	↕		O	O	*3 ■	*1 ⊗	⊗		●		
		O/D	↓		O	⊗		*2 ⊗	⊗	O			
	HOLD	2nd	↕			O	*3 ◎	O			●		
		3rd	↕		O	O	*3 ◎	*1 ⊗	⊗		●		
		*4 O/D	↑		O	⊗		*2 ⊗	⊗	O			
S	Except HOLD	1st	↕			O	Δ				●	●	
		2nd	↕			O	*3 Δ	O			●		
		3rd	↓		O	O	*3 Δ	*1 ⊗	⊗		●		
	HOLD	2nd	↕			O	*3 Δ	O			●		
		*4 3rd	↑		O	O	*3 Δ	*1 O	⊗		●		
L	Except HOLD	1st	↕			O	*3 O				●	●	O
		2nd	↓			O	*3 O	O			●		
	HOLD	1st	↕			O	*3 O				●	●	O
		*4 2nd	↑			O	*3 O	O			●		

OWC: one-way clutch
*1: Hydraulic pressure is applied to both 2nd applied side and 3rd released side of band servo piston.
     However, because area of 3rd released side is larger than 2nd applied side, the brake band does not engage.
*2: Hydraulic pressure is applied to O/D applied side in the above conditions (*1) and brake band engages.
*3: Indicates that engine braking is available as a result of operation of overrunning clutch.
*4: Prevents engine overspeed.
O: Constantly engaged.
●: Operates when accelerated.
Δ: Engaged when throttle opening is below approximately 1/8.
O: Engaged when vehicle speed is above approximately 10 km/h {6.2 mph} and throttle opening is below approximately 1/8.
■: Engaged when O/D inhibit signal (ASC signal) is ON and vehicle speed is above approximately 10 km/h {6.2 mph} and throttle opening is below approximately 1/8.
⊗: Engaged, however does not transmit power.

95E20648
Fig. 11: RX7 & 1993 929 Elements In Use
Courtesy of Mazda Motors Corp.

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Range	Mode	Gear	Shift	Reverse clutch	High clutch	Forward clutch	Overrunning clutch	Band servo piston 2nd applied	Band servo piston 3GR released	Band servo piston 4GR applied	Forward OWC	Low OWC	Low and reverse brake
P	–	–	–										
R	–	Reverse	–	○									○
N	–	–	–										
D	Except HOLD	1	↑				○				●	●	
D	Except HOLD	2	↕				○	○			●		
D	Except HOLD	3	↕		○		○	✴1 ○	○		●		
D	Except HOLD	4	↓		○		○	✴2 ○	○	○			
D	HOLD	2	↑				○	✴3 ○	○			●	
D	HOLD	3	↕		○		○	✴3 ○	✴1 ○	○		●	
D	HOLD	✴4 4	↓		○		○	✴2 ○	○	○			
S	Except HOLD	1	↑				○	Δ			●	●	
S	Except HOLD	2	↕				○	✴3 Δ	○		●		
S	Except HOLD	3	↓		○		○	✴3 Δ	✴1 ○	○		●	
S	HOLD	2	↑				○	✴3 Δ	○		●		
S	HOLD	✴4 3	↓		○		○	✴3 Δ	✴1 ○	○		●	
L	Except HOLD	1	↑				○	✴3 ○			●	●	○
L	Except HOLD	2	↓				○	✴3 ○	○		●		
L	HOLD	1	↕				○	✴3 ○			●	●	○
L	HOLD	✴4 2	↓				○	✴3 ○	○		●		

OWC: one-way clutch
✴1: Hydraulic pressure is applied to both 2nd applied side and Third gear released side of band servo piston.
However, because area of Third gear released side is larger than 2nd applied side, the brake band does not engage.
✴2: Hydraulic pressure is applied to Fourth gear applied side in the above conditions (✴1) and brake band engages.
✴3: Indicates that engine braking is available as a result of operation of overrunning clutch.
✴4: Prevents engine overspeed.
○: Constantly engaged.
●: Operates when accelerated.
Δ: Engaged when throttle opening is below approximately 1/8.
○: Engaged when vehicle speed is above approximately 10 km/h {6.2 mph} and throttle opening is below approximately 1/8.
○: Engaged, but does not transmit power.

95F20649
Fig. 12: 1994 929 Elements In Use
Courtesy of Mazda Motors Corp.

ELECTRONIC SELF-DIAGNOSTICS

Self-diagnostic system is integrated in PCMT and diagnoses faulty sensors (input devices), solenoid valves (output devices) and transaxle operation. Fault codes stored in PCMT identify specific components.

Codes may be retrieved from PCMT by using HOLD indicator light. Codes may be retrieved from PCMT by using OEM tester or aftermarket scan tester. See appropriate procedure.

NOTE: OEM tester may also be referred to as Electronic
          Controlled-Automatic Transmission (EC-AT) tester in trouble
          code charts.

RETRIEVING FAULT CODES

HOLD Indicator Light Procedure (RX7 & 929)
1) Locate Data Link Connector (DLC) underhood forward of left
strut. Short together GND and TAT terminals of DLC and turn ignition
on. See Fig. 13. Warning codes are flashed on HOLD indicator light on
dash. Codes are flashed in numerical order if more than one code is
present.
2) Note trouble code numbers. See TROUBLE CODE IDENTIFICATION
CHARTS. Perform appropriate diagnostic code chart. Refer to the
appropriate TROUBLE CODE CHARTS. After repairs are made, clear codes
by disconnecting negative battery cable for 20 seconds.
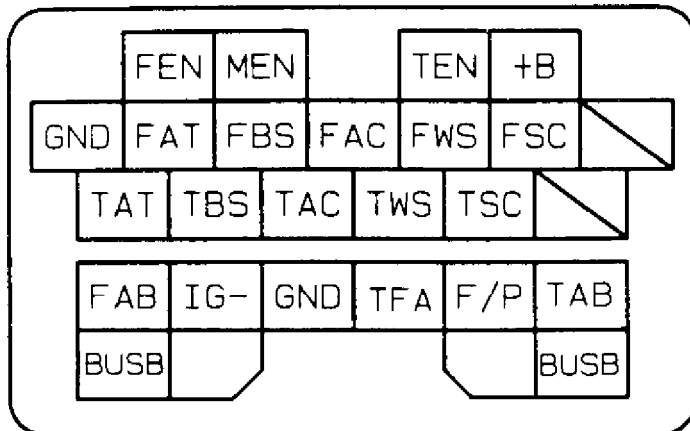
95D20563
Fig. 13: Locating DLC GND & TAT Terminals
Courtesy of Mazda Motors Corp.

OEM Tester Hook-Up
1) Use manufacturer's instructions on connecting Self-
Diagnosis checker and SST, selector and tester harness. Connect OEM
tester assembly to DLC located underhood forward of left strut.
2) Set system selector system select switch to position 2.
Set test switch to SELF TEST position. See Fig. 14.

NOTE: If using aftermarket scan tester, follow manufacturers
         procedures.

Retrieval Procedures
1) Connect OEM tester to appropriate positions. See OEM
TESTER HOOK-UP. See Fig. 14.
2) Turn ignition on, if "88" flashes on digital display and
buzzer sounds for 3 seconds, go to step 4). On RX7 and 929, if "88"
does not flash, check main relay and terminals 1N and 1P of PCMT for
an open or short circuit.
3) If "88" flashes and buzzer sounds continuously for more
than 20 seconds, check wiring to terminal 2N of PCMT for an open or
short circuit. See WIRING DIAGRAMS for wire color identification. If
wiring is okay, replace PCMT and repeat steps 1-2).

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    4) Note fault code numbers. See TROUBLE CODE IDENTIFICATION
CHARTS. Perform appropriate code chart. See TROUBLE CODE CHARTS. After
repairs are made, clear codes by disconnecting negative battery cable
for 20 seconds.
    5) Remove OEM tester and road test vehicle at 31 MPH. Depress
accelerator fully, stop vehicle gradually. Reconnect OEM tester to
test connector and connect grounds. Turn ignition on and check for
trouble codes.
    6) If transmission problems are still present, or no trouble
codes are stored, see ELECTRICAL COMPONENTS TESTS under TESTING.
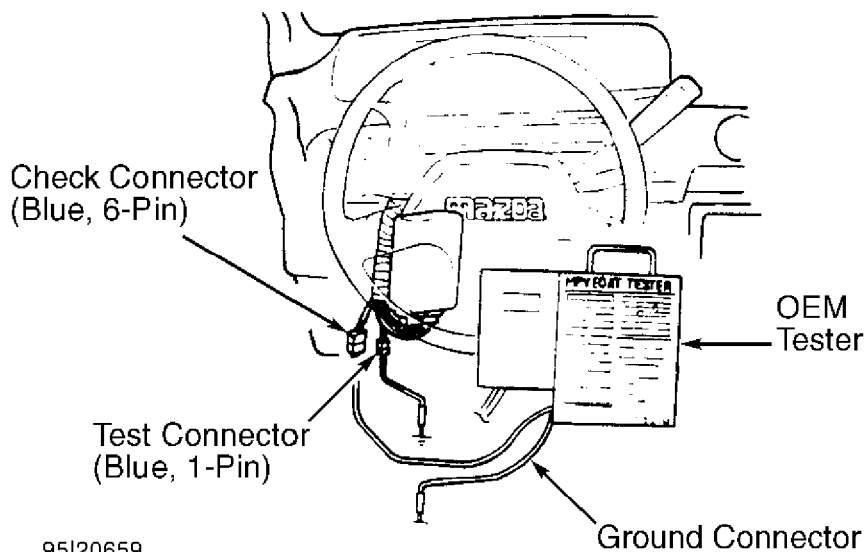
95I20659
Fig. 14: Connecting OEM Tester
Courtesy of Mazda Motors Corp.
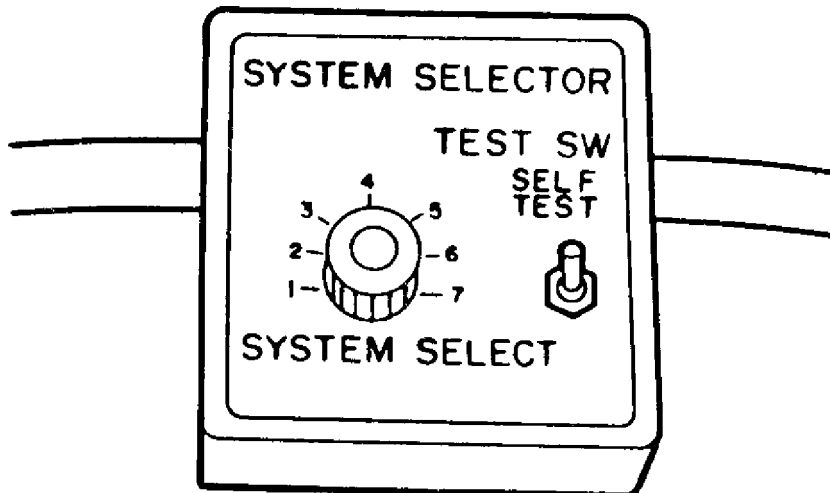
95E19764
Fig. 15: Identifying System Selector Switch Positions
Courtesy of Mazda Motors Corp.

TROUBLE CODE CHARTS

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TROUBLE CODE IDENTIFICATION CHARTS

DIAGNOSTIC TROUBLE CODE NUMBER

Code No.	Indicator flashing pattern	Diagnosed circuit	Condition	Point
01		Engine rpm signal	No input signal from ECU	• Wiring from powertrain control module (Engine) to powertrain control module (Transmission) • Powertrain control module (Engine)
06		Vehicle speed sensor (Revolution sensor)	No input signal from vehicle speed sensor (Revolution sensor)	• Vehicle speed sensor connector • Wiring from vehicle speed sensor to powertrain control module (Transmission) • Vehicle speedometer sensor resistance
07		Vehicle speedometer sensor	No input signal from vehicle speedometer sensor	• Vehicle speedometer sensor connector • Wiring from vehicle speedometer sensor to combination meter • Wiring from combination meter to powertrain control module (Transmission) • Speedometer resistance
12		Throttle position sensor	Open or short circuit of throttle position sensor or wiring	• Throttle position sensor connector • Wiring from throttle position sensor to powertrain control module (Transmission) • Throttle position sensor resistance
55		Vehicle speed pulse generator	No input signal from vehicle speed pulse generator	• Vehicle speed pulse generator connector • Wiring from vehicle speed pulse generator to powertrain control module (Transmission) • Vehicle speed pulse generator resistance
56		ATF thermosensor	Open or short circuit of ATF thermosensor or wiring	• ATF thermosensor connector • Wiring from ATF thermosensor to powertrain control module (Transmission) • ATF thermosensor resistance
57		Reduce torque signal/Slip lockup signal, torque reduced signal	Open or short circuit of reduce torque signal/slip lockup signal wiring, and/or torque reduced signal wiring	• Wiring from powertrain control module (Engine) to powertrain control module (Transmission) • Powertrain control module (Transmission) • Powertrain control module (engine)
58		Barometric absolute pressure sensor	Open or short circuit of barometic absolute pressure sensor wiring	• Wiring from powertrain control module (Engine) to powertrain control module (Transmission) • Powertrain control module (engine)
60		Shift A solenoid valve	Open or short circuit of solenoid valve wiring	• Solenoid valve connector • Wiring from solenoid valve to powertrain control module (Transmission) • Solenoid valve resistance • Wiring from dropping resistor to powertrain control module (Transmission) (Only No.64) • Dropping resistor resistance (Only No 64)
61		Shift B solenoid valve		
62		Overrunning clutch solenoid valve		
63		Lockup solenoid valve		
64		Line pressure solenoid valve		
65		Lockup control solenoid valve		

95B20660

Fig. 16: RX7 Trouble Code Identification Chart
Courtesy of Mazda Motors Corp.
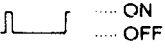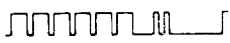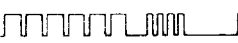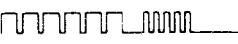
TROUBLE CODE NUMBER

CODE NO.	LOCATION OF MAL-FUNCTION	HOLD INDICATOR LIGHT FLASH CYCLE	SELF-DIAGNOSIS	FAIL-SAFE
01	Engine rpm signal (Ne1 signal)	····· ON ····· OFF	No input signal from distributor Ne1 signal	—
06	Vehicle speed sensor (revolution sensor)		No input signal from vehicle speed sensor	Shifting performed in accordance with signals from vehicle speedometer sensor
07	Vehicle speedometer sensor		No input signal from speedometer (vehicle speedometer sensor)	If a malfunction occurs to both vehicle speed sensor and vehicle speedometer sensor, shift A and B solenoid valve go OFF*. Lockup not provided
12	Throttle position sensor		Open or short circuit of throttle position sensor or wiring	Throttle opening judged as follows: 4/8 stroke: Idle switch OFF 0/8 stroke: Idle switch ON
55	Vehicle speed pulse generator		No input signal from vehicle speed pulse generator	Shifting performed in accordance with signals from vehicle speed sensor. Torque reduction control not provided
56	ATF thermosensor		Open or short circuit of ATF thermo sensor or wiring	—
57	Reduce torque signal, Torque reduced signal		Open or short circuit of reduce torque signal / torque reduced signal or wiring	Torque reduction control not provided
60	Shift A solenoid valve		Open or short circuit of solenoid valves or wiring	Shift A and B solenoid valves go OFF*
61	Shift B solenoid valve			
62	Overrunning clutch solenoid valve			Overrunning clutch solenoid valve goes OFF and engine braking is available when coasting. Shifting performed normally
63	Lockup solenoid valve			Lockup not provided. Shifting performed normally
64	Line pressure solenoid valve			Line pressure solenoid valve goes OFF and line pressure is set at maximum. Shifting performed normally
65	Lockup control solenoid valve			Lockup not provided. Shifting performed normally

* – If both shift "A" and "B" solenoid valves go OFF, "D" and "S" ranges become 3rd gear position and "L" range becomes 2nd gear position.

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Fig. 17: 929 Trouble Code Identification Chart
Courtesy of Mazda Motors Corp.

RX7 & 929 TROUBLE CODE CHARTS

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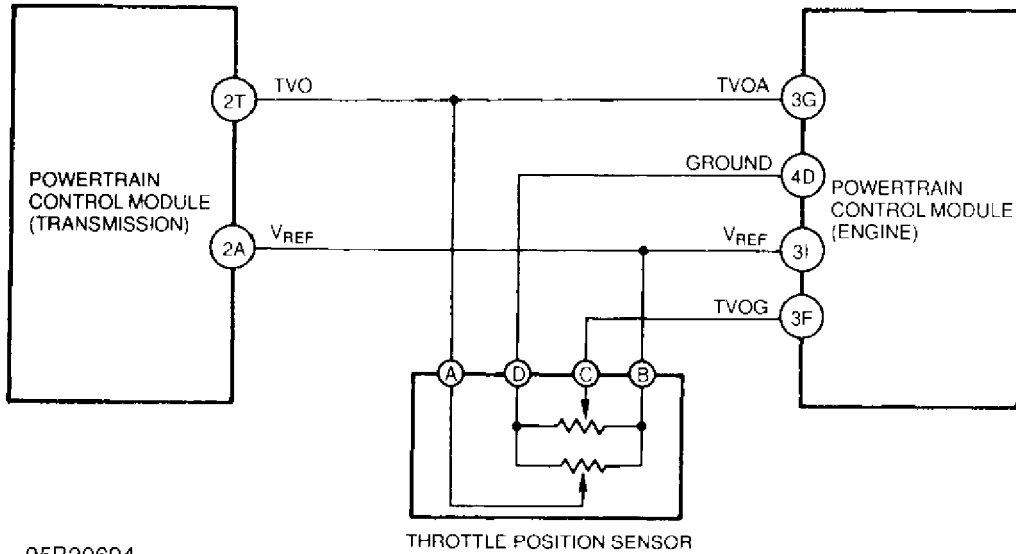## Article Text (p. 20)
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RX7
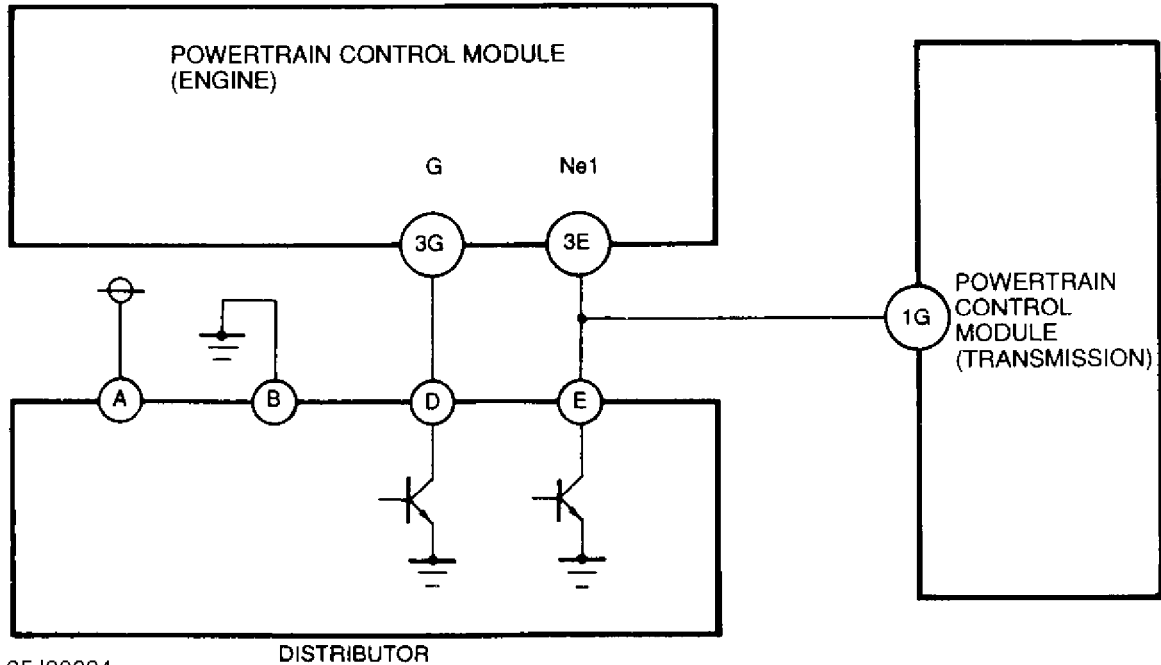
95J20684

Fig. 18: Schematic - Service Code No. 1
Courtesy of Mazda Motors Corp.

STEP	INSPECTION		ACTION
	SERVICE CODE NO. 01 ENGINE RPM SIGNAL		
1	Are there any poor connections at distributor, Powertrain Control Module (Engine) and Powertrain Control Module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of engine rpm signal at Powertrain Control Module (Transmission) OK?	Yes	Go to step 6
	(+) term. 1G / (−) term. Ground / Voltage (V): 2—3 While driving; 0 or 4.5—5.5 Engine stopped	No	Check wiring and connectors from Powertrain Control Module (Transmission) to distributor If OK, go to next step If not OK, repair wiring and /or connector
3	Disconnect the distributor connector Is voltage at Powertrain Control Module (Engine) terminal OK?	Yes	Go to next step
	(+) term. 3E / (−) term. Ground / Voltage (V) 4.5—5.5 / Condition Ignition switch ON	No	Replace Powertrain Control Module (Transmission)
4	At step 3 condition, is the voltage to the distributor connector (vehicle-side) OK?	Yes	Replace distributor
	(+) term. G/W / (−) term. Ground / Voltage (V) 4.5—5.5 / Condition Ignition switch ON	No	Go to next step
5	Is there continuity between distributor connector (vehicle-side) and Powertrain Control Module (Engine) terminal 3E?	Yes	Go to next step
		No	Repair wiring and/or connector
6	Disconnect negative battery cable for at least 20 seconds. Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace Powertrain Control Module (Transmission)
		No	Intermittent poor connection Check for cause

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Fig. 19: Flow Chart - Service Code No. 1
Courtesy of Mazda Motors Corp.

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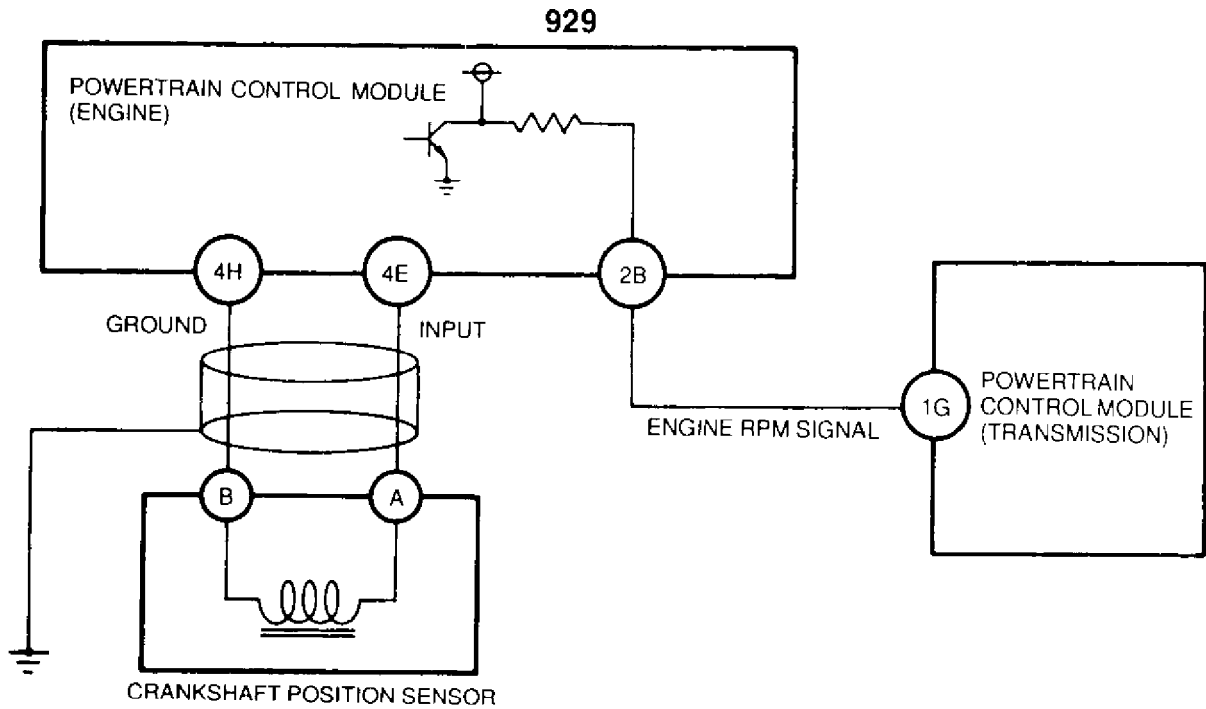
Fig. 20: Schematic - Diagnostic Trouble Code No. 1
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.01	ENGINE RPM SIGNAL		
STEP	INSPECTION		ACTION
1	Are there any poor connections at distributor, power-train control module (Engine) and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of engine rpm signal at powertrain control module (Transmission) OK?	Yes	Go to step 5
		No	Go to next step
3	Disconnect 16-pin powertrain control module (Transmission) connector Is there continuity between terminal 1G of powertrain control module (Transmission) and terminal 2B of powertrain control module (Engine)	Yes	Go to next step
		No	Repair wiring
4	Connect a circuit tester to terminals as shown Is input voltage of engine rpm signal at powertrain control module (Engine) OK?	Yes	Go to next step
		No	Check crank angle sensor and/or wiring If OK, replace powertrain control module (Engine) If not OK, repair or replace malfunction parts and/or wiring
5	Disconnect negative battery cable for at least 20 seconds, and depress the brake pedal. Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

Step 2 table:

(+) term.	(–) term.	Voltage (V)	Condition
1G	Ground	0	Engine stopped
		0.3–0.8	Engine idling
		1.8–2.2	Engine running at 3,000 rpm (no load)

Step 4 table:

(+) term.	(–) term.	Voltage (V)	Condition
2B	Ground	0	Engine stopped
		0.3–0.8	Engine idling
		1.8–2.2	Engine running at 3,000 rpm (no load)

Fig. 21: Flow Chart - Diagnostic Trouble Code No. 1
Courtesy of Mazda Motors Corp.

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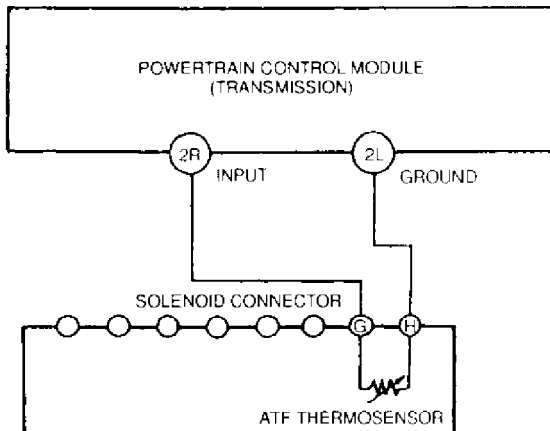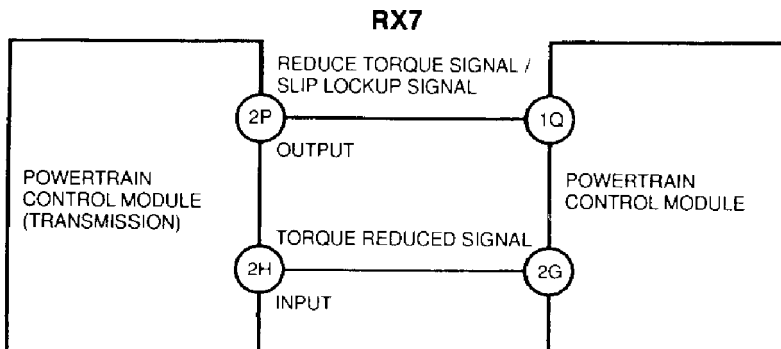Copyright © 1998 Mitchell Repair Information Company, LLC
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RX7 & 929
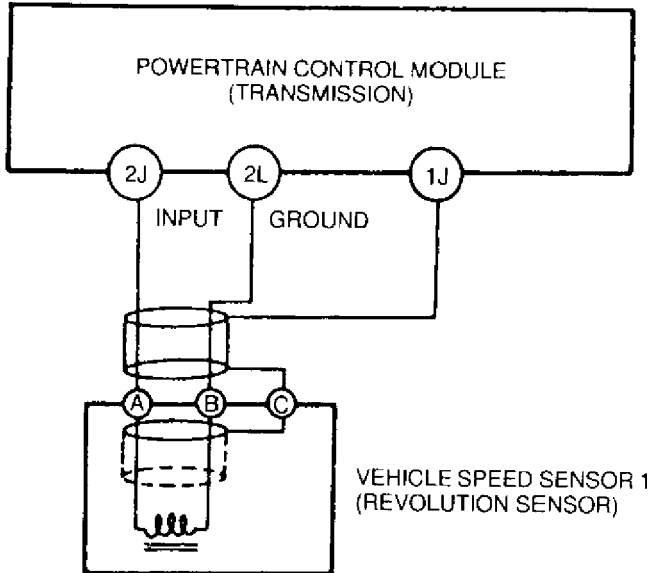
95D20688

Fig. 22:   Schematic - Diagnostic Trouble Code No. 6
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.06		VEHICLE SPEED SENSOR (REVOLUTION SENSOR)		
STEP	INSPECTION		ACTION	
1	Are there any poor connections at vehicle speed sensor and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector	
		No	Go to next step	
2	Connect a circuit tester to terminals as shown. Is input voltage of vehicle speed sensor at powertrain control module (Transmission) OK?	Yes	Go to step 5	
	see table below	No	Go to next step	
3	Disconnect 20-pin powertrain control module (Transmission) connector. Is resistance between terminal 2J and terminal 2L OK? **Resistance: 500–1,000 Ω**	Yes	Go to step 5	
		No	Go to next step	
4	Disconnect vehicle speed sensor connector. Is resistance of sensor OK? _see table below_	Yes	Check wiring and connectors from powertrain control module (Transmission) to vehicle speed sensor. If OK, go to next step. If not OK, repair wiring and/or connector	
		No	Replace vehicle speed sensor	
5	Disconnect negative battery cable for at least 20 seconds, and depress the brake pedal. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)	
		No	Intermittent poor connection. Check for cause	

Step 2 table:

(+) tern.	(–) term.	Voltage (V)	Condition
2J	2L	Approx. above 1.0 (AC range)	While driving (above 25km/h {16MPH})
		Approx. 0 (AC range)	Vehicle stopped

Step 4 table:

Terminal	Resistance (Ω)
A ↔ B	500–1,000
B ↔ C	∞
A ↔ C	∞

95E20689

Fig. 23:   Flow Chart - Diagnostic Trouble Code No. 6
Courtesy of Mazda Motors Corp.

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RX7
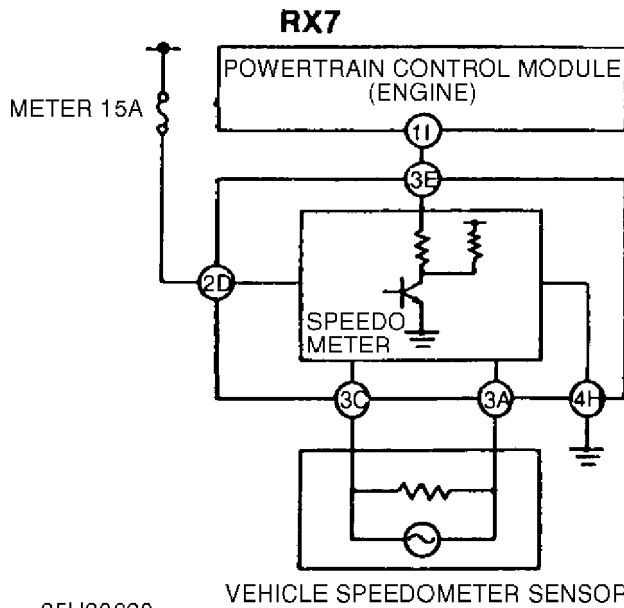
95H20690

Fig. 24: Schematic - Diagnostic Trouble Code No. 7
Courtesy of Mazda Motors Corp.

STEP	INSPECTION		ACTION
DIAGNOSTIC TROUBLE CODE NO.07		VEHICLE SPEEDOMETER SENSOR	
1	Are there any poor connections at vehicle speedometer sensor and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown. Is input voltage of vehicle speedometer sensor at powertrain control module (Transmission) OK?	Yes	Go to step 8
		No	Go to next step
3	Remove combination meter. Is there continuity between terminal 3E of meter connector and terminal 1I of powertrain control module (Transmission)?	Yes	Go to next step
		No	Repair or replace wiring and/or connector
4	Connect circuit tester to terminals 3C and 3A of meter connector. Does pointer of circuit tester move slightly when rear wheels are slowly turned?	Yes	Go to next step
		No	Replace speedometer
5	Remove vehicle speedometer sensor. Is resistance felt when turning speedometer driven gear by hand?	Yes	Go to next step
		No	Replace vehicle speedometer sensor
6	Disconnect vehicle speedometer sensor connector and connect circuit tester. Does pointer of circuit tester move slightly when driven gear is slowly turned?	Yes	Go to next step
		No	Replace vehicle speedometer sensor
7	Disconnect vehicle speedometer sensor connector. Is continuity of sensor OK? **Resistance: Approx. 290 Ω (20°C (68°F)); reference**	Yes	Check wiring and connectors from vehicle speedometer sensor to speedmetor. If OK, go to next step. If not OK, repair wiring and/or connector
		No	Replace vehicle speedometer sensor
8	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection. Check for cause

For Step 2 inspection:

(+) tern.	(−) term.	Voltage (V)	Condition
1I	Ground	2–3	Vehicle moving
		0 or 4.5–5.5	Vehicle stopped

95I20691

Fig. 25: Flow Chart - Diagnostic Trouble Code No. 7
Courtesy of Mazda Motors Corp.

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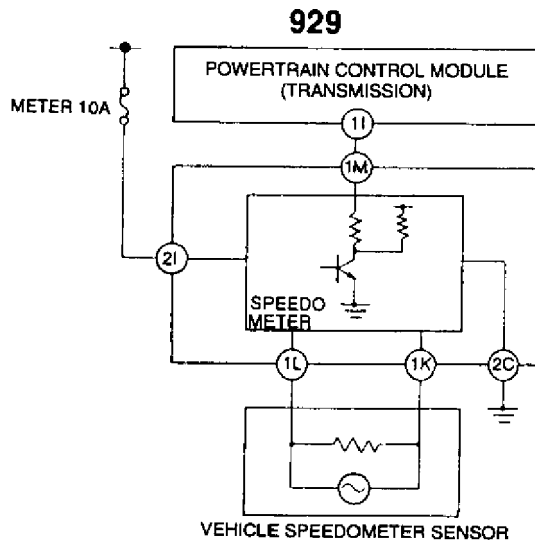
Fig. 26: Schematic - Service Code No. 7
Courtesy of Mazda Motors Corp.

STEP	INSPECTION		ACTION
	SERVICE CODE NO. 07 VEHICLE SPEEDOMETER SENSOR		
1	Are there any poor connections at vehicle speed sensor and Powertrain Control Module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown. Is input voltage of vehicle speedometer sensor at Powertrain Control Module (Transmission) OK?	Yes	Go to step 7
		No	Go to next step
3	Remove combination meter. Is there continuity between terminal 1M of meter connector and terminal 1I of Powertrain Control Module (Transmission)?	Yes	Go to next step
		No	Repair or replace wiring and/or connector
4	Connect circuit tester to terminals 1K and 1L of meter connector. Does pointer of circuit tester move slightly when rear wheels are slowly turned?	Yes	Replace speedometer
		No	Go to next step
5	Remove vehicle speedometer sensor. Is resistance felt when turning speedometer-driven gear by hand?	Yes	Go to next step
		No	Replace vehicle speedometer sensor
6	Disconnect vehicle speedometer sensor connector and connect circuit tester. Does pointer of circuit tester move slightly when driven gear is slowly turned?	Yes	Go to next step
		No	Replace vehicle speedometer sensor
7	Disconnect vehicle speedometer sensor connector. Is continuity of sensor OK? Resistance: Approx. 290Ω (20°C {68°F}); reference	Yes	Check wiring and connectors from vehicle speedometer sensor to speedometer. If OK, go to next step. If not OK, repair wiring and/or connector
		No	Replace vehicle speedometer sensor
8	Disconnect negative battery cable for at least 20 seconds. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace Powertrain Control Module (Transmission)
		No	Intermittent poor connection. Check for cause

Voltage table (Step 2):

(+) term.	(−) term.	Voltage (V)	Condition
1I	Ground	2—3	While driving
		0 or 4.5—5.5	Vehicle stopped

Fig. 27: Flow Chart - Service Code No. 7
Courtesy of Mazda Motors Corp.

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RX7

95B20694
Fig. 28: Schematic - Diagnostic Trouble Code No. 12 (1 of 2)
Courtesy of Mazda Motors Corp.

929
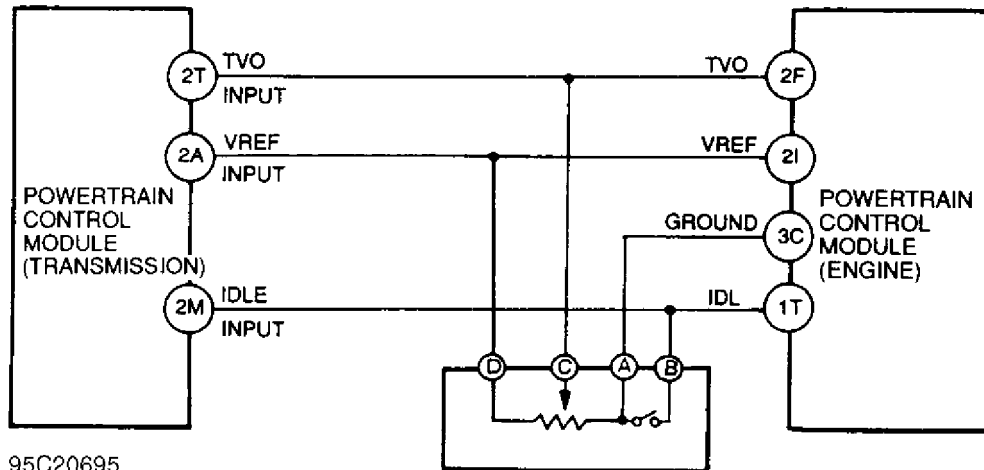
95C20695
Fig. 29: Schematic - Diagnostic Trouble Code No. 12 (2 of 2)
Courtesy of Mazda Motors Corp.

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DIAGNOSTIC TROUBLE CODE NO.12		THROTTLE POSITION SENSOR	
STEP	INSPECTION		ACTION
1	Are there any poor connections at throttle position sensor and powertrain control module (Transmission) connector or terminal?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of throttle position sensor (TVO) at powertrain control module (Transmission) OK?	Yes	Go to step 5
		No	Go to next step
3	Connect a circuit tester to terminals as shown Is input voltage of throttle position sensor (VREP) at powertrain control module (Transmission) OK?	Yes	Go to next step
		No	Check voltage at terminal 31 of powertrain control module (Engine) **Voltage: 4.5–5.5V (ignition switch ON)** If OK, go to next step If not OK, repair wiring and/or connector, or replace powertrain control module (Transmission)
4	Is throttle position sensor OK?	Yes	Check wiring and connectors from powertrain control module (Transmission) to throttle position sensor If OK, go to next step If not OK, repair wiring and/or connector
		No	Adjust or replace throttle position sensor
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

For Step 2 inspection:

(+) term.	(−) term.	Voltage (V)	Condition
2T	Ground	0.1–1.1	Throttle valve closed throttle position
		4.0–4.5	Throttle valve wide open throttle

For Step 3 inspection:

(+) term.	(−) term.	Voltage (V)	Condition
2A	Ground	4.5–5.5	Ignition switch ON
		0	Ignition switch OFF

95D20696
Fig. 30: Flow Chart - Diagnostic Trouble Code No. 12
Courtesy of Mazda Motors Corp.

RX7 & 929
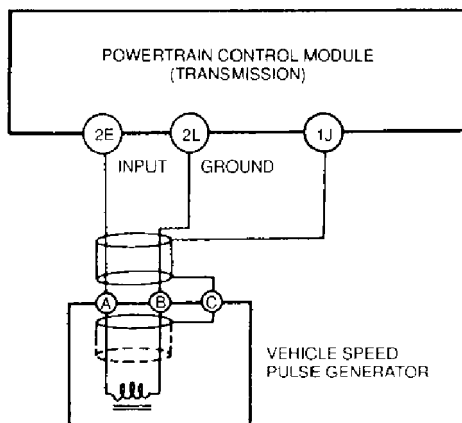
95E20697
Fig. 31: Schematic - Diagnostic Trouble Code No. 55
Courtesy of Mazda Motors Corp.

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DIAGNOSTIC TROUBLE CODE NO.55		VEHICLE SPEED PULSE GENERATOR		
STEP	INSPECTION			ACTION
1	Are there any poor connections at vehicle speed pulse generator and powertrain control module (Transmission) connector or terminal?		Yes	Repair or replace connector
			No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of vehicle speed pulse generator at powertrain control module (Transmission) OK?		Yes	Go to step 5
			No	Go to next step
3	Disconnect 20-pin powertrain control module (Transmission) connector Is resistance between terminal 2E and terminal 2L OK? **Resistance: 2.2–3.5 kΩ**		Yes	Go to next step
			No	Go to next step
4	Disconnect vehicle speed pulse generator connector Is resistance of vehicle speed pulse generator OK?		Yes	Check wiring and connectors from powertrain control module (Transmission) to vehicle speed pulse generator If OK, go to next step If not OK, repair wiring and/or connector
			No	Replace vehicle speed pulse generator
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed. Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?		Yes	Replace powertrain control module (Transmission)
			No	Intermittent poor connection Check for cause

Step 2 sub-table:

(+) tern.	(−) term.	Voltage (V)	Condition
2E	2L	Approx.0 above 0.5 (AC range)	While driving (above 25km/h (16mph))
		Approx. 0 (AC range)	Vehicle stopped

Step 4 sub-table:

Terminal	Resistance (KΩ)
A ↔ B	2.2–3.5
B ↔ C	∞
A ↔ C	∞

95F20698
Fig. 32: Flow Chart - Diagnostic Trouble Code No. 55
Courtesy of Mazda Motors Corp.

RX7 & 929

95G20699
Fig. 33: Schematic - Diagnostic Code No. 56
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.56	ATF THERMOSENSOR		
STEP	**INSPECTION**		**ACTION**
1	Are there any poor connections at ATP thermosensor and powertrain control module (Transmission) connector or terminal?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of ATF thermosensor at powertrain control module (Transmission) OK?	Yes	Go to step 5
		No	Go to next step

Step 2 table:

(+) tern.	(−) term.	Voltage (V)	Condition
2R	2L	Approx. 1.8	ATF temp. 10°C {50°F}
		Approx. 1.1	ATF temp. 40°C {104°F}
		Approx. 0.4	ATF temp. 80°C {176°F}

3	Disconnect 20-pin powertrain control module (Transmission) connector Is resistance between terminal 2R and terminal 2L OK?	Yes	Go to step 5
		No	Go to next step

Step 3 table:

Terminal	Resistance (KΩ)
2R ↔ 2L	Approx. 3.8 ATF temp. 10°C {50°F}
	Approx. 1.2 ATF temp. 40°C {104°F}
	Approx. 0.3 ATF temp. 80°C {176°F}

4	Disconnect solenoid connector Is resistance between terminal G and terminal H of ATF thermosensor OK?	Yes	Check wiring and connectors from powertrain control module (Transmission) to ATF thermosensor If OK, go to next step If not OK, repair wiring and/or connector
		No	Replace ATF thermosensor

Step 4 table:

Terminal	Resistance (KΩ)
G ↔ H	Approx. 3.8 ATF temp. 10°C {50°F}
	Approx. 1.2 ATF temp. 40°C {104°F}
	Approx. 0.3 ATF temp. 80°C {176°F}

5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

95J20700
Fig. 34: Flow Chart - Diagnostic Code No. 56
Courtesy of Mazda Motors Corp.

RX7

95A20701
Fig. 35: Schematic - Diagnostic Code No. 57
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.57		REDUCE TORQUE SIGNAL / SLIP LOCKUP SIGNAL, TORQUE REDUCED SIGNAL	
STEP	**INSPECTION**		**ACTION**
1	Are there any poor connections at powertrain control module (Engine) and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of torque reduced signal at powertrain control module (Transmission) OK?	Yes	Go to step 4
		No	Go to next step
3	Disconnect 20-pin powertrain control module (Transmission) connector Is there continuity between terminal 2H of powertrain control module (Transmission) and terminal 2G of powertrain control module (Engine)?	Yes	Go to next step
		No	Repair wiring
4	Connect a circuit tester to terminals as shown Is input voltage of torque reduced signal at powertrain control module (Transmission) OK?	Yes	Go to step 6
		No	Go to next step
5	Disconnect 20-pin powertrain control module (Transmission) connector Is there continuity between terminal 2P of powertrain control module (Transmission) and terminal 1Q of powertrain control module (Engine)?	Yes	Go to next step
		No	Repair wiring
6	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission) or powertrain control module (Engine)
		No	Intermittent poor connection Check for cause

Table within Step 2:

B+: Battery positive voltage

(+) tern.	(−) term.	Voltage (V)	Condition
2H	Ground	B+	Engine idling
		Below 1.0	Throttle opening above 1/8 (Engine coolant temp below 40°C (104°F))

Table within Step 4:

B+: Battery positive voltage

(+) tern.	(−) term.	Voltage (V)	Condition
2P	Ground	Below 1.0	When shifting from 1st to 2nd or from 2nd to 3GR with the throttle opening above 1.5/8 When slip lockup with the throttle opening below 0.5/8
		B+	Engine idling

95B20702

Fig. 36: Flow Chart - Diagnostic Code No. 57
Courtesy of Mazda Motors Corp.

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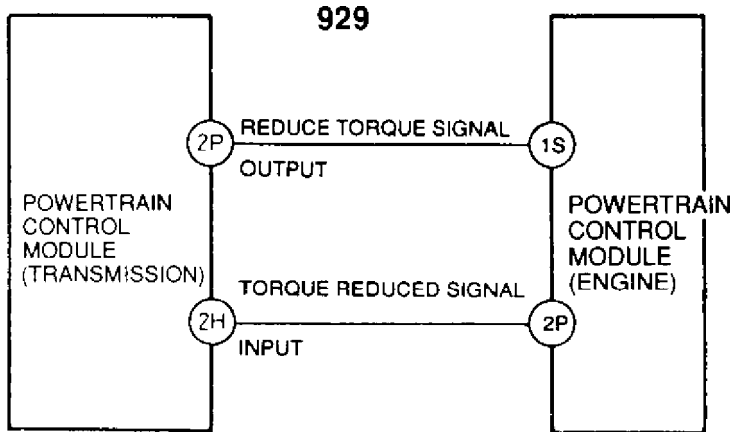
95C20703
Fig. 37: Schematic - Service Code No. 57
Courtesy of Mazda Motors Corp.

SERVICE CODE NO. 57	REDUCE TORQUE SIGNAL, TORQUE REDUCED SIGNAL		
STEP	INSPECTION		ACTION
1	Are there any poor connections at Powertrain Control Module (Engine) and Powertrain Control Module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is input voltage of torque reduced signal at Powertrain Control Module (Transmission) OK? B+: Battery positive voltage (see voltage table below) Some kinds of testers may give incorrect values. This is because the voltage output period is very short.	Yes	Go to step 4
		No	Go to next step
3	Disconnect 20-pin Powertrain Control Module (Transmission) connector Is there continuity between terminal 2H of Powertrain Control Module (Transmission) and terminal 2P of Powertrain Control Module (Engine)?	Yes	Go to next step
		No	Repair wiring
4	Connect a circuit tester to terminals as shown Is output voltage of reduce torque signal at Powertrain Control Module (Transmission) OK? B+: Battery positive voltage (see voltage table below) Some kinds of testers may give incorrect values. This is because the voltage output period is very short.	Yes	Gp to step 6
		No	Go to next step
5	Disconnect 20-pin Powertrain Control Module (Transmission) connector Is there continuity between terminal 2P of Powertrain Control Module (Transmission) and terminal 1S of Powertrain Control Module (Engine)?	Yes	Go to next step
		No	Repair wiring
6	Disconnect negative battery cable for at least 20 seconds Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace Powertrain Control Module (Transmission) or Powertrain Control Module (Engine)
		No	Intermittent poor connection Check for cause

Step 2 voltage table:

(+) term.	(−) term.	Voltage (V)	Condition
2H	Ground	B+	Engine warm
		Below 1	Engine cool

Step 4 voltage table:

(+) term.	(−) term.	Voltage (V)	Condition
2P	Ground	Below 1	Shifting
		B+	Others

95D20704
Fig. 38: Flow Chart - Service Code No. 57
Courtesy of Mazda Motors Corp.

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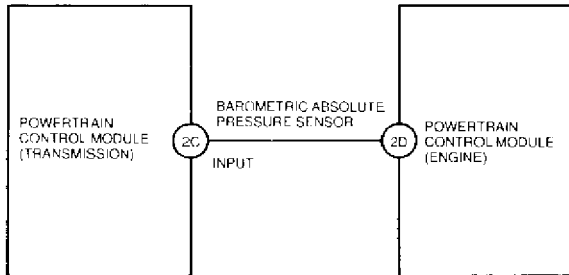
95E20705
Fig. 39: Schematic - Diagnostic Code No. 58
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.58		BAROMETRIC ABSOLUTE PRESSURE SENSOR		
STEP	INSPECTION		ACTION	
1	Are there any poor connections at powertrain control module (Engine) and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector	
		No	Go to next step	
2	Connect a circuit tester to terminals as shown. Is input voltage of barometric absolute pressure sensor at powertrain control module (Transmission) OK? (+) term.: 2C, (-) term.: Ground, Voltage (V): 2.0–4.5 / Ignition switch ON; 0V / Ignition switch OFF	Yes	Go to step 5	
		No	Go to next step	
3	Disconnect 20-pin powertrain control module (Transmission) connector. Is there continuity between terminal 2C of powertrain control module (Transmission) and terminal 2D of powertrain control module (Engine)?	Yes	Go to next step	
		No	Repair wiring	
4	Connect a circuit tester to terminals as shown. Is output voltage of barometric absolute pressure sensor at powertrain control module (Engine) OK? (+) term.: 2D, (-) term.: Ground, Voltage (V): 2.0–4.5V / Ignition switch ON; 0V / Ignition switch OFF	Yes	Go to next step	
		No	Replace powertrain control module (Engine)	
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)	
		No	Intermittent poor connection. Check for cause	

95F20706
Fig. 40: Flow Chart - Diagnostic Code No. 58
Courtesy of Mazda Motors Corp.

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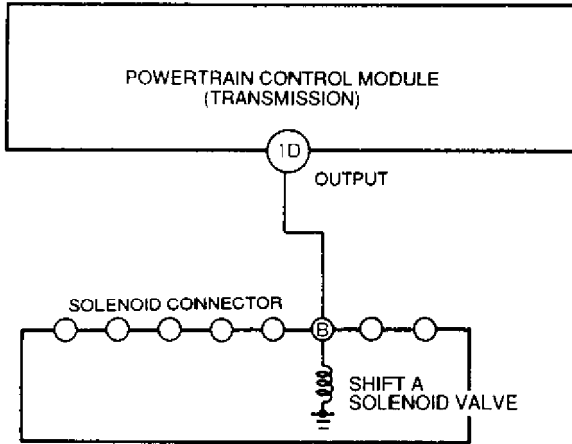
95G20707
Fig. 41: Schematic - Service Code No. 60
Courtesy of Mazda Motors Corp.

SERVICE CODE NO. 60		SHIFT A SOLENOID VALVE	
STEP	**INSPECTION**		**ACTION**
1	Are there any poor connections at solenoid valve and Powertrain Control Module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is output voltage of shift A solenoid valve at Powertrain Control Module (Transmission) OK? B+: Battery positive voltage	Yes	Check wiring and go to step 5
		No	Go to next step
3	Disconnect 16-pin Powertrain Control Module (Transmission) connector Is resistance between terminal 1D and a ground **Resistance: 20—40 Ω**	Yes	Go to step 5
		No	Go to next step
4	Disconnect solenoid connector Is resistance between ground and terminal B of shift A solenoid valve OK? **Resistance: 20—40 Ω**	Yes	Check wiring and connectors from Powertrain Control Module (Transmission) to shift A solenoid valve If OK, go to next step If not OK, repair wiring and/or connector
		No	Replace shift A solenoid valve
5	Disconnect negative battery cable for at least 20 seconds Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace Powertrain Control Module (Transmission)
		No	Intermittent poor connection Check for cause

Table within Step 2:

(+) term.	(−) term.	Voltage (V)	Condition
1D	Ground	B+	1st, Fourth gear
		Below 1	2nd, Third gear

95H20708
Fig. 42: Flow Chart - Service Code No. 60
Courtesy of Mazda Motors Corp.

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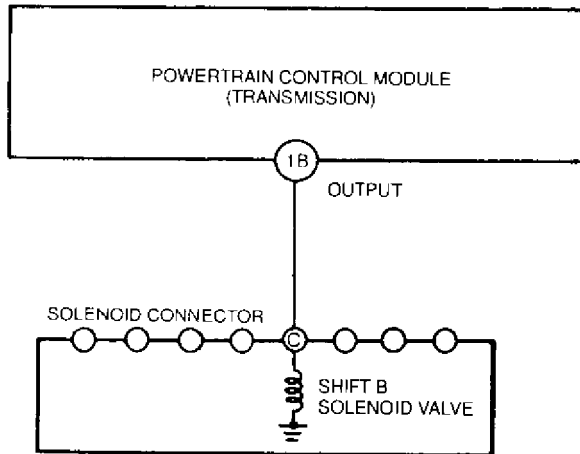## Article Text (p. 33)
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95I20709

Fig. 43: Schematic - Diagnostic Code No. 61
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DIAGNOSTIC TROUBLE CODE NO.61		SHIFT B SOLENOID VALVE		
STEP	INSPECTION			ACTION
1	Are there any poor connections at solenoid valve and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector	
		No	Go to next step	
2	Connect a circuit tester to terminals as shown Is output voltage of shift B solenoid valve at powertrain control module (Transmission) OK? B+: Battery positive voltage	Yes	Check wiring and go to step 5	
		No	Go to next step	
3	Disconnect 16-pin powertrain control module (Transmission) connector Is resistance between terminal 1B and a ground OK? **Resistance: 20–40Ω**	Yes	Go to step 5	
		No	Go to next step	

4	Disconnect solenoid connector Is resistance between ground and terminal C of shift B solenoid valve OK?
	
	Resistance: 20–40Ω
		Yes	Check wiring and connectors from powertrain control module (Transmission) to shift B solenoid valve
			   If OK, go to next step
			   If not OK, repair wiring and/or connector	

		No	Replace shift B solenoid valve	
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)	
		No	Intermittent poor connection Check for cause	

Inside step 2:

(+) term.	(–) term.	Voltage (V)	Condition
1B	Ground	B+	1st, 2nd gear
		Below 1.0	3GR, 4GR gear

95B20710

Fig. 44: Flow Chart - Diagnostic Code No. 61
Courtesy of Mazda Motors Corp.

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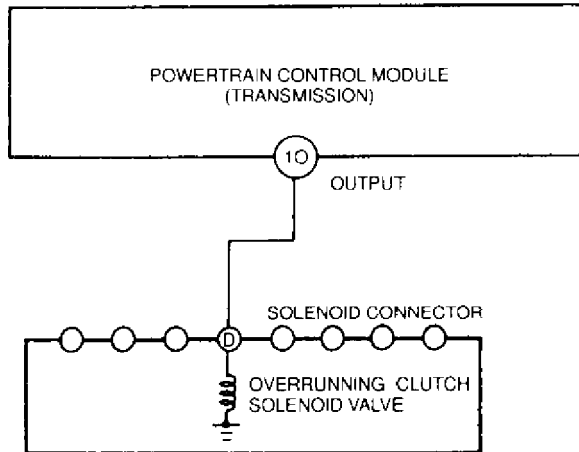**Article Text (p. 34)**
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95C20711
Fig. 45: Schematic - Diagnostic Code No. 62
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.62		OVERRUNNING CLUTCH SOLENOID VALVE		
STEP	INSPECTION		ACTION	
1	Are there any poor connections at solenoid valve and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector	
		No	Go to next step	
2	Connect a circuit tester to terminals as shown. Is output voltage of overrunning clutch solenoid valve at powertrain control module (Transmission) OK?	Yes	Check wiring and go to step 5	
		No	Go to next step	
	B+: Battery positive voltage			
3	Disconnect 16-pin powertrain control module (Transmission) connector. Is resistance between terminal 1O and a ground OK? **Resistance: 20–40Ω**	Yes	Go to step 5	
		No	Go to next step	
4	Disconnect solenoid connector. Is resistance between ground and terminal D of overrunning clutch solenoid valve OK? **Resistance: 20–40Ω**	Yes	Check wiring and connectors from powertrain control module (Transmission) to overrunning clutch solenoid valve. If OK, go to next step. If not OK, repair wiring and/or connector	
		No	Replace overrunning clutch solenoid valve	
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)	
		No	Intermittent poor connection. Check for cause	

The inner voltage table (Step 2):

(+) term.	(−) term.	Voltage (V)	Condition
1O	Ground	B+	D range (throttle valve closed)
		Below 1.0	D range (throttle valve wide open throttle)

95D20712
Fig. 46: Flow Chart - Diagnostic Code No. 62
Courtesy of Mazda Motors Corp.

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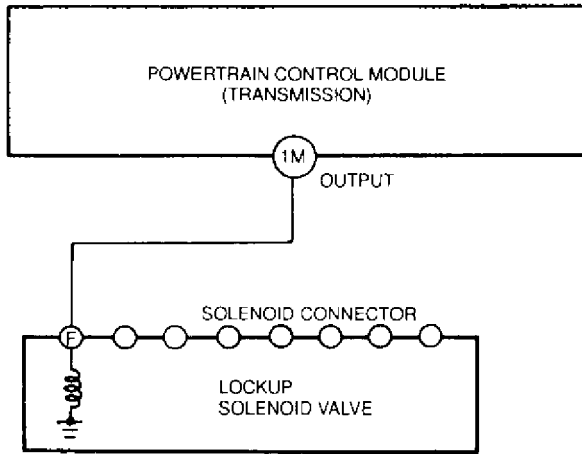## Article Text (p. 35)
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95E20713

Fig. 47:   Schematic - Diagnostic Code No. 63
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.63		LOCKUP SOLENOID VALVE	
STEP	**INSPECTION**		**ACTION**
1	Are there any poor connections at solenoid valve and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Disconnect 16-pin powertrain control module (Transmission) connector Is resistance between terminal 1M and a ground OK? **Resistance: 10–20Ω**	Yes	Go to step 4
		No	Go to next step
3	Disconnect solenoid connector Is resistance between ground and terminal F of lockup solenoid valve OK? **Resistance: 10–20Ω**	Yes	Check wiring and connectors from powertrain control module (Transmission) to lockup solenoid valve If OK, go to next step If not OK, repair wiring and/or connector
		No	Replace lockup solenoid valve
4	Connect a dwell meter to terminals as shown Is output duty of lockup solenoid valve at powertrain control module (Transmission) OK?	Yes	Go to next step
		No	Replace powertrain control module (Transmission)
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

Step 4 table:

(+) tern.	(–) term.	Duty (ON %)	Condition
1M	Ground	Approx. 5	No lockup
		Approx. 100	Lockup

95F20714

Fig. 48:   Flow Chart - Diagnostic Code No. 63
Courtesy of Mazda Motors Corp.

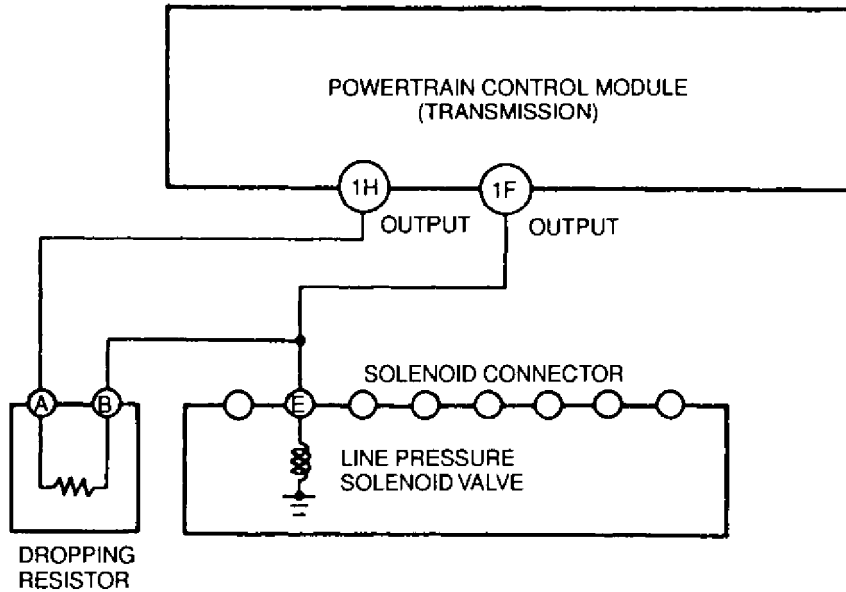# AUTO TRANS DIAGNOSIS - RA4A-EL & RB4A-EL
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95G20715

Fig. 49: Schematic - Diagnostic Code No. 64
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DIAGNOSTIC TROUBLE CODE NO.64	LINE PRESSURE SOLENOID VALVE		
STEP	INSPECTION		ACTION
1	Are there any poor connections at solenoid valve and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Disconnect 16-pin powertrain control module (Transmission) connector. Is resistance between terminal 1F (line pressure solenoid valve) and a ground OK? **Resistance: 2.5–5.0Ω**	Yes	Go to next step
		No	Go to step 4
3	Disconnect 16-pin powertrain control module (Transmission) connector. Is resistance between terminal 1H (dropping resistor) and a ground OK? **Resistance: 12.5–19.0Ω**	Yes	Go to step 5
		No	Go to step 7
4	Disconnect solenoid connector. Is resistance between ground and terminal E of line pressure solenoid valve OK? **Resistance: 2.5–5.0Ω**	Yes	Check wiring and connectors from powertrain control module (Transmission) to line pressure solenoid valve If OK, go to next step If not OK, repair wiring and/or connector
		No	Replace line pressure solenoid valve
5	Connect a dwell meter to terminals as shown. Is output duty of dropping resistor at powertrain control module (Transmission) OK?	Yes	Go to next step
		No	Replace powertrain control module (Transmission), perform road test, and go to step 8
6	Connect a dwell meter to terminals as shown. Is output duty of line pressure solenoid valve at powertrain control module (Transmission) OK?	Yes	Go to next step
		No	Replace powertrain control module (Transmission), perform road test, and go to step 8
7	Disconnect dropping resistor connector. Is resistance of resistor OK? **Resistance: 10–14Ω**	Yes	Check wiring and connectors from powertrain control module (Transmission) to dropping resistor If OK, go to next step If not OK, repair wiring and/or connector
		No	Repair or dropping resistor
8	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed. Connect battery cable and recheck for diagnostic trouble code. Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

Step 5 sub-table:

(+) term.	(−) term.	Duty (ON %)	Condition
1H	Ground	Approx. 100	Throttle valve closed throttle
		Approx. 5	Throttle valve wide open throttle

Step 6 sub-table:

(+) term.	(−) term.	Duty (ON %)	Condition
1F	Ground	Approx. 100	Throttle valve closed throttle position
		Approx. 5	Throttle valve wide open throttle

95H20716

Fig. 50: Flow Chart - Diagnostic Code No. 64
Courtesy of Mazda Motors Corp.

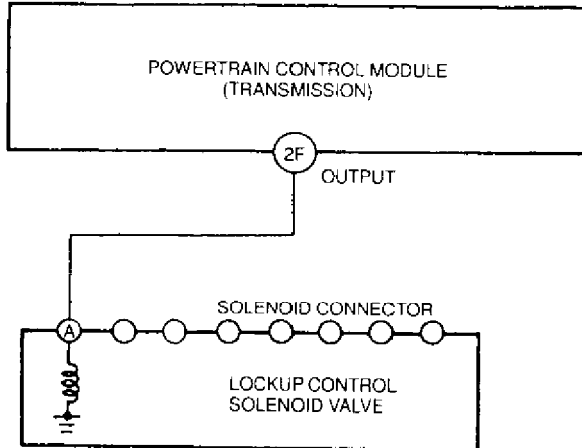# AUTO TRANS DIAGNOSIS - RA4A-EL & RB4A-EL
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RX7 & 929

95I20717

Fig. 51:   Schematic - Diagnostic Code No. 65
Courtesy of Mazda Motors Corp.

DIAGNOSTIC TROUBLE CODE NO.65		LOCKUP CONTROL SOLENOID VALVE	
STEP	**INSPECTION**	**ACTION**	
1	Are there any poor connections at solenoid valve and powertrain control module (Transmission) connectors?	Yes	Repair or replace connector
		No	Go to next step
2	Connect a circuit tester to terminals as shown Is output voltage of lockup control solenoid valve at powertrain control module (Transmission) OK? B+: Battery positive voltage	Yes	Check wiring and go to step 5
		No	Go to next step
3	Disconnect 20-pin powertrain control module (Transmission) connector Is resistance between terminal 2F and a ground OK? **Resistance: 20–40Ω**	Yes	Go to step 5
		No	Go to next step
4	Disconnect solenoid connector Is resistance between ground and terminal A of lockup control solenoid valve OK? **Resistance: 20–40Ω**	Yes	Check wiring and connectors from powertrain control module (Transmission) to lockup control solenoid valve If OK, go to next step If not OK, repair wiring and/or connector
		No	Replace lockup control solenoid valve
5	Disconnect negative battery cable for at least 20 seconds and the brake pedal is depressed Connect battery cable and recheck for diagnostic trouble code Is diagnostic trouble code displayed?	Yes	Replace powertrain control module (Transmission)
		No	Intermittent poor connection Check for cause

Step 2 voltage sub-table:

(+) tern.	(−) term.	Voltage (V)	Condition
2F	Ground	B+	Lockup
		Below 1.0	No lockup

95J20718

Fig. 52:   Flow Chart - Diagnostic Code No. 65
Courtesy of Mazda Motors Corp.

TESTING

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```
CAUTION: Stall and line pressure tests generate high engine and
         transmission temperatures. DO NOT hold throttle open more
         than 5 seconds. Allow engine to idle in "P" or "N" for at
         least one minute between tests.

         Preparation
         Check all fluid levels and correct if necessary. Warm engine
and transmission to operating temperature. Prior to performing stall,
lag time and line pressure tests, block front and rear wheels and set
parking brake.
```

STALL SPEED TEST

```
         Connect tachometer to engine. Ensure engine idle speed and
ignition timing is correct. Refer to the appropriate article in the
ENGINE PERFORMANCE section. Apply foot brake firmly and shift selector
to "D" range. Press accelerator pedal to floor and note maximum RPM.
Select "S", "R" and "L" ranges and repeat. Compare with STALL SPEED
table.


STALL SPEED
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
Application                     Stall RPM

RX7   ............................ 3000-3300
929   ............................ 1950-2250
ÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄÄ
```

STALL SPEED RESULTS

```
         High In All Ranges
         Insufficient line pressure, worn oil pump. Oil leakage from
oil pump, control valve and/or transmission case. Stuck pressure
regulator.

         High In "D" & "S"
         Forward clutch slipping. Forward one-way clutch slipping.
Low one-way clutch slipping.

         High In "R" Range
         Low and reverse brake slipping. Reverse clutch slipping.
Perform road test to see if low and/or reverse brake or reverse clutch
is at fault. Results indicate the following:

    *  Engine braking in "L" range, reverse clutch faulty.
    *  No engine braking in "L" range, low and/or reverse brake
    faulty.

         Low In All Ranges
         Low engine output. One-way clutch in torque converter
slipping.
```

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TIME LAG TEST

        With engine at idle, shift selector from "N" to "D", "N" to
"D" HOLD and "N" to "R". Time lag for transmission to engage should be
less than one second for "N" to "D" and less than 1.2 seconds for "N"
to "R".

TIME LAG RESULTS

        Longer Than Specified In "N" To "D" & "N" To "D" HOLD
        Low line pressure. Forward clutch slipping. Forward one-way
clutch slipping.

        High In "N" To "D"
        Low line pressure. Low one-way clutch slipping. N-D
accumulator not operating properly.

        High In "N" To "D" HOLD
        Low line pressure. Brake band slipping. 1-2 accumulator not
operating properly.

        High In "N" To "R"
        Low line pressure. Reverse clutch slipping. Low and reverse
brake slipping 3-4/N-R. Accumulator not operating properly.

LINE PRESSURE TEST

        1) Connect gauges to appropriate line pressure inspection
ports. See Fig. 53. Connect tachometer to engine. Ensure engine idle
speed and ignition timing is correct. See ENGINE PERFORMANCE section.
Apply foot brake firmly and shift selector to "D" range.
        2) Press accelerator pedal to floor and note pressure gauge.
Release throttle to read pressure at idle. Select "S", "R" and "L"
ranges and repeat. Compare with LINE PRESSURE SPECIFICATIONS table.
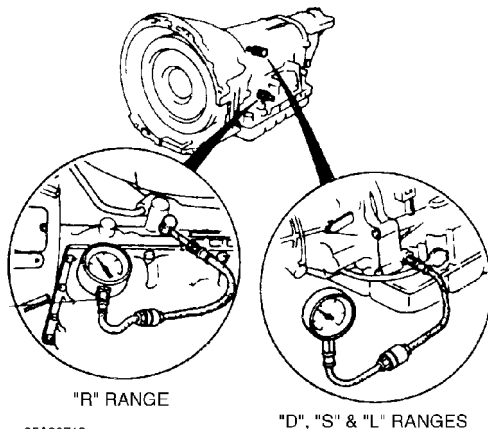
"R" RANGE
"D", "S" & "L" RANGES
95A20719
Fig. 53: Connecting Pressure Gauges (RX7 & 929)
Courtesy of Mazda Motors Corp.

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LINE PRESSURE SPECIFICATIONS
ÄÄ

		Idle	Stall
Application	Range	psi (kPa)	psi (kPa)
929	D, S, L	63-68 .... (432-470)	151-162 (1040-1118)
	R	87-92 .... (600-638)	210-222 (1452-1530)
RX7	D, S, L	72-76 .... (496-524)	174-184 (1200-1269)
	R	90-95 .... (621-655)	218-228 (1503-1572)

ÄÄ

LINE PRESSURE RESULTS

Low Pressure At Idle (All Ranges)
Worn oil pump. Damaged control piston in oil pump. Pressure
regulator valve or plug sticking. Damaged pressure regulator valve
spring. Fluid leakage between oil strainer and pressure regulator
valve.

Low At Idle In "D", "S" Or "L"
Fluid leakage from hydraulic circuit of forward clutch.

Low At Idle In "D" & "S" HOLD Mode
Fluid leakage from hydraulic circuit of band servo 2nd apply
side.

Low At Idle In "R"
Fluid leakage from hydraulic circuit of reverse clutch.

Low At Idle In "R" & "L"
Fluid leakage from hydraulic circuit of low and reverse
brake.

High At Idle
Throttle sensor out of adjustment. Damaged thermosensor. Line
pressure solenoid sticking. Short circuit of line pressure solenoid
circuit. Pressure modifier valve sticking. Pressure regulator valve or
plug sticking.

Low At Stall Speed
Throttle sensor out of adjustment. Damaged control piston in
oil pump. Line pressure solenoid sticking. Short circuit of line
pressure solenoid circuit. Pressure regulator valve or plug sticking.
Pressure modifier valve sticking. Pilot valve sticking.

ELECTRICAL COMPONENTS TESTS

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ATF Thermosensor
        Disconnect negative battery cable. Remove oil pan. Remove
thermosensor from transmission. Connect ohmmeter to thermosensor
terminals. Place thermosensor and thermometer in a container of water.
Heat water gradually, checking temperature. See Fig. 54. If resistance
is incorrect, replace thermosensor.
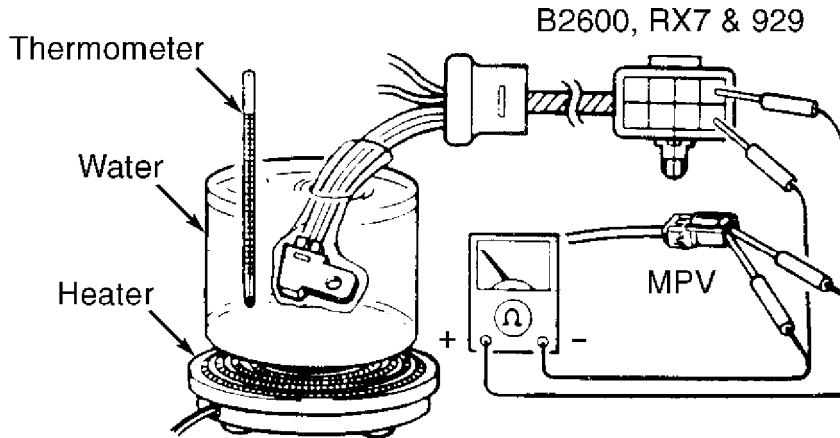
Water Temperature	Resistance
20°C (68°F)	Approx. 2.5 kΩ
80°C (176°F)	Approx. 0.3 kΩ

95G20905
Fig. 54: Testing ATF Thermosensor
Courtesy of Mazda Motors Corp.

ATF Thermoswitch (4WD)
        Disconnect negative battery cable. Remove oil pan and
thermoswitch. Place thermoswitch with a thermometer in a container of
ATF and gradually heat ATF. Using an ohmmeter, note when thermoswitch
closes and opens. Below 293øF (145øC) switch is open, above 302øF
(150øC) switch is closed. If thermoswitch does not operate as
described, replace thermoswitch.

Dropping Resistor
        Disconnect wire connectors at dropping resistor. Resistance
across wire connectors should be 10-14 ohms. If not 10-14 ohms,
replace dropping resistor.

Hold Switch
        1) Turn ignition on. On RX7, connect voltmeter between
terminal "D" or terminal "F" and ground. On 929, connect voltmeter
between terminal "A" or terminal "B" and ground. See Fig. 55. If
voltage is not as specified, check and repair circuit between power
source and switch. If voltage is okay, go to next step.
        2) Turn ignition off and disconnect hold switch connector.

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See Fig. 56. On RX7, connect ohmmeter between hold switch terminals "D" and "F". On 929, connect ohmmeter between hold switch terminals "A" and "B". If continuity is not correct, replace selector switch or selector lever knob.

Terminal Voltage	Switch
Approx. 12 V	Released
Below 1.5 V	Depressed

MPV

Terminal Voltage	Terminal
Approx. 12 V	A and B
Below 1.5 V	A and ground

B2600

RX7 & 929

	Terminal	Terminal voltage (V)	
Switch condition		D	F
Released		0	0
Depressed		B+	0

RX7

	Terminal	Terminal voltage (V)	
Switch condition		A	B
Released		B+	0
Depressed		0	0

929

95I20808

Fig. 55: Checking Hold Switch Voltage
Courtesy of Mazda Motors Corp.
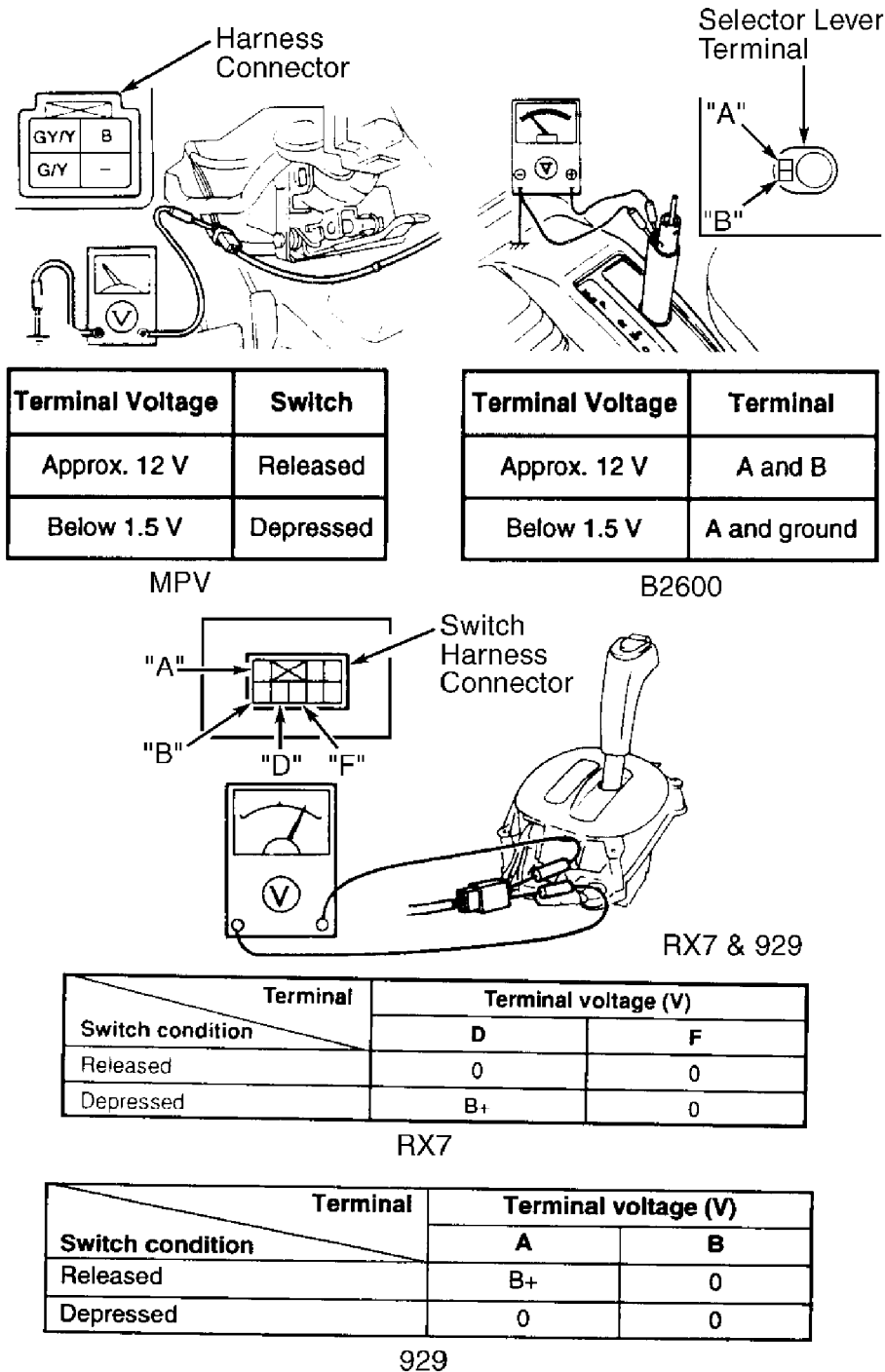
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Switch Connector

Continuity	Switch
Yes	Released
No	Depressed

MPV

Hold Button

Continuity	Switch
Yes	Released
No	Depressed

B2600

"A" "B" "D" "F" Switch Harness Connector

Switch condition	Continuity
Released	Yes
Depressed	No

95J20809   RX7 & 929

Fig. 56: Checking Continuity Of Hold Switch
Courtesy of Mazda Motors Corp.

          Inhibitor/Park Neutral Switch
          1) Shift selector lever to "P" or "N". Ensure vehicle starts
in these positions and not in any other. Ensure back-up lights come on
when in "R" and ignition is on.
          2) Disconnect wire connectors at inhibitor/park neutral
switch on transmission, connect ohmmeter and shift selector to ranges.
See Fig. 57. Check continuity between terminals. If continuity is not
as specified, adjust or replace switch.
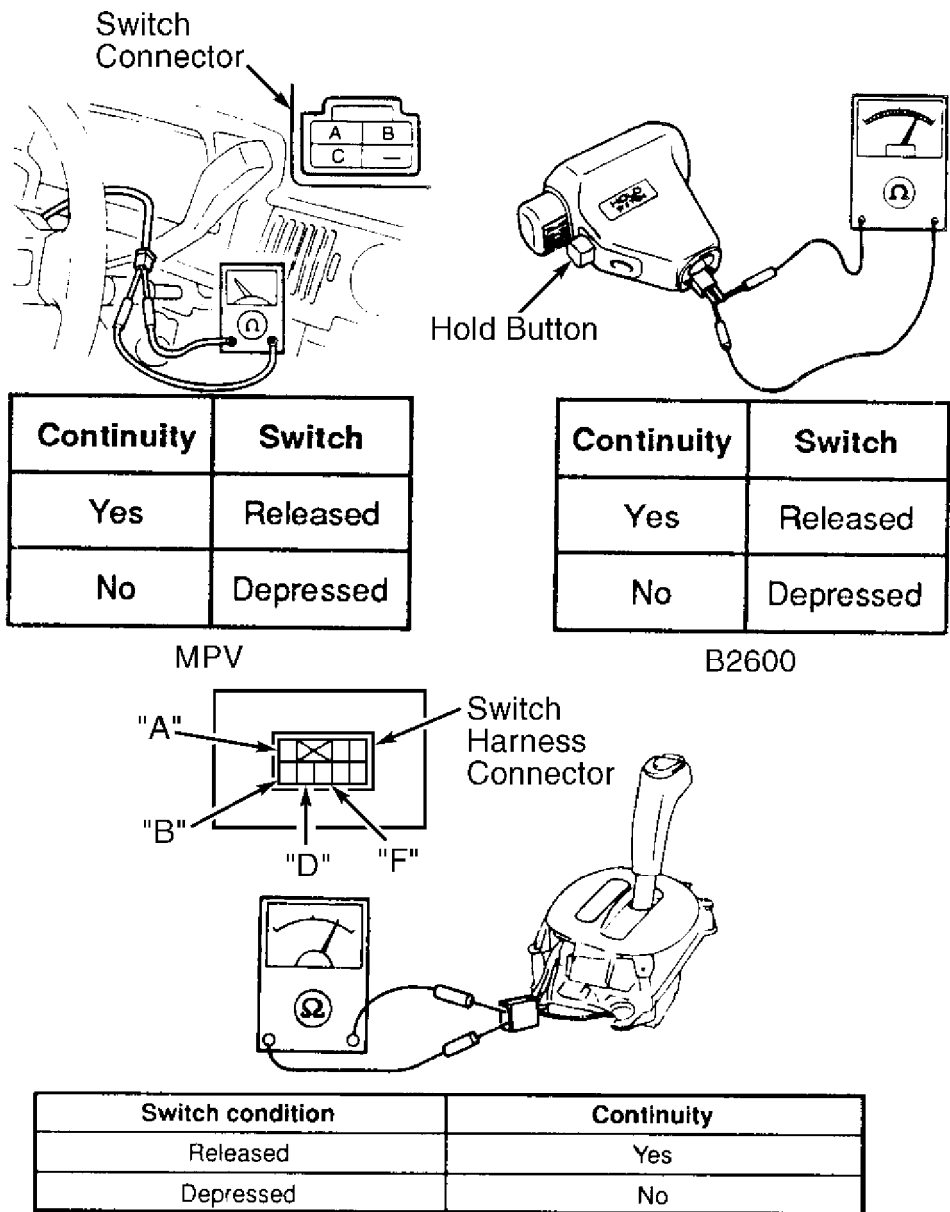
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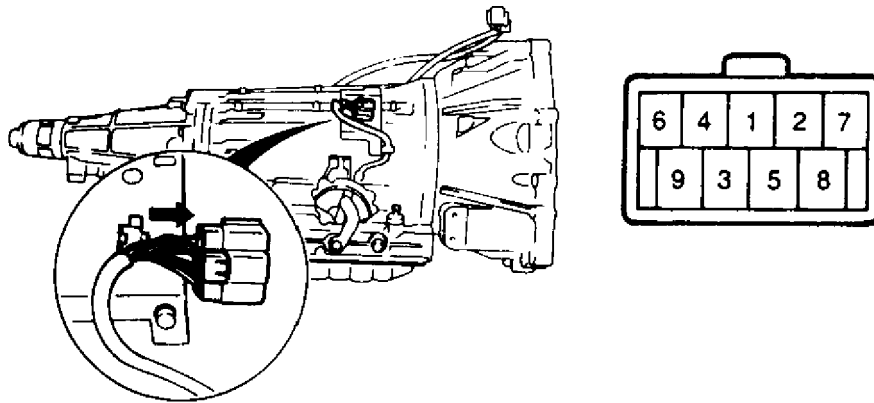
Position	1	2	3	4	5	6	7	8	9
P	O—						—O	O—	—O
R		O—					—O		
N			O—				—O	O—	—O
D				O—			—O		
S					O—		—O		
L						O—	—O		

O—O : Indicates continuity

95D20811

Fig. 57: Checking Inhibitor/Park Neutral Switch
Courtesy of Mazda Motors Corp.

Pulse Generator (RX7 & 929 Only)
Disconnect 3-wire connector at front of transmission. See
Fig. 58. Make sure 2200-3500 ohms are present between terminals "A"
and "B". Ensure ohmmeter reads infinity between all other terminal
pairs. If not, replace pulse generator.

RX7   929

Pulse
Generator
Connector
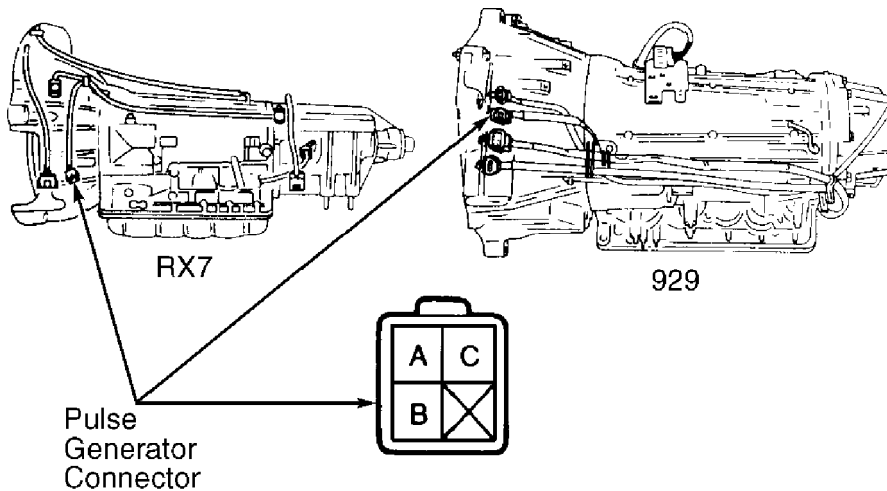
95E20812

Fig. 58: Checking Pulse Generator
Courtesy of Mazda Motors Corp.

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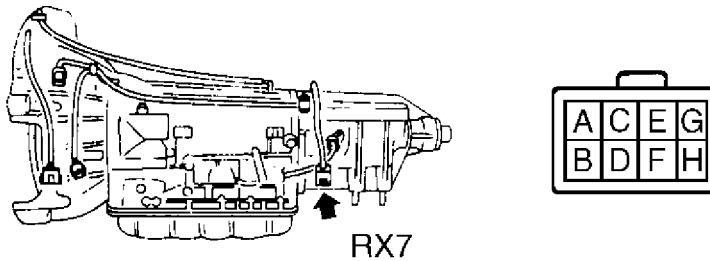Sunday, August 19, 2001 09:17PM

Solenoid Valves
        Disconnect solenoid valve connector and measure resistance
from respective terminal to ground. See Figs. 59-61. Also, refer to
the SOLENOID VALVE RESISTANCE SPECIFICATIONS table. If not as
specified, replace solenoid or assembly.

Terminal	Solenoid valve	Resistance (Ω)
A	Lockup control	20–40
B	Shift A	20–40
C	Shift B	20–40
D	Overrunning clutch	20–40
E	Line pressure	2.5–5.0
F	Lockup	10–20

95H20815

Fig. 59: View of Solenoid Valve Connector
Courtesy of Mazda Motors Corp.
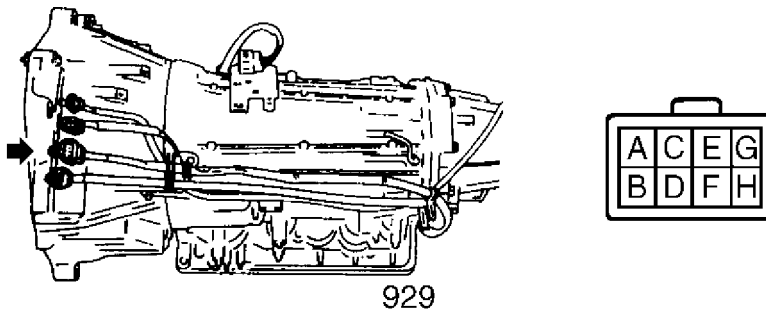
Terminal	Solenoid valve	Resistance (Ω)
A	Lockup control	20–40
B	Shift A	20–40
C	Shift B	20–40
D	Overrunning clutch	20–40
E	Line pressure	2.5–5.0
F	Lockup	10–20

95I20816

Fig. 60: Checking Solenoid Valves (RX7)
Courtesy of Mazda Motors Corp.

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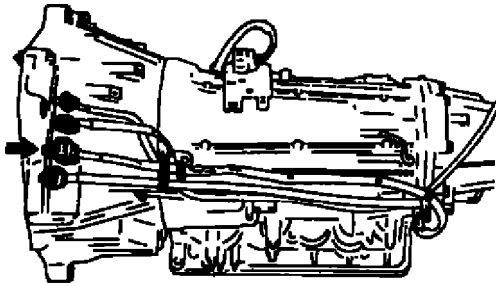
95J20817   **929**

Fig. 61: Checking Solenoid Valves(929)
Courtesy of Mazda Motors Corp.

SOLENOID VALVE RESISTANCE SPECIFICATIONS
ÄÄÄ
```
                                                Resistance
Terminal                Solenoid Valve          In Ohms

A  ...............   Lock-Up Control  .......... 20-40
B  .................    Shift "A"     ............. 20-40
C  .................    Shift "B"     ............. 20-40
D  .............. Overrunning Clutch  ......... 20-40
E  ...............    Line Pressure   ......... 2.5-5.0
F  ...................    Lock-Up     .............. 10-20
```
ÄÄÄ

     Speed Sensor No. 1 (Revolution Sensor)
     Disconnect speed sensor wiring connector at transmission. On
929, remove front exhaust pipe. See Figs. 62 and 63. On all models,
connect ohmmeter to terminals as indicated. If resistance is not as
specified, replace speed sensor.

RX7

Terminal	Resistance (Ω)
A and B	500-1,000
B and C	∞
A and C	∞

95F20821
Fig. 62: Checking Revolution Sensor (RX7)
Courtesy of Mazda Motors Corp.

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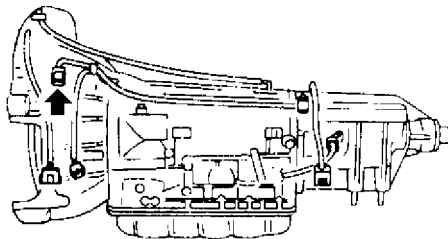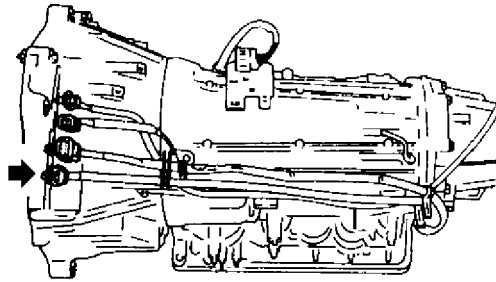## Article Text (p. 47)
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929

| Terminal	Resistance (Ω)
A and B	500–1,000
B and C	∞
A and C	∞

95G20822

Fig. 63: Checking Revolution Sensor (929)
Courtesy of Mazda Motors Corp.

Vehicle Speedometer Sensor (RX7 & 929)
1) On RX7, disconnect speedometer connector at instrument panel. Connect an A/C voltmeter to Yellow/White and Yellow/Red wires of instrument panel connector. On 929, disconnect White connector at instrument panel. Connect an A/C voltmeter to Green/Red and Blue/Yellow wires of instrument panel connector.
2) On all models, check for a voltage increase as rear wheel is turned. If no voltage increase occurs, go to next step. If voltage increases, vehicle speedometer sensor is okay.
3) Disconnect vehicle speedometer sensor wiring connector at transmission. See Figs. 64 and 65. Connect ohmmeter to terminals. If resistance is not about 290 ohms, replace vehicle speedometer sensor.
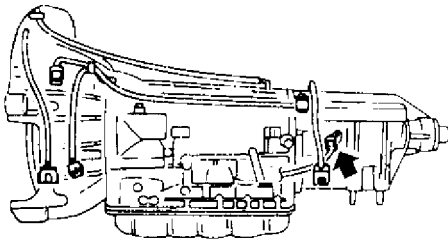
95H20880

Fig. 64: Locating Speedometer Sensor Connector (RX7)
Courtesy of Mazda Motors Corp.
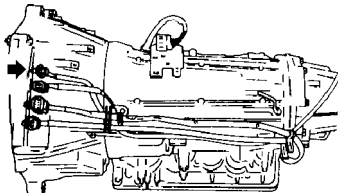
95I20881

Fig. 65: Locating Speedometer Sensor Connector (929)
Courtesy of Mazda Motors Corp.

PCMT
Turn ignition on. Check voltage at each control unit
terminal. See appropriate PCMT terminal voltage chart. See Figs. 66-
72. If voltage is not as specified at any terminal, repair or replace
component(s) or wiring. If no problem is found with any component or
wiring, replace PCMT.

NOTE: For additional electrical circuit information, see
           WIRING DIAGRAMS at end of this article.

2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1O	1M	1K	1I	1G	1E	1C	1A
2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1P	1N	1L	1J	1H	1F	1D	1B

95A20891

Fig. 66: RX7 PCMT Terminal Voltage Chart (1 of 4)
Courtesy of Mazda Motors Corp.

Terminal	Color	Component	Connected to	Voltmeter (+) terminal	Voltmeter (–) terminal	Correct voltage	Condition	Check area
1A	L/R	Battery (backup)	Battery	1A		B+	Constant	• Wiring and/or connector from terminal 1A to battery
1B (Output)	W/G	Shift B solenoid valve	Solenoid valve	1B		B+	P, R, and N ranges or 1st and 2nd gear positions	• Shift B solenoid valve • Wiring and/or connector from 1B terminal to shift B solenoid valve
						Below 1.0V	Third and Fourth gear positions	
1C (Output)	Y	Inhibitor signal	Engine control unit	1C		Below 1.0V	P and N ranges	• Park/Neutral switch, vehicle speed pulse generator, and/or powertrain control module (engine)
						B+	Except P and N ranges	• Wiring and/or connector from terminal 1C to powertrain control module (engine) terminal 1R
1D (Output)	W/R	Shift A solenoid valve	Solenoid valve	1D		B+	P, R, and N ranges or 1st and Fourth gear positions	• Shift A solenoid valve • Wiring and/or connector from terminal 1D to shift A solenoid valve
						Below 1.0V	2nd and Third gear positions	
1E (Input)	R	Park/Neutral switch (R range)	Park/Neutral switch	1E	Ground	B+	R range	• Park/Neutral switch • Wiring and/or connector from terminal 1E to park/neutral switch
						0V	Except R range	
1F (Output)	W/L	Line pressure solenoid valve	Solenoid valve	1F		Above 1.5V	Throttle valve closed throttle position	• Line pressure solenoid valve • Wiring and/or connector from terminal 1F to line pressure solenoid valve
						Below 1.0V	Throttle valve wide opened throttle	
1G (Input)	Y/L	Engine rpm signal	Engine control unit	1G		0.3–0.8V	Engine running at idle	• Wiring and/or connector from terminal 1G to powertrain control module (engine) terminal 2B • Powertrain control module (engine)
						0V	Engine stopped	
						1.8–2.2V	Engine running at 3,000 rpm (no load)	
1H (Output)	B/LG	Dropping resistor	Dropping resistor	1H		B+	Throttle valve closed throttle position	• Dropping resistor and/or solenoid valve (line pressure) • Wiring and/or connector between terminal 1H, dropping resistor, and solenoid valve
						Below 1.0V	Throttle valve wide opened throttle	
1I (Input)	G/R	Vehicle speedometer sensor	Speedometer	1I		2–3V	Vehicle moving	• Vehicle speedometer sensor and/or speedometer • Wiring and/or connector between terminal 1I speedometer, and vehicle speedometer sensor
						0V or 4.5–5.5V	Vehicle stopped	
1J (Ground)	B/L	Ground (Powertrain control module (Transmission))	—	1J		0V	Constant	• Wiring condition.
1K (Output)	Y	Hold indicator / FAT terminal (data link connector)	Combination meter (hold indicator light) and FAT terminal (data link connector)	1K		Below 1.0V	Hold mode	• Wiring and/or connector from terminal 1K to hold indicator light (combination meter) • Hold indicator light
						B+	Except hold mode	
1L (Input)	V/P	A/C signal	A/C relay	1L		Below 3.0V	A/C ON	• Powertrain control module (engine) and/or Air conditioning sensor • Wiring and/or connector from terminal 1L to Air conditioning sensor
						B+	A/C OFF	
1M (Output)	W	Lockup solenoid valve	Solenoid valve	1M	Ground	B+	Lockup	• Lockup solenoid valve • Wiring and/or connector from terminal 1M to lockup solenoid valve
						Below 1.0V	No lockup	
1N	B/Y	Battery (main)	Ignition switch	1N		B+	Ignition switch ON	• Meter fuse and/or ignition switch • Wiring and/or connector from terminal 1N to ignition switch (IG1)
						0V	Ignition switch OFF	
1O (Output)	W/Y	Overrunning clutch solenoid valve	Solenoid valve	1O		Below 1.0V	Throttle valve wide opened throttle (D range)	• Overrunning clutch solenoid valve • Wiring and/or connector from terminal 1O to overrunning clutch solenoid valve
						B+	Throttle valve closed (D range)	
1P	B/Y	Battery (main)	Ignition switch	1P		B+	Ignition switch ON	• Meter fuse and/or ignition switch • Wiring and/or connector from terminal 1P to ignition switch (IG1)
						0V	Ignition switch OFF	
2A (Input)	BR/W	Throttle sensor (VREF)	Throttle position sensor	2A		4.5–5.5V	Ignition switch ON	• Wiring and/or connector from terminal 2A to powertrain control module (engine) terminal 3I • Throttle position sensor
						0V	Ignition switch OFF	

Terminal 1D voltage [shift A solenoid valve] is below 1.0V when in HOLD mode in P, R, and N ranges.

95B20892

Fig. 67: RX7 PCMT Terminal Voltage Chart (2 of 4)
Courtesy of Mazda Motors Corp.

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Terminal	Color	Component	Connected to	Voltmeter (+) terminal	Voltmeter (−) terminal	Correct voltage	Condition	Check area
2B (Input)	Y/G	Park/Neutral switch (D range)	Park/Neutral switch	2B	Ground	B+	D range	• Park/Neutral switch • Wiring and/or connector from terminal 2B to park/neutral switch
						0V	Excect D range	
2C (Input)	G/Y	Barometric absolute pressure sensor	Powertrain control module (engine)	2C		2.0–4.5V	Ignition switch ON	• Wiring and/or connector from terminal 2C to powertrain control module (engine) erminal 2D
						0V	Ignition switch OFF	
2D (Input)	L/Y	Park/Neutral switch (P and N ranges)	Park/Neutral switch	2D	Ground	0V	P and N ranges	• Park/Neutral switch and/or ignition switch • Wiring and/or connector between terminal 2D park/neutral switch, and ignition switch (STA)
						B+	Except P and N ranges	
2E (Input)	O	Vehicle speed pulse generator	Vehicle speed vehicle speed pulse generator	2E*1	2L	Approx. above 0.5V AC	Vehicle speed above 25 km/h (16 MPH)	• Vehicle speed pulse generator • Wiring and/or connector from terminal 2E to vehicle speed pulse generator
						Approx. 0V (AC)	Vehicle stopped (Ignition switch ON)	
2P (Output)	G/W	Lockup control solenoid valve	Solenoid valve	2F		B+	lockup	• Lockup control solenoid valve • Wiring and/or connector from terminal 2F to lockup control solenoid valve
						Below 1.0V	No lockup	
2G (Input)	G/R	Slip lockup OFF signal	Powertrain control module (engine)	2G		Below 1.0V	Engine running at 3.000 rpm	• Wiring and/or connector from terminal 2G to powertrain control module (engine) terminal 2C • Powertrain control module (engine)
						B+	Engine running at idle	
2H (Input)	L/G	Torque reduced signal	Powertrain control module (engine)	2H*2	Ground	B+	Engine running at idle	• Wiring and/or connector from terminal 2H to powertrain control module (engine) terminal 2G • Throttle position sensor, vehicle speed sensor vehicle speed pulse generator, and/or powertrain control module (engine)
						Below 1.0V	Throttle opening above 1/8 (Engine coolant temp below 40°C (104°F))	
2I (Input)	W/Y	Hold switch	Hold switch	2I		B+	Switch depressed	• Hold switch • Wiring and/or connector from terminal 2I to hold switch
						0V	Switch released	

*1 Check terminal 2E (vehicle speed pulse generator) voltage by using the AC range.
*2 2H (Torque reduced signal) : Some kinds of testers may give incorrect values. This is because the voltage output period is very short.

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Fig. 68: RX7 PCMT Terminal Voltage Chart (3 of 4)
Courtesy of Mazda Motors Corp.

Terminal	Color	Component	Connected to	Voltmeter (+) terminal	Voltmeter (−) terminal	Correct voltage	Condition	Check area
2J (Input)	Y/G	Vehicle speed sensor (revolution sensor)	Vehicle speed sensor (revolution sensor)	2J*	2L	Approx. above 1.0V (AC)	Vehicle speed above 25 km/h (16 MPH)	• Vehicle speed sensor (revolution sensor) • Wiring and/or connector from terminal 2J to vehicle speed sensor
						Approx. 0V (AC)	Vehicle stopped	
2K	L/W	TAT terminal(data link connector) / 4GR inhibit signal (auto speed control signal)	TAT terminal (data link connector) and cruise control unit	2K	Ground	4.5–5.5	Ignition switch ON	• Terminal 1N and 1P voltage • Wiring and/or connector from terminal 2K to data link connector TAT terminal • Wiring and/or connector from terminal 2K to cruise control unit terminal G
						0V	TAT terminal grounded	
2L (Ground)	W	Ground (input signals)	—	2L		0V	Constant	• Wiring condition
2M (Input)	R/W	Idle signal	Powertrain control module (engine)	2M	Ground	4.5–5.5V	Throttle valve opened	• Throttle position sensor and/or powertrain control module (engine) • Wiring and/or connector from terminal 2M to powertrain control module (engine) terminal 2E
						Below 1.0V	Throttle valve closed throttle position	
2N (Input)	B	Water thermo-switch / mileage switch	Water thermo-switch and mileage switch	2N	Ground	0V	Engine coolant temp. above 115°C (239°F) or vehicle total mileage above 625 km (388 miles) and vehicle stopped	• Water thermo-switch and/or mileage switch • Wiring and/or connector from terminal 2N to water thermo-switch
						B+	Engine coolant temp. below 110°C (230°F) or vehicle total mileage below 625 km (388 miles) and vehicle stopped	
2O (Input)	LG/R	Stoplight switch	Stoplight switch	2O		B+	Brake pedal depressed	• Stoplight switch • Wiring and/or connector from terminal 2O to stoplight switch
						0V	Brake pedal released	
2P (Output)	G/W	Reduce torque signal / slip lockup signal	Powertrain control module (engine)	2P*	Ground	Below 1.0V	When shifting from 1st to 2nd or from 2nd to Third with the throttle opening above 1.5/8. When slip lockup with the throttle opening below 0.5/8.	• Wiring and/or connector from terminal 2P to powertrain control module (engine) terminal 1Q • Throttle position sensor, vehicle speed sensor, vehicle speed pulse generator, lock-up, lockup control solenoid valve, and/or powertrain control module (engine)
						B+	Engine running at idle	
2Q (Input)	BR/W	Park/Neutral switch (L range)	Park/Neutral switch	2Q		B+	L range	• Park/Neutral switch • Wiring and/or connector from terminal 2Q to park/neutral switch
						0V	Except L range	
2R (Input)	R	ATF thermo-sensor	ATF thermosensor	2R	2L	Approx. 2.4–0.4V	While warming up ATF Note • Approx. 1.8V: ATF temperature 10°C (50°F) • Approx. 1.1V: ATF temperature 40°C (104°F)	• ATF thermosensor • Wiring and/or connector from terminal 2R to ATF thermo-sensor
2S (Input)	L/R	Park/Neutral switch (S range)	Park/Neutral switch	2S		B+	S range	• Park/Neutral switch • Wiring and/or connector from terminal 2S to park/neutral switch
						0V	Except S range	
2T (Input)	B/G	Throttle position sensor (TVO)	Throttle position sensor	2T	Ground	0.1–1.1V	Throttle valve closed throttle position	• Throttle position sensor • Wiring and/or connector from terminal 2T to throttle position sensor
						4.0–4.5V	Throttle valve wide opened throttle	

* – Check terminal 2J using A/C range.
* – Erratic voltage readings may be found at terminal 2P. Ensure appropriate tester that can read very short voltage outputs is used.

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Fig. 69: RX7 PCMT Terminal Voltage Chart (4 of 4)
Courtesy of Mazda Motors Corp.

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2S	2Q	2O	2M	2K	2I	2G	2E	2C	2A	1O	1M	1K	1I	1G	1E	1C	1A
2T	2R	2P	2N	2L	2J	2H	2F	2D	2B	1P	1N	1L	1J	1H	1F	1D	1B

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Fig. 70: 929 PCMT Terminal Voltage Chart (1 of 3)
Courtesy of Mazda Motors Corp.

Terminal	Color	Component	Connection to	Voltmeter (+) terminal	Voltmeter (-) terminal	Correct voltage	Condition	Possible cause
1A	L/R	Battery (back up)	Battery	1A		B+	Constant	• Wiring and/or connector from terminal 1A to battery
1B (Output)	W	Shift B solenoid valve	Solenoid valve	1B		B+	P, R, and N ranges or 1st and 2nd gear positions	• Shift B solenoid valve
						Below 1.0V	Third and Fourth gear positions	
1C (Output)	R/L	Park/Neutral signal	PCME	1C		Below 1.0V	P and N ranges	• Park/Neutral switch and/or vehicle speed pulse generator
						B+	Other ranges	
1D (Output)	G	Shift A solenoid valve	Solenoid valve	1D		B+	P, R, and N ranges or 1st and Fourth gear positions	• Shift A solenoid valve
						Below 1.0V	2nd and Third gear positions	
1E (Input)	R/G	Park/Neutral switch (R range)	Park/Neutral switch	1E	Ground	B+	R range	• Park/Neutral switch
						0V	Other ranges	
1F (Output)	R	Line pressure solenoid valve	Solenoid valve	1F		Above 2.0V	Throttle valve closed throttle position (after ATF warm, engine stopped)	• Line pressure solenoid valve and/or dropping resistor
						Below 1.0V	Throttle valve wide open throttle (after ATF warm, engine stopped)	
1G (Input)	G/W	Engine rpm signal (Ne1 signal)	Distributor	1G		2—3V	Engine running at idle	• Distributor
						0V or 4.5—5.5V	Engine stopped	
1H (Output)	P	Dropping resistor	Dropping resistor	1H		B+	Throttle valve closed throttle position	• Dropping resistor and/or line pressure solenoid valve
						Below 1.0V	Throttle valve wide open throttle	
1I (Input)	G/R	Vehicle speedometer sensor	Speedometer	1I		2—3V	Vehicle moving	• Vehicle speedometer sensor and/or combination meter
						0V or 4.5—5.5V	Vehicle stopped	
1J (Ground)	B/LG	Ground (powertrain control module (transmission))	—	1J		0V	Constant	• Wiring from terminal 1J to ground
1K (Output)	GY/R	Hold indicator	Combination meter (hold indicator light)	1K		Below 1.0V	Hold mode	• Combination meter
						B+	Other modes	
1L (Input)	Y/W	A/C signal	PCME	1L		B+	A/C ON	• PCME and/or A/C system components
						Below 1.0V	A/C OFF	
1M (Output)	W/R	Lockup solenoid valve	Solenoid valve	1M		B+	Lockup	• Lockup solenoid valve
						Below 1.0V	No lockup	
1N	B/Y	Battery (main)	Main relay	1N		B+	Ignition switch ON	• Main relay • Wiring and/or connector from terminal 1N to main relay
						0V	Ignition switch OFF	
1O (Output)	W/B	Overrunning clutch solenoid valve	Solenoid valve	1O	Ground	Below 1.0V	Throttle valve open (D range)	• Overrunning clutch solenoid valve
						B+	Throttle valve closed throttle position (D range)	
1P	B/Y	Battery (main)	Main relay	1P		B+	Ignition switch ON	• Main relay • Wiring and/or connector from terminal 1P to main relay
						0V	Ignition switch OFF	
2A (Input)	BR/W	Throttle position sensor	Throttle position sensor	2A		4.5—5.5V	Ignition switch ON	• Main relay • PCME terminal 1B
						0V	Ignition switch OFF	
2B (Input)	G/Y	Park/Neutral switch (D range)	Park/Neutral switch	2B		B+	D range	• Park/Neutral switch
						0V	Other ranges	
2C (Input)	V	Barometric absolute pressure sensor	PCME	2C		Approx. above 3.8V	Atmospheric pressure above 96.6 kPa (725 mmHg, 28.5 inHg) (approx. below 400 m (1,312 ft))	• PCME • Wiring from terminal 2C to PCME terminal 2G
						Approx. below 3.3V	Atmospheric pressure below 88.0 kPa (660 mmHg, 26.0 inHg) (approx. above 1,200 m (3,937 ft))	

The terminal 1D voltage [shift A solenoid valve] is below 1.0V when in HOLD mode in P, R, and N ranges.

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Fig. 71: 929 PCMT Terminal Voltage Chart (2 of 3)
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Terminal	Color	Component	Connection to	Voltmeter (+) terminal	Voltmeter (−) terminal	Correct voltage	Condition	Possible cause
2D (Input)	B/Y	Park/Neutral switch (P and N ranges)	Park/Neutral switch	2D	Ground	0V	P and N ranges	• Park/Neutral switch
						B+	Other ranges	
2E (Input)	L/Y	Vehicle speed pulse generator	Vehicle speed pulse generator	2E*1	2L	Approx. above 0.5V (AC)	Vehicle speed above 25 km/h {16 mph}	• Vehicle speed pulse generator
						Approx. 0V(AC)	Engine stopped (ignition switch ON)	
2F (Output)	O	Lockup control solenoid valve	Solenoid valve	2F	Ground	B+	Lockup	• Lockup control solenoid valve
						Below 1.0V	No lockup	
2G (Output)	P/B	Vehicle speed signal	Not used	2G	Ground	2—3V	Vehicle speed above 25 km/h {16 mph}	
						0V or 4.5—5.5V	Vehicle stopped	
2H (Input)	GY	Torque reduced signal	PCME	2H*2	Ground	B+	After engine warm-up	• Wiring and/or connector from terminal 2H to PCME terminal 2P • Vehicle speed pulse generator
						Below 1.0V	Cold engine	
2I (Input)	L/B	Hold switch	Hold switch	2I	Ground	0V	Switch depressed	• Hold switch
						B+	Switch released	
2J (Input)	O/L	Vehicle speed sensor (revolution sensor)	Vehicle speed sensor (revolution sensor)	2J*1	2L	Approx. above 1.0V(AC)	Vehicle speed above 25 km/h {16 mph}	• Vehicle speed sensor (revolution sensor)
						Approx. 0V(AC)	Vehicle stopped	
2K	V	TAT terminal (data link connector) and 4GR inhibit signal (auto speed control signal)	TAT terminal (data link connector) and cruise control unit	2K	Ground	B+	Ignition switch ON (vehicle stopped)	• Main relay • Terminal 1N and 1P voltage • Wiring and/or connector from terminal 2K to data link connector TAT terminal • Wiring and/or connector from terminal 2K to cruise control unit terminal 1G
						0V	TAT terminal grounded (vehicle stopped)	
2L (Ground)	L/G	Ground (Input signals)	—	2L	Ground	0V	Constant	• Wiring from terminal 2L to ground
2M (Input)	BR/B	Idle switch	Throttle position sensor	2M	Ground	B+	Throttle valve open	• Throttle position sensor • Wiring and/or connector from terminal 2M to throttle position sensor
						0V	Throttle valve closed throttle position	
2N (Output)	P/W	FAT terminal (data link connector)	FAT Terminal (data link connector)	2N	Ground	0V	Hold mode	• Main relay • Terminal 1N and 1P voltage • Wiring and/or connector from terminal 2N to data link connector FAT terminal
						B+	Other modes	
2P (Output)	GY/L	Reduce torque signal	PCME	2P	Ground	Below 1.0V	When shifting	• Wiring and/or connector from terminal 2P to PCME terminal 1S
						B+	Other condition	
2Q (Input)	G	Park/Neutral switch (L range)	Park/Neutral switch	2Q	Ground	B+	L range	• Park/Neutral switch
						0V	Other ranges	
2R (Input)	Y	ATF thermosensor	ATF thermosensor	2R	2L	Approx. 2.4—0.4V	While warming up ATF Note • Approx. 1.8V: ATF temperature 10°C {50°F} • Approx. 1.1V: ATF temperature 40°C {104°F}	• ATF thermosensor
2S (Input)	LG/B	Park/Neutral switch (S range)	Park/Neutral switch	2S	Ground	B+	S range	• Park/Neutral switch
						0V	Other ranges	
2T (Input)	L	Throttle position sensor	Throttle position sensor	2T	Ground	Approx. 0.1—1.1V	Throttle valve closed throttle position	• Throttle position sensor • PCME terminal 2I voltage • Wiring and/or connector from terminal 2T to throttle position sensor
						3.0—4.3V	Throttle valve wide open throttle	

*1 Check the terminals 2E (vehicle speed pulse generator) and the 2J (vehicle speed sensor) voltage by using the AC range.
*2H (Torque reduced signal): Some kinds of testers may give incorrect values. This is because the voltage output period is very short.
*2P (Reduced torque signal): Some kinds of testers may give incorrect values. This is because the voltage output period is very short.

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Fig. 72: 929 PCMT Terminal Voltage Chart (3 of 3)
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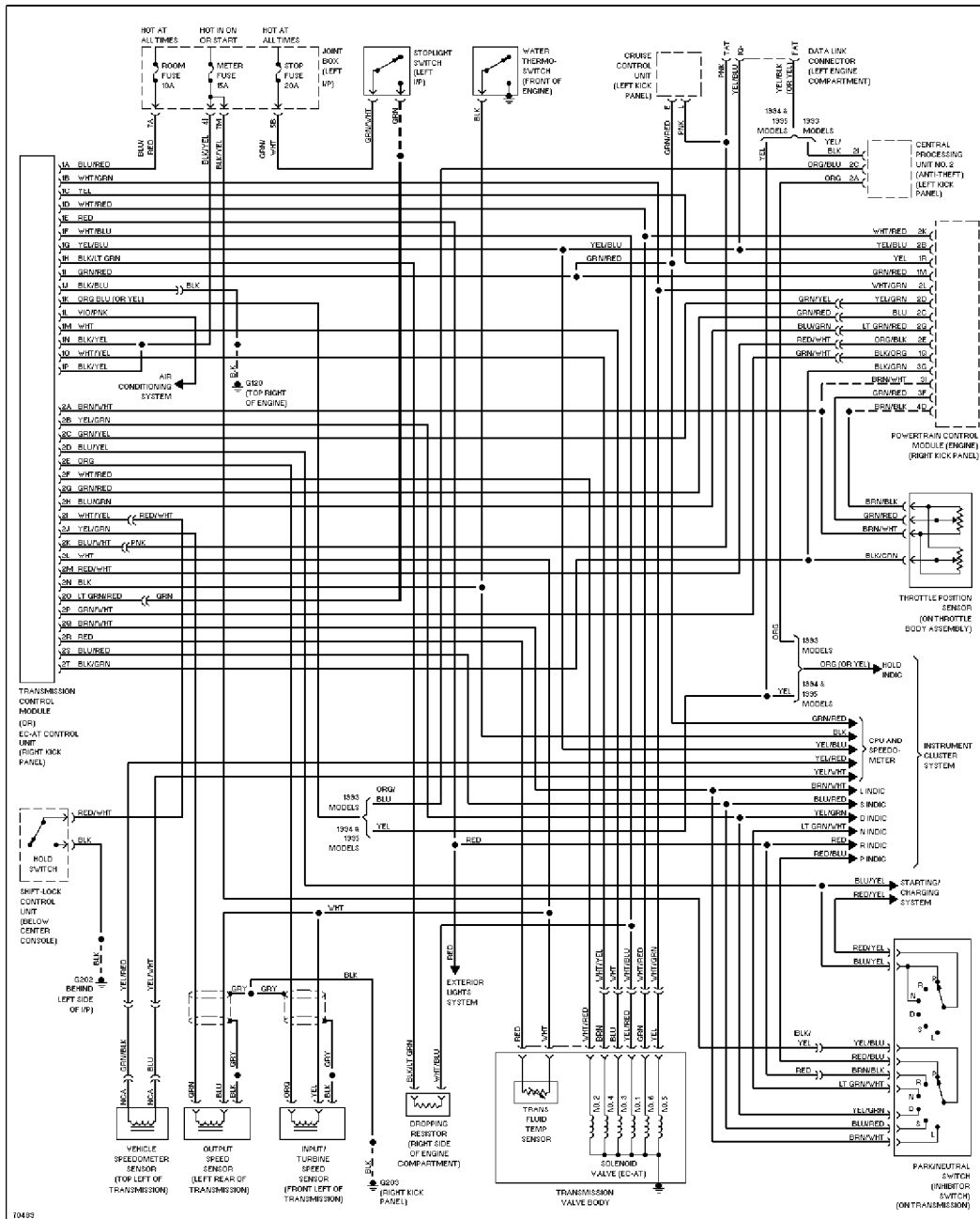Sunday, August 19, 2001 09:17PM

WIRING DIAGRAMS

Fig. 73: RX7 Wiring Diagram

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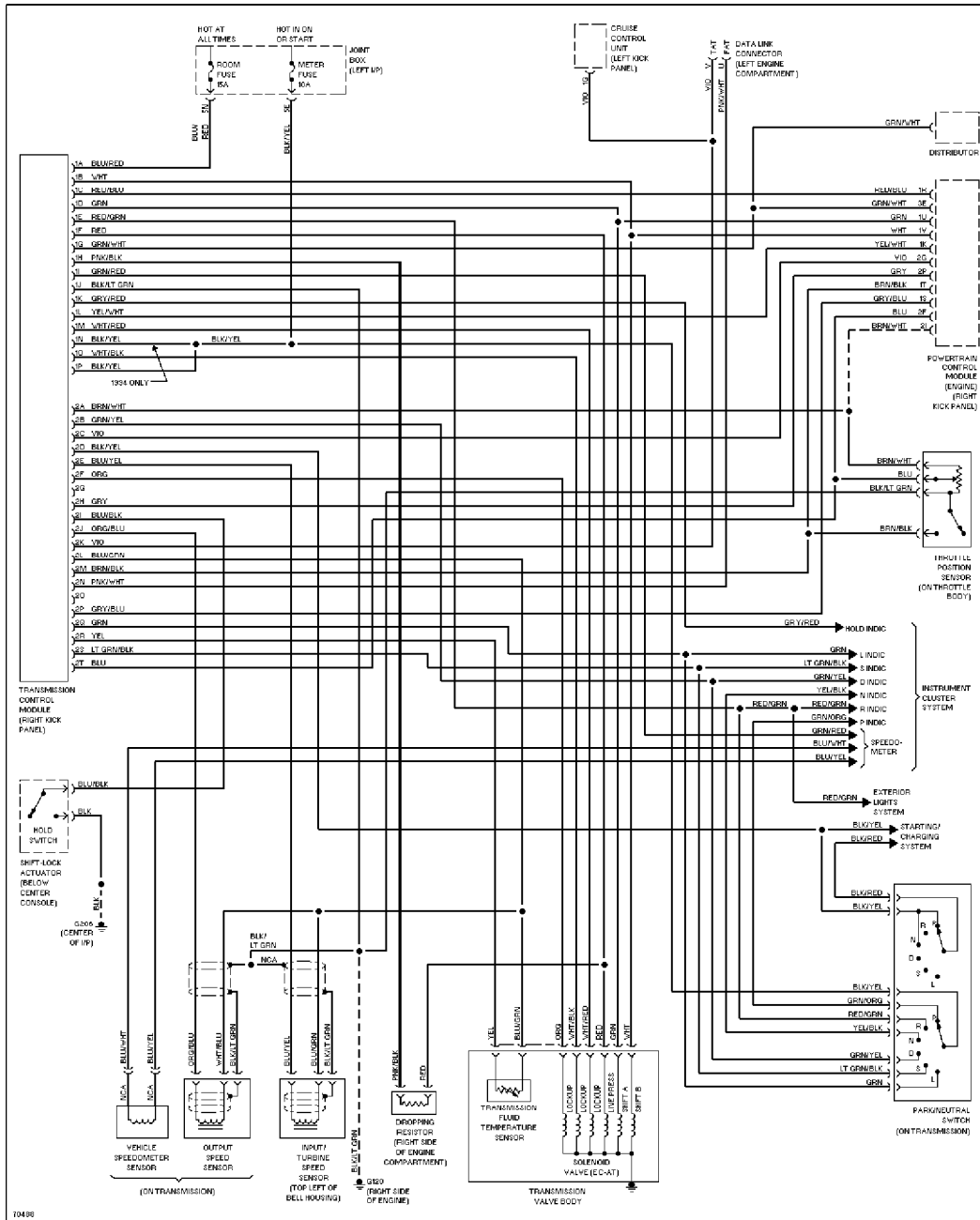Copyright © 1998 Mitchell Repair Information Company, LLC
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Fig. 74: 929 Wiring Diagram

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