

Transaxle/ Transmission

GENERAL	TR-2
AUTOMATIC TRANSAXLE SYSTEM	TR-13
MANUAL TRANSAXLE SYSTEM	TR-83

NOTE : 1. For Automatic Transaxle overhaul,
please refer to the "Overhaul Manual"
(Publication No.: PESE A007A).
2. For Manual Transaxle overhaul,
please refer to the "Overhaul Manual"
(Publication No.: PESE A006A)

GENERAL

EMHA0010

SPECIFICATIONS(M/T)

Model		M5GF1
		Forward 5 speed, reverse 1 speed
Type	First	3.455
Gear ratio	Second	1.947
	Third	1.296
	Fourth	0.943
	Fifth	0.775
	Reverse	3.455
Final gear ratio		3.882

SERVICE STANDARD

EMAA0020

Standard value	mm (in.)
Differential side bearing end play	0.05T-0.10T (0.0019T-0.0039T)
Gear backlash in differential	0.025L-0.150L (0.00095L-0.0057L)
Input front bearing snap ring end play	0.01L-0.12L (0.00038L-0.0045L)
Input rear bearing snap ring end play	0.01L-0.12L (0.00038L-0.0045L)
Output front bearing snap ring end play	0.01L-0.12L (0.00038L-0.0045L)
Output rear bearing snap ring end play	0.01L-0.09L (0.00038L-0.00342L)
5TH input gear snap ring end play	0.01L-0.05L (0.00038L-0.0019L)
3RD output gear snap ring end play	0.01L-0.05L (0.00038L-0.0019L)

TIGHTENING TORQUE

EMHA0030

Item	Nm	Kg.cm	lb.ft
Release bearing sleeve bolt	5-8	50-80	4-6
Clutch housing and bearing cover	38-50	380-500	27-35
Select lever	20-27	200-270	15-20
Oil drain plug	30-35	300-350	22-26
Poppet ball	35-42	350-420	26-31
Clutch housing to transmission case	35-42	350-420	26-31
Speedometer driven gear	4-6	40-60	3-4
Reverse idler bolt	43-55	430-550	32-40
Side cover bolt	10-12	100-120	7-8
Shift control cable bracket	20-27	200-270	15-20
Cylinder and hose assembly	15-22	150-220	11-16
Shift lever bracket	9-14	90-140	7-10
Front roll stopper bracket to subframe bolts	60-80	600-800	43-58
Front roll stopper insulator bolt and nut	50-65	500-650	36-47
Front roll stopper bracket to transaxle bolts	60-80	600-800	43-58
Rear roll stopper bracket to subframe bolts	50-65	500-650	36-47
Rear roll stopper insulator bolt and nut	50-65	500-650	36-47
Rear roll stopper bracket to transaxle bolts	60-80	600-800	43-58
Transaxle mounting sub bracket nut	60-80	600-800	43-58
Transaxle mounting bracket bolts	60-80	600-800	43-58
Transaxle mounting insulator bolt	90-110	900-1100	65-80
Front bearing retainer & detent body cover bolt	15-22	150-220	10-16

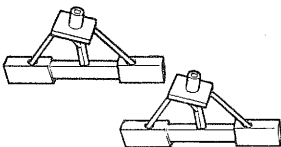
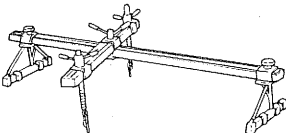
LUBRICATIONS

EMA90040

Item	Recommended lubricant	Quantity
Transaxle gear oil lit (U.S. Imp.qts.)	Hypoid gear oil, SAE 75W/90, API-GL4	2.1 (2.2, 1.8)
Transaxle input shaft spline	CASMOLY L9508	As required
Transaxle oil seal lip	RETINAX AM, MOLYTEX GREASE EP-2	As required
Transaxle case and clutch housing alignment surface	THREE BOND 1216	As required
Transaxle case and rear cover alignment surface	THREE BOND 1216	As required
Bearing retain bolt (flush bolt only)	THREE BOND1303	As required

SPECIAL TOOLS

EMHA0050

Tool(Number and Name)	Illustration	Use
09210-3A000 Engine support fixture adaptor	 EMHA005A	Removal and installation of transaxle assembly (use with 09200-38000)
09200-38001 Engine support fixture	 D0038001	Removal and installation of transaxle assembly

TROUBLESHOOTING

EMA90060

Symptom	Probable cause	Remedy
Vibration, noise	Loose or damaged transaxle and engine mounts Inadequate shaft end play Worn or damaged gears Use of inadequate grade of oil Low oil level Inadequate engine idle speed	Tighten or replace mounts Correct end play Replace gears Replace with specified oil Replenish Adjust idle speed
Oil leakage	Broken or damaged, oil seal or O-ring	Replace oil seal or O-ring
Hard shift	Faulty control cable Poor contact or wear of synchronizer ring and gear cone Weakened synchronizer spring Use of inadequate grade of oil	Replace control cable Correct or replace Replace synchronizer spring Replace with specified oil
Jumps out of gear	Worn gear shift fork or broken poppet spring Synchronizer hub to sleeve spline clearance too large	Replace shift fork or poppet spring Replace synchronizer hub and sleeve

SPECIFICATIONS(A/T)

EKHA0010

Item	F4A42-2	F4A51-2
Torque converter type	3-element, 1-stage, 2-phase type	
Transission type	4-speed forward, 1-speed reverse	
Engine displacement	2.0D	2.7D
Gear ratio		
1st	2.842	2.842
2nd	1.529	1.495
3rd	1.000	1.000
4th	0.712	0.731
Reverse	2.480	2.720
Final gear ratio	4.407	4.018

SERVICE SPECIFICATIONS

EKHA0020

Items	Standard value
Output shaft preload	0.01-0.09 mm
Brake reaction plate end play	0-0.16 mm
Low-reverse brake end play	1.35-1.81 mm
Second brake end play	0.79-1.25 mm
Underdrive sun gear end play	0.25-0.45 mm
Input shaft end play mm	0.70-1.45 mm
Differential case preload	0.045-0.105 mm
Underdrive clutch end play	1.65-1.85 mm
Reverse and overdrive clutch return spring end play	0-0.09 mm
Overdrive clutch end play	1.6-1.8 mm
Reverse-clutch end play	1.5-1.7 mm
Backlash between differential side gear and pinion	0.025-0.150 mm

TIGHTENING TORQUE

EKA90030

Item	Nm	kg-cm	lb-ft
Wiring harness bracket	20-26	200-260	14-18
Control cable bracket bolt	20-26	200-260	14-18
Fluid temperature sensor	27-33	270-330	19-23
Eye bolt	10-12	100-120	7-8
Oil cooler feed tube	11-13	110-130	8-9
Oil filter	10-12	100-120	7-8
Input shaft speed sensor	10-12	100-120	7-8
Output shaft speed sensor	18-25	180-250	13-18
Manual control lever	10-12	100-120	7-8
Transaxle range switch	4-6	40-60	3-4
Speedometer gear	8-10	80-100	6-7
Valve body cover	10-12	100-120	7-8
Valve body mounting bolt	10-12	100-120	7-8
Manual control shaft detent	5-7	50-70	4-5
Rear cover	20-26	200-260	14-18
Torque converter housing	42-54	420-540	29-38
Oil pump	20-26	200-260	14-18
Transfer drive gear	6-22	160-220	11-15
Output shaft lock nut	160-180	1600-1800	110-126
Output shaft bearing retainer	20-26	200-260	14-18
Oil filler plug	29-34	290-340	20-24
Oil drain plug	29-34	290-340	20-24
Transfer drive gear lock nut	180-210	1800-2100	126-147
Differential drive gear to subframe bolts	130-140	1300-1400	91-98
Valve body	10-12	100-120	7-8
Solenoid valve support	5-7	50-70	4-5
Plate	5-7	50-70	4-5
Pressure check plug	8-10	80-100	6-7
Front roll stopper bracket to subframe bolts	60-80	600-800	43-58
Front roll stopper insulator bolt and nut	50-65	500-650	36-47
Front roll stopper bracket to transaxle bolts	60-80	600-800	43-58
Rear roll stopper bracket	50-65	500-650	36-47
Rear roll stopper insulator bolt and nut	50-60	500-650	36-47
Rear roll stopper bracket to transaxle bolts	60-80	600-800	43-58

Item	Nm	kg·cm	lb·ft
Transaxle mounting sub bracket nut	60-80	600-800	43-58
Transaxle mounting bracket bolts	60-80	600-800	43-58
Transaxle mounting insulator bolt	90-110	900-1100	65-80

EKHA0040

LUBRICATIONS

Items	Specified lubricant	Quantity
Transaxle fluid lit. (U.S. qts., Imp,qts.)	GENUINE DIAMOND ATF SP-II M	7.8 (8.2,6.9) ; 2.0D 8.5 (8.9,7.5) ; 2.7D

SEALANTS

Items	Specified sealant
Rear cover	Hyundai genine sealant TB1281B or equivalent
Torque converter housing	Hyundai genine sealant TB1281B or equivalent
Valve body cover	Hyundai genine sealant TB1281B or equivalent

SNAP RING FOR ADJUSTMENT AND SPACER

EKA90050

Part name	Thickness mm	Identification Symbol
Thrust washer (For adjustment of input shaft end play)	1.8	18
	2.0	20
	2.2	22
	2.4	24
	2.6	26
	2.8	28

Part name	Thickness mm	Identification Symbol
Snap ring (For adjustment of underdrive clutch and overdrive clutch end plays)	1.6	None
	1.7	Blue
	1.8	Brown
	1.9	None
	2.0	Blue
	2.1	Brown
	2.2	None
	2.3	Blue
	2.4	Brown
	2.5	None
	2.6	Blue
	2.7	Brown
	2.8	None
	2.9	Blue
	3.0	Brown
Snap ring (For adjustment of low-reverse brake and second brake reaction plates end plays)	2.2	Blue
	2.3	Brown
	2.4	None
	2.5	Blue
Pressure plate (For adjustment of low-reverse brake and second brake end plays)	1.6	6
	1.8	1
	2.0	0
	2.2	2
	2.4	4
	2.6	6
	2.8	8
	3.0	D

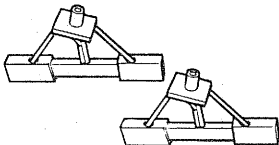
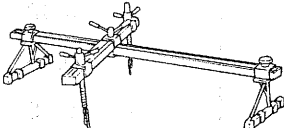
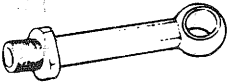
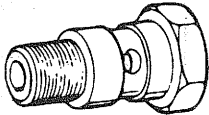
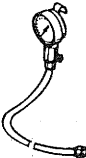
Part name	Thickness mm	Identification Symbol
Snap ring (For adjustment of reverse clutch end play)	1.9	None
	2.0	Blue
	2.1	Brown
	2.2	None
	2.3	Blue
	2.4	Brown
	2.5	None
	2.6	Blue
	2.7	Brown
Snap ring (For adjustment of reverse clutch and overdrive clutch spring retainers end plays)	2.8	None
	1.48	Brown
	1.53	None
	1.58	Blue
Thrust race (For adjustment of underdrive sun gear end play)	1.63	Brown
	1.6	-
	1.7	-
	1.8	-
	1.9	-
	2.0	-
	2.1	-
	2.2	-
	2.3	-
	2.4	-
	2.5	-
	2.6	-

Part name	Thickness mm	Identification Symbol
Spacer (For adjustment of output shaft preload)	1.88	88
	1.92	92
	1.96	96
	2.00	00
	2.04	04
	2.08	08
	2.12	12
	2.16	16
	2.20	20
	2.24	24
	2.28	28
	2.32	32
	2.36	36
	2.40	40
	2.44	44
	2.48	48
	2.52	52
	2.56	56
	2.60	60
	2.64	64
	2.68	68
	2.72	72
	2.76	76

Part name	Thickness mm	Identification Symbol
Spacer (For adjustment of differential case preload)	0.71	71
	0.74	74
	0.77	77
	0.80	80
	0.83	83
	0.86	86
	0.89	89
	0.92	92
	0.95	95
	0.98	98
	1.01	01
	1.04	04
	1.07	07
	1.10	J
	1.13	D
	1.16	K
	1.19	L
	1.22	G
	1.25	M
	1.28	N
	1.31	E
	1.34	O
	1.37	P
Spacer (For adjustment of backlash between differential side gear and pinion)	0.75 - 0.82	-
	0.83 - 0.92	-
	0.93 - 1.00	-
	1.01 - 1.08	-
	1.09 - 1.16	-

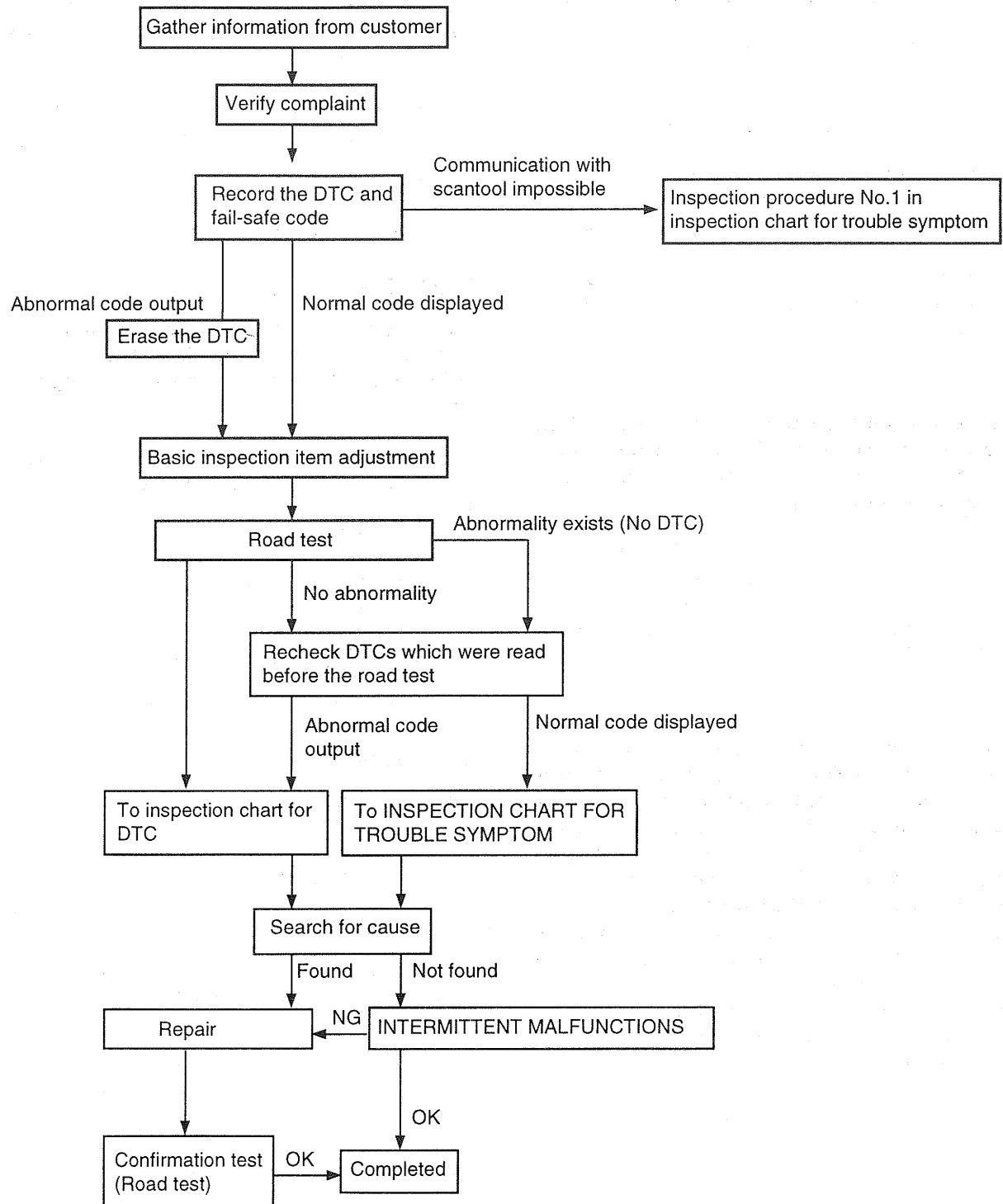
SPECIAL TOOLS

EKHA0060

Tool (Number and name)	Illustration	Use
09210-3A000 Engine support fixture adaptor	 EMHA005A	Removal and installation of transaxle (use with 09200-38000)
09200-38001 Engine support fixture	 D0038001	Removal and installation of transaxle.
09452-21001 Oil pressure gauge adapter	 EKAA006A	Measurement of the oil pressure. (use with 09452-21500 and 09452-21002)
09452-21002 Oil pressure gauge adapter	 EKAA006B	Measurement of the oil pressure. (use with 09452-21500 and 09452-21001)
09452-21500 Oil pressure gauge	 EKAA006C	Measurement of the oil pressure. (use with 09452-21002 and 09452-21002)

AUTOMATIC TRANSAXLE SYSTEM

TROUBLESHOOTING (A/T) EKA90070



BASIC INSPECTION ITEM**ADJUSTMENT** EKHA0080**AUTOMATIC TRANSMISSION FLUID CHECK**

1. Drive the vehicle until the fluid temperature rises to the normal temperature (70-80°C).
2. Park the vehicle on a levelled surface.
3. Move the selector lever through all positions to fill the torque converter and the hydraulic circuits with fluid, and then move the selector lever to the N position.
4. After wiping off any dirt around the oil level gauge, remove the oil level gauge and check the condition of the fluid.

NOTE

If the fluid smells as if it is burning, it means that the fluid has been contaminated by fine particles from the bushes and friction materials. A transmission overhaul may be necessary.

5. Check that the fluid level is at the HOT mark on the oil level gauge. If the fluid level is lower than this, pour in more fluid until the level reaches the HOT mark. Automatic transmission fluid : GENUINE HYUNDAI ATF SP-II M.

NOTE

If the fluid level is low, the oil pump will draw in air along with the fluid, which will cause bubbles to form inside the hydraulic circuit. This will in turn cause the hydraulic pressure to drop, which will result in late shifting and slipping of the clutches and brakes. If there is too much fluid, the gears can churn it up into foam and cause the same conditions that can occur with low fluid levels. In either case, air bubbles can cause overheating and oxidation of the fluid which can interfere with normal valve, clutch, and brake operation. Foaming can also result in fluid escaping from the transmission vent, in which case it may be mistaken for a leak.

6. Insert the oil level gauge securely.
7. The fluid and the oil filters should always be replaced when overhauling the transmission or after the vehicle has been driven under severe conditions. The replacement procedures are given below. Furthermore, the oil filters are special filters which are only to be used for the automatic transmission.

AUTOMATIC TRANSMISSION FLUID**REPLACEMENT**

If you have a fluid changer, use this changer to replace the fluid. If you do not have a fluid changer, replace the fluid by the following procedure.

1. Disconnect the hose which connects the transmission and the oil cooler (inside the radiator).
2. Start the engine and let the fluid drain out.

Running conditions : N range with engine idling.

CAUTION

The engine should be stopped within one minute after it is started. If the fluid has all drained out before then, the engine should be stopped at that point.

3. Remove the drain plug from the bottom of the transmission case to drain the fluid.
4. Replace the oil filters.
5. Install the drain plug via the gasket, and tighten it the specified torque.

Tightening torque : 32 Nm

6. Pour the new fluid in through the oil filler tube.

CAUTION

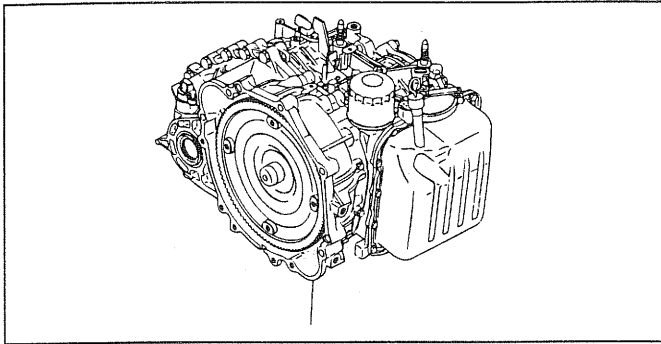
Stop pouring if the full volume of fluid cannot be poured in.

7. Repeat the procedure in step (2).

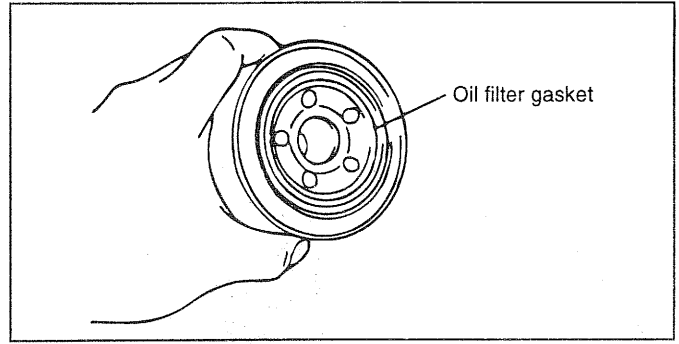
NOTE

Check the old fluid for contamination. If it has been contaminated, repeat the steps (6) and (7).

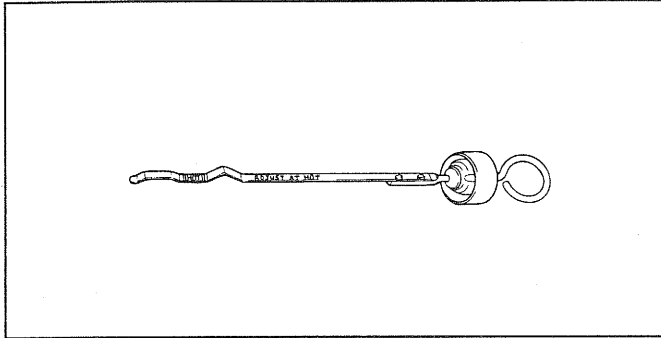
8. Pour the new fluid in through the oil filler tube.
9. Reconnect the hose which was disconnected in step (1) above, and firmly replace the oil level gauge.
10. Start the engine and run it at idle for 1-2 minutes.
11. Move the select lever through all positions, and then move it to the N position.
12. Drive the vehicle until the fluid temperature rises to the normal temperature (70-80°C), and then check the fluid level again. The fluid level must be at the HOT Mark.
13. Firmly insert the oil level gauge into the oil filler tube.



EKA9009E



EKA9001A



EKA9059A

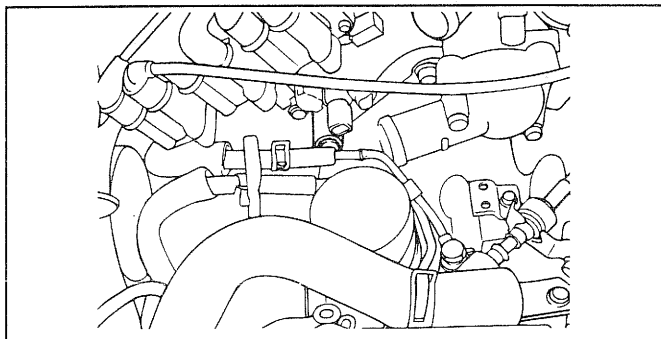
OIL FILTER REPLACEMENT

1. Remove the automatic transmission oil filter by filter wrench (chain, etc.) if available, after removing air cleaner assembly.
2. After removing, clean away automatic transaxle fluid, mud etc. adhered around the transaxle by cloth gloves or rags.
3. Clean the filter bracket side mounting surface.
4. Apply a small amount of automatic transmission fluid to the O-ring of the new oil filter.
5. Install the automatic transmission oil filter.

NOTE

Tightening torque : 11-13 Nm

6. Check the quantity of the automatic transmission fluid.

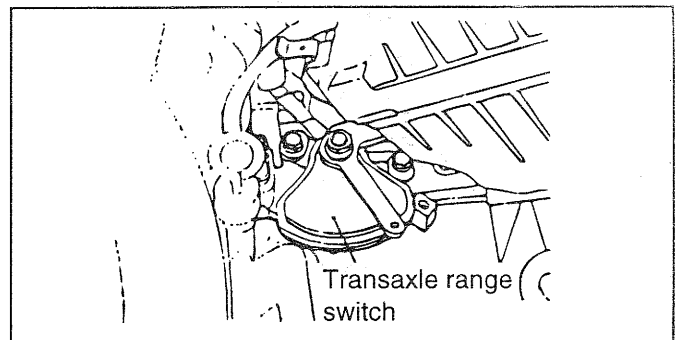


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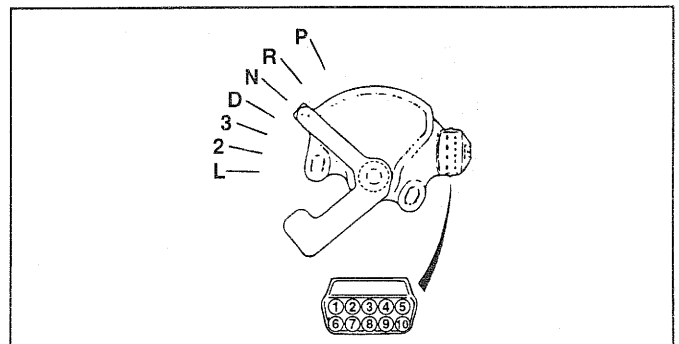
TRANSAXLE RANGE SWITCH CONTINUITY CHECK

Items	Terminal No.									
	6	5	4	3	2	1	10	9	8	7
P				○			○	○	○	
R									○	○
N			○				○	○	○	
D						○			○	
3		○							○	
2					○				○	
L	○								○	

EKAA008A



EKA9002A

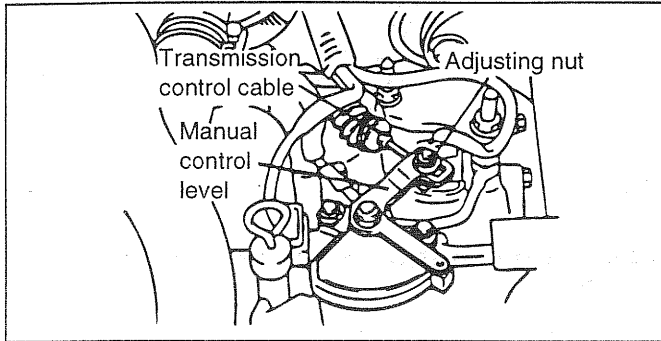


EKA9002B

TRANSAXLE RANGE SWITCH AND CONTROL CABLE ADJUSTMENT

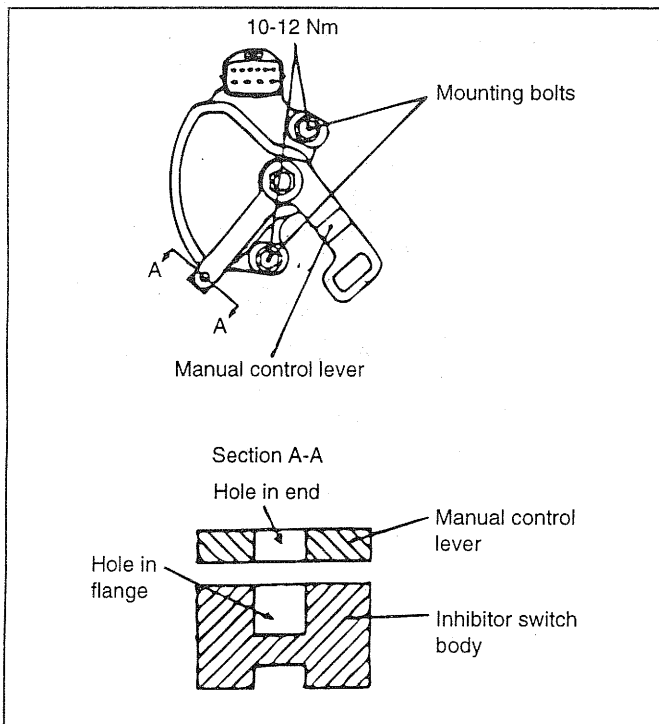
1. Set the selector lever to the "N" position.

2. Loosen the control cable to manual control lever coupling nut to free the cable and lever.
3. Set the manual control lever to the neutral position.



EKA9002C

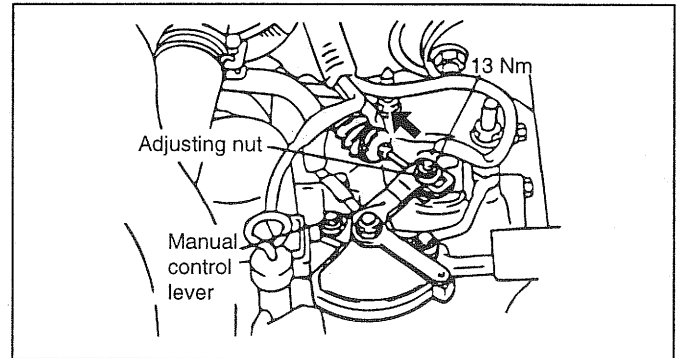
4. Loosen the transaxle range switch body mounting bolts and then turn the transaxle range switch body so the hole in the end of the manual control lever and the hole (cross section A-A in the figure) in the flange of the transaxle range switch body flange are aligned.
5. Tighten the transaxle range switch body mounting bolts to the specified torque. Be careful at this time that the position of the switch body is not changed.



EKA9003A

6. Gently pull the transmission control cable in the direction of the arrow, and then tighten the adjusting nut.
7. Check that the selector lever is in the "N" position.

8. Check that each range on the transmission side operates and functions correctly for each position of the selector lever.



EKA9003B

A/T CONTROL COMPONENT CHECK

1. THROTTLE POSITION SENSOR CHECK.

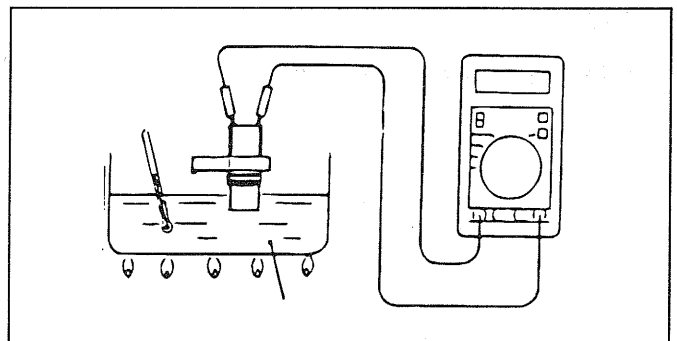
The TP Sensor is a variable resistor type that rotates with the throttle body shaft to sense the throttle valve angle. As the throttle shaft rotates, the output voltage of the TP Sensor changes. The ECM detects the throttle valve opening based on voltage change. (Refer to FL-section).

2. OIL TEMPERATURE SENSOR CHECK

- a. Remove the oil temperature sensor.
- b. Measure the resistance between terminals No.1 and No.2 of the oil temperature sensor connector.

Standard value :

Oil temperature (°C)	Resistance (KΩ)
0	16.7-20.5
100	0.57-0.69

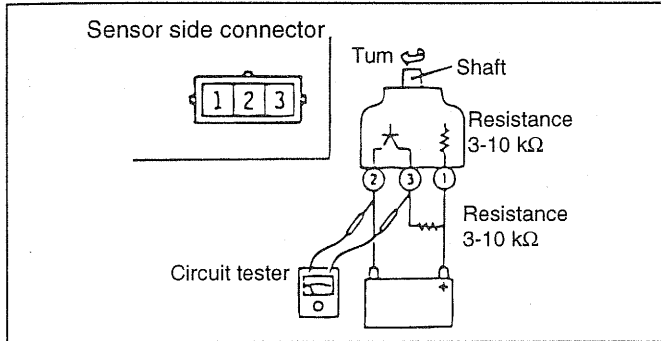


EKA9004A

3. VEHICLE SPEED SENSOR CHECK

- a. Remove the vehicle speed sensor and connect a 3-10 KΩ resistance as shown in the illustration.

- b. Turn the shaft of the vehicle speed sensor and check that there is voltage between terminals 2-3 (1 turn=4 pulses).

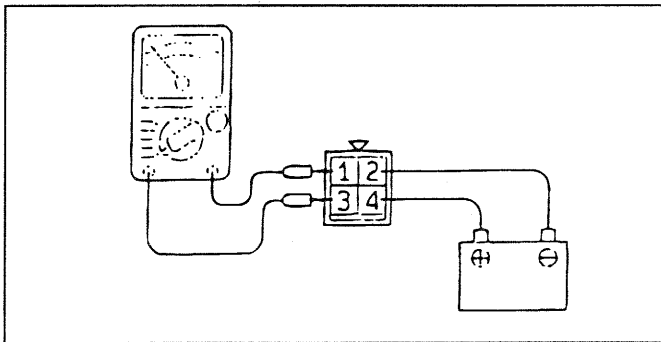


EKA9004B

4. A/T CONTROL RELAY CHECK

- a. Remove the A/T control relay.
- b. Use jumper wires to connect A/T control relay terminal (2) to the battery (-) terminal and terminal (4) to the battery (+) terminal.
- c. Check the continuity between terminal (1) and terminal (3) of the A/T control relay when the jumper wires are connected to and disconnected from the battery.
- d. If there is a problem, replace the A/T control relay.

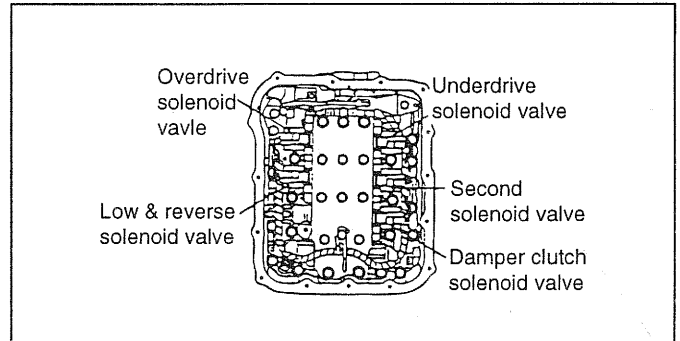
Jumper wire	Continuity between terminal No.1
Connected	Continuity
Disconnected	No continuity



EKA9005B

5. SOLENOID VALVE CHECK

- a. Remove the valve body cover.
- b. Disconnect the connectors of each solenoid valve.

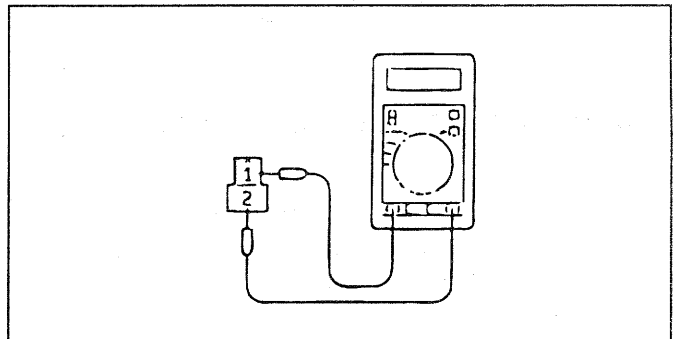


EKA9005C

- c. Measure the resistance between terminals 1 and 2 of each solenoid valve.

Standard value :

Name	Resistance
Damper clutch solenoid valve	2.7-3.4 Ω (at 20°C)
Low and reverse solenoid valve	
Second solenoid valve	
Underdrive solenoid valve	
Overdrive solenoid valve	



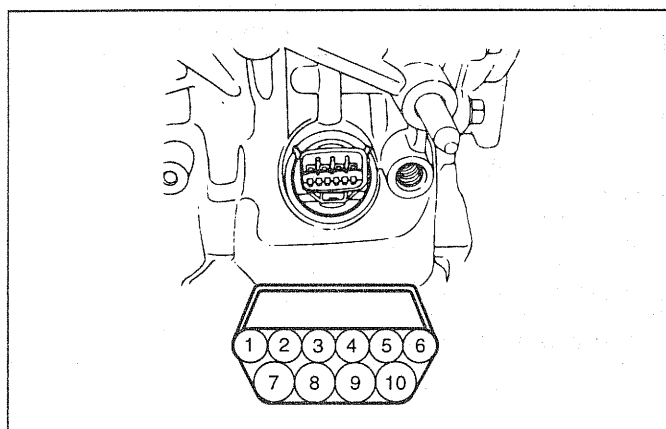
EKA9005D

- d. If the resistance is outside the standard value, replace the solenoid valve.

NOTE

Resistance of the solenoid valve connector.

Terminal No.	Name	Resistance
7 & 10	Damper clutch solenoid valve	2.7-3.4 Ω (at 20°C)
10 & 6	Low and reverse solenoid valve	
9 & 4	Second solenoid valve	
9 & 3	Underdrive solenoid valve	
9 & 5	Overdrive solenoid valve	



EKA9017B

TORQUE CONVERTER STALL TEST

This test measures the maximum engine speed when the selector lever is at the D or R position. The torque converter stalls to test the operation of the torque converter, starter motor, one-way clutch operation, the holding performance of the clutches, and brakes in the transmission.

CAUTION

Do not let anybody stand in front of or behind the vehicle while this test is being carried out.

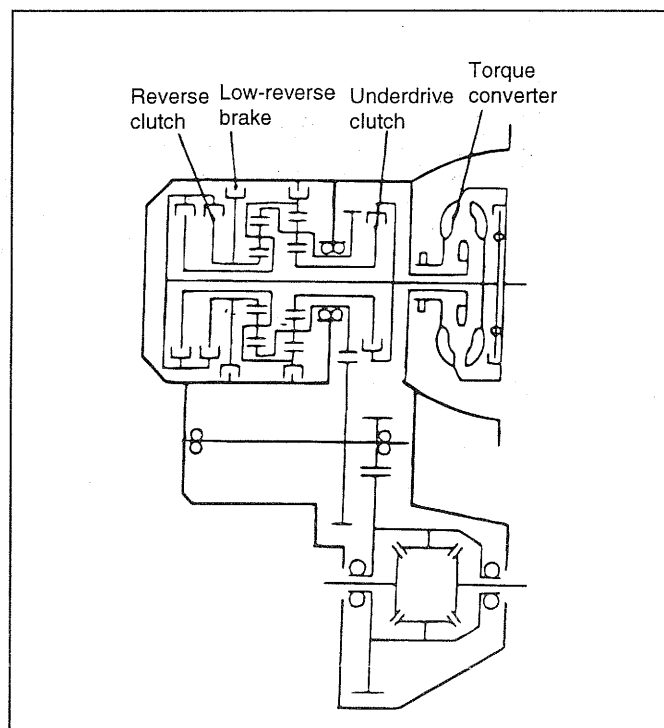
- Check the automatic transmission fluid level and temperature and the engine coolant temperature.
 - Fluid level : At the HOT mark on the oil level gauge
 - Fluid temperature : 80-100°C
 - Engine coolant temperature : 80-100°C
- Check both rear wheels (left and right).
- Pull the parking brake lever on with the brake pedal fully depressed.
- Start the engine.
- Move the selector lever to the D position, fully depress the accelerator pedal and take a reading of the maximum engine speed at this time.

CAUTION

- The throttle should not be left fully open for any more than eight seconds.
- If carrying out the stall test two or more times, move the selector lever to the N position and run the engine at 1,000 r/min to let the automatic transmission fluid cool down before carrying out subsequent tests.
Standard value
Stall speed : 2,000–2,900 r/min
- Move the selector lever to the R position and carry out the same test again.
Standard value Stall speed : 2,000–2,900 r/min

TORQUE CONVERTER STALL TEST JUDGEMENT RESULTS

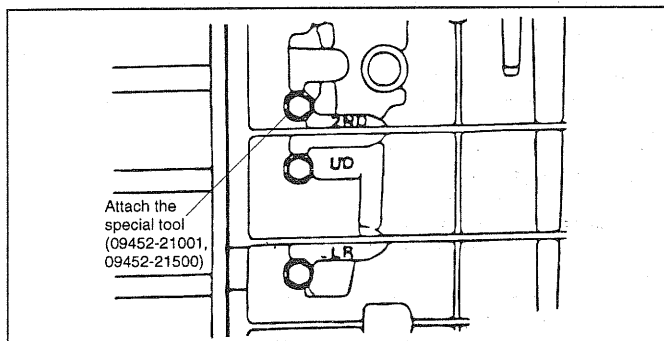
- Stall speed is too high in both D and R ranges
 - Low line pressure
 - Low & reverse brake Slippage
- Stall speed is too high in D range only
 - Underdrive clutch slippage
- Stall speed is too high in R range only
 - Reverse clutch slippage
- Stall speed too low in both D and R ranges
 - Malfunction of torque converter
 - Insufficient engine output



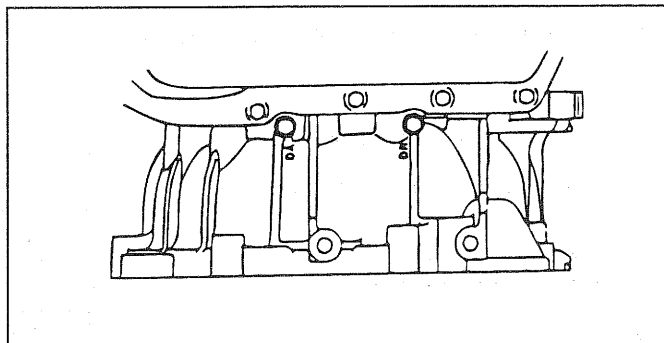
EKA9006A

HYDRAULIC PRESSURE TEST

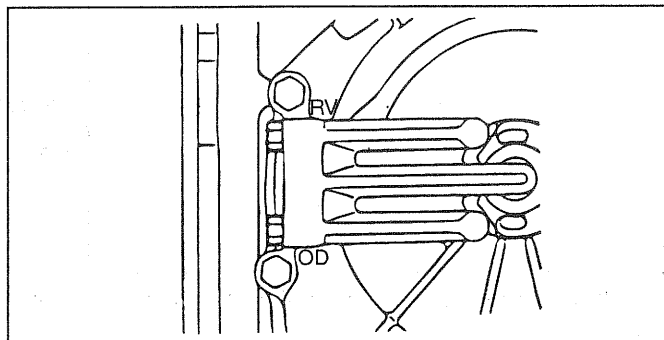
1. Warm up the engine until the automatic transmission fluid temperature is 80-100°C.
2. Jack up the vehicle so that the wheels are free to turn.
3. Connect the special tools (oil pressure gauge) to each pressure discharge port.
4. Measure the hydraulic pressure at each port under the conditions given in the standard hydraulic pressure table, and check that the measured values are within the standard value ranges.
5. If a value is outside the standard range, correct the problem while referring to the hydraulic pressure test diagnosis table.



EKA9007A



EKA9007B



EKA9007C

STANDARD HYDRAULIC PRESSURE TEST

Measurement condition			Standard hydraulic pressure kPa						
Selector lever position	Shift position	Engine speed (rpm)	Under drive clutch pressure(UD)	Reverse clutch pressure(REV)	Over-drive clutch pressure(OD)	Low and reverse brake pressure(LR)	Second brake pressure(2ND)	Damper clutch apply pressure(DA)	Damper clutch release pressure(DR)
P	-	2,500	-	-	-	310-390	-	-	-
R	Reverse	2,500	-	1,270-1,770	-	1,270-1,770	-	-	-
N	Neutral	-	-	-	-	310-390	-	-	-
D	1st gear	2,500	1,010-1,050	-	-	1,010-1,050	-	-	-
	2nd gear	2,500	-	-	-	-	1,010-1,050	-	-
	3rd gear	2,500	-	-	-	-	-	More than 7.5	0-0.1
	4th gear	2,500	-	-	-	-	590-690	More than 7.5	0-0.1

HYDRAULIC PRESSURE TEST DIAGNOSIS TABLE

Trouble symptom	Probable cause
All hydraulic pressures are high	Incorrect transmission control cable adjustment
	Malfunction of the regulator valve
All hydraulic pressures are low	Incorrect transmission control cable adjustment
	Malfunction of the oil pump
	Clogged internal oil filter
	Clogged external oil filter
	Clogged oil cooler
	Malfunction of the regulator valve
	Malfunction of the relief valve
	Incorrect valve body installation
Hydraulic pressure is abnormal in "R" range only	Malfunction of the regulator valve
	Clogged orifice
	Incorrect valve body installation
Hydraulic pressure is abnormal in "3" or "4" range only	Malfunction of the regulator valve
	Clogged orifice
	Incorrect valve body installation
	Malfunction of the overdrive solenoid valve
	Malfunction of the overdrive pressure control valve
	Malfunction of the regulator valve
	Malfunction of the switch valve
	Clogged orifice
Only underdrive hydraulic pressure is abnormal	Incorrect valve body installation
	Malfunction of the oil seal K
	Malfunction of the oil seal L
	Malfunction of the oil seal M
	Malfunction of the underdrive solenoid valve
	Malfunction of the underdrive pressure control valve
	Malfunction of check ball
	Clogged orifice
Only reverse clutch hydraulic pressure is abnormal	Incorrect valve body installation
	Malfunction of the oil seal A
	Malfunction of the oil seal B
	Malfunction of the oil seal C
	Clogged orifice
	Incorrect valve body installation

Trouble symptom	Probable cause
Only overdrive hydraulic pressure is abnormal	Malfunction of the oil seal D
	Malfunction of the oil seal E
	Malfunction of the oil seal F
	Malfunction of the overdrive solenoid valve
	Malfunction of the overdrive pressure control valve
	Malfunction check ball
	Clogged orifice
	Incorrect valve body installation
Only low and reverse hydraulic pressure is abnormal	Malfunction of the oil seal I
	Malfunction of the oil seal J
	Malfunction of the low and reverse solenoid valve
	Malfunction of the low and reverse pressure control valve
	Malfunction of the switch valve
	Malfunction of the fail safe valve A
	Malfunction of check ball
	Clogged orifice
Only second hydraulic pressure is abnormal	Malfunction of the oil seal G
	Malfunction of the oil seal H
	Malfunction of the oil seal O
	Malfunction of the second solenoid valve
	Malfunction of the second pressure control valve
	Malfunction of the fail safe valve B
	Clogged orifice
	Incorrect valve body installation
Only reverse clutch hydraulic pressure is abnormal	Malfunction of the oil cooler
	Malfunction of the oil seal N
	Malfunction of the damper clutch control solenoid valve
	Malfunction of the damper clutch control valve
	Malfunction of the torque converter pressure control valve
	Clogged orifice
Pressure applied to non operating element	Incorrect valve body installation
	Incorrect transmission control cable adjustment
	Malfunction of the manual valve
	Malfunction of check ball
	Incorrect valve body installation

DIAGNOSIS FUNCTION

EKAA0090

1. Connect HI-SCAN to the connector for diagnosis.
2. Read the output diagnostic trouble codes. Then follow the remedy procedures according to the "DIAGNOSTIC TROUBLE CODE DESCRIPTION" on the following page.

NOTE

- A maximum of 8 diagnostic trouble codes (in the sequence of occurrence) can be stored in the Random Access Memory (RAM) incorporated within the control module.
 - The same diagnostic trouble code can be stored at one time.
 - If the number of stored diagnostic trouble codes or diagnostic trouble patterns exceeds 8, already stored diagnostic trouble codes will be erased in sequence, beginning with the oldest.
 - Do not disconnect the battery until all diagnostic trouble codes or diagnostic trouble patterns have been read out, because all stored diagnostic trouble codes or diagnostic trouble patterns will be cancelled when the battery is disconnected.
3. If the fail-safe system is activated and the transaxle is locked in third gear, the diagnostic trouble code in the Fail-safe code description will be stored in the RAM. Three of these diagnostic trouble codes can be stored.
 4. The cancelation will occur if, with the transaxle locked in third gear, the ignition key is turned to the OFF position, but the diagnostic trouble code is stored in the RAM.

5. Memorization.

- Up to 8 diagnosis items and 3 fail-safe items can be memorized.
- If the memory capacity is exceeded, diagnosis and fail-safe items in the memory are overwritten, starting with the oldest.
- No code can be memorized more than once.

6. Diagnosis Code Deletion.

1) Automatic Deletion

All diagnosis codes are deleted from memory the 200 th time the ATF temperature reaches 50°C after memorization of the most recent diagnosis code.

2) Forced Deletion.

Memorized diagnosis codes can be deleted using the SCAN-TOOL provided the following conditions are satisfied :

- The ignition switch is ON
- There is no detection pulse from the crank angle sensor
- There is no detection pulse from the output shaft speed sensor
- There is no detection pulse from the vehicle speed sensor
- The fail-safe function is not operational

EKHA0100

ROAD TEST

No	Condition	Operation	Judgement : Value	Check item
1	Ignition switch : OFF	Ignition switch 1. ON	Battery voltage (mV)	Control relay
2	Ignition switch : ON Engine : Stopped Select lever position : P	Selector lever position 1. P, (2) R, 2. N, (4) D 3. 3, (6) 2, (7) L	(1) P, (2) R, (3) N, (4) D, (5) 3, (6) 2 (7) L	Transaxle range switch
		Accelerator pedal 1. Released 2. Half depressed 3. Depressed	1. 400-1,000 mV 2. Gradually rises from (1) 3. 4,500-5,000 mV	Throttle position sensor
		Brake pedal • Depressed • Released		Stop lamp switch

No	Condition	Operation	Judgement : Value	Check item
3	Ignition switch : ST Engine : Stopped	Starting test with lever P or N range	Starting should be possible	Starting possible or impossible
4	Warming up	Drive for 15 minutes or more so that the automatic fluid temperature becomes 70-90°C	Gradually rises to 70-90°C	Oil temperature sensor
5	Engine : Idling Selector lever position : N	A/C switch 1. ON 2. OFF	1. ON 2. OFF	Dual pressure switch
		Accelerator pedal 1. Released 2. Half depressed	1. ON 2. OFF	Idle position
			1. 650-900 rpm 2. Gradually rises from (1)	
			1. Data changes	Communication with engine-ECU
		Selector lever position 1. N → D 2. N → R	Should be no abnormal shifting shocks Time lag should be within 2 seconds	Malfunction when starting Malfunction when starting
6	Selector lever position : N (Carry out on a flat and straight road)	Selector lever position and vehicle speed 1. Idling in L range (Vehicle stopped) 2. Driving at constant speed of 20 km/h L position 3. Driving at constant speed of 30 km/h in 2 position 4. Driving at 50 km/h in 3 position with accelerator fully closed 5. Driving at constant speed of 50 km/h in D position (Each condition) 6. Should be maintained for 10 seconds or more)	(2) 1st, (4) 3rd, (3) 2nd, (6) 4th	Shift condition
			(2) 0%, (4) 100%, (3) 100%, (6) 100%	Low and reverse solenoid valve
			(2) 0%, (4) 0%, (3) 0%, (6) 100%	Underdrive solenoid valve
			(2)100%, (4)0%, (3) 100%, (6) 0%	Second solenoid valve
			(2) 100%, (3) 100%, (4)0%, (6) 0%	Overdrive solenoid valve
			(1) 0 km/h (4) 50 km/h	Vehicle speed sensor
			(4) 1,800-2,100 rpm	Input shaft speed sensor
			(4) 1,800-2,100 rpm	Output shaft speed sensor
7	Selector lever position : 3 (Carry out on a flat and straight road)	Selector lever position and vehicle speed 1. Releasing the accelerator pedal fully while driving at 50 km/h in 3rd gear 2. Driving at constant speed of 50 km/h in 3rd gear	(3) 0% (5) Approx. 70-90%	Damper clutch control solenoid valve
			(3) Approx. 100-300 rpm (5) Approx. 0-10 rpm	

No	Condition	Operation	Judgement : Value	Check item
8	Selector lever position : D (Carry out on a flat and straight road)	1. Accelerator to 4th gear at a throttle position sensor output of 1.5V (accelerator opening angle of 30 %). 2. Gently decelerate to a standstill 3. Accelerate to 4th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%). 4. While driving at 60 km/h in 4th gear, shift down to 3 range. 5. While driving at 40 km/h in 3rd gear, shift down to 2 range. 6. While driving at 20 km/h in 2nd gear, shift down to L range.	For (1),(2), and (3), the reading should be the same as the specified output shaft torque, and no abnormal shocks should occur. For (4),(5), and (6), downshifting should occur immediately after the shifting operation is made.	Malfunction when shifting
				Displaced shift points
8	Selector lever position : D (Carry out on a flat and straight road)	1. Accelerator to 4th gear at a throttle position sensor output of 1.5V (accelerator opening angle of 30 %). 2. Gently decelerate to a standstill 3. Accelerate to 4th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%). 4. While driving at 60 km/h in 4th gear, shift down to 3 range. 5. While driving at 40 km/h in 3rd gear, shift down to 2 range. 6. While driving at 20 km/h in 2nd gear, shift down to L range.	For (1),(2), and (3), the reading should be the same as the specified output shaft torque, and no abnormal shocks should occur. For (4),(5), and (6), downshifting should occur immediately after the shifting operation is made.	Does not shift
				Does not shift from 1 to 2 or 2 to 1
8	Selector lever position : D (Carry out on a flat and straight road)	1. Accelerator to 4th gear at a throttle position sensor output of 1.5V (accelerator opening angle of 30 %). 2. Gently decelerate to a standstill 3. Accelerate to 4th gear at a throttle position sensor output of 2.5 V (accelerator opening angle of 50%). 4. While driving at 60 km/h in 4th gear, shift down to 3 range. 5. While driving at 40 km/h in 3rd gear, shift down to 2 range. 6. While driving at 20 km/h in 2nd gear, shift down to L range.	For (1),(2), and (3), the reading should be the same as the specified output shaft torque, and no abnormal shocks should occur. For (4),(5), and (6), downshifting should occur immediately after the shifting operation is made.	Does not shift from 2 to 3 or 3 to 2
				Does not shift from 3 to 4 or 4 to 3

No	Condition	Operation	Judgement : Value	Check item
9	Selector lever position : N (Carry out on a flat and straight road).	Move selector lever to R range drive at constant speed of 10 km/h	The ratio between input and output speed sensor data should be the same as the gear ratio when reversing.	Does not shift

DIAGNOSTIC TROUBLE CODE DESCRIPTION

EKA90110

DTC No	Diagnosis item		Probable cause
P1704	Throttle position sensor	Short circuit	TPS output > 4.8 V with engine idling
P1703		Open circuit	TPS output < 0.2V with engine not idling
P1702		Sensor Maladjustment	TPS output < 0.2V or > 1.2V with engine idling
P0713	Fluid temperature sensor	Open circuit	Oil temperature sensor output > 4.57 V for 1 second or longer (oil temperature does not increase)
P0712		Short circuit	Output < 0.49V for 1 second
P0725	CKP sensor	Open circuit	No crank angle sensor output > pulse detected for 5 seconds at vehicle speed of 25 km/h
P0715	Input speed sensor	Short circuit/open circuit	No input speed sensor output pulse detected for > 1 second at vehicle speed of > 30 km/h
P0720	Output speed sensor	Short circuit/open circuit	At vehicle speed of > 30 km/h, output speed sensor output < 50% of vehicle speed sensor output for > 1 second. At vehicle speed of 6 km/h, stop lamp switch is ON continuously for 5 minutes
P0703	Stop lamp switch	Short circuit/open circuit	With relay voltage > 10V, open or short circuit is continuously for 5 minutes
P0750	LR solenoid valve	Short circuit/open circuit	With relay voltage > 10V, open or short circuit is continuously for 5 minutes.
P0755	UD solenoid valve	Short circuit/open circuit	
P0760	2nd solenoid valve	Short circuit/open circuit	
P0765	UD solenoid valve	Short circuit/open circuit	
P0743	TCC solenoid valve	Short circuit/open circuit	
P0731	Gear shift incomplete	1st	After gear shift, output shaft speed sensor output x gear ratio of new gear = input shaft speed sensor output
P0732		2nd	
P0733		3rd	
P0734		4th	
P0736		Reverse	

DTC No	Diagnosis item		Probable cause
P1749	Serial communication	Short circuit/open circuit	With ignition ON, battery voltage > 10V, and engine speed > 450 r/min, communication is continuously irregular for 1 second or communication error signal is received for > 4 seconds continuously
P0740	TCC solenoid valve	System defect/stuck on	DCC solenoid valve drive duty ratio is 100% for 4 seconds continuously
P1723	A/T control relay	Earth short circuit/open circuit	After ignition ON, A/T control relay voltage < 7V
P0707	Transaxle range switch	Open circuit	No signal is continuous for > 30 seconds
P0708		Short circuit	Above 2 kinds signals are continuous for 30 seconds
P1630	CAN-BUS OFF	TCU Fail/open/short	Receive BUS-OFF information from CAN CONTROLLER
P1631	CAN-TIME OUT ECU	ECU Fail/open/short	No output signal for 1.5 second
P1764	CAN CONTROLLER CIRCUIT	Circuit mal-function	Communication error output is continuously for > 1 second

INSPECTION CHART FOR DIAGNOSIS CODES

EKHA0120

Code	Diagnosis item		Probable cause
P1704	Throttle position sensor system If the TPS output voltage is 4.8 V or higher when the engine is idling, the output is judged to be too high and diagnosis code P1704 is the output. If the TPS output voltage is 0.2 V or lower at times other than when the engine is idling the output is judged to be too low and diagnosis code P1703 is the output. If the TPS output voltage is 0.2 V or lower or if it is 1.2 V or higher when the engine is idling, the TPS adjustment is judged to be incorrect and diagnosis code P1702 is the output.	Short circuit	Malfunction of the throttle position sensor Malfunction of connector Malfunction of the TCM
P1703		Open circuit	
P1702		Sensor Maladjustment	
P0713 P0712	Fluid temperature sensor system If the fluid temperature sensor output voltage is 4.57 V or more even after driving for 10 minutes or more (if the fluid temperature does not increase), it is judged that there is an open circuit in the fluid temperature sensor and diagnosis code P0713 is the output.	Open circuit	Malfunction of the oil temperature sensor Malfunction of connector Malfunction of the TCM

Code	Diagnosis item		Probable cause
P0725	CKP sensor system If no output pulse is detected from the crank angle sensor for 5 seconds or more while driving at 25 km/h or more, it is judged that there is an open circuit in the crank angle sensor and diagnosis code P0725 is the output.	Open circuit	Malfunction of the crank angle sensor Malfunction of connector Malfunction of the TCM
P0715	Input speed sensor system If no output pulse is detected from the input shaft speed sensor for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short. Circuit in the input shaft speed sensor and diagnosis code P0715 is the output. If diagnosis code P0715 is the output four times, the transmission is locked into 3rd gear (D range) or 2nd gear as a fail-safe measure.	Short circuit/open circuit	Malfunction of the input shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of connector Malfunction of the TCM
P0720	Output speed sensor system If the output from the output shaft speed sensor is continuously 50% lower than the vehicle speed for 1 second or more while driving in 3rd or 4th gear at a speed of 30 km/h or more, there is judged to be an open circuit or short-circuit in the output shaft speed sensor and diagnosis code P0720 is output. If diagnosis code P0720 is output four times, the transmission is locked into 3rd gear (D range) or 2nd gear as a fail-safe measure, and the N range lamp flashes at a frequency of 1 Hz. Malfunction of the input shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of connector Malfunction of the TCM	Short circuit/open circuit	Malfunction of the wide open throttle switch Malfunction of connector Malfunction of the TCM Malfunction of solenoid valve Malfunction of connector Malfunction of the TCM
P0703	Stop lamp switch system If the stop lamp switch is on for 5 minutes or more while driving, it is judged that there is a short circuit in the stop lamp switch and diagnosis code P0703 is the output.	Short circuit/open circuit	Malfunction of the stop lamp switch Malfunction of connector Malfunction of the TCM
P0750	Low and reverse solenoid valve system	Short circuit/Open circuit	Malfunction of solenoid valve Malfunction of connector Malfunction of the TCM
P0755	Underdrive solenoid valve system	Short circuit/Open circuit	
P0760	Second solenoid valve system	Short circuit/Open circuit	
P0765	Overdrive solenoid valve system If the resistance value for a solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the solenoid valve and the respective diagnosis code is output. The transmission is locked into 3rd gear as a fail-safe measure.	Short circuit/Open circuit	

Code	Diagnosis item		Probable cause
P0743	Torque converter clutch solenoid valve system	Short circuit/Open circuit	Malfunction of solenoid valve Malfunction of connector Malfunction of the TCM
P0740	If the resistance value for a solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the solenoid valve and the respective diagnosis code is output. The transmission is locked into 3rd gear as a fail-safe measure.	Defective system	
P0731	1st gear ratio does not meet the specification If the output from the output shaft speed sensor multiplied by the 1st gear ratio is not the same as the output from the input shaft speed sensor after shifting to 1st gear has been completed, diagnosis code P0731 is the output. If diagnosis code P0731 is output four times, the transmission is locked into 3rd gear as a fail-safe measure.		Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low ad reverse brake system Malfunction of the underdrive clutch system Noise generated
P0732	2nd gear ratio does not meet the specification If the output from the output shaft speed sensor multiplied by the 3rd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 3rd gear has been completed, diagnosis code P0732 is the output. If diagnosis code P0732 is the output four times, the transmission is locked into 3rd gear as a fail-safe measure.		Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear malfunction of the underdrive clutch system Malfunction of the overdrive clutch system Noise generated
P0733	3rd gear ratio does not meet the specification If the output from the output shaft speed sensor multiplied by the 3rd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 3rd gear has been completed, diagnosis code P0733 is the output. If diagnosis code P0733 is the output four times, the transmission is locked into 3rd gear as a fail-safe measure.		Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer malfunction of the transfer drive gear or driven gear malfunction of the second brake system Malfunction of the overdrive clutch system Noise generated

Code	Diagnosis item		Probable cause
P0734	4th gear ratio does not meet the specification If the output from the output shaft speed sensor multiplied by the 4th gear ratio is not the same as the output from the input shaft speed sensor after shifting to 4th gear has been completed, diagnosis code P0734 is the output. If diagnosis code P0734 is the output four times, the transmission is locked into 3rd gear as a fail-safe measure.		Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low and reverse brake system Malfunction of the reverse clutch system Noise generated
P0736	Reverse gear ratio does not meet the specification If the output from the output shaft speed sensor multiplied by the reverse gear ratio is not the same as the output from the input shaft speed sensor after shifting to reverse gear has been completed, diagnosis code P0736 is the output. If diagnosis code P0736 is the output four times, the transmission is locked into 3rd gear as a fail-safe measure.		Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low and reverse brake system Malfunction of the reverse brake system Malfunction of the reverse clutch system Noise generated
P1749	Serial communication If normal communication is not possible for a continuous period of 1 second or more when the ignition switch is at the ON position, the battery voltage is 10 V or more and the engine speed is 450 r/min or more, diagnosis code No.51 is the output. Diagnosis code No.51 is also output if the data being received is abnormal for a continuous period of 4 seconds under the same conditions.		Malfunction of connector Malfunction of the engine-ECU Malfunction of the TCM
P1723	A/T control relay system If the A/T control relay voltage is less than 7 V after the ignition switch has been turned ON, it is judged that there is an open circuit or a short-circuit in the A/T control relay earth and diagnosis code P1723 is the output. Then the transmission is locked into 3rd gear as a fail-safe measure.	Short circuit to earth/ Open circuit	Malfunction of the A/T control relay Malfunction of connector Malfunction of the TCM
P0707	Transaxle range switch	Open circuit	No signal is continuous for > 30 seconds
P0708		Short circuit	Above 2 kinds signals are continuous for 30 seconds
P1630	CAN-BUS OFF - No 3 speed hold fail - No PGA, B fail - Battery voltage > 10V continuously for 0.5 second - No engine stop - Receive BUS OFF information from CAN CONTROLLER		- TCM Fail - TCM side open & short

Code	Diagnosis item	Probable cause
P1631	CAN-TIME OUT ECM - No 3 speed hold fail - No PGA, B fail o Battry voltage > 10V continuously for 0.5 second - No engine stop - No output signal for 1.5 second	- ECM fail - ECM side open & short
P1764	TCM CAN CAN CONTROLLER - No 3 speed hold fail - No PGA, B fail - Battry voltage > 10V continuously for 0.5 second - No engine stop - Communication error output is continuously for > 1 second	CAN CONTROLLER circuit malfunction

INSPECTION CHART FOR THROUBLE SYMPTOMS

EKA90130

Trouble symptom		Probable cause
Communication with HI-SCAN is not possible If communication with the HI-SCAN is not possible, the cause is probably a defective diagnosis line or the TCM is not functioning.		Malfunction diagnosis line Malfunction of connector Malfunction of the TCM
Driving impossible	Starting impossible Starting is not possible when the selector lever is in P or N range. In such cases, the cause is probably a defective engine system, torque converter or oil pump.	Malfunction of the engine system Malfunction of the torque converter Malfunction of the oil pump
	Does not move forward If the vehicle does not move forward when the selector lever is shifted from N to D,3,2 or L range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the underdrive clutch or valve body.	Abnormal line pressure Malfunction of the underdrive solenoid valve Malfunction of the underdrive clutch Malfunction of the valve body
	Does not reverse If the vehicle does not reverse when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal pressure in the reverse clutch or low and reverse brake or a malfunction of the reverse clutch, low and reverse brake or valve body.	Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse brake solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body
	Does not move (forward or reverse) If the vehicle does not move forward or reverse when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the power train, oil pump or valve body.	Abnormal line pressure Malfunction of power train Malfunction of the oil pump Malfunction of the valve body

Trouble symptom		Probable cause
Malfunction when starting	Engine stalling when shifting If the engine stalls when the selector lever is shifted from N to D or R range while the engine is idling, the cause is probably a malfunction of the engine system, damper clutch solenoid valve, valve body or torque converter (damper clutch malfunction).	Malfunction of the engine system Malfunction of the damper clutch control solenoid valve Malfunction of the valve body Malfunction of the torque converter (Malfunction of the damper clutch)
	Shocks when changing from N to D and large time lag If abnormal shocks or a time lag of 2 seconds or more occur when the selector lever is shifted from N to D range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body or idle position switch.	Abnormal underdrive clutch pressure Abnormal low and reverse brake pressure Malfunction of the underdrive solenoid valve Malfunction of the valve body Malfunction of the idle position switch
Malfunction when starting	Shocks when changing from N to R and large time lag. If abnormal shocks or a time lag of 2 seconds or more occur when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low and reverse brake pressure, or a malfunction of the reverse clutch, low and reverse brake, valve body or idle position switch.	Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body Malfunction of the idle position switch
	Shocks when changing from N to D, N to R and large time lag. If abnormal shocks or a time lag of 2 seconds or more occur when the selector lever is shifted from N to D range and from N to R range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the oil pump or valve body.	Abnormal line pressure Malfunction of the oil pump Malfunction of the valve body
Malfunction when shifting	Shocks and running up. If shocks occur when driving due to upshifting or downshifting and the transmission speed becomes higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, oil pump, valve body or of a brake or clutch.	Abnormal line pressure Malfunction of each solenoid valve Malfunction of the oil pump Malfunction of the valve body Malfunction of each brake or each clutch
Displaced shifting points	All points. If all shift points are displaced while driving, the cause is probably a malfunction of the output shaft speed sensor, TPS or of a solenoid valve.	Malfunction of the output shaft speed sensor Malfunction of the throttle position sensor Malfunction of each solenoid valve Abnormal line pressure Malfunction of the valve body Malfunction of the TCM
	Some points. If some of the shift points are displaced while driving, the cause is probably a malfunction of the valve body, or it is related to control and is not an abnormality.	Malfunction of the valve body
Does not shift	No diagnosis codes. If shifting does not occur while driving and no diagnosis codes are output, the cause is probably a malfunction of the transaxle range switch, or TCM	Malfunction of the transaxle range Malfunction of the TCM

Trouble symptom		Probable cause
Malfunction while driving	Poor a acceleration. If acceleration is poor even if downshifting occurs while driving, the cause is probably a malfunction of the engine system or of a brake or clutch.	Malfunction of the engine system Malfunction of the brake of clutch
Malfunction while driving	Vibration. If vibration occurs when driving at constant speed or when accelerating and deceleration in top range, the cause is probably abnormal damper clutch pressure or a malfunction of the engine system, damper clutch control solenoid valve, torque converter or valve body.	Abnormal damper clutch pressure Malfunction of the engine system Malfunction of the damper clutch control solenoid valve Malfunction of the torque converter Malfunction of the valve body
Transaxle range switch system. The cause is probably a malfunction of the inhibitor switch circuit, ignition switch circuit or a defective TCM.		Malfunction of the transaxle range switch Malfunction of the ignition switch Malfunction of connector Malfunction of the TCM
Idle position switch system. The cause is probably a defective idle position switch circuit, or a defective TCM.		Malfunction of the dual pressure switch Malfunction of connector Malfunction of the TCM
Dual pressure switch system. The cause is probably a defective dual pressure switch circuit or a defective TCM.		Malfunction of the dual pressure switch Malfunction of connector Malfunction of A/C system Malfunction of the TCM
Vehicle speed sensor system. The cause is probably a defective vehicle speed sensor circuit or a defective TCM.		Malfunction of the vehicle speed sensor Malfunction of connector Malfunction of the TCM

ELEMENT IN USE AT EACH POSITION OF SELECTOR LEVER

EKA90140

Operating element		Underdrive clutch (UD)	Reverse clutch (REV)	Overdrive clutch (OD)	low-and re-verse brake (LR)	Second brake (2nd)
Selector lever position						
P	Parking	-	-	-	O	-
R	Reverse	-	O	-	O	-
N	Neutral	-	-	-	O	-
D	1st	O	-	-	O	-
	2nd	O	-	-	-	O
	3rd	O	-	O	-	-
	4th	-	-	O	-	O
3	1st	O	-	-	O	-
	2nd	O	-	-	-	O
	3rd	O	-	O	-	-
2	1st	O	-	-	O	-
	2nd	O	-	-	-	O
L	1st	O	-	-	O	-

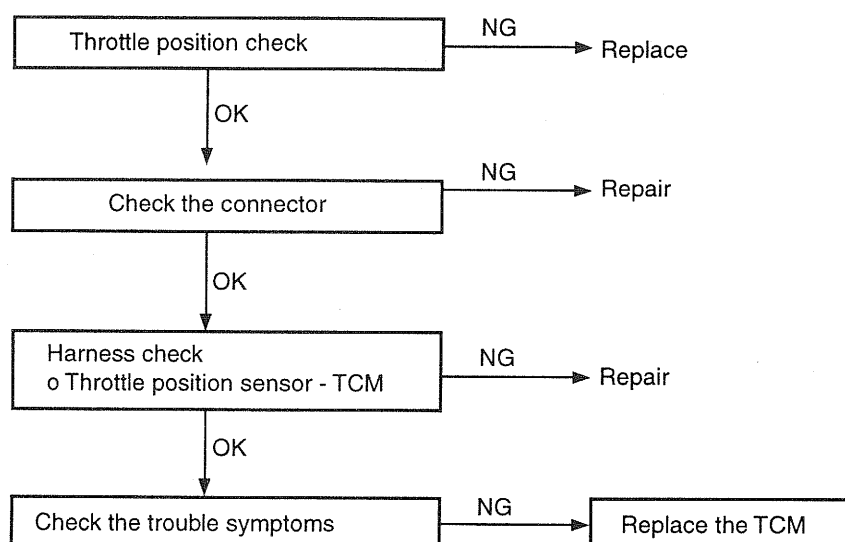
**OPERATING ELEMENT AND THEIR
FUNCTIONS**

Operating element	Code	Function
Underdrive clutch	UD	Connects input shaft underdrive sun gear
Reverse clutch	REV	Connects input shaft and reverse sun gear
Overdrive clutch	OD	Connects input shaft and overdrive planetary carrier
Low-and-reverse brake	LR	Locks low-and-reverse annulus gear and overdrive planetary carrier
Second brake	2ND	Locks reverse sun gear

INSPECTION PROCESS FOR DIAGNOSTIC TROUBLE CODES

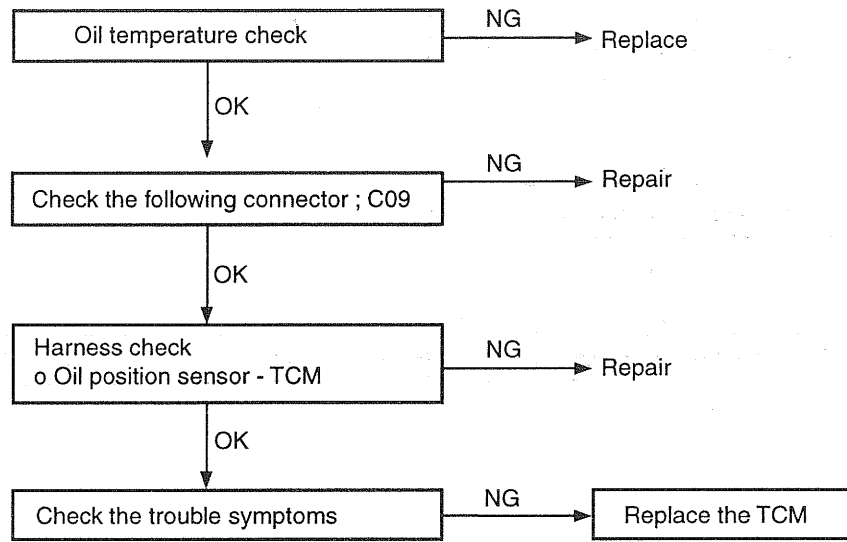
EKHA0270

Code No. P1704,P1703,P1702 throttle position sensor system	Probable cause
If the TPS output voltage is 4.8 V or higher when the engine is idling, the output is judged to be too high and diagnostic trouble code No.P1704 is the output. If the TPS output voltage is 0.2 V or lower at times other than when the engine is idling, the output is judged to be too low and diagnostic trouble code and No.P1703 is the output. If the TPS output voltage is 0.2 V or lower or if it is 1.2 V or higher when the engine is idling, the TPS adjustment is judged to be incorrect and diagnostic trouble and code No.P1702 is the output.	Malfunction of the throttle position sensor Malfunction of connector Malfunction of the TCM

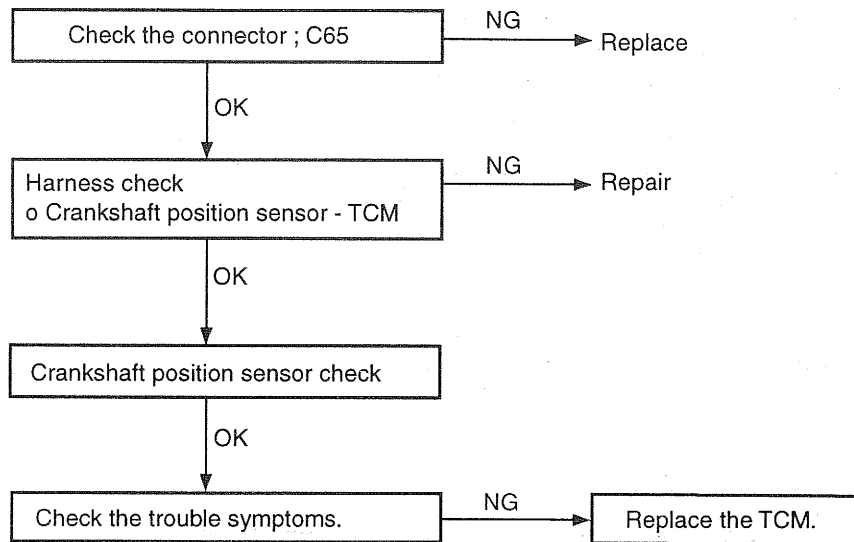


EKAA010A

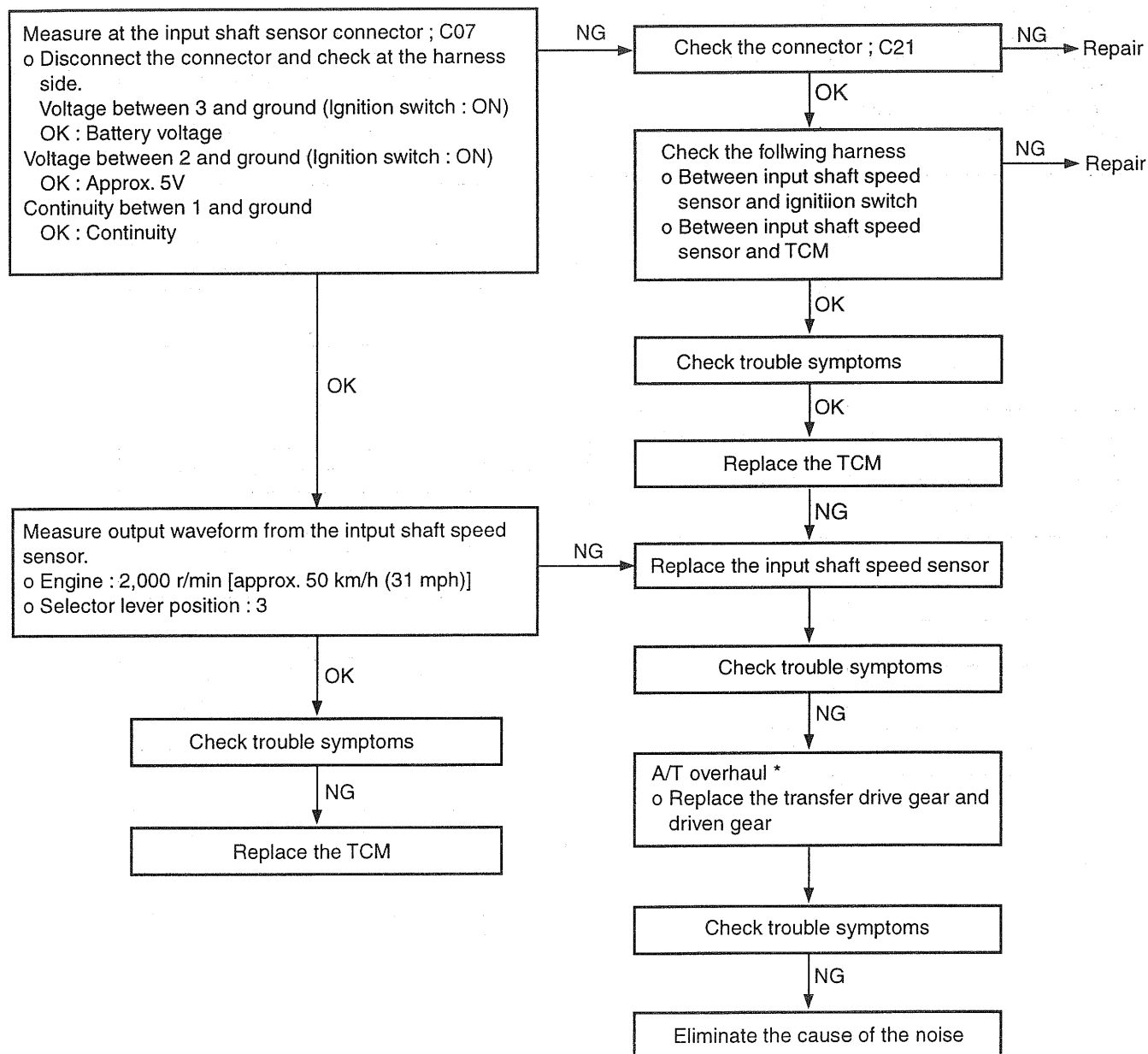
Code No. P0710, Oil temperature sensor system	Probable cause
If the oil temperature sensor output voltage is 2.6 V or more even after driving for 10 minutes or more (If the oil temperature does not increase), it is judged that there is an open circuit in the oil temperature sensor and diagnostic trouble code No.P0710 is the output. If the oil temperature sensor output detects the voltage which corresponds to 200°C(392°F) or more for more than one second, it is judged that there is an open circuit in oil temperature sensor and diagnostic trouble code No. P0710 is the output.	Malfunction of the oil temperature sensor Malfunction of connector Malfunction of the TCM



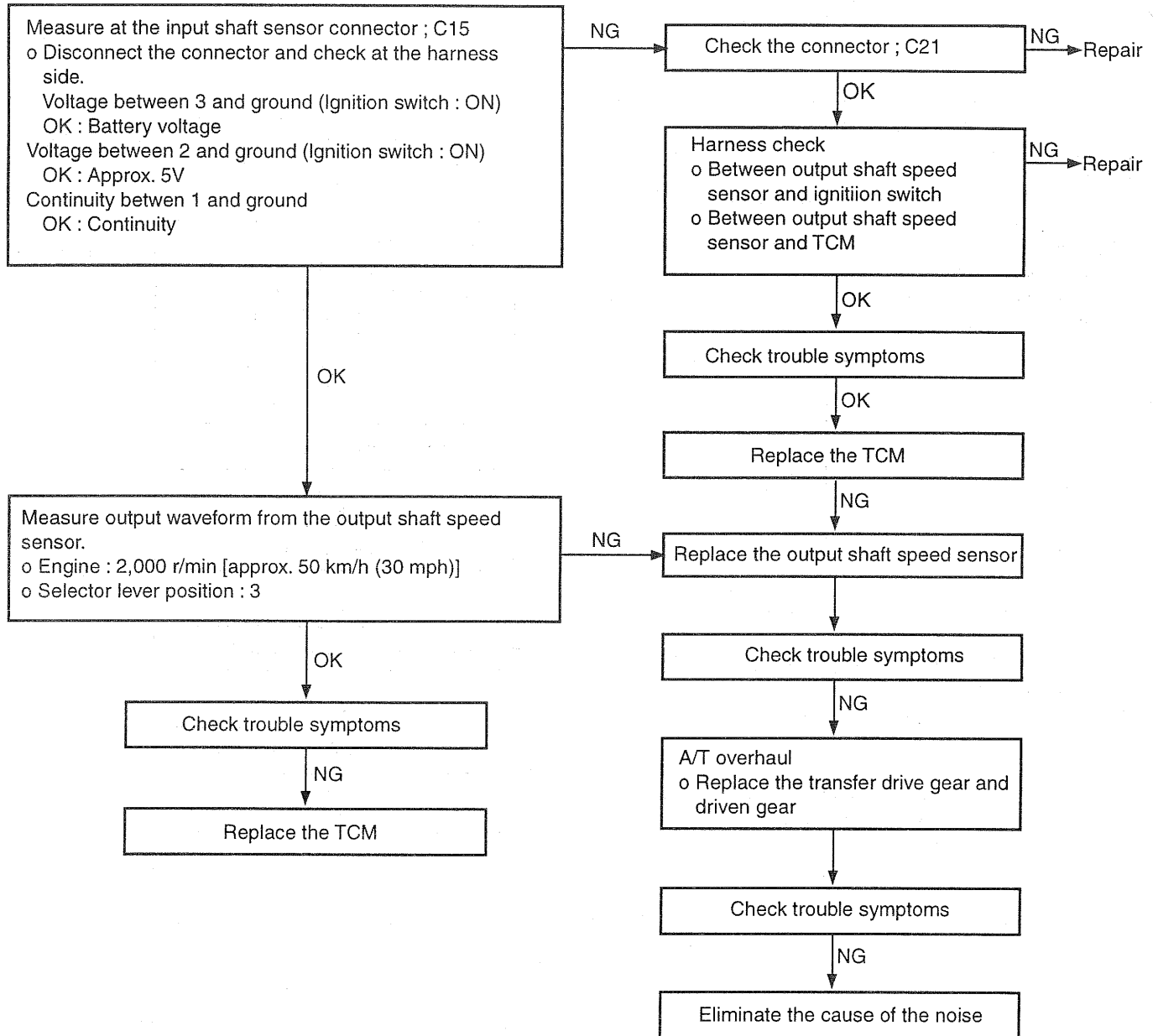
Code No. P0725 Crankshaft position sensor system	Probable cause
If no output pulse is detected from the crankshaft position sensor for 5 seconds or more while driving at 25 km/h (16 mph) or more, it is judged that there is an open circuit in the crankshaft position sensor and diagnostic trouble code No.P0725 is the output.	Malfunction of the crankshaft position sensor Malfunction of connector Malfunction of the TCM



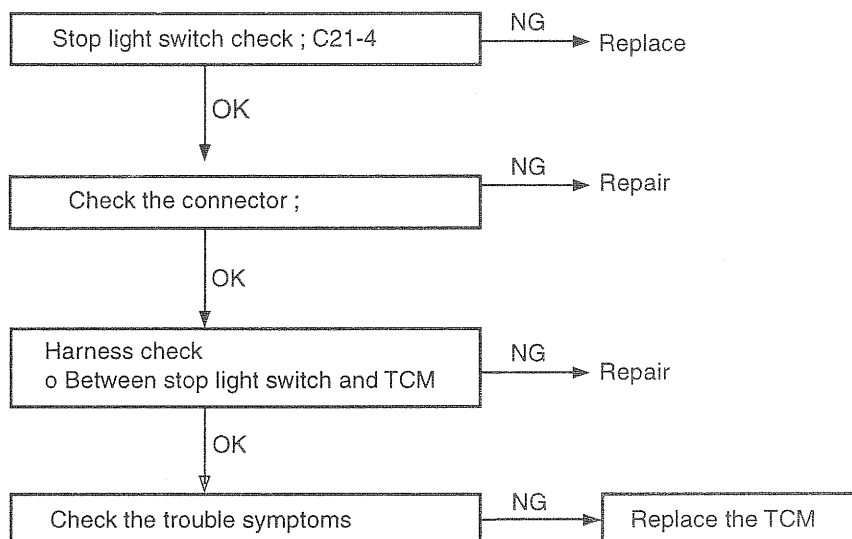
Code No. P0715 input shaft speed sensor system	Probable cause
If no output pulse is detected from the input shaft speed sensor for 1 seconds or more while driving in 3rd or 4th gear at a speed of 30 km/h (19 mph) or more, it is judged to be an open circuit or short-circuit in the input shaft speed sensor and diagnostic trouble code No.P0715 is the output. If diagnostic trouble code P0715 is the output four times, the transaxle is locked into 3rd gear or 2nd gear as a fail-safe measure.	Malfunction of the input shaft speed sensor Malfunction of underdrive clutch retainer Malfunction of connector Malfunction of the TCM



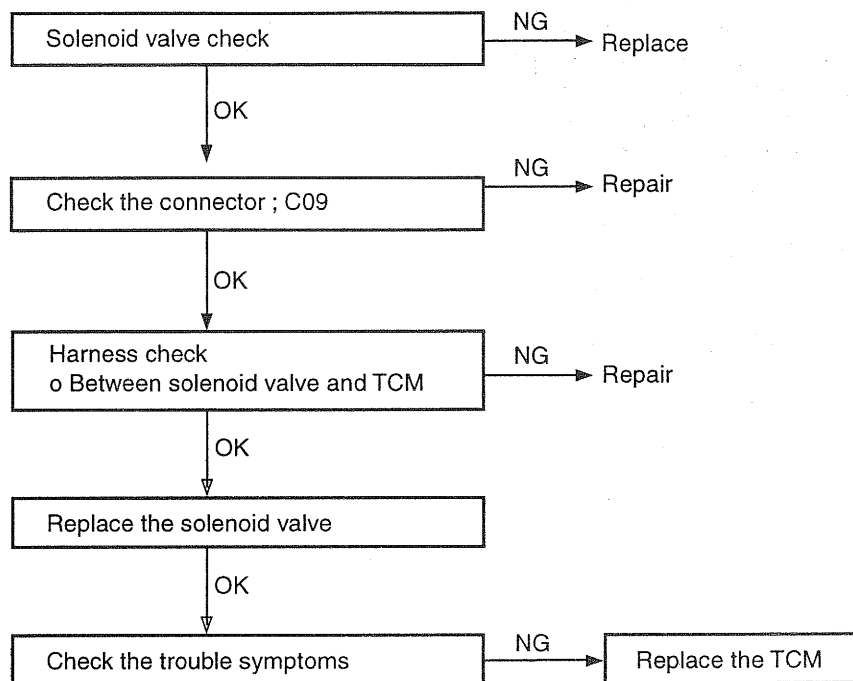
Code No. P0720 Output shaft sensor system	Probable cause
If the output from the output shaft speed sensor is continuously 50% lower than the vehicle speed for 1 second or more, it is judged to be an open circuit or short-circuit in the output shaft speed sensor and diagnostic trouble code No.P	Malfunction of the throttle position sensor Malfunction of connector Malfunction of the TCM



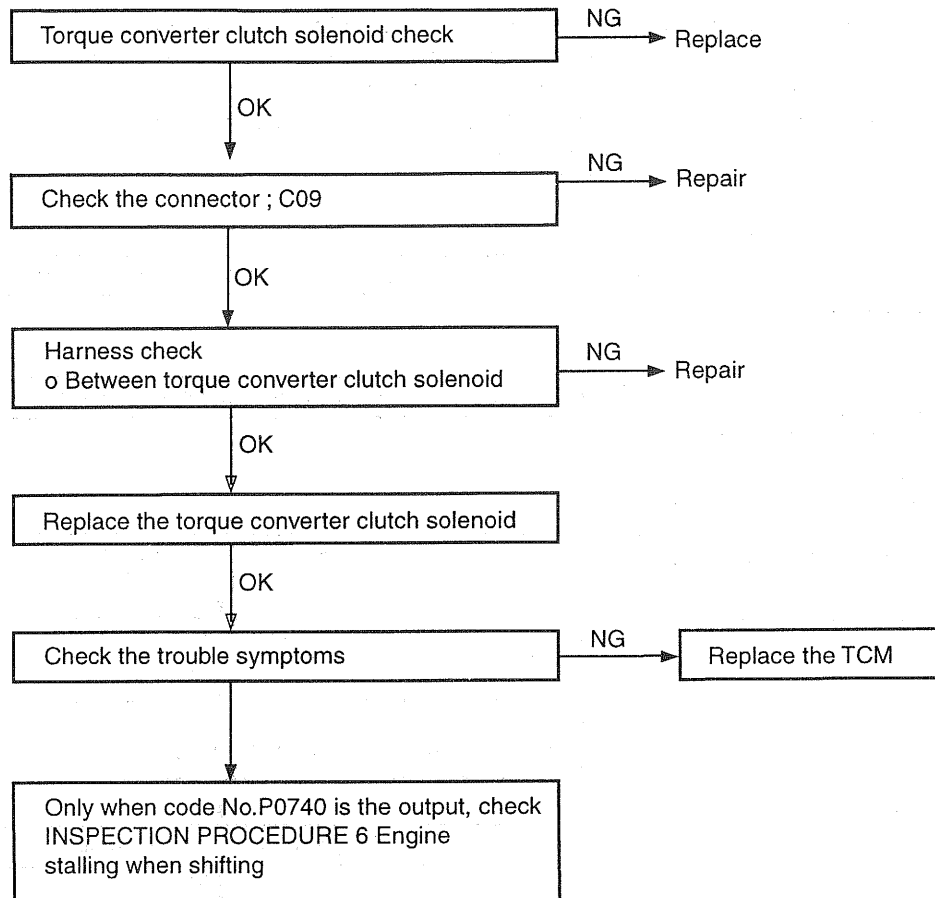
Code No.P0703 Stop light switch system	Probable cause
If the stop light switch is on for 5 minutes or more while driving, it is judged that there is a short circuit in the stop light switch and diagnostic trouble code P0703 is the output.	Malfunction of the stop light switch Malfunction of connector Malfunction of the TCM



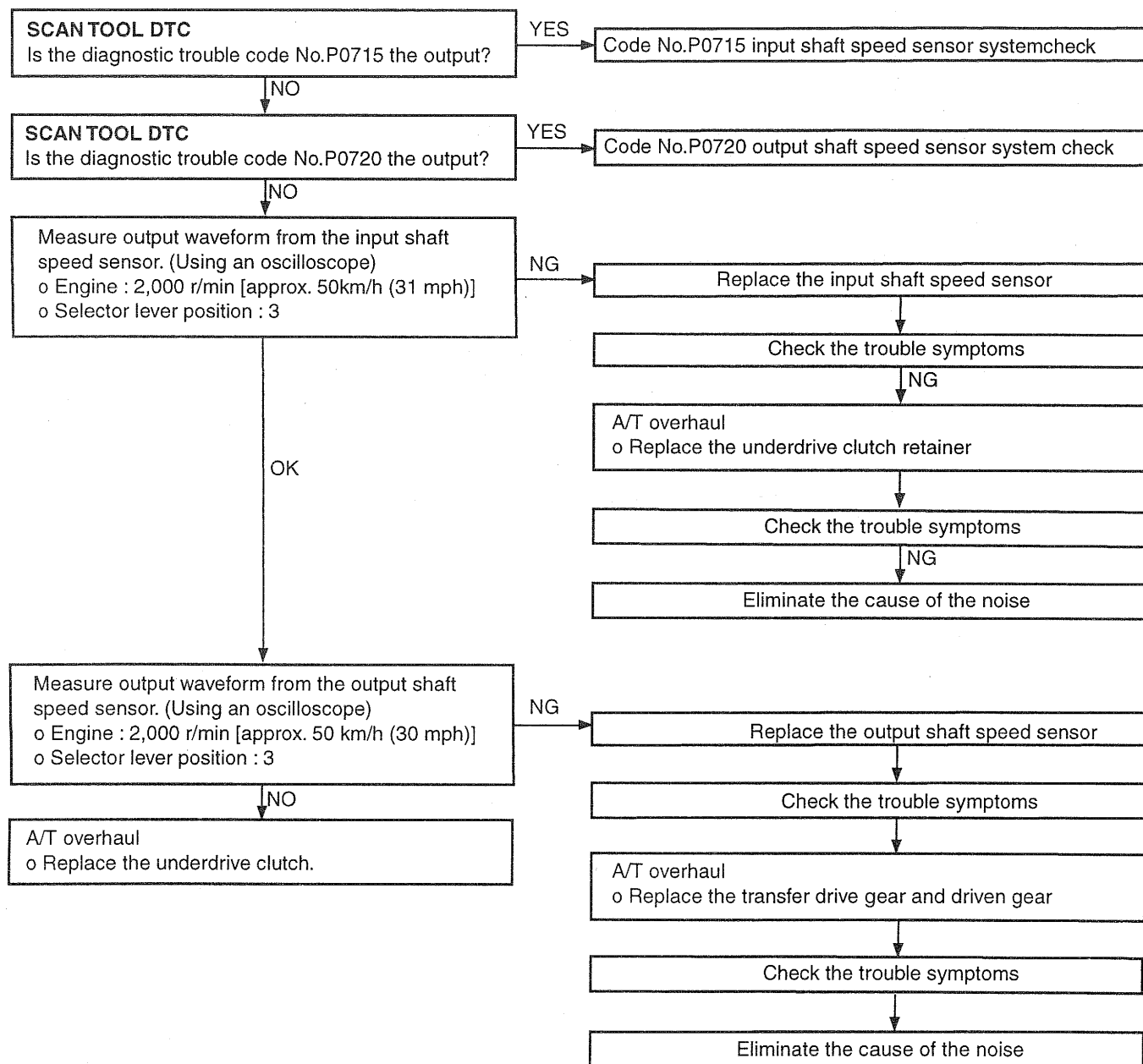
Code No.P0750 Low and reverse solenoid valve system	Probable cause
Code No.P0755 Underdrive solenoid valve system	
Code No.P0760 Second solenoid valve system	
Code No.P0765 Overdrive solenoid valve system	
If the resistance value for a solenoid valve is too large or too small, it is judged that there is a short-circuit or an open circuit in the solenoid valve and the respective diagnostic trouble code is output. The transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the solenoid valve Malfunction of connector Malfunction of the TCM



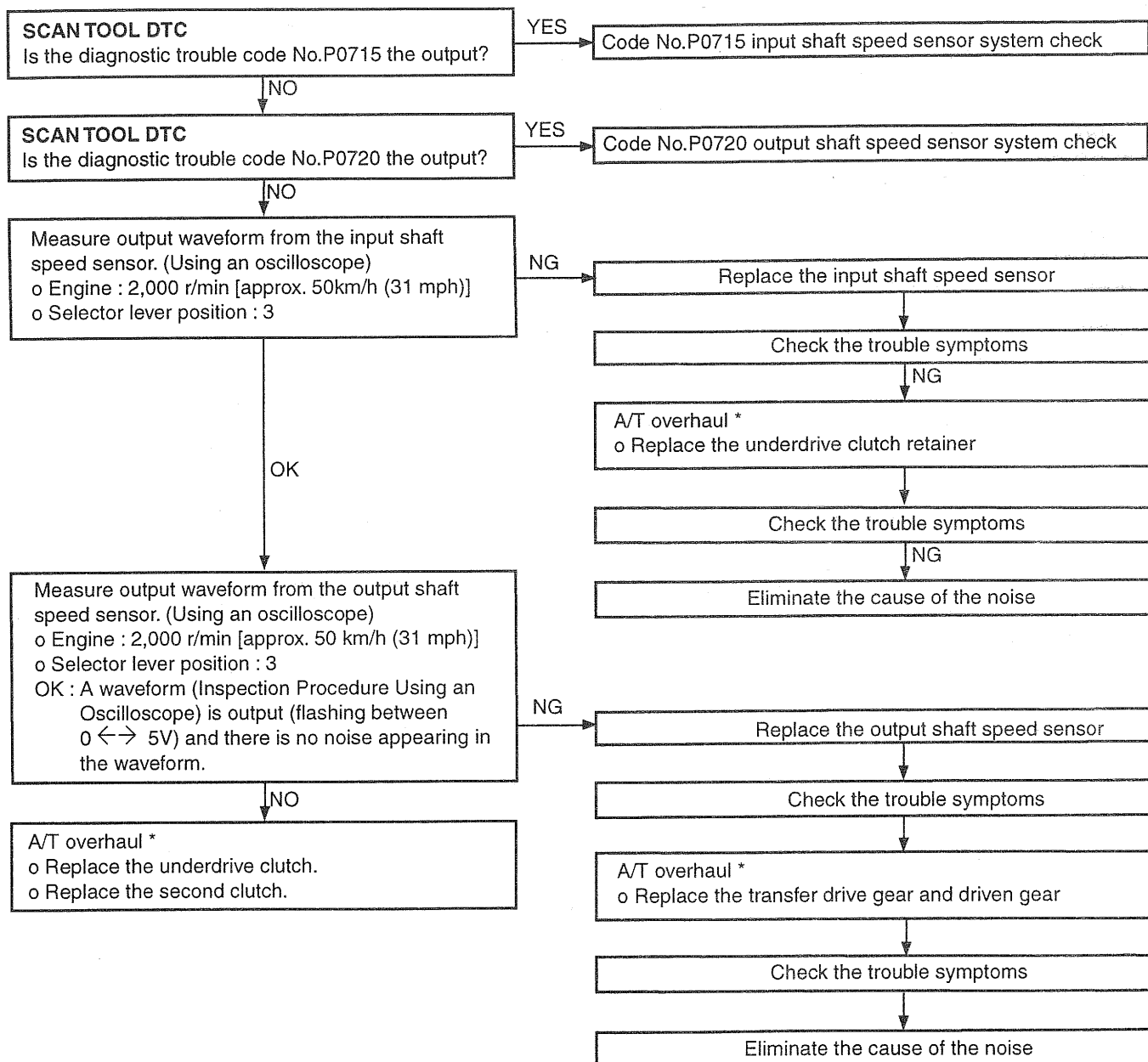
Code No.P0743 /P0740 Torque converter clutch solenoid system	Probable cause
If the resistance value for the torque converter clutch solenoid is too large or too small, it is judged that there is a short-circuit or an open circuit in the torque converter clutch solenoid and diagnostic trouble code No.P0743 is the output. If the drive duty rate for the torque converter clutch solenoid is 100% for a continuous period of 4 seconds or more, it is judged that there is an abnormality in the torque converter clutch system and diagnostic trouble code No.P0740 is the output. When diagnostic trouble code No.P0743 is the output, the transaxle is locked into 3rd gear as a fail-safe measure. If the lock-up clutch remains engaged for a continuous period of 10seconds when the TCM is attempting to disengage the lock-up clutch, it is judged that the torque converter clutch is stuck on and diagnostic trouble code P0740.	Malfunction of the torque converter clutch solenoid Malfunction of connector Malfunction of the TCM



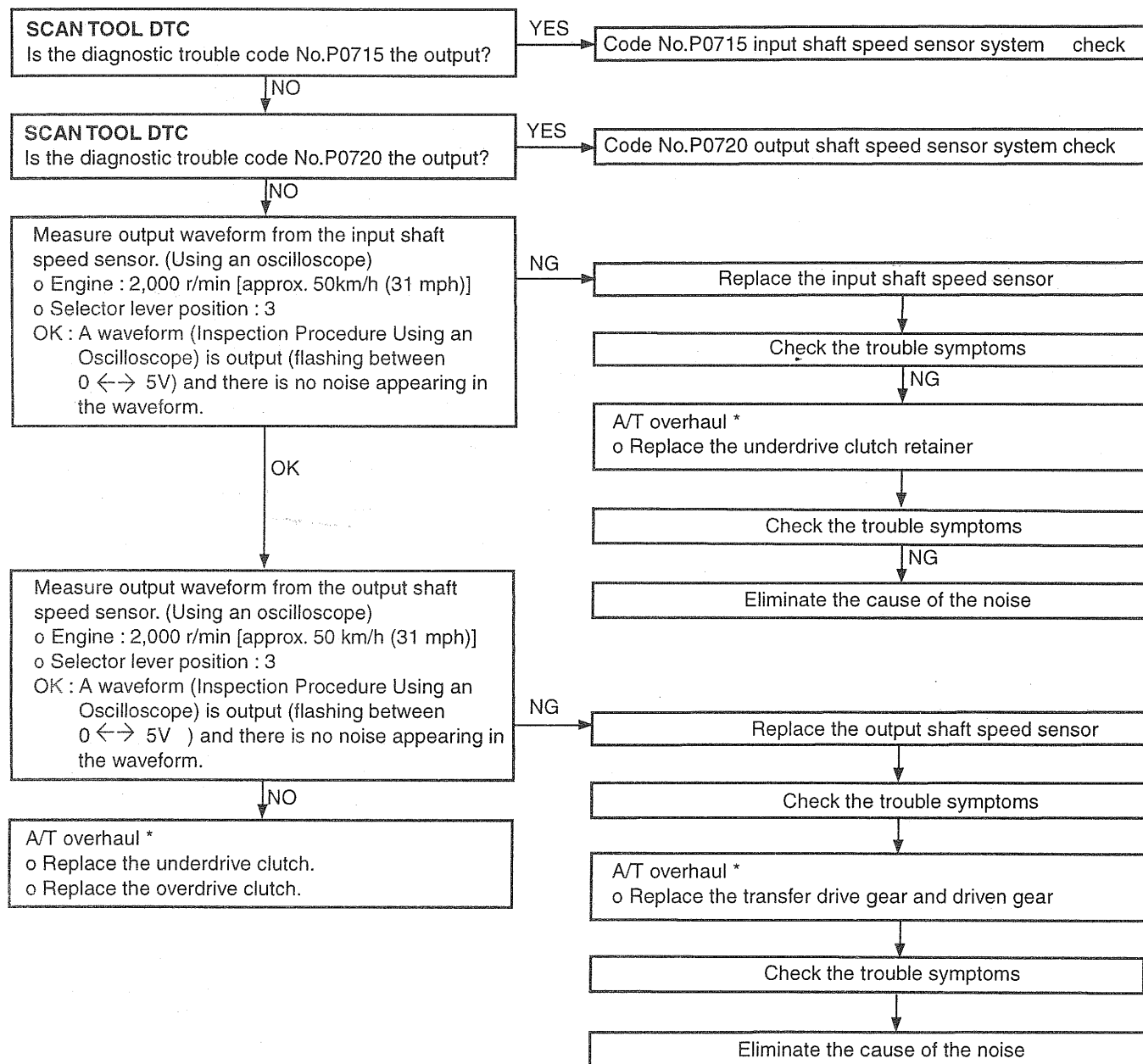
Code No.P0731 1st gear incorrect ratio	Probable cause
If the output from the output shaft speed sensor multiplied by the 2nd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 2nd gear has been completed, diagnostic trouble code No.P0732 is the output four times, the transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the second brake system Malfunction of the underdrive clutch system Noise generated



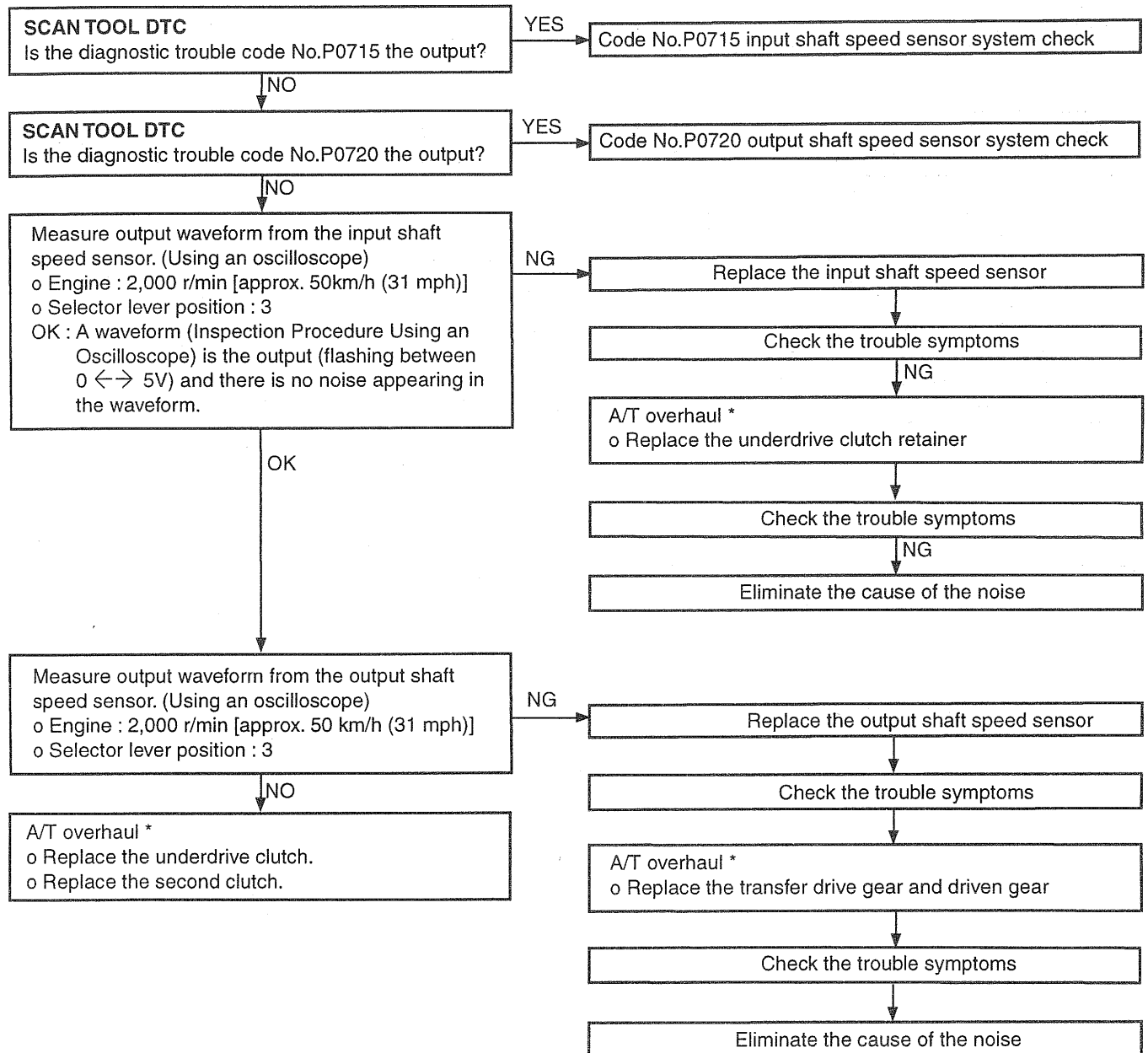
Code No.P0732 2nd gear incorrect ratio	Probable cause
If the output from the output shaft speed sensor multiplied by the 2nd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 2nd gear has been completed, diagnostic trouble code No.P0732 is the output. If diagnostic trouble code No.P0732 is the output four times, the transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the second brake system Malfunction of the underdrive clutch system Noise generated



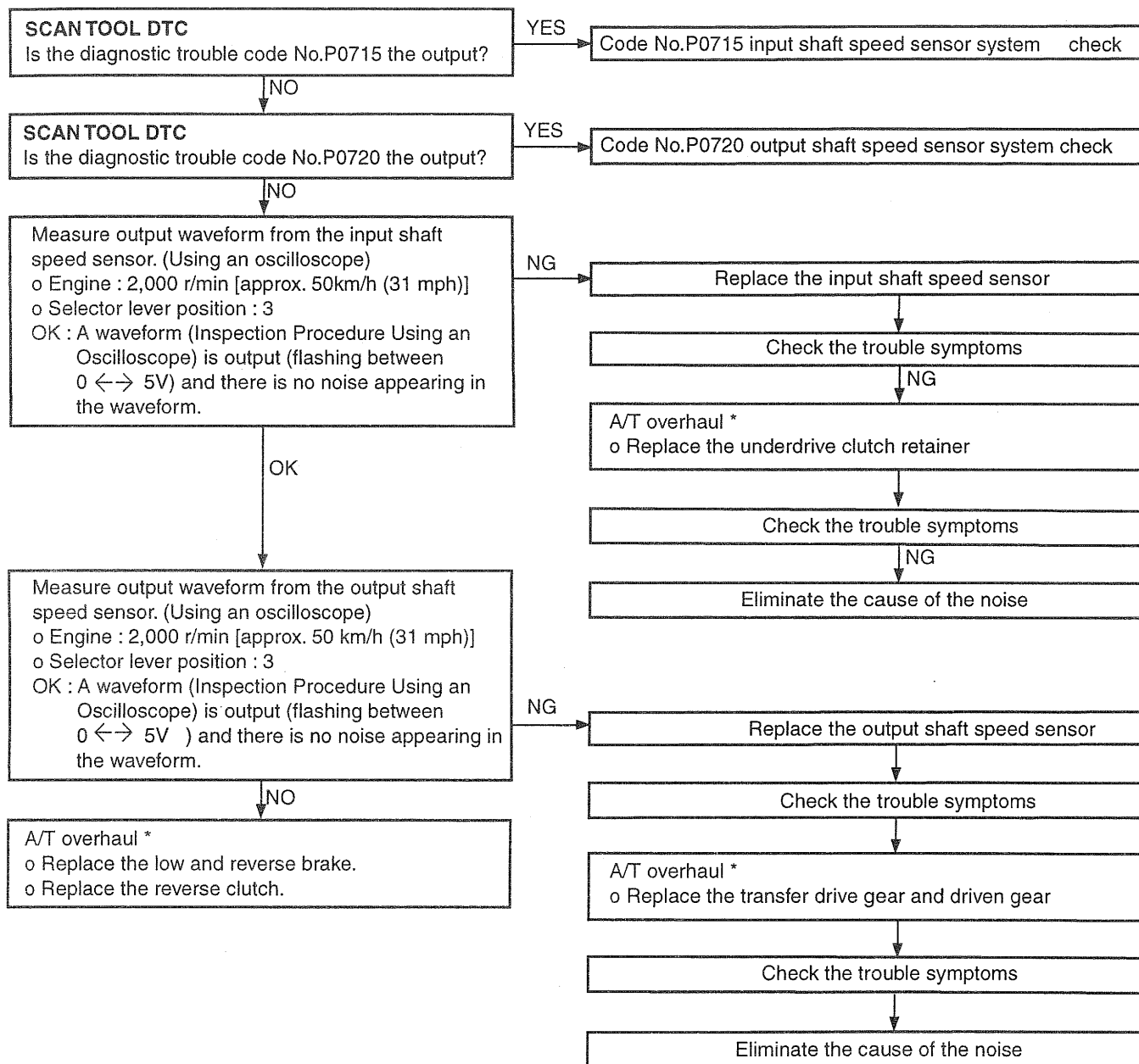
Code No.P0733 3rd gear incorrect ratio	Probable cause
If the output from the output shaft speed sensor multiplied by the 3rd gear ratio is not the same as the output from the input shaft speed sensor after shifting to 2nd gear has been completed, diagnostic trouble code No.P0732 is the output. If diagnostic trouble code No.P0732 is the output four times, the transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low and reverse brake system Malfunction of the underdrive clutch system Noise generated



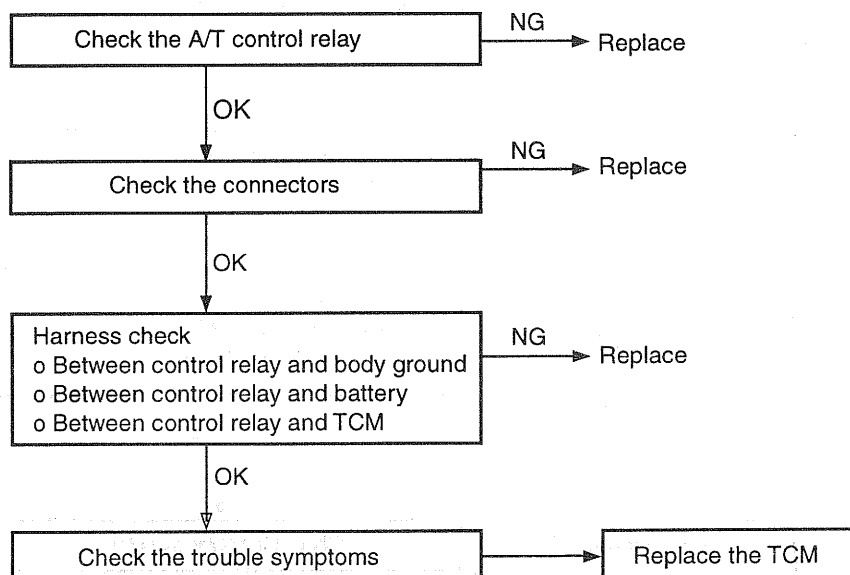
Code No.P0734 4th gear incorrect ratio	Probable cause
If the output from the output shaft speed sensor multiplied by the 4th gear ratio is not the same as the output from the input shaft speed sensor after shifting to 4th gear has been completed, diagnostic trouble code No.P0734 is the output. If diagnostic trouble code No.P0734 is the output four times, the transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low and reverse brake system Malfunction of the underdrive clutch system Noise generated



Code No.P0736 reverse gear incorrect ratio	Probable cause
If the output from the output shaft speed sensor multiplied by the reverse gear ratio is not the same as the output from the input shaft speed sensor after shifting to reverse gear has been completed, diagnostic trouble code No.P0736 is the output. If diagnostic trouble code No.P0736 is output four times, the transaxle is locked into 3rd gear as a fail-safe measure	Malfunction of the input shaft speed sensor Malfunction of the output shaft speed sensor Malfunction of the underdrive clutch retainer Malfunction of the transfer drive gear or driven gear Malfunction of the low and reverse brake system Malfunction of the underdrive clutch system Noise generated



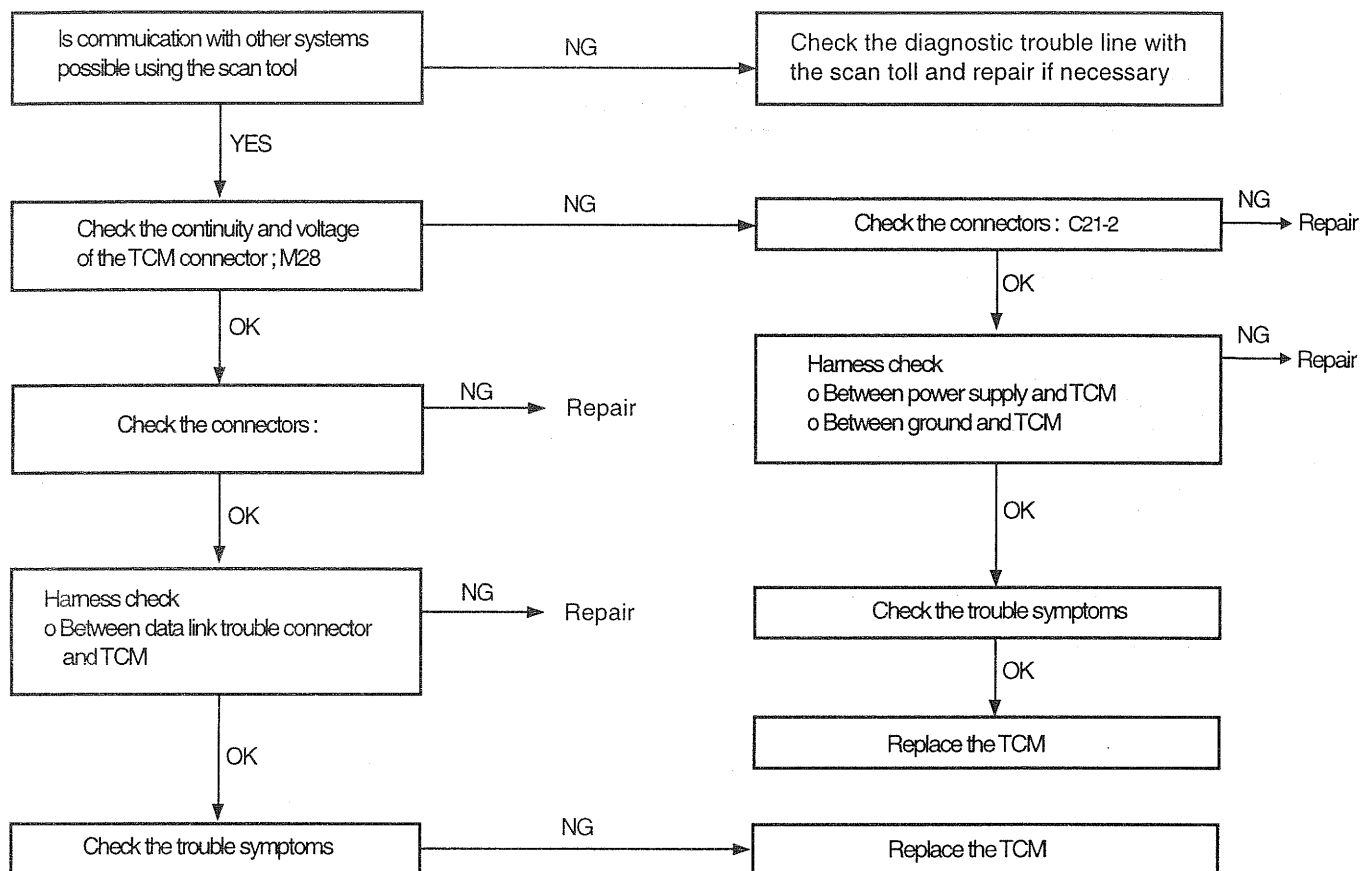
Code No.P1723 A/T Control relay system	Probable cause
If the relay voltage is less than 7 V after the ignition switch has been turned to ON, it is judged that there is an oped circuit or a short-circuit in the A/T control relay earth and diagnostic trouble code P1723 is the output. The transaxle is locked into 3rd gear as a fail-safe measure.	Malfunction of the A/T control relay Malfunction of connector Malfunction of the TCM



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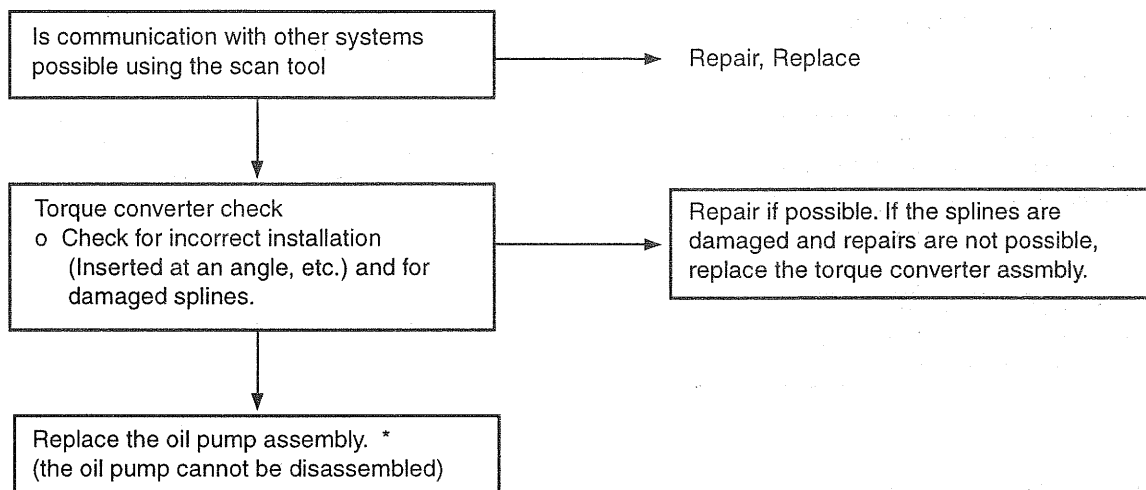
INSPECTION PROCEDURE 1

Communication with the scan tool	Probable cause
If communication with the scan tool is not possible, the cause is probably a defective diagnostic trouble line or the TCM is not functioning.	Malfunction of diagnostic trouble line Malfunction of connector Malfunction of the TCM



INSPECTION PROCEDURE 2

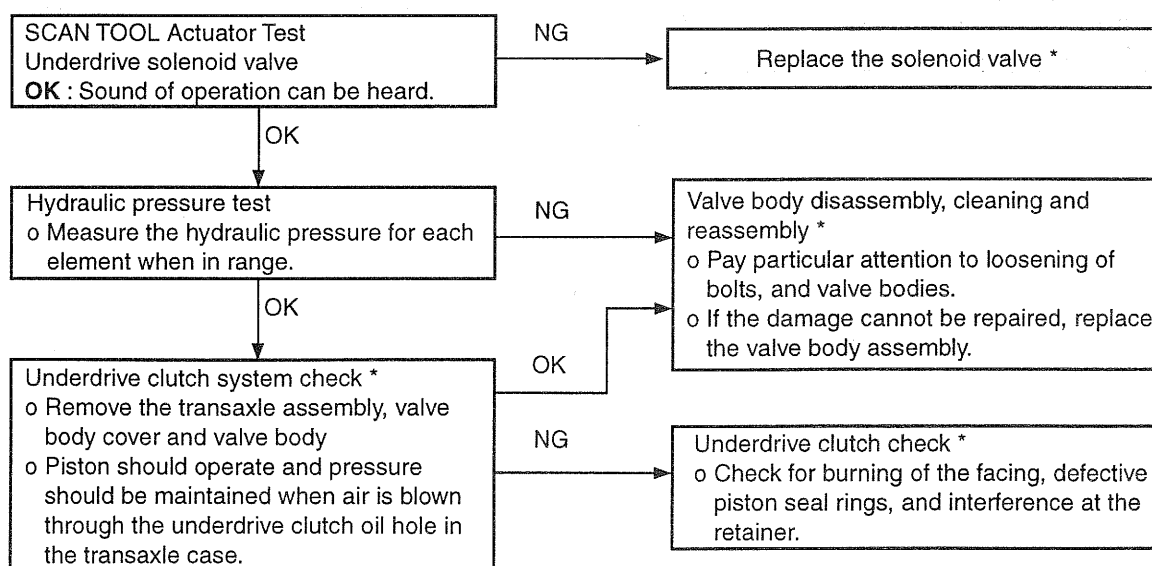
Starting impossible	Probable cause
Starting is not possible when the selector lever is in P or N range. In such cases, the cause is probably a defective engine system, torque converter or oil pump.	Malfunction of the engine system Malfunction of the torque converter Malfunction of the oil pump



EKAA011B

INSPECTION PROCEDURE 3

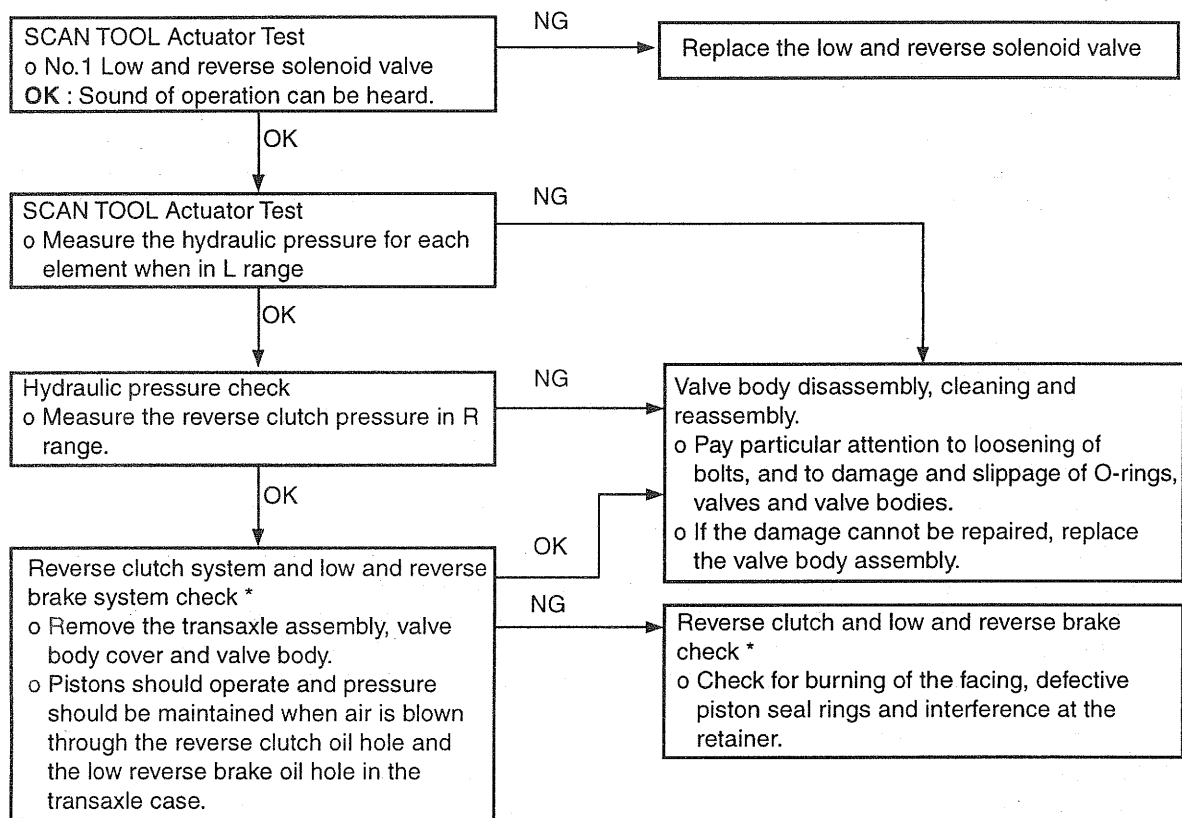
Does not move	Probable cause
If the vehicle does not move forward when the selector lever is shifted from N to D,3,2 or L range while the engine is idling, the cause is probably abnormal line pressure or a malfunction of the underdrive clutch or valve body.	Abnormal line pressure Malfunction of the underdrive solenoid valve Malfunction of the underdrive clutch Malfunction of the valve body



EKAA011C

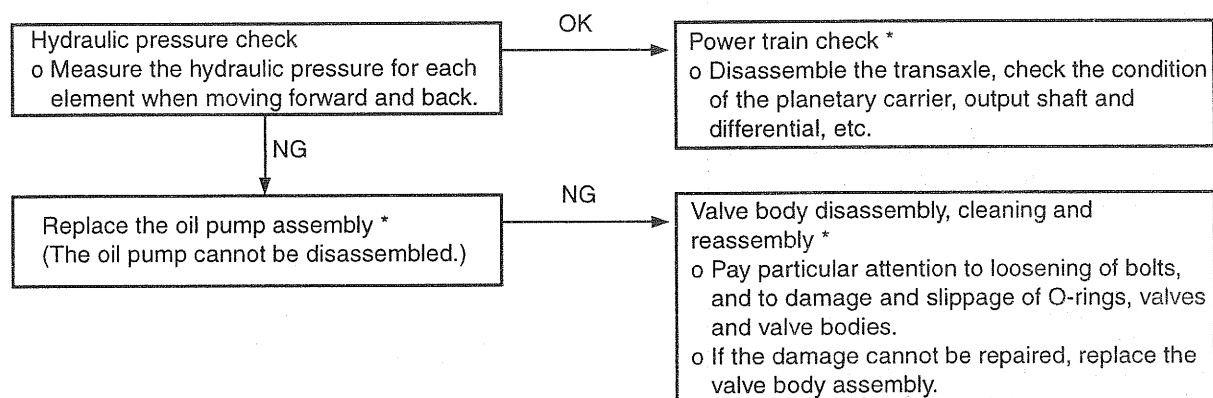
INSPECTION PROCEDURE 4

Does not reverse	Probable cause
If the vehicle does not reverse when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal pressure in the reverse clutch or low and reverse brake or a malfunction of the reverse clutch, low and reverse brake or valve body.	Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body



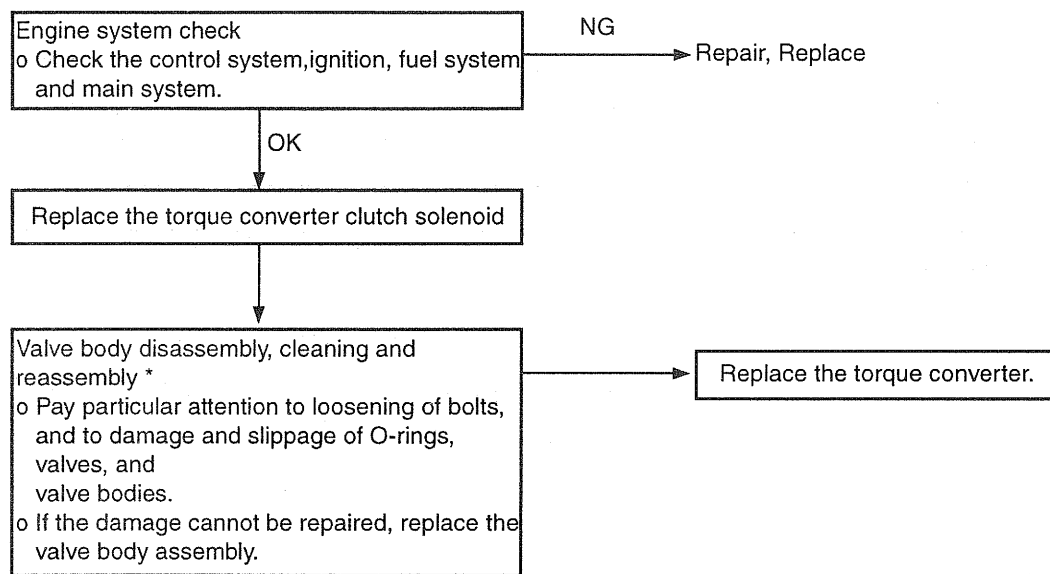
INSPECTION PROCEDURE 5

Does not move (forward or reverse)	Probable cause
If the vehicle does not move forward or reverse when the selector lever is shifted to any position while the engine is idling, the cause is probably abnormal line pressure, or a malfunction of the power train, oil pump or valve body.	Abnormal line pressure Malfunction of the underdrive solenoid valve Malfunction of the underdrive clutch Malfunction of the valve body



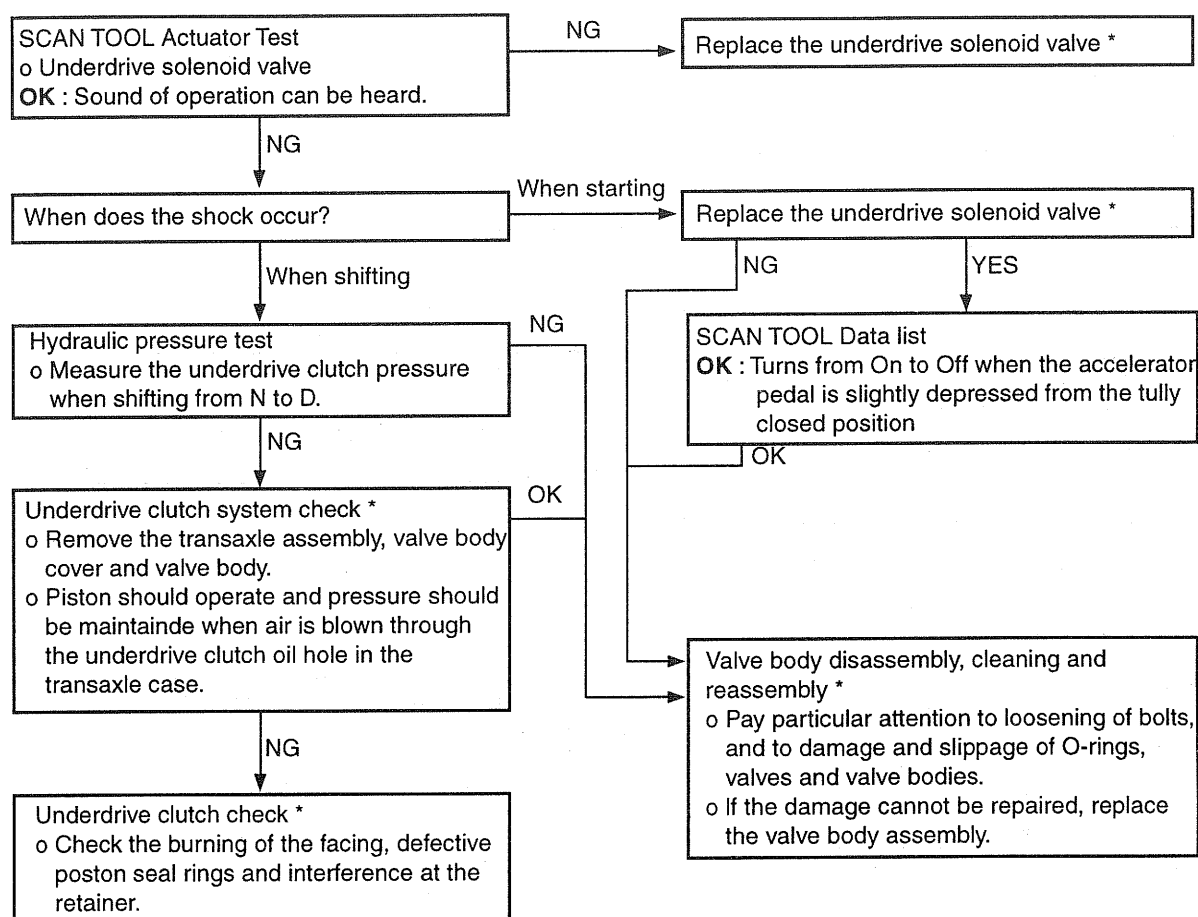
INSPECTION PROCEDURE 6

Engine stalling when shifting	Probable cause
If the engine stalls when the selector lever is shifted from N to D or R range while the engine is idling, the cause is probably a malfunction of the engine system, torque converter clutch solenoid, valve body or torque converter (torque converter clutch malfunction).	Malfunction of the engine system Malfunction of the torque converter clutch solenoid Malfunction of the valve body Malfunction of the torque converter (Malfunction of the torque converter clutch)



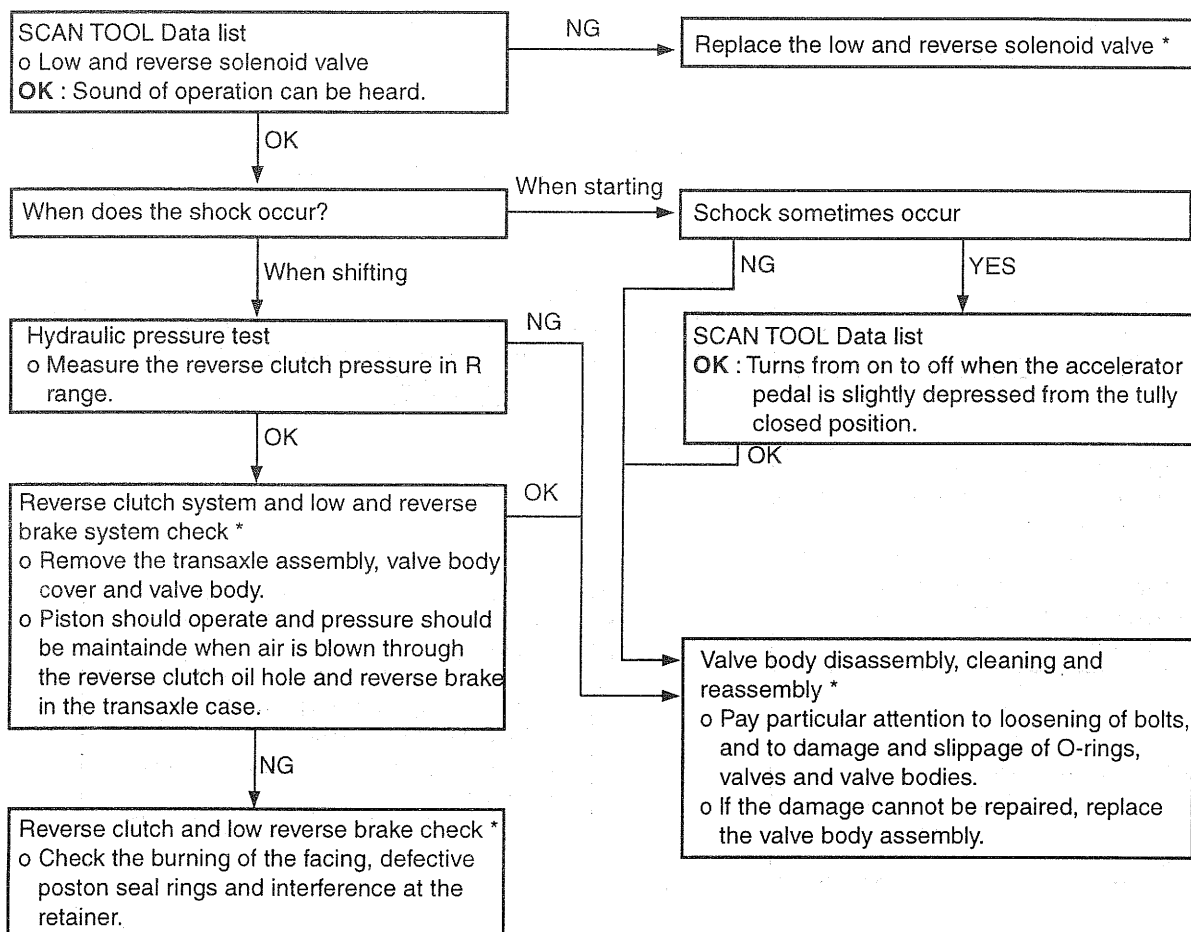
INSPECTION PROCEDURE 7

Shocks when changing from N to D and range time lag	Probable cause
If abnormal shocks or a time lag of 2 second or more occurs when the selector lever is shifted from N to D range while the engine is idling, the cause is probably abnormal underdrive clutch pressure or a malfunction of the underdrive clutch, valve body or closed throttle position switch.	Abnormal line pressure Malfunction of the underdrive solenoid valve Malfunction of the underdrive clutch Malfunction of the valve body Malfunction of the closed throttle position switch



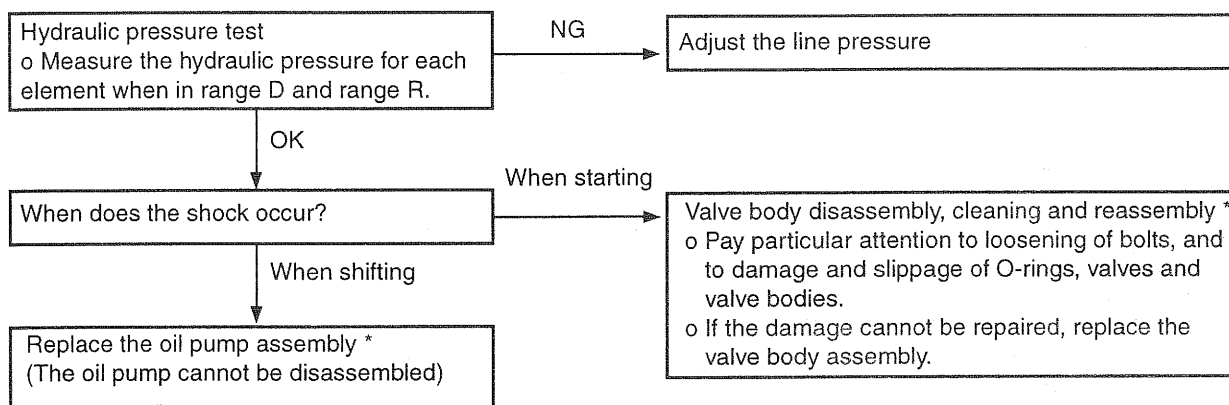
INSPECTION PROCEDURE 8

Shock when changing from N to R and large time lag	Probable cause
If abnormal shocks or a time lag of 2seconds or more occurs when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low and reverse brake pressure, or a malfunction of the reverse clutch, low and reverse brake, valve body or closed throttle position switch.	Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body Malfunction of the closed throttle position switch



INSPECTION PROCEDURE 9

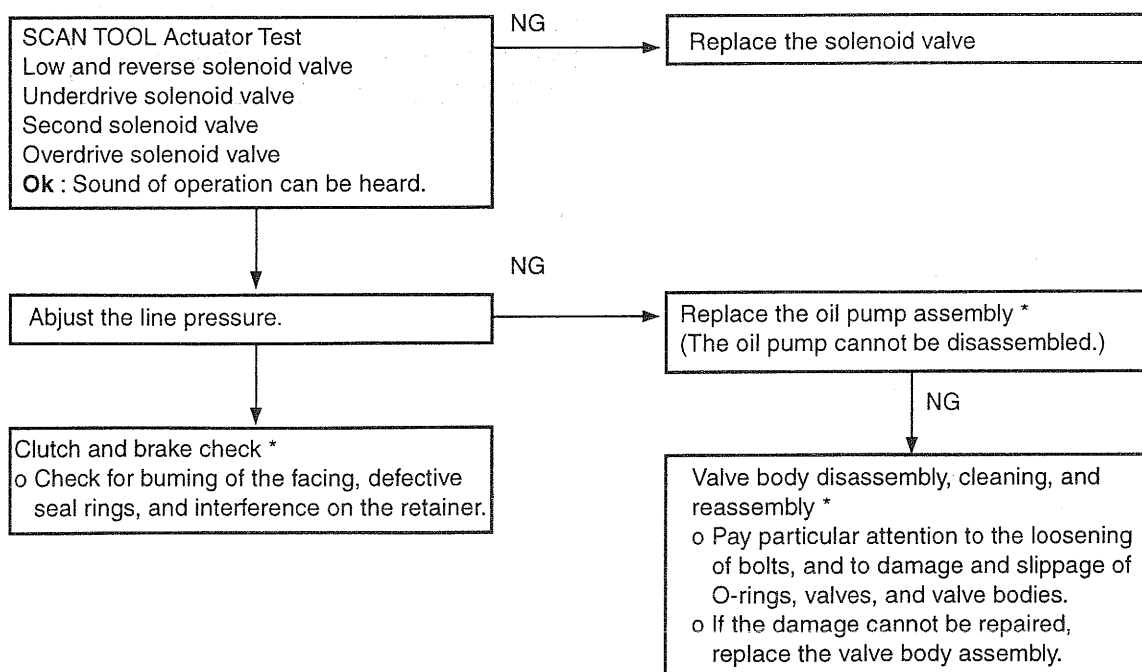
Shocks when changing from N to R and large time lag	Probable cause
If abnormal shocks or a time lag of 2seconds or more occurs when the selector lever is shifted from N to R range while the engine is idling, the cause is probably abnormal reverse clutch pressure or low and reverse brake pressure, or a malfunction of the reverse clutch, low and reverse brake, valve body or closed throttle position switch.	Abnormal reverse clutch pressure Abnormal low and reverse brake pressure Malfunction of the low and reverse solenoid valve Malfunction of the reverse clutch Malfunction of the low and reverse brake Malfunction of the valve body Malfunction of the closed throttle position switch



EKAA0111

INSPECTION PROCEDURE 10

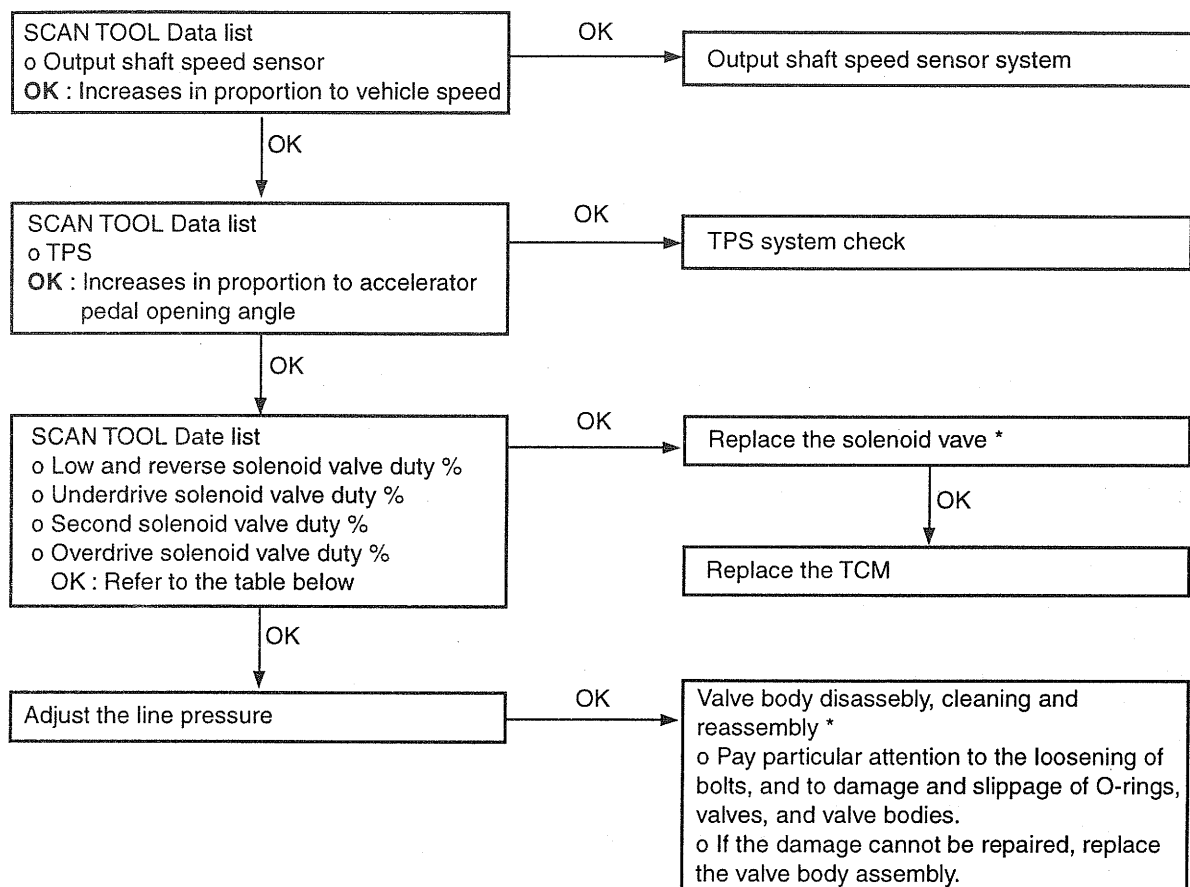
Shocks and running up	Probable cause
If shocks occur when driving due to upshifting or downshifting and the transaxle speed becomes higher than the engine speed, the cause is probably abnormal line pressure or a malfunction of a solenoid valve, oil pump, valve body or of a brake or clutch.	Abnormal line pressure Malfunction of each solenoid valve Malfunction of the oil pump Malfunction of the valve body Malfunction of each brake or each clutch



EKAA011J

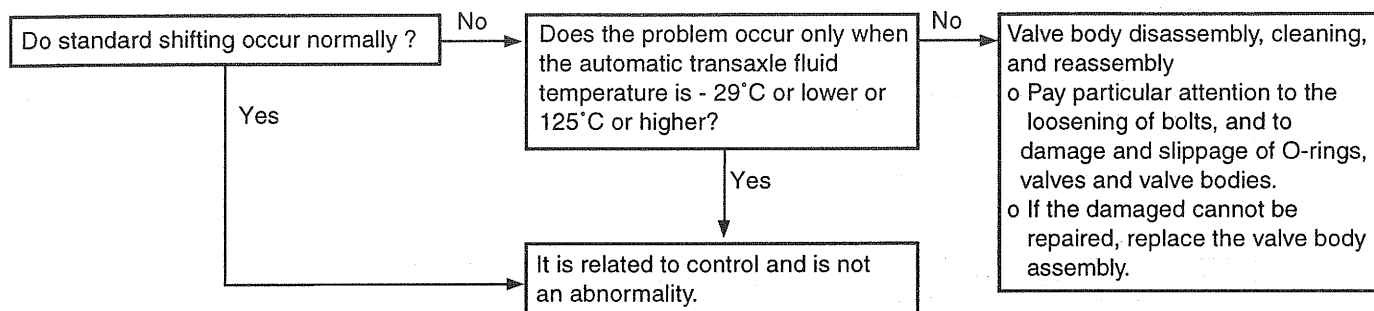
INSPECTION PROCEDURE 11

All points (Displaced shifting points)	Probable cause
If all shift points are displaced while driving, the cause is probably a malfunction of the output shaft speed sensor, TPS or a solenoid valve.	Malfunction of the output shaft speed sensor Malfunction of the throttle position sensor Malfunction of each solenoid valve Abnormal line pressure Malfunction of the valve body Malfunction of the TCM



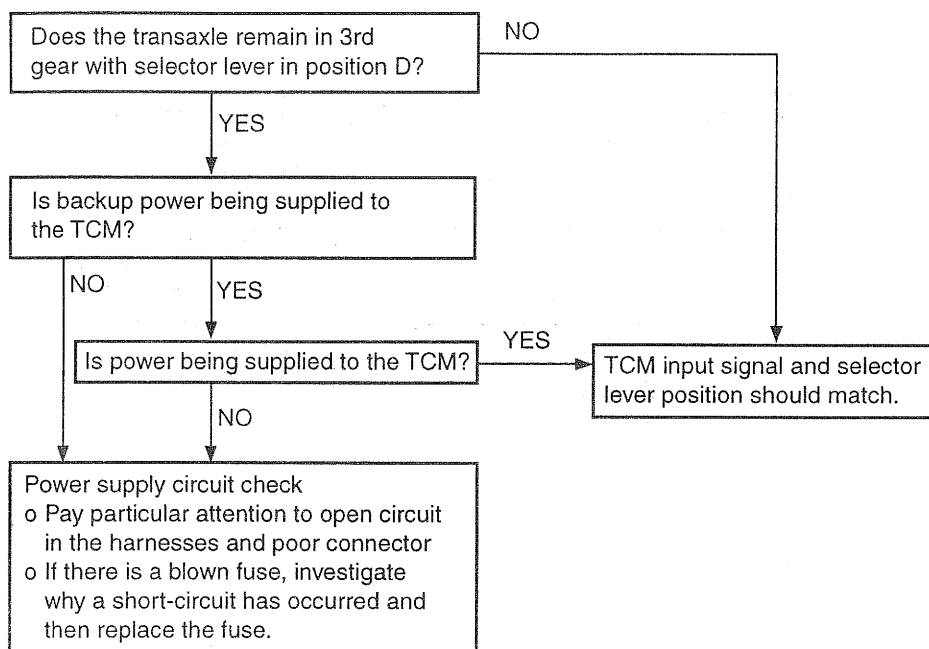
INSPECTION PROCEDURE 12

Some points (Displaced shifting points)	Probable cause
If some of the shift points are displaced while driving, the cause is probably a malfunction of the valve body, or it is related to control and is not an abnormality.	Malfunction of the valve body



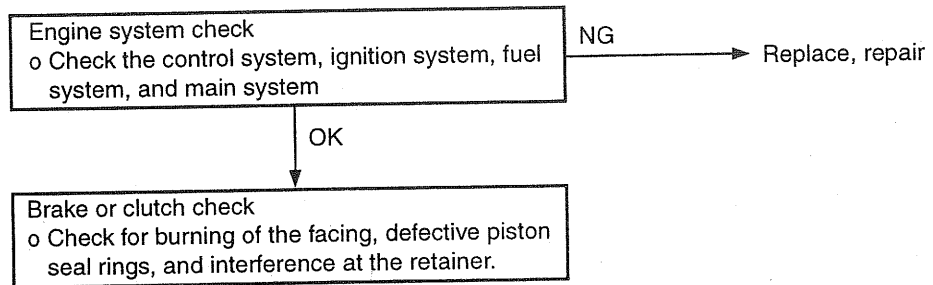
INSPECTION PROCEDURE 13

No diagnostic trouble codes (Does not shift)	Probable cause
If shifting does not occur while driving and no diagnostic trouble codes are given, the cause is probably a malfunction of the Park/Neutral position switch, or TCM.	Malfunction of the Park/Neutral position switch Malfunction of the TCM



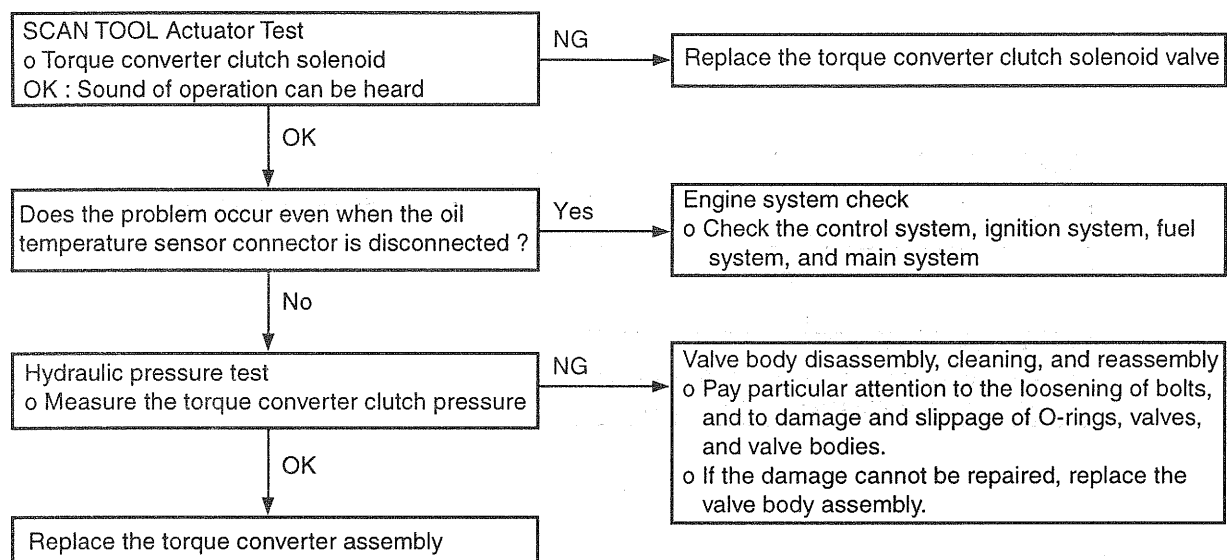
INSPECTION PROCEDURE 14

Poor acceleration	Probable cause
If acceleration is poor even if downshifting occurs while driving, the cause is probably a malfunction of the engine system or of a brake or clutch.	Malfunction of the engine system Malfunction of the brake or clutch



INSPECTION PROCEDURE 15

Vibration	Probable cause
If vibration occurs when driving at constant speed or when accelerating in top range, the cause is probably abnormal torque converter clutch pressure or a malfunction of the engine system, torque converter clutch solenoid, torque converter or valve body.	Abnormal torque converter clutch pressure Malfunction of the engine system Malfunction of the torque converter clutch solenoid Malfunction of the torque converter Malfunction of the valve body



SERVICE ADJUSTMENT PROCEDURES

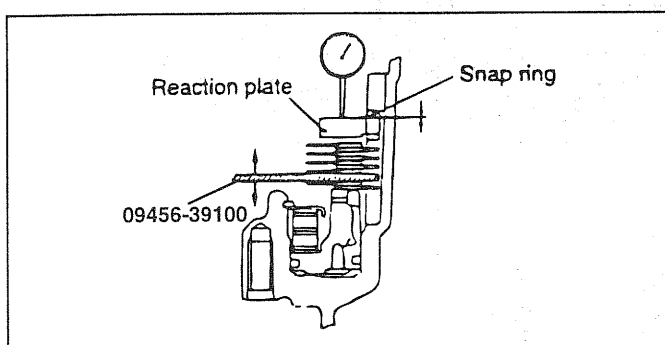
EKHA0150

BRAKE REACTIONPLATE END PLAY ADJUSTMENT

Replace the pressure plate of the low-reverse brake with the special tool, and then install the brake disc, brake plate, and snap ring as shown in the figure. Install the reaction plate and the used snap ring. Move the special tool to measure the end play, and then replace the snap ring to adjust the end play to standard value.

Standard value : 0-0.16 mm

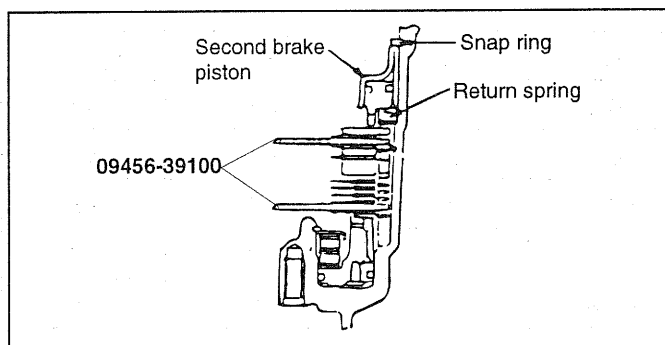
(Refer to the "Snap ring and spacer for adjustment")



EKA9011A

SECOND BRAKE END PLAY ADJUSTMENT

Replace the pressure plate of the second brake with the special tool, and then install the brake disc and brake plate as shown in the figure. Install the return spring, second brake piston, and snap ring.

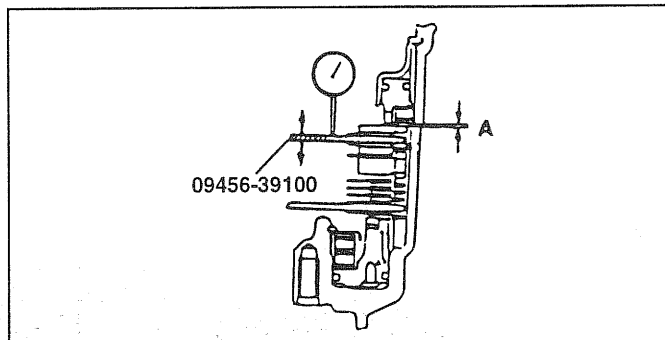


EKA9011B

Standard value : 0.79-1.25 mm

Reference Select a pressure plate whose thickness is within the following value. [A (moving amount) + thickness of the special tool — 1.25] to [A (moving

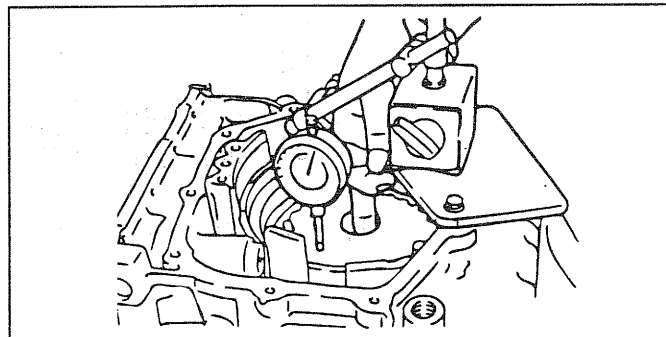
amount) + thickness of the special tool — 0.79]. (Refer to the "Snap ring and spacer for adjustment")



EKA9011E

LOW-REVERSE BRAKE END PLAY ADJUSTMENT

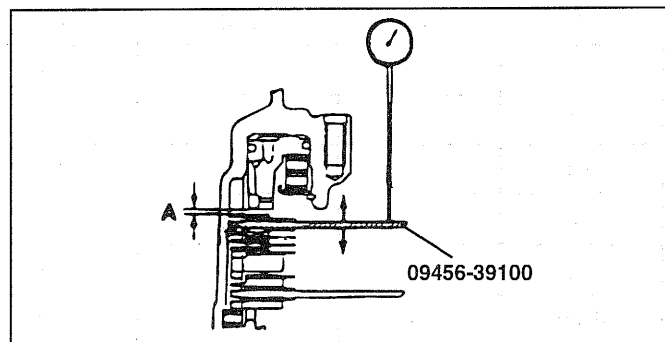
Reverse the transmission and install the dial gauge. Move the special tool up and down to measure the end play.



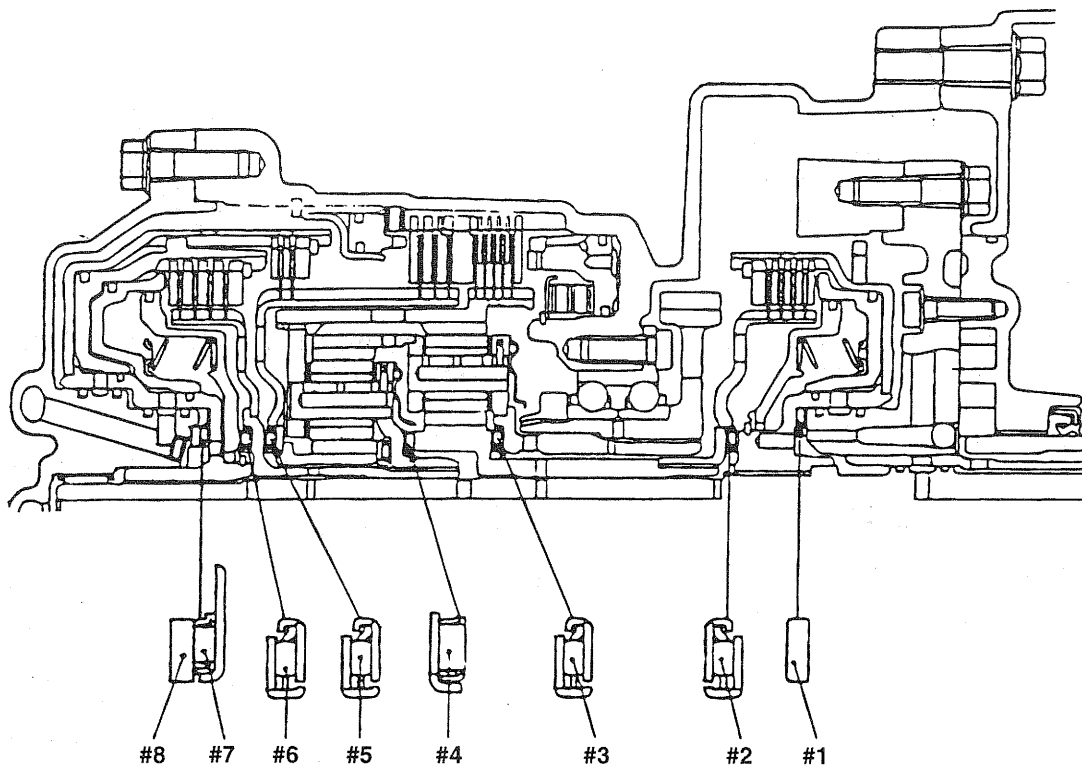
EKA9011D

Standard value : 1.35-1.81 mm

Reference Select a pressure plate whose thickness is within the following value. [A (moving amount) + thickness of the special tool — 1.81] to [A (moving amount) + thickness of the special tool — 1.35]. (Refer to the "Snap ring and spacer for adjustment").



EKA9011F



EKA9012A

IDENTIFICATION OF THRUST BEARING, THRUST RACES, AND THRUST WASHERS

O.D.	I.D.	Thickness	Symbol	O.D.	I.D.	Thickness	Symbol
59	47	1.8	#1	48.9	37	1.6	#8
59	47	2.0	#1	48.9	37	1.7	#8
59	47	2.2	#1	48.9	37	1.8	#8
59	47	2.4	#1	48.9	37	1.9	#8
59	47	2.6	#1	48.9	37	2.0	#8
59	47	2.8	#1	48.9	37	2.1	#8
49	36	3.6	#2	48.9	37	2.2	#8
49	36	3.6	#3	48.9	37	2.3	#8
45.3	31	3.3	#4	48.9	37	2.4	#8
49	36	3.6	#5	48.9	37	2.5	#8
49	36	3.6	#6	48.9	37	2.6	#8
59	37	2.8	#7	-	-	-	-

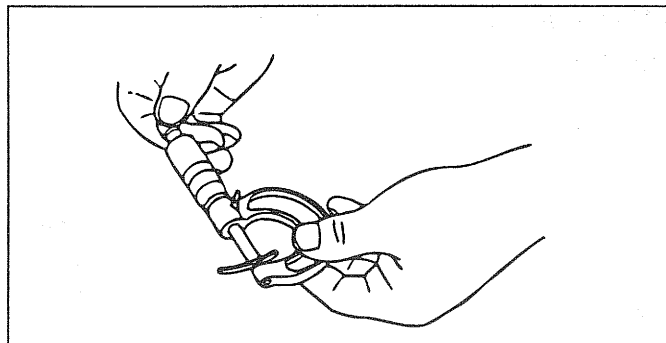
UNDERDRIVE SUN GEAR END PLAY ADJUSTMENT

Install the used thrust race #8, and then the rear cover. Measure end play of the underdrive sun gear. Replace thrust race #8 to adjust the play to the standard value.

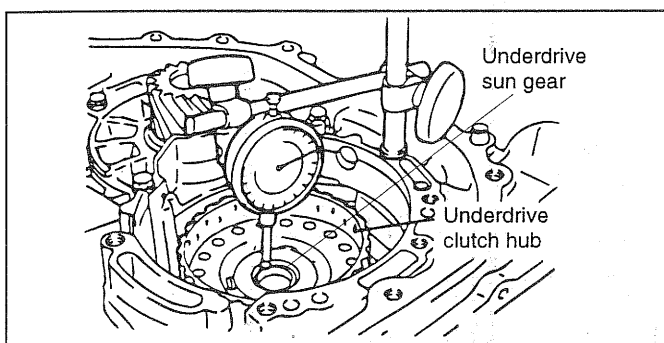
Standard value : 0.25-0.45 mm

NOTE

Installing the underdrive clutch hub makes it easy to measure the end play of the underdrive sun gear.



EKA9013C



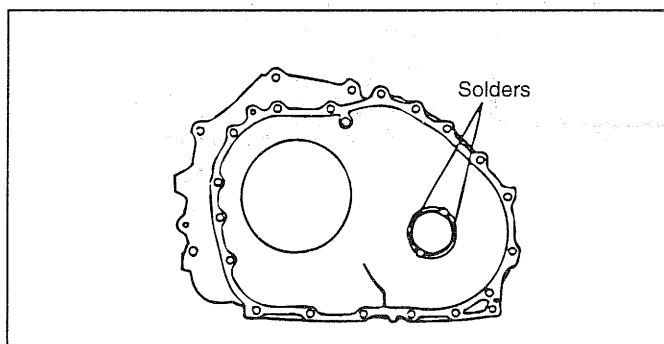
EKA9013A

DIFFERENTIAL CASE PRELOAD ADJUSTMENT

Place a solder (approx. 10 mm in length, 3 mm in diameter) on the torque converter housing as shown in the figure.

Install the torque converter housing to the transmission case without applying sealant. Tighten its mounting bolts to the specified torque. Loosen the bolts, and remove the solder. Use a micrometer to measure the thickness (T) of the pressed solder. Select a-spacer with a thickness that is within the following value.

Standard value : (T+0.045 mm) to (T+0.105 mm)

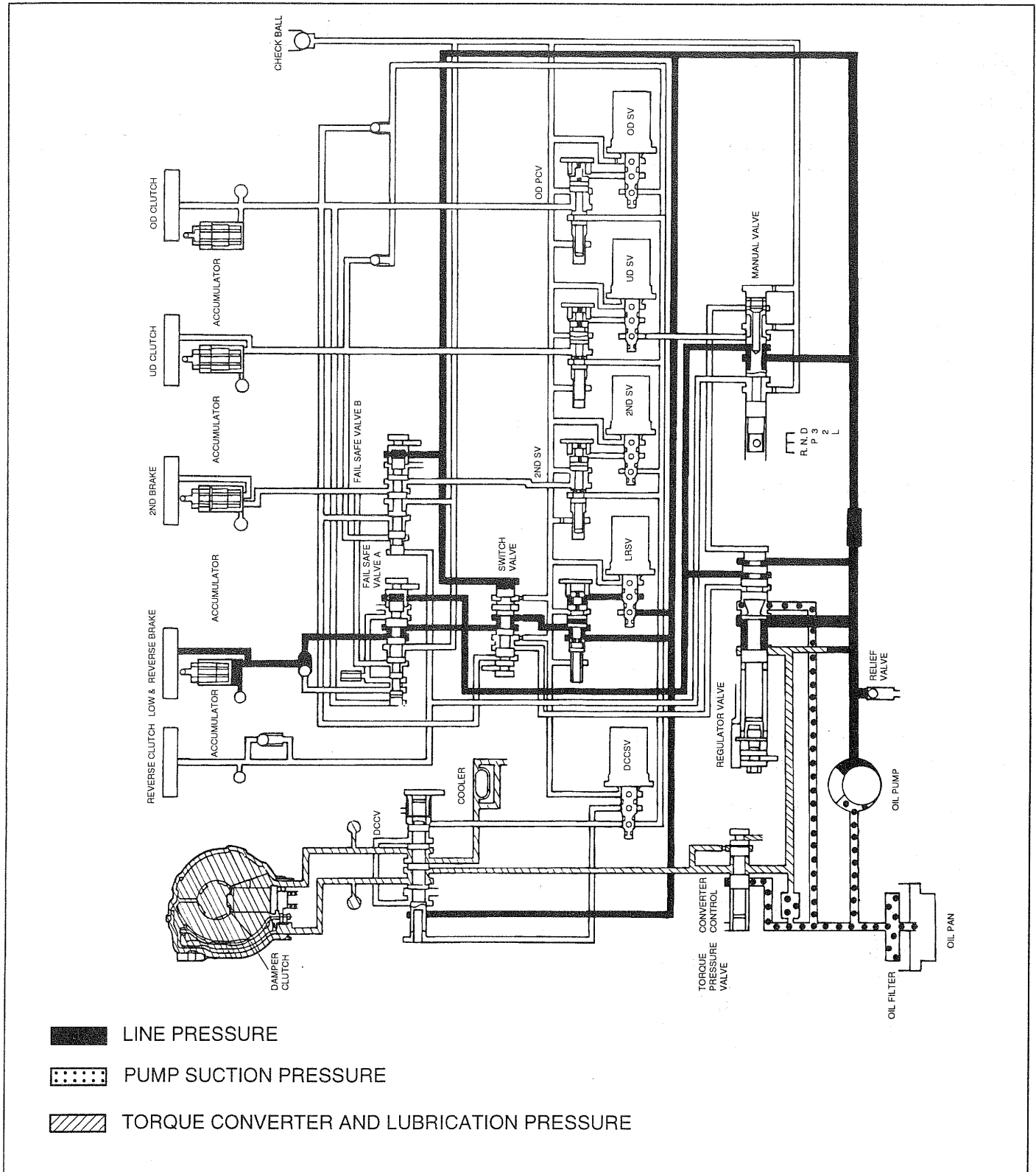


EKA9013B

AUTOMATIC TRANSAXLE HYDRAULIC CIRCUIT

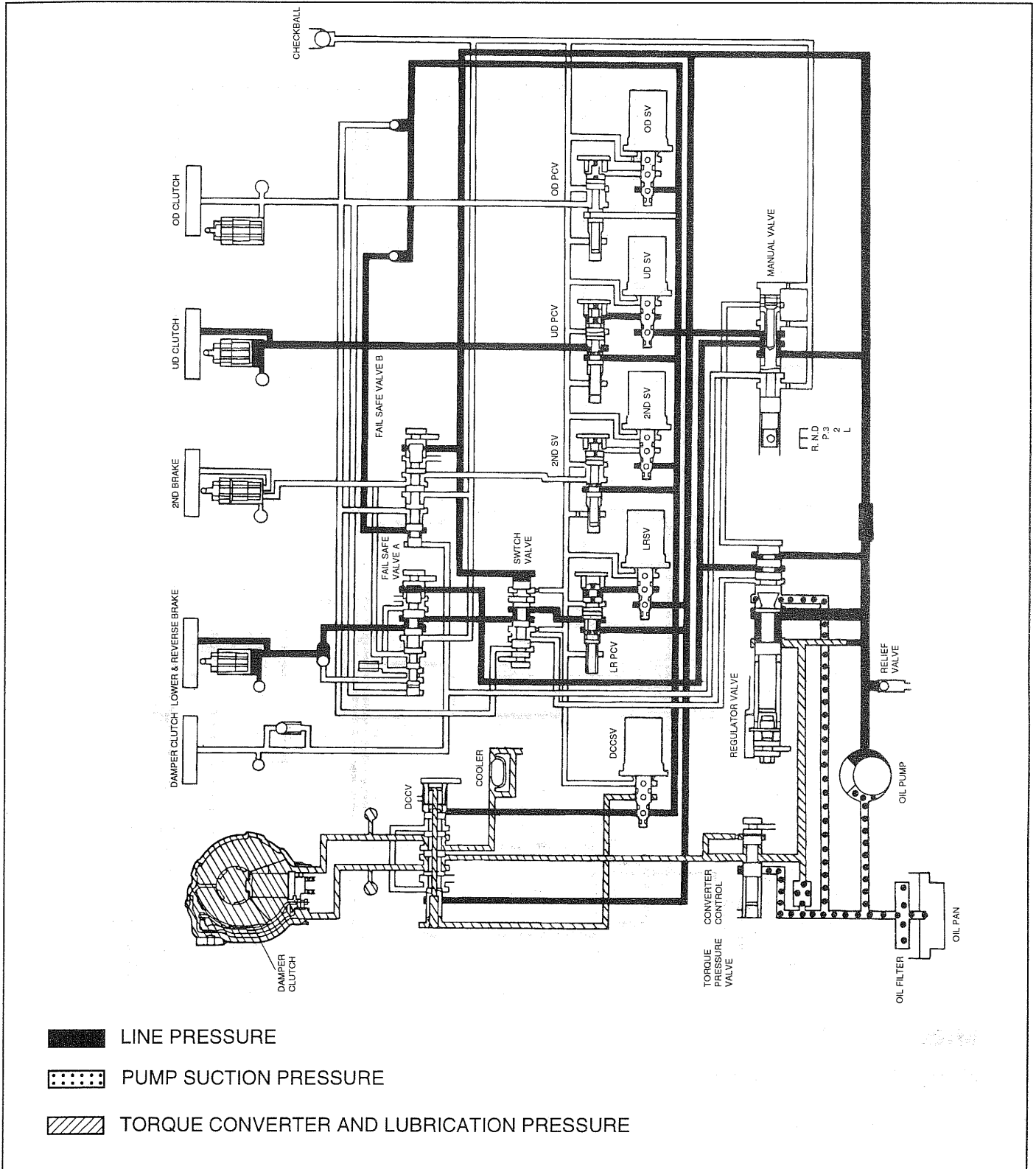
EKA90170

PARKING & NEUTRAL

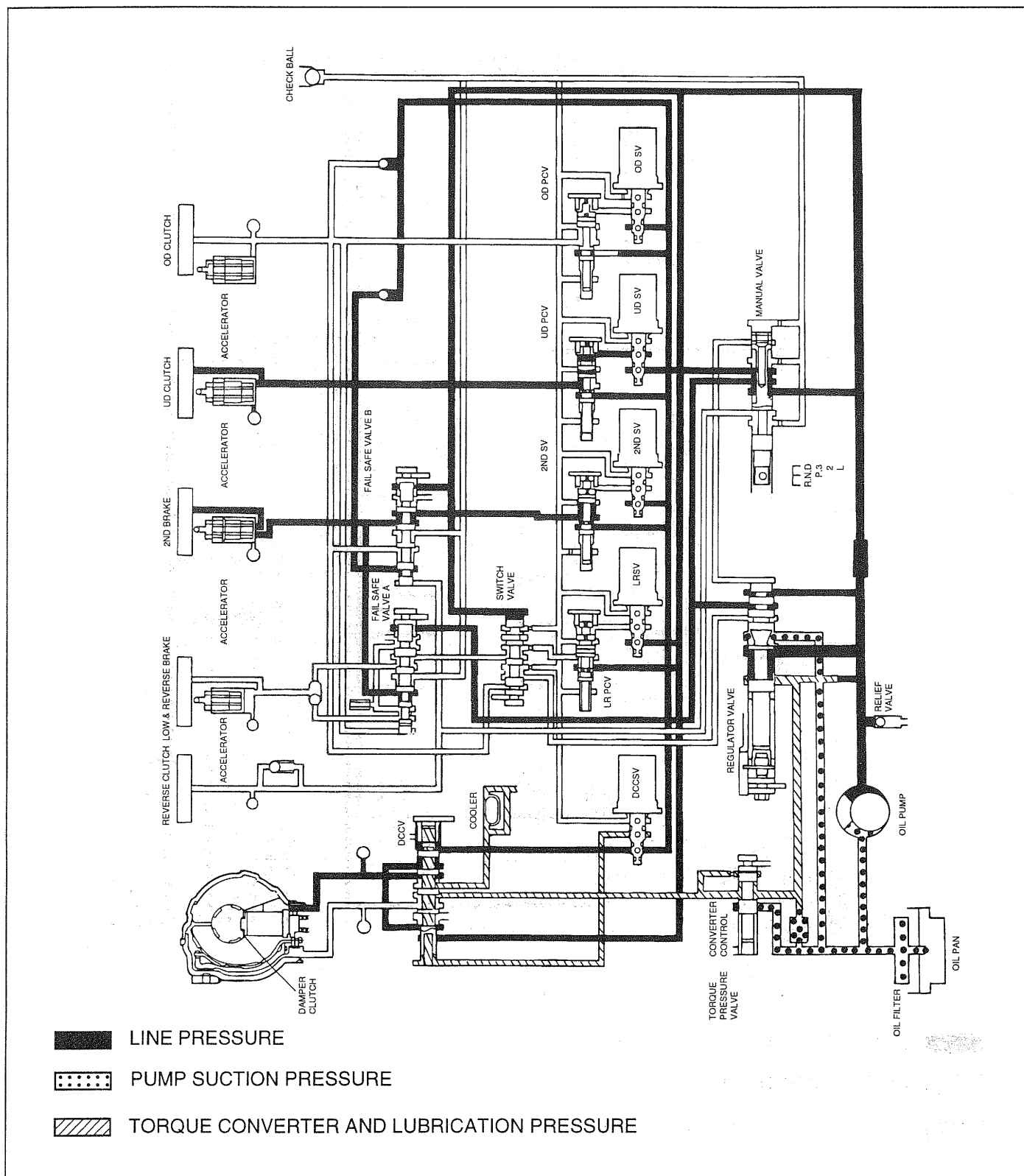


EKA9050A

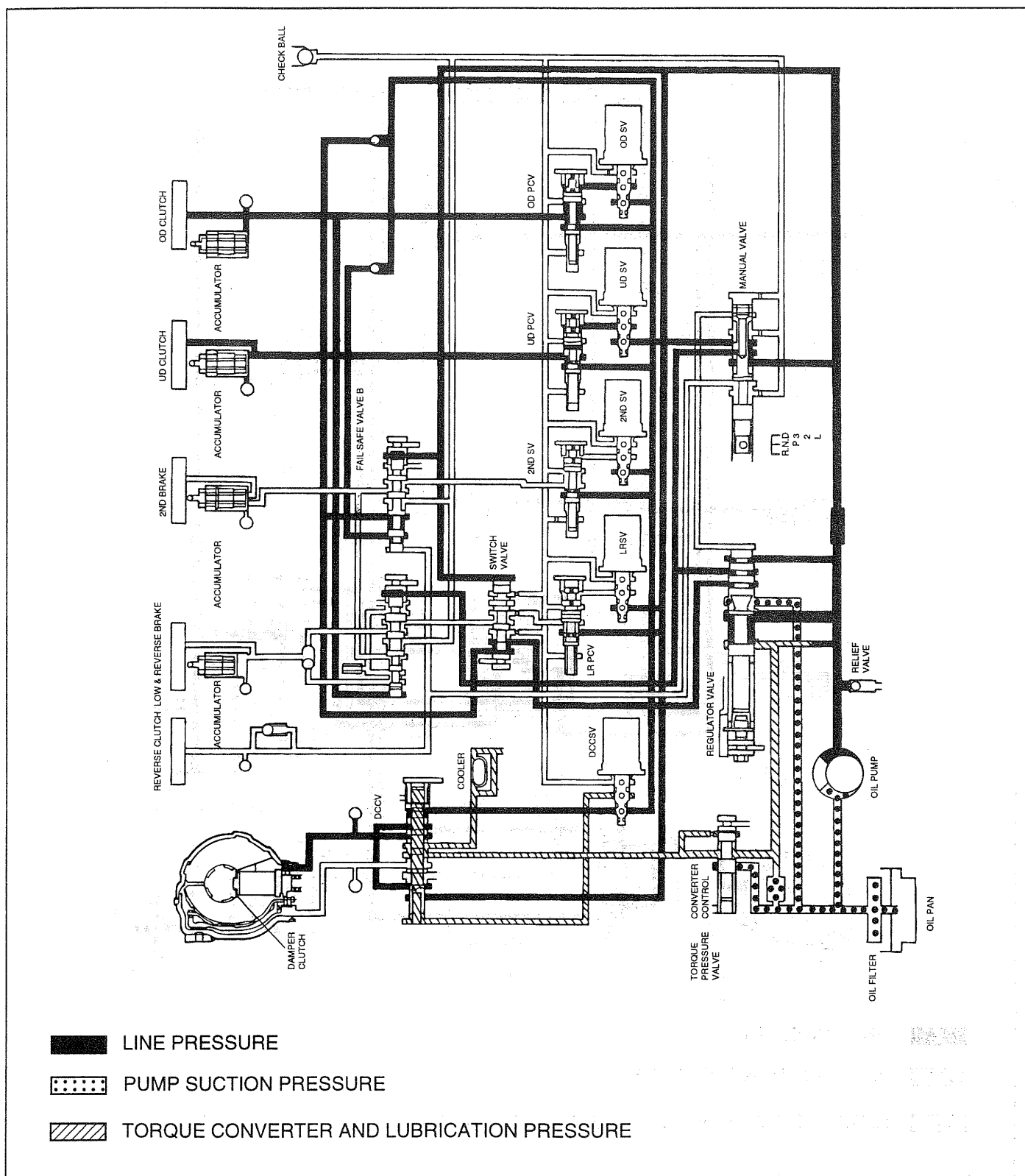
FIRST



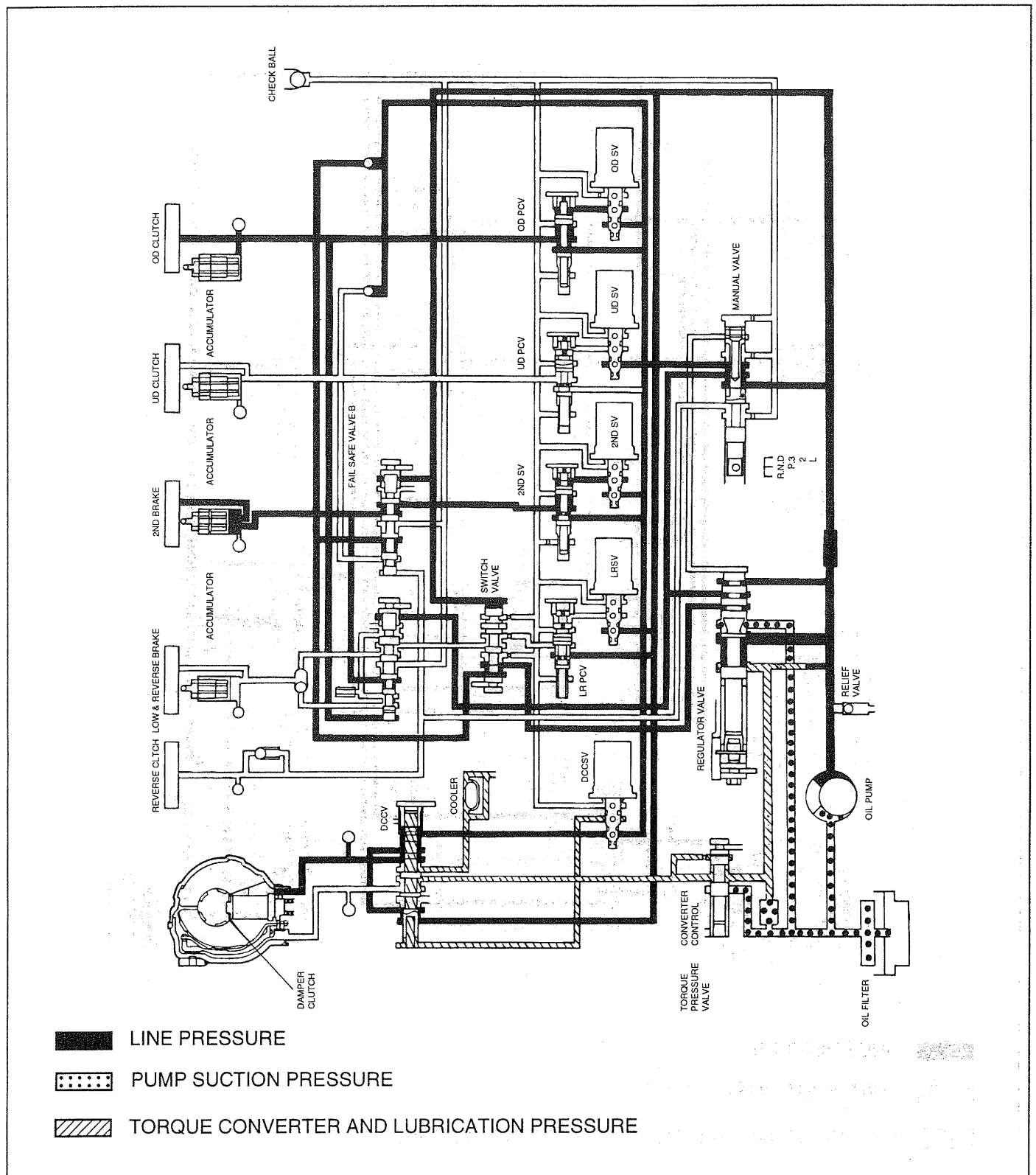
SECOND



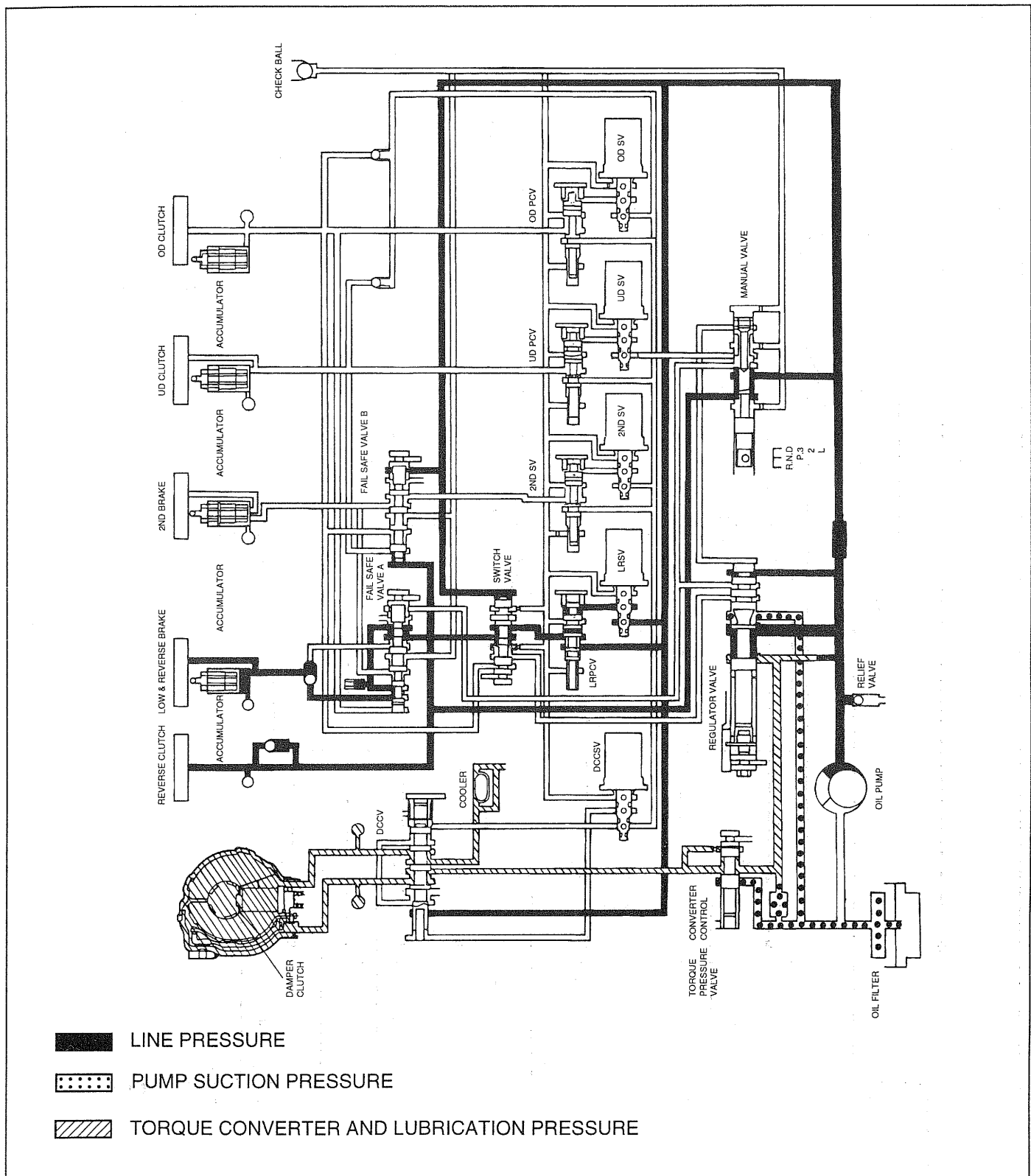
THIRD



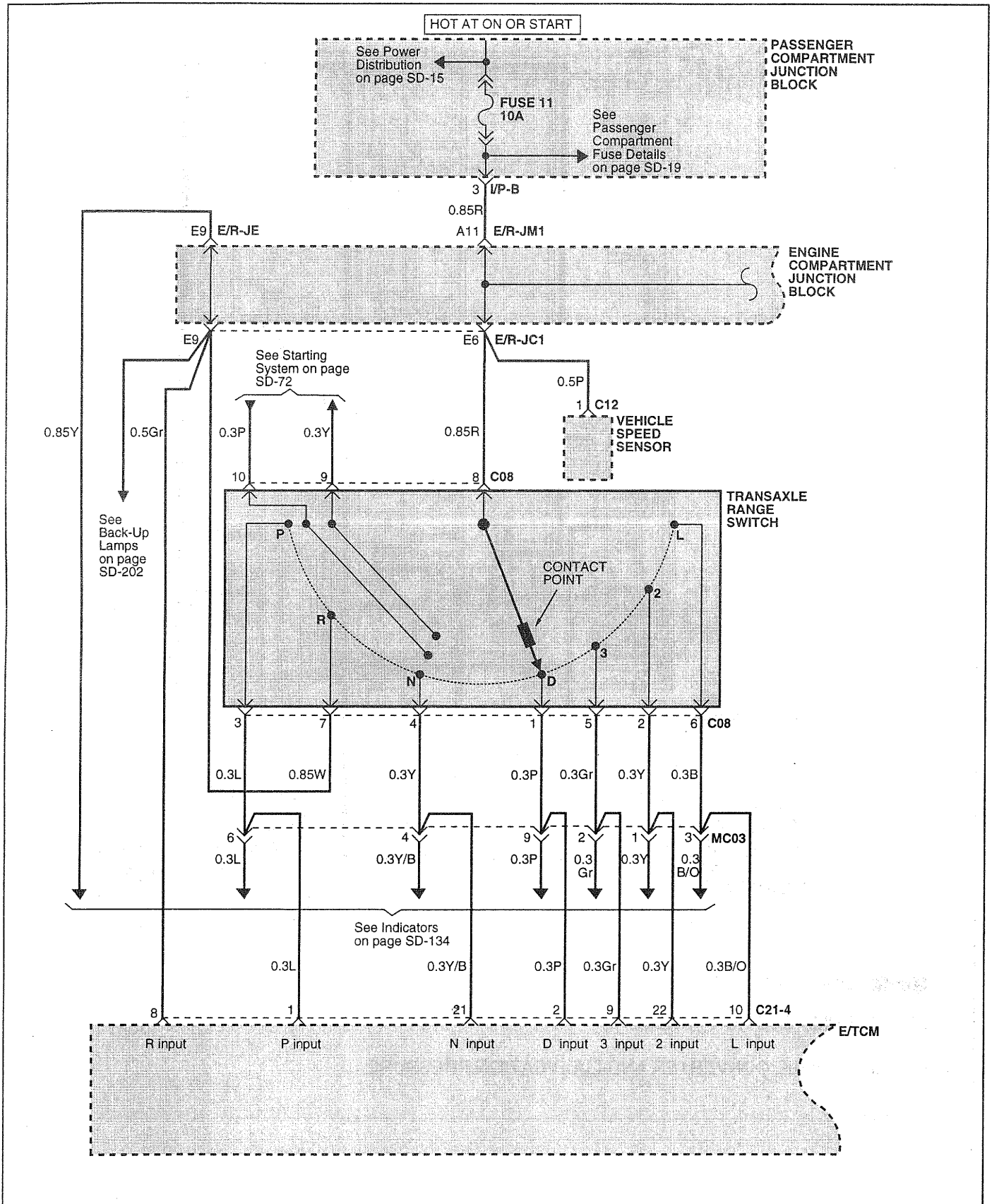
FOURTH

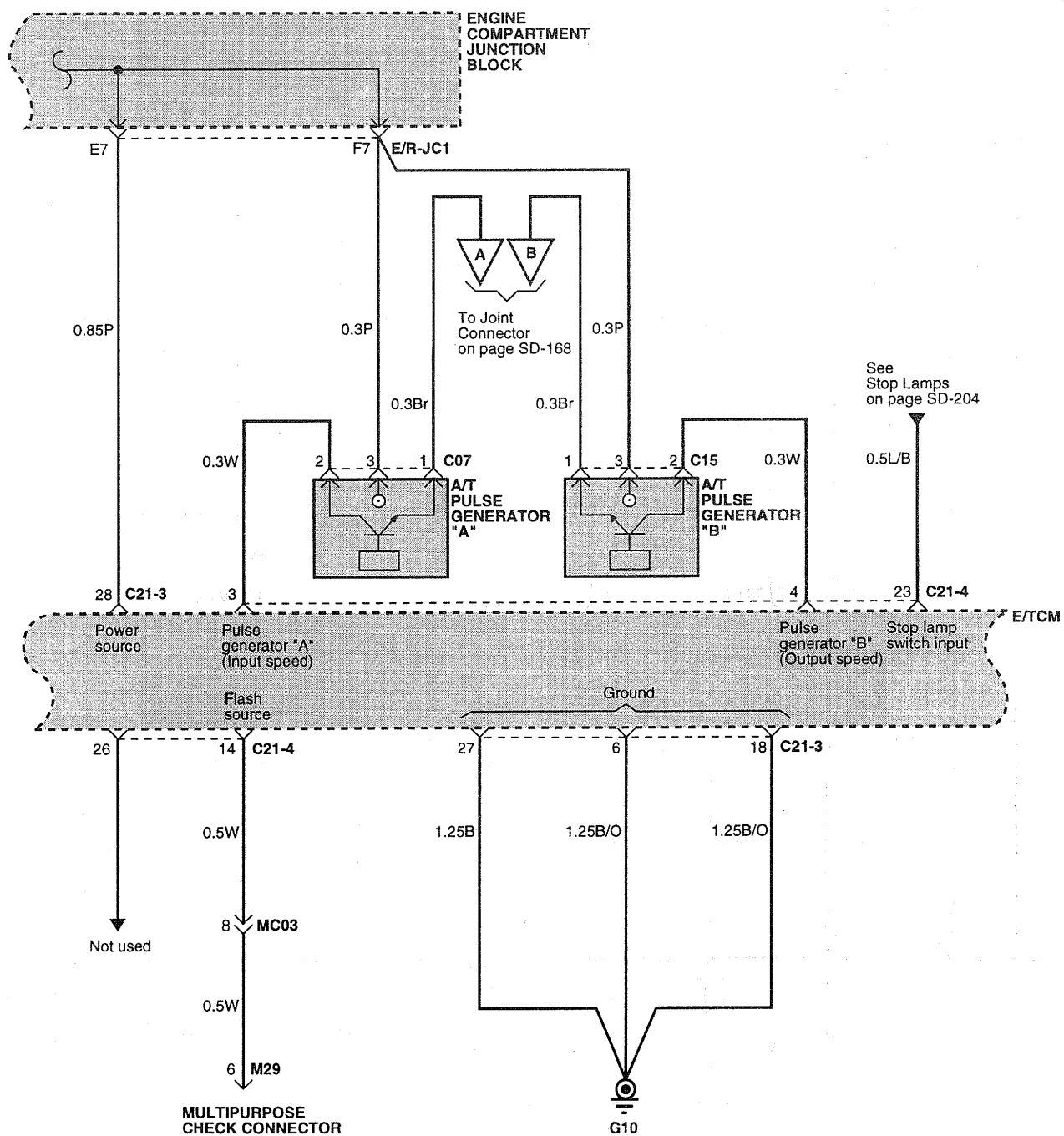


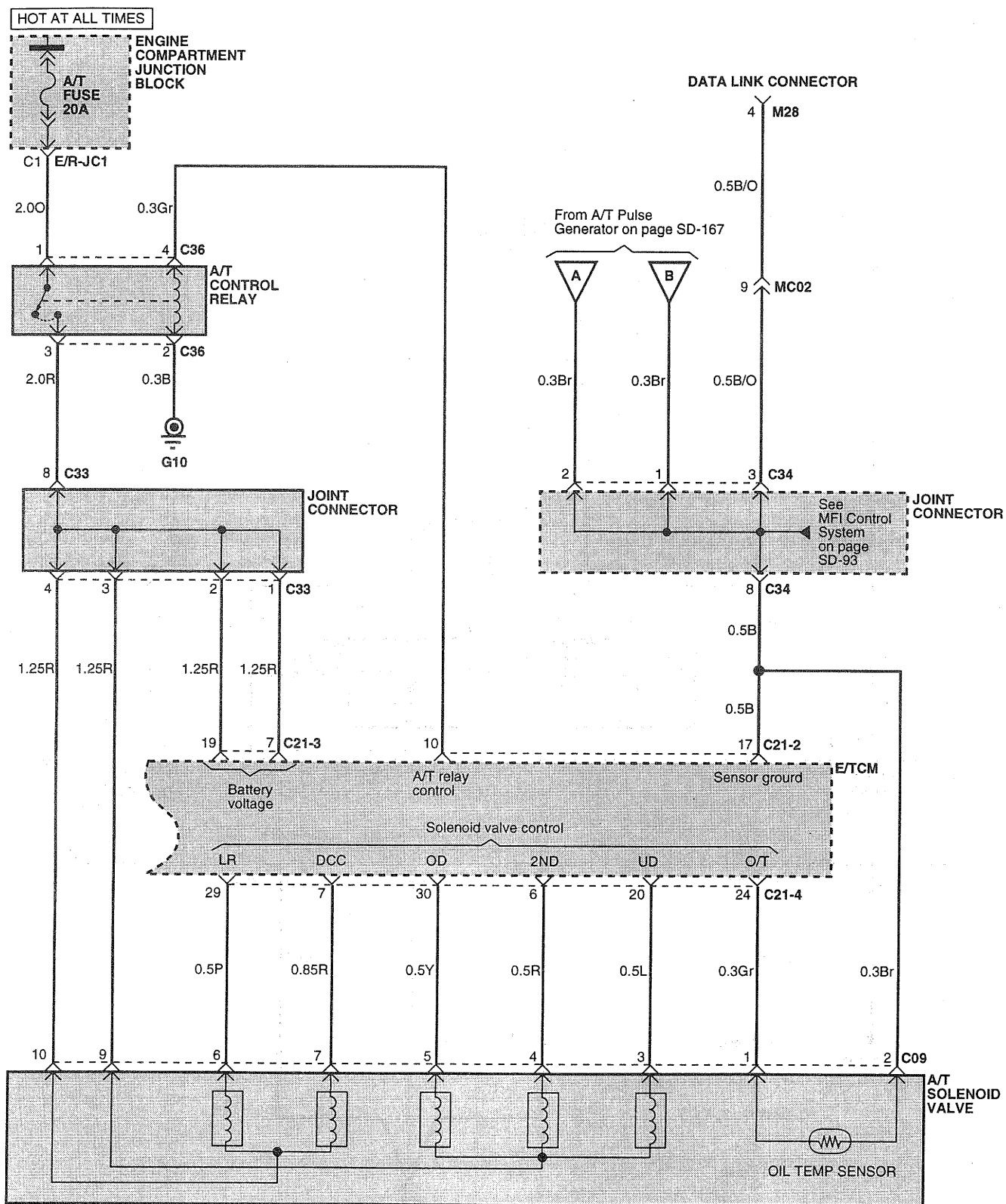
REVERSE



TCM CIRCUIT DIAGRAM (I4) (1) EKHA0300







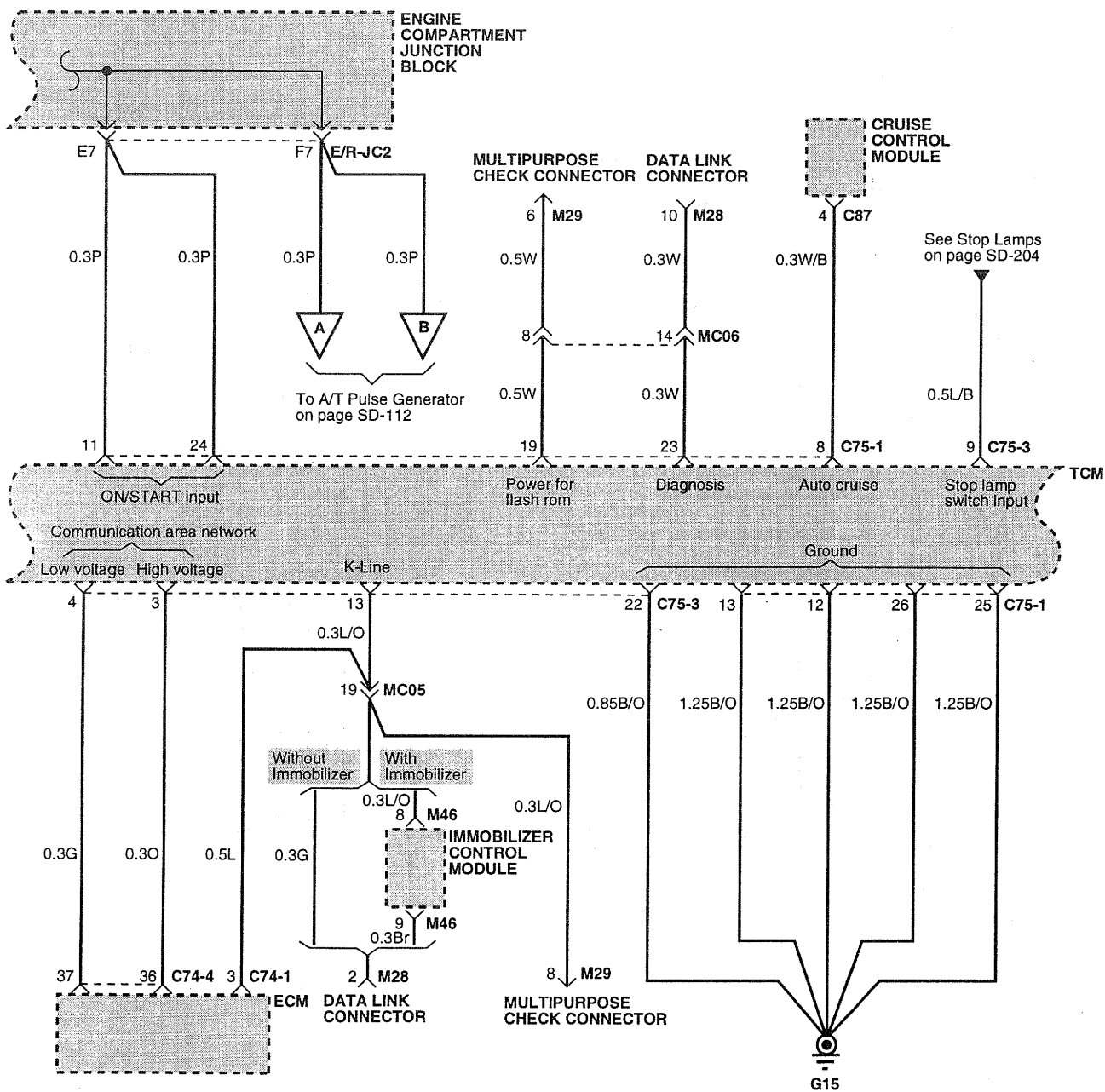
Wiring Diagram for Transaxle Range Switch (C57)

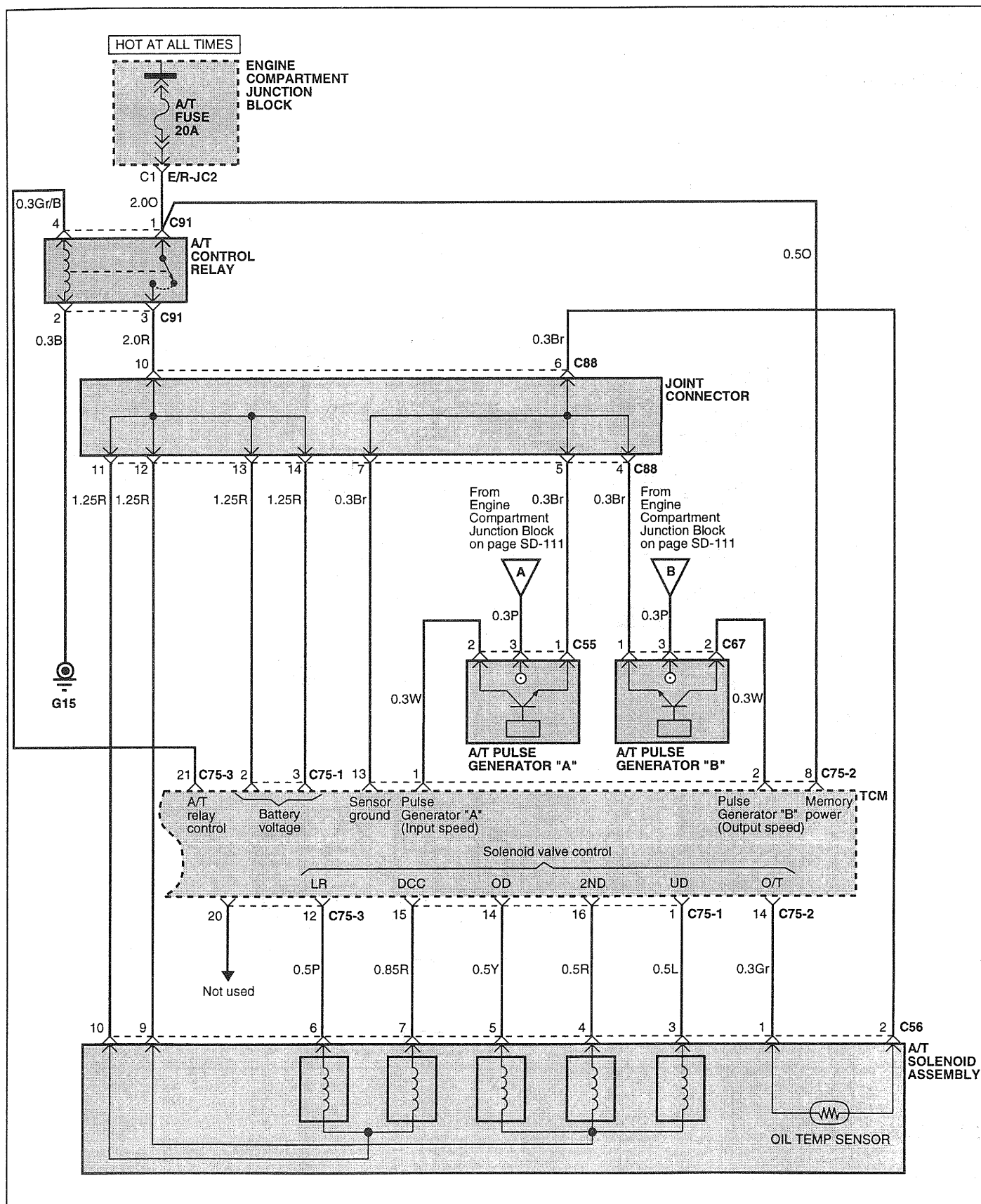
Legend:

- See Power Distribution on page SD-15
- See Passenger Compartment Fuse Details on page SD-19
- See Starting System on page SD-72
- See Indicators on page SD-134

Key Components and Connections:

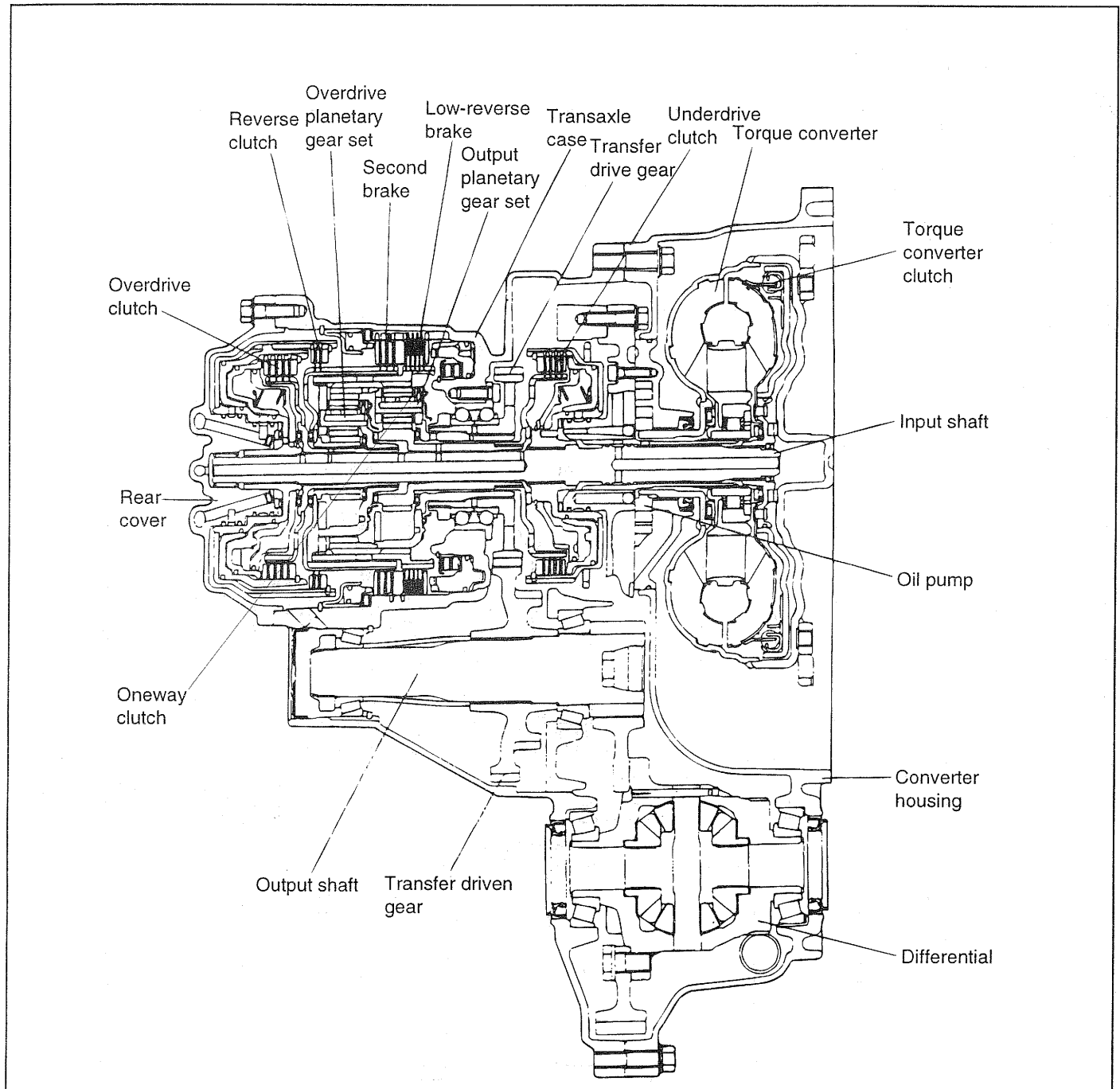
- PASSENGER COMPARTMENT JUNCTION BLOCK:**
 - 3 I/P-B (0.85R) to A11 E/R-JM1
 - FUSE 11 10A
- ENGINE COMPARTMENT JUNCTION BLOCK:**
 - E9 E/R-JE
 - E6 E/R-JC2 (0.5P)
- VEHICLE SPEED SENSOR (C66):**
 - 1 (0.5P) to E6 E/R-JC2
- TRANSAXLE RANGE SWITCH (C57):**
 - 10 (0.3P) to E9 E/R-JE
 - 9 (0.3Y) to E9 E/R-JE
 - 8 (0.85R) to A11 E/R-JM1
 - 3 (0.3L) to 16 R Input
 - 7 (0.85W) to 5 P Input
 - 4 (0.3Y) to 6 N Input
 - 1 (0.3P) to 17 D Input
 - 5 (0.3Gr) to 7 3 Input
 - 2 (0.3Y) to 18 2 Input
 - 6 (0.3B) to 8 L Input
- TCM (C75-3):**
 - 16 R Input (0.3L)
 - 5 P Input (0.85W)
 - 6 N Input (0.3Y/B)
 - 17 D Input (0.3P)
 - 7 3 Input (0.3Gr)
 - 18 2 Input (0.3Y)
 - 8 L Input (0.3B/O)
- Other Connections:**
 - 0.85Y to 16 R Input
 - 0.5Gr to 16 R Input
 - 0.3L to 6 N Input
 - 0.3Y/B to 6 N Input
 - 0.3P to 17 D Input
 - 0.3Gr to 17 D Input
 - 0.3Y to 18 2 Input
 - 0.3B/O to 8 L Input





AUTOMATIC TRANSAXLE

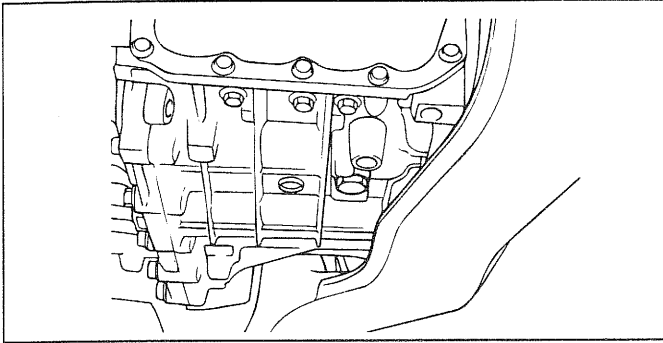
COMPONENTS EKA90240



EKA9008A

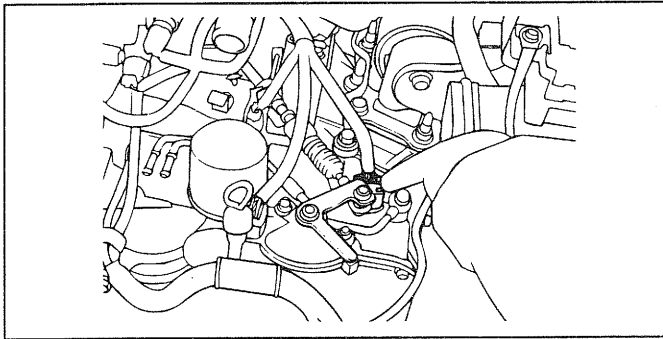
REMOVAL EKHA0250

1. Remove the drain plug and drain the automatic transaxle fluid.
2. Remove the air cleaner assembly.



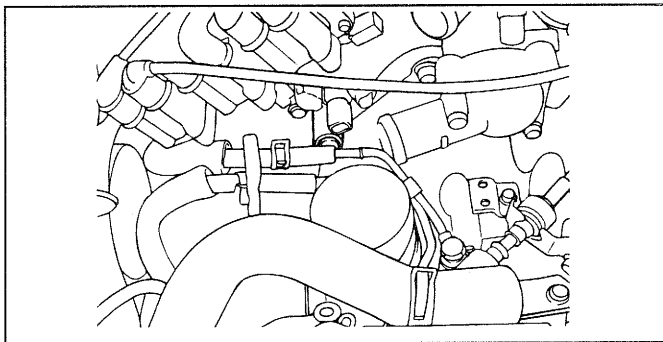
EKA9009A

3. Remove the control cable.
4. Disconnect the speedometer sensor connector.
5. Disconnect the transaxle range switch connector, solenoid connector, and oil temperature sensor connector.



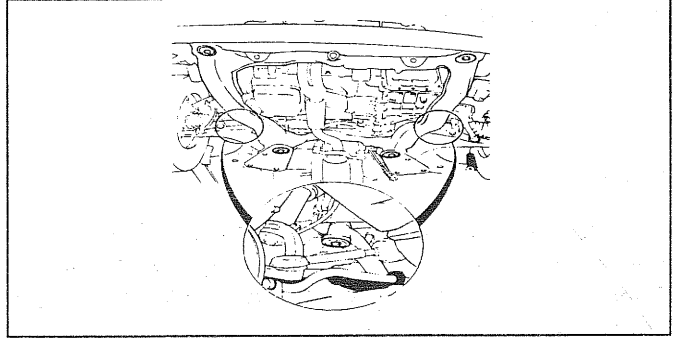
EKA9009B

6. Remove the oil cooler hose.



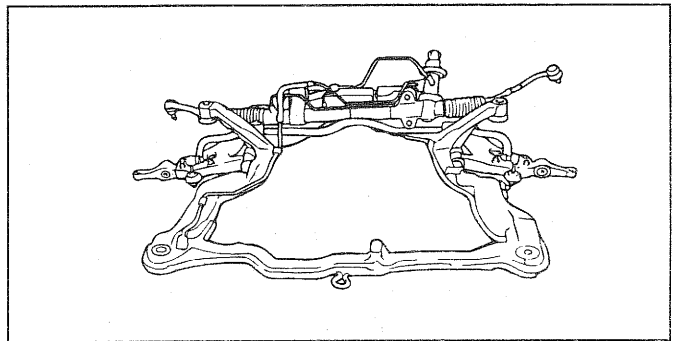
EKA9009C

7. Attach the special tool (09210-3A000, 09200-38001) and engine support fixture to the engine.
8. Remove the gear box, stabilizer bar, tie rod end, lower arm ball joint, and drive shaft.
9. Remove the gear box u-joint bolt and return the tube mounting bolts.
10. Remove the subframe mounting bolts and the sub-frame.



ECA9020A

11. Remove the starter motor.

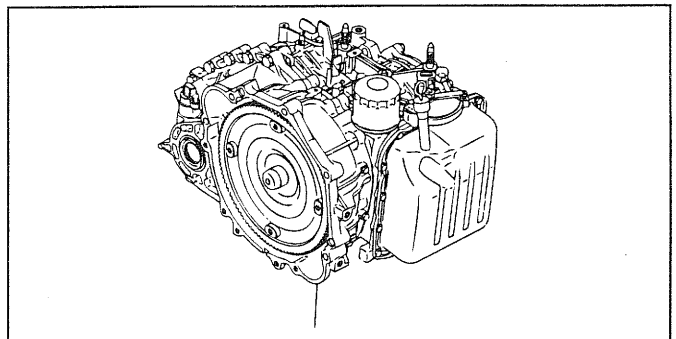


EKA9009F

12. Remove the automatic transaxle mounting bolts.
13. Remove the engine to automatic transaxle bolts.
14. Remove the automatic transaxle assembly by jack.

CAUTION

1. Engine and transmission mounting insulators should be installed as specified.
2. Mounting bracket installation procedures.
 - 1) Engine mounting bracket.
 - 2) T/M mounting bracket.
 - 3) Rear roll stopper mounting bracket.
 - 4) Front roll stopper mounting bracket.
3. When installing the front roll stopper mounting bracket, be especially careful not to crush the insulator. If crushed, idle vibration will most probably occur.



EKA9009E

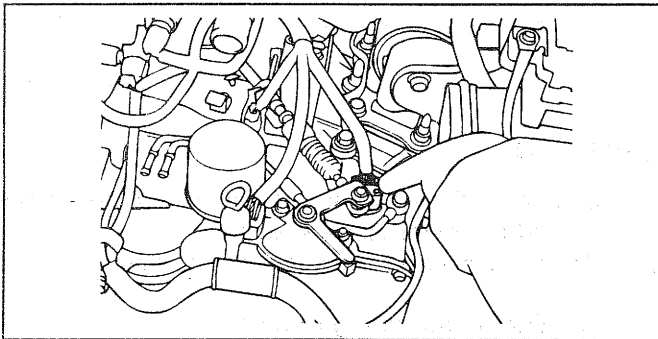
INSTALLATION EKHA0260

1. Attach the torque converter on the transaxle side and mount the transaxle assembly onto the engine.

CAUTION

If the torque conveter is mounted first on the engine, the oil seal on the transaxle may be damaged. Therefore, first be sure to assemble the torque converter to the transaxle.

2. Install the transaxle control cable and adjust as follows:
 1. Move the shift lever and the transaxle range swth to the "N" position and install the control cale.
 2. When connecting the control cable to the transaxle mounting bracket, install the clip until it contacts to the control cable.
 3. Remove any free-play in the control cable by adjusting the nut and then check to see that the selected lever moves smoothly.
 4. Check to see that the control cable has been adjusted correctly.
3. Installation is the reverse of removal.



EKA9009B

NOTE

For Manual Transaxle and Automatic Transaxle over-haul, refer to the "Overhaul Manual".

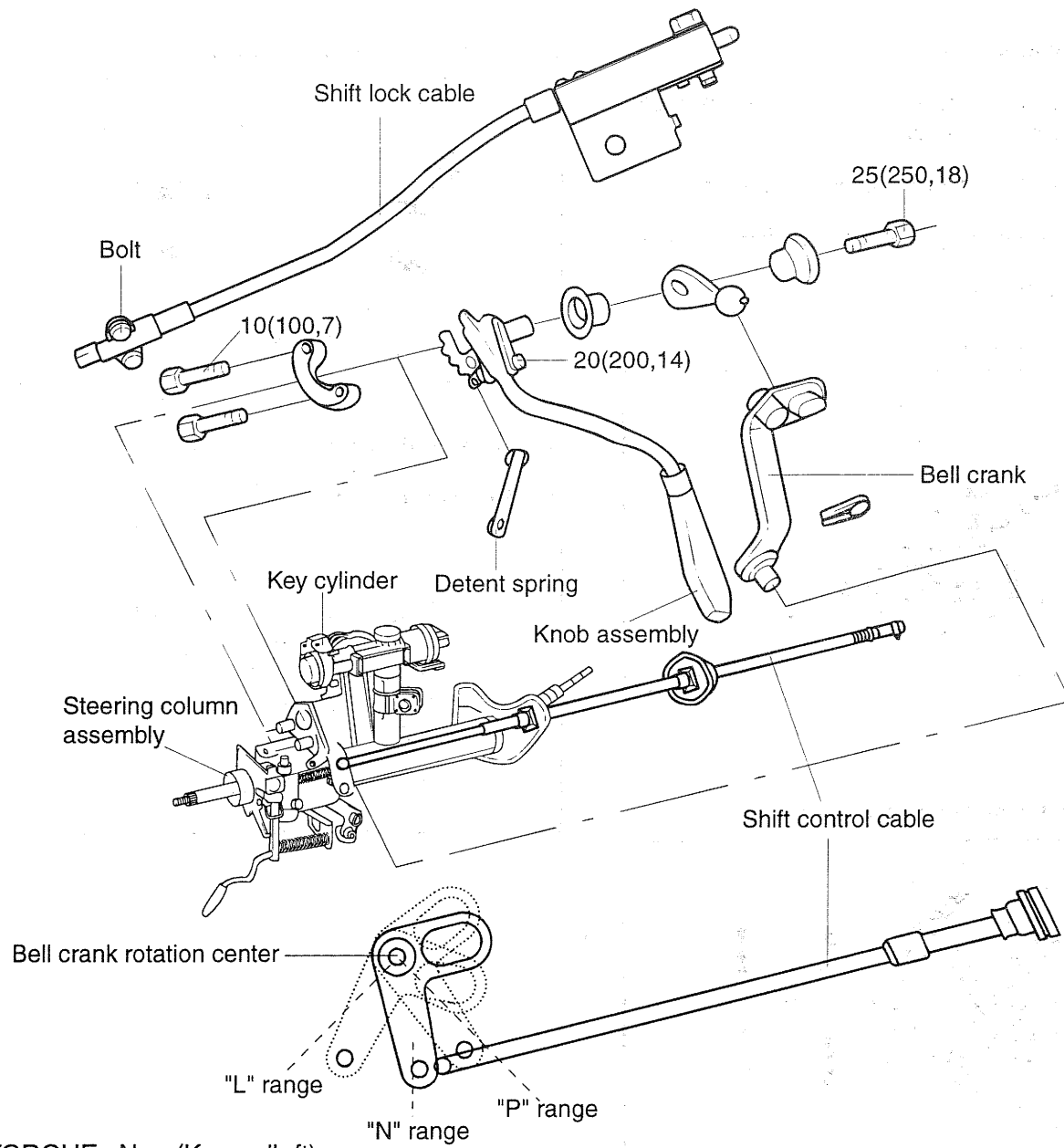
AUTOMATIC TRANSAXLE SHIFT CONTROL

AUTOMATIC TRANSAXLE CONTROL SYSTEM

EKHA0180

AUTOMATIC TRANSAXLE SHIFT CONTROL

COMPONENTS



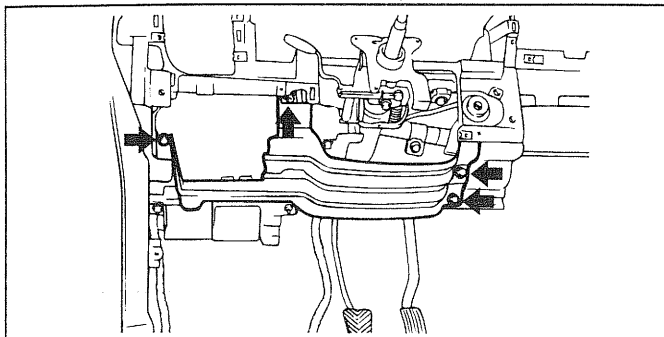
TORQUE : N.m (Kg.cm,lb.ft)

EKHA030A

REMOVAL

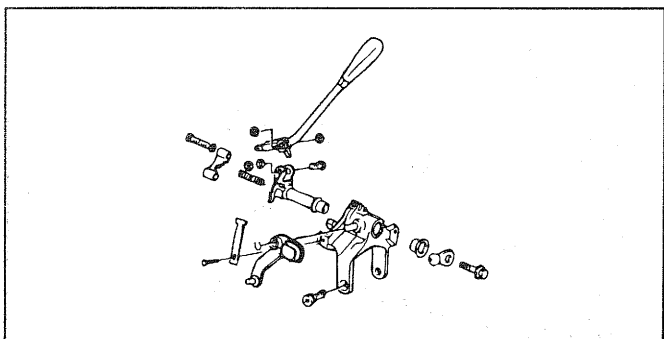
EKHA0190

1. Remove lower and the upper cover of the steering column.



ESHA040X

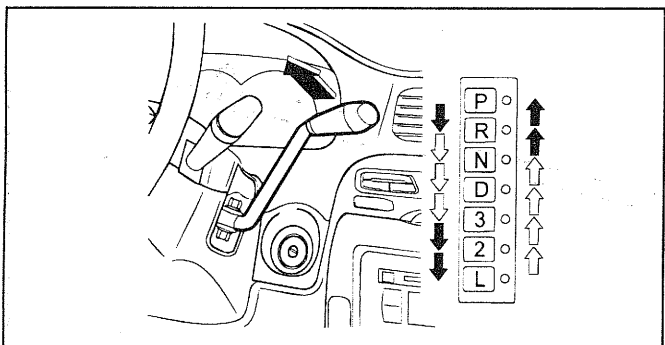
2. Remove the lower shroud cover.
3. Remove the shift control cable, the shift lock cable, and the key inter lock cable.
 - 1) Remove the clip of the control cable side.
 - 2) Remove the bolt and the air cleaner assembly.
 - 3) Remove battery.
 - 4) Remove cables.



EKHA040A

Shift lever

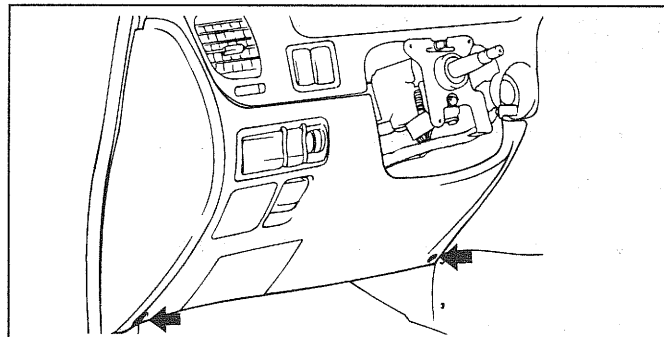
It is installed on the steering column side.



EKHA035A

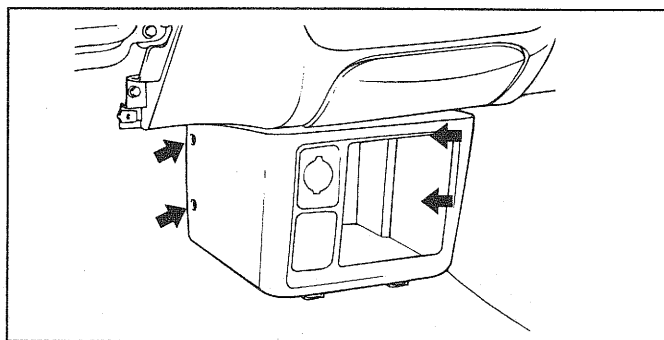
TCM REPLACEMENT

1. Remove the lower shroud cover.



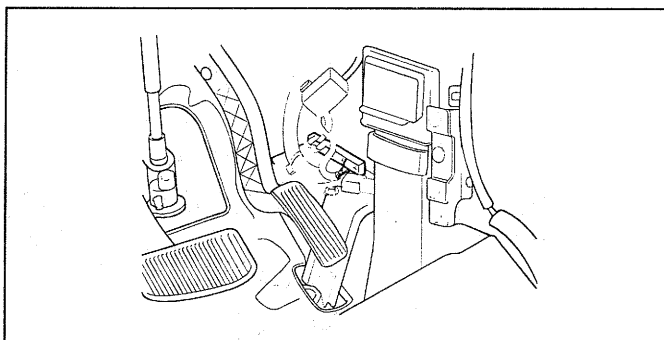
ESHA040S

2. Remove the multi box housing.



ESHA040L

3. Remove the center lower side cover.
4. Remove the TCM.



EKHA031A

MANUAL TRANSAXLE SYSTEM

MANUAL TRANSAXLE SYSTEM EMA90070

SERVICE ADJUSTMENT PROCEDURES

TRANSAXLE GEAR OIL LEVEL INSPECTION

Inspect each component for evidence of leakage. Check the gear oil level by removing the filler plug. If the oil is contaminated, it is necessary to replace it with new oil.

1. Remove oil filler plug and check level with finger.
2. Oil level must be up to fill the hole, add oil until it runs over. Then reinstall plug.
3. Replace the oil so that the transaxle gear oil is not dirty, and that it is not of a suitable viscosity.

REPLACEMENT OF TRANSAXLE GEAR OIL EMA90080

Use HP Gear Oil SAE 75W/90 (API-GL-4).

1. With the vehicle parked on a levelled surface, remove the drain plug and drain the transaxle oil.
2. Replace the gasket with a new one and install the drain plug.
3. Add new oil through the filler plug and, fill it to below the plug opening.

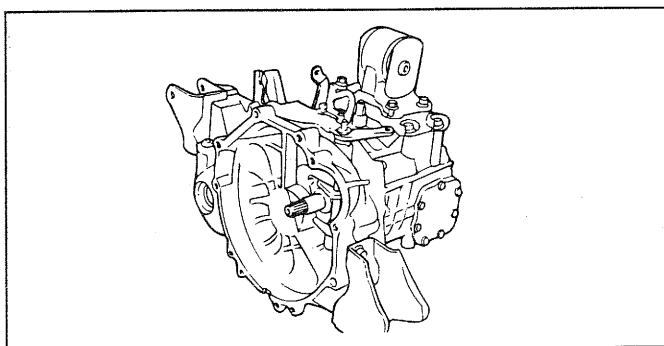
Standard value :

Transaxle oil total capacity

2.1 lit (2.2 U.S.qts., 1.8 imp.qts.)

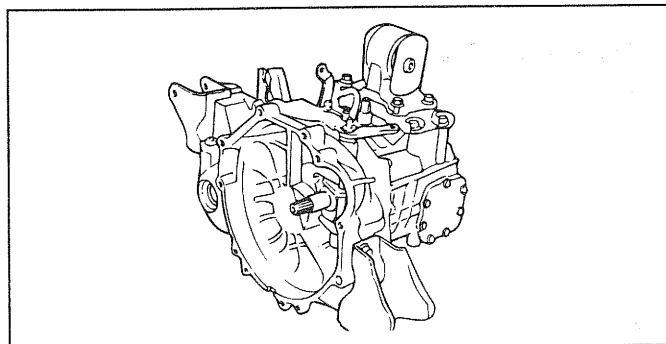
DRIVE SHAFT OIL SEAL REPLACEMENT EMA90090

1. Disconnect the drive shaft from the transaxle (Refer to "DS" group).



EMA9001F

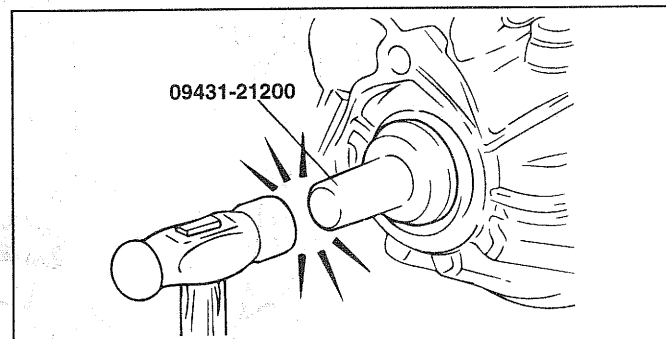
2. Using a flat-tip screwdriver, remove the oil seal.



EMA9001F

3. Using the special tool (09431-21200), tap the drive shaft oil seal into the transaxle.
4. Apply a coating of gear oil to the oil seal.

Transaxle gear oil : Hypoid gear oil, SAE 75W/90 conforming to API GL-4 or higher. Disconnect the drive shaft from the transaxle (Refer to "DS" group).

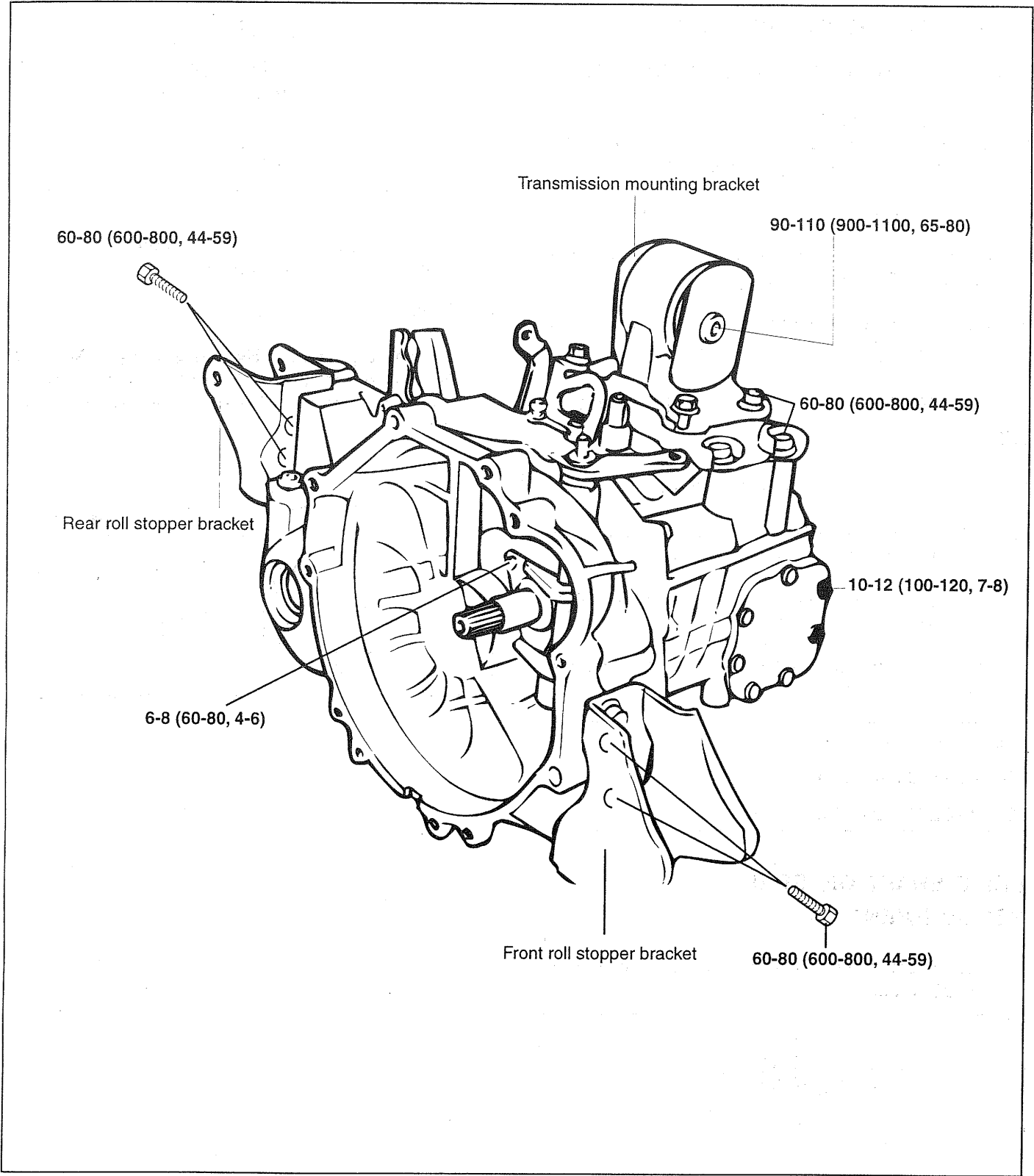


EMA9009G

MANUAL TRANSAXLE

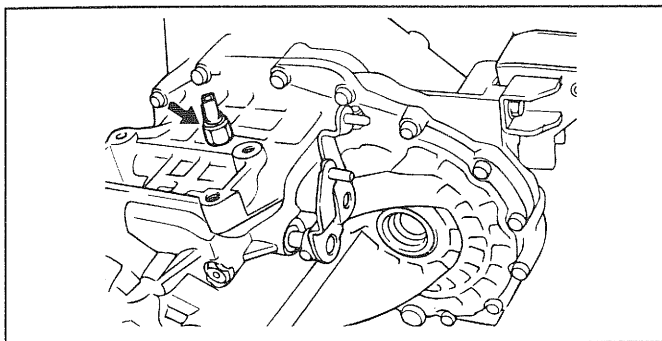
COMPONENTS

EMA90180



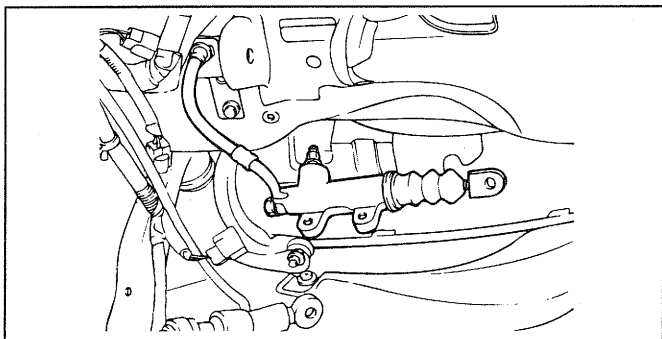
REMOVAL EMHA0190

1. Remove the battery (-) cable.
2. Remove the air duct.
3. Remove the air cleaner and air flow hose assembly.
4. Disconnect the backup light switch connector.
5. Disconnect the clutch tube and clip.



EMA9001D

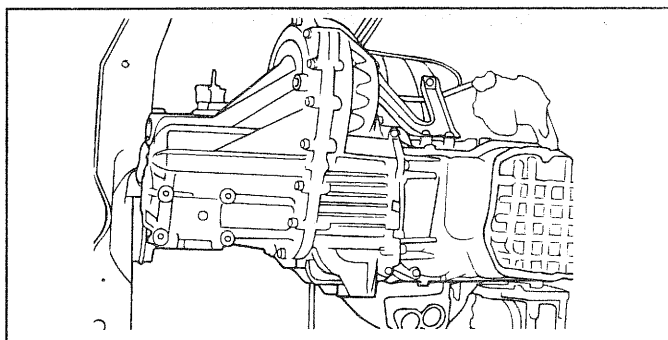
6. Remove the clutch release cylinder (Refer to "CH" Group).
7. Remove the speedometer cable.
8. Remove the select cable and shift cable (Refer to "MT" Group).



EOA9014D

9. Remove the starter motor mounting bolts, and remove the transaxle assembly upper connecting bolts.
10. Attach to the engine hooks using the special tool (09210-3A000, 09200-38001).
11. Remove the transaxle mounting bracket and insulator.
12. Lift the vehicle up.
13. Remove the front tire.
14. Remove the drain plug and drain the transaxle gear oil.

15. Disconnect the tie rod end. Lower arm ball joint and drive shaft. (Refer to "DS" Group).
16. Remove the gear box u-joint bolt and the return tube mounting bolts.
17. Remove the front muffler.
18. Remove the sub-frame mounting bolts and the sub-frame.
19. Remove the transaxle front and rear mounting bracket.
20. Remove the transaxle side mounting bolts.



EMA9019B

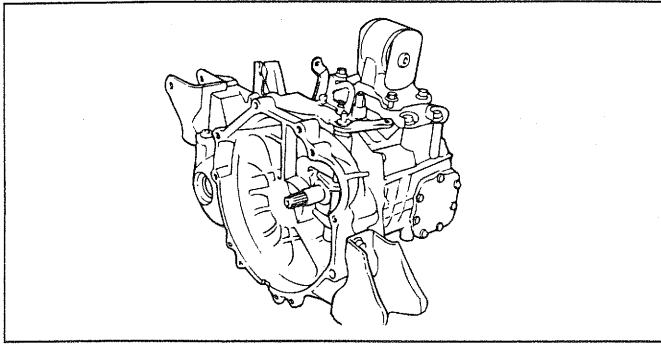
21. Remove the transaxle assembly supporting it with a jack.

NOTE

When supporting the transaxle assembly, make sure that the lifting force is applied to a wide area and, not to a small localized area.

CAUTION

1. Engine and transmission mounting insulators should be installed in the specified manner.
2. Mounting bracket installation procedures.
 - Engine mounting bracket.
 - T/M mounting bracket.
 - Rear roll stopper mounting bracket.
 - Front roll stopper mounting bracket.
3. When installing front roll stopper mounting bracket, be especially careful not to crush the insulator, if crushed, idle vibration will most probably occur.



EMA9001F

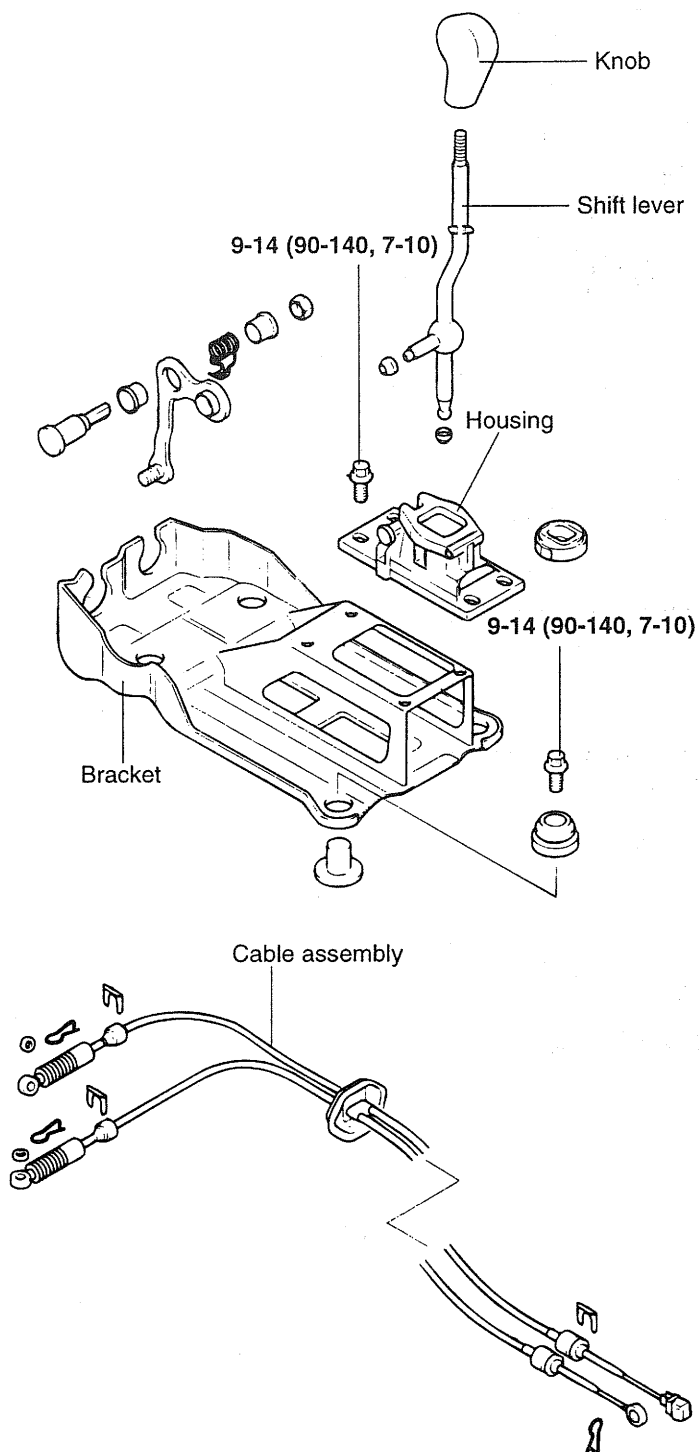
INSTALLATION

EMA90200

1. Installation is the reverse of removal.

MANUAL TRANSAXLE SHIFT CONTROL

COMPONENTS EMA90110

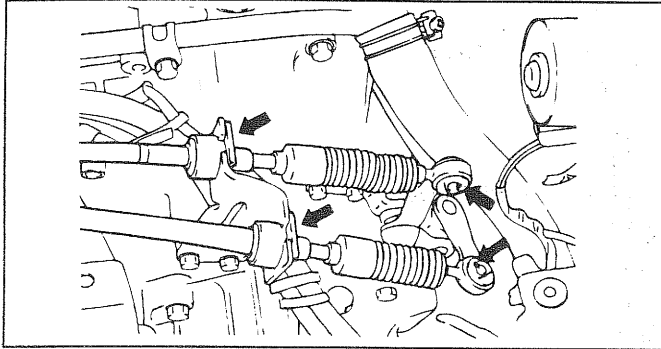


EMA9020A

REMOVAL EMA90120

1. Remove the console assembly (Refer to CONSOLE).
2. Remove the cotter pins and clips (shift lever side).
3. Remove the shift lever assembly.

4. Remove the retainer and bolts.
5. Remove the cotter pins and clips (Transaxle side).
6. Remove the shift cable and select cable.



EMA9012E

INSPECTION

EMA90130

1. Check the select cable for proper operation and for damage.
2. Check the shift cable for proper operation and for damage.
3. Check the boot for damage.
4. Check each bushing for wear, abrasion, sticking, restricted movement or damage.
5. Check for a weak or damaged spring.

REASSEMBLY

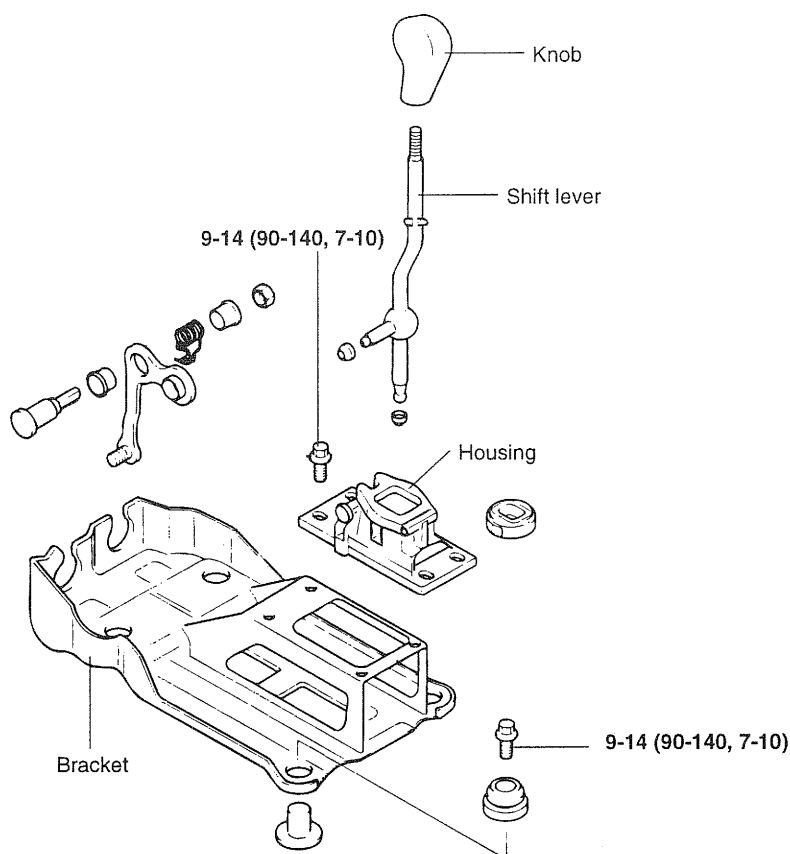
EMA90140

1. Install the shift lever assembly.
2. Installation of shift lever and select cable.

SHIFT LEVER

COMPONENTS EMA90150

COMPONENTS

**TORQUE : Nm (kg·cm, lb·ft)**

EMA9020B

INSPECTION EMA90160

1. Inspect the bushing for wear or damage.
2. Inspect the return spring for damage or deterioration.

REASSEMBLY EMA90170

1. Apply multi-purpose grease to the sliding part of the bushings.
2. Reassembly is reverse of the disassembly.

