ISUZU NPR, GMC FORWARD TILTMASTER AND CHEVROLET FORWARD

DIAGNOSTIC TROUBLE CODE RETRIEVAL AND DEFINITION

1988-1990 CODE RETRIEVAL PROCEDURE

1988-1990 Models Equipped With The JR403-E

The 1988-90 models use an ***ECONOMY Indicator Lamp***, as shown in Figure 1, that will flash continuously when the ignition is on and the Automatic Transmission Control Unit (ATCU) senses a fault in the transmission control system. If there are no codes stored the ECONOMY Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

1988-1990 CODE RETRIEVAL PROCEDURE

1. Ignition "OFF".
2. Shift lever in "D" range.
3. Economy switch in "NORMAL" position.
4. Ignition switch "ON".
5. Shift lever in "2" range.
6. Economy switch in ECONOMY position.
7. Shift lever in "1" range.
8. Economy switch in "NORMAL" position.
9. Depress accelerator pedal to the floor and release.

The **ECONOMY** Indicator Lamp will then flash a ***judgement flash*** that will have remained on ***LONGER*** than the other flashes as shown in Figure 3, ***the LONGER flash is the judgement code.***
If there are NO codes stored, the Economy Indicator Lamp will flash 10 short flickers as shown in Figure 3.

The Code Definition Chart for the 1988-1990 models ***only,*** is listed in Figure 3, and also indicates all of the judgement flicker codes the ATCU is capable of storing.
If the ECONOMY Indicator Lamp does **NOT** respond, check operation of the Inhibitor Switch, Economy Switch & Bulb, Kickdown Switch or the Idle Switch.

To Clear Codes on 1988-1990 models, remove the number 11 fuse from the glove box fuse panel, as shown in Figure 2.

1991 Models Equipped With The JR403-E - See Page 4.

1992-1994 Models Equipped With The JR403-E - See Page 6.

1995 Models Equipped With The JR403-E - See Page 8.

1995½-1998 Models Equipped With The JR403-E - See Page 10.

1999 Models Equipped With The Asin Seiki - See Page 13.

2000-UP Models Equipped With The Asin Seiki - See Page 16.

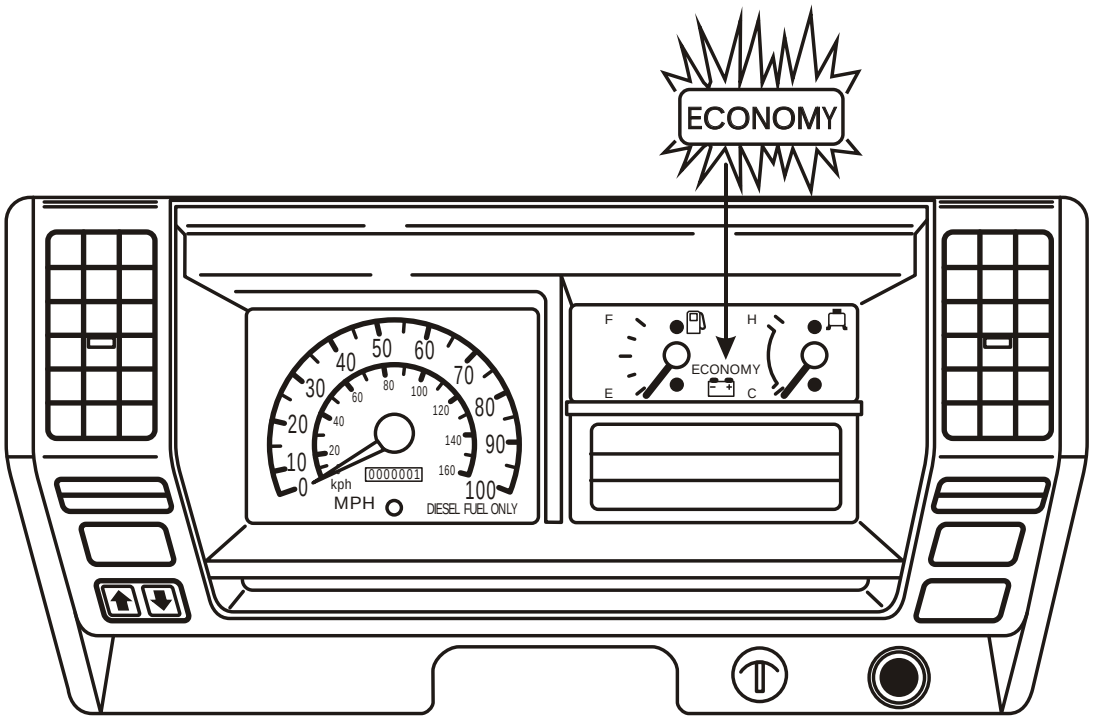
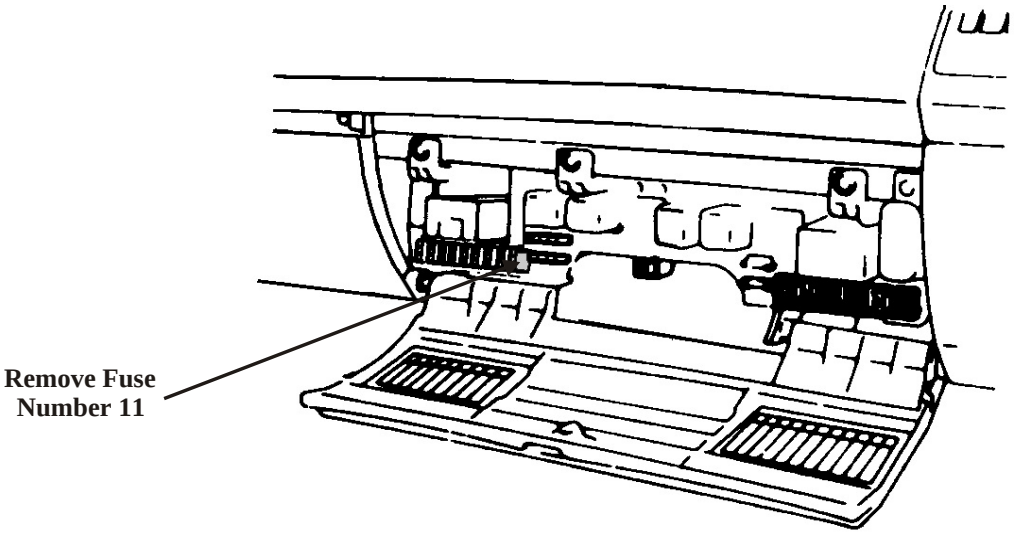


Figure 1

CLEAR CODES ON 1988-1998 MODELS



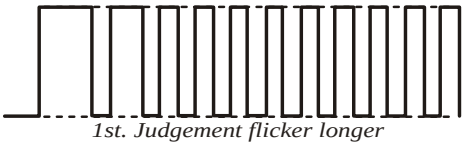
1988-1990 Models - Remove the number 11 fuse from glove box fuse box, as show above.

1991-1998 Models - Remove the number 11 fuse from glove box fuse box, as show above.
Special Note: On Budget Rental trucks, same fuse is labeled ***Circuit Breaker Number 8.***

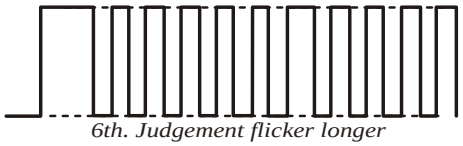
Figure 2

1988-1990 *"ONLY"* JUDGEMENT FLICKER CHART

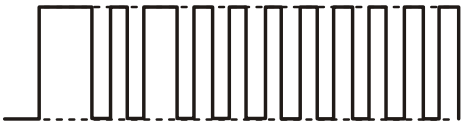
10 Short Flickers = No Codes



1st. Judgement flicker longer



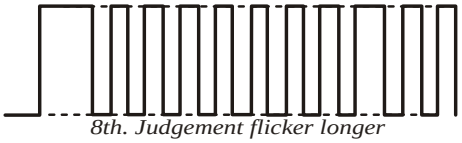
6th. Judgement flicker longer



2nd. Judgement flicker longer

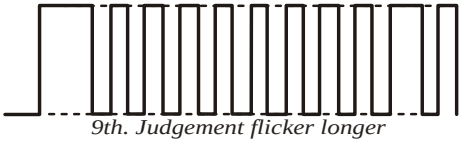
7th. Judgement flicker longer

3rd. Judgement flicker longer



8th. Judgement flicker longer

4th. Judgement flicker longer



9th. Judgement flicker longer

5th. Judgement flicker longer

10th. Judgement flicker longer

1988-1990 CODE DEFINITION CHART

JUDGEMENT CODE	COMPONENT AFFECTED	PROBABLE CAUSE
1	SPEED SENSOR #1	SPEED SENSOR ON TRANSMISSION FAULT
2	SPEED SENSOR #2	SPEED SENSOR IN SPEEDOMETER FAULT
3	THROTTLE SENSOR	OUT OF RANGE
4	SHIFT SOLENOID "A"	OPEN OR SHORTED
5	SHIFT SOLENOID "B"	OPEN OR SHORTED
6	OVERRUN CLUTCH SOLENOID	OPEN OR SHORTED
7	LOCK-UP SOLENOID	OPEN OR SHORTED
8	ATF THERMOSENSOR	ATF TEMP SENSOR FAULT
9	ENGINE RPM SENSOR	OPEN CIRCUIT
10	LINE PRESSURE SOLENOID	OPEN OR SHORTED

Figure 3

1991 CODE RETRIEVAL PROCEDURE

1991 Models Equipped With The JR403-E

The 1991 models also use the ***ECONOMY Indicator Lamp***, as shown in Figure 1, that ***may*** flash the ECONOMY Indicator Lamp when the ignition is on and the Automatic Transmission Control Unit (ATCU) senses a fault in the transmission control system. If there are no hard codes stored the ECONOMY Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

1991 CODE RETRIEVAL PROCEDURE

The 1991 model year code retrieval procedure changed to a diagnostic connector, and when jumped, will cause the Economy Indicator Lamp to flash the codes. Place a jumper from terminal to terminal on the diagnostic connector and observe the flashes on the Economy Indicator Lamp. The **TWO WIRE** diagnostic connector is located behind the glove box, next to the ATCU as shown in Figure 4.
The code pattern also changed which resembles the typical GM code format. The ECONOMY Indicator Lamp will flash a code pattern as illustrated in Figure 5.
Refer to Figure 5 for Code Definitions on 1991 models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.
When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 1991 models, remove the number 11 fuse from the glove box fuse panel, as shown in Figure 2.

1991 DIAGNOSTIC CONNECTOR LOCATION

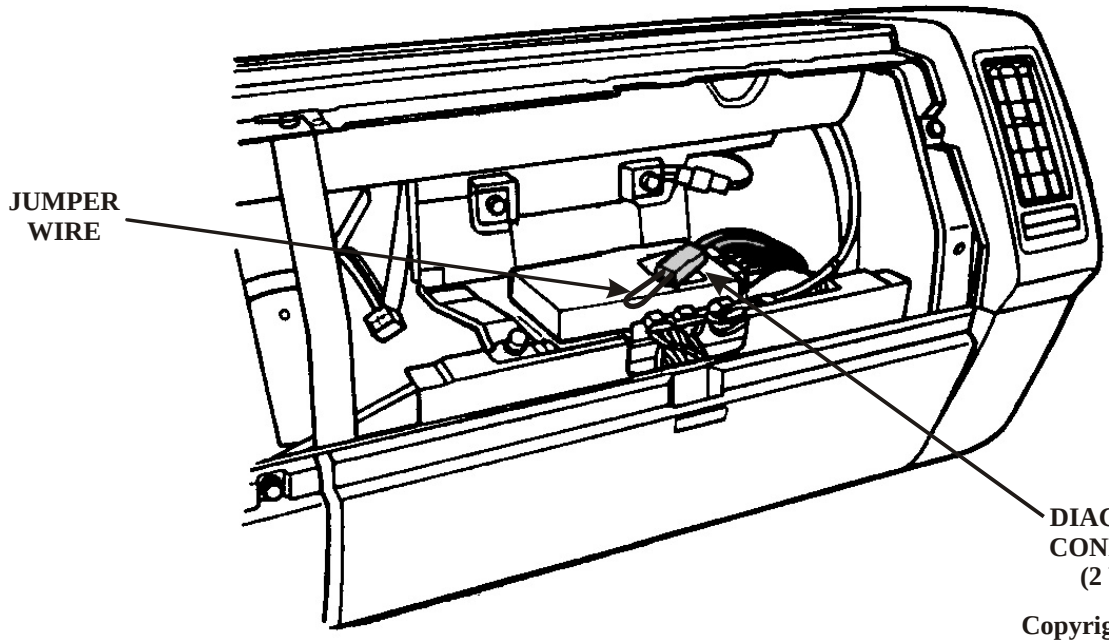
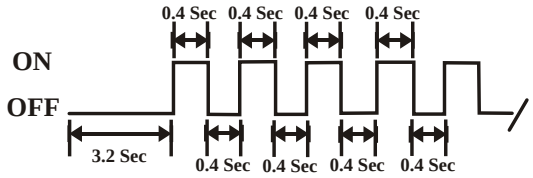


Figure 4

1991 CODE PATTERN

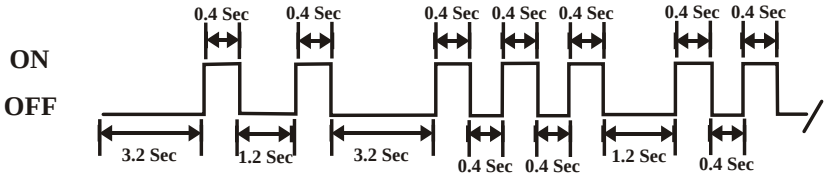
CONNECT JUMPER WIRE TO DIAGNOSTIC CONNECTOR FOR YOUR VEHICLE APPLICATION. "ECONOMY" LIGHT WILL FLASH AS FOLLOWS:

CONTINUOUS EVEN FLASH = ***"NO CODES"***



EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 DTC 32



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

CODE NUMBER	1991 CODE DEFINITION CHART	
	COMPONENT AFFECTED	**PROBABLE CAUSE**
11	SPEED SENSOR #1	SPEED SENSOR ON TRANSMISSION FAULT
24	SPEED SENSOR #2	SPEED SENSOR IN SPEEDOMETER FAULT
13	ENGINE RPM SENSOR	OPEN OR SHORTED
15	ATF THERMOSENSOR	OPEN OR SHORTED
21	THROTTLE SENSOR	OPEN OR SHORTED
31	SHIFT SOLENOID "A"	OPEN OR SHORTED
32	SHIFT SOLENOID "B"	OPEN OR SHORTED
33	OVERRUN CLUTCH SOLENOID	OPEN OR SHORTED
34	LOCK-UP SOLENOID	OPEN OR SHORTED
35	LINE PRESSURE SOLENOID	OPEN OR SHORTED

Figure 5

1992-1994 CODE RETRIEVAL PROCEDURE

1992-1994 Models Equipped With The JR403-E

The 1992-1994 models continue to use the ***ECONOMY Indicator Lamp***, as shown in Figure 1, that ***may*** flash the ECONOMY Indicator Lamp when the ignition is on and the Automatic Transmission Control Unit (ATCU) senses a fault in the transmission control system. If there are no hard codes stored the ECONOMY Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

1992-1994 CODE RETRIEVAL PROCEDURE

The 1992-1994 model year code retrieval procedure still uses a diagnostic connector, and when jumped, will cause the Economy Indicator Lamp to flash the codes, however, the Two Wire diagnostic connector was moved to the drivers side kick panel, adjacent to the master cylinder, as shown in Figure 6. It is a ***White*** connector with a ***Yellow/Black*** wire and a solid ***Black*** wire. Place a jumper from terminal to terminal on the diagnostic connector and observe the flashes on the Economy Indicator Lamp.
The code pattern also remains the same as 1991 models.. The ECONOMY Indicator Lamp will flash a code pattern as illustrated in Figure 7.
Refer also to Figure 7, for Code Definitions on 1992-1994 models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.
When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 1992-1994 models, remove the number 11 fuse from the glove box fuse panel, as shown in Figure 2.

1992-1994 DIAGNOSTIC CONNECTOR LOCATION

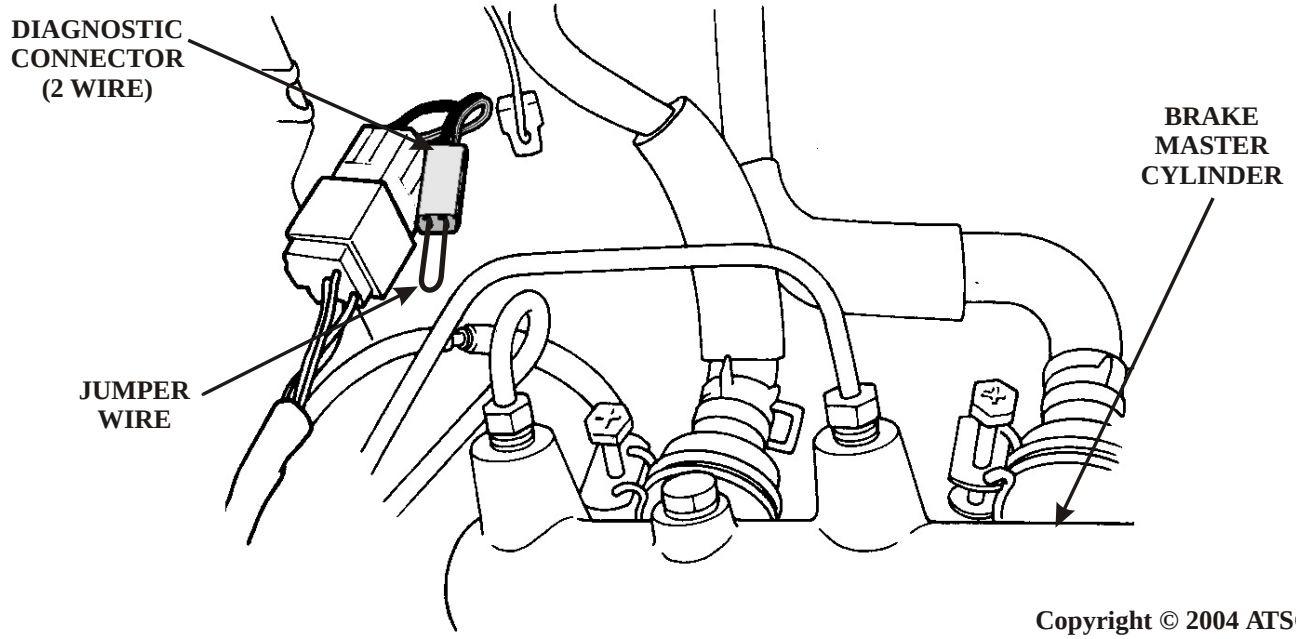
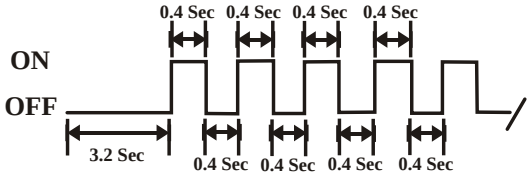


Figure 6

1992-1994 CODE PATTERN

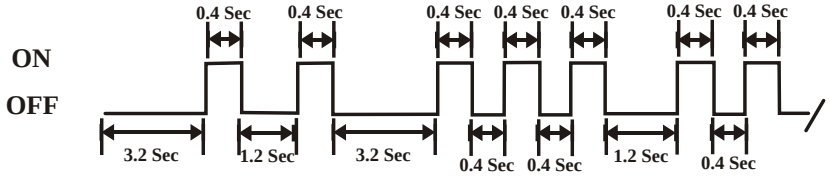
CONNECT JUMPER WIRE TO DIAGNOSTIC CONNECTOR FOR YOUR VEHICLE APPLICATION. "ECONOMY" LIGHT WILL FLASH AS FOLLOWS:

CONTINUOUS EVEN FLASH = *"NO CODES"*



EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 DTC 32



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

Inhibitor Switch code capability was added for the 1993 model year as shown in the code chart below.

CODE NUMBER	1992-1994 CODE DEFINITION CHART	
	COMPONENT AFFECTED	**PROBABLE CAUSE**
11	SPEED SENSOR #1	SPEED SENSOR ON TRANSMISSION FAULT
13	ENGINE RPM SENSOR	OPEN OR SHORTED
15	ATF THERMOSENSOR	OPEN OR SHORTED
*17	INHIBITOR SWITCH	OPEN OR SHORTED
24	SPEED SENSOR #2	SPEED SENSOR IN SPEEDOMETER FAULT
21	THROTTLE SENSOR	OPEN OR SHORTED
31	SHIFT SOLENOID "A"	OPEN OR SHORTED
32	SHIFT SOLENOID "B"	OPEN OR SHORTED
33	OVERRUN CLUTCH SOLENOID	OPEN OR SHORTED
34	LOCK-UP SOLENOID	OPEN OR SHORTED
35	LINE PRESSURE SOLENOID	OPEN OR SHORTED

***THIS CODE WAS ADDED FOR THE 1993 MODEL YEAR**

Figure 7

1995 CODE RETRIEVAL PROCEDURE

1995 Models Equipped With The JR403-E

The 1995 models continue to use the ***ECONOMY Indicator Lamp***, as shown in Figure 1, that ***may*** flash the ECONOMY Indicator Lamp when the ignition is on and the Automatic Transmission Control Unit (ATCU) senses a fault in the transmission control system. If there are no hard codes stored the ECONOMY Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

1995 CODE RETRIEVAL PROCEDURE

The 1995 model year code retrieval procedure still uses a diagnostic connector, in the same location as the 1992-94 models, ***But,*** the type of connector has changed to a ***Green, Three Wire Connector*** as shown in Figure 8. Jumper the two outer wires, which are ***Yellow/Black*** and solid ***Black,*** on the three wire diagnostic connector, as shown in Figure 8, and observe the flashes on the Economy Indicator Lamp.
The code pattern remains the same as 1992-94 models.. The ECONOMY Indicator Lamp will flash a code pattern as illustrated in Figure 9.
Refer also to Figure 9, for Code Definitions on 1995-1998 models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.
When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 1995 models, remove the number 11 fuse from the glove box fuse panel, as shown in Figure 2.

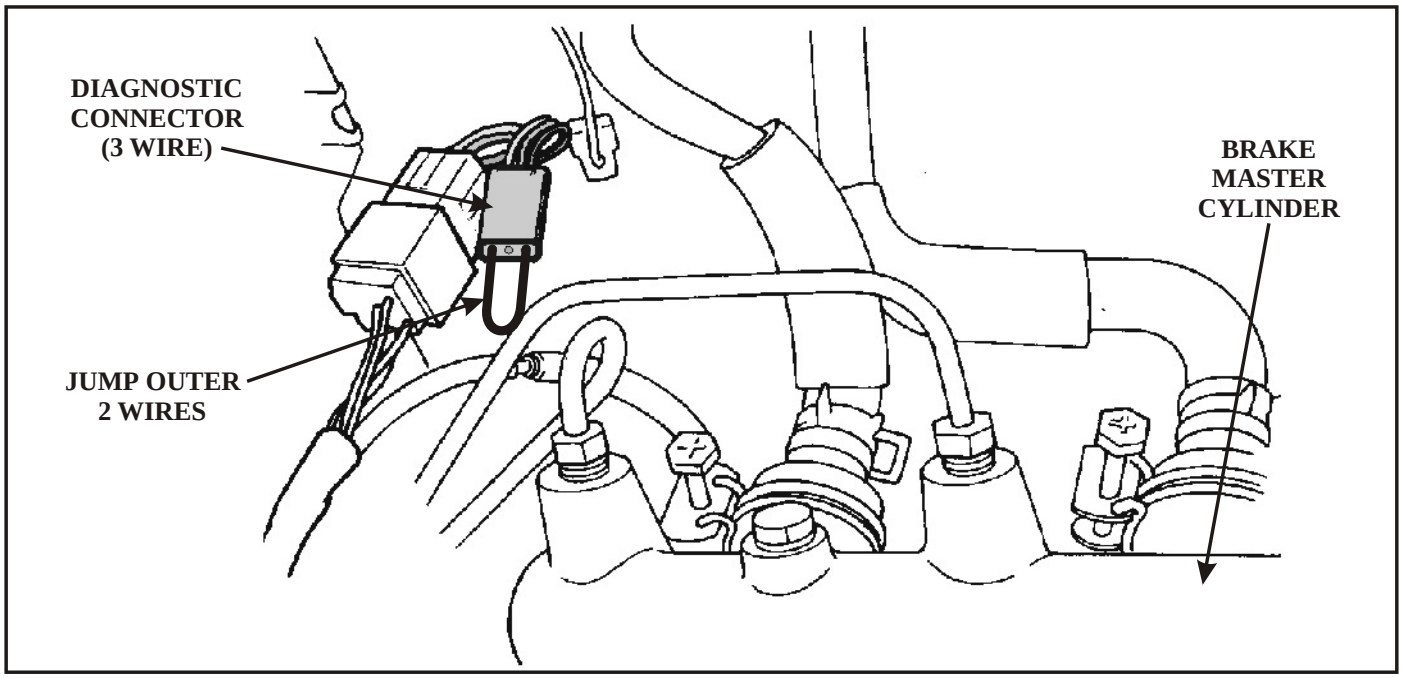
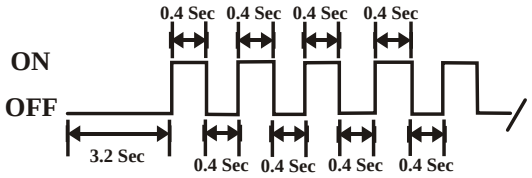


Figure 8

1995 CODE PATTERN

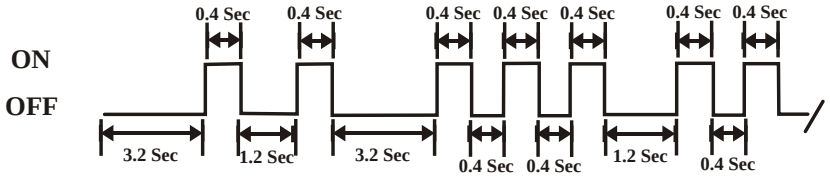
CONNECT JUMPER WIRE TO DIAGNOSTIC CONNECTOR FOR YOUR VEHICLE APPLICATION. "ECONOMY" LIGHT WILL FLASH AS FOLLOWS:

CONTINUOUS EVEN FLASH = *"NO CODES"*



EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 **DTC 32**



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

CODE NUMBER	1995-1998 CODE DEFINITION CHART	
	COMPONENT AFFECTED	**PROBABLE CAUSE**
11	SPEED SENSOR #1	Fault (On Extension Housing, Pulse Generator.)
13	ENGINE RPM SENSOR	Open or Shorted
15	ATF THERMOSENSOR	Open or Shorted
17	INHIBITOR SWITCH	Open or Shorted
21	THROTTLE SENSOR	Open or Shorted
*24	SPEED SENSOR #2	Fault (On Extension Housing, Gear Driven)
31	SHIFT SOLENOID "A"	Open or Shorted
32	SHIFT SOLENOID "B"	Open or Shorted
33	OVERRUN CLUTCH SOLENOID	Open or Shorted
34	LOCK-UP SOLENOID	Open or Shorted
35	LINE PRESSURE SOLENOID	Open or Shorted

The 1994 models will have the #2 Speed Sensor in the speedometer head.

Figure 9

1995½-1998 CODE RETRIEVAL PROCEDURE

1995½ - 1998 Models Equipped With The JR403-E

The 1995½-1998 models use a ***CHECK TRANS Indicator Lamp***, as shown in Figure 10, that ***may*** flash the CHECK TRANS Indicator Lamp when the ignition is on and the Automatic Transmission Control Unit (ATCU) senses a fault in the transmission control system. If there are no hard codes stored the CHECK TRANS Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

1995 CODE RETRIEVAL PROCEDURE

The 1995½-1998 model year code retrieval procedure still uses a diagnostic connector, in the same location as the 1995 models, the type of connector is the same ***Green, Three Wire Connector*** as shown in Figure 11. Jumper the two outer wires, which are ***Yellow/Black*** and solid ***Black,*** on the three wire diagnostic connector, as shown in Figure 11, and observe the flashes on the Check Trans Indicator Lamp.
The code pattern remains the same as 1995 models.. The CHECK TRANS Indicator Lamp will flash a code pattern as illustrated in Figure 12.
Refer also to Figure 12, for Code Definitions on 1995-1998 models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.
When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 1995½-1998 models, remove the number 11 fuse from the glove box fuse panel, as shown in Figure 2.

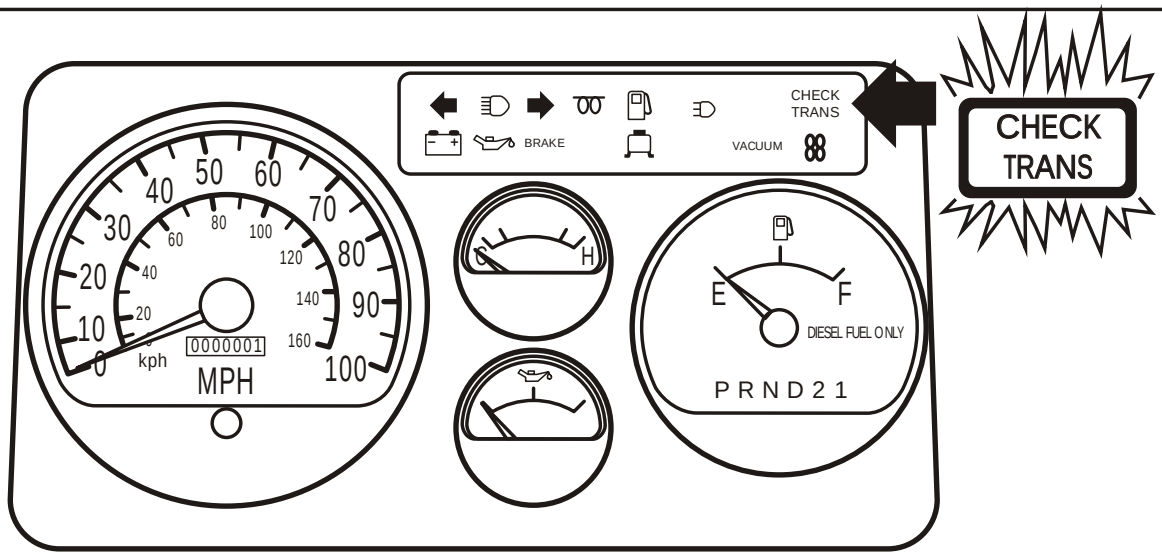


Figure 10

1995½ - 1998 DIAGNOSTIC CONNECTOR

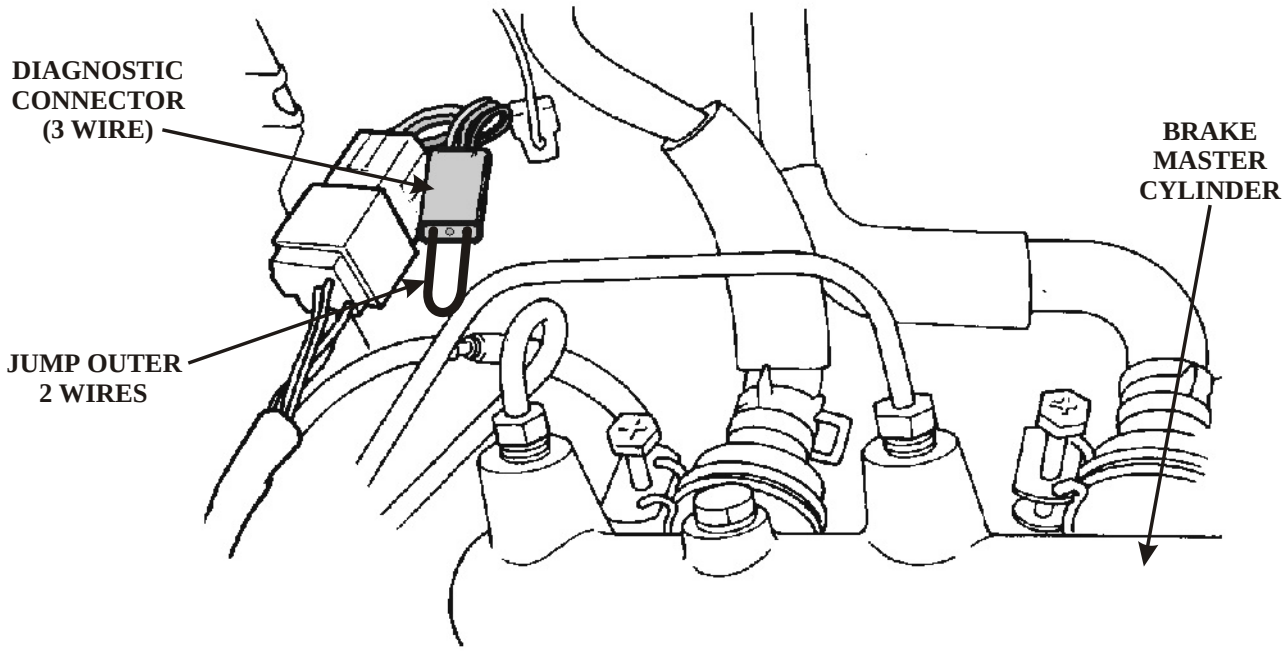
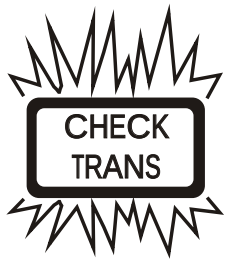


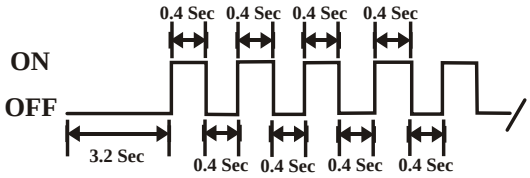
Figure 11

1995½ - 1998 CODE PATTERN

CONNECT JUMPER WIRE TO DIAGNOSTIC CONNECTOR FOR YOUR VEHICLE APPLICATION. "ECONOMY" LIGHT WILL FLASH AS FOLLOWS:

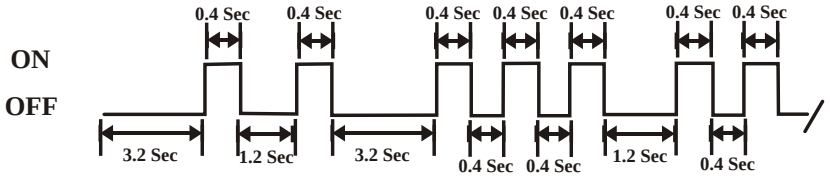
CONTINUOUS EVEN FLASH = *"NO CODES"*





EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 DTC 32



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

CODE NUMBER	1995-1998 CODE DEFINITION CHART	
	COMPONENT AFFECTED	**PROBABLE CAUSE**
11	SPEED SENSOR #1	Fault (On Extension Housing, Pulse Generator.)
13	ENGINE RPM SENSOR	Open or Shorted
15	ATF THERMOSENSOR	Open or Shorted
17	INHIBITOR SWITCH	Open or Shorted
21	THROTTLE SENSOR	Open or Shorted
*24	SPEED SENSOR #2	Fault (On Extension Housing, Gear Driven)
31	SHIFT SOLENOID "A"	Open or Shorted
32	SHIFT SOLENOID "B"	Open or Shorted
33	OVERRUN CLUTCH SOLENOID	Open or Shorted
34	LOCK-UP SOLENOID	Open or Shorted
35	LINE PRESSURE SOLENOID	Open or Shorted

The 1994 models will have the #2 Speed Sensor in the speedometer head.

Figure 12

1999 CODE RETRIEVAL PROCEDURE

1999 Models Equipped With The Aisin Seiki

Even though 1999 models recieved a new transmission they still use a ***CHECK TRANS Indicator Lamp***, as shown in Figure 13, that will flash the CHECK TRANS Indicator Lamp when the ignition is on and the Transmission Control Module (TCM) has sensed a fault in the transmission control system. If there are no hard codes stored the CHECK TRANS Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.

Code retrieval procedure must be followed ***exactly,*** as shown below.

1999 CODE RETRIEVAL PROCEDURE

The 1999 model year code retrieval procedure still uses a diagnostic connector, in the same location as the 1998 models, the type of connector is the same ***Green, Three Wire Connector*** as shown in Figure 14. Jumper the two outer wires, which are ***Black/White*** and solid ***Black,*** on the three wire diagnostic connector, as shown in Figure 14, and observe the flashes on the Check Trans Indicator Lamp.

The code pattern remains the same as 1998 models.. The CHECK TRANS Indicator Lamp will flash a code pattern as illustrated in Figure 16.

Refer also to Figure 16, for Code Definitions on 1999 models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.

When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 1999 models, it is now the number 16 fuse in the glove box fuse panel that you must remove, as shown in Figure 15.

Special Note: On Budget Rental trucks the same fuse is labeled ***Circuit Breaker 19.***

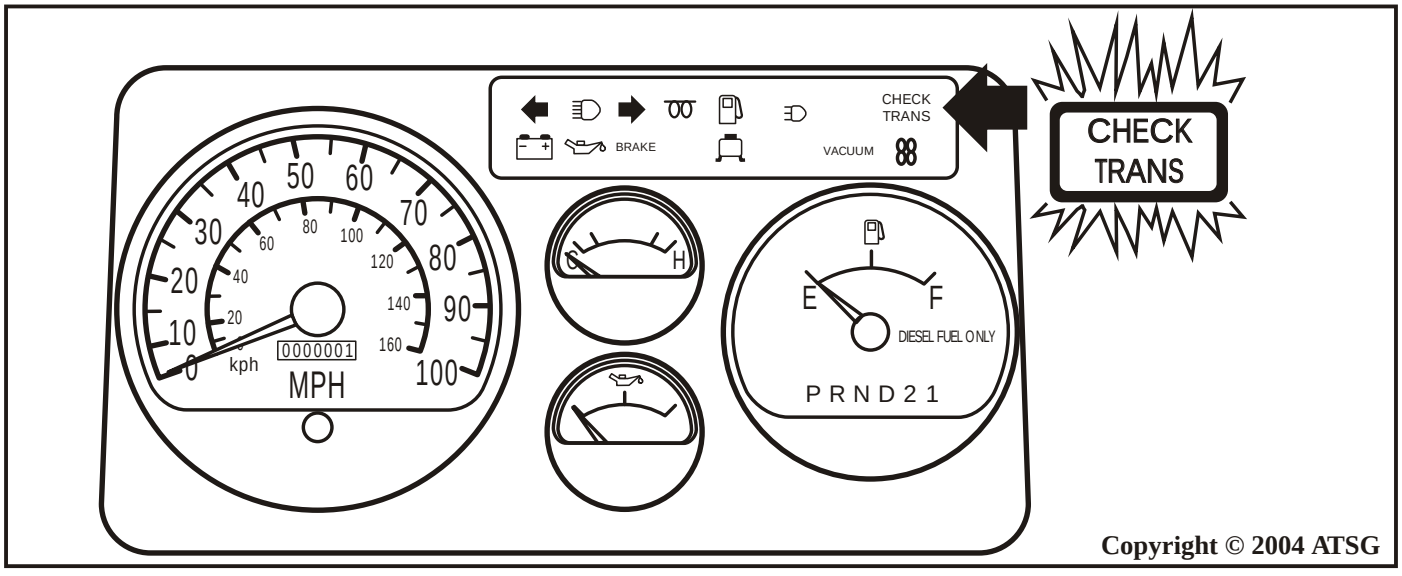


Figure 13

1999 DIAGNOSTIC CONNECTOR

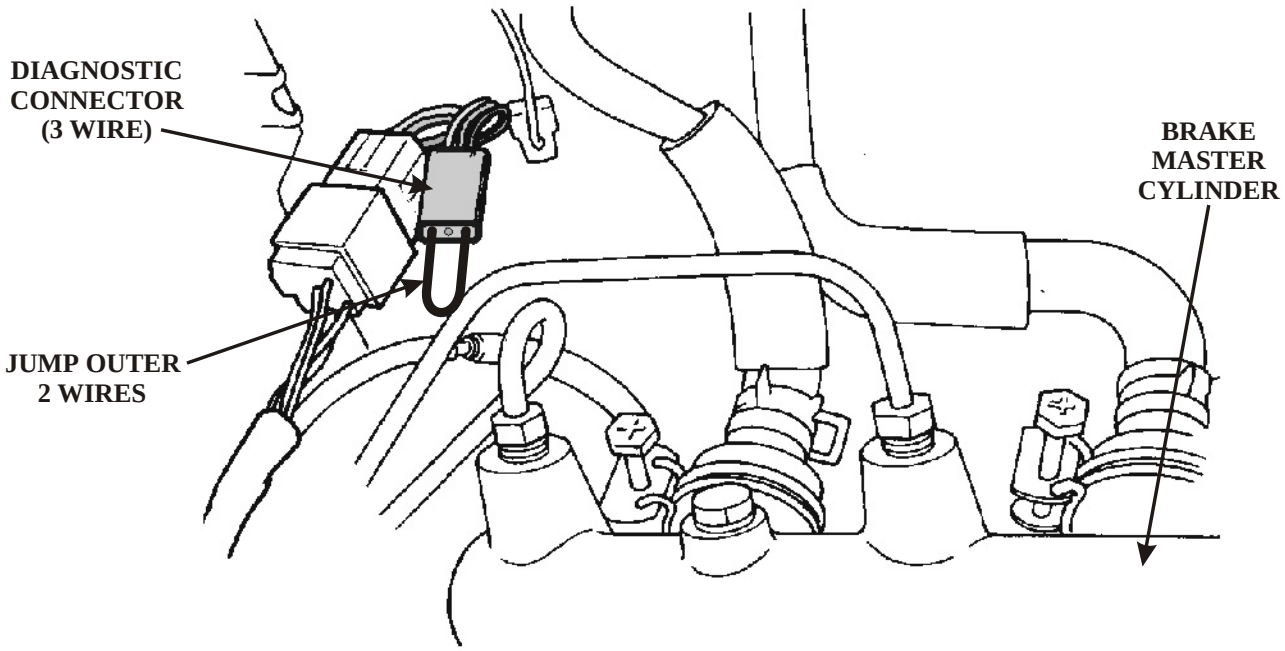
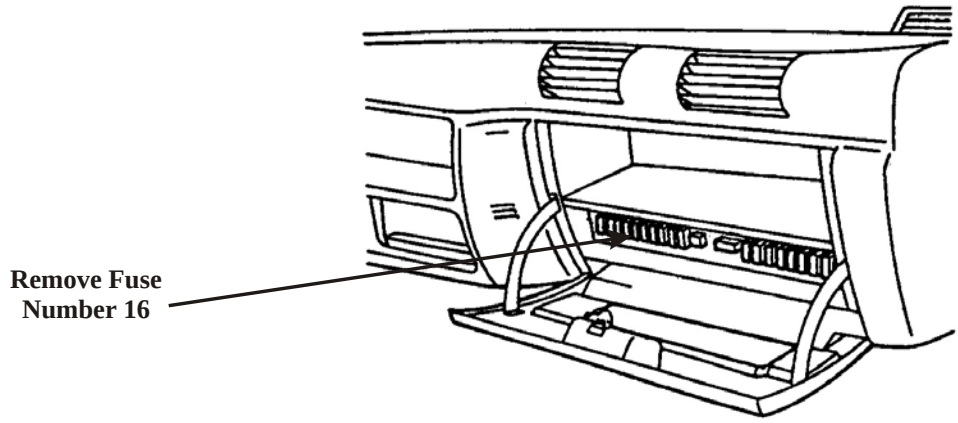


Figure 14

1999 CODE CLEARING PROCEDURE

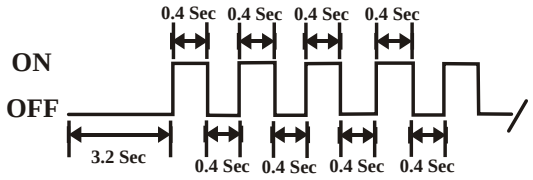


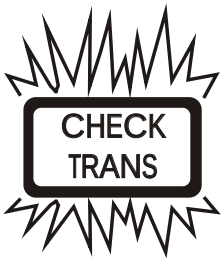
1999 Models - Remove the number 16 fuse from glove box fuse box, as show above.
Special Note: On Budget Rental trucks, same fuse is labeled ***Circuit Breaker Number 19.***

Figure 15

1999 CODE PATTERN

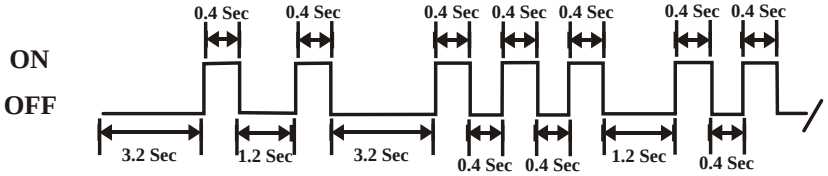
CONTINUOUS EVEN FLASH = *"NO CODES"*





EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 DTC 32



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

1999 CODE PATTERN AND DESCRIPTION

DTC	CODE PATTERN	CODE DESCRIPTION
11	ON / OFF	Vehicle Speed Sensor #1 circuit open or shorted (Located on Extension Housing, Pulse Generator)
13		Engine Speed Sensor circuit open or shorted
15		Automatic Transmission Fluid Thermosensor circuit open
17		Inhibitor Switch circuit open or shorted
21		Throttle Position Sensor circuit open or shorted
24		Vehicle Speed Sensor #2 circuit open or shorted (Located On Extension Housing, Gear driven)
31		Shift Solenoid #1 (S1) circuit open or shorted
32		Shift Solenoid #2 (S2) circuit open or shorted
33		Timing Solenoid (ST) circuit open or shorted
34		Lock-Up Solenoid circuit open or shorted
35		Line Pressure Solenoid circuit open or shorted
37		Exhaust brake system circuit open or shorted
38		Engine warm-up cut system circuit open or shorted

Figure 16

2000-UP CODE RETRIEVAL PROCEDURE

2000-UP Models Equipped With The Aisin Seiki

For the 2000 model year, they still use a ***CHECK TRANS Indicator Lamp***, as shown in Figure 17, that will flash the CHECK TRANS Indicator Lamp when the ignition is on and the Transmission Control Module (TCM) has sensed a fault in the transmission control system. If there are no hard codes stored the CHECK TRANS Indicator Lamp will come ON for 2 seconds and then go OUT when the ignition is turned on.
Code retrieval procedure must be followed ***exactly,*** as shown below.

2000-UP CODE RETRIEVAL PROCEDURE

For the 2000-Up model year, the three wire diagnostic connector was eliminated and replaced with the OBD II connector, as these vehicles are now OBD II compliant. However, the OBD II connector can be used to retrieve flash codes in the same format as previous models. Locate the OBD II diagnostic connector, as shown in Figure 17. Use a ***jumper wire between terminals 4 and 11***, as shown in Figure 18, and observe the flashes on the Check Trans Indicator Lamp.
The code pattern remains the same as 1999 models.. The CHECK TRANS Indicator Lamp will flash a code pattern as illustrated in Figure 19.
Refer also to Figure 19, for Code Definitions on 2000-Up models ***"only".***

If no codes are stored after the code retrieval procedure is performed, a ***Code "1"*** will be flashed repeatedly. If one code is stored, the code will be repeated three times.
When two or more codes are stored, each code will be repeated three times with each code displayed in numerical order.

To Clear Codes on 2000-Up models, Do the Following "Exactly".

1. ***Turn ignition "ON", but do not start engine.***
2. ***Jump terminals 4 and 11 in the diagnostic connector.***
3. ***Shift the transmission to "Neutral".***
4. ***Depress the brake pedal and release it.***
5. ***Depress the accelerator pedal fully and release it.***

When codes are cleared, the "Check Trans" lamp will flash rapidly for 10 seconds.

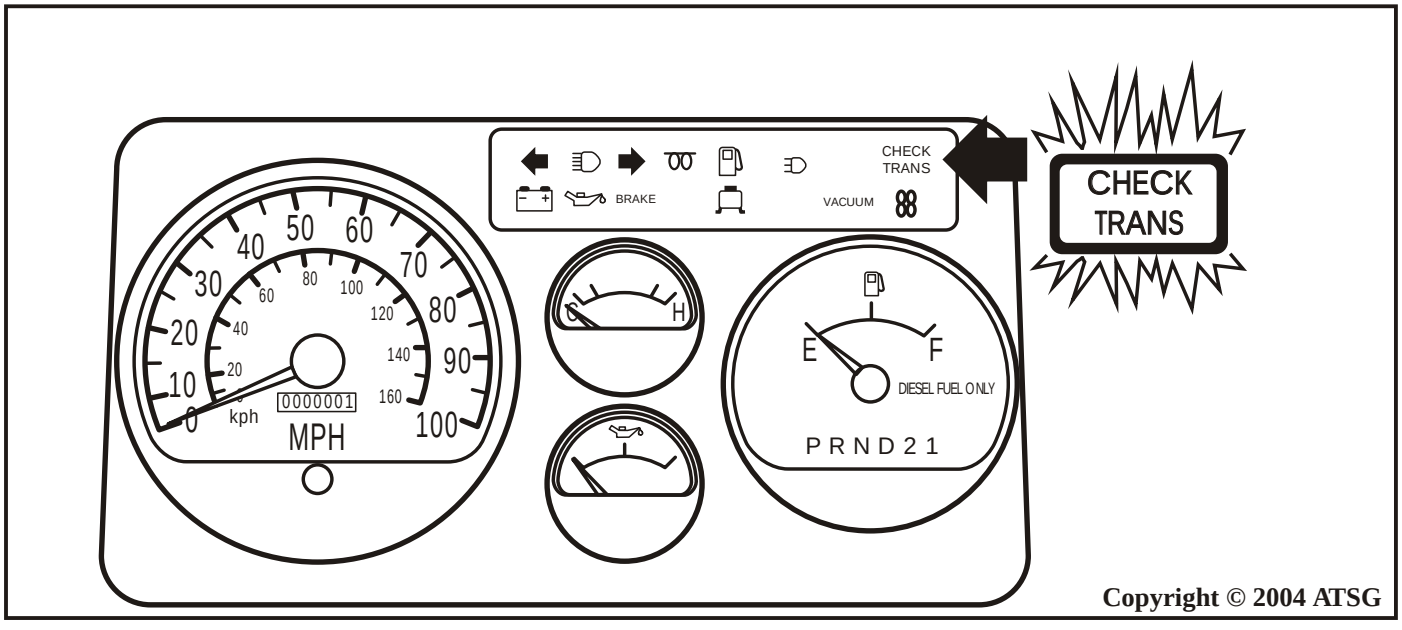


Figure 17

2000-UP OBD II DIAGNOSTIC CONNECTOR

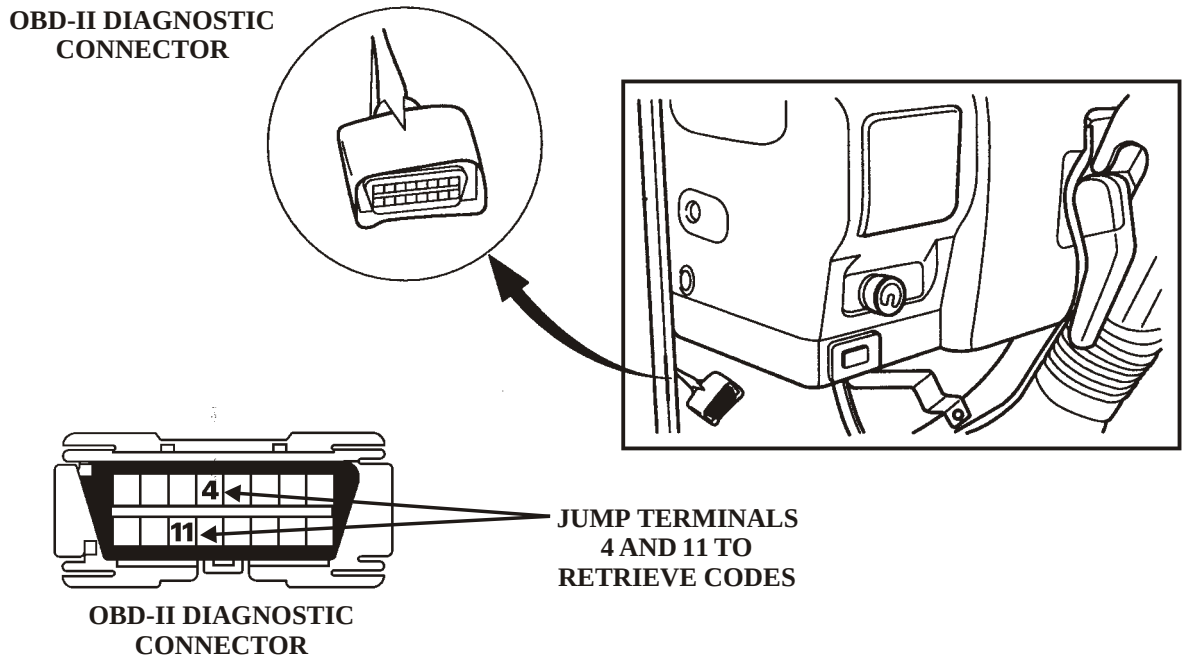
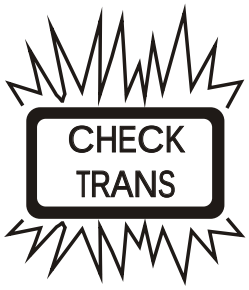
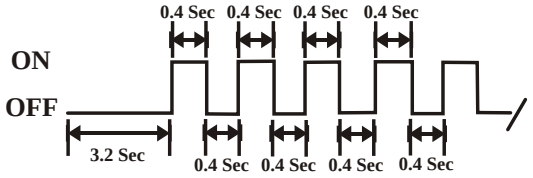


Figure 18

2000-UP CODE PATTERN

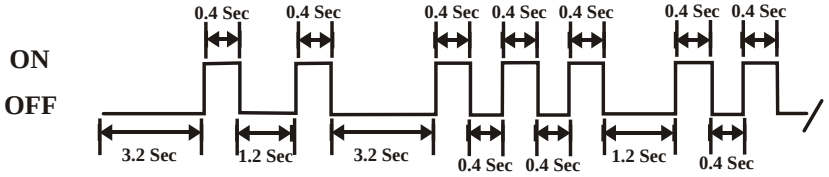
CONTINUOUS EVEN FLASH = *"NO CODES"*





EXAMPLE OD DTC 11 AND DTC 32 STORED

DTC 11 **DTC 32**



NOTE: EACH DIAGNOSTIC TROUBLE CODE WILL REPEAT 3 TIMES IN NUMERICAL ORDER

2000-UP CODE PATTERN AND DESCRIPTION

DTC	CODE PATTERN	CODE DESCRIPTION
11	ON / OFF	*Vehicle Speed Sensor #1 circuit open or shorted (Located on Extension Housing, Pulse Generator)*
13		*Engine Speed Sensor circuit open or shorted*
15		*Automatic Transmission Fluid Thermosensor circuit open*
17		*Inhibitor Switch circuit open or shorted*
21		*Throttle Position Sensor circuit open or shorted*
24		*Vehicle Speed Sensor #2 circuit open or shorted (Located On Extension Housing, Gear Driven)*
31		*Shift Solenoid #1 (S1) circuit open or shorted*
32		*Shift Solenoid #2 (S2) circuit open or shorted*
33		*Timing Solenoid (ST) circuit open or shorted*
34		*Lock-Up Solenoid circuit open or shorted*
35		*Line Pressure Solenoid circuit open or shorted*
37		*Exhaust brake system circuit open or shorted*
38		*Engine warm-up cut system circuit open or shorted*

Figure 19