

Roadranger®

Eaton® Fuller® Automated Transmissions

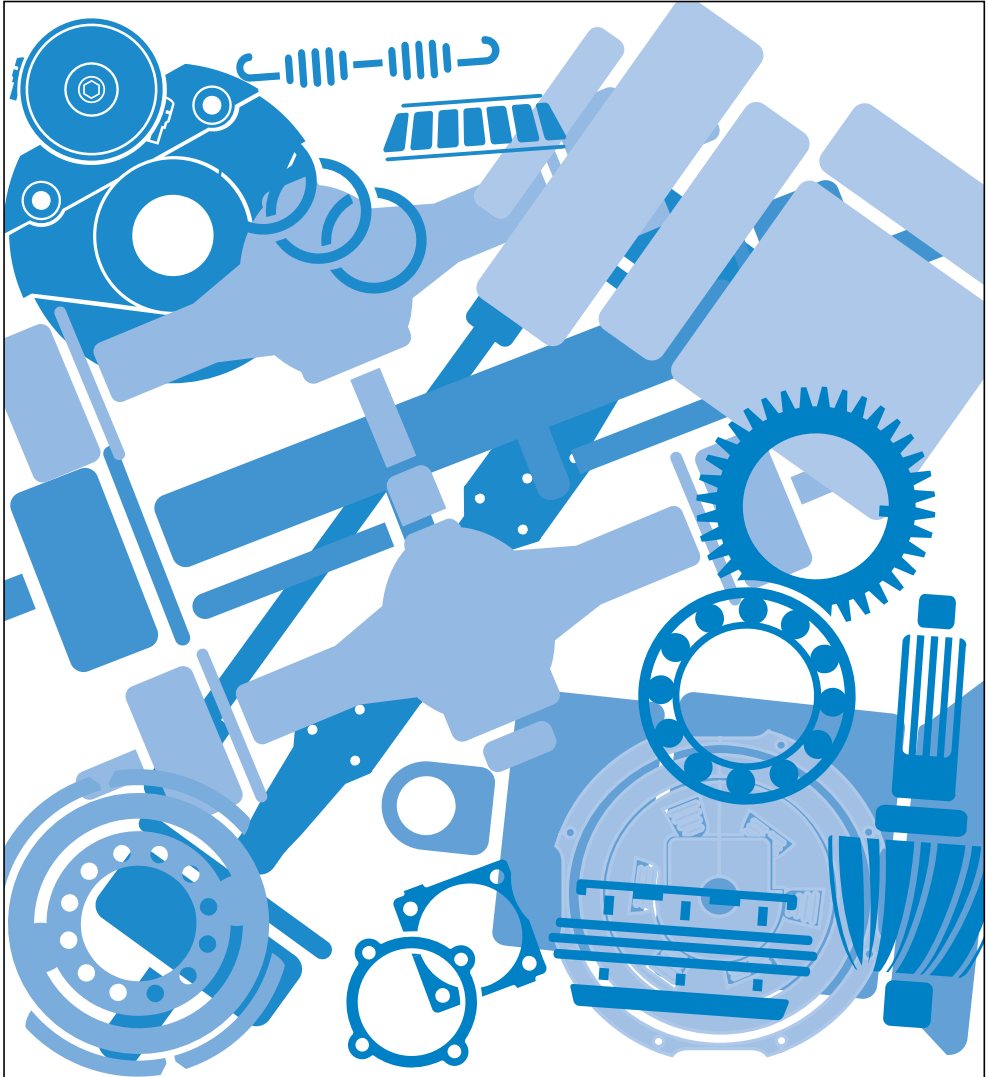
AutoShift® Gen II Models



EAT•N

One Great Drivetrain from Two Great Companies

Quick Reference Guide TRMT-0062 March 2000



General Warnings:



Before starting a vehicle:

- Sit in the driver's seat
- Place shift lever in neutral
- Set the parking brake



Before working on a vehicle or leaving the cab with engine running:

- Place shift lever in neutral
- Set the parking brake
- Block the wheels



Do not release the parking brake or attempt to select a gear until the air pressure is at the correct level.



When parking the vehicle or leaving the cab:

- Place shift lever in neutral
- Set the parking brake



To avoid damage to the transmission during towing:

- Place shift lever in neutral
- Lift the drive wheels off of the ground or disconnect the driveline



Do not operate vehicle if alternator lamp is lit or if gauges indicate low voltage.

Suggested Tools:

Pressure Gauges:

- 0-100 PSI Air Pressure Gauge

O.E. Tool & Equipment Group/Kent-Moore SPX Corporation 1 (800) 520-2584

Kent-Moore

Part No.	Description
5505027	Volt/Ohm Meter (Standard commercially available VOM)
5505030	Hydraulic Test Kit

O.E. Tool & Equipment Group/Kent-Moore SPX Corporation 1 (800) 328-6657

Kent-Moore

Part No.	Description
J-43318	Eaton Test Adapter Kit
J-38351-B	Serial Link Adapter Kit (RP-1202)
J-42660	Parallel Data Module (RP-1210A)

Eaton Service Parts 1 (888) 880-0970 Ext. 1

Part No.	Description
MF-KIT-04	Data Link Tester
TBD	Service Ranger PC Based Service Tool Software

Related Publications

AutoShift

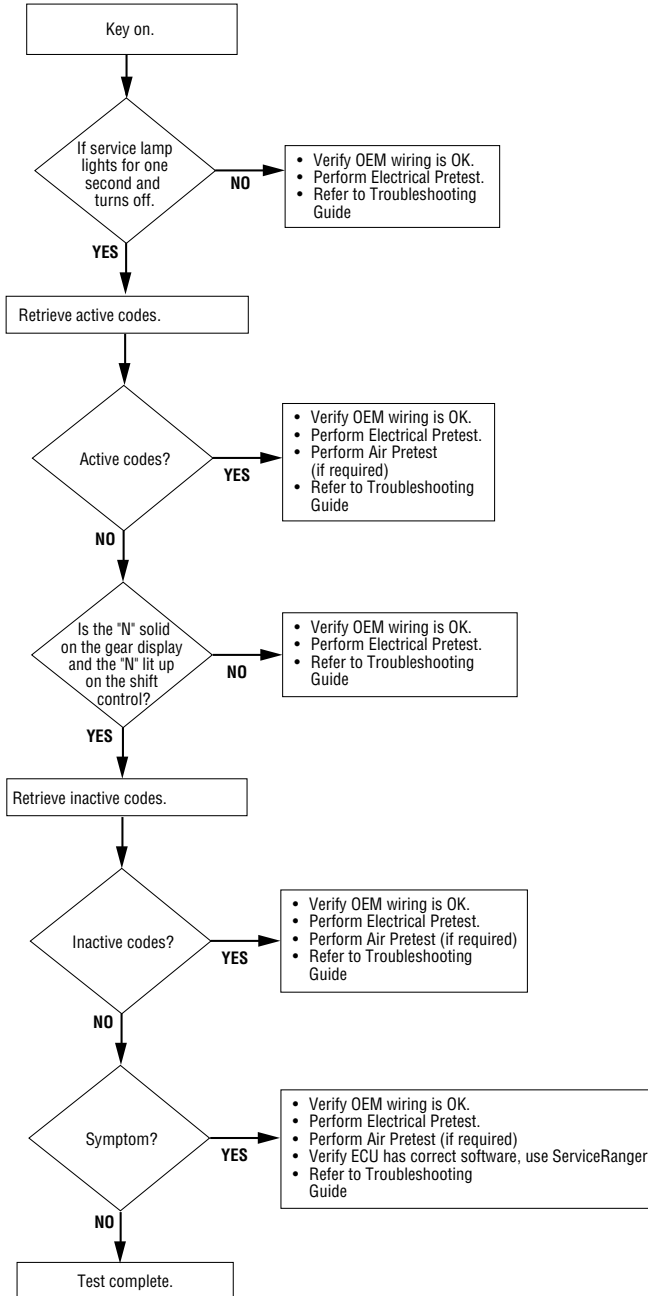
Installation Guide	Eaton TRIG-0062
Installation Guide AST	Eaton TRIG-0092
Service Manual	Eaton TRSM-0062

AutoShift

Driver Instructions	Eaton TRDR-0062
Driver Instructions AST	Eaton TRDR-0092
Autoshift II Direct Parts	
Shipment Program	Eaton TRIP-0062

For additional help 1-888-880-0970

Diagnostics Procedure



Step A Procedure

Condition

Action

1. Key on.
2. If service lamp lights for one second and then turns off.

Note: Some vehicle configurations do not have service lamps. In this case **Go to Step B.**

If service lamp lights for one second and turns off.

Go to **Step B.**

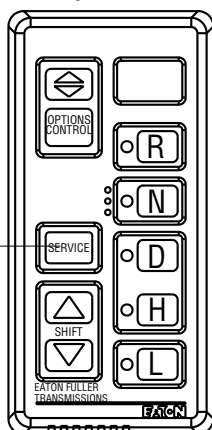
If service lamp never comes on

The fuse for the ignition power may be blown or the AutoShift may have a bad ground. Do the Electrical Pretest.

If Service lamp is Flashing

The AutoShift has detected an active component code. Verify the wiring is totally correct on the vehicle first. You may have to refer to OEM drawings. Then refer to the Troubleshooting Guide. Do not go straight to the Troubleshooting Guide before you verify the vehicle wiring or you may replace the incorrect component.

Service Lamp



If the service lamp is on steady

Replace the Push Button Shift Control.

Note: Some vehicles are equipped with an Eaton shift lever or a OEM shift lever. In this case the software in the Push Button Shift Control will cause the service light to be on steady. This is normal.

Step B Procedure

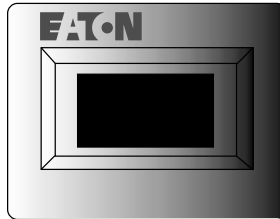
Condition

Action

1. Key on.
2. Make sure shift lever is in Neutral.
3. Observe Gear display

Note: The Gear Display may go through several displays before it stops.

If the Gear Display shows:



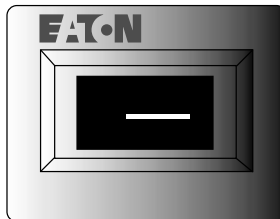
Blank Gear Display:

Transmission ECU and the Push Button Shift control are not communicating. Check the wiring between the Transmission ECU and the Push Button Shift Control.



Gear Display Lamp check:

This is OK.



Dash on the Gear Display:

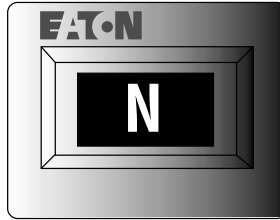
Transmission ECU and the Push Button Shift control are communicating. The transmission is trying to verify Neutral and it can't. It may be torque locked in gear. Or bad Powers and Grounds. The engine will not start in this mode.

Step B Procedure

Condition

Action

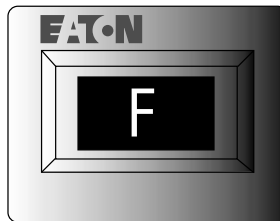
If the Gear Display shows:



"N" on the gear display:

This is good. The AutoShift is powered up completely. If the engine does not start check the start enable circuit.

Go to **Step C**.



Flashing "F":

The AutoShift has detected an active component code. Verify the wiring it totally correct on the vehicle first. You may have to refer to OEM drawings. Then refer to the Troubleshooting Guide. Do not go straight to the Troubleshooting Guide before you verify the vehicle wiring or you may replace the incorrect component.

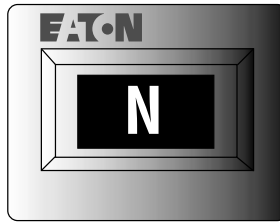
Step C Procedure

Condition

Action

1. Key on.
2. Depress the master clutch.
3. Start engine.
4. Release the clutch pedal.
5. Depress the clutch fully to the floor.
6. Select "D".
7. Observe the Gear Display

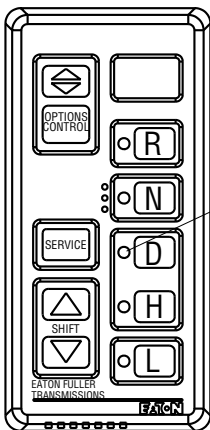
If the Gear Display shows.



Solid "N" on the Gear Display:

The AutoShift has not seen Input Shaft Speed. Make sure you have released the Clutch pedal fully.

Make sure the lamp for "D" is lit up on the Shift Control. If not the shift control may need to be replace.



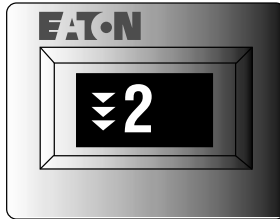
Lamp for "D"

Step C Procedure

Condition

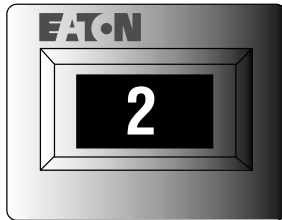
Action

If the Gear Display shows:



Down arrows with a flashing "2":

The input shaft turning faster than 150 rpm. Make sure that the Clutch is fully depressed. If problem continues the Clutch is not adjusted correctly.



Flashing "2":

The sliding clutch is butting. Release the clutch pedal slightly.

Solid "2":

The AutoShift is engaged in gear and is ready to go.

Problem

Possible Cause

The AutoShift will not shift until you lift off the throttle.

J1939 data link is not working. Check to see if the engine J1939 is turned on. Check the J1939 data link harness, terminating resistors. This is an OEM issue.

The AutoShift will not shift across the Dyno.

Place the AutoShift in "D" and button up the Maximum Start Gear. Then try it. If the AutoShift still does not shift the dyno has too much drag. The AutoShift needs to have the rolling inertia from the vehicle. If the dyno has too much drag the rear wheels slow down to fast. This is why the AutoShift will not shift.

The AutoShift is upshifting automatically in "H" or manual mode.

The only time the AutoShift will shift automatically is when the input shaft speed is 300 rpm over rated speed of the engine. The AutoShift may have the incorrect engine configuration downloaded into the Push Button Shift Control. This is corrected by downloading the correct configuration into the Push Button Shift Control, using VEPS or ServiceRanger.

The OEM shift lever does not work.

The Push Button Shift Control may not have the correct software. The easiest way to tell is if the Service Lamp is on solid, it is correct. The OEM shift lever or the OEM wiring may be the problem.

The AutoShift will not make Automatic shifts even after lifting off the throttle pedal.

The AutoShift has what is called RPM/Load based shifting. Simply push the upshift button while the shift control is still in "D". For more information read the Drivers Instruction Guide.

The engine will not start.

Make sure there is an "N" on the Gear Display. The problem is with the Start Enable circuit. Refer to OEM wiring diagrams.

The engine will start in any gear.

The problem is with the Start Enable circuit. Refer to OEM wiring diagrams.

When the key is turned off the AutoShift seems to calibrate forever. (X-Y Shifter) Several issues could cause this.

- OEM wiring. Verify the OEM interface harnesses.
- Bad Power and Ground. Perform the Electrical Pretest.
- The incorrect transmission ECU. This can be verified using ServiceRanger.
- The X-Y Shifter. The sensors could be bad.

Problem

Miscellaneous AutoShift complaints

After retrieving fault codes the Gear Display that is integrated in the dash is displaying fault code 5. There is no fault code 5.

There is an active fault code 44. Fault code 44 is for the Inertia Brake. This transmission does not have an Inertia Brake.

There are active fault codes present.

Possible Cause

- Always verify the OEM wiring first.
- Check the installation of the AutoShift second.
- Check the AutoShift transmission third.

It is not fault code 5, it is fault code 25, which means no code. The start up procedure for the dash panel does not allow the 2 to be displayed.

Attempt to clear the code. If fault code 44 comes right back the Transmission ECU may have been configured for a transmission that requires an Inertia Brake. This must be confirmed using Service Ranger. If this is the case the Transmission ECU will need to be replaced.

Record the fault codes. Clear the fault codes. If the fault codes come right back as active codes.

- Always verify the OEM wiring first.
- Check the installation of the AutoShift second.
- Check the AutoShift transmission third.

The following charts have what is supplied from Eaton as the default and what must be re-calibrated by the OEM. VEPS or ServiceRanger can accomplish the re-calibration.

Default	For indicated transmission model - no need to touch
Required	Re-calibration for this combination

Engine Governor	Peak Torque	AutoShift Generation 2
		6-ASX
1700	1200	N/A
1800		
1900		
2000		
2100		
2200	1300	2400 RPM Standard
2300	1400	
2400		
2500		
2600	1600	2600 RPM Standard

Engine Governor	Peak Torque	AutoShift Generation 2
		7-ASX
1700	1200	N/A
1800		
1900		
2000		
2100		
2200	1300	2100 RPM Standard
2300	1400	2400 RPM Standard
2400		
2500		
2600	1600	

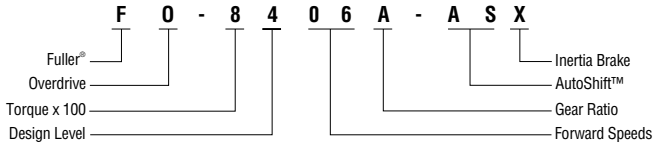
Engine Governor	Peak Torque	AutoShift Generation 2
		10-AS2
1700	1200	Heavy Duty Standard
1800		
1900		
2000		
2100		
2200	1300	2100 RPM Standard
2300	1400	2400 RPM Standard
2400		
2500		
2600	1600	

Engine Governor	Peak Torque	AutoShift Generation 2
		18-AS2
1700	1200	N/A
1800		1800 RPM Standard
1900		
2000		2000 RPM Standard
2100		2100 RPM Standard
2200	1300	N/A
2300	1400	
2400		
2500		
2600	1600	

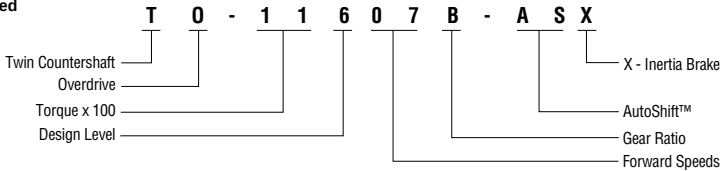
Model Number

The model number gives basic information about the transmission and is explained below. Use this number when calling for service assistance or replacement parts.

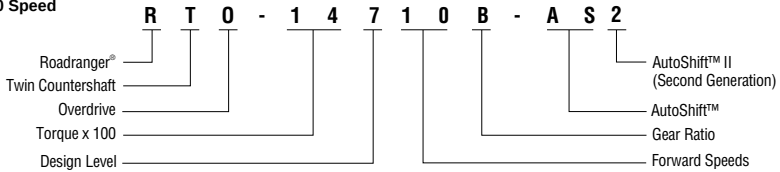
6 Speed



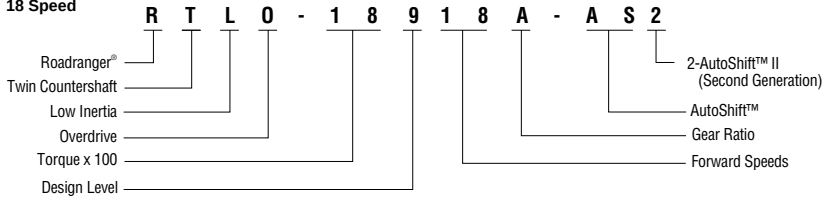
7 Speed



10 Speed



18 Speed



PREFIX KEY
F = Fuller®
L = Low Inertia
O = Overdrive
R = Roadranger®
T = Twin Countershaft

SUFFIX KEY
AS = AutoShift™
X = Inertia Brake
W = Wet Clutch
T = Torque Converter
2 = AutoShift™ II (Second Generation)

Retrieving and Clearing Fault Codes

During power-up, the service light will come on and go off. This is normal operation. But, if the service light comes on and stays on or comes on while driving, it means the transmission has detected a fault and you'll want to get to a service facility as soon as possible.

In the event there is a problem with the transmission, there are three primary tasks the driver should perform.

- **Driving Conditions:** Note the driving condition under which the problem occurred.
- **Transmission Conditions:** Note the condition of the transmission under which the problem occurred.
- **Retrieve Codes / Reset System:** Record fault codes and reset the transmission as described below.

Retrieving Fault Codes

Retrieve transmission fault codes by enabling the transmission system's self-diagnostic mode.

Note: You can also use a PC-based service tool, such as the ServiceRanger, to retrieve transmission fault codes.

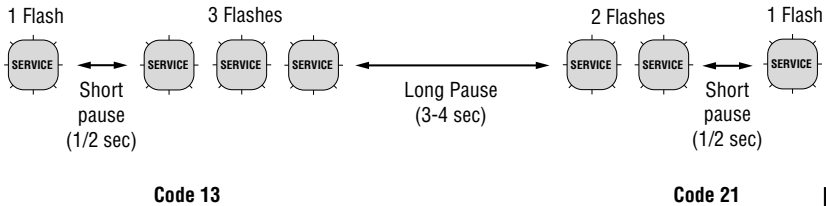
1. Place the shift lever in neutral.
2. Set the parking brake.
3. Turn the ignition key on but do not start the engine. If the engine is already running, you may still retrieve codes, however, do not engage the starter if engine stalls.
4. **To Retrieve Active Codes:** Start with the key in the on position. Turn the key off and on two times within five seconds ending with the key in the on position. After five seconds, the service lamp begins flashing two-digit fault codes. If no codes are active, the service light will flash code 25 (no codes).



To Retrieve Inactive Codes: Start with the key in the on position. Turn the key off and on four times within five seconds ending with the key in the on position. After five seconds, the service lamp begins flashing two-digit fault codes. If no codes are active, the service light will flash code 25 (no codes).



5. Observe the sequence of flashes on the indicator lamp and record the codes. A one to two second pause separates each stored code, and the sequence automatically repeats after all codes have been flashed.



Clearing Fault Codes

The following procedure clears all inactive fault codes from the ECU's memory. (Active fault codes are automatically cleared when the fault has been corrected.)

Note: You can also use a PC-based service tool, such as the ServiceRanger, to clear transmission fault codes.

1. Place the shift lever in neutral.
2. Set the parking brake.
3. Turn the ignition key on but do not start the engine.
4. Start with the key in the on position. Turn the key off and on six times within five seconds, ending with the key in the on position.



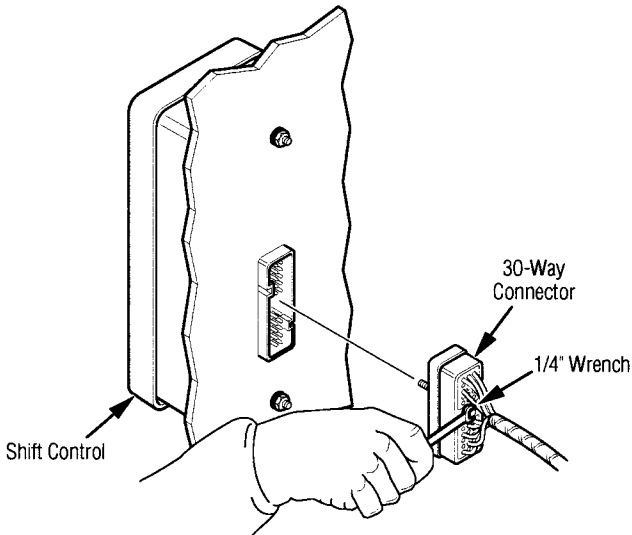
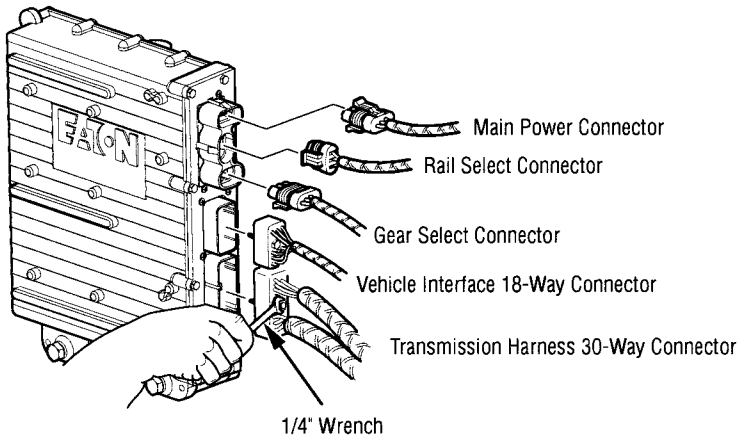
Note: If the codes have been successfully cleared, the service lamp will come on and stay on for five seconds.

5. Turn key off and allow system to power down.

Fault Code	Description
11	Shift Control
12	Transmission Controller
16	Eaton Proprietary Link (EPL)
17	Start Enable Relay Coil
21	Interrupt Clutch Solenoid
22	Lock-up Clutch Solenoid
24	Hydraulic System Fault
25	No Code
32	Switched System Voltage
33	Battery Voltage Supply
35	J-1939 Data Link
41	Range Failed to Engage
42	Splitter Failed to Engage
43	Range Solenoid Valve
44	Inertia Brake Solenoid Coil
46	Splitter Valve
51	Rail Select Sensor
52	Gear Select Sensor
56	Input Shaft Speed Sensor
57	Main Shaft Speed Sensor
58	Output Shaft Speed Sensor
61	Rail Select Motor
63	Gear Select Motor
65	Logic Power
71	Stuck Engaged
72	Failed to Select Rail
73	Failed to Engage Gear
74	Failed to Synchronize
83	Shift Lever Missing

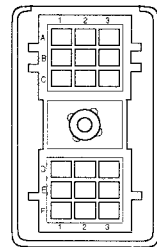
ECU Connectors

Using a 1/4" wrench, connectors must be tightened to 20-30 Lb_in (2.25-3.39 Nm).



Connector Pin Descriptions

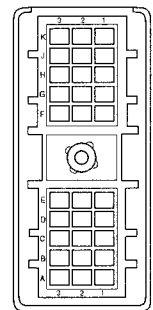
Vehicle Interface		
18-way	Description	Notes
A1	Batt 1	
A2	ATA +	
A3	GND 1	
B1	Trans batt 1	
B2	ATA –	
B3	GND 2	
C1	EPL +	
C2	EPL –	
C3	EPL shield	
D1	Aux speed 1+	
D2	Aux speed 1–	
D3	Aux input 2	Input, LO side
E1	Batt 2	
E2	Trans batt 2	
E3	Aux input 2	(Return)
F1	Aux input 1	Input, LO side
F2	Aux input 1	(Return)
F3	Aux output 1	Output, LO side driver



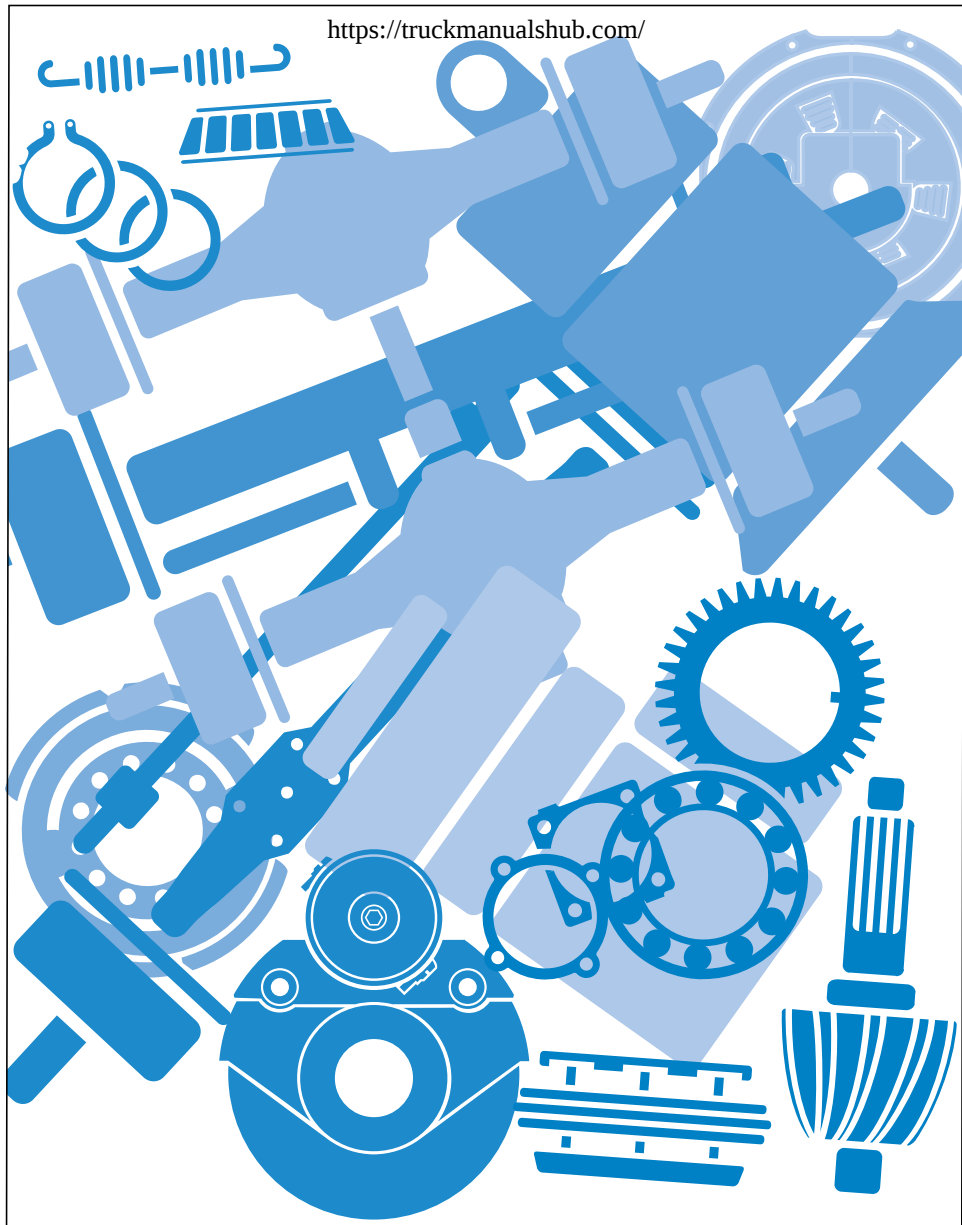
**Vehicle Interface
18-way Connector**

Connector Pin Descriptions

Shift Control		
30-way	Description	Notes
A1	Aux input/output 3	Input/output, LO side driver
A2	Start enable latch	
A3	Start enable relay –	
B1	Aux input 5	(Return)
B2	1587 +	
B3	Vdash	
C1	Ignition	
C2	1587 –	
C3	Start enable relay +	
D1	Aux input 5	Input, LO side
D2	Aux input 6	Input, LO side
D3	Aux output 3	Output, LO side driver
E1	Gear display clock	
E2	Gear display data	
E3	Gear display	(Return)
F1	EPL +	
F2	EPL –	
F3	EPL shield	
G1	1939 +	
G2	1939 –	
G3	1939 shield	
H1	Aux input 6	(Return)
H2	Aux output 2	Output, HI/LO side driver
H3	Aux input/output 4	Input/output, LO side driver
J1	Batt 1	
J2	Trans batt 1	
J3	GND 1	
K1	Batt 2	
K2	Trans batt 2	
K3	GND 2	



**Shift Control
30-way Connector**



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National Institute for
**AUTOMOTIVE
SERVICE
EXCELLENCE**

Roadranger®

MORE TIME ON THE ROAD

The Roadranger® System is an unbeatable combination of the best products from Eaton and Dana – partnering to provide you the most advanced, most trouble-free drivetrain in the industry. And it's backed by the Roadrangers – the most experienced, most expert, most accessible drivetrain consultants in the business.

For specifying or service assistance, call 1-800-826-HELP (4357) 24 hours a day, 7 days a week, (Mexico: 001-800-826-HELP (4357)) for more time on the road. Or visit our web site at www.roadranger.com.



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