

COMPUSHIFT II Manual

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Table of Contents

1	Preparing for Your Installation	12
1.1	Engine Preparation	12
1.2	Transmission Preparation	12
1.3	Additional Planning	12
1.4	Other Considerations.....	13
1.5	Tools You Will Need.....	13
1.6	Tools You May Need	13
1.7	Installation Notes for GM 4L80E / 4L60E Series	14
1.7.1	Transmission Output Shaft Speed (TOSS) Sensor	14
1.7.2	Transmission Main Plug.....	14
1.8	Installation Notes for Ford AODE / 4R70W / 4R100 / E4OD	14
2	Unpacking & Inspecting Your Kit.....	16
2.1	The COMPUSHIFT II Controller	16
2.2	The Display	16
2.3	Transmission Wiring Harness	17
2.4	Power & Engine Wiring Harness	18
2.5	Hydraulic Pressure Sensor Harness (Optional)	18
2.6	Switch-Shift Harness.....	19
2.7	The Acculink TPS (Optional).....	19
2.8	The TPS Connector for an Electronic Fuel Injection (Optional).....	20
2.8.1	For an Electronic Fuel Injection Engine with a standard GM TPS.....	20
2.8.2	For other types of Electronic Fuel Injection engines.....	21
2.9	Cable Operated Throttle Position Sensor (Optional)	21
3	Installation	22
3.1	Mount the Controller	22
3.2	Install the Transmission Harness	22
3.2.1	Connect the Main Transmission Plug.....	23
3.2.2	Connect to the TOSS Sensor	23
3.2.2.1	Installation	23

3.2.2.2	TOSS Locations for Different Transmissions	24
3.2.3	Connect the Lever Sensor Connector, if applicable	24
3.2.4	Connect to the Reproduced TOSS Signal	25
3.2.5	Connect the Transfer Case Calculation Wire (4WD)	25
3.3	Install the Power & Engine Harness	25
3.3.1	Connect the Throttle Position Sensor	26
3.3.2	Connect the Power and Meter Leads	26
3.3.3	Connect the Switch-Shift Harness	27
3.3.4	Connect the Overdrive Cancel Switch and Indicator	27
3.3.5	CAN Bus Connector	27
3.4	Install or Connect a Throttle Position Sensor	27
3.4.1	Install the AccuLink TPS (Optional)	27
3.4.1.1	Find the AccuLink TPS Parts	28
3.4.1.2	Assemble the AccuLink TPS and Bracket	28
3.4.1.3	Assemble and Install the Ratio Arm	29
3.4.1.4	Align the Ratio Arm	29
3.4.1.5	Assemble the Adjustable Arm	30
3.4.1.6	Attach The Throttle Position Sensor	30
3.4.1.7	Set the Adjustable Arm Length	31
3.4.1.8	Install the Adjustable Arm	31
3.4.1.9	Check the Adjustable Arm & TPS	31
3.4.1.10	Check The Linkage	32
3.4.1.11	Connect the AccuLink TPS to the Harness	33
3.4.1.12	Secure the Wiring Harness to the AccuLink TPS	34
3.4.2	Install the Cable-Operated TPS (Optional)	34
3.4.2.1	Install the Cable TPS	34
3.4.2.2	Mount the Cable Bracket	35
3.4.2.3	Mount the Sensor Box	35
3.4.3	Install the EFI TPS Adapter Harness (Optional)	36
3.4.3.1	EFI with a General Motors throttle position sensor	36
3.4.3.2	Other Systems	36
3.5	Install the Switch-Shift Wiring Harness (Optional)	37
3.5.1	Connect the Three (3) Leads	38
3.5.2	Connect to the Power & Engine Harness	38
3.6	Install the A-B Mode Switch (Optional)	39

3.6.1	Installing the Switch	39
3.6.2	Using the Switch	39
3.6.2.1	SETUP Screens	40
3.7	Install the Overdrive Cancel Switch (Optional)	40
3.7.1	Installing the Switch	40
3.7.2	Using the Switch	41
3.8	Install the Manual TCC Switch (Optional)	41
3.8.1	Installing the Switch	41
3.8.2	Using the Switch	42
3.9	Connect the Display	42
3.10	Checkout and Testing	42
3.10.1	Final Checks.....	42
3.11	Calibrate the Throttle Position Sensor	42
4	Monitoring & Tuning Your System.....	44
4.1	Display DASHBOARD Screens	45
4.1.1	Mixed Meter Screen.....	45
4.1.2	Large Digit Gear Screen	46
4.1.3	Large Digit Engine RPM Screen.....	47
4.1.4	Large Digit Vehicle Speed Screen	47
4.1.5	Large Digit Transmission Temperature Screen	47
4.1.6	Stopwatch Screen	47
4.1.7	System Setup Menu Screen	48
4.1.8	System Status Screen	49
4.1.9	Shift Speed Adjust Screen	49
4.1.10	Shift Pressure Adjustment Screen.....	50
4.2	Display SETUP Screens	50
4.2.1	How SETUP Screens Work	50
4.2.2	How to Enter SETUP Mode	51
4.2.3	Transmission Type	52
4.2.4	Engine Type	52
4.2.5	Shift Mode.....	52
4.2.6	Number of Engine Cylinders.....	53
4.2.7	Throttle Position Sensor Calibration	54
4.2.8	Maximum Engine RPM	55

4.2.9	Transfer Case Ratio	55
4.2.10	Final Drive Ratio	56
4.2.11	Speedometer Calibration	56
4.2.12	Tire Diameter.....	56
4.2.13	Vehicle Weight.....	57
4.2.14	TCC Mode.....	57
4.2.15	TCC Enable Gear.....	57
4.2.16	TCC Maximum Throttle	58
4.2.17	TCC Minimum Throttle.....	58
4.2.18	TCC Enable Speed	59
4.2.19	TCC Disable Percentage.....	59
4.2.20	R2L Pressure Boost	60
4.2.21	Downshift Offset.....	60
4.2.22	Load Factory Defaults	60
4.2.23	Advanced Setup	61
4.2.23.1	Shift Pressure Tables	62
4.2.23.2	Shift Speed Tables	65
4.2.23.3	TPS Direction.....	67
4.2.23.4	TPS Ground	68
4.2.23.5	MAP Sensor Ground	68
4.2.23.6	Engine Temp Sensor Bias	68
4.2.23.7	Transmission Temp Sensor Bias	69
4.2.24	System Diagnostics Screen.....	69
4.2.25	Display Contrast.....	69
4.2.26	Display Brightness.....	70
4.2.27	Display Color	70
4.2.28	System Units.....	70
4.2.29	Contact Information	71
5	Driving & Shifting	72
5.1	Fully Automatic Shifting	72
5.2	Using a Paddle Shifter or Switch-Shift (Optional)	72
5.3	Using the A/B Mode Switch (Optional).....	73
5.3.1	DASHBOARD Screens	73
5.3.2	SETUP Screens	73

5.4	Using the Overdrive Cancel Switch (Optional)	73
6	Diagnostics & Troubleshooting	74
6.1	Status LED and Display	74
6.2	Faults	74
6.2.1	Driver Fault.....	74
6.2.2	TPS Signal Low	75
6.2.3	TPS Signal High	75
6.2.4	Both TPS Signal Low & TPS Signal High.....	75
6.2.5	Transmission Temp Sensor	75
6.2.6	Transmission Over Temp.....	76
6.2.7	EEPROM Fault.....	76
6.2.8	System Voltage Low	76
6.2.9	System Voltage High	76
6.2.10	Invalid PRNDL.....	76
6.2.11	System Over Temp	77
6.3	System Diagnostics	77
6.3.1	Shift Pressure	77
6.3.2	Shift Solenoids	77
6.3.3	Torque Converter Clutch	77
6.3.4	Gear Lever Position	78
6.3.5	Transmission Temperature	78
6.3.6	Transmission Output Shaft Speed	78
6.3.7	Switch Input Diagnostics	78
6.3.8	Voltage Input Diagnostics.....	78
6.3.9	Speed Input Diagnostics.....	78
6.3.10	Switch Output Diagnostics	78
6.3.11	Software Version	78
7	Additional Guides & Information.....	79
7.1	Changing a Wiring Harness Terminal.....	79
7.2	COMPUSHIFT II Quick Install Guide.....	80
7.3	Installing the Transmission Pressure Sensor.....	80
7.3.1	Typical Installation	81
7.3.2	ZF4HP24	81
7.4	Installing the Six Shooter Acculink.....	83

- 7.5 Installing the AccuLink Refit Kit..... 83
 - 7.5.1 Introduction 83
 - 7.5.2 Installation Planning..... 83
 - 7.5.3 Required Tools and Supplies..... 83
 - 7.5.4 Removing the Old System 84
 - 7.5.5 Removing the Sensor 85
 - 7.5.6 Installing the Sensor Pin 85
 - 7.5.7 Installing the AccuLink TPS 86
 - 7.5.8 Aligning the Ratio Arm for Edelbrock AFB and Holley Carburetors..... 87
 - 7.5.9 Aligning the Ratio Arm for Rochester Quadrajet Carburetors 87
 - 7.5.10 Assembling the TPS Bracket..... 88
 - 7.5.11 Attaching the TPS to the Carburetor 89
 - 7.5.12 Installing the Adjustable Arm 91
 - 7.5.13 Checking the Adjustable Arm and Sensor..... 92
 - 7.5.14 Connecting the TPS..... 93
 - 7.5.15 Securing the TPS Wiring Harness 94
- 7.6 Connecting to a ZF 4HP24 Gear Lever Position Sensor..... 94
 - 7.6.1 US Version 94
 - 7.6.2 UK Version 94
- 7.7 Automatic Transmission Basics 95
- 8 Specifications & Pinouts 96**
 - 8.1 Controller Mechanical Drawings 96
 - 8.2 Controller Specifications 96
 - 8.2.1 COMPUSHIFT II..... 96
 - 8.2.1.1 System Design 96
 - 8.2.1.2 Programming 96
 - 8.2.1.3 Chassis 97
 - 8.2.1.4 Mounting Requirements 97
 - 8.2.1.5 Environmental Requirements 97
 - 8.2.1.6 Electrical Specifications..... 97
 - 8.2.1.7 Connectors 98
 - 8.2.1.8 Indicators..... 98
 - 8.3 Display Specifications..... 98
 - 8.3.1 COMPUSHIFT II..... 98

- 8.3.1.1 Type 98
- 8.3.1.2 Display Characteristics 98
- 8.3.1.3 Chassis 98
- 8.3.1.4 Environmental Requirements 99
- 8.3.1.5 Shock & Vibration 99
- 8.3.1.6 Electrical Specifications 99
- 8.3.1.7 Display Formats 99
- 8.3.1.8 Running Dashboard Displays 99
- 8.3.1.9 On-the-fly adjustments 99
- 8.3.1.10 Advanced Setup Features 100
- 8.4 AccuLink TPS Specifications 100
 - 8.4.1 Description 100
 - 8.4.2 Linkage 100
 - 8.4.3 Mounting Hardware 100
 - 8.4.4 Environmental Requirements 100
 - 8.4.5 Adjustments 100
 - 8.4.6 Attachment 100
- 8.5 Cable TPS Specifications 101
 - 8.5.1 Type 101
 - 8.5.2 Chassis 101
 - 8.5.3 Environmental Requirements 101
 - 8.5.4 Cable 101
- 8.6 Connector Pinouts 101
 - 8.6.1 Pinouts for Engine Connector 102
 - 8.6.1.1 ENGINE Connector 102
 - 8.6.2 Pinouts for Option Connector 104
 - 8.6.2.1 OPTIONS Connector 104
 - 8.6.3 Pinouts for Ford 4R70W - Black Plug 106
 - 8.6.3.1 TRANS 1 Connector 106
 - 8.6.3.2 ENGINE Connector 109
 - 8.6.3.3 OPTIONS Connector 111
 - 8.6.4 Pinouts for Ford 4R70W - White Plug 114
 - 8.6.4.1 TRANS 1 Connector 114
 - 8.6.4.2 ENGINE Connector 116
 - 8.6.4.3 OPTIONS Connector 118

8.6.5 Pinouts for Ford 4R100 121

8.6.5.1 TRANS 1 Connector 121

8.6.5.2 ENGINE Connector 123

8.6.5.3 OPTIONS Connector..... 125

8.6.6 Pinouts for Ford AODE 128

8.6.6.1 TRANS 1 Connector 128

8.6.6.2 ENGINE Connector 130

8.6.6.3 OPTIONS Connector..... 132

8.6.7 Pinouts for Ford E4OD 135

8.6.7.1 TRANS 1 Connector 135

8.6.7.2 ENGINE Connector 137

8.6.7.3 OPTIONS Connector..... 139

8.6.8 Pinouts for GM 4L60E and 4L80E 142

8.6.8.1 TRANS 1 Connector 142

8.6.8.2 ENGINE Connector 144

8.6.8.3 OPTIONS Connector..... 146

8.6.9 Pinouts for Toyota A442F..... 149

8.6.9.1 TRANS 1 Connector 149

8.6.9.2 TRANS 2 Connector 150

8.6.10 Pinouts for ZF 4HP24 155

8.6.10.1 TRANS 1 Connector 155

8.6.10.2 ENGINE Connector 158

8.6.10.3 OPTIONS Connector..... 160

8.6.11 Pinouts for Toyota AB60 162

8.6.11.1 Abbreviations 162

8.6.11.2 TRANS 1 Connector 163

8.6.11.3 TRANS 2 Connector 164

8.7 Warranty 170

HGM Automotive Electronics thanks you for buying COMPUSHIFT II. This transmission control system is a quality product that works exceptionally well. This owner's manual is organized in the sequence for a proper install. We highly recommend you review it in advance and follow it closely as you work.

	<p>Plan</p> <ul style="list-style-type: none"> • Preparing for Your Installation(see page 12) • Unpacking & Inspecting Your Kit(see page 16)
	<p>Installation(see page 22)</p> <ul style="list-style-type: none"> • Mount the Controller(see page 22) • Install the Transmission Harness(see page 22) • Install the Power & Engine Harness(see page 25) • Install or Connect a Throttle Position Sensor(see page 27) • Install the Switch-Shift Wiring Harness (Optional)(see page 37) • Install the A-B Mode Switch (Optional)(see page 39) • Install the Overdrive Cancel Switch (Optional)(see page 40) • Install the Manual TCC Switch (Optional)(see page 41) • Connect the Display(see page 42) • Checkout and Testing(see page 42) • Calibrate the Throttle Position Sensor(see page 42)
	<p>Monitoring & Tuning(see page 44)</p> <ul style="list-style-type: none"> • Display DASHBOARD Screens(see page 45) • Display SETUP Screens(see page 50)
	<p>Driving & Shifting(see page 72)</p>

	<p>Diagnostics & Troubleshooting(see page 74)</p> <ul style="list-style-type: none"> • Status LED and Display(see page 74) • Faults(see page 74) • System Diagnostics(see page 77)
	<p>Additional Guides & Information(see page 79)</p> <ul style="list-style-type: none"> • Changing a Wiring Harness Terminal(see page 79) • COMPUSHIFT II Quick Install Guide(see page 80) • Installing the Transmission Pressure Sensor(see page 80) • Installing the Six Shooter Acculink(see page 83) • Installing the AccuLink Refit Kit(see page 83) • Connecting to a ZF 4HP24 Gear Lever Position Sensor(see page 94) • Automatic Transmission Basics(see page 95)

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1 Preparing for Your Installation

Take the time now to plan your installation – it will save you more time down the road!

1.1 Engine Preparation

When you ordered COMPUSHIFT II, you had to choose from one (1) of three (3) Throttle Position Sensor (TPS) systems:

1. The AccuLink TPS for vehicles with Edelbrock AFB, Holley and Rochester Quadrajet carburetors; *or*
2. A wiring harness for Electronic Fuel Injection (EFI) vehicles that have their own TPS; *or*
3. A Cable Operated TPS for all other engines, including older diesel engines

NOTE: Please contact your distributor or [HGM headquarters](#)¹ right away if you're missing the required part(s) for your specific TPS system. Before starting, we highly recommend reading all of these instructions. Think through and plan your approach. It will pay off!

 Failure to follow all instructions may cause damage to COMPUSHIFT II, void its warranty, or damage to your vehicle.

1.2 Transmission Preparation

 **COMPUSHIFT II cannot properly operate a malfunctioning transmission, and a malfunctioning transmission may damage COMPUSHIFT II and void your warranty.**

Your transmission must be properly installed and in good mechanical condition before using COMPUSHIFT II. A qualified transmission repair shop can inspect, clean, install and/or rebuild your transmission as required. If there are any questions about the condition or type of transmission, please contact a qualified transmission repair facility, HGM Headquarters, or one of our distributors for a recommendation.

Find your transmission from the list below and review these specific tips:

- [Installation Notes for GM 4L80E / 4L60E Series](#)(see page 14)
- [Installation Notes for Ford AODE / 4R70W / 4R100 / E4OD](#)(see page 14)

1.3 Additional Planning

Prior to installation, you'll also need to decide:

¹ <http://www.hgmelectronics.com/contact>

- Where to mount your COMPUSHIFT II Controller.
 - Where to install the firewall grommets for your wiring harnesses.
 - How to route the wiring harnesses to the engine and transmission.
-

1.4 Other Considerations

- COMPUSHIFT II can provide an electronic signal to [operate an electronic speedometer](#)(see page 56).
 - COMPUSHIFT II also provides a signal that duplicates the speed sensor (TOSS) in your transmission. This can be used to [run an original in-dash speedometer](#)(see page 56), and eliminates the need for dual speed sensors.
 - Refer to the [COMPUSHIFT II Quick Install Guide](#)(see page 80), also included in the packaging, to get an overview of all the components.
-

1.5 Tools You Will Need

- No. 2 Phillips screwdriver
 - 1/8" or 3/16" flat blade screwdrivers
 - Drill and small drill bit assortment
 - Socket / open-end wrench assortment
 - Wire cutters / wire stripping pliers
 - Soldering iron and solder or wire crimping pliers
-

1.6 Tools You May Need

Depending on the installation, you may also need:

- File
- Tin snips
- Center punch
- Sheet metal tools
- Insulating tape
- Wire spade lugs
- Wire crimp connectors
- 1.1875" and 1.625" hole saw or chassis punch
- Volt/ohm-meter

1.7 Installation Notes for GM 4L80E / 4L60E Series

1.7.1 Transmission Output Shaft Speed (TOSS) Sensor

A few different types of Transmission Output Shaft Speed (TOSS) sensors are used in the GM 4L80E / 4L60E Series.

Two (2) different adapter wires are shown here. In both cases, one side of the adapter wires plugs into the TOSS sensor; the other plugs into the COMPUSHIFT II wiring harness.

- The connector with the orange gasket fits early-4L60E transmissions.
- The connector with the blue gasket fits late-4L60E and all 4L80E transmissions (see note below).



1.7.2 Transmission Main Plug

Early GM 4L80E transmissions had two (2) types of main body connectors: one is used today, but the other (pre-1994 shown here) is *no longer available*. While COMPUSHIFT II does *not* provide the connector for the discontinued model, fortunately, it can be easily fitted with the internal wiring harness / plug from a *late-model* GM 4L80E. Order it from General Motors, Part No. P/N24200161, and have a qualified transmission shop install.

1.8 Installation Notes for Ford AODE / 4R70W / 4R100 / E4OD

Ford transmissions have the following positions on shift lever: Park, Reverse, Neutral, Drive, 2, and 1. Unlike GM, there is no third gear selection. Instead, most Ford vehicles are equipped with an Overdrive Cancel switch and indicator. When selected, this switch prevents the transmission from shifting into 4th gear while in Drive, and the indicator illuminates to show that Overdrive (4th gear) is disabled.

Though the COMPUSHIFT II Kit does not provide it an Overdrive Cancel switch, one can be connected to the wire labeled "OVERDRIVE CANCEL" on the Engine & Power wiring harness. Connect this wire to a SPST/NO, MOM (single-pole, single throw normally open momentary) switch that connects to ground when turned on.

An LED lamp can be connected to the wire labeled "OVERDRIVE CANCEL INDICATOR". One side of the LED should be connected to the wire, and the other side connected to ground.

You do not need to use the "OVERDRIVE CANCEL" or "OVERDRIVE CANCEL INDICATOR" wires unless you want to prohibit fourth gear. If insulated, the wires can be left unconnected.

HGM stocks a variety of [pushbutton switches and indicators](#)² or you can provide your own.

² <http://www.hgmelectronics.com/products-compushift-accessories/>

2 Unpacking & Inspecting Your Kit

Be sure to read the packing slip because the as-shipped configuration tells you which transmission your COMPUSHIFT II is programmed to operate with – as well as what torque converter lockup and maximum upshift RPM rules are programmed into the unit. It will also tell you which of the optional components and wiring harness was included.

When you ordered COMPUSHIFT II, you had to choose from one (1) of three (3) Throttle Position Sensor (TPS) systems:

1. The AccuLink TPS for vehicles with Edelbrock AFB, Holley and Rochester Quadrajet carburetors; *or*
2. A wiring harness for Electronic Fuel Injection (EFI) vehicles that have their own TPS; *or*
3. A Cable Operated TPS for all other engines, including older diesel engines

Please contact your distributor or [HGM headquarters](#)³ right away if you're missing the required part(s) for your specific TPS system.

 All necessary wiring harnesses and TOSS adapter cables are included with your basic COMPUSHIFT II.

Here's what's in a COMPUSHIFT II kit:

2.1 The COMPUSHIFT II Controller

The controller is the heart of the transmission control system. On its exterior, you will see:

- Five (5) connectors for wiring:
 - Two (2) for the transmission wiring harnesses
 - One (1) for the power wiring harness
 - One (1) for the engine wiring harness
 - One (1) for the option wiring harness
 - One (1) for the Display cable
 - USB port
 - LED indicator showing "power on" and system status
 - SD card slot
-

2.2 The Display

The display is designed to work specifically with your COMPUSHIFT II Controller. It connects to the Controller via the attached cable.

You will use the Display to perform initial system setup and also to view readouts as you operate your vehicle.

³ <http://www.hgmelectronics.com/contact>

For more information on the COMPUSHIFT II Display and all of its screens, visit [Monitoring & Tuning Your System](#)(see page 44) section.



2.3 Transmission Wiring Harness

The Transmission Wiring Harness, shown here (or one similar), connects the COMPUSHIFT II Controller to the transmission.

See [here for installation instructions](#)(see page 22).

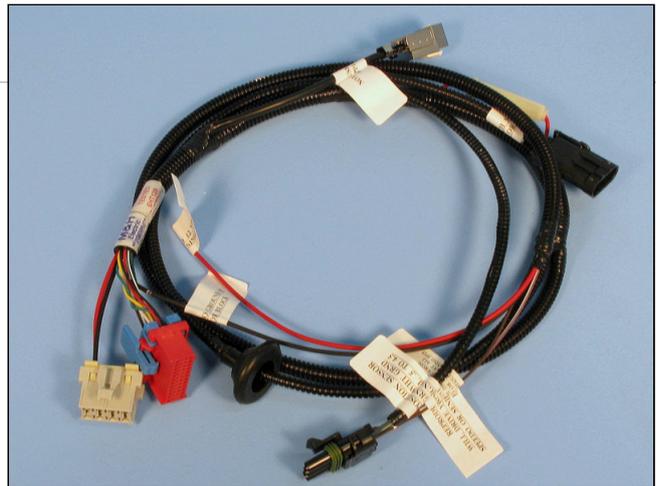


2.4 Power & Engine Wiring Harness

The Power & Engine Wiring Harness, shown here (or one similar) connects the COMPUSHIFT II Controller to the vehicle's TPS, tachometer, speedometer and power.

See [here for installation instructions](#)(see page 25).

Each harness has a rubber grommet for the firewall. These are placed in a recommended spot, but can be repositioned.



2.5 Hydraulic Pressure Sensor Harness (Optional)

The Hydraulic Pressure Sensor Harness, shown here, connects the COMPUSHIFT II Controller to the transmission's hydraulic pressure sensor port.

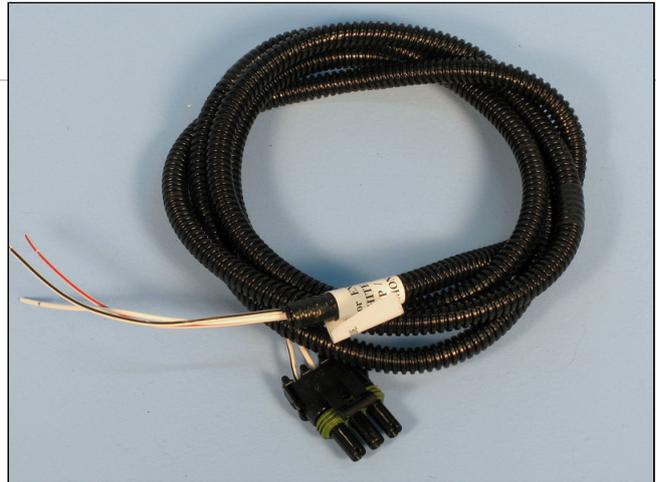


2.6 Switch-Shift Harness

COMPUSHIFT II includes the option to connect the Switch-Shift feature, allowing you to manually upshift and downshift via pushbutton controls or paddle shifter.

Switch-Shift uses an additional Switch-Shift Wiring Harness (see photo) that connects the Transmission Wiring Harness with the pushbutton controls.

See [here for installation instructions](#)(see page 37).



2.7 The Acculink TPS (Optional)

Acculink TPS fits all Edelbrock AFB, Holley and Rochester carburetors.

- The sensor is a spring-loaded, fully sealed rotary position sensor specifically designed for automotive use.
- All linkages, brackets, screws and nuts are made of stainless steel for corrosion resistance and longer life.
- The linkage and brackets are laser-cut for extreme accuracy.
- The sensor mounts directly to the carburetor and connects via a metal linkage. This eliminates installation and calibration difficulties that can occur with cable-driven sensors.

The Acculink Kit includes the following parts:

- Sensor bracket
- Ratio arm
- Adjustable arm (2 pieces)
- Two 10/32" x 7/8" Phillips pan-head screws
- Other mounting hardware (stainless steel nuts, washers, brackets and screws)



2.8 The TPS Connector for an Electronic Fuel Injection (Optional)

2.8.1 For an Electronic Fuel Injection Engine with a standard GM TPS

Most EFI engines have their own built-in Throttle Position Sensor (TPS), and you'll only need our provided adapter harness to tap into the signal. You will not need an Acculink TPS or Cable TPS..

No advance assembly is required for this adapter harness. You will install it later, in [this step](#)(see page 36) along with the Power & Engine Harness.

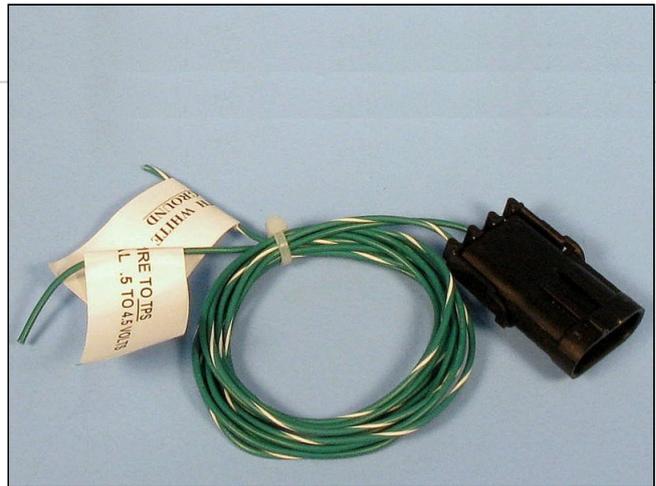
i For a diesel EFI engine, you will need to tap into the pedal position sensor signal. Consult your distributor or HGM for advice on this.



2.8.2 For other types of Electronic Fuel Injection engines

In installations where the EFI does not use the standard GM-style TPS, you will need the Universal EFI TPS wiring loom, shown here.

This loom has three leads that should be spliced into the appropriate signals on the EFI. The loom's connector plugs into the Power & Engine Harness, according to the instructions on [this page](#)(see page 36).



2.9 Cable Operated Throttle Position Sensor (Optional)

If you have a mechanically-actuated throttle that cannot accommodate AccuLink TPS, HGM Automotive Electronics offers a Cable TPS and Sensor Box.

The parts in the kit are shown in the photo.

To install, follow the instructions on this page: [Install the Cable-Operated TPS](#)(see page 34)

i Our Cable TPS and Sensor Box use the same sensor as the AccuLink TPS and can provide the signal necessary to shift the transmission.

3 Installation

Here is the sequence of steps for installation of COMPUSHIFT II.

- [Mount the Controller](#)(see page 22)
- [Install the Transmission Harness](#)(see page 22)
- [Install the Power & Engine Harness](#)(see page 25)
- [Install or Connect a Throttle Position Sensor](#)(see page 27)
 - [Install the AccuLink TPS \(Optional\)](#)(see page 27)
 - [Install the Cable-Operated TPS \(Optional\)](#)(see page 34)
 - [Install the EFI TPS Adapter Harness \(Optional\)](#)(see page 36)
- [Install the Switch-Shift Wiring Harness \(Optional\)](#)(see page 37)
- [Install the A-B Mode Switch \(Optional\)](#)(see page 39)
- [Install the Overdrive Cancel Switch \(Optional\)](#)(see page 40)
- [Install the Manual TCC Switch \(Optional\)](#)(see page 41)
- [Connect the Display](#)(see page 42)
- [Checkout and Testing](#)(see page 42)
- [Calibrate the Throttle Position Sensor](#)(see page 42)

3.1 Mount the Controller

Look inside your passenger compartment and decide where to mount the COMPUSHIFT II controller. It needs to be in a dry, cool, secure location -- the *farther away* from a heater outlet, the better. This photo shows the controller vertically mounted on an under-dash kick panel, an ideal spot.

You can also mount the controller on the floor pan or under a seat – provided there's at least 1" of clearance and free-flowing air around it. Make sure the engine exhaust system is not heating the spot where you plan to mount it.

Carefully consider the mounting location. The unit is *not waterproof* so never mount the controller in the engine compartment. Extreme shock and vibration, high temperature, or high input voltage can damage the unit.

You will be able to use the Display to conveniently make adjustments to COMPUSHIFT II at your convenience, so go ahead and mount the controller.

 When mounting the controller, please *use only the unit's built-in flange* (projected edge). Occasionally clients will try makeshift methods, like hanging it from cable ties or wrapping the unit in foam and tossing it under the seat. Don't do anything like this!

 The COMPUSHIFT II controller is a sealed assembly. **Do not open the controller case – this will void the warranty!**

3.2 Install the Transmission Harness

Once you have selected a place to mount the COMPUSHIFT II Controller as explained on the page, [Find & Mount the Controller](#)(see page 0), it's time to decide where to route the Transmission Wiring Harness.

The harness has a blue connector to the Controller and four or five connections to the transmission, depending on your transmission:

1. [Main Transmission Plug](#)(see page 23)
2. [TOSS Sensor Connector](#)(see page 23)
3. [Lever Position Sensor Connector](#)(see page 24)
4. [Reproduced TOSS Signal Wire](#)(see page 25)
5. [Transfer Case Calculation Wire](#)(see page 25)

(Your exact harness may differ from the one shown.)



 The Transmission Harness and its firewall grommet **must** be safely installed. You can reposition the firewall grommet as needed for your installation.

 The harness **must** be routed so that it **never** touches the exhaust system, the rotating drive shaft, or other moving parts of the drivetrain.

3.2.1 Connect the Main Transmission Plug

Safely route and connect the harness to the transmission.

3.2.2 Connect to the TOSS Sensor

There are two (2) common locations for the Transmission Output Speed Sensor (TOSS), depending on whether the vehicle is two- or four-wheel-drive. See the chart below for [TOSS Locations for Different Transmissions](#)(see page 24).

- Two-wheel-drive vehicles usually have a TOSS on the output snout or rear section of the transmission.
- Four-wheel-drive vehicles usually have the TOSS somewhere on the transfer case.

3.2.2.1 Installation

1. Choose the correct TOSS adapter for your transmission (see the [Planning Before You Install](#)(see page 0) page) and connect it to your vehicle's sensor.
2. Connect the TOSS adapter's other end to the Transmission Wiring Harness.

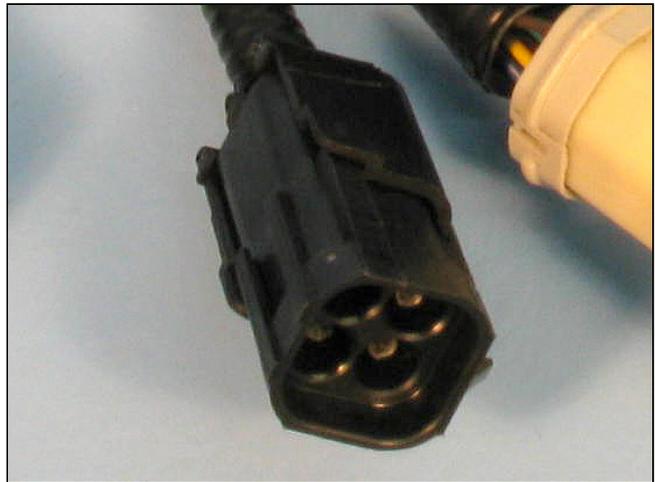
3.2.2.2 TOSS Locations for Different Transmissions

Transmission Type	TOSS Location
General Motors 4L60E	Extension housing
General Motors 4L80E	Left side of case at rear, not front
Ford AODE & 4R70W	Left side of case at rear
Ford E4OD	Extension housing the speedometer drive
Ford 4R100	Top of extension housing

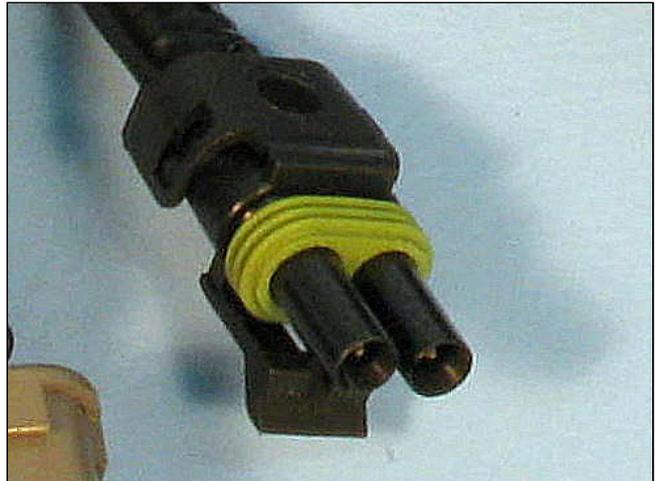
3.2.3 Connect the Lever Sensor Connector, if applicable

The COMPUSHIFT II transmission harness for some transmissions have an additional connector.

For a Ford 4R70W or 4R100 transmission, the Digital Range Sensor connector is separate from the main plug. It is a square 4-pin plug that connects to your transmission.



For a Ford AODE or E4OD, the Manual Lever Position Sensor connector is separate from the main plug. It is a male 2-pin plug that connects to your transmission.



3.2.4 Connect to the Reproduced TOSS Signal

Your COMPUSHIFT II Controller sends a signal that duplicates or reproduces the TOSS output, which is necessary for the proper operation of the OEM Electronic Control Module (ECM) system that was disconnected when you installed COMPUSHIFT II. This signal is sent via a purple/white wire labeled "Reproduced TOSS" on the Transmission Wiring Harness.

⚠ Do **not** attempt to connect your original TOSS wires to the TOSS wires now used by COMPUSHIFT II! If you need a TOSS signal, *only* use the Reproduced TOSS Signal via the purple/white wire labeled "Reproduced TOSS."

⚠ On GM vehicles, you can patch this connection to the cable that originally connected to the TOSS. GM does *not* make a plug / cable to fit this, so you must patch the wire directly.

3.2.5 Connect the Transfer Case Calculation Wire (4WD)

If you have a four-wheel-drive vehicle, you **must** connect the transfer case switch to the yellow Transmission Wiring Harness wire labeled "TRANSFER CASE CALCULATION WIRE."

You **must also** enter the transfer case's ratio into the COMPUSHIFT II Controller so it will operate correctly in the LOW Range.

3.3 Install the Power & Engine Harness

The Power & Engine Harness brings power to the COMPUSHIFT II system and provides several inputs and outputs to the vehicle.

It has two (2) connectors to the Controller (red = Engine, white = Power) and up to five (5) branches, depending on your specifications:

- [TPS Connector](#)(see page 0)

- Power and Meter Leads(see page 26)
- Switch-Shift Connector(see page 0)
- Overdrive Cancel(see page 0)
- CAN Bus Connector(see page 27)

 The Power & Engine Harness and its firewall grommet **must** be safely installed. You can re-position the firewall grommet as needed for your installation.

 The harness **must** be routed so that it **never** touches the exhaust system, the rotating drive shaft, or other moving parts of the drivetrain.



3.3.1 Connect the Throttle Position Sensor

Depending on your engine type, you may have installed an AccuLink TPS, an EFI TPS adapter, or a Cable TPS system.

Each of these solutions plugs into the same connector on the Power & Engine Harness.

3.3.2 Connect the Power and Meter Leads

- Connect the purple/white wire marked "SPEEDOMETER OUT ADJUSTABLE" to the speedometer.
- Connect the black wire marked "TO GROUND ON BATTERY OR BLOCK" to a good ground, preferably on the negative battery terminal or engine block.
- Connect the brown wire marked "RPM INPUT TO ECM" to either the tachometer output of an electronic ignition system (for example, an HEI), or the tachometer output of an MSD ignition system. This will allow your Display to show your engine RPM.
- Connect the red wire marked "TO 12 VOLTS SWITCHED CLEAN SINGLE CIRCUIT" to a circuit (min. 6 amps of current) that's powered when your ignition switch is turned on.

 Do **not** connect the tachometer input to the coil of an electronic capacitive discharge (CD) ignition. This may damage COMPUSHIFT II and void your warranty.

3.3.3 Connect the Switch-Shift Harness

Switch-Shift lets you manually upshift and downshift the transmission via a pair of pushbuttons or paddle shifters. A separate Switch-Shift Harness connects into the socket on the Power & Engine Harness.

See the section, [Install the Switch-Shift Wiring Harness](#)(see page 37) for detailed instructions.

3.3.4 Connect the Overdrive Cancel Switch and Indicator

If using a Ford transmission, you can use this optional feature.

- Connect the blue/red wire to the LED indicator.
 - Connect the blue/yellow wire to the switch.
For more information about this feature, see [this note](#)(see page 0) in the "Plan" section.
-

3.3.5 CAN Bus Connector

The CAN Bus allows a direction connection to an Engine Control Unit for engine management and data collection. Certain versions of the HGM software can obtain throttle position, engine speed, manifold pressure, manifold temperature and other information directly from the ECU through the CAN bus. Information on this feature is covered in a software guide specific to that software version.

3.4 Install or Connect a Throttle Position Sensor

When you ordered COMPUSHIFT II, you had to choose from one (1) of three (3) Throttle Position Sensor (TPS) systems:

1. The AccuLink TPS for vehicles with Edelbrock AFB, Holley and Rochester Quadrajet carburetors; *or*
2. A wiring harness for Electronic Fuel Injection (EFI) vehicles that have their own TPS; *or*
3. A Cable Operated TPS for all other engines, including older diesel engines

Based on your choice, select one of the following:

- [Install the AccuLink TPS \(Optional\)](#)(see page 27)
- [Install the Cable-Operated TPS \(Optional\)](#)(see page 34)
- [Install the EFI TPS Adapter Harness \(Optional\)](#)(see page 36)

3.4.1 Install the AccuLink TPS (Optional)

This video explains the complete installation, step-by-step, or you can follow the directions below.



Sorry, the widget is not supported in this export.
But you can reach it using the following URL:

<http://www.youtube.com/watch?v=dL7vZdjKlos>

3.4.1.1 Find the AccuLink TPS Parts

You should have the following parts:

- Sensor bracket
- Ratio arm
- Adjustable arm (2 pieces)
- Two 10/32" x 7/8" Phillips pan-head screws
- Other mounting hardware (stainless steel nuts, washers, brackets and screws)



3.4.1.2 Assemble the AccuLink TPS and Bracket

- Identify the TPS itself, the sensor bracket and the two 10/32" x 7/8" Phillips pan-head screws.
- Mount the TPS to the sensor bracket with the screws gently tightened. Be sure the plug side of the TPS is vertical (near the bracket mount), as shown.
- Tighten the TPS screws.



3.4.1.3 Assemble and Install the Ratio Arm

- Find the Ratio Arm from your COMPUSHIFT II Kit. It's the small oval piece of metal (shown here) with a protruding stud on its smaller end.
 - For Edelbrock AFB or Holley carburetors, remove the inset washer. For Rochester Quadrajets, leave the washer in place.
- Install the Ratio Arm onto the carburetor linkage as shown, using the 1/4-20" x 5/8" pan head Phillips screw, washer, and nylon insert lock nut.
 - The Ratio Arm is designed to mount in the linkage where a kick-down cable normally attaches.
 - The washer sits between the carburetor linkage and the nylon insert lock nut.
- Gently snug the screw and nut, but do *not* completely tighten.



3.4.1.4 Align the Ratio Arm

Edelbrock AFB & Holley

- Set the Ratio Arm so that the center of its pin is aligned with the edge of the carburetor linkage, as shown.
- Tighten the screw and nut in this position.

Rochester Quadrajets

- Set the Ratio Arm so that its pin is vertical.
- Tighten the screw and nut in this position.



3.4.1.5 Assemble the Adjustable Arm

The Adjustable Arm from your COMPUSHIFT II Kit contains two (4) pieces:

- Fixed, threaded section
- Sliding section
- Two screws

Find and assemble the Adjustable Arm, leaving the screws gently snug.



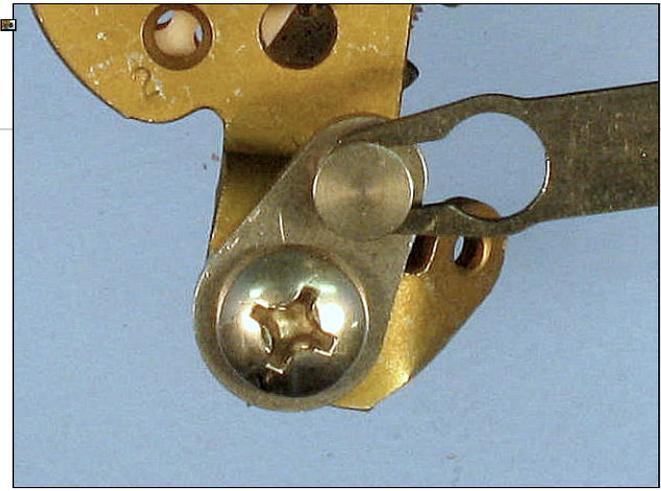
3.4.1.6 Attach The Throttle Position Sensor

Attach the fully assembled AccuLink TPS to the carburetor using its linkage side-rear manifold bolt.

- The TPS *must* be aligned correctly: rotation of the throttle linkage should match the rotation of the TPS.
- The Ratio Arm *must* be aligned along a straight line with the TPS (see photo). Hint: think of self-aligning window louvers.
- A straight edge or ruler can help you with correct alignment.

3.4.1.7 Set the Adjustable Arm Length

- Connect the fixed, threaded section of the Adjustable Arm to the Ratio Arm. The screw heads should face outward, away from the carburetor.
- Adjust the arm length so the edge of the sliding section's slot is aligned with the center of the TPS pin (as shown here) for the correct length.
- Tighten the adjustable arm screws at this position.
- Disable the fast-idle cam for the choke so the carburetor butterflies are on low-speed idle



3.4.1.8 Install the Adjustable Arm

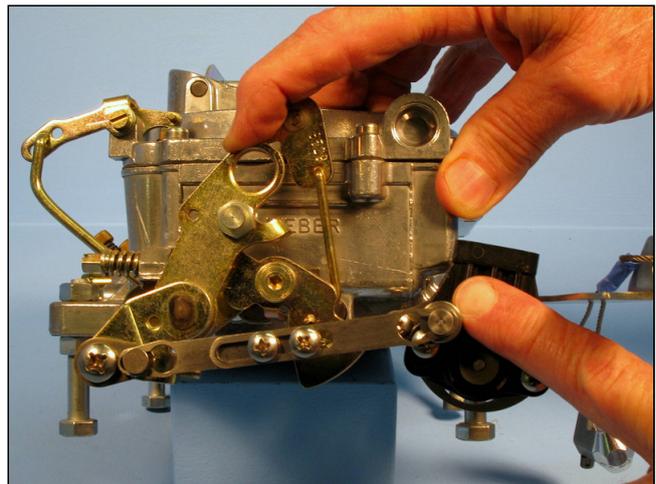
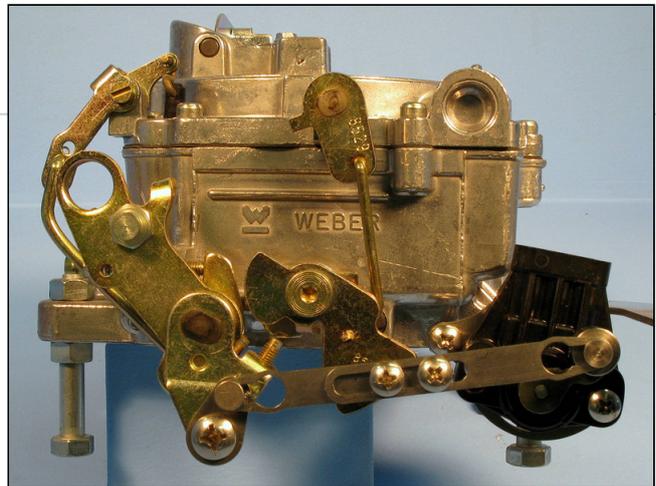
Install the Adjustable Arm by rotating the TPS so its pin can be inserted into the Arm, as shown here in its fully installed position.



3.4.1.9 Check the Adjustable Arm & TPS

- Check the Adjustable Arm with the throttle fully closed. There should be tension on the arm and *no* free play.
 - Correct any free play by slightly shortening the arm.
- Hold the carburetor linkage in the fully open position. Confirm the TPS has some remaining rotation/stroke by pressing on its arm as shown.
 - If the TPS is fully extended (i.e., there is *no* remaining rotation/stroke), then lengthen the arm slightly to correct.

- ⚠** The TPS should *not* reach the end of its rotation or stroke in either direction, but be slightly off the stop at each end of its travel. **Failure to achieve this could result in poor operation.**



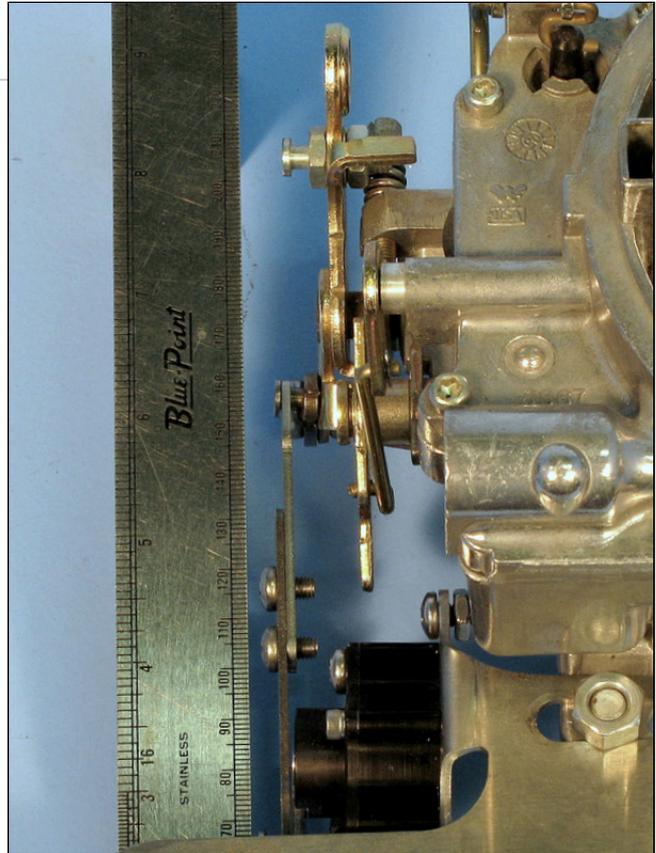
3.4.1.10 Check The Linkage

- Rotate the throttle linkage through its full range of travel to ensure no part of it hits the TPS.
- The position of the TPS bracket must clear the secondary butterfly linkage. This is especially important on the Rochester Quadrajet.
- To ensure smooth clearance, adjust the TPS bracket as necessary.

- ⚠** Do *not* lubricate the linkage. The AccuLink system is designed to work *without* lubrication. Most lubricants will attract dirt, shortening the life of the system.



i This photo shows an *incorrect* install: the TPS rotation is *not* aligned with the linkage, and neither are the arms.



3.4.1.11 Connect the AccuLink TPS to the Harness

- Snap the TPS plug into the [AccuLink TPS](#) (see page 27). The plug has a rubber gasket that fits tightly.
- Be sure to push the plug fully into the socket by squeezing the plug and the sensor together so you don't bend the sensor bracket.
 - This may require two hands.
 - If you can see the green gasket (first photo), it is not fully connected. It should be fully compressed (second photo).

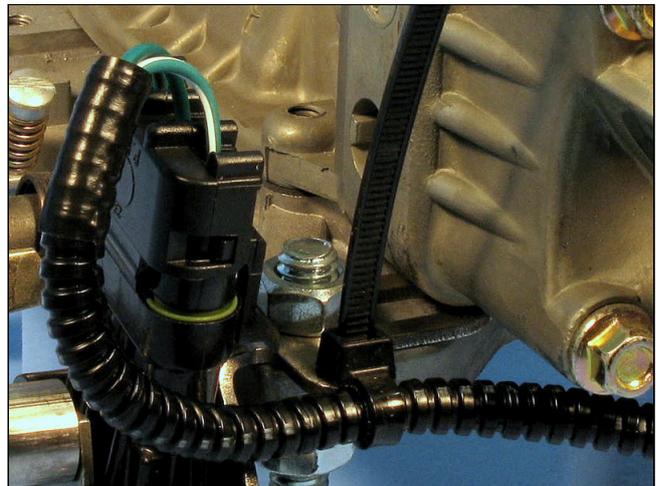
i Your system may have been shipped with an extension cable to connect the AccuLink TPS to the Controller if it's mounted far from the engine. If necessary, route the extension cable between the COMPUSHIFT II Controller and the TPS.



3.4.1.12 Secure the Wiring Harness to the AccuLink TPS

- From the bottom, feed the supplied cable tie and insert it through the slot in the TPS bracket.
- Cinch the cable tie around the wiring harness.
- Trim excess tie length as desired.

 Be sure to set the [TPS Ground](#) (see page 68) setting in the COMPUSHIFT controller to "on" when you are using an existing EFI TPS.



3.4.2 Install the Cable-Operated TPS (Optional)

If your vehicle is older and can't use our AccuLink TPS or doesn't have an EFI engine with built-in TPS, then you'll need to use our Cable Operated TPS

3.4.2.1 Install the Cable TPS

- Find the Ratio Arm and attach it to the throttle linkage at an appropriate point using the supplied screw, washer and locking nut.
 - The adjustable cable end attaches to the Ratio Arm.
 - The Ratio Arm must be attached so that the cable moves about 3/4" through the full throttle travel.
 - For correct travel, the end of the Ratio Arm should be positioned about 3/4" below the throttle plate shaft.
 - Travel should start from the closed throttle position, with the cable arm pointing at a 45-degree angle to the direction of cable travel.

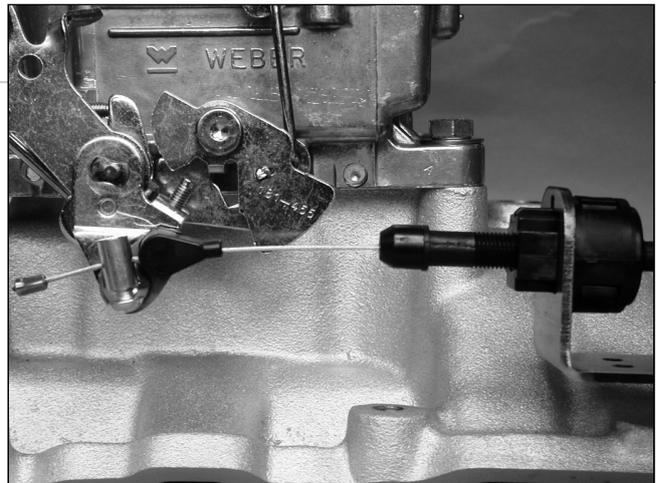
 This drawing shows a typical installation on a carburetor.



3.4.2.2 Mount the Cable Bracket

- Mount the cable housing and supplied bracket near the throttle linkage. As shown in the previous drawing, the cable should be horizontal and level when attached to the Ratio Arm.
- Both the cable housing and cable end have adjustable travel. To adjust the cable end, loosen the screw, move the end to its new position and re-tighten.
- The cable housing adjustment has a lock / unlock feature. Unlock the cable adjustment by pressing on the cable housing's square button. Slide the housing as necessary. Lock by pressing the button on the opposite side.
- The cable is spring-loaded, so be sure the cable has some preload in the closed throttle position. You can adjust the preload by loosening the cable-end screw and taking up the slack.

 You must **not** overextend the range of travel of the TPS. **Doing so will break the sensor and void your warranty.**



3.4.2.3 Mount the Sensor Box

- The splashproof Sensor Box can be mounted in the engine compartment, under the vehicle or inside the cabin. **Be sure to mount it away from the exhaust system and somewhat shielded from weather.**
- Use the supplied mounting tabs and sheet-metal screws. Be careful while routing the cable (avoid sharp bends) from the cable bracket to the Sensor Box.
- After installing the Sensor Box, plug in the sensor connector.

 If you have any questions about your ability to do this part of the job, get help from a qualified mechanic. Our distributors and the HGM headquarters are also available to advise you.

3.4.3 Install the EFI TPS Adapter Harness (Optional)

If you're using an Electronic Fuel Injected (EFI) engine and don't need to install a separate TPS, then you can use the HGM TPS adapter cable to the OEM wiring harness.

3.4.3.1 EFI with a General Motors throttle position sensor.

If your fuel injection uses the standard General Motors TPS socket, you can use our Y-adapter harness.

- Unplug the throttle position sensor from its original wiring harness.
- Plug the male end of the Y adapter harness into the throttle position sensor.
- Plug the original plug into the female end of the Y adapter harness.
- Connect the 3 wire mail COMPUSHIFT engine harness TPS connector into the mated connector on the Y adapter harness.



3.4.3.2 Other Systems

If you have some other type of socket, we can provide you with a bare pigtail adapter harness, which you can install yourself.

Route the adapter cable's two (2) wires as follows:

- Connect the green-white wire to the low or grounded side of the injection TPS.
- Connect the solid green wire to the sensor signal.

⚠ Be sure to set the [TPS Ground](#) (see page 68) setting in the COMPUSHIFT controller to "off" when you are using an existing EFI TPS.

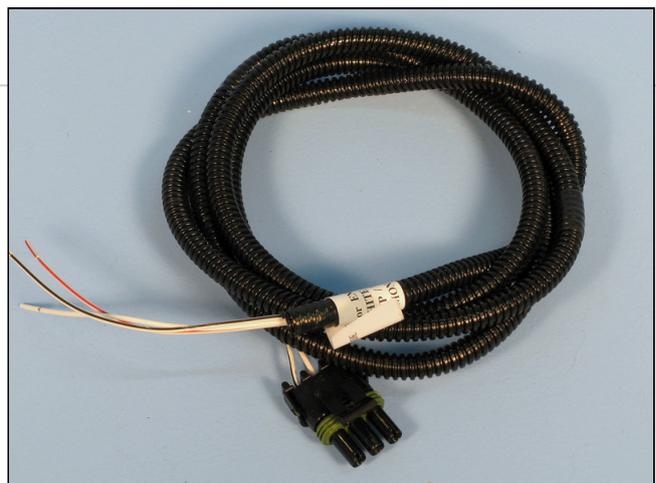


3.5 Install the Switch-Shift Wiring Harness (Optional)

You can utilize the COMPUSHIFT II Switch-Shift feature with an optional wire harness (usually for customers who want pushbutton or paddle shifting).

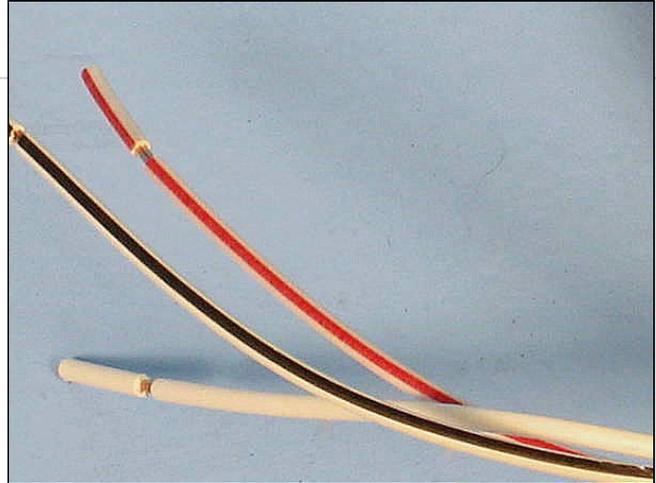
- Switch-Shift lets you manually upshift and downshift the transmission via a pair of pushbuttons or a paddle shifter.
- The Switch-Shift Wiring Harness (shown here) connects into the Transmission Wiring Harness and should be routed to your switch location or paddle shifter.

i Because each Switch-Shift installation is customized, you'll have to provide your own switches or paddle shifter. HGM Automotive Electronics can recommend switches or a paddle shifter for your specific application; just ask.



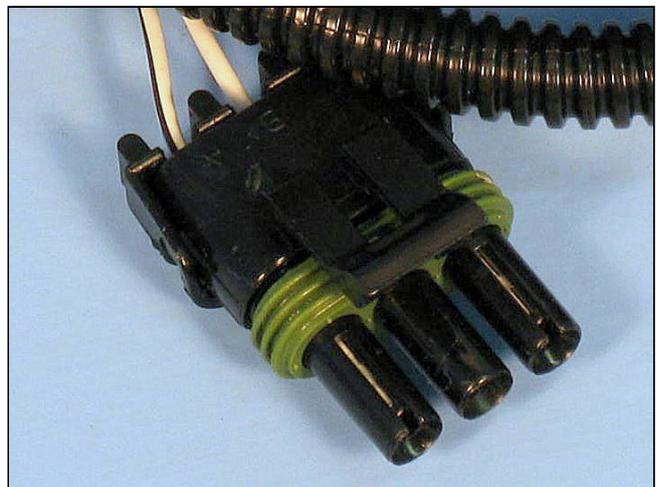
3.5.1 Connect the Three (3) Leads

- The white wire is common and gets connected to one pole of both switches.
- The white/red striped wire gets connected to the upshift switch.
- The white/black striped wire gets connected to the downshift switch.



3.5.2 Connect to the Power & Engine Harness

Snap together the three-prong plug with the socket provided on the Power & Engine Harness. Be sure to fully compress the green gasket.



3.6 Install the A-B Mode Switch (Optional)

COMPUSHIFT II offers an A-B mode feature. This allows you to configure two different setups (A and B) for your system in advance, and then switch between them easily.

For example, you could configure Mode A for performance driving and Mode B for hauling heavy loads.

To change between modes, use a momentary, normally-open switch. HGM offers an engraved billet switch that features an LED lamp to indicate the mode.

3.6.1 Installing the Switch

1. Locate a position that is easy to reach from the drivers seat.
2. Drill a 19mm or 3/4" hole for the switch.
3. Install the switch from the front with the o-ring in place.
4. Install the nut on the rear of the switch. Tighten gently.
5. From the switch, the black and yellow wires connect to ground. These wires have a ground lug already installed.
6. The green wire on the switch connects to the blue/orange wire from the COMPUSHIFT II engine harness marked "MODE SWITCH"
7. The red wire from the switch connects to the blue/red wire from the COMPUSHIFT II engine harness marked "MODE SWITCH LED"



3.6.2 Using the Switch

When you start the vehicle, the system will always start in Mode A.

To toggle between modes, press and hold the button for 3 seconds. The ring on the switch will light when you are in Mode B.

DASHBOARD Screens

A-B Mode is available for two of the DASHBOARD screens: [Shift Speed Adjust](#)(see page 49) and [Shift Pressure Adjust](#)(see page 50).

- You will only be able to see and adjust the setting for your current mode.
- You can adjust these on the fly by pressing the up or down key.

3.6.2.1 SETUP Screens

Within the [SETUP screens](#)(see page 50), many settings offer an Mode A/B feature.

- The settings that are intrinsic to your vehicle (such as vehicle weight and final drive ratio) do not offer Mode settings; they are constant for both modes.
- You should only enter SETUP mode when it is safe to do so. Do not attempt to adjust these settings while driving.

3.7 Install the Overdrive Cancel Switch (Optional)

HGM offers a billet push-button switch that can be used for overdrive cancel on transmissions that need it.

3.7.1 Installing the Switch

Here are the simple instructions on how to install it:

1. Locate a position that is easy to reach from the drivers seat.
2. Drill a 19mm or 3/4" hole for the switch.
3. Install the switch from the front with the o-ring in place.
4. Install the nut on the rear of the switch. Tighten gently.
5. From the switch, the red and yellow wires connect to ground. These wires have a ground lug already installed.
6. The green wire on the switch connects to the blue/yellow wire from the COMPUSHIFT II engine harness labelled "O/D CANCEL"
7. The other black wire from the switch connects to the blue/red wire from the COMPUSHIFT II engine harness labelled "O/D CANCEL LED"



3.7.2 Using the Switch

- After the vehicle is started, the overdrive function is enabled.
- Press the switch once to disable overdrive. The LED ring will turn on.
- Press the switch again to enable overdrive. The LED ring will turn off.

3.8 Install the Manual TCC Switch (Optional)

HGM offers a billet push-button switch that can be used for manual torque converter clutch control.

3.8.1 Installing the Switch

Here are the simple instructions on how to install it:

1. Locate a position that is easy to reach from the drivers seat.
2. Drill a 19mm or 3/4" hole for the switch.
3. Install the switch from the front with the o-ring in place.
4. Install the nut on the rear of the switch. Tighten gently.
5. From the switch, the black and yellow wires connect to ground. These wires have a ground lug already installed.
6. The green wire on the switch connects to the blue wire
7. The other black wire from the switch connects to the blue/red wire from the COMPUSHIFT II labelled "TCC Mengine harness labelled "O/D CANCEL LED"



3.8.2 Using the Switch

- Press the switch to lock the manually lock the torque converter clutch.
- Press the switch again to unlock the torque converter clutch.
- The LED will light any time the torque converter clutch is engaged.

3.9 Connect the Display

The COMPUSHIFT II Display has a backlit liquid-crystal display (LCD) and a 7-key keypad.

- It connects to the COMPUSHIFT II Controller with the attached cable.
- If you need to mount the Display at a greater distance from the Controller than the stock cable permits - up to 25 feet - contact HGM to order a custom cable.

The COMPUSHIFT II Display cable connects to the OPTIONS connector on the COMPUSHIFT II.

 Do *not* connect anything other than your COMPUSHIFT II Display to your COMPUSHIFT Controller, and do *not* connect anything other than your COMPUSHIFT II Controller to the Display. **Doing so can damage your Display, your COMPUSHIFT II Controller, or both, and void your warranty.**

See the [Tuning and Driving](#) (see page 44) section for details on the [Display SETUP Screens](#) (see page 50) and [Display DASHBOARD Screens](#) (see page 45).

3.10 Checkout and Testing

3.10.1 Final Checks

At this point, all of your wiring harnesses should be attached and in place, and the COMPUSHIFT II controller should be connected and mounted.

As a precaution, recheck all electrical connections and wire routing for safety. If these are confirmed to be OK, then reconnect your battery.

Once the battery is connected, do the following:

- Turn on the ignition switch to the first position, but do not start the engine.
- Confirm that the status LED on your COMPUSHIFT II Controller is blinking red.
- The display should be active and showing the [Mixed Meter Screen](#) (see page 45).
- Don't drive yet... you still need to [calibrate the throttle position sensor](#) (see page 42).

3.11 Calibrate the Throttle Position Sensor

Vehicles with CAN

If the COMPUSHIFT is connected to the CAN network on your engine management system, you can skip throttle position sensor calibration. This is because the engine management system is directly reporting throttle position to the COMPUSHIFT II controller.

This video explains how to perform the calibration, step-by-step, or you can follow the directions below.



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But you can reach it using the following URL:

<http://www.youtube.com/watch?v=HdUo24xsJMk>

As the final step of your COMPUSHIFT II installation, and before you drive your vehicle, you *must* calibrate the TPS.

- Start your engine. This would be a good time to confirm that the tachometer reads out correctly on the display.
- Allow the engine to idle and warm up enough so it's no longer on fast idle or choke. Then turn the engine off.
- With the vehicle in Park, and engine off, turn on the ignition switch to provide power to your COMPUSHIFT II. Wait 5 seconds. Do not start the engine.
- [Enter SETUP mode on the Display](#)(see page 51) and press the Right Arrow (next screen) until you get to the TPS Calibration Setup screen.
For more information about this screen, see this page: [Throttle Position Sensor Calibration screen](#)(see page 54).

Throttle Position
Sensor Calibration
0.06 < 2.51 < 4.94

- Press the "Enter" button and you'll have 5 seconds to completely depress and release the throttle pedal.
- This one stroke of the throttle pedal should be done in a slow, even motion *before* the 5 seconds elapse.
- Once you've stroked the throttle, wait 5 more seconds, and then observe the status LED on the COMPUSHIFT II Controller – it should be slowly blinking green.
- Depress the throttle pedal completely and hold it for 5 seconds. The LED should still be slowly blinking green.
- If your unit was configured by HGM or your dealer, or you have done [basic setup on the display](#)(see page 50), then you are ready to drive.

Calibrating
2.40
2.51 < 2.51 < 2.52



If the LED changes to red and starts to blink, there may be a problem with your COMPUSHIFT II installation or throttle calibration. If so, turn your ignition switch off for a few seconds and repeat the calibration procedure. If this fails to prevent the LED from blinking red, refer to [Diagnostics & Troubleshooting](#)(see page 74) to correct the fault.

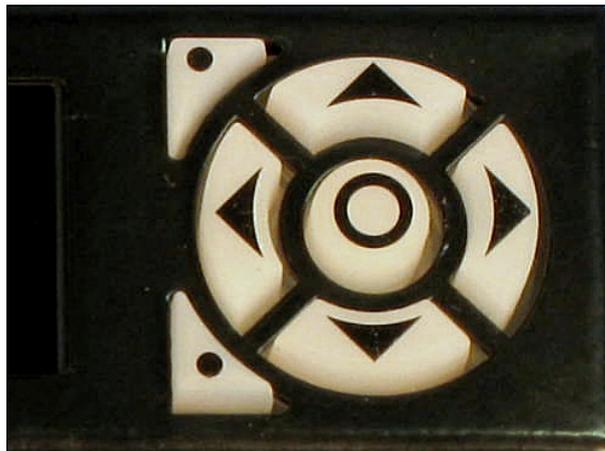
4 Monitoring & Tuning Your System

The Display operates in two different modes – DASHBOARD and SETUP – and each offers a sequence of screens with useful information:

- **DASHBOARD** screens are available while driving and display information about your transmission, COMPUSHIFT II and vehicle. The system displays information either in US standard or metric units, and you can select which you prefer in SETUP mode. The next section explains the [Display DASHBOARD Screens](#)(see page 45).
- **SETUP** screens are available when your vehicle is stopped and the engine is off with ignition switch on. SETUP allows you to change the Controller's programming. When COMPUSHIFT II is in SETUP mode, control of the transmission is disabled. SETUP is covered further in [Display SETUP Screens](#)(see page 50).

 *Never try to enter SETUP mode while driving.*

The buttons functions are standard throughout the screens:



	Button	Function
	Up / Down Arrows	Increase / Decrease Value
	Right / Left Arrows	Next / Previous Screen
	Center	Select / Save
	Top Left	Option
	Bottom Left	Exit / Go Higher in the Menu

4.1 Display DASHBOARD Screens

DASHBOARD screens are only displayed while driving. They let you adjust certain functions of your COMPUSHIFT II and act as a dashboard to monitor the performance of your vehicle and transmission.

- When the system power comes on, COMPUSHIFT II will always default to the [Mixed Meter Screen](#)(see page 45).

Screens are arranged in a repeating sequence, so if you press the "Next Screen" button (right arrow) a number of times, you'll eventually return to the initial screen.

The sequence is as follows:

- [Mixed Meter Screen](#)(see page 45)
- [Large Digit Gear Screen](#)(see page 46)
- [Large Digit Engine RPM Screen](#)(see page 47)
- [Large Digit Vehicle Speed Screen](#)(see page 47)
- [Large Digit Transmission Temperature Screen](#)(see page 47)
- [Stopwatch Screen](#)(see page 47)
- [System Setup Menu Screen](#)(see page 48)
- [System Status Screen](#)(see page 49)
- [Shift Speed Adjust Screen](#)(see page 49)
- [Shift Pressure Adjustment Screen](#)(see page 50)

4.1.1 Mixed Meter Screen

Your COMPUSHIFT II offers a display mode that presents a collection of valuable readouts on one screen.

Label	Meaning
TACH	Engine speed in RPM
GEAR	Transmission gear (see GEAR note below)
BATT	Battery voltage applied to COMPUSHIFT II in volts
TP	Throttle position
MPH	Vehicle speed
TCC	Status of the torque converter clutch
TEMP	Transmission temperature

Label	Meaning
PRB	Transmission hydraulic pressure as a percentage of maximum available pressure (see PRB note below)

TACH 8000 MPH 100
 GEAR A1 TCC ON
 TEMP 185 BATT 12.1
 TP 85 PRB 90

The "**PRB**" item represents the current shift pressure as a percentage of available hydraulic pressure. The internal pressure regulator that's part of the hydraulic pump assembly sets the minimum and maximum available pressure in the transmission. COMPUSHIFT II can set the pressure to be anywhere between the minimum and maximum set by the pressure regulator. When COMPUSHIFT II commands minimum pressure, this is displayed as 0%; maximum pressure is displayed as 100%. To see absolute hydraulic pressure, you must attach a pressure gauge to the test port on the transmission.

Regarding **GEAR**:

- If you use Switch-Shift controls (paddles or pushbuttons) to select your gear, the gear indicator is prefaced by an "S" (example: GEAR S1).
- When the automatic transmission is on control of shifting, the gear indicator is prefaced by an "A", as shown (example: GEAR A1).
- In manual mode, the gear indicator is prefaced by an "M" (example: GEAR M1).
- If you have a four-wheel-drive vehicle, and the transfer case is in "low," the display will show an "L" after the gear indicator (example: GEAR 1L).

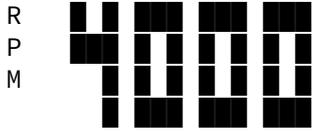
 The GEAR indicator may not read correctly until the engine is running. This is because some transmissions (notably GM) use hydraulic pressure to sense gear-lever position. Without the engine running to generate hydraulic pressure, the indicator can be incorrect. This is *not* a fault in your COMPUSHIFT II.

4.1.2 Large Digit Gear Screen

So you can view key readouts at a glance, the COMPUSHIFT II Display offers large-digit screens, including this one that shows the current transmission gear.

G ■ ■
 E
 A
 R ■

4.1.3 Large Digit Engine RPM Screen



So you can view key readouts at a glance, the COMPUSHIFT II Display offers large-digit screens, including this one that displays engine speed in RPM.

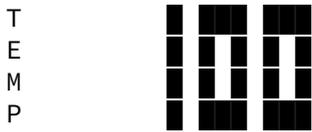
4.1.4 Large Digit Vehicle Speed Screen

So you can view key readouts at a glance, the COMPUSHIFT II Display offers large-digit screens, including this one that shows the current vehicle speed.



4.1.5 Large Digit Transmission Temperature Screen

So you can view key readouts at a glance, the COMPUSHIFT II Display offers large-digit screens, including this one that shows the current transmission temperature.



4.1.6 Stopwatch Screen

COMPUSHIFT II has a built-in stopwatch that allows you to time trips or other events.

The stopwatch also has a "lap time" capability.

Stopwatch
000:31:24.56
000:01:44.23

Button	Function
	Start the stopwatch count by pressing the "Select" button.

Button	Function
	To record a lap, press the "Option" button. The top time display always shows the time total elapsed time since the stopwatch was started. The bottom display always shows the time since the current lap began.
	Press "Select" a second time to stop the stopwatch entirely.
	Once stopped, you can review the lap times. Each lap's start time is displayed on the top time display. The lap time is shown in the bottom time display. Pressing the "Up" or "Down" button moves you to the next recorded lap time. Once all lap times have been displayed, you are returned to the first lap time. The system records up to 100 laps.
	Press "Select" a third time to reset the stopwatch and clear all lap times.

 The stopwatch continues to run while you're in other screens and maintains time as long as COMPUSHIFT II has power. The stopwatch can count up to 200 hours.

4.1.7 System Setup Menu Screen

This screen is the entry point for a second set of configuration controls, called SETUP mode.

The SETUP mode can only be entered from the "System Setup Menu" screen of the DASHBOARD mode. The vehicle should be stopped, engine off, transmission in park and ignition on *before* you enter the SETUP mode.

Button	Function
	Press the "Select" button to enter the Setup screen sequence.

Within SETUP mode, there is a sequence of screens arranged in a loop, just like the DASHBOARD screens are. See the [Display SETUP screens](#)(see page 50) page for details and links to each of the screens.

 You should only enter SETUP mode when it is safe to do so. Do not attempt to setup your COMPUSHIFT II while driving.

System Setup Menu

4.1.8 System Status Screen

When the system is functioning normally, the "System Status" screen will read "No Faults".

If there's a problem, the screen will display a series of messages indicating the nature of the problem(s). If there are multiple faults, this screen will repeatedly cycle through, showing each one for a few seconds. For more information on these fault messages, see the [Diagnostics & Troubleshooting](#) (see page 74) section for further reference on codes and their meanings.

Button	Function
	Press the "Select" button to clear the fault messages, one by one. If the problem occurred in the past, the message will be removed. If it is an active issue, the message will not clear out until the problem is resolved.

System Status

No Faults

4.1.9 Shift Speed Adjust Screen

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#) (see page 39) to change between them.

This display shows the relative shift speed adjustment. Increasing this value makes your transmission shift at higher road speed for a given throttle position (shift later, effectively).

Button	Function
	Press the "Increase" or "Decrease" button to change the relative shift speed.

Shift Speed Adjust A

3%

4.1.10 Shift Pressure Adjustment Screen

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#) (see page 39) to change between them.

This display shows the relative pressure adjustment. Increasing this value causes firmer shifts for a given throttle position.

Button	Function
	Press the "Increase" or "Decrease" button to change the relative shift pressure.

Pressure Adjust A

2%

4.2 Display SETUP Screens

SETUP mode is used to customize your COMPUSHIFT II configuration.

 You should only enter SETUP mode when it is safe to do so. Do not attempt to setup your COMPUSHIFT II while driving.

 If you purchased COMPUSHIFT II from a dealer, the dealer has pre-programmed your COMPUSHIFT II for your specific application based on a series of questions. We recommend consulting your dealer or HGM headquarters *before* attempting to program changes on your COMPUSHIFT II. Your COMPUSHIFT II is a finely engineered tool, and like any tool, can be used improperly.

 COMPUSHIFT II is designed to work in a variety of applications. **Incorrect programming in conjunction with some vehicle, engine and transmission combinations can result in extreme transmission and vehicle damage.** In particular, failure to provide adequate line pressure under high power or high RPM conditions can cause transmission failure. Be sure you know what you're doing before attempting to change programming in SETUP Mode.

4.2.1 How SETUP Screens Work

Each SETUP screen allows you to adjust the value of a parameter or group of parameters. In most cases, a SETUP screen starts by showing you the current value, which you can adjust.

4.2.2 How to Enter SETUP Mode

This screen is the entry point for a second set of configuration controls, called SETUP mode.

The SETUP mode can only be entered from the "System Setup Menu" screen of the DASHBOARD mode. The vehicle should be stopped, engine off, transmission in park and ignition on *before* you enter the SETUP mode.

Button	Function
	Press the "Select" button to enter the Setup screen sequence.

Within SETUP mode, there is a sequence of screens arranged in a loop, just like the DASHBOARD screens are. See the [Display SETUP screens](#)(see page 50) page for details and links to each of the screens.

 You should only enter SETUP mode when it is safe to do so. Do not attempt to setup your COMPUSHIFT II while driving.

System Setup Menu

Screens are arranged in a repeating sequence, so if you press the "Next Screen" button (right arrow) a number of times, you'll eventually return to the initial screen, [Transmission Type](#)(see page 52).

The sequence is as follows:

- [Transmission Type](#)(see page 52)
- [Engine Type](#)(see page 52)
- [Shift Mode](#)(see page 52)
- [Number of Engine Cylinders](#)(see page 53)
- [Throttle Position Sensor Calibration](#)(see page 54)
- [Maximum Engine RPM](#)(see page 55)
- [Transfer Case Ratio](#)(see page 55)
- [Final Drive Ratio](#)(see page 56)
- [Speedometer Calibration](#)(see page 56)
- [Tire Diameter](#)(see page 56)
- [Vehicle Weight](#)(see page 57)
- [TCC Mode](#)(see page 57)
- [TCC Enable Gear](#)(see page 57)
- [TCC Maximum Throttle](#)(see page 58)
- [TCC Minimum Throttle](#)(see page 58)
- [TCC Enable Speed](#)(see page 59)
- [TCC Disable Percentage](#)(see page 59)
- [R2L Pressure Boost](#)(see page 60)
- [Downshift Offset](#)(see page 60)
- [Load Factory Defaults](#)(see page 60)
- [Advanced Setup](#)(see page 61)

- [System Diagnostics Screen](#)(see page 69)
- [Display Contrast](#)(see page 69)
- [Display Brightness](#)(see page 70)
- [Display Color](#)(see page 70)
- [System Units](#)(see page 70)
- [Contact Information](#)(see page 71)

4.2.3 Transmission Type

This screen sets your transmission type, and should only be used for one of two reasons:

- You want to reset COMPUSHIFT II to the factory defaults, *or*
- You want to change the transmission type used. If you press the center button on this screen, you'll be asked for confirmation before you're allowed to change the transmission type and reset the system to factory defaults for that transmission.

Transmission Type

GM 4L60E

4.2.4 Engine Type

Engine Type

Gasoline

This screen allows you to select from Gasoline, Low Speed Diesel, or High Speed Diesel. Your selection will load the appropriate shift curves into COMPUSHIFT II.

4.2.5 Shift Mode

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

This screen sets your shifting mode to either Automatic or Manual. If the Shift Mode is set to "Manual", automatic shift sequencing is disabled. This means the vehicle is in whatever gear you put the lever, or however you set the Switch-Shift paddles/buttons.

In manual mode, COMPUSHIFT II still does pressure modulation and torque converter control -- you have just have to manually change gears.

Shift Mode A

Automatic

 Be aware! In manual mode, you are in control of the shifting. This means if you place the lever in fourth-gear position, the vehicle will be in fourth gear, even from a stop. Use care when operating the transmission in manual mode -- there is potential for overheating the torque converter or other vehicle damage. This mode is not recommended for street use.

4.2.6 Number of Engine Cylinders

If you connect a tachometer signal to COMPUSHIFT II (recommended), you need to tell COMPUSHIFT II how many times per engine revolution your tachometer signal fires. The frequency of this signal varies depending on the number and arrangement of engine cylinders.

Common Settings

The following table shows the usual relationship between engine type and pulses per revolution (PPR) for different types of gas engines:

Engine Type	Tachometer Pulses Per Revolution
V8	4
V6 or Inline 6	3
Inline 4	2
V12	6
Crank sensor	1

 You should check with your ignition, engine, or vehicle vendor to confirm this setting.

Number of Engine
Cylinders
8

4.2.7 Throttle Position Sensor Calibration

 For instructions on performing the calibration, see the page: [Checkout and Testing](#)(see page 42).

Before driving your vehicle, you must calibrate your Throttle Position Sensor as it is installed on your vehicle. Use this screen to initiate the calibration process and review the results.

The leftmost number shows the smallest voltage recorded during the calibration process. It corresponds to the 0% throttle position.

The rightmost number shows the largest voltage recorded during the calibration process and corresponds to the 100% throttle position.

The two voltages represent the minimum and maximum positions of the throttle position sensor.

The middle number is the current voltage from the TPS, and should move between the other two numbers as the throttle is moved.

If the measured throttle position sensor voltage exceeds either the minimum or maximum voltage, a TPS low or TPS high fault will be recorded in the system.

Before COMPUSHIFT II is properly calibrated, you will see "0.00" as the left-hand and right-hand numbers on the screen. In this situation, the system records both TPS low and TPS high faults until calibration.

During the calibration process, the left and right numbers are updated as the TPS is moved, defining the range of motion for the sensor which will result in the 0% and 100% readings.

```
Throttle Position
Sensor Calibration
0.00 < 0.04 < 0.00
```

Button	Function
	Press the "Select" button to begin the calibration process (see page 42).

During the calibration process, you will see "Calibrating" at the top of the screen.

```
Calibrating
2.69
0.05 < 2.51 < 2.52
```

Once properly calibrated, you will see a low value for the left-hand number on the screen and a higher value for the right-hand number (no longer zeros).

```
Throttle Position
Sensor Calibration
0.05 < 0.08 < 4.55
```

4.2.8 Maximum Engine RPM

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#) (see page 39) to change between them.

As you adjust the shift speed up and down, you may find that the wide-open throttle upshift RPM is different from the speed at which you feel comfortable running your engine.

The "Maximum Engine Speed" allows you to set an upper RPM limit or cap at which your COMPUSHIFT II will always upshift.

This feature is active whether you have a tachometer signal attached to COMPUSHIFT II or not. When there's no tachometer signal present, COMPUSHIFT II calculates the transmission input shaft speed from the output shaft speed and gear ratio.

Maximum Engine RPM A

5500 RPM

 Please be aware that slippage in the torque converter makes this method less accurate than a tachometer input.

 This feature is **not** a substitute for a proper rev limiter in your ignition or fuel system. Different transmissions respond to shift commands differently and with different delays. It's likely that your engine will exceed this RPM setting by some small amount, depending how quickly the transmission responds to a shift command. In the beginning, it's wise to set this feature conservatively. Initially, set this value at least 1000 RPM low, and then gradually increase the setting until you're happy with the resulting shift point.

4.2.9 Transfer Case Ratio

In order to calculate the correct shift speeds and DASHBOARD displays, COMPUSHIFT II needs to know the transfer case ratio when low range is engaged.

If your vehicle does not have a transfer case, then you probably haven't connected the transfer case switch wire, and so this setting won't matter to you.

Transfer Case Ratio

1.00

4.2.10 Final Drive Ratio

Final drive ratio and tire diameter are used to calibrate the display's speedometer and dynamometer.

Set the final drive ratio in this screen.

Final Drive Ratio

4.11

4.2.11 Speedometer Calibration

Because many electronically-controlled transmissions lack the ability to drive a speedometer, your COMPUSHIFT II has a feature to do so.

When you connect an electronic speedometer to the COMPUSHIFT II speedometer output signal, your speedometer will expect a certain number of pulses per revolution (PPR) of the drive shaft, and you can adjust the PPR with this setting.

If this value is set to 0.00, the controller will generate the same number of pulses per revolution as the transmission output speed sensor (TOSS). This allows the speedometer output to generate a reproduced TOSS signal.

Speedometer
Calibration
4.00

 HGM Automotive Electronics offers solutions for using an existing mechanical speedometer, if you have one. More information can be obtained from your speedometer vendor or HGM.

4.2.12 Tire Diameter

Tire diameter and final drive ratio are needed to calibrate the display's speedometer and dynamometer.

The best way to measure the wheel diameter is by measuring the radius of the driven wheel, when the vehicle is on the ground so you can take into account the flex (compression) in the tire.

Measure from the ground to the center of the wheel axle – double this number – and set the resulting diameter value here.

Tire Diameter

29.0 in

4.2.13 Vehicle Weight

The vehicle's mass is needed to calculate horsepower measurement. Use this screen to set this value as close as possible to the actual weight of your vehicle.

Vehicle Weight

3080 lbs

4.2.14 TCC Mode

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

TCC mode refers to the torque converter clutch. In previous models of COMPUSHIFT, the TCC was always automatically active, meaning it is preset at the specified MPH and selected gear.

COMPUSHIFT II introduces a new mode called "manual mode", in which the TCC is controlled by a switch, either on or off, based on driver input.

The default setting is Automatic, and you can change it to Manual if needed.

TCC Mode A

Automatic

 Manual TCC mode is only applicable for special vehicle setups, not as a standard.

4.2.15 TCC Enable Gear

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

You can choose to lock your Torque Converter Clutch (TCC) in either 4th gear, 3rd and 4th gear, or not at all. Some transmissions also offer the option to lock in 2nd gear.

- The 3rd and 4th gear setting is useful if your vehicle has high gearing and you frequently cruise in 3rd gear.
- The factory default for this setting is 4th gear only.

TCC Enable Gear A

4

4.2.16 TCC Maximum Throttle

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

As you increase throttle, the TCC should disengage to allow the torque converter to multiply torque for greater acceleration.

This screen allows you to adjust the throttle position where the TCC disengages.

For vehicles with higher torque engines, this parameter can be set higher.

TCC Maximum Throttle

A
35%

4.2.17 TCC Minimum Throttle

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

As you release the throttle in a normal transmission configuration, the TCC is disengaged.

Use this setting to establish a minimum threshold on your transmission - if the throttle drops below this percentage, the TCC will unlock.

If the TCC minimum throttle is set to 0%, you can release the throttle and the TCC will never unlock. This can cause the engine to bog down when the engine gets close to the throttle speed. Setting this to a small number above zero will prevent this.

As you release the throttle in a normal transmission configuration, the TCC is disengaged.

Use this setting to establish a minimum threshold on your transmission - if the throttle drops below this percentage, the TCC will unlock.

If the TCC minimum throttle is set to 0%, you can release the throttle and the TCC will never unlock. This can cause the engine to bog down when the engine gets close to the throttle speed. Setting this to a small number above zero will prevent this.

TCC Minimum Throttle

A
3%

4.2.18 TCC Enable Speed

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

Sometimes the combination of final drive ratio and tire size makes a car perform poorly below certain speeds while using the TCC. This is especially true if the engine does not produce much low-end torque. * This adjustment allows you to set the minimum speed at which the TCC can lock.

TCC Enable Speed A

25.0 MPH

4.2.19 TCC Disable Percentage

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

This adjustment allows you to set a percentage that determines the TCC disengage speed.

- For example, a 10% setting will establish a disengage speed that is 10% below the speed at which the TCC engages.
- In some vehicles torque converter clutch engagement causes the vehicle speed to drop enough for the TCC to disengage. This on-again-off-again situation can often be avoided by increasing this value.

TCC Disable
Percentage A

10%

4.2.20 R2L Pressure Boost

i This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

R2L affects Reverse, Low, and second gear. It raises the transmission pressure by this amount when in the position. This boost is ramped in slowly so it will not apply hard in reverse.

R2L Pressure Boost A

20%

4.2.21 Downshift Offset

i This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

This screen allows you to adjust the passing gear (downshift) sensitivity. You can tune it between 95% and 75%.

The highest setting (95%) is very sensitive, which means passing gear or downshift when stepping on the throttle is very easy.

When it is set to 75%, the throttle is less sensitive and takes more throttle to accomplish a downshift.

Downshift Offset A

95%

4.2.22 Load Factory Defaults

When you change your engine or transmission type via the SETUP screens, COMPUSHIFT II will automatically change the appropriate parameters that are different. But if you need to reset everything, use this function. You will be asked to confirm your decision, since this function has such a large impact.

Reset to
factory defaults

Button	Function
	Press the "Select" button to reset all settings.
	Press the Up button to confirm this change.

 This operation erases all settings, including any pre-programming that HGM configured before shipping to you, so use with caution.

4.2.23 Advanced Setup

Advanced Setup offers additional screens to fine-tune your COMPUSHIFT II configuration.

 Adjust these settings with care. If set improperly, you could damage your vehicle or your COMPUSHIFT II. If you have any questions, contact your distributor or HGM headquarters.

Button	Function
	Press the "Select" button enter Advanced Setup mode.

Advanced Setup Menu

Screens are arranged in a repeating sequence, so if you press the "Next Screen" button (right arrow) a number of times, you'll eventually return to the initial screen, [Shift Pressure Tables](#)(see page 62).

The sequence is as follows:

- [Shift Pressure Tables](#)(see page 62)
- [Shift Speed Tables](#)(see page 65)
- [TPS Direction](#)(see page 67)
- [TPS Ground](#)(see page 68)
- [MAP Sensor Ground](#)(see page 68)
- [Engine Temp Sensor Bias](#)(see page 68)
- [Transmission Temp Sensor Bias](#)(see page 69)

4.2.23.1 Shift Pressure Tables

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

This set of screens lets you adjust the exact transmission pressure that correlate with throttle position. Based on your selection in the [Transmission Type](#)(see page 52) screen, the appropriate default shift tables will be pre-loaded here.

Use this set of screens to make detailed adjustments to the shift point for each gear change.

 Before you edit, please read all the instructions below, including these [Important Notes](#)(see page 64)

Shift Pressure Tables A

Select a Gear To Edit

Based on your transmission, you will see a screen for each of your pressure tables..

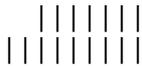
They arranged in a rotating sequence.

Button	Function
	Press the "Previous Screen" or "Next Screen" button to select the gear that you want to edit.
	Press the "Select" button to edit the table for the selected pressure table.
	Press the "Exit" button to exit the gear shift selection screens and to return to Advanced Setup

You can view the tables at two different levels of detail. You can make adjustments in both views. The zoomed-out view offers basic editing. The zoomed-in view allows fine-control editing.

```

||| Pressure
||| Gear 1
    
```

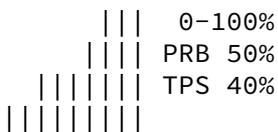


Zoomed-Out View

This view shows you the complete table, end-to-end, with a screen for each gear change.

For most purposes, this view is sufficient for tuning your COMPUSHIFT II.

Button	Function
	<p>Press the Left or Right button to move horizontally inside the table. The horizontal axis represents Throttle Position Percentage.</p> <ul style="list-style-type: none"> • Since you are in zoomed-out mode, the TPS % intervals will be factors of 10. This large range is indicated by the numbers at the top right of the screen (0%-100%). • Watch the right side of the screen to see the TPS % change as you move left and right. • Also watch the bottom of the screen to see the blinking cursor, indicating which column you are editing.
	<p>Use the "Increase" or "Decrease" button to adjust the value of the pressure.</p> <ul style="list-style-type: none"> • The pressure is adjustable in 1% intervals. Watch the right side of the screen to see the PRB % change as you adjust the pressure for a given TPS %. • Also watch the graph to see roughly how the column you are adjusting compares to the other columns
	<p>When you are done editing the speed in as many of the columns as you want to adjust, press the "Select" button to save your settings.</p>

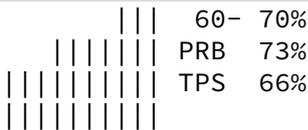


Zoomed-In View

The zoomed-in view shows you every single point, which you can customize for your preferences.

Some clients find the extra detail available in zoomed-in view convenient as they fine-tune the pressure tables, especially at for low values of TPS%.

Button	Function
	<p>Enter the zoomed-in mode from the zoomed-out mode. Select a gear change to edit, move left/right in zoomed-out mode, and then press the "Option" button to zoom on in the data for that specific 10% range.</p> <p>This mode gives you a "window" into the detailed data, showing you 10% of the TPS spectrum at a time. Check the top right of the screen to see what TPS % range you are viewing.</p>
	<p>Use the Left or Right button to move horizontally inside the table.</p> <ul style="list-style-type: none"> • Watch the right side of the screen to see the TPS % change as you move left and right. • Also watch the bottom of the screen to see the blinking cursor, indicating which column you are editing. • Since you are in zoomed-in mode, each column represents a 1% interval in TPS %. You can move left/right all the way from 0% to 100% TPS in zoomed-in mode using the left/right buttons.
	<p>Use the "Increase" or "Decrease" button to adjust the value of the pressure.</p> <ul style="list-style-type: none"> • The pressure is adjustable in 1% intervals. Watch the right side of the screen to see the PRB change as you adjust the speed for a given TPS %. • Also watch the graph to see roughly how your speed setting compares to the other columns.
	<p>When you are done editing the speed in as many of the columns as you want to adjust, press the "Option" button to return to zoomed-out mode.</p>
	<p>In zoomed-out mode, you will need to press the "Select" button to save your settings.</p>



Important Notes

Your table must always have a flat or upwards slope, moving left to right. In other words, COMPUSHIFT II will not allow you to set the shift pressure lower than a column that is to the left.

As you increase/decrease the value of a column, COMPUSHIFT will drag upwards/downwards any neighboring columns to ensure you don't have a situation that could confuse the system or damage your transmission.

4.2.23.2 Shift Speed Tables

 This setting offers "A" and "B" modes. You can set up two different COMPUSHIFT configurations in advance, and use the [mode switch](#)(see page 39) to change between them.

This set of screens lets you adjust the exact shift points that correlate with throttle position. Based on your selection in the [Transmission Type](#)(see page 52) screen and your settings in [Tire Diameter](#)(see page 56), [Transfer Case Ratio](#)(see page 55), and [Final Drive Ratio](#)(see page 56) screens, the appropriate default shift tables will be pre-loaded here.

Use this set of screens to make detailed adjustments to the shift point for each gear change.

 Before you edit, please read all the instructions below, including these [Important Notes](#)(see page 67)

Shift Speed Tables A

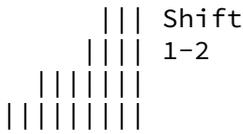
Select a Gear To Edit

Based on your transmission, you will see a screen for each of your gear changes.

They arranged in a rotating sequence.

Button	Function
	Press the "Previous Screen" or "Next Screen" button to select the gear change that you want to edit.
	Press the "Select" button to edit the table for the selected gear change.
	Press the "Exit" button to exit the gear shift selection screens and to return to Advanced Setup

You can view the tables at two different levels of detail. You can make adjustments in both views. The zoomed-out view offers basic editing. The zoomed-in view allows fine-control editing.*

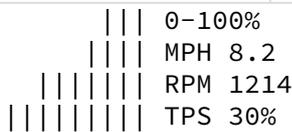


Zoomed-Out View

This view shows you the complete table, end-to-end, with a screen for each gear change.

For most purposes, this view is sufficient for tuning your COMPUSHIFT II.

Button	Function
	<p>Press the Left or Right button to move horizontally inside the table. The horizontal axis represents Throttle Position Percentage.</p> <ul style="list-style-type: none"> • Since you are in zoomed-out mode, the TPS % intervals will be factors of 10. This large range is indicated by the numbers at the top right of the screen (0%-100%). • Watch the right side of the screen to see the TPS % change as you move left and right. • Also watch the bottom of the screen to see the blinking cursor, indicating which column you are editing.
	<p>Use the "Increase" or "Decrease" button to adjust the value of the shift point.</p> <ul style="list-style-type: none"> • The vehicle speed and RPM are adjustable together in small intervals, less than 1 MPH. Watch the right side of the screen to see the MPH and RPM values change together as you adjust the speed for a given TPS %. • Also watch the graph to see roughly how the column you are adjusting compares to the other columns
	<p>When you are done editing the speed in as many of the columns as you want to adjust, press the "Select" button to save your settings.</p>



Zoomed-In View

The zoomed-in view shows you every single point, which you can customize for your preferences.

Some clients find the extra detail available in zoomed-in view convenient as they fine-tune the shift tables, especially at for low values of TPS%.

Button	Function
	<p>Enter the zoomed-in mode from the zoomed-out mode. Select a gear change to edit, move left/right in zoomed-out mode, and then press the "Option" button to zoom on in the data for that specific 10% range.</p> <p>This mode gives you a "window" into the detailed data, showing you 10% of the TPS spectrum at a time. Check the top right of the screen to see what TPS % range you are viewing.</p>
	<p>Use the Left or Right button to move horizontally inside the table.</p> <ul style="list-style-type: none"> • Watch the right side of the screen to see the TPS % change as you move left and right. • Also watch the bottom of the screen to see the blinking cursor, indicating which column you are editing. • Since you are in zoomed-in mode, each column represents a 1% interval in TPS %. You can move left/right all the way from 0% to 100% TPS in zoomed-in mode using the left/right buttons.
	<p>Use the "Increase" or "Decrease" button to adjust the value of the shift point..</p> <ul style="list-style-type: none"> • The shift speed is adjustable in 1% intervals. Watch the right side of the screen to see the MPH and RPM change as you adjust the speed for a given TPS %. • Also watch the graph to see roughly how your speed setting compares to the other columns.
	<p>When you are done editing the speed in as many of the columns as you want to adjust, press the "Option" button to return to zoomed-out mode.</p>
	<p>In zoomed-out mode, you will need to press the "Select" button to save your settings.</p>

```

||| 30- 40%
|||  MPH 9.3
||||| RPM 1367
||||| TPS 35%
    
```

Important Notes

Your table must always have a flat or upwards slope, moving left to right. In other words, COMPUSHIFT II will not allow you to set the shift speed value lower than a column that is to the left.

As you increase/decrease the value of a column, COMPUSHIFT will drag upwards/downwards any neighboring columns to ensure you don't have a situation that could confuse the system or damage your transmission.

4.2.23.3 TPS Direction

This screen allow you to choose between Normal and Reversed, depending on the your wiring configuration.

- The default is Normal.
- If your setup causes the TPS to send a reversed signal (4.5 V at zero throttle and low voltage at max throttle), change this setting to Reversed.

TPS Direction

Normal

4.2.23.4 TPS Ground

Use this screen to tell COMPUSHIFT II whether or not your setup needs a grounded throttle position sensor (TPS).

- If you are connecting to an existing engine management system that has a TPS, that system will provide the ground, and you should set this setting to "Off".
- If COMPUSHIFT is the only device connected to the TPS, then this setting should be set to "On".

TPS Ground

On

4.2.23.5 MAP Sensor Ground

COMPUSHIFT II can use a MAP (Manifold Absolute Pressure) as part of the shift and pressure control system. This is most often useful with engines that use forced induction (turbocharging or supercharging).

If you are using an engine management system that includes a MAP, then you can use that existing sensor for COMPUSHIFT II. In that case, your MAP sensor is already grounded, and you should set the MAP Sensor Ground to Off. If you are using a MAP solely for COMPUSHIFT II, then you should set the MAP Sensor Ground to On.

MAP Sensor Ground

Off

4.2.23.6 Engine Temp Sensor Bias

COMPUSHIFT II can use an engine temperature sensor as part of the shift and pressure control system. If you are using an engine management system that includes a temperature sensor, then you can use that sensor for COMPUSHIFT II.

In that case, your temperature sensor is already biased (powered), and you should set the Engine Temp Sensor Bias to Off.

If you are using an engine temperature sensor solely for COMPUSHIFT II, then you should set the Engine Temp Sensor Bias to On.

Engine Temp Sensor
Bias
Off

4.2.23.7 Transmission Temp Sensor Bias

This screen allows you to tell COMPUSHIFT II whether or not some other device is providing power to the transmission temperature sensor. In most cases, COMPUSHIFT is the only device reading transmission temperature, so you should leave this setting on.

- The default setting is "On."
- Change the setting to "Off" if you are connecting to an existing controller or temperature gauge that provides power to the temperature sensor.

Transmission Temp
Sensor Bias
On

4.2.24 System Diagnostics Screen

This self-contained diagnostics system can help you troubleshoot transmission system problems. For more information, see the section, [Diagnostics & Troubleshooting](#)(see page 74).

System Diagnostics
Menu



Only qualified transmission technicians should use the diagnostic mode, and it should never be used to drive a vehicle.

4.2.25 Display Contrast

The display contrast adjustment lets you choose the most comfortable setting for your angle and lighting situation. The factory default is satisfactory in most situations, and once set after your installation, further adjustments are rarely necessary.

Display Contrast

50%

4.2.26 Display Brightness

The display brightness adjustment lets you choose the most comfortable setting for your angle and lighting situation.

The factory default is satisfactory in most situations, and once set after your installation, further adjustments are rarely necessary.

Display Brightness

100%

4.2.27 Display Color

The display color adjustment lets you choose your preferred color for the text on the screen.

Edit the Red, Green, and Blue values to mix your custom color.

Display Color

Red	Green	Blue
10%	100%	35%

4.2.28 System Units

Your COMPUSHIFT II can display units in either metric or US standards.

The default is US. In metric mode, the measurements change as follows:

- Speed is measured in KPH instead of MPH.
- Temperature is measured in degrees C instead of degrees F.
- Vehicle mass is entered in KG instead of LBS.
- Pressure is measured in kPA or BAR instead of PSI.

System Units

US

 You can switch between measurement systems without affecting other programming. COMPUSHIFT uses metric units internally.

4.2.29 Contact Information

We've included our phone number and website (www.compshift.com⁴) in case you have any questions.

Go to the [Contact Us](#)⁵ page for complete information.

HGM Automotive
Electronics
www.compshift.com
1-877-744-3887

⁴ <http://www.compshift.com>

⁵ <http://www.hgmelectronics.com/contact>

5 Driving & Shifting

5.1 Fully Automatic Shifting

COMPUSHIFT II uses information about throttle position, vehicle speed and gear level to decide when to shift.

- As you increase the amount of applied throttle, COMPUSHIFT II decides to upshift at increasingly higher vehicle speeds.
- When you drive away with light throttle, COMPUSHIFT II upshifts relatively soon.
- If you give the engine full throttle, COMPUSHIFT II will upshift at a higher vehicle speed and engine RPM.

Shift firmness is controlled in much the same way as shift speed.

- Shift firmness is related to throttle position or engine load, not vehicle speed. This is because a firm shift is required to prevent slippage when the engine is making more torque. Under less power, the shift can be gentler.

5.2 Using a Paddle Shifter or Switch-Shift (Optional)

If you utilize the Switch-Shift feature, you can manually upshift and downshift the transmission via a pair of pushbuttons or paddles. Here's how the feature works:

- When you first put the transmission in gear, shifting will be automatic.
- Press either the upshift or downshift button to change the transmission gear. The display will show "S" in the GEAR meter instead of "A".
- After a button press, the transmission will stay in switch shift mode and will not automatically shift without another button press.
- At a stop in automatic mode, the transmission is normally in 1st gear. If you press the downshift button, the transmission remains in 1st gear, but changes to Switch Shift mode.
- You must downshift manually when coming to a stop.
- To cancel switch shift mode and return to fully automatic shifting, hold the downshift or upshift button for 2 seconds.
- Moving the shift lever also exits you out of Switch-Shift mode, and COMPUSHIFT II reverts to automatic mode.



Many transmissions do **not** have the ability to engine brake under automatic control. This means you **cannot** control your speed on a descent using the Switch-Shift controls. If you wish to use the engine while decelerating, you **must** use the shift lever.

5.3 Using the A/B Mode Switch (Optional)

To change between modes, press and hold the button for 2 seconds. It will be illuminated when you are in Mode B.

When you start the vehicle, the system will always start in Mode A.

5.3.1 DASHBOARD Screens

A-B Mode is available for two of the DASHBOARD screens: [Shift Speed Adjust](#)(see page 49) and [Shift Pressure Adjust](#)(see page 50).

- You will only be able to see and adjust the setting for your current mode.
- You can adjust these on the fly by pressing the up or down key.

5.3.2 SETUP Screens

Within the [SETUP screens](#)(see page 50), many settings offer an Mode A/B feature.

- The settings that are intrinsic to your vehicle (such as vehicle weight and final drive ratio) do not offer Mode settings; they are constant for both modes.
- You should only enter SETUP mode when it is safe to do so.
- Do not attempt to adjust these settings while driving.

5.4 Using the Overdrive Cancel Switch (Optional)

The pushbutton is a momentary type. Press it once and it will cancel the overdrive function. Touch it again and it will restore overdrive.

The light on the switch will be on when overdrive is off.

6 Diagnostics & Troubleshooting

Here is what you need to know about diagnostics and troubleshooting of the COMPUSHIFT II.

- [Status LED and Display](#)(see page 74)
- [Faults](#)(see page 74)
- [System Diagnostics](#)(see page 77)

6.1 Status LED and Display

Your COMPUSHIFT II is equipped with a set of built-in diagnostics that continually monitor the status of the system.

You can check system status by observing either the status LED on the Controller or the COMPUSHIFT II Display screens.

Under normal circumstances, when the ignition is on:

- The status LED on your COMPUSHIFT II should be green and slowly blinking.
- The Display (in Dashboard mode) the [System Status Display](#)(see page 0) will read "No Faults."

If a problem arises:

- The LED turns red and blinks to indicate the type of problem.
 - If the red LED blinks rapidly, there is a current problem. Consult the "System Status" screen on the Display to see the current issue(s).
 - If the red LED blinks slowly, there has been a fault in the past. Consult the "System Status" screen on the Display to see the past issue(s) and press the center button to clear fault messages one-by-one.
- The Display's [System Status Display](#)(see page 0) will show messages indicating the [fault code and name](#)(see page 74). If there are multiple faults, this screen will repeatedly cycle through, displaying each one.

 If you receive any fault message on your COMPUSHIFT II, we recommended you consult with your transmission vendor or your local HGM representative.

 The LED should never be solidly lit (it should always be blinking). If you observe a solid red or solid green LED, contact your HGM distributor or [our headquarters](#)⁶.

6.2 Faults

6.2.1 Driver Fault

These faults indicate a problem with a control solenoid or wiring in your transmission.

- Your COMPUSHIFT II can detect an open circuit or short circuit on the solenoid circuits. It signals any of these conditions by displaying the appropriate fault for the solenoid circuit, called a "driver".

⁶ <http://www.hgmelectronics.com/contact>

 COMPUSHIFT II may also temporarily disconnect that solenoid from the circuit.

Different transmissions uses different numbers of solenoid drivers for different functions. You can refer to the [Connector Pinouts](#)(see page 101) charts for an exact explanation of which driver runs which solenoid.

6.2.2 TPS Signal Low

This fault indicates a TPS signal *less* than that allowed by the current calibration. This can indicate faulty wiring, incorrect calibration, or a faulty TPS. In some cases, this can also be caused by cable slippage or an incorrect initial calibration.

- Repeat the calibration procedure before attempting other diagnostics.

6.2.3 TPS Signal High

This fault indicates a TPS signal *greater* than that allowed by the current calibration. This can indicate faulty wiring, incorrect calibration, or a faulty TPS. In some cases, this can also be caused by an incorrect initial calibration.

- Repeat the calibration procedure before attempting other diagnostics.

6.2.4 Both TPS Signal Low & TPS Signal High

If both the "TPS Signal High" and "TPS Signal Low" codes are indicated immediately after power is applied to COMPUSHIFT II, this indicates a lack of valid TPS calibration.

- You **must** calibrate the TPS by following the instructions in [Checkout and Testing](#)(see page 42).
- The TPS sensor **must** move through at least a quarter of its full stroke to calibrate properly.

 COMPUSHIFT II generally comes from the factory without TPS calibration, so these codes will appear as factory defaults prior to the first calibration. Also, if you reset COMPUSHIFT II using the optional Display, these codes will revert to factory defaults. (As a failsafe, when TPS is not calibrated, COMPUSHIFT II uses a constant value of 50% throttle.)

6.2.5 Transmission Temp Sensor

Indicates COMPUSHIFT II has received a temperature signal from the transmission that's out of the sensor's possible operating range, and it usually means the sensor has failed, or the wiring is faulty.

 In order to preserve shift quality, COMPUSHIFT II must have an accurate measurement of your transmission's temperature.

6.2.6 Transmission Over Temp

Indicates your transmission is running too hot.

-  Turn off your vehicle as soon as possible as transmission damage is imminent. This fault is triggered when transmission temperature exceeds 275°F / 135°C for 10 seconds or more.

6.2.7 EEPROM Fault

Indicates the internal memory system of your COMPUSHIFT II Controller has suffered a failure.

-  Contact HGM Automotive Electronics for repair or replacement of your Controller.

6.2.8 System Voltage Low

Indicates COMPUSHIFT II detects that the 12-volt power supply has dropped *too low* for an extended period.

- If you have an indication of this fault, make sure your COMPUSHIFT II has a good connection to 12-volt power and ground, and that your battery is fully charged.

6.2.9 System Voltage High

Indicates that COMPUSHIFT II detects that the 12-volt power supply has *exceeded* the normal operating range.

-  This condition can damage COMPUSHIFT II and other components in your vehicle. This fault usually indicates a failure of the vehicle charging system.

-  Do **not** disconnect your battery while the vehicle engine is running. Doing so could damage COMPUSHIFT II and any other vehicle electronics.

6.2.10 Invalid PRNDL

Indicates an invalid signal combination has been received from the transmission gear selector (PRNDL) switch.

-  Faulty wiring, a failed switch, or a hydraulic problem in the transmission can cause this.

6.2.11 System Over Temp

Indicates the internal temperature of COMPUSHIFT II has *exceeded* a safe range.

- COMPUSHIFT II will automatically turn itself off 25 seconds after this fault is displayed. The status LED will go dark.

 This fault can occur if a partial short exists in the transmission wiring, or if COMPUSHIFT II is overheated due to improper mounting.

6.3 System Diagnostics

The COMPUSHIFT II is equipped with a self-contained diagnostics system that can help troubleshoot transmission system problems.

In the diagnostic mode, any input to COMPUSHIFT II can be read, and any transmission function can be commanded.

 This mode should only be used by qualified transmission technicians. It should never be used to drive a vehicle. The transmission will resume being in a "safe" mode once diagnostics are exited.

Enter the diagnostic mode by pressing the "Select" button.

System Diagnostics

6.3.1 Shift Pressure

Use this screen to actively adjust shift pressure. (This value will be held until you exit diagnostics.)

6.3.2 Shift Solenoids

Use this screen to set the shift solenoids to any commanded gear. (This command will be held until you exit diagnostics.)

6.3.3 Torque Converter Clutch

Use this screen to engage the Torque Converter Clutch. You can set it to Off or On.

 Be especially careful locking the TCC on a vehicle with its driven wheels on the ground (e.g., the front wheels on a front-wheel-drive vehicle). The vehicle could move suddenly and the engine could stall.

6.3.4 Gear Lever Position

This screen displays the current gear lever position.

6.3.5 Transmission Temperature

This screen displays the current temperature of the transmission.

6.3.6 Transmission Output Shaft Speed

This screen displays the current reading from the TOSS sensor.

6.3.7 Switch Input Diagnostics

This menu will display current switch input values.

6.3.8 Voltage Input Diagnostics

This screen will show voltages at different controller inputs.

6.3.9 Speed Input Diagnostics

This screen will show the frequency of speed sensors.

6.3.10 Switch Output Diagnostics

This screen will show the status of switch input pullup current sources.

6.3.11 Software Version

This screen displays the current software version information for your reference.

7 Additional Guides & Information

Here are some additional guides and information about COMPUSHIFT II and accessories.

- [Changing a Wiring Harness Terminal](#)(see page 79)
- [COMPUSHIFT II Quick Install Guide](#)(see page 80)
- [Installing the Transmission Pressure Sensor](#)(see page 80)
- [Installing the Six Shooter Acculink](#)(see page 83)
- [Installing the AccuLink Refit Kit](#)(see page 83)
- [Connecting to a ZF 4HP24 Gear Lever Position Sensor](#)(see page 94)
- [Automatic Transmission Basics](#)(see page 95)

7.1 Changing a Wiring Harness Terminal

If you need to change or remove a wire in any of your HGM wiring harness connectors, it is easy to do with the right tool.

[Contact us](#)⁷ to order a terminal remover. It is the exact size and shape needed to release the terminal without damage to the connector or the wire.

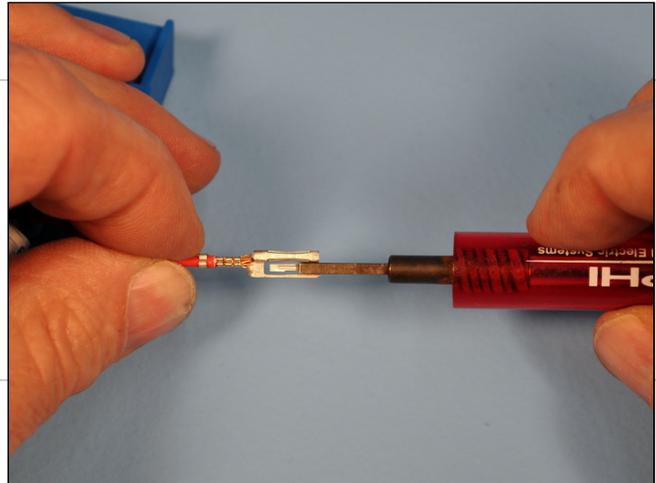
With the remover tool and a small flat-head screwdriver on hand, follow these steps below.

Use the small flat-head screwdriver with a gentle twist motion to release the clips that attach the retainer to the back side of the connector.

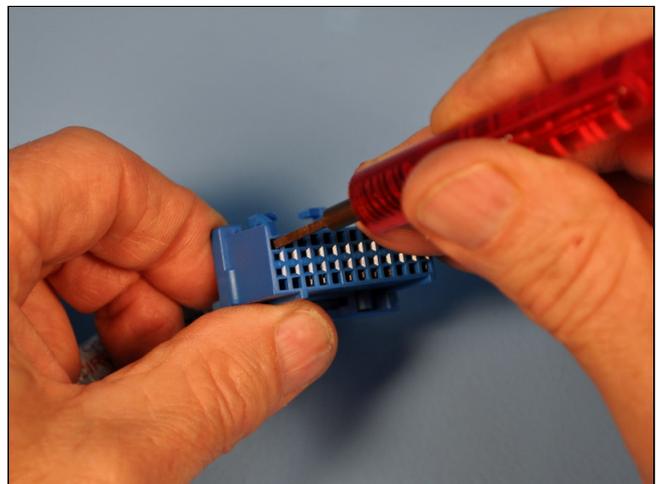
This photo shows how the removal tool releases the terminal connection inside the block. It fits exactly alongside the terminal and compresses the tooth that holds it in place.

⁷ <http://www.hgmelectronics.com/contact>

Locate the wire you want to remove in the connector block. Partially insert the tool in the **outside** hole (closer to the outside edge of the block - not the smaller holes along the center line) that corresponds to the wire.



From the back, press the wire into the block slightly to release tension on the terminal tooth. Fully insert the tool to release the tooth and the wire will slide out easily. If it does not release, try giving it more slack from the back - do not tug.



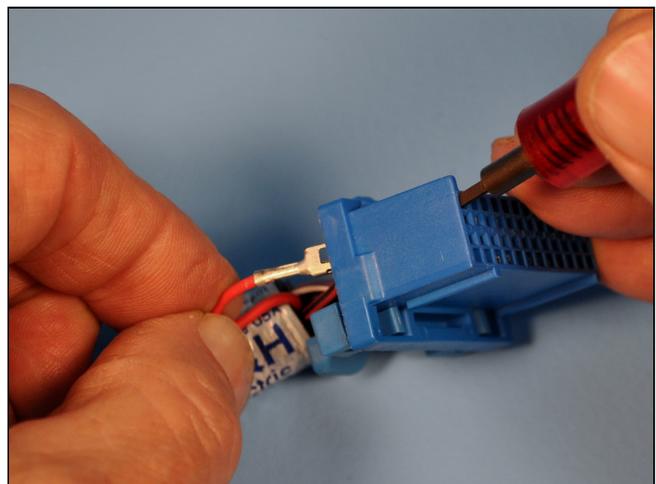
If you need to replace wires, you can contact HGM to order additional terminals. We have terminals already connected to pre-cut sections of wire in many different colors.

7.2 COMPUSHIFT II Quick Install Guide

This reference sheet was included in your original packaging.

Click the link below to open a PDF file, which you can print or save to your computer.

[COMPUSHIFT II Quick Install Guide.pdf](#)



7.3 Installing the Transmission Pressure Sensor

This sensor kit mounts directly to the transmission and reads pressure in PSI or Kilopascals directly on the **COMPUSHIFT II**⁸ display.

You will need:

- [Transmission Pressure Sensor Kit](#)⁹
- Appropriate wrench or socket

⁸ <http://www.hgmelectronics.com/products-compushift-controllers/compushiftii>

⁹ <https://hgmelectronics.squarespace.com/products-compushift-accessories/transmission-pressure-sensor-kit>

Most transmissions have a test port that connects directly to the sensor. On some, you will need to drill and tap a hole.

7.3.1 Typical Installation

Select a location to attach the sensor, preferably a pan bolt. If you have a stock pan with a lip around the edge, you will need to use the spacer. If you have a cast aluminum pan (as shown in photo), you might not. Plan to route the wire and hose away from exhaust heat.



Connect the hose to the pressure port on your transmission (you may need a 90-degree fitting, not supplied).



Remove the stock pan bolt. Using the provided bolt, install the clamp holding the sensor. Add the spacer between the clamp and the pan if needed.

Connect the cable to the sensor and its other end to the TRANS 2 socket on the COMPUSHIFT II controller.

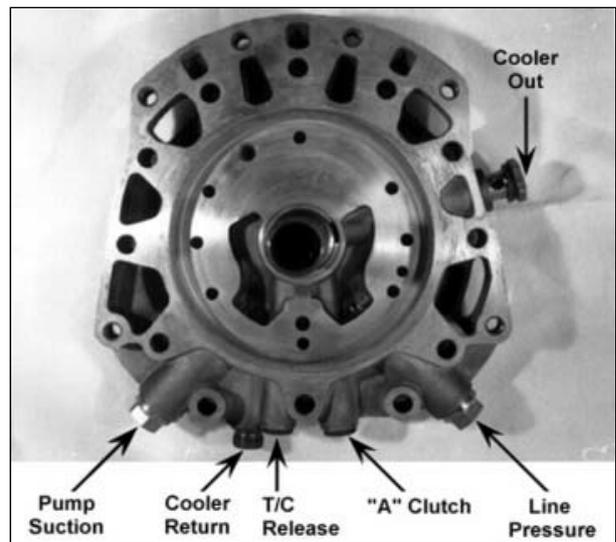
Be sure to check for leaks.



7.3.2 ZF4HP24

The ZF4HP24 does not have a 1/8" pipe threaded line pressure port. It needs an adapter. An easy way to make this adapter is to drill and tap the existing port plug.

First, locate the plug on the front pump assembly. Looking from the front of the transmission, the line pressure port is located at about the 4 o'clock position.



After locating the line pressure plug, remove it and drill an 11/32" hole through the plug. Then, thread the plug using a 1/8" pipe thread tap. The results should look like the photo to the left. You can now use that plug as an adapter to connect the pressure sensor.



7.4 Installing the Six Shooter Acculink

Acculink Installations for Barry Grant Six Shooter®

1. Follow all the [normal instructions for the Acculink throttle position sensor](#)(see page 27).
2. Install Acculink on the center carburetor only.
3. Remove the connecting rod from the front to rear carburetor and install spacers using longer bolts provided.
4. Re-use the original locking nuts.
5. Check linkage clearance at all throttle positions.
6. Install pins in ratio arm using Loctite®
7. Adjust the Acculink TPS so there is no play in the adjustable link rod. The TPS must have some preload.
8. Check the full stroke so to ensure the TPS does not mechanically hit the end of travel. This can damage the sensor and make the COMPUSHIFT fail. The ratio arm has a long end and a short end. This will allow you to adjust a stroke that will not damage the sensor. The long end UP makes the stroke shorter and the short end UP makes the stroke longer. This moves the pivot point closer and farther from throttle shaft center.

7.5 Installing the AccuLink Refit Kit

7.5.1 Introduction

HGM Automotive Electronics thanks you for upgrading your cable throttle position sensor to the AccuLink TPS system. We believe that great results can be achieved with a very careful installation of the cable operated throttle position sensor. We have hundreds of people (including us!) who use it. However, the cable-operated system can be difficult to get perfect. Some custom fabrication is usually required, and not everybody gets consistently great results.

We studied this problem at length and came up with a solution that fits the most popular carburetors: Holley, Edelbrock AFB, and Rochester QuadraJet. The AccuLink TPS offers the same or better performance with less hassle. It is compact, and has a very direct linkage. Installation and calibration requires a few simple steps and no custom fabrication.

Because the cable system and the AccuLink TPS use the same basic sensor and compatible wiring harnesses, we can offer it as an upgrade. This manual describes the upgrade process.

7.5.2 Installation Planning

This manual assumes that you have an installed and working COMPUSHIFT system. Your system should be using the cable operated throttle position sensor on a Holley, Edelbrock AFB, or Rochester QuadraJet carburetor. AccuLink TPS is not suitable for other systems at this time.

This book describes the process of removing the existing throttle position sensor and replacing it with the AccuLink TPS system.

The old system will be completely removed. Components from the old system will be removed and set aside for use in the new system. The old system will not be reusable when the AccuLink TPS installation is complete.

7.5.3 Required Tools and Supplies

For installation, you will need, at a minimum, the following tools:

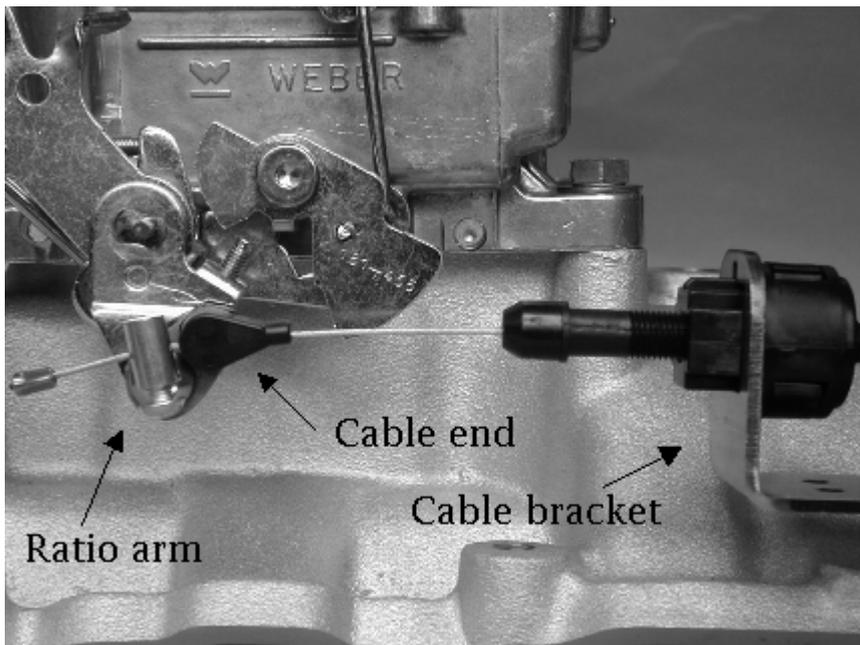
1. #2 Phillips screwdriver

2. Socket / end-wrench assortment

You may also need the following supplies:

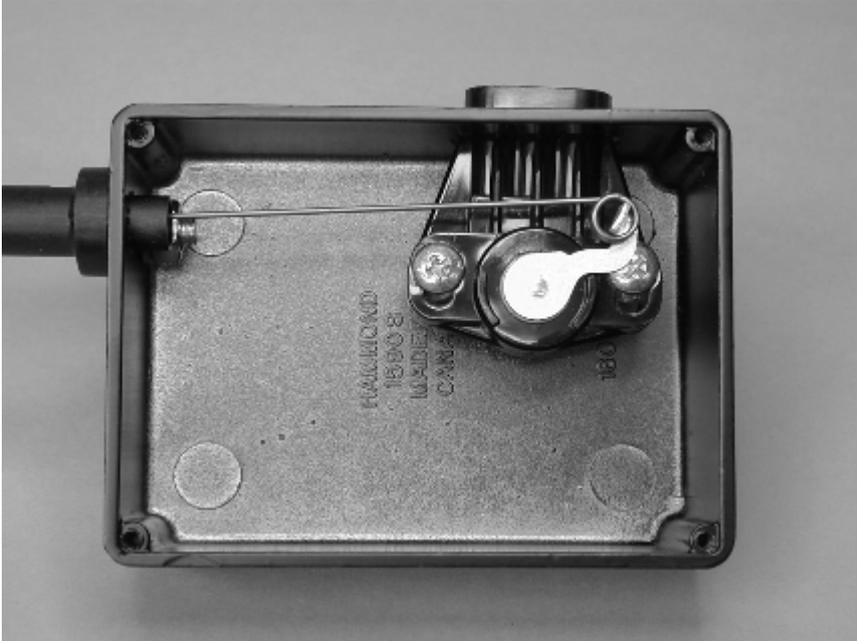
1. Insulating tape
2. Wire crimp connectors
3. Wire spade lugs

7.5.4 Removing the Old System



Remove the existing cable bracket, cable end, studs, and linkage plates.
Disconnect the throttle position cable wiring from the sensor box. Remove the box and the cable from the car.

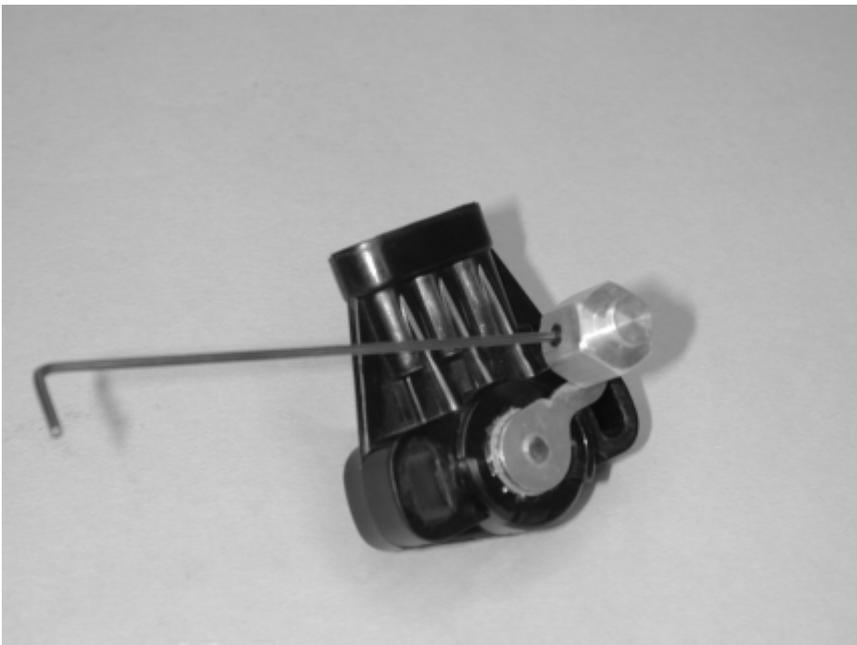
7.5.5 Removing the Sensor



Open the sensor box by removing the four case screws and lid. Lift the cable loop from the sensor and push it forward into the cable housing.

Using a Phillips screwdriver, remove the two screws holding the sensor. Remove the sensor from the case.

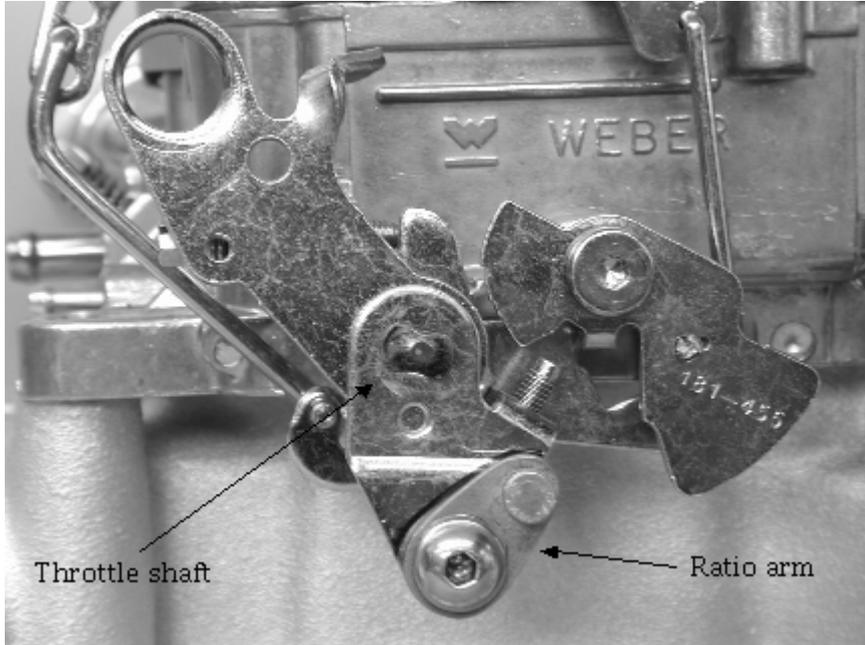
7.5.6 Installing the Sensor Pin



Place the sensor pin over the sensor arm and align the Allen set screw with the flat of the arm.

Tighten the Allen set screw.

7.5.7 Installing the AccuLink TPS

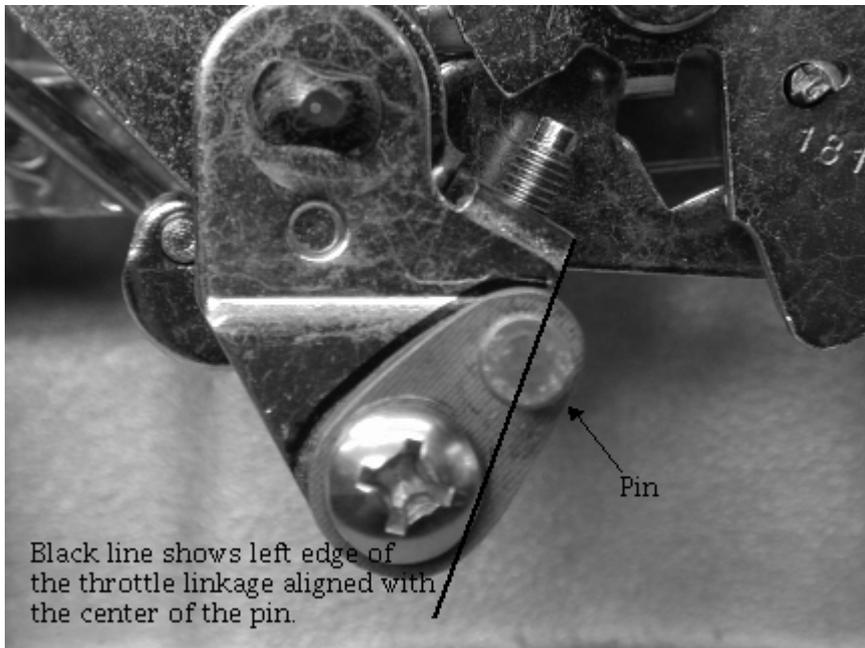


Begin installation by identifying the ratio arm. The ratio arm is a small oval piece of metal with a protruding stud on its smaller end.

If you are installing the arm on an Edelbrock AFB or Holley carburetor, remove the insert washer / knockout. For a Rochester Quadrajets, leave the washer in place.

Install the ratio arm onto the carburetor linkage using the 1/4-20 x 5/8 pan-head Phillips screw, washer, and nylon insert lock nut as shown above. The ratio arm is designed to mount in the linkage where a kick-down cable would normally attach. The washer sits between the carburetor linkage and the nylon insert nut as shown on the opposing page. Gently snug the screw and nut, but do not completely tighten.

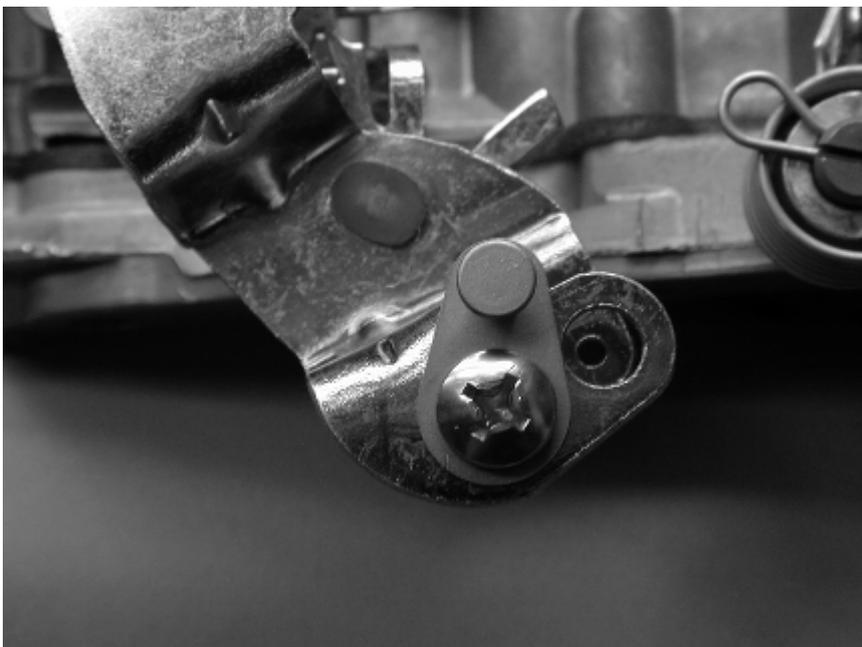
7.5.8 Aligning the Ratio Arm for Edelbrock AFB and Holley Carburetors



For Edelbrock AFB and Holley carburetors, set ratio arm angle so that the center of the ratio arm pin is aligned with edge of carburetor linkage as shown above.

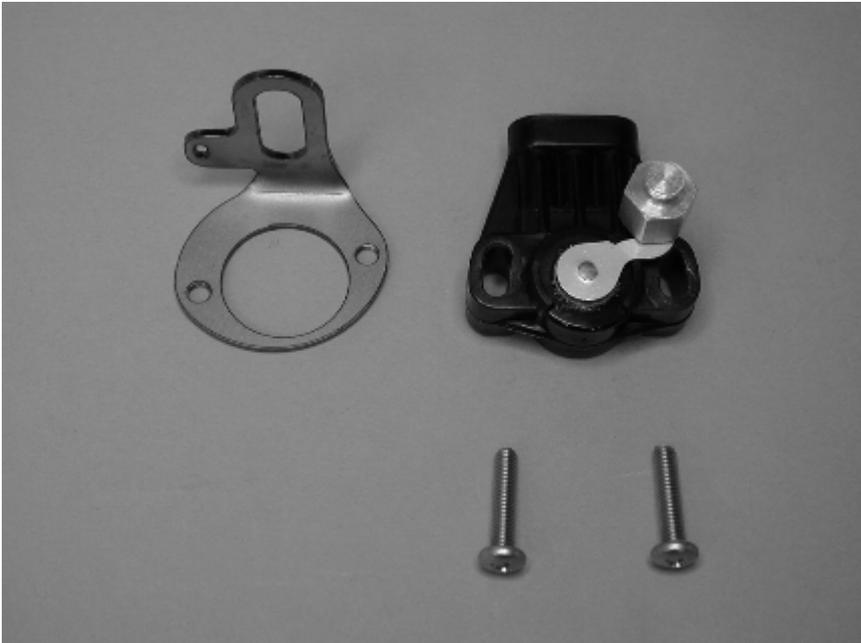
Tighten the screw and nut in this position.

7.5.9 Aligning the Ratio Arm for Rochester Quadrajet Carburetors



For the Rochester Quadrajets, set the ratio arm angle so that the ratio arm pin is vertical as shown in the picture above. Tighten the screw and nut in this position.

7.5.10 Assembling the TPS Bracket



Identify throttle position sensor, sensor bracket, and two 10/32x7/8 Phillips pan-head screws.

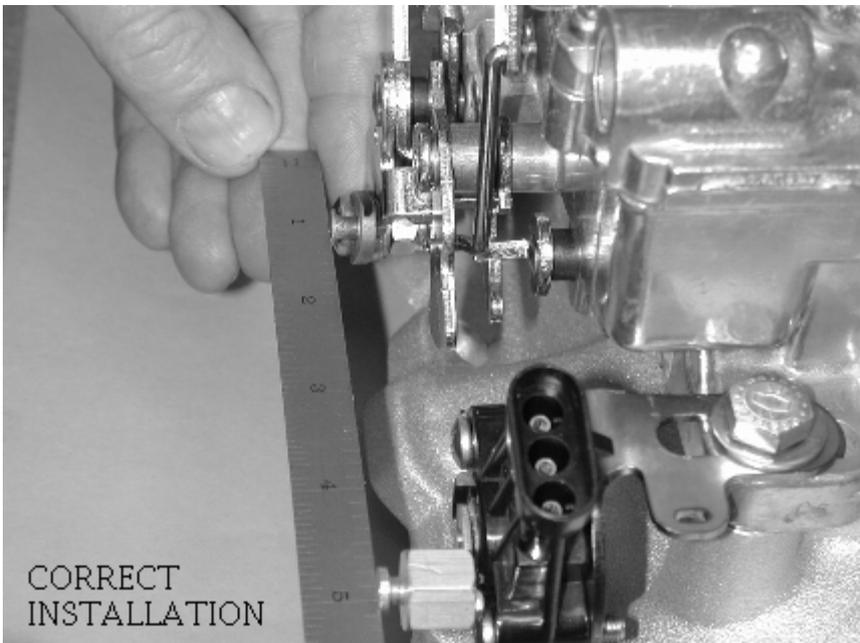
Mount the throttle position sensor to the sensor bracket as shown on the opposing page. Gently tighten the screws gently so that throttle position sensor can be rotated on the bracket.

Rotate throttle position sensor on the sensor bracket fully counterclockwise. The plug side of the throttle position sensor should be vertical. Tighten throttle position sensor screws.



This picture shows the completed sensor and bracket.

7.5.11 Attaching the TPS to the Carburetor

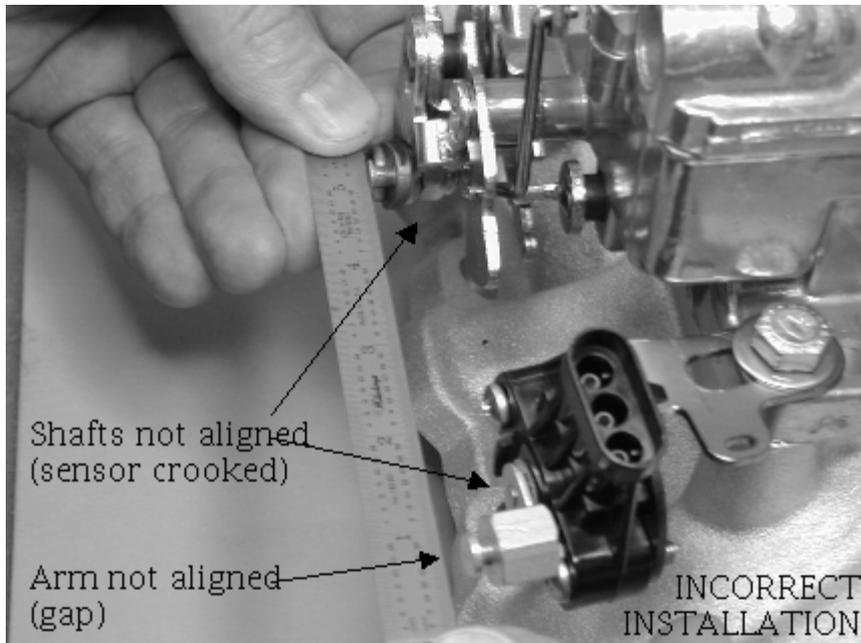


Attach the throttle position sensor and bracket assembly to the carburetor using the carburetor's linkage side rear manifold bolt.

The sensor must be aligned correctly. The rotation of the throttle linkage should match the rotation of the throttle position sensor. The ratio arm needs to be aligned along a straight line with the throttle position sensor (think of the motion of louvers on a window shade). A straight edge or ruler can be used as shown to assist with alignment.

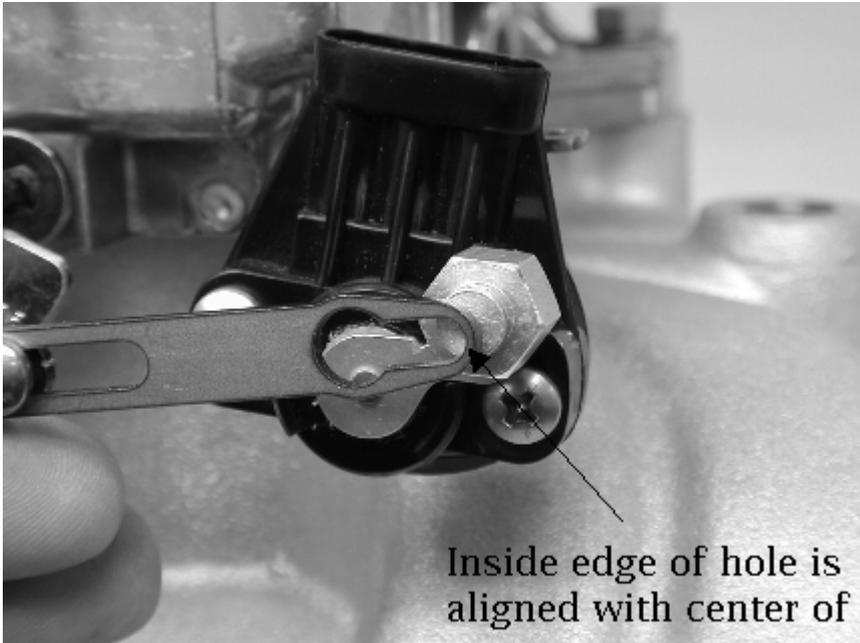
The position of the sensor bracket must be set to clear the secondary butterfly linkage. This is especially important on the Rochester Quadrajet.

Rotate the throttle linkage through its full range of travel to be sure that no part of it hits the throttle position sensor. Adjust the sensor bracket as needed to avoid interference.



This picture shows an example of an incorrect installation. The sensor rotation is not aligned with the linkage, and the arms are not aligned.

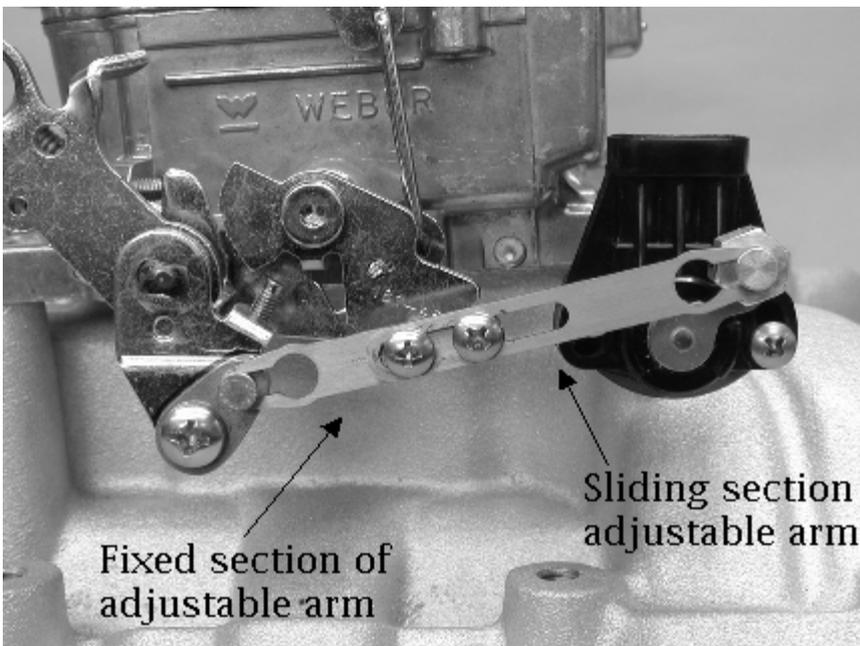
7.5.12 Installing the Adjustable Arm



The adjustable arm is made of two pieces: the fixed, threaded section and the sliding section. Identify and assemble the adjustable arm, leaving the screws gently snug. Attach the fixed section of the adjustable arm to the ratio arm. The screw heads should face outward, away from the carburetor.

Adjust the arm length so that edge of the hole of the sliding section is aligned with the center of the throttle position sensor pin. The correct length is shown in the picture above. Tighten the adjustable arm screws at this position.

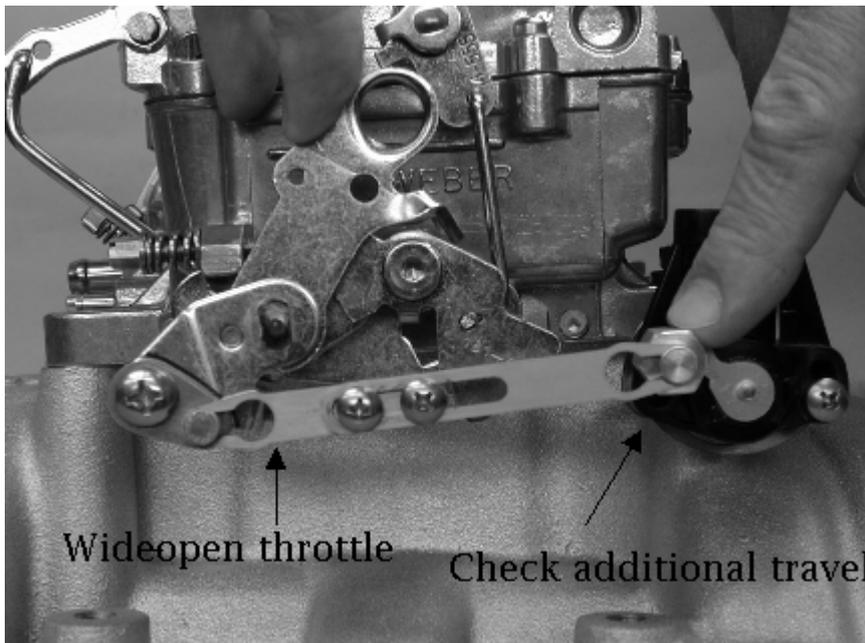
Disable the fast idle cam for the choke so that the carburetor butterflies are on low speed idle.



Attach the adjustable arm by rotating the throttle position sensor so that its pin can be inserted into the adjustable arm. The picture above shows the arm in its fully installed position.

Do not lubricate the linkage. The AccuLink system is designed to work WITHOUT lubrication. Most lubricants will attract dirt, shortening the life of the system.

7.5.13 Checking the Adjustable Arm and Sensor

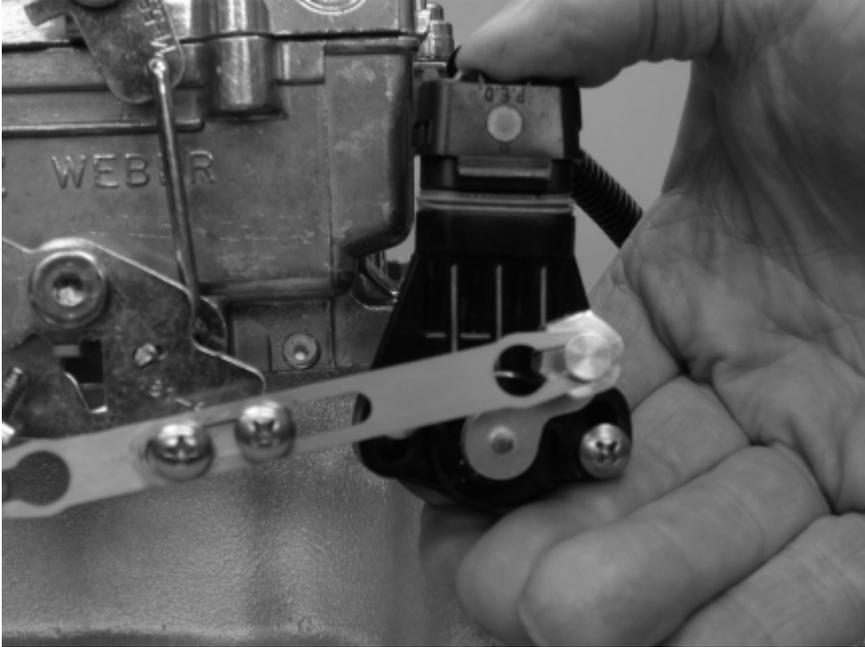


Check the adjustable arm with the throttle fully closed. There should be tension on the arm and no free play. Correct any free play by shortening the arm slightly.

Hold the carburetor linkage in the fully open position. Verify that the throttle position sensor has some remaining stroke / rotation by pressing on the sensor arm as shown above. The sensor should have some additional travel / rotation. If the sensor is fully extended, lengthen the arm slightly to correct.

THE THROTTLE POSITION SENSOR SHOULD NOT REACH THE END OF ITS ROTATION OR STROKE IN EITHER DIRECTION. IT SHOULD BE SLIGHTLY OFF THE STOP AT EACH END OF ITS TRAVEL. FAILURE TO DO THIS COULD RESULT IN POOR OPERATION.

7.5.14 Connecting the TPS



Install throttle position sensor plug into throttle position sensor. The plug has a rubber gasket that is tight fitting. Be sure to push the plug into the socket by squeezing the plug and the sensor together as shown so as not to bend the sensor bracket. This may require two hands.

Your system may have shipped with an extension cable for the throttle position sensor. If necessary, install the extension cable between the controller and the sensor.

7.5.15 Securing the TPS Wiring Harness



Insert the supplied cable tie from the bottom through the slot in the sensor bracket. Close the cable tie around the wire harness. Cut the excess tie length as desired.

Installation of the AccuLink TPS is now complete.

7.6 Connecting to a ZF 4HP24 Gear Lever Position Sensor

The gear lever position sensor for the ZF4HP-24 transmission comes in two varieties; US and UK.

The US version of the sensor has 5(five) wires that need to be processed by COMPUSHIFT II and the UK version has 4(four) wires.

7.6.1 US Version

In your vehicle you will find the sensor is connected to a loom that consists of 9 wires. The wires that you will need are BROWN/PURPLE, BLUE/PURPLE, BLUE/BLACK, BLUE/GREEN, and BLUE/WHITE. In your kit you are provided with a 5 Way plug that you can use for these wires to make connecting to the 5 Way plug on the provided transmission harness a snap. You may prefer to skip the 5 Way plugs and solder directly to the harness.

In either instance, BROWN/PURPLE connects to the BLACK wire on the harness, BLUE/PURPLE connects to BLUE/RED, BLUE/BLACK connects to BLUE/BLACK, BLUE/GREEN connects to BLUE, and BLUE/WHITE connects to WHITE.

7.6.2 UK Version

In your vehicle you will find the sensor is connected to a factory loom; due to lack of documentation and availability we can't tell you what wires you need from this loom, however, the wires you need directly off of the gear lever position sensor are BLACK, GRAY, YELLOW, and WHITE. You can trace the necessary wires on the factory loom back

to the source and figure it out that way, or solder the gear lever position sensor to the provided transmission harness.

In either instance, BLACK from the sensor connects to BLACK on the harness, GRAY connects to BLUE/RED, YELLOW connects to BLUE/BLACK, and WHITE connects to BLUE.

7.7 Automatic Transmission Basics

In using COMPUSHIFT II, it's helpful to understand how your automatic transmission works. This section gives a simplified overview of a typical automatic transmission.

The major components in your transmission include:

- **Torque Converter** = A special fluid coupling that makes the connection between your transmission and engine. It drives the gears in the transmission, which in turn, move the vehicle. This device has a special clutch called the "torque converter clutch" that directly connects the engine to the transmission in the same way a manual transmission clutch operates. This is usually done to improve fuel economy.
- **Hydraulic Pump** = Pumps oil in the transmission to provide lubrication and pressure to actuate clutches, bands and other components.
- **Control Solenoids** = These electrically controlled valves turn oil pressure on and off in the valve body and adjust hydraulic pressure.
- **Valve Body** = The valve body, in turn, routes oil pressure to the clutches and bands.
- **Gearsets** = These are a combination of gears that mesh to provide a specific gear ratio. Any "planetary" gearset (the type typically used with COMPUSHIFT II) has three main components: sun gear; planet gears and the planet gears' carrier; and ring gear.
- **Clutches & Bands** = Clutches and bands alternatively connect and disconnect different gears in the transmission. The correct sequencing of band and clutch activation is what shifts the transmission.
 - The amount of hydraulic pressure applied to the clutches determines how the transmission shifts. Under low pressure, the clutches engage slowly and softly, making a gentler shift. Under high pressure, the clutches engage rapidly and the shift is firm.

 It's vital that the shift pressure be adjusted according to the transmission load conditions. If the transmission shifts gently while the engine produces high torque, the transmission clutches will slip. This will eventually burn out the clutches. Conversely, if the transmission shifts firmly all the time, the clutches and drive train will be subjected to unnecessary stress. This could be unpleasant for the driver and passengers, too.

- The best programming of shift pressure provides the correct pressure during *all* driving circumstances. Your COMPUSHIFT II can be programmed to deliver neck-jerking shifts under full throttle, yet provide smooth drivability during light throttle and cruising.

 It's important to understand that not all aspects of shifting can be controlled by COMPUSHIFT II. The specifics of how the transmission is built make a tremendous difference in how it reacts to the control by COMPUSHIFT II. Identical COMPUSHIFT II Controllers will have different shift properties on differently built transmissions. We recommend you consult with a qualified transmission builder to achieve the exact shifting characteristics you want.

8 Specifications & Pinouts

- [Controller Mechanical Drawings](#)(see page 96)
- [Controller Specifications](#)(see page 96)
- [Display Specifications](#)(see page 98)
- [AccuLink TPS Specifications](#)(see page 100)
- [Cable TPS Specifications](#)(see page 101)
- [Connector Pinouts](#)(see page 101)
 - [Pinouts for Engine Connector](#)(see page 102)
 - [Pinouts for Option Connector](#)(see page 104)
 - [Pinouts for Ford 4R70W - Black Plug](#)(see page 106)
 - [Pinouts for Ford 4R70W - White Plug](#)(see page 114)
 - [Pinouts for Ford 4R100](#)(see page 121)
 - [Pinouts for Ford AODE](#)(see page 128)
 - [Pinouts for Ford E4OD](#)(see page 135)
 - [Pinouts for GM 4L60E and 4L80E](#)(see page 142)
 - [Pinouts for Toyota A442F](#)(see page 149)
 - [Pinouts for ZF 4HP24](#)(see page 155)
 - [Pinouts for Toyota AB60](#)(see page 162)
- [Warranty](#)(see page 170)

8.1 Controller Mechanical Drawings

For vehicle and powertrain integrators, HGM publishes solid models of the CS2 controller. Please choose from the following:

- CS2 Solid Model (STEP format)
- CS2 Solid Model (IGES format)

8.2 Controller Specifications

8.2.1 COMPUSHIFT II

8.2.1.1 System Design

- High-speed microcontroller running COMPUSHIFT II software
- Software-preprogrammed shift and pressure tables, proprietary shift algorithms, built-in diagnostics and display software
- Nonvolatile memory for storage of calibration and programming information
- High-density multilayer surface-mount printed circuit board
- Factory- and field-upgradeable

8.2.1.2 Programming

- Factory programmed with all necessary software
- Adjustments, setup and calibration via handheld display or PC setup utility
- No PC or laptop computer required to completely program COMPUSHIFT II

8.2.1.3 Chassis

- Chassis is a factory-sealed black powder-coated aluminum box with mounting flanges. There are no user-serviceable parts inside. The chassis should not be opened.
- Dimensions
 - 4.875 x 6.375 x 2.125" (excluding mounting flanges)
- Mounting Flange Dimensions
 - 0.625 x 6.375" (two flanges, opposite ends)
- Mounting Holes
 - 2 – #10 holes per flange

8.2.1.4 Mounting Requirements

- Controller must be mounted in a dry area, not exposed to heat from the exhaust, cooling, or heating systems
- Controller must have clear air circulation (a 1" air clearance around the sides and top is recommended)

8.2.1.5 Environmental Requirements

- Relative Humidity
 - 0% – 90%, non-condensing
- Temperature (Operating)
 - -30° – 60° C (-22° – 140° F)
- Temperature (Storage)
 - -30° – 85° C (-22° – 185° F)
- Protection
 - Automatic internal shutdown for over-temperature condition
 - Automatic protection against failed solenoids

8.2.1.6 Electrical Specifications

- Supply Voltage
 - 8 – 16 volts DC
- Supply Current, Quiescent
 - 600 mA @ 14.4 volts
- Supply Current, Maximum
 - 5 A @ 14.4 volts (dependent on transmission type)
- Solenoid Capacity
 - 12 solenoids drivers with automatic short-circuit protection
 - Short- and open-circuit detection with fault reporting
- Tachometer Input
 - High impedance 0 – 12 volt signal input
 - Tachometer input not required. Used for wide-open throttle upshift and data logging.
- Speedometer Input
 - Designed for variable reluctance inductive pickup on GM and Ford transmissions
 - Can function with appropriately conditioned 0 – 12 volt signal
- Speedometer Outputs
 - Reproduced OEM TOSS Signal
 - Variable pulse count per drive shaft revolution
- Throttle Position Sensor Input
 - 0 – 5 volt input, filtered against line noise

- Automatic calibration to stroke range
 - 5 volt reference signal provided
- Dual CAN buses for connection to vehicle networking

8.2.1.7 Connectors

- Power – connection to vehicle power
- Engine – connection to throttle position sensor, tachometer, speedometer, MAP sensor
- Options – connection to display and accessory switches and indicators
- Trans A – connection to transmission
- Trans B – connection to transmission and optional hydraulic pressure sensor
- USB – connection to PC

8.2.1.8 Indicators

- 1 Red/Green LED indicating system status

8.3 Display Specifications

8.3.1 COMPUSHIFT II

8.3.1.1 Type

- Handheld or dash-mountable backlit LCD display with 7-key keypad

8.3.1.2 Display Characteristics

- Number of Characters
 - 80 (20 characters x 4 lines)
- Matrix format
 - 5" x 7" with underline
- Display Area
 - 82.00 mm x 28.40 mm
- Character Size
 - 3.90 mm x 5.20mm (not including underline)
- LED Backlight
 - 100,000 hours typical life
 - Three-color adjustable brightness

8.3.1.3 Chassis

- Chassis is a factory-sealed, injection molded with a threaded inserts for mounting. There are no user-serviceable parts inside. The chassis should not be opened.
- Dimensions
 - 7.125" x 2.00" x 1.5"
- Threaded Mounting Insert
 - 4-40 machine screw

8.3.1.4 Environmental Requirements

- Relative Humidity
 - 0% – 90%, non-condensing
- Temperature (Operating)
 - 0° – 50° C (32° – 122° F)
- Temperature (Storage)
 - -20° – 70° C (-4° – 158° F)
- Mounting Requirements
 - Display must be mounted in a dry area. Direct sunlight should be avoided.

8.3.1.5 Shock & Vibration

- Normal automotive environment. The display should not be dropped.

8.3.1.6 Electrical Specifications

- All electrical power is provided by the COMPUSHIFT II controller
- Connection is provided via a standard 4-pin connector and 2 meter (6 foot) cable.
- Custom cable lengths available upon request

8.3.1.7 Display Formats

- Mixed display of information in small characters
- Large digits
- Bar graphs

8.3.1.8 Running Dashboard Displays

- The display provides a number of meters while the system is operating, including:
 - System Status and Diagnostics
 - Vehicle Speed
 - Engine Speed
 - Current Gear
 - Throttle Position
 - Relative Hydraulic Pressure
 - Transmission Temperature
 - System Voltage
 - Dynamometer
 - Accelerometer
 - Stopwatch with Lap Times
 - Data Log

8.3.1.9 On-the-fly adjustments

- Shift Pressure
- Shift Speed

8.3.1.10 Advanced Setup Features

- The display allows use of an extended set of programming features, including but not limited to:
 - Transmission Type Selection
 - Transmission Shift Mode Selection
 - Torque Converter Clutch Parameters
 - Tachometer Calibration
 - Speedometer Calibration
 - Tire Size
 - Final Drive Ratio
 - Vehicle Weight
 - Measurement Units

8.4 AccuLink TPS Specifications

8.4.1 Description

- Carburetor-mounted, direct linkage, actuated, sealed position sensor with spring preload

8.4.2 Linkage

- Adjustable stainless steel linkage arm, ratio arm, sensor arm

8.4.3 Mounting Hardware

- Stainless steel nuts, washers, brackets, screws

8.4.4 Environmental Requirements

- Relative Humidity
 - 0% – 90%
- Temperature (Operating and Storage)
 - -30° – 85° C (-22° – 185° F)

8.4.5 Adjustments

- Rotational adjustment on sensor
- Alignment adjustment on sensor bracket
- Linkage length adjustment on arm
- Mounting angle adjustment on ratio arm

8.4.6 Attachment

- Direct attachments to throttle linkage and intake manifold

8.5 Cable TPS Specifications

8.5.1 Type

- Cable-actuated, sealed variable resistor with spring preload

8.5.2 Chassis

- Chassis is a black powder-coated aluminum box with mounting flanges. The throttle cable exits one side of the box.
- Dimensions
 - 4.25 x 3.125 x 1.75" (excluding mounting flanges)
- Mounting Flange Dimensions
 - 3.125 x .5" (two flanges, opposite ends)
- Mounting Slots
 - 2 slots per flange, beveled to accept a No. 8 oval-head sheet metal screw

8.5.3 Environmental Requirements

- Relative Humidity
 - 0% – 90%
- Temperature (Operating and Storage)
 - -30° – 85° C (-22° – 185° F)

8.5.4 Cable

- Type
 - Steel cable in pre-lubricated high-temperature plastic housing
- Mounting
 - Cable housing attaches to a flange with a pair of provided nuts on the threaded housing end
- Dimensions
 - 3 L x 3/8" D
- Travel
 - 3/4"
- Adjustment
 - Screw adjustment on cable length
- Attachment
 - Socket-type attachment for provided stud

8.6 Connector Pinouts

Click on the link below with your transmission to view pinout details for each connector.

- [Pinouts for Engine Connector](#)(see page 102)
- [Pinouts for Option Connector](#)(see page 104)
- [Pinouts for Ford 4R70W - Black Plug](#)(see page 106)
- [Pinouts for Ford 4R70W - White Plug](#)(see page 114)
- [Pinouts for Ford 4R100](#)(see page 121)

- [Pinouts for Ford AODE](#)(see page 128)
- [Pinouts for Ford E4OD](#)(see page 135)
- [Pinouts for GM 4L60E and 4L80E](#)(see page 142)
- [Pinouts for Toyota A442F](#)(see page 149)
- [Pinouts for ZF 4HP24](#)(see page 155)
- [Pinouts for Toyota AB60](#)(see page 162)

8.6.1 Pinouts for Engine Connector

8.6.1.1 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.2 Pinouts for Option Connector

8.6.2.1 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.3 Pinouts for Ford 4R70W - Black Plug

8.6.3.1 TRANS 1 Connector

A	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									
B	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 3	
TRANS 1	A	2	+12V POWER	NO CONNECTION			
TRANS 1	A	3	+5V POWER	NO CONNECTION			
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TRANS PLUG PIN 1	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPACK 2PIN FEM
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN 5	
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN 2	
TRANS 1	A	9	SOLENOID 3	NO CONNECTION			
TRANS 1	A	10	SOLENOID 4	NO CONNECTION			

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	11	SOLENOID 5	SS2 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN 7	
TRANS 1	A	12	SOLENOID 6	SS1 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN 6	
TRANS 1	B	1	GND	MLPS GND	BLK	4 WAY PIN D	WEATHERPAC K 4PIN
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP	BRN	TRANS PLUG PIN 4	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPAC K 2PIN FEM
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	RANGE SENSOR A	BLU/RED	4 WAY PIN A	WEATHERPAC K 4PIN
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	RANGE SENSOR B	BLU/BLK	4 WAY PIN B	WEATHERPAC K 4PIN
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	RANGE SENSOR C	BLU	4 WAY PIN C	WEATHERPAC K 4PIN

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.3.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.3.3 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.4 Pinouts for Ford 4R70W - White Plug

8.6.4.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 2	JOINED IN LOOM
TRANS 1	A	1	+12V POWER	12VDC	RED 18GA	TRANS PLUG PIN 7	JOINED IN LOOM
TRANS 1	A	2	+12V POWER	12VDC PRESS SOL	RED/BLK 18GA	TRANS PLUG PIN 6	
TRANS 1	A	3	+5V POWER	NO CONNECTION			
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TRANS PLUG PIN 4	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPAC K 2PIN FEM
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN 9	

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN 3	
TRANS 1	A	9	SOLENOID 3	NO CONNECTION			
TRANS 1	A	10	SOLENOID 4	NO CONNECTION			
TRANS 1	A	11	SOLENOID 5	SS2 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN 5	
TRANS 1	A	12	SOLENOID 6	SS1 CONTROL SIDE	YEL/BLU	TRANSPLUG PIN 1	
TRANS 1	B	1	GND	DRS GND	BLK	4 WAY PLUG PIN D	WEATHERPAC K 4PIN
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP	BRN	TRANS PLUG PIN 8	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			

CONNECTOR	ROW	PIN #	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPAC K 2PIN FEM
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	RANGE SENSOR A	BLU/R	4 WAY PIN A	WEATHERPAC K 4PIN
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	RANGE SENSOR B	BLU/BLK	4 WAY PIN B	WEATHERPAC K 4PIN
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	RANGE SENSOR C	BLU	4 WAY PIN C	WEATHERPAC K 4PIN
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.4.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.4.3 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	TURNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.5 Pinouts for Ford 4R100

8.6.5.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 1	
TRANS 1	A	2	+12V POWER	12VDC PRES SOL	RED/BLK 18GA	TRANS PLUG PIN 12	
TRANS 1	A	3	+5V POWER	NO CONNECTION			
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TRANS PLUG PIN 7	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPACK 2PIN FEM
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN 11	
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN 4	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	9	SOLENOID 3	COAST CLUTCH	GRN	TRANS PLUG PIN 5	
TRANS 1	A	10	SOLENOID 4	NO CONNECTION			
TRANS 1	A	11	SOLENOID 5	SS2 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN 2	
TRANS 1	A	12	SOLENOID 6	SS1 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN 3	
TRANS 1	B	1	GND	DRS GND	BLK	4 WAY PIN D	WEATHERPAC K 4PIN
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP	BRN	TRANS PLUG PIN 8	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPAC K 2PIN FEM

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	RANGE SENSOR A	BLU/RED	4 WAY PIN A	WEATHERPACK 4PIN
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	RANGE SENSOR B	BLU/BLK	4 WAY PIN B	WEATHERPACK 4PIN
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	RANGE SENSOR C	BLU	4 WAY PIN C	WEATHERPACK 4PIN
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.5.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.5.3 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	TURNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.6 Pinouts for Ford AODE

8.6.6.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 2	JOINED IN LOOM
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 7	JOINED IN LOOM
TRANS 1	A	2	+12V POWER	12VDC PRESS SOL	RED/BLK 18GA	TRANS PLUG PIN 6	
TRANS 1	A	3	+5V POWER	5VDC TO 1K RES		B7	PULL UP RES
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TRANS PLUG PIN 4	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPAC K 2PIN FEM
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN 9	

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN 3	
TRANS 1	A	9	SOLENOID 3	NO CONNECTION			
TRANS 1	A	10	SOLENOID 4	NO CONNECTION			
TRANS 1	A	11	SOLENOID 5	SS 2-3 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN 5	
TRANS 1	A	12	SOLENOID 6	SS 1-2 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN 1	
TRANS 1	B	1	GND	MLPS GND	BLACK	MLPS PIN B	WEATHERPAC K 2PIN MALE
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP	BRN	TRANS PLUG PIN 8	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPAC K 2PIN FEM
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	MLPS	BLU/RED	MLPS PIN A	WEATHERPAC K 2PIN MALE

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	NO CONNECTION			
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	NO CONNECTION			
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.6.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.6.3 OPTIONS Connector

A	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									
B	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.7 Pinouts for Ford E4OD

8.6.7.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN 1	
TRANS 1	A	2	+12V POWER	12VDC PRES SOL	RED/BLK 18GA	TRANS PLUG PIN 12	
TRANS 1	A	3	+5V POWER	5VDC TO 1K RES		B7	PULL UP RES
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TRANS PLUG PIN 7	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPAC K 2PIN FEM
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN 11	
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN 4	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	9	SOLENOID 3	COAST CLUTCH	GRN	TRANS PLUG PIN 5	
TRANS 1	A	10	SOLENOID 4	NO CONNECTION			
TRANS 1	A	11	SOLENOID 5	SS2 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN 2	
TRANS 1	A	12	SOLENOID 6	SS1 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN 3	
TRANS 1	B	1	GND	MLPS GND	BLK	MLPS PLUG PIN B	WEATHERPAC K 2PIN MALE
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP	BRN	TRANS PLUG PIN 8	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPAC K 2PIN FEM
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	MLPS WITH PULL UP	BLU/RED	MLPS PLUG PIN A	WEATHERPAC K 2PIN MALE
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	NO CONNECTION			

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	NO CONNECTION			
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.7.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.7.3 OPTIONS Connector

A	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									
B	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.8 Pinouts for GM 4L60E and 4L80E

8.6.8.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED 18GA	TRANS PLUG PIN E	
TRANS 1	A	2	+12V POWER	12VDC PRESS SOL	RED/BLK 18GA	TRANS PLUG PIN C	
TRANS 1	A	3	+5V POWER	NO CONNECTION			
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP HIGH	BRN	TRANS PLUG PIN L	
TRANS 1	A	5	TISS INPUT HIGH	NO CONNECTION			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TOSS PIN A	WEATHERPACK 2PIN
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN D	
TRANS 1	A	8	SOLENOID 2	TCC PWM 4L60E	BLACK	TRANS PLUG PIN U	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	9	SOLENOID 3	TCC 4L80E	GRN/WHT	TRANS PLUG PIN S	
TRANS 1	A	10	SOLENOID 4	TCC 4L60E	GRN	TRANS PLUG PIN T	
TRANS 1	A	11	SOLENOID 5	SS 2-3 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN B	
TRANS 1	A	12	SOLENOID 6	SS 1-2 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN A	
TRANS 1	B	1	GND	NO CONNECTION			
TRANS 1	B	2	GND	NO CONNECTION			
TRANS 1	B	3	TOSS OUTPUT REPRO	REPRO TOSS	PPL/WHT	OUT OF LOOM @ TOSS	FLYING LEAD
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP LOW	BRN	TRANS PLUG PIN M	
TRANS 1	B	5	TISS INPUT LOW	NO CONNECTION			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TOSS PIN B	WEATHERPACK 2PIN
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	PSM A	BLU/RED	TRANS PLUG PIN N	
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	PCM B	BLU/BLK	TRANS PLUG PIN R	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	PSM C	BLU	TRANS PLUG PIN P	
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	NO CONNECTION			
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NO CONNECTION			
TRANS 1	B	12	TRANSFER CASE 1	TRANSFER CASE	YELLOW	OUT OF LOOM @ TOSS	FLYING LEAD

8.6.8.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.8.3 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.9 Pinouts for Toyota A442F

8.6.9.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION IN PLUG	TO LOOM PLUG TERM	TRANS LOOM COLOR
TRANS 1	A	1						
TRANS 1	A	2						
TRANS 1	A	3						
TRANS 1	A	4	TEMP SENS	TEMP HIGH	BRN 20GA	TRANS PLUG TERMINAL B	TERMINAL 1	BLUE
TRANS 1	A	5						
TRANS 1	A	6	TOSS	TOSS HIGH	PPL/YEL 20GA	TOSS PLUG TERMINAL A	WEATHER PACK	GRN ON TOSS
TRANS 1	A	7	SOLENOID 1					
TRANS 1	A	8	SOLENOID 2					
TRANS 1	A	9	SOLENOID 3	TCC CONTROL	GRN/WHT 20GA	TRANS PLUG TERMINAL D	TERMINAL 7	GRN
TRANS 1	A	10	SOLENOID 4	TIMING SOL	GRN 20GA	TRANS PLUG TERMINAL E	TERMINAL 3	GRN/RED
TRANS 1	A	11	SOLENOID 5	SS1	BLU/YEL 20GA	TRANS PLUG TERMINAL C	TERMINAL 4	RED
TRANS 1	A	12	SOLENOID 6	SS2	YEL/BLU 20GA	TRANS PLUG TERMINAL F	TERMINAL 8	WHT

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION IN PLUG	TO LOOM PLUG TERM	TRANS LOOM COLOR
TRANS 1	B	1	GND	MLPS	BLK 20GA	SHIFT LEVER PLUG PIN A	MLPS PIN 7	RED/BLU
TRANS 1	B	2	GND					
TRANS 1	B	3	REPRO TOSS	SPEED OUT	PPL/WHT 20GA	FLYING LEAD	OUT AT TOSS	
TRANS 1	B	4	TEMP SENS	TEMP LOW	BRN 20GA	TRANS PLUG TERMINAL G	TERMINAL 5	BRN/WHT
TRANS 1	B	5						
TRANS 1	B	6	TOSS	TOSS LOW	PPL 20GA	TOSS PLUG TERMINAL B	WEATHER PACK	RED ON TOSS
TRANS 1	B	7	SHIFT LEV 1	PARK	BLU/RED	SHIFT LEVER PLUG PIN B	MLPS PIN 8	GRN/WHT
TRANS 1	B	8	SHIFT LEV 2	DRIVE	BLU/BLK	SHIFT LEVER PLUG PIN C	MLPS PIN 2	GRN/YEL
TRANS 1	B	9	SHIFT LEV 3	SECOND	BLU/ORN	SHIFT LEVER PLUG PIN E	MLPS PIN 9	GRN
TRANS 1	B	10	SHIFT LEV 4	LOW	BLU/WHT	SHIFT LEVER PLUG PIN F	MLPS PIN 1	GRN/BLK
TRANS 1	B	11	SHIFT LEV 5	NU				
TRANS 1	B	12	TRANSFER CASE 1	T/C CALCU	YEL	FLYING LEAD	OUT AT TOSS	

Notes

1. TRANS PLUG IS BLACK 8 PIN
2. LEVER PLUG IS WHITE 7 PIN

8.6.9.2 TRANS 2 Connector

A	8	7	6	5	4	3	2	1
B	8	7	6	5	4	3	2	1

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION IN PLUG	TO LOOM PLUG TERM	TRANS LOOM COLOR
TRANS 2	B	8	GND					
TRANS 2	B	7	SPEED INPUT					
TRANS 2	B	6	SHIFT LEV 6	NEUTRAL	LT/BLU	SHIFT LEVER PLUG PIN G	MLPS PIN 3	GRN/RED
TRANS 2	B	5	SHIFT LEV 7	REVERSE	BLU/YEL	SHIFT LEVER PLUG PIN H	MLPS PIN 4	RED/BLK

ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	URNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.10 Pinouts for ZF 4HP24

8.6.10.1 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
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B	1	1	1	9	8	7	6	5	4	3	2	1
	2	1	0									

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	1	+12V POWER	12VDC SOLENOIDS	RED/BLK 18GA	TRANS PLUG PIN M	
TRANS 1	A	2	+12V POWER	NC			
TRANS 1	A	3	+5V POWER	NC			
TRANS 1	A	4	TEMP SENSOR	TRANS TEMP	BRN	TEMP SENSOR PLUG	TO SCREW-IN SENSOR
TRANS 1	A	5	TISS INPUT HIGH	NC			
TRANS 1	A	6	TOSS INPUT HIGH	TOSS HIGH	PPL/YEL	TRANS PLUG PIN E	
TRANS 1	A	7	SOLENOID 1	PRESS SOL CONT	GRN/RED	TRANS PLUG PIN B	
TRANS 1	A	8	SOLENOID 2	TCC CONTROL SIDE	GRN/WHT	TRANS PLUG PIN L	
TRANS 1	A	9	SOLENOID 3	NC			
TRANS 1	A	10	SOLENOID 4	NC			
TRANS 1	A	11	SOLENOID 5	SS2 CONTROL SIDE	BLU/YEL	TRANS PLUG PIN K	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	A	12	SOLENOID 6	SS1 CONTROL SIDE	YEL/BLU	TRANS PLUG PIN H	
TRANS 1	B	1	GND	DRS GND	BLK	5 WAY PLUG PIN D	TO SWITCH COM-BRN/PPL
TRANS 1	B	2	GND	NC			
TRANS 1	B	3	TOSS OUTPUT REPRO	NC			
TRANS 1	B	4	TEMP SENSOR RET	TRANS TEMP RTN	BRN	TEMP SENSOR PLUG	TO SCREW-IN SENSOR
TRANS 1	B	5	TISS INPUT LOW	NC			
TRANS 1	B	6	TOSS INPUT LOW	TOSS LOW	PPL	TRANS PLUG F	
TRANS 1	B	7	DIGITAL SHIFT LEVER 1	RANGE SENSOR A	BLU/RED	5 WAY PLUG PIN A	TO SWITCH W BLU/PPL
TRANS 1	B	8	DIGITAL SHIFT LEVER 2	RANGE SENSOR B	BLU/BLK	5 WAY PLUG PIN B	TO SWITCH X BLU/BLK
TRANS 1	B	9	DIGITAL SHIFT LEVER 3	RANGE SENSOR C	BLU	5 WAY PLUG PIN C	TO SWITCH Y BLU/GRN
TRANS 1	B	10	DIGITAL SHIFT LEVER 4	RANGE SENSOR D	LIGHT BLU	5 WAY PLUG PIN E	TO SWITCH Z BLU/WHT

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
TRANS 1	B	11	DIGITAL SHIFT LEVER 5	NC			
TRANS 1	B	12	TRANSFER CASE 1	NC			

8.6.10.2 ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

8.6.10.3 OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	TURNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

8.6.11 Pinouts for Toyota AB60

8.6.11.1 Abbreviations

The following abbreviations are used in the charts below.

Abbreviation	Connector
MAIN	Main transmission connector

Abbreviation	Connector
AUX	Auxiliary transmission connector
TISS	Transmission input speed sensor
TOSS	Transmission output speed sensor
MLPS	Manual lever position switch (side of transmissino)
SL	Shift Lever body connector
SI	Shift lever Indicator (bezel)

8.6.11.2 TRANS 1 Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	TERMINATION	WIRE COLOR	FUNCTION	NOTES
TRANS 1	A	10	AUX-02	Yellow	Solenoid SL2	
TRANS 1	A	11	MAIN-08	White / Blue	Solenoid S1	
TRANS 1	A	12	MAIN-15	Brown / Yellow	Solenoid S2	
TRANS 1	A	4	MAIN-02	Brown	Temperature Sensor 1 Ground	
TRANS 1	A	5	TRANS TISS-1	Purple	Input Shaft Speed High	
TRANS 1	A	6	TRANS TOSS-1	Purple / Yellow	Output Shaft Speed High	
TRANS 1	A	7	MAIN-13	Green / Red	Solenoid SLT	
TRANS 1	A	8	MAIN-12	Green / White	Solenoid SLU	
TRANS 1	A	9	MAIN-11	Yellow / Blue	Solenoid SL1	

CONNECTOR	ROW	PIN	TERMINATION	WIRE COLOR	FUNCTION	NOTES
TRANS 1	B	1	MAIN-03	Black	Solenoid Ground for SL1	Or TRANS 2 B8
TRANS 1	B	1	MAIN-04	Black	Solenoid Ground for SLU	Or TRANS 2 B8
TRANS 1	B	1	AUX-04	Black	Solenoid Ground for SL2	Or TRANS 2 B8
TRANS 1	B	1	MAIN-05	Black	Solenoid Ground for SLT	Or TRANS 2 B8
TRANS 1	B	10	MLPS-7	Blue / Yellow	MLPS Drive	
TRANS 1	B	12	FLYING LEAD	Yellow/Blk	Transfer Case Calculation	
TRANS 1	B	2	MLPS-2	Black / White	Ground for MLPS	
TRANS 1	B	4	MAIN-10	Brown	Temperature Sensor 1	
TRANS 1	B	5	TRANS TISS-2	Purple	Input Shaft Speed Low	
TRANS 1	B	6	TRANS TOSS-2	Purple / Yellow	Output Shaft Speed Low	
TRANS 1	B	7	MLPS-6	Blue / Orange	MLPS Park	
TRANS 1	B	8	MLPS-1	Blue / Red	MLPS Reverse	
TRANS 1	B	9	MLPS-9	Blue / Black	MLPS Neutral	

Note that ground wires MAIN-03, MAIN-04, AUX-04, and MAIN-05 can be connected to TRANS 2 B8 instead of TRANS 1 B1, depending on wiring loom build variation.

8.6.11.3 TRANS 2 Connector

A	8	7	6	5	4	3	2	1
B	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	TERMINATION	WIRE COLOR	FUNCTION	NOTES
TRANS 2	A	3	FLYING LEAD	Yellow / Red	Engine Torque Modulation	
TRANS 2	A	4	MAIN-06	Blue / White	Solenoid SR	
TRANS 2	A	5	MAIN-14	Purple	Solenoid S4	
TRANS 2	A	6	MAIN-07	Light Blue	Solenoid S3	
TRANS 2	B	8	MAIN-03	Black	Solenoid Ground for SL1	or TRANS 1 B1
TRANS 2	B	8	MAIN-04	Black	Solenoid Ground for SLU	or TRANS 1 B1
TRANS 2	B	8	AUX-04	Black	Solenoid Ground for SL2	or TRANS 1 B1
TRANS 2	B	8	MAIN-05	Black	Solenoid Ground for SLT	or TRANS 1 B1

Note that ground wires MAIN-03, MAIN-04, AUX-04, and MAIN-05 can be connected to TRANS 1 B1 instead of TRANS 2 B8, depending on wiring loom build variation.

ENGINE Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	1	TACH SIG IN	INPUT RPM SIG	BRN	FLYING LEAD	
ENGINE	A	2					
ENGINE	A	3					

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	A	4	5V	TPS 5 VOLT SUPPLY	GRN/RED	TPS TERMINAL C	
ENGINE	A	5	TPS SIGNAL	TPS SIGNAL	GRN	TPS TERMINAL B	
ENGINE	A	6	TPS RETURN	TPS GND	GRN/WHT	TPS TERMINAL A	
ENGINE	A	7	5V				
ENGINE	A	8	MAP SIGNAL				
ENGINE	A	9	MAP RETURN				
ENGINE	A	10	ENGINE TEMP				
ENGINE	A	11	CAN1 +	CAN BUS HIGH SIGNAL	YEL		
ENGINE	A	12	12V		RED		
ENGINE	B	1	TOSS OUT REPRO	ADJUSTABLE SPEEDOMETER OUTPUT	PPL/WHT	FLYING LEAD	
ENGINE	B	2					
ENGINE	B	3	MODE	MODE A/B SWITCH	BLUE/OR	FLYING LEAD	
ENGINE	B	4	MODE SWITCH	SWITCH LED ON/OFF		FLYING LEAD	

CONNECTOR	ROW	PIN	PIN NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
ENGINE	B	5	OD ON/OFF LED	TO LED ON SWITCH	BLU/RED	FLYING LEAD	
ENGINE	B	6	OD CANCEL SWITCH	SWITCH INPUT TO ECM	BLU/YEL	FLYING LEAD	
ENGINE	B	7	SWITCH SHIFT UP	SHIFT UP	WHT/RED	FLYING LEAD	
ENGINE	B	8	SWITCH SHIFT COM	GND OR COMMON	WHT/RED	FLYING LEAD	
ENGINE	B	9	SWITCH DOWN	SHIFT DOWN	WHT/BLK	FLYING LEAD	
ENGINE	B	10	ENGINE TEMP RETURN				
ENGINE	B	11	CAN1 -	CAN BUS LOW SIGNAL			
ENGINE	B	12	GND				

In addition, the following other connections are assigned.

CONNECTOR	ROW	PIN	TERMINATION	WIRE COLOR	FUNCTION
ENGINE	B	5	SI-1	White / Blue	S Mode Indicator
ENGINE	B	6	SL-3	Brown / White	S Mode
ENGINE	B	7	SL-1	Brown / Yellow	Shift Up
ENGINE	B	8	SL-5	Black	Ground
ENGINE	B	8	SL-7	Black	Ground
ENGINE	B	9	SL-2	Brown / Red	Shift Down

OPTIONS Connector

A	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1
B	1 2	1 1	1 0	9	8	7	6	5	4	3	2	1

Note: This is the view into the receptacle on controller, not the plug.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	1	12 V	12 VOLT OUT			
OPTIONS	A	2	5 V	5 VOLT DISPLAY	YELLOW	DISPLAY PLUG	
OPTIONS	A	3	CAN2+	CAN BUS 2 HIGH SIGNAL			
OPTIONS	A	4	RS232 TX	DISPLAY	RED	DISPLAY PLUG	
OPTIONS	A	5	LIN DATA	COMMUNICATION			
OPTIONS	A	6	NO CONNECTION				
OPTIONS	A	7	NO CONNECTION				
OPTIONS	A	8	NO CONNECTION				
OPTIONS	A	9	SOLENOID 12	REVERSE LAMP RELAY			Must drive relay, not lamps directly.

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	A	10	SOLENOID 11	NEUTRAL START RELAY			Not available on GM 4L80E, GM 4L60E, GM 4L65E
OPTIONS	A	11	SOLENOID 10				
OPTIONS	A	12	SOLENOID 9				
OPTIONS	B	1	GND	GND			
OPTIONS	B	2	GND	GND DISPLAY	BLACK	DISPLAY PLUG	
OPTIONS	B	3	CAN2-	CAN BUS 2 LOW SIGNAL			
OPTIONS	B	4	RS232 RX	DISPLAY	GREEN	DISPLAY PLUG	
OPTIONS	B	5	CALIBRATION SELECT 1				
OPTIONS	B	6	CALIBRATION INDICATOR 1				
OPTIONS	B	7	CALIBRATION SELECT 2				
OPTIONS	B	8	CALIBRATION INDICATOR 2				
OPTIONS	B	9	TCC MANUAL ENGAGE	TURNS ON TCC	BLU/OR	TO SWITCH	SWITCH TO GND

CONNECTOR	ROW	PIN	NAME	FUNCTION	WIRE COLOR	TERMINATION	NOTES
OPTIONS	B	10	TCC LOCKUP INDICATOR	POWERS LED	BLU	TO LED	
OPTIONS	B	11	NO CONNECTION				
OPTIONS	B	12	NO CONNECTION				

In addition, the following other connections are assigned.

CONNECTOR	ROW	PIN	TERMINATION	WIRE COLOR	FUNCTION
OPTIONS	A	10	FLYING LEAD	White / Brown	Neutral relay
OPTIONS	A	9	FLYING LEAD	White / Orange	Reverse relay
OPTIONS	B	10	FLYING LEAD	Blue	TCC LED ON
OPTIONS	B	5	SI-5	White / Green	Park Indicator
OPTIONS	B	6	SI-4	White / Brown	Reverse Indicator
OPTIONS	B	7	SI-3	White / Orange	Neutral Indicator
OPTIONS	B	8	SI-2	White / Black	D Mode Indicator
OPTIONS	B	9	FLYING LEAD	Blue/Orange	TCC Manual Mode

8.7 Warranty

For a period of one (1) year after purchase, HGM Automotive Electronics will repair or replace, at our expense and option, any COMPUSHIFT II component that in normal use has proven to be defective in workmanship or material. The customer must return the component prepaid to HGM Automotive Electronics with proof of purchase to allow opportunity to verify the alleged defect by inspection.

HGM Automotive Electronics will not be responsible for any asserted defect that specifically resulted from normal wear, misuse, abuse, or repair or alteration made by anyone other than an authorized HGM Automotive Electronics representative or service facility. Under no circumstances will HGM Automotive Electronics be liable for incidental or consequential damages resulting from defective products, or improper installation, configuration, or use.

This warranty is the sole warranty and sets forth the customer's exclusive remedy. All other warranties, express or implied, including fitness for purpose, are expressly disclaimed by HGM Automotive Electronics.