MPFI (ACM) Wiring Hardware Reference Guide
MPFI Revision D2

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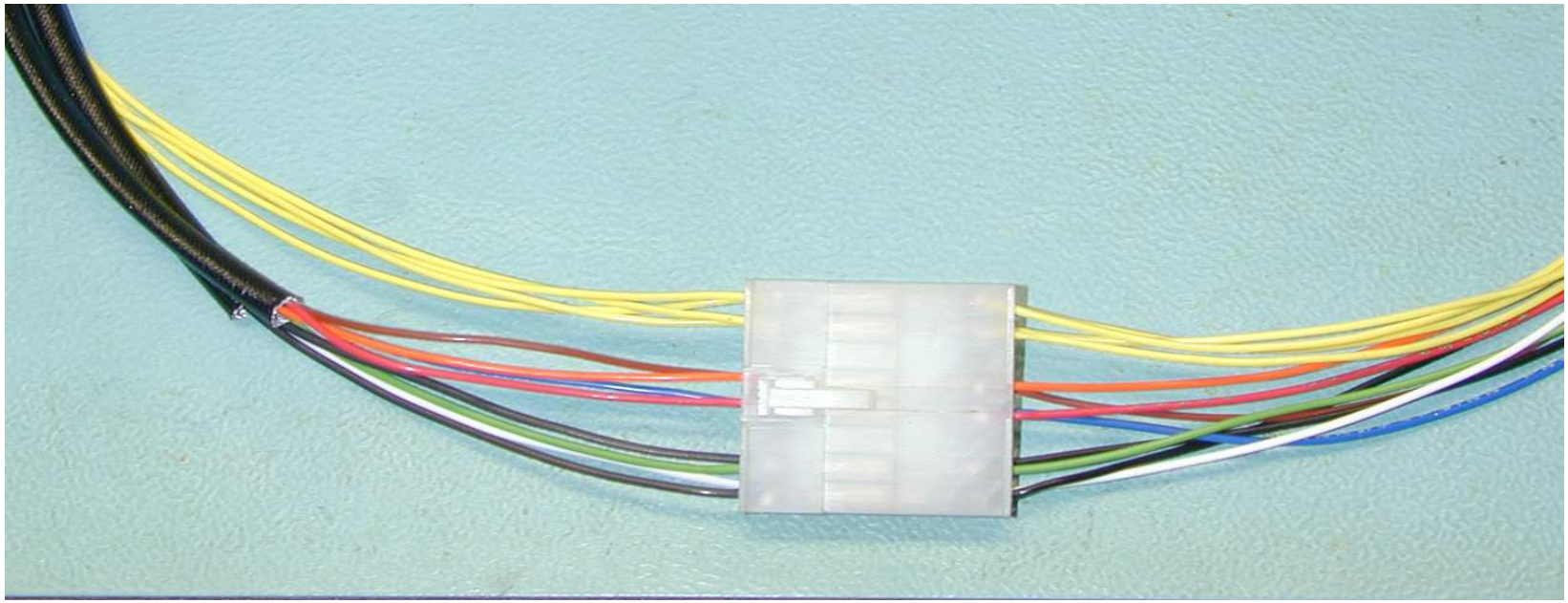
MPFI Connectors

The MPFI harness uses Molex Mini-Fit Jr. connectors

Host Vehicle: 20 pin white female housing P/N: 39-01-2201; male crimp brass with tin plating pin for 22-28 AWG wire P/N 39-00-0048

MPFI Unit: 20 pin white housing P/N: 39-01-2200; female crimp brass with tin plating pin for 22-28 AWG wire P/N: 39-00-0047

Figure 1: MPFI Connector mated pair (Picture For Example Purposes Only, ignore colors)



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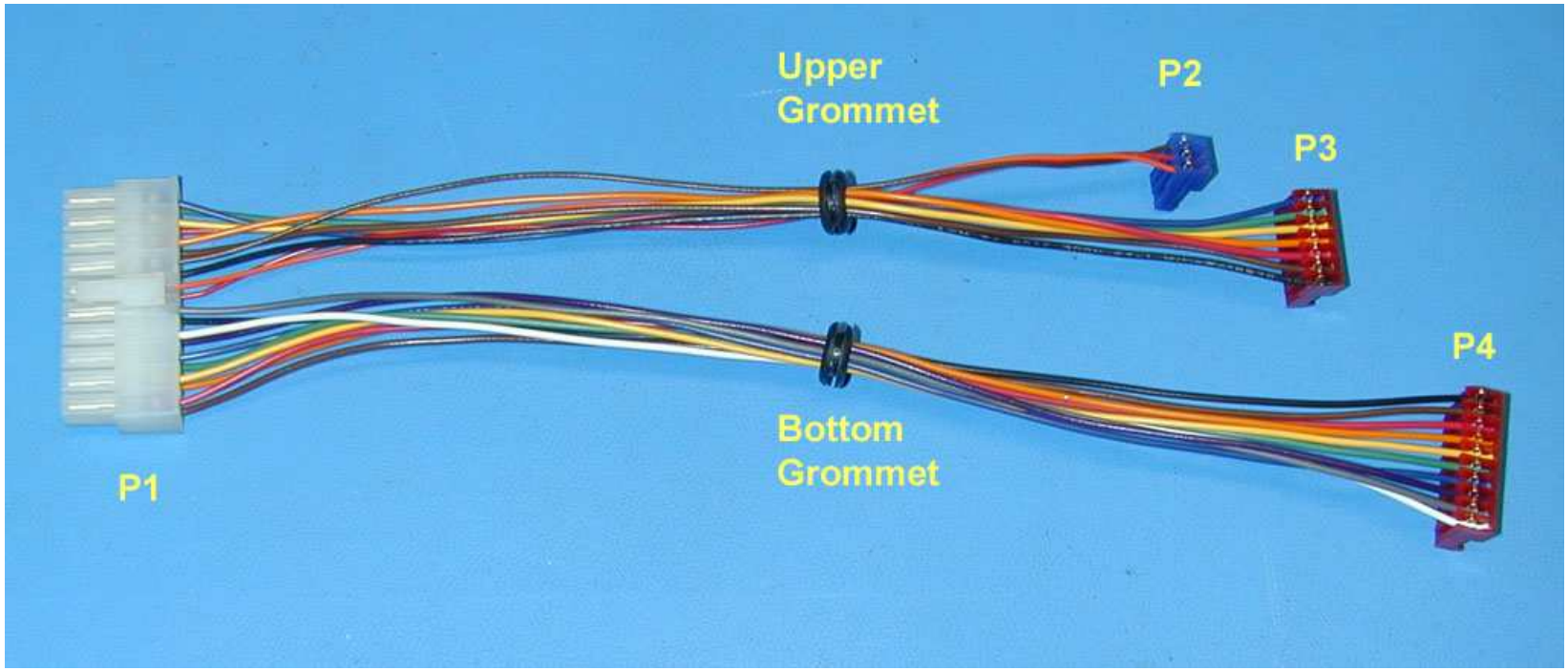
MPFI Connector Harness



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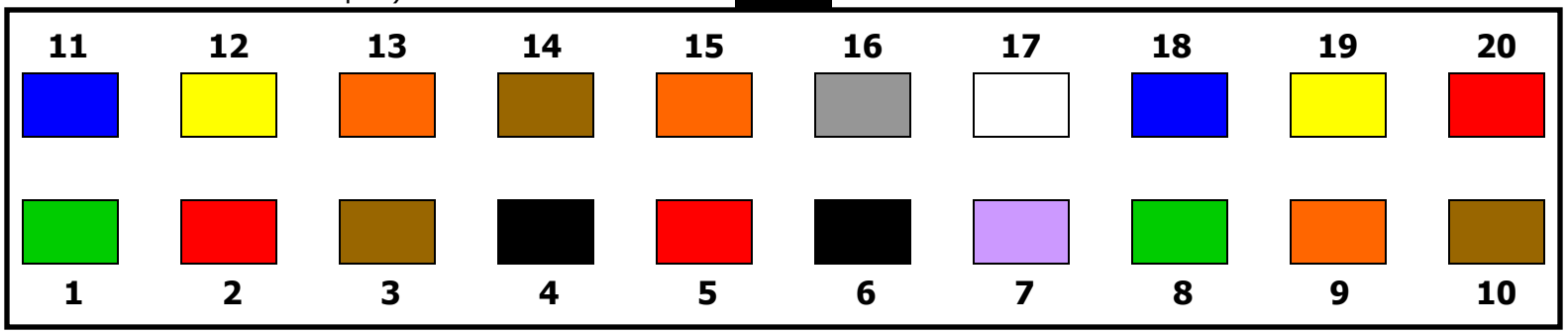
MPFI Pin-Out (6 Cyl.)

Figure 2: MPFI Connector Pin-out (Viewed from Mating Side of MPFI Connector)

Molex Mini-Fit Jr. (P/N: 39-01-2200 housing with 39-00-0047 pins)

Wire color is indicated by color in square



P1 Pin Number	Signal Name	P1 Pin Number	Signal Name
1	Engine Knock Sensor (KS_I)	11	ECU Knock Sensor (KS_O)
2	Engine MAP Sensor (MAP_I)	12	ECU MAP Sensor (MAP_O)
3	ECU VTS Signal (VTS_I)	13	Engine VTPS Signal (VTPS)
4	Logic Ground (LGND)	14	Programmer Vpp (PGV)
5	Programmer Data (PGD)	15	Programmer Clock (PGC)
6	Power Ground (PGND)	16	vTech Solenoid (VTS_O)
7	+13.8V (PWR)	17	Power Ground (PGND)
8	Injector #5 (INJ5)	18	Injector #6 (INJ6)
9	Injector #3 (INJ3)	19	Injector #4 (INJ4)
10	Injector #1 (INJ1)	20	Injector #2 (INJ2)

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MPFI Pin-Out (4/6 Cyl.) Cont.

Position	Color	Description	Notes
1	GRN	KS_I	Connect to Engine Side of host vehicle knock sensor
2	RED	MAP_I	Connect to Engine Side of host vehicle MAP Signal
3	BRN	VTS_I	Connect to ECU side of the host vehicle VTS signal
4	BLK	LGND	Connect to host vehicle logic ground (LGND)
5	RED	PGD	Do not connect
6	BLK	PGND	Connect to host vehicle Power Ground (PGND)
7	VIO	PWR	Connect to host vehicle switched +13.8V
8	GRN	INJ5	Connect to host vehicle Injector 5 Signal (6 Cyl. Only)
9	ORN	INJ3	Connect to host vehicle Injector 3 Signal
10	BRN	INJ1	Connect to host vehicle Injector 1 Signal
11	BLU	KS_O	Connect to ECU Side of host vehicle knock sensor
12	YEL	MAP_O	Connect to ECU Side of host Vehicle MAP Signal
13	ORN	VTPS	Connect to host vehicle VTEC Pressure Switch
14	BRN	PGV	Do not connect
15	ORN	PGC	Do not connect
16	GRY	VTS_O	Connect to engine side of the host vehicle VTS signal
17	WHT	PGND	Connect to host vehicle Power Ground (PGND)
18	BLU	INJ6	Connect to host vehicle Injector 6 Signal (6 Cyl. Only)
19	YEL	INJ4	Connect to host vehicle Injector 4 Signal
20	RED	INJ2	Connect to host vehicle Injector 2 Signal

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MPFI Wiring Guide
Acura RSX 2002-2005

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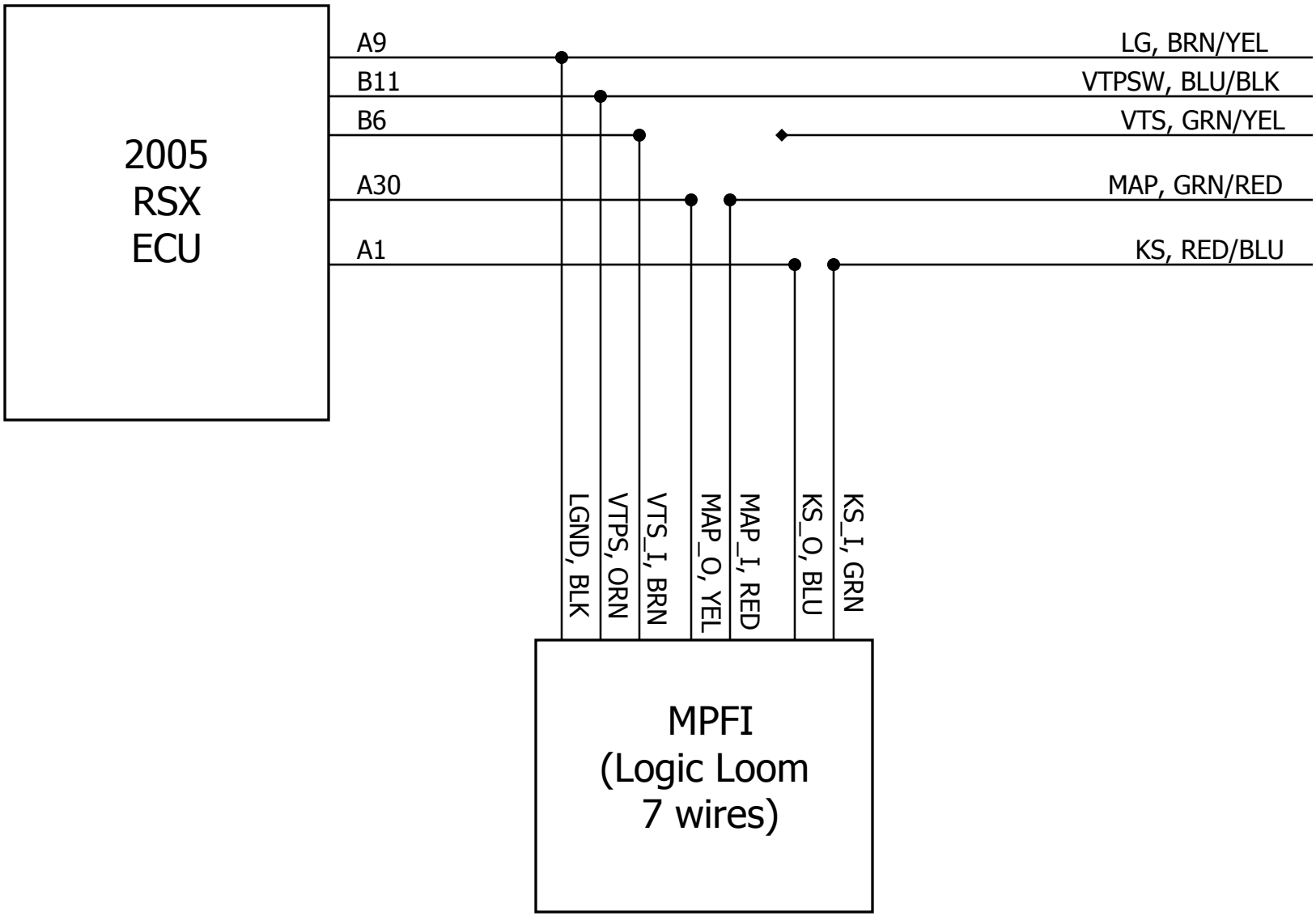
MPFI 2005 RSX Wiring



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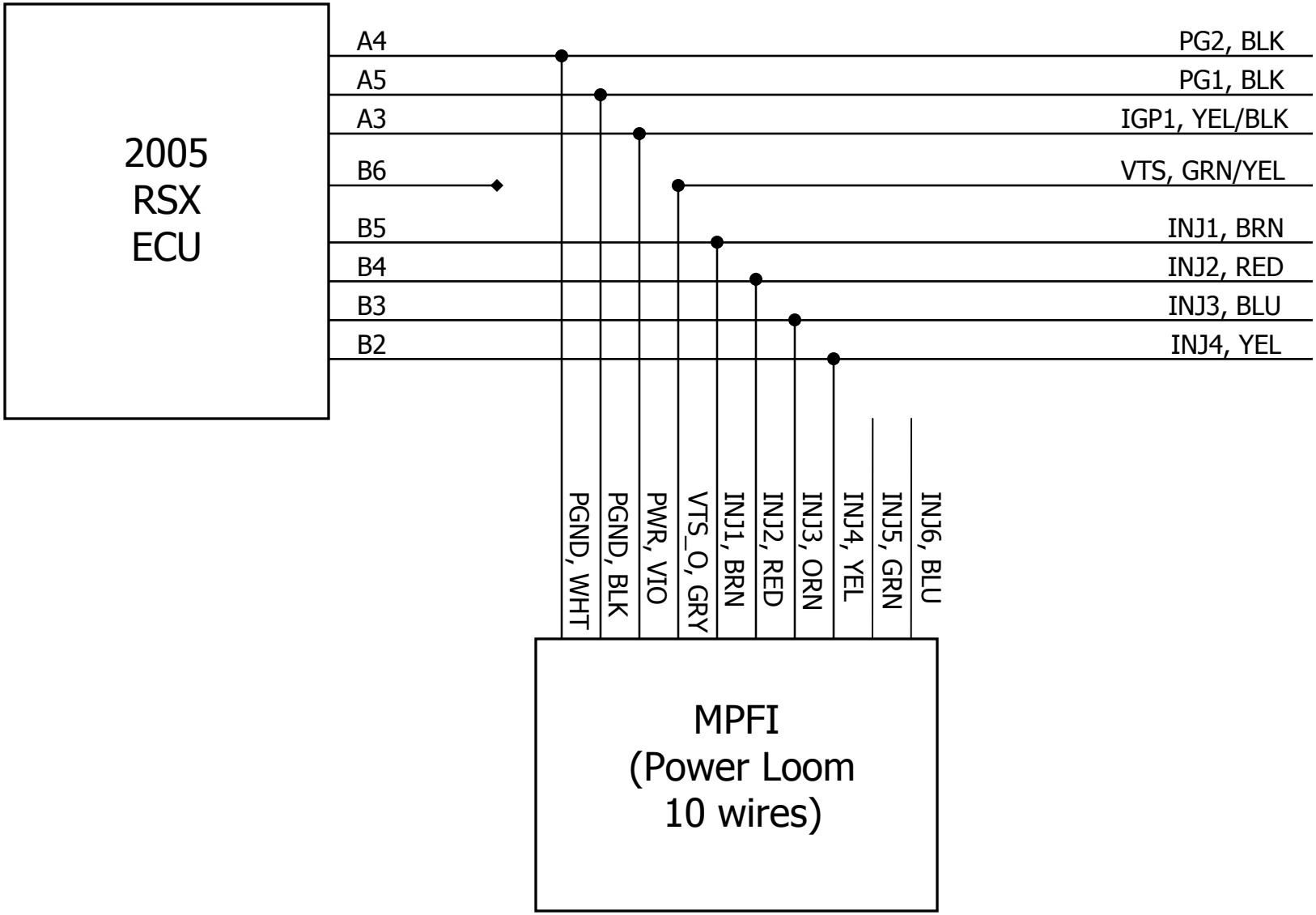
MPFI 2005 RSX Wiring (Cont.)



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MPFI Wiring Guide
Acura NSX
1991-1994

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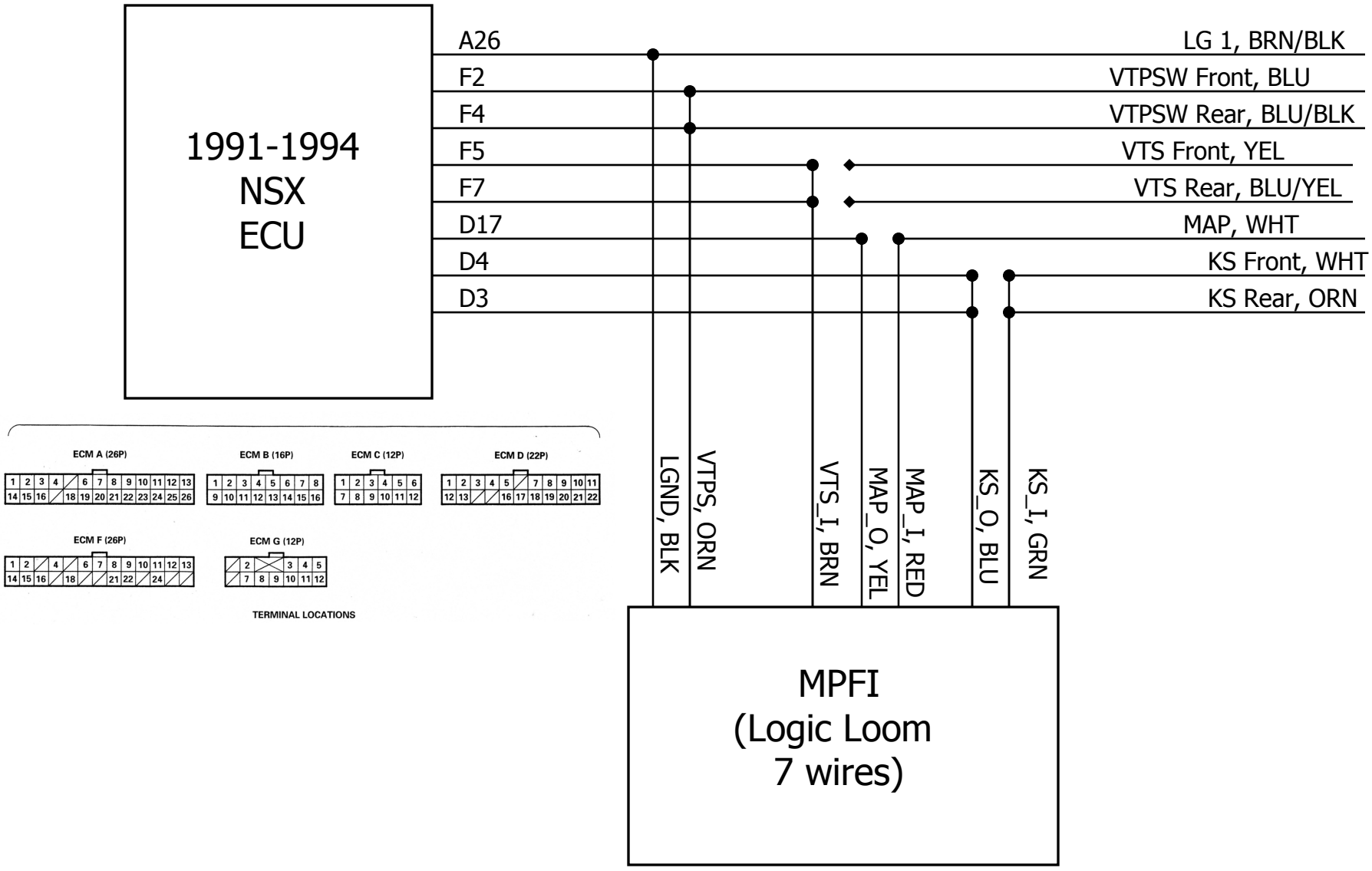
MPFI 1991-94 NSX Wiring



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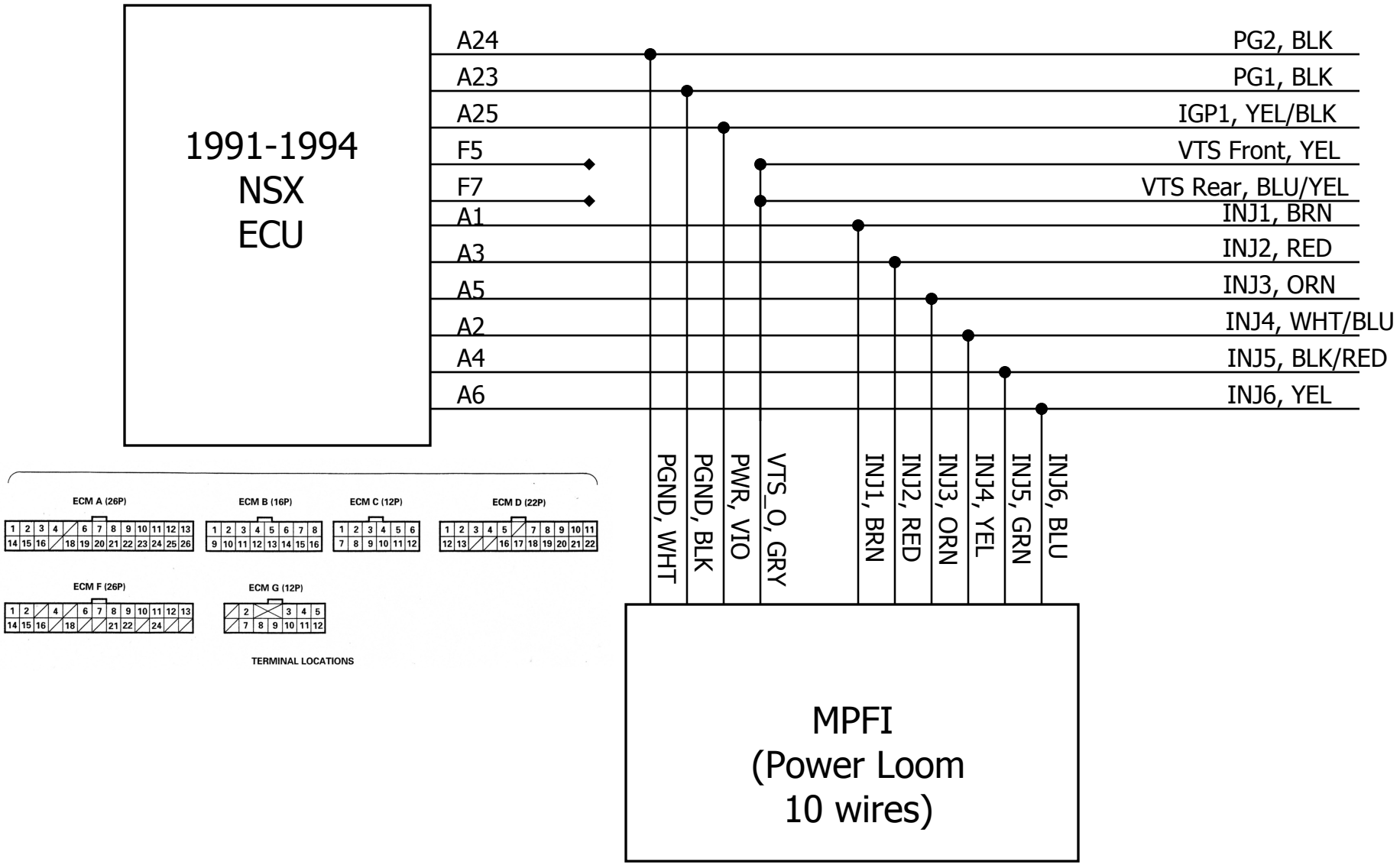

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MPFI Wiring Guide
Acura NSX
1995-2005

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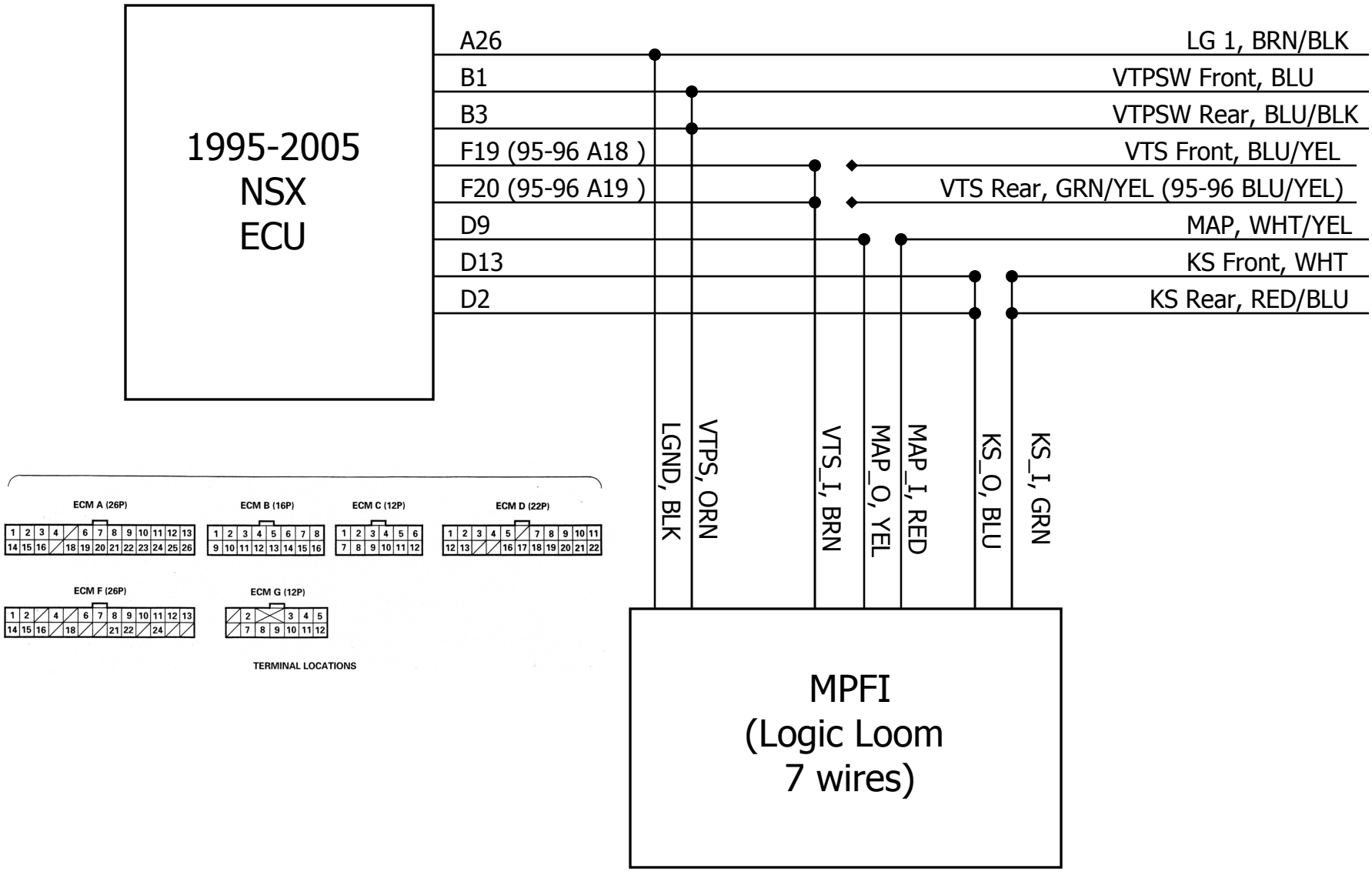
MPFI 1995-2005 NSX Wiring



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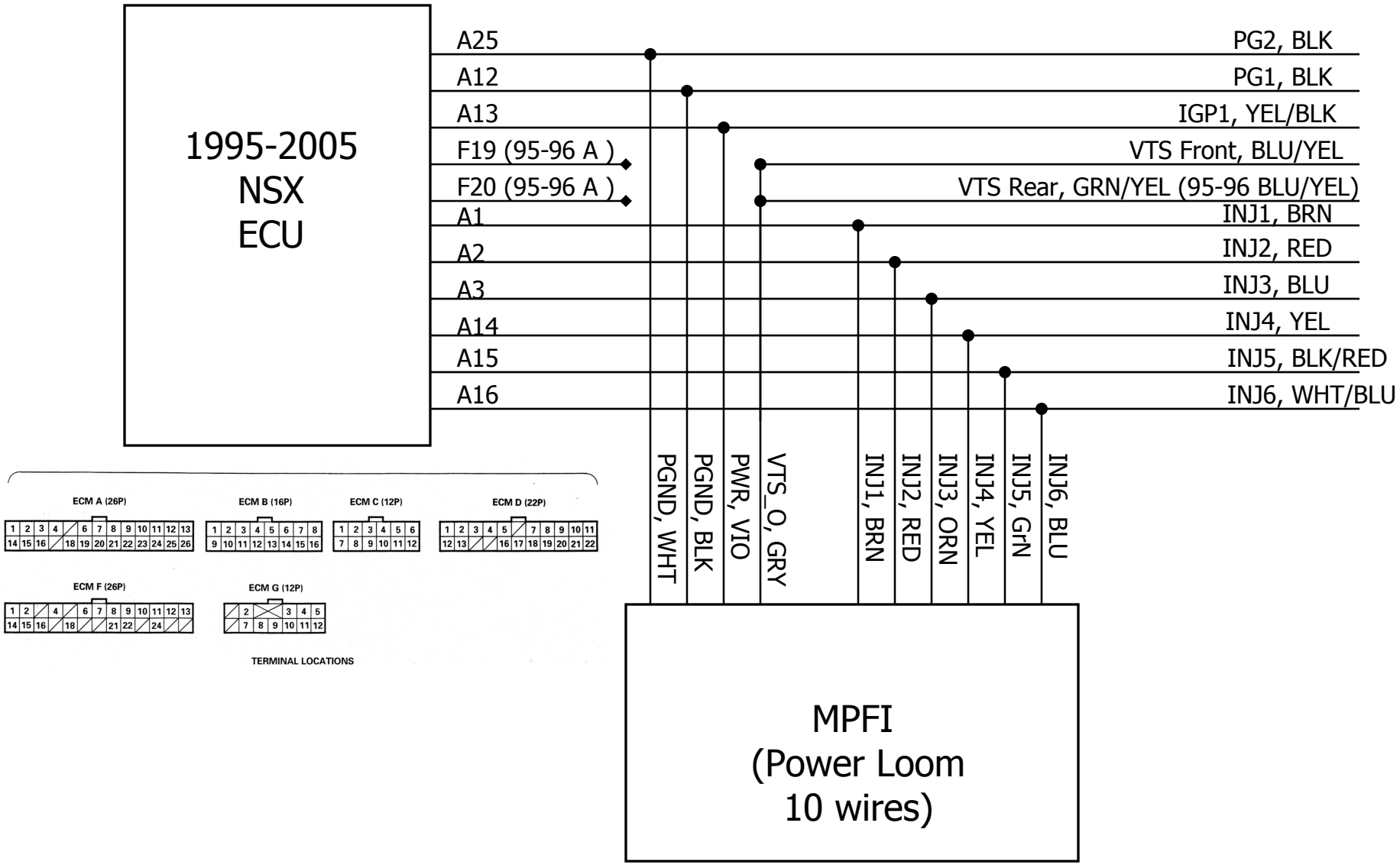
MPFI 1995-2005 NSX Wiring (Cont.)



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MPFI Wiring Guide
Acura TL 2004-2005

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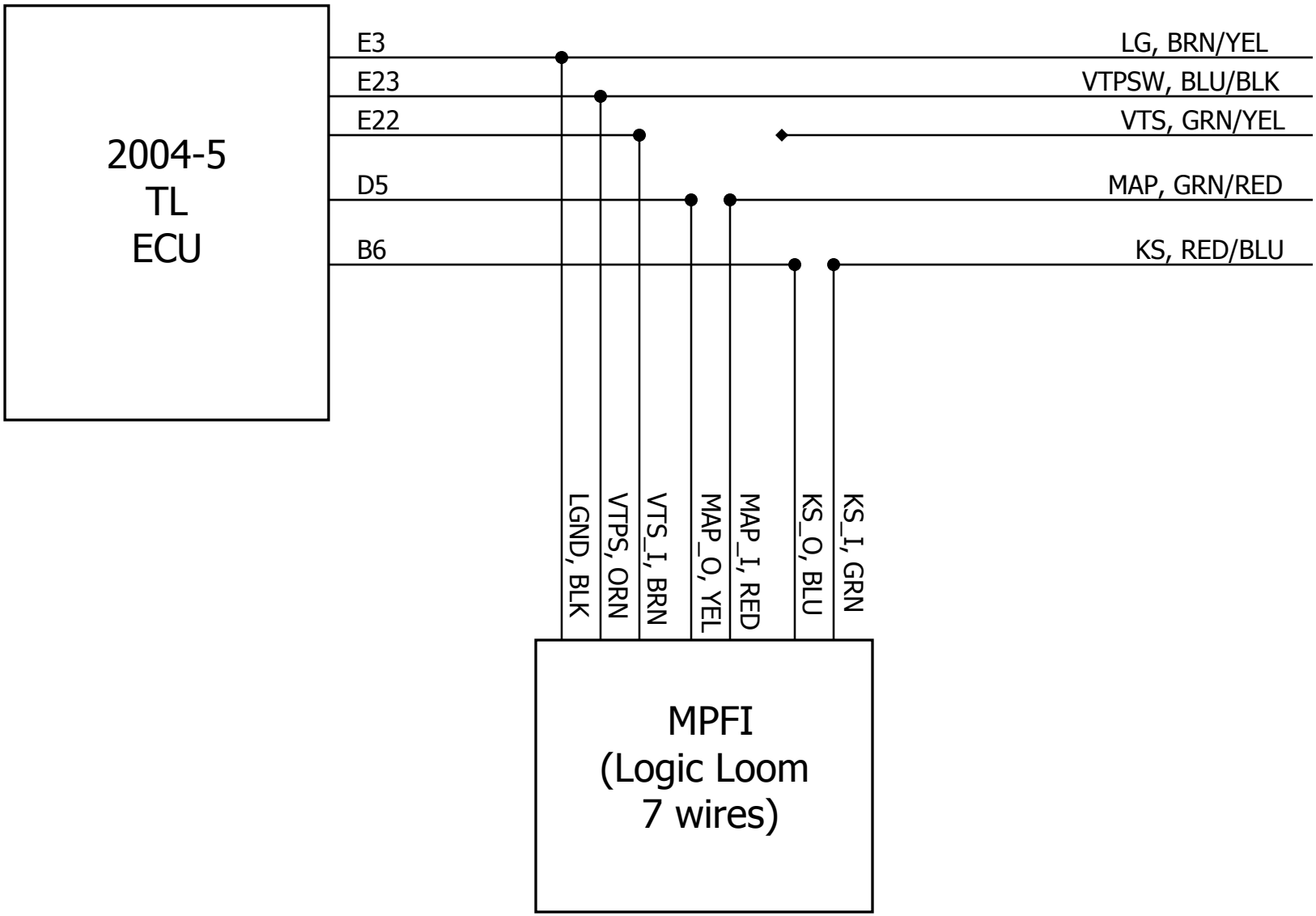
MPFI 2004-2005 TL Wiring



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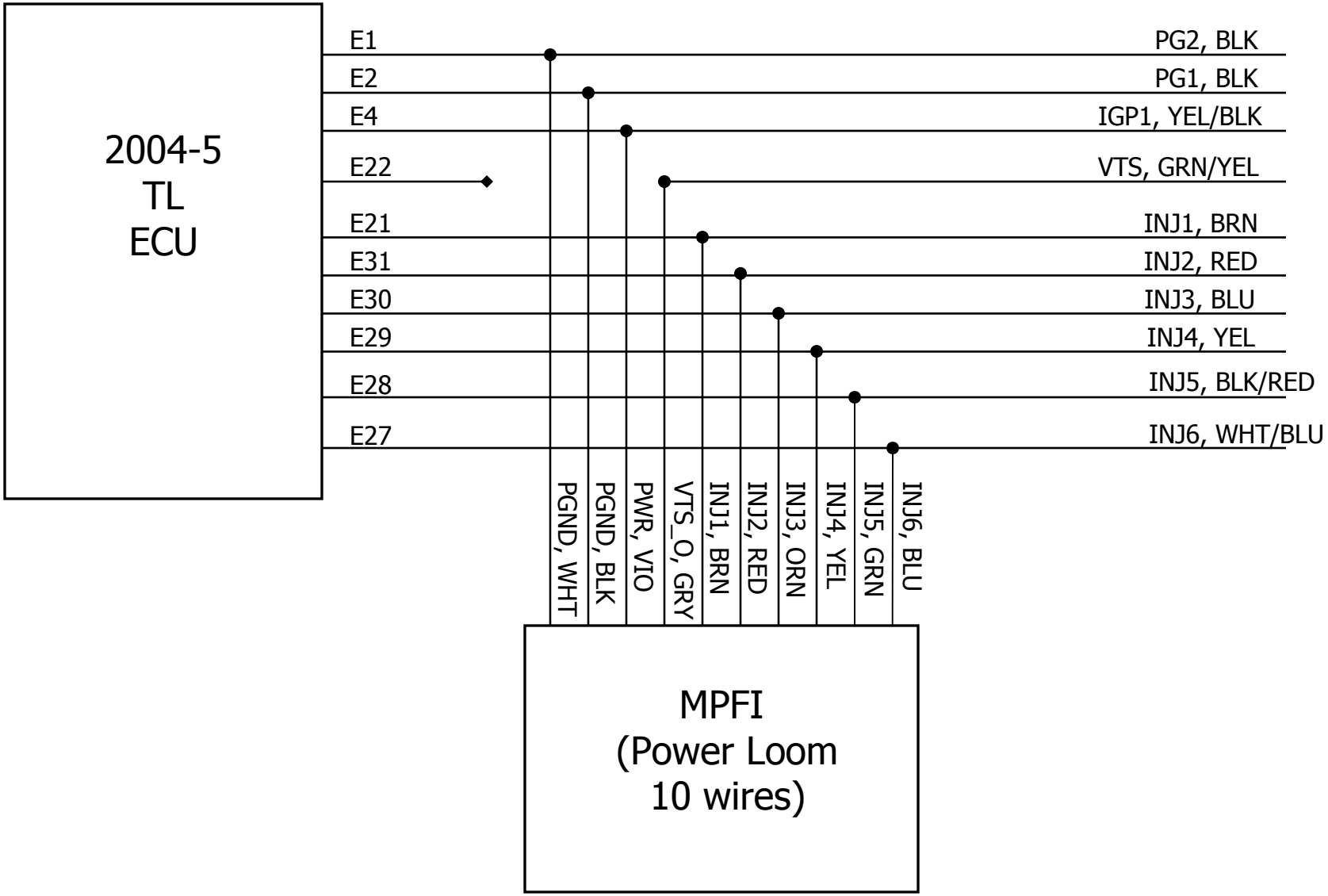
MPFI 2004-2005 TL Wiring (Cont.)



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Glossary of Terms

- **ECU** = Engine Control Unit, the original equipment manufacturer's (OEM) control computer that came installed in the host vehicle by either Honda or Acura.
- **CEL** = Check Engine Light, the diagnostic indicator from the vehicle ECU denoting that an abnormal condition was detected in engine operation.
- **AK** = Anti-Knock, the microphone signal from the engine block that detects engine pre-ignition.
- **MAP** = Manifold Absolute Pressure, the barometric pressure measured at the intake air manifold of the engine.
- **MPFI** = Multi Purpose Fuel Injector Unit, the White Oak Audio Design (or private label OEM customer of White Oak) piggyback control computer that is the topic of this Hardware Reference Guide. The MPFI may also be referred to as the ACM unit.

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Signal Descriptions

- **Engine Knock Sensor** – (Signal input to MPFI) This signal is from a high impedance, piezo-electric microphone that is attached to the engine block which detects the occurrence of engine pre-ignition and is responsible for retarding the spark timing if the ECU detects pre-ignition. This is an analog signal that is produced. This MPFI pin attaches to the Anti-Knock Sensor that is mounted on the vehicle engine block. This is an input to the MPFI. The MPFI modifies it, if required, and passes it on to the ECU via the ECU Knock Sensor output signal pin from the MPFI. The MPFI either passes this signal, unaltered, through to the vehicle ECU or attenuates it by approximately 20% depending on the table entry selected by the engine tuner using the MPFI Programming Utility application software in order to prevent the CEL from illuminating. The Engine Knock Sensor wire must be cut to install the MPFI, the output from the MPFI is fed to the ECU allowing the MPFI to modify the nature of the signal received by the ECU from the engine sensor.
- **Engine MAP Sensor** – (Signal input to MPFI) This pin attaches the Manifold Absolute Pressure Sensor that is mounted on the intake air manifold. This sensor measures the barometric pressure of the air in the intake manifold and converts it into an electrical signal that is fed to the ECU. This is an analog signal that is produced. This pressure signal allows the ECU to trim the fuel level for proper engine operation and emissions control. The normal signal level from this Honda/Acura sensor is 2.84 volts maximum when the sensor detects normal atmospheric pressure. When a vacuum is drawn on the manifold by the engine operation, the signal output from the MAP sensor decreases towards zero volts. Without a supercharger installed, the voltage range for this sensor is between zero and 2.84V. When a supercharger is added to the engine, it is quite possible that the manifold pressure will be above normal atmospheric pressure resulting in a signal greater than 2.84 volts. When this signal is in excess of 2.84V, a CEL condition may be detected by the ECU because the ECU considers this an abnormal condition and considers it to be a sensor failure. The MPFI clamps the MAP signal to 2.840V (or other value depending on what voltage value is chosen by the engine tuner using the MPFI Programming Utility application software). The MAP sensor wire in the vehicle must be cut and fed into the input of the MPFI. In turn, the MPFI either passes the signal through or modifies it depending on the value received from the MAP sensor.

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Signal Descriptions

- **ECU VTS Signal** – (Signal input to MPFI) This is the signal from the ECU that normally directly drives the vTech solenoid which, in turn, advances the camshaft to provide additional performance. This signal becomes an input to the MPFI. When the vehicle ECU calls for the vTech solenoid to be actuated, the MPFI will echo that command and actuate the vTech solenoid and advance the camshaft. The engine tuner can also override the vehicle and actuate the vTech solenoid even when the vehicle ECU is not calling for it. With the current software, the MPFI CANNOT override the vehicle ECU and defeat the vTech solenoid if the ECU is calling for it.
- **Logic Ground** – (Power Input to MPFI) This pin attaches the MPFI to the logic ground (low noise ground) in the host vehicle harness. This connection is spliced into (T connection) the logic ground without cutting the original logic ground wire to the ECU.
- **Programmer – Data** (do not connect) – This pin should not be connected. It is one of the 3 signals used by the White Oak MPFI programmer to program the MPFI onboard microcontroller to the specifications determined by the engine tuner using the MPFI Programming Utility application software.
- **Power Ground** (2 pins) – (Power input to MPFI) These pins attach the MPFI to the power ground in the host vehicle harness. These grounds return the high currents associated with driving the injectors and vTech solenoid to the battery ground of the vehicle. These should not be tied to the logic ground of the vehicle as the high ground currents from the injectors will cause unnecessary noise injection into the vehicle ECU.
- **+13.8V** – (Power input to MPFI) The vehicle switched battery potential that powers the vehicle, the vehicle ECU and the MPFI.

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Signal Descriptions

- **Injector #1- 6** – (Signal output from MPFI) These 6 signal are the low side drive for the respective injector number. The MPFI employs 6 open drain, high power MOSFET drivers which works in parallel with the drivers in the ECU. Each of these signals is connected (spliced into) to the original, respective wires that run from the ECU to the injector low side without cutting this connection. These six outputs are intended to drive saturated style injectors only and are not meant to drive peak hold style injectors. The stored energy in each injector during the on-cycle must not exceed 1.6 mJoules or damage may result to the MOSFET drivers in the MPFI. The MPFI was designed to drive stock saturated injectors supplied as standard equipment in Honda and Acura vehicles which meet these repetitive energy limit requirements. White Oak has an Excel spreadsheet for determining the energy stored in the injectors for non-Honda/Acura applications.BL
- **ECU Knock Sensor** - (Signal output from MPFI) This signal is from a piezo-electric microphone attached to the engine block that detects the occurrence of engine pre-ignition and is responsible for retarding the spark timing if the ECU detects pre-ignition. This MPFI pin attaches to the Anti-Knock Sensor that is mounted on the vehicle engine block. This is an input to the MPFI. The MPFI modifies it and passes it on to the ECU via the ECU Knock Sensor output signal pin from the MPFI. The MPFI either passes this signal through to the vehicle ECU or attenuates it by approximately 20% depending on the table entry selected by the engine tuner using the MPFI Programming Utility application software in order to prevent the CEL from illuminating. The Engine Knock Sensor wire is cut to install the MPFI, the output from the MPFI is fed to the ECU allowing the MPFI to modify the nature of the signal received by the ECU from the engine sensor.

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Signal Descriptions

- **ECU MAP Sensor** - (Signal output from MPFI) This pin is the MAP sensor output that the ECU sees. If the MAP sensor output is below the clamp value set by the engine tuner using the MPFI Programming Utility application software then the MPFI will pass the MAP sensor signal to the ECU unaltered. If the MAP sensor signal exceeds the clamp value, the MPFI will pass the clamp value to the ECU. The MPFI attaches the Manifold Absolute Pressure Sensor that is mounted on the intake air manifold. This sensor measures the barometric pressure of the air in the intake manifold and converts it into an electrical signal that is fed to the ECU. This pressure signal allows the ECU to trim the fuel level for proper engine operation and emissions control. The normal signal level from this Honda/Acura sensor is 2.84 volts maximum when the sensor detects normal air pressure. When a vacuum is drawn on the manifold by the engine operation, the signal output from the MAP sensor decreases towards zero volts. When a supercharger is added to the engine, it is quite possible that the manifold pressure will be above normal atmospheric pressure resulting in a signal greater than 2.84 volts. When this signal is in excess of 2.84V, a CEL condition may be detected by the ECU. The MPFI clamps the MAP signal to 2.840V (or other value depending on what is chosen by the engine tuner using the MPFI Programming Utility application software). The MAP sensor wire in the vehicle must be cut and fed into the input of the MPFI. In turn, the MPFI either passes the signal through or modifies it depending on the value received from the MAP sensor.
- **Engine VTPS Signal** - (Signal input/output to/from MPFI)

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Signal Descriptions

- **Programmer – Vpp** (do not connect) - This pin should not be connected. It is one of the 3 signals used by the White Oak MPFI programmer to program the MPFI onboard microcontroller to the specifications determined by the engine tuner using the MPFI Programming Utility application software.
- **Programmer – Clock** (do not connect) - This pin should not be connected. It is one of the 3 signals used by the White Oak MPFI programmer to program the MPFI onboard microcontroller to the specifications determined by the engine tuner using the MPFI Programming Utility application software.
- **vTech Solenoid** - (Signal output from MPFI) This pin actuates the vTech solenoid which changes the valve timing to increase engine performance. When the vehicle ECU calls for the vTech solenoid to be actuated, the MPFI will echo that command and actuate the vTech solenoid and advance the camshaft. The engine tuner can also override the vehicle and actuate the vTech solenoid even when the vehicle ECU is not calling for it. With the current software, the MPFI CANNOT override the vehicle ECU and defeat the vTech solenoid if the ECU is calling for it.

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