

TURBO TIMER type 1

INSTRUCTION MANUAL



Pursuing the Ultimate in Engine Performance and Efficiency.
HKS Company Limited

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1. NOTICE

This manual assumes that you have and know how to use the tools and equipment necessary to safely perform service operations on your vehicle. This manual assumes that you are familiar with typical automotive systems and basic service and repair procedures. Do not attempt to carry out the operations shown in this manual unless these assumptions are correct. Always have access to a factory repair manual. To avoid injury, follow the safety precautions contained in the factory repair manual.

- This manual indicates items that require careful attention in order to install this product safely, and lists precautions to avoid any possible damage and/or accidents.
- This product was designed for and tested on a factory-spec vehicle or a vehicle equipped with other HKS products. Performance and/or safety cannot be guaranteed if this product is installed onto other inapplicable vehicles.
- For any lost, defective and/or damaged parts, contact your retailer/dealer to order.
- HKS will not be held responsible for any damage caused by incorrect installation, mishandling, and/or misuse, nor for damages caused by modifications to or dismantling of this product.
- This product will only operate on a vehicle with DC12V negative ground.
- The specifications of this product are subject to change without notice.
- This manual is subject to be revised without notice.

PRODUCT	TURBO TIMER type-1
USE	Keeps the vehicle idling for a preset period of time after ignition has been turned off.
APPLICATION	DC12V Negative Ground Vehicles.
PART No.	41001-AK010
REMARKS	Some vehicles may require a Key Lock Release Adapter.

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3. SAFETY INSTRUCTIONS

Warning

- Make sure to work on the vehicle in a well-ventilated area to prevent possible explosion or fires.
- To avoid possible accidents, do not mount the unit in areas where the driver may become distracted during driving.
- Make sure to secure wires routed inside the vehicle to avoid possible accidents where the driver's feet may become caught or tangled in wiring.
- Do not install this product on a 24V vehicle. It may cause a fire.
- Make sure to disconnect the cable from the negative terminal of the battery to avoid possible damage to other electronics parts and/or a fire caused by a short circuit.
- For Nissan automatic transmissions equipped with the shift lock function, do not disengage the shift lock function; removing the key out of the ignition with the vehicle in gear/neutral may lead to serious accidents.
- Properly disconnect all connectors/harnesses by holding the connectors and not the wires. Failure to do so may damage the wires and/or connectors and can lead to shorts.

Warning

- Do not operate the Turbo Timer while driving. Always operate the Turbo Timer while the vehicle is parked in a safe location.
- When the Turbo Timer is operational (timer countdown idle with the ignition off), do not leave the vehicle until after the Engine has completely shut off.
- Make sure the parking brake is applied, and the gear selector is in neutral (for MT) or in the Park (P) position (for AT), prior to starting the Turbo Timer to prevent serious accidents.
- Do not operate the Turbo Timer indoors or in poorly-ventilated areas to prevent carbon monoxide poisoning from exhaust gases.
- If any unusual noises, scents, and/or vibrations are noticed while driving, stop using this product and consult your HKS Authorized Dealer immediately.
- If for any reason the Engine does not shut off after the timer countdown, turn off the Turbo Timer immediately, or disconnect the harness to prevent possible fires.
- Use this product with a relay capacity of 25A or less. Otherwise, if other electrical equipment (such as power windows) is used while this product is operational, it may cause fire and/or damage to the electrical equipment.

Caution

- Do not install this product by yourself unless you have and know how to use the tools and equipment necessary to safely perform service operations on your vehicle.
- Do not modify, disassemble, and/or repair the product and supplied parts to avoid any damage to the vehicle.
- Handle the parts with extra care at all times.
- Avoid allowing oil and/or water to enter the unit to prevent malfunctions that may cause damage to the Engine.
- To avoid possible malfunction and damage to the Engine, install the unit away from areas of excessive heat or water/moisture.
- Make sure all connections and wiring are correct to prevent electric shocks, shorts, or damage to the vehicle.
- Do not strip the covers off of wires when using splice connectors.
- Connect the ground wire to the screw that is used for the vehicle's chassis ground.
- For vehicles equipped with an automatic headlight system, make sure it is disabled. The Turbo Timer may conflict with the automatic headlight system if enabled, where the headlights may remain on even after the timer countdown sequence is complete and the Engine shuts off.
- If the product or the vehicle with the product does not operate properly, consult your retailer/dealer immediately.

- Daily maintenance of the vehicle is the responsibility of the owner/user.
- For vehicles equipped with a wireless door lock or a power telescopic steering column function, these functions may not be usable with this product.
- Engine RPM Display/Warning Function, Auto Timer Function, Speed / Speed Peak Hold Display with Warning Function, and Quarter Mile Timer / Acceleration interval calculation Function are not be usable on diesel vehicles.
- Engine RPM Display/Warning Function and Auto Timer functions are not be usable on some petroleum vehicles where a digital RPM signal is not available. Also, Speed / Speed Peak Hold Display with Warning Function, and Quarter Mile Timer / Acceleration interval calculation Function are not be usable on some petroleum vehicles where a digital speed signal is not available.

4. PREFACE

The number one cause of turbo failure is oil "coking". Oil "coking" occurs when a turbocharger is not properly cooled down and the oil that normally lubricates the center cartridge heats up and forms solidified oil deposits. A turbo timer allows an Engine to idle for a preset time after the ignition key has been turned to the off position and removed. By allowing a turbocharged Engine to idle, oil continues to pass through the turbo until it has cooled down to the point where oil "coking" will not occur, thereby prolonging the life of the turbocharger. The HKS Turbo Timer type-1 is a turbo timer that features a full measurement function.

- Turbo Timer function
 - Manual Mode: can be set in increments of 10 seconds from 0 - 10 min.
 - 2 Selectable Timer Countdown Settings: [Manual 1] & [Manual 2]
 - Auto Mode: Will determine the Engine's condition from the RPM and automatically set a time between 0 - 5 min.
- Speed / Speed Peak Hold display function
 - Will display the current speed (0 - 248 [mph]). It also can display the speed peak hold.

- Speed Warning function
 - Will set the warning speed (10 - 240 [mph]).
- Engine RPM / RPM Peak Hold display function
 - Will display the current RPM (0 - 9990 [r/min]). It also can display the RPM peak hold.
- Engine RPM Warning (shift up indicator, red zone indicator) function
 - Will set the warning RPM (1000 - 9900 [r/min]).
- Quarter Mile Time (Section time)
 - Auto start or manual start can determine the section times shown below. 0-60[foot], 0-1/8[mile], 0-1/4[mile], 0-60[mph]
- Stopwatch / Lap Time function
 - Interval measurement and lap time can be measured.
- Battery Voltage display / Voltage Peak Hold display function
 - Will display the current battery voltage (10 - 16V) and peak hold warning value.
- Battery Voltage Warning function
 - Will set the warning voltage (10 - 16V).
- Large LCD screen panel display
 - White LED-backlit LCD, which blinks when the timer countdown or warning function is activated.
- Safety Circuit function
 - This function prevents the vehicle to be driven after the Turbo Timer countdown has started.

Warning

- If the vehicle is driven after the Turbo Timer countdown has started, the Turbo Timer and Engine will automatically shut off. Do not attempt to drive the vehicle in this state.
- DC12V
 - This product operates only on DC12V negative ground vehicles. Do not install on 24V vehicles.

5. PARTS LIST

No.	Description	Qt	Remarks
1	Display Unit	1	
2	Control Unit	1	
3	Parking Brake Wire	1	Gray
4	RPM Signal Lead Wire	1	Brown
5	Speed Signal Lead Wire	1	Blue
6	Double-sided Tape	2	
7	Splice Connector	3	Red
8	Tie Wrap	3	100mm
9	Caution Sheet	1	
10	Instruction Manual	1	
11	Universal Application Harness Manual	1	
12	Vehicle Specific Wiring Diagram	1	

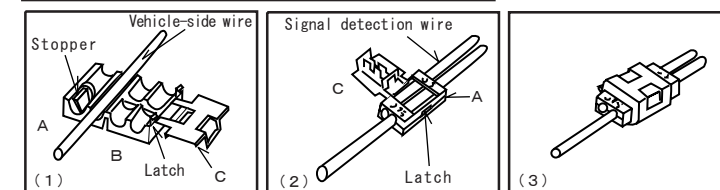
6. INSTALLATION

To install this product, pliers and a screwdriver are required.

Caution

- The safety circuit wiring must be performed, as the Turbo Timer will not operate without it.
- After completing the installation, confirm the safety circuit functions properly.
- Do not connect the black ground wire to the power supply wires (such as IG, +B, and/or ACC). It may cause damage to the Turbo Timer.

6-1. How to use the splice connector

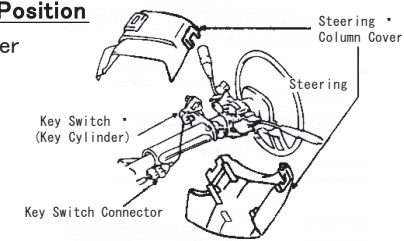


- (1) Place the vehicle-side wire onto side A (without stopper). Fold side B onto side A using pliers to ensure the snap is securely fastened.
- (2) Insert the signal detection wire until it reaches the stopper.
- (3) Fold side C to side A using pliers to ensure the snap is securely fastened.
- (4) Gently pull on the wire to verify the splice connector is completely tight.

6-2. Key Switch Connector Position

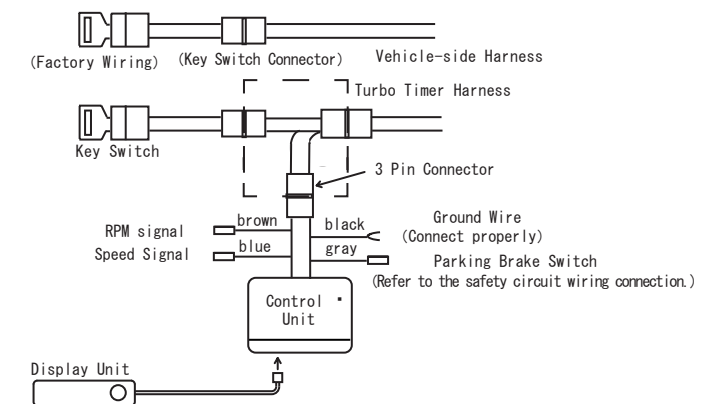
Remove the steering column cover depicted in the illustration.

- Keep the removed screws for reuse.
- Depending on the vehicle, the key switch connector may be directly connected to the key switch.



6-3. Wiring

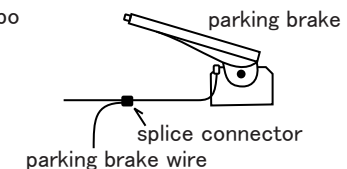
- For proper wiring, use the vehicle specific harness (available separately).
 - To verify the application, contact your HKS Authorized Dealer.
 - If the vehicle specific harness is not available for your vehicle, use the universal application harness available separately.
- (1) Remove the cable from the negative terminal of the battery.
 - (2) Reference the below diagram: Remove the key switch connector as shown in the illustration below; connect the Turbo Timer harness in between the key switch connector.
 - Note: If no Turbo Timer harness is available, connect the following behind the main ignition switch:
 - Red - 12V constant
 - Green - 12V ignition
 - Blue - 12V accessory
 - (3) Connect the 3 pin connector to the Turbo Timer.
 - (4) Connect the black ground wire onto a good chassis ground. To ensure a good ground, make sure there is no paint below the mounting surface (sand if necessary).
 - (5) Connect the display unit connector to the control unit.



6-4. Safety Circuit Wiring Connection

If there is one Parking Brake Wire

- (1) Connect the gray wire from the Turbo Timer to the supplied gray parking brake wire.
- (2) Using the supplied splice connector, connect the supplied gray parking brake wire to the vehicle's parking brake wire.



If there are two Parking Brake Wires

- (1) Connect the gray wire from the Turbo Timer to the supplied gray parking brake wire.
- (2) Turn the key switch on. (Do not start the Engine.)
- (3) Using a multi-meter, find the wire that reads 0V when the parking brake is engaged, and 12V when the parking brake is disengaged.
- (4) Using the supplied splice connector, connect the gray parking brake wire to the vehicle's parking brake wire found in (3)

6-5. RPM Signal Lead Wire Connection

- (1) Connect the brown wire from the Turbo Timer to the supplied brown RPM signal lead wire.
- (2) Refer to the corresponding vehicle list to find the correct ECU diagram.
- (3) Using the supplied splice connector, connect the brown RPM signal wire to the corresponding "I" in the ECU signal diagram.

6-6. Speed Sensor Lead Wire Connection

- (1) Connect the blue wire from the Turbo Timer to the supplied blue speed sensor wire.
- (2) Refer to the corresponding vehicle list to find the correct ECU diagram.
- (3) Using the supplied splice connector, connect the blue speed sensor wire to the corresponding "S" in the ECU signal diagram.

6-7. Mounting the Display Unit and the Control Unit

Warning

- When mounting the display unit and the control unit, make sure the harness and all wires are not twisted, stretched taut, or coming into contact with other vehicle parts. It may cause a malfunction that can damage the vehicle or become a distraction while driving.
- Do not touch or let dust settle on the adhesive surface of the double-sided tape. Do not apply the tape onto wooden or curved surfaces, as well as on fabric. Reuse of the tape may degrade the seal so that it may hold the mounted unit. Dropping the unit may cause a malfunction of the unit and/or damage to the vehicle.

Caution

- Install the unit away from areas of excessive heat, water/moisture, or uneven surfaces to avoid possible malfunction, damage to the Engine, and/or deformity of the case.

- Wipe off dust, water, or oil on the mounting surface using a mild detergent where the unit will be placed.
- Use the supplied double-sided tape to mount the unit.
- Secure harnesses using tie wraps in various locations.

6-8. After Installation

- Reinstall all removed parts back to their original positions.
- Reconnect the negative cable onto the battery

7.AFTER INSTALLATION

Caution

- Prior to confirming operation, make sure the foot brake is applied, and the immediate area around the vehicle is clear.

Check the following after the installation process is complete:

7-1. Check the following before starting the Engine

Check Item	Check
Make sure all bolts and nuts are tightened.	
Make sure all installed components and harnesses do not come in contact with other parts.	
Make sure all harnesses are secured tightly.	
Make sure connectors and harnesses are routed and connected properly.	
Make sure the correct splice connector is used and tightened completely.	
Make sure this product is mounted securely on an area that will not distract the driver while driving.	
Make sure the negative cable terminal is securely attached to the battery.	

7-2. Start the Engine and check the following

- Do not raise the Engine RPM right after starting the Engine. (Let it idle and warm up to standard operating temperature)

Check Item	Check
Make sure the installed parts are not coming into contact with each other.	
Make sure there is no excessive stress on harnesses.	
Make sure there are no loose bolts or connections after turning off the Engine. Re-tighten as necessary.	

7-3. Safety Circuit Function

Check the following to confirm the Turbo Timer function and the safety circuit operation:

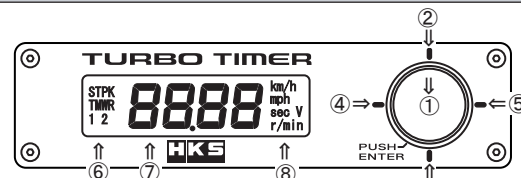
Step 1

- Start the Engine. Make sure the ignition key is on.
- Set the manual timer setting to 30 seconds or longer.
- Make sure the parking brake is applied, and step on the foot brake.
- Turn the ignition key off. Verify the Turbo Timer is working.
- After approx. 10 seconds have elapsed, release the parking brake. If the Turbo Timer shuts off immediately and the Engine stops when the parking brake is released, the Turbo Timer is installed correctly.

Step 2

- Start the Engine. Make sure the ignition key is on.
- Set the manual timer setting to 30 seconds or longer.
- Step on the foot brake, and release the parking brake.
- Turn the ignition key off. If the Turbo Timer shuts off immediately and the Engine stops when the parking brake is released, the Turbo Timer is installed correctly.

8.NAMES AND FUNCTIONS



- [Center Key]: To start and stop while in each mode. Also used to stop the operation. (Press this key to stop the Engine while the Turbo Timer is counting down.)
- [UP Key]: To select and set items in each mode.
- [DOWN Key]: To select and set items in each mode. (Press and holding this key in main mode to switch to Setup Mode.)
- [LEFT Key]: To move to each mode. (Press and holding this key in Setup Mode to switch to main mode.)
- [RIGHT Key]: To move to each mode.
- [Mode Display]: Displays the current mode.
- [Value Display Section]: Displays the values.
- [Unit Display Section]: Displays the unit of measure.

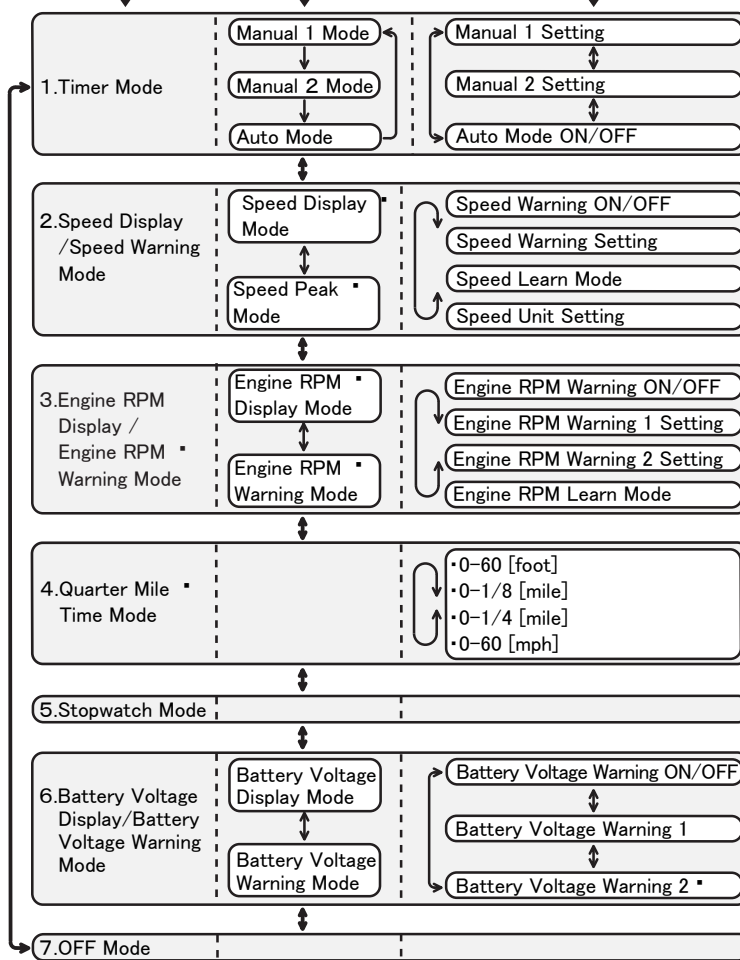
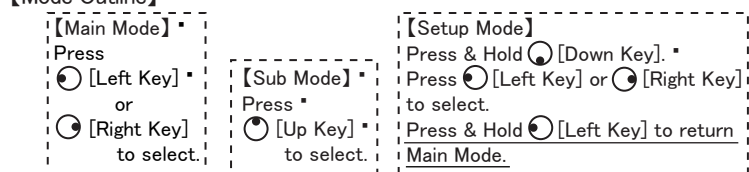
9.OPERATION

All of the following are to be done when the ignition is ON.

Mode Select

There are 7 main modes to the Turbo Timer, which are shown below and in each of these modes, there are sub modes and the Setup Mode. Switching to another mode can be done when the Turbo Timer is not operational (not in countdown).

[Mode Outline]



9-1. Timer Mode

This mode is to set the idling countdown timer. Press the [left or right key] to select the timer mode. **TM** will light up on the display. Press the [up key] to select from Manual 1 Mode, Manual 2 Mode, and Auto Mode. [Default: Manual 1 Mode]

Auto Mode

- By monitoring the Engine RPM; idle countdown time is automatically determined between 0-5 min according to operating conditions of the Engine. (if the RPM is below 2000[r/min], the auto time will stay at 0.00).
- The auto setting time changes by RPM
- Turn the ignition ON and if **1. 2** blinks on the display, then the auto setting is ready.
- After turning on the Engine, if the Turbo Timer detects the RPM, **1. 2** will turn off on the display.
- If you switch to Auto Mode while the Engine is running, **1** or **2** will be turned off, and the Turbo Timer will display the auto time.
- 1. 2** may flash when the vehicle slows down at a rapid rate, but this is normal.

(1) Setting the Idling Countdown Timer

Under the timer mode, press & hold the [down key] to move to the Setup Mode.

- Manual Mode 1: **TM1** will light up, and the user can set a countdown period between 0-10 minutes. Set the value using the [up or down key] (in increments of 10 sec.) [Default: 30 sec.]
- Manual Mode 2: **TM2** will light up, and the user can set a countdown period between 0-10 minutes. Set the value using the [up or down key] (in increments of 10 sec.) [Default: 1 min.]
- Auto Mode On/Off: Press the [up or down key] to turn the mode on or off. If the Engine RPM sensor wire is not connected, off the Auto Mode. [Default: ON]

(2) Timer Activation

- When the ignition is turned OFF, the Turbo Timer will countdown according to the preset time.
- The countdown refreshes every second, accompanied by a blinking backlight and audible beeping taking place simultaneously.
- When the display numbers read "0.00" the Engine will shut off along with the display.
- Timer OFF function
- Pressing and holding the [center key] during the countdown will turn the timer OFF, and the Engine will shut OFF. (the next time the ignition is turned ON, the Turbo Timer will automatically turn back ON and goes back to the normal setup.)
- Starting Countdown from Other Modes
- The Turbo Timer will automatically go into timer mode and will begin the countdown when the ignition is turned off, even when in other modes (with the exception of the OFF Mode).

9-2. Speed Display Mode

This mode displays either the current speed or peak speed. Further, the speed warning value can be set, and the warning function can be turned on or off while in this mode.

Important

- Default of speed unit of measure is [km/h]. To change the speed unit of measure, follow the instruction below.
- If power supply to the Turbo Timer is stopped by disconnecting the battery, all settings will be reset including the unit of measure setting. In this case, change the unit of measure again.

Setting the Speed Unit of Measure

Press the [left or right key] to select the Speed Display Mode. **km/h** will light up on the display. Press and hold the [down key] to move to Setup Mode. Press the [right key] 3 times to move to the speed unit setting display. Press the [up or down key] to switch the unit from km/h to mph. When km/h is selected, **km/h** will light up. When mph is selected, **mph** will light up.

(1) Speed Display

- Press the [left or right key] to select the Speed Display Mode. **mph** will light up on the display. The speed will be displayed once the vehicle starts moving. (May have a slight difference from the factory speedometer.) [Max. Speed Value: 248 [mph]]
- Press the [up key] to switch to the Speed Peak Mode. **PK** will light up on the display. Press and hold the [up key] during peak display to clear the peak value, and the current speed is set as the peak value.

(2) Speed Warning Mode

- Press and hold the [down key] to move to Setup Mode. Press the [up or down key] to switch the warning ON / OFF. [Default: OFF]
- Press the [right key] once to move to the speed warning ON/OFF setting screen to the speed warning value setting screen. **WR** will light up on the display. Press the [up or down key] to set the warning values. (Setting Range: 10-240 mph, Setting Increment: 10 mph)
 - If the vehicle exceeds the set warning value, the white backlight will blink, and alerts the driver with a beeping noise.
 - If the [center key] is pressed and held while the warning function is active, the warning function will turn OFF.
- Speed Learn Mode
 - If there is a big difference between the speedometer speed reading and the speed reading on the Turbo Timer display, there is a need for the computer to learn the speed sensor pulse.
 - How to learn (The driver must not perform the following while driving.)
 - Press and hold the [down key] while in Speed Display Mode to switch to Setup Mode. Press the [right key] twice to switch to Speed Learn Mode. 30[mph] will appear.
 - Press the [center key] to start learning. 30[mph] will blink on the display.
 - Test drive the vehicle and once the factory speedometer hits 30[mph], press the [center key] again. You will hear a beep that confirms the learning process has been completed.
 - After completing the learn process, it will go into Speed Display Mode. The current speed will be displayed.
 - Learn error: About 2 minutes of inactivity after entering Learn Mode, then it will go back to the Speed Display Mode.

9-3. Engine RPM Display Mode

This mode displays either the RPM or peak RPM of the vehicle. Further, the RPM warning value can be set and the warning function can be turned on or off while in this mode.

(1) Engine RPM Display

- Press the [left or right key] to select the Engine RPM Display Mode. **r/min** will light up on the display. The current RPM will be on display once the Engine starts. (There might be a slight difference than the stock RPM.) [Max. RPM: 9990 [r/min]]
- To display Engine RPM Peak Value: Press the [up key] while in Engine RPM Display Mode. The Engine RPM peak value will be shown, and **PK** will light up on the display to indicate it. Press the [up key] to switch between the Engine RPM Display and the peak RPM display. Press and hold the [up key] to clear the peak RPM; the current Engine RPM will be set as the new peak RPM.

(2) Engine RPM Warning Setting

- Press and hold the [down key] to switch to Setup Mode form Engine RPM Display Mode. Press the [up or down key] to turn the Engine RPM warning function on or off. [Default: OFF]
- While in the Engine RPM Warning ON/OFF setting screen, press the [right key] to select between Warning 1 and Warning 2. When Warning 1 is selected, **WR1** will light up. When Warning 2 is selected, **WR2** will light up.
 - Warning 1 **WR1** is the shift up indicator. [Default value is 5000[r/min]]
 - Warning 2 **WR2** is the red zone indicator. [Default value is 8000[r/min]]

- Press the [up or down key] to set the warning values after selecting between Warning 1 or Warning 2. (RPM Setting Range: 1000 - 9900 [r/min], Increments of 100[r/min]).
- The setting value for Warning 1 cannot exceed the setting value for Warning 2.
- When the Engine RPM goes over the set value of Warning 1, the white backlight will blink and two short audible beeps will warn the driver to upshift.
- When the Engine RPM goes over the set value of Warning 2, the backlight will blink rapidly and a long beep noise will warn the driver that the Engine RPM has reached redline.
- To deactivate the warning function while it is active (i.e. blinking display and audible beeping), press the [center key] when the warning function is active.

RPM Learn Mode

- If there is a big difference between the factory tachometer's RPM reading and the RPM reading on the Turbo Timer display, there is a need for the computer to learn the vehicle's number of cylinders.
- How to learn** (The driver must not perform the following while driving.)
- Press the [down key] while in Engine RPM Display Mode to switch to Setup Mode. Press the [left key] to switch to Learn Mode. 2000[r/min] will appear on the display.
 - Press the [center key] to start learning. 2000[r/min] will blink on the display.
 - Test drive the vehicle and once the factory tachometer hits 2000[r/min], press the [center key] again. You will hear a beep that confirms the learning process has been completed..
 - After completing the learn process, it will go into RPM Display Mode, and the current Engine RPM will appear.
- ※ Learn error: About 2 minutes of inactivity after entering Learn Mode, then it will go back to the Engine RPM Display Mode.

9-4. Quarter-Mile Time Mode

This mode will measure a sectional time.

- Press the [left or right key] to select the Quarter-Mile Time Mode.
- Press and hold the [down key] to switch to Setup mode. Press the [up or down key] to choose from the following modes:

<SPEED UNIT : mph>

<SPEED UNIT : km/h>

- Start and end time measurement.
 - <SPEED UNIT : mph> 0-60[foot], 0-1/8[mile], 0-1/4[mile], 0-60[mph] measurement
 - <SPEED UNIT : km/h> 0-100[m], 0-200[m], 0-400[m], 0-100[km/h], 0-150[km/h], 0-200[km/h] measurement
 - Make sure the vehicle is at a complete stop (if the vehicle is not at a complete stop, the numbers on the Timer will remain solid and the time measurement cannot be taken).
 - When the vehicle is at a complete stop, blinking numbers and a beep will indicate that the Timer is ready to measure the run.
 - In measuring the run, you can choose between auto start and manual start. If the [center key] is pressed when the numbers are blinking, it will change to manual start, and if the key is not pressed, it will be set to auto start.
- Auto Start**
- As soon as the run begins, the Timer automatically starts to measure the time.
 - When the set distance or speed is obtained, the Timer will automatically end and notifies the driver with a beeping noise.
- Manual Start**
- Press the [center key] to start a 3, 2, 1...countdown. A beep will sound and starts timing the run.
- 200 - 400[m] Measurement (<SPEED UNIT : Only in km/h>)
- Make sure the vehicle is at a complete stop (if the vehicle is not at a complete stop, the numbers on the Timer will remain solid and the time measurement cannot be taken).
 - When the vehicle is at a complete stop, blinking numbers and a beep will indicate that the Timer is ready to measure the run.
 - Begin the run; the Timer will automatically start measuring once the vehicle distance reaches 200[m], and will automatically end the measurement once the vehicle distance reaches 400[m].

- 50-100[km/h], 100-150[km/h] Measurement (<SPEED UNIT : Only in km/h>)
- When selecting 50-100[km/h], select 50[km/h], and when selecting 100-150 [km/h], select 100[km/h] respectively. 1000 will blink on the display, and the Timer is now ready to start measuring the run. The vehicle must be going less than the chosen speed range in order for the Timer to measure the run, otherwise [sec] will be displayed on the screen, and the Timer cannot measure the run.
 - Once the vehicle reaches the start measurement range, the Timer will beep and begin measuring the run.
 - Once the vehicle reaches the end measurement range, the Timer will stop measuring the run automatically and beep one more time.
- ※ To measure in <SPEED UNIT : km/h> , first set the unit of measure to "km/h", then select the measurement parameters and begin the run. Clear the Speed Display Mode's peak value after each SPEED UNIT measurement change.

(4) Measured time display

- If the measured time is under 60sec, it will display up to a hundredth of a second. The following example shows 12.48 seconds.

- If the measured time is over 60 sec, it will show the minute first and then the display will change to show the seconds, and switch back and forth. The following example shows 8 min 12.48 sec:

The maximum range for the display is 10min. If the run exceeds 10min, then the display will show a [sec].

- Reset / Restart
 - Press and hold the [up key] to reset the measured time after each run. You can restart the measurement by repeating step (3).
- Displaying the previous measurement
 - After the current measurement, press the [up key] to display the previous measured time for 2 seconds.

9-5. Stopwatch Mode

- Time measurement and lap time measurement can be made. The measured time is displayed in the same manner as the quarter-mile measurement time.
- Press the [left or right key] to select the Stopwatch mode. [ST] will light up on the display.
-
- Time measurement
 - Start Measurement
 - Press the [center key] to start the stopwatch.
 - Stop Measurement
 - Press the [center key] to stop the stopwatch.
 - Continue & Reset Measurement
 - Press the [center key] while the time measurement is stopped to restart time measurement. Press and hold the [up key] to reset the values. After resetting, repeat the stopwatch procedure for another measurement.
 - Lap time measurement
 - Time measurement
 - Press the [center key] to start the first time measurement. The measured time is displayed in the same manner as the time measurement above.
 - 1st & 2nd Lap time measurements
 - Press the [up key] during the time measurement to stop the 1st lap time measurement and start timing the 2nd run. The 1st measured time is displayed during the 2nd run, and [sec] will blink.
 - 3rd or more Lap time measurement
 - Press the [up key] during the time measurement to stop the 2nd lap time measurement and start timing next run. Repeat the same procedure for more runs. The previous measured time is displayed during the run, and [sec] will keep blinking.
 - Finish Measurement
 - Press the [center key] during the time measurement to end lap time. The time measured when the [center key] is pressed will be displayed, and [sec] will stop blinking.
- Time measurement and lap time measurement will display [sec] when it exceeds 10 min.

9-6. Battery Voltage Display Mode

This mode displays the current battery voltage and the battery voltage peak hold value. Further, the battery voltage warning value can be set, and the warning function can be turned on or off while in this mode.

(1) Battery Voltage Display

Press the [left or right key] to select the Battery Voltage Display Mode. [V] will illuminate on the display, and the current battery voltage will be displayed.

(2) Battery Voltage Peak Value Display

Press the [up key] to switch the Battery Voltage Display to the Peak Value Display, and vice versa. [PK] will illuminate when the Battery Voltage Peak Value Display is selected. To reset the peak voltage value, press and hold the [up key] while the peak voltage value is displayed. The peak hold value is reset to the current battery voltage.

(3) Battery Voltage Peak Hold Display with Warning Function

- To Switch the Warning Function ON or OFF
 - While in Battery Voltage Display Mode, press and hold the [down key] to switch to the Setup Mode. Press the [up or down key] to switch the battery voltage warning function on or off. [Default: OFF]
- To Set the Battery Voltage Warning Value: While in Setup Mode, press the [left or right key] to display the Warning Set Mode. [WR1] will illuminate when Warning 1 is selected and [WR2] will illuminate when Warning 2 is selected.

Warning 1 sets the lowest warning voltage value. The set value will only be saved if it is lower than the Warning 2 setting value. [Default: 10[V]]

Warning 2 sets the highest warning voltage value. The set value will only be saved if it is higher than the Warning 1 setting value. [Default: 16[V]]

Press the [up or down key] to set the battery voltage warning value. [Setting Range: 10-16[V] at interval of 0.1[V]]

- While the warning function is enabled, if the voltage were to exceed Warning 2 setting value or fall below Warning 1 setting value, the red backlight will blink and alerts the driver with a beeping noise.
- While the warning function is operational (i.e. blinking display and audible beeping), press the [center key] to turn the function off.
- If the voltage were to fall below 9[V], all displays, the backlight, and the Timer will shut off.

9-7. OFF Mode

- While in OFF Mode, all functions and displays and the backlight are turned off, and the Turbo Timer is not active.
- While the OFF Mode is selected, the Engine can be shut off without the countdown operation by turning the ignition off.
 - If the ignition is turned off while the OFF Mode is selected, the Turbo Timer will remain in OFF Mode when the ignition is turned back on. Therefore, no display will appear, and the backlight will not be turned on.

9-8. Parking Brake

- The safety circuit by the parking brake will function as follows
- If the ignition is turned off without the parking brake engaged (not in OFF Mode, countdown must not be at 0.00 sec.), the Engine will be shut off without activating the timer countdown operation.
 - If the parking brake is disengaged during the timer countdown operation, the countdown will stop, and the Engine will be shut off as well.

10.OPTIONAL PARTS LIST

A vehicle-specific harness may be available for your vehicle. Please reference <http://www.hksusa.com/products/?id=837> for details.

11.TROUBLESHOOTING

If this product is not performing properly; check all wiring and connections, referring to the following before contacting your dealer.

Symptoms	Cause	Countermeasure
Display does not power on after the ignition is on.	OFF Mode is selected.	Turn on the ignition, and press the [left or right key] to deactivate OFF Mode.
	Improper harness connection.	Make sure the harness is connected properly.
	Improper ground.	Make sure grounding is done correctly. Remove any paint and/or rust from the grounding surface.

Symptoms	Cause	Countermeasure
Display remains on despite the ignition being on or off.	Green wire wrongly connected to the vehicle's +B (constant power) wire.	Connect the green wire to the vehicle's IG wire.
Countdown does not start when the ignition is turned off, and the Engine is turned off as well.	Countdown time is set to "0.00."	Set the countdown time to longer than 10 sec.
	Wiring for the safety circuit is not complete.	Refer to 6-4.
	The parking brake is not applied.	Apply the parking brake.
Countdown does start when the ignition is turned off, but the Engine is immediately shut off as well.	The battery is losing its charge.	Check the battery voltage.
	Improper wiring	Connect the green wire to the vehicle's IG wire.
	Non-HKS harness is connected.	Use the correct HKS harness.

Warning

● Do not use this product if unusual occurrences should occur. Consult with your HKS Authorized Dealer immediately.

Caution

● Do not try to repair the product yourself. Consult with your HKS Authorized Dealer.

● If any unusual noises, scents, and/or vibrations are noticed while driving, please refer to a factory repair manual.

12.FOR SUBSEQUENT OWNERS

If this product is passed on to a new owner, make sure this instruction manual is included along with the product. Do not uninstall this product by yourself.

Caution

● If this product is removed, make sure all wires from the vehicle are insulated with electrical tape to prevent a possible short.

13.PRODUCT SPECIFICATIONS

- Operating Voltage DC 10-16V
- Operating Temperature -20~60°C (-4 to 140° F)
- Maximum Stand-by Voltage Less than 10 mA
- Unit Size - Display Unit 22.5 x 89.5 x 13.0mm
- Control Unit 21.0 x 80.0 x 69.0mm

14.INSTRUCTION MANUAL REVISION HISTORY

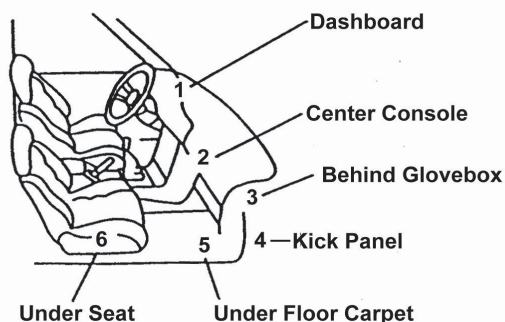
Ver.	Date	Details
3-1.01	2008/ 7	1st Edition
3-1.02	2008/ 8	2nd Edition
3-1.03	2008/10	3rd Edition
3-1.04	2010/ 8	4th Edition

VEHICLE SPECIFIC WIRING DIAGRAM

The following diagrams may differ slightly depending on vehicle year, or model (California or Federal). Confirm that the diagram shown corresponds to your vehicle by referencing the factory repair manual. Locate the engine control unit (ECU) using the diagram below.

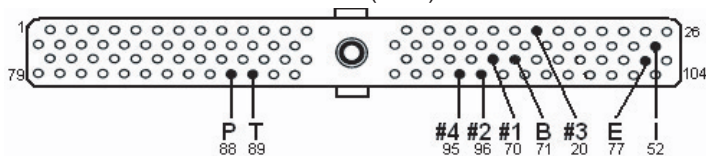
CHART EXPLANATION

- B- 12 volt ignition
- U- 12 volt battery
- E- ECU Ground
- P- Pressure sensor, Air flow signal
(Note: some applications have multiple "P" signals-Use P(AFR) for AFR and P(FCD) for FCD)
- I- RPM signal
- S- Speed Sensor
- T- Throttle Position Sensor
- #- Injector Signal
- * ALL DIAGRAMS ARE SHOWN FROM THE WIRE SIDE OF THE HARNESS



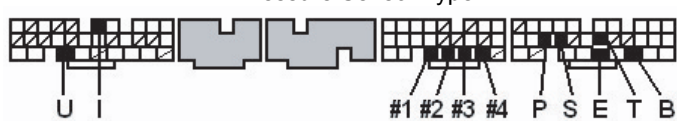
FORD

FOCUS ZX3 2000-2003
2.0L ZETEC (DOHC)
ECU LOCATION-4
Hot Wire (0-5V)

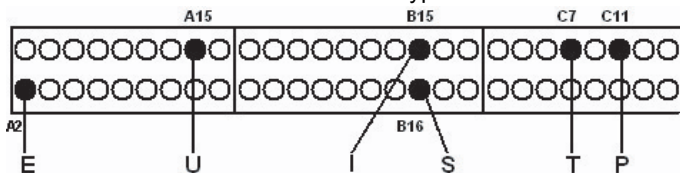


HONDA / ACURA

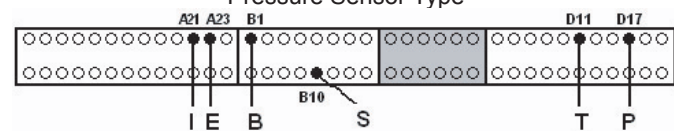
ACURA RSX / HONDA CIVIC SI 2002-2004
K20A2
ECU LOCATION-3
Pressure Sensor Type



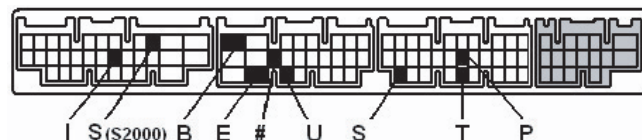
HONDA CIVIC 1988-1991
ACURA INTEGRA 1986-1993
D16A / B18A
ECU LOCATION- 4
Pressure Sensor Type



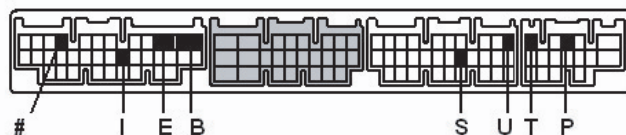
HONDA CIVIC 1992-1995 / DEL SOL 1993-1996
ACCORD 1990-1993 / PRELUDE 1993-1996
ACURA INTEGRA RS, LS, & GS 1994-1999
D15B / D16Z / F22A / H23A / H22A / B18A
ECU LOCATION- 4
Pressure Sensor Type



HONDA CIVIC SI 1999-2000 / ACURA INTEGRA
(ALL MODELS) 2000 / S2000 2000-2004
B16A / B18C / F20C
ECU LOCATION- 4
S2000 ECU LOCATION- 4 (Driver Side)
Pressure Sensor Type

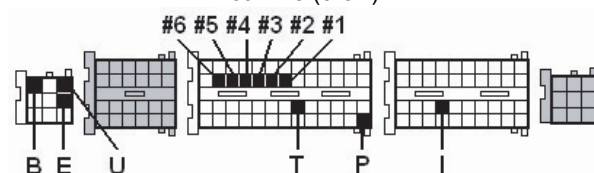


HONDA CIVIC 1996-2000 (Non-SI)
ACCORD 1994-1997 (4 CYL)
ACURA INTEGRA GSR 1994-1999
INTERGRA TYPE-R 1997-1998
D16Y / B18C1 / B18C5 / F22B
ECU LOCATION- 4
Pressure Sensor Type



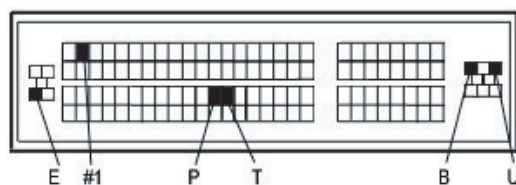
HYUNDAI

TIBURON
2003
G2.7V6
ECU LOCATION-4
Hot Wire (0-5V)



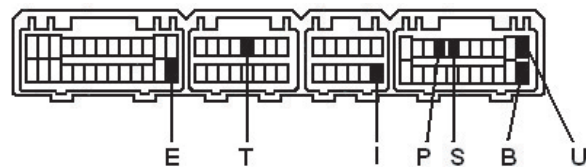
INFINITI

INFINITI G35C 2003-2005
VQ35DE Hot Wire (0-5V) Type



MAZDA

RX-7 TWIN TURBO 1992-1995
13B-REW
ECU LOCATION- 5
Pressure Sensor Type

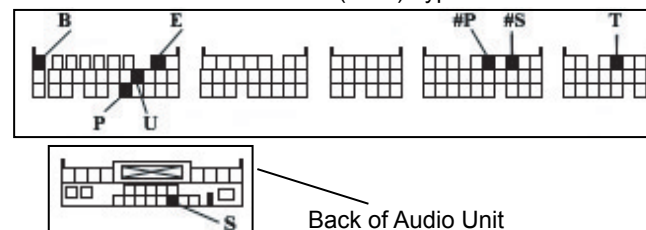


RX-7 TURBO 1989-1991
13BT
ECU LOCATION- 5
Hot Wire (0-5V) Type

Below: Speed Sensor signal "S" is located in the Factory Cruise Control Unit Harness located on the Driver Side Kick Panel. (Location-4)

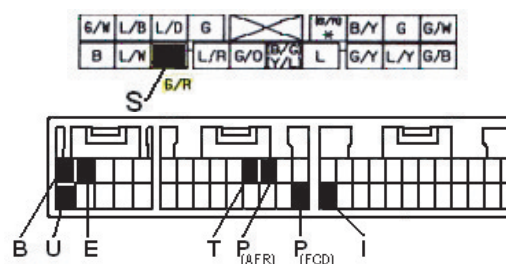


RX-8 2004-2007
13B-MSP
Hot Wire (0-5V) Type



RX-7 TURBO 1986-1988
13BT
ECU LOCATION- 5
Hot Wire (5-0V) Type

Below: Speed Sensor signal "S" is located in the Factory Cruise Control Unit Harness located on the Driver Side Kick Panel. (Location- 4)

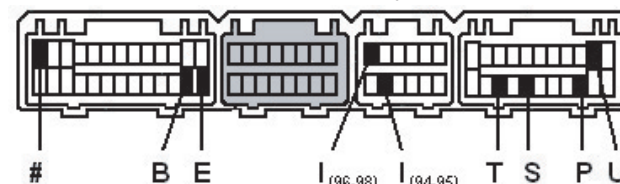


MITSUBISHI / DODGE / CHRYSLER / EAGLE

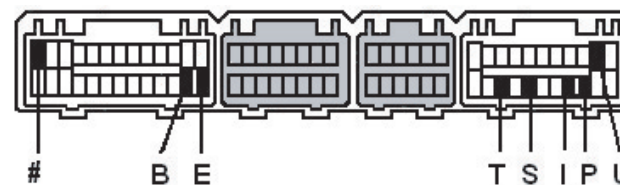
MITSUBISHI 3000GT VR-4
DODGE STEALTH RT TURBO
1990-1993
6G72BT
ECU LOCATION- 2
Karmen Vortex Type



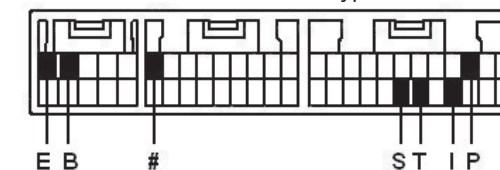
MITSUBISHI 3000GT VR-4
DODGE STEALTH RT TURBO
1994-1998
6G72BT
ECU LOCATION- 2
Karmen Vortex Type



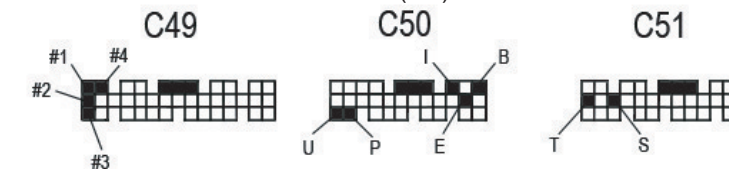
MITSUBISHI ECLIPSE
EAGLE TALON
1995-1999
4G63
ECU LOCATION- 2
Karmen Vortex Type



MITSUBISHI ECLIPSE
EAGLE TALON
CHRYSLER LASER
1989-1994
4G63
ECU LOCATION- 2
Karmen Vortex Type



MITSUBISHI LANCER EVOLUTION IX MR
2006 (MT)

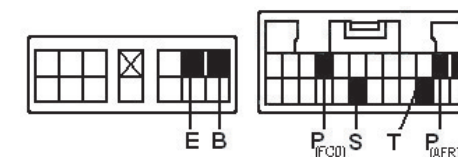


MITSUBISHI LANCER EVOLUTION VII / VIII
Base Model Only
2001-2005 (MANUAL TRANSMISSION ONLY)
ECU LOCATION- 3
MITSUBISHI LANCER EVOLUTION IV / V / VI
1996-2001
ECU LOCATION- 4
4G63
Karmen Vortex Type



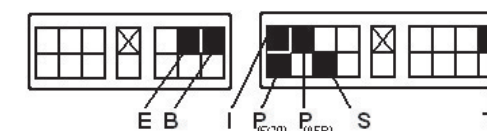
MITSUBISHI STARION ES/ESIR
PLYMOUTH CONQUEST TSI
1985-1989
G54BT
ECU LOCATION- 4
Karmen Vortex Type

RPM Signal (I) requires Analog to Digital Converter (p/n4299-RA004)



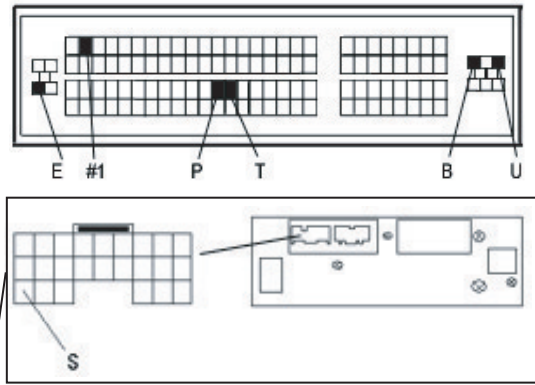
MITSUBISHI STARION ES PLYMOUTH CONQUEST
1983-1986
MITSUBISHI MIRAGE 85-86
G54BT
ECU LOCATION- 4
Karmen Vortex Type

RPM Signal (I) requires Analog to Digital Converter (p/n4299-RA004)



NISSAN

NISSAN 350Z
2003-2005
VQ35DE
Hot Wire (0-5V) Type

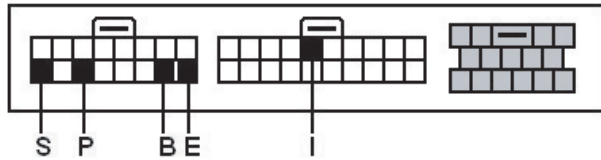


Gray 24 Pin Connector- Glove Box/Right of Luggage Floor

300ZX TWIN TURBO
1990-1996
VG30DETT
ECU LOCATION-5
Hot Wire (0-5V) Type



300ZX TURBO
1984-1988
VG30DET
ECU LOCATION- 4
Hot Wire (0-5V) Type



180SX
RPS13 1996-2000 SR20DE(T)
SILVIA
PS13 1991-1993 SR20DE
S14 1996-1998 SR20DE(T)
S14 1993-1996 SR20DE
S15 1999-2002 SR20DE(T)
ECU LOCATION-4
Hot Wire (0-5V) Type



If the stock tachometer shares the RPM SIGNAL "I", use I-1.
If NOT, use I-2

180SX
RPS13 1991-1996 SR20DET
SILVIA
PS13 1991-1993 SR20DE
ECU LOCATION-4
Hot Wire (0-5V) Type

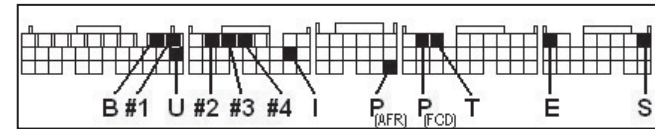


180SX
RS13 1989-1990 CA18DET
SILVIA
S13 1988-1990 CA18DE(T)
ECU LOCATION-4
Hot Wire (0-5V) Type

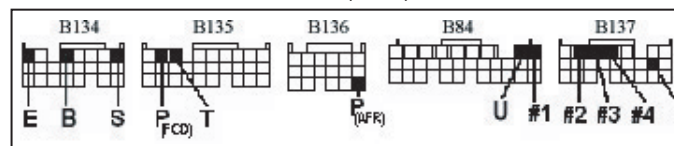


SUBARU

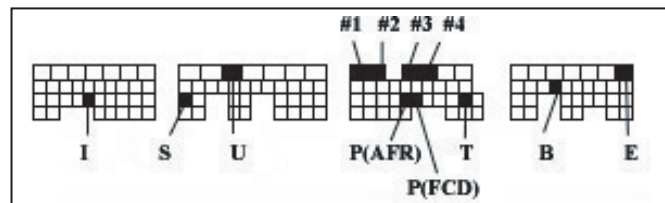
IMPREZA WRX
GDA 2002-2003
EJ205
ECU LOCATION-5
HOT WIRE (0-5V) TYPE



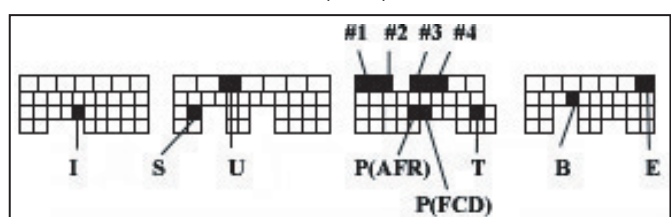
IMPREZA WRX
GDB 2004-2005
EJ205
ECU LOCATION-5
HOT WIRE (0-5V) TYPE



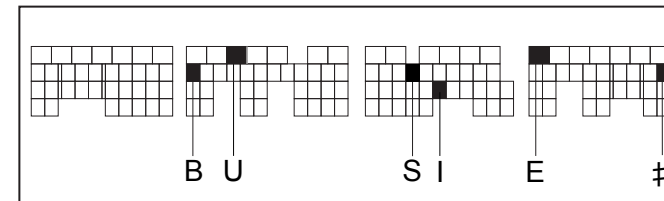
IMPREZA WRX STI US SPEC
GDB 2004
EJ25
ECU LOCATION-5
HOT WIRE (0-5V) TYPE



IMPREZA WRX STI US SPEC
GDB 2005-2006
EJ25
ECU LOCATION-5
HOT WIRE (0-5V) TYPE

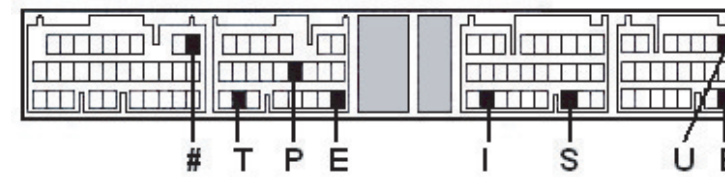


IMPREZA WRX STI US SPEC
GDB 2007
EJ25
ECU LOCATION-5
HOT WIRE (0-5V) TYPE

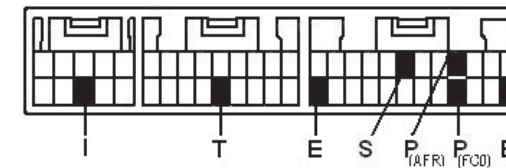


TOYOTA / LEXUS

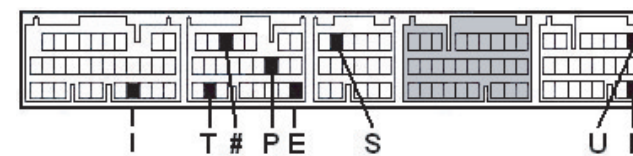
TOYOTA CELICA GT/GTS
MR2 SPYDER 2000-2003
2ZZ-GE / 1ZZ-FE
CELICA ECU LOCATION- Engine Compartment(Driver Side)
MR2-S ECU LOCATION- Behind Driver's Seat
Hot Wire (0-5V) Type



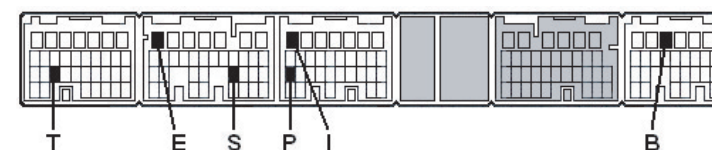
TOYOTA CELICA ALL-TRAC
1986-1989
3S-GTE
ECU LOCATION- 2
Hot Wire (5-0V) Type



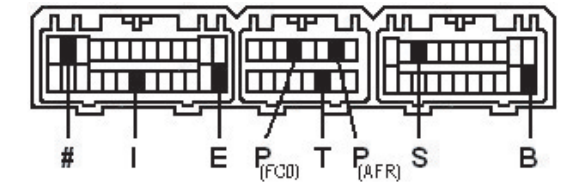
LEXUS IS300
2001
2JZ-GE
ECU LOCATION- Engine Compartment, Front/Driver's Side
Hot Wire (0-5V) Type



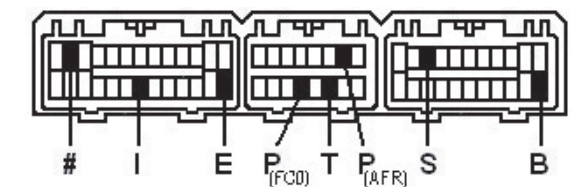
LEXUS IS300
2002
2JZ-GE
ECU LOCATION-Engine Compartment, Front/Driver's Side
Hot Wire (0-5V) Type



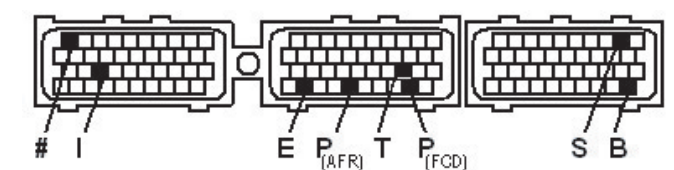
TOYOTA MR2 TURBO 1993-1995
3S-GTE
ECU LOCATION-TRUNK
TOYOTA CELICA ALL-TRAC 1990-1993
3S-GTE
ECU LOCATION- 2
Hot Wire (0-5V) Type



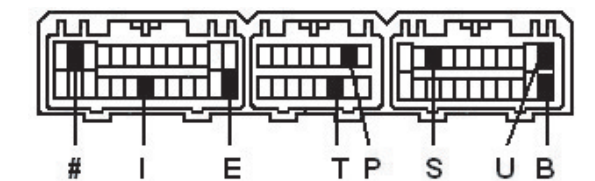
TOYOTA MR2 TURBO
1991-1992
3S-GTE
ECU LOCATION- TRUNK
Hot Wire (0-5V) Type



TOYOTA SUPRA TWIN TURBO
1993-1998
2JZ-GTE
ECU LOCATION-5
Hot Wire (0-5V) Type



TOYOTA SUPRA TURBO
1989-1992
7M-GTE
ECU LOCATION- 3
Karmen Vortex Type



TOYOTA SUPRA TURBO
1986-1988
7M-GTE
ECU LOCATION-3
Karmen Vortex Type

