

AGC Gearbox Computer Manual LG3.3R

Welcome

Congratulations on your purchase of the EMU (Engine Management Unit) type AGC (Automatic Gearbox Computer). We are sure that you will be satisfied with this robust, compact and user friendly controller, which was designed to meet today's requirements. This AGC was developed around the people involved with Gearbox Computers. We hope that it will give you years of trouble free operation.

Please read this manual to learn about the safety precautions and design features of your AGC. Failure to use and install this management system properly may cause injury to people or damage to equipment. This Manual was written with the novice and professional engine tuner in mind, and we would like to urge you to install the AGC according to our recommendations. This is the best way to get the most out of your AGC.



Please read the safety instructions before and after installation and before connecting the AGC, to ensure that the correct procedures are followed.

Introduction

This Automatic Gearbox Computer (AGC) controls the solenoid valves of the new generation automatic gearboxes. The main functions of the AGC are to control gear selection, lock-up converter and line pressure control. This is achieved by a user interface, parameter settings, Throttle Position Sensor (TPS), RPM pulse signal and Speed Sensor. The user interface consists of two switches and two LED's. The switches are for operating and programming of the AGC. The LED's are to indicate different modes of the AGC and for diagnostic purposes.

The user may set-up the AGC with parameters so that it can operate correctly for different engines or drive trains. The software will then activate or deactivate all the solenoids to operate the gearbox automatically and in a safe manner.

The AGC has two basic Modes namely [Automatic](#) and [Tiptronic](#) gear selection:

Automatic has two modes namely Drive and Drive Economy. In Drive Mode the gearbox will operate completely automatic up to 3rd gear. This is mainly used for urban driving and also when towing. In Drive Economy Mode the gearbox will operate up to 4th gear. This is mainly used for open roads where reduced RPM's will save petrol. The 4th gear on the Lexus gearbox has a huge 30% overdrive. It is an economy gear. This large overdrive was not made for town driving or pulling heavy loads. There is also a Towing selection which will change the gear-change settings to be more suitable for heavy loads. This mode will operate in both automatic modes.

Tiptronic have two modes namely Tiptronic Manual and Tiptronic Auto.

In Tiptronic Manual the driver selects a gear and the AGC will stay in that gear. It is used for certain off-road driving and Dyno Tuning mostly.

In Tiptronic Auto mode the AGC will shift to lower gears when the engine RPM's are too low. This will ensure that the gearbox is in the correct gear when pulling off. The AGC will also shift to higher gears when a preset maximum RPM is reached. This will prevent the driver from over revving the engine. It is used mostly for off-road driving and drag racing.

The lockup converter and line pressure control will be controlled by the AGC, which will engage and disengaged the lock-up and line pressure solenoids at certain RPM's, to ensure that the engine does not stall at low RPM's. The **Lock-up Converter** will always be controlled by the AGC and not the driver. This is mainly to protect the small clutch in the converter. The AGC will only engage the clutch under low load conditions if RPM criteria are met. It will also disengage the clutch when RPM's are too low, or use it as an extra ratio shift in 3rd and 4th gear when accelerating. In Automatic mode the lockup will only be used in 3rd and 4th gear, while in Tiptronic mode the lockup will be used in every gear. It will however only engage under low load conditions.

The **line pressure** solenoid will only be used in shift conditions up to 3rd gear and under low load conditions. This will ensure a soft shift when the driver cruises around in town.

The **Function LED** will be on, off or flash in different ways to let the driver know in which mode the AGC is operating. Drive Economy = On, Drive = Off, Tiptronic = Flashing.

The **Lock-up LED** will be on when the converter clutch is engaged. This is important for the user to see in Tiptronic during driving in soft sand. If the clutch is not engage the gearbox may overheat in a short time.

The two switches (**Up-shift & Down-shift**) or (**LOCK & UNLOCK**) will activate all these different settings and gear shifts as well as programming the AGC.

The AGC will use engine RPM's, TPS and Speed Sensor to decide which gear should be selected. It has a progressive RPM gear change according to the TPS. The deeper the accelerator pedal is pressed, the higher the RPM's for gear changes will be. There is thus no need to push the pedal completely for more aggressive acceleration.

No Speed Sensor Connected.

In Auto Mode the AGC will shift down to 2nd gear at robots. It will only shift to 1st at pull-off if enough throttle is applied quickly. This is due to the free running clutches in 1st & 2nd gear. This helps with smoother operation if the driver does not come to a complete stand-still and keep the gears in 2nd. The sensitivity for this feature is adjustable.

With Speed Sensor Connected.

In Auto Mode the AGC will shift down to 1st gear when the road speed falls under a pre set speed and if the throttle position is below 10%. On a down hill it will shift to 2nd gear if the road speed is above twice the pre set speed and if the throttle position is below 10%. This will ensure an even pull-off when the throttle is pressed again.



Hall Type Speed Sensor



Magnetic Type Speed Sensor

Features

- Automatic Drive Mode – shift automatic up to 3rd gear for town driving or towing
- Automatic Drive Economy Mode – shift automatic up to 4th gear for open road driving or cruising
- Tiptronic Manual Mode – for Dyno Tuning and Off-road driving
- Tiptronic Auto Mode – for Off-road driving, heavy towing or drag racing
- Automatic Towing Mode – for towing heavy loads in both automatic modes
- Lock-Up Converter Control – will engage the converter clutch under safe load conditions
- Line Pressure Control –for smoother low throttle shifting in Town
- User Programmable – to custom tune each AGC on different engines and drive trains
- LED indication – to check different signals and functions
- Internal Drive Module – to minimise wiring
- Progressive Gear Selection – variable RPM shifting depending on the TPS position.
- Wireless Kick Down – Kick-Down function in every gear without the need for a kick-down switch
- Reverse Gear Selection – will prevent the AGC from selecting gears when in reverse
- Compact – fit in small places
- Cost effective – lots of features for relative low cost
- SA Manufactured Product – Good backup support and repairs

Operating Instructions – Fixed Buttons

The driver has two buttons and one Function LED to select between all the different modes and settings as well as programming of the AGC. The AGC can be [set-up](#) to start in different modes to the preferences of the driver. These settings will be saved so that the AGC starts in the same mode every time.

When started.

The AGC will always start in automatic mode. The driver may set the AGC to start in Drive or Drive Economy mode by setting the [Drive Econo Start-up Selection](#) bit under programming.

Selecting between Drive and Drive Economy mode.

The driver may select between Drive and Drive Economy mode by pressing the up-shift button once. The LED will toggle indicating which mode is activated. The Function LED is On for Drive Mode and Off for Drive Economy Mode. When the driver is at high RPM's in Drive Economy and press the up-shift button the Function LED will go on but the AGC will not shift to 3rd gear until a safe RPM level is reached.

Selecting Tiptronic Mode.

To go in Tiptronic Mode, press the Down-shift button once. The AGC will go to Tiptronic mode and freeze in the current gear. No gearshift will take place. The green LED will flash indicating Tiptronic mode. It may be in Tiptronic Manual or Tiptronic Auto depending on the [Tiptronic Auto Selection](#) bit under programming. To shift gears the driver may press the Up-shift or Down-shift button once, for each gear shift. Keep in mind that a 3 second time limit between selections is enforced to give the gearbox time to do the manual shift action. There is also a rev limit placed on shifts to protect the gearbox from over revving. This means that if the engine RPM are too high, the AGC will not allow a lower gear to be shifted. The same goes for up-shift. If RPM's are too low, higher gears will not be shifted.

Selecting Automatic Mode.

To go back to Automatic mode, press and hold the Up-shift button for 4 seconds. After the 4 seconds the LED will stop flashing and go to the same state as it was in automatic mode. This means that Tiptronic will not affect the state of the Automatic mode. If it was in Drive Economy it will go back to Drive Economy mode.

Selecting Automatic Towing Mode.

This mode will always start in de-activated mode when the AGC is switched on. To go to Automatic Towing mode, press and hold the Up-shift button for 4 seconds. After the 4 seconds the Function LED will flash once

and Towing mode is activated. To de-activate Towing mode while driving, press and hold the Up-shift button again for 4 seconds. After the 4 seconds the LED will flash twice and Towing mode is de-activated. It will also be de-activated when the car is switched off. If the Function LED is on in Drive mode, it will flash *off* once or twice. If the LED is off in Drive Economy mode it will flash *on* once or twice. This setting can also be adjusted in Mode 3 [TPS Load Setting](#) %

Operating Instructions – Remote Buttons

The driver has two buttons on a key ring remote and one Function LED to select between all the different modes and settings as well as programming of the AGC. The AGC can be [set-up](#) to start in different modes to the preferences of the driver. These settings will be saved so that the AGC starts in the same mode every time.

When started.

The AGC will always start in automatic mode. The driver may set the AGC to start in Drive or Drive Economy mode by setting the [Drive Econo Start-up Selection](#) bit under programming.

Selecting between Drive and Drive Economy mode.

The driver may select between Drive and Drive Economy mode by pressing the LOCK button once. The LED will toggle indicating which mode is activated. The Function LED is On for Drive Mode and Off for Drive Economy Mode. When the driver is at high RPM's in Drive Economy and press the LOCK button the Function LED will go on but the AGC will not shift to 3rd gear until a safe RPM level is reached.

Selecting Tiptronic Mode.

To go in Tiptronic Mode, press the UNLOCK button once. The AGC will go to Tiptronic mode and freeze in the current gear. No gearshift will take place. The green LED will flash indicating Tiptronic mode. It may be in Tiptronic Manual or Tiptronic Auto depending on the [Tiptronic Auto Selection](#) bit under programming. To shift gears the driver may press the LOCK or UNLOCK button once, for each gear shift. Keep in mind that a 3 second time limit between selections is enforced to give the gearbox time to do the manual shift action. There is also a rev limit placed on shifts to protect the gearbox from over revving. This means that if the engine RPM are too high, the AGC will not allow a lower gear to be shifted. The same goes for up-shift. If RPM's are too low, higher gears will not be shifted.

Selecting Automatic Mode.

To go back to Automatic mode, press the LOCK button twice with a half second interval. The LED will stop flashing and go to the same state as it was in automatic mode. This means that Tiptronic will not affect the state of the Automatic mode. If it was in Drive Economy it will go back to Drive Economy mode.

Selecting Automatic Towing Mode.

This mode will always start in de-activated mode when the AGC is switched on. To go to Automatic Towing mode, press the LOCK button twice with a half second interval. The Function LED will flash once and Towing mode is activated. To de-activate Towing mode while driving, press the LOCK button twice with a half second interval. The LED will flash twice and Towing mode is de-activated. It will also be de-activated when the car is switched off. If the Function LED is on in Drive mode, it will flash *off* once or twice. If the LED is off in Drive Economy mode it will flash *on* once or twice. This setting can also be adjusted in Mode 3 [TPS Load Setting](#) %

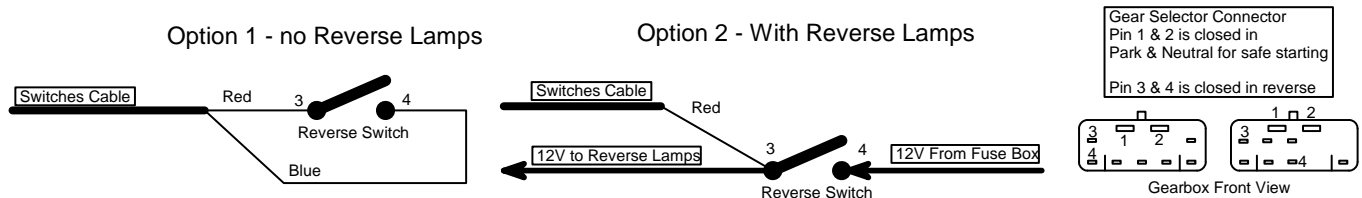
Notes on the Lexus Gearbox.

Please note that the gearbox was designed with free running clutches in 1st and 2nd gear, which will disengage the drive train in neutral when the throttle is released and the engine runs against the drive train. It is not a failure of the electronics. If you need the 1st gear as a brake during 4x4 downhill riding, put the AGC in Tiptronic 1st gear, and pull the lever further to 1st gear position. Note again that 1st and 2nd occupies the same position and the AGC will shift automatically between each other. If 2nd is selected by the AGC, the free

running clutch will be activated again. Only first gear in position 1 on the lever has engine brake when decelerating down a steep incline.

Reverse Selection

This input will force the gearbox into 4th gear which is required for reverse. The line pressure solenoid will function as normal. The switch can be on the gear lever or on the gearbox as in the drawing. It is essential that this switch is connected for correct gearbox operation. The level of the switch can be selected in mode 10 sub mode 6. It may be 12V from the reverse light or a ground contact. (Note that if the 12V selection is used, ensure that the reverse lamps are operating. If no lamps are present the AGC will activate reverse and stay in 4th gear).



1st or 2nd gear pull-off selection (No Speed Sensor connected)

The Lexus gearbox has two free running clutches in 1st and 2nd gear. The problem is that when you decelerate and the AGC select 2nd gear, the revs will fall back to idling RPM's. As there is no speed sensor indicating to the AGC that the car is not standing still, the AGC will gear down to 1st gear. If you did not stop the car will rev high and then select 2nd gear causing a lack of power and a jolt. To prevent this, the AGC will keep the gear selection in 2nd. The difference in pedal progression will select 1st or stay in 2nd. Accelerating more gently till the engine RPM is above 1300 will keep 2nd gear. Then normal operation is commenced. A slightly more aggressive acceleration will activate 1st gear. This sensitivity can be adjusted in mode 10 sub mode 5.

Set-Up Parameters

<u>Description</u>	<u>No of Digits</u>	<u>Units</u>
1. TPS Calibration		
2. TPS Correction Value %	3	50 – 150 %
3. TPS Towing setting %	3	50 – 150 %
4. Automatic Max RPM Change	2	100 Rpm Divisions (0-9900 Rpm)
5. Tiptronic Max RPM Change	2	100 Rpm Divisions (0-9900 Rpm)
6. RPM Correction Value %	3	50 – 150 %
7. Drive Econo Start-up Selection	1	1 = Drive; 2 = Drive Econo
8. Tiptronic Auto Selection	1	1 = Auto; 2 = Manual
9. TPS Calibration Test		Close & Open = off; Partially pressed = On
10. Set-up & Diagnostic Mode	1	
1 = LED Diagnostic Display;		
2 = LED Gear Selection Display;		
3 = Restore Factory Defaults;		
4 = Number of Pulses / RPM (2 Digits);		
5 = 1 st gear speed selection (mode 1 & 2) or 1 st or 2 nd Gear sensitivity % at pull-off (mode 3)		
6 = Reverse gear switch voltage level, 1 = 0V; 2 = 12V when reverse is selected.		
7 = Speed Sensor selection, 1 = 32 Pulse / Revolution, 2 = 4 Pulse / Revolution, 3 = No Speed Sensor		

Programming the AGC

To program the AGC the user may use one of two methods. A magnet on the magnetic switch at the front of the enclosure, or the down-shift button. Both methods will use the green LED on the enclosure and the Function LED on the dashboard. If the unit is installed without Tiptronic switches you will have to use the magnet method. You will also not be able to use all the functions of the AGC.

Magnet method.

To go into programming mode, hold a magnet across the two LED's on the enclosure. Switch the ignition on. The green LED will come on. Take the magnet away and the green LED will go off. (If not, then the magnet is not placed correctly with the north and south poles from side to side. Switch off, rotate the magnet 90° and try again). You are now in Programming Mode, mode zero. To activate Modes 1 to 10, tap the magnetic switch with the magnet in the same place for the same number as the mode you want to access. Example 3 taps for mode three. The AGC will then flash the data which is programmed in that mode, back to the user. The data may consist of one, two or three digits. If it has two digits, it will flash one digit and then the other with a space in between. The AGC then awaits input from the user. You enter one digit at a time, and the AGC will confirm this by flashing the exact number that you entered, back. Then enter the following digit. When the AGC finishes confirming the last digit, it will save the data and go back to mode zero. To enter a zero, enter 10 or more. A zero is flashed back as two fast flashes of the green LED. The next mode can now be accessed. Any mode can be accessed at any given order. Saved data will not be lost when the power goes off. If at any stage, you loose track of where you are with programming, switch the power off and start over. The following paragraphs will explain the different modes. To get out of the programming mode, switch the AGC off and on without the magnet. The AGC will not operate the gearbox when it is in Program Mode. Note that when TPS calibration is selected with mode 1, it will read the closed throttle value in the same time. Do not press the throttle when activating mode 1.

Down-Shift method.

To go into programming mode, press and hold the down-shift button. Switch the ignition on. The Function LED will come on. Release the button and the LED will go off. You are now in Programming Mode, mode zero. To activate Modes 1 to 10, press the down-shift button the same number of times as the mode you want to access. Example 3 presses for mode three. The AGC will then flash the data which is programmed in that mode, back to the user. The data may consist of one, two or three digits. If it has two digits, it will flash one digit and then the other with a space in between. The AGC then awaits input from the user. You enter one digit

at a time, and the AGC will confirm this by flashing the exact number that you entered, back. Then enter the following digit. When the AGC finishes confirming the last digit, it will save the data and go back to mode zero. To enter a zero, press the down-shift button 10 times or more. A zero is flashed back as two fast flashes of the LED. The next mode can now be accessed. Any mode can be accessed at any given order. Saved data will not be lost when the power goes off. If at any stage, you loose track of where you are with programming, switch the power off and start over. The following paragraphs will explain the different modes. To get out of the programming mode, switch the AGC off and on without pressing the down-shift button. The AGC will not operate the gearbox when it is in Program Mode. Note that when TPS calibration is selected with mode 1, it will read the closed throttle value in the same time. Do not press the throttle when activating mode 1.

Description and Programming of the Different Modes

Mode 0 – Program Mode

From this mode all the other modes can be selected. When you quit any mode the program will go back to Mode 0. Then the next mode can be activated without the need to switch off the ignition. To go out of program mode to normal operation mode, switch the ignition off and start the vehicle. No gear shift operation will take place in program mode.

To Activate

Press and hold the Down-Shift button. Switch the Ignition On. The Green LED will come ON. Now release the Down-Shift button. The Green LED will go off. You are now in Mode 0 (Program Mode).

Mode 1 - TPS Throttle Calibration (No default value – It must be set on the vehicle)

This mode will calibrate the TPS voltage for closed and open position in the AGC. Make sure the throttle is release or in closed position. When Mode 1 is selected the LED will flash once. The AGC will record closed throttle position. Now make sure the throttle is fully pressed and in the full open position. Enter the switch once and the LED will flash twice. The AGC will record the value and proceed to TPS throttle calibration test mode, to verify if the throttle is working correctly. This is the same as for Mode 9.

The Green Mode LED on the dashboard will be off. If the throttle is pressed slightly the LED will come on. Then press the throttle in completely. The LED will go off. If the throttle is released slightly the LED must come on again. Calibration is successful. To get out of this mode tap the switch once and the program goes to mode zero.

To Set

Start in Mode 0. Release the throttle. Enter 1. The LED will flash once. Press throttle to the floor. Enter 1. The LED will flash twice. Release the throttle slightly. The LED must come on. Release the throttle completely. The LED must go off. Press the throttle slightly. The LED must come on. Enter 1 to go back to Mode 0.

Mode 2 – TPS Correction % (Three Digits) (Default is 100)

(Auto mode only) This setting will alter the throttle position for gear changes. It is mainly used for different drive train ratios. If the AGC switches too early to a lower gear (too sensitive) when pressing the throttle, this setting can be reduced (90%) to make the TPS less sensitive. This will make the gear changes occur at deeper throttle position. If the AGC switches too late to a higher gear (not sensitive enough) when pressing the throttle, this setting can be increased (110%) to make the TPS more sensitive, so that gear changes can occur at less throttle position. This Setting can be adjusted between 50% and 150%.

To Set

Start in Mode 0. Enter 2. The LED will flash three digits with a delay between them. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. Enter your 3rd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. Remember to enter the leading zero if your value is below 100%.

Mode 3 – TPS Towing Mode Load Setting % (Three Digits) (Default is 70)

(Auto mode only) This setting will alter the throttle position for gear changes during heavy load conditions. It is mainly used when the vehicle is carrying or pulling a heavy load. Under load the throttle is normally pressed

in deeper thus making the AGC more sensitive and switching incorrectly. This setting will make the TPS less sensitive so that normal operation occurs at deeper throttle position. This setting will reduce (70%) the TPS voltage. The setting can be adjusted between 50% and 150%.

To Set

Start in Mode 0. Enter 3. The LED will flash three digits with a delay between them. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. Enter your 3rd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. Remember to enter the leading zero if your value is below 100%.

Mode 4 – Automatic Maximum RPM Change (Two Digits) (Default is 55)

(Auto mode only) This setting will force the AGC to change to the next gear when this RPM is reached during acceleration. This can be used for a rev limiter. Note that 1st to 2nd gear will change 500 RPM below this setting. This value is multiplied by 100 RPM's which means 55 = 5500 RPM's.

To Set

Start in Mode 0. Enter 4. The LED will flash two digits with a delay between them. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Mode 5 – Tiptronic Maximum RPM Change (Two Digits) (Default is 60)

(Tiptronic Auto mode only) When the [Tiptronic Auto selection](#) is 1, this setting will force the AGC change to the next gear when this RPM is reached during acceleration. Note that 1st gear to 2nd will change at 500 RPM's less than the setting. The reason is that with the engine power and shift time between gears, the engine increase too much in RPM. This value is multiplied by 100 RPM's which means 55 = 5500 RPM's.

To Set

Start in Mode 0. Enter 5. The LED will flash two digits with a delay between them. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Mode 6 – RPM Correction % (Three Digits) (Default is 100)

(Auto mode only) This setting will alter the RPM's for gear changes. It is mainly used for different engines on the Lexus gearbox. If the AGC switches too early to higher gears when doing a light throttle pull-off, this setting can be reduced (90%) to make the RPM's less sensitive so that gear changes can occur at higher RPM's. If the AGC switches too late to higher gears, this setting can be increased (110%) to make the RPM's more sensitive so that gear changes can occur at lower RPM's. The setting can be adjusted between 50% and 150%. For low revving engines this value should be increased above 100%.

To Set

Start in Mode 0. Enter 6. The LED will flash three digits with a delay between them. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. Enter your 3rd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. Remember to enter the leading zero if your value is below 100%.

Mode 7 - Drive Econo Start-up Selection (One Digit)(Default is 2)

This setting will let the user customise the AGC to which start-up mode he wants as the default.

If it is 1, the AGC will always start in Auto Drive mode, which means gearshift will only be automatic up to 3rd gear. If it is 2, the AGC will always start in Auto Drive Economy mode, which means gearshift will be automatic up to 4th gear. This is also the setting that must be used if the Tiptronic buttons are not installed. Note that this mode can easily be changed during driving by pressing the Up-Shift button once.

To Set

Start in Mode 0. Enter 7. The LED will flash one digit. Enter a 1 or 2. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Mode 8 - Tiptronic Auto/Manual Selection (One Digit)(Default is 1)

This setting will select between Tiptronic Manual (2) or Tiptronic Auto (1) mode. In Tiptronic Manual, the user selects a gear and the AGC will keep that gear until another gear is selected. In Tiptronic Auto mode, the

AGC will shift down when the RPM's fall below a certain value. It will also shift up if the Tiptronic Maximum RPM is reached. Between these limits the gear selection will not be altered.

To Set

Start in Mode 0. Enter 8. The LED will flash one digit. Enter a 1 or 2. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Mode 9 - TPS Calibration Test Mode

This mode will verify if the throttle was calibrated correctly. The green LED on the enclosure and the Function LED will be off. If the throttle is pressed slightly the LED will come on. Then press the throttle in completely. The LED will go off. If the throttle is released slightly the LED must come on again. This means calibration is successful.

To Check

Start in Mode 0. Press throttle to the floor. Enter 9. The LED must be off. Release the throttle slightly. The LED must come on. Release the throttle completely. The LED must go off. Press the throttle slightly. The LED must come on. Enter 1 to go back to Mode 0.

Mode 10 – Set-up & Diagnostic Mode (Default is 1)

Due to the large number of parameters on the AGC, mode 10 is used with a **Sub-Mode** menu. To activate any sub-mode, first enter 10, wait for diagnostic indication and then enter the sub-mode number. When mode 10 is selected, it will flash 1 or 2 times indicating the LED diagnostic display mode. Enter 1 or 2 to change the LED diagnostic modes or 3 to 7 to activate the different Sub Modes.

Sub-Mode 1– Normal Operation (One Digit)(Default is 1)

If it is set to 1, the LED's displays the following:

- a. The Yellow LED on the AGC is the Power. Always on when the Ignition is on.
- b. Green LED on the AGC displays the RPM or Speed Sensor pulses. If reverse is selected, the speed pulses are displayed. the LED flashes when the vehicle rolls backwards and off when it stands still. Note that the reverse switch must be operational to activate this diagnostic mode. If any other gear on the lever is selected, the LED will display the RPM pulses divided by 2. It will flash when the engine is running and off when the engine is not running. It is divided to make it easier to see it flash.
- c. The Red LED on the dashboard or shifter will be on when the lock-up clutch is engaged and off when not engaged.
- d. The Green LED on the dashboard or shifter will indicate Drive (on), Drive Economy (off) or Tiptronic mode (Flash).

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter a 1. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Sub-Mode 2 – Diagnostic Mode (One Digit)(Default is 1)

If it is set to 2, then the LED's displays the following:

- e. The Yellow LED on the AGC is the Power. Always on when the Ignition is on.
- f. Green LED on the AGC is on when reverse is selected and off for all other positions of the shifter.
- g. The Red LED on the dashboard or shifter will be on in 1st and 2nd gear. This will help the installer with fault finding to see when the AGC activates this solenoid valve.
- h. The Green LED on the dashboard or shifter will be on in 2nd and 3rd gear. This will help the installer with fault finding to see when the AGC activates this solenoid valve.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter a 2. The LED will flash the same value back. The value is saved and the program will go back to Mode 0.

Sub-Mode 3 – Restore Defaults (One Digit)

If 3 is entered all the defaults values will be restored as displayed in above modes.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter 3. The LED will flash the same value back. All default values are restored and the program will go back to Mode 0.

Sub-Mode 4 – Pulses/RPM (Two Digit)(Default is 04)

If 4 are entered, the number of Pulses / RPM can be adjusted for different engines or sensors. This can be set from 1 to 99 pulses per RPM. Default is set at 4 for V8 engines.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter 4. The LED will flash two digits. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. Remember to enter the leading zero if your value is below 10.

Sub-Mode 5 (Two Digit)(Default is 15 for Speed sensor or 56 with no Speed Sensor)

Mode 5 with Speed Sensor connected is to adjust the road speed at which the AGC will gear down from 2nd to 1st gear. The default value is 15. The higher the value the higher the road speed for will be for this shifting to take place.

Mode 5 without Speed Sensor connected is to adjust the pull-off sensitivity gear down from 2nd to 1st gear when the car is stopped. A higher % will make the kick down more sensitive. If you go around a corner without stopping the gear should stay in 2nd. This will require a more gently press on the accelerator pedal till the RPM's are above 1300. The selection is determined by the difference in accelerator pedal progression. At pull-off the pedal is normally pressed a bit faster than when accelerating out of a corner. The AGC will detect this difference and choose the correct gear. Default is set at 56.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter 5. The LED will flash two digits. Enter your 1st digit. The LED will flash the same value back. Enter your 2nd digit. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. Remember to enter the leading zero if your value is below 10.

Sub-Mode 6 – Reverse Logic Selection (One Digit)(No Default)

The Reverse switch level will simplify the wiring. If you have a switch on the gear lever only for this AGC, use ground level and enter a 1 in this mode. If you have reverse lights connected to this switch, connect the red wire to the reverse light side so that when the lights are off the input will earth through the reverse lamps. Then enter 2 in this mode to set a level of 12 volt when reverse is selected. Disadvantage is that when both reverse lights fail, you will create a reverse signal which will force the gearbox in 4th gear. You can install an optional small lamp in the lever or dashboard for reverse indication which will also bring the signal to ground when not in reverse. There is no default value for this mode. The last setting will stay unchanged when restoring defaults.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter 6. The LED will flash one digit. Enter a 1 or 2. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. This value will not change with Restore Defaults.

Sub-Mode 7 – Speed Sensor Selection (One Digit)(No Default)

This mode will select the kind of speed sensor connected to the AGC. Some gearboxes have a hall sensor which is an aluminium box on the tail piece of the gearbox. It has three wires connected to it. It has a gear with 32 teeth inside the gearbox. Enter a 1 for this type of sensor. Other gear boxes have a black magnetic sensor with a 2 pin connector. It normally has 4 lobes which the sensor detects. Enter a 2 for this type of sensor. The sensor does not determine the setting but rather the number of teeth. Note that the cables for the different sensor vary and must be ordered accordingly. This is due to the hall sensor that use 12V and the magnetic sensor that is connected to 5V. If no Speed Sensor is connected, enter a value of 3 in this mode. There is no default value for this mode. The last setting will stay unchanged when restoring defaults.

To Set

Start in Mode 0. Enter 10. The LED will flash one digit. Enter 7. The LED will flash one digit. Enter a 1, 2 or 3. The LED will flash the same value back. The value is saved and the program will go back to Mode 0. This value will not change with Restore Defaults.

Setting Up the Gearbox AGC

1. Start by restoring the default settings. Go to Mode 10 and enter 3.
2. Ensure that the setting “Pulse / RPM” in Mode 10 sub-mode 4 for your application are correct.
3. Ensure that the setting for the reverse input level Mode 10 sub-mode 6 is correct.
4. Select the Speed Sensor type of the gearbox in Mode 10 sub-mode 7.
5. Set the limit settings in [Mode 4 & 5](#) for max RPM changes.
6. Set the preferred start-up settings in [Mode 7 & 8](#) to the customer’s choice.
7. Do a TPS calibration in [Mode 1](#) and ensure correctness of operation.
8. Do a slow take-off (light throttle) and adjust [Mode 6](#) till the gear changes occur at the desired RPM’s.
9. Now drive on the open road and adjust Mode 2 to ensure that kick down occur at the correct throttle depression. Also ensure that the gearbox does not hunt under normal driving.
10. If no Speed sensor is connected, stop the car and pull off from stand-still in a normal manner. Adjust Mode 10 sub-mode 5 to ensure that the AGC select 1st gear when pulling off. Now slow down and pull off without stopping completely as if you go around a corner in 2nd gear. Press the throttle gently to accelerate. Feel the sensitivity between staying in 2nd gear and kick-down to 1st. Remember this setting effects pull off mode. Find a happy balance for the customer’s style of driving.
11. If the Speed Sensor is connected, put the AGC in diagnostic mode 2 (mode 10 sub-mode 2) to see the gear changes on the two LED’s. Pull off until the AGC select 2nd gear. Now release the throttle letting the vehicle slow down. Check the road speed at which the AGC gear back to 1st gear. If it is too high decrease the value in Mode 10 sub-mode 6. It should be around 10 Km/h.
12. Put the AGC back to diagnostic mode 1.

Faultfinding & Troubleshooting

1. The AGC does not come on when the ignition is switched on.
 - a. No 12V on the red wire of the 12 way connector
 - b. No earth on the black wire of the 12 way connector
2. The TPS does not [calibrate](#)
 - a. Faulty wiring. Check that a 5V supply and earth are present on the TPS and connected to the correct pins. The 5V is supplied by the EFI system. Measure the volts on pin 1 of the 12 way connector. It should vary between 1V (closed) and 4V (open) when pressing the pedal.
 - b. In case of the standalone AGC, the gearbox AGC will supply the 5 volt. The rest is the same as above.
3. The gearbox stay in 1st gear
 - a. No RPM signal from the EFI. Put LED indication in Diagnostic Mode (Mode 10 enter 1) and see if the Green LED on the AGC flicker if the engine idle.
 - b. Faulty setting for “Pulse / RPM” in Mode 10.
4. Gearbox stay in 4th gear
 - a. Reverse input stays active
 - b. Faulty setting for reverse input Mode 10 sub-mode 6.
 - c. No power on the brown wire of the 10 way connector
 - d. Faulty wiring on gearbox
5. The gearbox does not kick down and AGC hurry through gears
 - a. Faulty TPS [calibration](#) or wiring. Check point 2.
 - b. Faulty setting for “Pulse / RPM” in Mode 10

Safety Precautions

The following guidelines will ensure proper operation the first time. Failure to install equipment correctly may damage it or other equipment permanently. These failures will solely be the responsibility of the installer and no guarantees will be given by us. All equipment is tested before it leaves the factory. We accept no liability for malfunctioning of the equipment, or to injury that may result from installation or the use of the equipment. We also accept no liability for costs of traveling or transportation of the equipment or parts or vehicle recovery due to failures of any equipment. Please read the instructions and drawing and make sure you understand before you begin. ***Electronics is not DIY!***

Operator Safety

- Use only proper tools and products suited for auto installations. Sub standard products and installation procedures may cause failure to the equipment having your customer break down in dangerous areas.
- Use correct thickness of wire to carry the entire current requirement for that circuit. Too thin wires will heat up and may start a fire causing injury.
- Use fuses to protect each circuit separately. Joint circuits require large fuses which may heat and melt lesser circuits causing fires.
- Solder joints and cover with shrink sleeve to prevent loose connections which may cause fire.

Equipment Safety

- Mount the AGC inside the cab to prevent moisture from destroying it. Ensure that the enclosure is properly earthed to the body.
- Do not switch the power on before installation is complete. Test the solenoids on the gearbox to ensure correct resistance values.
- Never connect the trigger input wire to coil negative. This will destroy the AGC.
- Connect the fuse as per drawing to protect the AGC against solenoid failure.
- Do not wire the brown solenoid power wire on the 10 way connector to the Ignition switch or on the same circuit as the AGC or EFI. This will cause spikes which may damage or influence correct operation of equipment.
- Earth connections must be as short as possible to earth and not connected to a common earth wire which is connected at a distant ground.
- All screened wires must be connected only on one side, directly to ground on the body. Do not common it with other earth wires which are connected on a distant ground. This will induce spikes on the ground wires. Screen wires that go to sensors are normally grounded at the control box. Do not earth it on the engine side. Also try to connect the wires as close to the sensor as possible. Do not run sensor wires close to high tension leads as it will induce spikes to the AGC circuits.
- Make sure that the correct wire thickness is used for each power electronic component. If wires are common ensure that the wire is thick enough to carry the total current. Too thin wires will heat up and may start a fire. The same goes for relays. Be careful of cheap relays. They can seize and start a fire. Use 0.5mm^2 for every 5A of current.
- Check the relay Pin numbers as they differ in configuration. Putting in a wrong relay will damage the AGC.
- Solder each connection and use shrink sleeve rather than insulation tape. Cover connections and loose wires with PVC or pigtail sleeve rather than insulation tape.
- Ensure that all electronic settings are correct. Certain settings may damage equipment if not set to recommendations.
- Ensure a proper ground from battery negative to the body. This wire must be thick enough to carry the current of all the equipment in the car.