

SIL 04-TR-18
April, 2018
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SUBJECT: Service Calibration Configuration Restrictions and Guidance: FuelSense® 2.0

MODELS AFFECTED: 1000/2000/3000/4000 Series Product Families and TC10® Series Transmissions with Allison 5th Generation Controls

Introduction:

Effective April 19, 2018 with the release of Allison BCD 181 software, new restrictions will be in place that will limit the available calibration settings for new calibration configurations. This Service Information Letter (SIL) defines the calibration change allowances and restrictions for use in fielded vehicles, as well as FuelSense® 2.0 guidance when configuring or modifying a FuelSense® 2.0 calibration.

The new restrictions **prevent** the following for new calibration configurations:

- The installation of FuelSense® features when the FuelSense® parameter in the calibration is set to Disabled.
- The installation of FuelSense® 1.0 packages.
- The installation of Low Shift Speed settings outside of a FuelSense® 2.0 package. Low Shift Speed settings are defined as primary or secondary shift speeds that are more than 200 rpm below the governed speed calibration setting.

Prior to BCD 181 software, FuelSense® features (including Dynamic Shift Sensing, Neutral at Stop, and Acceleration Rate Management) have been available outside of a FuelSense® package, with a FuelSense® 1.0 package, or with a FuelSense® 2.0 package. With the release of BCD 181 software, the use of these features will require a FuelSense® 2.0 package, which is available for use at an additional cost. Restrictions may apply.



NOTE: FuelSense® 2.0 charges and restrictions may apply. For more information regarding FuelSense® 2.0 pricing, billing, and restrictions, please refer to TPPL 17-TPPL-08. For more information regarding the reflashing of TCMs with calibrations that contain a FuelSense® 2.0 package, refer to SIL 7-TR-17.

Service of Fielded Vehicles:

The following applies to TCMs in fielded vehicles with a calibration that has FuelSense® features and/or Low Shift Speeds without a FuelSense® package or with a FuelSense® 1.0 package:

- Can be serviced using the exact same calibration settings.
- Can be serviced with calibration changes unrelated to FuelSense® features, shift points, and shift schedules.

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- Can be serviced with calibrations that remove or reduce the FuelSense® features/package.
- Can be serviced with calibrations that increase the shift speed, if allowable.
- Can be serviced with calibrations that decrease the shift speed to a value that is within 200 rpm of the defined governed speed.
- **Cannot** be serviced with calibrations that add FuelSense® features or increase the FuelSense® package. If additional features are desired, a FuelSense® 2.0 calibration is required.
- **Cannot** be serviced with calibrations that decrease a shift speed setting to a value lower than 200 rpm below governed speed. The use of shift speeds lower than 200 rpm below the governed speed setting requires a FuelSense® 2.0 package.



NOTE: The FuelSense® package setting in the calibration may be modified in updated calibrations to allow for the service use of these BCD 181 restricted combinations.

Configuring a FuelSense® 2.0 Calibration:

FuelSense® 2.0 Package Selection:

Five (5) FuelSense® 2.0 packages are available, as shown in [Table 1](#).

Table 1. FuelSense® 2.0 Packages

Fuel Economy Feature	Available FuelSense® 2.0 Packages				
	FuelSense® 2.0	FuelSense® 2.0 Plus	FuelSense® 2.0 Max	FuelSense® 2.0 Natural Gas	FuelSense® 2.0 Natural Gas Plus
DynActive™ Shifting	Required	Required	Required	Required	Required
Dynamic Shift Sensing (same as FuelSense® 1.0 feature)	Optional	Optional	Optional	Optional	Optional
Neutral at Stop Standard, or Premium w/ Optional Coast Mode	Not Allowed	Required* (Premium** or Standard)	Optional* (Premium** or Standard)	Not Allowed	Required* (Premium** or Standard)
Enhanced Acceleration Rate Management	Not Allowed	Not Allowed	Required	Not Allowed	Not Allowed
* Neutral at Stop not applicable to Second-Gear-Start schedules and 7-speed models in the 3000 and 4000 Series Product Families. ** NAS-Premium required for availability of Optional Coast Mode.					

All five (5) FuelSense® 2.0 Packages are available in the following 1000/2000/3000/4000 vocational Series: B, T, Highway Series (HS), Rugged Duty Series (RDS), Pupil Transport/Shuttle Series (PTS), Specialty Series (SP), Off Road Series (ORS), International, Motorhome Series (MH), and Truck RV Series (TRV). Only the base FuelSense® 2.0 package is available for use with Emergency Vehicle Series (EVS) model transmissions. Only the Plus and Max FuelSense® 2.0 packages are available for use with TC10® Tractor Series transmissions. FuelSense® 2.0 packages are NOT available for use with Oil Field Series (OFS) model transmissions.

For more information regarding FuelSense® 2.0 packages, refer to the Allison Hub (<https://hub.allisontransmission.com/>), Engineering, Tech Data, Allison 5th Generation Controls – Controls Installation Manual Section A-1: Controls System Familiarization (Section 5.4 – FuelSense® Feature Packages) (<https://sap.allisontransmission.com/extranet/techdata/DownloadTechdata?Dir=extranet&FileToGet=5GCMA-1.pdf>).

FuelSense® 2.0 Features and Calibration Settings:

FuelSense® 2.0 offers the potential for improved fuel economy. FuelSense® 2.0 features include DynActive™ Shifting, Dynamic Shift Sensing, Neutral at Stop Standard, Neutral at Stop Premium, and Enhanced Acceleration Rate Management. Table 2 shows the available calibration settings for the FuelSense® parameter.

Table 2. Summary of Available Calibration Settings for the FuelSense® Parameter

Calibration Parameter	Available Answers	Default Value	Description
FuelSense®	<ul style="list-style-type: none"> – Disabled ¹ – FuelSense® 2.0 ^{1,2} – FuelSense® 2.0 Natural Gas ^{1,2} – FuelSense® 2.0 Plus ^{2,3} – FuelSense® 2.0 Natural Gas Plus ^{1,2,3} – FuelSense® 2.0 Max ^{2,3} 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Disabled TC10: <ul style="list-style-type: none"> – FuelSense® 2.0 Max 	The FuelSense® 2.0 package defines the available FuelSense® calibration features and allows the use of Low Shift Speeds. Only select a Natural Gas package when a Natural Gas engine is used.
¹ Not available for TC10® TS transmissions ² Not available for OFS models ³ Not available for EVS models			

DynActive™ Shifting:

DynActive™ Shifting is a new continuously-variable method of shift scheduling. Instead of using a shift point table with defined shift points (such as 2000 rpm S1 performance), DynActive™ Shifting chooses the most efficient shift point based on the current environmental and vehicle conditions. DynActive™ achieves the best fuel economy for a specified level of performance. Vehicle information such as torque, speed, grade, mass, etc. are constantly analyzed to pick the most efficient shift speed. DynActive™ Shifting is required in all FuelSense® 2.0 packages.

DynActive™ Shifting can be enabled in primary mode only, secondary mode only, or both. DynActive™ calibration settings will be used to define the shift point limits. The Engine Governed Speed calibration setting is used for the upper engine speed limit. The DynActive™ Minimum Engine Speed Operation calibration setting is used for the lower engine speed limit during DynActive™ operation. The economy bias settings define the amount of economy desired during DynActive™ operation. 100% economy bias will provide the lowest available shift points to keep the engine speed just above the DynActive™ Minimum Engine Speed Operation calibration setting value. 0% economy bias will provide performance shifting using the Engine Governed Speed setting as the upper limit of available shift points. Table-based shift schedules must also be defined in the calibration, and will be used in special conditions where DynActive™ is overridden, such as during ABS, driver preselects, engine brake operation, etc.

Table 3 summarizes the parameters required to configure DynActive™ Shifting, the available answers for each parameter, default values, and parameter description.

Table 3. Summary of DynActive™ Calibration Parameters and Available Settings

Calibration Parameter	Available Answers	Default Value	Description
DynActive™ Shifting	<ul style="list-style-type: none"> – Disabled – Enabled in Both Primary and Secondary Modes – Enabled in Primary Mode Only – Enabled in Secondary Mode Only 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Disabled TC10: <ul style="list-style-type: none"> – Enabled in Both Primary and Secondary Modes 	DynActive™ Shifting allows the TCM to calculate the ideal shift pattern based on a set of user selected criteria and environmental and vehicle conditions. DynActive™ Shifting can be enabled in primary mode only, secondary mode only, or both. If disabled, table-based shift schedules will be used. DynActive™ Shifting cannot be set to Disabled if a FuelSense® 2.0 package is selected.
Primary Mode: DynActive™, Flat Ground Economy Bias*	0-100%	Refer to Table 4	This setting adjusts the desired economy when the vehicle is operating on level ground. A setting of 100% provides maximum economy by using the lowest available shift points. A setting of 0% provides maximum performance by using the highest available shift points.
Primary Mode: DynActive™, Grade Economy Bias*	0-100%	Refer to Table 4	This setting adjusts the desired economy when the vehicle is operating on grades. A setting of 100% provides maximum economy by using the lowest available shift points. A setting of 0% provides maximum performance by using the highest available shift points.
Primary Mode: DynActive™, Minimum Engine Speed Operation (RPM)*	1000/2000 Series: <ul style="list-style-type: none"> – 1000-1500 rpm in increments of 50 rpm** 3000/4000 Series/TC10: <ul style="list-style-type: none"> – 900-1500 rpm in increments of 50 rpm 	1000/2000 Series: <ul style="list-style-type: none"> – 1000 rpm** 3000/4000 Series/TC10: <ul style="list-style-type: none"> – 900 rpm 	This setting defines the minimum engine speed that is allowed during DynActive™ operation. Increasing this value will result in higher shift points during DynActive™ operation, which will likely impact fuel economy.
* Similar parameter is available for Secondary Mode operation. ** 900 rpm is the minimum available setting and default setting for the 1000/2000 Product Series Family xFE model transmission.			

[Table 4](#) defines the default values, as well as values that can be used to target a blend between performance/economy or to bias the shift points more toward fuel economy for each Vocational Model family. Values are defined for the Flat Ground Economy Bias and Grade Economy Bias calibration settings.

Table 4. Economy Bias Settings by Vocational Model

Vocational Model Family	Flat Ground Economy Bias			Grade Economy Bias		
	Blend Between Performance and Economy	Default Value	Biased Toward Fuel Economy	Blend Between Performance and Economy	Default Value	Biased Toward Fuel Economy
Highway Series (HS)	25%	70%	70%	25%	25%	50%
Rugged Duty Series (RDS)	20%	60%	60%	25%	25%	40%
Pupil Transportation/ Shuttle Series (PTS)	25%	70%	70%	25%	25%	50%
Emergency Vehicle Series (EVS)	10%	0%	30%	15%	0%	25%
Bus Series (B)	35%	80%	80%	25%	25%	50%
Torqmatic Series (T)	25%	60%	60%	35%	50%	75%
Tractor Series (TS)	35%	80%	80%	30%	50%	60%
International Models (INT)	35%	60%	60%	35%	50%	75%
Motorhome Series (MH)	20%	40%	50%	25%	25%	50%
Truck-Based Recreational Vehicle (TRV)	20%	40%	50%	25%	25%	50%
Specialty Series (SP)	20%	25%	40%	15%	25%	40%
Off Road Series (ORS)	20%	25%	40%	15%	25%	35%

DynActive™ Calibration Setting Selection:

If an end user or fleet is interested in installing FuelSense® 2.0 with DynActive™ Shifting technology, first determine the amount of performance/economy that is desired by the customer. If the customer is interested in increasing fuel economy, it is recommended that the calibration initially be set up with bias settings between those defined as a “Blend Between Performance/Economy” and “Biased Toward Fuel Economy” in [Table 4](#). Higher economy bias values provide more fuel economy, and likely less vehicle performance than lower bias settings. If the user is mainly interested in performance shifting with DynActive™, then a low bias setting can be used to maximize the performance (increase the shift points), while still using DynActive™ shifting logic instead of table-based shift schedules during normal driving operation. To determine DynActive™ settings equivalent to a specific table-based shift schedule, see the following section called “iSCAAN Selection and Evaluation of DynActive Settings” for more information.

Using the default DynActive™ Minimum Engine Speed settings in Table 3 will maximize fuel economy. Higher DynActive™ Minimum Engine Speed values will result in higher shift points, which may negatively impact fuel economy. Natural gas engines will likely require higher minimum engine speed settings for acceptable engine transient response. Consult the engine manufacturer for recommended minimum engine speed settings for use with DynActive™ Shifting.

iSCAAN Selection and Evaluation of DynActive™ Settings:

iSCAAN (Allison System for Computerized Application Analysis), which is the Allison vehicle performance analysis tool, can now be used to evaluate the full throttle performance of a vehicle using DynActive™ Shifting. iSCAAN can also define the DynActive™ flat ground bias setting that is equivalent to an Allison table-based shift schedule. iSCAAN is available on the Allison Hub (<https://hub.allisontransmission.com/>) to approved users. Each distributorship has at least one approved iSCAAN user within their sales organization. System inputs include vocation, engine information, transmission information, shift points, chassis information, etc. iSCAAN outputs include a performance evaluation of the vehicle, transmission rating evaluation, converter selection evaluation, etc.

After the transmission and torque converter have been specified in the iSCAAN run, the shift schedule selection screen will appear. iSCAAN will pre-populate the Flat Ground Economy Bias to show the default value defined in Table 4. iSCAAN has the capability of generating a matrix that shows the equivalent flat ground economy bias setting for each table-based shift schedule available for the selected transmission model. The values shown in this table will vary by engine, transmission model, etc. Figure 1 shows an example of the iSCAAN-generated Economy Bias Matrix.

		Shift Strategy								
		S1/S5	S2/S6	S3/S7	S4/S8	S9	SA/SB	SC/SD	Fixed	Fixed 2
Shift Speed	1200	68	68	68	68	76	72	68	68	68
	1300	68	68	68	68	76	72	68	68	68
	1400	63	63	63	63	76	63	63	63	63
	1500	54	60	60	60	76	54	60	54	54
	1600	38	46	49	54	70	38	49	38	38
	1700	21	34	32	50	57	21	32	21	21
	1750	14	29	25	50	57	14	25	14	14
	1800	10	21	19	47	55	10	19	10	10
	1900	1	11	9	33	48	1	9	1	1
	1950	0	7	6	27	44	0	6	0	0
	2000	0	3	4	21	37	0	4	0	0
	2100	0	0	1	11	24	0	1	0	0

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Figure 1. Example of the iSCAAN-Generated DynActive™ Economy Bias Matrix

The iSCAAN user can select either FuelSense® 2.0 with DynActive™ Shifting or a table-based shift calibration for use in the vehicle performance evaluation. If FuelSense® 2.0 is selected, the Flat Ground Economy Bias setting that is selected will be used for the vehicle performance evaluation. Several iSCAAN runs can be submitted with varying bias settings to review the impact on vehicle performance.

Additional information and guidance is available on the Allison Hub (<https://hub.allisontransmission.com/>) under Engineering, iSCAAN, Help or by contacting the iSCAAN help desk (iscaanhelp@allisontransmission.com).

DynActive™ Calibration Setting Modification:

Once the FuelSense® 2.0 calibration settings are selected and loaded into the TCM using Allison TCM Reflash™, the DynActive™ economy bias settings can be modified using Allison DOC® Premium or Allison DOC® Fleets (FuelSense®). Allison DOC® Premium users can increase or decrease the bias settings in the calibration to provide

the customer with the desired level of economy. Refer to SIL 27-TR-17 and Allison DOC® User Guide (version 2017.4 and later) for parameter trimming capabilities.

Allison DOC® cannot be used to modify the FuelSense® package, the DynActive™ setting (primary, secondary, or both), or the minimum engine speed setting. A new calibration is required for these modifications.



NOTE: FuelSense® 2.0 charges and restrictions may apply. For more information regarding FuelSense® 2.0 pricing, billing, and restrictions, please refer to TPPL 17-TPPL-08. For more information regarding the reflashing of TCMs with calibrations that contain a FuelSense® 2.0 package, refer to SIL 7-TR-17.

For more information regarding DynActive™ Shifting, refer to the Allison Hub (<https://hub.allisontransmission.com/>), Engineering, Tech Data, Allison 5th Generation Controls – Controls Installation Manual Section A-2: Shift Calibration Familiarization (Section 4.4 – DynActive™ Shifting) (<https://sap.allisontransmission.com/extranet/techdata/DownloadTechdata?Dir=extranet/techdata&FileToGet=5GCMA-2.pdf>).

Dynamic Shift Sensing:

Dynamic Shift Sensing allows the transmission to automatically change between primary mode and secondary mode shifting. The controls will automatically select the Economy shift strategy when an unloaded vehicle state is detected and select the Performance shift strategy when the vehicle is loaded and its ability to accelerate is reduced. Dynamic Shift Sensing is available as an option with all FuelSense® 2.0 packages.

If Dynamic Shift Sensing is enabled, the “Dynamic Shift Sensing: Lower Shift Speed Schedule Shift Schedule Designation” parameter is used to define whether the economy shift schedule has been defined in the primary mode or the secondary mode. If the primary shift speed and primary shift schedule are set to the economy shift schedule, then Dynamic Shift Sensing: Low Shift Speed Schedule Shift Schedule Designation should be set to Primary.

Table 5 summarizes the parameters required to configure Dynamic Shift Sensing, the available answers for each parameter, default values, and parameter description.

Table 5. Summary of Dynamic Shift Sensing Calibration Parameters and Available Settings

Calibration Parameter	Available Answers	Default Value	Description
Dynamic Shift Sensing	<ul style="list-style-type: none"> – Disabled – Enabled 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Disabled TC10: <ul style="list-style-type: none"> – Enabled 	Dynamic Shift Sensing allows the transmission to automatically select between primary and secondary mode shifting based on vehicle load and operating conditions.
Dynamic Shift Sensing: Availability of Lower Shift Speed Schedule	<ul style="list-style-type: none"> – Custom – Low – Medium – High 	Medium	This setting changes the threshold at which the shift schedule changes between performance and economy. High allows for more operation in economy mode than medium or low. Low allows a very light load or grade to cause the transmission to shift at higher engine speeds for more performance.
Dynamic Shift Sensing: Custom Breakpoint Setting (kg)	1-2000000 kg	1000/2000 Series: <ul style="list-style-type: none"> – 12000 kg 3000/4000 Series/TC10: <ul style="list-style-type: none"> – 20000 kg 	If Dynamic Shift Sensing Availability of Lower Shift Speed Schedule is set to Custom, this setting defines the vehicle load which transitions Dynamic Shift Sensing away from the lower shift speed schedule.
Dynamic Shift Sensing: Lower Shift Speed Schedule Shift Schedule Designation	<ul style="list-style-type: none"> – Primary – Secondary 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Secondary TC10: <ul style="list-style-type: none"> – Primary 	This setting defines which mode is set to the economy shift schedule/lower shift speed. The primary and secondary shift speed and shift schedule settings must correspond with this setting.
Dynamic Shift Sensing: Lower Shift Speed Schedule Override Time	<ul style="list-style-type: none"> – 30 seconds – 1 minute – 2 minutes – 3 minutes – 4 minutes – 5 minutes 	30 seconds	If Dynamic Shift Sensing: Lower Shift Speed Shift Schedule Designation is set to Primary, Dynamic Shift Sensing will temporarily be disabled when secondary mode is active, which will keep the transmission in the higher/performance shift schedule for a limited amount of time. This setting defines the amount of time that the performance shift schedule is active before Dynamic Shift Sensing logic resumes.

Dynamic Shift Sensing is NOT available with OFS transmission models.

Custom Dynamic Shift Sensing:

Setting Dynamic Shift Sensing to the Custom setting allows a specific numerical value to be selected via the Custom Breakpoint Setting parameter. This parameter has a range from a minimum of 1 kg to a maximum of 2,000,000 kg. As the value is increased, the vehicle will operate in economy mode more often.

Dynamic Shift Sensing Calibration Setting Modification:

Once a FuelSense® 2.0 calibration is loaded into the TCM using Allison TCM Reflash™, the Dynamic Shift Sensing Availability of Lower Shift Speed Schedule setting can be modified using Allison DOC® Premium or Allison DOC®

Fleets (FuelSense®). Allison DOC® users can increase or decrease the availability setting in the calibration to provide the customer with the desired level of economy.

A new calibration is required to modify the FuelSense® Package. A new calibration or DOC Protected Parameter change can be requested in order to enable or disable Dynamic Shift Sensing in an existing calibration.



NOTE: FuelSense® 2.0 charges and restrictions may apply. For more information regarding FuelSense® 2.0 pricing, billing, and restrictions, please refer to TPPL 17-TPPL-08. For more information regarding the reflashing of TCMs with calibrations that contain a FuelSense® 2.0 package, refer to SIL 7-TR-17.

For more information regarding Dynamic Shift Sensing, refer to the Allison Hub (<https://hub.allisontransmission.com/>), Engineering, Tech Data, Allison 5th Generation Controls – Controls Installation Manual Section A-2: Shift Calibration Familiarization (Section 8.1 – DynActive Shift Sensing) (<https://sap.allisontransmission.com/extranet/techdata/DownloadTechdata?Dir=extranet/techdata&FileToGet=5GCMA-2.pdf>).

Neutral at Stop Standard and Neutral at Stop Premium:

Neutral at Stop is a feature that reduces or eliminates the load on the engine while the vehicle is stopped, reducing fuel usage and emissions. Neutral at Stop Standard allows transmission shifts to a partial Neutral condition with the vehicle at a stop with service brakes engaged. Neutral at Stop Premium provides full neutral with the vehicle at a stop with the service brakes engaged. Both functions lock the output while in Neutral to help prevent vehicle roll-back. Neutral at Stop is available with FuelSense® 2.0 Plus and Max packages.

The engine load reduction with Neutral at Stop Premium is greater than the engine load reduction with Neutral at Stop Standard. Thus, the potential for fuel savings is greater with the Premium version. However, with the Premium version, the return to range shift may have a delay. Quickly applying the throttle pedal may impact the shift quality as the vehicle accelerates from a stop.



NOTE: Neutral at Stop requires Application Engineering review for new chassis/engine/transmission combinations that have not yet been validated.



NOTE: Neutral at Stop requires the Neutral at Stop valve body for the 1000/2000 Series™ transmissions. Refer to SIL 11-1K2K-16: Neutral at Stop Disabler Separator Plate and SIL 13-1K2K-17: Neutral at Stop (NAS) Retrack Valve Body for more information.

Neutral at Stop with Coast Mode (Available in FuelSense® 2.0 Plus and FuelSense® 2.0 Max Packages):

Neutral at Stop Premium Optional Coast Mode allows Neutral to be initiated at 3 mph or less as the vehicle comes to a stop, preventing the engine from being loaded with drive idle stall torque resulting in incremental fuel economy improvement.



NOTE: Optional Coast Mode is only available with Neutral at Stop Premium. Coast Mode is NOT available with Neutral at Stop Standard.

Table 6 summarizes the parameters required to configure Neutral at Stop, the available answers for each parameter, default values, and parameter description.

Table 6. Summary of Neutral at Stop Calibration Parameters and Available Settings

Calibration Parameter	Available Answers	Default Value	Description
Neutral at Stop	<ul style="list-style-type: none"> – Disabled* – Standard – via GPI AS if defined in selected GPIO package* – Premium – Via GPI AS if defined in selected GPIO package – Premium – Via Service Brake Status Input – Premium – Via J1939 B2 Demanded Brake Application Pressure 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Disabled TC10: <ul style="list-style-type: none"> – Premium – Via GPI AS if defined in selected GPIO package 	This function can be used to reduce load on the engine after a vehicle comes to a stop while driving in a forward range.
FuelSense® 2.0 Coasting: Neutral at Stop	<ul style="list-style-type: none"> – Disabled – Enabled 	Disabled	This feature allows Neutral to be attained as the vehicle coasts to a stop with service brake active. This behavior is only active when this setting, as well as FuelSense® 2.0 and Neutral at Stop Premium, are all enabled.
Neutral at Stop: Brake Application Pressure Activation Level (kPa)	0-700 kPa	83	This setting sets the pressure level in kPa used to indicate that the service brakes are applied when using the "Premium - Via J1939 B2 Demanded Brake Application Pressure" setting for Neutral at Stop. Must be set greater than the corresponding activation level.
Neutral at Stop: Brake Application Pressure Deactivation Level (kPa)	0-700 kPa	69	This setting sets the pressure level in kPa used to indicate that the service brakes are released using the "Premium - Via J1939 B2 Demanded Brake Application Pressure" setting for Neutral at Stop. Must be set lower than the corresponding activation level.
* Not available for use with TC10® TS transmissions.			

Neutral at Stop Calibration Setting Modification:

A new calibration is required to modify the FuelSense® Package. A new calibration or DOC Protected Parameter change can be requested in order to modify the Neutral at Stop setting.



NOTE: FuelSense® 2.0 charges and restrictions may apply. For more information regarding FuelSense® 2.0 pricing, billing, and restrictions, please refer to TPPL 17-TPPL-08. For more information regarding the reflashing of TCMs with calibrations that contain a FuelSense® 2.0 package, refer to SIL 7-TR-17.

For more information regarding Neutral at Stop Standard or Neutral at Stop Premium, refer to Allison Tech Data on the Allison Hub (<https://hub.allisontransmission.com/>) under Engineering, Tech Data, Allison 5th Generation Controls, Input/Output Functions and Guides, Input Function AS: Neutral at Stop (https://sap.allisontransmission.com/extranet/techdata/DownloadTechdata?Dir=extranet/techdata&FileToGet=5G_INPUT-AS.pdf).

Acceleration Rate Management (ARM):

Acceleration Rate Management is an engine management function that can help prevent aggressive driving practices and may improve fuel economy by automatically controlling engine torque and limiting the vehicle acceleration to a calibrated rate. Full engine torque is permitted if the vehicle is unable to reach the calibrated acceleration rate, such as when heavily loaded or climbing a grade. Acceleration Rate Management is available with FuelSense® 2.0 Max packages.



NOTE: ARM functionality requires engine management integration between the engine and transmission controls and SAE J1939 CAN communication between vehicle components. For new installations of ARM, Application Engineering review is required.

Table 7 summarizes the parameters required to configure Acceleration Rate Management, the available answers for each parameter, default values, and parameter description.

Table 7. Summary of Acceleration Rate Management Calibration Parameters and Available Settings

Calibration Parameter	Available Answers	Default Value	Description
Acceleration Rate Management:	<ul style="list-style-type: none"> – Enabled – Disabled 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – Disabled TC10: <ul style="list-style-type: none"> – Enabled 	This feature allows the transmission TCM to manage engine torque to limit vehicle acceleration to a calibrated profile. This function may improve fuel economy by controlling aggressive driving practices.
Acceleration Rate Management: Level of Acceleration Control	<ul style="list-style-type: none"> – Custom – Base Economy – Intermediate Economy – High Economy – Super Economy – Ultra Economy 	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – High Economy TC10: <ul style="list-style-type: none"> – Super Economy 	This setting defines the level of acceleration limiting. Base economy allows for minimal engine limiting, allowing a higher level of acceleration. Ultra Economy provides a large amount of torque limiting, providing a higher potential for fuel savings.
Acceleration Rate Management: Custom Low Speed Acceleration Limit (m/s ²)	0.2235 min to 5 max	1000/2000/3000/4000 Series: <ul style="list-style-type: none"> – 1.7 TC10: <ul style="list-style-type: none"> – 1.14 	If Acceleration Range Management: Level of Acceleration Control is set to Custom, this setting defines the Low Speed Acceleration Limit for the curve. Refer to Figure 2 for further definition.

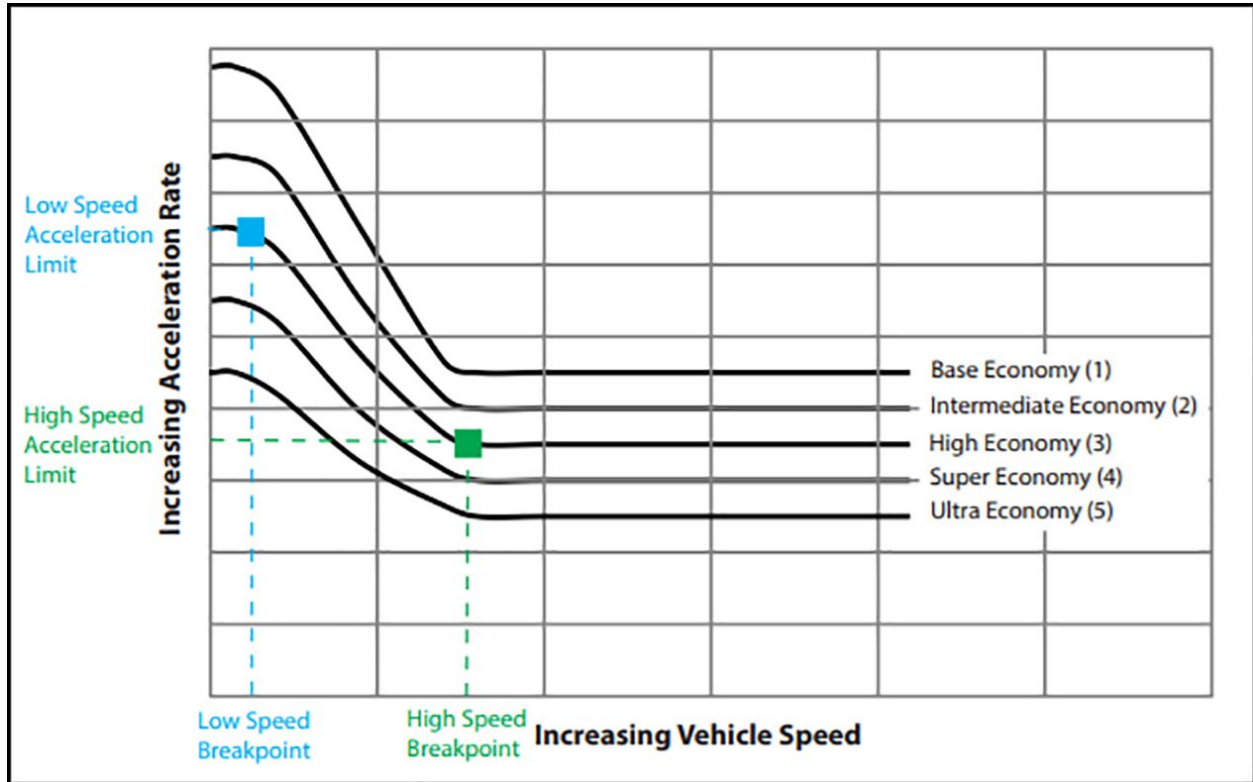
Table 7. Summary of Acceleration Rate Management Calibration Parameters and Available Settings (cont'd)

Calibration Parameter	Available Answers	Default Value	Description
Acceleration Rate Management: Custom Low Speed Breakpoint (KPH)	0 min to 18 max	1000/2000/3000/4000 Series: – 10.8 TC10: – 12.6	If Acceleration Range Management: Level of Acceleration Control is set to Custom, this setting defines the Low Speed Breakpoint for the curve. Refer to Figure 2 for further definition.
Acceleration Rate Management: Custom High Speed Acceleration Limit (m/s ²)	0.2235 min to 5 max	1000/2000/3000/4000 Series: – 0.75 TC10: – 0.71	If Acceleration Range Management: Level of Acceleration Control is set to Custom, this setting defines the High Speed Acceleration Limit for the curve. Refer to Figure 2 for further definition.
Acceleration Rate Management: Custom High Speed Breakpoint (KPH)	18 min to 162 max	1000/2000/3000/4000 Series: – 39.6 TC10: – 37.8	If Acceleration Range Management: Level of Acceleration Control is set to Custom, this setting defines the High Speed Breakpoint for the curve. Refer to Figure 2 for further definition.

When adding Acceleration Rate Management to a vehicle that did not previously have this feature, it is recommended that the Acceleration Rate Management: Level of Acceleration Control be set to Base Economy, Intermediate Economy, or High Economy for initial customer evaluation. The setting can then be increased or decreased to meet the requirements of the customer.

Enhanced Acceleration Rate Management (ARM):

Enhanced ARM levels offer more flexibility than the five Allison-defined levels. By setting ARM to the Custom setting, the user can define levels in between the Allison-defined levels, or levels that allow faster or slower levels of acceleration. Enhanced ARM is an optional feature that is available when ARM is set to Enabled and the ARM level is set to Custom.



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Figure 2. Custom Acceleration Rate Management Required Data Points

Acceleration Rate Management Calibration Setting Modification:

Allison DOC® can be used to modify the Acceleration Rate Management: Level of Acceleration Control setting. A new calibration is required to modify the FuelSense® Package or to enable/disable Acceleration Rate Management.



NOTE: FuelSense® 2.0 charges and restrictions may apply. For more information regarding FuelSense® 2.0 pricing, billing, and restrictions, please refer to TPPL 17-TPPL-08. For more information regarding the reflashing of TCMs with calibrations that contain a FuelSense® 2.0 package, refer to SIL 7-TR-17.

For more information regarding Acceleration Rate Management, refer to the Allison Hub (<https://hub.allisontransmission.com/>), Engineering, Tech Data, Allison 5th Generation Controls – Controls Installation Manual Section A-1: Controls System Familiarization (Section 4.8 – Acceleration Rate Management) (<https://sap.allisontransmission.com/extranet/techdata/DownloadTechdata?Dir=extranet&FileToGet=5GCMA-1.pdf>).

Determine Existing Calibration Settings:

To determine the existing settings in the Transmission Control Module (TCM), use the Allison Calibration Configuration Tool (ACCT), which is available in the Engineering section of the Allison Hub (<https://hub.allisontransmission.com/>). Select “Summary Report”, enter the TCM S/N, and select “Generate.” Review the FuelSense® settings defined in this calibration, as well as the primary and secondary shift speeds and shift schedules. Determine the calibration settings that will be modified.

ACCT Procedure for Creating Service Calibrations:

1. Select "Create New Request".
2. Enter the Based-On TCM serial number to retrieve the current calibration settings. The event date/time will default to the most recent calibration settings. Select "Continue".



NOTE: Some selections will be pre-populated, while others may require value selection.



NOTE: The selected release MUST be BCD 171 or later to enable FuelSense® 2.0.

3. Confirm selections, enter a description of the requested calibration changes, and select "Create".

A Par File Request number will be generated. The request can now be saved for later reference or can be edited and submitted.

4. The Customer Information page will show the existing FuelSense® package, if available. To release a FuelSense® 2.0 package, this setting MUST be set to FuelSense® 2.0.
5. Navigate to the FuelSense® page of ACCT, select the desired FuelSense® 2.0 package and set specific feature selections to the desired values.

On the Basic page, the primary and secondary shift speeds and shift schedules, which work in conjunction with Dynamic Shift Sensing (DSS) and DynActive™, can be modified.

6. Select the requested calibration setting changes. Then, select "Submit". If Submit is grayed-out, look for the Issues Exist Icon and resolve any issues that exist.

Upon approval of the request, ACCT will generate an email to the requester that will define the new TCM Assembly Number that can be loaded using Allison TCM Reflash™. Loading of this calibration will result in a charge unless the TCM already has a FuelSense® 2.0 entitlement greater than or equal to the level created in the new calibration.



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For access to ACCT, assistance in configuring a new FuelSense® 2.0 calibration, or questions regarding FuelSense® 2.0 features or functionality, please contact the calibration support desk at calibration_support@allisontransmission.com for assistance.