3.5.   DTC and Related Information

This section documents all supported DTCs, extended data records, snapshot data records, and other DTC related information supported by the ECU.

3.5.1. ReadDTCInformation Sub-Functions

SF	Name	0x01	0x02	0x03
0x01	reportNumberOfDTCByStatusMask	x		x
0x02	reportDTCByStatusMask	x		x
0x0A	reportSupportedDTC	x		x
0x04	reportDTCSnapshotRecordByDTCNumber	x		x
0x06	reportDTCExtendedDataRecordByDTCNumber	x		x

3.5.2. GroupOfDTC Parameters

GroupOfDTCParameter	Description
0xFFFFFF	All DTC's

3.5.3. Supported DTC Status Bits

Bit	Name
1	testFailedThisMonitoringCycle
3	confirmedDTC
6	testNotCompletedThisMonitoringCycle
7	warningIndicatorRequested

3.5.4. Supported Extended Data Records

Value (Hex)	Name	Type	Description
0x02	Monitoring cycle counter #2	unsigned	Number of monitoring cycles since the DTC fault detection counter last reached its maximum value of +127 (since DTC information was last cleared). The monitoring cycles during which the test was not completed are excluded.
0x10	DTC Fault Detection Counter	unsigned	The purpose of this counter is to provide a mechanism for filtering the results of a low-level fault detection process so that test results (pass and fail) can be qualified before setting any DTC status bits.

3.5.5. Supported Snapshot Data Records

Value (Hex)	Description
0x10	The first time since DTC information was cleared or the DTC was aged that the DTC fault detection counter reaches its maximum value of +127 (DTC status bit 3 is set to 1).

Refer to the specifics for each DTC to see the details of the snapshot data that is stored.

3.5.6. Freeze Frame Data Records

ECU supports 0 freeze frame data records

3.5.6.1. DTCs

The following table contains a summary of all DTCs supported by the ECU.

DTC (Hex)	DTC (display)	DTC Type	Root Description	Failure Type Byte Description
0x07AE09	P07AE-09	CD	Transmission Friction Element "G" Performance/Stuck Off	Component Failure
0x500C00	C100C-00	C	Steering Tracking	No Sub Type Information
0x5B002F	C1B00-2F	C	Steering Angle Sensor	Signal Erratic
0x5B0062	C1B00-62	C	Steering Angle Sensor	Signal Compare Failure
0x600B2F	C200B-2F	C	Steering Shaft Torque Sensor 1	Signal Erratic
0x600B61	C200B-61	C	Steering Shaft Torque Sensor 1	Signal Calculation Failure
0x600B62	C200B-62	C	Steering Shaft Torque Sensor 1	Signal Compare Failure
0x600C2F	C200C-2F	C	Steering Shaft Torque Sensor 2	Signal Erratic
0x600D49	C200D-49	C	Motor Rotation Angle Sensor	Internal Electronic Failure
0x9D2368	B1D23-68	C	Overheat Sensor	Event Information
0xC00188	U0001-88	C	High Speed CAN Communication Bus	Bus off
0xC10000	U0100-00	C	Lost Communication With ECM/PCM "A"	No Sub Type Information
0xC12100	U0121-00	C	Lost Communication With Anti-Lock Brake System (ABS) Control Module	No Sub Type Information
0xC15100	U0151-00	C	Lost Communication With Restraints Control Module	No Sub Type Information
0xC30000	U0300-00	C	Internal Control Module Software Incompatibility	No Sub Type Information
0xC40100	U0401-00	C	Invalid Data Received from ECM/PCM A	No Sub Type Information
0xC41500	U0415-00	C	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module	No Sub Type Information
0xC41522	U0415-22	C	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module	Signal Amplitude > Maximum
0xC45200	U0452-00	C	Invalid Data Received From Restraints Control Module	No Sub Type Information
0xC45222	U0452-22	C	Invalid Data Received From Restraints Control Module	Signal Amplitude > Maximum
0xE01149	U2011-49	C	Motor	Internal Electronic Failure
0xE01161	U2011-61	C	Motor	Signal Calculation Failure
0xE10000	U2100-00	C	Initial Configuration Not Complete	No Sub Type Information
0xF00041	U3000-41	C	Control Module	General Checksum Failure
0xF00046	U3000-46	C	Control Module	Calibration / Parameter Memory Failure
0xF00049	U3000-49	C	Control Module	Internal Electronic Failure
0xF00061	U3000-61	C	Control Module	Signal Calculation Failure
0xF00072	U3000-72	C	Control Module	Actuator Stuck Open
0xF00096	U3000-96	C	Control Module	Component Internal Failure
0xF00316	U3003-16	C	Battery Voltage	Circuit Voltage Below Threshold
0xF00317	U3003-17	C	Battery Voltage	Circuit Voltage Above Threshold
0xF00368	U3003-68	C	Battery Voltage	Event Information

Legends
C = Continuous DTC
D = On-Demand DTC
CD = Continuous and On-Demand DTC

3.5.6.2.   DTC 0x07AE09 - Transmission Friction Element "G" Performance/Stuck Off Component Failure

DTC Number	0x07AE09 (P07AE-09)
Root Description	Transmission Friction Element "G" Performance/Stuck Off
Failure Type Byte Description	Component Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is awake and assist is provided. 3. Steering wheel angle, torque, and vehicle speed meet test condition requirements.
Test Period	20 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if the ECU detects that Friction is above the friction threshold. Pass Criteria: If this fail criteria is not met (i.e the friction is below the friction threshold).
Action Taken By ECU in Response To Fault	A. For the current Journey: 1. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. Assist will be provided at the default Vehicle Speed 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x2 for friction detection code. 4. DTC will stay active every key cycle untill cleared by service technician. B. For subsequent journeys and provided that vehicle is confirmed not moving (below 2.7 kph): 1. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. The DTC will stay raised and assistance will stay permanently disabled unless cleared by a service technician after proper inspection 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x3 for friction detection code.
Fault Symptom Recognized by Vehicle Occupants	A. For the current Journey: 1. Assist will be provided at the default Vehicle Speed 2. Poor returnability 3. Increased Steering noise. Driver will be notified through change in EPAS failure signal (Message frame $82) . B. For subsequent journeys and provided that vehicle is confirmed not moving (below 2.7 kph): 1. Assistance will stay permanently disabled unless cleared by a service technician after proper inspection 2. Driver will be notified through change in EPAS failure signal (Message frame $82) .
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace the Gear

Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	0x0202

3.5.6.3.   DTC 0x500C00 - Steering Tracking No Sub Type Information

DTC Number	0x500C00 (C100C-00)
Root Description	Steering Tracking
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and Battery Voltage is in operational range [11V <= Vbatt <= 16V] 2. ECU is in Normal operation
Test Period	4 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is not supported if the PDC Type is SHORT TERM. The DTC is raised (testFailedThisMonitoringCycle = 1) if the PDC Type is LONG TERM and if Pull Drift Compensation Torque exceeds PDC REPAIR UPPER THRESHOLD VTD limit for 1 seconds Pass Criteria: If fail criteria is not met
Action Taken By ECU in Response To Fault	1. ECU still provides Assist with PDC 2. This DTC is no longer be monitored.
Fault Symptom Recognized by Vehicle Occupants	Assist Will NOT be removed
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1.I nspect Tires or suspension or … 2. Check for Ford TBD The DTC can be cleared by resetting the PDC torque via DID 0xFD08
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.4.   DTC 0x5B002F - Steering Angle Sensor Signal Erratic

DTC Number	0x5B002F (C1B00-2F)
Root Description	Steering Angle Sensor
Failure Type Byte Description	Signal Erratic
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	4ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: The DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU determines that designed Rack travel length is exceeded for 1 test periods. Pass Criteria: If fail criteria is not met (i.e. Rack Travel length is correct)
Action Taken By ECU in Response To Fault	1.ECU still provides Assist 2. This DTC is no longer monitored. 3. Requires ignition cycle or ECU reset to restart monitoring this DTC (5B002F) 4. ECU transmits Faulty RSP signal (msg $84) 5. PDC and Friction detection are turned off
Fault Symptom Recognized by Vehicle Occupants	Assist will NOT be removed
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Clear DTC. Cycle the ignition or issue ECU reset
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C,0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.5.   DTC 0x5B0062 - Steering Angle Sensor Signal Compare Failure

DTC Number	0x5B0062 (C1B00-62)
Root Description	Steering Angle Sensor
Failure Type Byte Description	Signal Compare Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	4ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if ECU detects the integrity of Relative Steering Position is Faulty for 4 consecutive test periods. Pass Criteria: If the fail criteria is not met (i.e. Integrity of Relative Steering Offset or RSP is not faulty)
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure. 4.Requires ignition cycle or ECU reset to restart monitoring all DTCs. 5. 'Steering wheel Angle' is set to Fauly
Fault Symptom Recognized by Vehicle Occupants	For RSP fault Assist will be removed and WarnIngIndicator will be turned ON (DTC status bit 7 will be set to '1'). Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.6.   DTC 0x600B2F - Steering Shaft Torque Sensor 1 Signal Erratic

DTC Number	0x600B2F (C200B-2F)
Root Description	Steering Shaft Torque Sensor 1
Failure Type Byte Description	Signal Erratic
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	1ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: The DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if Torque sensor 1 or Torque frequency 1 is out of range for 19 consecutive test periods. Pass Criteria: When fail criteria is not met (i.e. Torque sensor 1 or Torque frequency 1 will not be faulty).
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. It is possible for this DTC to fail when power steering assist has already been removed. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) 4. Message $82 SteeringColumnTorque = INVALID and SteWhlRelInit_An_Sns = Fault. 5. Requires ignition cycle OR ECU reset to restart monitoring all the DTCs.
Fault Symptom Recognized by Vehicle Occupants	Assist is removed and WarnIngIndicator will be turned ON. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.7. DTC 0x600B61 - Steering Shaft Torque Sensor 1 Signal Calculation Failure

DTC Number	0x600B61 (C200B-61)
Root Description	Steering Shaft Torque Sensor 1
Failure Type Byte Description	Signal Calculation Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	2 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria : This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if the ECU detects that the Integrity of the Torque sensor signal is Faulty for 9 consecutive test periods. Pass Criteria: If this fault criteria is not met (i.e. Integrity of Torque sensor corect)
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. It is possible for this DTC to fail when power steering assist has already been removed. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) 4. Message $82 SteeringColumnTorque = INVALID and SteWhlRelInit_An_Sns = Faulty. 5. Requires ignition cycle OR ECU reset to restart monitoring all the DTCs.
Fault Symptom Recognized by Vehicle Occupants	Assist is removed and WarnIngIndicator will be turned ON. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.8.   DTC 0x600B62 - Steering Shaft Torque Sensor 1 Signal Compare Failure

DTC Number	0x600B62 (C200B-62)
Root Description	Steering Shaft Torque Sensor 1
Failure Type Byte Description	Signal Compare Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	1 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if different between Torque sensor 1 and Torque sensor 2 is greater than error threshold or Torque sensor 1 is overrange for 19 consecutive test periods. Pass Criteria: If the criterias for the above faults are not met.
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. It is possible for this DTC to fail when power steering assist has already been removed. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) 4. Message $82 SteeringColumnTorque = INVALID and SteWhlRelInit_An_Sns = Faulty. 5. Requires ignition cycle OR ECU reset to restart monitoring all the DTCs.
Fault Symptom Recognized by Vehicle Occupants	Assist is removed and WarnIngIndicator will be turned ON. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.9.   DTC 0x600C2F - Steering Shaft Torque Sensor 2 Signal Erratic

DTC Number	0x600C2F (C200C-2F)
Root Description	Steering Shaft Torque Sensor 2
Failure Type Byte Description	Signal Erratic
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	1 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: The DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if Torque sensor 2 or Torque frequency 2 is out of range for 19 consecutive test periods. Pass Criteria: When fail criteria is not met (i.e. Torque sensor 2 or Torque frequency 2 will not be faulty).
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. It is possible for this DTC to fail when power steering assist has already been removed. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) 4. Message $82 SteeringColumnTorque = INVALID and SteWhlRelInit_An_Sns = Faulty. 5. Requires ignition cycle OR ECU reset to restart monitoring all the DTCs.
Fault Symptom Recognized by Vehicle Occupants	Assist is removed and WarnIngIndicator will be turned ON. Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.10. DTC 0x600D49 - Motor Rotation Angle Sensor Internal Electronic Failure

DTC Number	0x600D49 (C200D-49)
Root Description	Motor Rotation Angle Sensor
Failure Type Byte Description	Internal Electronic Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V.
Test Period	1 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria : This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) If the ECU detects failed motor position angle sensor. Pass Criteria: If the fault is criteria is not met (i.e. Motor position angle sensor is NOT faulty)
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. 2. This DTC is not Monitored in manual steering. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure. 4.Requires ignition cycle or ECU reset to restart monitoring all DTCs. 5. 'SteWhlRelInit_An_Sns is set to Faulty
Fault Symptom Recognized by Vehicle Occupants	1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.11. DTC 0x9D2368 - Overheat Sensor Event Information

DTC Number	0x9D2368 (B1D23-68)
Root Description	Overheat Sensor
Failure Type Byte Description	Event Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V and system is not in manual steering mode.
Test Period	20 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) when the system is reducing assist due to thermal limiting. Pass Criteria: If this fail criteria is not met [i.e. thermal current limits is equal to OR above the rated current].
Action Taken By ECU in Response To Fault	1. Steering assist may be limited. 2. DTC is no longer be monitored once DTC is raised. 3. Requires ignition cycle or ECU reset to monitor the DTC
Fault Symptom Recognized by Vehicle Occupants	Heavier than usual steering efforts
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. This DTC may be raised under extreme temperature usage conditions. Check heat protection. 2. Clear the DTC and cycle the ignition.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.12. DTC 0xC00188 - High Speed CAN Communication Bus Bus off

DTC Number	0xC00188 (U0001-88)
Root Description	High Speed CAN Communication Bus
Failure Type Byte Description	Bus off
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V. 2. ECU is in Normal operation
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised(testFailedThisMonitoringCycle = 1) if the ECU detects that transmission of CAN frame from PSCM module is not acknowledged by other CAN bus modules for 400 msec. 2) if the CAN bus is deemed to have communication error for greater than 5 seconds. Pass Criteria: If this fail criteria is not met (i.e. the PSCM module transmitts all the CAN message frame in correct format to the CAN bus).
Action Taken By ECU in Response To Fault	1.ECU still provides Assist (Ramps assist to default vehicle speed).
Fault Symptom Recognized by Vehicle Occupants	1.Assist is not removed, but provided at default vehicle speed levels.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Check CAN connection, CAN interface, or CAN bus and fix the faulty one. 2. Clear DTC and cycle the ignition (or ECU reset)
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.13. DTC 0xC10000 - Lost Communication With ECM/PCM "A" No Sub Type Information

DTC Number	0xC10000 (U0100-00)
Root Description	Lost Communication With ECM/PCM "A"
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V. 2. ECU is in Normal operation. 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU detects the ABSENT of CAN Message Frame from ECM/PCM module. Absent of the following messages/signals from the ECM/PCM module for more than Message Timeouts : $201 (_EngVehicleSpThrottle) : Timeout is 40ms $42C (_Battery_Mgmt_2) : Timeout is 200ms Pass Criteria: If these fail criterias are not met (above messages are being recieved from PCM Module in correct format).
Action Taken By ECU in Response To Fault	1. ECU will provide steering assist at highway levels after 3 missing message frames
Fault Symptom Recognized by Vehicle Occupants	Assist will be provided at highway speed level.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Fix the CAN interface, and check the ECM/PCM module for correct CAN message transmission 2. Clear DTC and Cycle the ignition (or ECU reset)
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.14. DTC 0xC12100 - Lost Communication With Anti-Lock Brake System (ABS) Control Module No Sub Type Information

DTC Number	0xC12100 (U0121-00)
Root Description	Lost Communication With Anti-Lock Brake System (ABS) Control Module
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V. 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU detects the ABSENT of CAN message Frame from ABS module. Absent of the following CAN message/signal from ABS module for 5 seconds will cause raising this fault : Message frame 0x74 (_BrakeSnData_2) Pass Criteria: If this fail criteria is not met (above message is being recieved in correct format from ABS Module).
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. This DTC is no longer be monitored for this key cycle. 3. ECU inhibits PDC/Friction detection as long as the faulty conditions are present
Fault Symptom Recognized by Vehicle Occupants	Assist will be provided.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Fix the CAN interface, and check the ABS module for correct CAN message transmission. 2. Clear DTC and cycle the ignition (or ECU reset)
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.15. DTC 0xC15100 - Lost Communication With Restraints Control Module No Sub Type Information

DTC Number	0xC15100 (U0151-00)
Root Description	Lost Communication With Restraints Control Module
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V. 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU detects the ABSENT of CAN message Frame from RCM module. Absent of the following CAN message/signal from RCM module for 5 seconds will cause raising this fault : Message frame 0x92 (_Accel_Data) Pass Criteria: If this fail criteria is not met (above message is being recieved in correct format from RCM Module).
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. This DTC is no longer be monitored for this key cycle. 3. ECU inhibits Friction detection as long as the faulty conditions are present
Fault Symptom Recognized by Vehicle Occupants	Assist will be provided.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40

Special Considerations	1. Fix the CAN interface, and check the RCM
	    module for correct CAN message transmission.
	2. Clear DTC and cycle the ignition (or ECU
	    reset)

Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.16. DTC 0xC30000 - Internal Control Module Software Incompatibility No Sub Type Information

DTC Number	0xC30000 (U0300-00)
Root Description	Internal Control Module Software Incompatibility
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON ECU terminal voltage is above 6V.
Test Period	4 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised(testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if the ECU HW and SW are not compatible. Pass Criteria: If this fail criteria is not met (i.e. Software is compatible).
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. Once in manual steering all DTCs are not monitored. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure. 4. Requires ignition cycle or ECU reset to restart monitoring all DTCs.
Fault Symptom Recognized by Vehicle Occupants	1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Check HW and SW compatibilty.Re-flash with compatible SW if necessary
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.17. DTC 0xC40100 - Invalid Data Received from ECM/PCM A No Sub Type Information

DTC Number	0xC40100 (U0401-00)
Root Description	Invalid Data Received from ECM/PCM A
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V. 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the : 1. CAN Signal 'VehVActlEng_D_Qf in message $201 is other than "OK" for 5 seconds. Pass Criteria: If these fail criterias are not met (receives VALID message/signal)
Action Taken By ECU in Response To Fault	1. ECU still provides Assist for Default Vehicle Speed. 2. DTC is no longer be monitored.
Fault Symptom Recognized by Vehicle Occupants	1. Assist will be provided at highway speed levels. 2. Higher steering efforts in parking situations.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Fix CAN interface and check the ECM/PCM module for correct CAN message transmission. 2. Clear the DTC and Cycle the ignition (or ECU reset).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.18. DTC 0xC41500 - Invalid Data Received From Anti-Lock Brake System (ABS) Control Module No Sub Type Information

DTC Number	0xC41500 (U0415-00)
Root Description	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V] 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the PSCM receives 'SteWhlCompAnEst_D_Qf' not "OK" Data (message frame $74) from ABS (Anti-Lock Brake) module after having received VALID and KNOWN data Pass Criteria: If this fail criteria is not met (receives VALID message/signal)
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. Friction Detection and PDC Functions are inhibited when the fail criteria exists. Functions are re-enabled when Faulty conditions are removed
Fault Symptom Recognized by Vehicle Occupants	Driver may experience that the PDC function is inhibited
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Fix CAN interface and check the ABS module for correct CAN message transmission. 2. Clear the DTC and Cycle the ignition (or ECU reset).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C,0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.19. DTC 0xC41522 - Invalid Data Received From Anti-Lock Brake System (ABS) Control Module Signal Amplitude > Maximum

DTC Number	0xC41522 (U0415-22)
Root Description	Invalid Data Received From Anti-Lock Brake System (ABS) Control Module
Failure Type Byte Description	Signal Amplitude > Maximum
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V.] 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is Raised When SteWhlComp_An_Est from Message $74 Exceeds the Rack Travel Limits. Pass Criteria: If this fail criteria is not met
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. PDC function is inhibited for the journey an dthe PDC Torque Demand is ramped out
Fault Symptom Recognized by Vehicle Occupants	No effect
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	
Special Considerations	1. Fix CAN interface and check the ABS module for correct CAN message transmission. 2. Clear the DTC and Cycle the ignition (or ECU reset).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.20. DTC 0xC45200 - Invalid Data Received From Restraints Control Module No Sub Type Information

DTC Number	0xC45200 (U0452-00)
Root Description	Invalid Data Received From Restraints Control Module
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V] 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the PSCM receives 'VehLatAActl_D_Qf' not "OK" Data for 5 seconds (message frame $92) from RCM Pass Criteria: If this fail criteria is not met (receives VALID message/signal)
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. Friction Detection Function is inhibited when the fail criteria exists. Functions are re-enabled when Faulty conditions are removed
Fault Symptom Recognized by Vehicle Occupants	None
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Fix CAN interface and check the RCM module for correct CAN message transmission. 2. Clear the DTC and Cycle the ignition (or ECU reset).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.21. DTC 0xC45222 - Invalid Data Received From Restraints Control Module Signal Amplitude > Maximum

DTC Number	0xC45222 (U0452-22)
Root Description	Invalid Data Received From Restraints Control Module
Failure Type Byte Description	Signal Amplitude > Maximum
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON + 5 sec and ECU terminal voltage is greater than 9V.] 2. ECU is in Normal operation 3. No 'Bus Off' condition detected
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the CAN signal 'VehLat_A_Actl' (message frame $92) is above 30 m/s^2 Pass Criteria: If this fail criteria is not met
Action Taken By ECU in Response To Fault	1. ECU still provides Assist 2. Friction detection algorithm is inhibited as long the CAN signal 'VehLat_A_Actl' is above maximum 30 m/sec/sec
Fault Symptom Recognized by Vehicle Occupants	No effect
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	
Special Considerations	1. Fix CAN interface and check the RCM module for correct CAN message transmission. 2. Clear the DTC and Cycle the ignition (or ECU reset).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.22. DTC 0xE01149 - Motor Internal Electronic Failure

DTC Number	0xE01149 (U2011-49)
Root Description	Motor
Failure Type Byte Description	Internal Electronic Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and the ECU terminal voltage is range [10V <= Vbatt <= 17V] 2. ECU is in Normal operation or running power up diagnostics.
Test Period	1 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128

Pass / Fail Criteria	Fail Criteria:
	This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if the ECU detects that motor phase voltage is greater than phase voltage threshold high OR less than the phase voltage threshold Low for the 19 consecutive test periods.
	
	Pass Criteria:
	  If this fail criteria is not met (i.e the motor
	  phase voltage is correct).

Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering.WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3.In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure 4. Requires ignition cycle or ECU reset to restart monitoring all DTCs. 5. SteWhlRelInit_An_Sns may be Faulty 6. SteWhlRelInit_An_Sns = Faulty
Fault Symptom Recognized by Vehicle Occupants	1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C,0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.23. DTC 0xE01161 - Motor Signal Calculation Failure

DTC Number	0xE01161 (U2011-61)
Root Description	Motor
Failure Type Byte Description	Signal Calculation Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and the ECU terminal voltage is range [10V <= Vbatt <= 17V] 2. ECU is in Normal operation.
Test Period	2 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1AND warningIndicatorRequested = 1) if the ECU detects that the integrity of the motor Torque estimate or Motor velocity signal is faulty for 9 consecutive test periods. Pass Criteria: If this Fail criteria is not met (i.e. motor Torque estimate or Motor velocity signal is NOT faulty).
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering.WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure 4.Requires ignition cycle or ECU reset to restart monitoring all DTCs. 5. SteWhlRelInit_An_Sns is set to Faulty
Fault Symptom Recognized by Vehicle Occupants	1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.24. DTC 0xE10000 - Initial Configuration Not Complete
No Sub Type Information

DTC Number	0xE10000 (U2100-00)
Root Description	Initial Configuration Not Complete
Failure Type Byte Description	No Sub Type Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is greater than 6.0 V.
Test Period	Power Up
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC shall be set (testFailedThisMonitoringCycle = 1) for new ECUs executing their application that have not yet been configured with a valid initial configuration (e.g., default configuration still present) in DID 0xDE00 or in TRW EOL Configuration. Pass Criteria: If the ECU configured with the valid configuration data.

Action Taken By ECU in Response To Fault	1 Assist will not be removed if the vehicle tune has not been configured (DE00) AND the TRW EOL Configuration is configured. Assist is removed if TRW EOL Configuration is not configured
	2. DTC is no longer be
	   monitored.
	3. Requires ignition cycle or ECU reset to
	   restart monitoring the DTC is monitored

Fault Symptom Recognized by Vehicle Occupants	Assist will not be removed if the vehicle tune ID is not configured AND TRW EOL Configuration is configured. Assist is removed if the TRW EOL Configuration is not configured
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	If assistance is present: 1. Configure the module with the proper DE00 configuration. 2. Clear DTC and cycle the Ignition (or ECU reset). If assistance is not present and this is the only DTC raised with (DE00) proper Vehicle Variant Tune Selected Remove the gear.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C,0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.25. DTC 0xF00041 - Control Module General Checksum Failure

DTC Number	0xF00041 (U3000-41)
Root Description	Control Module
Failure Type Byte Description	General Checksum Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is in Normal Operation
Test Period	4 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128

Pass / Fail Criteria	Fail Criteria:
	This DTC is raised(testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) if the ECU detect either of the following :
	  1. Boot ROM CRC check fails
	  2. Application Program ROM CRC Check fails
	  3. Application Constants ROM CRC Check fails
	4. data ROM in xFlash (Calibration Data) fails
	
	Pass Criteria: If this fail criteria is not met (i.e. ECU do not detect either of the above fails).

Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1'). 2. This DTC is not Monitored in manual steering. 3. Requires ignition cycle or ECU reset to restart monitoring all DTCs. 4. SteWhlRelInit_An_Sns = Faulty
Fault Symptom Recognized by Vehicle Occupants	Assist will be removed and WarnIngIndicator will be turned ON (DTC status bit 7 will be set to '1'). Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.26. DTC 0xF00046 - Control Module Calibration / Parameter Memory Failure

DTC Number	0xF00046 (U3000-46)
Root Description	Control Module
Failure Type Byte Description	Calibration / Parameter Memory Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is in Normal Operation
Test Period	Power Up - Tune safe condition
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU detect that CRC calculation does not match with the stored CRC for the associated calibration log OR if the ECU detect that Vehicle tune is not plausible. Pass criteria: if this fail criteria is not met (i.e. CRC calculation is correct Tune data is plausible)

Action Taken By ECU in Response To Fault	For faults that ECU can recover:
	1. ECU logs this DTC, loads a default Tune or calibration, and remain in normal
	   operation providing Assist
	2.This DTC (F00046) is no longer be
	   monitored.
	3. Requires ignition cycle or ECU reset to
	   restart monitoring this DTC (F00046) after it has been raised
	OR
	DTC E10000 may be raised on next ignition cycle.
	
	For faults that CU can not recover:
	1. Power Steering Assist is removed and system operates with manual steering.WarnIngIndicator will be requested to turn ON (DTC status bit 7 will be set to '1').
	2. This DTC is not Monitored in manual steering.
	3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure
	4.Requires ignition cycle or ECU reset to
	    restart monitoring all DTCs.

Fault Symptom Recognized by Vehicle Occupants	For faults that ECU can recover: Assist will not be removed and WarnIngIndicator will not be turned ON. Driver may feel a difference in steering feel For faults that ECU can not recover: 1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering

	system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.27. DTC 0xF00049 - Control Module Internal Electronic Failure

DTC Number	0xF00049 (U3000-49)
Root Description	Control Module
Failure Type Byte Description	Internal Electronic Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is in Normal Operation during Power up or Power down
Test Period	1 ms - 20ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	There are many internal Fault codes that map to this DTC: If this DTC is raised and Assist is still provided then potential fail criteria are: 1. ECU detected CRC faults associated with the different Tune or Calibration blocks 2. ECU detected Stuck bits in the CAN mailbox 3. CAN hardware not responding 4. Motor relay open circuit fault If this DTC is raised and Assist is removed then potential fail criteria are: 1. Motor phase voltage faults 2. Motor correct sense faults 3. 2nd Micro communication faults 4. General Micro failure such as watchdog reset Pass Criteria: If the above fail criterias are not met.
Action Taken By ECU in Response To Fault	For non loss of assist faults: 1. ECU logs this DTC and remain in normal operation providing Assist 2.This DTC (F00049) is no longer be monitored. 3. Requires ignition cycle or ECU reset to restart monitoring this DTC (F00049). For loss of assist fault: 1. . Power Steering Assist is permanately removed and system operates with manual steering. 2. Once in manual steering all DTCs are not monitored. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure. 4. This fault cannot be cleared with a key cycle, or clear DTC request and requires replacing the gear.
Fault Symptom Recognized by Vehicle Occupants	For loss of assist fault: 1. Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) For non loss of assist faults: Assist will NOT be removed and WarnIngIndicator will NOT be ON.

Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Clear DTC, cycle the ignition (or ECU reset) . System should be in normal operation state (for non loss of Assist fault). Otherwise, Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive(for loss of Assist fault).
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.28. DTC 0xF00061 - Control Module Signal Calculation Failure

DTC Number	0xF00061 (U3000-61)
Root Description	Control Module
Failure Type Byte Description	Signal Calculation Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is in Normal Operation
Test Period	2 ms - 20ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria : This DTC is raised (testFailedThisMonitoringCycle = 1 AND warningIndicatorRequested = 1) If the ECU detects that: 1. integrity of assist Torque or current calculation is faulty (Assist will be removed) Pass Criteria: If the above fault criteria is not met..
Action Taken By ECU in Response To Fault	1. Power Steering Assist is removed and system operates with manual steering. 2. This DTC is not Monitored in manual steering. 3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure. 4.Requires ignition cycle or ECU reset to restart monitoring all DTCs. 5.'Steering Wheel Angle' is set to INVALID
Fault Symptom Recognized by Vehicle Occupants	1.Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel)
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	Replace gear if DTC is reproduced after DTC cleared and IGN recycled (or ECU reset) following an evaluation of the steering system including a test drive.
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.29. DTC 0xF00072 - Control Module Actuator Stuck Open

DTC Number	0xF00072 (U3000-72)
Root Description	Control Module
Failure Type Byte Description	Actuator Stuck Open
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and Vbatt > 9 Volt 2. ECU is in Normal operation
Test Period	Power Up
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if Link relay fails to close. Pass Criteria: If this fail criteria is not met [i.e. Link relay is deemed to be 'closed' as expected].
Action Taken By ECU in Response To Fault	1. An 'A'-level fault is raised when the test fails and DTC 0xF000-72 (Control Module - Actuator stuck open) is confirmed. ECU logs this DTC and still capable of providing Assist. 2. Consequential B-level faults will be generated if the fault persists during the remaining power-up tests which will result in loss of assist AND In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure
Fault Symptom Recognized by Vehicle Occupants	DTC will not remove assist if raised by itself, but subsequent loss of assist DTCs will likely be logged.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.30. DTC 0xF00096 - Control Module Component Internal Failure

DTC Number	0xF00096 (U3000-96)
Root Description	Control Module
Failure Type Byte Description	Component Internal Failure
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and Battery Voltage is in operational range [11V <= Vbatt <= 16V] 2. ECU is in Normal operation
Test Period	4 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised if (testFailedThisMonitoringCycle = 1)ECU detects that Drive stage thermistor voltage is outside the upper and lower diagnostic thresholds. The ECU assumes a "default drive stage temperature" of 130 C Pass Criteria: If this fail criteria is not met.

Action Taken By ECU in Response To Fault	For non loss of assist faults:
	1. ECU logs this DTC and remain in normal
	   operation providing Assist
	2.This DTC (F00096) is no longer monitored for the current key cycle, but the drive stage temp is used if valid.
	3. Requires ignition cycle or ECU reset to
	   restart monitoring this DTC (F00096).
	
	For loss of assist fault:
	
	1. . Power Steering Assist is permanately removed and system operates with manual steering.
	2. Once in manual steering all DTCs are not
	   monitored.
	3. In CAN message $82 (EPAS Info) the signal EPAS_FAILURE = 0x1 for loss of assist diagnostic failure.
	4. This fault cannot be cleared with a key cycle, or clear DTC request and requires replacing the gear.

Fault Symptom Recognized by Vehicle Occupants	For loss of assist fault: 1. Assist is removed and WarnIngIndicator will be turned ON. 2.Driver will be notified through change in EPAS failure signal (Message frame $82) displayed on cluster (instrument panel) For non loss of assist faults: Assist will NOT be removed and WarnIngIndicator will NOT be ON.
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	For non loss of assist faults: Clear DTC, cycle the ignition (or ECU reset) . System should be in normal operation state else replace the gear. Evaluate if assist is present with the engine running.

Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.31. DTC 0xF00316 - Battery Voltage Circuit Voltage Below Threshold

DTC Number	0xF00316 (U3003-16)
Root Description	Battery Voltage
Failure Type Byte Description	Circuit Voltage Below Threshold
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is awake. 3. Engin is running above 500 rpm.
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if ECU detects that ECU terminal voltage is less than (9v). Pass Criteria: If this fail criteria is not met(i.e. If Battery voltage measured at the ECU terminals is not below the minimum threshold value).
Action Taken By ECU in Response To Fault	1. DTC is no longer be monitored once fault is detected. 2. Requires ignition cycle or ECU reset to monitor the DTC. 3. Assist may be reduced.
Fault Symptom Recognized by Vehicle Occupants	Heavier than usual steering efforts
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Check Battery connection 2. Check that Battery voltage is within the range of operating voltage 3. remove the DTC and recycle the ignition (or ECU reset)
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.32. DTC 0xF00317 - Battery Voltage Circuit Voltage Above Threshold

DTC Number	0xF00317 (U3003-17)
Root Description	Battery Voltage
Failure Type Byte Description	Circuit Voltage Above Threshold
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is awake.
Test Period	8 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the ECU detects that the ECU terminal voltage is higher than the (20v) threshold for 10 minutes. Pass Criteria: If the fail criteria is not met(i.e. battery voltage will not exceed the maximum threshold value).
Action Taken By ECU in Response To Fault	1. Steering assist is reduced above 16 V. 2. DTC is no longer be monitored once DTC is raised. 3. Requires ignition cycle or ECU reset to monitor the DTC
Fault Symptom Recognized by Vehicle Occupants	Heavier than usual steering efforts
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40
Special Considerations	1. Check Battery connection 2. Check that Battery voltage is within the range of operating voltage 3. remove the DTC and recycle the ignition (or ECU reset)
Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	

3.5.6.33. DTC 0xF00368 - Battery Voltage Event Information

DTC Number	0xF00368 (U3003-68)
Root Description	Battery Voltage
Failure Type Byte Description	Event Information
ECU Connector Pin	
Continuous Monitoring Supported	yes
Monitoring Cycle	ECU Operation Cycle
Test Run Criteria	1. Ignition ON and ECU terminal voltage is above 6V. 2. ECU is awake.
Test Period	20 ms
Fault Detection Counter Increment Value	127
Fault Detection Counter Decrement Value	128
Pass / Fail Criteria	Fail Criteria: This DTC is raised (testFailedThisMonitoringCycle = 1) if the Engine has been deemed running (Engine Speed above 500 RPM for at least 5 seconds AND ECU terminal voltage is less than 10.8 V AND PowerSystemStatus(message $42C) is other than Alternator Fault (Both Electrical and Mechanical) or if the Engine hs been deemed running (Engine Speed above 500 RPM for at least 5 seconds AND ECU terminal voltage is less than 11.8V and CAN signal PowerSystemStatus(message $42C) has Alternator Fault (Both Electrical and Mechanical). , Signal PowerSystemStatus in CAN frame $42C = 0x1 or 0x2). The DTC is also raised if the Engine has been deemed running for at least 5 seconds AND ECU terminal voltage is greater than 16V Pass Criteria: If this fail criteria is not met [i.e. Battery voltage is above 10.8v for a non-failed charging system or below 16 V].
Action Taken By ECU in Response To Fault	Derates PSCM Assist per ESAE5C-3200-BA v4 sec III.A.10 .
Fault Symptom Recognized by Vehicle Occupants	Heavier than usual steering efforts
Extended Data Record used for Aging Counter	0x02
Counter Value when Aged	40

Special Considerations	1. Check Battery that the Battery voltage is within the range of operating voltage
	2. Check alternator or related wiring harness
	   is not faulty.
	3. remove the DTC and recycle the ignition
	   (or ECU reset)

Extended Data Records Supported	0x02,0x10
Snapshot Records Supported	0x10
DIDs in Snapshot Record 0x10	0x3301,0x3302,0x3306,0x330C,0xD111,0xD117,0xD118,0xF40C, 0xF40D,0xFDAA
Samples in Snapshot Record 0x10	1
Reported via Control Routines	