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2016 FORD Mustang Shelby GT350 OEM Service and Repair Workshop Manual

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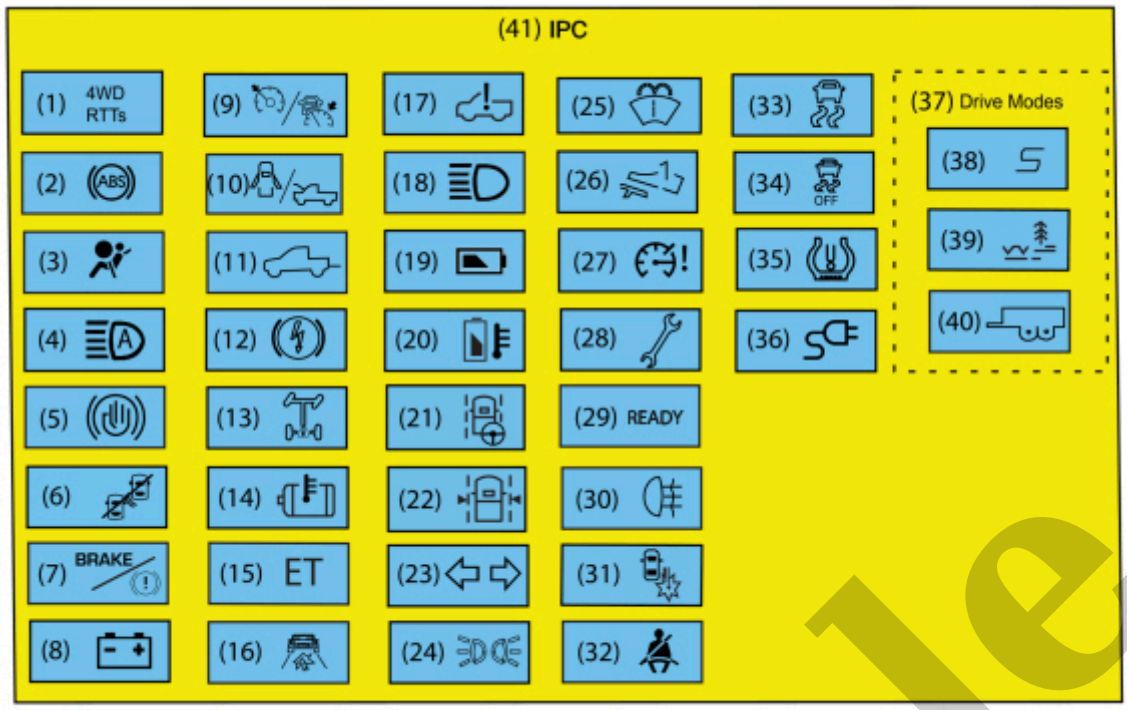

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Item	Description
1	4WD Reconfigurable Telltales (RTTs) (2H, 4H, 4L, 4A)
2	ABS (anti-lock brake system)
3	Airbag
4	Auto high beam
5	Auto hold
6	BLIS (blind spot information system) off
7	Brake warning
8	Charging system (12-volt battery)
9	Cruise control/adaptive cruise control
10	Door, hood ajar
11	Power tailgate ajar

33	Stability-traction control (sliding car icon)
34	Stability-traction control disabled (sliding car OFF icon)
35	TPMS (tire pressure monitoring system)
36	Vehicle plugged in
37	Drive modes
38	Sport
39	Off-road
40	Tow haul
41	IPC (instrument panel cluster)

Network Message Chart - Reconfigurable Telltales (RTTs)

The telltales and Reconfigurable Telltales (RTTs) are illuminated or displayed in the IPC (instrument panel cluster) when the IPC (instrument panel cluster) receives messaged inputs from other modules on the CAN (controller area network) , due to system faults detected, system status changes or for driver information. The IPC (instrument panel cluster) communcates on the HS-CAN3 (high-speed controller area network 3) . If the originating module communicates on a network other than the HS-CAN3 (high-speed controller area network 3) , the messaged signals are sent to the GWM (gateway module A) first, then to the IPC (instrument panel cluster) .

Indicator	Telltale/ RTT (reconfigurable telltale) (T, RTT or Both)	Network Message	Originating Module	Originating CAN (controller area network)	Receiving Module
ABS (anti-lock brake system) warning	RTT (reconfigurable telltale)	ABS (anti-lock brake system) warning indicator request	ABS (anti-lock brake system) module	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)

		right status • CTA (cross traffic alert) right sensor status • Side obstacle detect status-right • Side obstacle sensor status-right • BLIS (blind spot information system) trailer tow status-right			
Brake warning/low brake fluid warning/parking brake	RTT (reconfigurable telltale)	Brake (red) warning indicator request Park brake active status	ABS (anti-lock brake system) module	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
Charging system warning (12-volt battery)	RTT (reconfigurable telltale)	Battery low state of charge	BCM (body control module)	HS-CAN1 (high-speed controller area network 1)	IPC (instrument panel cluster)
Cruise control/ ACC (adaptive cruise control) /set speed display	RTT (reconfigurable telltale)	• Cruise control status • Cruise control override • Cruise conrol set speed display	PCM (powertrain control module)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)

				Area Network)	
Forward collision warning	RTT (reconfigurable telltale)	Forward collision warning indicator request	IPMA (image processing module A)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
Four-wheel drive	RTT (reconfigurable telltale)	• 4x2 indicator request • 4x4 low indicator request • 4x4 high indicator request • 4x4 auto indicator request	TCCM (transfer case control module)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
Hazard - stop safely now	RTT (reconfigurable telltale)	HEV (hybrid electric vehicle) transmission warning indicator request	SOBDMC (secondary on-board diagnostic control module C)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
		HEV (hybrid electric vehicle) battery warning indicator request	BECM (battery energy control module)	HS-CAN1 (high-speed controller area network 1)	
High beam	RTT (reconfigurable telltale)	Headlamp high beam status	BCM (body control module)	HS-CAN1 (high-speed controller area network 1)	IPC (instrument panel cluster)

Cooperative Countries [GCC])	telltale)		control module)	Rate Controller Area Network)	panel cluster)
Powertrain malfunction (wrench) warning	RTT (reconfigurable telltale)	• Engine service required • Transmission service required	PCM (powertrain control module)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
		High voltage battery service required	BECM (battery energy control module)	HS-CAN1 (high-speed controller area network 1)	
		4WD service required	TCCM (transfer case control module)	FD-CAN (Flexible Data Rate Controller Area Network)	
		Body service required	BCM (body control module)	HS-CAN1 (high-speed controller area network 1)	
Ready to drive	RTT (reconfigurable telltale)	Ready to drive indication request	SOBDMC (secondary on-board diagnostic control module C)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)
Reverse braking assist	RTT (reconfigurable telltale)	• Cross traffic alert brake warning-left	IPMA (image processing module A)	FD-CAN (Flexible Data Rate	IPC (instrument

TPMS (tire pressure monitoring system)	RTT (reconfigurable telltale)	Tire pressure warning indicator	BCM (body control module)	HS-CAN1 (high-speed controller area network 1)	IPC (instrument panel cluster)
Turn indicator (LH (left-hand) / RH (right-hand))	RTT (reconfigurable telltale)	• Left turn lamp on request • Right turn lamp on request	BCM (body control module)	HS-CAN1 (high-speed controller area network 1)	IPC (instrument panel cluster)
Vehicle plugged in	RTT (reconfigurable telltale)	Charge cord connection status	SOBDMC (secondary on-board diagnostic control module C)	FD-CAN (Flexible Data Rate Controller Area Network)	IPC (instrument panel cluster)

Networked Input Messages and Default States

NOTE

Whenever a network message is suspected as missing and confirmed by a missing message DTC (diagnostic trouble code) (U-code), it is important to look for other symptoms that can also be present in the IPC (instrument panel cluster) and throughout the vehicle. Once a DTC (diagnostic trouble code) sets in the IPC (instrument panel cluster) , it is helpful to review the complete message list to determine which other modules also rely on the same message and run the self-test for those modules. If the message is missing from other modules, the same or similar lost communication DTC (diagnostic trouble code) can also be set in those modules. Confirmation of missing messages common to multiple modules can indicate the originating module is the source of the concern or the communication network may be at fault.

For a list of all the network messages,

Refer to: Controller Area Network (CAN) Module Communications Network - Electric - System Operation and Component Description

(418-00A Controller Area Network (CAN) Module Communications Network, Description and Operation).

The IPC (instrument panel cluster) uses input messages from other modules to control the gauges, informational indicators, warning indicators and message center message displays over the communication

depending upon the type of software update or IPC (instrument panel cluster) level. The ethernet cable connections are used for higher speed downloads and enhanced data security. The ethernet cables are color coded specifically for each module.

The ethernet connection is used for module software updates only, and not for receiving messaged data related to IPC (instrument panel cluster) function or driver information. If a module communication concern is detected, it will only affect the CAN (controller area network) connections to the IPC (instrument panel cluster) .

For certain types of software updates, certain vehicle functions will be unavailable while the updates are occurring, such as vehicle start, driving the vehicle, charging the vehicle (HEV (hybrid electric vehicle)) or using the key fob to lock or unlock the vehicle. The vehicle owner can schedule the software updates for periods of vehicle non-use, or cancel the update prior to the software download. The vehicle owner will also be notified when an update is ready to download.

For additional information, REFER to Section 418-01B.

Startup-Shutdown

The IPC (instrument panel cluster) provides a startup/shutdown sequence also known as a welcome/goodbye strategy. The IPC (instrument panel cluster) initiates and follows a progressive strategy providing increasing IPC (instrument panel cluster) functionality from IPC (instrument panel cluster) wake up to ready to drive status. This sequence begins at RKE (remote keyless entry) unlock or driver door open through the ignition RUN state. During this period, the IPC (instrument panel cluster) provides increasing functionality from backlighting or illuminating gauge rings, gauge pointers, illuminating the PRNDM, backlighting of the message center display, displaying a message center splash screen, gauge and LED (light emitting diode) prove out, gauge sweep and finally normal IPC (instrument panel cluster) operation.

MyKey®

The MyKey® feature allows the customer to program a restricted driving mode that is tied to one or more keys known as a MyKey® key. The following features are provided by the IPC (instrument panel cluster) when a MyKey® key is being used:

- At the beginning of vehicle start up, as part of the welcome strategy, the message center greets the MyKey® driver with MYKEY ACTIVE DRIVE SAFELY displayed in the message center. If the MyKey® speed limiter feature is turned on, the message center also displays the MyKey® administrator selected top speed setting message. The MyKey® top speed selections are; 105, 110, 120 or 130 km/h (65, 70, 75, or 80 mph) or to the administrator desired setpoint.

- The IPC (instrument panel cluster) provides a periodic Belt-Minder® warning chime until the driver and passenger seatbelts are buckled. When the Belt-Minder® is issued, the ACM (audio front control module) is muted and the message center displays BUCKLE UP TO UNMUTE AUDIO.

- If the MyKey® speed limiter feature is turned on and the vehicle speed approaches the selected top speed (100, 110, 120 or 130 km/h [60, 70, 75, or 80 mph]), the message center displays NEAR VEHICLE

For information on the MyKey® features, refer to the Owner's Literature.

Dealer Test Mode (Engineering Test Mode)

To enter the IPC (instrument panel cluster) engineering test mode or dealer test mode, begin with the ignition off. Press and hold the RH (right-hand) steering wheel switch OK button. For push-button start vehicles, place the ignition on and continue to hold the button for 5-8 seconds until the display indicates Test or Gauge Sweep. For key ignition vehicles, place the ignition in the key on position, and wait 5-8 seconds until the display indicates Test or Gauge Sweep. Press the up or down arrow buttons to navigate through each of the display windows. To exit the IPC (instrument panel cluster) dealer test mode, press and hold the OK button for 5-8 seconds or place the ignition in off. Each down arrow button press advances the viewing window to the next set of items.

Gauges (Virtual)

Electric Motor Temperature

The electric motor temperature gauge displays the current detected temperature of the electric motor. If the electric motor temperature is too hot or too cold, a warning message will display in the message center indicating limited vehicle performance.

High Voltage Battery (Charge)

The high voltage battery gauge displays the current high voltage battery state of charge. One hundred percent represents the full amount of charge obtained from plugging the vehicle into a charging source. When the battery power is low, the gauge illuminates in amber, and when the battery power is depleted, the gauge illuminates in red.

When a navigation route is selected, a symbol illuminates on the gauge to indicate the battery charge needed to reach the selected destination or the next charging station.

High Voltage Battery Temperature

The high voltage battery temperature gauge displays the current detected battery temperature. If the battery temperature is too hot or too cold, a warning message will display in the message center indicating limited vehicle performance.

Power (Regenerative)

The power gauge displays the amount of power going to the wheels when accelerating or maintaining speed, and the amount of power regenerated and returned to the high voltage battery when slowing down or braking. The inner blue line on the gauge represents the percentage of maximum power available. If the system limits the power available, the blue line will display less than 100%.

Speedometer

The IPC (instrument panel cluster) receives the vehicle speed data from the PCM (powertrain control module) . The PCM (powertrain control module) receives the wheel speed data from the ABS (anti-lock brake system) .

Refer to the Normal Operation and Fault Condition description before each brake/stability-traction control system indicator Pinpoint Test for the IPC (instrument panel cluster) default action for network/missing message conditions.

Event/Fault Condition	ABS Indicator Status	Brake Warning Indicator Status	Electric Park Brake Indicator Status (Red)	Electric Park Brake Fault Indicator Status (Yellow)	Stability-Traction Control Indicator Status	Traction Control Disabled Indicator Status
Normal conditions	Off	Off	Off	Off	Off	Off
Parking brake applied	Off	• Flashing while applying • On when applied	Off	Off	Off	Off
Low brake fluid level or brake fluid level input concern	Off	On	Off	Off	Off	Off
Stability-traction control event - trailer sway	Off	Off	Off	Off	Flashing	Off
Stability-traction control event - brake applied	Off	Off	Off	Off	Flashing	Off
Stability-traction control disabled by driver	Off	Off	Off	Off	Off	On
Single wheel speed sensor fault	On	Off	Off	Off	On	Off
2 wheel speed sensor faults on the same axle or 3	On	On	Off	On	On	Off