TSM/TSSM OVERVIEW 3.1

GENERAL

See Figure 3-1. The turn signal module (TSM) has two major functions:

● Control turn signals.

● Serve as bank angle sensor.

The optional, factory-installed, security system (turn signal security module or TSSM) provides the same functionality as the TSM, but also includes:

● Security and immobilization functions.

See 3.2 TSM/TSSM FEATURES for complete details.

TROUBLESHOOTING

Problems fall into at least one of four categories:

● Turn signal malfunction.

● Bank angle (engine disable).

● Security lamp problem (TSSM only).

● Security system malfunction (TSSM only).

To resolve TSM/TSSM problems, five basic steps are involved. In order of occurrence, they are:

1. Check for trouble codes by observing the turn signals. See 3.8 CHECKING FOR TROUBLE CODES: TSM/TSSM or 3.9 CHECKING FOR TROUBLE CODES: TSSM ONLY.

2. Retrieve trouble codes using TSM/TSSM diagnostics. See 3.8 CHECKING FOR TROUBLE CODES: TSM/TSSM.

3. Diagnose system problems. This involves using special tools and the diagnostic flow charts in this section.

4. Correct problems through the replacement and/or repair of the affected components.

5. After repairs are performed, the work must be validated. This involves clearing the trouble codes and confirming proper vehicle operation as indicated by the behavior of the turn signals.

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Figure 3-1. TSM/TSSM
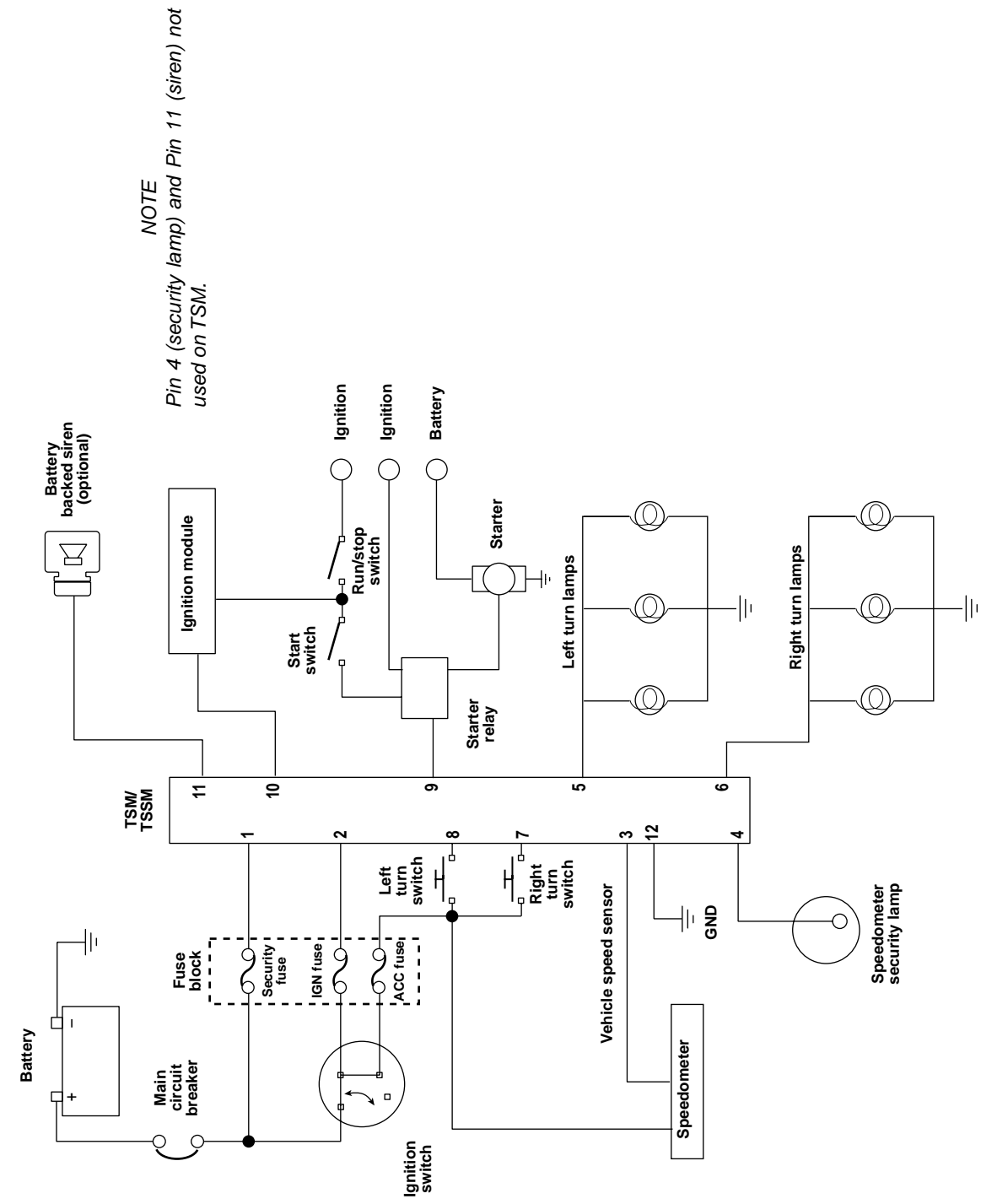

s0457xtm

Figure 3-2. Key Fob

NOTE

Pin 4 (security lamp) and Pin 11 (siren) not used on TSM.

Figure 3-3. Simplified TSM/TSSM Wiring: See Diagrams For Wire Colors

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TSM/TSSM FEATURES 3.2

GENERAL

The TSM/TSSM provides the following capabilities. Note that some hardware options and software settings are dependent upon vehicle market specifications.

TURN SIGNAL FUNCTIONS

TSM/TSSM Features

See 3.4 TSM/TSSM TURN SIGNAL FUNCTIONS for complete details.

● **Manual turn signal control:** Manual activation/deactivation of left and right turn signal flashing sequences.

● **Automatic turn signal cancellation:** Automatic cancellation of left and right turn signal flashing sequences based on either vehicle speed, vehicle acceleration or turn completion.

● **Emergency flashers:** Four-way left and right turn signal flashing capability.

● **Turn signal lamp diagnostics:** Self-diagnostics for short circuit and open lamp conditions on both left and right turn signal systems.

BANK ANGLE FUNCTIONS

TSM/TSSM Features

See 3.5 TSM/TSSM BANK ANGLE FUNCTION for complete details.

● **Emergency engine shutdown:** Monitors vehicle lean and will provide engine shutdown when lean exceeds 45° from vertical for more than one second.

● **Emergency outputs disable:** Monitors vehicle lean and will disable turn signal lamps and starter motor when lean exceeds 45° from vertical for more than one second.

SECURITY ALARM AND IMMOBILIZATION FUNCTIONS

TSSM Only Feature

The following information applies only to vehicles with the security option (TSSM). See 3.6 SECURITY SYSTEM (TSSM) FUNCTIONS for more information.

● **Remote arming/disarming:** See Figure 3-4. Owners may enable and disable security alarm and immobilization functions with a remote, personally carried transmitter. This transmitter is referred to as a **key fob** within this document.
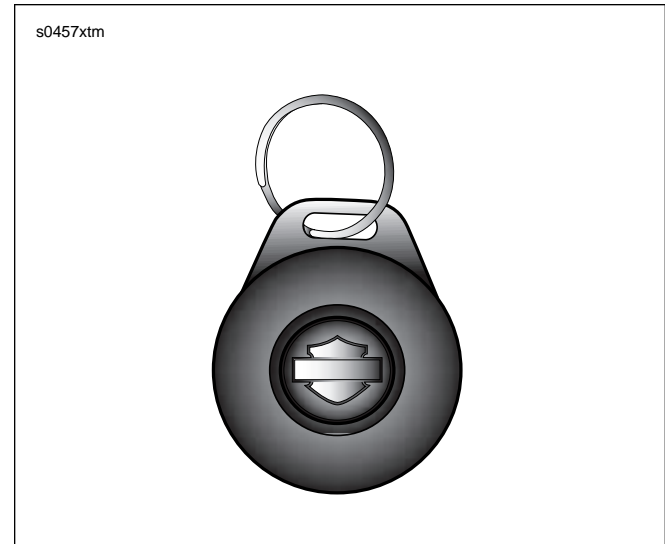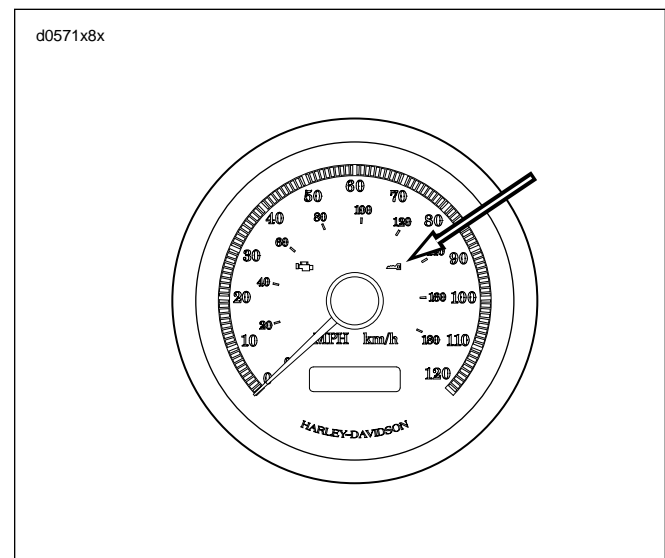

Figure 3-4. Key Fob

Figure 3-5. TSSM Lamp

● **Security status lamp:** See Figure 3-5. A lamp within the speedometer face tells the rider if the system is armed or disarmed.

● **Personal code disarming:** If a key fob is not available, the TSSM allows the rider to disable the security alarm and immobilization functions if the rider knows the previously entered personal code.

● **Security command confirmation:** When the system is armed or disarmed, the system provides visual feedback to the rider by flashing the turn signals and sounding the optional siren.

● **Auto-arming:** Automatically enables the security alarm and immobilization functions when the ignition key is switched OFF.

NOTE

Default auto-arming behavior depends upon vehicle market. All HDI vehicles have auto-arming by default. Motorcycles sold in other markets have auto-arming disabled, but it may be activated. See 3.3 TSM/TSSM VEHICLE DELIVERY.

● **Transport mode:** It is possible to arm the security system without enabling the motion detector for one ignition cycle. This allows the vehicle to be moved in an immobilized state.

● **Starter/ignition disable:** Should the security alarm and immobilization functions be triggered by a vehicle security condition, the starter and ignition system will be disabled.

● **Security system alarm:** See Figure 3-6. The system will alternately flash the left and right turn signals and sound an optional siren if a vehicle security condition is detected while the system is armed.

Figure 3-6. Siren

GENERAL

> ⚠️**WARNING**
>
> **ONLY FLT Harley-Davidson Motorcycles are suitable for sidecar use. Consult your Harley-Davidson Dealer. Use of vehicles other than FLT models for this purpose could result in death or serious injury.**

Setting up a vehicle TSM/TSSM depends on two factors:

● Does the vehicle have a sidecar attached?

● Does the vehicle have a turn signal module (TSM) or the optional security system (TSSM) installed?

All motorcycles ship with the TSM/TSSM set for use **without** a sidecar installed. If a motorcycle is equipped with a TSM, no further configuration is required. However, if a motorcycle has a sidecar or an optional security system (TSSM) installed, perform the following steps as necessary.

> **CAUTION**
>
> **If the vehicle is being operated with a sidecar, the setting MUST be switched from solo vehicle operation to sidecar operation or the TSM/TSSM will not function properly.**

1. Configure the TSM/TSSM for sidecar or solo configuration. If no sidecar is installed, skip this step.

2. Configure TSSM motorcycles by assigning **both** key fobs to the vehicle.

3. Configure TSSM motorcycles by entering a personal code picked by the owner. The personal code allows the owner to operate the system if the key fob is lost or inoperable. Record this code in the owner's manual and instruct the customer to carry a copy.

> *IMPORTANT NOTE*
>
> *Do not forget to enter a personal code for TSSM vehicles. If a code is not assigned and the key fob is lost or damaged while the vehicle is armed, the TSSM must be replaced.*

Changes to TSM/TSSM settings are made by a series of programming operations involving the ignition key, left/right turn signal switches and key fob (security systems).

At certain steps in the programming sequence, the motorcycle may provide confirmation of settings by flashing the turn signals, turn signal indicators and/or security lamp.

All programming operations are listed in table format. Follow the numbered steps to configure the system. If a confirmation response is listed, wait for the confirmation before continuing to the next step. Important information pertaining to certain actions will be found in the NOTES column.

SIDECAR CONFIGURATION

> ⚠️**WARNING**
>
> **ONLY FLT Harley-Davidson Motorcycles are suitable for sidecar use. Consult your Harley-Davidson Dealer. Use of vehicles other than FLT models for this purpose could result in death or serious injury.**

On motorcycles with a sidecar, the TSM/TSSM **must** be switched from the factory solo vehicle setting to the sidecar setting. See Table 3-1.

If a sidecar is removed from the motorcycle, the TSM/TSSM **must** be reconfigured. See Table 3-2.

POWER DISRUPTION AND CONFIGURING

The TSM/TSSM will not enter configuration mode on the first attempt after battery voltage has been removed from Pin 1. This will occur after any of the following situations:

● Battery disconnect or power drain.

● Security fuse removal.

● Connecting Breakout Box to TSM/TSSM connector.

Therefore, after all battery reconnects, the configuration sequence must be modified as follows.

1. Set run switch to **OFF**, cycle ignition key **ON**-OFF-**ON**-OFF-**ON** and press left turn signal switch **twice**.

2. Repeat step listed above.

3. Continue with configuration sequence listed.

KEY FOB ASSIGNMENT

The key fob on TSSM motorcycles must be set so it will operate the alarm system on the vehicle. This assignment **must** be completed with no pauses between steps greater than 10 seconds. Turn the ignition OFF after all key fobs have been assigned. The programming mode will also exit after 60 seconds has elapsed without detecting any fob signup messages or turn signal switch activity.

Two key fobs may be assigned to the TSSM. The first successful attempt to program a fob will disable all previously assigned fobs. If a second fob is to be programmed, it must be done in the same programming sequence as the initial fob.

To assign a key fob to a motorcycle, see Table 3-3.

PERSONAL CODE ENTRY

First Time Code Entry: TSSM Only

IMPORTANT NOTE

Do not forget to enter a personal code for TSSM vehicles. If a code is not assigned and the key fob is lost or damaged while the vehicle is armed, the TSSM must be replaced.

The TSSM personal code consists of five digits. Each digit can be any number from 1-9. The personal code **must** be used to disarm the security system in case the key fob becomes unavailable.

To set a personal code on a motorcycle with no code previously installed, see Table 3-4. The procedure listed uses 3-1-3-1-3 as the desired personal code.

NOTE
For better security, do not use 3-1-3-1-3 as a personal code. It is shown as an example only.

Decide what five digit code the owner would like to use. The code will be programmed using the turn signal switches and key fob. Keep a record of the code in a secure place such as your wallet or the owner's manual.

● When programming the personal code, the security lamp flashes to provide feedback when entering each digit.

● The number of security lamp flashes corresponds to the number currently selected for a given digit. Therefore, the lamp may flash 1-9 times depending on the number entered.

● Press the left turn switch one time to increment each digit of the code.

● Quickly press the key fob button twice to advance to the next digit of the code.

NOTE
The programming mode exits upon turning the key switch to OFF or if no turn signal switch/key fob button activity occurs for 60 seconds. No data is saved for partial configuration attempts.

Modifying Existing Codes: TSSM Only

If a code was previously entered, the lamp will flash the equivalent digit. Each additional press of the left turn switch will increment the digit.

● To advance from 5 to 6, press and release the left turn switch 1 time.

● To advance from 8 to 2, press and release the left turn switch 3 times (9-1-2).

Table 3-1. Configuring TSM/TSSM for Sidecar Use

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is disarmed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	1-3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	1 flash-Worldwide TSM, no security 2 flashes-North American/ Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press **right** turn switch **1 time** and release	1 flash turn signals & indicators	
5	Press **right** turn switch **1 time** and release	2 flashes turn signals & indicators	
6	Press **left** turn switch **1 time** and release	1 flash turn signals & indicators	
7	Press **left** turn switch **1 time** and release	2 flashes turn signals & indicators	
8	Turn **IGN** key OFF		

Table 3-2. Configuring TSM/TSSM for Solo Vehicle Use

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is disarmed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	1-3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	1 flash-Worldwide TSM, no security 2 flashes-North American/Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press **right** turn switch **1 time** and release	1 flash turn signals & indicators	
5	Press **right** turn switch **1 time** and release	2 flashes turn signals & indicators	
6	Press **left** turn switch **1 time** and release	2 flashes turn signals & indicators	
7	Press **left** turn switch **1 time** and release	1 flash turn signals & indicators	
8	Turn **IGN** key OFF		

Table 3-3. TSSM Key Fob Assignment

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is disarmed) This assignment procedure **must** be completed with no pauses between steps greater than 10 seconds
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	1-3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	1 flash-Worldwide TSM, no security 2 flashes-North American/Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press **right** turn switch **1 time** and release	1 flash turn signals & indicators	
5	Press **left** turn switch **1 time** and release	2 flashes turn signals & indicators	
6	Press and hold **key fob** button until confirmation is received	2 flashes turn signals & indicators	This may take 10-25 seconds
7	If you have two key fobs, press and hold button on second **key fob** until confirmation is received	2 flashes turn signals & indicators	optional step
8	Turn **IGN** key OFF		

Table 3-4. Programming A TSSM Personal Code (Example: 3-1-3-1-3)
With No Code Previously Installed

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is dis-armed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	1-3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects)	1 flash-Worldwide TSM, no security

2 flashes-North American/Domestic configuration TSSM

3 flashes-European/HDI configuration TSSM |
| 4 | Quickly press **key fob** button **2 times** and release | 1 flash turn signals & indicators | Vehicle is in personal code entry mode |
| 5 | Press **left** turn switch **1 time** and release | None if no code entered

1 - 9 flashes if code previously entered | A lack of confirmation flashes indicates no digit is entered |
| 6 | Press and release **left** turn switch to advance through the digits

In this example, you will press and release three times | security lamp flashes to indicate each digit selected

In this example, the lamp will flash 3 times | You've selected 3 as a number for the first digit |
| 7 | Quickly press **key fob** button **2 times** and release | 2 flashes turn signals & indicators | You've confirmed 3 as a number for the first digit and have advanced to entering the second digit |
| 8 | Press **left** turn switch **1 time** and release | none | A lack of confirmation flashes indicates no digit is entered |
| 9 | Press and release **left** turn switch to advance through the digits

In this example, you will perform this step one time | security lamp flashes to indicate each digit selected

In this example, the lamp will flash 1 time | You've selected 1 as a number for the second digit |
| 10 | Quickly press **key fob** button **2 times** and release | 3 flashes turn signals & indicators | You've confirmed 1 as a number for the second digit and have advanced to entering the third digit |
| 11 | Press **left** turn switch **1 time** and release | none | A lack of confirmation flashes indicates no digit is entered |
| 12 | Press and release **left** turn switch to advance through the digits

In this example, you will repeat this step three times | security lamp flashes to indicate each digit selected

In this example, the lamp will flash 3 times | You've selected 3 as a number for the third digit |
| 13 | Quickly press **key fob** button **2 times** and release | 4 flashes turn signals & indicators | You've confirmed 3 as a number for the third digit and have advanced to entering the fourth digit |
| 14 | Press **left** turn switch **1 time** and release | none | A lack of confirmation flashes indicates no digit is entered |
| 15 | Press and release **left** turn switch to advance through the digits

In this example, you will perform this step one time | security lamp flashes to indicate each digit selected

In this example, the lamp will flash 1 time | You've selected 1 as a number for the fourth digit |

Table 3-4. Programming A TSSM Personal Code (Example: 3-1-3-1-3)
With No Code Previously Installed

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
16	Quickly press **key fob** button **2 times** and release	5 flashes turn signals & indicators	You've confirmed 1 as a number for the fourth digit and have advanced to entering the fifth digit
17	Press **left** turn switch **1 time** and release	none	A lack of confirmation flashes indicates no digit is entered
18	Press and release **left** turn switch to advance through the digits. In this example, you will repeat this step three times	security lamp flashes to indicate each digit selected. In this example, the lamp will flash 3 times	You've selected 3 as a number for the fifth digit
19	Quickly press **key fob** button **2 times** and release	1 flash turn signals & indicators	You've confirmed 3 as a number for the fifth digit and have gone back to the first digit
20	Turn **IGN** key OFF		
21	Write down code in owner's manual		
22	Arm the security system and attempt to disarm using personal code entry. See Table 3-10.		

TSM/TSSM TURN SIGNAL FUNCTIONS 3.4

GENERAL

The TSM/TSSM's turn signal feature has several modes:

- Automatic cancellation.
- Manual cancellation.
- Four-way flashing.
- Diagnostics mode.

Unlike previous model years, all 2001 model turn signals cannot be activated or deactivated when the ignition key is in the ACC position. The turn signals can only be activated or deactivated with the ignition key in the IGN position.

CAUTION

If the vehicle is being operated with a sidecar, the setting MUST be switched from solo vehicle operation to sidecar operation or the TSM/TSSM will not function properly.

If a sidecar is installed, reconfigure the TSM/TSSM using the method under 3.3 TSM/TSSM VEHICLE DELIVERY.

AUTOMATIC CANCELLATION

Press the left or right turn switch to activate automatic turn signal cancellation. There is no need to hold the turn switch in when approaching the turn. The TSM/TSSM will not cancel the signal before the turn is actually completed.

- When the directional switch is released, the system starts a 20 count. As long as the vehicle is traveling above 7 MPH the directional will always cancel after 20 flashes if the system does not recognize any other input.

- If the vehicle speed drops to 7 MPH or less, including stopped, the directionals will continue to flash. Counting will resume when vehicle speed reaches 8 MPH and will automatically cancel when the count total equals 20 as stated above.

- The turn signals will cancel within two seconds upon turn completion if the turn is greater than 45 degrees. A sensor inside the TSM/TSSM cancels the signal after the vehicle has been returned to an upright position.

NOTE
The bank angle cancellation function has a calibration feature. Ride the motorcycle for 1/4 mile (0.4 KM) at steady speeds (upright) to calibrate the system.

MANUAL CANCELLATION

If you want to stop the turn signals from flashing, briefly depress the turn signal switch a second time.

If you are signalling to turn in one direction and you depress the switch for the opposite turn signal, the first signal is cancelled and the opposite side begins flashing.

FOUR-WAY FLASHING

Use the following method to activate the four-way flashers.

1. With the ignition key ON and security system disarmed (models with security only), press the left and right turn signal switches at the same time.

2. Turn the ignition key OFF and arm the security system if present and desired. The four-way flashers will continue for two hours.

3. To cancel four-way flashing, disarm the security system if necessary, turn the ignition key ON and press the left and right turn signal switches at the same time.

NOTE
Auto-arming (always active on HDI bikes, user selectable on other vehicles) requires that the four-way flashers be activated within 30 seconds of key OFF or after the vehicle has been disarmed.

This system allows a stranded vehicle to be left in the four-way flashing mode and secured until help is found.

If the security system is disarmed while the four-way flashers are active, the lights will flash as follows:

1. TSSM stops four-way flashing mode. Motorcycle sits for 1 second with turn signals off.

2. TSSM performs disarming confirmation (1 flash).

3. Motorcycle sits for 1 second with turn signals off.

4. Motorcycle restarts four-way flashing mode.

DIAGNOSTICS MODE

The TSM/TSSM measures the current when the turn signals are used. If there is a burned out light bulb on one side, the remaining light and the corresponding turn signal indicator flash at double the normal rate starting with the fifth flash.

Other diagnostic conditions monitored include:

- Short circuit in the turn signal wiring.
- Open circuit in the turn signal wiring.
- Stuck turn signal switch.

NOTE
- *A stuck turn signal switch will disable the automatic turn signal cancellation feature.*

- *If a stuck switch is detected, you must hold the left and right turn signal switches in for more than one second to activate the four-way flashers.*

See 3.8 CHECKING FOR TROUBLE CODES: TSM/TSSM for more information.

GENERAL

The turn signals, starter motor, ignition controller (ECM) and coil will be disabled in the event the vehicle tilts more than 45 degrees from vertical for longer than one second.

| **CAUTION** |

If the vehicle is being operated with a sidecar, the setting MUST be switched from solo vehicle operation to sidecar operation or the TSM/TSSM will not function properly.

If a sidecar is installed, reconfigure the TSM/TSSM using the method under 3.3 TSM/TSSM VEHICLE DELIVERY.

OPERATION

The engine will shut off automatically if the vehicle tilts more than 45 degrees from vertical for longer than one second. The engine will automatically shut off even if the tilt occurs at a very slow speed.

To restart the motorcycle after shutdown has occurred:

1. Return the motorcycle to an upright position.

2. Cycle the ignition key OFF-**ON** before restarting the vehicle.

SECURITY SYSTEM (TSSM) FUNCTIONS   3.6

GENERAL

Security System Operation

The TSSM provides security and immobilization functions not found on the TSM. The TSSM will disable the starter and ignition system. Additional functions include the ability to alternately flash the left and right turn signals and sound a siren (if purchased as an option) if a theft attempt is detected.

Conditions that activate the security system when system is armed include:

● **Detecting small vehicle movement:** Turn signals flash 3 times and optional siren chirps once and then turns off. If the vehicle is not returned to its original position the warning will reactivate after 4 seconds. This cycle may repeat a maximum of 255 times.

● **Detecting large vehicle movement:** System activates for 30 seconds and turn off. If the vehicle is not returned to its original position the alarm will reactivate after 10 seconds. This cycle may repeat a maximum of 10 times.

● **Detecting tampering of the security lamp circuit:** System activates for 30 seconds. This cycle repeats once for each tampering incident.

● **Detecting that a battery or ground disconnect has occurred while armed.** Siren, if installed, activates its self-alarm mode. Turn signals will not flash.

See 3.7 ARMING/DISARMING SECURITY SYSTEM (TSSM) for more information.

NOTE

Always disarm the TSSM before removing or disconnecting the battery to prevent the siren (if installed) from activating. If the TSSM is in auto-arming mode, you must disarm the system using two clicks of the key fob and disconnect the battery or remove the TSSM fuse before the 30 second arming period expires.

Security System Options

The following customization options are only available on the TSSM unit: alarm sensitivity, auto-arming feature and storage mode.

Default settings for the TSSM include:

● Solo vehicle configuration (sidecar not installed).

● Medium motion sensitivity on alarm sensitivity.

● Auto-arming standard on HDI vehicles and disabled on domestic motorcycles.

● Storage mode set to 60 days.

Differences By Market Specifications

The HDI version of the TSSM differs from the domestic TSSM in the following ways:

● The HDI version always auto-arms itself within 30 seconds after the ignition key is turned OFF.

● The HDI version does not have the remote arming only option.

ALARM SENSITIVITY

Sensitivity

The TSSM has four sensitivity settings: extremely low, low, medium or high. The selection picked controls the sensitivity of the security system in regards to motion detection.

To set alarm sensitivity, see Table 3-5.

Transport Mode

It is possible to arm the security system without enabling the motion detector for one ignition cycle. This allows the vehicle to be picked up and moved in an armed state. In this mode, any attempt to hot-wire the vehicle will trigger the security system.

● To enter the transport mode, see Table 3-6.

● To exit from transport mode and return the system to normal operation/functions, disarm the system using either the key fob or personal code.

NOTE
Transport mode is especially useful when working on HDI vehicles. If it is not used, then the alarm will activate under many typical service activities.

AUTO-ARMING FUNCTION

Auto-arming causes the system to automatically arm itself (no key fob needed) within 30 seconds after the ignition key is turned OFF. During this period, the security lamp stays on solid to indicate auto-arming is starting up.

The vehicle may be moved during these 30 seconds without triggering the alarm. However, any motion after that period will trigger the security alarm. Upon expiration of the auto-arming period, the turn signals flash twice, the security lamp begins to flash and the siren (if installed) chirps twice.

The TSSM allows remote arming via the key fob at anytime. However, if the system is remotely disarmed (with the key fob) but the ignition key is not turned ON within 30 seconds, the system will rearm itself when auto-arming is enabled.

The auto-arming setting depends upon vehicle market specifications.

- Motorcycles sold in North America have auto-arming **disabled** by default. However, the feature may be enabled if the customer desires.

- Vehicles sold elsewhere have auto-arming **enabled** and this setting cannot be changed.

When auto-arming is disabled, the key fob must be used to arm the security system.

To set the auto-arming function, if it is available on your vehicle, see Table 3-7.

STORAGE MODE

The TSSM has a special mode for long term storage. This mode prevents the security system from draining the battery after a period of days (30, 60, 90 or infinite) without any ignition key switch activity.

- If the TSSM is set to infinite, the system will not go into storage mode.

- Vehicles will enter storage mode whether the security system is armed or disarmed.

- If set to infinite or 90 days, the customer must use a trickle charger to keep the battery from discharging.

In storage mode, all alarm functions are suspended and the receiver is shut down and will not respond to the key fob. The vehicle is immobilized because the starter motor and ignition module are disabled. When the storage mode is entered, the security lamp stops flashing to conserve power.

To wake up the TSSM from storage mode, the ignition key must be turned ON. This will trigger the alarm if the system was previously armed. You must use the key fob or personal code to disarm the system and stop the alarm.

To set the storage mode preferences, see Table 3-8.

Table 3-5. TSSM Alarm Sensitivity

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is disarmed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	2 or 3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	2 flashes-North American/Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press and hold **key fob** button until confirmation is received	1 flash turn signals & indicators	
5	Press **left** turn switch **1 time** and release	turn signals & indicators flash to indicate option selected	1 flash-extremely low 2 flashes-low sensitivity 3 flashes-medium sensitivity 4 flashes-high sensitivity
6	Press and release **left** turn switch to advance through options	turn signals & indicators flash to indicate option selected	1 flash-extremely low 2 flashes-low sensitivity 3 flashes-medium sensitivity 4 flashes-high sensitivity
7	Turn **IGN** key OFF		

Table 3-6. TSSM Transport Mode

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is dis-armed)
2	Turn **IGN** key **ON**		
3	Press and hold **key fob** button until confirmation is received	3 flashes turn signals & indicators	
4	Turn **IGN** key OFF		
5	Press and hold **key fob** button until confirmation is received	3 flashes turn signals & indicators	The vehicle can be moved without tripping the alarm

Table 3-7. Selecting TSSM Auto-arming Function (Not Available on HDI Vehicles)

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is dis-armed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	2 or 3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	2 flashes-North American/ Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press and hold **key fob** button until confirmation is received	1 flash turn signals & indicators	
5	Press and hold **key fob** button until confirmation is received	2 flashes turn signals & indicators	
6	Press **left** turn switch **1 time** and release	turn signals & indicators flash to indicate option selected	1 flash- auto-arming disabled 2 flashes- auto-arming enabled
7	Press and release **left** turn switch to advance through options	turn signals & indicators flash to indicate option selected	
8	Turn **IGN** key OFF		

Table 3-8. TSSM Storage Mode Preferences

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		Verify that security lamp is not blinking (vehicle is disarmed)
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	2 or 3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	2 flashes-North American/ Domestic configuration TSSM 3 flashes-European/HDI configuration TSSM
4	Press and hold **key fob** button until confirmation is received	1 flash turn signals & indicators	
5	Release and then hold **key fob** button until confirmation is received	2 flashes turn signals & indicators	
6	Release and then hold **key fob** button until confirmation is received	3 flashes turn signals & indicators	
7	Press **left** turn switch **1 time** and release	turn signals & indicators flash to indicate option selected	1 flash-30 days 2 flashes-60 days 3 flashes-90 days 4 flashes-Infinite
8	Press **left** turn switch to advance through options	turn signals & indicators flash to indicate option selected	1 flash-30 days 2 flashes-60 days 3 flashes-90 days 4 flashes-Infinite
9	Turn **IGN** key OFF		

ARMING/DISARMING SECURITY SYSTEM (TSSM)   3.7

GENERAL

There are two methods to arm the security system:

- Using the key fob.
- Using auto-arming. See 3.6 SECURITY SYSTEM (TSSM) FUNCTIONS.

NOTE
The vehicle cannot be armed with the engine running or the ignition ON.

There are two ways to disarm the system:

- Using the key fob. This method works in all situations **except** before turning ignition key ON when TSSM storage mode is activated.
- Using the personal code.

SECURITY LAMP

See Table 3-9. The security lamp within the speedometer provides feedback to the rider confirming armed or disarmed status.

Table 3-9. Security Lamp Status

LAMP	MODE
Does not flash	No security system (TSM), security system not armed or storage mode active
Flashes every second	10 minute timeout after failed personal code entry attempt or a battery reconnect has occurred while armed
Flashes every 2 seconds	Security system armed
Flashes 3 times a second	Personal code entry mode
Stays on solid with ignition key OFF	Auto-arming is starting up. You have 30 seconds before system is armed.
Stays on solid with ignition key ON	If solid for more than 4 seconds after key ON, a current trouble code is present

USING KEY FOB

General

The TSSM's reception range for the key fob signal depends on a specific receiver pattern.

NOTE
Environmental and geographic conditions may affect signal range.

Arming the System

1. Hold key fob horizontal at waist level.
2. Point key fob at the front of the vehicle.
3. Hold down the key fob button until the system responds with two turn signal flashes.

Disarming the System

1. Hold key fob horizontal at waist level.
2. Point key fob at the front of the vehicle.
3. Quickly press the key fob button twice. The system will respond with one turn signal flash.

NOTE
Disarming function may require practice. The key fob button must be pressed twice within 1.5 seconds to send the disarm command. The action is very similar to double-clicking a computer mouse.

Troubleshooting

If the key fob button has been pressed numerous times while away from the vehicle, the fob may fall out of synchronization with the TSSM. If this happens, the TSSM might fail to recognize the key fob's commands.

To solve this problem, press and hold the key fob button for 10-15 seconds until the security system responds with two turn signal flashes. After confirmation, you may resume normal fob operation.

USING THE PERSONAL CODE

General

The personal code consists of five digits entered using the left and right turn signal switches. Each digit can be any number from 1-9. The personal code is intended to be used to disarm the vehicle in case the key fob becomes unavailable or inoperable.

See 3.3 TSM/TSSM VEHICLE DELIVERY to set a personal code.

Disarming the System

See Table 3-10. If you make an error while disarming the TSSM using the personal code, the alarm will activate for 30 seconds after the last digit is entered. After a failed attempt, the security lamp will flash once every second for 10 minutes. **During this time, the vehicle will not accept any attempt to enter a personal code.**

Table 3-10. Entering A Personal Code To Disarm TSSM (Example: 3-1-3-1-3)

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		
2	Turn **IGN** key to **ACC**		
3	Hold **both** turn switches in until confirmation	security lamp blinks at fast rate	System is ready for personal code entry
4	Enter first digit of code (3) by pressing **left** turn switch **3 times**		
5	Press **right** turn switch **1 time**		Serves as "enter" key for first digit
6	Enter second digit of code (1) by pressing **left** turn switch **1 time**		
7	Press **right** turn switch **1 time**		Serves as "enter" key for second digit
8	Enter third digit of code (3) by pressing **left** turn switch **3 times**		
9	Press **right** turn switch **1 time**		Serves as "enter" key for third digit
10	Enter fourth digit of code (1) by pressing **left** turn switch **1 time**		
11	Press **right** turn switch **1 time**		Serves as "enter" key for fourth digit
12	Enter fifth digit of code (3) by pressing **left** turn switch **3 times**		
13	Press **right** turn switch **1 time**	security lamp stops blinking	System is disarmed. You may use the vehicle or program another key fob

GENERAL

To diagnose the TSM/TSSM, observe the behavior of the turn signals. If the turn signals flash six fast four-way flashes shortly after key ON, then an error code is logged. See TURN SIGNAL DIAGNOSTICS which follow.

CODE TYPES

There are two types of trouble codes: current and historic. If a trouble code is stored, it can be read using TSM/TSSM diagnostics.

Current

Current trouble codes are those which are present during the current ignition cycle. See the appropriate flow charts for solutions.

Historic

If a particular problem happens to resolve itself, the active status problem is dropped and it becomes a historic code rather than a current code. For example, intermittent output shorts can become typical historic codes.

Historic codes are stored for 50 ignition cycles after any code was last set as current to assist in the diagnosis of intermittent faults. On the 50th cycle, the code will clear itself.

It is important to note that historic codes will exist whenever the system indicates the existence of a current fault.

TURN SIGNAL DIAGNOSTICS

To determine which error code (either current and/or historic) is logged:

1. Activate TSM/TSSM diagnostic mode using instructions in Table 3-11.

2. Observe the turn signals. All codes are flashed in numeric order.

    a. The flashes will pause for 4 seconds.

    b. Watch for four-way flashers to cycle a number of times equal to the first digit of the first DTC.

    c. The flashes will pause for 1.5 seconds.

    d. Watch for four-way flashers to cycle a number of times equal to the second digit of the first DTC.

    e. If multiple codes are present, the system will restart with Step A.

3. To determine the meaning of a code, see 3.11 INITIAL DIAGNOSTIC CHECK: TSM/TSSM and Table 3-13.

NOTES
- *If the turn signals flash six four-way flashes shortly after key ON, it indicates an error code has been logged sometime in the last 3 ignition cycles.*

- *On vehicles with a TSSM, the security lamp will also light for 8 seconds after the bulb check if historic codes are present. The security lamp will stay on if current codes are set. If a historic code is present, the security lamp will light for 50 ignition cycles or until the code is cleared manually.*

Table 3-11. Invoking TSM/TSSM Code Diagnostics

NO.	ACTION	WAIT FOR CONFIRMATION	NOTES
1	Set **RUN/OFF** switch to **OFF**		
2	Turn **IGN** key **ON**-OFF-**ON**-OFF-**ON**		
3	Press **left** turn switch **2 times** and release	1-3 flashes turn signals & indicators depending on vehicle configuration (See section under 3.3 TSM/TSSM VEHICLE DELIVERY regarding battery disconnects.)	1 flash-Worldwide TSM, no security 2 flashes-North American/ Domestic configuration TSSM 3 flashes-European/HDI con-figuration TSSM
4	Press **right** turn switch **1 time** and release	1 flash turn signals & indicators	
5	Press **right** turn switch **1 time** and release	2 flashes turn signals & indicators	
6	Press **right** turn switch **1 time** and release	3 flashes turn signals & indicators	
7	Press **left** turn switch **1 time** and release	turn signals & indicators flash to indicate trouble codes	See Table 3-13.
8	To clear codes, press and hold **left** turn switch for 4-5 seconds until confirmation is received	2 flashes turn signals & indicators	
9	Turn **IGN** key OFF		

SECURITY LAMP

To diagnose system problems, start by observing the behavior of the security lamp.

NOTE
- *See Figure 3-7. "Key ON" means that the ignition key is turned to ON and the engine stop switch is set to RUN (although the engine is **not** running).*

- *If the security lamp is not illuminated at Key ON or if it fails to turn OFF after the initial four second period, then a problem exists in the lamp circuit. See 3.12 NO SECURITY LAMP AT KEY ON or 3.13 SECURITY LAMP ON CONTINUOUSLY for more information.*

1. See Figure 3-8. When the ignition key is turned ON, the security lamp will illuminate for approximately four seconds and then turn off.

2. See Figure 3-9. After the lamp turns off after being illuminated for the first four second period, one of three situations may occur.

   a. The lamp remains off. This indicates there are no current fault conditions or stored historic trouble codes currently detected by the TSSM.

   b. The lamp stays off for only four seconds and then comes back on for an eight second period. This indicates a historic code is stored, but no current trouble code exists.

   c. If the lamp remains on beyond the eight second period, then a current trouble code exists.

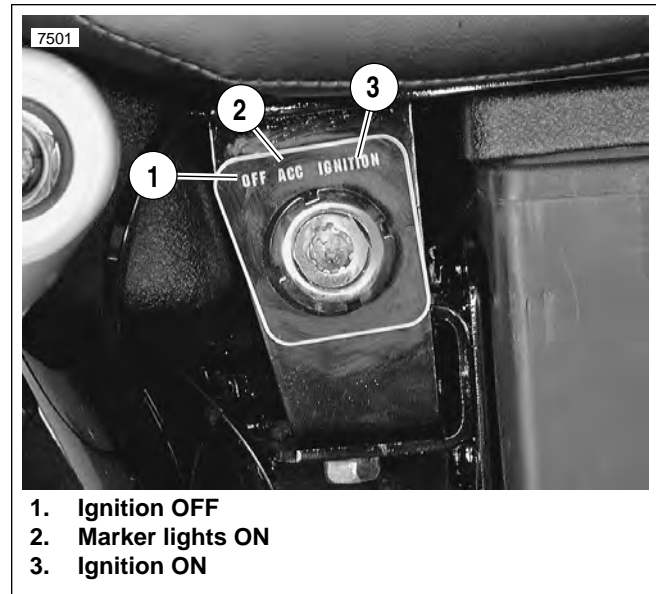3. See CODE TYPES under 3.8 CHECKING FOR TROUBLE CODES: TSM/TSSM for a complete description of trouble code formats.
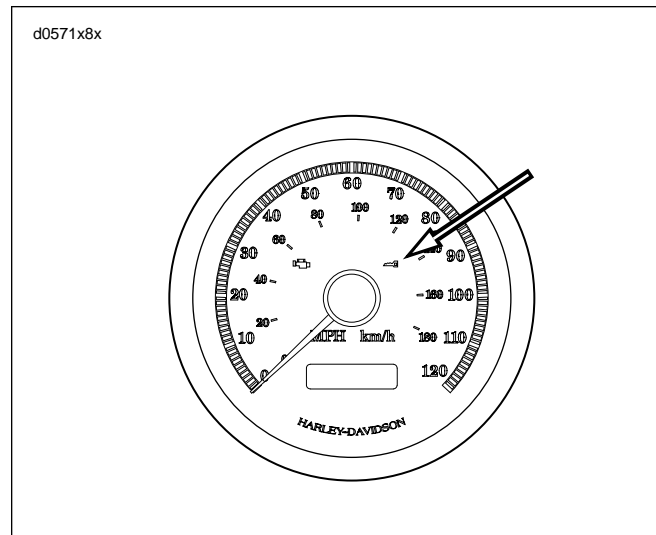

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1. **Ignition OFF**
2. **Marker lights ON**
3. **Ignition ON**

Figure 3-7. Ignition Switch

d0571x8x

Figure 3-8. Security Lamp

Figure 3-9. Security Lamp Operation

BREAKOUT BOX: TSM/TSSM 3.10
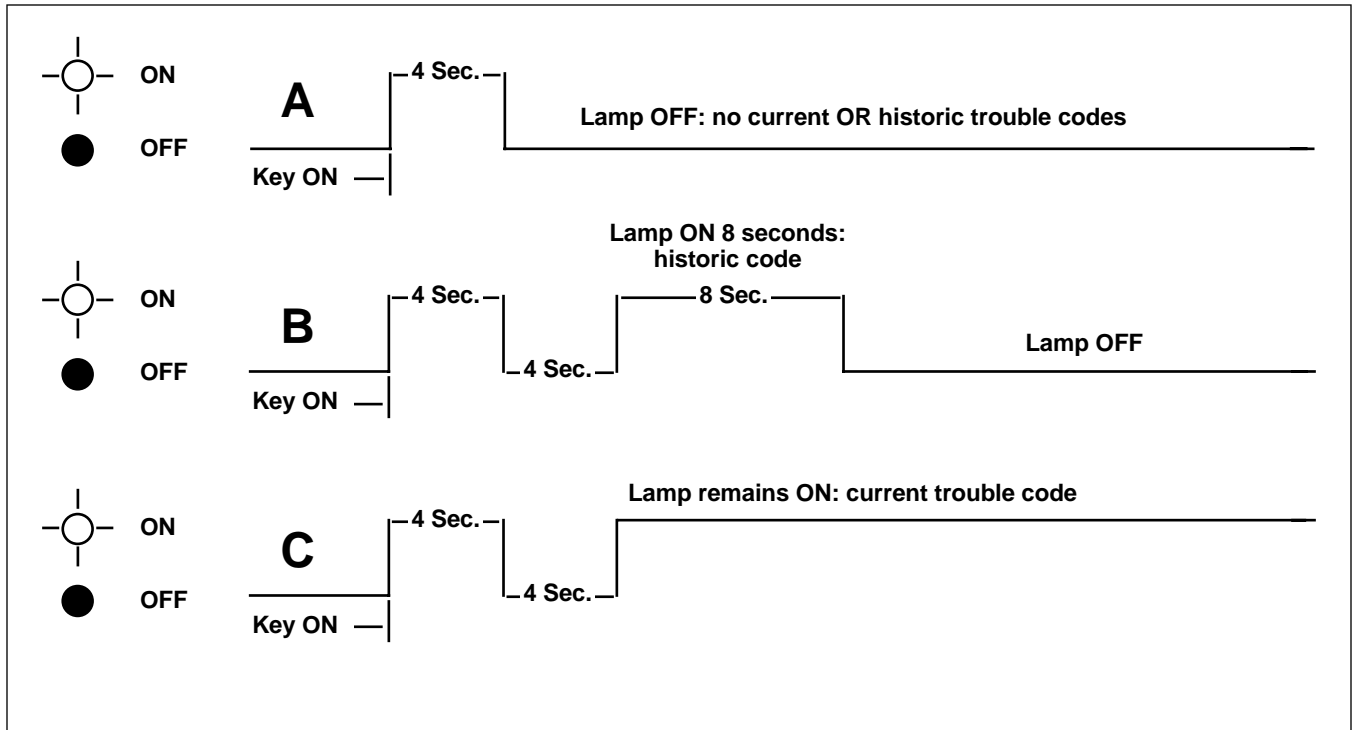
GENERAL

The BREAKOUT BOX (Part No. HD-42682) splices into the main harness. Used in conjunction with a DVOM, it allows circuit diagnosis of wiring harness and connections without having to probe with sharp objects.

INSTALLATION

1. Gain access to TSM/TSSM. See 2001 Dyna Service Manual (Part Number 99481-01).
2. See Figure 3-10. Depress latches on connector [30B].
3. See Figure 3-11. Attach Breakout Box to connector.
   a. Attach gray connector from Breakout Box to TSM/TSSM connector.
   b. Attach connector from the wiring harness to gray connector on Breakout Box.

REMOVAL

1. See Figure 3-10. Depress latches on connector [30B].
2. Detach gray Breakout Box connector from TSM/TSSM connector.
3. Detach gray Breakout Box connector from wiring harness.
4. Reattach TSM/TSSM connector to wiring harness.
5. Install parts removed for access.

NOTE
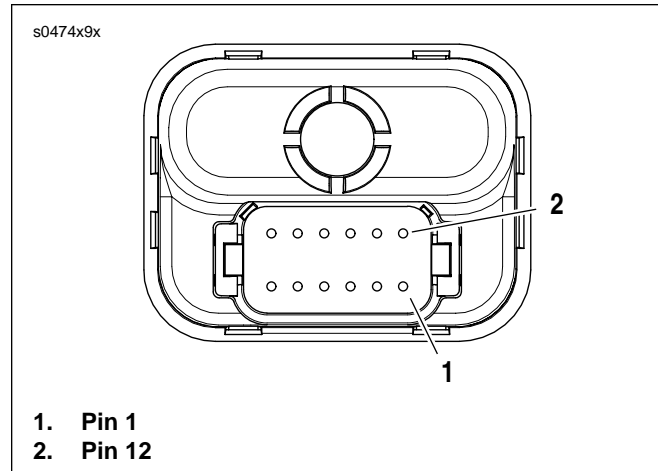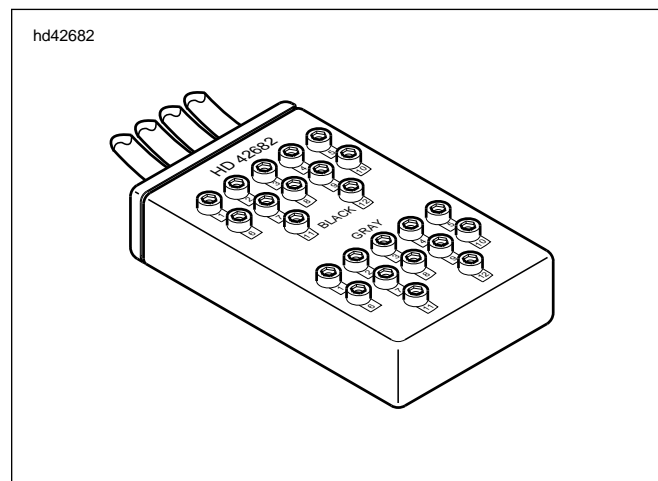*Vehicle will not start with TSM/TSSM disconnected or incorrectly mounted.*

1. **Pin 1**
2. **Pin 12**

Figure 3-10. TSM/TSSM Connector Pins

Figure 3-11. Breakout Box

Table 3-12. TSM/TSSM Connector [30B]

PIN	FUNCTION	PIN	FUNCTION
1	Battery	7	Right turn switch input
2	Ignition	8	Left turn switch input
3	Vehicle speed sensor	9	Start relay control
4	Security indicator	10	Ignition enable signal
5	Left turn feed	11	Alarm signal
6	Right turn feed	12	Ground

GENERAL

To locate faulty circuits or other system problems, follow the diagnostic flow charts in this section. For a systematic approach, always begin with the Diagnostic Check which follows. Read the general information and then work your way through the flow chart box by box.

Diagnostic Notes

If a numbered circle appears adjacent to a flow chart box, then more information is offered in the diagnostic notes. Many diagnostic notes contain supplemental information, descriptions of various diagnostic tools or references to other parts of the manual where information on the location and removal of components may be obtained.

Multiple Trouble Codes

DTCs that have a current fault status take priority over historic status codes.

Circuit Diagram/Wire Harness Connector Table

When working through a flow chart, refer to the illustrations, the associated circuit diagram and the wire harness connector table as necessary. The wire harness connector table for each circuit diagram identifies the connector number, description, type and general location.

In order to perform most diagnostic routines, a Breakout Box and a DVOM are required. See 3.10 BREAKOUT BOX: TSM/TSSM.

To perform the circuit checks with any degree of efficiency, a familiarity with the various wire connectors is also necessary. See the appendix or electrical section of your service manual.
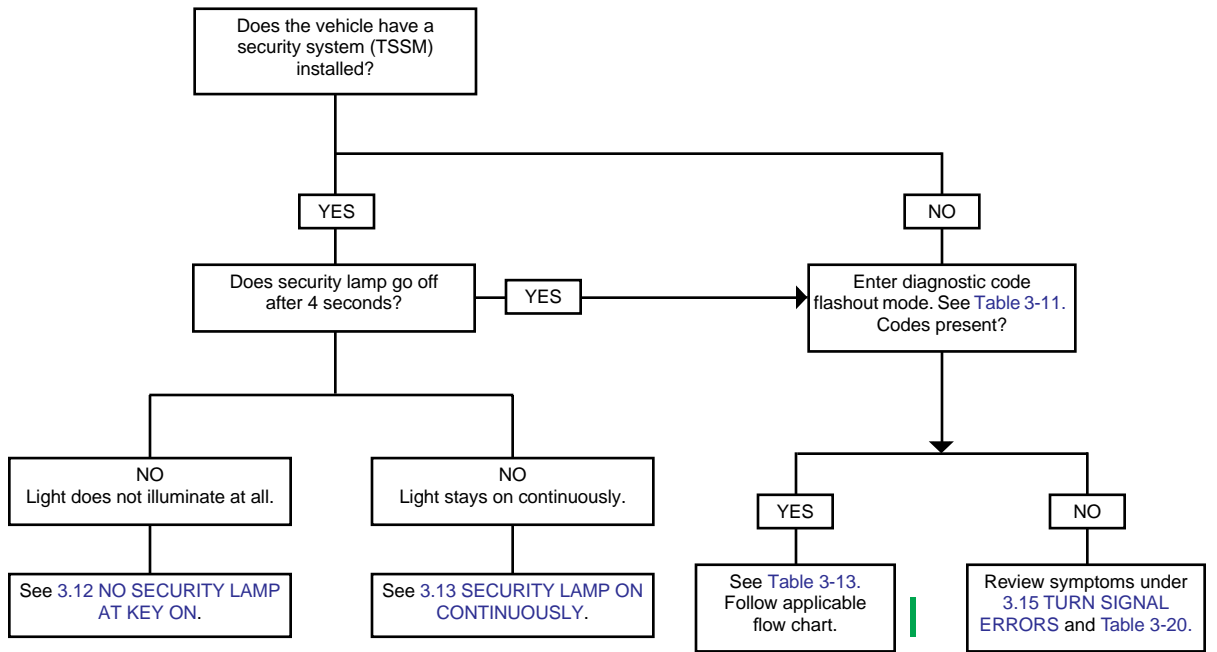
Job/Time Code Values

Dealership technicians filing warranty claims should use the job/time code values printed in **bold text** underneath the appropriate repair.

Table 3-13. TSM/TSSM Diagnostic Trouble Codes (DTC) and Fault Conditions

TURN SIGNAL LAMP CODE	FAULT CONDITION	SOLUTION
N/A	No security lamp at key ON	3.12 NO SECURITY LAMP AT KEY ON
N/A	Security lamp on continuously	3.13 SECURITY LAMP ON CONTINUOUSLY
N/A	Fob signal to TSSM weak or fails	3.14 KEY FOB SIGNAL TO TSSM WEAK OR FAILS
11	Battery voltage high	3.16 DTC 11
21	Left turn output fault	3.15 TURN SIGNAL ERRORS
22	Right turn output fault	3.15 TURN SIGNAL ERRORS
25	Ignition enable output high	3.17 DTC 25
31	Alarm output low	3.18 DTC 31, 32
32	Alarm output high	3.18 DTC 31, 32
34	Starter output high	3.19 DTC 34
35	Accelerometer fault	3.20 DTC 35
N/A	Ignition switch open/low (may show Code 41 if historic)	3.15 TURN SIGNAL ERRORS

Diagnostic Check

```
                    ┌─────────────────────┐
                    │  Does the vehicle    │
                    │  have a security     │
                    │  system (TSSM)       │
                    │  installed?          │
                    └─────────────────────┘
```

Does the vehicle have a security system (TSSM) installed?

YES

Does security lamp go off after 4 seconds?

YES

Enter diagnostic code flashout mode. See Table 3-11. Codes present?

NO

NO
Light does not illuminate at all.

NO
Light stays on continuously.

YES

NO

See 3.12 NO SECURITY LAMP AT KEY ON.

See 3.13 SECURITY LAMP ON CONTINUOUSLY.

See Table 3-13. Follow applicable flow chart.

Review symptoms under 3.15 TURN SIGNAL ERRORS and Table 3-20.

IMPORTANT NOTE
For the first three ignition cycles after a fault has occurred, the turn signals flash six fast four-way flashes shortly after key ON.