

2012 - Mazda6 - Body and Accessories

KEYLESS CONTROL MODULE INSPECTION [ADVANCED KEYLESS ENTRY AND PUSH BUTTON START SYSTEM]

1. Remove the front scuff plate. (See [FRONT SCUFF PLATE REMOVAL/ INSTALLATION.](#))
2. Remove the front side trim. (See [FRONT SIDE TRIM REMOVAL/ INSTALLATION.](#))
3. Measure the voltage according to the terminal voltage table.

• If the voltages cannot be verified as indicated in the terminal voltage table, inspect the parts under "Inspection item (s)".

▪ If the system does not work normally even though the inspection items or related wiring harnesses do not have any malfunction, replace the keyless control module.
- Terminal Voltage Table (Reference)
- KEYLESS CONTROL MODULE
WIRING HARNESS SIDE CONNECTOR
- | | | |
|----|----|----|
| 1E | 1C | 1A |
| 1F | 1D | 1B |

2K	2I	2G	2E	2C	2A
2L	2J	2H	2F	2D	2B

3AB	3Y	3V	3S	3P	3M	3J	3G	3D	3A
3AC	3Z	3W	3T	3Q	3N	3K	3H	3E	3B
3AD	3AA	3X	3U	3R	3O	3L	3I	3F	3C

4Y	4V	4S	4P	4M	4J	4G	4D	4A
4Z	4W	4T	4Q	4N	4K	4H	4E	4B
4AA	4X	4U	4R	4O	4L	4I	4F	4C

Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
1A	Steering lock unit ground	Steering lock unit	During steering lock unit operation	1.0 or less	Steering lock unit
			Other	Approx. 3.0	
1B	Power supply	ESCL 10 A fuse	Under any condition	B+	ESCL 10 A fuse Battery
1C	Power supply	Steering lock unit	Steering lock unit During lock/unlock control	B+	Steering lock unit
			Other	1.0 or less	
1D	Power supply	BCM	Under any condition	B+	ROOM 15 A fuse Battery BCM
1E	Power supply	ENG+B 10 A fuse	Under any condition	B+	ENG+B 10 A fuse Battery
1F	GND	Body ground	Under any condition	1.0 or less	Body ground
2A	Power supply	MIRROR 5 A fuse	Switch the ignitions to ACC	B+	ACC relay
			Switch the ignitions to off	1.0 or less	MIRROR 5 A fuse Battery
2B	Rx-PATS	Coil antenna	Communication lines, cannot be determined by voltage only (B+ when not communicating)	B+	Coil antenna
2C	Power supply	ENGINE IG 15 A fuse	Switch the ignitions to ON	B+	IG1 relay
			Switch the ignitions to ACC or off	1.0 or less	ENGINE IG 15 A fuse Battery
			Communication lines, cannot be		

2D	Tx-PATS	Coil antenna	determined by voltage only (B+ when not communicating)	B+	Coil antenna
2F	BCM communication	BCM	Communication lines, cannot be determined by voltage only (B+ when not communicating)	B+	BCM
2G	HS-CAN+	-	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2H	Keyless entry communication	Keyless receiver	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2I	HS-CAN-	-	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2J	Push button start	Push button start	Push button start is pushed	1.0 or less	Push button start
			Push button start is not pushed	B+	
2K	Push button start	Push button start	Push button start is pushed	1.0 or less	Push button start
			Push button start is not pushed	B+	
2L	Steering lock unit communication	Steering lock unit	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3B*1	Clutch pedal position switch	Clutch pedal position switch	Clutch pedal is depressed	1.0 or less	Clutch pedal position switch
			Clutch pedal is not depressed	B+	
3C	Keyless antenna (exterior, rear)	Keyless antenna (exterior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3E	Brake switch (MZR 2.5)	Brake switch	Brake pedal is depressed	Wave pattern1 (See. Pattern1)	Brake switch
			Brake pedal is not depressed	1.0 or less	
	GND (MZI 3.7 V6)	Body ground	Under any condition	1.0 or less	Body ground
3F	Keyless antenna (LF)	Keyless antenna (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		

3G	Trunk lid release input	Trunk lid opener switch	Trunk lid opener switch pressed	3.0	Trunk lid opener switch
			Trunk lid opener switch released	4.7	
3H	Unlock input	Touch sensor (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3I	Keyless antenna (interior, rear)	Keyless antenna (interior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3K	Keyless beeper power supply	Keyless beeper	Exterior keyless beeper sounds	5.0 or more	Keyless beeper
			Other	1.0 or less	
3L	Keyless antenna (interior, center)	Keyless antenna (interior, center)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3M*2	P position	P position switch	Shift position is P	Wave pattern1 (See. Pattern1)	P position switch
			Other	1.0 or less	
3N	GND	Body ground	Under any condition	1.0 or less	Body ground
3O	Keyless antenna (RF)	Keyless antenna (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3P	Lock input	Door lock-link switch (driver's door)	Driver's side door lock switch at LOCK	1.0 or less	Door lock-link switch
			Driver's side door lock switch at UNLOCK	Wave pattern2 (See Pattern2.)	
3Q	Unlock input	Touch sensor (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3R	Keyless antenna (interior, front)	Keyless antenna (interior, front)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
			Brake pedal is depressed	B+	

3S	Brake switch	Brake switch	Brake pedal is not depressed	1.0 or less	Brake switch
3T*1	Neutral switch	Neutral switch	Shift lever is in neutral position	1.0 or less	Neutral switch
			Shift lever is not in neutral position	Wave pattern1 (See Pattern1.)	
3U	Request switch (RF)	Request switch (RF)	Request switch is pressed	1.0 or less	Front outer handle (RF)
			Request switch is released	B+	
3X	Request switch (LF)	Request switch (LF)	Request switch is pressed	1.0 or less	Front outer handle (LF)
			Request switch is released	B+	
3Y	Keyless antenna (interior, center)	Keyless antenna (interior, center)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3Z	Keyless antenna (interior, rear)	Keyless antenna (interior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AA	Keyless antenna (interior, front)	Keyless antenna (interior, front)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AB	Keyless antenna (LF)	Keyless antenna (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AC	Keyless antenna (exterior, rear)	Keyless antenna (exterior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AD	Keyless antenna (RF)	Keyless antenna (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
4A	Steering lock unit unlock	Steering lock unit	Steering lock unit Unlocked condition	1.0 or less	Steering lock unit
			Steering lock unit Locked condition	Wave pattern2 (See Pattern2.)	

4B	Starter relay	Starter relay	Cranking		B+	Starter relay
			Other (Remove the starter relay)		1.0 or less	
4E	IG 1 relay control	IG 1 Relay	Switch the ignitions to ON		B+	IG 1 Relay
			Switch the ignitions to off or ACC		1.0 or less	
4F	ACC relay control	ACC Relay	Switch the ignitions to ACC		B+	ACC Relay
			Switch the ignitions to off		1.0 or less	
4H	IG 2 relay control	IG 2 Relay	Switch the ignitions to ON		B+	IG 2 Relay
			Switch the ignitions to off or ACC		1.0 or less	
4J	Push button illumination (ACC)	Push button start	In the case of ACC		1.0 or less	Push button start
			Case except the ACC		B+	
4K	Starter interlock switch (MZR 2.5, MTX)	Starter interlock switch	Switch the ignitions to off	Clutch pedal is not depressed	1.0 or less	Starter interlock switch
				Clutch pedal is depressed	4 V or more	
	Transaxle range switch (MZR 2.5, ATX)	Transaxle range switch		Shift position is not P or N range	1.0 or less	Transaxle range switch
				Shift position is P or N range	4 V or more	
	Starter relay No.2 control (MZI 3.7 V6)	Starter relay No.2	Shift the selector lever to P or N position.	Ignition switch ON	B+	Starter relay No.2
				Ignition switch off	Below 1.0	
4L	GND	Body ground	Under any condition		1.0 or less	Body ground
4Q	Power supply	Coil antenna	Communication lines, cannot be determined by voltage only (B+ when not communicating)		B+	Coil antenna
	Ring		Terminal used for communication therefore			

4R	illumination (immobilizer system)	Coil antenna	determination based on terminal voltage inspection not possible.			Coil antenna
4S	Power supply	Combined sensor	Until steering lock unit locks after switch the ignitions to off		B+	Combined sensor
			Steering lock unit locks after switch the ignitions to off		1.0 or less	BCM ABS/DSC HU/CM
4T	Push button illumination (Umber)	Push button start	System is malfunctioning		1.0 or less	Push button start
			Clutch pedal is depressed (MTX)	Push button start is pushed	1.0 or less/B+ (switch is changed every 0.5 seconds)	
			Brake pedal is depressed (ATX)			
			Other		B+	
4U	TNS	Auto light/wiper control module	TNS ON		B+	Auto light/wiper control module
			TNS OFF		1.0 or less	
4W	Push button illumination (ON)	Push button start	In the case of ON		1.0 or less	Push button start
			Case except the ON		B+	
4X	Power supply	A/C 10 A fuse	Switch the ignitions to ON		B+	IG 2 Relay
			Switch the ignitions to off or ACC		1.0 or less	A/C 10 A fuse Battery
4Y	Push button illumination (green)	Push button start	Engine start is available		1.0 or less	Push button start
			Other		B+	
4AA	Starter monitor	Starter relay	Switch the ignitions to off	Clutch pedal is not depressed (MTX)	1.0 or less	Starter relay
				Shift position is not P or N range (ATX)		

				Clutch pedal is depressed (MTX)	4.0 V or more (MZR 2.5)	
				Shift position is P or N range (ATX)	1.1 V or more (MZI 3.7 V6)	

*1

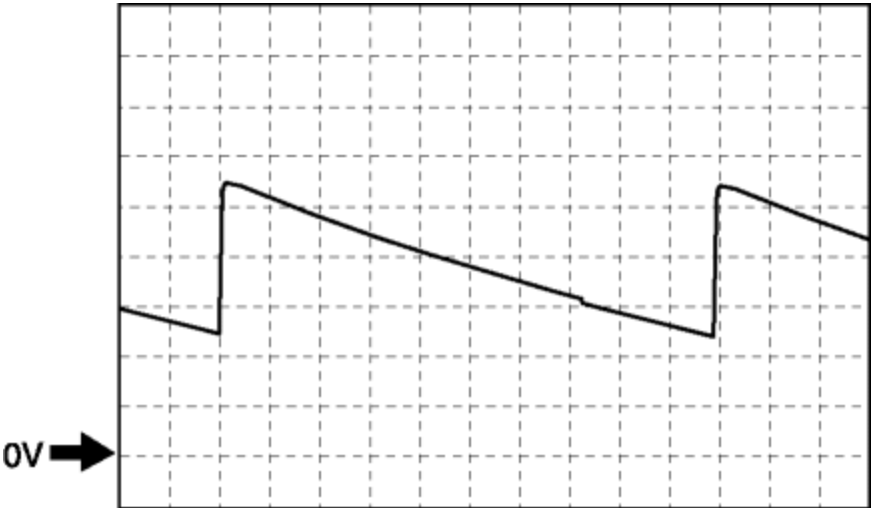
MTX

*2

ATX

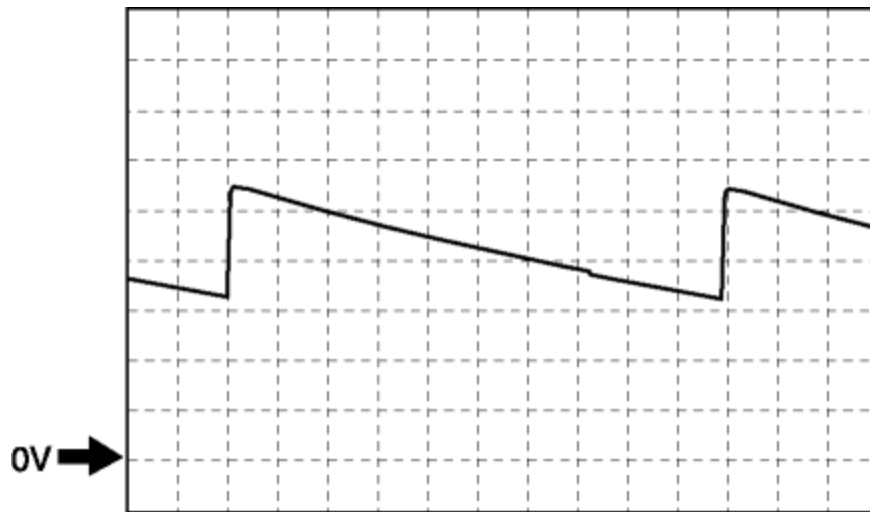
Generated pulse (reference)

Pattern1



- Terminal: 3E (+) ↔ body ground (-)
- Terminal: 3M (+) ↔ body ground (-)
- Terminal: 3T (+) ↔ body ground (-)
- Oscilloscope setting: 2 V/DIV (Y), 1 ms/DIV (X), DC range

Pattern2



- Terminal: 3P (+) ↔ body ground (-)
- Terminal: 4A (+) ↔ body ground (-)
- Oscilloscope setting: 2 V/DIV (Y), 1 ms/DIV (X), DC range

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KEYLESS CONTROL MODULE INSPECTION [ADVANCED KEYLESS ENTRY AND PUSH BUTTON START SYSTEM]

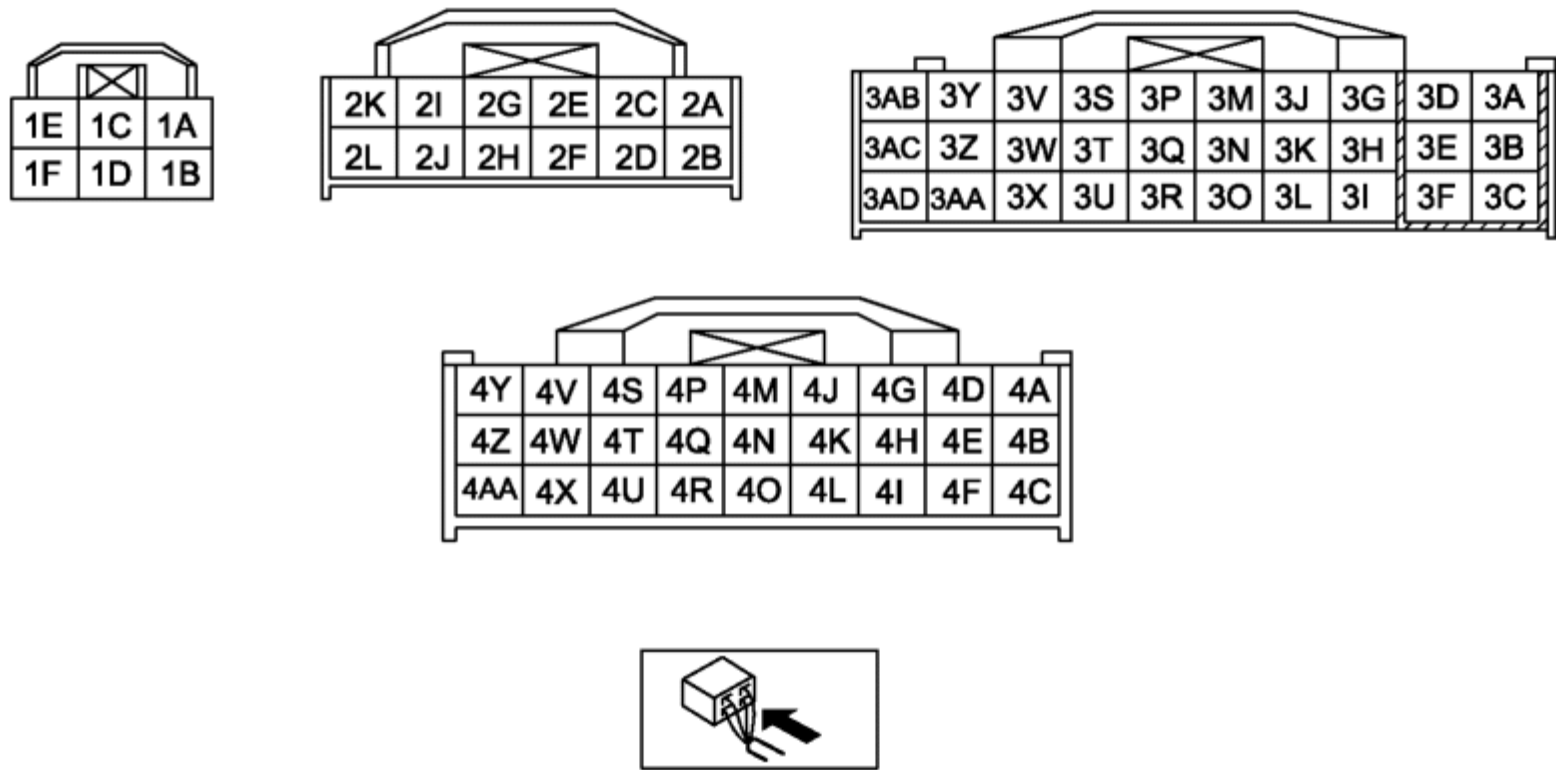
1. Remove the front scuff plate. (See FRONT SCUFF PLATE REMOVAL/ INSTALLATION.)
2. Remove the front side trim. (See FRONT SIDE TRIM REMOVAL/ INSTALLATION.)
3. Measure the voltage according to the terminal voltage table.

• If the voltages cannot be verified as indicated in the terminal voltage table, inspect the parts under "Inspection item (s)".

▪ If the system does not work normally even though the inspection items or related wiring harnesses do not have any malfunction, replace the keyless control module.

Terminal Voltage Table (Reference)

KEYLESS CONTROL MODULE
WIRING HARNESS SIDE CONNECTOR



Terminal	Signal name	Connected to	Measurement condition	Voltage (V)	Inspection item (s)
1A	Steering lock unit ground	Steering lock unit	During steering lock unit operation	1.0 or less	Steering lock unit
			Other	Approx. 3.0	
1B	Power supply	ESCL 10 A fuse	Under any condition	B+	ESCL 10 A fuse Battery
1C	Power supply	Steering lock unit	Steering lock unit During lock/unlock control	B+	Steering lock unit
			Other	1.0 or less	
1D	Power supply	BCM	Under any condition	B+	ROOM 15 A fuse Battery BCM
1E	Power supply	ENG+B 10 A fuse	Under any condition	B+	ENG+B 10 A fuse Battery
1F	GND	Body ground	Under any condition	1.0 or less	Body ground
2A	Power supply	MIRROR 5 A fuse	Switch the ignitions to ACC	B+	ACC relay
			Switch the ignitions to off	1.0 or less	MIRROR 5 A fuse Battery
2B	Rx-PATS	Coil antenna	Communication lines, cannot be determined by voltage only (B+ when not communicating)	B+	Coil antenna
2C	Power supply	ENGINE IG 15 A fuse	Switch the ignitions to ON	B+	IG1 relay
			Switch the ignitions to ACC or off	1.0 or less	ENGINE IG 15 A fuse Battery
			Communication lines, cannot be		

2D	Tx-PATS	Coil antenna	determined by voltage only (B+ when not communicating)	B+	Coil antenna
2F	BCM communication	BCM	Communication lines, cannot be determined by voltage only (B+ when not communicating)	B+	BCM
2G	HS-CAN+	-	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2H	Keyless entry communication	Keyless receiver	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2I	HS-CAN-	-	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
2J	Push button start	Push button start	Push button start is pushed	1.0 or less	Push button start
			Push button start is not pushed	B+	
2K	Push button start	Push button start	Push button start is pushed	1.0 or less	Push button start
			Push button start is not pushed	B+	
2L	Steering lock unit communication	Steering lock unit	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3B*1	Clutch pedal position switch	Clutch pedal position switch	Clutch pedal is depressed	1.0 or less	Clutch pedal position switch
			Clutch pedal is not depressed	B+	
3C	Keyless antenna (exterior, rear)	Keyless antenna (exterior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3E	Brake switch (MZR 2.5)	Brake switch	Brake pedal is depressed	Wave pattern1 (See. Pattern1)	Brake switch
			Brake pedal is not depressed	1.0 or less	
	GND (MZI 3.7 V6)	Body ground	Under any condition	1.0 or less	Body ground
3F	Keyless antenna (LF)	Keyless antenna (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		

3G	Trunk lid release input	Trunk lid opener switch	Trunk lid opener switch pressed	3.0	Trunk lid opener switch
			Trunk lid opener switch released	4.7	
3H	Unlock input	Touch sensor (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3I	Keyless antenna (interior, rear)	Keyless antenna (interior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3K	Keyless beeper power supply	Keyless beeper	Exterior keyless beeper sounds	5.0 or more	Keyless beeper
			Other	1.0 or less	
3L	Keyless antenna (interior, center)	Keyless antenna (interior, center)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3M*2	P position	P position switch	Shift position is P	Wave pattern1 (See. Pattern1)	P position switch
			Other	1.0 or less	
3N	GND	Body ground	Under any condition	1.0 or less	Body ground
3O	Keyless antenna (RF)	Keyless antenna (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3P	Lock input	Door lock-link switch (driver's door)	Driver's side door lock switch at LOCK	1.0 or less	Door lock-link switch
			Driver's side door lock switch at UNLOCK	Wave pattern2 (See Pattern2.)	
3Q	Unlock input	Touch sensor (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3R	Keyless antenna (interior, front)	Keyless antenna (interior, front)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
			Brake pedal is depressed	B+	

3S	Brake switch	Brake switch	Brake pedal is not depressed	1.0 or less	Brake switch
3T*1	Neutral switch	Neutral switch	Shift lever is in neutral position	1.0 or less	Neutral switch
			Shift lever is not in neutral position	Wave pattern1 (See Pattern1.)	
3U	Request switch (RF)	Request switch (RF)	Request switch is pressed	1.0 or less	Front outer handle (RF)
			Request switch is released	B+	
3X	Request switch (LF)	Request switch (LF)	Request switch is pressed	1.0 or less	Front outer handle (LF)
			Request switch is released	B+	
3Y	Keyless antenna (interior, center)	Keyless antenna (interior, center)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3Z	Keyless antenna (interior, rear)	Keyless antenna (interior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AA	Keyless antenna (interior, front)	Keyless antenna (interior, front)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AB	Keyless antenna (LF)	Keyless antenna (LF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AC	Keyless antenna (exterior, rear)	Keyless antenna (exterior, rear)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
3AD	Keyless antenna (RF)	Keyless antenna (RF)	Terminal used for communication therefore determination based on terminal voltage inspection not possible.		
4A	Steering lock unit unlock	Steering lock unit	Steering lock unit Unlocked condition	1.0 or less	Steering lock unit
			Steering lock unit Locked condition	Wave pattern2 (See Pattern2.)	

4B	Starter relay	Starter relay	Cranking		B+	Starter relay
			Other (Remove the starter relay)		1.0 or less	
4E	IG 1 relay control	IG 1 Relay	Switch the ignitions to ON		B+	IG 1 Relay
			Switch the ignitions to off or ACC		1.0 or less	
4F	ACC relay control	ACC Relay	Switch the ignitions to ACC		B+	ACC Relay
			Switch the ignitions to off		1.0 or less	
4H	IG 2 relay control	IG 2 Relay	Switch the ignitions to ON		B+	IG 2 Relay
			Switch the ignitions to off or ACC		1.0 or less	
4J	Push button illumination (ACC)	Push button start	In the case of ACC		1.0 or less	Push button start
			Case except the ACC		B+	
4K	Starter interlock switch (MZR 2.5, MTX)	Starter interlock switch	Switch the ignitions to off	Clutch pedal is not depressed	1.0 or less	Starter interlock switch
				Clutch pedal is depressed	4 V or more	
	Transaxle range switch (MZR 2.5, ATX)	Transaxle range switch		Shift position is not P or N range	1.0 or less	Transaxle range switch
				Shift position is P or N range	4 V or more	
	Starter relay No.2 control (MZI 3.7 V6)	Starter relay No.2	Shift the selector lever to P or N position.	Ignition switch ON	B+	Starter relay No.2
				Ignition switch off	Below 1.0	
4L	GND	Body ground	Under any condition		1.0 or less	Body ground
4Q	Power supply	Coil antenna	Communication lines, cannot be determined by voltage only (B+ when not communicating)		B+	Coil antenna
	Ring		Terminal used for communication therefore			

4R	illumination (immobilizer system)	Coil antenna	determination based on terminal voltage inspection not possible.			Coil antenna
4S	Power supply	Combined sensor	Until steering lock unit locks after switch the ignitions to off		B+	Combined sensor
			Steering lock unit locks after switch the ignitions to off		1.0 or less	BCM ABS/DSC HU/CM
4T	Push button illumination (Umber)	Push button start	System is malfunctioning		1.0 or less	Push button start
			Clutch pedal is depressed (MTX)	Push button start is pushed	1.0 or less/B+ (switch is changed every 0.5 seconds)	
			Brake pedal is depressed (ATX)			
			Other		B+	
4U	TNS	Auto light/wiper control module	TNS ON		B+	Auto light/wiper control module
			TNS OFF		1.0 or less	
4W	Push button illumination (ON)	Push button start	In the case of ON		1.0 or less	Push button start
			Case except the ON		B+	
4X	Power supply	A/C 10 A fuse	Switch the ignitions to ON		B+	IG 2 Relay
			Switch the ignitions to off or ACC		1.0 or less	A/C 10 A fuse Battery
4Y	Push button illumination (green)	Push button start	Engine start is available		1.0 or less	Push button start
			Other		B+	
4AA	Starter monitor	Starter relay	Switch the ignitions to off	Clutch pedal is not depressed (MTX)	1.0 or less	Starter relay
				Shift position is not P or N range (ATX)		

				Clutch pedal is depressed (MTX)	4.0 V or more (MZR 2.5)	
				Shift position is P or N range (ATX)	1.1 V or more (MZI 3.7 V6)	

*1

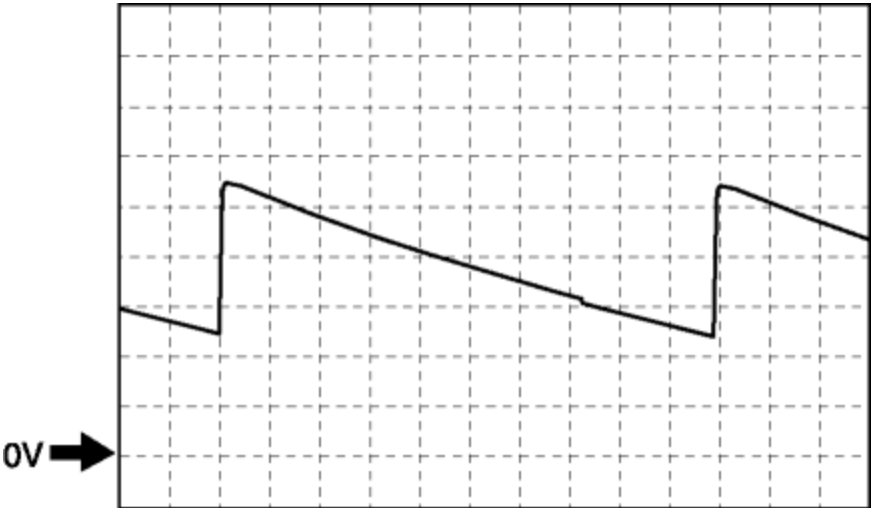
MTX

*2

ATX

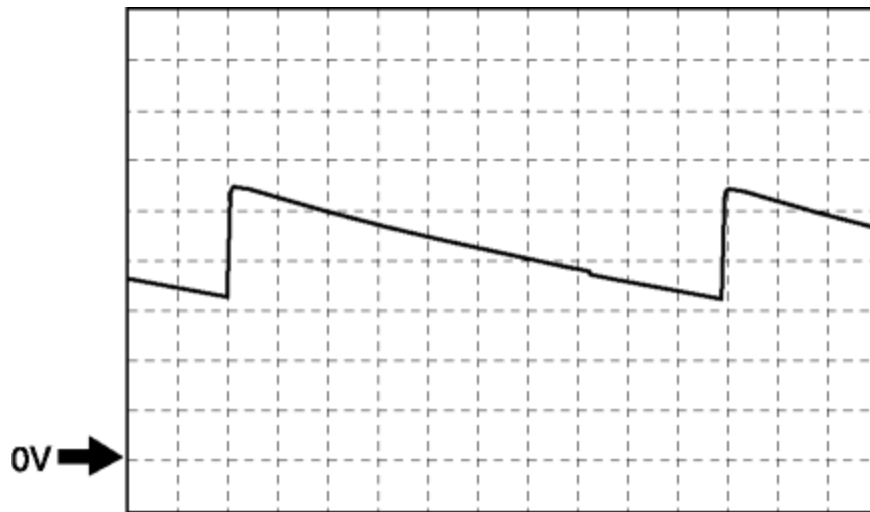
Generated pulse (reference)

Pattern1



- Terminal: 3E (+) ↔ body ground (-)
- Terminal: 3M (+) ↔ body ground (-)
- Terminal: 3T (+) ↔ body ground (-)
- Oscilloscope setting: 2 V/DIV (Y), 1 ms/DIV (X), DC range

Pattern2



- Terminal: 3P (+) ↔ body ground (-)
- Terminal: 4A (+) ↔ body ground (-)
- Oscilloscope setting: 2 V/DIV (Y), 1 ms/DIV (X), DC range

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