TRAINING
SERVICES
MME

mazda

Training Manual

Mazda3 Facelift

FL-005

ZOOM-ZOOM

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Technical Data

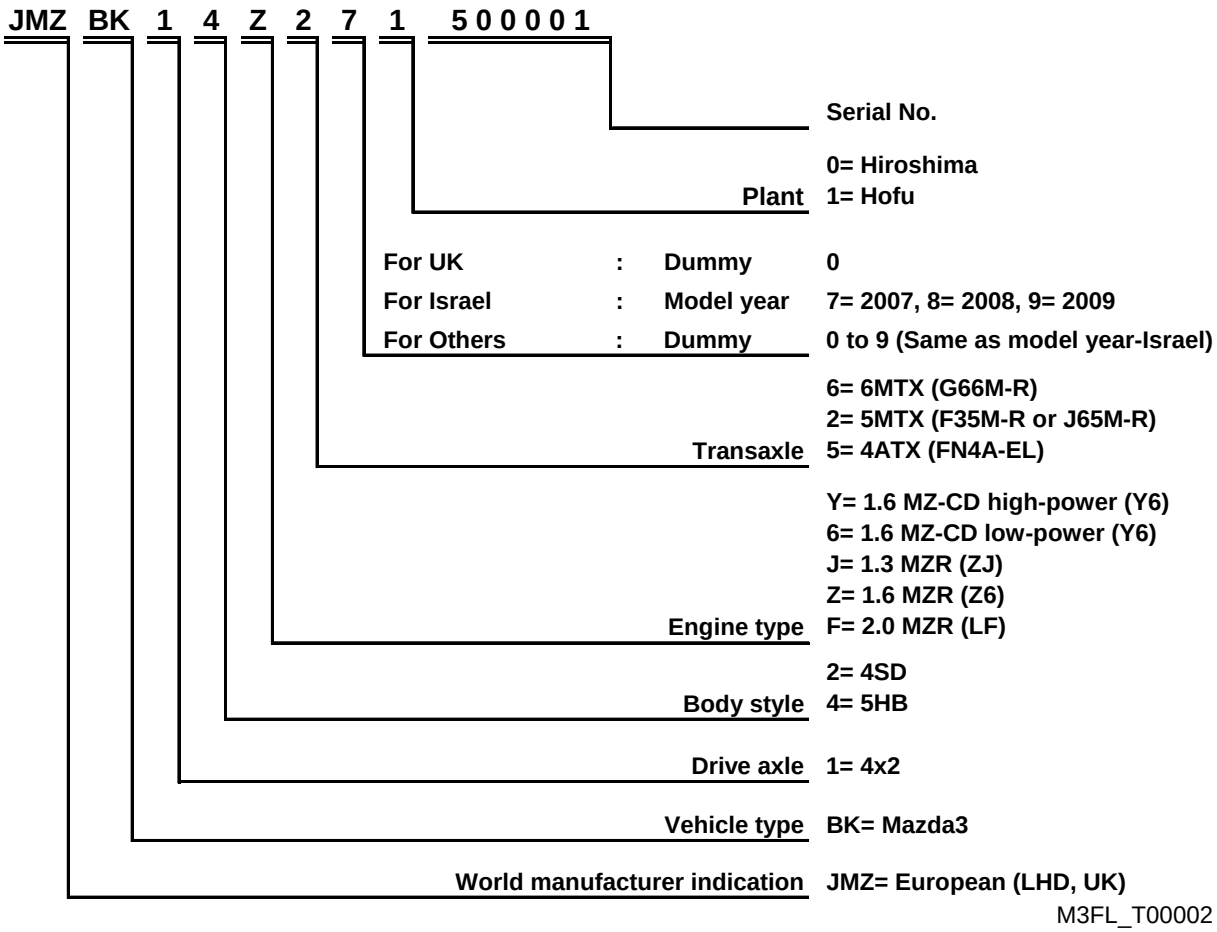
Item	1.3 MZR (ZJ) Engine	1.6 MZR (Z6) Engine	2.0 MZR (LF) Engine
Displacement	1,349 cm^3	1,598 cm^3	1,999 cm^3
Bore x stroke	74.0 x 78.4 mm	78.0 x 83.6 mm	87.5 x 83.1 mm
Compression ratio	10.0 : 1	10.0 : 1	10.8 : 1
Max. power	62 kW (84 PS) at 6000 min^{-1}	77 kW (105 PS) at 6000 min^{-1}	110 kW (150 PS) at 6500 min^{-1}
Max. torque	122 Nm at 4000 min^{-1}	145 Nm at 4000 min^{-1}	187 Nm at 4000 min^{-1}
Emission standard	Euro 4	Euro 4	Euro 4
Transmission	5-speed manual (F35M-R)	5-speed manual (F35M-R) or 4-speed automatic (FN4A-EL)	6-speed manual (G66M-R)

Item	1.6 MZ-CD (Y6) Low-power Engine	1.6 MZ-CD (Y6) High-power Engine
Displacement	1,560 cm^3	1,560 cm^3
Bore x stroke	75.0 x 88.3 mm	75.0 x 88.3 mm
Compression ratio	18.3 : 1	18.3 : 1
Max. power	66 kW (90 PS) at 4000 min^{-1}	80 kW (109 PS) at 4000 min^{-1}
Max. torque	215 Nm at 1750 min^{-1}	240 Nm at 1750 min^{-1}
Emission standard	Euro 4	Euro 4
Transmission	5-speed manual (J65M-R)	5-speed manual (J65M-R)

M3FL_T00001

Vehicle Identification Number

- The **VIN** (**V**ehicle **I**dentification **N**umber) key is as shown below.



M3FL_T00002

Scheduled Maintenance

Maintenance Item		Number of months or kilometers (miles), whichever comes first								
	Months	12	24	36	48	60	72	84	96	108
	x 1000 km	20	40	60	80	100	120	140	160	180
	x 1000 miles	12.5	25	37.5	50	62.5	75	87.5	100	112.5
GASOLINE ENGINE										
Engine valve clearance		Audible inspect every 120,000 km (75,000 miles), if noisy, adjust								
Drive belts*1				I			I			I
Idle speed (ZJ, Z6)		I		I		I		I		I
Spark plugs*2	Iridium type	Replace every 120,000 km (75,000 miles)								
	except Iridium type			R			R			R
Air cleaner element*3	ZJ, Z6	C	C	R	C	C	R	C	C	R
	LF			R			R			R
Evaporative system (if installed)				I			I			I
DIESEL ENGINE										
Drive belts*1		I	I	I	I	I	I	I	I	I
Engine timing belt*4		Replace every 240,000 km (150,000 miles) or 10 years								
Radiator cap			I		I		I		I	
Fuel system (Drain water)		D	D	D	D	D	D	D	D	D
Fuel filter				R			R			R
Air cleaner element*3				R			R			R
Diesel particulate filter (DPF) (if installed)		Replace every 120,000 km (75,000 miles)								
Fuel additive for DPF		Refill every 60,000 km (37,500 miles)								
GASOLINE and DIESEL ENGINE										
Engine oil*5		R	R	R	R	R	R	R	R	R
Engine oil filter*5		R	R	R	R	R	R	R	R	R
Cooling system			I		I		I		I	
Engine coolant	FL22 type*6	Replace every 200,000 km (125,000 miles) or 11 years								
	Others	Replace first at 100,000 km (62,500 miles) or 4 years; after that every 2 years								
Fuel lines and hoses			I		I		I		I	
Battery electrolyte level and specific gravity		I	I	I	I	I	I	I	I	I
Brake lines, hoses and connections		I	I	I	I	I	I	I	I	I
Brake fluid*7			R		R		R		R	
Parking brake		I	I	I	I	I	I	I	I	I
Disc brakes		I	I	I	I	I	I	I	I	I
Steering operation and linkages			I		I		I		I	
Front and rear suspension, ball joints and wheel bearing axial play			I		I		I		I	
Power steering fluid, lines, hoses and connections		I	I	I	I	I	I	I	I	I
Manual transaxle oil (for gasoline)						R				
Manual transaxle oil (for diesel)		I	I	I	I	I	I	I	I	I
Automatic transaxle fluid level				I			I			I
Drive shaft dust boots			I		I		I		I	
Bolts and nuts on chassis and body			T		T		T		T	
Body condition (for rust, corrosion and perforation)		Inspect annually								
Exhaust system and heat shields		Inspect every 80,000 km (50,000 miles) or 5 years								
Tires (including spare tire) (with inflation pressure adjustment)		I	I	I	I	I	I	I	I	I
Cabin air filter (If installed)			R		R		R		R	

M3FL_T00003

I : Inspect and repair, clean, adjust, or replace if necessary.
R : Replace
C : Clean
D : Drain
T : Tighten

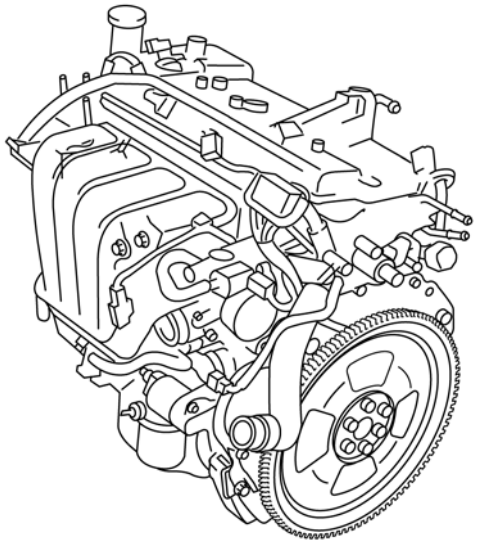
- Refer below for a description of items marked * in the maintenance chart:
  - *1: Also inspect and adjust the power steering and air conditioner drive belts, if installed.
  - *2: Verify the spark plug type from the installed spark plugs. Refer to specifications.
  - *3: If the vehicle is operated in very dusty or sandy areas, clean and if necessary replace the air cleaner element more often than the recommended intervals.
  - *4: Replacement of the timing belt is required every 240,000 km {150,000 miles} or 10 years. Failure to replace the timing belt may result in a major damage to the engine.
  - *5: If the vehicle is operated under hard conditions (dusty road, extended periods of idling or low speed operation, cold temperature or driving short distances), change the engine oil and oil filter every 10,000 km {6,250 miles} or less.
  - *6: When replacing the coolant on vehicles with the inscription “FL22” on the radiator cap itself or the surrounding area, use only coolant of this type.
  - *7: If the brakes are used extensively (for example, continuous hard driving or mountain driving) or if the vehicle is operated in extremely humid climates, change the brake fluid annually.

1.3 MZR Engine

Features

- The construction and operation of the 1.3 MZR engine is essentially carried over from that of the current Mazda3 with ZJ engine except for the following features:
  - Valve timing of the exhaust valves has been modified

Overview



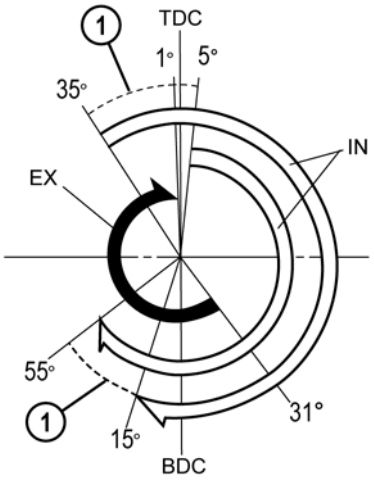
M3FL_01019

Mechanical

Mechanical

Camshaft

- The exhaust-side camshaft has been modified, so that the exhaust valves open later.



M3FL_01020

1 Variable domain

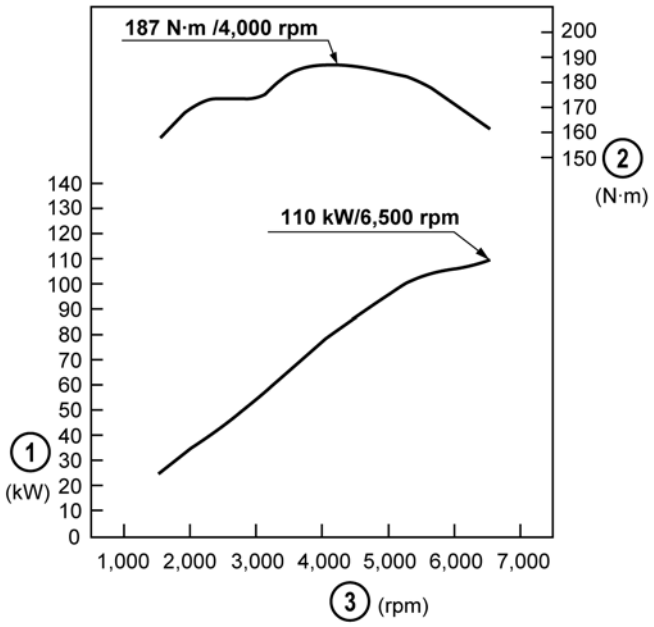
2.0 MZR Engine

Features

- The construction and operation of the 2.0 MZR engine is essentially carried over from that of the current Mazda3 with LF engine except for the following features:
  - Electronic throttle valve with drive-by-wire relay and accelerator pedal position sensor (similar to that of the Mazda6 F/L)
  - Direct ignition coils with integrated power transistor (similar to those of the Mazda6 F/L)
  - Linear-type (Broadband) upstream oxygen sensor (similar to that of the Mazda6 F/L)
  - Generator with two stator coils (similar to that of the Mazda6 F/L)
  - Magneto resistive-type crankshaft and camshaft position sensor (similar to that of the Mazda6 F/L)
  - Variable valve timing system with oil control valve and camshaft actuator (similar to that of the Mazda6 F/L)
  - Cruise control system integrated in the PCM, with cruise control switches and brake pedal position switch (similar to that of the Mazda6 F/L)

NOTE: Further information can be found in the Training Manual “Basic Petrol Engine Management” (CT-L2004)

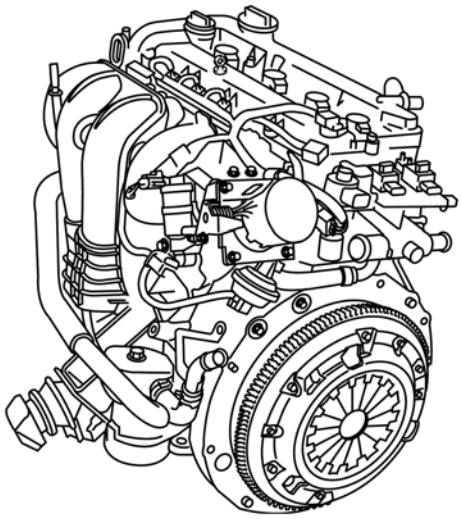
Engine Performance Curve



M3FL_01001

1 Power
2 Torque
3 Engine speed

Overview



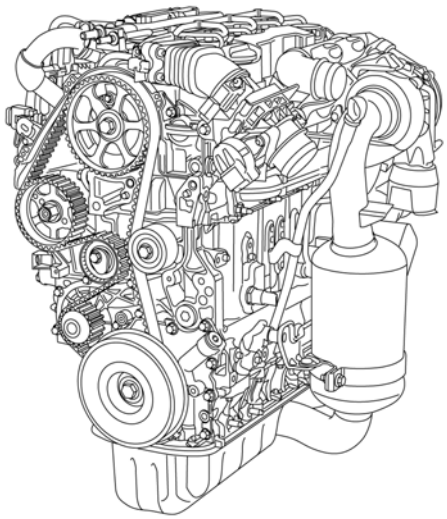
M3FL_01002

1.6 MZ-CD Engine

Features

- The construction and operation of the 1.6 MZ-CD engine is essentially carried over from that of the current Mazda3 with Y6 engine except for the following features:
  - CP3.2 high-pressure pump has been replaced by CP1H high-pressure pump for 1.6 MZ-CD high-power engine
  - Glow relay with a joint power supply for all glow plugs
  - Cruise control system integrated in the PCM has been introduced for 1.6 MZ-CD high-power engine.

Overview



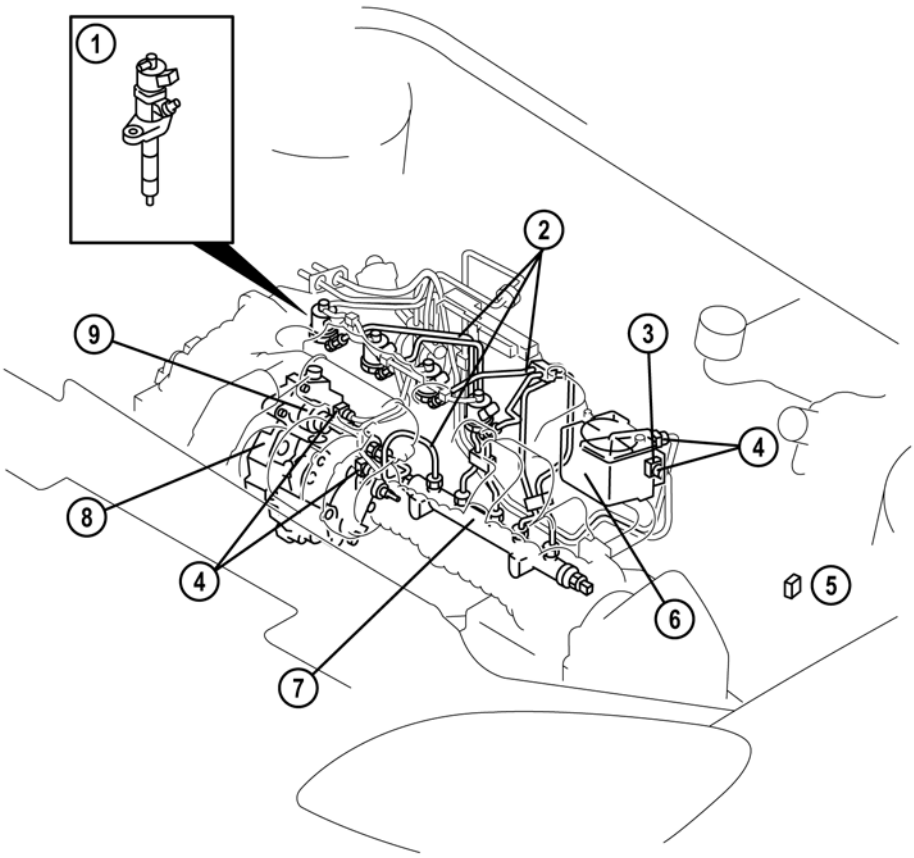
M3FL_01004

Fuel System

Features

- The fuel system of the 1.6 MZ-CD engine is essentially carried over from that of the current Mazda3 with 1.6 MZ-CD engine (Euro 4) except for the following features:
  - CP3.2 high-pressure pump replaced by the CP1H pump for the 1.6 MZ-CD high-power engine

Parts Location

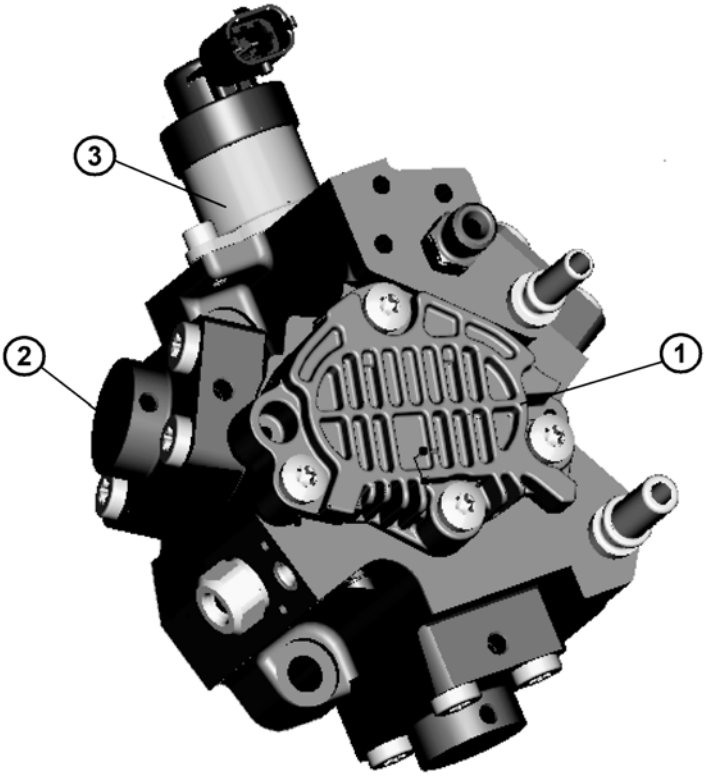


M3FL_01008

1 Injector
2 High-pressure line
3 Fuel warmer
4 Quick release connector
5 Fuel warmer relay
6 Fuel filter
7 Common rail
8 High-pressure pump
9 Fuel metering valve

High-pressure Pump

- The 1.6 MZ-CD high-power engine is equipped with the CP1H high-pressure pump, which is also manufactured by Bosch. The operation is similar to that of the CP3.2 pump.



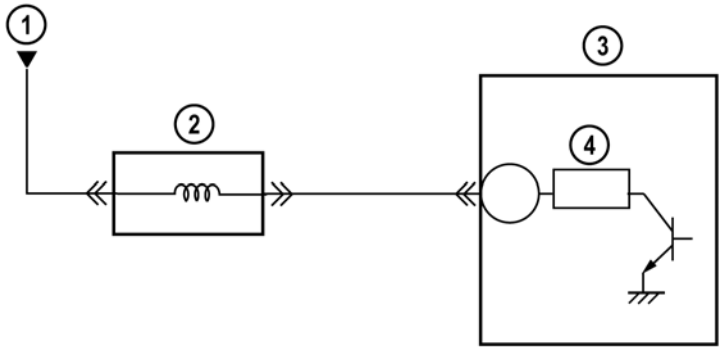
M3FL_01009

1 Feed pump
2 High-pressure pump element
3 Fuel metering valve

Fuel Metering Valve

- On the CP1H high-pressure pump the fuel metering valve closes the passage between feed pump and radial-piston pump when de-energized.

NOTE: In case of an open circuit the fuel metering valve adopts in the closed position. As a result, the engine stalls and does not start anymore.



M3FL_01010

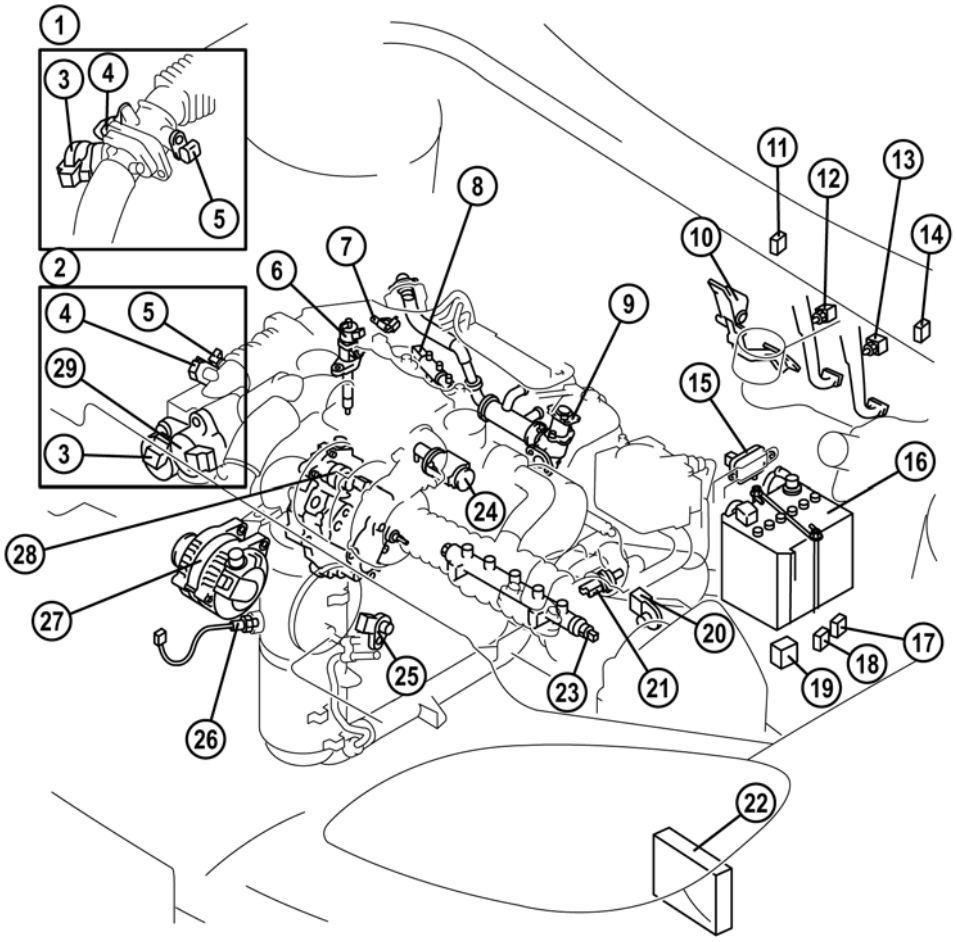
1 From PCM control relay
2 Fuel metering valve
3 PCM
4 Current detection circuit

Control System

Features

- The control system of the 1.6 MZ-CD engine is essentially carried over from that of the current Mazda3 with 1.6 MZ-CD engine (Euro 4) except for the following features:
  - Glow plug control module with separate power supply for all glow plugs replaced by a glow plug relay with joint power supply
  - Cruise control system integrated in the PCM for 1.6 MZ-CD high-power engine

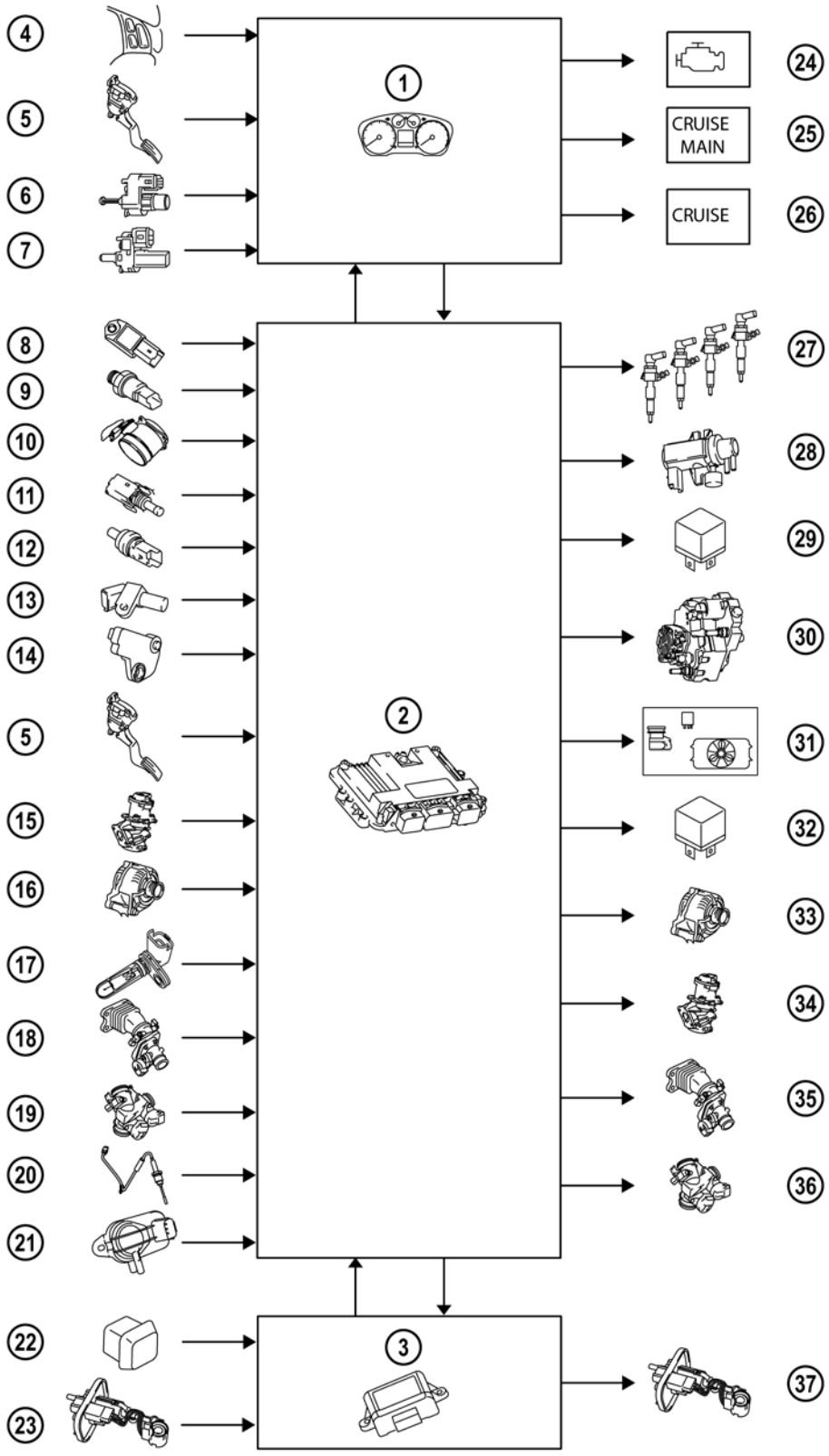
Parts Location



M3FL_01014

1 Low-power engine
2 High-power engine
3 ISV DC motor and position sensor
4 Manifold absolute pressure sensor
5 IAT sensor no.2
6 Injector
7 Camshaft position sensor
8 Fuel temperature sensor
9 EGR valve DC motor and position sensor
10 Accelerator pedal position sensor
11 Engine switch
12 Brake pedal position switch
13 Clutch pedal position switch
14 DLC-2
15 DPF differential pressure sensor (only high-power engine)
16 Battery
17 Starter relay
18 PCM control relay
19 Glow plug relay
20 MAF/ IAT sensor
21 Engine coolant temperature sensor
22 Powertrain control module (incl. Barometric pressure sensor)
23 Fuel pressure sensor
24 VBC solenoid valve
25 Crankshaft position sensor
26 Exhaust gas temperature sensor (only high-power engine)
27 Generator
28 Fuel metering valve
29 Charge-air cooler bypass valve DC motor and position sensor (only high-power engine)

Block Diagram

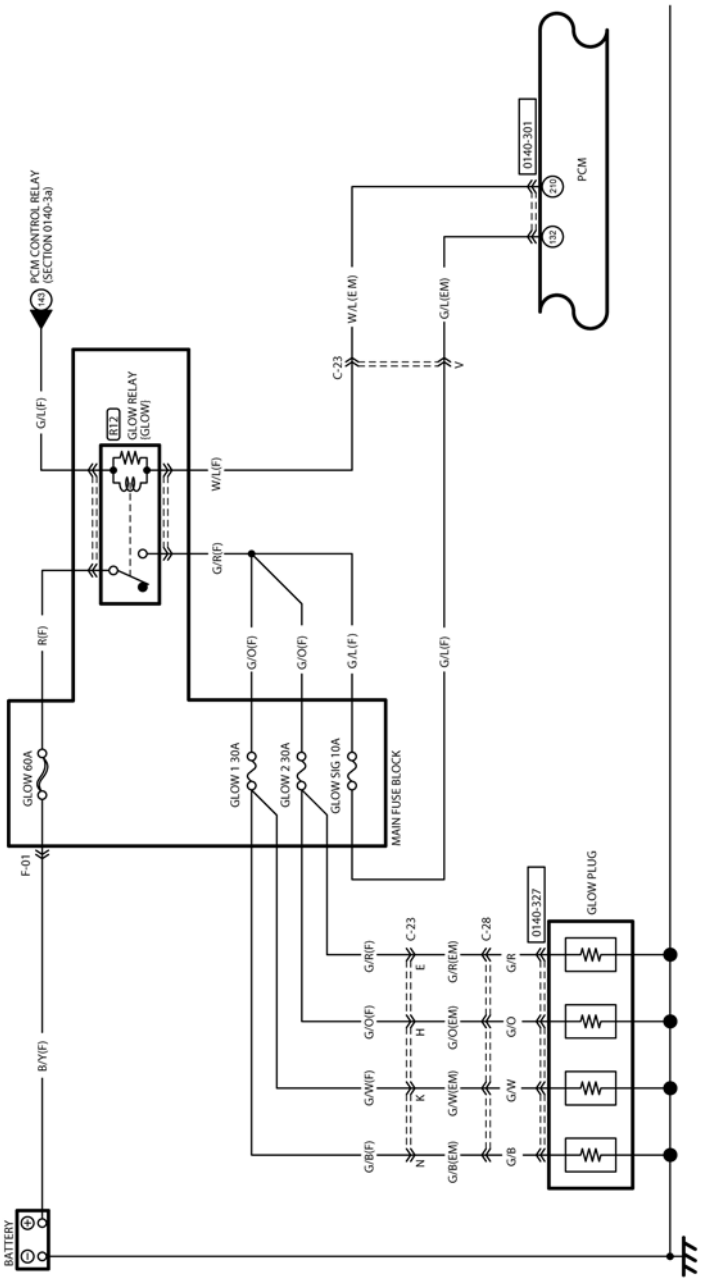


M3FL_01015

1 Instrument cluster
2 Powertrain control module (incl. Barometric pressure sensor)
3 Fuel additive control module (only high-power engines)
4 Cruise control switches (only high-power engines)
5 Accelerator pedal position sensor
6 Brake pedal position switch
7 Clutch pedal position switch
8 Manifold absolute pressure sensor
9 Fuel pressure sensor
10 MAF/ IAT sensor
11 Fuel temperature sensor
12 Engine coolant temperature sensor
13 Camshaft position sensor
14 Crankshaft position sensor
15 EGR valve position sensor
16 Generator (stator coil)
17 IAT sensor no. 2
18 ISV position sensor (only low-power engines)
19 ISV position sensor and charge-air cooler bypass valve position sensor (only high-power engines)
20 Exhaust gas temperature sensor (only high-power engines)
21 DPF differential pressure sensor (only high-power engines)
22 Fuel-filler switch (only high-power engines)
23 Fuel additive level sensor (only high-power engines)
24 Malfunction indicator light
25 Cruise main indicator light
26 Cruise indicator light
27 Injectors
28 VBC solenoid valve
29 Glow plug relay
30 Fuel metering valve
31 Cooling fan and A/C compressor (if equipped)
32 PCM control relay
33 Generator (field coil)
34 EGR valve DC motor
35 ISV DC motor (only low-power engines)
36 ISV DC motor and charge-air cooler bypass valve DC motor (only high-power engines)
37 Fuel additive pump (only high-power engines)

Glow Plug Relay

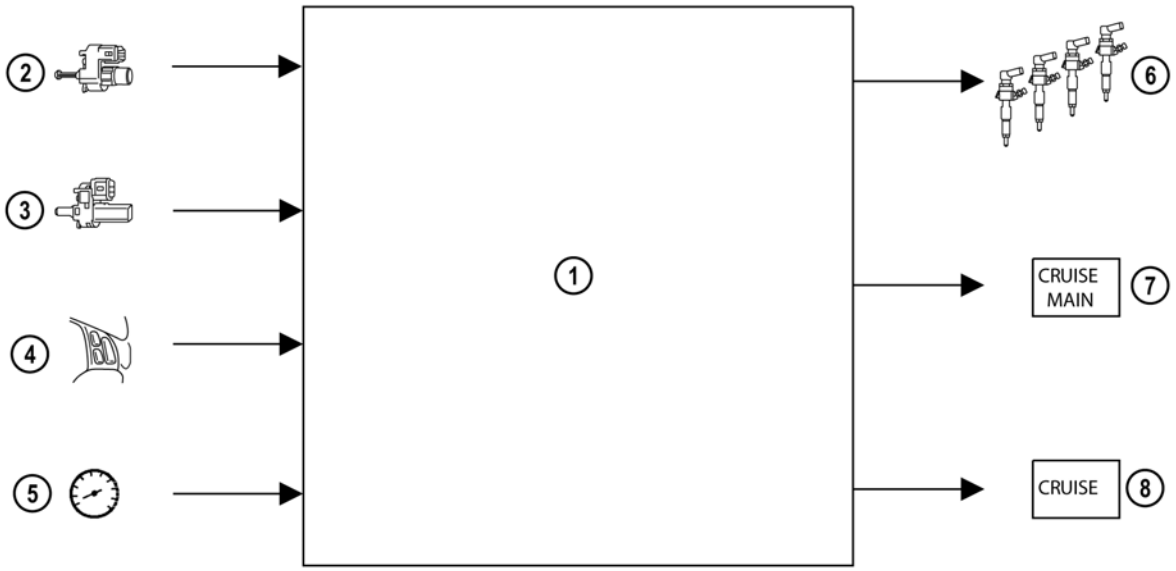
- The glow plug relay is located in the main fuse block and features a joint power supply terminal for all glow plugs. Depending on the operating conditions the PCM energizes the glow plug relay, which in turn switches the power supply to the glow plugs. To facilitate failure detection the PCM monitors the voltage outputted to the glow plugs.



M3FL_01016

Cruise Control System

- The 1.6 MZ-CD high-power engine features a cruise control system integrated in the PCM, i.e. the vehicle speed is controlled by variation of the fuel injection amount. When the desired vehicle speed has been set, the PCM determines the target injection amount based on the vehicle speed signal. If the actual vehicle speed goes below or above the set speed, the PCM increases or decreases the injection amount.



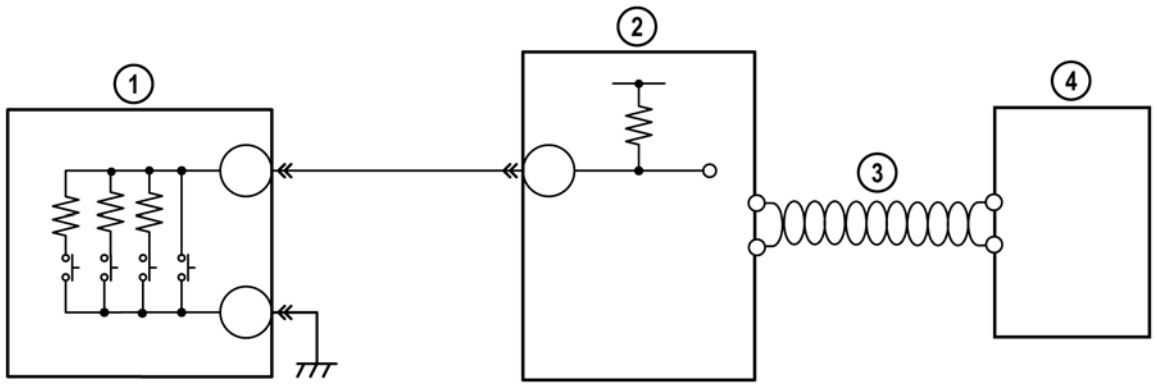
M3FL_01017

1 PCM
2 Brake pedal position switch
3 Clutch pedal position switch
4 Cruise control switches
5 VSS
6 Injectors
7 Cruise main indicator light
8 Cruise indicator light

Cruise Control Switches

- The cruise control switches are connected to the instrument cluster. Depending on the switch position the resistance and hence the voltage drop at the switches changes. The instrument cluster determines the driver's cruise control settings according to the voltage signal from the switches, and transmits a corresponding information via the high-speed CAN bus to the PCM.

NOTE: The cruise control switches can be checked using the input/output check mode for the instrument cluster.



M3FL_01018

1 Cruise control switches
2 Instrument cluster
3 High-speed CAN bus
4 PCM

Suspension

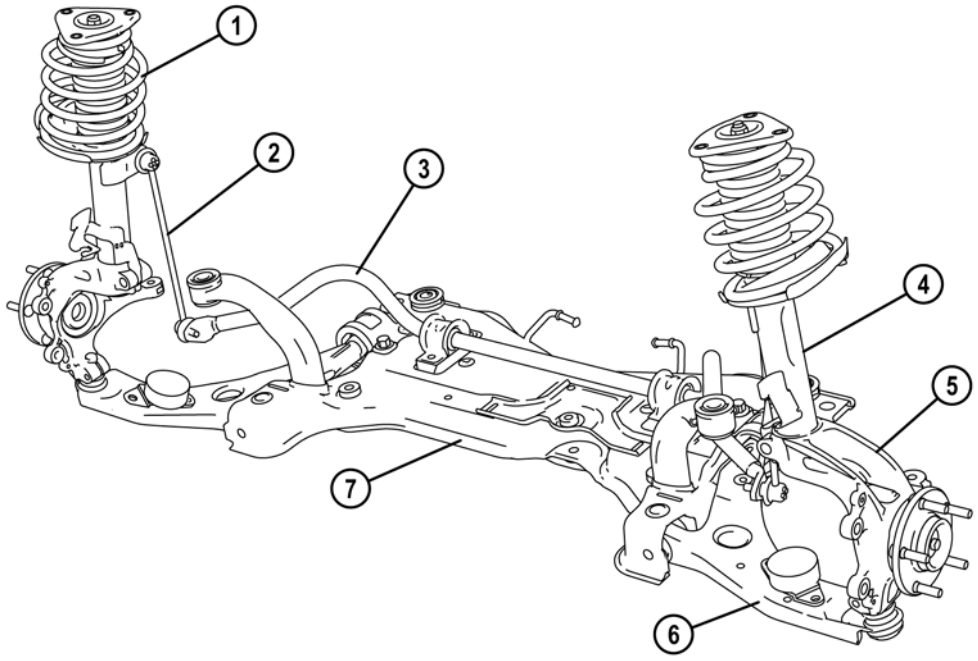
Suspension

Features

- The construction and operation of the suspension is essentially carried over from that of the current Mazda3 except for the following features:
  - Front shock absorbers have been modified
  - Front steering knuckle arm position has been modified
  - Rear twin-tube shock absorbers replaced by mono-tube shock absorbers with a larger piston diameter (similar to those of the Mazda5)
  - Rear lateral link position has been modified
  - Rear stabilizer mounting position has been modified

Front Suspension

- The steering knuckle arm position has been modified to reduce wheel toe-out when driving over bumps.

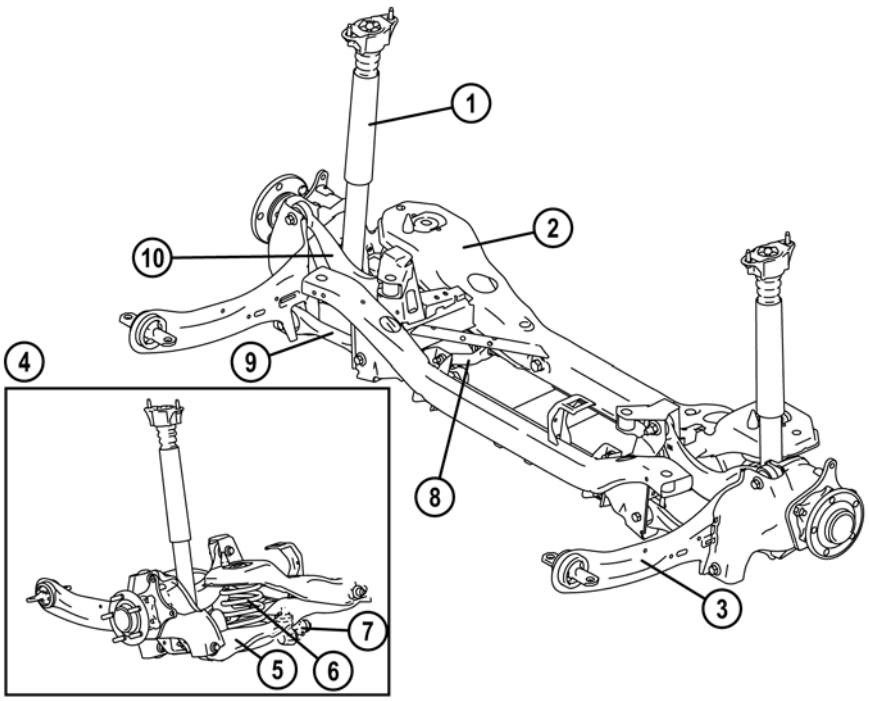


M3FL_02002

1 Coil spring
2 Stabilizer control link
3 Stabilizer
4 Shock absorber
5 Steering knuckle
6 Lower arm
7 Crossmember

Rear Suspension

- Mono-tube shock absorbers are used at the rear axle to reduce oil foaming and hence deterioration of the shock absorber performance at high temperatures. In addition, the lateral link position has been modified to increase wheel toe-in when driving over bumps.



M3FL_02001

1	Shock absorber	6	Coil spring
2	Crossmember	7	Stabilizer control link
3	Trailing link	8	Stabilizer
4	View from rear of the vehicle	9	Lateral link
5	Lower arm	10	Upper arm

Notes

Driveline/Axle

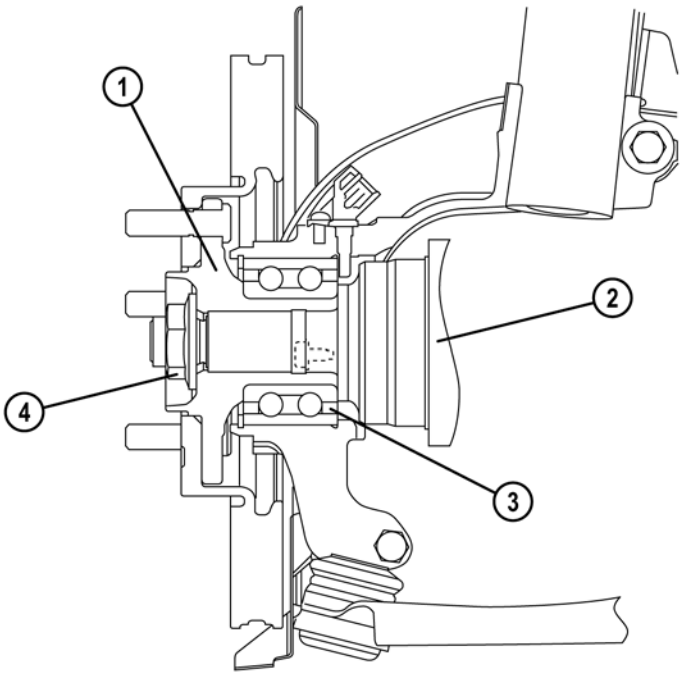
Driveline/Axle

Features

- The construction and operation of the driveline/axle is essentially carried over from that of the current Mazda3 except for the following features:
  - Lockbolt for connection between wheel hub and drive shaft replaced by locknut (similar to that of the Mazda5)
  - Shape of the joint shaft bracket has been modified (only ZJ/Z6 engine and LF engine)

Front Axle

- A lock nut is used for the connection between wheel hub and drive shaft.

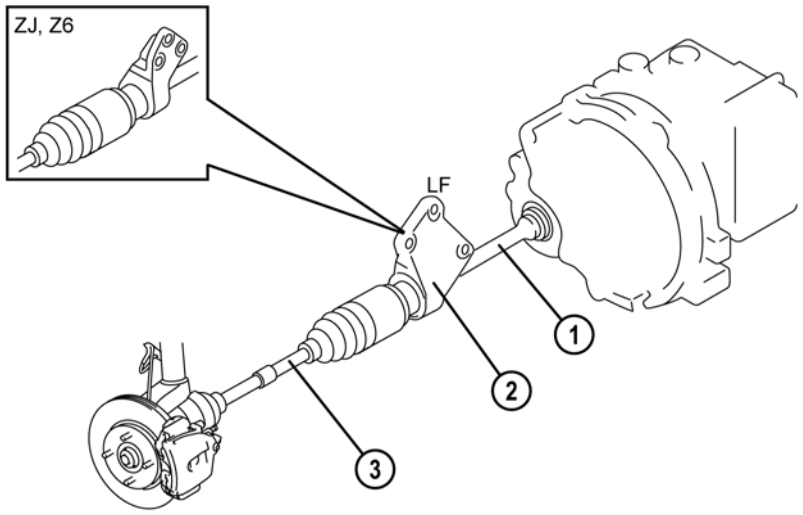


M3FL_03001

1 Wheel hub
2 Drive shaft
3 Wheel bearing
4 Lock nut

Drive Shaft

- On the ZJ/Z6 engine and on the LF engine a joint shaft bracket with a modified shape is used to reduce vibration and hence booming noise at high engine speeds.



M3FL_03002

1 Joint shaft
2 Bracket
3 Right front drive shaft

G66M-R Manual Transaxle

Features

- The construction and operation of the G66M-R manual transaxle is essentially carried over from that of the Mazda6 F/L and has the following features:
  - Triple-cone synchronizer mechanism for 1st and 2nd gear
  - Double-cone synchronizer mechanism for 3rd and 4th gear
  - Single-cone synchronizer mechanism for 5th, 6th and reverse gear
  - Gear ratios have been modified
  - Cable-type shift mechanism with integrated reverse lockout mechanism

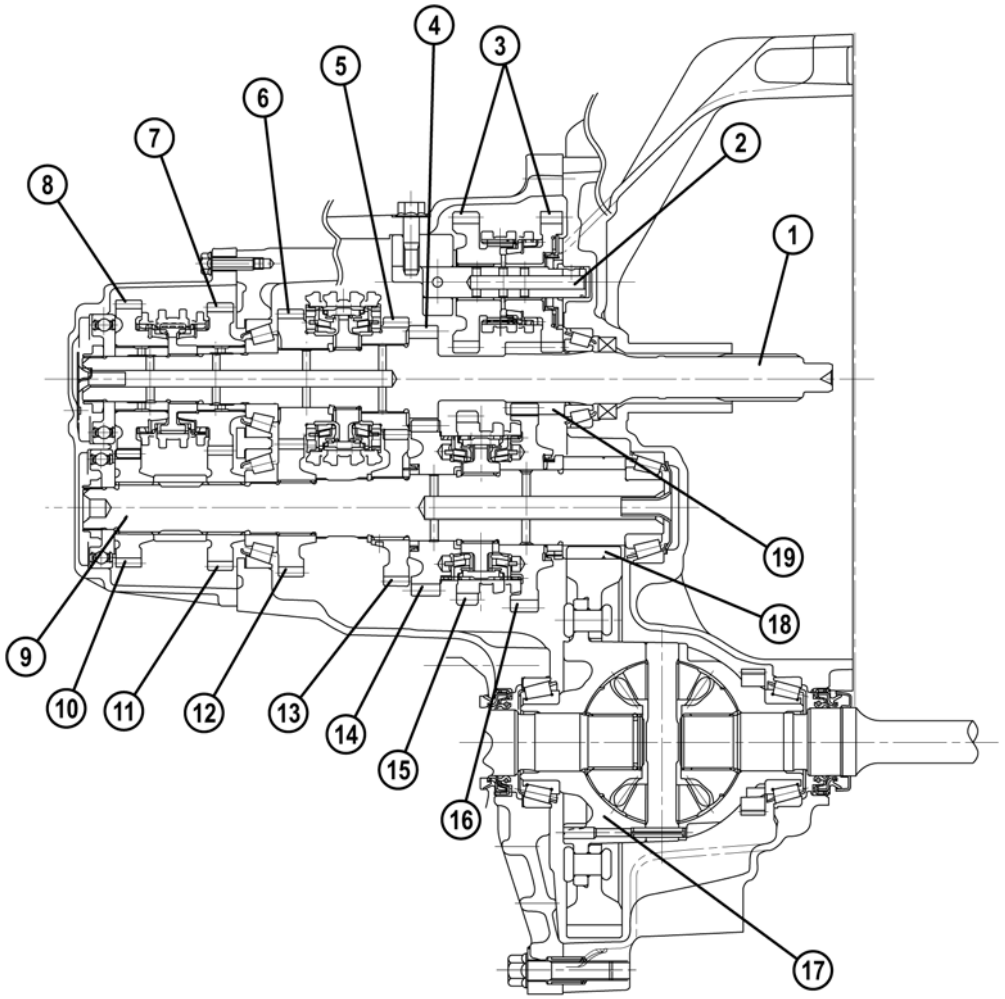
NOTE: Further information can be found in the Training Manual “Mazda6 Facelift” (FL-003).

Specifications

Item			Specification
Engine type			LF
Manual transaxle type			G66M-R
Operation system			Cable
Transaxle control			Floor-shift
Shift assist	Forward		Synchromesh
	Reverse		
Gear ratio	1GR		3.454
	2GR		2.059
	3GR		1.392
	4GR		1.030
	5GR		0.837
	6GR		0.717
	Reverse		3.198
Final gear ratio			4.388
Oil	Grade		API service GL-4 or GL-5
	Viscosity	All season	SAE 75W-90
		Above 10 °C (50 °F)	SAE 80W-90
	Capacity (approx. quantity)	L (US qt, Imp qt)	2.95 (3.12, 2.60)

M3FL_T05001

Overview

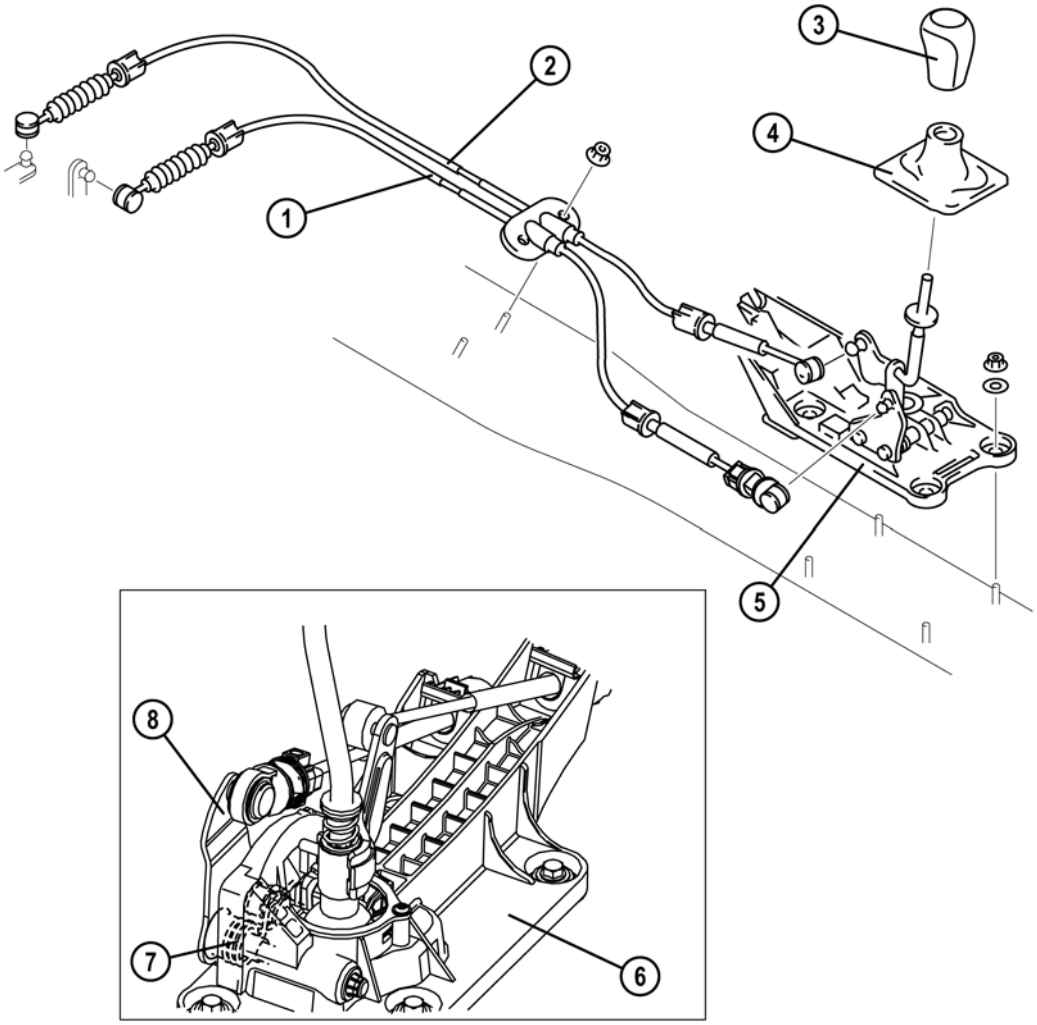


M3FL_05001

1	Primary shaft	11	Secondary 5th gear
2	Reverse idler gear shaft	12	Secondary 4th gear
3	Reverse idler gear	13	Secondary 3rd gear
4	Primary 2nd gear	14	Secondary 2nd gear
5	Primary 3rd gear	15	Secondary reverse gear (integrated in clutch hub sleeve)
6	Primary 4th gear	16	Secondary 1st gear
7	Primary 5th gear	17	Differential
8	Primary 6th gear	18	Output gear
9	Secondary shaft	19	Primary 1st/reverse gear
10	Secondary 6th gear		

Shift Mechanism

- On the G66M-R transaxle a cable-type shift mechanism with integrated reverse lockout mechanism is used. The adjustment procedure for the select cable is similar to that of the current Mazda3.

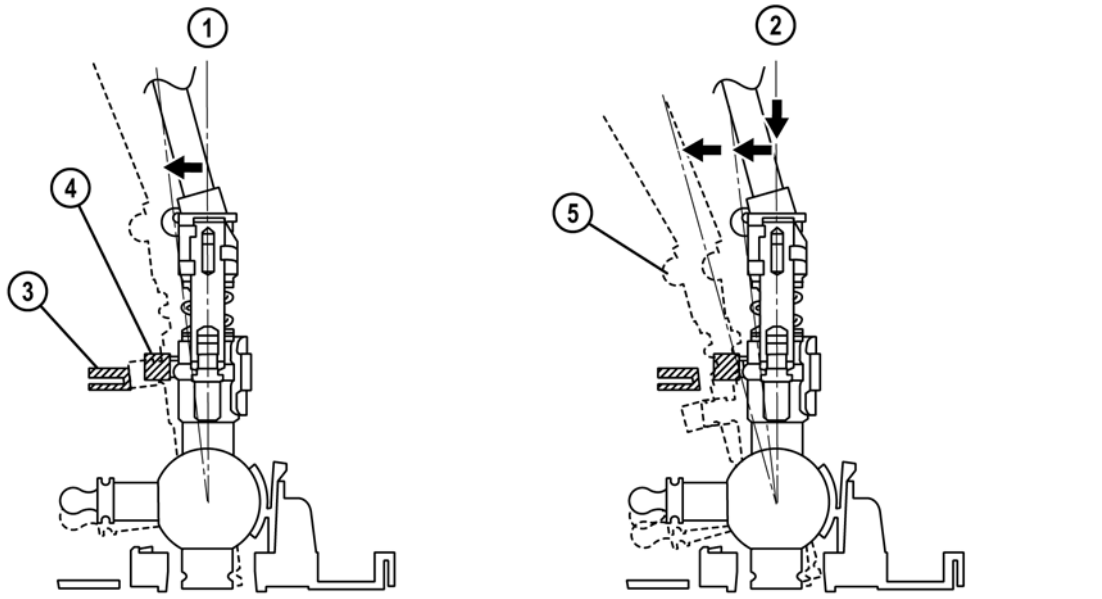


M3FL_05002

1 Select cable
2 Shift cable
3 Shift lever knob
4 Boot panel
5 Shift lever component
6 Base plate
7 Select spring
8 Select arm

Reverse Lockout Mechanism

- The reverse lockout mechanism prevents the driver from accidentally shifting into reverse gear when shifting into 1st gear.
- When shifting into 1st gear, the projection on the shift lever comes in contact with the guide plate, restricting the movement of the lever and preventing accidental shifting into reverse.
- When shifting into reverse gear, once the shift lever is pressed down and moved towards the reverse position, the projection on the lever goes under the guide plate, releasing the reverse shift restriction and allowing for shifting into reverse.



M3FL_05003

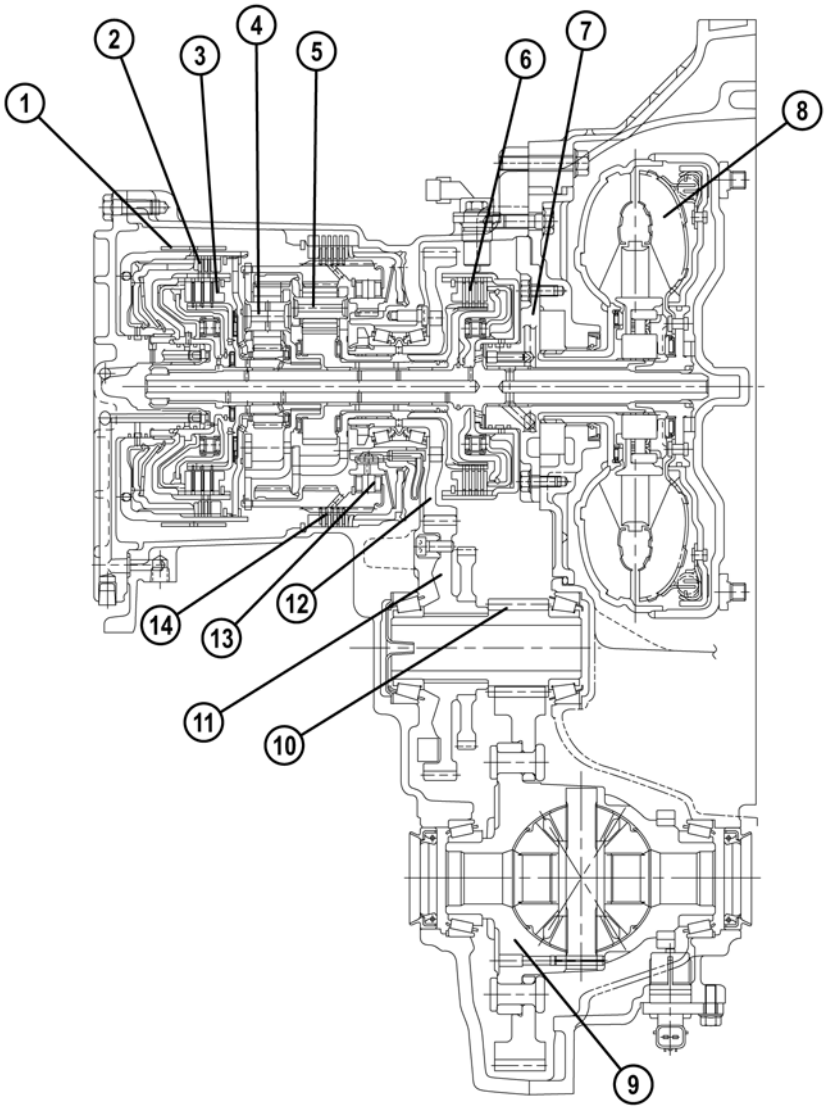
1 Shifting into 1st gear
2 Shifting into reverse gear
3 Guide plate
4 Projection
5 Reverse position

FN4A-EL Automatic Transaxle

Features

- The construction and operation of the FN4A-EL automatic transaxle is essentially carried over from that of the current Mazda3 except for the following features:
  - Shift mechanism with electrically-operated shift-lock system/key interlock system

Overview

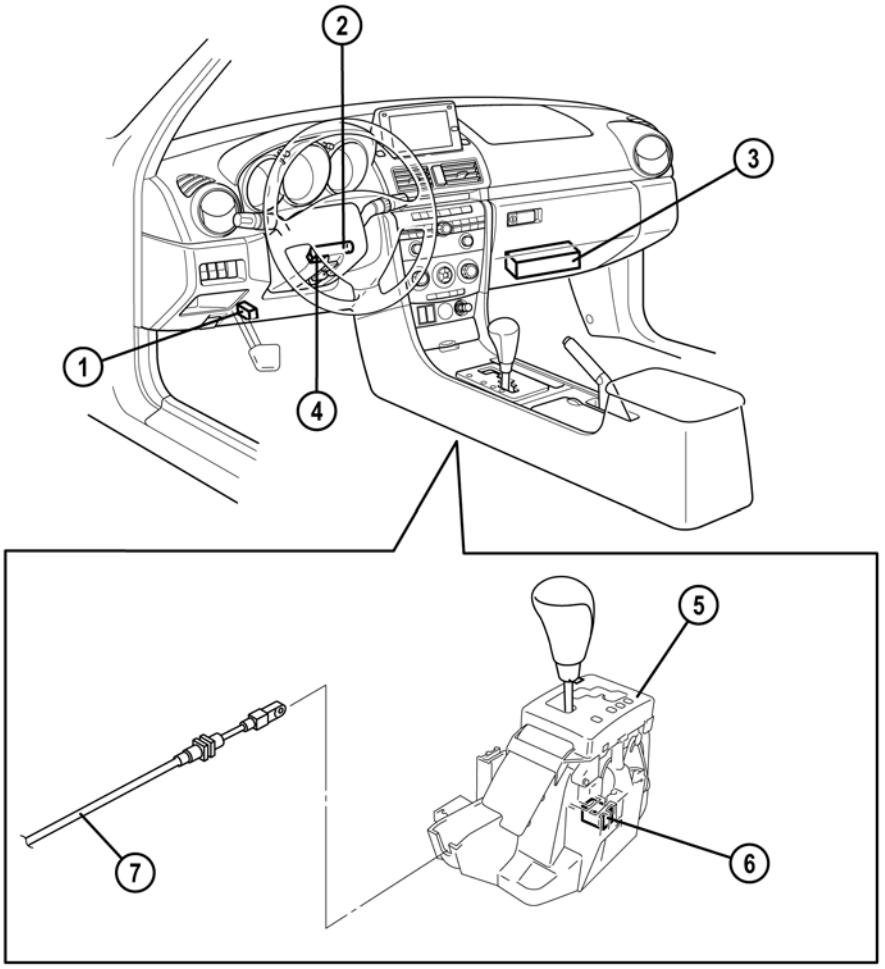


M3FL_05004

1 2-4 brake band
2 Reverse clutch
3 3-4 clutch
4 Rear planetary gear
5 Front planetary gear
6 Forward clutch
7 Oil pump
8 Torque converter
9 Differential
10 Output gear
11 Secondary gear
12 Primary gear
13 One-way clutch
14 Low and reverse brake

Shift Mechanism

- On the FN4A-EL transaxle the shift mechanism features an electrically-operated shift-lock system/key interlock system to prevent inadvertent selection of the wrong gear.

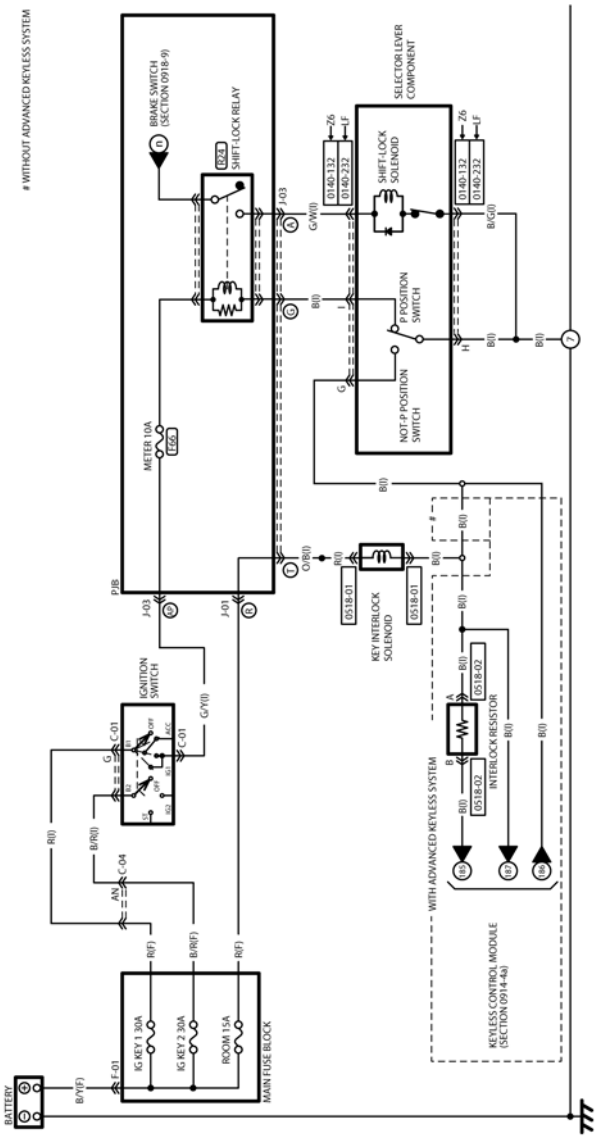


M3FL_05005

1 Brake switch
2 Ignition lock
3 PJB (with integrated shift-lock relay)
4 Key interlock solenoid
5 Selector lever component
6 Shift-lock solenoid
7 Selector cable

Shift-lock System/Key Interlock System

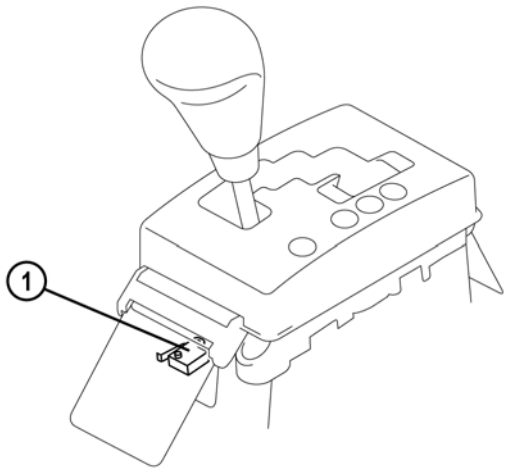
- The shift-lock system prevents the selector lever from being shifted out of P position unless the brake pedal is pressed, while the key interlock system allows the key to be removed from the ignition lock only when the selector lever is in P position.
- The system consists of the P position switch, shift-lock relay, shift-lock solenoid, key interlock solenoid, key interlock resistor and keyless control module (the latter two are only equipped on vehicles with Advanced Keyless Entry and Start System).



M3FL_05006

P Position Switch

- The P position switch is located at the selector lever component and detects, whether or not the selector lever is in P position.



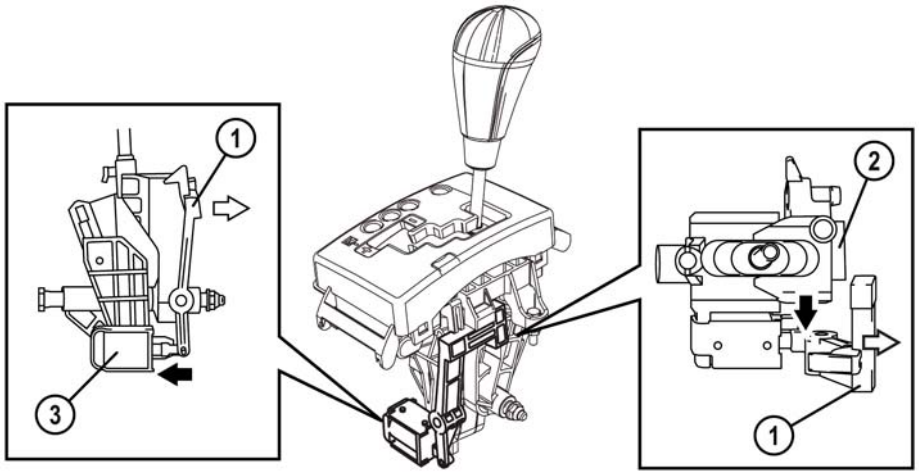
M3FL_05007

1 P position switch

- When the selector lever is in P position, the switch supplies ground to the shift-lock relay.
- When the selector lever is in any other position than P, the switch supplies ground to the key interlock solenoid (vehicles with standard keyless entry system) or to the keyless control module (vehicles with Advanced Keyless Entry and Start System).

Shift-lock Solenoid

- The shift-lock solenoid is located at the selector lever component and controls the position of the lock lever, which prevents the selector lever from being shifted out of P position.

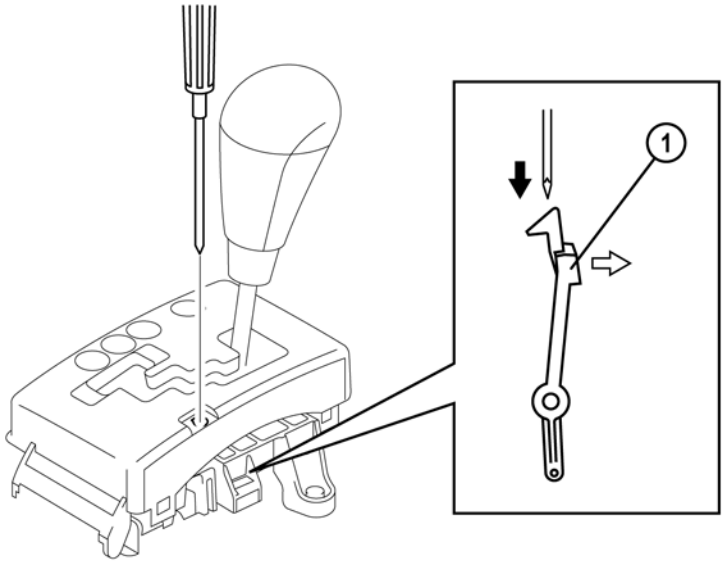


M3FL_05008

1 Lock lever
2 Selector lever
3 Shift-lock solenoid

- When the selector lever is in P position, the ignition is on and the brake pedal is pressed, the shift-lock relay and hence the shift-lock solenoid is energized. As a result, the lock lever does not restrict the movement of the selector lever, allowing shifting out of P position.
- In any other condition than above the shift-lock relay and hence the shift-lock solenoid is de-energized. As a result, the lock lever restricts the movement of the selector lever, preventing shifting out of P position.

NOTE: In case of an open circuit the selector lever cannot be moved out of P position. In order to manually release the shift lock insert a suitable object (e.g. vehicle key, screwdriver) into the hole at the selector lever component.

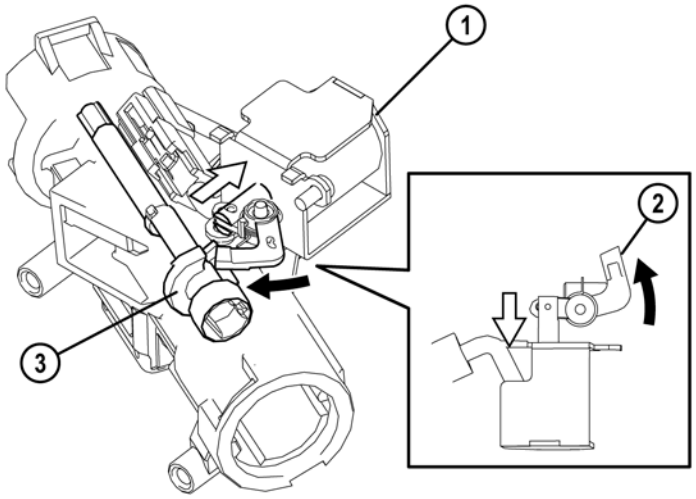


M3FL_05009

1 Lock lever

Key Interlock Solenoid

- The key interlock solenoid is located at the ignition lock and controls the position of the stopper, which prevents the key from being turned to the LOCK position.
- On vehicles with standard keyless entry system the key interlock solenoid is controlled by the P position switch, and on vehicles with Advanced Keyless Entry and Start System the solenoid is controlled by the keyless control module.



M3FL_05010

1 Key interlock solenoid
2 Stopper
3 Cam

- When the selector lever is in any other position than P, the key interlock solenoid is energized. As a result, the stopper restricts the movement of the ignition lock, preventing the key from being turned to LOCK position.
- When the selector lever is in P position, the key interlock solenoid is de-energized. As a result, the stopper does not restrict the movement of the ignition lock, allowing turning the key to LOCK position.

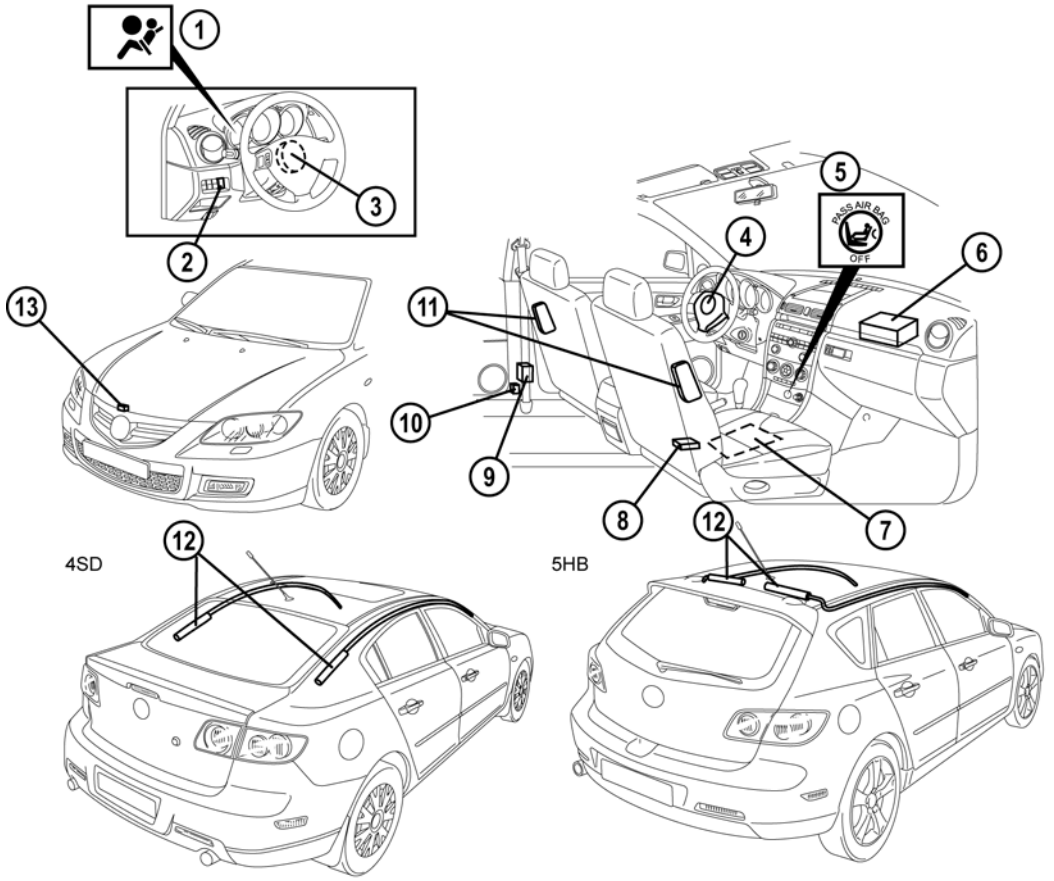
NOTE: In case of an open circuit the key can be turned to LOCK position in any position of the selector lever.

Airbag System

Features

- The construction and operation of the airbag system is essentially carried over from that of the current Mazda3 except for the following features:
  - Cable-type pretensioners integrated in the seat belt buckle have been replaced by ball-type pretensioners integrated in the seat belt retractor (similar to those of the Mazda6 F/L).
  - Buckle switch and occupancy sensor on the passenger-side have been introduced for front seat belt reminder system (refer to section 09, Instrumentation/Driver Info).

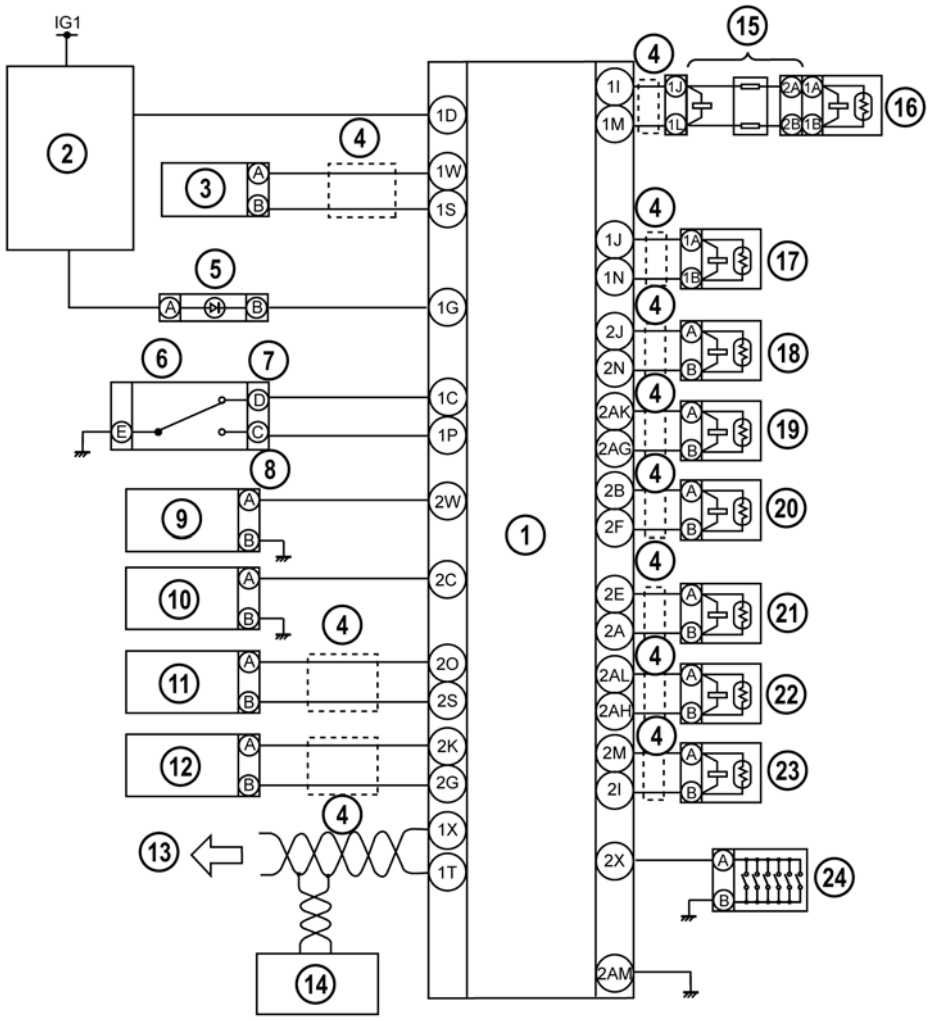
Parts Location



M3FL_08001

1 Airbag system warning light
2 PAD switch
3 Clock spring
4 Driver-side airbag
5 PAD indicator
6 Passenger-side airbag
7 Occupancy sensor
8 SAS control module
9 Seat belt pretensioner
10 Side airbag sensor
11 Side airbags
12 Curtain airbags
13 Crash zone sensor

Wiring Diagram



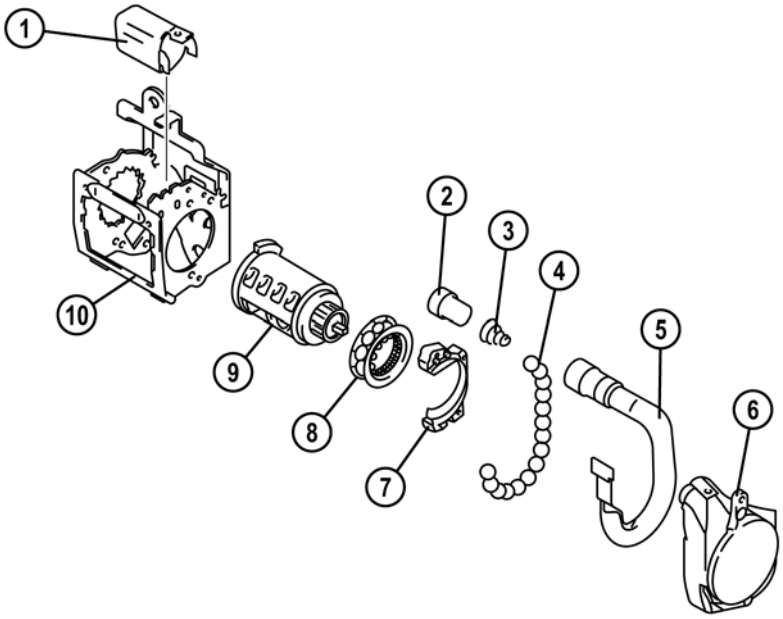
M3FL_08002

1	SAS control module	13	Mid-speed CAN bus
2	PJB	14	Instrument cluster
3	Crash zone sensor	15	Clock spring
4	Twisted pair	16	Driver-side airbag
5	PAD indicator	17	Passenger-side airbag
6	PAD switch	18	Driver-side side belt pretensioner
7	Passenger airbag ON	19	Driver-side curtain airbag
8	Passenger airbag OFF	20	Driver-side side airbag
9	Driver-side buckle switch	21	Passenger-side seat belt pretensioner
10	Passenger-side buckle switch	22	Passenger-side curtain airbag
11	Driver-side side airbag sensor	23	Passenger-side side airbag
12	Passenger-side side airbag sensor	24	Occupancy sensor

Ball-type Seat Belt Pretensioners

- Ball-type seat belt pretensioners are used at the front seats. The operation is similar to that of the Mazda6 F/L.

NOTE: Further information can be found in the Training Manual “Supplemental Restraint System” (CT-L1003).



M3FL_08003

1	Ball trap	6	Cover
2	Gas generator	7	Ball guide
3	Spring	8	Pinion
4	Balls	9	Spindle
5	Tube	10	Housing

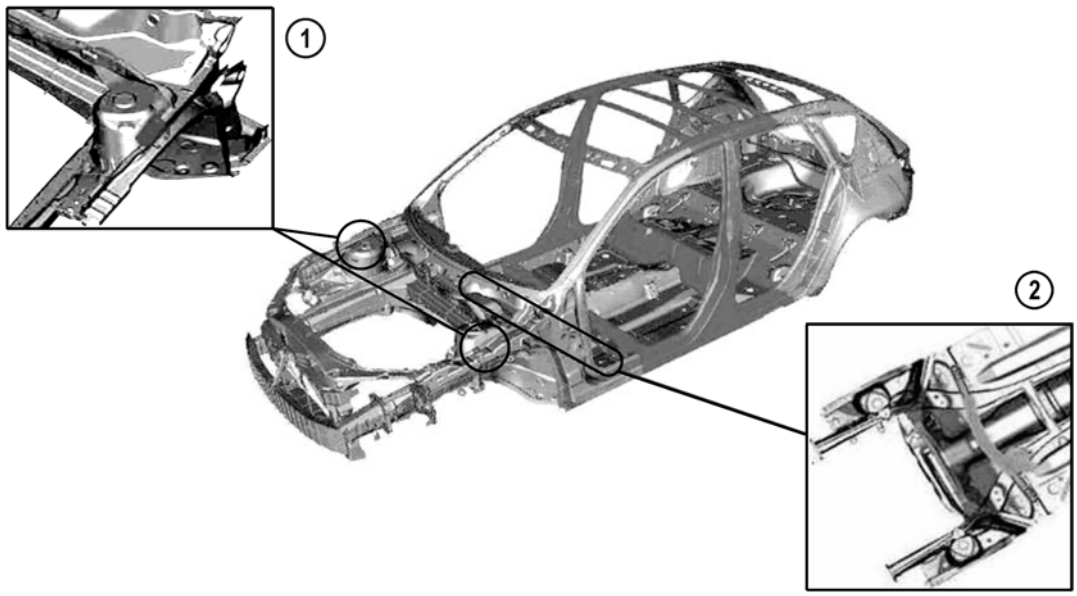
Body Panels

Features

- The construction of the body is essentially carried over from that of the current Mazda3 except for the following features:
  - Front suspension housings joined to the fender frame by brackets
  - Tunnel crossmember no.1 extended to the left and right side members

Front End

- The front suspension housings are joined to the fender frame by brackets to reduce deformation of the suspension housings when cornering and hence minimize changes in wheel camber.
- In addition, the tunnel crossmember no.1 connecting the transmission tunnel to the underbody is now extended to the left and right side members. This arrangement reduces the lateral deformation of the body when cornering, achieving a more linear steering response. Another benefit is decreased transmission of road vibrations from the front end to the cabin.



M3FL_09001a

1 Brackets
2 Tunnel crossmember

Glass/Windows/Mirrors

Features

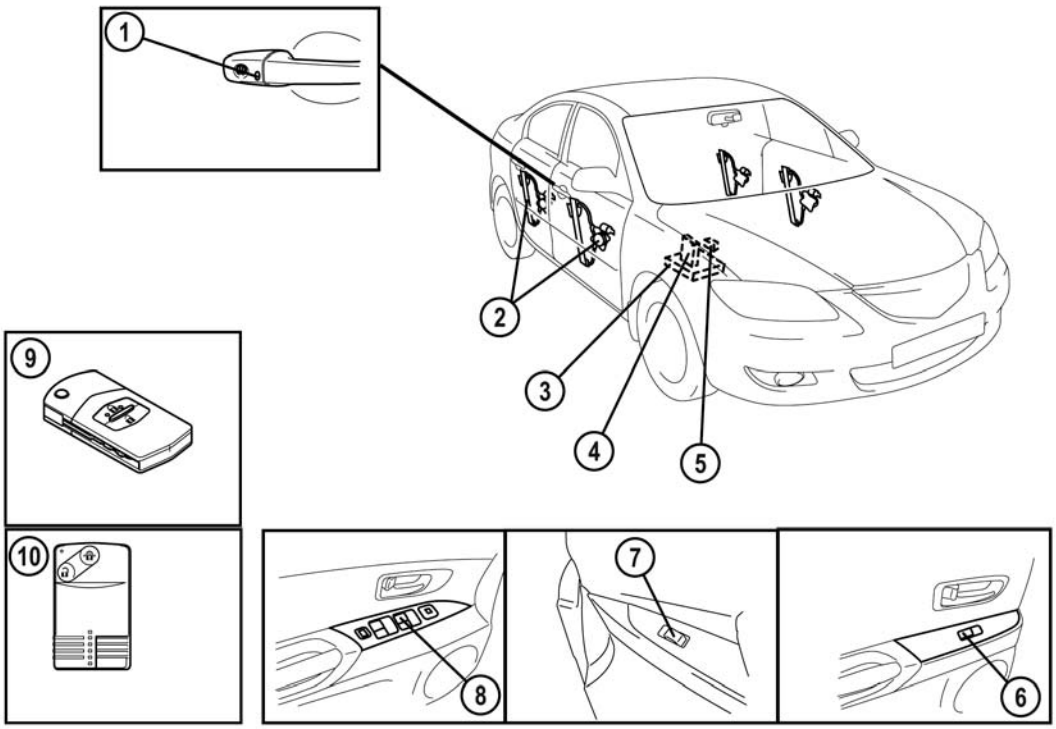
- The construction and operation of the glass/windows/mirrors is essentially carried over from that of the current Mazda3 except for the following features:
  - Exterior open/close function for the power windows has been introduced (similar to that of the Mazda5).

Exterior Opening/Closing Function

- The power windows feature an exterior open/close function (also termed as global opening/closing function), i.e. all of the windows can either be opened or closed from outside the vehicle. The operation is similar to that of the Mazda5.

NOTE: Further information can be found in the Training Manual “Mazda5” (NMT-007).

Parts Location



M3FL_09001

1 Driver-side request switch (with Advanced Keyless Entry and Start System)
2 Power window regulators
3 PJB
4 Keyless control module (with Advanced Keyless Entry and Start System)
5 Keyless receiver
6 Power window sub switch (rear doors)
7 Power window sub switch (passenger door)
8 Power window main switch (driver door)
9 Transmitter (with standard keyless entry system)
10 Transmitter (with Advanced Keyless Entry and Start System)

Security and Locks

Features

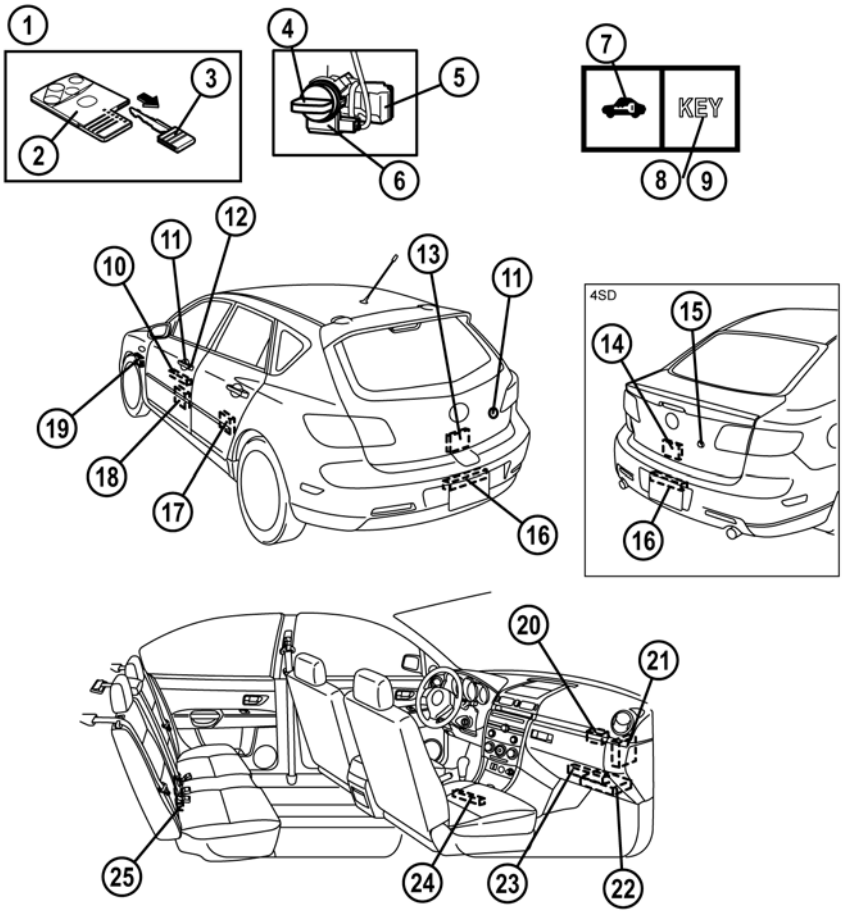
- The construction and operation of the security and lock system is essentially carried over from that of the current Mazda3 except for the following features:
  - Advanced Keyless Entry and Start System has been introduced (depending on the vehicle grade).

Advanced Keyless Entry and Start System

- The Advanced Keyless Entry and Start System is essentially carried over from that of the Mazda5 and has the following features:
  - Card key type transmitter
  - Three request switches (trunk lid request switch integrated in the key cylinder push switch on 4SD vehicles)
  - Six keyless antennas
  - Keyless receiver
  - Keyless control module connected to the high-speed CAN bus
  - Steering lock unit
  - Exterior keyless buzzer
  - D-PATS type immobilizer system with control function integrated in the keyless control module
  - Instrument cluster is not part of the immobilizer system

NOTE: Further information can be found in the Training Manual “Mazda5” (NMT-007).

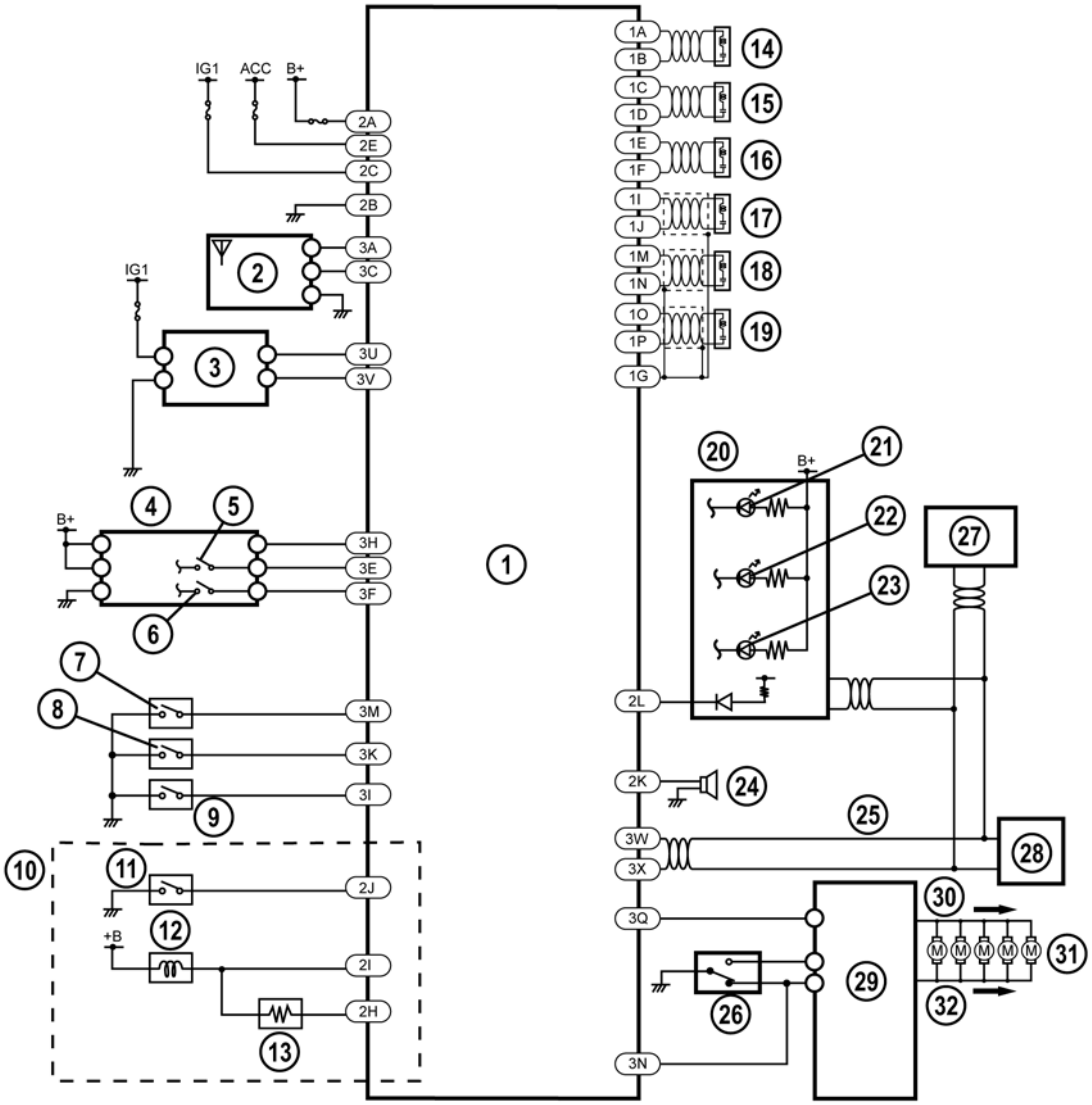
Parts Location



M3FL_09002

1	Card key	14	Trunk lid opener
2	Transmitter	15	Trunk lid request switch (integrated in key cylinder push switch)
3	Auxiliary key	16	Keyless antenna (exterior, rear)
4	Start knob (with ignition switch)	17	Rear door lock actuator
5	Steering lock unit	18	Front door lock actuator
6	Coil antenna	19	Keyless buzzer
7	Security light	20	Keyless receiver
8	Keyless warning light (red)	21	Keyless control module
9	Keyless indicator light (green)	22	PJB
10	Keyless antenna (exterior, LF)	23	Keyless antenna (interior, front)
11	Request switch	24	Keyless antenna (interior, middle)
12	Key cylinder switch	25	Keyless antenna (interior, rear)
13	Liftgate latch and lock actuator		

Wiring Diagram

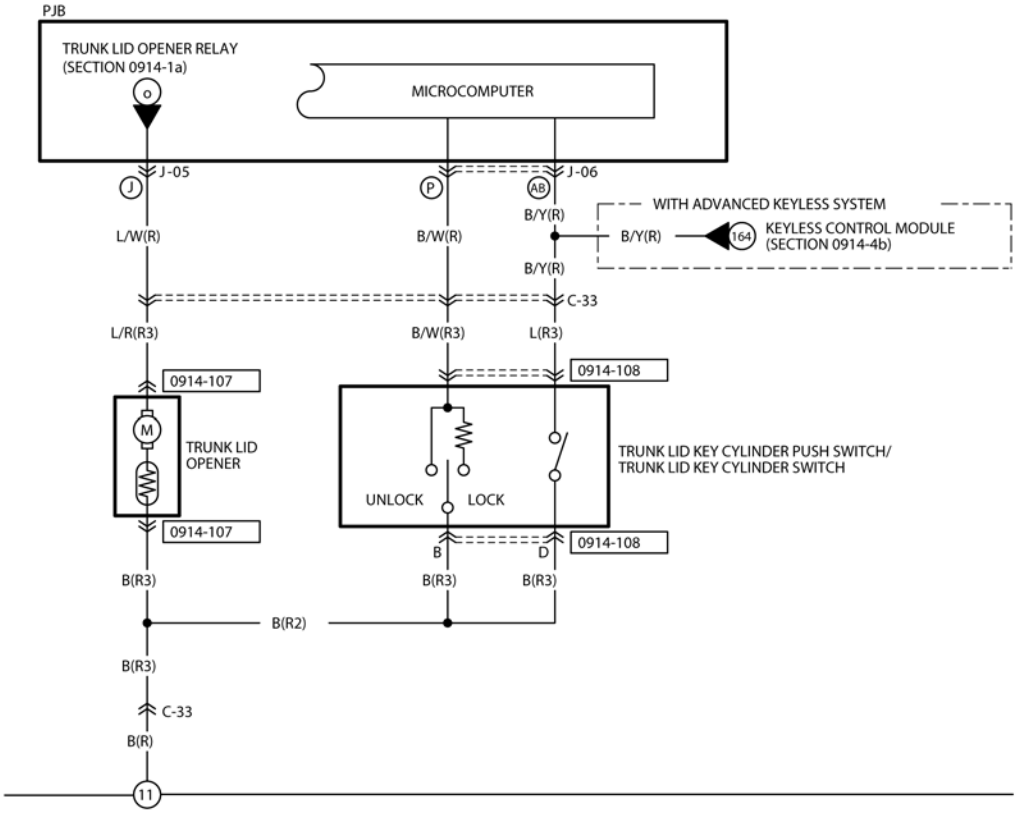


M3FL_09003

1 Keyless control module
2 Keyless receiver
3 Coil antenna
4 Steering lock unit
5 Push switch
6 Key reminder switch
7 Trunk lid/Liftgate request switch
8 Request switch (LF)
9 Request switch (RF)
10 With ATX
11 P position switch
12 Key interlock solenoid
13 Key interlock resistor
14 Keyless antenna (exterior, RF)
15 Keyless antenna (exterior, LF)
16 Keyless antenna (exterior, rear)
17 Keyless antenna (interior, rear)
18 Keyless antenna (interior, middle)
19 Keyless antenna (interior, front)
20 Instrument cluster
21 Security light
22 Keyless warning light (red)
23 Keyless indicator light (green)
24 Keyless buzzer
25 High-speed CAN bus
26 Door lock-link switch
27 PCM
28 DLC-2
29 PJB
30 Lock
31 Door lock actuators
32 Unlock

Trunk Lid Request Switch

- On 4SD vehicles the trunk lid request switch is integrated in the key cylinder push switch, i.e. when the push switch is pressed the keyless control module sends a request signal to the card key.

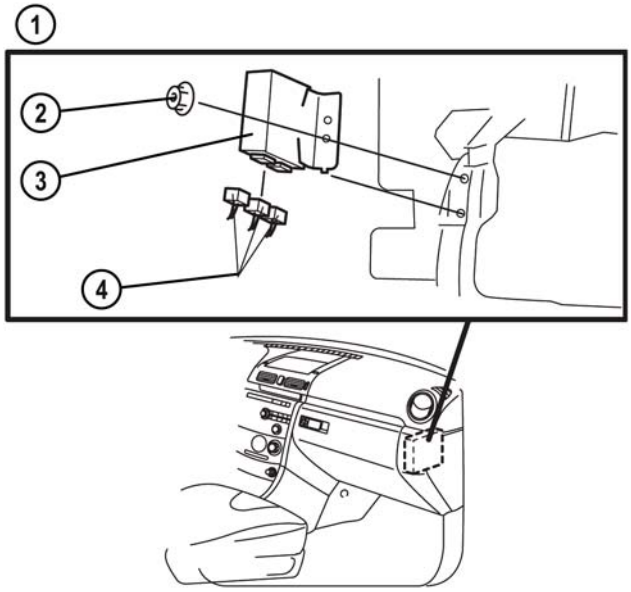


M3FL_09004

Keyless Control Module

- The Keyless Control Module is located behind the glove box. It confirms the identification of the card keys and transmits this information via the CAN bus to the PJB (for keyless entry) and to the PCM (for keyless start).

NOTE: When replacing the keyless control module, the new module has to be configured. To do this connect M-MDS to the vehicle and select the option **Toolbox→Module Programming→Programmable Module Installation→RKE**.



M3FL_09005

1 View from rear of the glove box
2 Nut
3 Keyless control module
4 Connectors

Operation

- The operation of the Keyless Entry and Start System is similar to that of the Mazda5.

Warning and Guidance Function

- The driver is informed of misuse or faults of the system via the exterior keyless buzzer, the keyless warning and indicator light and the interior buzzer (the latter two are integrated in the instrument cluster).

Warning	Operating condition	Exterior keyless buzzer	Interior buzzer	Keyless warning light (red)	Keyless indicator light (green)
Start knob not in LOCK position	Driver's door is open with start knob in ACC position.	-	Sounds 6 times	Flashes	-
Card key out of vehicle *1	Card key cannot be detected inside vehicle with driver's door open and start knob in any position except LOCK.	-	Sounds 3 times	Flashes *2	-
	Card key cannot be detected inside vehicle with all doors closed and start knob in any position except LOCK.	Sounds 6 times	-	Flashes *3	-
	Card key cannot be detected inside vehicle with start knob in any position except LOCK and under any condition other than above.	-	-	Flashes *2	-
Card key left in vehicle	Door or liftgate/trunk lid is open with proper card key inside vehicle and another card key carried.	Sounds for 10 s	-	-	-
Door lock inoperable	Request switch is pressed with card key carried and a door open or start knob not in LOCK position.	Sounds 6 times	-	-	-
Card key battery voltage low	Card key battery voltage is depleted.	-	-	-	Flashes (approx. 30 s after IG ON)

M3FL_T09001

Guidance	Operating condition	Exterior keyless buzzer	Interior buzzer	Keyless warning light (red)	Keyless indicator light (green)
Start knob operable	Start knob is operable (released) when it is pressed.	-	Sounds 6 times	-	On (max. 3 s)
Start knob inoperable	Start knob is inoperable (locked) when it is pressed.	-	Sounds 6 times	Flashes	-
Lock/unlock answer back	Doors are locked/unlocked with normal/advanced keyless entry function.	Locked: Sounds once Unlocked: Sounds twice	-	-	-

*1 : If the start knob is turned to the LOCK position with the card key out of the vehicle, the start knob is inoperable (the engine cannot be restarted). In addition, the engine cannot be restarted by turning the start knob from the ACC position to the START position even though the start knob has not been turned to the LOCK position before.
*2 : Stops flashing and goes out if the card key is detected inside the vehicle.
*3 : Stops flashing and goes out if the card key is detected inside the vehicle and door is opened.

M3FL_T09001a

Customization

- The following functions can be activated or deactivated using M-MDS:
  - Out of range auto-lock function (set to OFF from factory).
  - Lock/unlock answer-back buzzer (set to OFF from factory).
  - Card key battery voltage low warning (set to ON from factory).

- To do this connect M-MDS to the vehicle and select the option **Toolbox→Module Programming→Programmable Parameters→RKE**.

Service and Repair

Programming additional card keys with two or more card keys

- If two or more registered card keys are available, additional card keys can be programmed without using M-MDS. A maximum of six card keys can be programmed.

NOTE: Do not program card keys while M-MDS or any other computer devices are in the vehicle. Make sure all card keys are operational and have good batteries.

NOTE: Steps 3 to 6 below must be completed within 30 seconds after inserting the auxiliary key in the ignition lock.

1. Bring the two registered card keys (key 1 and key 2), and the card key to be programmed into the vehicle and close all doors.
2. Insert auxiliary key in the ignition lock.
3. Turn ignition switch to the ON position.
4. Push the UNLOCK button on card key 1 once.
5. Push the UNLOCK button on card key 2 once.
6. Turn ignition switch to ACC then back to ON three times.
7. Open and close the driver's door three times. The door lock actuators will lock once, then unlock to confirm that programming mode is active.
8. Push the UNLOCK button on the card key to be programmed twice. The door lock actuators will lock once, then unlock to confirm that programming was successful.

Programming additional card keys with M-MDS

1. Establish communication between M-MDS and the vehicle.
2. Select the option **Toolbox→Body→Security→PATS Functions**.
3. Select the option "Program Additional Card Key" and carry out the security access procedure (read out M-MDS outcode, and input corresponding incode).

Erasing registered card keys

1. Establish communication between M-MDS and the vehicle.
2. Select the option **Toolbox→Body→Security→PATS Functions**.
3. Select the option “Card Key Code Erase” and carry out the security access procedure (read out the M-MDS outcode, and input corresponding incode).

NOTE: After erasing all registered card keys at least one card key must be programmed for the system to operate correctly.

Steering lock unit programming

- If the steering lock unit is replaced, the new unit must be programmed using M-MDS.

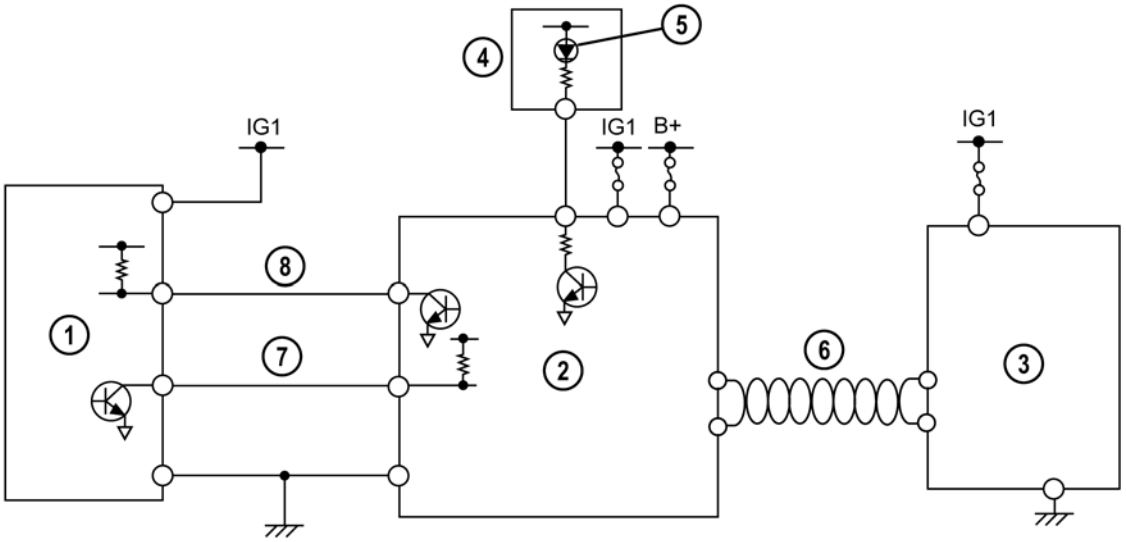
NOTE: Do not program the steering lock unit while M-MDS or any other computer devices are in the vehicle. Make sure all card keys are operational and have good batteries.

NOTE: To program the steering lock unit a registered card key is necessary. If there is no registered card key, perform the card key programming first and then the steering lock unit programming.

1. Bring a registered card key into the vehicle and close all the doors.
2. Establish communication between M-MDS and the vehicle.
3. Select the option **Toolbox→Body→Security→PATS Functions**.
4. Select the option “Steering Lock Unit Programming” and carry out the security access procedure (read out the M-MDS outcode, and input corresponding incode).

Immobilizer System

- A **D-PATS** (**D**istributed **P**assive **A**nti-**T**heft **S**ystem) type immobilizer system is used. The system consists of the auxiliary key (with integrated transponder), coil antenna, keyless control module and PCM.
- A maximum of eight keys can be registered.
- The coil antenna is connected to the keyless control module, which communicates via the high-speed CAN bus to the PCM.

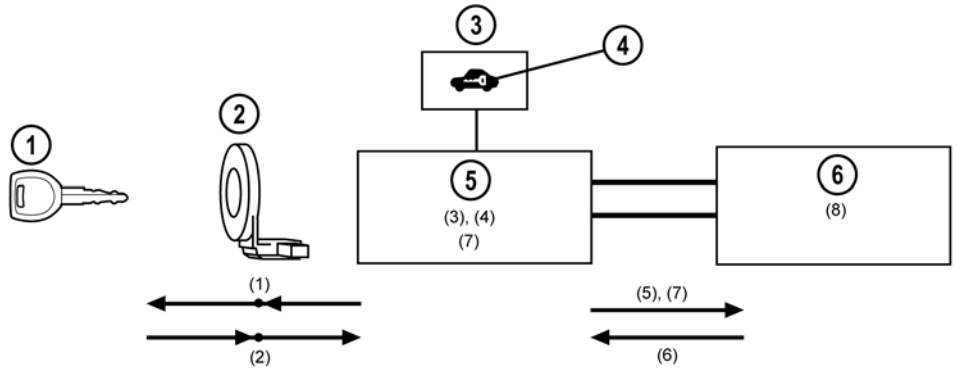


M3FL_09006

1	Coil antenna	5	Security light
2	Keyless control module	6	High-speed CAN bus
3	PCM	7	Rx line
4	Instrument cluster	8	Tx line

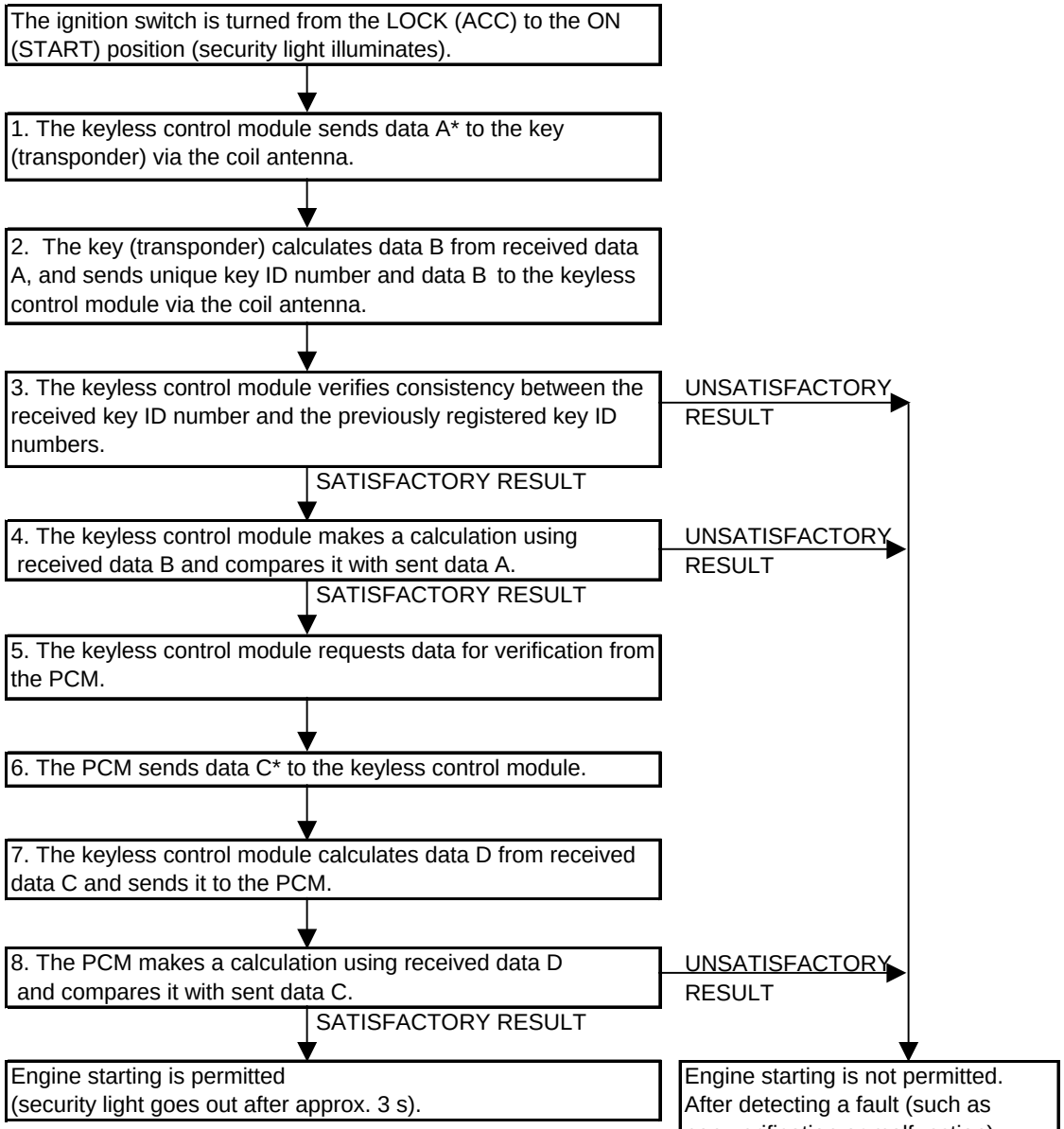
Operation

- On vehicles with Advanced Keyless Entry and Start System the control of the immobilizer system is carried out by the keyless control module. The keys contain a unique ID number that is programmed into the keyless control module and into the PCM.



M3FL_09007

1 Key (with integrated transponder)
2 Coil antenna
3 Instrument cluster
4 Security light
5 Keyless control module
6 PCM



*: Data A and C are different random values each time.

M3FL_T09004

Replacement of Immobilizer System Components

Operation	Necessary Preparation	Required Action
Adding keys/card keys (two or more programmed keys/card keys available)	• Two or more programmed keys/card keys. • One ore more keys/card keys to be programmed.	• Can be performed without M-MDS, providing "Customer spare key programming" function is enabled. • If "Customer spare key programming" function is disabled, perform the following procedure with M-MDS: Program Additional Ignition Key/ Program Additional Card Key
Adding keys/card keys (one or no programmed key/card key available)	• One or more keys/card keys to be programmed.	• Perform the following procedure with M-MDS: Program Additional Ignition Key/ Program Additional Card Key
Clearing key IDs	• Two or more keys to be programmed.	• All keys for the vehicle must be collected and programmed. • Perform the following procedure with M-MDS: Ignition Key Code Erase
Clearing card key IDs	• One or more card keys to be programmed.	• All card keys for the vehicle must be collected and programmed. • Perform the following procedure with M-MDS: Card Key Code Erase
Replacing PCM	• New PCM. • Keys to be programmed (two or more).	• All keys for the vehicle must be collected and programmed. • Perform the following procedure with M-MDS: Parameter Reset
Replacing steering lock unit	• New steering lock unit. • One programmed card key. • Keys to be programmed (two or more).	• Perform the following procedures with M-MDS in the indicated order: 1. Ignition Key Code Erase 2. Steering Lock Unit Programming
Replacing keyless control module	• New keyless control module. • Card keys to be programmed (one or more). • Keys to be programmed (two or more).	• All keys and card keys for the vehicle must be collected and programmed. • Perform the following procedures with M-MDS in the indicated order: 1. Ignition Key Code Erase 2. Parameter Reset 3. Card Key Code Erase 4. Steering Lock Unit Programming
Replacing instrument cluster	• New instrument cluster.	• No immobilizer system programming or resetting necessary.
Replacing coil antenna	• New coil antenna.	• No immobilizer system programming or resetting necessary.

M3FL_T09005

On-board Diagnostic System

- The on-board diagnostic system consists of the following functions:
  - Self test
  - PID monitor
  - Simulation test

Self Test

- The self-test function allows the Advanced Keyless Entry and Start System DTCs to be displayed. To do this connect M-MDS to the vehicle and select the option **Toolbox→ Self Test→Modules→RKE**.

PID Monitor

- The PID monitor function allows the PIDs for the Advanced Keyless Entry and Start System to be monitored. To do this connect M-MDS to the vehicle and select the option **Toolbox→Datalogger→Modules→RKE**.

PID	Definition	Unit/ Condition
DTC_CNT	Number of continuous DTCs	-
RPM	Engine speed	RPM
VSS	Vehicle speed	KPH
VPWR	Supply voltage	V
NUMCARD	Number of programmed card keys	-
NUMKEY	Number of programmed key ID numbers	-
DRSW_D	Door switch (driver's door)	OPEN/ CLOSE
DRSW_ALL	Door switch (all doors and liftgate)	OPEN/ CLOSE
REQ_SW_D	Request switch (driver's door)	On/Off
REQ_SW_P	Request switch (passenger door)	On/Off
REQ_SW_BK	Request switch (trunk lid/liftgate)	On/Off
LOCK_SW_D	Door lock-link switch	On/Off
IMMOBI	Immobilizer system equipped or not	On/Off
TR/LG_SW	Trunk lid/Liftgate latch switch	OPEN/ CLOSE
IG_KEY_IN	Key reminder switch	Key-In/ Key-Out
IG_SW_ST	Ignition switch (Push switch)	Pushed/ Not Pushed
BUZZER	Keyless buzzer	On/Off
PWR_IG1	Power supply (IG1 position)	On/Off
PWR_ACC	Power supply (ACC position)	On/Off

M3FL_T09002

Simulation Test

- The simulation test function allows certain PIDs for the Advanced Keyless Entry and Start System to be activated. To do this connect M-MDS to the vehicle and select the option **Toolbox→Datalogger→Modules→RKE**.

PID	Applicable Component	Unit/ Condition
BZR_OUT	Exterior keyless buzzer	On/Off
BZR_IN	Interior buzzer	On/Off
LNP_RED	Keyless warning light	On/Off
LNP_GREEN	Keyless indicator light	On/Off
DR_LOCK	All doors lock	Lock/ Off
DR_UNLOCK	All doors unlock	Unlock/ Off
SUPERLOCK	All doors doublelock	Lock/ Off

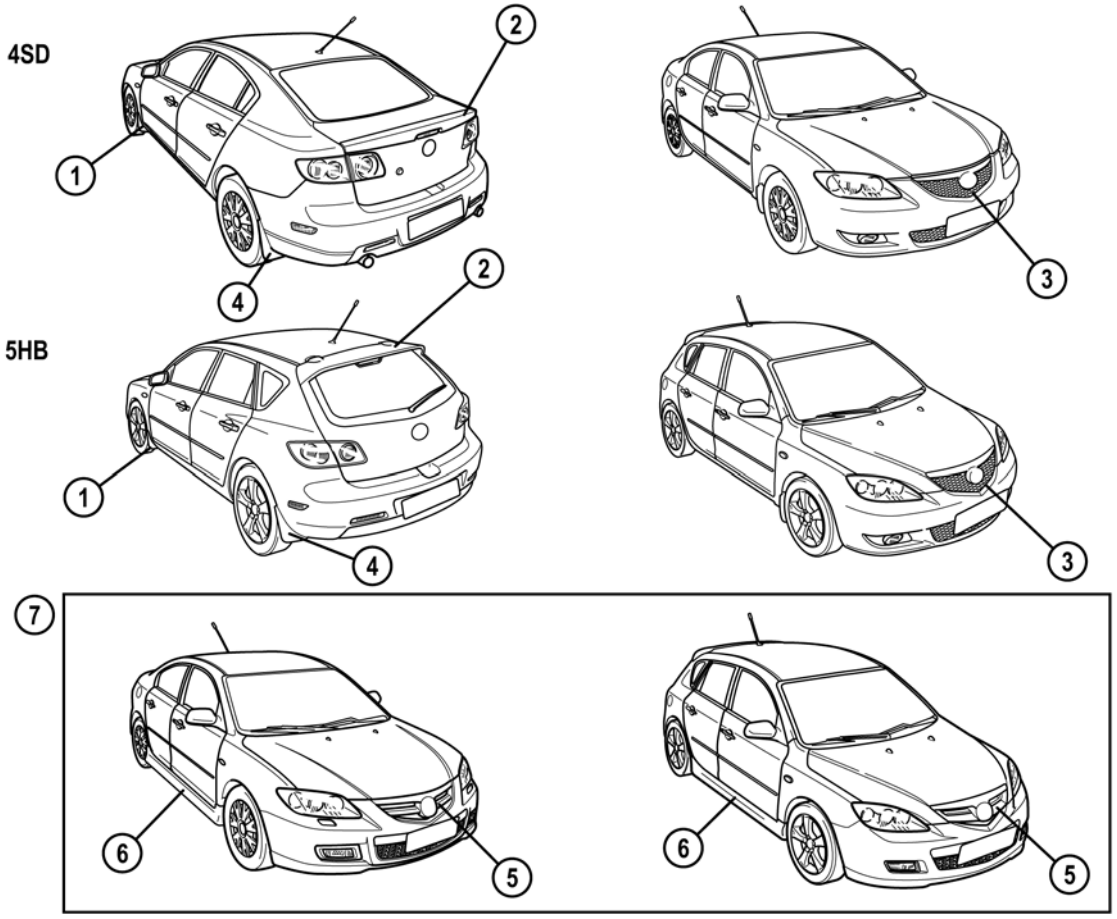
M3FL_T09003

Exterior Trim

Features

- The design of the exterior trim is essentially carried over from that of the current Mazda3 except for the following features:
  - New radiator grille design and front/rear bumper design
  - New rear combination lamp design (black bezels) and front fog lamp design (the latter one only for Sports Appearance Package)
  - New aluminium alloy wheel designs for 15-, 16-, and 17-inch wheels
  - Seven new exterior colours (True Red (A4A), Aurora Blue (34J), Galaxy Grey (32S), Icy Blue (33Y), Phantom Blue (32C), Phantom Purple (34N), Crystal White Pearl (34K))
  - Modified boot opening design and new boot lid recess for improved accessibility (only 4SD vehicles)
  - New underbody tyre deflectors and centre floor cover for improved aerodynamics

Parts Location



M3FL_09017

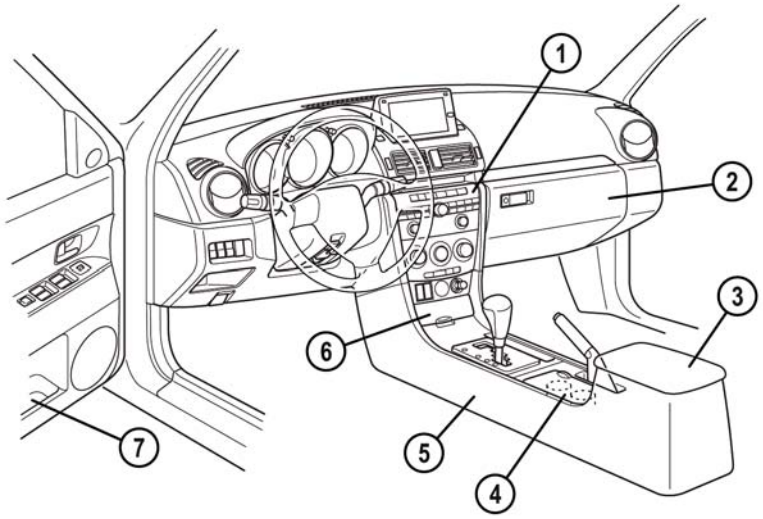
1 Front mud flap
2 Rear spoiler
3 Radiator grille (standard type)
4 Rear mud flap
5 Radiator grille (Sports type)
6 Side step moulding
7 With Sports Appearance Package

Interior Trim

Features

- The design of the interior trim is essentially carried over from that of the current Mazda3 except for the following features:
  - New seat and door trim upholstery materials
  - Instrument panel with new Piano Black or Titanium Grey trim (depending on vehicle grade)
  - New white driver meters with indirect blue lighting for better readability (depending on vehicle grade)
  - New steering wheel adjustment lever design and energy absorbing padding added to steering column to reduce risk of knee injury
  - New sound insulation under the bonnet and in the cabin roof

Parts Location



M3FL_09018

1 Audio unit
2 Glove box
3 Storage box
4 Cup holder
5 Center console
6 Ashtray
7 Door pocket

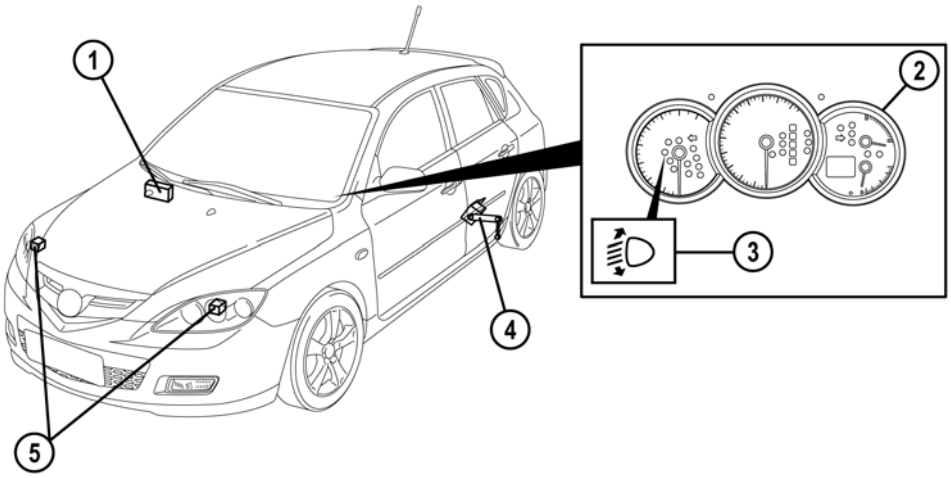
Lighting Systems

Features

- The construction and operation of the lighting systems is essentially carried over from that of the current Mazda3 except for the following features:
  - LED brake light/taillight has been added for 4SD vehicles (depending on vehicle grade).
  - Headlight auto-leveling control module connected to the DLC-2 (similar to that of the Mazda5)
  - Initialization procedure for the headlight auto-leveling control module has been added (similar to that of the Mazda5).

Headlight Auto-leveling System

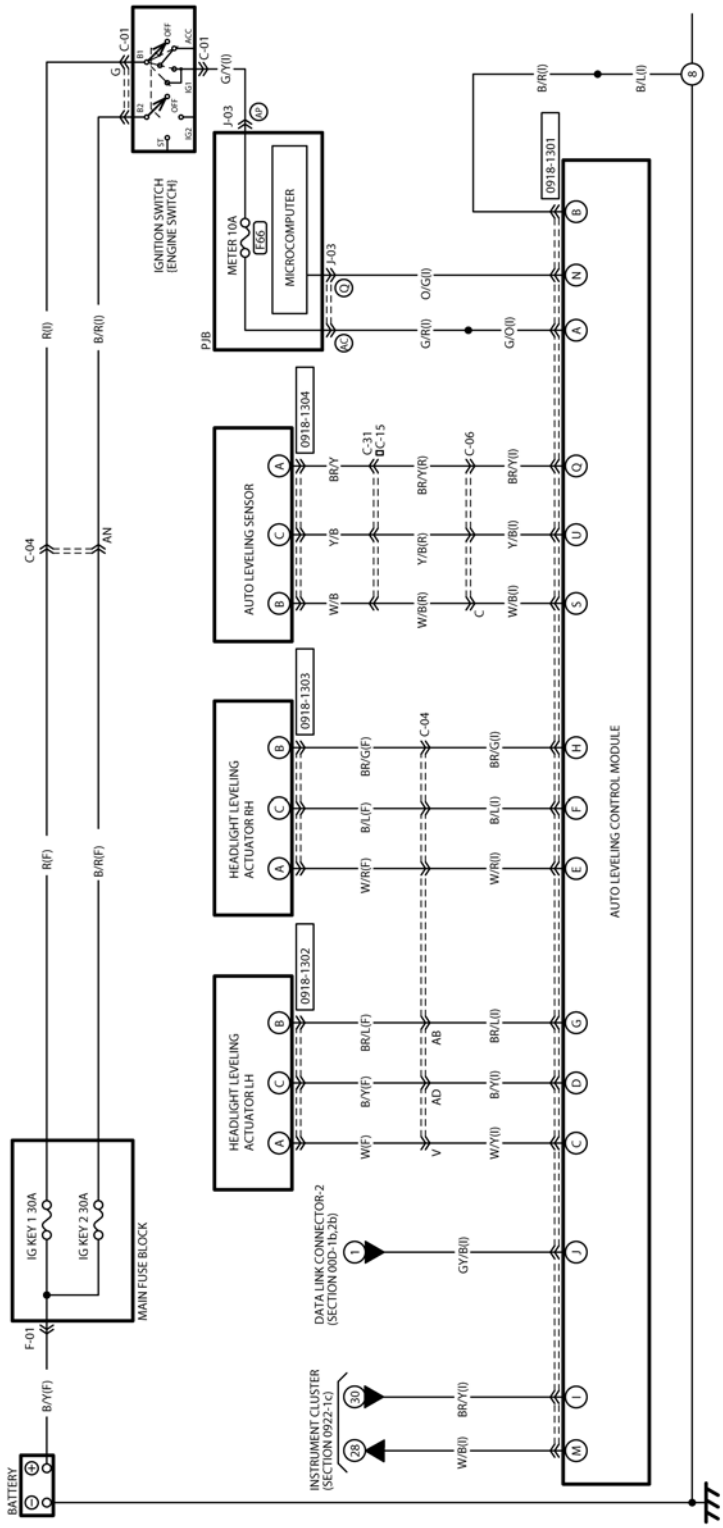
Parts Location



M3FL_09008

1 Auto-leveling control module
2 Instrument cluster
3 Auto-leveling warning light
4 Auto-leveling sensor
5 Headlight leveling actuator

Wiring Diagram



M3FL_09009

Initialization procedure for auto-leveling control module

- An initialization procedure for the auto-leveling control module has been added. When this procedure is activated, the auto-leveling control module detects the height of the unloaded vehicle via the signal from the auto-leveling sensor and stores it as a reference value in the control module memory.
- The auto-leveling control module must be initialized when any of the following procedures has been performed:
  - Front combination light replacement
  - Auto leveling control module replacement
  - Auto leveling sensor removal/installation
  - Instrument cluster replacement
  - PJB replacement
  - Replacement of suspension components or work that effects vehicle height
- In order to activate the initialization procedure for the auto-leveling control module, connect M-MDS to the vehicle and select the option **Toolbox→Electrical→Exterior Lighting→Headlamp→Auto-leveling Sensor Re-zero Procedure**.

NOTE: In case the initialization procedure using M-MDS is not possible, it can also be performed by connecting terminal B in the DLC-2 to ground (refer to the workshop manual for the detailed procedure).

Entertainment

Features

- The construction and operation of the entertainment system is essentially carried over from that of the current Mazda3 except for the following features:
  - Audio unit with 20 GB music hard disc drive and remote control has been introduced (similar to that of the Mazda5).

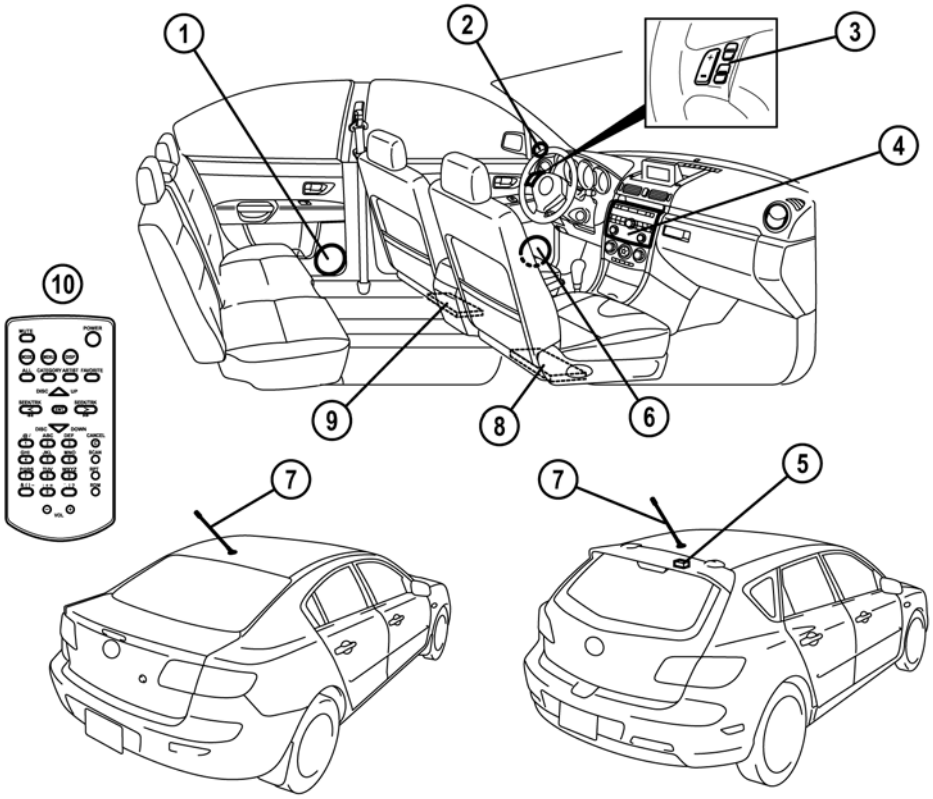
Audio System

Music Hard Disc Drive Specifications

Item	Specification
HDD capacity	20 GB
Playback signal compression method	Encrypted MP3
Maximum recordable tracks	3000
Maximum recordable albums	999
Favourite track registration capacity	Number of favorite lists: 4 Number of registerable tracks per list: 100
Category registration capacity	Number of categories: 5 Number of registerable albums per category: 999

M3FL_T09008

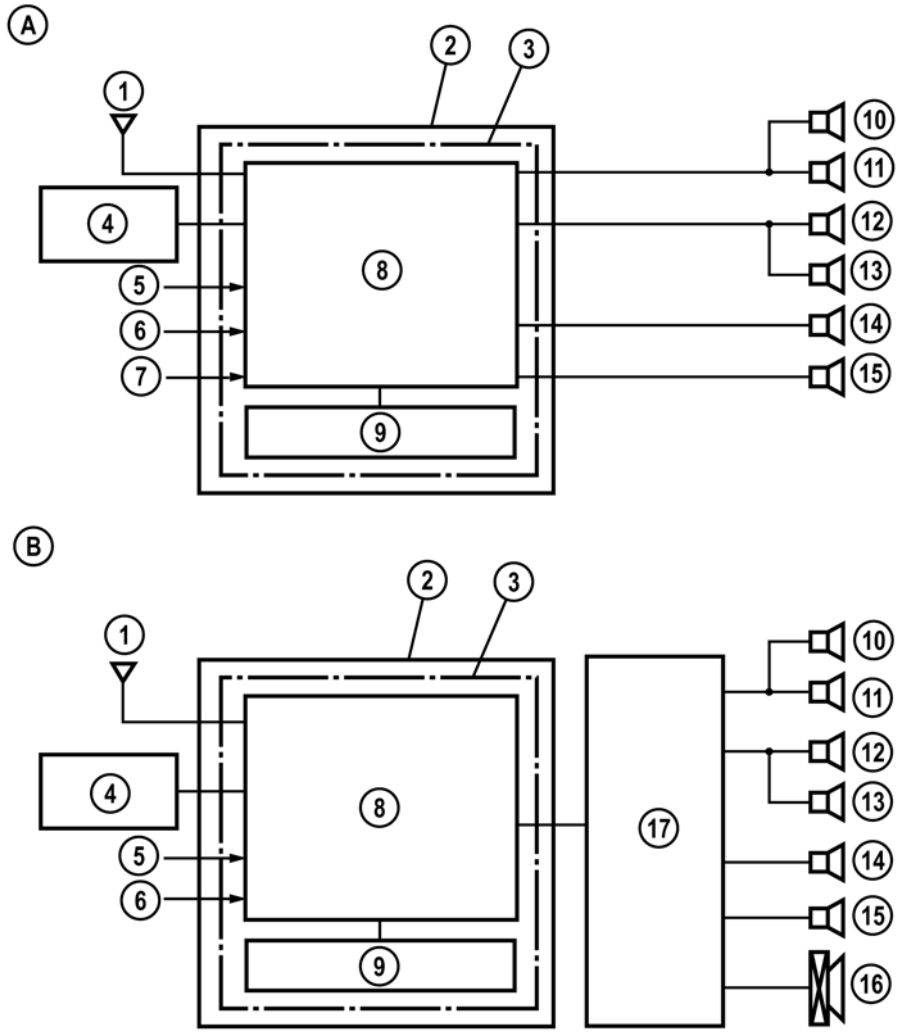
Parts Location



M3FL_09014

1	Rear door speaker	6	Front door speaker
2	Front tweeter	7	Roof antenna
3	Audio control switches	8	Woofer
4	Audio unit	9	Audio amplifier
5	Capacitor for high-mount brake light (only 5HB vehicles)	10	Remote control

System Overview



M3FL_09010

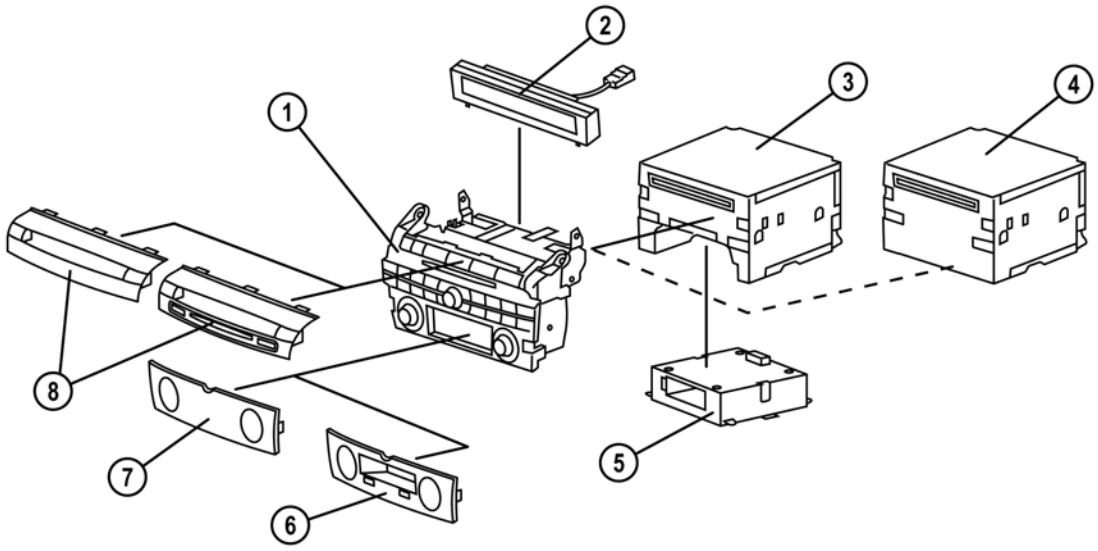
A	Standard audio system	B	Bose audio system
1	Antenna	10	Front tweeter (right)
2	Center panel module (integrated in audio unit)	11	Front door speaker (right)
3	Audio unit	12	Front door speaker (left)
4	Audio control switches	13	Front tweeter (left)
5	TNS signal	14	Rear door speaker (right)
6	VSS	15	Rear door speaker (left)
7	Remote control (with music HDD)	16	Woofer
8	Base unit	17	Audio amplifier
9	Lower module (without music HDD)		

Audio Unit

- An audio unit with 20 GB music HDD (**H**ard **D**isk **D**rive) is available, i.e. albums can be recorded from the CD player, stored on the hard disc in MP3 format and played back. The operation is similar to that of the Mazda5.

NOTE: Further information can be found in the Training Manual “Mazda5” (NMT-007).

- Depending on whether or not the audio unit is equipped with music HDD, the base unit is different.



M3FL_09011

1	Center panel module	5	Lower module
2	Information display	6	Cover (with lower module)
3	Base unit (without music HDD)	7	Cover (without lower module)
4	Base unit (with music HDD)	8	Cover

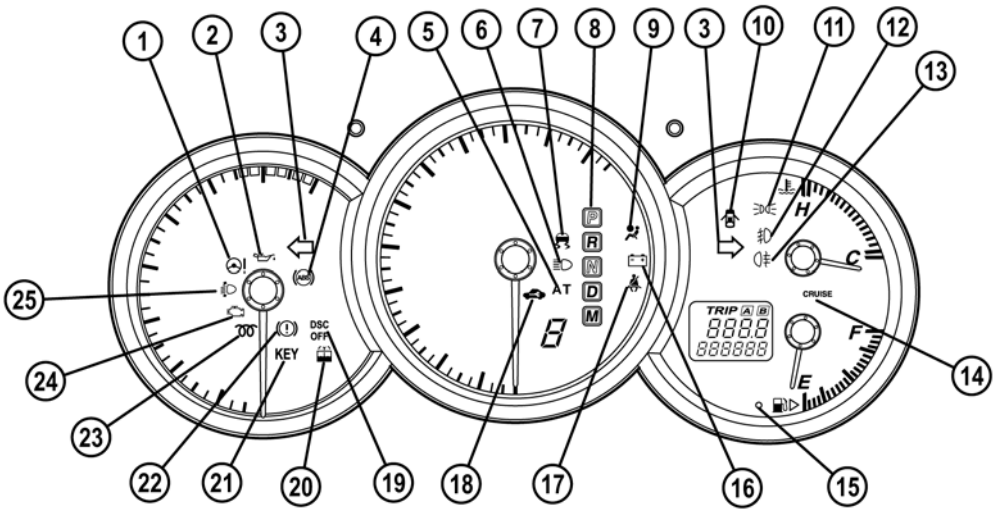
Instrumentation/Driver Info

Features

- The construction and operation of the instrumentation/driver information system is essentially carried over from that of the current Mazda3 except for the following features:
  - Odometer write procedure for the instrument cluster has been added (similar to that of the Mazda5).
  - Freeze frame data providing information about the instrument cluster control status at the occurrence of a fault have been added.
  - Driver-side seat belt reminder system replaced by front seat belt reminder system
  - Rear sear belt reminder system has been introduced (similar to that of the Mazda6 F/L).

Instrument Cluster

Overview



M3FL_09015

No.	Item	Input signal source	CAN system	Note
1	EHPAS warning light	EHPAS control module	X	—
2	Oil pressure warning light	Oil pressure switch	—	With 1.3/1.6/2.0 MZR engine
		PCM	X	With 1.6 MZ-CD engine
3	Turn indicator light	PJB	X	—
4	ABS warning light	• ABS HU/CM • DSC HU/CM	X	—
5	AT warning light	PCM	X	With ATX
6	High-beam indicator light	PJB	X	—
7	DSC indicator light	DSC HU/CM	X	—
8	Selector indicator light	PCM	X	With ATX
9	Airbag system warning light	SAS control module	X	—
10	Door ajar warning light	PJB	X	—
11	TNS indicator light	TNS relay	—	—
12	Front fog indicator light	Front fog light relay	—	—
13	Rear fog indicator light	Rear fog light relay	—	—
14	Cruise indicator light/ Cruise main indicator light	PCM	X	With cruise control system
15	Fuel-level warning light	Fuel gauge sender unit	—	—
16	Generator warning light	PCM	X	—
17	Seat belt warning light	SAS control module	X	—
18	Security light	• Coil antenna • PJB	X	With standard keyless entry system
		• Keyless control module • PJB	X	With Advanced Keyless Entry and Start System
19	DSC OFF indicator light	DSC HU/CM	X	—
20	Washer fluid level warning light	Washer fluid level sensor	—	—
21	Keyless warning/indicator light	Keyless control module	X	With Advanced Keyless Entry and Start System
22	Brake system warning light	• DSC HU/CM • ABS HU/CM • PJB	X	—
23	Glow indicator light	PCM	X	With 1.6 MZ-CD engine
24	MIL	PCM	X	—
25	Headlight auto-leveling warning light	Auto-leveling control module	—	With discharge headlight

M3FL_T09011

Odometer Write Procedure

- An odometer write procedure for the instrument cluster has been added. When configuring a new instrument cluster with M-MDS, the total mileage logged in the old cluster is automatically uploaded to the new cluster. To do this, connect M-MDS to the vehicle and select the option **Toolbox→Module Programming→Programmable Module Installation→IC**.
- The odometer write procedure can only be conducted once. However, the new instrument cluster must display less than 100 km for the mileage data to be uploaded. If a cluster with 100 km or more is configured, M-MDS will display an error message after configuring, indicating that the procedure failed. In this situation, all data other than the mileage will have been uploaded into the new instrument cluster, so that the configuration is actually successful.
- In order to upload the mileage data to a new instrument cluster with an odometer setting of 100 km or more, perform the odometer write procedure after completing the instrument cluster configuration. To do this select the option **Toolbox→Module Programming→Programmable Parameters→Odometer Write**. During this procedure M-MDS will request the user to input As-built data (VIN and Vehicle Data).

NOTE: Do NOT delete the M-MDS session until the odometer write procedure is completed. Otherwise it is not possible anymore to upload the mileage data to the new instrument cluster.

NOTE: In case the old instrument cluster is electrically damaged and therefore the configuration data cannot be read, the odometer write procedure cannot be performed.

Freeze Frame Data

- The **FFD** (**F**reeze **F**rame **D**ata) represent the instrument cluster control status at the occurrence of a fault. The instrument cluster can store the FFDs for up to four DTCs (FFD1 to FFD4), with the most recent data being FFD1. This data will not be overwritten, except that more than four DTCs are stored.
- The FFD is very helpful to diagnose the potential causes of a malfunction, especially when the malfunction is currently not present.
- When a fault is detected, the following data is stored in the instrument cluster memory:

FFD	Description	Unit/ Condition
Malfunction type	Type of malfunction that occurred: • Communication errors of other modules • Abnormal messages from the PCM • Warning light illumination request signal from other modules	—
Warning light control status	Warning light that was illuminated due to the malfunction: • Airbag system warning light • Generator warning light • MIL • ABS warning light • Brake system warning light • AT warning light • Keyless warning light	—
Meter/Gauge control status	Meter/Gauge that failed due to the malfunction: • Speedometer • Tachometer • Water temperature gauge	—
Traveled distance	Traveled distance when DTC was recorded (only the last four digits are recorded)	km
DTC status	Status of the DTC that was stored due to the malfunction	Cleared/ Not cleared

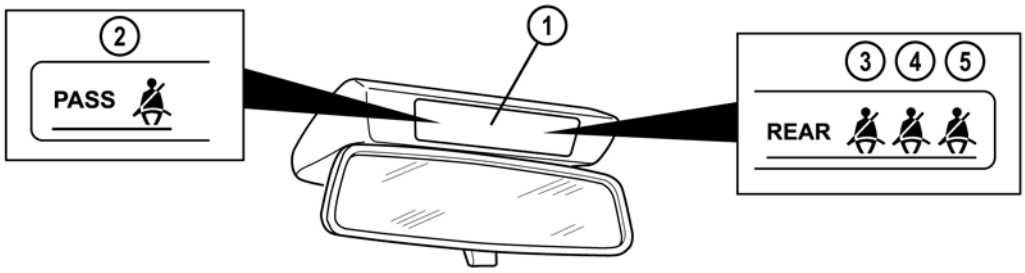
M3FL_T09010

- The FFD can be read out using M-MDS via the option **Toolbox→Electrical→IC Service Functions**.

NOTE: The FFD will not be cleared even if the corresponding DTC is cleared using M-MDS. In this case, only the DTC status will be set to “Cleared”.

Seat Belt Reminder System

- The seat belt reminder system warns the driver, when the driver/passenger seat belt and/or the rear seat belts are unfastened. It consists of driver-side/passenger-side buckle switch, passenger-side occupancy sensor, rear buckle switches, seat belt reminder indicator, driver seat belt warning light and warning chime (the latter two are integrated in the instrument cluster).



M3FL_09016

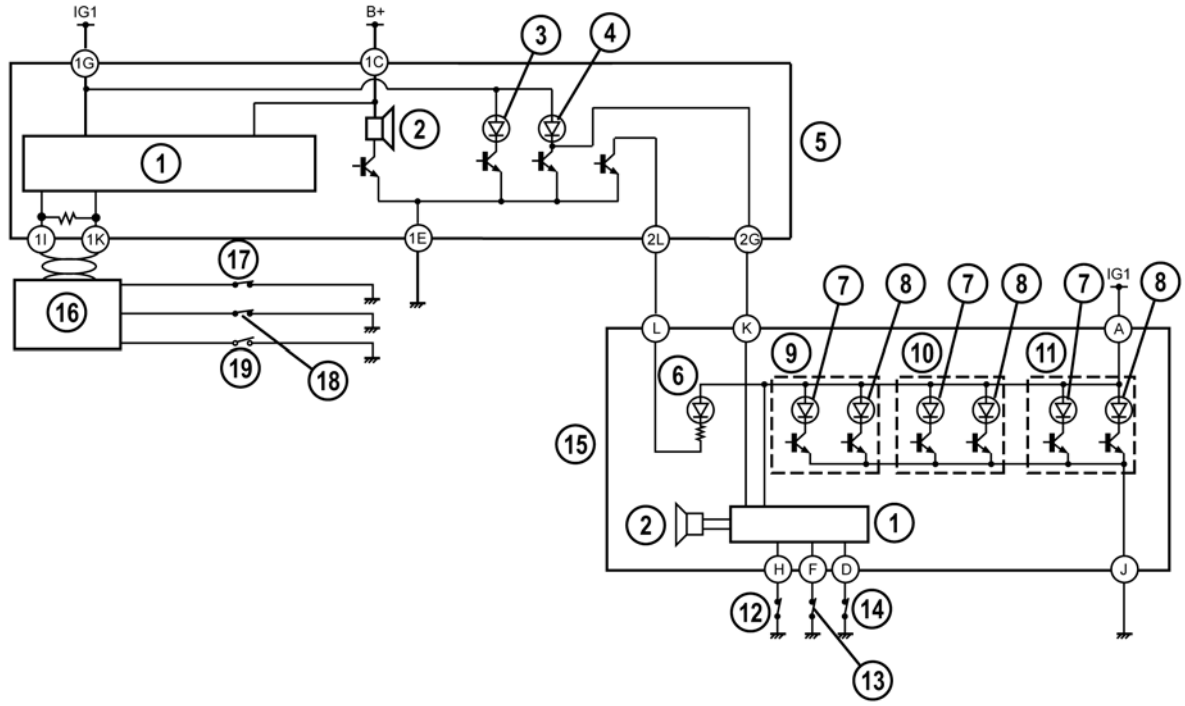
1 Seat belt reminder indicator
2 Passenger seat belt warning light
3 Rear left seat belt indicator light
4 Rear center seat belt indicator light
5 Rear right seat belt indicator light

Buckle Switches

- The buckle switches are integrated in the seat belt buckles and detect, whether or not the seat belts are buckled. When the seat belt is unbuckled, the switch supplies ground to the SAS control module (driver-side/passenger-side buckle switch) or to the seat belt reminder indicator (rear buckle switches).

Occupancy Sensor

- The occupancy sensor is integrated in the passenger seat cushion and detects, whether or not the passenger seat is occupied. When a weight of approx. 15 kg or more acts on the passenger seat, the sensor supplies ground to the SAS control module.



M3FL_09013

1 Microcomputer
2 Buzzer
3 Driver seat belt warning light
4 Generator warning light
5 Instrument cluster
6 Passenger seat belt warning light
7 Red (seat belt unfastened)
8 Green (seat belt fastened)
9 Rear left seat belt indicator light
10 Rear center seat belt indicator light
11 Rear right seat belt indicator light
12 Buckle switch (rear left)
13 Buckle switch (rear center)
14 Buckle switch (rear right)
15 Seat belt reminder indicator
16 SAS control module
17 Buckle switch (driver side)
18 Buckle switch (passenger side)
19 Occupancy sensor

Front Seat Belt Reminder Operation

- When the driver and/or the passenger seat belt is unfastened (driver side: seat belt is unbuckled; passenger side: seat belt is unbuckled and a weight of 15 kg or more is on the passenger seat) and the vehicle speed is less than 20 km/h, the SAS control module sends a “seat belt warning light on request” signal via the mid-speed CAN bus to the instrument cluster.
- When the vehicle speed is 20 km/h or more, the SAS control module additionally sends a “seat belt warning chime on request” signal to the instrument cluster.
- Depending on the signals from the SAS control module the instrument cluster activates the driver/passenger seat belt warning light and the warning chime. The below table shows the operation of the seat belt warning lights and the warning chime.

Item	Condition							
	Vehicle speed less than 20 km/h				Vehicle speed 20 km/h or more			
Driver seat belt	○	○	×	×	○	○	×	×
Passenger seat belt	○	×	○	×	○	×	○	×
Driver seat belt warning light								
Passenger seat belt warning light								
Warning chime								

○ : Fastened

× : Unfastened

 : Illuminated

 : Flashing

 : Beep

M3FL_T09009

- The instrument cluster deactivates the warning chime 90 s after the last activation, even if the vehicle speed drops below 20 km/h before the 90 s have elapsed.

NOTE: The driver/passenger seat belt warning chime can be deactivated using M-MDS via the option **Toolbox→Module Programming→Programmable Parameters→ Warning Lamps/Chimes**.

NOTE: The passenger seat belt warning light can be checked using the input/output check mode for the instrument cluster.

Rear Seat Belt Reminder Operation

- The seat belt reminder indicator activates all rear seat belt indicator lights after the ignition is switched on, or when the rear seat belts are unfastened or fastened while the engine is running. The colour of the indicator light provides information about the status of the seat belts:
  - If the indicator light is illuminated in red, the corresponding seat belt is unfastened (seat belt is unbuckled).
  - If the indicator light is illuminated in green, the corresponding seat belt is fastened (seat belt is buckled).
- In addition, the warning chime of the seat belt reminder indicator sounds for 0.5 s, when a seat belt is unfastened while the engine is running.
- The seat belt reminder indicator deactivates all rear seat belt indicator lights either 40 s after engine start (i.e. after the generator warning light is off) or 40 s after the last activation (in case the indicator lights have been activated while the engine is running).

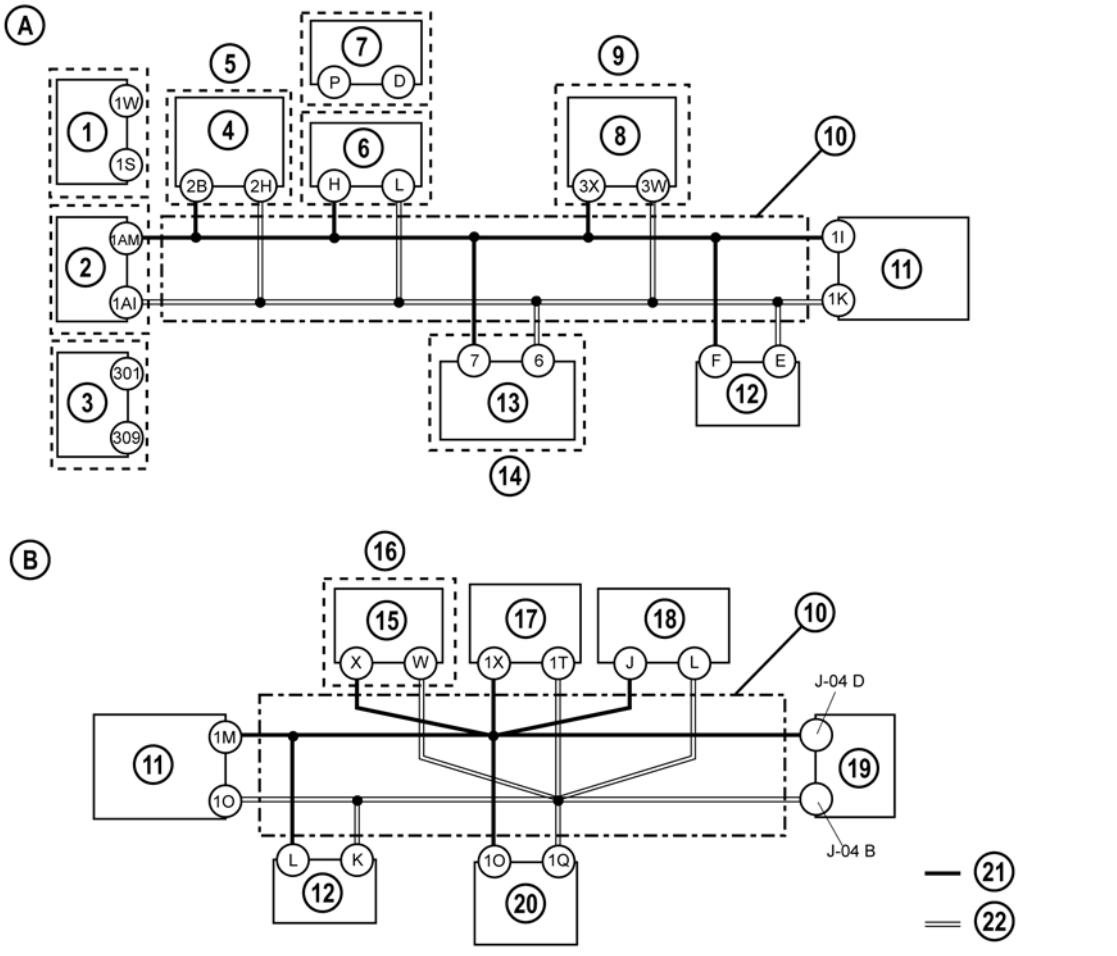
Control System

Features

- The construction and operation of the control system is essentially carried over from that of the current Mazda3 except for the following features:
  - Keyless control module connected to the high-speed CAN bus (similar to that of the Mazda5)

Controller Area Network

- On vehicles with Advanced Keyless Entry and Start System the keyless control module is connected to the high-speed CAN bus.



M3FL_09012

A	High-speed CAN bus	B	Mid-speed CAN bus
1	PCM (ZJ/Z6 engine)	12	DLC-2
2	PCM (LF engine)	13	Fuel additive control module
3	PCM (1.6 MZ-CD engine)	14	With 1.6 MZ-CD high-power engine
4	EHPAS control module	15	Climate control unit
5	With 2.0 MZR/1.6 MZ-CD engine	16	With full-auto A/C
6	ABS HU/CM	17	SAS control module
7	DSC HU/CM	18	Information display
8	Keyless control module	19	PJB
9	With Advanced Keyless Entry and Start System	20	Audio unit (base unit)
10	Twisted pair	21	CAN high
11	Instrument cluster	22	CAN low

High-speed CAN Signal Chart

- The following signals are transmitted via the high-speed CAN bus.

Signal	Multiplex module					
	PCM	FACM (*1)	EHPAS control module (*2)	ABS HU/CM DSC HU/CM	Keyless control module (*3)	Instrument cluster
Engine speed	OUT	IN	IN	IN	IN	IN
Vehicle speed	OUT	IN	IN	—	IN	IN
Engine torque	OUT	—	—	IN —	—	—
Accelerator pedal position (*2)	IN (*1) OUT	—	—	— IN	—	OUT (*1) —
Throttle position (*4)	OUT	—	—	IN —	—	—
Brake pedal position	IN (*1) OUT	—	—	— IN	—	OUT (*1) —
Clutch pedal position	IN (*1) OUT	—	— IN	—	—	OUT (*1) —
ATX gear position/ Selector lever position (ATX)	OUT	—	IN	— IN	—	IN
Transaxle specifications	OUT	—	—	— IN	—	—
Engine specifications	OUT	—	—	— IN	—	—
TCC status (ATX)	OUT	—	—	— IN	—	—
AT warning light on request (ATX)	OUT	—	—	—	—	IN
Torque reduction request	IN	—	—	— OUT	—	—
Torque reduction inhibit	OUT	—	—	— IN	—	—
Immobilizer-related information (*5)	IN OUT	—	—	—	—	OUT IN
Immobilizer-related information (*3)	IN OUT	—	—	—	OUT IN	—
Engine coolant temperature	OUT	—	—	—	—	IN
Traveled distance	OUT	—	—	—	—	IN
Fuel injection amount	OUT	—	—	—	—	IN
MIL on request	IN OUT	OUT —	—	—	—	— IN
Generator warning light on request	OUT	—	—	—	—	IN
Tire circumference	IN OUT	—	—	OUT IN	—	—

*1 : With 1.6 MZ-CD high-power engine
*2 : With 2.0 MZR/1.6 MZ-CD engine
*3 : With Advanced Keyless Entry and Start System
*4 : With 1.3/1.6 MZR engine
*5 : With standard keyless entry system
*6 : With 1.6 MZ-CD engine

M3FL_T09006

Signal	Multiplex module					
	PCM	FACM (*1)	EHPAS control module (*2)	ABS HU/CM DSC HU/CM	Keyless control module (*3)	Instrument cluster
EHPAS warning light on request (*2)	—	—	OUT	—	—	IN
Brake system status (EBD/ ABS/DSC)	IN	—	—	OUT	—	—
Wheel speed (LF, RF, LR, RR)	IN	—	—	OUT	—	—
Brake system warning light on request	—	—	—	OUT	—	IN
ABS warning light on request	—	—	—	OUT	—	IN
DSC indicator light on request	—	—	—	— OUT	—	IN
DSC OFF indicator light on request	—	—	—	— OUT	—	IN
Security light on request	—	—	—	—	OUT	IN
Keyless warning/indicator light on request (*3)	—	—	—	—	OUT	IN
Interior buzzer on request (*3)	—	—	—	—	OUT	IN
Cruise control system-related information (*6)	IN	—	—	—	—	OUT
Cruise/Cruise main indicator light on request	OUT	—	—	—	—	IN
Fuel tank level	IN	IN	—	—	—	OUT
Total additive injection amount (*1)	IN	OUT	—	—	—	—
Fuel additive injection status (*1)	IN	OUT	—	—	—	—
A/C on request	IN	—	—	—	—	OUT
Transaxle in reverse position	IN	—	—	—	—	OUT
Parking brake position	—	—	IN	—	—	OUT
Brake fluid level	—	—	—	IN	—	OUT
Ambient temperature	IN	—	—	—	—	OUT
Front wiper status	IN	—	—	—	—	OUT
TNS status	IN	—	—	—	—	OUT
PTC heater on request (*6)	IN	—	—	—	—	OUT
Glow indicator light on request (*6)	OUT	—	—	—	—	IN
Oil pressure warning light on request (*6)	OUT	—	—	—	—	IN
Generator load (*6)	OUT	—	—	—	—	IN
Generator control duty cycle (*6)	OUT	—	—	—	—	IN

*1 : With 1.6 MZ-CD high-power engine
*2 : With 2.0 MZR/1.6 MZ-CD engine
*3 : With Advanced Keyless Entry and Start System
*4 : With 1.3/1.6 MZR engine
*5 : With standard keyless entry system
*6 : With 1.6 MZ-CD engine

M3FL_T09006a

Mid-speed CAN Signal Chart

- The following signals are transmitted via the mid-speed-CAN bus.

Signal	Multiplex module					
	PJB	Climate control unit (*1)	SAS control module	Audio unit (base unit)	Information display	Instrument cluster
Ambient temperature	OUT	IN	—	—	IN	IN
Front wiper status	OUT	IN	—	—	—	IN
Turn indicator light on request	OUT	—	—	—	—	IN
Security light on request	OUT	—	—	—	—	IN
Alarm on request	OUT	—	—	—	—	IN
Door ajar warning light on request	OUT	—	—	—	—	IN
Brake fluid level	OUT	—	—	—	—	IN
High-beam indicator light on request	OUT	—	—	—	—	IN
Transaxle in reverse position	OUT	—	—	—	—	IN
Parking brake position	OUT	—	—	—	—	IN
Rear window defroster on request (*1)	IN	OUT	—	—	—	—
	OUT	IN				
A/C on request	IN	OUT	—	—	—	—
	OUT	—				IN
PTC heater on request (*2)	IN	OUT	—	—	—	—
	OUT	—				IN
A/C status display request	—	OUT	—	—	IN	—
Airbag system warning light on request	—	—	OUT	—	—	IN
Airbag system warning chime on request	—	—	OUT	—	—	IN
Buckle switch status	—	—	OUT	—	—	IN
Seat belt warning light on request	—	—	OUT	—	—	IN
Seat belt warning chime on request	—	—	OUT	—	—	IN
Temperature unit	OUT	—	—	—	IN	—
	—			IN	OUT	
INFO switch status	—	—	—	—	OUT	IN
Audio status display request	—	—	—	OUT	IN	—
Engine speed	IN	—	—	—	—	OUT
Vehicle speed	IN	IN	IN	IN	—	OUT
Engine coolant temperature	IN	IN	—	—	—	OUT
Key reminder switch position	IN	—	—	—	—	OUT
Ignition key position	—	—	—	IN	IN	OUT
Airbag system warning light status	—	—	IN	—	—	OUT
Driver information system data	—	—	—	—	IN	OUT
Generator load (*2)	IN	—	—	—	—	OUT
Generator control duty cycle (*2)	IN	—	—	—	—	OUT

*1 : With full-auto A/C
*2 : With 1.6 MZ-CD engine

M3FL_T09007

Mazda3 Product Changes History

- This section describes the product changes introduced during the cost reduction F/L of the Mazda3 in March 2005 (from VIN JMZBK1*****261573 on, except for vehicles with 1.6 MZ-CD high-power engine and DPF that were face-lifted from VIN JMZBK1*Y2**270808 on).

Engine

- Fuel filter with separate fuel warmer replaced by filter with integrated fuel warmer (only vehicles with 1.6 MZ-CD engine).

Steering

- Steering angle sensor integrated in the steering gear replaced by steering angle sensor at the steering wheel (only vehicles with EHPAS).

HVAC

- PTC heater deleted for certain markets (only vehicles with 1.6 MZ-CD engine).

Restraints

- Dual-stage driver/passenger airbags replaced by single-stage airbags.

Body & Accessories

- Black leather seats and seat warmer added for left-hand drive vehicles (optional).
- Separate key and transmitter replaced by retractable key with integrated transmitter.
- Body-coloured outer door handles, side mouldings and outer mirrors replaced by black-coloured components (only for Base grade).
- Rear ash tray, subtrunk box and trunk hooks deleted (the latter two only on 5HB vehicles).
- Door trim material modified.
- Red-coloured rear combination lamp bezel replaced by black-coloured bezel (except for Sports grade).

Appendix

- Audio unit (base unit) with separate upper module replaced by audio unit (base unit) with integrated upper module.
- Audio unit without CD player replaced by audio unit with CD player (except for Base grade).
- Bose audio system with CD changer, audio amplifier and woofer added (optional).
- Navigation system without TMC replaced by navigation system with TMC.
- Information display connected to the audio unit replaced by information display connected to the mid-speed CAN bus.
- Exterior colour Carbon Grey (28B) added.

ABS	**A**nti-lock **B**rake **S**ystem
A/C	**A**ir **C**onditioning
AT	**A**utomatic **T**ransmission
ATX	**A**utomatic **T**ransa**x**le
BDC	**B**ottom **D**ead **C**enter
CAN	**C**ontroller **A**rea **N**etwork
CD	**C**ompact **D**isc
DC	**D**irect **C**urrent
DLC	**D**ata **L**ink **C**onnector
D-PATS	**D**istributed **PATS**
DPF	**D**iesel **P**articulate **F**ilter
DSC	**D**ynamic **S**tability **C**ontrol
DTC	**D**iagnostic **T**rouble **C**ode
EBD	**E**lectronic **B**rakeforce **D**istribution
EGR	**E**xhaust **G**as **R**ecirculation
EHPAS	**E**lectro-**H**ydraulic **P**ower **A**ssist **S**teering
FACM	**F**uel **A**dditive **C**ontrol **M**odule
FFD	**F**reeze **F**rame **D**ata
F/L	**F**ace **L**ift
GR	**G**ear **R**atio
HDD	**H**ard **D**isk **D**rive
HU/CM	**H**ydraulic **U**nit/**C**ontrol **M**odule
IAT	**I**ntake **A**ir **T**emperature
IC	**I**nstrument **C**luster
ID	**Id**entification
ISV	**I**ntake **S**hutter **V**alve
LED	**L**ight **E**mitting **D**iode
MAF	**M**ass **A**ir **F**low
MIL	**M**alfunction **I**ndicator **L**ight

List of Abbreviations

M-MDS	**M**azda-**M**odular **D**iagnostic **S**ystem
MP3	**M**usic **P**icture Experts Group Layer-**3**
PAD	**P**assenger **A**irbag **D**eactivation
PATS	**P**assive **A**nti-**T**heft **S**ystem
PCM	**P**owertrain **C**ontrol **M**odule
PID	**P**arameter **ID**
PJB	**P**assenger **J**unction **B**ox
PTC	**P**ositive **T**emperature **C**oefficient
RKE	**R**emote **K**eyless **E**ntry
SAS	**S**ophisticated **A**irbag **S**ensor
TCC	**T**orque **C**onverter **C**lutch
TDC	**T**op **D**ead **C**enter
TMC	**T**raffic **M**essage **C**hannel
TNS	**T**ail-/**N**umber-/**S**idelights
VBC	**V**ariable **B**oost **C**ontrol
VIN	**V**ehicle **I**dentification **N**umber
VSS	**V**ehicle **S**peed **S**ensor
4SD	**4**-door **Se****d**an
5HB	**5**-door **H**atch**b**ack