



ESCAPE Training Manual

FOREWORD

This manual explains components, system operations and functions for the ESCAPE.

For proper repair and maintenance, a thorough familiarization with this manual is important, and it should always be kept in a handy place for quick and easy reference.

All the contents of this manual, including drawings and specifications, are the latest available at the time of printing. As modifications affecting repair or maintenance occur, relevant information supplementary to this volume will be made available at Ford dealers. This manual should be kept up-to-date.

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Ford Motor Company

APPLICATION:

This manual is applicable to vehicles beginning with the Vehicle Identification Numbers (VIN), and related materials shown on the following page.

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VEHICLE IDENTIFICATION NUMBERS (VIN)

LFA CKZTNX*2 000001—
LFA CLZTNX*2 000001—
LFA CMZTVX*2 000001—
LFA CNZTVX*2 000001—
LFA YKZTNX*2 000001—
LFA YLZTNX*2 000001—
LFA YMZTVX*2 000001—
LFA YNZTVX*2 000001—

RELATED MATERIALS

ESCAPE Repair Manual F1A3-10-06C
ESCAPE Overhaul Manual F1A3-30-06C
ESCAPE Bodyshop Manual F342-20-06C
ESCAPE Wiring Diagrams F1A3-20-06C

GENERAL INFORMATION

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SECTION

00

GENERAL INFORMATION . . . 00-00

00-00 GENERAL INFORMATION

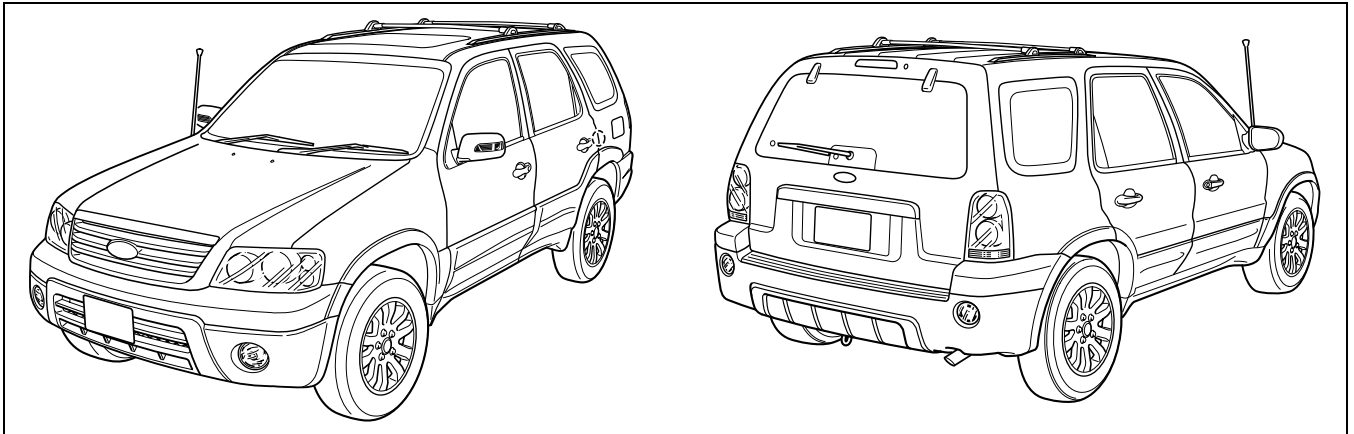
AIM OF DEVELOPMENT 00-00-1
VEHICLE IDENTIFICATION NUMBER
(VIN) CODE 00-00-4

VEHICLE IDENTIFICATION NUMBER
(VIN) 00-00-4
UNITS 00-00-5
NEW STANDARDS 00-00-5

AIM OF DEVELOPMENT

id000000100100

External View



aesffn00000088

Vehicle Outline

Engine

L3

- Mechanical
 - L3 (2.3 L) 4-cylinder engines have been adopted.
 - The lightweight, aluminum alloy cylinder block and lower block provide superior vibration resistance. Superior crank support stiffness combined with lightweight pistons and connecting rods have been adopted for a comfortable, liner drive feel.
 - Low-tension piston rings, and shimless tappets have been adopted, minimizing friction losses and improving fuel economy.
 - With the adoption of the variable valve timing mechanism, optimum valve timing corresponding to the engine operation condition is achieved.
 - An auto-tensioner that automatically adjusts the belt to compensate for stretching has been adopted to minimize maintenance requirements.
- Intake and exhaust controls
 - With the adoption of the variable intake air system, high torque is obtained from the lower-medium to high engine speed ranges.
 - The variable tumble system has been adopted to promote the atomization of the air-fuel mixture and to improve emission gas purification efficiency.
 - With the adoption of the variable valve timing system that controls intake valve timing in accordance with driving conditions to attain highly efficient air charging, maximum torque is achieved at all engine speeds.
 - An exhaust gas recirculation (EGR) system has been adopted for all models resulting in cleaner exhaust emissions and reduced fuel consumption.

AJ (3.0L Duratec)

- Mechanical
 - An aluminum-alloy cylinder head and cylinder block have been adopted.
- Intake and exhaust controls
 - An exhaust gas recirculation (EGR) system has been adopted for all models resulting in cleaner exhaust emissions and reduced fuel consumption.

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GENERAL INFORMATION

Suspension and steering

- Front suspension
 - A strut suspension has been adopted.
- Rear suspension
 - A multi-link suspension has been adopted.
- Power steering
 - With the adoption of an engine speed sensing power steering mechanism, handling stability has been improved.

Brakes

- A tandem-type master cylinder has been adopted, improving braking force.
- A large diameter, tandem diaphragm power brake unit has been adopted, improving braking force.
- A large diameter, ventilated disc-type front brake has been adopted, improving braking force.
- A large diameter, solid disc-type rear brake has been adopted, improving braking force.

ABS

- The ABS HU/CM, integrating both the hydraulic unit (HU) and control module (CM), has been adopted, resulting in size and weight reduction.

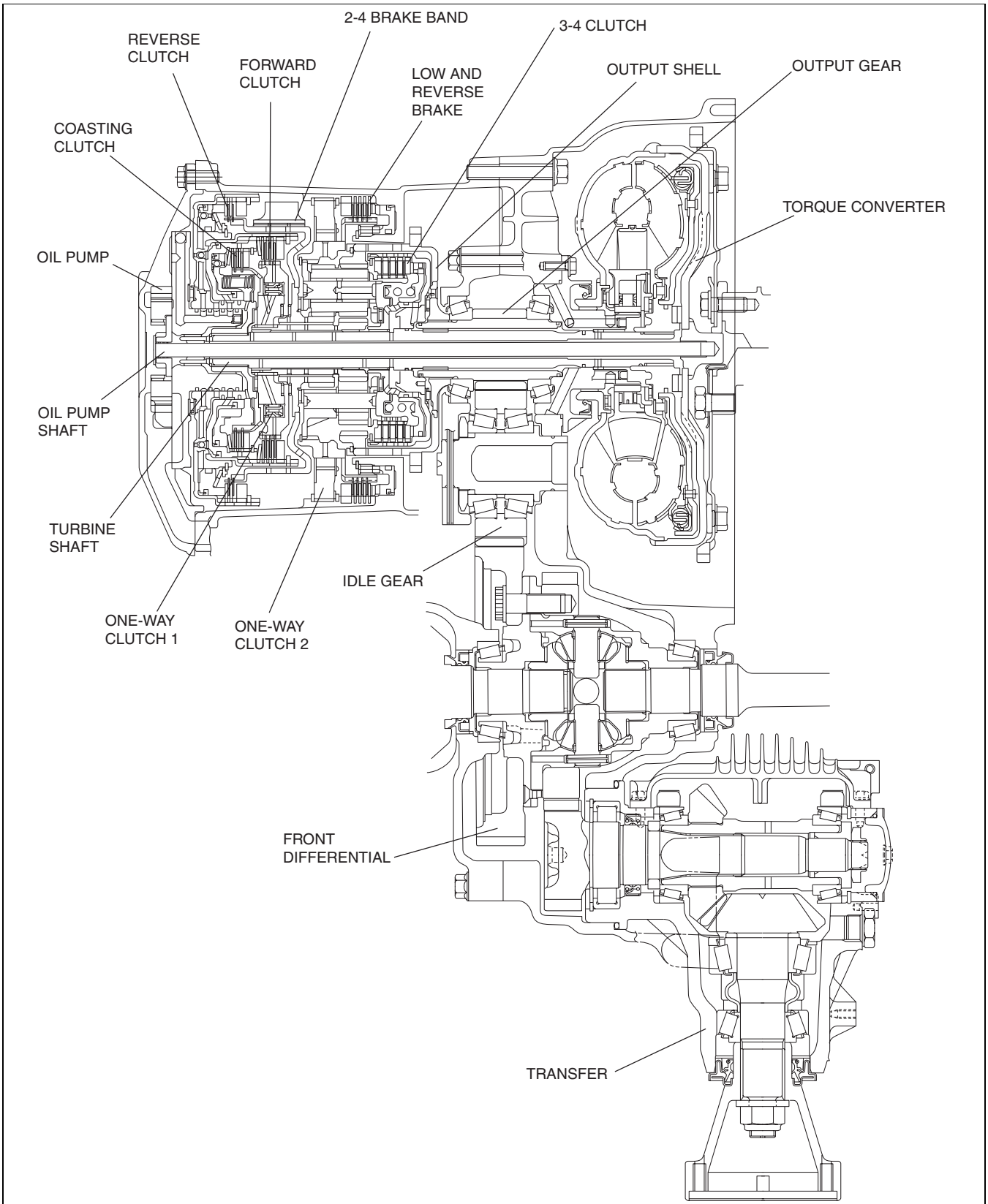
Transaxle/Transmission

Automatic transaxle [GF4AX-EL]

- GF4AX-EL automatic transaxles have been adopted for L3 engine vehicles.
 - Duty cycle solenoid valves have been adopted to provide optimal hydraulic pressure control according to driving conditions.
 - A 3-2 timing solenoid valve has been adopted to provide engagement timing control of the 2-4 brake band and 3-4 clutch to soften shift shock.
 - A variable displacement, trochoid gear oil pump has been adopted to provide quiet and high-efficiency oil discharge.

GENERAL INFORMATION

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atraan00000291

GENERAL INFORMATION

Automatic transaxle [LA4AX-EL (CD4E)]

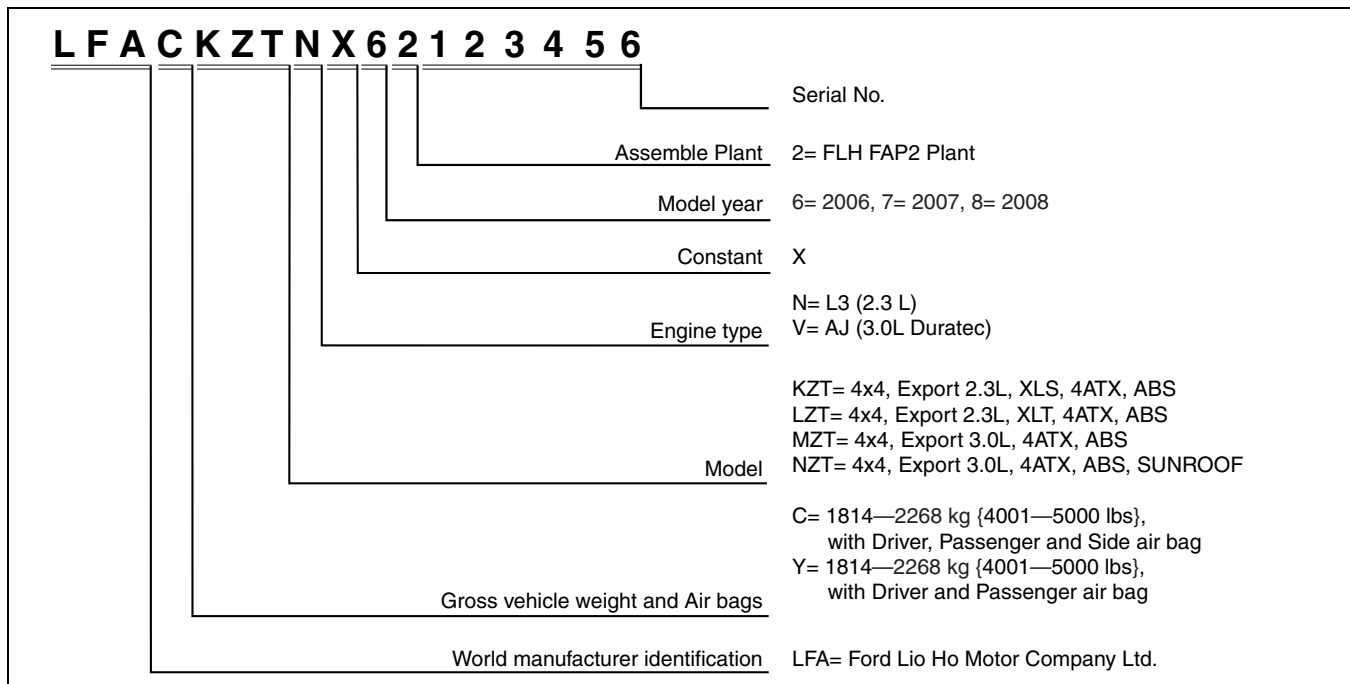
- LA4AX-EL automatic transaxles have been adopted for AJ (3.0L Duratec) engine vehicles.
- The automatic transaxle is a four-speed, front wheel drive automatic transaxle with electronic controls for:
 - Electronic pressure control for shift quality
 - Shift scheduling
 - 3-2 shift timing
 - Engine braking using coast clutch
 - TCC control
- The transaxle features a four element torque converter with a TCC and a geartrain that includes:
 - Compound planetary gear set
 - Chain drive
 - Planetary gear set final drive
 - Pinion and side gear differential
- The hydraulic control system of the transaxle has five solenoids that control:
 - Shift feel, through line pressure control
 - Shift scheduling, through shift valve positioning control
 - Modulated application of the TCC
 - Timing of 3-2 shifts
 - Engine braking using coast clutch

Safety

- An immobilizer system has been adopted. This anti-theft device prevents the engine from being started unless the encrypted identification code, transmitted from a special electronic chip embedded in the key, corresponds with the identification code registered in the vehicle.
- Side air bags that effectively protect the chest area have been adopted for the seats.

VEHICLE IDENTIFICATION NUMBER (VIN) CODE

id000000100200



aesffn00000043

VEHICLE IDENTIFICATION NUMBER (VIN)

id000000100300

- LFA CKZTNX*2 000001—
- LFA CLZTNX*2 000001—
- LFA CMZTVX*2 000001—
- LFA CNZTVX*2 000001—
- LFA YKZTNX*2 000001—
- LFA YLZTNX*2 000001—
- LFA YMZTVX*2 000001—
- LFA YNZTVX*2 000001—

GENERAL INFORMATION

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UNITS

Electrical current	A (ampere)
Electric power	W (watt)
Electric resistance	ohm
Electric voltage	V (volt)
Length	mm (millimeter)
	in (inch)
Negative pressure	kPa (kilo pascal)
	mmHg (millimeters of mercury)
	inHg (inches of mercury)
Positive pressure	kPa (kilo pascal)
	kgf/cm ² (kilogram force per square centimeter)
	psi (pounds per square inch)
Torque	N·m (Newton meter)
	kgf·m (kilogram force meter)
	kgf·cm (kilogram force centimeter)
	ft·lbf (foot pound force)
	in·lbf (inch pound force)
Volume	L (liter)
	US qt (U.S. quart)
	Imp qt (Imperial quart)
	ml (milliliter)
	cc (cubic centimeter)
	cu in (cubic inch)
	fl oz (fluid ounce)
Weight	g (gram)
	oz (ounce)

Conversion to SI Units (Système International d'Unités)

- All numerical values in this manual are based on SI units. Numbers shown in conventional units are converted from these values.

Rounding Off

- Converted values are rounded off to the same number of places as the SI unit value. For example, if the SI unit value is 17.2 and the value after conversion is 37.84, the converted value will be rounded off to 37.8.

Upper and Lower Limits

- When the data indicates upper and lower limits, the converted values are rounded down if the SI unit value is an upper limit and rounded up if the SI unit value is a lower limit. Therefore, converted values for the same SI unit value may differ after conversion. For example, consider 2.7 kgf/cm² in the following specifications:

210—260 kPa {2.1—2.7 kgf/cm², 30—38 psi}

270—310 kPa {2.7—3.2 kgf/cm², 39—45 psi}

- The actual converted values for 2.7 kgf/cm² are 265 kPa and 38.4 psi. In the first specification, 2.7 is used as an upper limit, so the converted values are rounded down to 260 and 38. In the second specification, 2.7 is used as a lower limit, so the converted values are rounded up to 270 and 39.

NEW STANDARDS

id000000801400

- Following is a comparison of the previous standard and the new standard.

New Standard		Previous Standard		Remark
Abbreviation	Name	Abbreviation	Name	
AP	Accelerator Pedal	—	Accelerator Pedal	
APP	Accelerator Pedal Position	—	Accelerator Pedal Position	
ACL	Air Cleaner	—	Air Cleaner	

GENERAL INFORMATION

New Standard		Previous Standard		Remark
Abbreviation	Name	Abbreviation	Name	
A/C	Air Conditioning	—	Air Conditioning	
BARO	Barometric Pressure	—	Atmospheric Pressure	
B+	Battery Positive Voltage	V _B	Battery Voltage	
—	Brake Switch	—	Stoplight Switch	
—	Calibration Resistor	—	Corrected Resistance	#6
CMP sensor	Camshaft Position Sensor	—	Crank Angle Sensor	
LOAD	Calculated Load Voltage	—	—	
CAC	Charge Air Cooler	—	Intercooler	
CLS	Closed Loop System	—	Feedback System	
CTP	Closed Throttle Position	—	Fully Closed	
CPP	Clutch Pedal Position	—	Clutch Position	
CIS	Continuous Fuel Injection System	EGI	Electronic Gasoline Injection System	
CS sensor	Control Sleeve Sensor	CSP sensor	Control Sleeve Position Sensor	#6
CKP sensor	Crankshaft Position Sensor	—	Crank Angle Sensor 2	
DLC	Data Link Connector	—	Diagnosis Connector	
DTM	Diagnostic Test Mode	—	Test Mode	#1
DTC	Diagnostic Trouble Code(s)	—	Service Code(s)	
DI	Distributor Ignition	—	Spark Ignition	
DLI	Distributorless Ignition	—	Direct Ignition	
EI	Electronic Ignition	—	Electronic Spark Ignition	#2
ECT	Engine Coolant Temperature	—	Water Thermo	
EM	Engine Modification	—	Engine Modification	
—	Engine Speed Input Signal	—	Engine RPM Signal	
EVAP	Evaporative Emission	—	Evaporative Emission	
EGR	Exhaust Gas Recirculation	—	Exhaust Gas Recirculation	
FC	Fan Control	—	Fan Control	
FF	Flexible Fuel	—	Flexible Fuel	
4GR	Fourth Gear	—	Overdrive	
—	Fuel Pump Relay	—	Circuit Opening Relay	#3
FSO solenoid	Fuel Shut Off Solenoid	FCV	Fuel Cut Valve	#6
GEN	Generator	—	Alternator	
GND	Ground	—	Ground/Earth	
HO2S	Heated Oxygen Sensor	—	Oxygen Sensor	With heater
IAC	Idle Air Control	—	Idle Speed Control	
—	IDM Relay	—	Spill Valve Relay	#6
—	Incorrect Gear Ratio	—	—	
—	Injection Pump	FIP	Fuel Injection Pump	#6
—	Input/Turbine Speed Sensor	—	Pulse Generator	
IAT	Intake Air Temperature	—	Intake Air Thermo	
KS	Knock Sensor	—	Knock Sensor	
MIL	Malfunction Indicator Lamp	—	Malfunction Indicator Light	
MAP	Manifold Absolute Pressure	—	Intake Air Pressure	
MAF	Mass Air Flow	—	Mass Air Flow	
MAF sensor	Mass Air Flow Sensor	—	Airflow Sensor	
MFL	Multiport Fuel Injection	—	Multiport Fuel Injection	
OBD	On-Board Diagnostic	—	Diagnosis/Self Diagnosis	
OL	Open Loop	—	Open Loop	
—	Output Speed Sensor	—	Vehicle Speed Sensor 1	
OC	Oxidation Catalytic Converter	—	Catalytic Converter	
O2S	Oxygen Sensor	—	Oxygen Sensor	
PNP	Park/Neutral Position	—	Park/Neutral Range	
PID	Parameter Identification	—	Parameter Identification	

GENERAL INFORMATION

New Standard		Previous Standard		Remark
Abbreviation	Name	Abbreviation	Name	
—	PCM Control Relay	—	Main Relay	#6
PSP	Power Steering Pressure	—	Power Steering Pressure	
PCM	Powertrain Control Module	ECU	Engine Control Unit	#4
—	Pressure Control Solenoid	—	Line Pressure Solenoid Valve	
PAIR	Pulsed Secondary Air Injection	—	Secondary Air Injection System	Pulsed injection
—	Pump Speed Sensor	—	NE Sensor	#6
RAM	Random Access Memory	—	—	
AIR	Secondary Air Injection	—	Secondary Air Injection System	Injection with air pump
SAPV	Secondary Air Pulse Valve	—	Reed Valve	
SFI	Sequential Multipoint Fuel Injection	—	Sequential Fuel Injection	
—	Shift Solenoid A	—	1–2 Shift Solenoid Valve	
		—	Shift A Solenoid Valve	
—	Shift Solenoid B	—	2–3 Shift Solenoid Valve	
		—	Shift B Solenoid Valve	
—	Shift Solenoid C	—	3–4 Shift Solenoid Valve	
3GR	Third Gear	—	3rd Gear	
TWC	Three Way Catalytic Converter	—	Catalytic Converter	
TB	Throttle Body	—	Throttle Body	
TP	Throttle Position	—	—	
TP sensor	Throttle Position Sensor	—	Throttle Sensor	
TCV	Timer Control Valve	TCV	Timing Control Valve	#6
TCC	Torque Converter Clutch	—	Lockup Position	
TCM	Transmission (Transaxle) Control Module	—	EC-AT Control Unit	
—	Transmission (Transaxle) Fluid Temperature Sensor	—	ATF Thermosensor	
TR	Transmission (Transaxle) Range	—	Inhibitor Position	
TC	Turbocharger	—	Turbocharger	
VSS	Vehicle Speed Sensor	—	Vehicle Speed Sensor	
VR	Voltage Regulator	—	IC Regulator	
VAF sensor	Volume Air Flow Sensor	—	Air Flow Sensor	
WUTWC	Warm Up Three Way Catalytic Converter	—	Catalytic Converter	#5
WOT	Wide Open Throttle	—	Fully Open	

#1: Diagnostic trouble codes depend on the diagnostic test mode

#2: Controlled by the PCM

#3: In some models, there is a fuel pump relay that controls pump speed. That relay is now called the fuel pump relay (speed).

#4: Device that controls engine and powertrain

#5: Directly connected to exhaust manifold

#6: Part name of diesel engine

ENGINE

01

SECTION

01

OUTLINE[L3]	01-00A	FUEL SYSTEM	
OUTLINE		[AJ (3.0L Duratec)]	01-14B
[AJ (3.0L Duratec)]	01-00B	EXHAUST SYSTEM[L3]	01-15A
ON-BOARD DIAGNOSTIC		EXHAUST SYSTEM	
[L3].	01-02A	[AJ (3.0L Duratec)]	01-15B
ON-BOARD DIAGNOSTIC		EMISSION SYSTEM[L3]	01-16A
[AJ (3.0L Duratec)]	01-02B	EMISSION SYSTEM	
MECHANICAL[L3]	01-10A	[AJ (3.0L Duratec)]	01-16B
MECHANICAL		CHARGING SYSTEM[L3]	01-17A
[AJ (3.0L Duratec)]	01-10B	CHARGING SYSTEM	
LUBRICATION[L3]	01-11A	[AJ (3.0L Duratec)]	01-17B
LUBRICATION		IGNITION SYSTEM[L3]	01-18A
[AJ (3.0L Duratec)]	01-11B	IGNITION SYSTEM	
COOLING SYSTEM[L3]	01-12A	[AJ (3.0L Duratec)]	01-18B
COOLING SYSTEM		STARTING SYSTEM[L3]	01-19A
[AJ (3.0L Duratec)]	01-12B	STARTING SYSTEM	
INTAKE-AIR SYSTEM[L3]	01-13A	[AJ (3.0L Duratec)]	01-19B
INTAKE-AIR SYSTEM		CONTROL SYSTEM[L3]	01-40A
[AJ (3.0L Duratec)]	01-13B	CONTROL SYSTEM	
FUEL SYSTEM[L3]	01-14A	[AJ (3.0L Duratec)]	01-40B

01-00A OUTLINE [L3]

ENGINE ABBREVIATIONS[L3]	01-00A-1
ENGINE FEATURES[L3]	01-00A-2

ENGINE SPECIFICATION[L3]	01-00A-3
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ENGINE ABBREVIATIONS[L3]

id0100a1100100

ABDC	After Bottom Dead Center
ABS	Antilock Brake System
ATDC	After Top Dead Center
ATF	Automatic Transaxle Fluid
BBDC	Before Bottom Dead Center
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
CAN	Controller Area Network
CCM	Comprehensive Component Monitor
CM	Control Module
DC	Drive Cycle
DOHC	Double Overhead Camshaft
EBD	Electronic Brakeforce Distribution
EX	Exhaust
FFD	Freeze Frame Data

HU	Hydraulic Unit
IN	Intake
KOEO	Key On Engine Off
KOER	Key On Engine Running
M	Motor
LF	Left Front
LR	Left Rear
OCV	Oil Control Valve
PCV	Positive Crankcase Ventilation
RF	Right Front
RR	Right Rear
SEI	Single Electronic Ignition
SST	Special Service Tool
TDC	Top Dead Center

OUTLINE [L3]

ENGINE FEATURES[L3]

id0100a1100200

On-board Diagnostic

To meet the EOBD regulations	<ul style="list-style-type: none">• Diagnostic test modes adopted
Improved serviceability	<ul style="list-style-type: none">• DTCs adopted• KOEO/KOER self-test function adopted• PID/DATA monitor function adopted• Simulation test function adopted

Mechanical

Improved engine performance	<ul style="list-style-type: none">• Variable valve timing mechanism adopted
Weight reduction	<ul style="list-style-type: none">• Aluminum-alloy adopted for mainframe parts (cylinder head and block)
Reduced vibration and noise	<ul style="list-style-type: none">• Aluminum-alloy cylinder head adopted• Crankshaft pulley with torsional damper adopted• Silent timing chain adopted• Deep skirt-type cylinder block adopted, composed of an integrated main bearing cap together with a ladder frame structure• Pendulum-type engine mounts adopted
Improved serviceability	<ul style="list-style-type: none">• Serpentine type drive belt adopted• Drive belt auto tensioner adopted• Timing chain adopted• Engine front cover with service holes adopted

Lubrication

Reduced noise	<ul style="list-style-type: none">• Aluminum alloy oil pan adopted
Reduced weight	<ul style="list-style-type: none">• Plastic oil strainer adopted
Improved lubricity	<ul style="list-style-type: none">• Trochoid gear type oil pump adopted• Oil jet valves adopted

Cooling System

Improved reliability	<ul style="list-style-type: none">• Degassing type coolant reserve tank adopted
Reduced weight	<ul style="list-style-type: none">• Cross flow type radiator with aluminum core and plastic tank adopted• Stainless steel thermostat with plastic thermostat cover adopted
Miniaturization	<ul style="list-style-type: none">• Built-in type water pump adopted
Reduced engine noise and vibration	<ul style="list-style-type: none">• Electric cooling fans adopted
Improved serviceability	<ul style="list-style-type: none">• Longer-life new engine coolant (type FL22) adopted

Intake-air System

Improved engine torque	<ul style="list-style-type: none">• Variable intake air system adopted
Improved noise reduction	<ul style="list-style-type: none">• Resonance chamber adopted
Improved emission gas purification	<ul style="list-style-type: none">• Variable tumble system adopted

Fuel System

Improved serviceability	<ul style="list-style-type: none">• Nylon tubes adopted for fuel hoses in engine compartment and around fuel tank; Quick release connectors adopted for joints
Reduction of evaporative gas	<ul style="list-style-type: none">• Returnless fuel system adopted

Emission System

Improved emission gas purification	<ul style="list-style-type: none">• Exhaust gas recirculation (EGR) system adopted• Catalytic converter system adopted
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Charging System

Miniaturization	<ul style="list-style-type: none">• Non-regulator type generator with built-in power transistor adopted
Reduced operation noise	<ul style="list-style-type: none">• Generator with two delta connection type stator coils adopted

Ignition System

Improved reliability	<ul style="list-style-type: none">• Independent ignition control system with distributorless ignition coils adopted
Improved durability	<ul style="list-style-type: none">• Spark plugs with an iridium alloy center electrode and platinum tip ground electrode adopted

OUTLINE [L3]

Starting System

Improved startability	<ul style="list-style-type: none"> Reduction type starter adopted
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Control System

Improved engine torque and output	<ul style="list-style-type: none"> Variable intake air control adopted
Improved emission performance	<ul style="list-style-type: none"> Variable tumble control adopted EGR system adopted
Wiring harness simplification	<ul style="list-style-type: none"> CAN adopted

01

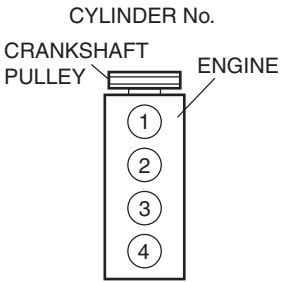
ENGINE SPECIFICATION[L3]

id0100a1100300

Specification

Item		Specification	
MECHANICAL			
Type		Gasoline, 4-cycle	
Cylinder arrangement and number		In-line, 4-cylinder	
Combustion chamber		Pentroof	
Valve system		DOHC, timing chain driven, 16 valves	
Displacement (ml {cc, cu in})		2,261 {2,261, 137.9}	
Bore × stroke (mm {in})		87.5 × 94.0 {3.44 × 3.70}	
Compression ratio		10:1	
Compression pressure (kPa {kgf/cm ² , psi} [rpm])		1,430 {14.5819, 207.404} [290]	
Valve timing	IN	Open BTDC (°)	0—30
		Close ABDC (°)	62—32
	EX	Open BBDC (°)	42
		Close ATDC (°)	5
Valve clearance (mm {in})	IN	0.22—0.28 {0.0087—0.011} [Engine cold]	
	EX	0.27—0.33 {0.0106—0.012} [Engine cold]	
LUBRICATION SYSTEM			
Type		Force-fed type	
Oil pressure (reference value) (kPa {kgf/cm ² , psi} [oil temperature: 100°C {212°F}])		337—591 {3.44—6.03, 49.0—85.8} [3,000]	
Oil pump	Type	Trochoid gear type	
	Relief valve opening pressure (reference value) (kPa {kgf/cm ² , psi})	420—520 {4.28—5.30, 60.9—75.4}	
Oil filter	Type	Full-flow, paper element	
	Bypass pressure (kPa {kgf/cm ² , psi})	80—120 {0.82—1.22, 11.6—17.4}	
Oil capacity (approx. quantity)	Total (dry engine) (L {US qt, Imp qt})	5.1 {5.4, 4.5}	
	Oil replacement (L {US qt, Imp qt})	4.0 {4.2, 3.5}	
	Oil and oil filter replacement (L {US qt, Imp qt})	4.4 {4.6, 3.9}	
COOLING SYSTEM			
Type		Water-cooled, Electromotive	
Coolant capacity (approx. quantity) (L {US qt, Imp qt})		7.5 {7.9, 6.6}	
Water pump	Type	Centrifugal, V-ribbed belt-driven	
Thermostat	Type	Wax, bottom-bypass	
	Opening temperature (°C {°F})	80—84 {176—183}	
	Full-open temperature (°C {°F})	97 {207}	
	Full-open lift (mm {in})	8.0 {0.31} or more	
Radiator	Type	Corrugated fin	
Cooling system cap	Cap valve opening pressure (kPa {kgf/cm ² , psi})	93.2—122.6 {0.95—1.25, 13.5—17.8}	

OUTLINE [L3]

Item		Specification
Cooling fan	Type	Electric
	Number of blades	No.1: 5 No.2: 7
	Outer diameter (mm {in})	300 {11.8}
	Fan motor output (W)	No.1: 70 No.2: 120
FUEL SYSTEM		
Injector	Type	Multiple hole type
	Type of fuel delivery	Top-feed
	Type of drive	Electronic
Pressure regulator control pressure (within the fuel tank)	(kPa {kgf/cm ² , psi})	Approx. 390 {3.98, 56.6}
Fuel pump	Type	Electric
Fuel tank	Capacity (L {US gal, Imp gal})	61.0 {16.1, 13.4}
Fuel	Type	Regular unleaded fuel (Research octane number is 90 or above)
EMISSION SYSTEM		
EGR	Type	Stepping motor
Catalyst	Type	WU-TWC (monolith) TWC (monolith)
EVAP control system	Type	Charcoal canister type
PCV system	Type	Closed type
CHARGING SYSTEM		
Battery	Voltage (V)	12
	Type and capacity (5-hour rate) (A·h)	55D23L (48)
Generator	Output (V·A)	12-110
	Regulated voltage (V)	13—15 (Controlled by PCM)
	Diagnosis function	On-board diagnostic system (Controlled by PCM)
IGNITION SYSTEM		
Ignition system	Type	SEI (Single Electronic Ignition)
	Spark advance	Electronic
	Firing order	1—3—4—2 (all cylinders independent firing)
		CYLINDER No. 
Spark plug	Type	LFG1 18 110 (ILTR5A-13G), L3Y2 18 110
STARTING SYSTEM		
Starter	Type	Coaxial reduction
	Output (kW)	1.4
CONTROL SYSTEM		
PSP switch	Type	ON/OFF
ECT sensor	Type	Thermistor
IAT sensor (Inside MAF sensor)	Type	Thermistor
TP sensor	Type	Hall element
APP sensor	Type	Hall element
MAF sensor	Type	Hot-wire
HO2S (front)	Type	Zirconia element (All range air/fuel ratio sensor)
HO2S (rear)	Type	Zirconia element (Stoichiometric air/fuel ratio sensor)

OUTLINE [L3]

Item		Specification
KS	Type	Piezoelectric element
MAP sensor	Type	Piezoelectric element
CKP sensor	Type	Hall element
CMP sensor	Type	Hall element

Recommended engine oil

Item	Specification
Grade	API SG/SH/SJ/SL or ILSAC GF-2/GF-3
Viscosity (SAE)	40, 30, 20, 20W-20, 10W-30, 10W-40, 10W-50, 20W-40, 15W-40, 20W-50, 15W-50, 5W-20, 5W-30

01

OUTLINE [AJ (3.0L Duratec)]

01-00B OUTLINE [AJ (3.0L Duratec)]

ENGINE ABBREVIATIONS
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ENGINE FEATURES
[AJ (3.0L Duratec)] 01-00B-2
ENGINE SPECIFICATION
[AJ (3.0L Duratec)] 01-00B-3

ENGINE ABBREVIATIONS[AJ (3.0L Duratec)]

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ABDC	After Bottom Dead Center
ABS	Antilock Brake System
ATDC	After Top Dead Center
ATF	Automatic Transaxle Fluid
ATX	Automatic Transaxle
BBDC	Before Bottom Dead Center
BDC	Bottom Dead Center
BTDC	Before Top Dead Center
CAN	Controller Area Network
CCM	Comprehensive Component Monitor
DC	Drive Cycle
D.P.F.	Differential Pressure Feedback
EX	Exhaust
HLA	Hydraulic Lash Adjuster
IG	Ignition
IN	Intake
KOEO	Key On Engine Off
KOER	Key On Engine Running
LH	Left Hand
M	Motor
O/D	Overdrive
OFF	Switch Off
ON	Switch On
OSS	Output Shaft Speed
P/S	Power Steering
RH	Right Hand
SST	Special Service Tool
TDC	Top Dead Center
TFT	Transaxle Fluid Temperature
TSS	Turbine Shaft Speed

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OUTLINE [AJ (3.0L Duratec)]

ENGINE FEATURES[AJ (3.0L Duratec)]

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Mechanical

Reduced weight	<ul style="list-style-type: none">Aluminum alloy oil pan adoptedAluminum alloy engine mount bracket adopted
Reduced engine noise and vibration	<ul style="list-style-type: none">Silent timing chain adoptedCrankshaft pulley with torsional damper adopted
Improved serviceability	<ul style="list-style-type: none">Drive belt auto tensioner adoptedTiming chain adoptedEngine front cover with service holes adopted

Lubrication

Reduced noise	<ul style="list-style-type: none">Aluminum alloy oil pan adopted
Improved lubricity	<ul style="list-style-type: none">Trochoid gear type oil pump adoptedWater-cooled type oil cooler adopted

Cooling System

Improved reliability	<ul style="list-style-type: none">Degassing type coolant reserve tank adopted
Reduced weight	<ul style="list-style-type: none">Cross flow type radiator with aluminum core and plastic tank adopted
Reduced engine noise and vibration	<ul style="list-style-type: none">Electric cooling fans adopted
Improved serviceability	<ul style="list-style-type: none">Longer-life new engine coolant (type FL22) adopted

Intake-air System

Improved noise reduction	<ul style="list-style-type: none">Resonance chamber adopted
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Fuel System

Improved serviceability	<ul style="list-style-type: none">Nylon tubing for fuel hoses in the engine compartment and around the fuel tank, and quick release connectors on the connecting parts adopted
Evaporative gas reduction	<ul style="list-style-type: none">Returnless fuel system adopted

Emission System

Improved emission gas purification	<ul style="list-style-type: none">EGR system adoptedCatalytic converter system (three-way catalyst) adopted
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Charging System

Improved reliability	<ul style="list-style-type: none">Generator with built-in power transistor adopted
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Ignition System

Improved reliability	<ul style="list-style-type: none">Independent ignition control system with distributorless ignition coils adopted
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Starting System

Improved startability	<ul style="list-style-type: none">Reduction type starter adopted
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Control System

Improved emission gas purification	<ul style="list-style-type: none">EGR control adopted
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ENGINE SPECIFICATION[AJ (3.0L Duratec)]

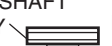
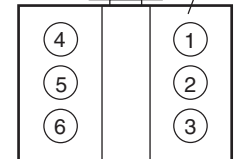
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Specification

Item		Specification	
MECHANICAL			
Type		Gasoline, 4-cycle	
Cylinder arrangement and number		60 ° V configuration, 6-cylinder	
Combustion chamber		Pentroof	
Valve system		DOHC, timing chain driven, 24 valves	
Displacement (ml {cc, cu in})		2,967 {2,967, 181.0}	
Bore × stroke (mm {in})		89.0 × 79.5 {3.50 × 3.13}	
Compression ratio		10.0 : 1	
Compression pressure (kPa {kgf/cm ² , psi} [rpm])		1,480 {15.10,215} [210]	
Valve timing	IN	Open BTDC (°)	4
		Close ABDC (°)	48
	EX	Open BBDC (°)	56
		Close ATDC (°)	12
Valve clearance (Engine cold)	IN	(mm {in})	0 {0} Maintenance-free
	EX		
LUBRICATION SYSTEM			
Type		Force-fed type	
Oil pressure (reference value) [oil temperature: 100°C {212°F}] (kPa {kgf/cm ² , psi} [rpm])		103 {1.1, 15} min [1,500]	
Oil pump	Type	Trochoid gear type	
	Relief valve opening pressure (reference value) (kPa {kgf/cm ² , psi})	485 {4.95, 70.3}	
Oil cooler	Type	Water-cooled	
Oil filter	Type	Full-flow, paper element	
	Bypass pressure (kPa {kgf/cm ² , psi})	125—151 {1.3—1.5, 18—22}	
Oil capacity (approx. quantity)	Total (dry engine) (L {US qt, Imp qt})	6.2 {6.6, 5.5}	
	Oil replacement (L {US qt, Imp qt})	5.2 {5.5, 4.6}	
	Oil and oil filter replacement (L {US qt, Imp qt})	5.7 {6.0, 5.0}	
COOLING SYSTEM			
Type		Water-cooled, Electromotive	
Coolant capacity (approx. quantity) (L {US qt, Imp qt})		10.0 {10.6, 8.80}	
Water pump	Type	Centrifugal, V-ribbed belt-driven	
Thermostat	Type	Wax, bottom-bypass	
	Opening temperature (°C {°F})	84—88 {184—190}	
	Full-open temperature (°C {°F})	99 {210}	
	Full-open lift (mm {in})	7.3 {0.29} or more	
Radiator	Type	Corrugated fin	
Cooling system cap	Cap valve opening pressure (kPa {kgf/cm ² , psi})	93.2—122.6 {0.95—1.25, 13.5—17.8}	
Cooling fan	Type	Electric	
	Number of blades	No.1: 5 No.2: 6	
	Outer diameter (mm {in})	No.1, No.2: 320	
	Fan motor output (W)	No.1, No.2: 220	
INTAKE-AIR SYSTEM			
Air cleaner element	Type	Paper element (dry type)	

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Item		Specification
FUEL SYSTEM		
Injector	Type	Multiple hole type
	Fuel supply type	Top-feed
	Drive types	Electronic
Pressure regulator control pressure	(kPa {kgf/cm ² , psi})	Approx. 450 {4.59, 65.3}
Fuel pump type		Electric
Fuel tank	Capacity (L {US gal, Imp gal})	61.0 {16.1, 13.4}
Fuel type		Unleaded (RON 90 or above)
EMISSION SYSTEM		
EGR type		Vacuum control
Catalyst type		WU-TWC
Evaporative emission (EVAP) control system		Canister type
Positive crankcase ventilation (PCV) system		Closed type
CHARGING SYSTEM		
Battery	Voltage (V)	12
	Type and capacity (5-hour rate) (A-h)	80D26L (55)
Generator	Output (V-A)	13.5-110
	Regulated voltage (V)	13—15
	Self diagnosis function	Equipped
IGNITION SYSTEM		
Ignition system	Type	SEI (Single Electronic Ignition)
	Spark advance	Electronic
	Firing order	<p style="text-align: center;">1—4—2—5—3—6</p> <p style="text-align: center;">CYLINDER No.</p> <p style="text-align: center;">CRANKSHAFT PULLEY  ENGINE</p>  <p style="text-align: center;">LH RH</p>
Spark plug	Type	AJ11 18 110 (AGSF-32N)
STARTING SYSTEM		
Starter	Type	Coaxial reduction
	Output (kW)	1.4
CONTROL SYSTEM		
ECT sensor		Thermistor
IAT sensor (Inside MAF)		Thermistor
TP sensor		Potentiometer type
MAF sensor		Hot wire
HO2S		Zirconia element (Stoichiometric air/fuel ratio sensor)
CKP sensor		Pickup type
CMP sensor		Pickup type
D.P.F. EGR sensor		Piezoelectric element type

Recommended engine oil

Item	Specification
Grade	API SM or ILSAC GF-4
Viscosity (SAE)	5W-30