2004 X-TYPE - Starting System - 303-06

Starting System 2.5L/3.0L

1. Verify the customer concern by operating the system.
2. Visually inspect for obvious signs of mechanical or electrical damage.
3. Make sure the vehicle is in NEUTRAL or PARK for automatic vehicles, NEUTRAL for manual vehicles.
4. Make sure the clutch pedal is fully depressed for Federal manual vehicles.

Visual Inspection Chart

Mechanical	Electrical
• Starter Motor • Flywheel Ring Gear • Engine Seized	• Starter Motor • Battery • Fuse 28 (15A) • Fuse 29 (30A) • Fuse 92 (10A) • Starter relay • Transmission range switch • Clutch switch; manual transmission (USA only) • Wiring harness(es) • Damaged, loose or corroded connectors • Engine control module (ECM)

5. If an obvious cause for an observed or reported concern is found, correct the cause, (if possible) before proceeding to the next step.
6. If the concern is not visually evident, verify the symptom and refer to the Symptom Chart.

Symptom Chart

DTC	Condition	Possible Sources	Action
P0616, P0617	The engine does not crank.	• Battery. • Circuit. • Starter motor. • Relay. • Inertia switch. • Ignition switch. • Transmission range switch (automatic transmission). • Clutch switch; manual transmission (USA only).	Goto **<<A>>**
None.	The engine cranks slowly.	• Battery. • Circuit. • Starter motor.	Goto **<<B>>**
None.	Unusual starter motor noise.	• Starter motor. • Flywheel ring gear.	INSPECT flywheel ring gear. For additional information, **<<303-00>>** INSPECT starter motor for alignment, cracked case. Make sure the mounting bolts are tightened. If necessary, INSTALL a new starter motor.
None.	The starter spins, but the engine does not crank.	• Starter motor. • Flywheel ring gear.	INSPECT the flywheel ring gear for missing teeth. **<<303-00>>** INSPECT starter motor pinion gear for missing teeth. CHECK starter motor for correct mounting. If concern persists, INSTALL a new starter motor.

A : P0616, P0617. THE ENGINE DOES NOT CRANK

WARNING:
BEWARE OF ROTATING PARTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE:
Make sure the vehicle is in NEUTRAL or PARK for automatic vehicles, NEUTRAL for manual vehicles. Make sure the clutch pedal is fully depressed for Federal manual vehicles.

NOTE:
Check that the inertia switch has not tripped.

A1 : CHECK THE BATTERY

1. Check the battery. For additional information. **<<414-00>>**

•Is the battery OK?

-> Yes
Goto **<<A2>>**

-> No
INSTALL a new battery. **<<414-01>>** CLEAR the DTC. TEST the system for normal operation.

A2 : CHECK THE STARTER RELAY

1. Turn the ignition switch to the CRANK position.

•Does the starter relay make an audible click?

-> Yes
Goto **<<A16>>**

-> No
Goto **<<A3>>**

A3 : CHECK FOR CRANK SUPPLY VOLTAGE TO STARTER RELAY

1. Remove the starter relay.
2. Turn the ignition switch to the CRANK position, and hold.
3. Measure the voltage between terminal 1 of the relay base and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A20>>**

-> No
Goto **<<A4>>**

A4 : CHECK FOR CRANK SUPPLY VOLTAGE TO ECM

1. Disconnect the ECM electrical connector EN16.
2. Turn the ignition switch to the CRANK position, and hold.
3. Measure the voltage between EN16 pin 6 (Y) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A6>>**

-> No
Goto **<<A5>>**

A5 : CHECK FUSE 28 IN THE ENGINE COMPARTMENT FUSE BOX.

1. Check the fuse.

•Is the fuse OK?

-> Yes
CHECK and repair the circuit including the power distribution fuse box, the starter relay base pin 1 and EN16 pin 6. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

This circuit includes the ignition switch

-> No
INSTALL a new fuse. TEST the circuit for cause of fuse failure.
Goto **<<A6>>**

A6 : CHECK ECM GROUND SIGNAL TO STARTER RELAY

1. Connect the ECM electrical connector EN16.
2. Turn the ignition switch to the CRANK position.
3. Measure the resistance between terminal 2 of the relay base and GROUND.

•Is the resistance less than 5 ohms?

-> Yes

INSTALL a new starter relay. For additional information, refer to the Electrical guide. CLEAR the DTC. TEST the system for normal operation.

-> No

Goto **<<A7>>**

A7 : CHECK ECM GROUND SIGNAL CIRCUIT FOR CONTINUITY

1. Disconnect the ECM electrical connector EN16.
2. Measure the resistance between terminal 2 of the starter relay base and EN16 pin 41 (GO).

•Is the resistance less than 5 ohms?

-> Yes

Automatic transmission vehicles.

Goto **<<A8>>**

Manual transmission vehicles.

Goto **<<A12>>**

Federal spec. manual transmission vehicles.

Goto **<<A13>>**

-> No

REPAIR the circuit between the starter relay and the ECM. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

A8 : CHECK FOR IGNITION VOLTAGE TO TRANSMISSION RANGE SENSOR

1. Turn the ignition switch to the ON position.
2. Measure the voltage between JB156 pin 10 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes

Goto **<<A11>>**

-> No

Goto **<<A9>>**

A9 : CHECK FUSE 92 IN THE CENTRAL JUNCTION FUSE BOX

1. Check the fuse.

•Is the fuse OK?

-> Yes

Repair the circuit between the power distribution fuse box and the transmission range switch. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
This circuit includes the central junction fuse box, inertia switch, ignition switch, ignition relay, and power distribution fuse box (Fuse 28, See test A5)

-> No
INSTALL a new fuse. TEST the circuit for cause of fuse failure. CLEAR the DTC. TEST the system for normal operation.

A10 : CHECK THE CIRCUIT BETWEEN TRANSMISSION RANGE SENSOR AND ECM FOR CONTINUITY

1. Measure the resistance between EN16 pin 31 (B) and JB156 pin 6 (B).

•Is the resistance less than 5 ohms?

-> Yes
Goto **<<A11>>**

-> No
REPAIR the circuit between EN16 pin 31 (B) and JB156 pin 6 (B). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

A11 : CHECK THE TRANSMISSION RANGE SENSOR

1. Disconnect the transmission range sensor electrical connector JB156.
2. Select PARK or NEUTRAL.
3. Measure the resistance between pins 6 and 10 of the TR sensor.

•Is the resistance less than 5 ohms?

-> Yes
INSTALL a new ECM. **<<303-14>>** Before replacing a ECM, contact Dealer technical support.

-> No
INSTALL a new transmission range sensor. **<<307-01>>** CLEAR the DTC. TEST the system for normal operation.

A12 : CHECK FOR IGNITION VOLTAGE TO ECM

1. Turn the ignition switch to the ON position.
2. Measure the voltage between EN16 pin 31 (B) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
INSTALL a new ECM. **<<303-14>>** Before replacing a ECM, contact Dealer technical support.

-> No
REPAIR the circuit between the ECM and the power distribution fuse box. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
This circuit includes the central junction fuse box, inertia switch, ignition switch, ignition relay, and power distribution fuse box (Fuse 28, See test A5)

A13 : CHECK FOR IGNITION VOLTAGE TO CLUTCH SWITCH; MANUAL TRANSMISSION (USA ONLY)

1. Turn the ignition switch to the ON position.
2. Measure the voltage between the clutch switch electrical connector PA5 pin 1 (B) and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A15>>**

-> No
Repair the circuit between the power distribution fuse box and the clutch switch. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.
This circuit includes the central junction fuse box, inertia switch, ignition switch, and power distribution fuse box (Fuse 28, See test A5)

A14 : CHECK THE CLUTCH SWITCH CIRCUIT FOR CONTINUITY; MANUAL TRANSMISSION (USA ONLY).

1. Disconnect the clutch switch electrical connector PA5.
2. Disconnect the ECM electrical connector EN16.
3. Measure the resistance between PA5 pin 2 (W) and EN16 pin 31 (B).

•Is the resistance less than 5 ohms?

-> Yes
Goto **<<A15>>**

-> No
REPAIR the circuit between PA5 pin 2 (W) and EN16 pin 31 (B). For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

A15 : CHECK THE CLUTCH SWITCH; MANUAL TRANSMISSION (USA ONLY).

1. Measure the resistance between PA5 pins 1 and 2.
2. Operate the clutch pedal while observing the ohmmeter reading.

•Does the resistance switch between 0 ohms and 10,000 ohms as the pedal is operated?

-> Yes
INSTALL a new ECM. **<<303-14>>** Before replacing a ECM, contact Dealer technical support.

-> No
INSTALL a new clutch switch. CLEAR the DTC. TEST the system for normal operation.

A16 : CHECK THE STARTER SOLENOID INPUT

NOTE:
The starter motor will disengage once a start is detected by the ECM.

1. Turn the ignition switch to the CRANK position.
2. Measure the voltage between starter motor connector ST3 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A20>>**

-> No
Goto **<<A17>>**

A17 : CHECK THE STARTER SOLENOID INPUT CIRCUIT FOR CONTINUITY

1. REMOVE the starter relay.
2. Disconnect starter motor connector ST3
3. Measure the resistance between ST3 and pin 5 of the starter relay base.

•Is the resistance less than 5 ohms?

-> Yes
Goto **<<A18>>**

-> No
REPAIR the circuit between ST3 and pin 5 of the starter relay base. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

A18 : CHECK THE STARTER RELAY BASE PIN 3 FOR PERMANENT SUPPLY

1. Measure the voltage between the starter relay base pin 3 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A20>>**

-> No
Goto **<<A19>>**

A19 : CHECK FUSE 29 OF THE POWER DISTRIBUTION FUSE BOX

1. Check the fuse.

•Is the fuse OK?

-> Yes
REPAIR the circuit between the starter relay base pin 3 and the battery. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

-> No
INSTALL a new fuse. Check the circuit for cause of fuse failure. CLEAR the DTC. TEST the system for normal operation.

A20 : CHECK THE STARTER FOR BATTERY VOLTAGE

1. Measure the voltage between the starter connector ST2 and GROUND.

•Is the voltage greater than 10 volts?

-> Yes
Goto **<<A21>>**

-> No
REPAIR the starter motor permanent live supply circuit. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

A21 : CHECK THE STARTER GROUND

1. Measure the resistance between starter outer casing and GROUND.

- **Is the resistance less than 2 Ohms?**

-> Yes
INSTALL a new starter motor. **<<303-06>>** CLEAR the DTC. TEST the system for normal operation.

-> No
REPAIR starter GROUND strap or connections. For additional information, refer to wiring diagrams. CLEAR the DTC. TEST the system for normal operation.

B : THE ENGINE CRANKS SLOWLY

B1 : CHECK FOR VOLTAGE DROP

WARNING:
BEWARE OF ROTATING PARTS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN PERSONAL INJURY.

NOTE:
The starter motor will disengage once a start is detected by the ECM.

NOTE:
Check battery condition before commencing this test.
Goto **<<A>>**

1. Turn the ignition switch to the CRANK position, and hold.

2. Measure the voltage between the starter motor permanent voltage supply terminal and the positive battery terminal while cranking.

- **Is the voltage less than 0.5 volts?**

-> Yes
Turn the ignition switch to the OFF position.
Goto **<<B2>>**

-> No
CLEAN and TIGHTEN all positive battery cable connections. TEST the system for normal operation. If the concern persists, INSTALL a new positive battery cable. **<<414-01>>**

B2 : CHECK FOR GROUND CONNECTION VOLTAGE DROP

1. Turn the ignition switch to the CRANK position, and hold.

2. Measure the voltage between the starter motor case and the battery negative terminal.

- **Is the voltage less than 0.5 volts?**

-> Yes
INSTALL a new starter motor. **<<303-06>>** TEST the system for normal operation.

-> No
CLEAN and TIGHTEN all negative battery cable connections, starter motor mounting and starter motor GROUND cable. TEST the system for normal operation. If the concern persists, INSTALL a new negative battery cable. **<<414-01>>**