

## The Starting System

### Starter

The starter motor drives the engine through a pinion gear that engages the ring gear on the flywheel.

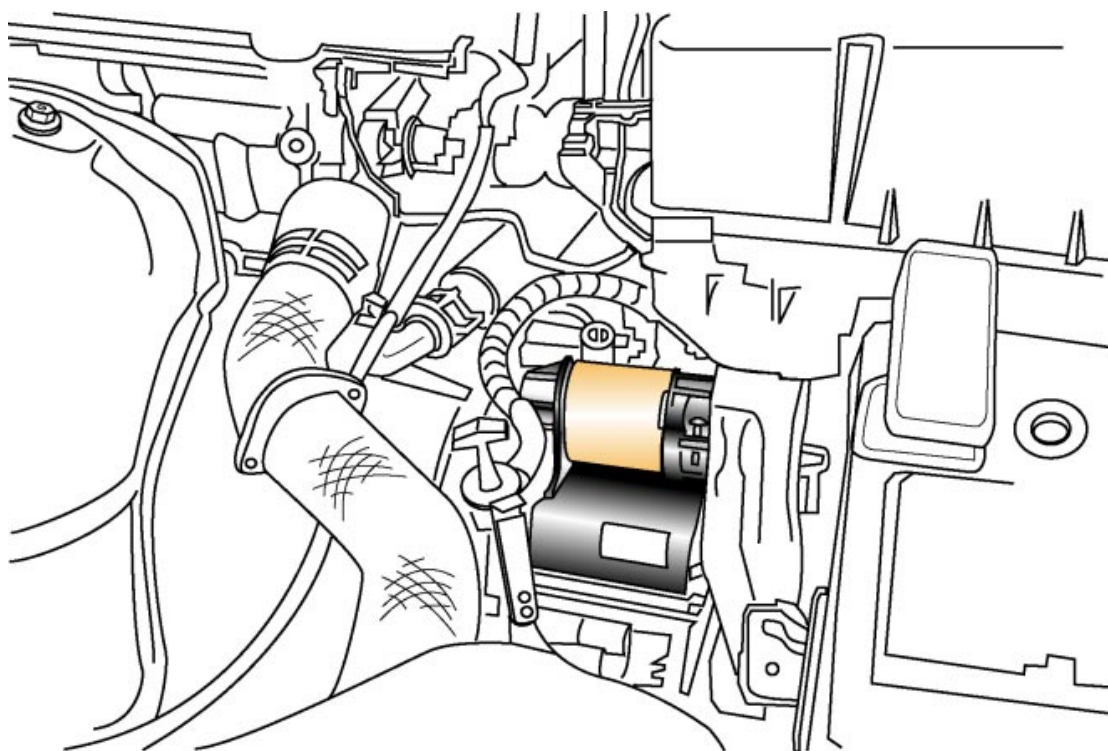


Fig. 4-01  
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### Starting System Overview

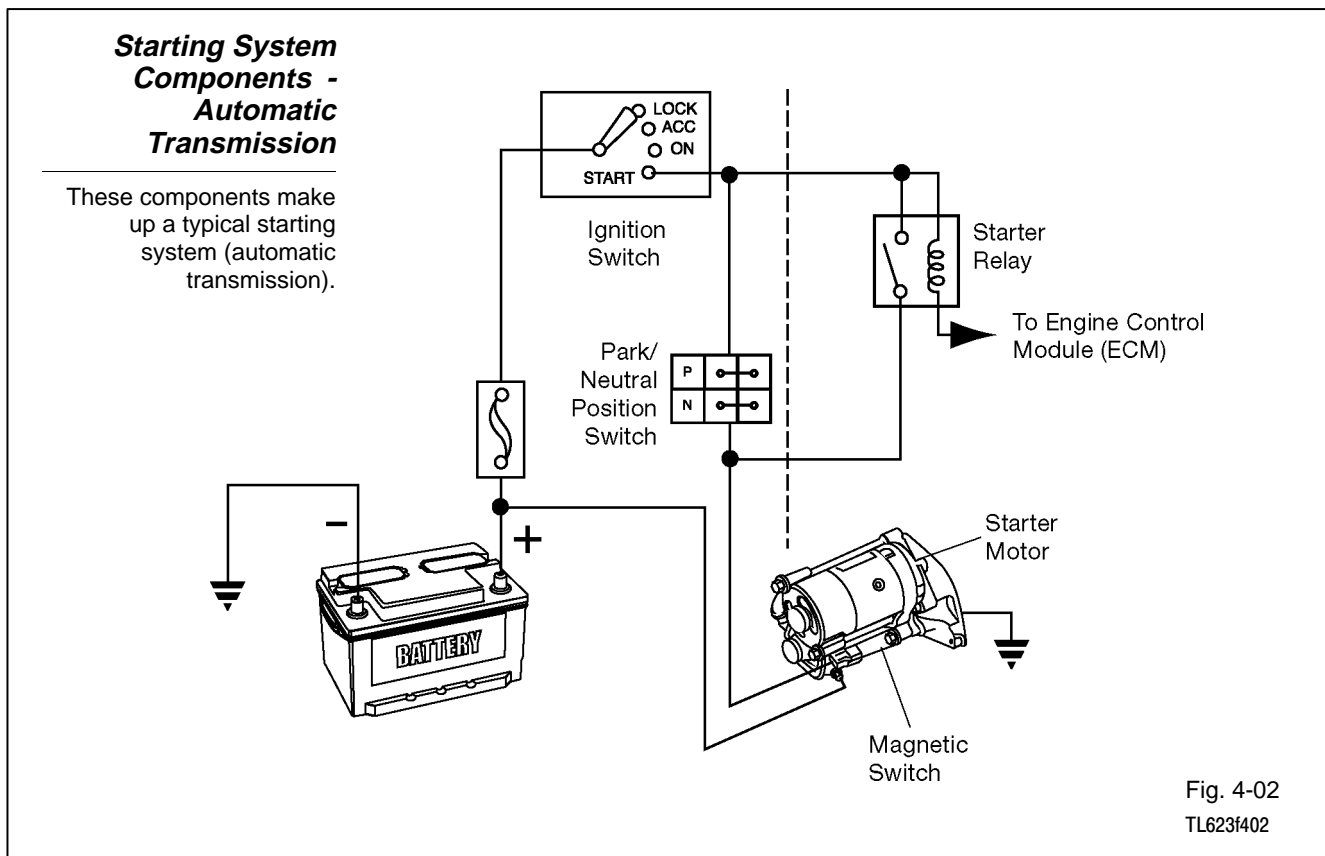
The starting system:

- Uses a powerful electric motor to drive the engine at about 200 RPM (fast enough to allow the fuel and ignition systems to operate).
- Drives the engine through a pinion gear engaged with a ring gear on the flywheel.
- Disengages as soon as the engine starts.

**Starting System Components**

These components make up a typical Toyota starting system:

- Starter motor
- Magnetic switch
- Over-running clutch
- Ignition switch contacts
- Park/neutral position (A/T) or clutch start (M/T) switch
- Clutch start cancel switch (on some models)
- Starter relay



**Starting System  
Components -  
Manual  
Transmission**

These components make up a typical starting system (manual transmission).

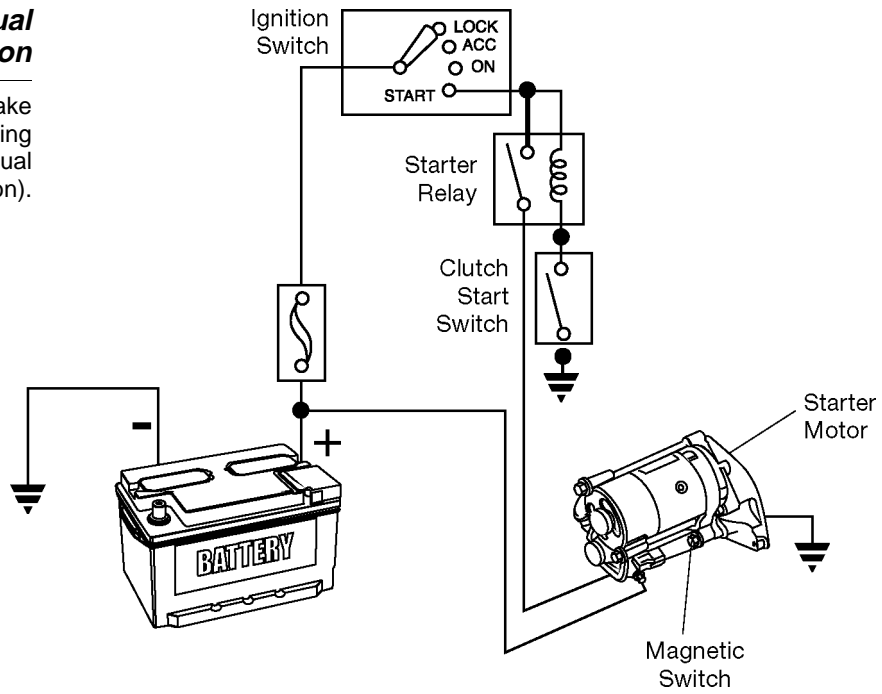
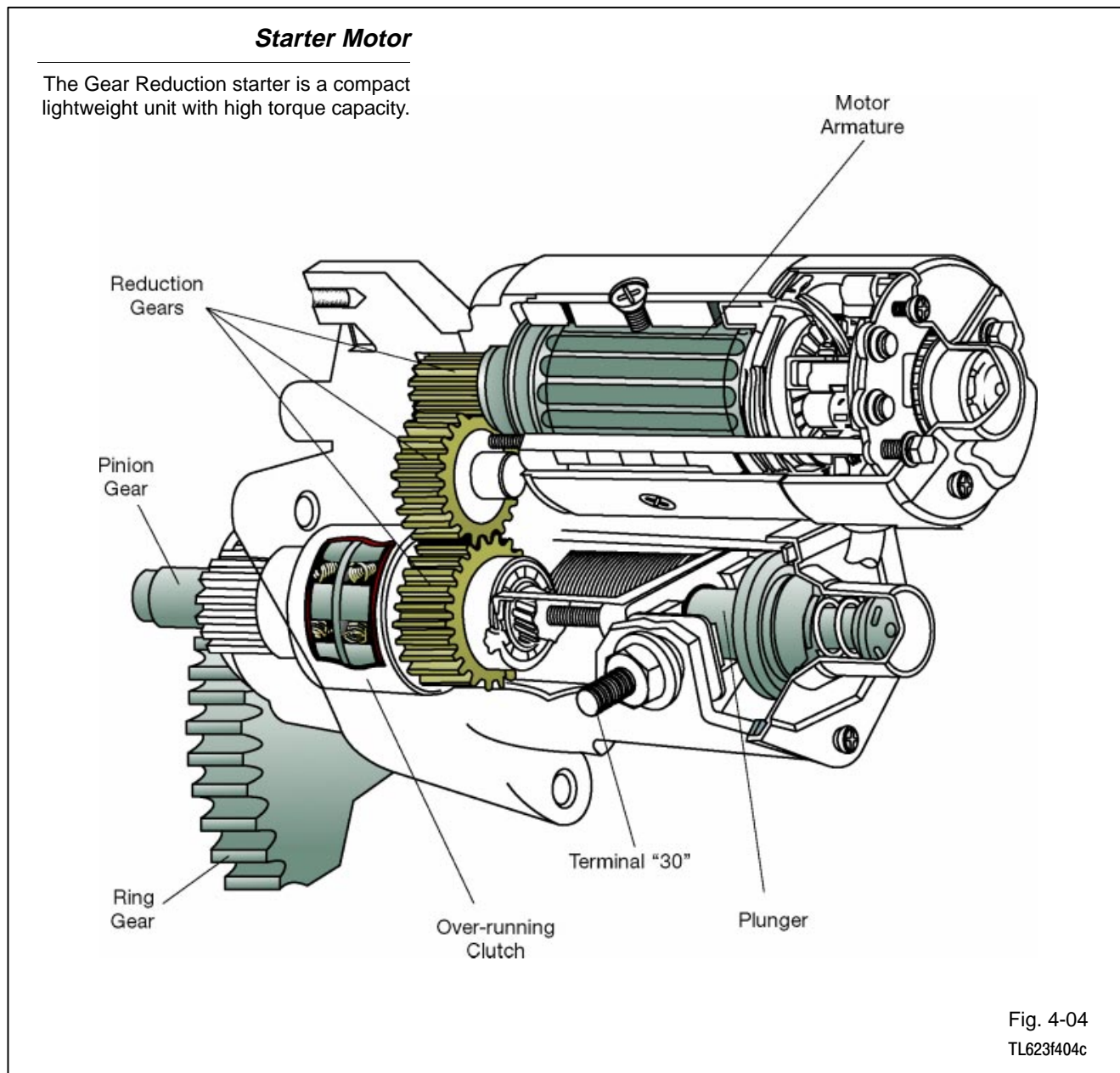


Fig. 4-03  
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## Section 4

**Starter Motor** Toyota vehicles are fitted with one of two types of starter motors:

- Gear reduction
- Planetary Reduction Segment (PS)



**Gear-Reduction Starter Motor**

The gear-reduction starter motor contains the components shown. This type of starter has a compact, high-speed motor and a set of reduction gears. While the motor is smaller and weighs less than conventional starting motors, it operates at higher speed. The reduction gears transfer this torque to the pinion gear at  $\frac{1}{4}$  to  $\frac{1}{3}$  the motor speed. The pinion gear still rotate faster than the gear on a conventional starter **and** with much greater torque (cranking power).