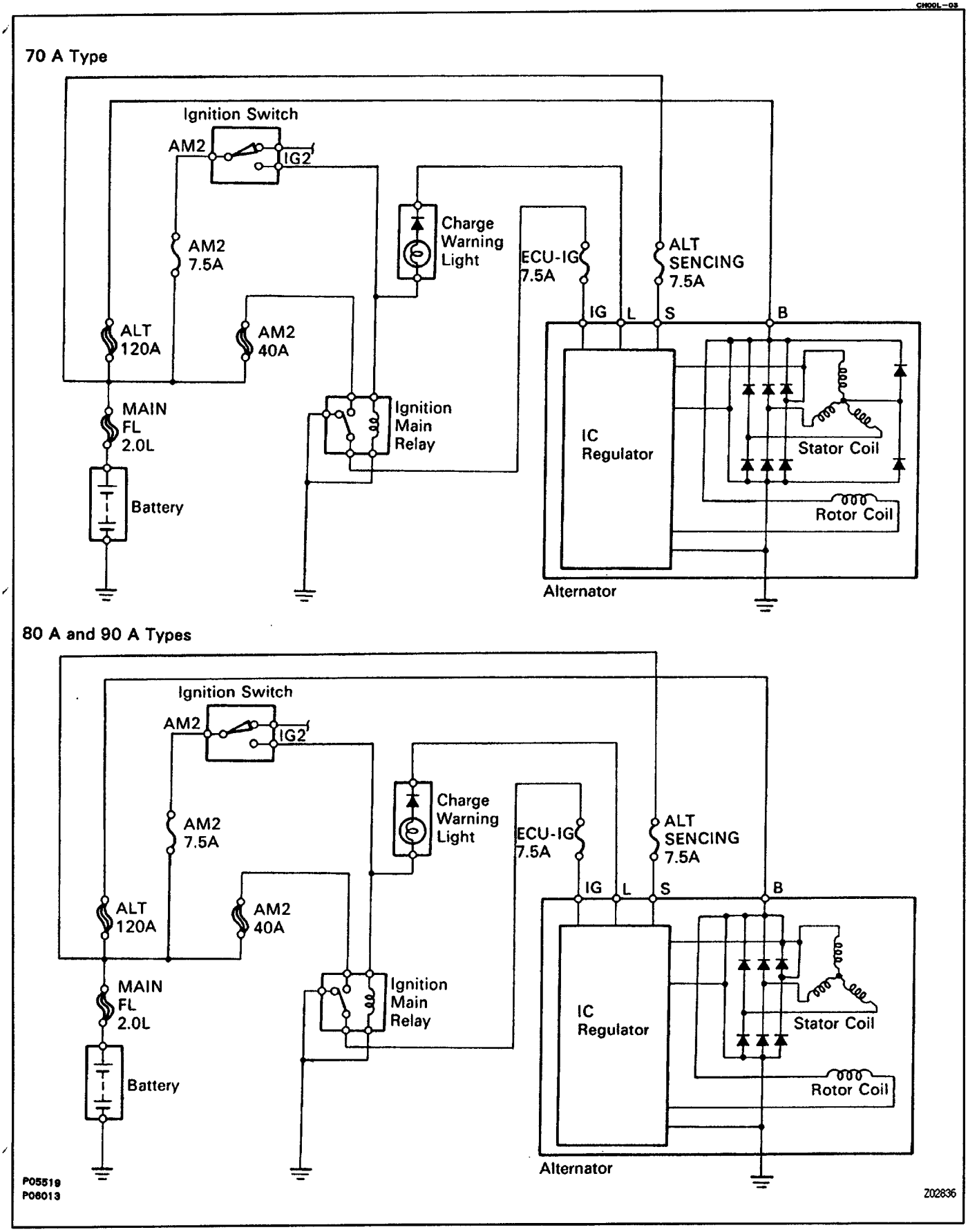SYSTEM CIRCUIT