

# PARTS & SERVICE NEWS

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**SUBJECT:** REPLACING STARTING SYSTEM MAGNETIC SWITCHES WITH A SOLID STATE RELAY AND SCHOTTKY ISOLATOR DIODE MODULE

**PURPOSE:** To replace mechanical components with electronic components for increased starting system reliability.

**APPLICATION:** Komatsu 930E Dump Trucks AFE48-A & UP; A30019, A30020, & UP

**FAILURE CODE:** D140Z9

**DESCRIPTION:** **XK0051**, modification kit for engine starting system wiring (Komatsu SSDA16V160 & Cummins QSK60 engines)  
**XK0049**, modification kit for engine starting system wiring (DDEC 4000 engines)

Some trucks in operation have experienced cranking motor failures due to failures with the magnetic switches in the starting system circuit. Two kits have been developed, one for Komatsu and Cummins QSK engines, and one for DDEC engines. The kits have been designed to help eliminate this problem by replacing the mechanical magnetic switches with a more reliable solid state relay. A Schottky isolator diode is to be installed to dissipate voltage spikes from the cranking motors that occur after the keyswitch has been released from the "START" position. The new relay and diode module are to be installed in the battery control box. Installation of these components in the control box reduces the risk of damage caused by vibrations and contamination.

Modification of the starting system includes the following tasks:

- remove magnetic switches from the power module sub-frame
- modify the battery control box for installation of additional components
- mount new solid state components in battery control box
- modify engine, auxiliary control box, and battery control box wiring
- add wiring from cranking motors to battery control box

Refer to the table on the following page for a complete list of parts included in these kits. A drawing that includes illustrations and instructions for completing this modification is listed in the table. The drawing is included in each of the kits.

*NOTE: The only difference between the two kits is noted within the table.*

<b>Modification Kit for Engine Starting System Wiring</b>		
<b>Part Number</b>	<b>Description</b>	<b>Quantity</b>
EJ7783	Modification Drawing	-
PC0938	Battery Isolator Diode, Shottky	1
MM0379	Lockwasher, 5 mm, external tooth	8
MM0373	Nut, M5, M/S	8
PC1109	Relay, 60 VDC, 100 Amp Solid State	1
MM0205	Lockwasher, M4, Type A, Zinc	2
MM0372	Nut, M4, M/S	2
MM0488	Stud, Projection, M5 x 20 mm	8
MM0483	Stud, Projection, M4 x 20 mm	2
CH4147	Cable Str., # 6 Battery Red, 9500 mm <i>(Komatsu &amp; QSK engines only)</i>	1
CH4149	Cable Str., # 6 Battery Red, 9000 mm <i>(DDEC engines only)</i>	1
CH4148	Cable Str., # 6 Battery Red	1
VH2587	Terminal Rings, 10-12 AWG	3
SP7846	Clip Loop	76
TB1939	Housing Str.	2
VZ3250	Diode Str.	2
EJ7784	Wire S C # 16	1
WA6139	Cord Grip Straight Style	1
CD9735	Terminal Butt Connector	7
VH2584	Terminal Ring 16-14 AWG	3
VH2592	Terminal Ring 12-10 AWG	2
EJ7785	Shrink Sleeve 0.25 in. dia. expanded	1
EJ8347	Cable Str., Start	1
MM0493	Stud, Projection, M6 x 20 mm	10
MM0176	Nut, Hex, M6 x 1mm	10
MM0375	Lockwasher, 6mm, external tooth	10