

PARTS & SERVICE NEWS

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(C)

SUBJECT: STARTER SAFETY RELAYS

PURPOSE: To release a heavy duty starter safety relay for use on engines equipped with a pre-lube engine oil system.

APPLICATION: Komatsu Mechanical Drive Dump Trucks:
 330M: A10190 and UP
 HD785-5LC: A10144, A10224, A10228 and UP

FAILURE CODE: D130ZC

DESCRIPTION: Starter Safety Relay Kit (XK0189)

Some trucks equipped with an engine oil pre-lube system may experience shorter than expected life from the starter safety relays. The additional demand that the pre-lube system places on the electrical system can shorten the life of the starter safety relays. A kit (XK0189) has been developed to replace the original starter safety relays with a single, heavy duty relay. For trucks that are equipped with two starters, refer to special instructions on page 4.

QUANTITY	PART NUMBER	DESCRIPTION
2	01010-80312	Capscrew
2	01571-00814	Seat
2	01643-50323	Washer
1	08050-03810	Connector, Body Assembly (Female)
1	421-01-A1170	Relay, Starter Safety
1	56106A4000	Drawing, Electrical Assembly
1	56106A4100	Drawing, Wiring Diagram
1	EK2374	Drawing, Rework Procedure
1	EK4909	Drawing, Safety Relay Replacement

1. Disconnect battery power by moving the battery disconnect switch to the "OFF" position.
2. Disconnect the wires from the two relays (1, Figure 1) and remove the two relays from the truck.
3. Weld two seats (1, Figure 2) to the truck as shown.
4. Mount the new relay (1, Figure 3) with capscrews (2) and washers (3).

NOTE: On steps 5-10, also refer to schematic drawing (Figure 4) for reference.

5. On existing truck wiring, locate the orange wire (1, Figure 4) and the black/yellow wire (13) that were connected to the relays. Cut the terminal off of each wire so that only the wire is left. (Two terminals and the short wire between the two terminals will be discarded from each wire)
6. Connect the orange wire (1) to the new round connector (11), pin number 1.
7. Connect the black/yellow wire (13) to connector (11), pin number 2.

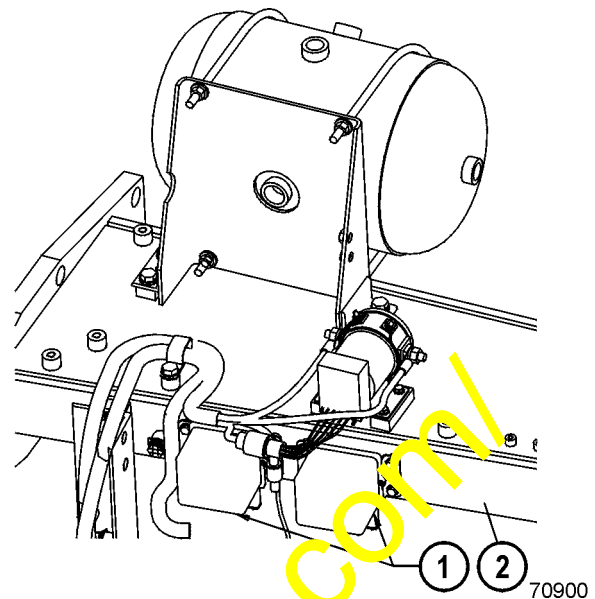


FIGURE 1. ORIGINAL STARTER SAFETY RELAYS

1. Relays, Starter Safety 2. L.H. Stay

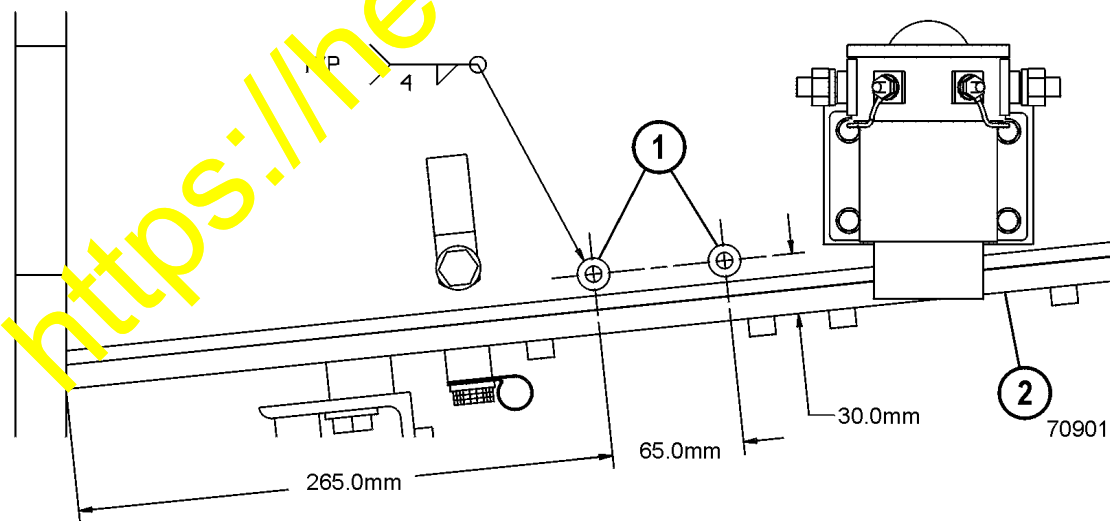


FIGURE 2. NEW SEAT LOCATION

1. Seat 2. L.H. Stay

8. Make a new ground wire about 6 inches long, using 16 gauge wire and connect one end to connector (11), pin number 3. Install a ring terminal on the other end of the ground wire and connect to capscrew (2, Figure 3).
9. Connect the 3 pin connector (11, Figure 4) to connector (10) that is attached to relay (9).
10. Connect the existing 6 gauge black wire (7) which was disconnected from the old relay, to the new relay, terminal "B". Connect the existing 6 gauge white wire (8) which was disconnected from the old relay, to the new relay, terminal "C". On wires (7) and (8), cut the eight inch pigtail wire lead off as close as possible to the connector and tape back the unused end.
11. Connect battery power by moving the battery disconnect switch to the "ON" position.
12. Test the starter circuit to insure it operates correctly.
 - a. Starter should automatically disengage as engine starts and begins to speed up.
 - b. Starter should not be able to re-engage if the engine is already operating.

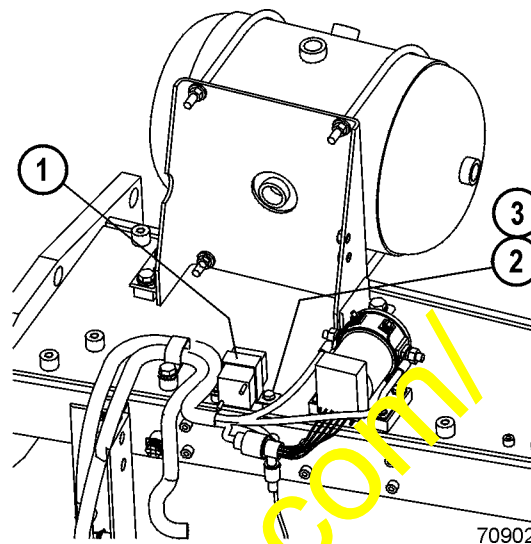


FIGURE 3. NEW STARTER SAFETY RELAY

- | | |
|--------------------------|-----------|
| 1. Relay, Starter Safety | 3. Washer |
| 2. Capscrew | |

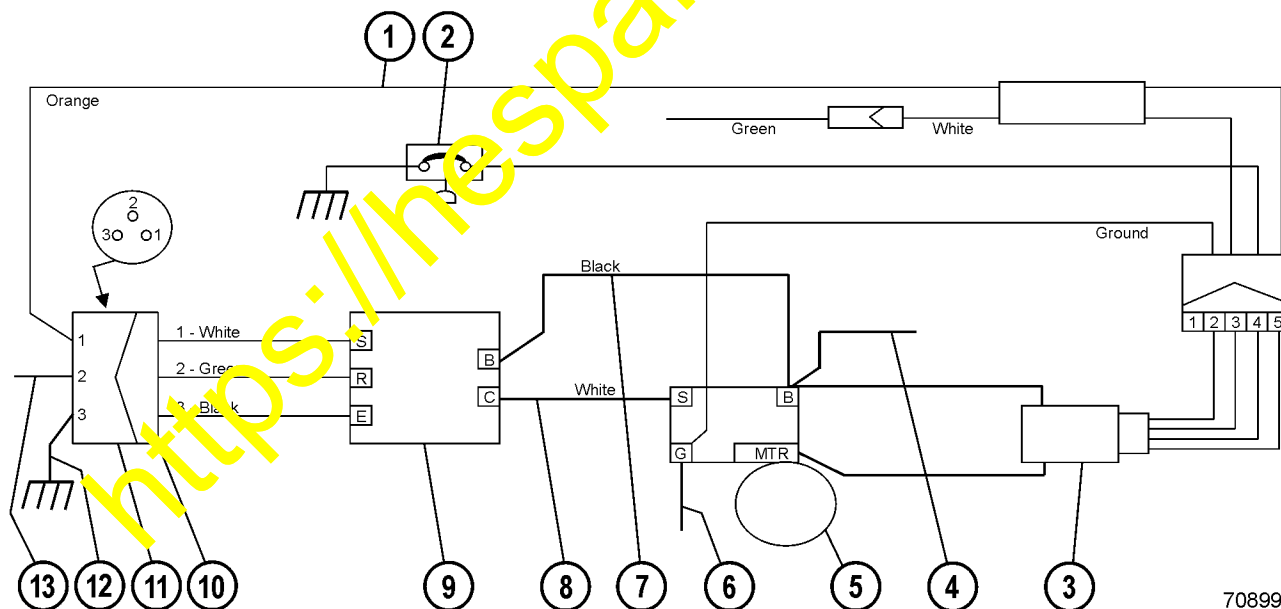


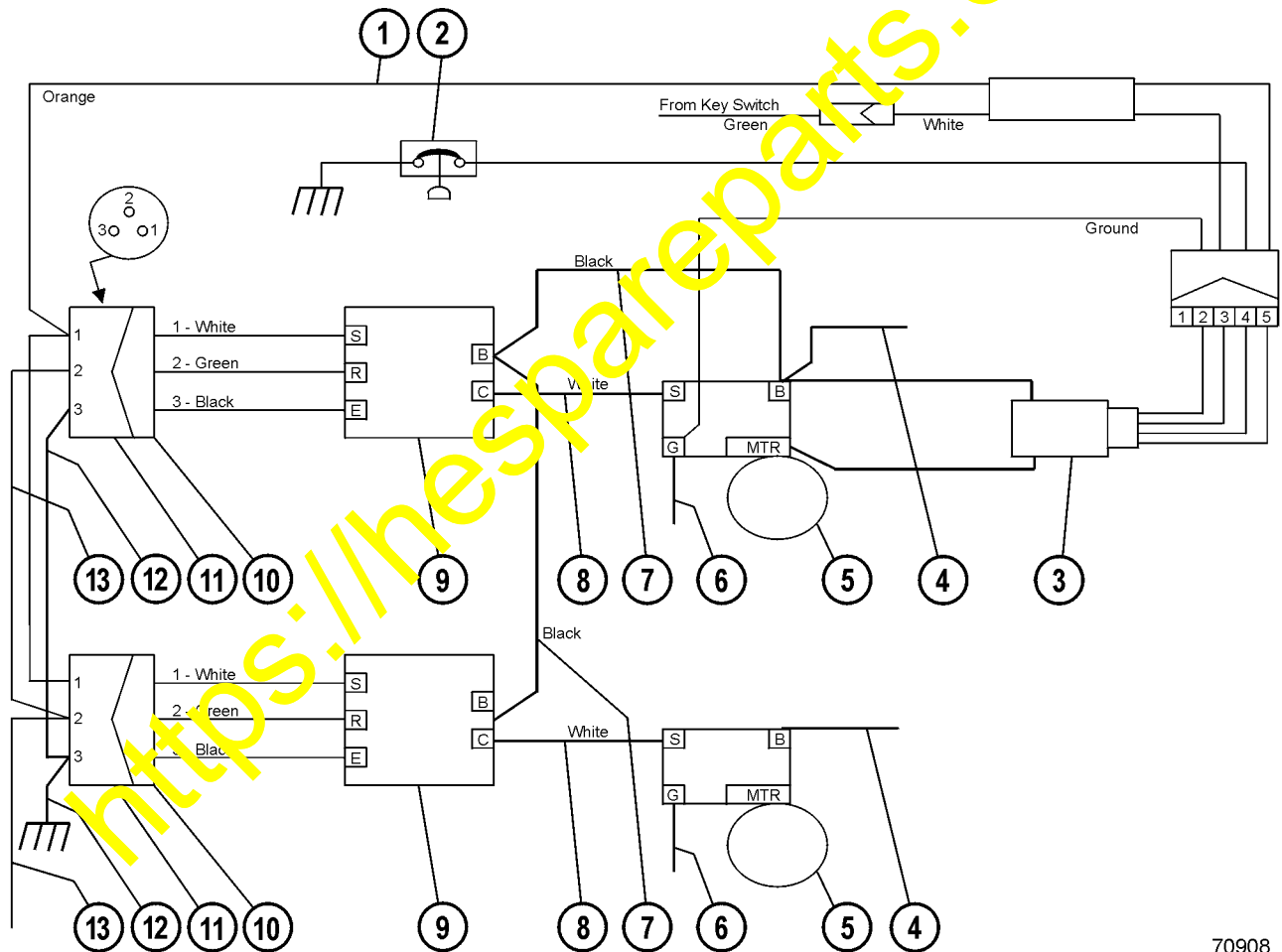
FIGURE 4. SAFETY RELAY WIRING SCHEMATIC

- | | | |
|---------------------------------|--|-----------------------------|
| 1. Wire, Orange | 6. Cable, Ground | 10. Connector, Safety Relay |
| 2. Pre-Lube Oil Pressure Switch | 7. Wire, Black | 11. Connector (08050-03810) |
| 3. Pre-Lube Timer/Relay | 8. Wire, White | 12. Wire, Ground |
| 4. Cable, 24V + Battery Source | 9. Relay, Starter Safety
(421-01-A1170) | 13. Wire, Black/Yellow |
| 5. Starter | | |

For trucks equipped with two starting motors

Some trucks may be equipped with two starter motors. Two kits (XK0189) will be required and some of the instructions will be different than a single relay installation. Follow the steps and wiring schematic below.

1. Perform all of the steps 1 through 12, with the following exceptions.
2. Mount a second relay near the first relay as shown in Figure 2.
3. Do not cut the pigtail wires off of wires (12 & 13, Figure 5) if they can be re-used inside the new connector.
4. Do not cut the black pigtail wire (7, Figure 5) apart.
5. Ground wires (12), wire (13), orange wire (1), and the black wire (7) can all remain in parallel circuits with each other.
6. The two white wire (8) circuits between the two safety relays "C" terminals and the two starter "S" terminals **must be separate circuits**. Do not connect these two wires together in parallel.



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FIGURE 5. SAFETY RELAY WIRING SCHEMATIC WITH TWO STARTERS

- | | | |
|---------------------------------|---|-----------------------------|
| 1. Wire, Orange | 6. Cable, Ground | 10. Connector, Safety Relay |
| 2. Pre-Lube Oil Pressure Switch | 7. Wire, Black | 11. Connector (08050-03810) |
| 3. Pre-Lube Timer/Relay | 8. Wire, White | 12. Wire, Ground |
| 4. Cable, 24V + Battery Source | 9. Relay, Starter Safety (421-01-A1170) | 13. Wire, Black/Yellow |
| 5. Starter | | |