

Installation/Maintenance Instructions MPS-C2000 Conversion Kits for Low Voltage Power Circuit Breakers

K-1600
K-DON 1600
K-2000

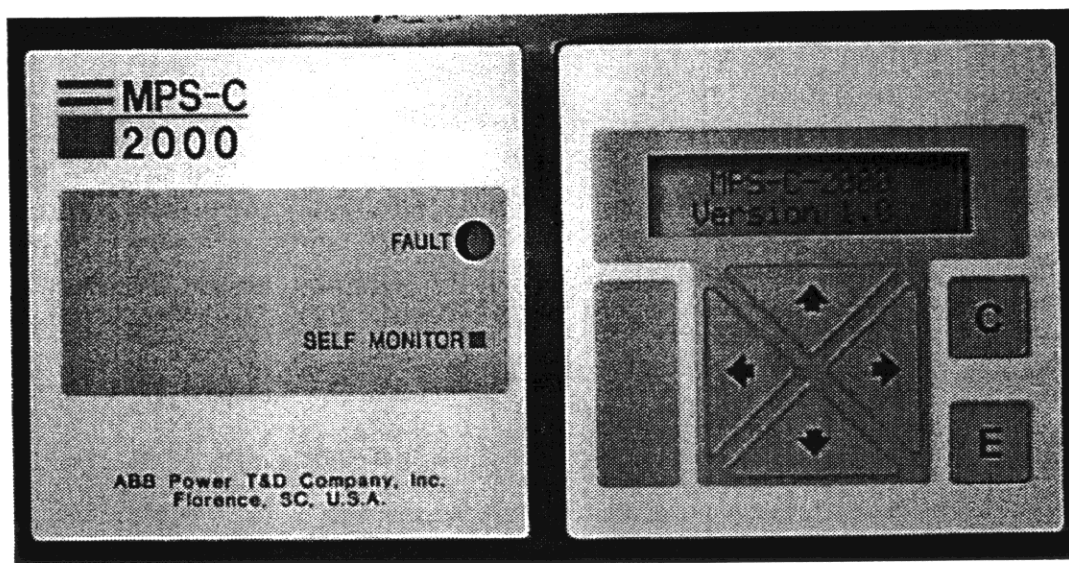


ABB Power T&D Co. Inc.
Distribution Systems Division



NOTE: This Instruction Book is provided solely for the convenience of the purchaser, and does not purport to cover all details or variations in equipment nor to provide contingency to be met in connection with installation, operation, or maintenance. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to the nearest District Office.

CONVERSION KIT INFORMATION

Parts Inventory. The kit contains the following:

- ◇ IB 6.1.2.7-12(This Manual)
- ◇ IB 6.2.10.5 (K-Line Installation/Maintenance Instructions)
- ◇ MPS-C2000 Trip Device
- ◇ Wire Harness
- ◇ Lower Molding and Sensor Assemblies
- ◇ Magnetic Trip Latch (herein called the Mag Latch)
- ◇ Miscellaneous other conversion parts specific to the breaker being upgraded - including the hardware required to complete the conversion.

There may be some other items, such as a trip coil or other options that were ordered with the kit. In addition, some kits may contain parts that are not required for all breakers.

Refer to Figures P-1 through P-5 for a complete listing of the parts included with this kit.

Wiring Diagrams. The breaker must be wired in accordance with the applicable diagram:

- 1) Phase only or 3-wire ground trip: Figure W-1
- 2) Phase and 4-wire ground trip: Figure W-2
- 3) Phase, 4-wire ground with double-ended sub. protection: Figure W-3

K1600/K2000 CONVERSION INSTRUCTIONS

Nomenclature & Conventions:

This manual assumes that the breaker being upgraded is either non-automatic, or has OD trip devices. If the breaker already has an electronic trip device ("SS" or "MPS"), a number of parts and steps discussed herein will be superfluous.

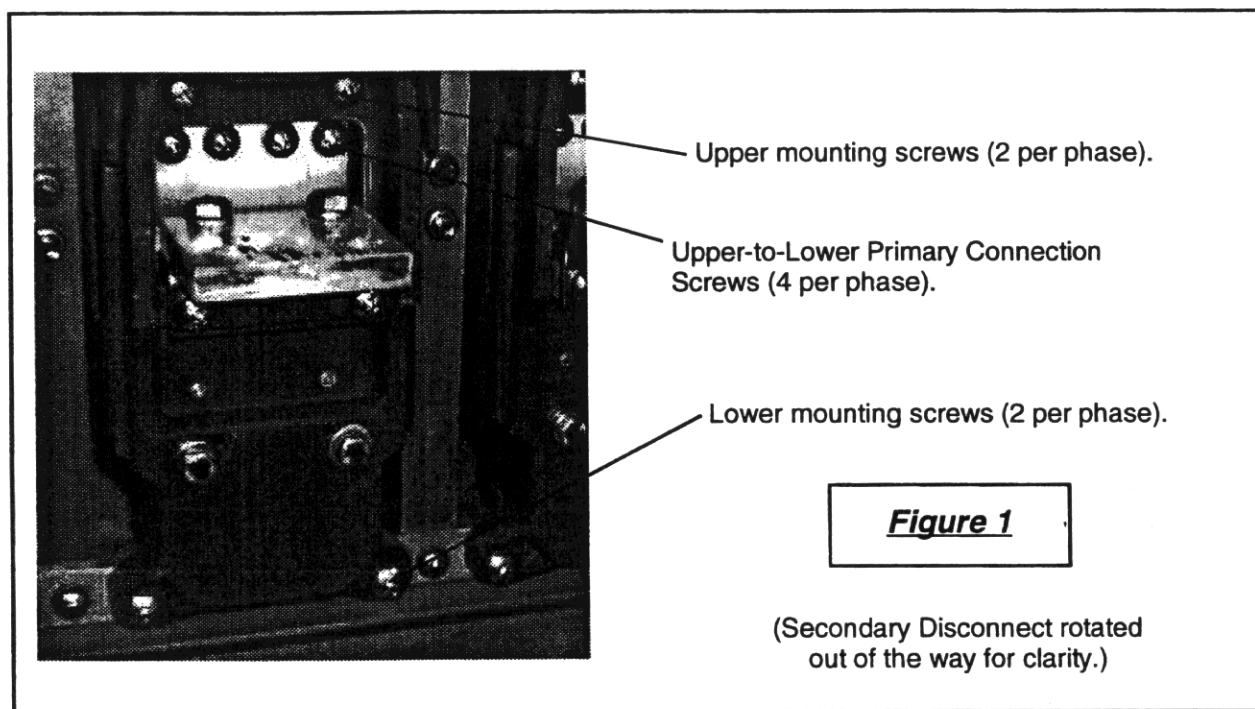
Unless otherwise specified, directions such as "left" and "right" assume that the breaker is being viewed from the front and is sitting upright.

When tightening hardware with split-type lock washers, the hardware should be tightened until the lock washer has been compressed flat and no gaps exist. **DO NOT OVER-TIGHTEN.**

NOTE: Save all hardware that is removed during disassembly. The manufacturer has attempted to provide all of the hardware that will be necessary for a normal conversion, but much of the hardware removed can be safely reused. If disassembly beyond the scope of this Instruction Book is attempted, additional hardware and/or replacement parts may be purchased from ABB.

Conversion Procedure

- (1) Remove the Secondary Disconnect Support Assembly from the rear of the breaker by removing the two round-head and two flat-head screws and their accompanying lock washers and bolts. Rotate the assembly so that it will be out of the way.
- (2) Lower Molding Assembly removal:
 - (A) Remove the Primary Disconnect Finger Assemblies from the three lower terminals by removing one retainer from each of the retaining pins (two per phase) and removing the pins.
 - (B) Remove the four screws and lock washers per phase that connect the lower and upper primary current



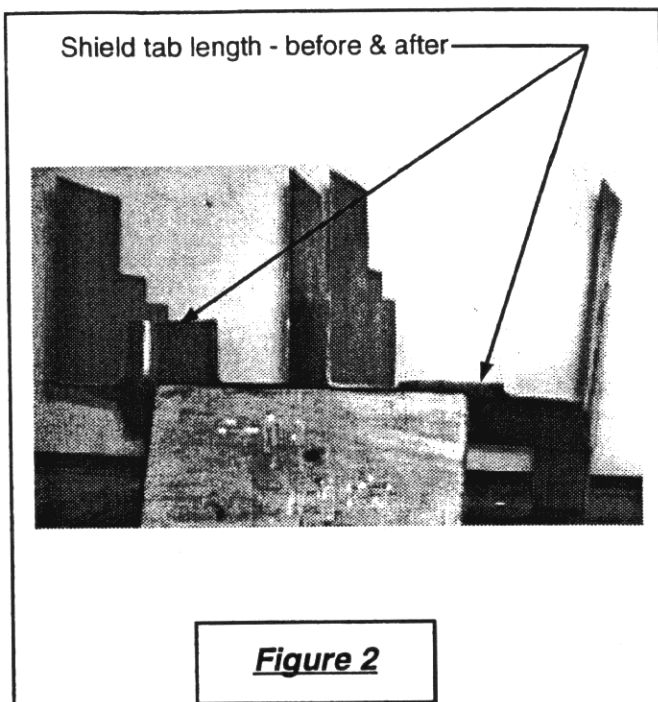
parts (see Figure 1).

- (B) Remove the two upper and two lower mounting screws and lock washers per phase that secure the Lower Molding Assembly (see Figure 1).
 - (C) Carefully remove the three assemblies from the breaker.
- (3) The Shields (716308A00):
- (A) Replacement shields have been provided, but due to the amount of breaker disassembly that would be required, it is recommended that the existing shield be modified in place unless it is damaged, or unless the breaker is being disassembled for another reason such that replacement will be easy.
 - (B) Note the length of the tabs on the existing shield (see Figure 2) To make the shield compatible with the MPSC current sensors, the tabs must be cut back so that they are the same length as the tabs on the replacement shield provided. Care must be taken when cutting the shield tabs to minimize the amount of particulate that falls into the breaker mechanism.

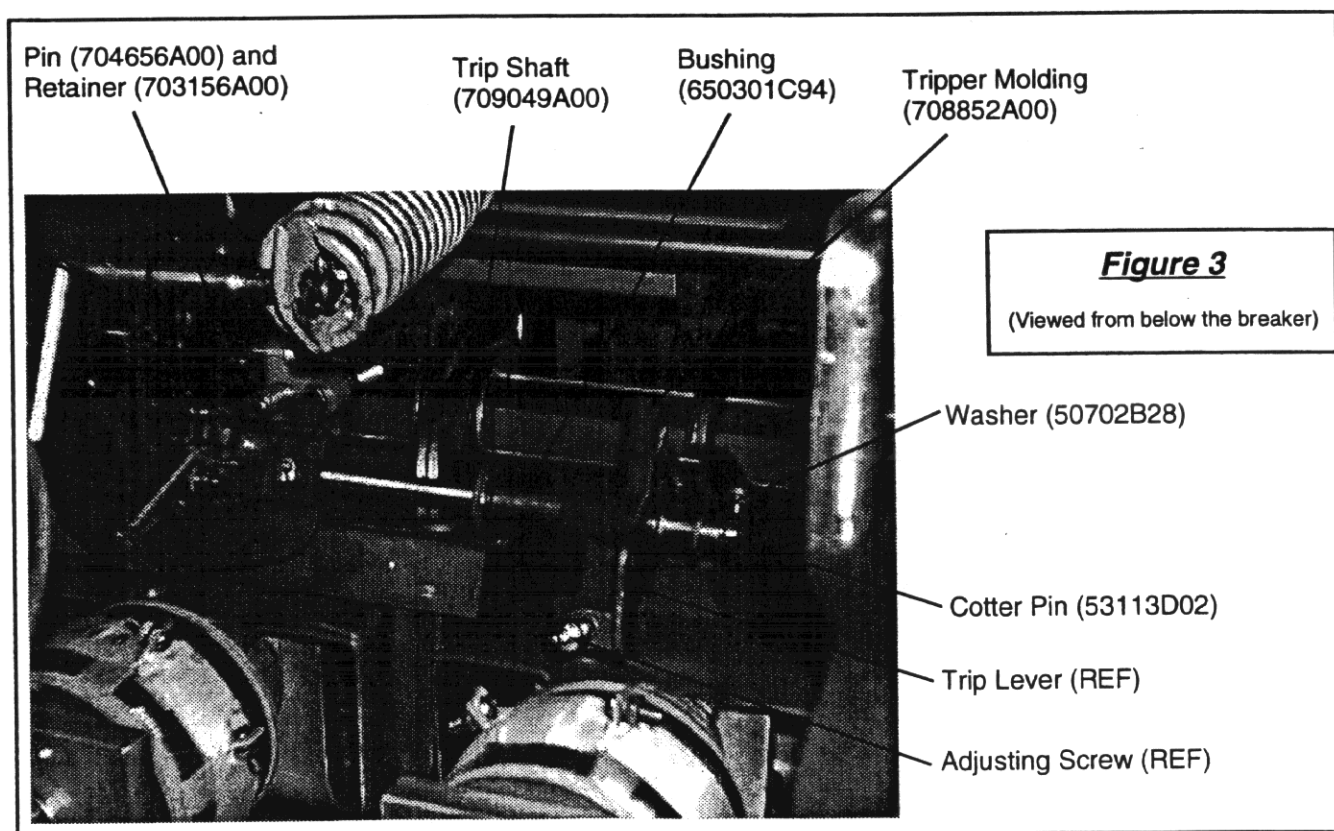
- (4) Mag Latch Actuator (716542T01). If the breaker being converted does not already have an Actuator, install the Actuator Assembly provided with the kit as shown in L-13285 (included at the end of this manual). (See also Figure P-4 for the Assembly configuration.)

(5) Mag Latch Installation:

- (A) If the Roll Pin (650043A30) hasn't already been installed into the Trip Shaft (709049A00), install it at this time (Figure P-3, Items 1 & 2).
- (B) Slide the Outer Tripper Molding over the long section of the Trip Shaft so that it nests on the pin in the shaft. (Figure 3).
- (C) Slide the bushing onto the shaft (Figure 3).
- (D) Slide the Trip Shaft through the hole in the support and into the end of the Center Tripper Molding (Figure 3).

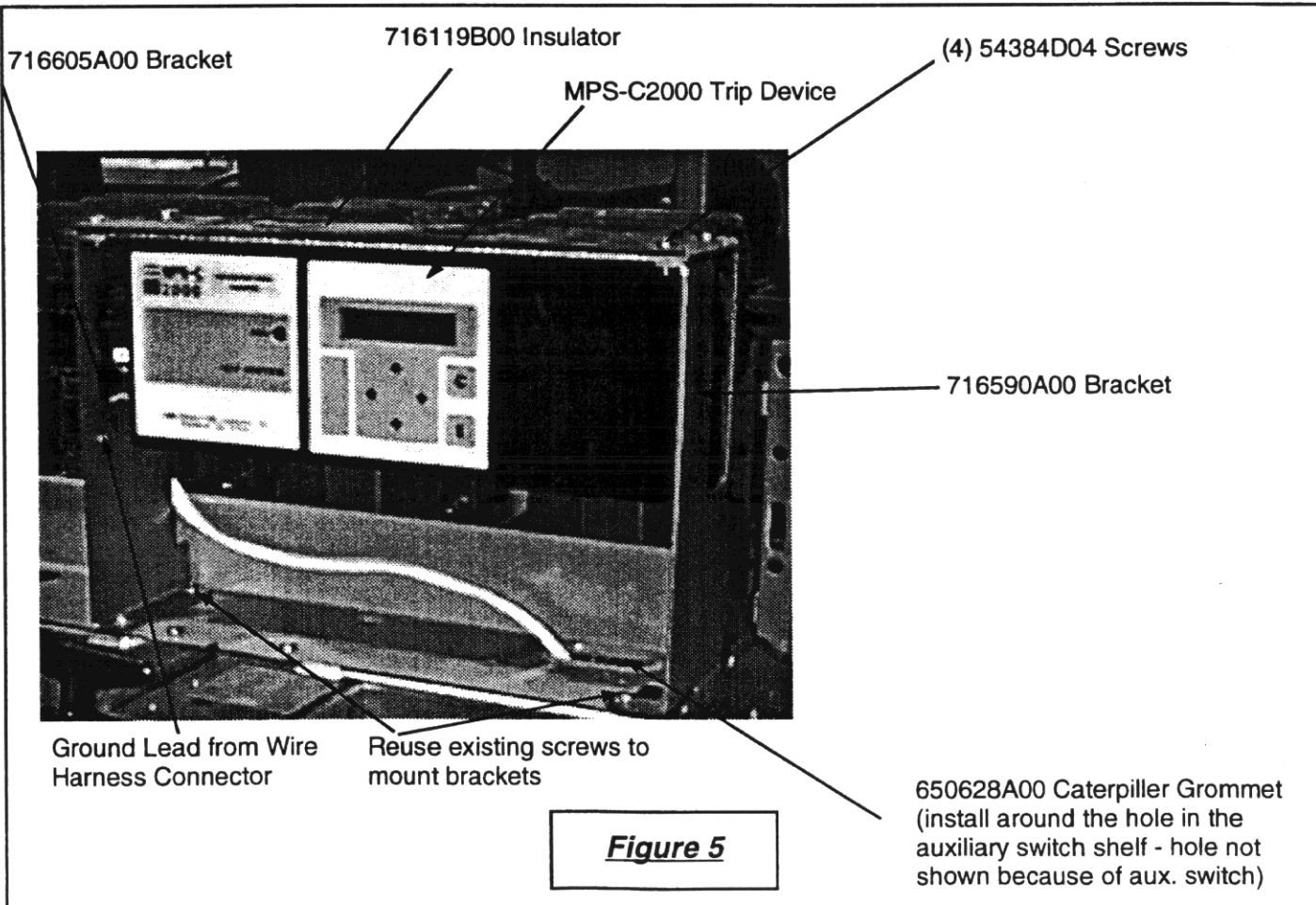
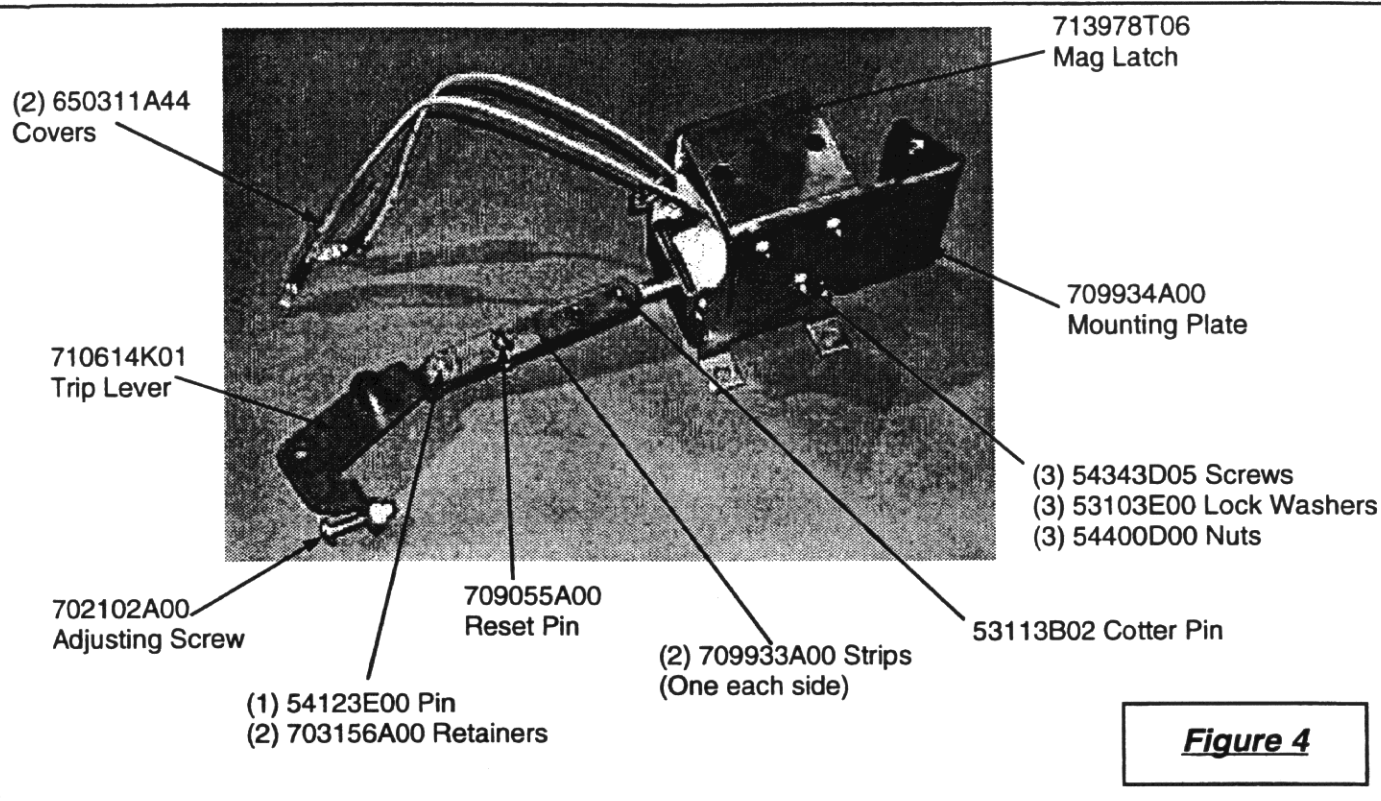


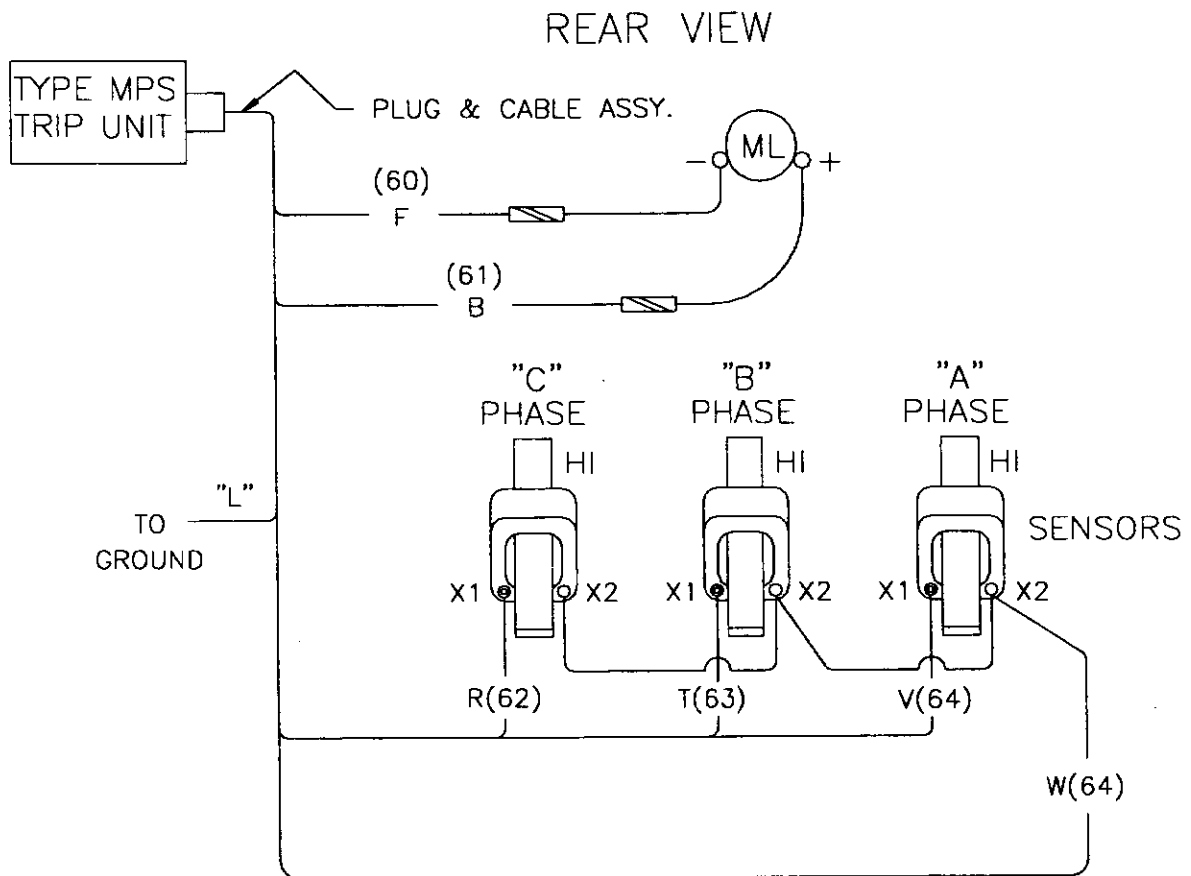
- (E) Insert the 704656A00 pin through the Center Tripper Molding and the Trip Shaft and secure it with a retainer (Figure 3).
- (F) If it hasn't already been done, assemble the Mag Latch to the trip/reset linkage parts (Figure 4)
- (G) Slide the Trip Lever onto the Trip Shaft so that it is oriented as shown in Figure 3.



- (H) Ensure that the Reset Pin is below the actuator, and secure the Mag Latch to the Front Panel of the breaker with two (54398F08) Screws.
- (J) Slide the Washer onto the end of the Trip Shaft and hold in place with the Cotter Pin (Figure 3).
- (6) Lower Molding Assembly Installation. Install the new Lower Molding Assemblies (709734...) and the Primary Disconnect Finger Assemblies using the reverse of the procedure given in Step 2 above. Replacement retainers (703250A00) have been provided to secure the Finger Assembly Retaining Pins.
- (7) MPS-C2000 Trip Device Installation (refer to Figure 5):
 - (A) Install the MPSC Support Brackets.
 - (B) Install the MPS-C2000 Trip Device, but do not install the screws at this point.
 - (C) Install the MPSC shield on top of the MPS-C2000 unit using (4) screws. Thread the screws through the MPS-C2000 mounting plate and the support brackets.
- (8) Wire Harness Installation:
 - (A) Attach the connector to the MPSC Trip Device, and secure with the small nylon screws (650605A02). Secure the ground wire from the connector to the lower right-hand screw that is holding the MPSC Trip Device, and tighten that screw.
 - (B) If the hole in the auxiliary tray does not have a grommet around its edge, install the caterpillar grommet (650628A00) at this time.
 - (C) Route the wire harness down through the hole in the auxiliary tray, down to near the bottom of the breaker, and then to the back of the breaker - do not secure the harness at this time.
 - (D) Attach the wire harness leads to the Current Sensors according the appropriate wiring diagram (W-1, W-2, or W-3). **NOTE THAT THE VIEW SHOWN IN THE WIRING DIAGRAMS IS FROM THE REAR OF THE BREAKER.** Use 54343C06 Screws, 53103D00 Lock Washers, and 54400C00 Nuts to make the connections.
 - (E) Slide a cover (the 650311A44 clear tubing) over each lead on the Mag Latch, attach the knife-leads per the wiring diagram, and then slide the clear tubing so that it covers the junction.
- (10) Verify breaker adjustment in accordance with the breaker Instruction Manual, and apply the conversion label in a conspicuous location on the breaker.

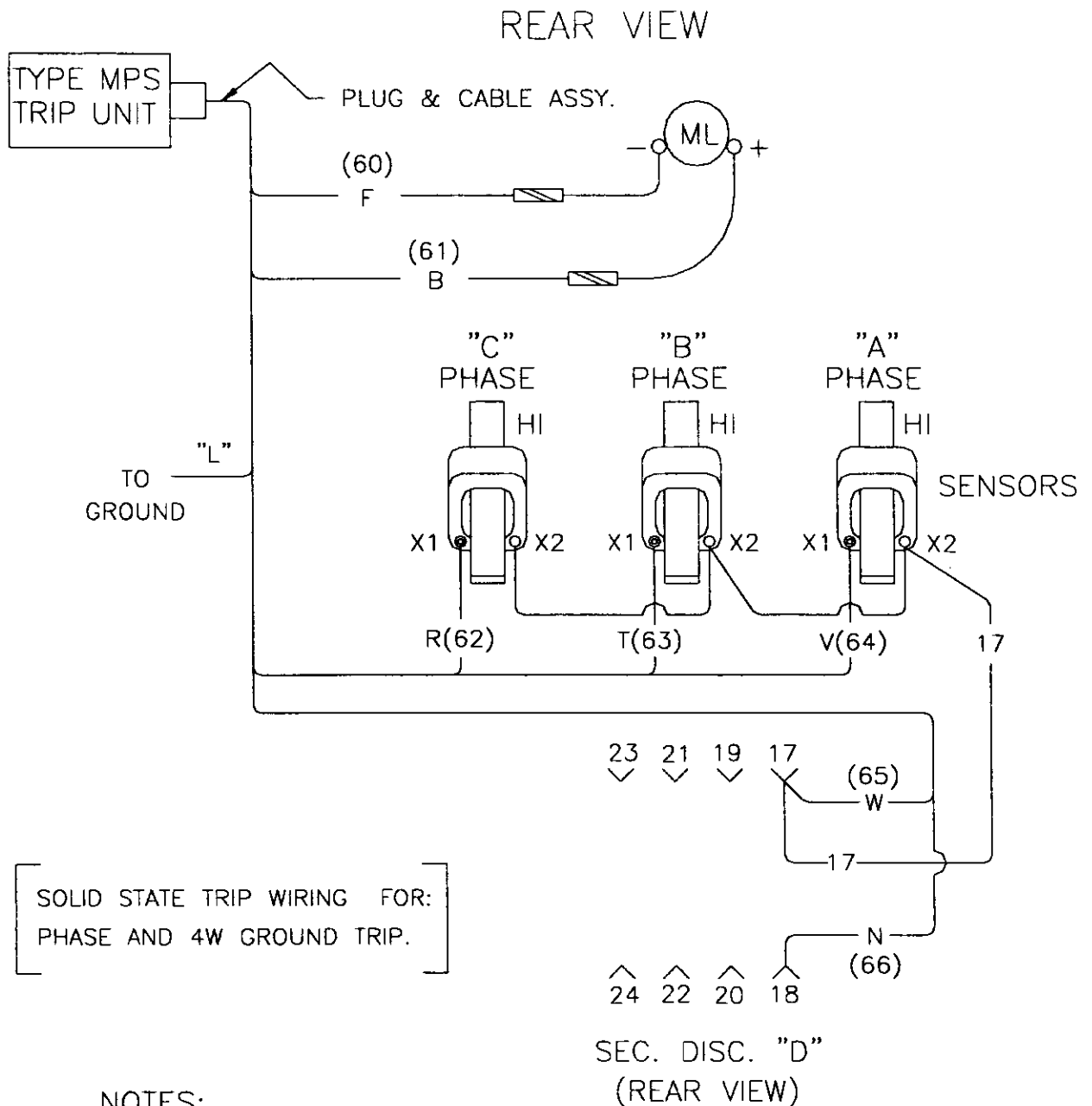
Upon Completion of the conversion, and prior to placing the breaker into service, the breaker must be tested to ensure that all facets of the MPS-C2000 Trip System are functioning properly. As a minimum, ABB recommends testing by primary current injection on each phase. Refer to the Circuit Breaker Instruction/ Maintenance Manual for test parameters.





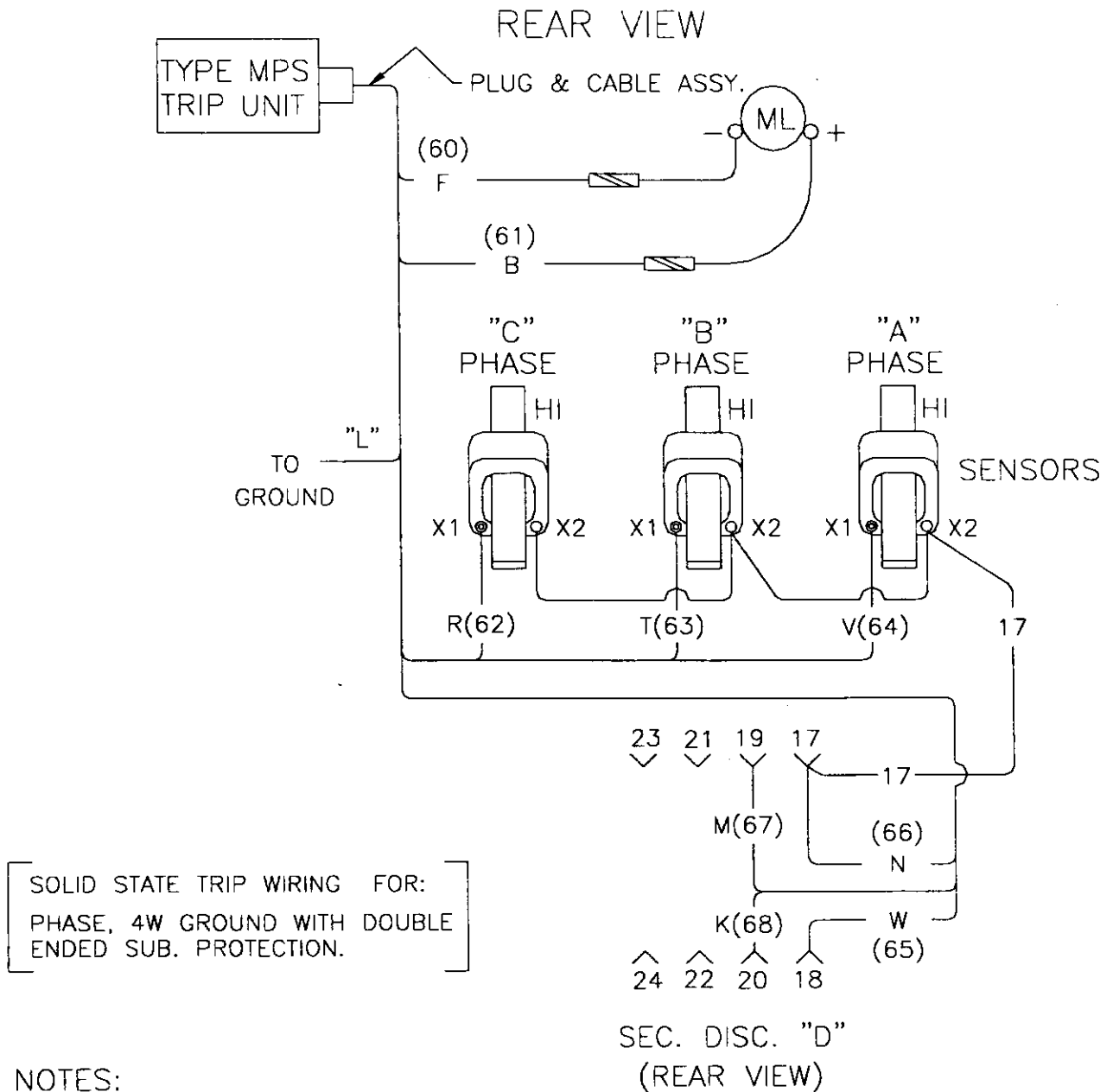
SOLID STATE TRIP WIRING FOR:
PHASE AND 4W GROUND TRIP.

Figure W-1
(Reference ABB Drawing 716131)



1. NEUTRAL SENSOR PRIMARY (H-1) MUST BE THE SAME AS PHASE SENSORS POLARITY (H-1) IN REFERENCE TO SOURCE AND LOAD.
2. THIS CIRCUIT REPLACES AUXILIARY SWITCH R-b (15-16) WIRING TO SECONDARY DISCONNECTS 17 & 18 ON R.H. 8-CONTACT AUXILIARY SWITCH ARRANGEMENTS.

Figure W-2
(Reference ABB Drawing 716129)

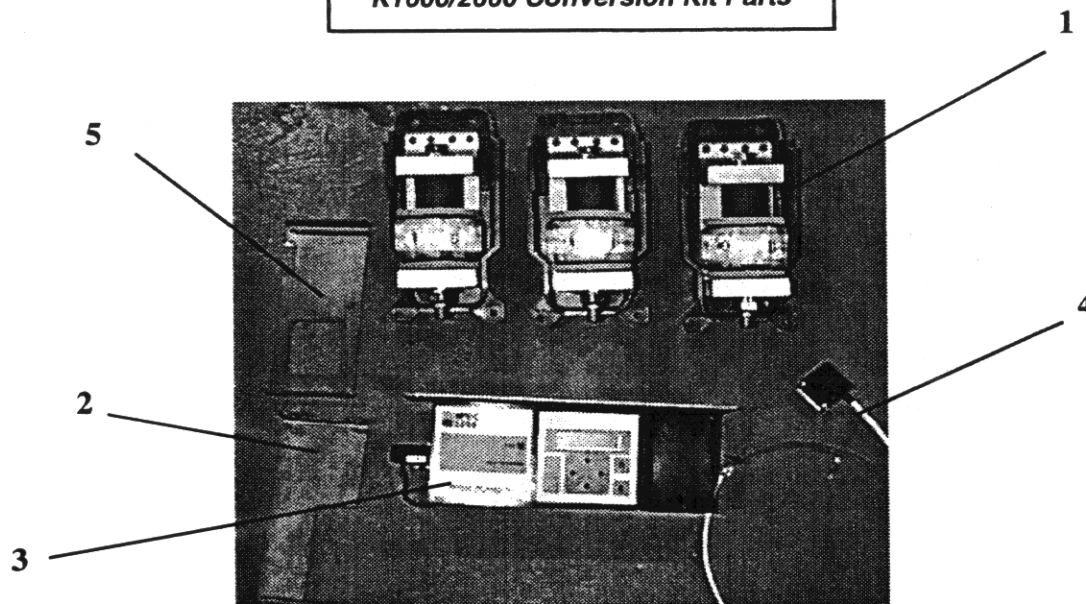


NOTES:

1. NEUTRAL SENSOR PRIMARY (H-1) MUST BE THE SAME AS PHASE SENSORS POLARITY (H-1) IN REFERENCE TO SOURCE AND LOAD.
2. THIS CIRCUIT REPLACES AUXILIARY SWITCH R-A (13-14), R-B (15-16) WIRING TO SECONDARY DISCONNECTS 19 & 20 AND 17 & 18 ON R.H. 8 CONTACT AUXILIARY SWITCH ARRANGEMENTS.

Figure W-3
(Reference ABB Drawing 716130)

Figure P-1
K1600/2000 Conversion Kit Parts



<u>Item</u>	<u>Part Number</u>	<u>Qty</u>	<u>Description and Remarks</u>	<u>Reference Step</u>
1	709734Txx	3	Lower Molding and Sensor Assembly (xx depends on rating)	6
2	716590A00	1	Support Bracket (RH)	7A & Figure 5
3	716666T03/4	1	MPS-C2000 Trip Device	7B & Figure 5
4	716326T01	1	Wire Harness	8C & Figure 5
5	716605A00	1	Support Bracket (LH)	7A & Figure 5

716308A00
Insulating Shield
(3 each)
(ref. Step 3)

716119B00
Insulator Strip
(1 each)
(ref. Step 7C)

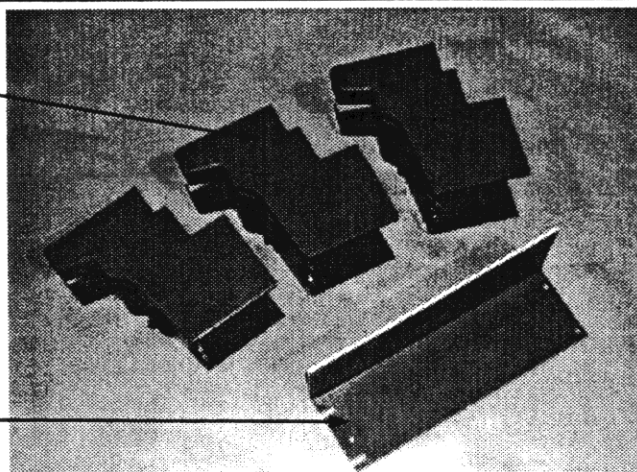


Figure P-2
**K1600/2000 Conversion
Kit Parts**

2 (shown installed)

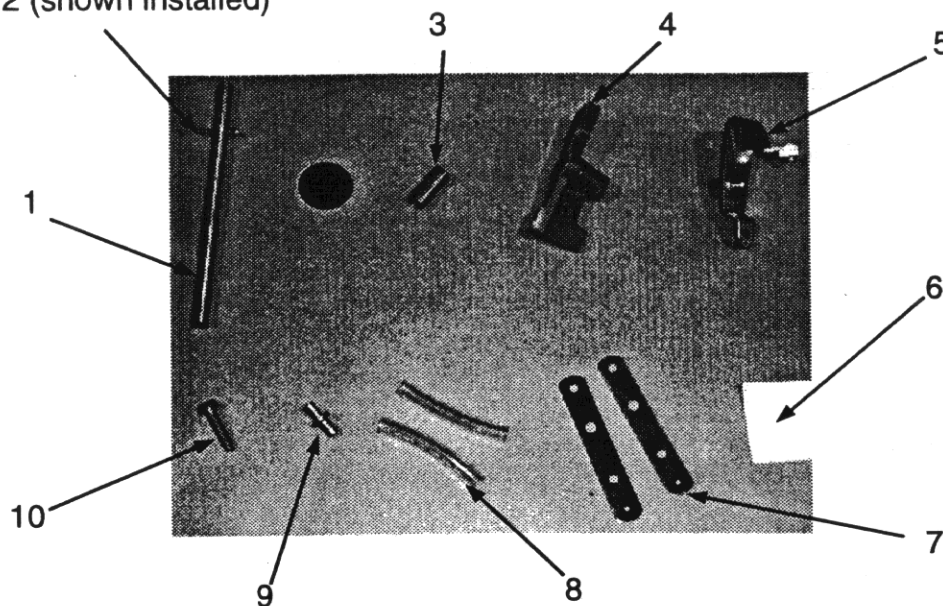
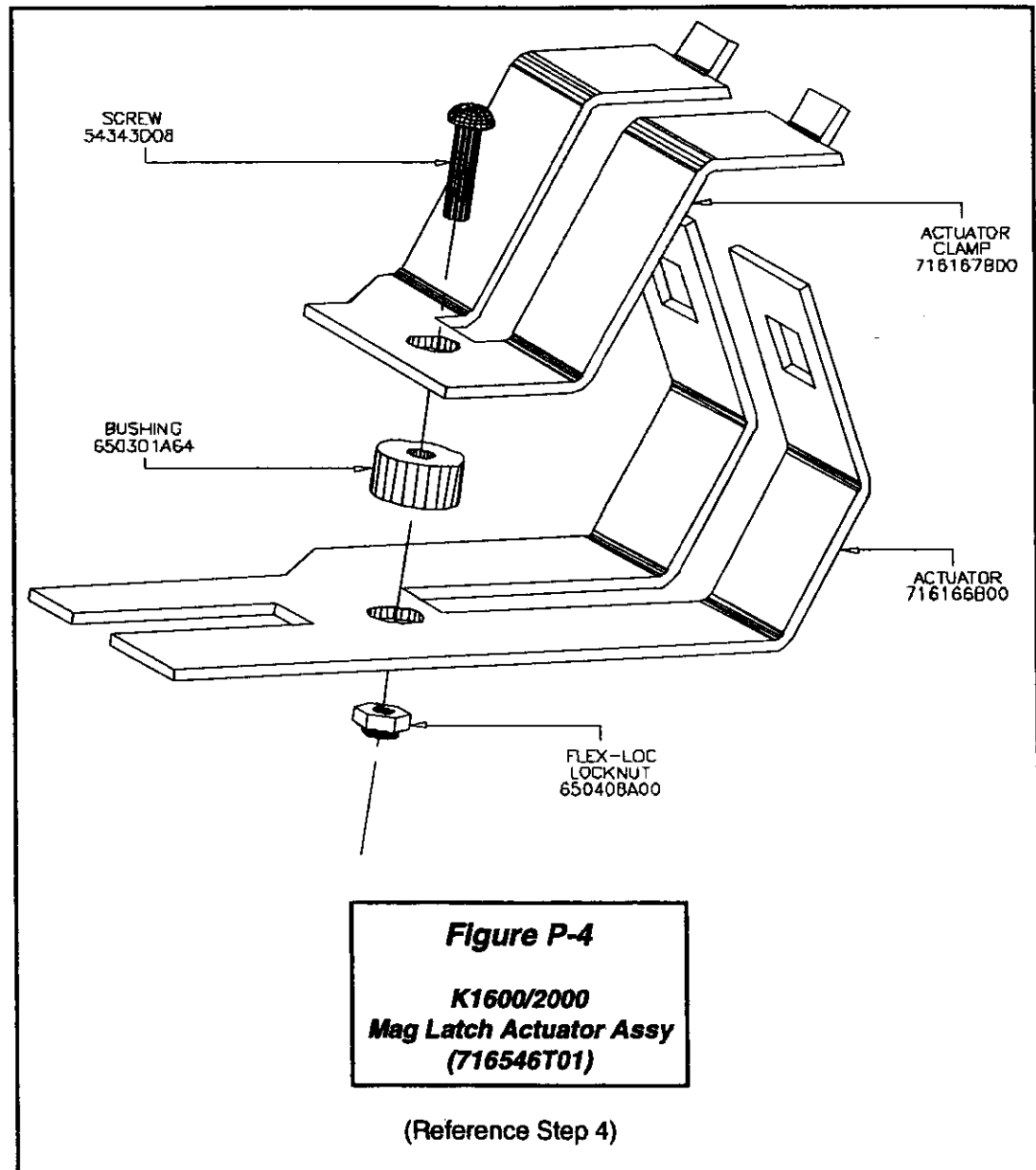


Figure P-3

**K1600/2000
Conversion Kit Parts**

<u>Item</u>	<u>Part Number</u>	<u>Qty</u>	<u>Description and Remarks</u>	<u>Reference Step(s)</u>
1	709049A00	1	Trip Shaft	5A - 5E
2	650043A30	1	Pin	5A
3	650301C94	1	Bushing	5C
4	708852A00	1	Outer Tripper Molding	5B
5	710614K01	1	Trip Lever	Figure 4 & 5G
6	716488A00	1	Conversion Label	10
7	709933A00	2	Mag Latch Reset Strip	Figure 4
8	650311A44	2	Cover	8 & Figure 4
9	709055A00	1	Pin	Figure 4
10	702102A00	1	Adjusting Screw	Figure 4



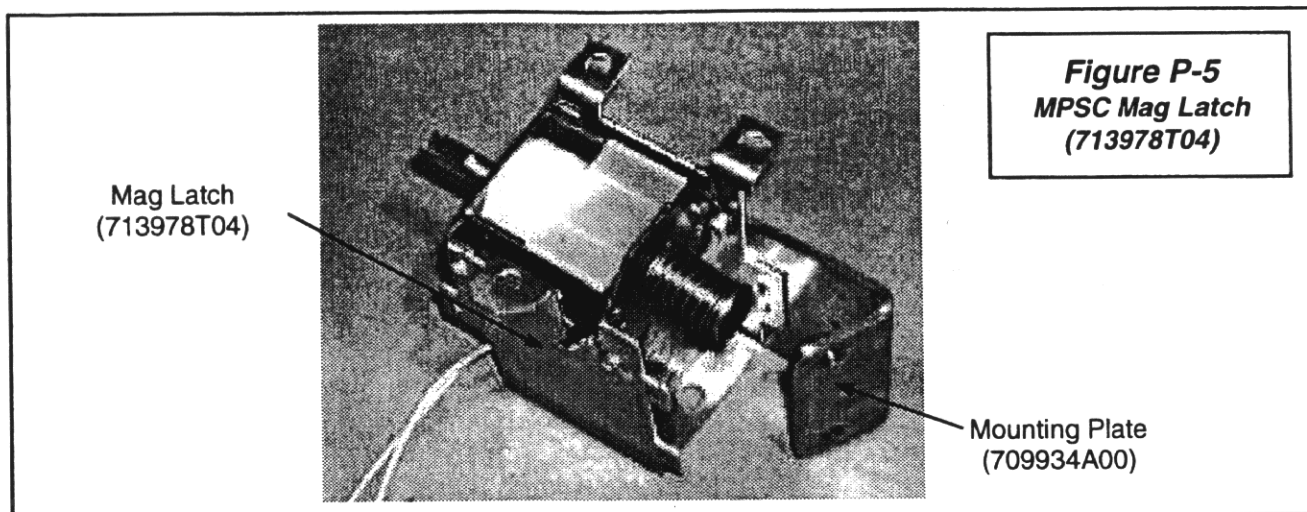


Figure P-6
K1600/2000 Conversion Kit Parts
(Hardware and Miscellaneous)

<u>Part Number</u>	<u>Qty</u>	<u>Description and Remarks</u>	<u>Reference Step(s)</u>
50702B28	1	Flat Washer (21/64 ID)	5F
53103D00	6	Lock Washer (#8 split)	8D
53103E00	3	Lock Washer (#10 split)	(REF - Part of 713978T04)
53113B02	1	Cotter Pin (.5" long - light weight)	Figure 4
53113D02	1	Cotter Pin (.5" long - heavy weight)	5F
54123E00	1	Pin (5/32 DIA)	Figure 4
54343C06	6	Screw (#8-32 x .5)	8D
54343D05	3	Screw (#10-32 x 7/16)	(REF - Part of 713978T04)
54343D08	1	Screw (#10-32 x .75)	(REF-Part of 716546T01-see Fig.P-4)
54384D04	4	Screw (#10 x .38 self tap)	Figure 5
54384D05	3	Screw (#10 x .5 self tap)	Figure 5
54398F08	2	Screw (1/4-20 x .75 w/lwr)	5H
54400C00	6	Nut (#8-32)	8D
54400D00	3	Nut (#10-32)	(REF - Part of 713978T04)
54500D00	3	Flat Washer (#10)	Figure 5
650408A00	1	Nut (#10-32 flexloc)	(REF-Part of 716546T01-see Fig.P-4)
650605A02	2	Screw (#4-40 x .25 nylon)	8A
650628A00	1	Caterpillar Grommet	8B
703156A00	3	Retainer (.187)	Figure 4 (2) and Step 5E (1)
703250A00	6	Retainer	6
704656A00	1	Pin (1/8 dia with 5/32 head)	5E



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