

WIRE HARNESS REPAIR

E4.0-5.5XN, E5.0XNS (E80-120XN, E100XNS) [A099]; N35-40ZRS2, N30ZDRS2 [B265]; S6.0-7.0FT (S135-155FT) [D024, E024, F024, G024]; A1.3-1.5XNT (A25-30XNT) [D203]; N35ZDR2, N45ZR2 [D264]; S30-35FT, S40FTS [E010, F010]; N35-40ZR2, N30ZDR2 [E470]; H1.6-1.8FT, H2.0FTS (H30-35FT, H40FTS) [F001, G001]; S2.0-3.5FT (S40-70FT, S55FTS) [F187, G187, H187]; S4.0-5.5FT, S5.5FTS (S80-120FT; S80-100FTBCS; S120FTS; S120FTPRS) [G004, H004, J004]; H6.0-7.0FT (H135-155FT) [H006, J006, K006, L006]; H2.0-3.5FT (H40-70FT) [L177, N177, P177]; H4.0FT5/FT6; H4.5FTS5, H4.5FT6; H5.0-5.5FT (H80-120FT) [N005, P005, R005, S005, U005]; E2.2-3.5XN (E45-70XN) [A268]; J2.2-3.5XN (J45-70XN) [A276]; J1.5-2.0XNT (J30-40XNT) [K160]; J1.6-2.0XN (J30-40XN) [A935]; H8.0FT, H8.0FT9, H9.0FT (H170FT, H175FT36, H190FT) [A299, B299, C299]; E30HSD₂, E35HSD₂, E40HSD₂ [B219]; E30HSD₃, E35HSD₃, E40HSD₃ [C219]; S50CT [A267]; S50CT, S50CT2 [B267]; H2.0-2.5CT (H50CT) [A274, B274]; E1.6-2.0XN (E30-40XN) [A269]; J4.0-5.0XN, J5.0-5.5XN6 (J80-120XN, J100XNL) [A970]; H2.0-3.0XT (H40-60XT) [A380]; J8.0XNL6, J8.0XNL9, J9.0XNL (J170-190XNL) [A250]; H3.0XT [A409]

HYSTER

SAFETY PRECAUTIONS

MAINTENANCE AND REPAIR

- The Service Manuals are updated on a regular basis, but may not reflect recent design changes to the product. Updated technical service information may be available from your local authorized Hyster® dealer. Service Manuals provide general guidelines for maintenance and service and are intended for use by trained and experienced technicians. Failure to properly maintain equipment or to follow instructions contained in the Service Manual could result in damage to the products, personal injury, property damage or death.
- When lifting parts or assemblies, make sure all slings, chains, or cables are correctly fastened, and that the load being lifted is balanced. Make sure the crane, cables, and chains have the capacity to support the weight of the load.
- Do not lift heavy parts by hand, use a lifting mechanism.
- Wear safety glasses.
- DISCONNECT THE BATTERY CONNECTOR before doing any maintenance or repair on electric lift trucks. Disconnect the battery ground cable on internal combustion lift trucks.
- Always use correct blocks to prevent the unit from rolling or falling. See HOW TO PUT THE LIFT TRUCK ON BLOCKS in the **Operating Manual** or the **Periodic Maintenance** section.
- Keep the unit clean and the working area clean and orderly.
- Use the correct tools for the job.
- Keep the tools clean and in good condition.
- Always use **HYSTER APPROVED** parts when making repairs. Replacement parts must meet or exceed the specifications of the original equipment manufacturer.
- Make sure all nuts, bolts, snap rings, and other fastening devices are removed before using force to remove parts.
- Always fasten a DO NOT OPERATE tag to the controls of the unit when making repairs, or if the unit needs repairs.
- Be sure to follow the **WARNING** and **CAUTION** notes in the instructions.
- Gasoline, Liquid Petroleum Gas (LPG), Compressed Natural Gas (CNG), and Diesel fuel are flammable. Be sure to follow the necessary safety precautions when handling these fuels and when working on these fuel systems.
- Batteries generate flammable gas when they are being charged. Keep fire and sparks away from the area. Make sure the area is well ventilated.

NOTE: The following symbols and words indicate safety information in this manual:



WARNING

Indicates a hazardous situation which, if not avoided, could result in death or serious injury.



CAUTION

Indicates a hazardous situation which, if not avoided, could result in minor or moderate injury and property damage.

On the lift truck, the **WARNING** symbol and word are on orange background. The **CAUTION** symbol and word are on yellow background.

TABLE OF CONTENTS

General	1
Deutsch Crimping Tool	1
How to Strip a Wire for Use With Deutsch Crimping Tool	1
How to Crimp With the Deutsch Crimping Tool	2
Calibration Test for the Deutsch Crimping Tool	4
Deutsch Connectors	5
DT, DTM, and DTP Series Connectors	5
Connector Receptacle Replacement	14
Connector Plug Replacement	22
Connector Receptacle Pin Replacement	30
Connector Plug Socket Replacement	39
HD Series Connectors	47
Connector Receptacle Replacement	50
Connector Plug Replacement	54
Connector Receptacle Pin Replacement	57
Connector Plug Socket Replacement	63
Sealing Plugs	67
Metri-Pack Connectors	69
Remove and Install	69
Micro-Pack Connectors	72
Weather-Pack Connectors	72
Weather-Pack Terminal Repair	73
AMPSEAL Crimping Tools	74
AMP Hand Crimping Tool With Certi-Crimp	74
Description	74
Stripping Wire for Use with AMP Hand Crimping Tool	75
Insulation Crimp Adjustment	76
Maintenance and Inspection for AMP Hand Crimping Tool	76
AMP Hand Crimping Tool	76
Crimp Height Inspection	76
How to use AMP Hand Crimping Tool	77
AMP Pro-Crimper II Tool	78
Description	78
Remove and Install Die Set and Locator Assembly	78
Stripping Wire for Use With AMP PRO-CRIMPER II Tool	79
Contact Support Adjustment	79
Crimp Height Adjustment	80
Maintenance and Inspection Procedures	80
PRO-CRIMPER II Tool	80
Crimp Height Inspection	80
How to Use AMP PRO-CRIMPER II Tool	81
AMPSEAL Connector Assemblies	82
Description for Plug Connector Assembly	82
Seal Plug	83
Contact Crimping	83
Contact Removal	83
Contact Insertion	85
Description for Plug Connector and Header Assembly	87
Voltage Reading	89
Seal Plug	89
Contact Crimping	90
Contact Removal	92

TABLE OF CONTENTS (Continued)

Contact Insertion	94
AMP Superseal 1.5 Crimping Tools	97
Mini Mic Receptacle and Tab Contacts	97
Description	97
Crimping Conditions and Measurements	97
Insertion of Rubber Seal on Cable	99
Correction or Replacement of Parts	99
AMP Hand Application Tool	103
Description	103
Maintenance and Inspection	104
Crimp Height Inspection	104
Crimp Height Adjustment	104
How to Use AMP Hand Application Tool	105
AMP Pro-Crimper II Tool	106
Description	106
Remove and Install Die Set and Locator Assembly	106
Adjustments	107
Contact Support	107
Crimp Height	108
Inspections and Maintenance	109
Crimp Height Inspection	109
Visual Inspection	109
Maintenance	110
How to Use Pro-Crimper II Tool	110
AMP Superseal 1.5 Connector Assemblies	110
Description	110
Harness Assembly	111
Positioning of Anti-Backout Device	111
Removal of Contacts	113
Repair and Maintenance	117
Panel Mount Option	117
AMP Fastin-Faston Hand Tools	117
Description - AMP Double Action Hand Tool	117
Maintenance and Inspection Procedures	118
Daily Maintenance	118
Periodic Tool Inspection	119
Lubrication	119
Visual Inspection	119
Crimp Height Inspection	119
Certi-Crimp Ratchet Inspection	120
How to Use AMP Double Action Hand Tool	121
Description - AMP Extraction Tool	122
Maintenance and Inspection	122
How to Use AMP Extraction Tool	123
AMP Fastin-Faston Receptacles and Housings	124
Description	124
Wire Repair	132
Wire Splicing Requirements	132
Deutsch Jiffy Splice	133
Assemble	133
Disassemble	135
Del-City Crimp-Solder-Shrink Splice	136

TABLE OF CONTENTS (Continued)

Twisted/Shielded Cable and Leads Repair	138
Twisted/Shielded Cable Repair	138
Twisted Leads Repair	139
Special Tools	140

This section is for the following models:

E4.0-5.5XN, E5.0XNS (E80-120XN, E100XNS) [A099];
 (N35-40ZRS2, N30ZDRS2) [B265];
 S6.0-7.0FT (S135-155FT) [D024, E024, F024, G024];
 A1.3-1.5XNT (A25-30XNT) [D203];
 (N35ZDR2, N45ZR2) [D264];
 (S30-35FT, S40FTS) [E010, F010];
 (N35-40ZR2, N30ZDR2) [E470];
 H1.6-1.8FT, H2.0FTS (H30-35FT, H40FTS) [F001, G001];
 S2.0-3.5FT (S40-70FT, S55FTS) [F187, G187, H187];
 S4.0-5.5FT, S5.5FTS (S80-120FT; S80-100FTBCS; S120FTS; S120FTPRS)
 [G004, H004, J004];
 H6.0-7.0FT (H135-155FT) [H006, J006, K006, L006];
 H2.0-3.5FT (H40-70FT) [L177, N177, P177];
 H4.0FT5/FT6; H4.5FTS5, H4.5FT6; H5.0-5.5FT (H80-120FT) [N005, P005, R005,
 S005, U005];
 E2.2-3.5XN (E45-70XN) [A268];
 J2.2-3.5XN (J45-70XN) [A276];
 J1.5-2.0XNT (J30-40XNT) [K160];
 J1.6-2.0XN (J30-40XN) [A935];
 H8.0FT, H8.0FT9, H9.0FT (H170FT, H175FT36, H190FT) [A299, B299, C299];
 (E30HSD₂, E35HSD₂, E40HSD₂) [B219];
 (E30HSD₃, E35HSD₃, E40HSD₃) [C219];
 (S50CT) [A267];
 (S50CT, S50CT2) [B267];
 H2.0-2.5CT (H50CT) [A274, B274];
 E1.6-2.0XN (E30-40XN) [A269];
 J4.0-5.0XN, J5.0-5.5XN6 (J80-120XN, J100XNL) [A970];
 H2.0-3.0XT (H40-60XT) [A380];
 J8.0XNL6, J8.0XNL9, J9.0XNL (J170-190XNL) [A250];
 H3.0XT [A409]

**"THE
QUALITY
KEEPERS"**

**HYSTER
APPROVED
PARTS**

General

This section covers the repair of the wire harness connectors, pins, sockets, and splicing of wires.

Deutsch Crimping Tool

HOW TO STRIP A WIRE FOR USE WITH DEUTSCH CRIMPING TOOL

1. Choose Metri-Pack Connector the correct AWG for the contact being used. See Table 15.
2. See Table 15 for recommended strip length for contact size. Measure strip length from end of wire as shown in Figure 1.

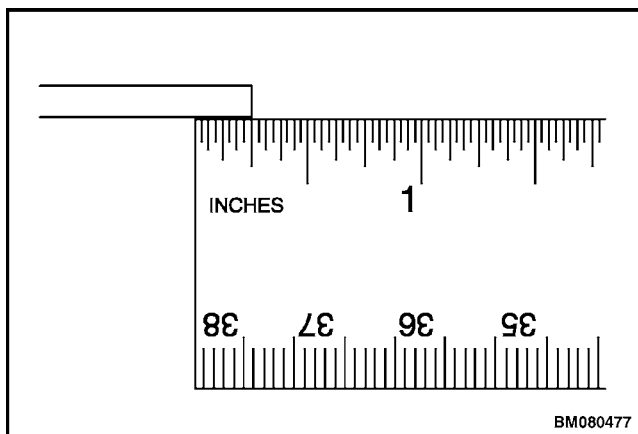


Figure 1. Strip Length Measurement

3. Strip the wire to the recommended strip length. A small piece of insulation should come off the wire after stripping. See Figure 2.

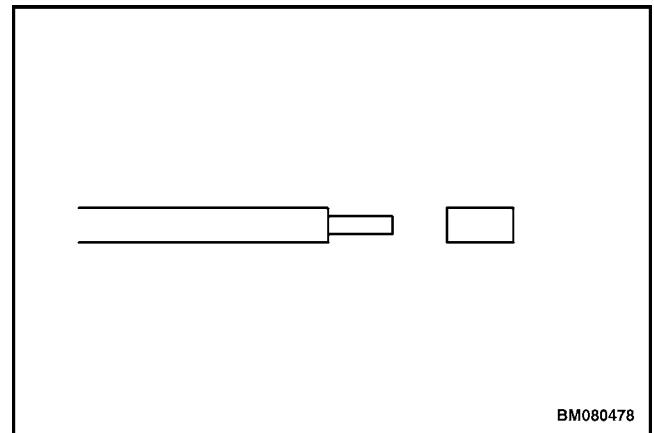


Figure 2. Stripped Wire

4. Check for any broken strands or for a nick in the wire. If either exists, the wires are damaged and should be cut and stripped again.
5. Measure the exposed strands to verify strip length is correct. See Figure 3.

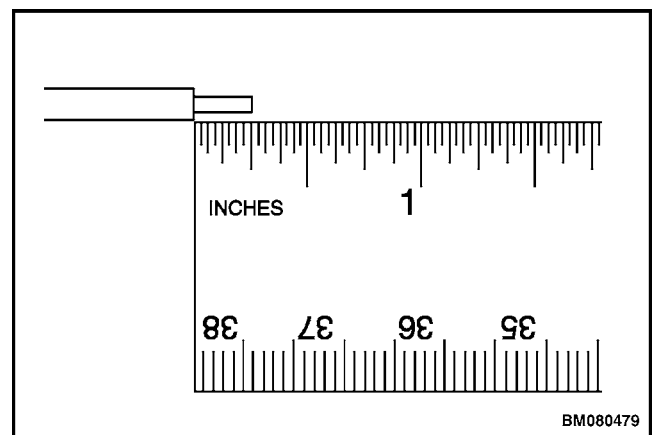


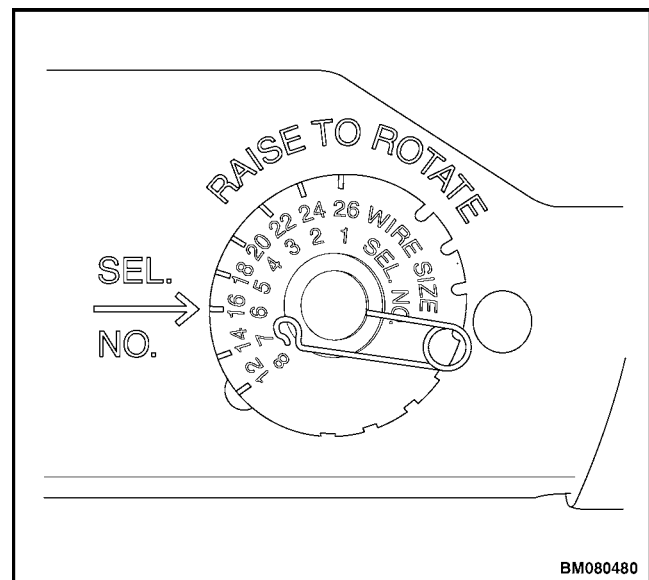
Figure 3. Strip Length Measurement Verification

Table 1. Wire Strip Length Specifications

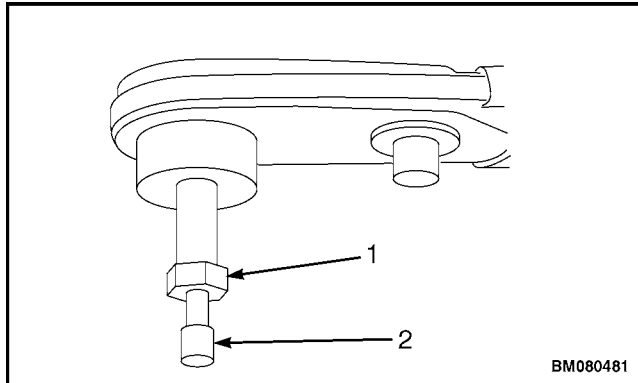
Contact Part Number	Type	Wire Gauge Range	Recommended Strip Length
1463136	Pin	20 AWG (0.5 mm ²)	3.96 to 5.54 mm (0.156 to 0.218 in.)
1463137	Socket	20 AWG (0.5 mm ²)	3.96 to 5.54 mm (0.156 to 0.218 in.)
1660396	Pin	20 AWG (0.5 mm ²)	4.0 to 5.5 mm (0.157 to 0.217 in.)
1330433	Pin	16 to 20 AWG (1.0 to 0.5 mm ²)	6.35 to 7.92 mm (0.250 to 0.312 in.)
1330434	Socket	16 to 20 AWG (1.0 to 0.5 mm ²)	6.35 to 7.92 mm (0.250 to 0.312 in.)
1659638	Pin	16 to 20 AWG (1.0 to 0.5 mm ²)	6.4 to 7.9 mm (0.252 to 0.311 in.)
1579860	Socket	16 to 20 AWG (1.0 to 0.5 mm ²)	6.4 to 7.9 mm (0.252 to 0.311 in.)
1330435	Pin	14 AWG (2.0 mm ²)	6.35 to 7.92 mm (0.250 to 0.312 in.)
1330436	Socket	14 AWG (2.0 mm ²)	6.35 to 7.92 mm (0.250 to 0.312 in.)
1653804	Socket	14 AWG (2.0 mm ²)	6.4 to 7.9 mm (0.252 to 0.311 in.)
0866401	Pin	12 to 14 AWG (3.0 to 2.0 mm ²)	5.64 to 7.21 mm (0.222 to 0.284 in.)
1554359	Socket	12 to 14 AWG (3.0 to 2.0 mm ²)	5.64 to 7.21 mm (0.222 to 0.284 in.)

HOW TO CRIMP WITH THE DEUTSCH CRIMPING TOOL

- Strip the insulation from the wire. See How to Strip a Wire for Use With Deutsch Crimping Tool.
- Raise the selector knob and rotate until arrow is aligned with wire gauge to be crimped. See Figure 4.

**Figure 4. Selector Knob**

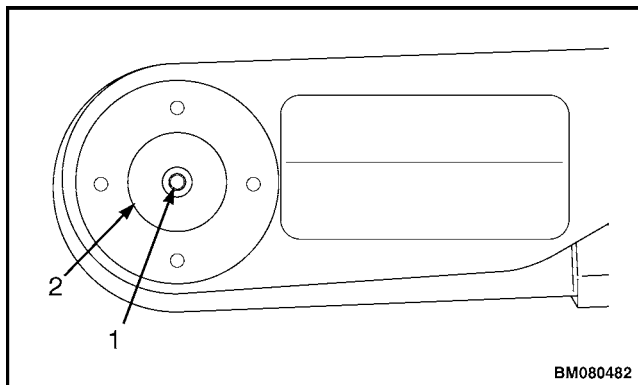
- Loosen lock nut and turn adjusting screw until it stops. See Figure 5.



1. LOCK NUT
2. ADJUSTING SCREW

Figure 5. Adjusting Screw and Lock Nut

4. Insert the contact into the crimping tool; for pin contacts, insert short end into crimping tool; for socket contacts, insert long end into crimping tool. See Figure 6.



1. INSERTION POINT
2. INDENTOR COVER

Figure 6. Insertion Point

5. Turn the adjusting screw clockwise until the contact is flush or slightly above flush with the indenter cover (cover around insertion point). See Figure 6. Tighten the lock nut.
6. Insert the wire into the contact. There should be no loose strands. All strands should be contained in the contact barrel. The contact must be centered between indicators. See Figure 7.

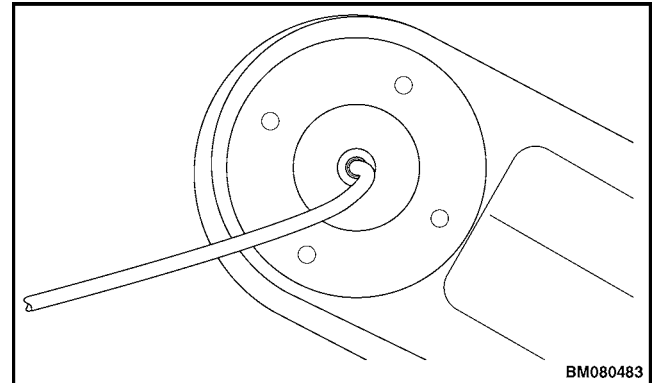
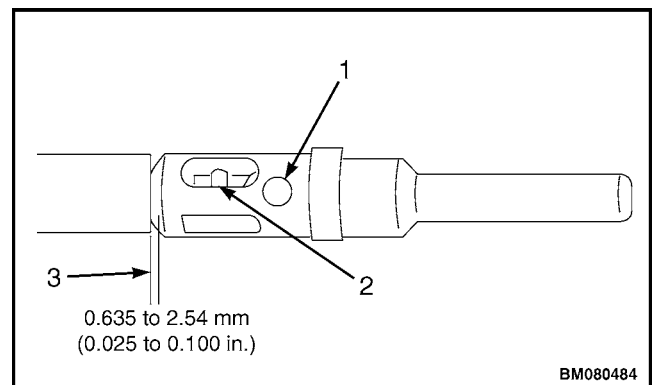


Figure 7. Wire Insertion

7. Close handles until handles stop.
8. Release handles and remove crimped contact.
9. Visually check the crimped contact for the following:
 - a. The conductor is inserted to the proper depth and is visible through the inspection hole. See Figure 8.
 - b. There is about 0.635 to 2.54 mm (0.025 to 0.100 in.) of conductor between the contact and the insulator.
 - c. There are no damaged wire strands.
 - d. There are no frayed wires or wires not entering the contact barrel.



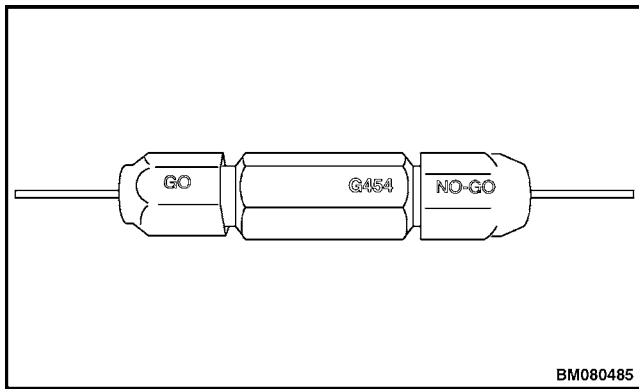
1. INSPECTION HOLE
2. CRIMP
3. INSULATION GAP,
0.635 TO 2.54 mm (0.025 TO 0.100 in.)

Figure 8. Proper Crimp

- If any of the conditions in Step 9 are not met, discard the contact, re-cut and strip the wire, and start the crimping process over.

CALIBRATION TEST FOR THE DEUTSCH CRIMPING TOOL

The G454 testing tool is needed for the following procedures. The G454 testing tool is for use with the Deutsch hand crimping tool only. See Figure 9.

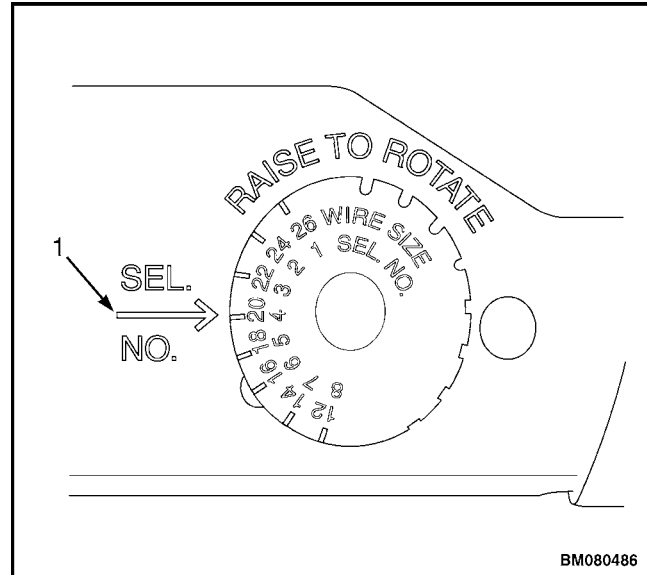


- GO END (GREEN)
- NO-GO END (RED)

Figure 9. G454 Testing Tool

NOTE: Testing for all wire sizes should be #20 wire size, selector number 4. This ensures proper calibration for all settings and further testing is not needed for the other selections.

- Set the Deutsch hand crimp tool to #20 wire size, selector number 4. See Figure 10.



- SELECTOR SET AT #20 WIRE SIZE, SELECTOR NUMBER 4

Figure 10. Selector Test Setting

- Squeeze the handles of the crimp tool completely together. See Figure 11.

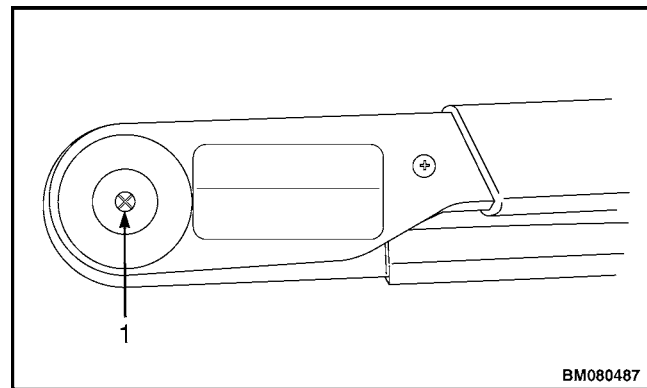
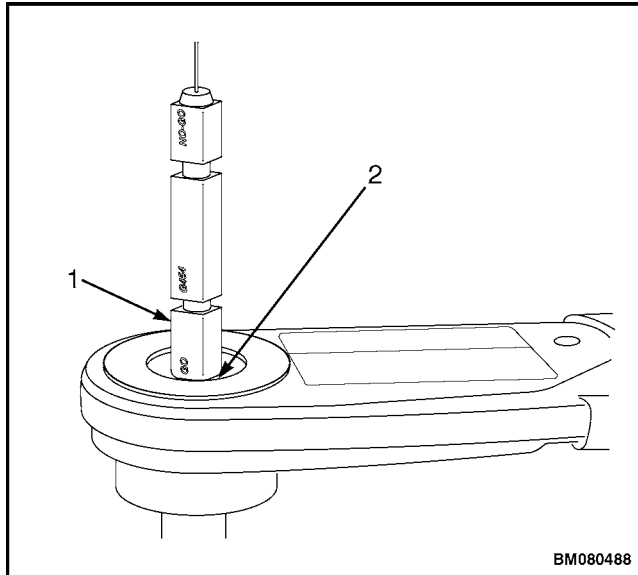


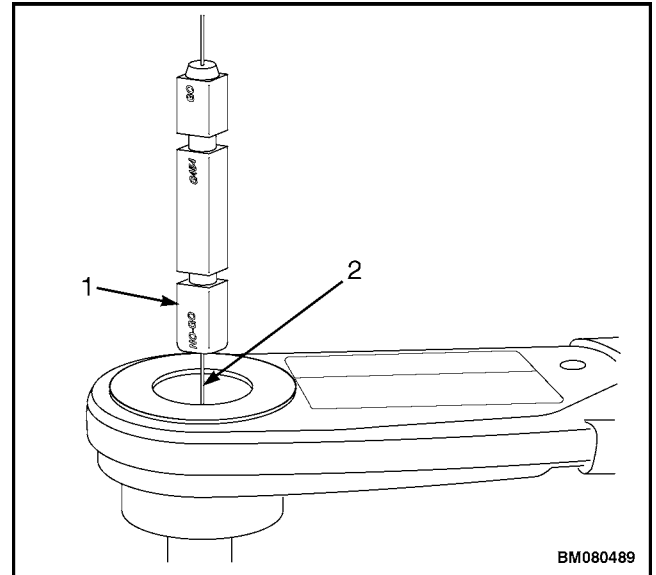
Figure 11. Insertion Point

- Insert the Go end (green) of the G454 testing tool into the insertion point of the crimp tool while the handles are completely closed. The Go end (green) should insert easily. If it does not insert, the calibration is incorrect and the crimp tool must be replaced. See Figure 12.



1. GO END (GREEN)
2. GO END COMPLETELY INSERTED

Figure 12. Go End Test



1. NO-GO END (RED)
2. NO-GO END SHOULD NOT INSERT ANY FURTHER

Figure 13. No-Go End Test

4. Insert the No-Go end (red) of the G454 testing tool into the insertion point of the crimp tool while the handles are still completely closed. The No-Go end (red) should not insert. If it does insert, the calibration is incorrect and the crimp tool must be replaced. See Figure 13.

Deutsch Connectors

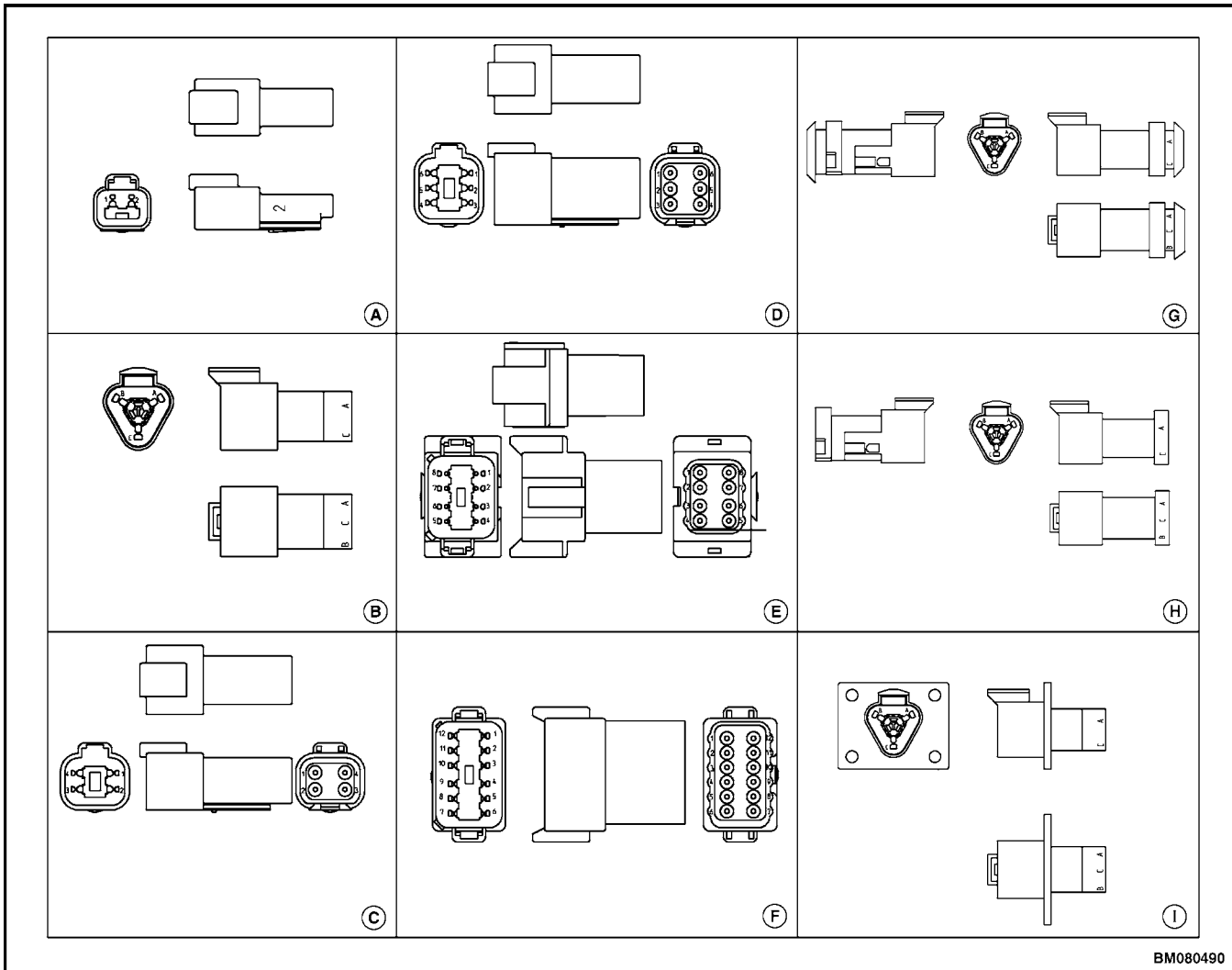
DT, DTM, AND DTP SERIES CONNECTORS

All Deutsch DT, DTM, and DTP series pin- and socket-type connectors are repaired in the same manner.

For examples of the DT connectors, see Figure 14 for the different connector receptacles, Figure 15 for the different connector receptacle secondary locks,

Figure 16 for the different connector plugs, and Figure 17 for the different connector plug secondary locks.

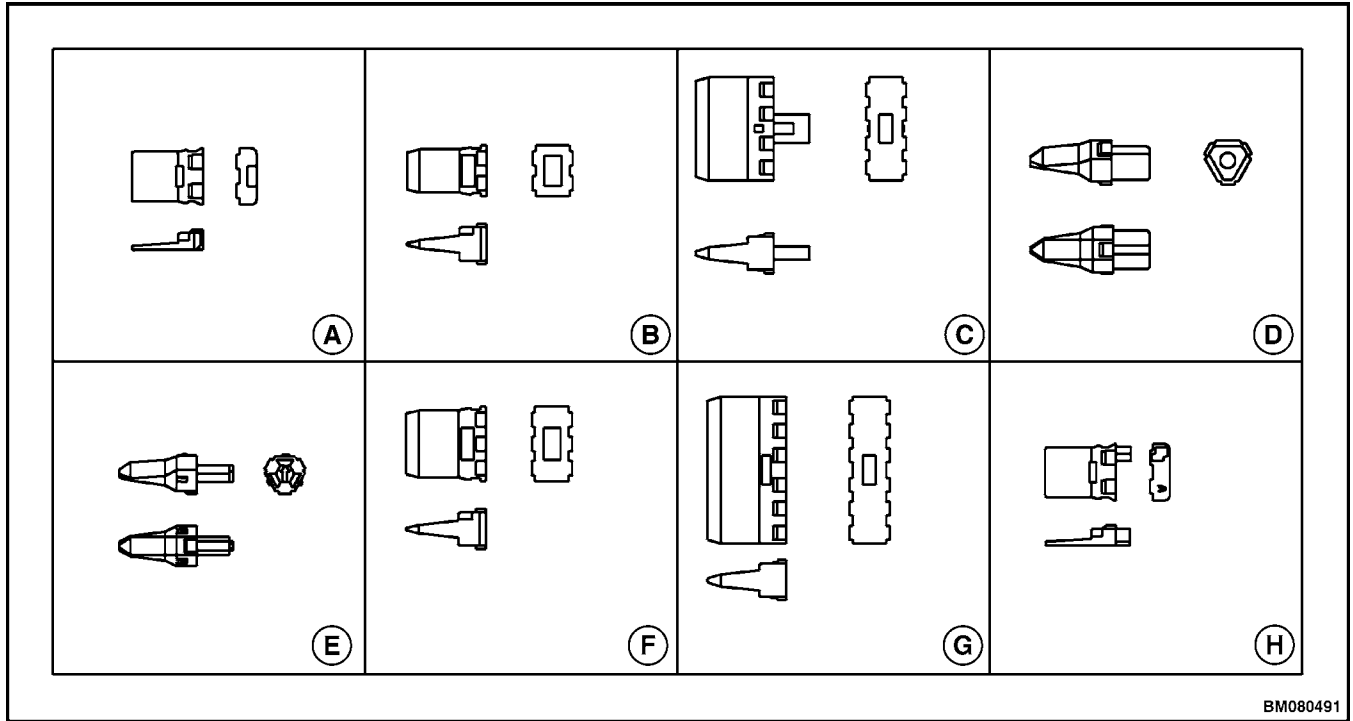
For examples of the DTM and DTP connectors, see Figure 18 for the different connector receptacles, Figure 19 for the different connector receptacle secondary locks, Figure 20 for the different connector plugs, and Figure 21 for the different connector plug secondary locks.



NOTE: ALL CONNECTOR RECEPTACLES ARE SHOWN WITH THE SECONDARY LOCK INSTALLED.

- | | |
|----------------------|---|
| A. CONNECTOR TYPE AA | F. CONNECTOR TYPE AF |
| B. CONNECTOR TYPE AB | G. CONNECTOR TYPE AB-A (SIMILAR TO TYPE AB) |
| C. CONNECTOR TYPE AC | H. CONNECTOR TYPE AB-B (SIMILAR TO TYPE AB) |
| D. CONNECTOR TYPE AD | I. CONNECTOR TYPE AB-C (SIMILAR TO TYPE AB) |
| E. CONNECTOR TYPE AE | |

Figure 14. DT Connector Receptacles

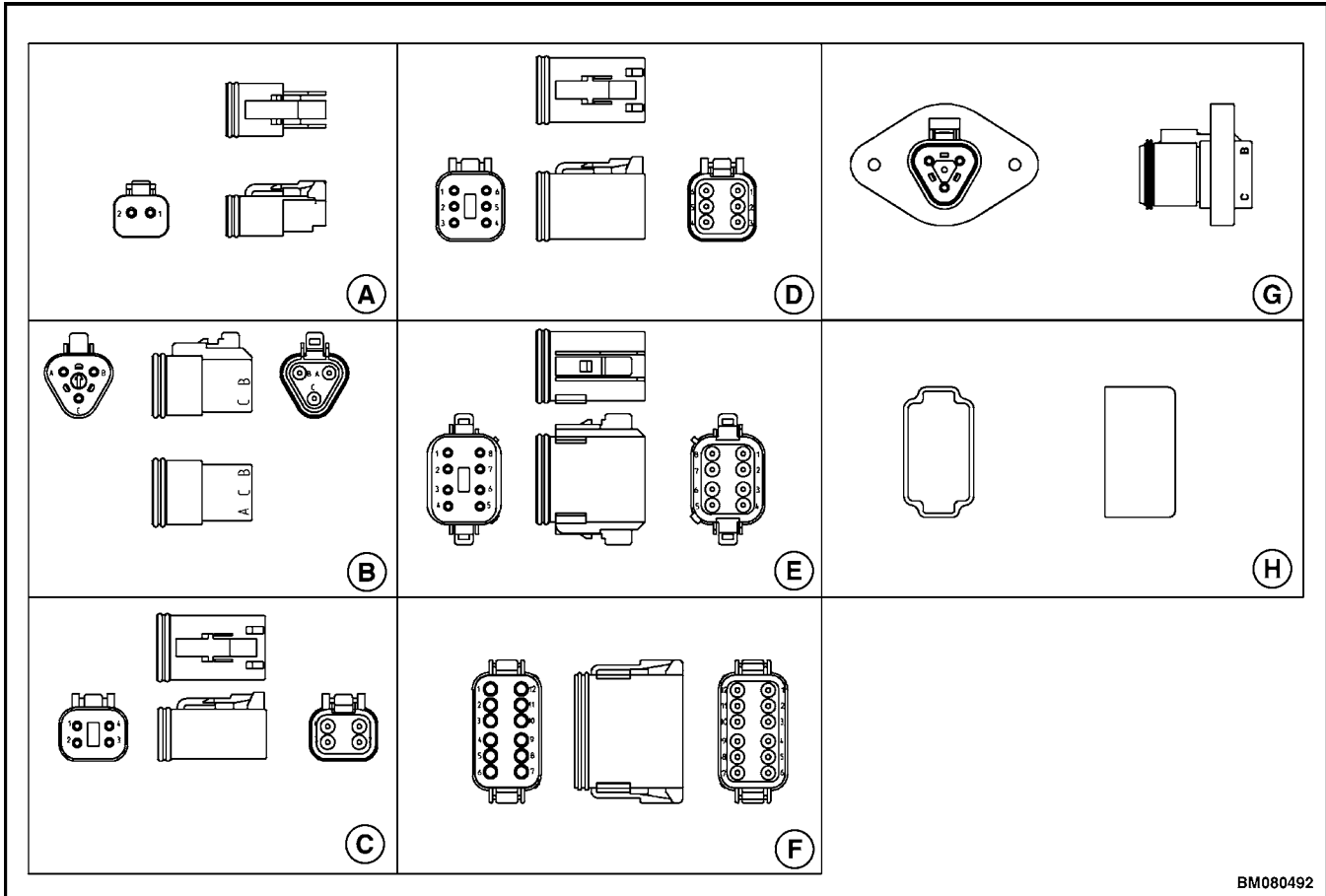


BM080491

- A. SECONDARY LOCK TYPE BA
- B. SECONDARY LOCK TYPE BB
- C. SECONDARY LOCK TYPE BC
- D. SECONDARY LOCK TYPE BD

- E. SECONDARY LOCK TYPE BE
- F. SECONDARY LOCK TYPE BF
- G. SECONDARY LOCK TYPE BG
- H. SECONDARY LOCK TYPE BH

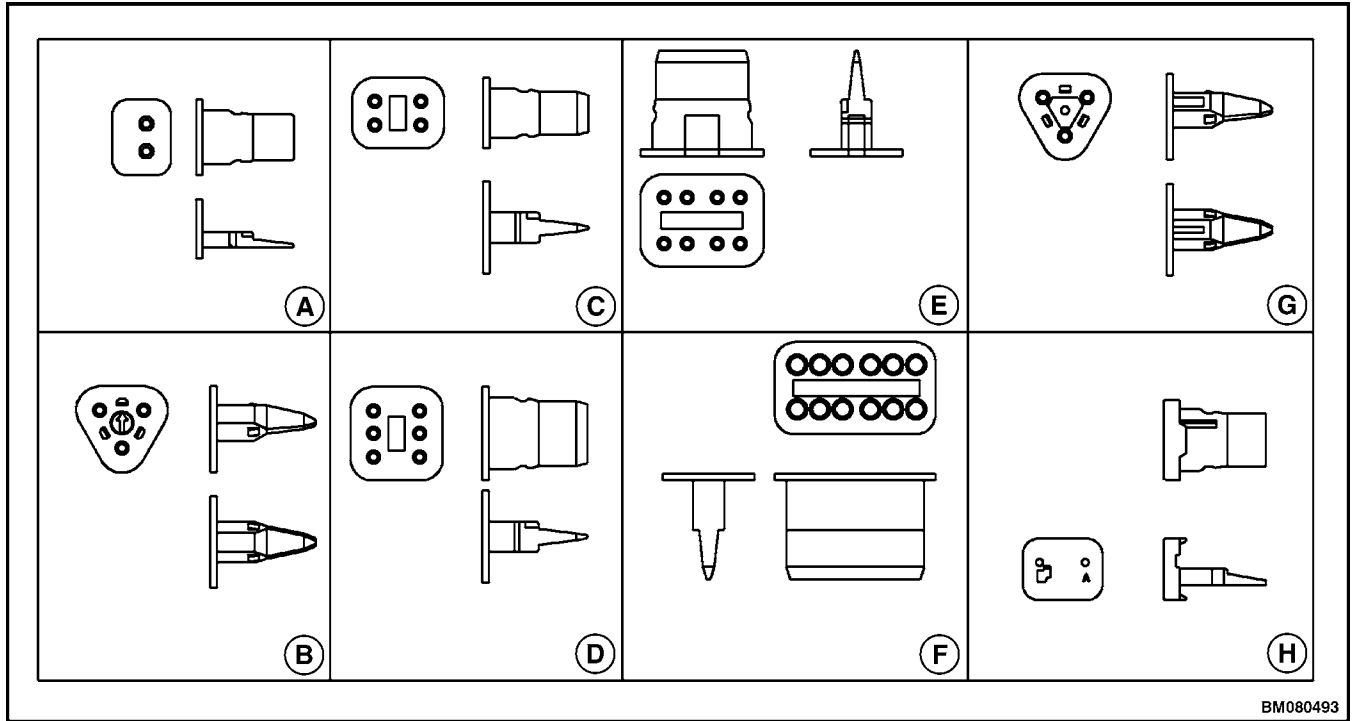
Figure 15. DT Connector Receptacle Secondary Locks



NOTE: ALL CONNECTOR PLUGS ARE SHOWN WITH THE SECONDARY LOCK INSTALLED.

- A. CONNECTOR TYPE CA
- B. CONNECTOR TYPE CB
- C. CONNECTOR TYPE CC
- D. CONNECTOR TYPE CD
- E. CONNECTOR TYPE CE
- F. CONNECTOR TYPE CF
- G. CONNECTOR TYPE CH (SIMILAR TO TYPE CB)
- H. CONNECTOR TYPE CG

Figure 16. DT Connector Plugs

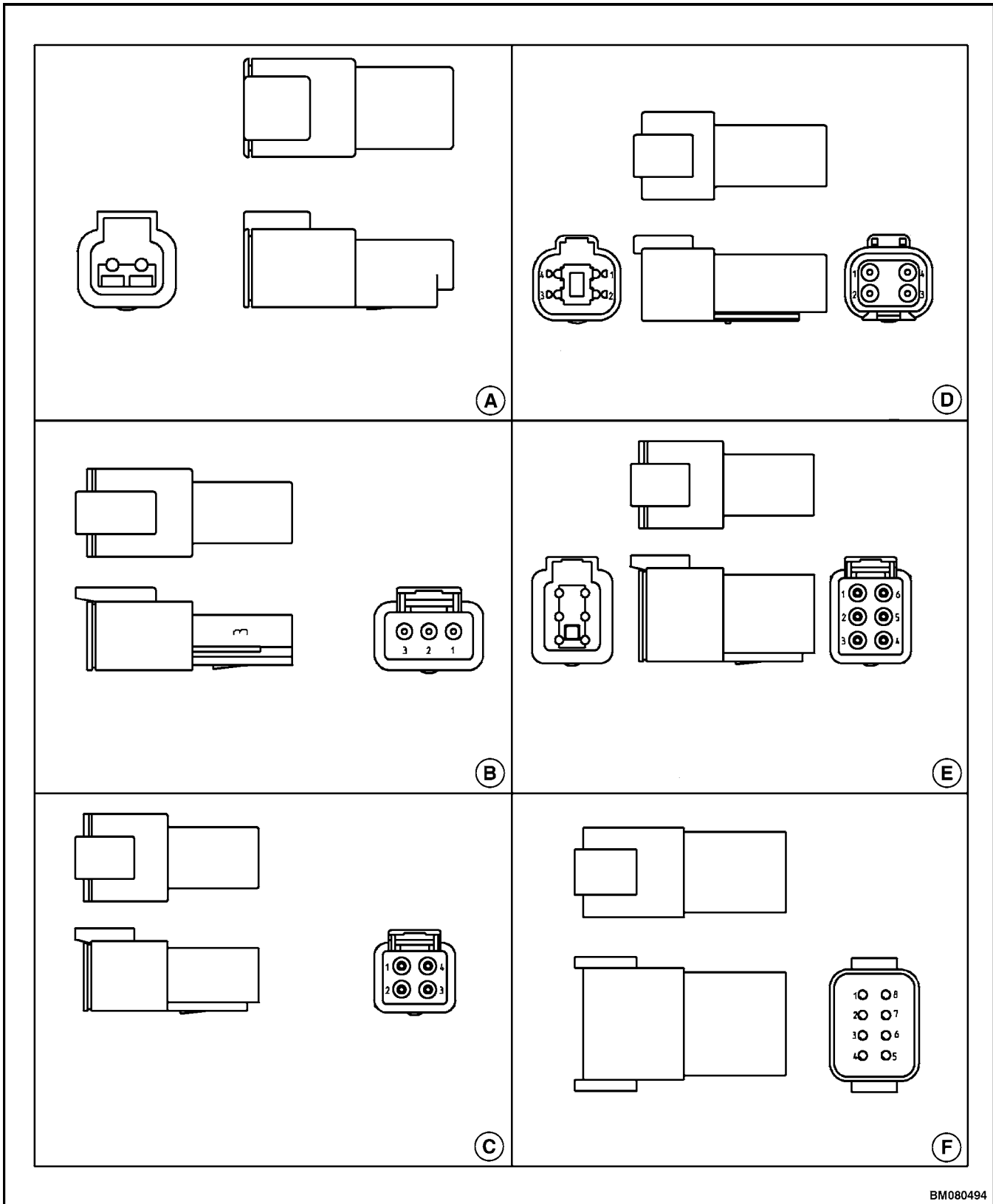


BM080493

- A. SECONDARY LOCK TYPE DA
- B. SECONDARY LOCK TYPE DB
- C. SECONDARY LOCK TYPE DC
- D. SECONDARY LOCK TYPE DD

- E. SECONDARY LOCK TYPE DE
- F. SECONDARY LOCK TYPE DF
- G. SECONDARY LOCK TYPE DG
- H. SECONDARY LOCK TYPE DH

Figure 17. DT Connector Plug Secondary Locks

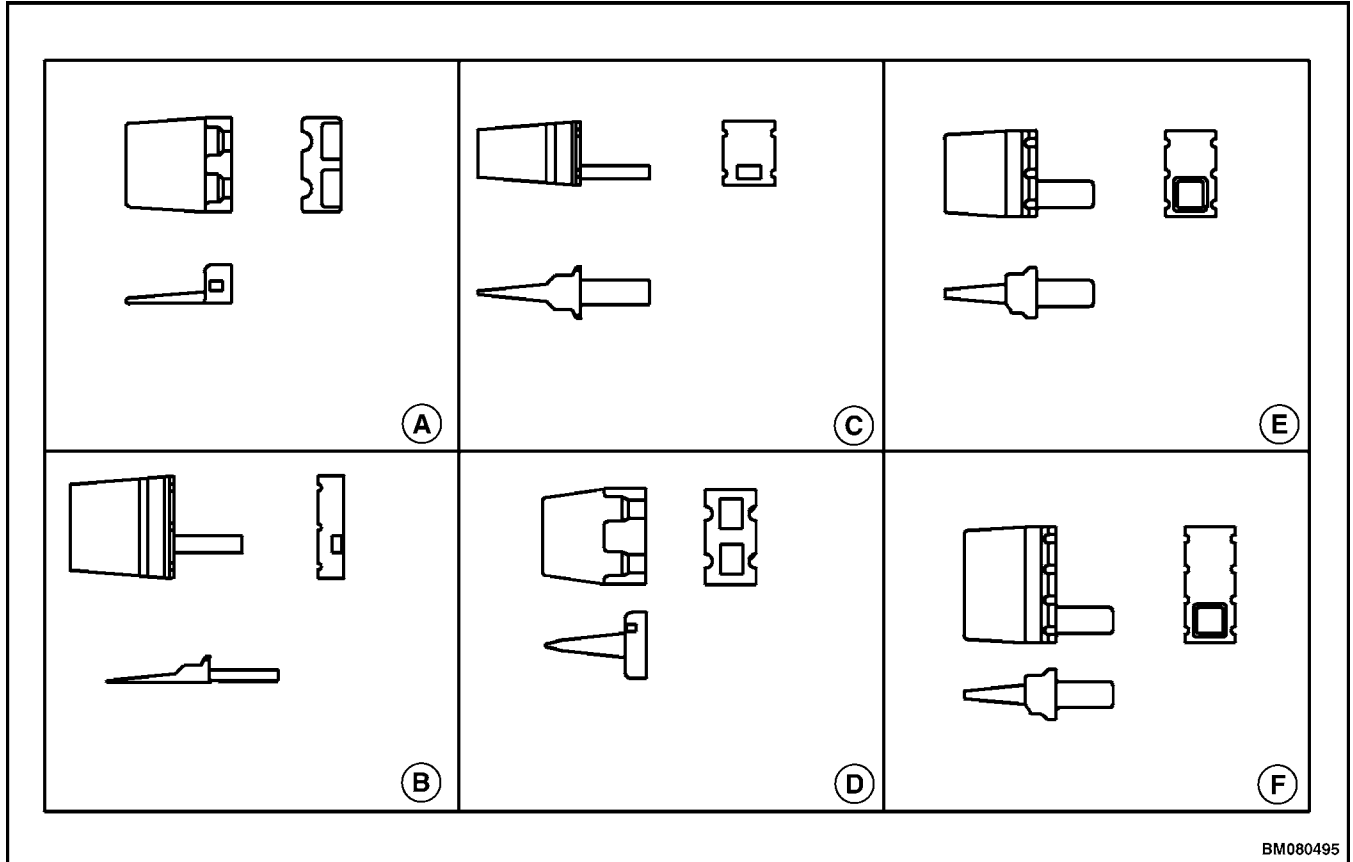


BM080494

Figure 18. DTM and DTP Connector Receptacles

Legend for Figure 18.

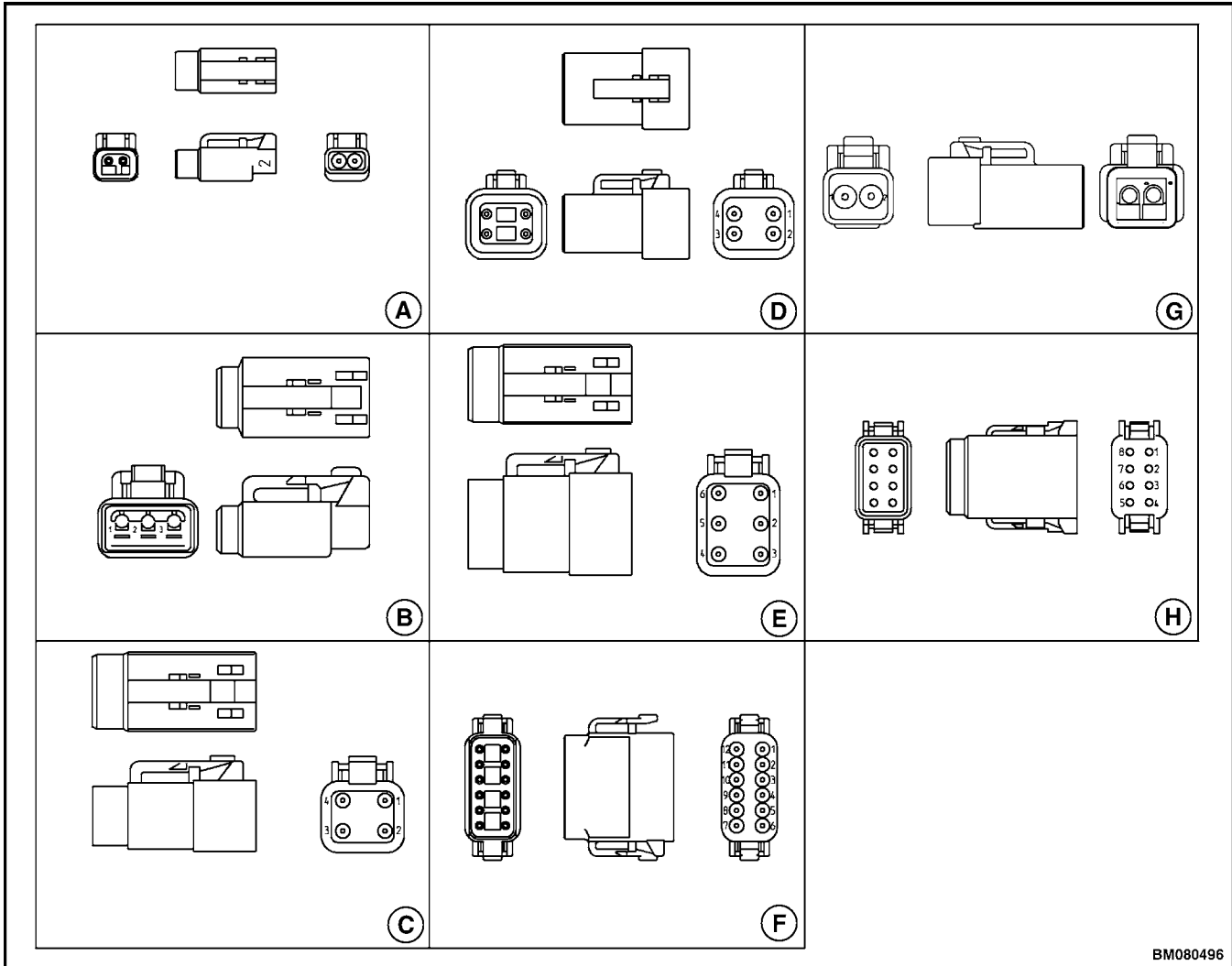
- A. DTP CONNECTOR TYPE EA
- B. DTM CONNECTOR TYPE EB
- C. DTM CONNECTOR TYPE EC
- D. DTP CONNECTOR TYPE ED
- E. DTM CONNECTOR TYPE EE
- F. DTM CONNECTOR TYPE EF



BM080495

- A. DTP SECONDARY LOCK TYPE FA
- B. DTM SECONDARY LOCK TYPE FB
- C. DTM SECONDARY LOCK TYPE FC
- D. DTP SECONDARY LOCK TYPE FD
- E. DTM SECONDARY LOCK TYPE FE
- F. DTM SECONDARY LOCK TYPE FF

Figure 19. DTM and DTP Connector Receptacle Secondary Locks

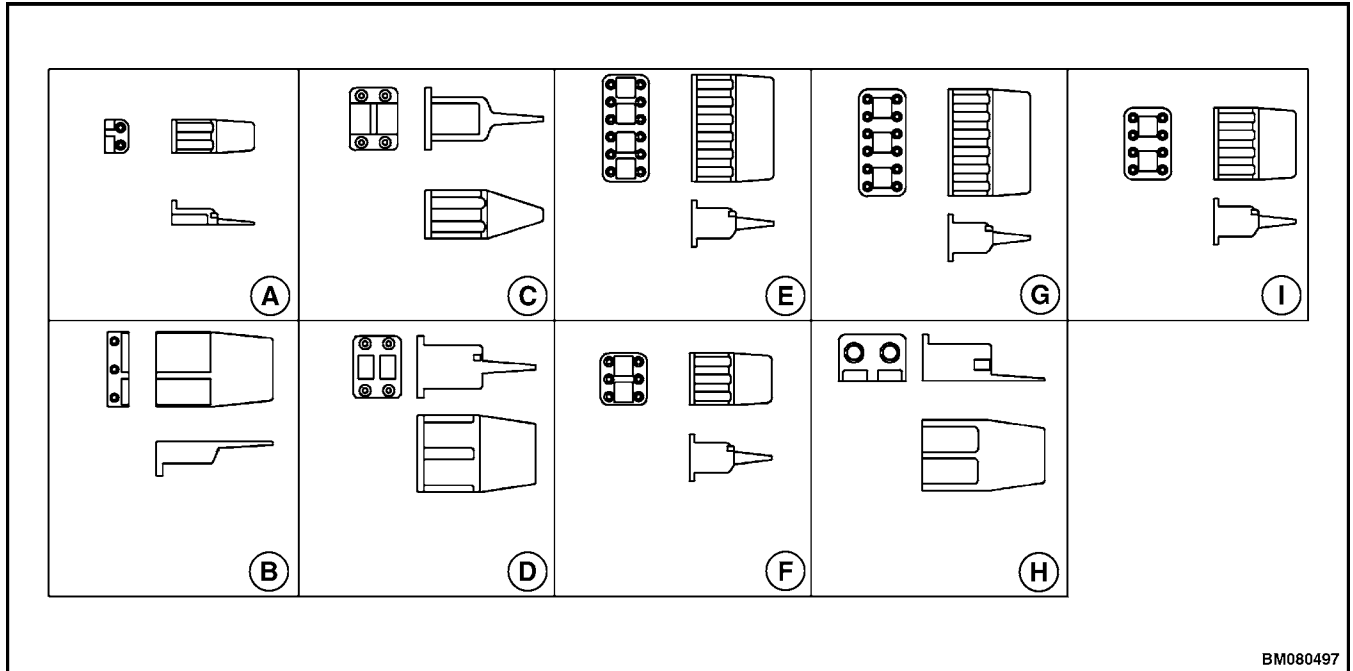


BM080496

- A. DTM CONNECTOR TYPE GA
- B. DTM CONNECTOR TYPE GB
- C. DTM CONNECTOR TYPE GC
- D. DTP CONNECTOR TYPE GD

- E. DTM CONNECTOR TYPE GF
- F. DTM CONNECTOR TYPE GE
- G. DTP CONNECTOR TYPE GG
- H. DTM CONNECTOR TYPE GH

Figure 20. DTM and DTP Connector Plugs



BM080497

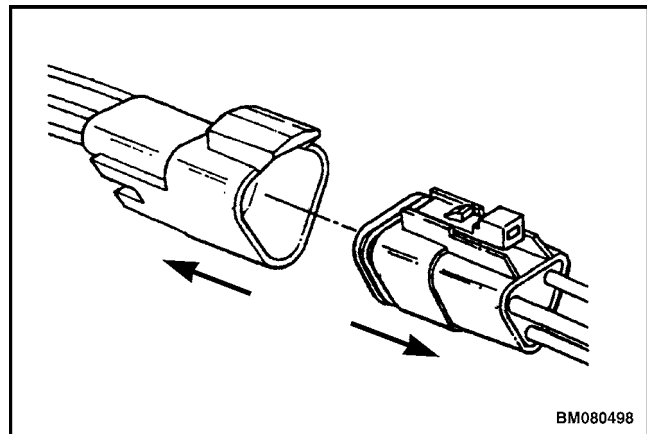
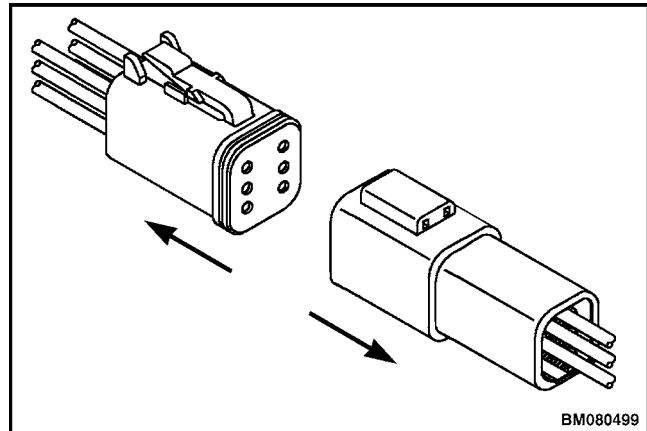
- | | |
|-------------------------------|-------------------------------|
| A. DTM SECONDARY LOCK TYPE HA | F. DTM SECONDARY LOCK TYPE HF |
| B. DTM SECONDARY LOCK TYPE HB | G. DTM SECONDARY LOCK TYPE HG |
| C. DTM SECONDARY LOCK TYPE HC | H. DTP SECONDARY LOCK TYPE HH |
| D. DTP SECONDARY LOCK TYPE HD | I. DTM SECONDARY LOCK TYPE HJ |
| E. DTM SECONDARY LOCK TYPE HE | |

Figure 21. DTM and DTP Connector Plug Secondary Locks

Connector Receptacle Replacement

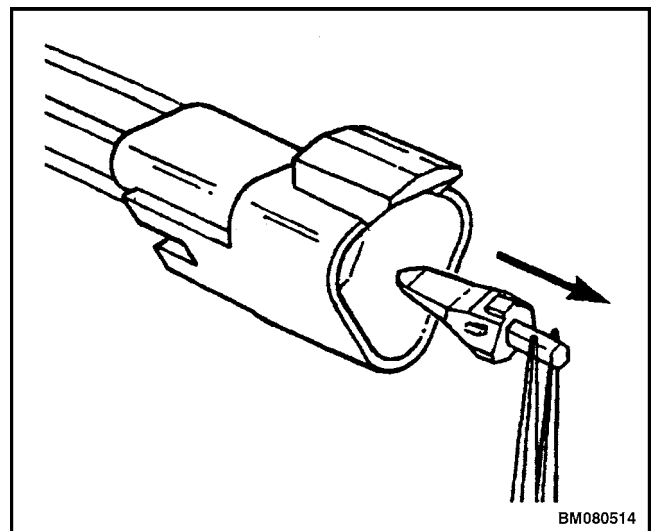
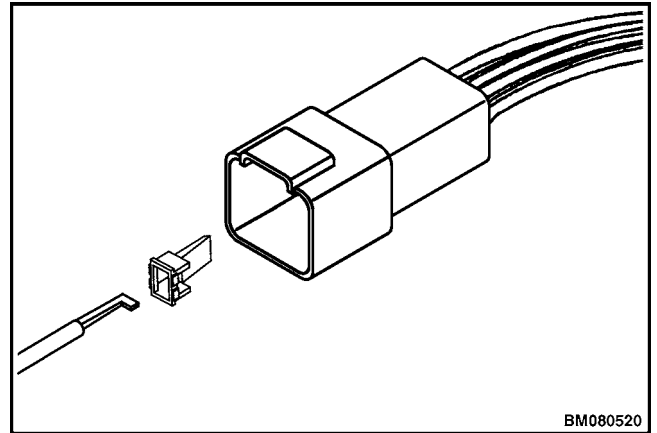
STEP 1.

Release the external locking clip(s) and separate the connector plug from the connector receptacle.



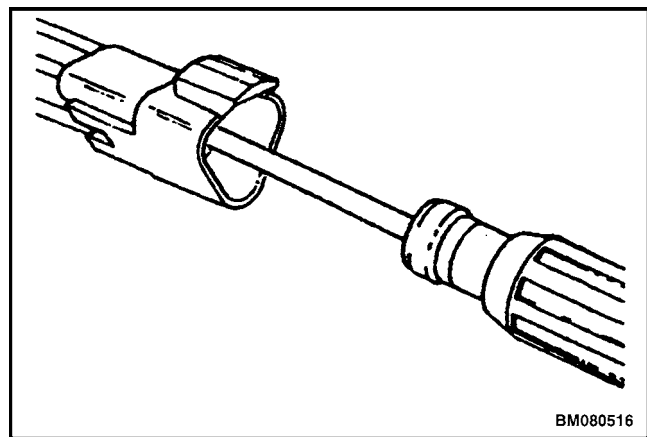
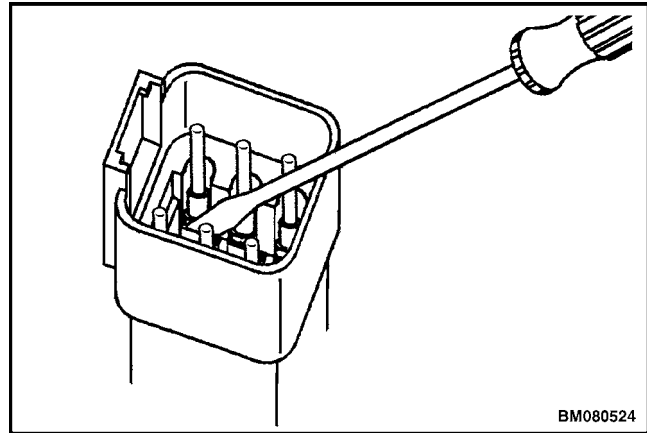
STEP 2.

Using a small hook end tool (Hyster Part No. 866404), or needle nose pliers, remove the secondary lock from the connector receptacle.



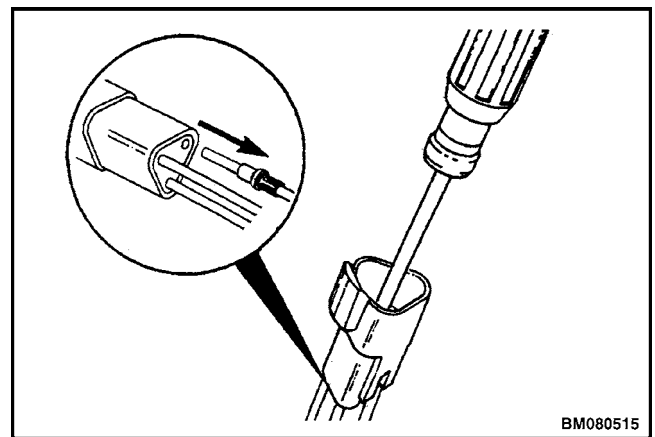
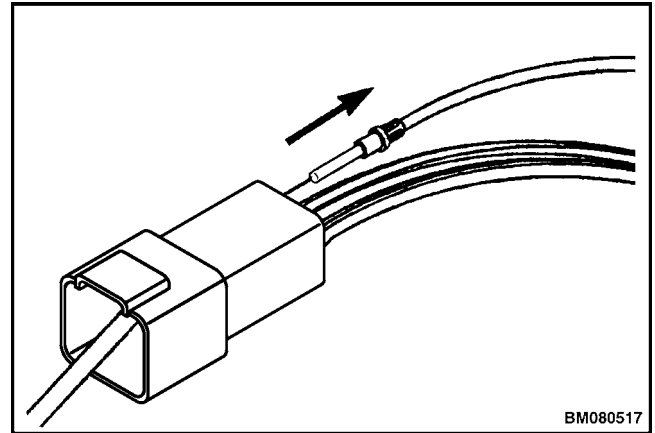
STEP 3.

Using a small, flat-blade screwdriver (Hyster P/N 866404), release the locking finger by moving it away from the pin.



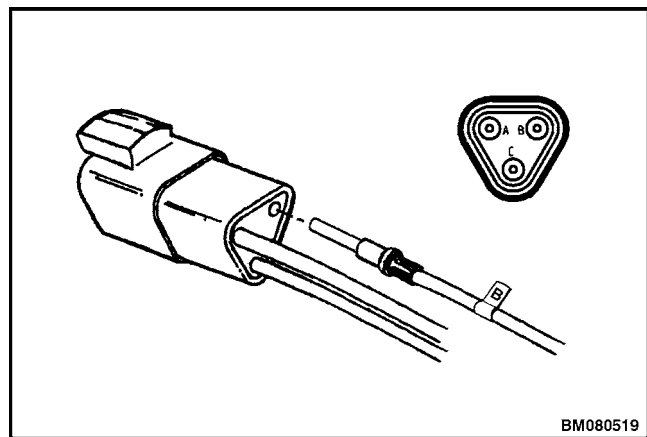
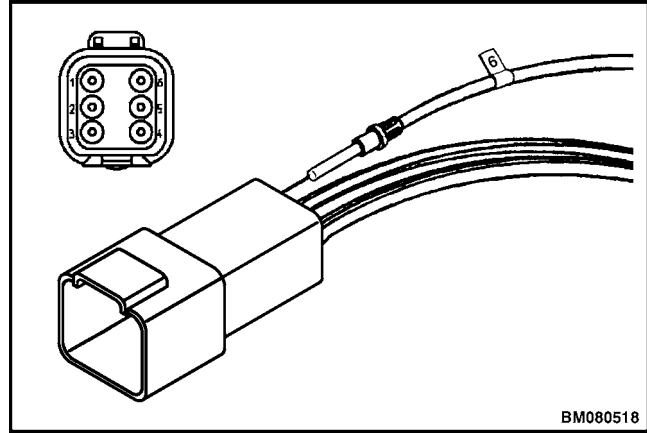
STEP 4.

Gently pull the wire backward while, at the same time, releasing the locking finger with the small, flat-blade screwdriver (Hyster P/N 866404).



STEP 5.

Tag the wire and mark it with the corresponding number or letter on the back of the connector from which the wire was removed.

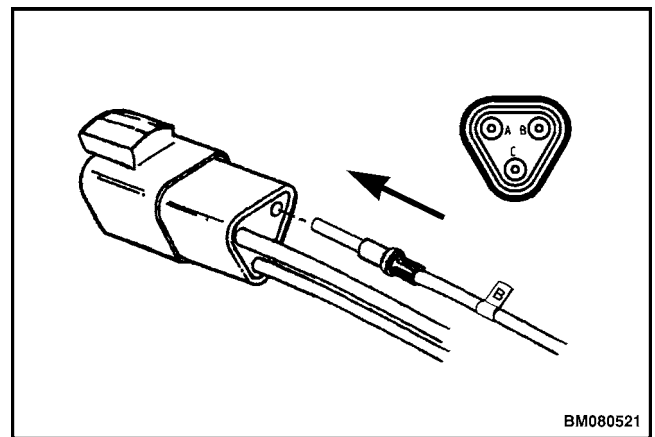
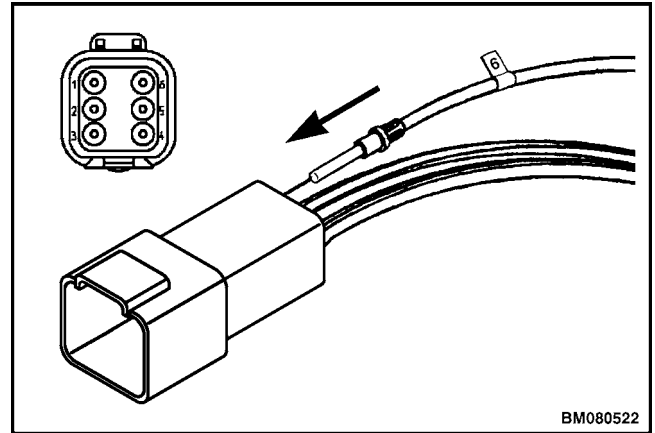


STEP 6.

Repeat Step 3 through Step 5 for the removal of the remaining wires.

STEP 7.

Insert the wires into the new connector receptacle according to the number or letter on the tag and connector receptacle. Push the wires straight into the back of the receptacle until a click is felt. Slightly tug each wire to verify the wire is properly locked in place. Remove tags.



NOTE: Verify that the seal is in place on the connector plug before installing the secondary lock.

Thanks for your reading.

Please click here to download complete manual instantly.

And can also choose other manuals.

Feel free --->write to me with any questions.

Our service email:

manuals007@hotmail.com