

<b>ADDRESSEES</b>	: Owners and operators of coaches listed under 'Application'
<b>COACH/BUS MODEL</b>	: T2100 Series and C2045 w/ Detroit Diesel Series 60 DDEC V engine
<b>BULLETIN TYPE</b>	: Service Information
<b>SECTION/CHAPTER</b>	: Section 3 – Drive train Chapter 2.2 Traction engine – control systems
<b>DATE</b>	: October 7, 2009
<b>SUBJECT</b>	: <b>Vehicle interface harness – chafing issues</b>
<b>TERMS &amp; CONDITIONS</b>	: -

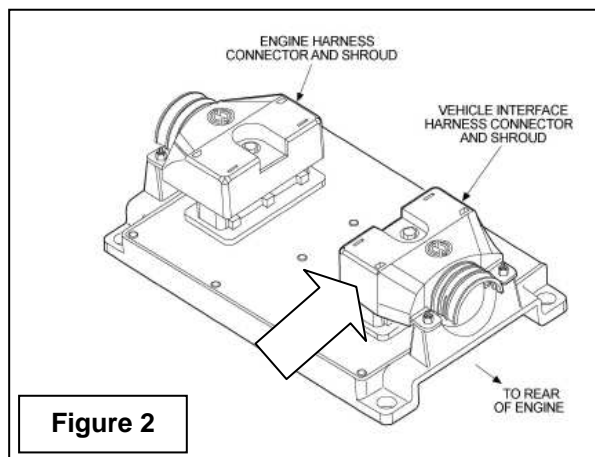
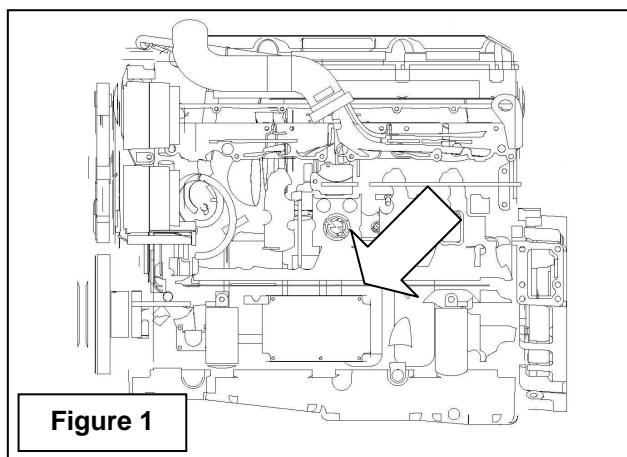
## APPLICATION:

Model	Engine	VIN T2140	VIN T2145
T2100	Detroit Diesel Series 60 DDEC V	40618 → 40629	44656 → 44666

Model	Engine	VIN
C2045	Detroit Diesel Series 60 DDEC V	46692 → 46788

## DESCRIPTION:

1. Van Hool has determined that, on the above-mentioned units, a defect may occur with respect to the vehicle interface harness connector and shroud that connect to the engine ECU (Figures 1 and 2).



*Description continued on next page.*

2. The part of the harness conduit that has been attached to the connector shroud may rub through the insulation of the wiring it contains.  
If this happens damage will occur just a few inches from the connector (Figure 3).

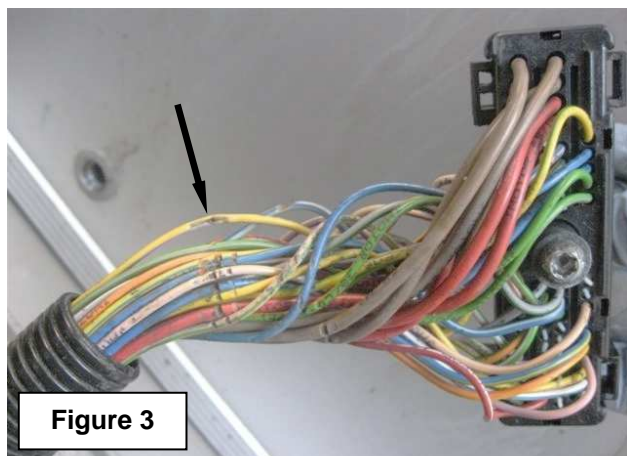


Figure 3

3. When regular maintenance inspections are performed the defect may go unnoticed as the shroud completely covers the connector and conduit.  
As a precautionary measure and in order to ensure system performance, it is therefore necessary to purposely check, and if necessary, improve the protection of the vehicle interface harness wires as described by the procedure further in this Bulletin.

### **MATERIAL:**

VH reference	Description	Qty.
10629667	Tape, self-amalgamating	A/R
Local sourcing	Electric parts cleaner	A/R
Local sourcing	Tie wrap	1
10559412	Splice connector, solder sleeve butt, 19 to 15 AWG*	A/R
10559413	Splice connector, solder sleeve butt, 15 to 13 AWG*	A/R
10884604	Wire harness, vehicle interface Detroit Diesel	1

\* Approximate sizes

- Parts/Waste disposal: discard old parts and products according to applicable environmental regulations.

### **PROCEDURE:**

#### **To check and improve the ECU connector wiring into shroud installation**

***NOTE:*** If the inspection described hereafter reveals corrosion or damage to related hardware such as the connector and shroud, this should be replaced as a matter of course.

If you do not have the expertise to perform present procedure, do not hesitate to go to your nearest ABC Customer Care & Parts Source service center.

#### **1. General:**

- This job should be executed by an experienced automotive electrician.
- For more information refer to the Maintenance Manual, and the Operator's Guide Book.

## 2. Special tools, equipment or services:

- This job does not require special tools, equipment nor services.

## 3. Preparations:

- Park the coach on a level-surfaced service pit with the front wheels straight.  
When using portable post lifts instead of a service pit, lower the suspension first.  
Apply the parking brake and shut down the engine.
- Switch off all systems and turn off the battery master switch.
- Put a "DO NOT OPERATE" tag on the instrument panel.
- Read the entire procedure before beginning to work.

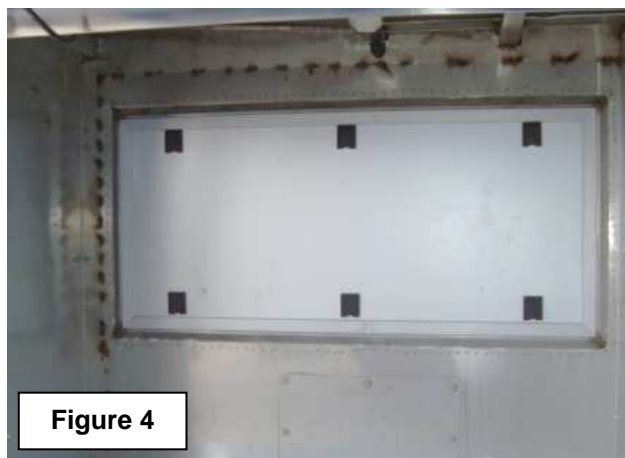
**CAUTION:** When working in the engine compartment, turn the starter motor inhibitor switch to "starter motor disabled" for the steps, which do not require engine operation.

**CAUTION:** Observe safe shop practices at all times.

## 4. To disconnect the vehicle interface harness assembly from the engine ECU:

***NOTE:** The engine ECU with the vehicle interface connector and harness are located on the right hand side of the engine.*

*On coaches without wheel chair lift, the connector and harness can be accessed either by removing the engine compartment door in the right-hand rear most luggage compartment (Figure 4), or from underneath the vehicle.*

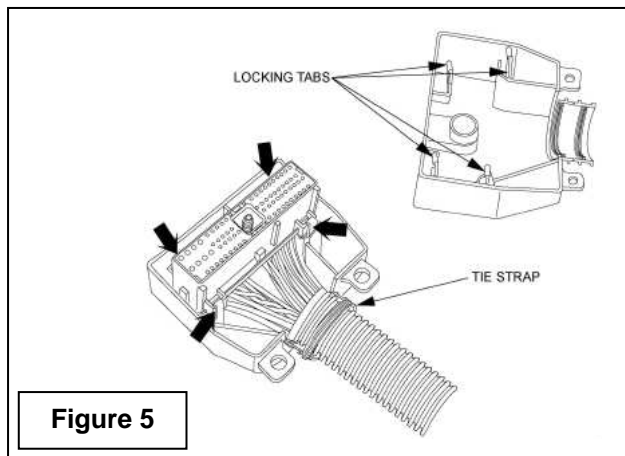


*On coaches featuring a wheel chair lift, the connector and harness should be accessed from underneath the vehicle only .*

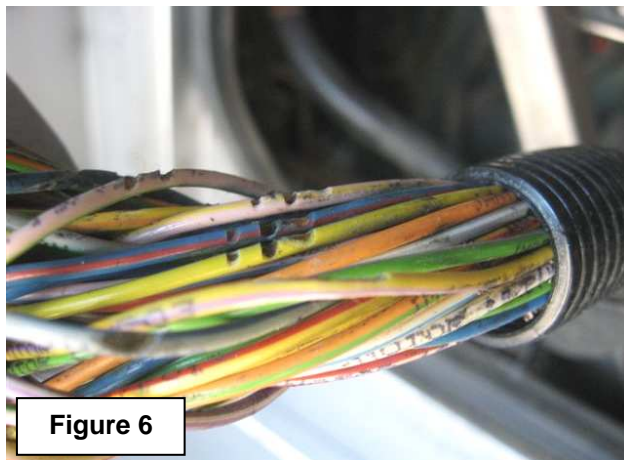
- 1) Locate the vehicle interface harness connector and shroud assembly (Figures 1 and 2).  
This is the assembly closest to the tag axle.  
Take note of the routing of the harness.  
Working inside the luggage compartment or underneath the vehicle, whichever is the most convenient, cut loose the harness over a length of approximately 3 ft by removing tie wraps as required.
- 2) Undo and remove the two locknuts securing the connector shroud to the ECU.  
Undo the center bolt securing the 68-pin connector.  
Carefully withdraw the connector and shroud from the ECU socket.

## 5. To inspect and repair damaged wiring:

- 1) Cut the tie wrap holding the harness in the neck of the shroud (Figure 5).
- 2) Remove the connector from the shroud by dislodging the four locking tabs (Figure 5). Use a small screwdriver to push back the tabs closest to the shroud wall.



- 3) Pull the conduit away from the connector to expose the inside wiring. Clean the wires with electric parts cleaner as required and inspect wire insulation for chafing (Figure 6). Also clean the connector pins and check them for damage or corrosion.



- 4) If the wire insulation is undamaged, proceed with subsection 6 "To improve the wire protection of the vehicle interface harness".
- 5) If the insulation of one or more wires has been damaged, the following splicing and repairing method for straight leads should be applied:

Label all damaged wires on each side of the damaged area.

Cut and strip them as required for splicing.

Reconnect the matching wires using solder sleeve butt splice connectors (Figure 7), which provide a tight connection and a durable and watertight insulation.

Make sure to follow the splice connector manufacturer's instructions, staggering the splices as shown in Figure 8.

Remove the labels.

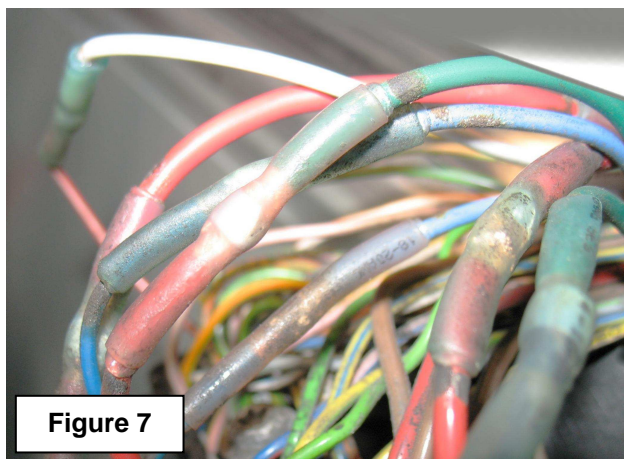


Figure 7

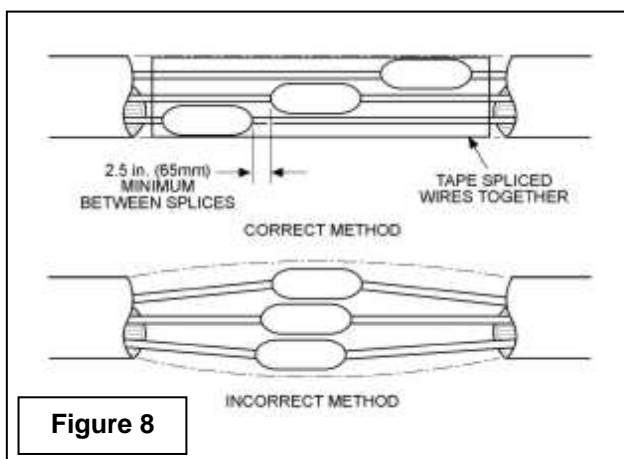


Figure 8

**6. To improve the wire protection of the vehicle interface harness:**

- 1) Pull the conduit away from the connector over a distance of 10 inches (Figure 9) to expose the inside wiring.  
Starting close to the connector, tape the wire loom over a distance of approximately 6 inches (Figures 10 and 11).  
Use the self-amalgamating tape from the parts list for this purpose.  
Ensure that at each new winding the tape overlaps the previous winding by 2/3rds.  
Remember that the tape should extend a minimum of 1 inch past the conduit when the affected parts are reassembled (Figure 18).  
Push the conduit back to its former position close to the connector.

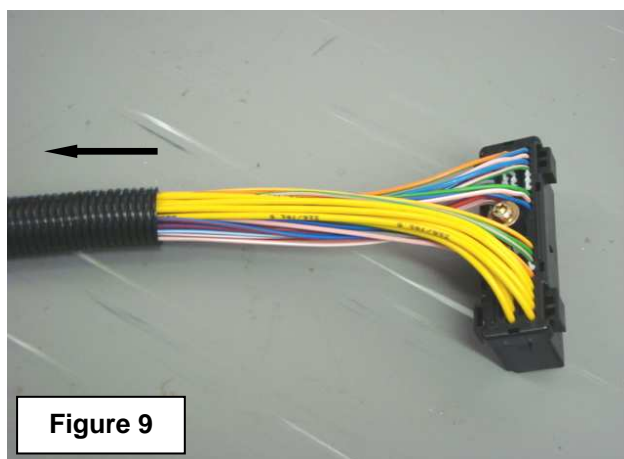
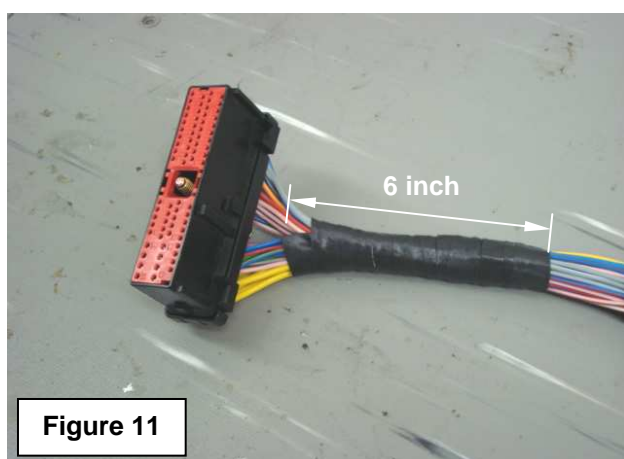
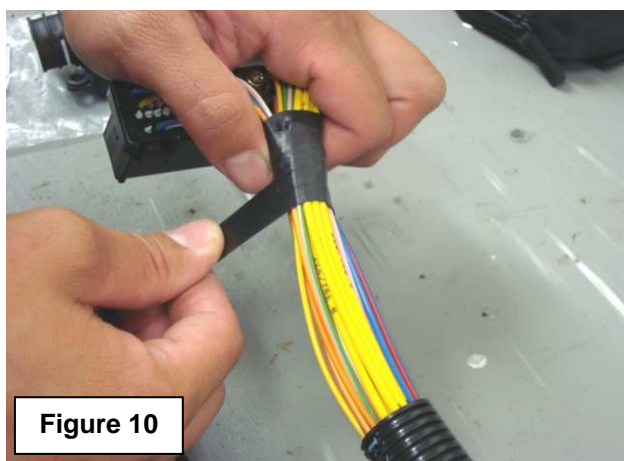


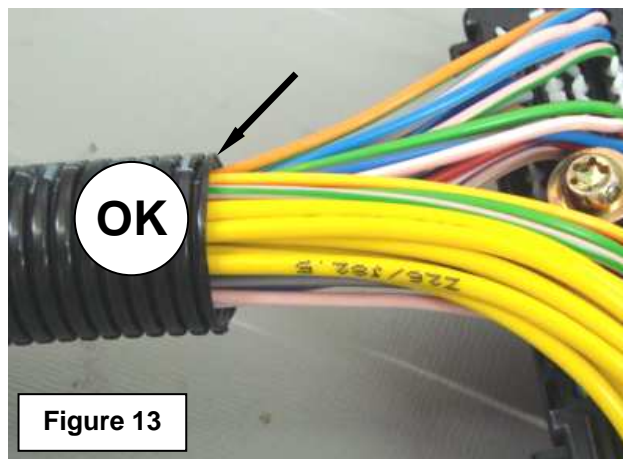
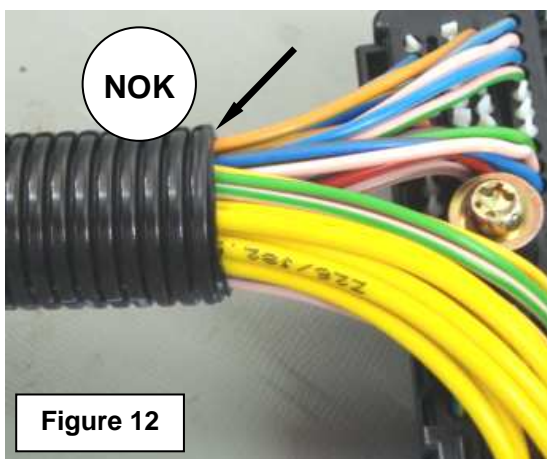
Figure 9



- 2) At the conduit exit closest to the connector, check the shape of the conduit outer rib. It shouldn't have a full radius as shown in Figure 12. Instead it should be bell mouthed as shown in Figure 13.

Correct as necessary using a utility knife and taking great care not to cut the wire jacketing. Before reshaping the conduit exit provide a hard plastic or metal insert on the inside to prevent cutting the wire insulation.

***NOTE:** It goes without saying that when all wires are already damaged and need repair the bell mouthing can best be done when all wires have been cut.*





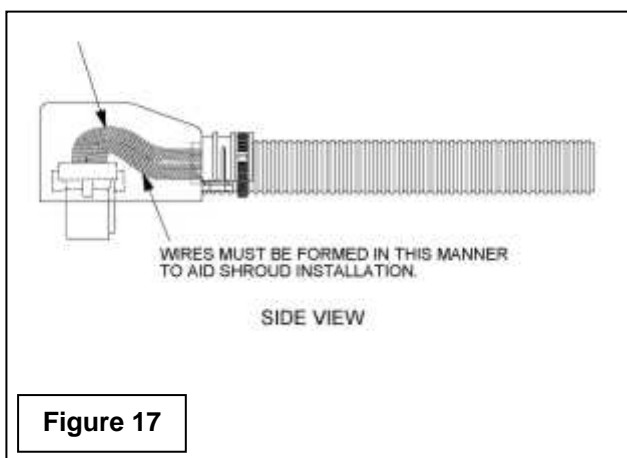
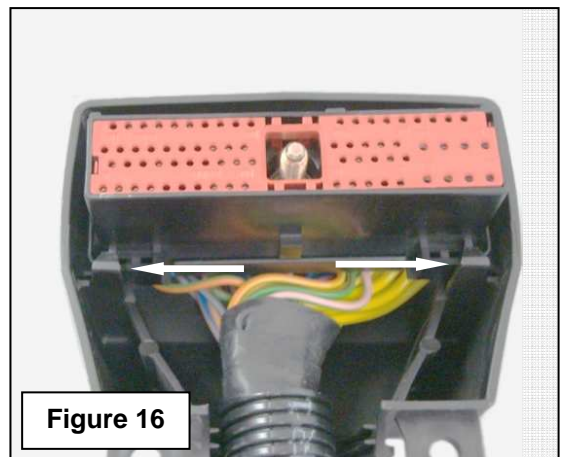
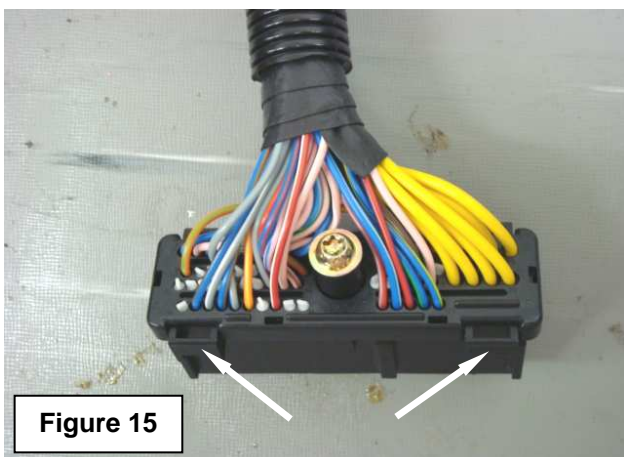
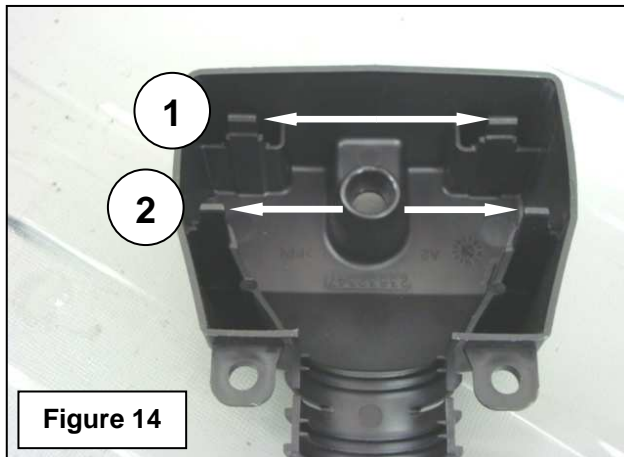
3) Reinstall the connector into the shroud, proceeding as follows:

Observe the locking tabs in the shroud and observe the connector body.

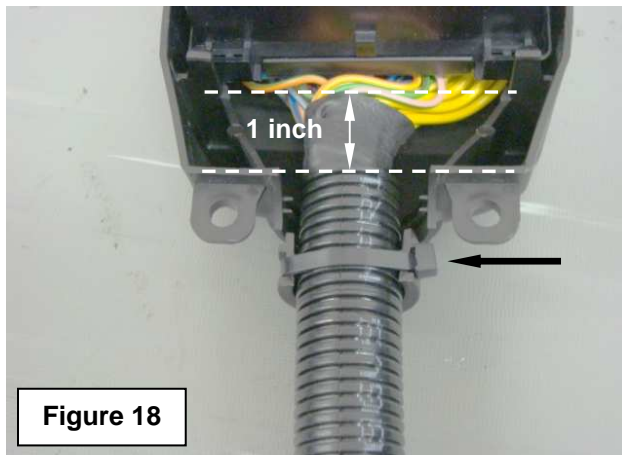
In the shroud the two locking tabs furthest from the collar (1, Figure 14) should be securely latched into the eyelets of the connector (Figure 15).

The two tabs closest to the collar (2, Figure 14) should be snapped over the connector tabs (Figure 16).

Ensure that the wires are not pinched between the connector and any of the shroud's protrusions during assembly (Figure 17).



- 4) Install the conduit into the shroud collar (Figure 18).  
Make sure that the conduit extends past the inner most ring on the shroud inlet.  
Use a tie wrap to secure the shroud to the conduit and the connector.



## **7. To reconnect the vehicle interface harness assembly to the engine ECU:**

- 1) Carefully reconnect the connector and shroud assembly to the ECU in reverse order to removal.  
Tightening torque for the connector center bolt: 50 in.lbf (5.6 Nm).  
The shroud lock nuts should be torqued to 30 in.lbf (3.4 Nm).
- 2) Referring to the notes previously taken, reinstall the vehicle interface harness using tie wraps.
- 3) Clear all fault codes, if diagnosed.
- 4) Remove all tools, close the access doors, and test drive the vehicle.

*Procedure complete.*

## **DISCLAIMER:**

The procedures contained herein are not exclusive. Van Hool cannot possibly know, evaluate, or advise the transportation industry of all conceivable ways in which a procedure may be undertaken or of the possible consequences of each such procedure. Other procedures may be as good, or better, depending upon the particular circumstances involved. Each carrier who uses the procedures herein must first satisfy itself thoroughly that neither the safety of its employees or agents, nor the safety or usefulness of any products, will be jeopardized by any procedure selected.

## **INFORMATION HANDLING:**

Important supplements to and modifications of the technical information not yet included in the manual, are communicated by means of Service Bulletins.

File the Service Bulletins at the back of your manual, in numerical order.

To make sure that you will be reminded of the Bulletins that have appeared in the meantime while paging the manual, mark the pages concerned by hand with the Service Bulletin number.