



# SERVICE BULLETIN

## SB1213

<b>ADDRESSEES</b>	: ABC Customer Care and Parts Source
<b>COACH/BUS MODEL</b>	: C2045, T2140, T2145
<b>BULLETIN TYPE</b>	: Product Improvement
<b>SECTION/CHAPTER</b>	: Section 11 – Body and accessories Chapter 10.10 – Windshield wipers & washers
<b>DATE</b>	: January 18, 2008
<b>SUBJECT</b>	: <b>DOGA wiper motor change</b>
<b>TERMS &amp; CONDITIONS</b>	: For units covered by the Van Hool normal warranty, the regular terms and conditions apply.

### **APPLICATION:**

Doga wiper motor VH 11025971 subject of this Bulletin can be retrofitted to following C-coaches:

Model	Engine	VIN
C2045	Cummins	46008 → 46097
	Detroit Diesel	46611 → 46739, 46746 → 46749
	Caterpillar	47050 → 47326, 47328 → 47329, 47332 → 47336, 47342 → 47390, 47392, 47397 → 47402

### **DESCRIPTION:**

#### **Production issues (C2045):**

1. Windshield wiper motor VH 11025972, which equipped earlier Commuter Coaches, has been phased out in production in favor of high torque wiper motor VH 11025971.
2. The new motor offers improved service life of the windshield wiping system and has been cut into production as from these units:

Model	Engine	VIN
C2045	Cummins	46098 →
	Detroit Diesel	46740 → 46745, 46750 →
	Caterpillar	47327, 47330 → 47331, 47337 → 47341, 47391, 47393 → 47396, 47403 →

*Description continued on next page.*

### **Field service issues (C2045, T2140, T2145):**

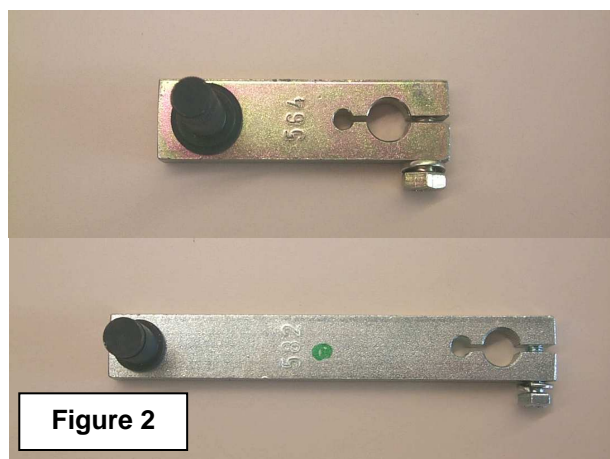
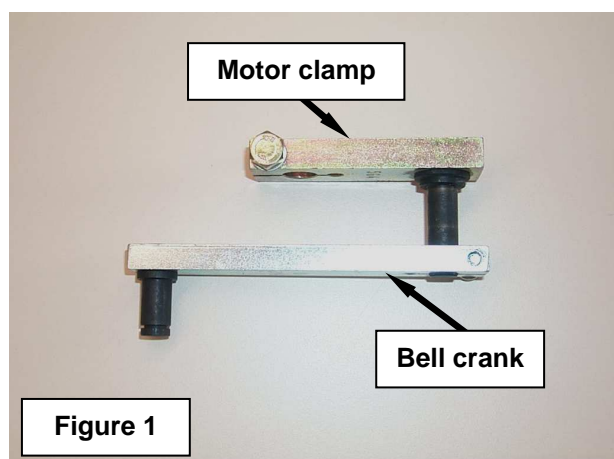
1. The C2045, T2140, T2145 units mentioned below have been equipped with a Doga windshield wiping system.

Model	Engine	VIN
T2140	Cummins	40148 →
	Detroit Diesel	40611 →
T2145	Cummins	44306 →
	Detroit Diesel	44617 →
	Caterpillar	44801 →
C2045	Cummins	46008 →
	Detroit Diesel	46611 →
	Caterpillar	47050 →

2. When replacing a wiper motor on these units, the following applies:

Doga, who are the manufacturers of the windshield wiper assembly, highly recommend that the motor clamp and bell crank (Figures 1 and 2) be replaced as a matter of course as these parts may have been damaged by the motor failure.

Not replacing these parts may result in failure of the wiper mechanism.



3. On C2045 units equipped with an old wiper motor VH 11025972, a new wiper motor VH 11025971 should be installed whenever a replacement is required.
4. This Bulletin contains the procedure explaining how to replace the wiper motor on Commuter Coaches equipped with old motor VH 11025972. Part 5 of the procedure provides instructions on how to replace the bell crank and clamp.
5. Customers who want to upgrade their coaches to the new standard may purchase the parts and install them as described in this Bulletin.

## **PARTS AND PRODUCTS:**

### **Old parts (C2045)**

<b>VH reference</b>	<b>Description</b>	<b>Qty.</b>
VH 11025972	Wiper motor, Doga model 258, starting torque 59 ft.lbf (80 Nm)	1
VH 91400272	Mounting plate, wiper motor	1
VH 10701180	Mounting bracket, wiper motor, welded tot chassis	1
VH 10952747	Hardware, motor clamp tie rod mtg.	1
VH 10952746	Hardware, bell crank tie rod mtg.	1

### **New parts (C2045)**

<b>VH reference</b>	<b>Description</b>	<b>Qty.</b>
VH 11025971	Wiper motor, Doga model 259, starting torque 96 ft.lbf (130 Nm)	1
VH 91400361	Mounting plate, wiper motor	1
VH 10701180	Mounting bracket, wiper motor, welded to chassis	1
VH 10616449	Protective mat, aluminized fiberglass	#
VH 10952747	Hardware, motor clamp tie rod mtg.	1
VH 10952746	Hardware, bell crank tie rod mtg.	1

### **Repair/retrofit parts (C2045)**

<b>VH reference</b>	<b>Description</b>	<b>Qty.</b>
VH 11025971	Wiper motor, Doga model 259, starting torque 96 ft.lbf (130 Nm)	1
VH 91400361	Mounting plate, wiper motor	1
VH 10616449	Protective mat, aluminized fiberglass	#
VH 10869159	Flange nut, M10, wiper arm assembly	4
VH 10994664	Cap, pivot, wiper arm	4
VH 10952739	Clamp, wiper motor, embossed "564"	1
VH 10952747	Hardware, motor clamp tie rod mtg.	1
VH 10952741	Bell crank, embossed "582"	1
VH 10952746	Hardware, bell crank tie rod mtg.	1

### **Repair parts (T2140, T2145)**

<b>VH reference</b>	<b>Description</b>	<b>Qty.</b>
VH 11025971	Wiper motor, Doga model 259, starting torque 96 ft.lbf (130 Nm)	1
VH 10616449	Protective mat, aluminized fiberglass	#
VH 11019984	Flange nut, M12, wiper arm assembly	4
VH 10994664	Cap, pivot, wiper arm	4
VH 10957496	Clamp, wiper motor, embossed "563"	1
VH 10952747	Hardware, motor clamp tie rod mtg.	1
VH 10957497	Bell crank, embossed "562"	1
VH 10952746	Hardware, bell crank tie rod mtg.	1

- On C2045 coaches the old and the new parts are not interchangeable and only new parts will be offered as service replacements.
- Parts may be purchased from your nearest ABC Customer Care & Parts Source service center.
- Parts and products disposition: discard according to applicable environmental regulations.

## **PROCEDURE:**

### **To replace wiper motor VH 11025972 by wiper motor VH 11025971 (C2045)**

- 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 technician.
- Job time estimate: 2.0 hours.
- For more information refer to:

the Electrical Wiring Diagram Booklet that comes with the coach,  
the Maintenance Manual, the Operating Manual,  
the Spare Parts Manual,  
the Spare Parts Manual sections that have been attached to this Bulletin.

#### **2. Special tools, equipment or services:**

- This job requires the use of:

a ¼" drive torque wrench ranging from 30 to 200 in.lbf with 1 in.lbf increments  
a ½" drive torque wrench ranging from 30 to 200 ft.lbf with 1 ft.lbf increments  
an 8.5 mm diameter drill bit for stainless steel.

#### **3. Preparations:**

- Park the coach on a level surface with the front wheels straight.  
Apply the parking brake and shut down the engine.

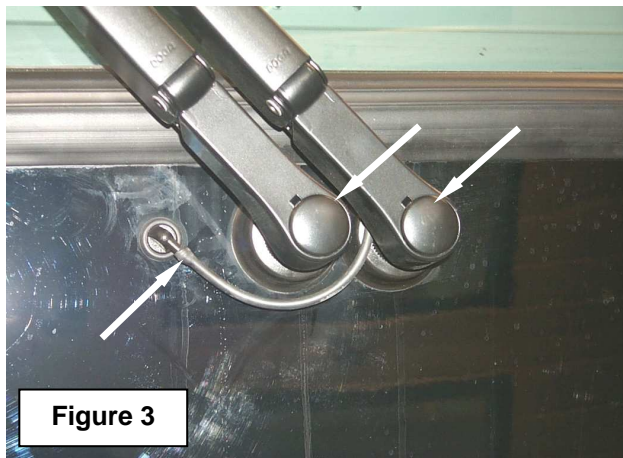
**IMPORTANT: Make sure to put the wipers in the "park" position.**

- Switch off all systems and turn off the battery master switch.
- Read the entire procedure before beginning to work.

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

#### 4. To remove old wiper motor VH 11025972:

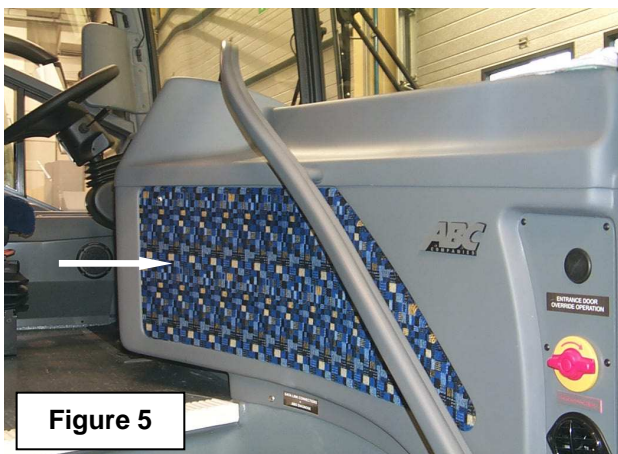
- 1) Disconnect the windshield washer tubing of the left hand wiper arm assembly from the elbow fitting (Figure 3).  
Lever off the caps covering the wiper arm nuts. Undo, remove and discard the nuts.



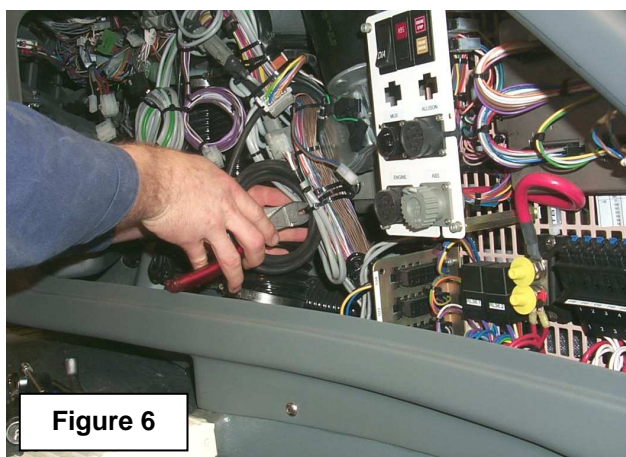
- 2) Carefully remove the wiper arm assembly (Figure 4).  
Repeat steps one and two for the right hand assembly.



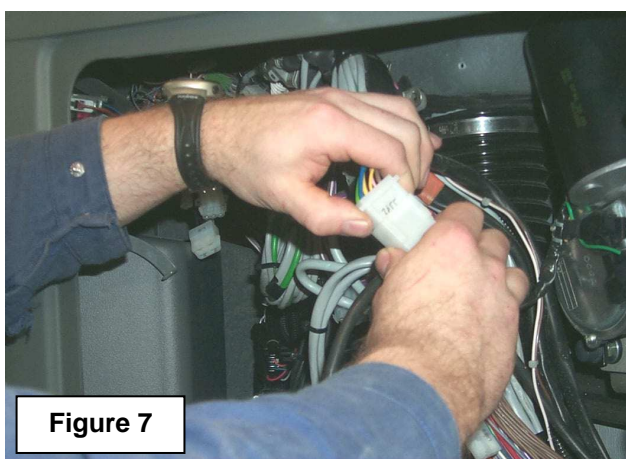
- 3) In the step well, on the right hand side of the dashboard (Figure 5), undo and remove the fasteners securing the trim panel. Remove the panel.



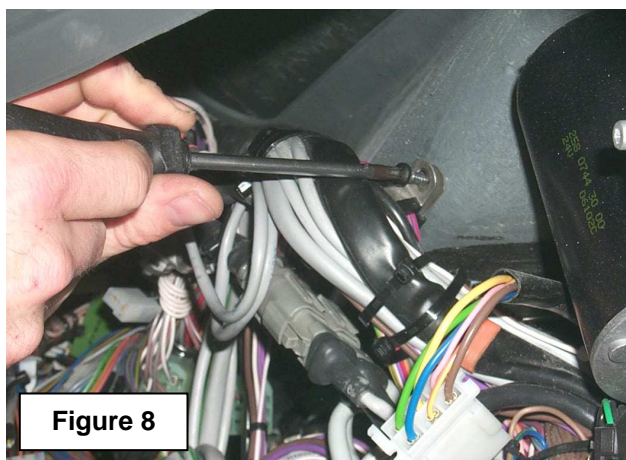
- 4) Cut cable ties as necessary to gain access to the wiper motor and the wiper motor multi connector (Figure 6).



- 5) Detach the wiper motor multi connector (Figure 7).

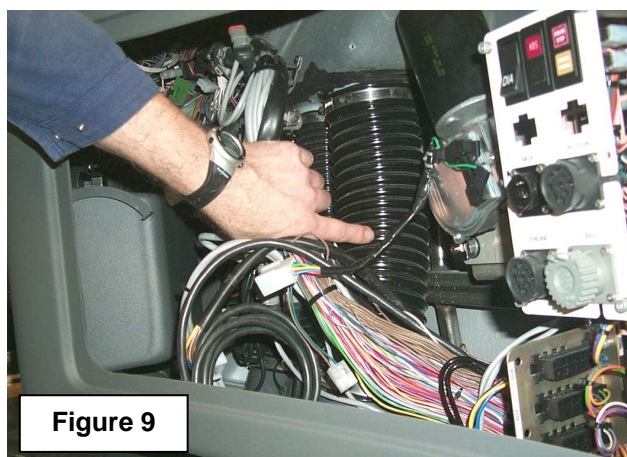


- 6) Undo and remove the self tapping screw securing the wire harness P-clamp to the dashboard housing (Figure 8).

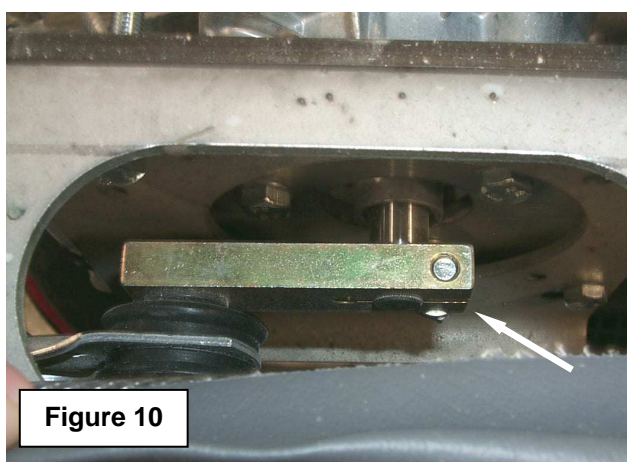




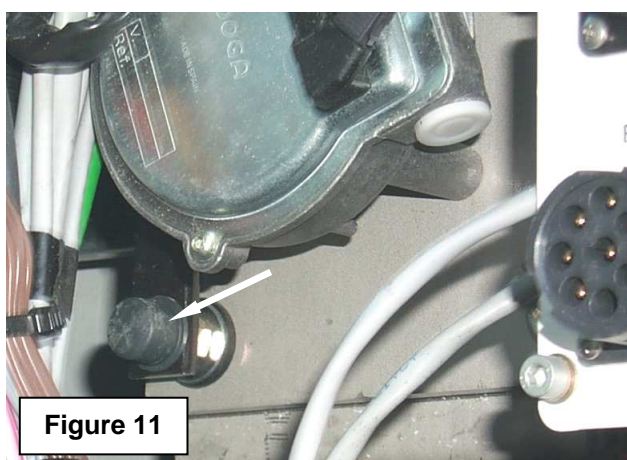
- 7) Slacken the upper and lower hose clamps securing the ventilation hose closest to the wiper motor assembly (Figure 9). Remove the hose.



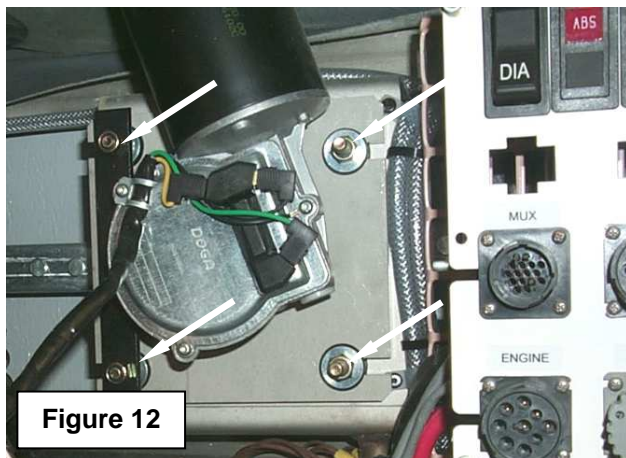
- 8) Reaching behind the wiper motor mounting plate undo and remove the bell crank clamp bolt (Figure 10). Detach the clamp from the wiper motor shaft.



- 9) Uncap the two left hand mounting bracket nuts (Figure 11).



- 10) Undo and remove the two mounting bracket nuts.  
Remove and discard the mounting bracket.  
Undo and remove the four nuts securing the wiper motor mounting plate to the chassis mounting bracket (Figure 12).  
Recover the nuts.



- 11) Withdraw the wiper motor and mounting plate assembly (Figure 13).  
Recover the M8 mounting bolts, the grommets and the top hat bushings.



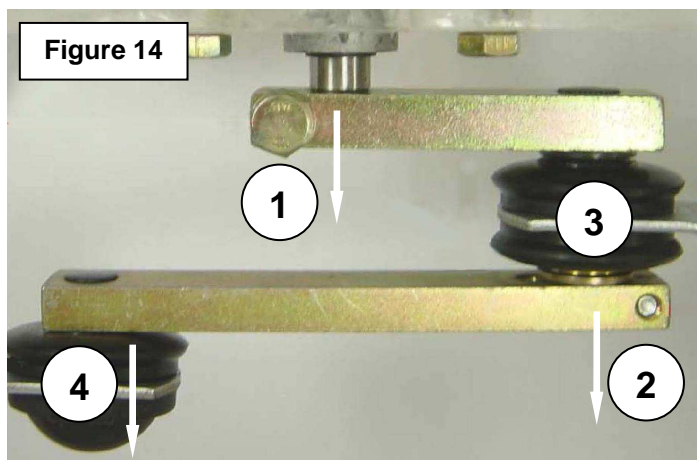
*Procedure continued on next page.*



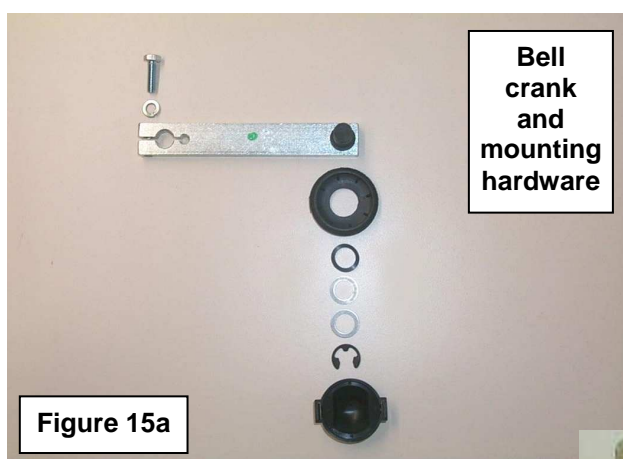
**5. To replace the wiper motor clamp and bell crank Figures 14 → 17):**

***NOTE:*** The motor clamp, the bell crank, and the wiper mechanism tie rods are not readily accessible and can't be shown as installed on the coach with the dashboard is fitted. The pictures used to illustrate this procedure show the parts off the vehicle.

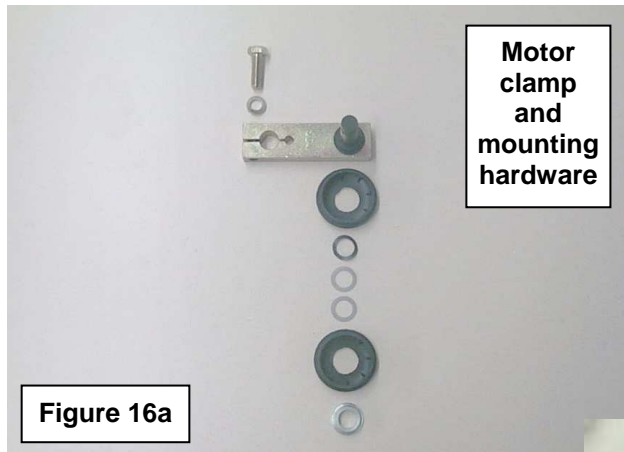
- 1) Undo the wiper motor clamp bolt (1, Figure 14).  
Detach the clamp and bell crank assembly from the motor shaft.  
Undo the bell crank clamp bolt (2, Figure 14).  
Detach the bell crank from the motor clamp pivot.  
Remove and discard the left-hand tie rod mounting hardware (3, Figure 14).  
Remove the cap from the right-hand tie rod (4, Figure 14).  
Remove the snap ring beneath the cap from the bell crank pivot.  
Detach the right-hand tie rod from the bell crank pivot.  
Remove and discard the right-hand tie rod mounting hardware.



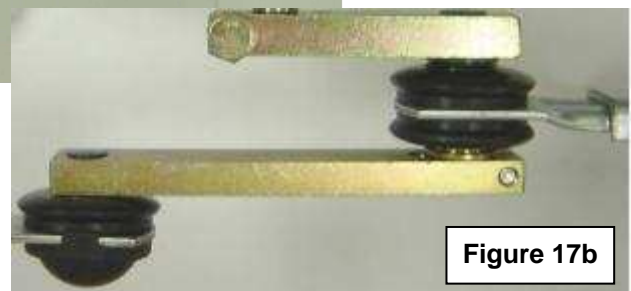
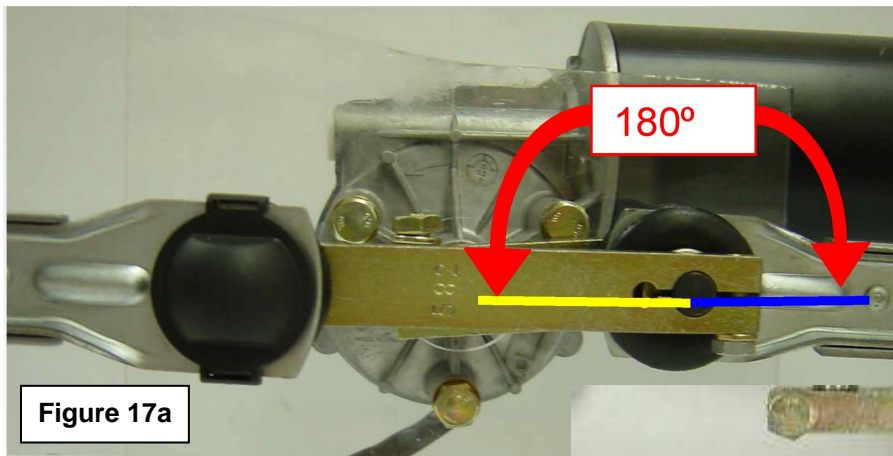
- 2) Assemble the bell crank, the right-hand tie rod and the tie rod mounting hardware as shown in Figures 15a and 15b.  
Secure the tie rod to the bell crank pivot with the snap ring.  
Install the cap.



- 3) Assemble the bell crank, the left-hand tie rod and the tie mounting hardware rod as shown in Figures 16a and 16 b.



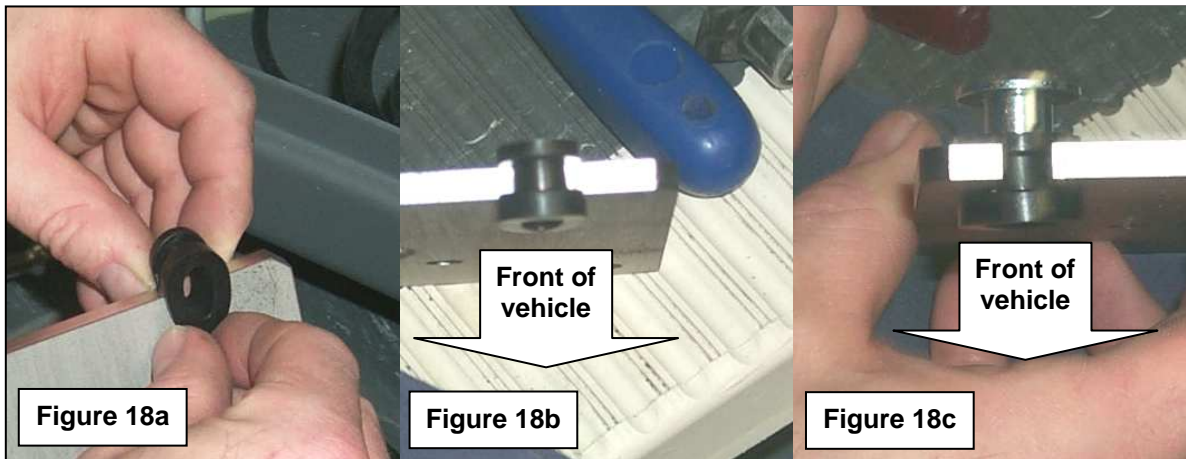
- 4) Align the bell crank and the motor clamp so, that they are at an 180° angle relative to one another (Figures 17a and 17b).  
Insert the motor clamp pivot into the splined hole of the bell crank.  
Tighten the bell crank clamp bolt (2, Figure 14) to a torque of 60 to 70 in.lbf (7 to 8 Nm).



- 5) Attach the bell crank and motor clamp assembly to the motor as shown in Figure 14.  
Tighten the motor clamp bolt (1, Figure 14) to a torque of 16 to 20 ft.lbf (22 to 27 Nm).

**6. To install new wiper motor VH 11025971:**

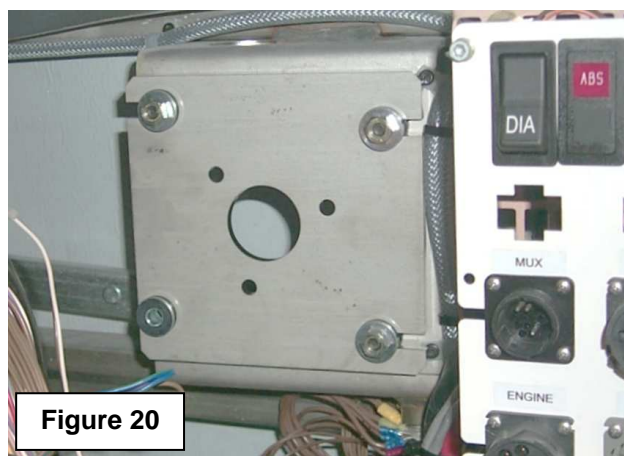
- 1) Transfer the grommets and the top hat bushings onto new wiper motor mounting plate VH 91400361 as shown in Figures 18a, 18b and 18c.  
The grommets and bushings are directional. Make sure the thick flange of the grommets points towards the front of the vehicle. The flange of the top hat bushings should point towards the rear of the vehicle.



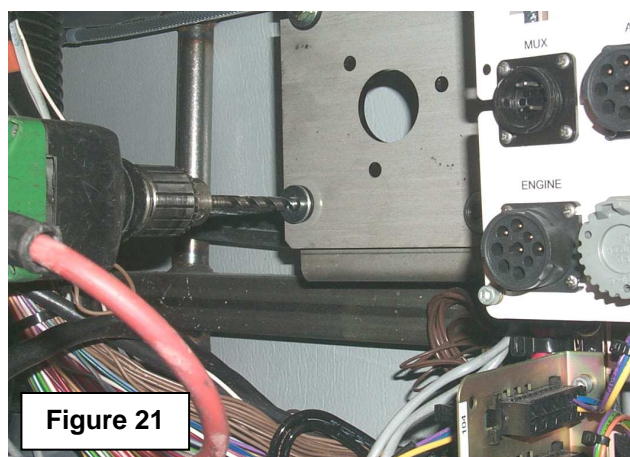
- 2) Install three mounting bolts as shown in Figure 19.



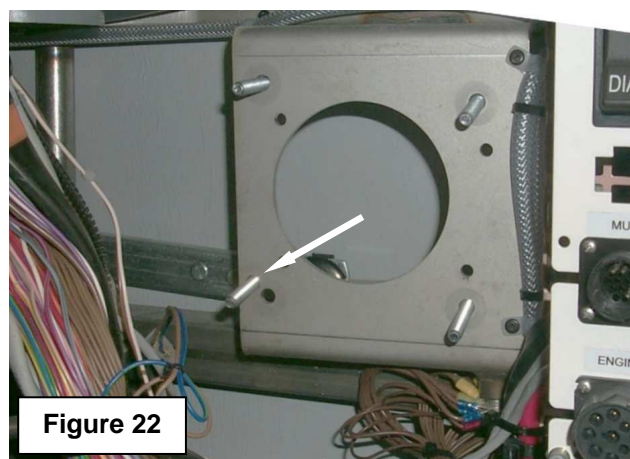
- 3) Temporarily fit the new mounting plate as shown in Figure 20. Finger tighten the nuts.



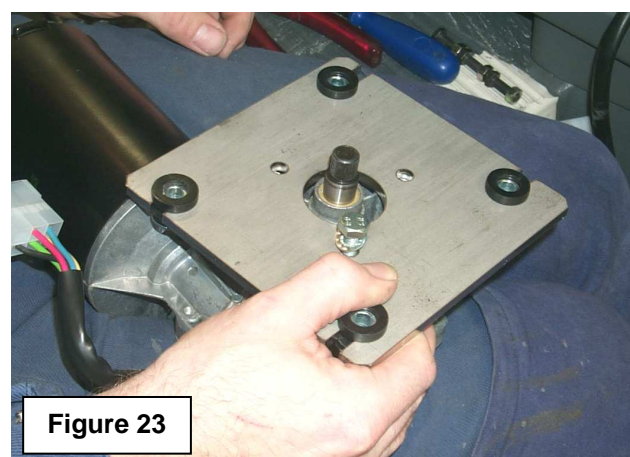
- 4) Using an 8.5 mm diameter drill bit, drill a new hole in left hand lower corner of the chassis mounting bracket (Figure 21).  
Use the top hat bushing as a guide.



- 5) Remove the mounting plate and install a fourth bolt in the newly drilled hole (Figure 22).

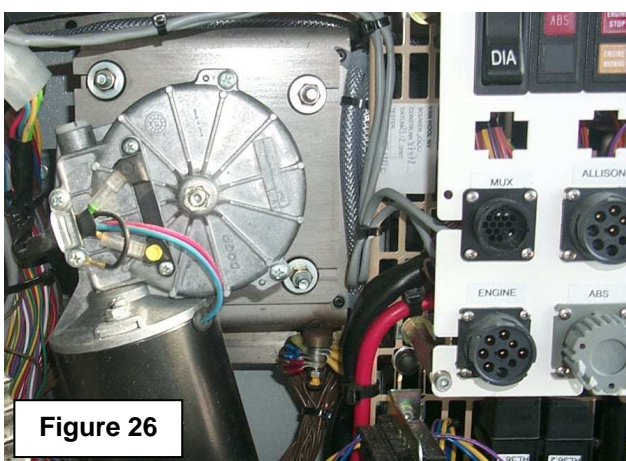
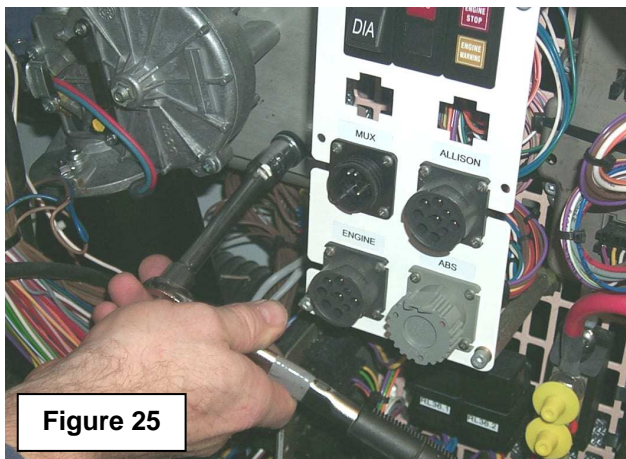
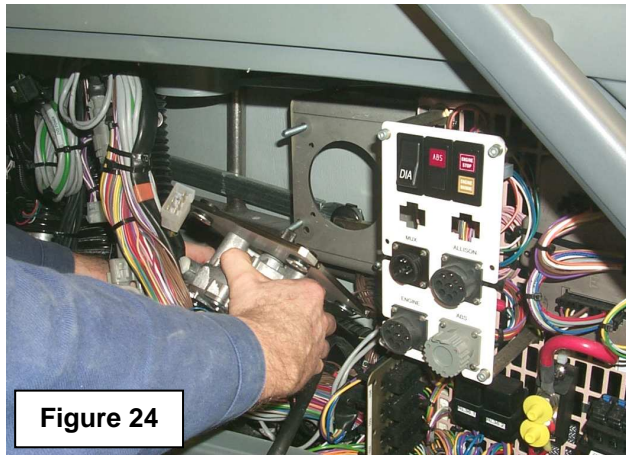


- 6) Attach the new wiper motor assembly to the new mounting plate (Figure 23).  
Tightening torque of the M8 mounting bolts: 117 in.lbf (20 Nm).



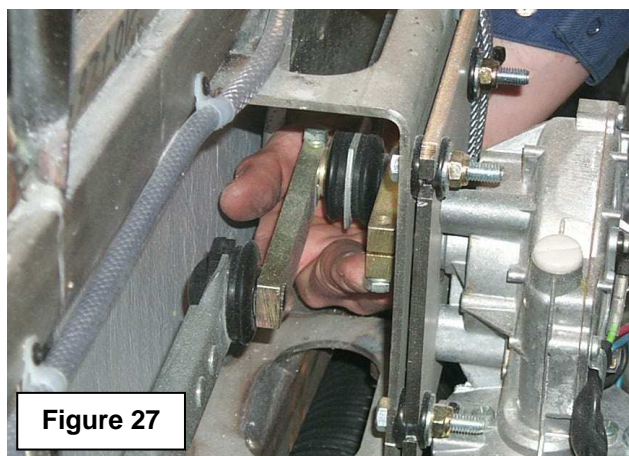


- 7) Install the new motor and mounting plate assembly with the motor pointing down (Figures 24 through 26). When running up the nuts in a cross-wise fashion, make sure the installation is free of stress and strain. Tightening torque for the M8 fasteners: 117 in.lbf (20 Nm). Note that the mounting bracket removed in step 10 of the motor removal procedure is no longer used.



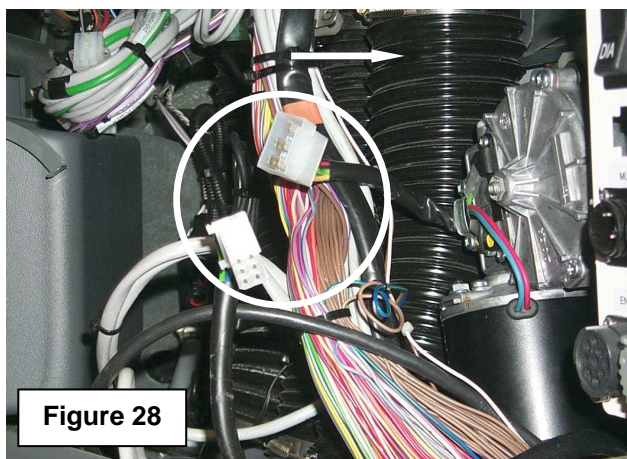
- 8) Reaching behind the wiper motor mounting plate, attach the clamp and bell crank assembly to the shaft of the new motor. Make sure the bell crank and the tie rods are in a horizontal position as shown in Figure 27. Tighten the wiper motor clamp bolt to a torque of 16 to 20 ft.lbf (22 to 27 Nm).





**Figure 27**

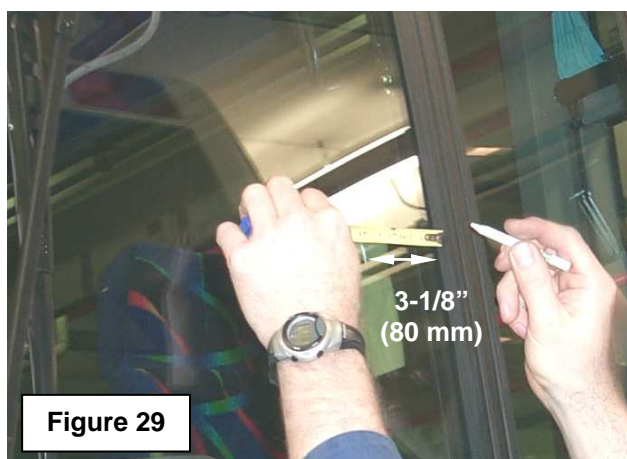
- 9) Reinstall the ventilation hose previously removed. Tighten the upper and lower hose clamps to a torque of 70 in.lbf (8 Nm).  
Do not assemble the wiper motor jack and plug yet (Figure 28).



**Figure 28**

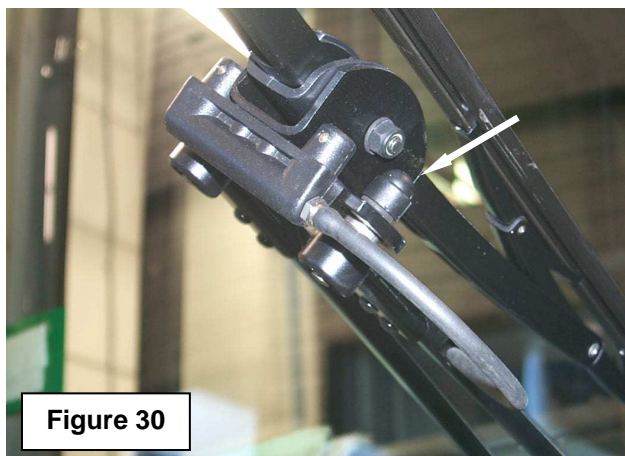
## 7. To adjust wiper blade position:

- 1) On both sides of the windshield center post, about half way up, draw a mark about 3-1/8 inch (80 mm) off the post (Figure 29) with a felt tipped pen. This is the location of the wiper blades in the “park” position.

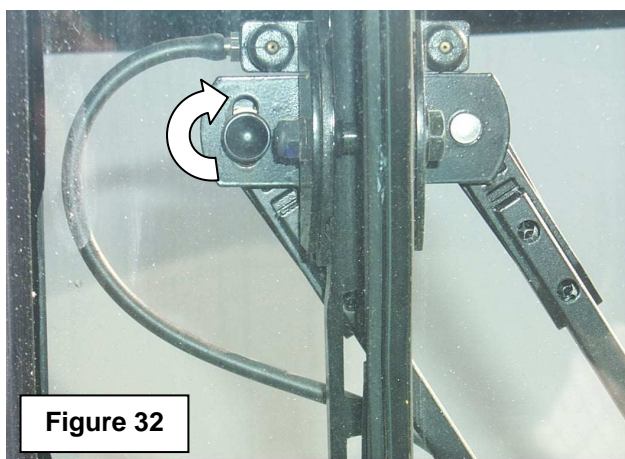


**Figure 29**

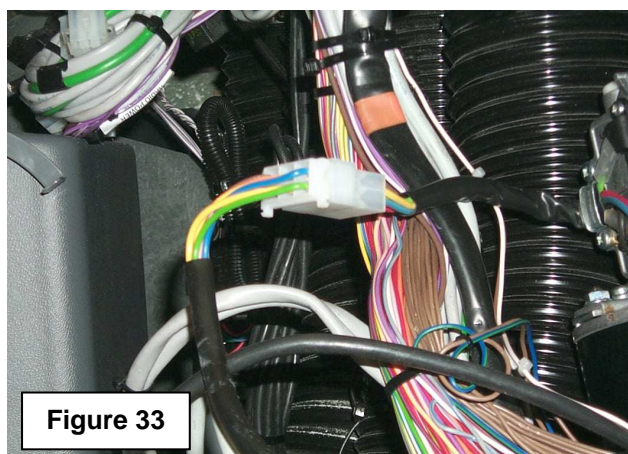
- 2) Positioning the wiper blades on the reference marks, reinstall the wiper arm assemblies. Tighten the wiper arm nuts to a torque of 33 ft.lbf (45 Nm). Refit the caps. Reconnect the washer tubing.
- 3) Check that the wiper blades are parallel to the center post. If this is not the case, fold the wiper arm assemblies down.
- 4) At the wiper blade hinge joint remove the protective cap shown in Figure 30. Undo the acorn nut (Figure 31).



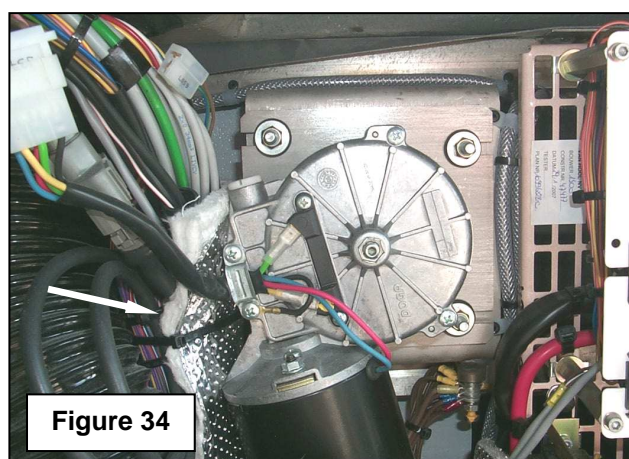
- 5) Turn the wiper blade in the proper direction until it is parallel to the post (Figure 32). Tighten the nut hand tight and refit the cap.



- 6) Inside the coach assemble the wiper motor plug and jack (Figure 33).  
Turn on the master switch and check wiper arm operation at low and briefly at high speed.  
Ensure that the wiping area is sufficient and correct.



- 7) Reinstall the wire harness P-clamp.  
Secure the wire harnesses with cable ties, at the same time covering them with protective mat VH 10616449 (Figure 34).



- 8) Reinstall the dashboard trim panel in the step well.  
Secure the fasteners hand tight.

*Procedure complete.*

**ATTACHMENTS:**

Spare Parts Manual sections 1010.01-0006, 1010.01-0007, 1010.01-0009, and 1010.01-0010  
“Windshield wiper & washer”

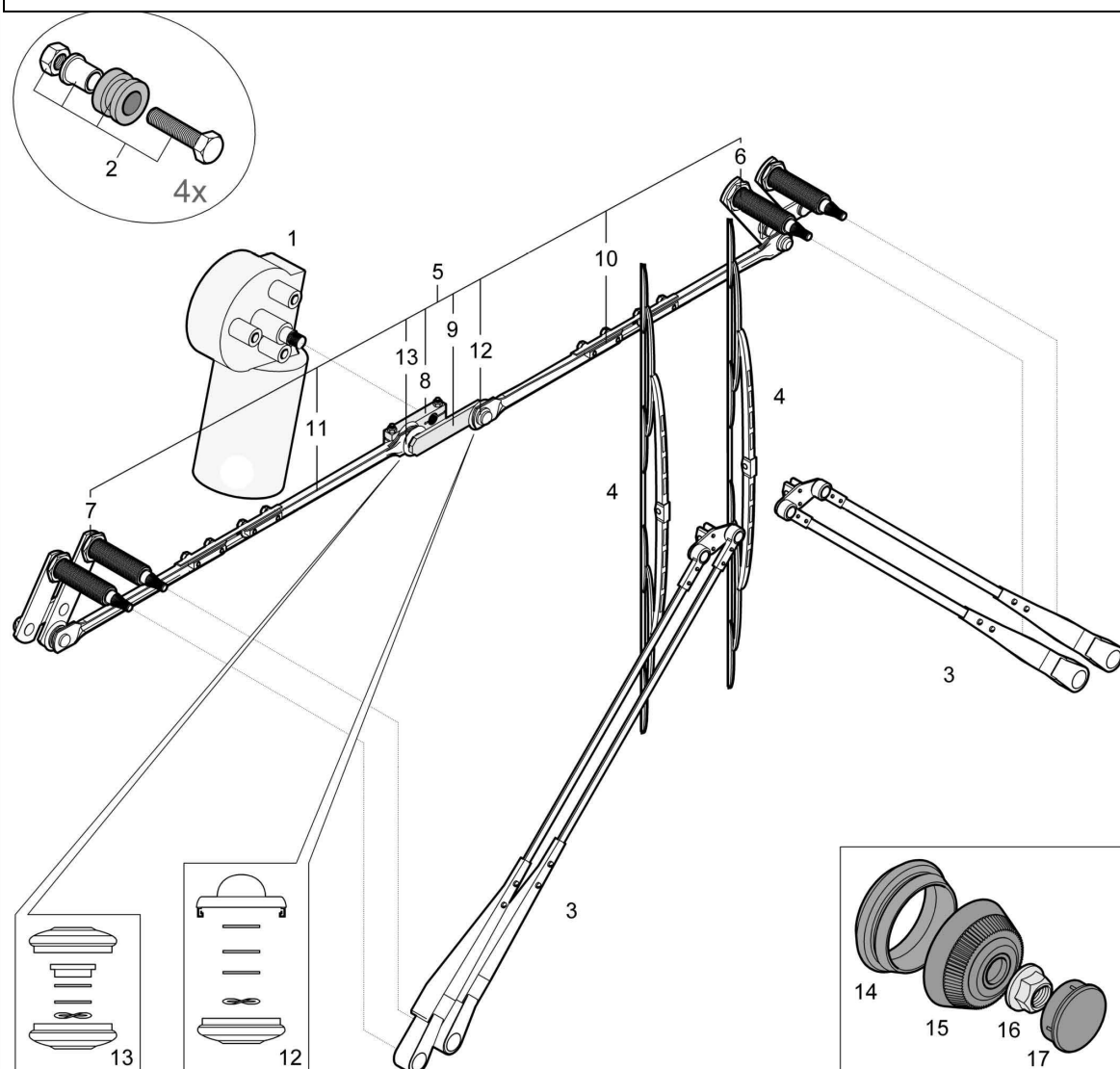
**DISCLAIMER:**

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.

**SERVICE INFORMATION:**

Service Bulletins are issued to supplement or supersede information in the Van Hool manuals. Note Service Bulletin number, date and subject on the register at the end of the relevant chapter(s). File Service Bulletin separately for future reference.



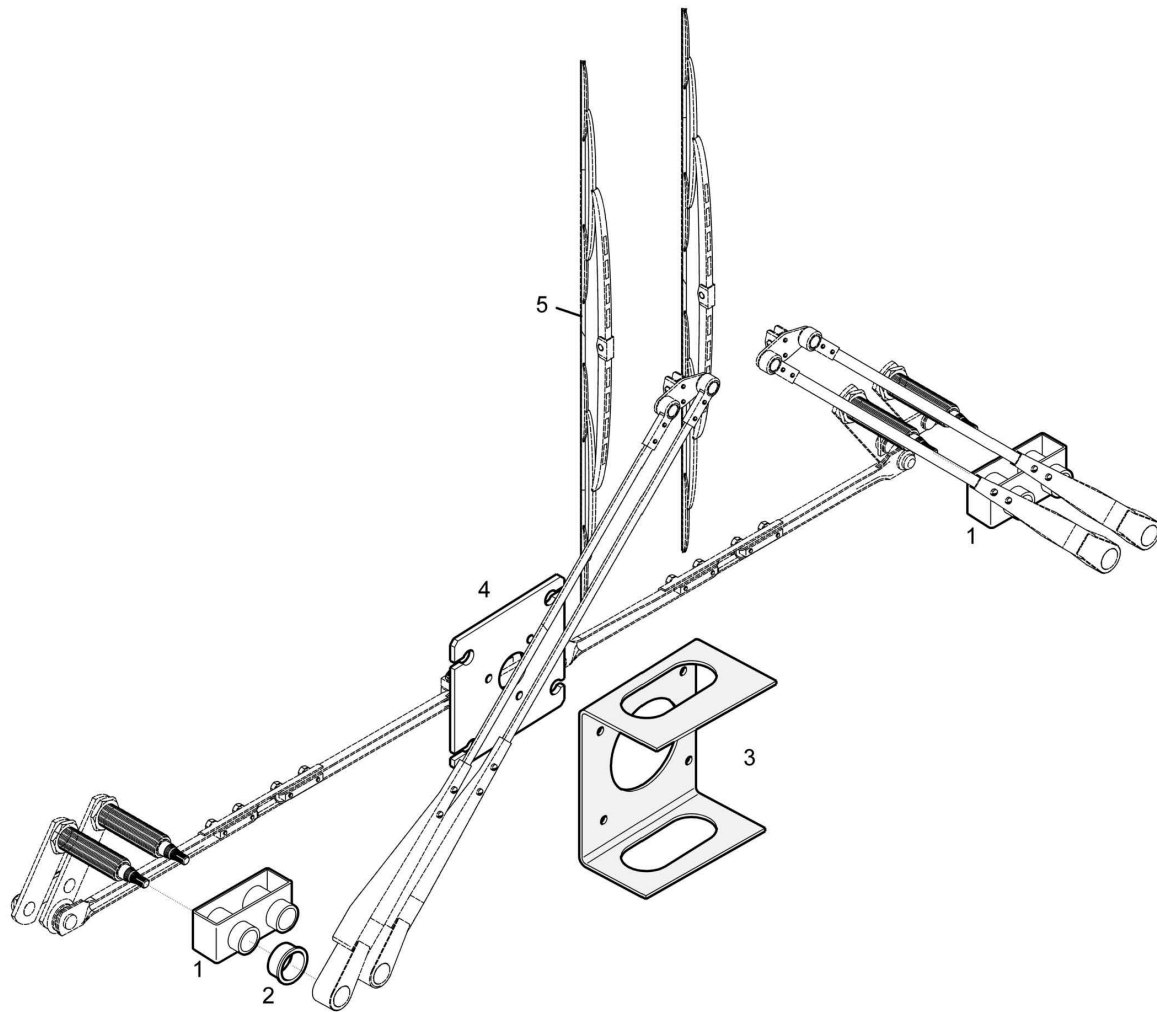
Pos.	Q.	Ref.N°	Description	Denominación	Spec.
1	1	11025971	Motor	Motor	
2	1	10916798	Set of assembly parts	Juego de piezas de fijación	
3	2	10952726	Wiper arm	Brazo del limpiaparabrisas	
4	2	10952728	Wiper blade	Escobilla del limpiaparabrisas	
5	1	10952731	Actuating linkage	Varillaje de mando	
6	*1	10952735	Lever	Palanca	
7	*1	10952737	Lever	Palanca	
8	*1	10952739	Lever	Palanca	
9	*1	10952741	Lever	Palanca	
10	*1	10952743	Bar	Barra	
11	*1	10952745	Bar	Barra	
12	*3	10952746	Set of assembly parts	Juego de piezas de fijación	
13	*1	10952747	Set of assembly parts	Juego de piezas de fijación	
14	#	11027199	Cap	Tapa	MAT: R
15	#	11027201	Cap	Tapa	MAT: P
16	#	10869159	Lock nut	Tuerca de frenado	DIN 6927 M10
17	#	10994664	Cap	Tapa	



**Windshield wiper & washer**  
**Limpiaparabrisas + accesorios**

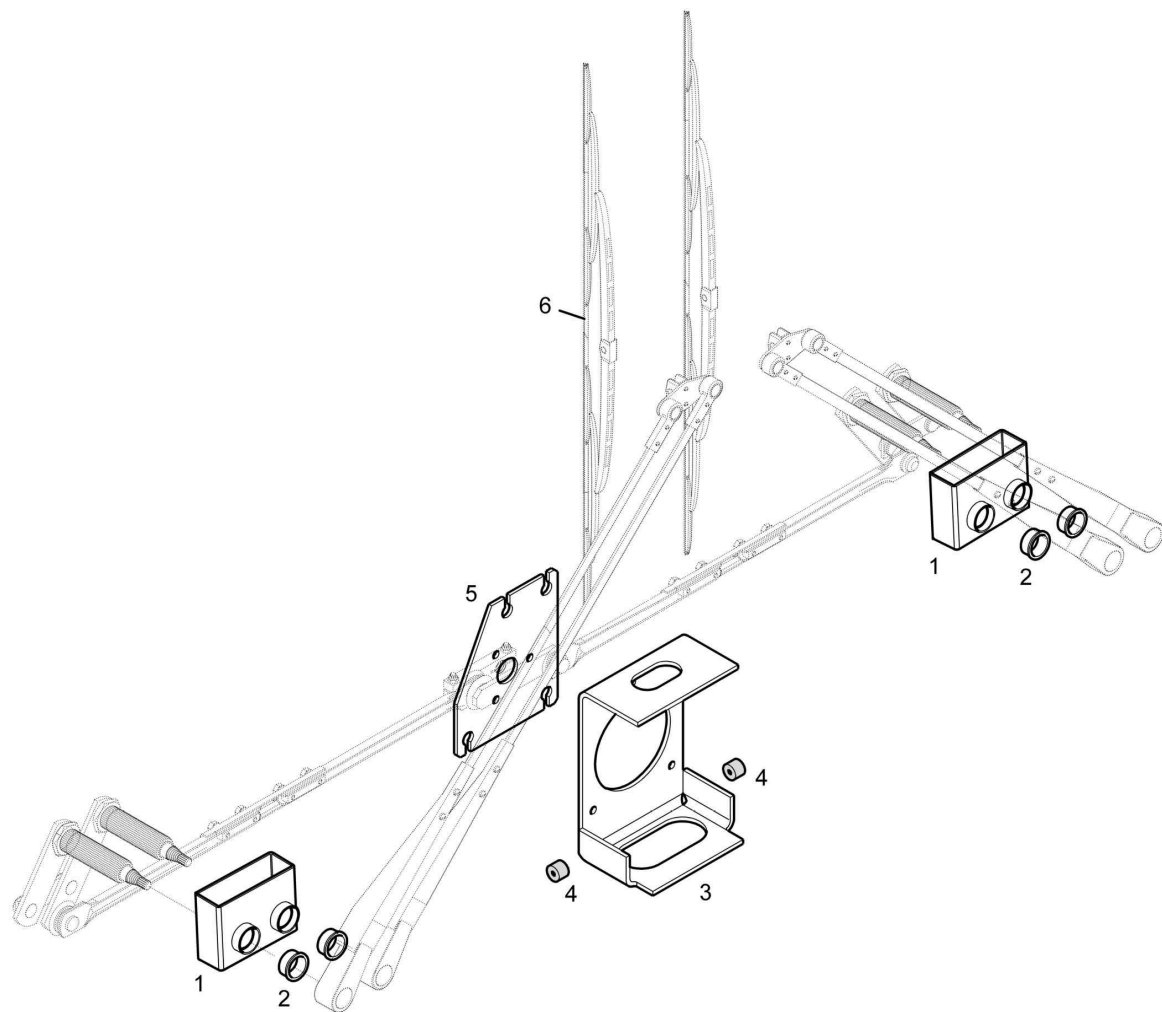
DOGA  
2007-06-26  
**1010.01-0009**





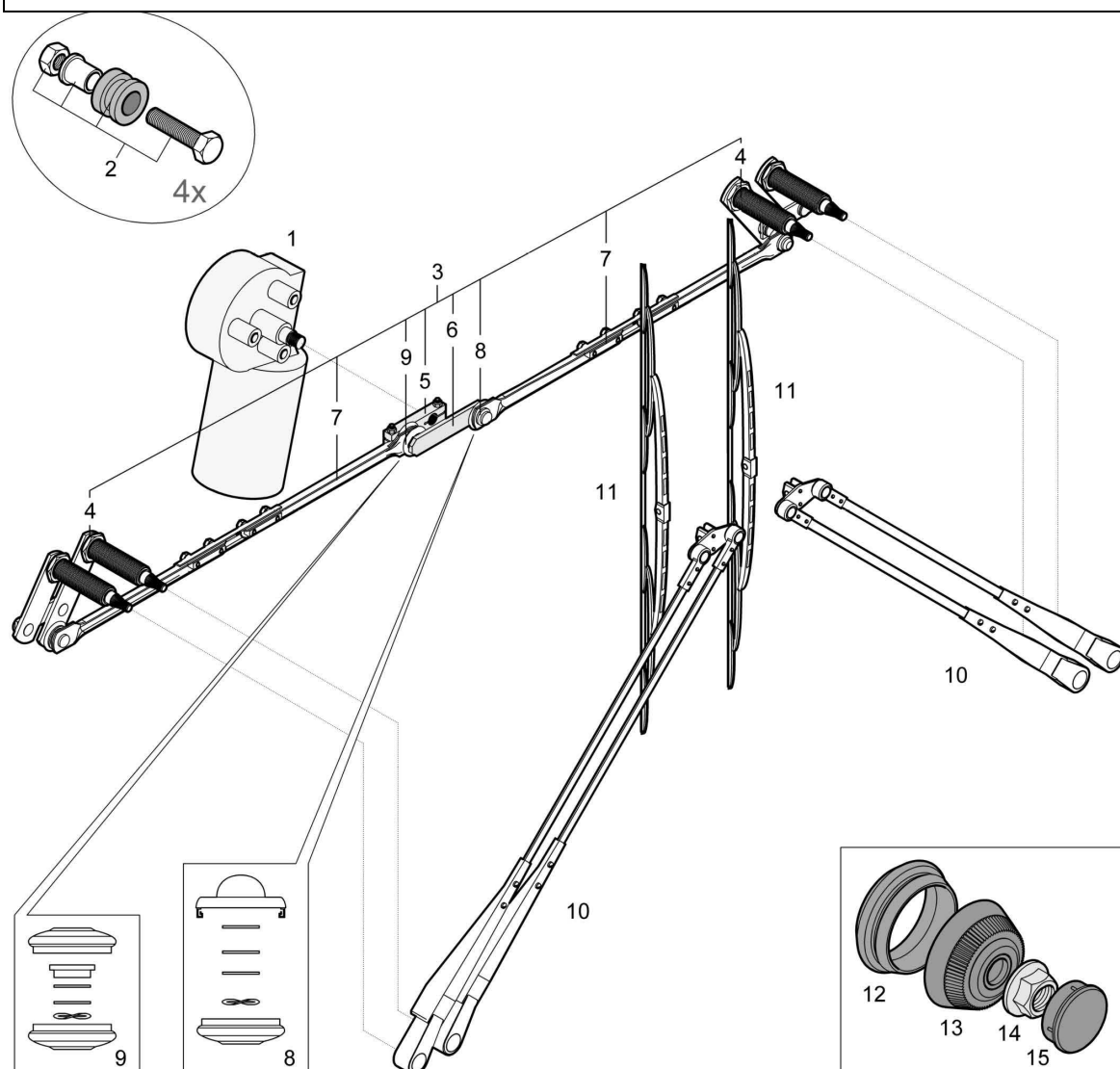
Pos.	Q.	Ref.N°	Description	Denominación	Spec.
1	2	10701181	Bracket	Soporte	
①			Welded to body	Soldado al chasis	
2	4	645802770	Bush	Casquillo	
3	1	10701180	Mounting bracket	Soporte de fijación	
①			Welded to body	Soldado al chasis	
4	1	91400361	Mounting plate	Plancha de montaje	
5	1	»1010.01-0004			
<b>VANHOO</b> Windshield wiper & washer Limpiaparabrisas + accesorios					DOGA 2007-03-15 <b>1010.01-0010</b>

**T2140 & T214545 – manuals #1503, #1504, #1505**



Pos.	Q.	Ref.N°	Description	Denominación	Spec.
1	2	91400234	Bracket	Soporte	M6
i			Welded to body	Soldado al chasis	
2	4	645801190	Bush	Casquillo	
3	1	91400231	Mounting bracket	Soporte de fijación	
i			Welded to body	Soldado al chasis	
4	2	10603602	Threaded ring	Anillo roscado	
i			Welded to body	Soldado al chasis	
5	1	91400232	Mounting plate	Plancha de montaje	
6	1	»1010.01-0007 »1010.01-0007	Windshield wiper & washer	Limpiaparabrisas + accesorios	
<b>VANHOOL</b> Windshield wiper & washer Limpiaparabrisas + accesorios					DOGA 2006-10-30 <b>1010.01-0006</b>

T2140 & T2145 – manuals #1512, #1513, #1514, #1529



Pos.	Q.	Ref.N°	Description	Denominación	Spec.
1	1	11025971	Motor	Motor	
2	1	10916798	Set of assembly parts	Juego de piezas de fijación	
3	1	10916800	Actuating linkage	Varillaje de mando	
4	*2	10952737	Lever	Palanca	
5	*1	10957496	Lever	Palanca	
6	*1	10957497	Lever	Palanca	
7	*2	10957499	Bar	Barra	
8	*3	10952746	Set of assembly parts	Juego de piezas de fijación	
9	*1	10952747	Set of assembly parts	Juego de piezas de fijación	
10	2	10951137	Wiper arm	Brazo del limpiaparabrisas	
11	2	10916804	Wiper blade	Escobilla del limpiaparabrisas	
12	#	11027199	Cap	Tapa	MAT: R
13	#	11027201	Cap	Tapa	MAT: P
14	#	11019984	Lock nut	Tuerca de frenado	M12x1.75mm
15	#	10994664	Cap	Tapa	



**Windshield wiper & washer**  
**Limpiaparabrisas + accesorios**

DOGA  
2007-06-26  
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