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4,991,950 5,110,196 5,137,247 5,196,965 385,243 5,687,035
387,317

Freightliner M2 Mirror System Manual

General Procedures

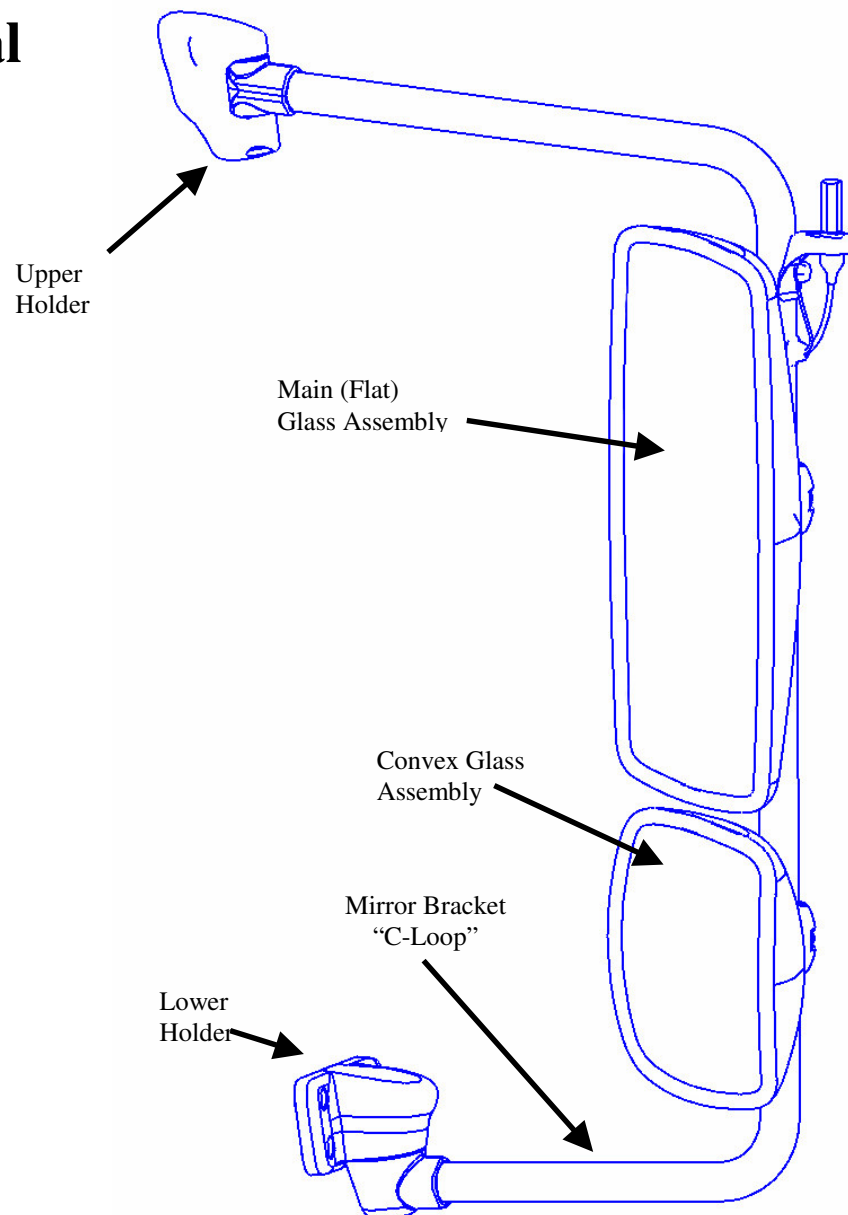
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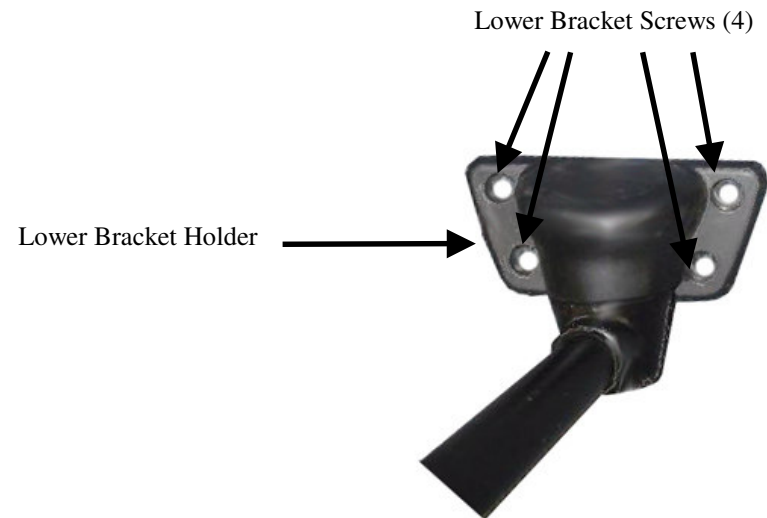
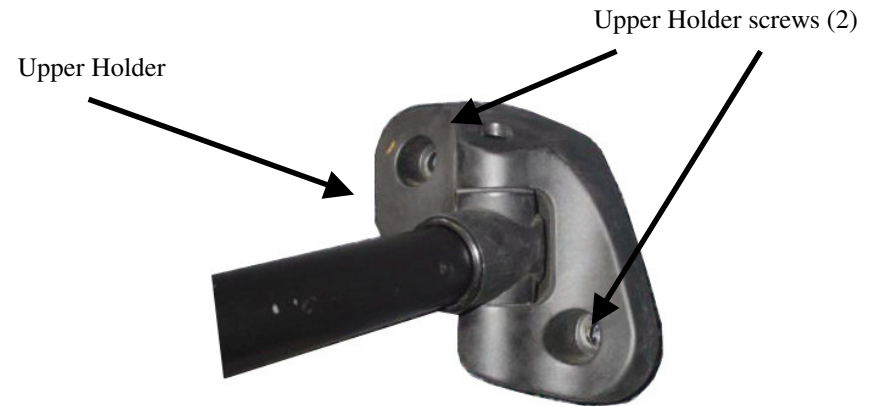
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(G.1) Removal of Entire Bracket and Mirror

- 1) Remove antenna from top of mirror
- 2) Ensure that the mirror has support and remove the four screws from the lower bracket holder. DO NOT allow mirror system to fall away from truck.
- 3) Remove two screws from upper bracket holder. Entire bracket is now free from truck.
- 4) Disconnect antenna and remote/heating wire harness (if installed) from plugs in door.

To re-install bracket:

1. Plug antenna and control cables back in to the door.
2. Use the two screws to attach upper holder to truck.
3. Reattach lower bracket with four screws.





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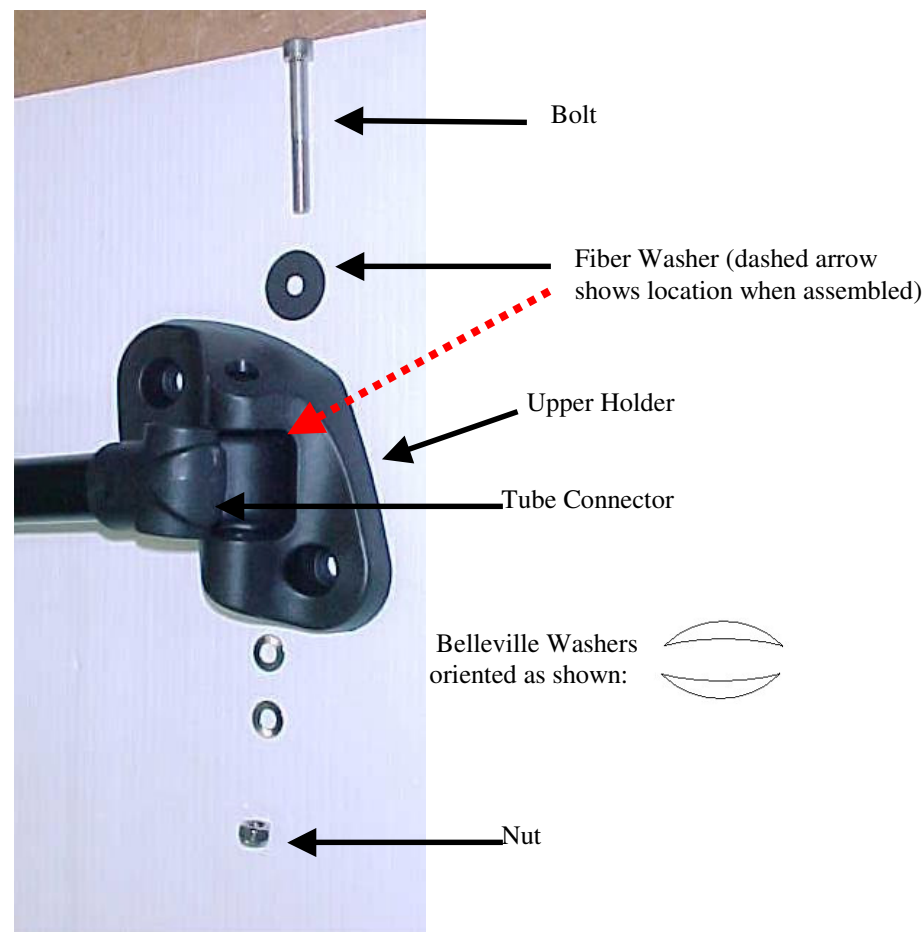
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(G.2) Changing Upper Fastener Kit

It is very important that you firmly hold the mirror and bracket system in place throughout this process. The fasteners keep the mirror from falling off the vehicle. Damage may occur to the door and mirror if the mirror is not supported.

- 1) Remove entire fastener kit. Hold mirror in place to prevent it from falling.
- 2) Once upper holder is attached to truck, put tube connector and fiber washer in place and insert bolt. Once the bolt is in place, the mirror should not fall away from the truck.
- 3) Line the Belleville washers up as shown and slide them onto the bottom of the screw. Attach the nut and tighten to 14-16 N-m.





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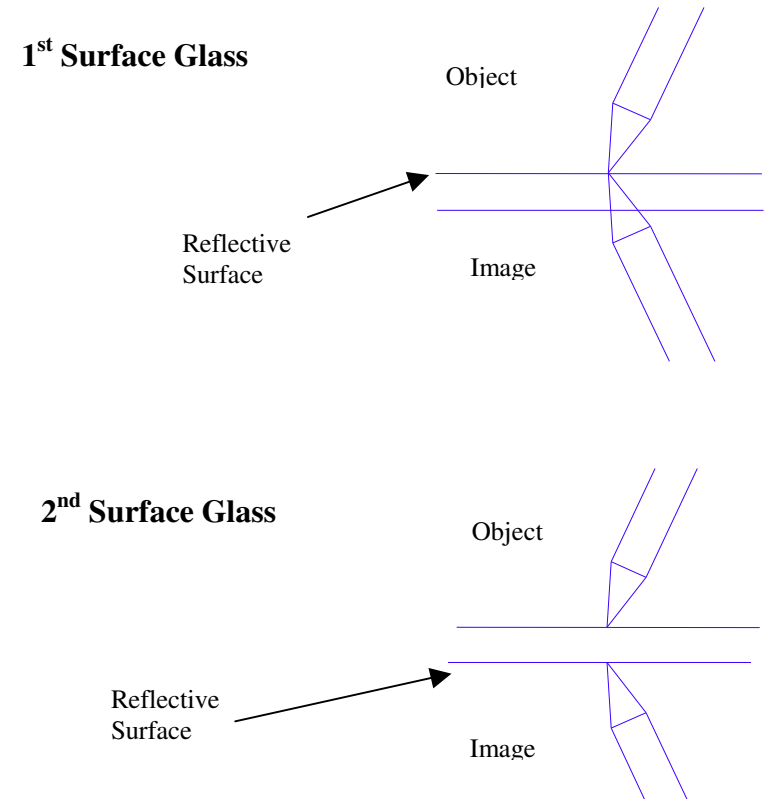
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(G.3) Cleaning the Mirror Glass

A standard glass cleaner and a soft, clean cloth should be used to clean the mirror surface. Avoid abrasive cleaners or brushes, as they can scratch the glass and damage your mirror plate.

Newer trucks have 1st surface glass, which has an exposed reflective surface and is not subject to corrosion.

To determine what kind of glass you have, place an object such as a pen on the glass surface. Angle the pen to one side, so you can see the tip. If there is a gap between the tip of the object and the tip of the image, your glass is 2nd surface.





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(G.4) Removing, Attaching, or Adjusting the Mirror Heads (From the Bracket)

To Adjust Mirror Head

- 1) Slightly loosen the two clamp bolts using a T-30 driver. To prevent the mirror from sliding down, hold it in place from the bottom.
- 2) Adjust mirror head to desired position. Tighten clamp screws to 9-11 N-m.

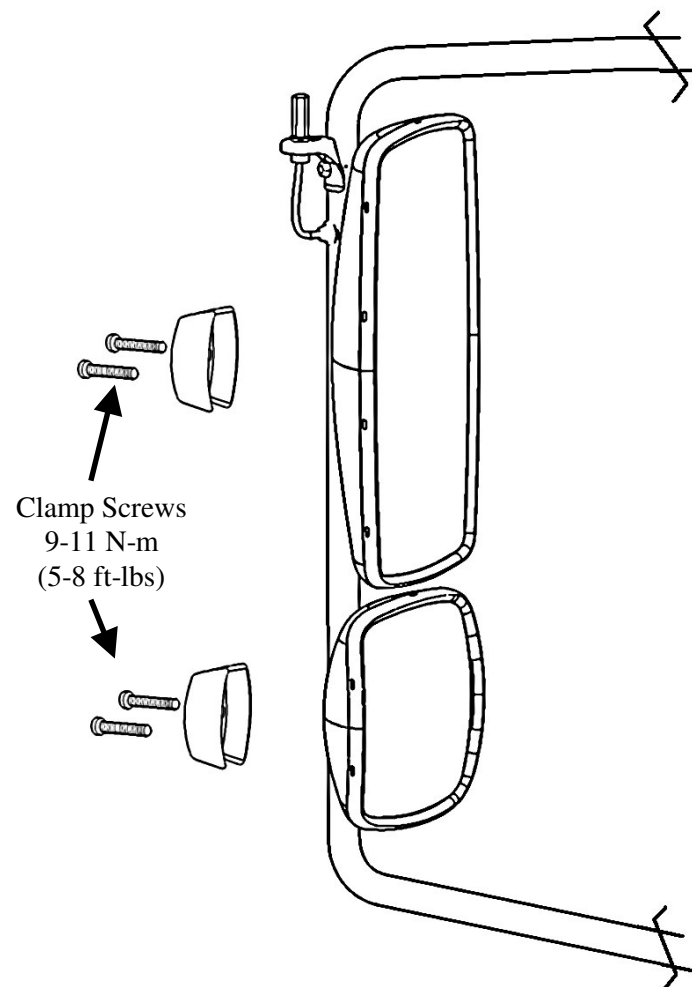
***MAKE SURE THE OPTIMUM VIEWING ANGLE
IS ASSURED FOR THE DRIVER OF THE VEHICLE
AT ALL TIMES!***

To Remove Mirror Head

- 1) If the mirror is heated and/or remote, you will need to remove the mirror plate (see **G.5.1**) and disconnect the control cables before removing the head.
- 2) Remove the two clamp bolts using a T-30 driver. To prevent the mirror from sliding down, hold it in place from the bottom.
- 3) Gently remove the mirror head from the bracket, making sure not to damage the wires or connectors.

To Attach Mirror Head

- 1) Place mirror head on bracket. Make sure that the wires coming from the bracket go into the mirror head. Tighten the two clamp bolts to 9-11 N-m (5-8 Ft-lbs) using a T-30 driver. Ensure the proper position is set for the driver.
- 2) Attach motor and heater cables (if applicable) and replace the glass according to **G.5.2**.



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(G.5.1) Removing Mirror Glass – Carrier Plate Style

If you have glass-and-bezel style mirror heads, use the procedure on G.5.3

Your Lang-Mekra mirror system is equipped with a durable mirror plate. The mirror glass is reinforced with anti-shattering adhesive to minimize splintering in the event of breakage. We strongly recommend the prompt replacement of damaged mirror plates.

If you have a heated mirror, be careful not to damage the wiring or the heater connections when changing the mirror plate, especially when detaching heater wires from the mirror plate.

To Remove the Mirror Plate

- 1) Use a small flat-head screwdriver to push in the locking tabs through the access slits along the mirror housing. **DO NOT use the screwdriver to pry the mirror plate!**
- 2) Start by pushing in the tab at the top of the mirror, then continue around the mirror while pulling firmly on the mirror plate.
- 3) Pull the mirror plate away from the housing. If the mirror is heated, detach the heater wires from the back of the plate. Do not cut the wires.





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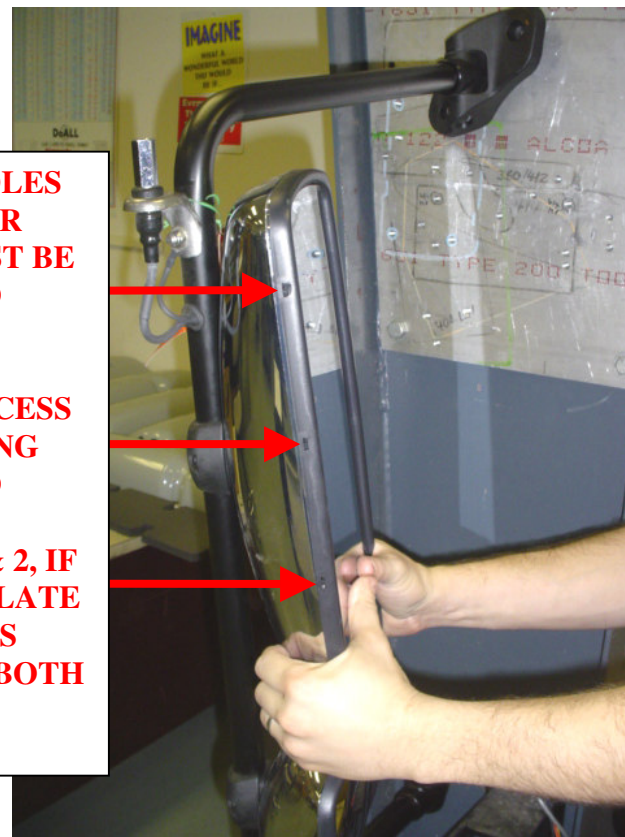
(G.5.2) Installing Mirror Glass – Carrier Plate Style

To Install Mirror Plate

- 1) If mirror is heated, attach wire terminals to back of new mirror plate.
- 2) Align locking clips on mirror plate with mirror housing. **Make sure all the clips are inside the housing before pushing on the mirror plate!** This will keep from damaging the locking clips. Failure to install the mirror plate correctly could result in vibration, or loss of mirror plate.
- 3) Press mirror plate into housing firmly, ensuring all clips lock into place.



1. ACCESS HOLES ON CARRIER PLATE MUST BE OUTBOUND
2. ARROWS DEPICT ACCESS HOLES BEING OUTBOUND
3. IGNORE 1 & 2, IF CARRIER PLATE HAS ACCESS HOLES ON BOTH SIDES.



(G.5.3) Glass-and-Bezel Style Instructions

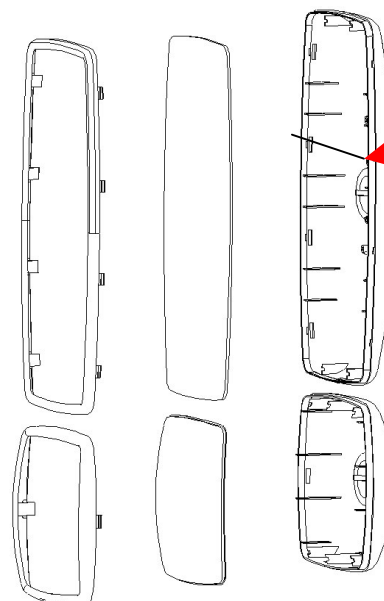
To Remove the Mirror Plate

1. Use a small flat-head screwdriver to push in the locking tabs thru the access slots along the mirror housing. **Do not use the screwdriver to pry the mirror plate!**
2. Start pushing in the tabs near the corner of the mirror, then continue around the mirror while pulling lightly on the mirror bezel.
3. Pull the mirror bezel away from the housing. If the mirror is heated, detach the heater wires. **Do not cut the wires.**



To Install the Mirror Plate

1. Attach wire terminals to back of new mirror plate.
2. Place glass between mirror housing and bezel. Align locking clips on bezel with mirror housing. **Make sure all the clips are inside the housing.**
3. Press mirror plate into housing firmly, ensuring that all clips lock into place.



Ensure metal wire retainer and foam pads are in place before installing mirror glass

Note: if you have glass-and-bezel style mirrors and you need to replace the glass, you may order a replacement glass and bezel kit. However, if you need to replace the mirror housing, the entire head assembly (including a new carrier plate) should be installed.



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T.1.1 Bracket Does Not Fold Back

Brackets are equipped with a fold-away feature, sometimes referred to as a break-away system. The mirrors will fold back either manually, or spontaneously upon impact. This feature helps to minimize damage to the mirror system and the door.

The brackets have rotating attachments that allow the fold away (break-away) function. The upper holder is designed to give the bracket stability. However, the upper fastener kit may sometimes require adjustment. See **G.2** to service the upper fastener.

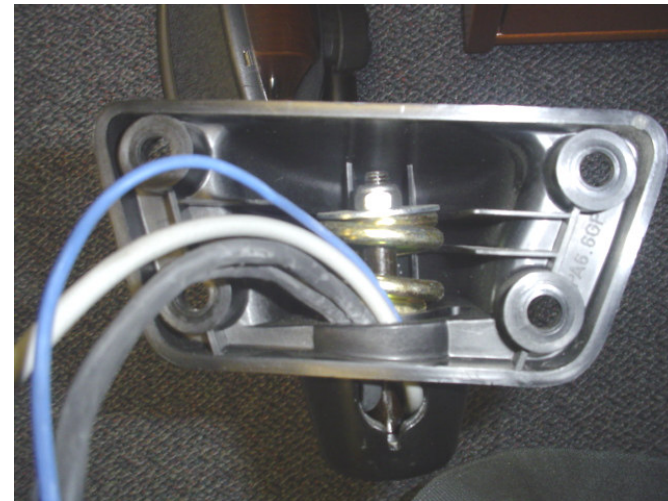
Do not attempt to disassemble the lower holder / break-away assembly. This assembly is spring-loaded, and serious injury could occur if improperly serviced.

T.1.2 Bracket Folds Back Too Easily or Vibrates

If the upper fastener kit is too loose, it will have to be tightened. If the upper fastener kit has been over-torqued and flattened the Belleville washers, the entire fastener kit must be replaced. See **G.2** to service the upper fastener.

Make sure the attachments to the door are secure.

Ensure the lower pivot is in the correct detent position.



Lower Holder Assembly



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T.1.3 Installing a Flip-out Arm

If the mirror system continues to vibrate, you may want to consider installing a third arm. (part number 614100006)

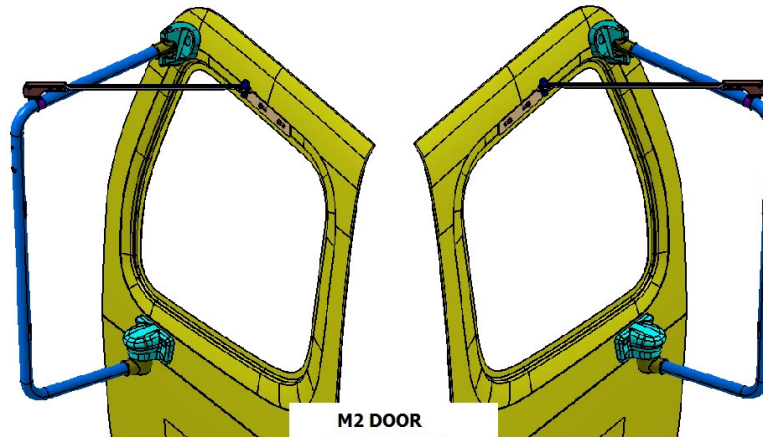
Please note that the pivot point at the holder and the arm is at the top of the holder.

1. First, attach the third arm to the top of the bracket as shown in the picture. Secure it in place using the M8 socket Head Bolt and M8 Nyloc nut provided with the kit.



2. Put the other end of the arm against the door and locate the spots where you will need to drill holes (note: If you have a look-down mirror on the passenger side, remove it and use those holes). Drill two 17/32" holes where needed and insert two 5/16 – 18 Rivnuts.

3. Secure the flat end of the arm to the door using the screws provided.





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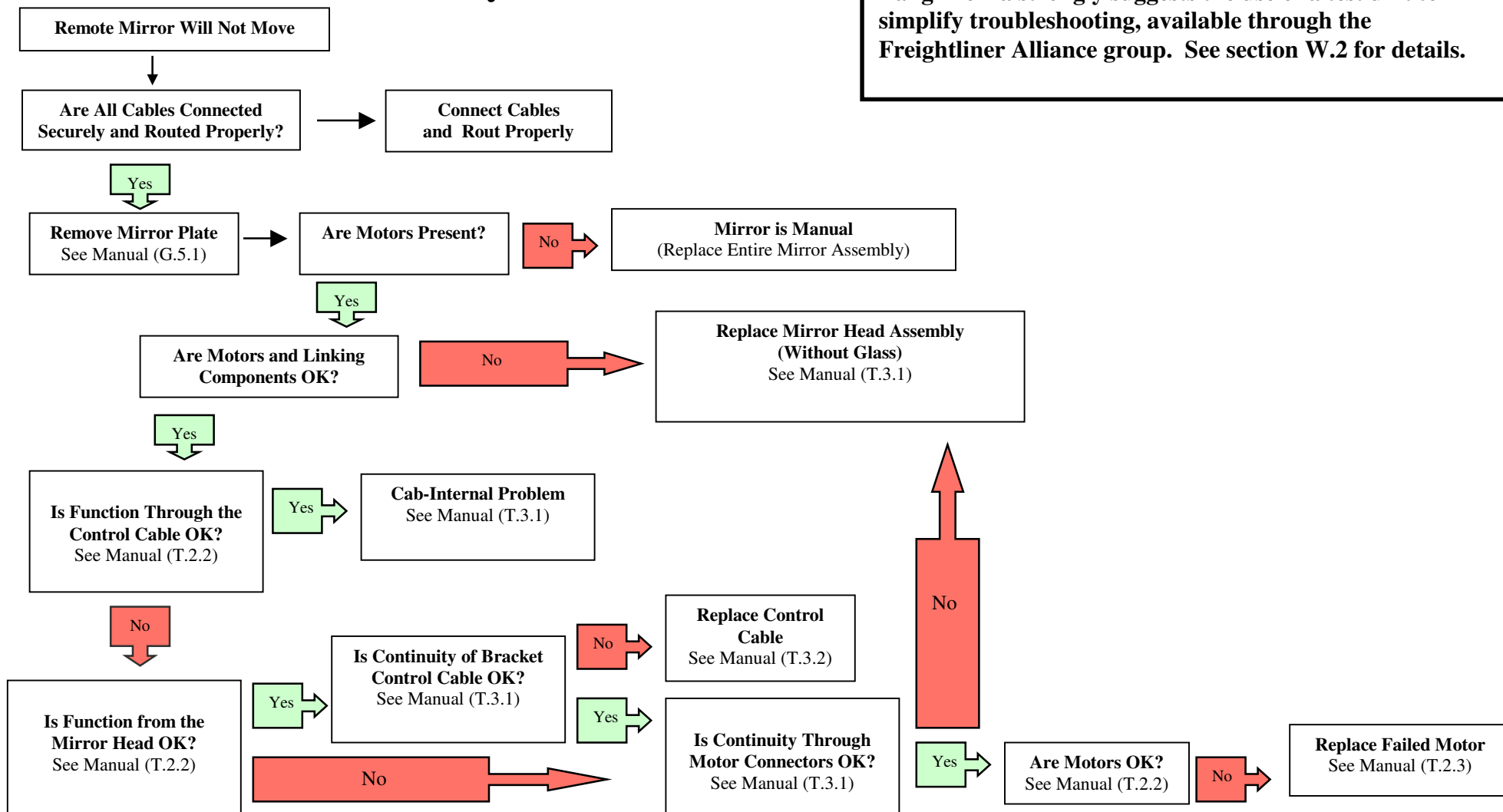
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T.2.1 Mirror Movement Analysis Flowchart

Lang-Mekra strongly suggests the use of a test unit to simplify troubleshooting, available through the Freightliner Alliance group. See section W.2 for details.





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T.2.2 Mirror Movement Analysis

- 1) Follow the flowchart in **T.2.1** to promptly diagnose mirror movement problems.
- 2) Make sure all cables and connections are tight.
- 3) Remove the mirror glass according to **G.5.1**. Check to ensure the mirror is remote (there are motors present). Sometimes, a customer may have a manual mirror with a remote control switch inside the truck. If this is the case, the entire assembly must be replaced if the customer wants a remote control mirror.
- 4) Are the motor arms and linking components in good visual condition and function? If not, replace the appropriate part as indicated in the flowchart.
- 5) Using a tester unit (or supplying power to the control cable according to **T.3.1**) check the mirror function from the end of the control cable at the door (under the lower cover). If the mirror functions properly, the fault is cab-internal.
- 6) Using a tester unit (or supplying power to the motor connector inside the mirror head) check the function of the mirror head. If the mirror functions at this point, but not from the control cable (under the lower cover), the problem is in the control cable. Check the connections, and if necessary replace the control cable according to **T.3.2**. Always perform a continuity check (see **T.3.1**) on the control cable and confirm the fault before attempting replacement.
- 7) If there is no continuity through the motor connector according to **T.3.1**, the motor must be replaced, or the mirror head assembly must be replaced. To determine which must be replaced, snip the wires for the appropriate motor about 2 1/2" from the motor connector. Put the motor leads to power—if the motor does not function, it must be replaced. See **T.2.5** for details. If the motor functions when the leads are directly connected to power, but does not function when power is supplied to the connection, the motor connector is faulty. The mirror head assembly must be replaced. See **T.2.4** for details.



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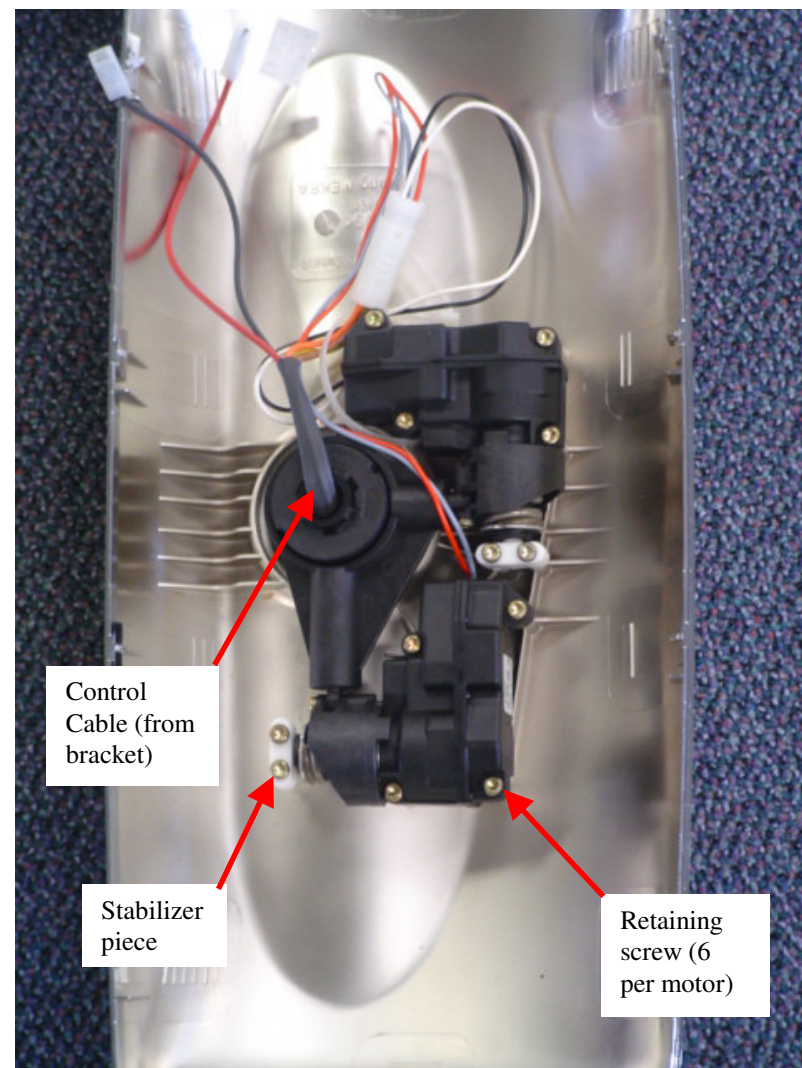
(T.2.3) Motor (Actuator) Replacement

Actuator Removal

- 1) Remove mirror plate (**G.5.1**)
- 2) After identifying the non-functioning motor according to **T.2.1** and **T.2.2**, remove the six retaining screws with a 4mm torx driver. Slide the unattached motor away from center pivot and lift it out of the housing.
- 3) Remove the white stabilizer piece from the old motor and save it. It will be used when installing the new motor.
- 4) Unplug the old actuator from the motors connector.

Actuator Installation

- 1) Plug the wires from the new actuator assembly into the motors connector on the control cable. Make sure the wires are not pinched or strained.
- 2) Attach the white stabilizing piece to the new motor and slide the motor into the center pivot.
- 3) Fasten motor with six screws to 0.7-1.2 N-m, using a 4mm torx driver.
- 4) Reinstall the glass, being sure to connect the heater wires if applicable (**G.5.2**).





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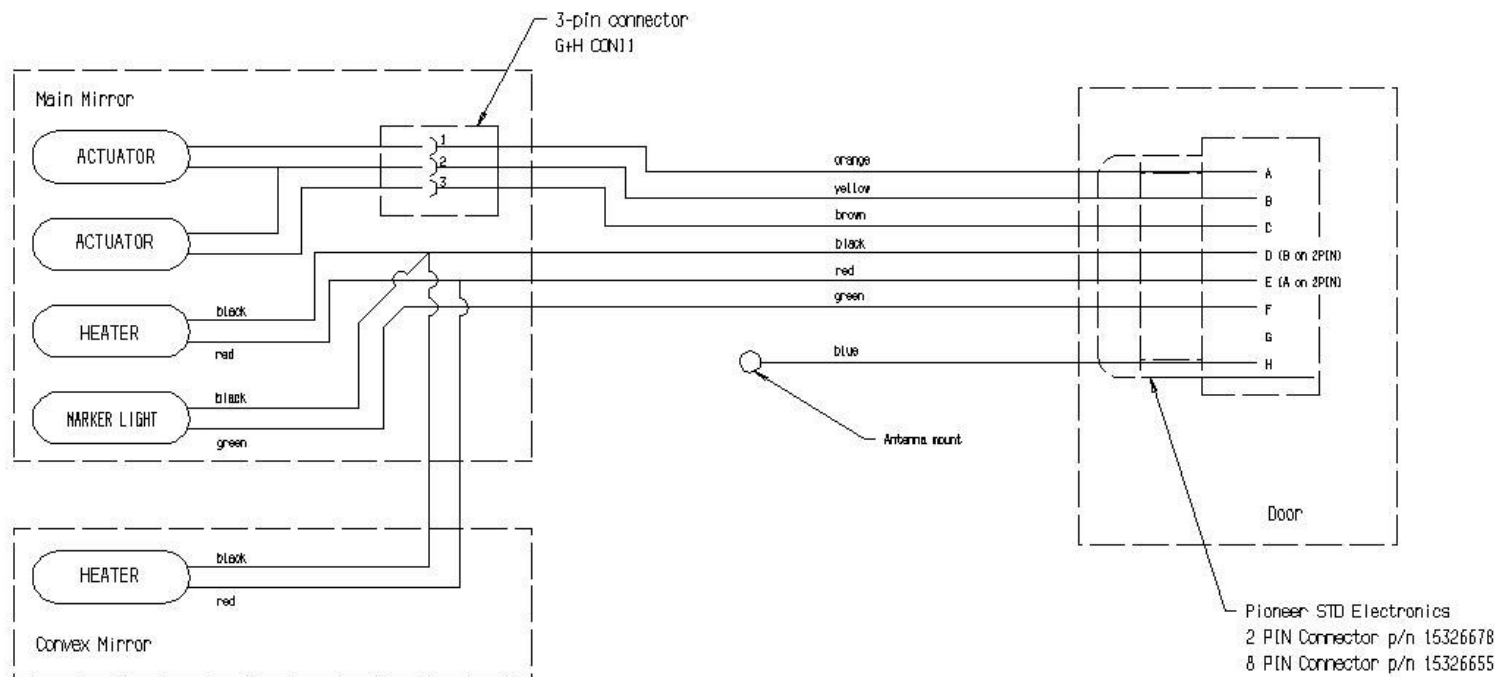
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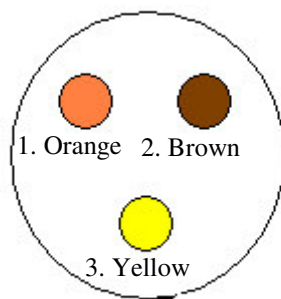
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(T.3.1) Wiring & Connections

HEATED/REMOTE WIRING

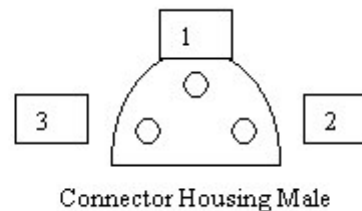


MOTOR CONNECTOR



From Control Cable

LH:
1- Red & Black
2-White
3-Gray



Actuator Assembly

RH:
1-Gray & white
2-Black
3-Red



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(T.3.2) Control Cable Replacement / CB Cable Replacement

When replacing the existing cabling, DO NOT remove the existing wiring. Instead, use the existing wiring to route the new cable through the bracket tube. Call our toll-free technical support hotline for assistance (1-888-MEKRA-4-U).



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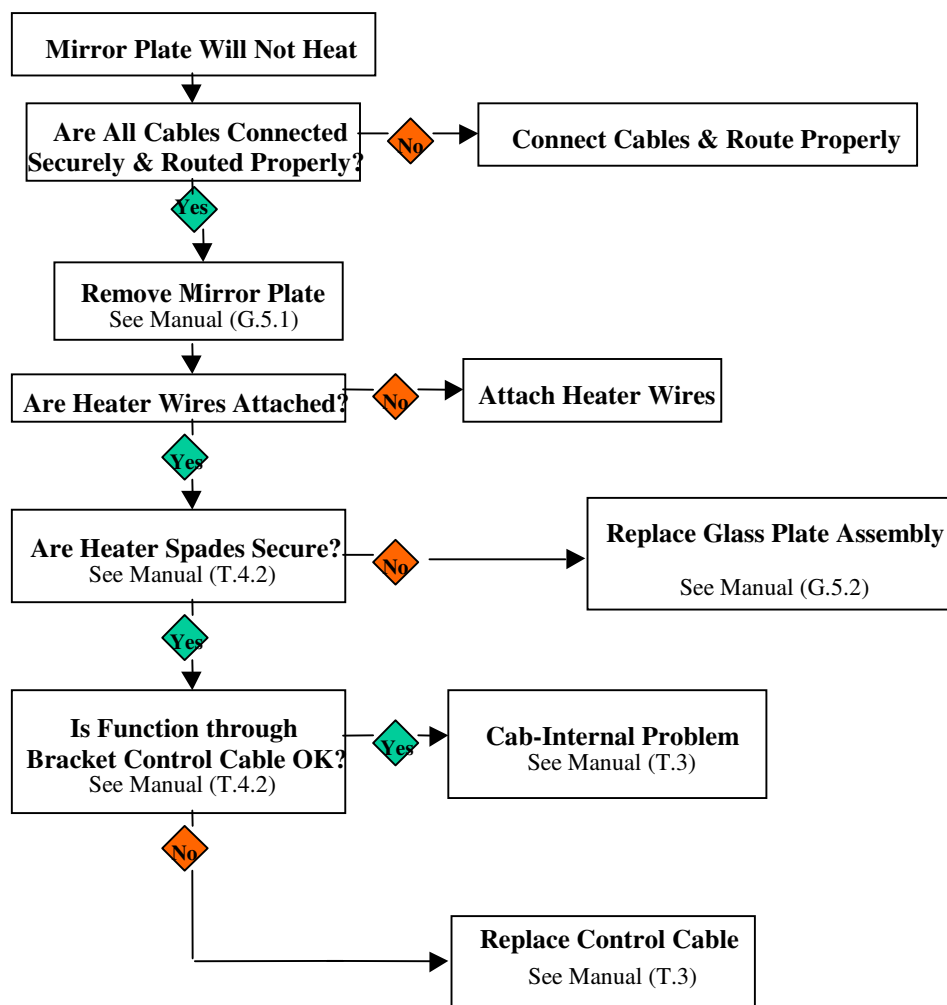
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(T.4.1) Mirror Heat Analysis Flowchart



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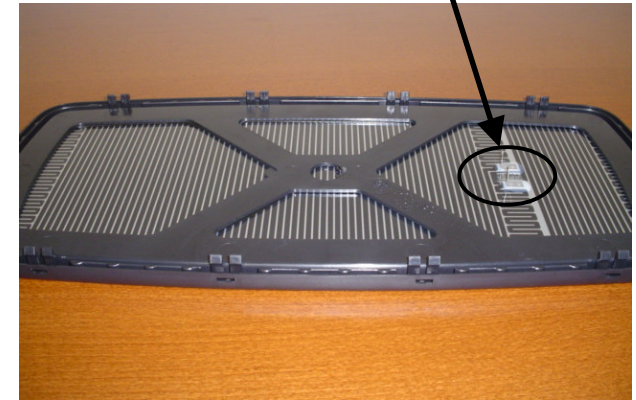
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(T.4.2) Mirror Heat Analysis

- 1) Follow the flowchart in **T.4.1** to promptly diagnose mirror heat problems.
- 2) Remove the mirror glass according to **G.5.1**. Check to ensure the mirror is heated. (Heater spades are present.)
- 3) Make sure all cables and connections are tight.
- 4) Check to see if the heater terminals are secure. (See Illustration). If not, replace the glass plate assembly.
- 5) Using a tester unit, or supplying power to the bracket cable according to **T.3**, test the function of the heat from control cable at the door (under the lower cover). If the mirror functions properly, the fault is cab-internal.
- 6) Using a tester unit, or supplying power to the heater terminals according to **T.3**, test the function of the heat from mirror head. If the heat functions at this point, but not from the control cable, the problem is in the control cable (inside the bracket). Check the connections, and if necessary replace the control cable as indicated in the flowchart. Always perform a continuity check (see **T.3**) on the control cable and confirm the fault before attempting to replace the control cable.
- 7) If the mirror fault is not with the control cable, replace the mirror glass according to **G.5**.

Heater Terminals



When attaching or detaching the heater wires, be sure to push or pull on the white terminal cover. Do not pull on the wires, or pull up or down on the heater terminals.

(T.5) Surface Finishes

The paint on the bracket and holders is a flexible, weather-resistant powder coating. This coating requires no topcoat. If the paint is chipped or otherwise damaged, use Dupont paint number 373-P-23290 for repainting of silhouette grey systems. For bright or chrome systems, a matching wet paint may be used after the surface is sufficiently prepared.



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(W.1) Warranty Coverage

Lang-Mekra provides a warranty for production parts covering materials and workmanship. Warranty reimbursement includes part replacement, repair time at accepted labor rates and reasonable administrative costs. The time period of the warranty coverage and specific terms of reimbursement are determined through the warranty agreement with the Freightliner Truck Corporation.

The warranty will cover:

- Functional Quality of Components
- Lang-Mekra Workmanship
- Confirmed Field Failures
- Labor Costs for Replacement
- Reasonable Administrative Costs

The warranty will not cover:

- Glass Breakage and Other Impact, Abuse, Mistreatment
- Minor Re-assembly
- Unnecessary and/or Improper Service
- Unauthorized Product Alterations and/or Additions
- Unreasonable Costs
- Full Mirror System Replacement

Please Do Not Submit Warranty Claims for Items That Have Suffered Impact!

Parts Returned Exhibiting Impact Damage Will Be Denied Coverage, and May Be Returned Freight-Collect

Lang-Mekra reserves the right to inspect submitted warranty claims. Upon satisfactory performance and history, dealers, fleets and other end users may be granted coverage based on description alone. Evaluation points will include:



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- Complete and Accurate Claim Descriptions
- Absence of Rejected Claims
- Use of Appropriate Replacement Parts
- Constructive Feedback

(W.2) Available Service Parts

All warranty replacements should utilize the appropriate service part or parts. **Unnecessary replacements cannot be covered by warranty.**

The following list represents all parts currently available for service and after-market use relating to the Lang-Mekra M2 mirrors. The reference number given corresponds to the illustration in the PartsPro service software. Please note that the illustrations and relevant part information in PartsPro are periodically updated.

Parts Pro #	LMNA Part Number	Description	Parts Pro #	LMNA Part Number	Description
1	59 4145 420	MIRROR ASSEMBLY,LH, BLACK,MAN/2HTD	3	59 4143 521	BRACKET ASSEMBLY, LH, RMT, HTD CB
2	59 4145 430	MIRROR ASSEMBLY,RH, BLACK,MAN/2HTD	4	59 4143 530	BRACKET ASSEMBLY, RH, RMT, HTD
1	59 4145 320	MIRROR ASSEMBLY,LH, BLACK,MAN/UHT	3	59 4143 520	BRACKET ASSEMBLY, LH, RMT, HTD
2	59 4145 330	MIRROR ASSEMBLY,RH, BLACK,MAN/UHT	4	59 4143 432	BRACKET ASSEMBLY, RH, MAN, HTD, LT
1	59 4145 020	MIRROR ASSEMBLY,LH, BLACK,MAN/UHT,NO CVX	3	59 4143 422	BRACKET ASSEMBLY, LH, MAN, HTD, LT
2	59 4145 030	MIRROR ASSEMBLY,RH, BLACK,MAN/UHT,NO CVX	4	59 4143 431	BRACKET ASSEMBLY, RH, MAN, HTD, CB
1	59 4144 521	MIRROR ASSEMBLY,LH, BRIGHT,RMT/2HTD,CB	3	49 4143 421	BRACKET ASSEMBLY, LH, MAN, HTD, CB
2	59 4144 431	MIRROR ASSEMBLY,RH, BRIGHT,RMT/2HTD,CB	4	59 4143 430	BRACKET ASSEMBLY, RH MAN, HTD
1	59 4144 520	MIRROR ASSEMBLY,LH, BRIGHT,RMT/2HTD	3	59 4143 420	BRACKET ASSEMBLY, LH, MAN, HTD
2	59 4144 530	MIRROR ASSEMBLY,RH, BRIGHT,RMT/2HTD	4	59 4143 130	BRACKET ASSEMBLY, RH, MAN, UNHT
1	59 4144 422	MIRROR ASSEMBLY,LH, BRIGHT,MAN/2HTD,LT	3	59 4143 120	BRACKET ASSEMBLY, LH, MAN, UNHT

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Tel: 1-888-MEKRA 4U / Fax: (803) 337 5265

E mail: quality@lang-mekra.com

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These Products May Be The Subject of Pending U.S. Patent Application 2009-01-20 or May Be Covered By One or More of the Following U.S. Patents: 4,991,950 5,110,196 5,137,247 5,196,965 385,243 5,687,035 387,317

2	59 4144 432	MIRROR ASSEMBLY,RH, BRIGHT,MAN/2HTD,LT	4	59 4143 030	BRACKET ASSEMBLY, RH, MAIN ONLY
1	59 4144 420	MIRROR ASSEMBLY,LH, BRIGHT,MAN/2HTD	3	59 4143 020	BRACKET ASSEMBLY, LH, MAIN ONLY
2	59 4144 430	MIRROR ASSEMBLY,RH, BRIGHT,MAN/2HTD	11	15 4143 107	Flat Glass Plate Assembly, Heated
1	59 4144 320	MIRROR ASSEMBLY,LH, BRIGHT,MAN/UHT	11	15 4143 100	Flat Glass Plate Assembly, Non-Heated
2	59 4144 330	MIRROR ASSEMBLY,RH, BRIGHT,MAN/UHT	12	15 4153 227	Convex Glass Plate Assembly, Heated
1	59 4144 421	MIRROR ASSEMBLY,LH, BRIGHT,MAN/2HTD,CB	12	15 4153 225	Convex Glass Plate Assembly, Non-Heated
6	51 4145 030	Main Mirror Head, Black, Manual	13	56 4154 030	Convex Mirror Head, Chrome
5	51 4145 200	Main Mirror Head, Black, Remote, LH	13	56 4155 030	Convex Mirror Head, Black
5	51 4145 210	Main Mirror Head, Black, Remote, RH	19	20 414 3010	Upper Holder, Black, LH
6	51 4144 030	Main Mirror Head, Chrome, Manual	20	20 414 3010	Upper Holder, Black, RH
5	51 4144 200	Main Mirror Head, Chrome, Remote, LH	18	11 3870 510B	Back clamp kit, Black
5	51 4144 210	Main Mirror Head, Chrome, Remote, RH	23	59 360 1152	Roof Mirror, Black
7	12 4143 010	Main Mirror Housing, Black	23	59 360 1228	Roof Mirror, Chrome
8	13 4142 010	Main Mirror Housing, Chrome	23	59 360 1152	Roof Mirror, Black
9	08 4143 012	Actuator Assembly, LH	23	59 360 1228	Roof Mirror, Chrome
10	08 4143 112	Actuator Assembly, RH	23	59 360 1228	Roof Mirror, Chrome
15	09 384 1100	CB Harness Replacement	16	09 414 0004	CB Cable and Ground
24	14 414 3000	Main (Flat) Bezel	24	14 415 3100	Convex Bezel



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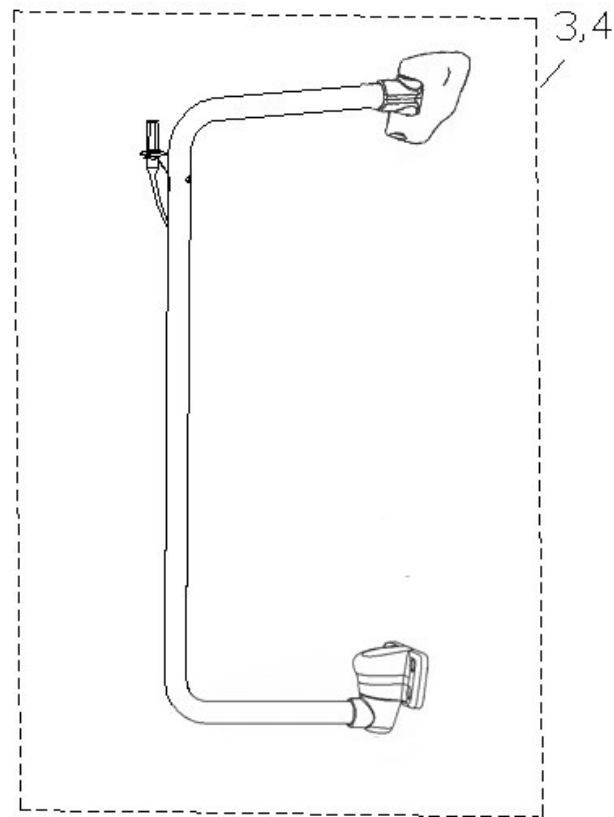
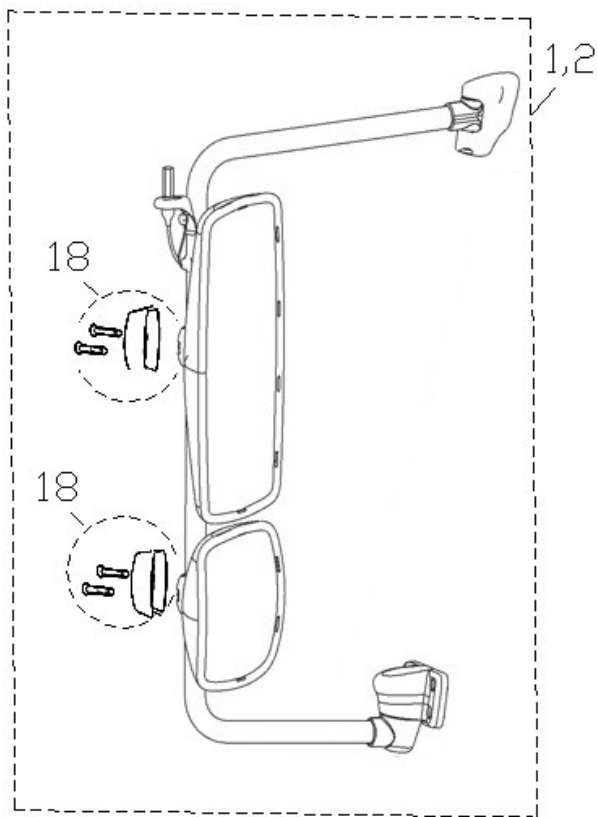
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387,317

24	40 415 5103	Main (Flat) Glass	24	40 414 5600	Convex Glass
N/S	61 410 0006	Flip-out (Third) Arm Kit			

(W.3) Parts Pro Illustrations





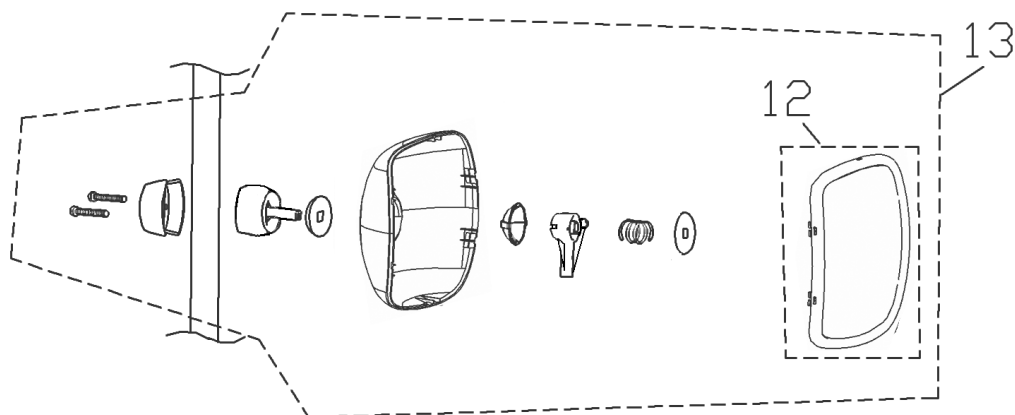
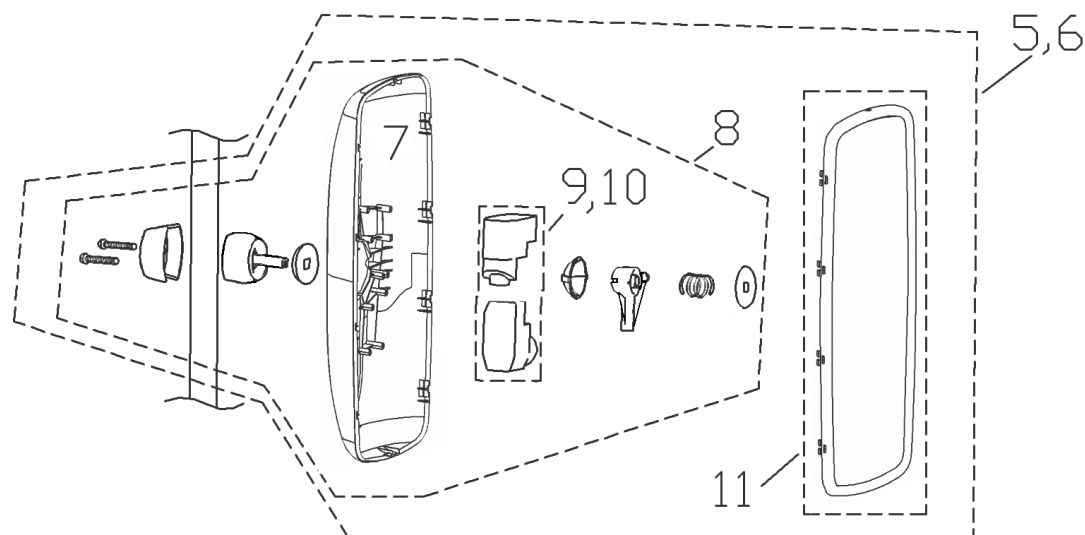
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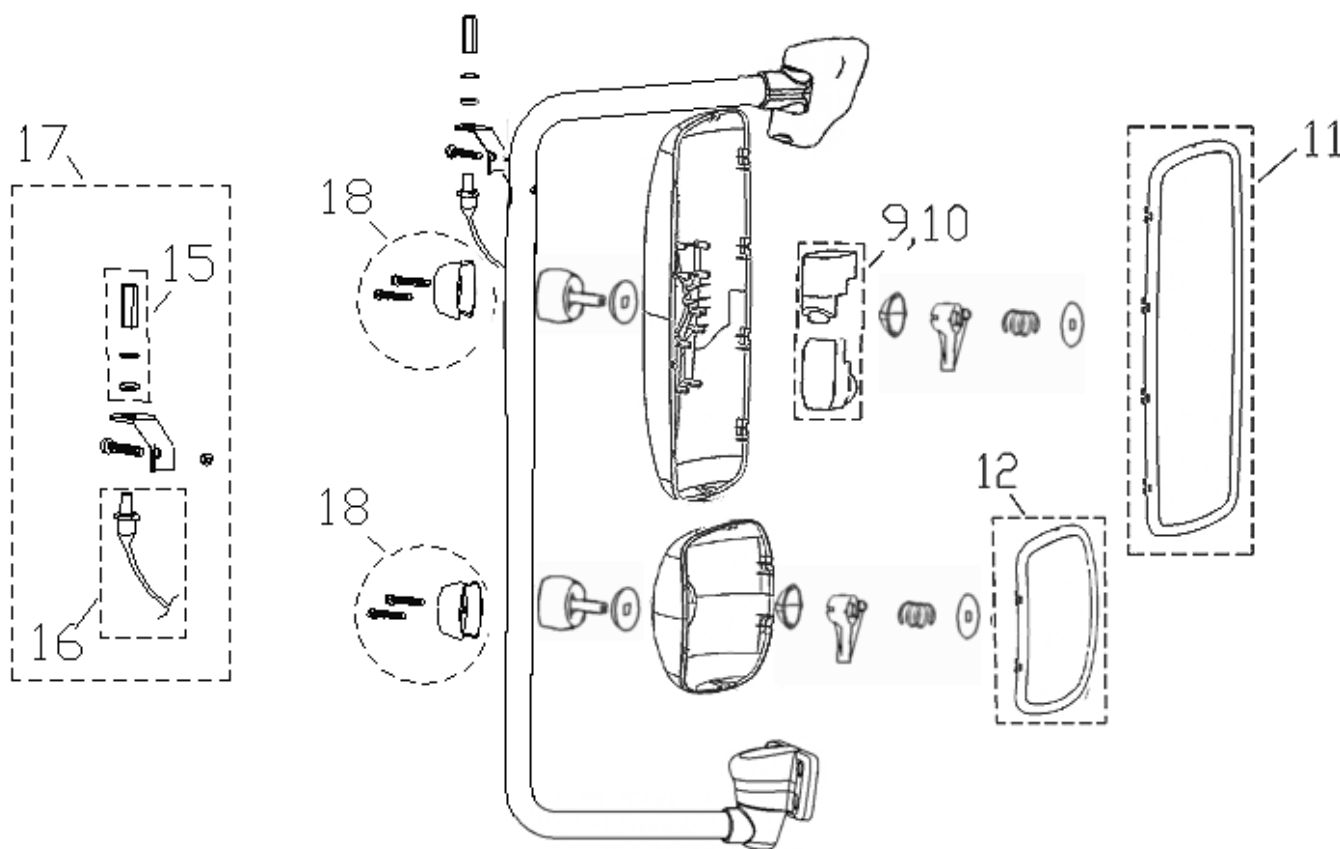
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