

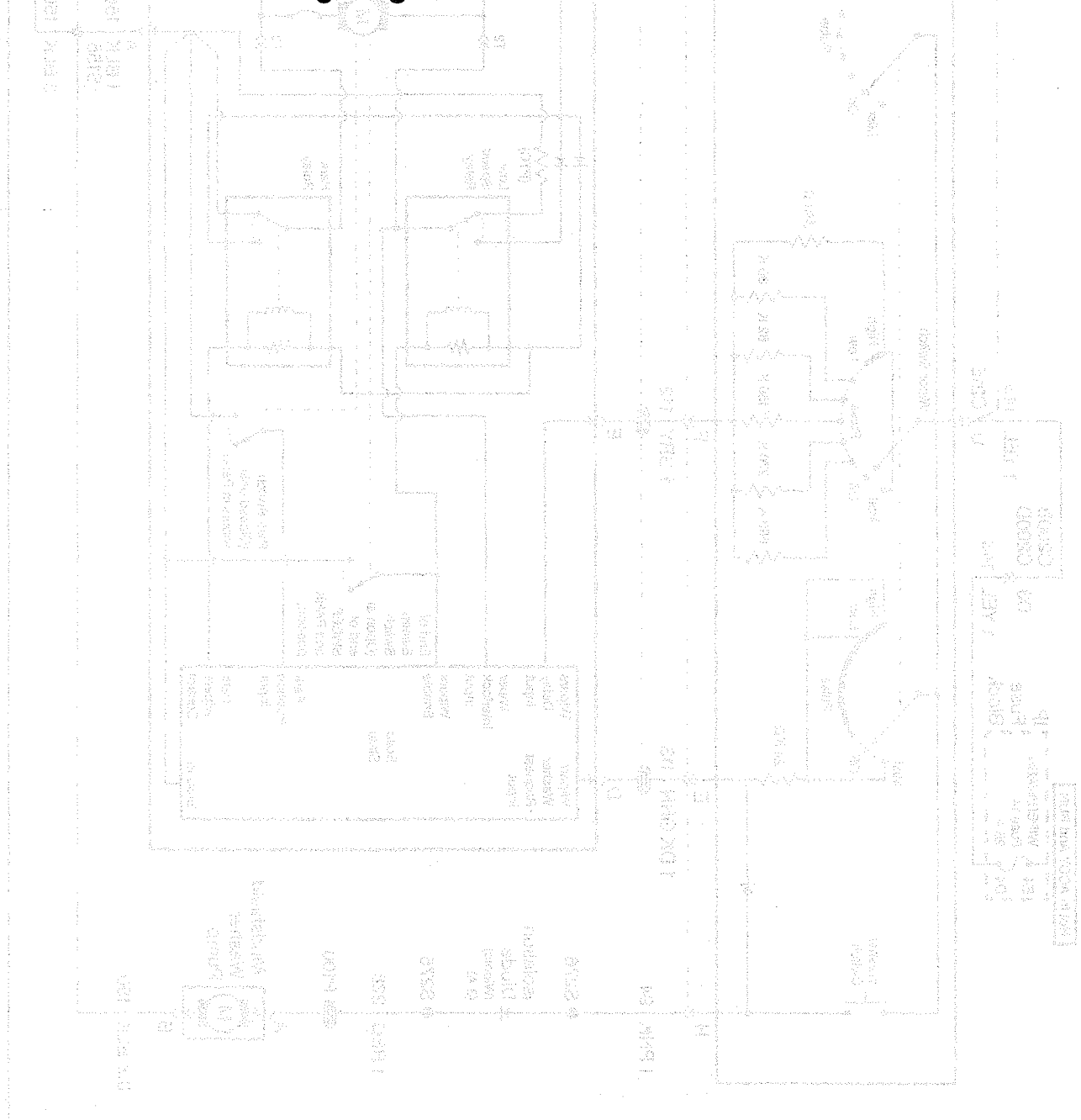
Wipers/Washer Systems

Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Wiper Arm Nuts	23 N·m	17 lb ft
Wiper Linkage Nut	10 N·m	7.5 lb ft
Wiper Linkage Screws	10 N·m	7.5 lb ft
Wiper Motor Cover Screws	3 N·m	26 lb in
Wiper Motor Screw	10 N·m	7.5 lb ft

Schematic and Routing Diagrams



8-240 Wipers/Washer Systems



Component Locator

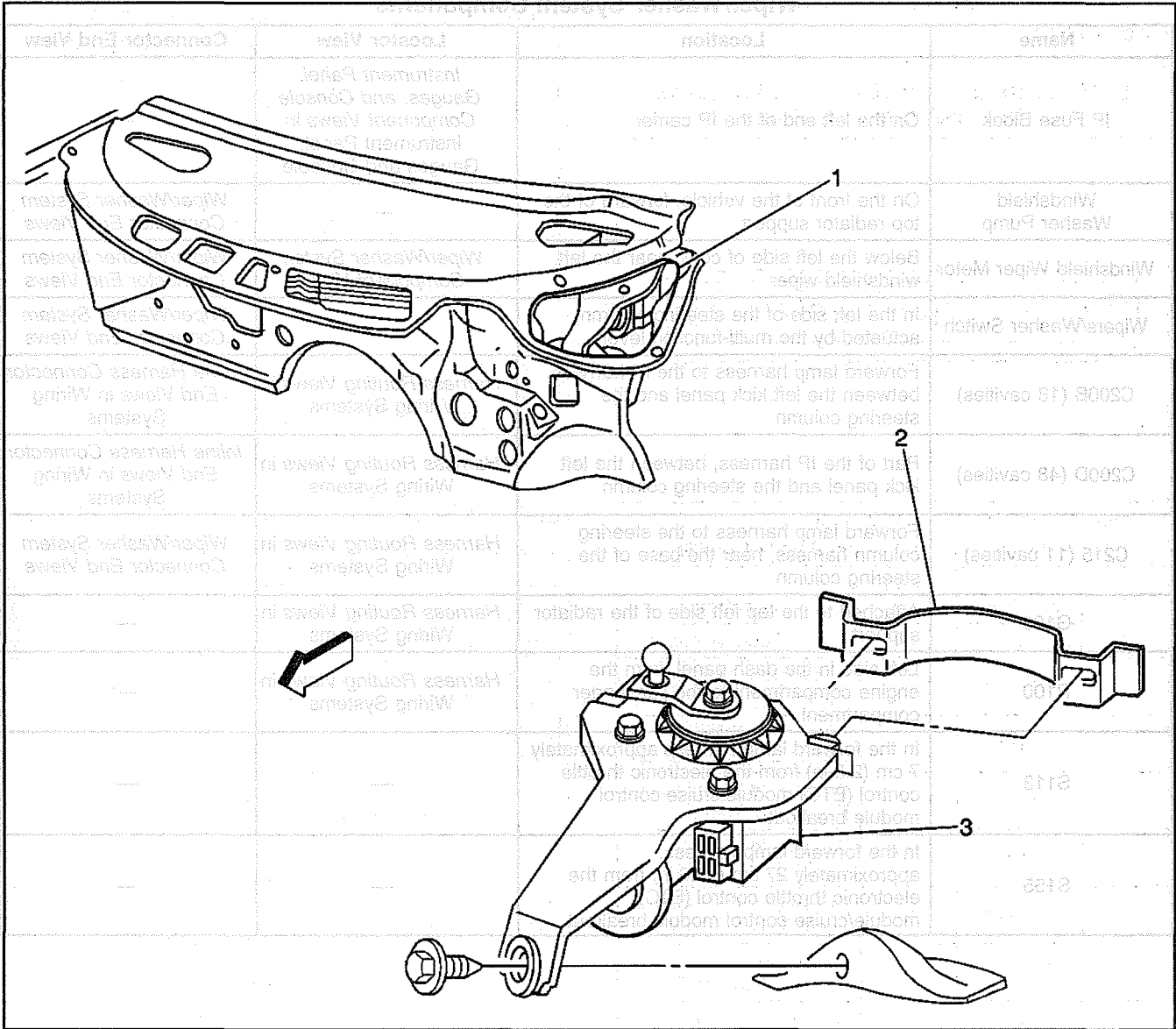
Wiper/Washer System Components

Name	Location	Locator View	Connector End View
IP Fuse Block	On the left end of the IP carrier	<i>Instrument Panel, Gauges, and Console Component Views in Instrument Panel, Gauges and Console</i>	—
Windshield Washer Pump	On the front of the vehicle, forward of the top radiator support	—	<i>Wiper/Washer System Connector End Views</i>
Windshield Wiper Motor	Below the left side of cowl, near the left windshield wiper	<i>Wiper/Washer System Component Views</i>	<i>Wiper/Washer System Connector End Views</i>
Wipers/Washer Switch	In the left side of the steering column, actuated by the multi-function lever	—	<i>Wiper/Washer System Connector End Views</i>
C200B (18 cavities)	Forward lamp harness to the IP harness, between the left kick panel and the steering column	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>
C200D (48 cavities)	Part of the IP harness, between the left kick panel and the steering column	<i>Harness Routing Views in Wiring Systems</i>	<i>Inline Harness Connector End Views in Wiring Systems</i>
C215 (11 cavities)	Forward lamp harness to the steering column harness, near the base of the steering column	<i>Harness Routing Views in Wiring Systems</i>	<i>Wiper/Washer System Connector End Views</i>
G106	Attached to the top left side of the radiator support	<i>Harness Routing Views in Wiring Systems</i>	—
P100	Left side in the dash panel, from the engine compartment to the passenger compartment	<i>Harness Routing Views in Wiring Systems</i>	—
S113	In the forward lamp harness approximately 7 cm (2.8 in) from the electronic throttle control (ETC) module/cruise control module breakout	—	—
S155	In the forward lamp harness, approximately 27 cm (10.6 in) from the electronic throttle control (ETC) module/cruise control module breakout	—	—

Wiper/Washer System Component Views

Component Locator

Windshield Wiper Motor

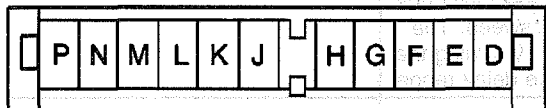


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Legend

- (1) Inside Left of Cowl
- (2) Windshield Wiper Motor Bracket
- (3) Windshield Wiper Motor

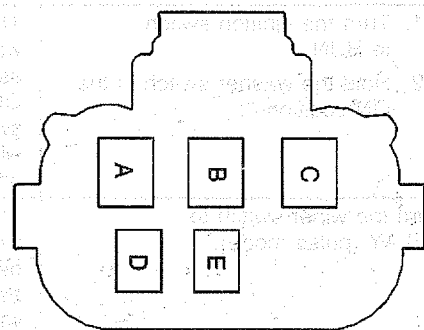
Visual Identification

Wiper/Washer System Connector
End ViewsC215 Connector for Multi-function Lever,
Wipers/Washer Switch

524871

Connector Part Information		• 0629-4509 • 11-Way F Pack-Con (BLK)	
Pin	Wire Color	Circuit No.	Function
D	YEL	143	Fused Output-Accessory
E	DK GRN	113	Windshield Wiper Switch Signal-On
F	GRY	112	Windshield Wiper Switch Signal-Low/Pulse
G	PPL	92	Windshield Wiper Motor Feed-High Speed
H	PNK	94	Windshield Washer Switch Signal
J	GRY/BLK	87	Cruise Control Resume/Accel Switch Signal
K	DK BLU	84	Cruise Control Set/Coast Switch Signal
L	GRY	397	Cruise Control On Switch Output
M	PNK	139	Fused Output-Ignition
N	—	—	Not Used
P	—	—	Not Used

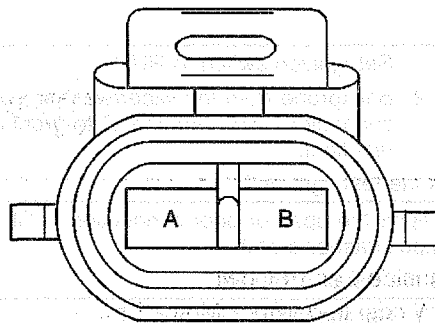
Windshield Wiper Motor



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Connector Part Information		• 1212-9126 • 5-Way F Metri-pack 280 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	BLK	150	Ground
B	YEL	143	Fused Input Feed
C	PPL	92	Windshield Wiper Motor Feed-High Speed
D	DK GRN	113	Wiper/Washer Request Input
E	GRY	112	Windshield Wiper Switch Delay Signal Input

Windshield Washer Pump



35437

Connector Part Information		• 1205-2641 • 2-Way F Metri-pack 150 Series (BLK)	
Pin	Wire Color	Circuit No.	Function
A	RED	228	Fused Input Feed
B	BLK	150	Ground

Diagnostic Information and Procedures

Wiper/Washer System Check

Step	Action	Normal Result(s)	Abnormal Result(s)*
1	1. Turn the ignition switch to RUN. 2. Hold the washer switch in the ON position.	The wipers operate at LO speed. The washer sprays the windshield as long as the washer switch is held in the ON position. After releasing the switch, the washer stops and the wipers return to the park position after 2–4 sweeps.	• Washers Inoperative • Wipers Mist, Delay, and Low Modes Inoperative
2	Turn the wiper switch to DELAY (pulse mode).	The wipers make one complete sweep, then pause for 1–22 seconds before making the next sweep. The pause time is adjusted by turning the wiper switch through the delay range.	Wipers Delay Mode Inoperative
3	1. Turn the wiper switch to DELAY. 2. Hold the wiper switch ON for 1–2 seconds.	The washer sprays as long as the washer switch is held ON. The wipers run at low speed during spray period and continue for 2–4 sweeps after the washer switch is released. The wipers then return to pulse operation.	• Washers Inoperative • Wipers Mist, Delay, and Low Modes Inoperative
4	Turn the wiper switch to LO.	The wipers run continuously at low speed.	Wipers Mist, Delay, and Low Modes Inoperative
5	Turn the wiper switch to HI.	The wipers run continuously at high speed.	Wipers High Mode Inoperative, Low Mode Operates
6	Turn the wiper switch to OFF.	The wipers return to the park position at low speed.	• Wipers Always On. • Wipers Blades Do Not Park
7	Turn the wiper switch to MIST, then release.	The wipers make one complete sweep, then return to the park position.	Wipers Mist, Delay, and Low Modes Inoperative

Wipers All Modes Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	1. Set ignition switch to RUN. 2. Backprobe from the wiper/washer switch connector C215, terminal D to ground, with a test light. Is the test light on?	—	Go to Step 4	Go to Step 3
3	Repair the open or poor connection in CKT 143 to the wiper/washer switch. Is the repair complete?	—	Go to Wiper/Washer System Check	—
4	1. Set the wiper switch to HI. 2. Connect the test light from connector C215, terminal G, to ground. Is the test light on?	—	Go to Step 7	Go to Step 5
5	Check for a poor connection at connector C215, terminal D or for an open in the pigtail (CKT 143) to the wiper/washer switch. Is a poor connection or an open present?	—	Go to Step 6	Go to Step 14
6	Repair the poor connection or the open in the pigtail (CKT 143). Is the repair complete?	—	Go to Wiper/Washer System Check	—
7	1. Disconnect the wiper motor connector. 2. Connect the test light from the wiper motor connector terminal C to ground. Is the test light on?	—	Go to Step 9	Go to Step 8

Wipers All Modes Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
8	Repair the open or the poor connection in CKT 92 between connection C215 and the wiper motor. Is the repair complete?	—	Go to Wiper/Washer System Check	—
9	Connect the test light from the wiper motor connector terminal C to terminal A. Is the test light on?	—	Go to Step 11	Go to Step 10
10	Repair the open or poor connection in CKT 150. Is the repair complete?	—	Go to Wiper/Washer System Check	—
11	Check for a poor connection to the wiper motor assembly. Is a poor connection present?	—	Go to Step 13	Go to Step 12
12	Replace the wiper motor. Refer to <i>Wiper Motor Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
13	Repair the poor connection. Is the repair complete?	—	Go to Wiper/Washer System Check	—
14	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—

Wipers Delay Mode Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Wiper/Washer System Check	Go to Wiper/Washer System Check
2	1. Turn the ignition to OFF. 2. Disconnect wiper/washer switch connector C215. 3. Turn the wiper switch to DELAY. 4. Measure the resistance through the wiper/washer switch from connector C215, terminal C to terminal A, using a <i>J 39200</i> set to the Ω scale. 5. Move the wiper switch through the entire delay range, one notch at a time. Does the resistance vary within the specified values?	39 K Ω to 680 K Ω	Go to Step 4	Go to Step 3
3	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
4	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Turn the ignition switch to RUN. 4. Turn the wiper switch to DELAY. 5. Measure the voltage from the wiper motor connector, terminal E, to ground using a <i>J 39200</i> . Is the measurement within the specified values?	10.5–15 volts	Go to Step 7	Go to Step 5
5	Check for a poor connection or an open in CKT 112. Is a poor connection or an open present?	—	Go to Step 6	Go to Step 7
6	Repair the poor connection or the open in CKT 112. Is the repair complete?	—	Go to Wiper/Washer System Check	—
7	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—

Wipers High Mode Inoperative, Low Mode Operates

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	Do the wipers operate at all with the wiper switch in HI?	—	Go to Step 4	Go to Step 3
3	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
4	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to HI. 3. Backprobe from the wiper/washer switch connector C215, terminal G, to ground with a test light. Is the test light on?	—	Go to Step 8	Go to Step 5
5	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or open present?	—	Go to Step 7	Go to Step 6
6	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
7	Repair the poor connection or the open. Is the repair complete?	—	Go to Wiper/Washer System Check	—
8	1. Disconnect the wiper motor connector. 2. Connect the test light from the wiper motor connector, terminal C, to ground. Is the test light on?	—	Go to Step 10	Go to Step 9
9	Repair the open in CKT 92. Is the repair complete?	—	Go to Wiper/Washer System Check	—
10	Check for a poor connection condition to the wiper motor. Is a poor connection condition present?	—	Go to Step 11	Go to Step 12
11	Repair the poor connection to the wiper motor. Is the repair complete?	—	Go to Wiper/Washer System Check	—
12	Replace the wiper motor. Refer to <i>Wiper Motor Replacement</i> . Is the repair complete?	—	Go to Wiper/Washer System Check	—

Wipers Mist, Delay, and Low Modes Inoperative

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to LO. 3. Measure the voltage by backprobing from the wiper/washer switch connector C215, terminal E, to ground using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 6	Go to Step 3
3	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or an open present?	—	Go to Step 4	Go to Step 5
4	Repair the poor connection or the open circuit. Is the repair complete?	—	Go to Wiper/Washer System Check	—

Wipers Mist, Delay, and Low Modes Inoperative (cont'd)

Step	Action	Value(s)	Yes	No
5	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
6	Measure the voltage by backprobing from the wiper/washer switch connector C215, terminal F, to ground using a <i>J 39200</i> . Is the measurement greater than the specified value?	1.0 V	Go to Step 10	Go to Step 7
7	Check for a poor connection at connector C215, or for an open in the pigtail to the wiper/washer switch. Is a poor connection or an open present?	—	Go to Step 8	Go to Step 9
8	Repair the poor connection or the open circuit. Is the repair complete?	—	Go to Wiper/Washer System Check	—
9	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
10	1. Disconnect the wiper motor connector. 2. Measure the voltage from the wiper motor connector, terminal D to ground, using a <i>J 39200</i> . Is the measurement greater than the specified value?	1.0 V	Go to Step 12	Go to Step 11
11	Repair the open in CKT 113. Is the repair complete?	—	Go to Wiper/Washer System Check	—
12	Measure the voltage from the wiper motor connector, terminal E, to ground using a <i>J 39200</i> . Is the measurement greater than the specified value?	1.0 V	Go to Step 14	Go to Step 13
13	Repair the open in CKT 112. Is the repair complete?	—	Go to Wiper/Washer System Check	—
14	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—

Wipers Always On

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	1. Set the ignition switch to RUN. 2. Set the wiper switch to OFF. 3. Disconnect the wiper/washer switch connector C215. Does the wiper keep running?	—	Go to Step 6	Go to Step 3
3	Check for a short to voltage in the pigtail wires to the wiper/washer switch. Is a short to voltage present?	—	Go to Step 5	Go to Step 4
4	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
5	Repair the short to voltage in the pigtail wires to the wiper/washer switch. Is the repair complete?	—	Go to Wiper/Washer System Check	—
6	Measure the voltage from connector C215 (vehicle side), terminal E, to ground using a <i>J 39200</i> . Is the measurement greater than the specified value?	1.0 V	Go to Step 14	Go to Step 7

Wipers Always On (cont'd)

Step	Action	Value(s)	Yes	No
7	Measure the voltage from connector C215 (vehicle side), terminal F, to ground using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 11	Go to Step 8
8	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal C, to ground using a J 39200. Is the measurement within the specified range?	10.5–15 V	Go to Step 9	Go to Step 10
9	Repair the short to voltage in CKT 92. Is the repair complete?	—	Go to Wiper/Washer System Check	—
10	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
11	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal E, to ground using a J 39200. Is measurement greater than the specified value?	1.0 V	Go to Step 12	Go to Step 13
12	Repair the short circuit to battery voltage condition in CKT 112. Is the repair complete?	—	Go to Wiper/Washer System Check	—
13	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
14	1. Reconnect the wiper/washer switch connector C201. 2. Disconnect the wiper motor connector. 3. Measure the voltage from wiper motor connector, terminal D, to ground using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 16	Go to Step 15
15	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
16	Repair the short to voltage in CKT 113. Is the repair complete?	—	Go to Wiper/Washer System Check	—

Wipers Blades Do Not Park

Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	1. Turn the ignition switch to RUN. 2. Turn the wiper switch to OFF. 3. Disconnect the wiper/washer switch connector C215. Do the wipers park?	—	Go to Step 3	Go to Step 4
3	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
4	Measure the voltage from connector C215 (vehicle side), terminal E, to ground using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 10	Go to Step 5

Wipers Blades Do Not Park (cont'd)

Step	Action	Value(s)	Yes	No
5	Measure the voltage from connector C215 (vehicle side), terminal F, to ground using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 7	Go to Step 6
6	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
7	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from the wiper motor connector, terminal E, to ground, using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 12	Go to Step 11
8	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
9	Repair the short to voltage in CKT 112. Is the repair complete?	—	Go to Wiper/Washer System Check	—
10	1. Reconnect the wiper/washer switch connector C215. 2. Disconnect the wiper motor connector. 3. Measure the voltage from the wiper motor connector, terminal D, to ground, using a J 39200. Is the measurement greater than the specified value?	1.0 V	Go to Step 8	Go to Step 7
11	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
12	Repair the short to voltage in CKT 113. Is the repair complete?	—	Go to Wiper/Washer System Check	—

Washers Inoperative

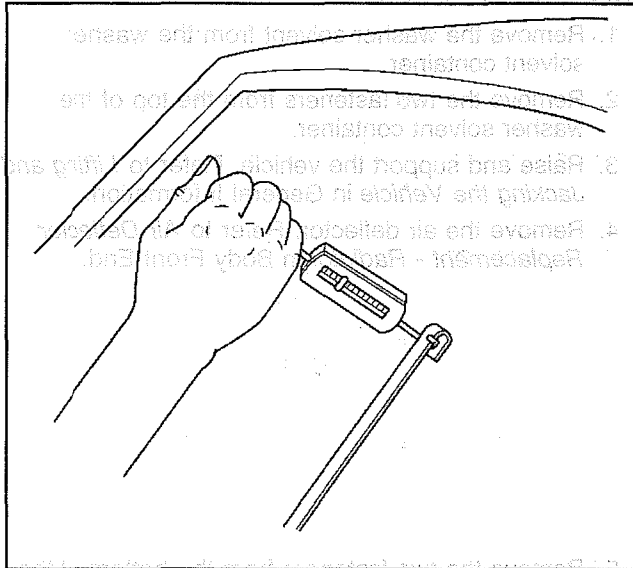
Step	Action	Value(s)	Yes	No
1	Was the Wiper/Washer System Check performed?	—	Go to Step 2	Go to Wiper/Washer System Check
2	Check the washer solvent container fluid level. Is the washer solvent container filled?	—	Go to Step 3	Go to Step 4
3	Fill the washer solvent container. Is the washer solvent container filled?	—	Go to Wiper/Washer System Check	—
4	Check the hoses to ensure that they are correctly attached and that they are not pinched or kinked. Are the hoses OK?	—	Go to Step 6	Go to Step 5
5	Repair the hoses. Are the hoses repaired?	—	Go to Wiper/Washer System Check	—
6	Check for clogged windshield washer nozzles. Are the nozzles clogged?	—	Go to Step 7	Go to Step 8
7	Replace the clogged nozzles. Are the nozzles replaced?	—	Go to Wiper/Washer System Check	—
8	Check WIPER/WASH fuse 14 in the IP Fuse Block. Is the fuse open?	—	Go to Step 9	Go to Step 10
9	Replace the open fuse. Is the replacement complete?	—	Go to Wiper/Washer System Check	—

(b) Washers Inoperative (cont'd) W

Step	Action	Value(s)	Yes	No
10	1. Disconnect the washer pump connector. 2. Turn the ignition switch to ON. 3. Connect a test light between terminals A and B of washer pump connector (harness side). 4. Activate the washer switch while observing the test light. Is the test light on?	—	Go to Step 11	Go to Step 14
11	Check for a poor connection at the washer pump connector. Is a poor connection present?	—	Go to Step 12	Go to Step 13
12	Repair the poor connection. Is the repair complete?	—	Go to Wiper/Washer System Check	—
13	Replace the washer pump. Refer to <i>Washer Pump Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
14	1. Connect the test light between the washer pump connector (harness side) terminal A and ground. 2. Activate the washer switch while observing test light. Is the test light on?	—	Go to Step 15	Go to Step 16
15	Repair the poor connection or open in CKT 150. Is the repair complete?	—	Go to Wiper/Washer System Check	—
16	1. Backprobe wiper/washer switch connector C215, terminal H, to ground with a test light. 2. Activate the washer switch. Is the test light on?	—	Go to Step 17	Go to Step 19
17	Check for a poor connection or an open in CKTs 94 and 228, or in the Isolation Diode. Is a poor connection or an open present?	—	Go to Step 18	Go to Step 20
18	Repair the poor connection or the open. Is the repair complete?	—	Go to Wiper/Washer System Check	—
19	Replace the wiper motor cover. Refer to <i>Wiper Motor Cover Replacement</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—
20	Replace the wiper/washer switch. Refer to <i>Multifunction Turn Signal Lever Replacement - On Vehicle</i> . Is the replacement complete?	—	Go to Wiper/Washer System Check	—

Wiper Arm Tip Pressure Check, Blade Element Check

Wiper Arm Tip Pressure Check



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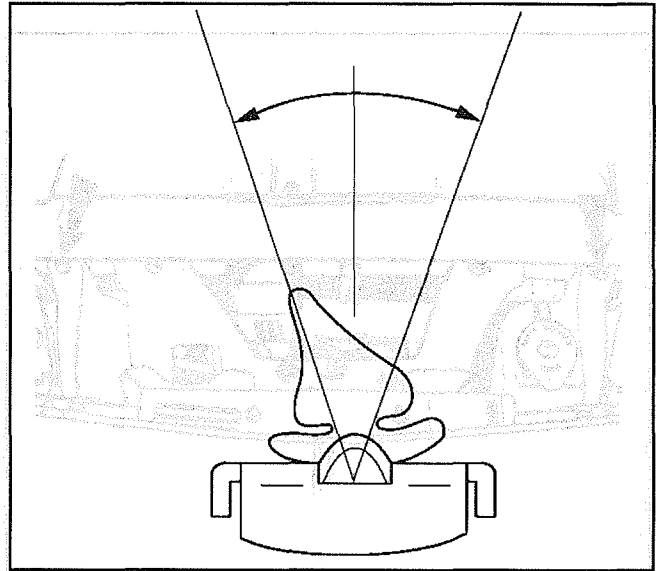
1. Run the wiper arms to the mid-wipe position.
2. Remove the wiper blades from the wiper arms. Refer to *Wiper Arm Blade Replacement*.
3. Attach a scale to the end of the wiper arm and measure the force required to lift the wiper arm perpendicular to the windshield to normal working height (height with the blade attached).
4. Replace the wiper arm if the measurement is not within the specification. Refer to *Wiper Arm Replacement*.

Tip Pressure

7.3–9.3 Newtons (26–33 oz)

5. Install the wiper blades on the wiper arms. Refer to *Wiper Arm Blade Replacement*.

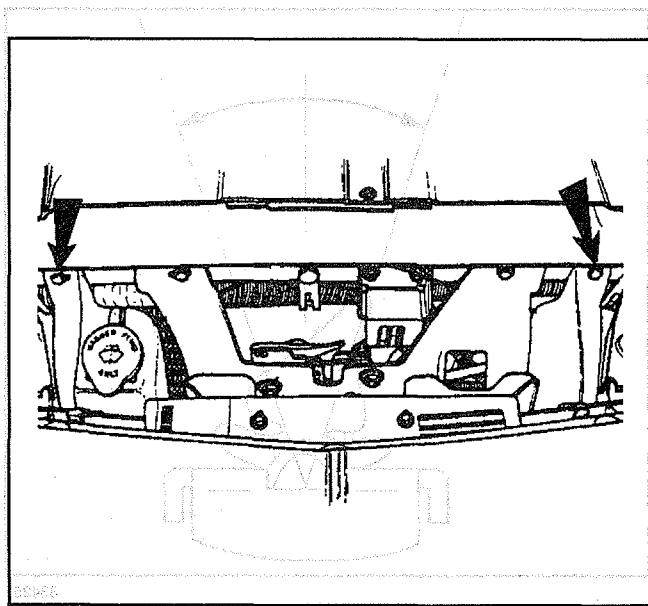
Blade Element Check



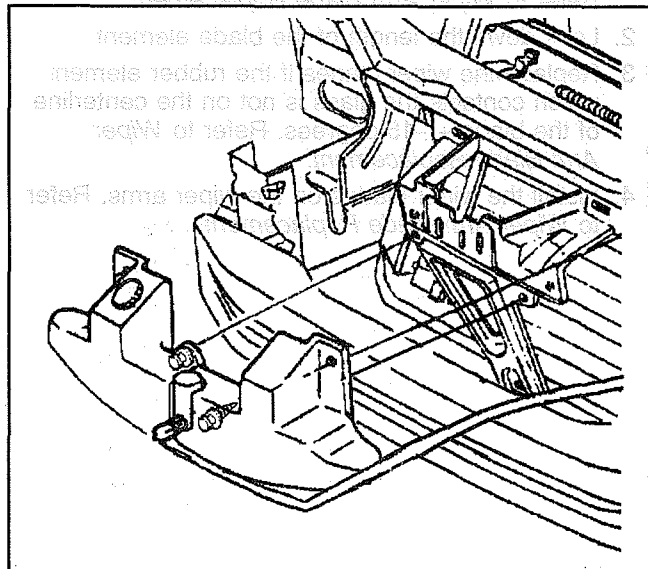
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1. Remove the wiper blades from the wiper arms. Refer to *Wiper Arm Blade Replacement*.
2. Look down the length of the blade element.
3. Replace the wiper blades if the rubber element which contacts the glass is not on the centerline of the blade ± 15 degrees. Refer to *Wiper Arm Blade Replacement*.
4. Install the wiper blades on the wiper arms. Refer to *Wiper Arm Blade Replacement*.

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Repair Instructions

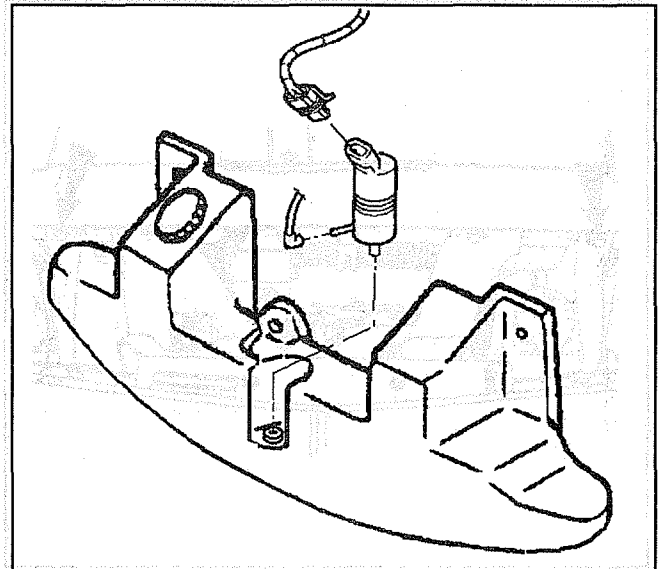
Washer Solvent Container Replacement

Removal Procedure

1. Remove the washer solvent from the washer solvent container.
2. Remove the two fasteners from the top of the washer solvent container.
3. Raise and support the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
4. Remove the air deflector. Refer to *Air Deflector Replacement - Radiator* in Body Front End.

5. Remove the two fasteners from the bottom of the washer solvent container.
6. Remove the washer solvent container.

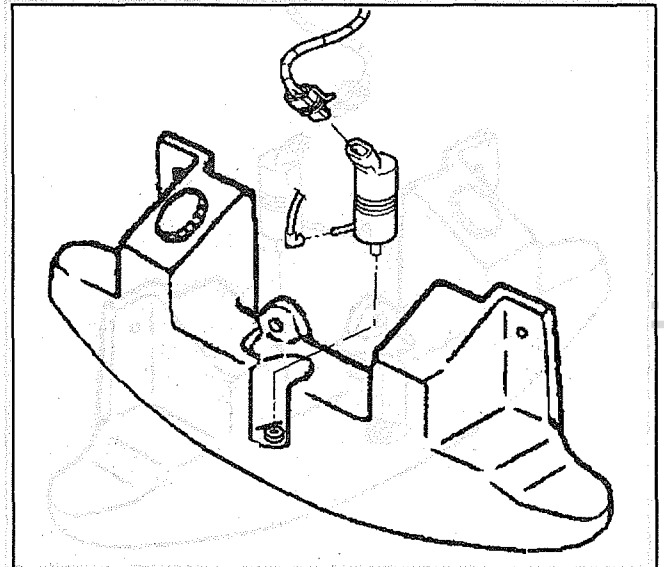
7. Disconnect the electrical connector from the washer pump.
8. Disconnect the washer hose from the washer pump.
9. Remove the washer pump from the washer solvent container.



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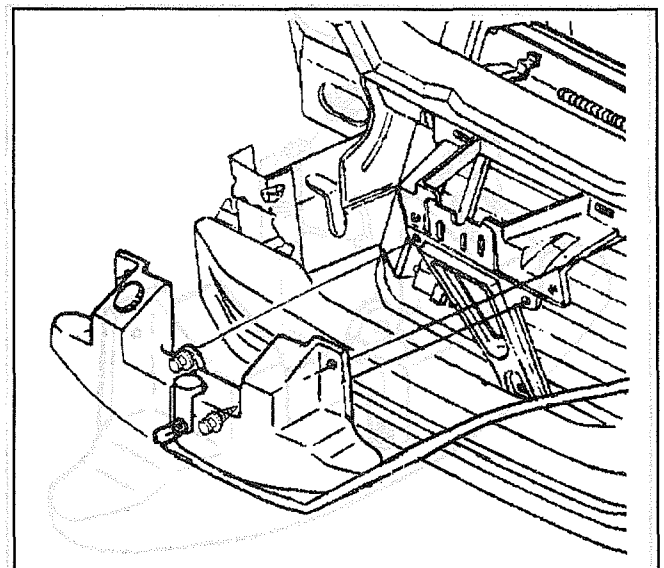
Installation Procedure

1. Install the washer pump into the washer solvent container.
2. Connect the washer hose to the washer pump.
3. Connect the electrical connector to the washer pump.

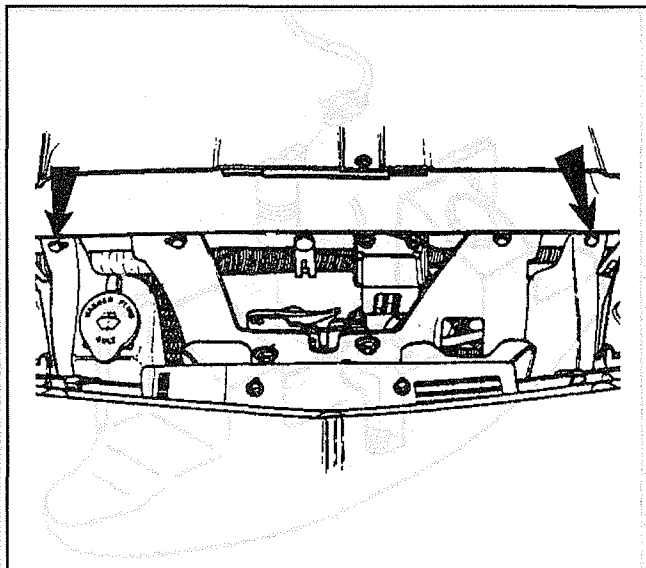


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4. Install the washer solvent container.
5. Install the two fasteners at the bottom of the washer solvent container.

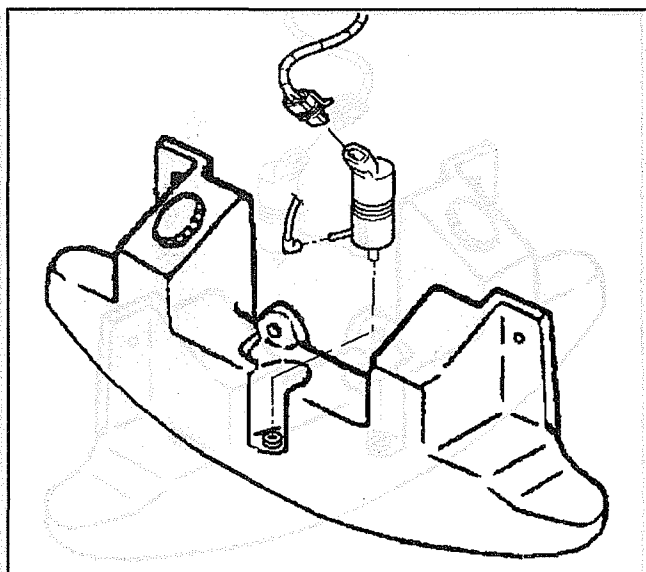


532061



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6. Install the air deflector. Refer to *Air Deflector Replacement - Radiator* in Body Front End.
7. Lower the vehicle. Refer to *Lifting and Jacking the Vehicle* in General Information.
8. Install the two fasteners at the top of the washer solvent container.
9. Refill the washer solvent container with washer solvent.

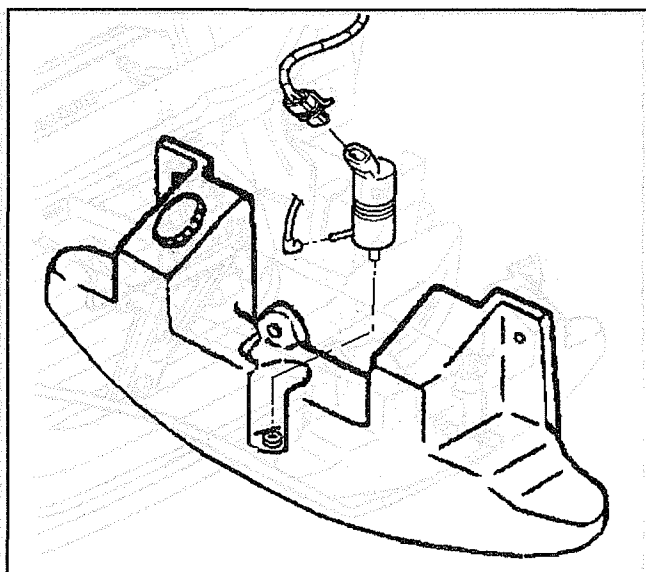


532062

Washer Pump Replacement

Removal Procedure

1. Remove the washer solvent from the washer solvent container.
2. Disconnect the electrical connector from the washer pump.
3. Remove the washer pump from the washer solvent container.
4. Remove the washer hose from the washer pump.



532062

Installation Procedure

1. Install the washer hose on the washer pump.
2. Install the washer pump into the washer solvent container.
3. Connect the electrical connector to the washer pump.
4. Refill the washer solvent container with washer solvent.

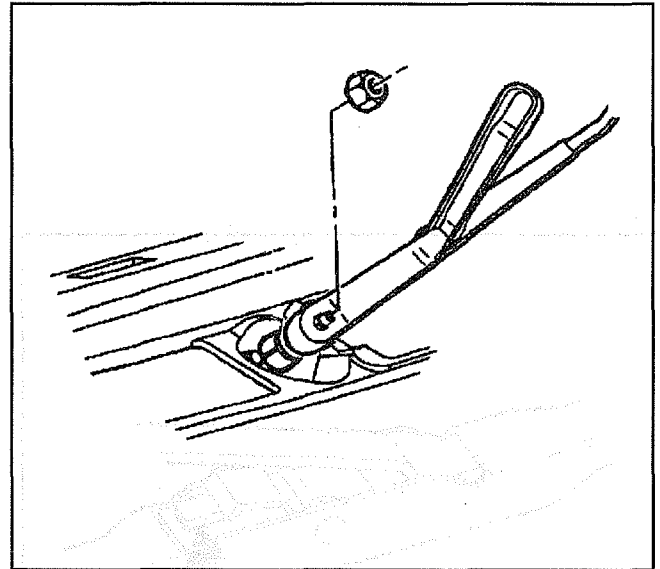
Wiper Arm Replacement

Removal Procedure

Tools Required

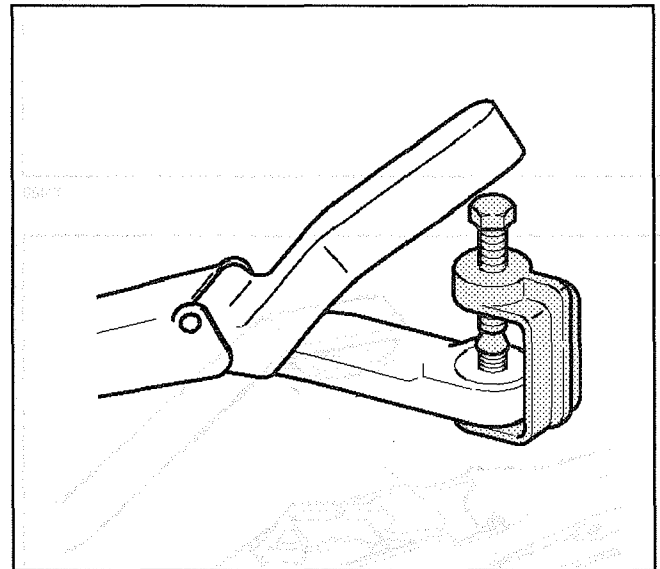
J 39637 Wiper Arm Puller

1. Turn the ignition switch to RUN.
2. Set the wipers to the lowest DELAY setting.
3. Turn the ignition to OFF when the wipers are at the innerwipe (end of sweep) position.
4. Mark the position of the wiper blade on the windshield with a suitable marker or masking tape.
5. Raise the hood.
6. Lift the wiper arm nut cover.
7. Remove the nut.



429883

8. Remove the wiper arm from the transmission drive shaft with the *J 39637*.
9. Remove the wiper blade, if required. Refer to *Wiper Arm Blade Replacement*.



532063

Installation Procedure

1. Install the wiper blade assembly, if removed. Refer to *Wiper Arm Blade Replacement*.
2. Install the wiper arm onto the transmission drive shaft, with the wiper blade aligned with the mark made during removal.

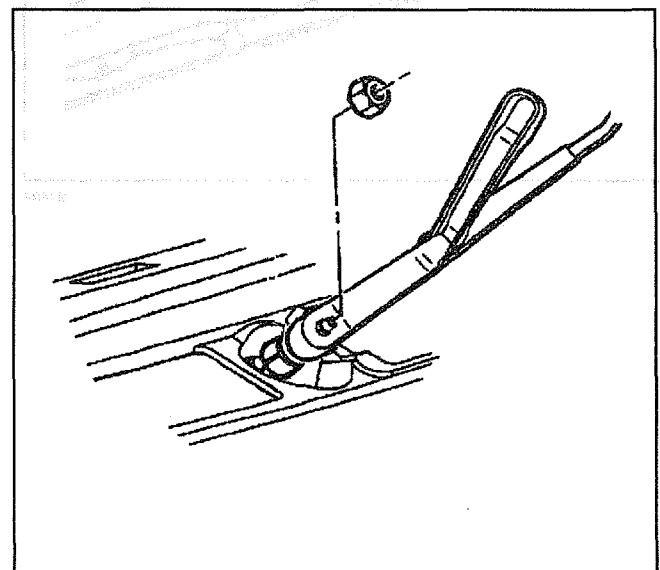
Notice: Refer to *Fastener Notice* in Cautions and Notices.

Important: It may be necessary to allow for some movement of a wiper arm when the nut is being tightened. If the wiper arm moves away from the desired alignment mark, loosen the nut and reposition the wiper arm.

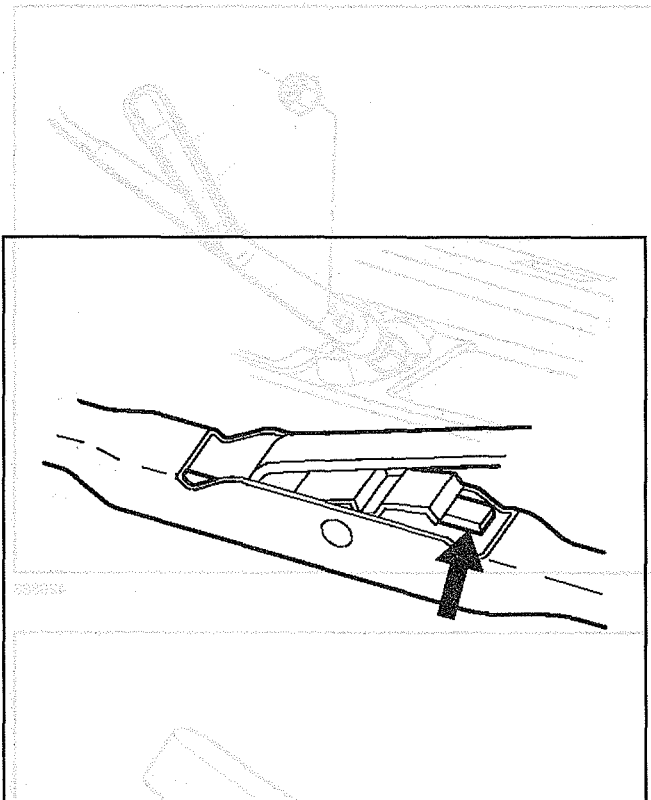
3. Install the nut onto the transmission drive shaft.

Tighten

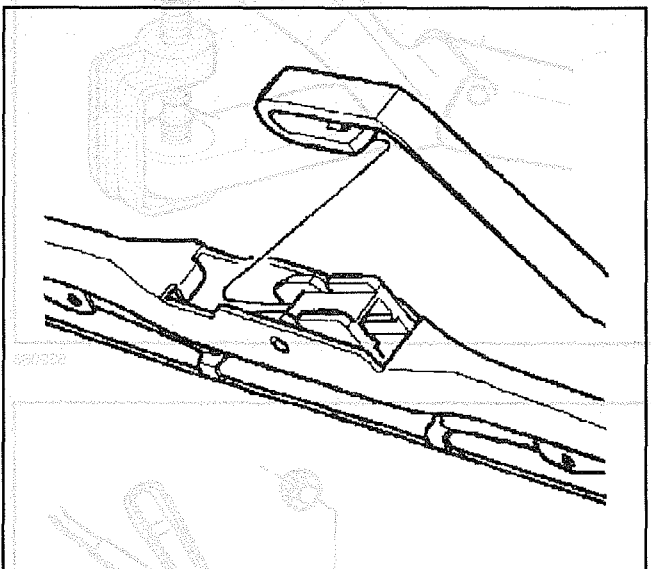
Tighten the nut to 23 N·m (17 lb ft) while holding the wiper arm.



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4. Close the nut cover.
5. Close the hood.
6. Clean the position marks from the windshield.
7. Run the wipers and check for proper wipe pattern.
8. Turn off the wipers and check for the correct park position.

Wiper Arm Blade Replacement

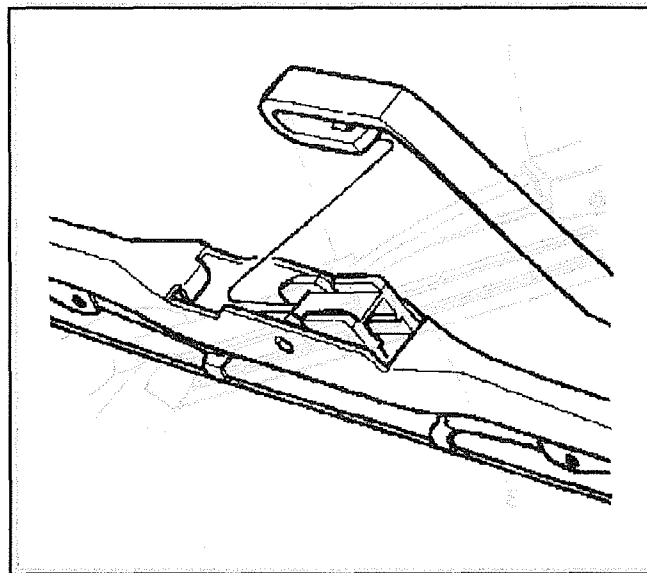
Removal Procedure

1. Push in the button of the wiper blade clip and remove the wiper blade from the inside radius of the wiper arm.

2. Bring the wiper arm out through the opening in the wiper blade.

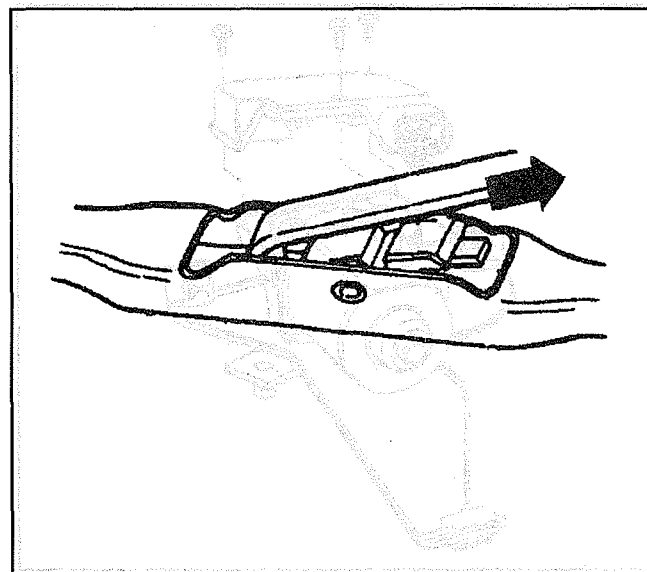
Installation Procedure

1. Insert the hook of the wiper arm through the opening in the wiper blade.



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2. Position the wiper blade pivot in the inside radius of the wiper arm hook.
3. Pull the wiper blade pivot into the wiper arm hook until the pivot locks into the hook.
4. Operate the wipers and check for proper operation.

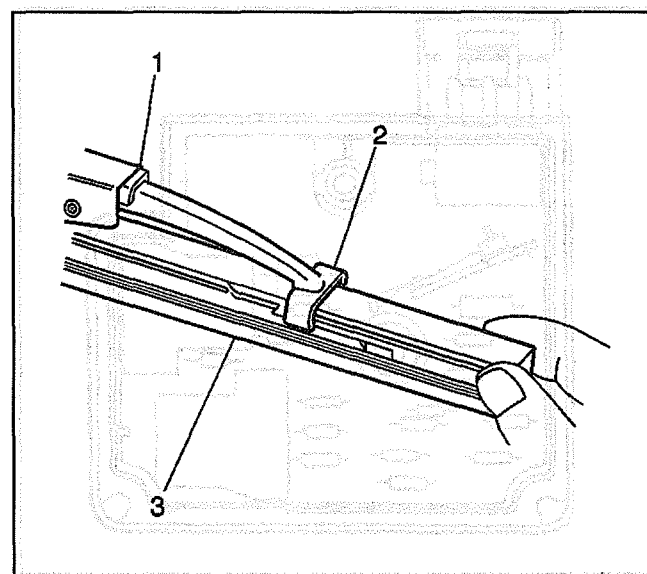


497481

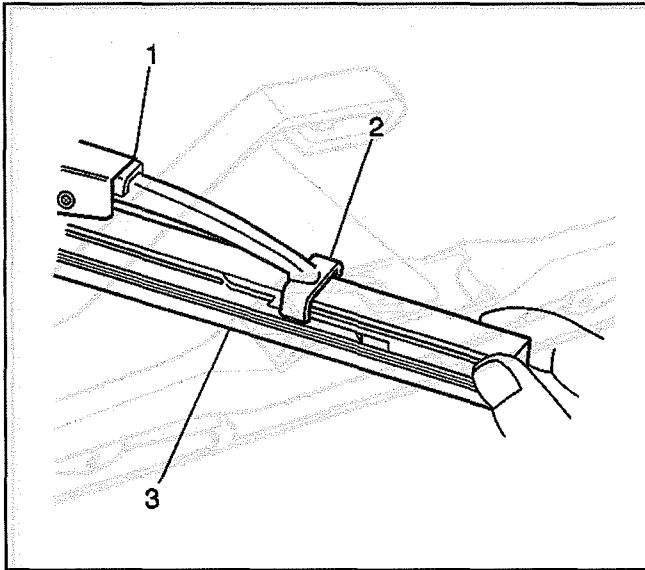
Wiper Blade Element Replacement**Removal Procedure**

Important: Replace the wiper blade element if it is removed from the wiper blade.

1. Remove the wiper blade from the wiper arm. Refer to *Wiper Arm Blade Replacement*.
2. Remove the bottom claws (2) of the wiper blade (1) from the notches in the wiper blade element (3).
3. Pull the wiper blade element (3) out through the wiper blade claws (2).



430069

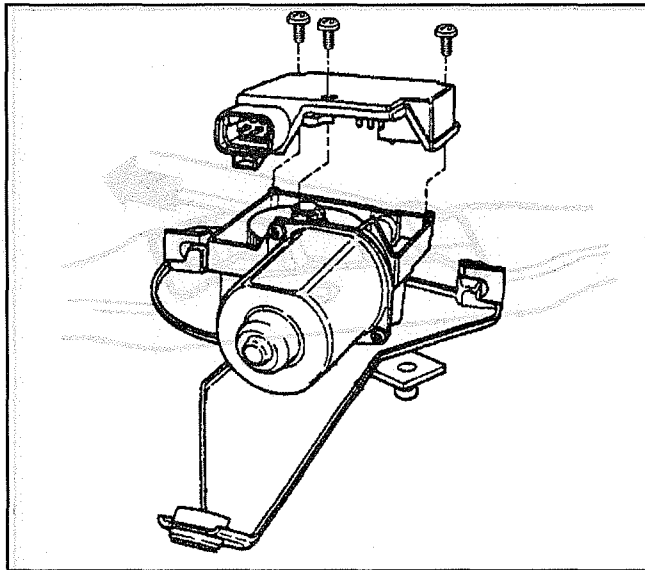


430069

Installation Procedure

Important: Keep the wiper blade claws in the rubber claw channel of the wiper blade element. Do not allow the claws of the wiper blade to contact the metal spline of the wiper blade element.

1. Insert the open end of the wiper blade element (3) into the bottom claws of the wiper blade (2).
2. Guide the wiper blade element (3) through the wiper blade (1) claw sets.
3. Engage the bottom claw (2) of the wiper blade (1) into the notches in wiper blade element (3).
4. Install the wiper blade onto the wiper arm. Refer to *Wiper Arm Blade Replacement*.

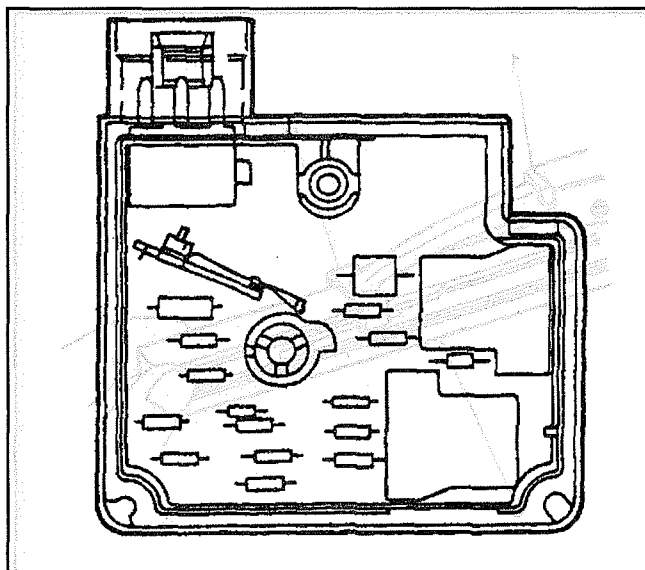


532064

Wiper Motor Cover Replacement

Removal Procedure

1. Remove the wiper motor. Refer to *Wiper Motor Replacement*.
2. Remove three screws from the wiper motor cover.
3. Remove the wiper motor cover.



532065

Installation Procedure

Important: Before installing the wiper motor cover, be sure that the inner wipe cam is positioned as shown.

1. Install the wiper motor cover on the wiper motor.

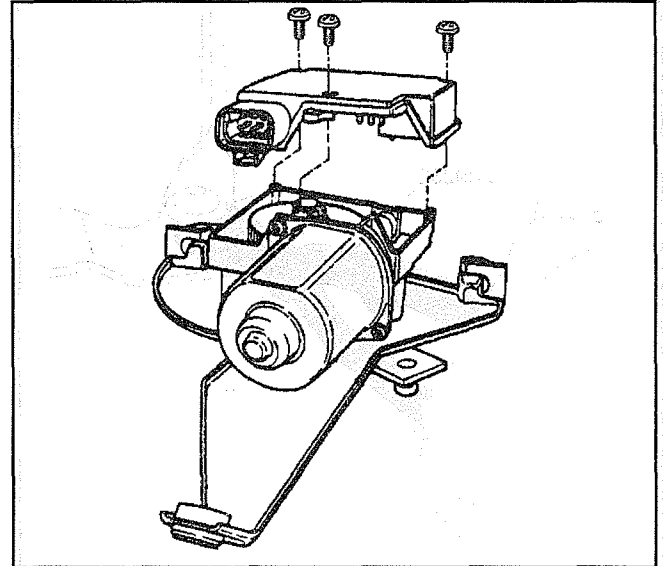
Notice: Refer to *Fastener Notice* in Cautions and Notices.

2. Install three screws.

Tighten

Tighten the screws to 3 N·m (26 lb in)

3. Install the wiper motor. Refer to *Wiper Motor Replacement*.



532064

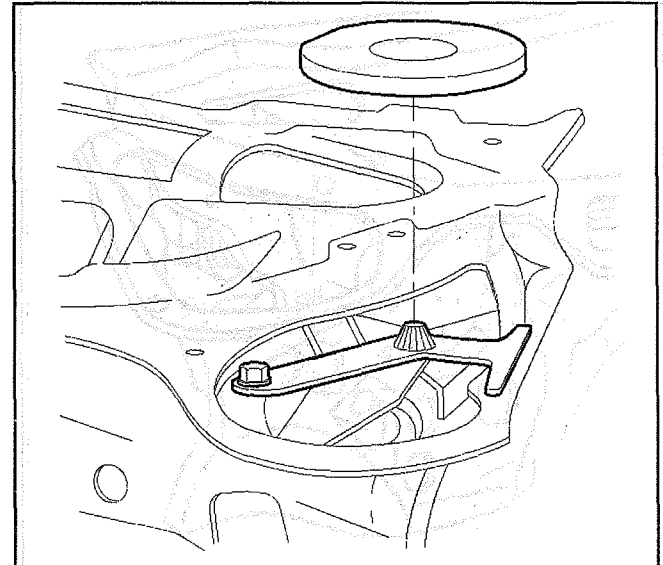
Wiper Motor Replacement

Removal Procedure

Tools Required

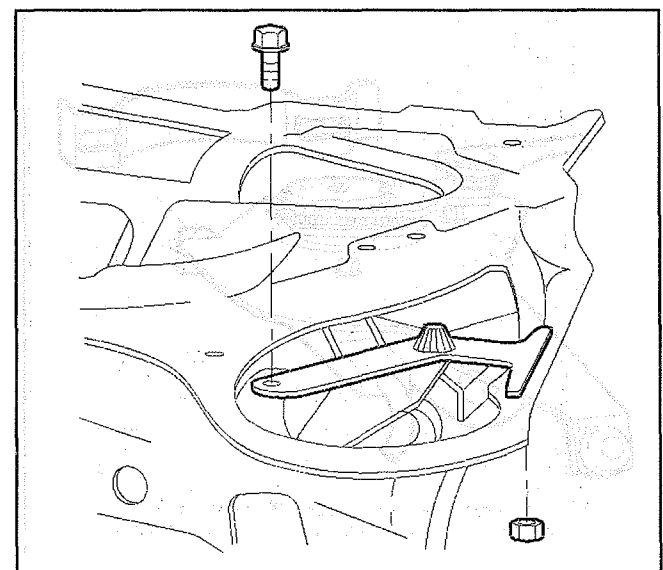
J 39232 Wiper Linkage Separator

1. Remove the wiper arms. Refer to *Wiper Arm Replacement*.
2. Remove the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
3. Remove the water shield.

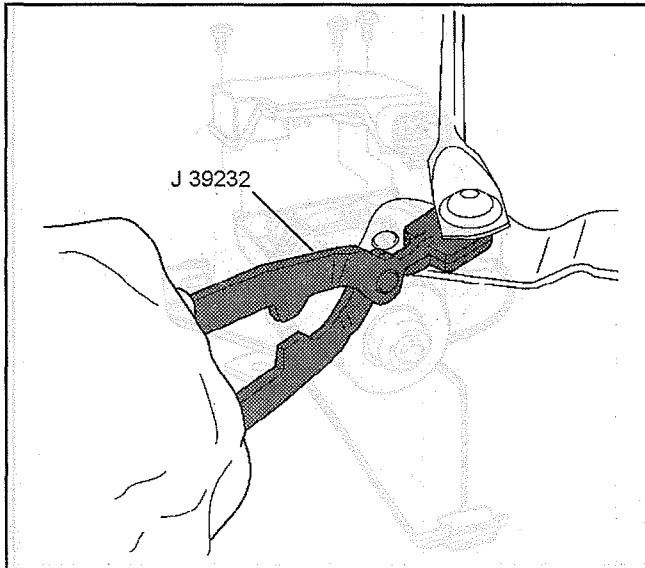


532066

4. Remove the screw and the nut.

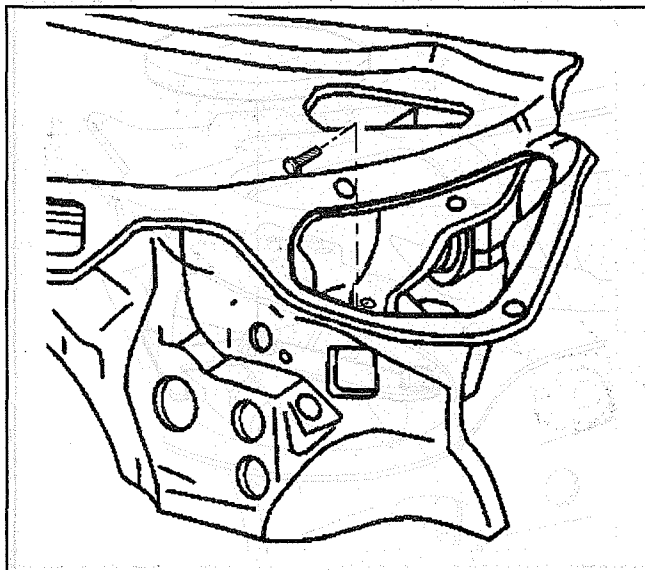


532057



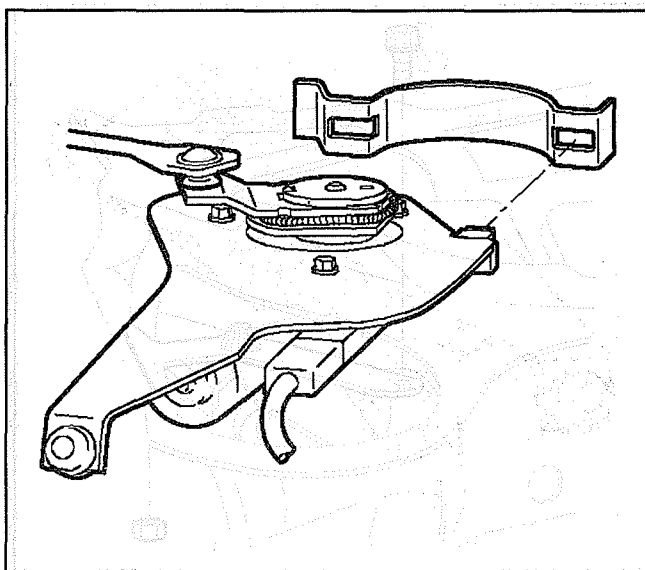
306506

5. Disconnect the RH linkage assembly from the LH linkage assembly with the J 39232.
6. Remove the LH linkage assembly.



532058

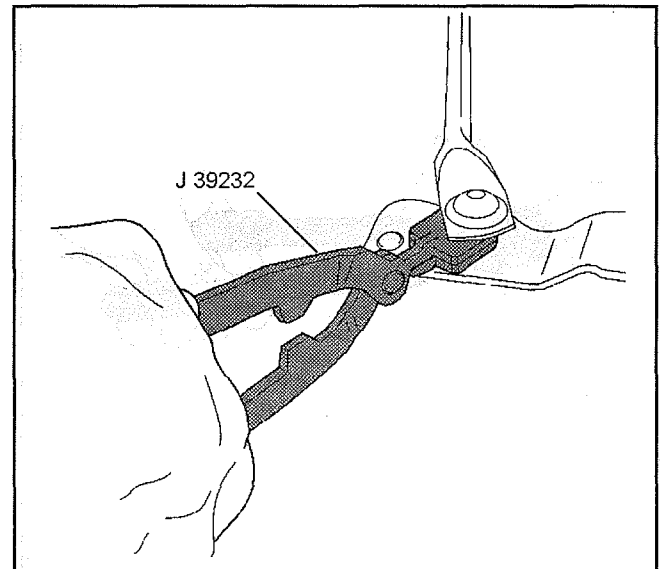
7. Remove the screw from the wiper motor.



532059

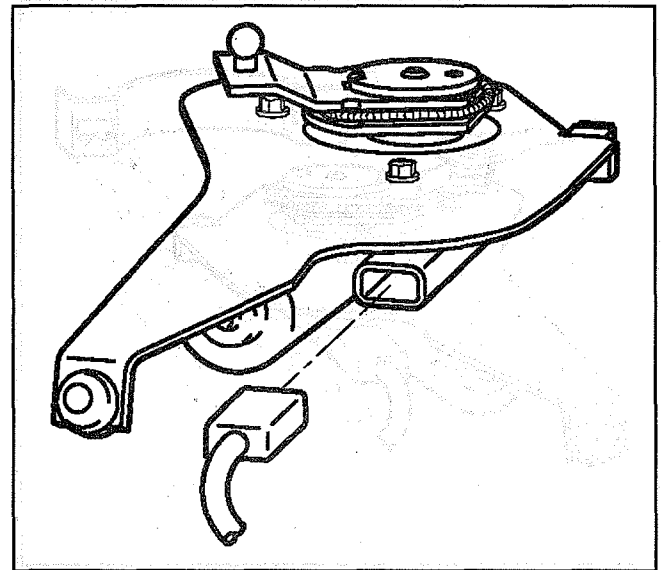
8. Pull the wiper motor free from the slots of the bracket.

9. Disconnect the RH linkage assembly from the wiper motor with the J 39232.



306506

10. Disconnect the electrical connector from the wiper motor.



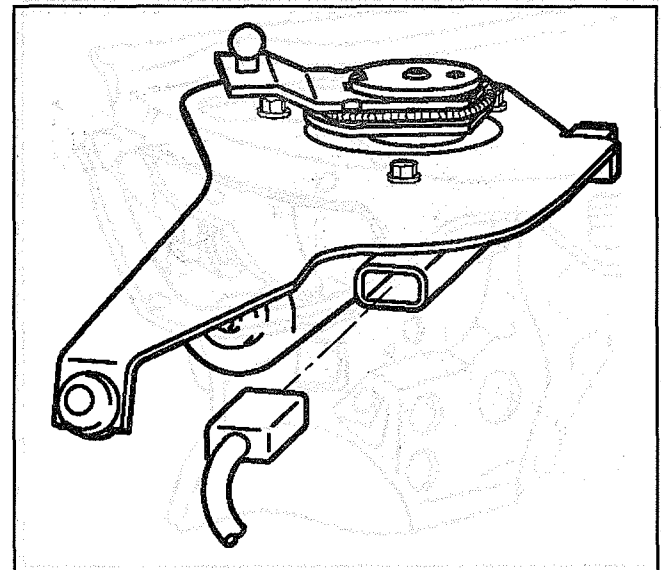
532056

Installation Procedure

Tools Required

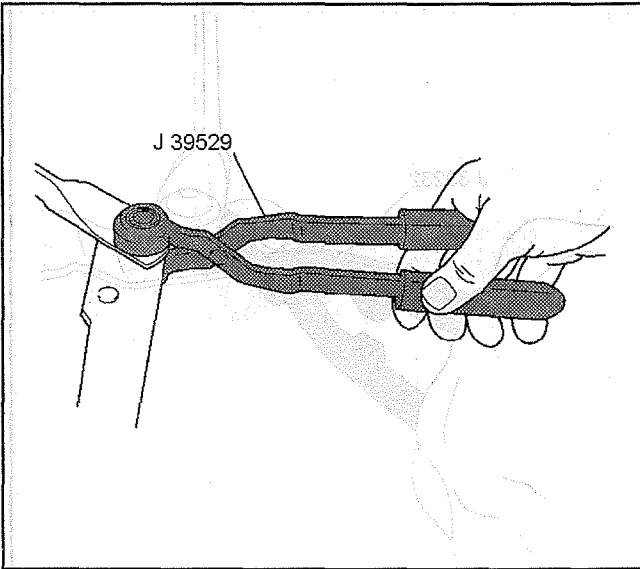
J 39529 Wiper Linkage Installer

1. Connect the electrical connector to the wiper motor.



532056

2. Connect the RH linkage assembly to the wiper motor with the *J 39529*.

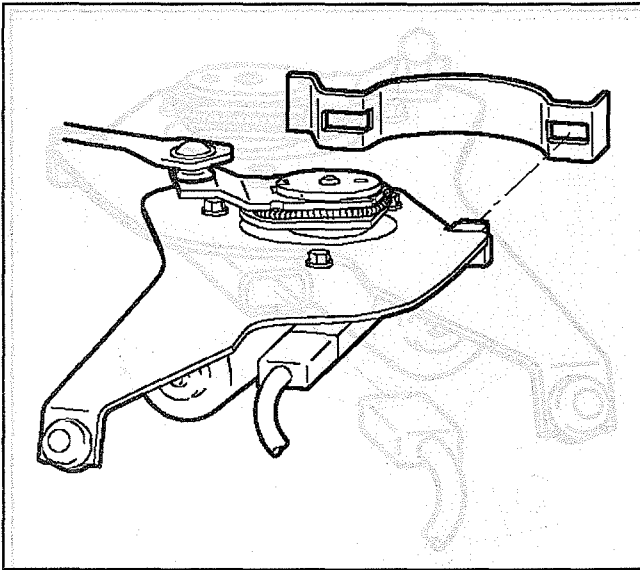


302502

306515

Important: When installing the wiper motor, be sure that the crank arm is in the innerwipe position. The crank arm drive pin must be engaged in the cam pocket.

3. Install the wiper motor with two locator pads pressed into the slots of the bracket.



532058

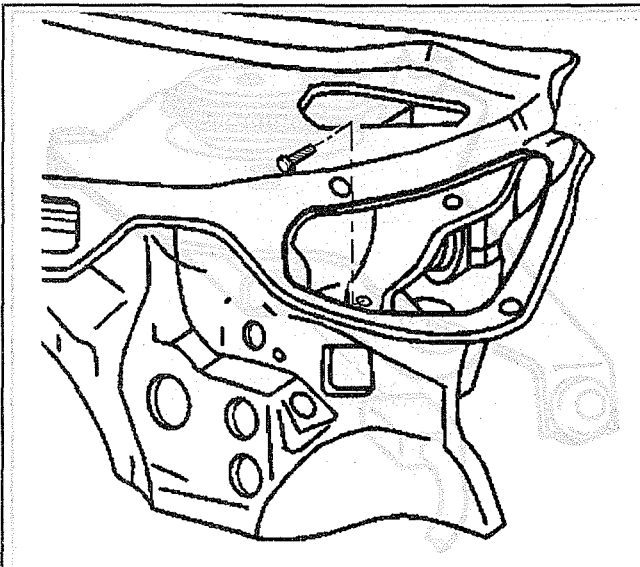
532059

Notice: Refer to *Fastener Notice* in Cautions and Notices.

4. Install the screw.

Tighten

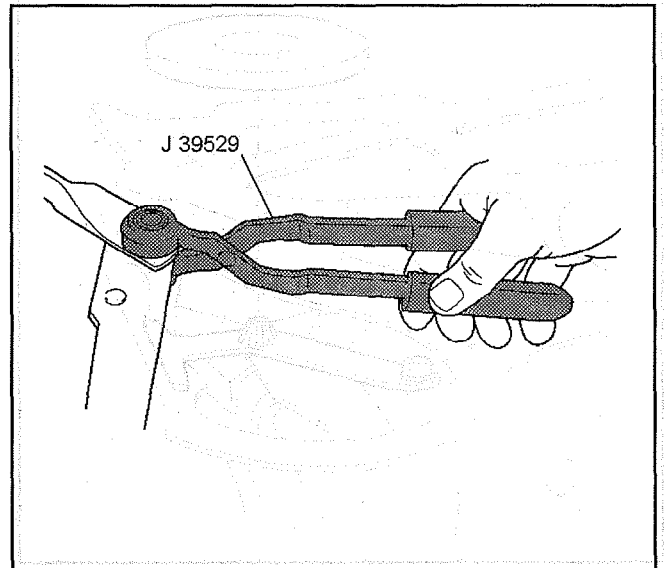
Tighten the screw to 10 N·m (7.5 lb ft).



532058

532058

5. Connect the RH linkage assembly to the LH linkage assembly with the *J 39529*.

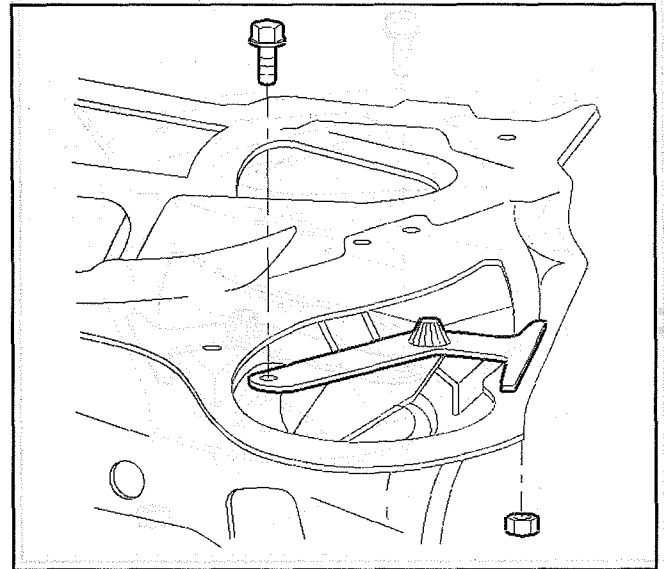


306515

6. Install the LH linkage assembly with the screw and nut.

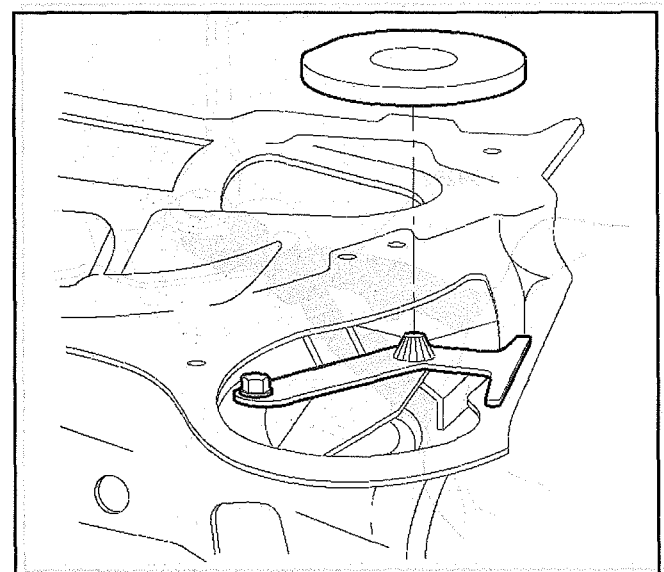
Tighten

Tighten the screw and the nut to 10 N·m (7.5 lb ft).

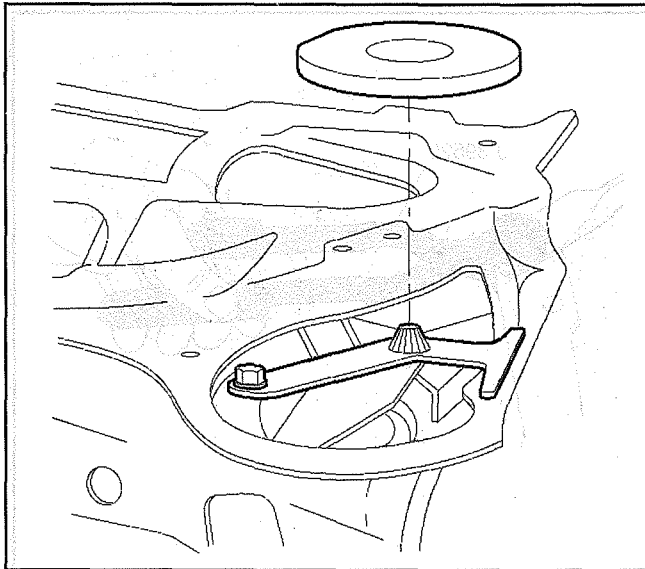


532057

7. Install the water shield on the LH linkage assembly with the flat side of the water shield under the windshield.
8. Install the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
9. Install the wiper arms. Refer to *Wiper Arm Replacement*.



532066



532066

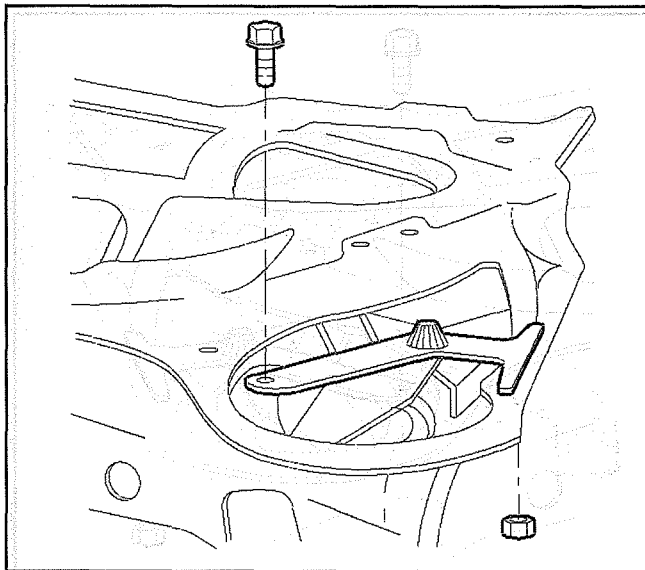
Wiper Transmission Replacement

Removal Procedure

Tools Required

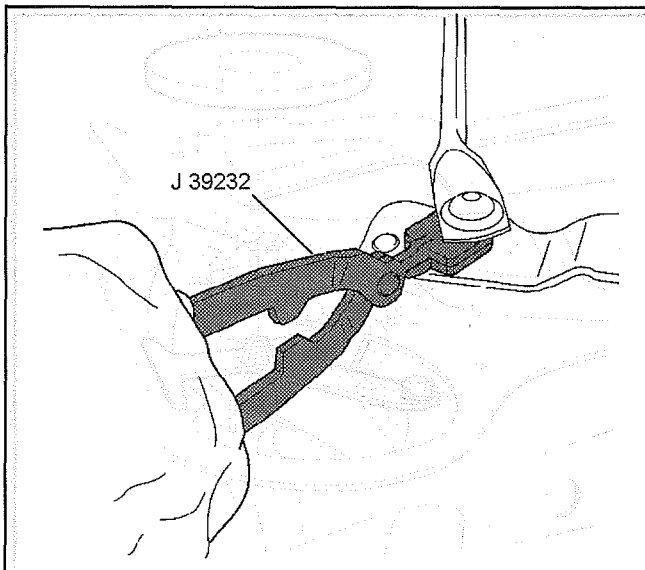
J 39232 Wiper Linkage Separator

1. Remove the wiper arms. Refer to *Wiper Arm Replacement*.
2. Remove the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
3. Remove the water shield.



532057

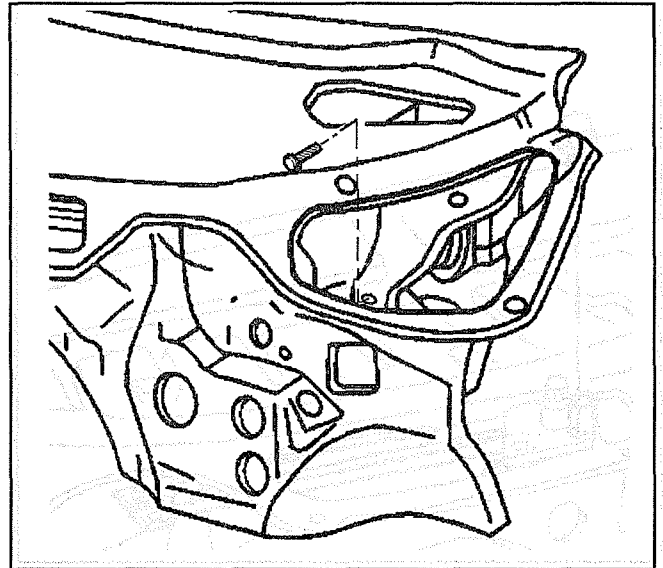
4. Remove the screw and nut.



306506

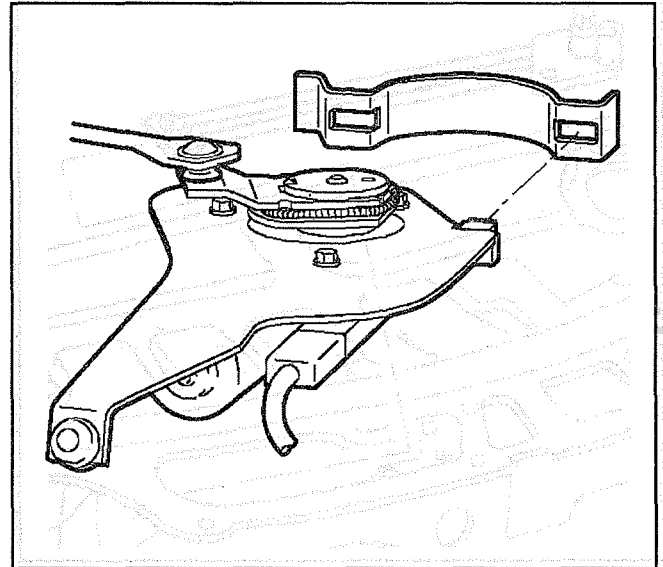
5. Disconnect the RH linkage assembly from the LH linkage assembly with the *J 39232*.
6. Remove the LH linkage assembly.

7. Remove the screw from the wiper motor.



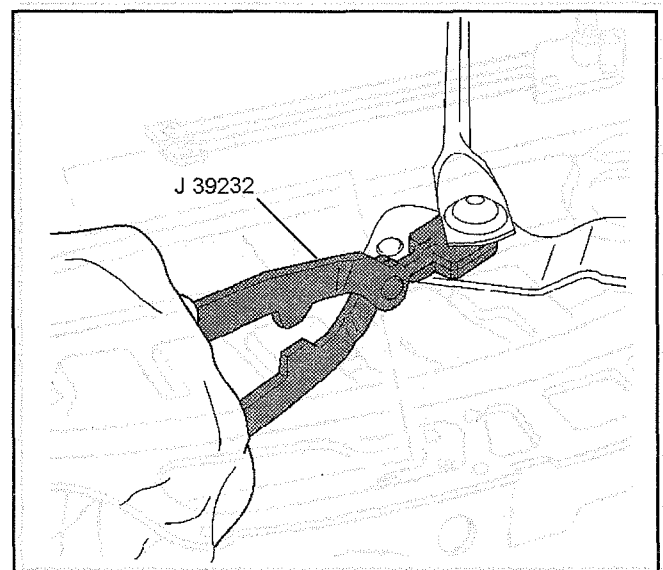
532058

8. Pull the wiper motor free from the slots of the bracket.

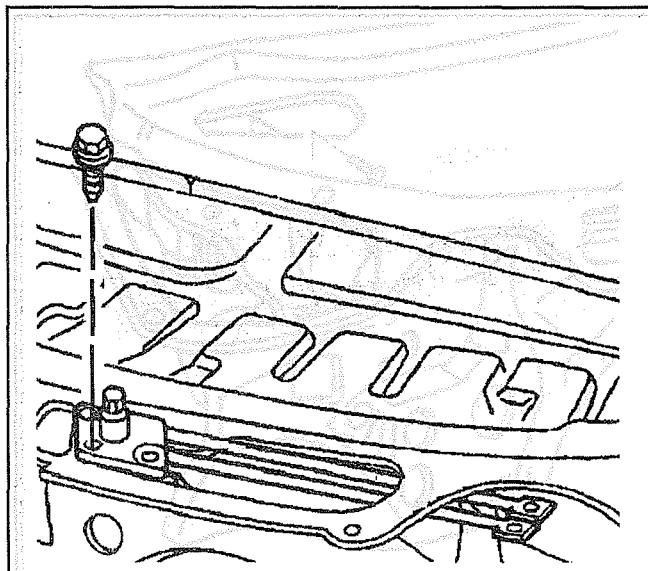


532059

9. Disconnect the RH linkage assembly from the wiper motor with the J 39232.

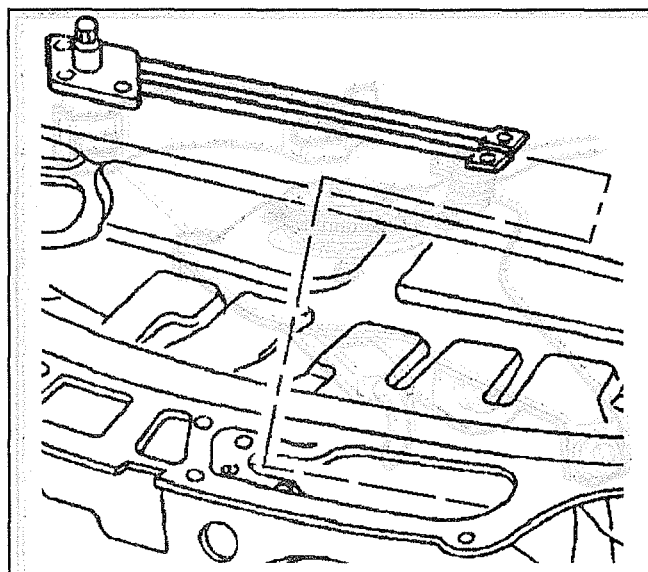


306506



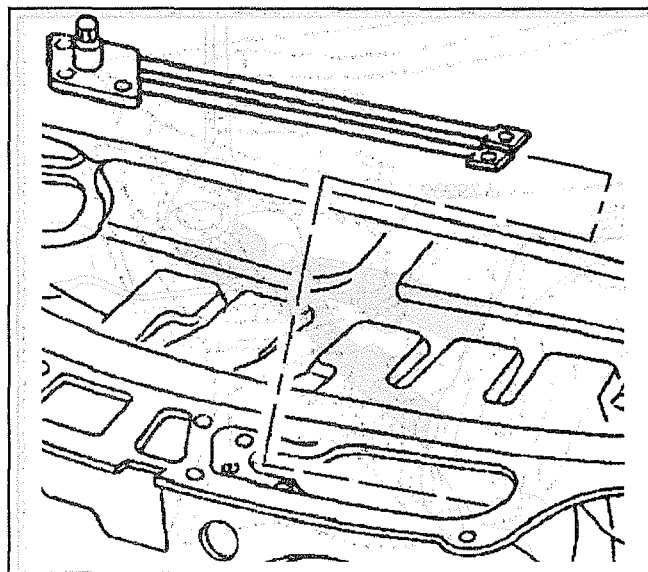
532067

10. Remove the three screws from the RH linkage assembly.



532068

11. Remove the RH linkage assembly from the plenum access hole.



532068

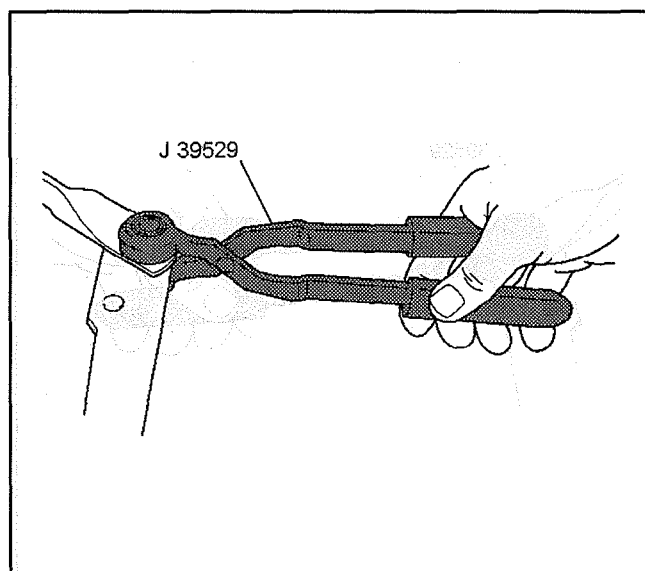
Installation Procedure

Tools Required

J 39529 Wiper Linkage Installer

1. Install the RH linkage assembly through the plenum access hole.

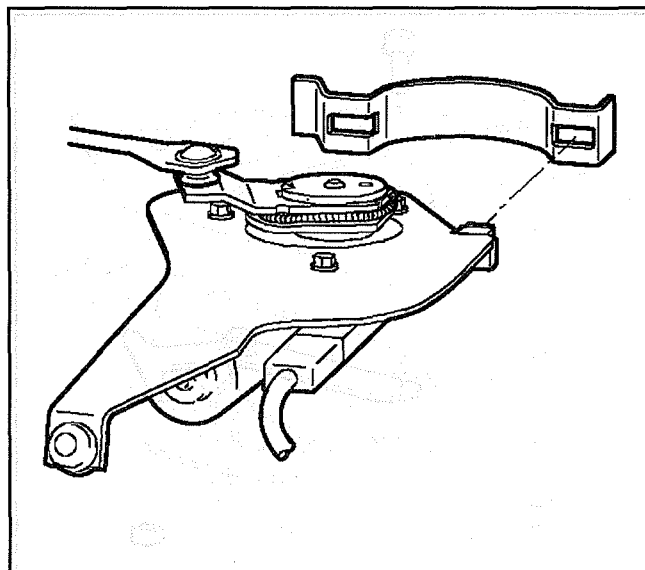
2. Connect the RH linkage assembly to the wiper motor with the *J 39529*.



306515

Important: When installing the wiper motor, be sure that the crank arm is in the innerwipe position. The crank arm drive pin must be engaged in the cam pocket.

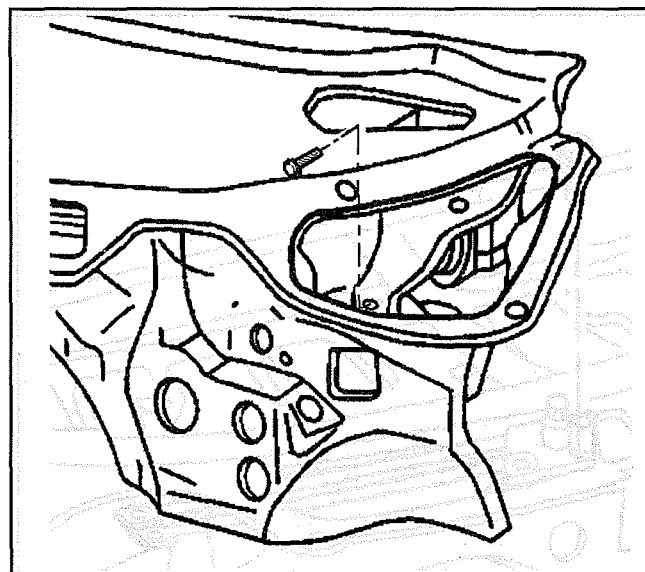
3. Install the wiper motor with two locator pads pressed into the slots of the bracket.



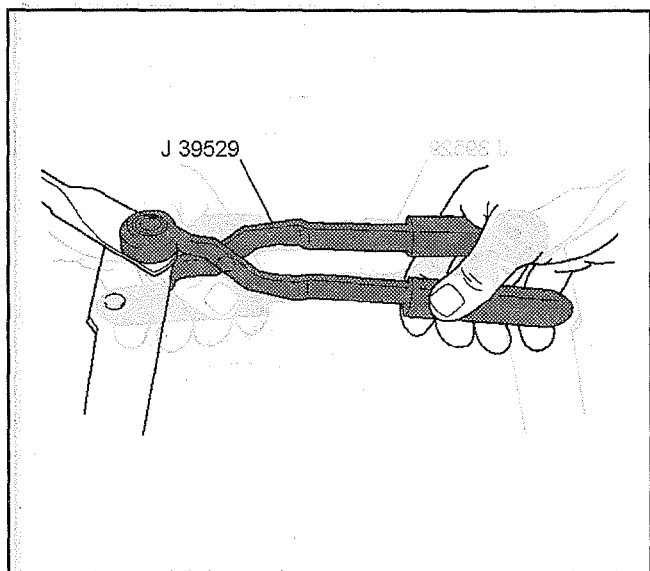
532059

Notice: Refer to *Fastener Notice* in Cautions and Notices.

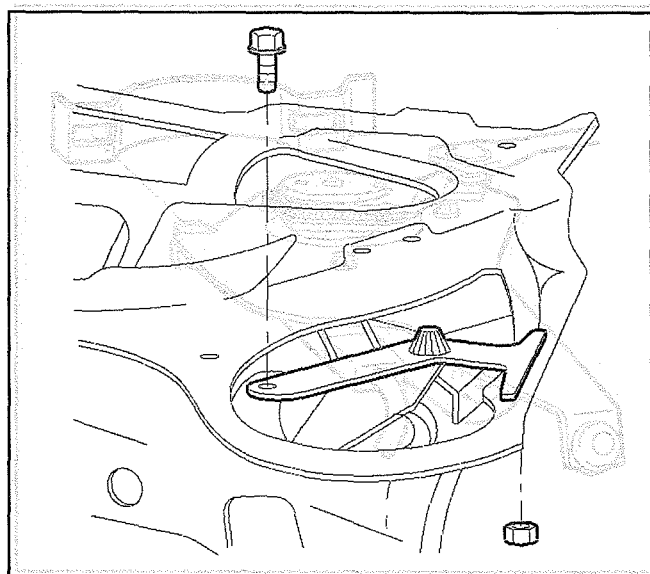
4. Install the screw.
Tighten
Tighten the screw to 10 N·m (7.5 lb ft).



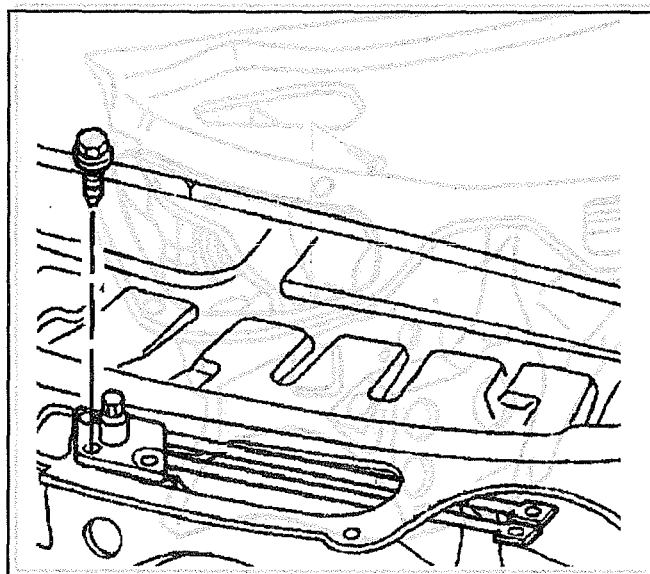
532058



5. Connect the RH linkage assembly to the LH linkage assembly with the **J 39529**.

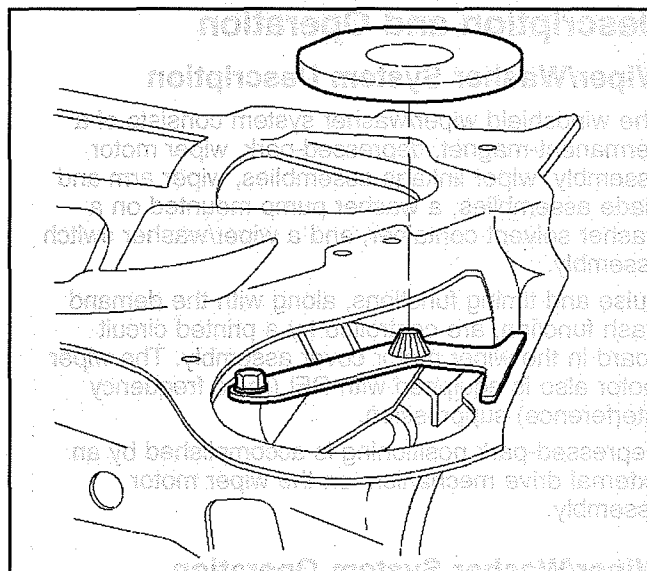


6. Install the LH linkage with the screw and the nut.
Tighten
 Tighten the screw and the nut to 10 N·m (7.5 lb ft).



7. Install three screws to the RH linkage assembly.
Tighten
 Tighten the screws to 10 N·m (7.5 lb ft).

8. Install the water shield on the LH linkage assembly with the flat side of the water shield under the windshield.
9. Install the air inlet grille panel. Refer to *Air Inlet Grille Panel Replacement* in Body Front End.
10. Install the wiper arms. Refer to *Wiper Arm Replacement*.



532066

Wiper Chatter Repair

Some vehicles may exhibit a condition where the windshield wipers chatter and/or wipe unevenly. Several items may contribute to this condition. To completely repair this condition, ALL of the items listed should be tested and repaired as necessary.

- Clean the windshield glass.
- Clean the wiper blade elements
- Perform the wiper arm pressure test
- Inspect the wiper blade element set

Windshield Glass Cleaning

Clean the windshield with windshield cleaner, GM P/N 1050011 or equivalent. The cleaner should not harm the paint finish or scratch the glass. The glass is clean when the water no longer beads, but sheets across the entire glass surface.

Blade Element Cleaning

Lift each blade assembly off of the windshield and clean the element with a cloth saturated with full strength washer solvent. Then rinse the blade assemblies with water.

In addition to the features of a conventional (non-pulse) wiper system (mist, low and high speeds), the pulse-type windshield wiper/washer system includes an operating mode in which the wipers make single sweeps with an adjustable time interval between sweeps. The time interval is controlled by a solid-state timer in the wiper motor assembly. The duration of the delay interval is determined by the delay resistor in the wiper/washer switch assembly. When the wiper switch is turned off, the wiper motor returns the wipers to the end of the sweep (downward) position and then reverses, activating its external depressed-park mechanism to lower the wipers to the park position.

Pulse Operation

With the wiper switch in DELAY (pulse), battery voltage is applied to the wiper motor at terminal B through CKT 148. Voltage also is applied to terminal D through CKT 113 and terminal E through CKT 112. The length of delay time between sweeps is controlled by the variable-pulse delay resistor. The delay is adjustable from 1–25 seconds.

Description and Operation

Wiper/Washer System Description

The windshield wiper/washer system consists of a permanent-magnet, depressed-park, wiper motor assembly, wiper linkage assemblies, wiper arm and blade assemblies, a washer pump mounted on a washer solvent container, and a wiper/washer switch assembly.

Pulse and timing functions, along with the demand wash function, are controlled by a printed circuit board in the wiper motor cover assembly. The wiper motor also is equipped with RFI (radio frequency interference) suppression.

Depressed-park positioning is accomplished by an external drive mechanism on the wiper motor assembly.

Wiper/Washer System Operation

In addition to the features of a conventional (non-pulse) wiper system (mist, low and high speeds), the pulse-type windshield wiper/washer system includes an operating mode in which the wipers make single sweeps with an adjustable time interval between sweeps. The time interval is controlled by a solid-state timer in the wiper motor assembly. The duration of the delay interval is determined by the delay resistor in the wiper/washer switch assembly.

When the wiper switch is turned off, the wiper motor returns the wipers to the end of the sweep (innerwipe) position and then reverses, activating its external depressed-park mechanism to lower the wipers to the park position.

Pulse Operation

With the wiper switch in DELAY (pulse), battery voltage is applied to the wiper motor at terminal B through CKT 143. Voltage also is applied to terminal D through CKT 113 and terminal E through CKT 112.

The length of delay time between sweeps is controlled by the variable-pulse delay resistor. The delay is adjustable from 1–22 seconds.

Low-Speed Operation

In the LO position of the wiper switch, battery voltage is applied to the wiper motor connector at terminal B through CKT 143, terminal E through CKT 112, and terminal D through CKT 113.

High-Speed Operation

In the HI position of the wiper switch, battery voltage is applied at terminal B, C, and E of the wiper motor assembly through CKTs 143, 92, and 112. Voltage also is applied at terminal D through CKT 113.

Park Position Operation

When turned OFF from any position, the wipers complete the last sweep and park. When the wiper switch is in OFF, the wiper motor assembly has battery voltage applied to terminal B only, from CKT 143. When the end-of-sweep switch opens, the control circuit reverses the wiper motor which activates the external depressed-park mechanism. The wiper motor continues to run until the park switch opens.

Washer Operation

When the washer switch is turned ON, battery voltage is applied to terminal D of the wiper motor assembly through CKT 113. The washer switch also applies voltage to terminal A which turns on the washer pump through CKTs 94 and 228. The wiper motor has voltage applied through the low-speed relay and operates at low speed for 2–4 wipes after the washer switch is released.

When the washer switch is held in the ON position, the wiper motor circuitry keeps the washer pump on only as long as the washer switch is held ON.

If the wipers had been in DELAY, LO, or HI, they would return to that operation after the wash cycle. If in OFF, they then return to the park position after 2–4 wipes.

Mist Operation

When the wiper switch is moved to MIST and released, the wipers make one sweep at low speed and return to the park position. If the wiper switch is held in MIST, the wipers continue to operate until the switch is released. The circuit operation is the same as that of LO.

Special Tools and Equipment

Illustration	Tool Number/ Description
 532070	J 39637 Wiper Arm Puller
 306527	J 39232 Wiper Transmission Separator

Illustration	Tool Number/ Description
 477018	J 39529 Wiper Transmission Installer
 3430	J 39200 Digital Multimeter