Wiper and Washer Systems: Testing and Inspection
Pinpoint Tests

A: Windshield Washer Inoperative

TEST STEP		RESULT	ACTION TO TAKE
A1	PRELIMINARY CHECKS		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes No	GO to A2. SERVICE or REPLACE as required. GO to A2.
A2	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes present?**	Yes No	DTC B1456 self test and continuous — REPAIR open in Circuit 941 (BK/W) between GEM module and washer pump relay. DTC B1460 self test and continuous — REPAIR battery short in Circuit 686 (T/R) between GEM and washer pump relay. CLEAR DTCs and RERUN self test. If DTC B1460 is still present, GO to A13. DTC B1431, B1434, B1458, B1446, B1476, and B1473 self test and continuous — GO to A7. DTC B1450 — GO to A3. GO to A4.
A3	CHECK CIRCUIT 680 (LB/O)		
	• Disconnect multi-function switch. • Read PID WASH-SW. • Ground Circuit 680 (LB/O). • **Does tester indicate washer switch is ON?**	Yes No	GO to A4. REPAIR open in Circuit 680 (LB/O) between switch and GEM module.
A4	CHECK SWITCH		
	• With key ON, rotate multi-function switch and observe proper function of each multi-function switch position. • **Does switch check OK?**	Yes No	GO to A5. REPAIR open in Circuit 684 (PK/Y) between multi-function switch and GEM module.
A5	CHECK CIRCUIT 684 (PK/Y)		
	• Check for short to ground on Circuit 684 (PK/Y). • **Is the circuit OK?**	Yes No	GO to A6. REPAIR short to ground in Circuit 684 (PK/Y) between multi-function switch and GEM module.
A6	CHECK CIRCUIT 950 (W/BK)		
	• Check for B+ on Circuit 950 (W/BK) power feed to washer pump relay contact. • **Is B+ present?**	Yes No	GO to A7. REPAIR open in Circuit 950 (W/BK) power feed to washer pump relay contact.
A7	CHECK CIRCUIT 941 (BK/W) FOR B+		
	• Disconnect windshield washer pump. • Run wiper control functional test with NGS Tester. • Energize washer pump relay. • Check for B+ on Circuit 941 (BK/W). • **Is B+ present?**	Yes No	GO to A8. REPAIR open in Circuit 941 (BK/W) between washer pump relay and windshield washer pump.

	TEST STEP	RESULT	ACTION TO TAKE
A8	CHECK VOLTAGE RELAY		
	• Energize washer pump relay. • Measure voltage on Circuit 941 (BK/W) between washer pump relay and windshield washer pump. • **Is B+ present?**	Yes No	CHECK for damaged windshield washer pump. CHECK washer pump relay for open. REPLACE relay. GO to **A9**.
A9	CHECK PUMP MOTOR GROUND		
	• Check for open in circuit between pump motor and ground. • **Is circuit OK?**	Yes No	GO to **A10**. REPAIR open in Circuit 57 (BK) between washer pump relay and windshield washer pump.
A10	CHECK CIRCUIT 297 (BK/LG) FUSE 12		
	• Check for ground short in Circuit 297 (BK/LG) power feed to 10A fuse 12. • **Is circuit OK?**	Yes No	GO to **A11**. REPAIR ground short in Circuit 297 (BK/LG) power feed to fuse 12.
A11	CHECK CIRCUIT 941 (BK/W) FOR GROUND SHORT		
	• Check for ground short in Circuit 941 (BK/W) between washer pump relay and windshield washer pump. • **Is circuit OK?**	Yes No	GO to **A12**. REPAIR ground short in Circuit 941 (BK/W) between washer pump relay and windshield washer pump.
A12	CHECK CIRCUIT 686 (T/R) FOR SHORT TO BATTERY		
	• Remove GEM connector C1. • Turn key ON. • Test Pin 24 connector C1 for battery voltage. • **Is B+ present?**	Yes No	REPAIR Circuit 686 (T/R) for short to battery. GO to **A13**. REPLACE washer control relay.
A13	FUNCTIONAL TEST		
	NOTE: Some abnormal drive symptoms may occur after the battery has been disconnected and reconnected. The vehicle may need to be driven 16 km (10 miles) or more to allow the powertrain control module to relearn the adaptive strategy. • Reconnect battery negative cable. • Connect Rotunda New Generation Star (NGS) tester 007-00500 or equivalent to data link connector (DLC). • Run wiper control functional test. • Energize washer pump relay. • **Does windshield washer pump work?**	Yes No	WIGGLE connectors for wiper control circuit to ISOLATE any intermittent connections or damaged wiring. SERVICE as required. Windshield washer pump work or damaged. REPLACE windshield washer pump.

B: Wipers Are Inoperative

	TEST STEP	RESULT	ACTION TO TAKE
B1	PRELIMINARY CHECKS		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes No	GO to **B2**. SERVICE or REPLACE as required. GO to **B2**.

	TEST STEP	RESULT	ACTION TO TAKE
B2	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes retrieved with the New Generation Star (NGS) Tester?**	Yes	DTC B1431 and B1446 self test and continuous, and DTC B1476, B1446 and B1473 self test — GO to **B3**.
			DTC B1438 and B1450 self test and continuous — GO to **B5**.
			DTC B1431, B1432 and B1446 self test and continuous, and B1476, and B1465 self test — REPAIR battery short in Circuit 646 (Y/W) between run relay and GEM.
			DTC B1431, B1434, and B1458 self test and continuous, and DTC B1446, B1476, and B1473 self test — GO to **B8**.
			DTC B1450 and B1638 self test and continuous — REPAIR open in circuit between multi-function switch and ground.
			DTC 1446 and B1840 self test and continuous, and DTC B1473 and B1476 self test — GO to **B10**.
			DTC B1446 self test and continuous, and DTC B1476, B1473 and maybe B1448 self test — OPEN contacts in speed relay. REPLACE relay.
		No	CHECK for open in Circuits 56 (DB/O) and 58 (W) between speed relay and windshield wiper motor. SERVICE as required.
B3	CHECK CIRCUIT 63 (R)		
	• Disconnect battery ground cable. NOTE: Some abnormal drive symptoms may occur after the battery has been disconnected and reconnected. The vehicle may need to be driven 16 km (10 miles) or more to allow the powertrain control module to relearn the adaptive strategy. • Check for damaged Circuit 63 (R) between run relay and power feed. • **Is circuit OK?**	Yes	GO to **B4**.
		No	REPAIR open in Circuit 63 (R) between run relay and power feed.
B4	CHECK RUN RELAY		
	• Check for open in run relay coil. • **Is relay OK?**	Yes	REPLACE relay. GO to **B5**.
		No	REPAIR open in Circuit 646 (Y/W) between run relay and GEM module.

Fig. 53 Test B: Windshield Wipers Inoperative At All Switch Positions (Part 2 Of 4).

TEST STEP		RESULT	ACTION TO TAKE
B5	CHECK FOR OPEN IN CIRCUIT 684 (PK/Y)		
	• Disconnect multi-function switch. • Check for B+ on Circuit 684 (PK/Y). • **Is the circuit OK?**	Yes No	GO to B6. REPAIR short to ground in Circuit 684 (PK/Y) between multi-function switch and GEM module.
B6	CHECK FOR SHORT IN CIRCUIT 684 (PK/Y)		
	• Read PIK WPMODE. • Ground Circuit 684 (PK/Y). • **Does tester indicate HIGH?**	Yes No	GO to B7. REPAIR open in Circuit 684 (PK/Y) between multi-function switch and GEM module.
B7	CHECK CIRCUIT 680 (LB/O)		
	• Check for continuity to ground between Circuit 680 (LB/O) and ground. • **Is there continuity?**	Yes No	REPLACE multi-function switch. GO to B8. REPAIR open in Circuit 680 (LB/O).
B8	CHECK CIRCUIT 63 (R) FUSE 16 (30A)		
	• Check fuse 16 (30A) for continuity. • **Is fuse good?**	Yes No	GO to B9. REPAIR ground short in Circuit 63 (R) between IP fuse 16 (30A) and windshield wiper motor.
B9	CHECK CIRCUIT 56 (DB/O)		
	• Check for ground short in Circuit 56 (DB/O) between speed relay and windshield wiper motor. • **Is circuit OK?**	Yes No	CHECK for ground short in circuit between run relay and speed relay contacts. REPAIR as required. GO to B10. REPAIR ground short in Circuit 56 (DB/O) between speed relay and windshield wiper motor.
B10	CHECK FOR OPEN CIRCUIT		
	• Disconnect battery ground cable. • Check for open in Circuit 63 (R) between run relay and speed relay contacts. • **Is circuit OK?**	Yes No	GO to B11. REPAIR open in Circuit 63 (R) between run relay and speed relay contacts.
B11	CHECK CIRCUIT 28 (BK/PK) FOR SHORT TO GROUND		
	• Gain access to RUN/PARK relay. • With key OFF, check Circuit 28 (BK/PK) for continuity to ground. • **Is continuity present?**	Yes No	REPAIR short to ground in Circuit 28 (BK/PK). GO to B12.
B12	CHECK FOR OPEN CIRCUIT 671 (BK)		
	• Check for open in Circuit 671 (BK) between wiper motor park sense terminal and power feed. • **Is circuit OK?**	Yes No	GO to B13. REPAIR open in Circuit 671 (BK) between wiper motor park sense terminal and power feed.
B13	CHECK GROUND CIRCUIT		
	• Check for open in Circuit 57 (BK) between windshield wiper motor and ground. • **Is circuit OK?**	Yes No	GO to B14. REPAIR open in Circuit 57 (BK) between wiper motor and ground.

Fig. 53 Test B: Windshield Wipers Inoperative At All Switch Positions (Part 3 Of 4).

TEST STEP		RESULT	ACTION TO TAKE
B14	FUNCTIONAL TEST		
	NOTE: Some abnormal drive symptoms may occur after the battery has been disconnected and reconnected. The vehicle may need to be driven 16 km (10 miles) or more to allow the powertrain control module to relearn the adaptive strategy. • Reconnect battery negative cable. • Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Run wiper control functional test. • Energize run relay. • **Do wipers function?**	Yes ▶ No ▶	WIGGLE connectors for wiper control circuit to ISOLATE any intermittent connections or damaged wiring. SERVICE as required. GO to **B15**.
B15	CHECK WIPER MOTOR		
	• Check windshield wiper motor for open on ground side. • **Does windshield wiper motor check OK?**	Yes ▶ No ▶	CHECK run relay for open or stuck in open condition. REPLACE relay. SERVICE or REPLACE windshield wiper motor.

Fig. 53 Test B: Windhsield Wipers Inoperative At All Switch Positions (Part 4 Of 4).

C - Windshield Wipers Inoperative at High Speed

TEST STEP		RESULT	ACTION TO TAKE
C1	PRELIMINARY CHECKS		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes ▶ No ▶	GO to **C2**. SERVICE or REPLACE as required. GO to **C2**.
C2	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes present?**	Yes ▶ ▶ ▶ ▶ ▶ No ▶	DTC B1434 self test and continuous, and DTC B1466 self test — GO to **C3**. DTC B1436 self test and continuous, and DTC B1466 self test — REPAIR battery short in Circuit 647 (GY / LB) between GEM and speed relay. If DTC B1436 is still present, GO to **C4**. DTC B1466 self test — Speed relay stuck closed. REPLACE relay. DTC B1476 self test — GO to **C5**. DTC B1431, B1434, B1458, B1446, B1476, and B1473 self test and continuous — REPAIR short to ground in Circuit 56 (DB / O) between speed relay and wiper motor high speed connection. CHECK for open in high speed contact in turn signal and windshield washer switch. SERVICE or REPLACE as required.

Fig. 54 Test C: Windshield Wipers Inoperative At High Speed (Part 1 Of 2).

	TEST STEP	RESULT	ACTION TO TAKE
C3	CHECK CIRCUIT 63 (R)		
	• Check for open in Circuit 63 (R) power feed to speed relay. Check for loose connectors and damaged wiring. • **Is circuit OK?**	Yes ▶ No ▶	GO to **C4**. REPAIR open in Circuit 63 (R) as required.
C4	CHECK SPEED RELAY		
	• Disconnect speed relay. • Check relay coil for open. • **Is relay OK?**	Yes ▶ No ▶	REPAIR open in Circuit 647 (Y / LB) between GEM and speed relay. GO to **C5**. REPLACE relay.
C5	CHECK CIRCUIT 56 (DB / O)		
	• Disconnect battery ground cable. • Check for open in Circuit 56 (DB / O) between speed relay and wiper motor high speed connection. • **Is the circuit OK?**	Yes ▶ No ▶	GO to **C6**. REPAIR open in Circuit 56 (DB / O) between speed relay and windshield wiper motor.
C6	FUNCTIONAL TEST		
	NOTE: Some abnormal drive symptoms may occur after the battery has been disconnected and reconnected. The vehicle may need to be driven 16 km (10 miles) or more to allow the powertrain control module to relearn the adaptive strategy. • Reconnect battery. • Run wiper control functional test. • Energize run relay. • Energize speed relay. • **Does windshield wiper motor run at high speed?**	Yes ▶ No ▶	WIGGLE connectors for wiper control circuit to ISOLATE any intermittent connections or damaged wiring. SERVICE as required. CHECK windshield wiper motor for open high speed winding. SERVICE or REPLACE as required.

Fig. 54 Test C: Windshield Wipers Inoperative At Hight Speed (Part 2 Of 2).

D - Windshield Wipers Inoperative at Low Speed

	TEST STEP	RESULT	ACTION TO TAKE
D1	PRELIMINARY CHECKS		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes ▶ No ▶	GO to **D2**. SERVICE or REPLACE as required. GO to **D2**.

Fig. 55 Test D: Windshield Wipers Inoperative At Low Speed (Part 1 Of 2).

TEST STEP		RESULT	ACTION TO TAKE
D2	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes present?**	Yes	DTC B1466 self test — CHECK speed relay for open. REPLACE relay.
			DTC B1473 self test — GO to **D3**.
			DTC B1431, B1434, B1468, B1446, B1476, and B1473 self test and continuous — REPAIR ground short in Circuit 58 (W) between speed relay and wiper motor low speed connection.
			DTC 1434 self test and continuous, and DTC B1466 self test — REPAIR ground short in Circuit 58 (W) between GEM and speed relay.
			Open circuit between the dark sense at the wiper motor and the GEM CI PIn 15 Circuit 671 (BK).
		No	CHECK multi-function switch for damage. SERVICE or REPLACE as required.
D3	CHECK CIRCUIT 58 (W)		
	• Disconnect battery ground cable. • Check for open in Circuit 58 (W) between speed relay and wiper motor low speed connection. • **Is circuit OK?**	Yes	GO to **D4**.
		No	REPAIR open in Circuit 58 (W) between speed relay and wiper motor low speed connection.
D4	FUNCTIONAL TEST		
	NOTE: Some abnormal drive symptoms may occur after the battery has been disconnected and reconnected. The vehicle may need to be driven 16 km (10 miles) or more to allow the powertrain control module to relearn the adaptive strategy. • Reconnect battery. • Run wiper control functional test. • Energize run relay. • Energize speed relay. • **Does windshield wiper motor change from low speed to high speed and then back to low speed?**	Yes	WIGGLE connectors for wiper control circuit to ISOLATE any intermittent connections or damaged wiring. SERVICE as required.
		No	CHECK windshield wiper motor for open low speed winding. SERVICE or REPLACE as required. CLEAR all DTCs and RETEST system.

Fig. 55 Test D: Windshield Wipers Inoperative At Low Speed (Part 2 Of 2).

E - Windshield Wipers Operate at Only One Interval Setting

TEST STEP		RESULT	ACTION TO TAKE
E1	PRELIMINARY CHECKS		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes	GO to **E2**.
		No	SERVICE or REPLACE as required. GO to **E2**.
E2	CHECK WASHER FUNCTION		
	• Key in RUN. • Press washer button. • **Does washer work?**	Yes	CHECK multi-function switch for damage. REPLACE switch.
		No	GO to **E3**.

Fig. 56 Test E: Windshield Wipers Operate At Only One Interval Setting (Part 1 Of 2).

TEST STEP		RESULT	ACTION TO TAKE
E3	CHECK CIRCUIT 680 (LB/O)		
• Disconnect turn signal and windshield washer switch. • Check for B+ in Circuit 680 (LB/O) at switch. • **Is B+ present?**		Yes ▶	REPAIR battery short in Circuit 680 (LB/O) between GEM and TURN signal and windshield washer switch.
		No ▶	REPAIR open in Circuit 680 (LB/O) between GEM and multi-function switch.

Fig. 56 Test E: Windshield Wipers Operate At Only One Interval Setting (Part 2 Of 2).

F : Wipers Continue to Run When Switch Is Turned OFF

TEST STEP		RESULT	ACTION TO TAKE
F1	PRELIMINARY CHECKS		
• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**		Yes ▶ No ▶	GO to **F2**. SERVICE or REPLACE as required. GO to **F2**.
F2	ON-DEMAND SELF TEST		
• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes retrieved with New Generation Star (NGS) Tester?**		Yes ▶ ▶ ▶ ▶ No ▶	DTC B1431 self test and continuous, and DTC B1446, B1476 and B1473 self test — REPAIR ground short in Circuit 646 (Y/W) between GEM module and run relay. DTC B1441 and B1467 self test — REPAIR ground short in Circuit 680 (LB/O) between turn signal and windshield washer switch and GEM. DTC B1448, B1473, B1446, and B1476 self test — Park sensor switch stuck in high. REPAIR open Circuit 671 (BK) between wiper motor and GEM connector C1-1S. SERVICE or REPLACE as required. DTC B1467 self test and continuous, and DTC B1446 self test — CHECK run relay for shorted contacts. REPLACE relay. GO to **F3**.
F3	READ PID WASH-SW		
• Place multi-function switch in OFF position. • Read PID WASH-SW. • **Does tester indicate switch OFF?**		Yes ▶ No ▶	CHECK for battery short in Circuit 56 (DB/O) and 58 (W) between wiper motor Lo/Hi windings and speed relay. SERVICE or REPLACE as required. CHECK multi-function switch for damage. SERVICE or REPLACE as required.

Fig. 57 Test F: Windshield Wipers Continue To Run When Switch Is Turned Off.

G - Front and Rear Wipers Inoperative

TEST STEP		RESULT	ACTION TO TAKE
G1	CHECK 30A IP FUSE 16		
	• Check 30A fuse 16. • **Is fuse OK?**	Yes No	GO to **G4**. GO to **G2**.
G2	CHECK CIRCUIT 297 (BK/LG) FOR OPEN		
	• Remove fuse 16 (30A). • With key ON, using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, measure for B+ at ignition switch. • **Is B+ present?**	Yes No	GO to **G3**. SERVICE Circuit 297 (BK/LG) for open.
G3	CHECK CIRCUIT 297 (BK/LG) FOR SHORT TO GROUND		
	• Remove fuse 16 (30A). • Disconnect battery. • With key ON, using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check fuse 16 at Circuit 297 (BK/LG) to a known good ground. • **Is continuity present?**	Yes No	GO to **G4**. SERVICE Circuit 297 (BK/LG) between IP fuse panel and Ignition switch. RECONNECT battery. CLEAR all DTCs and RETEST.
G4	CHECK CIRCUIT 63 (R) FOR OPEN		
	• With key ON, using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, measure B+ at IP fuse 16 (30A). • **Is B+ present?**	Yes No	GO to **G5**. SERVICE Circuit 63 (R) between IP fuse 16 and Run/Park relay coil.
G5	CHECK CIRCUIT 63 (R) FOR SHORT TO GROUND		
	• Remove fuse 16 (30A). • Disconnect battery. • With key OFF, using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check IP fuse 16 at Circuit 63 (R) to a known good ground. • **Is continuity present?**	Yes No	System OK. SERVICE Circuit 63 (R) between IP fuse panel and Run/Park relay coil. RECONNECT battery. CLEAR all DTCs and RETEST.

Fig. 58 Test G: Front & Rear Wipers Inoperative.

H - Wipers Run With Switch Off

TEST STEP		RESULT	ACTION TO TAKE
H1	CHECK CIRCUIT 297 (BK/LG) FOR SHORT TO BATTERY		
	• Key OFF. • Remove IP fuse 16 (30A). • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 297 (BK/LG) from ignition switch for B+. • **Is B+ present?**	Yes No	SERVICE Circuit 297 (BK/LG). REINSTALL fuse 16 and RETEST. GO to **H2**.
H2	CHECK CIRCUIT 297 (BK/LG) FOR BATTERY SHORT		
	• Key OFF. • Remove IP fuse 16 (30A). • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 297 (BK/LG) for B+. • **Is B+ present?**	Yes No	SERVICE Circuit 297 (BK/LG) from IP fuse panel to GEM. TEST ignition switch

Fig. 59 Test H: Front & Rear Wipers W/Key Out.

J - Rear Wiper Inoperative

	TEST STEP	RESULT	ACTION TO TAKE
J1	CHECK POWER DISTRIBUTION BOX 20 AMP MAXI FUSE		
	• Check fuse for open. • **Is fuse OK?**	Yes ▶ No ▶	GO to **J2**. SERVICE Circuit 88 (BK / W) for short to ground. REPLACE fuse. CLEAR all DTCs and RERUN self test.
J2	CHECK IP FUSE 23 (15A)		
	• Check fuse 23 (15A) for open. • Check connectors for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes ▶ No ▶	GO to **J3**. SERVICE and REPLACE as required. GO to **J3**.
J3	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform On-Demand Self Test. • **Are any diagnostic codes retrieved with the New Generation Star (NGS) Tester?**	Yes ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ ▶ No ▶	DTC B1619, B1622, self test and continuous — GO to **J4**. DTC B1814, B1818 — GO to **J1**. DTC B1814 — GO to **J9**. DTC B1818 — GO to **J15**. DTC B1818, B1820 self test and continuous — GO to **J17**. DTC B1822 self test and continuous — GO to **J21**. DTC B1825 self test and continuous — GO to **J23**. DTC B1826 self test and continuous — GO to **J24**. DTC B1829 self test and continuous — GO to **J26**. DTC B1839 self test — GO to **J27**. GO to **J4**.
J4	REQUEST PID STATUS		
	• With NGS still connected, read PID RDEF SW. • Toggle rear defrost switch. • **Does switch change states?**	Yes ▶ No ▶	Switch OK. CLEAR all DTCs and RETEST system. GO to **J5**.
J5	CHECK CIRCUIT 598 (LB) FOR OPEN		
	• Gain access to GEM as outlined in Section 18-04A. • Remove GEM connector C2. • Place rear wiper motor switch in park position. • Check for unseated terminals. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Pin 07 to Circuit 598 (LB) at the rear wiper motor. • **Is there less than 5 ohms?**	Yes ▶ No ▶	GO to **J6**. REPAIR open in Circuit 598 (LB). RECONNECT GEM connector. CLEAR all DTCs and RETEST system.
J6	CHECK CIRCUIT 598 (LB) FOR B+		
	• Check for B+ on Circuit 598 (LB). • Remove GEM connector C2. • Key ON. • Measure B+ on Circuit 598 (LB), Pin 07. • **Is voltage greater than 9 volts?**	Yes ▶ No ▶	SERVICE Circuit 598 (LB) for battery short. CLEAR all DTCs and RETEST system. GO to **J7**.

Fig. 60 Test J: Rear Wipers Inoperative (Part 1 Of 4).

	TEST STEP	RESULT	ACTION TO TAKE
J7	CHECK FOR SHORT TO GROUND CIRCUIT 598 (LB)		
	• Disconnect rear wiper motor connector. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check for continuity to GEM mounting bracket. • **Is there less than 5 ohms?**	Yes No	SERVICE Circuit 598 (LB) for short to ground. GO to J8.
J8	WIPER MOTOR GROUND TEST		
	• Disconnect rear wiper motor connector. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, measure between Pins 02 and 06 for continuity. • **Is there less than 5 ohms?**	Yes No	REPLACE rear wiper motor. CLEAR DTCs and RETEST system. System OK.
J9	CHECK CIRCUIT 411 (BK/LB) FOR SHORT TO GROUND		
	• Access the rear wiper down relay in the engine compartment. • Remove the rear wiper down relay connector. • Check for continuity to ground on Circuit 411 (BK/LB). • **Is there less than 5 ohms?**	Yes No	SERVICE Circuit 411 (BK/LB) for short to ground. GO to J10.
J10	CHECK WIPER DOWN RELAY		
	• Replace wiper down relay with a known good relay. • **Does system operate?**	Yes No	REPLACE relay. CLEAR all DTCs and RETEST system. GO to J11.
J11	CHECK CIRCUIT 411 (BK/LB) FOR OPEN		
	• Remove wiper down relay. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, measure for open circuit between Circuit 411 (BK/LB) of the wiper down relay and the rear wiper motor connector harness side Pin 03 for continuity. • **Is there less than 5 ohms?**	Yes No	GO to J12. SERVICE Circuit 411 (BK/LB) for open.
J12	CHECK CIRCUIT 592 (T) FOR OPEN		
	• Gain access to GEM module. • Key OFF. • Remove GEM connector C2. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check for continuity between C2, Pin 10 and engine compartment wiper down relay Circuit 592 (T). • **Is there less than 5 ohms?**	Yes No	GO to J13. SERVICE Circuit 592 (T) for open. CLEAR all DTCs and RETEST system.
J13	CHECK REAR WIPER DOWN RELAY		
	• Remove rear wiper down relay. • **Is relay OK?**	Yes No	GO to J14. REPLACE relay. CLEAR all DTCs and RETEST system.
J14	CHECK CIRCUIT 592 (T) FOR SHORT TO GROUND		
	• Key OFF. • Measure C2, Pin 10 for continuity to ground. • **Is continuity present?**	Yes No	SERVICE Circuit 592 (T) for short to ground. CLEAR all DTCs and RETEST system. GO to J15.
J15	CHECK CIRCUIT 592 (T) FOR BATTERY SHORT		
	• Gain access to GEM module. • Remove GEM connector C2. • Key ON. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, measure voltage at Pin 10 connector C2. • **Is there greater than 1 volt?**	Yes No	SERVICE Circuit 592 (T) for battery short. GO to J16.

Fig. 60 Test J: Rear Wipers Inoperative (Part 2 Of 4).

TEST STEP		RESULT ▶	ACTION TO TAKE
J16	MEASURE WIPER DOWN RELAY		
	• Gain access to the rear wiper down ISO relay in engine compartment relay module No. 3. • Remove relay. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, test the two outer pins of the three pin row for continuity. • **Is continuity between 50-70 ohms?**	Yes ▶ No ▶	Relay OK. CLEAR all DTCs and RETEST system. If any DTCs are remaining, GO to **J3**. REPLACE relay. CLEAR DTCs and RETEST system.
J17	CHECK CIRCUIT 410 (W/O) FOR SHORT TO GROUND		
	• Gain access to the rear wiper up relay in the engine compartment relay module No. 3. • Remove the rear wiper up relay. • Key OFF. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check for continuity to ground Circuit 410 (W/O). • **Is continuity present?**	Yes ▶ No ▶	SERVICE Circuit 410 (W/O) for short to ground. CLEAR all DTCs and RETEST system. GO to **J18**.
J18	MEASURE REAR WIPER UP RELAY		
	• With rear wiper relay removed, test the two outer pins of the three pin row for continuity. • **Is continuity between 50-70 ohms?**	Yes ▶ No ▶	Relay OK. GO to **J19**. If sent from **J27**, GO to **J28**. REPLACE rear wiper up relay. CLEAR all DTCs and RETEST system.
J19	CHECK CIRCUIT 591 (LG) FOR BATTERY SHORT		
	• Remove wiper up relay. • Key ON. • Check Circuit 591 (LG) for battery voltage. • **Is B+ present?**	Yes ▶ No ▶	SERVICE Circuit 591 (LG) for battery short. GO to **J20**.
J20	CHECK CIRCUIT 591 (LG) FOR OPEN		
	• Gain access to GEM module. • Remove GEM connector C2. • Key OFF. • Remove rear wiper up relay. • Check for continuity between Circuit 591 (LG) at the wiper up relay and GEM connector C2, Pin 08. • **Is continuity present?**	Yes ▶ No ▶	Circuit OK. INSTALL rear wiper relay. CLEAR all DTCs and RETEST system. If DTCs are detected, GO to **J3**. SERVICE Circuit 591 (LG) for open. CLEAR all DTCs and RETEST system.
J21	CHECK CIRCUIT 587 (P/Y) FOR OPEN PARK SENSE		
	• Gain access to GEM module. • Remove GEM connector C2. • Remove rear wiper motor access panel. • Check for continuity between GEM connector C2, Pin 04, rear wiper motor connector Circuit 587 (P/Y). • **Is continuity less than 5 ohms?**	Yes ▶ No ▶	GO to **J22**. SERVICE Circuit 587 (P/Y) for open. CLEAR all DTCs and RETEST system.
J22	CIRCUIT 587 (P/Y) BATTERY SHORT PARK SENSE		
	• Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 587 (P/Y). • Probe GEM connector C2, Pin 04. • Key ON. • **Is B+ present?**	Yes ▶ No ▶	SERVICE Circuit 587 (P/Y) for battery short. CLEAR all DTCs and RETEST system. GO to **J23**.
J23	CHECK CIRCUIT 587 (P/Y) FOR SHORT TO GROUND		
	• Gain access to GEM connector C2, Pin 04. • Key OFF. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check for continuity to the GEM mounting bracket. • **Is continuity present?**	Yes ▶ No ▶	REPAIR or REPLACE rear wiper motor. GO to **J24**. SERVICE Circuit 587 (P/Y) for short to ground. CLEAR all DTCs and RETEST system.

Fig 60. Test J: Rear Wipers Inoperative (Part 3 Of 4).

TEST STEP		RESULT	ACTION TO TAKE
J24	CHECK CIRCUIT 597 (DG/P) FOR BATTERY VOLTAGE		
	• Gain access to GEM module. • Remove connector C2. • Key ON. • Check for voltage on C2, Pin 06. • **Is B+ present?**	Yes ▶ No ▶	SERVICE Circuit 597 (DG/P) for battery short reconnector. CLEAR all DTCs and RETEST system. GO to **J25**.
J25	CHECK CIRCUIT 597 (DG/P) FOR OPEN TO HIGH SENSE		
	• Key OFF. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 597 (DG/P) between GEM connector C2, Pin 06 and rear wiper motor Circuit 579 (DG/P). • **Is continuity present?**	Yes ▶ No ▶	GO to **J26**. SERVICE Circuit 597 (DG/P) for open. CLEAR all DTCs and RETEST system.
J26	CHECK CIRCUIT 597 (DG/P) FOR SHORT TO GROUND		
	• Key OFF. • Remove GEM connector C2. • Check Circuit 597 (DG/P), Pin 06 using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent. • Measure for continuity to GEM mounting bracket. • **Is continuity present?**	Yes ▶ No ▶	SERVICE Circuit 597 (DG/P) for short to ground. CLEAR all DTCs and RETEST system. GO to **J27**.
J27	CHECK CIRCUIT 57 (BK) FOR OPEN		
	• Key OFF. • Gain access to engine compartment relay module No. 3. • Remove the rear wiper down and up relays. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 57 (BK) at each relay to a known good ground. • **Is continuity present?**	Yes ▶ No ▶	GO to **J18**. SERVICE Circuit 57 (BK) for open to ground. CLEAR all DTCs and RETEST system.
J28	CHECK CIRCUIT 700 (W/P) FOR BATTERY SHORT		
	• Gain access to GEM module connector C1. • Key ON. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check connector C1, Pin 04 for battery voltage. • Open and close liftgate and lift gate glass. • **Is B+ present?**	Yes ▶ No ▶	SERVICE Circuit 700 (W/P) for battery short. CLEAR all DTCs and RETEST system. GO to **J29**.
J29	CHECK CIRCUIT 700 (W/P) FOR OPEN		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent. • Request PID LGATE SW. • Open and close liftgate. • **Does LGATE SW change states?**	Yes ▶ No ▶	System OK. SERVICE Circuit 700 (W/P) for open.

Fig. 60 Test J: Rear Wipers Inoperative (Part 4 Of 4).

K - Washer Non-Functional: No Interval Delay

TEST STEP		RESULT	ACTION TO TAKE
K1	PRELIMINARY CHECK		
	• Check fuses for continuity. • Check connections for clean, tight fit. • Check for loose or damaged wires. • **Do components and wiring check OK?**	Yes ▶ No ▶	GO to **K2**. SERVICE or REPLACE as required. GO to **B2**.

Fig. 61 Test K: Washer Non-Functional - No Interval Delay (Part 1 Of 2).

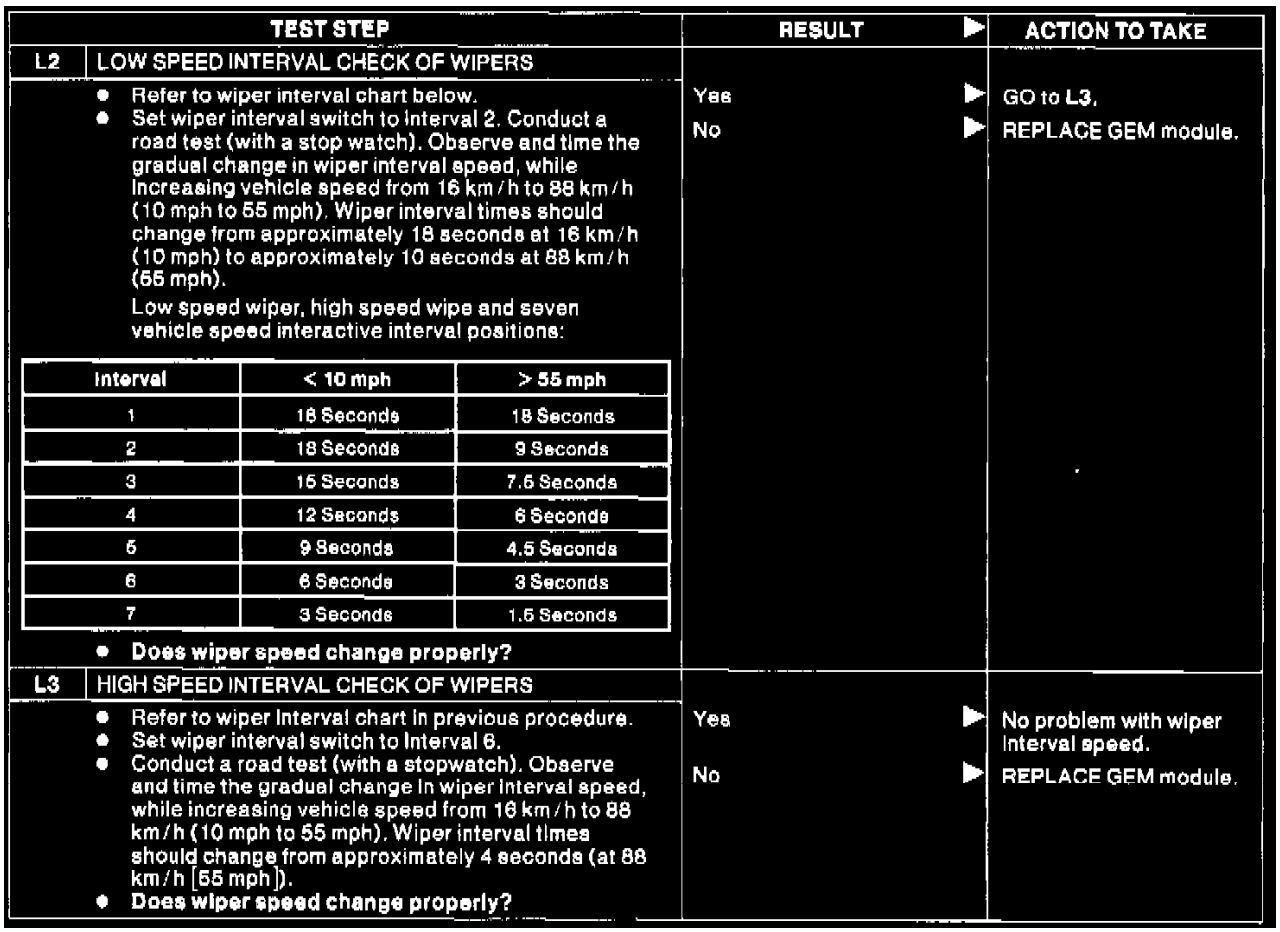
	TEST STEP	RESULT	ACTION TO TAKE
K2	ON-DEMAND SELF TEST		
	• Connect Rotunda New Generation Star (NGS) Tester 007-00500 or equivalent to data link connector (DLC). • Retrieve continuous DTCs. • Perform on-demand self test. • **Are any diagnostic codes retrieved with New Generation Star (NGS) Tester?**	DTC B1450 self test and continuous ▶	GO to **K3**.
K3	CHECK FOR SHORT TO BATTERY CIRCUIT 680 (LB/O)		
	• Gain access to GEM module connector C1 • Remove connector C1. • Key ON. • Using Rotunda Digital Volt-Ohmmeter 014-00407 or equivalent, check Circuit 680 (LB/O) C1 Pin 13 for short to battery. • **Is B+ present?**	Yes ▶ No ▶	REPAIR battery short in Circuit 680 (LB/O). CLEAR all DTCs and RETEST system. GO to **K4**.
K4	CHECK CIRCUIT 680 (LB/O) FOR CONTINUITY		
	• Gain access to GEM module connector C1 • Remove connector C1. • Key OFF. • Check for continuity between C1 Pin 13 and C1 Pin 21. • Depress windshield washer switch. • **Is there less than 5 ohms?**	Yes ▶ No ▶	REPAIR open circuit with C1 Pins 13 and 21. GO to **K5**.
K5	CHECK CIRCUIT 359 (GY/R) FOR OPEN		
	• Gain access to multi-function switch • Check for continuity between the windshield wiper switch connector Circuit 359 (GY/R) and GEM connector C1 Pin 21. • Check Circuit 680 (LB/O) between windshield wiper switch connector and Pin 13 of GEM connector C1. • **Is continuity present?**	Yes ▶ No ▶	REPLACE windshield washer and wiper switch. CLEAR all DTCs and RETEST system. SERVICE Circuits 359 (GY/R) and 680 (LB/O) for open. CLEAR DTCs and RETEST system.

Fig. 61 Test K: Washer Non-Functional - No Interval Delay (Part 2 Of 2).

L - Wiper Intervals Not Properly Altered By Vehicle Speed

	TEST STEP	RESULT	ACTION TO TAKE
L1	PRELIMINARY CHECKS		
	• Determine that windshield wiper system is not failing by first conducting Pinpoint Tests B, C, D, E and F. • **Are there failures?**	Yes ▶ No ▶	REPAIR or REPLACE circuits as necessary. GO to **L2**.

Fig. 62 Test L: Windshield Wiper Interval(s) Not Properly Altered By Vehicle Speed (Part 1 Of 2).



TEST STEP		RESULT	ACTION TO TAKE
L2	LOW SPEED INTERVAL CHECK OF WIPERS		
	• Refer to wiper interval chart below. • Set wiper interval switch to Interval 2. Conduct a road test (with a stop watch). Observe and time the gradual change in wiper interval speed, while increasing vehicle speed from 16 km/h to 88 km/h (10 mph to 55 mph). Wiper interval times should change from approximately 18 seconds at 16 km/h (10 mph) to approximately 10 seconds at 88 km/h (55 mph). Low speed wiper, high speed wipe and seven vehicle speed interactive interval positions:	Yes No	GO to L3. REPLACE GEM module.
L3	HIGH SPEED INTERVAL CHECK OF WIPERS		
	• Refer to wiper interval chart in previous procedure. • Set wiper interval switch to Interval 6. • Conduct a road test (with a stopwatch). Observe and time the gradual change in wiper interval speed, while increasing vehicle speed from 16 km/h to 88 km/h (10 mph to 55 mph). Wiper interval times should change from approximately 4 seconds (at 88 km/h [55 mph]). • **Does wiper speed change properly?**	Yes No	No problem with wiper interval speed. REPLACE GEM module.

Interval	< 10 mph	> 55 mph
1	18 Seconds	18 Seconds
2	18 Seconds	9 Seconds
3	15 Seconds	7.6 Seconds
4	12 Seconds	6 Seconds
5	9 Seconds	4.5 Seconds
6	6 Seconds	3 Seconds
7	3 Seconds	1.5 Seconds

Fig. 62 Test L: Windshield Wiper Interval(s) Not Properly Altered By Vehicle Speed (Part 2 Of 2).