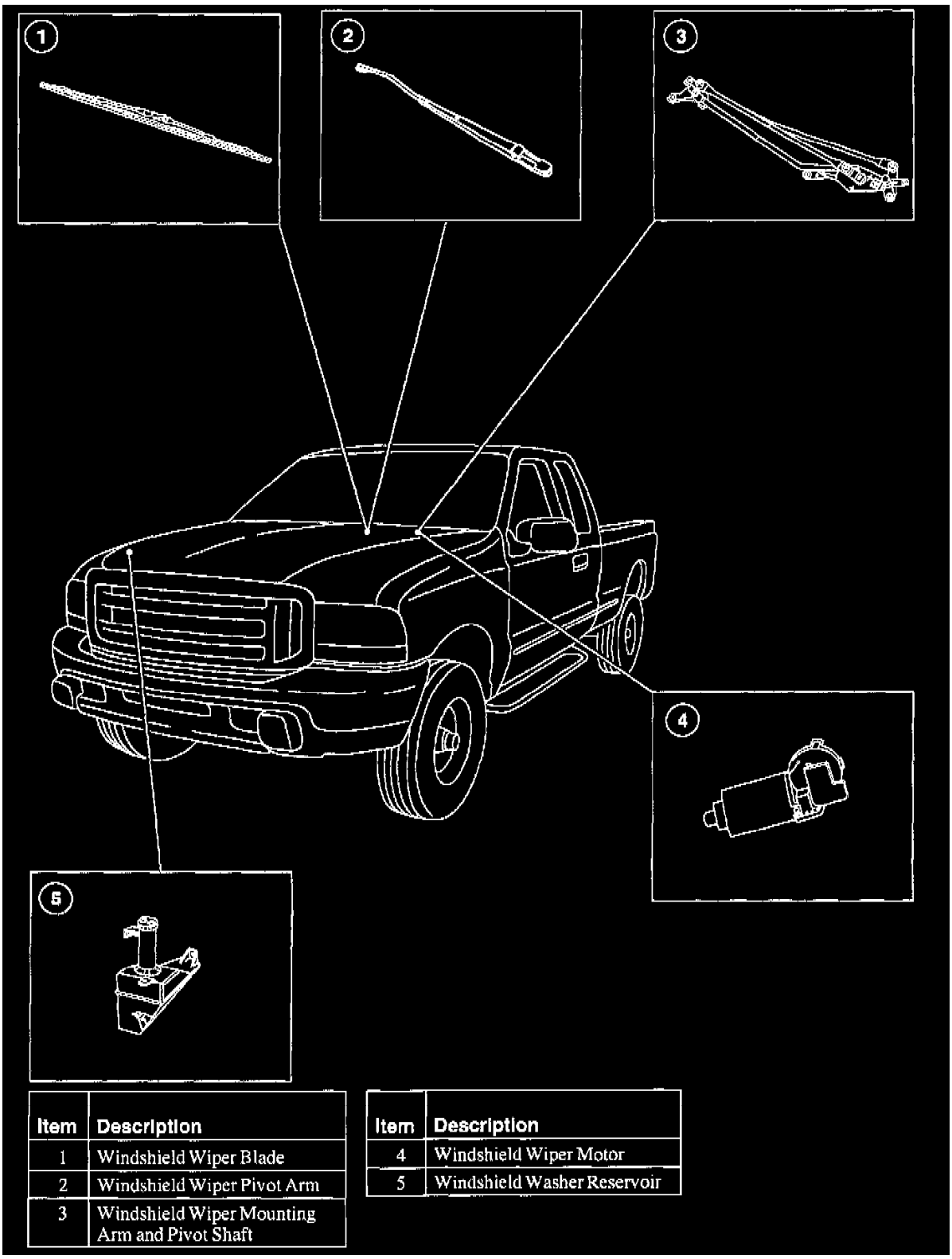
Wiper and Washer Systems: Description and Operation
Super Duty Series



Item	Description
1	Windshield Wiper Blade
2	Windshield Wiper Pivot Arm
3	Windshield Wiper Mounting Arm and Pivot Shaft

Item	Description
4	Windshield Wiper Motor
5	Windshield Washer Reservoir

OPERATION

There are four different operating modes of the wiper system: off mode, low speed mode, high speed mode, and interval mode.

In the off mode, there is no windshield wiper motor activity and the windshield wiper motor will be in the PARK position.

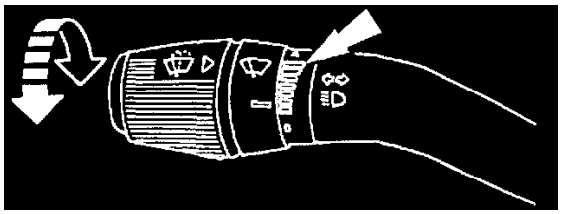
In the low speed mode, the windshield wiper motor will be set to a low speed setting. The windshield wiper high/low relay is deactivated, while the windshield wiper run/park relay is activated.

In the high speed mode, the windshield wiper motor will be set to a high speed setting. The windshield wiper high/low relay and the windshield

wiper run/park relay are both activated.

In the interval mode, the windshield wiper motor will be set to a low speed setting with the windshield wiper high/low relay deactivated. The windshield wiper run/park relay is activated at the beginning of each wipe and deactivated when the windshield wiper motor park switch reaches the RUN position.

The permanent magnet three-brush F windshield wiper motor allows selection of either low or high speed, when selected via the steering column mounted multi-function switch. When the multi-function switch is in the LOW position, the common brush and low speed brush are used. When the multi-function switch is in the HIGH position, current bypasses part of the armature winding to the high speed brush. When the multi-function switch is moved to the OFF position, the windshield wiper motor will continue to run at low speed until the windshield wipers park.



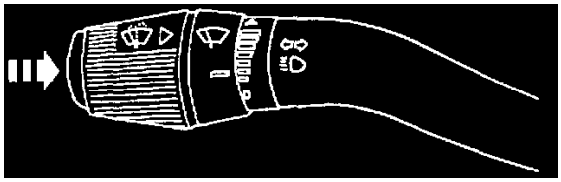
When the multi-function switch is in the Interval **(INT)** position, the windshield wipers will make a single sweep followed by a pause. The control knob on the end of the multi-function switch adjusts the pause from approximately **1-20 seconds**.

Mode Switch State	Resistance Ranges (k ohms)	
	Lowest	Highest
OFF	46.08	48.93
INTERVAL	10.86	11.54
LOW	3.96	4.20
HIGH	0.0	0.4

Interval Delay/Wash Switch State	Resistance Ranges (k ohms)	
	Lowest	Highest
1 (Long)	95.0	105.0
2	77.9	86.1
3	64.6	71.4
4	48.45	53.55
5	34.2	37.8
6	19.0	21.0
7 (Short)	3.14	3.47
Wash	0.0	0.4

The Generic Electronic Module **(GEM)** responds to the windshield wiper control commands by interpreting inputs from the steering column multi-function switch. The speed dependent wipers will compensate for the extra moisture that accumulates on the windshield at higher speeds, except when the multi-function switch is in the INT 1 position. At higher speeds, the speed dependent feature shortens the delay between wipes when using the variable interval wipers. Delays will automatically adjust at speeds between **16** and **105 km/h (10** and **65 mph)**.

Delay/Wash Switch State	Dwell Interval	
	0-10 MPH	65 MPH and Above
1 (Long)	18	18
2	16	5
3	13	4
4	10	3
5	7	2
6	4	1
7 (Short)	1	0



To engage the windshield washer, push the knob of the multi-function switch toward the steering column. When the multi-function switch is in the OFF or INT position, the windshield wipers will run as long as the knob is depressed. When the knob is released, the washer will stop immediately, but the windshield wipers will continue to run for two to three sweeps, then return to their previous set operation. Washer engagement does not affect windshield wiper operation when the multi-function switch is at the LOW or HIGH position.

Feature Inputs
- Ignition switch RUN position: (battery potential on both RUN and RUN/ACC inputs).
- Ignition switch ACC position: (battery potential on RUN/ACC input only).
- Wiper switch position: (different resistance for each mode; see Wiper Switch Resistance Values table).
- Interval Delay/Wash switch position: (different resistance for each mode; see Interval Delay/Wash Switch Resistance Values table).
- Windshield wiper motor park switch: (ground for PARK position and battery potential for RUN position).
- Vehicle speed signal (sinusoid wave: **0.7-20 V, 2.2 Hz/mph)** (GEM only).

Feature Outputs
- Windshield wiper high/low relay control (ground to activate and open circuit to deactivate).
- Windshield wiper run/park relay control (ground to activate and open circuit to deactivate).
- Washer pump relay control (ground to activate and open circuit to deactivate).