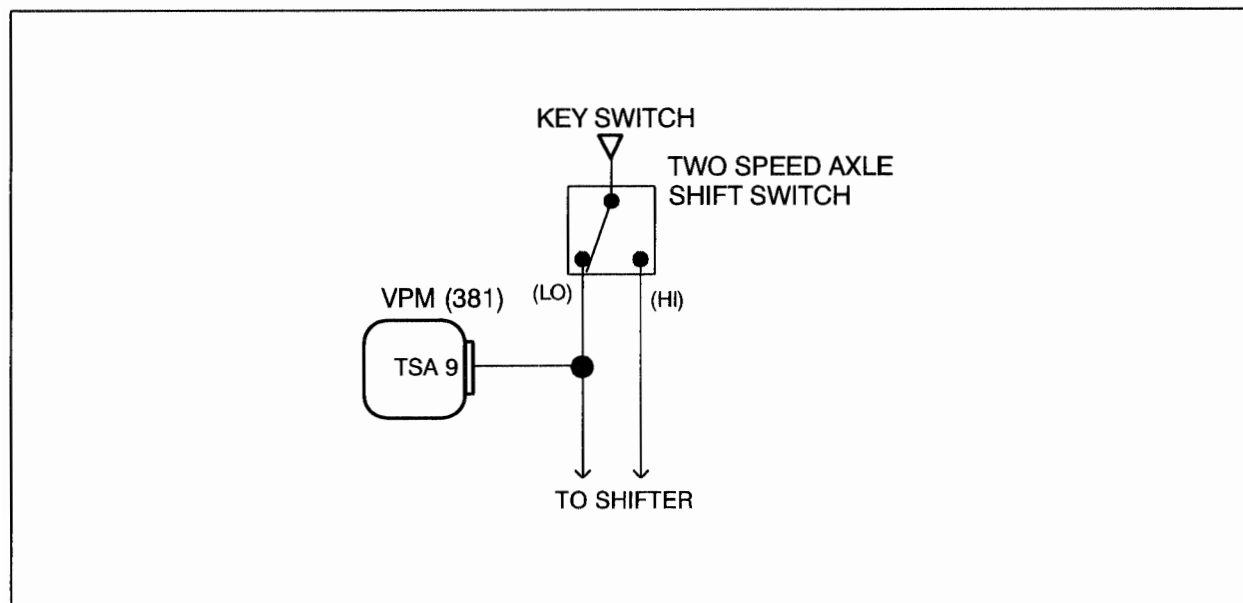


## ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

### TWO SPEED AXLE INPUT CIRCUIT (TSA)

#### TWO SPEED AXLE SPEEDOMETER CIRCUIT



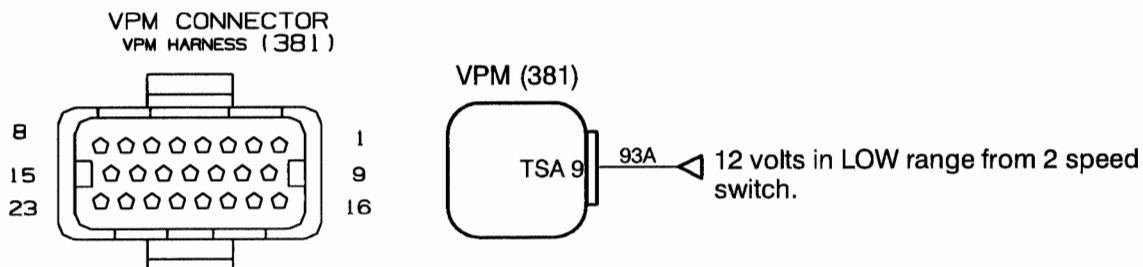
#### SIGNAL FUNCTIONS

The VPM is programmed with the high and low rear axle ratios. The ratios are used to calculate the speedometer signal, depending on which mode the switch is in. The VPM uses the high ratio unless voltage is applied to VPM terminal 9 indicating the two speed selector switch is in the low range.

The two speed switch applies 12 volts to the VPM at terminal 9 ( and to the shifter) when the switch is in the LO position.

#### FAULT DETECTION MANAGEMENT

There are no ECM diagnostics for the two speed circuits.

**TWO SPEED AXLE INPUT CIRCUIT (TSA)****Two Speed Axle Speedometer  
(TSA)****Fault Codes:****There are no Diagnostic Codes for this application.****USE PROLINK EST TO PERFORM THE FOLLOWING TEST**

1. Use Prolink EST to verify correct VPM programming including correct rear axle ratios (high and low)
  - A. If programmed correctly go to step 2.
  - B. If programming is not correct, make necessary programming corrections.
2. Use EST to monitor two speed switch while changing switch position several times.
  - A. If switch does not function, go to step 3.
  - B. If switch functions properly go to step 4.
3. Disconnect connector (381) from VPM. With key ON and switch in LOW position, measure voltage to ground at circuit 93A. Battery voltage ( $12 \pm 1.5$  volts) should be present.
  - A. If less than 10.5 v check connections, if 0 volts check for open/short to ground.
  - B. If battery voltage is present, replace the VPM.
4. Refer to Service Manual Group 08 Instruments, and perform Speedometer Self Diagnostic Test.
  - A. If the self test is not OK, follow the recommendations of the service manual.
  - B. If the self test is OK, road test the vehicle and have a passenger monitor vehicle speed using the Pro-link. If the Prolink displays the correct speed replace the speedometer/tachometer unit. If the Prolink does not display the correct speed, replace the VPM.

## ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

### TWO SPEED AXLE INPUT CIRCUIT (TSA)

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#### EXTENDED DESCRIPTION

**NOTE: THE PURPOSE OF THIS SECTION IS TO DIAGNOSE THE TWO SPEED INTERFACE WITH THE SPEEDOMETER. THIS SECTION DOES NOT DIAGNOSE TWO SPEED AXLE OPERATION.**

The vehicle speed sensor reads the revolutions of the transmission speedometer gear and sends a signal to the VPM. VPM programming includes the high and low rear axle ratios. The VPM uses the sensor input and rear axle ratios to calculate the speedometer signal, depending on which range the vehicle is operating in. When voltage is applied to VPM terminal 9 from the two speed circuit, the VPM uses the low ratio.

The Two Speed Axle switch receives ACC power from 10A fuse F14. This is a normally open switch with "High" as the normal operating position. With the Two-Speed switch in the "Low" position, 12V accessory power is applied through VPM connector (381) at VPM terminal 9.

#### ECM DIAGNOSTICS

There are no ECM/VPM diagnostics for this circuit.

#### TROUBLESHOOTING

If the speedometer/odometer does not correctly show vehicle speed when changing from the high to low range, or low to high range, perform Testing Two-Speed Speedometer Circuit on page 223.

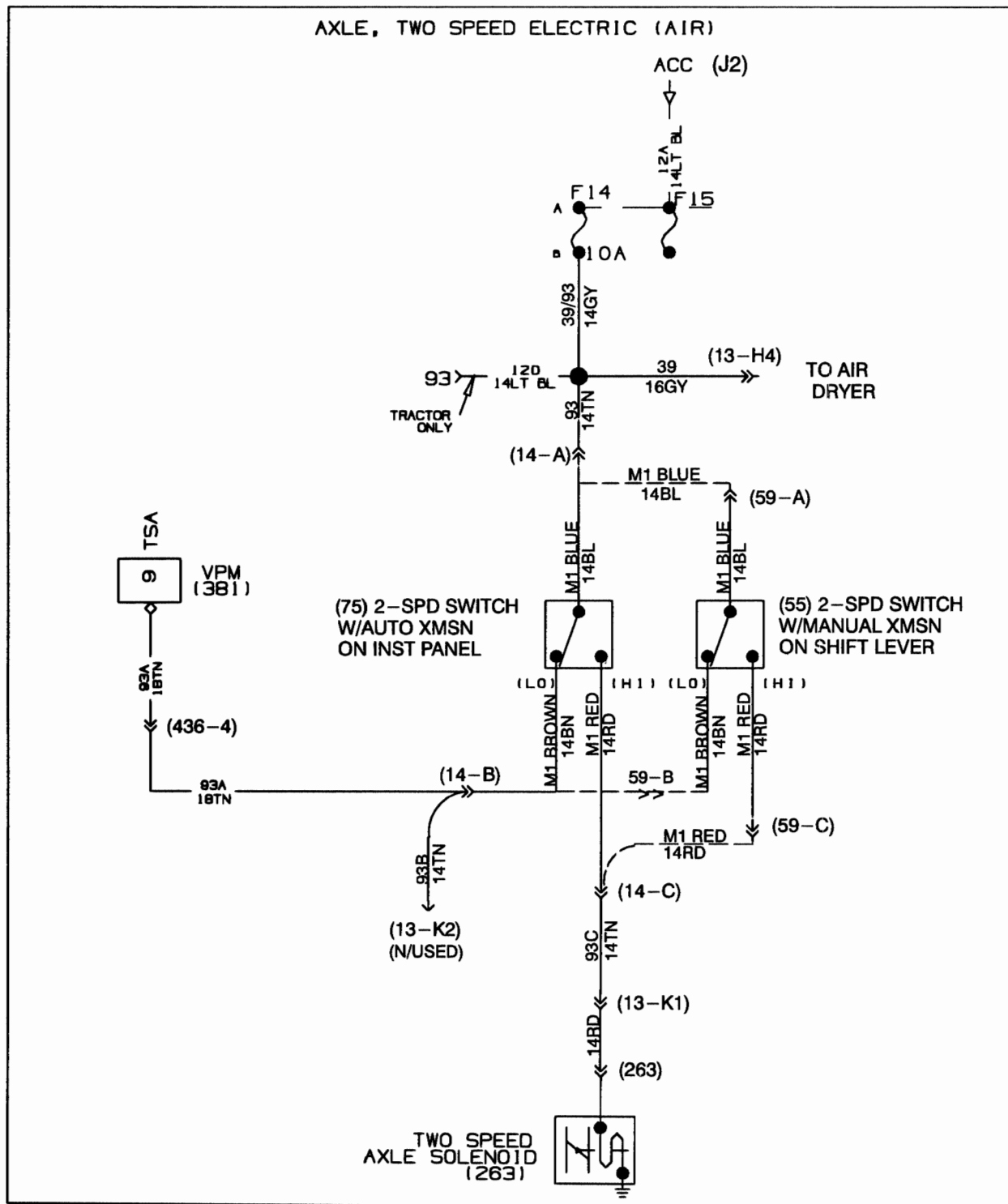
#### BEFORE TROUBLESHOOTING

- A. Before troubleshooting, make sure that the batteries are fully charged! Check battery connections and grounds for clean, tight connections free of damage. Voltage tests will give misleading results if the batteries are not fully charged.
- B. Before troubleshooting, inspect circuit connectors for pushed back, loose, or damaged (spread or bent) terminals, or wires with cut strands etc. Wires and connections must be free of damage or corrosion. When some connectors corrode, a light white residue will be present that must be removed.
- C. Before troubleshooting, inspect suspect circuit grounds for clean, tight connections free of damage.

## TWO SPEED AXLE INPUT CIRCUIT (TSA)

## CIRCUIT DIAGRAM TWO SPEED ELECTRIC (AIR)

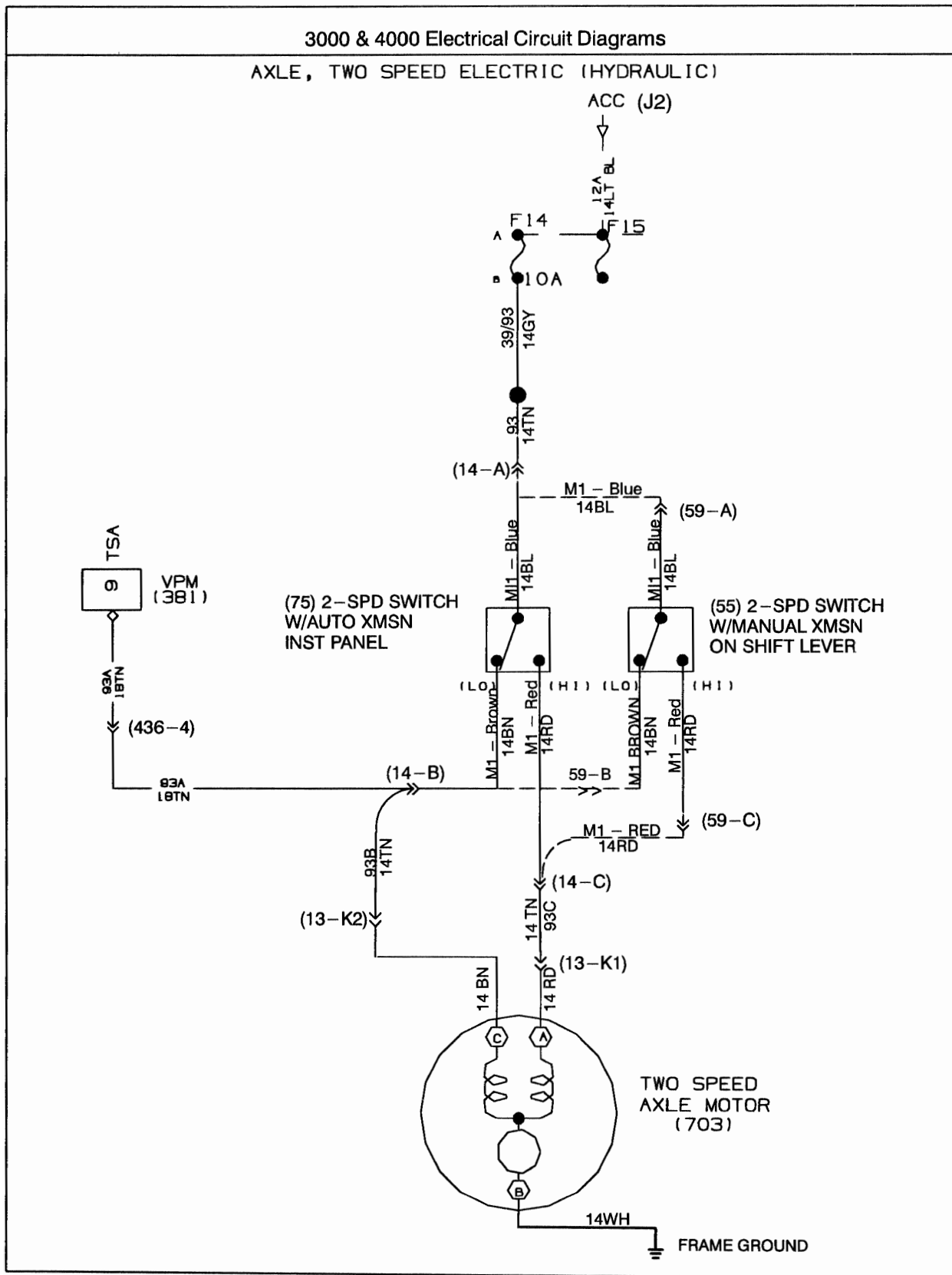
3000 &amp; 4000 Electrical Circuit Diagrams



# ELECTRONIC CONTROL SYSTEM DIAGNOSTICS

## TWO SPEED AXLE INPUT CIRCUIT (TSA)

### TWO SPEED ELECTRIC (HYDRAULIC)



## TWO SPEED AXLE INPUT CIRCUIT (TSA)

## TESTING TWO-SPEED SPEEDOMETER CIRCUIT

Refer to circuit diagram  
on page 221 or 222.

