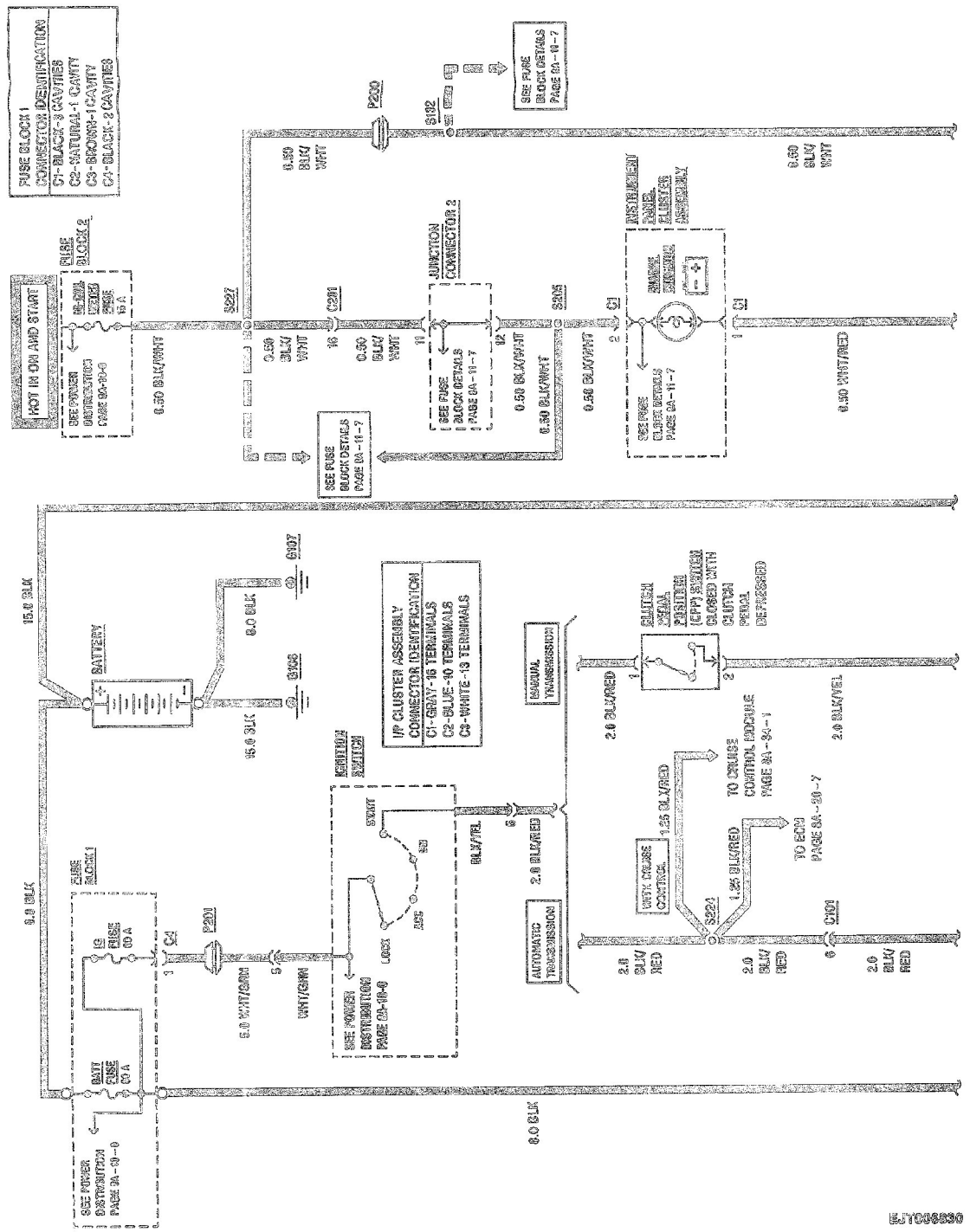
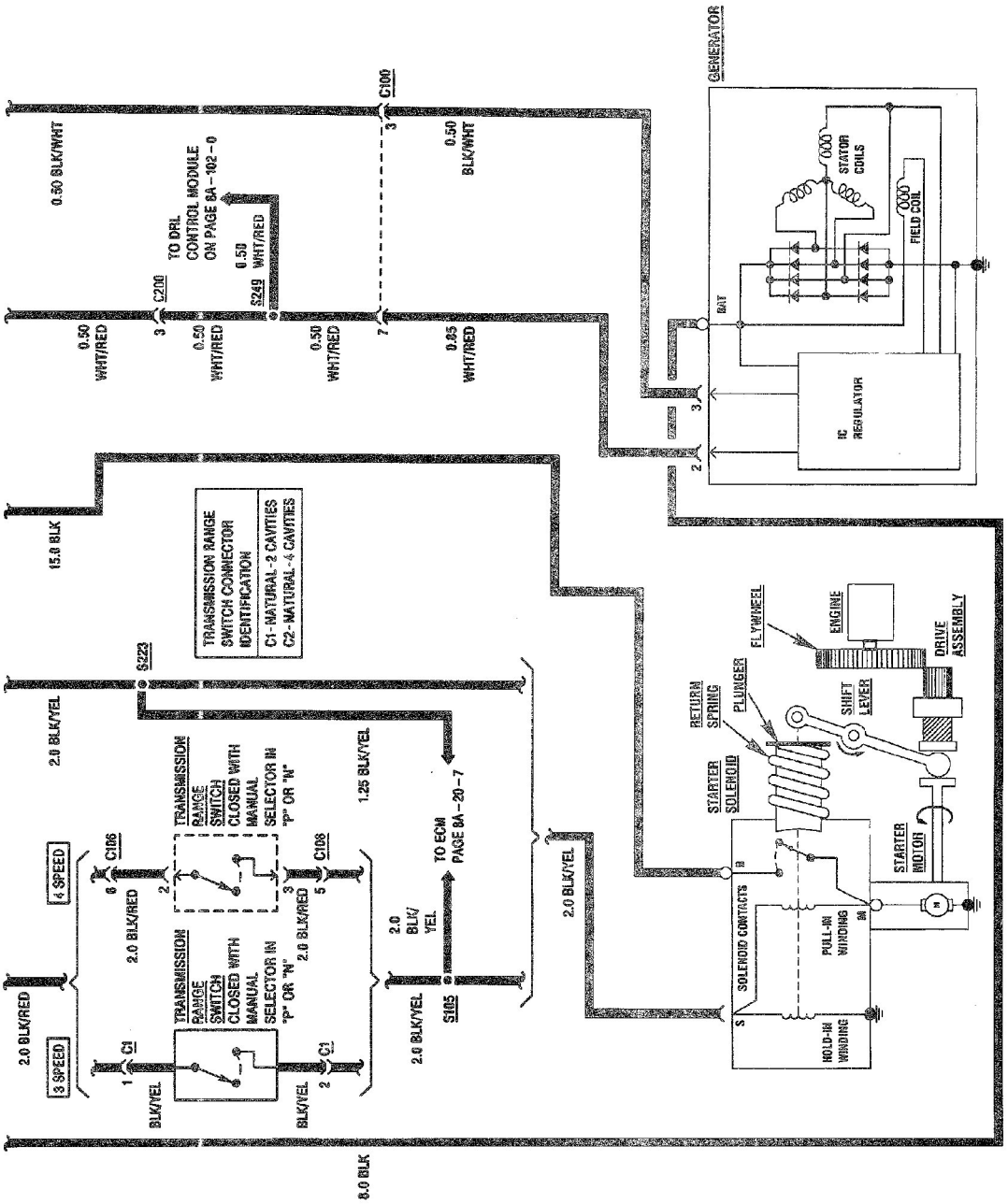
STARTER AND CHARGING




GENERATOR
STATOR COILS
FIELD COIL
BAT
IC REGULATOR
C100
0.50 BLK/WHT
0.50 BLK/WHT
TO DRL CONTROL MODULE ON PAGE 8A-102-0
C200
S249
0.50 WHT/RED
0.50 WHT/RED
0.50 WHT/RED
0.50 WHT/RED
0.85 WHT/RED
15.0 BLK
TRANSMISSION RANGE SWITCH CONNECTOR IDENTIFICATION
C1 - NATURAL - 2 CAVITIES
C2 - NATURAL - 4 CAVITIES
S223
2.0 BLK/YEL
1.25 BLK/YEL
TO ECM PAGE 8A-20-7
2.0 BLK/YEL
S105
2.0 BLK/YEL
2.0 BLK/YEL
2.0 BLK/RED
3 SPEED
4 SPEED
C1
C106
C108
TRANSMISSION RANGE SWITCH CLOSED WITH MANUAL SELECTOR IN "P" OR "N"
TRANSMISSION RANGE SWITCH CLOSED WITH MANUAL SELECTOR IN "P" OR "N"
2.0 BLK/RED
2.0 BLK/RED
BLK/YEL
BLK/YEL
8.0 BLK
STARTER SOLENOID
RETURN SPRING
PLUNGER
SOLENOID CONTACTS
PULL-IN WINDING
HOLD-IN WINDING
SHIFT LEVER
FLYWHEEL
ENGINE
DRIVE ASSEMBLY
STARTER MOTOR

EJT007830

STARTER AND CHARGING

COMPONENT	LOCATION	201-PG	FIG.	CONN
Battery	RH Rear Engine Compartment, behind Strut Tower	01	A	
Clutch Pedal Position (CPP) Switch (Manual Transmission)	Behind LH I/P, above Engine Control Module (ECM)	06	A	
Fuse Block 1	RH Engine Compartment, front of Battery	01	A	
C4 (2 Cavities)	Main Harness to Fuse Block 1, below Fuse Block 1	01	A	
Fuse Block 2	Under LH I/P	06	A	
Generator	RH lower front of Engine			
Ignition Switch	On Steering Column	06	A	
Instrument Panel Cluster Assembly	LH I/P	07	A	
C1 (16 Terminals)	I/P Harness to I/P Cluster Assembly, behind I/P Cluster Assembly	07	A	81-03
Junction Connector 2 (20 Cavities)	I/P Harness, LH side of I/P, behind Illumination Controller			
Transmission Range Switch (Automatic Transmission)	RH side of Transmission	14	B	202-14A1
C1 (2 Cavities) (3-Speed Automatic Transmission)	RH side of Transmission	14	B	
C100 (16 Cavities)	Main Harness to Engine Harness, on Bulkhead mounted to Bracket, left of Front Wiper Motor	04	A	202-01A1
C101 (16 Cavities)	Main Harness to Engine Harness, on Bulkhead mounted to Bracket, left of Front Wiper Motor	04	A	202-02A1
C106 (10 Cavities) (4-Speed Automatic Transmission)	Engine Harness to Transmission Harness, RH Rear Engine, under Intake Manifold	.....	.....	202-05A1
C200 (22 Cavities)	Main Harness to I/P Harness, LH I/P near Fuse Block 2	06	A	202-06A1
C201 (16 Cavities)	Main Harness to I/P Harness, LH I/P near Fuse Block 2	06	A	202-07A1
G106	RH Inner Fender, near Battery	01	A	
G107	RH Engine, near Starter Motor			
P200	LH Engine Compartment on Bulkhead, near Brake Master Cylinder	04	A	
P201	RH Rear Engine Compartment on Bulkhead, near Battery	01	A	
S105	Engine Harness, at Bulkhead near Distributor			
S132	Main Harness, at Bulkhead near Front Wiper Motor			
S205	I/P Harness, behind center of I/P			
S223	Main Harness, near Fuse Block 2			
S224 (Automatic Transmission)	Main Harness, near I/P left of Steering Column			
S227	Main Harness, near Fuse Block 2			
S249	Main Harness, left of Steering Column			

TROUBLESHOOTING HINTS

1. Check BATT and IG Fuses using a test lamp.
2. Check the IG-COIL METER Fuse with a fuse tester.
3. Check the hydrometer eye that is built into the BATTERY before troubleshooting the Starter or Charging System.
   - Green Eye - BATTERY is charged.
   - Dark Eye - BATTERY is discharged. Recharge the BATTERY.
   - Clear or Yellow Eye - BATTERY fluid is low. Replace the BATTERY.
4. Check the BATTERY for overcharge conditions such as spewing of electrolyte or yellowing of the BATTERY case. If any of these conditions are present, refer to SECTION 6D1.
5. Check that all STARTER assembly connections are clean and tight.
6. Check that G106 and G107 are clean and tight.

SYSTEM DIAGNOSIS

STARTER SYSTEM

TEST	RESULT	ACTION
1. Turn IGNITION SWITCH to "START."	ENGINE does not crank and STARTER SOLENOID does not click.	GO to step 2.
	ENGINE does not crank or cranks slowly and STARTER SOLENOID clicks.	GO to step 10.
2. Connect a test lamp from STARTER SOLENOID terminal S to chassis ground. Press clutch pedal if equipped with manual transmission. Turn IGNITION SWITCH to "START."	Test lamp lights.	Replace STARTER SOLENOID.
	Test lamp does not light.	GO to step 3 if equipped with manual transmission. GO to step 7 if equipped with automatic transmission.
3. Backprobe CLUTCH PEDAL POSITION (CPP) SWITCH connector with a test lamp from cavity 2 to chassis ground. Turn IGNITION SWITCH to "START" and depress clutch pedal.	Test lamp lights.	Repair open in BLK/YEL wire between CPP SWITCH and STARTER SOLENOID.
	Test lamp does not light.	GO to step 4.
4. Backprobe CPP SWITCH connector with a test lamp from cavity 1 to chassis ground. Turn IGNITION SWITCH to "START."	Test lamp lights.	Replace CPP Switch.
	Test lamp does not light.	GO to step 5.
5. Backprobe IGNITION SWITCH connector with a test lamp from cavity 6 to chassis ground. Turn IGNITION SWITCH to "START."	Test lamp lights.	Repair open in BLK/RED wire between CPP SWITCH and IGNITION SWITCH.
	Test lamp does not light.	GO to step 6.
6. Backprobe IGNITION SWITCH connector with a test lamp from cavity 5 to chassis ground.	Test lamp does not light.	Repair open in WHT/GRN wire between FUSE BLOCK 1 and IGNITION SWITCH.
	Test lamp lights.	Replace IGNITION SWITCH.
7. With gear selector in PARK or NEUTRAL, backprobe TRANSMISSION RANGE SWITCH from connector C1 cavity 2 (3 speed automatic) or cavity 3 (4 speed automatic) to chassis ground. Turn IGNITION SWITCH to "START."	Test lamp lights.	Repair open in BLK/YEL wire between TRANSMISSION RANGE SWITCH and STARTER SOLENOID.
	Test lamp does not light.	GO to step 8.

STARTER AND CHARGING

TEST	RESULT	ACTION
8. Backprobe TRANSMISSION RANGE SWITCH from connector C1 cavity 1 (3 speed automatic) or cavity 2 (4 speed automatic) to chassis ground. Turn IGNITION SWITCH to "START."	Test lamp lights.	Replace TRANSMISSION RANGE SWITCH.
	Test lamp does not light.	GO to step 9.
9. Backprobe IGNITION SWITCH connector with a test lamp from cavity 6 to chassis ground. Turn IGNITION SWITCH to 'START."	Test lamp lights.	Repair open in BLK/RED wire between IGNITION SWITCH and TRANSMISSION RANGE SWITCH.
	Test lamp does not light.	GO to step 6.
10. Using a digital multimeter, measure voltage across BATTERY terminals with IGNITION SWITCH in "START."	Less than 9.6 volts.	GO to step 11.
	More than 9.6 volts.	GO to step 12.
11. Perform Battery Load Test. Refer to Section 6D1.	BATTERY defective.	Replace BATTERY.
	BATTERY good.	Repair/replace STARTER.
12. Using a digital multimeter, measure voltage drop between battery negative (-) post and engine block and then between battery positive (+) post and STARTER SOLENOID terminal S while cranking the engine.	Voltage drop through either battery cable more than 0.5 volts.	Check for poor connection at BATTERY and STARTER SOLENOID. If OK, replace battery cables.
	Voltage drop through either battery cable less than 0.5 volts.	Repair/replace starter.

CHARGING SYSTEM
NOTE:BATTERY MUST BE IN CHARGED STATE BEFORE CONTINUING DIAGNOSIS.

TEST	RESULT	ACTION
1. Turn IGNITION SWITCH to "ON."	Charge Indicator lights.	GO to step 2.
	Charge Indicator does not light.	GO to step 4.
2. Start engine.	Charge Indicator goes out.	GO to step 3.
	Charge Indicator remains lit.	GO to step 7.
3. Using a digital multimeter, measure the voltage across BATTERY terminals with engine running at fast idle.	Voltage between 13.5 and 15.5 volts.	All systems in this Section are functioning normally.
	Voltage less than 13.5 or more than 15.5 volts.	Remove GENERATOR and replace IC Regulator.
4. Remove GENERATOR connector. Connect a fused jumper from GENERATOR connector cavity 2 to chassis ground.	Charge Indicator lights.	GO to step 5.
	Charge Indicator does not light.	GO to step 6.
5. Connect a test lamp from GENERATOR connector cavity 3 to chassis ground. Turn IGNITION SWITCH to "ON."	Test lamp lights.	Remove GENERATOR and replace IC Regulator.
	Test lamp does not light.	Repair open in BLK/WHT wire between FUSE BLOCK 2 and GENERATOR.
6. Backprobe INSTRUMENT PANEL CLUSTER ASSEMBLY connector C1 with a test lamp from terminal 2 to chassis ground.	Test lamp does not light.	Repair open in BLK/WHT wire between INSTRUMENT PANEL CLUSTER ASSEMBLY and FUSE BLOCK 2.
	Test lamp lights.	Check INSTRUMENT PANEL CLUSTER ASSEMBLY PRINTED CIRCUIT for opens. If OK, repair open in WHT/RED wire.

TEST	RESULT	ACTION
7. Turn IGNITION SWITCH to "OFF." Remove GENERATOR connector. Turn IGNITION SWITCH to "ON."	Charge Indicator remains lit.	Repair short to ground in WHT/RED wire.
	Charge Indicator goes out.	Remove GENERATOR and check IC Regulator.

COMPONENT REPLACEMENT INFORMATION

For component replacement procedures, refer to the section listed below.

CIRCUIT OPERATION

STARTER SYSTEM

With the ignition key in the "START" position, BATTERY voltage is transferred through the IGNITION SWITCH to the CLUTCH PEDAL POSITION (CPP) SWITCH or the TRANSMISSION RANGE SWITCH. The CPP SWITCH is used on those vehicles equipped with a manual transmission while the TRANSMISSION RANGE SWITCH is used on those vehicles equipped with an automatic transmission. When the clutch pedal is depressed, the CPP SWITCH is closed and BATTERY voltage is applied to the STARTER SOLENOID windings. When the manual selector is in either "P" or "N," the TRANSMISSION RANGE SWITCH is closed and BATTERY voltage is transferred to the STARTER SOLENOID windings. In each case, this causes the SHIFT LEVER to push out the DRIVE ASSEMBLY, engaging it with the FLYWHEEL. This action will also cause the contacts in the STARTER SOLENOID to close, providing voltage to the STARTER MOTOR.

Once the ENGINE starts, an override mechanism allows the DRIVE ASSEMBLY to turn at the same speed as the FLYWHEEL. Once the ignition key is released, placing the IGNITION SWITCH in the "ON" position, the windings in the STARTER SOLENOID are de-energized and the RETURN SPRING returns the DRIVE ASSEMBLY to its original position and opens the contacts.

CHARGING SYSTEM

The GENERATOR provides DC voltage to operate the vehicle's electrical systems and to recharge the BATTERY. The voltage output of the GENERATOR is controlled by a built-in IC Regulator.

When the IGNITION SWITCH is moved to "ON," BATTERY voltage is applied through the IG-COIL METER Fuse and the Charge Indicator to the IC Regulator in the GENERATOR. When the GENERATOR is not rotating, the IC Regulator provides a ground and causes the Charge Indicator to light.

AC voltage is generated in three Stator Coils. This AC voltage is converted to DC voltage in the Rectifier Bridge. The DC output is applied to the vehicle's BATTERY and electrical supply circuits at the "BAT" terminal of the GENERATOR. A separate output voltage is provided to the Charge Indicator. Since equal voltage is now being applied to both sides of the Charge Indicator, the lamp loses its ground and goes out.

The IC Regulator is also connected to battery voltage through the GENERATOR "BAT" terminal. When the BATTERY is fully charged, the IC Regulator senses this and reduces the output of the GENERATOR, preventing an overcharge condition. When the BATTERY is drained, the IC Regulator senses the low voltage and increases the output of the GENERATOR.