

**A**

Abbreviations and Their Meanings .....	0-28
Accelerator Controls	
Cable Replacement (4.3L) .....	6-1498
Cable Replacement (5.0L, 5.7L) .....	6-2220
Cable Replacement (7.4L) .....	6-3230
Pedal Replacement (4.3L) .....	6-1503
Pedal Replacement (5.0L, 5.7L) .....	6-2225
Pedal Replacement (7.4L) .....	6-3233
Accelerator Pedal Position Module	
Replacement (6.5L) .....	6-2674
Accessory Installation (6.5L) .....	6-668
Accessory Removal (6.5L) .....	6-582
Accessory Switch Panel Replacement .....	8-889
Accessory Switch Replacement .....	8-554
Acid Rain .....	8-1224
Actuator	
Auxiliary Mode Replacement	
(A/C - Manual) .....	1-207
Auxiliary Temperature Replacement	
(A/C - Manual) .....	1-206
Mode Replacement (A/C - Manual) .....	1-188
Temperature Replacement (A/C - Manual) ....	1-189
Actuator Replacement	
Door Lock .....	8-1172
Adjustment	
Pitman Shaft Over-Center Preload -	
Power Steering .....	2-51
Worn Thrust Bearing Preload -	
Power Steering .....	2-49
Adjustments	
Backlash Adjustment	
Rear Drive Axle .....	4-142
Backlash Inspection and Adjustment	
Front .....	4-88
Locking Differential Adjustment	
Rear Drive Axle - Locking/Limited .....	4-174
Description .....	4-174
Park/Neutral Back Up Switch	
Automatic Transmission - 4L60-E .....	7-155
Automatic Transmission - 4L80-E .....	7-474
Pinion Depth Adjustment	
Rear Drive Axle .....	4-134
Shift Cable	
Automatic Transmission - 4L60-E .....	7-150
Automatic Transmission - 4L80-E .....	7-466
Wheel Bearing Adjustment	
Rear Drive Axle .....	4-157, 4-159
AIR	
Check Valve/Pipe Replacement	
Bank .....	6-3317
Air Cleaner	
Assembly Replacement (4.3L) .....	6-1592
Assembly Replacement (5.0L, 5.7L) .....	6-2323
Assembly Replacement (6.5L) .....	6-2740
Assembly Replacement (7.4L) .....	6-3324
Element Replacement (4.3L) .....	6-1590
Element Replacement (5.0L, 5.7L) .....	6-2322
Element Replacement (6.5L) .....	6-2738
Element Replacement (7.4L) .....	6-3323
Intake Duct Replacement (4.3L) .....	6-1596
Intake Duct Replacement (5.0L, 5.7L) .....	6-2328
Intake Duct Replacement (7.4L) .....	6-3326

Air Conditioning	
Diagnosis	
Compressor Control Circuit (4.3L) .....	6-1446
Compressor Control Circuit (5.0L, 5.7L) .....	6-2157
Compressor Control Circuit (7.4L) .....	6-3171
Request Circuit (6.5L) .....	6-2651
Air Distributor Duct Replacement (Non-A/C) .....	1-43
Air Inlet Assembly	
Replacement (Non-A/C) .....	1-40
Air Inlet Grille Panel Replacement .....	8-829
Air Outlet Duct Replacement	
Instrument Panel (Non-A/C) .....	1-45
Left Lap (Non-A/C) .....	1-46
Air Outlet Replacement	
Floor (Non-A/C) .....	1-43
Rear Floor (Non-A/C) .....	1-44
Air Wind/Noise	
Diagnosis	
Air Pressure Test .....	8-740
Air/Wind Noise	
Diagnosis	
Air/Wind Noise .....	8-740
Soap Suds or Bubble Test .....	8-741
Tracing Powder or Chalk Test .....	8-740
Alignment	
Checking Frame Alignment .....	8-1228
Alignment Checking	
Frame and Underbody .....	8-1228
Aluminum Wheel	
Porosity Repair .....	3-107
Refinishing .....	3-107
Amplifier Replacement .....	8-224
Antenna Extension Cable Replacement .....	8-228
Antenna Replacement	
Fixed .....	8-228
Antilock Brake System	
Bleed Procedure .....	5-249
BPMV Hydraulic Flow Chart .....	5-168
Brake Pressure Modulator Valve	
Replacement .....	5-251
Component Locations .....	5-176
Component Views .....	5-179
Connector End Views .....	5-181
Description	
Abbreviations and Definitions .....	5-263
ABS System .....	5-264
ABS System Operation .....	5-265
Basic Knowledge Required .....	5-264
General .....	5-263
Service Precautions .....	5-263
Diagnosis	
ABS Indicator Off No DTC Set .....	5-246
ABS Indicator On No DTC Set .....	5-248
Clearing Diagnostic Trouble Codes .....	5-184
Diagnostic System Check .....	5-185
Displaying Diagnostic Trouble Codes .....	5-184
DTC List .....	5-188
Intermittents and Poor Connections .....	5-184
Scan Tool Diagnostics .....	5-184
Self-Diagnostics .....	5-184
Electronic Brake Control Module	
Replacement .....	5-250

- Antilock Brake System (cont.)  
 Front Wheel Speed Sensor Bracket  
   Replacement ..... 5-262  
 GM SPO Group Numbers ..... 5-167  
 Schematic  
   ABS Schematic Icons ..... 5-172  
   ABS Schematic References ..... 5-172  
 Schematics ..... 5-173  
 Special Tools ..... 5-267  
 Specifications  
   Fastener Tightening ..... 5-167  
 Tube Adapter Replacement ..... 5-262  
 Wheel Speed Sensor  
   Replacement ..... 5-252, 5-254, 5-256  
 Anti-Theft Labeling ..... 0-16  
 Arm Blade Replacement ..... 8-189  
 Armrest Bracket Replacement  
   Door ..... 8-892  
 Armrest Replacement  
   Front Seat ..... 8-1046, 8-1047  
   Rear Seat ..... 8-1081  
 Arrows and Symbols, Description ..... 0-4  
 Ashtray Lamp Replacement ..... 8-150  
 Ashtray Replacement ..... 8-552  
   Doors ..... 8-892  
 Assist Handle Replacement ..... 8-1105, 8-1106,  
   8-1107, 8-1108  
 Audible Warnings  
   Diagnosis  
     Diagnostic System Check ..... 8-544  
     Fasten Safety Belt Chime Always On ..... 8-544  
     Fasten Safety Belt Chime Inoperative ..... 8-545  
     Key-In-Ignition Chime On  
       with LF Door Closed ..... 8-547  
     Key-In-Ignition Chime Inoperative ..... 8-546  
     Lights On Chime Inoperative ..... 8-549  
     Overspeed Chime Inoperative ..... 8-548  
 Auto Trans Shift Lock Control  
   Assemble (Tilt Column) ..... 2-205  
   Description ..... 2-144  
     Circuit (Standard Column) ..... 2-144  
     Circuit (Tilt Column) ..... 2-221  
   Diagnosis  
     System Check ..... 2-150  
     System Check (Standard Column) ..... 2-91  
     System Diagnosis ..... 2-93, 2-94  
   Disassemble (Tilt Column) Off-Vehicle ..... 2-205  
   Off-Vehicle Repair  
     Assemble (Standard Column) ..... 2-130  
   Schematics ..... 2-88  
 Auto Trans Shift Lock Control Schematics  
   Steering Wheel/Column - Tilt ..... 2-149  
 Automatic Transmission - 4L60-E  
   2-4 Servo ..... 7-166  
   Accumulator Assembly ..... 7-195  
   Component Location ..... 7-214  
   Component Location Table ..... 7-47  
   Control and Shift Solenoids Replacement ..... 7-180  
   Control Valve Assembly ..... 7-190  
 Automatic Transmission - 4L60-E (cont.)  
   Description  
     Diagnosis ..... 7-208  
     Electrical Connector Description ..... 7-213  
     Electronic Component ..... 7-209  
     Preliminary Checking Procedure ..... 7-207  
     Torque Converter Clutch  
       Electrical Controls ..... 7-212  
     Transmission ID Information ..... 7-206  
   Diagnosis  
     1st Gear Range Only - No Upshift ..... 7-138  
     2nd Gear Start ..... 7-144  
     2nd/3rd Gears Only or  
       1st/4th Gears Only ..... 7-140  
     3-2 Flare or Tie-Up ..... 7-140  
     Component Resistance ..... 7-134  
     Delay in Drive and Reverse ..... 7-144  
     Drives in Neutral ..... 7-144  
     Electrical/Garage Shift Procedure ..... 7-126  
     Electronic Component Malfunctions ..... 7-136  
     Fluid Leak ..... 7-145  
     Flywheel/Torque Converter  
       Vibration Test ..... 7-129  
     Functional Test Procedure ..... 7-42  
     Harsh Garage Shift ..... 7-142  
     Harsh Shifts ..... 7-138  
     Inaccurate Shift Points ..... 7-138  
     Line Pressure Check Procedure ..... 7-126  
     No 2-3 Shift or 2-3 Shift Slips,  
       Rough or Hunting ..... 7-140  
     No 3-4 Shift, Slips or Rough 3-4 Shift ..... 7-140  
     No Drive in All Ranges ..... 7-144  
     No Overrun Braking - Manual 3-2-1 ..... 7-142  
     No Park ..... 7-144  
     No Part Throttle or Delayed Downshifts ..... 7-141  
     No Reverse or Slips in Reverse ..... 7-141  
     No Torque Converter Clutch Apply ..... 7-142  
     No Torque Converter Clutch Release ..... 7-143  
     Noise and Vibration Analysis ..... 7-128  
     Oil Out the Vent ..... 7-144  
     Oil Pressure High or Low ..... 7-137  
     Ratcheting Noise ..... 7-144  
     Road Test Procedure ..... 7-127  
     Slipping or Rough 1-2 Shift ..... 7-139  
     Slips in 1st Gear ..... 7-139  
     Third Gear Only ..... 7-140  
     Torque Converter Clutch ..... 7-130  
     Torque Converter Clutch Shudder ..... 7-131, 7-143  
     Transmission Fluid Checking Procedure ..... 7-124  
     Transmission Fluid Pressure Valve  
       Position Switch Resistance Check ..... 7-134  
     Vibration in Reverse and  
       Whining Noise in Park ..... 7-144  
     Wiring Harness Check ..... 7-132  
   Electronic Component Views ..... 7-48  
   Extension Housing Rear Oil Seal ..... 7-194  
   Filler Tube Replacement ..... 7-171  
   Fluid/Filter Changing ..... 7-155

## Automatic Transmission - 4L60-E (cont.)

Flywheel to Torque Converter Bolts .....	7-174
In-Line Harness Connector End View .....	7-49
Internal Connector End Views .....	7-50
Oil Cooler Flushing .....	7-204
Oil Cooler Line Replacement .....	7-158
Oil Cooler Replacement .....	7-165
Park/Neutral Back Up Switch Adjustment .....	7-155
Park/Neutral Back Up Switch Replacement .....	7-154
Replacement .....	7-198
Schematic	
Controls Schematic Diagrams .....	7-44
Schematic Icon Table .....	7-43
Schematic Reference Table .....	7-43
Shift Cable Adjustment .....	7-150
Shift Cable Replacement .....	7-147
Special Tools .....	7-246
Specifications	

## Diagnostic Trouble Code (DTC)

Identification .....	7-37
Fastener Tightening .....	7-32
Fluid Capacity .....	7-39
Line Pressure .....	7-41
Range Reference Table .....	7-39
Scan Tool Data Definitions .....	7-34
Scan Tool Data Value Examples .....	7-33
Shift Solenoid Valve State and Gear Ratio .....	7-40
Shift Speed Table .....	7-40
Temperature vs Resistance .....	7-32
TFP Manual Valve Position Switch Logic ....	7-41

## Torque Converter Clutch PWM Solenoid,

TCC Solenoid, and Wiring Harness ...	7-185
Torque Converter Cover Replacement .....	7-173
Valve Body .....	7-176
Vehicle Speed Sensor Replacement .....	7-197

## Automatic Transmission - 4L80-E

Accumulator Housing Replacement .....	7-483
Component Location .....	7-516
Component Location Table .....	7-274
Control Valve Body Replacement .....	7-498
Description	

Abbreviations and Their Meanings .....	7-509
Adapt Function .....	7-512
Component and System .....	7-511
Electronic Component .....	7-512
General Description .....	7-511
General Service Information .....	7-509
Identification Information .....	7-511

## Diagnosis

Case Extension Bearing/Seal Failed .....	7-460
Clutch Plate .....	7-443
Component Fluid Leak Points .....	7-446
Converter Ballooning .....	7-458
Delayed Shift 1 to 2 .....	7-463
Difficult to Shift Out of Park .....	7-450
Does Not Stay in Park .....	7-450
Electronic Component Malfunctions .....	7-445
Engine Coolant in Transmission .....	7-443
Engine Stall .....	7-458
Engine Stall in Neutral .....	7-447

## Automatic Transmission - 4L80-E (cont.)

## Diagnosis (cont.)

Engine Starts in Gear .....	7-449
Erratic Shift Quality .....	7-459
First and Fourth Gear Only - D4 .....	7-454
First and Second Gear Only - D4 .....	7-454
First Gear Only - D4 .....	7-454
Fluid Foaming .....	7-458
Fluid Leak .....	7-464
Case Extension .....	7-464
Cooler Connector .....	7-464
Electrical Connector .....	7-464
Fill Tube .....	7-464
Line Pressure Plug .....	7-465
Manual Shaft .....	7-464
Oil Pan .....	7-463
Output Shaft Seal .....	7-465
Pump Body Seal .....	7-465
Vehicle Speed Sensor .....	7-465
Fluid Leak Diagnosis and Repair .....	7-444
Forward Motion in Neutral .....	7-447
Fourth Gear Starts .....	7-459
Functional Test Procedure .....	7-264
Harness Check .....	7-441
Harsh Shift 3 to 4 .....	7-461
Harsh Shift 4 to 3 .....	7-461
Harsh Shift D to R .....	7-461
Harsh Shift D4 to D3, D2, or D1 .....	7-462
Harsh Shifts .....	7-461
High Line Pressure .....	7-447
Inaccurate Shift Points .....	7-460
Inadequate Lubrication .....	7-447
Inadequate Lubrication at Low Line or Heavy Loads .....	7-447
Incorrect TCC Apply or Release .....	7-457
Line Pressure Check Procedure .....	7-435
Loss of Drive .....	7-449
Loss of Power .....	7-447
Low Line Pressure .....	7-448
No D2 to D1 .....	7-463
No D3 to D2 .....	7-463
No Engine Braking - D1 .....	7-452
No Engine Braking - D2 .....	7-452
No Engine Braking - D3 .....	7-453
No First Gear - D1 .....	7-451
No First Gear - D2 .....	7-452
No First Gear - D3 .....	7-453
No First Gear - D4 .....	7-454
No Fourth Gear - D4 .....	7-456
No Gear Selection .....	7-449
No Overrun Braking - D1 .....	7-451
No Overrun Braking - D2 .....	7-452
No Overrun Braking - D3 .....	7-453
No Park .....	7-450
No Reverse .....	7-451
No Second Gear - D1 .....	7-451
No Second Gear - D2 .....	7-452
No Second Gear - D3 .....	7-453
No Second Gear - D4 .....	7-455

## Automatic Transmission - 4L80-E (cont.)

## Diagnosis (cont.)

No Second Gear Engine Braking - D2 .....	7-453
No TCC Apply .....	7-456
No Third Gear - D3 .....	7-453
No Third Gear - D4 .....	7-455
No Torque in Reverse and Third .....	7-448
No Torque in Second Gear .....	7-459
No Torque Multiplication .....	7-458
Noise .....	7-458
Oil Cooler Flow Test .....	7-443
Oil Out the Vent Tube .....	7-459
Overheating .....	7-448
Overheating at WOT .....	7-448
Remains in Park .....	7-450
Road Test Procedure .....	7-436
Second and Third Gear Only - D4 .....	7-454
Second Gear Only - D4 .....	7-454
Second Gear Starts .....	7-459
Shift Lever Indicates Wrong Gear .....	7-449
Slipping TCC .....	7-457
Soft Shift 2 to 1 .....	7-462
Soft Shift 2 to 3 .....	7-462
Soft Shift 3 to 2 .....	7-462
Soft Shift D3 to D2 .....	7-463
Soft Shift into R .....	7-462
Soft Shift R to D .....	7-462
Soft Shifts .....	7-462
Soft TCC Apply .....	7-457
TCC Stuck On .....	7-457
Third and Fourth Gear Only - D4 .....	7-455
Third Gear Starts .....	7-459
Torque Converter Clutch .....	7-438
Torque Converter Clutch Shudder .....	7-439
Torque Converter Evaluation .....	7-438
Torque Converter Vibration Test .....	7-439
Transmission Fluid Checking Procedure ....	7-434
Transmission Fluid Temperature Valve Position Switch Resistance Check .....	7-440
Transmission Seized .....	7-460
Transmission Slips .....	7-460
Vibration .....	7-458
Electronic Component Views .....	7-275
Filler Tube and Seal Replacement .....	7-476
Fluid/Filter Changing .....	7-475
Forward Servo Replacement .....	7-485
Heat Shield Replacement .....	7-496
Internal Connector End Views .....	7-276
Oil Cooler Flushing .....	7-508
Oil Cooler Line Replacement .....	7-486
Park Lock Pawl and Actuator Replacement ....	7-480
Park/Neutral Back Up Switch Adjustment ....	7-474
Park/Neutral Back Up Switch Replacement ....	7-473
Pressure Regulator Replacement .....	7-481
Replacement .....	7-501
Reverse Servo Replacement .....	7-484
Schematic	
Icon Table .....	7-265
Reference Table .....	7-265
Schematic Locations .....	7-266, 7-269

## Automatic Transmission - 4L80-E (cont.)

Shift Cable Adjustment .....	7-466
Shift Cable Replacement .....	7-469
Special Tools .....	7-547
Specifications	
Component Resistance .....	7-263
Specifications	
Diagnostic Trouble Code (DTC)	
Identification .....	7-255, 7-258
Fastener Tightening .....	7-249, 7-250
Fluid Capacity .....	7-261
General .....	7-262
Line Pressure .....	7-263
Range Reference .....	7-261
Range Signal .....	7-262
Shift Solenoid Valve State and Gear Ratio .....	7-261
Shift Speed .....	7-262
Tech 2 Data Value Examples .....	7-250, 7-252
Temperature vs Resistance .....	7-249
Transmission Scan Tool Data Definitions ....	7-253
Torque Converter Clutch Valve and Spring Replacement .....	7-482
Transmission Oil Cooler Replacement .....	7-496
Vehicle Speed Sensor Replacement .....	7-479
Vent Hose Replacement .....	7-497
Automatic Transmission - 4L60-E	
Description	
Fluid Checking Procedure .....	7-208
Diagnosis	
Front Oil Leak .....	7-144
No Drive in Drive Range .....	7-144
General Information .....	7-207
Axle Identification - Front .....	0-14
Axle Identification - Rear .....	0-15
Axle Replacement	
Rear Drive Axle .....	4-146, 4-147, 4-149
Axle Replacement, Front .....	3-80
Axle Tube Assembly	
Front Drive Axle .....	4-91

**B**

## Balance Shaft

Bearing and/or Bushing Installation (4.3L) ....	6-194
Bearing and/or Bushing Removal (4.3L) .....	6-193
Bearing and/or Bushing Replacement (4.3L) ...	6-107
Clean and Inspect (4.3L) .....	6-193
Installation (4.3L) .....	6-234
Removal (4.3L) .....	6-158
Replacement (4.3L) .....	6-105
Balancing Tires and Wheels .....	0-104
Ball Joint Replacement,	
Lower Front Suspension .....	3-47, 3-49
Ball Joint Replacement,	
Upper Front Suspension .....	3-43, 3-45
Ball Joint Wear Check,	
Front Suspension .....	3-36
Basecoat/Clearcoat Paint Systems .....	8-1220
Basic Steps Before Cleaning .....	8-1131

- Battery
  - Battery Charge Low
    - or Completely Discharged ..... 6-1013
  - Cable ..... 6-1015
  - Charging ..... 6-1012
  - Description ..... 6-1045
  - Hydrometer Displays Dark or Yellow Dot ..... 6-984
  - Jump Starting in Case of Emergency ..... 6-1013
  - Load Test ..... 6-985
  - Load Test - Parasitic ..... 6-985
  - Replacement ..... 6-1015
  - Tray and Hold-Down Retainer
    - Description ..... 6-1044
  - Tray Replacement ..... 6-1016, 6-1018
- Battery Temperature vs Minimum Voltage ..... 6-964
- Battery Usage Specifications ..... 6-963
- Bezel Replacement
  - IP Cluster ..... 8-550
- Blade Element Cleaning ..... 8-194
- Blade Element Replacement
  - Rear ..... 8-197
- Blower
  - Diagnosis
    - High Speed Inoperative -
      - Auxiliary (A/C - Manual) ..... 1-121
    - High Speed Inoperative (A/C - Manual) .... 1-116
    - Inoperative at Any Speed -
      - Auxiliary (A/C - Manual) ..... 1-118
    - Inoperative at Any Speed
      - (A/C - Manual) ..... 1-113
    - Inoperative Med-1 (A/C - Manual) ..... 1-114
    - Inoperative Med-2 (A/C - Manual) ..... 1-115
    - Low Speed Inoperative -
      - Auxiliary (A/C - Manual) ..... 1-119
    - Low Speed Inoperative (A/C - Manual) .... 1-114
    - Medium Speed Inoperative -
      - Auxiliary (A/C - Manual) ..... 1-120
    - Operates at High Speed Only -
      - Auxiliary (A/C - Manual) ..... 1-122
    - Operates at High Speed Only
      - (A/C - Manual) ..... 1-116
    - Operates Continuously -
      - Auxiliary (A/C - Manual) ..... 1-122
    - Operates Continuously (A/C - Manual) ..... 1-117
  - Motor and Fan Assembly Replacement
    - (A/C - Manual) ..... 1-180
  - Motor and Fan Replacement -
    - Auxiliary (A/C - Manual) ..... 1-203, 1-204
  - Resistor Replacement -
    - Auxiliary (A/C - Manual) ..... 1-202
  - Resistor Replacement (A/C - Manual) ..... 1-180
  - Switch Replacement (A/C - Manual) ..... 1-187
- Blower Motor
  - Description
    - Controls Circuit (A/C - Manual) ..... 1-216
- Blower Motor (cont.)
  - Diagnosis
    - Blower Motor Does Not Operate
      - at Any Speed (Non-A/C) ..... 1-21
    - Blower Motor Does Not Operate
      - at High Speed (Non-A/C) ..... 1-23
    - Blower Motor Does Not Operate
      - at Low Speed Only (Non-A/C) ..... 1-25
    - Blower Motor Operates
      - at High Speed Only - Auxiliary ..... 1-28
    - Blower Motor Operates
      - at High Speed Only (Non-A/C) ..... 1-28
    - Blower Motor Operates
      - Continuously (Non-A/C) ..... 1-29
    - Med-1 Inoperative ..... 1-27
    - Med-2 Inoperative ..... 1-27
    - Noise ..... 1-115
    - Motor and Fan Replacement (Non-A/C) ..... 1-41
    - Relay Replacement (A/C - Manual) ..... 1-179
    - Replacement - Auxiliary (Non-A/C) ..... 1-66
    - Resistor Replacement - Auxiliary (Non-A/C) ... 1-69
    - Resistor Replacement (Non-A/C) ..... 1-41
  - Blower Motor - Auxiliary
    - Diagnosis
      - Blower Motor High Speed
        - Inoperative (Non-A/C) ..... 1-24
      - Blower Motor Inoperative
        - at Any Speed (Non-A/C) ..... 1-22
      - Blower Motor Low Speed
        - Inoperative (Non-A/C) ..... 1-26
      - Blower Motor Medium Speed
        - Inoperative (Non-A/C) ..... 1-25
      - Blower Motor Operates
        - Continuously (Non-A/C) ..... 1-30
  - Blower Switch Replacement (Non-A/C) ..... 1-38
  - Body Front End
    - Special Tools ..... 8-836
    - Specifications
      - Fastener Tightening ..... 8-809
      - GM SPO Group Numbers ..... 8-809
  - Body Rear End
    - Component Views ..... 8-1137
    - Components ..... 8-1136
    - Connector End Views ..... 8-1140
    - Description
      - Liftgate Window Release Circuit ..... 8-1190
    - Schematic
      - Schematic References ..... 8-1134
    - Specifications
      - Fastener Tightening ..... 8-1133
      - GM SPO Group Numbers ..... 8-1133
  - Body Side
    - Front Door Body Side Molding
      - Replacement ..... 8-722
    - Rear Door Body Side Molding
      - Replacement ..... 8-724
  - Boost Sensor Replacement (6.5L) ..... 6-2735
  - Brake Adjustment, Drum ..... 5-145

Brake Backing Plate Replacement ..... 5-138, 5-139  
 Brake Booster  
   Hose Replacement ..... 5-77  
 Brake Booster Push Rod Gauging Procedure ..... 5-88  
 Brake Booster Replacement, Hydraulic .... 5-78, 5-80, 5-83, 5-85  
 Brake Caliper  
   Inspection ..... 5-115  
   Overhaul ..... 5-115, 5-118  
   Replacement ..... 5-106, 5-109, 5-110  
 Brake Caliper and Anchor Plate  
   Wear Adjustment ..... 5-113  
 Brake Combination Valve Description ..... 5-90  
 Brake Combination Valve Replacement ..... 5-68  
 Brake Drum  
   Inspection ..... 5-129  
   Replacement ..... 5-128  
 Brake Lining Replacement,  
   Drum Brakes ..... 5-130, 5-134  
 Brake Pad Inspection ..... 5-97  
 Brake Pads Replacement ..... 5-98, 5-100, 5-103  
 Brake Pedal Replacement ..... 5-66  
 Brake Pedal Travel  
   Hydraulic Brakes ..... 5-22  
 Brake Rotor  
   Refinishing ..... 5-124  
 Brake Rotor Replacement ..... 5-121  
 Brake Shoe Inspection, Drum Brakes ..... 5-129  
 Brake System Diagnosis  
   Hydraulic Brakes ..... 5-16  
 Brake System Testing  
   Hydraulic Brakes ..... 5-14  
 Brake Vacuum Booster  
   Diagnosis ..... 5-52  
 Brake Vacuum Brake Booster  
   Description ..... 5-91  
 Brake Warning System  
   Schematics ..... 5-7  
 Brakes Drag ..... 5-39  
 Bumper Replacement  
   Rear Door ..... 8-1173  
 Bumpers  
   Air Deflector Replacement  
     Front Fascia ..... 8-801  
   Fascia Replacement  
     Front ..... 8-802  
   Filler Replacement  
     Front Center ..... 8-805  
     Front Side ..... 8-805  
   License Bracket Replacement  
     Front ..... 8-801  
   Replacement  
     Front ..... 8-803  
     Rear ..... 8-807  
   Specifications  
     Fastener Tightening ..... 8-800  
     GM SPO Group Numbers ..... 8-800  
   Step Pad Replacement  
     Rear ..... 8-806  
 Bushing Replacement  
   Spring  
     Rear Suspension ..... 3-94

## C

Cable Replacement  
   Accelerator Controls (4.3L) ..... 6-1498  
   Accelerator Controls (5.0L, 5.7L) ..... 6-2220  
   Accelerator Controls (7.4L) ..... 6-3230  
   Hood Latch Release ..... 8-817  
 Cage Nut Service, Damaged ..... 8-1252  
 Camshaft  
   Bearing Installation (4.3L) ..... 6-190  
   Bearing Installation (5.0L, 5.7L) ..... 6-408  
   Bearing Installation (6.5L) ..... 6-625  
   Bearing Installation (7.4L) ..... 6-817  
   Bearing Removal (4.3L) ..... 6-189  
   Bearing Removal (5.0L, 5.7L) ..... 6-407  
   Bearing Removal (6.5L) ..... 6-624  
   Bearing Removal (7.4L) ..... 6-814  
   Camshaft and Bearings Clean  
     and Inspect (4.3L) ..... 6-187  
   Camshaft and Bearings Clean  
     and Inspect (5.0L, 5.7L) ..... 6-405  
   Camshaft and Bearings Clean  
     and Inspect (6.5L) ..... 6-625  
   Camshaft and Bearings Clean  
     and Inspect (7.4L) ..... 6-816  
   Installation (4.3L) ..... 6-234  
   Installation (5.0L, 5.7L) ..... 6-449  
   Installation (6.5L) ..... 6-648  
   Installation (7.4L) ..... 6-857  
   Removal (4.3L) ..... 6-159  
   Removal (5.0L, 5.7L) ..... 6-375  
   Removal (6.5L) ..... 6-605  
   Removal (7.4L) ..... 6-782  
   Replacement (4.3L) ..... 6-109  
   Replacement (5.0L, 5.7L) ..... 6-336  
   Replacement (6.5L) ..... 6-560  
   Replacement (7.4L) ..... 6-742  
 Camshaft Position Sensor  
   Replacement (4.3L) ..... 6-1576  
 Camshaft Position Sensor  
   Replacement (5.0L, 5.7L) ..... 6-2309  
 Camshaft Position Sensor  
   Replacement (7.4L) ..... 6-3308  
 Camshaft Retard Offset  
   Adjustment (5.0L, 5.7L) ..... 6-2234  
 Camshaft Retard Offset Adjustment (7.4L) ..... 6-3237  
 Cargo Door Lock Rod and Outside  
   Handle Replacement ..... 8-1163  
 Cargo Lamp Replacement ..... 8-161  
 Cargo Lamp Switch Replacement ..... 8-162  
 Carpet Replacement  
   Front ..... 8-1094, 8-1095, 8-1098  
   Rear Panel ..... 8-1119  
 Cassette Player Care and Cleaning ..... 8-225  
 Catalytic Converter Replacement .... 6-3385, 6-3387, 6-3389, 6-3391  
 CD Changer Replacement  
   Remote ..... 8-227  
 CD Player Replacement  
   Remote ..... 8-226  
 CDR Valve and Hoses Replacement (6.5L) ..... 6-2737  
 Center Pillar Garnish Molding  
   Replacement ..... 8-1111, 8-1112, 8-1113

- Charge Indicator
  - Always On ..... 6-987
  - Inoperative ..... 6-988
- Charging System
  - Circuit Description ..... 6-1050
- Charging System Check ..... 6-978
- Charging System Description ..... 6-1048
- Cigar Lighter/Auxiliary Outlets
  - System Check ..... 8-358
- Cleaning
  - Basic Steps Before Cleaning ..... 8-1131
  - Fabric Trim ..... 8-1131
  - Glass Surfaces ..... 8-1132
  - Removal of Specific Stains ..... 8-1132
- Cleaning Agents ..... 8-1131
- Cleaning Fabric Trim
  - Spot ..... 8-1131
- Cleaning Vinyl Trim ..... 8-1131
- Clearance Lamp Replacement ..... 8-143
- Clearcoat Repair without Repainting ..... 8-1223
- Clearcoat Thickness ..... 8-1225
- Clutch
  - Assembly Replacement ..... 7-561
  - Concentric Slave Cylinder ..... 7-563
  - Description
    - Clutch Driven Members ..... 7-565
    - Clutch Driving Members ..... 7-565
    - Clutch Operating Members ..... 7-565
  - Diagnosis
    - Actuator Fluid Leaks ..... 7-555
    - Does Not Disengage ..... 7-550
    - Grabbing (Chattering) ..... 7-552
    - Master Cylinder Fluid Leaks ..... 7-555
    - Noisy ..... 7-553
    - Pedal Hard to Push ..... 7-554
    - Pedal Spongy ..... 7-556
    - Pedal Stays on Floor
      - (Clutch Disengaged) ..... 7-553
    - Pedal Sticks or Binds ..... 7-556
    - Pedal Travels to Floor
      - (Fluid in Master Cylinder) ..... 7-555
    - Preliminary Checking Procedure ..... 7-550
    - Rattle (Trans Click) ..... 7-553
    - Release Bearing Noisy
      - w/ Clutch Engaged ..... 7-553
    - Slipping ..... 7-551
    - Spin Down Time ..... 7-550
    - Unable to Select Gears ..... 7-556
  - Hydraulic Clutch Bleeding ..... 7-560
  - Master Cylinder Replacement ..... 7-558
  - Pedal Replacement ..... 7-557
  - Special Tools ..... 7-566
  - Specifications
    - Fastener Tightening ..... 7-550
    - Start Switch Replacement ..... 7-561
- Coat Hook Replacement ..... 8-1108
- Coding Keys and Lock Cylinders ..... 0-32
- Coil Springs Replacement, Front ..... 3-62
- Colors
  - Exterior and Interior ..... 0-21
- Compact Disc Care and Cleaning ..... 8-227
- Compressor
  - Clutch Coil Removal (A/C - Manual) ..... 1-149
  - Clutch Plate and Hub Assembly
    - Removal (A/C - Manual) ..... 1-147
  - Clutch Plate/Hub Assembly Install
    - (A/C - Manual) ..... 1-153
  - Clutch Rotor and/or Bearing Install
    - (A/C - Manual) ..... 1-154
  - Clutch Rotor and/or Bearing
    - Removal (A/C - Manual) ..... 1-147
  - Compressor Clutch Coil Install
    - (A/C - Manual) ..... 1-156
  - Control Switches Install (A/C - Manual) ..... 1-161
  - Control Switches Removal (A/C - Manual) ... 1-152
  - Hose Assembly Replacement
    - (A/C - Manual) ..... 1-166, 1-167
  - Leak Testing (A/C - Manual) ..... 1-161
  - Oil Level Check (A/C - Manual) ..... 1-143
  - Pressure Relief Valve Install
    - (A/C - Manual) ..... 1-160
  - Pressure Relief Valve Removal
    - (A/C - Manual) ..... 1-152
  - Pressure Relief Valve Replacement
    - (A/C - Manual) ..... 1-163, 1-164
  - Replacement (A/C - Manual) ..... 1-144, 1-145, 1-146
  - Sealing Washers Replacement
    - (A/C - Manual) ..... 1-164
  - Shaft Seal Install (A/C - Manual) ..... 1-158
  - Shaft Seal Removal (A/C - Manual) ..... 1-150
- Condenser Replacement (A/C - Manual) ..... 1-176
- Console
  - Cup Holder Replacement
    - Front Floor ..... 8-560
  - Replacement
    - Front Floor ..... 8-559
  - Storage Bin Replacement ..... 8-558
- Console Lamp Replacement ..... 8-148
- Control Arm Replacement, Lower ..... 3-58, 3-59
- Control Arm Replacement, Upper ..... 3-55, 3-56
- Control Assembly
  - Replacement (A/C - Manual) ..... 1-186
  - Replacement (Non-A/C) ..... 1-37
- Conversion Table
  - English/Metric ..... 0-3
- Coolant
  - Heater Description ..... 6-959
  - Recovery Reservoir Replacement
    - (Engine Cooling) ..... 6-916
  - Recovery System Description ..... 6-959
- Coolant Heater
  - Cord Replacement (Engine Cooling) ..... 6-956
- Coolant Heater Replacement
  - (Engine Cooling) ..... 6-954
- Coolant Level Module
  - Replacement (Engine Cooling) ..... 6-914

- Cooling Fan and Motor Replacement
  - (Engine Cooling) - Auxiliary ..... 6-930
- Cooling Fan Relay Replacement
  - (Engine Cooling) - Auxiliary ..... 6-931
- Cooling Fan - Engine
  - Auxiliary is Inoperative ..... 6-902
  - Auxiliary Runs Continuously ..... 6-903
- Cooling System Draining and Filling ..... 6-913
- Courtesy Lamp/Reflector Replacement
  - Door ..... 8-149
- Cover Replacement
  - Rear Door Access Hole ..... 8-1162
- Crankshaft
  - Balancer Clean and Inspect (4.3L) ..... 6-185
  - Balancer Clean and Inspect (5.0L, 5.7L) ..... 6-403
  - Balancer Clean and Inspect (6.5L) ..... 6-617
  - Balancer Clean and Inspect (7.4L) ..... 6-805
  - Balancer Installation (4.3L) ..... 6-249
  - Balancer Installation (5.0L, 5.7L) ..... 6-465
  - Balancer Installation (6.5L) ..... 6-654
  - Balancer Installation (7.4L) ..... 6-877
  - Balancer Removal (4.3L) ..... 6-146
  - Balancer Removal (5.0L, 5.7L) ..... 6-361
  - Balancer Removal (6.5L) ..... 6-599
  - Balancer Removal (7.4L) ..... 6-765
  - Balancer Replacement (4.3L) ..... 6-98
  - Balancer Replacement (5.0L, 5.7L) ..... 6-330
  - Balancer Replacement (6.5L) ..... 6-549
  - Balancer Replacement (7.4L) ..... 6-733
  - Crankshaft and Bearings Clean and Inspect (4.3L) ..... 6-176
  - Crankshaft and Bearings Clean and Inspect (5.0L, 5.7L) ..... 6-393
  - Crankshaft and Bearings Clean and Inspect (6.5L) ..... 6-615
  - Crankshaft and Bearings Clean and Inspect (7.4L) ..... 6-795
  - Crankshaft and Bearings Installation (4.3L) ..... 6-228
  - Crankshaft and Bearings Installation (5.0L, 5.7L) ..... 6-443
  - Crankshaft and Bearings Installation (6.5L) ..... 6-641
  - Crankshaft and Bearings Installation (7.4L) ..... 6-851
  - Crankshaft and Bearings Removal (4.3L) ..... 6-162
  - Crankshaft and Bearings Removal (5.0L, 5.7L) ..... 6-378
  - Crankshaft and Bearings Removal (6.5L) ..... 6-609
  - Crankshaft and Bearings Removal (7.4L) ..... 6-785
  - Crankshaft Rear Oil Seal and Housing Installation (4.3L) ..... 6-230
  - Front Cover Oil Seal Replacement (4.3L) ..... 6-99
  - Front Cover Oil Seal Replacement (5.0L, 5.7L) ..... 6-331
  - Front Cover Oil Seal Replacement (7.4L) ..... 6-736
  - Front Oil Seal Replacement (6.5L) ..... 6-551
  - Position Reluctor Ring Replacement (4.3L) ..... 6-101
- Crankshaft (cont.)
  - Position Reluctor Ring Replacement (5.0L, 5.7L) ..... 6-334
  - Position Reluctor Ring Replacement (7.4L) ..... 6-738
  - Rear Oil Seal and Housing Installation (5.0L, 5.7L) ..... 6-445
  - Rear Oil Seal and Housing Removal (4.3L) ..... 6-161
  - Rear Oil Seal and Housing Removal (5.0L, 5.7L) ..... 6-377
  - Rear Oil Seal and Housing Replacement (4.3L) ..... 6-121, 6-123
  - Rear Oil Seal and Housing Replacement (5.0L, 5.7L) ..... 6-346, 6-348
  - Rear Oil Seal Installation (6.5L) ..... 6-644
  - Rear Oil Seal Removal (6.5L) ..... 6-609
  - Rear Oil Seal Removal (7.4L) ..... 6-785
  - Rear Oil Seal Replacement (6.5L) ..... 6-563
  - Rear Oil Seal Replacement (7.4L) ..... 6-750
  - Crankshaft Position Sensor Replacement (4.3L) ..... 6-1574
  - Crankshaft Position Sensor Replacement (5.0L, 5.7L) ..... 6-2307
  - Crankshaft Position Sensor Replacement (6.5L) ..... 6-2724
  - Crankshaft Position Sensor Replacement (7.4L) ..... 6-3306
  - Crankshaft Position System Variation Learn Procedure (4.3L) ..... 6-1484
  - Crankshaft Position System Variation Learn Procedure (5.0L, 5.7L) ..... 6-2204
  - Crankshaft Position System Variation Learn Procedure (7.4L) ..... 6-3219
  - Crankshaft Rear Oil Seal Installation (7.4L) ..... 6-855
- Cruise Control
  - Cable Adjustment ..... 8-702
  - Cable Replacement ..... 8-695, 8-698
  - Component Locations ..... 8-681
  - Component Views ..... 8-682
  - Connector End Views ..... 8-683
  - Description
    - System Circuit ..... 8-704
    - System Description ..... 8-703
  - Diagnosis
    - Does Not Disengage with Brake Pedal ..... 8-693
    - Does Not Resume, Accel, or Tap Up ..... 8-692
    - Inoperative ..... 8-685, 8-689
    - System Check ..... 8-684
  - Module Replacement ..... 8-694
  - Schematic
    - Icons ..... 8-677
    - References ..... 8-677
    - Schematics ..... 8-678, 8-680
  - Specifications
    - Fastener Tightening ..... 8-677
    - GM SPO Group Numbers ..... 8-677
- Cup Holder Replacement
  - Front Floor Console ..... 8-560
- Cupholder Replacement ..... 8-553
- Cylinder Boring and Honing (4.3L) ..... 6-167
- Cylinder Boring and Honing (5.0L, 5.7L) ..... 6-384
- Cylinder Boring and Honing (6.5L) ..... 6-613



Cylinder Boring and Honing (7.4L) .....	6-793
Cylinder Head	
Assemble (4.3L) .....	6-204
Assemble (5.0L, 5.7L) .....	6-420
Assemble (6.5L) .....	6-632
Assemble (7.4L) .....	6-828
Clean and Inspect (4.3L) .....	6-199
Clean and Inspect (5.0L, 5.7L) .....	6-414
Clean and Inspect (6.5L) .....	6-629
Clean and Inspect (7.4L) .....	6-823
Disassemble (4.3L) .....	6-198
Disassemble (5.0L, 5.7L) .....	6-414
Disassemble (6.5L) .....	6-628
Disassemble (7.4L) .....	6-822
Installation (4.3L) .....	6-244
Installation (5.0L, 5.7L) .....	6-457, 6-459
Installation (6.5L) .....	6-650
Installation (7.4L) .....	6-864, 6-865
Removal (4.3L) .....	6-151
Removal (5.0L, 5.7L) .....	6-365, 6-367
Removal (6.5L) .....	6-603
Removal (7.4L) .....	6-774, 6-776
Replacement (4.3L) .....	6-93, 6-96
Replacement (5.0L, 5.7L) .....	6-326
Replacement (6.5L) .....	6-540
Replacement (7.4L) .....	6-730

## D

Data Link Communications	
Circuit Description .....	8-385
Daytime Running Lamps	
Control Module Replacement .....	8-146
Relay Replacement .....	8-146
Decal and Stripe Replacement .....	8-732
Decimal and Metric Equivalents .....	0-3
Definition of Caution, Notice and Important .....	3
Defroster	
Diagnosis	
Defrosting Insufficient (A/C - Manual) .....	1-137
Defrosting Insufficient .....	1-31
Description of Arrows and Symbols .....	0-4
Diagnosis	
Excessive Road Shock .....	3-11
Front Wheel Shimmy .....	3-12
Low or Uneven Trim Height .....	3-17
Noise - Front Suspension .....	3-10
Poor Directional Stability .....	3-9
Stop Lamp Always On	
Center High Mounted .....	8-123
Suspension General .....	3-3
Tire Hop or Poor Handling .....	3-10
Tire Wear, Abnormal or Excessive .....	3-4, 3-5
Vehicle Leads/Pulls .....	3-3
Wheel Bearings .....	3-13
Diagnostic Work Sheets .....	0-5
Disc Brakes	
Brake Caliper	
Inspection .....	5-115
Overhaul .....	5-115, 5-118
Brake Caliper and Anchor Plate	
Wear Adjustment .....	5-113

Disc Brakes (cont.)	
Brake Rotor Replacement .....	5-121
Burnishing Pads and Rotors .....	5-106
Description .....	5-125
Diagnosis	
Brake Rotor Lateral Runout Check .....	5-96
Brake Rotor Thickness Variation Check .....	5-96
Brake Rotor Tolerance .....	5-97
Refinishing Brake Rotors .....	5-124
Special Tools .....	5-126
Specifications	
Caliper Wear Shim .....	5-95
Component .....	5-95
Fastener Tightening .....	5-95
GM SPO Group Numbers .....	5-95
Distributor	
Inspection .....	6-1040
Installation (4.3L) .....	6-250
Installation (5.0L, 5.7L) .....	6-467
Installation (7.4L) .....	6-872
Overhaul .....	6-1034
Removal (4.3L) .....	6-149
Removal (5.0L, 5.7L) .....	6-363
Removal (7.4L) .....	6-768
Replacement .....	6-1027, 6-1032
Dome Lamp Replacement .....	8-152, 8-153
Door Access Hole Cover Replacement	
Rear .....	8-1162
Door Adjustment	
Rear .....	8-1156
Door Bumper Replacement	
Rear .....	8-1173
Door Check Link Replacement	
Rear .....	8-1161
Door Hinge Replacement .....	8-1158
Door Jamb Switch Replacement .....	8-154
Door Latch Control Handle Replacement	
Left Rear .....	8-1164
Door Latch Replacement .....	8-1168, 8-1170
Door Lock Actuator Replacement .....	8-1172
Door Lock Replacement	
Rear .....	8-1171
Door Lock Switch Replacement .....	8-891
Auxiliary .....	8-1118
Door Locks	
Diagnosis	
One Door Locks Inoperative .....	8-884
One Motor .....	8-884
Power Door Lock Switch Inoperative .....	8-879
One .....	8-879
Power Door Locks .....	8-879
Inoperative .....	8-879, 8-881
Power Door Locks Switch Inoperative .....	8-883
Rear .....	8-883
Door Protector Replacement	
Rear .....	8-1154
Door Replacement	
Rear .....	8-1155
Door Sill Plate Replacement .....	8-1093
Door Striker Replacement	
Body Mounted Rear .....	8-1177
Left Rear .....	8-1176

Door Trim Panel Replacement	
Rear .....	8-1144
Door Upper Garnish Molding Replacement	
Rear .....	8-1114
Door Weatherstrip Replacement	
Rear .....	8-1189
Door Wiring Harness Replacement .....	8-1178
Doors	
Armrest Bracket Replacement .....	8-892
Ashtray Replacement .....	8-892
Description	
Door Description .....	8-954
Door Outside Rearview Mirrors .....	8-956
Heated Mirror Circuit .....	8-957
Power Door Locks Circuit .....	8-956
Power Door Locks Operation .....	8-956
Power Mirrors Circuit .....	8-956
Power Windows Circuit .....	8-955
Power Windows Operation .....	8-954
Diagnosis	
Automatic Door Lock .....	8-871
Inoperative - Power Locks Operate .....	8-871
Outside Mirrors System Check .....	8-871
Power Door Locks System Check .....	8-870
Power Windows System Check .....	8-870
Door Adjustment .....	8-900
Door Check Link Replacement .....	8-915
Door Handle Bezel Replacement .....	8-893, 8-894
Door Handle Bracket Replacement	
Inside .....	8-918
Door Handle Replacement	
Front Door Outside .....	8-915
Inside .....	8-918
Rear Inside .....	8-919
Rear Outside .....	8-917
Door Hardware Lubrication .....	8-930
Door Hinge Replacement .....	8-907, 8-908
Front .....	8-910
Door Module Replacement	
Front .....	8-931
Door Replacement .....	8-901
Front .....	8-902
Rear .....	8-905
Hinge Replacement	
Rear Door .....	8-912
Latch Replacement .....	8-924, 8-925, 8-927, 8-928
Lock Cylinder Replacement .....	8-922
Lock Cylinders	
Binding .....	8-923
Lock Replacement	
Front Door .....	8-920
Rear Door .....	8-922
Mirror Face Replacement .....	8-952
Mirror Replacement	
Manual .....	8-951
Mirrors Replacement .....	8-950
Power Door Systems Component Views .....	8-853
Power Door Systems Components .....	8-849

Doors (cont.)	
Power Door Systems	
Connector End Views .....	8-860
Power Window Switch Replacement	
Rear Door .....	8-890
Pressure Relief Valve Replacement .....	8-953
Schematic	
Door Locks .....	8-842
Outside Mirrors .....	8-846
Power Door Systems Schematic Icons .....	8-838
Power Door Systems Schematic	
References .....	8-838
Power Windows .....	8-839
Sealing Strip Replacement	
Front Door Window Belt Outer .....	8-946
Outer Belt .....	8-945
Side Front Door Bottom Auxiliary .....	8-947
Special Tools .....	8-957
Specifications	
Fastener Tightening .....	8-837
GM SPO Group Numbers .....	8-837
Striker Replacement .....	8-929, 8-930
Trim Panel Replacement	
Map Pocket .....	8-894
Side Front Door .....	8-896
Side Rear Door .....	8-898
Upper Extension .....	8-895
Water Deflector Replacement	
Front Door .....	8-899
Rear Door .....	8-900
Weatherstrip Replacement	
Door .....	8-947
Front Door Window .....	8-948
Rear Door Window .....	8-949
Side Door Opening .....	8-949
Window Regulator Handle	
Replacement .....	8-938, 8-939
Window Regulator Replacement	
Front Door .....	8-936
Rear Door .....	8-937
Window Replacement	
Front Door .....	8-940
Rear Door .....	8-942
Window Run Channel	
Replacement .....	8-944, 8-945
Wiring Harness	
Replacement .....	8-932, 8-933, 8-935
Drain Cock	
Replacement (Engine Cooling) .....	6-944
Draining and Filling Cooling System	
(Engine Cooling) .....	6-913
Draining Fluids and Oil Filter	
Removal (4.3L) .....	6-142
Draining Fluids and Oil Filter	
Removal (5.0L, 5.7L) .....	6-357
Draining Fluids and Oil Filter	
Removal (7.4L) .....	6-757

Drive Belt		DTC C0237	5-217, 5-219
Diagnosis (7.4L)	6-692	DTC C0238	5-222, 5-224
Idle Pulley Replacement (4.3L)	6-53, 6-54	DTC C0241-C0254	5-226
Idle Pulley Replacement (5.0L, 5.7L)	6-301	DTC C0265/C0266	5-229
Idle Pulley Replacement (6.5L)	6-513	DTC C0267 or C0268	5-232
Idle Pulley Replacement (7.4L)	6-705	DTC C0269/C0274	5-235
Replacement (4.3L)	6-50	DTC C0271-C0273	5-238
Replacement (5.0L, 5.7L)	6-299	DTC C0281	5-240
Replacement (6.5L)	6-510	DTC C0286	5-242
Replacement (7.4L)	6-703	DTC C0288	5-244
Tensioner Diagnosis (7.4L)	6-696	DTC C0300	4-266
Tensioner Replacement (4.3L)	6-53	DTC C0305	4-269
Tensioner Replacement (5.0L, 5.7L)	6-300	DTC C0308	4-272
Tensioner Replacement (6.5L)	6-512	DTC C0309	4-274
Tensioner Replacement (7.4L)	6-704	DTC C0310	4-276
Drive Tension Specifications	0-39	DTC C0315	4-278
Drum Brake Adjustment	5-145	DTC C0323	4-280
Drum Brakes		DTC C0324	4-282
Specifications		DTC C0327	4-284
Component	5-127	DTC C0357	4-287
Fastener Tightening	5-127	DTC C0362	4-289
GM SPO Group Numbers	5-127	DTC C0367	4-291
System Description	5-145	DTC C0374	4-293
Disc Brakes		DTC C0376	4-294
Brake Caliper		DTC C0472	2-232
Replacement	5-106, 5-109, 5-110	DTC C0473	2-235
DTC B0688	8-631	DTC C0495	2-238
DTC B0768	4-261	DTC C0498	2-241
DTC B1015	9-70	DTC C0499	2-243
DTC B1016	9-74	DTC C0503	2-245
DTC B1017	9-78	DTC C0504	2-247
DTC B1018	9-82	DTC C0550	4-296
DTC B1019	9-85	DTC C0559	8-656, 8-249
DTC B1021	9-88	DTC C0611	4-297
DTC B1022	9-92	DTC C0895	4-298
DTC B1024	9-96	DTC P0101	6-2439
DTC B1025	9-99	DTC P0101	6-1128, 6-1739, 6-2839
DTC B1026	9-102	DTC P0102	6-1133, 6-1744, 6-2443, 6-2844
DTC B1035	9-106	DTC P0103	6-1137, 6-1748, 6-2447, 6-2848
DTC B1036	9-108	DTC P0106	6-1140
DTC B1051	9-111	DTC P0106	6-1751
DTC B1053	9-112	DTC P0107	6-1144
DTC B1054	9-113	DTC P0107	6-1754, 6-2851
DTC B1061	9-121	DTC P0108	6-2855
DTC B1071	9-123	DTC P0108	6-1148, 6-1758
DTC B2725	4-263	DTC P0112	6-2859
DTC B2947	8-633	DTC P0112	6-1152, 6-1762, 6-2450
DTC B2948	8-636	DTC P0113	6-1155, 6-1765, 6-2453, 6-2861
DTC B2957	8-639	DTC P0117	6-1158, 6-1768, 6-2456, 6-2864
DTC B2958	8-642	DTC P0118	6-1160, 6-1771, 6-2459, 6-2867
DTC B2960	8-646	DTC P0121	6-1163, 6-1774, 6-2462, 6-2870
DTC B3031	8-649	DTC P0122	6-1167, 6-1778, 6-2465, 6-2874
DTC B3033	8-652	DTC P0123	6-1171, 6-1782, 6-2468, 6-2878
DTC C0000	2-230	DTC P0125	6-1174
DTC C0221	5-189	DTC P0125	6-1785, 6-2881
DTC C0222	5-192	DTC P0126	6-2471
DTC C0223	5-195	DTC P0131	6-1787
DTC C0225	5-198	DTC P0131	6-1176, 6-2883
DTC C0226	5-201	DTC P0132	6-1791
DTC C0227	5-204	DTC P0132	6-1180, 6-2887
DTC C0229	5-207	DTC P0133	6-2891
DTC C0235	5-209, 5-211	DTC P0133	6-1184, 6-1795
DTC C0236	5-213, 5-215	DTC P0134	6-1188, 6-1800, 6-2896
		DTC P0135	6-1193, 6-1805, 6-2901

DTC P0137	6-1809, 6-1813, 6-2905	DTC P0327	6-1257, 6-1942, 6-2983
DTC P0138	6-1817, 6-1821, 6-2909	DTC P0335	6-2561
DTC P0140	6-2913	DTC P0336	6-2986
DTC P0140	6-1825, 6-1830	DTC P0336	6-1261, 6-1946
DTC P0141	6-1835, 6-1839, 6-2918	DTC P0337	6-1264, 6-1949, 6-2989
DTC P0143	6-1197, 6-1843	DTC P0338	6-1267, 6-1952, 6-2992
DTC P0144	6-1847	DTC P0339	6-1270, 6-1955, 6-2995
DTC P0144	6-1201	DTC P0340	6-1273
DTC P0146	6-1205, 6-1851	DTC P0340	6-1958, 6-2998
DTC P0147	6-1209, 6-1856	DTC P0341	6-1276, 6-1961
DTC P0151	6-2922	DTC P0341	6-3001
DTC P0151	6-1213, 6-1860	DTC P0370	6-2564
DTC P0152	6-1217, 6-1864, 6-2926	DTC P0380	6-2568
DTC P0153	6-1221, 6-1868, 6-2930	DTC P0400	6-2571
DTC P0154	6-1225, 6-1873, 6-2935	DTC P0401	6-3003
DTC P0155	6-1230, 6-1878, 6-2940	DTC P0401	6-1278, 6-1964, 6-2574
DTC P0157	6-1882, 6-1886, 6-2944	DTC P0402	6-2576
DTC P0158	6-1890, 6-1894	DTC P0404	6-1281, 6-1967, 6-2578, 6-3006
DTC P0158	6-2948	DTC P0405	6-1286, 6-2580
DTC P0160	6-1898, 6-1903	DTC P0405	6-1971, 6-3010
DTC P0160	6-2952	DTC P0406	6-2583
DTC P0161	6-1908, 6-1912, 6-2957	DTC P0410	6-1975, 6-3014
DTC P0171	6-1234, 6-1916, 6-2961	DTC P0420	6-1290, 6-1981, 6-1984, 6-1987, 6-3019
DTC P0172	6-1238, 6-1921, 6-2965	DTC P0430	6-3022
DTC P0174	6-1242, 6-1926, 6-2969	DTC P0430	6-1990, 6-1993
DTC P0175	6-1246, 6-1931, 6-2973	DTC P0440	6-1293, 6-1996, 6-3025
DTC P0182	6-2474	DTC P0442	6-2002
DTC P0183	6-2477	DTC P0442	6-1299, 6-3031
DTC P0215	6-2480	DTC P0446	6-3036
DTC P0216	6-2483	DTC P0446	6-1304, 6-2007
DTC P0218	7-52, 7-278, 7-281	DTC P0452	6-1309, 6-2012, 6-3041
DTC P0219	6-2487	DTC P0453	6-1312, 6-2015, 6-3044
DTC P0220	6-2489	DTC P0461	6-2018, 6-2021
DTC P0221	6-2491	DTC P0461	6-1315, 6-3047
DTC P0222	6-2494	DTC P0462	6-3050
DTC P0223	6-2497	DTC P0462	6-1318, 6-2024, 6-2026
DTC P0225	6-2500	DTC P0463	6-1321, 6-2029, 6-2031, 6-3053
DTC P0226	6-2502	DTC P0500	6-1324, 6-2033, 6-3056
DTC P0227	6-2505	DTC P0501	6-2586
DTC P0228	6-2508	DTC P0502	7-284
DTC P0231	6-2511	DTC P0502	7-55
DTC P0236	6-2514	DTC P0503	7-288
DTC P0237	6-2517	DTC P0503	7-59
DTC P0238	6-2520	DTC P0506	6-1327, 6-2036, 6-3059
DTC P0251	6-2523	DTC P0507	6-3063
DTC P0263	6-2527	DTC P0507	6-1331, 6-2040
DTC P0266	6-2529	DTC P0560	7-292, 7-295
DTC P0269	6-2531	DTC P0567	6-2588
DTC P0272	6-2533	DTC P0568	6-2590
DTC P0275	6-2535	DTC P0571	6-2592
DTC P0278	6-2537	DTC P0601	6-1335, 6-2044, 6-3067
DTC P0281	6-2539	DTC P0601	6-2595
DTC P0284	6-2541	DTC P0602	6-1336, 6-2045
DTC P0300	6-1936	DTC P0602	6-2595, 6-3069
DTC P0300	6-1250, 6-2543, 6-2977	DTC P0603	6-1338, 6-2047
DTC P0301	6-2545	DTC P0603	6-3071
DTC P0302	6-2547	DTC P0604	6-1340, 6-2049
DTC P0303	6-2549	DTC P0604	6-2596, 6-3073
DTC P0304	6-2551	DTC P0605	6-1341, 6-2050, 6-3075
DTC P0305	6-2553	DTC P0606	6-2596
DTC P0306	6-2555	DTC P0704	6-1342, 6-2051, 6-3077
DTC P0307	6-2557	DTC P0711	7-63, 7-298, 7-301
DTC P0308	6-2559	DTC P0712	7-67
DTC P0325	6-1254, 6-1939, 6-2980		

DTC P0712	7-304, 7-307	DTC P1509	6-2123, 6-3150
DTC P0713	7-71	DTC P1621	6-1417, 6-2127, 6-2616
DTC P0713	7-310, 7-314	DTC P1621	6-3154
DTC P0716	7-317, 7-320	DTC P1626	6-2128, 6-3155
DTC P0717	7-324, 7-327	DTC P1626	6-1418, 6-2617
DTC P0719	7-75, 7-330, 7-334	DTC P1627	6-2618
DTC P0722	7-337	DTC P1630	6-2619
DTC P0723	7-341	DTC P1631	6-1421, 6-2131, 6-2620, 6-3158
DTC P0724	7-345, 7-348	DTC P1635	6-2624
DTC P0724	7-78	DTC P1641	6-2627
DTC P0730	7-350, 7-353	DTC P1643	6-2629
DTC P0740	7-81	DTC P1653	6-2631
DTC P0741	7-356, 7-359	DTC P1654	6-2635
DTC P0742	7-84	DTC P1655	6-2637
DTC P0742	7-362, 7-365	DTC P1656	6-2641
DTC P0748	7-87, 7-368, 7-372	DTC P1810	7-109, 7-403, 7-407
DTC P0751	7-91, 7-375, 7-378	DTC P1811	7-410
DTC P0753	7-381, 7-385	DTC P1860	7-113, 7-413, 7-417
DTC P0753	7-94	DTC P1870	7-117, 7-421, 7-425
DTC P0756	7-98, 7-389, 7-392	DTC P1875	7-122, 7-429, 7-432
DTC P0758	7-101, 7-395, 7-399	DTC U1016	8-370
DTC P0785	7-105	DTC U1016	8-367
DTC P1106	6-1345, 6-2054, 6-3080	DTC U1026	6-1423, 6-2134, 6-2644
DTC P1107	6-3083	DTC U1041	6-1426, 6-2137
DTC P1107	6-1348, 6-2057	DTC U1192	6-1429, 6-2140, 6-2645
DTC P1111	6-1351	DTC U1192	8-373
DTC P1111	6-2060, 6-3086	DTC U1193	6-1432, 6-2143
DTC P1112	6-1354, 6-2062, 6-3088	DTC U1255	8-376
DTC P1114	6-1357, 6-2064, 6-3090		
DTC P1115	6-1359, 6-2066, 6-3092		
DTC P1121	6-1361		
DTC P1121	6-2068, 6-3094		
DTC P1122	6-3096		
DTC P1122	6-1364, 6-2070		
DTC P1125	6-2597		
DTC P1133	6-2072		
DTC P1133	6-1367, 6-3098		
DTC P1134	6-1372, 6-2077, 6-3103		
DTC P1153	6-2082		
DTC P1153	6-1377, 6-3108		
DTC P1154	6-1382, 6-2087, 6-3113		
DTC P1191	6-2599		
DTC P1214	6-2601		
DTC P1216	6-2603		
DTC P1217	6-2606		
DTC P1218	6-2609		
DTC P1336	6-1387, 6-2092, 6-3118		
DTC P1345	6-1390, 6-2094, 6-3121		
DTC P1351	6-1393, 6-2097, 6-3124		
DTC P1361	6-1396, 6-3127		
DTC P1361	6-2100		
DTC P1380	6-1399, 6-2103, 6-3130		
DTC P1381	6-1401		
DTC P1381	6-2105, 6-3132		
DTC P1404	6-1403, 6-2107, 6-3134		
DTC P1406	6-2611		
DTC P1409	6-2613		
DTC P1415	6-2110, 6-3137		
DTC P1416	6-2113		
DTC P1416	6-3140		
DTC P1441	6-1406, 6-2116		
DTC P1441	6-3143		
DTC P1508	6-1409, 6-2119, 6-3146		
DTC P1509	6-1413		

## E

## EGR

Pipe Replacement (4.3L)	6-1590
Pipe Replacement (5.0L, 5.7L)	6-2321
Endgate Handle Replacement	8-1165, 8-1166
Endgate Hinge Replacement	8-1160
Endgate Lamp Replacement	8-163
Endgate Latch Replacement	8-1167
Endgate Linkage Replacement	8-1166
Endgate Lock Striker Replacement	8-1174, 8-1175
Endgate Replacement	8-1157, 8-1158
Endgate Weatherstrip Replacement	8-1187
Endgate Window Hinge Replacement	8-1159
Endgate Window Release Inoperative	8-1141
Endgate Window Release System Check	8-1141
Endgate Window Striker Replacement	8-1175
Endgate Window Support Replacement	8-1177

## Engine - 6.5L

## Diagnosis

Engine Vacuum Pump Test	6-492
-------------------------	-------

## Engine Block

Clean and Inspect (4.3L)	6-166
Clean and Inspect (5.0L, 5.7L)	6-383
Clean and Inspect (6.5L)	6-612
Clean and Inspect (7.4L)	6-792
Plug Installation (4.3L)	6-223
Plug Installation (5.0L, 5.7L)	6-439
Plug Installation (6.5L)	6-639
Plug Installation (7.4L)	6-846
Plug Removal (4.3L)	6-162
Plug Removal (5.0L, 5.7L)	6-379
Plug Removal (6.5L)	6-610
Plug Removal (7.4L)	6-788

## Engine Control - 7.4L

## Description

- Fuel Metering ..... 6-3351
- System Component ..... 6-3351

## Engine Controls - 4.3L

- Component Views ..... 6-1086
- Components ..... 6-1081
- Connector End Views ..... 6-1103

## Description

- Air Intake System ..... 6-1634
- Crankcase Ventilation System ..... 6-1634
- Enhanced Ignition System ..... 6-1630
- EVAP Control System ..... 6-1627
- Exhaust Gas Recirculation System ..... 6-1633
- Fuel Metering System Component ..... 6-1620
- Fuel Supply Component ..... 6-1617
- Fuel System ..... 6-1615
- CSFI ..... 6-1615
- Information Sensors/Switches ..... 6-1610
- Knock Sensor System ..... 6-1633
- Long Term Fuel Trim ..... 6-1626
- Serial Data Communications ..... 6-1608
- Short Term Fuel Trim ..... 6-1625
- Speed Density System ..... 6-1626

## Diagnosis

- Air Conditioning Compressor
  - Control Circuit ..... 6-1446
- Alcohol/Contaminants-in-Fuel ..... 6-1462
- Backfire ..... 6-1443
- Crankcase Ventilation System ..... 6-1474
- Cranks but Does Not Run ..... 6-1116
- Cuts Out, Misses ..... 6-1440
- Data Link Connector ..... 6-1113
- Detonation/Spark Knock ..... 6-1439
- Dieseling, Run-On ..... 6-1443
- Enhanced Ignition System ..... 6-1466
- EVAP Control System ..... 6-1463
- Exhaust Gas Recirculation System ..... 6-1471
- Fuel Injector Balance Test ..... 6-1452
- Fuel Injector Circuit Diagnosis ..... 6-1458
- Fuel Injector Coil Test ..... 6-1456
- Fuel Pump Relay Circuit ..... 6-1118
- Fuel System ..... 6-1121
- Hard Start ..... 6-1436
- Hesitation, Sag, Stumble ..... 6-1439
- Idle Air Control System ..... 6-1475
- Inspection/Maintenance Status
  - Reset Procedures ..... 6-1479
- Intermittent Conditions ..... 6-1436
- Knock Sensor System Diagnosis ..... 6-1470
- Lack of Power, Sluggishness,
  - or Sponginess ..... 6-1438
- Malfunction Indicator Lamp
  - Circuit Check ..... 6-1110
- Manual Transmission Shift Light ..... 6-1450
- Poor Fuel Economy ..... 6-1441
- Powertrain On Board Diagnostic
  - System Check ..... 6-1108
- Restricted Exhaust System Check ..... 6-1444

## Engine Controls - 4.3L (cont.)

## Diagnosis (cont.)

- Rough, Unstable, or Incorrect Idle,
  - Stalling ..... 6-1442
- Service Bay Test ..... 6-1479
- Surges/Chuggles ..... 6-1437
- Symptoms ..... 6-1435
- Vehicle Control Module ..... 6-1445
- Emission Hose Routing Diagram ..... 6-1067
- Schematic
  - Icons ..... 6-1068
  - References ..... 6-1068
- Schematics ..... 6-1069
- Special Tools ..... 6-1635
- Specifications
  - DTC List ..... 6-1061, 6-1062, 6-1065
  - Fastener Tightening ..... 6-1052
  - GM SPO Group Numbers ..... 6-1066
  - Scan Tool Data Definitions ..... 6-1056
  - Scan Tool Data List ..... 6-1053
  - Temperature vs Resistance ..... 6-1052
- Vehicle Control Module
  - Connector End Views ..... 6-1099

## Engine Controls - 5.0L, 5.7

## Specifications

- Scan Tool Data Definitions ..... 6-1643

## Engine Controls - 5.0L, 5.7L

- Component Views ..... 6-1694
- Components ..... 6-1688
- Connector End Views ..... 6-1714
- Description
  - Air Intake System ..... 6-2368
  - Crankcase Ventilation System ..... 6-2368
  - Electric Engine Cooling Fan ..... 6-2348
  - Enhanced Ignition System ..... 6-2362
  - EVAP Control System ..... 6-2359
  - Exhaust Gas Recirculation System ..... 6-2367
  - Fuel Metering System Components ..... 6-2354
  - Fuel Supply Component ..... 6-2351
  - Fuel System ..... 6-2349
  - CSFI ..... 6-2349
  - Information Sensors/Switches ..... 6-2343
  - Knock Sensor System ..... 6-2365
  - Long Term Fuel Trim ..... 6-2358
  - Secondary Air Injection System ..... 6-2366
  - Serial Data Communications ..... 6-2339
  - Short Term Fuel Trim ..... 6-2357
  - Speed Density System ..... 6-2358

## Diagnosis

- Air Conditioning Compressor
  - Control Circuit ..... 6-2157
- Alcohol/Contaminants-in-Fuel ..... 6-2174
- Backfire ..... 6-2154
- Crankcase Ventilation System ..... 6-2194
- Cuts Out, Misses ..... 6-2151
- Data Link Connector ..... 6-1724
- Detonation/Spark Knock ..... 6-2150
- Dieseling, Run-On ..... 6-2154
- Electric Cooling Fan ..... 6-2161
- Engine Cranks but Does Not Run ..... 6-1727

## Engine Controls - 5.0L, 5.7L (cont.)

## Diagnosis (cont.)

Enhanced Ignition System .....	6-2180
EVAP Control System .....	6-2175
Exhaust Gas Recirculation System .....	6-2191
Fuel Injector Balance Test .....	6-2165
Fuel Injector Circuit .....	6-2170
Fuel Injector Coil Test .....	6-2168
Fuel Pump Relay Circuit .....	6-1729
Fuel System .....	6-1732
Fuel Tank Pressure Sensor .....	6-2172
Hard Start .....	6-2147
Hesitation, Sag, Stumble .....	6-2150
Idle Air Control System .....	6-2195
Inspection/Maintenance Status	
Reset Procedure .....	6-2199
Intermittent Condition .....	6-2147
Lack of Power, Sluggishness,	
or Sponginess .....	6-2149
Malfunction Indicator Lamp Circuit .....	6-1721
Manual Transmission Shift Light .....	6-2163
Poor Fuel Economy .....	6-2152
Powertrain On Board Diagnostic	
System Check .....	6-1719
Restricted Exhaust System Check .....	6-2155
Rough, Unstable, or Incorrect Idle,	
Stalling .....	6-2153
Secondary Air Injection System .....	6-2185
Service Bay Test .....	6-2199
Surges/Chuggles .....	6-2148
Symptoms .....	6-2146
Vehicle Control Module .....	6-2156
Emission Hose Routing Diagram .....	6-1658
Password Learn Procedure .....	6-2204
Schematic	
Icons .....	6-1659
References .....	6-1659
Schematics .....	6-1660, 6-1676
Special Tools .....	6-2369
Specifications	
DTC List .....	6-1648, 6-1649, 6-1653
Fastener Tightening .....	6-1639
GM SPO Group Numbers .....	6-1657
Scan Tool Data List .....	6-1640
Temperature vs Resistance .....	6-1639
Vehicle Control Module	
Connector End Views .....	6-1710

## Engine Controls - 6.5

## Description

Accelerator Pedal Position Module .....	6-2751
---	--------

## Diagnosis

Fuel Injection System .....	6-2663
-----------------------------	--------

## Engine Controls - 6.5L

Component Views .....	6-2403
-----------------------	--------

Components .....	6-2399
------------------	--------

Connector End Views .....	6-2422
---------------------------	--------

## Description

Air Intake System .....	6-2758
Crankcase Ventilation System .....	6-2758
Exhaust Gas Recirculation System .....	6-2757

## Engine Controls - 6.5L (cont.)

## Description (cont.)

Fuel Supply Component .....	6-2754
Fuel System .....	6-2751
Glow Plug System .....	6-2756
Information Sensors/Switches .....	6-2747
Serial Data Communications .....	6-2744

## Diagnosis

Air Cleaner .....	6-2666
Air Conditioning Request Circuit .....	6-2651
CDR Valve Test .....	6-2666
Contamination Testing .....	6-2655
Cruise Control .....	6-2652
Cuts Out, Misses .....	6-2649
Data Link Connector .....	6-2431
Engine Cranks but Does Not Run .....	6-2433
Excessive Smoke .....	6-2650
Fuel Heater Functional .....	6-2659
Fuel Knock/Combustion Noise .....	6-2648
Fuel Manager/Filter .....	6-2658
Fuel Pump Relay Circuit .....	6-2436
Fuel Quality .....	6-2656
Fuel Return System .....	6-2664
Fuel Sender .....	6-2656
Fuel Supply System Check .....	6-2657
Fuel Tank Leak Check .....	6-2655
Glow Plug System Check .....	6-2665
Hard Start .....	6-2646
Hesitation, Sag, Stumble .....	6-2649
Injection Nozzle(s) .....	6-2663
Intermittent Condition .....	6-2646
Lack of Power, Sluggishness,	
or Sponginess .....	6-2648
No Malfunction Indicator Lamp .....	6-2428
Poor Fuel Economy .....	6-2650
Powertrain On-Board Diagnostic	
System Check .....	6-2426
Restricted Exhaust System Check .....	6-2651
Specific Gravity Testing .....	6-2656
Surges/Chuggles .....	6-2647
Symptoms .....	6-2646
Water-in-Fuel Lamp Circuit .....	6-2661
Emission Hose Routing Diagram .....	6-2384
Fuel Injection Line Routing Diagram .....	6-2385
Powertrain Control Module	
Connector End Views .....	6-2419

## Schematic

Icons .....	6-2386
References .....	6-2386
Schematics .....	6-2387
Special Tools .....	6-2759

## Specifications

DTC List .....	6-2380
Fastener Tightening .....	6-2374
Fuel System .....	6-2383
GM SPO Group Number .....	6-2383
RPM vs Hertz .....	6-2373
Scan Tool Data Definitions .....	6-2377
Scan Tool Data List .....	6-2374
Temperature vs Resistance .....	6-2373



## Engine Controls - 7.4L

Component Views .....	6-2795
Components .....	6-2790
Connector End Views .....	6-2816
Description	
Air Intake System .....	6-3361
Crankcase Ventilation System .....	6-3361
Electric Engine Cooling Fan .....	6-3345
Enhanced Ignition System .....	6-3356
EVAP Control System .....	6-3355
Exhaust Gas Recirculation System .....	6-3359
Fuel Supply Component .....	6-3348
Fuel System .....	6-3346
Information Sensors/Switches .....	6-3340
Knock Sensor System .....	6-3358
Long Term Fuel Trim .....	6-3355
Secondary Air Injection System .....	6-3359
Serial Data Communications .....	6-3336
Short Term Fuel Trim .....	6-3355
Speed Density System .....	6-3355
Diagnosis	
Air Conditioning Compressor	
Control Circuit .....	6-3171
Alcohol/Contaminants-in-Fuel .....	6-3193
Backfire .....	6-3168
Crankcase Ventilation System .....	6-3210
Cuts Out, Misses .....	6-3165
Data Link Connector .....	6-2824
Detonation/Spark Knock .....	6-3164
Dieseling, Run-On .....	6-3168
Electric Cooling Fan .....	6-3175
Engine Cranks but Does Not Run .....	6-2827
Enhanced Ignition System .....	6-3197
EVAP Control System .....	6-3194
Exhaust Gas Recirculation System .....	6-3207
Fuel Injector Balance Test .....	6-3179
Fuel Injector Balance Test with Tech 2 .....	6-3183
Fuel Injector Circuit .....	6-3189
Fuel Injector Coil Test .....	6-3187
Fuel Pump Relay Circuit .....	6-2829
Fuel System .....	6-2832
Fuel Tank Pressure Sensor .....	6-3191
Hard Start .....	6-3161
Hesitation, Sag, Stumble .....	6-3164
Idle Air Control System .....	6-3211
Intermittent Condition .....	6-3161
Lack of Power, Sluggishness,	
or Sponginess .....	6-3163
Malfunction Indicator Lamp	
Circuit Check .....	6-2821
Manual Transmission Shift Light .....	6-3177
Poor Fuel Economy .....	6-3166
Powertrain On-Board Diagnostic	
System Check .....	6-2819
Restricted Exhaust System Check .....	6-3169
Rough, Unstable, or Incorrect Idle,	
Stalling .....	6-3167
Secondary Air Injection System .....	6-3202
Surges/Chuggles .....	6-3162

## Engine Controls - 7.4L (cont.)

Diagnosis (cont.)	
Symptoms .....	6-3160
Vehicle Control Module .....	6-3170
Password Learn Procedure .....	6-3219
Schematic	
Emission Hose Routing Diagram .....	6-2775
Icons .....	6-2776
References .....	6-2776
Schematics .....	6-2777
Special Tools .....	6-3362
Specification	
Scan Tool Data Definitions .....	6-2765
Specifications	
DTC List .....	6-2770, 6-2771
Fastener Tightening .....	6-2761
GM SPO Group Numbers .....	6-2774
Scan Tool Data List .....	6-2762
Temperature vs Resistance .....	6-2761
Vehicle Control Module Connector End Views	
Vehicle Control Module .....	6-2812
Connector End Views (7.4L) .....	6-2812
Engine Coolant Temperature Sensor	
Replacement (4.3L) .....	6-1485
Engine Coolant Temperature Sensor	
Replacement (5.0L, 5.7L) .....	6-2205
Engine Coolant Temperature Sensor	
Replacement (6.5L) .....	6-2669
Engine Coolant Temperature Sensor	
Replacement (7.4L) .....	6-3220
Engine Coolant Temperature Sensor	
Replacement (Engine Cooling) .....	6-942
Engine Cooling	
Component Views .....	6-900
Components .....	6-899
Connector End Views .....	6-902
Description	
Coolant Heater .....	6-959
Coolant Recovery System .....	6-959
Cooling System .....	6-958
Electric Engine Cooling Fan .....	6-961
Radiator Assembly .....	6-960
Radiator Filler/Pressure Cap Assembly .....	6-960
Thermostat .....	6-962
Water Pump .....	6-961
Diagnosis	
Auxiliary Cooling Fan Inoperative .....	6-902
Auxiliary Cooling Fan Runs Continuously .....	6-903
Coolant Concentration Testing .....	6-909
Cooling System Leak Testing .....	6-910, 6-912
Fan Clutch .....	6-908
Loss of Coolant .....	6-905
Overheating .....	6-904
Thermostat .....	6-907, 6-908
Schematic	
Cooling Fan .....	6-898
Cooling System Icons .....	6-897
Cooling System References .....	6-897
Special Tools .....	6-962
Specifications	
Fastener Tightening .....	6-896
GM SPO Group Numbers .....	6-896



- Engine Electric
  - Specifications
    - Fastener Tightening ..... 6-963
- Engine Electrical
  - Component Locations ..... 6-970
  - Description
    - Battery ..... 6-1044, 6-1045
    - Battery Operation ..... 6-1047, 6-1048
    - Battery Tray and Hold-Down Retainer ..... 6-1044
    - Charging System ..... 6-1048
    - Charging System Circuit ..... 6-1050
    - Charging System Operation
      - Charging System ..... 6-1050
      - Operation ..... 6-1050
    - Ignition System ..... 6-1050
    - Starting System Circuit ..... 6-1044
    - Starting System Operation ..... 6-1044
  - Diagnosis
    - Battery Hydrometer Displays
      - Dark or Yellow Dot ..... 6-984
    - Battery Load Test ..... 6-985
    - Charge Indicator Always On ..... 6-987
    - Charge Indicator Inoperative ..... 6-988
    - Charging System Check ..... 6-978
    - Engine Cranks/Cranks Slowly,
      - but Does Not Start ..... 6-981
    - Generator Assembly Bench Check ..... 6-990
    - Generator Noise Test ..... 6-989
    - Generator Not Operating Properly ..... 6-989
    - Ignition Coil Test ..... 6-991
    - Parasitic Load Test - Parasitic ..... 6-985
    - Spark Plug Visual ..... 6-992
    - Spark Plug Wire Harness ..... 6-994
    - Starter Motor Noise ..... 6-982, 6-983
    - Starter No Load Test ..... 6-983
    - Starter Solenoid Clicks,
      - Engine Does Not Crank ..... 6-981
    - Starter Solenoid Does Not Click ..... 6-978
    - Starting System Check ..... 6-978
    - Voltmeter Displaying High or Low ..... 6-988
  - Generator Replacement ..... 6-1021, 6-1022
  - Ground Strap Replacement ..... 6-1020
  - Ignition Coil and Ignition Control
    - Module Replacement ..... 6-1041, 6-1042
  - Schematic
    - Starting and Charging ..... 6-966
    - Starting and Charging Icons ..... 6-965
    - Starting and Charging References ..... 6-965
  - Spark Plug Replacement ..... 6-1026
  - Spark Plug Wire Harness
    - Replacement ..... 6-1024, 6-1025
  - Special Tools ..... 6-1051
  - Specifications
    - Battery Temperature vs
      - Minimum Voltage ..... 6-964
    - Battery Temperature vs Voltage Drop ..... 6-964
    - Battery Usage Table ..... 6-963
    - Spark Plug Wire Resistance ..... 6-965
    - Starter Motor Usage Table ..... 6-964
- Engine Electrical (cont.)
  - Starting and Charging Component Views ..... 6-972
  - Starting and Charging Connector
    - End Views ..... 6-976
- Engine Exhaust
  - Catalytic Converter Replacement .... 6-3385, 6-3387, 6-3389, 6-3391
  - Description
    - Exhaust System ..... 6-3393
  - Diagnosis
    - Exhaust Leakage (Not OBD II) ..... 6-3383
    - Restricted Exhaust ..... 6-3382
    - Vibration or Rattling ..... 6-3382
  - Specifications
    - Fastener Tightening ..... 6-3382
    - GM SPO Group Numbers ..... 6-3382
    - System Inspection ..... 6-3384
- Engine Flywheel
  - Clean and Inspect (4.3L) ..... 6-186
  - Clean and Inspect (5.0L, 5.7L) ..... 6-404
  - Clean and Inspect (6.5L) ..... 6-618
  - Clean and Inspect (7.4L) ..... 6-806
  - Installation (4.3L) ..... 6-257
  - Installation (5.0L, 5.7L) ..... 6-473
  - Installation (6.5L) ..... 6-667
  - Installation (7.4L) ..... 6-886
  - Removal (4.3L) ..... 6-143
  - Removal (5.0L, 5.7L) ..... 6-358
  - Removal (6.5L) ..... 6-583
  - Removal (7.4L) ..... 6-758
  - Replacement (4.3L) ..... 6-124, 6-126
  - Replacement (5.0L, 5.7L) ..... 6-349, 6-350
  - Replacement (6.5L) ..... 6-565
  - Replacement (7.4L) ..... 6-751
- Engine Front Cover Clean and Inspect (6.5L) ..... 6-637
- Engine Front Cover Installation (4.3L) ..... 6-239
- Engine Front Cover Installation (5.0L, 5.7L) ..... 6-451
- Engine Front Cover Installation (6.5L) ..... 6-653
- Engine Front Cover Installation (7.4L) ..... 6-860
- Engine Front Cover Removal (4.3L) ..... 6-156
- Engine Front Cover Removal (5.0L, 5.7L) ..... 6-373
- Engine Front Cover Removal (6.5L) ..... 6-600
- Engine Front Cover Removal (7.4L) ..... 6-779
- Engine Front Cover Replacement (4.3L) ..... 6-100
- Engine Front Cover Replacement (5.0L, 5.7L) .... 6-332
- Engine Front Cover Replacement (6.5L) ..... 6-552
- Engine Front Cover Replacement (7.4L) ..... 6-737
- Engine ID and Partial VIN Location ..... 0-10
- Engine Mechanical - 4.3L
  - Description
    - Cleanliness and Care ..... 6-263
    - Engine Components ..... 6-259
    - Identification ..... 6-260
    - Lubrication ..... 6-262
    - New Product Information ..... 6-259
    - Replacing Engine Gaskets ..... 6-263
    - Separating Parts ..... 6-265
    - Thread Repair ..... 6-222
    - Tools and Equipment ..... 6-265
    - Use of RTV and Anaerobic Sealer ..... 6-263

## Engine Mechanical - 4.3L (cont.)

## Diagnosis

Base Engine Misfire .....	6-31
Drive Belt .....	6-38
Drive Belt Tensioner .....	6-43
Engine Compression Test .....	6-33
Engine Noise .....	6-33
Oil Consumption .....	6-36
Oil Leak .....	6-36
Oil Pressure Diagnosis and Testing .....	6-36
Valve Train .....	6-33

## Disassembled Views

Service Prior to Assembly .....	6-223
---------------------------------	-------

## Special Tools

Specifications .....	6-26
----------------------	------

Fastener Tightening .....	6-23
---------------------------	------

GM SPO Group Numbers .....	6-28
----------------------------	------

Sealers, Adhesives, and Lubricants .....	6-30
--	------

## Engine Mechanical - 5.0L, 5.7L

## Description

Cleanliness and Care .....	6-478
Engine Components .....	6-475
Engine Identification .....	6-477
Lubrication .....	6-477
New Product Information .....	6-476
Replacing Engine Gaskets .....	6-478
Separating Parts .....	6-480
Thread Repair .....	6-438
Tools and Equipment .....	6-480
Use of RTV and Anaerobic Sealer .....	6-479

## Diagnosis

Base Engine Misfire .....	6-280
Drive Belt .....	6-287
Drive Belt Tensioner .....	6-291
Engine Compression Test .....	6-282
Engine Noise .....	6-282
Oil Consumption .....	6-285
Oil Leak .....	6-285
Oil Pressure Diagnosis and Testing .....	6-285
Valve Train .....	6-282

## Disassembled Views

Service Prior to Assembly .....	6-439
---------------------------------	-------

## Special Tools

Specifications .....	6-481
----------------------	-------

Engine Mechanical .....	6-271, 6-273
-------------------------	--------------

Fastener Tightening .....	6-269
---------------------------	-------

GM SPO Group Numbers .....	6-276
----------------------------	-------

Sealers, Adhesives, and Lubricants .....	6-279
--	-------

## Engine Mechanical - 6.5L

## Description

Cleanliness and Care .....	6-672
Engine Components .....	6-669
Identification .....	6-670
Lubrication .....	6-671
New Product Information .....	6-670
Replacing Engine Gaskets .....	6-672
Separating Parts .....	6-674
Tools and Equipment .....	6-674
Use of RTV and Anaerobic Sealer .....	6-673

## Engine Mechanical - 6.5L (cont.)

## Diagnosis

Drive Belt .....	6-498
Drive Belt Tensioner .....	6-502
Engine Compression Test .....	6-492
Engine Cranking Speed Test .....	6-491
Engine Noise .....	6-493
Oil Leak .....	6-496
Oil Pressure Diagnosis and Testing .....	6-495
Valve Train .....	6-495

## Disassembled Views

Service Prior to Assembly .....	6-639
---------------------------------	-------

## Special Tools

Specifications .....	6-486
----------------------	-------

Fastener Tightening .....	6-485
---------------------------	-------

GM SPO Group Numbers .....	6-490
----------------------------	-------

Sealers, Adhesives, and Lubricants .....	6-491
--	-------

## Engine Mechanical - 7.4L

## Description

Cleanliness and Care .....	6-891
Engine Components .....	6-888
Lubrication .....	6-891
New Product Information .....	6-889
Replacing Engine Gaskets .....	6-891
Separating Parts .....	6-893
Thread Repair .....	6-845
Tools and Equipment .....	6-893
Use of RTV and Anaerobic Sealer .....	6-892

## Diagnosis

Base Engine Misfire .....	6-683
Engine Compression Test .....	6-685
Engine Noise .....	6-685
Oil Consumption .....	6-689
Oil Leak .....	6-690
Oil Pressure Diagnosis and Testing .....	6-689
Valve Train .....	6-687

## Disassembled Views

Identification .....	6-890
----------------------	-------

Service Prior to Assembly .....	6-845
---------------------------------	-------

Special Tools .....	6-894
---------------------	-------

Specifications .....	6-679
----------------------	-------

## Specifications

Fastener Tightening .....	6-677
---------------------------	-------

GM SPO Group Numbers .....	6-681
----------------------------	-------

Sealers, Adhesives, and Lubricants .....	6-682
--	-------

## Engine Mount

Inspection (4.3L) .....	6-55, 6-56
-------------------------	------------

Inspection (5.0L, 5.7L) .....	6-302
-------------------------------	-------

Inspection (6.5L) .....	6-514
-------------------------	-------

Inspection (7.4L) .....	6-706
-------------------------	-------

Replacement (4.3L) .....	6-56, 6-59
--------------------------	------------

Replacement (5.0L, 5.7L) .....	6-303, 6-304, 6-305, 6-306, 6-307, 6-308
--------------------------------	---

Replacement (6.5L) .....	6-515, 6-517
--------------------------	--------------

Replacement (7.4L) .....	6-707, 6-709
--------------------------	--------------

Engine Oil and Oil Filter Replacement .....	6-140
---	-------

## Engine Oil and Oil Filter

Replacement (5.0L, 5.7L) .....	6-356
--------------------------------	-------

- Engine Oil and Oil Filter Replacement (6.5L) ... 6-580  
 Engine Oil and Oil Filter Replacement (7.4L) ... 6-756  
 Engine Oil Cooler Line Replacement  
     (Engine Cooling) ..... 6-920  
 Engine Oil Pressure Sensor/Switch  
     Replacement (6.5L) ..... 6-2723  
 Engine Protection Shield Replacement ..... 8-1250  
 Engine Replacement (4.3L) ..... 6-127  
 Engine Replacement (5.0L, 5.7L) ..... 6-350  
 Engine Replacement (6.5L) ..... 6-572  
 Engine Replacement (7.4L) ..... 6-752  
 Engine Set-Up and Testing (4.3L) ..... 6-258  
 Engine Set-Up and Testing (5.0L, 5.7L) ..... 6-474  
 Engine Set-Up and Testing (6.5L) ..... 6-669  
 Engine Set-Up and Testing (7.4L) ..... 6-887  
 Engine Wiring Harness  
     Assembly Installation (6.5L) ..... 6-661  
     Assembly Removal (6.5L) ..... 6-591  
 English/Metric Conversion Table ..... 0-3  
 Entertainment  
     Amplifier Replacement ..... 8-224  
     Antenna Extension Cable Replacement ..... 8-228  
     Antenna Module Replacement  
         Fixed ..... 8-228  
     Cassette Player Care and Cleaning ..... 8-225  
     CD Changer Replacement  
         Remote ..... 8-227  
     CD Player Replacement  
         Remote ..... 8-226  
     Compact Disc Care and Cleaning ..... 8-227  
     Component Locations ..... 8-205  
     Component Views ..... 8-207  
     Connector End Views ..... 8-211  
     Description  
         Radio/Audio System ..... 8-236  
         Radio/Audio System Circuit ..... 8-244  
         Radio/Audio System  
             Operation ..... 8-236, 8-237, 8-239  
     Diagnosis  
         Amplifier Inoperative ..... 8-215  
         Antenna Diagnostic Check ..... 8-221  
         Compact Disc Inoperative ..... 8-219  
         Remote ..... 8-219  
         Radio Display and/or Buttons  
             Do Not Illuminate ..... 8-217  
         Radio Display Does Not Dim  
             with IP Dimmer Switch ..... 8-217  
         Radio Display Inoperative,  
             No Sound from Speakers ..... 8-216  
         Radio Memory Inoperative ..... 8-215  
         Radio/Audio System Check ..... 8-214  
         Speakers Inoperative ..... 8-222  
             One ..... 8-222  
         Tape Player Inoperative ..... 8-218  
         Tape Plays Weak, Slow,  
             or Garbled Output ..... 8-218  
         Radio Replacement ..... 8-223  
         Rear Seat Audio Control Replacement ..... 8-224  
     Schematic  
         Icons ..... 8-200  
         Radio/Audio System ..... 8-201  
         References ..... 8-200  
 Entertainment (cont.)  
     Speaker Replacement ..... 8-230, 8-231, 8-232,  
         8-234, 8-235  
     Specifications  
         Fastener Tightening ..... 8-200  
         GM SPO Group Numbers ..... 8-200  
 EVAP  
     Canister Purge Solenoid Valve  
         Replacement (4.3L) ..... 6-1568  
     Canister Purge Solenoid Valve  
         Replacement (5.0L, 5.7L) ..... 6-2303  
     Canister Purge Solenoid Valve  
         Replacement (7.4L) ..... 6-3302  
     Canister Replacement (4.3L) ..... 6-1572  
     Canister Replacement (5.0L, 5.7L) ..... 6-2306  
     Canister Replacement (7.4L) ..... 6-3303  
     System Cleaning (4.3L) ..... 6-1573  
     System Cleaning (5.0L, 5.7L) ..... 6-2306  
     System Cleaning (7.4L) ..... 6-3305  
     Vent Valve Replacement (4.3L) ..... 6-1572  
     Vent Valve Replacement (5.0L, 5.7L) ..... 6-2305  
     Vent Valve Replacement (7.4L) ..... 6-3303  
 Evaporator Core Replacement  
     (A/C - Manual) ..... 1-182  
 Evaporator Tube Replacement  
     (A/C - Manual) ..... 1-173  
 Exhaust Gas Recirculation  
     Control Pressure Sensor  
         Replacement (6.5L) ..... 6-2734  
     Pipe Replacement (7.4L) ..... 6-3321  
     Solenoid Filter Replacement (6.5L) ..... 6-2733  
     Solenoid Replacement (6.5L) ..... 6-2732  
     Valve Replacement (4.3L) ..... 6-1588  
     Valve Replacement (5.0L, 5.7L) ..... 6-2319  
     Valve Replacement (6.5L) ..... 6-2731  
     Valve Replacement (7.4L) ..... 6-3321  
     Vent Solenoid Replacement (6.5L) ..... 6-2733  
 Exhaust Manifold  
     Clean and Inspect (4.3L) ..... 6-221  
     Clean and Inspect (5.0L, 5.7L) ..... 6-437  
     Clean and Inspect (6.5L) ..... 6-638  
     Clean and Inspect (7.4L) ..... 6-842, 6-843  
     Installation (4.3L) ..... 6-256  
     Installation (5.0L, 5.7L) ..... 6-472  
     Installation (6.5L) ..... 6-658  
     Installation (7.4L) ..... 6-879, 6-881, 6-883, 6-884  
     Removal (4.3L) ..... 6-144  
     Removal (5.0L, 5.7L) ..... 6-359  
     Removal (6.5L) ..... 6-595  
     Removal (7.4L) ..... 6-759, 6-761, 6-763  
     Replacement (4.3L) ..... 6-90, 6-92  
     Replacement (5.0L, 5.7L) ..... 6-323, 6-324  
     Replacement (6.5L) ..... 6-537, 6-539  
     Replacement (7.4L) ..... 6-728  
 Exterior and Interior Colors ..... 0-21  
 Exterior Trim  
     Cleaning Bright Metal Parts ..... 8-733  
     Description  
         Adhesive Retained Molding  
             and Emblem ..... 8-734  
         Emblem/Nameplate ..... 8-719  
         Foreign Material Deposit Removal ..... 8-733  
         Rear Panel Molding Replacement ..... 8-730

Exterior Trim (cont.)	
Specifications	
Fastener Tightening .....	8-718
GM SPO Group Numbers .....	8-718
Washing and Waxing .....	8-733

## F

Fan	
Clutch Replacement	
(Engine Cooling) .....	6-928, 6-929
Electric Engine Cooling Fan Description .....	6-961
Shroud Replacement	
(Engine Cooling) .....	6-944, 6-948
Fasteners .....	0-22
Fender Replacement	
Front .....	8-819, 8-822
Rear Dual Wheel .....	8-1186
Stepside .....	8-1181
Filter Replacement	
In-Line Fuel (4.3L) .....	6-1518, 6-1519
In-Line Fuel (5.0L, 5.7L) .....	6-2241, 6-2242
In-Line Fuel (7.4L) .....	6-3244
Fluid Capacities, Approximate .....	0-39
Fluids and Lubricants, Recommended .....	0-40
Flushing (Engine Cooling) .....	6-914
Fog Lamp	
Aiming Procedure .....	8-135
Replacement	
Front .....	8-134
Switch Replacement .....	8-144
Fog Lamp Bulb Replacement .....	8-134
Frame	
Diagnosis	
Conditions - Buckle .....	8-1233
Conditions - Cracks in Web of Rails .....	8-1235
Conditions - Diamond .....	8-1234
Conditions - Improper Tracking .....	8-1235
Conditions - Sag .....	8-1232
Conditions - Sideways .....	8-1234
Conditions - Twist .....	8-1234
Straightening .....	8-1236
Frame and Underbody	
Description	
Centerline .....	8-1254
Datum .....	8-1254
Frame Conditions .....	8-1256
General .....	8-1256
Minimizing Frame Service .....	8-1257
Repairing Cracks .....	8-1255
Running Board .....	8-1256
Vertical Body Zero Line .....	8-1255
Welding .....	8-1255
Diagnosis	
Alignment Checking .....	8-1228
Checking Frame Alignment .....	8-1228
Frame Conditions .....	8-1229
Specifications	
Electrode Chart .....	8-1227
Fastener Tightening .....	8-1226
GM SPO Group Numbers .....	8-1226

Frame and Underbody (cont.)	
Specifications (cont.)	
Plug Weld Chart .....	8-1227
Welding Chart .....	8-1226
Yield Strength of Different Metals .....	8-1226
Frame Bracket Knock Out Removal .....	3-23, 3-25
Front .....	8-144
Front Drive Axle	
Axle Shaft and Seal Replacement .....	4-57
Description .....	4-95
Diagnosis .....	4-49, 4-50
Electric Motor Actuator Check .....	4-51
Four-Wheel-Drive Diagnosis .....	4-50
Noise Diagnosis .....	4-48
Differential Carrier Assembly Replacement .....	4-62
Differential Carrier Bushing Replacement .....	4-61
Differential Pilot Bearing Replacement .....	4-58
Electric Motor Actuator Replacement .....	4-54
Indicator Switch Replacement .....	4-53
Lubricant Change .....	4-51
Output Shaft, Bearing,	
and Tube Replacement .....	4-56
Shield Replacement .....	4-52
Shift Fork Replacement .....	4-55
Shift Mechanism Inspection .....	4-56
Special Tools .....	4-96
Specifications	
Fastener Tightening .....	4-47
GM SPO Group Numbers .....	4-47
Lubrication .....	4-47
Unit Repair	
Backlash Inspection and Adjustment .....	4-88
Bearings Inspection .....	4-80
Carrier Case Assembly .....	4-85
Cleaning Carrier Components .....	4-79
Differential Assembly Installation .....	4-78
Differential Carrier Final Assembly .....	4-94
Differential Carrier Overhaul .....	4-69
Differential Case Assembly Assemble .....	4-84
Gear Tooth Contact Pattern Check .....	4-90
Pinion Bearing Cup Installation .....	4-80
Pinion Depth Adjustment .....	4-81
Pinion Installation .....	4-83
Ring and Pinion Gear Inspection .....	4-79
Thrust Washers, Shims,	
and Adjuster Sleeves .....	4-80
Vent Hose Replacement .....	4-54
Front Drive Axle Assembly Replacement .....	4-64
Front Drive Shaft	
Pinion, Flange, and Dust Deflector	
Replacement .....	4-59
Front Fender	
Protector Replacement .....	8-727
Front Fender Replacement .....	8-819, 8-822
Front Suspension	
Component Locations .....	3-32
Description	
General .....	3-83
Diagnosis	
Ball Joint Wear Check .....	3-36
Special Tools .....	3-84

- Front Suspension (cont.)  
 Specifications  
   Fastener Tightening ..... 3-30  
   GM SPO Group Numbers ..... 3-31  
 Front Wheel Opening  
   Flare Replacement ..... 8-721  
   Molding Replacement ..... 8-720  
 Fuel Balance Pump  
   Replacement (5.0L, 5.7L) ..... 6-2279  
 Fuel Balance Pump Replacement (7.4L) ..... 6-3282  
 Fuel Feed and Fuel Return Pipe  
   Purge Procedure (6.5L) ..... 6-2716  
 Fuel Filler Tube  
   Replacement (4.3L) ..... 6-1539, 6-1540  
 Fuel Filler Tube Replacement  
   (5.0L, 5.7L) ..... 6-2273, 6-2274  
 Fuel Filler Tube  
   Replacement (7.4L) ..... 6-3276, 6-3277  
 Fuel Filter Element Replacement (4.3L) ..... 6-1519  
 Fuel Filter Element  
   Replacement (5.0L, 5.7L) ..... 6-2242  
 Fuel Filter Element Replacement (6.5L) ..... 6-2676  
 Fuel Filter Element Replacement (7.4L) ..... 6-3245  
 Fuel Filter Replacement,  
   In-Line (4.3L) ..... 6-1518, 6-1519  
 Fuel Filter Replacement,  
   In-Line (5.0L, 5.7L) ..... 6-2241, 6-2242  
 Fuel Filter Replacement, In-Line (7.4L) ..... 6-3244  
 Fuel Heater Replacement (6.5L) ..... 6-2685  
 Fuel Hose/Pipes  
   Assembly Replacement (4.3L) ..... 6-1549,  
     6-1550, 6-1552  
   Assembly Replacement  
     (5.0L, 5.7L) ..... 6-2285, 6-2286,  
     6-2287, 6-2288, 6-2290  
   Assembly Replacement (7.4L) ..... 6-3287, 6-3288,  
     6-3289, 6-3290, 6-3292  
 Fuel Hose/Pipes Assembly  
   Replacement (6.5L) ..... 6-2715  
 Fuel Hose/Pipes Replacement  
   Engine Compartment (4.3L) ..... 6-1546  
   Engine Compartment (5.0L, 5.7L) ..... 6-2282  
   Engine Compartment (7.4L) ..... 6-3285  
 Fuel Injection  
   Pump Installation (6.5L) ..... 6-655  
   Pump Removal (6.5L) ..... 6-596  
 Fuel Injection Pump  
   Clean and Inspect (6.5L) ..... 6-638  
 Fuel Injection Pump Replacement (6.5L) ..... 6-2717  
 Fuel Injector Replacement  
   CSFI (5.0L, 5.7L) ..... 6-2300  
   SFI (7.4L) ..... 6-3300  
 Fuel Injector Replacement (4.3L) ..... 6-1561  
 Fuel Level Sensor Replacement (4.3L) ..... 6-1545  
 Fuel Level Sensor Replacement (5.0L, 5.7L) ..... 6-2281  
 Fuel Level Sensor Replacement (7.4L) ..... 6-3284  
 Fuel Lift Pump Replacement (6.5L) ..... 6-2713  
 Fuel Manager/Filter  
   Replacement (6.5L) ..... 6-2679  
   Water Draining Procedure (6.5L) ..... 6-2681  
 Fuel Meter Body Assembly  
   Replacement (4.3L) ..... 6-1557  
 Fuel Meter Body Assembly Replacement  
   (5.0L, 5.7L) ..... 6-2295  
 Fuel Pressure Connection Valve  
   Replacement (4.3L) ..... 6-1554  
 Fuel Pressure Connection Valve  
   Replacement (5.0L, 5.7L) ..... 6-2294  
 Fuel Pressure Connection Valve  
   Replacement (7.4L) ..... 6-3296  
 Fuel Pressure Regulator Replacement  
   CSFI (4.3L) ..... 6-1556  
   CSFI (5.0L, 5.7L) ..... 6-2298  
   SFI (7.4L) ..... 6-3299  
 Fuel Pressure Relief Procedure (4.3L) ..... 6-1512  
 Fuel Pressure Relief Procedure (5.0L, 5.7L) ..... 6-2235  
 Fuel Pressure Relief Procedure (7.4L) ..... 6-3238  
 Fuel Pump  
   Replacement (7.4L) ..... 6-3280  
 Fuel Pump and Engine Oil Pressure  
   Sensor Replacement (4.3L) ..... 6-1562  
 Fuel Pump and Engine Oil Pressure  
   Sensor Replacement (5.0L, 5.7L) ..... 6-2302  
 Fuel Pump and Engine Oil Pressure  
   Switch Replacement (7.4L) ..... 6-3301  
 Fuel Pump Relay Replacement (4.3L) ..... 6-1561  
 Fuel Pump Relay Replacement (5.0L, 5.7L) ..... 6-2301  
 Fuel Pump Relay Replacement (6.5L) ..... 6-2723  
 Fuel Pump Relay Replacement (7.4L) ..... 6-3301  
 Fuel Pump Replacement (4.3L) ..... 6-1543  
 Fuel Pump Replacement (5.0L, 5.7L) ..... 6-2277  
 Fuel Rail Assembly Replacement (7.4L) ..... 6-3297  
 Fuel Sender Assembly  
   Replacement (5.0L, 5.7L) ..... 6-2276  
   Replacement (6.5L) ..... 6-2711  
   Replacement (7.4L) ..... 6-3278  
   Service (6.5L) ..... 6-2712  
 Fuel Sender Assembly Replacement (4.3L) ..... 6-1542  
 Fuel System  
   Cleaning (5.0L, 5.7L) ..... 6-2292  
 Fuel System Cleaning (4.3L) ..... 6-1553  
 Fuel System Cleaning (6.5L) ..... 6-2715  
 Fuel System Cleaning (7.4L) ..... 6-3294, 6-3295  
 Fuel Tank  
   Draining Procedure (4.3L) ..... 6-1520  
   Draining Procedure (5.0L, 5.7L) ..... 6-2243  
   Draining Procedure (6.5L) ..... 6-2689  
   Draining Procedure (7.4L) ..... 6-3246  
   Pressure Sensor Diagnosis (4.3L) ..... 6-1460  
   Pressure Sensor Replacement (4.3L) ..... 6-1538  
   Pressure Sensor Replacement  
     (5.0L, 5.7L) ..... 6-2271, 6-2272  
   Pressure Sensor  
     Replacement (7.4L) ..... 6-3274, 6-3275  
   Replacement (4.3L) ..... 6-1521, 6-1525,  
     6-1530, 6-1534  
   Replacement (5.0L, 5.7L) ..... 6-2244, 6-2247,  
     6-2251, 6-2255,  
     6-2260, 6-2264, 6-2268  
   Replacement (6.5L) ..... 6-2689, 6-2692, 6-2696,  
     6-2700, 6-2704, 6-2707  
   Replacement (7.4L) ..... 6-3246, 6-3250,  
     6-3253, 6-3258,  
     6-3263, 6-3267, 6-3270  
 Fuse Block Replacement ..... 8-572, 8-573

**G**

- Garage Door Opener
  - Component Location ..... 8-708
  - Component Views ..... 8-709
  - Connector End Views ..... 8-710
  - Description
    - Circuit ..... 8-717
    - General ..... 8-716
    - Operation ..... 8-716
  - Diagnosis
    - Does Not Transmit ..... 8-711
    - Inoperative ..... 8-711
    - System Check ..... 8-711
  - Schematic
    - Icons ..... 8-706
    - References ..... 8-706
    - Schematics ..... 8-707
    - Specification
      - GM SPO Group Numbers ..... 8-706
- Garage Door Opener Module Replacement .... 8-712
- Garage Door Opener Programming -
  - Universal ..... 8-716
- Garnish Molding Replacement
  - Center Pillar ..... 8-1111, 8-1112, 8-1113
  - Liftgate ..... 8-1187
  - Rear Door Upper ..... 8-1114
  - Upper Pillar ..... 8-1114
  - Window ..... 8-1155
  - Windshield Pillar ..... 8-1110
- Generator
  - Bench Check Assembly ..... 6-990
  - Noise Test ..... 6-989
  - Not Operating Properly ..... 6-989
  - Replacement ..... 6-1021, 6-1022
- Glass Surface Cleaning ..... 8-1132
- Glow Plug
  - Relay Replacement (6.5L) ..... 6-2726
- Glow Plug Removal (Damaged) (6.5L) ..... 6-2730
- Glow Plug Replacement - Left Side (6.5L) .... 6-2728
- Glow Plug Replacement - Right Side (6.5L) .... 6-2729
- GM SPO Group Numbers
  - Antilock Brake System ..... 5-167
  - Cruise Control ..... 8-677
- Grille Replacement ..... 8-731, 8-732

**H**

- Handle Replacement
  - Assist ..... 8-1105, 8-1106, 8-1107, 8-1108
  - Cargo Door Lock Rod and Outside ..... 8-1163
  - Endgate ..... 8-1165, 8-1166
  - Left Rear Door Latch Control ..... 8-1164
- Headlamp
  - Aiming ..... 8-130, 8-131
  - Bulb Replacement ..... 8-127
  - Control Module Replacement ..... 8-128
  - Replacement ..... 8-126
  - Switch Replacement ..... 8-144
- Headlights
  - Schematics ..... 8-20
- Headlights - DRL Schematics ..... 8-22
- Headliner Replacement ..... 8-1101, 8-1102, 8-1103, 8-1104

- Headrest Bushing Replacement
  - Bucket Seat ..... 8-1042, 8-1043
- Headrest Replacement
  - Front Seat ..... 8-1039, 8-1040, 8-1041
  - Rear Seat ..... 8-1082, 8-1083, 8-1084, 8-1085, 8-1086, 8-1087
- Headrest Retainer Replacement
  - Front Seat ..... 8-1044, 8-1045
  - Rear Seat ..... 8-1089
- Heated Mirrors
  - Diagnosis
    - Inoperative ..... 8-887
    - Left Inoperative ..... 8-887
    - Right Inoperative ..... 8-888
- Heated Seat Switch Replacement
  - Front ..... 8-1035
  - Rear ..... 8-1037
- Heater
  - Control Switch
    - Auxiliary Replacement (Non-A/C) ..... 1-55, 1-56
  - Core Description (Non-A/C)
    - Heating and Ventilation (Non-A/C) ..... 1-71
  - Core Replacement (Non-A/C) ..... 1-52
  - Description
    - Blower Controls Circuit (Non - A/C) ..... 1-72
    - Controls (Non-A/C) ..... 1-72
  - Description - Auxiliary (Non-A/C) ..... 1-72
  - Heater Core Replacement -
    - Auxiliary (Non-A/C) ..... 1-67
  - Heater Hose Replacement -
    - Auxiliary (Non-A/C) ..... 1-57, 1-61, 1-62
  - Hose Replacement (A/C - Manual) ..... 1-185
  - Hose Replacement
    - (Non-A/C) ..... 1-47, 1-48, 1-49, 1-51
  - Hot Water Bypass Valve (Non-A/C) ..... 1-51
  - System Description (Non-A/C) ..... 1-71
  - Water Valve Replacement (A/C - Manual) .... 1-185
- Heater and Ventilation (Non-A/C)
  - Description
    - Air Distribution System ..... 1-71
- Heater and Ventilation, Non-A/C
  - Specifications
    - Fastener Tightening Specifications ..... 1-5
- Heater and Ventilation (Non-A/C)
  - Description
    - Heater System ..... 1-71
- Heater Blower Controls
  - Component Locations (Non-A/C) ..... 1-10
  - Component Views (Non-A/C) ..... 1-13
  - Connector End Views (Non-A/C) ..... 1-17
  - Diagnosis
    - System Check (Non-A/C) ..... 1-21
  - Schematic
    - Icons (Non-A/C) ..... 1-6
    - Schematic Reference (Non-A/C) ..... 1-6
    - Schematics (Non-A/C) ..... 1-7
- Heater Core Replacement ..... 1-185
- Heater Module Replacement
  - Seats ..... 8-1039
- Heater Replacement
  - Front Seat Back ..... 8-1037
  - Front Seat Cushion ..... 8-1038

- Heater Replacement -
  - Engine (Block) Coolant ..... 6-954
- Heating and Ventilation (Non - A/C)
  - Special Tools ..... 1-72
- Heating and Ventilation (Non A/C)
  - Diagnosis
    - High or Low Temperature Control Effort ..... 1-36
- Heating and Ventilation (Non-A/C)
  - Description
    - Auxiliary Heater ..... 1-72
    - Blower Controls Circuit ..... 1-72
    - Operating Modes ..... 1-72
  - Diagnosis
    - Blower Noise ..... 1-34
    - Defrosting Insufficient ..... 1-31
    - Function Test ..... 1-20
    - Heat Excessive ..... 1-34
    - Heater Output Temperature Check ..... 1-31
    - Heating Insufficient ..... 1-31
    - Improper Air Delivery ..... 1-21
  - Specifications
    - GM SPO Group Numbers ..... 1-5
- Heating Insufficient (A/C - Manual) ..... 1-136
- Hinge Replacement
  - Endgate ..... 8-1160
  - Endgate Window ..... 8-1159
  - Hood ..... 8-813
- Hitch Replacement
  - Trailer ..... 8-1248
- Hood
  - Bumper Replacement ..... 8-811
  - Hinge Replacement ..... 8-813
  - Insulator Replacement ..... 8-818
  - Latch Release Cable Replacement ..... 8-817
  - Latch Replacement ..... 8-815, 8-816
  - Latch Support Replacement ..... 8-816
  - Link Replacement ..... 8-814
  - Replacement ..... 8-812
- Hood Rear Seal Replacement ..... 8-830
- Hook Replacement, Coat ..... 8-1108
- Hook Replacement, Tow ..... 8-1250
- Horn Replacement ..... 8-618
- Horns
  - Component Locations ..... 8-611
  - Component Views ..... 8-612
  - Connector End Views ..... 8-614
  - Description
    - Circuit ..... 8-619
    - General ..... 8-619
  - Diagnosis
    - Horns Always on ..... 8-616
    - Horns Inoperative ..... 8-615
  - Schematic
    - References ..... 8-609
  - Schematics ..... 8-610
  - Specifications
    - Fastener Tightening ..... 8-609
    - GM SPO Group Numbers ..... 8-609
- Hose Replacement -
  - Radiator ..... 6-917, 6-918, 6-919, 6-920
- Hose Routing Diagram
  - Emission (4.3L) ..... 6-1067
  - Emission (5.0L, 5.7L) ..... 6-1658
  - Emission (6.5L) ..... 6-2384
  - Emissions (7.4L) ..... 6-2775
- How to Obtain Replacement Labels ..... 0-21
- How to Use Diagnostic Tables ..... 8-252
- HVAC - Manual
  - Description ..... 1-211
  - Handling of Refrigerant Lines
    - and Fittings ..... 1-211
  - A/C Hose Replacement - Auxiliary ..... 1-171
  - Accumulator Replacement ..... 1-178
  - Air Delivery Schematics ..... 1-81
  - Air Distributor Duct Replacement ..... 1-190
  - Blower Control Schematic ..... 1-76
  - Blower Motor and Fan Assembly
    - Replacement ..... 1-180
  - Blower Motor and Fan Replacement -
    - Auxiliary ..... 1-203, 1-204
  - Blower Motor Relay Replacement ..... 1-179
  - Blower Motor Relay Replacement -
    - Auxiliary ..... 1-206
  - Blower Motor Resistor Replacement ..... 1-180
  - Blower Motor Resistor Replacement -
    - Auxiliary ..... 1-202
  - Blower Switch Replacement ..... 1-187
  - Component Locations ..... 1-85
  - Component Views ..... 1-89
  - Compressor Control Schematic ..... 1-79
  - Compressor Hose Assembly
    - Replacement ..... 1-166, 1-167
  - Compressor Oil Level Check ..... 1-143
  - Compressor Pressure Relief Valve
    - Replacement ..... 1-163, 1-164
  - Compressor Replacement ..... 1-144, 1-145, 1-146
  - Compressor Sealing Washers
    - Replacement ..... 1-164
  - Compressor/Condensor Hose Replacement -
    - Auxiliary ..... 1-194, 1-195, 1-197
  - Condensor Replacement ..... 1-176
  - Condensor Tube Replacement ..... 1-169
  - Connector End Views ..... 1-96
  - Control Assembly Replacement ..... 1-186
  - Control Assembly Replacement -
    - Auxiliary ..... 1-191, 1-192
  - Control Assembly Replacement -
    - Front Auxiliary ..... 1-191
  - Description
    - A/C System ..... 1-208
    - Accumulator ..... 1-213
    - Air Delivery Circuit ..... 1-218
    - Air Distribution System ..... 1-209
    - Blower Controls Circuit ..... 1-216
    - Compressor ..... 1-214
    - Compressor Controls Circuit ..... 1-218
    - Condenser ..... 1-213
    - Control Assembly ..... 1-215
    - Evaporator ..... 1-213
    - Expansion (Orifice) Tube ..... 1-212

## HVAC - Manual (cont.)

## Description (cont.)

Handling R-134a .....	1-211
Heater Core .....	1-214
Heater System .....	1-211
High Pressure Relief Valve .....	1-214
Maintaining Chemical Stability .....	1-212
O-Ring .....	1-216
Refrigeration System .....	1-209
Relays and Switches .....	1-215
Thermal Expansion Valve .....	1-212

## Diagnosis

A/C Clutch Circuit .....	1-106, 1-110
Air Delivery System Check .....	1-104
Air Inlet Valve Actuator Inoperative .....	1-132
Blower Control System Check .....	1-103
CCOT A/C System .....	1-127
Compressor Control System Check .....	1-104
Cooling Insufficient - A/C Inoperative .....	1-137
Defrosting Insufficient .....	1-137
Functional Check .....	1-103
Heating Insufficient .....	1-136
Leak Testing .....	1-125
Mode Valve Actuator Inoperative ....	1-130, 1-131
Noise .....	1-141
Odor .....	1-142
Refrigerant System Checks .....	1-125
System Performance Test .....	1-124
Temperature Actuator Inoperative ...	1-133, 1-134
Vacuum System .....	1-123
Evaporator Core Replacement .....	1-182
Evaporator Core Replacement -	
Auxiliary .....	1-198, 1-200
Evaporator Tube Extension Replacement ....	1-170
Evaporator Tube Replacement .....	1-173
Evaporator Tube Replacement - Auxiliary ....	1-201
Expansion (Orifice) Tube .....	1-174, 1-175
Expansion (Orifice)Tube Replacement -	
Auxiliary .....	1-193
Heater Core Replacement .....	1-185
Heater Hoses Replacement .....	1-185
Heater Water Valve Replacement .....	1-185
Mode Actuator Replacement .....	1-188
Mode Actuator Replacement - Auxiliary .....	1-207
Refrigerant Recovery .....	1-143
Schematic Icons .....	1-75
Special Tools .....	1-220
Specifications	
Compressor .....	1-74
Fastener Tightening .....	1-73
Fitting and Line Tightening .....	1-73
GM SPO Group Numbers .....	1-74
R-134a Metric Fitting Sizes .....	1-74
System Capacities .....	1-74
Temperature Actuator Replacement .....	1-189
Temperature Actuator Replacement -	
Auxiliary .....	1-206
Thermal Expansion Valve Replacement .....	1-174
Thermal Expansion Valve Replacement -	
Auxiliary .....	1-207

## Hydraulic Brake Booster

Description .....	5-91
Diagnosis	

Accumulator Leak-Down Test .....	5-57
----------------------------------	------

## Hydraulic Brake Booster Diagnosis

Noise .....	5-56
Hydraulic Brake Booster Replacement ....	5-78, 5-80, 5-83, 5-85

## Hydraulic Brake System

Component .....	5-9
Schematic	
References .....	5-6

## Hydraulic Brakes

Brake Pedal Travel Gradually Increases .....	5-24
--	------

## Description

Brake Fluid and Brake Fluid Handling .....	5-90
Brake Warning System .....	5-92
Brake Warning System Circuit .....	5-93
Brake Warning System Operation .....	5-92
Combination Valve .....	5-90
Hydraulic Brake Booster .....	5-91
Master Cylinder .....	5-90
Stoplamp Switch .....	5-90
Vacuum Brake Booster .....	5-91

## Diagnosis

Accumulator Leak-Down Test .....	5-57
Brake Fluid Leaks .....	5-50
Brake Hose and Pipe .....	5-51
Brake Pedal Excessive Action .....	5-28
Brake Pedal Excessive Effort .....	5-26
Brake Pedal Excessive Travel .....	5-22
Brake Pedal Travel .....	5-22
Brake System .....	5-16
Brake System Groan at the End of Stop .....	5-49
Brake System Noise	
with Brakes Applied .....	5-46
Brake System Noise	
with Brakes Not Applied .....	5-47
Brake System Slow Release .....	5-35
Brake System Slow Response .....	5-31
Brake System Testing .....	5-14
Brake Warning Indicator Always On .....	5-12
Brake Warning Indicator Inoperative .....	5-13
Brakes Drag .....	5-39
Brakes Self Apply When Turning	
Steering Wheel .....	5-50
Braking Uneven - Side to Side .....	5-40
Braking Uneven Front to Rear .....	5-43
Diagnostic System Check .....	5-14
External Conditions that Affect Brake	
Performance .....	5-14
Hydraulic Booster .....	5-53, 5-54, 5-55
Hydraulic Booster Functional Test .....	5-57
Hydraulic Brake Booster	
Functional Test .....	5-57
Hydraulic Booster Noise .....	5-56
Hydraulic System Fluid Loss .....	5-51
Master Cylinder Diagnosis .....	5-50



- Hydraulic Brakes (cont.)  
 Diagnosis (cont.)  
   Seal Leak ..... 5-58  
   Vacuum Booster ..... 5-52  
 Front Brake Hose Replacement ..... 5-69, 5-70  
 GM SPO Group Numbers ..... 5-6  
 Pipe Replacement ..... 5-68  
 Special Tools ..... 5-94  
 Specifications  
   Brake System ..... 5-5  
   Fastener Tightening ..... 5-5  
 System Bleeding ..... 5-71  
 System Flushing ..... 5-74  
 Vacuum Brake Booster Hose Replacement .... 5-77  
 Vacuum Brake Booster Replacement ..... 5-75  
 Hydraulic Brakes System  
   Schematic  
     Icons ..... 5-6  
 Hydraulic Brake System  
   Component Views ..... 5-10  
   Connector End Views ..... 5-11
- I**
- Identification, Vehicle ..... 0-5  
 Idle Air Control Valve Replacement (4.3L) ..... 6-1495  
 Idle Air Control Valve  
   Replacement (5.0L, 5.7L) ..... 6-2217  
 Idle Air Control Valve Replacement (7.4L) ..... 6-3228  
 Ignition Coil and Ignition Control  
   Module Replacement ..... 6-1041, 6-1042  
 Ignition Lock Cylinder Replacement  
   (Standard Column) ..... 2-98  
 Ignition System  
   Description ..... 6-1050  
 Important, Caution and Notice, Definition of ..... 3  
 Inflator Module Replacement  
   (Standard Column) ..... 2-103  
 Injection Line(s) Replacement (6.5L) ..... 6-2721  
 Injection Nozzle(s) Replacement (6.5L) ..... 6-2722  
 Injection Timing Adjustment (6.5L) ..... 6-2720  
 Instrument Cluster  
   Description  
     Circuit ..... 8-581  
     General ..... 8-579  
     Operation ..... 8-580  
   Lamp Replacement ..... 8-552  
 Instrument Cluster, Gauges and Console  
   Description  
     Gauges ..... 8-576  
     Indicators ..... 8-579  
 Instrument Panel  
   Carrier ..... 8-565  
   Cluster Replacement ..... 8-551  
   Compartment Lamp Replacement ..... 8-150  
   Compartment Replacement ..... 8-557  
   Description ..... 8-575  
   Forward Extension Compartment  
     Replacement ..... 8-561  
   Rotating IP Assembly ..... 8-562  
 Instrument Panel Air Outlet Ducts  
   Replacement (Non-A/C) ..... 1-45  
 Instrument Panel Compartment Lamp  
   Inoperative ..... 8-115  
 Instrument Panel, Gauges and Console  
   Description  
     Audible Warnings ..... 8-583  
     Audible Warnings Circuit ..... 8-583  
   Diagnosis  
     Engine Coolant Temperature Gauge  
       Always Cold ..... 8-522  
     Engine Coolant Temperature Gauge  
       Always Hot ..... 8-523  
     Engine Coolant Temperature Gauge  
       Inaccurate or Inoperative ..... 8-523  
     Engine Oil Pressure Gauge  
       Always High ..... 8-524  
     Engine Oil Pressure Gauge  
       Always Low ..... 8-525, 8-526  
     Engine Oil Pressure Gauge  
       Inaccurate or Inoperative ..... 8-526, 8-527  
     Fasten Safety Belt Indicator Always On ..... 8-533  
     Fasten Safety Belt Indicator Inoperative ..... 8-533  
     Fuel Gauge Always  
       Indicates Empty ..... 8-528, 8-529  
     Fuel Gauge Always Indicates Full ..... 8-530, 8-532  
     Instrument Cluster ..... 8-520  
       System Check ..... 8-520  
     Low Engine Coolant Indicator  
       Always On ..... 8-534  
     Low Engine Coolant Indicator  
       Inoperative ..... 8-535  
     PRNDL Displays Inoperative  
       or Inaccurate ..... 8-536, 8-537  
     PRNDL Logic Input Test ..... 8-538  
     Speedometer and/or Odometer  
       Inoperative ..... 8-539  
     Speedometer Inaccurate  
       (J 38522 Unavailable) ..... 8-538  
     Tachometer Inaccurate ..... 8-540  
     Tachometer Inoperative ..... 8-540, 8-541  
     Volt Gauge Inaccurate or Inoperative ..... 8-532  
   Instrument Cluster Component Locations ..... 8-499  
   Instrument Cluster Component Views ..... 8-504  
   Instrument Cluster Connector End Views ..... 8-514  
   Schematic  
     Audible Warnings Schematic Icons ..... 8-542  
     Audible Warnings Schematic References ..... 8-542  
     Instrument Cluster Schematic Icons ..... 8-491  
     Instrument Cluster Schematic References ..... 8-491  
   Schematics  
     Audible Warnings ..... 8-543  
     Instrument Cluster ..... 8-492  
       Analog ..... 8-492  
   Special Tools ..... 8-584  
   Specifications  
     Fastener Tightening ..... 8-490  
     GM SPO Group Numbers ..... 8-490

Intake Air Resonator Replacement (4.3L) .....	6-1600
Intake Air Resonator Replacement (5.0L, 5.7L) .....	6-2332
Intake Air Resonator Replacement (7.4L) .....	6-3330
Intake Air Temperature Sensor Replacement (4.3L) .....	6-1494
Intake Air Temperature Sensor Replacement (5.0L, 5.7L) .....	6-2215
Intake Air Temperature Sensor Replacement (6.5L) .....	6-2673
Intake Air Temperature Sensor Replacement (7.4L) .....	6-3227
Intake Manifold	
Assemble (4.3L) .....	6-217
Assemble (5.0L, 5.7L) .....	6-433
Assemble (7.4L) .....	6-839
Clean and Inspect (4.3L) .....	6-216
Clean and Inspect (5.0L, 5.7L) .....	6-431
Clean and Inspect (6.5L) .....	6-638
Clean and Inspect (7.4L) .....	6-838
Disassemble (4.3L) .....	6-211
Disassemble (5.0L, 5.7L) .....	6-427
Disassemble (7.4L) .....	6-835
Installation (4.3L) .....	6-247
Installation (5.0L, 5.7L) .....	6-463
Installation (6.5L) .....	6-663, 6-664, 6-665
Installation (7.4L) .....	6-867
Removal (4.3L) .....	6-150
Removal (5.0L, 5.7L) .....	6-364
Removal (6.5L) .....	6-585, 6-586, 6-588
Removal (7.4L) .....	6-771
Replacement (4.3L) .....	6-61, 6-68
Replacement (5.0L, 5.7L) .....	6-310, 6-314
Replacement (6.5L) .....	6-522, 6-525
Replacement (7.4L) .....	6-713, 6-716
Interior Trim	
Specifications	
Fastener Tightening .....	8-1092
GM SPO Group Numbers .....	8-1092

## J

Jack and Tool Stowage .....	8-1145, 8-1147, 8-1149, 8-1151, 8-1153
Jacking and Lifting .....	0-35

## K

Key Coding and Lock Cylinders .....	0-32
Keyless Entry	
Component Location .....	8-591
Component Views .....	8-595
Connector End Views .....	8-596
Description	
Remote Keyless Entry System .....	8-606
Remote Keyless Entry System Circuit .....	8-607
Remote Keyless Entry System Operation .....	8-606
Diagnosis	
Courtesy Lamps Inoperative With Transmitter .....	8-602
Door Lock/Unlock Inoperative .....	8-601
Left Front .....	8-601

Keyless Entry (cont.)	
Diagnosis (cont.)	
Door Lock/Unlock Inoperative with Transmitter .....	8-602
Rear .....	8-602
Door Unlock Inoperative with Transmitter .....	8-600
All .....	8-600
Doors Lock Inoperative with Transmitter .....	8-600
All .....	8-600
Liftgate Window Release Inoperative with Transmitter .....	8-601
Remote Keyless Entry System Does Not Change Customization Modes .....	8-598
Remote Keyless Entry System Does Not Program .....	8-598
Remote Keyless Entry System Inoperative .....	8-597
System Check .....	8-597
Transmitter Test .....	8-599
Door Lock Receiver Replacement .....	8-603
Schematic	
Icons .....	8-585
References .....	8-585
Schematics .....	8-586
Specifications	
GM SPO Group Numbers .....	8-585
Transmitter Programming .....	8-606
Transmitter Replacement .....	8-603
Transmitter Synchronization .....	8-605
Knee Bolster Replacement .....	8-556
Knock Sensor Replacement (4.3L) .....	6-1580
Knock Sensor Replacement (5.0L, 5.7L) .....	6-2313
Knock Sensor Replacement (7.4L) .....	6-3314

## L

Label	
Anti-Theft Labeling .....	0-16
Service Parts ID .....	0-16
Label, Vehicle Certification .....	0-9
Labels	
Replacement, How to Obtain .....	0-21
Latch Replacement	
Door .....	8-1168, 8-1170
Endgate .....	8-1167
Hood .....	8-815, 8-816
Liftgate .....	8-1143
Leaf Spring Replacement	
Rear Suspension .....	3-95, 3-97, 3-99
Leaf Springs Replacement, Front .....	3-64
License Lamp Replacement .....	8-155, 8-156, 8-157, 8-158
Liftgate Garnish Molding Replacement .....	8-1187
Liftgate Latch Replacement .....	8-1143
Liftgate Window	
Replacement .....	8-793
Lifting and Jacking .....	0-35
Lighting Systems .....	8-123
Component Locations .....	8-44
Component Views .....	8-56
Connector End Views .....	8-82

## Lighting Systems (cont.)

## Description

Backup Lights Circuit .....	8-166
Daytime Running Lamps Circuit .....	8-164
Exterior Lights Circuit .....	8-164
Fog Lights Circuit .....	8-164
Interior Lights Circuit .....	8-166
Interior Lights Dimming Circuit .....	8-166

## Diagnosis

Backup Lamps Always On .....	8-96
Backup Lamps Inoperative .....	8-95
Backup Lights System Check .....	8-94
Clearance Lamps Inoperative .....	8-96
Component Illumination Lamps Inoperative .....	8-97
Courtesy Lamp or Dome Lamp Always On .....	8-100
Courtesy Lamp or Dome Lamp Inoperative .....	8-98
Courtesy Lamps Inoperative - Ashtray .....	8-98
Daytime Running Lamps Always On .....	8-101
Daytime Running Lamps Indicator Inoperative .....	8-104
Daytime Running Lamps Inoperative .....	8-102
Daytime Running Lamps On With Park Brake Applied .....	8-113
Daytime Running Lamps System Check .....	8-92
Endgate Identification Lamps Inoperative .....	8-117
Exterior Lights System Check .....	8-93
Fog Lamp Indicator Inoperative .....	8-106
Fog Lamps Always On .....	8-104
Fog Lamps Inoperative - All .....	8-105
Fog Lights System Check .....	8-93
Hazard Lamps Inoperative .....	8-106
Headlamp Inoperative .....	8-109
Left High Beam .....	8-109
Left Low Beam .....	8-107
Right High Beam .....	8-110
Headlamps Inoperative .....	8-110
High Beams .....	8-110, 8-111
Low and High Beams .....	8-112
Low Beams .....	8-108
One Lamp .....	8-111
Right Low Beam .....	8-108
Headlight System Check .....	8-92
High Beam Indicator Inoperative .....	8-113, 8-114
Illuminated Entry Lamps Inoperative .....	8-114
Instrument Panel Compartment Lamp Inoperative .....	8-115
Instrument Panel Lamps Inoperative .....	8-116
Instrument Panel Lamps Inoperative in Parade Mode .....	8-116
Interior Lights Dimming System Check .....	8-95
Interior Lights System Check .....	8-94
License Lamps Inoperative .....	8-118, 8-119
Marker Lamps Inoperative .....	8-119
Park and Tail Lamps Inoperative .....	8-120
Roof Marker Lamps Inoperative .....	8-118
Spotlamp Inoperative .....	8-124

## Lighting Systems (cont.)

## Diagnosis (cont.)

Stop Lamps Always On .....	8-120, 8-121
Stop Lamps Inoperative .....	8-121
All .....	8-121, 8-122
Center High Mounted .....	8-123
Turn Signal Indicators Inoperative .....	8-125
Turn Signal Lamps Inoperative .....	8-124
Left or Right Side .....	8-124
Underhood Lamp Inoperative .....	8-115
Vanity Mirror Lamp Inoperative .....	8-115

## Schematic

Backup Lights .....	8-33
Exterior Lights .....	8-26
Fog Lights .....	8-25
Headlights .....	8-20
Headlights - Daytime Running Lamps .....	8-22
Icons .....	8-19
Interior Lights .....	8-34
Interior Lights Dimming .....	8-41
References .....	8-19

## Special Tools

Special Tools .....	8-166
---------------------	-------

## Specifications

Bulb Usage .....	8-15
Fastener Tightening .....	8-15
GM SPO Group Numbers .....	8-18

## Linkage Replacement

Endgate .....	8-1166
---------------	--------

## Lock Actuator Replacement

Door .....	8-1172
------------	--------

## Lock Cylinders and Key Coding

Lock Cylinders and Key Coding .....	0-32
-------------------------------------	------

## Lock Replacement

Rear Door .....	8-1171
-----------------	--------

## Lock Striker Replacement

Endgate .....	8-1174, 8-1175
---------------	----------------

## Long Trip/Highway Maintenance

Schedule .....	0-62, 0-67
----------------	------------

## Lubricants and Fluids Recommended

Lubricants and Fluids Recommended .....	0-40
---	------

## Luggage Carrier Replacement

Luggage Carrier Replacement .....	8-959, 8-961
-----------------------------------	--------------

## Lumbar Bladder Replacement

Lumbar Bladder Replacement .....	8-1017, 8-1018, 8-1019, 8-1020
----------------------------------	-----------------------------------

## Lumbar Pump Replacement

Lumbar Pump Replacement .....	8-1013
-------------------------------	--------

## Lumbar Switch Replacement

Lumbar Switch Replacement .....	8-1014, 8-1015, 8-1016, 8-1017
---------------------------------	-----------------------------------

## M

## Maintenance Schedule

Long Trip/Highway .....	0-62, 0-67
-------------------------	------------

## Maintenance and Lubrication

Inspections and Other Services .....	0-77
--------------------------------------	------

Maintenance Items .....	0-41
-------------------------	------

Maintenance Schedule .....	0-42, 0-43
----------------------------	------------

Owner Checks and Services .....	0-70
---------------------------------	------

Periodic Maintenance Inspections .....	0-79, 0-80
--	------------

## Maintenance Items

Maintenance Items .....	0-41
-------------------------	------

## Maintenance Lubrication

Explanation of Scheduled Services .....	0-72
---	------

## Maintenance Schedule, Short Trip/City

Maintenance Schedule, Short Trip/City .....	0-45, 0-51
---	------------

## Manifold Absolute Pressure Sensor

Replacement (5.0L, 5.7L) .....	6-2209
--------------------------------	--------

Manifold Absolute Pressure Sensor  
Replacement (7.4L) ..... 6-3222

Manifold Air Pressure Sensor  
Replacement (4.3L) ..... 6-1488

Maintenance Schedule ..... 0-42, 0-43

Manual Transmission - New Venture  
Backup Lamp Switch ..... 7-17, 7-18  
Description and Operation ..... 7-29  
Diagnosis ..... 7-7  
Clutch Spin Down Time ..... 7-7  
Fluid Check ..... 7-8  
Fluid Replacement ..... 7-10, 7-12  
Replacement ..... 7-19, 7-23, 7-26  
Shift Lever ..... 7-14  
Special Tools ..... 7-30  
Specifications  
Fastener Tightening ..... 7-7  
Lubrication ..... 7-7  
Vehicle Speed Sensor ..... 7-14, 7-16

Marker Lamp  
Replacement  
Side ..... 8-136, 8-137

Marker Lamp Replacement  
Roof ..... 8-142

Mass Air Flow Sensor Replacement (4.3L) .... 6-1487

Mass Air Flow Sensor Replacement  
(5.0L, 5.7L) ..... 6-2207

Mass Air Flow Sensor Replacement (6.5L) .... 6-2670

Mass Air Flow Sensor Replacement (7.4L) .... 6-3221

Master Cylinder  
Bench Bleeding ..... 5-65  
Overhaul ..... 5-62  
Replacement ..... 5-59, 5-61  
Reservoir Filling ..... 5-58

Meanings of Abbreviations ..... 0-28

Mirror Face Replacement ..... 8-952

Mirror Replacement  
Door ..... 8-950  
Manual ..... 8-951

Mirrors  
Diagnosis  
Heated Mirror Inoperative ..... 8-887  
Left ..... 8-887  
Heated Mirrors Inoperative ..... 8-887  
Power Mirrors Inoperative in Up and  
Down Direction - Right ..... 8-886  
Power Mirrors Inoperative ..... 8-884  
Power Mirrors Inoperative in Left and  
Right Direction - Right ..... 8-886  
Power Mirrors Inoperative in Up and  
Down Direction - Left ..... 8-885  
Power Mirrors Inoperative in Left and  
Right Direction - Left ..... 8-885  
Heated Mirror Inoperative  
Right ..... 8-888

Mode Actuator Replacement (A/C - Manual) .... 1-188

Molding Replacement  
Center Pillar Garnish ..... 8-1111, 8-1112, 8-1113  
Front Door Body Side ..... 8-722  
Front Wheel Opening ..... 8-720  
Liftgate Garnish ..... 8-1187  
Rear Door Body Side ..... 8-724  
Rear Door Upper Garnish ..... 8-1114

Molding Replacement (cont.)  
Rear Panel ..... 8-730  
Rear Quarter ..... 8-726  
Rear Window Lower ..... 8-1118  
Rear Window Upper ..... 8-1115, 8-1116, 8-1117  
Rocker Panel ..... 8-729  
Upper Pillar Garnish ..... 8-1114  
Window Garnish ..... 8-1155  
Windshield Pillar Garnish ..... 8-1110

Mount Replacement ..... 8-1237, 8-1239, 8-1241,  
8-1243, 8-1245, 8-1247

Body ..... 8-1237, 8-1239, 8-1241,  
8-1243, 8-1245, 8-1247

## N

Notice, Caution and Important, Definition of ..... 3

## O

Oil Fill Tube  
Installation (6.5L) ..... 6-667  
Removal (6.5L) ..... 6-583

Oil Filter  
Adapter and Valve Assembly  
Installation (4.3L) ..... 6-243  
Adapter and Valve Assembly  
Installation (5.0L, 5.7L) ..... 6-456  
Adapter and Valve Assembly  
Installation (6.5L) ..... 6-640  
Adapter and Valve Assembly  
Installation (7.4L) ..... 6-850  
Adapter and Valve Assembly  
Removal (5.0L, 5.7L) ..... 6-370  
Adapter and Valve Assembly  
Removal (6.5L) ..... 6-610  
Adapter and Valve Assembly  
Removal (7.4L) ..... 6-786, 6-787  
Adapter and Valve Assembly  
Replacement (4.3L) ..... 6-111  
Adapter and Valve Assembly  
Replacement (5.0L, 5.7L) ..... 6-340  
Adapter and Valve Assembly  
Replacement (6.5L) ..... 6-566  
Adapter and Valve Assembly  
Replacement (7.4L) ..... 6-745

Oil Filter Adapter and Valve Assembly  
Removal (4.3L) ..... 6-153

Oil Level Indicator and Tube  
Installation (4.3L) ..... 6-254

Oil Level Indicator and Tube  
Installation (5.0L, 5.7L) ..... 6-452

Oil Level Indicator and Tube  
Installation (6.5L) ..... 6-666

Oil Level Indicator and Tube  
Installation (7.4L) ..... 6-885

Oil Level Indicator and Tube Removal (4.3L) ..... 6-145

Oil Level Indicator and Tube  
Removal (5.0L, 5.7L) ..... 6-372

Oil Level Indicator and Tube Removal (6.5L) ..... 6-584

Oil Level Indicator and Tube Removal (7.4L) ..... 6-759

Oil Level Indicator and Tube  
Replacement (4.3L) ..... 6-119

Oil Level Indicator and Tube Replacement (5.0L, 5.7L) .....	6-343
Oil Level Indicator and Tube Replacement (6.5L) .....	6-530
Oil Level Indicator and Tube Replacement (7.4L) .....	6-726
Oil Pan	
Clean and Inspect (4.3L) .....	6-210
Clean and Inspect (5.0L, 5.7L) .....	6-427
Clean and Inspect (6.5L) .....	6-638
Clean and Inspect (7.4L) .....	6-834
Installation (4.3L) .....	6-240
Installation (5.0L, 5.7L) .....	6-454
Installation (6.5L) .....	6-647
Installation (7.4L) .....	6-862
Removal (4.3L) .....	6-154
Removal (5.0L, 5.7L) .....	6-371
Removal (6.5L) .....	6-606
Removal (7.4L) .....	6-777
Replacement (4.3L) .....	6-115
Replacement (5.0L, 5.7L) .....	6-341
Replacement (6.5L) .....	6-568
Replacement (7.4L) .....	6-747
Oil Pump	
Assemble (4.3L) .....	6-208
Assemble (5.0L, 5.7L) .....	6-425
Assemble (6.5L) .....	6-636
Assemble (7.4L) .....	6-832
Clean and Inspect (4.3L) .....	6-207
Clean and Inspect (5.0L, 5.7L) .....	6-424
Clean and Inspect (6.5L) .....	6-635
Clean and Inspect (7.4L) .....	6-831
Disassemble (4.3L) .....	6-205
Disassemble (5.0L, 5.7L) .....	6-422
Disassemble (6.5L) .....	6-633
Disassemble (7.4L) .....	6-829
Drive Installation (6.5L) .....	6-659
Drive Removal (6.5L) .....	6-594
Drive Replacement (6.5L) .....	6-527
Installation (4.3L) .....	6-240
Installation (6.5L) .....	6-647
Oil Pump, Pump Screen and Deflector Installation (5.0L, 5.7L) .....	6-453
Oil Pump, Pump Screen and Deflector Installation (7.4L) .....	6-861
Oil Pump, Pump Screen and Deflector Removal (5.0L, 5.7L) .....	6-372
Oil Pump, Pump Screen and Deflector Removal (7.4L) .....	6-779
Oil Pump, Pump Screen and Deflector Replacement (5.0L, 5.7L) .....	6-344
Removal (4.3L) .....	6-155
Removal (6.5L) .....	6-607
Replacement (4.3L) .....	6-121
Replacement (6.5L) .....	6-571
Replacement (7.4L) .....	6-749
Ordering Information, Special Tools .....	0-4
O-Ring Replacement	
Dual .....	1-165
Outside Air Temperature Sensor Replacement .....	8-810
Overhead Console Replacement .....	8-1109

Oxygen Sensor Replacement, Heated (4.3L) .....	6-1489
Oxygen Sensor Replacement, Heated (5.0L, 5.7L) .....	6-2211
Oxygen Sensor Replacement, Heated (7.4L) .....	6-3223

## P

Paint Coatings	
Environmental Fallout	
Acid Rain .....	8-1224
Paint Gauges .....	8-1225
Paint/Coatings	
Anti-Corrosion Treatment and Repair .....	8-1220
Basecoat/Clearcoat Paint Systems .....	8-1220
Clearcoat Repair without Repainting .....	8-1223
Paint Identification .....	8-1223
Specifications	
Clearcoat Repair - 3M Products .....	8-1218
Clearcoat Repair - Meguiar Products .....	8-1219
Painting	
Clearcoat Thickness .....	8-1225
Rail Dust Damage Repair .....	8-1225
Panel Information and Repair	
Specifications	
Repair Materials .....	8-1191
Flexible Plastic Part .....	8-1191
Rigid Plastic Part .....	8-1191
Panel Repair	
Backing Patch Fabrication .....	8-1202
Gouge or Puncture .....	8-1193
Partial .....	8-1197
Plastic Structure .....	8-1208
Panel Replacement	
Air Inlet Grille .....	8-829
Complete .....	8-1201
Wheelhouse .....	8-831, 8-833
Panels, Plastic .....	8-1192
Park Brake	
Brake Drum Replacement .....	5-162
Cable Replacement .....	5-156, 5-158, 5-159, 5-162
Cable Service/Adjustment .....	5-164
Component Locations .....	5-148
Component Views .....	5-148
Connector End Views .....	5-149
Description	
System .....	5-166
System Circuit Description .....	5-166
Diagnosis	
Diagnostic System Check .....	5-149
Hydraulic Park Brake .....	5-150
PARK BRAKE Indicator Lamp	
Does Not Light .....	5-150
Lever Replacement .....	5-154
Lubrication Procedure .....	5-154
Schematic	
Icons .....	5-146
References .....	5-146
Schematics .....	5-147
Shoe Replacement .....	5-152
Special Tools .....	5-166

## Park Brake (cont.)

- Specifications
  - Fastener Tightening ..... 5-146
  - GM SPO Group Numbers ..... 5-146
- Park/Turn Signal Lamps Replacement ..... 8-138
- Password Learn Procedure (4.3L) ..... 6-1484
- Password Learn Procedure (6.5L) ..... 6-2668
- Password Learn Procedure (7.4L) ..... 6-3219
- Pedal Replacement
  - Accelerator Controls (4.3L) ..... 6-1503
  - Accelerator Controls (5.0L, 5.7L) ..... 6-2225
  - Accelerator Controls (7.4L) ..... 6-3233
- Pickup Box Replacement ..... 8-1180
- Piston
  - Oil Cooling Nozzle Installation (6.5L) ..... 6-639
  - Oil Cooling Nozzle Removal (6.5L) ..... 6-611
- Piston and Connecting Rod
  - Assemble (4.3L) ..... 6-174
- Piston and Connecting Rod
  - Assemble (5.0L, 5.7L) ..... 6-391
- Piston and Connecting Rod
  - Assemble (6.5L) ..... 6-622
- Piston and Connecting Rod
  - Assemble (7.4L) ..... 6-812
- Piston and Connecting Rod
  - Disassemble (4.3L) ..... 6-169
- Piston and Connecting Rod
  - Disassemble (5.0L, 5.7L) ..... 6-386
- Piston and Connecting Rod
  - Disassemble (6.5L) ..... 6-619
- Piston and Connecting Rod
  - Disassemble (7.4L) ..... 6-807
- Piston, Connecting Rod, and Bearing
  - Installation (4.3L) ..... 6-231
- Piston, Connecting Rod, and Bearing
  - Installation (5.0L, 5.7L) ..... 6-447
- Piston, Connecting Rod, and Bearing
  - Installation (6.5L) ..... 6-645
- Piston, Connecting Rod, and Bearing
  - Installation (7.4L) ..... 6-855
- Piston, Connecting Rod, and Bearing
  - Removal (4.3L) ..... 6-160
- Piston, Connecting Rod, and Bearing
  - Removal (5.0L, 5.7L) ..... 6-376
- Piston, Connecting Rod, and Bearing
  - Removal (6.5L) ..... 6-607
- Piston, Connecting Rod, and Bearing
  - Removal (7.4L) ..... 6-782
- Piston, Connecting Rod and Bearings
  - Clean/Inspect (4.3L) ..... 6-170
- Piston, Connecting Rod and Bearings
  - Clean/Inspect (5.0L, 5.7L) ..... 6-387
- Piston, Connecting Rod and Bearings
  - Clean/Inspect (6.5L) ..... 6-619
- Piston, Connecting Rod and Bearings
  - Clean/Inspect (7.4L) ..... 6-808
- Piston Selection (4.3L) ..... 6-173
- Piston Selection (5.0L, 5.7L) ..... 6-390
- Piston Selection (6.5L) ..... 6-621
- Piston Selection (7.4L) ..... 6-811
- Plastic Panel Information and Repair
  - Description
    - Handling Precautions For Plastic ..... 8-1217

## Plastic Panel Information and Repair (cont.)

- Description (cont.)
  - How to Identify Plastic Parts ..... 8-1217
  - Plastic Identification and Refinishing
    - Systems ..... 8-1215
  - Plastic Repair Precautions ..... 8-1217
- Plastic Panels ..... 8-1192
- Plastic Repair Instructions ..... 8-1192
- Plate Replacement
  - Door Sill ..... 8-1093
- Power Accessory Switch Panel Replacement ..... 8-889
- Power Door Lock Switch Replacement ..... 8-891
- Power Mirrors
  - Diagnosis
    - Inoperative ..... 8-884
    - Inoperative in Left and Right Direction ..... 8-885
    - Left ..... 8-885
    - Right ..... 8-886
    - Inoperative in Up and Down Direction ..... 8-886
    - Left ..... 8-885
    - Right ..... 8-886
- Power Steering
  - Bleeding the System ..... 2-32
  - Check Valve Replacement ..... 2-62
  - Checking and Adding Fluid ..... 2-31
  - Control Valve Replacement ..... 2-29, 2-30
  - Cooler Replacement ..... 2-45
  - Description
    - Gear ..... 2-65
    - Pump ..... 2-65
    - System ..... 2-65
  - Diagnosis
    - Excessive Wheel Kickback or Loose
      - Steering ..... 2-15
    - External Leakage Check ..... 2-14
    - Foaming, Milky-Appearing PS Fluid,
      - Low in Level ..... 2-17
    - Gear and Pump Leaks ..... 2-12
    - Groan Noise in Steering Pump ..... 2-18
    - Growl Noise in Steering Pump ..... 2-18
    - Growl Noise Particularly Noticeable at
      - Standstill ..... 2-19
    - Increase in Effort While Turning ..... 2-15
    - Low Oil Pressure Due to Restriction
      - in the Hose ..... 2-17
    - Low Oil Pressure Due to Steering Gear ..... 2-17
    - Low Oil Pressure Due to Steering Pump ..... 2-17
    - Noise ..... 2-18
    - Belt Squeal ..... 2-18
    - Chirp in Steering Pump ..... 2-18
    - Objectionable Hiss ..... 2-14
    - Poor Return of Steering Wheel ..... 2-15
    - Rattle or Chuckle Noise In Steering Gear ..... 2-14
    - Rattle or Knock Noise in Steering Pump ..... 2-19
    - Steering Effort Hard in Both Directions ..... 2-16
    - Swish Noise in Steering Pump ..... 2-19
    - System Test Procedure ..... 2-12
    - Vehicle Leads to One Side or the Other ..... 2-17
    - Wheel Surges or Jerks While Turning ..... 2-16
    - Whine Noise in Steering Pump ..... 2-19

- Power Steering (cont.)**  
 Flushing the System ..... 2-35  
 Gear Disassembled View ..... 2-11  
 Gear Replacement ..... 2-48  
 Hoses Replacement ..... 2-36  
 Housing End Plug Replacement ..... 2-55  
 Pitman Shaft and Side Cover Replacement ..... 2-54  
 Pitman Shaft Over-Center Preload  
 Adjustment ..... 2-51  
 Pitman Shaft Seal Replacement ..... 2-43, 2-44  
 Pitman Shaft Seals and Bearing  
 Replacement ..... 2-62  
 Pump Replacement ..... 2-20, 2-22, 2-23  
 Rack Piston and Worm Shaft Replacement ..... 2-58  
 Reservoir Replacement ..... 2-25, 2-27  
 Special Tools ..... 2-66  
 Specifications  
 Fastener Tightening ..... 2-7  
 General Specifications ..... 2-7  
 GM SPO Group Numbers ..... 2-7  
 Spool Valve Replacement ..... 2-56  
 Thrust Support Replacement ..... 2-63  
 Worm Thrust Bearing Preload Adjustment ..... 2-49
- Power Steering Pump**  
 Disassembled View ..... 2-9, 2-10
- Power Supply Replacement - 12 Volt** ..... 8-554
- Power Window Switch Replacement**  
 Rear Door ..... 8-890
- Power Windows**  
 Diagnosis  
 Inoperative ..... 8-877  
 Left Front ..... 8-874, 8-875  
 Right ..... 8-878  
 Right Front ..... 8-876  
 Power Windows Inoperative ..... 8-872  
 All ..... 8-872
- Powertrain Control Module**  
 Connector End Views (6.5L) ..... 6-2419  
 Description (6.5L) ..... 6-2743  
 Replacement/Programming (6.5L) ..... 6-2667
- Pressure Relief Valve Replacement**  
 Door ..... 8-953
- Programming Auto Learn-PASSLOCK** ..... 8-669
- Programming Transmitter-Keyless Entry** ..... 8-606
- Programming/Replacement**  
 Powertrain Control Module (6.5L) ..... 6-2667  
 Vehicle Control Module (4.3L) ..... 6-1480  
 Vehicle Control Module (5.0L, 5.7L) ..... 6-2200  
 Vehicle Control Module (7.4L) ..... 6-3215
- Propeller Shaft**  
 Center Bearing Replacement ..... 4-21  
 Description ..... 4-27  
 Center Bearing ..... 4-28  
 Universal Joint ..... 4-27
- Diagnosis**  
 Leak at Front Slip Yoke ..... 4-6  
 Noise ..... 4-7  
 Knock or Clunk Noise ..... 4-7  
 Noise ..... 4-7  
 Ping, Snap, or Click Noise ..... 4-7  
 Noise ..... 4-7  
 Scraping Noise ..... 4-7  
 Squeak Noise ..... 4-7
- Propeller Shaft (cont.)**  
 Diagnosis (cont.)  
 Roughness or Vibration ..... 4-6  
 Shudder on Acceleration at Low Speed ..... 4-7  
 Propeller Shaft Replacement, One-Piece ..... 4-13  
 Propeller Shaft Replacement, Three-Piece ..... 4-18  
 Propeller Shaft Replacement, Two-Piece ..... 4-15  
 Special Tools ..... 4-28  
 Specifications  
 Fastener Tightening ..... 4-5  
 GM SPO Group Numbers ..... 4-5  
 Runout Specifications ..... 4-5  
 Universal Joints Replacement ..... 4-22, 4-24  
 Propeller Shaft Replacement ..... 4-8, 4-9, 4-12  
 Propeller Shaft Runout Specifications ..... 0-81  
 Proper Use of Torque Wrenches ..... 0-26
- Protector Replacement**  
 Rear Door ..... 8-1154
- Pump Replacement**  
 Fuel (4.3L) ..... 6-1543  
 Fuel (5.0L, 5.7L) ..... 6-2277  
 Fuel (7.4L) ..... 6-3280  
 Fuel Balance (5.0L, 5.7L) ..... 6-2279  
 Fuel Balance (7.4L) ..... 6-3282  
 Fuel Injection (6.5L) ..... 6-2717  
 Fuel Lift (6.5L) ..... 6-2713
- ## Q
- Quick Connect Fitting Service**  
 Metal Collar (4.3L) ..... 6-1513  
 Metal Collar (5.0L, 5.7L) ..... 6-2236  
 Metal Collar (7.4L) ..... 6-3238  
 Plastic Collar (4.3L) ..... 6-1516  
 Plastic Collar (5.0L, 5.7L) ..... 6-2239  
 Plastic Collar (7.4L) ..... 6-3241
- ## R
- Radiator**  
 Assembly Description ..... 6-960  
 Filler/Pressure Cap Assembly Description ..... 6-960  
 Hose Replacement (Engine Cooling) ... 6-917, 6-918,  
 6-919, 6-920  
 Replacement (Engine Cooling) ..... 6-951  
 Surge Tank Replacement (Engine Cooling) ..... 6-916
- Radiator Support Replacement** ..... 8-824
- Radio Replacement** ..... 8-223
- Radio/Audio**  
 System Check ..... 8-214  
 System Schematic ..... 8-201
- Rear Compartment Opening Weatherstrip**  
 Replacement ..... 8-1188
- Rear Drive Axle**  
 Axle Replacement ..... 4-146, 4-147, 4-149  
 Bearing Cup Replacement ..... 4-153, 4-155
- Description**  
 Rear Axle ..... 4-160
- Diagnosis**  
 Noise ..... 4-106  
 Determining Type of Noise ..... 4-106  
 Wheel Bearing Wear ..... 4-108

- Rear Drive Axle (cont.)
    - Disassembled View ..... 4-103
    - Hub and Drum Assembly Replacement ..... 4-150
    - Hub and Rotor Assembly Replacement ..... 4-152
    - Oil Seal and/or Bearing Replacement ..... 4-112
    - Pinion Oil Seal Replacement ..... 4-117, 4-120, 4-123
    - Special Tools ..... 4-161
    - Specifications
      - Fastener Tightening ..... 4-100
      - GM SPO Group Numbers ..... 4-102
      - Lubrication ..... 4-101
      - Pinion Bearing and Differential
        - Bearing Preload ..... 4-101
      - Spacer and Shim ..... 4-100
    - Unit Repair
      - Axle Housing Inspection ..... 4-133
      - Backlash Adjustment ..... 4-142
      - Bearings Inspection ..... 4-133
      - Depth Adjustment ..... 4-134
      - Determining Total Shim Pack Size ..... 4-137
      - Differential Case Assembly ..... 4-136
      - Differential Inspection ..... 4-133
      - Differential to Axle Housing Assemble ..... 4-140
      - Disassemble ..... 4-128
      - Drive Axle Final Assembly ..... 4-145
      - Gear Tooth Contact Pattern Check ..... 4-143
      - Inspection Before Disassembly ..... 4-127
      - Pinion and Ring Gear Inspection ..... 4-133
      - Pinion Installation ..... 4-138
      - Shims Inspection ..... 4-133
      - Vent Hose Replacement ..... 4-125
      - Wheel Bearing Adjustment ..... 4-157, 4-159
  - Rear Drive Axle - Locking/Limited Slip
    - Special Tools ..... 4-176
    - Specifications
      - Fastener Tightening ..... 4-164
      - Lubrication ..... 4-164
      - Reaction Block, 10 1/2 Inch Axle ..... 4-164
      - Thrust Block Sizes (Locking) ..... 4-164
    - Unit Repair
      - Locking Differential Adjustment ..... 4-174
      - Locking Differential Assemble ..... 4-175
      - Locking Differential Cam Unit Assembly ..... 4-174
      - Locking Differential Cam Unit
        - Disassembly ..... 4-172, 4-173
      - Locking Differential Cleaning
        - and Inspection ..... 4-173
      - Locking Differential Disassemble ..... 4-165, 4-171
  - Rear Fender Replacement
    - Dual Wheel ..... 8-1186
  - Rear Panel Carpet Replacement ..... 8-1119
  - Rear Quarter
    - Molding Replacement ..... 8-726
  - Rear Seat ..... 8-1081
  - Rear Seat Audio Controls Replacement ..... 8-224
  - Rear Suspension
    - Component Locations ..... 3-88
    - Specifications
      - Fastener Tightening ..... 3-87
      - GM SPO Group Numbers ..... 3-87
  - Rear Window
    - Defogger Braided Lead Wire ..... 8-796
    - Replacement ..... 8-782, 8-787
  - Rear Window Upper Molding
    - Replacement ..... 8-1115, 8-1116, 8-1117
  - Rear Window Lower Molding Replacement ..... 8-1118
  - Rearview Mirror
    - Replacement ..... 8-761
    - Support Replacement ..... 8-762
  - Relay
    - Blower Motor Relay Replacement
      - (A/C - Manual) ..... 1-179
    - Blower Motor Replacement - Auxiliary
      - (A/C - Manual) ..... 1-206
    - DRL Relay Replacement ..... 8-146
    - Fuel Pump Relay Replacement (4.3L) ..... 6-1561
    - Fuel Pump Relay Replacement
      - (5.0L, 5.7L) ..... 6-2301
    - Fuel Pump Relay Replacement (6.5L) ..... 6-2723
    - Steering Linkage (Non-Rack & Pinion)
      - Relay Rod Replacement ..... 2-75
  - Release Systems
    - Diagnosis
      - Endgate Window Release
        - System Check ..... 8-1141
      - Schematics ..... 8-1135
    - Replacement ..... 6-994, 6-995
    - Reprogramming Seed and Key-PASSLOCK ..... 8-669
  - Rocker Panel
    - Molding Replacement ..... 8-729
  - Roof
    - Description
      - Luggage Carrier ..... 8-964
    - Specifications
      - Fastener Tightening ..... 8-958
      - GM SPO Group Numbers ..... 8-958
  - RPO Code List ..... 0-16
  - Running Board Replacement ..... 8-1251
- ## S
- Scan Tool
    - Does Not Communicate
      - with Class 2 Data Line ..... 8-381
    - Does Not Communicate with Components ..... 8-380
    - Does Not Communicate
      - with E and C Data Line ..... 8-383
    - Does Not Communicate with EBCM ..... 8-379
    - Does Not Communicate
      - with UART Data Line ..... 8-381
  - Schematic
    - Backup Lights ..... 8-33
    - Exterior Lights ..... 8-26
    - Fog Lights ..... 8-25
    - Headlights - Daytime Running Lamps ..... 8-22
    - Instrument Cluster
      - Analog ..... 8-492
    - Interior Lights ..... 8-34
    - Interior Lights Dimming ..... 8-41



- Schematics
  - Audible Warnings ..... 8-543
  - Auto Trans Shift Lock Control ..... 2-88
  - Steering Wheel/Column - Tilt ..... 2-149
  - Automatic Day-Night Mirror ..... 8-746
  - Auxiliary Battery ..... 8-286
  - Cigar/Auxiliary Outlets ..... 8-306
  - Cruise Control ..... 8-678, 8-680
  - Defogger ..... 8-744
  - Door Locks ..... 8-842
  - Engine Controls (4.3L) ..... 6-1069
  - Engine Controls (5.0L, 5.7L) ..... 6-1660, 6-1676
  - Engine Controls (6.5L) ..... 6-2387
  - Engine Controls (7.4L) ..... 6-2777
- Schematics
  - Garage Door Opener ..... 8-707
  - Ground Distribution ..... 8-287
- Schematics
  - Headlights ..... 8-20
  - Heated Seats ..... 8-972
  - Horns ..... 8-610
  - Keyless Entry ..... 8-586
  - Lumbar Support ..... 8-969
  - Outside Mirrors ..... 8-846
  - Power Distribution ..... 8-277
  - Power Seats ..... 8-968
  - Power Windows ..... 8-839
  - Release Systems ..... 8-1135
  - SIR ..... 9-47
  - Theft Deterrent ..... 8-623
  - Upfitter Provision ..... 8-307
- Seal Replacement
  - Hood Rear ..... 8-830
- Seat Adjuster Motor Replacement
  - Front ..... 8-1034
- Seat Adjuster Track Cover Replacement
  - Front ..... 8-1033
- Seat Back Cover and Pad Replacement
  - Rear ..... 8-1062, 8-1063, 8-1064, 8-1065, 8-1066, 8-1067
- Seat Back Cover Replacement
  - Rear Folding ..... 8-1080
- Seat Back Frame Replacement
  - Rear ..... 8-1075, 8-1076, 8-1078, 8-1079
- Seat Back Heater Replacement
  - Front ..... 8-1037
- Seat Back Replacement
  - Rear ..... 8-1069, 8-1070, 8-1072, 8-1073
- Seat Belt
  - Child Restraint Tether Anchor ..... 9-36
  - Child Seat Tether Outer Hardware Kit ..... 9-35
- Seat Belt Height Adjuster Replacement
  - Front ..... 9-21
- Seat Belt Replacement
  - Front ..... 9-6, 9-8, 9-10, 9-12, 9-14, 9-16, 9-18
  - Intermediate ..... 9-22
  - Rear ..... 9-25, 9-27, 9-28, 9-29, 9-31, 9-33
- Seat Belts
  - Description
    - Seat Belt System ..... 9-42
    - System Operation ..... 9-43
  - Diagnosis
    - Operational and Functional Checks ..... 9-3
    - Seat Belt Service Precautions ..... 9-5
- Seat Belts (cont.)
  - Emergency Locking Retractor Checks ..... 9-5
  - Seat Belt Checks ..... 9-4
  - Specifications
    - Fastener Tightening ..... 9-3
- Seat Cushion Cover and Pad Replacement
  - Rear ..... 8-1058, 8-1059, 8-1060, 8-1061
- Seat Cushion Frame Replacement
  - Rear ..... 8-1053, 8-1054, 8-1055, 8-1056
- Seat Cushion Heater Replacement
  - Front ..... 8-1038
- Seat Replacement
  - Rear ..... 8-1048, 8-1049, 8-1050
  - Rear Bench ..... 8-1052
- Seat Support Cover Replacement
  - Rear Folding ..... 8-1081
- Seats
  - Adjuster Replacement
    - Front ..... 8-1027, 8-1030, 8-1031, 8-1032
  - Armrest Replacement ..... 8-1081
  - Front Seat ..... 8-1046, 8-1047
  - Description
    - Heated Seats ..... 8-1091
    - Heated Seats Circuit ..... 8-1091
    - Power Lumbar Circuit ..... 8-1091
    - Power Lumbar Operation ..... 8-1090
    - Power Seat ..... 8-1090
    - Systems Circuit Description ..... 8-1090
    - Power Seat Systems Operation ..... 8-1090
  - Diagnosis
    - Hard to Move Forward and Rearward ..... 8-990
    - Heated Seat Inoperative ..... 8-988
    - Heated Seats System Check ..... 8-983
    - Lumbar Support Does Not Deflate ..... 8-986
    - Lumbar Support Does Not Inflate ..... 8-987
    - Lumbar Support System Check ..... 8-983
    - Manual Seat Adjuster Does Not Lock ..... 8-990
    - Manual Seat Adjuster Does Not Unlock ..... 8-990
    - Power Seat Adjuster ..... 8-983
    - Power Seat Adjuster Does Not Move Horizontally ..... 8-984
    - Power Seat Adjuster Does Not Move Vertically ..... 8-984
    - Power Seat Adjuster Horizontal Chuck or Looseness ..... 8-984
    - Power Seat Adjuster Inoperative ..... 8-984
    - Power Seat Does Not Move Forward/Rearward ..... 8-985
    - Power Seat Does Not Tilt Forward ..... 8-985
    - Power Seat Does Not Tilt Rearward ..... 8-986
    - Power Seat Systems Check ..... 8-983
- Headrest Bushing Replacement
  - Bucket Seat ..... 8-1042, 8-1043
- Headrest Replacement
  - Front Seat ..... 8-1039, 8-1040, 8-1041
  - Rear Seat ..... 8-1082, 8-1083, 8-1084, 8-1085, 8-1086, 8-1087
- Headrest Retainer Replacement
  - Front Seat ..... 8-1044, 8-1045
  - Rear Seat ..... 8-1089

## Seats (cont.)

Heated Seat Switch Replacement	
Front .....	8-1035
Rear .....	8-1037
Heater Module Replacement .....	8-1039
Lumbar Bladder Replacement .....	8-1017, 8-1018, 8-1019, 8-1020
Lumbar Pump Replacement .....	8-1013
Lumbar Switch Replacement .....	8-1014, 8-1015, 8-1016, 8-1017
Power Seat Systems Component Views .....	8-977
Power Seat Systems Components .....	8-974
Power Seat Systems Connector	
End Views .....	8-980
Schematic	
Power Seat Systems Schematic Icons .....	8-967
Power Seat Systems Schematic	
References .....	8-967
Schematics	
Heated Seats .....	8-972
Lumbar Support .....	8-969
Power Seats .....	8-968
Seat Back Cover and Pad Replacement	
Front .....	8-1003, 8-1004, 8-1005
Seat Back Frame Replacement	
Front .....	8-1006, 8-1007, 8-1008
Seat Back Recliner Handle Replacement	
Front .....	8-1009, 8-1011, 8-1013
Seat Cushion Frame Replacement	
Front .....	8-995, 8-997, 8-999
Seat Cushion Trim Cover and Pad	
Replacement .....	8-1000, 8-1001, 8-1002
Seat Replacement	
Bench .....	8-991
Front Bucket .....	8-992
Split Bench .....	8-992
Seat Riser Replacement .....	8-1023, 8-1024, 8-1025, 8-1026
Seat Riser Trim Cover Replacement	
Power .....	8-1021, 8-1022
Special Tools .....	8-1091
Specifications	
Fastener Tightening .....	8-965
GM SPO Group Numbers .....	8-965
Secondary Air Injection	
Check Valve/Pipe Replacement	
(5.0L, 5.7L) .....	6-2315
Pump Replacement (5.0L, 5.7L) .....	6-2315
Pump Replacement (7.4L) .....	6-3315
Service Parts ID Label .....	0-16
Sheet Metal Support Replacement .....	8-829
Shield Replacement	
Engine Protection .....	8-1250
Wheelhouse Splash .....	8-835
Shock Absorber Replacement	
Rear Suspension .....	3-92, 3-93
Shock Absorber Replacement,	
Front .....	3-77, 3-78, 3-79
Short Trip/City Maintenance Schedule .....	0-45, 0-51
Side Marker Lamp Replacement .....	8-160

## SIR

AIR BAG Warning Lamp Replacement .....	9-134
Coil Centering (Standard Column) .....	2-139
Component Views .....	9-51
Components .....	9-49
Connector End Views .....	9-52, 9-54
Description	
Special Tools .....	9-156
System Component Description	
and Definitions .....	9-153
System Operation .....	9-152
Diagnosis	
AIR BAG Warning Lamp	
Comes On Steady .....	9-61
AIR BAG Warning Lamp	
Does Not Come On .....	9-66
Diagnostic System Check .....	9-56
General Diagnosis .....	9-55
Intermittents and Poor Connections .....	9-55
SDM Integrity Check .....	9-59
Disabling the SIR System .....	9-125
Enabling the SIR System .....	9-126
General Service Instructions .....	9-127
Inflatable Restraint Coil Centering	
(Tilt Column) .....	2-200
Inflatable Restraint Front End Discriminating	
Sensor Replacement .....	9-130
Inflatable Restraint Instrument Panel Inflator	
Module Replacement .....	9-129
Inflatable Restraint IP Module Switch	
Replacement .....	9-133
Inflatable Restraint Sensing and Diagnostic	
Module Replacement .....	9-128
Inflatable Restraint Steering Wheel Module	
Coil Replacement .....	9-134
Inflatable Restraint Steering Wheel Module	
Replacement .....	9-134
Inflator Module Handling, Shipping,	
and Scrapping .....	9-140
Repairs and Inspections Required	
After an Accident .....	9-139
Schematics .....	9-47
Icons .....	9-46
References .....	9-46
Service Precautions .....	9-125
Special Tools .....	9-157
Specifications	
Fastener Tightening .....	9-44
GM SPO Group Numbers .....	9-45
Scan Tool Data Definitions .....	9-45
Scan Tool Data List .....	9-44
Wiring Repair .....	9-135
Solenoid	
Control and Shift Solenoids Replacement	
Automatic Transmission (4L60-E) .....	7-180
Power Steering Solenoid Actuator,	
Discharge Fitting Replacement .....	2-250
Torque Converter Clutch PWM Solenoid,	
TCC Solenoid, and Wiring Harness	
Automatic Transmission (4L60-E) .....	7-185

- Spare Tire Carrier Replacement ..... 3-112, 3-113
- Spark Plug
  - Replacement ..... 6-1026
  - Visual Diagnosis ..... 6-992
  - Wire Harness Diagnosis ..... 6-994
- Speaker Replacement ..... 8-230, 8-231, 8-232, 8-234, 8-235
- Special Tools
  - Antilock Brake System ..... 5-267
  - Automatic Transmission (4L60-E) ..... 7-246
  - Automatic Transmission (4L80-E) ..... 7-547
  - Body Front End ..... 8-836
  - Clutch ..... 7-566
  - Disc Brakes ..... 5-126
  - Doors ..... 8-957
  - Engine Controls (4.3L) ..... 6-1635
  - Engine Controls (5.0L, 5.7L) ..... 6-2369
  - Engine Controls (6.5L) ..... 6-2759
  - Engine Controls (7.4L) ..... 6-3362
  - Engine Cooling ..... 6-962
  - Engine Electrical ..... 6-1051
  - Engine Mechanical (4.3L) ..... 6-265
  - Engine Mechanical (5.0L, 5.7L) ..... 6-481
  - Engine Mechanical (6.5L) ..... 6-674
  - Engine Mechanical (7.4L) ..... 6-894
  - Front Drive Axle ..... 4-96
  - Front Suspension ..... 3-84
  - General Information ..... 0-38
  - Heating and Ventilation (Non - A/C) ..... 1-72
  - HVAC - Manual ..... 1-220
  - Hydraulic Brakes ..... 5-94
  - Instrument Panel, Gauges and Console ..... 8-584
  - Lighting Systems ..... 8-166
  - Manual Transmission
    - New Venture ..... 7-30
  - Park Brake ..... 5-166
  - Power Steering ..... 2-66
  - Propeller Shaft ..... 4-28
  - Rear Drive Axle ..... 4-161
  - Rear Drive Axle - Locking/Limited Slip ..... 4-176
  - Seats ..... 8-1091
  - SIR ..... 9-157
  - Stationary Windows ..... 8-799
  - Steering Linkage (Non-Rack & Pinion) ..... 2-82
  - Steering Wheel/Column - Standard ..... 2-144
  - Steering Wheel/Column - Tilt ..... 2-221
  - Theft Deterrent ..... 8-676
  - Tires and Wheels ..... 3-120
  - Transfer Case ..... 4-236
  - Transfer Case (NVG 246-NP8) ..... 4-329
  - Vacuum Pump ..... 6-3381
  - Variable Effort Steering ..... 2-254
  - Wheel Alignment ..... 3-29
  - Wheel Drive Shafts ..... 4-46
- Special Tools Ordering Information ..... 0-4
- Specifications
  - Line Pressure
    - Automatic Transmission ..... 7-263
    - 4L80-E ..... 7-263
- Specifications ..... 8-677
- 7.4L ..... 6-679
- Approximate Fluid Capacities ..... 0-39
- Battery Temperature vs Minimum Voltage ..... 6-964
- Battery Temperature vs Voltage Drop ..... 6-964
- Specifications (cont.)
  - Battery Usage ..... 6-963
  - Brake System
    - Hydraulic Brakes ..... 5-5
  - Caliper Wear Shim
  - Disc Brakes ..... 5-95
  - Component
    - Drum Brakes ..... 5-127
  - Component Resistance
    - Automatic Transmission (4L80-E) ..... 7-263
  - Components
    - Disc Brakes ..... 5-95
  - Compressor
    - HVAC - Manual ..... 1-74
  - Diagnostic Trouble Code (DTC) Identification
    - Automatic Transmission (4L60-E) ..... 7-37
    - Automatic Transmission (4L80-E) ... 7-255, 7-258
  - Drive Belt Tension ..... 0-39
  - DTC List
    - Engine Controls (4.3L) ..... 6-1061, 6-1062, 6-1065
    - Engine Controls
      - (5.0L, 5.7L) ..... 6-1648, 6-1649, 6-1653
    - Engine Controls (6.5L) ..... 6-2380
    - Engine Controls (7.4L) ..... 6-2770, 6-2771
    - Engine Mechanical (4.3L) ..... 6-26
    - Engine Mechanical (5.0L, 5.7L) ..... 6-271, 6-273
    - Fastener Tightening ..... 1-5
    - 4.3L ..... 6-23
    - 5.0L, 5.7L ..... 6-269
    - 6.5L ..... 6-485
    - Antilock Brake System ..... 5-167
    - Automatic Transmission ..... 7-32
    - 4L60-E ..... 7-32
    - 4L80-E ..... 7-249, 7-250
    - Body Rear End ..... 8-1133
    - Bumpers ..... 8-800
    - Clutch ..... 7-550
    - Cruise Control ..... 8-677
    - Disc Brakes ..... 5-95
    - Doors ..... 8-837
    - Drum Brakes ..... 5-127
    - Engine Controls (4.3L) ..... 6-1052
    - Engine Controls (5.0L, 5.7L) ..... 6-1639
    - Engine Controls (6.5L) ..... 6-2374
    - Engine Controls (7.4L) ..... 6-2761
    - Engine Cooling ..... 6-896
    - Engine Electrical ..... 6-963
    - Engine Exhaust ..... 6-3382
    - Entertainment ..... 8-200
    - Exterior Trim ..... 8-718
    - Frame and Underbody ..... 8-1226
    - Front Drive Axle ..... 4-47
    - Front Suspension ..... 3-30
    - Horns ..... 8-609
    - HVAC - Manual ..... 1-73
    - Hydraulic Brakes ..... 5-5
    - Instrument Panel, Gauges and Console .... 8-490
    - Interior Trim ..... 8-1092
    - Lighting Systems ..... 8-15
    - Manual Transmission ..... 7-7

## Specifications (cont.)

New Venture .....	7-7
Park Brake .....	5-146
Power Steering .....	2-7
Propeller Shaft .....	4-5
Rear Drive Axle .....	4-100
Rear Drive Axle - Locking/Limited Slip Rear Axle .....	4-164
Rear Suspension .....	3-87
Roof .....	8-958
Seat Belts .....	9-3
Seats .....	8-965
SIR .....	9-44
Steering Linkage (Non-Rack & Pinion) .....	2-67
Steering Wheel/Column - Standard .....	2-83
Steering Wheel/Column - Tilt .....	2-145
Tires and Wheels .....	3-104
Transfer Case .....	4-177
Transfer Case - NVG 246-NP8 .....	4-237
Turbocharger .....	6-3366
Vacuum Pump .....	6-3378
Variable Effort Steering .....	2-222
Wheel Alignment .....	3-18
Wheel Drive Shafts .....	4-29
Wipers/Washer System .....	8-167
Fastener Tightening Specifications	
Body Front End .....	8-809
Fitting and Line Tightening	
HVAC - Manual .....	1-73
Fluid Capacities	
Transfer Case .....	4-177
Transfer Case - NVG 246-NP8 .....	4-237
Fluid Capacity	
Automatic Transmission .....	7-39
4L60-E .....	7-39
4L80-E .....	7-261
Fuel System	
Engine Controls (6.5L) .....	6-2383
General	
Automatic Transmission (4L80-E) .....	7-262
General Specifications	
Power Steering .....	2-7
GM SPO Group Number	
Engine Controls (6.5L) .....	6-2383
Stationary Windows .....	8-743
Variable Effort Steering .....	2-222
GM SPO Group Numbers	
Body Front End .....	8-809
Body Rear End .....	8-1133
Bumpers .....	8-800
Disc Brakes .....	5-95
Doors .....	8-837
Drum Brakes .....	5-127
Engine Controls (4.3L) .....	6-1066
Engine Controls (5.0L, 5.7L) .....	6-1657
Engine Controls (7.4L) .....	6-2774
Engine Cooling .....	6-896
Engine Exhaust .....	6-3382
Engine Mechanical (4.3L) .....	6-28

## Specifications (cont.)

## GM SPO Group Numbers (cont.)

Engine Mechanical (5.0L, 5.7L) .....	6-276
Engine Mechanical (6.5L) .....	6-490
Entertainment .....	8-200
Exterior Trim .....	8-718
Frame and Underbody .....	8-1226
Front Drive Axle .....	4-47
Front Suspension .....	3-31
Garage Door Opener .....	8-706
Heating and Ventilation (Non-A/C) .....	1-5
Horns .....	8-609
HVAC - Manual .....	1-74
Hydraulic Brakes .....	5-6
Instrument Panel, Gauges and Console ....	8-490
Interior Trim .....	8-1092
Keyless Entry .....	8-585
Lighting Systems .....	8-18
Park Brake .....	5-146
Power Steering .....	2-7
Propeller Shaft .....	4-5
Rear Drive Axle .....	4-102
Rear Suspension .....	3-87
Roof .....	8-958
Seats .....	8-965
SIR .....	9-45
Steering Linkage (Non-Rack & Pinion) .....	2-67
Steering Wheel/Column - Standard .....	2-83
Steering Wheel/Column - Tilt .....	2-145
Theft Deterrent .....	8-622
Tires and Wheels .....	3-104
Vacuum Pump .....	6-3378
Wheel Alignment .....	3-18
Heater and Ventilation, Non-A/C .....	1-5
Lubrication	
Front Drive Axle .....	4-47
Manual Transmission (New Venture) .....	7-7
Rear Drive Axle .....	4-101
Rear Drive Axle - Locking/Limited Slip .....	4-164
Pinion Bearing and Differential Bearing Preload	
Rear Drive Axle .....	4-101
Propeller Shaft Runout .....	0-81
Range Reference	
Automatic Transmission (4L80-E) .....	7-261
Range Reference Table	
Automatic Transmission (4L60-E) .....	7-39
Range Signal	
Automatic Transmission (4L80-E) .....	7-262
Reaction Block, 10 1/2 Inch Axle	
Rear Drive Axle - Locking/Limited Slip .....	4-164
Recommend Fluids and Lubricants .....	0-40
RPM vs Hertz	
Engine Controls (6.5L) .....	6-2373
Runout Specifications	
Propeller Shaft .....	4-5
Scan Tool Data Definitions	
Automatic Transmission (4L60-E) .....	7-34
Engine Controls (4.3L) .....	6-1056
Engine Controls (5.0L, 5.7L) .....	6-1643
Engine Controls (6.5L) .....	6-2377

## Specifications (cont.)

## Scan Tool Data Definitions (cont.)

Engine Controls (7.4L) .....	6-2765
SIR .....	9-45
Transfer Case - NVG 246-NP8 .....	4-239

## Scan Tool Data Definitions

Theft Deterrent .....	8-620
-----------------------	-------

## Scan Tool Data List

Engine Controls (4.3L) .....	6-1053
Engine Controls (5.0L, 5.7L) .....	6-1640
Engine Controls (6.5L) .....	6-2374
Engine Controls (7.4L) .....	6-2762
SIR .....	9-44
Theft Deterrent .....	8-620
Transfer Case - NVG 246-NP8 .....	4-237

## Scan Tool Data Value Examples

Automatic Transmission (4L60-E) .....	7-33
---------------------------------------	------

## Sealers, Adhesives, and Lubricants

Engine Mechanical (4.3L) .....	6-30
Engine Mechanical (5.0L, 5.7L) .....	6-279
Engine Mechanical (6.5L) .....	6-491
Engine Mechanical (7.4L) .....	6-682

## Fastener Tightening

Engine Mechanical (7.4L) .....	6-677
--------------------------------	-------

## Shift Solenoid Valve State and Gear Ratio

Automatic Transmission (4L60-E) .....	7-40
Automatic Transmission (4L80-E) .....	7-261

## Shift Speed

Automatic Transmission (4L80-E) .....	7-262
---------------------------------------	-------

## Shift Speed Table

Automatic Transmission (4L60-E) .....	7-40
---------------------------------------	------

## Spacer and Shim

Rear Drive Axle .....	4-100
-----------------------	-------

## Spark Plug Wire Resistance

.....	6-965
-------	-------

## Starter Motor Usage

.....	6-964
-------	-------

## System Capacities

HVAC - Manual .....	1-74
---------------------	------

## Tech 2 Data Value Examples

Automatic Transmission (4L80-E) ...	7-250, 7-252
-------------------------------------	--------------

## Temperature vs Resistance

Automatic Transmission (4L60-E) .....	7-32
Automatic Transmission (4L80-E) .....	7-249
Engine Control (5.0L, 5.7L) .....	6-1639
Engine Controls (4.3L) .....	6-1052
Engine Controls (6.5L) .....	6-2373
Engine Controls (7.4L) .....	6-2761

## Thrust Block Sizes (Locking)

Rear Drive Axle - Locking/Limited Slip .....	4-164
--	-------

## Tire and Wheel Runout

.....	0-81
-------	------

## Tire Inflation Pressure

.....	0-40
-------	------

## Transmission Scan Tool Data Definitions

Automatic Transmission (4L80-E) .....	7-253
---------------------------------------	-------

## Trim Height

Trim Height Specifications .....	3-3
----------------------------------	-----

## Vacuum Pump

.....	6-3378
-------	--------

## Wheel Alignment

.....	3-18
-------	------

## Spotlamp Bulb Replacement

.....	8-141
-------	-------

## Spotlamp Replacement

.....	8-139
-------	-------

## Spotlamp Travel Adjustment

.....	8-141
-------	-------

## Spring

## Bushing Replacement

Rear Suspension .....	3-94
-----------------------	------

## Rear Suspension

Leaf Spring Replacement .....	3-95, 3-97, 3-99
Shackle Replacement .....	3-100, 3-101

## Spring Replacement, Front Leaf

.....	3-64
-------	------

## Springs Replacement, Front Coil

.....	3-62
-------	------

## Squeaks and Rattles

## Noise Repair

Rear of Vehicle .....	8-742
-----------------------	-------

## Stabilizer Shaft

Link Replacement .....	3-40, 3-41, 3-42
------------------------	------------------

## Stabilizer Shaft Link Bracket Replacement

Rear Suspension .....	3-91
-----------------------	------

## Stabilizer Shaft Replacement

Rear Suspension .....	3-91
-----------------------	------

## Stains Removal

.....	8-1132
-------	--------

## Starter

## Diagnosis

Motor Noise Diagnosis .....	6-982, 6-983
-----------------------------	--------------

No Load Test .....	6-983
--------------------	-------

Solenoid Clicks, Engine Does Not Crank .....	6-981
--	-------

Solenoid Does Not Click .....	6-978
-------------------------------	-------

## Starter Motor

.....	6-994, 6-995
-------	--------------

Inspection .....	6-1007, 6-1010
------------------	----------------

Overhaul .....	6-996, 6-999
----------------	--------------

## Starter Motor Usage

.....	6-964
-------	-------

## Starter Motor

Pinion Clearance Check .....	6-1011
------------------------------	--------

## Starting System

Circuit Description .....	6-1044
---------------------------	--------

Operation .....	6-1044
-----------------	--------

## Starting System Check

.....	6-978
-------	-------

## Stationary Windows

## Body Side Stationary Window

Replacement .....	8-771
-------------------	-------

Component Locations .....	8-747
---------------------------	-------

Component Views .....	8-749
-----------------------	-------

Connector End Views .....	8-752
---------------------------	-------

## Description

Adhesive Service Kit Description .....	8-796
--	-------

Automatic Day-Night Mirrors Circuit .....	8-797
---	-------

Compass Calibration .....	8-798
---------------------------	-------

Compass Variance Set-Up .....	8-798
-------------------------------	-------

Extended Method Description .....	8-797
-----------------------------------	-------

General .....	8-797
---------------	-------

Magnetic Field .....	8-798
----------------------	-------

Mirror Function .....	8-799
-----------------------	-------

Rear Window Defogger Circuit .....	8-797
------------------------------------	-------

Short Method Description .....	8-796
--------------------------------	-------

## Diagnosis

## Automatic Day-Night Mirror

Does Not Change .....	8-758
-----------------------	-------

## Automatic Day-Night Mirror

Inoperative in Reverse .....	8-759
------------------------------	-------

Automatic Day-Night Mirrors Inoperative ...	8-758
---	-------

## Automatic Day-Night Mirrors

System Check .....	8-755, 8-756
--------------------	--------------

## Stationary Windows (cont.)

- Diagnosis (cont.)
  - Defogger Grid Lines ..... 8-757
  - Defogger Inoperative - Rear ..... 8-756
  - Defogger Lamp Switch
    - Inoperative - Rear ..... 8-757
  - Defogger System Check ..... 8-755
  - Mirrors - Compass Inoperative
    - or Inaccurate ..... 8-760
  - Outside Automatic Day-Night Mirrors
    - Inoperative ..... 8-759
- Grid Line Repair ..... 8-796
- Hinged Body Side Window Replacement ..... 8-782
- Quarter Window Replacement ..... 8-777
- Schematic
  - Automatic Day-Night Mirror ..... 8-746
  - References ..... 8-743
- Schematics
  - Defogger ..... 8-744
- Special Tools ..... 8-799
- Specifications
  - GM SPO Group Numbers ..... 8-743
- Window Polishing ..... 8-794
- Steering Knuckle Replacement ..... 3-51, 3-54
- Steering Linkage (Non-Rack & Pinion)
  - Description
    - Linkage ..... 2-81
  - Drag Link Replacement ..... 2-76
  - Idle Arm Replacement ..... 2-74
  - Inspection ..... 2-68
  - Pitman Arm Replacement ..... 2-78, 2-79, 2-80
  - Special Tools ..... 2-82
  - Specifications
    - Fastener Tightening ..... 2-67
    - GM SPO Group Numbers ..... 2-67
  - Steering Damper Replacement ..... 2-77
  - Tie Rod Adjuster Replacement ..... 2-73
  - Tie Rod Replacement ..... 2-70, 2-72
- Steering Wheel
  - Description
    - Wheel and Column (Standard Column) ..... 2-144
- Steering Wheel Replacement
  - (Standard Column) ..... 2-106
  - Intermediate Shaft Replacement ..... 2-165
- Steering Wheel/Column - Standard
  - Column Replacement ..... 2-109, 2-112
  - Component Locations ..... 2-89
  - Component Views ..... 2-90
  - Connector End Views ..... 2-91
  - Description
    - Auto Trans Shift Lock Control ..... 2-144
    - Auto Trans Shift Lock Control Circuit ..... 2-144
    - Ignition Lock System ..... 2-144
    - Wheel and Column ..... 2-144
  - Diagnosis
    - Hazard Switch Cannot Be Turned Off ..... 2-97
    - Hazard Switch Does Not Stay On ..... 2-97
    - High Lock Effort ..... 2-93
    - High Steering Shaft Effort ..... 2-95
    - Ignition Switch Does Not Turn ..... 2-97
    - Ignition Switch Electrical System
      - Does Not Operate ..... 2-97

## Steering Wheel/Column - Standard (cont.)

- Diagnosis (cont.)
  - Key Cannot Be Removed in the
    - Off Lock Position ..... 2-92
  - Lash in Steering Column ..... 2-95
  - Lock System Does Not Lock ..... 2-92
  - Lock System Does Not Unlock ..... 2-91
  - Lock System Sticks in Start ..... 2-92
  - Loose Steering Wheel ..... 2-96
  - Noise in Steering Column ..... 2-95
  - Turn Signal Difficult to Operate ..... 2-97
  - Turn Signal Does Not Cancel ..... 2-96
- Disassembled View ..... 2-84, 2-86
- Horn Pad Replacement ..... 2-105
- Horn Switch Replacement ..... 2-105
- Ignition Lock Cylinder Replacement ..... 2-98
- Inflatable Restraint Steering Wheel
  - Module Coil - Disassemble ..... 2-123, 2-124
- Inflator Module Replacement ..... 2-103
- Intermediate Shaft Replacement ..... 2-107
- Multifunction Turn Signal Hazard
  - Switch Replacement ..... 2-100
- Off-Vehicle Repair
  - Auto Trans Shift Lock Control -
    - Assemble ..... 2-130
- Schematic
  - Schematic References ..... 2-87
- Shift Lever Replacement ..... 2-102
- Shift Lever Seal Replacement ..... 2-103
- Special Tools ..... 2-144
- Specifications
  - Fastener Tightening ..... 2-83
  - GM SPO Group Numbers ..... 2-83
- Steering Column Seal Replacement ..... 2-114, 2-116
- Unit Repair
  - Accident Damage ..... 2-139
  - Electronic Column Lock Module -
    - Assemble ..... 2-134
  - Electronic Column Lock Module -
    - Disassemble ..... 2-133, 2-134
  - Housing - Assemble ..... 2-136, 2-137
  - Ignition and Key Alarm Switch
    - Assembly - Assemble ..... 2-128, 2-129
  - Ignition and Key Alarm Switch
    - Assembly - Disassemble ..... 2-127, 2-128
  - Inflatable Restraint Coil Centering ..... 2-139
  - Linear Shift Assembly - Assemble ..... 2-132
  - Linear Shift Assembly - Disassemble ..... 2-131
  - Shift Lever - Assemble ..... 2-123
  - Shift Lever - Disassemble ..... 2-122
  - Steering Column Shrouds -
    - Assemble ..... 2-120, 2-121
  - Steering Column Shrouds -
    - Disassemble ..... 2-117, 2-118
  - Steering Shaft, Lower Bearing,
    - Jacket - Assemble ..... 2-141, 2-143
  - Steering Shaft, Lower Bearing,
    - Jacket - Disassemble ..... 2-140, 2-141
  - Turn Signal and Multifunction Switch
    - Assembly - Assemble ..... 2-126

- Steering Wheel/Column - Standard (cont.)  
 Unit Repair (cont.)  
   Turn Signal and Multifunction Switch  
     Assembly - Disassemble ..... 2-124, 2-125
- Steering Wheel/Column - Tilt  
 Component Locations ..... 2-150  
 Description  
   Auto Trans Shift Lock Control ..... 2-221  
   Auto Trans Shift Lock Control Circuit ..... 2-221  
   Ignition Lock System ..... 2-221  
   Steering Wheel and Column ..... 2-221
- Diagnosis  
   Auto Trans Shift Lock Control  
     System Check ..... 2-150  
   Hazard Switch Does Not Stay On  
     Wheel/Column ..... 2-155  
   Hazard Warning Cannot Be Turned Off .... 2-155  
   High Lock Effort ..... 2-152  
   High Steering Shaft Effort ..... 2-153  
   Ignition Switch Does Not Turn ..... 2-155  
   Ignition Switch Electrical System  
     Does Not Operate ..... 2-155  
   Key Cannot Be Removed in the  
     Off Lock Position ..... 2-152  
   Lash In Steering Column ..... 2-153  
   Lock System Does Not Lock ..... 2-151  
   Lock System Does Not Unlock ..... 2-150  
   Lock System Sticks in Start ..... 2-151  
   Loose Steering Wheel ..... 2-154  
   Loose Steering Wheel  
     (Every Other Tilt Position) ..... 2-154  
   Noise in Steering Column ..... 2-152  
   Noise When Tilting Steering Column ..... 2-154  
   Steering Wheel Does Not Lock  
     in Any Tilt Position ..... 2-154  
   Steering Wheel Not Returning  
     to Top Tilt Position ..... 2-154  
   Turn Signal Difficult to Operate ..... 2-155  
   Turn Signal Does Not Cancel ..... 2-155  
   Turn Signal Does Not Stay  
     in Turn Position ..... 2-154  
   Horn Pad Replacement ..... 2-163  
   Horn Switch Replacement ..... 2-163  
   Ignition Lock Cylinder Replacement ..... 2-156  
   Infl Rst Steering Wheel Module Coil -  
     Assemble ..... 2-182, 2-184  
   Infl Rst Steering Wheel Module Coil -  
     Disassemble ..... 2-181  
   Inflator Module Replacement ..... 2-161  
   Multifunction Turn Signal Hazard Switch  
     Replacement ..... 2-158
- Off-Vehicle  
   Auto Trans Shift Lock Control -  
     Disassemble ..... 2-205  
   Replacement ..... 2-167, 2-170  
   Schematic ..... 2-148  
   References ..... 2-173, 2-174  
   Seal Replacement ..... 2-160  
   Shift Lever Replacement ..... 2-160  
   Shift Lever Seal Replacement ..... 2-160  
   Special Tools ..... 2-221
- Steering Wheel/Column - Tilt (cont.)  
 Specifications  
   Fastener Tightening ..... 2-145  
   GM SPO Group Numbers ..... 2-145  
 Steering Wheel Replacement ..... 2-164  
 Tilt Lever Replacement ..... 2-161  
 Turn Signal and Multifunction Switch  
   Assembly - Disassemble ..... 2-201, 2-202
- Unit Repair  
   Auto Trans Shift Lock Control -  
     Assemble ..... 2-205  
   Electronic Column Lock Module -  
     Assemble ..... 2-196, 2-197  
   Electronic Column Lock Module -  
     Disassemble ..... 2-196  
   Ignition and Key Alarm Sw Assembly -  
     Assemble ..... 2-187, 2-188  
   Ignition and Key Alarm Sw Assembly -  
     Disassemble ..... 2-186, 2-187  
   Inflatable Restraint Coil Centering ..... 2-200  
   Linear Shift Assembly - Assemble ..... 2-190  
   Linear Shift Assembly - Disassemble ..... 2-189  
   Shift Lever - Assemble ..... 2-180  
   Shift Lever - Disassemble ..... 2-180  
   Shrouds - Assemble ..... 2-178, 2-179  
   Shrouds - Disassemble ..... 2-175, 2-177  
   Steering Column Accident Damage ..... 2-220  
   Steering Shaft, Lower Bearing,  
     Jacket - Assemble ..... 2-212, 2-216  
   Steering Shaft, Lower Bearing,  
     Jacket - Disassemble ..... 2-206, 2-209  
   Tilt Head Assembly Assemble ..... 2-198, 2-199  
   Tilt Head Assembly Disassemble ... 2-197, 2-198  
   Tilt Spring - Assemble ..... 2-194, 2-195  
   Tilt Spring - Disassemble ..... 2-192, 2-193  
   Turn Signal and Multifunction Switch  
     Assembly - Assemble ..... 2-203, 2-204
- Visual Identification  
   Disassembled View ..... 2-146, 2-147
- Steering Wheel/Housing - Standard  
 Unit Repair  
   Housing - Disassemble ..... 2-135  
 Stepside Fender Replacement ..... 8-1181  
 Stoplamp Switch  
   Replacement ..... 5-89  
 Striker Replacement  
   Body Mounted Rear Door ..... 8-1177  
   Endgate Lock ..... 8-1174, 8-1175  
   Endgate Window ..... 8-1175  
   Left Rear Door ..... 8-1176
- Struts or Shock Absorbers  
 Diagnosis  
   Bench Test ..... 3-12  
   Leak ..... 3-11  
   Noisy ..... 3-11  
   Weak ..... 3-11  
 Sunshade Replacement ..... 8-1110  
 Support Replacement  
   Radiator ..... 8-824  
   Sheet Metal ..... 8-829

Surge Tank	
(Diesel) Replacement (Engine Cooling) .....	6-915
Suspension	
Diagnosis	
Abnormal or Excessive Tire Wear .....	3-4, 3-5
Excessive Road Shock .....	3-11
Front Wheel Shimmy .....	3-12
General .....	3-3
Hard Steering .....	3-12
Low or Uneven Trim Height .....	3-17
Noise - Front Suspension .....	3-10
Noisy Front Suspension .....	3-9
Poor Directional Stability .....	3-9
Struts or Shack Absorbers Weak .....	3-11
Struts or Shock Absorber Bench Test .....	3-12
Struts or Shock Absorbers Leak .....	3-11
Struts or Shock Absorbers Noisy .....	3-11
Tire Hop or Poor Handling .....	3-10
Trim Height .....	3-8
Trim Height Inspection Procedure .....	3-6
Vehicle Leads/Pulls .....	3-3
Wheel Bearings .....	3-13
Wheel Tramp .....	3-9
Front	
Description .....	3-83
General .....	3-83
Rear	
Component Locations .....	3-88
Description .....	3-103
General .....	3-103
Switch	
Accessory Switch Replacement .....	8-554
Blower Replacement (A/C - Manual) .....	1-187
Blower Replacement (Non-A/C) .....	1-38
Cargo Lamp Switch Replacement .....	8-162
Clutch Start Switch Replacement .....	7-561
Door Jamb Switch Replacement .....	8-154
Door Lock Switch Replacement	
Auxiliary .....	8-1118
Emergency Roof Lamp Switch Replacement	
Roof Lamp Switch Replacement .....	8-147
Emergency .....	8-147
Fog Lamp Switch Replacement .....	8-144
Headlamp Switch Replacement .....	8-144
Heated Seat Switch Replacement	
Front .....	8-1035
Rear .....	8-1037
Horn Switch Replacement	
(Standard Column) .....	2-105
Horn Switch Replacement (Tilt Column) .....	2-163
Lumbar Switch Replacement .....	8-1014, 8-1015,
	8-1016, 8-1017
Multifunction Turn Signal Hazard Switch	
Replacement (Tilt Column) .....	2-158
Park/Neutral Back Up Switch Adjustment	
Automatic Transmission - 4L60-E .....	7-155
Automatic Transmission - 4L80-E .....	7-474
Park/Neutral Back Up Switch Replacement	
Automatic Transmission - 4L60-E .....	7-154
Automatic Transmission - 4L80-E .....	7-473
Power Accessory Switch	
Panel Replacement .....	8-889

Switch (cont.)	
Power Door Lock Switch Replacement .....	8-891
Rear Door Power Window Switch	
Replacement .....	8-890
Stoplamp Switch Replacement .....	5-89
Synchronization of the Keyless Entry	
Transmitter .....	8-605

## T

Tail/Turn Signal Lamp Replacement .....	8-159
TDC Offset Adjustment (6.5L) .....	6-2720
Temperature Actuator Replacement	
(A/C - Manual) .....	1-189
Temperature Control Cable	
Replacement (Non-A/C) .....	1-39
Temperature Sensor Replacement	
Outside Air .....	8-810
Theft Deterrent	
Component Locations .....	8-624
Component Views .....	8-625
Connector End Views .....	8-626
Description	
Content Theft Deterrent .....	8-672
Content Theft Deterrent Operation .....	8-673
Vehicle Theft Deterrent .....	8-674
Vehicle Theft Deterrent Operation .....	8-675
Diagnosis	
Diagnostic System Check .....	8-628
Displaying DTCs .....	8-627
Engine Cranks But Does Not Start .....	8-658
Intermittents and Poor Connections .....	8-627
Scan Tool .....	8-627
SECURITY Indicator Always On	
Or Flashing .....	8-662
SECURITY Indicator Inoperative .....	8-665
System Check .....	8-630
Content .....	8-630
Module Replacement .....	8-668
PASSLOCK	
Reprogramming Auto Learn .....	8-669
Reprogramming Seed and Key .....	8-669
Programming Replacement Keys,	
Ignition Cylinder, or Powertrain	
Control Module, .....	8-670, 8-671
Schematic	
Icons .....	8-622
References .....	8-622
Schematics .....	8-623
Special Tools .....	8-676
Specifications	
GM SPO Group Numbers .....	8-622
Scan Tool Data Definitions .....	8-620
Scan Tool Data List .....	8-620
Thermostat	
Description .....	6-962
Housing Crossover Replacement	
(Engine Cooling) .....	6-935
Installation (6.5L) .....	6-666
Removal (6.5L) .....	6-584
Replacement (Engine Cooling) .....	6-931, 6-933



- Thread Inserts ..... 0-25
- Thread Repair (6.5L) ..... 6-671
- Throttle Body
  - Assembly Replacement (7.4L) ..... 6-3233
  - Installation (7.4L) ..... 6-871
  - Removal (7.4L) ..... 6-770
- Throttle Body Assembly
  - Replacement (4.3L) ..... 6-1504
- Throttle Body Assembly Replacement
  - (5.0L, 5.7L) ..... 6-2226
- Throttle Position Sensor
  - Replacement (4.3L) ..... 6-1492
- Throttle Position Sensor Replacement
  - (5.0L, 5.7L) ..... 6-2213
- Throttle Position Sensor
  - Replacement (7.4L) ..... 6-3225
- Timing Adjustment, Injection (6.5L) ..... 6-2720
- Timing Chain
  - Timing Chain and Camshaft Sprocket
    - Removal (6.5L) ..... 6-601
  - Timing Chain and Sprockets Clean
    - and Inspect (4.3L) ..... 6-195
  - Timing Chain and Sprockets Clean
    - and Inspect (5.0L, 5.7L) ..... 6-411
  - Timing Chain and Sprockets Clean
    - and Inspect (6.5L) ..... 6-627
  - Timing Chain and Sprockets Clean
    - and Inspect (7.4L) ..... 6-819
  - Timing Chain and Sprockets
    - Installation (4.3L) ..... 6-237
  - Timing Chain and Sprockets Installation
    - (5.0L, 5.7L) ..... 6-450
  - Timing Chain and Sprockets
    - Installation (6.5L) ..... 6-652
  - Timing Chain and Sprockets
    - Installation (7.4L) ..... 6-858
  - Timing Chain and Sprockets
    - Removal (4.3L) ..... 6-157
  - Timing Chain and Sprockets
    - Removal (5.0L, 5.7L) ..... 6-374
  - Timing Chain and Sprockets
    - Removal (7.4L) ..... 6-780
  - Timing Chain and Sprockets
    - Replacement (4.3L) ..... 6-102
  - Timing Chain and Sprockets
    - Replacement (5.0L, 5.7L) ..... 6-334
  - Timing Chain and Sprockets
    - Replacement (6.5L) ..... 6-557
  - Timing Chain and Sprockets
    - Replacement (7.4L) ..... 6-739
  - Wear Check (6.5L) ..... 6-600
- Tire
  - Chain Usage Description ..... 3-118
  - Hoist and Shaft Replacement ..... 3-115, 3-116
  - Inflation Description ..... 3-118
  - Mounting and Dismounting ..... 3-110
  - Placard Description ..... 3-120
  - Rotation ..... 3-111
  - Spare Tire Carrier Replacement ..... 3-112, 3-113
- Tire and Wheel Balancing ..... 0-104
- Tire and Wheel Runout Specifications ..... 0-81
- Tire Inflation Pressure Specifications ..... 0-40
- Tire Placard ..... 0-10
- Tire Repair ..... 3-110
- Tire Wear
  - Abnormal or Excessive ..... 3-4, 3-5
- Tires and Wheels
  - Description
    - All Seasons Tires Description ..... 3-119
    - Aluminum Wheels ..... 3-120
    - Chain Usage ..... 3-118
    - General ..... 3-118
    - Inflation ..... 3-118
    - Metric Wheel Nuts and Bolts ..... 3-118
    - P-Metric Sized Tires ..... 3-119
    - Replacement Tires ..... 3-119
    - Tire Placard ..... 3-120
    - Wheel Repair ..... 3-120
    - Wheels ..... 3-120
  - Diagnosis
    - Radial Tire Lead/Pull Correction ..... 3-106
    - Wheel Mounting Surface Check ..... 3-105
  - Special Tools ..... 3-120
  - Specifications
    - Fastener Tightening ..... 3-104
    - GM SPO Group Numbers ..... 3-104
    - Wheel Installation ..... 3-109
    - Wheel Removal ..... 3-107, 3-108
- Torque Rod Replacement
  - Rear Compartment Lid ..... 8-1161
- Torque Wrenches
  - Proper Use ..... 0-26
- Torsion Bar and Support Assembly
  - Replacement, Front ..... 3-72, 3-74
- Tow Hook Replacement ..... 8-1250
- Trailer Hitch Replacement ..... 8-1248
- Transfer Case
  - Adapter Replacement ..... 4-227
  - Component Locations ..... 4-184
  - Component Views ..... 4-187, 4-197
  - Connector End Views ..... 4-199, 4-201
  - Control Module Replacement ..... 4-230
  - Description ..... 4-232
    - Control Module ..... 4-235
    - Data Memory Retention Check ..... 4-236
    - Encoder Signal Check ..... 4-236
    - Encoder Switch Monitor Check ..... 4-236
    - Mode Shifts ..... 4-235
    - Motor and Relay Voltage Checks ..... 4-236
    - Motor/Encoder Circuit Operation ..... 4-236
    - RAM/ROM Check ..... 4-236
    - Range Shifts ..... 4-235
    - System ..... 4-234
  - Diagnosis ..... 4-214
    - All Shift Select Buttons Do Not Light ..... 4-209
    - All Shift Select Buttons Remain Lit ..... 4-211
    - Clearing Memory ..... 4-207
    - Diagnostic Trouble Codes ..... 4-206
    - Four-Wheel-Drive Does Not Disengage ..... 4-213
    - Four-Wheel-Drive Does Not Engage ..... 4-213
    - Four-Wheel-Drive Indicator
      - Does Not Light ..... 4-214
    - Four-Wheel-Drive Indicator
      - Does Not Turn Off ..... 4-214
    - Functional Test Failed ..... 4-208

- Transfer Case (cont.)
- Diagnosis (cont.)
    - More Than One Shift Select Button
      - Remains Lit ..... 4-212
    - No Shift Select Buttons Remain Lit ..... 4-212
    - Obtaining Diagnostic Trouble Codes ..... 4-206
    - One or Two Shift Select Buttons
      - Do Not Light ..... 4-210
    - Perform a Diagnostic On the TCCM ..... 4-213
    - Reduced or No Mode and Range
      - Shift Operation ..... 4-213
    - System Diagnosis ..... 4-204
    - Transfer Case Electronic Shift System ..... 4-214
    - Transfer Case Functional Test ..... 4-207
    - Troubleshooting Hints ..... 4-204
  - Driver Control Switch Replacement ..... 4-229
  - Electrical Connector Replacement ..... 4-232
  - Motor/Encoder Replacement ..... 4-228
  - Oil Replacement ..... 4-215
  - Output Shaft Seal Replacement ..... 4-219, 4-220
  - Rear Extension Housing Replacement ..... 4-221
  - Replacement ..... 4-223, 4-225
  - Schematic
    - Icons ..... 4-178
    - References ..... 4-178
  - Schematics ..... 4-179
  - Shield Replacement ..... 4-215
  - Shift Cable Replacement ..... 4-216
  - Shift Lever Replacement ..... 4-217
  - Special Tools ..... 4-236
  - Specifications
    - Fastener Tightening ..... 4-177
    - Fluid Capacities ..... 4-177
  - Speed Sensor Replacement ..... 4-231
- Transfer Case - NVG 246-NP8
- Component Locations ..... 4-243
  - Component Views ..... 4-246
  - Connector End Views ..... 4-253
  - Control Module Replacement ..... 4-327
  - Description
    - Electrical Circuit ..... 4-329
  - Diagnosis
    - Diagnostic System Check ..... 4-257
    - Diagnostic Trouble Codes ..... 4-260
    - Front Axle Will Not Disengage ..... 4-304
    - Front Axle Will Not Engage ..... 4-301
    - General ..... 4-257
    - Intermittents and Poor Connections ..... 4-257
    - No Correction for Slip in AWD Mode ..... 4-309
    - Range/Mode Switch Inoperative ..... 4-307
    - Service Indicator Does Not Light ..... 4-318
    - Service Indicator Stays ON
      - When Key is ON ..... 4-316
    - Switch Indicator Lamps Do Not Light -
      - One or More ..... 4-314
    - Switch Indicator Lamps Flash
      - Continuously ..... 4-310
    - Switch Indicator Lamps Remain ON -
      - Two or More ..... 4-312
  - Driver Control Switch Replacement ..... 4-326
  - Motor/Encoder Replacement ..... 4-325
- Transfer Case - NVG 246-NP8 (cont.)
- Oil Replacement ..... 4-320
  - Output Shaft Seal Replacement ..... 4-321
  - Replacement ..... 4-322
  - Schematic
    - Icons ..... 4-240
    - References ..... 4-240
  - Schematics ..... 4-241
  - Shield Replacement ..... 4-320
  - Special Tools ..... 4-329
  - Specifications
    - Fastener Tightening ..... 4-237
    - Fluid Capacities ..... 4-237
    - Scan Tool Data Definitions ..... 4-239
    - Scan Tool Data List ..... 4-237
    - Speed Sensor Replacement ..... 4-327, 4-328
  - Transmission Floor Shift Control
    - Indicator Lamp Replacement ..... 8-152
  - Transmission ID and Partial VIN Location ..... 0-12
  - Transmitter
    - Battery Replacement
      - Keyless Entry ..... 8-604
    - Programming
      - Keyless Entry ..... 8-606
    - Replacement
      - Keyless Entry ..... 8-603
    - Synchronization
      - Keyless Entry ..... 8-605
  - Trim Cleaning
    - Fabric ..... 8-1131
    - Fabric Spot ..... 8-1131
  - Trim Cleaning
    - Vinyl ..... 8-1131
  - Trim Height Diagnosis ..... 3-8
  - Trim Height Inspection Procedure ..... 3-6
  - Trim Panel Replacement
    - Hinge Pillar ..... 8-1120
    - Rear Door ..... 8-1144
    - Rear Quarter ..... 8-1120, 8-1121, 8-1122, 8-1126
    - Rear Quarter Lower ..... 8-1128, 8-1129, 8-1130
  - Turbocharger
    - Description ..... 6-3377
    - Diagnosis
      - Blue Exhaust Smoke,
        - Warm Engine Only ..... 6-3367
      - Lacks Power,
        - Black Smoke at WOT ..... 6-3366
      - Lacks Power,
        - No Black Smoke at WOT ..... 6-3366
      - Noise ..... 6-3367
      - Turbocharger ..... 6-3367
      - Wastegate Actuator ..... 6-3369
    - Installation (6.5L) ..... 6-660
    - Removal (6.5L) ..... 6-593
    - Specifications
      - Fastener Tightening ..... 6-3366
  - Turbocharger Replacement ..... 6-3370
- U**
- Upper Garnish Molding Replacement ..... 8-1114

## V

- Vacuum Brake Booster
  - Replacement ..... 5-75
- Vacuum Pump
  - Description
    - General ..... 6-3381
    - Diagnosis ..... 6-3378
    - Special Tools ..... 6-3381
    - Specifications ..... 6-3378
    - Fastener Tightening ..... 6-3378
    - GM SPO Group Numbers ..... 6-3378
  - Vacuum Pump Replacement ..... 6-3379
- Valve
  - Guide Reaming/Valve and
    - Seat Grinding (4.3L) ..... 6-202
  - Guide Reaming/Valve and Seat Grinding
    - (5.0L, 5.7L) ..... 6-417
  - Guide Reaming/Valve and
    - Seat Grinding (6.5L) ..... 6-631
  - Guide Reaming/Valve and
    - Seat Grinding (7.4L) ..... 6-826
  - Lash Adjustment (5.0L, 5.7L) ..... 6-462
  - Lifter Installation (4.3L) ..... 6-244
  - Lifter Installation (5.0L, 5.7L) ..... 6-456
  - Lifter Installation (6.5L) ..... 6-649
  - Lifter Installation (7.4L) ..... 6-863
  - Lifter Removal (4.3L) ..... 6-152
  - Lifter Removal (5.0L, 5.7L) ..... 6-369
  - Lifter Removal (6.5L) ..... 6-604
  - Lifter Removal (7.4L) ..... 6-776
  - Lifter Replacement (4.3L) ..... 6-87
  - Lifter Replacement (5.0L, 5.7L) ..... 6-321
  - Lifter Replacement (6.5L) ..... 6-546
  - Lifter Replacement (7.4L) ..... 6-724
  - Lifters and Guides Clean and
    - Inspect (4.3L) ..... 6-197
  - Lifters and Guides Clean and
    - Inspect (5.0L, 5.7L) ..... 6-413
  - Lifters and Guides Clean and
    - Inspect (6.5L) ..... 6-628
  - Lifters and Guides Clean and
    - Inspect (7.4L) ..... 6-820
  - Rocker Arm and Push Rod
    - Installation (4.3L) ..... 6-245
  - Rocker Arm and Push Rod
    - Installation (5.0L, 5.7L) ..... 6-461
  - Rocker Arm and Push Rod
    - Installation (7.4L) ..... 6-866
  - Rocker Arm and Push Rod
    - Removal (4.3L) ..... 6-150
  - Rocker Arm and Push Rod
    - Removal (5.0L, 5.7L) ..... 6-365
  - Rocker Arm and Push Rod
    - Removal (7.4L) ..... 6-774
  - Rocker Arm and Push Rod
    - Replacement (4.3L) ..... 6-82
  - Rocker Arm and Push Rod
    - Replacement (5.0L, 5.7L) ..... 6-317
  - Rocker Arm and Push Rod
    - Replacement (7.4L) ..... 6-720
  - Rocker Arm and Push Rods
    - Clean and Inspect (4.3L) ..... 6-196
- Valve (cont.)
  - Rocker Arm and Push Rods
    - Clean and Inspect (5.0L, 5.7L) ..... 6-412
  - Rocker Arm and Push Rods
    - Clean and Inspect (7.4L) ..... 6-820
  - Rocker Arm and Shaft Assemble (6.5L) ..... 6-628
  - Rocker Arm and Shaft Clean
    - and Inspect (6.5L) ..... 6-627
  - Rocker Arm and Shaft Disassemble (6.5L) ... 6-627
  - Rocker Arm Cover Clean
    - and Inspect (4.3L) ..... 6-210
  - Rocker Arm Cover Clean
    - and Inspect (5.0L, 5.7L) ..... 6-427
  - Rocker Arm Cover Clean
    - and Inspect (6.5L) ..... 6-637
  - Rocker Arm Cover Clean
    - and Inspect (7.4L) ..... 6-834
  - Rocker Arm Cover Installation (4.3L) ..... 6-253
  - Rocker Arm Cover Installation (5.0L, 5.7L) ... 6-470
  - Rocker Arm Cover Installation (6.5L) ..... 6-651
  - Rocker Arm Cover
    - Installation (7.4L) ..... 6-875, 6-876
  - Rocker Arm Cover Removal (4.3L) ..... 6-148
  - Rocker Arm Cover
    - Removal (5.0L, 5.7L) ..... 6-362, 6-363
  - Rocker Arm Cover Removal (6.5L) ..... 6-602
  - Rocker Arm Cover Removal (7.4L) ... 6-766, 6-767
  - Rocker Arm Cover
    - Replacement (4.3L) ..... 6-76, 6-79
  - Rocker Arm Cover
    - Replacement (5.0L, 5.7L) ..... 6-316
  - Rocker Arm Cover Replacement (6.5L) ..... 6-531
  - Rocker Arm Cover Replacement (7.4L) ..... 6-718
  - Rocker Arm, Shaft, and Push Rod
    - Installation (6.5L) ..... 6-651
  - Rocker Arm, Shaft, and Push Rod
    - Removal (6.5L) ..... 6-603
  - Rocker Arm, Shaft, and Push Rod
    - Replacement (6.5L) ..... 6-535
  - Rocker Arm Stud Installation (5.0L, 5.7L) .... 6-419
  - Rocker Arm Stud Removal (5.0L, 5.7L) ..... 6-419
  - Stem Oil Seal and Valve Spring
    - Replacement (4.3L) ..... 6-83
  - Stem Oil Seal and Valve Spring
    - Replacement (5.0L, 5.7L) ..... 6-318
  - Stem Oil Seal and Valve Spring
    - Replacement (6.5L) ..... 6-544
  - Stem Oil Seal and Valve Spring
    - Replacement (7.4L) ..... 6-722
  - Vanity Mirror Lamp Replacement ..... 8-151
  - Variable Assist Steering
    - Overhaul
      - Actuator Assembly ..... 2-57
  - Variable Effort Steering
    - Component Locations ..... 2-224
    - Component Views ..... 2-225
    - Connector End Views ..... 2-226
    - Description
      - Circuit Operation ..... 2-253
      - System ..... 2-252
      - System Operation ..... 2-252

## Variable Effort Steering (cont.)

Diagnosis	
Clearing DTCs .....	2-229
Diagnostic Process .....	2-229
Displaying DTCs .....	2-229
DTC List .....	2-229
Intermittents and Poor Connections .....	2-229
Scan Tool Diagnostics .....	2-229
Self-Diagnostics .....	2-229
System Check .....	2-227
Power Steering Solenoid Actuator,	
Discharge Fitting Replacement .....	2-250
Schematic	
Icons .....	2-222
References .....	2-222
Schematic Diagrams .....	2-223
Special Tools .....	2-254
Specifications	
Fastener Tightening .....	2-222
GM SPO Group Number .....	2-222
Steering Wheel Rotation Sensor	
Replacement .....	2-251
Vehicle Certification Label .....	0-9
Vehicle Control Module	
Connector End Views (4.3L) .....	6-1099
Connector End Views (5.0L, 5.7L) .....	6-1710
Description (4.3L) .....	6-1603
Description (5.0L, 5.7L) .....	6-2335
Description (7.4L) .....	6-3332
Diagnosis (4.3L) .....	6-1445
Diagnosis (5.0L, 5.7L) .....	6-2156
Diagnosis (7.4L) .....	6-3170
Replacement/Programming (4.3L) .....	6-1480
Replacement/Programming (5.0L, 5.7L) .....	6-2200
Replacement/Programming (7.4L) .....	6-3215
Vehicle Identification .....	0-5
Vehicle Speed Sensor	
Manual Transmission - New Venture .....	7-14, 7-16
Vehicle Speed Sensor Replacement	
Automatic Transmission - 4L60-E .....	7-197
Automatic Transmission - 4L80-E .....	7-479
Vehicle Speed Signal Buffer	
Replacement (6.5L) .....	6-2735
Vent Hose	
Replacement	
Rear Drive Axle .....	4-125
Vibration Diagnosis	
Balancing Tires and Wheels .....	0-104
Classifying the Vibration .....	0-86
Correcting Driveline Vibration -	
RWD and 4WD .....	0-109
Correcting Non-Uniform Tires .....	0-108
Correcting Tire and Wheel Vibration .....	0-99
Driveline Vibration Analysis .....	0-91
Engine Related Vibration .....	0-95
General Description .....	0-125
General Service Precautions .....	0-99
Road Test .....	0-84
Systematic Approach .....	0-82
Tire and Wheel Vibration .....	0-89

## Vibration Diagnosis (cont.)

Vibration Diagnosis .....	0-82
Wheel Runout Measurement .....	0-90
Wheel Weight Usage .....	0-108
VIN Derivative .....	0-8
VIN, Partial, Location and Engine ID .....	0-10
Voltmeter	
Displaying High or Low .....	6-988

## W

Washer	
Pump Replacement .....	8-187
Solvent Container Replacement .....	8-186
Wastegate Actuator (Turbocharger) .....	6-3375
Wastegate Solenoid Replacement (6.5L) .....	6-2737
Water Deflector Replacement .....	8-1145
Water Pump	
Clean and Inspect (4.3L) .....	6-222
Clean and Inspect (5.0L, 5.7L) .....	6-437
Clean and Inspect (6.5L) .....	6-638
Clean and Inspect (7.4L) .....	6-844
Description .....	6-961
Installation (4.3L) .....	6-255
Installation (5.0L, 5.7L) .....	6-471
Installation (6.5L) .....	6-657
Installation (7.4L) .....	6-879
Removal (4.3L) .....	6-145
Removal (5.0L, 5.7L) .....	6-360
Removal (6.5L) .....	6-595
Removal (7.4L) .....	6-764
Replacement (Engine Cooling) .....	6-936, 6-939
Water-in-Fuel Sensor Replacement (6.5L) .....	6-2681
Waterleaks	
Body Waterleak Repair .....	8-738
Diagnosis	
Air Hose Test .....	8-737
Body Waterleak Repair .....	8-735
Dust Leaks .....	8-737
Generalized Testing .....	8-737
Test Preparation .....	8-736
Water Hose Test .....	8-737
Stationary Window Waterleak Repair .....	8-739
Weatherstrip Lubrication .....	8-1132
Weatherstrip Replacement	
Door .....	8-947
Endgate .....	8-1187
Front Door Window .....	8-948
Rear Compartment Opening .....	8-1188
Rear Door .....	8-1189
Rear Door Window .....	8-949
Side Door Opening .....	8-949
Welding	
Electrode Chart .....	8-1227
Plug Weld Chart .....	8-1227
Welding Chart	
Frame and Underbody .....	8-1226
Wheel	
Installation	
Tires and Wheels .....	3-109
Removal	
Tires and Wheels .....	3-107, 3-108

- Wheel Alignment
  - Description
    - General ..... 3-27, 3-28
  - Diagnosis
    - Preliminary Alignment Inspection ..... 3-19, 3-20
  - Frame Bracket Knock Out Removal ..... 3-23, 3-25
  - Measuring ..... 3-21
  - Special Tools ..... 3-29
  - Specifications ..... 3-18
    - Fastener Tightening ..... 3-18
    - GM SPO Group Numbers ..... 3-18
- Wheel Bearing Adjustment
  - Front ..... 3-75, 3-76
- Wheel Bearing, Hub, Knuckle, and Seal Replacement ..... 3-67, 3-68, 3-70
- Wheel Bearings
  - Adjustment
    - Rear Drive Axle ..... 4-157, 4-159
  - Diagnosis ..... 3-13
- Wheel Bolt Replacement
  - Rear Suspension ..... 3-94
- Wheel Cylinder Replacement ..... 5-140, 5-141, 5-144
- Wheel Drive Shaft
  - Deflector Ring Replacement ..... 4-31
  - Inner Joint and Seal Replacement ..... 4-32
  - Outer Joint and Seal Replacement ..... 4-37
- Wheel Drive Shafts
  - Boot Cover Replacement ..... 4-42
  - Disassembled Views ..... 4-30
  - Special Tools ..... 4-46
  - Specifications
    - Fastener Tightening ..... 4-29
- Wheel Hub, Bearing, Knuckle, and Seal Replacement, Front ..... 3-67, 3-68, 3-70
- Wheel Hub Bolt Replacement ..... 3-37, 3-38, 3-39
- Wheel Opening Flare Replacement
  - Rear ..... 8-728
- Wheel Stud Replacement
  - Rear Suspension ..... 3-102, 3-103
- Wheel Tramp Diagnosis ..... 3-9
- Wheel Weight Usage ..... 0-108
- Wheelhouse
  - Panel Replacement ..... 8-831, 8-833
  - Splash Shield Replacement ..... 8-835
- Wheels
  - Aluminum Wheels Description ..... 3-120
  - Description ..... 3-120
  - Repair Description ..... 3-120
- Windnoise
  - Exterior ..... 8-741
  - Interior ..... 8-741
- Window Garnish Molding Replacement ..... 8-1155
- Window Hinge Replacement
  - Endgate ..... 8-1159
- Window Regulator Handle Replacement
  - Door ..... 8-938, 8-939
- Window Regulator Replacement
  - Front Door ..... 8-936, 8-937
- Window Replacement
  - Front Door ..... 8-940
  - Liftgate ..... 8-793
  - Rear Door ..... 8-942
- Window Run Channel Replacement ..... 8-944, 8-945
- Window Support Replacement
  - Endgate ..... 8-1177
- Windows
  - Diagnosis
    - Power Windows Inoperative ..... 8-877
      - All ..... 8-872
      - Left Front ..... 8-874, 8-875
      - One ..... 8-873
      - Right ..... 8-878
      - Right Front ..... 8-876
  - Windshield Glass Cleaning ..... 8-194
  - Windshield Pillar Garnish Molding Replacement ..... 8-1110
  - Windshield Replacement ..... 8-764
  - Wiper ..... 8-189
    - Arm Blade Replacement
      - Rear ..... 8-196
    - Arm Replacement ..... 8-187
      - Rear ..... 8-194
    - Blade Element Replacement ..... 8-190
      - Rear ..... 8-197
    - Chatter Repair ..... 8-194
    - Motor Module Replacement ..... 8-193
    - Motor Replacement ..... 8-191
      - Rear ..... 8-198
    - Transmission Replacement ..... 8-192
  - Wiper Blade Element Cleaning ..... 8-194
  - Wipers/Washer Systems
    - Component Locations ..... 8-170
    - Component Views ..... 8-171
    - Connector End Views ..... 8-176
    - Description
      - Circuit ..... 8-198
    - Diagnosis
      - Rear System Check ..... 8-178
      - System Check ..... 8-178
      - Washer Pump Inoperative ..... 8-182
      - Washers Inoperative ..... 8-185
        - Rear ..... 8-185
      - Wiper Always On ..... 8-181
      - Wiper Arm Tip Pressure Check, Blade Element Check ..... 8-183
      - Wipers Always On ..... 8-185
        - Rear ..... 8-185
      - Wipers Delay Mode Inoperative ..... 8-180
      - Wipers High Mode Inoperative, Low Mode Operates ..... 8-181
      - Wipers Inoperative ..... 8-179
        - All Modes ..... 8-179
        - Rear ..... 8-184
    - Schematic
      - Icons ..... 8-167
      - References ..... 8-167
    - Schematics
      - Rear ..... 8-169
    - Schematics Pulse ..... 8-168
    - Specifications
      - Fastener Tightening ..... 8-167

## Wipers/Washers Systems

## Description

- Wiper/Washer System Circuit ..... 8-199
- Rear ..... 8-199

## Wiring Harness Replacement

- Door ..... 8-1178

## Wiring Systems

## Cigar Lighter/Auxiliary Outlets

- System Check ..... 8-358

## Data Link Communications

- Component Views ..... 8-363

## Data Link Communications Connector

- End Views ..... 8-364

## Data Link Connector (DLC) Components

## Description

- Camper and Trailer Wiring ..... 8-384
- Cigar Lighter/Auxiliary Outlet Circuit ..... 8-386
- Data Link Communications ..... 8-385
- Harness Routing Views ..... 8-455
- In-Line Harness Connector End Views ..... 8-387
- Power and Grounding Circuit ..... 8-385

## Diagnosis

- Auxiliary Outlets Inoperative ..... 8-359
- Checking Aftermarket Accessories ..... 8-261
- Cigar Lighter Inoperative ..... 8-359
- Circuit Protection ..... 8-265
- Circuit Breakers ..... 8-265
- Fuses ..... 8-265
- Fusible Links ..... 8-265

## Connector Position Assurance Locks

## Connector Repairs

## Data Link Communications Diagnostic

- System Check ..... 8-365

## Data Link Connector (DLC)

- System Check ..... 8-366

## Electrical Symbols

## Flat Wire Repairs

## General Electrical Diagnosis Procedures

## HO2S Wiring Repairs

## How to Use Circuit Descriptions

## How to Use Component Location Tables

## How to Use Component Location Views

## How to Use Connector End Views

## How to Use Diagnostic System Checks

## How to Use Electrical Diagnosis

## How to Use Electrical Schematics

## How to Use Schematic Icon Tables

## How to Use Schematic Reference Tables

## Intermittents and Poor Connections

## Probing Electrical Connectors

## Pull to Seat Connectors

## Push to Seat Connectors

## Repairing Connector Terminals

## Repairing Damaged Wire Insulation

## Scan Tool Does Not Communicate

- with Class 2 Data Line ..... 8-381

## Scan Tool Does Not Communicate

- with Components ..... 8-380

## Wiring Systems (cont.)

## Diagnosis (cont.)

- Scan Tool Does Not Communicate with E and C Data Line ..... 8-383

- Scan Tool Does Not Communicate with EBCM ..... 8-379

- Scan Tool Does Not Communicate with UART Data Line ..... 8-381

- Scan Tool Does Not Communicate with VCM/PCM ..... 8-378, 8-379

## SIR Wiring Repairs

- Splicing Copper Wire Using Splice Clips ..... 8-266

- Splicing Copper Wire Using Splice Sleeves ..... 8-268

## Splicing In-Line Harness Diodes

## Splicing Twisted or Shielded Cable

## Symptom Diagnostic Example

## Terminal Position Assurance Locks

## Testing for Continuity

## Testing for Electrical Intermittents

## Testing for Short to Ground

## Testing for Voltage

## Testing for Voltage Drop

## Troubleshooting with a Digital Multimeter

## Troubleshooting with a Short Finder

## Troubleshooting with a Test Light

## Truck Zoning

## Using Connector Test Adapters

## Using Fused Jumper Wires

## Weather Pack Connectors

## Where to Find Electrical Schematics

## Wiring Repairs

## Power and Grounding Component Views

## Power and Grounding Components

## Power and Grounding Connector

- End Views ..... 8-353

## Schematics

## Auxiliary Battery

## Schematics

## Cigar Lighter/Auxiliary Outlets

## Data Link Communications

- Schematic Icons ..... 8-360

## Data Link Communications Schematic

- References ..... 8-360

## Data Link Connector (DLC) Schematics

## Ground Distribution

## Power and Grounding Schematic Icons

## Power and Grounding Schematic

- References ..... 8-276

## Power Distribution

## Upfitter Provision

## Work Sheets, Diagnostic

## Y

## Yield Strength of Different Metals