

1982 Service Manual Up-Date



All Models Except
Firenza

OLDSMOBILE
service
manual



CAUTION

To reduce the chance of personal injury and/or property damage, the following instructions must be carefully observed:

Proper service and repair are important to the safety of the service technician and the safe, reliable operation of all motor vehicles. If part replacement is necessary, the part must be replaced with one of the same part number or with an equivalent part. Do not use a replacement part of lesser quality.

The service procedures recommended and described in this service manual are effective methods of performing service and repair. Some of these procedures require the use of tools specially designed for the purpose.

Accordingly, anyone who intends to use a replacement part, service procedure or tool, which is not recommended by the vehicle manufacturer, must first determine that neither his safety or safe operation of the vehicle will be jeopardized by the replacement part, service procedure or tool selected.

It is important to note that this manual contains various 'cautions' and 'notices' that must be carefully observed in order to reduce the risk of personal injury during service or repair, or the possibility that improper service or repair may damage the vehicle or render it unsafe. It is also important to understand that these 'cautions' and 'notices' are not exhaustive, because it is impossible to warn of all the possible hazardous consequences that might result from failure to follow these instructions.

“For vehicles sold in Canada and equipped with non-closed loop engines, also refer to the appropriate Canadian Service Manual Supplement.”

1982 SERVICE MANUAL UPDATE

(ALL MODELS EXCEPT FIRENZA)

FOREWORD

This manual provides corrected or additional information that was not included in the 1982 Chassis Service Manual and the 1982 Omega and Cutlass Ciera Service Manual. In cases where information can-not easily be added to a service manual, it is suggested that a notation be made in that particular service manual to refer to this manual.

An understanding of the material contained herein and in monthly issues of the Oldsmobile Service Guild and Dealer Technical Bulletins, issued when necessary, will assist service personnel in properly maintaining the quality to which Oldsmobiles are built.

All information, illustrations and specifications contained in this Manual are based on the latest product information available at the time of publication approval. The right is reserved to make changes at any time without notice.

CAUTION: Most of the parts on 1982 Oldsmobiles are dimensioned in the metric system. It is important to note that, during any maintenance procedures, replacement fasteners must have the same measurements and strength as those removed, whether metric or customary. (Numbers on the heads of metric bolts and on surfaces of metric nuts indicate their strength. Customary bolts use radial lines for this purpose, while most customary nuts do not have strength markings.) Mismatched or incorrect fasteners can result in car damage or malfunction, or possibly personal injury. Therefore, fasteners removed from the car should be saved for re-use in the same locations whenever possible. Where the fasteners are not satisfactory for re-use, care should be taken to select a replacement that matches the original. For information and assistance, see your Oldsmobile dealer.

SERVICE DEPARTMENT
OLDSMOBILE DIVISION

GENERAL MOTORS CORPORATION
LANSING, MICHIGAN

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GENERAL INFORMATION

SECTION OA

TRANSMISSION USAGE CHART

Transmission code LB MX2(350C) is now being used in the Cutlass Supreme Coupe and Sedan. Include this addition to figure OA-7, page OA-4 in your Chassis Service Manual.

ENGINE IDENTIFICATION

The correct engine cubic inch displacement for the 2.8L engine used in the Omega is 173 cu. in., not 273 cu. in. Please correct figure OA-2 on page OA-1 in your Omega & Cutlass Ciera Service Manual.

STARTING VIN SERIAL NUMBER SEQUENCE CHANGE

The Ste. Therese assembly plant for 1982 has started its Cutlass Supreme model serial number VIN sequence with 300001 rather than 400001 as indicated on page OA-3 of the 1982 Chassis Service Manual.

EMISSION CONTROL SYSTEM MAINTENANCE AND LUBRICATION

SECTION OB

LIFTING FRONT WHEEL DRIVE CARS

When lifting a front wheel drive car and working on the rear of the car, the following caution must be observed.

CAUTION: On front wheel drive vehicles, the centerline-of-gravity is further forward than on rear wheel drive vehicles. Therefore, whenever removing major components from the rear of the vehicle, while supported on a hoist, it is mandatory to support the vehicle in a manner to prevent the possibility of the vehicle tipping forward. Personal injury could occur.

WHEEL LUG NUT TORQUE

An incorrect torque specification is given on page OB-2, figure OB-1 in your 1982 Chassis Service Manual. The correct torque specification for "all except 88 with 7/16" wheel studs", is 100 ft. lbs.

SECTION 1

HEATER

AND

AIR CONDITIONING

BLOWER MOTOR CASE – EVAPORATOR CORE 1982 CUTLASS CIERA WITH 4.3L V6 DIESEL

Removal

The following is the revised procedure for removal of the blower motor case assembly or evaporator core, from the 1982 Cutlass Ciera equipped with a 4.3L V6 diesel (VIN T).

1. Disconnect the negative battery cable(s).
2. Drain the cooling system.
3. Hoist the car at the suspension lift points. (See "Vehicle Lifting Procedures" in section OB, page OB-11.)
4. Disconnect the exhaust pipe at the rear exhaust manifold.
5. Rotate the intermediate steering shaft so the steering gear stub shaft clamp bolt is in the up position and remove the bolt.
6. Position floor stands at the front body lift points. (See "Vehicle Lifting Procedures" in section OB, page OB-11.)
7. Remove the two (2) rear frame (cradle) to body mount bolts, remove the mount lower cushions from the bolts and reinstall the bolts with retainers at least three (3) turns into the cage nuts.
8. Lower the cradle until it just contacts the retainers on the bolts.
9. Remove the cowl exhaust manifold heat shield.
10. Remove the water valve retaining bolt.
11. Remove two (2) heater hoses from heater core.
12. Remove the three (3) accessible blower housing to cowl bolts at bottom of housing.
13. Raise the frame cradle into position and install the cradle to body mount bolts. Torque the body mount bolts to 105 N•m (77 ft. lbs.).
14. Remove floor stands and lower car.
15. Remove the engine mounting strut, page 6A7-4 figure 6A7-8.
16. Position a floor jack under the front crossmember of the cradle and raise the jack until the jack just starts to raise the car.
17. Remove the two (2) front body mount bolts with the lower cushions and retainer.
18. Lower the floor jack to allow about 203mm (8") of downward travel of the cradle. As the jack is being lowered, correct any interferences between brackets, hoses, pipes, wiring harnesses, cables, etc., to prevent damage.
19. Disconnect the power steering reservoir from its bracket. Leave the hoses attached and lay the reservoir aside.
20. Disconnect the blower motor wiring and remove the blower motor.
21. Remove the blower motor resistor and relay.
22. Remove the evaporator pipe bracket.
23. Remove the sound insulator from the blower housing.
24. Remove the blower housing to cowl bolts and remove the housing.

IF REMOVING THE EVAPORATOR CORE, CONTINUE

AS FOLLOWS:

25. Refer to Section 1B1 for C.C.O.T. A/C System Discharging Procedures.

26. Disconnect liquid line at evaporator inlet and low pressure line at accumulator inlet.

27. Remove evaporator.

Installation

1. Install evaporator, if removed, and blower housing to cowl using sealing compound to avoid possible water leaks.

2. If removed, reconnect liquid line at evaporator inlet and low pressure line at accumulator inlet. (Refer to page 1B1-12, figure 1B1-13 for pipe and hose connection torque specifications.)

3. Install the sound insulator on the blower housing.

4. Install the evaporator pipe bracket.

5. Install the blower motor resistor and relay.

6. Install blower motor and connect blower motor wiring.

7. Install the power steering reservoir on its bracket.

8. Raise the front crossmember of the cradle using a floor jack. As the crossmember is being raised, correct any interferences between brackets, hoses, pipes, cables, wiring harnesses, etc., to prevent damage.

9. Install the two (2) front body mount bolts with the lower cushions and retainer. Torque the front body mount bolts to 105 N•m (77 ft. lbs.).

10. Remove floor jack.

11. Install engine mounting strut. Torque bolts to 57 N•m (42 ft. lbs.).

12. Hoist the car at the suspension lift points. (See "Vehicle Lifting Procedures" in section OB, page OB-11.)

13. Position floor stands at the front body lift points. (See "Vehicle Lifting Procedures" in section OB, page OB-11.)

14. Remove the two (2) rear frame (cradle) to body mount bolts. Remove the mount lower cushions from the bolts and reinstall the bolts with retainers at least three (3) turns into the cage nuts.

15. Lower the cradle until it just contacts the retainers on the bolts.

16. Install the three (3) accessible blower housing to cowl bolts at bottom of housing.

17. Install two (2) heater hoses to heater core.

18. Install water valve retaining bolt.

19. Install the cowl exhaust manifold heat shield.

20. Raise the frame cradle into position and install the cradle to body bolts. Torque the body mount bolts to 105 N•m (77 ft. lbs.).

21. Remove jack stands.

22. Install the steering gear stub shaft clamp bolt. Torque clamp bolt to 62 N•m (46 ft. lbs.).

23. Connect the exhaust pipe to the rear exhaust manifold. Torque exhaust pipe to manifold bolts to 31 N•m (23 ft. lbs.).

24. Lower car.

**POLY GROOVE CLUTCH COIL REMOVAL –
1982 CUTLASS CIERA WITH 4.3L DIESEL ENGINE**

The following is the revised procedure for removal of the poly groove clutch coil from the A/C compressor for the 1982 Cutlass Ciera equipped with a 4.3L (V-6) Diesel.

1. Remove the clutch plate and hub assembly (Refer to section 1C1 page 1C1-2.)

2. Remove the pulley rotor and bearing assembly. (Refer to section 1C1, page 1C1-6). Mark the location of the clutch coil terminals on the compressor.

3. Install guide J-25031-1 to the front head, then install puller J-22888 using puller legs J-25287-10 and remove the clutch coil from the front head. (Fig. 1C1-1).

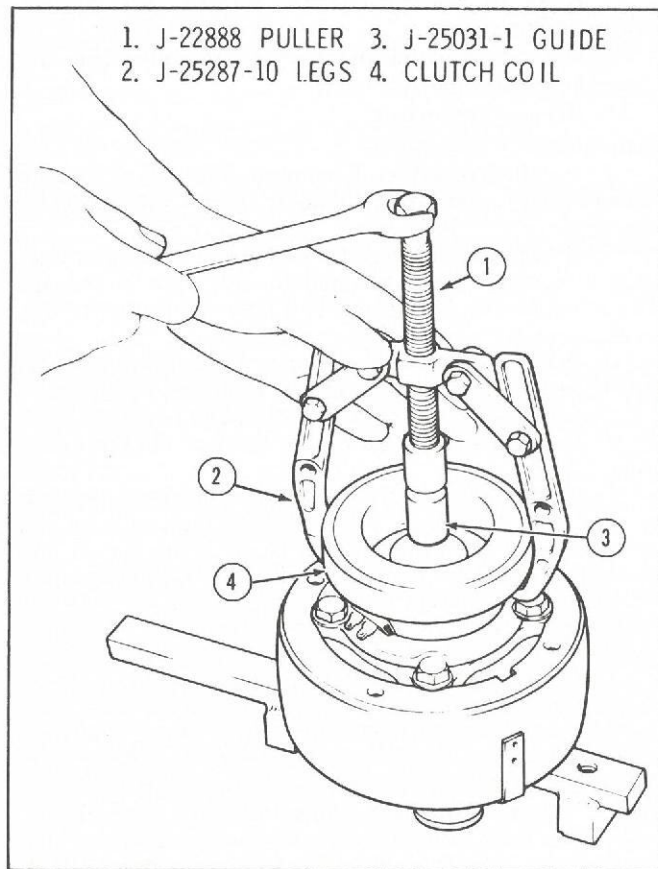


Fig. 1C1-1—Removing Poly Groove Clutch Coil
- Replaces Fig. 1C1-22

**INTERMEDIATE STEERING SHAFT TO
STUB SHAFT CLAMP BOLT – 1982
CUTLASS CIERA**

The 1982 Omega and Cutlass Ciera service manual lists the incorrect torque specifications for the intermediate steering shaft to stub shaft clamp bolt on page 1B1-21, step 14. The correct torque for this bolt is 62N·m (46 Ft. Lbs.).

**R – 4 A/C COMPRESSOR INERTIA RING
1982 V-6 DIESEL ENGINE**

Inertia rings are not used on A/C compressors on V-6 Diesel engines (VIN V and T). Note this information in section 1D, page 1D-9 in the 1982 Chassis Service Manual, and section 1C1, page 1C1-8 in the 1982 Omega and Cutlass Ciera Service Manual.

SECTION 3

STEERING AND SUSPENSION

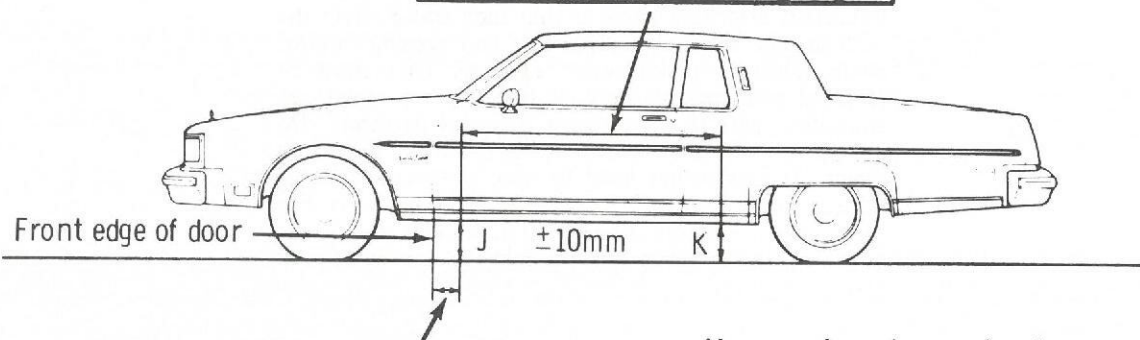
NOTICE: All steering and suspension fasteners are important attaching parts in that they could affect the performance of vital components and systems, and/or could result in major repair expense. They must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality of substitute design. Torque values must be used as specified during reassembly to assure proper retention of these parts. For prevailing torque nut(s) and bolt(s), refer to the "Reuse of Prevailing Torque Nut(s) and Bolt(s)" chart in Section 10.

WHEEL ALIGNMENT

CHASSIS SERVICE MANUAL

Trim heights checked with correct tire pressures, fuel tank full or equivalent weight in the trunk. No passengers or added weight in car. Front seat in rear position. Trunk must be empty except for spare tire and jack or simulated fuel load.

CUTLASS	1590 mm (62-5/8")
DELTA 88	1725 mm (68")
NINETY-EIGHT	
TORONADO	1775 mm (70")



CUTLASS	25 mm (1")
DELTA 88	
NINETY-EIGHT	43 mm (1-3/4")
TORONADO	0 mm (0")

Measure from known level floor to rocker panel.

SERIES	J	K
CUTLASS - 4 DR.		
CUTLASS - 2 DR. - & P205/75 Tires	259 mm (10-3/16")	259 mm (10-3/16")
CUTLASS - 2 DR. - Exc. P205/75 Tires	255 mm (10")	255 mm (10")
CUTLASS CRUISER	252 mm (9-7/8")	261 mm (10-1/4")
DELTA 88	264 mm (10-3/8")	269 mm (10-9/16")
CUSTOM CRUISER	267 mm (10-1/2")	271 mm (10-5/8")
NINETY-EIGHT	270 mm (10-5/8")	274 mm (10-3/4")
*TORONADO	*245 mm (9-5/8")	*245 mm (9-5/8")

*Trim height is controlled by the adjustment setting of the torsion bar adjusting bolt. Clockwise rotation of the bolt increases the front height. Counter clockwise rotation decreases front height.

*Measured from bottom of wheel opening molding.

Fig. 3-1—Trim Height - Replaces Figure 3A-8

POWER STEERING GEAR AND PUMP

OMEGA AND CUTLASS CIERA SERVICE MANUAL

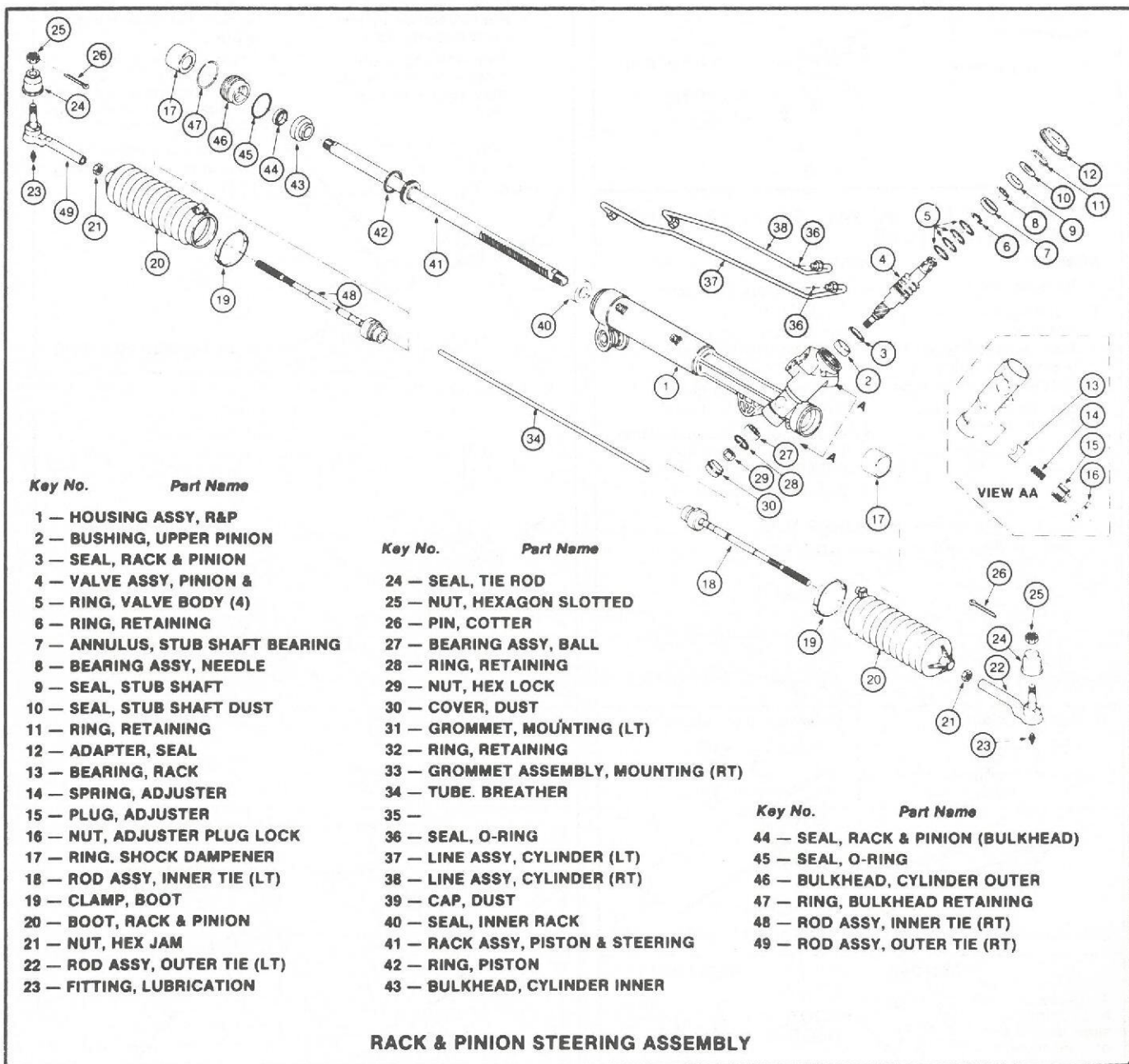


Fig. 3-2—Power Rack and Pinion Steering Assembly - Replaces Page 3B2-9

1. REMOVE AND INSTALL OUTER TIE ROD

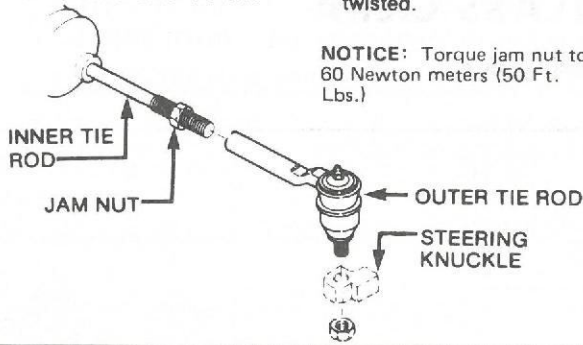
REMOVE

1. Loosen jam nut.
2. Remove tie rod from steering knuckle, using Tool J-24319-01 or BT 7101.
3. Remove outer tie rod.

INSTALL

1. Install parts as shown.
2. Do not tighten jam nut.
3. Make toe-in adjustment by turning inner tie rod.
4. Be sure boot is not twisted.

NOTICE: Torque jam nut to 60 Newton meters (50 Ft. Lbs.)



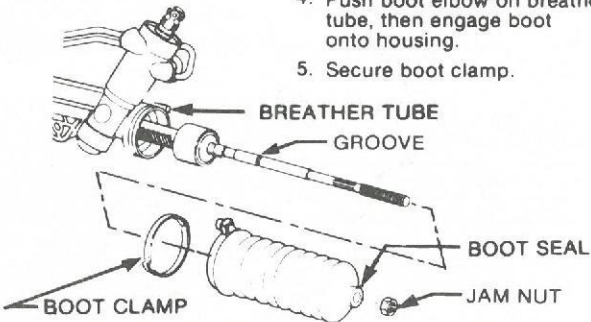
2. REMOVE AND INSTALL BOOT SEAL AND BREATHER TUBE

REMOVE

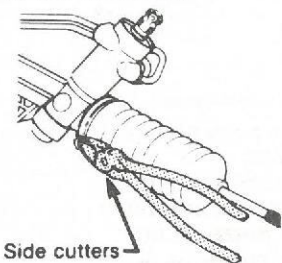
1. Remove jam nut.
2. Cut boot clamp and discard.
3. Mark breather tube location on housing before removing tube.
4. See insert for proper boot seal removal.

INSTALL

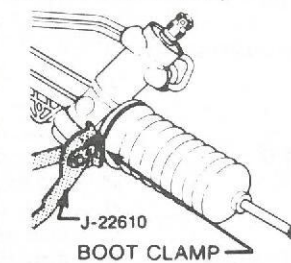
1. Line up mark and install breather tube.
2. Install new clamp on boot before installing boot.
3. See insert for proper installation of boot seal.
4. Push boot elbow on breather tube, then engage boot onto housing.
5. Secure boot clamp.



A. Cut boot clamp



B. Secure boot clamp



REMOVE

To prevent boot damage, slide tie rod end of boot toward center of gear enough to expose boot groove on the tie rod. Place a rubber band in groove. This fills the groove and allows removal of boot from gear without damage.



REPLACE

1. Remove rubber band.
2. Slide boot on tie rod until boot snaps into groove.



THE FOLLOWING STEPS MUST BE PERFORMED WITH RACK & PINION ASSEMBLY REMOVED FROM CAR

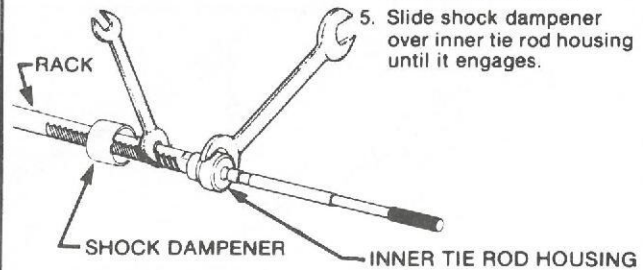
3. REMOVE AND INSTALL INNER TIE ROD

REMOVE

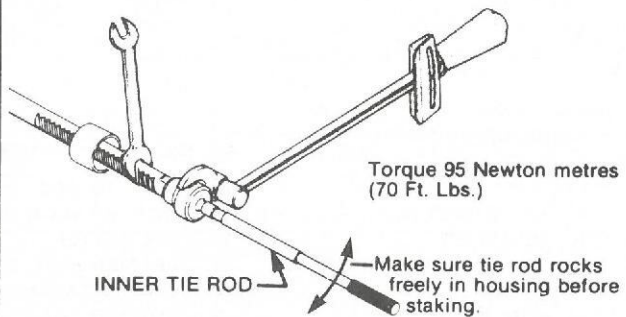
1. Remove shock dampener ring from inner tie rod housing and slide back on rack.
2. Put wrench on rack flat to prevent rack damage when removing tie rod.
3. Put wrench on tie rod pivot housing flats.
4. Turn housing counter-clockwise until tie rod assembly separates from rack.

INSTALL

1. Bottom inner tie rod assembly on rack.
2. Torque housing. (Use wrench on rack to avoid internal gear damage.)
3. Support rack and housing and stake tie rod housing to rack flat. (Stake both sides.)
4. Inspect stake, a .25 millimetres (.010 inch) feeler gage must not pass between rack and housing stake on both sides.
5. Slide shock dampener over inner tie rod housing until it engages.



A. Torque inner tie rod.



B. Stake housing to rack (both sides).

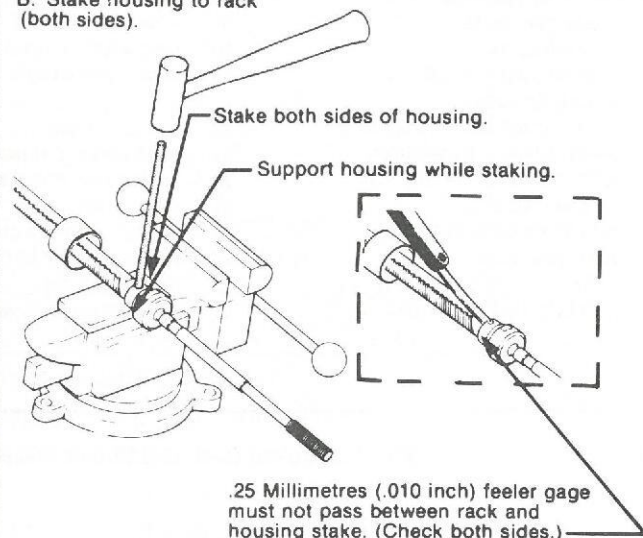


Fig. 3-3—Remove and Install Outer Tie Rod - Replaces Page 3B2-10

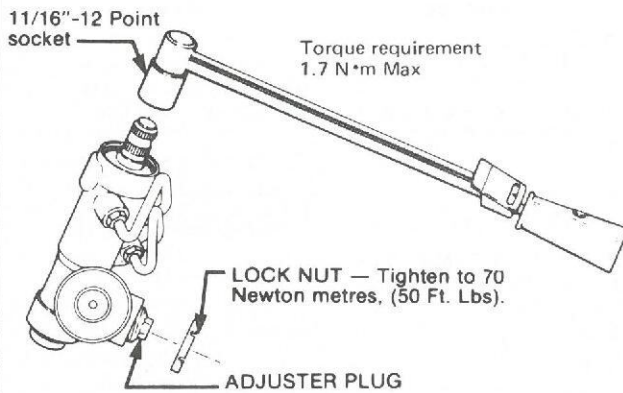
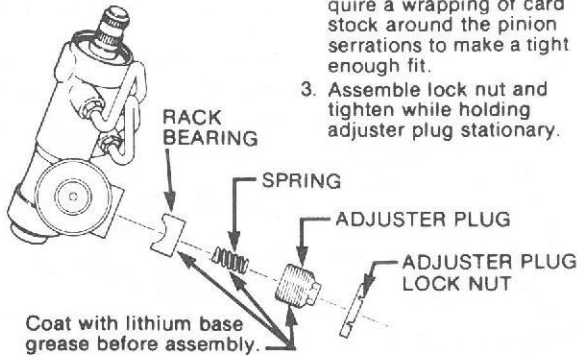
4. REMOVE AND INSTALL RACK BEARING

REMOVE

1. Loosen adjuster plug lock nut.
2. Turn adjuster plug counterclockwise until it separates from housing.
3. Remove parts as shown.

INSTALL

1. Install parts as shown.
 2. Turn adjuster plug clockwise until it bottoms, then back off 50° to 70°. Check torque on pinion.
- NOTICE:** Due to tolerances, some sockets will require a wrapping of card stock around the pinion serrations to make a tight enough fit.
3. Assemble lock nut and tighten while holding adjuster plug stationary.



5. REMOVE AND INSTALL STUB SHAFT SEALS

REMOVE

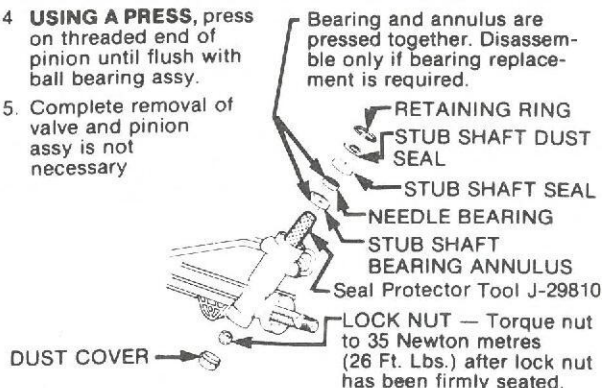
1. Remove retaining ring.
2. Remove dust cover.
3. While holding the stub shaft remove lock nut from pinion.

NOTICE: If stub shaft is not held, damage to the pinion teeth will occur.

4. **USING A PRESS**, press on threaded end of pinion until flush with ball bearing assy.
5. Complete removal of valve and pinion assy is not necessary

INSTALL

1. Install annulus assembly in gear.
2. Place seal protector Tool J-29810 on stub shaft and install stub shaft seals and snapping.
3. While holding stub shaft firmly seat the lock nut, torque to specifications.



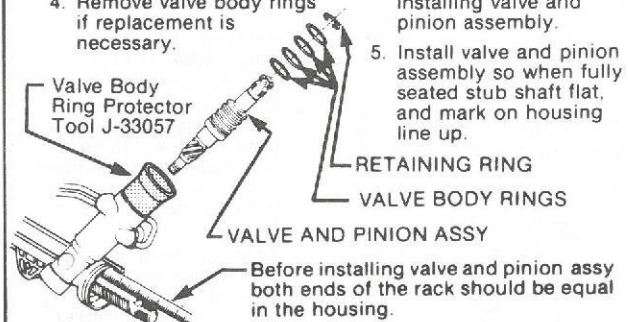
6. REMOVE AND INSTALL VALVE AND PINION ASSY

REMOVE

1. Turn stub shaft until rack is equal distance on both sides of housing, with pinion fully engaged.
2. Mark location of stub shaft flat on housing.
3. **USING A PRESS**, press on threaded end of pinion until it is possible to remove valve and pinion assy.
4. Remove valve body rings if replacement is necessary.

INSTALL

1. Install new valve body rings if required.
2. Care should be taken not to cut rings at installation.
3. Measure rack so that it's equal on both sides.
4. Use valve body ring protector, Tool J-33057 to prevent damaging valve body rings while installing valve and pinion assembly.
5. Install valve and pinion assembly so when fully seated stub shaft flat, and mark on housing line up.



7. REMOVE AND INSTALL BULKHEAD

REMOVE

1. Use punch in access hole to remove bulkhead retaining ring.
2. If only the bulkhead, bulkhead O-ring seal or rack seal (bulkhead) are to be replaced. Loosen (LT) fitting and remove cylinder line.
3. Plug (LT) cylinder line hole at cylinder using a finger or plastic cap with 7/16 x 20 internal threads over hole to prevent oil leaking from cylinder.
4. Using a 11/16 inch-12 point socket turn stub shaft. Move rack to the right forcing the bulkhead out of the housing. Use drain pan to catch hydraulic oil from assy.
5. If inner rack seal or piston ring are to be replaced, use rack to remove bulkhead instead of compressed oil method.

INSTALL

1. Using crocus cloth remove burrs or sharp edges from retaining ring groove in housing. This must be done to insure that the new O-ring is not damaged at assembly.
2. Install parts as shown.
3. Coat all seals with power steering fluid.
4. Slip bullet seal protector over end of rack and install bulkhead.
5. Make sure open end of retaining ring is approximately 13 millimeters (.50 inch) from access hole.
6. Retaining ring must be fully seated.

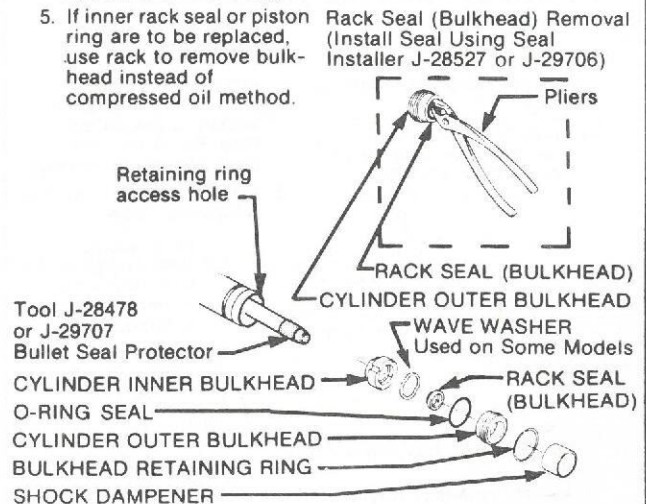


Fig. 3-4—Remove and Install Rack Bearing - Replaces Page 3B2-11

8. REMOVE AND INSTALL INNER RACK SEAL, RACK AND PISTON RING

REMOVE

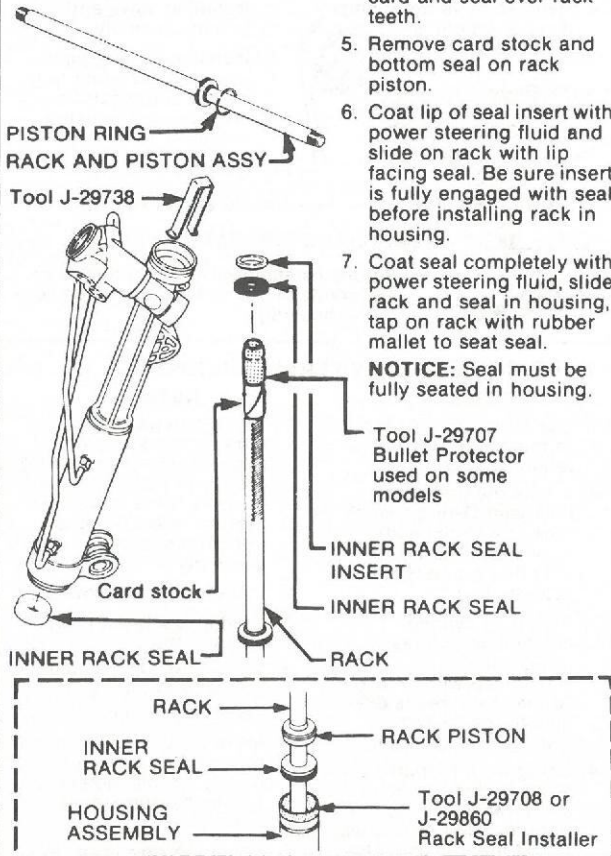
1. Remove rack from housing.
2. Remove piston ring and dispose.
3. Fit tool J-29738 into housing. Using rod approx. 12" long, gently tap on rod until seal is removed.
4. Dispose of old seal.

INSTALL

1. Install new piston ring on rack.
2. Care should be taken not to cut ring at installation.
3. Wrap card stock around end of rack and rack teeth.
4. Coat seal lip with power steering fluid, slide seal with seal lip facing piston on to card stock, slide card and seal over rack teeth.
5. Remove card stock and bottom seal on rack piston.
6. Coat lip of seal insert with power steering fluid and slide on rack with lip facing seal. Be sure insert is fully engaged with seal before installing rack in housing.
7. Coat seal completely with power steering fluid, slide rack and seal in housing, tap on rack with rubber mallet to seat seal.

NOTICE: Seal must be fully seated in housing.

Tool J-29707 Bullet Protector used on some models



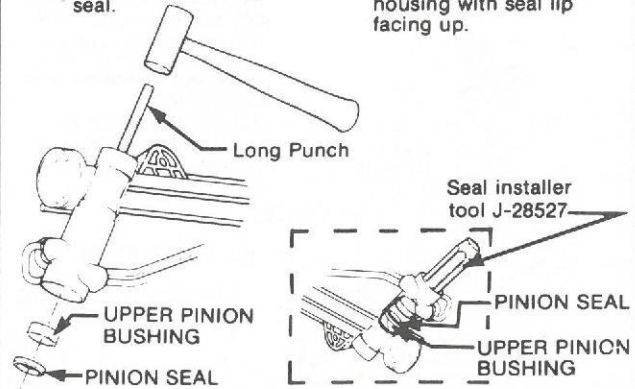
10. REMOVE AND INSTALL UPPER PINION BEARING & SEAL

REMOVE

1. Remove upper pinion bushing and seal with a punch.
2. Dispose of bushing and seal.

INSTALL

1. Install new bushing as shown.
2. Install new seal. Using installer, seat seal in housing with seal lip facing up.



11. REMOVE AND INSTALL CYLINDER LINE

REMOVE

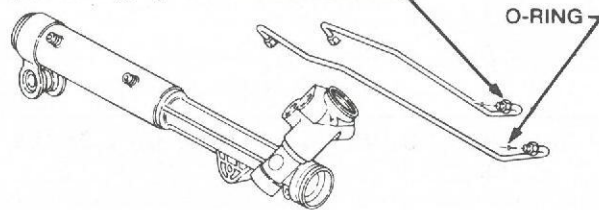
1. Using flare wrench loosen fittings and remove cylinder line.
2. Be sure O-ring is also removed and disposed of.

INSTALL

1. Place new O-ring seal on cylinder line.
2. Assemble both ends to housing finger tight to assure proper alignment.
3. Tighten to specifications.

NOTICE: Care should be taken not to strip aluminum housing.

FITTINGS — Torque 20 Newton metres (15 Ft. Lbs.), 4 places



9. REMOVE AND INSTALL BALL BEARING ASSY

REMOVE

1. Remove bearing retaining ring.
2. Use drift or punch and gently tap on bearing until bearing is removed.

INSTALL

1. Install new ball bearing assy. Using a suitable socket, press on outer race. Be careful not to cock bearing in housing.
2. Install retaining ring. See reference below.

Note position of large lug to be sure beveled side of ring is properly located.

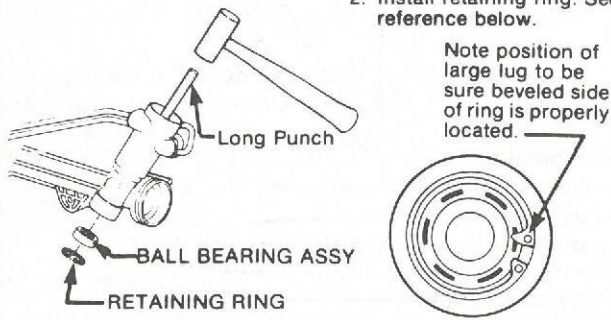


Fig. 3-5—Remove and Install Rack Seal, Rack and Piston Ring - Replaces Page 3B2-12

CHASSIS SERVICE MANUAL

POWER STEERING PUMP

Toronado models equipped with a 5.0L V-8 engine use a power steering pump which has a remote reservoir/filler. The service procedure on this type of pump is the same as that shown on page 3B3-9 of the 1982 Chassis Service Manual.

POWER STEERING PUMP—TORONADO WITH 5.0L V-8

Removal (Fig. 3-8)

1. Loosen generator and power steering pump belts.
2. Remove vacuum pump and bracket assembly.
3. Disconnect pressure and return lines from pump.
4. Remove nut and bolt attaching generator bracket to power steering adjustment bracket.

5. Remove bolt attaching power steering pump adjustment bracket to power steering pump support.
6. Remove nut from back side of pump.
7. Remove pump and bracket assembly from car.

Installation

1. Position pump and bracket assembly in car.
2. Position vacuum pump and bracket assembly in car.
3. Install nuts and bolts loosely.
4. Connect pressure and return lines to pump. Torque pressure line fitting to 27 N·m (20 Ft. Lbs.).
5. Torque all fasteners to specifications, except for the nut at the back of the pump.
6. Adjust power steering and generator belts. Refer to page OB-9 for belt tension.

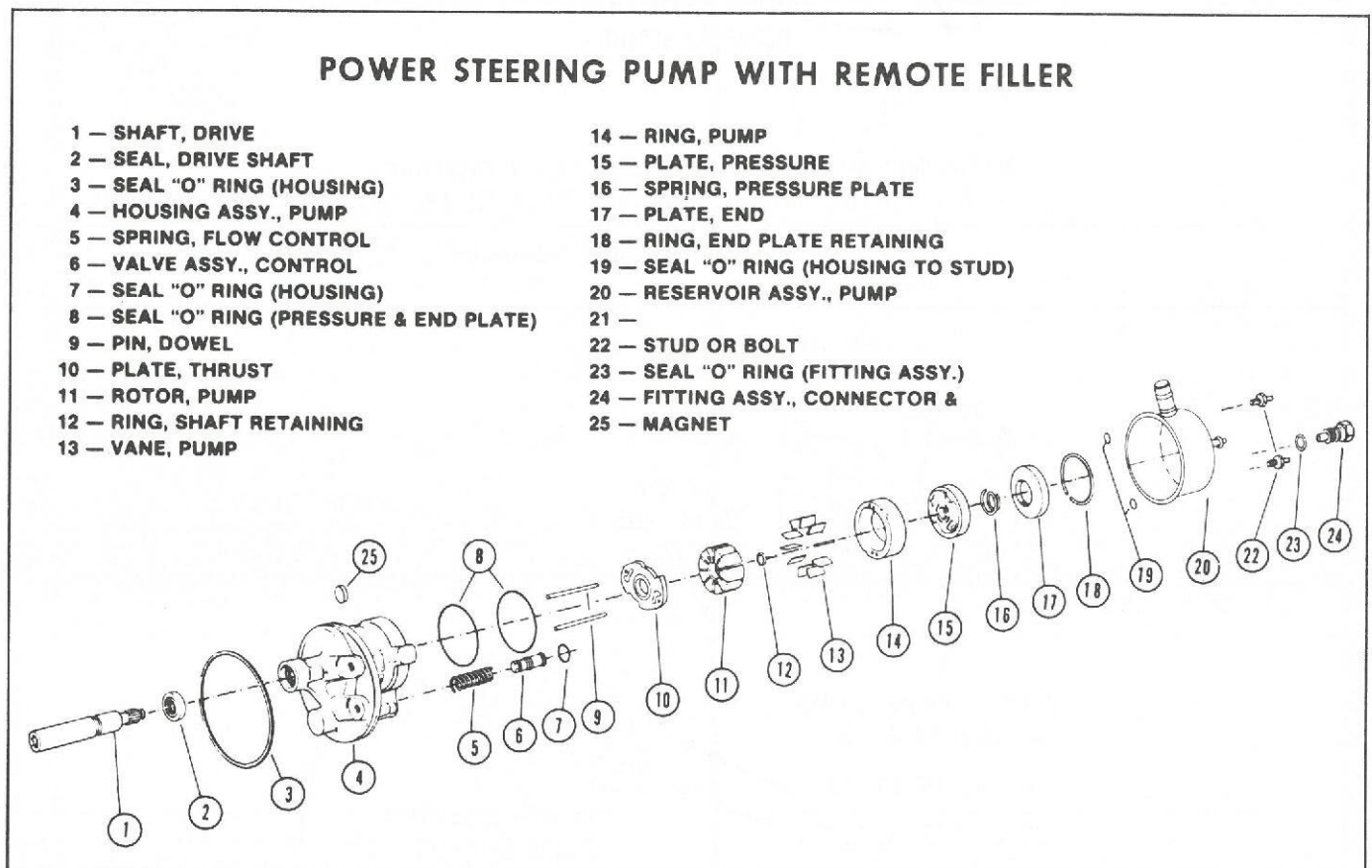


Fig. 3-6—Power Steering Pump with Remote Filler - Toronado

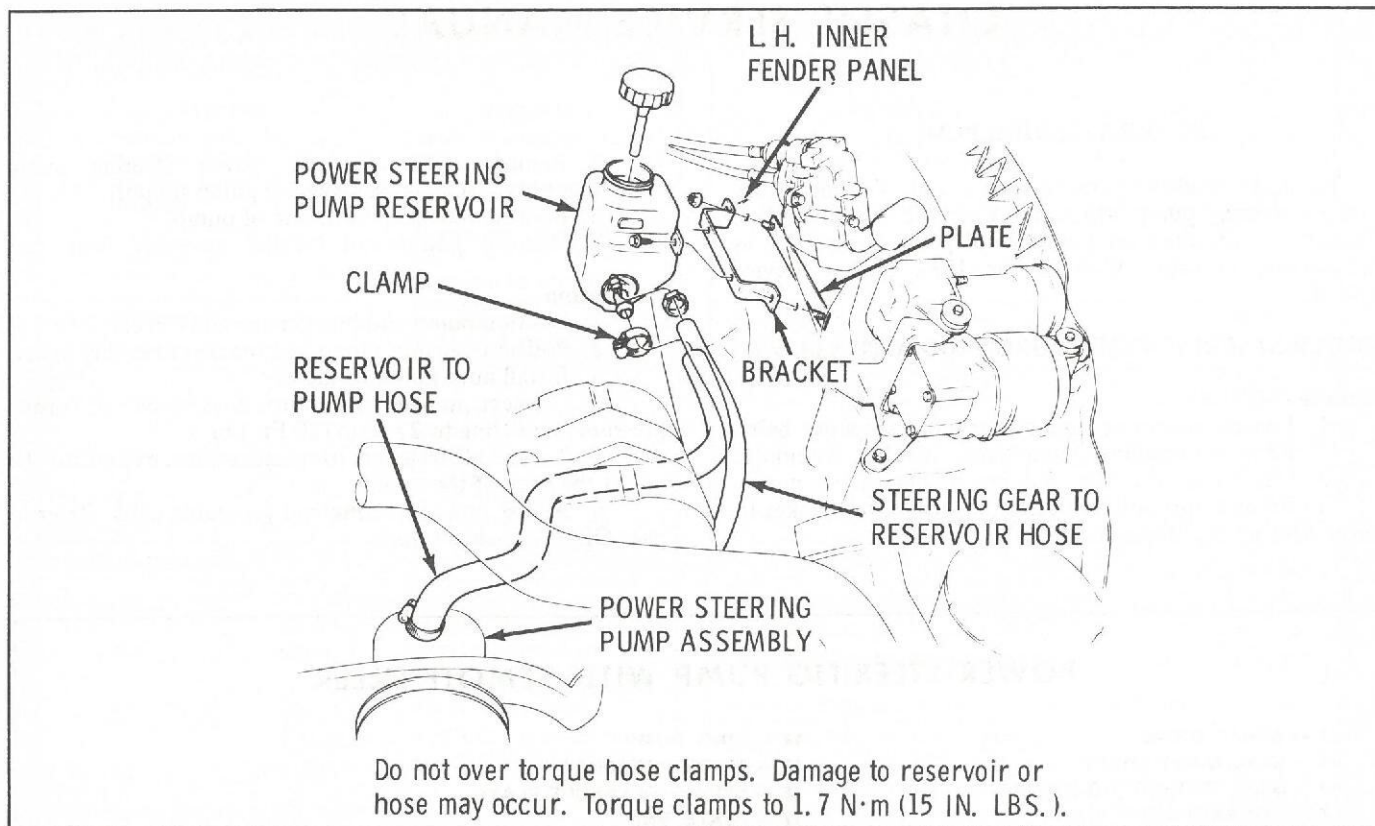


Fig. 3-7—Remote Reservoir/Filler - Toronado

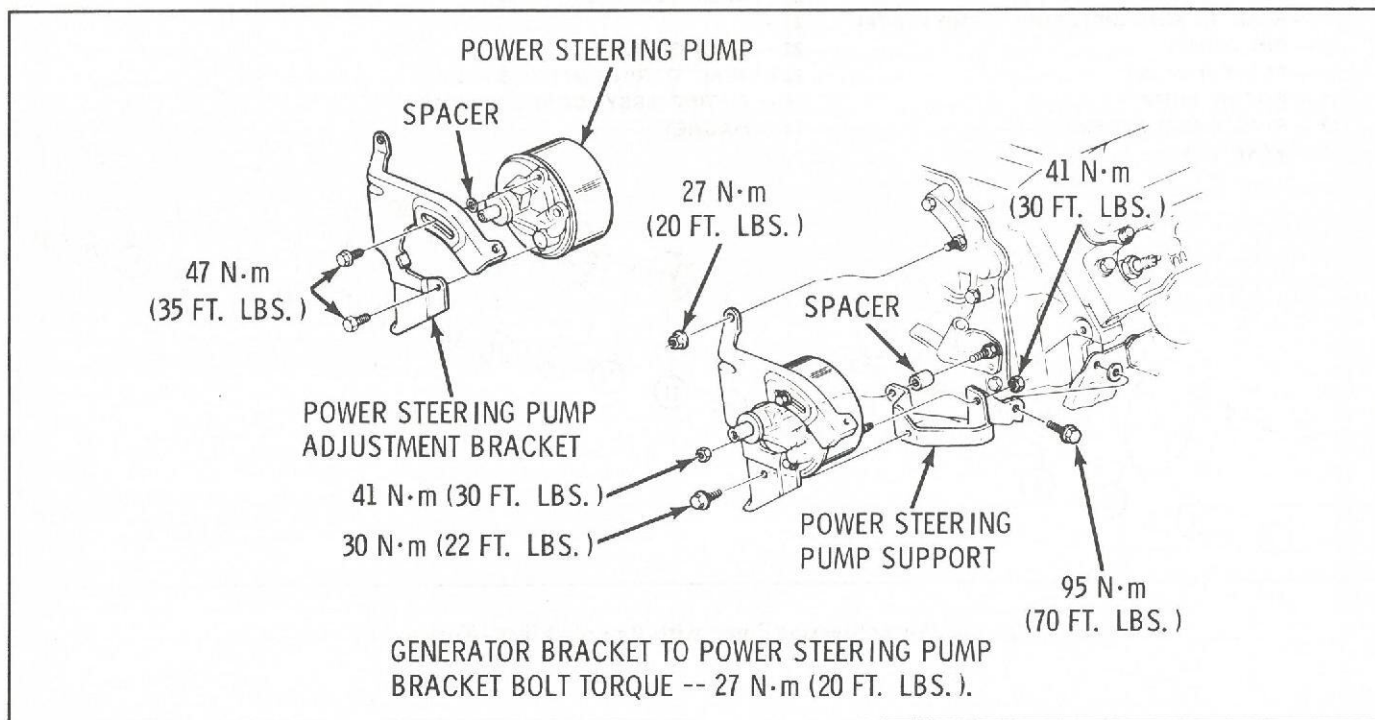


Fig. 3-8—Power Steering Pump Mounting - Toronado with 5.0L V-8

POWER STEERING HOSE ROUTING - GASOLINE ENGINES

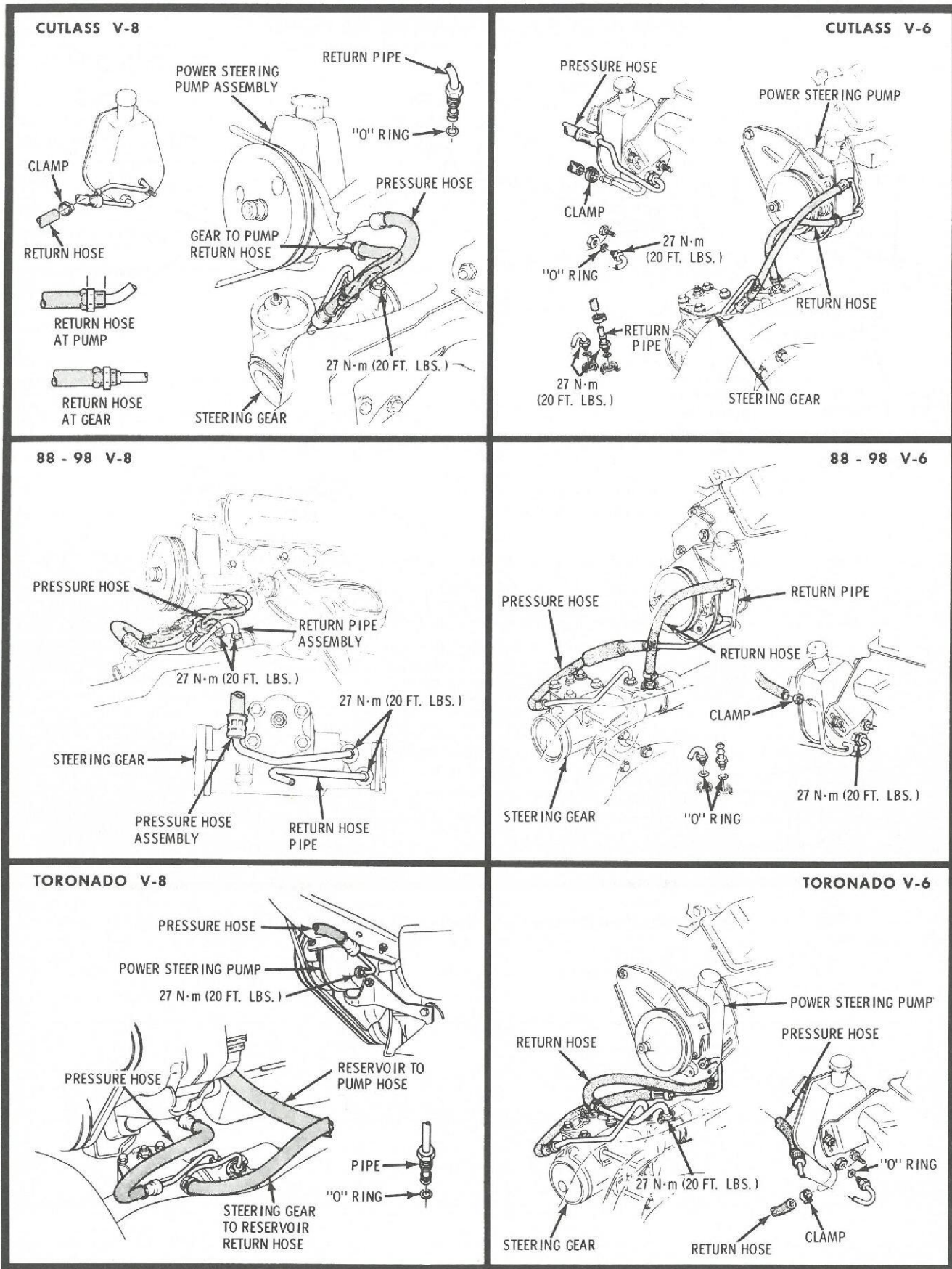


Fig. 3-9—Power Steering Hose Routing (Gasoline Engines) - Replaces Figure 3B3-7

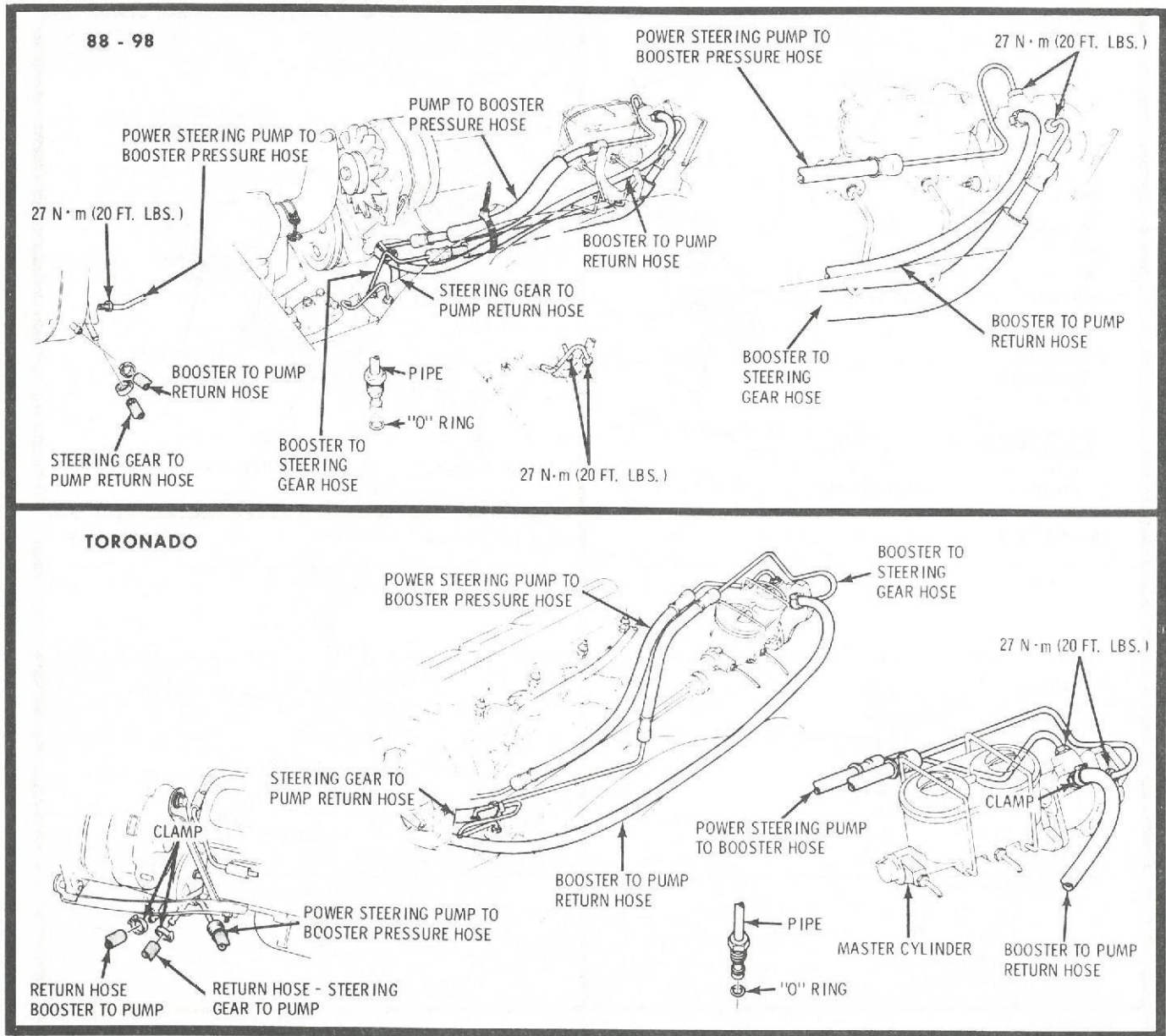


Fig. 3-10—Power Steering Hose Routing (V-8 Diesel Exc. Cutlass) - Replaces Figure 3B3-10

POWER STEERING GEAR (605 MODEL)

GENERAL DESCRIPTION

This Integral Power Steering Gear has a control valve which directs oil to either side of the rack piston. The rack piston converts hydraulic power into mechanical force. This force is transmitted to the mating pitman shaft teeth, through the pitman shaft to the steering linkage.

Whenever a part which forms a sealing surface for an "O" ring seal is removed, the "O" ring seal should also be removed and replaced with a new seal. Whenever one of the Pitman shaft or stub shaft seals are removed all adjacent seals should be removed and replaced with new seals. Lubricate all new seals with power steering fluid to ease assembly.

Round side cover — held in place with retaining ring



(605 MODEL)

Key No. Part Name

- 1-HOUSING, STEERING GEAR
- 2-RETAINER, STRG. COUPLING SHIELD
- 3-BEARING ASSY., NEEDLE (STUB SHAFT)
- 4-SEAL, STUB SHAFT
- 5-SEAL, STUB SHAFT DUST
- 6-RING, RETAINING (STUB SHAFT SEAL)
- 7-BEARING ASSY., NEEDLE (PITMAN SHAFT)
- 8-SEAL, PITMAN SHAFT
- 9-WASHER, SEAL BACK-UP (PITMAN SHAFT)
- 10-RING, RETAINING (PITMAN SHAFT SEAL)
- 11-SEAL, PITMAN SHAFT DUST
- 12-WASHER, LOCK (PITMAN SHAFT)
- 13-NUT, PITMAN ARM
- 14-BEARING ASSY., RACE & UPPER
- 15-RING, VALVE BODY (3)
- 16-SEAL, "O" RING (VALVE BODY) (3)
- 17-BODY ASSY., VALVE
- 18-SEAL, "O" RING (DAMPNER)
- 19-SPOOL, VALVE

Key No. Part Name

- 20-SHAFT ASSY., STUB
- 21-SEAL, "O" RING (SHAFT TO WORM)
- 22-WORM ASSY., PIN & STRG.
- 23-RING, RETAINING (SHAFT TO WORM)
- 24-RING, RACK PISTON
- 25-SEAL, "O" RING (RACK PISTON)
- 26-RACK-PISTON-NUT
- 27-BEARING ASSY., SUPPORT & LWR. THR.
- 28-SEAL, "O" RING (ADJUSTER PLUG)
- 29-PLUG, ADJUSTER
- 30-NUT, ADJUSTER LOCK
- 31-SPRING, SIDE COVER
- 32-SEAL, "O" RING (SIDE COVER)
- 33-GEAR ASSY., PITMAN SHAFT
- 34-COVER, ASSY., HOUSING SIDE
- 35-RING, RETAINING (SIDE COVER)
- 36-NUT, PRELOAD ADJUSTER SEALING

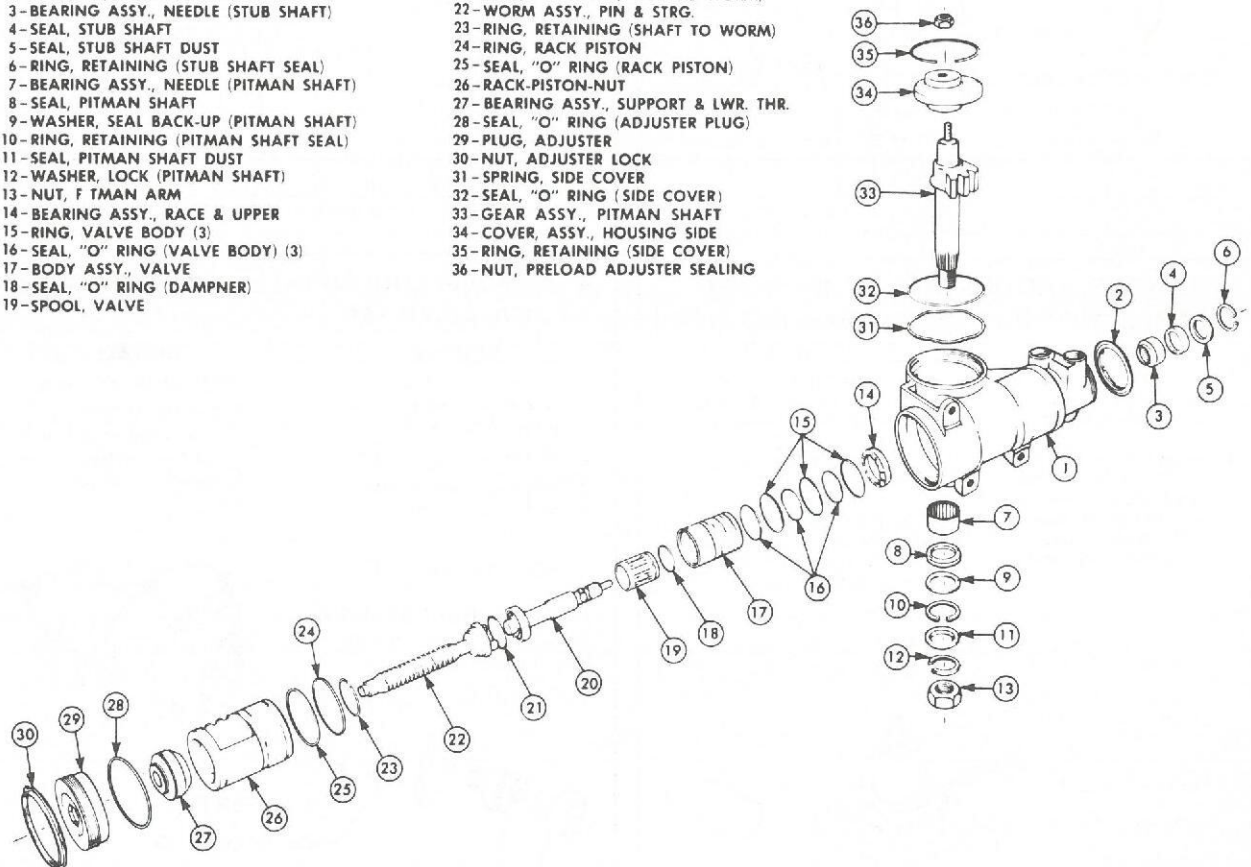


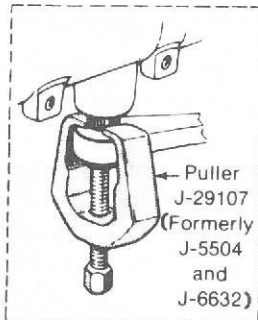
Fig. 3-11—Power Steering Gear (605 Model) - Replaces Page 3B3-11

1. REMOVE AND INSTALL PITMAN SHAFT SEALS IN CAR

REMOVE

1. Clean exposed end of pitman shaft and end of housing after removing arm.
2. Remove retaining ring.
3. Start engine and turn wheels fully to the right to force seals and washer out.
4. Turn off engine.
5. Inspect housing and shaft.

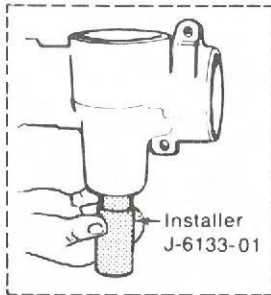
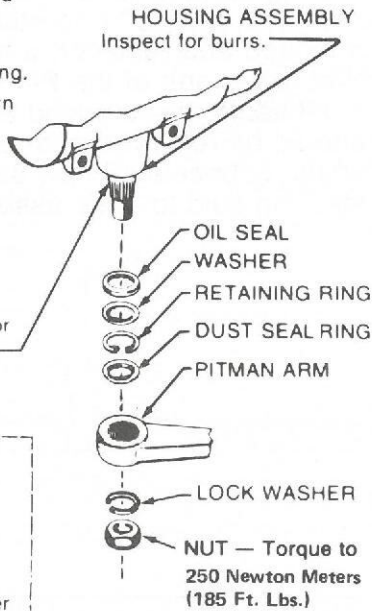
PITMAN SHAFT — Inspect seal surface for roughness and pitting



Remove Pitman Arm

INSTALL

1. Install parts as shown. Inspect for burrs.



Install Seals

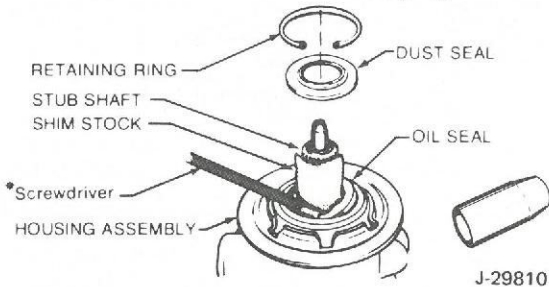
2. REMOVE AND INSTALL STUB SHAFT SEALS WITHOUT DISASSEMBLING GEAR

REMOVE

1. Remove retaining ring and dust seal. Take care not to scratch shaft.
2. Wrap 0.1mm to 0.2mm (.005" to .008") shim stock around shaft and insert between shaft and sealing lip until and sealing lip until it bottoms. Pry seal out.*

INSTALL

1. Install stub shaft seal protector J-29810 on stub shaft. Install stub shaft seal. Coat top of seal with anhydrous calcium grease.
2. Install dust seal just deep enough to clear retaining ring groove, then install retaining ring.



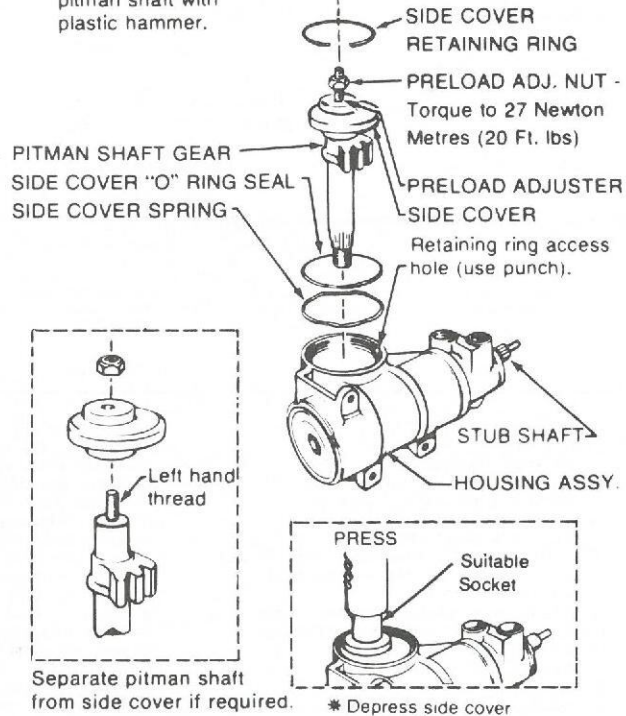
3. REMOVE AND INSTALL PITMAN SHAFT AND SIDE COVER

REMOVE

1. If pitman shaft and side cover are to be separated, remove preload adjuster nut. IT IS A LEFT HAND THREAD.
2. Rotate stub shaft to center gear, then remove parts as shown. Tap on thread end of pitman shaft with plastic hammer.

INSTALL

1. Install parts as shown. Use new retaining ring, make sure that open end of retaining ring is approx. 13mm (1/2") from access hole.
2. Side cover must be depressed to install retaining ring. (SEE BELOW)*



4. REMOVE AND INSTALL LOWER BEARING AND ADJUSTER

REMOVE

1. Loosen lock nut. Use punch against edge of one slot.
2. Remove parts as shown.
3. Inspect lower thrust bearing assembly.

INSTALL

1. Install parts as shown.
2. Adjust thrust bearing preload (see adjustment procedure) before tightening lock nut.

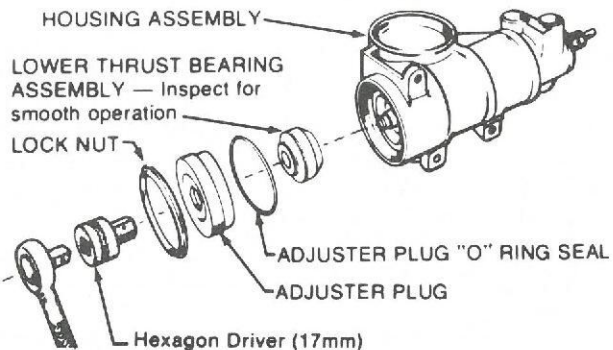


Fig. 3-12—Remove and Install Pitman Shaft Seals in Car - Replaces Page 3B3-12

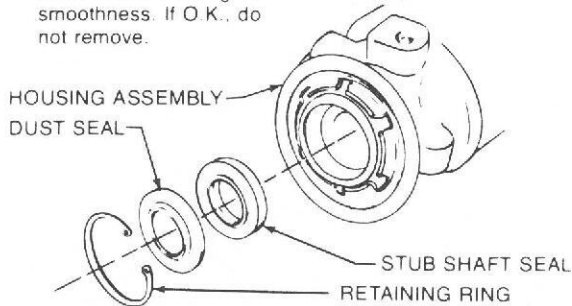
9. REMOVE AND INSTALL STUB SHAFT SEALS AND BEARINGS

REMOVE

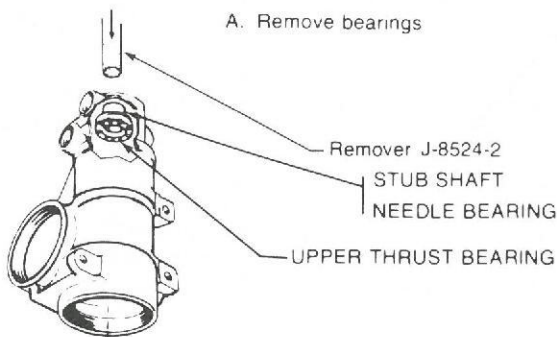
1. Clean end of housing to prevent dirt from entering gear.
2. Remove parts as shown, being careful not to score housing bore.
3. Remove stub shaft needle bearing and upper thrust bearing if required. Put a finger into the stub shaft cavity and hook it onto the upper thrust bearing race. Turn the race while pulling up. If bearing operation is smooth, it does not need removal. Check the stub shaft needle bearing for smoothness. If O.K., do not remove.

INSTALL

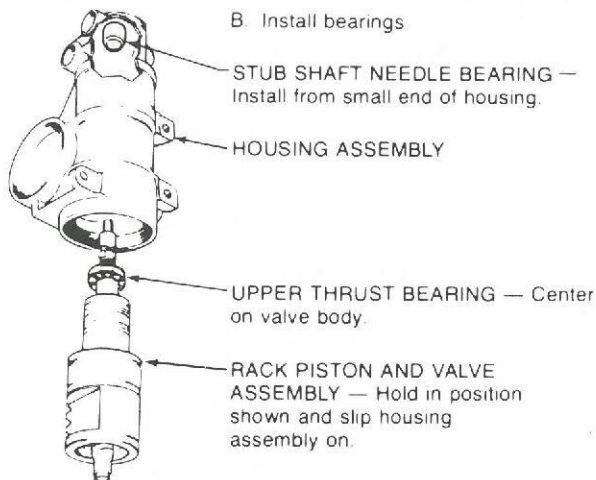
1. If removed, install new stub shaft needle bearing. Bottom tool on housing counterbore.
SERVICE thrust bearing DOES NOT SNAP ON needle bearing. If removed, install as shown below.
2. Install stub shaft seal. Liberally coat top of seal with anhydrous calcium grease.
3. Install dust seal just deep enough to clear retaining ring groove, then install retaining ring.



A. Remove bearings



B. Install bearings



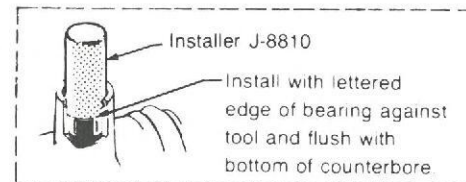
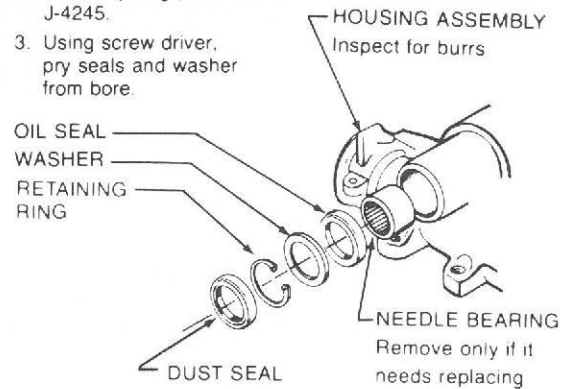
10. REMOVE AND INSTALL PITMAN SHAFT SEALS AND BEARING

REMOVE

1. Clean end of housing thoroughly to prevent dirt from entering and be extremely careful not to score the housing bore.
2. Remove retaining ring with snap ring pliers J-4245.
3. Using screw driver, pry seals and washer from bore.

INSTALL

1. Bottom oil seal in counterbore. Install washer. Coat seal lip and washer face with anhydrous calcium grease.
2. Install remaining parts as shown.



Remove and install bearing (not necessary unless bearing is to be replaced).

Fig. 3-13—Remove and Install Stub Shaft Seals and Bearings - Replaces Page 3B3-14

STEERING WHEELS AND COLUMNS

OMEGA AND CUTLASS CIERA SERVICE MANUAL

STEERING COLUMN LOWER BEARING RETAINER

The lower bearing retainer used on Omega and Cutlass Ciera steering column is attached to the column using a retainer which slips onto the steering shaft. (Fig. 3-14)

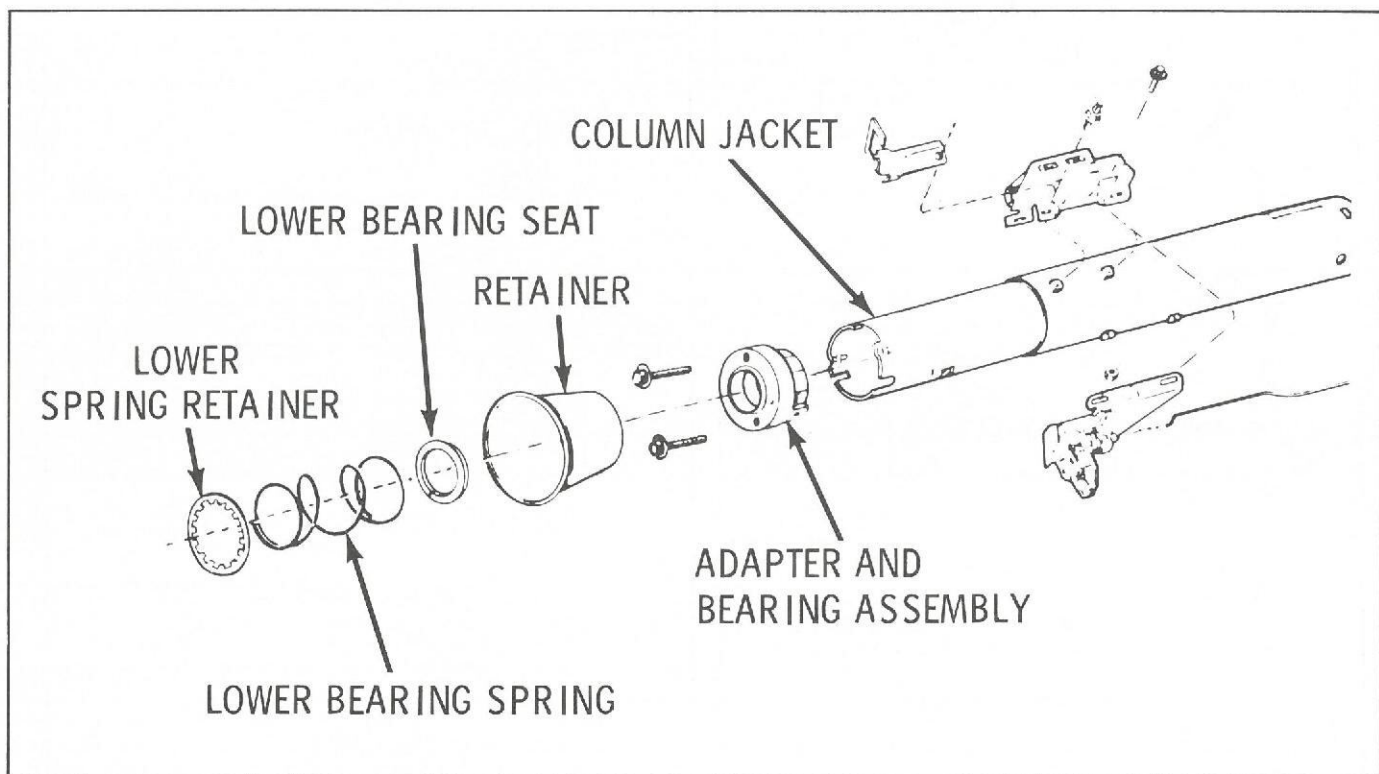


Fig. 3-14—Steering Column Lower Bearing Retainer - Omega & Cutlass Ciera

REMOVE AND INSTALL STEERING COLUMN

NOTICE: Once the steering column is removed from the car, the column is extremely susceptible to damage. Dropping the column assembly on its end could collapse the steering shaft or loosen the plastic injections which maintain column rigidity. Leaning on the column assembly could cause the jacket to bend or deform. Any of the above damage could impair the column's collapsible design. If it is necessary to remove the steering wheel, use standard wheel puller. Under no condition should the end of the shaft be hammered upon as hammering could loosen the plastic injections which maintain column rigidity.

REMOVE

1. Disconnect negative battery cable
2. If column is to be repaired remove steering wheel. Refer to STEERING WHEEL Removal.
3. Remove parts as shown

INSTALL

- See NOTICE on Page 3B3-1 of this section.
1. Install parts as shown
 2. If steering wheel was removed refer to STEERING WHEEL Installation.
 3. Connect negative battery cable

NOTICE: Do not over torque screws attaching lower support to steering column, as damage to lower bearing and adapter may occur.

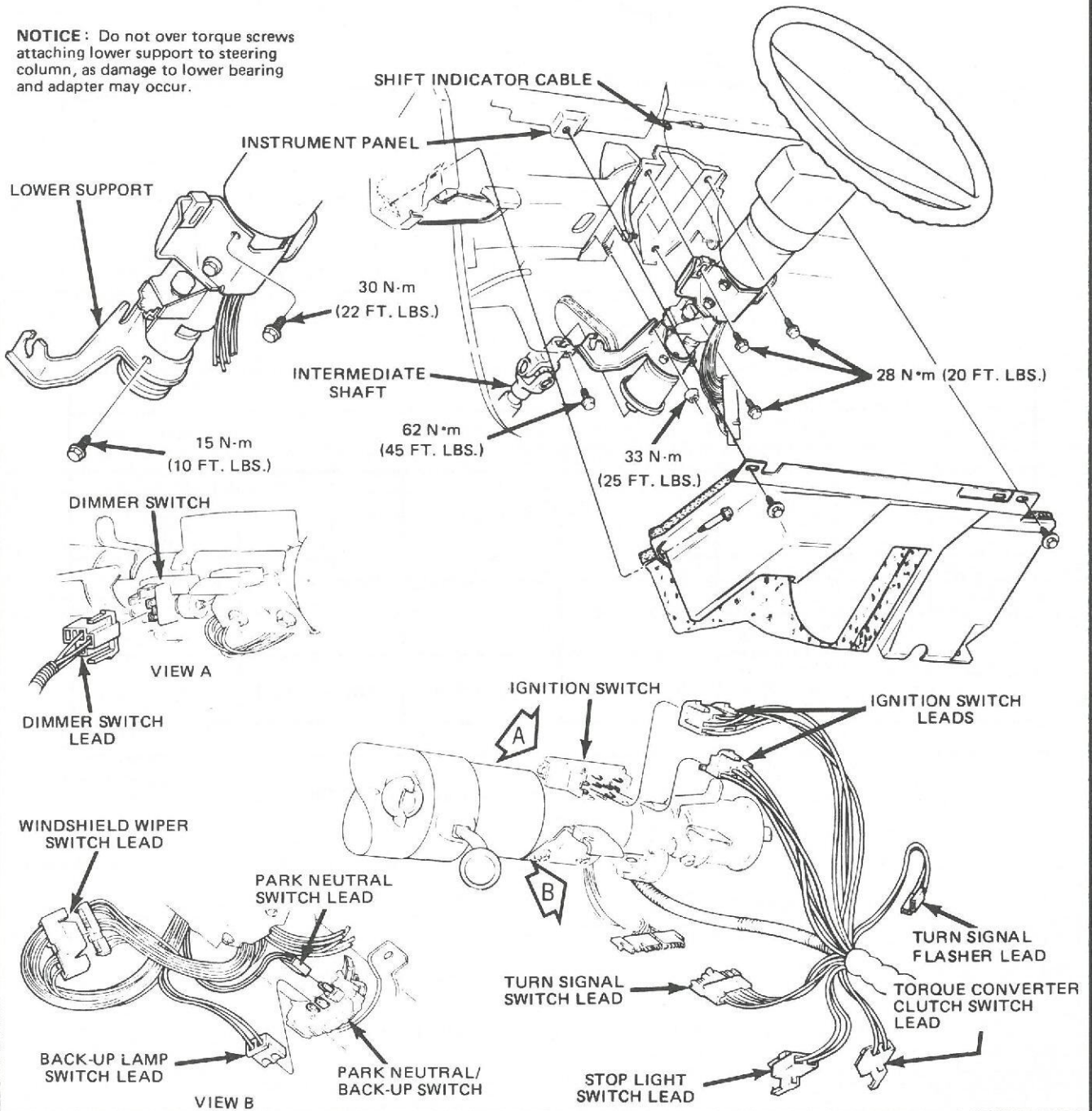
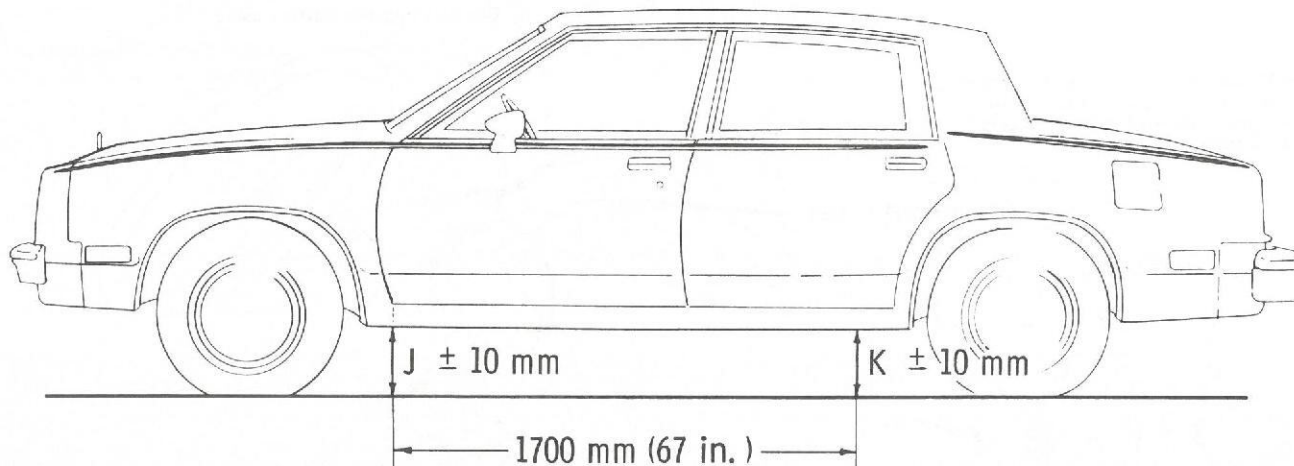


Fig. 3-15—Remove and Install Steering Column - Replaces Page 3B3-4

FRONT SUSPENSION

OMEGA AND CUTLASS CIERA SERVICE MANUAL



TRIM HEIGHTS						
Trim heights checked with tire pressures shown. Full fuel tank or equivalent weight in the trunk. No passengers or added weight in car. Front seat in rear position. Trunk must be empty except for spare tire and jack or simulated fuel load.						
MODEL	ENGINE	TIRE	TIRE PRESSURE		TRIM HEIGHT AT ROCKER	
			FRONT	REAR	FRONT J	REAR K
CUTLASS CIERA	GAS	P185/80R13 P205/70R13	240 kpa (35 psi)	240 kpa (35 psi)	236mm (9-1/4")	238mm (9-3/8")
	DIESEL	P185/75R14				
OMEGA	ALL	P185/80R13 P205/70R13 P215/60R14	240 kpa (35 psi)	240 kpa (35 psi)	237mm (9-3/8")	239mm (9-1/2")

Fig. 3-16—Trim Height Chart - Replaces Figure 3C-10

STABILIZER IDENTIFICATION

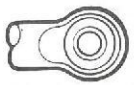
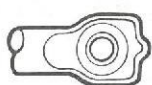
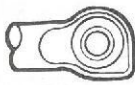
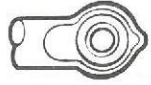
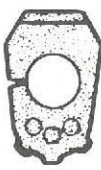
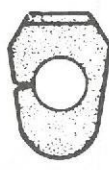


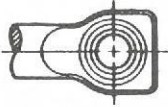
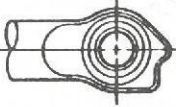
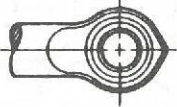
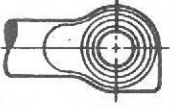




CUTLASS				
STABILIZER SHAFT				
STABILIZER DIAMETER	25 mm (.98")	27 mm (1.06)	29 mm (1.14")	32 mm (1.26")
CODE	CS	CT	CU	CY
BUSHING AND COLOR	 Yellow	 No Ribs	 Pink	 Green
USAGE	CUTLASS EXC. WAGONS, F41 & Y78	CUTLASS WAGONS LD5 EXC. F41	CUTLASS WAGONS EXC. F41 CUTLASS SUPREME Y78 EXC. F41	F41
88-98				
STABILIZER SHAFT				
STABILIZER DIAMETER	30mm (1.18")	24 mm (.94")	26 mm (1.02")	28 mm (1.10")
CODE	CR	CN	CF	CJ
BUSHING AND COLOR	 Pink	 Orange	 Yellow	 Black
USAGE	CUSTOM CRUISER F41	88 EXC. F41	88 & F41 98 EXC. F41	CUSTOM CRUISER EXC. F41 98 & F41

Fig. 3-17—Stabilizer Identification Chart - Replaces Figure 3C-11

OMEGA REAR SPRING POSITIONING

Fig. 3-18 illustrates the correct rear spring positioning on the Omega only. Both rear springs must be positioned with the end of the lower coil toward the rear of the vehicle (parallel to axle center line) within $\pm 15^\circ$. Note this on page 3D-3 of the Omega and Cutlass Ciera Service Manual.

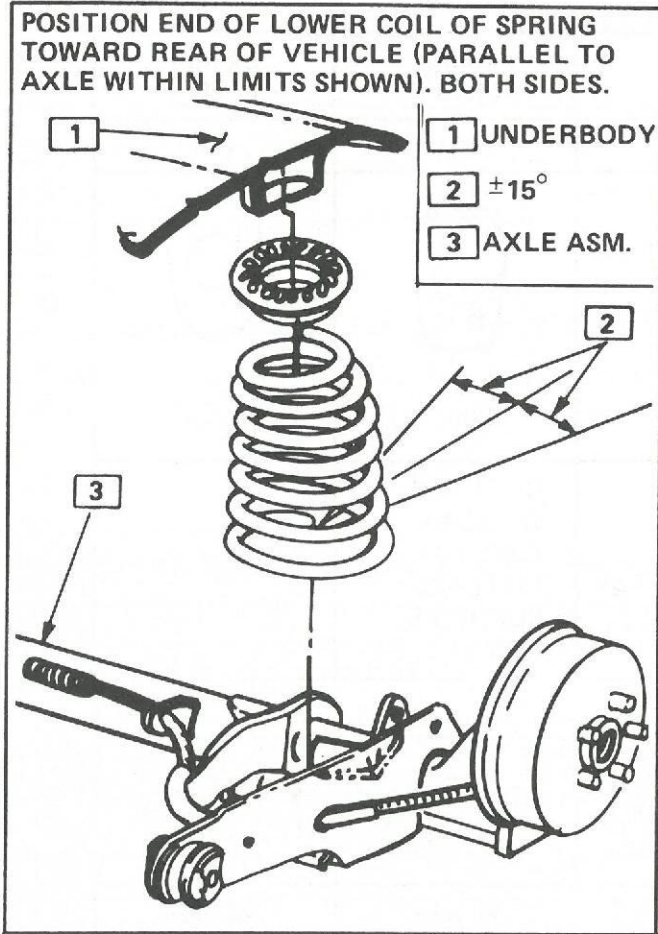


Fig. 3-18—Omega Rear Spring Positioning

SECTION 4

REAR AXLE

NOTICE: All rear axle and final drive attaching fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. It must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of this part.

CHASSIS SERVICE MANUAL

REAR AXLE IDENTIFICATION					
SERIES	RING GEAR DIAMETER	GEAR RATIO	GEAR TEETH	CONVENTIONAL CODE	LIMITED SLIP CODE
Cutlass (Cast Iron Brake Drums)	7-1/2" 190mm	2.29	48:21, 41:18	2AH	2BH
		*2.39	43:18	2AP	
		2.41	41:17	2AJ	2BJ
		2.56	41:16	2AA	2BA
		2.73	41:15	2AB	2BB
		2.93	41:14	2AG	2BG
		3.08	40:13	2AC	2BC
		3.23	42:13	2AD	2BD
Cutlass (Aluminum Brake Drums)	7-1/2" 190mm	2.29	48:21, 41:18	2RA	
		2.39	43:18	2RJ	
		2.41	41:17	2RB	
		2.56	41:16	2RC	
Cutlass Cruiser (Cast Iron Brake Drums)	7-1/2" 190mm	2.29	48:21, 41:18	2AT	2BT
		2.41	41:17	2AZ	2BZ
		2.56	41:16	2AY	2BY
		2.73	41:15	2AX, 2RX	2BX
		3.23	42:13	2AU	2BU
88 (Cast Iron Brake Drums)	7-1/2" 190mm 4-3/4" Bolt Circle	*2.39	43:18	8GH	
		2.41	41:17	8GF	
		2.56	41:16	8GA	
		2.73	41:15	8GB	
		2.93	41:14	8GG	
88 (Aluminum Brake Drums)	7-1/2" 190mm 4-3/4" Bolt Circle	*2.39	43:18	8HH	
		2.41	41:17	8HF	

*Serviced with 2.41 ring and pinion.

Fig. 4-1—Rear Axle Chart - Replaces Figure 4B-74

REAR AXLE IDENTIFICATION CONT'D.					
SERIES	RING GEAR DIAMETER	GEAR RATIO	GEAR TEETH	CONVENTIONAL CODE	LIMITED SLIP CODE
98 (Cast Iron Brake Drums)	7-1/2" 190mm 5" Bolt Circle	2.73 2.93	41:15 41:14	8FC 8FB	
88 (Aluminum Brake Drums)	7-1/2" 190mm 5" Bolt Circle	2.73	41:15	8HB	
98 (Cast Iron Brake Drums)	7-1/2" 190mm 5" Bolt Circle	2.73 2.93	41:15 41:14	8FC 8FB	
88 (Cast Iron Brake Drums)	8-1/2" 216mm	2.41 2.56 2.73 3.08 3.23	41:17 41:16 41:15 40:13 42:13	8LE 8LF	8LZ 8LY 8LX 8LV 8LU
88 (Cast Iron Brake Drums)	8-3/4" 222mm 4-3/4" Bolt Circle	2.41 2.56 2.73 2.93 3.08 3.23	41:17 41:16 41:15 41:14 40:13 42:13	2TF 2TJ 2TK	2TT 2TU 2TW 2TX 2TZ
98 (Cast Iron Brake Drums)	8-3/4" 222mm 5" Bolt Circle	2.73 2.93 3.08 3.23	41:15 41:14 40:13 42:13	8WJ 8WK	8WW 8WX 8WY 8WZ
Custom Cruiser (Cast Iron Brake Drums)	8-3/4" 222mm 5" Bolt Circle	2.41 2.73 2.93 3.08 3.23	41:17 41:15 41:14 41:13 42:13	8YC 8YE 8YF 8YJ 8YK	8YT 8YW 8YX 8YY 8YZ

Fig. 4-1a—Rear Axle Chart Cont'd. - Replaces Figure 4B-74

FINAL DRIVE

PERIODIC MAINTENANCE

Periodic or seasonal changes are not recommended except for heavy duty type driving such as trailer towing. Refer to Section OB or maintenance schedule for change intervals.

Always clean dirt or foreign material from around plug opening before removing filler plug.

Check lubricant level at each engine oil change period. The fluid level should be maintained no lower than 6.35mm (1/4") below filler plug opening.

FINAL DRIVE DIAGNOSIS

For Final Drive Diagnosis refer to Section 4B.

FRONT DRIVE AXLE DIAGNOSIS

Clicking Noise In Turns

1. Worn or damaged outboard joint. (Check for cut or damaged seals).

"Clunk" When Accelerating From "Coast" to "Drive"

1. Loose inboard joint flange bolts
2. Worn or damaged inboard joint.
3. Damaged rubber damper on R.H. inboard joint.

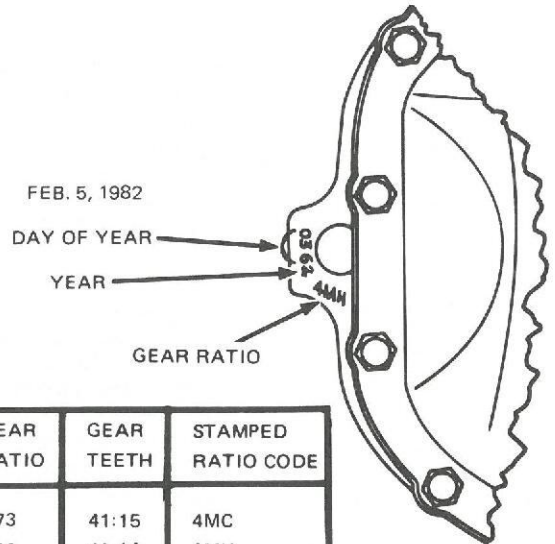
Shudder Or Vibration During Acceleration

1. Excessive joint angle.
2. Worn or damaged inboard or outboard joints.
3. Sticking spider assembly

Vibration At Highway Speeds

1. Out of balance front wheels or tires.
2. Out of round front tires.

FINAL DRIVE IDENTIFICATION



GEAR RATIO	GEAR TEETH	STAMPED RATIO CODE
2.73	41:15	4MC
2.93	41:14	4MH
3.15	41:13	4ME

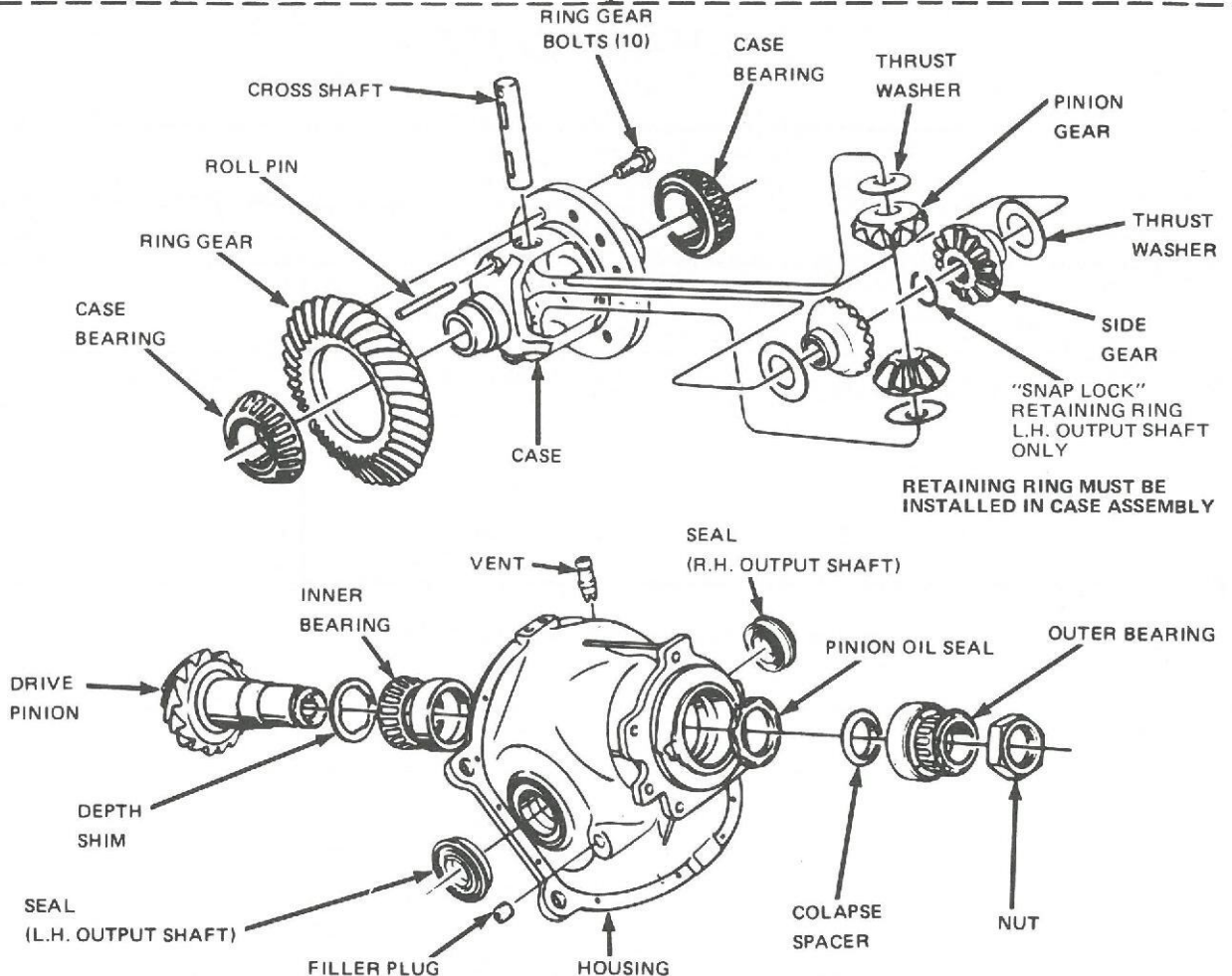


Fig. 4-2—Periodic Maintenance - Replaces Page 4C-3

SECTION 5

BRAKES

NOTICE: All brake attaching fasteners are important attaching parts in that they could affect the performance of vital parts and systems, and/or could result in major repair expense. It must be replaced with one of the same part number or with an equivalent part if replacement becomes necessary. Do not use a replacement part of lesser quality or substitute design. Torque values must be used as specified during reassembly to assure proper retention of this part.

CAUTION: When servicing wheel brake parts, do not create dust by grinding or sanding brake linings or by cleaning wheel brake parts with a dry brush or with compressed air. (A water-dampened cloth should be used). Many wheel brake parts contain asbestos fibers which can become airborne if dust is created during servicing. Breathing dust containing asbestos fibers may cause serious bodily harm.

OMEGA AND CUTLASS CIERA

SERVICE MANUAL

BRAKE SYSTEM DIAGNOSIS QUICK TAKE-UP MASTER CYLINDER		
CONDITION	POSSIBLE CAUSE	CORRECTION
Hard Pedal	Center orifice in quick take-up valve clogged.	Clean orifice or replace master cylinder body.
Excessive Pedal Travel or Soft Pedal	Fluid bypassing quick take-up valve to reservoir. Quick take-up valve is: 1. Damaged 2. Missing 3. Unseated	Replace master cylinder body.
Slow Pedal Return	Compensating (peripheral) holes in quick take-up valve clogged.	Replace master cylinder body.

Fig. 5-1—Quick Take-up Master Cylinder Diagnosis

CHASSIS SERVICE MANUAL

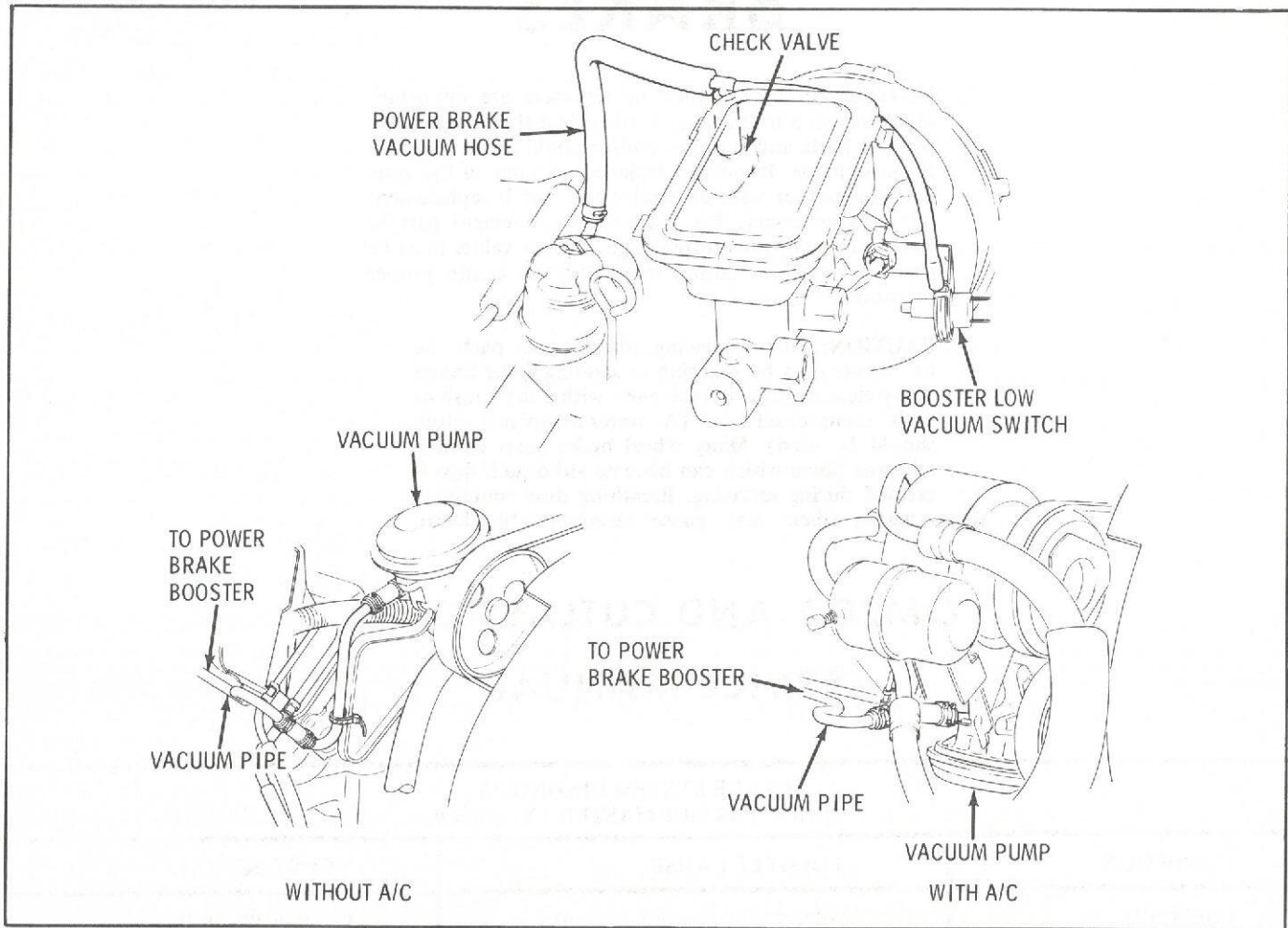


Fig. 5-2—Power Brake Vacuum Pipe and Hose (Cutlass & V6 Diesel) - Replaces Figure 5-7

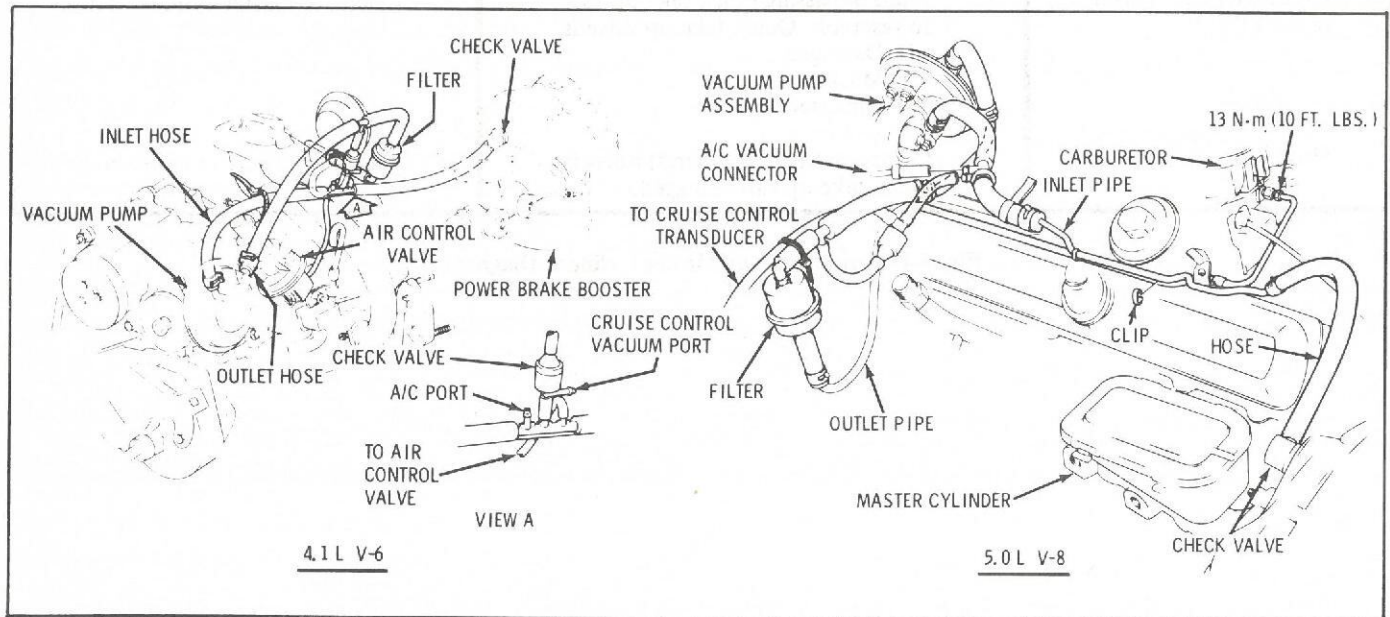


Fig. 5-3—Power Brake Vacuum Hose (Toronado) - Replaces Figure 5-9

MASTER CYLINDER

The master cylinder used on Toronado and Cutlass models equipped with diesel engines is a straight bore cast iron unit. Disassembly, Inspection and assembly on this type of master cylinder is as follows:

Disassembly (Figs. 5-4 & 5-5)

1. Clean outside of master cylinder thoroughly. Remove reservoir cover and diaphragm. Turn cylinder over and pump push rod by hand to drain all brake fluid. Always discard used fluid.

2. Place master cylinder in a vise so the jaws grip the mounting flange. Remove lock ring and primary piston assembly. Remove secondary piston, secondary piston spring and retainer by blowing air through the outlet port.

3. Place master cylinder in vise, so that outlet holes are up. Enlarge hole in tube fitting insert using a 13/64" drill. Place a heavy washer over outlet on master cylinder and thread a 1/4-20 x 3/4" screw into the insert. Tighten screw until insert is unseated. Remove insert, screw, and washer.

4. Remove primary seal, and secondary seal from secondary piston.

5. Use clean brake fluid to clean all metal brake parts thoroughly. Air dry and place cleaned parts on clean paper or lint free clean cloth.

Do not use antifreeze, alcohol, gasoline, kerosene, or any other cleaning fluid that might contain even a trace of mineral oil.

Inspection

Inspect cylinder bore for scoring or corrosion. It is best to replace a corroded cylinder. Corrosion can be identified as pits or excessive roughness.

Polish any discolored or stained area with crocus cloth by revolving cylinder on cloth supported by finger.

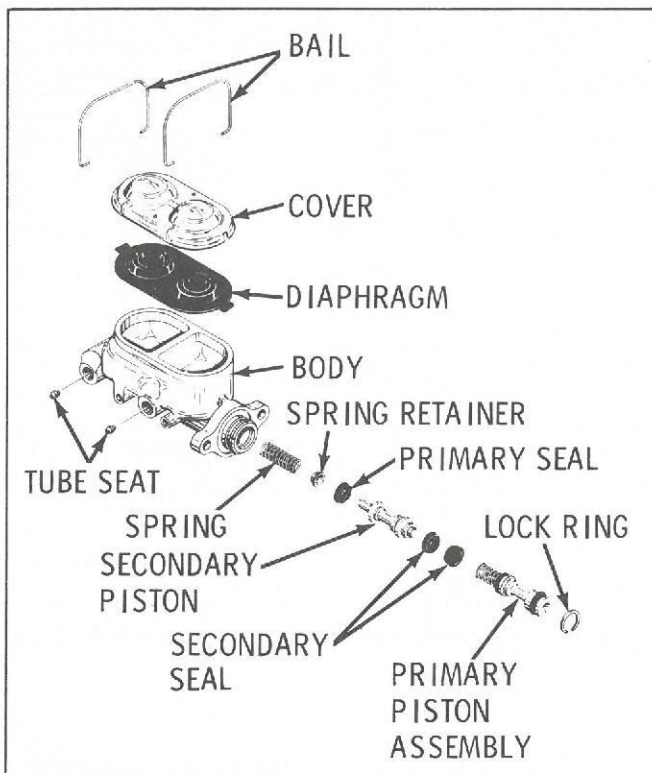


Fig. 5-4—Master Cylinder Assembly

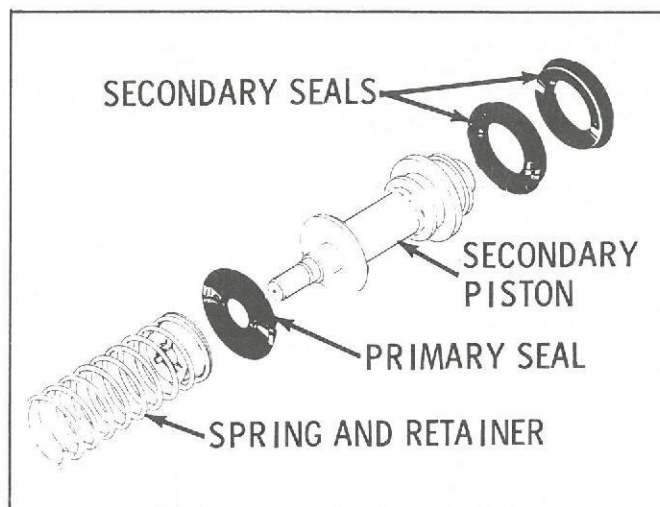


Fig. 5-5—Secondary Piston and Seals

Rinse cylinder in clean brake fluid. Shake excess rinsing fluid from cylinder. Do not use a rag to dry cylinder, as lint from rag cannot be kept from cylinder bore surfaces.

Make certain that compensating port in cylinder is clean.

If scratches or corroded spots are too deep to be polished satisfactorily, the cylinder should be replaced.

Assembly

1. Place brass tube fitting insert (new parts) in outlet holes so that it is in a position to be pressed into outlet hole. The recommended method of inserting tube fitting insert is to thread a spare brake line tube nut into outlet hole and turn nut down until tube fitting insert bottoms. Remove tube nut and check outlet hole for loose burrs, which might have been turned up when tube fitting insert was pressed down.

2. Put new secondary seal in groove in end of secondary piston (Fig. 5-5).

3. Assemble a new primary seal over end of secondary piston, so that flat side of the seal seats against flange of piston (Fig. 5-5).

4. Assemble new secondary seal into groove on end of the secondary piston.

5. In order to insure correct assembly of the primary piston, a complete primary piston assembly is included in the repair kits.

6. Coat bore of master cylinder with clean brake fluid. Coat primary and secondary seals on secondary piston with clean brake fluid. Insert the secondary piston spring retainer into secondary piston spring. Place retainer and spring over end of secondary piston, so that retainer locates inside lip of primary cup.

7. Hold master cylinder with open end of bore down, push secondary piston into bore, so that spring will seat against closed end of bore.

8. Place master cylinder in a vise with open end of bore up. Coat primary and secondary seal on primary piston with clean brake fluid. Push primary piston assembly, spring end first, into bore of master cylinder. Hold the piston down and snap lock ring into position in groove in inside diameter of bore.

9. Install a new reservoir diaphragm in reservoir cover where needed, and install cover on master cylinder. Beaded side faces master cylinder casting to insure positive sealing. The bail wire is now pushed into position to hold reservoir cover.

HYDRO-BOOST II BRAKES

The spool valve sleeve shown in Figure 5-6 is used on Cutlass and Toronado models only. The purpose of the spool valve sleeve is to limit the pressure to the brake calipers to approximately 2300 psi.

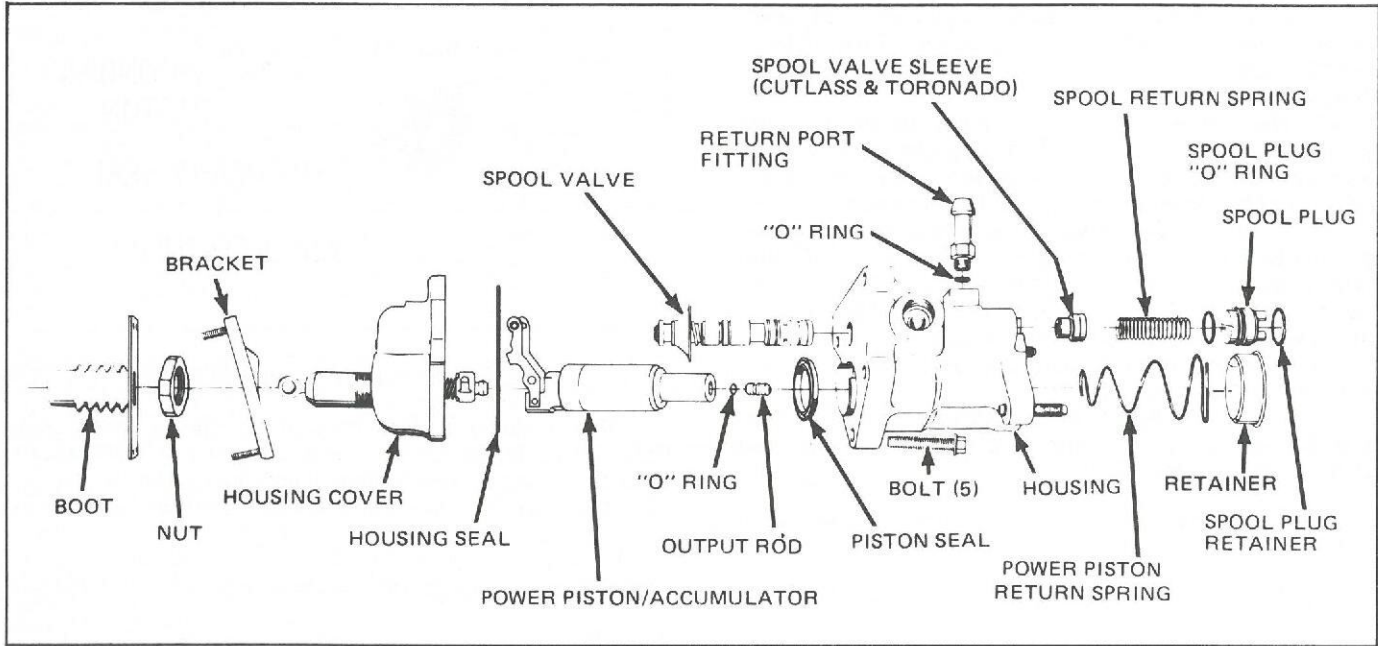


Fig. 5-6—Hydro-Boost Assembly - Replaces Figure 5-44

SECTION 6

ENGINE

ALL NEW GENERAL MOTORS VEHICLES ARE CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO THE REQUIREMENTS OF THE REGULATIONS FOR THE CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES. THIS CERTIFICATION IS CONTINGENT ON CERTAIN ADJUSTMENTS BEING SET TO FACTORY STANDARDS. IN MOST CASES, THESE ADJUSTMENT POINTS EITHER HAVE BEEN PERMANENTLY SEALED AND/OR MADE INACCESSIBLE TO PREVENT INDISCRIMINATE OR ROUTINE ADJUSTMENT IN THE FIELD. FOR THIS REASON, THE FACTORY PROCEDURE FOR TEMPORARILY REMOVING PLUGS, CAPS, ETC., FOR PURPOSES OF SERVICING THE PRODUCT MUST BE STRICTLY FOLLOWED AND, WHEREVER PRACTICABLE, RETURNED TO THE ORIGINAL INTENT OF THE DESIGN.

ENGINE COMPRESSION TESTING

Engine compression testing is not given in section 6 of the 1982 Omega and Cutlass Ciera Service Manual. Please refer to the following when needed.

ENGINE COMPRESSION TEST

COMPRESSION TEST - GASOLINE ENGINES

Disconnect the "BAT." terminal from the HEI distributor.

To determine if the valves or pistons are at fault, a test should be made to determine the cylinder compression pressure. When checking cylinder compression, the throttle and choke should be open, all spark plugs removed, and the battery at or near full charge. The lowest reading cylinder should not be less than 70% of the highest and no cylinder reading should be less than 100 pounds.

This should be done with four "puffs" per cylinder.

Normal - Compression builds up quickly and evenly to specified compression on each cylinder.

Piston Rings - Compression low on first stroke tends to build up on following strokes but does not reach normal. Improves considerably with addition of oil.

Valves - Low on first stroke does not tend to build up on following strokes. Does not improve much with addition of oil.

Use approximately three squirts from a plunger type oiler.

NOTICE: Disconnect the 12V lead to the ignition coil on the 2.5L L4 to prevent damage to the Hall Effect switch.

COMPRESSION TEST - DIESEL ENGINES

To determine if the valves or rings are the cause of low compression, a test should be made to determine the cylinder compression pressure.

When checking compression, the batteries should be at or near full charge. The lowest reading cylinder should not be less than 70% of the highest and no cylinder reading should be less than 275 pounds.

1. Remove air cleaner then install air crossover cover J-26996-1.
2. Disconnect the wire from the fuel solenoid terminal of the injection pump.
3. Disconnect wires from glow plugs then remove all glow plugs.
4. Screw the compression gage J-26999 into the glow plug hole of the cylinder that is being checked.
5. Crank engine.

Allow six "puffs" per cylinder.

Normal - Compression builds up quickly and evenly to specified compression on each cylinder. **Piston Rings Leaking** - Compression low on first stroke tends to build up on following strokes but does not reach normal.

NOTICE: Do not add oil to any cylinder during a compression test as extensive engine damage can result.

Fig. 6-1—Engine Compression Testing

DIESEL ENGINE DIAGNOSIS

Below is a revised chart for the condition of "Engine starts and idles rough with excessive noise and/or smoke, but clears up after warm up". Reference this on page 6-11 of the Service Manual.

Engine Starts and Idles Rough WITH Excessive Noise and/or Smoke, But Clears Up After Warm-Up	1. Incorrect Starting Procedure	Advise Operator on Correct Starting Procedure (See Owner's Manual.)
	2. Injecion Pump Timing Incorrect	Check timing with J-33075 timing meter and reset if needed.
	3. Insufficient Engine Break-in Time	Break-in engine 2000 or more miles
	4. Air in System	Install a section of clear plastic tubing on the fuel return fitting from the engine. Evidence of bubbles in fuel when cranking or running indicates the presence of an air leak in the suction fuel line.
	5. In-Op. Glow Plug	Replace Faulty Glow Plug
	6. Nozzle(s) Malfunction	Remove and clean or replace.
	7. Housing Pressure Cold Advance In-Op.	Check operation — See Section 6C5

**DIESEL ENGINE IDLE ROUGHNESS
DIAGNOSIS PROCEDURE**

The following charts replace existing charts as follows; Fig. 6-2 replaces Fig. 6-2 on page 6-15 of both Service Manuals. Fig. 6-3 replaces Fig. 6-3 on page 6-16 of both Service Manuals.

DIESEL ENGINE IDLE ROUGHNESS DIAGNOSIS PROCEDURE (CONT'D)

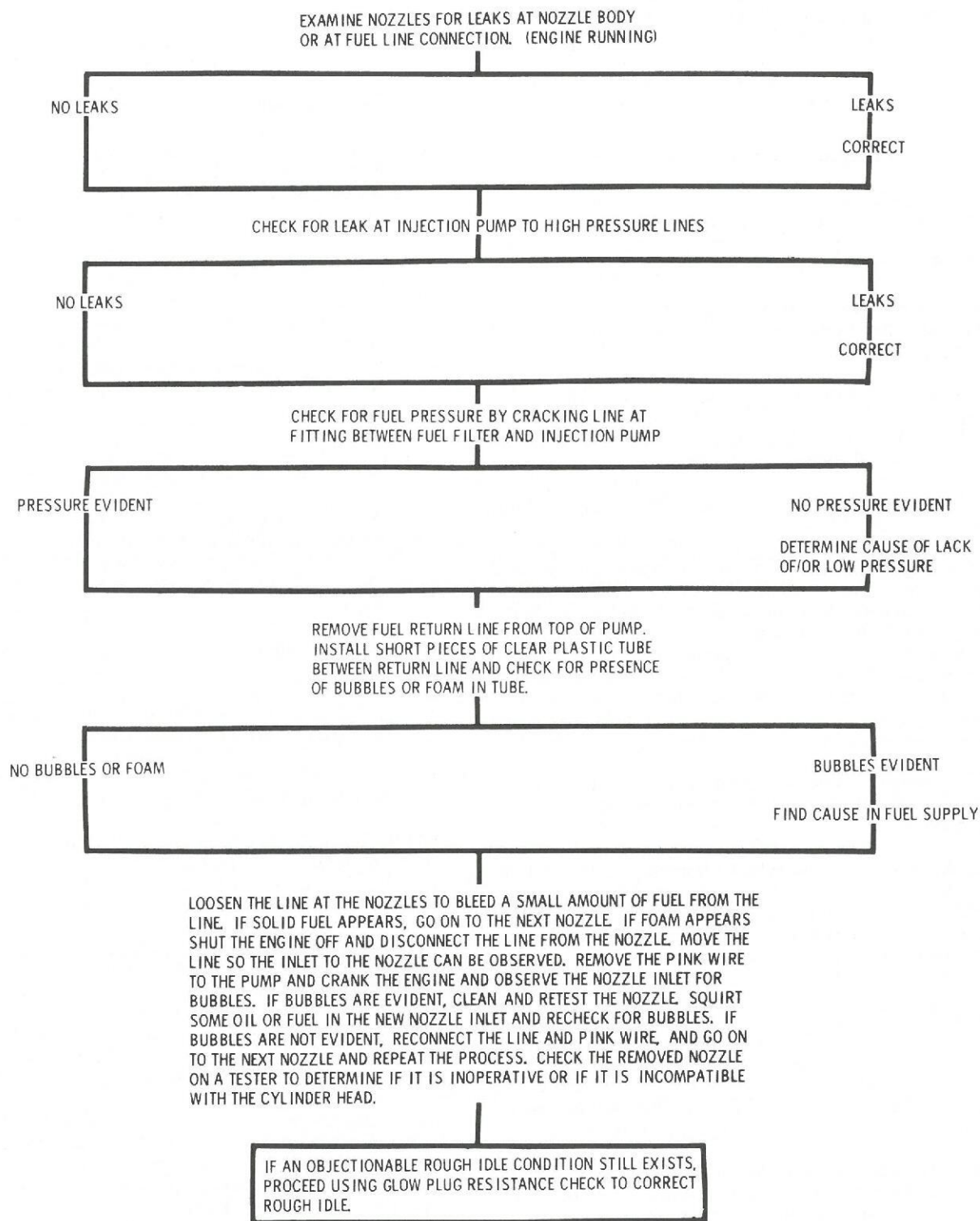


Fig. 6-2—Diesel Engine Idle Roughness Diagnosis Procedure 2 of 2

GLOW PLUG RESISTANCE PROCEDURE

1. Use the Kent-Moore High Impedence Digital Multimeter (Essential Tool J-29125) for resistance measurements.
2. Select scales as follows: LH Switch to "OHMS", RH Switch to full counterclockwise, "200Ω," Slide Center Switch to the left "DC.LO."
3. Start engine, turn on heater and allow engine to warm up. REMOVE all the feed wires from the glow plugs.
4. Disconnect the generator two lead connector.
5. Using Mag-Tach J-26925, adjust engine speed by turning the idle speed screw on the side of the injection pump to the worst engine idle roughness, but do not exceed 900 RPM.
6. Allow engine to run at worst idle speed for at least one minute. The thermostat must be open and the upper radiator hose hot.
7. Attach an alligator clip to the black test lead of the multimeter. **THIS CLIP MUST BE GROUNDED TO THE FAST IDLE SOLENOID.** It must remain grounded to this point until all tests are completed.
8. On a separate sheet of plain writing paper write down the engine firing order.
9. With engine still idling, probe each glow plug terminal and record the resistance values on each cylinder in firing sequence. Most readings will be between 1.8 and 3.4 OHMS. If these readings are not obtained, turn engine "OFF" for several minutes and recheck the glow plugs. The resistance should be .7 or .8 OHMS. If this reading is not obtained check meter for correct settings, check for low or incorrect battery in meter and check the meter ground wire to the engine.
10. The resistance values are dependent on the temperature in each cylinder, and therefore indicate the output of each cylinder.
11. If ohm reading on any cylinder is about 1.2 or 1.3 ohms, check to see if there is an engine mechanical problem. Make a compression check of the low reading cylinder and the cylinders which fire before and after the low cylinder reading. Correct the cause of the low compression before proceeding to the fuel system.
12. Examine the results of all cylinder glow plug resistance readings, looking for differences between cylinders. Normally, rough engines will have a difference of .3 ohms or more between cylinders in firing order. It will be necessary to raise or lower the reading on one or more of these cylinders by selection of nozzles.
13. Remove the nozzles from the cylinders in which you wish to raise or lower the ohm reading. Determine the pop off pressure of the nozzles as well as checking the nozzle for leakage and spray pattern. (Refer to Testing of Nozzles.)
 - A. Install nozzles with a higher pop off pressure to lower the ohm reading, and nozzles with lower pop off pressure to raise an ohm reading. Normally, a change of about 30 psi in pressure will change the reading by .1 ohm. Nozzles normally will drop off in pop off pressure with miles. Use nozzles from parts stock or a new car. Use broken-in nozzles on a car with 1500 or more miles, if possible.
 - B. Whenever a nozzle is cleaned or replaced, before installing the injection pipe, crank the engine and watch for air bubbles at the nozzle inlet. If bubbles are present, clean or replace the nozzle.
 - C. Install the injection pipe, restart engine and check idle quality. If idle is still not acceptable, recheck glow plug resistance of each cylinder in firing order sequence. Record readings.
 - D. Examine all glow plug resistance readings looking for differences of .3 ohms or more between cylinders.

It will be necessary to raise or lower the reading on one or more of these cylinders as previously done.
 - E. After making additional nozzle changes again check idle quality. Normally, after completing two series of resistance checks and nozzle changes, idle quality can be restored to an acceptable level.
14. An injection pump change may be necessary if the following occurs:
 - A. If the problem cylinder moves from cylinder to cylinder as changes in nozzles are made.
 - B. If cylinder ohm readings do not change when nozzles are changed.

NOTE: It is important to always recheck the cylinders at the same RPM. Sometimes the cylinder readings do not indicate that an improvement has been made although the engine may in fact idle better.

A nozzle with a tip leak can allow more fuel than normal into the cylinder, which will raise the glow plug ohm reading. This will rob fuel from the next nozzle in the firing sequence and will result in that glow plug having a low ohm reading. If this is encountered, it is advisable to remove and check the nozzle with a high reading. If it is leaking, it could be causing the rough idle.

Some glow plugs have been found which do not increase in resistance with heat. If you experience low readings on a glow plug and it does not change with nozzle change, then switch glow plugs between a good and bad cylinder. If the reading of each cylinder is not the same as before the switch, then the glow plug can not be used for rough idle diagnosis, although it will function for starting the car.

Fig. 6-3—Glow Plug Resistance Procedure

SECTION 6A

ENGINE MECHANICAL

CRANK PULLEY HUB AND/OR OIL SEAL -2.5L I4

On page 6A1-11 of the Omega and Cutlass Ciera Service Manual, under "Installation", step 4, the torque values are incorrect. The correct torque is 260 N·M (192 Lb. Ft.)

TIMING CHAIN DAMPNER -3.8 and 4.1L V-6

On page 6A1-18 of the Chassis Service Manual within Fig. 6A1-40A is shown a left hand timing chain dampner. This dampner is not used in 1982.

PISTON TO BORE CLEARANCE -5.7L V-8 DIESEL

Make the following correction on page 6A5-42 of the Chassis Service Manual, under "Piston Selection", step 1 d. The piston to bore clearance should be .003-.004".

CYLINDER HEAD PRE-CHAMBER - 5.7L V-8 DIESEL

Please note the following on page 6A5-36 of the Chassis Service Manual;

When replacing a pre-chamber, clean the flat surface of pre-chamber that faces the piston. Observe if a .010 marking is stamped on the surface. If so, replace with a .010" oversize (deeper) pre-chamber.

NOTICE: Failure to install the correct size pre-chamber will result in cylinder head gasket failure.

REAR CAMSHAFT PLUG - 4.3L V-6 DIESEL

Fig. 6A-1 replaces Fig. 6A6-73 on page 6A6-37 of the Chassis Service Manual and Fig. 6A7-77 on page 6A7-26 of the Omega and Cutlass Ciera Service Manual.

4.3L V-6 DIESEL ENGINE SPECIFICATION, 1982 CHASSIS SERVICE MANUAL, SECTION 6A6.

The 4.3L V-6 Diesel engine piston clearance to bore (selective) specification on page 6A6-44 is incorrect. The correct specification for the piston clearance to bore is .076-102 mm (.003-.004). Please note this correction in your manual.

ANTI-SIEZE MATERIAL, NOZZLES AND GLOW PLUGS - 4.3L V-6 DIESEL - VIN T

The correct Service Part number is 1052771 (GMWDD) FEL - PRO C-102, LOCTITE Nickel ANTI-SIEZE or equivalent.

1982 CUTLASS CIERA V-6 DIESEL RIGHT (REAR) EXHAUST MANIFOLD R&R

Use the following procedure instead of the one on page 6A7-7 of 1982 Omega and Cutlass Ciera Service Manual.

1. Disconnect the battery ground cable(s).
2. Remove both exhaust crossover pipe to right (rear) exhaust manifold bolts.
3. Hoist the car - see section OB of the 1982 Omega and Cutlass Ciera Service Manual, page OB-11 for lifting procedures.
4. Remove the exhaust pipe to exhaust manifold bolts.
5. Disconnect the speedometer cable at the transaxle.
6. Remove the exhaust manifold to cylinder head bolts.

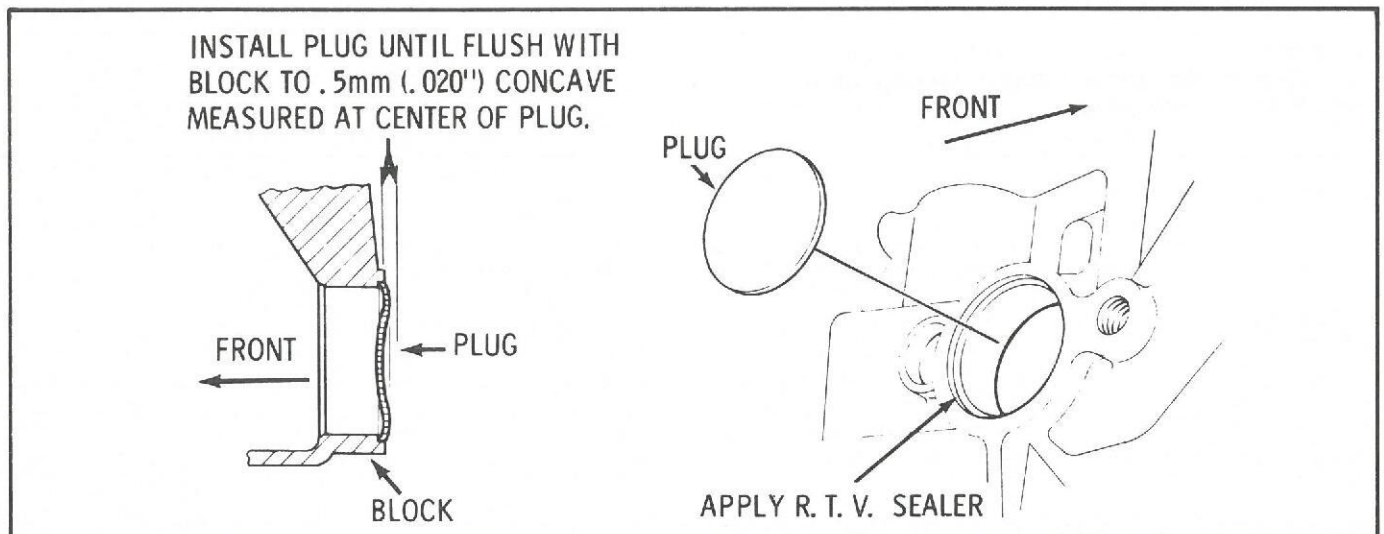


Fig. 6A-1 - Rear Camshaft Plug - V6 Diesel

7. Remove the exhaust manifold through the right front wheel opening.

To install, reverse the removal procedure. Lubricate the entire exhaust manifold to cylinder head bolt with lubricant 1052080 or equivalent. Use a new gasket, torque the bolts to 39 N·m (29 Ft. Lbs.) and bend the lock tabs over the bolt heads.

INTAKE MANIFOLD GASKET – 4.3L V-6 DIESEL

On page 6A6-19 of the Chassis Service Manual and page 6A7-7 of the Omega and Cutlass Ciera Service Manual reference the following change under "Installation", step 1.

1. DO NOT apply any sealer to intake manifold gasket.

CYLINDER HEAD NOZZLE AND GLOW PLUG THREAD REPAIR – 4.3L V-6 DIESEL – VIN T

The following procedure replaces the one on page 6A7-14 of the Omega and Cutlass Ciera Service Manual. The procedure can be performed "on car" using Available Tool Kit J-33052;

FRONT (LEFT) BANK

1. If repairing No. 5 cylinder nozzle or glow plug first remove the cooling fan assembly.

REAR (RIGHT) BANK

1. Remove the engine support strut (Fig. 6A7-8, page 6A7-4 in the Service Manual).

2. If equipped with a single battery; first disconnect the negative battery cable at the battery, then at the engine and disconnect the positive battery cable at the battery.

3. Disconnect the upper oil cooler hose at the radiator.

4. Remove the air cleaner assembly and install J-26996-1 cover.

5. Place a floor jack under the front crossmember of the cradle and raise the jack until the jack just starts to raise the car.

6. Remove the front two body mount (No. 2 and No. 3) bolts with the retainers. See section 2A, Fig. 2A-3, page 2A-3 of the Service Manual.

7. Release the jack slowly while watching and correcting any interference with hoses, lines, valance panel, pipes and cables. Lower the cradle about 203 mm (8 inches).

BOTH BANKS

1. Remove the nozzle (using a back-up wrench on the inlet fitting) or glow plug.

2. Apply a liberal amount of heavy bodied grease to the tap.

3. Insert the tap in the hole, apply downward pressure and tap the hole until the stop collar contacts the cylinder head.

4. If resistance was encountered prior to the stop collar contacting the cylinder head remove the tap from the hole and clean it.

5. Reconnect the battery cables, and disconnect the injection pump 3 lead connector so that the fuel shut-off solenoid will be in-operative.

6. Place a sharpened writing pencil in the opening and hold it tightly in the hole. Place a cloth around the opening and have an assistant crank the engine through 3-4 compression strokes.

7. Remove the pencil and observe if any chips are present. If so repeat step 6.

8. Clean the tap and repeat steps No. 2, 3, 6 and 7. Remove any remaining particles from the hole with a cotton swap.

9. Disconnect the battery cable, if connected at step 5 and reconnect the injection pump 3 lead connector.

10. Thread the insert onto the end of the mandrel engaging the tang into the end of the mandrel. (Figure 6A7-41, page 6A7-15 of the Service Manual) Thread the mandrel into the prewinder. Install the thread insert into the cylinder head until the stop collar contacts the prewinder. Top of the insert must be equivalent of one "thread" (turn) below the top of the hole.

11. Remove the tang on the insert by breaking it off with a drift pin. Remove the tang.

12. Clean out the hole thoroughly.

13. Install the glow plug or injection nozzle as specified in "Glow Plug" in this section or "Injection Nozzle", Section 6C5.

14. a. If the cooling fan was removed, install it. Torque the bolts to 9.5 N·m (85 in. LBS.)

- b. If the cradle was lowered;

1. Raise the jack slowly while correcting any interference with hoses, lines, valance panel, pipes and cables.

2. Install the body mount bolts and retainers, torque to 105 N·m (77 Ft. LBS.)

3. Install the air cleaner assembly.

4. Connect the upper oil cooler hose to the radiator using a new "O" ring. Torque the hose fitting 35 N·m (26 Ft. Lbs.)

15. Start the engine and inspect for leaks.

SECTION 6B

COOLING AND RADIATOR

**DRAINING AND REFILLING THE COOLING SYSTEM –
2.5L L4 OMEGA**

The above procedure was omitted from page 6B-9 of the Omega and Cutlass Ciera Service Manual;

Replace hoses every 24 months or 30,000 miles or earlier if checked, swollen or otherwise deteriorated. Every two years or 30,000 miles, whichever first occurs, the cooling system should be flushed and refilled using the following recommended procedure:

1. Remove the thermostat housing cap when the engine is COOL by:

- Slowly rotating cap counterclockwise to detent. (Do not press down while rotating.)
- Wait until any residual pressure (indicated by a hissing sound) is relieved.
- After all hissing ceases, press down on cap while continuing to rotate counterclockwise.

CAUTION: To avoid the danger of being burned, do not remove cap while engine and radiator are still hot, scalding fluid and steam may be blown out under pressure.

2. Remove the thermostat by using the wire handle to lift it out of the housing.

3. With the thermostat removed, install the thermostat housing cap.

4. **BLOCK DRIVE WHEELS**, Place transmission in PARK (automatic transmission) or NEUTRAL (manual transmission) and set the parking brake. Start and run the engine one minute and shut it off.

5. Remove the thermostat housing cap, open radiator drain valve and block drain plug to drain coolant.

6. Remove the radiator cap, clean, test and replace it, if needed. Clean and inspect the radiator filler neck. Install the radiator cap.

7. Run water through the thermostat housing until the liquid coming out of system is nearly colorless.

8. Allow system to drain completely and then close radiator drain valve tightly, and install block drain plug.

9. Remove recovery cap leaving hoses in place. Remove coolant recovery tank and empty of fluid. Flush tank with clean water, drain and reinstall.

10. Add enough water and ethylene glycol antifreeze (meeting GM Specification 1825-M) to provide the required cooling, freezing and corrosion protection. Use a solution that is at least 50 percent antifreeze but no more than 70 percent antifreeze.

CAUTION: Under some conditons, the ethylene glycol in engine coolant is flammable. To help avoid being burned when adding coolant, DO NOT spill it on the exhaust system or hot engine parts.

11. Add coolant through the thermostat housing until it reaches the housing cap seat. Install the thermostat and cap, making sure the arrows on the cap line up with the radiator inlet hose on the thermostat housing. Fill the coolant recovery tank to the "FULL HOT" mark. Put the recovery tank cap back on.

It is the owner's responsibility to keep the freeze protection at a level proportionate with the temperatures which may occur in the area of vehicle operation.

- Maintain cooling system freeze protection at -37° (-34°F), to ensure protection against corrosion and loss of coolant from boiling even though freezing temperatures are not expected.
- Add ethylene glycol base coolant that meets GM Specifications 1825-M when coolant additions are required because of coolant loss or to provide additional protection against freezing at temperatures lower than -37° (-34°F).

NOTICE: Alcohol or methanol base coolants or plain water are not recommended at any time.

1982 TORONADO RADIATOR USAGE CHART

Note the following change on page 6B-3 of the Chassis Service Manual;

Radiator code BB is replaced by BF.

**ENGINE FAN BLADE CLUTCH ASSEMBLY – 1982
CUTLASS WITH THE 4.3L V-6 DIESEL, VIN V.**

Note the following in the 1982 Chassis Service Manual in section 6B, page 6B-9 and section 6A6, page 6A6-33 at step No. 16;

The fan blade clutch assembly has a yellow dot on the clutch assembly mounting flange which MUST be aligned with the yellow dot on the water pump pulley. See Fig. 6B-1.

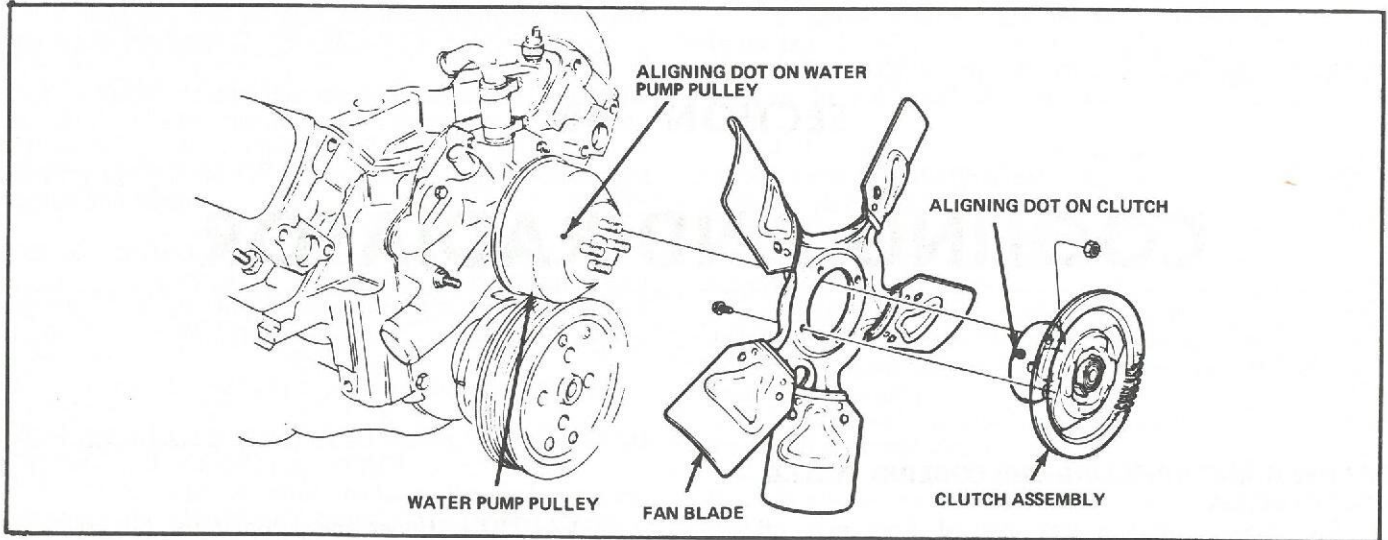


Fig. 6B-1 Engine Fan Clutch Installation – VIN V

FUEL SYSTEM & CARBURETOR

"ALL NEW 1982 VEHICLES ARE CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO THE REQUIREMENTS OF THE REGULATIONS FOR THE CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES. THIS CERTIFICATION IS CONTINGENT ON CERTAIN ADJUSTMENTS BEING SET TO FACTORY STANDARDS. THUS, THESE ADJUSTMENT POINTS EITHER HAVE BEEN PERMANENTLY SEALED AND/OR MADE INACCESSIBLE TO PREVENT INDISCRIMINATE ADJUSTMENT IN THE FIELD. FOR THIS REASON, THE FACTORY PROCEDURE FOR TEMPORARILY REMOVING PLUGS, CAPS, ETC., FOR THE PURPOSES OF SERVICING THE PRODUCT MUST BE STRICTLY FOLLOWED AND, WHEREVER PRACTICABLE, RETURNED TO THE ORIGINAL INTENT OF THE DESIGN."

FUEL PUMP TEST – V-6 DIESEL

Note the following on page 6C-8 of the Chassis Service Manual and on page 6C-4 of the Omega and Cutlass Ciera Service Manual;

At step 2b and 3, the incorrect vacuum specification is given. The correct specification is 17.9 kPa (5.3 "HG).

ELECTRIC FUEL PUMP – V-6 DIESEL

Note the following on page 6C-9 of the Chassis Service Manual and on page 6C-4 of the Omega and Cutlass Ciera Service Manual;

The illustration showing pump mounting does not show a ground lead that is installed under the bracket screw. Also when torquing the bracket screw, torque it to 24 N·m (18 ft. lbs.).

FUEL RETURN SYSTEM – VIN 8 ENGINE

On page 6C-14, 6C-15, and 6C-16 of the Chassis Service Manual, Figs. 6C-20, 6C-22, 6C-24 and 6C-31 show that no fuel return line is present. Later production VIN 8 engine will use a fuel return line as shown in Fig. 6C-21, 6C-23, 6C-25 and 6C-32.

IDLE SPEED CONTROL (ISC)

The ISC plunger adjustment specifications are shown in the Chassis Service Manual on page 6C1-9 (Fig. 6C1-13) or page 6C2-9 (Fig. 6C2-12) and in the Omega and Cutlass Ciera Service Manual on page 6C2-7 (Fig. 6C2-12).

The Idle Speed Control speed specifications were omitted from the 1982 Chassis Service Manual. Please add the following;

Page 6C1-7, step 11 – speed should be 470 RPM.

Page 6C1-8, step 15b – speed should be 900 RPM.

Page 6C2-7, step 11 – speed should be 450 RPM.

Page 6C2-7, step 15b – speed should be 900 RPM.

DIFFERENTIAL VACUUM DELAY VALVE (DVDV) – VIN 8 AND Y

Please note this in sections 6C1 and 6C2 of your 1982 Chassis Service Manual;

The DVDV is located in the vacuum line between the Idle Load Compensator (ILC) and the vacuum source (Fig. 6C-1). It is used on both the 4.3L (VIN 8) and the 5.0L (VIN Y) V-8's.

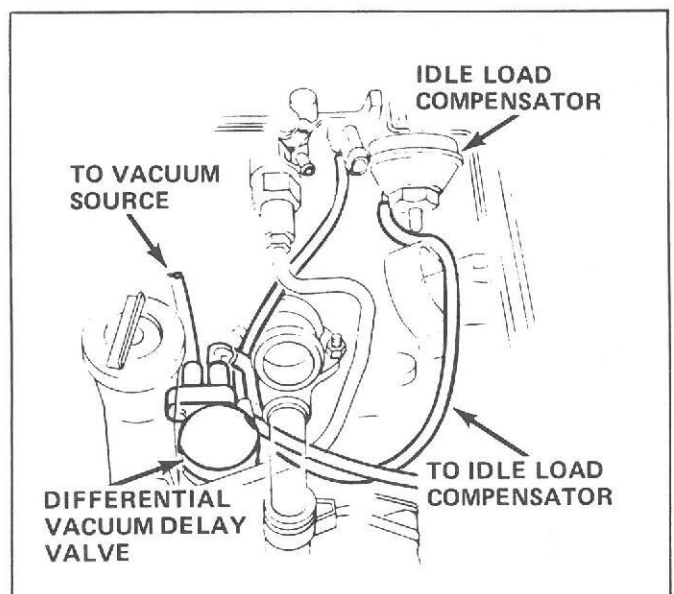


Fig. 6C-1 ILC, DVDV And Hose Routing – VIN 8 and Y

The DVDV acts as cushioning device by slightly delaying the operation of the ILC until a constant vacuum change has occurred. Without the DVDV the ILC would react too quickly to changes in engine vacuum, causing a surging condition or if too restrictive to vacuum flow, it would cause a stalling or run-on condition.

To check the operation of the DVDV, install a vacuum gage with a "T" into the hose from the DVDV to the ILC. Install a vacuum pump to port 1 (Fig. 6C-2) and apply 60 kPa (17.8") of vacuum while watching the other vacuum gage, it should take six (6) to nine (9) seconds for the vacuum to rise to 57.0 kPa (16.9"). Remove the vacuum gage with "T", install the vacuum pump to port 2 and leave port 1 open. Air should flow through the valve after 1.7 kPa (.5") is applied.

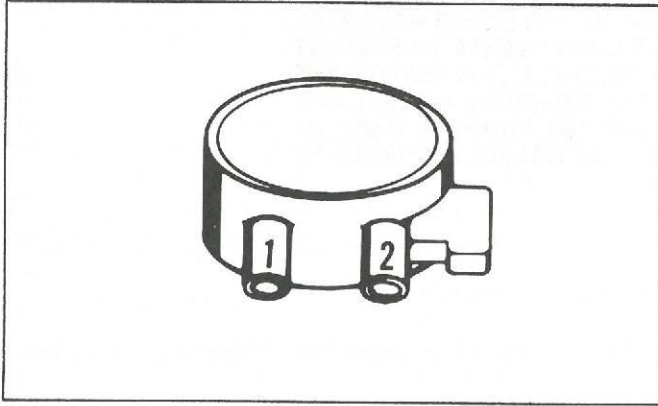


Fig. 6C-2 Differential Vacuum Delay Valve – VIN 8 and Y

CARBURETOR SPECIFICATIONS

Note on page 6C3-19, Fig. 6C3-30 of the Omega and Cutlass Ciera Service Manual, that the Secondary Lockout Adjustment gauge clearance (step 3) should be .3mm – 1mm (.011" – .040").

Figures 6C3, 6C-4 and 6C-5 are charts that give revised carburetor specifications that were available at time of this Manual's printing. Use these charts instead of the ones found in the Chassis Service Manual and Omega and Cutlass Ciera Service Manual.

CARB. NUMBER	FLOAT LEVEL	CHOKE ROD CAM ADJ.	E2SE						
			VACUUM BREAK PRI. SIDE	AIR VALVE ROD	VACUUM BREAK SEC. SIDE	UNLOADER	AIR VALVE SPRING WIND UP	LEAN MIXTURE SCREW PRESET ●	IDLE MIXTURE NEEDLE PRESET ●
17082316	1/4"	17°	26°	1°	34°	35°	1	2 1/2	4
17082317	1/4"	17°	29°	1°	35°	35°	1	2 1/2	4
17082320	1/4"	25°	30°	1°	35°	33°	1	2 1/2	4
17082321	1/4"	25°	29°	1°	35°	33°	1	2 1/2	4
17082356	13/32"	22°	25°	1°	35°	30°	1	2 1/2	4
17082357	13/32"	22°	25°	1°	35°	30°	1	2 1/2	4
17082358	13/32"	22°	25°	1°	35°	30°	1	2 1/2	4
17082359	13/32"	22°	25°	1°	35°	30°	1	2 1/2	4
17082390	13/32"	17°	26°	1°	34°	35°	1	2 1/2	4
17082391	13/32"	25°	29°	1°	35°	35°	1	2 1/2	4
17082398	13/32"	17°	26°	1°	34°	35°	1	2 1/2	4
17082490	13/32"	17°	26°	1°	34°	35°	1	2 1/2	4
17082491	13/32"	25°	29°	1°	35°	35°	1	2 1/2	4
17082498	13/32"	17°	26°	1°	34°	35°	1	2 1/2	4
17082640	1/4"	17°	26°	1°	34°	35°	1	2 1/2	4
17082641	1/4"	17°	29°	1°	35°	35°	1	2 1/2	4
17082642	1/4"	25°	30°	1°	35°	33°	1	2 1/2	4

● From Bottomed Position

Fig. 6C-3 E2SE Carburetor Specifications

E2MC - E2ME									
CARB. NUMBER	FLOAT LEVEL	CHOKE ROD CAM ADJ.	FRONT VACUUM BREAK	REAR VACUUM BREAK	UNLOADER	LEAN MIXTURE SCREW ●	IDLE AIR BLEED VALVE ●	IDLE MIXTURE NEEDLE PRESET ●	
17082150	13/32"	14°	24°	36° †	35°	3 1/2	*	6 1/8	
17082152	13/32"	14°	24°	36° †	35°	3 1/2	*	6 1/8	
17082182	5/16"	18°	28°	24°	32°	3 1/2	4 3/4	*	
17082183	5/16"	18°	24°	28°	27°	3 1/2	4 3/4	*	
17082184	5/16"	18°	28°	24°	32°	3 1/2	4 3/4	*	
17082186	5/16"	18°	21°	19°	27°	3 1/2	4 3/4	*	
17082192	5/16"	18°	28°	24°	32°	3 1/2	4 3/4	*	
17082194	5/16"	18°	28°	24°	32°	3 1/2	4 3/4	*	
17082196	13/32"	18°	21°	19°	27°	3 1/2	4 3/4	*	

† At High Altitude Set To 40°

* "On Car" Adjustment

● From Bottomed Position

Fig. 6C-4 E2MC - E2ME Carburetor Specifications

E4MC - E4ME									
CARB. NUMBER	FLOAT LEVEL	CHOKE ROD CAM ADJ.	FRONT VACUUM BREAK	REAR VACUUM BREAK	UNLOADER	AIR VALVE SPRING WIND UP	LEAN MIXTURE SCREW ●	IDLE AIR BLEED VALVE ●	IDLE MIXTURE NEEDLE PRESET ●
17082244	9/32"	24.5°	21°	16°	32°	9/16	3 1/2	4 3/4	*
17082245	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082246	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082247	3/8"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082248	9/32"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082249	9/32"	24.5°	20°	15°	38°	9/16	3 1/2	4 3/4	*
17082251	7/16"	14°	25°	45°	35°	1/2	3 1/2	4 3/4	*
17082253	7/16"	14°	27°	41°	35°	1/2	3 1/2	*	3 3/4
17082264	9/32"	24.5°	21°	16°	32°	9/16	3 1/2	4 3/4	*
17082265	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082266	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082267	3/8"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082268	3/8"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082269	9/32"	24.5°	20°	15°	38°	9/16	3 1/2	4 3/4	*
17082294	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082295	3/8"	24.5°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082298	3/8"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*
17082299	3/8"	18°	26°	26°	32°	5/8	3 1/2	4 3/4	*

* "On Car" Adjustment

● From Bottomed Position

Fig. 6C-5 E4MC - E4ME Carburetor specifications

SECTION 6C5

DIESEL FUEL INJECTION

ALL NEW 1982 GENERAL MOTORS CARS ARE CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO THE REQUIREMENTS OF THE REGULATIONS FOR THE CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES. THIS CERTIFICATION IS CONTINGENT ON CERTAIN ADJUSTMENTS BEING SET TO FACTORY STANDARDS THUS, THESE ADJUSTMENT POINTS EITHER HAVE BEEN PERMANENTLY SEALED AND/OR MADE INACCESSIBLE TO PREVENT INDISCRIMINATE ADJUSTMENT IN THE FIELD. FOR THIS REASON, THE FACTORY PROCEDURE FOR TEMPORARILY REMOVING PLUGS, CAPS, ETC., FOR THE PURPOSES OF SERVICING THE PRODUCT MUST BE STRICTLY FOLLOWED AND, WHEREVER PRACTICABLE, RETURNED TO THE ORIGINAL INTENT OF THE DESIGN.

NOTICE: DO NOT USE STARTING FLUIDS. SUCH AIDS CAN CAUSE IMMEDIATE ENGINE DAMAGE.

THROTTLE LINKAGE ADJUSTMENTS -V8 (FIGURE 6C5-6, 1982 CHASSIS SERVICE MANUAL)

The procedure below replaces the one on page 6C5-3;

1. If equipped with cruise control, remove clip from cruise control throttle rod and disconnect the rod from the throttle lever assembly.
2. Disconnect the transmission T.V.. (or detent) cable from the throttle assembly.
3. Loosen the lock nut on the pump rod and shorten rod several turns.
4. Rotate the bellcrank lever assembly to the full throttle position and hold in that position.
5. Lengthen the pump rod until the injection pump lever just contacts the full throttle stop.
6. Release the bellcrank assembly and tighten the pump rod lock nut.
7. Depress and hold the metal lock tab on the cable upper end. Move the slider through the fitting in the direction away from the bellcrank lever assembly until the slider stops against the metal fitting. Release the metal tab.
8. Reconnect the transmission T.V. or detent cable.
9. Rotate the bellcrank lever assembly to the full throttle stop and release the lever assembly.
10. Reconnect the cruise control throttle rod, if so equipped.
11. Adjust the vacuum regulator valve, see "Vacuum Regulator Adjustment".
12. Reset the idle speeds and adjust the cruise control servo rod, see "Idle Speed Adjustment".

VACUUM REGULATOR VALVE ADJUSTMENT 5.7L V-8 Diesel

Reference the following on page 6C5-3 of the Chassis Service Manual.

The additional steps below must be performed if the Vacuum Regulator Valve has a WHITE colored electrical switch cover-see Fig. 6C5-1;

- (Perform steps 1 through 14 as described presently)
15. Place the transmission selector lever in "Park", apply the parking brake and block the drive wheels.
16. Install air crossover cover J-26996-1.
17. Start the engine and let it run at idle until fully warmed up. Then shut off the engine.

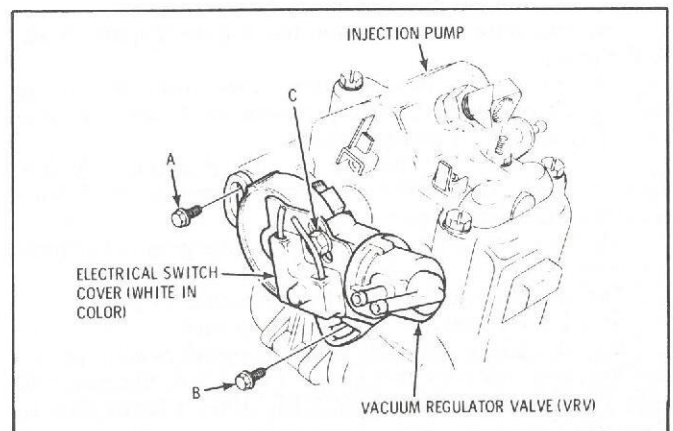


Fig. 6C5-1—Vacuum Regulator Valve Electrical Switch Identification

18. Clean the front cover RPM counter (probe holder) and crankshaft balancer rim.
19. Install the magnetic pick-up probe of tool J-26925 fully into the RPM counter. Connect the battery leads; red to positive and black to negative.
20. Disconnect the two lead connector at the generator.
21. Turn off all electrical accessories.
22. Allow no one to touch either the steering wheel or service brake pedal. Start the engine and place the transmission selector lever in "Drive".
23. Unplug the connector from the fast idle cold advance (engine temp.) switch and install a jumper between the connector terminals - Do not allow the jumper to touch ground. (Figure 6C5-13 of the Chassis Service Manual.)
24. Check the fast idle solenoid speed against the one given on the "Vehicle Emission Information Label." Reset if required, see Figure 6C5-5, of the Chassis Service Manual.
25. Shut off the engine, reconnect the lead at the generator and disconnect and remove the tachometer.
26. Turn key to run position (DO NOT START). Fast idle solenoid should activate. Open throttle to be sure pump is on "fast" idle.
27. Loosen VRV cover adjustment screw with a 5/16" wrench (Screw "C", See Fig. 6C5-1)
28. Disconnect the VRV electrical lead connector from the engine harness connector and install a self-powered test light between the VRV connector terminals.
29. If test light is not on, turn VRV cover until test light is on.

30. Adjust VRV cover until test light just goes off. (Contacts just open.)
31. Tighten VRV cover adjustment (Screw "C"). Remove test light, reconnect the VRV lead connectors, remove the jumper from the engine temp. switch connector and install the connector on the temp. switch.
32. Remove the air crossover cover and install the air cleaner assembly.

INJECTION PUMP

INJECTION PUMP AND LINES REMOVE AND INSTALL

Page 6C5-8 of the 1982 Chassis Service Manual describes the procedure for removal and installation of the diesel (VIN N & V) injection pump with lines attached.

It has been found that the injection pump alone can be removed and installed with the lines left on the nozzles. For removal proceed to step 7 without making any changes in the procedure but now continue as given below;

8. Disconnect the injection line clamps that are closest to the pump.

9. Disconnect the injection lines from the pump and cap all openings. Carefully reposition the lines to gain enough clearance for pump removal.

10. On the V-8, remove 3 nuts retaining injection pump, using Tool J-26987. On the V-6, remove the 2 bolts retaining the injection pump.

11. Remove the pump and discard the pump to adapter "O" ring.

The changes in the installation procedure are;

Step 2 the protective caps remain on till step 4.

Step 4 Remove the caps from the openings and connect the injection lines to the pump. Install the disconnected injection line clamps (Fig. 6C5-14, 1982 Chassis Service Manual).

INJECTION PUMP SEAL AND "O" RING REPLACEMENT.

Seal and "O" ring replacement damage can be minimized with the use of a thick bodied assembly fluid such as SNYKUT lubricant or equivalent.

INJECTION PUMP

Page 6C5-8, Installation of injection pump, the torque for the 4.3L V-6 is 51N·M (20 in. LBS.).

Reference the following corrections in your Chassis Service Manual;

ROOSA-MASTER PUMP

AUTO ADVANCE SEALS

The following is a revised procedure to replace the one on page 6C5-12 of the Chassis Service Manual and page 6C5-10 of the Omega & Cutlass Ciera Service Manual;

Removal

1. Remove the rocker lever by removing the retaining ring and lever pin.
2. Remove the power side plug or spring side plug as required.
3. Remove the "O" ring and/or seal as required.

Installation

1. Lube the new seals and/or "O" rings and reassemble as shown on the existing illustrations.
2. Torque the plugs to 27 N·M (20Ft. Lbs.).
3. Install the rocker lever; lever pin and retaining rings.

HYDRAULIC HEAD SEAL

Reference the following on page 6C5-13 of the Chassis Service Manual under "Hydraulic Head Seal-Installation;

Prior to installing the head assembly into the pump housing locate and line up together the "Dots" on the rotor slot and drive shaft tang.

Install the head assembly into the pump housing, lube and install the two head locking screws finger tight. Turn the pump upside down.

NOTICE: Insertion of the head too far into the pump may cut the housing seal at the vent screw area. If the head goes in further than the location screw holes, check the housing to see if seal is exposed, if it is, remove and replace the seal.

CAV PUMP

Page 6C5-15, Installation torque of the inspection plate screws should be 2.3 N·M (20 in. LBS.).

On page 6C5-17, Fig. 6C5-38 is incorrect. Refer to Fig. 6C5-1 below for the correct identification of the parts shown.

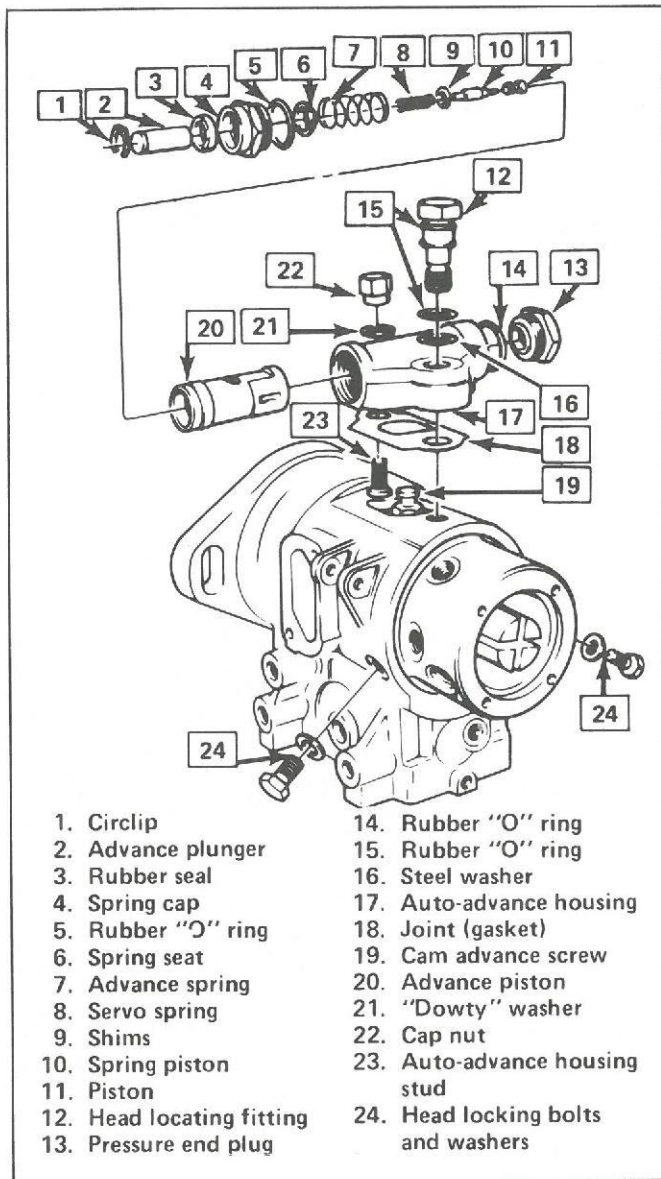


Fig. 6C5-2—CAV Pump Auto-Advance Unit

Page 6C5-18 (upper left column) step 2 of the installation of the auto-advance pressure end plug seal, torque in Newton-Meters should be 28.

Page 6C5-18, step 19 of the removal of the drive shaft seals should read as follows;

"Rotate the pump so the the drive end is up, push the thrust sleeve against the weight retainer to prevent the weights from falling out and remove the drive shaft and governor weight assembly from the pump."

Page 6C5-19, installation of Hydraulic Head Seal; Step 14 – Cam advance screw torque should be 29 Ft. LBS.

Step 19 – should read– "Progressively and evenly tighten both the head locating fitting to 40 N·M (29 Ft.LBS.) and the cap nut to 15 N·M (11 Ft. LBS.)".

Step 21 – Torque valve of advance pressure end plug should be 21 Ft. LBS.

Reference the following corrections in your Omega and Cutlass Ciera Service Manual:

Idle speed adjustments (pg. 6C5-4) –

"If equipped with cruise control, disconnect the servo cable at the servo prior to starting the engine."

INJECTION PUMP

Page 6C5-6, Installation of injection pump, the torque is 51 N·M (38 Ft. LBS.).

The C.A.V. pump will not be used in the Cutlass Ciera therefore refer only to the Chassis Service Manual for service procedures on this pump.

ENGINE ELECTRICAL

SECTION 6D

STARTER CIRCUIT DIAGNOSIS

A revision to the starter circuit diagnosis chart in the Chassis Service Manual, page 6D-5, figure 6D-4 should be noted. On the left side of the page, the words "Green Eye Showing" and "Eye Dark" should be switched. Please note this change in your service manual.

V-8 DIESEL (VIN N) STARTER REMOVAL – EXCEPT TORONADO

Due to the compact size of the new gear reduction starter used on 5.7L V-8 diesel engines, it is no longer necessary to lower the exhaust crossover to remove the starter. The new starter removal procedure below should be used in place of the procedure found on page 6D-26 of your Chassis Service Manual.

Removal

1. Disconnect batteries, hoist car.
2. Remove flywheel cover.
3. Remove starter shield upper bolt and side nut and remove shield.
4. Note position of wires and disconnect wires from starter (on 88 and 98 it may be necessary to gain access to the starter wires from the front of the engine).
5. Remove 2 starter lower bolts and lower starter between the flywheel and the exhaust crossover.

V-6 DIESEL (VIN N) STARTER REMOVAL

To ease removal and installation of the starter motor on the 4.3L V-6 diesel, a new removal procedure has been developed. This new procedure should be used in place of the procedure on page 6D-26 of your Chassis Service Manual. The new procedure is as follows:

Removal

1. Disconnect battery, hoist car.
2. Remove flywheel housing cover.
3. Remove starter shield upper support attaching bolt and shield side nut. Remove shield.

4. Note position of wires, then disconnect.
5. Remove two starter mounting bolts, and lower starter between exhaust crossover and flywheel.

V-6 DIESEL STARTER (A SERIES)

A new starter removal procedure has been developed for the V-6 Diesel engines on the Cutlass Ciera. The new procedure will replace the procedure found on page 6D-35 of the Omega/Cutlass Ciera Service Manual. The new procedure is as follows:

Removal

1. Disconnect negative battery lead at battery (2 batteries on diesel with High Capacity option).
2. Install engine holding fixtures as in oil pan removal procedure - page 6A7-15.
3. Raise car on hoist.
4. Remove left and center engine mount stud nuts.
5. Remove 2 front cradle mount bolts and lower cradle enough at front to gain access to flywheel cover bolts.
6. Remove 4 flywheel cover bolts and remove cover (2 pieces).
7. Remove starter shield nut at starter and flex shield for removal accessibility.
8. Note position of wires and disconnect wires from starter.
9. Remove 2 starter bolts and remove starter.
10. Reverse removal procedures for installation.

V-6 DIESEL ALUMINUM STARTER

The tool usage on page 6D-53 of the Omega and Cutlass Ciera Service Manual may be incorrect. Tool J-6627-A used to remove the Armature Drive End Bearing should be replaced by tool J-22912-01, the same tool used to remove the Armature Commutator End Bearing. In addition, it will be necessary to follow the Armature Commutator End Bearing removal procedure for removal of the Armature Drive End Bearing with J-22912-01. Note this change in your manual.

BATTERY USAGE CHART

Figure 6D-1 contains updated information on battery usage for Cutlass, 88, 98 and Toronado. This information replaces the chart found on page 6D-55 of your Chassis Service Manual.

BATTERY USAGE CHART									
ENGINE		CUTLASS		88		98		TORONADO	
DISP.	VIN	STD	UA1*	STD	UA1*	STD	UA1*	STD	UA1*
3.8L V6	A	1980694	1980695	1980694	1980695				
4.1L V6	4					1980694	1980695	1980694	1980696
4.3L V6D	V	1980858(2)	1980696(2)						
4.3L V8	8	1980694	1980695	1980694	1980695				
5.0L V8	Y	1980694	1980695	1980694	1980695	1980694	1980695	1980694	1980696
5.7L V8D	N	1980858(2)	1980696(2)	1980695(2)	1980696(2)	1980695(2)	1980696(2)	1980795(2)	1980696(2)
*UA1— HIGH CAPACITY BATTERY									
BATTERY SPECIFICATIONS									
BATT. NO.†	TYPE	VOLTS	LOAD TEST AMPS	†† RESERVE CAPACITY IN MIN.	††† COLD CRANKING CURRENT @ 0° F (18° C)				
1980694	694-85A-60	12	170	90	350				
1980695	695-87A-60	12	230	115	465				
1980696	696-89A-60	12	270	135	540				
1980858	858-75-60	12	220	90	440				
† From usage chart									
†† Reserve Capacity = The approximate time in minutes a battery can support a 25 AMP load without the terminal voltage dropping below 10.2 volts at 80° F (27° C) in the event of a charging system failure.									
††† Cold Cranking = Amperage available for 30 seconds of engine cranking at 0° F (-18° C) without discharging to 7.2 volts terminal.									

Fig. 6D-1—Battery Usage Chart

ENGINE EMISSION CONTROLS

SECTION 6E1

ALL NEW GENERAL MOTORS VEHICLES ARE CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO THE REQUIREMENTS OF THE REGULATIONS FOR THE CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES. THIS CERTIFICATION IS CONTINGENT ON CERTAIN ADJUSTMENTS BEING SET TO FACTORY STANDARDS. IN MOST CASES, THESE ADJUSTMENT POINTS EITHER HAVE BEEN PERMANENTLY SEALED AND/OR MADE INACCESSIBLE TO PREVENT INDISCRIMINATE OR ROUTINE ADJUSTMENT IN THE FIELD. FOR THIS REASON, THE FACTORY PROCEDURE FOR TEMPORARILY REMOVING PLUGS, CAPS, ETC., FOR PURPOSES OF SERVICING THE PRODUCT MUST BE STRICTLY FOLLOWED AND, WHEREVER PRACTICABLE, RETURNED TO THE ORIGINAL INTENT OF THE DESIGN.

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COMPUTER COMMAND CONTROL SYSTEM

Note in your Chassis Service Manual Section 6E and Omega and Cutlass Ciera Service Manual, Section 6E1, that figures 6E1-1 through 6E1-10 replace corresponding charts. Figures 6E1-5, 6E1-7, 6E1-8 and 6E1-10 replace charts in the Chassis Service Manual only.

ELECTRONIC CONTROL MODULE (ECM) AND PROM REPLACEMENT

The 1982 Chassis Service Manual on page 6E-52 gives the procedure for ECM or PROM replacement on VIN A and 4 engines only. In Fig. 6E1-11 and Fig. 6E1-12 of this

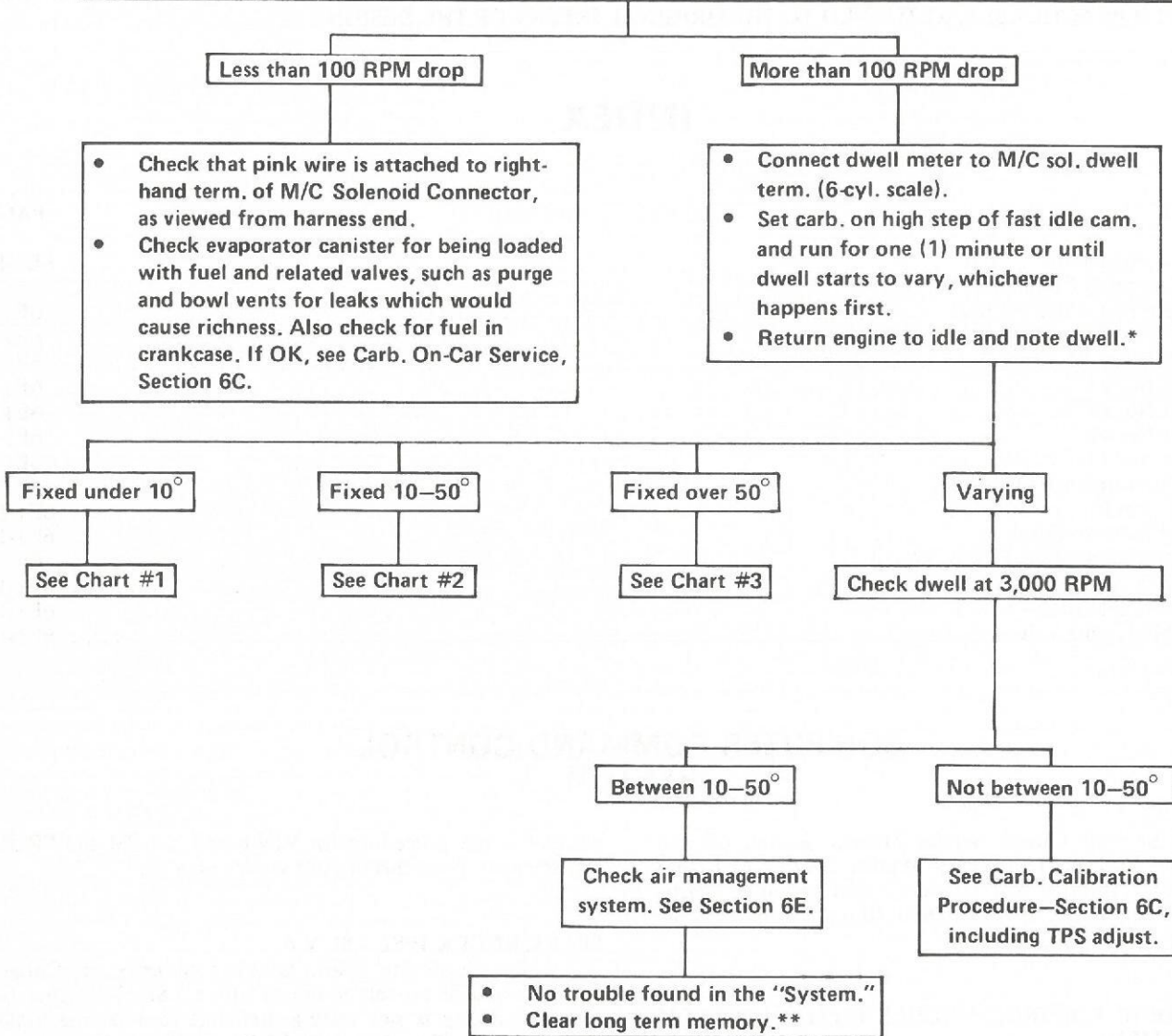
Manual is the procedure for VIN 8 and Y ECM and PROM replacement. Note this in your service manual.

SPARK KNOCK 1982 3.8L V-6

When diagnosing spark knock comments on Cutlass Supreme and 88 models equipped with a 3.8L V-6 engine, be sure the owner is not resting their left foot on the brake pedal which will activate the EGR cutoff solenoid causing the EGR valve to turn off. Also be sure the brake switch is adjusted properly. Please note this on page 6E-63, of the Chassis Service Manual.

SYSTEM PERFORMANCE CHECK

1. Start engine.
2. Ground "test" term. (Must not be grounded before engine is started.)
3. Disconnect purge hose from canister and plug it. On E2SE carburetors, disconnect bowl vent at carburetor.
4. Connect tachometer.
5. Disconnect Mixture Control (M/C) Solenoid and ground M/C Solenoid dwell term.
6. Run engine at 3,000 RPM and, while keeping throttle constant, reconnect M/C Solenoid and note RPM. If car is equipped with an electric cooling fan, it may lower RPM when it engages.
7. Remove ground from M/C Solenoid dwell term. before returning to idle.



*Oxygen sensors may cool off at idle and the dwell change from varying to fixed. If this happens, running the engine at fast idle will warm it up again.

**See Code(s) Clearing Procedure.

Fig. 6E1-1 System Performance Chart

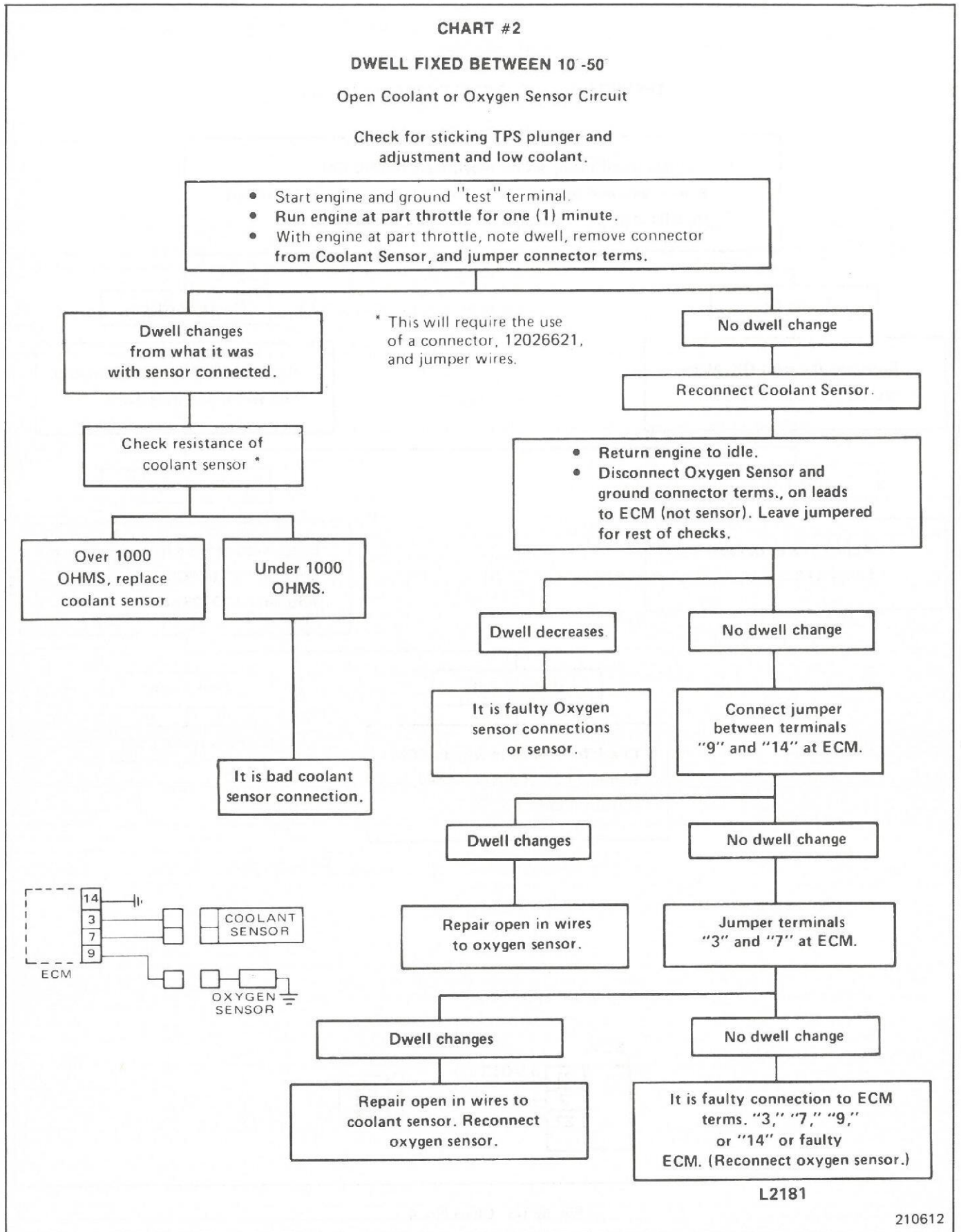


Fig. 6E1-2 Chart No. 2

CHART 4
TPS WIDE-OPEN THROTTLE CIRCUIT CHECK

- Connect dwell meter set on 6-cyl. scale to M/C Sol.
- Start engine and ground "test" term. With engine running at part throttle, depress TPS plunger completely and note dwell.

Under 20°

Enrichment circuit OK. Make system performance check.

Under 10°

Adjust TPS or replace faulty TPS.

No dwell change.

Disconnect TPS harness connector from sensor and note dwell.

No change.

Check voltage from harness connector terminal "B" to "C" with digital voltmeter J-29125 or equivalent.

Under 2 volts

Check for ground in wire to ECM terminal "2." If not grounded, it is faulty ECM.

Over 2 volts

It is a faulty ECM.

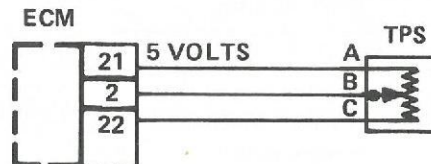


Fig. 6E1-3 Chart No. 4

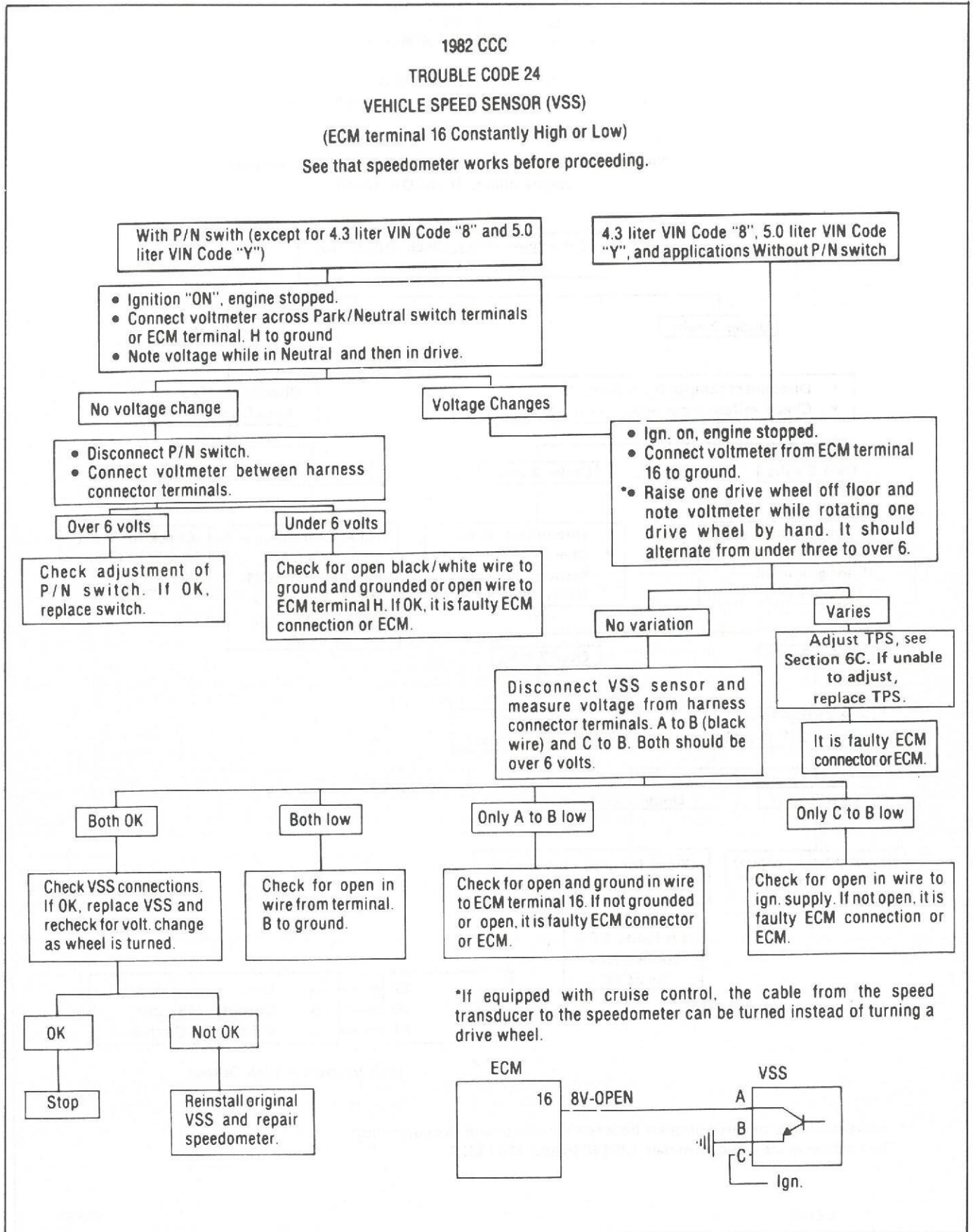
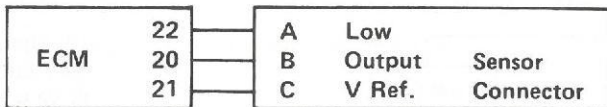
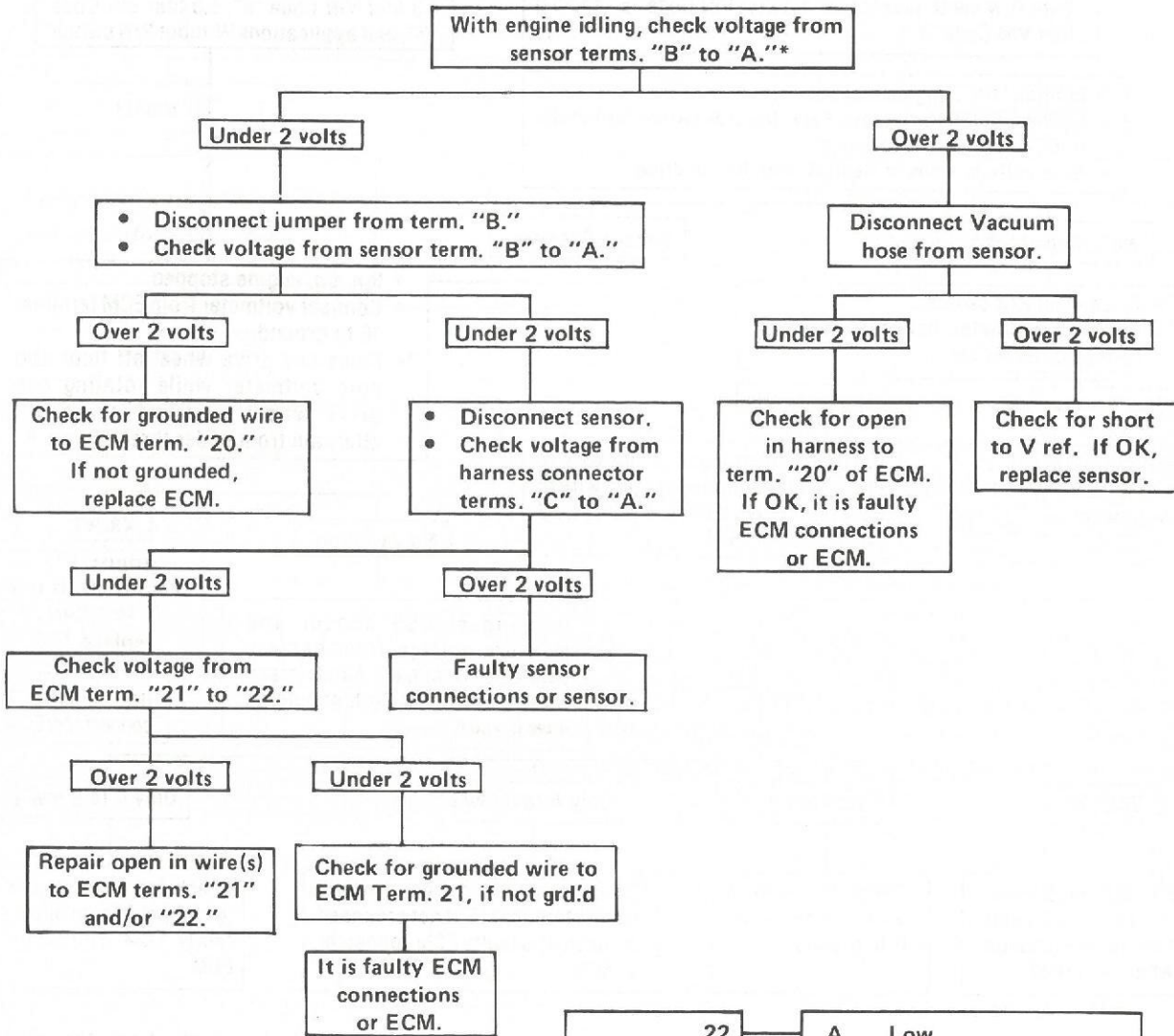


Fig. 6E1-4 Chart (Code) No. 24

CHART #34

TROUBLE CODE 34
VACUUM SENSOR CIRCUIT

Check for over 34kPa (10 inches) of vacuum at sensor with engine idling. If not OK, repair.



High Vacuum = High Output

*This requires use of three jumpers between the sensor and the connector. They can be made using terminals 12014836 and 12014837.

Fig. 6E1-5 Chart No. 34 (Chassis Manual Only)

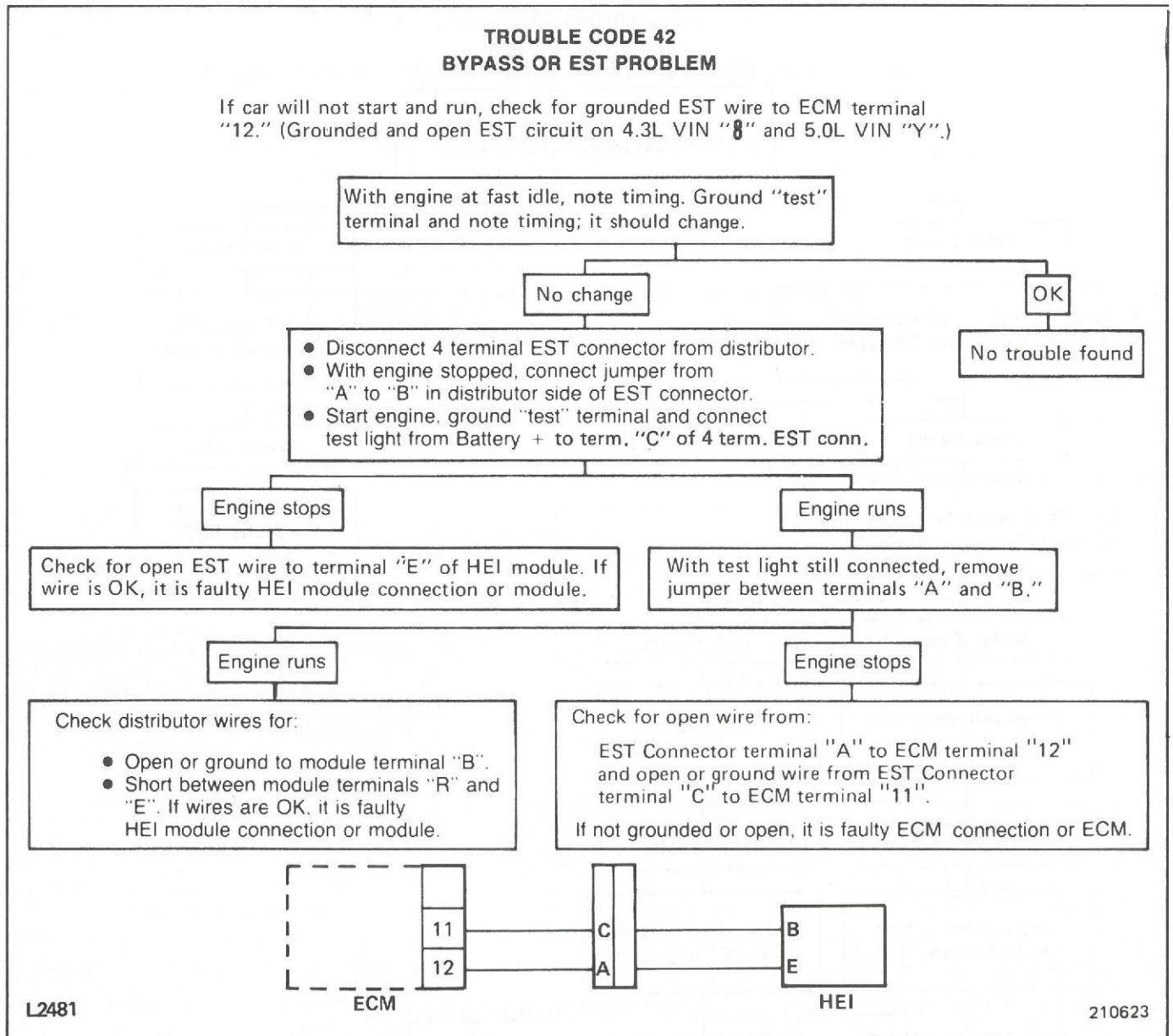


Fig.6E1-6 Chart (Code) No. 42

**CHART 43
TROUBLE CODE 43
VOLTAGE AT ECM TERM. "L" LOW**

With engine idling, check voltage from ECM term. "L" to ground.

Under 6 volts.

Over 6 volts.

- Ignition "ON," engine stopped.
- Recheck voltage at ECM term. "L."

It is faulty ECM connection or ECM.

Under 6 volts.

Over 6 volts.

Disc. ECM connector and recheck voltage at "L" in connector.

It is most likely a faulty ESC controller, but could be a knock sensor.

Under 6 volts.

Over 6 volts.

Check volt. from ESC term. "J" to ground.

Replace ECM.

Over 6 volts.

Under 6 volts.

Repair open in wire to ECM term. "L."

Check volt from ESC term. "F" to ground.

Over 9 volts.

Under 9 volts.

Check for grounded wire to ESC term. "J." If not grounded, it is faulty ESC connection or ESC controller.

Repair circuit from ESC term. "F" to Ign.

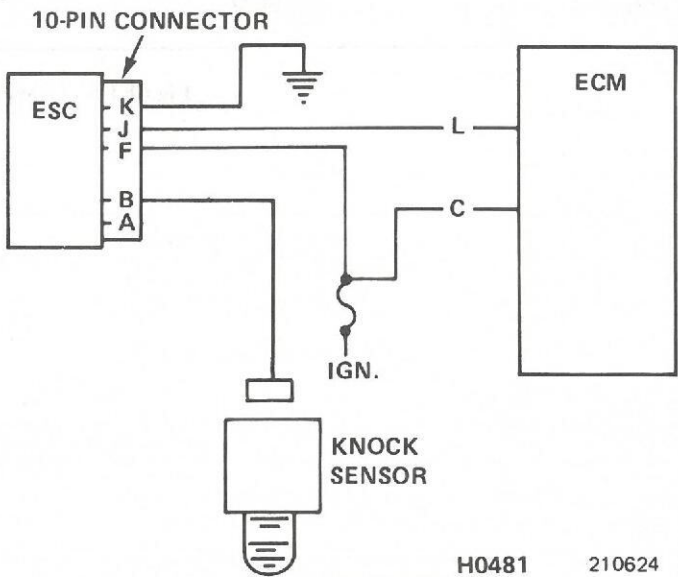
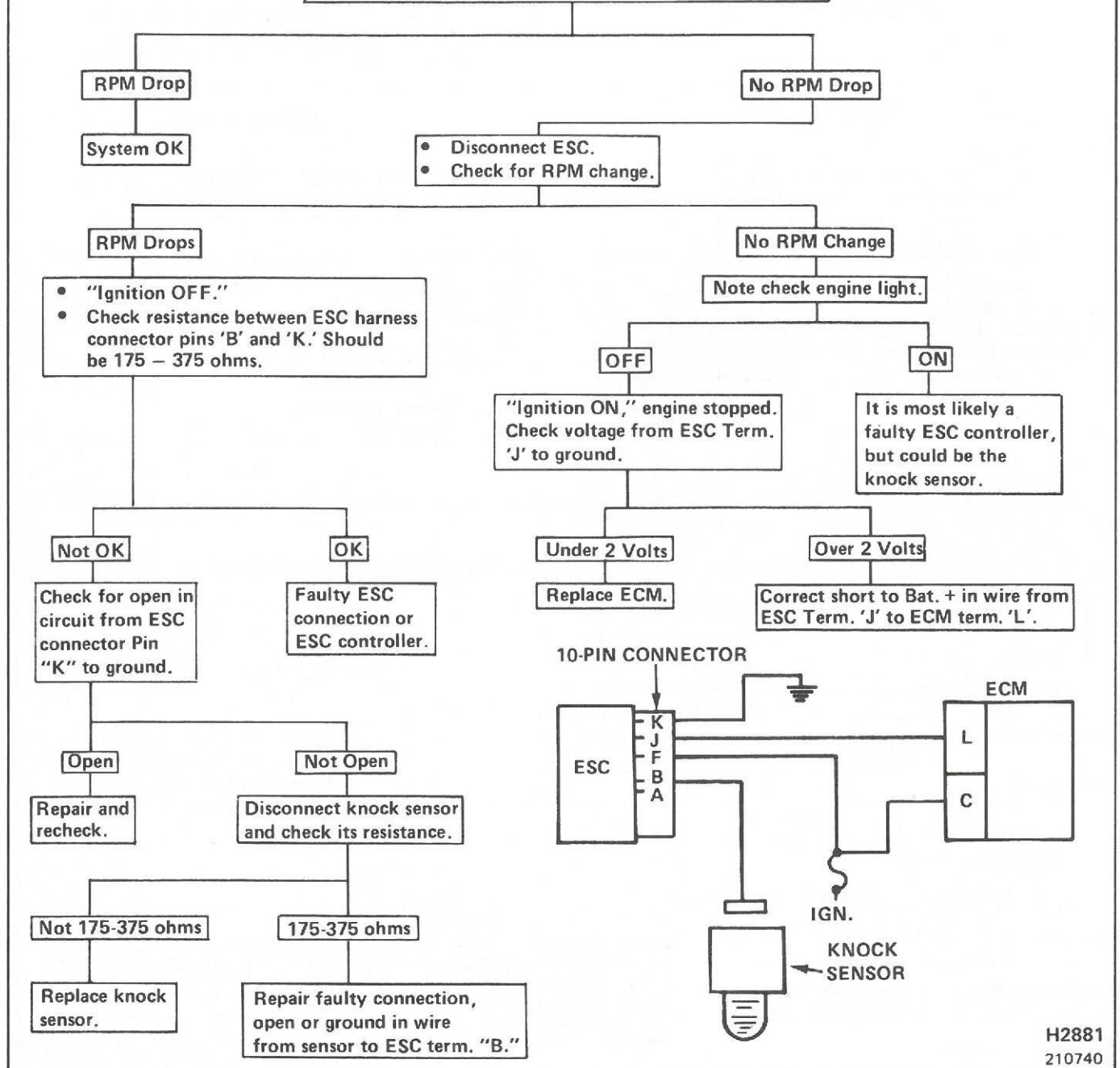


Fig.6E1-7 Chart No. 43 (Chassis Manual Only)

**ELECTRONIC SPARK CONTROL (ESC)
SYSTEM CHECK
ENGINE KNOCK, POOR PERFORMANCE OR POOR ECONOMY – NO CODE 43
(VIN 4 ONLY)**

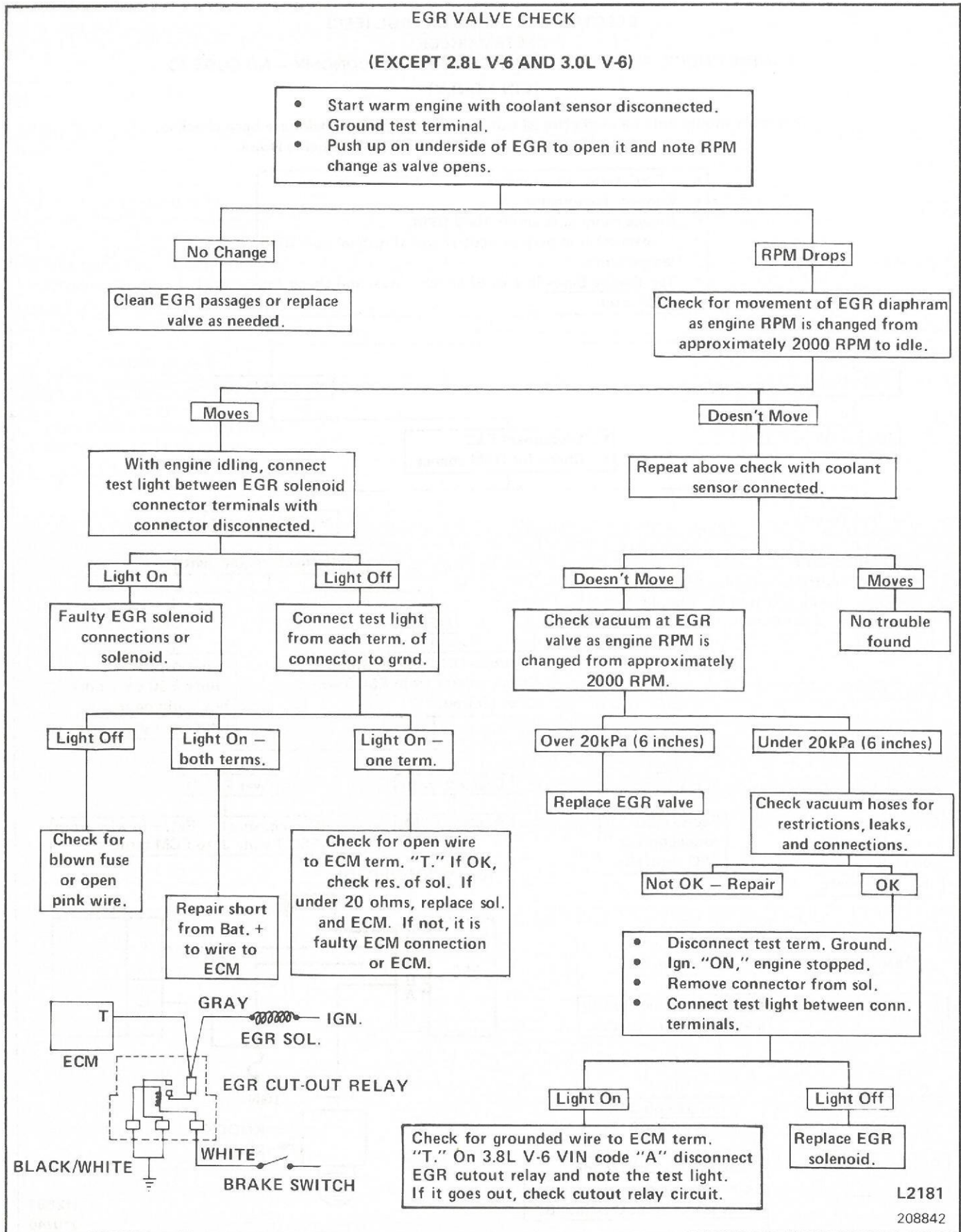
This chart should only be used after all other causes of Spark Knock have been checked, i.e., Timing, EGR, Engine Temperature or Excessive Engine Noise.

- "Test" term, ungrounded.
- Connect tachometer.
- Engine running at about 1500 RPM.
- Transmission in park or neutral and at normal operating temperature.
- Tap Engine Block in area of knock sensor and check for RPM drop.



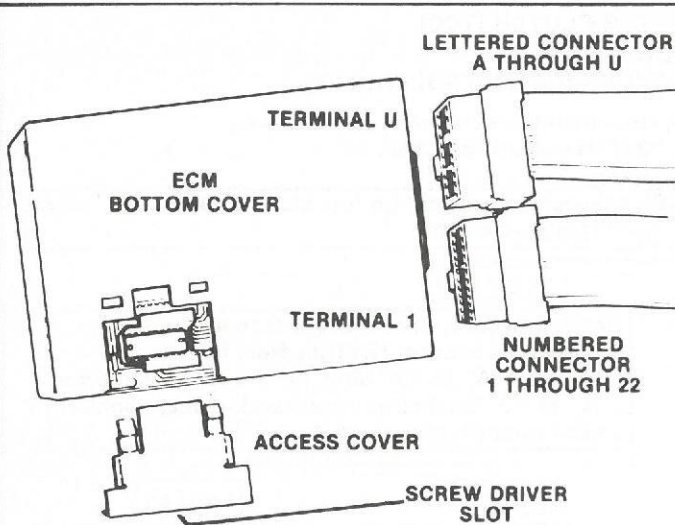
H2881
210740

Fig. 6E1-8 ESC Performance Check (Chassis Manual Only)



L2181
208842

Fig. 6E1-9 EGR Check

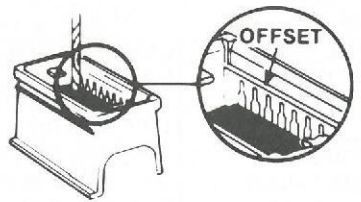
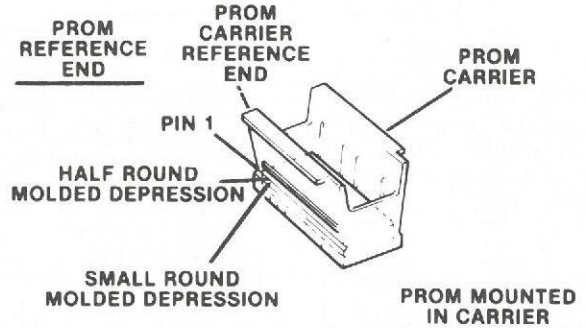
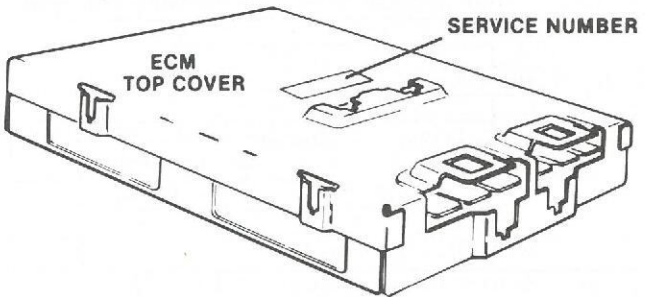


ELECTRONIC CONTROL MODULE (ECM) MOUNTING HARDWARE NOT ILLUSTRATED.

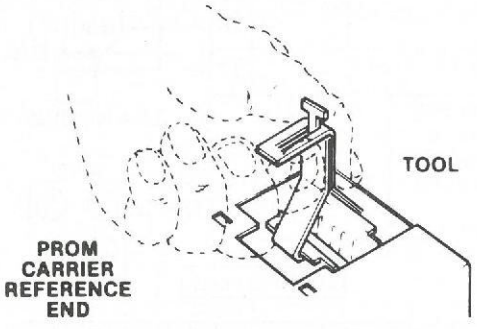
- A. 1. Disconnect the two connectors from the ECM. One is numbered and the other is lettered.
 2. Remove the ECM mounting hardware.
 3. Remove the ECM from the passenger compartment.
 4. Turn the ECM so the bottom cover is facing up
 5. Remove the slide off PROM access cover with the aid of a small screwdriver placed in the screwdriver slot.

TAKE THE NEW ECM OUT OF IT'S PACKAGING AND CHECK THE SERVICE NUMBER TO MAKE SURE IT IS THE SAME AS THE DEFECTIVE ECM.
REPLACEMENT ECM IS SUPPLIED WITHOUT ENGINE CALIBRATION UNIT (PROM). CARE SHOULD BE TAKEN WHEN REMOVING THE PROM FROM A DEFECTIVE ECM AS IT WILL BE USED IN THE REPLACEMENT ECM.

2. Grasp the engine calibration unit (PROM) carrier with the PROM removal tool. Gently rock the carrier from side to side while applying a firm upward force. Remove the PROM and carefully set it aside for installation in the replacement ECM.
 Note the reference end of PROM carrier (squared off symmetrical end).



Push PROM down until pins are even with offset on side of carrier.
VIEW "A"



- B. 1. Get the PROM removal tool supplied with the replacement ECM and use it to remove the PROM from the defective ECM.

- C. 1. Take the PROM mounted in the PROM carrier (which you had previously set aside) and check that the molded half round depression on the PROM is at the squared off symmetrical end of the carrier. Also make sure there is equal space between the ends of the PROM and the carrier.
 2. Position the PROM in the carrier as indicated in View "A". Make sure to position the ends of the PROM pins even with the narrow molded offset on the inside wall of the carrier near the bottom.

Fig. 6E11 PROM/ECM Replacement – VIN 8 and Y (1 of 2)

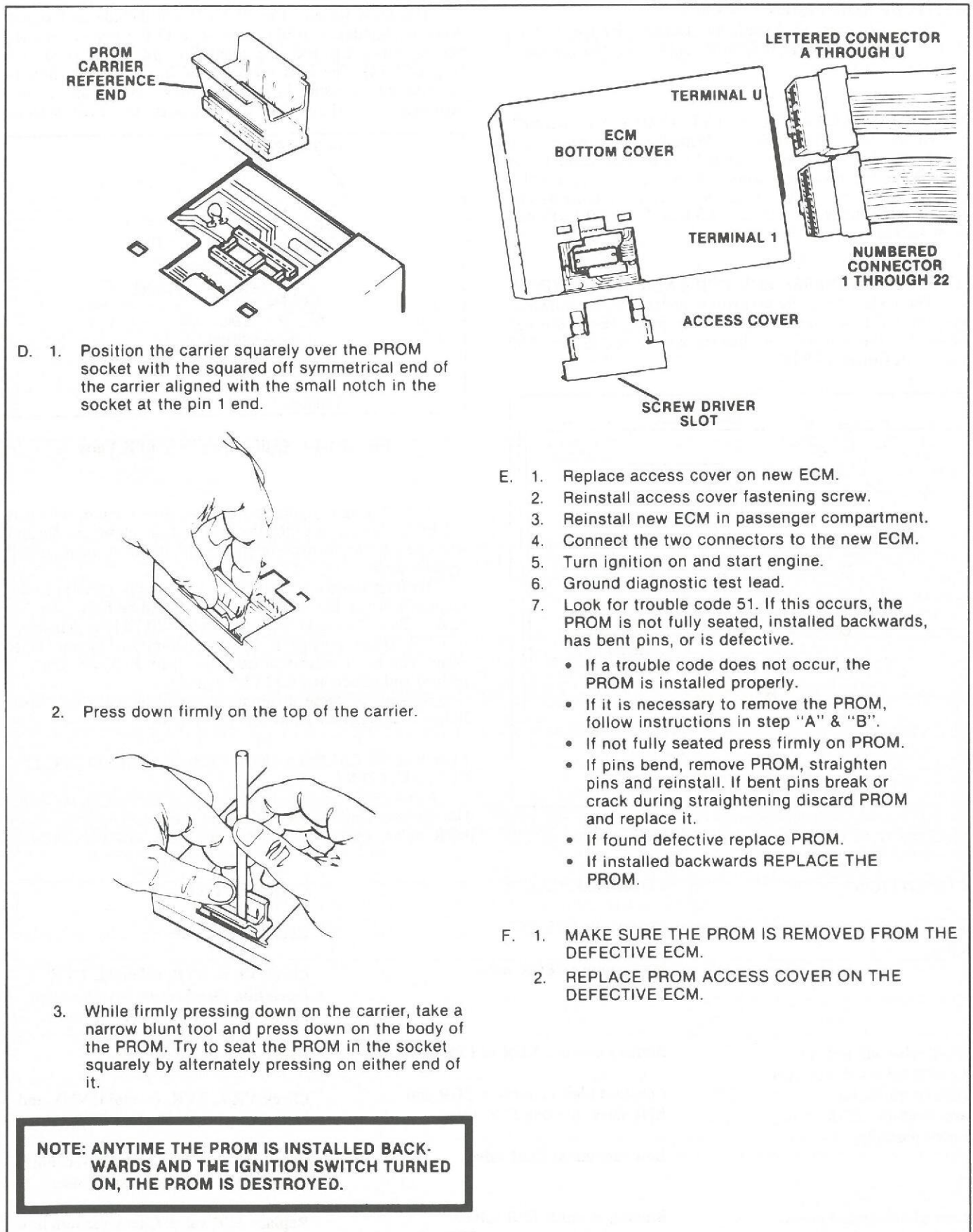


Fig. 6E1-12 PROM/ECM Replacement – VIN 8 and Y (2 of 2)

ALTITUDE ADJUSTMENTS – VIN 8

Note on page 6E-54 of the Chassis Service Manual that the adjustment DOES NOT apply to cars certified for use in California.

VACUUM MODULATOR VALVE (VMV) V-6 DIESEL

In the 1982 Chassis Service Manual on page 6E-67 and 6E-68 and the Omega and Cutlass Ciera Service Manual page 6E1-71, in the paragraph titled "Vacuum Modulator Valve (VMV) V-6", the metric vacuum valves are incorrect. The correct equivalents are; 14" = 47.3 kPa, 12" = 40.5 kPa and 9" = 31.0 kPa.

1982 LT6 V-6 DIESEL EGR FOR CALIFORNIA (VIN V)

The Exhaust Gas Recirculation system (EGR) shown in the 1982 Chassis Service Manual on pages 6E-65 through 6E-69 for the V-6 will be changed when used in the 1982 California Cutlass (RWD).

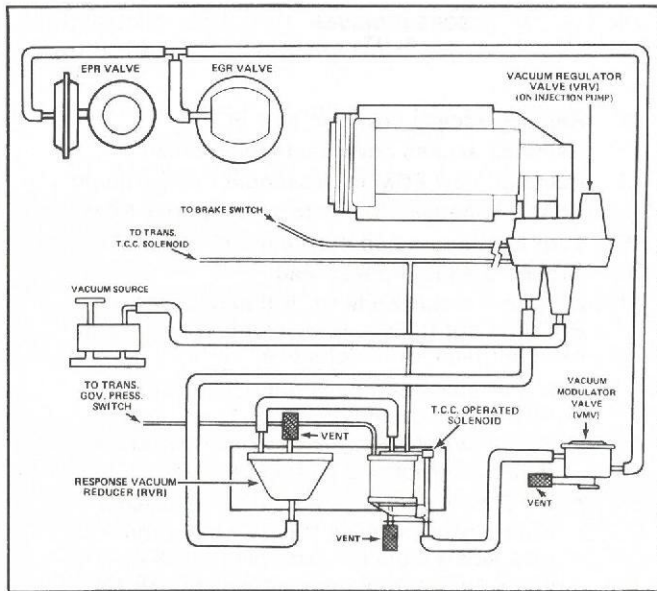


Fig. 6E1-13 California VIN V EGR System

The EGR system (Fig. 6E1-13) will include an Exhaust Pressure Regulator (EPR) valve. The EPR valve is installed between the R.H. exhaust manifold and the exhaust pipe (Fig. 6E1-14). The EPR valve is used in the exhaust flow to increase backpressure in the exhaust system which in turn increases the exhaust gas flow through the EGR system.

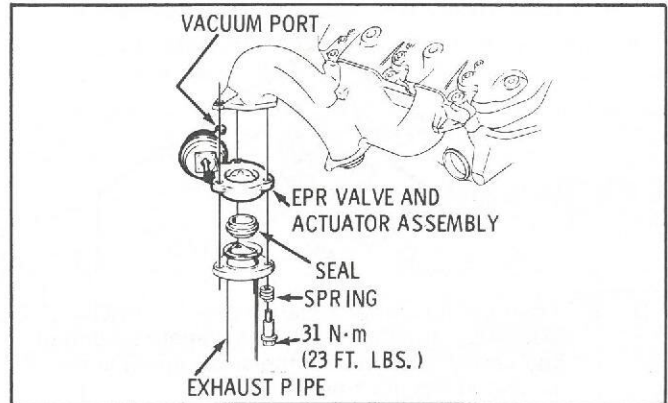


Fig. 6E1-14 California VIN V EPR Valve

The EPR valve operates from the same vacuum source as the EGR valve. The EPR valve will be fully closed at idle and will open as the throttle is open until at full throttle, it will be fully open.

To functionally test the EPR valve apply vacuum to the vacuum port on the valve. The valve should be fully closed at 35.46 kPa (12 inches) and open below 20.26 kPa (6 inches).

The other change is in the calibration of the EGR valve. The EGR valve will be fully open at 35.46 kPa (12 inches) and closed at 25.33 (7.5 inches).

Because of these differences, diagnosis will differ also. Below is a diagnosis chart for this system.

EGR VALVE CALIBRATION – 4.3L V-6 DIESEL, 1982 CUTLASS CIERA

Note the following change on page 6E1-69 of the 1982 Omega and Cutlass Ciera Service Manual; The V-6 Diesel EGR valve will be closed below 25.33 kPa (7.5 inches).

CONDITION	POSSIBLE CAUSE	CORRECTION
EGR valve will not open valve.	Binding or stuck EGR No vacuum to EGR valve.	Replace EGR valve. Check VRV, RVR, solenoid, T.C.C. Operation (See Section 7A), Vacuum Pump, VMV, and connecting hoses.
EGR valve will not close, or EPR valve will not open. (Heavy smoke on acceleration). EGR valve opens partially.	Binding or stuck EGR or EPR valve. Constant high vacuum to EGR and EPR valve. Binding EGR valve. Low vacuum at EGR valve.	Replace EGR or EPR valve. Check VRV, RVR, solenoid, VMV and connecting hoses. Replace EGR valve. Check VRV, RVR, solenoid, vacuum pump, VMV and connecting hoses.
Loss of power and heavy smoke on acceleration, EGR valve functions normally.	Binding or stuck EPR valve, constant high vacuum to EPR valve.	Replace EPR valve. Check vacuum hose routing.

SECTION 6E2

ELECTRONIC FUEL INJECTION

CONTENTS

SUBJECT	PAGE	SUBJECT	PAGE
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Chart 1 (Drivers Complaint)	6E2-4	Code 33 (MAP Sensor Signal Voltage High)	6E2-18
Chart 2 (No "Check Engine" Light)	6E2-5	Code 45 (Rich Exhaust Indication)	6E2-19
Chart 4 (Engine Crank But Will Not Run)	6E2-6	Diagnostic Circuit Check	6E2-3
Chart 5 (Fuel System Diagnosis)	6E2-8 & 6E2-9	Fuel Injection Schematic	6E2-7
Chart 6 (Engine Cranks But Will Not Run)	6E2-10	E.C.M. Service	6E2-20
Chart 8A (Coolant Fan Control Circuit)	6E2-11	Extended Cranking Time	6E2-20
Chart 8D (T.C.C. Diagnosis)	6E2-12	False Code 24	6E2-20
Chart 9 (A/C Control Relay)	6E2-13	Fuel Injector Installation	6E2-21
Chart 11 (Idle Air Control)	6E2-14	Idle Air Control Valve Replacement	6E2-20
Code 21 (T.P.S. Signal Voltage High)	6E2-15	T.P.S. Adjustment	6E2-21
Code 22 (T.P.S. Signal Voltage Low)	6E2-16		

ALL NEW GENERAL MOTORS VEHICLES ARE CERTIFIED BY THE UNITED STATES ENVIRONMENTAL PROTECTION AGENCY AS CONFORMING TO THE REQUIREMENTS OF THE REGULATIONS FOR THE CONTROL OF AIR POLLUTION FROM NEW MOTOR VEHICLES. THIS CERTIFICATION IS CONTINGENT ON CERTAIN ADJUSTMENTS BEING SET TO FACTORY STANDARDS. IN MOST CASES, THESE ADJUSTMENT POINTS EITHER HAVE BEEN PERMANENTLY SEALED AND/OR MADE INACCESSIBLE TO PREVENT INDISCRIMINATE OR ROUTINE ADJUSTMENT IN THE FIELD. FOR THIS REASON, THE FACTORY PROCEDURE FOR TEMPORARILY REMOVING PLUGS, CAPS, ETC., FOR PURPOSES OF SERVICING THE PRODUCT MUST BE STRICTLY FOLLOWED AND, WHEREVER PRACTICABLE, RETURNED TO THE ORIGINAL INTENT OF THE DESIGN.

REFERENCE THE FOLLOWING IN YOUR 1982 OMEGA AND CUTLASS CIERA SERVICE MANUAL, SECTION 6E2.

PLEASE NOTE THAT FIGURES 6E2-1 THROUGH 6E2-20 REPLACE EXISTING ILLUSTRATIONS.

NOTICE: TO PREVENT INTERNAL ECM DAMAGE, THE IGNITION SWITCH MUST BE IN THE "OFF" POSITION WHEN RECONNECTING ECM POWER AFTER SERVICE. THIS INCLUDES CONNECTING BATTERY CABLES, REPLACING ECM FUSE, RECONNECTING ECM PIGTAIL, AND CONNECTING JUMPER CABLES WHEN JUMP STARTING, ETC.

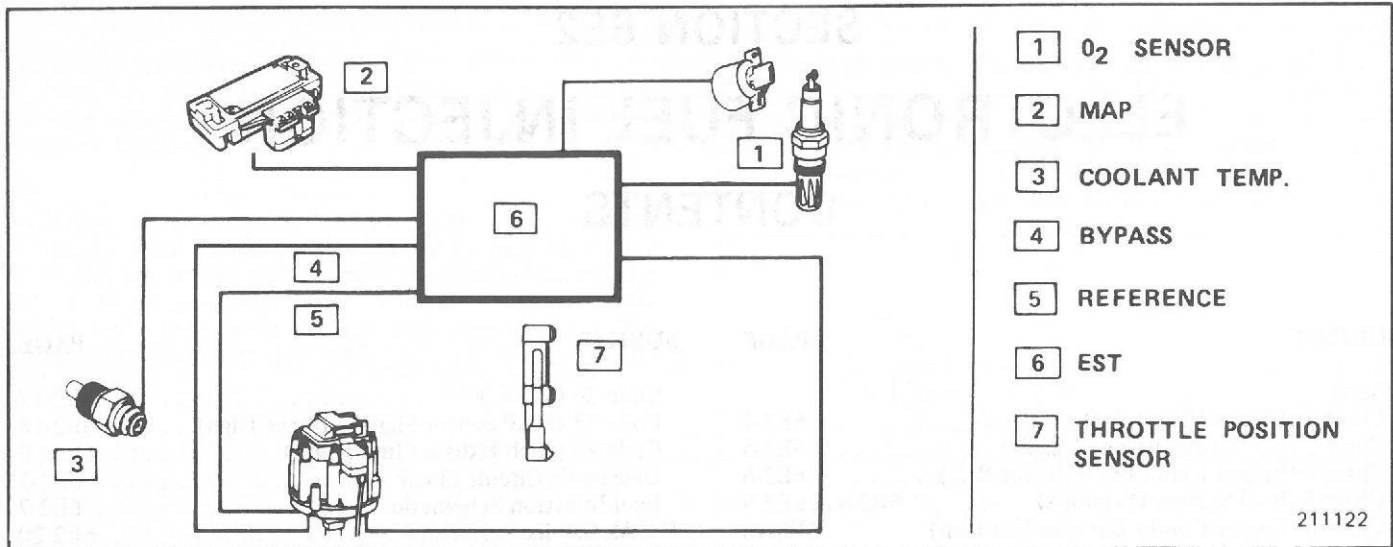


Fig. 6E2-1—Run Open Loop - Replaces Fig. 6E2-11

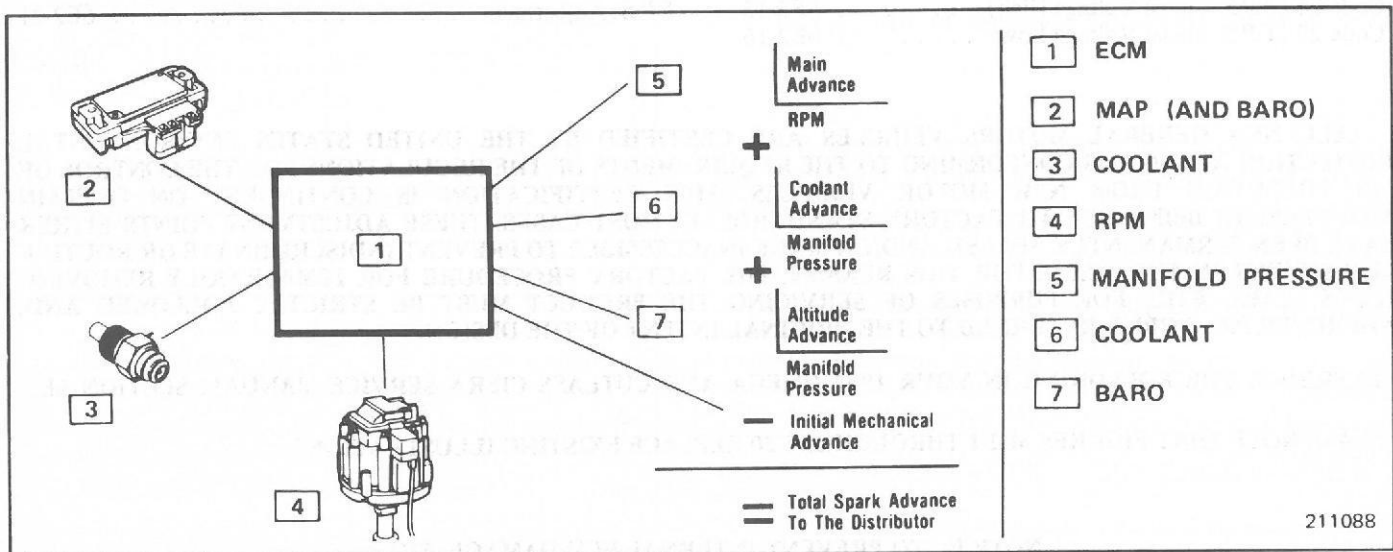


Fig. 6E2-2—Electronic Spark Timing - Replaces Fig. 6E2-16

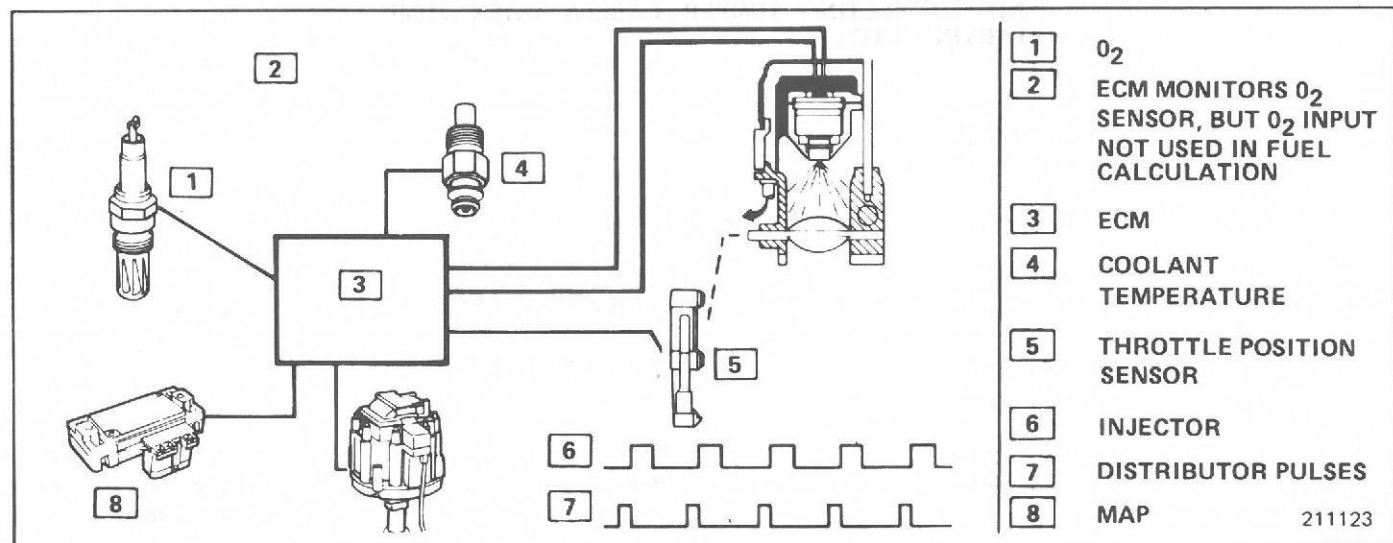
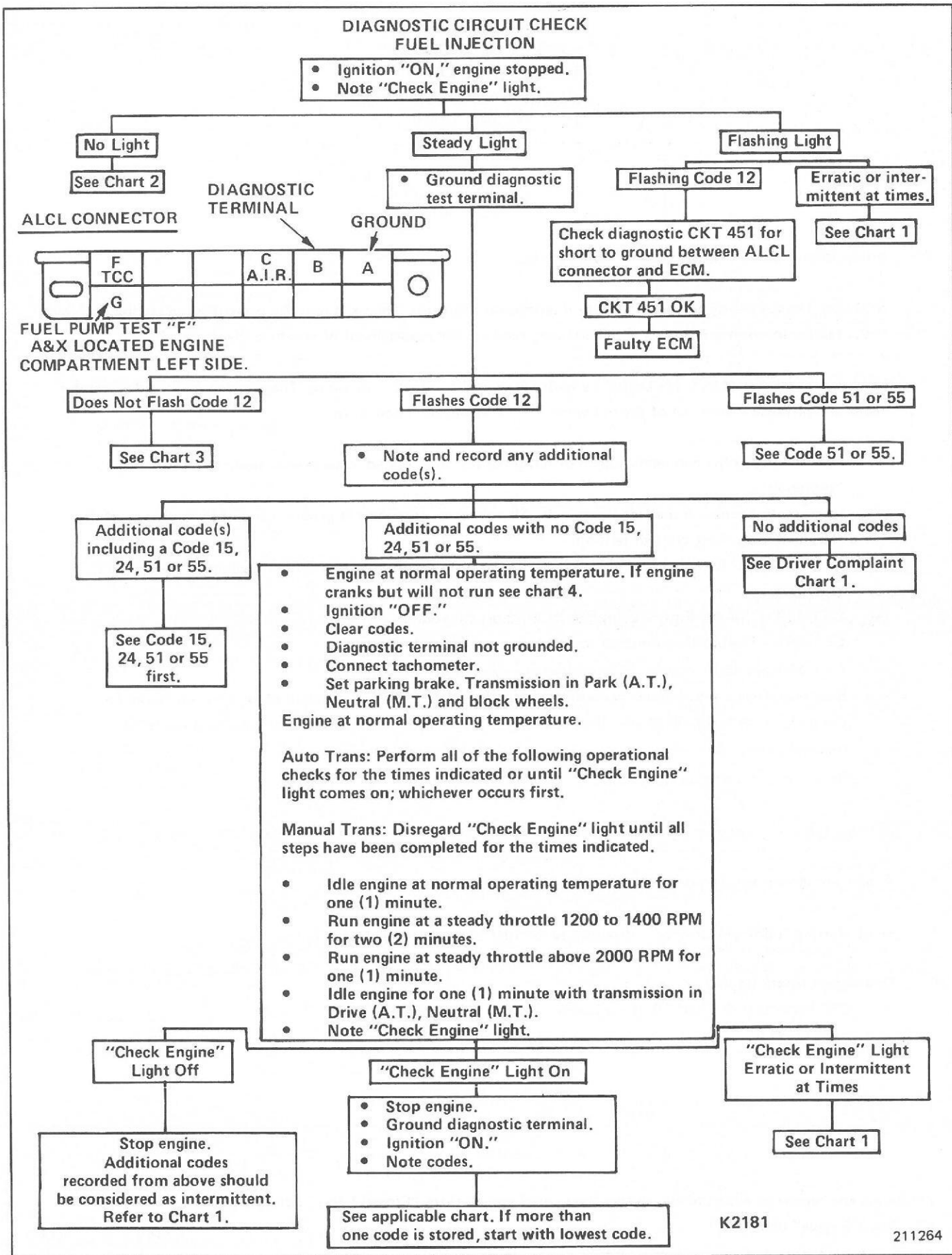


Fig. 6E2-3—Spark Timing Inputs - Replaces Fig. 6E2-17



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Fig. 6E2-4—Diagnostic Circuit Check - Replaces Fig. 6E2-3

CHART 1
FUEL INJECTION
DRIVER'S COMPLAINT

- Intermittent "check engine" light or stored codes.

NOTICE: Do not use diagnostic charts for intermittent problems. The fault must be present to locate the problem. If the fault is intermittent, use of the charts may result in the replacement of non-defective parts.

Most intermittent problems are caused by faulty electrical connectors or wiring. Diagnosis must include a careful visual and physical inspection of the indicated circuit wiring and connectors.

- Poor mating of the connector halves or terminals not fully seated in connector body (backed out "terminals").
 - Improperly formed or damaged terminals. All connector terminals in problem circuit should be carefully reformed to increase contact tension.
 - HEI distributor EST wires should be routed away from distributor, ignition coil, secondary wiring and generator.
 - CKT 419 – "Check Engine Lamp" to ECM, short to ground.
 - CKT 451 – Diagnostic connector to ECM, short to ground.
 - CKT 450 and 450R - Check ECM ground at engine block attachment.
 - Electrical system interference caused by a defective relay, ECM driven solenoid, or a switch causing a sharp electrical surge. Normally, the problem will occur when the defective component is operated.
 - Improper installation of electrical options, I.E. lights, 2 way radio, etc...
 - Open Air Conditioning clutch diode.
- Stalling, rough or improper idle speed – see Chart 11.
 - Engine cranks but will not run –see chart 4 or 4A.
 - Hard starting, poor performance, driveability or fuel economy –see Chart 7.
 - Detonation (spark knock)
 - ESC Performance Chart 10, if applicable
 - EGR Chart 8.

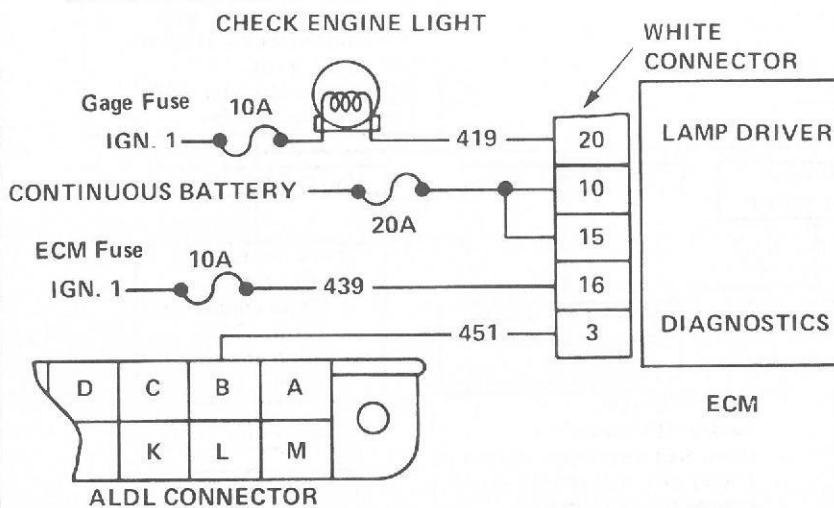
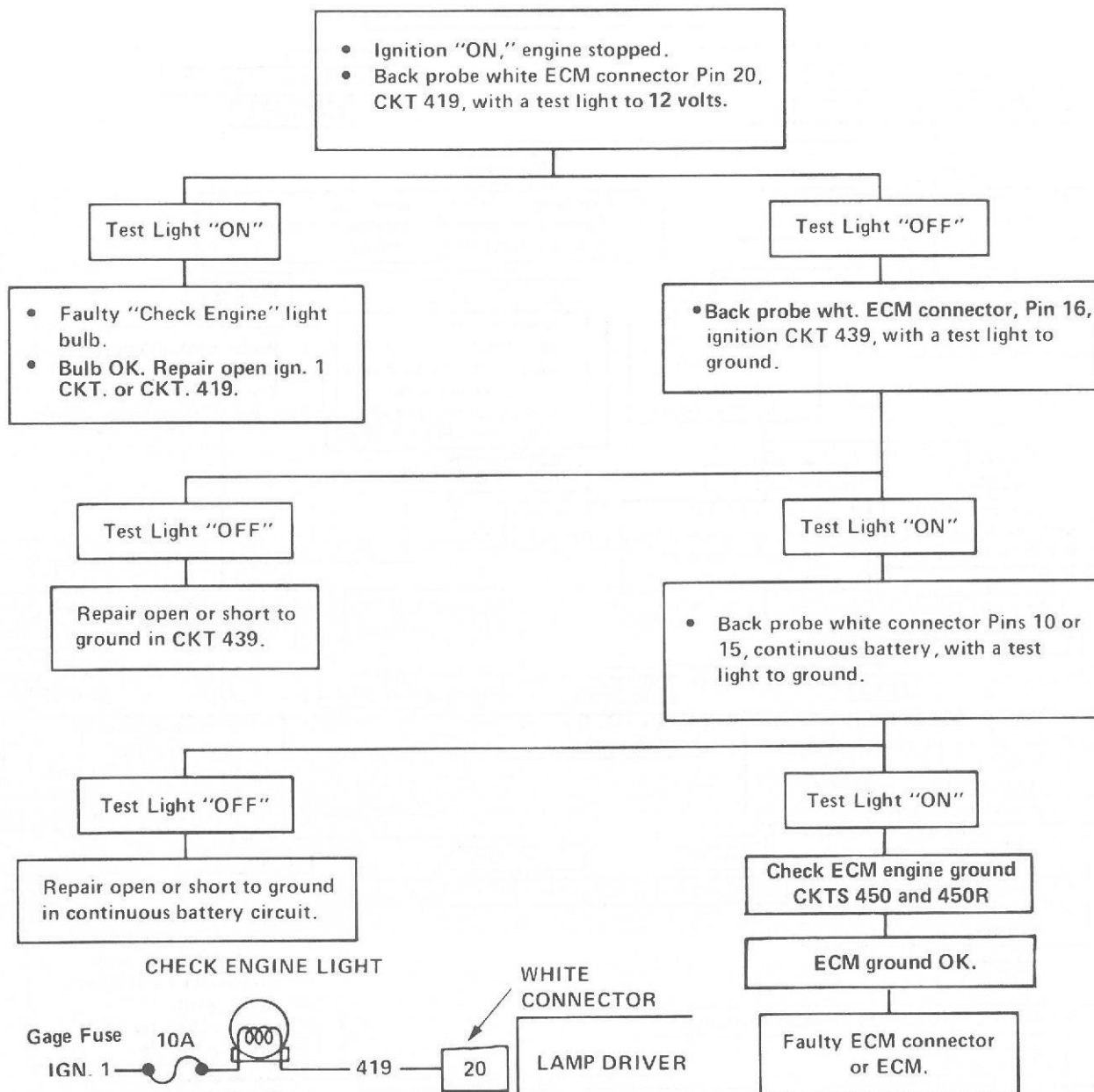
Following any repairs or adjustments, always clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

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CHART 2

FUEL INJECTION
NO "CHECK ENGINE" LIGHT



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

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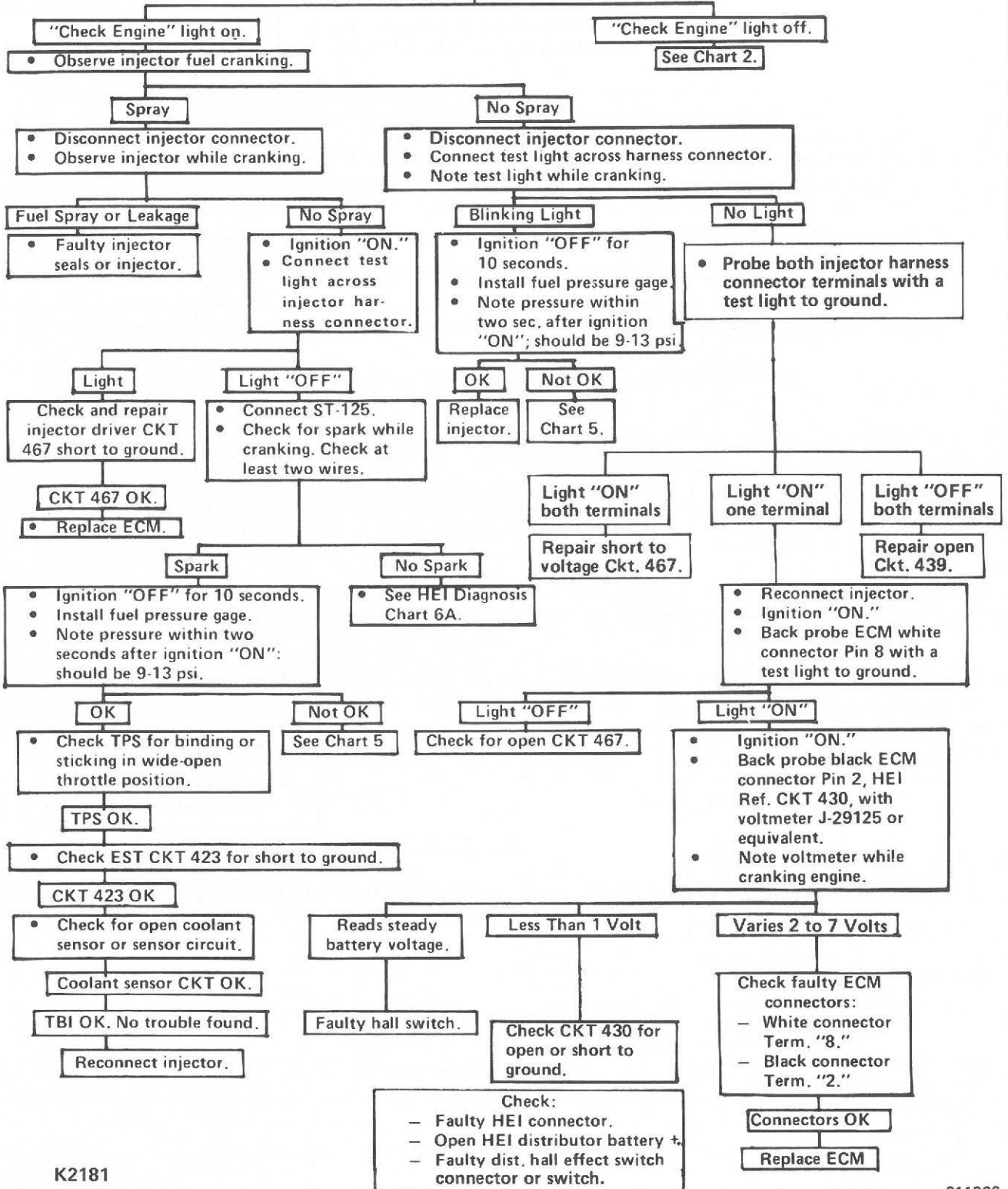
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Fig. 6E2-6—No Check Engine Light - Replaces Fig. 6E2-25

**CHART 4
FUEL INJECTION
2.5L**

Engine cranks but will not run.

- Fuel tank quantity OK.
- Ignition "ON."
- Note "Check Engine" light.



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Fig. 6E2-7—Engine Cranks But Will Not Start, 2.5L - Replaces Fig. 6E2-27

**SCHEMATIC
CHARTS 4 AND 5
FUEL INJECTION
2.5L**

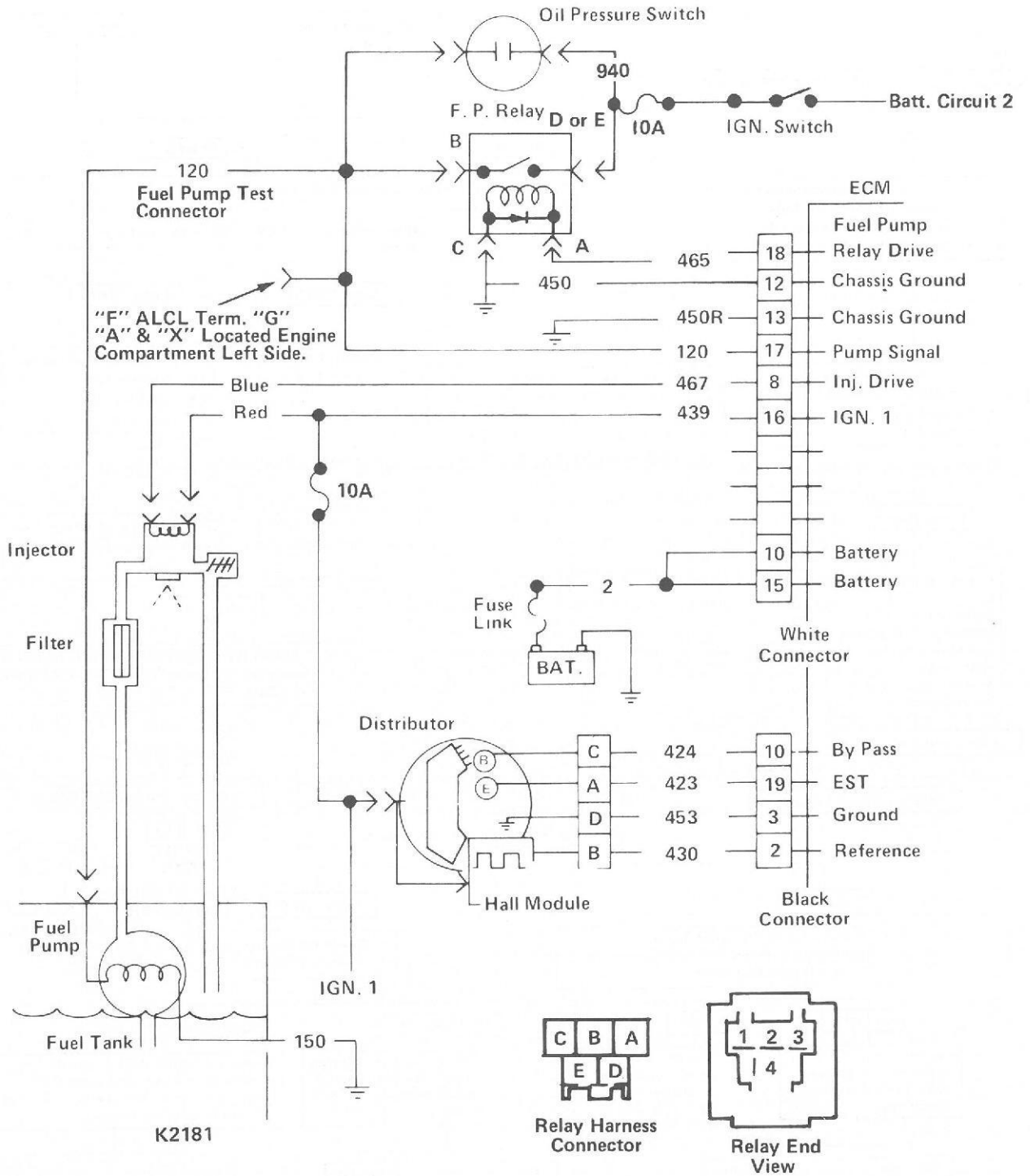
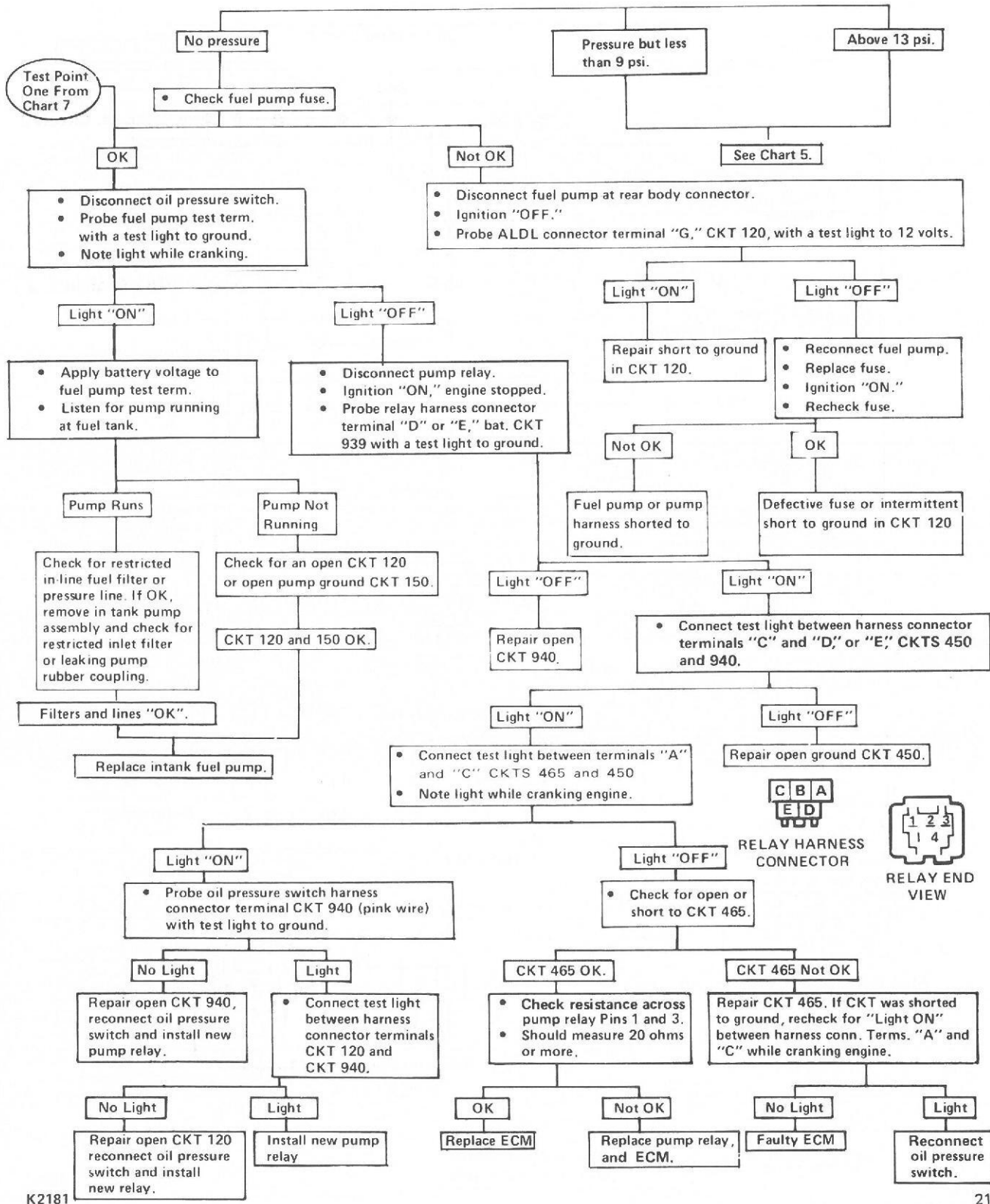


Fig. 6E2-8—Fuel System Schematic, 2.5L - Replaces Fig. 6E2-28

CHART 5
FUEL INJECTION
FUEL SYSTEM 2.5L (VIN CODE)
 (1 of 2)

*Notice: EFI system under pressure. To avoid spillage. Refer to field service procedures for testing or making repairs requiring disassembly of fuel lines or fittings.

- Fuel quantity OK.
- Install fuel pressure gage.
- Note pressure while cranking.



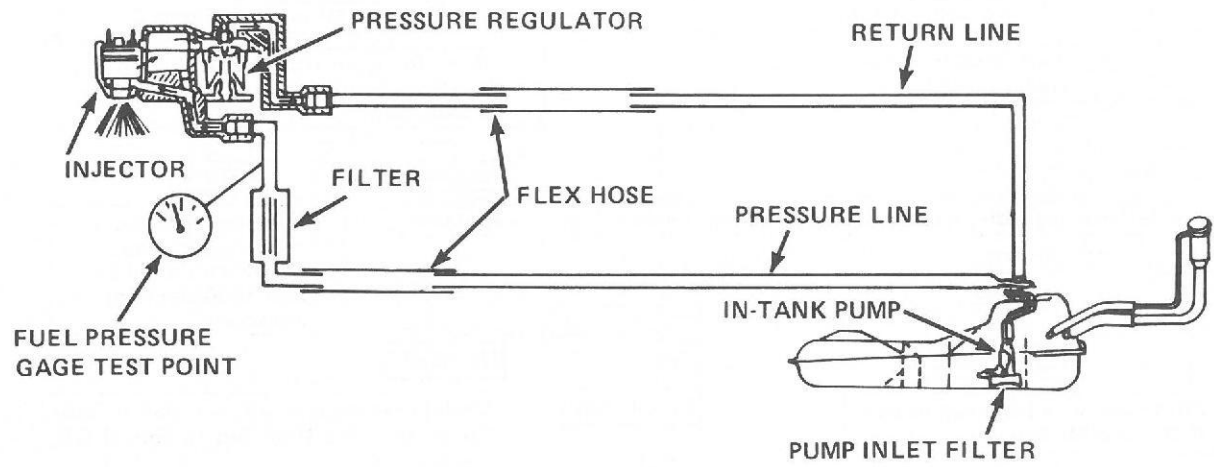
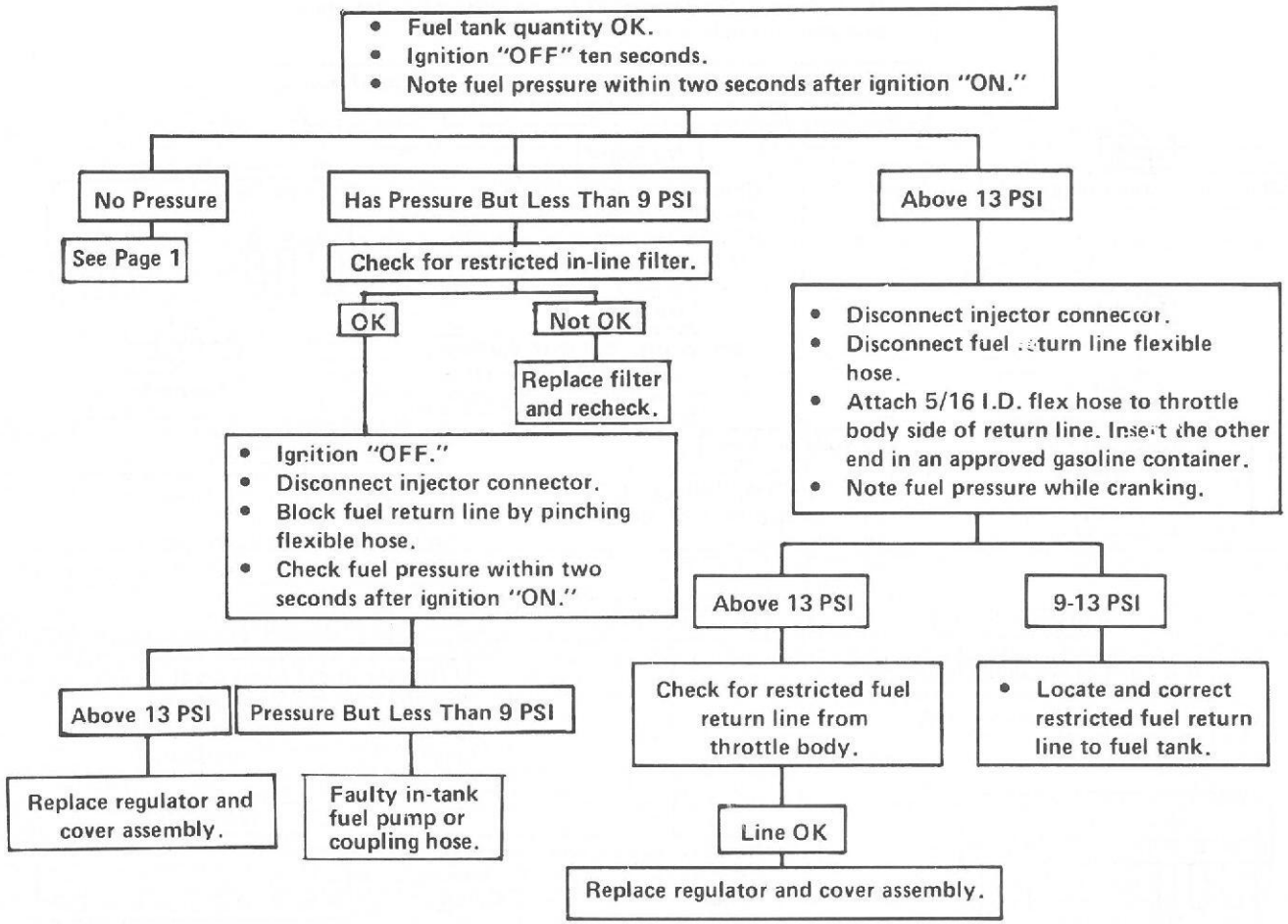
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Fig. 6E2-9—Fuel System Diagnosis (1 of 2), 2.5L - Replaces Fig. 6E2-29

CHART 5
 (Page 2 of 2)
 From Chart 5, Page 1
FUEL INJECTION
2.5L FUEL SYSTEM DIAGNOSIS

NOTICE: EFI system under pressure. To avoid fuel spillage, refer to field service procedures for testing or making repairs requiring disassembly of fuel lines or fittings.



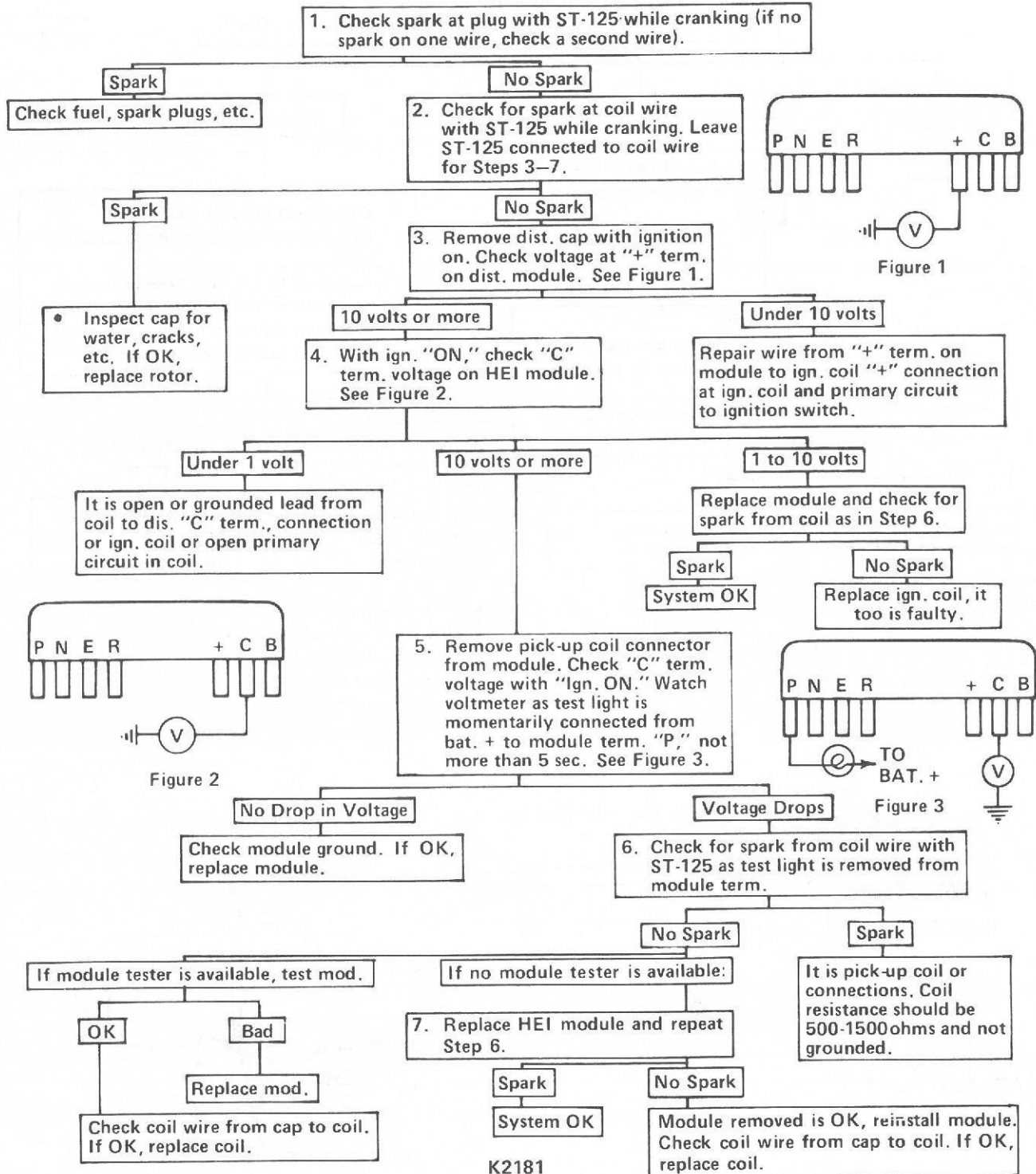
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Fig. 6E2-10—Fuel System Diagnosis (2 of 2), 2.5L - Replaces Fig. 6E2-30

**CHART 6A
FUEL INJECTION
ENGINE CRANKS, BUT WILL NOT RUN
(WITH REMOTE COIL)**

NOTE: If a tachometer is connected to the tachometer terminal, disconnect it before proceeding with the test.



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Fig. 6E2-11-HEI Diagnosis - Replaces Fig. 6E2-31

**CHART 8A
FUEL INJECTION
COOLANT FAN CONTROL CIRCUIT
2.5L WITH AIR CONDITIONING**

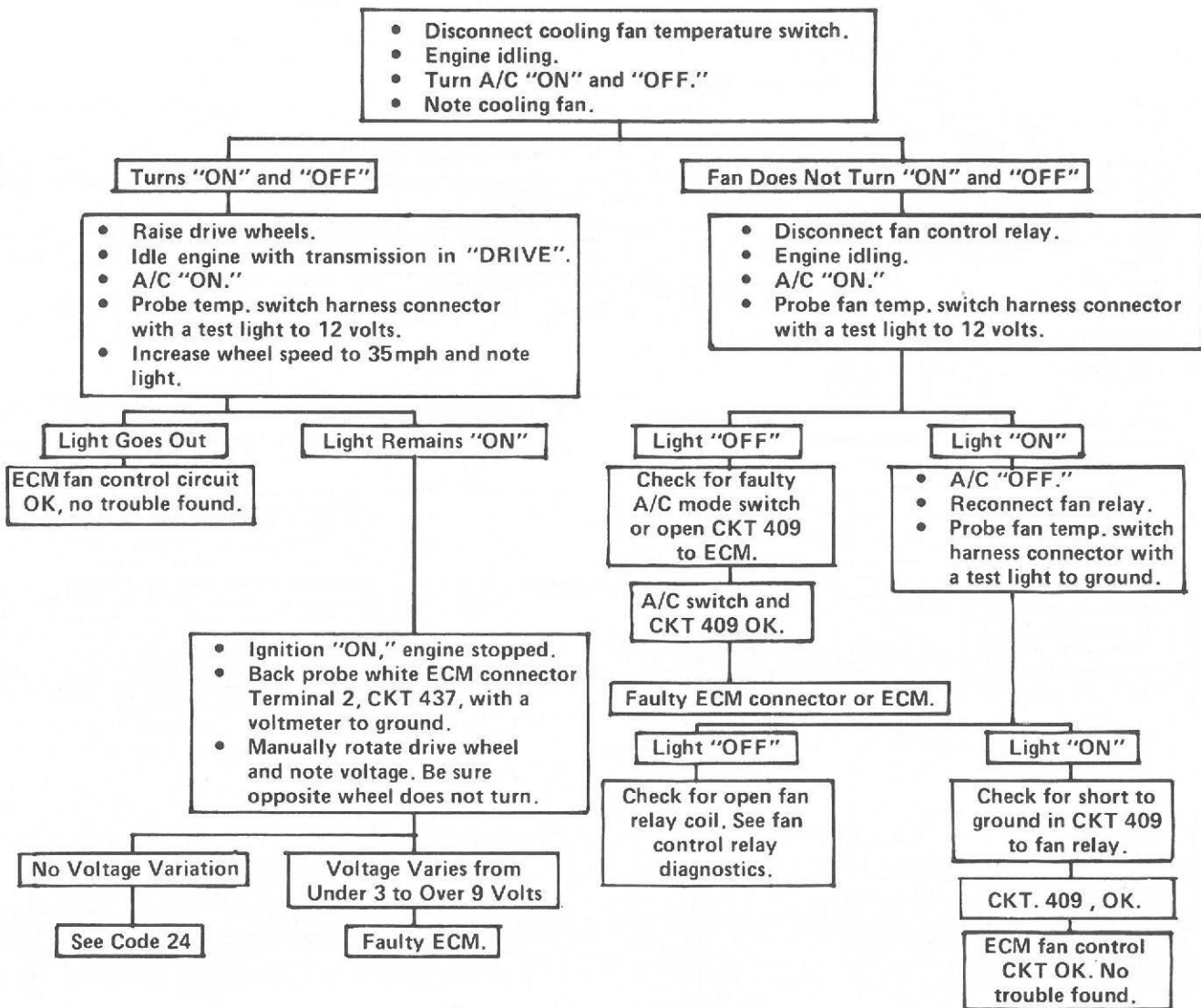
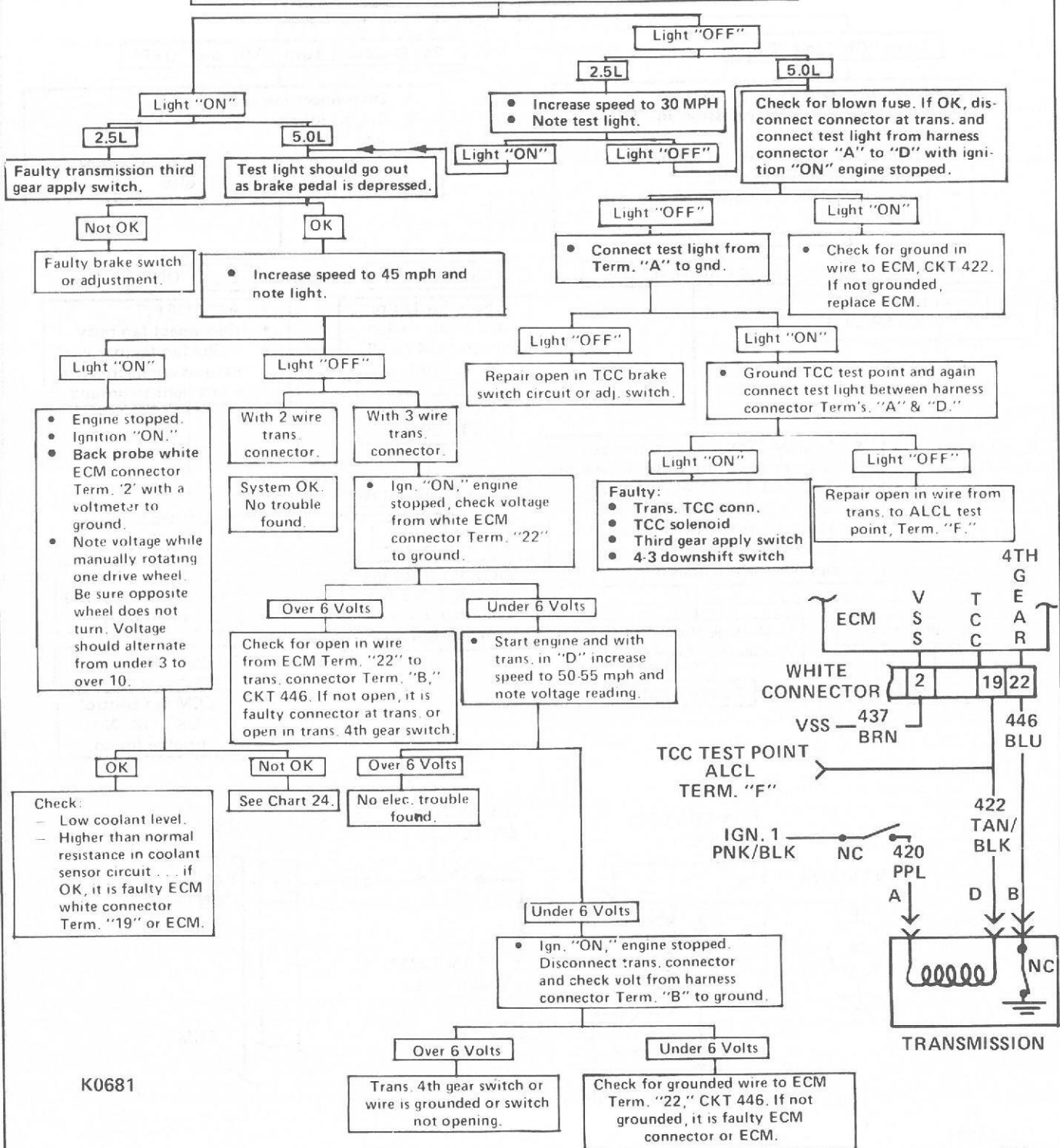


CHART 8D
FUEL INJECTION
TRANSMISSION CONVERTER CLUTCH (TCC)
ELECTRICAL DIAGNOSIS

Mechanical checks, such as linkage, oil level, etc., should be performed prior to using this chart.

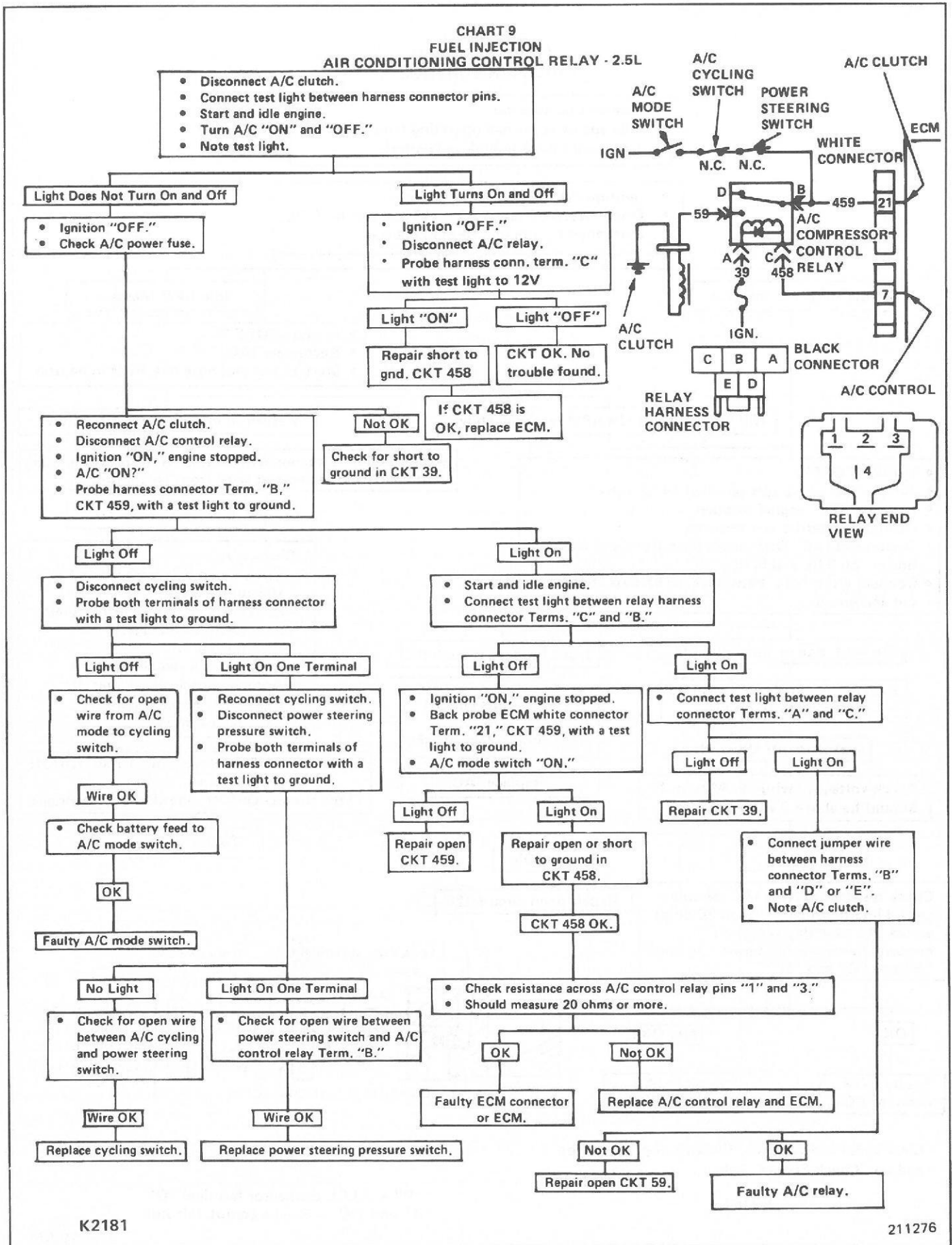
- Engine at normal operating temperature.
- Connect test light from TCC test point, ALCL Term. "F," and ground.
- Raise drive wheel.
- Start and idle engine in "Drive" wheels stopped.
- Note light.



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Fig. 6E2-13—T.C.C. Electrical Diagnosis - Replaces Fig. 6E2-35

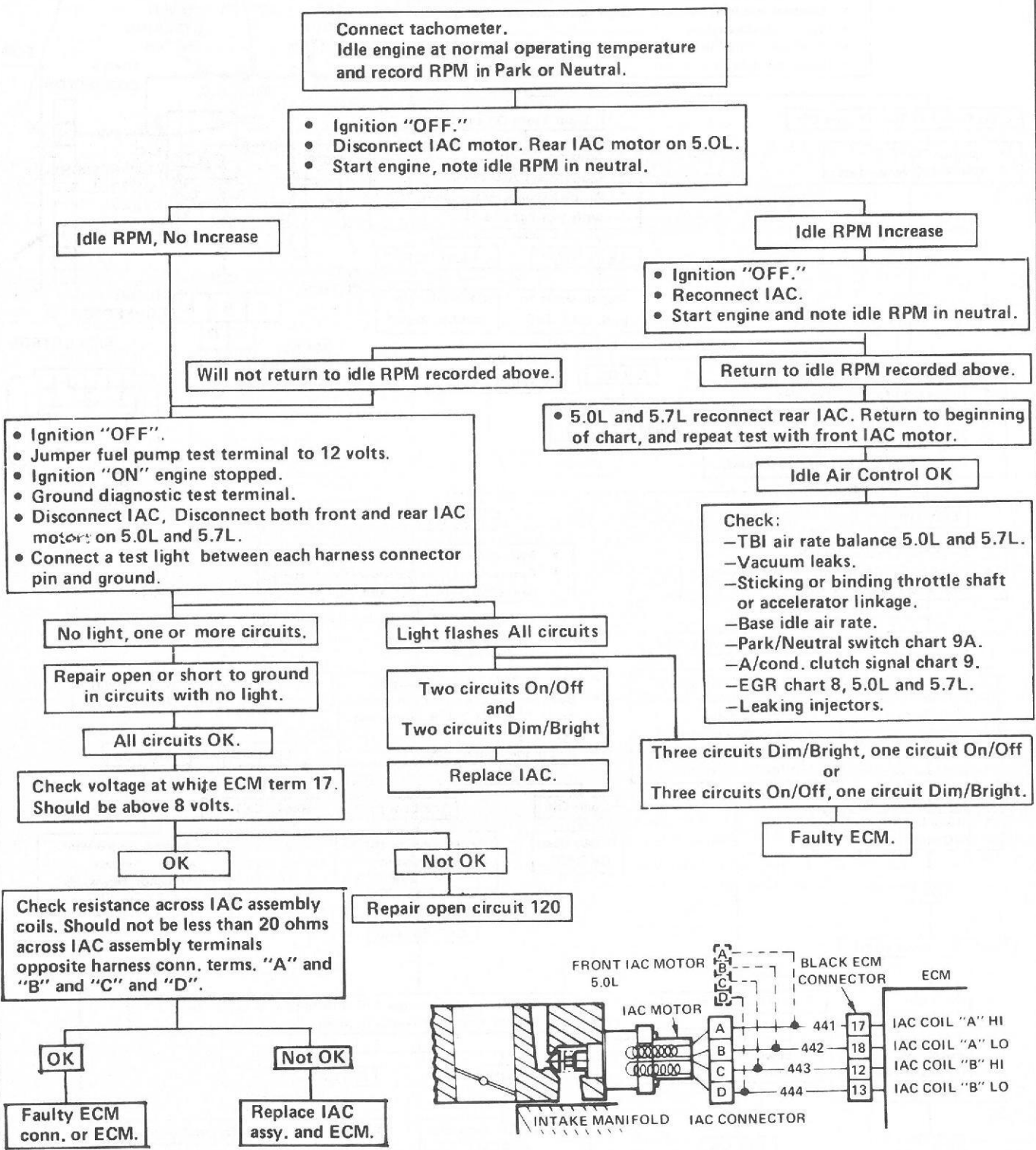


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Fig. 6E2-14—Air Conditioning Control, 2.5L - Replaces Fig. 6E2-36

**CHART 11
FUEL INJECTION
IDLE AIR CONTROL**



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

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**"F" - ALCL connector terminal "G"
"A" and "X" - Engine compt. left side

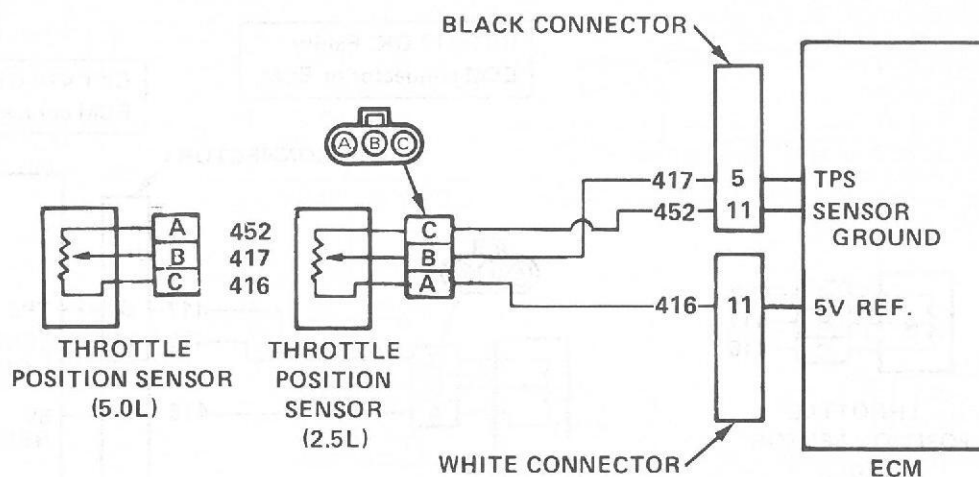
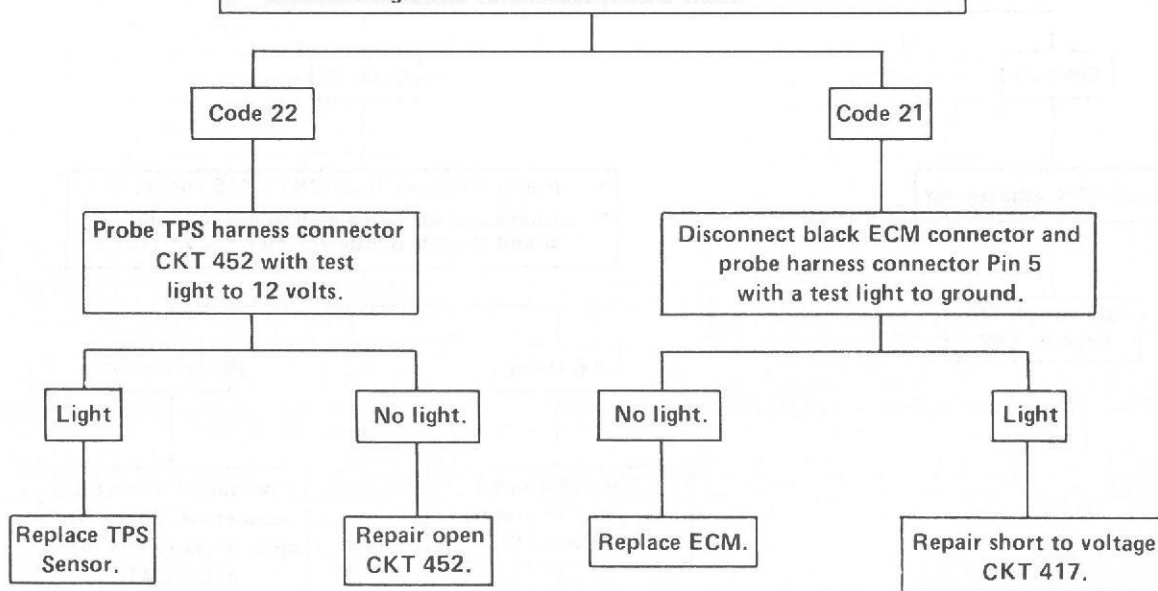
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Fig. 6E2-15-Idle Complaint - Replaces Fig. 6E2-39

CODE 21

FUEL INJECTION
THROTTLE POSITION SENSOR
(SIGNAL VOLTAGE HIGH)

- Diagnostic terminal not grounded.
- Clear codes.
- Disconnect TPS sensor.
- Start engine and idle for 1 minute or until "Check Engine" light comes on.
- Ignition "ON" engine stopped.
- Ground Diagnostic Terminal and Note Code.



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

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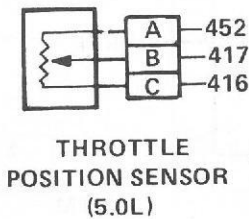
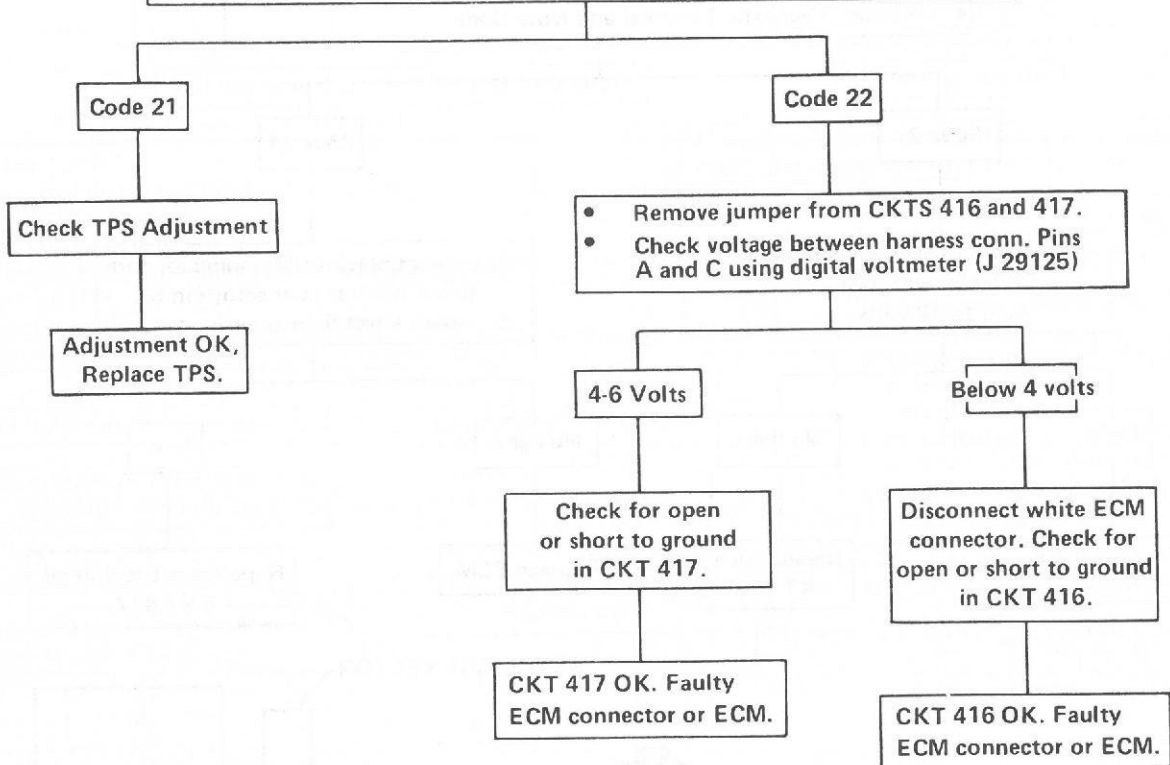
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Fig. 6E2-16—T.P.S. Check - Replaces Fig. 6E2-43

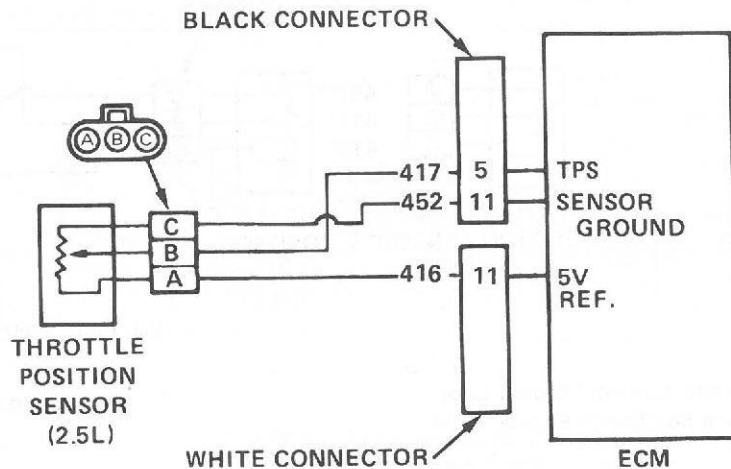
CODE 22
1982 FUEL INJECTION
THROTTLE POSITION SENSOR
(SIGNAL VOLTAGE LOW)

- Diagnostic terminal not grounded.
- Clear codes.
- Disconnect TPS and jumper CKTS 416 and 417.
- Start engine and idle for 1 minute or until "Check Engine" light comes on.
- Ignition "ON," engine stopped. Ground Diagnostic Terminal and Note Code.



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

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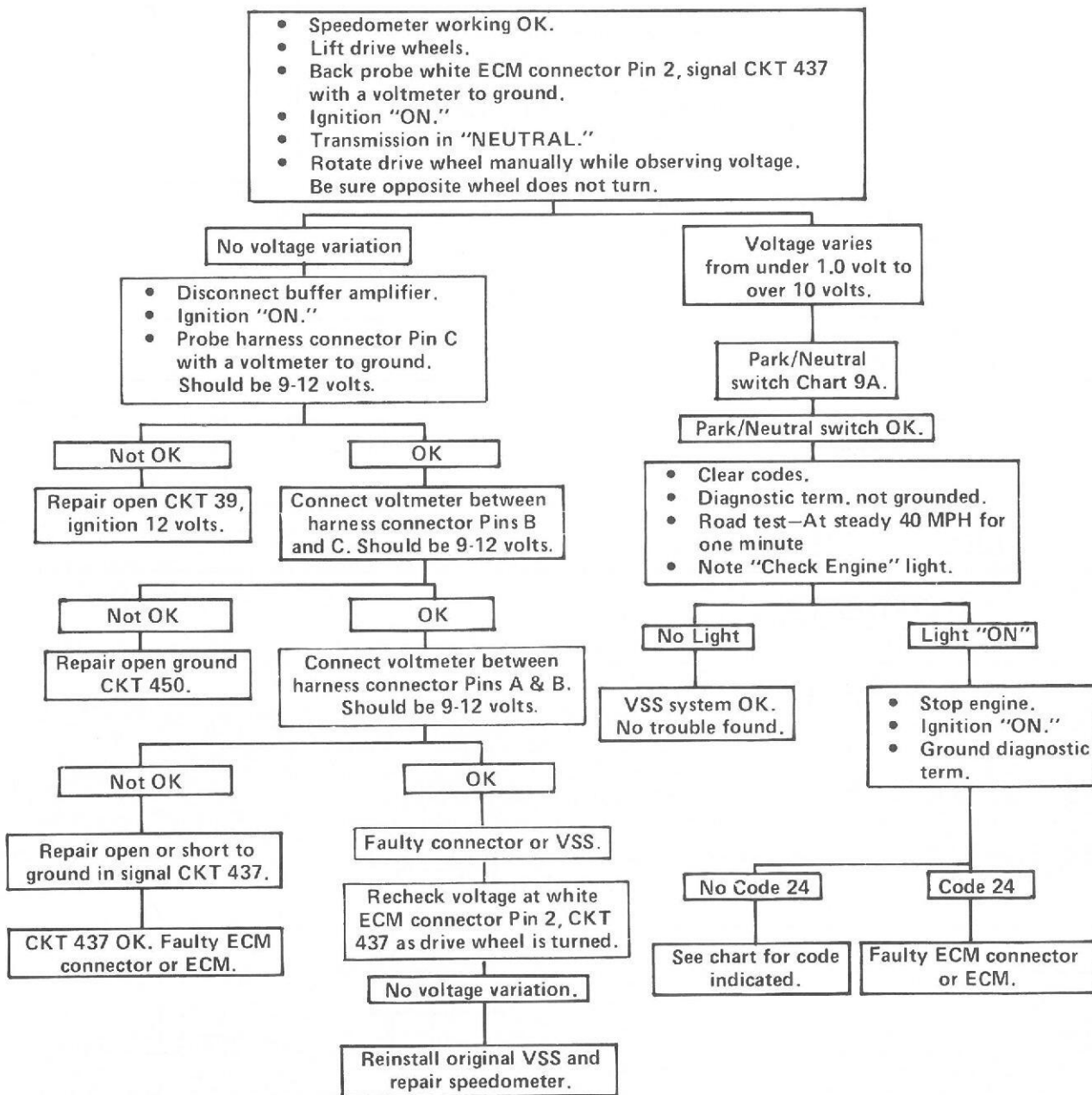


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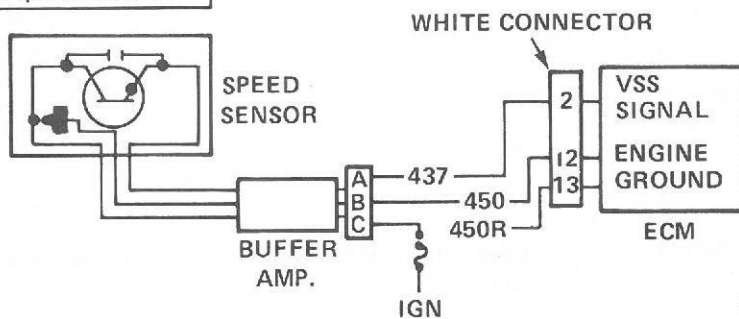
Fig. 6E2-17-T.P.S. Check - Replaces Fig. 6E2-44

**CODE 24
1982 FUEL INJECTION
VEHICLE SPEED SENSOR (VSS)**

NOTICE: A False Code 24 and "Check Engine" light may be set if engine is run above 1200 RPM in Neutral on vehicles equipped with manual transmission. To prevent misdiagnosis, disregard Code 24 if set under these circumstances.



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.



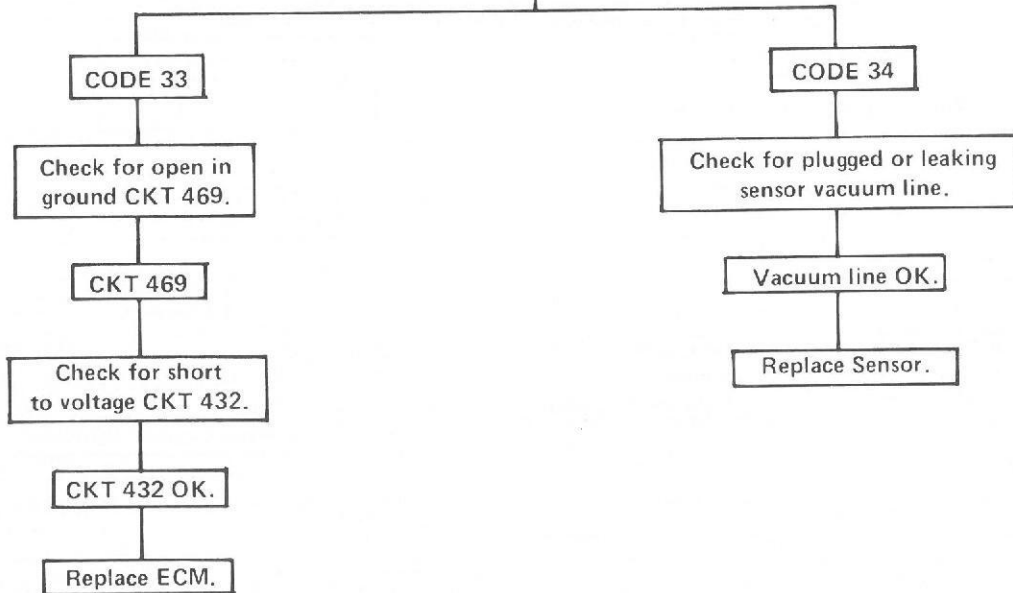
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Fig. 6E2-18—Vehicle Speed Sensor - Replaces Fig. 6E2-45

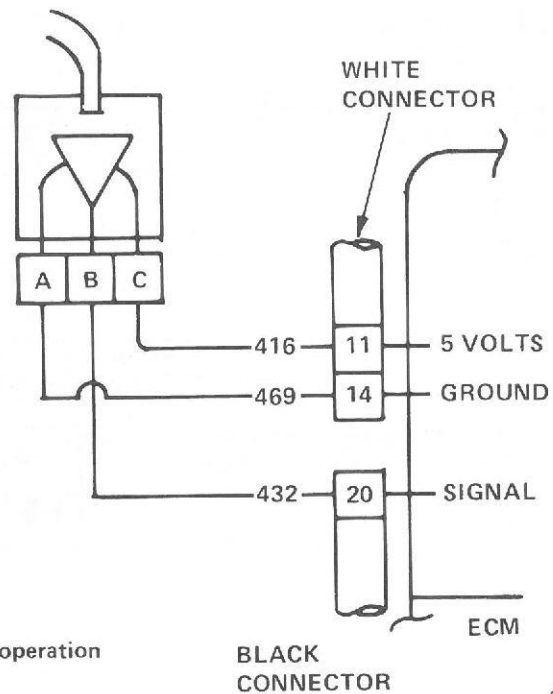
**CODE 33
FUEL INJECTION
MAP SENSOR
(SIGNAL VOLTAGE HIGH)**

- Ignition "OFF," clear codes.
- Disconnect MAP sensor connector.
- Diagnostic terminal not grounded.
- Start engine and run for 1 minute or until "Check Engine" light comes on.
- Ignition "ON," engine stopped.
- Ground diagnostic terminal and note code.



MANIFOLD PRESSURE

MAP SENSOR



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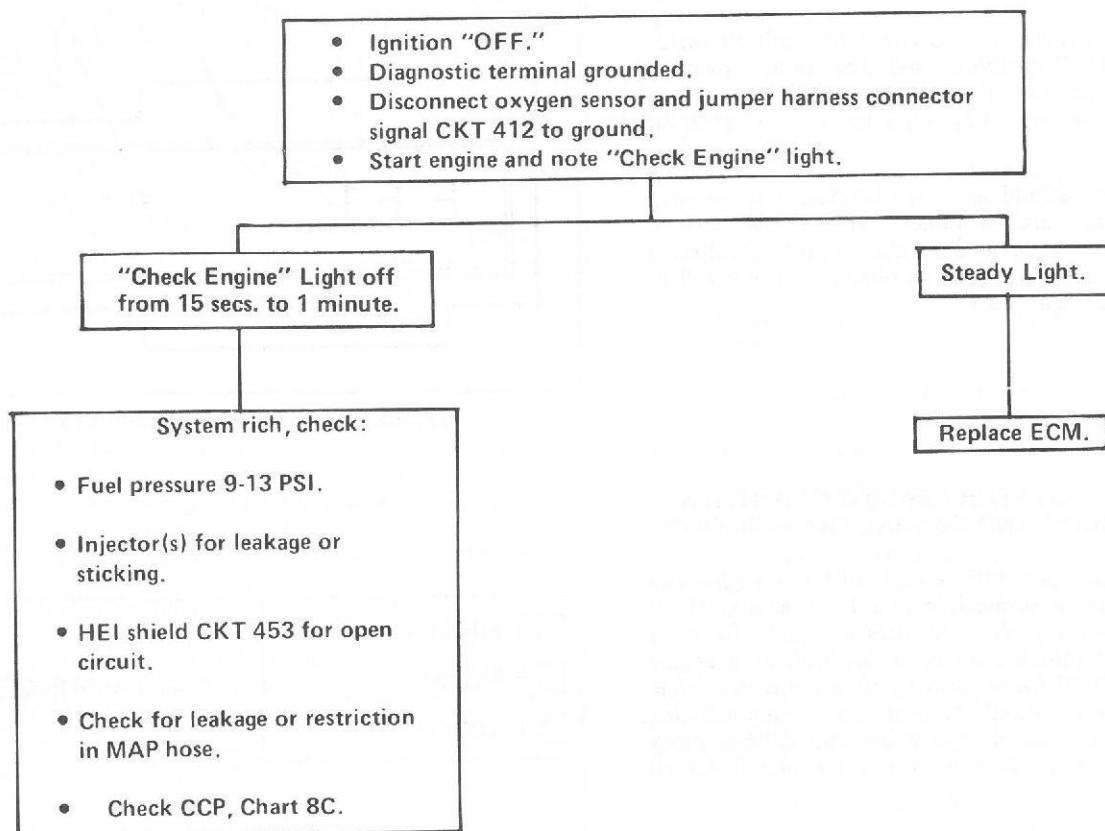
Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.

BLACK CONNECTOR

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Fig. 6E2-19—Code 33 - Replaces Fig. 6E2-46

CODE 45
FUEL INJECTION
RICH EXHAUST INDICATION



Clear codes and confirm "Closed Loop" operation and no "Check Engine" light.
FIELD SERVICE MODE:

Open-Loop: "Check Engine" light flashes at a rate of 2 times per second.

Closed-Loop: "Check Engine" light flashes at a rate of 1 time per second.

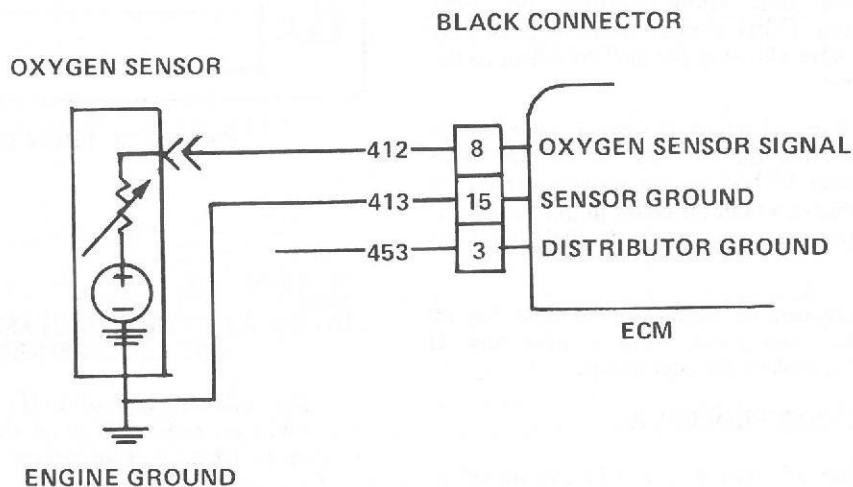


Fig. 6E2-20—Code 45 - Replaces Fig. 6E2-50

ELECTRONIC FUEL INJECTION ECM SERVICE

While performing service on the ECM of an electronic fuel injection equipped vehicle, it is imperative that the ignition switch is in the 'off' position.

Internal ECM damage may occur if the ignition switch is left in the "ON" position, and the ECM power is disconnected or connected. Battery cables, ECM fuse, or any other power feed to the ECM must be serviced with the ignition "off".

This procedure should also be observed if it becomes necessary to "jump-start" a vehicle with a low battery.

If the ECM has been damaged in this fashion, a run-down battery condition will be observed. There will be no noticeable performance loss.

FALSE CODE 24 ON VEHICLES EQUIPPED WITH A 2.5L EFI L-4 ENGINE AND MANUAL TRANSMISSION

On vehicles equipped with a 2.5L EFI L-4 engine and manual transmission, it is possible to set a false code 24 if certain engine operating characteristics are met. To set a false code 24, the vehicle may be in Neutral, with engine RPM above 1200 RPM for more than 60 seconds. A trouble code set in this manner should be disregarded when servicing the vehicle. The code may be cleared from the ECM memory by disconnecting the positive battery cable pigtail for 10 seconds.

EXTENDED CRANKING TIME ON 2.5L EFI

Extended cranking time (slow starting) on 1982 Electronic Fuel Injection (EFI) models could be caused by the fuel pump check valve allowing the fuel to return to the fuel tank after shut down.

If this condition is encountered, the check valve can be diagnosed by disconnecting the fuel line at the fuel filter (see instructions on page 6E2-55 of the service manual for relieving pressure). Connect a radiator tester pump to the line from the tank and apply air pressure. Note fuel tank filler cap must be removed.

If 15 PSI pressure can be obtained and held for 60 seconds after pumping, the check valve is operating. If pressure cannot be held, replace the fuel pump.

EFI PROM REPLACEMENT PROCEDURE

Due to the random orientation of the PROM socket to ECM circuit board, the alignment notch in the socket should be disregarded. To be sure the PROM is aligned properly, be sure the end of the PROM holder (with upper rails cut back) goes away from the PROM notch. Fig. 6E2-21). Note that the notch is located in the opposite end of the PROM holder from computer command control ECM (Fig. 6E2-22). If the PROM is installed incorrectly, damage will occur to both PROM and ECM. EFI PROM replacement procedures are shown on page 6E2-48.

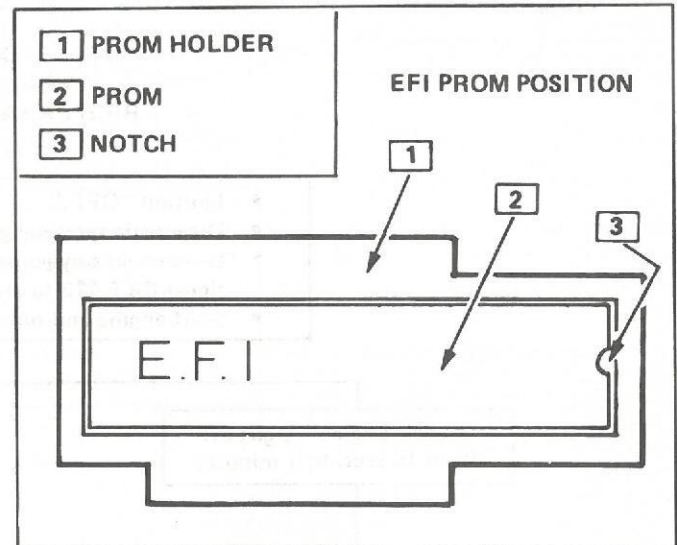


Fig. 6E2-21—PROM Installation EFI

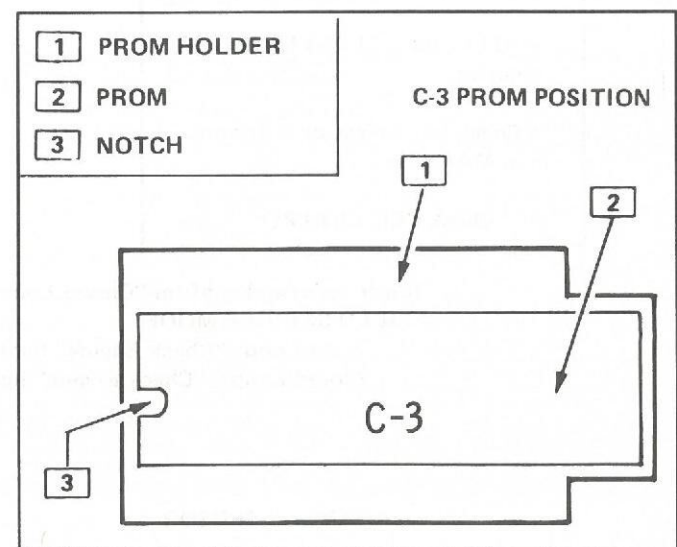


Fig. 6E2-22—PROM Installation C-3

IDLE AIR CONTROL (IAC) ASSEMBLY REPLACEMENT 1982 2.5L L-4 EQUIPPED WITH EFI

The following procedure is a revision to the replacement procedure on page 6E2-50 of the Service Manual. Use this procedure when it is necessary for Idle Air Control Valve (IACV) assembly replacement.

REMOVAL (Fig. 6E2-23)

1. Remove air cleaner.
2. With ignition "OFF", disconnect electrical connection to the Idle Air Control Valve (IACV).
3. Using a 1-1/4" wrench (32mm), remove IACV from throttle body. Remove old gasket(s) from IACV unit and DISCARD (new gasket included in kit).

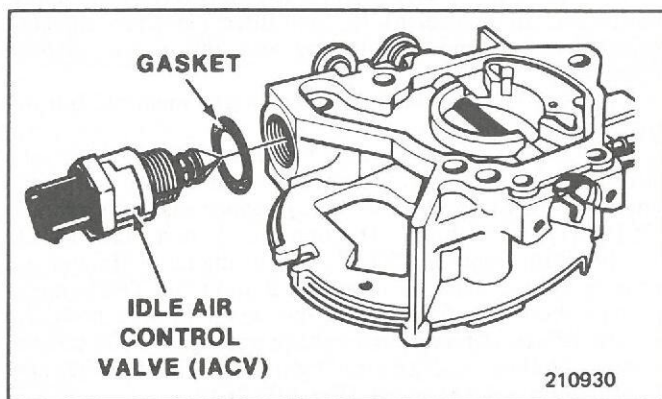


Fig. 6E2-23—Idle Air Control

NOTICE: Before installing new idle air control assembly, measure the distance that the conical valve is extended. Measure the distance from the gasket mounting surface on the motor housing to the end of cone (see Figure 6E2-24). Distance should not exceed 28mm (1-1/8"). If the cone is extended too far, damage may occur to the motor when installed.

Identify replacement IACV assembly as being either Type I (having collar at electric terminal end) or Type II (without collar). If measured dimension "A" is greater than 28mm (1-1/8"), distance must be reduced as follows:

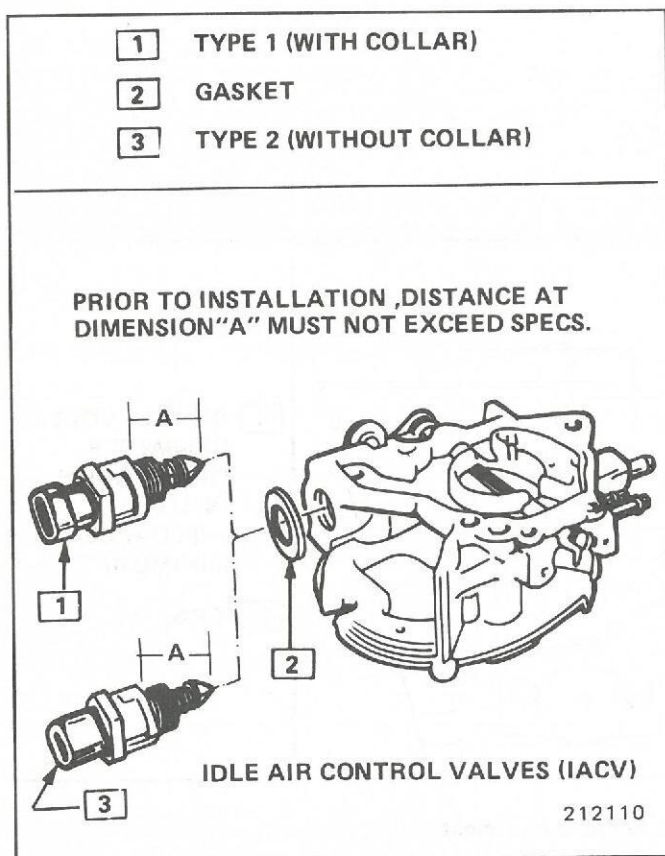


Fig. 6E2-24—Idle Air Control Valve Identification

TYPE I — Exert firm pressure on conical valve to retract it. (A slight side-to-side movement may be helpful.)

TYPE II — Compress retaining spring from conical valve while turning valve "in" with a clockwise motion. Return spring to original position with straight portion of spring end aligned with flat surface of valve.

1. Install new idle air control assembly to throttle body. Use new gasket supplied with assembly. Tighten motor to 18 N·m (13 ft. lbs.).

2. Reconnect electrical connection to idle air control assembly.

3. Install air cleaner.

4. Start engine and allow engine to reach operating temperature.

5. On manual transmission vehicle, idle speed will be controlled when operating temperature is reached. On automatic transmission vehicles, engage transmission in "Drive" when operating temperature is reached. This will allow ECM to control idle speed.

Verify proper operation of idle air control assembly as follows:

Connect tachometer, start engine and allow it to reach operating temperature. With parking brake applied, engage transaxle in drive range and turn air conditioning on. Engine RPM should be controlled at approximately 750 RPM.

FUEL INJECTOR INSTALLATION

On page 6E2-60 is the installation instructions when installing the fuel injector assembly. Please note that the correct lubricant to use on the "O" rings is AUTOMATIC TRANSMISSION.

REVISED THROTTLE POSITION SENSOR ADJUSTMENT PROCEDURE — 1982 2.5L L-4 EFI

This revised procedure should be used instead of the procedure given in the Service Manual on page 6E2-61.

1. Remove air cleaner from engine.

2. Using tool J-33047, check minimum idle speed. Adjust if necessary.

CAUTION: To reduce the risk of fire and personal injury, it is necessary to relieve the fuel system pressure before servicing fuel system components.

3. To do this: Remove fuse marked "Fuel Pump" from fuse block in passenger compartment. Crank engine—engine will start and run until fuel supply is exhausted. When engine stops, engage starter again for 3.0 seconds to assure dissipation of any remaining pressure. Leave fuel pump fuse out until step 16.

4. With ignition "Off," disconnect electrical connectors from idle air control, throttle position sensor, and injector.

5. Disconnect throttle linkage, return spring, and cruise control linkage if so equipped.

6. Disconnect vacuum hoses from throttle body (note routing for proper connection during assembly).

7. Disconnect fuel supply and return lines at throttle body unit. This will require use of back up wrench to hold fuel nuts on throttle body.

8. Remove three (3) bolts securing throttle body to intake manifold and remove throttle body.

9. Invert throttle body and place on a clean flat surface.

10. Using a 5/16" drill bit, drill completely through the two (2) TPS screw access holes in base of throttle body to be sure of removing the spot welds holding TPS screws in place. (Fig. 6E2-25).

11. Remove the two (2) TPS attaching screws and apply loctite 262 or equivalent to first three (3) screw threads. Reinstall screws and TPS leaving attaching screws slightly loose.

12. Lay throttle body unit on intake manifold but do not bolt down.

13. Install jumper wires between TPS harness and throttle position sensor. (Jumpers may be made from 3, 6" lengths of 16 gauge wire; three (3) connectors) part number 12014837, and three (3) connectors) part 12014836).

14. With ignition "On," use a digital voltmeter to measure voltage between terminals B and C on TPS harness. Voltage should be $.525 \pm .075$ in the closed throttle position. Rotate TPS to obtain proper voltage and tighten TPS screws. Recheck voltage reading after tightening screws to be sure adjustment has not changed. (Fig. 6E2-26).

15. With ignition "Off," remove jumpers from TPS and TPS harness.

16. Reverse removal procedure for TBI installation, and with ignition "Off," replace fuel pump fuse.

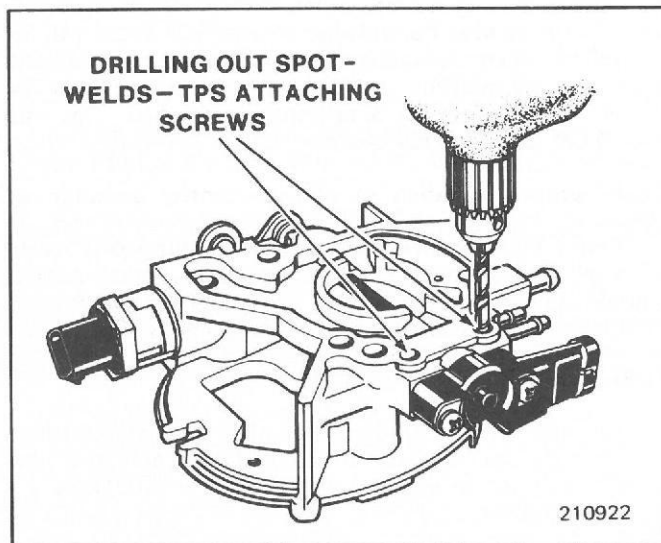


Fig. 6E2-25—Spot Weld Removal

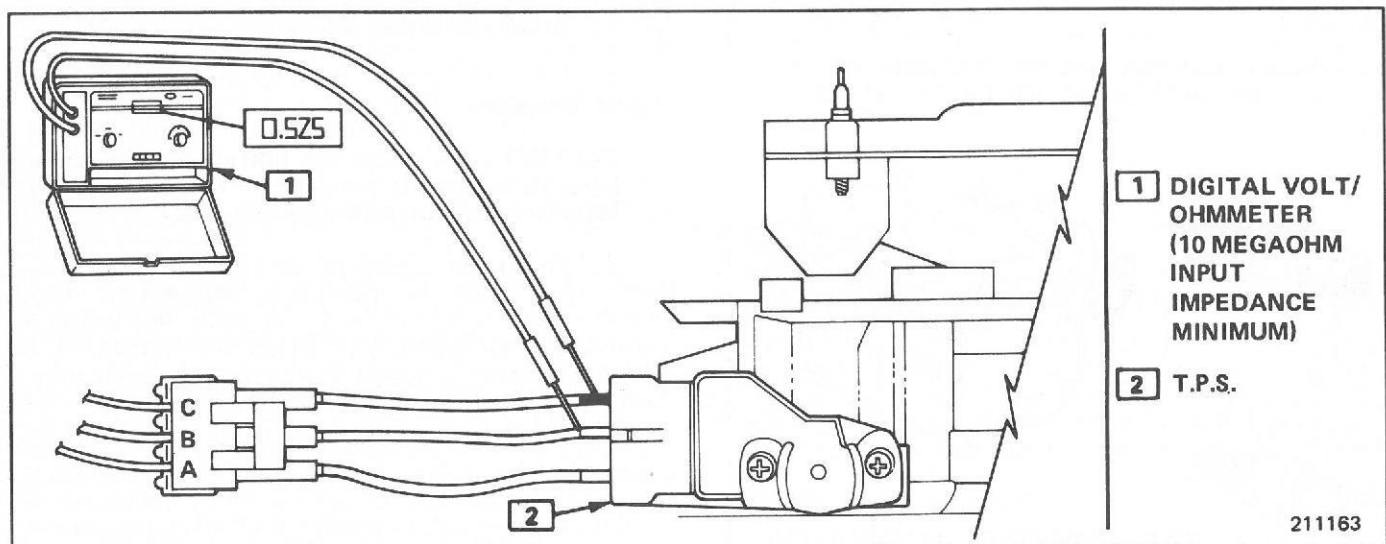


Fig. 6E2-26—Throttle Position Sensor Adjustment

SECTION 6H

VACUUM PUMPS

1982 CUTLASS CIERA 2.5L VACUUM PUMP

The 1982 Omega and Cutlass Ciera Service Manual does not contain information in Section 6H on the vacuum pump used on the 2.5L L4 in the Cutlass Ciera when equipped with Cruise Control.

This vacuum pump is installed on the engine in the same location where the mechanical fuel pump was in prior years (Fig. 6H-1). This vacuum pump is operated by a lobe on the camshaft.

To test the pump, remove the vacuum lines from both ports at the pump and plug the hose openings. Install a vacuum gage to the "inlet" port (Fig. 6H-1). Block the drive wheels, apply the parking brake firmly and place the selector lever in "park". Start the engine and operate it at idle while observing the vacuum gage. After one minute of engine operation the minimum vacuum reading should be 53.0 kPa (15.0" Hg).

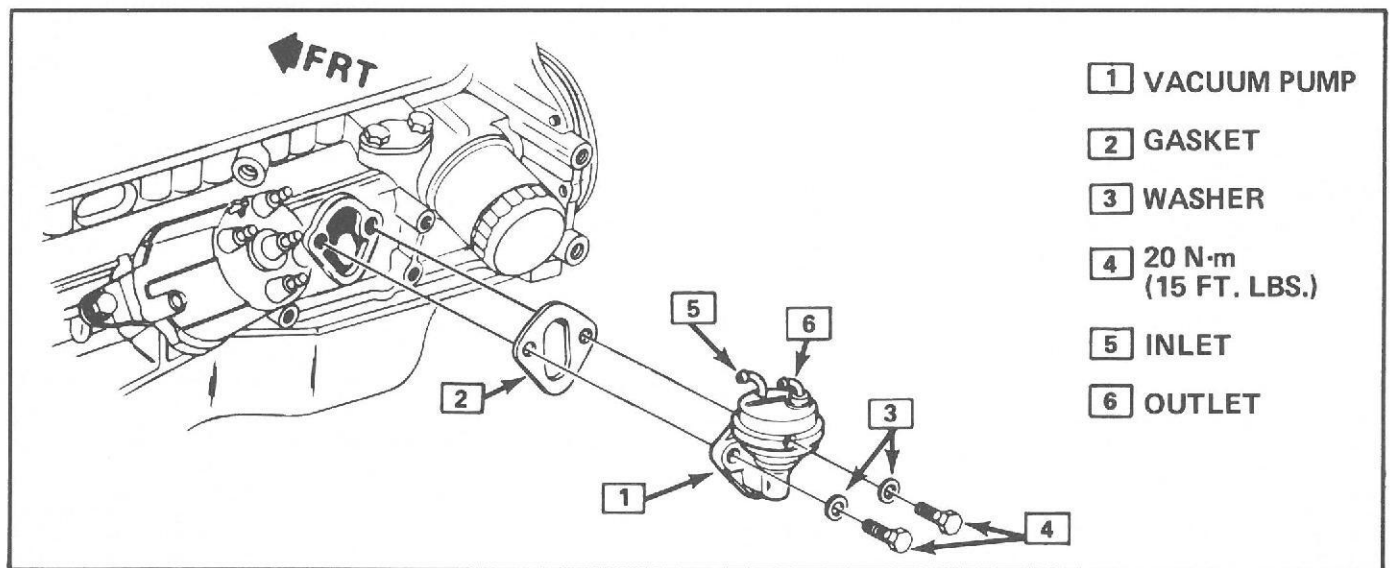


Fig. 6H-1—2.5L L4 VACUUM PUMP

SECTION 7A

AUTOMATIC TRANSMISSION ON CAR SERVICE INCLUDING REMOVAL AND INSTALLATION

REVISED TRANSMISSION CONVERTER FLUSHING PROCEDURE ALL AUTOMATIC TRANSMISSIONS

The service flushing procedure for all converters has been revised due to the addition of the converter clutch.

In the revised procedure a pipe plug is used to insure that rebalancing is not required. The pipe plug can also be replaced if a leak develops.

Converters equipped with the hydraulic clutch (T.C.C.) that have been contaminated with antifreeze cannot be re-used. Antifreeze will attack seals in the converter and the adhesive used to bond the clutch material to the pressure plate. Converters contaminated with water can be used if flushed properly.

Follow the procedure below:

1. Drill a 11/32" hole in the converter between the two vane extrusions and adjacent to the converter weld seam edge. See Fig. 7A-1.

a. Drill the hole to approximate completion.

b. Remove the drill bit from the started hole and coat it with grease to hold any metal chips.

c. Complete drilling the hole at low drill speed.
NOTICE: To prevent converter damage, drill at right angles to the surface and sleeve the drill bit so it can enter no deeper than 1/4".

2. Apply grease to a 1/8 x 27 NPSF tap and thread the hole.

3. Drain and flush the converter as currently detailed in the service manual.

4. Coat a 1/8 x 27 NPTF pipe plug with teflon pipe sealant or equivalent and install.

5. Torque to 11 N•m (8 ft. lbs.).

6. Pressure check for leaks as detailed in the service manual.

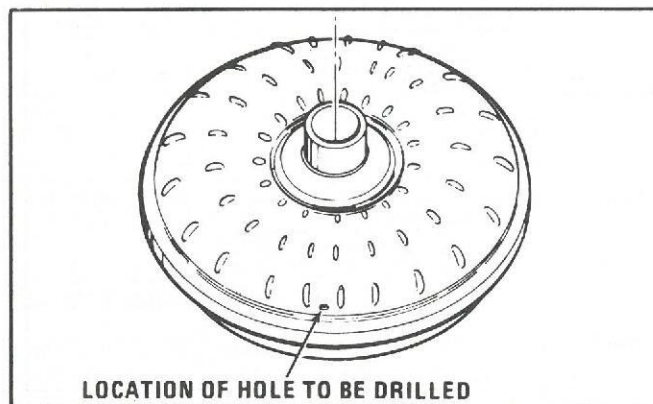


Fig. 7A-1 - Hole Location

GOVERNOR COVER SEAL—AT250C & AT350C

When reinstalling the governor cover on AT250C and AT350C transmissions, use Loctite 515 or equivalent sealer instead of Loctite Cup Plug Sealer no. 2 as mentioned on page 7A-17 of your 1982 Service Manual.

HEAD BOLT TEMPERATURE SWITCH

A head bolt temperature switch is being added to the Torque Converter Clutch (TCC) circuit on all V8 diesels (Fig. 7A-2). This switch will prevent TCC engagement when the engine temperature is below 67°C (152°F). This switch will be located in the exposed right rear cylinder head bolt (Fig. 7A-3). Please note this change on page 7A-23 of the 1982 Chassis Service Manual and pages 50, 260 and 462 of the Electrical Troubleshooting Manual.

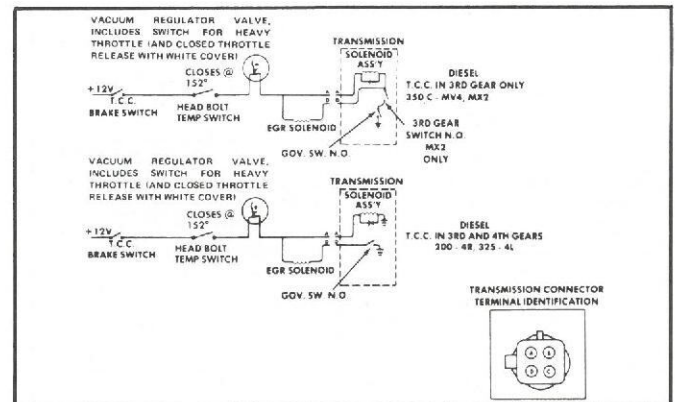


Fig. 7A-2—Head Bolt Temperature Switch Schematic

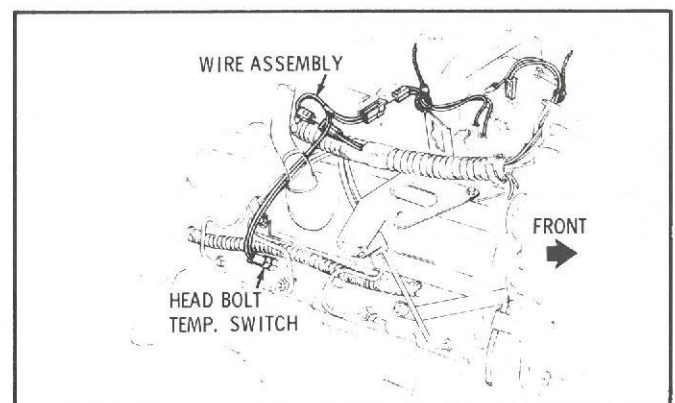


Fig. 7A-3—Head Bolt Temperature Switch Location

AUTOMATIC TRANSMISSION REAR OIL SEALS

When installing a new rear oil seal on automatic transmissions, be sure to lubricate the sealing lip on the new seal with automatic transmission fluid. Also, the output shaft yoke must be clean and free from corrosion before reinstallation. Failure to follow this procedure will cause rapid wear of the new seal.

TRANSMISSION CONVERTER CLUTCH (TCC) ELECTRICAL DIAGNOSIS

On page 7A-22 of the 1982 Chassis Service Manual there is an incorrect diagnosis chart. The correct chart for diagnosis of a torque converter clutch on a diesel equipped Cutlass, 88, 98 and Toronado appears in fig. 7A-4. The chart found on page 7A-21 is also incorrect. Use the chart found in section 6E of this manual in it's place.

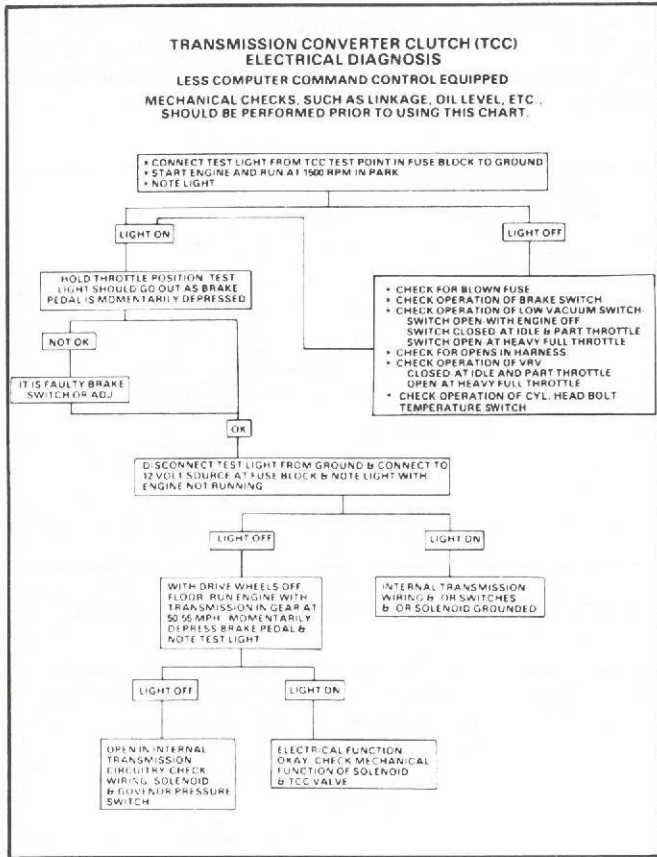


Fig. 7A-4—T.C.C. Diagnosis (Diesel)

TRANSMISSION CONVERTER CLUTCH DIAGNOSIS

The following charts 7A-5, 7A-6 and 7A-7 should be used in place of the charts on pages 7A-9, 7A-10 and 7A-11 in your 1982 Omega and Cutlass Ciera Service Manual.

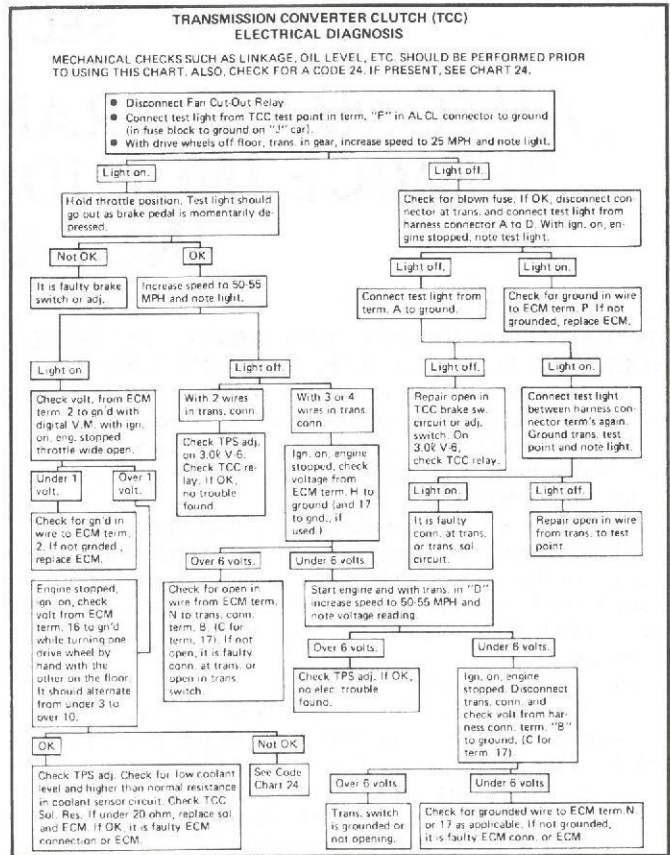


Fig. 7A-5—T.C.C. Electrical Diagnosis

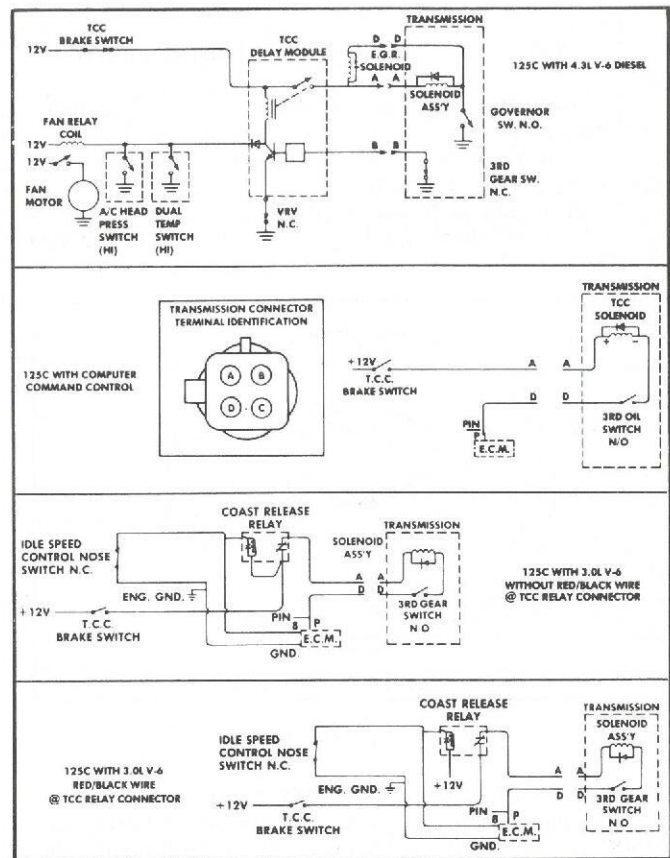


Fig. 7A-6—T.C.C. Wiring Schematic

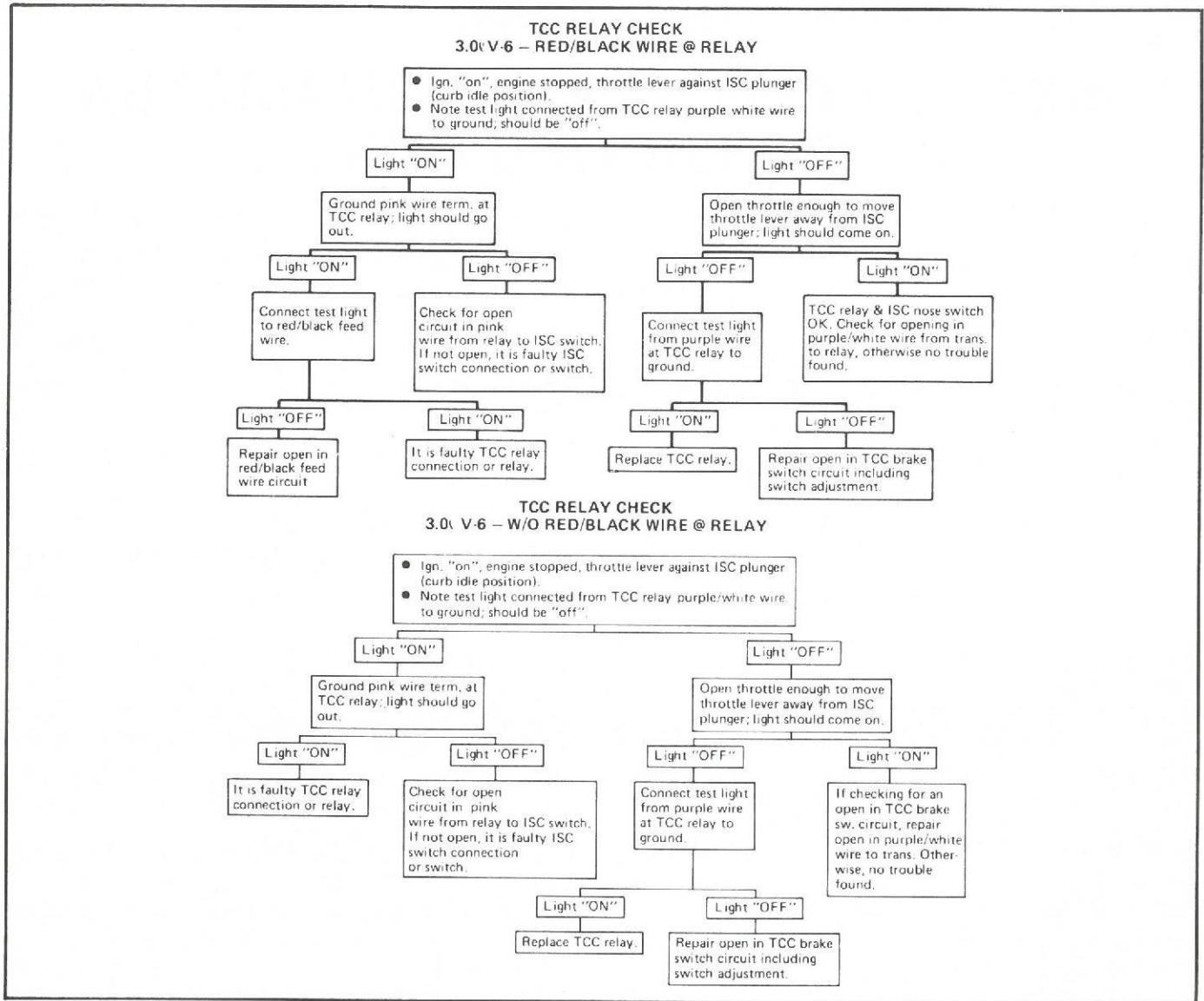


Fig. 7A-7—T.C.C. Relay Check for 3.0L V-6

TORQUE CHART

A torque chart was not included in section 7A of the Omega and Cutlass Ciera Service Manual. Use the following chart when servicing the automatic transaxle.

	N•m	Ft.Lbs.
Cooler Lines at Case	14	10
Cooler Lines at Radiator	27	20
Flywheel to Torque Converter (All except VIN T)	41	30
Flywheel to Torque Converter (VIN T)	47	35
Governor Cover to Case	11	8
Manual Detent Spring Assy. to Case	11	8
Oil Pan and Valve Body Cover	16	12
Park Lock Bracket Cover to Case	24	18
Speedo Driven Gear to Governor Cover	9	75*
Starter Mounting Bolts	43	32
T.V. Cable to Case	9	75*
Valve Body to Case	24	18
Valve Body to Case Cover	11	8
Valve Body to Driven Sprocket Support	24	18

* = In. Lbs.

SECTION 125C

AUTOMATIC TRANSAXLE DIAGNOSIS AND UNIT REPAIR

TRANSMISSION AUXILIARY VALVE BODY (DIESEL)

Use fig. 125C-1 to replace fig. 7A-20 on page 7A-12 and fig. 125C-228 on page 125C-61. The illustration in the Omega and Cutlass Ciera Service Manual is for Canadian cars only.

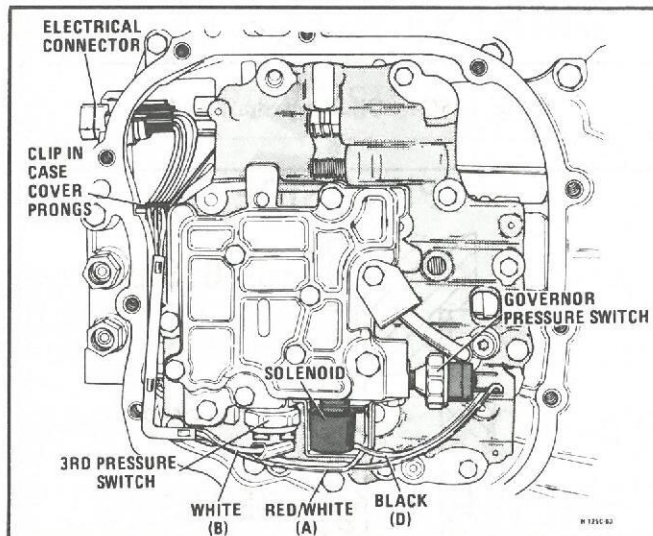


Fig. 125C-1—Auxiliary Valve Body (Diesel)

SUPPORT FIXTURE FASTENER KIT FOR AT125 & AT125C

A new fastener kit, J-28664-6, has been released for the AT125 and AT125C transmission support fixture J-28664.

The addition of this fastener kit to the transmission support fixture will decrease the possibility of personal injury or transmission damage occurring due to failure to use all the bolts necessary to hold the transmission in place. To install the transmission support fixture onto either the AT125 or AT125C transmission, follow the procedure listed below.

1. Remove converter retaining strap J-28539 and converter.
2. Place the support fixture J-28664 on the transmission installing attaching bolts 1, 2 and 3 as shown in fig. 125C-2. Torque bolts to 11 N·m (8 ft. lbs.).

CAUTION: Install all bolts as shown for the transmission support fixture J-28664 to reduce the possibility of personal injury or transmission damage.

3. Install support fixture and transmission into transmission support fixture base J-3289-20. Install locating pin fully into base. Drain the transmission by turning the right hand axle end down.

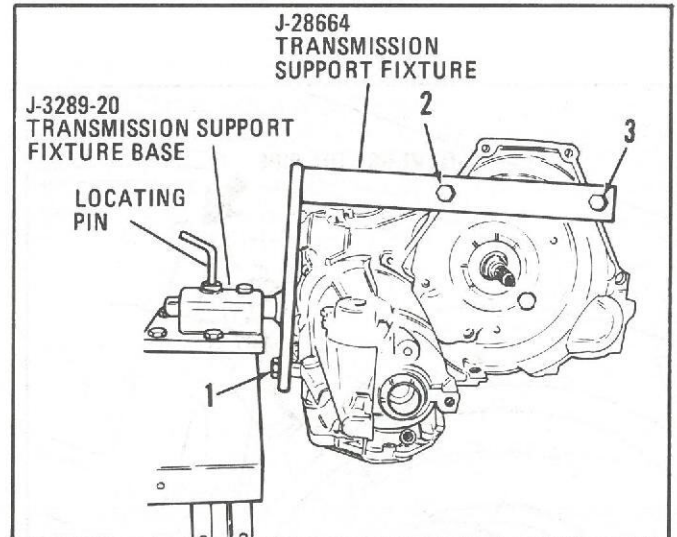


Fig. 125C-2—Transmission Support Fixture

NEW INTERMEDIATE BAND AND DIRECT CLUTCH HOUSING FOR AT125C

Beginning mid August, 1981, the following AT125C transmission models (BL, PL, PK, CL, CV and OP) were built with a new wider intermediate band and a new direct clutch housing and drum assembly. (See fig. 125C-3.) The new design direct clutch housing has a wider finished surface area to accommodate the new wider intermediate band assembly. Do not mix these new design parts with the narrower past design parts.

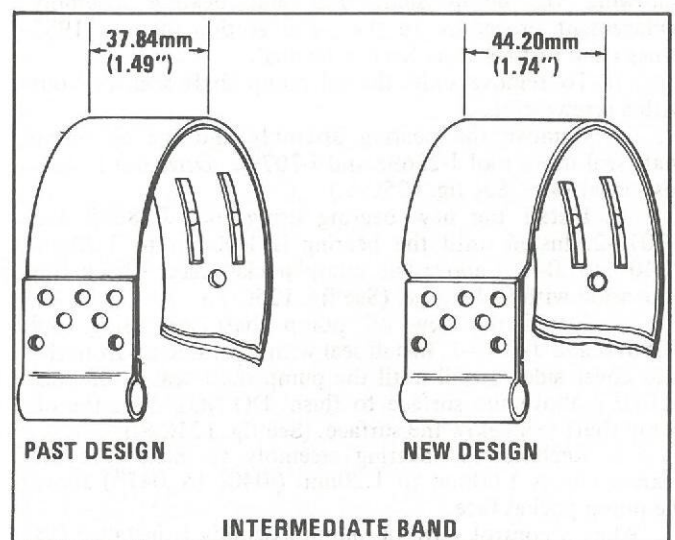


Fig. 125C-3—Intermediate Band Comparison

BAND ANCHOR PLUG AT125 & AT125C

A new design band anchor plug is being used in all AT125 and AT125C series transmissions. The new design band anchor plug is held in place by a tab that fits behind the reverse oil pipe. (See fig. 125C-4.) To remove the new design band anchor plug, you must first remove the reverse oil pipe.

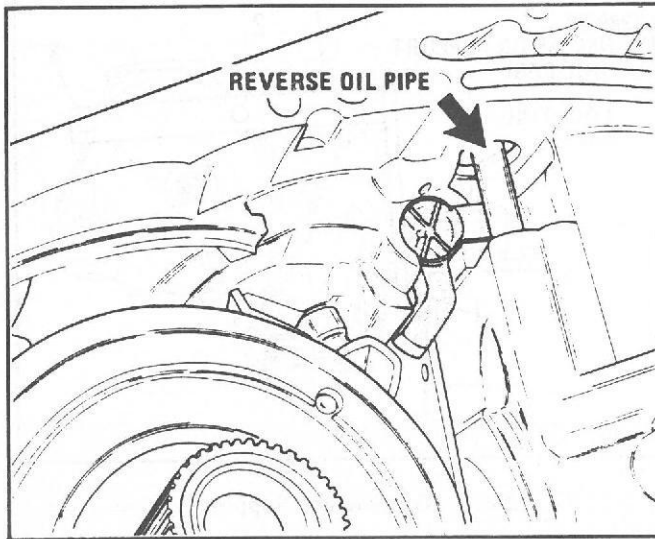


Fig. 125C-4—New Design Band Anchor

OIL PUMP SHAFT BEARING AND SEAL—AT125C

All 1982 AT125C transmissions are being built with a new oil pump shaft seal. (See fig. 125C-5.) Please add the following oil pump shaft seal and bearing assembly replacement procedure to the 125C section of your 1982 Omega and Cutlass Ciera Service Manual.

1. To remove only the oil pump shaft seal, pry out with a screwdriver.

2. Remove the bearing assembly and the oil pump shaft seal using tool J-28698 and J-7079-2. Drive out toward case cover side. (See fig. 125C-6.)

3. Install the new bearing using tool J-28698 and J-7079-2. Install until the bearing is 1.00mm to 1.20mm (.040" to .047") above the pump pocket face. Check this dimension with feeler gage. (See fig. 125C-7.)

4. Install the new oil pump shaft seal using tool J-28698 and J-7079-2. Install seal with steel side up from the case cover side. Install until the pump shaft seal is .050mm (0.020") above the surface to flush. DO NOT drive the oil pump shaft seal below the surface. (See fig. 125C-8.)

5. Recheck the bearing assembly to make sure the bearing cup is 1.00mm to 1.20mm (.040" to .047") above the pump pocket face.

When a control valve oil pump assembly is installed ON CAR, be certain the oil pump shaft is completely seated in the Control Valve Oil Pump assembly before installing. The new oil pump shaft seal may be used on all 1980/81 AT125C transmissions.

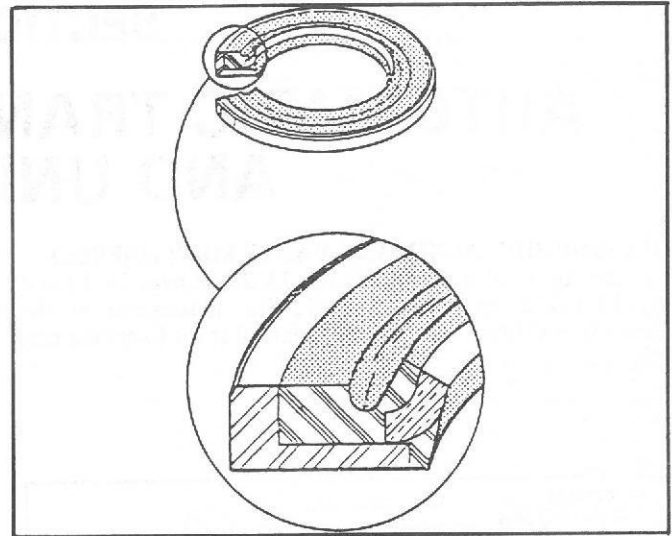


Fig. 125C-5—Oil Pump Shaft Seal

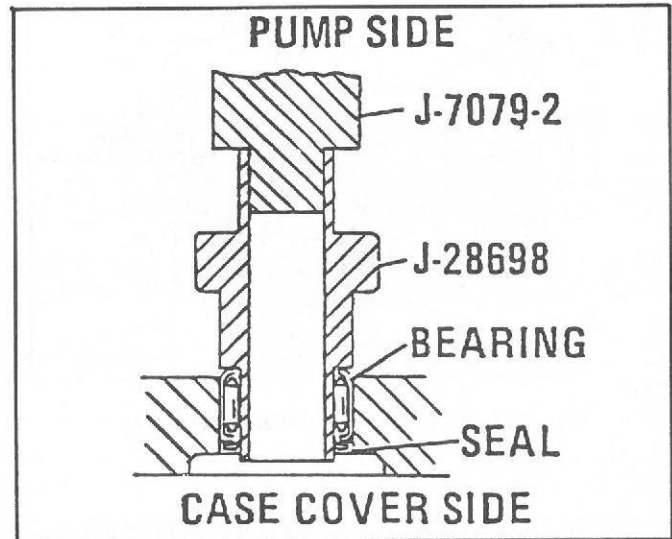


Fig. 125C-6—Removing Bearing and Seal

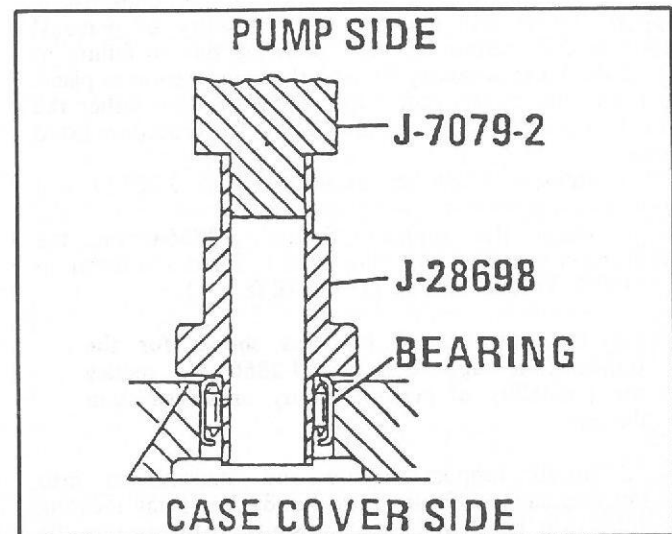


Fig. 125C-7—Installing New Bearing

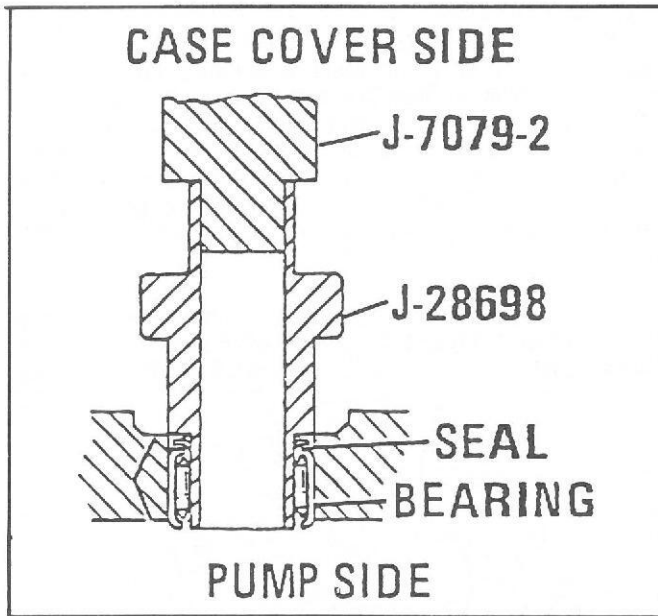


Fig. 125C-8—Installing New Seal

SECTION 200-4R AUTOMATIC 200-4R TRANSMISSION

REVISED COLOR CODE FOR SELECTIVE THRUST WASHERS, AT200-4R

The color codes for the selective thrust washer located between the oil pump and the overdrive clutch housing have changed.

Use figure number 200-4R-1 in place of figure 200-4R-216 found on page 200-4R-54 of the 1982 Chassis Service Manual.

OVERDRIVE UNIT END PLAY WASHER THICKNESS CHART		
THICKNESS		IDENTIFICATION NUMBER AND/OR COLOR
4.25 - 4.36 mm	(0.167" - 0.171")	0 - Scarlet
4.36 - 4.48 mm	(0.172" - 0.176")	1 - White
4.49 - 4.60 mm	(0.177" - 0.180")	2 - Brown or Cocoa Brown
4.61 - 4.72 mm	(0.181" - 0.185")	3 - Gray
4.73 - 4.84 mm	(0.186" - 0.190")	4 - Yellow
4.85 - 4.96 mm	(0.191" - 0.195")	5 - Light Blue
4.97 - 5.08 mm	(0.196" - 0.200")	6 - Pink or Purple
5.09 - 5.20 mm	(0.201" - 0.204")	7 - Black or Orange
5.21 - 5.32 mm	(0.205" - 0.209")	8 - Green

Fig. 2004R-1—Overdrive Unit End Play
Washer Thickness Chart

SECTION 325-4L AUTOMATIC 325-4L TRANSMISSION

AT325-4L ACCUMULATOR PISTONS

Use figures 325-4L-1 and 325-4L-2 in place of the incorrect figures on pages 325-4L-10 and 325-4L-64 in your 1982 Chassis Service Manual. Use figure 325-4L-1 in place of figures 325-4L-20 and 325-4L-229, and figure 325-4L-2 in place of figures 325-4L-19 and 325-4L-228.

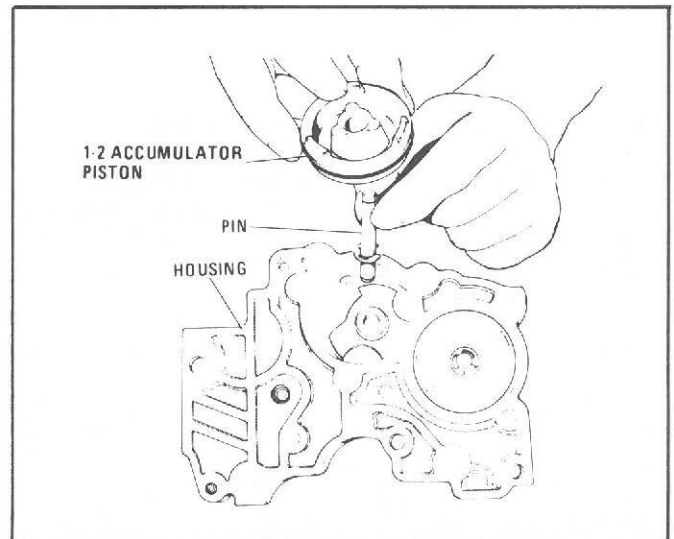


Fig. 325-4L-1—Removing the 1-2 Accumulator Piston
and Pin from the Housing

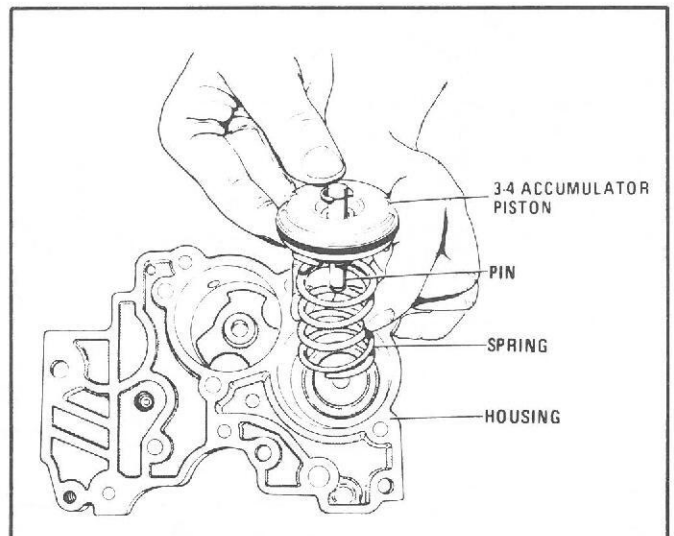


Fig. 325-4L-2—Removing the 3-4 Accumulator Piston,
Pin, and Spring from the Housing

**SELECTIVE THRUST WASHER COLOR CODES—
AT325-4L**

Color codes have been added to overdrive unit end play selective washers to aid in identification. The color code is located on the outer edge of the washer near the tang. Add the following color codes next to the identification numbers on fig. 325-4L-31A on page 325-4L-13 and fig. 325-4L-208A on page 325-4L-53.

Identification Number	Color Code
1	Gray
2	Dark Green
3	Pink
4	Brown
5	Light Blue
6	White
7	Yellow
8	Light Green
9	Orange
10	Violet
11	Red
12	Dark Blue

CHECK BALL IDENTIFICATION ON AT325-4L

Use figure number 325-4L-3 to replace figure 325-4L-17, and figure 325-4L-4 to replace figure 325-4L-22 and 325-4L-223 in your 1982 Chassis Service Manual. Also, note on figure 325-4L-153 that the "Pellet and Spring" is the equivalent of the number 7 check ball.

AT325-4L OIL PUMP

When assembling the 1982 AT325-4L oil pump, it is critical that the oil pump gears be installed properly. The driven gear must be installed with the identification mark (Δ) facing down in the gear pocket. (See fig. 325-4L-5.) Install the drive gear with the chamfer on the drive tangs facing up. (See fig. 325-4L-5.) Incorrect installation of pump gears will result in extreme wear to the pump gears and/or loss of engagement between converter hub and pump drive tangs.

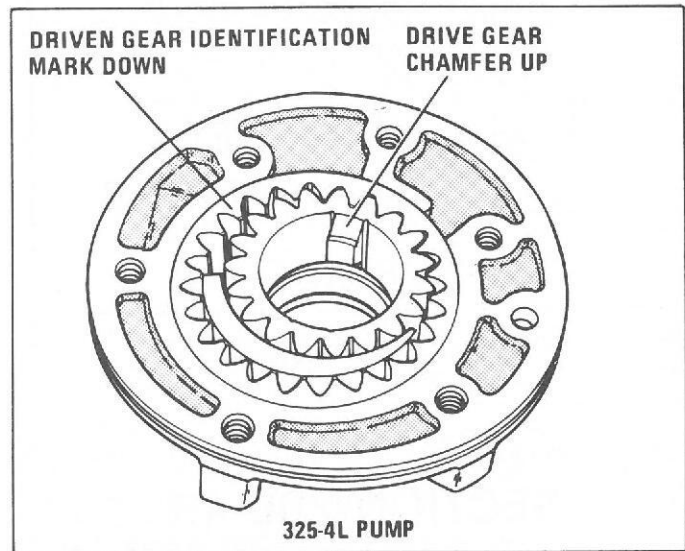


Fig. 325-4L-5—Installation of Oil Pump Gears

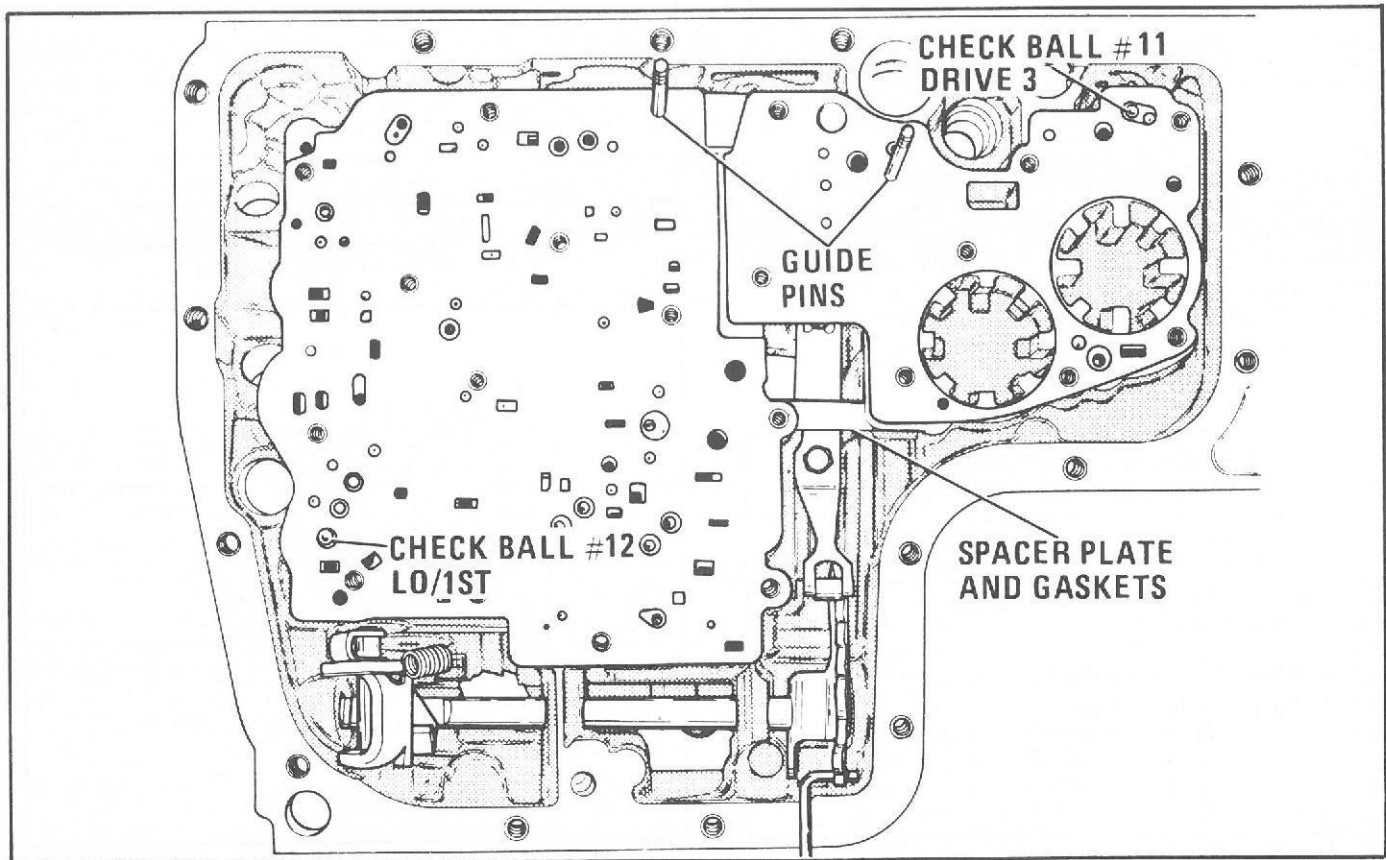


Fig. 325-4L-3—Location of Check Balls on Spacer Plate and Gasket

SPROCKET COVER BOLTS AT325-4L

Beginning mid August, 1981, all AT325-4L transmission sprocket covers will be fastened to the unit with standard sprocket cover bolts. Previously, all AT325-4L diesel model transmissions were equipped with five (5) stud type bolts which were situated around the case cover to accommodate the chain cover insulator.

When the sprocket cover is removed from any AT325-4L which is built with the stud type bolt, use the standard bolts during reassembly. If the stud type bolt is used and handling damage occurs to the bolt, a leak could result.

AT325-4L DRIVE & DRIVEN SPROCKETS

The drive and driven sprockets are called out incorrectly in Figures 325-4L-37 and 325-4L-173C in your 1982 Chassis Service Manual. The drive sprocket should be changed to read driven sprocket and the driven sprocket should read drive sprocket.

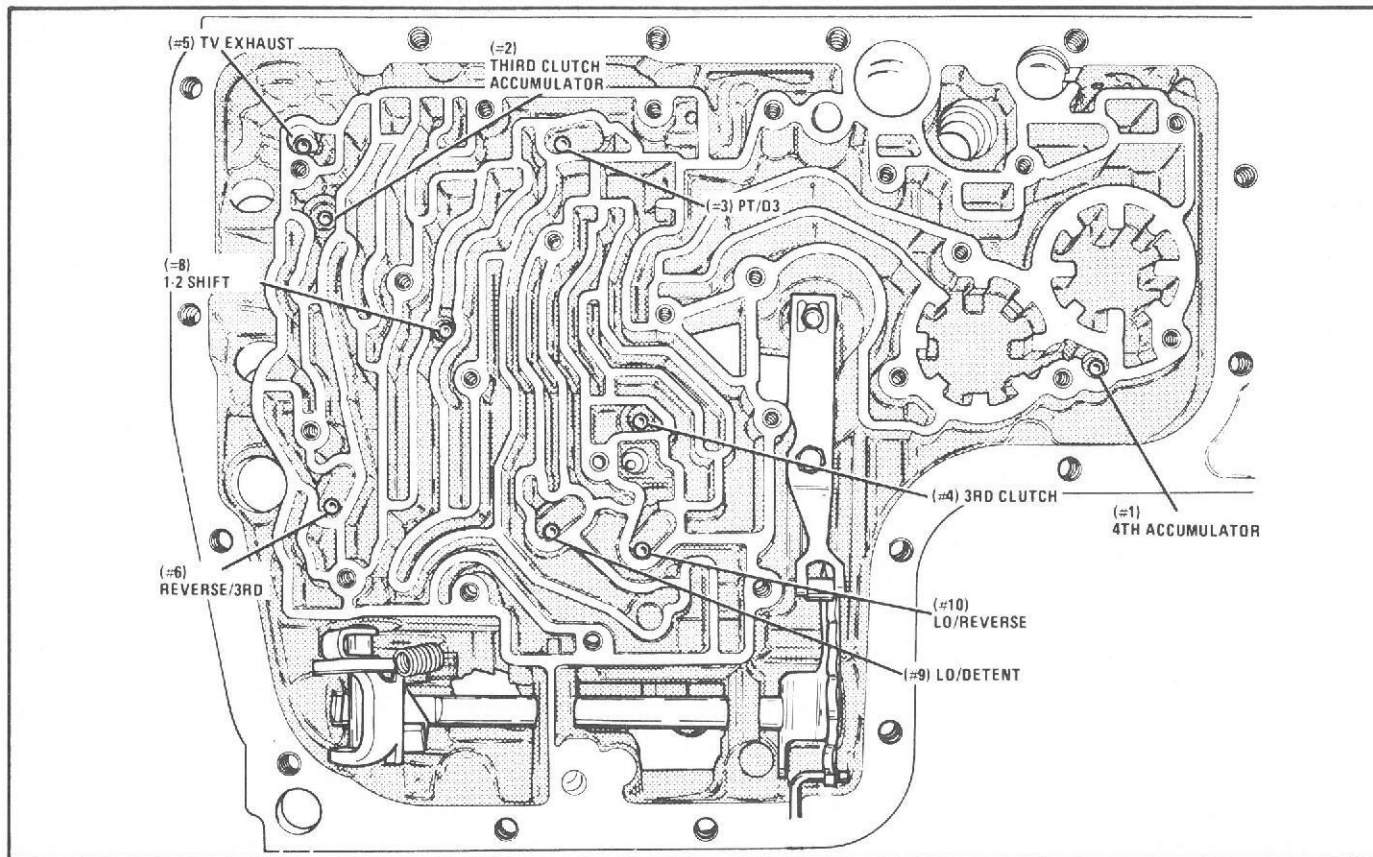


Fig. 325-4L-4—Check Ball Locations

SECTION 8A

ELECTRICAL TROUBLESHOOTING

COMPUTER COMMAND CONTROL TROUBLE CODES CHART

The Computer Command Control Trouble Code Charts are located on the following pages in the Electrical Troubleshooting Manual (ETM) and Omega and Cutlass Ciera Service Manual:

<u>SERIES</u>	<u>MANUAL</u>	<u>PAGES</u>
Cutlass	ETM	15
88/98	ETM	217
Toronado	ETM	418
Cutlass Ciera	Omega/Cutlass Ciera	8A-114
Omega	Omega/Cutlass Ciera	8A-316

These charts, however, do not contain all the trouble codes that are possible with the system. Refer to section 6E, Emission Control Systems, of the Chassis Service Manual for all possible trouble codes and detailed diagnostic procedures for the Computer Command Control System.

"CHECK ENGINE" LIGHT DRIVER MODULE

The "Check Engine" Light Driver Module is contained inside a plastic housing which is light green in color. This housing is taped to the I/P Harness, but its particular location on the harness is dependent upon car line and application. Figure 8A-1 shows specific locations for the Light Driver Module for each car line. This should be used to supplement the information found in the component location charts on the following pages of the Electrical Troubleshooting Manual (ETM) and section 8A in the Omega and Cutlass Ciera Service Manual.

<u>SERIES</u>	<u>MANUAL</u>	<u>PAGES</u>
Cutlass Supreme	ETM	19
88/98	ETM	220 & 233
Cutlass Ciera	Omega/Cutlass Ciera	8A-117
Omega	Omega/Cutlass Ciera	8A-319

The Light Driver Module location on the Toronado can be found on page 434 - Figure 3 of the ETM.

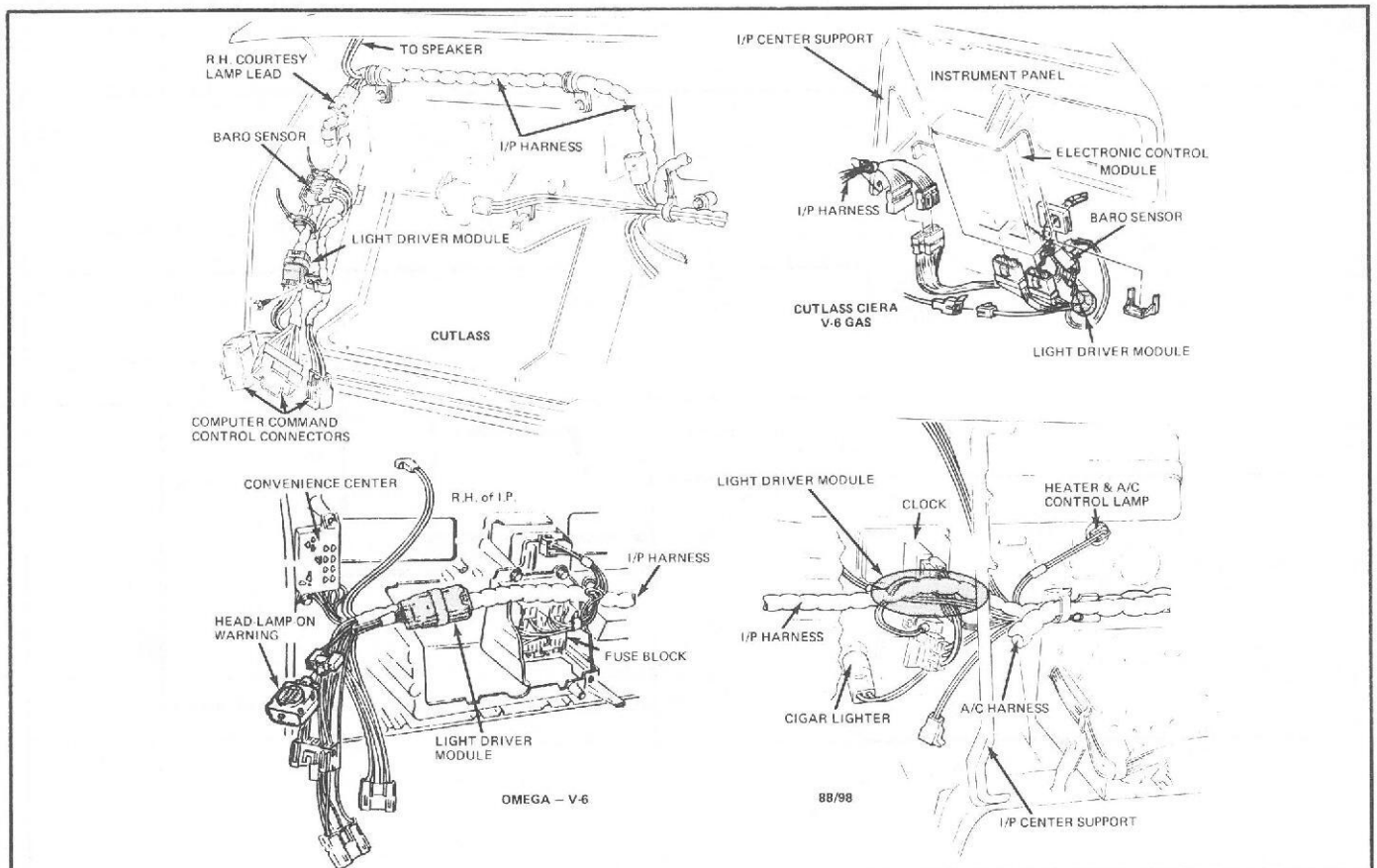


Fig. 8A-1—Light Driver Module - All Series

COMPUTER COMMAND CONTROL (IGNITION)

On all Computer Command Control systems with Electronic Spark Timing (EST) Distributor, the Distributor Reference Pulse Input Wire and the Distributor Ground Wire are twisted together and shielded. This shielding prevents these wires from picking up signals from outside sources, such as spark plug wires, and causing erratic timing. The shielding covers the PPL/WHT wire and the BLK/RED wire from approximately where the ECM harness joins the I/P harness to 1" to 2" from the EST 4-way connector. Note this change on the following pages of the Electrical Troubleshooting Manual and the Omega and Cutlass Ciera Service Manual in section 8A.

<u>SERIES</u>	<u>MANUAL</u>	<u>PAGES</u>
Cutlass	ETM	18
88/98	ETM	219 & 234
Tornado	ETM	422 & 435
Cutlass Ciera	Omega/Cutlass Ciera	8A-116
Omega	Omega/Cutlass Ciera	8A-318

Figure 8A-2 shows how the manuals should be marked to reflect this change.

COMPUTER COMMAND CONTROL V-6 VIN 4

The Engine Identification, located in the yellow box at the top of page 236 of the Electrical Troubleshooting Manual (ETM), is incorrect for the information contained on that page. The information on that page is for V6 VIN 4 engine instead of V6 VIN A engine. Note this change in your manual.

**COMPUTER COMMAND CONTROL – V6
(ENGINE DATA SENSORS, EMISSION CONTROLS)**

On page 22 in the Electrical Troubleshooting Manual (ETM), 2 wires have been omitted. The gray (gry) wire that extends from cavity B on the Exhaust Gas Recirculation (EGR) solenoid to cavity D on the EGR cut-out relay is missing. The other missing Gray (gry) wire extends from cavity D on the EGR cut-out relay to cavity T on the ECM. Figure 8A-3 shows the correct wire routing for the EGR solenoid. Note this correction in your manual.

Cutlass and 88 models with V-6 VIN A engines, use an EGR cut-out relay to control the EGR solenoid during certain driving conditions. The Electrical Troubleshooting Manual (ETM) shows this relay on the following pages:

Cutlass	pages 22 & 23
88	pages 222 & 223

Figure 8A-4 shows the location of the EGR cut-out relay and should be used to supplement the information already in the manual.

**COMPUTER COMMAND CONTROL V-6 VIN 4
(ENGINE DATA SENSORS, EMISSION CONTROLS)**

Two of the cavities in the Electronic Control Module (ECM) are not labeled on page 236 of the Electrical Troubleshooting Manual (ETM). The coolant temperature sensor return is cavity 7 in the ECM and the Manifold Absolute Pressure Input is cavity 20. Note this information in your manual.

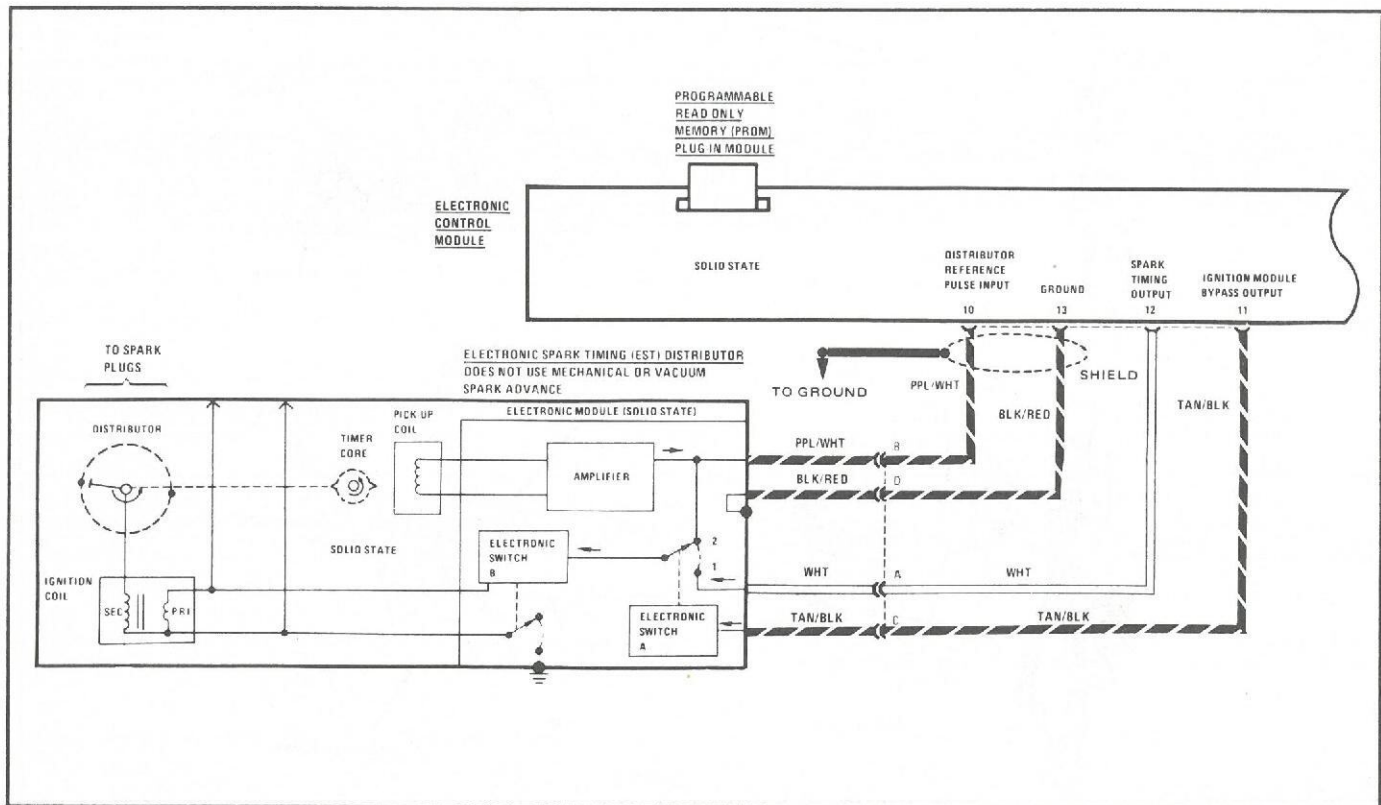


Fig. 8A-2—EST Distributor Wiring

**COMPUTER COMMAND CONTROL – V6
(ENGINE DATA SENSORS, EMISSION CONTROLS)**

The location of the Barometric Pressure (BARO) Sensor as described in component location charts in the Electrical Troubleshooting Manual (ETM) is incorrect. Figure 8A-5 shows the correct location of the BARO sensor on Cutlass, 88/98 and Toronado. Note these corrections in the component location chart on the following pages of the ETM:

Cutlass	page 23
88/98	pages 223 & 237
Toronado	page 439

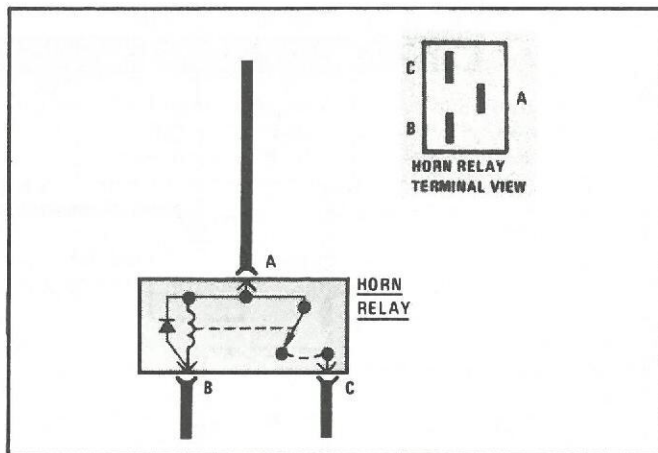


Fig. 8A-6—Horn Relay

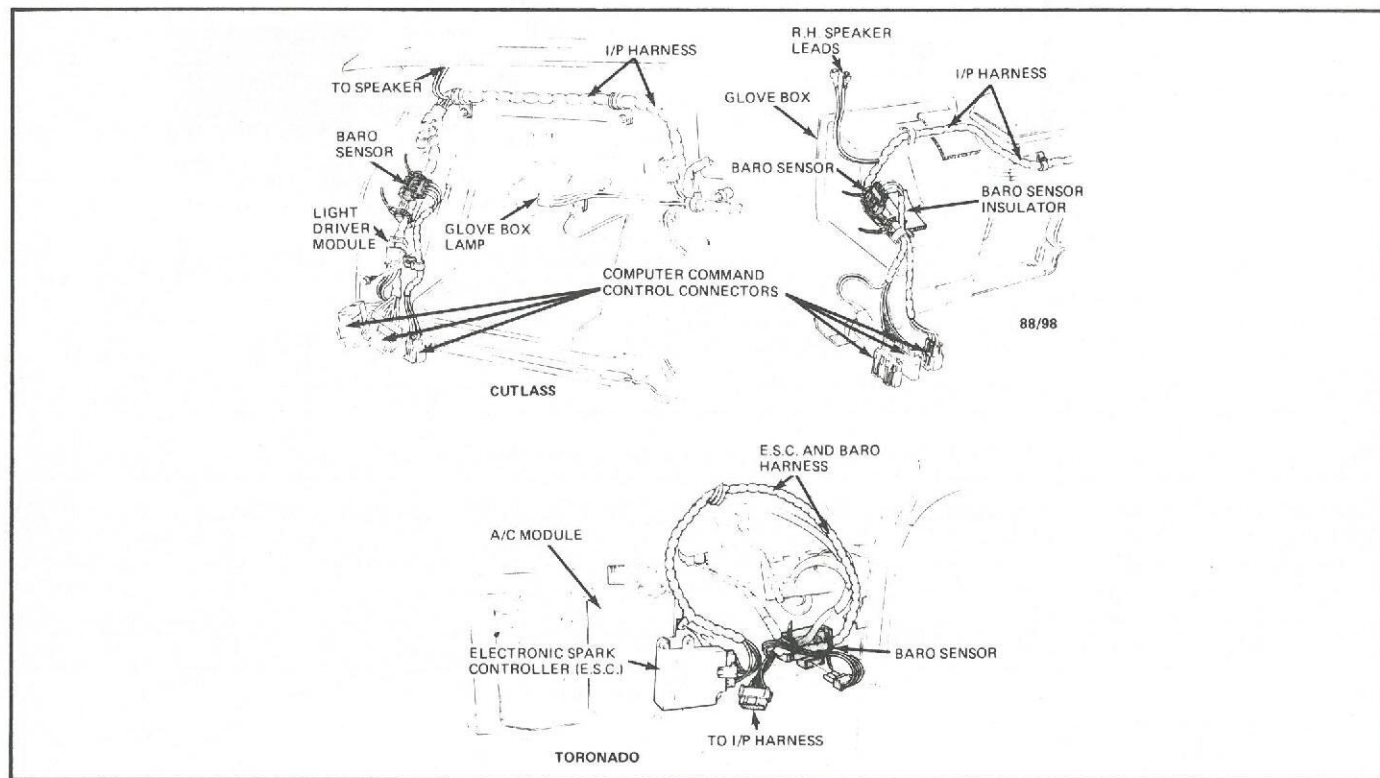


Fig. 8A-5—Baro Sensor Location

HORN

A new horn relay is being used on Cutlass, 88, 98 and Toronado. A diode has been added to the relay, as shown in Figure 8A-6, to prevent chime warning operation with horn application. This change should be noted on the following pages of the Electrical Troubleshooting Manual (ETM):

Cutlass	page 81
88/98	page 301
Toronado	page 501

This diode may affect the troubleshooting of the horn circuit. Refer to page xii in the ETM for explanation.

A/C TEMPERATURE CUT-OUT RELAY

Cutlass, 88, 98 and Toronado equipped with V-8 diesel engines have an A/C Temperature cut-out relay which prevents A/C compressor operation when engine begins to overheat (coolant temperature reaches 258 degrees). This is a new system for 1982 and more information about it may be found in the Electrical Troubleshooting Manual (ETM) on the following pages:

Cutlass	pages 104 - 109
88/98	pages 350 - 352
Toronado	pages 533 - 538

Figure 8A-7 shows the exact location of the relay for each model. Reference this figure whenever troubleshooting A/C compressor clutch conditions.

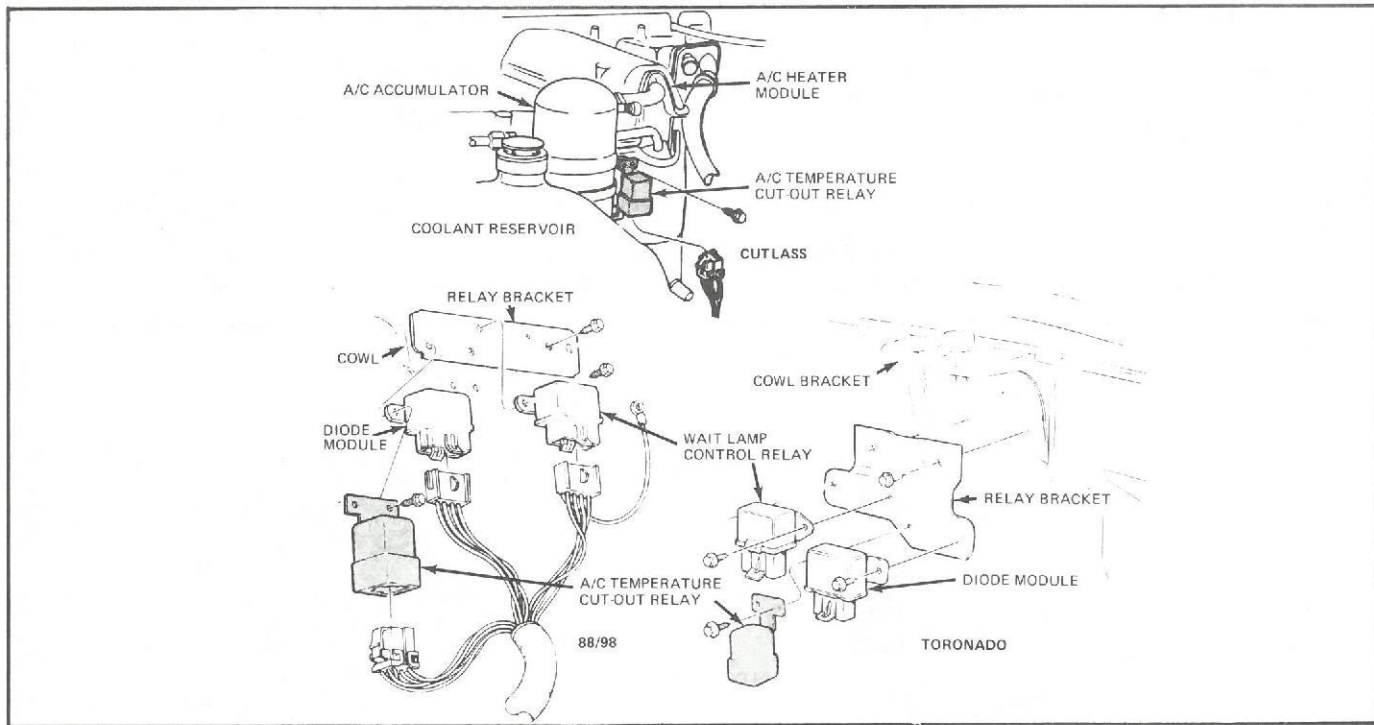


Fig. 8A-7—A/C Temperature Cut-Out Relay

BOOSTER LOW VACUUM SWITCH

Figure 1 on page 115 of the Electrical Troubleshooting Manual (ETM) shows the incorrect location of the Booster Low Vacuum Switch. Figure 8A-8 shows the correct location of the switch on Cutlass models.

In the component location charts on pages 343 for 88/98 and 545 for Toronado, the Booster Low Vacuum

Switch is missing. Figure 8A-8 shows the switch location for these models.

Page 8A-338 of the Omega/Cutlass Ciera Service Manual shows the Booster Low Vacuum Switch. Figure 8A-8 will supplement this information by showing the exact location of the switch on the car.

Note these corrections in your manuals.

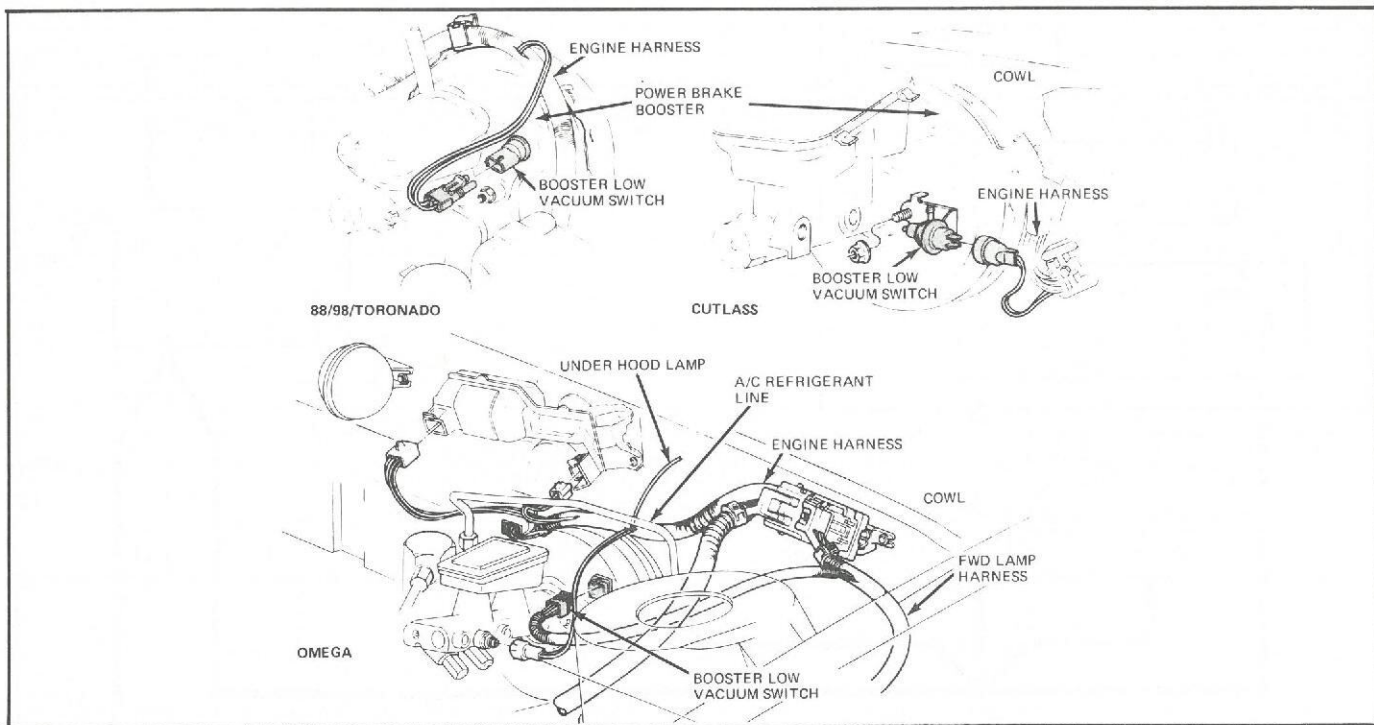


Fig. 8A-8—Booster Low Vacuum Switch

LOW BRAKE VACUUM RELAY

The Low Brake Vacuum Relay (called the Low Brake Vacuum Delay Unit on Toronado) is located on pages 342 and 343 for 88/98 and pages 544 and 545 for Toronado in the Electrical Troubleshooting Manual (ETM). The component location charts on those pages have no Page-Figure references for the relay. Figure 8A-9 shows the location of the relay and should be used when attempting to locate the relay. In addition, page 342 of the ETM shows that the Low Brake Vacuum Warning System is used on

88/98 with V-8 gasoline engines, as indicated by the yellow shaded area on that page. This should be revised to read V-6 and V-8 gasoline engines with 4-speed transmission.

GLOW PLUGS/FUEL CONTROL

A portion of the yellow wire that completes the circuit from the Glow Plug Relay to the Wait Lamp Control Relay on pages 248 and 249 of the Electrical Troubleshooting Manual (ETM) is missing. Figure 8A-10 shows the completed circuit. Note this correction in your manual.

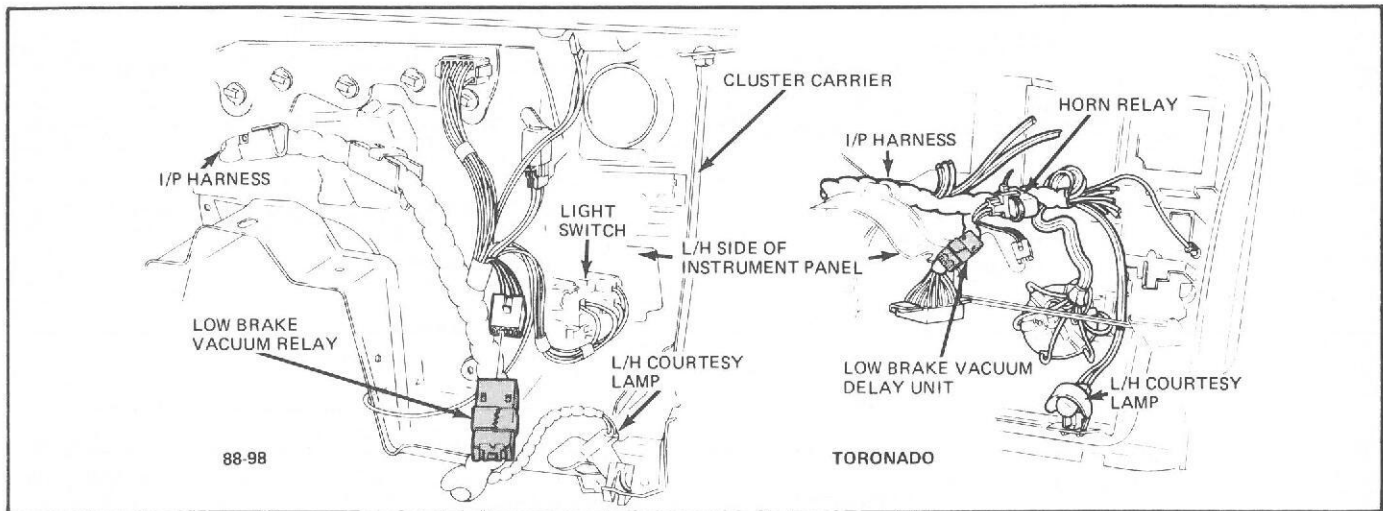


Fig. 8A-9—Low Brake Vacuum Relay

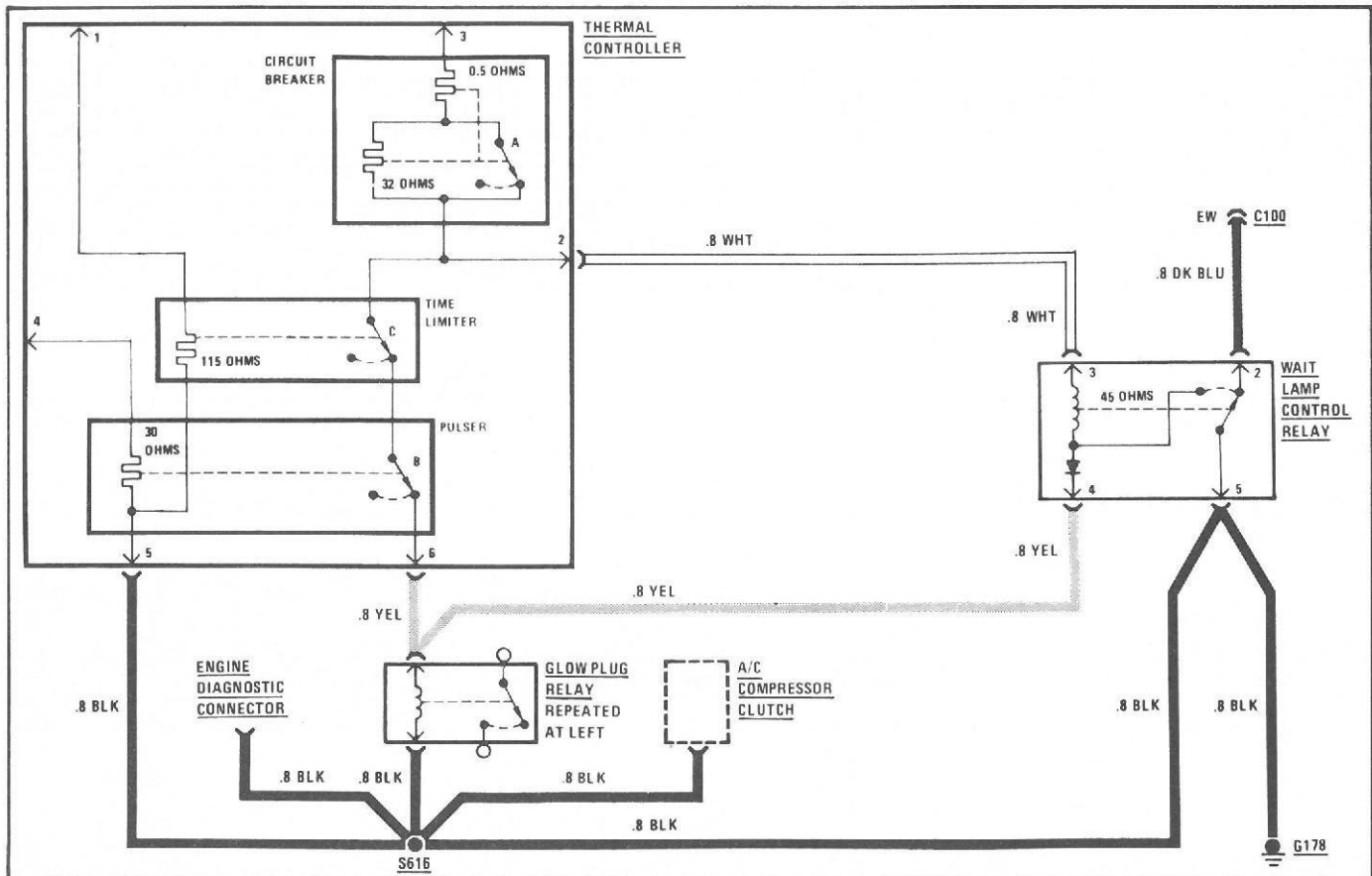


Fig. 8A-10—Glow Plugs/Fuel Control

AIR CONDITIONING (COMPRESSOR)

The Air Conditioning Compressor Clutch Diode located on page 351 of the Electrical Troubleshooting Manual is shown incorrectly. The diode should be shown like the ones on page 350, which are correct. Mark your ETM to reflect this change.

INSTRUMENT PANEL (GAGES)

The fuel gage sender wiring for the Custom Cruiser with a diesel engine has been omitted from page 364 of the Electrical Troubleshooting Manual (ETM). The fuel gage circuit will be slightly different for the wagon than what is shown on that page. A 1mm tan wire will replace the 1mm pink wire used from connector C209 to connector C214 in the circuit from the fuel gage to the fuel tank unit. Note this information in your ETM.

FUEL GAGE DIAGNOSIS

When diagnosing fuel gage conditions, refer to the Fuel Gage Diagnosis chart located on page 8A1-3 of the Chassis Service Manual for Cutlass, 88, 98 and Toronado or page 8A-397 for Omega and Cutlass Ciera. It will be necessary to note this on the following pages:

<u>SERIES</u>	<u>MANUAL</u>	<u>PAGES</u>
Cutlass	ETM	114 & 115
88/98	ETM	364 & 365
Toronado	ETM	486, 487, 490, 491
Cutlass Ciera	Omega/Cutlass Ciera	8A-158 & 8A-159
Omega	Omega/Cutlass Ciera	8A-330 thru 8A-335

It should also be noted that the fuel gage sender wiring for the Custom Cruiser with a diesel engine has been omitted from page 364 of the ETM. The Fuel Gage circuit will be slightly different for the wagon than what is shown on that page. A 1mm tan wire will replace the 1mm pink wire used from connector C209 to connector C214. Note these corrections in your manuals.

ELECTROLUMINESCENT SAIL PANEL LAMPS

The Electroluminescent Lamp system is standard on the 98 Regency Brougham sedan models. These lamps are located on the center pillar ("B" Pillar) between the front and rear doors. The lamps operate anytime the headlamp switch is in the "park" or "head" position. Circuit operation description, circuit diagrams and diagnostic charts for the system can be found in the 1982 Body Manual.

Electroluminescent Lamp operation is described in the Body Manual, on page 10-72, however, the following changes must first be made.

Change the heading in the left column FROM:

ELECTROLUMINESCENT SAIL PANEL LAMPS
Except Buick C and E and Oldsmobile C Styles

TO:

ELECTROLUMINESCENT SAIL PANEL LAMPS
Buick C and E and Oldsmobile C Styles

Change the heading in the right column FROM:

ELECTROLUMINESCENT SAIL PANEL LAMPS
Buick C and E and Oldsmobile C Styles

TO:

ELECTROLUMINESCENT SAIL PANEL LAMPS
Except Buick C and E and Oldsmobile C Styles

The circuit diagram and diagnostic charts for the Oldsmobile system can be found on pages 10-74 through 10-10-77. Note these items in your Body Manual.

AUTOMATIC DOOR LOCKING SYSTEM

The automatic door locking system (option AU4), available on 98 and Toronado models is a new option for 1982. This system is different from the power door lock system (option AU3), in that the automatic door locking system locks all doors when the transmission selector lever is moved to the 'drive' position. When the selector lever is moved to the 'park' position, all doors will unlock. This system will NOT operate unless all doors are closed; courtesy lamps are off; and the ignition switch is in the 'on' position.

All information necessary to troubleshoot this system is contained in the 1982 Body Manual. Description of operation for the system is located on page 10-86. Diagnostic information can be found on page 10-107. Those diagnostic charts located on pages 10-107 through 10-114 should be used for diagnosing the Oldsmobile automatic door locking system.

WARNING SYSTEMS

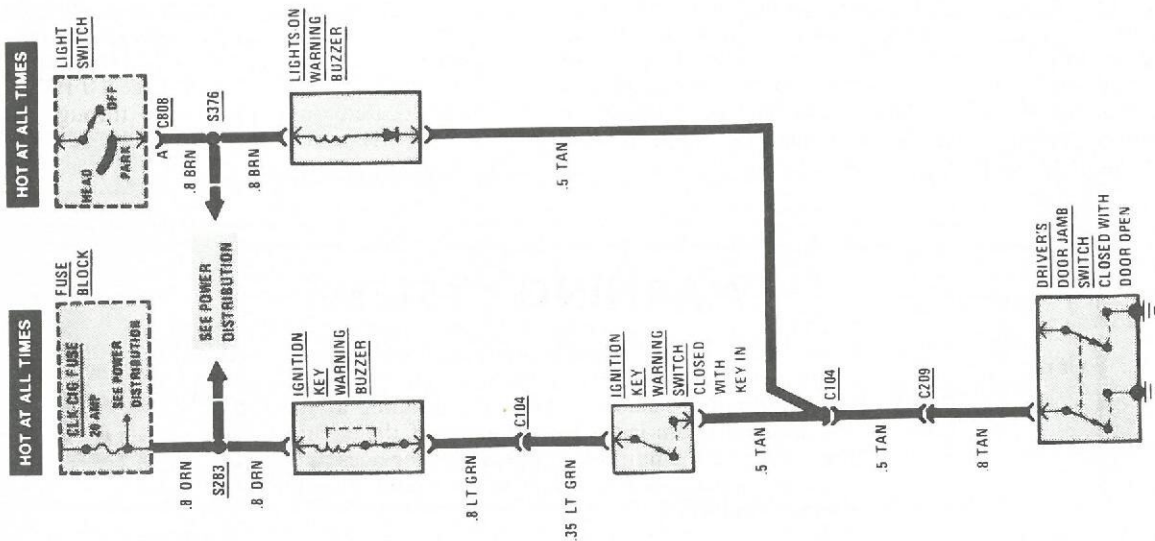
The Electrical Troubleshooting information on the following pages replaces information found in the Electrical Troubleshooting Manual (ETM). The heading at the top of the circuit diagram indicates the name of the circuit, the car line usage and the number of the page it replaces in the ETM. Use this updated information when troubleshooting these affected circuits.

Page-Figure

COMPONENT LOCATION

Driver's Door Jamb Switch	In driver's door jamb
Ignition Key Warning Buzzer	On LH side of fuse block
Ignition Key Warning Switch	In upper portion of steering column, above lock
Lights-on Warning Buzzer	Above fuse block 374-1
C104 (11 cavities)	Attached to RH side of steering column 272-1
C209 (11 cavities)	Connected to fuse block 271-1
S283	L/P harness, near clock 262-3
S376	L/P harness, near headlight switch

EIGHTY-EIGHT ONLY



CIRCUIT OPERATION

Ignition Key Warning

Voltage is applied to the fuse at all times. Whenever the key is in the IGNITION SWITCH and the driver's door is open, current flows through the fuse, the IGNITION KEY WARNING BUZZER, the IGNITION KEY WARNING SWITCH, and the DRIVER'S DOOR JAMB SWITCH (to ground), sounding the IGNITION KEY WARNING BUZZER.

Lights-On Warning

With the LIGHT SWITCH in Park or Head and the DRIVER'S DOOR JAMB SWITCH closed (door open), current flows through the LIGHT SWITCH, LIGHTS-ON WARNING BUZZER, and door switch to ground, sounding the buzzer.

connector. If IGNITION KEY WARNING BUZZER sounds, make a continuity check of DRIVER'S DOOR JAMB SWITCH.
 — Check continuity through IGNITION KEY WARNING SWITCH.
 — Check buzzer and related wiring.

Lights-On Warning

If buzzer doesn't sound:

- Check for voltage at connector to LIGHTS-ON WARNING BUZZER (BRN wire).
- With LIGHTS-ON WARNING BUZZER removed and driver's door open, check for ground at terminal connected to TAN wire.
- Check continuity through buzzer and related wiring.

TROUBLESHOOTING HINTS

Ignition Key Warning

If buzzer doesn't sound:

- Check FUSE by operating CIGAR LIGHTER or checking clock operation.
- Check for voltage in the TAN wire by grounding the TAN wire at the DRIVER'S DOOR JAMB SWITCH

COMPONENT LOCATION	Page-Figure
Fuse Block	205-1
Seatbelt Switch	In driver's seatbelt assembly
Seatbelt Timer-Buzzer	Attached to LH side of fuse block
C209 (11 cavities)	Attached to RH side of fuse block
C369 (1 cavity)	LH shroud, near fuse block
C370 (2 cavities)	Under driver's seat
G110	Behind I/P, to left of steering column
G196	LH side of transmission hump, under driver's seat
S220	I/P harness, near light switch
S287	I/P harness, near light switch

CIRCUIT OPERATION

With the IGNITION SWITCH in "Run," "Bulb Test" or "Start," voltage is applied through GAGES FUSE to the SEATBELT TIMER-BUZZER and is available to power the timer, "FASTEN BELTS" INDICATOR and the buzzer.

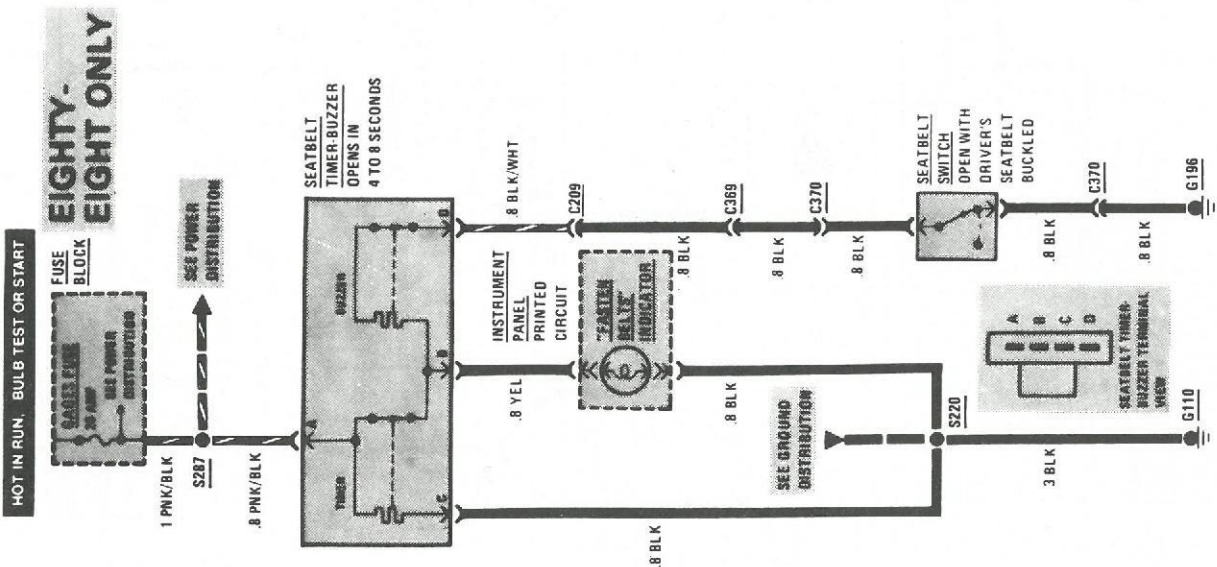
Current flows through the timer heating element to ground. Current also flows through the timer contacts to "FASTEN BELTS" INDICATOR to ground. This lights the "FASTEN BELTS" INDICATOR. With the driver's seatbelt not buckled, current flows through the timer contacts, buzzer and SEATBELT SWITCH to ground, sounding the buzzer.

After 4 to 8 seconds of timer operation, the time contacts open. The current path to the "FASTEN BELTS" INDICATOR and the SEATBELT SWITCH is cut off.

TROUBLESHOOTING HINTS

If neither buzzer nor indicator work:

- Check GAGES FUSE by looking at FUEL GAGE for operation.



If buzzer sounds and indicator never comes on:

- Check G110 by operating windshield wipers.

If indicator works, but buzzer doesn't stop when seatbelt is buckled:

- Check SEATBELT SWITCH.

If indicator works, but buzzer doesn't sound:

- Check that SEATBELT SWITCH ground is clean and tight.
- Check continuity through SEATBELT SWITCH with seatbelt unbuckled.
- Check SEATBELT TIMER-BUZZER.

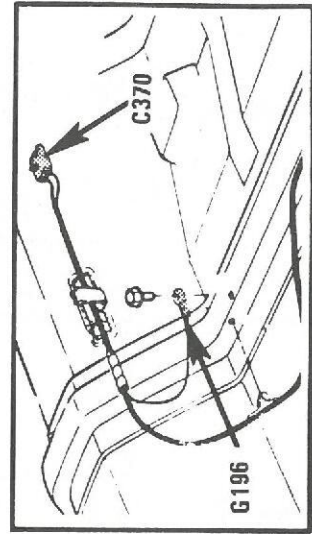


Figure 1 - Under Driver's Seat

CIRCUIT OPERATION

The Reminder Package contains a TONE GENERATOR with warning and reminder indicators. The TONE GENERATOR is powered through the CLK-CIG FUSE and GAGES FUSE.

With the IGNITION SWITCH in "Run," "Bulb Test," or "Start," voltage is applied through the GAGES FUSE to the SEATBELT WARNING MODULE and in parallel through "TEMP," "CHARGE," "LOW COOLANT," and "LOW FUEL" INDICATORS to the TONE GENERATOR.

When the coolant level is below the LOW COOLANT PROBE, current flows through the LOW COOLANT INDICATOR and a fast pulsed tone is sounded.

With the IGNITION SWITCH in "Run," "Bulb Test," or "Start," voltage is applied through the GAGES FUSE and the "TEMP" INDICATOR to the "TEMP" INDICATOR SWITCH. When the switch closes, current flows through the switch to ground. The indicator goes on and the generator produces a fast pulsed tone.

When the FUEL GAGE SENDER indicates low fuel supply by low resistance, the tone generator sounds a steady tone and the LOW FUEL INDICATOR goes on.

With the IGNITION SWITCH in "Run" before engine starting, current flows through the GAGES FUSE, the "CHARGE" INDICATOR, the TONE GENERATOR and grounds in the GENERATOR. The indicator goes on. Current flow is the same in the case of a charging system malfunction, but a fast pulsed tone is also sounded, when the system voltage drops below 7 - 9 volts.

COMPONENT LOCATION

Diode Module	Top center of engine cowl	Page-Figure
Fuel Tank Unit	Top of fuel tank	259-1
Key Switch	Part of ignition switch	286-3
LH Front Door Jamb Switch	In LH front door jamb	272-1
Low Coolant Probe	Rear RH side of radiator	
Seatbelt Switch	Part of driver's seatbelt	
Seatbelt Warning Module	Above fuse block, taped to harness	374-3
Sentinel Amplifier	On I/P support, left of radio	255-3
"TEMP" Indicator Switch	Rear LH top of engine	
Tone Generator	Under LH side of I/P, near fuse block	259-2
C100 (40 cavities)	LH side of engine cowl	286-2
C104 (11 cavities)	Attached to RH side of steering column	272-1
C209 (11 cavities)	Connected to fuse block	271-1
C214 (6 cavities)	In trunk, attached to LH rear fuse block	280-2
C322 (6 cavities)	Behind LH side of I/P	283-1
C369 (1 cavity)	Upper LH cowl, near fuse block	
C370 (2 cavities)	At seatbelt switch	292-1
C537 (3 cavities)	Behind LH side of I/P, above light switch	255-3
C596 (1 cavity)	RH engine cowl, near grommet	
G110	Behind I/P, to left of steering column	300-1
G196	LH side of transmission hump	292-1
G240	Front LH side of fuel tank, at mounting bracket	286-3
S220	I/P harness, near light switch	300-1
S283	I/P harness, near clock	262-3
S287	I/P harness, upper right of steering column	
S427	I/P harness, near light switch	300-1
S657	Theft reminder harness, behind LH I/P	

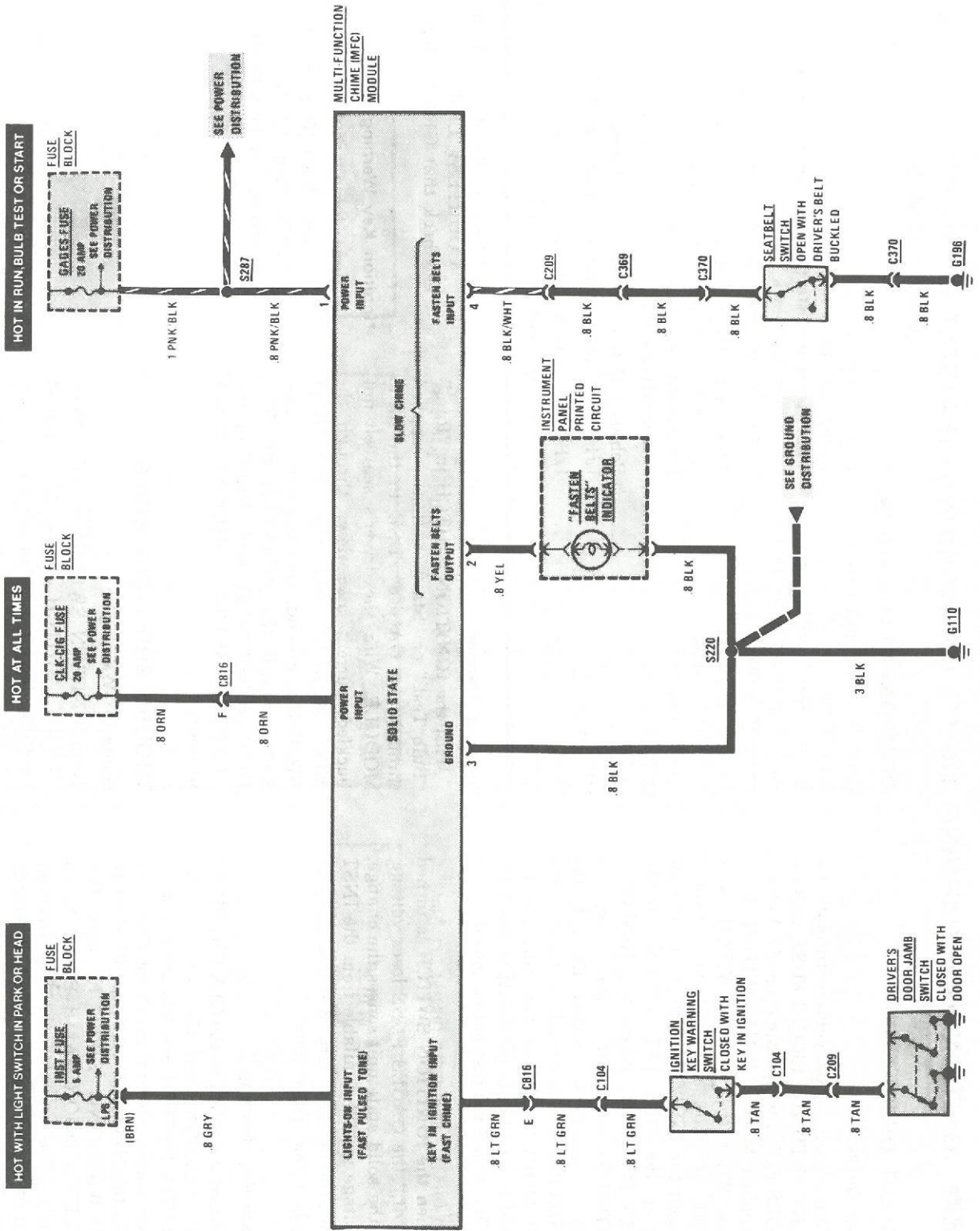
When the SEATBELT SWITCH closes, ground is provided for Pin 4 of the SEATBELT WARNING MODULE. This operates the module for 4 to 8 seconds, which sounds a chime and provides voltage to light the "FASTEN BELTS" INDICATOR.

Voltage is applied at all times through the TAIL FUSE to the LIGHT SWITCH.

With the LIGHT SWITCH pulled to "Head" or "Park" and the LH FRONT DOOR JAMB SWITCH closed, the LIGHTS ON INDICATOR goes on and a fast pulsed tone is produced.

With both the LH FRONT DOOR JAMB SWITCH and KEY SWITCH closed, the TONE GENERATOR produces a steady tone.

372 88/98 IGNITION KEY WARNING/LIGHTS-ON WARNING/SEATBELT WARNING (WITH CHIME)



CIRCUIT OPERATION

Lights-On Warning

This circuit needs voltage through the LIGHT SWITCH, CLK-CIG FUSE, and the GAGES FUSE to operate properly. Voltage is applied to the LIGHT SWITCH at all times. When the LIGHT SWITCH is in "Head" or "Park," this voltage is applied through the INST FUSE to the solid state unit in the MULTI-FUNCTION CHIME (MFC) MODULE. When the IGNITION SWITCH is in "Start," "Bulb Test," or "Run," voltage is applied through the GAGES FUSE to the solid state unit in the MFC MODULE. These two voltages are sensed by the lights on circuit in the MFC MODULE and the fast pulsed tone does not sound.

When the IGNITION SWITCH is turned to "Off," the GAGES FUSE loses voltage, and the solid state unit senses the change. If voltage is still available from the INST FUSE, the lights-on circuit senses this and sounds a fast pulse tone.

Ignition Key Warning

Voltage is applied to the CLK-CIG FUSE at all times. Whenever the key is in the IGNITION SWITCH and the driver's door is open, current flows through the CLK-CIG FUSE, the MFC MODULE, the IGNITION KEY WARNING SWITCH, and the DRIVER'S DOOR JAMB SWITCH (to ground). This operates the key warning circuit in the MFC MODULE which sounds a fast chime.

COMPONENT LOCATION

Driver's Door Jamb Switch	In driver's door jamb	205-1
Fuse Block	Under L.H side of I/P	287-1
Ignition Key Warning Switch	Upper portion of steering column, above lock	
Multi-Function Chime Switch	LH side of fuse block	374-2
Seatbelt Switch	Part of driver's seatbelt assembly	
C104 (11 cavities)	Attached to RH side of steering column	272-1
C209 (11 cavities)	Attached to LH side of fuse block	271-1
C369 (1 cavity)	LH shroud, near fuse block	
C370 (2 cavities)	Under driver's seat	292-1
G110	Behind I/P, to left of steering column	300-1
G196	LH side of trans. hump, under drivers seat	292-1
S220	I/P harness, near light switch	300-1
S287	I/P harness, near light switch	255-3

Seatbelt Warning

With the IGNITION SWITCH in "Run," "Bulb Test," or "Start," voltage is applied through the GAGES FUSE to the MFC MODULE. With the driver's seatbelt not buckled, current also flows through the MFC MODULE and the SEATBELT SWITCH to ground, sounding a slow chime, and through the "FASTEN BELTS" INDICATOR to ground, lighting the "FASTEN BELTS" INDICATOR (4-8 seconds).

TROUBLESHOOTING HINTS

Lights-On Warning

Turn IGNITION SWITCH to "Off." Turn LIGHT SWITCH knob to brightest setting. If chime doesn't sound:
 — Check INST FUSE by looking at instrument lighting.

Ignition Key Warning

If chime doesn't sound:

- Check CLK-CIG FUSE by operating COURTESY LIGHTS.
- Check that G110 is clean and tight.
- Check CLK-CIG FUSE by operating COURTESY LIGHTS and GAGES FUSE by checking to see if the gages are working.

- Check CLK-CIG FUSE by operating COURTESY LIGHTS.
- Check that G110 is clean and tight.

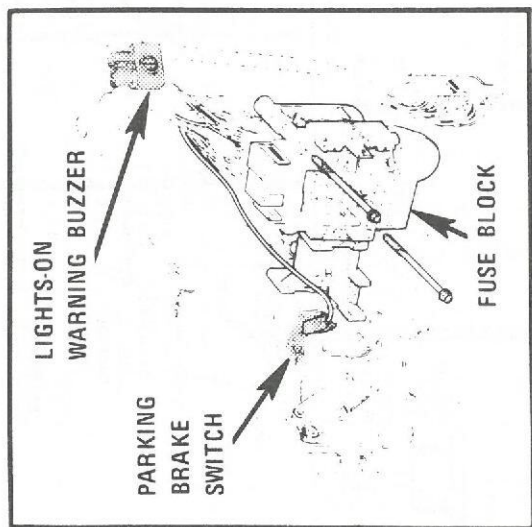


Figure 1 - Park Brake Bracket (88 Only)

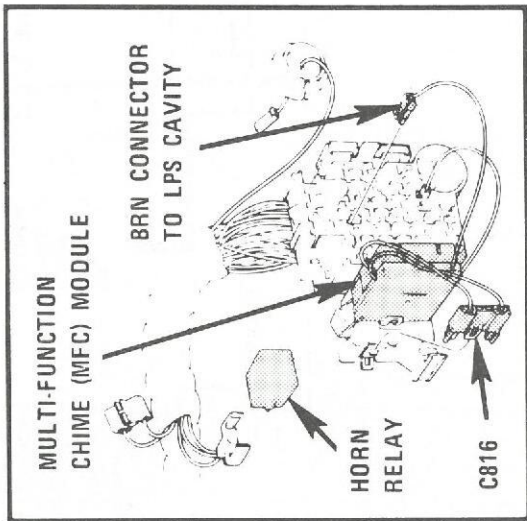


Figure 2 - Fuse Block Area (Without Reminder; 88/98)

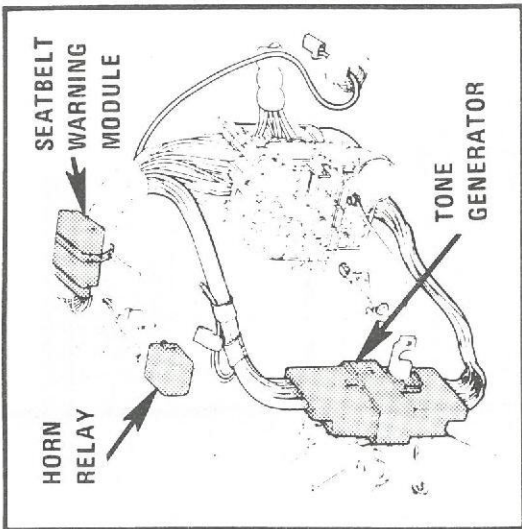


Figure 3 - Fuse Block Area (With Reminder; 88/98)

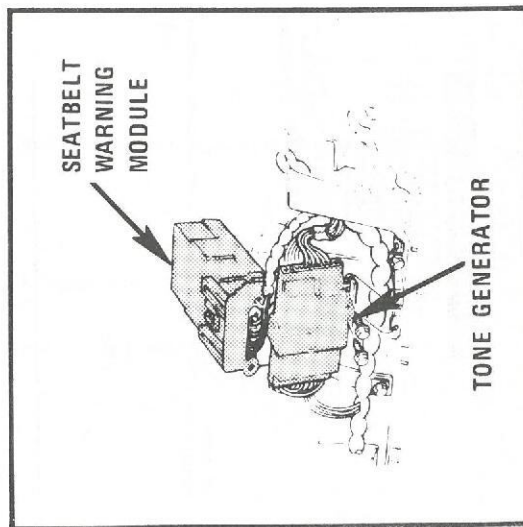


Figure 4 - Behind I/P At Radio Support (Toronto)

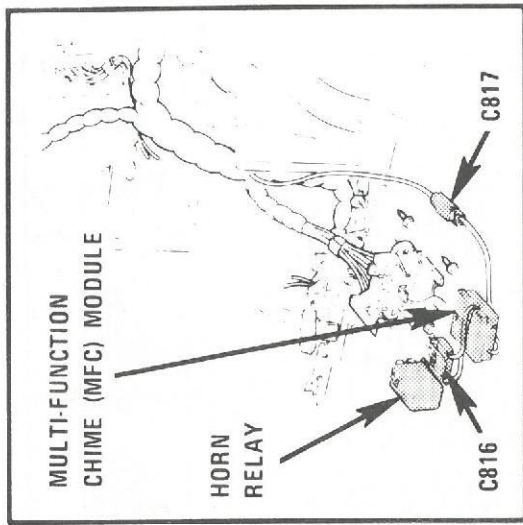


Figure 5 - I/P Convenience Center (Toronto)

CIRCUIT OPERATION

With the IGNITION SWITCH in "Bulb Test" or "Start," current flows through the GAGES FUSE, the indicators (except LIGHTS ON and "FASTEN SEATBELTS" INDICATORS), and the TONE GENERATOR to ground. The indicators go on as a test.

With the IGNITION SWITCH in "Run," "Bulb Test," or "Start," voltage is applied through the GAGES FUSE to the SEATBELT WARNING MODULE and in parallel through the LOW COOLANT, LOW FUEL and GEN indicators to the TONE GENERATOR.

When the coolant level is below the LOW COOLANT PROBE, current flows through the LOW COOLANT INDICATOR and a fast pulsed tone is sounded.

When the FUEL GAGE SENDER indicates low fuel supply, by low resistance, the tone generator sounds a steady tone for about six seconds. The LOW FUEL INDICATOR goes on and remains on.

With the IGNITION SWITCH in "Run" before engine starting, current flows through the GAGES FUSE, the GEN INDICATOR, the TONE GENERATOR, and through the BRN/WHT wire (to ground). The indicator goes on. Current flow is the same in the case of a charging system malfunction, but a fast pulsed tone is also sounded, when the system voltage drops below 7 - 9 volts.

When the SEATBELT SWITCH closes, ground is provided for Pin 4 of the SEATBELT WARNING MODULE. This operates the module for 4 to 8 seconds, which sounds a chime and provides voltage

COMPONENT LOCATION

Diode Module	Top center portion of engine cowl.....	Page-Figure 460-2
Fuel Gage Sender	Top center portion of fuel tank	
Fuse Block	Under LH side of I/P	406-1
Instrument Panel.....	Behind I/P, above steering column	437-1
Key Switch.....	RH side of steering column	
LH Front Door Jamb Switch	In LH front door jamb	480-1
Low Coolant Probe	Rear RH side of radiator	405-6
Seatbelt Switch	Part of driver's seatbelt.....	481-4
Seatbelt Warning Module	Above tone generator.....	374-4
Tone Generator.....	Behind I/P, below generator	495-3
Twilight Sentinel Amplifier ..	Behind I/P, to right of radio	495-3
C100 (40 cavities)	Bulkhead connector, left cowl	460-1
C103 (44 cavities)	Behind I/P, to left of steering column	485-2
C104 (11 cavities)	Attached to RH side of steering column	430-1
C209 (11 cavities)	Attached to LH side of fuse block	406-1
C279 (2 cavities)	LH side of trunk, behind wheel well	475-1
C363 (1 cavity).....	Behind I/P, to right of LH junction block	
C364 (2 cavities)	LH side of transmission hump, near driver's seat	495-2
C759 (6 cavities)	Under center portion of rear fender.....	475-2
G107	Behind I/P, to left of steering column	485-1
G169	In trunk, near LH rear lights.....	475-2
G195	LH floor pan, under driver's seat	495-2
S217	I/P harness, above steering column	485-2
S221	I/P harness, to left of radio	437-1
S298	I/P harness, to left of radio	437-1
S333	Rear lights harness, to right of LH clip	475-2
S496	I/P harness	437-1
S655	I/P harness, near theft controller above fuse block	468-3
S656	Fuel tank harness in back of center portion of rear bumper	
S657	I/P harness, near fuse block	

to light the "FASTEN BELTS" INDICA-TOR. TAIL FUSE to the LIGHT SWITCH. With the LIGHT SWITCH pulled to "Head" or "Park" and the LH FRONT DOOR JAMB

Voltage is applied at all times through the

REMINDER PACKAGE/SEATBELT WARNING TORONADO 495

SWITCH closed, the LIGHTS ON INDICATOR goes on and a fast-pulsed tone is produced.

With both the LH FRONT DOOR JAMB SWITCH and KEY SWITCH closed, the TONE GENERATOR produces a steady tone.

TROUBLESHOOTING HINTS

If no indicators go on during "Bulb Test" or "Start," check GAGES FUSE.

If the LIGHTS ON INDICATOR doesn't work:

- Check TAIL FUSE by operating tail lights.
- Check LH FRONT DOOR JAMB SWITCH by opening door to operate courtesy lights.

If tone generator does not work:

- Check CLK-CIG FUSE.
 - Check that G107 is clean and tight.
- Refer to Chassis Service Manual - Section 9 for diagnosis.

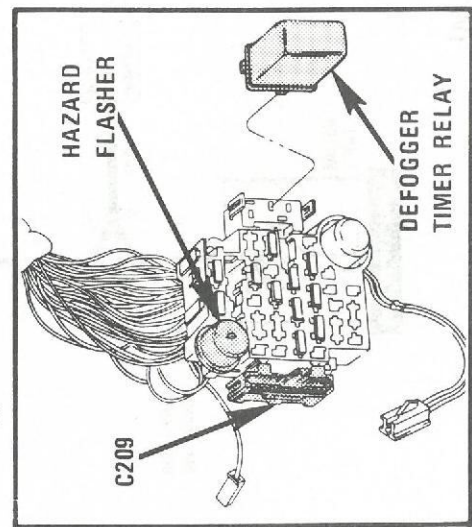


Figure 1 - Fuse Block, Under Left Side Of I/P

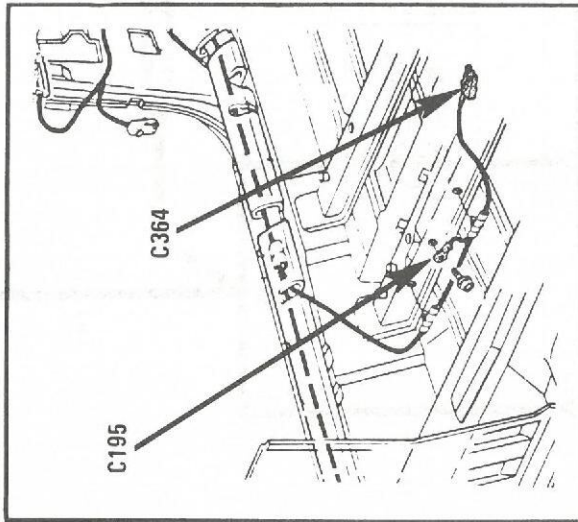


Figure 2 - Under Driver's Seat

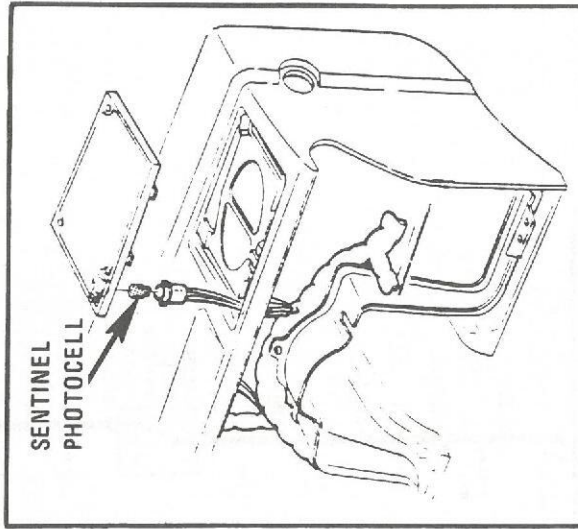


Figure 4 - At LH Speaker Grill

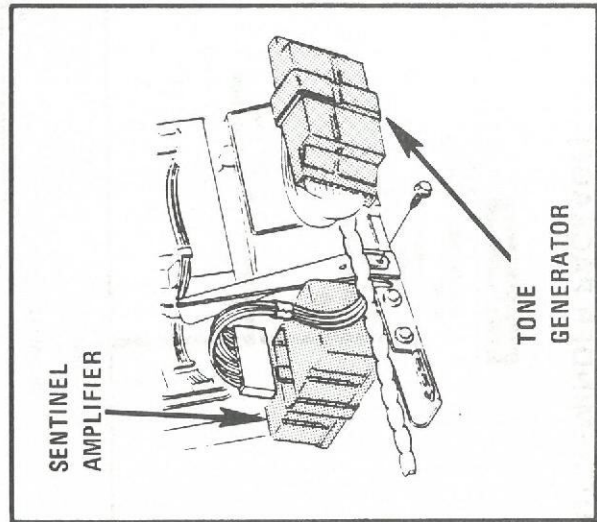


Figure 3 - Behind I/P, At RH Radio Support

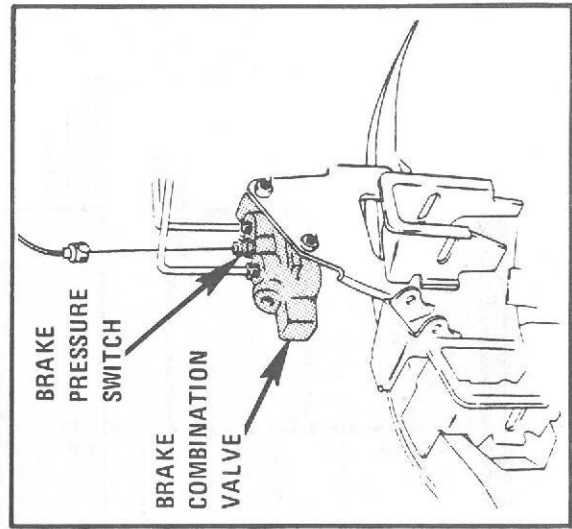


Figure 5 - Under LH Side Of Engine Cowl, At Frame

IGNITION KEY WARNING/LIGHTS-ON WARNING/SEATBELT WARNING (WITH CHIMES)

88/98

373

CIRCUIT OPERATION

Lights-On Warning

This circuit needs voltage through the LIGHT SWITCH, CLK-CIG FUSE, and the GAGES FUSE to operate properly. Voltage is applied to the LIGHT SWITCH at all times. When the LIGHT SWITCH is in "Head" or "Park," this voltage is applied through the INST FUSE to the solid state unit in the MULTI-FUNCTION CHIME (MFC) MODULE. When the IGNITION SWITCH is in "Start," "Bulb Test," or "Run," voltage is applied through the GAGES FUSE to the solid state unit in the MFC MODULE. These two voltages are sensed by the lights on circuit in the MFC MODULE and the fast pulsed tone does not sound.

When the IGNITION SWITCH is turned to "Off," the GAGES FUSE loses voltage, and the solid state unit senses the change. If voltage is still available from the INST FUSE, the lights-on circuit senses this and sounds a fast pulse tone.

Ignition Key Warning

Voltage is applied to the CLK-CIG FUSE at all times. Whenever the key is in the IGNITION SWITCH and the driver's door is open, current flows through the CLK-CIG FUSE, the MFC MODULE, the IGNITION KEY WARNING SWITCH, and the DRIVER'S DOOR JAMB SWITCH (to ground). This operates the key warning circuit in the MFC MODULE which sounds a fast chime.

COMPONENT LOCATION

COMPONENT LOCATION	Page-Figure
Driver's Door Jamb Switch	205-1
Fuse Block	287-1
Ignition Key Warning Switch	
Multi-Function Chime Switch	374-2
Seatbelt Switch	
C104 (11 cavities)	272-1
C209 (11 cavities)	271-1
C369 (1 cavity)	
C370 (2 cavities)	292-1
G110	300-1
G196	292-1
S220	300-1
S287	255-3

In driver's door jamb	
Under LH side of I/P	
Upper portion of steering column, above lock	
LH side of fuse block	
Part of driver's seatbelt assembly	
Attached to RH side of steering column	
Attached to LH side of fuse block	
LH shroud, near fuse block	
Under driver's seat	
Behind I/P, to left of steering column	
LH side of trans. hump, under drivers seat	
I/P harness, near light switch	
I/P harness, near light switch	

Seatbelt Warning

With the IGNITION SWITCH in "Run," "Bulb Test," or "Start," voltage is applied through the GAGES FUSE to the MFC MODULE. With the driver's seatbelt not buckled, current also flows through the MFC MODULE and the SEATBELT SWITCH to ground, sounding a slow chime, and through the "FASTEN BELTS" INDICATOR to ground, lighting the "FASTEN BELTS" INDICATOR (4-8 seconds).

- Check CLK-CIG FUSE by operating COURTESY LIGHTS.
- Check that G110 is clean and tight.

Ignition Key Warning

If chime doesn't sound:

- Check CLK-CIG FUSE by operating COURTESY LIGHTS and GAGES FUSE by checking to see if the gages are working.

TROUBLESHOOTING HINTS

Lights-On Warning

Turn IGNITION SWITCH to "Off." Turn LIGHT SWITCH knob to brightest setting. If chime doesn't sound:

- Check INST FUSE by looking at instrument lighting.

COMPUTER COMMAND CONTROL (VEHICLE SENSORS, TORQUE CONVERTER CLUTCH) – V-6

A change has been made in the Torque Converter Clutch (TCC) circuit on Cutlass Ciera models with the V-6 gasoline engine. Figure 8A-11 shows the new wiring for the TCC Coast Release Relay and should be used in place of the relay circuitry found on page 8A-124 of the Omega/Cutlass Ciera Service Manual.

TORQUE CONVERTER CLUTCH – DIESEL

The power feed to the solid state unit of the Torque Converter Clutch (TCC) Delay Module is missing on page 8A-142 of the Omega/Cutlass Ciera Service Manual. This feed circuit needs to be added from the point where the Lt. Blu wire, circuit 383, connects at the module to the solid state unit as shown in Fig. 8A-12. Note this information in your manual.

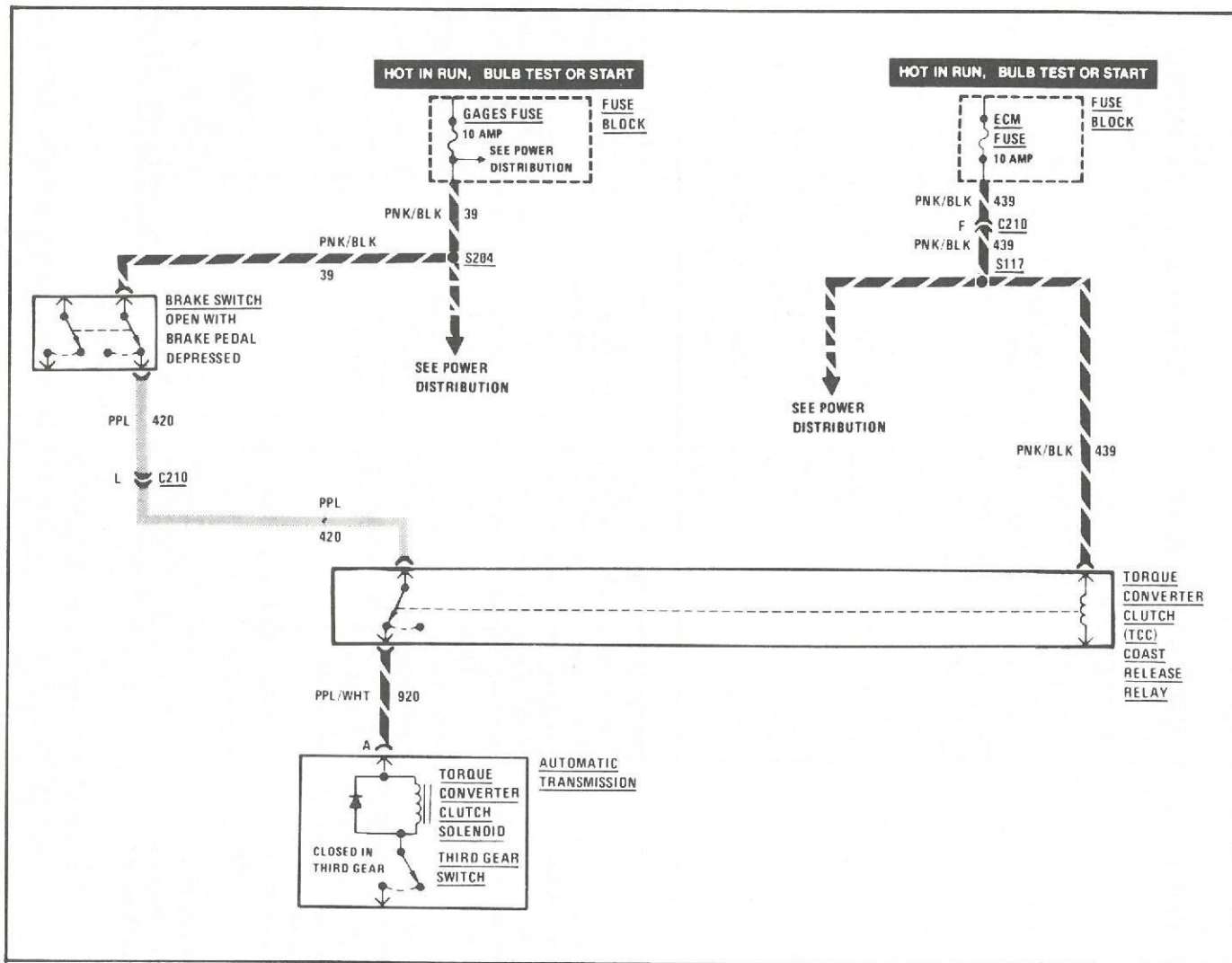


Fig. 8A-11—Computer Command Controls (Vehicle Sensors, TCC) –V6 'A' Car

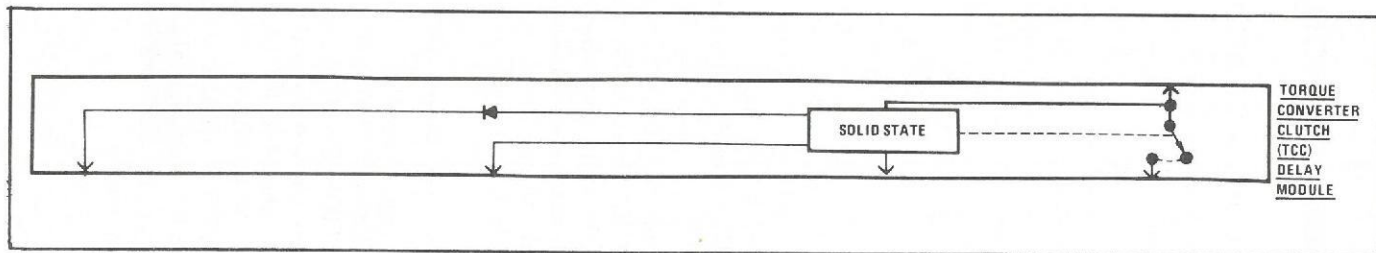


Fig. 8A-12—Torque Converter Clutch - Diesel

INSTRUMENT PANEL CLOCK

Instrument panel mounted clocks are now available as optional equipment (option codes UE8 and U35) on Cutlass Ciera models. Figure 8A-13 is the circuit diagram for the clock circuit. Refer to this diagram when troubleshooting instrument panel mounted clocks only. When troubleshooting digital clocks found in the radio, refer to pages 8A-198 through 8A-200 in the Omega/Cutlass Ciera Service Manual.

POWER ANTENNA

In the power antenna circuit diagram found on page 8A-216 of the Omega/Cutlass Ciera Service Manual, a change has occurred in connector C107 wiring. The PNK wire (circuit 143) leading from the radio to the antenna relay is shown as terminal C in connector C107. This terminal should be changed to B. The BLK wire (circuit 150) leading from the relay to ground G204 is marked terminal B. This terminal should be terminal C. Note these changes in your manual.

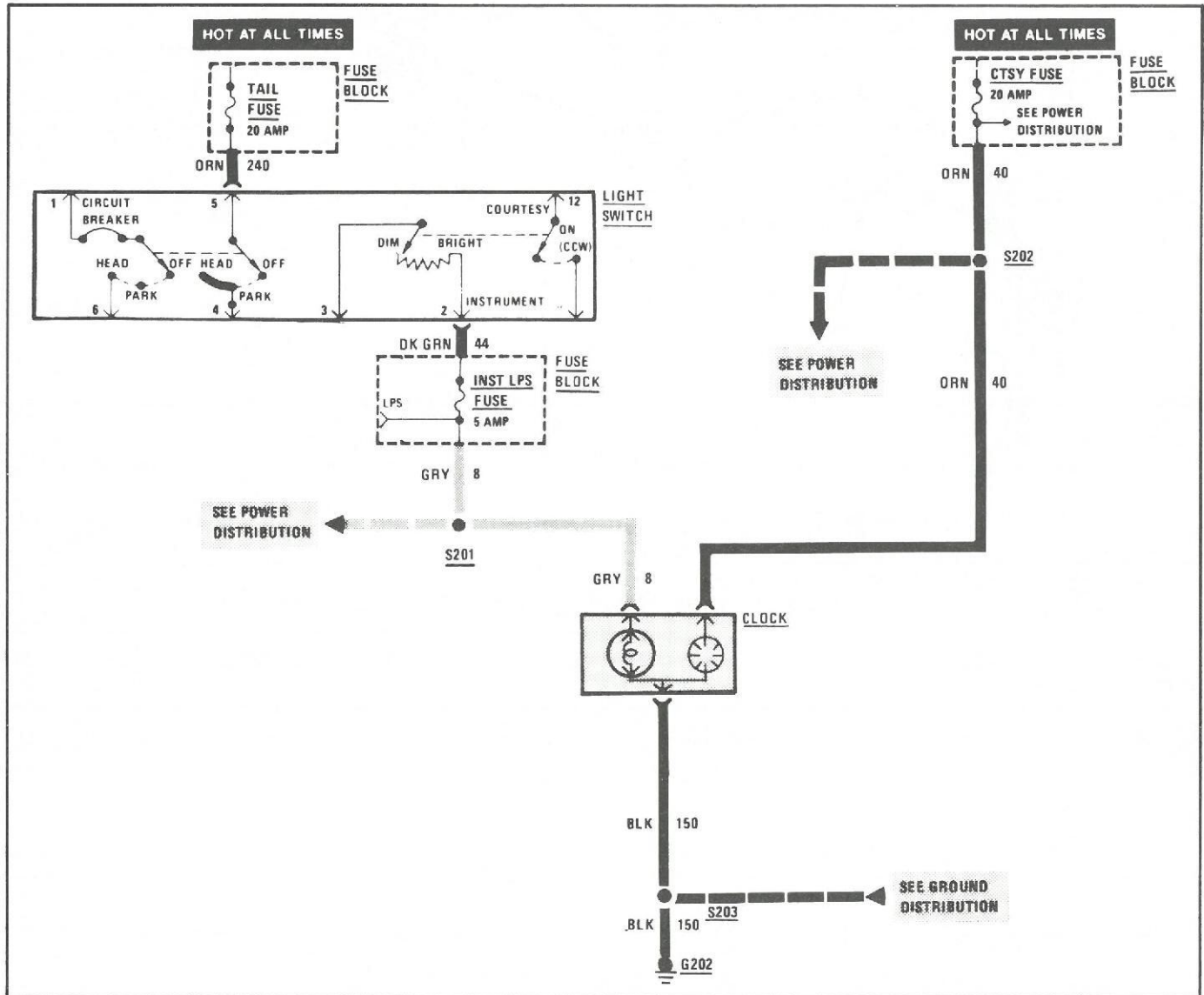


Fig. 8A-13—Cutlass Ciera I/P Clock

AUDIO ALARM SYSTEM (CHIME/BUZZER)

The Lights-on buzzer is standard equipment on Omega models. The circuit diagram located on page 8A-340 of the Omega/Cutlass Ciera Service Manual shows that the Lights-on warning is a function of the Audio Alarm Assembly. This is true for models with chime warning systems only (option TR9). With the base buzzer system, the Lights-on buzzer is a

separate unit from the Audio Alarm Assembly as shown in Figure 8A-14. The wiring of the separate Lights-on buzzer portion of the Audio Alarm System is shown in 8A-15. Lights-on buzzer component location for Cutlass Ciera is also shown in Figure 8A-14.

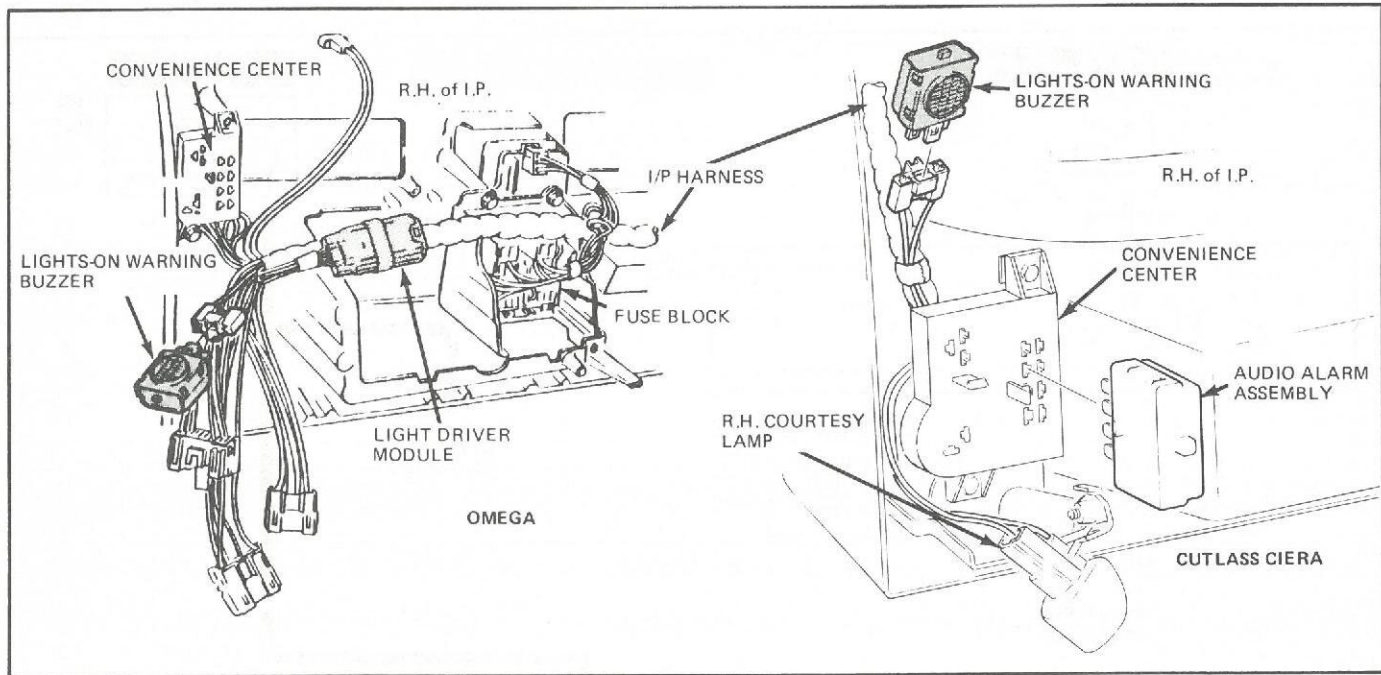


Fig. 8A-14—Audio Alarm System (Chime/Buzzer)

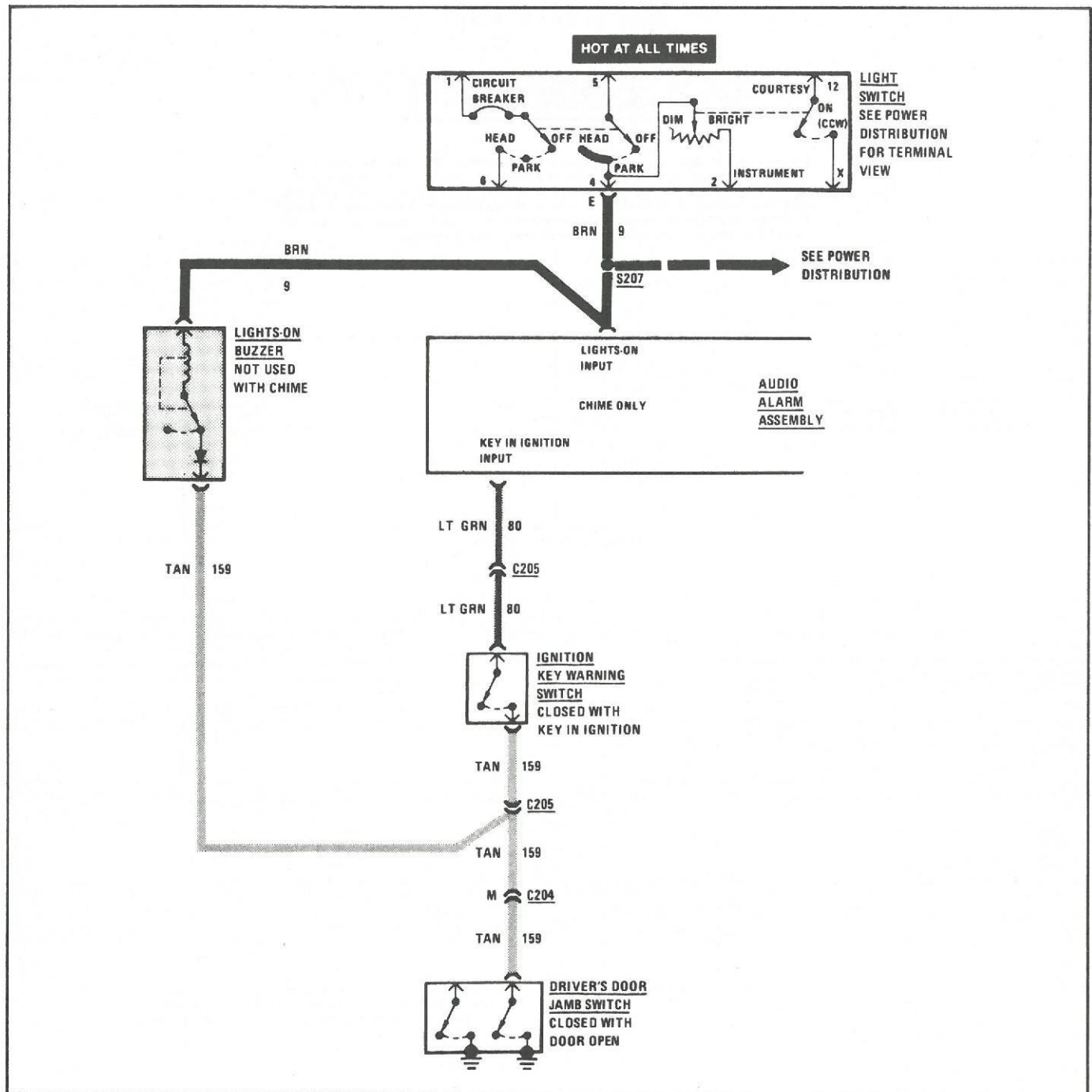


Fig. 8A-15—Audio Alarm System (Chime/Buzzer)

GLOW PLUGS/FUEL CONTROL

A new procedure has been developed for checking glow plug continuity when diagnosing the Diesel Glow Plug System as shown in Figure 8A-16. This procedure is for an engine that will not start— with wait lamp and glow plug relay operation normal, and should be used instead of the diagnosis located on the following pages:

SERIES**MANUAL****PAGES**

Cutlass	ETM	45
88/98	Chassis Service ETM	6A5-11 & 6A6-12 253
Toronado	Chassis Service ETM	6A5-19 455
Cutlass Ciera	Chassis Service	6A5-19
	Omega/Cutlass Ciera	8A-137

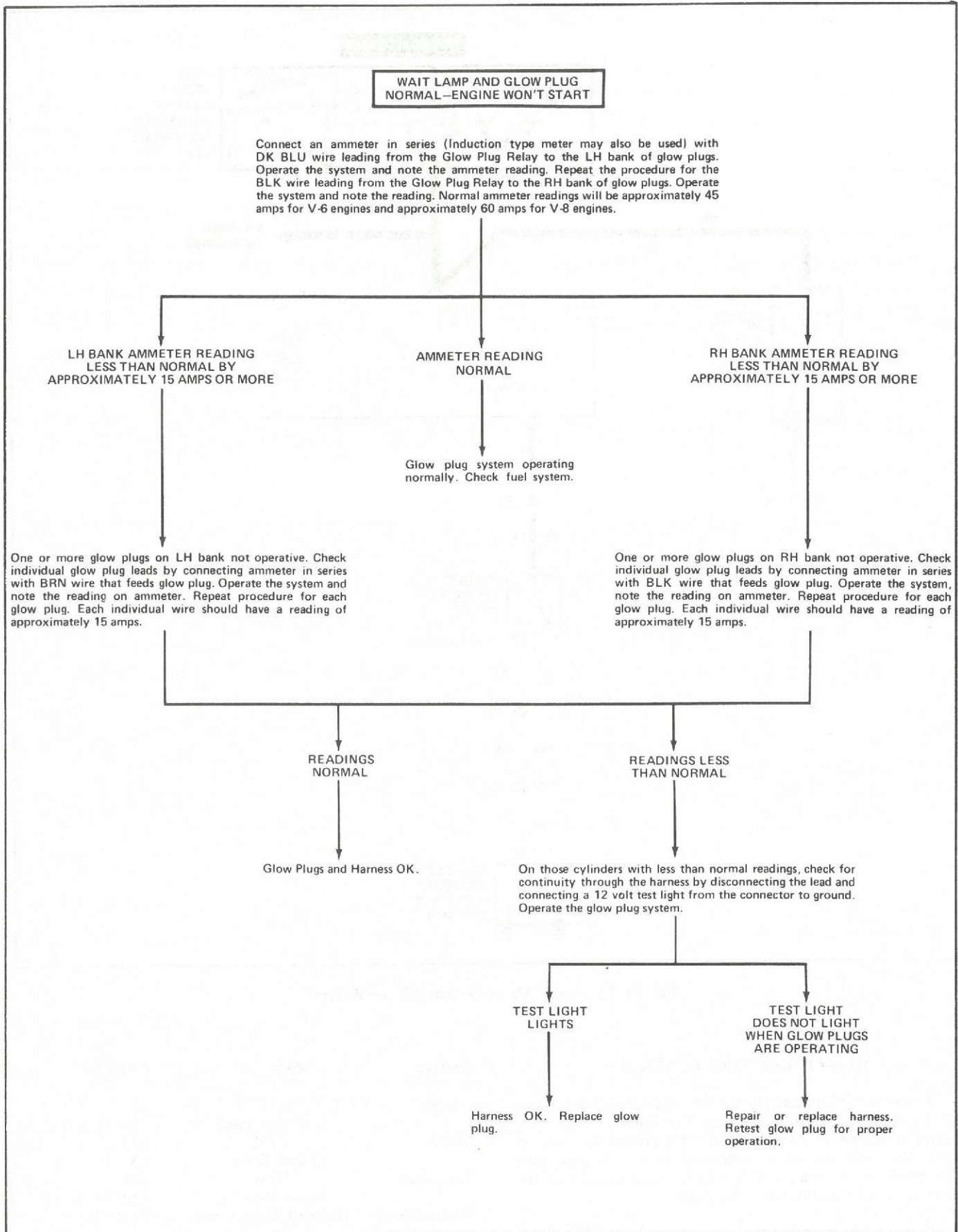


Fig. 8A-16—Glow Plug Diagnosis

SECTION 8B

INSTRUMENT PANEL

VEHICLE SPEED SENSOR REMOVAL—1982 TORONADO

The following is the revised procedure for removal of the vehicle speed sensor from the 1982 Toronado.

1. Disconnect negative battery cable.
2. Remove steering column trim cover and disengage shift indicator cable clip from steering column shift bowl.
3. Remove two (2) nuts attaching steering column to support and lower steering column.
4. Remove left hand trim cover.
5. Disconnect speedometer cable from transmission. (On cars equipped with cruise control, disconnect speedometer cable at cruise control transducer.)
6. Remove ten (10) screws attaching cluster carrier to instrument panel pad.
7. Remove two (2) screws attaching front radio bracket to cluster carrier. Pull radio out slightly and remove two (2) nuts attaching front radio bracket to radio and remove bracket.
8. Remove the front radio bracket bolt from right hand side of radio.
9. Remove ash tray and remove two (2) screws attaching ash tray receiver to cluster carrier.
10. Pull cluster carrier rearward and disengage the speedometer cable at the speedometer.
11. Disconnect electrical connector from vehicle speed sensor.
12. Remove screw attaching vehicle speed sensor pick-up to rear of speedometer head.
13. Remove screw attaching vehicle speed sensor to cluster carrier and remove vehicle speed sensor.
14. For vehicle speed sensor installation, reverse removal operations. Torque two (2) nuts attaching steering column to support to 27 N·m (20 ft. lbs.). Refer to section 3B4, figure 3B4-3 for shift indicator cable adjustment procedure.

VEHICLE SPEED SENSOR REMOVAL — 1982 CUTLASS

The following is the revised procedure for removal of the vehicle speed sensor from the 1982 Cutlass.

1. Disconnect negative battery cable.
2. Remove steering column trim cover and disconnect shift indicator clip from steering column shift bowl.
3. Remove instrument panel cluster trim pad.
4. Disconnect speedometer cable from transmission. (On cars equipped with cruise control disconnect speedometer cable at cruise control transducer).

5. Remove four (4) screws attaching instrument panel cluster assembly to instrument panel adapter.

6. Pull cluster assembly rearward far enough to disengage speedometer cable and remove the screw attaching vehicle speed sensor pick-up to rear of speedometer head.

7. Remove cluster assembly.

8. Remove eight (8) screws attaching instrument panel adapter to instrument panel pad, and pull adapter rearward far enough to remove screw attaching vehicle speed sensor to rear of instrument panel adapter.

9. Disconnect electrical connector from vehicle speed sensor.

10. Remove vehicle speed sensor.

11. For vehicle speed sensor installation reverse removal operations. Refer to section 3B4 Figure 3B4-3 for shift indicator cable adjustment procedure.

INSTRUMENT PANEL MOUNTED CLOCK — 1982 CUTLASS CIERA

Removal (Fig. 8B-1)

1. Disconnect negative battery cable(s).
2. Carefully insert a clean putty knife blade between the right hand trim panel and the right hand trim pad.
3. Gently pry the trim panel outward and remove.
4. Remove two (2) screws attaching clock to instrument panel.
5. Pull clock rearward to remove.
6. Reverse procedure to install.

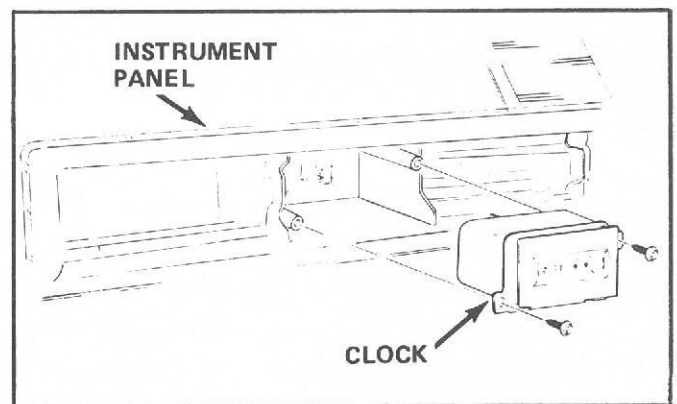


Fig. 8B-1—Instrument Panel Mounted Clock

ACCESSORIES

SECTION 9

CRUISE CONTROL VACUUM SYSTEMS

The following applies to models listed below:

Cutlass Ciera with a 2.5L L-4 (VIN R)

Cutlass Ciera with a 3.0L V-6 (VIN E)

98 and Tornado with a 4.1L V-6 (VIN 4)

88 with a 5.0L V-8 (VIN Y) with the 2004R transmission

Custom Cruiser, 98 and Tornado with a 5.0L V-8 (VIN Y)

These models use a belt or cam driven vacuum pump that supplies additional vacuum assist for heavy load (hill climbing) cruise control operation. (Also power brake operation in most cases).

Vehicles equipped with a vacuum pump will utilize a check valve as part of the Resume Cruise Control vacuum harness. The check valve selects the higher of the two available vacuum sources (manifold or vacuum pump) to allow maximum system performance under various driving conditions.

Refer to Figure 9-1. During normal vacuum conditions of light to moderate load, air flows from Port "A" to Port "C" to the intake manifold. The single arrows in Figure 9-1 show this air flow. A small amount of air also flows from Port "A" to Port "B" through the connector and to the vacuum pump. The .035" restriction in the hose connector between Port "B" and the vacuum pump keeps the volume

of air relatively small. Whenever manifold vacuum at Port "C" drops to a level lower than the vacuum at Port "B" (pump output), the 3-port check valve closes Port "C". The change in vacuum level and closing of Port "C" is caused by heavy load operation. Under heavy load, the system will now operate off the vacuum pump. Air flow is shown by the double arrows in Figure 9-1.

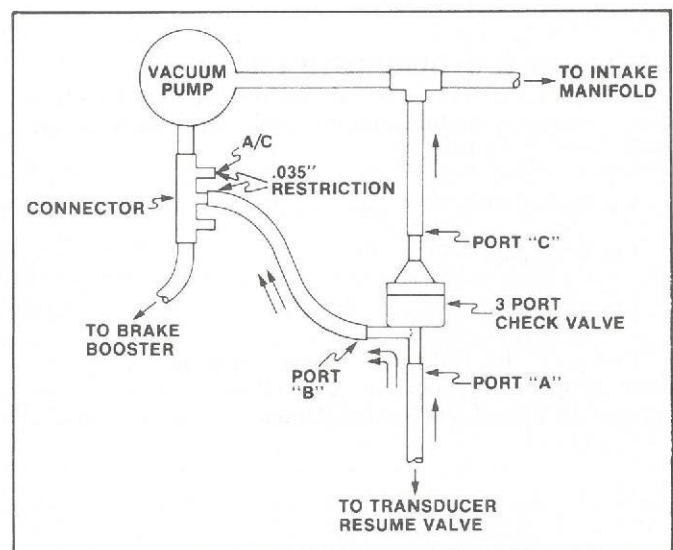


Fig. 9-1—Cruise Control Vacuum Assist System

Refer to Fig. 9-2 for diagnostic information that is in addition to that already given in the Service Manual.

To correct cruise engagement or cruise operation below engagement speed complaints, clean the check valve and connections with mineral spirits. (See Fig. 9-1). Recheck by blowing low pressure air into PORT "A" while PORT "B" is plugged and then into PORT "B" while PORT "A" is

plugged. In both cases, air should exit out of PORT "C". To check flow in the other direction blow air into PORT "C", no air should exit out of PORT "B" or PORT "A".

Check the 3-port valve for proper installation. Notice that the arrowhead shaped portion of the 3-port check valve must always point to the intake manifold (Figure 9-1.)

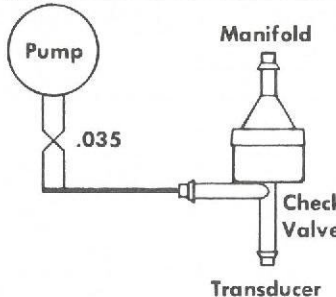
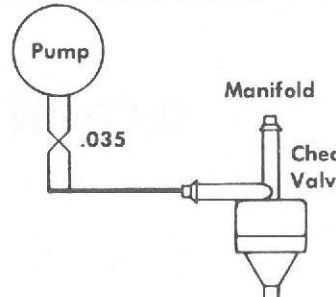
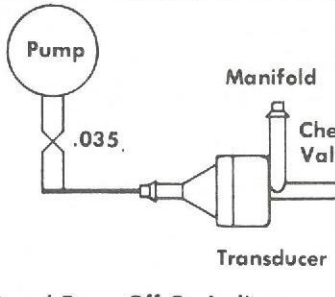
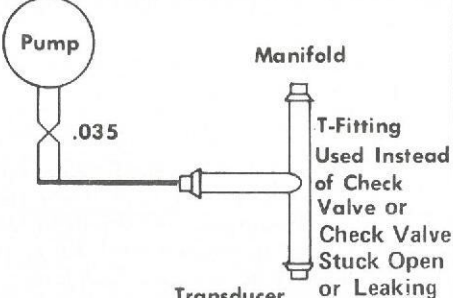
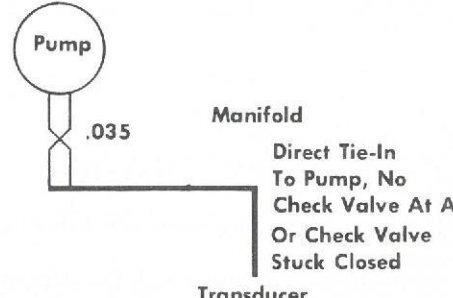
CONDITION	① Normal (Checked Manifold Vacuum)	② Reversed (Unchecked Manif. Vacuum)	③ Checked Pump
			
RESULT	Resume Cruise Operates Normally	Cruise Inoperative	Speed Drops Off On Inclines, No Downshift.
CONDITION	④ Open Check Valve		⑤ Blocked Check Valve
			
RESULT	Speed Drops Off On Inclines, No Downshift.		Surging Speed

Fig. 9-2—Check Valve Diagnosis

FUSE REMOVAL IN DIAGNOSTIC CHARTS

Disregard the statement "always remove CLK-CIG fuse before removing module" on the following charts in the Chassis Service Manual;

Fig. 9-56, page 9-46

Fig. 9-57, page 9-47

Fig. 9-58, page 9-48

Disregard the statement "always remove CTYS fuse before removing module" on the following charts in the Omega and Cutlass Ciera Service Manual;

Fig. 9-27, page 9-31

Fig. 9-28, page 9-32

DIESEL ENGINE TRANSDUCER USAGE

In order to improve cruise control performance, a new transducer has been released for all diesel equipped cars. The new transducer will have a code RX. The chart on page 9-32 of the Chassis Service Manual shows that the 4.3L and 5.7L diesel engines are equipped with transducer RS. The low speed limit setting will be the same for the new RX transducer as it was for the RS.

2B9B10

SECTION 11

BODY SERVICE**UNIBODY COLLISION REPAIR PROCEDURES
1982 OMEGA & 1982 CUTLASS CIERA VEHICLES**

The following repair procedures are to acquaint you with recommended repair guidelines, based upon conclusions drawn from durability testing, for all unibody constructed 1982 Omega and 1982 Cutlass Ciera vehicles.

1. The oxy-acetylene torch can be used for heating and welding operations on unibody components (see temperature limitations in no. 4 below). With regard to welding, only mild steel rod should be used - **NO BRAZING SHOULD BE ATTEMPTED.**

2. Sectioning of the engine compartment lower side inner rail is a practical repair approach using a butt weld joint. It is necessary to grind off the galvanized coating in the area of the weld joint approximately 25mm (1") either side to prevent zinc contamination of the weld bead.

Select an area rearward of the damaged area where the new rail section can be indexed to the existing rail. As an example, the replacement inner rail may be trimmed approximately 50mm (2") rearward of the 29mm (1.16") hole. The hole then serves to index the new rail section for accurate transfer of the cut line to the existing rail.

3. If damage is extensive, all other components, i.e. front upper rails, front lower outer rails, engine compartment side panel and engine compartment front panel should be replaced as a complete assembly.

4. Do not section the engine compartment lower side inner rail if straightening is a more practical approach. When straightening is the selected repair method, do not apply torch heat beyond the very dull red stage, approximately 649°C - 760°C (1200°F - 1400°F). Heat applied at that range is sufficient to relieve work hardening without a detrimental effect upon the base metal.

5. All welded and/or heated areas are to be thoroughly cleaned, preferably by sand blasting, followed by metal

conditioning. Prime with a chromate primer (Dupont Acrylic Chromate Prime - green - 215S) or equivalent to protect metal surfaces where galvanized surfaces and primer coating may have been burned by gas welding operations. A universal type primer surfacer should then be applied over the chromate primer, following the manufacturers' label directions. All joints should be sealed using 3M All Around Autobody Sealant No. 8500 or equivalent prior to color application.

6. The interior surface of all boxed sections, such as the lower side rails, as well as all repaired areas and surfaces should be coated with an anti-corrosion compound to provide corrosion protection. Some materials especially suited for this are "Guard-Mor" part number 1051685, 60 liters (16 gal.); 1051686, 210 liters (55 gal.); or an equivalent type material. Use a probe wand to obtain full material coverage.

7. The procedure above, recommending oxy-acetylene welding, does not preclude the use of the MIG welder for component replacement and sectioning.

**CABLE REPLACEMENT,
SUNROOF SLIDING PANEL
1982 CUTLASS, 88, 98
AND TORONADO SUNROOF
EQUIPPED VEHICLES**

When a right or left sunroof drive cable assembly is damaged, both assemblies must be replaced. This is done to assure even parallel travel of the sunroof assembly.

Left and right cable assemblies are part of a service kit available through GMWDD.

