



JUMP STARTING PROCEDURE

WARNING: REVIEW ALL SAFETY PRECAUTIONS AND WARNINGS IN GROUP 8A, BATTERY/STARTING/CHARGING SYSTEMS DIAGNOSTICS.

DO NOT JUMP START A FROZEN BATTERY, PERSONAL INJURY CAN RESULT.

DO NOT JUMP START WHEN BATTERY INDICATOR DOT IS YELLOW OR BRIGHT COLOR.

DO NOT ALLOW JUMPER CABLE CLAMPS TO TOUCH EACH OTHER WHEN CONNECTED TO A BOOSTER SOURCE.

DO NOT USE OPEN FLAME NEAR BATTERY.

REMOVE METALLIC JEWELRY WORN ON HANDS OR WRISTS TO AVOID INJURY BY ACCIDENTAL ARCHING OF BATTERY CURRENT.

WARNING: WHEN USING A HIGH OUTPUT BOOSTING DEVICE, DO NOT ALLOW DISABLED VEHICLE'S BATTERY TO EXCEED 16 VOLTS. PERSONAL INJURY OR DAMAGE TO ELECTRICAL SYSTEM CAN RESULT.

CAUTION: When using another vehicle as a booster, do not allow vehicles to touch. Electrical systems can be damaged on either vehicle.

TO JUMP START A DISABLED VEHICLE:

(1) Raise hood on disabled vehicle and visually inspect engine compartment for:

- Battery cable clamp condition, clean if necessary.
- Frozen battery.
- Yellow or bright color test indicator, if equipped.
- Low battery fluid level.
- Generator drive belt condition and tension.
- Fuel fumes or leakage, correct if necessary.

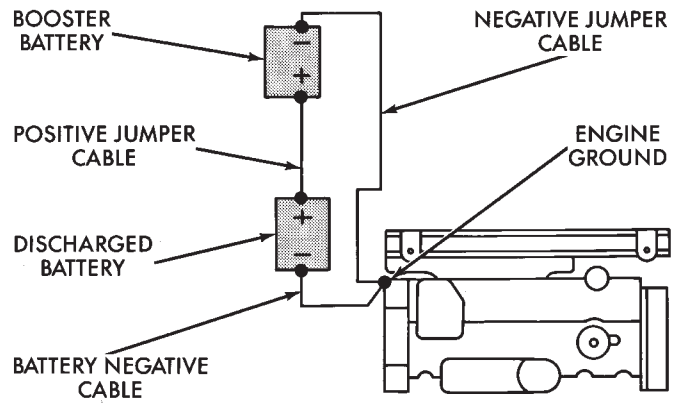
CAUTION: If the cause of starting problem on disabled vehicle is severe, damage to booster vehicle charging system can result.

(2) When using another vehicle as a booster source, turn off all accessories, place gear selector in park or neutral, set park brake or equivalent and operate engine at 1200 rpm.

(3) On disabled vehicle, place gear selector in park or neutral and set park brake or equivalent. Turn OFF all accessories (Keyless Entry system must be turned OFF manually).

(4) Connect jumper cables to booster battery. RED clamp to positive terminal (+). BLACK clamp to negative terminal (-). DO NOT allow clamps at opposite end of cables to touch, electrical arc will result (Fig. 1). Review all warnings in this procedure.

(5) On disabled vehicle, connect RED jumper cable clamp to positive (+) terminal. Connect BLACK jumper cable clamp to engine ground as close to the ground cable attaching point as possible (Fig. 1).



DO NOT ALLOW VEHICLES TO TOUCH

9100-3

Fig. 1 Jumper Cable Clamp Connections

CAUTION: Do not crank starter motor on disabled vehicle for more than 15 seconds, starter will overheat and could fail.

(6) Allow battery in disabled vehicle to charge to at least 12.4 volts (75% charge) before attempting to start engine. If engine does not start within 15 seconds, stop cranking engine and allow starter to cool (15 min.), before cranking again.

DISCONNECT CABLE CLAMPS AS FOLLOWS:

- Disconnect BLACK cable clamp from engine ground on disabled vehicle.
- When using a Booster vehicle, disconnect BLACK cable clamp from battery negative terminal. Disconnect RED cable clamp from battery positive terminal.
- Disconnect RED cable clamp from battery positive terminal on disabled vehicle.

HOISTING RECOMMENDATIONS

Refer to Owner's Manual provided with vehicle for proper emergency jacking procedures.

WARNING: THE HOISTING AND JACK LIFTING POINTS PROVIDED ARE FOR A COMPLETE VEHICLE. WHEN THE ENGINE OR REAR SUSPENSION IS REMOVED FROM A VEHICLE, THE CENTER OF GRAVITY IS ALTERED MAKING SOME HOISTING CONDITIONS UNSTABLE. PROPERLY SUPPORT OR SECURE VEHICLE TO HOISTING DEVICE WHEN THESE CONDITIONS EXIST.

CAUTION: Do not position hoisting device on suspension components, damage to vehicle can result.



for the required removal procedure.

(2) Separate the tension strut from the lower control arm assembly.

(3) Position lower control arm in arbor press with tension strut bushing inside Receiver, Special Tool MB-990799 and special tool supporting lower control arm (Fig. 5). Position Remover, Special Tool, 6644-4 on top of tension strut bushing (Fig. 5). Using the arbor press, press Remover, Special Tool, 6644-4 down through the tension strut bushing until the arbor press can push it no farther. As Remover, Special Tool, 6644-4 is pressed down through tension strut bushing it will cut the bushing into two pieces.

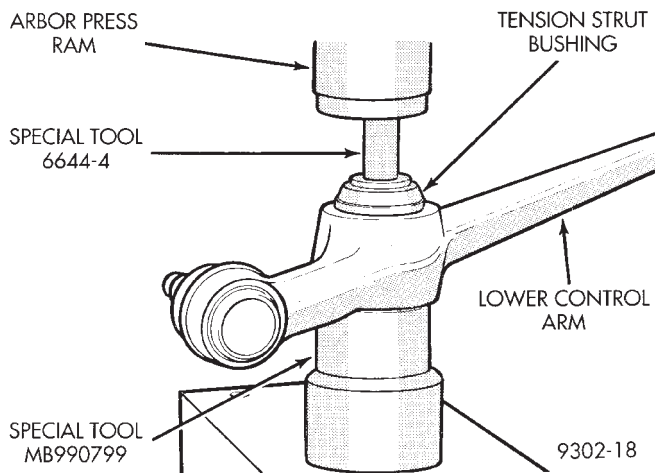


Fig. 5 Removing Lower Control Arm Tension Strut Bushing

(4) Remove lower control arm assembly from arbor press. Remove pieces of tension strut and Remover, Special Tool 6644-4, from lower control arm.

INSTALL

(1) Thoroughly lubricate the replacement tension strut bushing, lower control arm and Installer, Special Tool 6644-3 using Mopar® Silicone Spray Lube or an equivalent.

(2) By hand, install tension strut bushing into large end of Installer, Special Tool 6644-3. Press bushing into installer as far as it will go by hand.

(3) Position lower control arm in arbor press, so tension strut hole in lower control arm is centered on Receiver, Special Tool MB-990799. (Fig. 6). Position Installer, Special Tool 6644-3 with previously installed bushing, inside of tension strut bushing hole in lower control arm (Fig. 6). Position Installer, Special Tool 6644-2 on top of tension strut bushing (Fig. 6). Using the arbor press, press the tension strut bushing into the lower control arm. As the bushing is being pressed into the control arm a pop will be heard. When the pop is heard Installer, Special Tool 6644-3 will slightly move

up off the control arm. At this time remove the control arm assembly from the arbor press and pull Special Tool 6644-3 off the tension strut bushing in the control arm. Tension strut bushing is now installed.

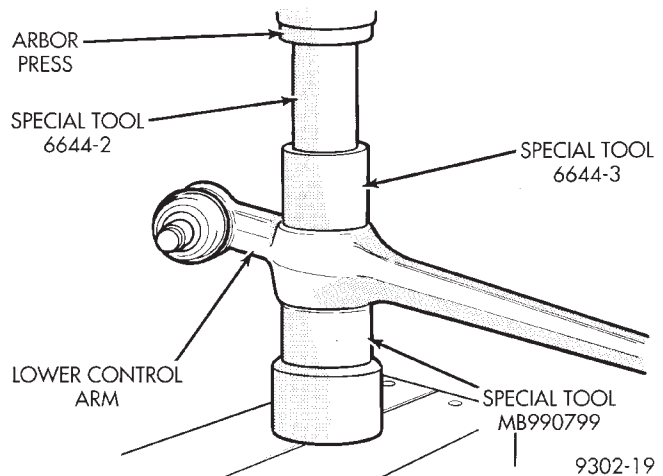


Fig. 6 Installing Tension Strut Bushing Into Lower Control Arm

BALL JOINTS

The lower front suspension ball joints operate with no free play. See Inspection Ball Joint Wear to determine if the ball joint is worn and requires replacement.

The ball joints are not replaceable as a separate component of the lower control arm assembly. If a ball joint is found to be defective, the entire lower control arm will need to be replaced. Do not attempt any type of repair on the ball joint assembly.

INSPECTION BALL JOINT WEAR

Raise front wheels of vehicle using jack stands or a frame contact hoist, until front suspension is in full rebound and tires are not in contact with the ground. Grasp tire at top and bottom, and apply an in and out force on the wheel and tire. While applying force to the tire, look for any movement between the lower ball joint and lower control arm. If any movement is evident the lower ball joint is worn and the lower control arm requires replacement.

BALL JOINT SEAL INSTALLATION

(1) By hand, initially install the ball joint seal on the lower control arm.

(2) Lower control arm is to be supported using a 1 1/4 inch socket (Fig. 7). Position the 1 1/4 inch socket, lower control arm and Seal Installer, Special Tool MB-990800 in an arbor press (Fig. 7).

(3) Using Installer, Special Tool MB-990800, press seal onto ball joint housing until it is squarely seated against top surface of control arm (Fig. 7).



(2) Install the lateral links to spindle attaching bolt (Fig. 14). Torque the lateral links to spindle attaching bolt to 140 N•m (105 ft. lbs.).

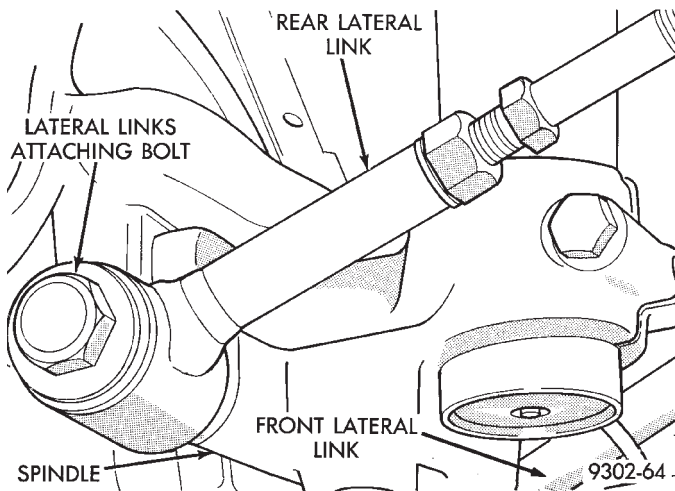


Fig. 14 Lateral Links To Spindle Attaching Bolt

(3) Install bolt attaching trailing arm to trailing arm bracket on bottom of spindle (Fig. 15). Torque trailing arm to trailing arm bracket attaching bolt to 100 N•m (74 ft. lbs.).

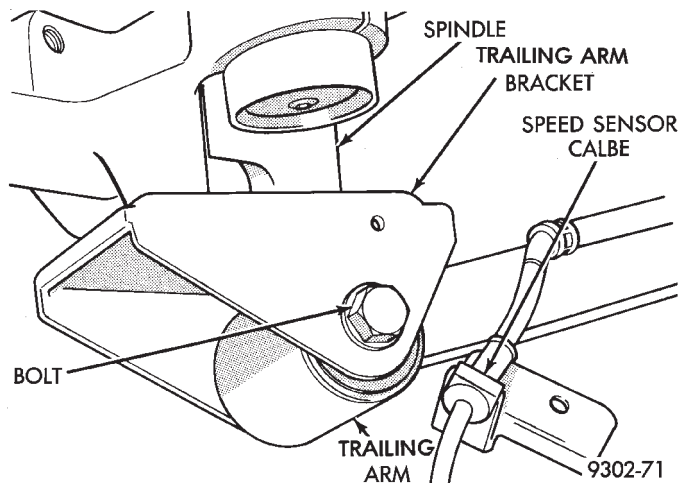


Fig. 15 Trailing Arm To Spindle Bracket Bolt

(4) If vehicle is equipped with Anti-Lock Brakes. Mount rear speed sensor cable routing tube to the rear trailing arm and speed sensor cable routing bracket to trailing arm bracket at rear spindle (Fig. 16).

(5) On vehicles equipped with rear drum brakes. Install the rear brake support plate onto the spindle (Fig. 17). Install the 4 bolts attaching the rear brake support plate to the rear spindle (Fig. 17). Torque the brake support plate to spindle mounting bolts to 115 N•m (85 ft. lbs.).

(6) On vehicles equipped with rear disc brakes. Install the disc brake adapter back on the spindle (Fig. 18). Install the 4 bolts attaching the disc brake

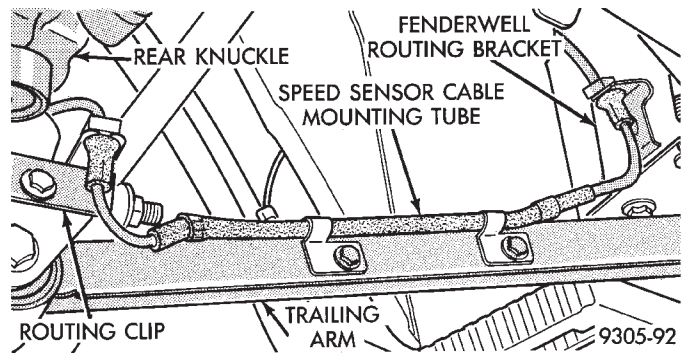


Fig. 16 Speed Sensor Routing Tube And Bracket

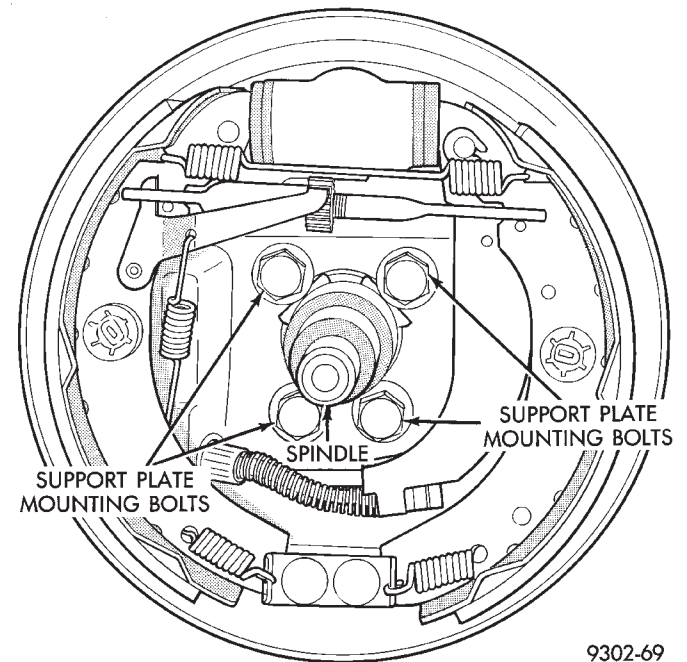


Fig. 17 Brake Support Plate Mounting Bolts

adapter to the rear spindle (Fig. 18). Torque the disc brake adapter to spindle mounting bolts to 115 N•m (85 ft. lbs.).

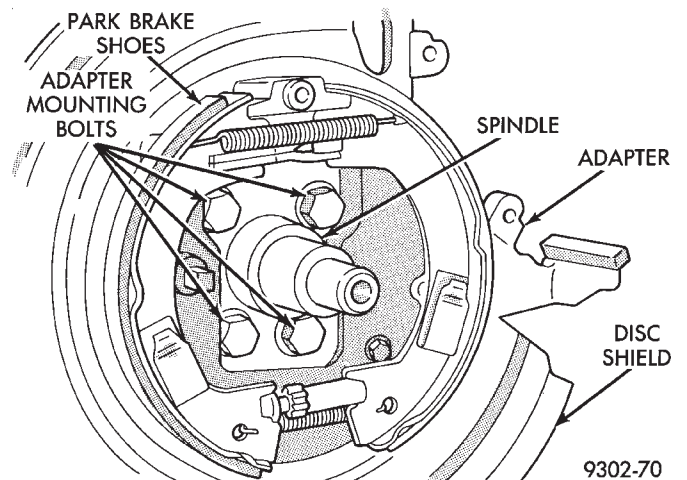


Fig. 18 Disc Brake Adapter Mounting



KELSEY HAYES DOUBLE PIN CALIPER ASSEMBLY

INDEX

	page		page
Brake Shoe Service Procedures	30	Disc Brake Caliper Service	32
Caliper Assembly Inspection	30		

BRAKE SHOE SERVICE PROCEDURES

BRAKE SHOE REMOVAL

(1) Raise vehicle on jackstands or centered on a hoist. See Hoisting in the Lubrication and Maintenance section of this manual.

(2) Remove front wheel and tire assemblies from vehicle.

(3) Remove the 2 caliper assembly to steering knuckle guide pin bolts (Fig. 1).

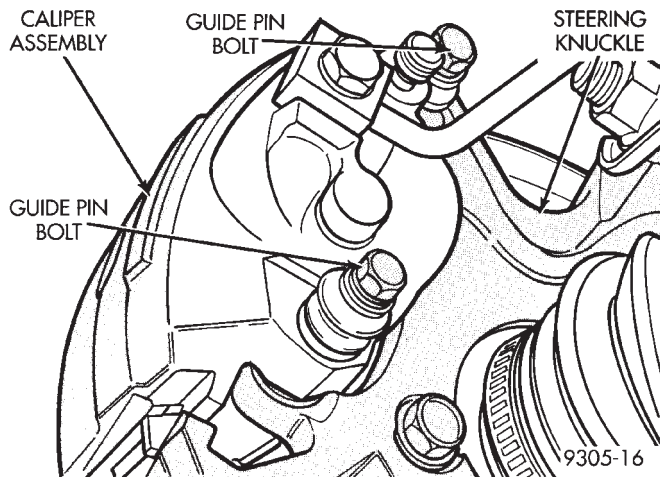


Fig. 1 Removing Caliper Assembly Guide Pin Bolts

(4) Remove caliper assembly from steering knuckle and braking disc, by first rotating top of caliper assembly away from steering knuckle. Then lifting caliper assembly off bottom machined abutment on steering knuckle (Fig. 2).

(5) Support caliper firmly to prevent weight of caliper from damaging the flexible brake hose (Fig. 3).

(6) Remove front braking disk (rotor) from hub, by pulling it straight off wheel mounting studs (Fig. 4).

(7) Remove outboard brake shoe, by prying the shoe retaining clip over raised area on caliper. Then slide the shoe down and off the caliper (Fig. 5).

(8) Pull inboard brake shoe away from piston, until retaining clip is free from cavity in piston. (Fig. 6).

CALIPER ASSEMBLY INSPECTION

Check for piston seal leaks (brake fluid in and around boot area and inboard lining) and for any ruptures of the piston dust boot. If boot is damaged, or fluid leak is visible, disassemble caliper assembly

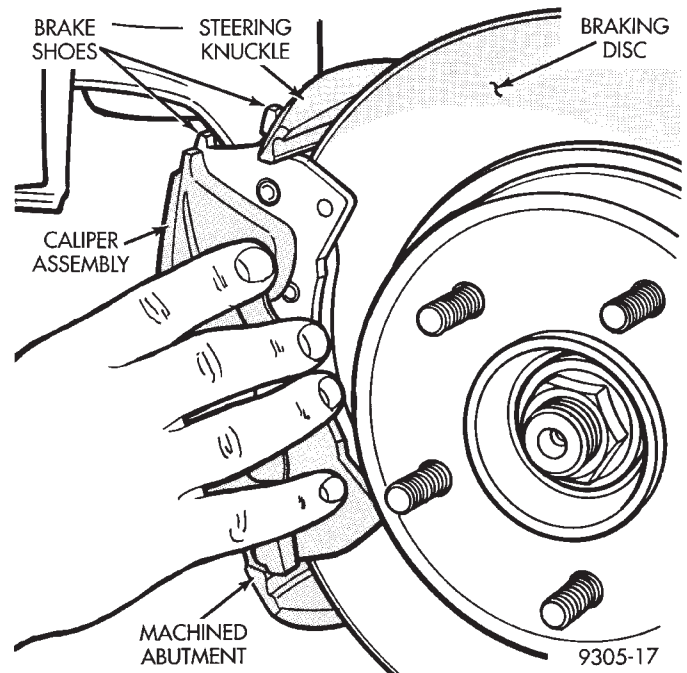


Fig. 2 Removing Caliper Assembly From Steering Knuckle And Rotor

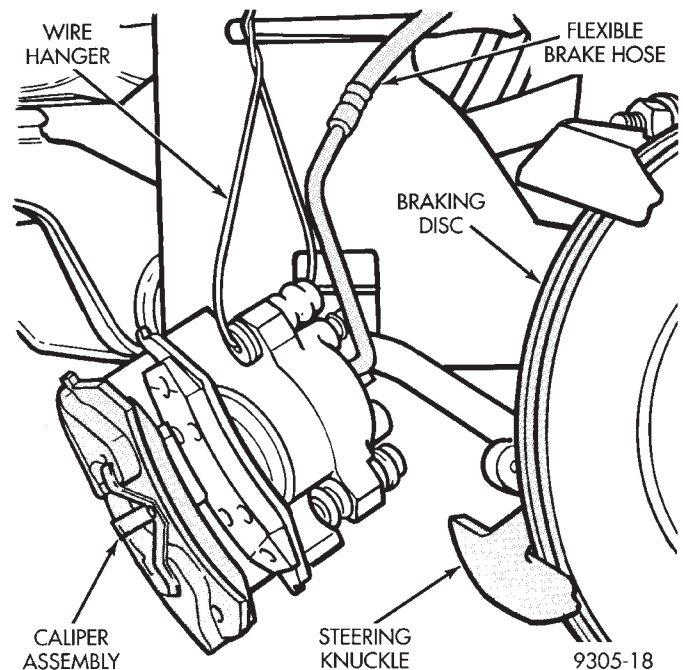


Fig. 3 Storing Caliper

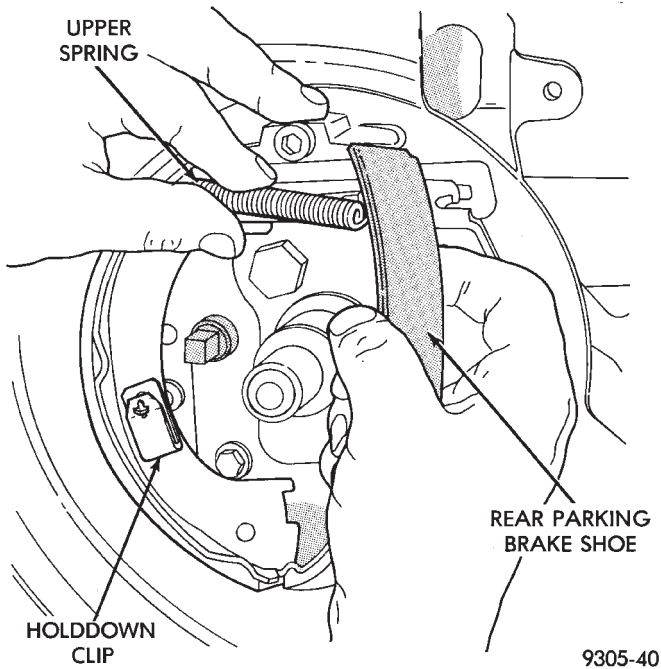


Fig. 4 Removing Shoe and Upper Spring

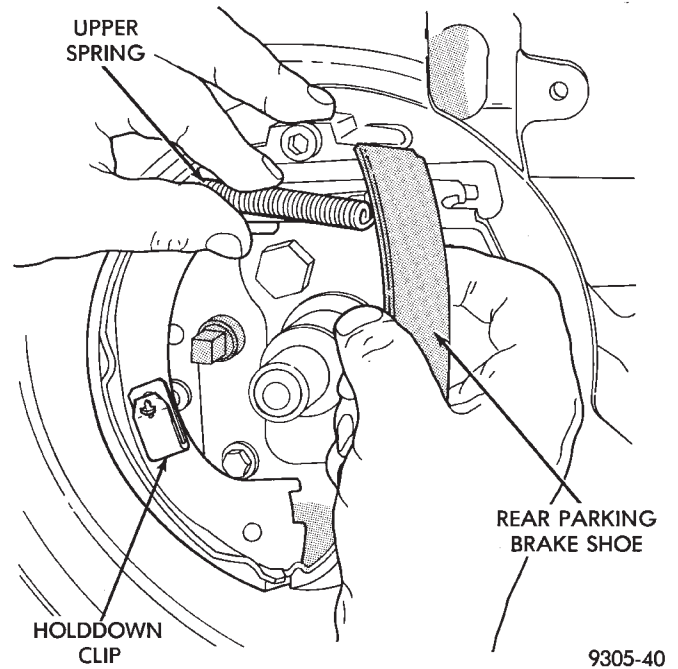


Fig. 6 Installing Upper Spring

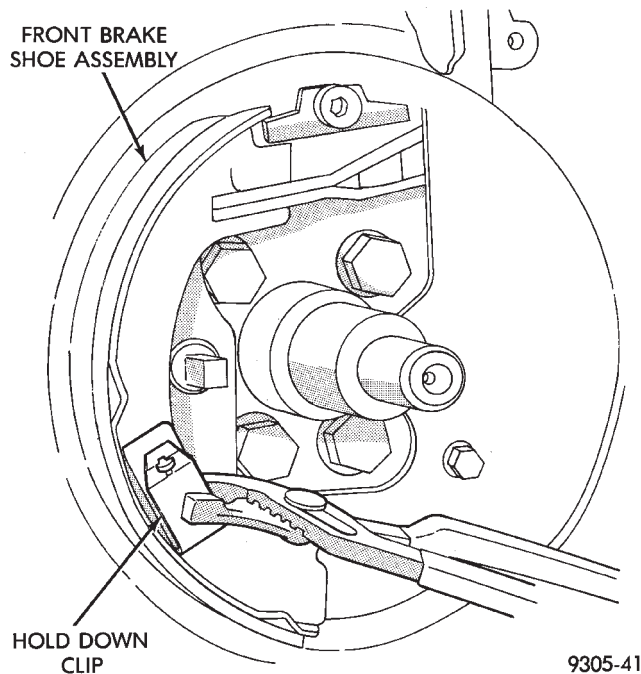


Fig. 5 Removing Front Holddown Clip And Shoe

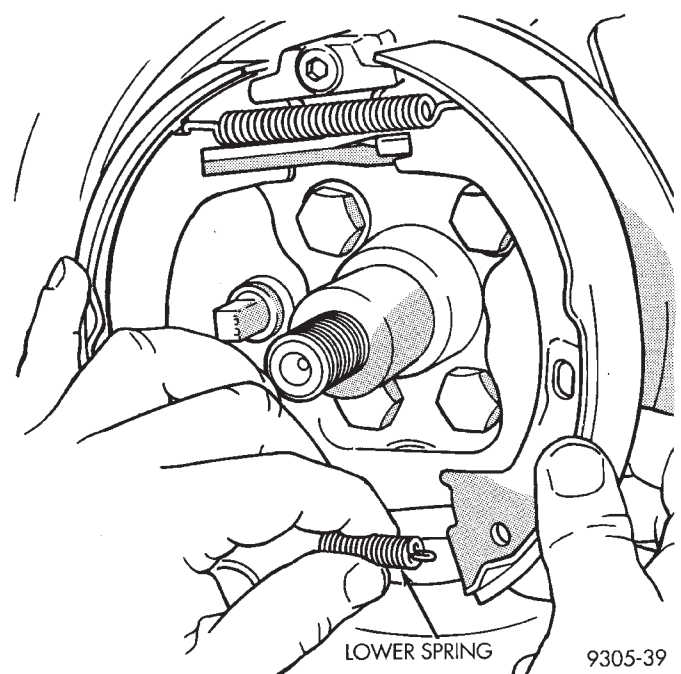


Fig. 7 Installing Lower Spring

(4) Install lower parking brake, shoe to shoe return spring (Fig. 7).

(5) Install parking brake shoe adjuster assembly with star wheel rearward (Fig. 8).

(6) Install rear, parking brake shoe holddown clip (Fig. 9).

(7) Adjust parking brake shoes to a diameter to 171 mm (6.75 inch).

(8) Install rear hub and bearing assembly on spindle.

(9) Install hub and bearing assembly, thrust washer and retaining nut. Torque the hub and bearing assembly retaining nut to 168 N•m (124 ft. lbs.).

(10) Install the nut lock and cotter pin on the rear spindle. Then install hub and bearing assembly dust cap.

(11) Install rear braking disc.

(12) Install rear, disc brake caliper on the adapter (See Brake Shoe Removal).

(13) Install wheel and tire assemblies.



SERVICE PROCEDURES

INDEX

	page		page
Automatic Transmission Oil Cooler	18	Electric Fan Motor	18
Coolant	10	Engine Thermostats	9
Coolant Deaeration Pressure Bottle	13	Radiator Hoses and Clamps	17
Cooling System Drain, Clean, Flush and Filling ..	12	Radiators	15
Deaeration Pressure Bottle Pressure Cap	14	Testing System for Leaks	13
Dual Fan Module	17	Water Pumps	8

WATER PUMPS

A quick test to tell whether or not the pump is working is to see if the heater warms properly. A defective pump will not be able to circulate heated coolant through the long heater hose.

The water pump on all models can be replaced without discharging the air conditioning system.

WATER PUMP—3.3L ENGINE

The pump has a die cast aluminum body and a stamped steel impeller. It bolts directly to the chain case cover (Fig. 1), using an O-ring for sealing. It is driven by the back surface of the Poly-V Drive Belt.

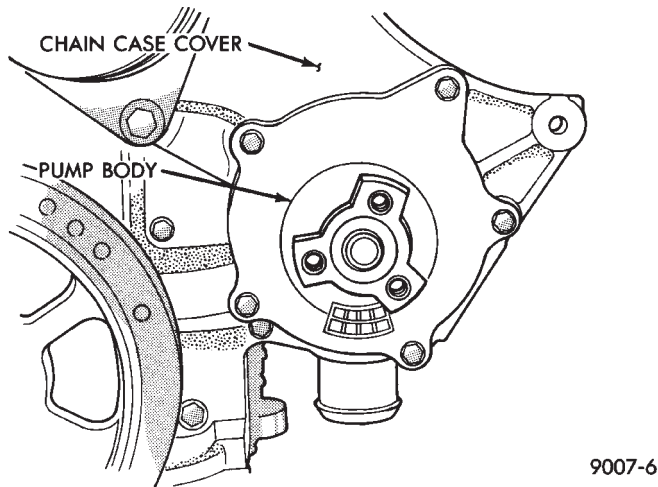


Fig. 1 Water Pump—3.3L Engine

REMOVAL

WARNING: DO NOT REMOVE PRESSURE CAP WITH THE SYSTEM HOT AND UNDER PRESSURE BECAUSE SERIOUS BURNS FROM COOLANT CAN OCCUR.

- (1) Drain Cooling System. Refer to Draining Cooling System in this group.
- (2) Remove Poly V Drive Belt.
- (3) Remove right front lower fender shield.
- (4) Remove pump pulley bolts and remove pulley.
- (5) Remove pump mounting screws (Fig. 1). Remove pump.

- (6) Remove and discard O-ring seal.
- (7) Clean O-ring groove and O-ring surfaces on pump and chain case cover. Take care not to scratch or gouge sealing surface.

INSPECTION

Replace the water pump if it has any of the following defects.

- (1) Damage or cracks on the pump body.
- (2) Coolant leaks; if the seal is leaking, evident by traces of coolant leaks from vent hole.
- (3) Loose or rough turning bearing.
- (4) Impeller rubs either the pump body or oil pump housing.

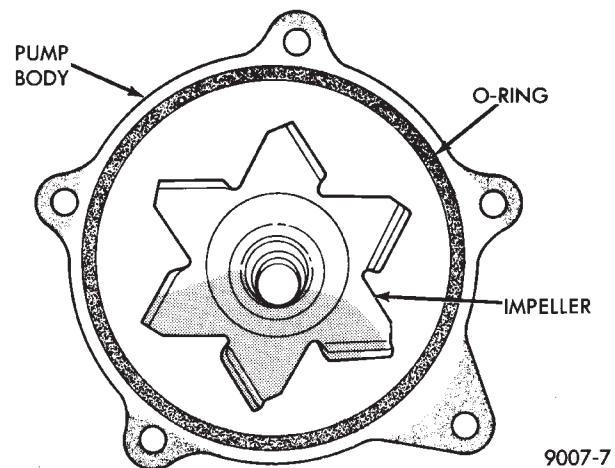


Fig. 2 Water Pump Body

INSTALLATION

CAUTION: Keep the O-ring free of oil or grease.

- (1) Install new O-ring in O-ring groove (Fig. 2).
- (2) Install pump to chain case cover. Torque screws to 12 N•m (105 in. lbs.).
- (3) Rotate pump by hand to check for freedom of movement.
- (4) Position pulley on pump. Install screws and torque to 30 N•m (250 in. lbs.).
- (5) Install drive belt. See Accessory Drive Belts this group.

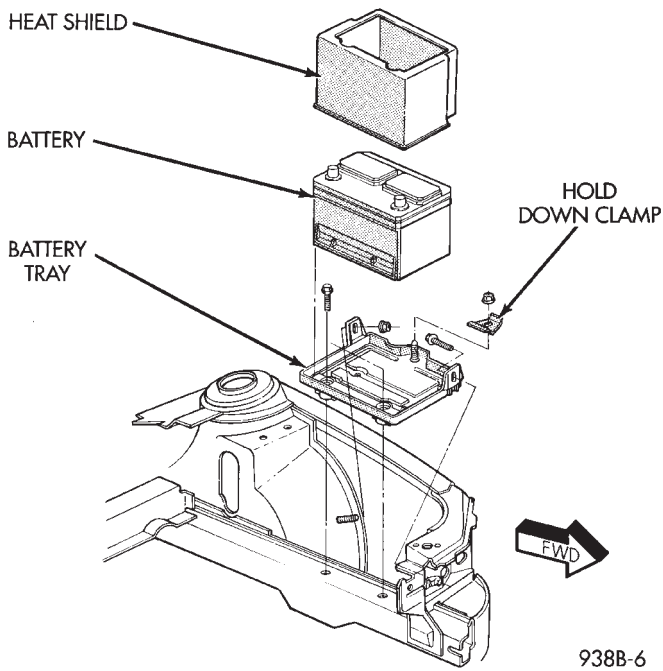


Fig. 3 Battery Heat Shield/Hold-Down/Tray

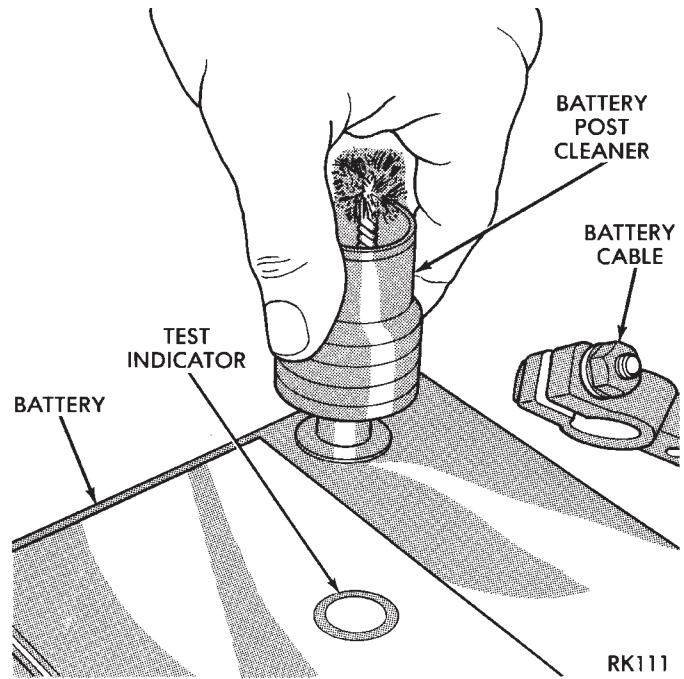


Fig. 5 Cleaning Battery Posts

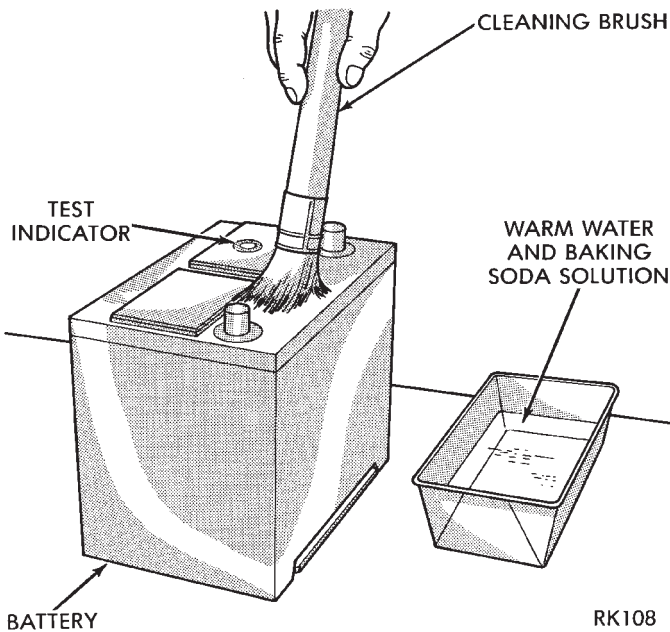


Fig. 4 Cleaning Battery

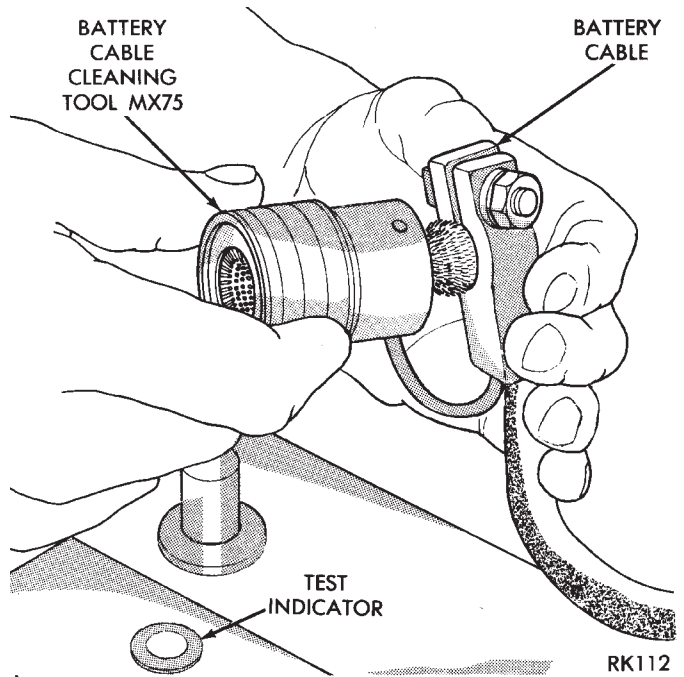


Fig. 6 Cleaning Battery Cable Terminal

(9) Clean inside surfaces of battery terminal clamps with a suitable battery terminal cleaning tool (Fig. 6). Replace damaged or frayed cables and broken terminal clamps.

(10) Inspect battery for proper or damaged hold down ledge.

(11) Install battery in vehicle making sure that battery is properly positioned on battery tray (Fig. 3).

(12) Install battery hold down clamp, making sure that it is properly positioned on battery.

(13) Place battery heat shield, over battery. The top inside surface of heat shield must be flush with top of battery.

(14) Connect battery cable clamps to battery posts making sure top of clamp is flush with top of post (Fig. 7). Install POSITIVE cable first.

(15) Tighten clamp nuts securely.



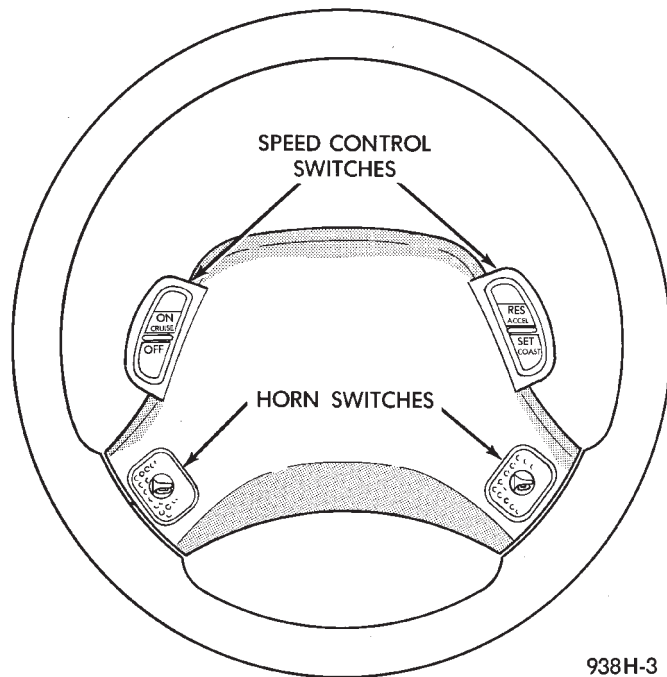
SPEED CONTROL SYSTEM

CONTENTS

	page		page
CHECKING FOR FAULT CODE	5	ROAD TEST	2
DIAGNOSIS PROCEDURES	2	SERVO UNIT	8
ELECTRICAL TEST:	5	SERVO VACUUM TEST	7
ELECTRICAL TESTS AT POWERTRAIN		SPEED CONTROL RELAY TEST	8
CONTROL MODULE	6	SPEED CONTROL SWITCH REMOVAL	8
ELECTRICAL TESTS AT SERVO	5	SPEED CONTROL SWITCH TEST	7
GENERAL INFORMATION	1	STOP LAMP SPEED CONTROL SWITCH TEST .	7
INOPERATIVE SYSTEM	5	VACUUM SUPPLY TEST	7

GENERAL INFORMATION

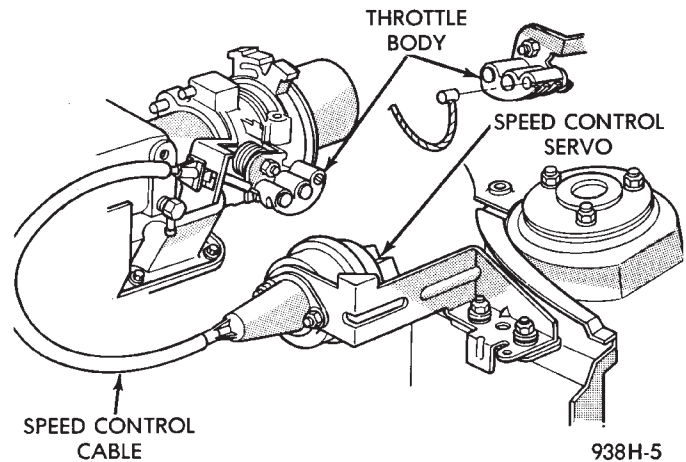
The speed control system is electronically controlled and vacuum operated. The electronic control is integrated into the powertrain control module, located on the right side under the air cleaner. The controls are located on the steering wheel and consist of two switches. The ON and OFF buttons are located on the upper left side of the air bag module. The RESUME/ACCEL and SET/COAST buttons are located on the upper right side of the air bag module (Fig.1). For identification and location of the major components (Fig. 2 and 3).



938H-3

Fig. 1 Speed Control Switch

The system is designed to operate at speeds above 35 mph (50 km/h).



938H-5

Fig. 2 Speed Control System—3.5L Engine

WARNING: THE USE OF SPEED CONTROL IS NOT RECOMMENDED WHEN DRIVING CONDITIONS DO NOT PERMIT MAINTAINING A CONSTANT SPEED, SUCH AS IN HEAVY TRAFFIC OR ON ROADS THAT ARE WINDING, ICY, SNOW COVERED, OR SLIPPERY.

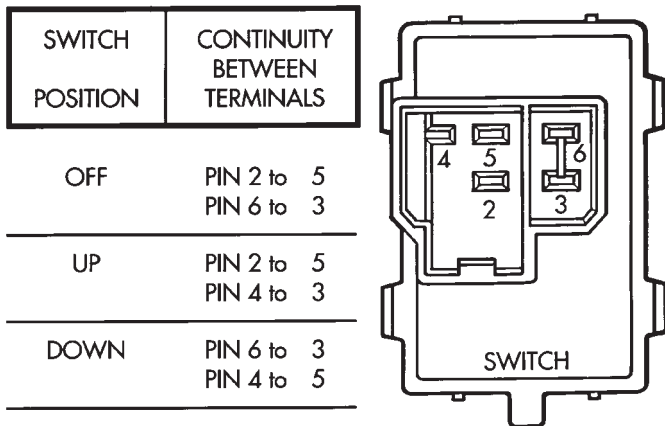
TO ACTIVATE:

Press the ON button. The speed control functions are now ready for use. The system has an AUTO-OFF feature which turns the system off whenever the system loses power or the ignition is turned OFF. If this happens, the ON button must be pressed to activate the system.

TO DEACTIVATE:

- A soft tap of the brake pedal
- Normal brake application

While the system is engaged will disengage speed control without erasing the set speed in memory. A sudden increase in engine rpm may be experienced if the clutch pedal is depressed while the speed control system is engaged. Pushing the OFF button or turning off the ignition erases the set speed in memory.



938S-1

Fig. 2 Passenger Window Switch

ually disconnect the motor approximately 1 second after the window bottoms out. Failure of the electron switch to detect stall current, will cause the switch to disconnect after approximately 13 seconds. The auto down function can be canceled by any movement of the switch.

WINDOW LIFT MOTOR TEST

(1) Remove door trim panel, refer to Group 23, body.

(2) Connect positive (+) lead from a test battery to either of the two motor terminals.

(3) Connect negative (-) lead from test battery to remaining motor terminal.

(4) The motor should now rotate in one direction to either move window up or down.

(a) If window happens to already be in full UP position and motor is connected so as to rotate in UP direction no movement will be observed.

(b) Likewise, motor connected to DOWN direction rotation, no movement will be observed if window is already in full DOWN position.

(5) Reverse battery leads (steps 1 and 2 above) and window should now move. If window does not move, remove motor. See below for motor removal from vehicle.

(6) If window moved completely up or down, motor should be reversed one more time (reverse leads from step 5) to complete a full window travel inspection.

SWITCH REMOVAL

MASTER SWITCH

- (1) Using a trim stick, remove switch bezel.
- (2) Remove three mounting screws.
- (3) Remove switch and disconnect wire connector.

- (4) For installation, reverse above procedures.

DOOR SWITCH

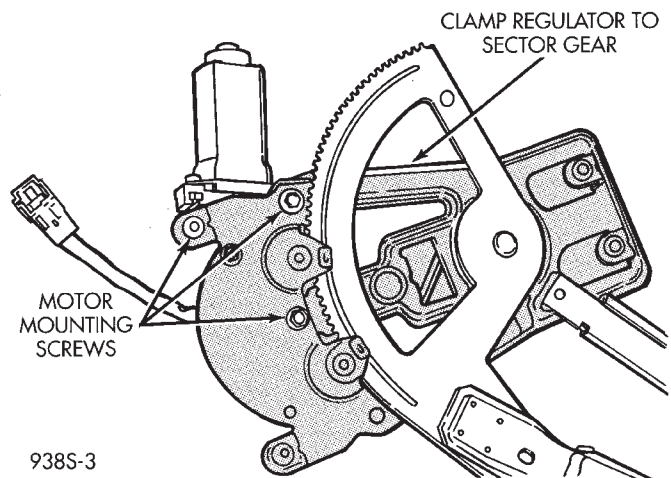
- (1) Using a trim stick, remove bezel and switch.
- (2) Disconnect switch wire connector.
- (3) For installation, reverse above procedures.

MOTOR REPLACEMENT

REMOVAL

WARNING: DO NOT HAVE ANY HANDS OR FINGERS IN SECTOR GEAR AREA WHERE THEY CAN BE PINCHED BY SMALL MOVEMENTS OF REGULATOR LINKAGE.

- (1) Remove door trim panel and window regulator, refer to Group 23, Body.
- (2) Disconnect wiring connector from motor.
- (3) Secure regulator in vise to prevent regulator sector gear from rotating.
- (4) Remove three mounting screws that hold motor gearbox to regulator (Fig. 3).



938S-3

Fig. 3 Motor Removal

- (5) Remove motor from regulator.

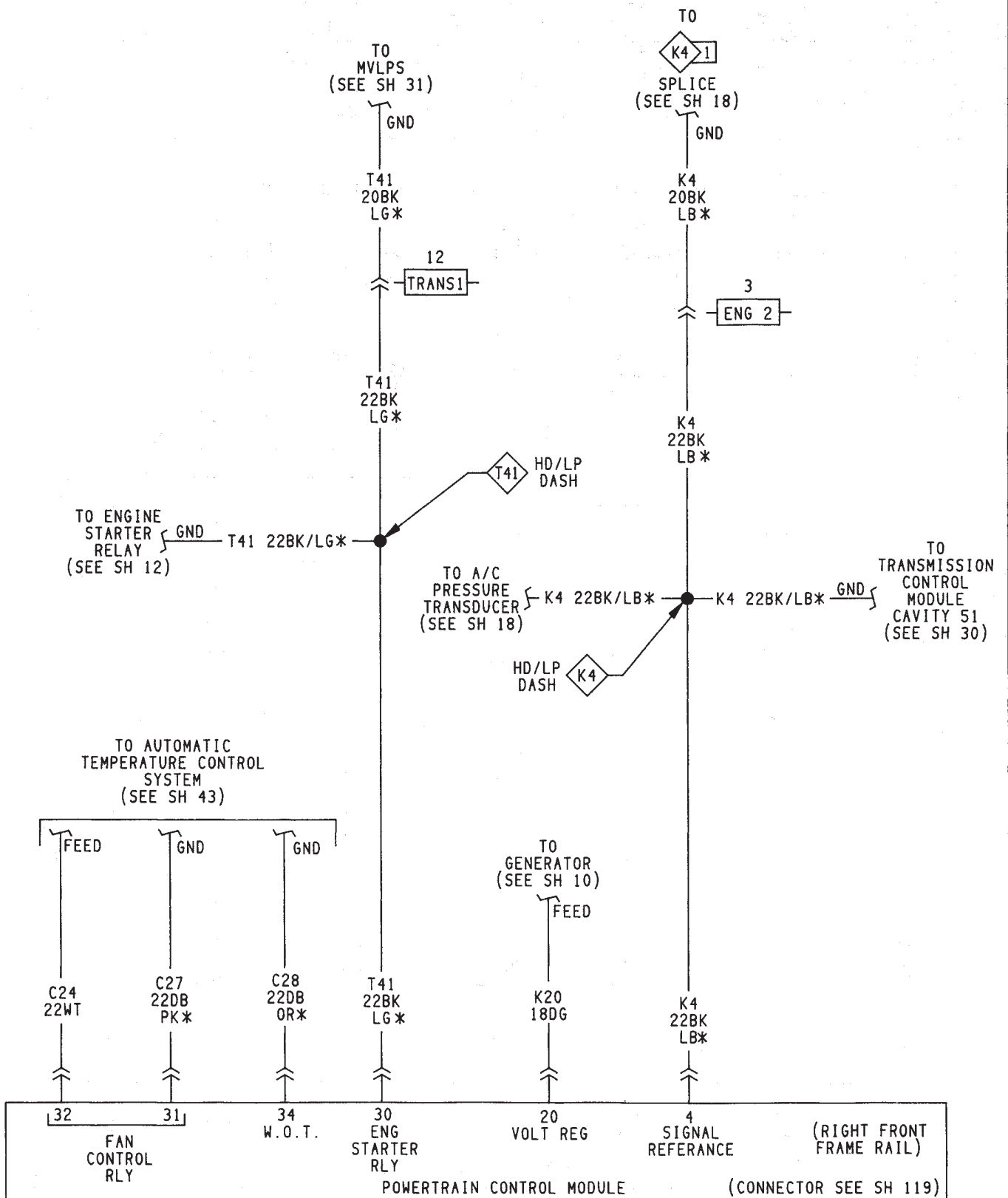
INSTALLATION

(1) Install new motor on regulator by positioning motor gearbox so that it engages regulator sector teeth.

(2) A slight rotational or rocking movement may be necessary to bring three motor gearbox screw holes into proper position.

(3) Install three gearbox screws and one tie down bracket screw, if applicable. Tighten to 5.6 to 8 N•m (50 to 70 in. lbs.) torque.

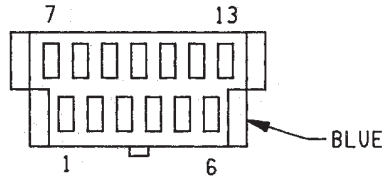
(4) Install regulator, using the switch, test operation of motor.



FUEL INJECTION IGNITION SYSTEM (3.3L ENGINE)

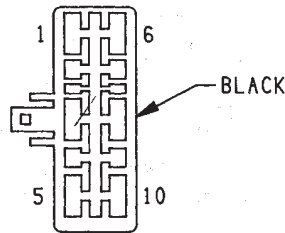
938W-9

LH 20



CONNECTOR 1
VIEWED FROM TERMINAL END

CAV	CIRCUIT	FUNCTION	SHEET
1	C21 22DB/OR*	A/C DAMPED PRESSURE SWITCH	44
2	C36 22RD/WT*	BLEND AIR FEEDBACK SIGNAL	45
3	C57 22GY/TN*	SENSOR/ACTUATOR GROUND SIGNAL	45
4	Z2 22BK/LG*	GROUND	44
5	F20 22WT	EVIC IGNITION FEED	44
6	L7 20BK/YL*	TAIL,LICENSE,SIDE MARKER LAMP	44
7	C37 22RD	MODE ACTUATOR FEEDBACK SIGNAL	45
8	C34 22DB/WT*	(+/-) COM TO BLEND,RECIRC,MODE ACTUATOR	45
9	C33 22DB/RD*	(+/-) VOLT TO BLEND AIR ACTUATOR	45
10	C35 22DG/YL*	(+/-) VOLT TO MODE ACTUATOR	45
11	C32 22GY/DB*	(+/-) VOLT TO RECIRCULATION ACTUATOR	45
12	E2 22OR	HEADLAMP SWITCHED DIMMABLE LAMP	44
13	C26 22PK/DB*	ATC +5V SIGNAL	45



CONNECTOR 2
VIEWED FROM TERMINAL END

CAV	CIRCUIT	FUNCTION	SHEET
1	C15 12BK/WT*	HEATED REAR WINDOW	44
	—	—	—
2	C4 18TN	A/C AND HEATER BLOWER MOTOR (LOW)	44
3	C6 18LB	A/C AND HEATER BLOWER MOTOR (M2)	44
4	—	—	—
5	Z1 12BK	GROUND	44
6	—	—	—
7	C5 18LG	A/C AND HEATER BLOWER MOTOR (M1)	44
8	A4 12BK/PK*	HEATED REAR WINDOW	44
9	—	—	—
10	C7 12BK/TN*	A/C AND HEATER BLOWER MOTOR (HIGH)	44

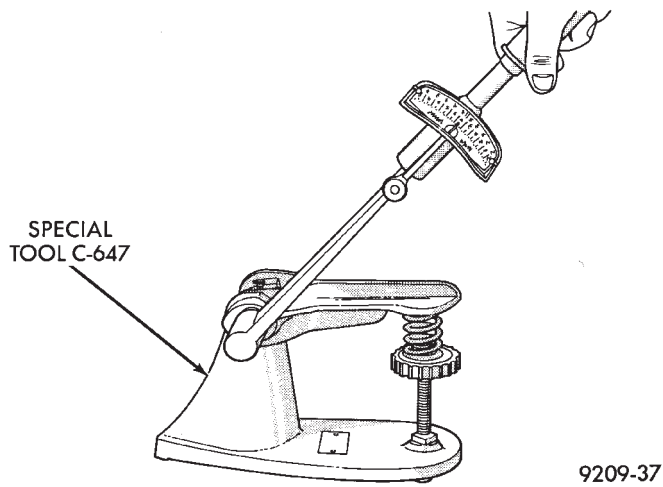


Fig. 22 Testing Valve Spring with Tool C-647

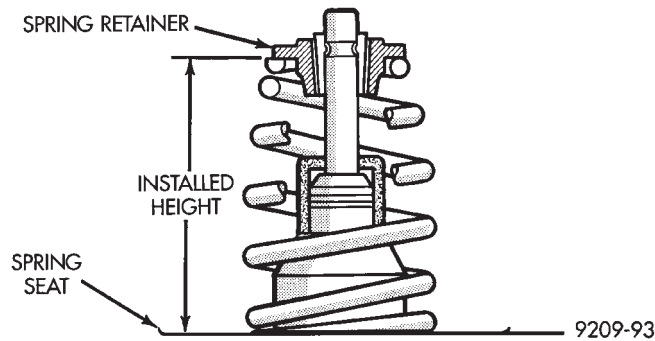


Fig. 23 Checking Valve Installed Height

VALVE INSTALLATION

- (1) Coat valve stems with clean engine oil and insert them in cylinder head.
- (2) If valves or seats are reground, check installed valve spring height (Fig. 23).
- (3) Install new cup seals on all valve stems and over valve guides (Fig. 23). Install valve springs and valve retainers.
- (4) Compress valve springs with Valve Spring Compressor Tool C-3422-B, with adapter 6412 install locks and release tool. **If valves and/or seats are reground, measure the installed height of springs, make sure measurements is taken from top of spring seat to the bottom surface of spring retainer. If height is greater than 1-19/32 inches, (40.6mm), install a 1/32 inch (.794mm) spacer in head counterbore to bring spring height back to normal 1-17/32 to 1-19/32 inch (39.1 to 40.6mm).**

REPLACE VALVE STEM SEALS OR VALVE SPRINGS, CYLINDER HEAD NOT REMOVED

- (1) Perform fuel system pressure release procedure **before attempting any repairs**
- (2) Disconnect negative battery cable.
- (3) Remove Air Cleaner Cover and hose assembly.

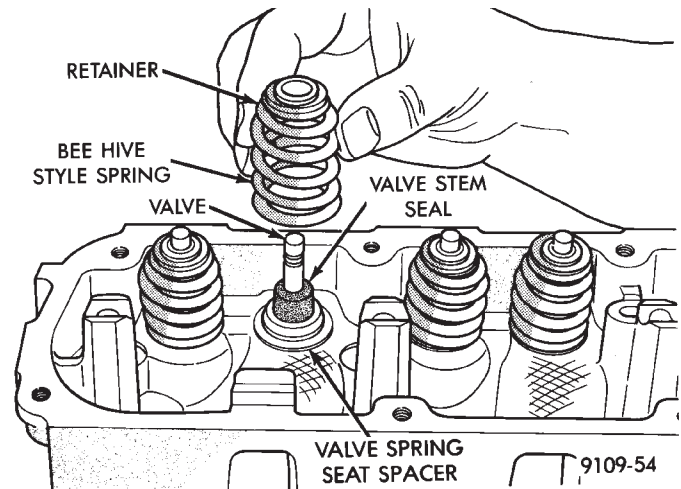


Fig. 24 Installing Valve, Cup Seal, Spring and Retainer

(4) Remove Intake Manifold; Refer to Intake/Exhaust Manifold 3.3L Engine Group 11 Exhaust System and Intake Manifolds of this manual for removal procedure.

- (5) Remove cylinder head covers and spark plugs.
- (6) Remove connector wire from ignition coils.
- (7) Using suitable socket and flex handle at crankshaft pulley retaining screw, turn engine so the number 1 piston is at Top Dead Center on the compression stroke.

(8) Remove rocker arms with rocker shaft and install a dummy shaft. The rocker arms should not be disturbed and left on shaft.

(9) With air hose attached to spark plug adapter installed in number 1 spark plug hole, apply 90 to 100 psi air pressure (620.5 to 689 kPa). This is to hold valves into place while servicing components.

(10) Using Tool C-4682 or Equivalent compress valve spring and remove retainer valve locks and valve spring.

(11) The intake valve stem seals should be pushed firmly and squarely over the valve guide using the valve stem as guide. **Do Not Force** seal against top of guide. When installing the valve retainer locks, compress the spring **only enough** to install the locks.

CAUTION: Do not pinch seal between retainer and top of valve guide.

(12) Follow the same procedure on the remaining 5 cylinders using the firing sequence 1-2-3-4-5-6. **Make sure piston in cylinder is at TDC on the valve spring that is being covered.**

- (13) Remove spark plug adapter tool .
- (14) Remove dummy shaft and install rocker shaft assembly and tighten screws to 28 N•m (250 in. lbs.).
- (15) Install rocker arm covers tighten screws to 14 N•m (120 in. lbs.) and connector to ignition coils.



(5) Position piston ring end gaps as shown in (Fig. 13).

(6) Position oil ring expander gap at least 45° from the side rail gaps but **not** on the piston pin center or on the thrust direction. Staggering ring gap is important for oil control.

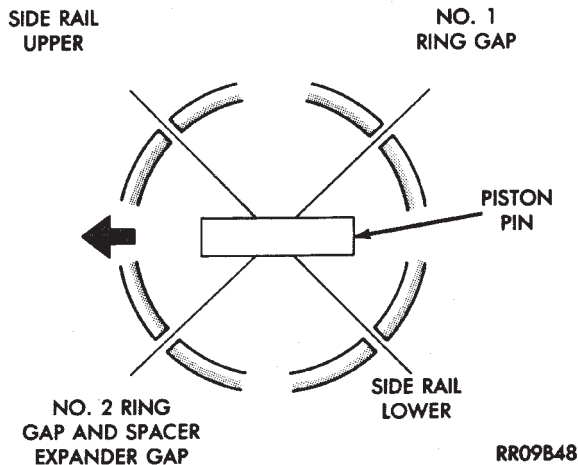


Fig. 13 Piston Ring End Gap Position

INSTALLING PISTON AND CONNECTING ROD ASSEMBLY

(1) Before installing pistons and connecting rod assemblies into the bore, ensure that compression ring gaps are staggered so that neither is in line with oil ring gap.

(2) Before installing the ring compressor, make sure the oil ring expander ends are butted and the rail gaps located as shown in (Fig. 14).

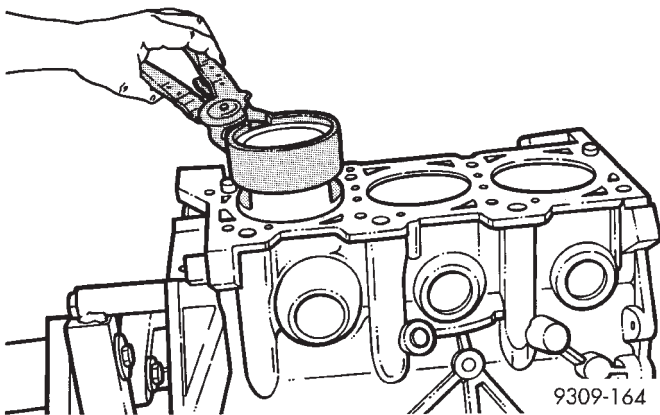


Fig. 14 Installing Piston

(3) Immerse the piston head and rings in clean engine oil, slide the ring compressor over the piston and tighten with the special wrench. **Be sure position of rings does not change during this operation.**

(4) Install connecting rod bolt protectors on rod bolts. (Fig. 3)

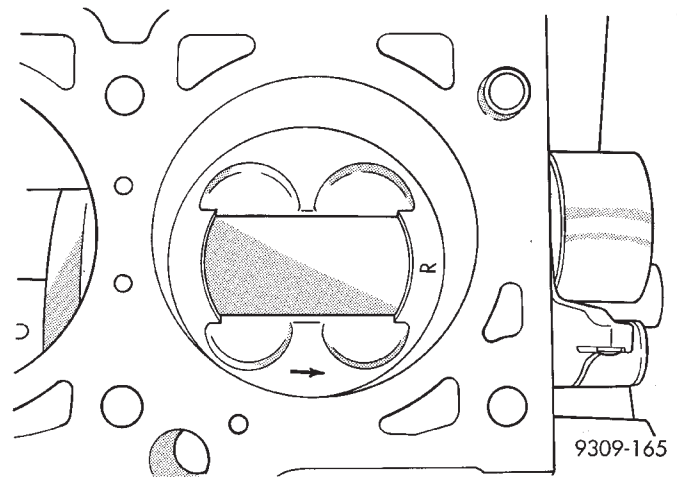


Fig. 15 Piston I.D. Marks

(5) Rotate crankshaft so that the connecting rod journal is on the center of the cylinder bore. Insert rod and piston into cylinder bore and guide rod over the crankshaft journal.

CAUTION: Piston Assemblies are not to be interchanged from bank to bank.

(6) The arrow on top of piston must be pointing toward front of engine (Fig. 15).

(7) Tap the piston down in cylinder bore, using a hammer handle. At the same time, guide connecting rod into position on connecting rod journal.

(8) Install rod caps. Install nuts on cleaned and oiled rod bolts and tighten nuts to 54 N•m (40 ft. lb.) Plus 1/4 turn.

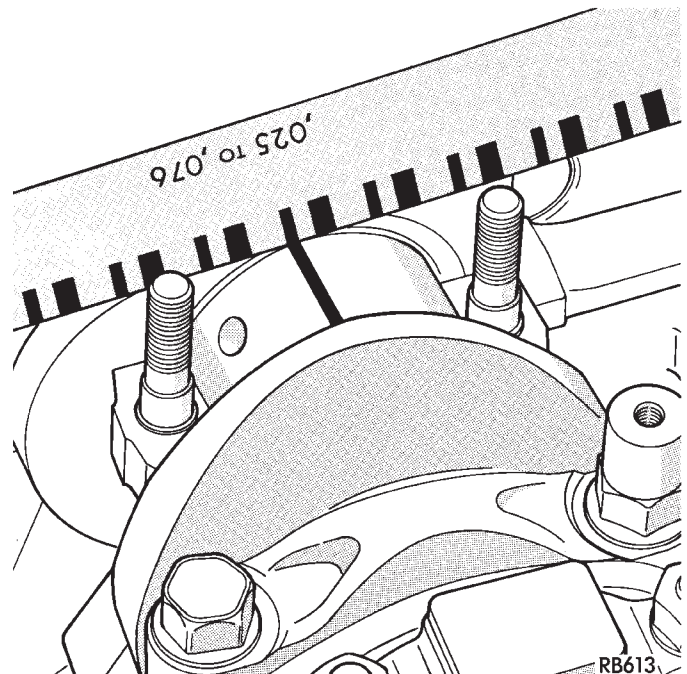


Fig. 16 Checking Connecting Rod Bearing Clearance—Typical

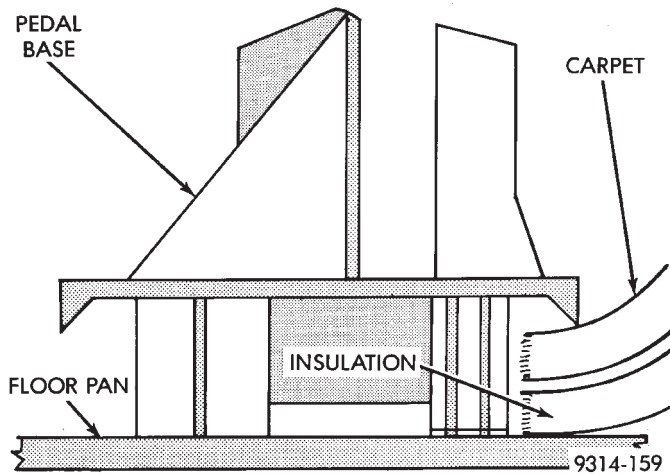


Fig. 4 Carpet and Insulation Placement

(3) Remove retainer clip from throttle cable and grommet at dash panel (Fig. 2).

(4) From the engine compartment, pull the throttle cable out of the dash panel grommet. The grommet should remain in the dash panel.

(5) Remove the throttle cable from throttle bracket by carefully compressing both retaining ears simultaneously. Then gently pull the throttle cable from throttle bracket.

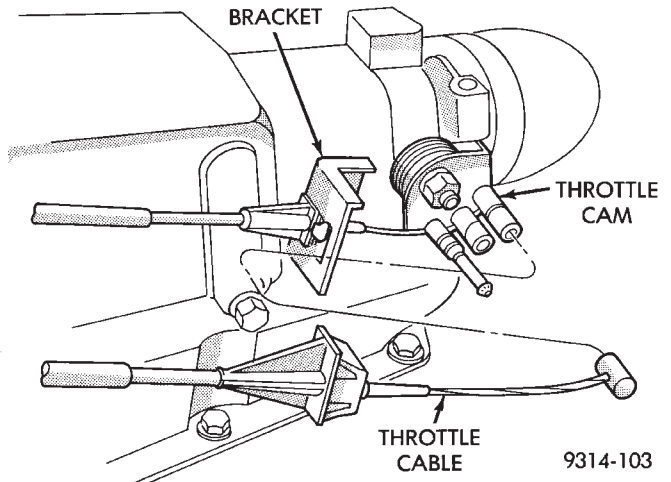


Fig. 6 Throttle Cable Removal/Installation—3.5L Engine

INSTALLATION

(1) From the engine compartment, push the housing end fitting into the dash panel grommet.

(2) Install the cable housing (throttle body end) into the cable mounting bracket on the engine.

(3) From inside the vehicle, hold up the pedal and install throttle cable and cable retainer in the upper end of the pedal shaft.

(4) At the dash panel, install the cable retainer clip between the end of the throttle cable fitting and grommet (Fig. 2).

(5) From the engine compartment, rotate the throttle lever to wide open and install the throttle cable. On 3.5L engines, ensure the power steering hose is routed through the hook on the throttle cable mounting bracket (Fig. 7). Make sure the throttle cam and power steering hose do not bind.

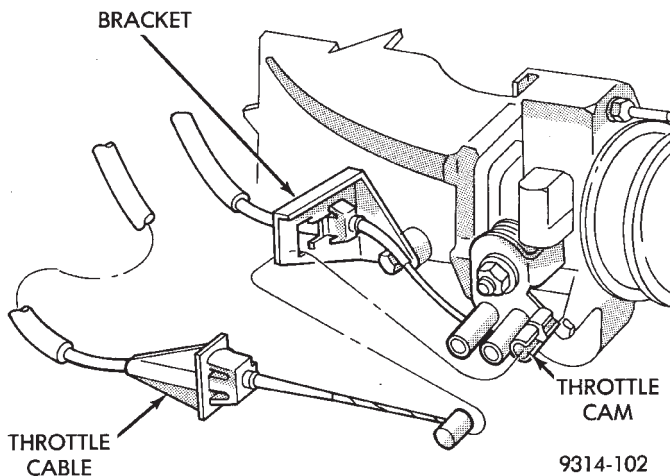


Fig. 5 Throttle Cable Removal/Installation—3.3L Engine

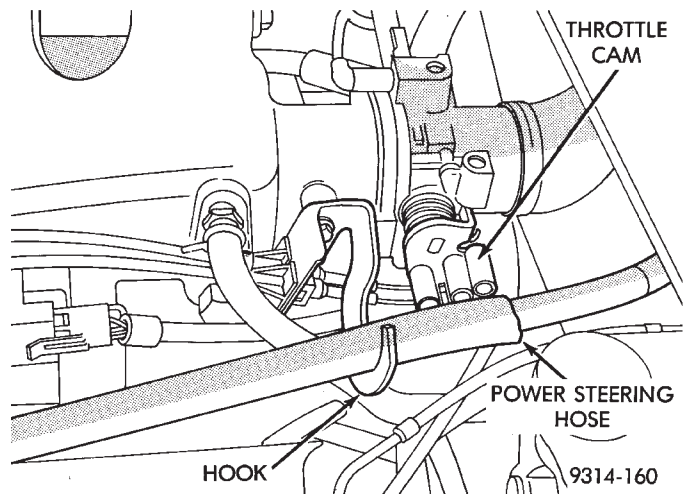


Fig. 7 Power Steering Hose and Bracket—3.5L Engine



EXHAUST EMISSION CONTROLS

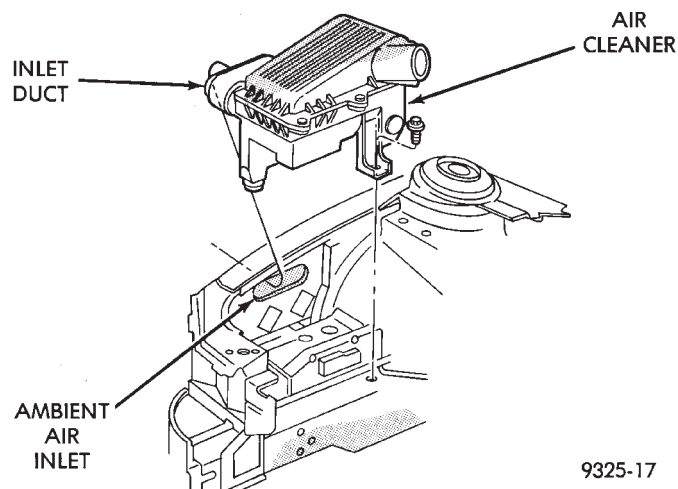
INDEX

	page		page
Air Cleaner	9	EGR Tube—3.5L Engine	16
EGR System Service	14	Exhaust Gas Recirculation (EGR) System	11
EGR Tube—3.3L Engine	15	Heated Oxygen Sensors	9

AIR CLEANER

LH vehicles do not use a heated air inlet system. The powertrain control module (PCM) adjusts fuel injector pulse width and ignition timing to compensate for different ambient temperatures.

The air cleaner attaches to the a bracket on right inner fender panel (Fig. 1). An opening in the body pane connect the inlet duct to ambient air.



9325-17

Fig. 1 Air Cleaner and Mounting Bracket

The 3.3L air induction system uses a resonator between the air cleaner and throttle body (Fig. 2). The make-up air hose for the PCV system attaches to the resonator.

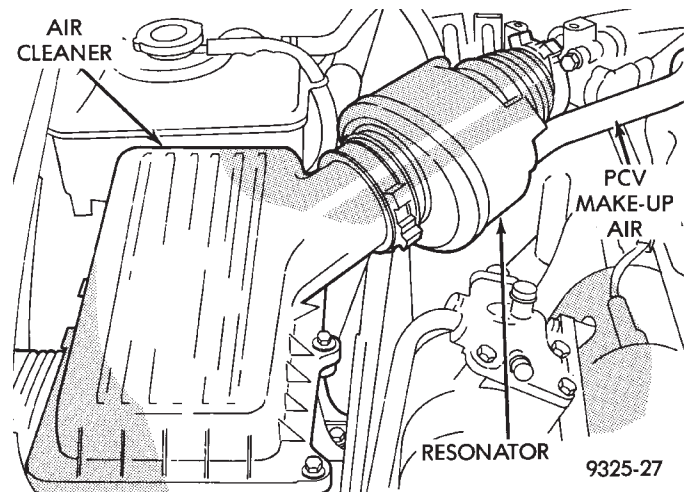
The 3.5L air induction system has a plenum that supplies filtered air to the throttle bodies, idle air control motor and PCV make-up air circuit (Fig. 3).

FILTER ELEMENT REPLACEMENT

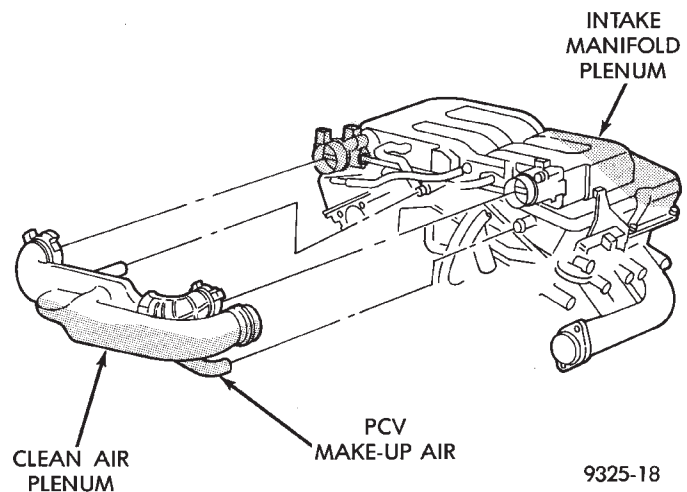
- (1) Remove air cleaner lid attaching screws. Lift lid off of air cleaner housing.
- (2) Remove filter element (Fig. 4).
- (3) If necessary, clean the inside of the air cleaner housing.
- (4) Install new filter element.
- (5) Place lid over air cleaner housing. Tighten screws.

HEATED OXYGEN SENSORS

The fuel injection system uses two heated oxygen sensors. Both sensors monitor the amount of oxygen in the exhaust gas stream. The oxygen sensors are



9325-27

Fig. 2 Air Induction System—3.3L Engine

9325-18

Fig. 3 Clean Air Plenum—3.5L Engine

mounted in the exhaust manifolds (Fig. 5 or Fig. 6). The left sensor monitors the odd numbered cylinders. The right sensor monitors the even numbered cylinders.

The inputs from the oxygen sensors tell the powertrain control module (PCM) the oxygen content of the exhaust gas. Based on the inputs from the two oxygen sensors, the PCM fine tunes the air-fuel ratio in each cylinder bank by adjusting injector pulse width.

The heated oxygen sensors produce from 0 to 1 volt, depending upon the oxygen content of the exhaust gas in the exhaust manifold. When a large amount of oxygen is present (caused by a lean air-