

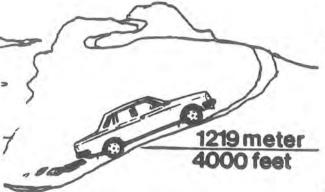
| Reference Bulletins: | Subject: | Product |
|----------------------|---|-------------|
| | ALTITUDE ADJUSTMENTS 140, 160, 1800 | CARS |
| | 240, 260 DIESEL MODELS 1968-82 | Group 24 |
| | Date: JANUARY, 1982 | No. 101 |

Page 1 of 6 THIS BULLETIN APPLIES TO THE U.S. ONLY AND SUPERSEDES SEPTEMBER 1981. IT CONTAINS INFORMATION DESIGNED TO IMPROVE ENGINE PERFORMANCE OF VEHICLES NORMALLY OPERATED AT ALTITUDE ABOVE 4000 FT. (1219 METERS).

Altitude adjustments

What are they?

Altitude adjustments are: "adjustments made to vehicle, engine or emissions control function in order to improve emissions at altitudes other than those for which the vehicles were designed."



Why do it?

EPA regulations permit adjustment of vehicles The Environmental Protectionto improve high altitude performance without causing excessive exhaust emissions.

Agency (E.P.A.) defines: - <u>High altitude</u> as any elevation of more than 1219 meters (4000 feet)

 Low altitude as any elevation less or equal to 1219 meters (4000 feet)

See page 3 for list of counties designated by E.P.A. as high altitude counties.

Altitude adjustments will improve: - exhaust emissions - engine performance

- engine driveability



Important that all Service Personnel Read - Circulate and initial

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| SERVICE | SHOP FOREMAN | SERVICE | SERVICE TECHNICIANS |
|---------|-----------------|---------|---------------------|
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When to do it?

All vehicles are adjusted for low altitude as delivered from the factory.

<u>Certain new vehicles</u> sold for principal use at high altitude (82 and later) <u>must be</u> <u>adjusted</u> before delivery to the customer. This is to be done by the dealer and should be considered part of the normal Pre-Delivery Service.

Owners of vehicles 1968-1981 operating vehicles principally in high altitude areas (above 4000 ft) are recommended to adjust their vehicles for high altitude operation

NOTE: Vehicles adjusted for high altitude operation <u>must be re-adjusted</u> to low altitude specifications when the vehicle is returned to continuous low altitude operation.

How to do it?

Carburetor engines (B2OB, B3OA) see page 4 Fuel injection engines (B2OF, B21F, B27/28F, B3OF) see page 5 Diesel engines (D24) see page 8

Counties wholly situated above 1219 meters (4000 feet)

Bannock

State of Idaho

Volvo Dealers located in those counties who are predominently affected by the regulations are identified by Dealer Number.

State of Arizona

Apache Navejo State of Colorado

| (Jame | 10550000 / 12771 |
|-----------------|------------------|
| Adams | Jefferson (4377) |
| Alamosa (4270) | Lahe |
| Arapahoe (4370) | La Plata |
| Archuleta | Larimer (4322) |
| Boulder (4336) | Las Animes |
| Chaffee | Lincoln |
| Clear Creek | Mesa (4356) |
| Conejos | Mineral |
| Costilla | Moffat |
| Crowley | Montemuma |
| Custer | Montrose |
| Dolores | Morgan |
| Delta | Ouray |
| Denver (4323) | Park |
| Douglas | Pikin |
| Eagle | Pueblo (4321) |
| Elbert | Rio Blanco |
| El Paso (4380) | Rio Grande |
| Freemont | Routt |
| Garfield | Saguache |
| Gilpin | San Juan |
| Grand | San Miguel |
| Gunnison | Summit |
| Hinsdale | Teller |
| Huerfano | Washington |
| Jackson | Weld (4335) |
| | |

Bear Lake Bingham Blaine Bonneville Butte Camas Caribou Cassia Clark Custer Franklin Fremont Jefferson Modison Minidoka Oneida Power Teton Valley

State of Montana

Beaverhead Deer Lodge Gallatin Jefferson Madison Meagher Park Silver Bow

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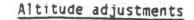
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Counties wholly situated above 1219 meters (4000 feet) (Con't)

| State of Nebraska | State of Oregon | |
|---|------------------|--|
| Banner | Lake | |
| Kimball | | |
| Sioux | State of Utah | |
| State of Nevada | Beaver | |
| A PROPERTY OF A | Box Elder | |
| Carson City | Cache | |
| Douglas | Carbon | |
| Elko | Daggett | |
| Esmeralda | Davis | |
| Eureka | Duschesne | |
| Humboldt | Emery | |
| Lander | Grand | |
| Lyon | Iron | |
| Mineral | Jaub | |
| Storey | Kane | |
| White Pine | Millard | |
| | Morgan | |
| State of New Mexico | Piute | |
| Source of them them to | Rich | |
| Bernalillo (4320) | Salt Lake (5281) | |
| Catron | San Juan | |
| Colfax | Sanpete | |
| Curry | Sevier | |
| De Baca | Summit | |
| Grant | Topele | |
| Guadalupe | Unitah | |
| Harding | Utah | |
| Lincoln | Wasatch | |
| Los Alamos | Wayne | |
| Luna | Weber (5278) | |
| McKinley | and the second | |
| Mora | State of Wyoming | |
| Rio Arriba | | |
| Sandoval | Albany | |
| San Juan | Carbon | |
| San Miguel | Converse | |
| Sante Fe (4385) | Fremont | |
| Sierra | Goshen | |
| Socorro | Hot Springs | |
| Taos | Johnson | |
| Torrance | Laramie | |
| Union | Lincoln | |
| Valencia | Natrona | |
| | Niobrara | |
| | Park | |
| | Platte | |
| | Sublette | |
| 12 | Sweetwater | |
| | Teton | |
| | | |
| | Unita | |

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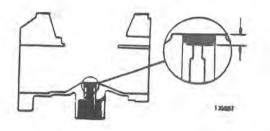




Carburetor engines (B20B, B30A)

Adjust the vehicle at the actual altitude it will be driven

High altitude adjustment of carbureted engines means that the specified values for idle-Co and idle speed should be checked and if necessary adjusted at the actual altitude the vehicle is to be operated.

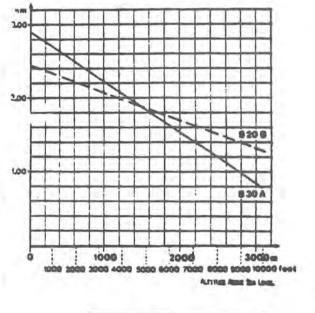


LOW ALTITUDE

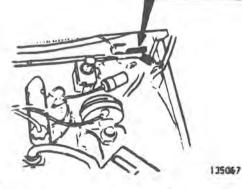
135010

If specified values cannot be met (i.e., vehicles that have been driven many miles) this can mean that the fuel metering needle and/or jet are worn. In this case they must be replaced before proper adjustments can be made.

NOTE: When replacing the fuel jet, the basic adjustment varies according to altitude, see diagram.







Label

Vehicles that have been adjusted for high altitudes must also have a label applied in the engine compartment.

- Clean the area with a suitable agent and apply the label, part no. 1313496-0.
- NOTE: When an engine is re-adjusted for low altitude the label must be removed.

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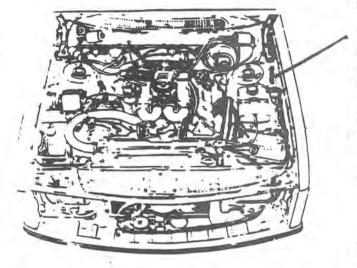
Altitude adjustments

Fuel injection engines (B2OF, B21F, B27/28F, B3OF)





LOW ALTITUDE 135010



Adjust the vehicle at the actual altitude it will be driven

High altitude adjustment of fuel injected engines means that the specified values of idle-CO and idle speed should be checked and if necessary adjusted at the actual altitude the vehicle is to be driven at.

On engine B28F Federal 1981-82 further measures must however be taken, see below.

Label

Vehicles that have been adjusted for high altitudes must also have a modification label applied in the engine compartment.

- Clean the area with a suitable agent and apply the label, part no. 1313496-0.
- NOTE: When an engine is re-adjusted for low altitude the label must be removec.

B28F 1981-82

Switch Manifold



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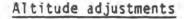
Wire

High altitude: disconnect full load enrichment

- Remove black wire from micro-switch located adjacent to throttle control pulley (see illustration)
- Insulate connector using electrical tape or equivalent and secure to wiring harness.

CAUTION:

Do not allow the connector to contact switch terminals.



Diesel engines D24 1981-82

SING COLLEGE

High altitude adjustments Change fuel injection pump setting. Two separate adjustments are required.

For each 3,300 feet (1,000 meters) increase in altitude:

- increase injection timing by 0.07mm (distributor plunger stroke at top dead center)
- reduce fuel injection amount by 2.3cc/stroke. (This corresponds to counterclockwise movement of the screw approx. 35 degrees.)

Example: for an altitude of 2,000 meters (6,600 feet) above sea level:

Calculate injection timing setting

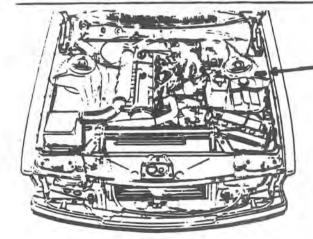
Normal setting + $(2000 \text{ m} \times 0.07)$ = High altitude setting 1000 m

Normal setting for 1980-81 = 0.75mm Normal setting for 1982 = 0.85mm

Calculate fuel amount adjustment screw setting

nigh Altitude Label

2000 m x 35 degrees = 70 degrees (the screw should be turned 70 degrees 1000 m counterclockwise)



THIS VEHICLE IS MODIFIED FOR HIGH ALTITUDE ORIVING

Vehicles that have been adjusted for high altitude must also have two labels applied in the engine compartment. Clean the area with a suitable agent and apply the labels, part no. 131496-0.

LOW altitude adjustment

Re-adjust injection timing and fuel amount adjusting screw setting to normal settings.

Remove labels.

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