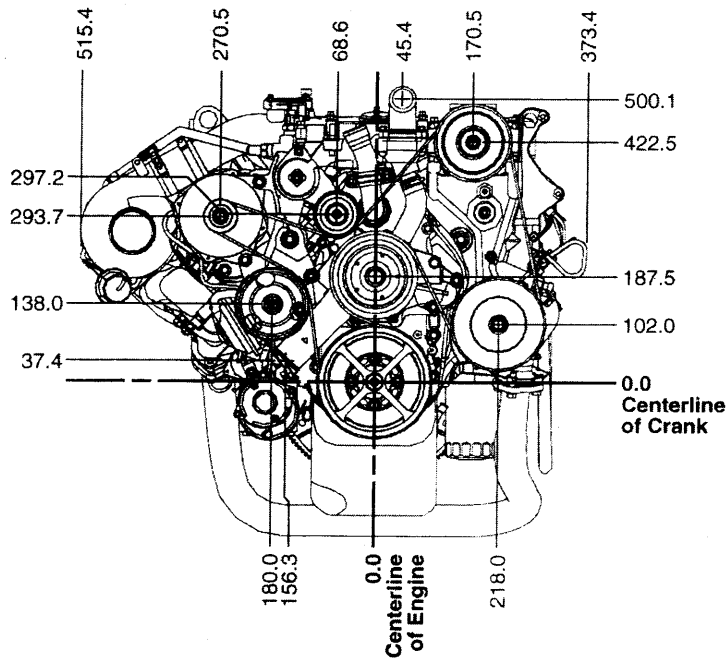
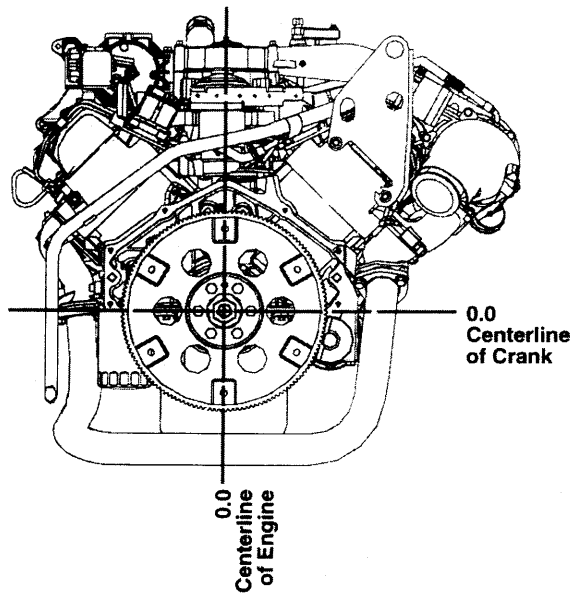


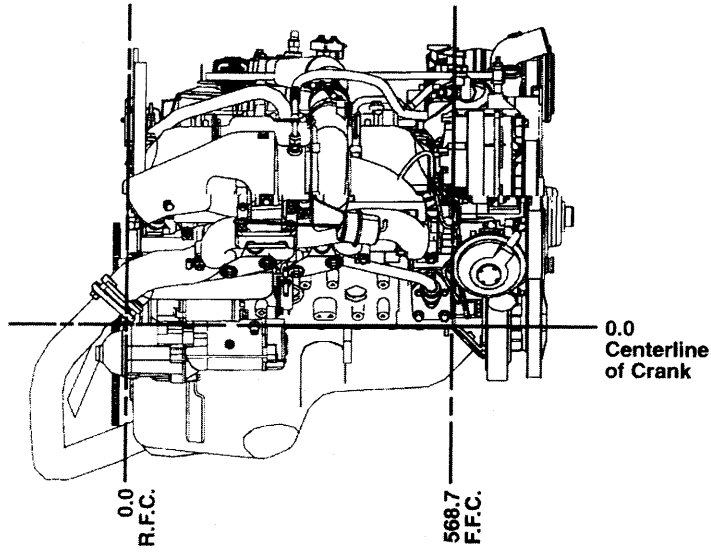
L65 P Truck Type Application Main Views



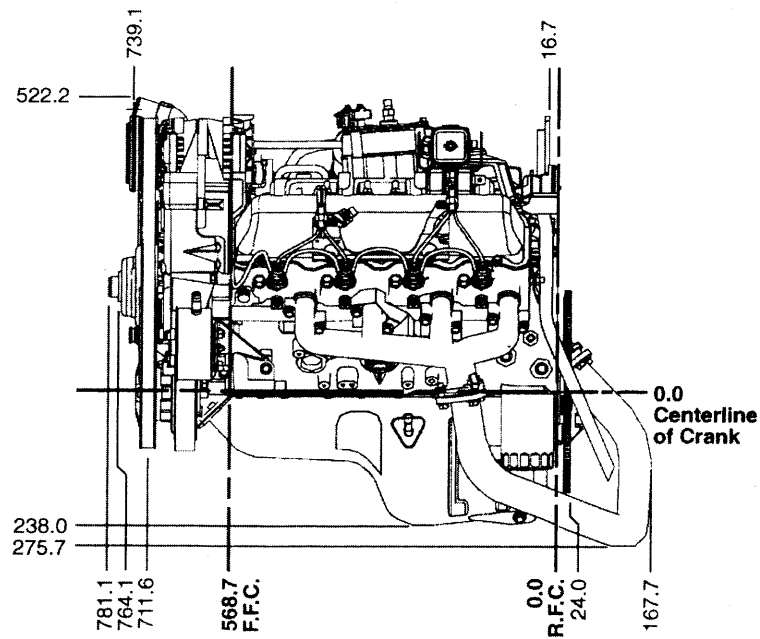
L65 Front View



L65 Rear View

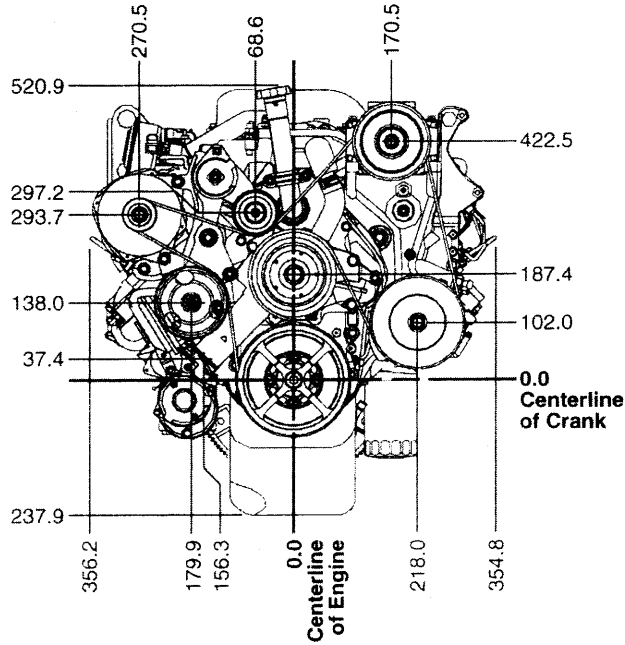


L65 RH Side View

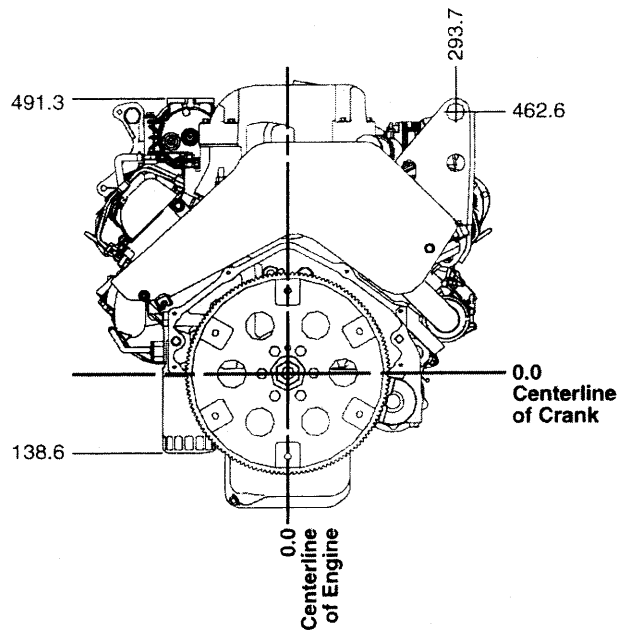


L65 LH Side View

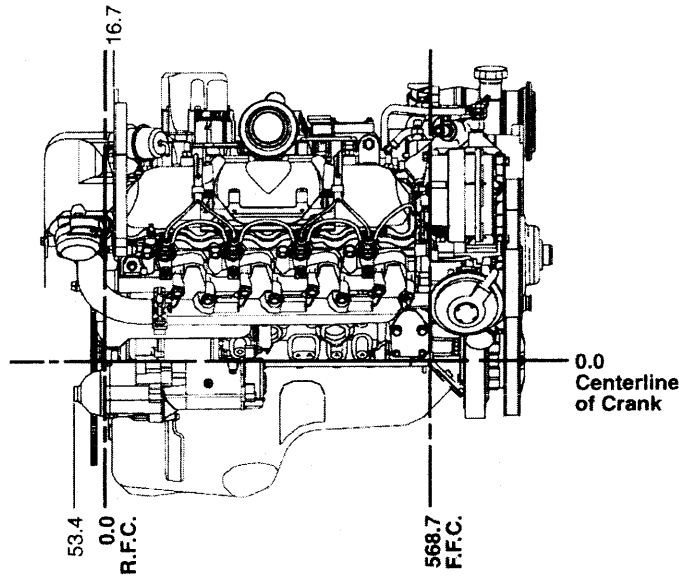
L65 Center Mounted Turbo Main Views



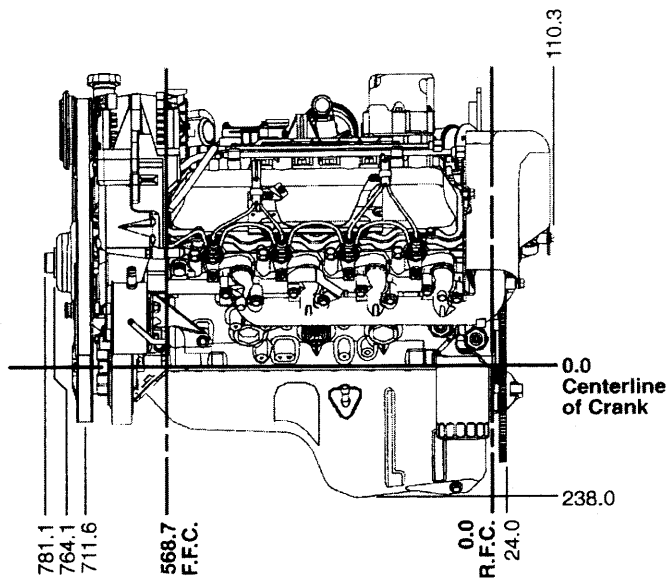
L65 Front View



L65 Rear View



L65 RH Side View



L65 LH Side View

3.0 Major System and Interface Descriptions

3.1 Transmission

The transmission shall be attached to the rear end of the engine which provides the flange face attachment illustrated in the figure 3.1-1.

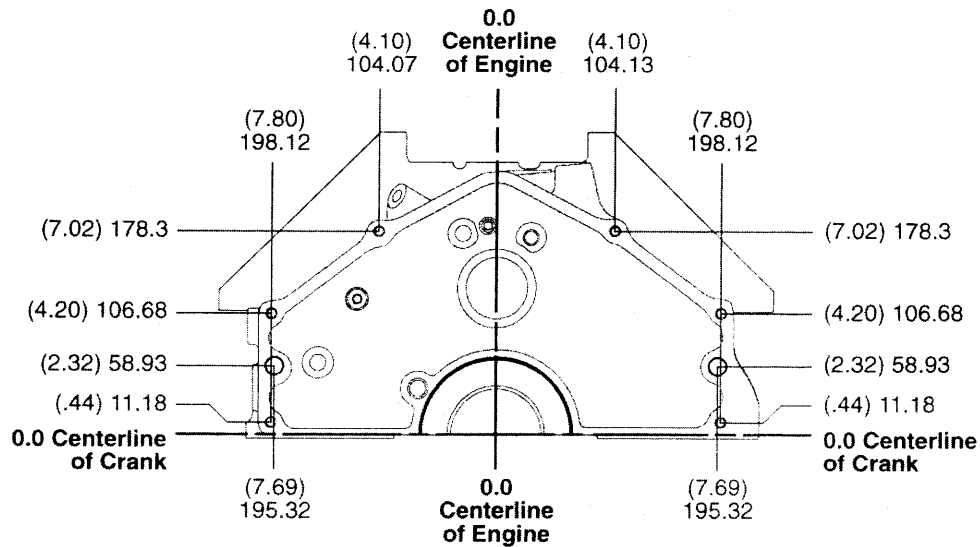


Figure 3.1-1: Transmission Attachment

3.1.1 Transmission System

Engine transmission interface must be achieved considering different combinations of engines and transmissions of different OEM's, manual or automatic type.

Figure 3.1.1-1 shows the different possible combinations and the possible interfaces required to address by GEP and Customer Engineers.

		Transmission Configuration Requirements		
		Automatic		Manual
		Electronic Controlled	Mechanical Controlled	Mechanical Controlled
Engine Requirements	PCMECM Electronic Controlled Engine	Vehicle Speed Sensor	Vehicle Speed Sensor	Vehicle Speed Sensor
		Brake Switch	Brake Switch	Brake Switch
		4WD Switch	Barometric Pressure (opt.)	Clutch Pedal
		A/C Switch		
		Shift Switches		
		Torque Conv. Clutch (TCC)		
		Trans. Fluid Temp. (TFT)		
		Pressure Control Solenoid		
	Trans. Range Pres. Switch			
	Mechanical Controlled Engine	Throttle Position Sensor	Engine Load	No Interface Needs Between Engine & Transmission
		Engine Speed Sensor (RPM)	Brake Switch	
		Barometric Pressure (opt.)	Barometric Pressure (opt.)	
		A/C Switch	TPS Valve	
		Vehicle Speed	VRV Valve	
Brake Switch		TV Cable		

Figure 3.1.1-1 Engine Transmission Combinations

2.5 Configuration as Shipped

2.5.1 Engine as Shipped

Engine as shipped from the engine plant is to conform to a common state of dress as described below. The following components are installed at the engine plant:

- Accessory Drive Brackets that are standard across an engine family
- Coolant Temperature Sensor/Switch
- Harmonic Balancer
- Crankshaft Sensor
- Direct Drive Accessories (not belt driven)
- Engine Lift Brackets
- Engine Oil
- Engine Oil Dipstick and Tube (Except L57 and L65 GMT 600)
- Exhaust manifold(s)
- Exhaust Manifold Heat Shields (As required)
- Engine Fuel System
- Heater Hose Nipples
- Engine Wiring Harness
- Manifold Air Pressure Sensor Pipes/Hoses
- Oil Pressure Sensor/Switch
- Oil Filter
- Transmission Alignment Dowels
- Water Pump
- Flywheel and or Flexplate
- Fuel Filter with Header (except L65 with Center Mount Turbo - GMT 600)
- Crankcase Ventilation System
- Front Crankshaft Pulley

2.6 Identification and Marking Tag

2.6.1 Engine Serial Number

The Engine Serial Number is located on the right front cylinder head, the left rear cylinder head, and on the oil pan.

2.6.2 Emissions Certification Labeling

A vehicle emission control label that meets the format and content requirements of Federal Regulation 40 CFR 86.095-35 and CARB Regulation Title XIII California Code of Regulations Section 1965 shall be attached to the vehicle subsystem in the location required by the regulations above.

Incomplete Vehicles manufactured in two or more stages shall meet the certification labeling requirements of the regulations above.

2.6.3 Engine Identification - Broadcast Codes

The 6500 Diesel Engine has an identification number stamped on an upper front left bank of the block, near the #1 cylinder intake manifold.

The stamping shows the following information:

- Broadcast code (engine configuration), using the first three characters:
 - Model year (1st letter)
 - Engine size and application (2nd & 3rd letters)
- Month of manufacture, using two digits (01 to 12)
- Day of manufacture using two digits (01 to 31)

3.1.1.1 Automatic Transmission - L57 & L65

The GEP Automatic Transmission recommended is the Hydramatic 4L80-E(MT1).

The following engine-transmission interface issues must be considered:

- a. Compatible Rotation
- b. Torque Converter ballooning at stall
 - 1. Flex Plate burst speed
 - 2. Thrust Bearing load
- c. Attachment
- d. Concentricity
- e. Bending Moment at rear face of block
- f. Transmission Torque, Speed Management
- g. Transmission Vacuum Supply (If required)
- h. Torsional Requirements

Figure 3.1.1.1-I shows the PCM Engine to Automatic Transmission Electric Diagram

The following sensors and switches signals must be equalized:

- 4WD Low Switch
- Vehicle Speed Sensor (VSS)
- Range Pressure Switch
- Transmission Input Speed Sensor
- Switch Solenoids
- Connections to PCM

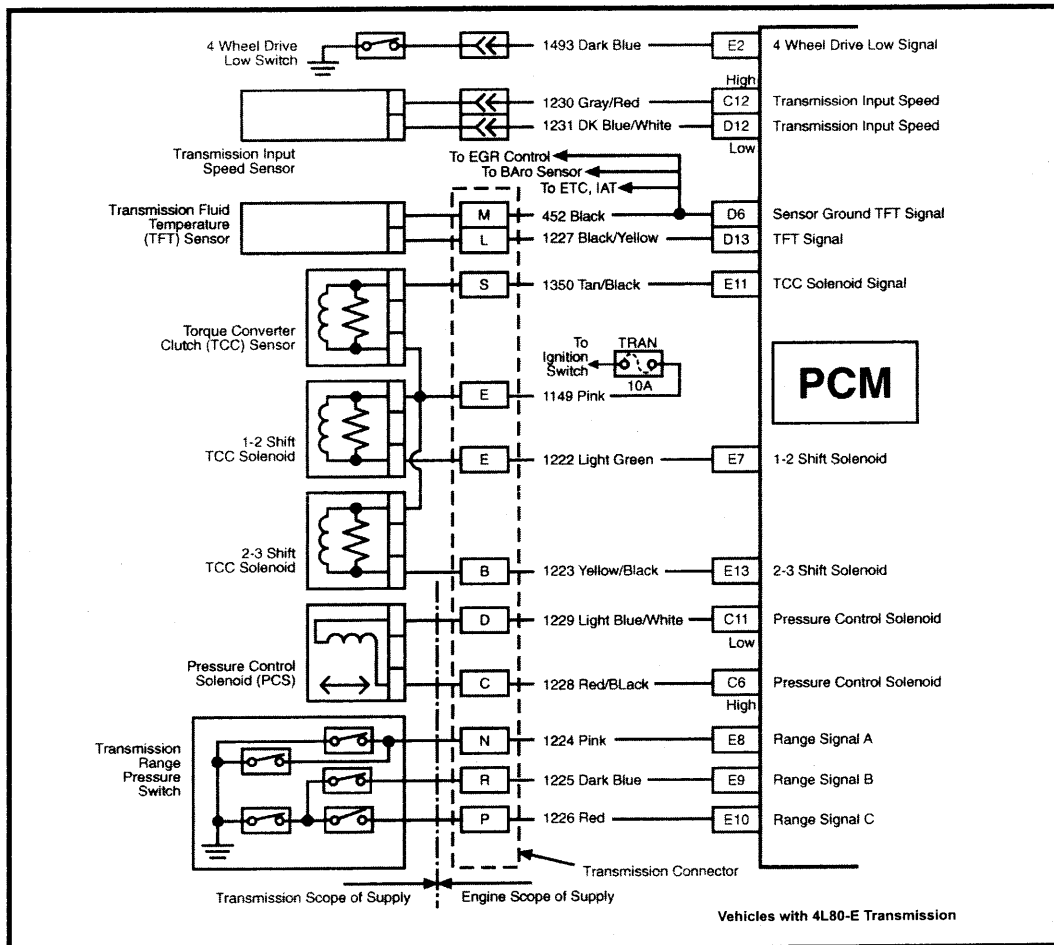


Figure 3.1.1.1-I PCM Engine to Automatic Transmission Electric Diagram

3.1.1.2 Automatic Transmission - L65-04

The GEP Automatic Transmission recommended is the Hydramatic 4L80-E(MT1).

The following engine-transmission interface issues must be considered:

- a. Compatible Rotation
- b. Torque Converter ballooning at stall
 - 1. Flex Plate burst speed
 - 2. Thrust Bearing load
- c. Attachment
- d. Concentricity
- e. Bending Moment at rear face of block
- f. Transmission Torque, Speed Management
- g. Transmission Vacuum Supply (If required)
- h. Torsional Requirements

Figure 3.1.1.2-I shows the TCM Engine to Automatic Transmission Electric Diagram

The following sensors and switches signals must be equalized:

- 4WD Low Switch
- Vehicle Speed Sensor (VSS)
- Range Pressure Switch
- Transmission Input Speed Sensor
- Switch Solenoids
- Connections to TCM

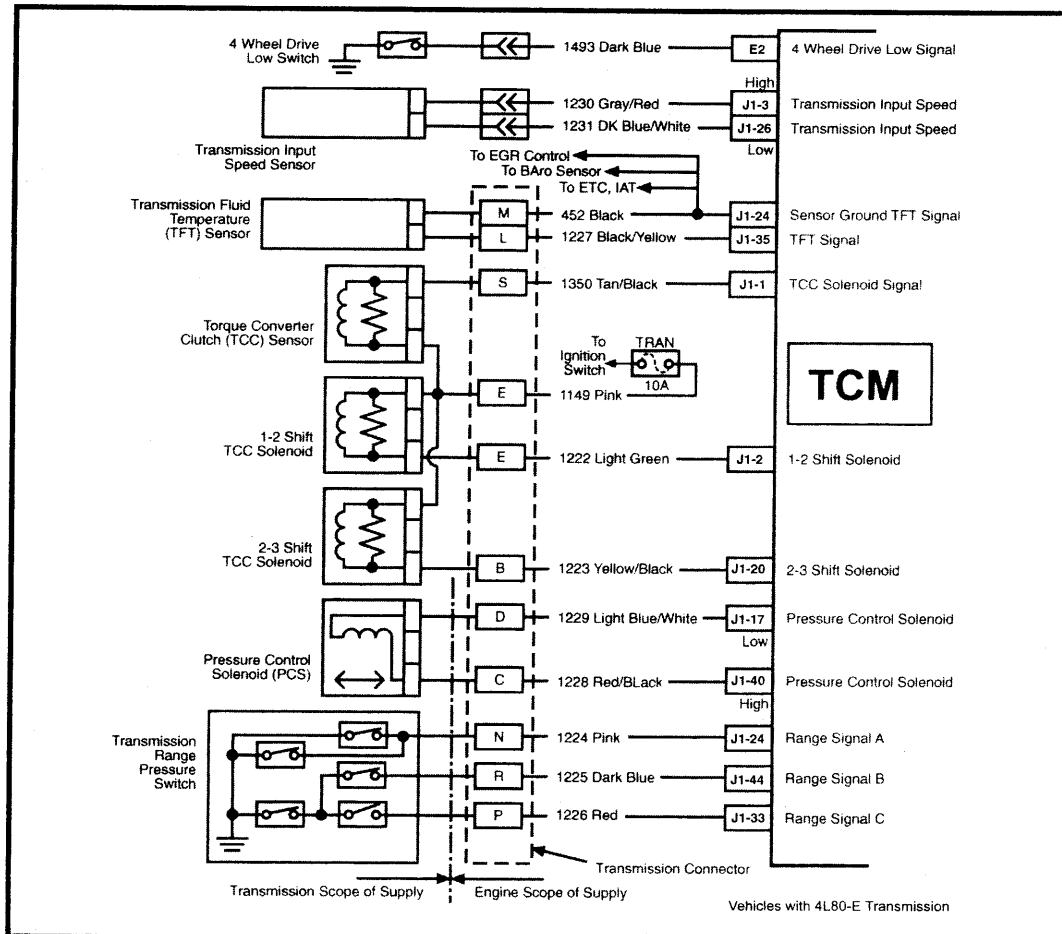


Figure 3.1.1.2-I TCM Engine to Automatic Transmission Electric Diagram

3.1.1.3 Manual Transmission and Clutch

The GEP Manual Transmission recommended is a Five Speed Manual (MW 3).

The following engine-transmission, clutch interface issues must be considered:

- a. Compatible Rotation
- b. Attachment
- c. Concentricity
- d. Bending Moment at rear face of block
- e. Transmission Torque, Speed Management
- f. Torsional Excitation
- g. Clutch Induced Thrust Load
- h. Pilot Bearing or Bushing requirement for Engine Crankshaft
- i. Flywheel Burst Speed and Inertia Mass

The engine shall be removable with the transmission remaining in the vehicle. The transmission shall be replaceable with the engine in place.

Manual transmissions require the engine crankshaft pilot bearing to be able to support up to 920 lbs (4292 N) of radial load due to transmission internal gear forces.

The Clutch connection to PCM electric diagram shows the characteristics of the input that the PCM will require. (See Figure: 3.4.3.3-1).

3.2 Accessory Drive System

The maximum allowable torque transmitted through the front crankshaft pulley is 72 ft lbs.

3.3 Standard Accessory Descriptions

The application engineer will indicate the detailed auxiliary bracket assemblies needed for any engine application.

3.3.1 Cooling Fan

Cooling Fan assembly is not part of the engine scope or extent of supply.

GEP might supply under customer request and specification, a Cooling Fan produced by GEP or one of its subsidiaries; but in no case, such Cooling Fan alone and/or in combination with: the alternator, Air Conditioning Compressor and any other Accessory Drive shall produce a resistive torque to be driven from the front crankshaft pulley in excess of 72 ft. lb.

3.3.2 Alternator

Alternator is not part of the engine scope or extent of supply.

GEP might supply under customer request and specification, an electrical generator assembly produced by GEP or one of its subsidiaries; but in no case, such electrical generator alone and/or in combination with: the Power Steering Pump, Air Conditioning Compressor and any other Accessory Drive shall produce a resistive torque to be driven from the front crankshaft pulley in excess of 72 ft-lb.

3.3.3 Power Steering Pump

Power steering pump assembly is not part of the engine scope or extent of supply.

GEP might supply under customer request and specification, a power steering pump produced by GEP or one of its subsidiaries; but in no case, such power steering pump alone and/or in combination with: the alternator, Air Conditioning Compressor and any other Accessory Drive shall produce a

resistive torque to be driven from the front crankshaft pulley in excess of 72 ft. lb.

3.3.4 A/C Compressor

Air conditioning compressor is not part of the engine scope of supply.

GEP might supply under customer request and specification, an air conditioning compressor produced by GEP or one of its subsidiaries; but in no case such air conditioning compressor alone and/or in combination with: the alternator, Power Steering Pump and any other Accessory Drive shall produce a resistive torque to be driven from the front crankshaft pulley in excess of 72 ft. lb.

GMPT shall not define any vehicle air conditioning parameters.

3.3.5 Vacuum Support for Brakes

A belt driven vacuum pump will be supplied with the turbo engine.

The vacuum pump is the basic diaphragm type driven from a press-on pulley.

The weight of the belt driven pump is 1.18 Kg. Typical performance of the pump is graphically shown in the tables below. (Figures: 3.3.5-I and II)

6500 Vacuum Pump Performance at Indicated RPM's / 136 Series
500mmHg

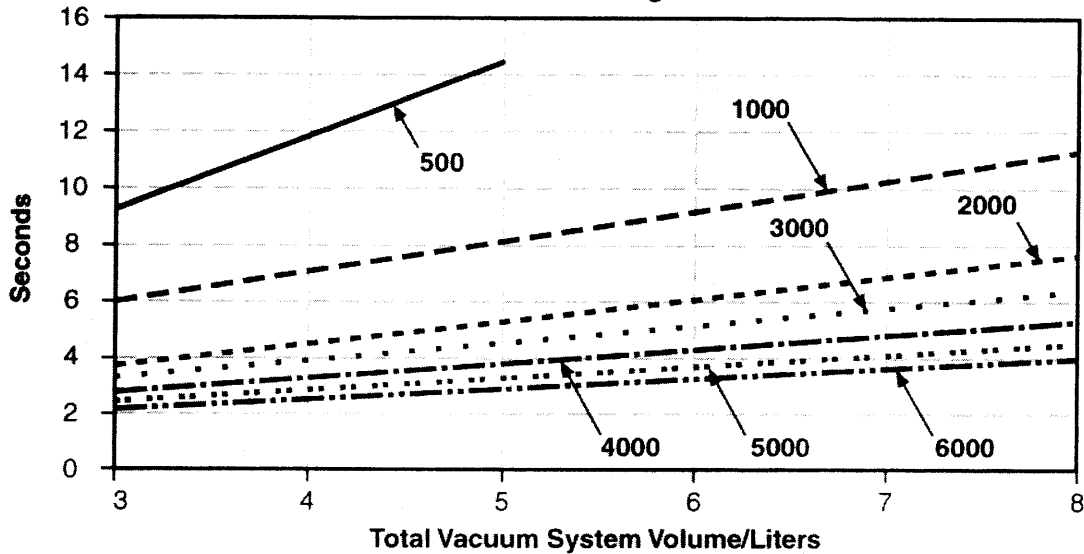


Figure 3.3.5-I Vacuum Support for Brakes