

Section 7 – Transmission

Models equipped with automatic transmissions have a steering column mounted neutral/park start safety mechanical lockout feature, which interfaces with the steering column ignition switch. Starter should operate only when gearshift lever is in neutral or park position. Readjust the shift linkage if necessary as outlined in the Truck Service Manual.

Transmission lubricant capacity. (Refer to Owner's Manual).

It is mandatory that no change be made to the clutch master cylinder location, clutch master or slave cylinder push rod length, or pedal position.

POWERTRAIN SPECIFICATIONS AND LINE-UP CHARTS

SPECIFICATIONS – AUTOMATIC TRANSMISSIONS (6-SPEED)

	6-SPEED	6-SPEED	6-SPEED
RPO	MYC	MYD	MW7
MAKE	6L80	6L90	ALLISON
CASE MATERIAL	ALUMINUM	ALUMINUM	ALUMINUM
TORQUE RATING (LB.-FT.)	439	531	660
RATIO (:1)			
1st Gear	4.03	4.03	3.10
2nd Gear	2.36	2.36	1.81
3rd Gear	1.53	1.53	1.41
4th Gear	1.15	1.15	1.00
5th Gear	0.87	0.87	0.71
6th Gear	0.67	0.67	0.61
Reverse	3.06	3.06	4.49
OUTPUT SHAFT SPLINE # OF TEETH	32 (2WD/AWD)	36 (2WD) / 29 (AWD)	34
PITCH DIAMETER	33.8667 mm	38.1 mm (2WD)/36.25 mm (AWD)	43.18 mm
TORQUE CONVERTER CLUTCH	YES	YES	YES
SIZE	300 mm	300 mm	310 mm
“K” FACTOR	101 k	101 k	6.6L = 107
STALL TORQUE RATIO	1.9	1.9	6.6L = 2.0
PTO OPENING	NO	NO	YES

POWERTRAIN SPECIFICATIONS AND LINE-UP CHARTS

SPECIFICATIONS – AUTOMATIC TRANSMISSIONS (8-SPEED)

	8-SPEED	8-SPEED
RPO Codes	M5N, M5T	M5U, M5X
Make	8L45	8L90
Case Material	Aluminum	Aluminum
Torque Rating (lb/ft)	635	635
1st Gear Ratio	4.62	4.560
2nd Gear Ratio	3.04	2.971
3rd Gear Ratio	2.07	2.075
4th Gear Ratio	1.66	1.688
5th Gear Ratio	1.26	1.270
6th Gear Ratio	1.000	1.000
7th Gear Ratio	0.85	0.845
8th Gear Ratio	0.60	0.652
Reverse	3.93	3.818
Torque Converter Size Diameter of Torque Converted Turbine	236 mm	258 mm
Torque Converter Clutch	Yes	Yes
PTO	No	No

GENERAL INSTRUCTIONS - NEW FULL SIZE C/K PICKUPS & CHASSIS-CABS

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AUTOMATIC TRANSMISSION/ENGINE AVAILABILITY MATRIX

ENGINE / TRANSMISSION	M5U	M5X	MYC (6-SPEED)	MYD (6-SPEED)	MW7 (6-SPEED)
4.3L LV3 V6			BASE	N/A	N/A
5.3L L83 V8	A		BASE	N/A	N/A
6.6L L5P DIESEL			N/A	N/A	A
6.2L L86 V8	A		BASE	N/A	N/A
5.3L L8B		A			

Section 8 – Fuel and Exhaust

Fuel Systems

The fuel evaporative emission control equipment is certified to be in compliance with the Federal and California Vehicle Emission Standards. The fuel tank is molded from multi-layer plastic and should not be repaired or altered. Metal fuel lines have a surface coating to reduce corrosion on inside and outside surfaces to comply with useful life requirements. All fuel hoses, including plastic lines, are made of a low permeation multi-layer material to comply with enhanced evaporative emission requirements. Any alterations to systems or components including materials, hose lengths and their location, except as described in the fuel fill system modifications section, could void compliance. The system includes:

- Fuel tank, fuel level sender, fuel fill and vent hoses and pipes, emission canisters, fuel feed, fuel return and vapor lines, purge control solenoids, fuel fill cap, canister vent solenoid.

For these reasons, **NO ALTERATION OF THE FUEL SYSTEM IS RECOMMENDED.**

Fuel Fill

It is recommended that when mounting the fuel filler pipe assembly and vent hose that a minimum of 3.0 in. clearance be provided to any body component to prevent contact between hoses and/or mating parts and that retention be provided to ensure routing and prevent failure due to wear and fatigue. Both the fill and vent hoses must be routed (and supported, if needed) such that there are no sags or kinks. As viewed from the filler neck, pipes and hoses must have a downward slope toward the tank. There should be a minimum of 4° of downward slope in the fill and vent pipe at any location. No fuel traps are allowed. Alterations of fuel line routings could affect the ability of the completed vehicle and are, therefore, not desirable. The complete fuel system must comply with FMVSS 301. If additional new hose is required when installing fuel tank filler neck, this hose must be suitable for use with unleaded fuels or diesel fuel respectively and must allow the vehicle to meet enhanced evaporative emissions requirements.

Fuel Lines

Fuel line routing precautions:

- 5 in. minimum clearance to exhaust system is required or a metal shield must be provided.
- Fuel lines should be clipped to chassis to prevent chafing. Metal clips must have rubber or plastic liners.
- Use corrosion resistant steel tubing with short sections of approved hose to connect components. Hose-to-tube connections should be clamped for diesel systems. Steel tube ends should be beaded for hose retention. Fuel supply is pressurized by an in-tank pump for MPFI systems. Coupled hose or nylon quick-connects must be used. Clamped hose is not acceptable for MPFI systems.

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All gasoline engine vehicles are equipped with fuel evaporative emission control equipment which is certified to be in compliance with the Federal or applicable California Vehicle Emission Standards. Alterations to fuel tank and metering unit, lines, canister or canisters, canister filters, canister purge control valves, relay switches, tank auxiliary vent valve, engine speed controller, or other devices/systems are therefore not allowable since vehicle adherence to C.A.R.B. and Federal regulations may be affected.

Diesel powered vehicles incorporate water drain provisions in the fuel system. These valves are only to be opened when siphoning water and contaminants from the fuel system.

Body attachment brackets and u-bolts must be located such that there is adequate clearance to all fuel system components, such as the fuel lines and the fuel level sending unit, under all operating conditions.

Fuel Tank

For vehicles with full frames, the tank must provide adequate clearance to top, front, rear and sides to body and other supports.

Tank may be pressurized to 1.25 PSI maximum to check for final line leakage or for forcing fuel through the system. Pressures greater than this amount may be detrimental and affect tank durability.

The use of auxiliary fuel tanks is not recommended. If an auxiliary fuel tank is added, the alterer must take responsibility for compliance with affected motor vehicle safety standards. Also, if an auxiliary fuel tank is added to a gasoline-powered vehicle, the fuel must be drawn through a pipe at the top of the tank (balance line between tanks is not permitted).

In gasoline engines the fuel pump is located in the fuel tank. The battery must be disconnected before starting any work on the fuel system.

Gaseous Fuel Conversions

In the use of dual fuel systems, the vehicle operator should strictly adhere to the manufacturer's procedures for switching from gasoline to gaseous fuel operation. Improper switching procedures may result in overheating and damage to the exhaust system and the vehicle. The gaseous fuel tank should not be mounted in an enclosed area of the vehicle, such as the passenger compartment, truck, etc., and the system should be vented to the outside of the vehicle. In addition, vehicles converted to gaseous fuels should not be stored in enclosed places such as garages. Further, General Motors cautions purchasers that the design, location and installation of any type of fuel storage system involves significant technical and engineering considerations and that these statements on gaseous fuel conversions should not be interpreted to be an approval by General Motors of any modification to the original equipment fuel system. Conversions to gaseous fuel should be made in conformance with applicable Federal and State regulations. Removal of emission-control components or the addition of gaseous fuel systems, which could damage or reduce the longevity of those components could also cause the mechanical and emission performance warranty to be voided.

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Exhaust System

Particular care should be taken to prevent the possibility of exhaust fumes and carbon monoxide exposure to vehicle occupants in units completed by body builders. Holes and openings through the floor and all other parts of the body must be permanently and adequately sealed by the body builder to avoid exhaust intrusion into any occupant area. If it is necessary to change the exhaust outlet location, the exhaust discharge must be unobstructed and directed away from occupant areas. Alteration of the exhaust outlet or its position may increase exhaust noise and render the vehicle illegal in those areas with pass-by noise regulations. All vehicles >10,000 lbs. GVWR come under Federal noise regulations, vehicles ≤10,000 lbs. GVWR are regulated by various state and local regulations of the Environmental Protection Agency; see those regulations for rules, test procedure and noise levels permitted.

Tail pipe outlet location must be tested statically and with the vehicle in motion to ensure that exhaust gases do not penetrate side or rear windows or under body seams and holes. Auxiliary power plants should also be tested under the same conditions. Tail pipe exit ahead of rear wheels is not recommended.

Check for leaks in exhaust systems and repair as required.

Exhaust temperatures can exceed 1600°F under extreme operating conditions, with pipe surface temperatures slightly less than this. Extreme care must be used when placing body components in the proximity of the exhaust system so as not to exceed the rated temperature limits of the components. Due to variants in underbody configurations of the vehicles, we are not in a position to make recommendations on how to insulate or design components in the proximity of the exhaust system.

Each manufacturer must make temperature checks of critical areas of his vehicle and adjust his design accordingly, or provide shielding to ensure safe operation of his body components.

The same can be said for the engine compartment. Obviously there will be additional heat radiated from the engine. How much is retained in the area will depend on how well this area is ventilated in your individual designs. Here again, temperature checks of interior areas surrounding the engine should be made to determine if your insulation is adequate. This is the same engineering practice we have followed on our complete vehicles incorporating these exhaust systems.

Exhaust system materials are selected and tested to withstand the operating environment of the vehicle. **Do not modify the exhaust system in any way.** The tail pipes are made of 409 stainless steel.

Heat shields are mounted to the underbody and/or exhaust system components (catalytic converter and muffler). Shields for the propshaft hanger bearings are also provided in some vehicles.

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2007I Diesel Exhaust Systems, option LMM, Duramax 6.6L Diesel

With the exception of the tailpipe, do not modify the exhaust system in any way.

Exhaust system materials are selected and tested to withstand the operating environment of the vehicle. Tailpipes are made of 4 inch outer diameter 409 aluminized stainless steel w 1.8 mm wall thickness; modifications should have the same construction.

The exhaust gas temperature exiting the diesel particulate filter may be as high as 1200° F. The exhaust system is provided with a cooler on the tailpipe to reduce the exit gas temperature. If it is necessary to change the tailpipe outlet location, the exhaust cooler must be re-attached to the tailpipe after the final location is determined.

Alteration of the exhaust outlet or its position may increase exhaust noise and render the vehicle illegal in those areas with pass-by noise regulations. All vehicles >10,000 lbs GVWR come under Federal noise regulations of the Environmental Protection Agency; see those regulations for rules, test procedures, and permitted noise levels.

Care should be taken to prevent the possibility of exhaust gas / carbon monoxide exposure to vehicle occupants in 2nd units added by body builders. Holes and openings through the floor and all other parts of the body must be permanently and adequately sealed by the body builder to avoid exhaust gas intrusion into any occupant area. Exhaust discharge must be unobstructed and directed away from occupant areas. The tailpipe outlet location must be tested statically and with the vehicle in motion to ensure that exhaust gas does not penetrate side or rear windows or underbody seams and holes. Auxiliary power plants should also be tested under the same conditions. The tailpipe outlet must extend 2.0 to 2.5 in. outboard of the 2nd unit side panels. Positioning of the tailpipe exit ahead of the rear wheels is not recommended. If tailpipe modifications are necessary, check for leaks in the exhaust system and repair as required.

Exhaust temperatures can exceed 1600° F under extreme operating conditions, with pipe surface temperatures slightly less than this. Extreme care must be used when placing body components in the proximity of the exhaust system so as not to exceed the rated temperature limits of the components. Due to variants in underbody configurations of the installed 2nd units , we are not in a position to make recommendations on how to insulate or design components in the proximity of the exhaust system. Each manufacturer must make temperature checks of critical areas of his 2nd unit and adjust his design accordingly, or provide shielding to ensure safe operation of his 2nd unit components. For those portions of the vehicle provided by General Motors, heat shields are mounted to the underbody and/or exhaust system components to manage the exhaust temperatures.

Section 9 – Steering

Check power steering fluid level and system operations. (Refer to Owner's Manual).

Steering wheel and horn pad must not be altered or replaced.

The steering column mast jacket must not be altered.

Section 10 – Tires

Check wheel lug nuts for proper torque; specifications are provided in the Owner's Manual.

Substitution of tires of greater capacity than those offered as original equipment by vehicle manufacturer is not approved for use on original equipment wheels. Any usage of higher capacity tires must be accompanied by higher capacity wheels. However, the wheel offset (the distance from centerline of rim to wheel mounting face) must be the same as the replaced original equipment wheel to ensure proper wheel bearing loading and clearance of tires to body and chassis components. Increasing tire and wheel capacity does not necessarily increase vehicle GVW ratings.

Any substitution of tires may affect Speedometer/Odometer accuracy.

It is recommended that tire chain clearance guideline J683, from the Society of Automotive Engineers, be adhered to in designing rear wheelhouse clearance.

Check tires and inflate to recommended tire pressure according to the tire pressure information provided in Owner's Manual and tire inflation label provided with vehicle.

All vehicles with a GVWR <10,000 lbs. are provided with a factory-installed tire pressure monitoring system per FMVSS 138. See the Incomplete Vehicle Documents for important information regarding this system.

Section 12 – Electrical Battery and Battery Cables

The vehicle battery should be located and positioned to make use of the existing battery cables. If the battery requires relocation and longer cables are required, a proportionately larger gauge wire must be used. If, in relocating the battery the negative ground cable is attached to the frame rail, a cable of similar gauge must be provided between the frame rail and the engine. This is required due to the heavy electrical loads imposed by the starting circuit. To ensure proper operation of the battery cables the following chart on length, gauge and materials must be strictly adhered to:

Combined length of positive and negative	
Cable Gauge	Cable in Inches (Copper)
4	66
2	107
0	170

The All New C/K is equipped with a Remote Positive (+) Jump Starting terminal which is located behind a red plastic cover near the engine accessory drive bracket. This terminal is intended for jump starting only and should NOT be used by upfitters to obtain battery power. Three fused studs, however, are available on the Underhood Electrical Center and, if available, may be used by upfitters to obtain battery power. If the battery is remotely mounted (other than in the engine compartment), the 'sense' circuit in the generator regulator shall be used. The sense circuit consists of a 7.76 OHM 1/4 watt resistor connected in series between the 'S' terminal of the generator and the B+ terminal of the battery.

Auxiliary Battery (Heavy Duty Pickups, Gasoline Engines Only)

If an auxiliary battery is to be retro-fitted, the electrical schematic for option TP2 is recommended as a guide. This will result in the auxiliary battery being connected to the vehicle load and charging circuit when the ignition switch is 'on' (fuse block terminal "Acc. Ign. Fused"). When the ignition switch is turned off, the interlocking relay is disengaged and the auxiliary battery is disconnected from the vehicle circuit.

Modifications/add-on wiring must be carefully reviewed to ensure compatibility with the base vehicle wiring by reviewing system schematics, wire routing paths, harness connections, etc. Due to the wide range of modifications that may be required for vocational needs, it is not feasible for the O.E.M. to take into account all potential revisions. For this reason, any person modifying existing vehicle wiring must assume responsibility that the revisions have not degraded the electrical system performance. Any add-on wiring must be properly fused and routed to prevent cut, pinch, and chafe problems, as well as avoid exposure to excessive heat. Care must be exercised that existing vehicle interfaces do not have their current load capabilities exceeded and the respective control devices are not overloaded. Added wire size should be at least as large as the wire to which it is attaching in order for fuse protection to be maintained.

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A wiring repair kit is available through your dealer. This kit contains instructions, tools and components for making repairs to wiring harness components. This kit would also greatly assist in accomplishing necessary add-on wiring, such as body marker lamps, so that system reliability/durability is maintained.

Electrical wiring components can be obtained through your authorized GM dealer. Many Packard Electric components are also available through Pioneer Standard Company (1-800-PACKARD). Pioneer may also be able to assist in making necessary wiring additions by providing custom wiring stubs or jumpers to your specifications.

Section 13 – Cooling

To provide satisfactory engine cooling, the following conditions must be met:

1. Do not locate any large objects in front of the radiator core or grille, such as batteries, spare tires, lights/sirens, etc. They restrict air flow into the radiator core and influence fan blade stress.
2. Grille opening, size configuration and the external baffles provided should not be altered in any manner. Any reduction in cooling ability may adversely affect engine/transmission performance.
3. Fan clutches not conforming to the original equipment specifications may not operate correctly and may stay “on” continuously, never come on, or cycle on and off excessively. This will result in a reduction of fuel economy, engine overheat at times, and annoying cycling respectively.
4. Heavy duty cooling equipment is required when snow plows, winches, etc., are installed.
5. If a heater unit is not installed in the vehicle or a heater shut-off valve is required, a line connecting the heater connection on the engine to the heater connection on the surge tank outlet hose (gas) or lower radiator hose (diesel) must be installed. When a shut-off valve is required in the heating system, it must be teed into the system in such a manner as to maintain continuous flow between engine heater connection – surge tank outlet hose/lower radiator hose connection at all times.

Do not install any internal flow restrictors.

NOTE: SCPI unit does not have internal coolant passages.