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## INTRODUCTION

This section contains essential information for the proper and accurate use of the QUANTUM Labor Time Guide. When used in conjunction with the QUANTUM Policy & Procedures Manual, warranty compensation for the labor operations in this guide may be cost recovered directly from QUANTUM.

The times published in this Labor Time Guide are used by QUANTUM to calculate the amount of labor compensation allowed for the payment of warranty claims. These published labor times are not intended for use as retail labor rates.

The information in this guide applies only to 1999 to 2000 model year 7.4L engines or 2001 to 2002 model year 8.1L engines that are manufactured by General Motors for propane operation. The labor times published in this guide identify the applicable labor operations and labor times required to perform a repair, replacement and/or adjustment operation on a propane-equipped 1999-2002 GM Medium Duty Truck. These times represent those of an average technician in a typical dealership using normally available hand tools, equipment and any Special Service Tools specified to diagnose and perform the repair. The use of genuine parts marketed by QUANTUM and repair procedures prescribed in the QUANTUM Service Manual supplement are used as the basis of the labor times.

## LABOR TIME STUDY DEVELOPMENT

### GENERAL

The labor time allowances published in this guide have been developed by QUANTUM. The established labor times include the actual time required to perform the operation plus an additional allowance for operating variables and normal diagnostics referenced as a *“Contingency Allowance.”* Established labor times do not include time to remove and replace components other than vehicle manufacturer’s options and accessories.

## TOOLS

Standard hand tools and any required Special Service Tools are used in performing the labor time studies. No power-operated tools were used for labor time study development. Procedures outlined in the Service Manual Supplement, Service Publications and good shop practices are used when developing the allowances for the Labor Time Guide.

## VEHICLES

Labor times were developed using production models equipped with standard equipment.

## TECHNICIANS

Certified Automotive Service Excellence (ASE) technicians who are not specialists in any particular vehicle system developed the times shown. However, they are accustomed to following service/repair manual procedures.

## TIME ALLOWANCES

Timing a technician in the actual performance of the repair develops the time allowances published in this guide. It includes that portion of the repair operation associated with the actual removal, disassembly, cleaning, re-assembly, installation and/or adjustment of the affected component or assembly. The cleaning time in each operation is limited to that directly associated with the installation or replacement of components such as mating surfaces. It does not include cleaning other areas of the vehicle which may have been contaminated by failure of the component being replaced such as coolant sprayed inside the engine compartment. If a particular step in a labor operation requires more than one technician, the time for that step is multiplied accordingly.

Also included in this Labor Time Guide is time required to perform the associated labor elements in the completion of a repair operation. For example: preparation for service, preparation time to hoist, use of Special Service Tools and time to open packaged parts. When applicable, the labor times are included once in each basic repair operation. Accordingly, they are not included in any “Add” condition repair operation.

The time allowance includes the actual time required to perform the operation plus an additional allowance to provide for operating variables. Time allowances do not include time to remove and replace special equipment other than manufacturer options and accessories.

## GLOSSARY OF TERMS

### OPERATION DESCRIPTION

The Operation Description identifies the repair to be performed and may include sub-headings such as: Add conditions, Notes, Includes and other information. This information is essential for both the technician and warranty claim processing personnel to properly complete a warranty claim for accurate cost recovery.

### FAILED PART / CAUSAL PART

The Failed Part or Causal Part is the part that caused the repair and/or replacement of other parts. The technician must identify the part as defective; i.e., one that exhibits a flaw or manufacturer's defect in material or workman-ship. That part **must be tagged** for warranty failure analysis identification before returning it to QUANTUM Technologies.

### TROUBLE CODES / CONDITION CODING

The method of coding to identify a failed part's defect or reason for the service. The trouble code selected must identify the manufacturer's defect of the part as accurately as possible. The code selected by the repairing technician identifies the manufacturer's defect and/or workmanship condition qualifying the repair for warranty eligibility.

### ADD CONDITIONS

Add Conditions may be required to complete the performance of a labor operation, or supplement a labor operation, are included in the Add sections under the Operation Description. Each Add narrative is preceded

by an alpha letter designation. If an Add is performed, the alpha designator should be recorded on the shop repair order under the Operation Number.

### EXCHANGE

Exchange is used when the component is identified by QUANTUM's exchange program. Usually there is a core value assigned to the defective part to insure its return to QUANTUM for re-manufacturing.

### REPLACE

Replace is used when the part or assembly is subject to replacement only. This includes transfer of attaching components from the original part being replaced to the new part, the installation of the new part and any inspection, adjustment, cleaning or lubrication operations that may be required to complete the repair.

### R&R OR REPLACE

R&R means the part or assembly can be removed and re-installed after the part has been aligned, adjusted, repaired as a separate operation or removed for a sublet repair. Replace means the part or assembly can be replaced with a new (or exchanged) part or assembly. Reference the "Replace" paragraph for additional information.

### RECONDITION

When the word Recondition is used, an assembly is removed from the vehicle, disassembled, cleaned, inspected, reconditioned with same or new parts, reinstalled and adjusted. When this term is used in an Add condition, it does not include Remove and Reinstall, but identifies only that labor necessary to recondition an assembly once it is removed from the vehicle.

### INCLUDES

The Includes which follow some of the Labor Descriptions are provided to assist in identifying whether or not certain items or functions are included within the operation. These are not all encompassing because placing all such information in this Labor Time Guide would make it difficult to use. If there are any questions as to whether something is included or not, reference the

QUANTUM Service Manual Supplement or use the Request for Review Form to question and/or recommend changes. Some examples are:

- Fuel System Evacuation
- Leak Check
- Road Test

## CUSTOMER PROBLEM ANALYSIS

This is the process of translating the customer's complaint to a symptom. Examples are: stalling, hesitation, surges, engine cranks but will not start, etc. It also includes those failures that are readily apparent to the normal senses of sight, touch, sound and smell, such as leaking coolant line or cracked casting. Defining the symptom is the duty of the service writer and/or service manager.

## SYMPTOM DIAGNOSIS

This is the process used to locate the cause of the problem based upon the symptom. Symptom Diagnosis is complete when the cause of failure has been identified. This process is the responsibility of both the technician and dealership management.

## REPAIR DIAGNOSIS

These are the checks, tests and measurements needed in the repair to find the cause of a failure or identify the defective/faulty part. Repair Diagnosis is the responsibility of the technician.

Examples are:

- Cleaning and inspection of all parts.
- Use of test equipment.
- Use of common instruments such as an ohmmeter, volt-amp meter, a leak detector or a cooling system pressure tester that may be required by QUANTUM Service Manual Supplement procedures.

## LABOR OPERATION NUMBER

The Labor Operation Number is applicable to the labor performed and must be recorded

on the repair order. The applicable Labor Operation Number is obtained from either the QUANTUM Labor Time Guide or Technical Service Bulletins published by QUANTUM.

## OVERLAPPING LABOR

Overlapping labor is labor in which two operations include the same repair steps. The Overlapping Labor amount must be deducted from the second labor operation. The remaining labor amount is entered as a lesser amount than the total allowable on the second labor operation. Overlapping time is not compensated.

## DUPLICATE LABOR

Duplicate Labor is the same labor charged twice, either to two different cost recovery sources, or overlapping labor charged to the same or different cost recovery sources. Regardless, Duplicate Labor is not eligible for compensation unless authorized by QUANTUM.

## STRAIGHT TIME

Straight Time is applicable only when a labor operation is required and no labor operation description or operation number exists in the labor time guide. All Straight Time is indicated **Policy "A"** and must be approved by QUANTUM **before** the expense is incurred. Precise labor step documentation indexed to time is required and must be recorded on the shop repair order to identify and justify this expense. Prior approval may be obtained by contacting QUANTUM Technical Assistance at 1-800-816-8691.

## ADDITIONAL or OTHER LABOR

Additional or Other Labor may be required when unusual or abnormal conditions are encountered. This time must be identified as such and follow the same time recording and labor step documentation as Straight Time. Warranty compensation for all additional time is also considered **Policy "A"** and must be approved by QUANTUM **before** the expense is incurred. Prior approval may be obtained by contacting QUANTUM Technical Assistance at 1-800-816-8691.

## POLICY CODES

Certain QUANTUM Policy Codes apply to the Generic Labor Operations listed on page 11. Each letter indicates a policy as it applies to a labor operation. Policy codes and descriptions are:

**Policy “A”** – Requires authorization from QUANTUM Technical Support prior to completion.

**Policy “B”** – Base Emission Warranty: 60 months or 50,000 miles (80,856 kilometers).

**Policy “S”** – Sublet of work to a propane shop within your area that is authorized to remove/replace/repair the high pressure fuel tank.

All prior approvals may be obtained by contacting QUANTUM Technical Assistance at 1-800-816-8691.

## NORMAL DIAGNOSIS

Normal Repair Diagnosis time is included in the Contingency Allowance portion of all labor time operations. It is the responsibility of qualified dealership supervisory personnel to assist technicians in both customer problem analysis and symptom diagnosis.

## ADDITIONAL DIAGNOSTICS

Additional Diagnostics is labor that is necessary to complete a satisfactory diagnosis that is beyond the Normal Diagnosis allowed in the Contingency Allowance. This time must be identified as such and follow the same time recording, labor step documentation as Straight Time. All additional diagnostic time must be approved by QUANTUM *before* the expense is incurred.

## TECHNICAL ASSISTANCE

Service technicians may call QUANTUM Technical Assistance for help in those circumstances that require extensive diagnosis or repair advice whether the vehicle is in or out of warranty. Technical Assistance must be contacted to obtain

Authorization Numbers for those repairs or additional labor that requires prior authorization for warranty compensation. Technical Assistance (1-800-816-8691) may be contacted between the hours of 8:00 a.m. and 5:00 p.m. Pacific Time.

## COMPLETED WARRANTY CLAIMS

Submit your completed warranty claim (w/ standard hourly labor rate for warranty) to:

**QUANTUM Technologies**  
**25242 Arctic Ocean Drive**  
**Lake Forest, CA 92630**  
**Attn: MD Warranty Claims**

## REQUEST FOR REVIEW

### INTRODUCTION

A formal system exists to provide assistance regarding the service labor time allowances in this guide. QUANTUM will provide all possible assistance in understanding the development process, the content of individual standards, the means for accomplishing repairs within the times established and the assurance that every effort has been made to maintain the accuracy of these times. QUANTUM stands ready to review and, if necessary, adjust any allowance that is inconsistent with the time actually being spent on warranty repairs that are within the scope and definitions described in this guide.

Although the same methods of labor time allowance development are applied to every labor time study, the actual time required to make a repair on a like component may vary. A time change is never arbitrarily made. Each time change is based on one or more of the following:

- Design change of the component.
- Design change in other components that affect the accessibility to the repaired component.
- Change in the procedure or method of repair.
- Change in the tools or equipment used to make the repair.
- Final review and verification of times after receiving a Request for Review form.

## **REQUEST FOR REVIEW FORM**

Questions and/or suggestions regarding labor operations or time allowances in the Labor Time Guide must be submitted on a Request for Review form. This form is the last page of this guide.

A properly completed form will provide QUANTUM the detailed information that identifies the technician's difficulties in performing a labor operation within the published labor time allowance. When completing this form, it is important that all vehicle identification data affecting or influencing the operation in question be provided.

## **DEALER'S RESPONSIBILITIES**

Your request for review must include a detailed, step by step description of your labor procedure in the space provided. This will allow QUANTUM to both understand your concern and potential cause(s) for the variance between your actual time and the published labor time.

When submitting a Request for Review, the following steps are required:

- Verify that the technician has followed Service Manual Supplement procedure and utilized all necessary equipment.
- Complete the Request for Review Form included in this guide.
- Use one form for each labor allowance in question (or combination of standards representing one repair job).
- Provide specific performance time for two repairs performed by the same technician to assist in determining average time.
- Identify the technician involved, as it may be necessary to review the process.
- Provide comments that may help in identifying the problem area including individual step times.

- Sign and forward the form to QUANTUM.

## **QUANTUM'S RESPONSIBILITIES**

Upon completion of the Request for Review form, QUANTUM will review the request and the actual procedure and will then make a recommendation to either re-time the operation or provide the requester an explanation. You will be notified with an explanation of the status of your inquiry within 30-days of our receipt. Immediate changes in a labor allowance will appear in a warranty bulletin. This change will also appear in the next revision of the Labor Time Guide.

**TROUBLE CODES**

<b>CAUSE OF PROBLEM</b>	<b>CODE</b>	<b>CAUSE OF PROBLEM</b>	<b>CODE</b>
Bent	1A	Paint-acid rain	5A
Casting defect	1B	Chrome plating defective	5C
Compression	1C	Paint- cracking	5G
Broken	1D	Paint - peeling	5L
Burned	1E	Paint - poor repair	5P
Carbon deposit	1F	Paint - primer shows through	5R
Chipped	1G	Poor metal finish	5T
Clogged / restricted / blocked	1H	Rusted / corroded	5W
Collapsed	1J		
Cracked	1K	Component - ground	6B
Cut	1L	Component - inoperative	6C
Dented	1M	Component - intermittent	6D
Burrs	1N	Component - missing	6E
Discharged	1P	Component - open	6F
Does not match	1R	Component - shorted	6G
Condensation / moisture	1W	Connector - bent / damaged	6H
Foreign material	1Y	Connector - corroded	6J
		Connector - missing	6L
Leaks	2C	Connector - disconnected	6M
Clearance - excessive	2E	Connector - partially connected	6N
Clearance - too tight	2F	Connector - seal damaged	6P
Improperly cut	2G	Lamp (bulb) - improperly installed	6R
Improper installation	2H	Lamp (bulb) - defective	6S
Improperly padded	2J	Lamp (bulb) - contains moisture	6T
Improperly sealed	2K	Overcharged	6U
Incorrect pressure	2L	Socket - broken	6W
Insufficient lubrication	2N	Socket - corroded	6X
Insufficient sealant	2P	Socket - open	6Y
Kinked	2S	Socket - shorted	6Z
Improper torque	2T		
Loose	2W	Socket / lamp - disconnected	7A
		Terminal - backed out	7B
Misadjusted / misaligned	3A	Terminal - bent or damaged	7C
Misrouted	3C	Wire - shorted to ground	7D
Missing	3D	Terminal - crimped over insulation	7E
Not connected	3F	Terminal - not crimped / soldered	7F
Not drilled	3G	Wire - burned - external heat	7G
Balance / imbalance	3K	Wire - burned - internal heat	7H
Out of calibration	3L	Wire - chaffed	7J
Out of round	3M	Wire - crossed in connector	7K
Poor machining	3N	Wire - cut / broken / open	7L
Poor release	3P	Wire - misrouted	7M
Porosity	3R	Wire - missing	7N
Punctured	3W	Wire - not long enough	7P
Registers incorrectly	3X	Wire - pinched	7R
Ruptured	3Z	Wire - ring terminal disconnected	7S
		Wire - ring terminal loose	7T
Scored	4A	Electrical interference	7W
Scratched	4B		
Sheared	4D	No trouble found	9Z
Stripped	4G		
Torn	4H	Extended service parts warranty	88
Warped / wavy	4N	Technical service bulletin	93
Weak	4Q	Special policy	95
Weld broken	4R	PDI	99
Weld omitted	4S	Campaign	96
Twisted	4T		
Worn	4X		
Wrong part	4Z		

## LPG FUEL SYSTEM LABOR OPERATIONS

LABOR OPERATION DESCRIPTION	OPERATION NUMBER	MODEL YEAR				
		1999	2000	2001	2002	
		YEAR VIN CODE				
		X	Y	1	2	
<b>ENGINE CONTROL UNIT (ECU) – REPLACE</b> <u>QUANTUM Part Numbers</u> - AE2-21897 (1999) - 100140 (2000) - 100668 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.  NOTE: Parts restriction in place for warranty replacement. Contact QUANTUM Technical Assistance at 1-800-816-8691.	<b>E0050</b>	0.3	0.3	0.3	0.3	
		0.3	0.3	0.3	0.3	
<b>LPG WIRE HARNESS – REPAIR</b>  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>E1015</b>	0.2	0.2	0.2	0.2	
		0.3	0.3	0.3	0.3	
<b>ELECTRIC LOW PRESSURE LOCK-OFF (LPL) SOLENOID (UNDERBODY) – REPLACE</b> <u>QUANTUM Part Numbers</u> - AV2-20134-008 (1999 and 2000) - 101821 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>F1003</b>	0.4	0.4	0.4	0.4	
		0.3	0.3	0.3	0.3	
<b>FUEL FILTER – REPLACE</b> <u>QUANTUM Part Number</u> - F1-20804-001 (All Model Years)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>F1004</b>	0.3	0.3	0.3	0.3	
		0.3	0.3	0.3	0.3	

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LABOR OPERATION DESCRIPTION	OPERATION NUMBER	MODEL YEAR				
		1999	2000	2001	2002	
		YEAR VIN CODE				
		X	Y	1	2	
<b>ELECTRIC LOW PRESSURE LOCK-OFF (LPL) SOLENOID (UNDERHOOD) – REPLACE</b> <u>QUANTUM Part Numbers</u> - AV2-20134-006 (1999 and 2000) - 101821 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>F1015</b>	0.8	0.8	0.5	0.5	
		0.3	0.3	0.3	0.3	
<b>IDLE CONTROL SOELNOID (ICS) – REPLACE</b> <u>QUANTUM Part Numbers</u> - V2-21679 (1999 and 2000) - 100562 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M0060</b>	0.3	0.3	0.3	0.3	
		0.3	0.3	0.3	0.3	
<b>ELECTRONIC THROTTLE CONTROL (ETC) SOLENOID – REPLACE</b> <u>QUANTUM Part Numbers</u> - V2-21678 (1999 and 2000) - V2-21520 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M0065</b>	0.4	0.4	0.3	0.3	
		0.3	0.3	0.3	0.3	
<b>FUEL MIXER COVER – REPLACE</b> <u>QUANTUM Part Numbers</u> - 105406 (1999 and 2000) - 103604 (2001 and 2002)	<b>M0070</b>	0.3	0.3	0.3	0.3	

LABOR OPERATION DESCRIPTION	OPERATION NUMBER	MODEL YEAR				
		1999	2000	2001	2001	
		YEAR VIN CODE				
		X	Y	1	2	
<b>FUEL MIXER OUTLET ELBOW – REPLACE</b> <u>QUANTUM Part Numbers</u> - A2-21389 (1999 and 2000) - 103166 (2001 and 2002)	<b>M0075</b>	0.8	0.8	0.9	0.9	
<b>PRESSURE RELIEF DEVICE (PRD) – REPLACE</b>  <b>Mixer Outlet Elbow PRD (One Only)</b>  <b>Fuel Mixer Cover PRD (One Only)</b>  <u>QUANTUM Part Numbers (All Model Years)</u> - Housing: 103232 - Spring: 103229 - Piston with Foam Bumper: 106818  <b>ADD:</b> Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M0076</b>  <b>M0076</b>	N/A  0.2	N/A  0.2	0.2  0.4	0.2  0.4	
		0.3	0.3	0.3	0.3	
<b>LOW PRESSURE REGULATOR (LPR) w/ FITTINGS (NOMINAL FLOW) – REPLACE</b> <u>QUANTUM Part Numbers</u> - 100155 (1999) - 100214 (2000) - 100325 (2001 and 2002)  Includes: Drain and fill radiator.  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.  B - Replace LPR w/o fittings: You may claim 0.4 hours to transfer fittings from the defective LPR to the replacement LPR.	<b>M1001</b>	1.1   0.3  0.4	1.1   0.3  0.4	0.6   0.3  0.4	0.6   0.3  0.4	

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LABOR OPERATION DESCRIPTION	OPERATION NUMBER	MODEL YEAR				
		1999	2000	2001	2001	
		YEAR VIN CODE				
		X	Y	1	2	
<b>LPG FUEL SYSTEM PRESSURE CHECK</b> Includes: Connect fuel pressure gauges. Check LPR primary and secondary pressure. Disconnect gauges.	<b>M1002</b>	0.5	0.5	0.5	0.5	
<b>LPG FUEL CONTROL SYSTEM CHECK</b> Includes: Connect scan tool or test equipment. Check for trouble codes (DTCs). Check HO2S operation, FCS duty cycle and ICS duty cycle. Disconnect scan tool or test equipment.	<b>M1003</b>	0.5	0.5	0.5	0.5	
<b>COOLANT GASKET, LOW PRESSURE REGULATOR (LPR) – REPLACE</b> <u>QUANTUM Part Number</u> - 104404  Includes: Drain and fill radiator.  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M1006</b>	1.3	1.3	0.8	0.8	
<b>FUEL CONTROL SOLENOID (FCS) – REPLACE</b> <u>QUANTUM Part Number</u> - 100291 (1999 and 2000) - 100562 (2001 and 2002)  <b>ADD:</b> B - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M1010</b>	0.4	0.4	0.3	0.3	
<b>FUEL MIXER – REPLACE</b> <u>QUANTUM Part Number</u> - AM-21241-001 (1999 and 2000) - 100717-001 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>M1015</b>	0.6	0.6	0.4	0.4	
		0.3	0.3	0.3	0.3	

LABOR OPERATION DESCRIPTION	OPERATION NUMBER	MODEL YEAR				
		1999	2000	2001	2001	
		YEAR VIN CODE				
		X	Y	1	2	
<b>LPG FUEL LINE – REPLACE</b> <u>QUANTUM Part Number</u> - AH1-20838-003 (1999 and 2000) - 100768 (2001 and 2002)  <b>ADD:</b> A - Diagnosis Time: You may claim 0.0 to 0.3 hours depending on actual time performing diagnosis.	<b>T1001</b>	0.4	0.4	0.4	0.4	
		0.3	0.3	0.3	0.3	

## GENERIC LABOR OPERATIONS

LABOR OPERATION DESCRIPTION	OPERATION CODE:	TIME ALLOWED
<b>CREDIT      Policy "A"*</b> Requires <u>Prior Approval</u> By QUANTUM Technical Support; Have your technician call 1-800-816-8691. Refer to page 4.	<b>CREDIT Policy "A"</b>	0.0
<b>DEBIT</b>	<b>DEBIT</b>	0.0
<b>ADDITIONAL DIAGNOSTIC TIME      Policy "A"</b> Requires <u>Prior Approval</u> By QUANTUM Technical Support; Have your technician call 1-800-816-8691. Refer to page 4.	<b>G0001 Policy "A"</b>	0.5
<b>EMISSIONS TEST</b>	<b>G0002</b>	0.3
<b>FASTENER OR FITTING TIGHTENING</b>	<b>G0003</b>	0.1
<b>FREIGHT (WCM Only)</b>	<b>G0004</b>	0.0
<b>INSPECTION - PRE-DELIVERY</b>	<b>G0005</b>	0.3
<b>ROAD TEST</b>	<b>G0006</b>	0.3
<b>STRAIGHT TIME      Policy "A"*</b> Requires <u>Prior Approval</u> By QUANTUM Technical Support; Have your technician call 1-800-816-8691. Refer to page 4.	<b>G0007 Policy "A"</b>	0.0

## ALPHABETICAL INDEX OF LABOR OPERATIONS & CODES

LABOR OPERATION DESCRIPTION	OPERATION NUMBER
COOLANT GASKET, LPR - REPLACE	<b>M1006</b>
ELECTRIC LOW PRESSURE LOCK-OFF (LPL) SOLENOID (UNDERBODY) – REPLACE	<b>F1003</b>
ELECTRIC LOW PRESSURE LOCK-OFF (LPL) SOLENOID (UNDERHOOD) – REPLACE	<b>F1015</b>
ELECTRONIC THROTTLE CONTROL (ETC) SOLENOID – REPLACE	<b>M0065</b>
ENGINE CONTROL UNIT (ECU) - REPLACE	<b>E0050</b>
FUEL CONTROL SOLENOID (FCS) – REPLACE	<b>M1010</b>
FUEL FILTER – REPLACE	<b>F1004</b>
FUEL MIXER – REPLACE	<b>M1015</b>
FUEL MIXER COVER – REPLACE	<b>M0070</b>
FUEL MIXER OUTLET ELBOW – REPLACE	<b>M0075</b>
IDLE CONTROL SOLENOID – REPLACE	<b>M0060</b>
LPG FUEL CONTROL SYSTEM CHECK	<b>M1003</b>
LPG FUEL LINE – REPLACE	<b>T1001</b>
LPG FUEL SYSTEM PRESSURE CHECK	<b>M1002</b>
LPG WIRE HARNESS – REPAIR	<b>E1015</b>
LPR (CONVERTER) – REPLACE	<b>M1001</b>
PRESSURE RELIEF DEVICE (PRD) - REPLACE	<b>M0076</b>

**COMPLETING THE REQUEST FOR REVIEW FORM**

When completing the request for review form, include a detailed description of each step. List all components, the number and type of fasteners, and any Special Service Tools or procedures that are required. Use this labor time study example as a guide. Use the Labor Time Study form on page 16 for your own time study. Fill it out similar to the example shown here and include it with the Request for Review sheet on page 15.

When complete, send both forms to:  
 QUANTUM Technologies  
 25242 Arctic Ocean Drive  
 Lake Forest, CA 92610  
 Attn: Labor Time Request for Review

**EXAMPLE:**

**LABOR TIME STUDY**

<b>Step</b>	<b>Labor Description</b>	<b>Watch Time (Min/Sec)</b>
1	Prep vehicle.	4' 00"
2	Remove hot and cold air ducts.	0' 35"
3	Remove air cleaner assembly.	0' 32"
4	Remove 3 air cleaner bracket screws and spacers.	0' 37"
5	Remove 1 air valve cover screw.	0' 08"
6	Remove air valve cover and spring assembly.	0' 06"
7	Remove air valve and diaphragm assembly.	0' 03"
8	Unpack parts.	1' 00"
9	Install air valve and diaphragm assembly.	0' 08"
10	Install spring and cover.	0' 10"
11	Install 1 air valve screw and snug finger tight.	0' 08"
12	Install spacers, air cleaner bracket assembly & screws. Tighten evenly.	0' 46"
13	Install air cleaner assembly.	1' 03"
14	Install hot and cold air ducts.	0' 30"
	<b>Total Watch Time (min/sec)</b>	<b>9' 46"</b>

## REQUEST FOR REVIEW

Please insure this Request for Review is filled out completely so that it can be investigated and processed without delay.

**SERVICE FACILITY INFORMATION**

Service Facility Name: \_\_\_\_\_

Service Facility Address: \_\_\_\_\_

City \_\_\_\_\_ State: \_\_\_\_\_ Zip Code \_\_\_\_\_

Telephone Number (\_\_\_\_\_) \_\_\_\_\_ Fax Number: (\_\_\_\_\_) \_\_\_\_\_

OPERATION NUMBER	CURRENT PUBLISHED TIME	SUGGESTED TIME
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**VEHICLE INFORMATION:**

Model Year \_\_\_\_\_ Model Line \_\_\_\_\_ VIN# \_\_\_\_\_

Mileage \_\_\_\_\_ Engine \_\_\_\_\_

**TECHNICIAN INFORMATION:**

Technician's Name \_\_\_\_\_

Are you certified in this area of repair?  Yes  No

How many times have you performed this repair?  Once  Twice More? How many? \_\_\_\_\_

Is the QUANTUM Service Manual Supplement accurate?  Yes  No Describe the inaccuracy:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(Please include any additional inaccuracies and/or suggestions on a separate sheet. We welcome your input.)

Have you attended an QUANTUM Technical Training Class for this type of work?  Yes  No

**SERVICE MANAGER SIGNATURE:** (required) \_\_\_\_\_

Date: (required) \_\_\_\_\_

***A detailed, step by step labor description is required on the back of this form before a labor time study will be considered for review.***

**LABOR TIME STUDY FORM**

Step	Labor Description	Watch Time (Min/Sec)
1		
2		
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30		
<i>(Attach additional sheets if necessary)</i>		
Total Repair Time (minutes/seconds)		