Freightliner LLC New Vehicle and Aftermarket Parts Limited Warranties warrant that Freightliner LLC products will be free from defects in material and workmanship that occur under normal use within the applicable warranty period, subject to certain limitations and exclusions as specified in the Warranty Manual.

Alternators that have been damaged by handling or abnormal operation are not warrantable and should not be submitted for warranty. (See Section 1 and 2 of the Warranty Manual and the following Sections of this document for a thorough description of warranty limitations and exclusions, including damage.)

Always follow the troubleshooting instructions in the vehicle's workshop/service manual. **Submitting a fully functional alternator for a warranty claim will be returned as no defect found.**

IMPORTANT: Before replacing an alternator:

- **Check all the batteries.** U.S. and Canadian dealers must use a Midtronics Micro740 battery tester; each battery must have a result of "Good Battery." (See Section 54 of the vehicle's workshop/service manual for complete details on Battery diagnosis and charging and optional diagnostic procedures outside of the USA & Canada.)

- **Make sure the alternator drive belt is tight and in good condition.** (See Section 1 of the vehicle's workshop/service manual and maintenance manual for complete details for drive belt diagnosis, service, and maintenance.)

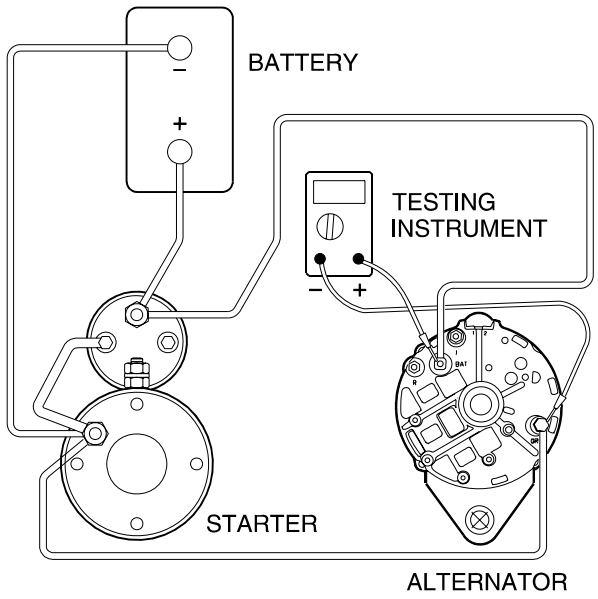
- **Make sure the battery and alternator cables are in good condition and terminals at the alternator, starter, and battery are clean and tightened to the proper torque.** (See Section 15 & 54 of the vehicle's workshop/service manual and maintenance manual for complete details on maintaining connections.)

- **Use quality test equipment.** Accuracy of warranty checks depends upon the proper use of quality test equipment that is maintained and calibrated. This guide presumes that the technician will use a high quality multi-meter. (In addition, a technician may evaluate an alternator with a Delco Remy bench-top tester where available.) If warranty checks are not completed with quality test equipment then warranty may not be assessed correctly.

Partial or No Charging (All 12v alternators)

Section 15.01.01

Damage Code:
124-003A04590 (if warrantable)



09/20/2005 f151094

Figure 1. Alternator output measurement. (See Section 15 of the Workshop Manual for alternator troubleshooting instructions.)

NOTE: Defective alternators often cause the batteries to become severely discharged, which may damage the batteries. If the batteries are not charged and tested according to the instructions in Section 54 of the vehicle's workshop/service manual, then a subsequent failure of the starting and charging system may occur.

Symptoms:

- Alternator is not charging or partially charging. (See Section 15 of the vehicle's workshop/service manual for alternator troubleshooting instructions.)
- Usually the battery voltage is low.
- Usually hard starting.
- Lights may flicker or dim in the cab.
- Low voltage disconnect may activate.

IMPORTANT: Similar symptoms may be caused by low battery voltage, poor battery condition, loose or corroded cable connections, damaged cables, or a loose or worn alternator drive belt, so check these items before replacing the alternator.

Warranty Coverage:

The alternator is **warrantable** within the applicable warranty period if it is not charging or is partially charging when checked per the troubleshooting section of the vehicle's workshop/service manual.

The alternator is **not warrantable** if a non-warrantable condition exists as described in the following sections.

Overcharging (12v non-remote sense alternator)

Section 15.01.02

Damage Code:
124-003A04590 (if warrantable)

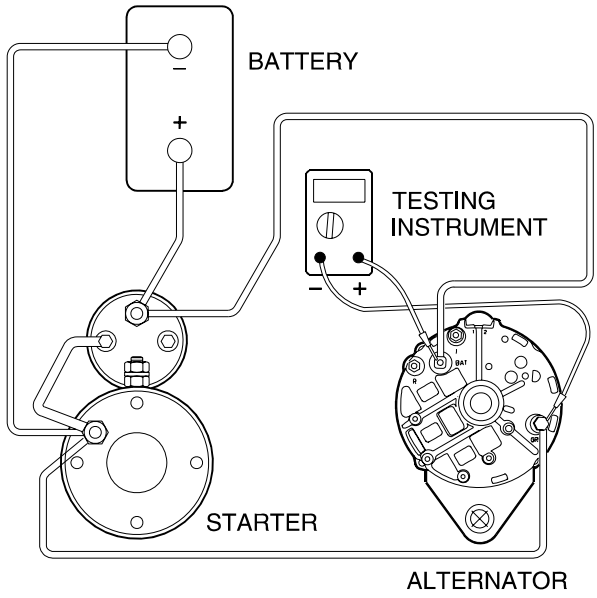


Figure 2. Alternator output measurement. (See Section 15 of the vehicle's workshop/service manual for alternator troubleshooting instructions.)

Symptoms:
o Alternator is overcharging at more than 14.9 volts. (See Section 15 of the vehicle's workshop/service manual for alternator troubleshooting instructions.)
o Usually the voltage increases over 14.9 volts as engine speed increases.
o Electrical components on the truck such as light bulbs may burnout frequently.

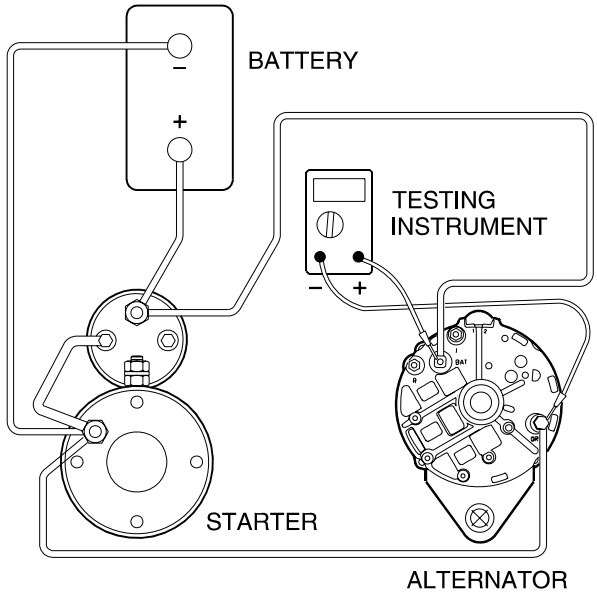
Warranty Coverage:
The alternator is **warrantable** within the applicable warranty period if it is overcharging when checked per the troubleshooting section of the vehicle's workshop/service manual.

The alternator is **not warrantable** if a non-warrantable condition exists as described in the following sections.

Overcharging (12v alternator with remote sense)

Section 15.01.03

Damage Code:
124-003A04590 (if warrantable)



09/20/2005 f151094

Figure 3. Alternator output measurement. (See Section 15 of the vehicle's workshop/service manual for alternator troubleshooting instructions.)

Symptoms:

o Alternator is overcharging at more than 14.9 volts. (See Section 15 of the vehicle's workshop/service manual for alternator troubleshooting instructions.)

o Usually the voltage increases over 14.9 volts as engine speed increases.

o Electrical components on the truck such as light bulbs may burnout frequently.

IMPORTANT: Similar symptoms may be caused by a failure of the remote sense circuit. See Service Bulletin 15-13 for details on remote sense alternators.

Warranty Coverage:

The alternator is **warrantable** within the applicable warranty period if it is overcharging when checked per the troubleshooting section of the vehicle's workshop/service manual and Service Bulletin 15-13.

The alternator is **not warrantable** if a non-warrantable condition exists as described in the following sections.

The alternator is **not warrantable** if the over-charging condition is caused by a defective remote battery sense circuit as the alternator is designed to charge at 15 volts in this condition (see Service Bulletin 15-13 for details).

Bearing Failure: Noisy, Rattling, Binding or Sticking	**Section 15.01.04**
	Damage Code: 124-003A04345 (binds/ sticks) or 124-003A04500 (noisy)
No Picture.	**Symptoms**: o Usually noises come from the alternator that will change with speed while the engine is running. o The shaft rotation will feel rough, bind, or stick with the belt off when turned by hand. o Alternator shaft may seize. o Belt may wear abnormally. o Belt may be damaged.
	Warranty Coverage: The alternator is **warrantable** within the applicable warranty period if the bearing is noisy, rattling, binding, or sticking. The alternator is **not warrantable** if a non-warrantable condition exists as described in the following sections.

Failure Caused by Excessive External Heat from Engine Exhaust (22SI)

Section 15.01.05

Damage Code:
124-003A04590 (if warrantable)

Figure 5. 22SI Alternator damaged by exhaust.

The melted plastic cable cover (Fig. 5, Ref. 1), and the soot on the heat sinks (Fig. 5, Ref. 2), indicate exposure to hot exhaust. The exhaust is pulled into the alternator and causes it to overheat and fail.

NOTE: Alternators damaged by excessive heat from the exhaust must be distinguished from contamination. (See Sections 15.01.08 and 15.01.11 of this document)**.**

Symptoms:
- Partial or no charging. (See Section 15.01.01 of this document.)
- Soot (fine black dust) is evidence of an exhaust leak. It covers the inside of the fan, heat sinks (Fig. 5, Ref. 2), inside the drive-end casting, between the fan vanes, and tends to cover the sides of the alternator that face the exhaust and EGR. Soot will coat the heat sinks, but it will not clog them.
- Cable covers may melt (Fig. 5, Ref. 1).

Warranty Coverage:
The alternator is **warrantable** as consequential damage of a warrantable and repaired engine exhaust leak.

IMPORTANT: The most common source of external heat is an exhaust leak near the alternator. **Be sure to repair the exhaust leak.** Trucks with this sort of failure often have multiple claims when the exhaust leak is not repaired correctly. (Check for bulletins from the engine manufacturer and repair the exhaust leak per the engine manufacturer's instructions.)

Failure Caused by Excessive External Heat from Engine Exhaust (24SI)

Section 15.01.06

Damage Code:
124-003A04590 (if warrantable)

Figure 6. 24SI Alternator damaged by exhaust.

The melted plastic shield (Fig. 6, Ref. 1) and the soot on the casting (Fig. 6, Ref. 2) indicate exposure to hot exhaust. The exhaust pulled into the alternator and causes it to overheat and fail.

NOTE: Alternators damaged by excessive heat from the exhaust must be distinguished from contamination. (See Sections 15.01.09 and 15.01.12 of this document)**.**

Symptoms:
- o Partial or no charging. (See Section 15.01.01 of this document.)
- o Melted plastic shield (Fig. 6, Ref. 1).
- o Soot (fine black dust) covers the outside of the metal casting and tends to coat the side on the alternator that faces the exhaust manifold and EGR (Fig. 6, Ref. 2).

Warranty Coverage:
The alternator is **warrantable** as consequential damage of a warrantable and repaired engine exhaust leak.

IMPORTANT: The most common source of external heat is an exhaust leak near the alternator. **Be sure to repair the exhaust leak.** Trucks with this sort of failure often have multiple claims when the exhaust leak is not repaired correctly. (Check for bulletins from the engine manufacturer and repair the exhaust leak per the engine manufacturer's instructions.)

Failure Caused by Excessive External Heat from Engine Exhaust (34SI & 35SI)

Section 15.01.07

Damage Code:
124-003A04590 (if warrantable)

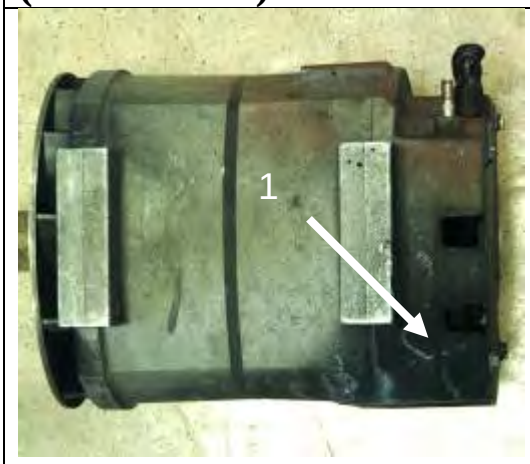


Figure 7A (Side view). 34SI/35SI alternator damaged by excessive heat. Notice that the soot is on surfaces nearest the exhaust manifold and EGR system (Fig. 7A, Ref. 1).

Symptoms:
- Partial or no charging. (See Section 15.01.01 of this document.)
- Soot (fine black dust) tends to coat the side on the alternator that faces the exhaust and EGR (Fig. 7A, Ref. 1), covers the inside the drive-end casting (Fig. 7B, Ref. 2), and between the fan vanes (Fig. 7B, Ref. 3).
- Cable covers may melt.

NOTE: Alternators damaged by excessive heat from the exhaust must be distinguished from contamination. (See Sections 15.01.10 and 15.01.13 of this document.)

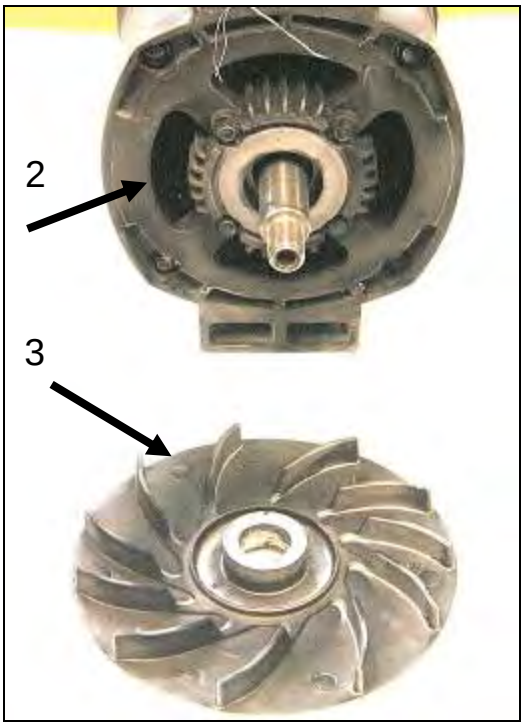
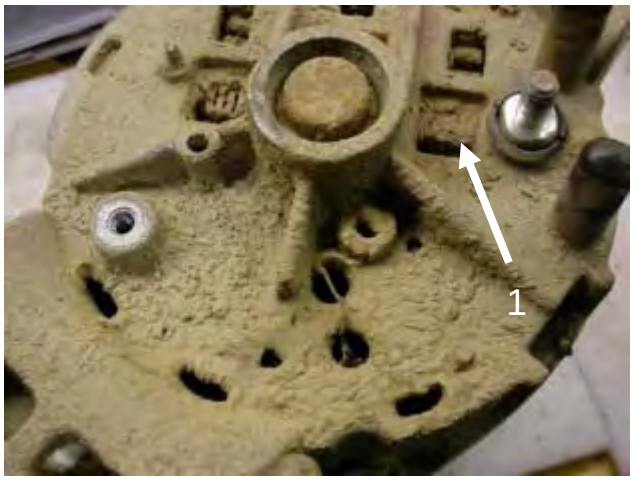


Figure 7B (Front view). A 34/35SI Alternator damaged by exhaust heat will have a thin layer of black exhaust soot coating on the front of the alternator (Fig. 4C, Ref. 2) and inside of the fan (Fig. 4C, Ref. 3). The hot exhaust is pulled into the alternator and causes it to overheat and fail.

Warranty Coverage:
The alternator is **warrantable** as consequential damage of a warrantable and repaired engine exhaust leak.

IMPORTANT: The most common source of external heat is an exhaust leak near the alternator. **Be sure to repair the exhaust leak.** Trucks with this sort of failure often have multiple claims when the exhaust leak is not repaired correctly. (Check for bulletins from the engine manufacturer and repair the exhaust leak per the engine manufacturer's instructions.)

Excessive Dirt & Debris Contamination Failure (22SI)	**Section 15.01.08** **Damage Code: N/A**
 Figure 8. An alternator with a large accumulation of dirt or dried mud. The debris will obstruct air flow through the cooling fins on the heat sinks which prevents cooling of the alternator and causes premature failure.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Debris will clog more than 70% of any one of the six heat-sink openings (Fig. 8, Ref. 1) will cause alternator to overheat and fail. Debris can include dirt, fibers, agricultural byproducts, concrete dust, and other road debris. The contaminants reduce the alternator's ability to reject heat, which causes it to fail prematurely. **Warranty Coverage**: An alternator failure caused by dirt and debris contamination is **not warrantable**.

Excessive Dirt & Debris Contamination Failure (24SI)	**Section 15.01.09** **Damage Code: N/A**
A photo of a 24SI alternator damaged by contamination was not available at the time of publication. Please refer to Sections 15.01.08 & 15.01.10 as similar accumulations of debris can cause a non-warrantable failure.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Accumulation of debris that can include dirt, fibers, agricultural byproducts, concrete dust, and other road debris. These contaminants reduce the alternator's ability to reject heat, which causes it to fail prematurely. **Warranty Coverage**: An alternator failure caused by dirt and debris contamination is **not warrantable**.

Excessive Dirt & Debris Contamination Failure (34SI & 35SI)

Section 15.01.10

Damage Code: N/A

Figure 10A (Side view). 34/35SI alternator damaged by excessive contamination.

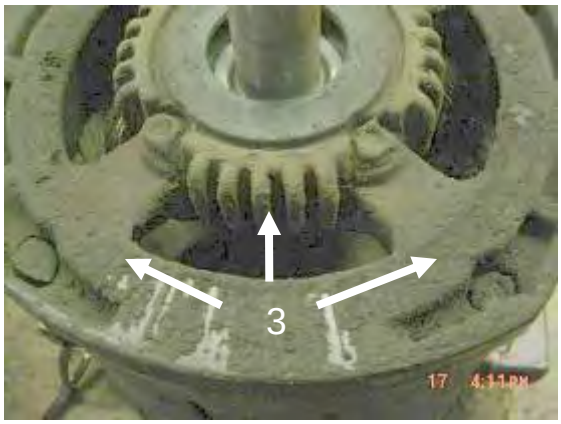


Figure 10B (Front view). 34/35SI alternator damaged by excessive contamination with the fan off.

Figure 10C (Fan). 34/35SI alternator damaged by contamination.

Symptoms:

o Partial or no charging. (See Section 15.01.01 of this document.)

o Look for excessive dirt build-up visible on the outside of the casting and through the vent holes at the back of the alternator (Fig. 10A, Ref. 1 & 2), on the front-end casting (Fig. 10B, Ref. 3), and under the fan (Fig. 10C, Ref. 4). Excessive amounts of dirt inside the alternator will eventually cause it to fail.

o Accumulation of debris that can include dirt, fibers, agricultural byproducts, concrete dust, and other road debris. These contaminants reduce the alternator's ability to reject heat, which causes it to fail prematurely.

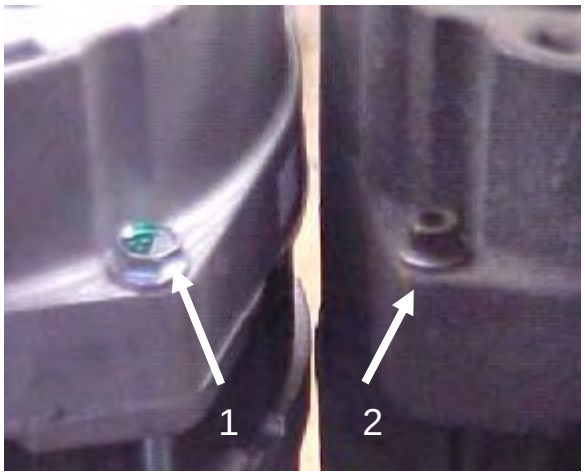
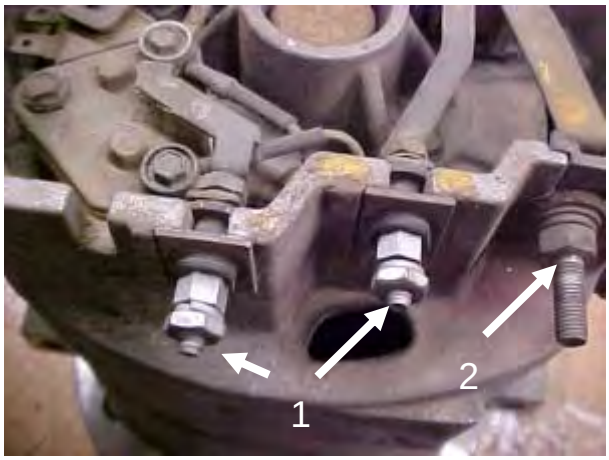
Warranty Coverage:

An alternator failure caused by dirt and debris contamination is **not warrantable**.

Oil Contamination Failure (22SI)	**Section 15.01.11**
	Damage Code: 124-003A04590 (if warrantable)
 Figure 11. 22SI alternator damaged by oil contamination. **NOTE:** Determine the source of the oil and correct the problem. Possible sources of oil contamination include: 1) Oil mist from the breather tube on C-15 engines can be pulled into the alternator. 2) Spillage during oil-filter-element replacement may occur on vehicles with certain Mercedes-Benz Engines if element housing is directly above the alternator. Carelessly removing the element can result in oil dripping from the element onto the alternator.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Contamination will be black and oily. o If oil is pulled into the alternator it will cling to the internal components, which will prevent cooling of the internal components and cause it to fail.
	Warranty Coverage: Alternator failures that result from oil contamination caused by a warrantable engine failure are **warrantable.** Alternator failures that result from oil contamination caused by a spillage are **non-warrantable.**

Oil Contamination Failure (24SI)	**Section 15.01.12**
	Damage Code: 124-003A04590 (if warrantable)
A photo of a 24SI alternator damaged by oil contamination was not available at the time of publication. Please refer to Sections 15.01.11 & 15.01.13 as similar accumulations of oil can cause a failure. **NOTE:** Determine the source of the oil and correct the problem. Possible sources of oil contamination include: 1) Oil mist from the breather tube on C-15 engines can be pulled into the alternator. 2) Spillage during oil-filter-element replacement may occur on vehicles with certain Mercedes-Benz Engines if element housing is directly above the alternator. Carelessly removing the element can result in oil dripping from the element onto the alternator.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Contamination will be black and oily. If oil is pulled into the alternator it will cling to the internal components, which will prevent cooling of the internal components and cause it to fail. **Warranty Coverage**: Alternator failures that result from oil contamination caused by a warrantable engine failure are **warrantable.** Alternator failures that result from oil contamination caused by a spillage are **non-warrantable.**

Oil Contamination Failure (34SI & 35SI)	**Section 15.01.13**
	Damage Code: 124-003A04590 (if warrantable)
 Figure 13. A 34SI alternator damaged by oil contamination. **NOTE:** Determine the source of the oil and correct the problem. Possible sources of oil contamination include: 1) Oil mist from the breather tube on C-15 engines can be pulled into the alternator. 2) Spillage during oil-filter-element replacement may occur on vehicles with certain Mercedes-Benz Engines if element housing is directly above the alternator. Carelessly removing the element can result in oil dripping from the element onto the alternator.	**Symptoms**: o Partial or no charging (See Section 15.01.01 of this document.) o Contamination will be black and oily. o If oil is pulled into the alternator it will cling to the internal components, which will prevent cooling of the internal components and cause it to fail.
	Warranty Coverage: Alternator failures that result from oil contamination caused by a warrantable engine failure are **warrantable.** Alternator failures that result from oil contamination caused by a spillage are **non-warrantable.**

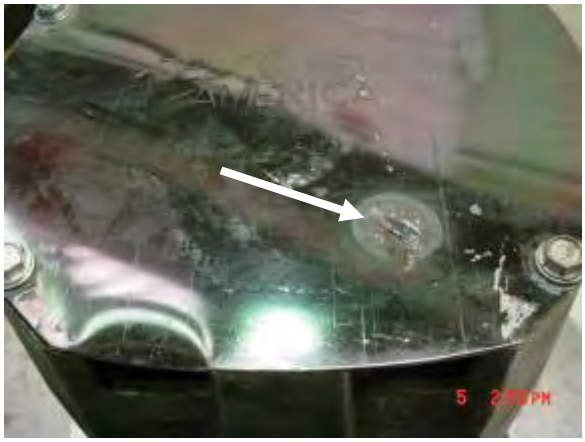
Modified Parts & Field Repairs	**Section 15.01.14**
	Damage Code: N/A
 Figure 14A. Remy only uses hex-head screws (Ref. 1) not socket head screws (Ref. 2) for through bolts.  Figure 14B. The R & I terminals (Ref.1) do not appear to have been in service as long as the B terminal (Ref. 2), which indicates that this alternator was modified.	**Symptoms**: o Any evidence of a non-Remy part (Fig. 14A, Ref. 2). o Any evidence of a field repair. o Any evidence of modification (Fig. 14B). **Warranty Coverage**: An alternator with a field repair is **not warrantable.** A modified alternator is **not warrantable.**

Disassembled Parts	**Section 15.01.15**
	Damage Code: N/A
 Figure 15. Customer disassembled unit.	**Symptoms**: o Disassembled alternator. See Figure 15.
	Warranty Coverage: Disassembled alternators are **not warrantable.**

Non-Remy Remanufactured Alternator	**Section 15.01.16**
	Damage Code: N/A
 Figure 16. Alternator not rebuilt by Remy.	**Symptoms**: o Alternator does not have a Remy badge or has a badge from another re-builder (Fig. 16). o Alternator does not have a Remy part number. o Alternator has Non-Remy components installed.
	Warranty Coverage: Returned components **not** matching the part number of the claimed primary failed item are **not warrantable**.

Shaft Damage Due to a Loose Pulley	**Section 15.01.17**
	Damage Code: 124-003435950 (if warrantable)
 Figure 17. Wearing and bluing on rotor shaft indicates that the pulley spun on the shaft, because the pulley nut was not tightened to the correct torque.	**Symptoms**: o Usually the shaft has turned blue from heat (Fig. 17). o Usually the shaft is damaged. o Usually the pulley is loose.
	Warranty Coverage: A worn or blued shaft is **warrantable** if all of the following apply: o The part is within new vehicle warranty. o The failure occurs within the vehicle's initial operating period. (Refer to the Initial Operating Period in Section 1.5 of the Warranty Manual.) A Worn or Blued Shaft is **not warrantable** if any of the following apply: o The alternator is a replacement part. o The damage occurred after the vehicle's initial operating period.

Damaged Lug on J-mount Alternator	**Section 15.01.18**
	Damage Code: 124-003930950 (if warrantable)
 Figure 18A. Mounting lug fractured.  Figure 18B. Oblong misshapen mounting hole.	**Symptoms**: o Mounting lug may fracture due to improper installation (Figure 18A). o Deformed, oblong, misshapen, wallowed, or otherwise enlarged mounting holes (Figure 18B). o Noises or rattling due to loose or fractured mounting lug. **Warranty Coverage**: Damaged lugs are **warrantable** if all of the following apply: o The part is within new vehicle warranty. o The failure occurs within the vehicle's initial operating period. (Refer to the Initial Operating Period in Section 1.5 of the Warranty Manual.) o The failure is not the result of shipping or handling. Damaged lugs are **not warrantable** if any of the following apply: o The alternator is a replacement part. o The damage occurred after the vehicle's initial operating period. o The damage is the result of shipping or handling.

Arcing Damage	**Section 15.01.19**
	Damage Code: 124-003651940 (if warrantable)
 Figure 19A. Arcing marks indicate an arcing event that can damage the unit.  Figure 19B. Arcing marks indicate an arcing event that can damage the unit.	**Symptoms**: o Arcing marks. Arcing can damage internal components (Fig. 19A & 19B). **Warranty Coverage**: Arcing damage is **warrantable** if all of the following apply: o The part is within new vehicle warranty. o The failure occurs within the vehicle's initial operating period. (Refer to the Initial Operating Period in Section 1.5 of the Warranty Manual.) Arcing damage is **not warrantable** if any of the following apply: o The alternator is a replacement part. o The damage occurred after the vehicle's initial operating period.

Damaged Terminal	**Section 15.01.20**
	Damage Code: 124-003087950 Loose cable (if warrantable) 124-003651950 Loose wire (if warrantable)
 Figure 20A. Terminal damaged due to arcing of a loose wire.  Figure 20B. Heavy arcing present from loose cable terminal.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Arcing marks or heavy corrosion on terminals. Arcing can damage internal components (Figure 20A & 20B). o Intermittent charging.
	Warranty Coverage: Damaged terminals are **warrantable** if all of the following apply: o The part is within new vehicle warranty. o The failure occurs within the vehicle's initial operating period. (Refer to the Initial Operating Period in Section 1.5 of the Warranty Manual.) Damaged terminals are **not warrantable** if any of the following apply: o The alternator is a replacement part. o The damage occurred after the vehicle's initial operating period.

Bent Terminals	**Section 15.01.21**
	Damage Code: 124-003A04940 (if warrantable)
 Figure 21. Bent terminals can indicate that the unit was damaged.	**Symptoms**: o Partial or no charging. (See Section 15.01.01 of this document.) o Bent terminals (Figure 21). o Possible intermittent charging.
	Warranty Coverage: An alternator with one or more bent terminals is **warrantable** if all of the following apply: o The part is within new vehicle warranty. o The failure occurs within the vehicle's initial operating period. (Refer to the Initial Operating Period in Section 1.5 of the Warranty Manual.) o The failure is not the result of shipping or handling. An alternator with one or more bent terminals is **not warrantable** if any of the following apply: o The alternator is a replacement part. o The damage occurred after the vehicle's initial operating period. o The failure is the result of shipping or handling.

Damaged Shaft Threads	**Section 15.01.22**
	Damage Code: N/A
 Figure 22A. Damaged pulley shaft.  Figure 22B. Cross-threaded shaft threads.  Figure 22C. Shaft damaged during pulley removal.	**Possible Symptoms**: o Damaged threads (Figure 22A). o Cross-threaded shaft (Figure 22B). o Mushroomed shaft (Figure 22C). **Warranty Coverage**: o Alternators with damaged shaft threads (for the pulley nut) are **not warrantable**. **NOTE:** Be sure to remove and install the pulley and pulley nut properly to avoid damaging the shaft thread.