

ATTENTION:

- GENERAL MANAGER
- PARTS MANAGER
- CLAIMS PERSONNEL
- SERVICE MANAGER

IMPORTANT - All Service Personnel Should Read and Initial in the boxes provided, right.



SUBARU

QUALITY DRIVEN® SERVICE

SERVICE BULLETIN

APPLICABILITY: All Turbo Equipped Models
SUBJECT: Turbo Vehicle Operation and Care

NUMBER: 02-101-07
DATE: 02/28/07

INTRODUCTION

Many Subaru vehicles are equipped with turbo charged engines and are often referred to as performance or enthusiasts' vehicles. Turbo charged engines require some special care and precautions. Special attention should be paid to the following:

(1) MODIFICATIONS

Modifying the engine tuning of a Subaru to increase horse power by Engine Control Unit (ECU) replacement or reprogramming can lead to engine failures. Other external engine modifications, such as intake or exhaust systems, can also lead to failures. Any modifications can reduce engine durability and cause reliability deterioration.



Aftermarket Air Fuel Controller wired to ECM



Aftermarket Chip Processor

Intake system

Modifications to the intake systems, including the air cleaner, can cause the following:

- Allow foreign objects to enter the engine.
- Change the Air/Fuel mixture ratio, due to the change of intake air amount.
- System malfunctions due to a contaminated air flow sensor.
- Reduced engine durability due to higher horse power that exceeds engine design specifications.
- Turbo charger internal damage from excessive turbine speed.

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CAUTION: VEHICLE SERVICING PERFORMED BY UNTRAINED PERSONS COULD RESULT IN SERIOUS INJURY TO THOSE PERSONS OR TO OTHERS.

Subaru Service Bulletins are intended for use by professional technicians ONLY. They are written to inform those technicians of conditions that may occur in some vehicles, or to provide information that could assist in the proper servicing of the vehicle. Properly trained technicians have the equipment, tools, safety instructions, and know-how to do the job correctly and safely. If a condition is described, DO NOT assume that this Service Bulletin applies to your vehicle, or that your vehicle will have that condition.





Aftermarket Cold Air Intake

Camshaft

Modifications to the Camshaft can create higher cylinder pressure due to the increase of intake air amount, and may result in engine damage.

Exhaust system

Modifications to the Exhaust System may create a reduction of exhaust resistance. This can lead to similar problems as found in Intake System modifications.



Aftermarket Exhaust System



Aftermarket Exhaust Bypass Valve

Body

Body modifications on vehicles may interfere with the flow of air to the Engine Cooling System, Intercooler, or Exhaust System. This can cause a raise in engine operating temperature which, in turn, would result in a rise in the intake air temperature which will affect the Engine Management System.

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Ignition System

Modifications to the Engine Ignition System, such as “plugs”, can cause abnormal ignition, and result in engine damage.



Ring Land Damage from Detonation

Others

Relocation of any vehicle component may affect the Engine Management System and, in turn, cause potential engine damage.



Aftermarket Blow Off Valve



Ring Land Broken from Over Boosting

(2) MAINTENANCE

Engine Oil and oil filter

- Some brands of oil which are available in the aftermarket may not have enough lubrication ability and durability, regardless the price. (Poor performance oil causes damage on the crankshaft bearing, camshaft bearing, piston ring, cylinder liner, or turbo charger.)
- If the oil complies with the American Petroleum Institute (API) classification of SM (or SL minimum), and is within the recommended viscosity, it will not cause engine problems.
- A lack of oil may cause damage to the crankshaft bearing, camshaft bearing, piston ring, cylinder liner, or turbo charger.
- When the vehicle is used under severe driving conditions, moderate to hard acceleration on a somewhat regular basis, the engine oil and filter should be changed every 3,750 miles (6,000 km) or 3.75 months. For additional examples of severe driving conditions, refer to the Warranty & Maintenance Booklet.

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- The use of a Genuine Subaru oil filter is strongly recommended. Many aftermarket oil filters have different filtration capacity and relief valve opening pressure. Those filters may not meet Subaru's requirements and may cause engine problems.



Aftermarket Oil Filter



Rod Bearing Spun from Lack of Oil

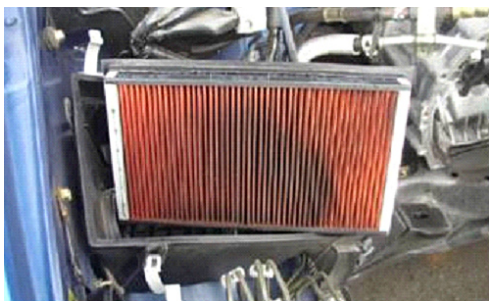
Coolant

- Use only Genuine Subaru Long Life Coolant.
- The use of a silicate type coolant deteriorates the aluminum surface of the radiator, causing loss in cooling performance, and may cause engine overheating.
- Use only Genuine Subaru coolant conditioner. Non-genuine coolant conditioners contain large particles that may clog the coolant passages in the radiator resulting in a loss of cooling performance and may cause engine overheating.

Please refer to Service Bulletin 09-42-05.

Air Cleaner

If the air cleaner element is contaminated, intake air flow is reduced. This condition will create an increase in engine vacuum causing an extra load on the turbo charger.



Contaminated Air Cleaner Element

(3) FUEL

Adequate quality and octane number fuel should be always used. The use of poor quality or low octane fuel can cause engine damage. Requirements vary by model, so please see the vehicle's owners manual for more details.

For example: 07MY Impreza WRX STI

Use super-premium unleaded gasoline with an octane rating of 93 AKI or higher. If super-premium unleaded gasoline with an octane rating of 93 AKI is not available, premium unleaded gasoline with an octane rating of 91 AKI or higher may be temporarily used. For optimum engine performance and driveability, it is required that you use super-premium grade unleaded gasoline with an octane rating of 93 AKI or higher.

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(4) DRIVING

Racing / Abusive Driving

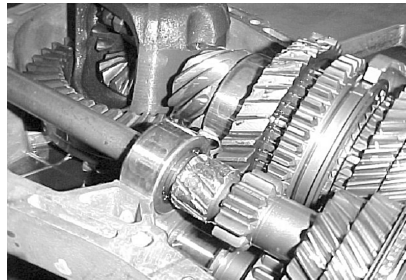
The term “racing” refers to all forms of racing whether street, drag, rally, sanctioned or un-sanctioned, etc. Any damage that results from racing is not warrantable.

Some examples of abusive driving are exceeding maximum recommended RPMs, excessive torque transferred to the transmission during acceleration from a complete stop (dumping the clutch), downshifting at high RPMs and missing shifts.

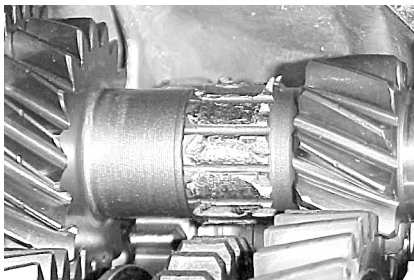
The photos below depict some results of abusive driving:



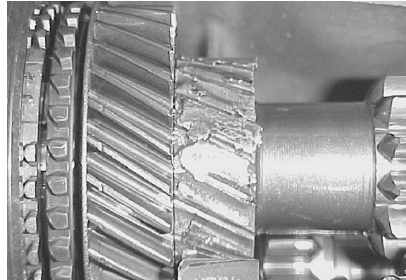
Second Gear Teeth Missing



First Gear Teeth Stripped from Mainshaft



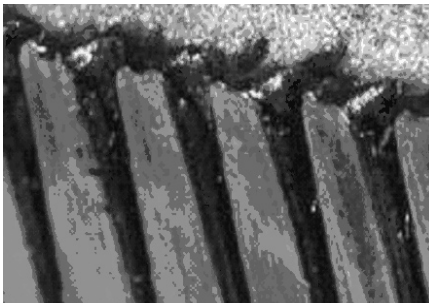
Reverse Gear Teeth Stripped



Second Gear Teeth Missing

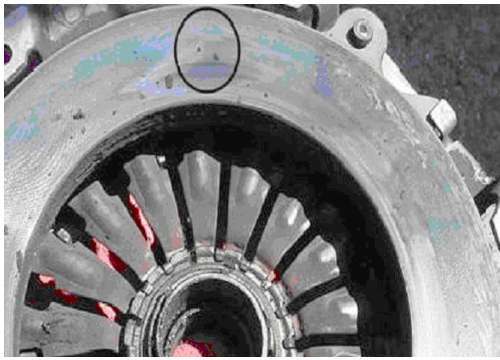


6-Speed 1-2 Shift Interlock Arm Broken

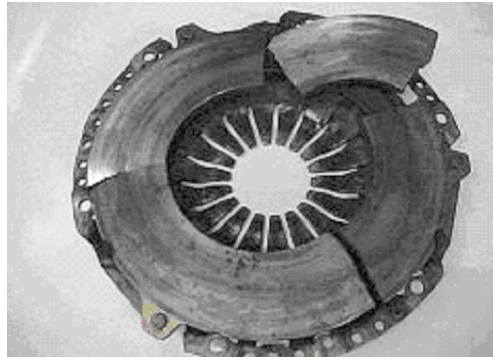


Damaged Land of Baulk Ring

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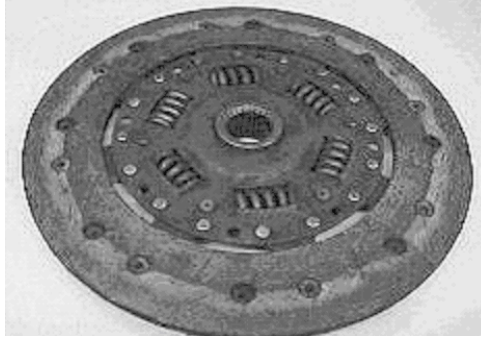
Over Heated Pressure Plate



Broken Pressure Plate



Over Heated Flywheel



Over Heated Clutch Disc



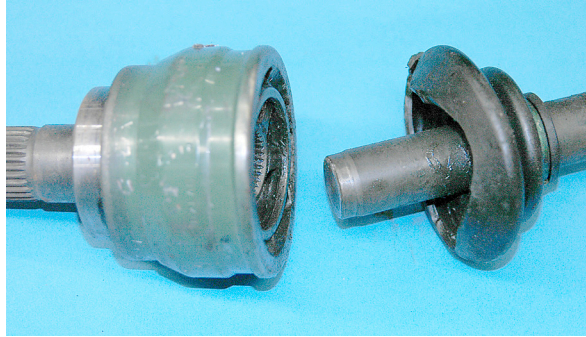
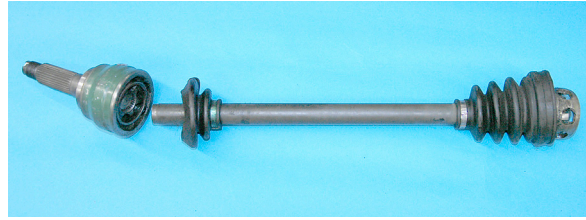
Rear Differential Gear Damage



Burnt automatic transmission clutches

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The following 3 photos show an axle shaft that was sheared off at the “Bell Joint” (BJ) as the result of abuse.



Engine Over-revving

- Subaru engines are equipped with a fuel cut-off device that prevents engine over-revving on acceleration. However, over-revving due to shift-down on MT vehicles can not be prevented.
- Driving under these conditions will also consume engine oil at a much higher rate than consumed during normal driving conditions.
- It is highly recommended that the oil level should be checked at every fill-up, especially if the vehicle is being driven under severe driving conditions or aggressively.
- The fuel cut-off function is an emergency action to protect the engine from damage, therefore continuously revving the engine at the point of fuel cut-off is not recommended. Doing so will cause damage to the engine/catalytic converter from extremely high temperatures.
- In hard turning situations, and with less than a quarter tank of fuel, it is possible that fuel flow can be momentarily interrupted, which will result in intermittent combustion temperature increases. Such temperature increases will deteriorate the engine and affect long term durability.