



Power

Exchange

Core acceptance
criteria

September 2013

 **Perkins**[®]

THE HEART OF EVERY GREAT MACHINE

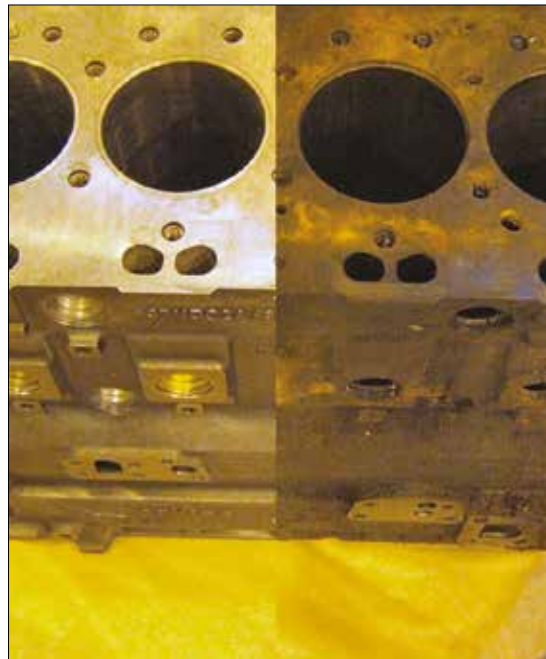


Core acceptance criteria

We are working hard to ensure cost-effective continuity of supply for components throughout your engine lifecycle. Power Exchange, our remanufactured parts programme, is a competitive offering and dependable service solution delivering you good as new quality parts, from reworked core.

A sustainable, proven proposition, supplying you reliable remanufactured parts backed with the same warranty as new and delivering long-lasting environmental benefits.

Power Exchange components are produced to the latest design specification and use only genuine components. Our remanufacturing process uses state of the art techniques and advanced technologies to enable us to guarantee that each part is as reliable as new.



Remanufactured core

Old core

Power Exchange components consistently deliver you the same performance as new and are long lasting backed by the same 12-month warranty.

We offer you a vast range of remanufactured parts covering most of our engine ranges, which is regularly reviewed to adapt to the market and exceed our customer expectations.

Power Exchange

Core acceptance criteria

Introduction and key points

Introduction

Our Power Exchange programme operates on an exchange basis. For every remanufactured part sold, a core (or worn out unit) must be returned in order to receive a core refund. Each core must be inspected against the Power Exchange Core Acceptance Criteria to determine whether it is eligible for full core refund, damaged core refund or no core refund. This introduction explains how to inspect cores using the core acceptance criteria.

Core acceptance criteria

This guide contains the core acceptance criteria we use to inspect cores for deposit refunds. You should inspect cores by consistently applying these criteria.

Each product family has a series of visual checks that must be performed to determine if the core is acceptable for refund.

At the beginning of each core acceptance criteria document, to help you with your inspection you will find simple visual core acceptance guidelines. We have also included core inspection tips that you can refer to on where to look for likely damage and several pictures to aid with the inspection.

Some product families, such as cylinder heads, have two possible levels of core deposit refunds – full and damaged. You must inspect the core to determine which level is appropriate.

The core inspection criteria, is designed to ensure it is easy to apply and takes only a few minutes to perform with no special tools required.

Abrasive cleaning

Cores should not be cleaned by abrasive methods such as sandblasting or glass beading. If abrasive cleaning has damaged critical areas, the core will receive no refund.

Disassembled cores

Cores may be disassembled for repair requirement determination, failure analysis, or other diagnostic requirements only. If a core is disassembled and then returned to us, it must be returned completely reassembled with the original parts from that core.

Cores that have been disassembled run increased risk of corrosive damage and loss of parts before inspection by us, which may decrease core refund received. Further, components that are disassembled and reassembled with scavenged parts (parts from other than the original core) will receive no core refund.

Cores with evidence of unsuccessful attempts to salvage

Cores showing signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for core refund. Please see the individual core criteria for specific information on each product family.

Non-operational damage

Cores exhibiting non-operational damage such as mishandling, excessive rust, corrosion, pitting or fire damage are not acceptable for core refund.

Packaging of cores for return

The customer holding the core entitlement is responsible for packaging the core in the container of the original Power Exchange part for return to us for core refund. If the original packaging is not available, the customer must pack the core in suitable packaging to prevent any damage in transit.

If the core returned to us is in a damaged condition due to improper packaging, the core credit will be reduced to a damaged core refund or no core refund dependent upon the product family.

Preparing the core for packaging

1. Heavy soil and grease build-up should be removed from cores, especially for cores from foreign locations destined to the USA for remanufacture. Do not, however, use sandblasting or abrasive cleaning methods. Steam cleaning is not necessary, unless required by governmental regulations and/or the core acceptance criteria.
2. Drain all fluids, such as oil and antifreeze from the cores by removing all oil filters to facilitate complete drainage. Existing filters should be reinstalled after draining or properly dispose all fluids and seal the filter base on the engine with a cover/plug, or puncture resistant tape to contain residual fluids.
3. Plug or tape all openings.



Core acceptance criteria

Alternators

You will receive:

Full core refund

- Housings or rotor not cracked, broken or damaged
- Fully assembled and complete (see explanation below)
- No non-operational damage (such as: excessive rust, mishandling, melting to the housing from an electrical arch, and/or hammer strike)
- Acceptable Perkins part number
- Rotor turns

Damaged core refund

- Housings or rotor cracked, broken or damaged
- Non-operational damage (such as: excessive rust, mishandling melting to the housing from an electrical arch, and/or hammer strike)
- Seized rotor

No core refund

- Any missing sub-assemblies (see explanation below)
- Not interchangeable with a Perkins Power Exchange alternator
- Disassembled
- Fire damage

Core acceptance criteria

Alternators - continued

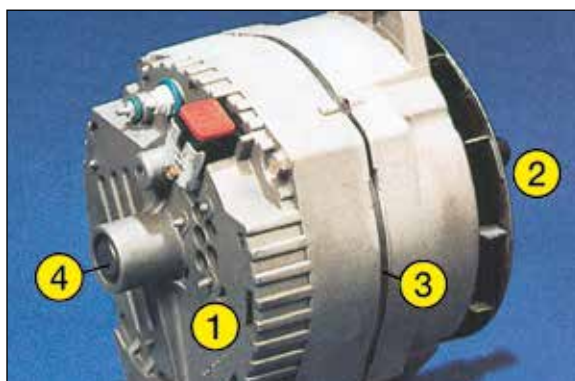


Figure 1 - full core refund

1. Opposite drive end
2. Drive end
3. Stator
4. Rotor



Figure 2 - damaged core refund
Broken housing



Figure 3 - damaged core refund
Cracked housing



Figure 4 - damaged core refund
Non operational damage - hammer strike to shaft



Core acceptance criteria

Alternators - continued

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Fully assembled and complete

If any major sub-assembly is missing, **no core refund** will be issued. Major sub-assemblies include:

- Rotor
- Drive end frame
- Stator
- Opposite drive end frame

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.

Seized rotor

Damaged core refund will be given if the rotor does not turn by hand.

Fire damage

Cores that have been exposed to heat from a fire do not qualify for core credit. Visual evidence of fire damage is the melting of the housing. Melting of the housing from an electrical arch is not considered fire damage but it does reduce the core credit to a damaged core refund.

Core acceptance criteria

Atomisers - fuel injectors

You will receive:

Full core refund

- Acceptable Perkins part number or service code
- Not bent or broken
- Damage to nozzle tip
- No excessive rust or corrosion
- Fully assembled and complete
- No damage to fuel feed or leak off threads



Figure 1 - full core refund



Figure 2 - full core refund
Damaged nozzle

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Bent or broken

Bent or broken nozzles can usually be identified by visual inspection.

Cracked body assemblies or damaged threads will receive no core refund.

Minor scratches, nicks, gouges on the body or evidence of overheating are acceptable for full core refund.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.



Core acceptance criteria

Camshafts and camshaft kits

You will receive:

Full core refund

- Acceptable Perkins part number
- Not visibly broken or welded (see inspection tips)
- No signs of non-operational damage (such as mishandling, excessive rust, corrosion, pitting or evidence of unsuccessful attempts to salvage)
- Fully assembled and complete (assemblies and kits only)

No core refund

- Unacceptable part number or not a Perkins part
- Non-operational damage (such as mishandling, excessive rust, corrosion, pitting or evidence of unsuccessful attempts to salvage)
- Visibly broken or welded

Core acceptance criteria

Camshafts and camshaft kits - continued



Figure 1 - full core refund
Bearing failure



Figure 2 - full core refund
Damaged gear

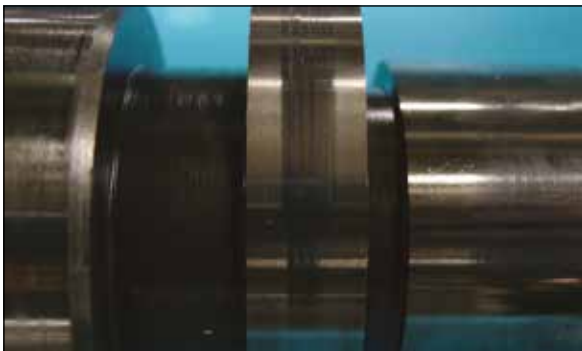


Figure 3 - full core refund
Normal lobe wear damage



Figure 4 - full core refund
Material missing on lobe



Figure 5 - full core refund
Material missing on lobe



Core acceptance criteria

Camshafts and camshaft kits - continued

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Non-operational damage (mishandling, excessive rust, corrosion or pitting)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting which are most often caused by improper storage, will result in no core refund.

Fully assembled with gear

When applicable, gears should accompany returned camshaft. Each missing, cracked, broken or welded gear will be add charged. Gears that have been removed from the camshaft are not required to be reattached to the camshaft for core credit. The gear must be packaged with the camshaft with additional protection to prevent any in-transit non-operational damage.

Broken or welded

The condition of the bearing journals and lobes does not affect core credit unless non-operational damage is present.

Rocker arms and lifters

Each camshaft kit should have the correct number of rocker arms or lifters returned with the camshaft.

Core acceptance criteria

Complete engines

You will receive:

Full core refund

- Cylinder block is not visibly cracked, broken or welded
- Non-failed and running engine core
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Acceptable Perkins engine model
- Must be returned on engine stand provided with reman engine purchase

Damaged core refund

- Cylinder block visibly cracked, broken or previously welded by source other than Perkins
- Acceptable Perkins engine model
- Failed, non-running engine core
- Evidence of bearing, piston, connecting rod, valve, gear train or other internal failure
- Not returned on engine stand provided with reman engine purchase
- Cores are not drained (see inspection tips)

No core refund

- Scavenged cores returned (see inspection tips)
- Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Disassembled
- Not an acceptable Perkins engine model

All complete engine core must be returned completely assembled with these components included **in the container from the original Power Exchange complete engine:**

- Sump (oil pan) assembly
- Damper assembly (if applicable)
- Timing case
- Intake and exhaust manifold
- Turbocharger (if applicable)
- Governor (if applicable)
- Fuel filter group
- Top cover (rocker cover)
- Flywheel housing (if applicable)
- Oil cooler (if applicable)
- Water pump
- Fuel/air ratio control (if applicable)
- Cylinder head
- Crankshaft assembly
- Camshaft assembly
- Connecting rods and pistons
- Liners (if applicable)



Core acceptance criteria

Complete engines - continued

- Fuel lift pump
- Thermostat housing cover
- Air compressor (if applicable)
- Cylinder block
- Injector assemblies
- Fumes disposal (breather system) tube
- Oil filter group
- All engine-mounted pulleys
- Valve mechanism group
- Electronic control module (ECM) (if applicable)

If there is a known internal failure, use 'KNOWN' inspection code on the electronic CCR.

Damaged blocks

Cracked or broken or welded blocks will receive damaged core refund.

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust or corrosion will result in no core refund.

Engine cores with fire damage receive no core refund.

Engine cores which appear to have had salvageable parts removed from them and had non-salvageable parts substituted in their place, will be subject to a detailed inspection. Disassembly of suspect cores may be necessary to determine the authenticity of the core.

If a returned core is found to have been scavenged or assembled from scrap material, the core will be rejected and the customer returning the core to Perkins will be charged a £200 inspection fee.

Drain all cores

Completely drain and recycle or properly dispose of all fluids. If fluids are not drained then credit will be reduced to damaged core refund. To receive full credit you must drain all coolant from the engine block, oil cooler and water pump. Drain all oil from the engine block, remove oil filters, and seal all openings with plugs and covers from the remanufactured engine or with puncture resistant tape. Leaks or spills during transportation are very serious and are a health and safety risk. Perkins customers are liable for any clean up costs or damage resulting from in transit leaks or spills.

Core acceptance criteria

Connecting rods

You will receive:

Full core refund

- Fully assembled and complete – rod and end cap match and are marked
- Rod not scored and discoloured due to overheating from a bearing failure
- No pin bore damage due to failed bushing
- Rod not visibly cracked, broken, bent or twisted
- No non-operational damage (mishandling, excessive rust, corrosion or pitting)
- Acceptable Perkins part number

No core refund

- Unacceptable part number or not a Perkins part
- Not fully assembled and complete
- The bearing from the crankshaft bore is not required to be removed (see inspection tips for clarification)
- Non-operational damage
- Connecting rod and original end cap does not correspond with matching marks (see figure 5, 6 and 7)
- Connecting rod is visibly cracked, broken, bent or twisted (see figure 4)
- Crankshaft bore of the connecting rod is scored and discoloured from a bearing failure (refer to inspection tips for clarification; see figure 1)



Figure 1 - no core refund
Crank bore is scored and heat discoloured



Figure 2 - full core refund
Chemical/sludge discolouration



Figure 3 - no core refund
Pin bore damage



Figure 4 - no core refund
Visibly bent and twisted



Figure 5 - full core refund
Cap and rod markings matched



Figure 6 - full core refund
Cap and rod markings matched



Figure 7 - no core refund
Mismatched cap



Core acceptance criteria

Connecting rods - continued

Discolouration due to overheating from a bearing failure

Rod bearing failure (blue-black colour) will not cause core rejection. To be rejected, the crank bore must show evidence of bearing failure scoring and a rough inner diameter and be discoloured from overheating as shown in figure 1.

Discolouration from chemical build-up or sludge is acceptable (see figure 2).

Fully assembled and complete (rod and end cap must match and are marked)

Rod and end cap must match and be marked for full credit. If your cores are not already numbered, mark your rods and end caps before removal. Then reassemble them into matched sets before core shipment. If either the rod or the end cap is unmarked upon return to Perkins, no core refund will be issued.

Non-operational damage (mishandling, excessive rust, corrosion or pitting)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust, or pitting, which are most often caused by improper storage, will result in a damaged core refund.

Core acceptance criteria

Crankshafts

You will receive:

Full core refund

- Not visibly cracked or broken
- Not chromed or welded
- Complete with undamaged gear and counterweights (where applicable)
- Not excessively damaged fillet areas
- Undamaged by mishandling, excessive rust, corrosion or pitting
- Acceptable Perkins part number

No core refund

- Chromed or welded
- Cracked or broken



Figure 1 - no core refund
Visible crack



Figure 2 - no core refund
Visible crack

Fully assembled with gear and counterweights

Gears must be included with your core.

Condition of the gear is not a factor unless the gear is an integral part of the crankshaft forging. For these, no core refund will be issued if the gear is cracked, damaged or broken.

When applicable, counterweights must be returned.

Chromed or welded

Cores which have been competitively rebuilt using chrome plating or welding are not acceptable for full core refund. When checking for welding or chrome plating:

- Look for a shiny, raised journal surface as shown in figure 3
- Inspect the oil holes and look for a layer of chrome or weld material
- Inspect the journal surface. A chromed surface usually will have a shattered glass appearance
- A copper sulphate test may be done to verify a chromed part



Figure 3 - no core refund
Chromed journal surface

Non-operational damage (mishandling, excessive rust, corrosion or pitting)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund (figure 4).

Core acceptance criteria

Crankshafts - continued

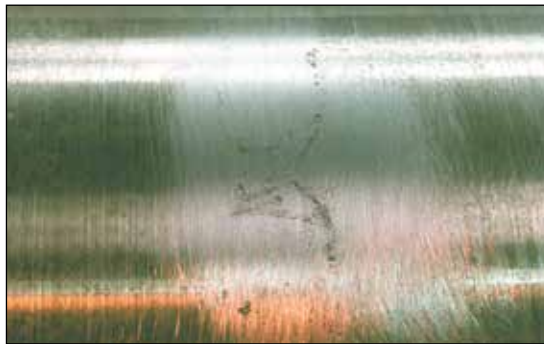


Figure 4 - no core refund
Excessive pitting

Excessively damaged fillet areas

Bearing failures may cause excessive fillet damage. Damage is excessive when metal is removed from the red shaded areas as shown in Figure 5. It is usually due to contact with the connecting rod or main bearing.

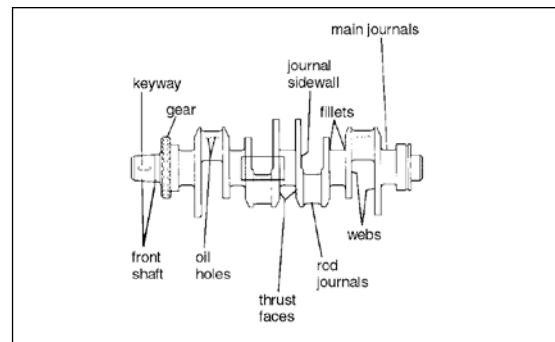
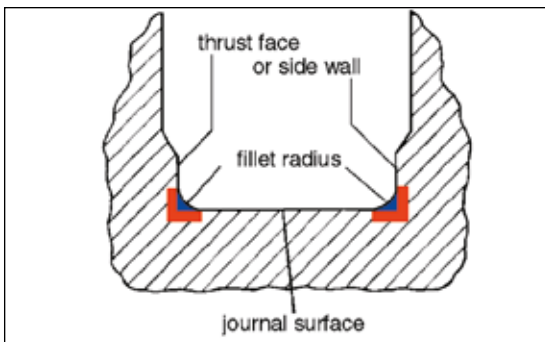


Figure 5

A crankshaft with metal removed from the blue shaded area of the fillet radii is acceptable for full credit.
A crankshaft with metal removed from the red shaded areas is not acceptable for full credit.



Figure 6 - full core refund
Bearing build-up

Core acceptance criteria

Cylinder blocks

You will receive:

Full core refund

- Cylinder block is not cracked, broken or welded
- Fully assembled with matched bearing caps in proper locations
- No non-operational damage (mishandling, unsuccessful attempts to salvage, excessive rust, corrosion, pitting or fire damage)
- Acceptable Perkins part number
- Liners must be included (if applicable)
- No material removed from top deck surface of block



Figure 1 - not acceptable

No damaged core refund is available for cylinder blocks.

Damaged blocks

Cracked, broken or welded blocks receive no core refund. Examine all areas of the block including the top deck face, pan rail, front and rear mounting faces, cam bores and cylinder bores. Top deck cracks are most commonly found between the water passages and bolt holes as per figure 1.

Fully assembled

Blocks must be returned completely assembled with the bearing caps properly bolted in place and with liners if applicable.

Cylinder liners

Blocks with cylinder bores lined with genuine Perkins liners are acceptable.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.

Unsuccessful attempts to salvage the block will result in no core refund.

Blocks with fire damage will receive no core refund.

Core acceptance criteria

Cylinder heads



Figure 1 - damaged core refund
Welder's mark



Figure 2 - damaged core refund
Bottom deck crack



Figure 3 - damaged core refund
Top deck crack



Figure 4 - damaged core refund
Dropped valve damage



Figure 5 - damaged core refund
Metal stamp on combustion face



Figure 6 - damaged core refund
A plug which is not cast iron has been welded into this head to replace a cracked area around the bore. Perkins does not use or authorise this process



Figure 7 - damaged core refund
This head had a top deck crack and was repaired by welding the freeze plug hole shut. Perkins does not use or authorise this process

You will receive:

Full core refund

- Not visibly cracked, damaged or welded (see exception under *cracked full core refund*)
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust, corrosion or metal stamps on combustion face)
- Acceptable Perkins part number

Damaged core refund

- Visibly cracked, damaged, or previously welded (see exception under *cracked full core refund*)
- Non-operational damage (mishandling, excessive rust, corrosion or metal stamps on combustion face)
- Disassembled completely

No core refund

- Broken casting
- Not a Perkins part or not an acceptable part number
- Any evidence of unsuccessful attempts to salvage
- Fire damage

Core acceptance criteria

Cylinder heads - continued

Visual inspection

Only a visual inspection of the cylinder head is needed. You are not required to disassemble, clean, dye check or magnaflux cylinder head cores.

Welded

- **Full core refund**

Perkins Power Exchange cylinder heads, welded or unwelded, have the Perkins part number stamped on them. Any Perkins Power Exchange cylinder head will receive full core refund if it is uncracked and meets all other full core refund criteria.

- **Damaged core refund**

Cylinder heads with a welder's mark (figure 1) or with any visible weld as in figures 6 and 7 will result in a damaged core refund.

Minor cosmetic damage is acceptable for full core refund. Cosmetic welding is often used on the sides of castings to hide minor dents and scratches or to repair bolt hole bosses. Welding in the fire ring area is never cosmetic and will result in damaged core refund if welded by a source other than Perkins.

Cracked

- **Full core refund**

A head with an internal crack that is not visible is eligible for full core refund if it meets all other full core refund criteria. Mark the head 'Internal Crack' to assure it is not reused.

- **Damaged core refund**

Cracked cylinder heads are acceptable for damaged core refund. Cracks are often difficult to locate. For best results, scrape away excess oil, dirt and carbon. Shine a flashlight at an angle rather than straight at the head. Cylinder heads typically crack in the fire ring area on the bottom deck (figure 2) or on the top deck (figure 3). One good indicator that a top deck crack may be present is a build-up of dirt and oil near the crack. You can usually find these cracks by carefully inspecting the top decks between adapter holes and freeze plugs.

Damaged

A severely damaged cylinder head is acceptable for damaged core refund. Severe damage is usually caused by debris from a major engine failure such as dropped valves, damaged pistons or injector tips (figure 4). No add charge will be made for valves damaged due to a component failure within a cylinder. Minor damage such as stripped threads, broken bolts, and scratches in non-machined areas are acceptable for full core refund.

Pitting

Pitting which occurs through normal operation will be acceptable for full refund. Pitting is defined as the flaking of metal caused by the presence of moisture during operation (figure 8). Pitting usually occurs in the fire ring area of the bottom deck or around exhaust parts.



Figure 8 - full core refund
Pitting



Core acceptance criteria

Cylinder heads - continued

Fully assembled

The following parts should be included with your assembled cylinder head kit for core return:

- Head casting
- Valves
- Springs
- Guides
- Adapters (when applicable)



Figure 9 - full core refund
Complete cylinder head for core return

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.

Core acceptance criteria

Diesel Particulate Filter (DPF)

You will receive:

Full core refund

- Unit is fully assembled and complete (refer to figure 1)
- Unit is an acceptable Perkins part number
- Operational damage within acceptable limits
 - Ceramic component on outlet side of DPF not blackened with soot (refer to figure 4)
 - No honeycomb cracks and edge chipping limited to less than a two radial cell limit in from the edge (refer to figures 2 and 3)
- Unit has no non-operational damage (mishandling damage, excessive rust, corrosion and pitting)

Damaged core refund

- Unit is fully assembled and complete
- Unit is an acceptable Perkins part number
- Operational damage exceeds acceptable limits
 - Ceramic component on outlet side of DPF blackened with soot (refer to figure 4)
 - Honeycomb cracks or chipped honeycomb edge that exceeds limit of two radial cells in from the edge (refer to figures 2 and 3)
- Unit has non-operational damage (mishandling damage, excessive rust, corrosion, and pitting) (refer to figure 5)

No core refund

- Unit is disassembled or not complete
- Unit is not an acceptable Perkins part number
- Fire damage

Core acceptance criteria

Diesel Particulate Filter (DPF) - continued



Figure 1 - full core refund
Fully assembled and complete



Figure 2 - damaged core refund
Honeycomb cracking



Figure 3 - damaged core refund
Honeycomb chipping exceeding two radial cell limit



Figure 4 - damaged core refund
Operational damage - indicates internal cracking
that is passing soot



Figure 5 - damaged core refund
Non-operational damage - case damage

Core acceptance criteria

Diesel Particulate Filter (DPF) - continued

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Honeycomb inspection

Inspect the honeycomb face for cracking/chipping. Visible cracking will only qualify for damaged core refund. Chipping which can be caused by mishandling can still qualify for full core refund as long as it means its repairable. Repairable is defined as damage which is limited to less than two cells in from the outer edges regardless of number of cells impacted.

Non-operational damage (mishandling, excessive rust, corrosion or pitting)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting which are most often caused by improper storage, will result in no core refund.

Shipping instructions

To prevent damage during shipment, all Diesel Particulate Filter cores should be carefully packed, preferably in the replacement filter shipping container. Unpackaged DPFs will likely be damaged in transit. This will result in reduced core refund.



Core acceptance criteria

ECMs

You will receive:

Full core refund

- Fully assembled and complete
- No signs of tampering or attempts to rebuild
- Acceptable Perkins part number

No core refund

- Unit is disassembled or not complete
- Unit is not an acceptable Perkins part number
- Fire damage



Figure 1 - full core refund

Core acceptance criteria

Fuel injection pumps

This document covers the following pumps:



Figure 1 - Lucas Rotary



Figure 2 - Stanadyne Rotary



Figure 3 - Delphi



Figure 4 - Bosch EPVE



Figure 5 - in-line



Figure 6 - Bosch VP30



Core acceptance criteria

Fuel injection pumps - continued

You will receive:

Full core refund

- Acceptable Perkins part number
- No visible cracked or broken parts (including connections to electronic modules)
- No damage to the drive end of the main shaft
- Fully assembled and complete
- Drive shaft **can** be rotated by hand (Stanadyne and Lucas)
- Drive shaft **can not** be rotated by hand (Bosch and Delphi)
- Identification plate is intact and adhered to fuel pump
- No evidence of unauthorised interference
- No damaged threads on fuel connectors onto the pump body and housing

Damaged core refund

- Meets the above criteria but drive shaft does not rotate (Stanadyne and Lucas)
- Meets the above criteria but drive shaft does rotate (Bosch and Delphi)
- Identification plate is not intact but is identifiable as a Perkins part

No core refund

- Not an acceptable Perkins part number
- Cracked or broken parts (including connections to electronic modules)
- Damage to the drive end of the main shaft
- Not fully assembled and complete
- Evidence of unauthorised interference
- Damaged threads on fuel connectors onto the pump body and housing

Note: It is necessary to remove the top cover of the fuel pump to view the head. Refer to the inspection tips for removing the cover. (Stanadyne only)

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Cracked or broken housings

Check for visible cracks in the housing. No core refund will be given if the housing is cracked or broken. Housing or body cracks are an indication of possible internal damage. Minor cracks on the mounting flange are acceptable for full core refund.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.

Core acceptance criteria

Fuel injection pumps - continued

Inspection tips continued

Internal inspection (Stanadyne only)

Remove the top cover by removing three securing screws (figure 7) and check that the head (figure 8) rotates when the drive shaft is turned. Remember to replace cover after inspection.

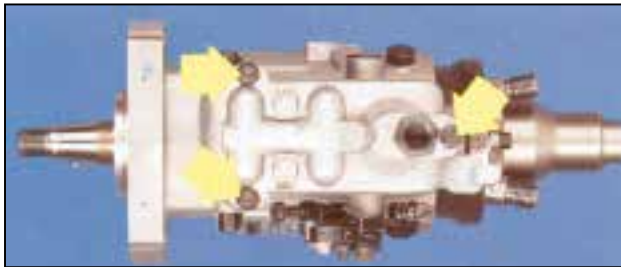


Figure 7 - securing screws (top view)

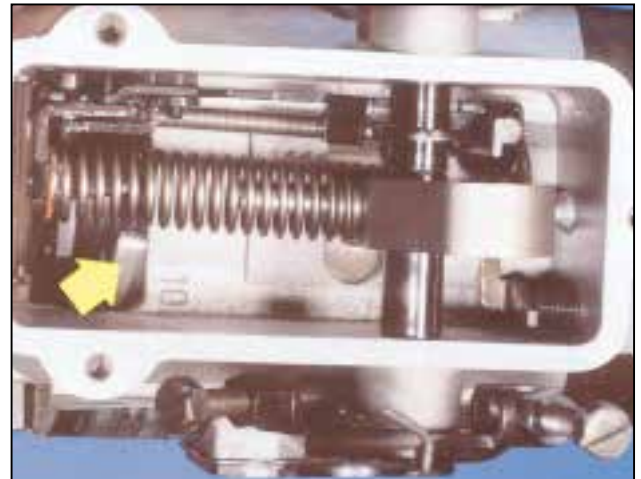


Figure 8 - head (internal view)



Core acceptance criteria

High pressure pump

You will receive:

Full core refund

- No cracked, broken or welded housings
- Fully assembled and complete
- Unit has no non-operational damage (mishandling damage, excessive rust, corrosion and pitting)
- Acceptable Perkins part number
- Drive shaft must rotate one full revolution when turned on the pump (refer to inspection tips for rotating drive shaft requirements)

No core refund

- Housing is cracked, broken or welded
- Disassembled
- Unit has been damaged by fire or mishandling (non-operational damage)
- Unit is not an acceptable Perkins part number
- Drive shaft will not turn on the pump

Core acceptance criteria

High pressure pump - continued



Figure 1 - full core refund
High pressure oil pump with 8T-4139 bolt



Figure 2 - no core refund
Pump with non-operational damage

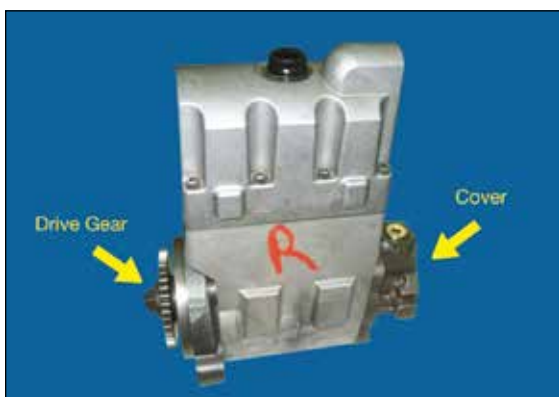


Figure 3 - full core refund
Pump group complete with drive gear and cover



Figure 4 - full core refund
Pump group complete with drive gear, injection actuation control valve and fuel transfer pump



Figure 5 - full core refund
Pump group with compensator assembly and block assembly (including the control valve)



Core acceptance criteria

High pressure pump - continued

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Cracked or broken housings

Check for visible cracks in the housing. No core refund will be given if the housing is cracked or broken.

Internal Inspection of the pump

Thread 8T-4139 bolt into end of drive shaft until finger tight. Continue turning head of bolt clockwise with small wrench. If internal mechanism of pump rotates and all other criteria are met, full core refund should be given. If shaft will not turn one full revolution with minimum force, no credit should be given.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust, corrosion or pitting which are most often caused by improper storage, will result in no core refund.

Fire damage

Cores that have been exposed to heat from a fire do not qualify for core credit. Visual evidence of fire damage is the melting of the housing.

Core acceptance criteria

Lift pump

You will receive:

Full core refund

- No cracked or broken housings
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust, corrosion or pitting)
- Acceptable Perkins part number



Figure 1 - full core refund
Fully assembled

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust, corrosion or pitting which are most often caused by improper storage, will result in no core refund.



Core acceptance criteria

Long engines (kits)

You will receive:

Full core refund

- Cylinder block and head are not visibly cracked, broken or welded
- Fully assembled
- No non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Crankshaft is not visibly broken
- Acceptable Perkins engine model
- Non-failed running core (crankshaft rotates two complete revolutions)(see inspection tips)

Damaged core refund

- Cylinder block or head visibly cracked, broken or previously welded
- Crankshaft is visibly broken
- Failed non-running core (crankshaft does not rotate two complete revolutions)(see inspection tips)
- Cores are not drained (see inspection tips)

No core refund

- Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Scavenged cores returned (see inspection tips)
- Disassembled
- Not an acceptable Perkins engine model

All long block core must be returned completely assembled with these components included **in the container from the original Power Exchange long block:**

- Crankshaft with bearing caps and bearings
- Pistons and connecting rods with bearings
- Cylinder block
- Cylinder head
- Liners (if applicable)
- Camshaft (if applicable)
- Push rods and followers (if applicable)
- Rocker lever assembly (if applicable)

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Core acceptance criteria

Long engines (kits) - continued

Damaged cylinder blocks/heads

Cracked or broken cylinder heads or blocks will receive damaged core refund.

Examine all exposed areas of the cylinder block and head including front and rear mounting faces and pan rail.

Long blocks with visibly broken crankshafts receive damaged core refund.

Failed, non-running cores

Long engine core returns must be 'non-failed, running core' to qualify for full core refund. To validate the engine has not failed, a 'rotation' test is required.

The 'rotation' test consist of two full revolutions of the crankshaft in one direction and one full revolution in the opposite direction. Normal compression must be present and no internal noise must be observed. Missing compression and/or internal noise is evidence of a failed engine and damaged core refund will be applied.

Reason code 'Know' should be used on the electronic CCR for failed, non-running engine core returns.

An engine may not successfully pass the 'Bar-Over' test if:

1. Parts are left loose in the oil pan.
2. Internal parts are not properly assembled.
3. The head gaskets have been removed.
4. Water has filled the cylinders and caused a hydraulic lock.

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust or corrosion will result in no core refund.

Blocks with fire damage receive no core refund.

Long blocks which appear to have had salvageable parts removed from them and had non-salvageable parts substituted in their place will be subject to a detailed inspection. Disassembly of suspect cores may be necessary to determine the authenticity of the core.

If a returned core is found to have been scavenged or assembled from scrap material, the core will be rejected and the customer returning the core to Perkins will be charged a £200 inspection fee.

Drain all cores

Completely drain and recycle or properly dispose of all fluids. If fluids are not drained then credit will be reduced to damaged core refund. To receive full credit you must drain all coolant from the engine block, oil cooler and water pump. Drain all oil from the engine block, remove oil filters, and seal all openings with plugs and covers from the remanufactured engine or with puncture resistant tape. Leaks or spills during transportation are very serious and are a health and safety risk. Perkins customers are liable for any clean up costs or damage resulting from in transit leaks or spills.

Core acceptance criteria

Oil coolers

You will receive:

Full core refund

- No cracked or broken housings (no salvage welding)
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust, corrosion or pitting)
- Acceptable Perkins part number

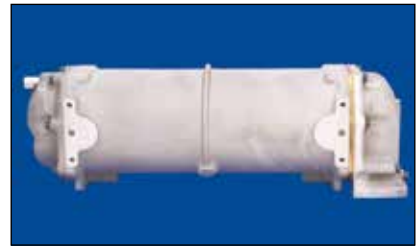


Figure 1 - full core refund
Fully assembled

Cracked or broken housings

Check for visible cracks in the housing. If cracked or broken, no core credit will be issued.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust, corrosion, or pitting which are most often caused by improper storage, will result in no core refund.

Core acceptance criteria

Oil pumps

You will receive:

Full core refund

- No cracked or broken housings
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust, corrosion or pitting)
- Acceptable Perkins part number



Figure 1 - full core refund
Fully assembled

Cracked or broken housings

Check for visible cracks in the housing. If cracked or broken, no core credit will be issued.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust, corrosion, or pitting which are most often caused by improper storage, will result in no core refund.

Core acceptance criteria

Overhaul kits

You will receive:

Full core refund

- Acceptable Perkins part number
- All components fully assembled and complete (see figure 1 - example returnable core checklist)
- Each kit consist part complies with the core refund requirements stated by that part's standard core acceptance criteria – see Inspection tips

No core refund

- All consist parts are an unacceptable part number or not a Perkins part
- All consist parts are completely disassembled

Dealer Code	_____
Kit Part Number	_____
Shipment Number	_____

Figure 2 - A4 size label to outside of original packing crate



Figure 3 - crate

Dealer Code	_____
Case Number	_____
Part Number	_____

Figure 4 - label fixed to each 'consist' part within original packing crate

Core acceptance

Ordering a precious metal kit will generate Reman core entitlements for the Reman components within the kits at consist level.

Engine range	2206	2506	2806
Turbocharger	✓	✓	✓
Cylinder head	✓	✓	✓
Water pump	✓	✓	✓
Injectors (set of 6)	✓	✓	✓
Oil pump	✓	✓	✓

Figure 1 - example returnable core checklist

Core acceptance criteria

Overhaul kits - continued

Inspection tips

Please use the appropriate core acceptance criteria to inspect and return the individual cores.

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Fully assembled and complete

If any major sub-assembly is missing, no core refund will be issued.

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund.

Fire damage

Cores that have been exposed to heat from a fire do not qualify for core credit.

Reman kit core packaging

Core returns for Reman kits should be returned using the original external packing crate (figure 3). This is designed for re-use, using original fixings. DO NOT USE NAILS OR STAPLES TO SECURE THIS packaging whenever possible.

If the original packaging is not available or stable, then package in a sturdy/durable carton, crate or box, etc. Kit consist parts must be packaged together using one (1) single case. A single A4 label should be attached externally to the crate (see figures 3 and 4).

Individual case numbers and appropriate inspection line must apply to each 'consist' part within the external packing crate.

A label should be fixed to each Individual 'consist' part showing dealer code, case number and part number (see figure 4).

Refer to Practices and Policies, Core Return and Management Procedure and Core Return Shipping Instructions in the 'Policies and Instructions' tab and to Core Acceptance Guide Introduction in the 'Core Acceptance Guidelines' tab for additional information applicable to all cores.



Core acceptance criteria

Short engines

You will receive:

Full core refund

- Cylinder block is not visibly cracked, broken or welded
- Fully assembled
- No non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Crankshaft is not visibly broken
- Acceptable Perkins engine model
- No material removed from top surface of cylinder block

Damaged core refund

- Cylinder block is visibly cracked, broken or welded
- Crankshaft is visibly broken
- Cores are not drained (see inspection tips)

No core refund

- Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)
- Not an acceptable Perkins engine model

All short block core must be returned completely assembled with these components included in the container from the original Power Exchange short block:

- Crankshaft with bearing caps and bearings in correct position
- Pistons and connecting rods with bearings
- Cylinder block
- Liners (if applicable)

Damaged cylinder blocks

Cracked or broken cylinder blocks will receive damaged core refund.

Examine all exposed areas of the cylinder block including deck faces, pan rail, front and rear mounting faces, cylinder bores and cam bore bosses.

Short blocks with visibly broken crankshafts receive damaged core refund.

Top deck cracks are commonly found between the water passages and bolt holes.

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive rust or corrosion will result in no core refund.

Blocks with fire damage receive no core refund.

Short engines which appear to have had salvageable parts removed from them and had non-salvageable parts substituted in their place will be subject to a detailed inspection. Disassembly of suspect cores may be necessary to determine the authenticity of the core.

If a returned core is found to have been scavenged or assembled from scrap material, the core will be rejected and the customer returning the core to Perkins will be charged a £200 inspection fee.

Drain all cores

Completely drain and recycle or properly dispose of all fluids. If fluids are not drained then credit will be reduced to damaged core refund. To receive full credit you must drain all coolant from the engine block, oil cooler and water pump. Drain all oil from the engine block, remove oil filters, and seal all openings with plugs and covers from the remanufactured engine or with puncture resistant tape. Leaks or spills during transportation are very serious and are a health and safety risk. Perkins customers are liable for any clean up costs or damage resulting from in transit leaks or spills.

Core acceptance criteria

Starter motors

You will receive:

Full core refund

- Housings not cracked, broken or damaged
- Fully assembled and complete
- No excessive rust, corrosion or fire damage
- Acceptable Perkins part number
- Armature turns

Damaged core refund

- Housings cracked, broken or damaged
- Fully assembled and complete
- Excessively rusted, corroded or pitted
- Acceptable Perkins part number
- Armature drive locked

No core refund

- Disassembled
- Any missing sub-assemblies
- Unacceptable Perkins part number



Figure 1 - typical illustration of starter sub-assemblies

1. Armature (hidden)
2. Drive housing
3. Solenoid
4. Lever housing
5. Commutator end frame
6. Main housing
7. Drive (Pinion) (hidden)



Core acceptance criteria

Starter motors - continued

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Evidence of unsuccessful attempts to salvage

Cores that show signs of unsuccessful salvage attempts will be rejected. Cores must be in the 'as removed' condition to be considered for the programme.

Locked armature

Damaged core refund will be given if the armature will not turn when using a screwdriver or pliers.

Fully assembled and complete

No core refund will be issued for cores with one or more major subassemblies missing. The starter is considered fully assembled if drive or pinion is the only component missing. However, the armature must still rotate.

Non-operational damage (mishandling, excessive rust, corrosion, pitting or fire damage)

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in a damaged core refund.

Core acceptance criteria

Turbochargers

Note: No disassembly is required. Use visual inspection and adjustable flashlight

You will receive:

Full core refund

- Turbine wheel is not cracked, broken or bent to the extent that it is visible without disassembly
- Unit is fully assembled with end housings and complete (band clamps must be tight)
- Unit is an acceptable Perkins part number
- Unit has not been damaged by fire
- Unit has no non-operational damage due to:
 - Mishandling that results in broken flanges or housings
 - Torch marks that melt any housing material on the turbocharger

Damaged core refund

- Turbine wheel is cracked, broken or bent to the extent that it is visible without disassembly
- Unit is not fully assembled and complete (band clamps are loose or missing)
- Unit is an acceptable Perkins part number
- Unit has not been damaged by fire
- Unit has non-operational damage due to either of:
 - Mishandling that results in broken flanges or housings
 - Torch marks that melt any housing material on the turbocharger or cartridge

No core refund

- Unit has been damaged by fire
- Unit is not an acceptable Perkins part number
- Unit is disassembled

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Turbine wheel damage

Do not disassemble the turbine housing to inspect the turbine wheel. Inspect for damage to turbine wheel using a flashlight. If necessary, adjust the flashlight beam and tilt the turbo to allow easier inspection to determine if the turbine wheel is bent or broken.

Core acceptance criteria

Turbochargers - continued

Acceptable Perkins part number

The core must be an acceptable Perkins part number.

Other tips

- Do not inspect compressor wheel
- Do not inspect for housing cracks
- Wheels do not have to turn to receive full core credit
- To avoid shipping damage for returned core, place the core in the packaging of the replacement part with proper packaging to protect the core



Figure 1 - full core refund
Fully assembled and complete



Figure 2 - full core refund
Operational damage - crack



Figure 3 - full core refund
Damage - chipped cold housing

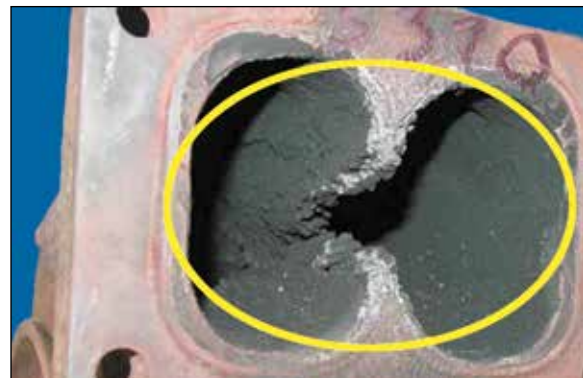


Figure 4 - full core refund
Webbing burned out

Core acceptance criteria

Turbochargers - continued



Figure 5 - full core refund
Turbo with hammer marks/blows on cold housing



Figure 6 - damaged core refund
Hot wheel bent



Figure 7 - damaged core refund
Hot wheel broken



Figure 8 - damaged core refund
Hot wheel broken



Figure 9 - damaged core refund
Non-operational damage - melted by torch

Core acceptance criteria

Unit injectors

You will receive:

Full core refund

- Acceptable Perkins part number
- Injector tip cracked or broken
- Fully assembled and complete
- No excessive rust or corrosion
- No damage to control solenoid or electrical connections



Figure 1 - full core refund
Mechanical



Figure 2 - full core refund
Electronic



Figure 3 - full core refund
Broken tappet and spring



Figure 4 - no core refund
Cracked body

Inspection tips

Please refer to 'Power Exchange Programme Manual' under the Training Documents tab, or 'PP3008 - Core Acceptance Criteria' under the Core Acceptance Criteria tab at <https://customer.perkins.com/powerexchange> for additional information applicable to all cores.

Core acceptance criteria

Unit injectors - continued

Inspection tips

Cracked or damaged

Check injector cores for any visible cracks. Cracking will usually be found on the injector case if it exists and will result in no core refund.

Missing or broken springs, tappets, guide pins or injector tips are acceptable and should receive full core refund.
Bent or broken levers are also acceptable for full core refund.

Rust or corrosion damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting, which are most often caused by improper storage, will result in no core refund. Pitting caused by combustion gas erosion around the injector end is acceptable.

Be sure to protect the injector core to prevent damage during return shipment. Fuel levers are easily bent by improper shipping methods.

Core acceptance criteria

Water pumps

You will receive:

Full core refund

- Housings and pulleys (if applicable) are not visibly cracked or broken (see inspection tips)
- Fully assembled and complete
- No non-operational damage (mishandling, excessive rust on machined surfaces, pitting or corrosion)
- Acceptable Perkins part number



Figure 1 - full core refund

Cracked or broken

Check the housing and pulley (if applicable) for visible cracks and damage.

Non-operational damage

If rust can be wiped away with an emery cloth, the core will be accepted for full core refund. Excessive corrosion, rust or pitting which are most often caused by improper storage, will result in no core refund.

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