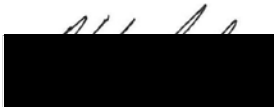




Continental Motors

ENGINE EXAMINATION REPORT

ENGINE MODEL	IO-550-P (converted to turbo-normalized by Vitatoe)
ENGINE SERIAL NUMBER	1005420
AIRCRAFT MAKE & MODEL	Cessna T210N
AIRCRAFT SERIAL NUMBER	21063356
AIRCRAFT REGISTRATION	N5300A
FILE NUMBER	17-294

NAME	SIGNATURE	DATE
Kurt Gibson		04/05/2018

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GENERAL INFORMATION

EXAMINATION		ACCIDENT DATA	
DATE	03/13/2018	NTSB ACCIDENT #	CEN18LA031
FACILITY	Continental Motors Inc.	NTSB INVESTIGATOR	Joshua Lindberg
ADDRESS	[REDACTED] Mobile, Alabama 36615	FAA INVESTIGATOR	Mike Brockel
		ACCIDENT DATE	11/12/2017
		ACCIDENT LOCATION	Grayslake, Illinois

ENGINE INFORMATION

ENGINE POSITION	Front (single engine)
TOTAL TIME	1010.1 (time taken at the last maintenance entry)
TIME SOH (TOP)	79.9 (time taken at the last maintenance entry)
TYPE & TIME SLI	Unknown
BUILD DATE	10/05/2011
IN SERVICE DATE	04/02/2012

Significant logbook information:

The last maintenance item was on 07/27/2017 at a tachometer time of 1010.1 and the entry indicated compliance with AD 71-09-07R1 (exhaust system inspection), installing a new fuel injector as well as a new CHT probe. The last oil change was performed on 06/29/2017 at a tachometer time of 1001.73. The last 100-hour engine inspection was performed on 11/01/2016; at the same time the engine was reinstalled after a top overhaul.

Report Summary:

Search Code(s):

10-08-03

15-12-40

The #4 connecting rod had separated from the crankshaft and displayed thermal damage signatures to the rod. All of the connecting rod bearings displayed wiping of the bearing surface consistent with lubrication distress; the #4 bearings were severely damaged consistent with a lack of lubrication.

An engine monitor had been installed in the aircraft that recorded several engine parameters (including oil pressure) during the accident flight. The data shows the oil pressure remained steady for approximately 2 hours; after 2 hours the oil pressure began to decrease. The oil pressure decreased steadily from 51 psi to a low of about 13 psi over the course of approximately 42 minutes.

Disposition of engine following exam:

The engine was shipped to Myers Aviation in Oshkosh, Wisconsin.

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NAME	Kurt Gibson	NAME	Greg Eastburn
ADDRESS	Mobile, Alabama	ADDRESS	Mobile, Alabama
ORGANIZATION	Continental Motors	ORGANIZATION	Continental Motors
PHONE		PHONE	N/A
NAME	Lisa Jersild	NAME	Pam Sullivan
ADDRESS	Mobile, Alabama	ADDRESS	NTSB Central Region
ORGANIZATION	Continental Motors	ORGANIZATION	NTSB
PHONE	N/A	PHONE	
NAME	Phillip Grice	NAME	
ADDRESS	Mobile, Alabama	ADDRESS	
ORGANIZATION	Continental Motors	ORGANIZATION	
PHONE		PHONE	

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It was noted that the engine had been converted from an IO-550-P to a turbo normalized engine by Vitatoe Aviation. There were no signs of impact or thermal damage to the engine. The crankcase had two large holes in the crankcase; one was located near the #4 cylinder, the other hole was in between the #3 and the #5 cylinder. All six cylinders remained attached to the crankcase with the #4 cylinder displaying mechanical damage to the cylinder skirt as well as two of the attachment studs had broken free from the crankcase. The propeller flange remained attached to the crankshaft and there were no visible cracks noted in the external portion of the crankshaft.

The fuel pump, throttle and metering unit, and the manifold valve remained attached to their installation points and were undamaged. There were no signs of fuel leaks around any of the fuel components. All six of the fuel nozzles remained installed in their cylinders and the fuel lines remained secured to the nozzles.

Both of the magnetos remained attached to their installation point and were undamaged. The ignition harness remained secure to both magnetos and to each spark plug. All of the spark plugs remained installed in their cylinders and were undamaged. There were anomalies noted with the ignition system.

The majority of the induction system remained attached to its installation point; the #6 induction tube going into the cylinder and both intercoolers had been removed and were found loose within the crate. There were no signs of induction leaks noted. The exhaust system had been removed from the engine and the components were located within the crate; there were no anomalies noted with the exhaust system.

The turbocharger and associated components were shipped loose in the crate; there were no external anomalies noted with any of the associated components.

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ENGINE TEARDOWN AND COMPONENT EXAMINATION

EXHAUST SYSTEM

Condition:

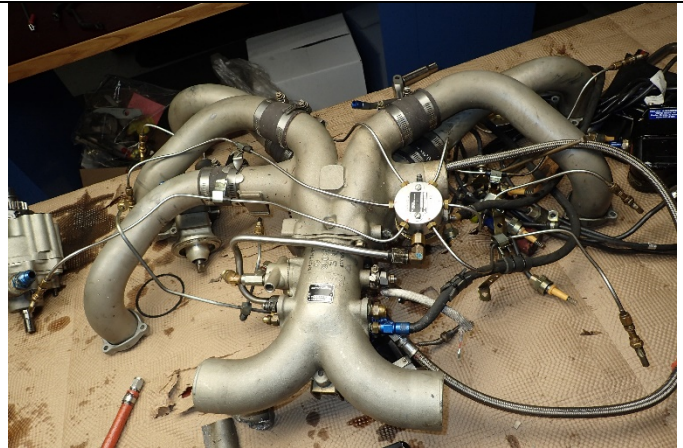
The exhaust system remained intact. There were no signs of exhaust leaks or other anomalies noted with the exhaust system.



INDUCTION SYSTEM

Condition:

The induction system remained intact and was undamaged. There were no signs of induction leaks or any other anomalies noted.



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IGNITION SYSTEM

LEFT MAGNETO

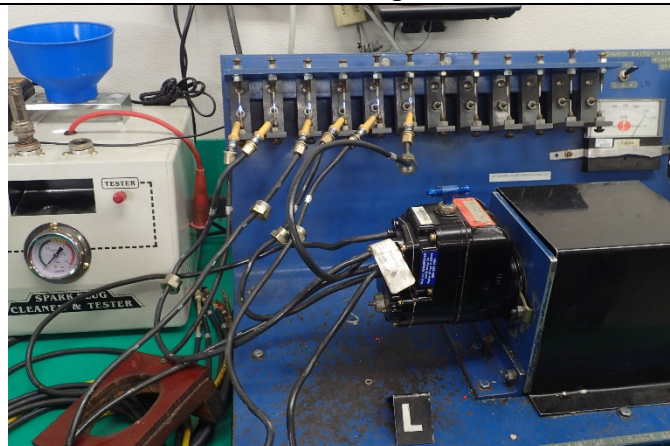
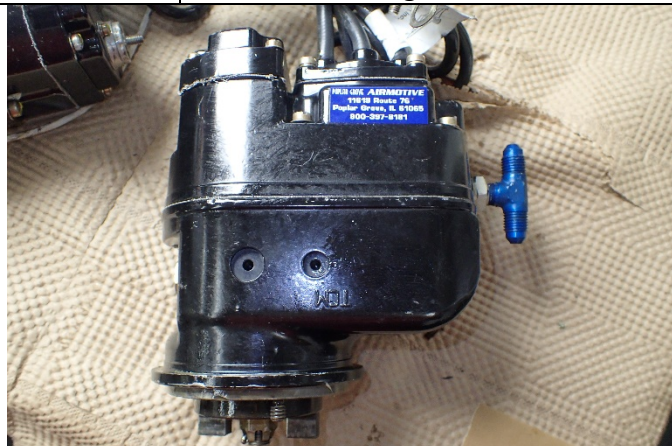
Manufacturer: CMI

P/N: 10-500556-101

S/N: D11IA021

Condition:

The magneto remained attached to its installation point and was undamaged. The magneto was removed and placed on a test bench. The magneto operated normally and was capable of producing a spark across an approximate 7mm gap on all six posts and in the correct firing order. There were no anomalies noted with the magneto.



RIGHT MAGNETO

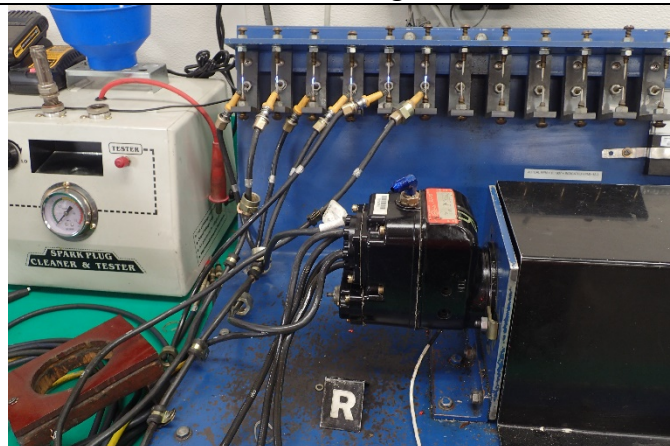
Manufacturer: CMI

P/N: 10-500556-101

S/N: D11IA061

Condition:

The magneto remained attached to its installation point and was undamaged. The magneto was removed and placed on a test bench. The magneto operated normally and was capable of producing a spark across an approximate 7mm gap on all six posts and in the correct firing order. There were no anomalies noted with the magneto.



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IGNITION HARNESS

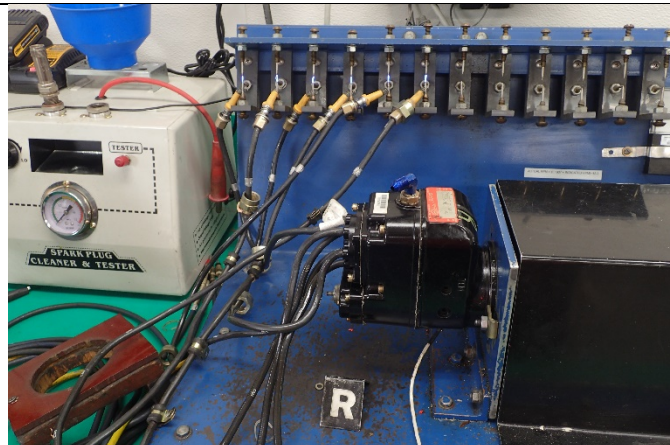
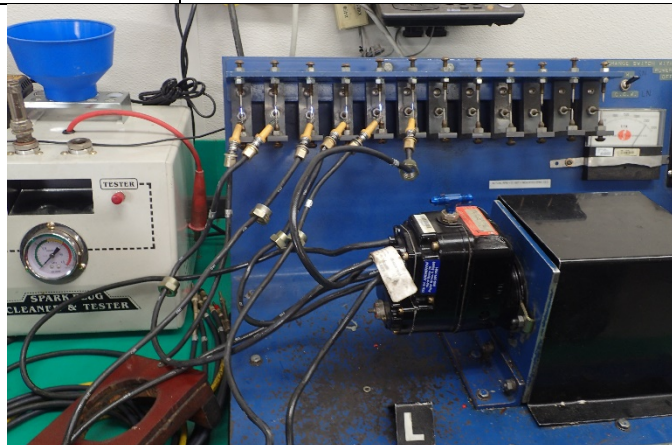
Manufacturer: CMI

P/N: 10-423674-25

S/N: K16H

Condition:

The ignition harness remained intact and was secured to both magnetos as well as each spark plug. The ignition harness was tested during the magneto bench tests; the ignition harness was capable of conducting a spark from the magneto post to each ignition lead end. There were no anomalies noted with the ignition harness.



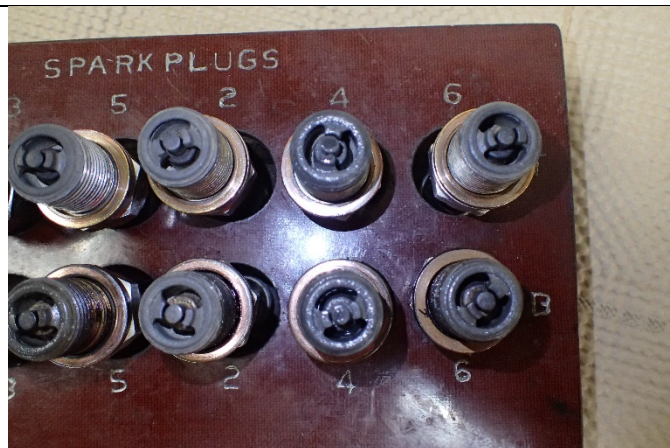
SPARK PLUGS

Manufacturer: Tempest

P/N: URHB32E

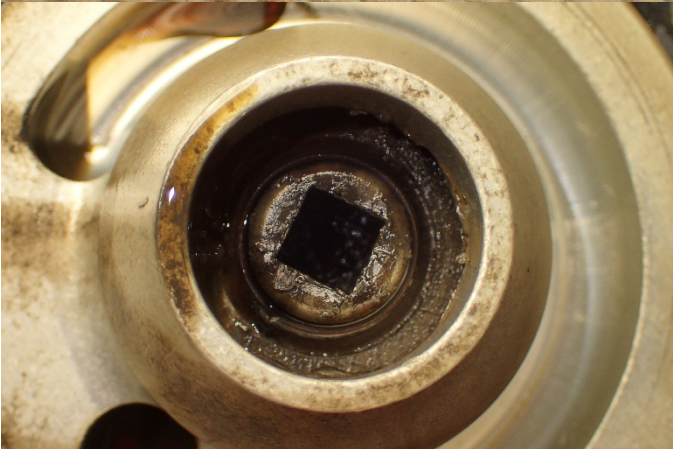
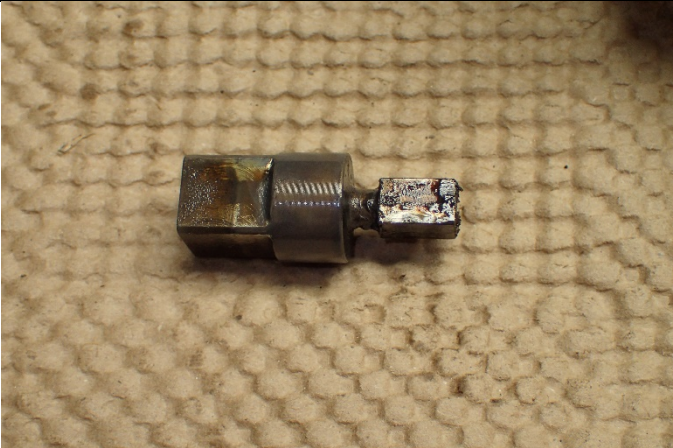
Condition:

All of the spark plugs remained installed in their cylinders and were undamaged. The spark plugs were removed and visually inspected. The spark plugs displayed normal operating and combustion signatures. There were no anomalies noted with the spark plugs.

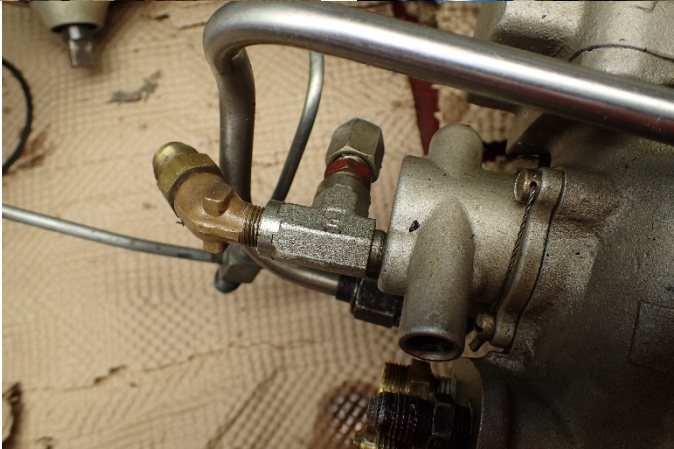
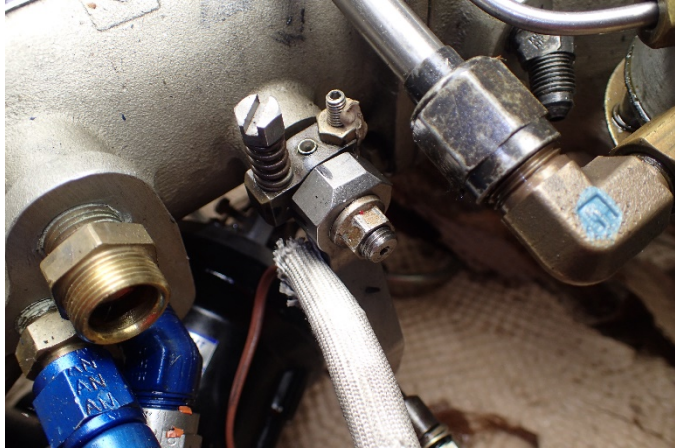
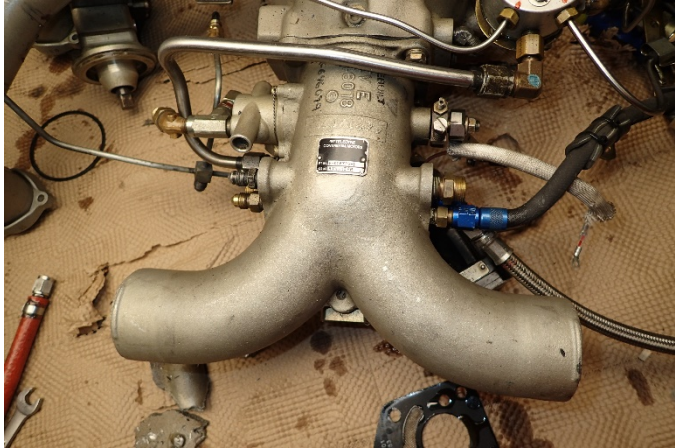


FUEL SYSTEM

FUEL PUMP	Manufacturer: CMI (Overhauled by Great Planes Fuel Metering Inc.)	P/N: 649368-44A4	S/N: B07JA215
Condition:	The fuel pump remained attached to its installation point and was undamaged. The fuel pump was removed and it was noted that the fuel pump drive coupling remained intact and the fuel pump drive was capable of normal rotation. The mixture control arm remained secured to the mixture control shaft and was capable of normal movement. There were no anomalies noted with the fuel pump.		



THROTTLE BODY METERING UNIT	Manufacturer: CMI	P/N: R-656785-1	S/N: A111A139R
Condition:	The throttle and metering assembly remained intact and was undamaged. The throttle control arm remained secured to the throttle valve shaft and was capable of normal movement. There were no anomalies noted with the throttle and fuel metering assembly.		



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FUEL MANIFOLD VALVE

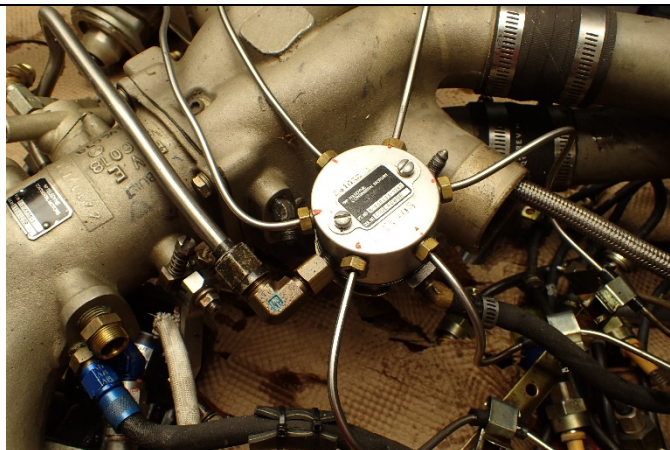
Manufacturer: CMI

P/N: R-646433-12A2

S/N: C10EA080R

Condition:

The manifold valve remained attached to its installation point and was undamaged. There were no signs of fuel leaks noted around the manifold valve. There were no anomalies noted.



FUEL NOZZLES AND LINES

Manufacturer: CMI

Position

#1

#3

#5

#2

#4

#6

Size

5520 (O78)

3531 (O78)

5520 (O78)

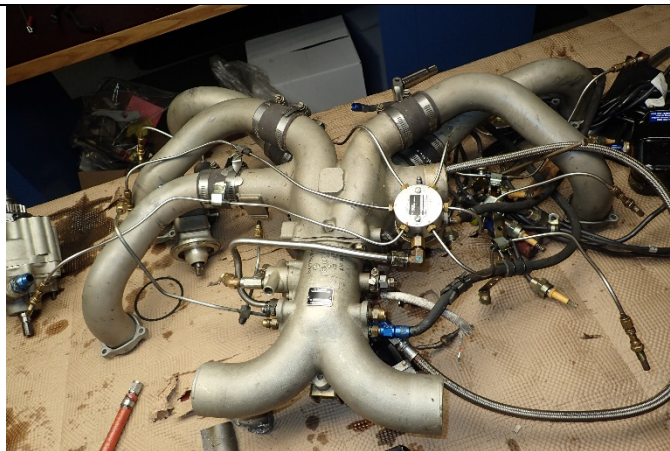
?515 (O78)

6526 (O78)

652? (O78)

Condition:

All of the fuel nozzles remained installed in their cylinders and were undamaged. It was noted that some of the nozzles were installed in the incorrect cylinders.



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LUBRICATION SYSTEM

OIL SUMP

Condition:

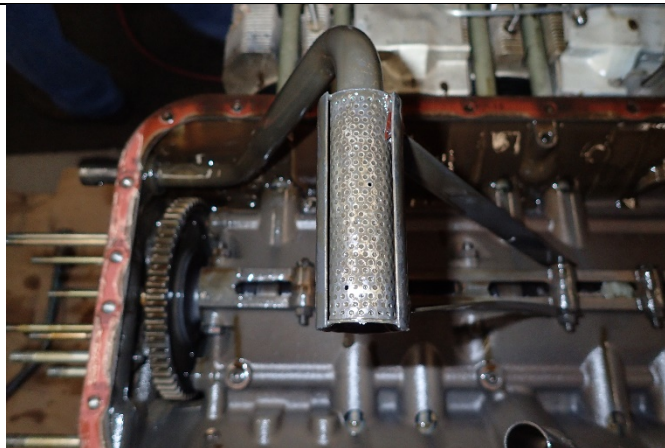
The oil sump remained intact and was undamaged. The oil sump was removed and it was noted that the oil sump contained a significant amount of metallic material within the oil sump.



OIL PICK-UP TUBE & SCREEN

Condition:

The oil pickup tube and screen remained intact and undamaged. The pick-up screen contained metallic material within the screen.



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OIL PUMP

Condition:

The oil pump remained intact and undamaged. The oil pump was disassembled and the internal components were visually inspected. There were a few flakes of metallic material within the oil pump and a small amount of gouging along the oil pump housing consistent with hard particle passage.



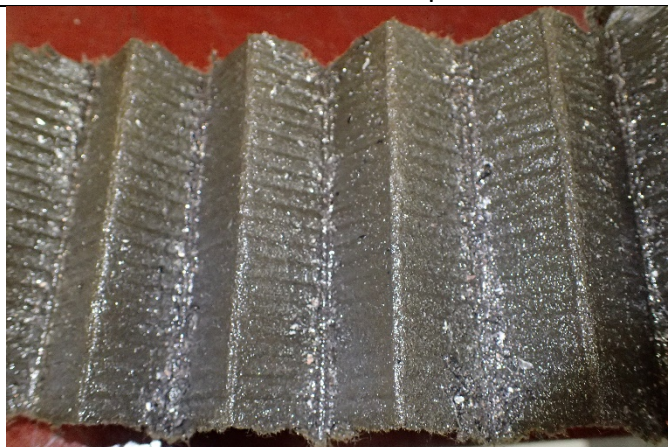
OIL FILTER

Manufacturer: Tempest

P/N: AA48109

Condition:

The oil filter remained attached to the oil filter adapter and was undamaged. The oil filter was removed and the filter housing was cut open. The oil filter pleats were visually inspected; there was significant metallic material noted within the filter pleats.



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Manufacturer: Niagara

P/N: J0281A

S/N: H11-9345-209

Condition:

The oil cooler remained intact and undamaged. There were no signs of oil leaks around the cool cooler; there were no anomalies noted.

**OIL LINES****Condition:**

The majority of the oil lines had been removed from the engine and were put in a plastic bag and placed into the crate. All of the oil lines were checked for blockages; no blockages could be found. Due to the fact that the oil lines were removed prior to the examination it could not be determined if any of the oil line B-nuts were loose from their attachment points.

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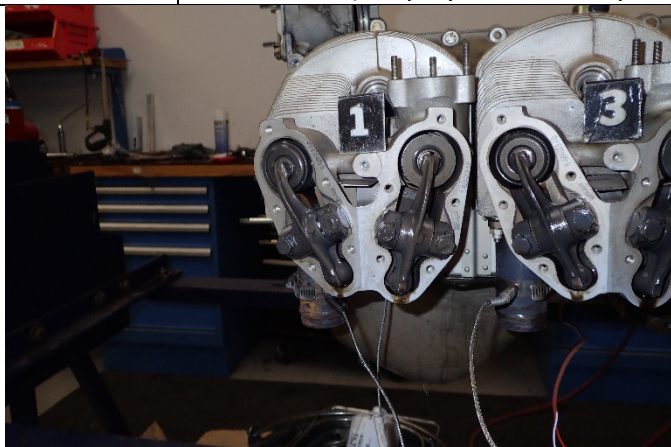
ENGINE S/N:

1005420

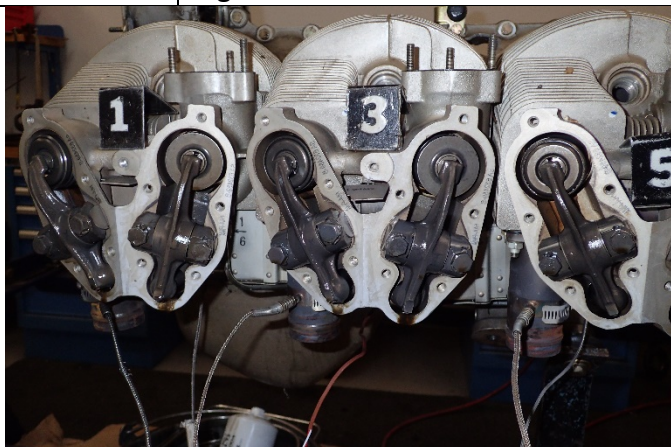
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CYLINDERS

CYLINDER #1	P/N: 658595A1	S/N: AC16GB292	Head Date: Not observed
Condition:	The cylinder remained attached to its installation point and was undamaged. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.		



CYLINDER #3	P/N: 658595A1	S/N: AC16GB331	Head Date: Not observed
Condition:	The cylinder remained attached to its installation point and displayed mechanical damage to the cylinder skirt. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.		



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CYLINDER #5

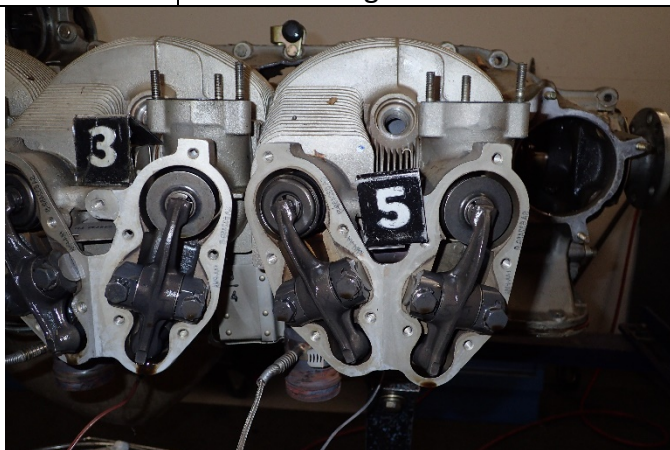
P/N: 658595A1

S/N: AC16GB355

Head Date: Not observed

Condition:

The cylinder remained attached to its installation point and displayed minor mechanical damage to the cylinder skirt. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.



CYLINDER #2

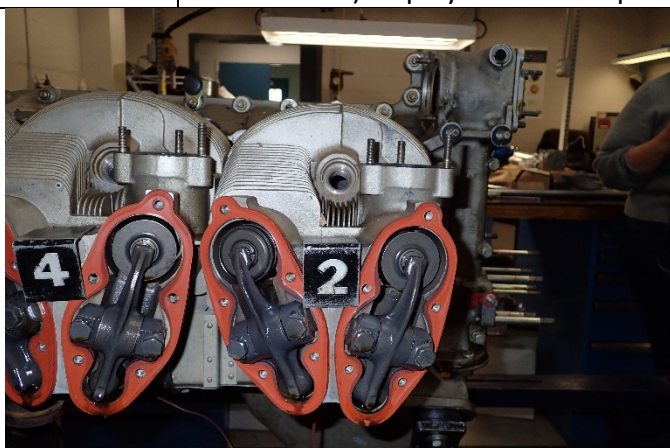
P/N: 658595A1

S/N: AC16GB300

Head Date: Not observed

Condition:

The cylinder remained attached to its installation point and was undamaged. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.



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CYLINDER #4

P/N: 658595A1

S/N: AC16GB334

Head Date: Not observed

Condition:

The cylinder remained attached to the engine and displayed mechanical damage to the cylinder skirt. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.



CYLINDER #6

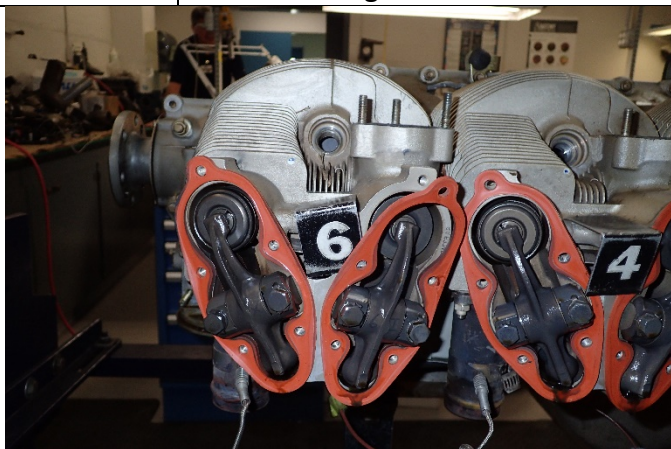
P/N: 658595A1

S/N: AC16GB337

Head Date: Not observed

Condition:

The cylinder remained attached to its installation point and displayed minor mechanical damage to the cylinder skirt. The cylinder was removed and visually inspected. The cylinder bore and valve heads displayed normal operating and combustion signatures. The overhead components (valves, springs, and rocker arms) displayed normal operating and lubrication signatures.



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ENGINE S/N:

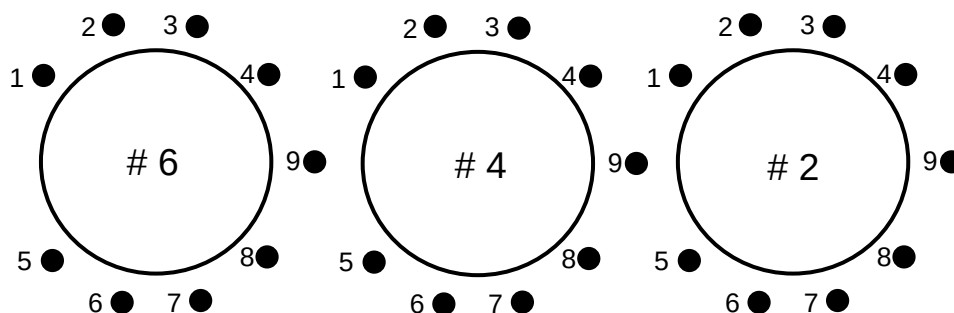
1005420

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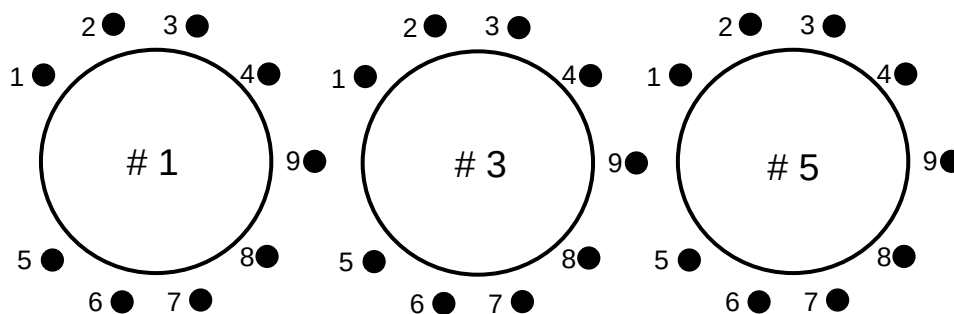
Cylinder Through-Bolt and Deck Stud Break-Away (Tightening/Loosening) Torque Measurements (in-lbs)

(NOTE: Position numbers 1 and 5 are through-bolts)

	Bolt 1	Stud 2	Stud 3	Stud 4	Bolt 5	Stud 6	Stud 7	Stud 8	Stud 9
	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose
Cylinder #2	910/661	895/710	869/700	837/677	980/781	844/706	810/680	767/635	581/501
Cylinder #4	968/848	Case Fracture	Case Fracture	697/570	941/765	772/567	718/548	743/595	540/415
Cylinder #6	940/755	804/687	822/658	730/592	922/695	779/475	699/581	713/ Error	691/517



	Bolt 1	Stud 2	Stud 3	Stud 4	Bolt 5	Stud 6	Stud 7	Stud 8	Stud 9
	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose	Tight / Loose
Cylinder # 1	875/686	826/676	826/666	773/622	946/763	783/619	748/597	771/608	590/482
Cylinder # 3	1111/ 898	719/604	726/597	564/480	1064/ 847	827/684	852/766	588/439	511/422
Cylinder # 5	840/649	724/585	740/605	717/580	1116/ 911	834/701	844/686	776/633	660/539



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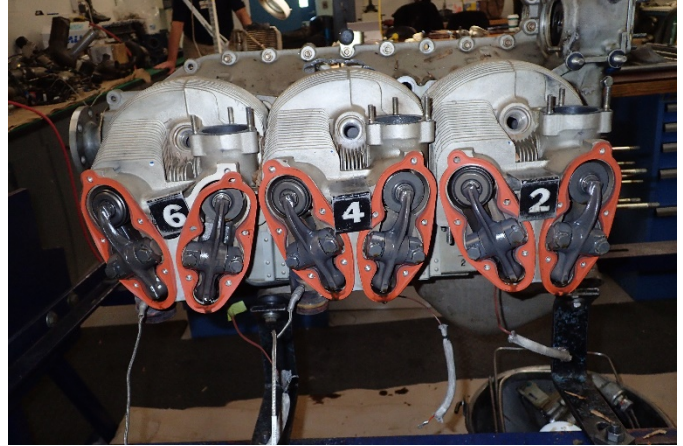
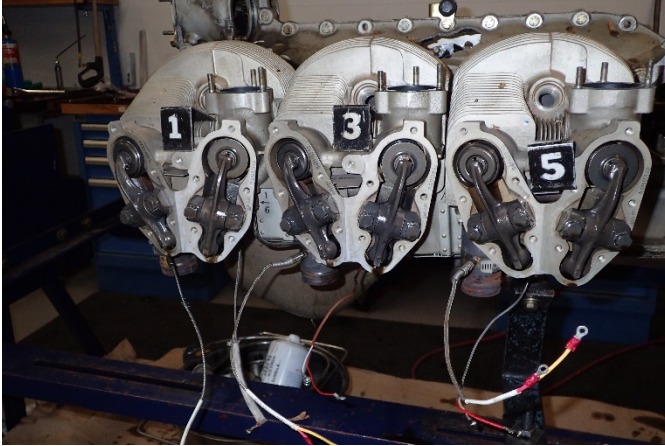
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VALVES AND GUIDES

Condition: All of the valve heads displayed normal operating and combustion signatures. The valve stems displayed normal operating and lubrication signatures. There were no anomalies noted with any of the valves.

ROCKER ARMS AND SHAFTS

Condition: All of the rocker arms displayed normal operating and lubrication signatures. There were no anomalies noted.



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#1 PISTON, RINGS AND PIN

Piston P/N: 654857

Condition:

The piston remained attached to the connecting rod and displayed mechanical damage to the rear of the piston. All of the piston rings remained installed in their grooves and were capable of normal movement. There were no anomalies noted with the piston.



#3 PISTON, RINGS AND PIN

Piston P/N: 654857

Condition:

The piston remained attached to its connecting rod and displayed a significant amount of mechanical damage to the rear of the piston as well as the piston skirt. The rear piston ring was broken; however, the remaining piston rings remained installed in their grooves, were undamaged, and were capable of normal movement. There were no anomalies noted with the piston.



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PAGE 21 of 41**#5 PISTON, RINGS
AND PIN**

Piston P/N: 654857

Condition:

The piston remained attached to the connecting rod and displayed mechanical damage to the rear of the piston. All of the piston rings remained installed in their grooves and were capable of normal movement. There were no anomalies noted with the piston.

**#2 PISTON, RINGS
AND PIN**

Piston P/N: 654857

Condition:

The piston remained attached to the connecting rod and displayed mechanical damage to the rear of the piston. All of the piston rings remained installed in their grooves and were capable of normal movement. There were no anomalies noted with the piston.



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#4 PISTON, RINGS AND PIN

Piston P/N: 654857

Condition:

The piston remained attached to its connecting rod; however, the connecting rod had separated from the crankshaft. The piston displayed a significant amount of mechanical damage to the rear of the piston as well as the piston skirt. There were two semi-circular indentations on the piston face consistent with valve strikes. The rear piston ring displayed mechanical damage; the remaining piston rings were undamaged and displayed normal operating signatures.



#6 PISTON, RINGS AND PIN

Piston P/N: 654857

Condition:

The piston remained attached to its connecting rod and displayed mechanical damage to the rear of the piston as well as the piston skirt. The rear piston ring was broken; however, the remaining piston rings remained installed in their grooves, were undamaged, and were capable of normal movement. There were no anomalies noted with the piston.



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CRANKCASE ASSEMBLY

CRANKCASE

Casting
Number:

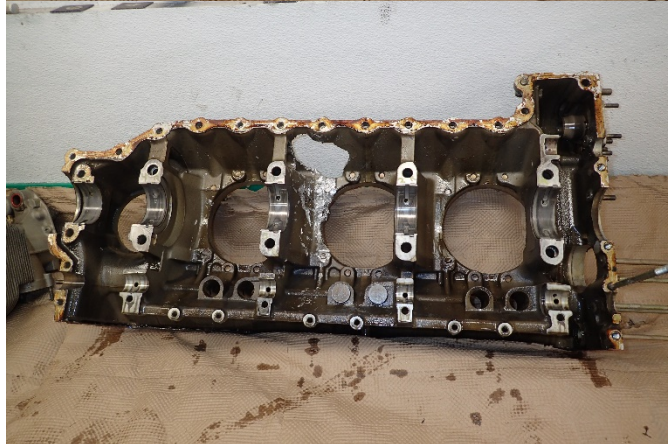
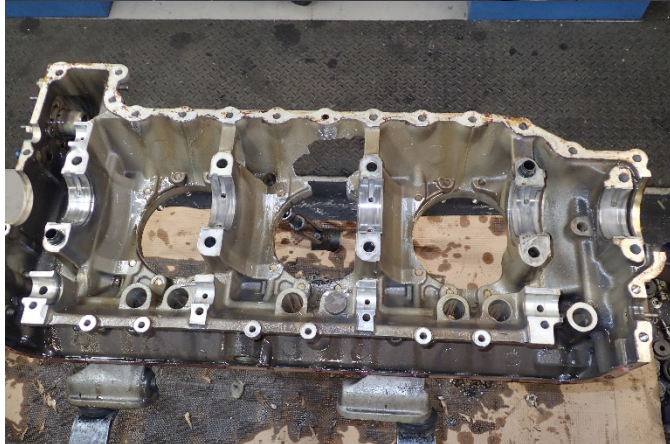
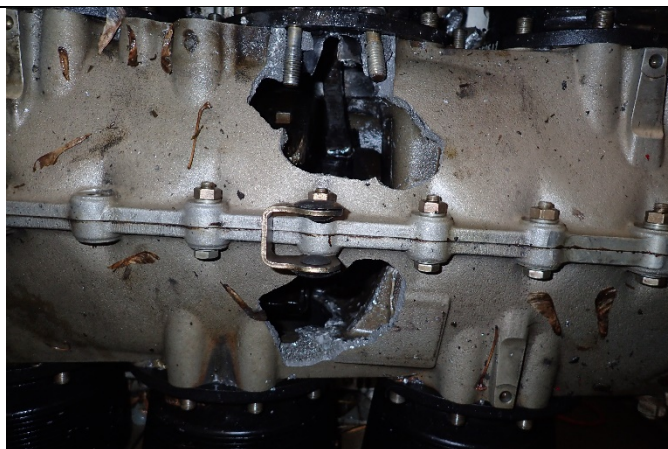
1-3-5: 655435

2-4-6: 655434

S/N: R11EA004

Condition:

The crankcase had two holes in the top of the crankcase; one hole was adjacent to the #4 cylinder, the other hole was located near the data plate installation point. The inside of both of the crankcase halves displayed mechanical damage with the most damage concentrated near the two holes. There were no signs of fretting on the bearing supports or signs of bearing shift. The oil galley were checked for blockages; there were no blockages found.



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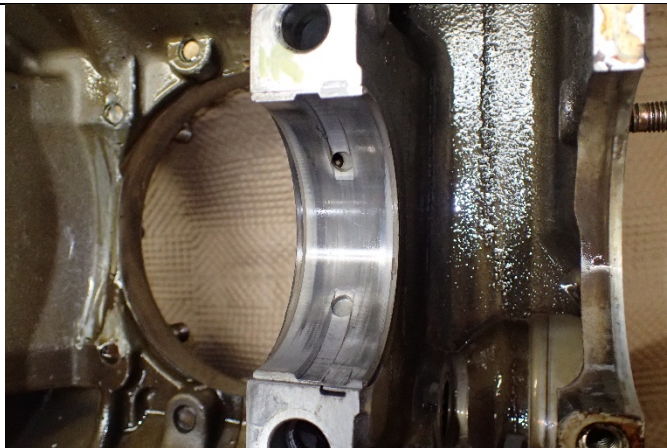
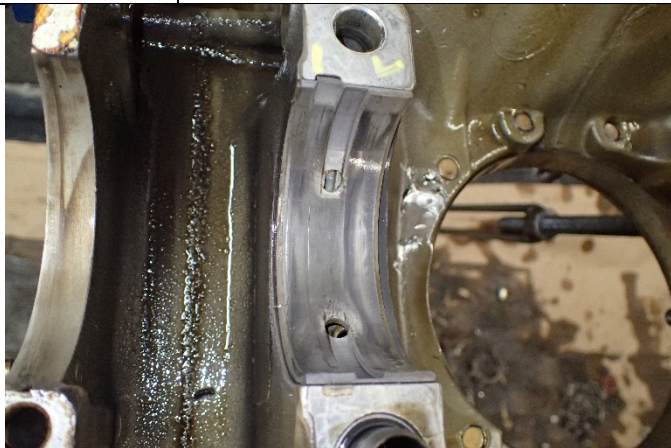
#1 MAIN BEARINGS

P/N: 654503

Date Code: 8-10

Condition:

The bearings remained intact and installed in their bearing supports. There were no signs of lock tab elongation or bearing shift. The bearings displayed normal operating and lubrication signatures.



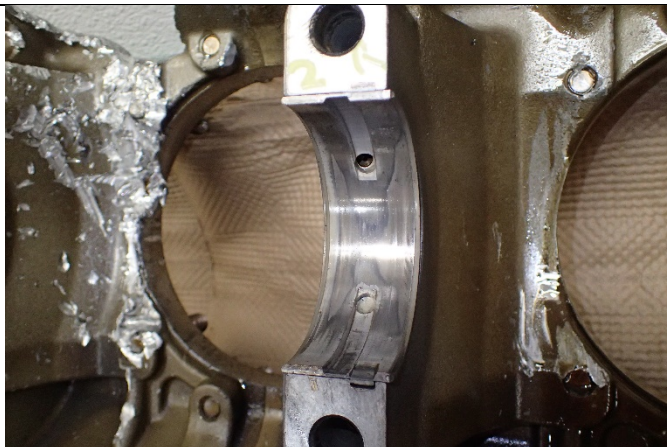
#2 MAIN BEARINGS

P/N: 654503

Date Code: 8-10

Condition:

The bearings remained intact and installed in their bearing supports. There were no signs of lock tab elongation or bearing shift. The bearings displayed normal operating and lubrication signatures.



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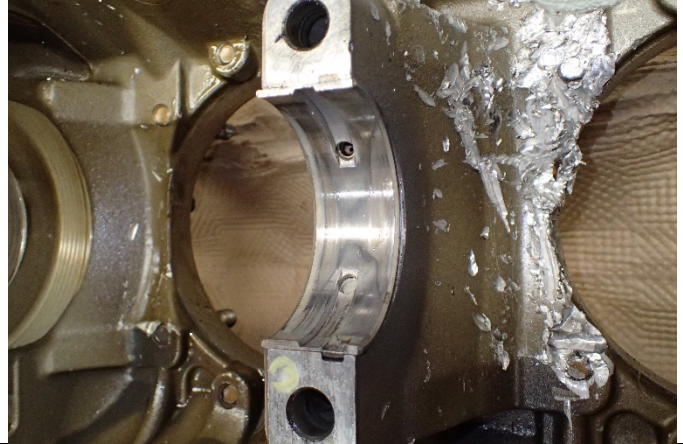
#3 MAIN BEARINGS

P/N: 654503

Date Code: 8-10

Condition:

The bearings remained intact and installed in their bearing supports. There were no signs of lock tab elongation or bearing shift. The bearings displayed normal operating and lubrication signatures.



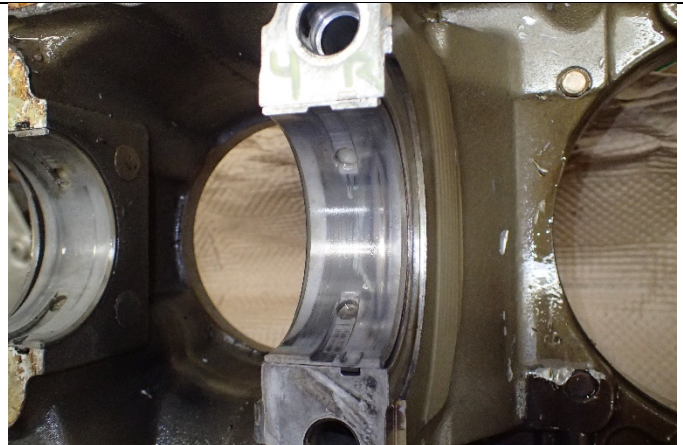
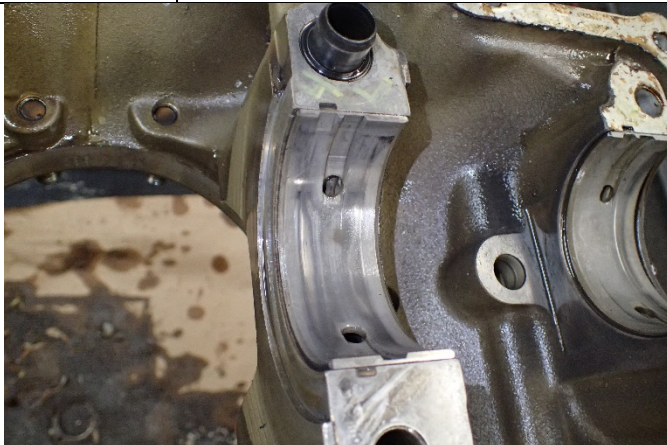
#4 MAIN BEARINGS

P/N: 633547

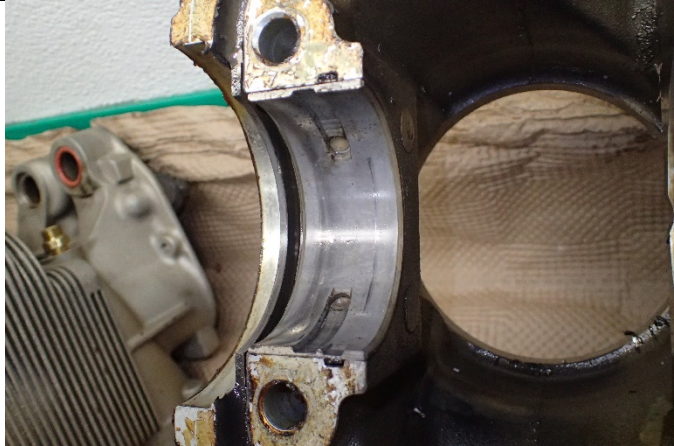
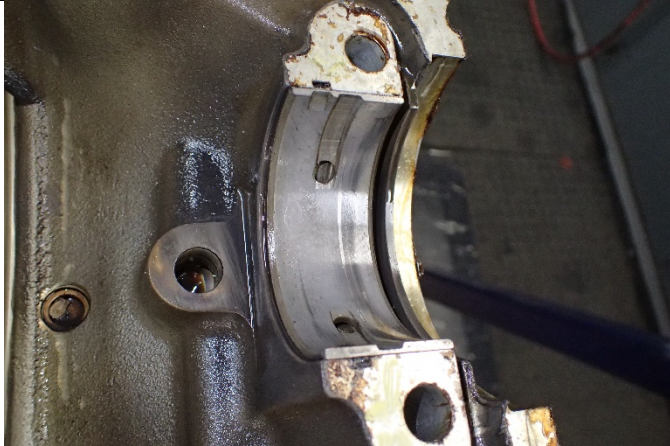
Date Code: 10-10

Condition:

The bearings remained intact and installed in their bearing supports. There were no signs of lock tab elongation or bearing shift. The bearings displayed normal operating and lubrication signatures.



#5 MAIN BEARINGS	P/N: 633547	Date Code: 10-10
Condition:	The bearings remained intact and installed in their bearing supports. There were no signs of lock tab elongation or bearing shift. The bearings displayed normal operating and lubrication signatures.	



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CRANKSHAFT ASSEMBLY

CRANKSHAFT

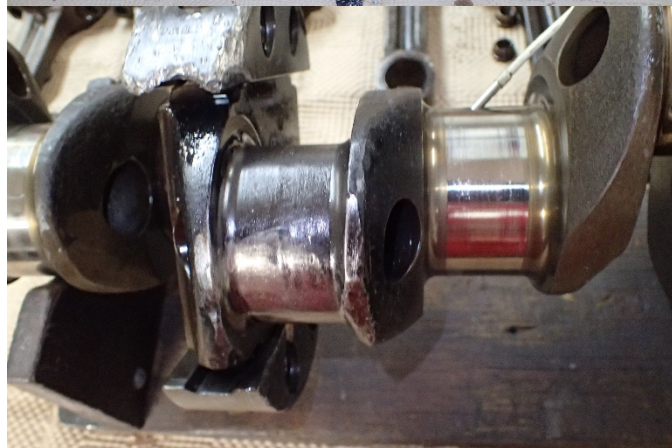
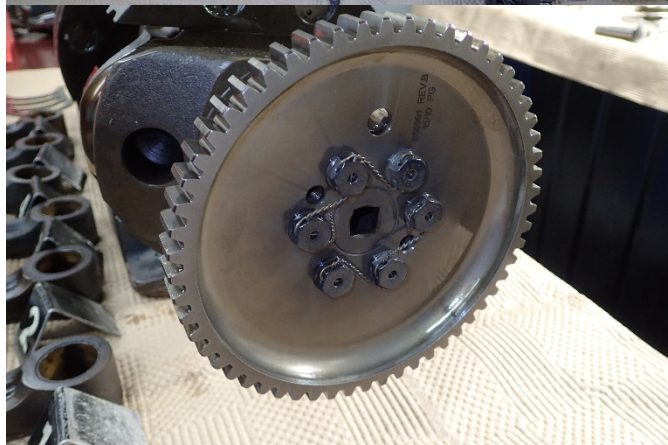
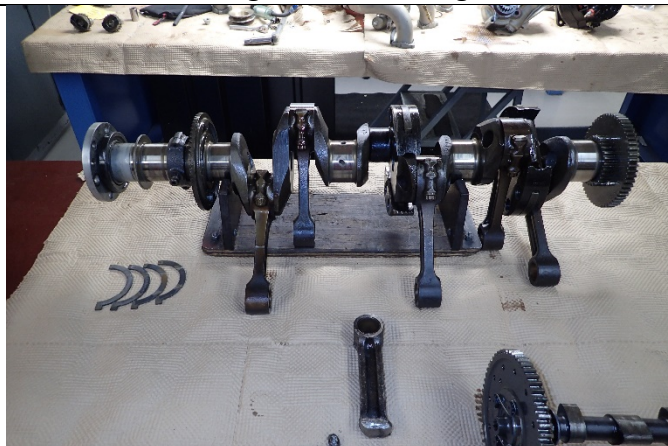
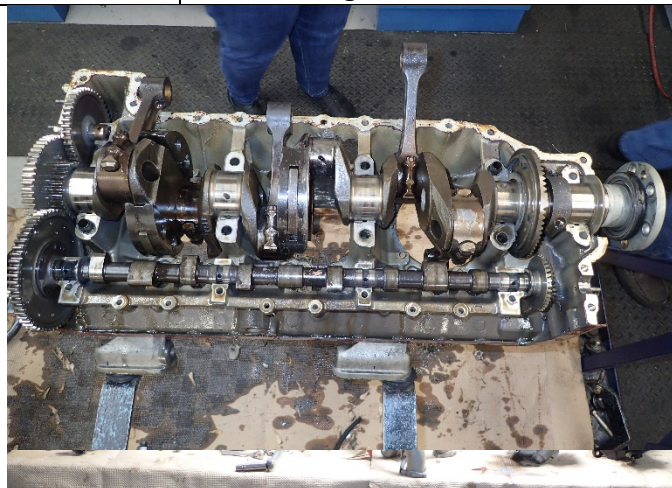
Forging Number: 649878

S/N: N11GA152

Heat code: KBLB

Condition:

The crankshaft remained intact and displayed varying amounts of thermal damage to the connecting rod journals with the #4 connecting rod journal displaying the most thermal damage; the #4 connecting rod journal also displayed mechanical damage. The oil galleries were inspected using a light and all the galleries were found to be clear of obstructions. The crankshaft gear remained secured and there was no damage noted to the gear teeth.



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TRANSFER COLLAR

Condition:

The transfer collar remained attached to its installation point and was undamaged. There were no anomalies noted with the transfer gear.



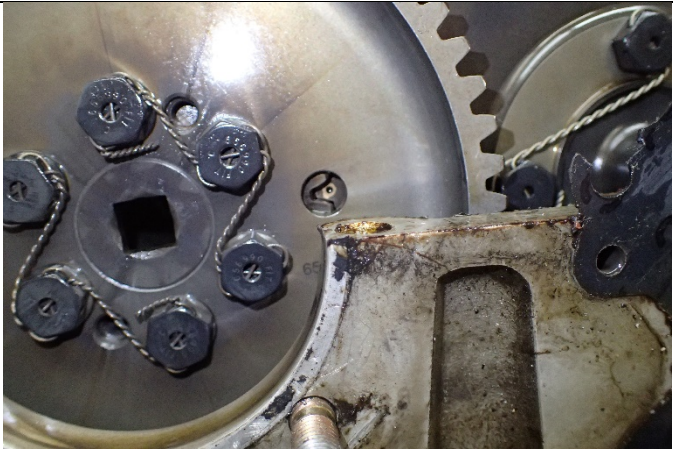
COUNTER WEIGHTS

Condition:

All of the counterweights remained attached to their hangers and displayed varying amounts of mechanical damage. All of the counterweights were capable of normal movement on their hangers.



INTERNAL TIMING	
Condition:	The crankshaft to camshaft timing was verified to be correct.



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#1 CONNECTING ROD

Forging: 646126

S/N: AE11GB153

Condition:

The connecting rod remained attached to its connecting rod journal and to its piston. The rod displayed minor thermal discoloration around the bearing support.

#1 CONNECTING ROD BEARING

P/N: 642398

Date Code: 3-09

Condition:

The bearings remained within the bearing supports. The bearing displayed wiping and smearing of the bearing layers which is consistent with lubrication distress.



#3 CONNECTING ROD

Forging: 646126

S/N: AE11GB095

Condition:

The connecting rod remained attached to its connecting rod journal and to its piston. The rod displayed minor thermal discoloration around the bearing support.

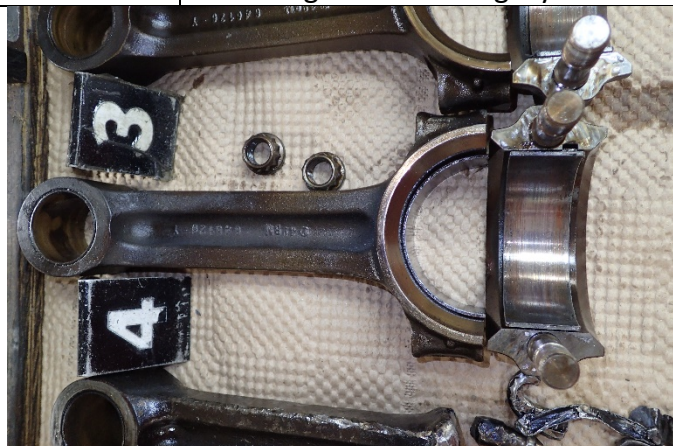
#3 CONNECTING ROD BEARING

P/N: 642398

Date Code: 3-09

Condition:

The bearings remained within the bearing supports. The bearing displayed wiping and smearing of the bearing layers which is consistent with lubrication distress.



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#5 CONNECTING ROD

Forging: 646126

S/N: AE11GB148

Condition:

The connecting rod remained attached to its connecting rod journal and to its piston. The rod displayed minor thermal discoloration around the bearing support.

#5 CONNECTING ROD BEARING

P/N: 642398

Date Code: 3-09

Condition:

The bearings remained within the bearing supports. The bearing displayed wiping and smearing of the bearing layers which is consistent with lubrication distress.



#2 CONNECTING ROD

Forging: 646126

S/N: AE11GB151

Condition:

The connecting rod remained attached to its connecting rod journal and to its piston. The rod displayed minor thermal discoloration around the bearing support.

#2 CONNECTING ROD BEARING

P/N: 642398

Date Code: 3-09

Condition:

The bearings remained within the bearing supports. The bearing displayed wiping and smearing of the bearing layers which is consistent with lubrication distress.



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#4 CONNECTING ROD

Forging: 646126

S/N: AE11GB134

Condition:

The connecting rod had separated from its connecting rod journal and displayed thermal discoloration and mechanical damage. Portions of the connecting rod bolts and cap were found separate from the connecting rod and displayed mechanical damage and thermal discoloration.

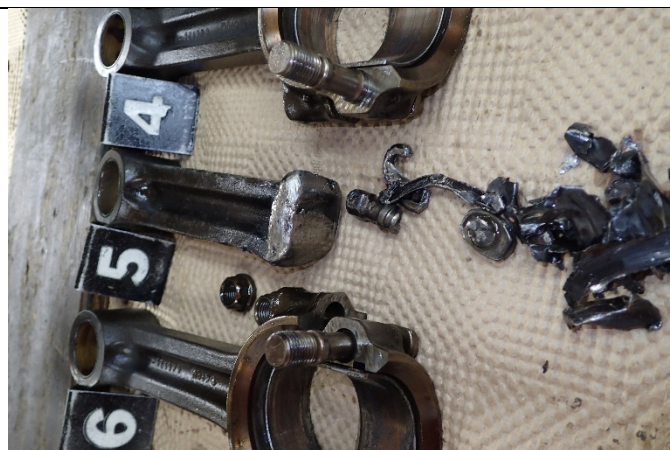
#4 CONNECTING ROD BEARING

P/N: Illegible

Date Code: Illegible

Condition:

Portions of the bearings were located in the oil sump and displayed a significant amount of damage consistent with lubrication distress.



#6 CONNECTING ROD

Forging: 646126

S/N: AE11GB089

Condition:

The connecting rod remained attached to its connecting rod journal and to its piston. The rod displayed minor thermal discoloration around the bearing support.

#6 CONNECTING ROD BEARING

P/N: 642398

Date Code: 3-09

Condition:

The bearings remained within the bearing supports. The bearing displayed wiping and smearing of the bearing layers which is consistent with lubrication distress.



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CAMSHAFT

CAMSHAFT

P/N: 654084

S/N: 104546

Condition:

The camshaft remained intact and displayed minor mechanical damage. The camshaft lobes displayed normal operating and lubrication signatures. The camshaft gear was undamaged and remained secured to the camshaft.



LIFTERS

#1

#3

#5

#2

#4

#6

INTAKE

658088

Inaccessible

658088

658088

658088

658088

EXHAUST

658077

Inaccessible

658077

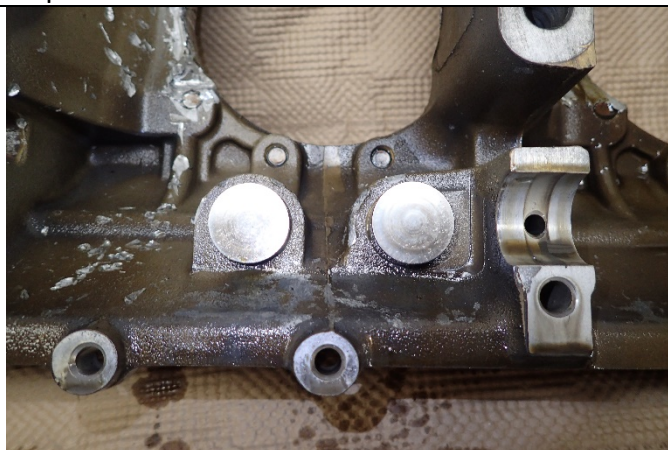
658077

Inaccessible

658077

Condition:

All of the lifters remained installed in their installation points. The #3 intake and exhaust as well as the #4 exhaust lifters could not be removed from their installation points due to mechanical damage to the surrounding crankcase. The remaining lifters were removed and displayed normal operating signatures; the lifters that could not be removed displayed normal operating signatures on the visible portions of the lifters.



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ACCESSORY GEARS

Condition:

All of the accessory gears remained installed in their installation points and were undamaged. The gears displayed normal operating signatures; there were no anomalies noted.



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ACCESSORIES

STARTER

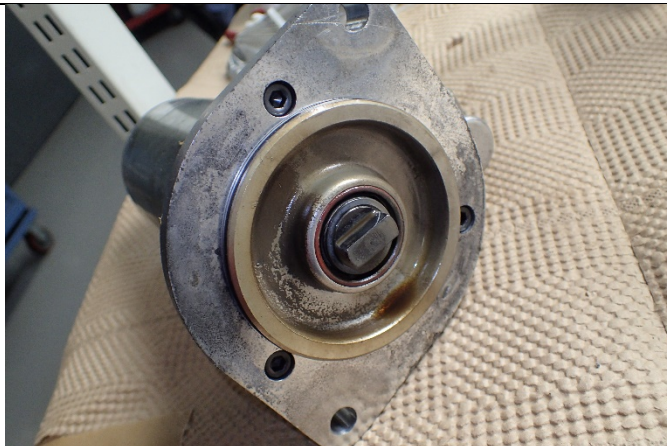
Manufacturer: Skytech

P/N: C24ST5

S/N: 4C5-051501

Condition:

The starter remained intact and undamaged. There were no anomalies noted with the starters.

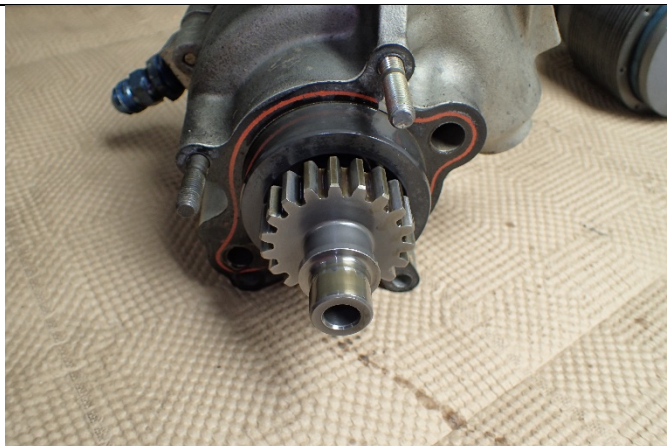


STARTER ADAPTER

P/N: Illegible

Condition:

The starter adapter remained attached to its installation point and was undamaged. The starter gear was capable of normal movement. The adapter was partially disassembled to allow to view the operation of the scavenge pump; the scavenge pump gears operated normally. There were no anomalies noted.



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ALT/GEN #1

Manufacturer: CMI

P/N: R-649305

S/N: 017AA014R

Condition:

The alternator remained attached to its installation point and was undamaged. There were no anomalies noted with the alternator.



ALT/GEN #2

Manufacturer: B&C Specialty Products

P/N: BC425-1

S/N: 056306K

Condition:

The backup alternator remained attached to its installation point and was undamaged. There were no anomalies noted with the alternator.



VACUUM PUMP	Manufacturer: Tempest	P/N: AA442CW	S/N: 0C1306
Condition:	The vacuum pump remained attached to its installation point and was undamaged. The pump was removed and the sheer coupling was noted to be intact. There were no anomalies noted with the vacuum pump.		



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TURBO

Manufacturer: Kelly Aerospace

P/N: 406610-5

S/N: JA0177

Condition:

The turbocharger remained intact and was undamaged. The compressor and turbine blades displayed normal operating signatures and were capable of rotation. There were no anomalies noted with the turbocharger.



TURBO CONTROLLER

Manufacturer: Garrett

P/N: 470688-9007

S/N: AL016921

Condition:

The turbocharger controller remained intact and was undamaged. There were no anomalies noted with the controller.



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WASTEGATE

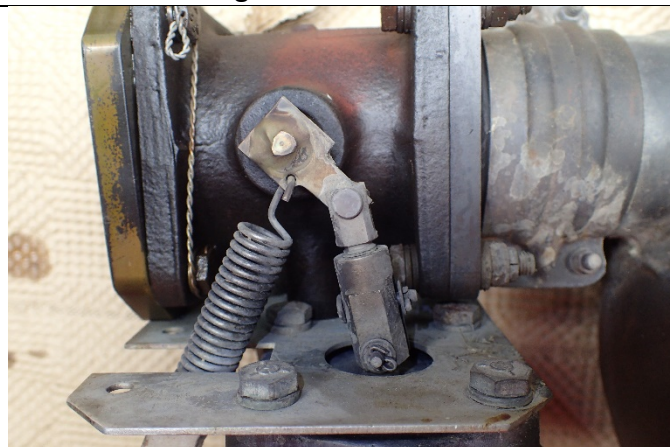
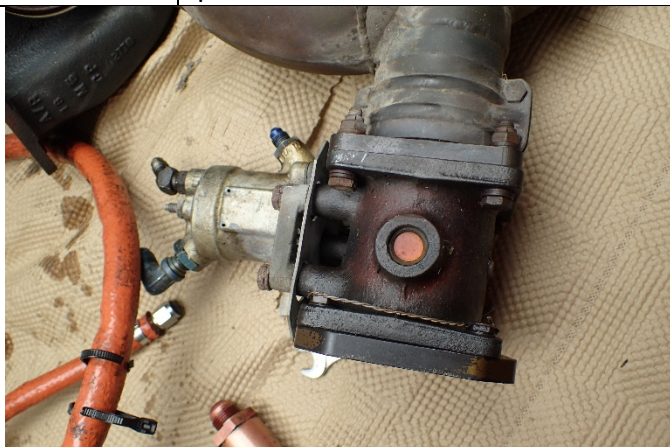
Manufacturer: Dataplate missing

P/N: Dataplate missing

S/N: Dataplate missing

Condition:

The wastegate remained intact and was undamaged. The wastegate was in the open position. There were no anomalies noted with the wastegate.



OVERBOOST VALVE

Manufacturer: Kelly Aerospace

P/N: 470930-1

S/N: DB0112

Condition:

The overboost valve remained attached to its installation point and was undamaged. There were no anomalies noted with the overboost valve.



CHECK VALVES

Condition:

Both of the check valves remained attached to their installation points and were undamaged. The check valves were removed and disassembled. The check valve for the turbocharger scavenge oil was found to have a broken spring causing the valve to not close automatically; however, the valve was able to move freely. The inlet check valve was disassembled and was capable of normal operation.

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Scavenge Oil Check Valve



Scavenge oil check valve not closing automatically



Broken oil scavenge check valve spring



Turbocharger Inlet Check Valve



Turbocharger Inlet Check Valve



Turbocharger Inlet Check Valve

PROPELLER

PROPELLER GOVERNOR	Manufacturer: McCauley	P/N: C290D3?/T23	S/N: 810192
Condition:	The propeller governor remained attached to its installation point and was undamaged. The governor was removed and the gasket screen was noted to be clear of any contaminates. There were no anomalies noted with the governor.		

