



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety

Central Region

3/17/2022

INVESTIGATION SUMMARY

CEN22FA011

A. INVESTIGATION PARTICIPANTS:

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B. ACCIDENT SUMMARY

HISTORY OF FLIGHT

On October 11, 2021, at 0857 mountain daylight time, a Beech 58TC airplane, N6748V, was destroyed when it was involved in an accident near Mesa, Colorado. The pilot was fatally injured. The airplane was operated as a Title 14 *Code of Federal Regulations* Part 91 personal flight.

Employees at Blake Field Airport (AJZ), Delta, Colorado, stated that before departure the pilot fueled the airplane with 100 gallons of aviation gasoline. The airplane taxied away from the fuel pump at 0839 and proceeded to runway 03. They also stated that this was the airplane's first flight after an annual inspection had been completed on October 1, 2021.

ADS-B data revealed that about 0846 the airplane departed from runway 03 and proceeded northeast for about 4 nautical miles (nm), then turned left to north-northwest and climbed over the Grand Mesa. After crossing over the Grand Mesa, the airplane reached about 14,000 ft mean sea level (msl). At 0855:51 the airplane turned right and descended about 1,000 ft, then rapidly climbed to 15,000 ft. At 0856:26 the airplane descended rapidly toward terrain.

A summary of ATC comms revealed that pilot was in contact with ATC and checked in at 11,000 ft climbing to 14,000 ft. At 0857:00 the controller asked the pilot, "did you get an updraft, mountain wave out there? I'm showing you 800 ft high." There were no other communications from the pilot.

<u>ATC radar scope</u>	<u>OpsVue track data</u>
0855 level 14,000	0855.47 level at 14,000
0856.06 descend down to 13,300	0856.06 descend down to 12,775
0856.17 descend down to 12,800	0856.26 climb up to 15,075
0856.29 climb up to 14,900	
0856.55 descend down to 11,900	
ATC contact about 856:58	

PERSONNEL INFORMATION

Pilot: Robert Dale Cannon / PRIVATE ASEL AMEL INSTRUMENT

Medical: 3rd class 11/24/2020. Limitations: Must wear corrective lenses. Must use hearing amplification

Flight hours: 3,600 total and 30 hours in last six months as of 11/24/2020

Logbook: 3,851.5 total time / 3,590.4 PIC / 1,086.1 ASEL / 2,765.4 AMEL / 306.3 actual / 161 simulated

AIRCRAFT INFORMATION

The aircraft was a 1980 Beech 58TC Baron, s/n: TK-120. Hobbs 3,429.7 hours (at accident site)

The airplane was dropped off for annual inspection on 6/24/21. Annual/100-hr inspection completed 10/1/2021 at 3,429.3 AFTT, by Smiling Aviation, Delta, Colorado. Maintenance documentation from the most recent annual inspection noted a discrepancy that there was oil around the RIGHT propeller governor. The corrective action was to remove the LEFT propeller governor and install a new gasket.

16	Oil around prop gov right engine.	Part # MS9144-01	QTY 1 Prop gov gasket	Removed left prop governor installed new gasket and re installed.
		Part #	QTY	
		Part #	QTY	
1.5	. Removed left prop governor installed new gasket and re installed.			147.00

METEOROLOGICAL INFORMATION

Synoptic Conditions - The NWS Surface Analysis Chart for 1500Z depicted high pressure dominating over Colorado with a low pressure system and associated frontal wave over western Wyoming. The station models in the immediate vicinity of the accident site depicted winds from the east at 5 knots, clear skies, with surface temperatures in the 40's degrees Fahrenheit (F), and dew point temperatures in the 30's. No significant Weather was depicted over western Colorado at the time. The NWS National Composite Radar Mosaic for 1500Z depicted a few echoes in the range of 5 to 20 dBZ to the southeast and northeast of the accident site, with no significant meteorological echoes along the flight path.

METAR KGJT 111353Z AUTO 11020KT 10SM CLR 07/01 A2985 RMK AO2 PK WND 13028/1342

METAR KGJT 111453Z AUTO 10015KT 10SM CLR 08/01 A2983 RMK AO2 PK WND 11026/1354 SLP074 T00830011 57014=

Accident 1457Z

METAR KGJT 111553Z AUTO 13021G27KT 10SM CLR 09/01 A2981 RMK AO2 PK WND 12028/1536 SLP064 00940011=

METAR KGJT 111653Z AUTO 09014G25KT 10SM CLR 09/01 A2978 RMK AO2 PK WND 12027/1618 SLP059

METAR KGJT 111753Z AUTO 12010KT 10SM CLR 12/02 A2975 RMK AO2 SLP044 T01170017

The NWS Terminal Aerodrome Forecast (TAF) current at the time of the accident was as follows:

AMD TAF KGJT 111512Z 1115/1212 12015KT P6SM FEW250

FM111800 18012KT P6SM SCT100 BKN250

FM112100 22011G20KT P6SM SCT100 BKN250

FM120200 13009KT P6SM OVC250

FM120800 13011G20KT P6SM SCT080 BKN100

Sounding - A High-Resolution Rapid Refresh (HRRR) numerical model for 1500Z was obtained for the approximate accident site and plotted on a standard Skew T log P diagram from the surface to 450-hPa or 21,000 ft. The sounding depicted at the accident airplanes cruising altitude of 15,000 ft a temperature near -6.5° Celsius (C), a dew point temperature of -15° C, with a relative humidity of 49%, and a wind from 216° at 28 knots. The RAOB program depicted the potential for light turbulence and mountain wave activity at that level with a wavelength of 3.55 nm, with vertical velocity of 413 fpm. The sounding did not depict any inflight structural icing, and only moderate turbulence through the depth of the sounding.

Satellite Imagery - The GOES-16 infrared and visible imagery surrounding the period depicted scattered mid-level clouds over the area associated with altocumulus standing lenticular (ACSL). The radiative cloud top temperature over the accident site was 271 Kelvin or -2.16° C, which corresponded to cloud tops near 12,000 ft.

Pilot Reports - the following reports were recorded over Colorado during the period.

ASE UA /OV DBL 207010/TM 1932/FL160/TP C25M/TB LGT-MOD

APA UA /OV APA350001/TM 1855/FL070/TP C25B/WV 16017G24/TB MOD

COS UA /OV 5E COS/TM 1825/FL075/TP PA28A/TB LT-MOD TURB

GXY UA /OV ADS-GXY/TM 1811 /FL085/TP M20T/RM HEADWIND THEN TAILWIND AFTER TURN AT AMAE

NWS Inflight Weather Advisories - there were no SIGMETs, Convective SIGMETs, or AIRMETs issued over the route of flight issued.

WRECKAGE AND IMPACT INFORMATION

The accident site was located at 39.206489 x -108.123727 at an elevation of 5,750 feet. The geographic area consisted of rocky, and muddy terrain on a mountainside. The accident site was inaccessible due to poor weather conditions on 10/12-14. The NTSB and Textron reconvened on 10/19/21 for the on-site examination, documentation, and recovery. On-site observations detailed below.



SURVIVAL ASPECTS

The pilot was found outside of the airplane, a few feet in front of the left wing. The pilot's 3-point seatbelt and shoulder harness were found unbuckled with no impact damage, stretching or other evidence of any force applied upon impact. The shoulder harness was found behind the pilot's seat.

C. EXAMINATION SUMMARY

1.0 On-Scene Airframe Examination

The aircraft impacted rocky mountainside in a near wings and nose level attitude. The right wing remained attached to the fuselage. The section of the wing outboard of the engine exhibited extensive compression damage. The leading edge was separated at the leading-edge piano hinge attachment. The lower wing skin remained attached to the forward spar and was separated from the aft spar. The flap and aileron remained attached. The fuel cells were ruptured. The wet wing fuel wing tip was impact separated and was present at the accident site.

The left wing remained partially attached to the fuselage and exhibited extensive compression damage. The spars were bent upward approximately 30 degrees outboard of the engine. The flap remained attached the aileron was impact separated. The aileron was fracture separated from the mounts and was present at the accident site. The trim tab was observed intact but impact separated.

The empennage received extensive impact damage approximately 24" forward of the vertical stabilizer and was displaced to the left side of the fuselage. The empennage remained attached to the fuselage by the lower skin and stringers. The vertical stabilizer and horizontal stabilizers did not receive significant impact damage. The elevator weights were separated from the elevators and were present at the accident site. The rudder remained attached to the empennage. The top portion of the rudder impact separated from the upper attach point and was bent left approximately 90 degrees at the center hinge point.

The nose of the aircraft was highly compressed and displaced upward and aft. The nose baggage door was present at the accident site. The exterior of the door was covered in a layer of engine oil. Multiple windshield fragments found on-site were also covered in a thin layer of oil.

The landing gear was observed in the retracted position. The nose and left main gear were fracture separated from the attach points.

The engine ignition switches were observed in the OFF position and did not show evidence of impact damage or post-accident manipulation. According to the first responders, no one touched the instrument panel or any switches.

2.0 Post-Recovery Airframe Examination

Seats five and six were not installed. On-scene photographs depict that the pilot was ejected from the wreckage. The pilot's lap belt was found unlatched at the accident site and there was no evidence of stretching in the belt webbing. The three-point shoulder harness was found unlatched and behind the pilot's seat.

Throttle levers were found aft near the idle position. Mixture and propeller levers were in intermediate positions but near full forward. The fuel boost pump switches were observed in the ON position.

The left landing gear was observed in the retracted position. The nose and right main gear were fracture separated from the attach points. The landing gear handle was impact damaged.

Fuel selector handles in the cockpit were positioned to the LEFT and RIGHT tank respectively. The right fuel strainer screen was fracture separated and observed at the accident site. The fuel system was fragmented in the wings. All fuel bladder tanks were ruptured. The fuel caps were observed in place. The airplane was equipped with the 196-gallon fuel system. The left fuel selector cable housing was impact separated from the valve control handle in the cockpit. The cable protruded about the same amount through left and right control handle assemblies. The left handle was bent aft approximately 30 degrees. The right selector valve was positioned to the right tank. The left fuel strainer was clear of contaminants. The left selector valve was positioned to OFF; however, the cable had been pushed upward due to impact and the cable pulled the valve to OFF.

The aileron flight control cables were observed attached to the right and left aileron bellcranks. Both forward arms of the aileron wing bellcranks remained connected to the balance control cable and were fracture separated from the bellcrank. The aileron control cable chain remained in place on the control column sprocket in the cockpit. The left aileron was impact separated from the wing and was observed at the accident site. The aileron trim tab was separated from the aileron and was present at the accident site. The cables were continuous from the cockpit to the control surface.

The rudder and elevator control cables were observed attached at the control surface bellcranks and to the cockpit controls. The rudder and elevator remained attached to the empennage and were observed to be continuous, on scene. The elevator and rudder control cables were cut in multiple locations to facilitate recovery. The lower arm (up elevator cable) of the aft elevator bellcrank was fracture separated from the bellcrank. The autopilot pitch servo bridal cables were securely attached to the elevator control cables. The empennage section sustained substantial impact damage common to the autopilot pitch servo mount. The cable was loosely wrapped around the servo capstan.

The elevator and rudder trim control cable were attached to their respective trim actuator chains. The pitch trim servo was observed with the cables loosely wrapped around the drive pulley and remained attached to the cable clevis.

A Century IV autopilot was installed. The autopilot pitch cables and connections were cut for recovery, and the aft elevator bell crank was impact fractured. The autopilot pitch servo appeared normal with no anomalies when manually actuated.

The flap indicator in the cockpit showed about 15° extended and the flap handle was found down, and impact crushed down. However, the flap jackscrews indicated that the flaps were retracted at the time of impact.

3.0 On-Scene Engine Examination (Left)

The left engine was found at the accident site and mostly remained near it's nacelle but was partially separated from the nacelle. The left engine was mostly separated from the nacelle and engine mounts and remained attached via engine control cables and wiring.

4.0 Post-Recovery Engine Examination (Left)

The left engine remained intact with slight impact damage to the oil sump. The turbo, fuel control, turbo controller, and associated plumbing was impact separated from their respective mounts but remained

connected. The turbocharger spun freely and smoothly when rotated by hand. There was no evidence of rotational damage or impact signatures. The oil and fuel supply lines remained securely attached. The magnetos remained attached. They were removed and spun using an electric drill. The leads for the top spark plugs produced a strong blue arc. The spark plugs were removed and examined; they appeared normal per the Champion Check-a-Plug chart. The fuel injectors were removed and were free of obstructions. All fuel rail assembly fittings were tight. The fuel pump was removed from the accessory housing. The pump drive was intact and the pump rotated freely. The fuel flow divider valve was removed and examined; the screen was free of debris and obstructions. The propeller remained attached to the crankshaft. The crankshaft rotated smoothly when rotated by hand. The rocker covers were removed to observe valve train operation. Each cylinder produced compression and suction during the appropriate stroke while rotating the propeller and blocking the spark plug hole. Valve movement was observed during propeller rotation. There were no anomalies noted that would have precluded normal operation.

5.0 On-Scene Engine Examination (Right)

The right engine was still mostly attached to the nacelle via the engine mounts. The engine compartment, propeller blades, and right-side nose compartment were covered in a layer of engine oil. See photo below.



6.0 Post-Recovery Engine Examination (Right)

The engine sustained upward impact crushing damage sustained during the accident sequence. The oil sump was crushed upward and punctured by the oil dipstick tube. The oil sump was removed, no signs of debris or catastrophic engine failure were evident. The propeller hub remained attached to the crankshaft and one blade was impact separated from the hub. The other two blades remained attached to the hub.

Pushrod tubes were observed bent upwards as a result of impact. The rocker covers were removed to examine the valves and springs, no anomalies were noted. Due to impact damage the crankshaft was unable to rotate. The upper spark plugs were removed and examined. They appeared normal per the Champion Check-a-Plug chart. The cylinders were viewed internally with a borescope. The valves, pistons, and cylinder walls did not exhibit signs of catastrophic failure or abnormal wear. The left and

right magnetos were impact separated from their mounts. They both sustained minimal impact damage. The left mag casing was partially fractured and separated at the data tag. Both mags were manually rotated and produced a spark at each terminal. Note: The right mag had one wire pulled from one terminal, so a spark was not observed at that terminal.

The turbo, fuel control, turbo controller, and associated plumbing was separated from their respective mounts but remained connected. Multiple oil and fuel lines were fracture separated at the fittings. The turbocharger wastegate valve was fractured from the valve control housing at the base. The wastegate control was removed from the turbo housing mount and examined. The turbo charger compressor housing was fractured, and impact separated from the turbo. The turbine rotor was in contact with the housing and seized. There was no evidence of rotational damage on the rotor assembly. The oil line from the turbocharger wastegate control valve outlet (p/n 635381-2) to the inlet side of the (VAPC) turbo pressure controller (p/n 640655-22) was loose at the wastegate outlet end. During the examination, the B-nut was rotated approximately $\frac{3}{4}$ to 1 full rotation clockwise before the fitting tightened against the mating surface of the flared union fitting.

The fuel rail assembly was in place and attached, but the connections were easily turned clockwise with a wrench at all 6 fuel injector locations. The fuel injectors were removed from the cylinder heads and observed to be free from obstructions. When removing the fuel injectors, it was noted that only two to three threads were engaged. The No. 2 fuel injector was dislodged from the cylinder head. The thread material from the cylinder head remained in the injector threads. The fuel injectors were removed and examined. Fuel injectors 1,2,3,5, and 6 were free of obstructions. The No. 4 injector was partially obstructed. The material obstructing the injector was removed using a piece of 0.02" safety wire. The material was soft in composition and black in color. The fuel flow divider valve was removed and examined. Black rubber material from the flow divider diaphragm was present in the pressure chamber of the flow divider. The flow divider did not have a fuel filter screen installed. The fuel pump was removed from the accessory housing. The pump drive was intact, and the pump rotated freely. Fuel flow transducer was free and clear, and air was blown through without obstruction.

The propeller governor was impact fractured at the control and at the base of the unit near the mounting base. The lower forward nut was not secure and turned counterclockwise with light finger pressure. The top forward and lower rear nuts were not tight and easily turned with a wrench. The top rear nut was tight. The top studs were slightly bent upward. The black rubber gasket was torn and damaged at the top at near the edge of the unit exterior, likely from the governor being crushed upward during impact. The lower area of the gasket did not have any damage or indentions.

Appended to this document are 3 figures extracted from the Continental Motors TSIO-520 engine overhaul manual, which illustrate the loose connections and fittings as mentioned above.

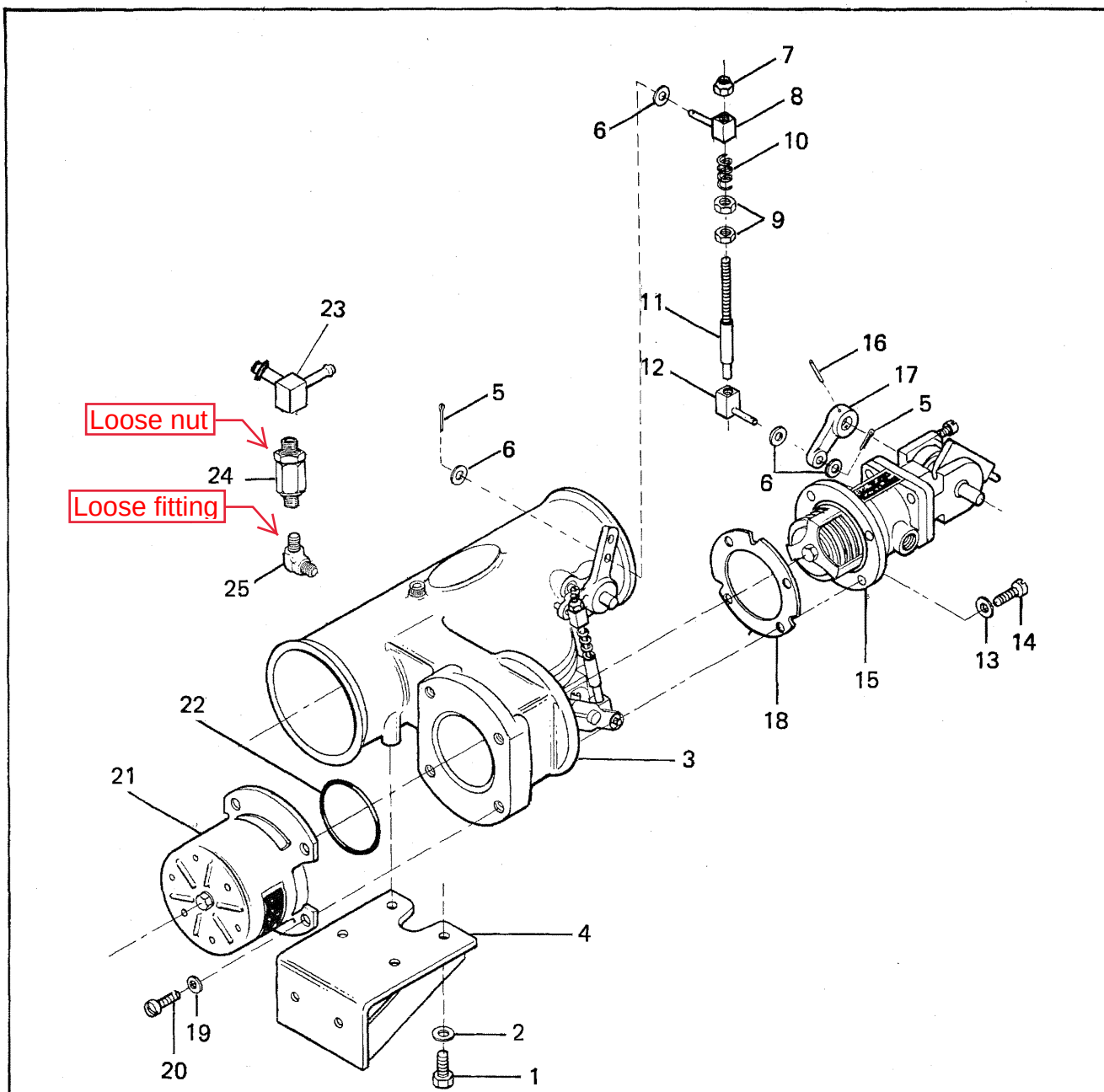


FIGURE 9-3 THROTTLE AND CONTROL ASSEMBLY

- | | |
|----------------------------------|---------------------------|
| 1. Bolt | 13. Washer |
| 2. Washer | 14. Bolt |
| 3. Throttle and Control Assembly | 15. Controller |
| 4. Bracket | 16. Pin |
| 5. Cotter Pin | 17. Lever |
| 6. Washer | 18. Gasket |
| 7. Nut | 19. Washer |
| 8. Rod End | 20. Bolt |
| 9. Nut | 21. Pressure Relief Valve |
| 10. Spring | 22. Gasket |
| 11. Rod | 23. Fitting |
| 12. Rod End | 24. Check Valve |
| | 25. Elbow |

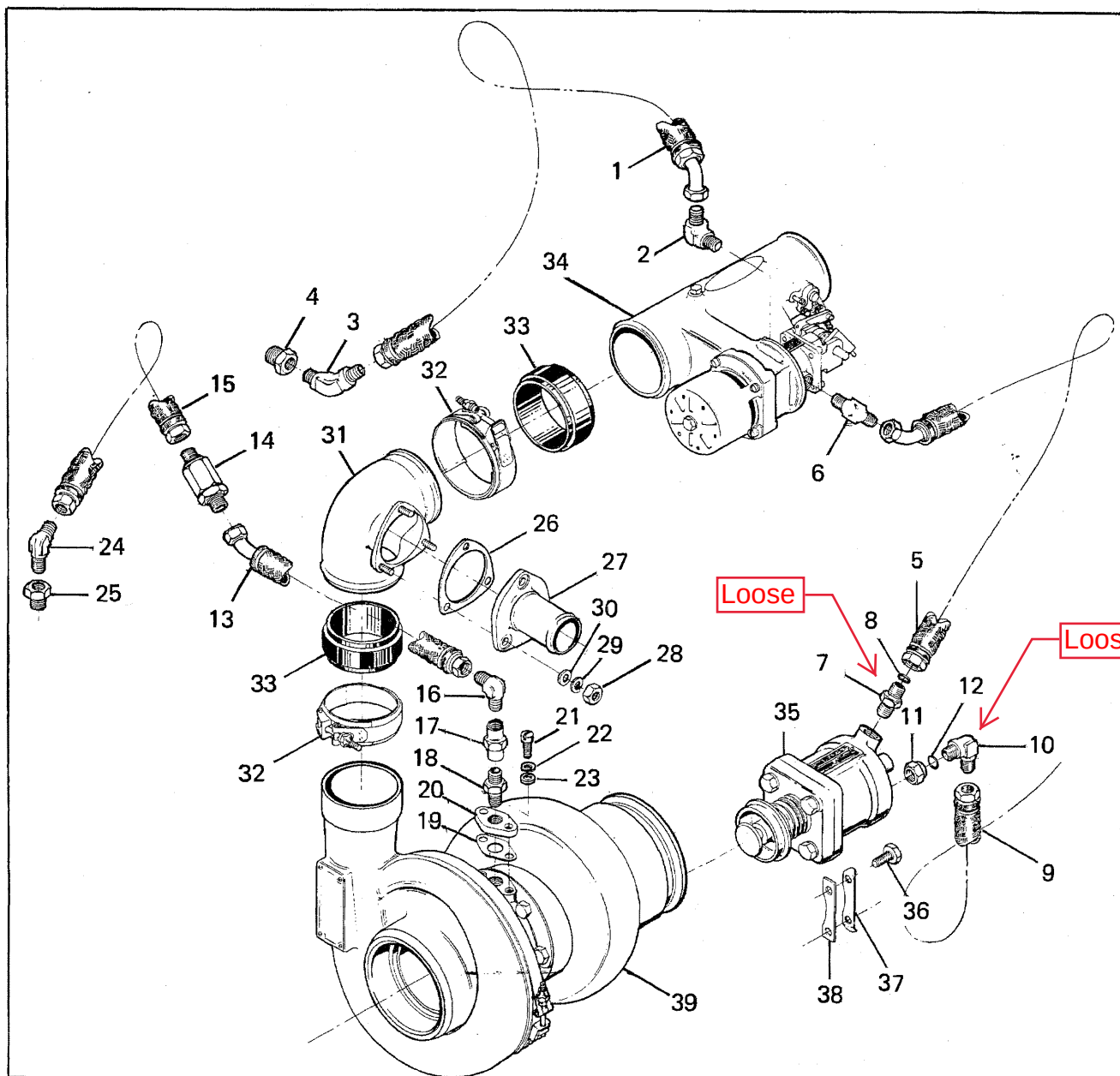


FIGURE 9-4 INDUCTION/EXHAUST RELATED PARTS

- | | | |
|----------------------------------|------------------------------------|-------------------------------|
| 1. Hose, Controller to Engine | 14. Check Valve | 27. Sonic Venturi |
| 2. Elbow 90° | 15. Hose Check Valve to Oil Cooler | 28. Nut |
| 3. Elbow 45° | 16. Elbow 90° | 29. Lockwasher |
| 4. Reducer | 17. Coupling | 30. Washer |
| 5. Hose, Controller to Wastegate | 18. Nipple | 31. Induction Tube |
| 6. Elbow | 19. Gasket | 32. Coupling |
| 7. Nipple | 20. Adapter, Turbo Oil Inlet | 33. Sleeve |
| 8. O-Ring | 21. Bolt | 34. Throttle and Control Assy |
| 9. Hose, Wastegate to Oil Cooler | 22. Lockwasher | 35. Wastegate Valve |
| 10. Elbow 90° | 23. Washer | 36. Bolt |
| 11. Nut | 24. Elbow | 37. Clamp Plate |
| 12. O-Ring | 25. Reducer | 38. Lock Plate |
| 13. Hose, Turbo to Check Valve | 26. Gasket | 39. Turbocharger |

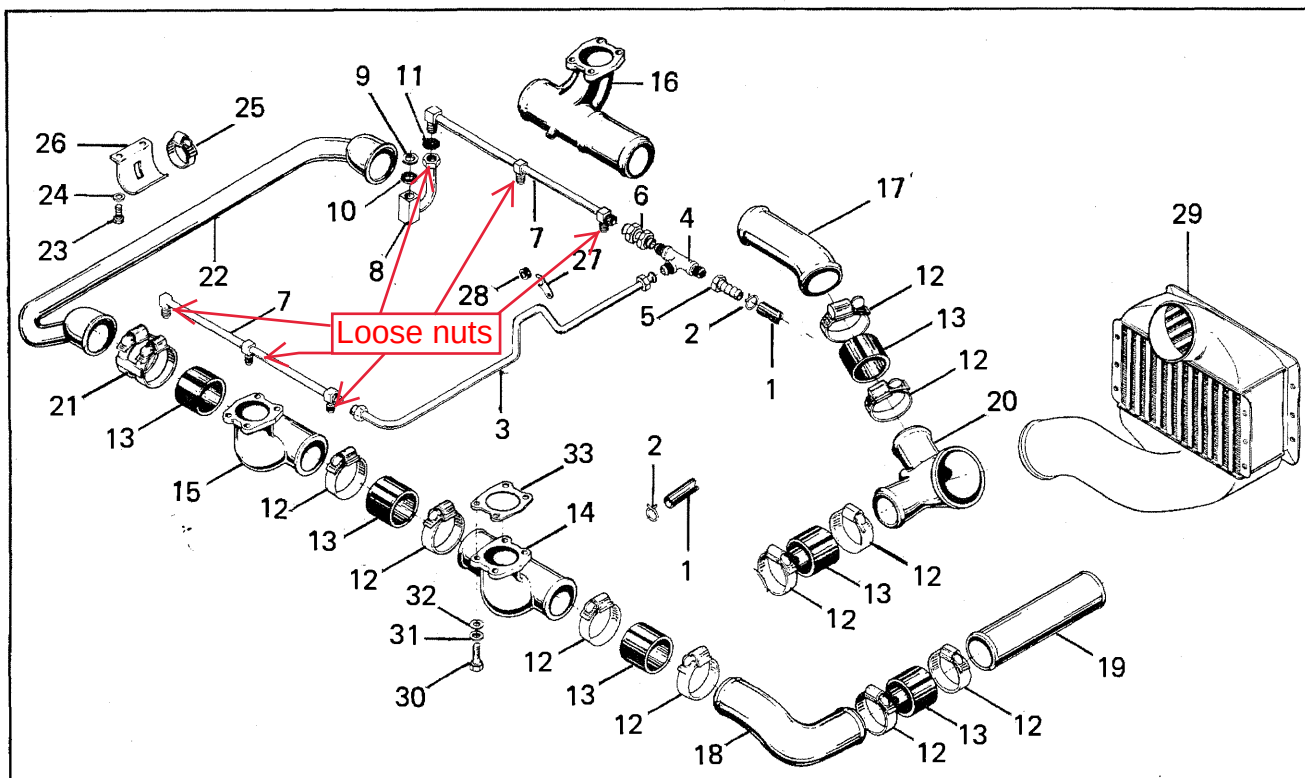


FIGURE 9-5 INDUCTION SYSTEM

- | | |
|-------------------------|-----------------------|
| 1. Hose | 18. Elbow, 2-4-6 side |
| 2. Hose Clamp | 19. Tube |
| 3. Air Manifold Tube | 20. Riser |
| 4. Tee | 21. Clamp Assembly |
| 5. Coupling, Barbed | 22. Balance Tube |
| 6. Tube Assembly | 23. Bolt |
| 7. Tube Assembly | 24. Tab Washer |
| 8. Sleeve | 25. Clamp |
| 9. Washer | 26. Bracket |
| 10. Gasket | 27. Bracket |
| 11. Gasket | 28. Grommet |
| 12. Clamp | 29. Intercooler |
| 13. Hose | 30. Bolt |
| 14. Elbow, Cyl. 2, 4, 5 | 31. Lockwasher |
| 15. Elbow, Cyl. 1, 6 | 32. Washer |
| 16. Elbow, Cyl. 3 | 33. Gasket |
| 17. Elbow, 1-3-5 side | |

Loose nuts

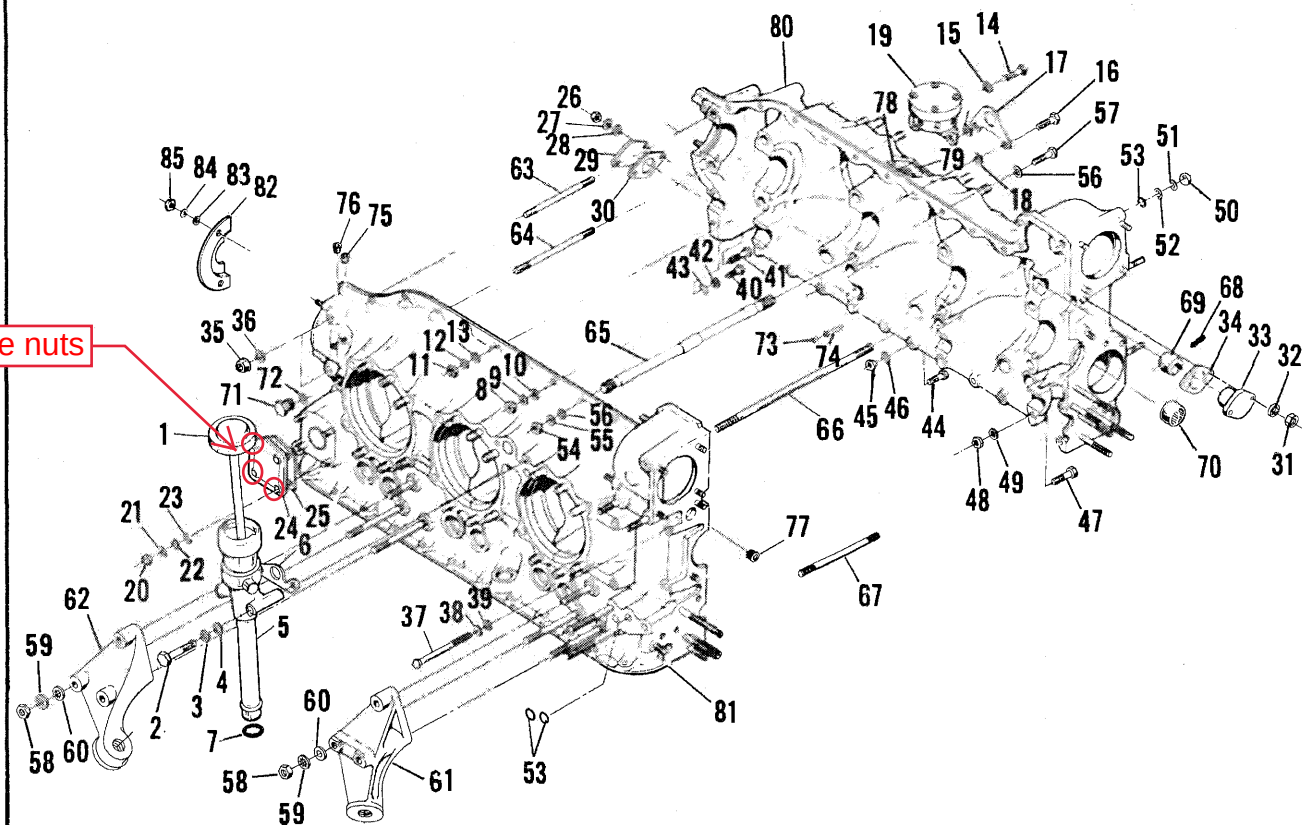


FIGURE 4-24. CRANKCASE ASSEMBLY, PERMOLD ENGINE.

- | | |
|---------------------------------------|---------------------------|
| 1. Rod and Cap Assembly,
Oil Gauge | 42. Washer, Lock |
| 2. Bolt, Hex Head | 43. Washer, Plain |
| 3. Washer, Lock | 44. Bolt, Hex Head |
| 4. Washer, Plain | 45. Nut, Lock |
| 5. Breather Assembly,
Oil Filler | 46. Washer, Plain |
| 6. Gasket, Breather
Assembly | 47. Bolt, Hex Head |
| 7. O-Ring, Breather Assembly | 48. Nut, Lock |
| 8. Nut, Hex | 49. Washer, Plain |
| 9. Washer, Lock | 50. Nut, Hex |
| 10. Washer, Plain | 51. Washer, Lock |
| 11. Nut, Hex | 52. Washer, Plain |
| 12. Washer, Lock | 53. O-Ring |
| 13. Washer, Plain | 54. Nut, Hex |
| 14. Bolt, Hex Head | 55. Washer, Lock |
| 15. Washer, Plain | 56. Washer, Plain |
| 16. Bolt, Hex Head | 57. Bolt, Hex Head |
| 17. Eye, Engine Lifting | 58. Nut, Hex |
| 18. Spacer | 59. Washer, Lock |
| 19. Valve Assembly, Fuel
Manifold | 60. Washer, Plain |
| 20. Nut, Hex | 61. Bracket, Engine Mount |
| 21. Washer, Lock | 62. Bracket, Engine Mount |
| 22. Washer, Plain | 63. Bolt, Thru |
| 23. Spacer | 64. Bolt, Thru |
| 24. Cover, Governor Pad | 65. Bolt, Thru |
| 25. Gasket, Governor Pad Cover | 66. Bolt, Thru |
| 26. Nut, Hex | 67. Bolt, Thru |
| 27. Washer, Lock | 68. Pin, Dowel |
| 28. Washer, Plain | 69. Bushing, Idler Pin |
| 29. Cover, Cam Hole | 70. Bearing, Needle |
| 30. Gasket, Cam Hole Cover | 71. Plug, Machine Thread |
| 31. Nut, Hex | 72. Gasket, Copper |
| 32. Washer, Lock | 73. Screen, Squirt Nozzle |
| 33. Bushing, Idler Gear | 74. Nozzle, Squirt |
| 34. Gasket, Idler Gear | 75. Plug, Pipe |
| 35. Nut, Flanged | 76. Plug, Pipe |
| 36. Washer, Plain | 77. Plug, Pipe |
| 37. Bolt, Drilled Head | 78. Screw, Drive |
| 38. Washer, Lock | 79. Plate, Identification |
| 39. Washer, Plain | 80. Crankcase, 1-3-5 Side |
| 40. Screw, Hex Head | 81. Crankcase, 2-4-6 Side |
| 41. Bolt, Hex Head | 82. Retainer, Oil Seal |
| | 83. Washer, Plain |
| | 84. Washer, Lock |
| | 85. Bolt |