

700, 800, 730 830 Tractors

Service Manual

9-74321R0

Reprinted



SECTION

C

SPECIFICATIONS FOR CASE

700 & 800 SERIES ----- A251 GASOLINE ENGINE
(Eng. Block A11111 Only)

700 & 800 SERIES ----- A267 DIESEL ENGINE
(Eng. Block A11112 Only)

730 SERIES ----- A251 GASOLINE ENGINE

830 SERIES ----- A284 GASOLINE ENGINE

730 SERIES ----- A267 DIESEL ENGINE

830 SERIES ----- A301 DIESEL ENGINE

WHEEL TRACTORS

The Specifications Listed are the Same Unless Otherwise Indicated

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diesel engines

A267 AND A301 ENGINE SPECIFICATIONS

Type -----	CASE Full Diesel 4 Cylinder, 4 Stroke Cycle, Valve-in-Head Engine.
Cylinder Heads -----	Multiple Cylinder Heads can be removed in- dividually for Servicing(2 Cylinders per Head).
Firing Order -----	1-3-4-2
Bore A267 -----	4-1/8 Inches
A301 -----	4-3/8 Inches
Stroke -----	5 Inches
Piston Displacement A267 -----	267 Cubic Inches
A301 -----	301 Cubic Inches

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A267 AND A301 ENGINE SPECIFICATIONS (Continued)

Compression Ratio ----- 15 to 1

Full Governed Engine Speed No Load

A267 (700 Series) -----	1650 RPM
A267 (800 Series Case-O-Matic) -----	1950 RPM
A267 (730 Series) -----	1860 RPM
A301 (830 Series) -----	1860 RPM
A267 (730 Series Case-O-Matic) -----	2060 RPM
A301 (830 Series Case-O-Matic) -----	2060 RPM

Full Governed Engine Speed Full Load

A267 (700 Series) -----	1500 RPM
A267 (800 Series Case-O-Matic) -----	1800 RPM
A267 (730 Series) -----	1700 RPM
A301 (830 Series) -----	1700 RPM
A267 (730 Series Case-O-Matic) -----	1900 RPM
A301 (830 Series Case-O-Matic) -----	1900 RPM

Engine Idling Speed ----- 600 RPM

Air Cleaner ----- Heavy Duty Oil Bath Type

Oil Filter, Crankcase A267 (Eng. Block A11112 Only) ----- Replaceable Element Type
 A267 and A301 ----- Replaceable Full Flow Element Type

Exhaust Valve Rotators (A301 Only) ----- Positive Type

Method of Starting Diesel Engine ----- Engine Starts on Diesel
 Fuel (12 Volt Electric Starting Motor)

Decompressor ----- Holds Exhaust Valves Open So
 Can Be Manually Cranked for Servicing

Maximum Compression Pressures

(Engine Warmed Up To Operating Temperature and Running At 1600 RPM)

Altitude	Sea Level	1000 Ft.	2000 Ft.	3000 Ft.	4000 Ft.	5000 Ft.
Compression	480 to	455 to	435 to	415 to	395 to	375 to
Pressure	510 PSI	485 PSI	465 PSI	445 PSI	425 PSI	405 PSI

Allowable Variance Between Cylinders ----- 25 Pounds Pressure at 1600 RPM

CYLINDER SLEEVES

Type ----- Replaceable Wet Type: Two Rubber "O"
 Ring Seals Carried On Each Sleeve.

Inside Diameter of Sleeve Bore, A267 ----- 4.125 to 4.126 Inches. Replace Sleeve When In-
 side Diameter Below Top Ring Ridge Exceeds 4.133
 Inches.

A301 ----- 4.375 to 4.376 Inches. Replace Sleeve When In-
 side Diameter Below Top Ring Ridge Exceeds 4.333
 Inches.

Piston Clearance in Sleeve (At Skirt) A267 ----- .0045 to .0055 Inch
 A301 ----- .0045 to .0065 Inch

PISTON AND PISTON PINS

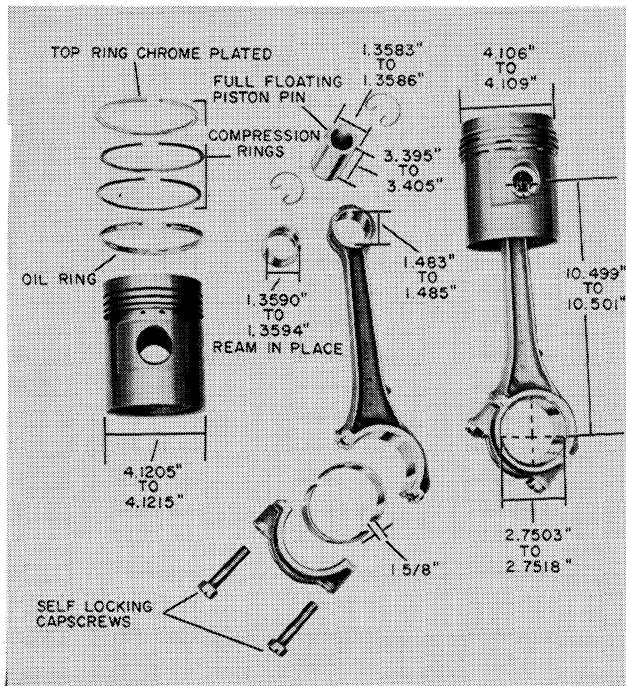


Figure C-1. A267

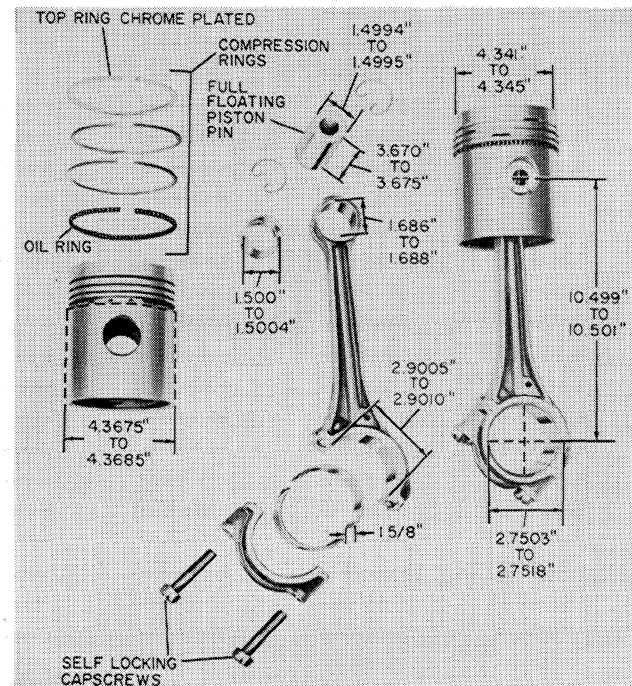


Figure C-2. A301

Piston Material A267 -----	Special Alloy Iron: Parco-Lubrized
A301 -----	Aluminum
Piston Weight (Less Pin) A267 -----	4.742 to 4.758 Pounds
A301 -----	3.937 to 3.939 Pounds
Diameter of Piston at Top A267 -----	4.106 to 4.109 Inches
A301 -----	4.341 to 4.345 Inches
Diameter of Piston at Top of Skirt Measured	
Immediately Below Oil Ring, Across Thrust Face A267 -----	4.1205 to 4.1215 Inches
A301 -----	4.3675 to 4.3685 Inches
Piston Pins -----	Full Floating Type: Held in Position with Snap Rings In Piston, Replace Bronze Bushing in Connecting Rod.
Piston Pin Length A267 -----	3.395 to 3.405 Inches
A301 -----	3.670 to 3.675 Inches
Piston Pin Diameter A267 -----	1.3583 to 1.3586 Inches
A301 -----	1.4994 to 1.4995 Inches
Piston Pin Fit in Piston A267 -----	.0002 to .0009 Inch. When Pin is Lubricated with Light Engine Oil and Held Upright In Vise, Weight of Piston Should Allow It To Slide Slowly Into Position Over Pin.
Piston Pin Fit In Position A301 -----	.0000 to .0003 Inch With Piston 50° F. Warmer Than Piston Pin.
Piston Pin Fit In Connecting Rod Bushing A267 -----	.0004 to .0011 Inch
A301 -----	.0005 to .0010 Inch

PISTON RINGS

Rings Per Piston -----	4 - (3 Compression and 1 oil)
Compression Rings (Top 3)	
1st. (Top) Ring -----	Chromium Plated; Tapered Face; Top Marked

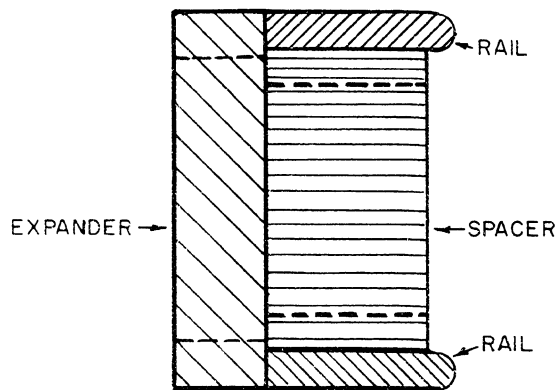
2nd. and 3rd. Rings ----- Relief Indicates Bottom Side
 Width of Ring (All 3) ----- .0930 to .0935 Inch

Ring End Gap (All 3) When Compressed In
 4.125 Inch Cylinder A267 ----- .013 to .023 Inch

Ring End Gap (All 3) When Compressed In
 4.375 Inch Cylinder A301 ----- .013 to .025 Inch

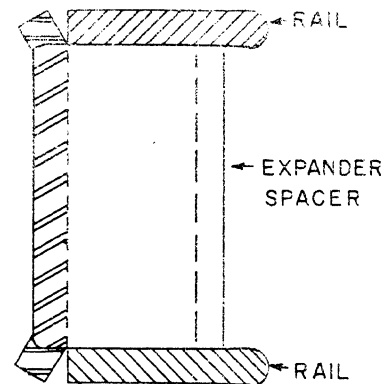
Side Clearance in Groove of 1st (Top) Ring A267 ----- .003 to .0045 Inch
 A301 ----- .0045 to .0060 Inch

Side Clearance In Groove of 2nd and 3rd Ring ----- .0025 to .004 Inch



INSTALL WITH EITHER SIDE UP

Figure C-3 Original Equipment Oil Ring A267



INSTALL WITH EITHER SIDE UP

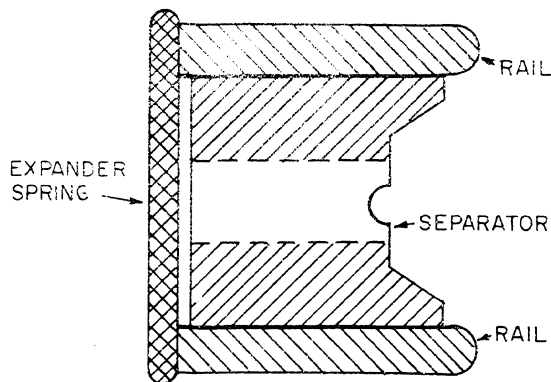
Figure C-4. Original Equipment Oil Ring A301

Oil Ring ----- To Install Replacement Ring, Follow Instructions Packed With Rings.

Width of Rings

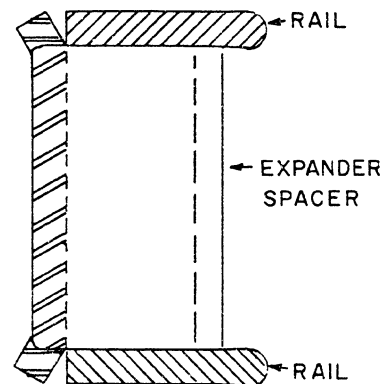
Original Equipment A267 ----- .2455 to .2485 Inch
 A301 ----- .2470 to .2490 Inch

Replacement Ring ----- .2441 to .2474 Inch



INSTALL WITH EITHER SIDE UP

Figure C-5. Replacement Oil Ring A267



INSTALL WITH EITHER SIDE UP

Figure C-6. Replacement Oil Ring A301

Side Clearance In Groove

Original Equipment A267	-----	.0025 to .0065 Inch
A301	-----	.0025 to .0085 Inch
Replacement Ring A267	-----	.0036 to .0079 Inch
A301	-----	.0025 to .0085 Inch

CONNECTING RODS

Piston Pin Bushing	-----	Replaceable Bronze Bushing Ream In Place
A267	-----	Use 1.3590 to 1.3594 Reamer
A301	-----	Use 1.5000 to 1.5004 Reamer

Piston Pin Hole Diameter In Rod

(Without Bushing) A267	-----	1.483 to 1.485 Inches
A301	-----	1.686 to 1.688 Inches

Inside Diameter of Piston

Pin Bushing in Rod A267	-----	1.3590 to 1.3594 Inches; Install New Bushing if Inside Diameter Exceeds 1.363 Inches.
A301	-----	1.500 to 1.5004 Inches; Install New Bushing if Inside Diameter Exceeds 1.504 Inches.

Connecting Rod Bearing ----- Replaceable Precision, Steel Backed Copper-Lead Alloy Liners.

Connecting Rod Capscrews ----- Self Locking Type, No Lock Wires Required -
May Be Used More Than Once.

Connecting Rod Length (Center to Center
Between Pin Hole and Bearing Journal Hole) ----- 10.499 to 10.501 Inches

Bearing Liner Width ----- 1-5/8 Inch

Diameter of Crankshaft Journal Hole

In Rod (Without Liner) ----- 2.9005 to 2.9010 Inches

Inside Diameter of Bearing Liner (Standard

Liner in Place In Rod and Capscrews Tight) ----- 2.7503 to 2.7518 Inches

Diameter of Crankshaft Rod Journal ----- 2.748 to 2.749 Inches

Clearance Between Rod Bearing

and Crankshaft Journal ----- .0013 to .0038 Inch; Install New Bearing Liners
When Clearance Exceeds .006 Inch.

Undersize Bearing Liners Available

for Service ----- .002, .010, .020, .030 Inch

Allowable Connecting Rod Bearing End Play ----- .005 to .012 Inch

CRANKSHAFT AND MAIN BEARINGS

Crankshaft ----- Balanced; Drilled to Provide Pressure Lubrication
to Main and Connecting Rod Bearings.

Type Main Bearings ----- Replaceable, Precision, Steel Backed Copper-Lead
Alloy Liners.

Bearing Capscrews ----- Self Locking Type, No Lock Wires Required May
be used More Than Once.

Bearing Taking End Thrust ----- Center (Two Replaceable Bronze Thrust Washers)

Crankshaft End Play (Measured
at Center Main Bearing) ----- .004 to .012 Inch; Install New Thrust Washers
If End Play Exceeds .020 Inch.

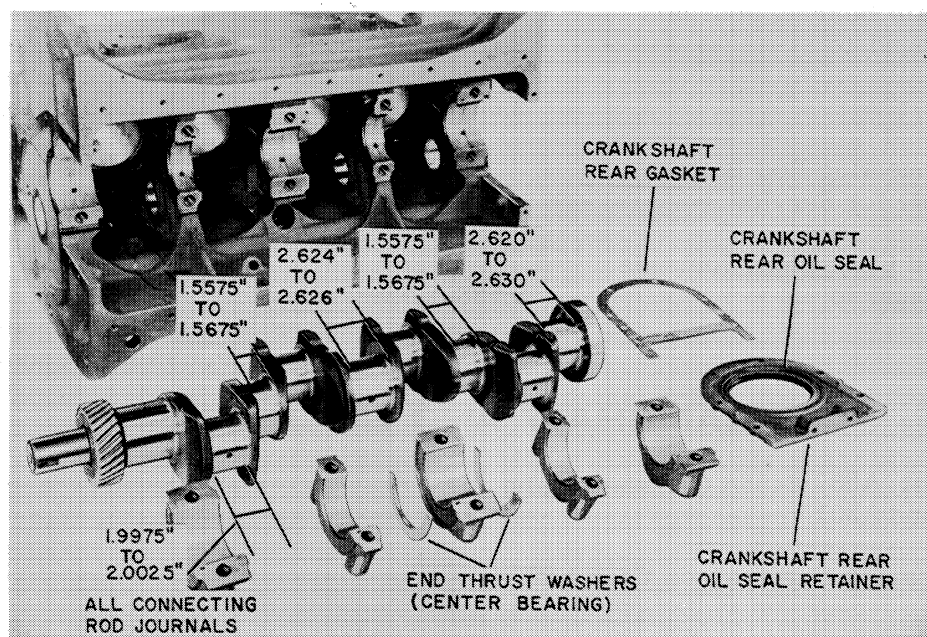


Figure C-7. Crankshaft and Main Bearings

Oversize Thrust Washers (For
End Play) Available for Service ----- .006 Inch

Connecting Rod Bearing Journal Diameter ----- 2.748 to 2.749 Inches

Main Bearing Journal Diameter ----- 2.998 to 2.999 Inches

Crankshaft Main and Connecting Rod
Journal Bearings out of Round ----- Maximum .001 Inch

Inside Diameter of Main Bearing Liners
(In Place and Capscrews Tight) ----- 3.0006 to 3.0026 Inches

Clearance Between Main
Bearing Liner and Journal ----- .0016 to .0046 Inch; Install New Bearing Liner
When Clearance Exceeds .0065 Inch.

Width of 1st, 3rd and 5th Main
Bearing Liners ----- 2-7/32 Inches

Width of 2nd and 4th Main
Bearing Liners ----- 1-5/32 Inches

Width Between Crankshaft Main Bearing Cheeks

A. 5th ----- 2.620 to 2.630 Inches

B. 2nd, 4th ----- 1.5575 to 1.5675 Inches

C. 3rd (Center) ----- 2.624 to 2.626 Inches

Width Between Crankshaft
Rod Bearing Journal Cheeks ----- 1.9975 to 2.0025 Inches

Undersize Main Bearing Liners
Available for Service ----- .002, .010, .020, .030 Inches

Crankshaft Main Bearing Journals
Should be Ground to ----- 2.988-2.989 Inches for .010 Inch Undersize Bearing
2.978-2.979 Inches for .020 Inch Undersize Bearing
2.968-2.969 Inches for .030 Inch Undersize Bearing

Undersize Connecting Rod Bearing
Shells Available for Service ----- .002, .010, .020, .030 Inches

Connecting Rod Crankshaft Journals
Should be Ground to ----- 2.738-2.739 Inches for .010 Inch Undersize Bearing
2.728-2.729 Inches for .020 Inch Undersize Bearing
2.718-2.719 Inches for .030 Inch Undersize Bearing

CAMSHAFT AND BUSHINGS

Type Camshaft A267 (6456A Camshaft Only) ----- Harmonic
A267 and A301 ----- Polydyne

Number of Bearing Surfaces on Camshaft ----- 4

Type Bushing ----- Replaceable, Precision, Steel Backed Babbitt

Bushing Lubrication ----- Pressure Lubricated from Oil Pump;
Camshaft Drilled to Provide Pressure Lubrication to Valve Rocker Arm Assembly and
to Timing Gear Train.

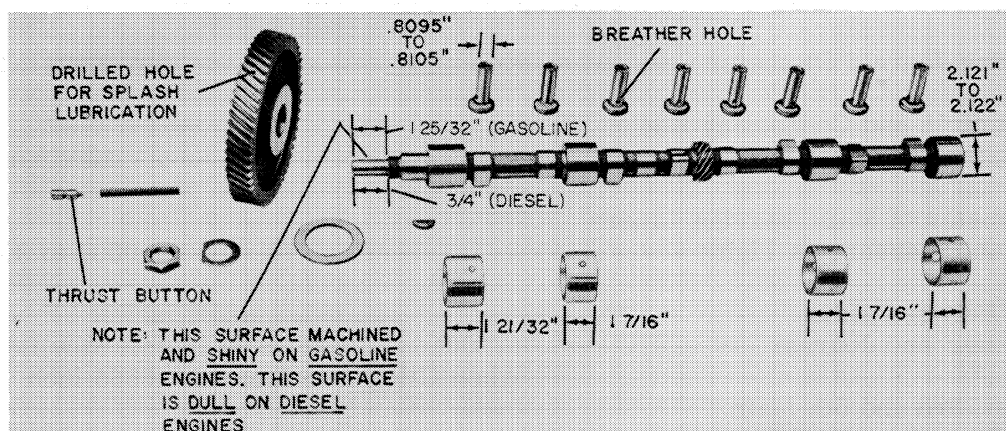


Figure 8. Camshaft, Camshaft Bushings and Valve Push Rod Lifters, A267 (6456A Camshaft Only)

Diameter of Camshaft at Each
Bearing Surface A267 (6456A Camshaft Only) ----- 2.121 to 2.122 Inches
A267 and A301 ----- 2.246 to 2.247 Inches

Inside Diameter of Each Bushing
(Measured when in Place in Block A267 (6456A Camshaft Only) --- 2.1234 to 2.1264 Inches
A267 and A301 ----- 2.2484 to 2.2514 Inches
No. 1 (Front) Bushing Length A267 and A301 ----- 1-21/32 Inches

No. 2 and 3 Bushing Length (A267 and A301) ----- 1-7/16 Inches
 No. 4 Bushing Length (A267 and A301 w/Welch Type Camshaft Plug) ----- 1-7/16 Inches
 No. 4 Bushing Length (A267 and A301 w/Cup Type Camshaft Plug) ----- 1-5/32 Inches
 Camshaft End Play ----- Automatically Taken Up By Spring Loaded
 Thrust Button in Front End of Camshaft, Bronze Washer
 Provided Between Drive Gear and Front Bearing.

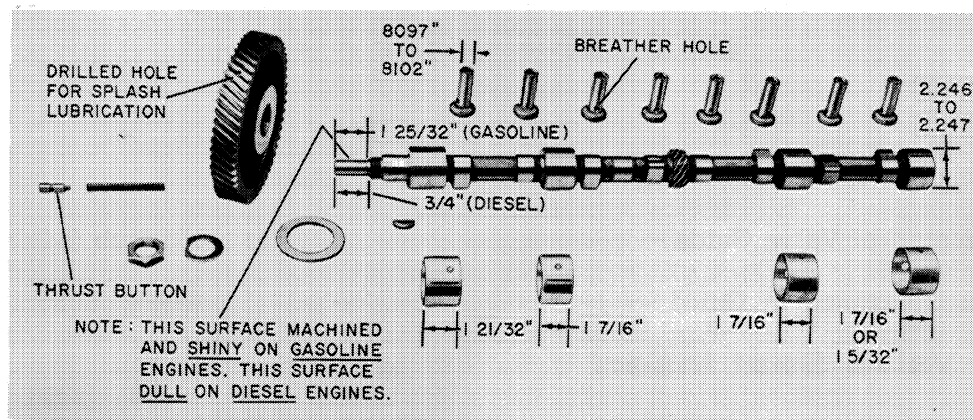


Figure C-9. Camshaft, Camshaft Bushings and Valve Push Rod Lifters A267 and A301

Camshaft Bronze Washer

Outside Diameter ----- 3.240 to 3.260 Inches
 Inside Diameter A267 (6456A Camshaft Only) ----- 2.125 to 2.135 Inches
 A267 and A301 ----- 2.250 to 2.260 Inches
 Thickness ----- .1225 to .1275 Inches

VALVE PUSH ROD LIFTERS

Type ----- Mushroom Type
 Outside Diameter of End that Projects into Block A267 (6456A Camshaft) -- .8095 to .8105 Inch
 A267 and A301 ----- .8097 to .8102 Inch
 Diameter of Bore in Block for Lifter ----- .8115 to .8130 Inch
 Oversize Lifter Available for Service ----- .010 Inch Oversize Lifter
 Bore in Block Must be Reamed to ----- .8215 to .8225 Inch
 .010 Inch Oversize Lifter.

Valves **VALVES**

Valve Tappet Clearance

A267 Intake and Exhaust (Eng. Block A11112 Only) ----- .012 Inch Engine Cold
 A267 and A301 Intake and Exhaust ----- .025 Inch Engine Cold

Exhaust Valves

Seat Angle ----- 44 Degrees
 Maximum Valve Race Runout ----- .002 Inch as Determined with
 a Dial Indicator.
 Diameter of Valve Stem ----- .4000 to .401 Inch. Install New Valve
 If There is More than .002 Inch Difference
 in Diameter at any Point on Stem.

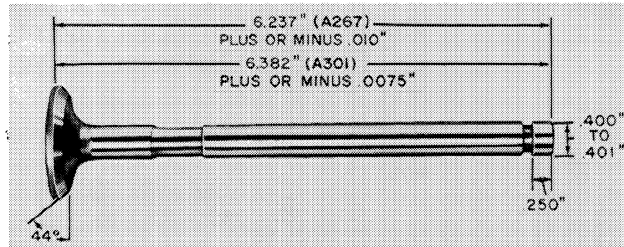


Figure C-10. Exhaust Valve

Inside Diameter of Valve Guide ----- .4045 to .4055 Inch (After Assembly)

Valve Stem Clearance in Guide ----- .0035 to .0055 Inch

Exhaust Valve Seat Insert

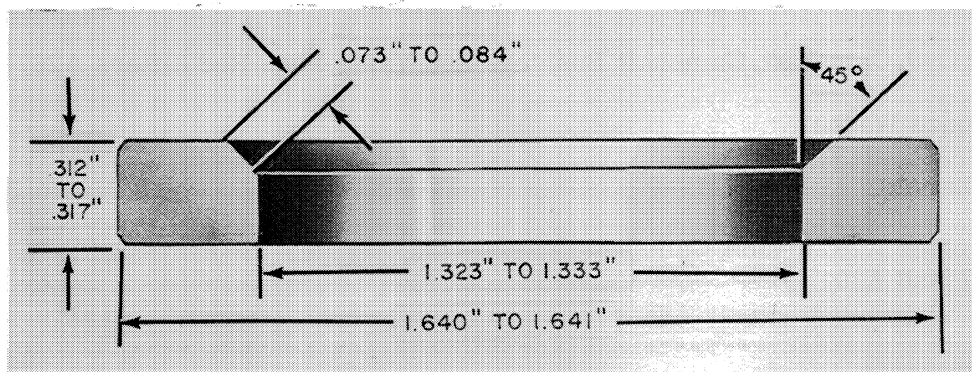


Figure C-11. Exhaust Valve Seat Insert, A267

Seat Angle ----- 45 Degrees

Seat Width ----- .073 to .084 Inch

Insert Height ----- .312 to .317 Inch

Outside Diameter of Insert A267 ----- 1.640 to 1.641 Inches

A301 ----- 1.722 to 1.723 Inches

Inside Diameter of Insert A267 ----- 1.323 to 1.333 Inches

A301 ----- 1.401 to 1.411 Inches

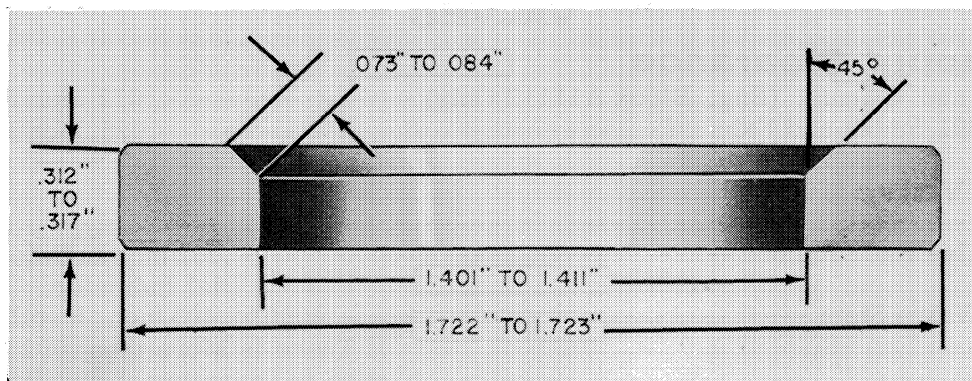


Figure C-12. Exhaust Valve Seat Insert, A301

Maximum Allowable Seat Runout ----- .003 Inch as Determined with a Dial Indicator

Intake Valves

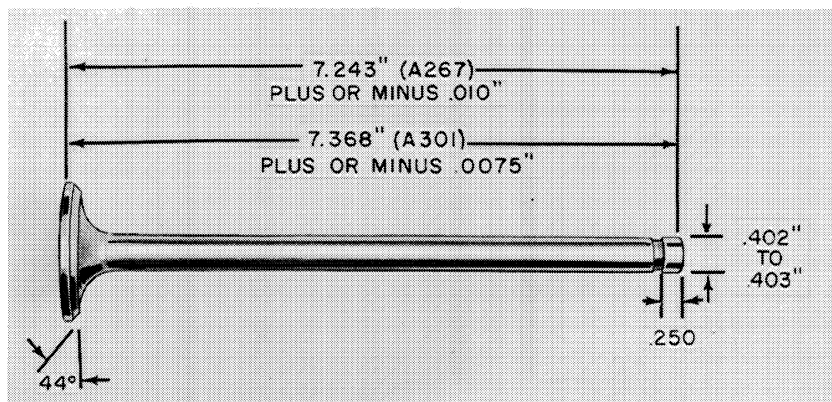


Figure C-13. Intake Valve

Seat Angle on Valve ----- 44 Degrees

Maximum Valve Face Runout ----- .002 Inch as Determined with a Dial Indicator

Diameter of Valve Stem ----- .402 to .403 Inch; Install New Valve if there is
More Than .002 Inch Difference in Diameter at any
Point on Stem.

Inside Diameter of Valve Guide ----- .4045 to .4055 Inch (After Assembly)

Stem Clearance in Guide ----- .0015 to .0035 Inch

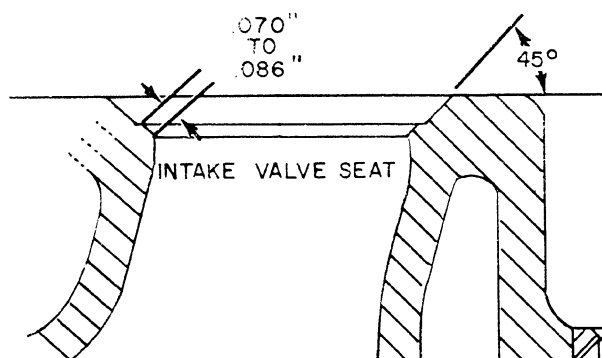


Figure C-14. Intake Valve Seat, A267 and A301

Intake Valve Seat

Seat Angle ----- 45 Degrees

Seat Width ----- .070 to .086 Inch

Exhaust Valve Guides

Length ----- 3-7/32 Inches

Outside Diameter ----- .7510 to .7515 Inch

Inside Diameter ----- .4045 to .4055 Inch (After Assembly)

Valve Stem Clearance in Guide ----- .0035 to .0055 Inch

Distance Above Head Guide Must Protrude ----- 1-1/16 Inches, Press Fit



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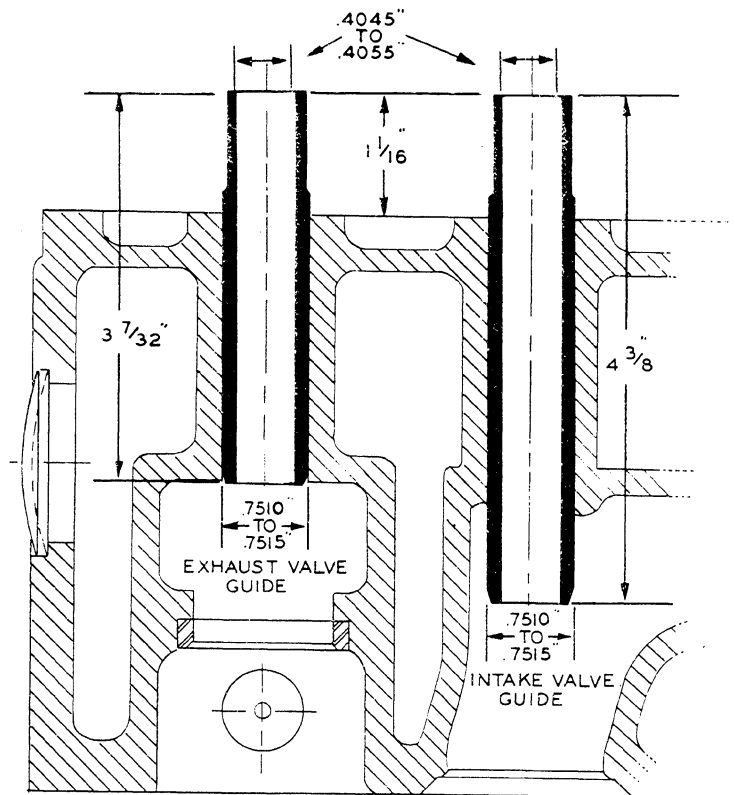


Figure C-15. Intake and Exhaust Valve Guides

Intake Valve Guides

Length	-----	4-3/8 Inches
Outside Diameter	-----	.7510 to .7515 Inch
Inside Diameter	-----	.4045 to .4055 Inch (After Assembly)
Valve Stem Clearance in Guide	-----	.0015 to .0035 Inch
Distance Above Head Guide Must Protrude	-----	1-1/16 Inches, Press Fit

VALVE SPRINGS

Free Length A267	-----	Approximately 2.590 Inches
A301	-----	Approximately 2.438 Inches

Spring Pressure at Compressed Height of 1-1/2
Inches (Valve Open) A267 (Eng.Block A11112 Only) ----- 99 Pounds; Install New Spring If
Pressure is Less than 89 Pounds.

Spring Pressure at Compressed Height
of 1-17/32 Inches (Valve Open) A267 and A301----- 95 Pounds; Install New Spring If
Pressure is Less than 87 Pounds.

Spring Pressure at Compressed Height of 1-15/16
Inches (Valve Closed) A267 (Eng.Block A11112 Only) ---- 49 Pounds; Install New Spring If
Pressure is Less than 44 Pounds.

Spring Pressure at Compressed Height
of 1-15/16 Inches (Valve Closed) A267 and A301 ----- 45 Pounds; Install New Spring If
Pressure is Less than 41 Pounds.

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