AJS & Matchless Technical Data

(Bernal Osborne's book "Modern Motorcycle Maintenance", first published in 1949)

An excellent book and very technical. The information would apply to all the twins as they didn't change much and all the long stroke singles from 1949 until they were phased out by the short stroke singles and the Norton engines - far as I can tell.

Models: 347c.c. 16M A.J.S. and G3L Matchless.

Tappet Clearance (cold): Inlet, nil. Exhaust, nil.
Valve Timing: Inlet opens before T.D.C. at 32 degrees. Inlet closed after B.D.C. at 63 degrees. Exhaust opens before B.D.C. at 65 degrees. Exhaust closes after T.D.C. at 30 degrees.
Re-time to camwheel marks.
Tappet Clearances for Valve Setting: Inlet, .016". Exhaust, .016".
Ignition Advance: ½" B.T.D.C.
Valve Guides Protrude from Cylinder Head: Inlet, ½". Exhaust, 9/16"
Cylinder Bore in Inches: 2.7187 +/- .0005"
Rebore to next plus size when bore wear exceeds .008"
Piston Clearances: Top Land, .031". Top Skirt, .0015". Bottom Skirt, .001".
Piston Rings: End gap, .006" to .008". Vertical play, .003".
Main Bearings: Driving Side: Ball bearing, 1-1/4" by 5/8" by 1".
Timing side: Plain bush, 7/8" + .00125" - .0015".
Mainshaft: End Float: .025".
Big End/Connecting Rod: Side Play: High, .013". Low, .009".
Big End Bearing: Steel Roller, ¼" by ¼" (30 rollers). High Limit, 1.20350". Low Limit, 1.20325"
Reamed Diameters: Connecting Rod: Little end (reamed), 7/8" + .0005". Big end, High limit, 2.0005". Low limit, 2.0000". Camshaft Bushes, ½" + .0005". Tappet Guides, 9/16" + .00075" - .0005". Rocker Bushes, 5/8" +.001" - .000".
Gearbox: Mainshaft Bearing: Clutch end, 1-9/32" by 62mm. Mainshaft bearing, K/S end, 12mm by 40mm by 17mm. Transmission bushings should have between .0015" and .002" running clearance. When worn to + .006", they can be considered to be worn past usable service and should be replaced.
Left Hand Threads: Engine small timing pinion nut.

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Models: 498cc 18 A.J.S. and G80 Matchless.

Tappet Clearance (cold): Inlet, nil. Exhaust, nil.

Valve Timing: Inlet opens before T.D.C. at 32 degrees. Inlet closes after B.D.C, at 63 degrees. Exhaust opens before B.D.C. at 65 degrees. Exhaust closes after T.D.C. at 30 degrees.

Ignition advance: ½" B.T.D.C.

Valve Guides Protrude from Cylinder Head: Inlet, ½". Exhaust, 9/16".

Cylinder Bore in Inches: 3.250" + .0005" Rebore to next plus size when wear exceeds .008".

Piston Clearances: Top land, .0355". Top skirt, .0015". Bottom skirt, .001"

Piston Rings: End gap, .006" to .008". Vertical play, .003".

Main Bearings: Driving side: Ball bearing, 2-1/4" by 5/8" by 1" bore. Timing side: Plain bush, 7/8" + .00125" - .0015".

Mainshaft: End float, .025".

Big End/Connecting Rod: Side play: high, .013", low .009".

Big End Bearing: Type: Steel roller, ¼" by ¼" dia. (30 rollers). High limit, 1.20350". Low limit, 1.20325".

Reamed Diameters: Connecting rod: little end (reamed), 7/8" + .0005" - .00025". Big end (lapped): High limit, 2.0005", low limit 2.0000". Camshaft bushes, ½" +.0005". Tappet guides, 9/16" + .0075" - .00050". Rocker bushes, 5/8" + .001" - .000".

Gearbox: Mainshaft bearing: clutch end, 1-9/32" by 62mm by 16mm. Mainshaft bearing: K/S end, 12mm by 40mm by 17mm. Transmission bushings should have between .0015" and .002" running clearance. When worn to + .006", they can be considered to be worn past usable service and should be replaced.

Left Hand Threads: Engine small timing pinion nut.

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Models: 498cc A.J.S. 49/20Ttwin and Matchless 49/G9 Twin.

Tappet Clearance (cold): Inlet, nil. (one year later, it is .006")
Exhaust, nil. (ditto. With unleaded fuel, I would go with .006" for both).
Ignition Advance: 3/8" B.T.D.C.
Valve Guides Protrude from Cylinder Head: Inlet, 11/16". Exhaust, 11/16".
Cylinder Bore in Inches: 2.598" +- .00-5"
Rebore to next oversize when wear exceeds .008".
Piston Clearances: Top land, .015". Top skirt, .015". Bottom Skirt, to size.
Piston Rings: End gap, .015". Vertical play, .003"
Main Bearings: Driving side: Roller, 3" by 1-3/8" by 11/16".
Timing side: As above.
Mainshaft: End float: High, .010". Low, .004".
Big End/Connecting Rod: Side play: high, .032". Low, .026".
Big End Bearings: Type: 1-5/8" diameter, plain, bi-metal (shell type).
Reamed Diameters: Connecting Rod: Little end (reamed), ¾" + .00050" - .00025". Big end: High, 1.62625". Low, 1.62575". Camshaft bushes, 13/16" +.001" - .000". Idler wheels, .623". Rocker bushes, ½". Cam followers, 3/8" + .001" - .002".
Gearbox: Mainshaft bearing: Clutch end, 1-9/32" by 62mm by 16mm. Mainshaft bearing: K/S end, 12mm by 40mm by 17mm. Transmission bushings should have between .0015" and .002" running clearance. When worn to + .006", they can be considered to be worn past usable service and should be replaced.
Left Hand Threads: Camshaft nuts.

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Models: A.J.S. 7R, 348cc (racing):

Tappet Clearance (cold): Inlet, .005". Exhaust, .014".
Valve Timing: Inlet opens before T.D.C. at 62 degrees. Inlet closed after B.D.C. at 64 degrees. Exhaust opens before B.D.C. at 63 degrees. Exhaust closes after T.D.C at 40 degrees.
Tappet Clearances for Valve Setting: Inlet, .005". Exhaust, .014".
Ignition Advance: 40 degrees B.T.D.C.
Valve Guides Protrude from Cylinder Head: Inlet, 13/32". Exhaust, 7/16"
Cylinder Bore in Inches: High, 2.914". Low, 2.913".
Rebore to next oversize when bore exceeds .008" wear.
Piston Clearances: Top land, .024". Top skirt, .010". Bottom skirt, .009".
Piston Rings: End gap, .015". Vertical play, .003".
Main Bearings: Driving side: Ball, 2-1/2" by 1" by ¾". Timing side: Roller cage, 1-7/8" by 1-3/8" by 1-7/16".
Mainshaft: End float: high, .026". Low, .014".
Big End (connecting rod): Side play: High, .013". Low, .009".
Big End Bearings: Type: Steel roller, 5/8" by ¼" dia. (14 rollers). Dimensions: High, 1.5150". Low, 1.5145".
Reamed Diameters: Connecting rod: Little end (reamed), high, .8755". Low, .87425". Big end (lapped): High, 2.01600". Low, 2.01575". Camshaft bushes: Ball bearing, 1-9/16" by 5/8" by 7/16". Idler wheels: Ball bearing, 1-5/16" by ½" by 3/8". Rocker bushes: 9/16" + .00075" - .0005".
Gearbox: Driving gear bearing, 1-9/32" by 62mm by 16mm. Mainshaft bearing, 17mm by 40mm by 12mm. Driving gear bush, .8465" + .001" diameter. Layshaft bushes, .6125" + .001" diameter. Second gear layshaft and third gear mainshaft bushes, .8465" + .001" diameter. Cam spindle and foot-change spindle bushes (inner), .375" + .001" diameter. Foot-change spindle bush (outer), .812" + .001" diameter.
Left hand threads: Crankshaft pinion nut.

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