workshop manual for 6.354, T6.354, 6.3542 and 6.372 diesel engines

Perkins Engines Limited

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CONTENTS

Unified Threads and Engine No. Location

All threads used on the 6.354 engine, excepting for proprietary equipment, are Unified Series and American Pipe Series.

Unified threads are not interchangeable with B.S.F. threads and although B.S.W. have the same number of threads per inch as Unified Coarse, interchanging is not recommended, due to a difference in thread form.

The engine number is stamped on the side of the auxiliary drive housing. This number should be quoted when requesting information or ordering parts.

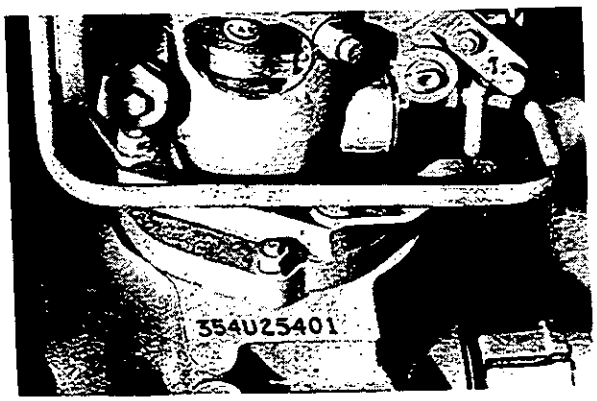
With early engines, the number consists of seven digits commencing with the figure "8".

Later engines had a number consisting of numbers and letters, e.g., 354U25401.

With current engines, the number consists of fifteen letters and numbers and a typical number is TB20102U510123D.

In all cases the engine number should be quoted **in full.**

Throughout this manual where it is considered necessary to use abbreviations, they are in accordance with those recommended by the British Standards Institute.



Engine Number Location

SAFETY PRECAUTIONS

THESE SAFETY PRECAUTIONS ARE IMPORTANT. Refer also to the local and government. regulations applicable in your jurisdiction.

Do not use these engines in marine applications.

Do not modify the engine.

Do not smoke when refuelling.

Always remove spilt fuel and soaked clothing to a safe place.

Do not refuel whilst the engine is running (unless absolutely necessary).

Never clean, lubricate or adjust the engine whilst it is running (unless qualified to do so, in which case, extreme care should be taken to avoid injury).

Do not attempt any adjustments you do not understand.

Ensure the engine is positioned so as to prevent a build-up of toxic emissions.

Warn persons in the area to keep well clear during engine and equipment or vehicle operation.

Do not wear loose clothing or allow long hair near moving machinery.

Keep well clear of rotating parts or machinery in operation. Note that fans are not clearly visible whilst the engine is running.

Do not run the engine with any safety guards removed.

Do not remove the radiator cap whilst the engine is hot and coolant is under pressure as scalding can result.

On no account should sea water or any other electrolytic or corrosive medium be used in the cooling system.

Keep sparks or flames away from batteries as the gases from the electrolyte (especially whilst the battery is under charge) are highly inflammable. This acid is also dangerous to the skin especially the eyes.

Always disconnect the battery terminals before repairing or interfering with the electrical system.

Only one person should be in control of the engine.

Always operate the engine from the control panel or operators seat.

If your skin comes into contact with high pressure fuel, seek medical attention immediately.

Diesel fuel can cause skin infections to some people. Use protective gloves or hand cream.

Do not move mobile equipment without first ensuring the brakes are in good working order.

Ensure that the transmission drive control is in "Out of Drive" position before starting the engine.

Fit in genuine Perkins Parts.

SAFETY IS SENSE. USE IT

Foreword

This Workshop Manual has been compiled for use in conjunction with normal workshop practice. Mention of certain accepted practices, therefore, has been purposely omitted in order to avoid repetition.

Throughout this manual, whenever "left" or "right" hand side of the engine is referred to, it is that side of the engine when viewed from the flywheel end.

Reference to renewing joints and cleaning off joint faces, has to a great extent been omitted from the text, it being understood that this will be carried out where applicable.

Similarly, it is understood that in reassembly and inspection, all parts are to be thoroughly cleaned, and where present, burrs and scale are to be removed.

It follows that any open ports of high precision components e.g. fuel injection equipment, exposed by dismantling, will be blanked off until reassembled, to prevent the ingress of foreign matter.

When fitting setscrews or studs into holes which are tapped through into the interior of the engine, a suitable sealant should be used. Some fasteners are supplied as spares with a coloured pre-treated sealant. The threads do not require sealant for first use, but must be cleaned and sealed if used again.

Users of Turbocharged engines should read the contents of Section "P" BEFORE STARTING their engine. Particular reference should be made to Sections 5 and 6.

Engine Designation

Different types of 6.354 Engines are available, i.e., Turbocharged and Normally Aspirated. Turbocharged engines have the letter "T" prefixed to the engine designation, i.e. T6.354, and Normally Aspirated engines are known as 6.354 engines.

Vertical and Horizontal engines are also available, Horizontal engines have the letter "H" prefixed to the engine designation, e.g., H6.354.

Extra heavy duty engines are designated 6.3542.

Engines of increased capacity (due to a larger cylinder bore diameter are designated 6.372.

Engines built for Massey Ferguson applications are designated AT6.354, A6.3541, A6.354 and A6.372. The appropriate engine designation is given where peculiar information relates to Massey Ferguson engines, otherwise the information is the same as listed under standard engine types.

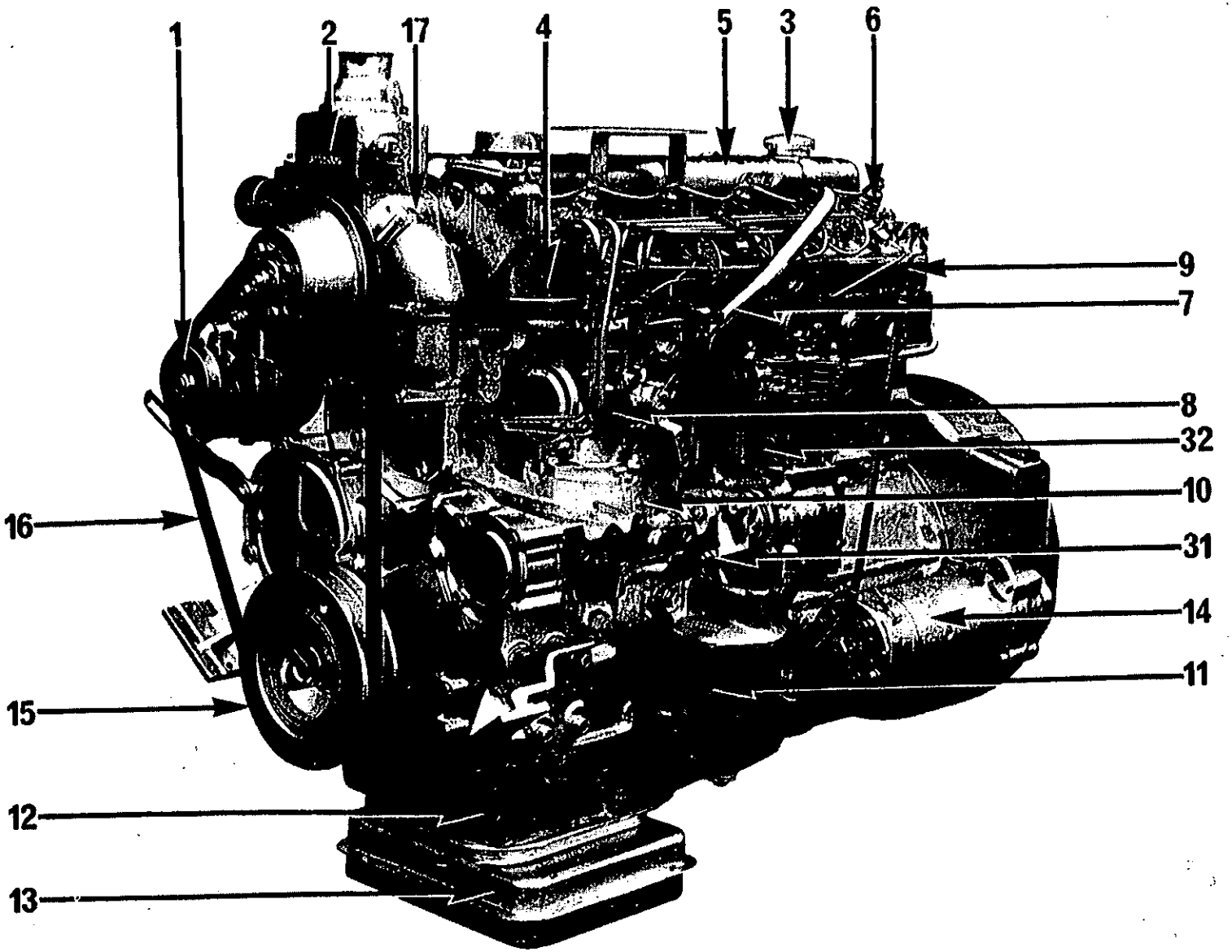
All references to 6.354 engines in this Workshop Manual may be taken to refer to all types unless otherwise stated.

SECTION A
Engine Photographs

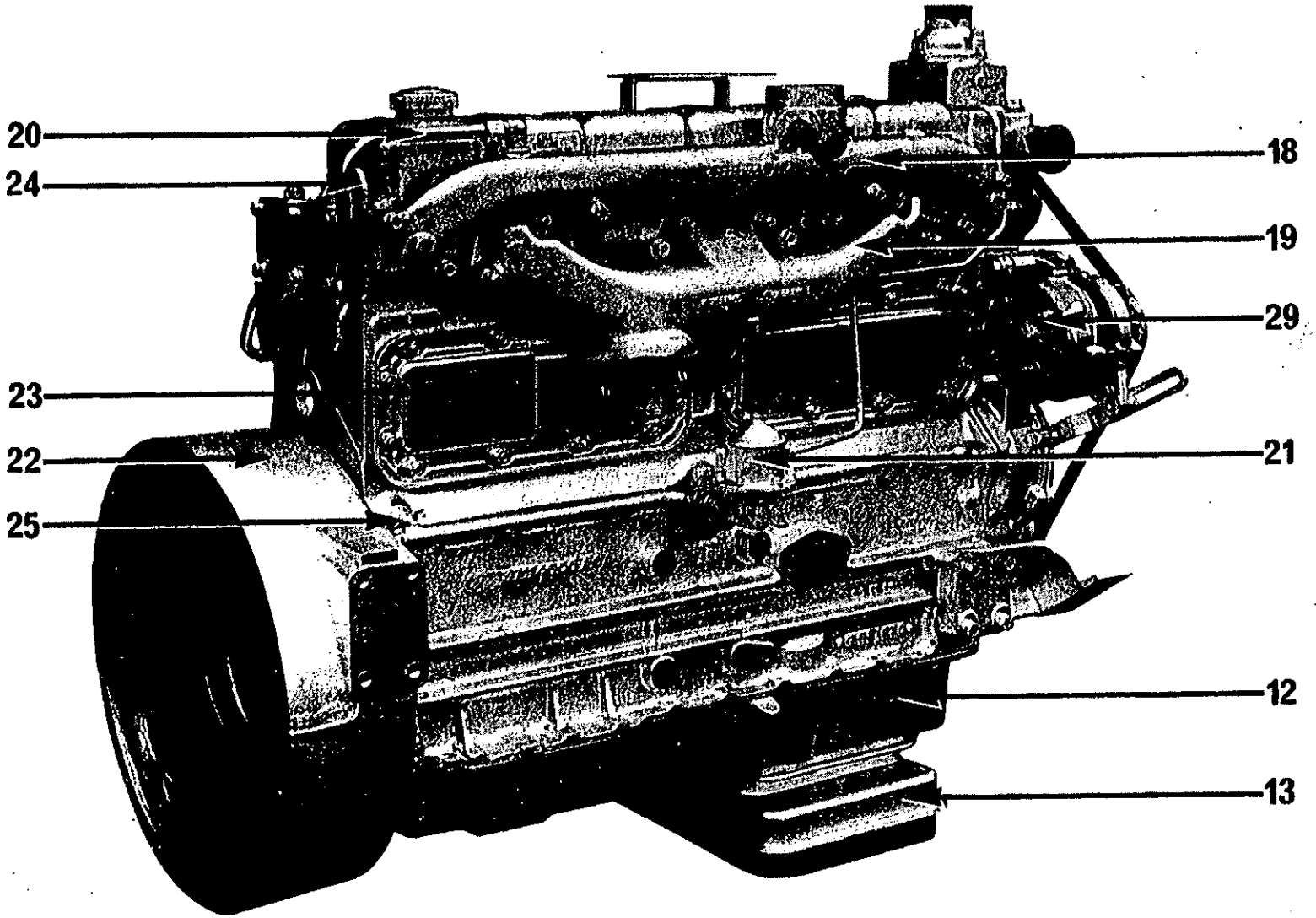
Perkins Engines are built to individual requirements to suit the applications for which they are intended and the following engine views do not necessarily typify any particular specification.

Index to Engine Photographs

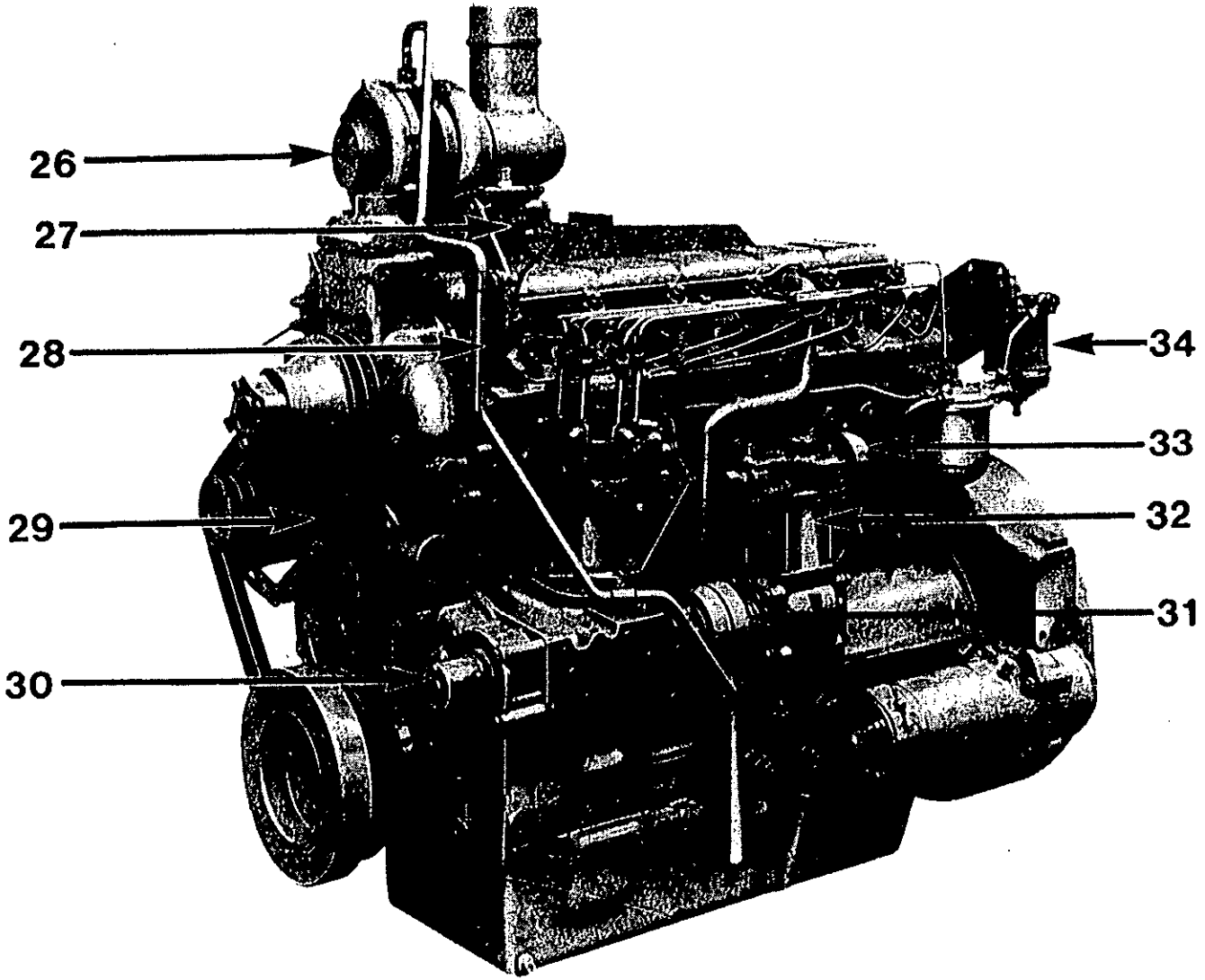
1. Alternator Pulley
2. Water Pump Outlet (incorporating thermostat).
3. Lubricating Oil Filler.
4. Fuel Oil Filter.
5. Cylinder Head Cover.
6. Atomiser.
7. Breather Pipe.
8. Fuel Injection Pump.
9. Dipstick.
10. Engine Number Location.
11. Lubricating Oil Filter.
12. Sump.
13. Sump Well.
14. Starter Motor.
15. Vibration Damper/Crankshaft Pulley.
16. Fan Belt.
17. Water Pump.
18. Induction Manifold.
19. Exhaust Manifold.
20. Air Feed Pipe to Compressor.
21. Fuel Lift Pump.
22. Flywheel Housing.
23. Push Rod Inspection Cover.
24. Rear Lifting Bracket.
25. Cylinder Block Drain Tap.
26. Turbocharger.
27. Thermostart Reservoir.
28. Lubricating Oil Feed Pipe to Turbocharger.
29. Alternator.
30. Hour Meter.
31. Compressor Coupling.
32. Compressor.
33. Compressor Breather.
34. Primary Fuel Oil Filter incorporating a water trap.



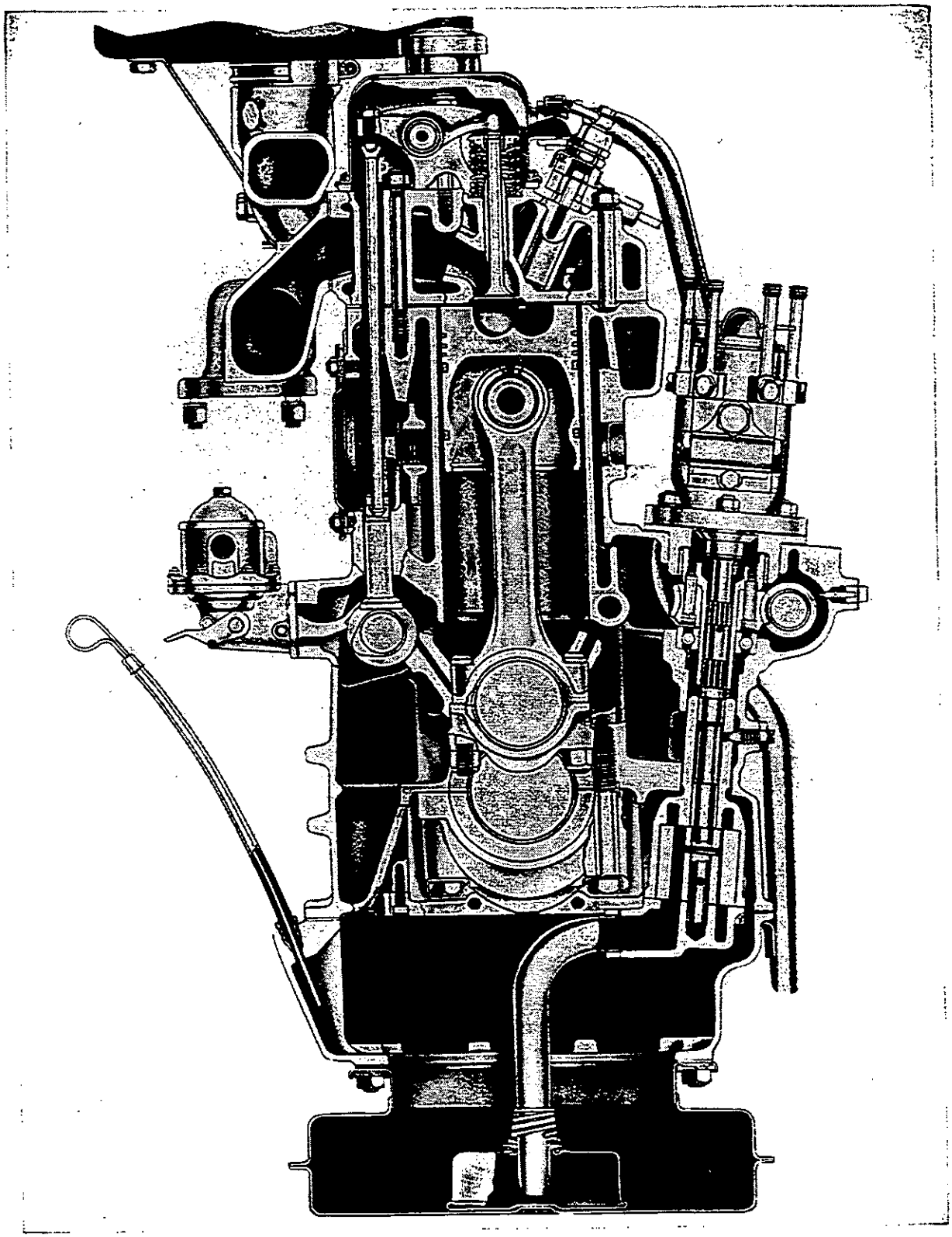
Near-side View of the 6.354 Engine.



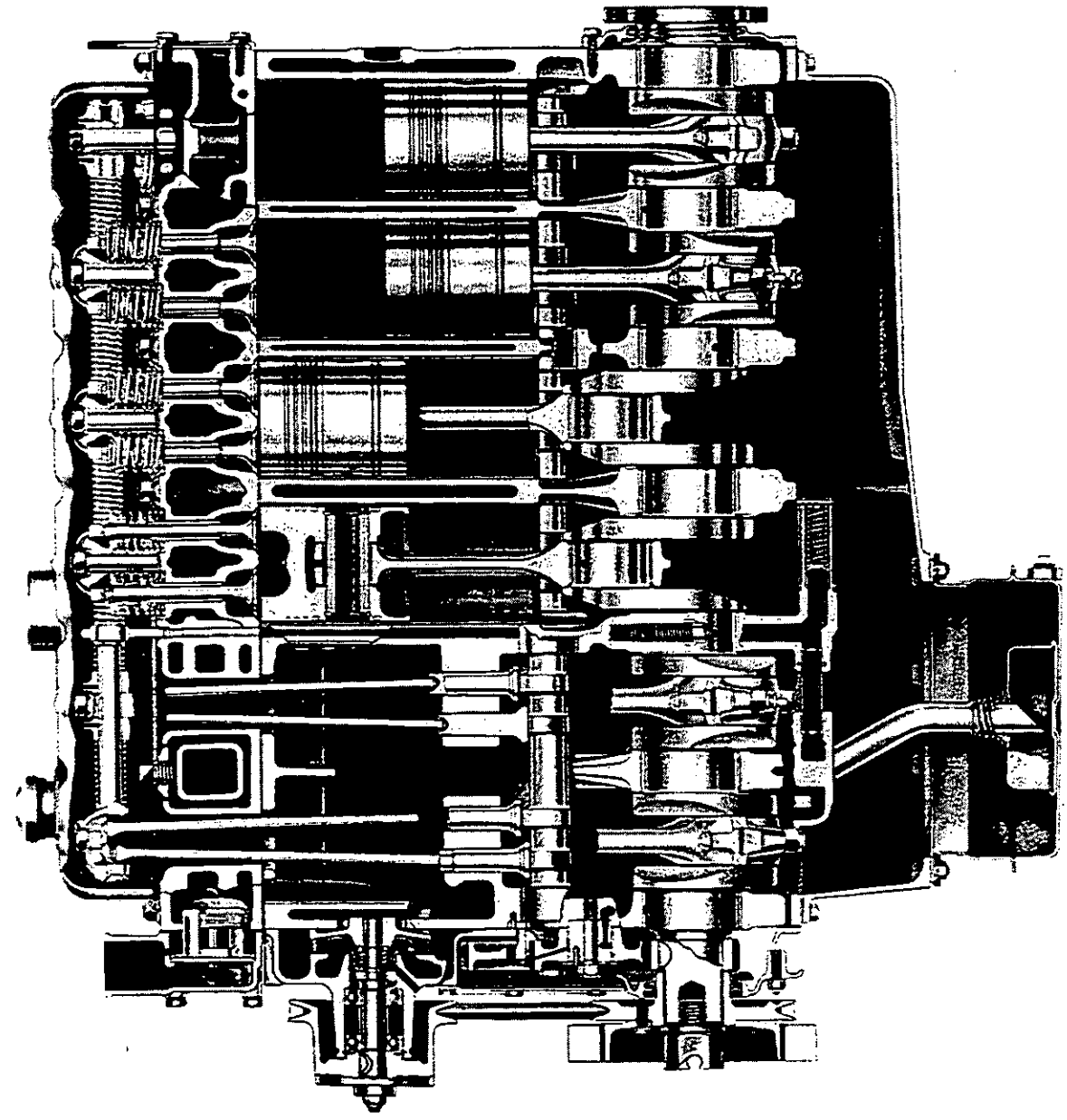
Off-side View of the 6.354 Engine.



Near-side View of a Typical Industrial Turbocharged 6.354 Engine



Cross Sectional View — 6.354 Engine.



Longitudinal Sectional View — 6.354 Engine.

SECTION B
Technical Data

Bore (6.372)	3.975 in (100 mm)*
Bore (6.3542, T6.354 and 6.354)	3.875 in (98,4 mm)*
Stroke	5 in (127 mm)
No. of Cylinders	Six
Cubic Capacity (6.372)	372 in³ (6,1 litres)
Cubic Capacity (6.3542, T6.354 and 6.354) ...	354 in³ (5,8 litres)
Compression Ratio	16 : 1
Firing Order	1,5,3,6,2,4,.
Combustion System	Direct Injection
Valve Clearance (cold)	0.012 in (0,30 mm)

*Nominal—for actual bore size, see pages B.3 and B.4.

DETAILS OF RATINGS

6.372 Engines

Industrial and Agricultural	121 bhp (90 kw) at 2,500 rev/min 292 lbf ft (40,4 kgf m)

6.3542, T6.354 and 6.354 Engines

Vehicle	120 bhp (89 kW) at 2,800 rev/min
(alternative rating)	112 bhp (85 kW) at 2,800 rev/min
Maximum Torque	260 lbf ft (36 kgf m)
Agricultural	104 bhp (78 kW) at 2,400 rev/min
Maximum Torque	266 lbf ft (36,8 kgf m)
*Industrial (Turbocharged)	117 bhp (87 kW) at 2250 rev/min
Maximum Torque	305 lbf ft (42,4 kgf m)
Industrial (Normally Aspirated — Mech. Gov.) ...	90 bhp (67 kW) at 2,250 rev/min
Maximum Torque	238 lbf ft (32,9 kgf m)
†Industrial (Normally Aspirated—Hyd. Gov.) ...	112 bhp (85 kW) at 2,800 rev/min
Maximum Torque	260 lbf ft (36 kgf m)

*Continuous Rating. †Intermittent Rating.

Note : All the above ratings are maximum and can vary according to application. For details of individual ratings, apply to your nearest Perkins Distributor.

Engine Weights

Basic Weight—Minus Flywheel or Backplate

(a) Vehicle type with exhauster	836 lb (380 kg)
(b) Agricultural type and Industrial with basic alloy oil sump.	825 lb (375 kg)

Typical Installed Weight—Basic plus flywheel, housing, starter motor, air cleaner, fan and filters.

(a) Vehicle type	1020 lb (464 kg)
(b) Agricultural and Industrial with alloy sump and medium weight flywheel	1040 lb (472 kg)

Recommended Torque Tensions

The following torque figures will apply with the components lightly oiled before assembly.

Component	Screw Size U.N.F.	lbf ft	kgf m	Nm
Cylinder Head Nuts (and/or Setscrews)	$\frac{1}{2}$	100	13,8	136
Cylinder Head Nuts	$\frac{7}{16}$ in	60	8,3	81
Big End Nuts (Cadmium Plated) see Page F.5 ...	$\frac{1}{2}$ in	75	10,4	102
Big End Nuts (Phosphated) see Page F.5	$\frac{1}{2}$ in	95	13,1	129
Filter Bowl Retaining Setscrew		10	1,38	13,6
Main Bearing Setscrew (see Page H.1)	$\frac{5}{8}$	150	20,7	203
Main Bearing Setscrew (see Page H.1)	$\frac{5}{8}$	180	24,9	244
Idler Gear Hub Nuts (early)	$\frac{7}{16}$ in	50	6,9	68
Idler Gear Hub Nuts (current)	$\frac{1}{2}$ in	65	9,0	88
Idler Gear Hub Nuts (heavy duty)	$\frac{3}{8}$ in	24	3,3	32
Sump to Cylinder Block Setscrews	$\frac{5}{16}$ in	15	2,1	20
Flywheel Setscrews	$\frac{1}{2}$ in	80	11,1	108
Camshaft Gear Retaining Setscrew	$\frac{1}{2}$ in	50	6,9	68
Crankshaft Pulley Setscrew (with $\frac{3}{8}$ in washer) ...	$\frac{7}{8}$ in	300	41,5	406
Crankshaft Pulley Setscrew (with $\frac{1}{4}$ in washer) ...	$\frac{7}{8}$ in	250	34,5	339
Crankshaft Damper Setscrews	$\frac{5}{16}$ in	15	2,1	20
Atomiser Securing Nuts	$\frac{5}{16}$ in	12	1,7	16
Dynamo Pulley Nut	$\frac{7}{16}$ in	20	2,7	27
Dynamo Pulley Nut	$\frac{5}{8}$ in	25	3,5	34
Alternator Pulley Nut	$\frac{7}{16}$ in	30	4,1	41
Alternator Pulley Nut	$\frac{9}{16}$ in	30	4,1	41
Alternator Pulley Nut	$\frac{5}{8}$ in	42	5,8	57
Induction Manifold Setscrews (with corrugated joints) (See Page E.9)		24	3,3	32
High Pressure Fuel Pipe Nuts		15	2,1	20
Thermostart Insulation Adaptor	$1\frac{1}{4}$ in	10	1,38	13,6
Thermostart Unit	$\frac{7}{8}$	10	1,38	13,6

Note : Connecting rod nuts shold be replaced whenever the big ends are disturbed.

$\frac{1}{2}$ in cylinder head nuts were fitted as from Engine No. 8060000.

Rocker Cover Joint (Black Plastic VITON) ... Torque on cover fixings must not exceed 8 lbf ft (1,1 kgf m) — 11 Nm.

De-Rating For Altitude

Where engines operate at high altitudes they should be de-rated.
The following table is given as a general guide, to be applied on a percentage basis, where specific figures for a particular engine rating are not available.

Altitude	Maximum fuel delivery de-rating*
0/ 2000 ft (600 metre)	No change
2000/ 4000 ft (1200 metre)	6%
4000/ 6000 ft (1800 metre)	12%
6000/ 8000 ft (2400 metre)	18%
8000/10000 ft (3000 metre)	24%
10000/12000 ft (3600 metre)	30%

*Measured at setting speed given on pump setting code.

It should be noted that the above information only applies to **normally aspirated engines.**

MANUFACTURING DATA AND DIMENSIONS

The data regarding clearances and tolerances is given for personnel engaged upon major overhauls. Further information can be obtained on request from your nearest Perkins Distributor.

Cylinder Block

Height between Top Face and C/L of Crankshaft ...	13.869/13.873 in (352,27/352,37 mm)
Parent Bore Diameter for Cast Iron Flangless Cylinder Liner	4.0615/4.0625 in (103,16/103,19 mm)
Parent Bore Diameter for Cast Iron Flanged Cylinder Liner 6.3542, T6.354 and 6.354	4.0625/4.0635 in (103,19/103,22 mm)
Parent Bore Diameter for Flanged Cast Iron Cylinder Liner — 6.372	4.1025/4.1035 in (104,20/104,23 mm)
Parent Bore Diameter for Cylinder Liner (Chrome) Thin Wall	3.9625/3.9635 in (100,65/100,67 mm)
Parent Bore Diameter for Cylinder Liner (Chrome) Thick Wall	4.0625/4.0635 in (103,19/103,21 mm)
Main Bearing Parent Bore Diameter	3.166/3.167 in (80,42/80,44 mm)
Camshaft Parent Bore Diameter No. 1	2.000/2.001 in (50,8/50,83 mm)
Camshaft Parent Bore Diameter No. 2	1.990/1.992 in (50,55/50,6 mm)
Camshaft Parent Bore Diameter No. 3	1.980/1.982 in (50,29/50,34 mm)
Camshaft Parent Bore Diameter No. 4	1.970/1.972 in (50,04/50,09 mm)
Recess Dia. for Cylinder Liner Flange — 6.3542, T6.354 and 6.354	4.205/4.210 in (106,73/106,93 mm)
Recess Diameter for Cylinder Liner Flange — 6.372	4.245/4.250 in (107,82/107,95 mm)
Recess Depth for Cylinder Liner Flange	0.150/0.154 in (3,81/3,91 mm)

Cylinder Liners (Cast Iron — Flangeless) — 6.3542,T6.354 and 6.354

Type	Dry—Interference Fit
Interference Fit of Liner	0.003/0.005 in (0,076/0,127 mm)
Inside Diameter of Liner after Finish Honing ...	3.877/3.878 in (98,48/98,50 mm)
Depth of Liner in relationship to Cylinder Block Top Face (Early Type) — T6.354 and 6.354 ...	0.005/0.013 in (0,13/0,33 mm)
Height of Liner in relationship to Cylinder Block Top Face (Later Type)	0.028/0.035 in (0,71/0,89 mm) Above
Minimum permissible height in service	0.020 in (0,51 mm)
Maximum Oversize (Rebore)	+0.030 in (+0,76 mm)
Overall Length of Liner (Early Type)	8.963/8.973 in (227,7/227,9 mm)
Overall Length of Liner (Later Type)	9.005/9.015 in (228,7/229 mm)

Cylinder Liners (Cast Iron — Flangeless) — 6.372

Type	Dry — Interference Fit
Interference Fit of Liner	0.003/0.005 in (0,08/0,13 mm)
Inside Diameter of Liner after Finish Honing ...	3,9785/3,9795 in (101,05/101,08 mm)
Height of Liner in relationship to Cylinder Block Top Face	0.028/0.035 in (0,71/0,89 mm) Above
Reboring	Not Permissible

Cylinder Liners (Cast Iron-Flanged)

Type	Dry—Interference Fit (Production)—Transition Fit (Service)
Interference Fit of Liner (Production)	0.002/0.004 in (0,05/0,10 mm)
Inside Diameter of Production Liner after Finish Honing — 6.3542, T6.354 and 6.354 ...	3.877/3.878 in (98,48/98,50 mm)
Inside Diameter of Production Liner after Finish Honing — 6.372	3.9785/3.9795 in (101,05/101,07 mm)

Fit of Liner (Service)	—0.001/+0.001 in (—0,025/+0,025 mm)
Inside Diameter of Service Liner after Fitting — 6.3542, T6.354 and 6.354	3.877/3.8795 in (98,48/98,54 mm)
Inside Diameter of Service Liner after Fitting — 6.372	3.980/3.981 in (101,09/101,12 mm)
Flange Thickness (Early)	0.144/0.146 in (3,66/3,71 mm)
Flange Thickness (Current)	0.150/0.152 in (3,81/3,86 mm)
Height of Liner above Cylinder Block Top Face ...	0.028/0.035 in (0,71/0,89 mm)
Depth of Liner Flange below Top Face of Cylinder Block (Early)	0.004/0.010 in (0,10/0,25 mm)
Relationship of Liner Flange to Top Face of Cylinder Block (Current)	0.002 in (0,05 mm) ABOVE to 0.004 in (0,10 mm) BELOW
Overall Length of Liner	8.941/8.954 in (227,1/227,43 mm)

Cylinder Liners (Chrome Plated)

Type	Dry—Transition Fit
Inside Diameter after Fitting—Thin Wall	3.8765/3.879 in (98,46/98,53 mm)
Depth of Liner below Cylinder Block Top Face (Early Type) Thin Wall	0.001/0.009 in (0,025/0,23 mm)
Depth of Liner below Cylinder Block Top Face (Later Type) Thin Wall	0.004/0.008 in (0,1/0,2 mm)
Flange Thickness (Early Type) Thin Wall ...	0.040/0.045 in (1,016/1,143 mm)
Flange Thickness (Later Type) Thin Wall ...	0.043/0.045 in (1,092/1,143 mm)
Overall Length of Liner (Both Types) Thin Wall ...	8.92125/8.89125 in (226,6/225,84 mm)
Inside Diameter after Fitting—Thick Wall ...	3.877/3.8795 in (98,48/98,54 mm)
Height of Liner above Cylinder Block Top Face ...	0.028/0.035 in (0,71/0,89 mm)
Depth of Liner Flange below Cylinder Block Top Face—Thick Wall	0.004/0.008 in (0,1/0,2 mm)
Flange Thickness—Thick Wall	0.144/0.146 in (3,66/3,71 mm)
Overall Length of Liner—Thick Wall	8.939/8.954 in (227,05/227,43 mm)

Pistons

Note : The piston heights quoted are production limits. Where service pre-topped pistons are used, then the piston heights can be lower than that quoted. Piston heights should never be above these limits. Where engines have to conform to the smoke density regulation B.S. AU 141a : 1971, then piston heights must conform to production limits. This is achieved by using untopped pistons and machining to suit.

6.3542 Engines

Type	Toroidal Cavity in Crown
Piston height in relation to Cylinder Block ...	0.0018/0.0103 in (0,05/0,26 mm) Above
Bore Diameter for Gudgeon Pin	1.37485/1.37505 in (34,92/34,93 mm)
Compression Ring Groove Width No. 1	0.1275/0.1285 in (3,24/3,27 mm)
Compression Ring Groove Width Nos. 2 and 3 ...	0.0957/0.0967 in (2,43/2,46 mm)
Scraper Ring Groove Width	0.2525/0.2535 in (6,41/6,44 mm)

6.372, T6.354 and 6.354 engines

Type	Toroidal Cavity in Crown
Piston Height in relation to Cylinder block (Turbocharged)	0.000/0.005 in (0,00/0,127 mm) Below
Piston Height in relation to Cylinder Block (Normally Asp.)	0.0018/0.0103 in (0,05/0,26 mm) Above
Bore Diameter for Gudgeon Pin (Turbocharged) ...	1.5001/1.5004 in (38,103/38,110 mm)
Bore Diameter for Gudgeon Pin (Normally Asp.) ...	1.37485/1.37505 in (34,92/34,93 mm)
Compression Ring Groove Width No. 1 (Turbocharged)	0.127/0.128 in (3,23/3,25 mm)
Compression Ring Groove Width Nos. 2 and 3 (Turbocharged)	0.0957/0.0967 in (2,43/2,46 mm)
Compression Ring Groove Width (Normally Asp.)	0.0957/0.0967 in (2,43/2,46 mm)
Scraper Ring Groove Width	0.2525/0.2535 in (6,41/6,44 mm)

Piston Rings

Ring gaps given are for when checking in an unworn portion of the cylinder bore.

Turbocharged Engines

Compression Ring Width—Top Ring	0.124/0.125 in (3,15/3,175 mm)
Compression Ring Width—2nd and 3rd Rings ...	0.0928/0.0938 in (2,36/2,38 mm)
Scraper Ring Width	0.2485/0.250 in (6,32/6,35 mm)
Top Ring Clearance in Groove	0.002/0.004 in (0,051/0,1 mm)
2nd and 3rd Ring Clearance in Groove	0.0019/0.0039 in (0,05/0,1 mm)
Scraper Ring Clearance in Groove	0.0025/0.005 in (0,06/0,13 mm)
Piston Ring Gap (chrome)	0.016/0.034 in (0,41/0,86 mm)
Piston Ring Gap (cast iron)	0.012/0.030 in (0,30/0,76 mm)

Normally Aspirated 6.372 and 6.354 Engines

Compression Ring Width	0.0928/0.0938 in (2,36/2,38 mm)
Scraper Ring Width	0.249/0.250 in (6,33/6,35 mm)
Compression Ring Clearance in Groove	0.0019/0.0039 in (0,05/0,1 mm)
Scraper Ring Clearance in Groove	0.0025/0.0045 in (0,06/0,11 mm)
Piston Ring Gap (chrome)	0.016/0.034 in (0,41/0,86 mm)
Piston Ring Gap (cast iron)	0.012/0.030 in (0,30/0,76 mm)
Scraper Ring Gap (6.372) — varies according to application	0.014/0.028 in (0,36/0,71 mm)

6.3542 Engines

Compression Ring Width—Top Ring	0.124/0.125 in (3,15/3.17 mm)
Compression Ring Width—2nd and 3rd Rings ...	0.0927/0.0937 in (2,36/2,38 mm)
Scraper Ring Width	0.249/0.250 in (6,33/6,35 mm)
Top Ring Clearance in Groove	0.0025/0.0045 in (0,06/0,11 mm)
2nd and 3rd Ring Clearance in Groove	0.002/0.004 in (0,05/0,10 mm)
Scraper Ring Clearance in Groove	0.0025/0.0045 in (0,06/0,11 mm)
Nos. 1, 2, 3 and 4 Ring Gap	0.016/0.034 in (0,41/0,86 mm)
No. 5 Ring Gap	0.012/0.030 in (0,30/0,76 mm)

Small End Bush

Type	Steel Backed, Lead Bronze Lined.
Outside Diameter (Normally Asp.)	1.535/1.536 in (38,99/39,01 mm)
Outside Diameter (Turbocharged)	1.660/1.661 in (42,16/42,19 mm)
Length	1.316/1.336 in (33,43/33,93 mm)
Inside Diameter before Reaming (Normally Asp.) ...	1.359/1.363 in (34,52/34,62 mm)
Inside Diameter before Reaming (Turbocharged) ...	1.489/1.493 in (37,82/37,92 mm)
Inside Diameter after Reaming (Normally Asp.) ...	1.3765/1.37575 in (34,96/34,94 mm)
Inside Diameter after Reaming (Turbocharged) ...	1.5015/1.50075 in (38,14/38,12 mm)
Clearance Between Small End Bush and Gudgeon Pin	0.0017/0.00075 in (0,038/0,024 mm)

Gudgeon Pin

Type	Fully Floating
Outside Diameter (Normally Asp.)	1.3748/1.375 in (34,92/34,93 mm)
Outside Diameter (Turbocharged)	1.4998/1.500 in (38,09/38,1 mm)
Length (Normally Asp.)	3.297/3.312 in (83,74/84,12 mm)
Length (Turbocharged)	3.250/3.2599 in (82,55/82,8 mm)
Fit in Piston Boss	Transition
Fit in Piston Boss (Turbocharged)	Clearance

Connecting Rod

Type	"H" Section
Cap Location to Connecting Rod	Serrations
Big End Parent Bore Diameter	2.646/2.6465 in (67,21/67,22 mm)
Small End Parent Bore Diameter (Normally Asp.) ...	1.53125/1.53225 in (38,9/38,92 mm)
Small End Parent Bore Diameter (Turbocharged) ...	1.65625/1.65725 in (42,07/42,09 mm)
Length from C/L of Big End to C/L of Small End	8.624/8.626 in (219,05/219,1 mm)
Connecting Rod Side Play	0.0095/0.0145 in (0,24/0,36 mm)

Connecting Rod Alignment

Large and small end bores must be square and parallel with each other within the limits of ±0.010 in (0,25 mm) measured 5 in (127 mm) each side of the axis of the rod on test mandrel as shown in Fig. B.1. With the small end bush fitted, the limit of ±0.010 in (0,25 mm) is reduced to ±0.0025 in (0,06 mm).

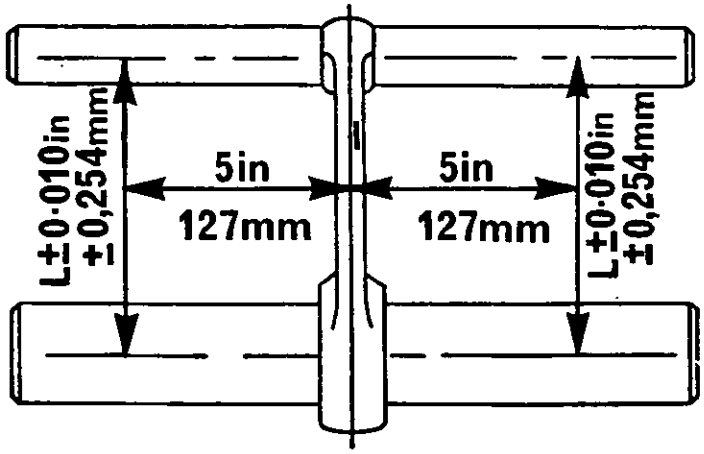


Fig. B.1.

Crankshaft

Overall Length	33.83375/33.85375 in (859,38/859,89 mm)
Main Journal Diameter	2.9984/2.9996 in (76,16/76,19 mm)
Main Journal Length—No. 1	1.454/1.484 in (36,91/37,69 mm)
Main Journal Length—Nos. 2, 3, 5, 6 and 7 ...	1.545/1.549 in (39,24/39,34 mm)
*Main Journal Length—No. 4	1.738/1.741 in (44,15/44,22 mm)
*Fillet Radius—Main Journals	0.145/0.156 in (3,68/3,96 mm)
Crankpin Diameter	2.4988/2.4998 in (63,47/63,49 mm)
*Crankpin Length	1.5885/1.5915 in (40,35/40,42 mm)
*Fillet Radius—Crankpins	0.145/0.156 in (3,68/3,96 mm)
Surface Finish—All pins and journals	16 micro-inches (0,4 microns) maximum
Main Journal and Crankpin—Regrind Undersizes ...	—0.010, 0.020 & 0.030 in (—0,25, 0,51 & 0,76 mm)
Oil Seal Helix Diameter (rope seal only)	3.124/3.125 in (79,35/79,38 mm)
Oil Seal Helix Width	0.050/0.080 in (1,27/2,03 mm)
Oil Seal Helix Depth	0.004/0.008 in (0,1/0,2 mm)
Flange Diameter	5.247/5.249 in (133,27/133,32 mm)
Flange Width (rope seal)	0.500 in (12,7 mm)
Flange Width (lip seal)...	1.200 in (30,48 mm)
Spigot Bearing Recess (Depth)	0.781 in (19,84 mm)
Spigot Bearing Recess (Bore)	1.849/1.850 in (46,96/47,0 mm)
Crankshaft End Float	0.002/0.015 in (0,05/0,38 mm)

*Fillet radius and surface finish must be maintained during crankshaft regrinding. Length of No. 4 main journal not to exceed 1.759 in (44,68 mm) after regrinding ; where necessary use oversize thrust washers to suit. Length of crankpins not to exceed 1.5965 in (40,55 mm) after regrinding.

Important Note: See remarks on Page H.2 concerning the regrinding of Nitrided and Tufftrided crankshafts.

Crankshaft Thrust Washers

Type	Steel Backed, Lead Bronze Faced
Position in Engine	Centre Main Bearing
Thrust Washer Thickness (Standard)	0.089/0.091 in (2,26/2,31 mm)
Thrust Washer Thickness (Oversize)	0.0965/0.0985 in (2,45/2,51 mm)
Thrust Washer Outside Diameter	4.088/4.098 in (103,84/104,09 mm)
Thrust Washer Inside Diameter	3.42/3.43 in (86,87/87,12 mm)

Main Bearings

Type	Pre-finished, Steel Backed, Aluminium Silicon Faced
Shell Width—Nos. 1, 2, 3, 5, 6 and 7	1.245/1.255 in (31,62/31,88 mm)
Shell Width—No. 4	1.435/1.445 in (36,45/36,7 mm)
Outside Diameter of Main Bearing	3.166/3.167 in (80,42/80,44 mm)
Inside Diameter of Main Bearing	3.0010/3.0026 in (76,23/76,27 mm)
Main Bearing Running Clearance	0.0014/0.0042 in (0,036/0,107 mm)
Shell Thickness	0.0822/0.0825 in (2,088/2,096 mm)

Connecting Rod Bearings

Type	Pre-finished, Steel Backed, Aluminium Silicon Faced
Shell Width	1.245/1.255 in (31,62/31,88 mm)
Outside Diameter of Con-Rod Bearing	2.646/2.6465 in (67,21/67,22 mm)
Inside Diameter of Con-Rod Bearing	2.5008/2.5019 in (63,52/63,55 mm)
Con-Rod Bearing Running Clearance	0.0010/0.0031 in (0,025/0,079 mm)
Shell Thickness	0.0723/0.0726 in (1,836/1,844 mm)

Camshaft

No. 1 Journal Length	1.148 in (29,16 mm)
No. 1 Journal Diameter	1.9965/1.9975 in (50,71/50,74 mm)
No. 1 Journal Running Clearance	0.0025/0.0045 in (0,064/0,11 mm)
No. 2 Journal Length	1.375 in (34,93 mm)
No. 2 Journal Diameter	1.9865/1.9875 in (50,46/50,48 mm)
No. 2 Journal Running Clearance	0.0025/0.0055 in (0,064/0,14 mm)
No. 3 Journal Length	1.375 in (34,93 mm)
No. 3 Journal Diameter	1.9765/1.9775 in (50,20/50,23 mm)
No. 3 Journal Running Clearance	0.0025/0.0055 in (0,064/0,14 mm)
No. 4 Journal Length	1.125 in (28,58 mm)
No. 4 Journal Diameter	1.9665/1.9675 in (49,95/49,97 mm)
No. 4 Journal Running Clearance	0.0025/0.0055 in (0,064/0,14 mm)
Cam Lift	0.3035 in (7,71 mm)
Oilways for Rocker Shaft Lubrication	No. 2 Journal
Width of Spigot for Thrust Washer	0.222/0.232 in (5,638/5,892 mm)
Camshaft End Float	0.004/0.016 in (0,1/0,41 mm)

Camshaft Thrust Washer

Type	360°
Thrust Washer Outside Diameter	2.872/2.874 in (72,95/73,0 mm)
Cylinder Block Recess Diameter for Thrust Washer	2.875/2.885 in (73,03/73,28 mm)
Clearance Fit of Washer in Recess	0.001/0.013 in (0,025/0,33 mm)
Thrust Washer Internal Diameter	1.75 in (44,45 mm)
Thrust Washer Thickness	0.216/0.218 in (5,49/5,54 mm)
Cylinder Block Recess Depth for Thrust Washer (Early Engines)	0.154/0.156 in (3,86/3,91 mm)
Cylinder Block Recess Depth for Thrust Washer (Later Engines)	0.215/0.218 in (5,46/5,54 mm)
Protrusion of Thrust Washer above Cylinder Block Front Face (Early Engines)	0.062/0.066 in (1,53/1,68 mm)
Protrusion of Thrust Washer above Cylinder Block Front Face (Later Engines)	0.000/0.005 in (0,00/0,13 mm)
Spares only	–0.002/+0.003 in (–0,05/+0,08 mm)

Cylinder Head

Cylinder Head Length	29.28125 in (743,74 mm)
Cylinder Head Depth	3.235/3.265 in (82,17/82,93 mm)
Skimming Allowance on Cylinder Head Face	0.012 in (0,30 mm)*
Leak Test Pressure	30 lbf/in² (2,11 kgf/cm²) — 207 kN/m²
Valve Seat Angle	45°
Valve Guide Bore in Cylinder Head	0.6247/0.6257 in (15,87/15,89 mm)

*Providing the nozzle protrusion does not exceed 0.144 in (3,66 mm) after skimming.
With earlier engines, nozzle protrusion should not exceed 0.224 in (5,69 mm) after skimming.

Valve Guides

Internal Diameter	0.3743/0.3764 in (9,51/9,56 mm)
Outside Diameter	0.6260/0.6264 in (15,90/15,91 mm)
Internal Diameter of Counterbore (Exhaust Valve Guide Only)	0.421/0.441 in (10,69/11,20 mm)
Depth of Counterbore (Exhaust Valve Guide Only)	0.40625 in (10,32 mm)
Interference Fit of Guide in Cylinder Head Bore	0.0011/0.0026 in (0,03/0,07 mm)
Overall Length of Guide (Inlet)	2.281 in (57,94 mm)
Overall Length of Guide (Exhaust)	2.406 in (61,11 mm)
Overall Protrusion above bottom face of Valve Spring Recess	0.594 in (15,08 mm)

Inlet Valves

Valve Stem Diameter	0.3725/0.3735 in (9,46/9,49 mm)
Clearance Fit of Valve in Guide	0.0008/0.0032 in (0,02/0,08 mm)
Valve Head Diameter	1.736/1.746 in (44,09/44,35 mm)
Valve Face Angle	45°
Valve Head depth below Cylinder Head Face—Production Limits	0.029/0.039 in (0,74/0,99 mm)
Overall Length	4.830/4.845 in (122,68/123,06 mm)
Sealing Arrangement	Rubber Deflector

Exhaust Valves

Valve Stem Diameter	0.372/0.373 in (9,45/9,47 mm)
Clearance Fit of Valve in Guide	0.0013/0.0037 in (0,03/0,09 mm)
Valve Head Diameter	1.438/1.442 in (36,54/36,64 mm)
Valve Face Angle	45°
Valve Head Depth below Cylinder Head Face— Production Limits	0.029/0.039 in (0,74/0,99 mm)
Overall Length	4.845/4.862 in (123,03/123,54 mm)

Inner Valve Springs

T6.354 and 6.354 Engines

Fitted Length	1.5625 in (39,7 mm)
Load at Fitted Length	15.4 lb ± 0.77 lb (7 kg ± 0,35 kg)
No. of Active Coils	9
No. of Damper Coils	2
Coiled	R.H.—Damper Coils to Cylinder Head

6.372 and 6.3542 Engines

Fitted Length	1.340 in (34,02 mm)
Load at Fitted Length	20.1/23.3 lb (9,1/10,5 kg)
No. of Active Coils	4.9
No. of Damper Coils	1
Coiled	R.H. — Damper coil to cylinder head

Outer Valve Springs

T6.354 and 6.354 Engines

Fitted Length	1.780 in (45,21 mm)
Load at Fitted Length	38/42 lb (17,24/19,05 kg)
No. of Active Coils	7.5
No. of Damper Coils	2
Coiled	L.H.—Damper Coils to Cylinder Head

6.372 and 6.3542 Engines

Fitted Length	1.410 in (35,81 mm)
Load at Fitted Length	39.5/43.7 lb (17,9/19,8 kg)
No. of Active Coils	3.625
No. of Damper Coils	1
Coiled	L.H.—Damper coil to cylinder head

Tappets

Overall Length	2.96875 in (75,41 mm)
Tappet Shank Diameter	0.7475/0.7485 in (18,99/19,01 mm)
Cylinder Block Tappet Bore Diameter	0.750/0.75125 in (19,05/19,08 mm)
Running Clearance of Tappet in Bore	0.0015/0.00375 in (0,04/0,09 mm)
Outside Diameter of Tappet Foot	1.1875 in (30,16 mm)

Rocker Shaft

Overall Length	26.3125 in (668,38 mm)
Outside Diameter of Shaft	0.7485/0.7495 in (19,01/19,04 mm)

Rocker Levers (Unbushed)

Internal Diameter of Rocker Lever Bore	0.7505/0.752 in (19,06/19,1 mm)
Clearance of Rocker Lever to Rocker Shaft	0.001/0.0035 in (0,025/0,09 mm)

Rocker Levers (Bushed)

Internal Bore Diameter of Rocker Lever for Bush ...	0.875/0.8762 in 22,22/22,25 mm)
Outside Diameter of Bush	0.877/0.8785 in (22,27/22,34 mm)
Interference Fit of Bush in Rocker Lever ...	0.0008/0.0035 in (0,02/0,09 mm)
Internal Diameter of Bush (after reaming in situ) ...	0.7505/0.7520 in (19,06/19,1 mm)
Clearance of Bush to Rocker Shaft	0.001/0.0035 in (0,03/0,09 mm)

Push Rods

Length of Push Rod	10.456/10.540 in (256,6/267,7 mm)
Shank Diameter	0.310/0.312 in (7,87/7,93 mm)

TIMING GEARS

Camshaft Gear

Number of Teeth	56
Inside Diameter of Gear Boss	1.375/1.376 in (34,93/34,95 mm)
Outside Diameter of Camshaft Hub	1.3751/1.3757 in (34,93/34,94 mm)
Transition Fit of Gear to Hub	—0.0007/+0.0009 in (—0,018/+0,023 mm)

Auxiliary Drive Gear

Number of Teeth	28
Internal Diameter of Gear Bore	1.000/1.001 in (25,4/25,43 mm)
Maximum Adjustment in Slotted Locating Holes ...	10°

Crankshaft Gear

Number of Teeth	28
Internal Diameter of Crankshaft Gear Bore ...	1.875/1.876 in (47,63/47,65 mm)
Crankshaft Diameter for Gear	1.875/1.8755 in (47,63/47,64 mm)
Fit of crankshaft gear to crankshaft	—0.0005/+0.001 in (—0,012/+0,025 mm)
Length of crankshaft gear—Early	1.057/1.067 in (26,85/27,10 mm)
—Current Spares	1.329/1.339 in (33,75/34,01 mm)

Idler Gears and Hubs (Standard)

Number of Teeth	37
Inside Diameter of Gear	1.53125/1.53225 in (38,89/38,92 mm)
Outside Diameter of Bush	1.53375/1.53575 in (38,96/39,01 mm)
Inside Diameter of Bush	1.3755/1.3771 in (34,94/34,98 mm)
Outside Diameter of Hub	1.374/1.3745 in (34,90/34,91 mm)
Fit of Hub inside Bush	0.001/0.003 in (0,025/0,076 mm) clearance
Diameter of Oil Hole Drilling in Gear	0.073 in (1,85 mm)
End Float of Gears	0.002/0.012 in (0,05/0,305 mm)

Idler Gears and Hubs (Heavy Duty)

Number of Teeth	37
Inside Diameter of Gear	1.937/1.9385 in (49,2/49,24 mm)
Outside Diameter of Bush	1.9415/1.9435 in (49,31/49,36 mm)
Inside Diameter of Bush	1.6248/1.6257 in (41,37/41,39 mm)
Outside Diameter of Hub	1.621/1.622 in (41,17/41,3 mm)
Fit of Hub inside Bush	0.0028/0.0047 in (0,07/0,12 mm) clearance
End Float of Gears	0.002/0.004 in (0.05/0.10 mm)

Idler Gears and Hubs (Heavy Duty for Power Take-Off)

Number of Teeth	37
Inside Diameter of Gear	2.0625/2.0643 in (52,38/52,44 mm)
Outside Diameter of Bush	2.06625/2.06825 in (52,43/52,49 mm)
Inside Diameter of Bush	1.875/1.8778 in (47,63/47,69 mm)
Outside Diameter of Hub	1.8714/1.8730 in (47,54/47,58 mm)
Fit of Hub inside Bush	0.002/0.0064 in (0,05/0,16 mm) clearance
End Float of Gears	0.0015/0.004 in (0,04/0,10 mm)

Timing Gear Backlash

All Gears	0.003 in (0,076 mm) minimum

Auxiliary Drive Shaft Assembly

Drive Shaft—Overall Length	10.25 in (260,35 mm)
Number of Teeth on Worm	11
Outside Diameter of Worm—Early	1.619/1.624 in (41,12/41,25 mm)
—Current	1.870 in (47,5 mm)
Diameter of Front Journal—Early	1.748/1.749 in (44,4/44,42 mm)
—Current	1.9355/1.9365 in (49,16/49,19 mm)
Diameter of Rear Journal	1.248/1.249 in (31,7/31,72 mm)

Drive Shaft Bush — Front

Outside Diameter of Bush—Early	1.9375/1.9385 in (49,21/49,24 mm)
—Current	2.1283/2.1303 in (54,06/54,11 mm)
Housing, Bore	2.125/2.1264 in (53,98/54,0 mm)
Interference fit of bush	0.0021/0.0053 in (0,05/0,13 mm)
Inside Diameter of Bush—Fitted—Early	1.750/1.7516 in (44,45/44,49 mm)
—Current ...	1.9375/1.9397 in (49,21/49,27 mm)
Running Clearance of Shaft in Bush—Early ...	0.001/0.0036 in (0,025/0,09 mm)
—Current ...	0.001/0.0042 in (0,025/0,11 mm)

Drive Shaft Bush — Rear

Outside Diameter of Bush	1.4086/1.4105 in (35,78/35,83 mm)
Housing Diameter for Bush	1.4063/1.4076 in (35,73/35,75 mm)
Interference Fit in Housing	0.001/0.0042 in (0,03/0,11 mm)
Internal Diameter of Bush—Fitted	1.25/1.2519 in (31,75/31,79 mm)
Running Clearance of Shaft in Bush	0.001/0.0036 in (0,025/0,09 mm)

Auxiliary Drive Thrust Washers

Thickness	0.1875/0.1905 in (4,76/4,84 mm)
Cylinder Block Recess Depth for Thrust Washer ...	0.184/0.187 in (4,67/4,75 mm)
Outside Diameter	2.806/2.812 in (71,27/71,42 mm)
Groove Width on Drive Shaft	0.193/0.1965 in (4,9/4,99 mm)
Groove to Washer Clearance	0.0025/0.009 in (0,064/0,23 mm)

Fuel Pump Drive Shaft (early engines)

Overall Length	3.875 in (98,43 mm)
Outside Diameter of Shaft for Wormwheel ...	1.0002/1.0006 in (25,4/25,42 mm)
Outside Diameter of Shaft for Adaptor Plate ...	2.3095/2.3115 in (58.66/58,71 mm)

Wormwheel (early engines)

Number of Teeth	22
Internal Diameter	1.000/1.0008 in (25,4/25,42 mm)
Transition Fit of Wormwheel to Drive Shaft ...	—0.0006/+0.0006 in (—0,015/+0,015 mm)
Distance between Centres—Wormwheel to Auxiliary Drive Shaft	1.95 in (49,53 mm)—Early 2.375 in (60.33 mm)—Current

Fuel Pump Adaptor Plate Bush (early engines)

Internal Diameter of Plate for Bush	2.50/2.5012 in (63,5/63,53 mm)
Internal Diameter of Plate for Fuel Pump ...	1.8141/1.8125 in (46,08/46,04 mm)
Width of Datum Slot	0.121/0.129 in (3,07/3,28 mm)
Outside Diameter of Bush	2.5053 in (63,63 mm)
Internal Diameter of Bush (requires boring in situ) ...	2.3125/2.3143 in (58,74/58,78 mm)
Running Clearance of Fuel Pump Drive Shaft in Bush	0.001/0.0048 in (0,02/0,122 mm)

Hydraulically Loaded Wormwheel (later engines)

Bore Dia. in Cylinder Block for Fuel Pump Adaptor Plate and Upper Thrust Collar ...	3.500/3.5014 in (88,90/88,94 mm)
Fuel Pump Adaptor Plate Dia.	3.4986/3.4995 in (88,86/88,89 mm)
Fit of Adaptor Plate in Cylinder Block	0.0005/0.0028 in (0,01/0,07 mm)
Outer Dia. of Upper Thrust Collar	3.496/3.498 in (88,80/88,85 mm)
Clearance of Upper Thrust Collar in Cylinder Block	0.002/0.0054 in (0,05/0,14 mm)
Fuel Pump Adaptor Plate — Parent Bore Dia. for Bush	2.0625/2.0643 in (52,34/52,43 mm)
Outer Dia. of Bush	2.06625/2.06825 in (52,48/52,53 mm)
Interference Fit of Bush in Adaptor Plate	0.00195/0.00575 in (0,05/0,15 mm)
Width of Groove in Upper Thrust Collar	0.0957/0.0967 in (2,43/2,46 mm)
Upper Thrust Collar Sealing Ring Thickness ...	0.0928/0.0938 in (2,36/2,38 mm)
Clearance of Sealing Ring in Groove	0.0019/0.0039 in (0,05/0,10 mm)
Inner Dia. of Bush in Fuel Pump Adaptor Plate ...	1.8750/1.8766 in (47,63/47,67 mm)
Upper Dia. of Fuel Pump Drive Shaft	1.8714/1.8730 in (47,53/47,57 mm)
Clearance of Drive Shaft in Adaptor Plate Bush ...	0.002/0.0052 in (0,05/0,13 mm)
Inner Dia. of Upper Thrust Collar	1.886/1.890 in (47,90/48,01 mm)
Clearance of Drive Shaft in Upper Thrust Collar ...	0.013/0.0186 in (0,33/0,47 mm)
Inner Dia. of Bush in Lower Thrust Collar ...	1.6255/1.6266 in (41,29/41,32 mm)
Lower Dia. of Fuel Pump Drive Shaft	1.6214/1.6224 in (41,18/41,21 mm)
Clearance of Drive Shaft in Bush	0.0031/0.0052 in (0,08/0,12 mm)
Inside Dia. of Lower Thrust Collar	1.7812/1.7828 in (45,24/45,28 mm)
Outside Dia. of Lower Thrust Collar Bush ...	1.7843/1.7857 in (45,32/45,36 mm)
Interference Fit of Bush in Lower Thrust Collar ...	0.0015/0.0045 in (0,04/0,11 mm)

LUBRICATION SYSTEM

Normal Lubricating Oil Pressure at Maximum Engine Speed and Normal Working Temperature	30/60 lbf/in² (2,11/4,22 kgf/cm²) — 207/414 kN/m²

Sump

Sump Capacity	24 Imperial Pints (13.6 Litres) (vehicle only)*

*Other sump capacities vary according to application.

Oil Pump

Type of Pump	Rotor Type
No. of Lobes—Inner Rotor	Three, Four or Six
No. of Lobes—Outer Rotor	Four, Five or Seven

Pump Part No. 41314044 (Hobourn Eaton) and 41314096 (Concentric or Hobourn Eaton)

Inner rotor to outer rotor	0.001/0.006 in (0,02/0,15 mm)
Outer rotor to pump body	0.0055/0.010 in (0,14/0,25 mm)
Inner and outer rotor end clearance	0.001/0.005 in (0,02/0,13 mm)

Pump Part No. 41314053 (Concentric)

Inner rotor to outer rotor	0.001/0.0035 in (0,02/0,09 mm)

Pump Part No. 41314058 (Concentric)

Inner Rotor to Outer Rotor	0.003/0.005 in (0,08/0,13 mm)

Pump Part No. 41314062 and 41314067 (Concentric High Capacity)

Inner rotor to outer rotor	0.001/0.005 in (0,02/0,13 mm)

Pump Part Nos. 41314053 and 41314058 (Concentric)

Pump Part Nos. 41314062 and 41314067 (Concentric High Capacity)

Outer rotor to pump body	0.006/0.015 in (0,15/0,38 mm)

Inner rotor end clearance	0.0015/0.003 in (0,04/0,08 mm)
Outer rotor end clearance	0.0005/0.0025 in (0,01/0,06 mm)

Note : For replacement purposes the whole pump assembly must be replaced.

Relief Valve

Pressure Setting I	50/60 lbf/in² (3,52/4,22 kgf/cm²) — 345/414 kN/m²
Pressure Setting II (Identified by a distance piece under split pin)	60/70 lbf/in² (4,22/4,92 kgf/cm²) — 414/483 kN/m²
Length of Plunger	0.875 in (22,23 mm)
Outside Diameter of Plunger	0.747/0.749 in (18,91/18,96 mm)
Inside Diameter of Valve Housing Bore	0.750/0.751 in (19,05/19,08 mm)
Clearance of Plunger in Bore	0.001/0.004 in (0,025/0,1 mm)
Outside Diameter of Spring	0.679/0.695 in (17,25/17,65 mm)
Solid Length	1.56 in (39,62 mm)
Fitted Length (Normally Asp.)	2.0625 in (52,39 mm)
Fitted Length (Turbocharged)	2.0625 in (52,39 mm)
Fitted Load (Normally Asp.)	13.33 lb ± 5½ oz (6,05 kg ± 155 grammes)
Fitted Load (Turbocharged)	18.4 lb ± 8½ oz (8,37 kg ± 240 grammes)
Load at $1\frac{13}{16}$ in (46 mm) Spring Length (Normally Asp.)	21.47 lb ± 9½ oz (9,75 kg ± 270 grammes)
Load at $1\frac{13}{16}$ in (46 mm) Spring Length (Turbocharged)	26.6 lb±12½ oz (12,0 kg±355 grammes)

Lubricating Oil Filter

Type of Filter	Full Flow
Element Type	Paper or Replaceable Cannister
By-Pass Valve Setting	8/12 lbf/in² (0,56/0,84 kgf/cm²) — 55/82 kN/m²
Type of Valve	Pressure Differential Spring Loaded Ball (paper type only)

COOLING SYSTEM

Type of Cooling System

Cylinder Head	Water Pump Circulation
Cylinder Block	Thermo-Syphon
Engine Water Capacity (Less Radiator)	20 Imperial Pints (11,4 Litres)

Thermostat

Type	Bellows or Wax
Opening Temperature	170/182°F (77/83°C)
Fully Open at	202°F (94°C)
Valve Lift	0.312/0.469 in (7,92/11,91 mm)

Water Pump

Type	Centrifugal
Outside Diameter of Shaft for Pulley	0.7492/0.7497 in (19,03/19,04 mm)
Inside Diameter of Pulley Bore	0.7500/0.7508 in (19,05/19,07 mm)
Clearance Fit of Pulley on Shaft	0.0003/0.0016 in (0,01/0,05 mm)
Outside Diameter of Shaft for Impeller	0.6262/0.6267 in (15,9/15,92 mm)
Diameter of Impeller Bore	0.6249/0.6257 in (15,87/15,89 mm)
Interference Fit of Impeller on Shaft	0.0005/0.0018 in (0,013/0,046 mm)
Impeller Blade to Body Clearance	0.012/0.035 in (0,3/0,89 mm)

FUEL SYSTEM

Fuel Lift Pump

	(1965).
Type of Pump	A.C. Delco—U.F. Series
Method of Drive (Vertical Engines)	Eccentric on Camshaft
Method of Drive (Horizontal Engines)	Eccentric on Auxiliary Drive Shaft
Delivery Pressure	5/8 lbf/in² (0,35/0,56 kgf/cm²)
Diaphragm Spring Colour	Blue

Fuel Filter

Element Type	Paper Element
Pressure Valve	Gravity Vent Valve

Fuel Injection Pump

Make	C.A.V.
Type	D.P.A.
Pump Rotation	Anti-Clockwise viewed from drive shaft end.
Timing Letter (Hydraulic)	'H'
Timing Letter (Mechanical)	'F'
No. 1 Cylinder Outlet	'X'

ATOMISERS

Code	Holder	Nozzle	Setting Pressure	Working Pressure
X	BKBL67S5100	BDLL150S6225	175 atm (181 kgf/cm²) 2570 lbf/in²	170 atm (176 kgf/cm²) 2500 lbf/in²
Y	BKBL67S5151	BDLL150S6329	175 atm (181 kgf/cm²) 2570 lbf/in²	170 atm (176 kgf/cm²) 2500 lbf/in²
CM	BKBL67S5299	BDLL150S6472	195 atm (201 kgf/cm²) 2870 lbf/in²	180 atm (186 kgf/cm²) 2650 lbf/in²
CN	BKBL67S5299	BDLL150S6329	195 atm (201 kgf/cm²) 2870 lbf/in²	180 atm (186 kgf/cm²) 2650 lbf/in²
CP	BKBL67S5299	BDLL150S6435	195 atm (201 kgf/cm²) 2870 lbf/in²	180 atm (186 kgf/cm²) 2650 lbf/in²
DW	BKBL67S5299	BDLL150S6382	210 atm (217 kgf/cm²) 3090 lbf/in²	195 atm (201 kgf/cm²) 2870 lbf/in²
ZZ	BKBL67S5151	BDLL150S6395	175 atm (181 kgf/cm²) 2570 lbf/in²	170 atm (176 kgf/cm²) 2500 lbf/in²
CL	BKBL67S5299	BDLL150S6507	210 atm (217 kgf/cm²) 3090 lbf/in²	195 atm (201 kgf/cm²) 2870 lbf/in²
FC	BKBL67S5299	BDLL150S6649	210 atm (217 kgf/cm²) 3090 lbf/in	195 atm (201 kgf/cm²) 2870 lbf/in²
AF	BKBL67S5100	BDLL150S6435	175 atm (181 kgf/cm²) 2570 lbf/in²	170 atm (176 kgf/cm²) 2500 lbf/in²
AN	BKBL67S5151	BDLL150S6472	175 atm (181 kgf/cm²) 2570 lbf/in²	170 atm (176 kgf/cm²) 2500 lbf/in²
AT	BKBL67S5238	BDLL150S6472	205 atm (212 kgf/cm²) 3010 lbf/in²	190 atm (196 kgf/cm²) 2790 lbf/in²
DV	BKBL67S5299	BDLL150S6576C	215 atm (222 kgf/cm²) 3160 lbf/in²	200 atm (207 kgf/cm²) 2940 lbf/in²
DL	BKBL67S5299	BDLL150SY6545	210 atm (217 kgf/cm²) 3090 lbf/in²	195 atm (201 kgf/cm²) 2870 lbf/in²
EG	BKBL67S5299	BDLL150S6600	210 atm (217 kgf/cm²) 3090 lbf/in²	195 atm (201 kgf/cm²) 2870 lbf/in²
FL	BKBL67S5299	BDLL150S6673	215 atm (222 kgf/cm²) 3160 lbf/in²	200 atm (207 kgf/cm²) 2940 lbf/in²
XE	OKLL67S2921	OLL150S6649	210 atm (217 kgf/cm²) 3090 lbf/in²	195 atm (201 kgf/cm²) 2870 lbf/in²

Engine Checking and Fuel Pump Marking Angles, Static Timing

The correct marking angles and static timing can be found by reference to the prefix letters and figures of the setting code adjacent to the word "Set" on the fuel pump identification plate. Engine checking and fuel pump marking angles are for use with timing tool MS67B.

Prefix Letters 6.354 & 6.3542	Engine Checking Angle (Degrees) (with engine at TDC compression)	Fuel Pump Marking Angle (Degrees)	Static Timing (BTDC—Degrees)	Piston Displacement BTDC
A50E	154	143	22	0.230 in (5,84 mm)
AX53, AX58, AX60	159	146	26	0.325 in (8,26 mm)
AY58E	159	145	28	0.372 in (9,45 mm)
AY59	160	146	28	0.372 in (9,45 mm)
AY62E	160	146	28	0.372 in (9,45 mm)
BX64	160	144	32	0.485 in (12,32 mm)
BY57E	160	146	28	0.372 in (9,45 mm)
CR52, CR55, CR62, ER42, ER45, ER47, ER51, ER54, ER57	158	144	28	0.372 in (9,45 mm)
EX42E	155	146	18	0.155 in (3,94 mm)
EX51E, EX53E	160	146	28	0.372 in (9,45 mm)
EX56	159	146	26	0.325 in (8,26 mm)
EX56E, FX46E	160	146	28	0.372 in (9,45 mm)
GX52E	156	144	24	0.275 in (6,98 mm)
HX51E	160	146	28	0.372 in (9,45 mm)
KX46E, KX47E	154	143	22	0.230 in (5,84 mm)
LR52, LR54, LR58	155	142	26	0.325 in (8,26 mm)
MR52, MR56	161	147	28	0.372 in (9,45 mm)
MR62, MR66, MR69, MR72	158	144	28	0.372 in (9,45 mm)
MX49E	161	146	30	0.426 in (10.82 mm)
MX53E, MX56, MX56E	160	146	28	0.372 in (9,45 mm)
PR62, PR63	158	142	32	0.485 in (12,32 mm)
PX53E, PX56E	160	146	28	0.372 in (9,45 mm)
RR62, RR62E, RR63, RR67	158	144	28	0.372 in (9,45 mm)

TECHNICAL DATA—B.16

Prefix Letters	Engine Checking Angle (Degrees) (with engine at TDC compression)	Fuel Pump Marking Angle (Degrees)	Static Timing (BTDC—Degrees)	Piston Displacement BTDC
SR48E, SR55, SR58, SR63, SR64, SR67	154	143	22	0.230 in (5,84 mm)
WR51E	160	146	28	0.372 in (9,45 mm)
WR57	159	145	28	0.372 in (9,45 mm)
WX48E	157	144	26	0.325 in (8,26 mm)
XR55, XR60, XR63, YR56, YR58, YR62, YR70	154	143	22	0.230 in (5,84 mm)
ZR61	160	146	28	0.372 in (9,45 mm)
T6.354				
BX84, CX75	160	144	32	0.485 in (12,32 mm)
CY106E	153	145	16	0.125 in (3,18 mm)
DR69, DR82, DR88	156	143	26	0.325 in (8,26 mm)
DR91	154	143	22	0.230 in (5,84 mm)
DX92, DX96	161	146	30	0.426 in (10,82 mm)
DY80E	160	144	32	0.485 in (12,32 mm)
ET69	160	144	32	0.485 in (12,32 mm)
JR91	154	143	22	0.230 in (5,84 mm)
JR105	158	143	30	0.426 in (10,82 mm)
KR70, KR70E	160	146	28	0.372 in (9,45 mm)
KR79/600/9/2450	162	146	32	0.485 in (12,32 mm)
KR79/750/6/2380	160	146	28	0.372 in (9,45 mm)
KR69/750/6/2520	162	146	32	0.485 in (12,32 mm)
KR79/750/9/2300	162	146	32	0.485 in (12,32 mm)
KR79/750/9/2350	160	146	28	0.372 in (9,45 mm)
KR79/750/9/2430, KR79/750/9/2450	162	146	32	0.485 in (12,32 mm)
KR79E	162	146	32	0.485 in (12.32 mm)
KR82, KR82E	160	146	28	0.372 in (9,45 mm)
KR85	162	146	32	0.485 in (12,32 mm)
LX61E, LX69E, LX71E	159	144	30	0.426 in (10,82 mm)
TR71, TR84	158	144	28	0.372 in (9,45 mm)
TX71E, TX76E	159	144	30	0.426 in (10,82 mm)
UR88	158	142	32	0.485 in (12,32 mm)

Prefix Letters	Engine Checking Angle (Degrees) (with engine at TDC compression)	Fuel Pump Marking Angle (Degrees)	Static Timing (BTDC—Degrees)	Piston Displacement BTDC
VR72, VR74, VR76E, VR82, VR88, VR90	159	144	30	0.426 in (10,82 mm)
XX69E, XX75E	159	144	30	0.426 in (10,82 mm)
YR73	156	143	26	0.325 in (8,26 mm)
YX84E, YX90E	160	144	32	0.485 in (12,32 mm)
ZX59E	158	146	24	0.275 in (6,98 mm)
6.372				
HR59E, HR65, HR67	158	144	28	0.372 in (9,45 mm)
SX59E	158	146	24	0.275 in (6,98 mm)

ELECTRICAL SYSTEM

Alternator

Make	C.A.V. or Lucas
Type	AC5, 11AC, 15ACR, 17 ACR or 18ACR
Maximum output AC5 12 volt (hot)	55A
Maximum output AC5 24 volt (hot)	31A
Maximum output 11AC 12 volt (hot)	43A
Maximum output 15ACR (hot)	28A
Maximum output 17ACR (hot)	36A
Maximum output derated 17ACR (hot)	25A
Maximum output 18ACR (hot)	45A

Dynamo

Make	Lucas
Type	C40L—2 Brush Shunt Wound
Rotation	Clockwise
Maximum Output	25 amps
Cut-In Speed	630/744 rev/min

Starter Motor

Make	Lucas or C.A.V.
Type	M45G CA45 or M50
Maximum Current	1150 amps
Starter Cable Resistance	0.0017 ohms max.
No. of Teeth on Pinion	10

Note : The above data is general and can vary with individual applications.

Starting Aid

Make	C.A.V.
Voltage	12 (24 volt systems have resistor in circuit)
Maximum Current Consumption	12.5 — 13.5 A at 11.5V
Flow Rate through Thermostart	3.5 — 5.0 ml/min
Height of Reservoir above centre of Thermostart ...	4½/10 in (114,3/254 mm)