CONSEQUENT upon further developments in research and design on the earlier models of the marque, the XK 140 series of Jaguar cars was introduced at the 1954 Motor Show.

Cars of this new range retain some basic components which are similar to those employed on earlier vehicles, but which have been further developed to suit the requirements of performance in current production models. In addition to the well-known Sports body, the chassis is also available fitted with either drop head or fixed head coachwork. Engine types are supplied in various stages of tuned performance condition to suit individual requirements, and among the items supplied in these “Special Equipment models” are “C” type cylinder head fitted on all models, to the standard cylinder head, high speed crankshaft damper and dual exhaust systems. A range of optional extras is available, included in which is the Laycock-de Normanville overdrive which operates on the top gear ratio only. See Service Supplement 226 C/J.

Identification of vehicles is by chassis and engine numbers. Chassis numbers are to be found stamped on the nearside chassis frame above the rear engine mounting bracket. Prefix “A” to this number indicates a “Special Equipment” model, the engine of which is fitted with a standard cylinder head. Prefix “S” indicates a “C” type cylinder head fitted.

Engine numbers are stamped on the offside of the cylinder block above the oil filter, and at the front of the cylinder head casting; /7, /8, /9, suffix indicating the compression ratio of the model in question. Suffix “S” denotes a “C” type cylinder head. Gearbox numbers are stamped on a boss at the rear side of the unit casting and letter “E” at the end of the prefix letters shows that an overdrive unit is fitted. The body number is stamped on a plate attached to the nearside of the dash panel beneath the bonnet.

All these numbers and letters are to be found collectively on a plate fixed to the nearside of the dash panel. It is essential that all these numbers and letters relevant to the chassis, engine, and to any particular component should be quoted when ordering spare parts.

No special tools are needed for repair work to the car except for a template for timing the camshafts. This is supplied in the car tool kit. Threads and hexagons are in the main SAE, but a certain number will be found to be BSF.

ENGINE

Mounting
At front, cylindrical rubber blocks bonded to studded plates at each end, bolted to brackets on either side of crankcase, and to chassis brackets. At rear, round rubber blocks with moulded-in nuts bonded to plates bolted to chassis frame brackets. Set screws through brackets bolted to either side of flywheel housing screw into moulded-in nuts. Tighten fully.

Removal
Engine and gearbox should be removed together. Procedure for engine/gearbox removal also applies when an overdrive unit is fitted to the gearbox.

To remove engine, detach bonnet from hinges and take out radiator matrix complete after removal of mounting brackets on either side. Take off fan cowling and dynamo together with all pipes, wires and control cables fitted to engine. Remove exhaust downpipes at flanges and disconnect propeller shaft.

Take out interior carpets and remove gearbox cowl and shifterboards, and take off gearbox top cover complete with gear lever. Blanking plate should be fitted to top of gearbox to prevent damage. Jack up and support rear of engine and remove mounting brackets and rubbers.

On R.H.D. models remove split pin and clevis pin securing adjusting rod to clutch pedal shaft lever. Take out pinch bolt securing clutch pedal and pedal stem and withdraw stem. Take out pinch bolt securing pedal to shaft and withdraw shaft through chassis frame until inner end of shaft is well clear of bearing housing in bellhousing. On L.H.D. cars re-
Ball and Roller Bearing Data

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Int. dia.</th>
<th>Ext. dia.</th>
<th>Width</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>.8167</td>
<td>0.040</td>
<td>0.046</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

Engine

| Water pump | 0.8180 |
| Gearbox | 0.090 |
| Front | 0.090 |
| End | 0.090 |

Front axle

| Front hub | 0.090 |
| Rear hub | 0.086 |

NUT TIGHTENING TORQUE DATA

<table>
<thead>
<tr>
<th>Engine</th>
<th>Nut Size</th>
<th>Inch</th>
</tr>
</thead>
<tbody>
<tr>
<td>Main bearings</td>
<td>5/16</td>
<td></td>
</tr>
<tr>
<td>Camshaft bearings</td>
<td>3/8</td>
<td></td>
</tr>
</tbody>
</table>

Connecting Rods

Big ends thin wall, steel-backed; white metal-lined shells located by tabs. No hard birthing permissible.

Small ends bronze bushed for floating gudgeon pins.

Pistons

Brice split skirt aluminum alloy. Gudgeon pins located by spring rings. Top compression ring chromium plated. Pistons should be fitted with cylinder bore number stamped on crown towards rear with split to near side. Note that Jaguar practice is to number cylinders from rear to front. Where reference is made in this article to cylinder numbers, our usual practice is to number from rear to front is maintained.

Camshafs

Duplex roller endless chain drive in two stages. First stage drives double roller sprocket and has flat spring tensioner on off side, nylon rubber block on near side. Second stage passes round idler sprocket, both camshaft sprocket gears below small tensioner sprocket on eccentric hub.

Complete assembly of timing chains, sprockets and brackets can be removed after removal of cam cover.

Each camshaft runs in four split steel-backed white metal lined shells, located by dowels. Oil fed through drillings in head to rear bearings, and through hollow shafts to other bearings. End float controlled by front bearing between sprocket and flange.

When removing head for top overhaul first slacken or remove chain tensioner, then detach each sprocket and slide it inwards along slot, securing it with nut on stud.

Before refitting cylinder head it is important to observe procedure as follows to avoid fouling of inlet and exhaust valves

\[ \text{Diagram showing order of tightening of cylinder head nuts, also six securing front of head. See also "Nut Tightening Torque Data"} \]
or valves with pistons, in addition to noting that engine should not be rotated with camshaft sprockets removed.

Position camshafts, using valve timing gauge (provided in tool kit). Key of gauge locates in keyway of camshaft and bottom face of gauge with camshaft cover face on cylinder head. Turn crankshaft to T.D.C. No. 1 firing (flywheel mark visible through aperture to nearside of bell-housing). Check rotor arm position in distributor, right cylinder head and connect timing chains.

**Valves and Tappets**

Overhead, set at 70 deg., included angle. Not interchangeable, inlet larger than exhaust. Split cone oil filler, double springs with seats between springs and head.

Valve guides plain, no shoulder, interchangeable. Press in until outer end projects 1/8in. from spring seat, after total immersion of cylinder head in boiling water for 30 mins.

Valve seat inserts for inlet and exhaust shrunk into light alloy head.

Plain cylindrical tappets fit over valves and slide in guides shrunk into head. Adjust clearance between cam and tappet by pad on top of valve stem. Pads are available in thicknesses ranging from .010in. to .015in. in .001in. steps. Pads are identified by etched letters A to S, A being thinnest. Camshaft must be removed for tappet adjustment.

For removal of valve seat inserts or tappet guides, light alloy head must be heated in oven or muffle for one hour from cold at a temperature of 300°F, when new parts should press in easily.

**Lubrication**

Gear pump in sump, bolted to front of No. 1 main bearing cap and driven from skew gear by loose quill. To remove pump, disconnect delivery pipe at flange.

Subsequent to engine No. G 1908, Hoburn Eccentric eccentric rotor oil pump fitted. When this type of pump is fitted, oil pressure relief valve is in filter head.

Skew drive gear retained on shaft (Woodruff key) by nut. Shaft runs in bronze bush pressed into housing on front of crankcase. Upper end of shaft has offset slot for distributor drive.

When refitting skew gear, shaft and bush assembly, turn crankshaft to T.D.C. 1/6, and push in assembly so that, when skew gear meshes with crankshaft gear, slot is parallel to crankshaft centreline, with larger segment towards engine.

**Ignition**

Anti-clockwise distributor, with centrifugal and vacuum control, spigoted on crankcase on offside front, and retained by clamp plate.

When removing distributor, slacken clamp, leaving clamp plate on crankcase.

Set timing by means of scale and pointer on crankshaft damper. On road test, micrometer adjustment should not be made in excess of six “clicks” either advance or retard.

**Cooling Systems**

Pump and fan. Non-adjustable bellows thermostat in front end of inlet manifold water jacket.

Adjust fan belt by swinging dynamo until there is about 7in. movement either way on vertical run of belt.

---

**TRANSMISSION**

**Clutch**

Borg & Beck single dry plate, graphite thrust release bearing.

Only external adjustment is by nut on rear end of pedal pull rod, to give free movement at pedal pad.

Access to clutch for service after removal of gearbox and bell-housing.

**Gearbox**

Four-speed, synchronesh on 2nd, 3rd and top gears. Single helical gears.

**To remove gearbox** take up carpet, seats, floorboards, gearbox cowl and propeller shaft tunnel. Disconnect front end of propeller shaft, reversing light switch wire, speedo drive and clutch pedal linkage. Remove cotter-clamp bolt from base of clutch pedal, and detach pedal cross-shaft ball housing from bell-housing. Push pedal cross-shaft outwards, and wedge outer end outside chassis frame. Take out four bolts holding rear mounting to gearbox, and setscrew from stabilizer mounting. Jack up engine under rear of sump, detach bell-housing bottom cover and take out bell-housing setscrews. Gearbox can then be drawn back and lifted out. Note: If overdrive is fitted, engine and gearbox must be removed as complete unit to achieve access to gearbox.

**To dismantle gearbox** remove top cover with remote control assembly, selector rods and forks. Engage top and 1st gears to lock box, and undo driving flange nut. Draw off flange, extract speedo drive pinion and detach rear cover with lipped oil seal. Draw off speedo drive gear and thick washer.
Using bridge extractor bolted to rear casing and acting against end of mainshaft, drive off housing with rear ball bearing and layshaft and reverse spindles, allowing layshaft cluster to drop to bottom of box. Remove bell-housing and front bearing cover with lip seal (note copper washers under seizure heads).

Turn primary shaft so that cut-away on top gear dogs clears layshaft constant mesh gear. Tap mainshaft forward to drive out primary shaft and ball bearing, with only rolled roller bearing bearing. Main shaft assembly, with rollers and inner race of bearing, can then be lifted out through top. Lift off layshaft cluster with needle roller bearings against thrust washers, and bushed reverse idler.

Primary shaft ball bearing retained on shaft with clip shield by left-hand threaded sleeve nut.

To drive main shaft assembly slide off top/3rd synchro assembly, noting interlocking plunger and ball (in later gearboxes only) in drilling through synchro hub. Press down plunger in shaft, locking 3rd gear splined thrust washer, releasing washer. Slide off 3rd gear with 41 needle rollers. Draw off inner race of roller bearing and remove 2nd gear and synchro assembly (same as top/3rd gear, with excepted angular ball and ball). While reassembling note that interlocking plunger and ball in top/3rd and 2nd synchro hubs must be opposite cutaway spaces on mainshaft and in synchro sleeves.

JL layshaft cluster is built up, with integral 1st gear. To dismantle, extract spring ring behind constant mesh gear and press back, until split ring recessed in front is released. Second spring ring retains 3rd and 2nd gears against shoulder on shaft.

Reverse idler spindle should not be separated from rear extension housing, as rubber sealing ring recessed in spindle cannot be replaced without special thimble.

When reassembling box insert small retaining ring in layshaft needle roller race, and insert 29 needle rollers in each end, sticking them in with thick grease. Insert outer retaining ring in front end of shaft with large bronze thrust washer. Press back mainshaft, and then press forward with gear end against bearing. When assembled, shaft is 0.32mm less than pinion. Insert stepped steel washer at rear (pegged to shaft) and small bronze thrust washer. Lower cluster into box and insert thin rod to support it.

Remove reverse locking lever from box, feed in mainshaft and primary shaft assemblies, and drive in roller bearing outer race. Lift layshaft cluster with rod and insert dummy spindle .980in in diametrical line with gears chambered on end, into layshaft box so as not to disturb needle rollers. Assemble long distance-piece on mainshaft, and offer up rear extension housing with spindle, and reverse idler in place on spindle (fork gear to front). Insert layshaft spindle, pushing out dummy spindle to front. When rear housing is in place, assemble reverse rocking lever and fork, and complete assembly of box.

To dismantle top cover remove lever and pivot jaw assembly (nut on front of pivot housing). Detach sealing plate from rear of cover and unscrew plugs retaining selector springs and plungers. Unscrew taper-ended screws from selector forks, and draw out rods to rear one at a time, catching interlock balls as they are released from cross-drilling in rear of cover.

**CHASSIS DATA**

<table>
<thead>
<tr>
<th>CHASSIS DATA</th>
<th>GLUTCH</th>
</tr>
</thead>
<tbody>
<tr>
<td>Make</td>
<td>Borg &amp; Beck</td>
</tr>
<tr>
<td>Type</td>
<td>s.d.p. 19 A8-G</td>
</tr>
</tbody>
</table>

**GEARBOX**

- **Type**: Synchronesh
- **No. of forward speeds**: 4
- **Gear or final ratios**:
  - 1st: 45/13 stc, 43/13 high
  - 2nd: 45/13 stc, 43/13 high
- **Not quoted**

**PROPELLER SHAFT**

- **Make**: Hardy Spicer
- **Type**: Needle roller bearing U.J.

**FINAL DRIVE**

- **Type**: Hypoid semi-floating
  - Crownwheel/level pinion teeth: 45/13 stc, 43/13 high

**BRAKES**

- **Make**: Lockheed
- **Type**: 2 LS (self-adjusting)
  - Drum diameter: 12in
  - Lining width: 2in
  - Thickness: 1in
  - No. of rivets per shoe: 12

**SPRINGS**

- **Length (eye centres, load at centre)**: 44in
- **Width**: 7in
- **No. of leaves**: 8
- **Free camber (length, coil)**: 5in
- **Linked camber (length, coil at load)**: 130lb/in

**SHOCK ABSORBERS**

- **Make (front)**: Girling
- **Type**: Torsen diagonal 5/20 NF
- **Type**: Replacement

**STEERING BOX**

<table>
<thead>
<tr>
<th>Type</th>
<th>Adjustments: column end final</th>
<th>Rank and pinion</th>
<th>n/d</th>
<th>eccentric sleeve</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Rack and pinion</td>
<td>m3</td>
<td>eccentric sleeve</td>
</tr>
</tbody>
</table>

**FRONT-END SERVICE DATA**

- **Castor (static lader)**: 5°
- **Gamber (static lader)**: 5°
- **King pin inclination (static lader)**: 5°
- **Toe-in**: 0-1in
- **No. of turns lock to lock**: 2

**Adjutments**:
- **caster**: shims
- **camber**: shim
- **tie-in**: screwed to rear ends

**SHOCK ABSORBERS**

Front and rear, Girling telescopic hydraulic, no provision for topping up.

**Steering Gear**

- **Rack and pinion**: Rack operates short track rods, adjustable for length, through ball joints at either end of rods, lubricated from rack. Only provision for adjustment is for pinion and rack mesh made by means of eccentric sleeve with external serrations at upper end over which square adjuster plate fits. Rotation of plate (through 90 deg) either way effects adjustment.
Parts of the engine showing cylinder block, head and sump, crankshaft, con rod and piston assembly, camshafts, camshaft drive sprockets and casing, oil pump, water pump, fan and manifolds
Right: Rack and pinion steering gear components, assembly view below. Steering column and bearing tube, and "flexible" section of column shown in line to left. Centre are components of the front suspension, showing upper and lower links, ball joints, torsion bar, anti-roll bar and hubs for pressed steel or optional wire wheels. Note shims for adjusting castor angle. Below are the components of the rear axle, again with alternative wheel mounting.
**KEY TO MAINTENANCE DIAGRAM**

**DAILY**
1. Radiator top up.
2. Engine sump top up.

**EVERY 2,500 MILES**
3. Engine sump—drain and refill.
4. Battery
5. Gearbox
6. Rear axle
7. Brake fluid reservoir
8. Engine oil filter—remove and clean.
9. Steering boxing—oil
10. Steering tie rod ball joints.
11. King pins
12. Propeller shaft universal joints
13. Propeller shaft splines
14. Fuel brake pedal boss
15. Handbrake cables
16. Rear spring gaiters
17. Carburettor piston dampers—oil.
18. Distributor—oil shaft bearing, auto advance, contact breaker pivot, grease cap.

**EVERY 5,000 MILES**
19. Carburettor filters—remove and clean.
20. Front wheel bearings.
21. Rear wheel bearings grease cap.
22. Engine oil filter—remove.
23. Air cleaner—clean and reoil.
25. Handbrake ratchet
26. Screen wiper pivots
27. Door, bonnet, bootlid, petrol filter cover, locks and hinges.

**EVERY 10,000 MILES**
28. Gearbox
29. Rear axle
30. Overdrive oil pump—clean oil filter.
31. Petrol pump filter—clean.
*If fitted*

**FILL-UP DATA**
<table>
<thead>
<tr>
<th>Component</th>
<th>Pints</th>
<th>Litres</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine sump</td>
<td>22</td>
<td>12.5</td>
</tr>
<tr>
<td>Gearbox</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Rear axle</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Cooling system</td>
<td>2.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Fuel tank</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>Tyre pressure: front</td>
<td>23</td>
<td>14</td>
</tr>
<tr>
<td>Tyre pressure: rear</td>
<td>25</td>
<td>15</td>
</tr>
</tbody>
</table>

*Total capacity—Allow 3pt for filter.*

**DRAINING POINTS**
Left: Radiator drain tap on radiator bottom outlet, access from below. Right: Cylinder block drain tap at rear on near side. Note that heater is not drained by these taps.

**RECOMMENDED LUBRICANTS**

<table>
<thead>
<tr>
<th>S.A.E. No.</th>
<th>Vacuum</th>
<th>Wakefield</th>
<th>Shell</th>
<th>Esso</th>
<th>B.P. Energol</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Above 90°F</td>
<td>Mobil Oil AF</td>
<td>Castrol XXI</td>
<td>X-100 40</td>
<td>Esso 49</td>
<td>Energol S.A.E. 40</td>
</tr>
<tr>
<td>22°F to 90°F</td>
<td>Mobil Oil A</td>
<td>Castrol XL</td>
<td>X-100 30</td>
<td>Esso 30</td>
<td>Energol S.A.E. 30</td>
</tr>
<tr>
<td>Below 22°F</td>
<td>Mobil Oil Arctic</td>
<td>Castrolite</td>
<td>X-100 25/20W</td>
<td>Esso 29</td>
<td>Energol S.A.E. 20</td>
</tr>
<tr>
<td>Gearbox, Carburettor dump, Distributor, Oil can</td>
<td>Mobil Oil A</td>
<td>Castrol XL</td>
<td>X-100 30</td>
<td>Esso 30</td>
<td>Energol S.A.E. 30</td>
</tr>
</tbody>
</table>

**Rear axle**

<table>
<thead>
<tr>
<th>Propeller shaft needle roller bearings</th>
<th>Mobilise UX 100</th>
<th>Castrol Hypoy</th>
<th>Spirit 90 EP</th>
<th>Exper Compound 90</th>
<th>Energol EP 90</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gear Oil 110</td>
<td>Mobilise C 110</td>
<td>Castrol D</td>
<td>Spirit 110 EP</td>
<td>Gear Oil 110</td>
<td>Energol 110</td>
</tr>
<tr>
<td>Chassis nipples (except wheel hubs and propeller shaft needle roller bearing)</td>
<td>Mobilgrease No. 1 or 2</td>
<td>Castrol Medium or WB</td>
<td>Rotinax E1 or A</td>
<td>Esso Grease or Esso High Temp Grease</td>
<td>Energrease CS or N3</td>
</tr>
</tbody>
</table>

**Wheel hubs**

<table>
<thead>
<tr>
<th>Mobilgrease No. 5</th>
<th>Castrol Medium or WB</th>
<th>Rotinax A</th>
<th>Esso High Temp. Grease</th>
<th>Energrease N3</th>
<th>Energol EP 90</th>
</tr>
</thead>
</table>

**Upper cylinder lubricant**

| Mobil Upperlube | Castrol | Donax U | Esso Mix | Energol U.C.L. | Energol EP 90 |

**Brake operation fluid reservoir**

| Lockheed Brake Fluid (S.A.E. Spec. 70R3) | | | | | |

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