Service Instruction Manual

Fourth Issue

STANDARD VANGUARD

SERIES I AND II
and
TRIUMPH "RENOWN" MODELS

ROAD SPRINGS AND SHOCK ABSORBERS

SECTION H

THE STANDARD MOTOR COMPANY LTD., COVENTRY

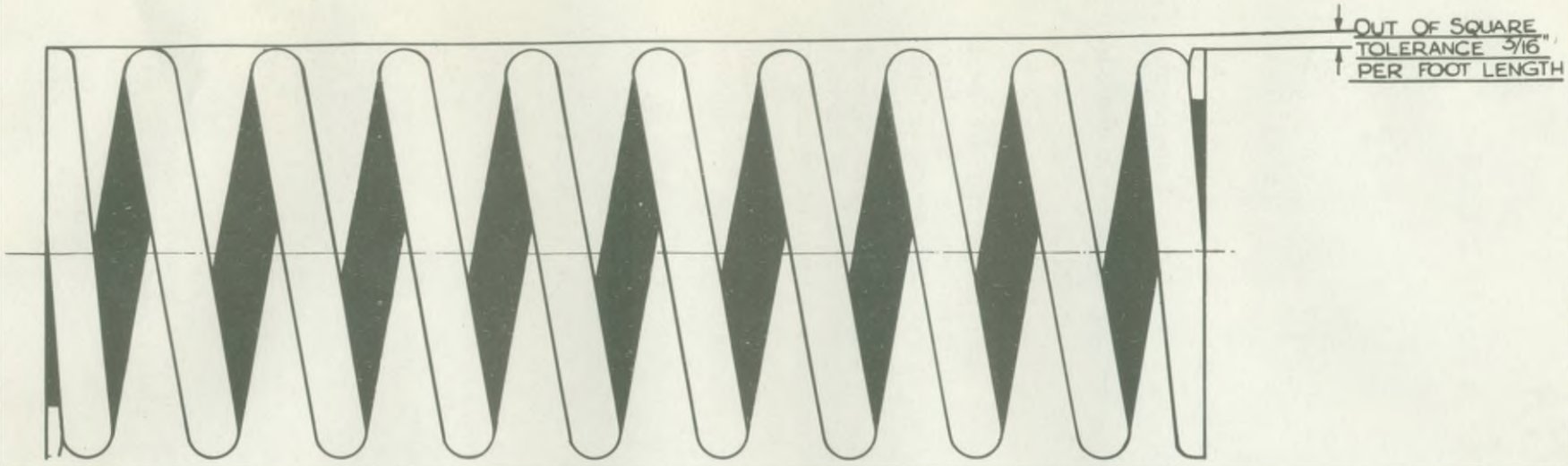
ROAD SPRINGS,

REAR SUSPENSION AND SHOCK ABSORBERS

INDEX

ILLUSTRATIONS

Series II Supplement



GENERAL DATA

ITEM	DIMENSION	UNIT
MAX WHEEL BOUND	3·0	IN
MAX WHL: REBOUND	2·25	IN
SPRUNG LOAD AT WHEEL	700	LB
LEVERAGE	0·67	—
STATIC WHEEL DEFLECTION	6·20	IN
WHEEL RATE	113	LB/IN
PERIODICITY	75	OSC/MIN
WAHL FACTOR	1·20	—
STATIC STRESS	MEAN 67300 WAHL 80800	LB/IN^2
STRESS AT MAX^{M} BOUND	100,000 120,000	LB/IN^2
LADEN HEIGHT AT WHEEL	$\pm\frac{1}{8}$	IN
CLEARANCE FROM CHOC-A-BLOC AT MAX: WHEEL BUMP	0·34	IN

SPRING DATA

ITEM	DIMENSION	UNIT
SECTION OF COILS	·530 ± ·005	IN
Nº OF FREE COILS	$8\frac{1}{2}$	—
MEAN DIA OF COILS	3·75 ± 0·010	IN
RATE	252 *	LB/IN
FREE LENGTH	12·4 APPROX	IN
FITTED LENGTH	$8\frac{1}{4} \pm \frac{3}{32}$	IN
STATIC DEFLECTION	4·17	IN
FITTED LOAD	1050 *	LB
SOLID LENGTH	5·3. 5·43 MAX	IN
STRESS AT SOLID	MEAN 115,000 WAHL 138,000	LB/IN^2
HAND OF HELIX	UNIMPORTANT	—
FINISH		—
MATERIAL	SILICO MANGANESE GROUND BAR	—

* IMPORTANT

NOTE:- TO ENSURE SPRINGS WILL NOT SETTLE DOWN ON THE ROAD EACH SPRING MUST BE SCRAGGED SOLID IMMEDIATELY BEFORE TEST

Fig. 1. Front spring for "Vanguard" Saloon, 12 cwt. Delivery Van, Station Car and "Pick-up" Utility.

ROAD SPRINGS,

REAR SUSPENSION AND SHOCK ABSORBERS

FRONT SPRINGS (STANDARD)
(Fig 1)

Description.

Low periodicity coil springs are used with the " Vanguard " model. Fig. 1 is an actual photograph of the drawing for this spring with its accompanying data. Damping action is provided by piston-type shock absorbers.

Maintenance.

This spring is not likely to require replacing during the car's lifetime, unless it is used under very exacting conditions. It is important, however, to ensure that the shock absorbers, which are a composite part of the front suspension unit, are maintained in accordance with the maker's instructions given later in this section.

These springs require no lubrication. Indeed, although the rubber cup washer at either end of each is resistant to oil splashing, saturation of these washers will lead to their ultimate destruction.

If the precaution mentioned in the previous paragraph is observed, the rubber washers should last for many thousands of miles. For instructions regarding removal of front spring, refer to " Front Suspension and Steering " Section.

FRONT SPRING DATA FOR " RENOWN "

Max. Wheel Bound	3.0"
Max. Wheel Rebound	$1\frac{3}{4}$"
Sprung Load at Wheel	630 lb.
Leverage	0.676
Static Wheel Deflection	$7\frac{1}{4}$"
Wheel Rate	87 lb/in.
Periodicity	70 Osc./Min.
Wahl Factor	1.18
Static Stress :	
Mean	71,000 lb./in.^{2}
Wahl.	83,000 lb./in.^{2}
Stress at Max. Bound :	
Mean	106,000 lb./in.^{2}
Wahl	125,000 lb./in.^{2}
Laden Height at Wheel	$\pm\frac{1}{8}$"
Clearance from Choc-a-block at Max. Wheel Bump	0.46"
Section of Coils	5" ± .005"
Number of Free Coils	9
Mean Dia. of Coils	3.75" +.020" —.010"
Rate	190 lb./in.
Free Length	12.9" approx.
Fitted Length	8" ± $\frac{3}{32}$"
Static Deflection	4.9"
Fitted Load	930"
Solid Length	$5\frac{1}{8}$" $5\frac{1}{4}$" Max.
Stress at Solid :	
Mean	113,000 lb./in^2.
Wahl.	133,000 lb./in^2.
Hand of Helix	Unimportant
Finish	—
Material	Silico Manganese Ground Bar

REAR SPRINGS
(Fig. 2)

Description.

Semi-elliptical laminated springs are used which have their fulcrum points offset from centre. The long end of each spring is fitted towards the rear of the car.

The springs are provided with bonded rubber bushings at either end and are shackled at their rear extremities to silent bloc bushings in each chassis side member.

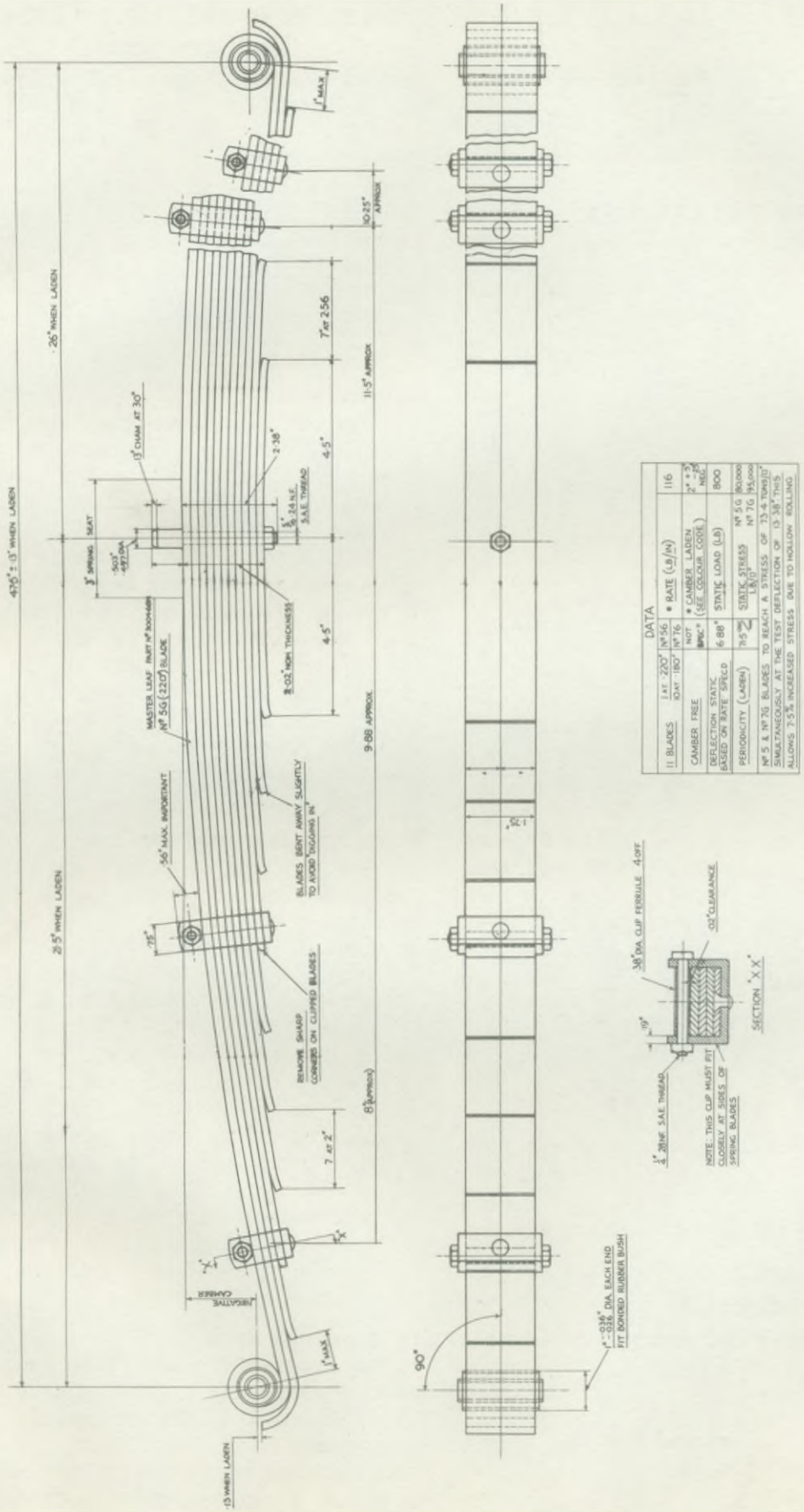
The spring used with the Saloon is shown in Fig. 2, together with relevant data. A slightly heavier spring is used for the " Pick up " and Van, whilst yet another spring is used on the Estate Car. The data for the two latter types of springs are given below.

DATA FOR VAN & PICK UP
(Comm. No. V.1—V.96429).

Loaded Centres (inches)	$47\frac{1}{2} \pm \frac{1}{8}$"
Deflection (static) based on the rate specified (inches)	6.7
Periodicity (laden)	$72\frac{1}{2}$" Osc Min
Number and thickness of blades	15 of .203"
Rate (lb./in.)	195
Camber Laden	$2\frac{1}{2}$" NEG. (Nominal)
Static Load (lbs.)	1,320
Static Stress with No. 6G Blades (lbs./sq. in.)	86,500

Comm. No. V.96430 and Future.
Detail 300469.

Loaded Centres	47.5" ± .13"
No. of Blades	14 of .203" (No. 6G). 1 of .238" (No. 4G).
Deflection (Static) Based on Rate Specified	6.5"



DATA

11 BLADES	1 AT 220" 10 AT 180"	Nº 5G Nº 7G	116
CAMBER FREE		* CAMBER LADEN (SEE COLOUR CODE)	2° ± 3° -2° NEG
DEFLECTION STATIC BASED ON RATE SPECD		STATIC LOAD (LB)	800
PERIODICITY (LADEN)	115	STATIC STRESS LB/IN² Nº 5G Nº 7G	80,000 95,000

Nº 5 & Nº 7G BLADES TO REACH A STRESS OF 73·4 TONS/IN² SIMULTANEOUSLY AT THE TEST DEFLECTION OF 13·38" THIS ALLOWS 7·5% INCREASED STRESS DUE TO HOLLOW ROLLING

DETAIL 3004468

Fig. 2. Rear road springs fitted to "Vanguard" Saloon

Periodicity (Laden)	73.5 Osc/Min.
Rate (lb./in.)	203
Camber Laden.	2.5″ Neg. (Nominal)
Static Load (lbs.)	1320
Static Stress (lbs. sq. in.)	No. 4 G.—78,000 No. 6 G.—91,400

DATA FOR ESTATE CAR

Comm. No. V1—V.100433.
Detail 60958.

Loaded Centres	47.5″ ± $\frac{1}{8}$″
No. of Blades	10 of .203″ 2 of .180″
Deflection (Static)	
Based on Rate Specified	6.45″
Periodicity (Laden)	74 Osc/Min.
Rate (lbs. ins.)	155
Camber (Laden)	2″ Negative (Nominal)

Comm. No. V.100434 & Future.
Detail 300470.

Loaded Centres	47.5 ± .13″.
No. of Blades	10 of .203 (No. 6G.) 1 of .238″ (No. 4G.)
Deflection (Static)	
Based on Rate Specified	6.33″
Periodicity (Laden)	74.5 Oscillations per Min.
Rate (lbs./ins.)	158
Camber (Laden)	2″ Neg. Nominal
Static Load. (lbs.)	1000
Static Stress (lbs. per sq. in)	No. 4 G.—81,700 No. 6 G.—94,000

DATA FOR SALOONS.

Comm. No. V1—V.61807.
Detail 60195.

No. of Blades	12 of .180″
Deflection (Static)	
Based on Rate Specified	6$\frac{7}{8}$″
Periodicity (Laden)	71$\frac{1}{2}$″ Osc/Min.
Rate (lbs. ins.)	116
Camber (Laden)	2 $+\frac{1}{2}$″ $-\frac{1}{4}$″
Static Load (lbs.)	800
Static Stress (lbs. per sq. in.)	89,000

Comm. No. V.61807—V.97700.
Detail 300198.

Data as for Detail 60195 with exception of Laden Camber, which is 2$\frac{1}{2}$″ $+\frac{1}{2}$″ $-\frac{1}{4}$″ Neg.

Comm. No. V.97701 and Future.
Detail 300468.

Data as indicated in Fig. 2.

DATA FOR TRIUMPH "RENOWN."

Detail 300283.

Loaded Centres	47.5″ ± .13″
No. of Blades	6 of .180″ (No. 7G). 9 of .165″ (No. 8G).
Deflection Static	
Based on Rate Specified	6.9″
Periodicity (Laden)	71 Osc/Min.
Rate (lbs./ins.)	132
Camber (Laden)	2.31″ NEG.
Static Load (lbs.)	910
Static Stress No. 7G. (Lbs. per sq. in.)	76,400 93,000

Lubrication.

The only lubrication required is for the road leaves, and under no circumstances should an attempt be made to lubricate the bonded rubber bushings or the silent bloc bush in each chassis side member.

Over-lubrication of the spring leaves is not recommended, it merely being necessary, after the springs have been cleaned, to brush the leaves at the edge with engine oil, when sufficient of this oil will penetrate between the leaves to provide interleaf lubrication. Lubrication of spring blades is chiefly required at the ends of the leaves, where one presses upon the next, and where the maximum relative motion between the leaves takes place.

To remove rear road springs.

1. Jack up rear of car and fit chocks under front wheels.
2. Remove road wheels.
3. Detach nuts from "U" bolts securing springs to rear axle casing. Leave shock absorber arms attached to bottom spring plate.
4. Whilst supporting rear axle on a jack remove the shackle pins at either end of each spring. To clear the way for the removal of the front shackle pin on the right-hand side of the chassis it will be necessary to release the three exhaust tail pipe support clips and to lower the rear of the silencer and its tail pipe slightly, thus enabling the use of a drift on the pin in question.

To dismantle springs.

In general, the best procedure to adopt when dealing with a spring which has settled badly, or where blades are broken, is to fit a replacement.

In some cases, however, it may be impossible to obtain a replacement without delay and a

repair of the existing spring may then be necessary.

We do not recommend resetting of road springs, as such repairs are rarely satisfactory, but where such resetting is unavoidable it should be carried out by a competent spring-maker, after reference to the data given earlier in this section.

Where, in spite of the remarks made in the previous paragraphs, it is found necessary to dismantle a road spring, proceed as follows :—

1. Remove the four spring clips.
2. Remove the centre bolt and dismantle spring.
3. Clean and examine blades for cracks or breakages. Cracks or breakages will most likely occur towards the bolt hole in each blade, where the maximum stress occurs. Replace bent or worn centre bolts.

To reassemble.

The only provision our Spares Department make for these springs, other than complete replacements, is the supplying of the master blade. Where blades other than the master leaf have to be replaced, therefore, a local source of supply will have to be sought.

If, for any reason, it is impossible to obtain a replacement spring complete, and blades, other than the master leaf, have to be fitted, the replacement used should be of the same thickness and have substantially the same free curvature as the remaining leaves. If this latter condition is not fulfilled and a thicker leaf is used, it will be more highly stressed when the spring is in use. Similarly, if the replacement used has more free curvature than the rest of the blades, it will be subjected to more bending and undesirably stressed.

Where springs have settled, and an examination fails to disclose any damaged or broken blades, it is usually preferable, in the absence of a replacement spring, to add an additional spring blade rather than to attempt to have the spring reset. The extra blade should be chosen to be as long as possible, consistent with fitting into the body of the spring without another leaf over-lapping it and leaving a gap. When fitting an extra blade in this manner, it will be necessary to ensure that the spring " U " bolts are long enough to accommodate the extra blade, and, as far as the clips are concerned, it will be most likely necessary to manufacture fresh ones to take the additional blade thickness.

When reassembling spring, liberally smear the surfaces of the blades with a graphited grease if available.

When a spring clip has to be riveted to a leaf, the sliding surface should be filed flush and smooth and it is important that the clips are correctly located.

1. With rear end of springs trailing insert the front shackle pins, but do not yet tighten up the nuts.
2. Raise the rear ends of springs and fit the shackle pins through spring and shackles, but do not yet tighten nuts.
3. Position spring packing plate on the centre pin dowelled head, on the side remote to the steering unit only for Standard Models, but on both sides where a Renown Model is being serviced. Lower the banjo casing on to the springs, engaging the respective spring centre pin with the hole in each banjo bracket. Position the shock absorber anchor plates so that the hole in each of these fits over its respective spring pin nut. Install " U " Bolts and Rubber Buffers, fit Simmonds self locking nuts and plain washers, securing these nuts with a $\frac{5}{8}$" A/F Spanner.
4. Fit road wheels and remove jacks, thus placing the weight of the car on to the springs.
5. Now that the weight is on the springs, the shackle pin nuts should be securely tightened with four persons in the car. This delayed tightening of the shackle pin nuts ensures that the bonded rubber bushes will be secured in their neutral position of twist.
6. The same delayed tightening of shackle arms is necessary to ensure the proper securing of the " Silent Bloc " bushings in the chassis side members.

SHOCK ABSORBERS

Description.

The rear road springs, by reason of interleaf friction, tend to damp out the oscillation of the rear axle, but in the case of the front springs used on the " Vanguard " no such damping is provided.

In the case of the rear springs, the damping provided requires supplementing by shock absorbers or, as their manufacturers prefer to call them, " dampers." As far as the front springs are concerned, in the absence of any damping at all, the shock absorbers or " dampers " become an essential part of the front suspension system.

Two different types of " shock absorbers " or " dampers " are used with the " Vanguard " models. One of these is manufactured by Messrs. Armstrong's Patents Co. Ltd. and the other by Messrs. Girling Ltd. These two types of " dampers " must be fitted as a complete set or as a pair for the front or rear of the car.

ARMSTRONG HYDRAULIC SHOCK ABSORBERS

(Figs. 3 and 4)

This shock absorber has two equal sized cylinders, with steel pistons which are reciprocated through short connecting rods, the connecting rods are coupled to a rocking beam which is fixed on a spindle. The rocking beam's spindle is oscillated by an external lever which is connected, in the case of the rear dampers, by a link to the axle. With the front dampers, the rocking beam's spindle is double-ended and the lever fitted at either end of the spindle forms the upper arms for the front suspension units.

An upward bump of the road wheels causes one piston to descend so building up pressure in that cylinder. The pressure is transferred through a port to a valve chamber and, according to the predetermined strength of a spring above the conical bump valve, this valve is forced off its seating, thus allowing fluid to flow through a further port to the other cylinder, the piston which rises as the bump piston descends.

When the axle returns violently, or rebounds, after a heavy bump the raised piston descends with great rapidity and pressure is built up in its cylinder and is transferred back to the valve chamber. In this direction the fiuid flows into the hollow conical bump valve through radial holes (see Fig. 5) and impinges upon the conical surface of the rebound valve which is held by another spring on the lower end of the valve spindle. This rebound valve then opens and the fiuid passes back through the port to the bump cylinder. The resistance to sudden movement depends on the strength and adjustment of the two valve springs.

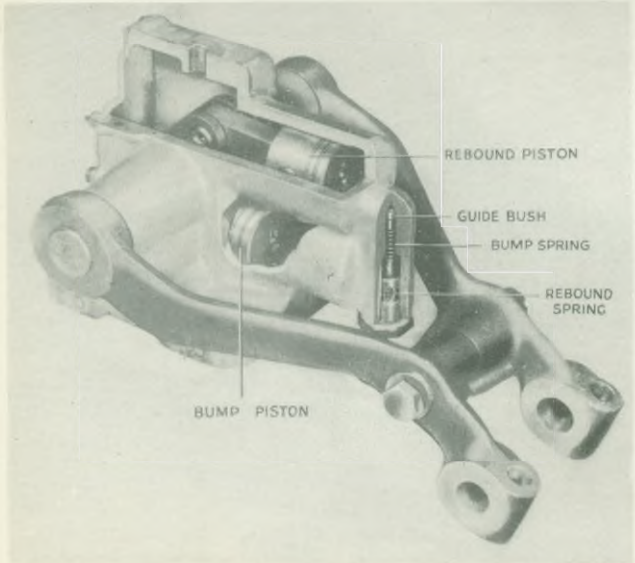


Fig. 3. Armstrong front shock absorber

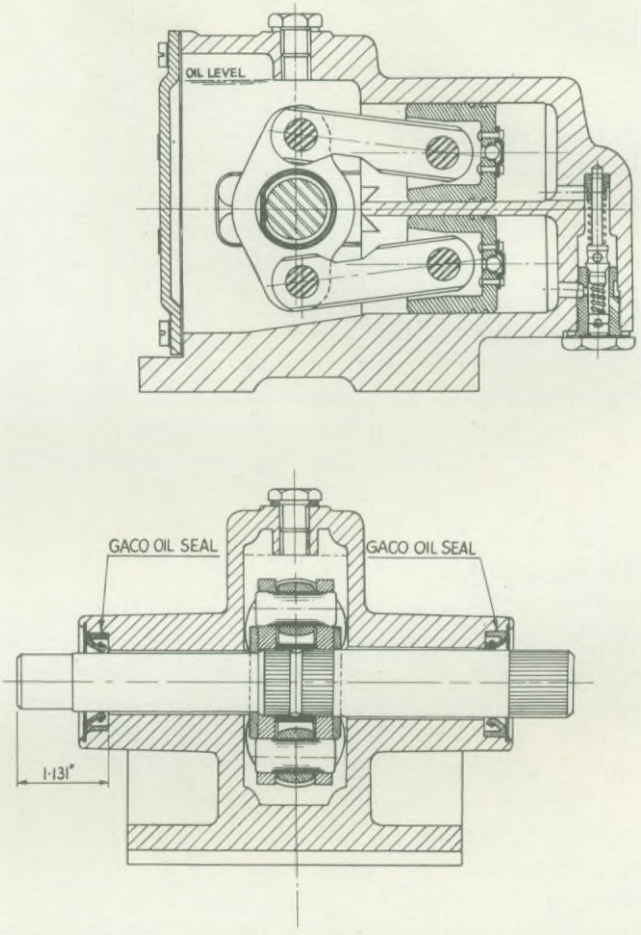


Fig. 4. Sectional arrangement of Armstrong front shock absorber

Under smooth road conditions, where only small deflections of the axle are encountered and, consequently, small piston travel is experienced, provision is made for the passage of fluid from one cylinder to the other, by means of a small " bleed " slot on the collar abutting the bump valve cone. Thus the passage of fluid from one cylinder to the other is permitted without actual operation of the valves. The size of this " bleed " path is obviously a critical factor in the operations of this Shock Absorber and having been calculated, after careful experimental work, for the particular model, should not be altered without guidance from the manufacturers of these components.

Similarly, the strength of the valve springs, decided by the manufacturers, will give the best results for all normal use and any alterations required to meet special circumstances should only be made after recommendations of the Manufacturer concerned.

Maintenance of Armstrong Shock Absorbers.

This damper calls for very little maintenance attention and is limited to the checking of mounting bolts, etc., and of the fluid level, where the operation of the absorber is suspect and there are signs of external leakage. Where leakage is appreciable, and this cannot be rectified by attention to cover plate screws or filler plug, the absorber should be replaced. On the other hand, if leakage is on an insignificant scale and can be met by " topping up " at infrequent intervals, the necessity will no doubt be preferred to the cost of a replacement unit.

Where it is necessary for any reason to " top up " an Armstrong Damper, the type of fluid used should be Armstrong Shock Absorber Oil No. 549, or in the case of Overseas Agents, where this fluid may not always be obtainable, by one of the alternatives recommended in the " General Data " Section of this Manual. The correct fluid level should be such as to bring this up to the bottom of the filler plug hole, as shown in Fig. 4.

Defects in these components, as previously indicated, are best met by fitting replacements, alternatively the advice of a local agent of the manufacturers should be obtained, if it is impossible to consult the manufacturers themselves.

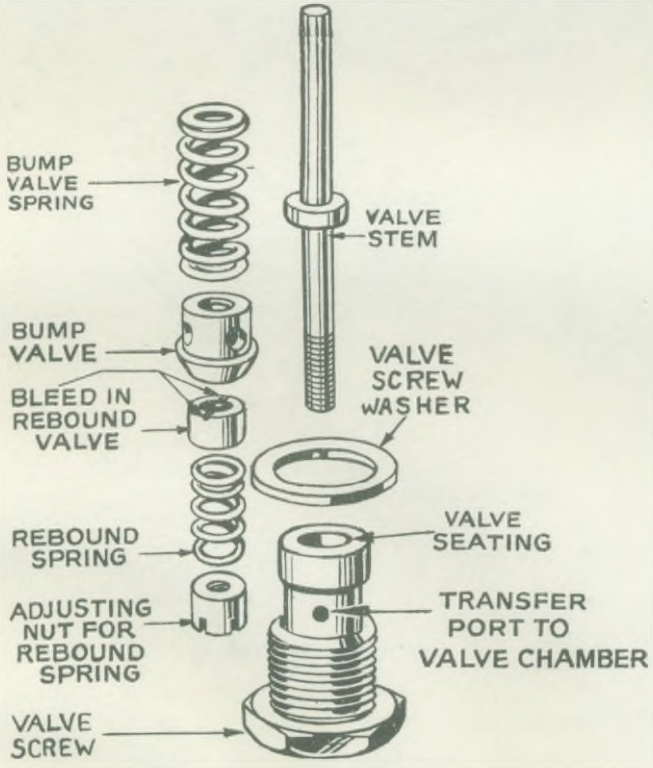


Fig. 5. Valve arrangement for Armstrong damper

THE GIRLING P.V.A. TYPE HYDRAULIC DAMPER

Description.

This damper comprises a cast-iron body in which operate two cast-iron pistons flexibly linked together and actuated by a hardened steel rocker arm bearing on hardened steel pads as shown in Fig. 6.

The cylinder and pistons being of the same material ensures that a constant clearance is maintained between pistons and cylinder walls at all temperatures, thereby contributing materially towards consistent performance.

The make up valves have been designed so that no flexing of the steel discs takes place in operation. This obviates fractured valves which sometimes gave trouble in the earlier types of this damper.

The high-pressure valves in the P.V.A. type damper are located in a separate chamber (see Fig. 7) in the main body of the damper and are especially designed to facilitate accurate settings. This type of valve is far less susceptible to the presence of small particles of dirt or solid matter than the original disc valves employed in previous piston types, and by their location in a separate chamber, end-to-end discharge of the working chambers is assured, so that even at the highest piston speeds there will be positive and immediate filling of each working chamber in readiness for the next stroke in the reverse direction.

Any wear between piston and rocker is taken up by the high tensile steel spring connectors which can be seen in Fig. 7. As there is a free and ample passage for fluid through the make up valve of the returning piston, there is a minimum of drag which prevents the occurrence of hydraulic knocks.

For the sealing of the cylinders, the use of gaskets has been avoided and both cylinder ends

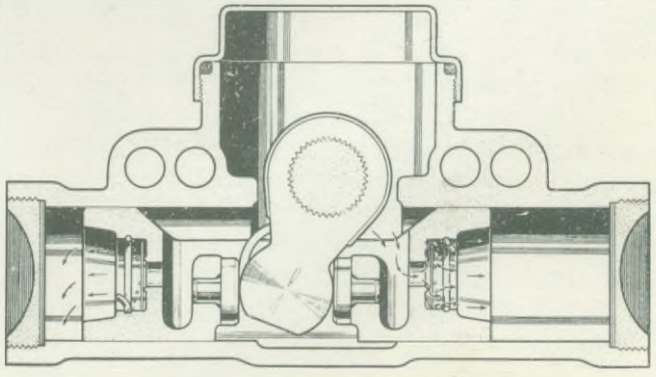


Fig. 6. Section through working chamber of Girling damper

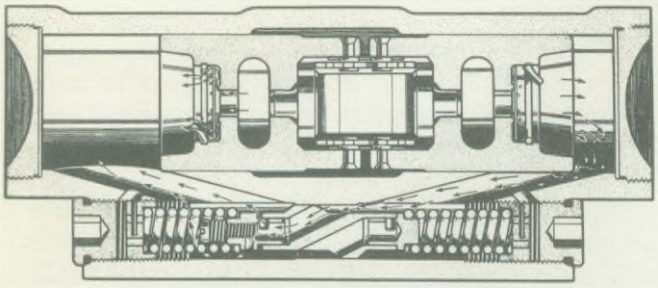


Fig. 7 **Girling hydraulic damper type P.V.**

are closed by special steel inserts, which ensures complete closure and freedom from leaks.

The normal type of robust forged steel linkage is used, fitted with tight rubber bearings. This linkage is the same as that used on the earlier PR and PV piston type dampers and most of these earlier movements can be replaced by that type now under consideration.

Operation of damper.

As irregularities in the road surface are encountered, and the vehicle suspension is thereby deflected, rotary movement of the rocker in the damper actuates the pistons in the working chamber.

Movement of the piston towards the end of its chamber forces the fluid through a channel into the valve chamber, which is cast integrally with the main body. On generation of sufficient pressure, the fluid lifts the spring-loaded sleeve valve off its seating and escapes to low-pressure side of the main chamber. While one piston is forcing the fluid at high pressure through the sleeve valve concerned, the pressure in the other cylinder falls, allowing the make up valve to open in order to recuperate the small volume of fluid that has escaped past the piston, into the reserve chamber, thus maintaining the pressure chambers full of fluid ready for a change in direction of movement and reversal of the direction of flow of the fluid.

To control the bleed for slow movement of the rocker, a bleed valve is incorporated in the valve body. This valve, which operates for "bump" and "rebound," is preset before leaving the factory.

Under no circumstances should any attempt be made to interfere with these adjustments, as the riding qualities of the car will be impaired and damage may be caused to the unit.

No responsibility will be accepted by the manufacturers for dampers where unauthorized adjustments have been made.

THE PVA/X TYPE DAMPER

(See Fig. 8).

This damper functions in a precisely similar manner to the P.V.A. type already described and the internal design is the same.

This type of damper is fitted to the front suspension units and is provided with a double-ended rocker shaft. The double-ended rocker shaft accommodates the upper wishbone of the front suspension units.

In view of the greater stresses to which this body is subjected, as an essential part of each front suspension unit, it is of sturdier construction than that for the rear suspension and has four fixing holes instead of two.

No attempt should be made to dismantle this linkage, and the whole unit should be returned to Messrs. Girling Ltd., or one of their agents, for repair or replacement.

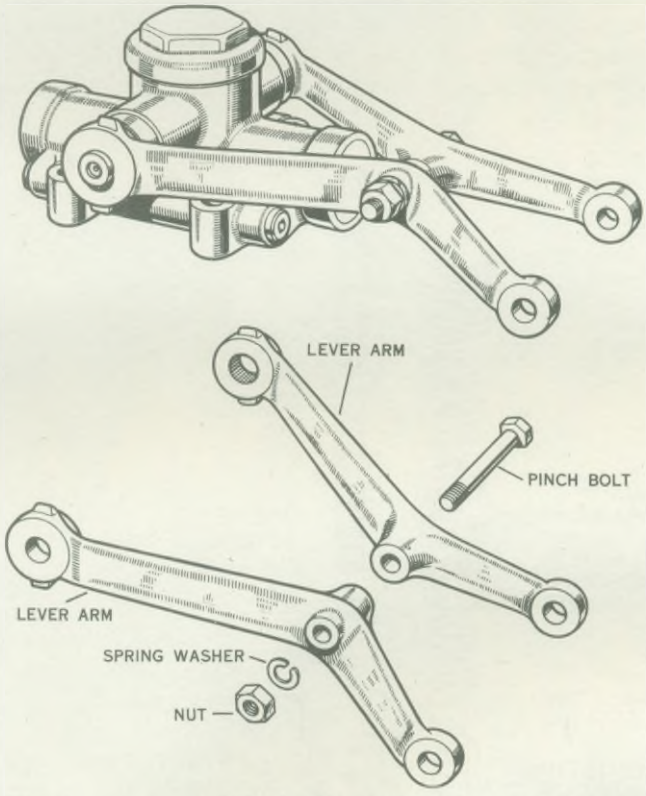


Fig. 8. **P.V.A./X type Girling front damper**

Maintenance.

The only attention required on the chassis is the periodical examination of the anchorage to the chassis, tightening the fixing bolts as necessary.

Connecting link bearings will last for considerable periods, but are normally renewed when complete overhauls are being carried out. Details for renewal of these parts are given later in this section.

Dampers should be topped-up with Girling Piston Type Damper Thin Oil occasionally as explained below.

Testing.

When the question of vehicle suspension is under consideration, the chassis springs and tyre pressures should be first checked.

If the dampers do not appear to function satisfactorily, an indication of their resistance can be obtained by carrying out the following check :—

Remove the dampers from the chassis. (For removal of the dampers fitted to the front of the car refer to " Front Suspension " section).

Bolt the damper to a suitable plate, using the fixing lugs for this purpose. Under no circumstances should the damper be gripped directly in the vice as this will distort the unit.

Move the lever arm up and down slowly through its complete stroke, when as even resistance throughout should be experienced.

If, on the other hand, the resistance is erratic, and free movement of the lever arm is noted, it may indicate lack of fluid.

If the addition of fluid (added as detailed below) fails to correct the erratic resistance mentioned above, a replacement damper should be fitted.

Too much resistance—when it is not possible to move the lever arm slowly by hand —possibly indicates a broken internal part, or a seized piston, in which case the assembly should be replaced.

Topping up with fluid.

The necessity for " topping up " should only arise where serious leakage is occurring, of which there will be obvious external signs. Unless this can be simply rectified, a replacement unit should be fitted. Where leakage is slight, the infrequent necessity for " topping up " will, no doubt, be preferred to the cost of replacing the unit.

Where it is necessary to " top up " for any reason, proceed as follows :—

Remove the complete assemblies from the chassis and place in a vice using a suitable clamping plate.

Before removing the filler cap completely clean the exterior of the damper to ensure that no dirt or foreign matter enters the movement through the filler plug hole.

Use only Girling Piston Type Damper thin oil. In this connection the correct oil is made up and distributed on behalf of Messrs. Girling by Messrs. C. C. Wakefield Ltd.

Whilst adding fluid the lever arm must be, worked throughout its full stroke to expel air from the pressure chamber.

Top up with fluid until level with the top of the body. (The unit cannot be overfilled).

When refitting damper to the chassis after bolting in position, but before reconnecting links, work the arm through the full stroke to make sure no air is present.

If for any reason it is not possible to remove the dampers from the chassis, these precautions are essential :—

(a) The unit must be thoroughly cleaned before the filler cap is moved.
(b) A shield should be placed over the unit before the cap is removed in order to protect the unit and not withdrawn until the filler cap is replaced.
(c) The filler cap must be absolutely clean internally and externally. (Restrictions at the present time do not allow the supply of small cars with a special filler spout.)
(d) Use only Girling Piston Type Damper Thin Oil, available from Messrs. C. C. Wakefield Ltd.
(e) For the removal of the filler cap Girling Spanner No. T.1562 should be used (see Fig. 9).

Special precaution when changing front shock absorber.

It is particularly important, when fitting replacement front shock absorbers to ensure that that the correct type of arm is fitted.

At Commission Nos. V.90234 and V.90486, respectively, for Girling and Armstrong equipment, shock absorbers having a more curved type of arm, are fitted. The arms were cranked with a view to increasing the vertical range of front wheel movement. With the greater range of vertical movement a reduction in the front spring abutment brackets was necessary and is explained in Service Bulletin No. V.41G. Whilst it is possible to fit the earlier shock absorber with the modified frame, it is not possible to fit the later shock absorber with the earlier frame, as the vertical links with the greater wheel movement will strike the outer edge of the front spring abutment bracket.

It is obviously particularly important when

ordering replacement shock absorbers for a vehicle with an earlier number that those quoted above, to quote the number of the car for which they are required. The two different types of arms are shown in Fig. 10 as also are the modified and unmodified bracket.

Fig. 9. Special ring spanner for removal of tapered hexagonal filler cap for Girling damper

FURTHER NOTES ON ROAD SPRINGS

The part numbers for the rear springs, originally fitted to the various models, with the Commission numbers of the cars concerned, are summarized below for the sake of convenience. In a number of cases, where replacements are required, a different detail will now be supplied by our Spares Department. In such cases, the alternative part numbers are given.

Rear road springs fitted to Standard Two Litre models.

Part No.	*Commission Nos.*	*Replacement Part No.*
Saloons.		
60195	V.1—V.61806 . .	300468
300198	V.61807—V.97700 . .	300468
300468	V.97701—V.115434 . .	300468
Estate cars.		
60958	V.1—V.100433 . .	300470
300470	V.100434 and Future . .	300470
Van and Pick-ups.		
60962	V.1—V.96429 . .	300469
300469	V.96430—Series II . .	300469

Series II Details given in Supplement.

Rear springs fitted to Triumph "Renown" models.

Part No.	*Commission Nos.*	*Replacement Part No.*
300283	TDB.1—TDB.6500 . .	300283
104816	TDC.1—TDC.1808 . .	104816
301044	TDC.1809 and Future . .	301044

Front spring Triumph "Renown".

Data for the front springs fitted to this model up to Commission No. TDC.1 is given on Page 4.

Front spring data for Part No. 103820 (TDC.1 and future).

Item.	*Dimension.*
Max. wheel bound . .	At spring outer coil—$2\frac{1}{4}$" At wheel—$2\frac{3}{4}$"
Max. wheel rebound . .	3"
Spring load at wheel . .	673 lbs.
Leverage	.666"
Static wheel deflection	7.9"
Wheel rate	84.4 lbs./ins.
Periodicity	66.7 Osc./min.
Whal. factor	118
	Mean. *Whal.*
Static stress	77,300 91,200 lbs. per sq. inch
Stress at max. bound	110,000 130,000 lbs. per sq. in.
Laden height at wheel. .	$\pm\frac{1}{8}$"
Clearance from choc-a-block at max. wheel bump (spring movement)	.5"
Section of coils . .	5±.005"
Number of free coils . .	9
Mean dia. of coils . .	3.75" $^{+.020"}_{-.015"}$
Rate	190 lbs./inch
Free length	13.3 approx.
Fitted length	$8" \pm \frac{3}{32}"$.
Static deflection . .	5.3"
Fitted load	1,010 lbs
Solid length	$5\frac{1}{8}"$—$5\frac{1}{4}"$ max.
	Mean *Whal.*
Stress at solid	118300 139,600 lbs. per sq. inch
Hand of helix	Unimportant
Material	Silico manganese ground bar

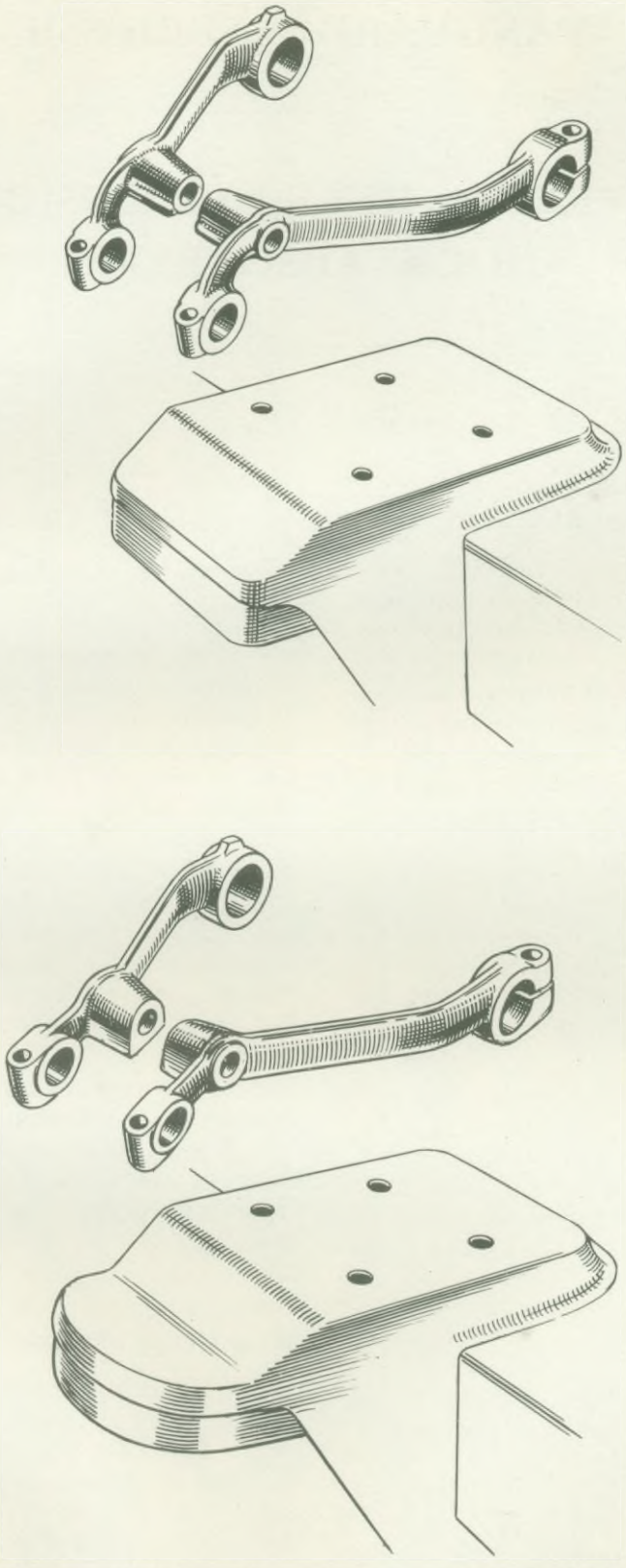


Fig. 10. Showing the two types of front shock absorber arms used with the spring abutment bracket with which they were fitted. The later combination with the curved arm is shown at the top of the illustration

"VANGUARD"—SERIES II

ROAD SPRINGS, REAR SUSPENSION AND SHOCK ABSORBERS

SUPPLEMENT

REAR ROAD SPRINGS

Rear road springs with helper blades are now fitted with these models and where such springs are used on the SALOON models, stabiliser bars are not fitted.

With the Van and Pick-up models, stabiliser bars are dispensed with on the introduction of Series II models and before the embodiment of helper blades in the road springs, which are, however, to be fitted as soon as supplies become available.

With the ESTATE CAR, the rear springs, at the time of going to print, have not been modified to include helper blades, but are scheduled to be so equipped when supplies of suitably modified springs become available. The stabiliser bar will continue to be used with this model, until the modified springs are fitted.

The rear road spring fitted to the Series II Saloon is shown in Fig. 1. The part number of this spring is 301143 and, as can be seen, helper blades are embodied. Fit in pairs.

Details of rear springs fitted on Series II models are as follows :—

Part No.	*Commission Nos.*	*Replacement Part No.*
Saloons.		
301058	V.200001—V.201208 ..	301058
*301143	V.201209 and Future ..	301143
Vans and Pick-ups.		
300469	V.96430 until 301151 becomes available ..	300469
*301151	As soon as available ..	301151

* Fitted with helper blades.

SHOCK ABSORBERS

Front shock absorbers—Armstrong Type I.S.10.

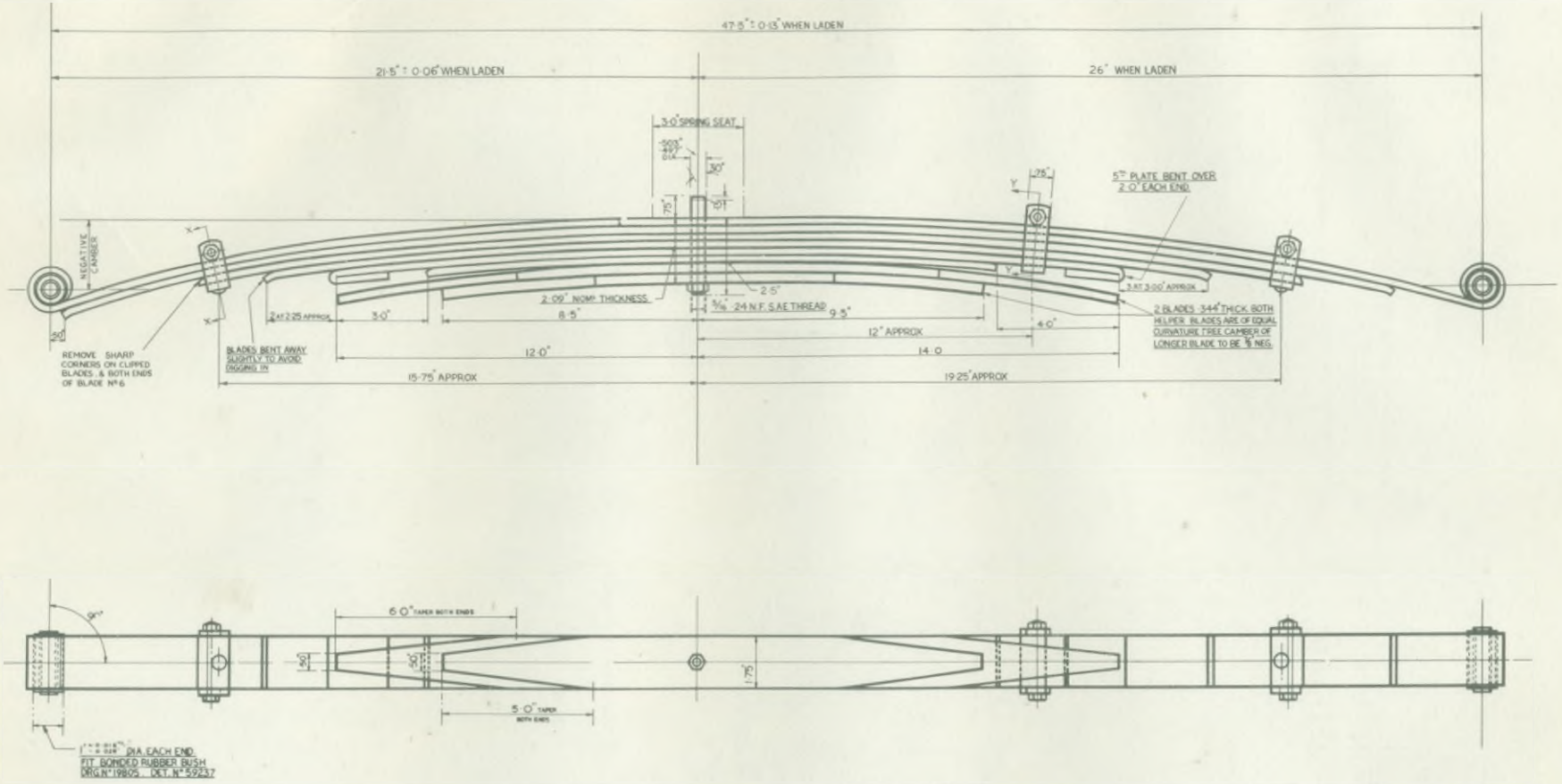
A slight modification in the design of the Armstrong front shock absorbers, introduced at Commission No. V.200001 which, whilst not affecting interchangeability, does alter the appearance of the unit. The new unit is made from cast iron instead of the white metal alloy previously employed. The change to cast iron has been made to provide better anti-fade characteristics. In view of the fact that interchangeability is not affected, Part No. 201302 is retained for the later component. The later type of shock absorbers may be identified by the cast iron casing and the fact that its cover plate slopes backwards instead of being vertical. Fig. 2 may be compared with that for the earlier component illustrated in the main body of the manual.

Whilst interchangeability between these two different absorbers is permissible, each type is better paired and should, where possible, be so assembled.

Rear shock absorbers.

The Girling make of shock absorber fitted to the Series II model remains as used with the Series I models, but with the component manufactured by Messrs. Armstrong. At Commission No. V.201240 the Type DAS.10 fitted to the Series I models was discontinued and a modified assembly, Type DAS.10R, was introduced. The modified shock absorber is shown in Fig. 3.

(See over for illustrations)



DATA			
8 BLADES	6 AT 0·234" 2 AT 0·344"	RATE LB/IN (WITH HELPER BLADES REMOVED)	135
CAMBER FREE	NOT SPEC'D	CAMBER LADEN (SEE COLOUR CODE)	NOM. 2·13" NEG.
DEFLECTION STATIC BASED ON RATE SPEC'D	6·3"	STATIC LOAD (LBS)	850
PERIODICITY (LADEN)	75 CPM	STATIC STRESS OF MAIN PLATES (LB/□")	85,300

Fig. 1. Rear road spring Part No. 301143. These springs can be used to replace Part No. 30158, if fitted in pairs

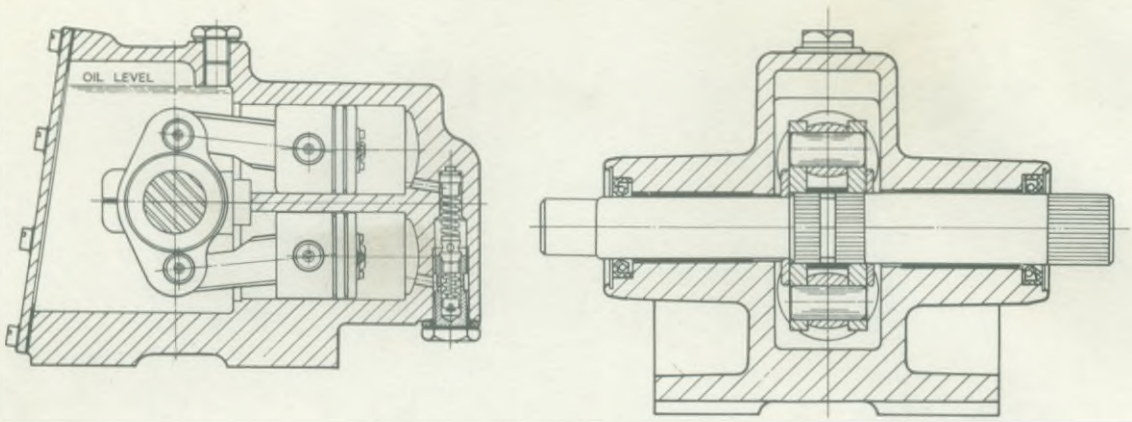


Fig. 2. Sectional arrangement of Armstrong front shock absorber

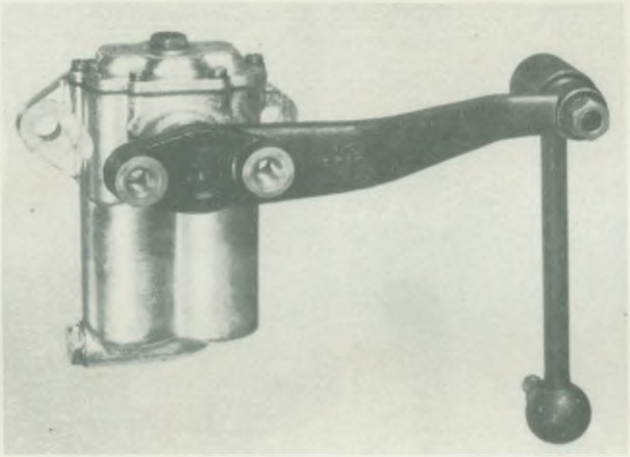


Fig. 3. Armstrong rear shock absorber (Type DAS.10R). Introduced on Series II two-litre models at Commission No. V.201240