

## GROUP V FRONT SUSPENSION

### V 1 Removing and refitting a front suspension assembly

Fig. 1  
1 Tools: Open ended spanners 7/10/11/17/36 mm, screwdriver 10 mm, ring spanners 17/19/22 mm, pliers, hammer, chisel, drift 6 mm, plastic hammer, screw 10x1 mm, tube pieces, washers, commercial-type puller.

Fig. 2  
2 1. Remove wheel cover plate, slacken wheel nuts, jack-up the vehicle.

2. Remove wheel and brake drum.

3. Remove dust cap.  
(open ended spanner 36 mm, large screwdriver or tire lever)

Fig. 3  
3 4. Remove cotter pin from hub nut.  
(cotter pin pliers)

5. Unscrew hub nut.  
(ring spanner 22 mm)

6. Remove wheel hub with the aid of a commercial-type puller.

Fig. 4  
4 7. Remove the spacer washer on steering knuckle (tub axle).

8. Detach brake hose on wheel cylinder.  
(open ended spanner 17 mm)

Fig. 5  
5 9. Slacken two screws fixing wheel cylinder assembly, on inner side of brake support.  
(open ended spanner 10 mm)

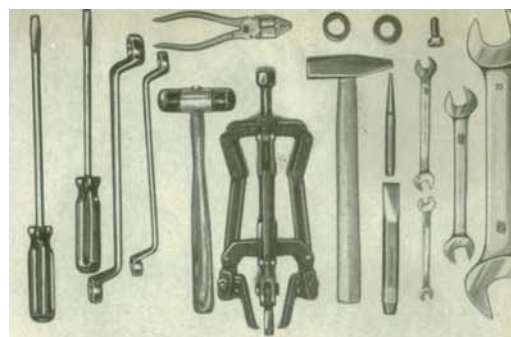
10. Slacken the two screws securing the adjusting cam assemblies, at inside bottom of brake support.  
(open ended spanner 10 mm)

11. Remove rubber cap from bleeder screw.

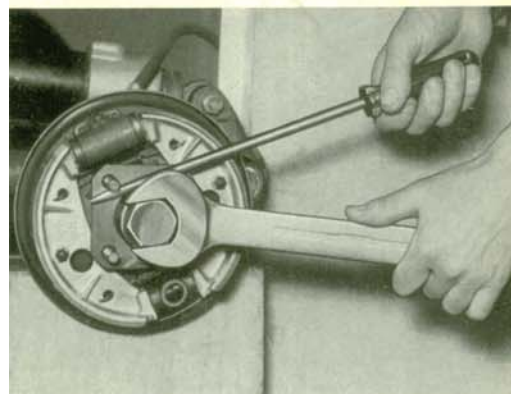
12. Remove brake shoes with wheel cylinder and adjusting cam assemblies.

**Caution:** To remove the brake shoes enter the two forefingers in the center holes, so that the linings will not be soiled by grease or oil.

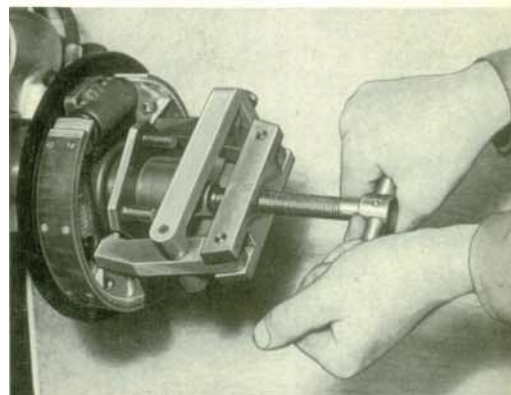
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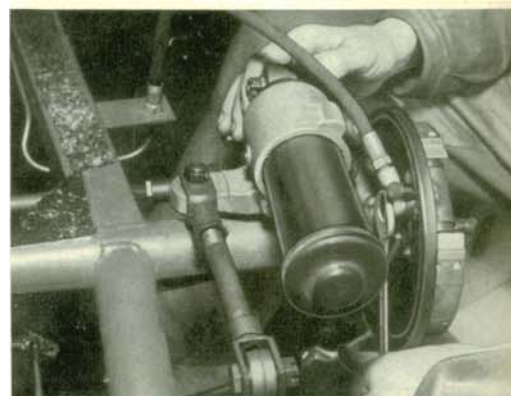
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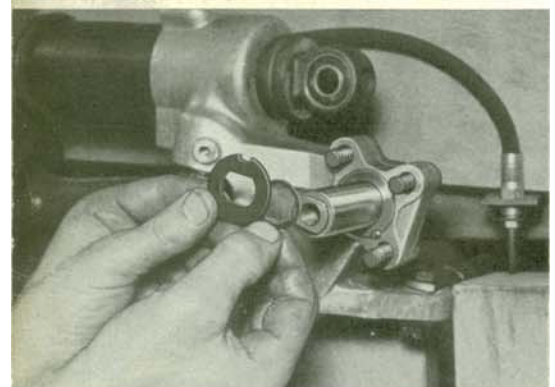
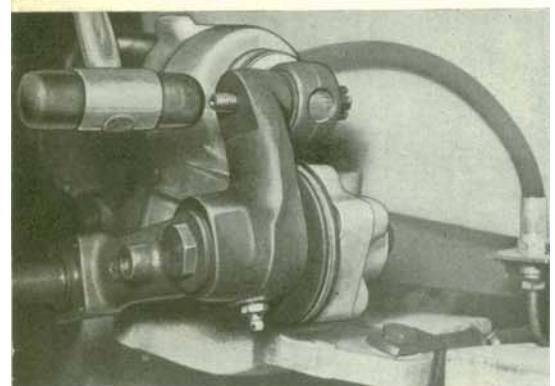
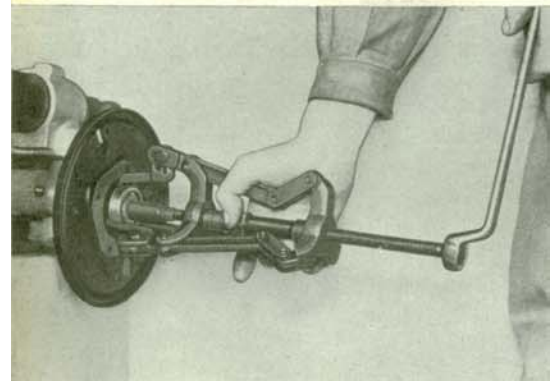
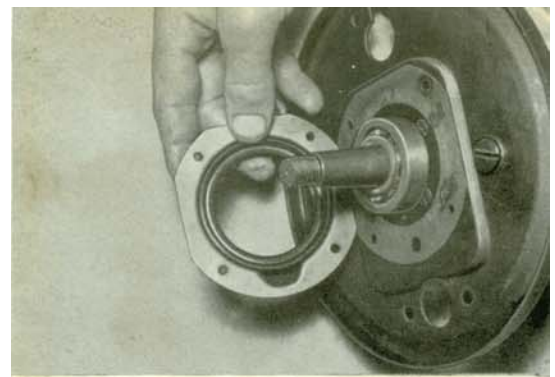
- Fig. 6 13. Remove screws fixing dust cover for oil seal.  
(open ended spanner 7 mm)
14. Remove dust cover and oil seal assembly.
- Caution: When assembling make certain that the recess serving as outlet for the oozing oil is fitted downwards.

- Fig. 7 15. Remove ball bearing from steering knuckle.  
(commercial-type puller)

- Fig. 8 Caution: When assembling replace ball bearing with the aid of a suitable tube piece applied against the inner race of ball bearing.
16. Remove the four slotted-head screws fixing brake support.  
(screwdriver 10 mm)
17. Remove the big slotted-head screw for reception of brake reaction on support plate.  
(large screwdriver)
18. Unscrew the nut from spring rod shaft.  
(open ended spanner 17 mm)
19. Drive out spring rod shaft by means of a plastic mallet or with a brass drift, if very tight.

- Fig. 9 20. Release lock tab of tab washer for swing arm fulcrum shaft.  
(hammer and chisel)
21. Remove screw from swing arm shaft.  
(ring spanner 22 mm)
- Caution: When assembling make certain that the spacer between swing arm shaft and lock plate is fitted correctly. The lock tab of tab washer must be bent down into the recess on the lock plate border.

- Fig. 10 22. Remove swing arm assembly.
- Caution: When pressing a new bearing bush into the swing arm unit make sure that the flange side of bushing points outwards, so that the lubrication hole in swing arm coincides with the annular groove in the bushing.





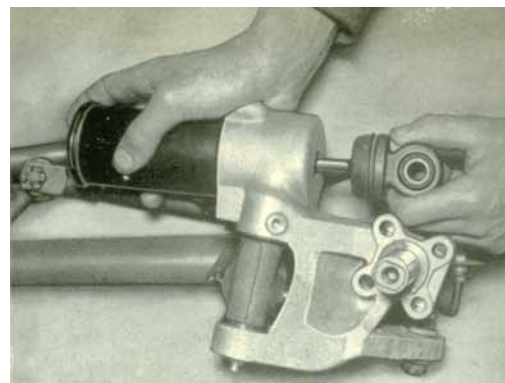
- Fig. 11
23. Remove rubber cap for coil spring.
  24. Remove cotter pin from the spring rod nut.  
(cotter pin pliers)
  25. Unscrew nut from front end of coil spring rod, simultaneously securing the coil spring rod against distortion.  
(ring spanner)
- Caution: See also Group F Springs and Shock absorbers F1 to 2 and 5.
26. Withdraw spring plate and coil spring.
  27. Remove coil spring rod rearwards, remove the spring support bushing with the two rubber buffers by pushing them forward.

- Fig. 12
28. Remove cotter pin from nut securing track rod bolt.  
(cotter pin pliers)
  29. Unscrew the nut from track (tie) rod bolt.  
(ring spanner 17 mm, open ended spanner 17 mm to hold the bolt)
  - 29a On the left-hand front suspension additionally remove cotter pin from nut securing steering drag link bolt, unscrew this nut and remove steering drag link.  
(ring spanner 17 mm, open ended spanner 17 mm to hold the bolt)
  30. Unscrew nut from threaded end of taper key on steering knuckle king pin. (open ended spanner 10 mm)
  31. Unscrew grease nipple from steering knuckle king pin.  
(open ended spanner 11 mm)
  32. Drive out the taper key, using a hammer and finally a drift.  
(hammer, drift)
  33. Remove king downwards pin by means of pull screw M 10 x 1, suitable tube pieces and washers.  
(screw M 10 x 1, open ended spanner 17 mm)

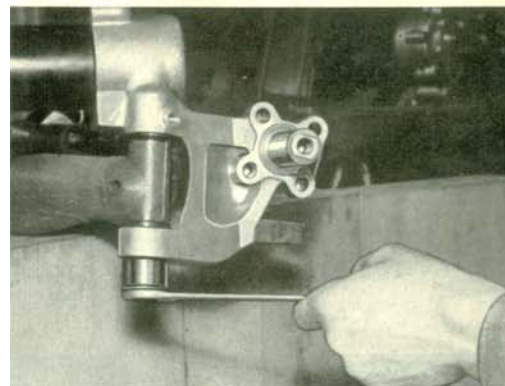
- Fig. 13
34. Remove steering knuckle.
  35. Straighten lock tab of tab washer securing the swing arm shaft.  
(hammer and chisel)
  36. Unscrew nut from swing arm shaft.  
(ring spanner 19 mm)
  37. Remove swing arm shaft with the aid of a press.

- Fig. 14
38. Remove wheel hub ball bearing with the aid of a press.

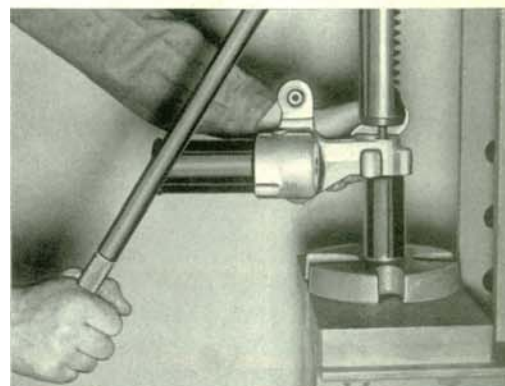
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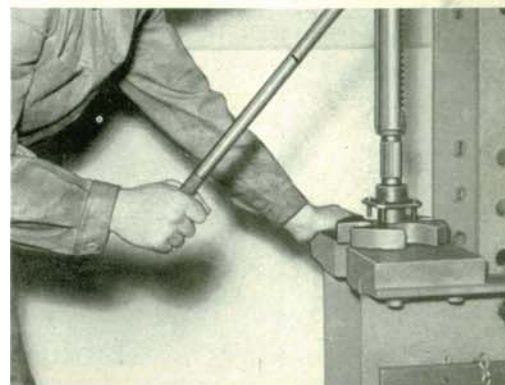
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Fig. 39. Press out, respectively drive  
15 out the king pin bearing bushing.

Caution: To press out this bushing fill the inner space behind the bushing flange with consistent grease to render it airtight and with the aid of the king pin and short blows of a plastic hammer drive the bushing upwards, which will come out through the hydraulic action of the grease stored behind the bushing flange.

V 10/11 Front wheel alignment,  
checking toe-in

Fig. 16 Tools: Toe gauge, ring spanner  
17 mm, cotter pin pliers,  
open-ended spanner 22mm

Fig. 18 1. Jam toe gauge between the two  
front wheel tires.

Fig. 19 2. Set the indicating pointer to the  
zero mark on the quadrant.

Caution: In order to provide a  
clear illustration the adjust-  
ment of the indicator arrange-  
ment is shown with the track (tie)  
rod removed.

3. Pull the vehicle ahead until the  
toe gauge hangs at the same  
height at rear.

4. Read the difference on the toe  
gauge quadrant.

Caution: Toe-in, that is the  
amount the front wheels are  
closer together at the front  
than they are at the rear, should  
be 3 to 5 mm. If the toe-in  
reading is incorrect, check  
front suspension for damages.  
Replace all parts, which are  
damaged, worn or distorted.  
Thereupon measure toe again  
and adjust, if necessary.

5. Slacken lock nut for clevis on  
left-hand end of track (tie) rod.  
(open ended spanner 22 mm)

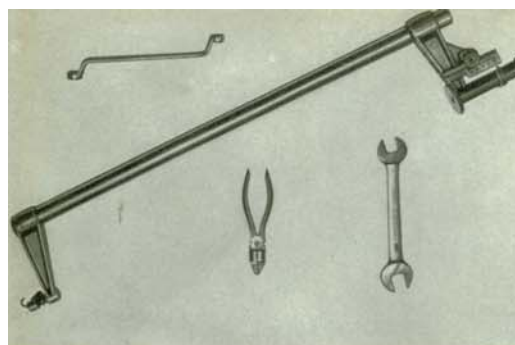
6. Remove cotter pin from nut on  
left-hand end of track (tie) rod  
and unscrew this nut.  
(cotter pin pliers, ring spanner  
17 mm)

Fig. 20 7. Adjust the track (tie) rod clevis  
in order to lengthen or shorten  
the rod. Rotation by 180 deg.  
(1/2 turn = 1 mm of toe altera-  
tion). Clockwise rotation in-  
creases, anticlockwise rotation  
reduces toe-in.

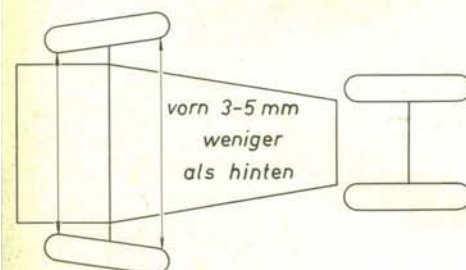
8. Attach track (tie) rod, tighten  
clevis bolt nut and repin, and  
secure with the lock nut.

9. Check toe again.

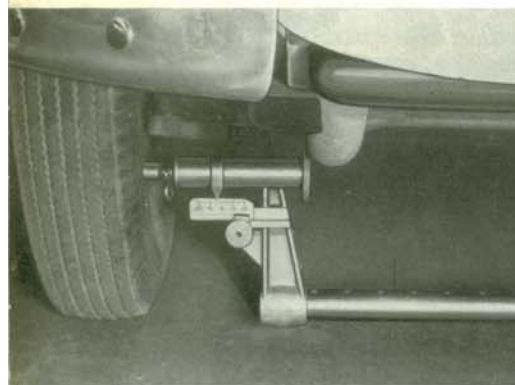
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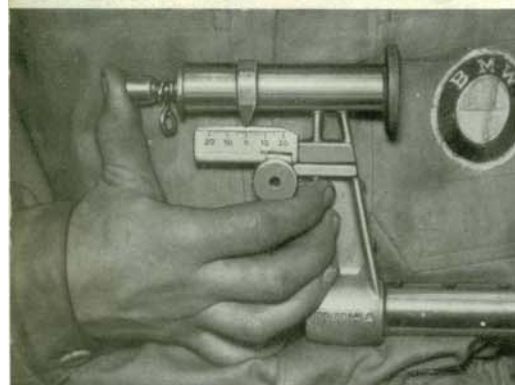
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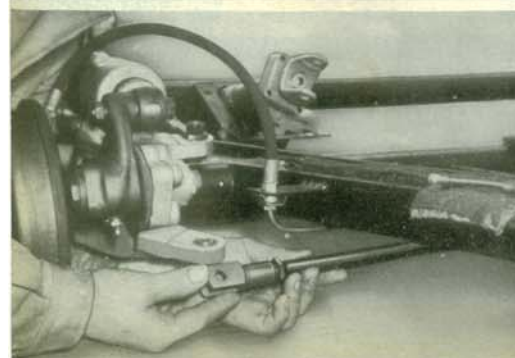
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## Shop Manual Motocoupé BMW Isetta

### Annex for Export Model 57

#### Group V Front suspension

##### V 1 Removing and refitting front suspension assembly (with instructions for repair)

Tools: Ring spanners SW 7/14/17/19/22/36 front suspension spring compressor, socket SW 21, open ended spanners 14/17, 2 screw drivers, hammer, pliers, commercial type hub puller V 5090, brass-drift torque-wrench with sockets SW 19/20, wood block (height 1.3") special reamers 20 mm Ø F 7, 22 Ø H 7, 25 Ø H 7

picture 21

- 1 - Remove hub cap, slacken wheel nuts, jack up front end of vehicle.
- 2 - Remove wheel and brake drum picture 22
- 3 - Remove dust cap picture 2
- 4 - Remove cotter pin from end of spindle and slacken the castellated nut with washer (pliers, socket SW 22)
- 5 - Remove hub assembly by using puller. Remove disk in front of brake holder.

Note: On assembling, check that felt seal assembly is centralized on the hub. If not, loosen the screws again, centralize the felt seal assembly by rotating the hub, retighten screws. On replacing outer ball bearing in the hub, use the same spacer between hub and outer race of bearing, otherwise bearing race will crack or pit.

pictures 24 and 24

- 6 - Detach brake hose on wheel cylinder  
(Only necessary if brake hose, wheel cylinder or backing plate have to be replaced. Bleed brake system).
- 7 - Remove brake shoes by means of a screw driver. Keep hands clean while handling brake shoes. Do not permit oil or grease to come in contact with linings.

Note: When assembling make certain that the big holes in the brake shoes are below the wheel spindle.

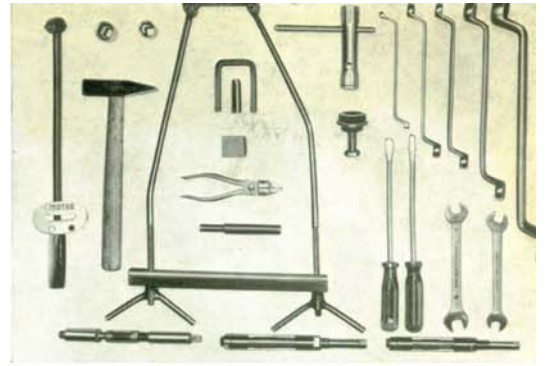
pictures 26 and 5

- 8 - Prevent pistons from leaving cylinders by means of a rubber band (a).

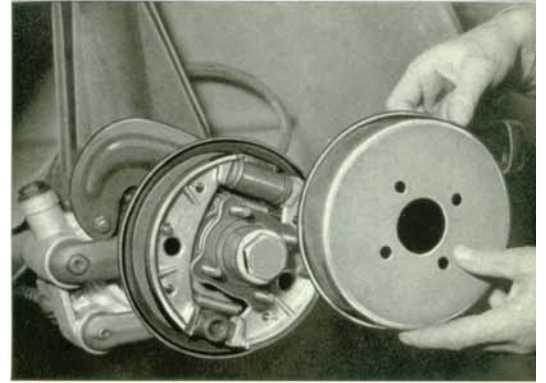
picture 27



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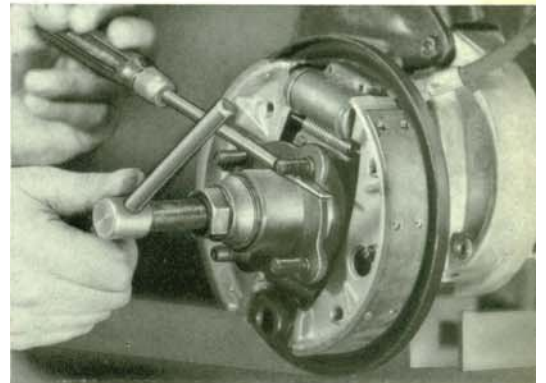
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- 9 - Remove dust cover and oil seal assembly from backing plate only if inner ball bearing is left on wheel spindle and if oil seal or ball bearing have to be checked.

Note: On assembling make certain that the recess serving as outlet for oil leakage is fitted downwards. Recess for right steering knuckle is different from the left-hand one.

- 10 - Remove ball bearing using commercial-type puller.

picture 7

- 11 - After removing cotter pin, unscrew castle nut from track rod, remove bolt and 2 washers.

Note: On assembling, tighten nut when wheels are in straight ahead position.

picture 28

- 12 - Remove steering drag link on the left-hand front suspension.

Note: On assembling tighten nut when wheels are in straight ahead position.

picture 29

- 13 - Unscrew nut from bolt of shock absorber.

Note: When assembling, put wooden block between shock absorber and swing arm and tighten nut to 55 ft/lbs. torque.

picture 31

- 14 - using front suspension spring compressor tighten the 2 wing nuts until the 2 bolts of the housing can be removed easily after unscrewing the nuts. Back off the 2 wing nuts simultaneously.

Note: Tighten nuts of the 2 bolts to 20 ft/lbs. torque

pictures 32 and 33

- 15 - Remove housing and shock absorber

picture 34

- 16 - Unscrew nut and remove backing plate.

Note: When assembling put wooden block between shock absorber and swing arm and tighten nut to 58 ft/lbs. torque.

picture 35

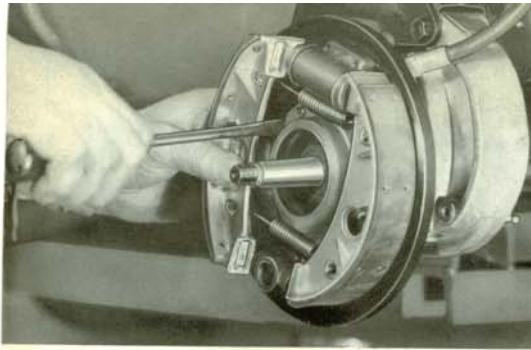
- 17 - Unscrew nut from taper key on steering knuckle king pin. Turn front suspension inside and drive out taper key with a hammer.

Note: Be certain that end of taper key or nut does not contact the swing arm

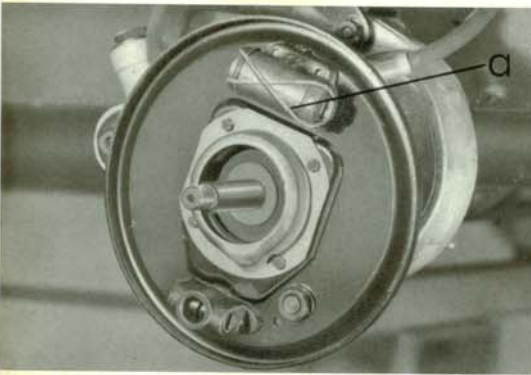
picture 36



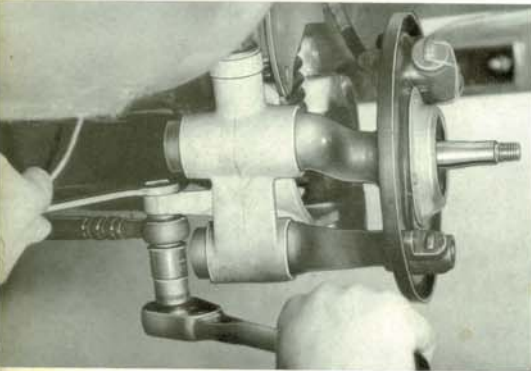
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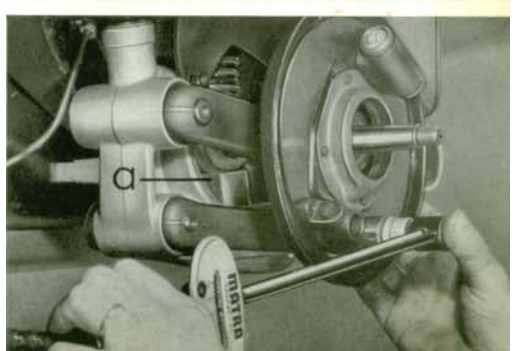
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- 18 - Pry out king pin with 2 screwdrivers.

Picture 37

If it is impossible to pull out king pin, even with the aid of a commercial puller, drive it out upwards by using hammer and drift. Press in upper closed end bushing because the dust cap installed before will not seal a second time.

- 19 - Remove backing plate and rubber seal ring.

Note: When assembling, place rubber seal ring into groove of backing plate, so as to avoid jamming of seal ring.

picture 38

- 20 - Remove swing arm from frame, separate upper and lower spacers.

picture 39

Note: Clearance between swing arm and frame 0.05 mm. On assembling install correct size spacer.

- 21 - Using arbor press and press tool compress spring housing and shock absorber so far that 2 holding down nuts of shock absorber can be unscrewed. Remove washer and rubber stops.

picture 41

Note: Use guide pin on installing spring housing

picture 42

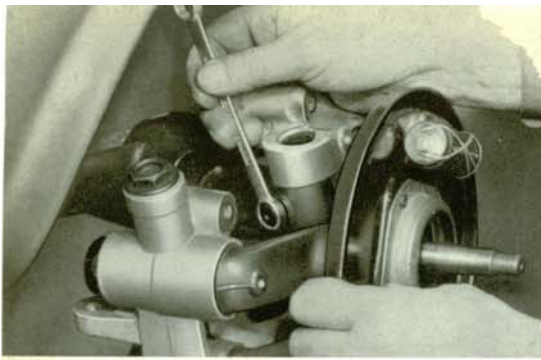
- 22 - Remove spring housing, upper rubber stop (a), washer (b) spring (c) washer (d) grommet (e) spring plate from shock absorber.

Note: When assembling place multirate spring in position with the closed coils toward the spring plate.

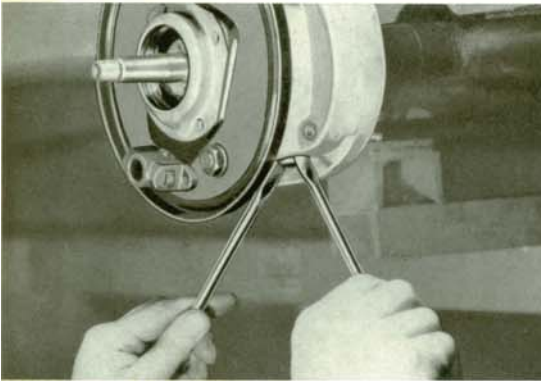
picture 43

- 23 - Test action of shock absorber in vertical position. Shock absorbers are permanently sealed and non-adjustable. If replacement is necessary, remove grommet, stop plate, 3 rubber stops, sleeve from worn shock absorber.
- 24 - If replacement of bushing is necessary, make certain that the bushing shell flushes with the shock absorber eye on one side.

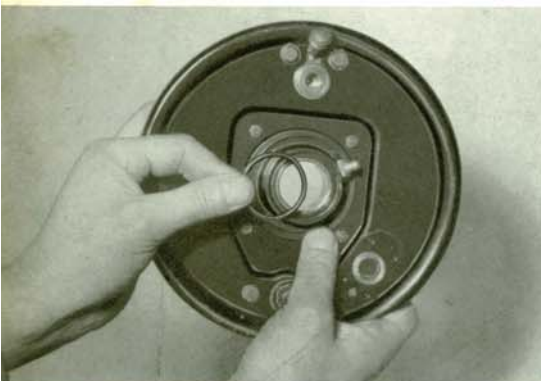
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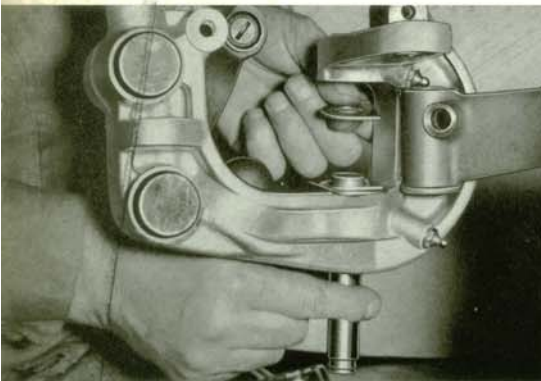
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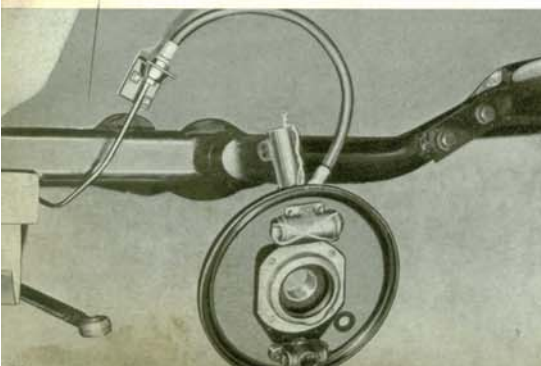
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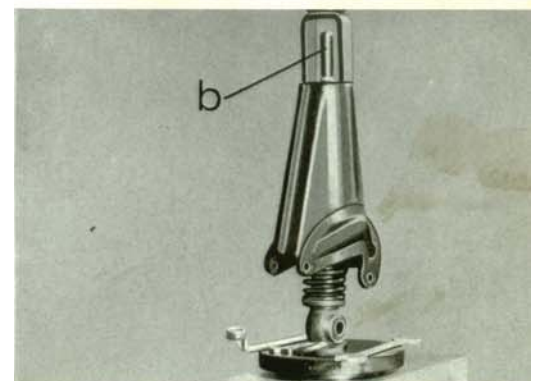
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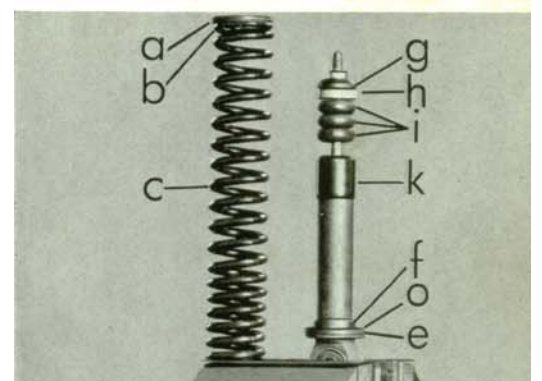
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- 25 - Remove swing arm from steering knuckle housing.  
Remove dust cap.

Note: Replace dust cap with sealing compound

picture 44

Unlock lock washer, unscrew nut, remove washer  
and pull out swing arm. Separate rubber seal ring

picture 45

Note: On assembling, place rubber seal ring into  
groove of swing arm.

- 26 - Remove backing plate support (as described under  
item 25)

picture 46

- 27 - Replace bushings in steering knuckle housing  
a) drive out dust cup from inside, press out  
king pin bushings. Press in bushing and make  
certain that the lower bushing overlaps the  
housing with 1.8 mm. Ream bushings to 20.02 -  
20.04 mm  $\varnothing$

pictures 47 and 48

- b) drive out bushings from swing arm and backing  
plate support.  
Press in bushings so that they will flush with  
the housing outside.  
Ream bushing of swing arm to 25.00-25.02 mm  $\varnothing$   
backing plate support to 22.00 - 22.02 mm  $\varnothing$

picture 49

- 28 - If replacement of rubber bushing in backing plate  
support is necessary, make sure that the measurement  
between the lower face of backing plate and face of  
steering knuckle is 65.5 mm  $\pm$  0.2

picture 50

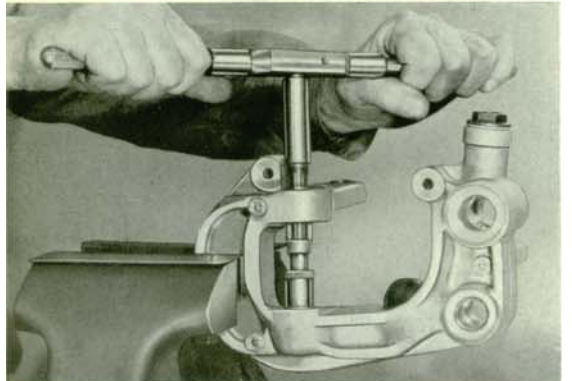
- 29 - Front wheel alignment as described under pictures 16 - 20.



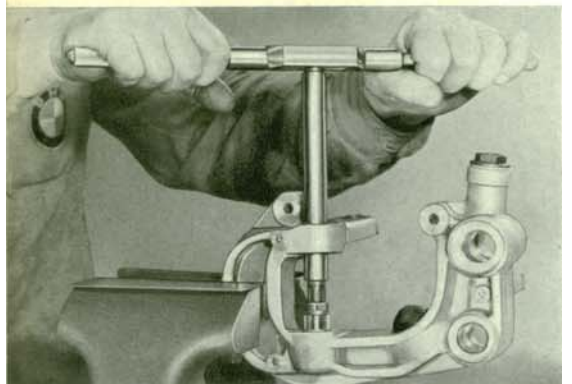
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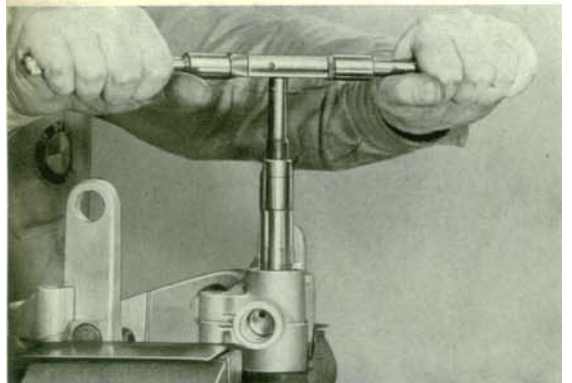
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