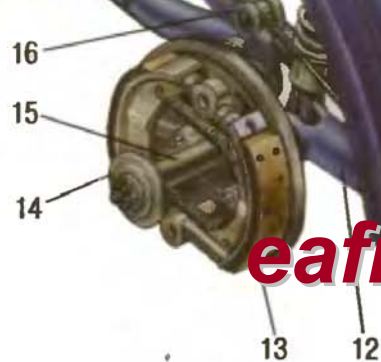




Ural (Урал) - Dnepr (Днепр) Part 2: Russian Motorcycle Rear-Wheel Plungers and Swing-Arms

***(Also See Part 1: Russian Motorcycle Swing-Arms, Part 3: Sidecar Swing-Arms,
Part 4: Swing-Arm Components and Part 5: Repair of Swing-Arms)***



***Ernie Franke
eafranke@tampabay.rr.com
2 / 2013***

Rear Suspension on M-72, M-61 and M-62 (1WD)

- **Plunger Rear Suspension Was the Original Rear Suspension Design: M-72**
 - **Plunger Was Used on M-72, Ural M-61 and M-62**
 - **M-61 and M-62 Plunger Frames Different from the M-72 Frames**
 - **Rear Suspension Bolted Directly to Rear Drive**
- **Next Generation Was the K-750**
 - **In 1958 Kiev Motorcycle Plant (KMZ) Replaced Plunger-Framed M72-N with the Swingarm-Framed K-750**
 - **Essentially the Same Bike with a Swing-Arm Frame Instead of Plunger Frame**
 - **Swing-Arm Is an Improvement in Rear Suspension with Shocks**
 - **K-750 Was a Soviet Improvement on Plunger-Framed R-71/M-72 Design to Better Cope with Roads and Terrain Found Throughout the USSR**
 - **Rear Swing-Arm on Inside of Frame, Unlike Later Ural Swing-Arm Located on the Outside of Frame**



M-72 pioneered the plunger suspension system, but was replaced in the K-750. Ural's M-61 and M-62 also used the plunger suspension system.

005203-n8

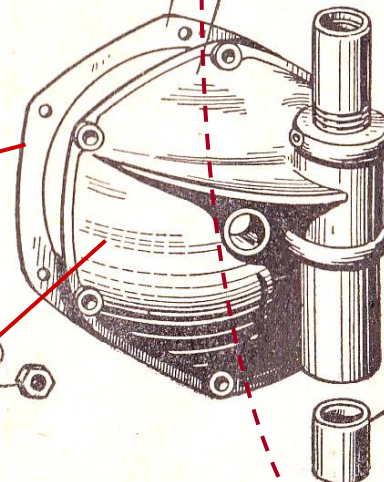
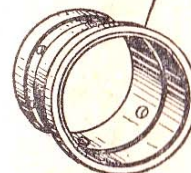
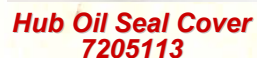
7205116

7205104
Needle Bearing Race

7209206

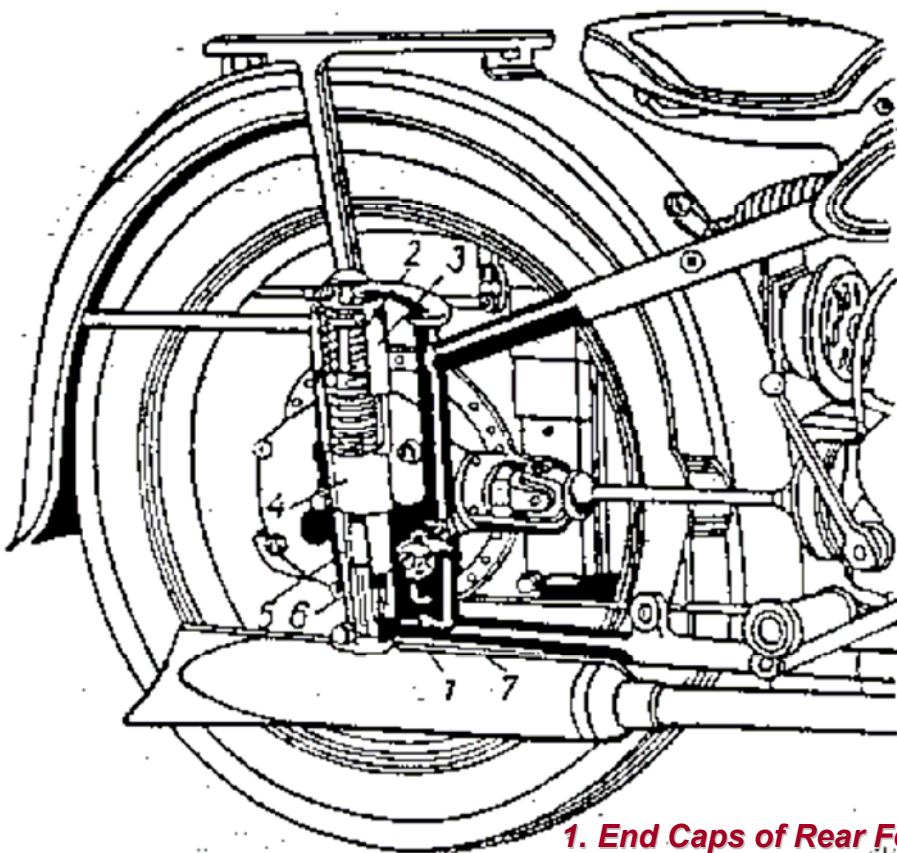
7209204-7

7209203



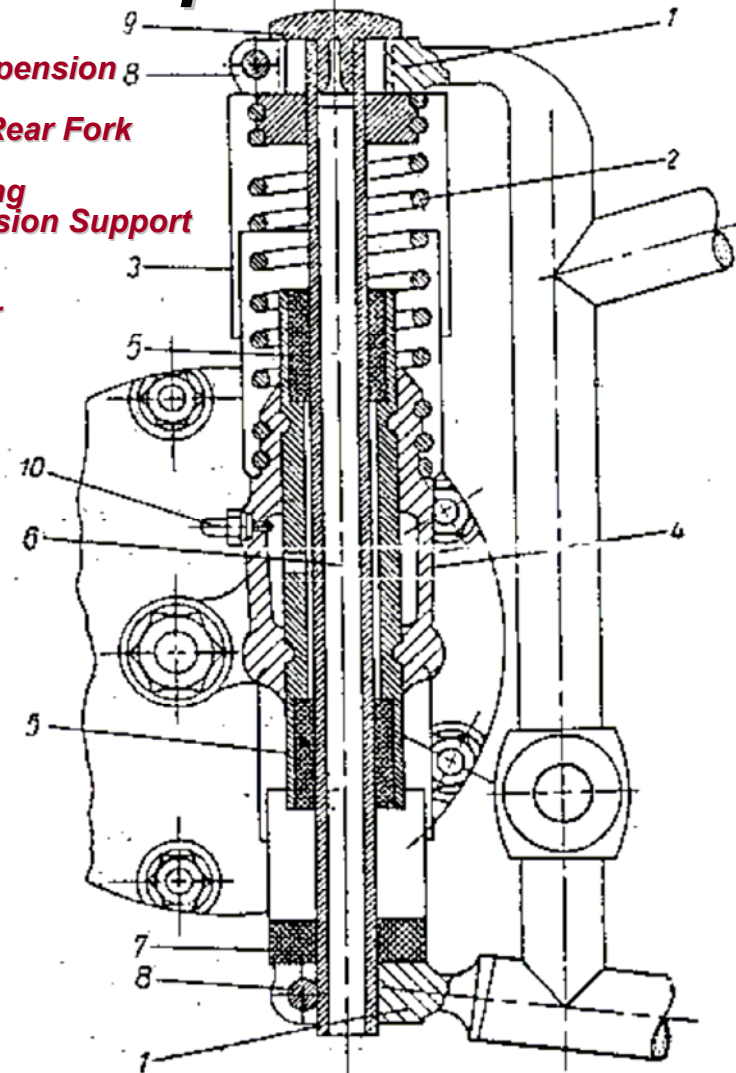
7205121
Rear Drive Cover

M-72 Rear-Wheel Plunger Suspension



- 1. End Caps of Rear Fork
- 2. Spring
- 3. Spring Housing
- 4. Right Suspension Support
- 5. Guide Sleeve
- 6. Bar
- 7. Rubber Buffer

- Rear-Wheel Suspension (cut-away)**
- 1. End Caps of Rear Fork
 - 2. Spring
 - 3. Spring Housing
 - 4. Right Suspension Support
 - 5. Guide Sleeve
 - 6. Bar
 - 7. Rubber Buffer
 - 8. Lock Screw
 - 9. Absorber
 - 10. Stuffing Box



Suspension of the rear wheel by spiral springs weakens the road impacts. Strong shocks are caught by the rubber buffers (7). The support (4) of the right shock absorber is connected to the frame cover of the final drive (FD). Therefore the FD can only be removed together with the right shock absorber.

M-72 with Plunger Suspension System (1WD)

Prefix for M-72 Part #s: 7209-
Example: Frame Part #: 7209147

Ears for Plunger Attachment

Ball Joint for
Sidecar
Attachment

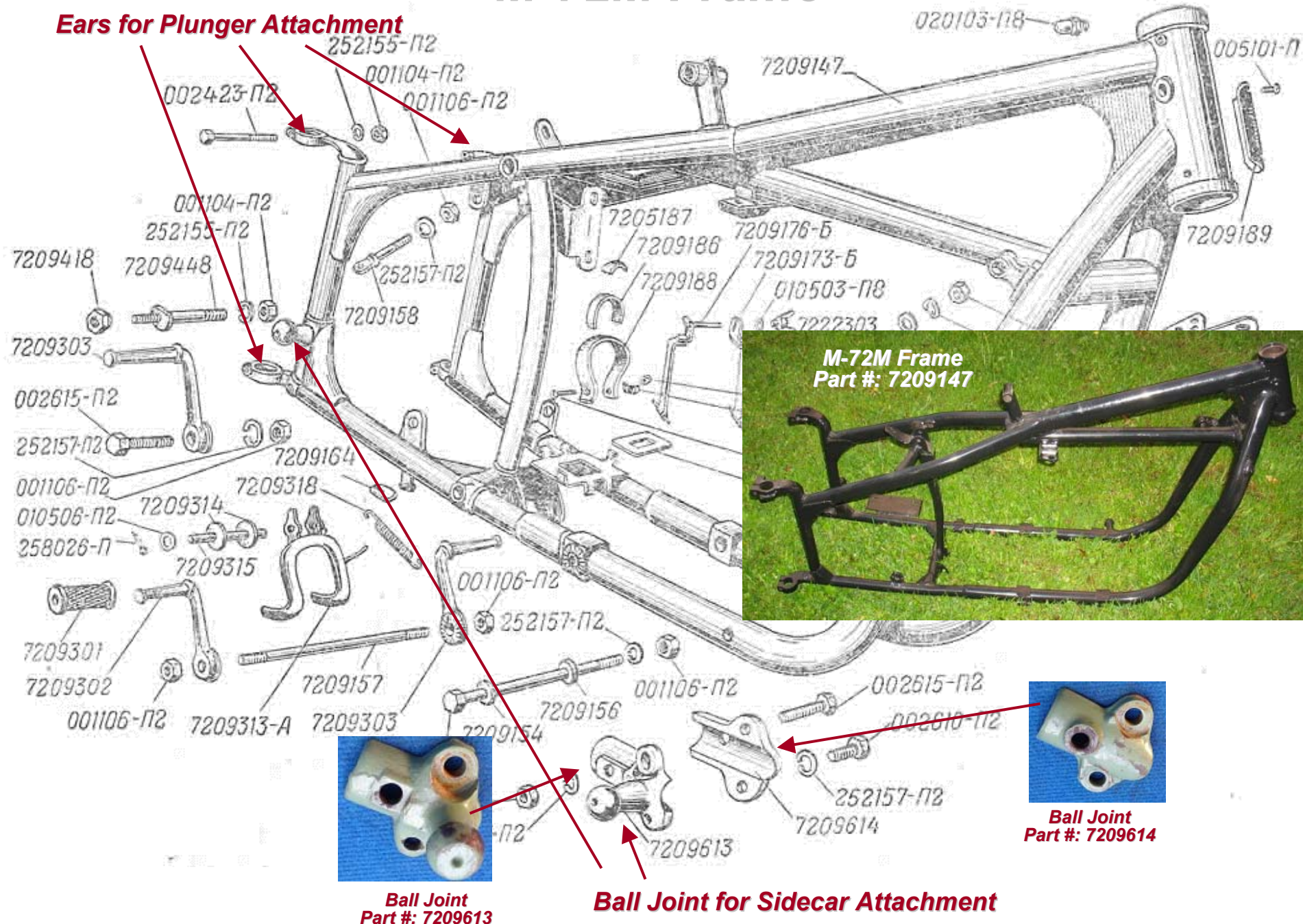
Coil-Spring
Shock Absorber

Ear for
Attachment
to
Rear Axle

The original Russian M-72, modeled after the German R71, had a plunger suspension for the rear-wheel.

M-72M Frame

Ears for Plunger Attachment



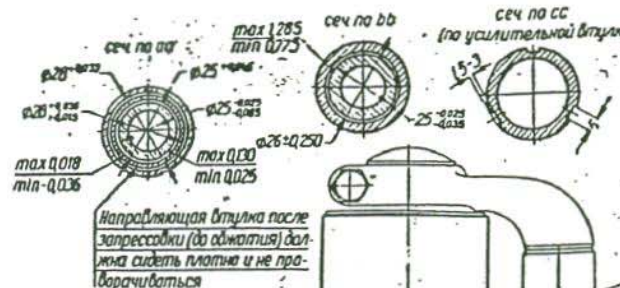
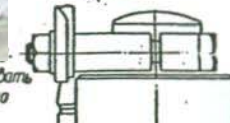
M-72M Frame
Part #: 7209147

Ball Joint
Part #: 7209614

Ball Joint
Part #: 7209613

Ball Joint for Sidecar Attachment

M-72 Plunger Rear Suspension (bcozz.multiply.com)

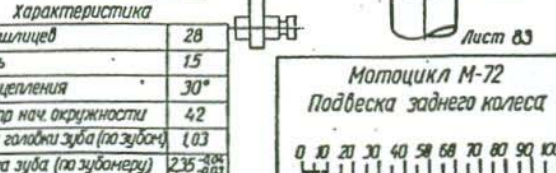
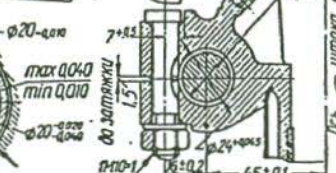
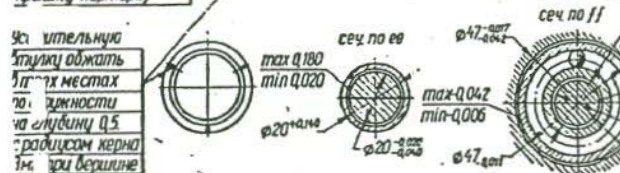
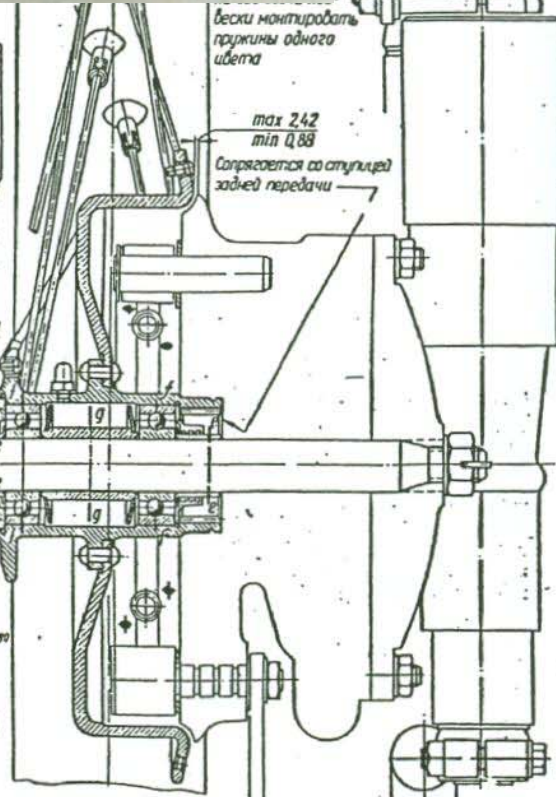
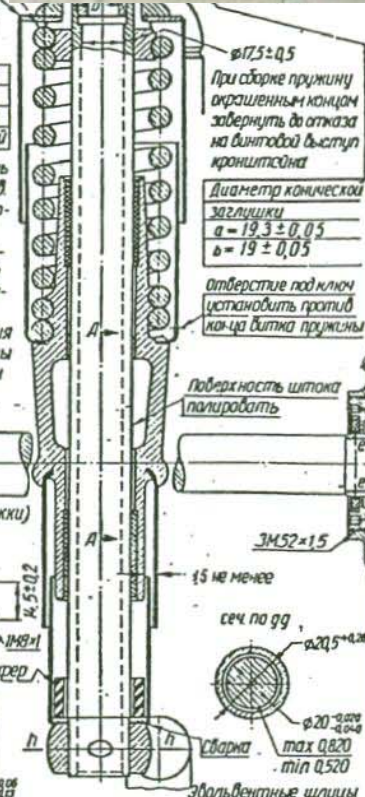


Направляющая втулка после запрессовки (до обжатия) должна сидеть плотно и не проворачиваться

неперпендикулярность осей втулки и оси редуктора не более 0.1 на длине 100 мм

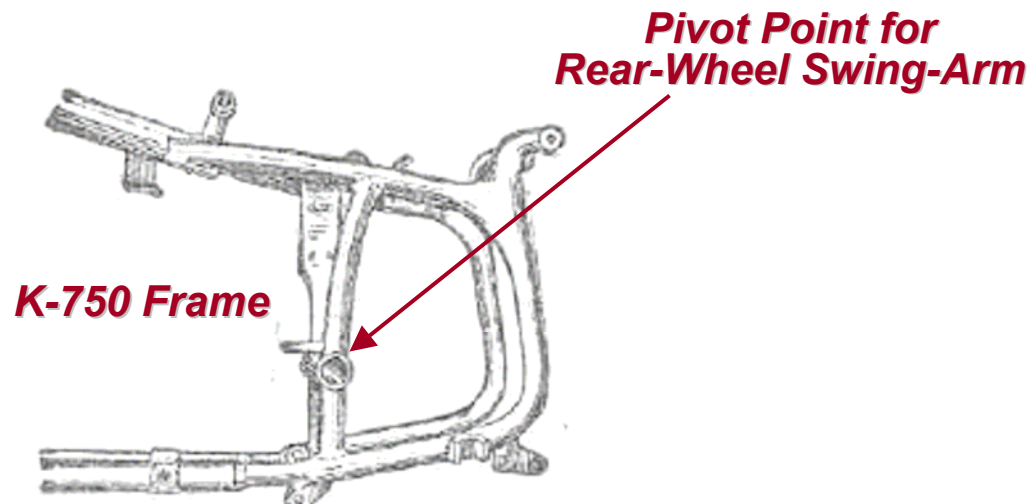
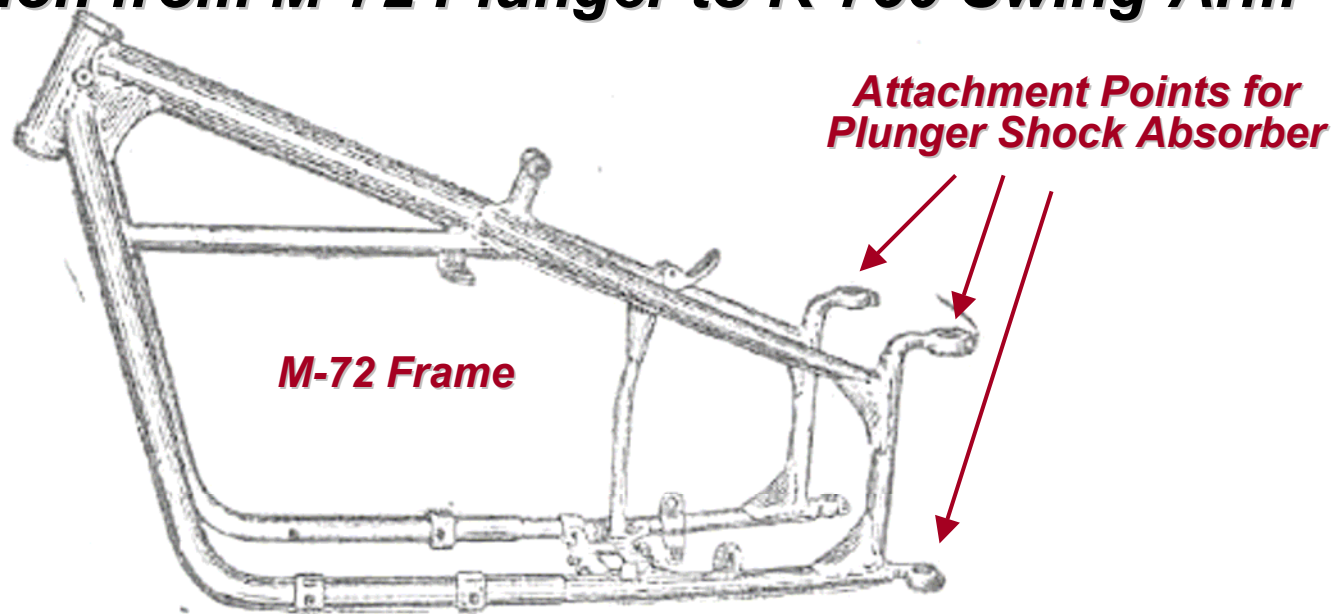
Группа	Усилие в кг	Цвет
I	200-210	Синий
II	211-220	Черный
III	220-230	Красный

Плоскости на торцах должны составлять не менее половины длины концевых витков. Неперпендикулярность оси пружины к торцу - не более 1.5 на длине 145 мм. 5% пружин испытывать на эксцентрикаторе прессы при 318 об/мин в продолжение 5 мин до сопряжения витков (без ударов между витками). После испытания остаточная деформация должна быть не более 1 мм. Изгиб пружины по оси - не более 2 мм на всей длине.



Характеристика	
Число шлицев	28
Модуль	1.5
Угол зацепления	30°
Диаметр нач. окружности	42
Высота головки зуба (по зубам)	1.03
Толщина зуба (по зубам)	2.35 ± 0.03

Transition from M-72 Plunger to K-750 Swing-Arm



On the M-72, the ends of the shock are attached to the motorcycle frame, while the body of the shock is attached to the rear-wheel axle or casing. For the K-750, the rear-wheel and final drive are attached to a lever swing-arm.

K-750 with Rear-Wheel, Swing-Arm Suspension

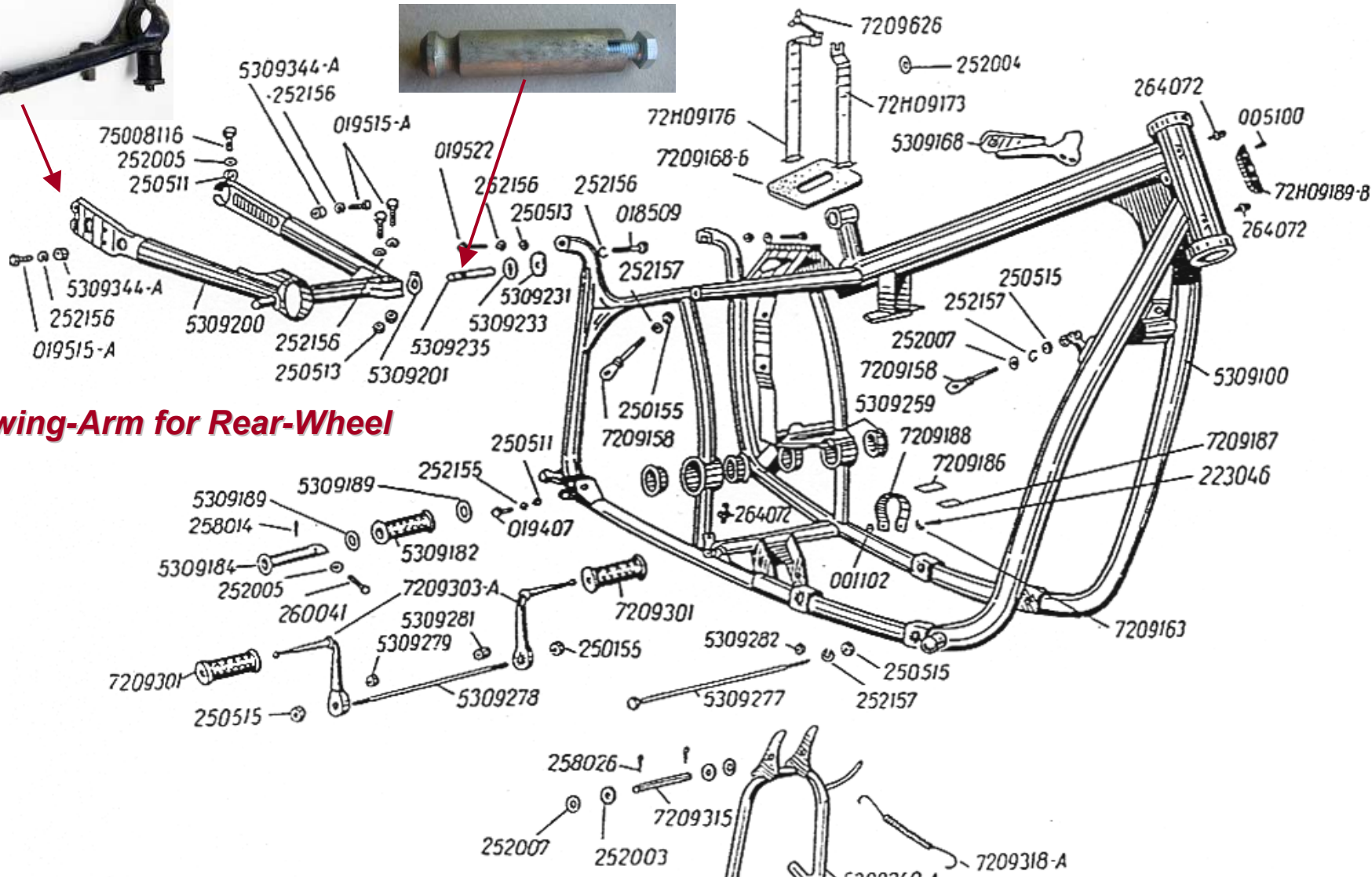


The K-750 was the first heavy Russian motorcycle to use a rear-wheel, swing-arm suspension. Unlike Ural (IMZ) bikes, the swing-arm is on the inside of the frame.

K-750, K-750M Frame (1WD)

Swing-Arm
5309200

Swing-Arm Pin
5309235



The K-750 pioneered the swing-arm rear-wheel suspension system for heavy Russian motorcycles with sidecars.

K-750, K-750M, K-750B Swing-Arm (1WD)

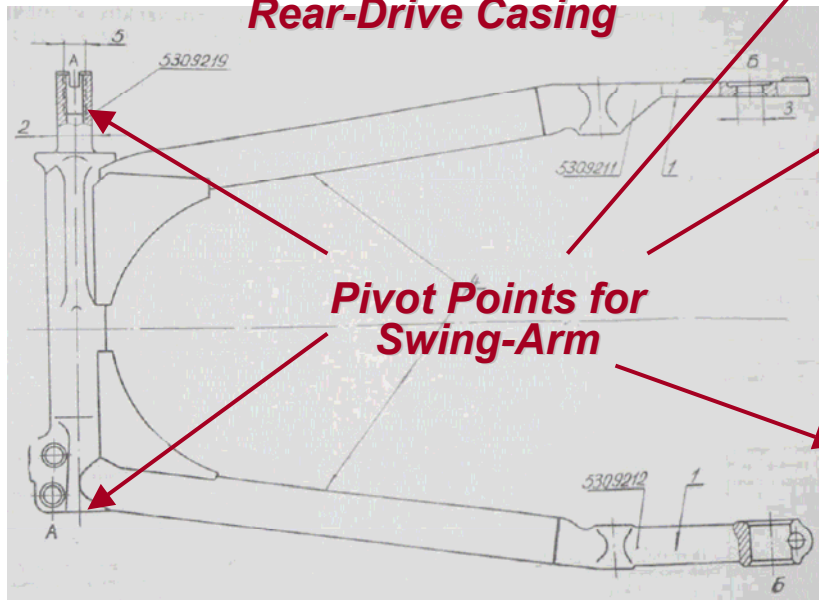
Swing-Arm
(K-750)
Part #: 5309200
Vendor ID: 003.194
List Price: €75.61
(www.oldtimergarage.eu)



Attachment Holes to
Rear-Drive Casing



Swing-Arm
(K-750)
Vendor ID: 3485
List Price: €40.00 slightly used
(www.ural-hamburg.de)

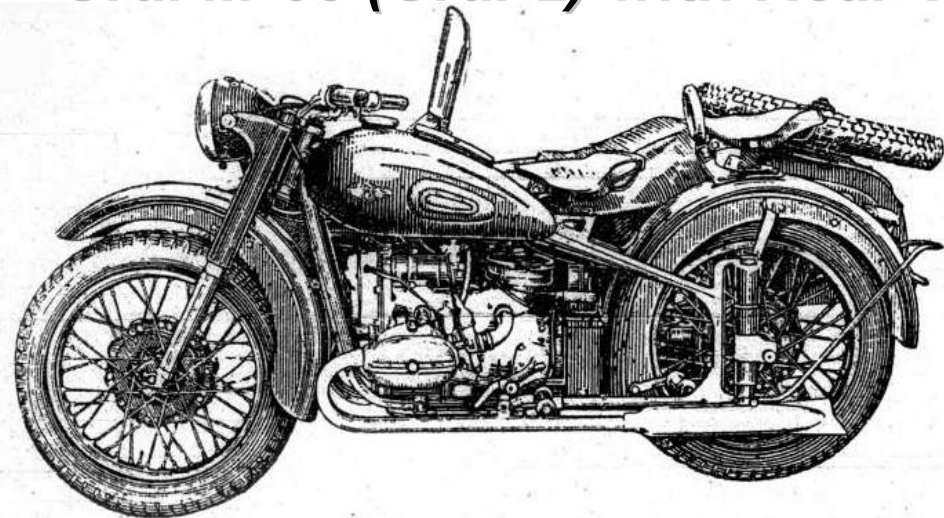


Pivot Points for
Swing-Arm



Swing-Arm
(MT-11, K-750)
Vendor ID: 588
List Price: €45.00
(www.ural-hamburg.de)

Ural M-63 (Ural-2) with Rear-Wheel, Swing-Arm Suspension

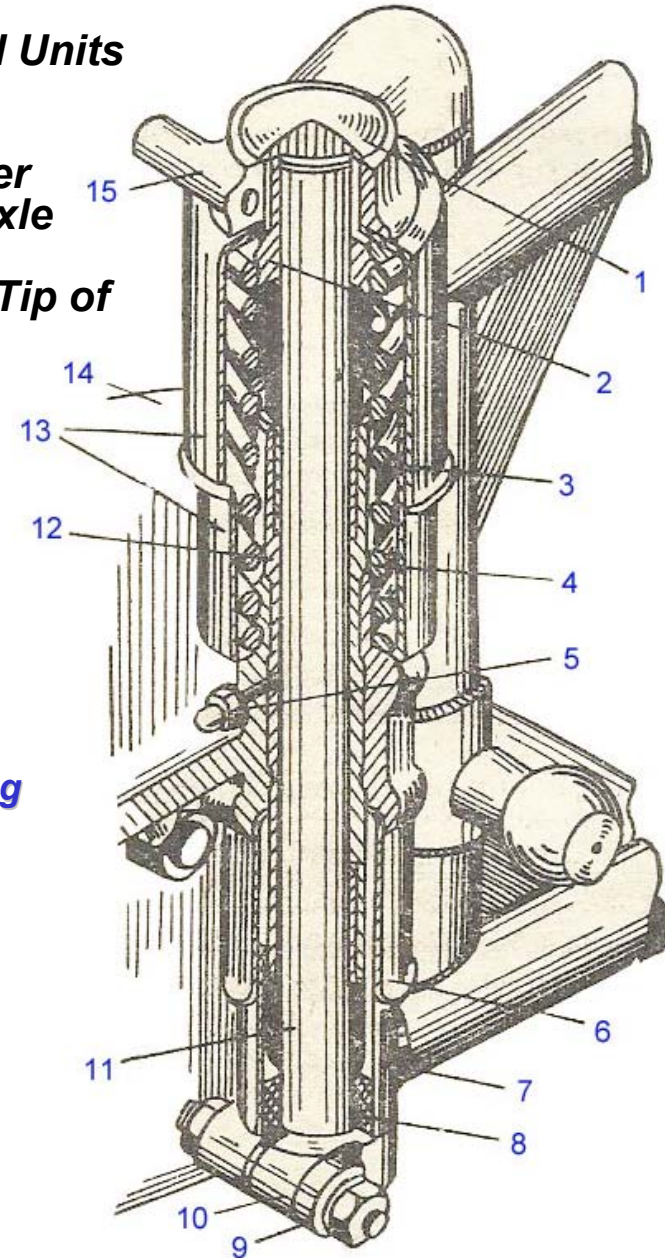


The M-63 was the first Ural to use a rear-wheel, swing-arm suspension. Unlike Dnepr (KMZ) bikes, the Ural swing-arm is on the outside of the frame.

M-61 / M-62 Punger Suspension Shock Absorbers

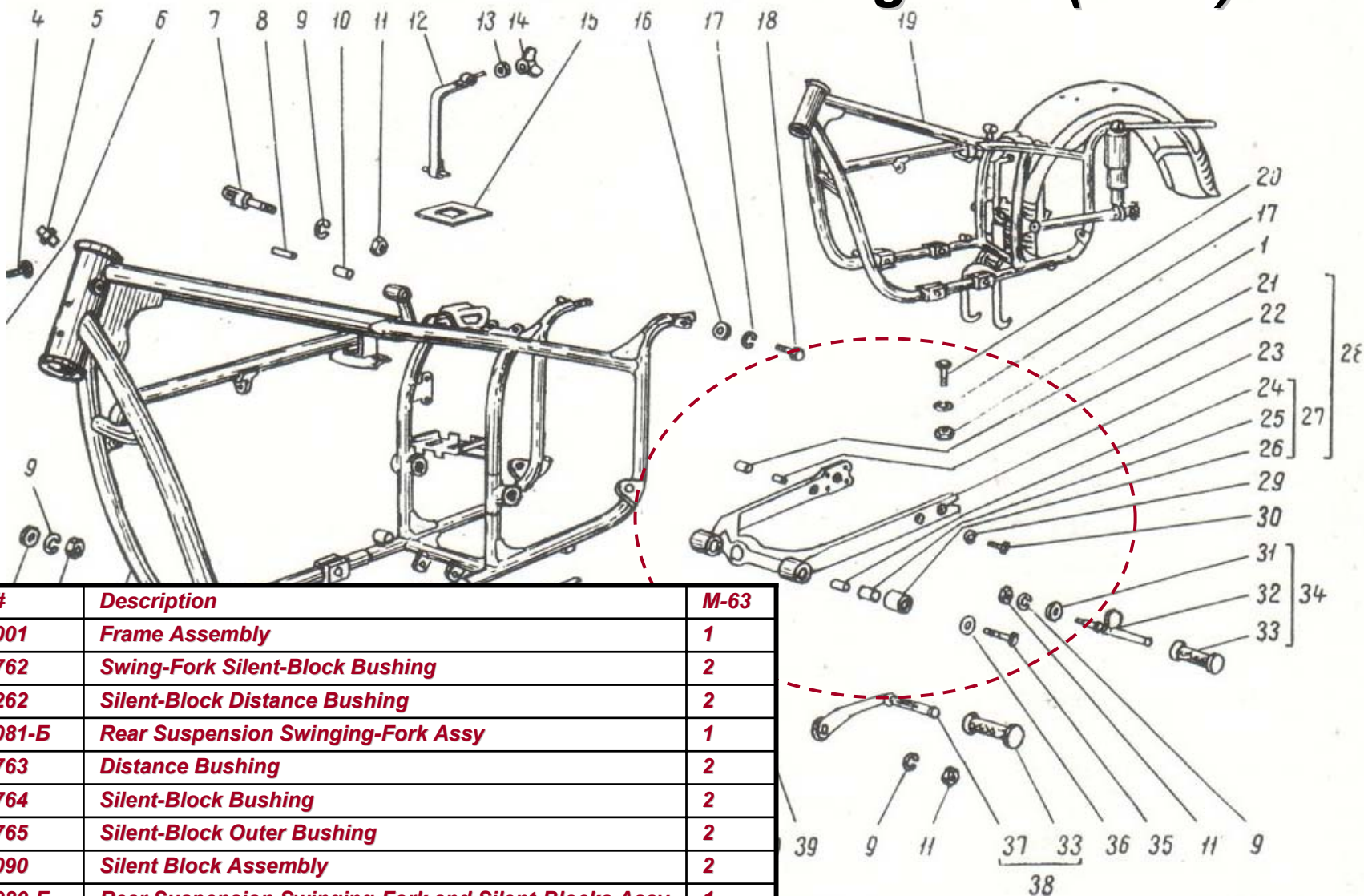
- M-61 and M-62 Rear-Suspension Consists of Two Identical Units
 - Non-Hydraulic Shock Absorbers (Coil-Spring)
 - Installed in Rear Rack Frame
- Right Arm Made in One Piece with Rear-Drive Casing Cover
- Left Arm Is a Separate Item Connected to Sidecar-Wheel Axle
- Both Brackets Able to Move on Steel Rod (11)
- Suspension Springs (Coils) Wrapped on a Bracket on the Tip of the Spring and Enclosed
- Bottom of Spring Connected with Rear-Wheel Axle
- Top of Spring Connected with Bike Frame
- Sidecar Has Torsion Bar Suspension

1. Plug
2. Top of the Coil-Spring
3. Guide Sleeve
4. Coil-Spring
5. Lubricator Port
- 6, 7, 13. Covers
8. Buffer
9. Lower Pinch Bolt
- 10, 15. Tips frame
11. Shock Strut
12. Bushing
14. Rear Cover



True hydraulic shock absorbers do not show-up until M-63.

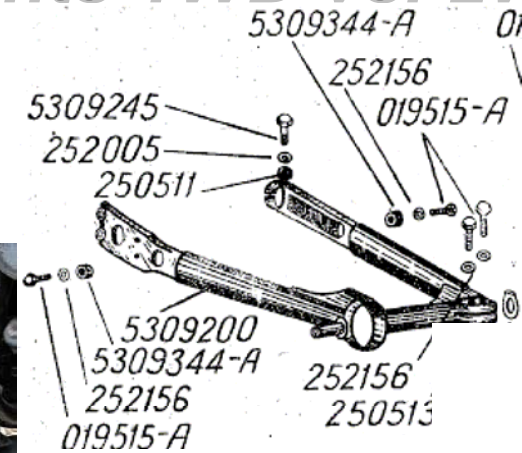
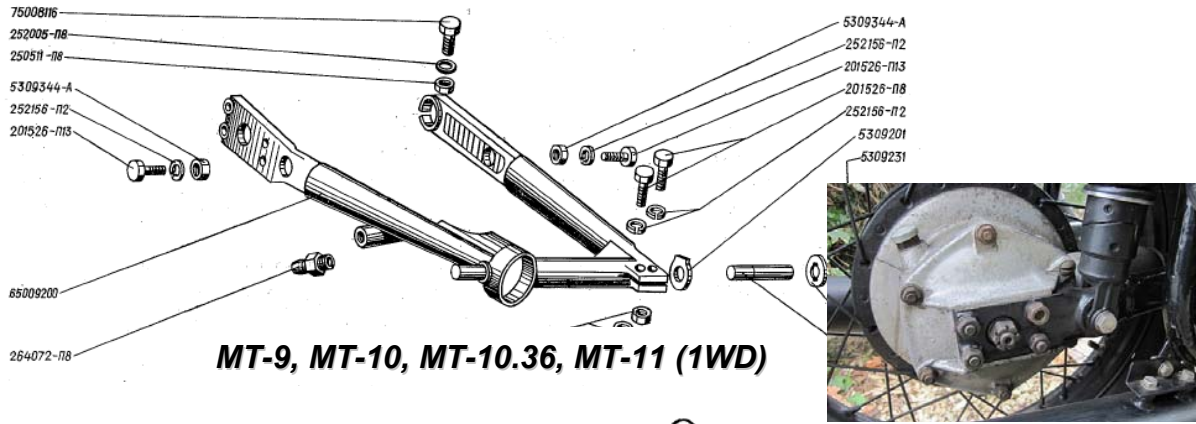
M-63 Detail of Rear-Wheel Swing-Arm (1WD)



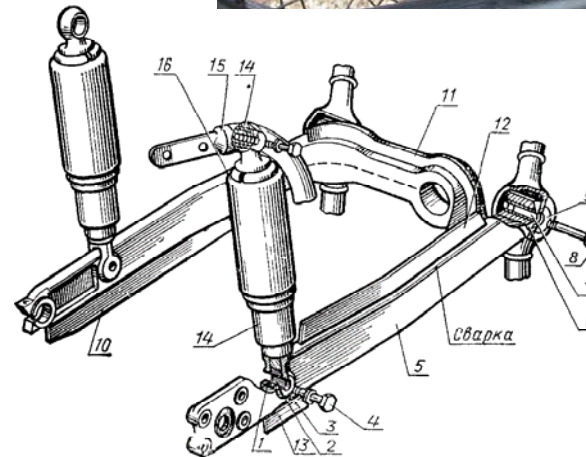
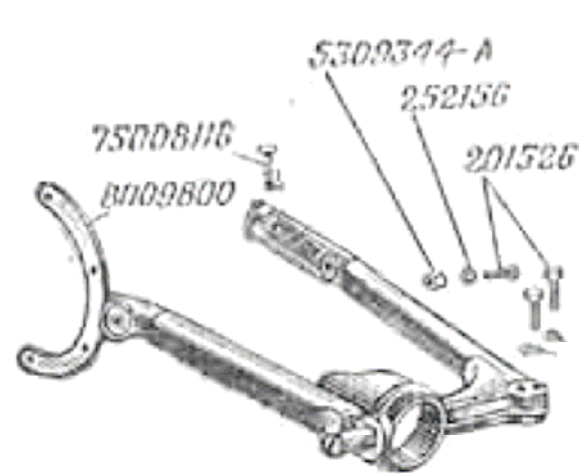
Item	Part #	Description	M-63
19	6309001	Frame Assembly	1
21	6309762	Swing-Fork Silent-Block Bushing	2
22	6309262	Silent-Block Distance Bushing	2
23	6309081-B	Rear Suspension Swinging-Fork Assy	1
24	6309763	Distance Bushing	2
25	6309764	Silent-Block Bushing	2
26	6309765	Silent-Block Outer Bushing	2
27	6309090	Silent Block Assembly	2
28	6309080-B	Rear Suspension Swinging-Fork and Silent-Blocks Assy	1
29	252156-Π2	Spring Washer for Bolt Fastening Shock to Swing-Arm	2
30	365007-Π29	Bolt M10X1X42 for fastening Shock to Swing-Arm	2
35	6309759-B	Pin	2
36	367951-Π2	Silent-Block Pin Lock Washer	2
52	6309007	Motorcycle Frame	1

Footrests

Rear Drive Swing-Arm Attachments 1WD vs. 2WD



K-750, K-750M (1WD)



Ural M-63, M-66, M-67, M-67.36 (1WD)



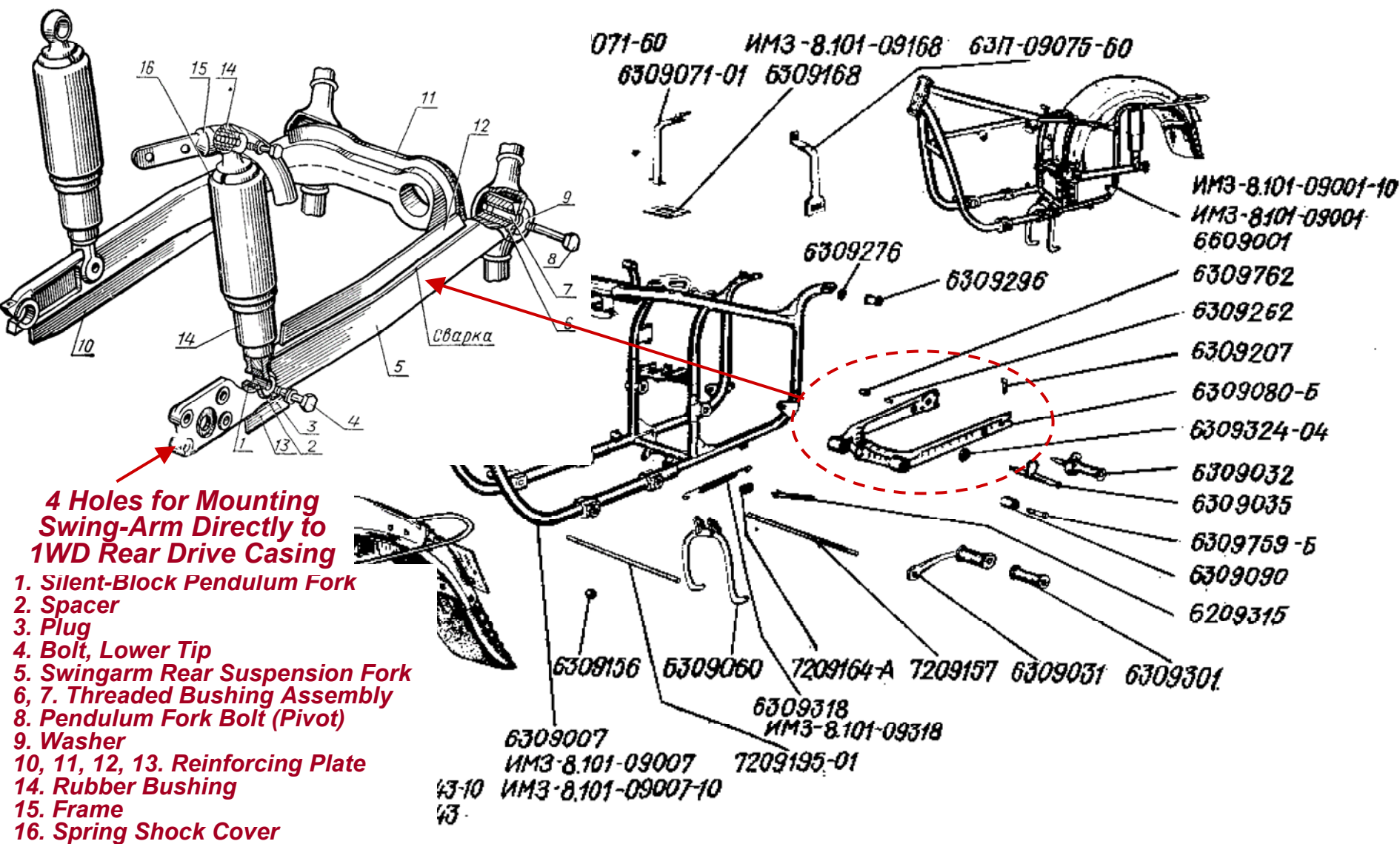
MT-12, MT-16, MB-750, MB-650 (2WD)

Ural 650cc / 750 cc

Note: M-72, M-61 and M-62 Have Plunger (non-Swing-Arm) Rear Drive Suspensions

1WD swing-arms have a straight bracket attachment to the rear drive casing, whereas the 2WD rear drive swing-arms attach with a C-shaped bracket.

Ural M-63, M-66, M-67 Swing-Arm Frame (1WD)

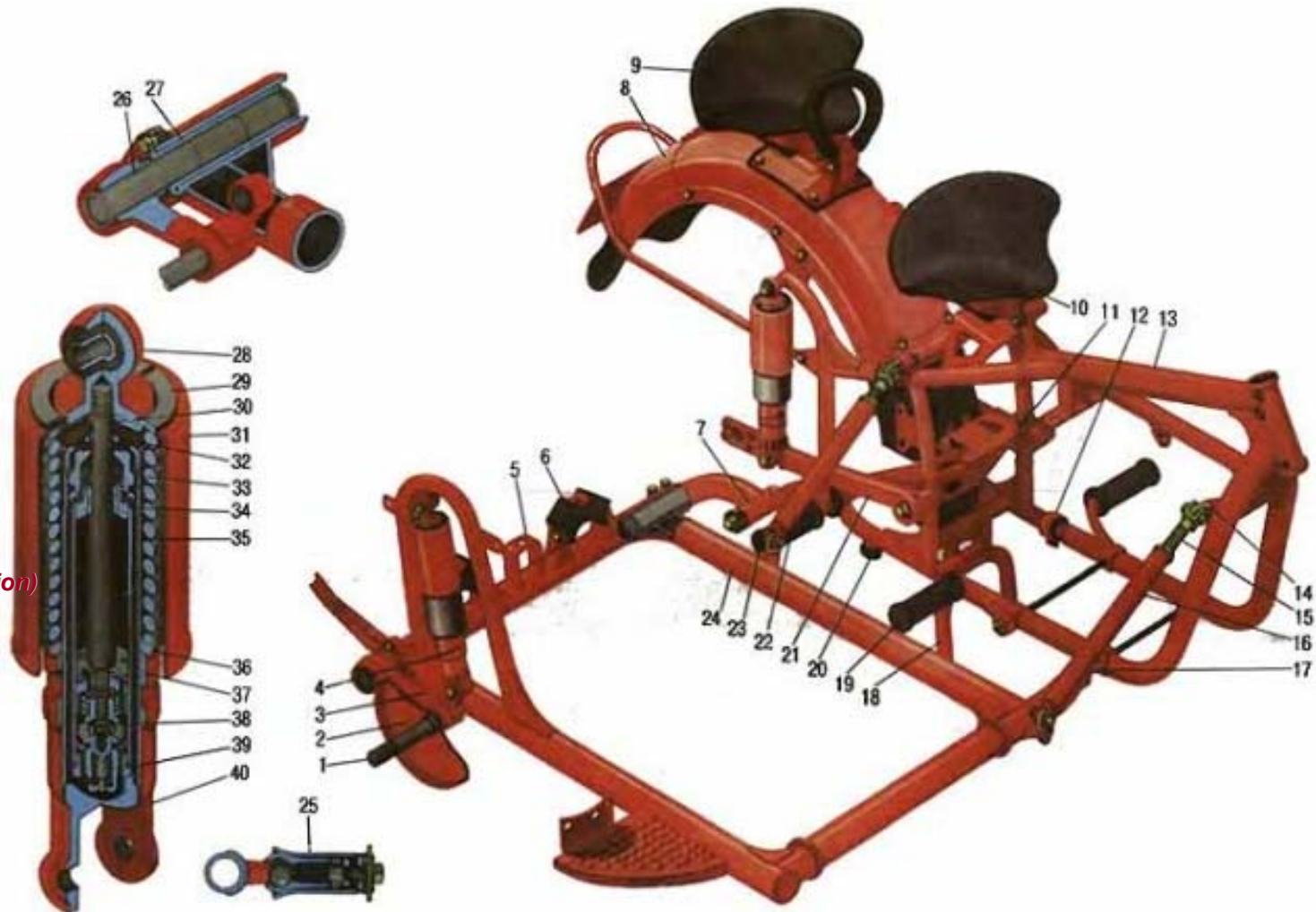


Because Ural's M-63 / M-66 / M-67 do not offer 2WD, the swing-arm is not C-shaped on the open end of the bracket.

M-63 (Ural-2) Motorcycle Suspension

Motorcycle and Sidecar Frame

1. Sidecar Wheel Axle
2. Guard Plate
3. Pendulum Wheel Axle Lever
4. Sidecar Shock Absorber
5. Rubber Bumper
6. Rubber A-Shaped Isolator
7. Rear Sleeve
8. rear wing
9. Passenger Seat
10. Driver Seat
11. Battery Platform
12. Foot starter bumper,
13. Motorcycle Frame
14. Front Support Tie Eyelet
15. Adjustable Front Bar Clamp
16. Front Tie-Rod
17. Front Bushing
18. Stand
19. Driver's Foot-Rest
20. Bumper Support
21. Rear Suspension Swing-Arm
22. Rod
23. Passenger Foot-Rest
24. Sidecar Frame
25. Clamping Holder (cross-section)
26. Swing-Arm Axle
27. Swing-Arm Axle Hub
28. Upper Shock Mount
29. Resistance Springs
30. Rod Assembly
31. Top Cover
32. Stop
33. Spring
34. Body of Shock
35. Lower Guard
36. Stop Ring
37. Cam
38. Working Cylinder
39. Compression Valve
40. Lower Shock Mount



Ural introduced the spring / hydraulic shock absorber when they changed from the plunger of the M-61 / M-62 to the swing-arm suspension of the M-63.

M-63, M-66 and M-67 Frames (1WD)

ИМЗ-8.101-09167

63П-09071-60

ИМЗ-8.101-09168

63П-09075-60

6309158

6309167

6309071-01

6309168

ИМЗ-8.101-09001-10

ИМЗ-8.101-09001

6609001

6309762

6309262

6309207

6309080-Б

6309324-04

6309032

6309035

6309759-Б

6309090

6209315

6309276

6309296

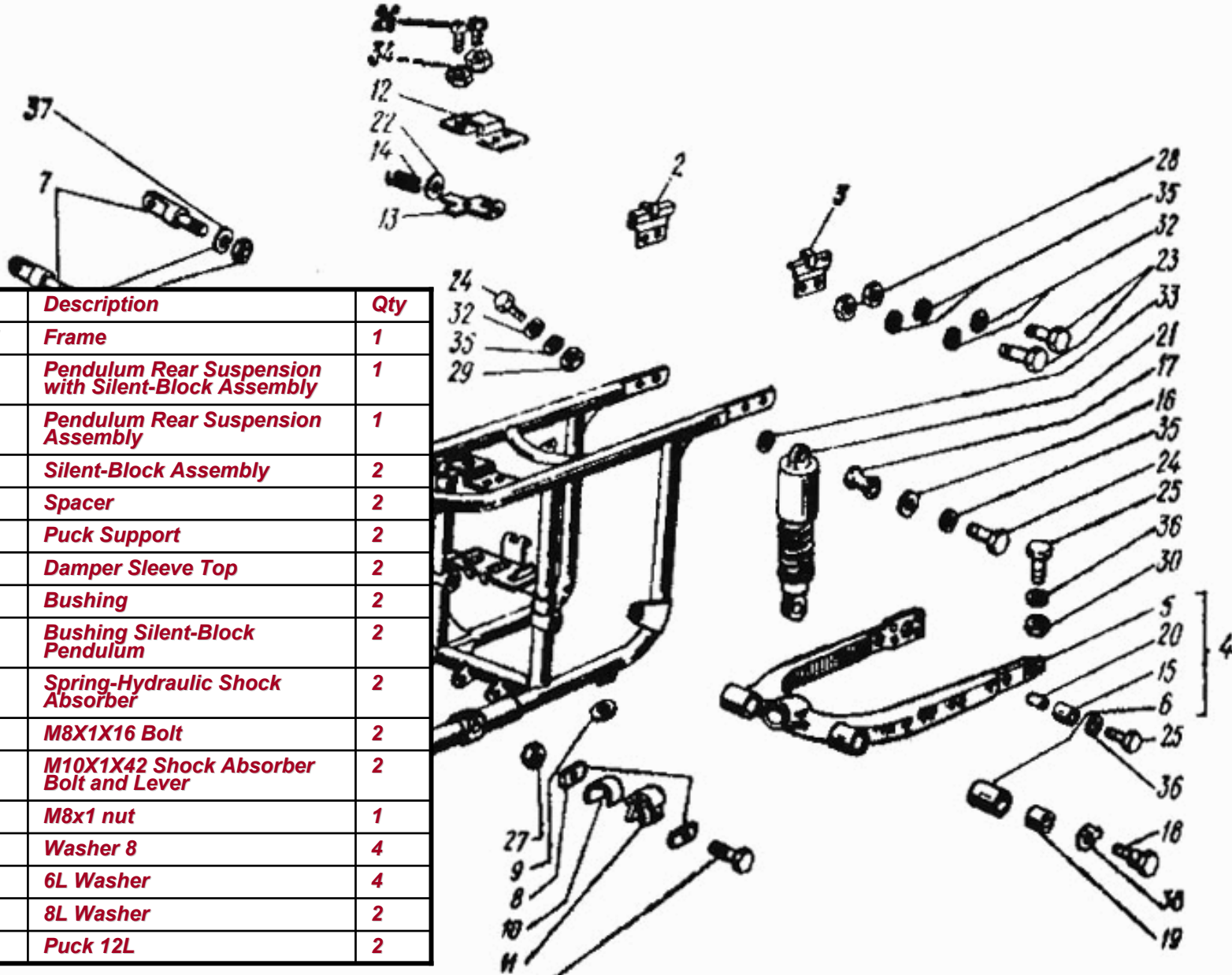
6309446

4-A 7209157 6309031 6309301

1-09318

Part #	Description	M-63	M-66	M-67
6309080-Б	Rear Suspension Swinging-Fork and Silent-Block Assy	1	1	1
6309081-Б	Rear Suspension Swinging-Fork Assy	1	1	1
6309324-04	Swinging-Fork Bumper	2	2	2
6309207	Clamping Bolt	1	1	1
6309262	Distance Bushing	2	2	2
6309762	Swing-Fork Silent-Block Bushing	2	2	2
6309759-Б	Pin	2	2	2
6309090	Silent Block Assembly	2	2	2
6609001	Frame Assembly	1	1	-
6309007	Motorcycle Frame	1	1	-
ИМЗ-8.101-09001	Frame Assembly	-	-	1
ИМЗ-8.101-09007	Motorcycle Frame	-	-	1

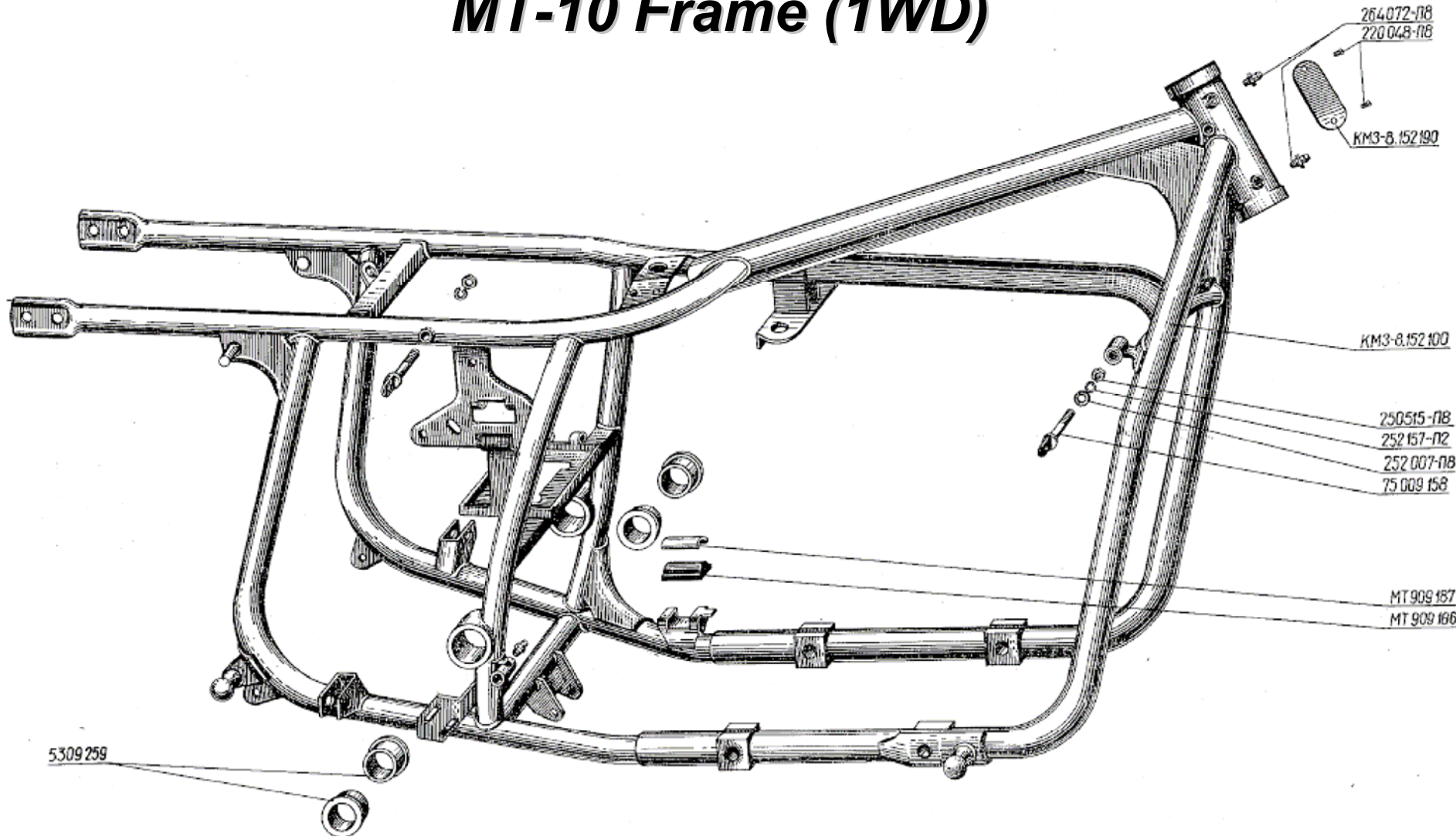
M-67.36 Frame



#	Part #	Description	Qty
1	ИМЗ-8.101-09007	Frame	1
4	ИМЗ-8.101-09080	Pendulum Rear Suspension with Silent-Block Assembly	1
5	ИМЗ-8.101-09081	Pendulum Rear Suspension Assembly	1
6	309090	Silent-Block Assembly	2
15	6309262	Spacer	2
16	6309276	Puck Support	2
17	6309296	Damper Sleeve Top	2
19	ИМЗ-8.101-09760	Bushing	2
20	6309762	Bushing Silent-Block Pendulum	2
21	ИМЗ-8.101-26001	Spring-Hydraulic Shock Absorber	2
24	201474-П29	M8X1X16 Bolt	2
25	201525-П29	M10X1X42 Shock Absorber Bolt and Lever	2
30	250511-П29	M8x1 nut	1
33	252005-П29	Washer 8	4
35	252154-П2	6L Washer	4
36	252155-П2	8L Washer	2
38	252157-П2	Puck 12L	2

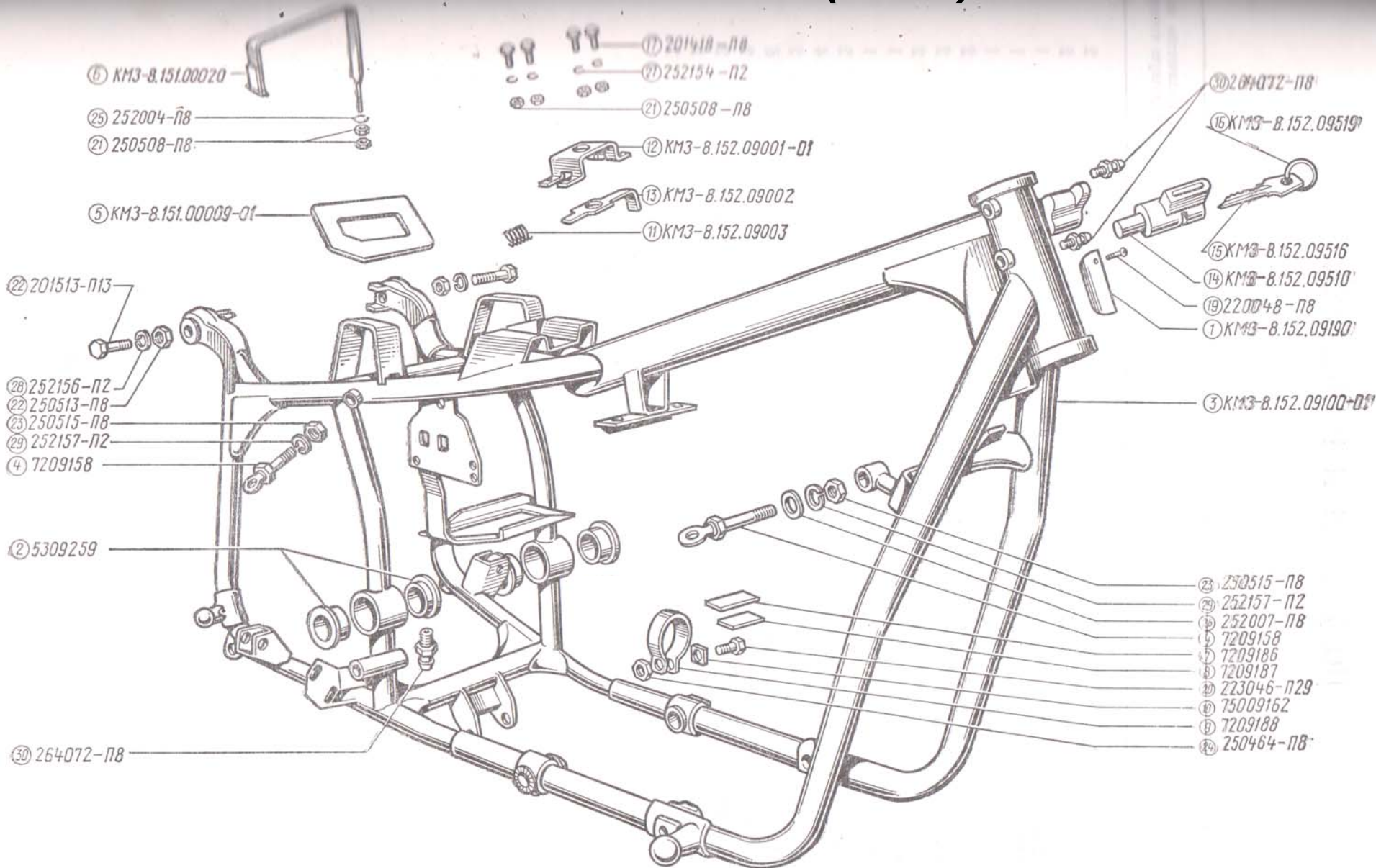
Ural's M-67.36 frame has a swing-arm rear-drive with spring-hydraulic shocks.

MT-10 Frame (1WD)



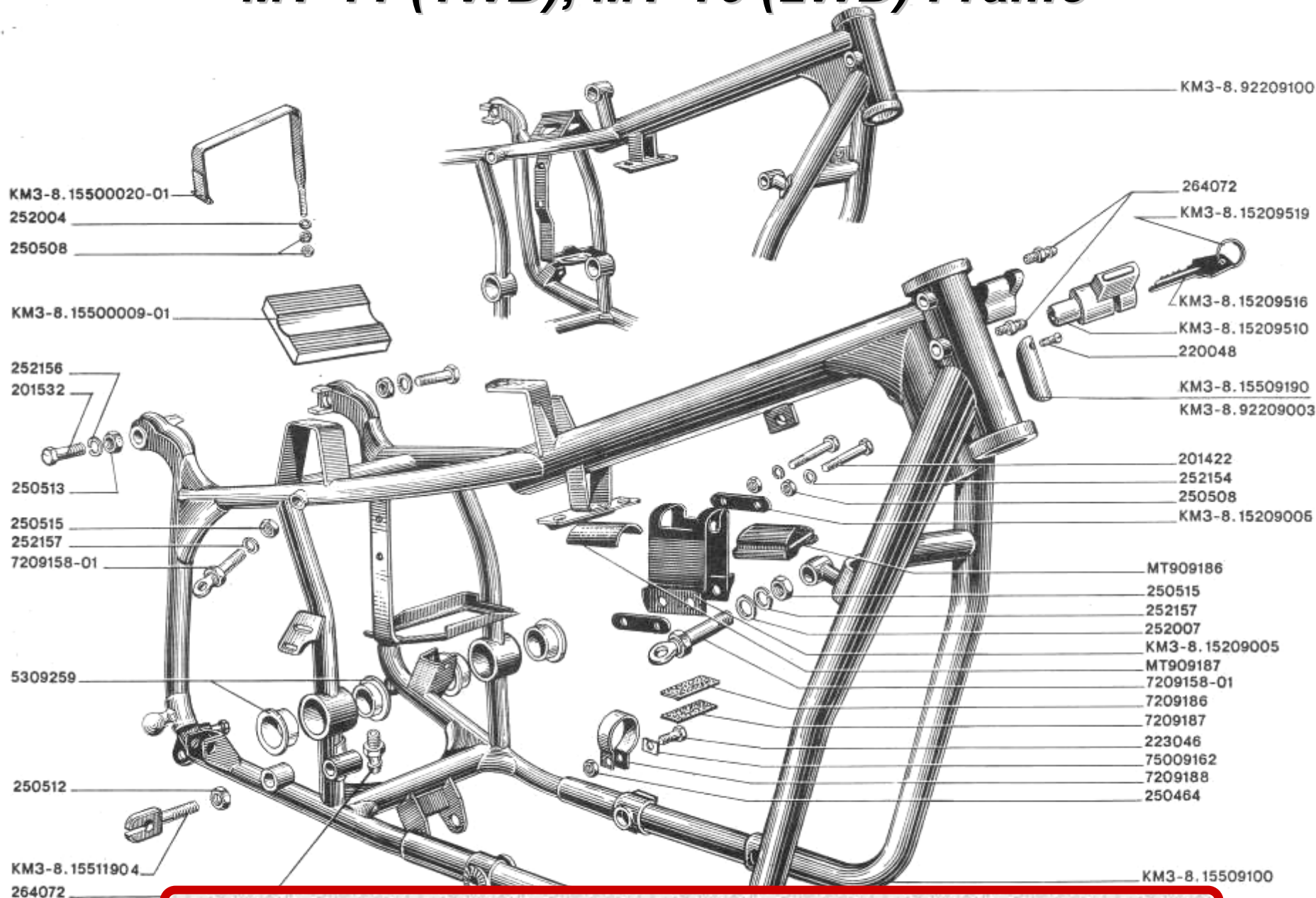
Dnepr's MT-10 frame accommodates a swing-arm rear-drive.

MT-10.36 Frame (1WD)



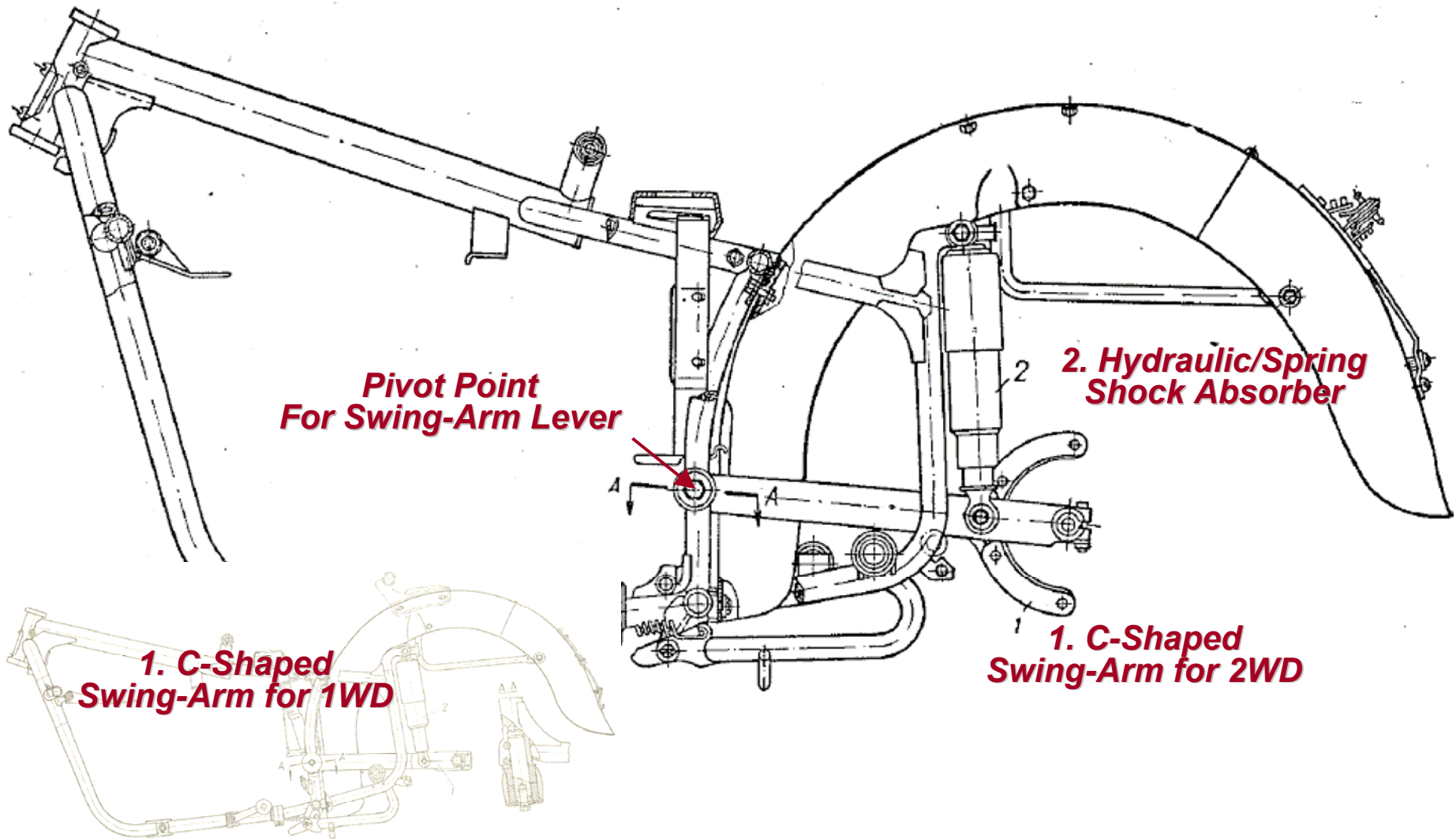
Dnepr's MT-10.36 frame accommodates a swing-arm rear-drive.

MT-11 (1WD), MT-16 (2WD) Frame



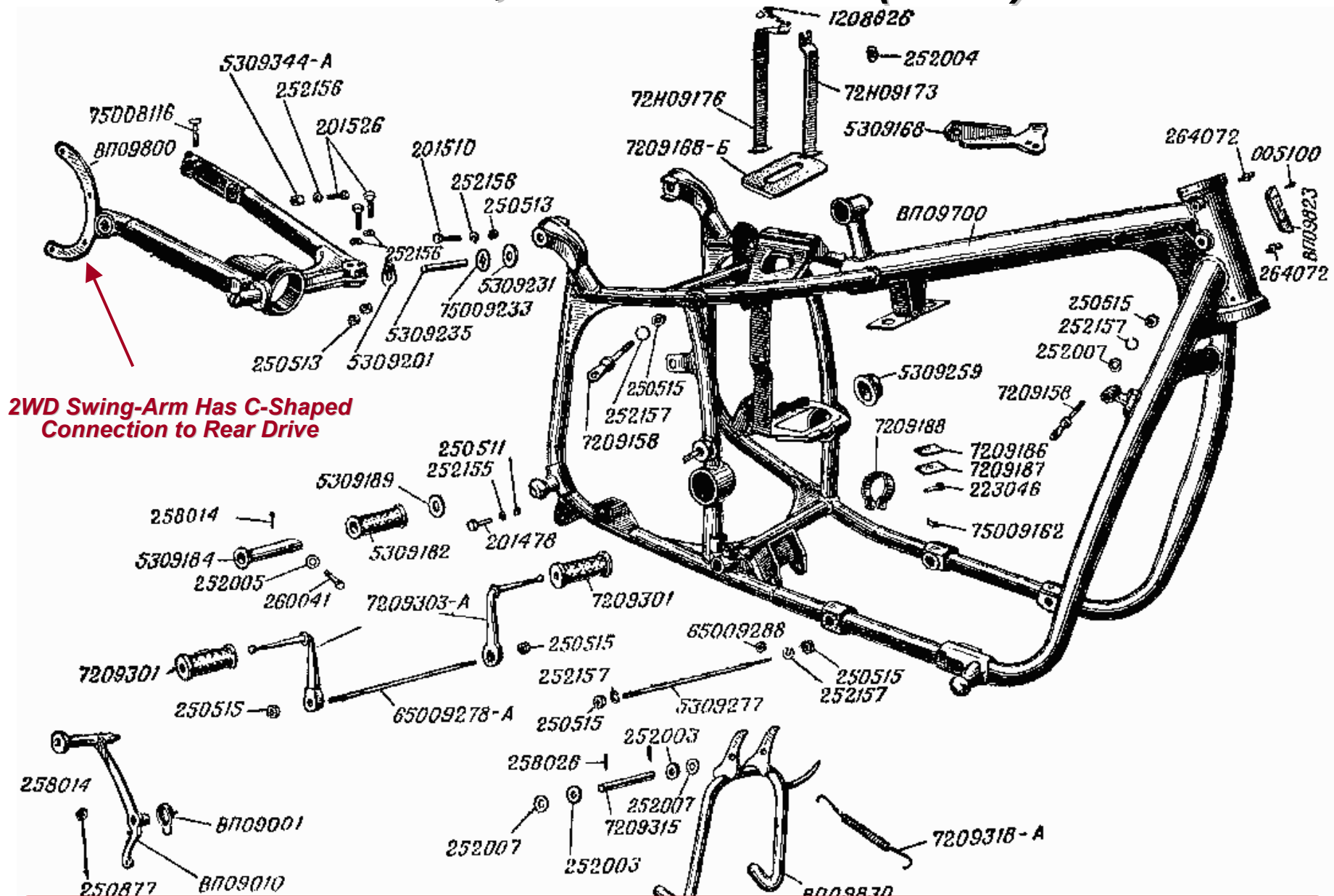
Dnepr's MT-11 frame accommodates a swing-arm rear-drive.

Swing-Arm for 1Wd and 2WD



The end bracket on the swing-arm for two-wheel drive (2WD) requires a C-shaped attachment to avoid the transverse drive shaft powering the sidecar-wheel.

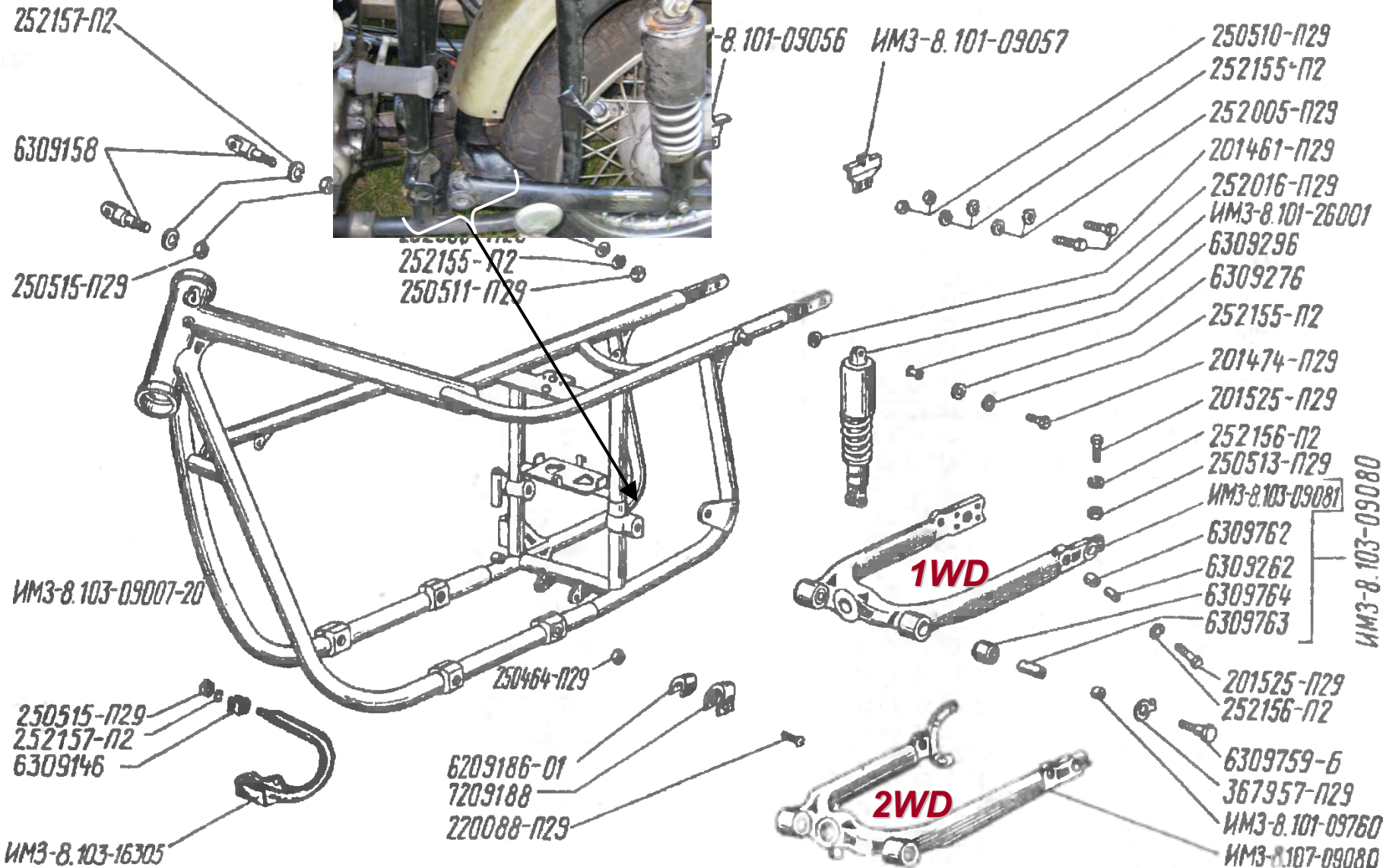
MB-750, MT-12 Frame (2WD)



Dnepr's MB-750 / MT-12 frame accommodates a 2WD swing-arm rear-drive.

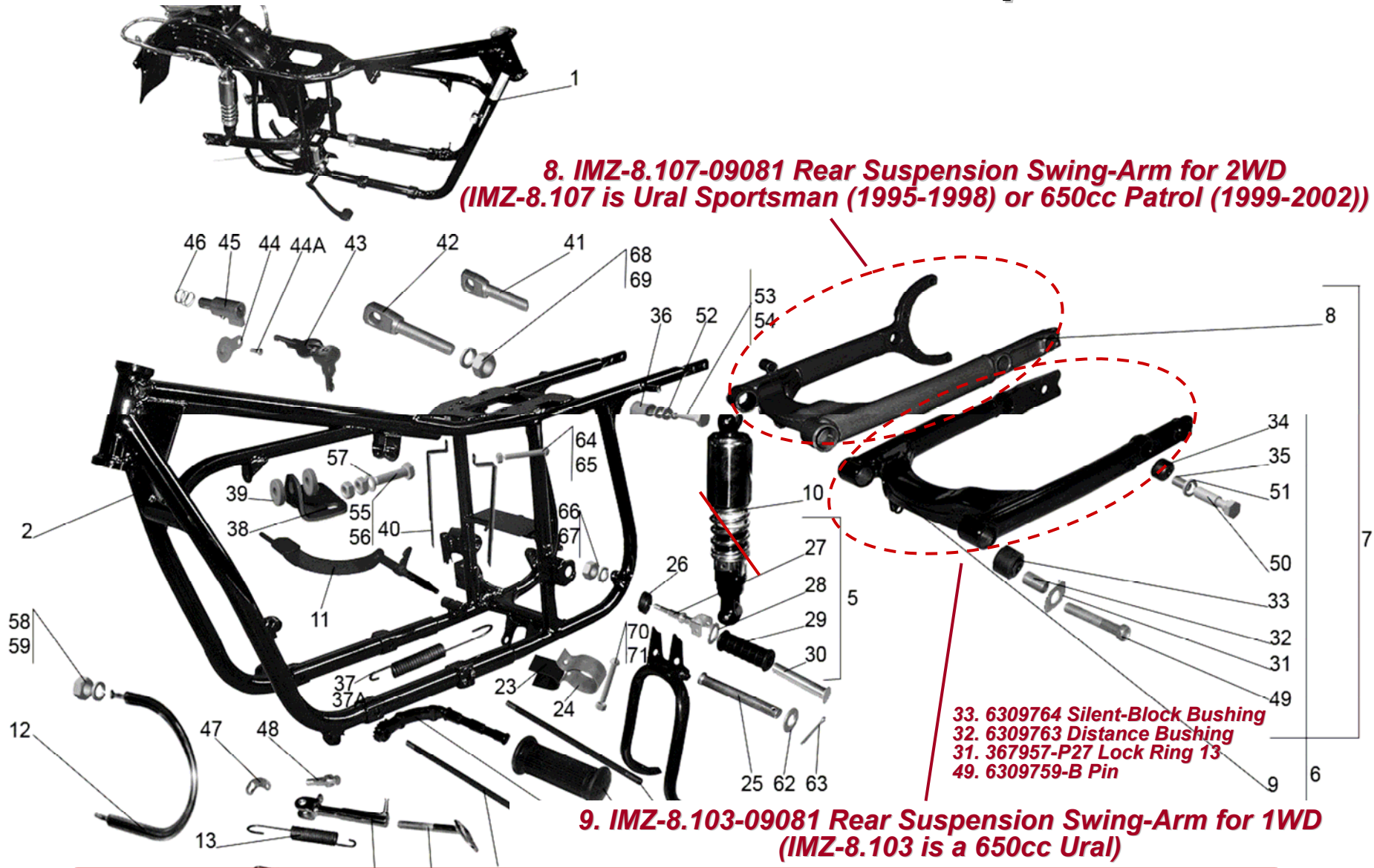
Ural 650cc : (1WD or 2WD)

(IMZ-8.103-10: Deco Classic, IMZ-8.103-40: Tourist, IMZ-8.107: Sportsman)



Ural's 650 frame accommodates either a 1WD or 2WD swing-arm rear-drive.

Ural 650cc 1WD versus 2WD Suspension



**The swing-arm is different between the 1WD and 2WD modern Urals.
 The 2WD version uses a C-shaped support which allows
 the transverse shaft to drive the sidecar wheel.**

Ural 750cc Rear Drive Suspension: 1WD versus 2WD

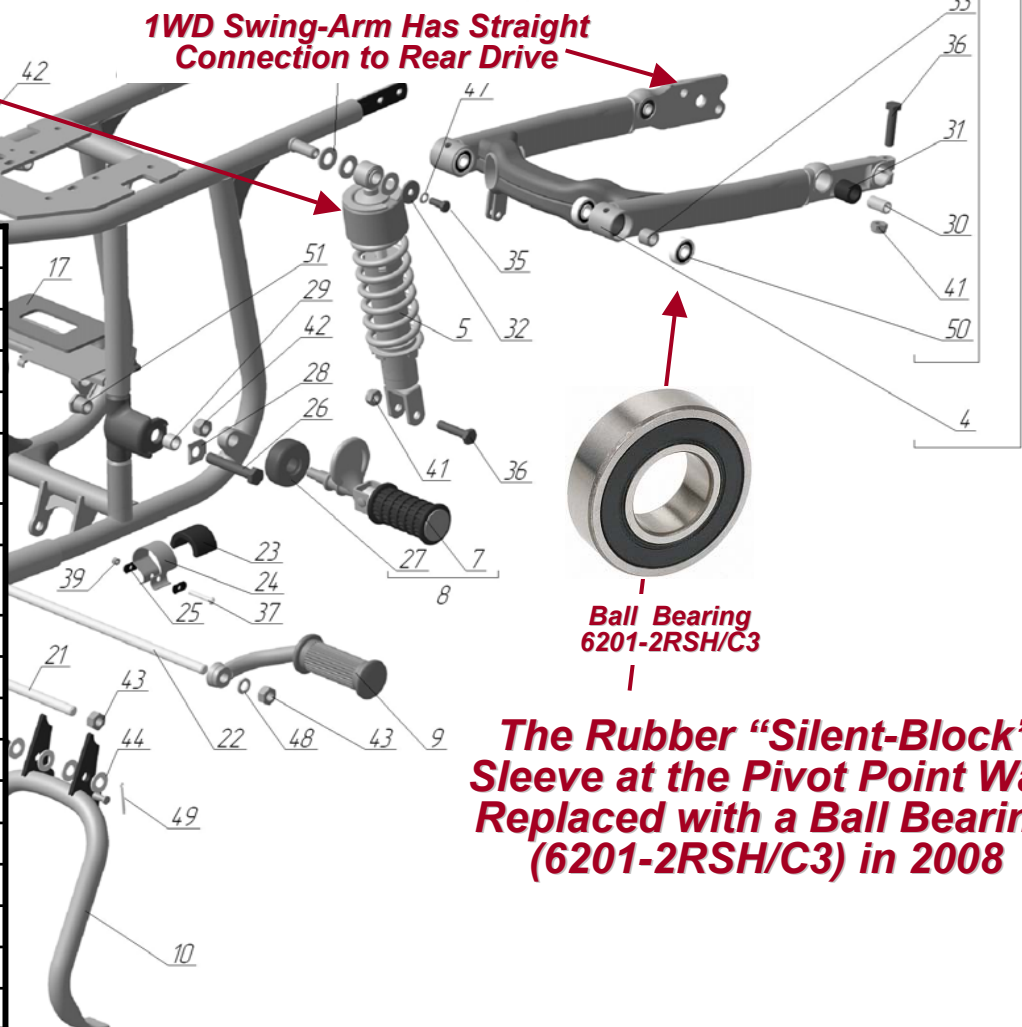


2WD Swing-Arm Has C-Shaped Connection to Rear Drive



1WD Swing-Arm Has Straight Connection to Rear Drive

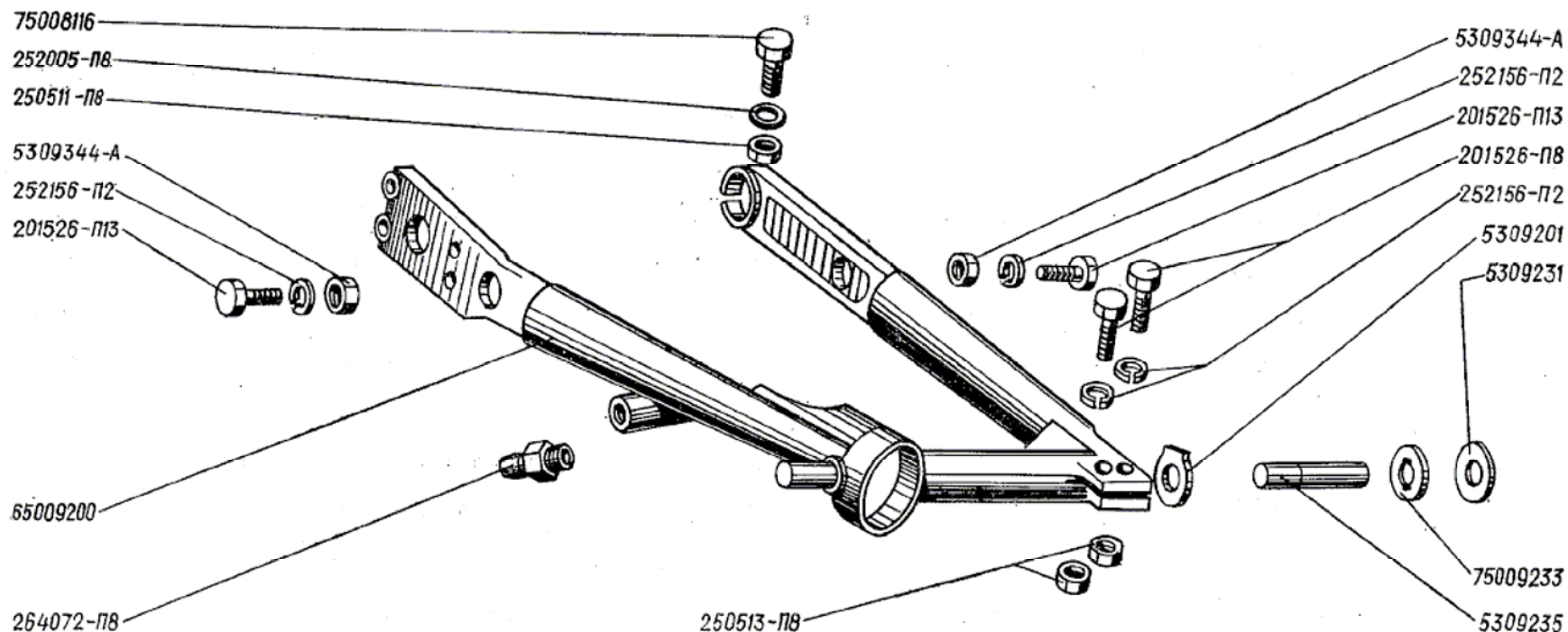
#	Part #	Description	Qty
11	IMZ-8.1037-09001-20	Frame Assy.	1
2	IMZ-8.1037-09007-20	Frame	1
3A	IMZ-8.107-09080-10	2WD Swing-Arm Assy.	1
3	IMZ-8.107-09081-10	2WD Swing-Arm	1
4	IMZ-8.103-09081 or IMZ-8.1037-09081	1WD Swing-Arm	1
5	IMZ-8.1037-26001-08	Hydraulic/Spring Shock	2
6	IMZ-8.103-09080 or IMZ-8.1037-09080	1WD Swing-Arm Assy.	
14	63-09158	Sidecar Tie Rod Bracket	1
15	IMZ-8.1037-09158	Sidecar Tie Rod Bracket	1
26	IMZ-8.1037-09759-10	Pin	2
27	63-09324-04	Swing-Arm Pad	2
30	63-09262	Distance Bushing	2
31	63-09762	Swing-Arm Silent-Block	2
33	IMZ-8.124-09760	Distance Bushing	2
36	DIN 960 M10x1x45	Bolt M10x1-6gx45 Zn 8.8	3
41	DIN 985 M10x1	Nut M10x1-6H ZN 8.8	3
50	6201-2RSH/C3	Ball Bearing	4



**Ball Bearing
6201-2RSH/C3**

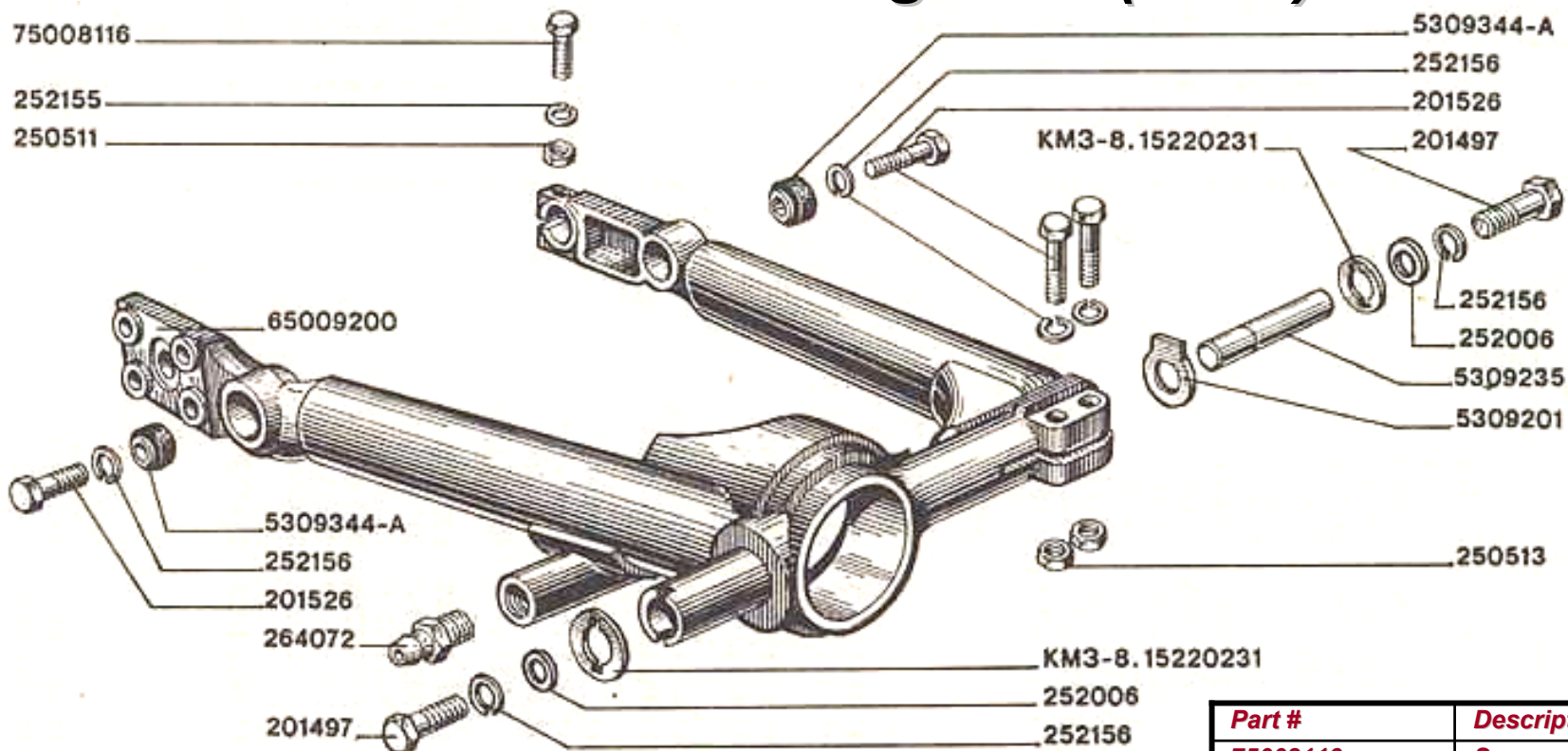
The Rubber "Silent-Block" Sleeve at the Pivot Point Was Replaced with a Ball Bearing (6201-2RSH/C3) in 2008

MT-9, MT-10, MT-10.36 Rear-Wheel Swing-Arm (1WD)



Part #	Description	Qty
65009200	Swing-Arm	1
75008116	Bolt	1
5209201	Silent-Block Washer	1
5309231	Protective Sleeve	1
75009233	Special Washer	1
5309234	Detachable Journal	1
5309344-A	Distance Bushing	2
201526-П8	Bolt	2
250511-П8	Nut	1
250513-П8	Nut	2
252005-П8	Washer	1
252156-П2	Washer	4
264072-П8	Lubricator	1
201526-П13	Bolt	2

MT-11 Swing-Arm (1WD)



Part #	Description	Qty
75008116	Screws	1
65009200	Swing-Arm	1
5309201	Washer Hob	1
KM3-8.15220231	Dust Cover	2
5309235	Removable Pin	1
5309344-A	Spacer	4
201497	Bolt M10	2
201526	Bolt M10x1	4
250511	Nut M8x1	1
250513	Nut M10x1	2
252155	Washer 10	2
252155	Washer 8L (8Л)	1
252156	Puck 10L (8Л)	6
264072	Oiler M6x1 (M6h1)	1

Ural Tourist 750cc Rear-Wheel Swing-Arm (1WD)



2005 Ural Tourist 750cc Swing-Arm



Rubber "Silent-Block" Spacers

In 2008, Ural replaced the rubber "silent-block" spacers with ball bearings.

Ural Rear-Wheel Swing-Arm Assembly (1WD)



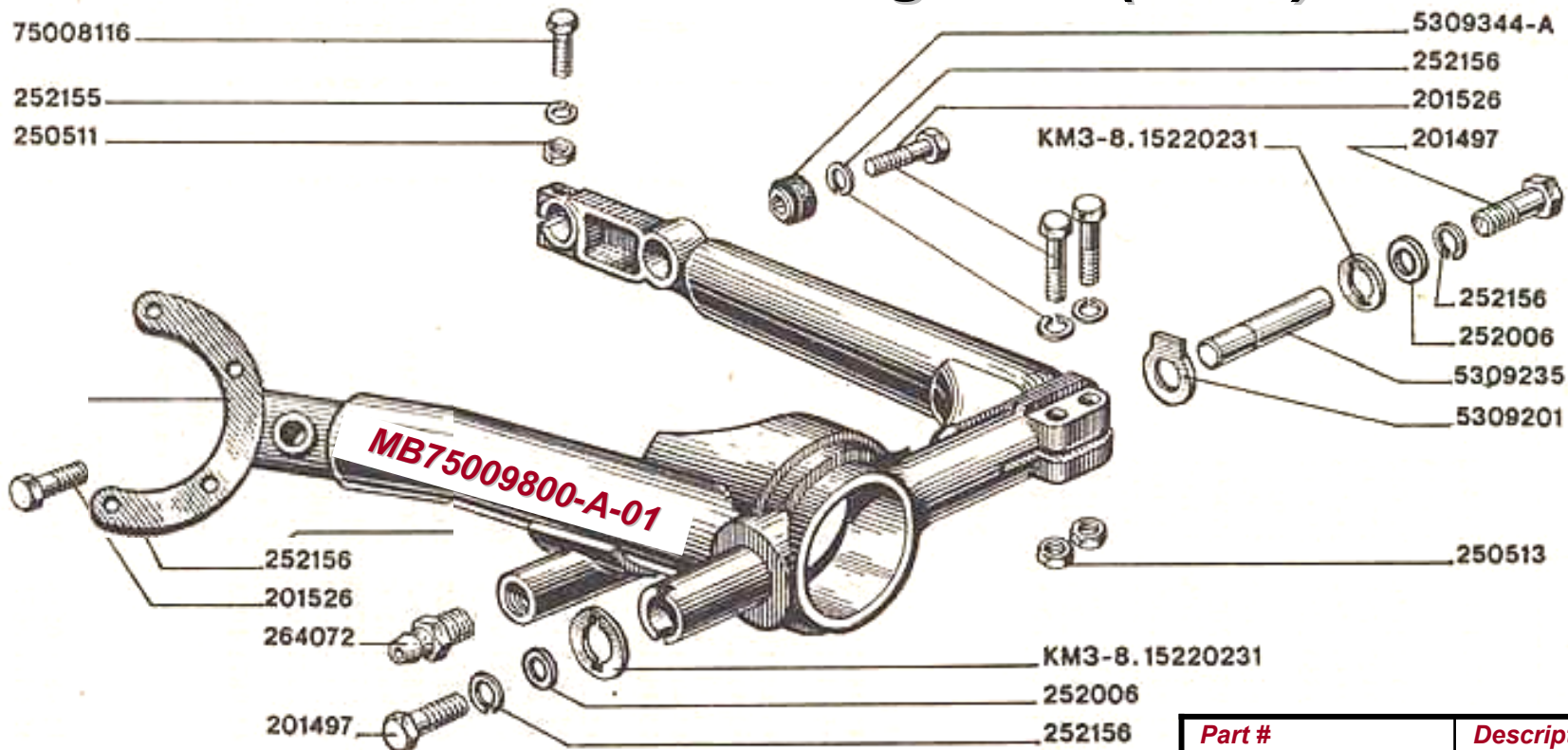
**Rear-Wheel Swing-Arm Assembly
(Ural)**
List Price: \$49.42CAD
Vendor ID: 192
(www.russiagarage.com)



Silent-Block,
32mm OD, 13mm ID, height 29mm
Vendor ID: 332
List Price: \$3.00
(www.russiagarage.com)



MT-16 Swing-Arm (2WD)

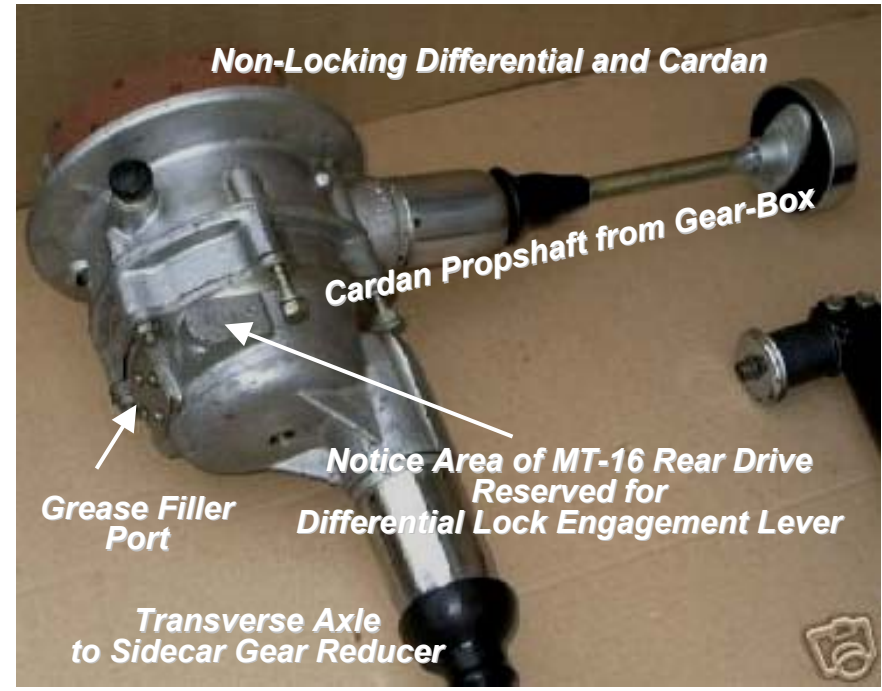


Part #	Description	Qty
75008116	Screws	1
5309201	Washer Hob	1
KM3-8.15220231	Dust Cover	2
5309235	Removable Pin	1
5309344-A	Spacer	2
MB75009800-A-01	Swing-Arm	1
201497	Bolt M10	2
201526	Bolt M10x1	4
250511	Nut M8x1	1
250513	Nut M10x1	2
252155	Washer 10	2
252155	Washer 8L (8Л)	1
264072	Oiler M6x1 (M6h1)	1

MT-16 Suspension (opposit.ru)



MT-16 Rear Drive and Sidecar Wheel Gear Reducer



Rear-Wheel Swing-Arm: Two-Wheel Drive (2WD)



Swing-Arm
(MT-16, MB-750)
Vendor ID: 622
List Price: €45.00
(www.ural-hamburg.de)



Swing-Arm
(MT-12, MT-16, MB-650, MB-750)
Vendor ID: 2666
List Price: €45.00 (Used 500km)
(www.ural-hamburg.de)



Swing-Arm
(MB-750)
Part #: WP09800
Vendor ID: 003.193
List Price: €90.74
(www.oldtimergarage.eu)



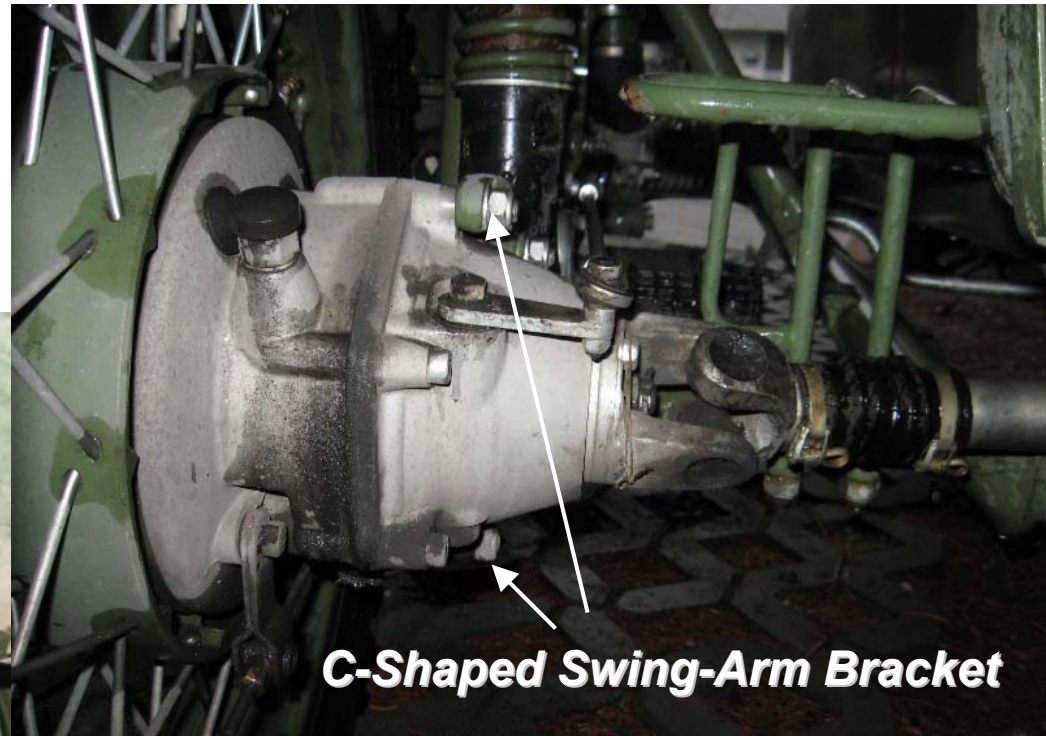
Swing-Arm, 2WD
(MT-16)
Vendor ID: 160917760155
List Price: US \$57.00
(www.ebay.com)

IMZ-8.1037 Patrol or Gear-UP (2WD) (www.sovietsteeds.com)



The 2WD swing-arm has a C-shaped bracket for attaching to the rear drive.

2007 Gear-Up



Ural Swing-Arm Bushing Replacement (www.advrider.com)

- **Swing-Arm Bushing: Rubber Silent-Block Sleeve**
- **Spent an Hour Pulling the Swing-Arm Bushings**
- **Rubber Holding the Steel Sleeve Allowed Swing-Arm to Move Laterally about 3/8"**
- **Triquest in NorCal Did Not Know of Any Bearing to Replace the Old "Sleeve in the Rubber Bushing" Part (Silent-Block)**
- **Went to Bearing Shop**
 - **Owner Recommended a Pair (each side of each pivot) of Spherical Plain Bearings: Aurora Model GEZ008ES.**
 - **1/2" ID and 7/8" OD (No Manufacturer Available with 1/2" ID by 1.125" OD Bearing)**
 - **Pressed into a Bronze Bushing after Bushing Is Pressed into Swing-Arm Holes**
 - **Spherical Bearing Appears Small in Size**
 - **Bearing Is Rated at 9,000 lbs of Radial Static Load Capacity (with 1.5 safety Factor)**
 - **Swing-Arm Pivot Not Totally Static (5° of Arc Is Pretty Close)**
 - **Bearings Especially Rated for Shock Loading**
- **Ural Replaced Rubber Bushing with Ball Bearing in 2008**
 - **Frame Where Rear-Wheel Swing-Arm Connects Was Changed to Accommodate Bearings and Thus New-Style Swing-Arm Can't Be Installed on Older Ural bikes**

