Lancia at Work

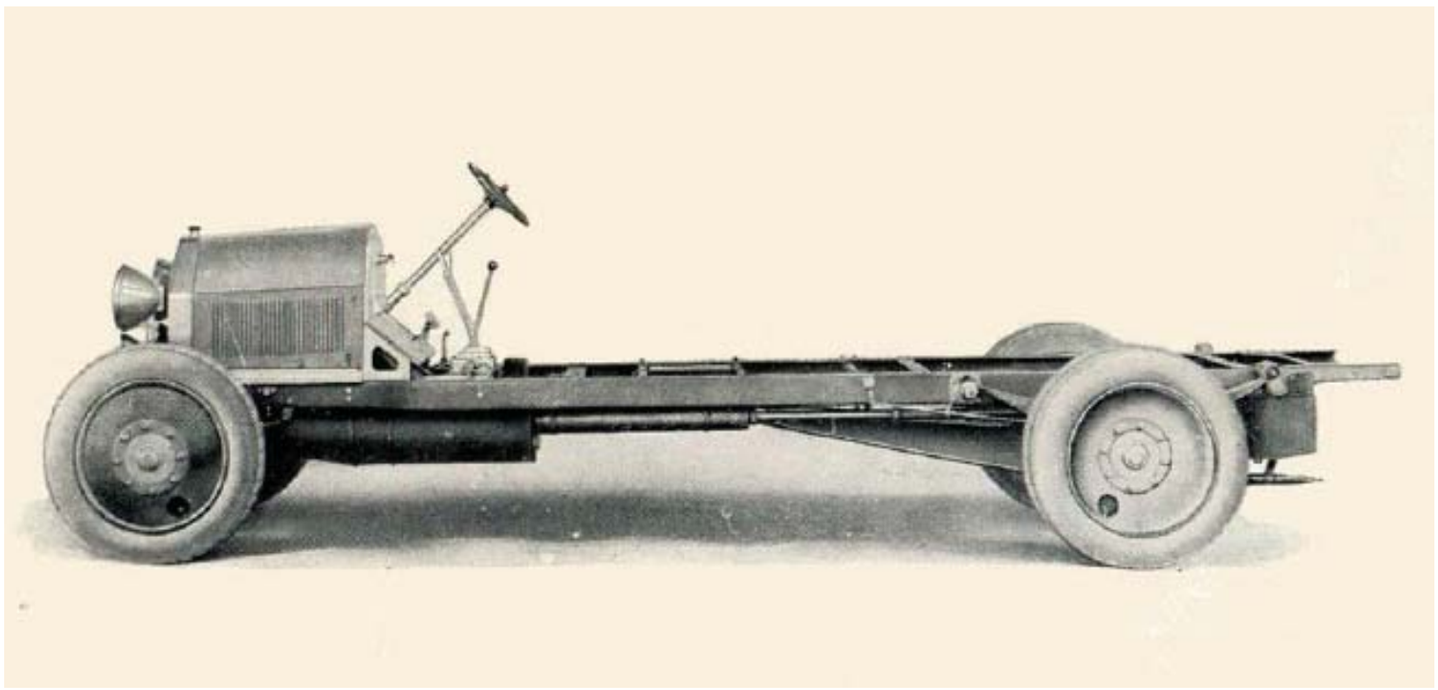
Geoff Goldberg

Lancia's history of trucks, buses and service vehicles has long been hard to grasp. Lancisti have long been aware of the commercials, as they were called, but due to the complexities and variations of the truck production this is a story that has been difficult to unravel. Some have sensed that trucks helped establish or even stabilize the engineering culture at Lancia. Further inspection suggests that the roots and interfaces may well go deeper.

Lancia made more than 58,000 major trucks, not including smaller, light commercial variations. Series production started by 1915, with many different models being made until 1970. If smaller trucks and commercial vehicles based on car chassis are also counted, the total count is roughly 85,000—more than 1,000 per year.

Like the cars, there were many variations in the trucks—including changes to chassis, special bodies, new names, different numbering systems, specials for the military, changed wheelbases, restyled fronts and so on. They were made for many uses—industrial hauling, military transport, autobuses, fuel supplies—practically any and all purposes were served by these trucks. Similarly to the cars, some commercials were produced in volume, some just in variation. And the overall number of variations can be staggering. Yet overall, there is a clear path of continuity and sense of vision in the company's work.

In general, the trucks can be organized in families around engine types. When Lancia changed engines, they sometimes changed



designations. Some models, like the Esatau, had chassis numbers changed based on their purpose, or by variations in their cab design. But in general, major families can be organized by the motors.

BEGINNINGS

When was the first Lancia truck? It is difficult to pin down - Bernabo suggests it might have been a "small lorry" on the chassis of the "Eta" car. Wim Oude Weernink states the first truck chassis was laid down in 1911, called the "1Z", distinct from the Zeta cars of the same time. It featured a 5-liter monoblock motor and a most unusual transaxle with double crown wheels (for 3rd and 4th gears), with a torque tube from the motor to the transaxle.[1]

On this chassis were made some early armored cars, looking like early tanks, by Ansaldo from 1915 – 1918, and even saw action in WWII in Yugoslavia.[2]

J GROUP

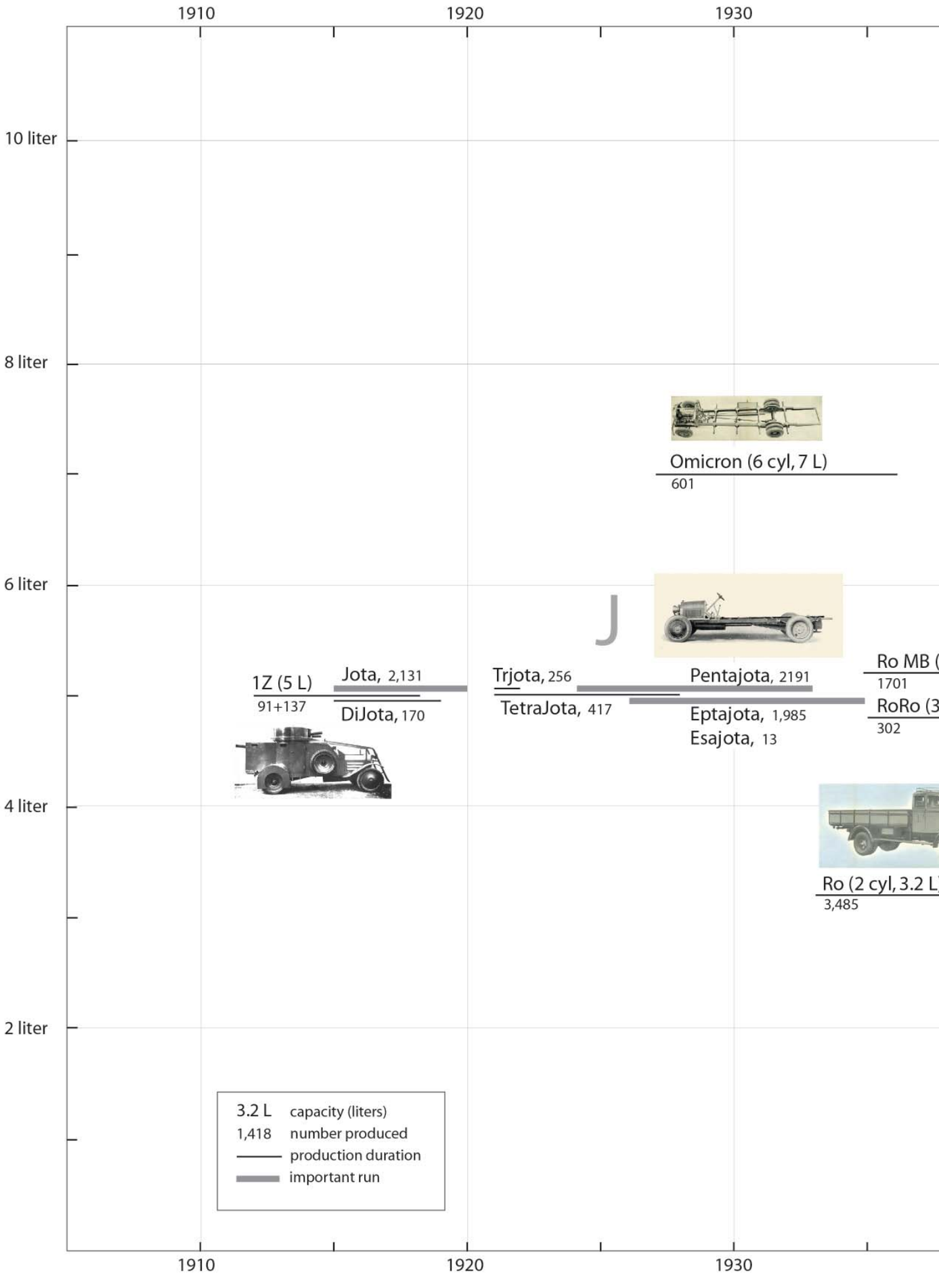
Lancia's first series truck production started with the Jota in 1915 with its 4 cylinder, 5-liter motor. The Jota family was a broad one, and includes many variations—the Dijota, Trjota, Tetrajota, Pentajota, Esajota, and Eptajota—all the way up to 1935. The Pentajota was a very early heavy duty truck, with payload over 10,000 lbs; the Esajota had a lowered floor, to serve as a bus. Overall about 7,000 were made, powered by the same motor.

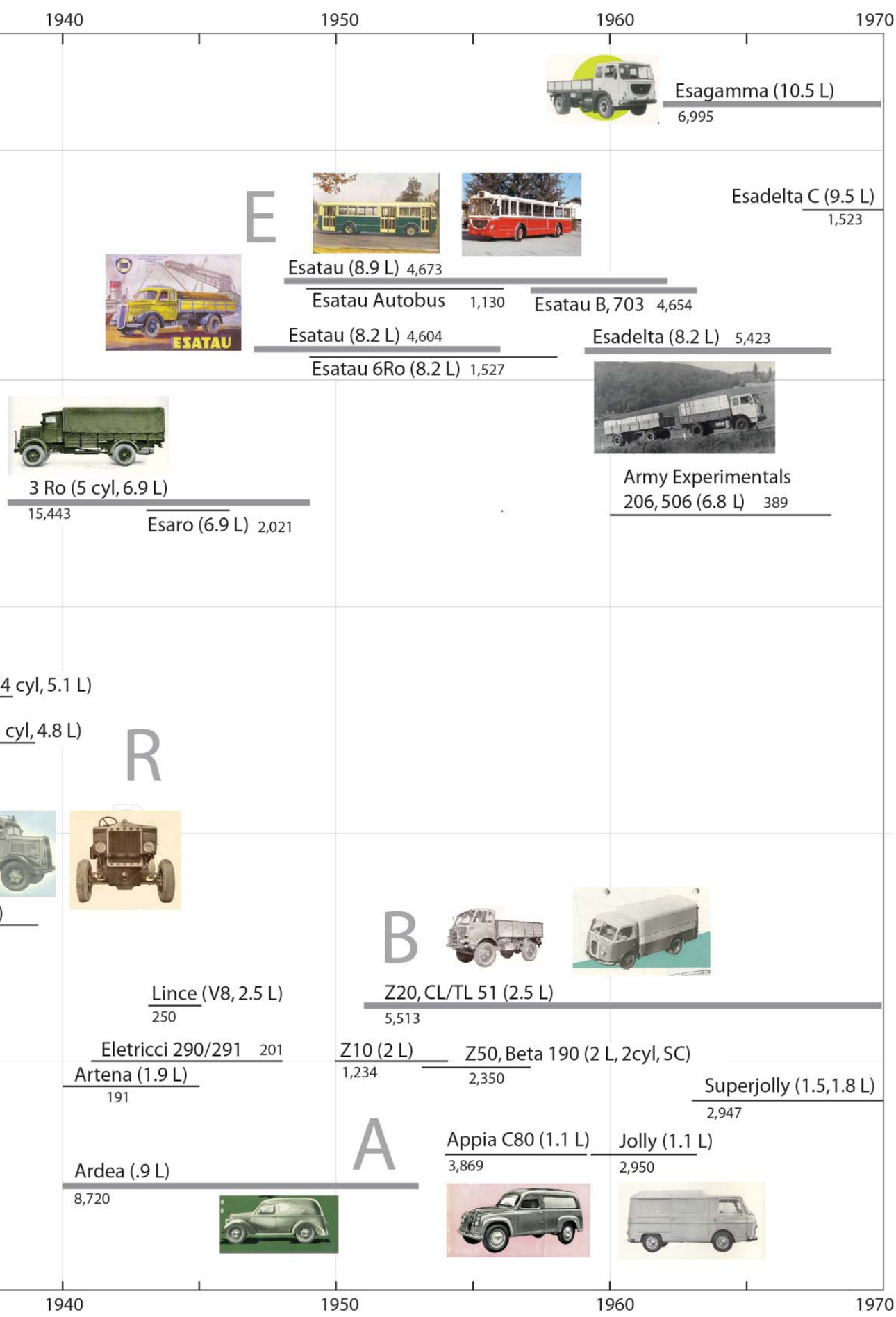
O GROUP

Lancia's first mainly passenger truck was the Omicron of 1927, designed with low side rails to facilitate its use as a bus, but with more power from a new motor. Roughly 550 were made up through 1936, most provided with a massive 7-liter straight six cylinder engine. This DOHC motor had hemispherical combustion chambers, remarkable for such an early design, before this was featured on the car motors. This was made at the same time as the Lambda, showing that Lancia was able to optimize breathing on their trucks at the same time as making the V4 Lambda motor with its necessary breathing compromises. Later Omicrons were also fitted with the diesel engines used in the Ro series—in 2C, 3C, and 5C configurations, but only a few.

Top Santo and I give the barchetta and ourselves a break from the hot Sicilian sun under a tree in an olive grove near Agrigento.

Above An Italian difference of opinion taking place in the piazza in Caltagirone, complete with onlookers, with the Lancia in the foreground.


1910
1920
1930
10 liter
8 liter
6 liter
4 liter
2 liter
Omicron (6 cyl, 7 L)
601
J
1Z (5 L)
91+137
Jota, 2,131
DiJota, 170
Trjota, 256
TetraJota, 417
Pentajota, 2191
Eptajota, 1,985
Esajota, 13
Ro MB (
1701
RoRo (3
302
Ro (2 cyl, 3.2 L
3,485
3.2 L capacity (liters)
1,418 number produced
production duration
important run


1940
1950
1960
1970
Esagamma (10.5 L)
6,995
E
Esadelta C (9.5 L)
1,523
Esatau (8.9 L) 4,673
Esatau Autobus 1,130
Esatau B, 703 4,654
ESATAU
Esatau (8.2 L) 4,604
Esatau 6Ro (8.2 L) 1,527
Esadelta (8.2 L) 5,423
3 Ro (5 cyl, 6.9 L)
15,443
Esaro (6.9 L) 2,021
Army Experimentals
206, 506 (6.8 L) 389
4 cyl, 5.1 L)
cyl, 4.8 L)
R
B
Lince (V8, 2.5 L)
250
Z20, CL/TL 51 (2.5 L)
5,513
Eletricci 290/291 201
Z10 (2 L)
1,234
Z50, Beta 190 (2 L, 2cyl, SC)
2,350
Artena (1.9 L)
191
Superjolly (1.5,1.8 L)
2,947
A
Appia C80 (1.1 L)
3,869
Jolly (1.1 L)
2,950
Ardea (.9 L)
8,720
1940
1950
1960
1970

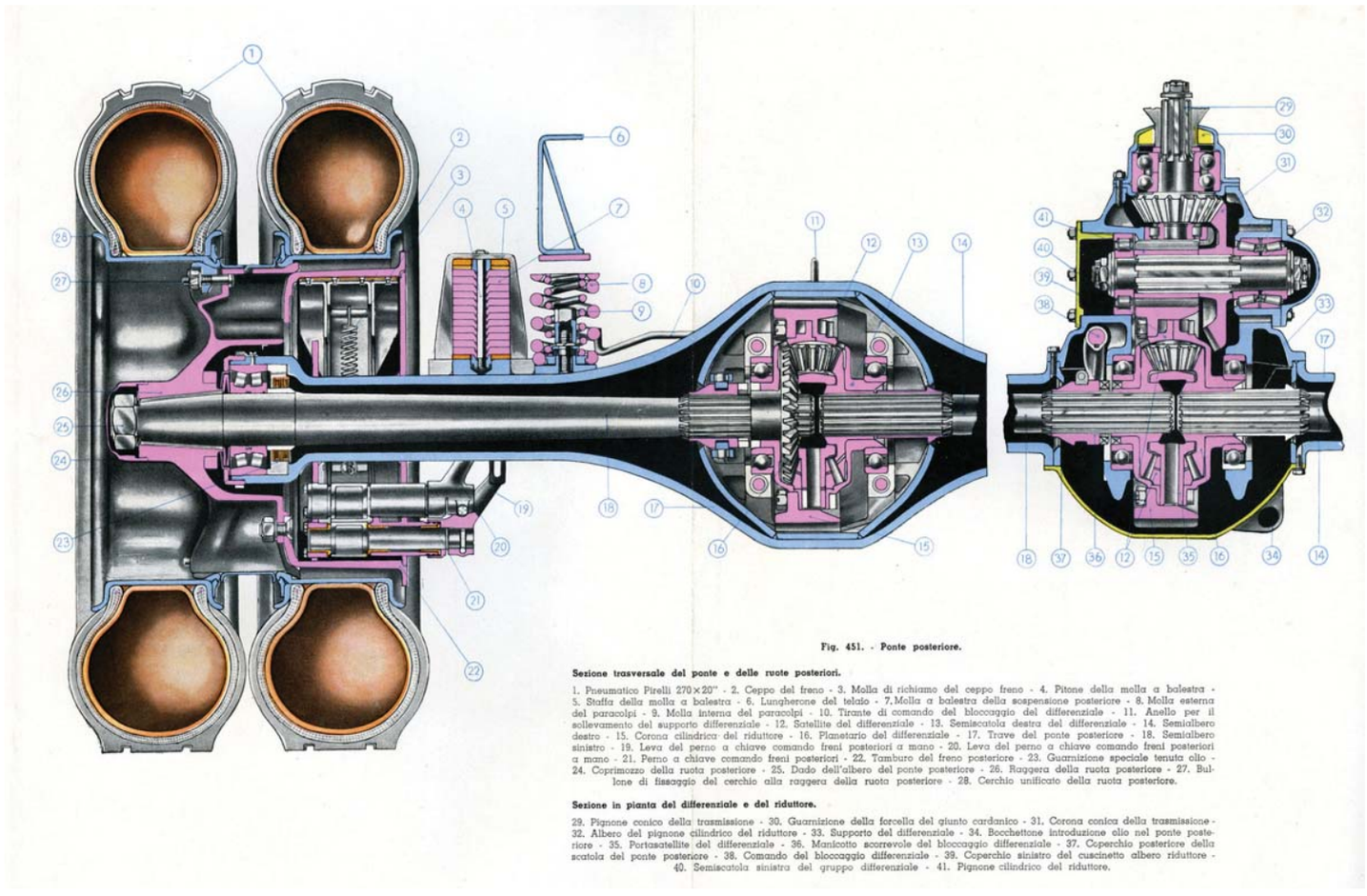


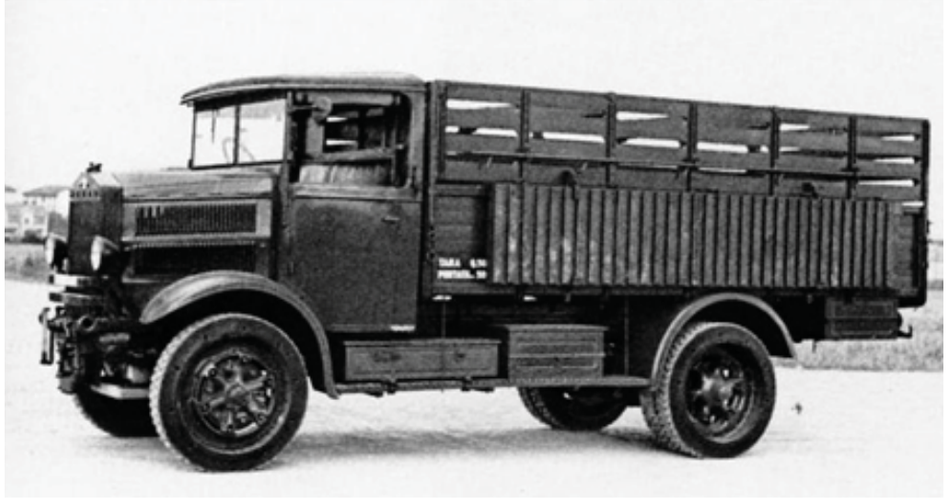
Fig. 451. - Ponte posteriore.

Sezione trasversale del ponte e delle ruote posteriori.

1. Pneumatico Pirelli 270×20" - 2. Ceppo del freno - 3. Molla di richiamo del ceppo freno - 4. Pitone della molla a balestra - 5. Staffa della molla a balestra - 6. Longherone del telaio - 7. Molla a balestra della sospensione posteriore - 8. Molla esterna del paracolpi - 9. Molla interna del paracolpi - 10. Tirante di comando del bloccaggio del differenziale - 11. Anello per il sollevamento del supporto differenziale - 12. Satellite del differenziale - 13. Semiscatola destra del differenziale - 14. Semialbero destro - 15. Corona cilindrica del riduttore - 16. Planetario del differenziale - 17. Trave del ponte posteriore - 18. Semialbero sinistro - 19. Leva del perno a chiave comando freni posteriori a mano - 20. Leva del perno a chiave comando freni posteriori a mano - 21. Perno a chiave comando freni posteriori - 22. Tamburo del freno posteriore - 23. Guarnizione speciale tenuta olio - 24. Coprimozzo della ruota posteriore - 25. Dado dell'albero del ponte posteriore - 26. Raggera della ruota posteriore - 27. Bullone di fissaggio del cerchio alla raggera della ruota posteriore - 28. Cerchio unificato della ruota posteriore.

Sezione in pianta del differenziale e del riduttore.

29. Pignone conico della trasmissione - 30. Guarnizione della forcella del giunto cardanico - 31. Corona conica della trasmissione - 32. Albero del pignone cilindrico del riduttore - 33. Supporto del differenziale - 34. Bocchettone introduzione olio nel ponte posteriore - 35. Portasatelliti del differenziale - 36. Manicotto scorrevole del bloccaggio differenziale - 37. Coperchio posteriore della scatola del ponte posteriore - 38. Comando del bloccaggio differenziale - 39. Coperchio sinistro del cuscinetto albero riduttore - 40. Semiscatola sinistra del gruppo differenziale - 41. Pignone cilindrico del riduttore.



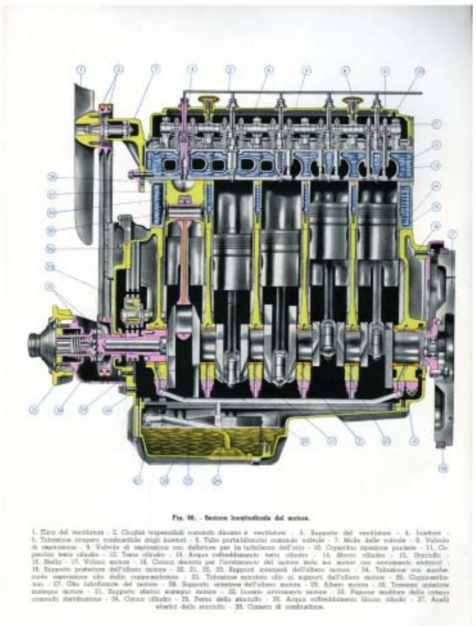
R GROUP

The RO series of trucks were built from 1934 through 1949. The RO came first, with three versions sequentially, cutely named RO, RORO and 3RO.[3] The first two were equipped with two stroke diesel engines with tandem piston configurations, made under license from Junkers. The RO had 2 cylinders (and 4 pistons), the RORO 3 cylinders. The last model, the 3RO, had a different Lancia-designed motor, a four-stroke 6.9-liter diesel motor, uniquely with 5 cylinders.[4]

Although there is some uncertainty on production of early ROs, the 3RO was the volume leader with about 15,000 made from 1939 on. Over 10,000 were supplied to the military. At the end of the war, 2,000 examples of the Esarò were produced, essentially a 3RO renamed and with a gasoline powered engine.

The 3RO was significant technically. In it, breathing efficiency was pursued with 4 valves per cylinder, although earlier Lancia motors had been typically side valve motors. Unlike the gasoline DOHC Omicron, the diesel 3RO had a single cam shaft on the side and a system of double rockers above, an answer used by Lancia later in the Beta trucks and the Appia.

Maintenance was simplified with the change from the Omicron's complex hemi-head to a simple flat milled head in the 3RO, locating combustion chambers in the piston crown, a Heron type solution, better for diesels. The factory publicity material noted one of the features of the 5 cylinder motor was that the two central pistons were never at the same location and thus all the main bearings could be sized identically.



photograph courtesy Luigi De Virgilio

Top Santo and I give the barchetta and ourselves a break from the hot Sicilian sun under a tree in an olive grove near Agrigento. **Above** An Italian difference of opinion taking place in the piazza in Caltagirone, complete with onlookers, with the Lancia in the foreground.

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The 3RO also used the concept of the "composite" engine block—a multilayered structure—its engine done in parts. From Esarò manual, one can note:

valve cover assembly	probably aluminum
head	cast iron
cylinder block	cast iron
upper crankcase	aluminum
lower crankcase	aluminum

Experience with this composite layering remained with Lancia, later used in the Appia and Fulvias of the 1950s and 1960s.

E GROUP

The Esatau was Lancia's significant postwar truck, made from1947 through 1962. Its motor was based derived from the 3RO but had 6 cylinders. Initially sized at 8.2 liters it was enlarged to 8.9 liters in 1953. It was made for military, industrial and transportation use. Over 1,000 were supplied as autobuses, as had the earlier 3RO. Lancia also provided the military with shortened models, called Esatau 6RO.

In October, 1956, the new Esatau B was introduced with its vertical inset grille similar to the Appia and Aurelia. It was in major production through the early 1960s, dropped after 1962. Esataus came in many shapes and sizes fulfilling a wide set of purposes and custom uses, and over 12,000 were made.

The Esadelta was next member of the "E" family, introduced in 1959. This medium-sized truck was based on the Esatau engine of 8.2 liters, and was sold in multiple configurations

PRODUCTION 1950-51

CAMION BETA - Charge: 2 Tonnes 150

Moteur à essence 4 Cylindres 75 × 108, 1.908 cm³. **Puissance** 46 CV à 3.500 t/m. **Embrayage** monodisque. **Changement de vitesses** à 5 vitesses et marche arrière. **Pont** avec couple conique Gleason 10/57. **Suspension** AV à roues indépendantes. **Cabine** avancée. **Frein hydraulique** avec double cylindre sur les roues arrière. **Frein à main** sur la transmission. **Roues** à disque avec **pneus** de 6,50 × 16, type transport, jumelés à l'arrière. **Caisse** avec ridelles rabattables de 3 m 25 × × 1 m 70 × 0 m 48. **Cabine** métallique. **Empattement** 2 m 55. **Voie**: de l'arrière 1 m 45, de l'avant 1 m 35. **Rayon de braquage**: 5 m 50. **Charge** utile 2 Tonnes 150. **Poids** à pleine charge: 4 Tonnes. **Vitesse** 82 Km. **Consommation** normale, 16 lit. aux 100 Km.

CAMION ESATAU - Charge 7 Tonnes 550

Moteur Diesel 6 Cylindres 108 × 150, 8.245 cm³. **Puissance** 122 CV, à 2.000 t/m. **Embrayage** à disques multiples. **Boite de vitesses** avec réducteur: 8 vitesses et 2 marches AR. **Pont** à double réducteur, rapport 7,07. **Frein** à air comprimé sur les 4 roues et sur la transmission, à main sur la transmission. **Pneus**: 12,00 × 22, ou Métalic E 22, jumelés à l'arrière. **Cabine** métallique avec couchettes. **Camion normal**: Empattement 5 m. Longueur max. normale 8 m 30. Rayon de braquage: 8 m 10. **Camion court**: Empattement 4 m 30. Longueur max. 7 m 56. Rayon de braquage: 7 m 40. **Poids** à pleine charge: motrice 14 Tonnes, remorque 14 Tonnes. **Vitesse**: 53 Km. **Consommation** normale: 20 lit. aux 100 Km; avec remorque: 26 lit. 5.

CAMION ESATAU A 3 AXES - Charge 10 Tonnes

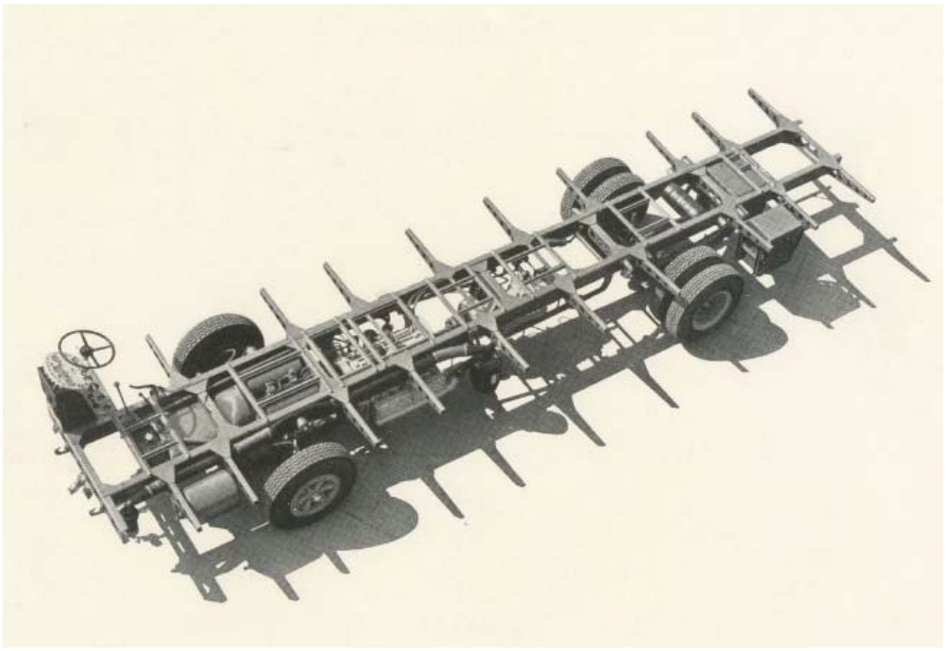
Moteur, embrayage, boîte de vitesses, pont, comme le camion à 2 axes. 3ème axe portant à l'arrière. **Frein** à air comprimé sur les 6 roues et sur la transmission, à main sur la transmission. **Pneus**: 12,00 × 22 ou Métalic E 22. **Cabine** métallique avec couchettes. **Empattement**: 5 m 625. **Longueur** maximum 9 m 56. **Rayon de braquage**: 9 m 20. **Poids** à pleine charge: motrice 18 Tonnes; remorque 12 Tonnes. **Vitesse**: 53 Km. **Consommation** normale: 21 lit. 5 aux 100 Km; avec remorque 30 lit. 7 aux 100 Km.

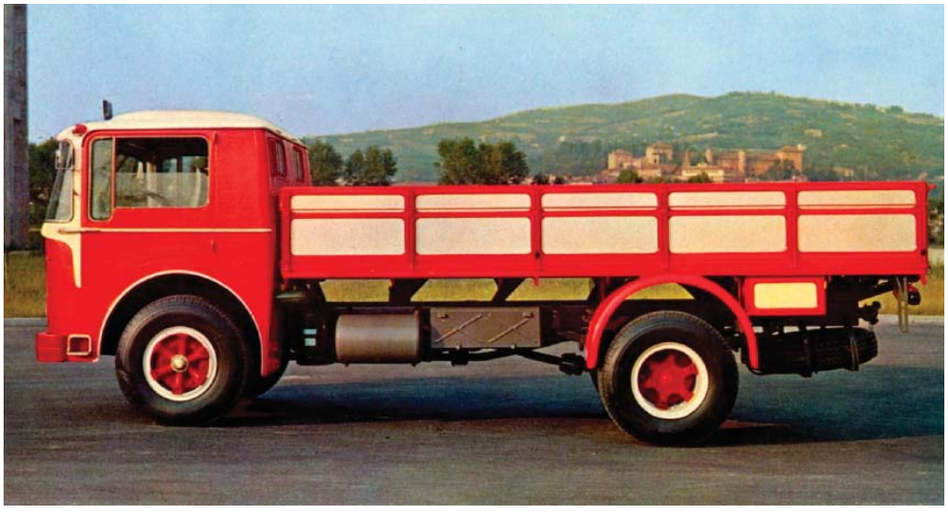
AUTOCAR DE LIGNE ESATAU/P - Nombre de places: 61 + 1

Moteur horizontal sous la partie avant du châssis. Type Diesel à 6 Cylindres 108 × 150, 8.245 cm³. **Puissance**: 122 CV à 2.000 t/m. **Embrayage** à disques multiples. **Boîte de vitesses** avec réducteur à 8 vitesses et 2 marches arrière. **Pont** à double réduction. **Frein** à air comprimé sur les 4 roues et sur la transmission; à main sur la transmission. **Pneus**: 12,00 × 22, ou Métalic E 22. **Empattement**: 5 m 50. **Longueur**: 11 m. **Rayon de braquage**: 9 m 10. **Poids** à pleine charge: 14 Tonnes; remorque: 10 Tonnes. **Vitesse** à demande (85 Km - 76 Km - 66 Km - 58 Km). **Consommation** normale: 19 lit. aux 100 Km; avec remorque: 26 lit. 5 aux 100 Km.

Les indications relatives à la consommation de carburant sont fixées selon la formule du Bureau Italien Normalisation Automobile (2/3 de la vitesse max. à pleine charge et sur route plate)

LANCIA & C. - FABBRICA AUTOMOBILI - TORINO - S. p. A.





as a chassis or complete truck, and with 2 or 3 axles. In 1963, engine size was increased to 8.9 liters, and increased again to 9.5 liters in the Esadelta C, made from 1967 – 1970 quite successfully. Overall, about 7,000 Esadeltas were made.

The Esagamma was Lancia's last major truck. Very powerful, it was introduced in 1962 with a new 10.5-liter motor designed by De Virgilio. As the second most powerful truck in Europe at the time, it was designed with attention to new legislation about increasing allowable axle loads, eliminating 8 wheelers. Thus axle location was carefully considered to allow for better weight distribution of anticipated 10,000 kg loads; unfortunately these rules were not adopted until a decade later.[5]

Esagammas were recognized for their economical consumption and low running costs. Not as simple or robust as the large Fiat, they did not fare well in large fleets and were best appreciated by thoughtful drivers. With their large payload, they found a variety of uses throughout Europe, including the 80,000-liter tanker for refueling large jets. Produced through 1970 when Fiat stopped production, a few chassis were made in years following.

In summary, then, the main groups are the Jota, Omicron, RO family, and the "Es": Esatau, Esadelta and Esagamma. For more detail, two books are suggested: La Lancia by Weernink gives chassis and production numbers, and Lancia Camion outlines the different uses, body builders, and styles.

Lancia's commercial trucks can also be understood as how they are powered: diesel and gasoline motors were used. In a few cases, motors were converted to use alternative fuels (methane) as well. In general, it is possible to separate the truck models by the kind of fuel: for example, the DOHC, hemi-head Omicron was a gasoline motor; the 3RO motor with its Heron heads and pushrods was a diesel engine. The Jota family were all gasoline; the "E"s (Esatau, Esadelta, Esagamma) were all diesels. Some, like the Esaro were made in both versions. The civilian Beta truck (Z10) was a gasoline motor, the military version (Z20 or CL51) had a different motor and was diesel powered.

"CARS THAT GO TO WORK"

Lancia made smaller commercial vehicles alongside the major trucks. First, small trucks were based on conversions of car chassis,

starting with the first Lancia trucks in 1911. This happened in 1940 when 191 military trucks were produced on the Artena chassis. That approach was used again with the Ardea 800 and Appia C80 on pickup and panel trucks.

Later Lancia individually named their small truck models as the Jolly and Superjolly, the former based on the Appia motor, the latter on the Flavia drivetrain.

How many of these smaller trucks were made? Approximately 8,800 Ardea 800s were made, followed by 3,090 Appia-based C80s through 1959. Then the Jolly was introduced, based on the Appia motor, with about 3,000 produced through 1963. This was followed by the Flavia-engined Superjolly, in both 1.5 and 1.8-liter sizes, of which approximately 3,000 were made. In total, about 18,000 smaller trucks were made based on car chassis.

BETA (Z FAMILY)

Starting in 1950, Lancia introduced a separate lineup of medium-sized trucks—three different models each with different motors. Internally identified as the Z10, Z20, and Z50, there were two four-cylinder motors and one two-cylinder, powering many variants.

The first was the Beta of 1950, called internally the Z10, a gasoline powered 2-liter truck. It came in a variety of body configurations with staggered 0º 4 cylinder motors. In production only a few years from 1950-1953, it was replaced in 1953 with the

Beta Z50 with its 2-liter diesel motor of two supercharged cylinders. Later called the Beta 190, this truck stayed in production through approximately 1957.

The last member of this group of small trucks was called the CL51 and TL51, Army types for Carro Leggero and Trattore Leggero. Initially identified as the Z20 by Lancia, it featured a 2.5-liter, four-cylinder motor similar to the earlier Z10 motor with its staggered cylinders of 0º. However, in detail the motors are almost totally different. the CL and TL51 trucks became valued by the Italian military, with 5,513 produced through 1970.[6]

Due to the number of variations, the exact number of Z family trucks is quite difficult to determine exactly, but approximately 8,800 were made in total.

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Above An Italian difference of opinion taking place in the piazza in Caltagirone, complete with onlookers, with the Lancia in the foreground.

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THE ODDITIES

Not all commercial production was straightforward; some trucks did not fit the above outline. For example, during WWII, Lancia made two very interesting products—one was a light commercial truck designed from scratch using electrical power,[7] with batteries under the floor, as the 290 in four wheel or 291 in six-wheel configuration.

Production started in 1942, and 202 were made. By the end of the war, the engines were replaced with Artena engines. As a side note, I have a parts book for these rarities!

Also in wartime, Lancia developed a small, high-speed armored scout car—the Lince.[8] Powered by a modified Astura V8 engine, more importantly it featured independent suspension by strut on all wheels and 4WD. It had both front and rear steering, the rear only after the front wheels had reached full lock. 250 examples were made of this most remarkable vehicle.

After the success of the CL51/TL51 small truck for the military in the 1950s, Lancia looked for other ways to service that market. They developed the 506 in 1958, with a inclined 7-liter engine,[9] producing about 380 over the next five years.

Other military prototypes were more successful; in the late 1960s Lancia produced a 4x4 7.5 ton vehicle, with an engine possibly based on the Esadelta C. Prototypes were ready in the early 1970s, but it was finally brought to the market with a Fiat motor yet oddly with Lancia labels.

Called the Lancia Iveco 6611 or CL-75 for the military, this was the last bit of Lancia truck production. Begun in 1975, it was sold under the OM and finally Fiat's IVECO name until the 1990s.

In conclusion, then, the history of Lancia commercials has much the same character as that of the cars. Lancia's commercials are as engaging not just for their technical solutions, but as yet another insight into how a creative engineering team responded to an evolving market. All the factors that were appreciated at Lancia—continuity and innovation, mass production and unique solutions—were in play here as well. While the commercials elude personal ownership, they give us one one more way to appreciate the work of this complex group of makers.

TOTAL NUMBERS

Production numbers of the trucks was determined by detailed comparisons between four sources: Amatori and Rosani in *Storia della Lancia*, Condolo's *Lancia Camion*, and Weernink's *La Lancia*.[10]

These all showed some variations, but after careful reconciliation, Rosani's work was deemed the most accurate and is used for the summary chart, below, and the large illustrated chart.

The differences between each source can, for the most part, be explained. And while absolute total numbers will never be known for sure, this summary chart is a reasonably accurate summary.[11]

	TOTALS
Jota	7,163
Omicron	601
Ro Family	22,952
Esatau	12,855
Esadelta	6,946
Esagamma	6,995
Others [12]	931
TOTAL BIG TRUCKS	58,443
Beta (all the Z family)	8,863
"Cars that work"	18,668
TOTAL ALL TRUCKS	85,974

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NOTES

1 *A very early IZ or Zeta chassis has been found in England reportedly with a 2.6-liter monoblock motor (unlike the cars). Its early origins are unknown, but it was rebodied as an ambulance in WWI.*

2 *Numbers of armored cars, called "autoblinda" vary from 130 to 174.*

3 *There was also the RoMB made for the military with an earlier type 4 cylinder side valve motor.*

4 *This work would have been done under Giuseppe Sola, in charge for commercial vehicles at this time. The truck was ready in 1938, probably without Jano's input; he had joined Lancia in the end of the 1937.*

5 *This was a major issue because the chassis was designed for regulations to allow for higher total weight; instead, the heavier frame resulted in a reduced payload having to conform to the older regulations [per Luigi De Virgilio].*

6 *Lancia efforts to clean up their model names in 1953 identify both Z20 and Z30. Other model names exist as well for these trucks: Z20A, Z20AA, Z21, &c.*

7 *Due to lack of fuel for civilian use during wartime.*

8 *Sometimes referred to as the Lynx in English. A note on Lince production: All four sources stated that 250 Lince were produced, and that number is used here. However, the Daimler Fighting Vehicles Project has a detailed review of the Lancia Lynx, noting it was a copy of the Daimler Dingo but with Lancia's engine. They note some 300 were made early in WWII, and after the 1943 Armistice in Italy, a further 392 were produced until March 1945.*

9 *A gasoline model possibly derived from the Esatau.*

10 *The excellent* Lancia Camion, *by Condolo, published by Fondazione Negri has much good detail but the numbering is inconsistent. Amatori's Storia della Lancia gives yearly production and sales records, but in the later years, some errors are included. Wim Oude Weernink's* La Lancia (*first and second ed.*) *were consulted and supplemented by the factory's "Lancia dal 1906 caratteristiche tecniche".*

11 *The older records tend to be more in common. The biggest variation is in the Ro truck, where Rosani includes military vehicles the others did not. Rosani also counts Esagamma production past 1969.*

12 *"Others" includes the 91 very early IZ trucks, 250 Lince and 201 Elettrice trucks in WWII, 389 of the type 506 trucks of the 1960s. Not included are the 130 – 170 tanks made by Ansaldo in WWI on IZ truck chassis, and some autobus chassis made under subcontract to other suppliers.*