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<b>Customer Order Number</b>	
<b>Job Number</b>	EJC65-070-09
<b>Incoming</b>	21/9/2022
<b>Finish</b>	24/9/2022

Multi-Turn Actuators - L120

Product Brand

[Limatorque®](#)

Type

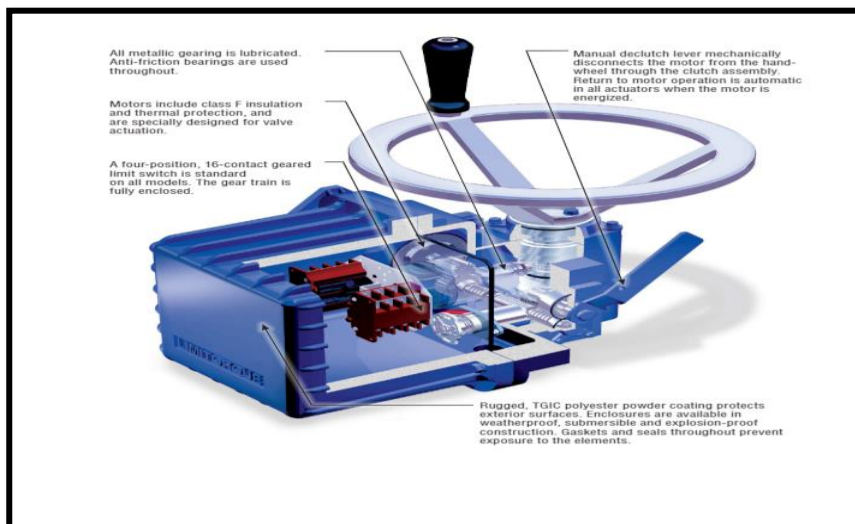
[Electric Actuators](#)

SubType

Intrusive Multi-Turn Actuators

About this product

The Flowserve Limatorque L120 electric actuator is designed for a wide range of environmental applications in power, oil & gas, and water industries.



Test & Inspected By Meer Service Co.,Ltd	Witnessed By	Reviewed By	Approved By
<i>Narongrit P.</i>	<i>Pornchai T.</i>	<i>Phiphat T.</i>	<i>Panuwat N.</i>
( Mr.Narongrit Pramual )	( Mr.Pornchai Thongpjit )	( Mr.Phiphat Thamdarob )	( Mr.Panuwat Nurat )
Date: 24/9/2022	Date: 24/9/2022	Date: 24/9/2022	Date: 24/9/2022



# Actuator Overhaul Report



**MEER SERVICE CO.,LTD**

99/33 Moo.5 T.Map Kha, A.Nikom Phatthana,

Rayong 21180 Thailand EMAIL. sale@meer.co.th

Tel : +66 2 114 3195

Actuator Description				Gear Box	
Tag No.	HV-1807			S/N	
Actuator S/N	L833958			Ratio	
Order No.	16-477-3957-3-REV-A1			Type	
Type	L120-190			Manufacturer	
Output speed	20-160 rpm.				
Torque	2584 Nm.			Valve Description	
Motor Rating	25 KW 15Min			Size	
VOLTS.		PH.		HZ.	
L.R. AMPS	9	Amp.		Class	
RUN AMPS		Amp.		Manufacturer	

Power Measurement	Before	After	Function Test	Before	After
Voltage Between Phase 1 & 2	417.8 V.	405.4 V.	Manual Operation	✓	✓
Voltage Between Phase 1 & 3	421.9 V.	407.6 V.	Local Operation	✓	✓
Voltage Between Phase 2 & 3	421.4 V.	408.1 V.	Local Indication	✓	✓
Current of Phase 1	10.48 A.	9.53 A.	Remote Operation	✓	✓
Current of Phase 2	10.48 A.	9.81 A.	Remote Indication	✓	✓
Current of Phase 3	9.94 A.	9.39 A.	Stoke Time	70.12 Sec.	Sec.

Primary Setting Function	Before Overhaul	After Overhaul
Direction of rotation	Clockwise	Clockwise
Close Action	Close by Limit	Close by Limit
Open Action	Open by Limit	Open by Limit
Torque Switch Close Setting	1550.4 Nm.	1550.4 Nm.
Torque Switch Open Setting	1550.4 Nm.	1550.4 Nm.



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1. Actuator Gear Case	Check	Repair	Replace	Comment
External Threads	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Centre Column	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clutch Assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Flanged	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Worm Shaft Assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Worm Shaft Gear	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2. Base/Stem Nut Assembly	Check	Repair	Replace	Comment
Thrust Base / Stem Nut	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3. Electrical Compartment	Check	Repair	Replace	Comment
Geared Limit Switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Torque Switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local position indication	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Local control switches	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4. Hand Operation	Check	Repair	Replace	Comment
Handwheel Shaft	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Declutch Lever Assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clutch Assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Clutch Pinion Assembly	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Declutch Compression Spring	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5. Terminal Assembly	Check	Repair	Replace	Comment
Terminal Block Connections	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Looms	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Terminal Cover	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Conduit Entries	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6. Electrical Operation	Check	Repair	Replace	Comment
Absolute encoder	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Limit and Torque Switch	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
LCD multi-lingual display	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Power PCB	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Contactors	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Torque sensing	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7. Motor Assembly	Pass	Fail	Comment	
Insulation Test(Flash Test at 500VDC)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	U-G = $\geq 550M \Omega$ V-G = $\geq 550M \Omega$ W-G = $\geq 550M \Omega$	
Windings	U-V = 2.91 $\Omega$ U-W = 2.82 $\Omega$ V-W = 2.83 $\Omega$			
Thermal	0.68 $\Omega$			
Heater	2095 $\Omega$			
8. Option PCBs	Check	Repair	Replace	Comment
Type	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9. Other	Yes	No	Comment	
Paint	<input type="checkbox"/>	<input checked="" type="checkbox"/>		



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# Function Test at Shop (Before)

**Picture Actuator**



Fig 1. Visual Check the Actuator at Shop



Fig 2. Current of Phase 1 (Before)



Fig 3. Current of Phase 2 (Before)



Fig 4. Current of Phase 3 (Before)



Fig 5. Feedback Signal 0% (Before)



Fig 6. Feedback Signal 100% (Before)



Fig 7. Remove Actuator at Shop

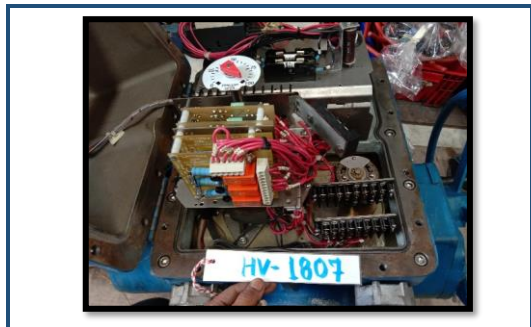


Fig 8. Remover Electronic Part



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# Inspect Mechanic Part



**Picture Actuator**



Fig 9. Inspect Center Column



Fig 10. Inspect Spring Torque



Fig 11. Inspect Worm Gear

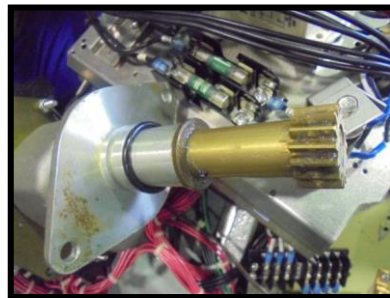


Fig 12. Inspect Gear Torque Switch



Fig 13. Inspect Gear Shaft Motor



Fig 14. Inspect Shaft Hand Wheel



Fig 15. Inspect Declutch Lever



Fig 16. Inspect Motor of the Actuator



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# Cleaning all Part



**Picture Actuator**



Fig 17. Cleaning Center Column



Fig 18. Cleaning Spring Torque



Fig 19. Cleaning Worm Gear



Fig 20. Cleaning Gear Torque Switch



Fig 21. Cleaning Gear Shaft Motor



Fig 22. Cleaning Shaft Hand Wheel



Fig 23. Cleaning Declutch Lever

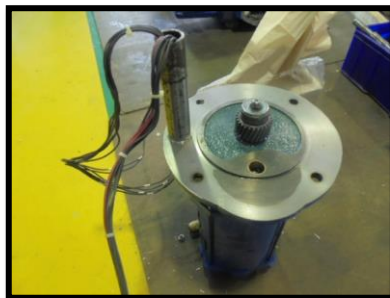


Fig 24. Cleaning Motor of the Actuator



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# Inspection by Penetrant Testing ( PT Test )

**Picture Actuator**



Fig 25. Inspection by Penetrant Testing ( PT Test ) Worm Gear



Fig 26. Inspection by Penetrant Testing ( PT Test ) Worm Gear



Fig 27. Inspection by Penetrant Testing ( PT Test ) Gear Shaft Motor



Fig 28. Inspection by Penetrant Testing ( PT Test ) Gear Shaft Motor



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# Maintenance Kit Replaced

**Picture Actuator**



Fig 29. New Part Kit for Overhaul



Fig 30. Change New O-ring



Fig 31. Change New O-ring



Fig 32. Change New O-ring



Fig 33. Change New O-ring



Fig 34. Change New X-ring



Fig 35. Change New Gasket



Fig 36. Change New Gasket



**Picture Actuator**



Fig 37. Change New Grease



Fig 38. Change New Grease



Fig 39. Assembly Mechanic Part



Fig 40. Assembly Mechanic Part



**Actuator Overhaul Report**



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# **Power Measurement and Function Test at Shop (After)**



**Picture Actuator**



Fig 42. Coil Resistance 1 Test



Fig 43. Coil Resistance 2 Test



Fig 44. Coil Resistance 3 Test



Fig 45. Insulation U1-G Test



Fig 46. Insulation V1-G Test



Fig 47. Insulation W1-G Test



Fig 48. Current of Phase 1 Test (After)



Fig 49. Current of Phase 2 Test (After)

**Picture Actuator**

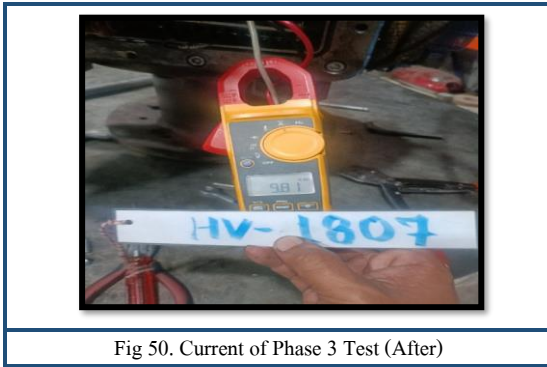


Fig 50. Current of Phase 3 Test (After)



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# Torque Test Bench

**Picture Actuator**



Fig 51. Disassembly Gear Torque Switch



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## Spare Part Replacement

## Engineer's Comments

### Factory testing

- Control power supply
- Customer inputs and outputs
- Direction of rotation
- Handwheel operation
- LCD and LED operations
- Local control
- Microprocessor checks
- Motor current and thermistor
- Output speed and torque
- Position-sensor checks
- Valve jammed function