CAMERON
A Schlumberger Company

Saf-T-Gard MH7035L Series Hydraulic Actuators

For use with 1 13/16-, 2-, 3-, and 4-in nominal gate valves

DESIGN FEATURES

Fail safe design. If hydraulic pressure is lost, the actuator will close the valve with available spring force without the assistance of well bore pressure.

Superior piston design. The top shaft and piston are incorporated into a single unit. T-seals with peek back up seals are utilized. A 3-in piston keeps swept volumes low for quicker displacement and faster closing times.

Nonpressurized actuator housing. The piston assembly is captured in a hydraulic power head contained fluid assembly. This allows the hydraulic head to capture the pressure between the piston seal and the top of the head assembly, keeping the spring housing from being pressurized. Because the housing is not pressurized, proximity switches can be mounted on the side of the housing for electric position indication, versus mounting them to the top shaft assembly.

Corrosion-resistant materials. The Cameron MH7035L actuators are coated externally and internally with Ever-Slik® 1201 corrosion-resistant coating, which provides excellent chemical and abrasion resistance with good thermal stability. The spring package is coated with a SermaGard® coating.

Cameron seal technology. Cameron incorporates its decades of seal design knowledge and experience into its Saf-T-Gard* actuator.

Fixed drift adjustment. Stainless-steel spacers are used during the initial installation of the actuator to adjust the drift. Subsequent removal and replacement of the actuator does not affect the drift setting.

The MH7035L hydraulic actuator was developed for 2-, 3-, and 4-in valves. The MH7035L actuator can operate any gate valve that will require 35,000 lbf or less to open the valve. By focusing on smaller valve sizes, the actuator can be more compact and can fit into areas with space restraints. These types of designs provide the customer with a quality design at minimal cost.

Optional devices and accessories

Cameron has a complete line of accessories available to adapt to existing actuators in the field or installed on new manufactured actuators. Standard items include hydraulic overrides, manual overrides, fusible lock open devices, electric proximity switches, solenoid valves for SCADA tie-ins, quick exhausts, and manual reset relays.

Ease of maintenance

Including the bonnet assembly, the MH7035L actuator consists of 23 components. The actuator without bonnet consists of 16 parts. Minimal downtime is required when replacing the piston seal, as the piston installed at the top of the actuator in a power head assembly separates from the spring housing. Removing the power head and changing the seal can be performed in minutes.

Optional accessories and devices.

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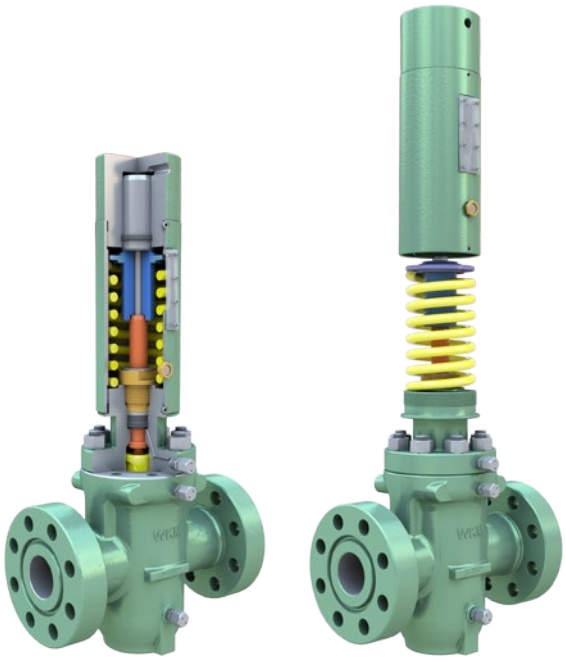
Rising stem and nonrising stem visual indication. A rising stem version is available that provides visual indication when the valve is open or closed. A nonrising stem version is available which provides visual indication via indicator windows mounted on the actuator housing. This version shortens the actuator and removes a seal from the power head.

Rapid closure. The exhaust port is designed with a standard ½-in NPT thread, reducing closure time.

Maintenance	Interval
Cycle open and close	Once a month
Replace actuator seals	Every 5 years or when leakage occurs
Inspect head, housing and piston	When seals are replaced
Replace safety relief device (if applicable)	As required
Clean debris from vent or breather holes	As required
Technical data for MH7035L LT series actuators	
Model	MH7035L
Actuator piston size, in [mm]	3 [76.2]
Specific application sizing, in [mm]	1 13/16 to 4⅛ [46 to 105]
API classification	API 6A (6FA and 6FC are available)
Actuator trim	Standard AA
Retained fluid actuators	Upon request not standard
Actuator bonnet trim	EE, FF, and HH (covers complete range)
PSL	PSL 1, 2, 3, and 4†
PR-1 and PR-2	Appendix F 2.5
Actuator maximum operating pressure, psi [MPa]	6,000 [41.4]
Actuator test pressure, psi [MPa]	9,000 [62.1]
Spring preload at full closed position, lbf [N]	1,200 [5,338]
Actuator operating temperature, degF [degC]	–20 to 250 [–29 to 138]
Actuator inlet port, in	½ NPT
Bonnet backseat test port	Standard
Packing indicator port	Standard

Rising stem design.



Nonrising stem design.

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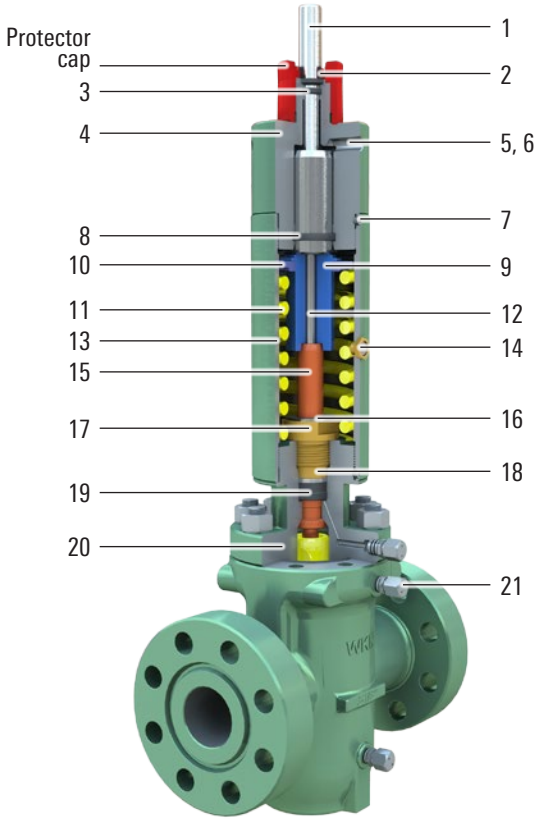


MH7035L Series hydraulic actuator with rising stem.

Actuator Kit		
Item	**Description**	**Material**
1	Piston	Stainless steel
2	Wiper	Elastomer and metal
3	Seal	Elastomer
4	Head	Carbon steel with protective coating
5	Port protector	Plastic
6	Plug	Carbon steel with protective coating
7	Set screw	Stainless steel
8	Seal	Elastomer
9	Downstop	Carbon steel with protective coating
10	Spring retainer	Carbon steel with protective coating
11	Spring	Low alloy steel with protective coating
12	Bolt	Carbon steel with protective coating
13	Housing	Carbon steel with protective coating
14	Vent fitting	Brass
Bonnet Kit		
15	Stem	Material class dependent
16	Washer	Stainless steel
17	Packing retainer	Aluminum bronze
18	Back up ring	Polyaryletherketone (virgin)
19	Packing seal	Standard: SLS* spring-loaded lip seal Optional: VariPak®
20	Bonnet	Material class dependent
21	Grease fitting	Material class dependent

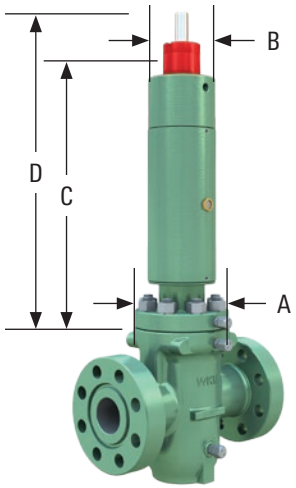
MH7035LNRS Operating Pressure Calculation Formulas Rising Stem Actuator

Valve Size, in	Valve Model	Crack Open Supply Pressure Requirement, psi	Crack Open Supply Pressure Requirement, at Full Differential Pressure, psi [MPa]	Hold Open Supply Pressure Requirement, psi	Hold Open Supply Pressure Requirement, at Full Differential Pressure, psi [MPa]	Swept Volume, in³
1 13/16	10M FLS	.333 × WP + 272	3,602 [24.8]	.214 × WP + 418	2,558 [17.6]	14.41
	15M FLS	.334 × WP + 272	5,282 [36.4]	.214 × WP + 418	3,628 [25.0]	14.41
2 1/16	3M FL/FLS	.338 × WP + 272	1,286 [8.9]	.214 × WP + 419	1,061 [7.3]	14.41
	3M 'M'	.335 × WP + 272	1,277 [8.8]	.214 × WP + 428	1,070 [8.8]	15.13
	5M FL/FLS	.340 × WP + 272	1,972 [13.6]	.214 × WP + 419	1,489 [10.3]	14.41
	5M 'M'	.337 × WP + 272	1,957 [13.5]	.214 × WP + 428	1,498 [10.3]	15.13
	10M FLS	.341 × WP + 272	3,682 [25.4]	.214 × WP + 419	2,559 [17.6]	14.41
	15M FLS	.369 × WP + 272	5,812 [40.1]	.214 × WP + 419	3,628 [25.0]	14.41
2 9/16	3M FL/FLS	.449 × WP + 277	1,624 [11.2]	.258 × WP + 466	1,240 [8.6]	17.69
	3M 'M'	.434 × WP + 277	1,579 [10.9]	.258 × WP + 470	1,244 [8.6]	18.05
	5M FL/FLS	.452 × WP + 277	2,537 [17.5]	.258 × WP + 466	1,756 [12.1]	17.69
	5M 'M'	.436 × WP + 277	2,457 [16.9]	.258 × WP + 470	1,760 [12.1]	18.05
	10M FLS	.453 × WP + 277	4,807 [33.2]	.258 × WP + 466	3,046 [21.0]	17.69
3 1/8	3M FL	.566 × WP + 282	1,980 [13.7]	.307 × WP + 515	1,436 [9.9]	21.16
	3M 'M'	.555 × WP + 282	1,947 [13.4]	.307 × WP + 522	1,443 [10.0]	21.70
	5M FL	.569 × WP + 282	3,127 [21.6]	.307 × WP + 515	2,050 [14.1]	21.16
	5M FLS	.571 × WP + 282	3,137 [21.6]	.307 × WP + 515	2,050 [14.1]	21.16
	5M 'M'	.559 × WP + 282	3,077 [21.2]	.307 × WP + 522	2,057 [14.2]	21.70
4 1/8	3M FL	.901 × WP + 370	3,073 [21.2]	.478 × WP + 850	2,284 [15.8]	21.17
	3M FLS	.903 × WP + 370	3,079 [21.2]	.478 × WP + 850	2,284 [15.8]	21.17
	3M 'M'	.901 × WP + 370	3,073 [21.2]	.478 × WP + 853	2,287 [15.8]	21.35
	5M FL	.905 × WP + 370	4,895 [33.8]	.478 × WP + 850	3,240 [22.3]	21.17
	5M FLS	.908 × WP + 370	4,910 [33.9]	.478 × WP + 850	3,240 [22.4]	21.17
	5M 'M'	.905 × WP + 370	4,895 [33.8]	.478× WP + 853	2,287 [15.8]	21.35

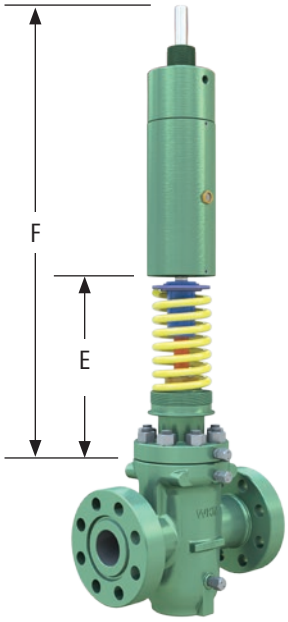
Saf-T-Gard MH7035L Series Hydraulic Actuators

Specification

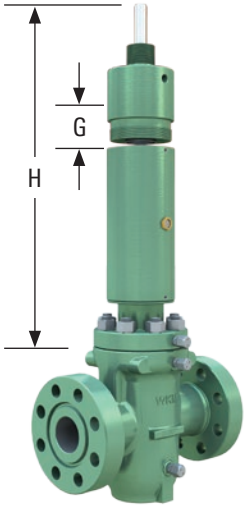
Rising stem



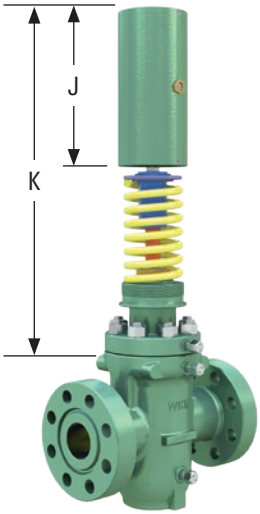
Rising stem design dimensions.



Complete actuator removal.



Partial disassembly removal.

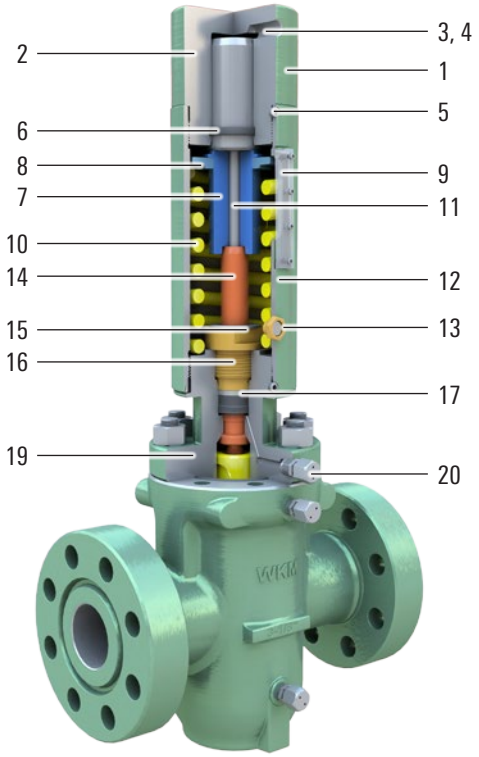


Partial disassembly removal.

Dimensions

Valve Size, in	Valve Model	Bonnet Diameter (A), in	Housing Diameter (B), in	Valve Open Height (C), in	Valve Closed Height (D), in	Complete Actuator Removal Height (E), in	Complete Actuator Removal Height (F), in	Partial Disassembly Removal Height (G), in	Partial Disassembly Removal Height (H), in	Partial Disassembly Removal Height (J), in	Partial Disassembly Removal Height (K), in
1 13/16	10M FLS	8.94	6.62	28.64	31.11	18.66	40.52	1.91	33.33	14.55	33.21
	15M FLS	9.50	6.62	28.64	31.11	18.66	40.52	1.91	33.33	14.55	33.21
2 1/16	3/5M FL/FLS	6.88	6.62	27.92	30.39	17.94	39.80	1.91	32.61	14.55	32.49
	3/5M 'M'	7.13	6.62	28.01	30.61	18.16	40.02	1.91	32.84	14.55	32.71
	10M FLS	9.00	6.62	28.64	31.11	18.66	40.52	1.91	33.33	14.55	33.21
	15M FLS	9.50	6.62	28.64	31.11	18.66	40.52	1.91	33.33	14.55	33.21
2 9/16	3/5M FL/FLS	7.88	6.62	26.92	29.95	17.50	39.36	1.91	32.18	14.55	32.05
	3/5M 'M'	7.75	6.62	26.80	29.89	17.44	39.30	1.91	32.12	14.55	31.99
	10M FLS	9.38	6.62	28.77	31.80	19.35	41.21	1.91	34.03	14.55	33.90
3 1/8	3M FL	8.38	6.62	29.79	33.41	20.50	42.36	1.91	35.64	14.55	35.05
	5M FL	9.12	6.62	29.79	33.41	20.50	42.36	1.91	35.64	14.55	35.05
	5M FLS	9.12	6.62	27.54	31.16	18.25	40.11	1.91	33.39	14.55	32.80
	3/5M 'M'	9.13	6.62	27.03	30.74	17.83	39.69	1.91	32.97	14.55	32.38
4 1/8	3M FL	10.38	8.62	33.00	37.99	23.22	53.51	2.88	40.87	17.97	41.19
	3M FLS	10.38	8.62	31.59	36.58	21.81	52.10	2.88	39.86	17.97	39.78
	3M 'M'	12.13	8.62	31.19	36.18	21.41	51.70	2.88	39.46	17.97	39.38
	5M FL	10.69	8.62	31.59	36.58	21.81	52.10	2.88	39.46	17.97	39.78
	5M FLS	10.81	8.62	31.59	36.58	21.81	52.10	2.88	39.46	17.97	39.78

Saf-T-Gard MH7035L Series Hydraulic Actuators



MH7035L Series hydraulic actuator with nonrising stem.

MH7035L Nonrising Stem Technical Data

Item	Description	Material
Actuator Kit		
1	Piston	Stainless steel
2	Head	Carbon steel with protective coating
3	Port protector	Plastic
4	Plug	Carbon steel with protective coating
5	Set screw	Stainless steel
6	Seal	Elastomer
7	Downstop	Carbon steel with protective coating
8	Spring retainer	Carbon steel with protective coating
9	Indicator window	Clear acrylic
10	Spring	Low-alloy steel with protective coating
11	Bolt	Carbon steel with protective coating
12	Housing	Carbon steel with protective coating
13	Vent fitting	Brass
Bonnet Kit		
14	Stem	Material class dependent
15	Washer	Stainless steel
16	Packing seal	Aluminum bronze
17	Back up ring	Polyaryletherketone (virgin)
18	Packing seal	Standard: SLS seal Optional: VariPak
19	Bonnet	Material class dependent
20	Grease fitting	Material class dependent

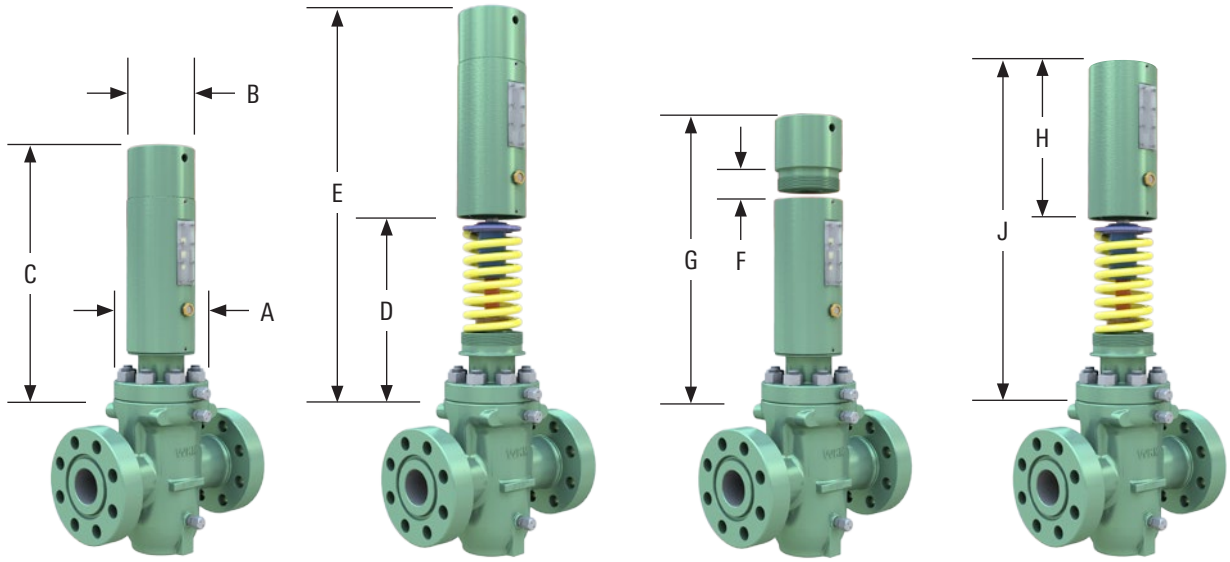
MH7035LNRS Operating Pressure Calculation Formulas Nonrising Stem Actuator

Valve Size, in	Valve Model	Crack Open Supply Pressure Requirement, psi	Crack Open Supply Pressure Requirement, at Full Differential Pressure, psi [MPa]	Hold Open Supply Pressure Requirement, psi	Hold Open Supply Pressure Requirement, at Full Differential Pressure, psi [MPa]	Swept Volume, in³
1 13/16	10M FLS	.276 × WP + 220	2,980 [20.6]	.177 × WP + 341	2,111 [14.6]	17.43
	15M FLS	.276 × WP + 220	4,360 [30.1]	.177 × WP + 341	2,996 [20.7]	17.43
2 1/16	3M FL/FLS	.279 × WP + 220	1,057 [7.3]	.177 × WP + 341	872 [6.0]	17.43
	3M 'M'	.277 × WP + 220	1,051 [7.2]	.177 × WP + 349	880 [6.1]	18.30
	5M FL/FLS	.281 × WP + 220	1,625 [11.2]	.177 × WP + 341	1,226 [8.5]	17.43
	5M 'M'	.279 × WP + 220	1,615 [11.1]	.177 × WP + 349	1,234 [8.5]	18.30
	10M FLS	.282 × WP + 220	3,040 [21.0]	.177 × WP + 341	2,111 [14.6]	17.43
	15M FLS	.305 × WP + 220	4,795 [33.1]	.177 × WP + 341	2,996 [20.7]	17.43
2 9/16	3M FL/FLS	.371 × WP + 224	1,337 [9.2]	.213 × WP + 380	1,019 [7.0]	21.40
	3M 'M'	.359 × WP + 224	1,301 [9.0]	.213 × WP + 384	1,023 [7.1]	21.83
	5M FL/FLS	.373 × WP + 224	2,089 [14.4]	.213 × WP + 380	1,445 [10.0]	21.40
	5M 'M'	.361 × WP + 224	2,029 [14.0]	.213 × WP + 384	1,449 [10.0]	21.83
	10M FLS	.375 × WP + 224	3,974 [27.4]	.213 × WP + 380	2,510 [17.3]	21.40
3 1/8	3M FL	.468 × WP + 229	1,633 [11.3]	.254 × WP + 421	1,183 [8.2]	25.59
	3M 'M'	.459 × WP + 229	1,606 [11.1]	.254 × WP + 427	1,189 [8.2]	26.25
	5M FL	.470 × WP + 229	2,579 [17.8]	.254 × WP + 421	1,691 [14.1]	25.59
	5M FLS	.472 × WP + 229	2,589 [17.9]	.254 × WP + 421	1,691 [11.7]	25.59
	5M 'M'	.462 × WP + 229	2,539 [17.5]	.254 × WP + 427	1,697 [11.7]	26.25
4 1/8	3M FL	.745 × WP + 301	2,536 [17.5]	.395 × WP + 698	1,883 [13.0]	32.87
	3M FLS	.747 × WP + 301	2,542 [17.5]	.395 × WP + 698	1,883 [13.0]	32.87
	3M 'M'	.745 × WP + 301	2,536 [17.5]	.395 × WP + 701	1,888 [13.0]	33.09
	5M FL	.748 × WP + 301	4,895 [27.9]	.395 × WP + 698	2,673 [18.4]	32.87
	5M FLS	.751 × WP + 301	4,056 [28.0]	.395 × WP + 698	2,673 [18.4]	32.87
	5M 'M'	.748 × WP + 301	4,895 [27.9]	.395 × WP + 701	2,676 [18.5]	33.09

Saf-T-Gard MH7035L Series Hydraulic Actuators

Specification

Nonrising stem



Nonrising stem design dimensions. *Complete actuator removal.* *Partial disassembly removal.* *Partial disassembly removal*

Dimensions

Valve Size, in	Valve Model	Bonnet Diameter (A), in	Housing Diameter (B), in	Valve Open or Closed	Complete Actuator Removal		Partial Disassembly Removal			
				Height (C), in	Height (D), in	Height (E), in	Height (F), in	Height (G), in	Height (H), in	Height (J), in
1 13/16	10M FLS	8.94	6.62	22.91	18.66	38.12	1.91	24.82	14.55	33.21
	15M FLS	9.50	6.62	22.91	18.66	38.12	1.91	24.82	14.55	33.21
2 1/16	3M/5M FL/FLS	6.88	6.62	22.19	17.94	37.40	1.91	24.10	14.55	32.49
	3M/5M 'M'	7.13	6.62	22.28	18.16	37.62	1.91	24.19	14.55	32.71
	10M FLS	9.00	6.62	22.91	18.66	38.12	1.91	24.82	14.55	33.21
	15M FLS	9.50	6.62	22.91	18.66	38.12	1.91	24.82	14.55	33.21
2 9/16	3M/5M FL/FLS	7.88	6.62	21.19	17.50	36.96	1.91	23.10	14.55	32.05
	3M/5M 'M'	7.75	6.62	21.07	17.44	36.90	1.91	22.98	14.55	31.99
	10M FLS	9.38	6.62	23.04	19.35	38.81	1.91	24.95	14.55	33.90
3 1/8	3M FL	8.38	6.62	23.42	20.50	39.96	1.91	25.33	14.55	35.05
	5M FL	9.12	6.62	23.42	20.50	39.96	1.91	25.33	14.55	35.05
	5M FLS	9.12	6.62	21.17	18.25	37.71	1.91	23.08	14.55	32.80
	3M/5M 'M'	9.13	6.62	20.66	17.83	37.29	1.91	22.57	14.55	32.38
4 1/8	3M FL	10.38	8.62	30.60	23.22	46.12	2.88	33.48	17.97	41.19
	3M FLS	10.38	8.62	29.19	21.81	44.71	2.88	32.07	17.97	39.78
	3M 'M'	12.13	8.62	28.79	21.41	44.31	2.88	31.67	17.97	39.38
	5M FL	10.69	8.62	29.19	21.81	44.71	2.88	32.07	17.97	39.78
	5M FLS	10.81	8.62	29.19	21.81	44.71	2.88	32.07	17.97	39.78
	5M 'M'	12.13	8.62	28.79	21.41	44.31	2.88	31.67	17.97	39.38

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